

# March Monthly Compliance Report

Solid Waste Permit #588  
Bristol Integrated Solid Waste Management Facility  
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**SCS ENGINEERS**

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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.iii in Appendix A of the Consent Decree between the City and VDEQ. This report covers the Solid Waste Permit #588 landfill during the month of March.

### 1.0 GAS COLLECTION

The following sections describe the steps the City, in collaboration with its consultants and contractors, has taken to improve the operation, monitoring, and performance of the facility's landfill gas collection and control system (GCCS).

#### 1.1 SURFACE AND LEACHATE COLLECTION EMISSIONS

##### 1.1.1 Surface Emissions

###### 1.1.1.1 Quarterly SEM

SCS performed the First Quarter surface emissions monitoring event on March 15, 2023. The surface emission monitoring route included the entire waste footprint of the Permit No. 588 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 outside of the active filling area.

No exceedances were detected during this quarterly monitoring event on the serpentine route or at the pipe penetrations. This monitoring event also represented the weekly monitoring event for that week. A quarterly SEM report will be submitted to the VDEQ as part of the Semi-Annual Report. In addition, monitoring results were presented to the VDEQ in a letter dated March 22, 2023.

###### 1.1.1.2 Weekly SEM

In addition to the standard regulatory quarterly surface emissions monitoring, SCS performed additional surface emissions monitoring on March 9, 2023, March 23, 2023, and March 29, 2023. (The quarterly event on March 15, 2023, described in section 1.1.1.1, also represents a weekly SEM event.) These Weekly Surface Emissions Monitoring (SEM) Events were performed in accordance with Section 3.5 of the Plan of Action in Response to the Expert Panel Report, submitted to VDEQ on July 6, 2022.

The monitoring in March generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 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 surface emission monitoring route included the entire waste footprint of the Permit No. 588 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.

SCS submitted letters to VDEQ outlining the results of the March monitoring events on March 15, 2023, March 22, 2023, March 29, 2023, and April 5, 2023. Copies of those submittals are included in Appendix A. Table 1 summarizes the results of the four monitoring events in March.

Table 1. Summary of March Surface Emissions Monitoring

Description	March 9, 2023	March 15, 2023	March 23, 2023	March 29, 2023
Number of Points Sampled	149	149	149	147
Number of Points in Serpentine Route	100	100	100	100
Number of Points at Surface Cover Penetrations	49	49	49	47
Number of Exceedances	0	0	0	1
Number of Serpentine Exceedances	0	0	0	0
Number of Pipe Penetration Exceedances	0	0	0	1

Out of the 594 recorded points monitored as part of the four March monitoring events, only one exceedance was found. The exceedance was a pipe penetration exceedance located at gas extraction well (EW) 52. Following the surface emissions monitoring event, the liquids removal pump was repaired and the flexible hose connecting the well to the header piping was replaced. This location will be monitored again during the week of April 3, 2023 to confirm that surface emissions have been reduced at this location.

### 1.1.2 Leachate Collection Emissions

SCS Field Services (SCS-FS) visited the Bristol Landfill on March 1, 2023, and performed monitoring of the leachate, witness zone, and gradient control clean-outs at the northern and southern ends of the landfill. The results of that monitoring are included in SCS-FS's summary report for the month of March dated April 7, 2023. A copy of this report is included in Appendix B. The monitoring data for the clean-outs at the southern end of the landfill are listed as LC01 – LC10. The monitoring data for the clean-outs at the northern end of the landfill are listed as NC01 – NC10. Table 2 presents the cleanout pipe identification labeling convention, which is based on site records and review of correspondence.

Table 2. Cleanout Pipe Identification

Northern Cleanouts		Southern Cleanouts	
ID #	Description	ID #	Description
NC01	Leachate East	LC01	Gradient West
NC02	Leachate Center	LC02	Gradient East
NC03	Leachate West	LC03	Leachate Center
NC04	Witness East	LC04	Witness East

Northern Cleanouts		Southern Cleanouts	
ID #	Description	ID #	Description
NC05	Witness Center	LC05	Leachate West
NC06	Witness West	LC06	Gradient Center West
NC07	Gradient East	LC07	Leachate East
NC08	Gradient Center East	LC08	Gradient Center East
NC09	Gradient Center West	LC09	Leachate West
NC10	Gradient West	LC10	Witness Center

## 1.2 EXISTING GAS EXTRACTION SYSTEM PERFORMANCE

SCS and SCS-FS have been coordinating with the City to improve the performance of the existing gas system. Specific actions taken to maintain and improve the system are detailed in SCS-FS's summary report for the month of March.

## 1.3 REMOTE MONITORING SYSTEM

In the fall of 2022, SCS Remote Monitoring & Control (SCS-RMC) installed 25 industrial internet of things (IIoT) temperature sensors in the landfill gas well-heads. The purpose of the sensors is to record and transmit well-head gas temperatures via a cellular connection to a database managed by SCS-RMC. As outlined in previous monthly compliance reports for the SWP #588 Landfill the system is currently undergoing commissioning.

The City is providing average temperatures recorded by the sensors to VDEQ on a daily basis via e-mail. In addition, SCS prepares a semi-monthly report with analysis of this data. The semi-monthly reports for March are included in Appendix C.

## 1.4 LARGE-DIAMETER DUAL-PHASE EXTRACTION WELLS

SCS completed design work on an expansion of the existing GCCS during the month of December. The proposed expansion includes at least 5 large diameter dual-phase extraction wells. SCS submitted the design to VDEQ prior to December 31, 2022. The City commenced solicitation of contractor's bids for this project by advertising for bids and received one bid for the project from SCS Field Services Construction (SCS-CONS). On January 26, 2023 the City awarded the project to SCS-CONS.



Figure 1. Proposed Landfill Gas Collect Well Location Marker



During the week of March 6, 2023, the proposed locations of the large diameter dual extraction wells and the perimeter LFG wells described in Section 2.1 were surveyed and marked in the field by the City's surveyor. An example of a proposed well location marked in the field is shown in Figure 1. In some cases the proposed well locations were modified to avoid conflicts with existing infrastructure. Proposed well elevations were recorded and reviewed by SCS. The proposed well scheduled was modified based on the surveyed well locations and elevations.

Figure 2. Trailer Landfill Gas Well Drilling Supplies Delivered to the ISWMF



During the week of March 20, 2023 SCS-CONS began the process of mobilizing equipment to the site. Figures 2 and 3 show examples of tools and supplies mobilized to the site.

Figure 3. Landfill Gas Collection System Piping Delivered to the ISWMF



During the week of March 20, 2023 chlorinated polyvinyl chloride (CPVC) casings for the perimeter LFG wells described in Section 2.1 also arrived on site. Due to the longer lead times associated the steel casings required for the large diameter dual extraction wells, those casings were not delivered during the month of March. Drilling of the perimeter LFG wells began during the last week of March and those activities are described in Section 2.1.

## 1.5 VDEQ CONCURRENCE ON WELLS

As described in previous monthly compliance reports, the City engaged with VDEQ in discussions about the proposed approach for landfill GCCS improvements and expansions. Upon completion of the landfill gas collection system, SCS will submit updated as-built drawings depicting the completed system to VDEQ. The City intends to delay installation of temporary or final cover systems until the City and VDEQ agree that the GCCS is sufficient.

## 2.0 SIDEWALL ODOR MITIGATION

The City initiated design and construction work to address fugitive emissions emanating from the quarry sidewalls. Specific aspects of the proposed design features are outlined in the following sections.

### 2.1 PERIMETER GAS COLLECTION SYSTEM

SCS's design of the GCCS expansion outlined in Section 1.4 included perimeter LFG wells. These wells will be placed closer to the sidewall to intercept landfill gas that potentially could migrate to the quarry wall. These wells will supplement the sidewall odor mitigation system described in section 2.2. The City completed bidding and contracting of construction for the perimeter LFG wells as part of the large diameter dual extraction well installation described in Section 1.4.



During the week of March 20, 2023 the CPVC casings for the perimeter LFG wells were delivered to the site along with other equipment and supplies required for construction. The casings delivered to site are shown in Figure 4.

Figure 4. Chlorinated Polyvinyl Chloride Casing for Landfill Gas Extraction Wells



On March 28, 2023 a pre-construction meeting was held with SCS, SCS-CONS, and the City in attendance. Drilling of perimeter LFG wells began on March 29, 2023. Figure 5 shows drilling operations. Drilling of perimeter wells EW-69, EW-70, EW-73, EW-76, and EW-78 was completed in March. Approximately 438 vertical feet of landfill gas extraction wells were drilled during the month of March. This length represents approximately 25 percent of the total vertical length of perimeter LFG wells proposed.

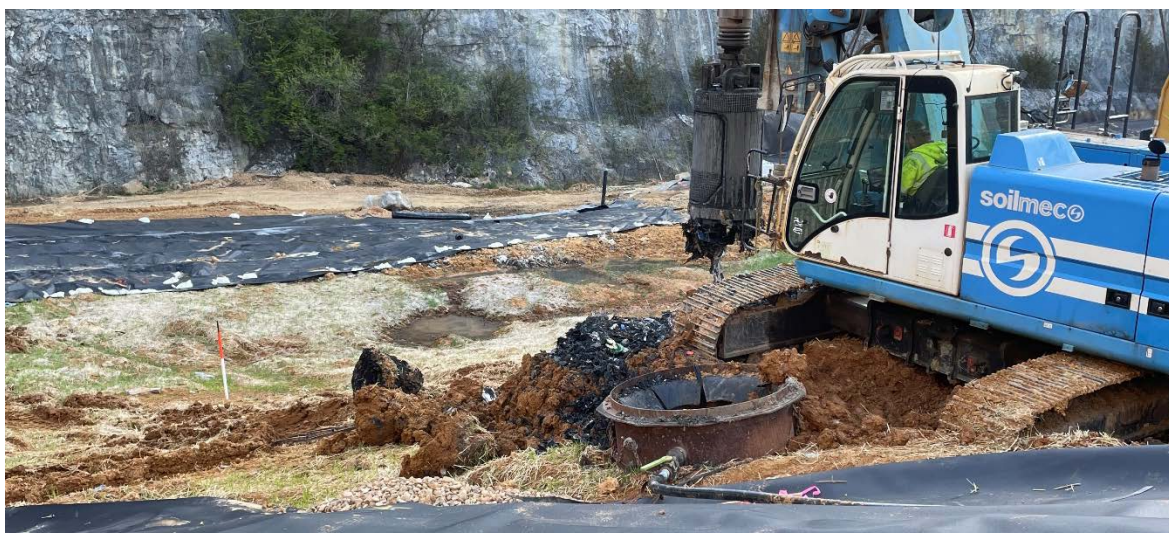


Figure 5. Landfill Gas Extraction Well Drilling



SCS-CONS is utilizing a vacuum box to reduce emissions from partially drilled wells. The vacuum box is placed over partially constructed wells when drilling will not be completed during a single day. The vacuum box covers the open well and is connected to the active GCCS. Landfill gas is conveyed through the vacuum box to the GCCS so it is not emitted. The vacuum box may also be utilized during drilling to reduce emissions during drilling. The vacuum box utilized for this project is shown in Figure 6.

Figure 6. Vacuum Box at the Base of Drill Rig



Drilling of the perimeter LFG wells will continue during the month of April.

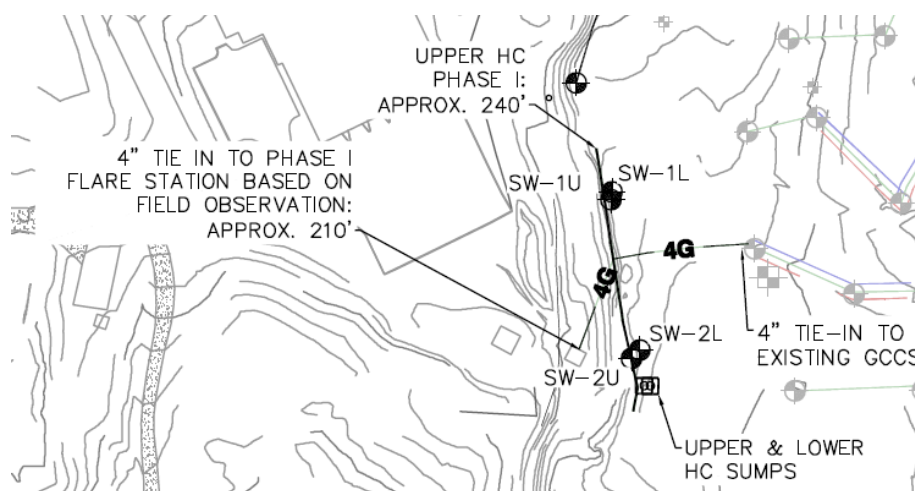
## 2.2 SIDEWALL ODOR MITIGATION SYSTEM

On behalf of the City and in an effort to capture emissions from the quarry sidewall, SCS designed a sidewall odor mitigation system (SOMS) during the month of October. On October 20, 2022 SCS provided an overview of the proposed system to VDEQ staff. The design of this system was prepared and submitted to VDEQ on November 1, 2022. A project manual detailing the specifications of the system was developed concurrently with the design of the system.

## 2.3 PILOT SYSTEM CONSTRUCTION

SCS-CONS completed substantial construction of Phase 1 of the SOMS during the month of February, and began monitoring Phase 1 connected Horizontal Collector (HC) wellheads during the month of March. Phase 1 is considered the pilot system portion of the SOMS. SCS submitted a design engineer certification to VDEQ on February 10, 2023 that documented the substantial completion of Phase 1 of the SOMS. Figure 7 shows the Phase 1 as-built, which includes the locations of the HC wellheads and HC sumps installed in Phase I, as well as the 4" header connection to the existing LFGCCS.

Figure 7. SOMS Phase I Approximate As-Built



Phase 1 was initially connected to an auxiliary flare located near the system. HC wellhead measurements of gas quality were taken on a weekly basis during the month of March. A summary of those measurements is shown in Table 3.

Table 3. Sidewall HC Wellhead Gas Quality Measurements

Device ID	Date/Time	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)
SW1L	3/9/2023 9:50:28 AM	6.4	14.7	15.2
SW1L	3/10/2023 12:10:17 PM	22.4	30.9	7.5
SW1L	3/15/2023 3:16:41 PM	14.2	23.8	11.0
SW1L	3/17/2023 3:30:52 PM	34.9	45.3	0.8



Device ID	Date/Time	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)
SW1L	3/20/2023 1:40:23 PM	4.0	12.3	15.4
SW1L	3/23/2023 9:34:25 AM	9.0	22.7	11.3
SW1L	3/28/2023 9:33:52 AM	8.2	30.5	11.3
SW1U	3/9/2023 9:54:02 AM	0.1	1.3	23.0
SW1U	3/10/2023 12:06:59 PM	1.3	4.1	19.1
SW1U	3/17/2023 3:34:03 PM	13.0	26.9	12.2
SW1U	3/23/2023 9:36:43 AM	1.1	3.4	19.5
SW1U	3/28/2023 9:36:22 AM	0.8	11.0	21.7
SW2L	3/9/2023 9:57:28 AM	18.4	28.0	10.4
SW2L	3/10/2023 12:00:09 PM	42.6	50.0	0.8
SW2L	3/15/2023 3:09:57 PM	30.2	43.8	4.8
SW2L	3/17/2023 3:38:53 PM	40.6	56.7	0.0
SW2L	3/20/2023 1:45:05 PM	24.8	42.1	6.3
SW2L	3/23/2023 9:39:47 AM	28.0	46.1	4.4
SW2L	3/28/2023 9:39:12 AM	28.3	54.5	4.5
SW2U	3/9/2023 10:06:59 AM	0.6	2.2	22.8
SW2U	3/10/2023 12:03:14 PM	30.0	55.7	1.7
SW2U	3/15/2023 2:59:18 PM	17.2	35.5	9.3
SW2U	3/17/2023 3:41:57 PM	32.0	63.3	0.2
SW2U	3/20/2023 1:49:35 PM	10.6	25.1	14.2
SW2U	3/23/2023 9:42:07 AM	13.2	31.3	11.5
SW2U	3/28/2023 9:41:32 AM	13.5	45.4	11.1

Sidewall wellhead lower collector 1 (SW1L) is connected to the horizontal collector placed in waste inside the landfill liner close to the northern limit of Phase 1. Measurements of gas composition taken at SW1L indicate that methane levels are low, but that landfill gas is being captured by the system. Sidewall wellhead upper collector 1 (SW1U) is connected to the horizontal collector placed outside of the liner and waste. SW1U is close to the northern limit of Phase 1. Measurements of gas composition taken at SW1U indicate that ambient air is being pulled in at this location. This is expected for the proximity of this section of the horizontal collector to the Phase 1 temporary termination.

Sidewall wellhead lower collector 2 (SW2L) is connected to the horizontal collector placed in waste inside the landfill liner close to the center of Phase 1. Measurements of gas composition taken at SW1L indicate that methane levels are lower than typical of landfill gas collection systems, but that landfill gas is being captured by the system. Sidewall wellhead upper collector 2 (SW2U) is connected to the horizontal collector placed outside of the liner and waste. SW2U is close to the center of Phase 1. Measurements of gas composition taken at SW2U indicate that methane levels are low, but that landfill gas is being captured by the system.

The fact that landfill gas is being collected by both the upper and lower collectors is evidence that the system is capturing fugitive emissions. This data supports the construction of Phase 2 utilizing the same general configuration. SCS-FS will continue to monitor Phase 1 of the system during the month of April.

Soil cover was installed on top of Phase 1 of the system during the remainder of March. Figure 8 shows soil placement on Phase 1 of the system. Phase 1 collectors were connected to the existing LFG system via a 4-inch HDPE pipe with isolation valves on February 16, 2023. Wellheads were installed at 4 locations on Phase 1 of the SOMS. Gas collected from the SOMS is currently routed to the primary flare and power generation facility. On March 2, 2023, SCS-CON made repairs to the 4-inch HDPE pipe layout to correct fall for proper condensate drainage.

Figure 8. Phase 1 Sidewall Odor Mitigation System Construction





## 2.4 FULL SYSTEM CONSTRUCTION

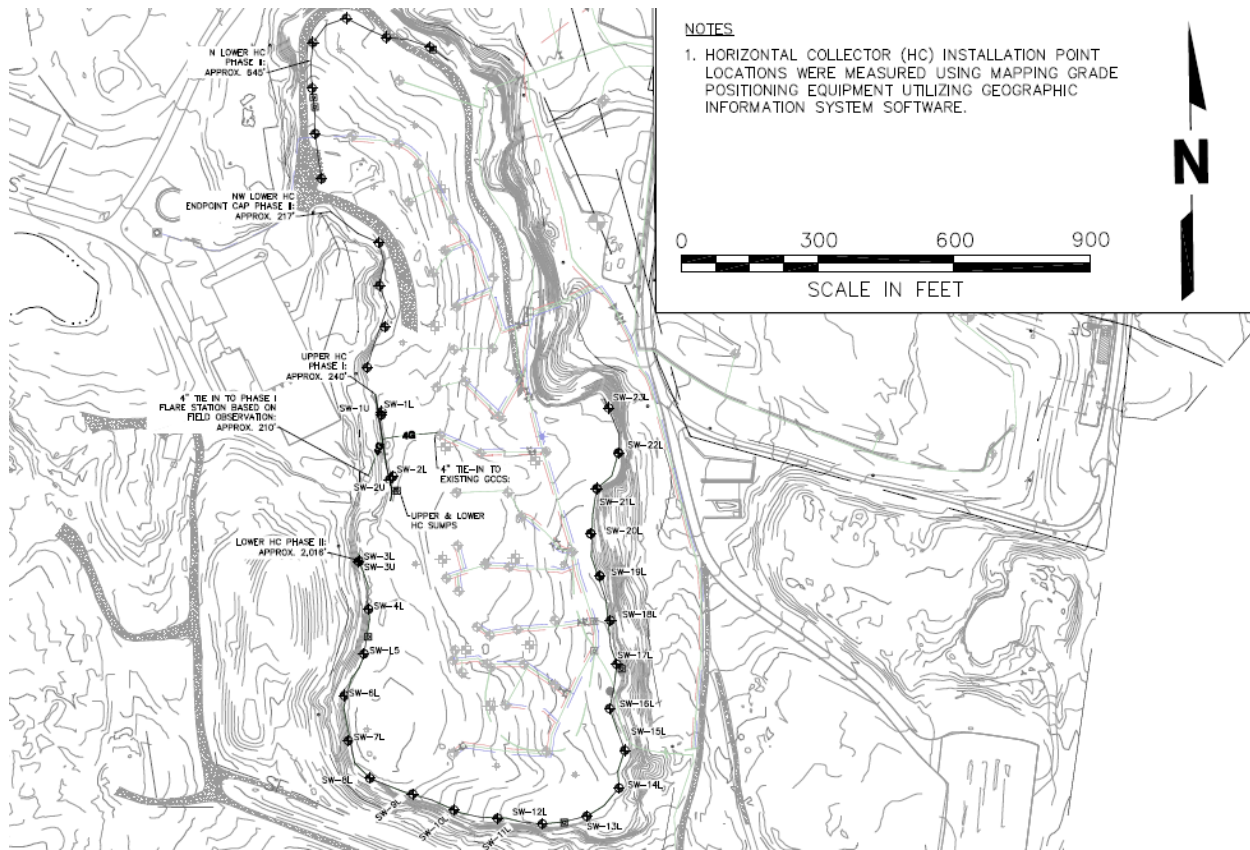
SCS-CONS continued construction of Phase 2 of the SOMS. Lower horizontal collector placement has been completed along the west sidewall south of Phase 1, the south sidewall, the southern portion of the east sidewall, and now further toward the northeastern sidewall. Figure 9 shows Phase 2 construction activities. The crew continued the installation of liquids collection sumps at low elevation points, and wellheads were installed every 100'. Phase 2 lower collector construction progress, including HC wellhead and sump locations, is shown in the approximate as-built depicted as Figure 10.

Figure 9. Phase 2 SOMS Construction



Some sections of sidewall were found to have discontinuities in the existing liner. Work proceeded along the inconsistent liner conditions based on the procedures proposed as a result of discussions between SCS, the City, and VDEQ.

Figure 10. Phase 2 Sidewall Odor Mitigation System Progress As-Built



Throughout the month of March, SCS-CON continued trenching for Phase 2 installation. During the week of March 13, 2023 SCS-CON began placing the geomembrane on top of the lower collector. This installation process continued during the remainder of the month.

### 3.0 WASTE TEMPERATURE MONITORING

On behalf of the City, SCS designed a temperature monitoring system to collect temperature data throughout the waste mass. The steps taken by the City to implement this system are described in the following sections.

#### 3.1 TEMPERATURE MONITORING SYSTEM DESIGN

The temperature monitoring system consists of 9 boreholes drilled into the waste mass. A steel casing was placed in each borehole and the hole was backfilled around the casing with aggregate. A series of temperature sensors was placed inside the steel casing. At the top of each borehole, an IloT transmitter collects the data from the sensors and transmits it to a cloud-based RMC system. The City submitted design of the temperature monitoring system to VDEQ on November 30, 2022.

## 3.2 TEMPERATURE MONITORING SYSTEM INSTALLATION

Installation of the in-situ Landfill Temperature Monitoring System began in October of 2022 and installation of replacement sensors was completed in February of 2023. Details of construction progress can be found in the monthly compliance reports for the SWP #588 Landfill.

SCS began collecting temperature data on a daily basis on February 15, 2023. The temperature sensors continued to transmit temperature data from all 9 casings during the month of March. Average daily temperatures recorded by the sensors for the Month of March are included in Appendix D. Each week the average temperatures from Wednesday of that week are downloaded and compared to temperatures recorded during the previous week. The average daily temperatures recorded on Wednesdays during the month of March are shown in Figures 9 through 17 on the following pages. For reference average temperatures recorded on February 15, 2023 (the first day that the sensors collected data) are also shown.

Figure 11 shows daily average temperatures in Temperature Probe 1 (TP-1) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. On average, during the month of March the average variation in temperatures along the length of the probe was approximately 2 degrees Fahrenheit. TP-1 was originally drilled to a depth of 180 feet, but the contractor was unable to install the casing beyond a depth of 160 feet. TP-1 is equipped with an ambient temperature sensor above the waste surface, but a software issue prevented that sensor from reporting during the month of February. A software update resolved the ambient temperature reporting issue and ambient temperatures were recorded during the month of March.

Figure 11. Average Temperatures within TP-1 on Select Days in March

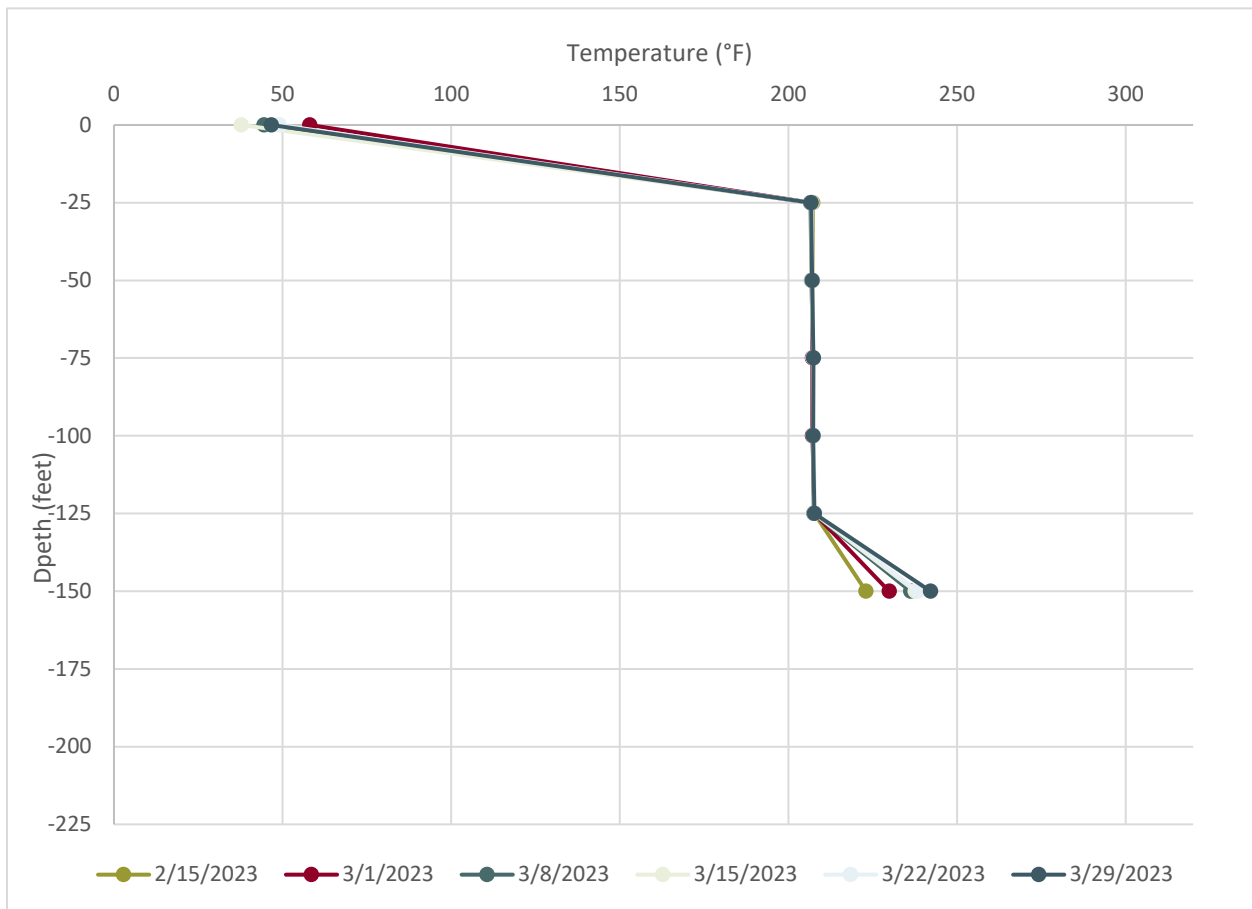


Figure 12 shows daily average temperatures in Temperature Probe 2 (TP-2) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. During the month of March the average variation in temperatures along the length of the probe was approximately 42 degrees Fahrenheit. TP-2 was originally drilled to a depth of 160 feet. TP-2 is equipped with an ambient temperature sensor above the waste surface, but a software issue prevented that sensor from reporting during the month of February. A software update resolved the ambient temperature reporting issue and ambient temperatures were recorded during the month of March.

Figure 12. Average Temperatures within TP-2 on Select Days in March

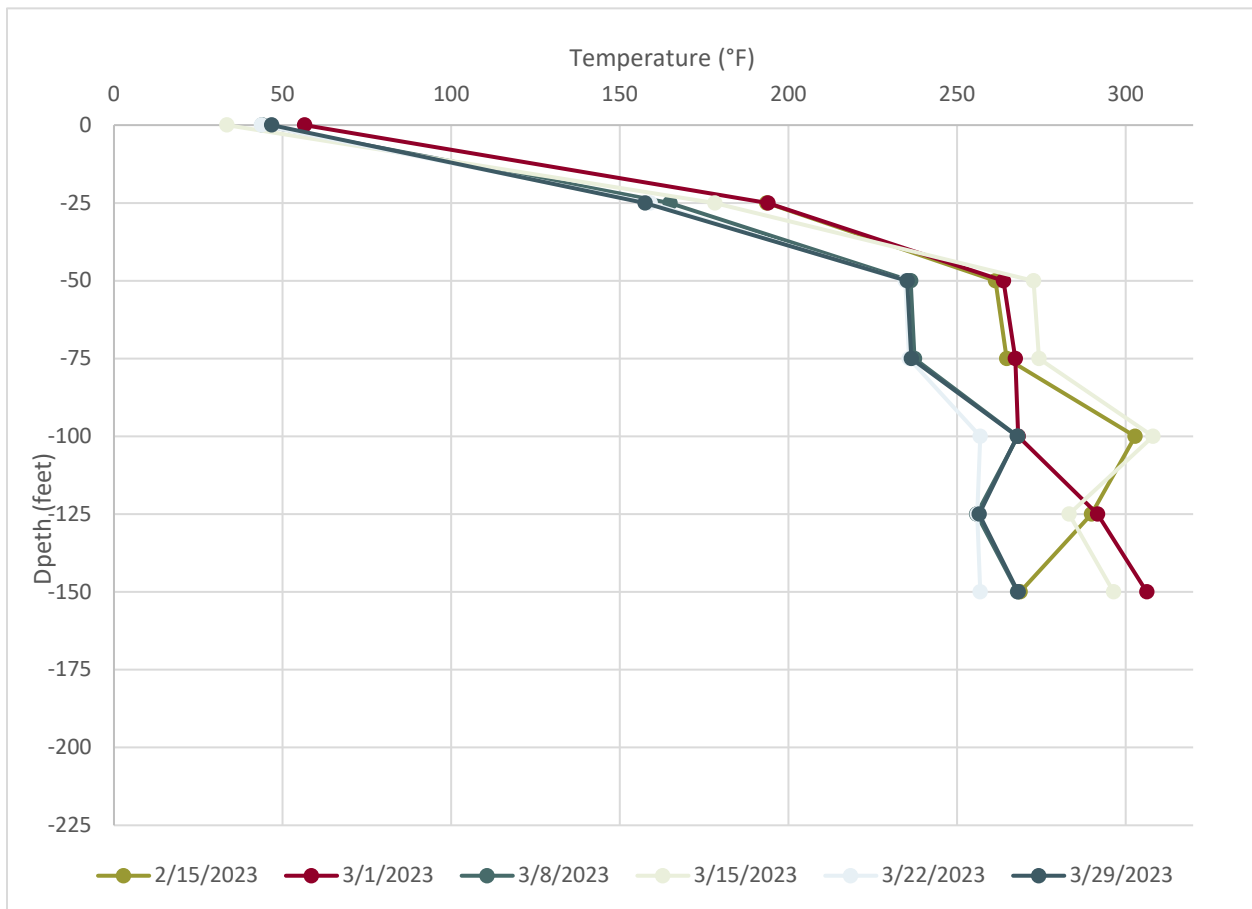




Figure 13 shows daily average temperatures in Temperature Probe 3 (TP-3) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. During the month of March the average variation in temperatures along the length of the probe was approximately 5 degrees Fahrenheit.

Figure 13. Average Temperatures within TP-3 on Select Days in March

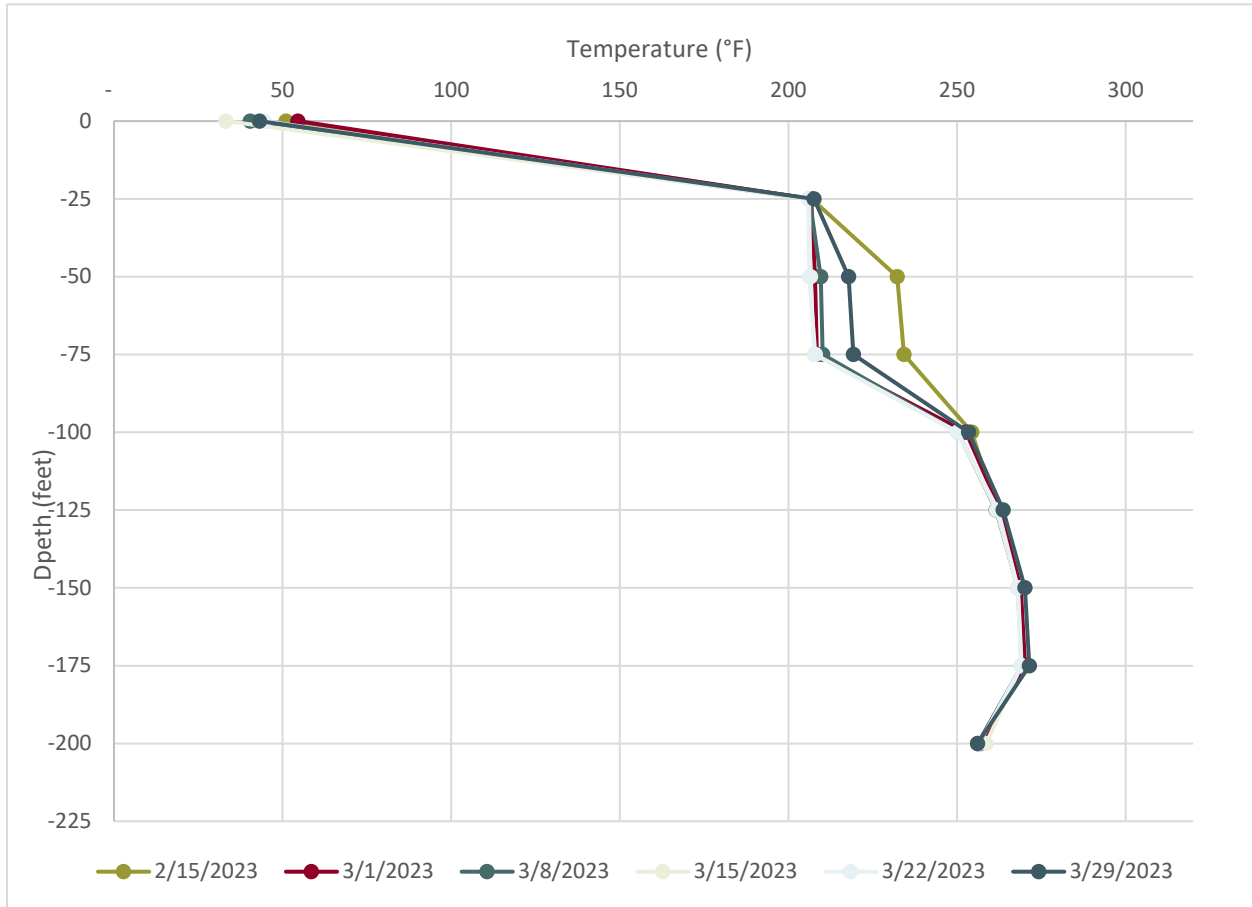




Figure 14 shows daily average temperatures in Temperature Probe 4 (TP-4) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. During the month of March the average variation in temperatures along the length of the probe was approximately 8 degrees Fahrenheit.

Figure 14. Average Temperatures within TP-4 on Select Days in March

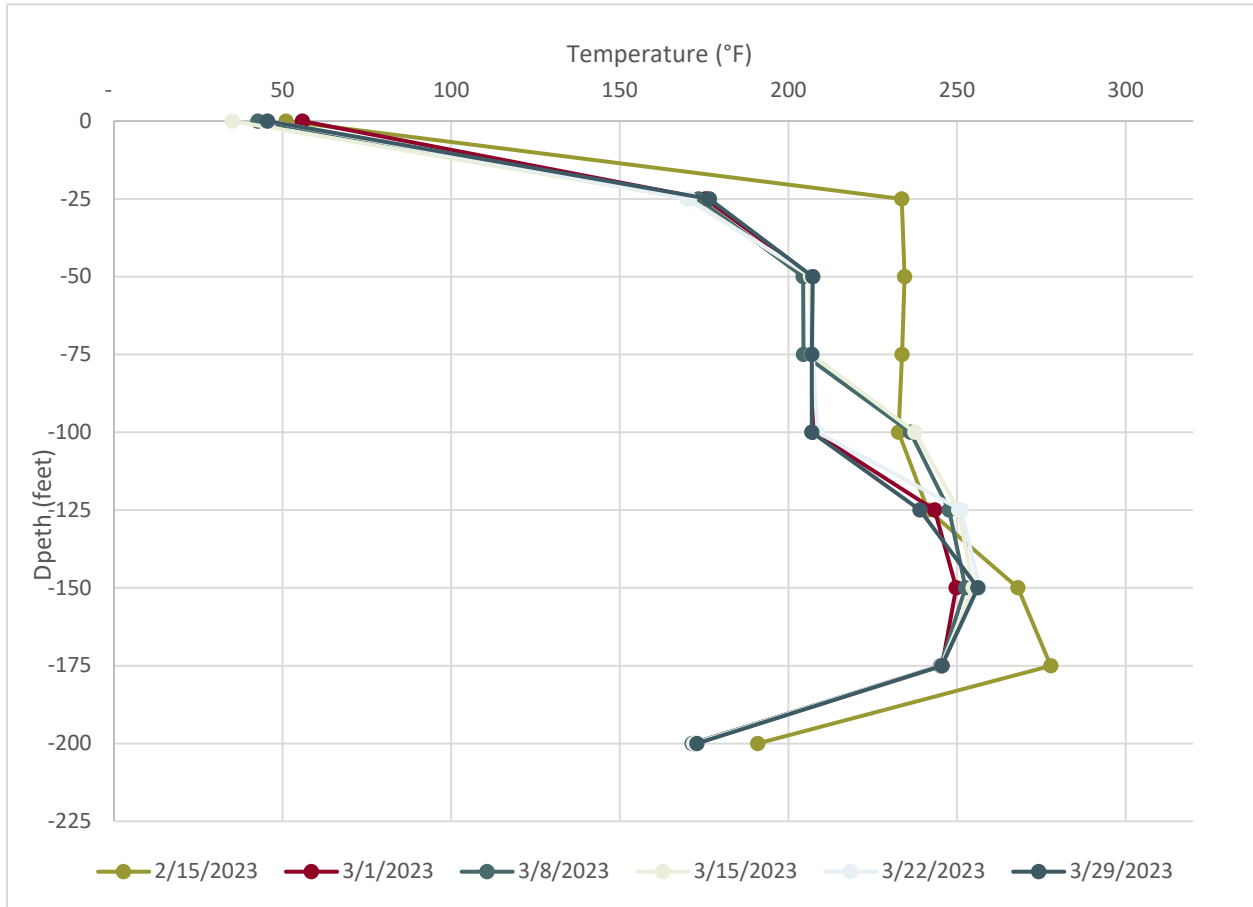


Figure 15 shows daily average temperatures in Temperature Probe 5 (TP-5) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. During the month of March the average variation in temperatures along the length of the probe was approximately 6 degrees Fahrenheit.

Figure 15. Average Temperatures within TP-5 on Select Days in March

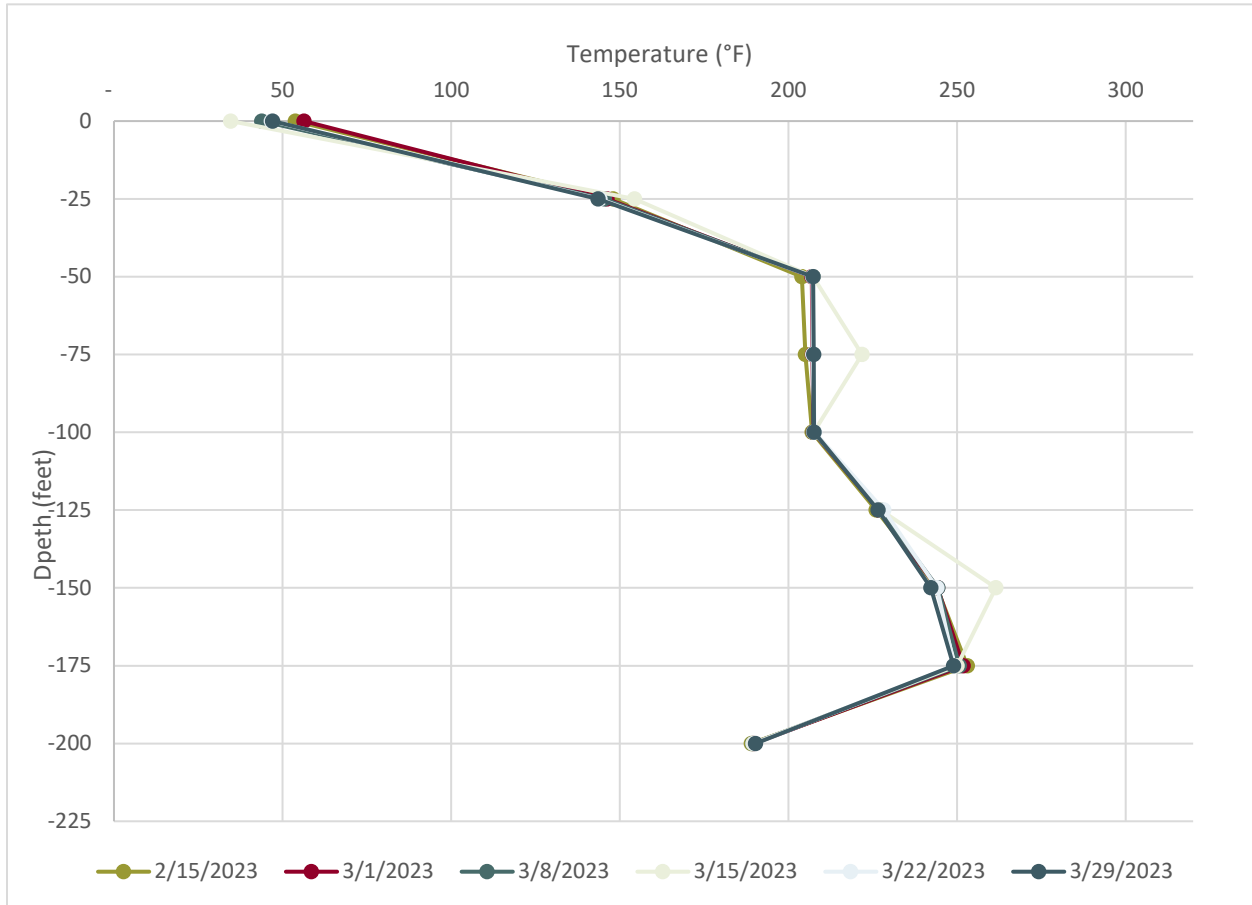


Figure 16 shows daily average temperatures in Temperature Probe 6 (TP-6) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. During the month of March the average variation in temperatures along the length of the probe was approximately 25 degrees Fahrenheit. TP-6 was originally drilled to a depth of 208 feet and casing was installed to the full depth. During the installation of the replacement sensors, a blockage within the casing prevented placement of sensors below the 125-foot depth.

Figure 16. Average Temperatures within TP-6 on Select Days in March

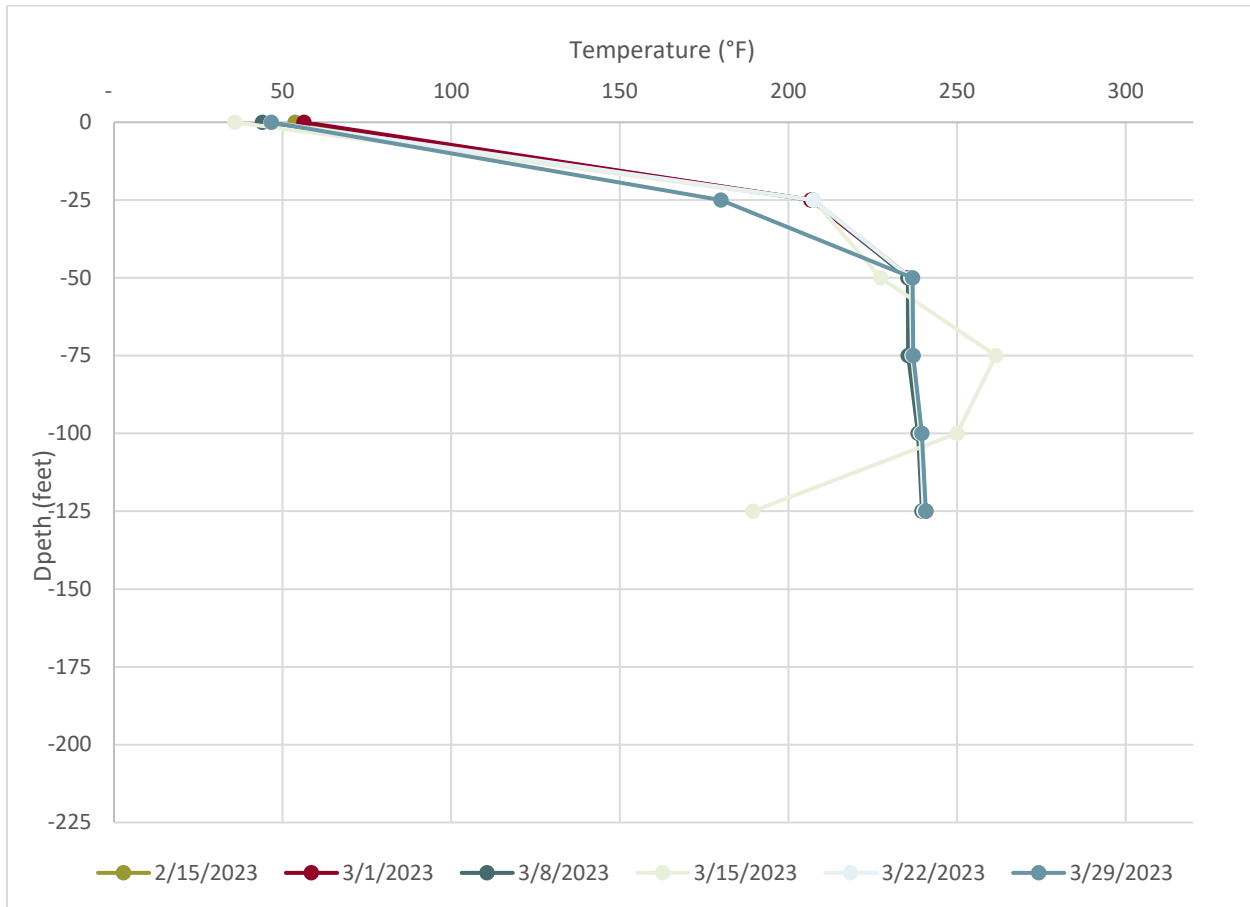


Figure 17 shows daily average temperatures in Temperature Probe 7 (TP-7) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. During the month of March the average variation in temperatures along the length of the probe was approximately 2 degrees Fahrenheit.

Figure 17. Average Temperatures within TP-7 on Select Days in March

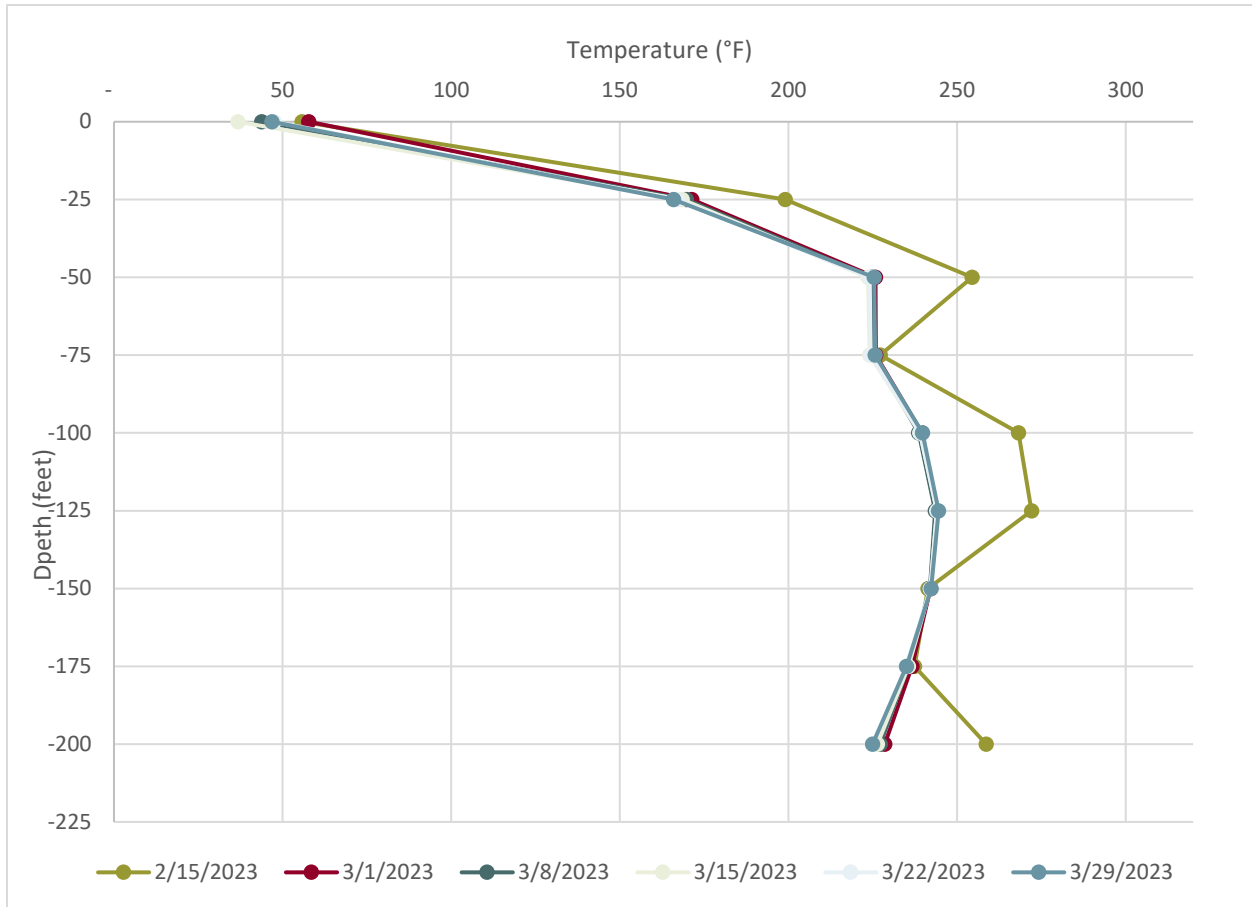


Figure 18 shows daily average temperatures in Temperature Probe 8 (TP-8) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. During the month of March the average variation in temperatures along the length of the probe was approximately 5 degrees Fahrenheit.

Figure 18. Average Temperatures within TP-8 on Select Days in March

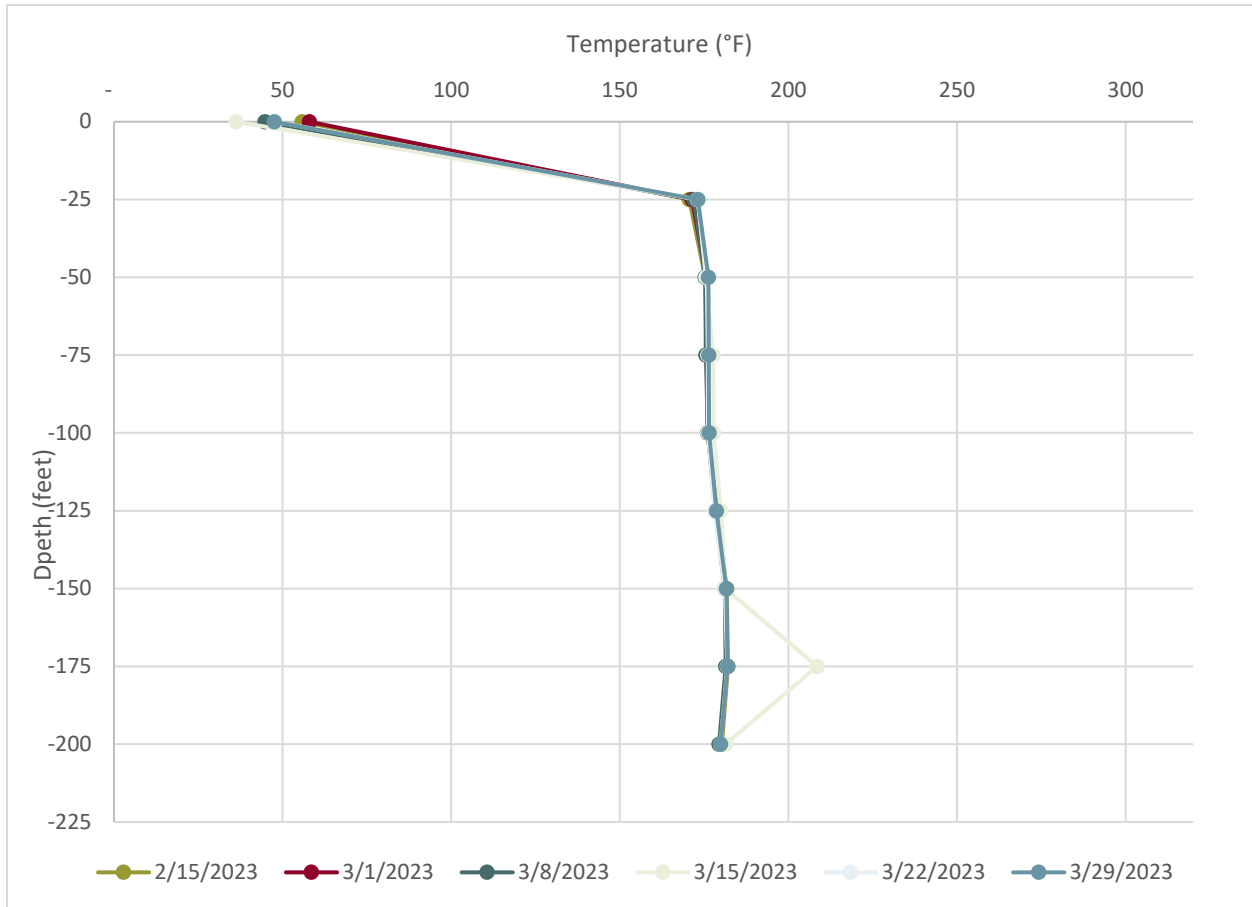
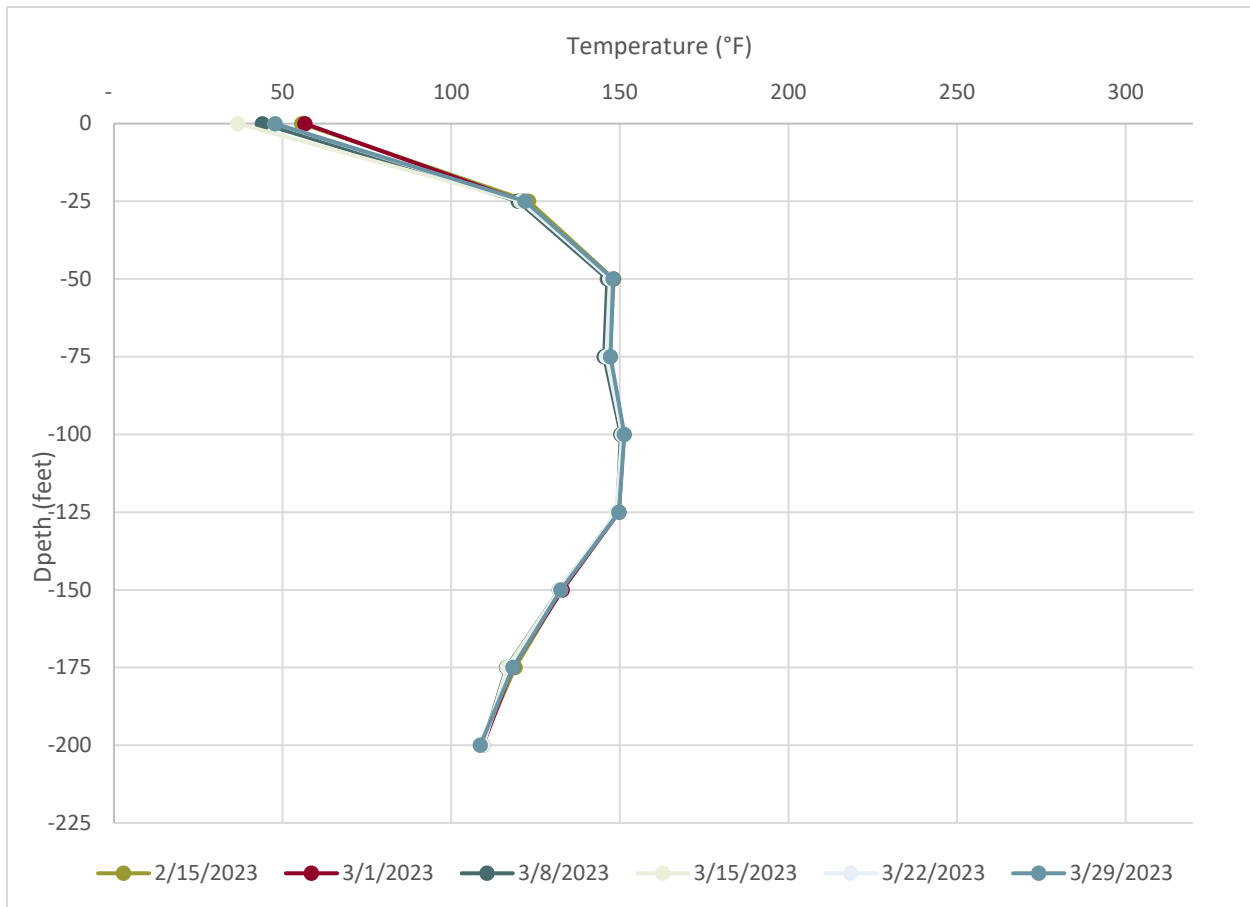


Figure 18 shows daily average temperatures in Temperature Probe 9 (TP-9) on February 15, 2023; March 1, 2023; March 8, 2023, March 15, 2023, March 22, 2023; and March 29, 2023. During the month of March the average variation in temperatures along the length of the probe was approximately 1 degree Fahrenheit.

Figure 19. Average Temperatures within TP-9 on Select Days in March



## 4.0 LEACHATE EXTRACTION AND MONITORING

The City has begun taking steps to improve the extraction of leachate from the waste mass and collect analytical data on leachate characteristics. The following sections detail steps taken to achieve these goals.

### 4.1 EXISTING SYSTEM OPTIMIZATION

During mobilizations to conduct surface emissions monitoring outlined in Section 1.1.1, SCS also collected stroke counter data from the pumps installed in the GCCS extraction wells. Stroke counts were collected from 18 wells on March 6, 2023; March 15, 2023; March 23, 2023; and March 29, 2023. The data collected is summarized in Table 4. Cells marked with “\*” represent dates when the pump was removed from the well for maintenance.

Table 4. Summary of Dual Extraction Well Pump Stroke Counter Data

Well	March 6, 2023	March 15, 2023	March 23, 2023	March 29, 2023
EW64	98033	98033	98081	98083
EW61	212085	212085	212104	212105
EW50	785764	822928	839985	845964
EW49	439650	439671	439674	439674
EW60	*	*	*	*
EW52	*	*	*	*
EW68	1812384	1813237	1821390	1833338
EW51	*	*	240234	281076
EW67	300396	347164	347188	347190
EW54	*	*	*	170975
EW55	*	*	*	*
EW58	1615441	1615455	1615455	1758091
EW59	1103346	1224576	1366734	1371333
EW57	*	190761	224470	248610
EW65	3871	3890	3942	3950
EW63	48067	48071	48072	48073
EW62	113994	113995	114010	114011
EW53	1852600	1852600	1852617	1852618

Based on this data and stroke counts taken on March 29, 2022, SCS can estimate the number of gallons of liquid pumped from each well. SCS assumed that each stroke correlates to approximately 0.3 gallons of liquid removed from the well. This data will then be used to repair or replace pumps or replace nonfunctional stroke counters. Estimates of the quantities of liquids removed between the reading dates is shown in Table 5.

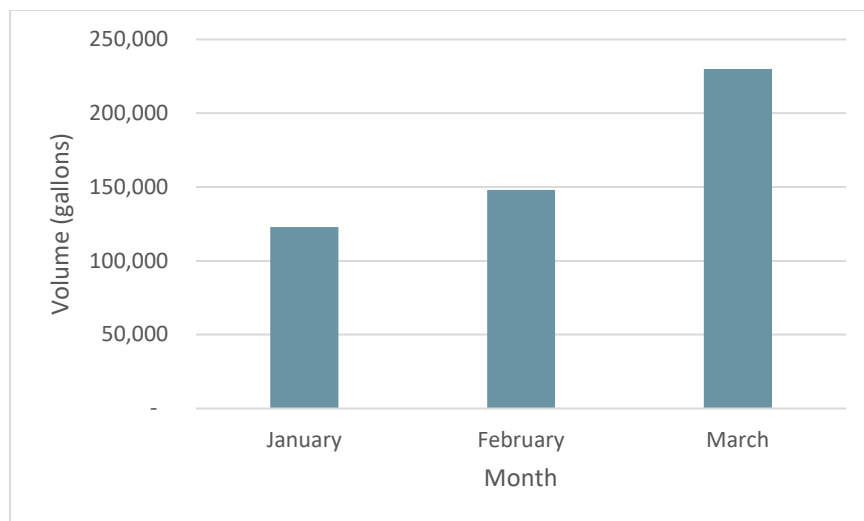
Table 5. Summary of Dual Extraction Well Pump Liquids Removal

Well	Liquids Removed (gal) February 28, 2023 to March 6, 2023	Liquids Removed (gal) March 6, 2023 to March 15, 2023	Liquids Removed (gal) March 15, 2023 to March 23, 2023	Liquids Removed (gal) March 23, 2023 to March 30, 2023
EW64	0	0	15	1
EW61	0	0	6	1
EW50	2324	8826	5117	1794
EW49	1	1	1	0
EW60	0	0	0	0

Well	Liquids Removed (gal) February 28, 2023 to March 6, 2023	Liquids Removed (gal) March 6, 2023 to March 15, 2023	Liquids Removed (gal) March 15, 2023 to March 23, 2023	Liquids Removed (gal) March 23, 2023 to March 30, 2023
EW52	0	0	0	0
EW68	253	4	2446	3584
EW51	0	0	0	12253
EW67	14028	2	2	1
EW54	0	0	0	19398
EW55	0	0	0	0
EW58	0	4	0	42791
EW59	5305	31064	42647	1380
EW57	0	19697	10113	7242
EW65	0	6	16	3
EW63	1	1	1	1
EW62	0	0	5	1
EW53	10	0	5	1

SCS estimates that approximately 230,000 gallons of liquids were removed from the landfill gas collection and control system during the month of March. This is an increase of approximately 82,000 gallons when compared to the previous month. The change in landfill gas liquids removal over the last three months is depicted in Figure 20.

Figure 20. Estimated Volume of Liquids Removed from Landfill Gas Wells





The City and SCS understand that operations of dewatering pumps are critical to address issues related to heat, odors, and the efficient operation of the GCCS. The landfill conditions present a challenging environment for pump operations. Pumps require servicing after relatively short intervals.

During the construction of the LFGCCS expansion outlined in Sections 1.4 and 2.1, multiple types of leachate extraction pumps will be installed. After installation, the City and SCS will evaluate the performance of those pumps. Based on that evaluation, the City will select the pump type that is most effective given the landfill conditions.

During February, six pumps were removed and taken back to the manufacturer's facility (Pump One) for cleaning and repair. These pumps were returned to the site in March and reinstalled in their respective extraction wells.

## 4.2 SAMPLING AND ANALYSIS PLAN

On November 1, 2022, SCS submitted to VDEQ the Dual Phase Landfill Gas Extraction Well Leachate Monitoring Plan for the Bristol Integrated Solid Waste Management Facility Solid Waste Permit #588 Landfill and the plan was subsequently revised on December 1, 2022. Refer to the November and December Compliance Reports for the SWP #588 Landfill for additional information.

## 4.3 SAMPLING AND ANALYSIS

### 4.3.1 Sample Collection

On March 6, 2023, SCS collected leachate samples from two Dual Phase LFG-EWs (EW-58 and EW-59). At the time of sample collection dissolved oxygen, oxidation-reduction potential, pH, specific conductance, temperature, and turbidity were measured and recorded. The sample collection log is included in **Appendix F**.

SCS' field staff was not able to collect samples from the other wells for the following reasons:

- Pumps were not running at the time of sample collection in the following wells: EW-49, EW-50, EW-51, EW-53, EW-61, EW-62, EW-67, and EW-68.
- There was no pump in EW-52, EW-54, EW-56, EW-57, and EW-60 at the time of sample collection.
- The pump was not running and the well was too tall to safely remove well head on well EW-49.
- The pump was not running as there was no air supply connected to the pump for wells EW-55 and EW-63.
- The pump was disconnected for wells EW-64 and EW-65.

The samples were delivered to Enthalpy Analytical (Enthalpy) in Richmond, Virginia and Weck Laboratories, Inc (Weck) in City of Industry, California for analysis. The Enthalpy's Virginia Division of Consolidated Laboratory Services (VELAP) certifications are provided on the certificate of analysis (COA) included in **Appendix F**. The samples were analyzed for the parameters utilizing the analytical methods outlined in the Dual Phase Landfill Gas Extraction Well Leachate Monitoring Plan.

### 4.3.2 Quality Assurance and Quality Control

Field quality control (QC) involved the collection and analysis of trip blanks to verify that the sample collection and handling processes did not impair the quality of the samples. Trip blanks were prepared for volatile organic compound (VOC) analysis via Solid Waste (SW)-846 Method 8260D. In conjunction with the preparation of the groundwater sample collection bottle set, laboratory personnel filled each trip blank sample bottle with distilled/deionized water and transported them with the empty bottle kits to SCS. Field personnel handled the trip blanks like a sample; they remained un-opened, were transported in the sample cooler, and were returned to the laboratory for analyses. A trip blank is used to indicate potential contamination due to the potential migration of VOCs from the air at the site or in the sample shipping containers, through the septum or around the lid of the sampling vials and into the sample.

Laboratory quality assurance/quality control (QA/QC) involves the routine collection and analysis of method reagent blanks, matrix spike (MS) and matrix spike duplicate (MSD) samples, and laboratory control samples (LCS). A brief summary of each of these is presented below:

- **Method Blank** – The method blank is deionized water subjected to the same reagents and manipulations to which site samples are subjected. Positive results in the method blanks may indicate either contamination of the chemical reagents or the glassware and implements used to store or prepare the sample and resulting solutions.
- **MS/MSD** – A MS is an aliquot of a field sample with a known concentration of target parameter added to it. An MSD is an intra-laboratory split sample spiked with a known concentration of target parameter. Spiking for each occurs prior to sample analysis. MS/MSD samples are collected for every batch of twenty or fewer samples. Matrix spike recoveries are used to indicate what effect the sample matrix may have on the reported concentration and/or the performance of the sample preparation and analysis.
- **LCS** – These samples consist of distilled/deionized water injected with the parameters of interest for single parameter methods and selected parameters for multi-parameter methods according to the appropriate analytical method. LCS samples are prepared and analyzed for each batch containing twenty or fewer samples. LCS recoveries are used to monitor analytical accuracy.

Surrogate recoveries are also measured as a part of laboratory QA/QC. Surrogates are organic compounds that are similar to the parameters of interest in chemical composition, extraction, and chromatography, but are not normally found in environmental samples. These compounds are inserted into blank, standards, samples, and spiked samples prior to analysis for organic parameters only. Percent recoveries are calculated for each surrogate. Spike recoveries at or below acceptance criteria indicate whether analytical results can be considered biased high or biased low.

Field and laboratory QA/QC also involves the routine collection and analysis of duplicate field samples. These samples are collected at a rate of one per sample event. A duplicate is a separate sample collected independently in such a manner that it equally represents the medium at a given time and location. Co-located samples provide intra-laboratory precision information for the entire measurement system, including sample collection, homogeneity, handling, shipping, storage, preparation, and analysis.

No trip blank detects were identified for the March 2023 monitoring event. A biological oxygen demand (BOD) concentration of 0.4 milligrams per liter was detected in the March 2023 method blank. The laboratory analysis report for the February 2023 monitoring event trip blank is included in

**Appendix F.** The March 2023 monitoring event laboratory QA/QC reports, including the method blank results, are included in the COAs in **Appendix F**.

### 4.3.3 Data Validation

To identify analytical data that may not represent valid results, data from the monitoring events were validated by the Laboratory and SCS in accordance with United States Environmental Protection Agency (EPA) guidance<sup>1</sup>. Data flagged with a “J” qualifier indicates the quantitation of the parameter is less than the laboratory’s limit of quantitation but greater than the laboratory’s limit of detection (LOD); thus, the concentration is considered estimated. Samples with parameter detections less than five times that of the trip blank, field blank, and/or method blank detection but greater than the laboratory’s LOD are flagged with a “B” qualifier. Samples with common laboratory contaminant parameter detections less than 10 times that of the trip blank, field blank, and/or method/laboratory blank detection but greater than the laboratory’s LOD are flagged with a “B” qualifier. Data with a “B” qualifier are considered not validated as the detection may be anomalous due to cross-contamination during sampling, transportation of samples, or laboratory analysis. No leachate results were flagged with a “B” qualifier for the March 2023 monitoring event as no constituents were detected in the March 2023 trip blank and BOD was detected in the leachate samples as concentrations greater than five times the concentration detected in the March 2023 method blank.

### 4.3.4 Laboratory Analytical Results

Chemical characteristics of leachate samples collected from extraction wells EW-58 and EW-59 are summarized in **Table 6**. The associated COA is included in **Appendix F**. Parameter results from the March 2023 and previous monitoring events (November 2022 – February 2023) are presented on a table in **Appendix F**.

Table 6. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-58	EW-59	LOD	LOQ
Parameter	March 2023 Concentration			
Ammonia as N (mg/L)	667	1480	73.1	100
Biological Oxygen Demand (mg/L)	1570	9190	0.2	2
Chemical Oxygen Demand (mg/L)	1690	---	500	500
	---	10600	2000	2000
Nitrate as N (mg/L)	ND	ND	1.04	5.1
Nitrite as N (mg/L)	ND	ND	1	5
Total Kjeldahl Nitrogen (mg/L)	879	1920	33.6	100
Total Recoverable Phenolics (mg/L)	0.4	---	0.03	0.05

<sup>1</sup> United States Environmental Protection Agency. Guidance for Data Usability in Risk Assessment (Part A-14). April 1992.

United States Environmental Protection Agency. Office of Superfund Remediation and Technology Innovation. National Functional Guidelines for Inorganic Superfund Methods Data Review. January 2017.

United States Environmental Protection Agency. Office of Superfund Remediation and Technology Innovation. National Functional Guidelines for Organic Superfund Methods Data Review. January 2017.

Table 6. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-58	EW-59	LOD	LOQ
Parameter	March 2023 Concentration			
	---	13.9	0.3	0.5
<b>SEMI-VOLATILE ORGANIC COMPOUND (ug/L)</b>				
Anthracene	---	ND	51	102
	ND	---	117	234
<b>TOTAL METALS (mg/L)</b>				
Arsenic	1.07	1	0.01	0.02
Barium	0.406	0.683	0.005	0.01
Cadmium	ND	ND	0.002	0.004
Chromium	0.213	0.188	0.008	0.01
Copper	ND	ND	0.008	0.01
Lead	ND	ND	0.006	0.01
Mercury	ND	---	0.0002	0.0002
	---	ND	0.0004	0.0004
Nickel	0.1254	0.1033	0.007	0.01
Selenium	ND	ND	0.04	0.05
<b>TOTAL METALS (mg/L)</b>				
Silver	ND	ND	0.005	0.01
Zinc	0.0689	0.0538	0.01	0.01
<b>VOLATILE FATTY ACIDS (mg/L)</b>				
Acetic Acid	ND	640	---	500
Butyric Acid	ND	ND	---	500
Propionic Acid	ND	ND	---	500
<b>VOLATILE ORGANIC COMPOUNDS (ug/L)</b>				
2-Butanone	257	2770	30	100
Acetone	375	---	70	100
	---	6810	700	1000
Benzene	1540	727	4	10
Ethylbenzene	131	71.5	4	10
Tetrahydrofuran	353	464	100	100
Toluene	182	98.1	5	10
Xylenes, Total	240	111	10	30

--- = not available

LOD = laboratory's Limit of Detection

LOQ = laboratory's Limit of Quantitation

mg/L = milligrams per liter

ND = Not Detected

ug/L = micrograms per liter

## **5.0 SETTLEMENT MONITORING AND MANAGEMENT**

The City is taking steps to track and manage settlement occurring in the landfill. A summary of actions taken to quantify and manage settlement is included in the sections below.

### **5.1 SETTLEMENT MONITORING AND MANAGEMENT PLAN**

On behalf of the City, SCS submitted a settlement monitoring and management plan to VDEQ on November 15, 2022. Refer to the November Monthly Compliance Report for the SWP #588 Landfill for additional information.

### **5.2 MONTHLY SURVEYS**

#### **5.2.1 Topographic Data Collection**

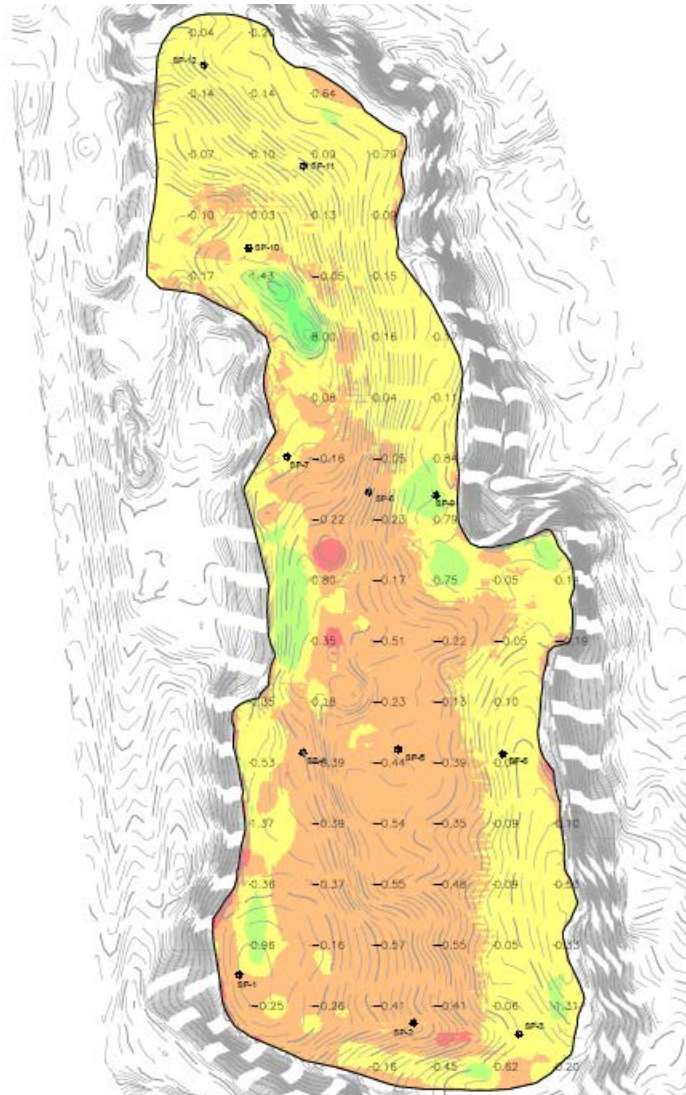
The City, through SCS, collected topographic data of the Solid Waste Permit #588 Landfill using photogrammetric methods via an unmanned aerial vehicle (UAV or drone). On March 8, 2023 the flight was completed and the topographic data collected. The topographic data collected is shown on Sheet 1 in Appendix E.

The topography within the landfill footprint was compared to topographic data collected by SCS using photogrammetric methods on February 7, 2023. A drawing depicting the February 7, 2023 topography is included as Sheet 2 in Appendix E.

Based on a comparison of the topographic data collected on those two dates, settlement occurred that reduced the volume of waste in the landfill by approximately 3,800 cubic yards. During that same time period approximately 6,300 cubic yards of construction related fill were placed on the landfill. This fill was primarily soil placed as part of the sidewall odor mitigation system construction. This resulted in a net volume increase of approximately 2,500 cubic yards.

A visual depiction of settlement and filling at the landfill during this time is depicted in Figure 21. Areas in red indicate where elevations decreased and areas in green indicate areas where elevations have increased. Darker colors indicate greater changes in elevation. This drawing is also included as Sheet 3 in Appendix E.

Figure 21. 1-Month Elevation Change Color Map



The largest settlement occurred primarily in the southern end of the landfill where the waste settled by approximately 0.5 feet or more in some areas. Settlement in the northern portion of the landfill was generally less substantial. The eastern side of the landfill exhibited an increase in elevation, likely due to sediment deposition during storm events and waste relocation associated with construction of the Sidewall Odor Mitigation System. Increases in elevation along the western edge of the landfill are most likely due to installation of the Sidewall Odor Mitigation System. Soil stockpile locations associated with the Sidewall Odor Mitigation System showed a negative elevation change due to material removal from the stockpiles.

SCS calculated the waste footprint for purposes of analysis to be 752,610 square feet. Based on that area and the net volume change, the average elevation change within the waste was less than 0.1 feet.

SCS also compared the topographic data collect in March to the topographic data collected on December 2, 2022. Based on a comparison of the topographic data collected on those two dates, settlement occurred that reduced the volume of waste in the landfill by approximately 18,700 cubic

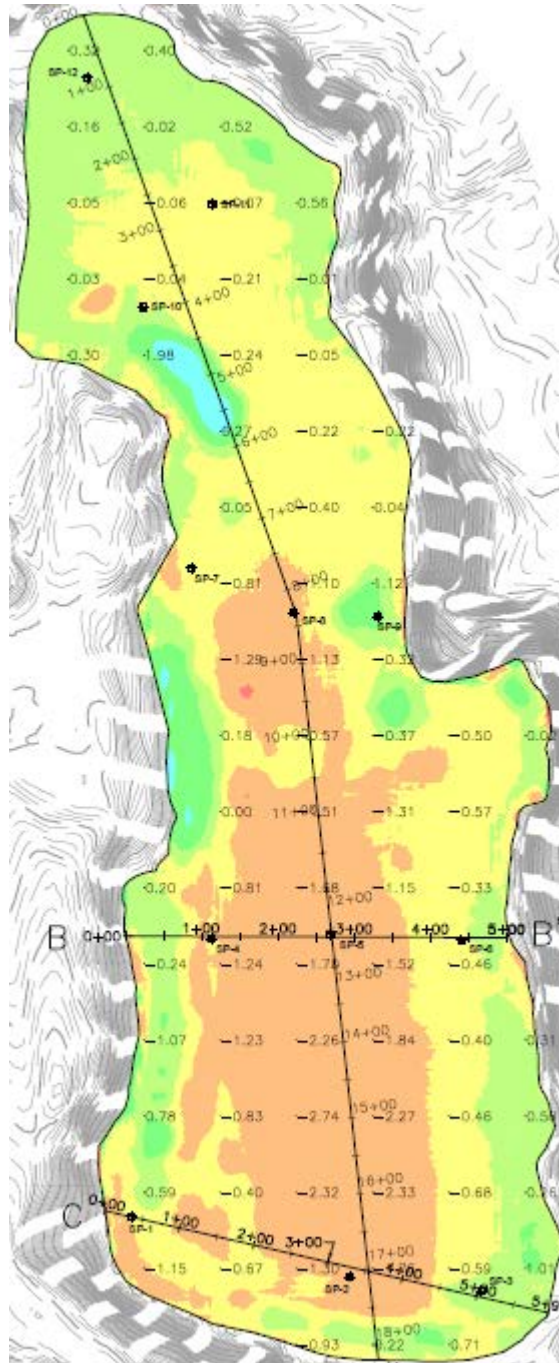
yards. During that same time period approximately 6,200 cubic yards of construction related fill were placed on the landfill. This fill was primarily soil placed as part of the sidewall odor mitigation system construction. This resulted in a net volume decrease of approximately 12,500 cubic yards.

The largest settlement occurred primarily in the southern end of the landfill where the waste settled by approximately 2 feet or more in some areas. Settlement in the northern portion of the landfill was generally less substantial. The eastern side of the landfill exhibited an increase in elevation, likely due to sediment deposition during storm events and waste relocation associated with construction of the Sidewall Odor Mitigation System. Increases in elevation along the western edge of the landfill are most likely due to installation of the Sidewall Odor Mitigation System. There were some large variations in elevation associated with soil stockpiling.

A visual depiction of settlement and filling at the landfill during this time is depicted in Figure 22. Areas in red indicate where elevations decreased and areas in green indicate areas where elevations have increased. Darker colors indicate greater changes in elevation. This drawing is also included as Sheet 4 in Appendix E.



Figure 22. 3-Month Elevation Change Color Map



SCS will collect topographic data covering the landfill surface again in April using photogrammetric methods via UAV. This data will be compared to the data collected in February.

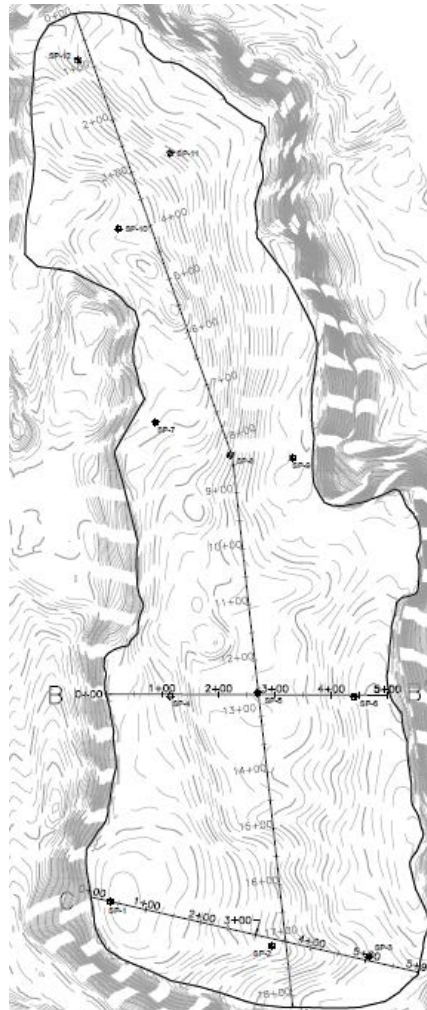


## 5.2.2 Settlement Plate Surveys

On November 7, 2022 SCS field services installed 12 settlement plates on the Solid Waste Permit #588 landfill. The construction and installation of the settlement plates generally conforms to the design outline in the Settlement Monitoring and Management Plan. The tops of the PVC pipes were spray painted orange to improve visibility.

The locations of the settlement plates were surveyed by the City's surveyor on November 14, 2022. The settlement plates were surveyed again on December 13, 2022; January 3, 2023; February 6, 2023; and March 8, 2023. The settlement plate locations are depicted in Figure 23 on Sheet 1 in Appendix E. The surveyed coordinates<sup>2</sup> and elevation changes of the settlement plates are shown in Table 7.

Figure 23. Settlement Plate Locations



<sup>2</sup> Settlement plate locations and coordinates are based on a local coordinate system.

Table 7. Settlement Plate Locations

Settlement Plate	Northing	Easting	Elevation on March 8, 2023	Elevation Change Since February 6, 2023	Elevation Change Since Installation
SP-1	3,397,886.2	10,412,078.1	1,833.0	-0.4	-1.5
SP-2	3,397,806.5	10,412,364.3	1,807.8	-0.5	-2.8
SP-3	3,397,787.3	10,412,536.7	1,783.4	-0.1	-0.3
SP-4 <sup>3</sup>	3,398,250.2	10,412,185.2	1,814.3	-0.8	-3.2
SP-5	3,398,256.3	10,412,338.7	1,798.5	-0.3	-2.2
SP-6	3,398,249.4	10,412,510.8	1,777.0	-0.1	-0.7
SP-7 <sup>4</sup>	3,398,737.4	10,412,157.3	1,826.8	-1.4	-1.8
SP-8	3,398,679.2	10,412,290.7	1,805.6	-0.4	-1.7
SP-9	3,398,673.1	10,412,400.6	1,785.2	-0.2	-0.7
SP-10	3,399,080.4	10,412,092.2	1,839.6	-0.1	-0.6
SP-11	3,399,216.1	10,412,183.7	1,816.1	0.0	-0.3
SP-12	3,399,382.0	10,412,019.6	1,810.4	0.0	-0.3

The settlement plates will be surveyed again during the month of April. The elevations surveyed will be compared to the elevations surveyed the previous months.

## 6.0 INTERMEDIATE COVER AND EVOH COVER SYSTEM

The City is taking steps to provide intermediate and temporary cover of the wastes in the landfill. The sections below outline the steps taken by the City.

### 6.1 INTERMEDIATE COVER INSTALLATION

The City completed hauling and placement of a 12-inch thick intermediate cover across the entire landfill prior to October 10, 2022. The cover was placed in accordance with 9VAC20-81-140(B)(1)(d). SCS coordinated with the City to dig a series of test holes to verify cover thickness in select locations. Details of these verifications were discussed in the October Monthly Compliance Report for the SWP #588 Landfill.

### 6.2 EVOH COVER SYSTEM DESIGN

SCS submitted responses, including revised documents, on March 20, 2023 to comments received from VDEQ concerning the Interim EVOH Cover System Preliminary Design Plans. The submitted

<sup>3</sup> Based on field observations SP-4 appears to have been disturbed during grading on an adjacent roadway.

<sup>4</sup> Based on field observations SP-7 appears to have been disturbed during grading on an adjacent stockpile.

documents included a revised operations manual and settlement calculations for the proposed stormwater basin.

SCS is preparing construction drawings for the EVOH Cover System, including revisions discussed in the response to comments letter. The construction drawings build upon the preliminary design plans. Additions to the construction drawings include additional design cross sections, pre and post stormwater management plans, landfill gas management plans and details, access road design, and other items.

SCS is also drafting specifications and contract documents for the construction of the EVOH Cover System.

### **6.3 EVOH COVER SYSTEM PROCUREMENT**

Drawings used for the purposes of bidding, procurement and construction of the EVOH cover system will generally conform to the layout and details in the drawings described in section 6.2. SCS also prepared and submitted to VDEQ a specification for the EVOH geomembrane on January 30, 2023 based upon industry standards and discussions with material manufacturers. This specification and drawing set represent the first steps in the procurement process. SCS and the City have coordinated with potential suppliers to specify a product that is not currently anticipated to have long lead times.

### **6.4 EVOH COVER SYSTEM INSTALLATION**

Installation of the EVOH cover system will begin after the installation of other infrastructure is complete.

## **7.0 STORMWATER MANAGEMENT**

The stormwater volume calculations, assumptions, design, and control measures will be addressed by the stormwater management plan, which is currently in progress. The stormwater management plan will be submitted to VDEQ on or before April 30, 2023.

SCS is designing a stormwater pumping system to convey stormwater collected atop the EVOH cover system to an adequate discharge point in compliance with VPDES permit VAR050053. The proposed system includes the construction of a collection basin in the southeast corner of the quarry and the installation of a nearby long-term stormwater pump. The stormwater will be conveyed by pipe up and out of the quarry via the northern access point.

SCS is evaluating perimeter run-on control measures, including stormwater diversion berms and drainage swales. However, run-on control measures may be significantly limited by the quarry sidewall topography and the natural slope of top areas adjacent to the sidewalls.

## **8.0 MISCELLANEOUS**

### **8.1 CEASE WASTE ACCEPTANCE**

The City ceased acceptance of offsite waste at the Solid Waste Permit #588 landfill prior to September 12, 2022.

## 8.2 LONG-TERM PLAN

SCS submitted the Monitoring, Maintenance, and Repair Plan to VDEQ for the SWP #588 landfill on December 30, 2022. Refer to the December Monthly Compliance Report for the SWP #588 Landfill for additional information. The City has taken steps to implement the plan including the following actions:

- Performing quarterly inspections
- Performing surface emission monitoring
- Maintaining the existing intermediate cover
- Monitoring and repairing landfill gas liquids extraction pumps
- Monitoring and repairing components of the landfill gas collection system

These steps were summarized in a letter submitted to VDEQ on March 31, 2023. A copy of that letter is included in Appendix G.

## 8.3 MONTHLY COMPLIANCE REPORTS

As outlined in the introduction this report is intended to provide comprehensive updates regarding progress towards completion of each item outlined in Appendix A of the Consent Decree between the City and VDEQ,


## 8.4 COMMUNITY OUTREACH PROGRAM

The City's consultant leading community outreach, McGuireWoods Consulting, outlined the actions taken as part of their community outreach efforts. For the month of March, those actions include:

- **March – ongoing basis:** Seven posts on the BristolVALandfill.org site and the existing City of Bristol Landfill Notifications and Information page covering several important updates including:
  - Progress updates during construction of the Sidewall Odor Mitigation System (SOMS).
  - Provided information about the gas well expansion project to ensure residents were aware of when the projects would begin and what they should expect once drilling for the wells began. An update was provided several days prior to the start of drilling as well as again the day drilling was scheduled to begin.
  - City published statement related to remediation costs and potential funding sources following the City's budget briefing on March 28<sup>th</sup>
  - Provided links to news articles chronicling construction updates and information related to how Bristol, VA is funding current and future work at the landfill.
- **E-mail communication sent to the list of members of the public signed up through the Bristol, VA website, the BristolVALandfill.org website, or at the November 1 Open House to receive information via e-mail**
  - E-mails sent that included weekly remediation progress update and links to website updates and latest news articles on the following days:
    - Friday, March 3<sup>rd</sup>

- Monday, March 20<sup>th</sup>
  - Monday, March 27<sup>th</sup>
  - Wednesday, March 29<sup>th</sup>
  - Friday, March 31<sup>st</sup>
- All e-mails sent in March had over a 50 percent open rate





Appendix A  
Surface Emissions Monitoring Summary Letters

March 15, 2023  
File No. 02218208.04

Mr. Jonathan Chapman  
Enforcement Specialist  
Virginia Department of Environmental Quality  
SW Regional Office  
355-A Deadmore Street  
Abingdon, VA 24210

Subject: Weekly Surface Emissions Monitoring Event – March 9, 2023  
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on March 9, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Appendix A.1.i of the Consent Decree between the Commonwealth of Virginia and the City of Bristol.

The monitoring generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 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 includes the entire waste footprint of the Permit No. 588 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, including at the newly installed temperature probes. The approximate monitoring route and sampling locations are presented in the attached Drawing.

At the time of monitoring, all areas of the Permit No. 588 Landfill footprint are subject to regulatory monitoring based on the regulatory time schedule stipulated in 40 CFR 63.1960(b) and 40 CFR 60.36f(b). The Permit No. 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitoring is provided in Table 1.



Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	149
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	49
Number of Exceedances <sup>1</sup>	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

### Remonitoring of Ongoing Exceedances

In accordance with 40 CFR 63.1960(c)(4)(ii) and 40 CFR 60.36f(c)(4)(ii), corrective actions and a remonitoring event are to be performed within 10 days of the initial exceedance. In accordance with 40 CFR 63.1960(c)(4)(iii) and 40 CFR 60.36f(c)(4)(iii) additional corrective actions and a second 10-day retest are to be performed if the initial 10-day retest indicates methane values greater than the regulatory threshold. The Facility performs corrective actions, as necessary, including wellhead vacuum adjustments, the installation of well-bore seals, and addition of soil cover prior to weekly monitoring events at locations that previously exhibited elevated methane concentrations.

In accordance with 40 CFR 63.1960(c)(4)(v) and 40 CFR 60.36f(c)(4)(v) a new well or collection device must be installed or an alternate remedy must be submitted within 120-days at locations that continue to exhibit methane concentrations above the regulatory threshold for two consecutive retests.

A summary of ongoing exceedance points is provided in Table 2.

---

Table 2. Ongoing Weekly SEM Exceedances

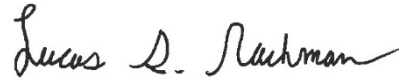
Point ID	Initial Exceedance Date	3/9/23 Event	3/9/23 Event Result	Comments
No Ongoing Exceedances				

If you have questions or require additional information, please contact either of the undersigned.

Sincerely,



Will Fabrie  
Associate Staff Professional  
SCS Engineers



Lucas S. Nachman  
Project Professional  
SCS Engineers

LSN/WJF/cjw

cc: Randall Eads, City of Bristol  
Mike Martin, City of Bristol  
Joey Lamie, City of Bristol  
Jonathan Hayes, City of Bristol  
Jake Chandler, City of Bristol  
Susan "Tracey" Blalock, VDEQ

Encl. Surface Emissions Monitoring Results  
Bristol SEM Route Drawing

**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 9, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
1	13.7 PPM	OK			Start Serpentine Route
2	4.2 PPM	OK			
3	11.9 PPM	OK			
4	25 PPM	OK			
5	62.8 PPM	OK			
6	11.5 PPM	OK			
7	103 PPM	OK			
8	141 PPM	OK			
9	2.1 PPM	OK			
10	2.3 PPM	OK			
11	1.7 PPM	OK			
12	20.8 PPM	OK			
13	8.1 PPM	OK			
14	49.2 PPM	OK			
15	5.7 PPM	OK			
16	40.1 PPM	OK			
17	8.1 PPM	OK			
18	17.6 PPM	OK			
19	7.9 PPM	OK			
20	6.4 PPM	OK			
21	34.9 PPM	OK			
22	54.8 PPM	OK			
23	65.8 PPM	OK			
24	30 PPM	OK			
25	6.8 PPM	OK			
26	8 PPM	OK			
27	18.1 PPM	OK			
28	63.8 PPM	OK			
29	8.4 PPM	OK			
30	7.7 PPM	OK			
31	18.2 PPM	OK			
32	21.1 PPM	OK			
33	6.4 PPM	OK			
34	11 PPM	OK			
35	6.3 PPM	OK			
36	4.6 PPM	OK			
37	8 PPM	OK			
38	9.8 PPM	OK			
39	28.8 PPM	OK			
40	25.9 PPM	OK			
41	8.3 PPM	OK			
42	13.3 PPM	OK			



**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 9, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
43	7.1 PPM	OK			
44	5.3 PPM	OK			
45	33.2 PPM	OK			
46	29.9 PPM	OK			
47	11.7 PPM	OK			
48	0.7 PPM	OK			
49	0.4 PPM	OK			
50	2.8 PPM	OK			
51	1.1 PPM	OK			
52	11.6 PPM	OK			
53	22.4 PPM	OK			
54	25.9 PPM	OK			
55	10.7 PPM	OK			
56	1.9 PPM	OK			
57	2.7 PPM	OK			
58	1.3 PPM	OK			
59	6.3 PPM	OK			
60	5.4 PPM	OK			
61	5.5 PPM	OK			
62	0.6 PPM	OK			
63	4.2 PPM	OK			
64	4.1 PPM	OK			
65	5.1 PPM	OK			
66	2.8 PPM	OK			
67	1.6 PPM	OK			
68	1.4 PPM	OK			
69	1.4 PPM	OK			
70	2 PPM	OK			
71	2.5 PPM	OK			
72	6.6 PPM	OK			
73	211 PPM	OK			
74	35.5 PPM	OK			
75	6.1 PPM	OK			
76	107 PPM	OK			
77	22.5 PPM	OK			
78	10.3 PPM	OK			
79	13.5 PPM	OK			
80	99.6 PPM	OK			
81	48.7 PPM	OK			
82	54.5 PPM	OK			
83	124 PPM	OK			
84	154 PPM	OK			

**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 9, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
85	37.3 PPM	OK			
86	0.7 PPM	OK			
87	6.3 PPM	OK			
88	2.3 PPM	OK			
89	1.1 PPM	OK			
90	3.3 PPM	OK			
91	1 PPM	OK			
92	22.1 PPM	OK			
93	82.8 PPM	OK			
94	133 PPM	OK			
95	230 PPM	OK			
96	3.2 PPM	OK			
97	69.9 PPM	OK			
98	6.4 PPM	OK			
99	1.7 PPM	OK			
100	PPM	OK			End Serpentine
	95.2				Route
101	40.4 PPM	OK			EW-35
102	127 PPM	OK			EW-52
103	17.2 PPM	OK			TP-4
104	43.8 PPM	OK			EW-60
105	278 PPM	OK			EW-48
106	1.4 PPM	OK			TP-6
107	4.1 PPM	OK			EW-61
108	5.5 PPM	OK			EW-36
109	82.1 PPM	OK			EW-34
110	106 PPM	OK			EW-50
111	167 PPM	OK			EW-67
112	18.3 PPM	OK			EW-47
113	461 PPM	OK			EW-54
114	23.7 PPM	OK			EW-55
115	5.1 PPM	OK			TP-2
116	7.3 PPM	OK			EW-46
117	6.5 PPM	OK			EW-66
118	276 PPM	OK			EW-58
119	115 PPM	OK			EW-57
120	23.8 PPM	OK			TP-1
121	184 PPM	OK			EW-59
122	482 PPM	OK			EW-56
123	163 PPM	OK			EW-41
124	74.4 PPM	OK			EW-53
125	11.6 PPM	OK			EW-40

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 9, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
126	7.3 PPM	OK			TP-3
127	208 PPM	OK			EW-51
128	57.3 PPM	OK			EW-39
129	40.1 PPM	OK			TP-5
130	6.7 PPM	OK			EW-68
131	75 PPM	OK			EW-38
132	7.6 PPM	OK			TP-7
133	11.8 PPM	OK			EW-49
134	13 PPM	OK			EW-31R
135	3.6 PPM	OK			EW-65
136	5.2 PPM	OK			EW-37
137	6.8 PPM	OK			TP-8
138	2.3 PPM	OK			EW-64
139	0.5 PPM	OK			EW-30R
140	0.2 PPM	OK			EW-63
141	0.7 PPM	OK			EW-42
142	2.4 PPM	OK			TP-9
143	0 PPM	OK			EW-33R
144	0.1 PPM	OK			EW-62
145	0 PPM	OK			EW-29R
146	1.2 PPM	OK			EW-25
147	2.2 PPM	OK			EW-24
148	0.6 PPM	OK			EW-32
149	2 PPM	OK			EW-32R

Number of locations sampled:	149
Number of exceedance locations:	0

# SCS ENGINEERS

## EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MARCH 9, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	

**NOTES:**

Points 1 through 100 represent serpentine SEM route.

Points 101 through 149 represent SEM at Pipe Penetrations

Weather Conditions: Sunny, 48°F Wind: SW - 7 MPH

Sampling Calibration: Methane - 500 ppm, Zero Air - 0.0 ppm

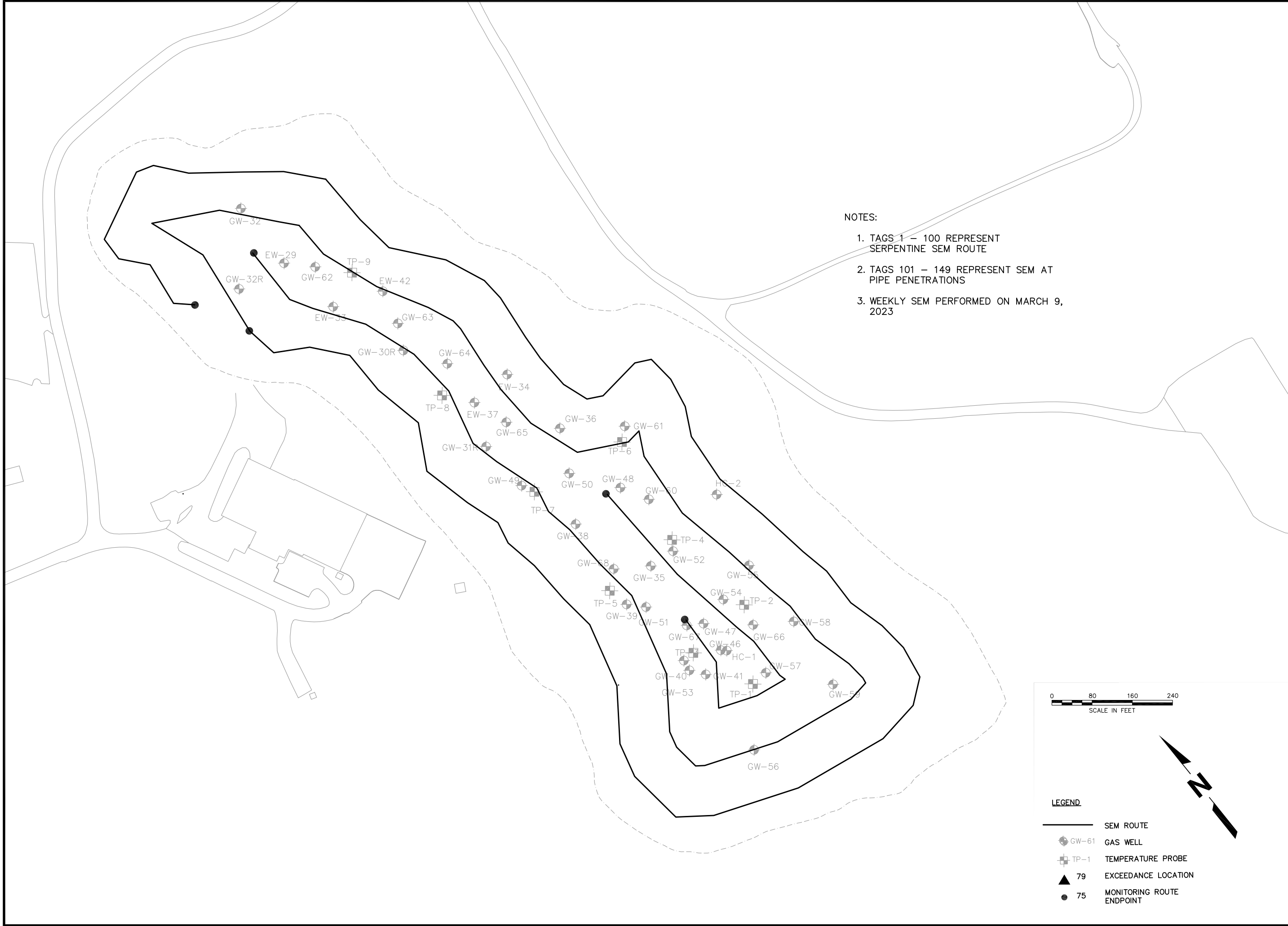
3/9/2023 10:49 ZERO 0.1 PPM

3/9/2023 10:51 SPAN 500.0 PPM

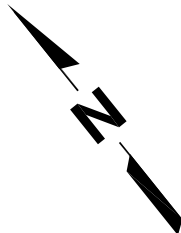
Background Reading:

3/9/2023 10:53 Upwind 2.9 PPM

3/9/2023 10:56 Downwind 2 PPM



NOTES:  
 1. TAGS 1 - 100 REPRESENT SERPENTINE SEM ROUTE  
 2. TAGS 101 - 149 REPRESENT SEM AT PIPE PENETRATIONS  
 3. WEEKLY SEM PERFORMED ON MARCH 9, 2023



- LEGEND**
- SEM ROUTE
  - GW-61 GAS WELL
  - TP-1 TEMPERATURE PROBE
  - 79 EXCEEDANCE LOCATION
  - 75 MONITORING ROUTE ENDPOINT

NO.		REVISION		DATE	
SHEET TITLE			PROJECT TITLE		
WEEKLY SEM ROUTE			SURFACE EMISSIONS MONITORING SOLID WASTE PERMIT #588		
CLIENT			CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY		
			2655 VALLEY DRIVE BRISTOL, VA 24201		
SCS ENGINEERS		D/W: BT: LSN		D/A: RW: BT: DBK	
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 12100 WOODBURN AVENUE, SUITE 100 PH: (804) 378-7440 FAX: (804) 378-7433		02218208.04		02218208.04	
FILE:			02218208.04		
DATE:			3/9/23		
SCALE:			AS SHOWN		
DRAWING NO.			1 of 1		



March 22, 2023  
File No. 02218208.04

Mr. Jonathan Chapman  
Enforcement Specialist  
Virginia Department of Environmental Quality  
SW Regional Office  
355-A Deadmore Street  
Abingdon, VA 24210

Subject: Weekly Surface Emissions Monitoring Event – March 15, 2023  
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on March 15, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Appendix A.1.i of the Consent Decree between the Commonwealth of Virginia and the City of Bristol.

The monitoring generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 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 includes the entire waste footprint of the Permit No. 588 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, including at the newly installed temperature probes. The approximate monitoring route and sampling locations are presented in the attached Drawing.

At the time of monitoring, all areas of the Permit No. 588 Landfill footprint are subject to regulatory monitoring based on the regulatory time schedule stipulated in 40 CFR 63.1960(b) and 40 CFR 60.36f(b). The Permit No. 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitoring is provided in Table 1.



Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	149
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	49
Number of Exceedances <sup>1</sup>	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

### Remonitoring of Ongoing Exceedances

In accordance with 40 CFR 63.1960(c)(4)(ii) and 40 CFR 60.36f(c)(4)(ii), corrective actions and a remonitoring event are to be performed within 10 days of the initial exceedance. In accordance with 40 CFR 63.1960(c)(4)(iii) and 40 CFR 60.36f(c)(4)(iii) additional corrective actions and a second 10-day retest are to be performed if the initial 10-day retest indicates methane values greater than the regulatory threshold. The Facility performs corrective actions, as necessary, including wellhead vacuum adjustments, the installation of well-bore seals, and addition of soil cover prior to weekly monitoring events at locations that previously exhibited elevated methane concentrations.

In accordance with 40 CFR 63.1960(c)(4)(v) and 40 CFR 60.36f(c)(4)(v) a new well or collection device must be installed or an alternate remedy must be submitted within 120-days at locations that continue to exhibit methane concentrations above the regulatory threshold for two consecutive retests.

A summary of ongoing exceedance points is provided in Table 2.

---

Table 2. Ongoing Weekly SEM Exceedances

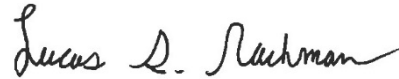
Point ID	Initial Exceedance Date	3/15/23 Event	3/15/23 Event Result	Comments
No Ongoing Exceedances				

If you have questions or require additional information, please contact either of the undersigned.

Sincerely,



Quinn F. Bernier, PE  
Project Professional  
SCS Engineers



Lucas S. Nachman  
Project Professional  
SCS Engineers

LSN/QFB/cjw

cc: Randall Eads, City of Bristol  
Mike Martin, City of Bristol  
Joey Lamie, City of Bristol  
Jonathan Hayes, City of Bristol  
Jake Chandler, City of Bristol  
Susan "Tracey" Blalock, VDEQ

Encl. Surface Emissions Monitoring Results  
Bristol SEM Route Drawing

**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 15, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
1	146 PPM	OK			Start Serpentine Route
2	16.4 PPM	OK			
3	8 PPM	OK			
4	18.6 PPM	OK			
5	47.4 PPM	OK			
6	4.7 PPM	OK			
7	3 PPM	OK			
8	2.8 PPM	OK			
9	2.6 PPM	OK			
10	5.2 PPM	OK			
11	7.8 PPM	OK			
12	39.7 PPM	OK			
13	30.3 PPM	OK			
14	3.7 PPM	OK			
15	12.4 PPM	OK			
16	2.8 PPM	OK			
17	42.7 PPM	OK			
18	37 PPM	OK			
19	4.5 PPM	OK			
20	39 PPM	OK			
21	5.7 PPM	OK			
22	29.7 PPM	OK			
23	101 PPM	OK			
24	41.8 PPM	OK			
25	66.6 PPM	OK			
26	5.8 PPM	OK			
27	109 PPM	OK			
28	113 PPM	OK			
29	116 PPM	OK			
30	24.4 PPM	OK			
31	9.4 PPM	OK			
32	3.4 PPM	OK			
33	10.6 PPM	OK			
34	5.9 PPM	OK			
35	44.1 PPM	OK			
36	24.4 PPM	OK			
37	6.6 PPM	OK			
38	41.8 PPM	OK			
39	11.1 PPM	OK			
40	9 PPM	OK			
41	3.5 PPM	OK			
42	53.6 PPM	OK			

**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 15, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
43	30.6 PPM	OK			
44	9.3 PPM	OK			
45	4.6 PPM	OK			
46	4.1 PPM	OK			
47	1.5 PPM	OK			
48	1.5 PPM	OK			
49	2.1 PPM	OK			
50	1.6 PPM	OK			
51	3.9 PPM	OK			
52	16.8 PPM	OK			
53	9 PPM	OK			
54	11.1 PPM	OK			
55	3.8 PPM	OK			
56	7.9 PPM	OK			
57	8.7 PPM	OK			
58	9.3 PPM	OK			
59	6.1 PPM	OK			
60	2.6 PPM	OK			
61	17.4 PPM	OK			
62	8.6 PPM	OK			
63	4.9 PPM	OK			
64	2.7 PPM	OK			
65	2.7 PPM	OK			
66	5 PPM	OK			
67	1.6 PPM	OK			
68	10.4 PPM	OK			
69	9.2 PPM	OK			
70	11 PPM	OK			
71	5.6 PPM	OK			
72	5.1 PPM	OK			
73	4.1 PPM	OK			
74	2.1 PPM	OK			
75	6.8 PPM	OK			
76	5.5 PPM	OK			
77	12.5 PPM	OK			
78	2.7 PPM	OK			
79	171 PPM	OK			
80	1.8 PPM	OK			
81	3 PPM	OK			
82	84.2 PPM	OK			
83	8.8 PPM	OK			
84	5.2 PPM	OK			



**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 15, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
85	16.8 PPM	OK			
86	5.9 PPM	OK			
87	53.2 PPM	OK			
88	5.7 PPM	OK			
89	22.2 PPM	OK			
90	1.5 PPM	OK			
91	1.3 PPM	OK			
92	73.2 PPM	OK			
93	9.2 PPM	OK			
94	6.9 PPM	OK			
95	31.7 PPM	OK			
96	88 PPM	OK			
97	41.2 PPM	OK			
98	10.1 PPM	OK			
99	7.5 PPM	OK			
100	147 PPM	OK			End Serpentine Route
101	272 PPM	OK			EW-35
102	153 PPM	OK			EW-52
103	10.9 PPM	OK			TP-4
104	251 PPM	OK			EW-60
105	212 PPM	OK			EW-48
106	3.1 PPM	OK			TP-6
107	1.5 PPM	OK			EW-61
108	1.5 PPM	OK			EW-36
109	83.5 PPM	OK			EW-34
110	56.5 PPM	OK			EW-50
111	82.7 PPM	OK			EW-67
112	4.4 PPM	OK			EW-47
113	133 PPM	OK			EW-54
114	4 PPM	OK			EW-55
115	14.6 PPM	OK			TP-2
116	3.2 PPM	OK			EW-46
117	139 PPM	OK			EW-66
118	6.4 PPM	OK			EW-58
119	290 PPM	OK			EW-57
120	5 PPM	OK			TP-1
121	356 PPM	OK			EW-59
122	427 PPM	OK			EW-56
123	6.4 PPM	OK			EW-41
124	125 PPM	OK			EW-53
125	43.9 PPM	OK			EW-40

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 15, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
126	4.6 PPM	OK			TP-3
127	469 PPM	OK			EW-51
128	18.7 PPM	OK			EW-39
129	102 PPM	OK			TP-5
130	3.4 PPM	OK			EW-68
131	50.3 PPM	OK			EW-38
132	22.3 PPM	OK			TP-7
133	2.3 PPM	OK			EW-49
134	1.2 PPM	OK			EW-31R
135	3.1 PPM	OK			EW-65
136	0.2 PPM	OK			EW-37
137	0.3 PPM	OK			TP-8
138	0.6 PPM	OK			EW-64
139	1.5 PPM	OK			EW-30R
140	1.5 PPM	OK			EW-63
141	22.1 PPM	OK			EW-42
142	9.1 PPM	OK			TP-9
143	2.2 PPM	OK			EW-33R
144	1.5 PPM	OK			EW-62
145	0.3 PPM	OK			EW-29R
146	29.6 PPM	OK			EW-25
147	31.5 PPM	OK			EW-24
148	4.2 PPM	OK			EW-32
149	2.8 PPM	OK			EW-32R

Number of locations sampled:	149
Number of exceedance locations:	0

# SCS ENGINEERS

## EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MARCH 15, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	

**NOTES:**

Points 1 through 100 represent serpentine SEM route.

Points 101 through 149 represent SEM at Pipe Penetrations

Weather Conditions: Sunny, 30°F Wind: S - 5 MPH

Sampling Calibration: Methane - 500 ppm, Zero Air - 0.0 ppm

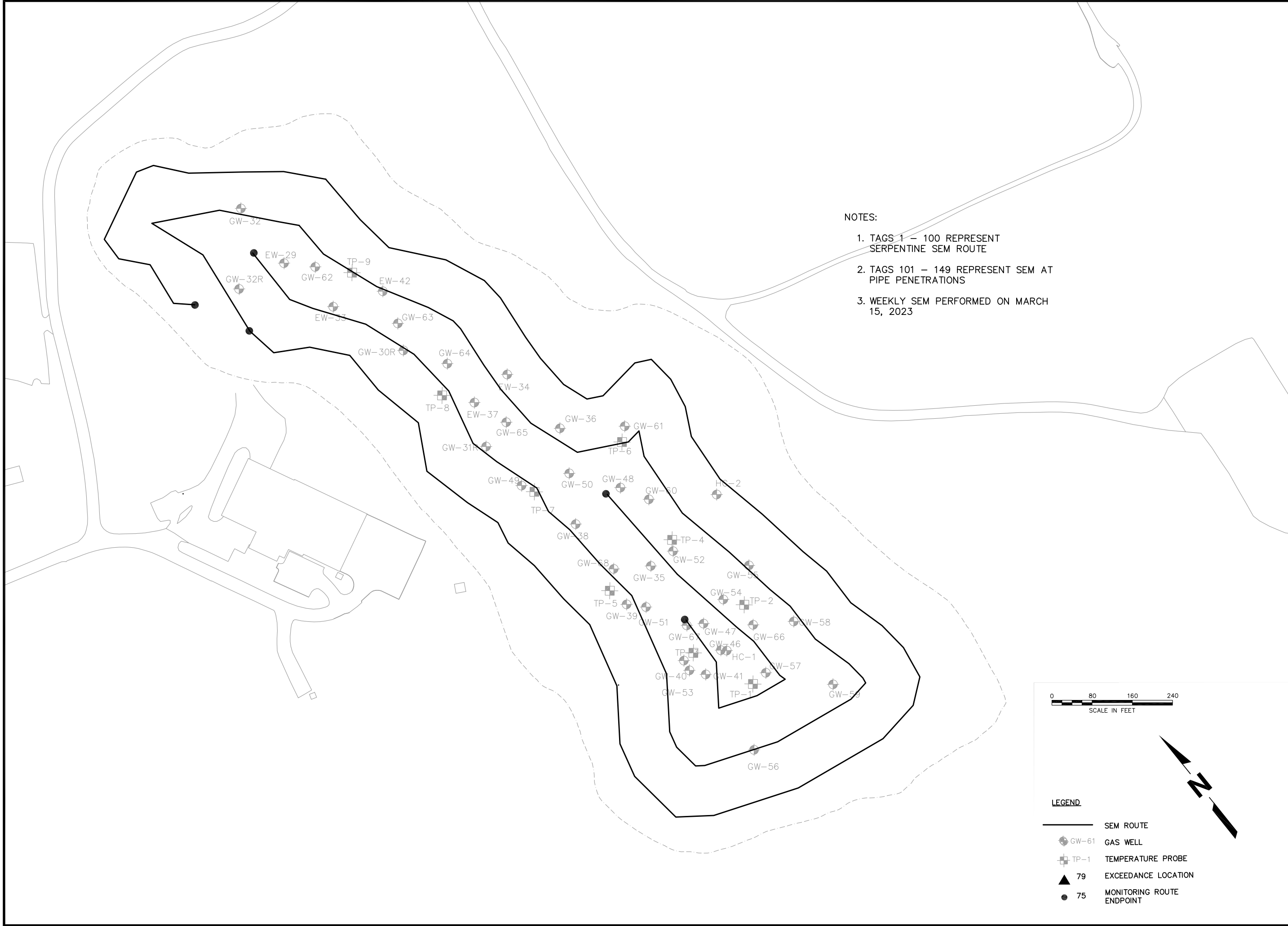
3/15/2023 8:46 ZERO 0.0 PPM

3/15/2023 8:48 SPAN 500.0 PPM

Background Reading:

3/15/2023 8:50 Upwind 2.4 PPM

3/15/2023 8:53 Downwind 1.7 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 149 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON MARCH 15, 2023

**LEGEND**

- SEM ROUTE
- GW-61 GAS WELL
- TP-1 TEMPERATURE PROBE
- 79 EXCEEDANCE LOCATION
- 75 MONITORING ROUTE ENDPOINT

NO.		REVISION		DATE	
SHEET TITLE			PROJECT TITLE		
WEEKLY SEM ROUTE			SURFACE EMISSIONS MONITORING SOLID WASTE PERMIT #588		
CLIENT			CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY		
			2655 VALLEY DRIVE BRISTOL, VA 24201		
SCS ENGINEERS		STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.		D/W: BT: LSN	
02218208.04		02218208.04		D/A: RW: BT: LSN	
FILE:		02218208.04		APP: BT: DBK	
DATE:		3/15/23			
SCALE:		AS SHOWN			
DRAWING NO.		1		of 1	

March 29, 2023  
File No. 02218208.04

Mr. Jonathan Chapman  
Enforcement Specialist  
Virginia Department of Environmental Quality  
SW Regional Office  
355-A Deadmore Street  
Abingdon, VA 24210

Subject: Weekly Surface Emissions Monitoring Event – March 23, 2023  
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on March 23, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Appendix A.1.i of the Consent Decree between the Commonwealth of Virginia and the City of Bristol.

The monitoring generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 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 includes the entire waste footprint of the Permit No. 588 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, including at the newly installed temperature probes. The approximate monitoring route and sampling locations are presented in the attached Drawing.

At the time of monitoring, all areas of the Permit No. 588 Landfill footprint are subject to regulatory monitoring based on the regulatory time schedule stipulated in 40 CFR 63.1960(b) and 40 CFR 60.36f(b). The Permit No. 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitoring is provided in Table 1.



Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	149
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	49
Number of Exceedances <sup>1</sup>	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

### Remonitoring of Ongoing Exceedances

In accordance with 40 CFR 63.1960(c)(4)(ii) and 40 CFR 60.36f(c)(4)(ii), corrective actions and a remonitoring event are to be performed within 10 days of the initial exceedance. In accordance with 40 CFR 63.1960(c)(4)(iii) and 40 CFR 60.36f(c)(4)(iii) additional corrective actions and a second 10-day retest are to be performed if the initial 10-day retest indicates methane values greater than the regulatory threshold. The Facility performs corrective actions, as necessary, including wellhead vacuum adjustments, the installation of well-bore seals, and addition of soil cover prior to weekly monitoring events at locations that previously exhibited elevated methane concentrations.

In accordance with 40 CFR 63.1960(c)(4)(v) and 40 CFR 60.36f(c)(4)(v) a new well or collection device must be installed or an alternate remedy must be submitted within 120-days at locations that continue to exhibit methane concentrations above the regulatory threshold for two consecutive retests.

A summary of ongoing exceedance points is provided in Table 2.

---



Table 2. Ongoing Weekly SEM Exceedances

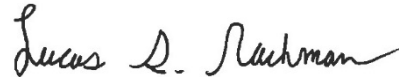
Point ID	Initial Exceedance Date	3/23/23 Event	3/23/23 Event Result	Comments
No Ongoing Exceedances				

If you have questions or require additional information, please contact either of the undersigned.

Sincerely,



Nicholas Gathings  
Associate Staff Professional  
SCS Engineers



Lucas S. Nachman  
Project Professional  
SCS Engineers

LSN/NG/cjw

cc: Randall Eads, City of Bristol  
Mike Martin, City of Bristol  
Joey Lamie, City of Bristol  
Jonathan Hayes, City of Bristol  
Jake Chandler, City of Bristol  
Susan "Tracey" Blalock, VDEQ

Encl. Surface Emissions Monitoring Results  
Bristol SEM Route Drawing

**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 23, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
1	44.7 PPM	OK			Start Serpentine Route
2	29.9 PPM	OK			
3	34.2 PPM	OK			
4	14.2 PPM	OK			
5	74 PPM	OK			
6	6.2 PPM	OK			
7	8.1 PPM	OK			
8	9.6 PPM	OK			
9	5.8 PPM	OK			
10	12.8 PPM	OK			
11	23.9 PPM	OK			
12	49.8 PPM	OK			
13	29.7 PPM	OK			
14	6.4 PPM	OK			
15	6.9 PPM	OK			
16	9.2 PPM	OK			
17	6.5 PPM	OK			
18	17.4 PPM	OK			
19	12.5 PPM	OK			
20	5.3 PPM	OK			
21	5.1 PPM	OK			
22	3.1 PPM	OK			
23	2.6 PPM	OK			
24	2.2 PPM	OK			
25	23.5 PPM	OK			
26	19.2 PPM	OK			
27	4.9 PPM	OK			
28	4.1 PPM	OK			
29	1.4 PPM	OK			
30	1 PPM	OK			
31	25.3 PPM	OK			
32	27.3 PPM	OK			
33	53.6 PPM	OK			
34	161 PPM	OK			
35	7.5 PPM	OK			
36	10.3 PPM	OK			
37	6.7 PPM	OK			
38	15.5 PPM	OK			
39	6.9 PPM	OK			
40	65 PPM	OK			
41	5.1 PPM	OK			
42	7.3 PPM	OK			

**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 23, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
43	2.6 PPM	OK			
44	2.9 PPM	OK			
45	2.5 PPM	OK			
46	3.4 PPM	OK			
47	4 PPM	OK			
48	7 PPM	OK			
49	3.5 PPM	OK			
50	3.5 PPM	OK			
51	32.8 PPM	OK			
52	5.3 PPM	OK			
53	5.4 PPM	OK			
54	6.2 PPM	OK			
55	6.9 PPM	OK			
56	8.8 PPM	OK			
57	5.3 PPM	OK			
58	4.5 PPM	OK			
59	5.2 PPM	OK			
60	5.3 PPM	OK			
61	9 PPM	OK			
62	6.9 PPM	OK			
63	8 PPM	OK			
64	5.1 PPM	OK			
65	2.8 PPM	OK			
66	3.1 PPM	OK			
67	5.8 PPM	OK			
68	6.7 PPM	OK			
69	2.4 PPM	OK			
70	2.3 PPM	OK			
71	4.7 PPM	OK			
72	5.1 PPM	OK			
73	4.9 PPM	OK			
74	4.4 PPM	OK			
75	17.2 PPM	OK			
76	103 PPM	OK			
77	7 PPM	OK			
78	48.6 PPM	OK			
79	14.4 PPM	OK			
80	4.3 PPM	OK			
81	3.4 PPM	OK			
82	282 PPM	OK			
83	9.7 PPM	OK			
84	12 PPM	OK			

# SCS ENGINEERS

## EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MARCH 23, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
85	37.6 PPM	OK			
86	20.4 PPM	OK			
87	25.5 PPM	OK			
88	109 PPM	OK			
89	289 PPM	OK			
90	15.5 PPM	OK			
91	127 PPM	OK			
92	10 PPM	OK			
93	60.1 PPM	OK			
94	9.8 PPM	OK			
95	21.2 PPM	OK			
96	6.9 PPM	OK			
97	12.2 PPM	OK			
98	101 PPM	OK			
99	9.8 PPM	OK			
100	70.5 PPM	OK			End Serpentine Route
101	120 PPM	OK			EW-35
102	299 PPM	OK			EW-52
103	21.2 PPM	OK			TP-4
104	480 PPM	OK			EW-60
105	137 PPM	OK			EW-48
106	3.6 PPM	OK			TP-6
107	6.3 PPM	OK			EW-61
108	8 PPM	OK			EW-36
109	39.6 PPM	OK			EW-34
110	17.5 PPM	OK			EW-50
111	311 PPM	OK			EW-67
112	31.5 PPM	OK			EW-47
113	359 PPM	OK			EW-54
114	246 PPM	OK			EW-55
115	5.5 PPM	OK			TP-2
116	7 PPM	OK			EW-46
117	22.6 PPM	OK			EW-66
118	6.7 PPM	OK			EW-58
119	182 PPM	OK			EW-57
120	10.2 PPM	OK			TP-1
121	263 PPM	OK			EW-59
122	410 PPM	OK			EW-56
123	41.4 PPM	OK			EW-41
124	252 PPM	OK			EW-53
125	13.4 PPM	OK			EW-40

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 23, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
126	6.5 PPM	OK			TP-3
127	11 PPM	OK			EW-51
128	16.2 PPM	OK			EW-39
129	23.4 PPM	OK			TP-5
130	22.8 PPM	OK			EW-68
131	104 PPM	OK			EW-38
132	32.1 PPM	OK			TP-7
133	13.9 PPM	OK			EW-49
134	4.8 PPM	OK			EW-31R
135	4.4 PPM	OK			EW-65
136	5 PPM	OK			EW-37
137	8.2 PPM	OK			TP-8
138	7.1 PPM	OK			EW-64
139	7.1 PPM	OK			EW-30R
140	15.9 PPM	OK			EW-63
141	7.9 PPM	OK			EW-42
142	22.7 PPM	OK			TP-9
143	2.7 PPM	OK			EW-33R
144	13.5 PPM	OK			EW-62
145	7.1 PPM	OK			EW-29R
146	96.9 PPM	OK			EW-25
147	104 PPM	OK			EW-24
148	11.5 PPM	OK			EW-32
149	34.9 PPM	OK			EW-32R

Number of locations sampled:	149
Number of exceedance locations:	0

# SCS ENGINEERS

## EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MARCH 23, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	

**NOTES:**

Points 1 through 100 represent serpentine SEM route.

Points 101 through 149 represent SEM at Pipe Penetrations

Weather Conditions: Cloudy, 55°F Wind: W - 5 MPH

Sampling Calibration: Methane - 500 ppm, Zero Air - 0.0 ppm

3/23/2023 9:15 ZERO 0.1 PPM

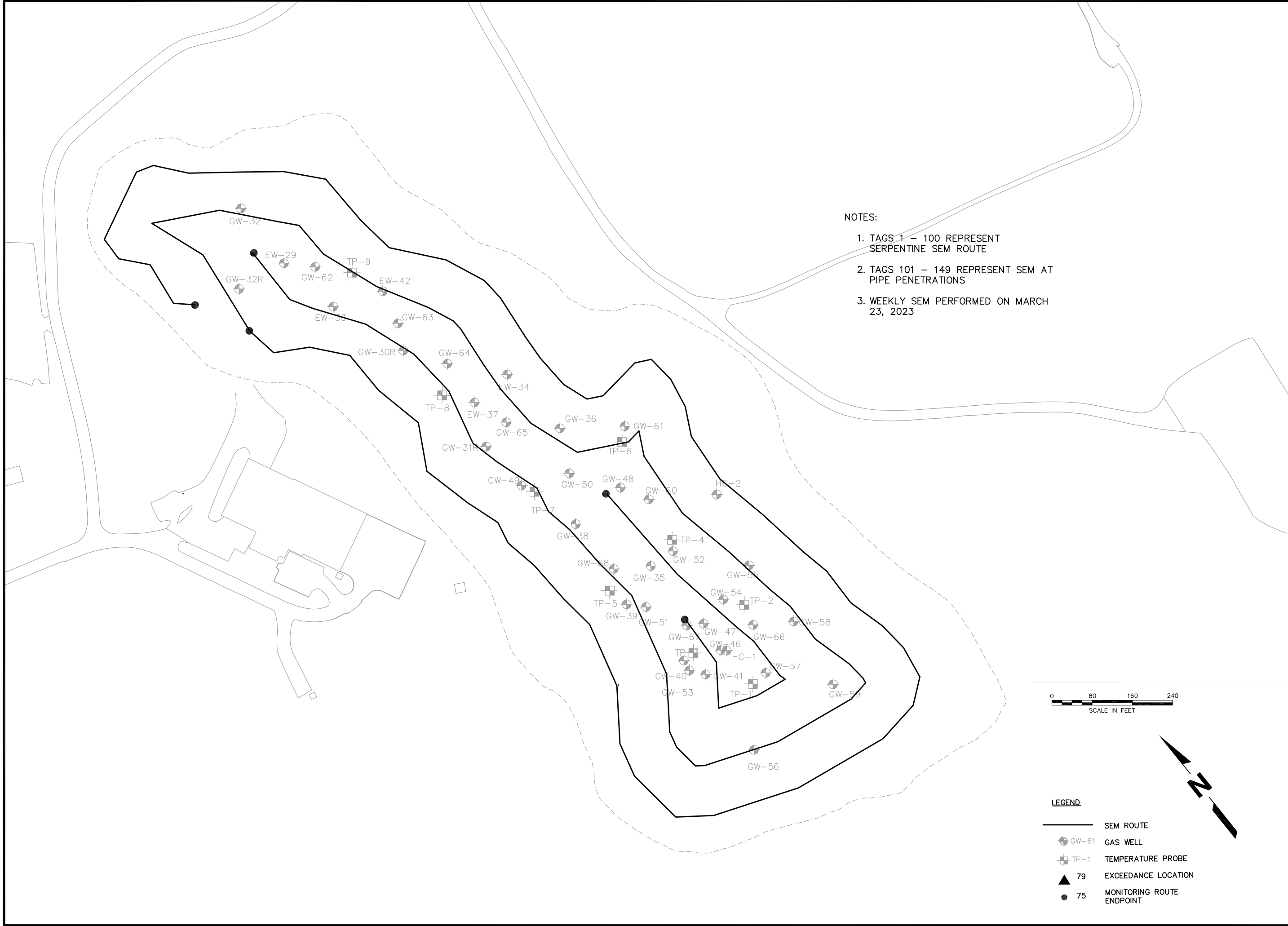
3/23/2023 9:17 SPAN 502.0 PPM

Background Reading:

3/23/2023 9:19 Upwind 2.3 PPM

3/23/2023 9:22 Downwind 1.8 PPM





- NOTES:
1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
  2. TAGS 101 – 149 REPRESENT SEM AT PIPE PENETRATIONS
  3. WEEKLY SEM PERFORMED ON MARCH 23, 2023

NO.		REVISION		DATE	
SHEET TITLE			PROJECT TITLE		
WEEKLY SEM ROUTE			SURFACE EMISSIONS MONITORING SOLID WASTE PERMIT #588		
CLIENT			CLIENT		
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY			CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY		
2655 VALLEY DRIVE			2655 VALLEY DRIVE		
BRISTOL, VA 24201			BRISTOL, VA 24201		
SCS ENGINEERS		DWN. BY:		D/A RW BY:	
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.		LSN		SN	
12700 WOODBURN AVENUE, SUITE 100, BRISTOL, VA 24201		DBK		APR. BY:	
PH: (804) 378-7440 FAX: (804) 378-7433					
FILE: 02218208.04					
DATE: 3/23/23					
SCALE: AS SHOWN					
DRAWING NO. 1 of 1					

April 5, 2023  
File No. 02218208.04

Mr. Jonathan Chapman  
Enforcement Specialist  
Virginia Department of Environmental Quality  
SW Regional Office  
355-A Deadmore Street  
Abingdon, VA 24210

Subject: Weekly Surface Emissions Monitoring Event – March 29, 2023  
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on March 29, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Appendix A.1.i of the Consent Decree between the Commonwealth of Virginia and the City of Bristol.

The monitoring generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 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 includes the entire waste footprint of the Permit No. 588 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, including at the newly installed temperature probes. The approximate monitoring route and sampling locations are presented in the attached Drawing.

At the time of monitoring, all areas of the Permit No. 588 Landfill footprint are subject to regulatory monitoring based on the regulatory time schedule stipulated in 40 CFR 63.1960(b) and 40 CFR 60.36f(b). The Permit No. 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitoring is provided in Table 1.



Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	147
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	47
Number of Exceedances <sup>1</sup>	1
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	1

### Remonitoring of Ongoing Exceedances

In accordance with 40 CFR 63.1960(c)(4)(ii) and 40 CFR 60.36f(c)(4)(ii), corrective actions and a remonitoring event are to be performed within 10 days of the initial exceedance. In accordance with 40 CFR 63.1960(c)(4)(iii) and 40 CFR 60.36f(c)(4)(iii) additional corrective actions and a second 10-day retest are to be performed if the initial 10-day retest indicates methane values greater than the regulatory threshold. The Facility performs corrective actions, as necessary, including wellhead vacuum adjustments, the installation of well-bore seals, and addition of soil cover prior to weekly monitoring events at locations that previously exhibited elevated methane concentrations.

In accordance with 40 CFR 63.1960(c)(4)(v) and 40 CFR 60.36f(c)(4)(v) a new well or collection device must be installed or an alternate remedy must be submitted within 120-days at locations that continue to exhibit methane concentrations above the regulatory threshold for two consecutive retests.

A summary of ongoing exceedance points is provided in Table 2.

---

Table 2. Ongoing Weekly SEM Exceedances

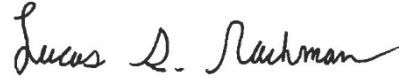
Point ID	Initial Exceedance Date	3/29/23 Event	3/29/23 Event Result	Comments
No Ongoing Exceedances				

If you have questions or require additional information, please contact either of the undersigned.

Sincerely,



Nick Gathings  
Associate Staff Professional  
SCS Engineers



Lucas S. Nachman  
Project Professional  
SCS Engineers

LSN/NG/cjw

cc: Randall Eads, City of Bristol  
Mike Martin, City of Bristol  
Joey Lamie, City of Bristol  
Jonathan Hayes, City of Bristol  
Jake Chandler, City of Bristol  
Susan "Tracey" Blalock, VDEQ

Encl. Surface Emissions Monitoring Results  
Bristol SEM Route Drawing

**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 29, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
1	13.8 PPM	OK			Start Serpentine Route
2	308 PPM	OK			
3	1.4 PPM	OK			
4	14.6 PPM	OK			
5	6.8 PPM	OK			
6	2.7 PPM	OK			
7	5 PPM	OK			
8	4 PPM	OK			
9	9.4 PPM	OK			
10	4 PPM	OK			
11	11.1 PPM	OK			
12	11.6 PPM	OK			
13	4.8 PPM	OK			
14	64.3 PPM	OK			
15	14.8 PPM	OK			
16	13.9 PPM	OK			
17	8.8 PPM	OK			
18	3.9 PPM	OK			
19	19.1 PPM	OK			
20	36.5 PPM	OK			
21	402 PPM	OK			
22	81.9 PPM	OK			
23	143 PPM	OK			
24	9.3 PPM	OK			
25	335 PPM	OK			
26	96.4 PPM	OK			
27	4.8 PPM	OK			
28	6.3 PPM	OK			
29	15.9 PPM	OK			
30	0.7 PPM	OK			
31	0.5 PPM	OK			
32	3.8 PPM	OK			
33	135 PPM	OK			
34	59.1 PPM	OK			
35	1.6 PPM	OK			
36	1.4 PPM	OK			
37	2.3 PPM	OK			
38	7.2 PPM	OK			
39	376 PPM	OK			
40	5.5 PPM	OK			
41	2.3 PPM	OK			
42	1.4 PPM	OK			

**SCS ENGINEERS****EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS  
WEEKLY MONITORING EVENT - MARCH 29, 2023  
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
43	2 PPM	OK			
44	9 PPM	OK			
45	74.4 PPM	OK			
46	2.9 PPM	OK			
47	6.4 PPM	OK			
48	113 PPM	OK			
49	3.9 PPM	OK			
50	3.8 PPM	OK			
51	18.3 PPM	OK			
52	9.6 PPM	OK			
53	3 PPM	OK			
54	5.6 PPM	OK			
55	11 PPM	OK			
56	2.4 PPM	OK			
57	1.4 PPM	OK			
58	2.2 PPM	OK			
59	2.6 PPM	OK			
60	6.6 PPM	OK			
61	2.3 PPM	OK			
62	0.9 PPM	OK			
63	0.6 PPM	OK			
64	1.6 PPM	OK			
65	1.9 PPM	OK			
66	5 PPM	OK			
67	1.7 PPM	OK			
68	1.9 PPM	OK			
69	36.1 PPM	OK			
70	2.3 PPM	OK			
71	117 PPM	OK			
72	4.1 PPM	OK			
73	19.3 PPM	OK			
74	46.1 PPM	OK			
75	2.6 PPM	OK			
76	2.1 PPM	OK			
77	175 PPM	OK			
78	57 PPM	OK			
79	5.5 PPM	OK			
80	1.5 PPM	OK			
81	20.5 PPM	OK			
82	119 PPM	OK			
83	224 PPM	OK			
84	4.3 PPM	OK			

# SCS ENGINEERS

## EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MARCH 29, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
85	84.9 PPM	OK			
86	24.8 PPM	OK			
87	11.5 PPM	OK			
88	8.3 PPM	OK			
89	2.9 PPM	OK			
90	1 PPM	OK			
91	0.3 PPM	OK			
92	0.4 PPM	OK			
93	0.9 PPM	OK			
94	61.6 PPM	OK			
95	14.8 PPM	OK			
96	7.2 PPM	OK			
97	0.8 PPM	OK			
98	1.7 PPM	OK			
99	6.2 PPM	OK			
100	2.1 PPM	OK			End Serpentine Route
101	175 PPM	OK			EW-35
102	801 PPM	HIGH_ALARM	36.59900	-82.14749	EW-52
103	17.3 PPM	OK			TP-4
104	82.9 PPM	OK			EW-60
105	29.3 PPM	OK			EW-48
106	6.4 PPM	OK			TP-6
107	4.1 PPM	OK			EW-61
108	2.6 PPM	OK			EW-36
109	51.4 PPM	OK			EW-34
110	94.7 PPM	OK			EW-50
111	77.6 PPM	OK			EW-67
112	0.9 PPM	OK			EW-47
113	87.4 PPM	OK			EW-54
114	56.4 PPM	OK			EW-55
115	2.7 PPM	OK			TP-2
116	5.9 PPM	OK			EW-46
117	24.7 PPM	OK			EW-66
118	6.9 PPM	OK			EW-58
119	154 PPM	OK			EW-57
120	38.5 PPM	OK			TP-1
121	152 PPM	OK			EW-59
122	230 PPM	OK			EW-56
123	47.5 PPM	OK			EW-41
124	7.2 PPM	OK			EW-53
125	1.2 PPM	OK			EW-40



# SCS ENGINEERS

## EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MARCH 29, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
126	1.8 PPM	OK			TP-3
127	7.2 PPM	OK			EW-51
128	60.3 PPM	OK			EW-39
129	1.5 PPM	OK			TP-5
130	5.3 PPM	OK			EW-68
131	13.2 PPM	OK			EW-38
132	2 PPM	OK			TP-7
133	0.8 PPM	OK			EW-49
134	1.4 PPM	OK			EW-31R
135	1.5 PPM	OK			EW-65
136	0.2 PPM	OK			EW-37
137	0.5 PPM	OK			TP-8
138	0.4 PPM	OK			EW-64
139	0.3 PPM	OK			EW-30R
140	0.2 PPM	OK			EW-63
141	1.5 PPM	OK			EW-42
142	0.4 PPM	OK			TP-9
143	0.3 PPM	OK			EW-33R
144	0.2 PPM	OK			EW-62
145	0.1 PPM	OK			EW-29R
146	23.4 PPM	OK			EW-32
147	2.4 PPM	OK			EW-32R

Number of locations sampled:	147
Number of exceedance locations:	1

# SCS ENGINEERS

## EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MARCH 29, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	

**NOTES:**

Points 1 through 100 represent serpentine SEM route.

Points 101 through 147 represent SEM at Pipe Penetrations

Weather Conditions: Sunny, 45°F Wind: E - 5 MPH

Sampling Calibration: Methane - 500 ppm, Zero Air - 0.0 ppm

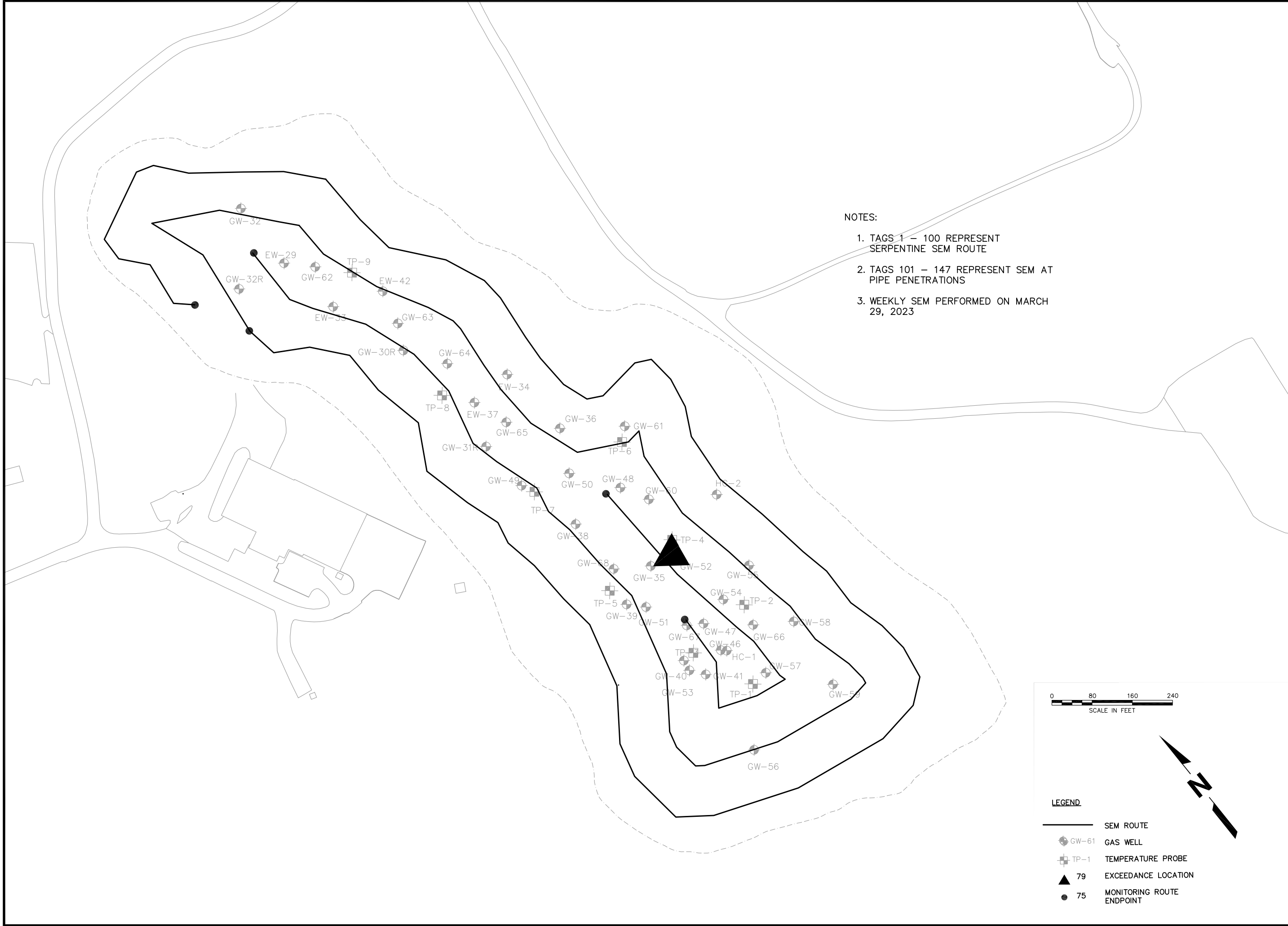
3/29/2023 8:14 ZERO 0.0 PPM

3/29/2023 8:17 SPAN 501.0 PPM

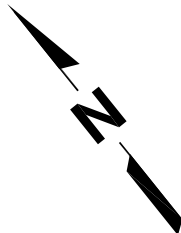
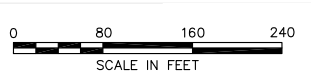
Background Reading:

3/29/2023 8:17 Upwind 4.5 PPM

3/29/2023 8:21 Downwind 22.9 PPM




- NOTES:
1. TAGS 1 - 100 REPRESENT SERPENTINE SEM ROUTE
  2. TAGS 101 - 147 REPRESENT SEM AT PIPE PENETRATIONS
  3. WEEKLY SEM PERFORMED ON MARCH 29, 2023



- LEGEND**
- SEM ROUTE
  - GW-61 GAS WELL
  - TP-1 TEMPERATURE PROBE
  - 79 EXCEEDANCE LOCATION
  - 75 MONITORING ROUTE ENDPOINT

NO.		REVISION		DATE	
SHEET TITLE			PROJECT TITLE		
WEEKLY SEM ROUTE			SURFACE EMISSIONS MONITORING SOLID WASTE PERMIT #588		
CLIENT			CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY		
			2655 VALLEY DRIVE BRISTOL, VA 24201		
SCS ENGINEERS		DWN. BY:		D/A RW BY:	
STEARNS, CONRAD AND SCHMIDT		LSN		SN	
CONSULTING ENGINEERS, INC.		DBK		APR. BY:	
1000 W. MAIN ST., SUITE 200					
BRISTOL, VA 24201					
PH: (804) 378-7440 FAX: (804) 378-7433					
FILE: 02218208.04					
DATE: 3/29/23					
SCALE: AS SHOWN					
DRAWING NO. 1 of 1					



Appendix B  
SCS-FS March Summary Report

April 7, 2023  
Job No. 07223016.00

Mr. Michael Martin  
City of Bristol  
2125 Shakesville Road  
Bristol, VA 24201

Subject: Summary of Operation, Monitoring, and Maintenance (OM&M) Services  
Permit Area 588 Gas Collection Control System (GCCS)  
City of Bristol Integrated Solid Waste Management Facility, Bristol, Virginia  
March 2023

Dear Mr. Martin:

SCS Field Services (SCS-FS) performed routine and non-routine monitoring and maintenance on the Solid Waste Permit (SWP) #588 Landfill gas collection and control system (GCCS) for the City of Bristol at the Bristol Integrated Solid Waste Management Facility (ISWMP) during the month of March, 2023. This report summarizes the work performed and presents the data collected. The monitoring data is presented in the following attachments:

- Attachment 1. SWP #588 Wellfield Monitoring Data
- Attachment 2. Exceedance Detail Report
- Attachment 3. Enhanced Monitoring Record Form and Analytical Results
- Attachment 4. Daily Logs

The tables in Attachment 1 include the March blower/flare station (BFS) monitoring data and the last three months of monitoring data for the wellheads and the leachate cleanouts.

### **GCCS SITE ACTIVITIES**

SCS-FS monitored the extraction wells (EW) each week throughout the month. Adjustments were made and wellheads were re-monitored as needed to maintain regulatory compliance and the target gas concentrations and flow rates. The blower/flare station operation was monitored each working day.

On March 2, SCS-FS conducted non-routine enhanced monitoring and carbon monoxide (CO) sampling (enhanced monitoring) for compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAP) at EW-37. Samples for CO and fixed gases analysis were collected and submitted to Enthalpy Analytical for analysis. Analytical results as available from the laboratory for the enhanced monitoring sampling events are included in Attachment 3.

On March 7, SCS-FS fused a 2-inch cap on an open J-trap below the north side clean-outs.

On March 8, SCS-FS found that a 4-inch valve near EW-61 was closed. With this valve closed, 12 extraction wells had lost vacuum. SCS-FS reopened the valve and restored vacuum to those wells.

On March 9, SCS-FS conducted enhanced monitoring and CO sample collection at EW-37.

On March 16, SCS-FS conducted enhanced monitoring and CO sample collection at EW-37 and -57.

On March 20, SCS-FS replaced the orifice plates in side wall wells 1L, 2L, and 2U from 1.75-inch to 1.25-inch. SCS-FS unclogged an ice blockage in the air line to restore air pressure to the pumps in SWP #588.

On March 21, SCS-FS made wellhead repairs to EW-38 and -48 and wellhead and pump repairs to EW-66. SCS-FS bumped tested and verified that pumps were operating in EW-50, -58, -65, and -68.

On March 23, SCS-FS conducted enhanced monitoring at EW-37 and -51. Samples for CO analysis were collected at EW-51. No sample was collected at EW-37, as it was below the regulatory limit of 145 degrees Fahrenheit. SCS-FS also performed pump maintenance at EW-57 and -58.

On March 24, SCS-FS installed a pump and set it at 69 feet in EW-54. The stroke counter was at 106317. SCS-FS also measured depth to liquid at 27.7 feet. SCS-FS also added new flex hose and clamps to the wellhead.

On March 27, SCS-FS installed a pump and set it at 88 feet in EW-51. The stroke counter was at 244985.

On March 28, SCS-FS noted that EW-24 and -25 have been removed and abandoned in SWP #588 by the construction. SCS-FS preformed pump inspection and bump tested pumps at EW-50, -51, -54, -57, -59, -61, and -68, and got them operating. Pumps at EW-49 and -65 were shut off pending repairs due to liquid/foam in the exhaust line.

On March 29, SCS-FS conducted enhanced monitoring and CO sample collection at EW-37, -51, and -57. SCS-FS installed a pump at EW-60. The stroke counter was at 163945. SCS-FS noticed that some of the bolts on the flex coupling at the BFS had come off, so new bolts and washers were installed.

On March 30, SCS-FS installed a pump and replaced the flex hose at EW-52, and replaced the pump at EW-62.

Please contact either of the undersigned if you have any questions or need additional information regarding this report.

Very truly yours,



Mike Gibbons  
Project Manager  
**SCS FIELD SERVICES**



Thomas M. Lock  
Vice President / Northeast Region Manager  
**SCS FIELD SERVICES**

Attachments

cc: Bob Dick, SCS Engineers

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## **Attachments**

1. Wellfield Monitoring Data
2. Exceedance Detail Report
3. Enhanced Monitoring Record Forms and Analytical Results
4. Daily Logs

**Attachment 1**

**SWP #588 Wellfield Monitoring Data**



## Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
30R	1/12/2023 12:22	49.0	37.1	0.5	13.4	127.2	127.3	-7.0	-6.7	-5.8	
30R	2/3/2023 09:48	18.7	20.3	8.1	52.9	128.1	128.2	-0.6	-0.5	-6.3	
30R	2/7/2023 14:32	21.7	21.0	6.1	51.2	129.2	129.8	-0.6	-0.5	-6.2	
30R	2/8/2023 08:36	20.0	20.7	6.5	52.8	128.8	129.0	-0.6	-0.5	-6.1	No Change
30R	2/14/2023 13:01	21.4	21.9	5.8	50.9	129.9	129.9	-0.6	-0.6	-0.6	No Change
30R	2/22/2023 14:46	22.4	21.1	6.4	50.1	129.7	129.8	-0.5	-0.5	-5.4	No Change
30R	3/1/2023 13:38	23.5	23.0	4.9	48.6	130.2	130.2	-0.3	-0.3	-4.7	No Change
30R	3/7/2023 11:17	19.7	21.0	6.3	53.0	128.1	128.2	-0.8	-0.8	-5.6	Decreased Flow/vacuum
30R	3/15/2023 09:28	20.8	22.2	6.2	50.8	123.2	124.5	-0.4	-0.4	-4.9	
30R	3/23/2023 10:21	24.4	51.6	1.6	22.4	132.7	132.7	-16.0	-14.7	-15.6	
30R	3/28/2023 11:52	18.3	40.2	5.8	35.7	129.0	60.8	-0.6	-0.6	-3.6	
31R	1/5/2023 13:43	21.0	38.2	2.8	38.0	138.2	138.3	-21.0	-21.0	-21.4	
31R	2/1/2023 13:30	24.7	48.5	0.6	26.2	127.5	127.6	-21.5	-20.9	-16.8	
31R	3/2/2023 09:28	17.7	35.3	8.7	38.3	103.1	103.0	-16.0	-17.6	-17.5	No Change
31R	3/15/2023 10:40	34.2	51.5	2.1	12.2	124.2	124.3	-18.6	-17.8	-19.0	No Change
31R	3/23/2023 09:56	20.4	21.9	5.7	52.0	127.8	127.7	-0.4	-0.4	-4.3	No Change
31R	3/28/2023 11:36	22.5	67.4	1.3	8.8	137.9	137.9	-15.5	-15.3	-15.9	Valve Adjustment:No Change
32R	1/5/2023 12:42	48.8	39.5	0.0	11.7	128.6	128.6	-2.4	-2.4	-6.2	
32R	2/3/2023 10:32	52.0	39.8	0.0	8.2	118.9	118.1	-1.3	-1.2	-3.2	Increased Flow/Vacuum
32R	2/8/2023 08:15	52.4	39.2	0.9	7.5	120.2	120.3	-1.0	-1.0	-3.3	Increased Flow/Vacuum
32R	2/14/2023 13:23	51.2	40.4	0.0	8.4	122.8	122.8	-0.9	-0.9	-3.4	No Change
32R	2/22/2023 15:08	49.2	36.7	2.1	12.0	120.3	120.4	-0.8	-0.8	-1.4	No Change
32R	3/1/2023 13:16	55.2	40.1	0.0	4.7	120.1	120.1	-0.6	-0.6	-1.1	No Change
32R	3/7/2023 10:38	56.0	40.2	0.3	3.5	114.6	114.6	-0.6	-0.6	-1.1	No Change
32R	3/15/2023 10:05	52.4	47.6	0.0	0.0	82.2	82.7	-0.1	0.0	0.1	No Change
32R	3/29/2023 11:45	52.6	45.8	0.0	1.6	134.4	134.4	-4.6	-4.8	-7.2	
24	1/5/2023 12:51	3.9	6.1	18.0	72.0	60.8	61.1	-0.8	-0.4	-22.8	
24	2/3/2023 11:12	0.6	1.8	21.7	75.9	44.9	44.6	-0.5	-0.4	-22.5	
24	2/8/2023 08:44	0.4	1.0	22.1	76.5	67.0	66.3	-0.5	-0.5	-22.6	No Change
24	2/22/2023 15:13	8.6	6.3	17.2	67.9	93.1	93.2	-0.3	-0.3	-21.7	No Change
24	3/1/2023 13:06	20.8	15.0	9.0	55.2	84.9	84.6	-0.2	-0.2	-21.3	No Change
24	3/7/2023 10:57	0.4	1.9	21.8	75.9	67.3	66.9	-1.2	-1.1	-22.4	No Change
24	3/15/2023 09:50	0.3	2.1	22.7	74.9	34.2	33.9	-1.9	-1.9	-21.8	
25	1/5/2023 13:02	0.4	0.7	21.0	77.9	68.1	68.1	-0.4	-0.4	-22.7	
25	2/3/2023 11:20	0.2	1.6	22.7	75.5	45.3	44.2	-6.1	-6.2	-6.2	
25	2/8/2023 08:41	0.2	0.6	22.2	77.0	64.2	63.7	-2.4	-2.4	-22.3	



# Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
25	2/22/2023 15:16	0.4	1.0	21.7	76.9	94.3	94.1	-0.2	-0.2	-21.9	No Change
25	3/1/2023 13:08	0.3	10.1	18.1	71.5	81.3	81.5	-0.9	-0.9	-21.3	No Change
25	3/7/2023 11:00	0.0	0.7	22.5	76.8	61.6	61.5	-1.2	-1.2	-22.6	No Change
25	3/15/2023 09:53	0.1	11.0	21.0	67.9	35.8	35.5	-1.6	-1.6	-21.8	No Change
29	1/5/2023 12:45	56.0	38.5	1.0	4.5	100.0	100.0	-4.7	-4.4	-4.4	
29	2/3/2023 10:24	53.0	36.5	2.4	8.1	46.2	46.0	-2.1	-2.0	-2.0	
29	2/8/2023 08:21	58.0	39.7	0.9	1.4	59.9	59.8	-1.7	-1.7	-1.7	No Change
29	2/14/2023 13:17	57.1	40.1	0.5	2.3	92.7	92.8	-1.4	-1.4	-1.3	No Change
29	2/22/2023 15:05	58.6	41.0	0.4	0.0	98.3	98.3	-0.9	-0.9	-0.9	No Change
29	3/1/2023 13:19	57.7	40.2	0.3	1.8	95.7	95.7	-0.5	-0.5	-0.4	Can Not Sample due to Access/Safety
29	3/7/2023 10:47	57.8	40.1	0.8	1.3	84.6	84.3	-0.4	-0.4	-0.8	Increased Flow/Vacuum
29	3/15/2023 09:47	57.2	42.8	0.0	0.0	52.7	52.6	0.2	0.2	0.2	Can Not Sample due to Access/Safety
29	3/16/2023 13:16	58.9	39.2	0.2	1.7	66.9	66.4	-0.2	-0.3	-0.9	
29	3/29/2023 11:42	55.0	42.5	0.8	1.7	103.8	101.9	-7.2	-7.2	-8.9	Valve Adjustment:No Change
32	1/5/2023 12:47	57.1	42.9	0.0	0.0	72.0	72.3	-3.9	-3.9	-10.7	
32	2/3/2023 10:27	50.6	40.4	9.1		60.5	62.8	-2.8	-3.0	-6.6	Increased Flow/Vacuum
32	2/8/2023 08:47	57.5	42.1	0.4	0.0	75.8	77.3	-7.0	-8.1	-9.4	Increased Flow/Vacuum
32	2/14/2023 13:20	56.3	43.7	0.0	0.0	87.6	87.0	-14.5	-14.3	-15.3	Increased Flow/Vacuum
32	2/22/2023 15:21	55.7	44.3	0.0	0.0	89.6	89.6	-15.9	-16.2	-14.9	Increased Flow/Vacuum
32	3/1/2023 13:11	57.5	42.3	0.1	0.1	89.2	89.2	-15.2	-15.2	-16.8	Increased Flow/Vacuum
32	3/7/2023 10:52	56.6	43.1	0.4		88.9	88.6	-15.4	-16.1	-16.8	Increased Flow/Vacuum
32	3/15/2023 10:00	55.7	44.3	0.0	0.0	83.2	83.2	-13.0	-13.0	-13.0	Increased Flow/Vacuum
33	1/5/2023 13:11	37.0	29.5	4.2	29.3	129.4	129.5	-2.0	-2.0	-1.5	
33	2/3/2023 11:56	38.6	26.1	9.3	26.0	116.2	118.4	-1.2	-1.2	-7.0	
33	2/14/2023 13:26	36.9	30.1	3.3	29.7	118.7	118.8	-1.2	-1.2	-6.2	No Change
33	2/22/2023 15:00	36.6	28.4	4.0	31.0	115.9	116.1	-1.4	-1.3	-6.5	No Change
33	3/1/2023 13:26	37.2	27.6	3.6	31.6	119.8	119.8	-1.2	-1.1	-5.7	No Change
33	3/7/2023 11:22	31.9	24.2	5.6	38.3	116.1	116.1	-1.0	-1.0	-5.4	Decreased Flow/vacuum
33	3/15/2023 09:43	34.0	25.4	5.5	35.1	116.6	117.1	-0.9	-0.8	-5.0	
33	3/23/2023 09:43	38.3	29.6	3.1	29.0	121.2	121.4	-0.7	-0.6	-4.0	No Change
34	1/5/2023 13:37	2.8	72.8	0.1	24.3	138.0	138.0	-8.9	-8.9	-8.8	
34	2/3/2023 09:54	12.5	16.1	15.0	56.4	127.2	128.1	-2.2	-2.2	-1.4	
34	2/7/2023 14:20	2.1	67.8	0.5	29.6	128.0	128.3	-6.2	-6.2	-8.1	No Change
34	2/14/2023 12:51	1.3	74.2	0.0	24.5	136.8	136.8	-4.4	-4.4	-6.2	
34	2/22/2023 14:40	1.0	39.4	10.1	49.5	114.7	114.9	-3.2	-3.2	-5.1	No Change
34	3/1/2023 13:50	1.5	71.8	0.0	26.7	118.3	102.3	-0.1	-5.1	-5.2	Increased Flow/Vacuum

# Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
34	3/15/2023 09:16	0.7	72.1	0.0	27.2	45.3	44.8	-5.7	-5.6	-5.5	No Change
34	3/23/2023 10:15	1.0	71.2	0.1	27.7	124.8	125.2	-4.5	-4.5	-2.2	
34	3/28/2023 11:45	1.6	91.7	0.0	6.8	126.8	126.9	-4.5	-3.6	1.9	
35	1/5/2023 14:15	32.6	23.4	9.9	34.1	66.9	66.9	-7.1	-7.1	-20.1	Increased Flow/Vacuum
35	2/1/2023 12:39	21.7	17.2	14.2	46.9	48.0	47.7	-12.2	-11.7	-18.3	
35	2/7/2023 11:23	19.4	15.1	13.5	52.0	68.1	67.7	-13.7	-12.3	-20.9	
35	2/14/2023 12:10	3.1	7.5	19.4	70.0	77.8	76.8	-5.6	-5.6	-20.5	
35	2/22/2023 11:43	2.2	2.0	20.7	75.1	86.5	85.7	-6.8	-6.9	-17.1	No Change
35	3/1/2023 14:19	2.9	2.1	20.0	75.0	81.4	81.1	-18.7	-18.7	-19.0	No Change
35	3/15/2023 14:25	2.5	2.1	20.8	74.6	56.8	56.6	-18.2	-18.2	-19.2	
35	3/23/2023 10:46	4.3	4.4	19.5	71.9	56.0	55.8	-13.1	-13.1	-16.4	
36	1/5/2023 13:51	15.1	10.1	16.4	58.4	65.7	65.8	-22.6	-22.2	-22.1	Can Not Sample due to Access/Safety
36	2/3/2023 09:34	11.3	9.0	18.5	61.2	48.8	48.8	-22.3	-22.3	-22.2	
36	2/7/2023 14:12	21.2	14.9	14.0	49.9	76.0	75.7	-21.9	-21.9	-21.9	
36	3/2/2023 09:33	21.6	15.7	14.0	48.7	85.1	84.7	-19.4	-19.3	-19.0	
36	3/23/2023 10:31	18.3	13.2	14.6	53.9	77.2	76.2	-18.6	-18.3	-18.3	
36	3/28/2023 11:32	22.7	48.1	14.7	14.6	58.2	58.4	-41.6	-17.3	-36.4	
37	1/5/2023 13:34	15.5	27.4	6.3	50.8	151.9	151.8	-2.3	-2.2	-9.0	High Temp
37	1/6/2023 07:24	16.1	26.9	6.7	50.3	149.2	149.2	-2.0	-2.0	-9.1	
37	1/12/2023 12:18	15.0	24.3	6.2	54.5	149.7	149.7	-8.5	-8.5	-8.1	
37	1/18/2023 12:33	14.0	26.2	6.8	53.0	149.0	149.0	-1.8	-1.8	-8.1	
37	1/25/2023 11:53	14.2	28.4	6.1	51.3	149.7	149.8	-1.8	-1.8	-7.8	
37	2/1/2023 13:33	18.2	30.2	6.3	45.3	150.9	150.9	-1.9	-1.9	-7.4	
37	2/3/2023 10:18	14.9	27.2	7.8	50.1	148.6	149.0	-1.8	-1.6	-7.3	
37	2/7/2023 14:26	17.0	28.3	6.6	48.1	150.4	150.5	-6.2	-6.5	-6.8	
37	2/8/2023 09:35	16.7	29.2	6.3	47.8	149.1	149.1	-1.5	-1.5	-6.7	
37	2/14/2023 12:54	16.2	31.5	5.9	46.4	149.6	149.6	-1.5	-1.5	-6.4	
37	2/15/2023 10:32	17.1	29.3	6.5	47.1	148.6	148.6	-1.4	-1.4	-6.3	
37	2/22/2023 14:36	17.5	30.9	6.1	45.5	149.1	149.5	-1.5	-1.5	-6.7	
37	2/23/2023 09:25	16.1	30.3	6.0	47.6	149.0	148.9	-1.4	-1.4	-6.0	
37	3/1/2023 13:44	16.4	31.1	5.6	46.9	149.6	149.7	-1.3	-1.3	-5.5	
37	3/2/2023 08:46	16.2	31.4	6.2	46.2	148.6	148.6	-1.5	-1.5	-6.0	
37	3/7/2023 11:27	17.1	31.0	6.5	45.4	149.1	149.1	-1.5	-1.4	-5.9	
37	3/9/2023 11:24	19.4	32.5	6.4	41.7	149.0	149.0	-1.3	-1.3	-5.6	
37	3/15/2023 09:21	16.1	33.0	6.2	44.7	147.7	147.7	-1.3	-1.3	-5.7	
37	3/16/2023 09:53	13.1	25.8	9.9	51.2	148.6	148.6	-1.3	-1.3	-5.4	

## Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
37	3/23/2023 10:12	15.6	32.8	5.8	45.8	149.3	149.3	-1.2	-1.2	-4.6	High Temp
37	3/23/2023 13:01	16.4	33.9	5.5	44.2	144.9	144.4	-1.1	-1.1	-4.3	
37	3/28/2023 11:42	15.2	43.3	6.1	35.4	151.0	151.0	-1.1	-1.1	-4.0	
37	3/29/2023 11:52	15.1	35.4	6.4	43.2	150.6	150.6	-3.1	-3.1	-13.9	
											Valve Adjustment:No Change
38	1/5/2023 14:06	34.6	23.0	9.5	32.9	104.2	104.1	-13.3	-13.3	-13.3	No Change
38	2/1/2023 13:20	15.9	12.6	16.8	54.7	47.7	47.8	-23.0	-22.9	-22.9	
38	2/7/2023 11:54	28.1	19.0	11.3	41.6	105.7	105.7	-11.9	-11.9	-11.9	
38	2/14/2023 12:31	2.6	3.2	20.7	73.5	101.1	101.3	-8.5	-8.5	-7.7	
38	2/22/2023 12:01	0.5	0.7	21.7	77.1	99.7	100.0	-7.5	-7.7	-7.1	No Change
38	3/1/2023 14:00	0.3	1.0	20.7	78.0	99.6	99.6	-12.3	-12.4	-10.3	
38	3/15/2023 14:45	33.7	22.2	9.8	34.3	93.6	93.6	-11.0	-11.0	-11.0	
38	3/23/2023 10:40	0.0	0.5	21.3	78.2	96.7	97.3	-7.2	-7.9	-6.8	
38	3/28/2023 11:20	34.3	24.6	9.5	31.6	100.8	100.9	-10.0	-10.0	0.5	No Change
39	1/5/2023 14:21	29.4	20.0	11.0	39.6	60.2	60.3	-18.1	-18.4	-17.7	Increased Flow/Vacuum
39	2/1/2023 12:48	0.9	1.8	22.2	75.1	40.9	40.9	-16.5	-17.1	-16.7	
39	2/7/2023 11:32	0.7	1.5	21.1	76.7	63.9	64.2	-21.5	-21.5	-21.4	
39	2/14/2023 12:16	1.2	10.0	19.0	69.8	69.6	67.8	-15.3	-15.5	-15.6	
39	2/22/2023 11:49	1.9	3.4	20.5	74.2	78.0	78.0	-12.3	-13.1	-13.0	No Change
39	3/1/2023 14:25	3.8	3.8	19.4	73.0	84.6	87.3	-12.5	-12.9	-13.5	Increased Flow/Vacuum
39	3/15/2023 14:18	2.2	3.1	20.7	74.0	56.6	55.4	-12.6	-12.3	-12.6	Decreased Flow/vacuum
39	3/23/2023 10:49	1.7	3.7	20.0	74.6	58.8	58.5	-12.0	-11.4	-10.6	Valve Adjustment:Closed valve 1/2 to 1 turn
39	3/28/2023 11:05	1.3	8.2	22.2	68.4	55.4	55.4	-10.0	-9.8	-10.1	
40	1/5/2023 15:04	45.5	54.2	0.3	0.0	138.5	139.3	-17.7	-17.7	-18.7	Increased Flow/Vacuum
40	2/1/2023 12:17	46.1	53.4	0.5	0.0	124.2	124.0	-4.7	-4.7	-9.1	
40	2/1/2023 13:25	2.7	72.9	0.2	24.2	123.6	123.8	-7.0	-7.0	-7.0	
40	2/7/2023 10:59	49.0	50.6	0.4	0.0	127.7	128.4	-10.3	-12.7	-12.8	
40	2/14/2023 11:54	48.9	50.3	0.1	0.7	129.8	129.7	-13.0	-13.8	-15.4	Increased Flow/Vacuum
40	2/22/2023 11:09	45.2	47.0	3.6	4.2	124.1	124.0	-10.2	-11.0	-12.5	Increased Flow/Vacuum
40	3/1/2023 15:06	49.4	49.8	0.2	0.6	118.7	118.9	-7.0	-7.0	-6.2	Increased Flow/Vacuum
40	3/9/2023 10:45	32.0	63.0	0.0	5.0	139.1	139.2	-8.3	-8.1	-8.8	No Change
40	3/15/2023 13:40	31.6	63.6	0.0	4.8	141.8	142.0	-8.4	-8.8	-9.0	Increased Flow/Vacuum
40	3/23/2023 10:26	4.7	78.7	0.0	16.6	74.9	74.8	6.7	6.8	6.7	Valve Adjustment:Opened Valve 1/2 to 1 turn
40	3/23/2023 13:21	4.4	75.4	0.9	19.4	71.7	71.9	-7.0	-6.1	-7.3	
40	3/28/2023 10:37	5.4	94.6	0.0	0.0	71.9	73.9	-1.3	-1.3	-0.9	
41	1/5/2023 15:06	50.6	49.3	0.2		128.3	128.4	-6.7	-6.7	-16.6	
41	2/1/2023 12:06	55.7	42.5	1.3	0.5	46.3	46.3	-19.8	-19.8	-19.6	

# Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
41	2/7/2023 10:53	50.0	38.4	2.6	9.0	108.2	109.1	-19.0	-19.3	-1.6	Positive Static Press.,Increased Flow/Vacuum
41	2/14/2023 11:48	50.3	39.8	1.8	8.1	96.9	97.3	-17.1	-16.7	-1.2	
41	2/22/2023 10:48	52.6	40.2	1.7	5.5	94.3	93.9	-15.3	-15.2	-3.5	
41	3/1/2023 14:59	48.1	34.0	7.9	10.0	94.1	94.3	-13.9	-13.9	-2.3	
41	3/9/2023 10:50	33.3	66.6	0.1	0.0	83.4	83.4	-4.2	-4.2	-3.4	
41	3/15/2023 13:52	34.9	64.8	0.3	0.0	85.0	85.5	-4.0	-4.2	-4.9	
41	3/23/2023 10:20	23.4	20.4	11.0	45.2	69.3	69.2	-7.5	-7.7	-7.7	
41	3/28/2023 10:30	21.8	27.4	12.0	38.9	75.5	75.6	-9.0	-8.9	-9.2	
42	1/5/2023 13:13	36.4	27.4	7.5	28.7	120.0	119.9	-1.5	-0.9	-0.9	Decreased Flow/vacuum
42	2/3/2023 09:59	57.8	42.2	0.0	0.0	105.5	107.7	-0.9	-0.8	-0.8	
42	2/8/2023 08:30	0.3	0.7	21.9	77.1	111.1	111.3	-0.1	-0.1	-0.1	
42	2/14/2023 13:10	57.5	41.0	0.5	1.0	111.5	111.4	-0.4	-0.4	-0.3	
42	2/22/2023 14:56	56.4	43.6	0.0	0.0	115.2	115.6	-0.4	-0.4	-0.4	
42	3/1/2023 13:31	56.7	41.3	0.1	1.9	90.7	98.4	-0.9	-1.4	-5.1	
42	3/7/2023 11:10	50.7	39.1	0.2	10.0	121.4	121.7	-3.8	-4.2	-5.5	
42	3/15/2023 09:36	46.8	37.4	0.4	15.4	119.1	119.3	-7.4	-7.4	-5.9	
42	3/23/2023 09:46	50.2	38.9	0.0	10.9	119.4	119.3	-4.4	-4.4	-4.8	
42	3/28/2023 14:00	50.5	41.5	0.0	7.9	119.2	120.0	-3.8	-3.8	-4.4	
46	1/5/2023 14:51	54.0	46.0	0.0	0.0	143.9	143.9	-1.3	-1.2	-20.4	Increased Flow/Vacuum,High Temp
46	2/1/2023 12:01	53.6	46.4	0.0	0.0	145.5	144.8	-1.3	-0.7	-20.2	
46	2/7/2023 10:48	53.0	45.0	1.0	1.0	143.4	144.0	-1.0	-1.2	-20.2	
46	2/14/2023 11:42	51.5	43.5	0.1	4.9	143.9	143.8	-6.1	-6.2	-20.6	
46	2/22/2023 10:30	44.2	38.1	1.4	16.3	139.2	140.0	-6.9	-5.3	-19.4	
46	3/1/2023 14:57	43.1	37.1	1.2	18.6	144.6	144.9	-7.5	-7.5	-17.1	
46	3/9/2023 10:33	44.0	38.1	1.5	16.4	145.2	144.8	-6.0	-7.1	-15.5	
46	3/15/2023 13:30	40.5	35.0	1.8	22.7	144.6	144.5	-7.2	-7.2	-16.7	
46	3/23/2023 10:12	38.8	37.6	1.9	21.7	145.4	145.4	-4.8	-4.9	-14.3	
46	3/23/2023 13:24	39.8	38.7	1.8	19.7	145.4	145.8	-4.9	-4.9	-14.4	
46	3/28/2023 10:21	34.5	50.9	2.0	12.7	148.5	148.5	-4.4	-4.4	-14.3	
47	1/5/2023 15:11	54.0	36.5	3.1	6.4	63.0	62.6	-21.4	-21.3	-21.2	Increased Flow/Vacuum
47	2/1/2023 12:26	56.8	41.0	1.4	0.8	89.1	89.0	-22.3	-22.3	-21.9	
47	2/7/2023 11:07	55.3	40.3	1.1	3.3	72.9	73.4	-19.5	-19.5	-19.6	
47	2/14/2023 12:00	36.4	28.0	7.6	28.0	97.6	97.9	-20.8	-20.8	-20.7	
47	2/22/2023 11:22	55.8	40.0	1.0	3.2	98.5	98.6	-19.9	-19.9	-19.7	
47	3/1/2023 14:36	56.4	40.4	0.4	2.8	102.2	102.2	-19.1	-19.1	-19.1	
47	3/9/2023 10:56	56.8	36.4	1.4	5.4	91.8	91.9	-18.1	-18.1	-18.0	

## Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
47	3/15/2023 14:01	53.7	39.2	1.0	6.1	86.8	86.9	-19.4	-19.4	-19.3	
47	3/23/2023 10:34	53.0	41.5	1.5	4.0	86.9	86.0	-16.8	-16.6	-16.8	Valve Comment:Broken valve
47	3/28/2023 10:43	43.5	56.1	0.5	0.0	93.6	93.4	-16.5	-16.5	-16.7	Valve Adjustment:Opened Valve 1/2 to 1 turn
48	1/5/2023 14:01	3.2	2.9	20.0	73.9	65.2	65.5	-21.8	-21.8	-21.8	
48	2/1/2023 13:01	6.1	5.2	20.0	68.7	40.1	40.1	-23.1	-22.3	-22.3	
48	2/7/2023 11:57	0.6	1.3	21.2	76.9	69.2	68.7	-21.5	-21.5	-21.4	No Change
48	2/14/2023 12:26	1.7	9.2	19.1	70.0	62.6	62.5	-20.0	-20.0	-20.5	
48	2/22/2023 11:58	1.3	1.5	21.2	76.0	72.7	72.4	-19.1	-19.1	-19.4	No Change
48	3/1/2023 14:05	3.0	1.9	20.1	75.0	79.1	79.2	-0.1	-19.0	-18.9	No Change
48	3/15/2023 14:40	0.3	0.8	21.5	77.4	50.4	48.6	-16.8	-16.7	-17.0	Decreased Flow/vacuum
48	3/23/2023 10:37	0.0	1.3	20.9	77.8	59.2	59.1	-15.0	-15.2	-16.8	No Change
48	3/28/2023 11:17	3.1	16.6	21.1	59.1	56.2	56.2	-4.5	-15.7	-10.3	
49	1/5/2023 13:45	28.9	31.9	5.1	34.1	136.1	136.2	-9.0	-9.0	-9.0	
49	2/3/2023 09:40	40.9	37.1	3.1	18.9	133.0	133.2	-3.9	-3.9	-3.9	Can Not Sample due to Access/Safety
49	2/7/2023 12:18	35.1	32.6	3.6	28.7	135.0	135.6	-3.9	-3.9	-3.9	No Change
49	2/14/2023 12:35	39.0	35.6	2.4	23.0	135.4	135.4	-4.4	-4.4	-4.4	
49	2/22/2023 12:12	47.1	41.0	0.9	11.0	95.8	95.6	-1.6	-1.5	-1.5	Can Not Sample due to Access/Safety
49	3/1/2023 13:54	49.0	42.4	0.5	8.1	132.1	132.2	-1.4	-1.3	-1.3	No Change
49	3/10/2023 08:38	55.0	44.8	0.2	0.0	78.6	78.7	-0.3	-0.3	-0.2	No Change
49	3/15/2023 14:56	57.5	42.0	0.5	0.0	126.6	127.6	-1.1	-1.1	-1.1	No Change
49	3/23/2023 10:25	54.2	43.2	0.3	2.3	130.9	131.0	-1.5	-1.5	-1.5	
49	3/29/2023 12:30	43.2	55.4	0.5	1.0	133.3	133.3	-1.3	-1.3	0.7	
50	1/5/2023 13:48	44.4	32.3	2.6	20.7	124.4	124.3	-2.7	-2.6	-2.4	
50	2/1/2023 13:11	50.0	35.1	1.4	13.5	123.9	124.0	-2.5	-2.5	-21.6	
50	2/7/2023 12:16	49.5	34.4	0.9	15.2	125.0	125.2	-2.1	-4.5	-0.1	Increased Flow/Vacuum
50	2/14/2023 12:38	34.8	30.2	1.4	33.6	122.7	122.7	-5.5	-5.5	-5.5	
50	2/22/2023 12:09	40.0	29.5	1.3	29.2	121.8	122.0	-5.1	-5.1	-5.1	No Change
50	3/1/2023 13:57	39.9	31.1	0.8	28.2	120.9	121.0	-4.8	-4.8	-17.3	No Change
50	3/10/2023 08:40	53.6	39.1	0.0	7.3	118.0	118.3	-1.9	-1.9	-3.0	
50	3/15/2023 14:54	51.4	36.0	0.8	11.8	124.8	124.8	-6.0	-6.0	-5.9	No Change
50	3/23/2023 10:28	23.7	20.8	7.2	48.3	118.0	118.1	-6.8	-6.8	-6.8	
50	3/28/2023 11:23	32.5	33.1	1.7	32.7	119.7	119.7	-5.9	-5.9	-13.3	Valve Comment:0839985
51	1/5/2023 14:24	39.2	53.9	0.7	6.2	130.6	130.5	-12.2	-11.5	-11.4	
51	2/1/2023 12:43	39.7	48.2	3.1	9.0	68.5	68.4	-9.1	-9.4	-8.3	
51	2/7/2023 11:27	41.1	37.0	4.7	17.2	80.4	80.8	-21.5	-21.5	-21.2	Increased Flow/Vacuum
51	2/14/2023 12:13	34.8	47.0	3.2	15.0	96.3	97.1	-9.4	-7.4	-11.0	



## Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
51	2/22/2023 11:45	6.3	66.1	2.8	24.8	91.2	91.1	-5.8	-6.3	-6.1	No Change
51	3/1/2023 14:29	13.2	61.0	2.3	23.5	84.3	81.5	-7.7	-7.7	-8.4	No Change
51	3/15/2023 14:13	25.2	56.9	2.5	15.4	78.9	78.7	-5.5	-5.3	-6.0	Decreased Flow/vacuum
51	3/23/2023 10:48	1.3	30.1	17.1	51.5	169.2	177.8	-3.8	-6.4	-8.1	Valve Comment:0229820
51	3/23/2023 13:13	13.7	45.6	5.0	35.7	166.4	167.3	-5.5	-4.6	-6.7	Valve Comment:0243375
51	3/29/2023 12:25	5.7	75.9	1.5	16.9	169.8	169.2	-1.6	-1.5	-0.9	Valve Comment:0281076
52	1/5/2023 14:12	42.2	56.8	0.2	0.8	144.0	144.0	-18.0	-17.5	-16.9	
52	2/1/2023 12:36	47.4	51.2	1.0	0.4	130.7	130.8	-18.2	-18.2	-18.5	
52	2/7/2023 11:19	43.0	49.8	1.0	6.2	135.1	135.8	-21.4	-21.3	-21.2	Increased Flow/Vacuum
52	2/14/2023 12:08	36.1	42.2	3.7	18.0	118.8	119.1	-19.6	-19.6	-19.5	
52	2/22/2023 11:39	35.5	38.1	6.0	20.4	115.6	117.9	-19.7	-19.7	-18.8	
52	3/1/2023 14:16	43.6	43.3	2.4	10.7	104.3	104.4	-19.0	-19.0	-19.0	No Change
52	3/15/2023 14:32	28.3	26.9	9.8	35.0	84.4	84.2	-19.0	-19.1	-19.0	Decreased Flow/vacuum
52	3/23/2023 10:43	45.4	41.9	3.3	9.5	89.9	90.6	-15.4	-15.8	-15.5	Valve Adjustment:Opened Valve 1/2 to 1 turn
52	3/28/2023 10:53	30.2	46.9	7.8	15.2	94.1	94.2	-16.4	-16.4	-16.4	
53	1/5/2023 15:02	48.6	38.7	3.9	8.8	120.0	120.9	-17.8	-17.8	-1.7	Positive Static Press
53	2/1/2023 12:13	39.7	59.7	0.6	0.0	144.6	144.5	-14.1	-13.5	-15.8	
53	2/7/2023 10:57	4.2	46.0	7.0	42.8	141.5	142.4	-14.1	-14.1	-15.7	
53	2/14/2023 11:51	23.3	49.0	4.0	23.7	144.7	144.2	-13.9	-13.2	-16.2	
53	2/22/2023 10:52	23.4	47.6	4.7	24.3	151.7	152.4	-11.4	-10.9	-14.4	High Temp,Increased Flow/Vacuum
53	2/23/2023 09:28	23.0	46.9	5.0	25.1	145.3	145.6	-12.7	-12.1	-14.0	High Temp
53	3/1/2023 15:03	29.9	59.4	0.9	9.8	141.1	141.2	-10.6	-10.6	-10.6	No Change
53	3/9/2023 10:41	29.2	26.6	8.4	35.8	73.4	73.3	-9.0	-8.9	-9.4	Can Not Sample due to Access/Safety
53	3/15/2023 13:34	23.2	19.5	10.7	46.6	68.6	68.4	-9.8	-9.9	-9.9	Decreased Flow/vacuum
53	3/23/2023 10:23	31.7	65.0	0.2	3.1	111.6	114.1	-7.1	-7.2	-7.8	Valve Comment:1852617
53	3/28/2023 10:33	28.6	71.4	0.0	0.0	143.9	144.6	-8.6	-8.5	-9.1	Valve Adjustment:Opened Valve 1/2 to 1 turn
53	3/28/2023 10:58	18.0	26.0	15.4	40.7	58.4	58.7	-13.4	-13.4	-15.4	
54	1/5/2023 15:14	35.3	64.7	0.0	0.0	61.7	62.0	-21.1	-21.1	-21.2	
54	2/1/2023 12:29	29.0	63.6	1.3	6.1	122.9	122.9	-22.0	-22.0	-21.2	
54	2/7/2023 11:12	28.1	62.0	5.9	4.0	131.2	133.8	-21.3	-21.3	-21.1	No Change
54	2/14/2023 12:02	18.5	36.5	8.5	36.5	78.1	77.6	-20.8	-20.8	-20.8	
54	2/22/2023 11:33	25.9	66.0	0.0	8.1	142.0	141.8	-19.5	-19.5	-19.8	
54	3/1/2023 14:38	24.5	66.0	0.0	9.5	132.4	132.5	-19.2	-19.1	-18.9	No Change
54	3/9/2023 10:59	24.0	65.8	0.1	10.1	112.1	112.2	-18.1	-18.0	-17.9	No Change
54	3/15/2023 14:04	21.2	65.9	0.0	12.9	97.3	97.6	-19.4	-19.4	-19.6	No Change
54	3/23/2023 10:37	20.2	66.3	0.1	13.4	94.9	94.8	-16.3	-16.4	-16.5	Valve Adjustment:Opened Valve 1/2 to 1 turn





## Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
54	3/28/2023 10:47	16.5	46.1	9.7	27.7	140.3	140.4	-16.5	-16.3	-16.8	Valve Comment:0152697;Valve Adjustment:Closed valve 1/2 to 1 turn
55	1/5/2023 15:16	42.2	34.0	4.2	19.6	60.8	60.5	-21.0	-20.9	-20.9	No Change
55	2/3/2023 09:26	37.0	32.9	4.4	25.7	37.0	36.9	-21.4	-21.4	-21.4	
55	2/7/2023 10:41	40.7	34.5	3.2	21.6	74.4	74.9	-22.1	-22.1	-22.0	
55	2/7/2023 11:15	40.0	33.0	3.8	23.2	84.8	85.3	-21.5	-21.5	-21.4	
55	2/14/2023 12:04	39.5	35.7	3.4	21.4	74.9	75.0	-20.9	-20.8	-20.9	
55	2/22/2023 11:29	46.4	36.6	1.8	15.2	83.5	83.3	-20.0	-20.0	-20.0	
55	3/1/2023 14:41	45.2	38.9	1.6	14.3	86.0	85.6	-19.1	-19.1	-19.3	
55	3/9/2023 11:02	28.2	23.2	11.0	37.6	70.4	69.7	-18.1	-18.1	-18.0	
55	3/15/2023 14:09	30.1	27.1	8.1	34.7	55.0	54.9	-19.4	-19.4	-19.4	
55	3/23/2023 10:40	46.8	45.9	1.1	6.2	57.1	57.1	-16.5	-16.6	-12.1	
55	3/28/2023 10:50	38.4	57.5	1.7	2.4	59.7	59.7	-16.7	-16.5	-14.5	
56	1/5/2023 14:38	44.3	40.0	3.6	12.1	130.4	130.4	-18.3	-18.3	-20.1	Increased Flow/Vacuum
56	2/1/2023 11:18	42.1	39.9	4.3	13.7	131.9	132.1	-19.1	-19.1	-21.2	
56	2/7/2023 10:08	42.3	38.0	4.4	15.3	130.9	130.8	-18.2	-18.1	-20.4	
56	2/14/2023 11:19	42.0	37.0	4.3	16.7	127.6	131.1	-20.0	-20.0	-20.0	
56	2/22/2023 10:11	43.2	38.7	4.1	14.0	133.4	133.4	-17.5	-17.5	-18.4	
56	3/1/2023 15:18	42.2	39.7	3.5	14.6	134.6	134.2	-16.1	-16.2	-16.4	
56	3/9/2023 10:10	47.1	44.0	2.3	6.6	134.0	134.1	-16.6	-16.6	-17.1	
56	3/15/2023 10:58	44.9	43.5	2.5	9.1	130.4	130.8	-18.2	-18.1	-18.4	
56	3/23/2023 09:48	42.5	42.9	2.7	12.0	105.6	105.8	-16.1	-16.1	-16.8	
56	3/28/2023 09:47	40.4	54.7	3.4	1.5	129.8	130.2	-12.5	-12.4	-13.0	
57	1/5/2023 14:43	41.4	49.1	9.4	0.1	143.4	145.6	-20.6	-20.5	-20.4	High Temp
57	1/6/2023 07:40	48.1	51.8	0.1	0.0	148.1	148.4	-21.1	-21.0	-20.8	
57	1/12/2023 12:36	38.0	45.7	1.4	14.9	176.1	176.9	-12.8	-8.1	-12.0	
57	1/18/2023 11:59	6.4	10.5	16.9	66.2	172.4	172.4	0.0	0.0	0.1	
57	1/25/2023 12:05	31.7	59.3	0.6	8.4	170.0	170.3	-20.2	-20.2	-20.0	
57	2/1/2023 11:27	43.8	55.7	0.5	0.0	155.3	155.3	-21.2	-20.9	-20.5	
57	2/3/2023 10:41	40.2	55.2	0.1	4.5	150.8	150.9	-20.3	-20.3	-18.6	
57	2/7/2023 10:28	41.5	54.2	0.3	4.0	153.2	153.0	-21.0	-21.0	-20.9	
57	2/8/2023 09:43	42.0	55.4	0.3	2.3	152.5	152.4	-20.8	-20.8	-20.5	
57	2/14/2023 11:27	34.4	56.0	0.6	9.0	147.4	147.7	-20.7	-20.8	-20.8	
57	2/15/2023 12:23	40.1	56.7	0.5	2.7	149.6	149.7	-20.4	-20.5	-20.5	
57	2/22/2023 10:19	40.3	58.2	0.0	1.5	149.7	149.7	-18.6	-18.7	-18.7	
57	2/23/2023 09:38	38.9	57.8	0.4	2.9	144.3	144.5	-17.6	-16.7	-17.2	
57	3/1/2023 15:10	38.5	58.9	0.0	2.6	145.3	144.5	-18.1	-0.2	-17.9	



# Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
57	3/9/2023 10:18	33.5	62.5	0.0	4.0	143.2	143.3	-17.2	-17.1	-16.9	No Change
57	3/15/2023 11:03	1.0	74.9	0.0	24.1	170.5	170.5	-18.1	-18.3	-18.4	
57	3/16/2023 10:06	23.2	54.6	3.2	19.0	146.4	147.1	-16.4	-16.4	-16.1	High O2
57	3/23/2023 09:59	29.1	58.3	1.1	11.5	133.5	137.2	-15.3	-15.3	-15.5	
57	3/28/2023 10:14	29.6	70.4	0.0	0.0	144.1	147.2	-14.1	-14.0	-14.2	Valve Comment:0224544
57	3/29/2023 12:10	21.4	57.8	2.7	18.1	162.1	157.7	-12.2	-12.1	-12.5	Valve Adjustment:No Change;Well Comment:0248610
58	1/5/2023 14:48	26.7	36.1	2.2	35.0	119.7	120.2	-6.0	-6.0	-6.0	
58	2/1/2023 11:40	31.1	45.2	0.7	23.0	124.2	124.2	-3.0	-2.9	-0.5	
58	2/7/2023 10:37	36.3	42.3	1.6	19.8	115.8	116.4	-11.2	-11.1	-11.1	
58	2/14/2023 11:31	49.9	50.0	0.0	0.1	94.9	95.1	-20.7	-20.7	-20.6	
58	2/22/2023 10:22	2.1	2.4	19.9	75.6	71.7	70.6	-18.4	-18.4	-18.4	No Change
58	3/1/2023 14:48	1.0	1.1	20.4	77.5	79.5	79.5	-17.6	-17.6	-17.5	No Change
58	3/9/2023 10:22	9.6	8.8	19.4	62.2	68.7	68.5	-16.5	-16.5	-16.2	No Change
58	3/15/2023 11:06	37.2	54.1	0.0	8.7	112.8	112.8	-4.1	-4.0	-4.0	No Change
58	3/23/2023 10:03	38.6	57.0	0.2	4.2	90.2	89.0	-7.4	-7.5	-14.9	
58	3/28/2023 10:09	39.2	60.8	0.0	0.0	117.2	117.7	-3.7	-5.0	-14.7	Valve Comment:1753310;Valve Adjustment:Opened Valve 1/2 to 1 turn
59	1/5/2023 14:40	31.5	30.6	5.9	32.0	114.2	114.3	-1.6	-1.6	-22.3	
59	2/1/2023 11:22	30.0	31.8	6.2	32.0	115.3	115.3	-3.1	-1.9	-22.8	
59	2/7/2023 10:22	29.8	30.0	6.2	34.0	112.6	112.8	-1.8	-1.2	-21.9	
59	2/14/2023 11:22	38.6	37.3	3.3	20.8	114.0	113.9	-1.4	-1.4	-21.7	
59	2/22/2023 10:14	45.3	43.7	2.0	9.0	114.1	114.1	-3.0	-3.1	-21.2	Opened Valve 1/2 to 1 Turn
59	3/1/2023 15:14	34.3	36.5	3.7	25.5	112.5	112.5	-3.3	-3.3	-20.0	No Change
59	3/9/2023 10:14	35.9	40.6	3.7	19.8	115.6	115.3	-2.4	-2.4	-2.4	
59	3/9/2023 10:15	34.3	39.3	3.8	22.6	115.0	115.2	-2.4	-0.1	-18.7	Increased Flow/Vacuum
59	3/15/2023 10:55	28.2	34.7	4.9	32.2	112.3	112.3	-2.7	-2.7	-20.3	
59	3/23/2023 09:56	33.2	40.9	2.5	23.4	111.2	111.0	-2.8	-2.7	-17.7	Valve Comment:1366734;Valve Adjustment:Closed valve 1/2 to 1 turn
59	3/28/2023 10:05	37.5	55.3	0.0	7.2	160.7	160.3	-7.3	-7.6	-15.6	Valve Comment:1366950;Valve Adjustment:Opened Valve 1/2 to 1 turn
59	3/29/2023 12:19	31.2	49.8	2.2	16.9	119.3	119.4	-2.5	-2.5	-14.2	Valve Adjustment:No Change;Well Comment:1371333
60	1/5/2023 14:09	52.0	48.0	0.0	0.0	138.5	138.7	-5.2	-5.2	-21.5	
60	2/1/2023 12:56	56.3	43.6	0.1	0.0	112.4	112.6	-6.7	-7.4	-21.9	
60	2/7/2023 11:51	56.4	40.0	0.6	3.0	115.1	115.6	-17.2	-17.3	-21.1	Increased Flow/Vacuum
60	2/14/2023 12:23	37.1	34.3	1.8	26.8	117.1	117.2	-19.3	-19.3	-21.0	Increased Flow/Vacuum
60	2/22/2023 11:55	22.2	16.2	12.6	49.0	116.5	116.5	-16.5	-17.9	-19.9	No Change

## Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
60	3/1/2023 14:12	47.1	36.1	0.0	16.8	114.8	115.0	-18.0	-18.0	-19.0	Increased Flow/Vacuum
60	3/15/2023 14:37	48.6	37.1	0.0	14.3	111.1	110.9	-18.2	-18.2	-17.9	Increased Flow/Vacuum
60	3/23/2023 10:44	45.2	35.0	0.2	19.6	109.6	110.0	-16.2	-16.2	-17.0	No Change
60	3/28/2023 11:13	41.9	45.6	0.0	12.6	112.2	112.1	-15.5	-15.5	-16.5	Valve Adjustment:Opened Valve 1/2 to 1 turn
61	1/5/2023 13:54	36.2	49.9	1.9	12.0	127.3	127.3	-0.9	-0.9	-20.7	
61	2/1/2023 13:15	29.0	68.9	0.1	2.0	114.8	114.7	-1.3	-0.6	-21.8	
61	2/7/2023 12:13	39.5	56.5	0.0	4.0	120.7	120.8	-0.3	-0.2	-21.8	No Change
61	2/14/2023 12:43	35.0	60.3	0.0	4.7	120.4	123.2	-1.8	-1.8	-21.2	
61	2/22/2023 12:06	34.4	28.8	6.4	30.4	110.5	110.8	-1.4	-1.4	-19.9	No Change
61	3/2/2023 09:15	38.3	34.3	4.7	22.7	96.3	96.0	-1.6	-1.6	-17.8	No Change
61	3/15/2023 14:49	40.8	35.0	3.8	20.4	82.3	82.6	-1.4	-1.3	-17.9	No Change
61	3/23/2023 10:34	34.7	32.8	7.7	24.8	107.5	108.5	-1.2	-1.2	-17.3	No Change
61	3/28/2023 11:27	34.5	51.4	2.4	11.7	130.2	130.0	-0.7	-0.7	-16.8	Valve Adjustment:No Change
62	1/5/2023 13:06	54.2	45.8	0.0	0.0	62.5	62.6	-0.1	-0.1	-9.2	
62	2/3/2023 10:05	54.3	45.7	0.0	0.0	45.3	49.9	0.3	-0.3	-6.1	
62	2/3/2023 11:22	12.2	12.7	14.8	60.3	57.2	67.7	-1.7	-1.7	-6.6	
62	2/8/2023 08:24	33.0	33.0	2.5	31.5	116.9	117.0	-0.5	-0.4	-6.3	No Change
62	2/14/2023 13:14	38.6	35.0	1.7	24.7	117.4	117.5	-0.1	-0.2	-5.7	No Change
62	2/22/2023 15:02	47.0	38.8	1.1	13.1	117.1	117.4	-1.2	-1.2	-5.4	Increased Flow/Vacuum
62	3/1/2023 13:22	21.7	20.0	7.5	50.8	116.9	116.8	-1.3	-1.3	-5.8	No Change
62	3/7/2023 11:05	20.0	18.3	9.1	52.6	111.1	111.1	-1.6	-1.5	-5.0	Decreased Flow/vacuum
62	3/15/2023 09:40	20.4	17.1	7.1	55.4	107.8	108.3	-1.6	-1.5	-5.4	No Change
62	3/23/2023 09:40	26.4	23.0	6.9	43.7	113.4	113.4	-1.3	-1.3	-4.6	No Change
62	3/28/2023 13:57	40.7	37.5	6.4	15.4	116.2	116.2	-1.2	-1.2	-4.8	Valve Comment:0114010;Valve Adjustment:No Change
63	1/5/2023 13:16	19.3	19.4	8.7	52.6	130.2	130.1	-0.8	-0.3	-8.9	
63	2/1/2023 13:39	19.0	21.9	9.2	49.9	134.1	133.6	-1.5	-1.4	-7.3	
63	2/1/2023 13:43	21.9	21.0	8.9	48.2	121.8	121.9	-1.0	-0.6	-6.7	
63	2/8/2023 08:33	18.9	19.5	9.1	52.5	120.4	120.4	-0.4	-0.4	-6.4	
63	2/14/2023 13:06	22.6	21.9	7.4	48.1	123.0	122.8	-0.2	-0.2	-6.4	
63	2/22/2023 14:50	25.7	23.0	7.0	44.3	123.2	123.1	-0.4	-0.4	-6.4	No Change
63	3/1/2023 13:35	30.4	27.8	4.8	37.0	124.9	124.9	-0.3	-0.3	-5.3	No Change
63	3/7/2023 11:13	14.8	16.2	9.9	59.1	117.1	117.2	-0.5	-0.4	-5.6	Decreased Flow/vacuum
63	3/15/2023 09:32	10.9	11.6	13.9	63.6	88.1	88.3	-0.3	-0.3	0.2	
63	3/23/2023 09:49	16.7	19.0	7.8	56.5	113.8	113.9	-0.3	-0.3	-4.8	No Change
63	3/28/2023 14:03	19.7	27.0	7.8	45.6	112.6	110.4	-0.2	-0.1	-4.5	Valve Comment:0048073;Valve Adjustment:Closed valve 1/2 to 1 turn



## Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
64	1/5/2023 13:28	21.4	26.3	5.9	46.4	147.4	147.3	-0.9	-0.9	-0.9	
64	1/6/2023 07:34	20.9	25.8	6.5	46.8	145.0	145.2	-1.1	-1.0	-1.0	
64	1/12/2023 12:26	22.5	27.2	5.5	44.8	144.7	144.8	-1.0	-1.0	-1.0	
64	2/1/2023 13:47	18.2	20.0	9.8	52.0	133.9	134.1	-1.6	-1.6	-7.5	
64	2/7/2023 14:29	17.6	19.1	10.0	53.3	131.2	132.1	-1.2	-1.1	-6.6	No Change
64	2/14/2023 12:58	18.0	21.2	9.2	51.6	126.8	126.8	-0.9	-0.9	-6.2	No Change
64	2/22/2023 14:43	19.7	19.4	9.7	51.2	132.3	132.7	-1.2	-1.1	-6.6	No Change
64	3/1/2023 13:41	20.0	21.3	8.6	50.1	133.0	132.9	-0.9	-0.9	-5.4	No Change
64	3/15/2023 09:25	16.8	16.7	11.0	55.5	123.5	123.1	-0.7	-0.7	-5.8	
64	3/23/2023 10:08	21.7	26.3	5.7	46.3	137.5	138.2	-1.0	-1.0	-4.6	
64	3/28/2023 11:49	10.5	66.8	5.1	17.7	137.0	137.0	-0.8	-0.7	-3.7	Valve Comment:0099087
65	1/5/2023 13:39	8.7	14.3	10.9	66.1	135.6	135.7	-1.8	-1.2	-1.2	
65	2/3/2023 09:37	8.5	13.2	12.9	65.4	131.0	131.3	-1.2	-1.2	-1.2	Can Not Sample due to Access/Safety
65	2/7/2023 14:23	8.3	14.5	11.2	66.0	132.7	132.9	-1.3	-1.3	-1.2	Can Not Sample due to Access/Safety
65	2/14/2023 12:48	7.4	16.0	11.2	65.4	132.8	132.9	-1.2	-1.2	-1.1	No Change
65	2/22/2023 14:33	10.1	12.8	11.0	66.1	133.0	133.3	-1.2	-1.2	-1.2	No Change
65	3/1/2023 13:47	10.0	13.5	10.4	66.1	132.4	132.6	-1.3	-1.2	-1.2	No Change
65	3/15/2023 09:12	10.4	14.8	9.9	64.9	129.2	129.8	-1.2	-1.1	-1.1	
65	3/23/2023 10:18	9.5	16.0	10.2	64.3	130.2	130.5	-1.1	-1.1	-1.0	No Change
65	3/28/2023 11:39	8.8	34.9	10.4	45.9	133.6	133.6	-0.9	-0.9	-16.4	Valve Adjustment:No Change
66	1/12/2023 12:32	45.0	50.8	0.0	4.2	122.1	124.8	-6.2	-6.2	-6.2	
66	2/1/2023 11:50	44.2	55.8	0.0	0.0	116.2	116.9	-17.9	-17.8	-20.4	
66	2/7/2023 10:35	45.0	54.9	0.0	0.1	114.6	115.0	-20.5	-20.5	-20.5	
66	2/14/2023 11:33	35.5	63.5	0.0	1.0	86.1	86.4	-20.5	-20.5	-20.5	
66	2/22/2023 10:25	36.6	60.4	1.0	2.0	87.6	88.0	-17.6	-17.6	-17.7	
66	3/1/2023 14:07	35.5	35.7	4.3	24.5	124.9	125.0	-1.2	-1.2	-18.7	No Change
66	3/1/2023 14:51	24.7	42.3	7.0	26.0	79.1	77.6	-16.9	-16.6	-16.7	No Change
66	3/9/2023 10:25	19.6	35.2	10.4	34.8	58.5	58.4	-15.5	-15.4	-15.8	No Change
66	3/15/2023 11:10	14.1	24.9	13.7	47.3	40.1	40.1	-16.1	-16.0	-16.0	Can Not Sample due to Access/Safety
66	3/23/2023 10:08	34.4	65.1	0.5	0.0	55.2	55.2	-13.6	-13.5	-13.9	
66	3/28/2023 10:18	26.1	73.9	0.0	0.0	70.2	70.2	-13.1	-13.0	-13.2	
67	1/5/2023 15:09	38.0	61.6	0.1	0.3	68.6	68.5	-21.0	-21.0	-21.0	
67	2/1/2023 12:21	31.7	64.0	0.5	3.8	124.5	124.7	-21.9	-21.8	-21.8	
67	2/7/2023 11:05	29.7	63.0	0.0	7.3	85.8	85.9	-21.7	-21.6	-21.2	
67	3/1/2023 14:33	25.6	63.5	0.3	10.6	150.1	149.8	-19.0	-19.0	-19.0	High Temp
67	3/2/2023 09:38	28.1	63.3	0.1	8.5	143.9	144.2	-17.4	-17.4	-17.3	No Change



# Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
67	3/9/2023 10:53	21.0	60.0	1.7	17.3	143.2	143.0	-18.1	-18.0	-18.0	Increased Flow/Vacuum
67	3/15/2023 13:58	20.4	53.3	3.5	22.8	123.1	122.8	-19.3	-19.3	-19.3	Decreased Flow/vacuum
67	3/23/2023 10:30	17.6	56.6	3.9	21.9	109.2	109.8	-16.5	-16.6	-16.6	Valve Comment:0347188
67	3/28/2023 10:40	10.2	73.1	5.3	11.4	137.3	137.0	-16.6	-16.5	-16.7	Valve Comment:0347188
68	1/5/2023 14:17	58.6	41.4	0.0	0.0	129.1	129.0	-15.5	-15.1	-20.5	
68	2/1/2023 12:52	57.1	42.8	0.0	0.1	125.2	125.2	-17.3	-16.7	-20.5	
68	2/7/2023 11:41	52.5	42.5	1.1	3.9	129.3	129.8	-18.1	-18.0	-21.2	Increased Flow/Vacuum
68	2/14/2023 12:19	58.5	41.5	0.0	0.0	125.7	125.6	-18.0	-18.1	-19.1	Increased Flow/Vacuum
68	2/22/2023 11:52	57.7	42.3	0.0	0.0	125.8	125.8	-18.5	-18.5	-17.5	Increased Flow/Vacuum
68	3/1/2023 14:21	58.6	41.4	0.0	0.0	125.3	125.3	-17.1	-17.1	-17.6	Increased Flow/Vacuum
68	3/15/2023 14:20	57.5	42.5	0.0	0.0	123.4	121.6	-18.4	-18.7	-18.8	Increased Flow/Vacuum
68	3/23/2023 10:46	58.8	40.6	0.6	0.0	123.2	123.4	-15.3	-15.3	-15.7	No Change
68	3/28/2023 11:09	55.9	44.1	0.0	0.0	125.0	125.2	-14.7	-14.6	-15.1	Valve Comment:1831585
HC01	1/5/2023 14:54	26.5	20.2	12.3	41.0	62.1	61.9	-19.7	-20.2		
HC01	2/1/2023 11:55	25.6	23.2	11.3	39.9	41.4	41.3	-20.6	-20.6		
HC01	2/7/2023 10:46	16.8	15.2	14.8	53.2	64.8	64.9	-20.7	-20.7		
HC01	2/14/2023 11:37	12.5	5.0	17.5	65.0	66.7	66.7	-20.1	-20.2		
HC01	2/22/2023 10:27	0.0	0.1	21.2	78.7	79.5	79.4	-11.6	-10.4		No Change
HC01	3/1/2023 14:54	11.1	8.7	16.3	63.9	79.9	79.8	-15.6	-15.6		No Change
HC01	3/9/2023 10:30	15.5	15.1	15.8	53.6	63.9	64.0	-15.4	-15.5		No Change
HC01	3/15/2023 11:12	22.0	20.1	10.9	47.0	48.5	48.5	-16.0	-16.0		No Change
HC01	3/23/2023 10:15	20.5	18.7	11.2	49.7	55.2	55.2	-7.6	-7.6	-13.6	
HC01	3/28/2023 10:26	26.6	36.4	9.0	28.0	55.3	55.3	-12.0	-11.9	-13.2	Valve Adjustment:No Change
SW1L	3/9/2023 09:50	6.4	14.7	15.2	63.7	93.7	93.8	-0.5	-0.5	-3.8	
SW1L	3/10/2023 12:10	22.4	30.9	7.5	39.2	82.5	82.5	-0.2	-0.1	-0.7	
SW1L	3/15/2023 15:16	14.2	23.8	11.0	51.0	92.9	93.0	-0.2	-0.2	-2.5	
SW1L	3/17/2023 15:30	34.9	45.3	0.8	19.0	86.0	86.2	-0.2	-0.2	-1.6	Valve Adjustment:Closed valve 1/2 to 1 turn
SW1L	3/20/2023 13:40	4.0	12.3	15.4	68.3	96.3	96.3	-0.1	-0.1	-1.8	
SW1L	3/23/2023 09:34	9.0	22.7	11.3	56.9	100.3	100.5	-0.1	-0.1	-3.2	Valve Adjustment:Closed valve 1/2 to 1 turn
SW1L	3/28/2023 09:33	8.2	30.5	11.3	50.0	103.0	103.0	-0.1	-0.1	-3.2	Valve Adjustment:No Change
SW1U	3/9/2023 09:54	0.1	1.3	23.0	75.6	78.7	78.7	-0.2	-0.2	-4.4	
SW1U	3/10/2023 12:06	1.3	4.1	19.1	75.5	70.8	70.7	0.0	0.0	-0.6	
SW1U	3/17/2023 15:34	13.0	26.9	12.2	47.9	77.2	77.2	-0.1	-0.1	-1.4	
SW1U	3/23/2023 09:36	1.1	3.4	19.5	76.0	82.2	82.4	-0.1	-0.1	-3.2	
SW1U	3/28/2023 09:36	0.8	11.0	21.7	66.5	82.7	82.8	-0.1	-0.1	-3.1	Valve Adjustment:No Change
SW2L	3/9/2023 09:57	18.4	28.0	10.4	43.2	106.1	106.1	-0.6	-0.6	-3.3	

## Bristol Virginia Landfill - SWP #588 Extraction Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
SW2L	3/10/2023 12:00	42.6	50.0	0.8	6.6	99.7	99.7	-0.1	-0.1	-0.3	
SW2L	3/15/2023 15:09	30.2	43.8	4.8	21.2	107.4	107.4	-0.4	-0.4	-3.4	
SW2L	3/17/2023 15:38	40.6	56.7	0.0	2.7	107.2	107.3	-0.3	-0.3	-1.4	
SW2L	3/20/2023 13:45	24.8	42.1	6.3	26.9	110.8	110.8	-0.2	-0.2	-2.7	
SW2L	3/23/2023 09:39	28.0	46.1	4.4	21.5	109.2	109.1	-0.2	-0.2	-3.2	
SW2L	3/28/2023 09:39	28.3	54.5	4.5	12.6	109.8	109.8	-0.2	-0.2	-3.3	Valve Adjustment:No Change
SW2U	3/9/2023 10:06	0.6	2.2	22.8	74.4	59.4	59.3	-0.2	-0.1	0.0	
SW2U	3/10/2023 12:03	30.0	55.7	1.7	12.6	105.1	105.2	0.0	0.0	-0.4	
SW2U	3/15/2023 14:59	17.2	35.5	9.3	38.0	108.9	108.9	-0.2	-0.2	-1.2	
SW2U	3/17/2023 15:41	32.0	63.3	0.2	4.5	107.8	107.8	-0.2	-0.2	-0.7	
SW2U	3/20/2023 13:49	10.6	25.1	14.2	50.1	105.6	105.6	-0.1	-0.1	-2.0	Valve Adjustment:No Change
SW2U	3/23/2023 09:42	13.2	31.3	11.5	44.1	106.3	106.3	-0.1	-0.1	-2.5	
SW2U	3/28/2023 09:41	13.5	45.4	11.1	30.1	108.5	108.5	-0.1	-0.1	-1.7	Valve Adjustment:No Change



## Bristol Virginia Landfill - North South Clean-Outs Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	Comments
LC01	1/5/2023 13:49	0.9	1.1	19.7	78.3	69.8	69.4	-20.2	-20.1	
LC01	1/6/2023 07:51	50.2	48.0	1.8	0.0	52.9	52.9	-21.2	-21.2	
LC01	1/6/2023 09:42	38.8	43.5	17.8		59.1	57.6	-20.6	-20.6	
LC01	2/8/2023 09:57	54.9	44.4	0.7	0.0	57.8	57.7	-18.5	-18.5	Increased Flow/Vacuum
LC01	3/1/2023 10:51	56.7	42.0	0.0	1.3	60.7	60.6	-18.2	-18.2	Increased Flow/Vacuum
LC02	1/5/2023 13:52	45.5	47.1	1.1	6.3	57.8	57.7	-20.8	-20.8	
LC02	1/6/2023 07:53	47.3	47.7	0.1	4.9	53.3	53.3	-21.2	-21.3	
LC02	2/8/2023 09:58	47.2	48.8	4.0	0.0	55.5	56.2	-19.3	-19.4	Increased Flow/Vacuum
LC02	3/1/2023 10:53	34.3	40.5	0.0	25.2	60.5	60.5	-19.6	-19.6	No Change
LC03	1/6/2023 07:54	9.5	5.5	18.5	66.5	52.6	52.6	-22.6	-22.6	
LC03	2/8/2023 10:00	7.0	4.3	19.5	69.2	52.1	52.1	-21.9	-21.8	Decreased Flow/Vacuum
LC03	3/1/2023 10:56	8.8	4.4	18.4	68.4	73.3	73.2	-20.9	-20.8	Increased Flow/Vacuum
LC04	1/6/2023 07:56	14.4	7.1	15.3	63.2	53.1	53.5	-22.8	-22.7	
LC04	2/8/2023 10:02	16.4	9.0	14.5	60.1	52.8	52.9	-22.0	-21.9	No Change
LC04	3/1/2023 10:58	11.1	4.7	15.2	69.0	74.9	75.0	-20.9	-20.9	Increased Flow/Vacuum
LC05	1/6/2023 07:59	52.2	46.0	0.0	1.8	54.5	54.5	-21.3	-21.2	
LC05	2/8/2023 10:10	53.3	43.0	0.1	3.6	58.4	58.4	-19.8	-19.7	No Change
LC05	2/8/2023 10:10	53.3	43.0	0.1	3.6	58.4	58.4	-19.8	-19.7	No Change
LC05	3/1/2023 11:00	49.2	38.5	0.0	12.3	62.1	62.0	-18.7	-18.7	No Change
LC06	1/6/2023 08:01	27.3	21.3	11.7	39.7	53.7	53.7	-22.7	-22.6	
LC06	2/8/2023 10:08	34.0	20.4	10.0	35.6	53.4	53.5	-22.0	-21.9	No Change
LC06	3/1/2023 11:02	25.2	14.2	12.4	48.2	71.8	72.1	-20.9	-20.9	No Change
LC08	1/6/2023 07:57	47.8	46.9	0.2	5.1	54.3	54.3	-20.9	-20.9	
LC08	2/8/2023 10:04	50.9	46.0	0.3	2.8	55.8	55.9	-19.0	-19.0	Increased Flow/Vacuum
LC08	3/1/2023 11:05	39.0	39.8	0.0	21.2	59.5	59.5	-18.8	-18.7	No Change
LC09	1/6/2023 08:03	43.5	26.5	6.2	23.8	54.0	54.1	-22.7	-22.7	
LC09	2/8/2023 10:07	8.2	16.0	15.3	60.5	53.3	53.4	-21.8	-21.8	No Change
LC09	3/1/2023 11:08	41.5	28.0	5.7	24.8	75.9	76.2	-21.0	-20.9	No Change
LC10	1/6/2023 08:04	33.4	22.6	9.8	34.2	56.6	56.7	-22.6	-22.6	
LC10	2/8/2023 10:05	31.0	47.2	6.3	15.5	53.3	53.3	-21.9	-21.9	No Change
LC10	3/1/2023 11:10	36.9	23.5	7.6	32.0	78.8	79.1	-20.9	-20.9	Increased Flow/Vacuum
NC01	1/6/2023 08:21	0.2	0.3	22.1	77.4	38.2	38.1	-20.1	-20.1	
NC01	2/8/2023 10:15	0.7	2.1	20.3	76.9	67.2	67.2	-17.9	-17.9	



## Bristol Virginia Landfill - North South Clean-Outs Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	Comments
NC01	3/1/2023 11:17	0.2	0.7	20.4	78.7	86.7	86.9	-17.8	-17.8	No Change
NC02	1/6/2023 08:23	3.4	3.4	19.6	73.6	37.3	37.2	-1.3	-1.3	
NC02	2/8/2023 10:16	3.0	3.1	20.4	73.5	67.6	67.7	-6.4	-6.4	
NC02	3/1/2023 11:21	0.2	0.4	20.5	78.9	87.7	87.9	-5.7	-5.6	No Change
NC03	1/6/2023 08:26	0.7	1.0	21.8	76.5	37.3	37.3	-20.1	-20.1	
NC03	2/8/2023 10:17	0.6	1.1	21.1	77.2	69.3	69.6	-18.1	-18.2	No Change
NC03	3/1/2023 11:23	0.1	0.3	20.6	79.0	89.1	89.2	-17.9	-17.9	No Change
NC04	1/6/2023 08:27	0.1	0.2	22.3	77.4	37.1	37.0	-18.8	-18.8	
NC04	2/8/2023 10:18	0.2	0.6	21.9	77.3	71.2	71.3	-15.5	-15.5	
NC04	3/1/2023 11:26	0.1	0.2	20.6	79.1	89.5	89.7	-15.7	-15.6	No Change
NC05	1/6/2023 08:28	0.1	0.2	22.4	77.3	37.1	37.1	-18.9	-18.9	
NC05	2/8/2023 10:19	0.2	0.7	21.8	77.3	71.9	72.0	-15.3	-15.2	No Change
NC05	3/1/2023 11:28	0.1	0.2	20.6	79.1	90.7	90.8	-15.6	-15.6	No Change
NC06	1/6/2023 08:29	0.1	0.2	22.4	77.3	37.2	37.2	-18.8	-18.8	
NC06	2/8/2023 10:20	0.2	0.8	21.8	77.2	72.8	72.9	-15.3	-15.2	No Change
NC06	3/1/2023 11:30	0.1	0.2	20.6	79.1	90.3	90.0	-15.6	-15.6	No Change
NC07	1/6/2023 08:31	6.0	5.7	16.9	71.4	37.4	37.4	-20.1	-20.1	
NC07	2/8/2023 10:21	0.2	0.7	21.8	77.3	74.5	74.5	-19.5	-19.5	No Change
NC07	3/1/2023 11:33	0.1	0.1	20.5	79.3	90.1	90.1	-18.0	-18.1	No Change
NC08	1/6/2023 08:33	7.3	6.6	13.4	72.7	37.6	37.6	-20.1	-20.1	
NC08	3/1/2023 11:35	0.1	0.1	20.6	79.2	87.3	87.4	-18.0	-18.1	No Change
NC09	1/6/2023 08:34	15.5	14.3	5.5	64.7	42.4	43.0	-20.1	-20.1	
NC09	3/1/2023 11:37	0.0	0.1	20.6	79.3	87.1	87.2	-18.2	-18.2	No Change
NC10	1/6/2023 08:36	0.2	0.3	22.3	77.2	48.3	48.5	-15.4	-15.4	
NC10	3/1/2023 11:39	0.0	0.1	20.7	79.2	87.3	87.4	-14.9	-14.9	No Change

## Bristol Virginia Landfill - Blower/Flare Data - 03/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Temp (F)	Static Pressure ("H2O)	Flow (scfm)	Comments
Blower Inlet	3/1/2023 08:30	30.8	32.0	5.0	32.2	64.4	-24.4	325	
Blower Inlet	3/2/2023 08:17	33.3	33.3	4.6	28.8	58.3	-24.5	336	
Blower Inlet	3/3/2023 08:39	36.2	35.6	3.3	24.9	58.9	-24.6	325	
Blower Inlet	3/6/2023 15:02	36.2	33.6	4.2	26.0	76.7	-24.5	315	
Blower Inlet	3/7/2023 08:20	35.9	34.0	4.1	26.0	59.0	-24.6	270	
Blower Inlet	3/9/2023 08:26	30.0	30.0	6.6	33.4	59.8	-24.5	335	
Blower Inlet	3/9/2023 15:21	31.9	29.8	6.5	31.8	65.0	-24.4	762	
Blower Inlet	3/9/2023 15:23	31.6	30.1	6.4	31.9	64.0	-24.4	779	
Blower Inlet	3/10/2023 08:23	36.7	34.0	4.0	25.3	56.0	-24.6	625	
Blower Inlet	3/10/2023 12:18	34.2	33.9	4.5	27.4	68.2	-24.6	325	
Blower Inlet	3/13/2023 07:41	33.5	33.5	4.7	28.3	66.7	-24.5	695	
Blower Inlet	3/13/2023 12:02	34.5	35.0	4.2	26.3	68.4	-24.6	325	
Blower Inlet	3/14/2023 07:36	30.0	35.7	4.3	30.0	31.1	-24.6	325	
Blower Inlet	3/15/2023 08:18	32.4	33.6	4.3	29.7	42.6	-24.4	318	
Blower Inlet	3/16/2023 08:21	6.0	6.0	19.5	68.5	41.3	-24.5	403	
Blower Inlet	3/16/2023 08:31	18.5	20.1	12.3	49.1	51.6	-24.5	400	
Blower Inlet	3/16/2023 08:35	26.1	28.2	8.2	37.5	56.4	-24.6	400	
Blower Inlet	3/16/2023 12:57	30.9	30.0	6.7	32.4	72.7	-24.5	818	
Blower Inlet	3/16/2023 14:42	31.1	30.3	6.6	32.0	90.1	-24.4	820	
Blower Inlet	3/17/2023 10:38	30.4	31.3	6.2	32.1	61.5	-24.9	800	
Blower Inlet	3/17/2023 13:05	36.1	34.7	4.1	25.1	67.0	-24.7	625	
Blower Inlet	3/17/2023 14:45	35.7	34.7	3.9	25.7	68.3	-24.7	680	
Blower Inlet	3/17/2023 15:49	33.0	39.6	4.0	23.5	55.4	-24.6	795	
Blower Inlet	3/20/2023 10:06	26.6	29.3	7.1	37.0	42.6	-24.4	608	
Blower Inlet	3/20/2023 13:58	28.2	33.4	6.3	32.0	55.5	-24.4	670	
Blower Inlet	3/20/2023 15:28	29.6	33.0	5.9	31.4	55.5	-24.5	715	
Blower Inlet	3/21/2023 09:21	28.1	34.7	6.4	30.9	53.2	-24.6	770	
Blower Inlet	3/23/2023 08:38	30.3	32.8	5.4	31.4	53.3	-24.6	328	
Blower Inlet	3/23/2023 12:42	26.1	29.1	7.5	37.3	54.0	-24.6	760	
Blower Inlet	3/24/2023 09:28	31.0	31.3	5.5	32.2	60.1	-24.7	700	
Blower Inlet	3/27/2023 09:00	30.1	26.7	7.1	36.1	59.8	-24.6	220	





## Bristol Virginia Landfill - Blower/Flare Data - 03/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Temp (F)	Static Pressure ("H2O)	Flow (scfm)	Comments
Blower Inlet	3/27/2023 09:13	29.3	27.6	7.1	36.0	59.8	-24.6	230	
Blower Inlet	3/27/2023 15:05	30.0	29.4	6.4	34.2	70.0	-24.9	700	
Blower Inlet	3/28/2023 08:51	28.4	37.5	6.9	27.2	64.9	-24.7	700	
Blower Inlet	3/28/2023 14:13	29.5	39.3	6.1	25.1	69.0	-25.1	740	
Blower Inlet	3/29/2023 09:29	27.6	35.8	6.4	30.2	63.0	-24.5	330	Valve Adjustment:No Change
Blower Inlet	3/29/2023 14:41	30.1	32.1	4.8	33.0	71.5	-24.9	860	
Blower Inlet	3/30/2023 08:49	26.3	28.9	6.9	37.9	58.0	-24.6	420	
Blower Inlet	3/30/2023 14:49	28.0	30.9	6.0	35.2	75.0	-24.6	850	
Blower Inlet	3/31/2023 09:02	25.4	28.9	7.0	38.7	58.0	-24.7	440	
Blower Inlet	3/31/2023 14:42	29.4	29.6	5.9	35.1	61.8	-25.6	340	



## Bristol Virginia Landfill - Calibration Record Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Comments
BRTL0000	1/5/2023 09:17	49.6	35.2	0.0	15.2	
BRTL0000	1/5/2023 11:44	0.0	0.1	20.9	79.0	
BRTL0000	1/5/2023 11:46	50.0	34.9	0.0	15.1	
BRTL0000	1/5/2023 14:16	49.9	35.0	0.0	15.1	
BRTL0000	1/6/2023 07:03	0.0	0.2	20.9	78.9	
BRTL0000	1/6/2023 07:06	50.0	35.0	0.0	15.0	
BRTL0000	1/12/2023 11:55	0.0	0.2	20.9	78.9	
BRTL0000	1/12/2023 11:57	50.0	35.0	0.0	15.0	
BRTL0000	1/18/2023 11:30	0.2	0.1	20.9	78.8	
BRTL0000	1/18/2023 11:32	49.9	34.9	0.0	15.2	
BRTL0000	1/25/2023 11:17	0.1	0.1	20.9	78.9	
BRTL0000	1/25/2023 11:18	49.9	35.0	0.0	15.1	
BRTL0000	2/1/2023 10:51	50.0	35.1	0.0	14.9	
BRTL0000	2/1/2023 11:55	0.2	0.1	20.9	78.8	
BRTL0000	2/1/2023 11:56	49.9	35.0	0.0	15.1	
BRTL0000	2/3/2023 08:57	50.0	35.2	0.0	14.8	
BRTL0000	2/3/2023 09:02	0.0	0.2	21.0	78.8	
BRTL0000	2/6/2023 10:58	0.0	0.1	20.9	79.0	
BRTL0000	2/6/2023 11:01	50.0	34.9	0.0	15.1	
BRTL0000	2/7/2023 09:03	0.0	0.1	20.9	79.0	
BRTL0000	2/7/2023 09:05	50.0	34.9	0.0	15.1	
BRTL0000	2/8/2023 07:50	0.1	0.2	20.9	78.8	
BRTL0000	2/8/2023 07:54	50.0	35.0	0.0	15.0	
BRTL0000	2/14/2023 09:20	0.0	0.1	20.9	79.0	
BRTL0000	2/14/2023 09:24	50.0	34.9	0.0	15.1	
BRTL0000	2/15/2023 09:20	0.0	0.1	20.9	79.0	
BRTL0000	2/15/2023 09:22	50.0	35.0	0.0	15.0	
BRTL0000	2/16/2023 08:21	0.0	0.2	20.9	78.9	
BRTL0000	2/16/2023 08:24	50.0	35.0	0.0	15.0	
BRTL0000	2/17/2023 08:30	0.0	0.2	20.9	78.9	
BRTL0000	2/17/2023 08:32	49.9	35.0	0.0	15.1	



## Bristol Virginia Landfill - Calibration Record Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Comments
BRTL0000	2/20/2023 13:24	0.0	0.2	20.9	78.9	
BRTL0000	2/20/2023 13:27	50.0	35.0	0.0	15.0	
BRTL0000	2/21/2023 08:11	0.0	0.2	20.9	78.9	
BRTL0000	2/21/2023 08:13	50.0	35.0	0.0	15.0	
BRTL0000	2/22/2023 08:15	0.0	0.2	20.9	78.9	
BRTL0000	2/22/2023 08:18	50.0	35.1	0.0	14.9	
BRTL0000	2/22/2023 14:26	0.0	0.0	20.9	79.1	
BRTL0000	2/22/2023 14:27	50.0	35.0	0.0	15.0	
BRTL0000	2/23/2023 08:42	0.0	0.1	20.9	79.0	
BRTL0000	2/23/2023 08:47	50.0	34.9	0.0	15.1	
BRTL0000	2/24/2023 07:47	0.0	0.1	20.9	79.0	
BRTL0000	2/24/2023 07:58	50.0	35.0	0.0	15.0	
BRTL0000	2/27/2023 14:02	0.1	0.2	20.9	78.8	
BRTL0000	2/27/2023 14:04	50.0	34.9	0.0	15.1	
BRTL0000	2/28/2023 07:45	0.0	0.2	20.9	78.9	
BRTL0000	2/28/2023 07:47	50.0	35.0	0.0	15.0	
BRTL0000	3/2/2023 08:09	0.0	0.1	20.9	79.0	
BRTL0000	3/2/2023 08:13	49.8	34.8	0.0	15.4	
BRTL0000	3/3/2023 08:18	0.0	0.2	20.9	78.9	
BRTL0000	3/3/2023 08:21	49.9	35.3	0.0	14.8	
BRTL0000	3/6/2023 07:40	49.8	35.2	0.0	15.0	
BRTL0000	3/7/2023 08:05	0.0	0.2	20.9	78.9	
BRTL0000	3/7/2023 08:11	50.0	35.0	0.0	15.0	
BRTL0000	3/7/2023 08:13	0.0	0.2	11.0	88.8	
BRTL0000	3/9/2023 08:11	0.0	0.3	20.9	78.8	
BRTL0000	3/9/2023 08:14	49.9	35.0	0.0	15.1	
BRTL0000	3/9/2023 08:17	0.0	0.2	11.0	88.8	
BRTL0000	3/10/2023 08:04	0.0	0.1	20.9	79.0	
BRTL0000	3/10/2023 08:06	50.0	35.1	0.0	14.9	
BRTL0000	3/13/2023 07:23	0.0	0.1	21.1	78.8	
BRTL0000	3/13/2023 07:27	50.2	35.1	0.0	14.7	



## Bristol Virginia Landfill - Calibration Record Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Comments
BRTL0000	3/14/2023 07:31	0.0	0.2	20.9	78.9	
BRTL0000	3/14/2023 07:33	50.0	34.9	0.0	15.1	
BRTL0000	3/15/2023 08:07	0.0	0.2	20.9	78.9	
BRTL0000	3/15/2023 08:10	50.1	35.0	0.0	14.9	
BRTL0000	3/16/2023 08:06	0.0	0.1	20.9	79.0	
BRTL0000	3/16/2023 08:09	50.0	35.0	0.0	15.0	
BRTL0000	3/16/2023 08:12	0.0	0.1	11.0	88.9	
BRTL0000	3/16/2023 12:43	50.1	34.9	0.0	15.0	
BRTL0000	3/23/2023 09:01	0.0	0.1	20.9	79.0	
BRTL0000	3/23/2023 09:04	0.0	0.0	11.0	89.0	
BRTL0000	3/23/2023 09:06	49.9	35.0	0.0	15.1	



## **Attachment 2**

Exceedance Detail Report

# Exceedance Detail Report

Date Range: 03/01/2023 to 03/31/2023

Report Date: 04/06/2023

Site Name: Bristol Virginia Landfill

Point ID	Point Name	Record Date	Days Between Readings	Point Status	Effective Date	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	CO Req	Total Days Open	Corrective Action Comments	Corrective Action Due Dates		
						CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)					5 Day	15 Day	120 Day
<b>BRTLGW29</b>						Active		>= 145	>= 145	>= 0	>= 0				NESHAP AAAA HOV 145	5 Day	15 Day	120 Day
29		3/15/2023 9:47:31 AM	0			57.2	0	52.7	52.6	0.18	0.20	Sample due to	N		good reading on 03/16/2023	3/19/2023	3/29/2023	7/12/2023
29		3/16/2023 1:16:27 PM	1			58.9	0.2	66.9	66.4	-0.22	-0.28	Comments:,,,,,,	N	2				
<b>BRTLGW37</b>						Active		>= 145	>= 145	>= 0	>= 0				NESHAP AAAA HOV 145	5 Day	15 Day	120 Day
37		3/30/2022 12:20:33 PM	0			13.8	6.4	150	150	-1.24	-1.75	check,,,,,,	N			4/3/2022	4/13/2022	7/27/2022
37		4/6/2022 12:14:16 PM	7			14.2	7.3	149	149	-1.98	-1.95	Change,,,,,,	N					
37		4/13/2022 1:45:11 PM	7			16.5	7	159	159	-1.70	-1.70	Comments:,,,,,,	N					
37		4/13/2022 1:47:58 PM	0			16	7	159	159	-2.10	-2.14	Comments:,,,,,,	N					
37		4/21/2022 7:24:55 AM	8			13.1	8.3	159	159	-2.35	-2.27	Comments:,,,,,,	N					
37		5/4/2022 12:21:07 PM	13			13	7.3	149	149	-2.57	-2.42	Open,No Change,,,,,,	N					
37		5/16/2022 10:51:43 AM	12			11.6	9.8	150	150	-2.21	-2.39	Comments:Adjustment,,,,,,	N					
37		5/16/2022 2:09:00 PM	0			14.9	9.8	159	159	-2.48	-2.48	Comments:,,,,,,	N					
37		5/24/2022 10:23:52 AM	8			17	7.8	150	150	-3.44	-3.43	Comments:,,,,,,	N					
37		5/24/2022 10:26:15 AM	0			17.3	7.9	150	150	-3.47	-3.44	Comments:,,,,,,	N					
37		6/1/2022 12:43:16 PM	8			22	6.2	150	150	-2.89	-2.89	Comments:,,,,,,	N					
37		6/8/2022 11:34:45 AM	7			6.5	14.8	155.8	155.9	-12.72	-12.63	Comments:,,,,,,	N					
37		6/16/2022 1:35:06 PM	8			21.6	6.7	153.9	153.8	-2.56	-2.54	Comments:,,,,,,	N					
37		7/6/2022 12:59:43 PM	20			19.2	6.6	154.2	153.8	-2.44	-2.43	Comments:,,,,,,	N					
37		7/11/2022 1:31:12 PM	5			19.8	6.7	155.5	155.5	-2.25	-2.19	Comments:,,,,,,	N					
37		7/11/2022 1:36:48 PM	0			19.6	6.5	155.7	155.8	-2.12	-2.10	Comments:,,,,,,	N					
37		8/3/2022 12:31:49 PM	23			20	7.3	155.5	155.5	-2.39	-2.38	Comments:,,,,,,	N					
37		8/3/2022 12:35:39 PM	0			20.2	7.3	155.4	155.4	-2.72	-2.77	Comments:,,,,,,	N					
37		8/3/2022 2:29:58 PM	0			19.5	6.6	152.2	152.9	-3.03	-3.01	Comments:,,,,,,	N					
37		8/24/2022 11:44:07 AM	21			19.2	7.6	152.7	152.8	-15.16	-15.14	Open,,,,,,	N					
37		9/1/2022 11:37:46 AM	8			20.8	7.6	155	154.7	-3.14	-3.14	Comments:,,,,,,	N					
37		9/1/2022 12:28:35 PM	0			18.9	7.9	152.7	152.7	-15.15	-15.13	Comments:,,,,,,	N					
37		AM	41			20.5	7.6	152	151.5	-2.69	-2.64	Comments:,,,,,,	N					
37		10/12/2022 2:36:59 PM	0			28.3	7.1	151	151	-2.74	-2.75	Comments:,,,,,,	N					
37		AM	7			20	7.4	149	149.1	-2.94	-2.85	Comments:,,,,,,	N					
37		AM	22			18.2	7.1	147.6	147.7	-13.82	-13.78	Comments:Fully Open,,,,,,	N					
37		AM	7			18.4	7.3	147.2	147.3	-8.91	-8.90	Comments:Fully Open,,,,,,	N					
37		12/8/2022 12:32:15 PM	21			18.7	6.3	151.2	150.8	-1.64	-1.61	Comments:,,,,,,	N					
37		12/9/2022 9:19:24 AM	1			19	6.7	148.5	148.5	-1.51	-1.53	Comments:High Temp,,,,,,	N					
37		12/14/2022 8:37:04 AM	5			17.4	6.2	148.6	148.6	-1.56	-1.57	Comments:,,,,,,	N					
37		AM	6			14.7	6.6	148.6	148.6	-1.45	-1.47	Comments:Fully Open,,,,,,	N					
37		1/5/2023 1:34:21 PM	16			15.5	6.3	151.9	151.8	-2.26	-2.23	Comments:,,,,,,	N					
37		1/6/2023 7:24:18 AM	1			16.1	6.7	149.2	149.2	-1.97	-1.95	Comments:,,,,,,	N					
37		1/12/2023 12:18:14 PM	6			15	6.2	149.7	149.7	-8.51	-8.49	Comments:High Temp,,,,,,	N					
37		1/18/2023 12:33:18 PM	6			14	6.8	149	149	-1.84	-1.82	Comments:High Temp,,,,,,	N					
37		1/25/2023 11:53:12 AM	7			14.2	6.1	149.7	149.8	-1.82	-1.79	Comments:High Temp,,,,,,	N					
37		2/1/2023 1:33:56 PM	7			18.2	6.3	150.9	150.9	-1.89	-1.86	Comments:,,,,,,	N					
37		2/3/2023 10:18:21 AM	2			14.9	7.8	148.6	149	-1.75	-1.64	Comments:High Temp,,,,,,	N					
37		2/7/2023 2:26:19 PM	4			17	6.6	150.4	150.5	-6.15	-6.47	Change,,,,,,	N					
37		2/8/2023 9:35:19 AM	1			16.7	6.3	149.1	149.1	-1.49	-1.50	Change,High Temp,,,,,,	N					
37		2/14/2023 12:54:47 PM	6			16.2	5.9	149.6	149.6	-1.50	-1.49	Comments:High O2,,,,,,	N					



# Exceedance Detail Report

Date Range: 03/01/2023 to 03/31/2023

Report Date: 04/06/2023

Site Name: Bristol Virginia Landfill

Point ID	Point Name	Record Date	Days Between Readings	Point Status	Effective Date	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	CO Req	Total Days Open	Corrective Action Comments	Corrective Action Due Dates			
						CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)					5 Day	15 Day	120 Day	
37		2/15/2023 10:32:47 AM	1			17.1	6.5	148.6	148.6	-1.42	-1.41	Comments:High O2,,,,,,	N						
37		2/22/2023 2:36:29 PM	7			17.5	6.1	149.1	149.5	-1.51	-1.53	Change,,,,,,	N						
37		2/23/2023 9:25:10 AM	1			16.1	6	149	148.9	-1.41	-1.42	Comments:,,,,,,	N						
37		3/1/2023 1:44:44 PM	6			16.4	5.6	149.6	149.7	-1.33	-1.33	Change,,,,,,	N						
37		3/2/2023 8:46:55 AM	1			16.2	6.2	148.6	148.6	-1.48	-1.45	Change,,,,,,	N						
37		3/7/2023 11:27:10 AM	5			17.1	6.5	149.1	149.1	-1.50	-1.41	,,	N						
37		3/9/2023 11:24:19 AM	2			19.4	6.4	149	149	-1.28	-1.27	Comments:High O2,,,,,,	N						
37		3/15/2023 9:21:07 AM	6			16.1	6.2	147.7	147.7	-1.25	-1.26	Flow/Vacuum,,,,,,	N						
37		3/16/2023 9:53:43 AM	1			13.1	9.9	148.6	148.6	-1.34	-1.34	Comments:,,,,,,	N						
37		3/23/2023 10:12:30 AM	7			15.6	5.8	149.3	149.3	-1.16	-1.16	Comments:High Temp,,,,,,	N						
37		3/23/2023 1:01:44 PM	0			16.36	5.54	144.9	144.4	-1.11	-1.11		N						
37		3/28/2023 11:42:28 AM	5			15.16	6.12	151	151	-1.12	-1.12		N						
37		3/29/2023 11:52:12 AM	1			15.08	6.37	150.6	150.6	-3.10	-3.11	Change	N	367					
<b>BRTLGW40</b>								<b>&gt;= 210</b>	<b>&gt;= 210</b>	<b>&gt;= 0</b>	<b>&gt;= 0</b>				<b>NSPS AAAA HOV 210</b>	<b>5 Day</b>	<b>15 Day</b>	<b>120 Day</b>	
40		3/23/2023 10:26:53 AM	0			4.7	0	74.9	74.8	6.71	6.75		N		good reading on 03/23/2023	3/27/2023	4/6/2023	7/20/2023	
40		3/23/2023 1:21:43 PM	0			4.35	0.88	71.7	71.9	-6.98	-6.06		N	1					
<b>BRTLGW51</b>								<b>&gt;= 145</b>	<b>&gt;= 145</b>	<b>&gt;= 0</b>	<b>&gt;= 0</b>				<b>NESHAP AAAA HOV 145</b>	<b>5 Day</b>	<b>15 Day</b>	<b>120 Day</b>	
51		3/23/2023 10:48:48 AM	0			1.28	17.07	169.2	177.8	-3.83	-6.41	Valve Comment:0229820	N		good reading on 04/05/2023	3/27/2023	4/6/2023	7/20/2023	
51		3/23/2023 1:13:23 PM	0			13.7	5.04	166.4	167.3	-5.51	-4.58	Valve Comment:0243375	N		good reading on 04/05/2023				
51		3/29/2023 12:25:40 PM	6			5.67	1.54	169.8	169.2	-1.64	-1.49	Valve Comment:0281076	N		9 good reading on 04/05/2023				
<b>BRTLGW53</b>								<b>&gt;= 145</b>	<b>&gt;= 145</b>	<b>&gt;= 0</b>	<b>&gt;= 0</b>				<b>NESHAP AAAA HOV 145</b>	<b>5 Day</b>	<b>15 Day</b>	<b>120 Day</b>	
53		3/1/2023 3:03:29 PM	0			29.9	0.9	141.1	141.2	-10.63	-10.62	Change,,,,,,	N	1					
<b>BRTLGW57</b>								<b>&gt;= 145</b>	<b>&gt;= 145</b>	<b>&gt;= 0</b>	<b>&gt;= 0</b>				<b>NESHAP AAAA HOV 145</b>	<b>5 Day</b>	<b>15 Day</b>	<b>120 Day</b>	
57		1/5/2023 2:43:59 PM	0			41.4	9.4	143.4	145.6	-20.55	-20.54	Comments:,,,,,,	N			1/9/2023	1/19/2023	5/4/2023	
57		1/6/2023 7:40:46 AM	1			48.1	0.1	148.1	148.4	-21.06	-21.04	Comments:,,,,,,	N						
57		1/12/2023 12:36:07 PM	6			38	1.4	176.1	176.9	-12.83	-8.09	Comments:High Temp,,,,,,	N						
57		1/18/2023 11:59:14 AM	6			6.4	16.9	172.4	172.4	0.04	0.04	Comments:High Temp,,,,,,	N						
57		1/25/2023 12:05:49 PM	7			31.7	0.6	170	170.3	-20.15	-20.16	Sample,,,,,,	N						
57		1/25/2023 12:05:49 PM	0			31.7	0.6	170	170.3	-20.15	-20.16	Sample,,,,,,	N						
57		2/1/2023 11:27:35 AM	7			43.8	0.5	155.3	155.3	-21.19	-20.85	Comments:,,,,,,	N						
57		2/3/2023 10:41:30 AM	2			40.2	0.1	150.8	150.9	-20.28	-20.29	Comments:High O2,,,,,,	N						
57		2/7/2023 10:28:03 AM	4			41.5	0.3	153.2	153	-21.00	-20.99	Flow/Vacuum,High	N						
57		2/8/2023 9:43:21 AM	1			42	0.3	152.5	152.4	-20.81	-20.78	Comments:High Temp,,,,,,	N						
57		2/14/2023 11:27:21 AM	6			34.4	0.6	147.4	147.7	-20.74	-20.78	Comments:High Temp,,,,,,	N						
57		2/15/2023 12:23:29 PM	1			40.1	0.5	149.6	149.7	-20.44	-20.46	Comments:High Temp,,,,,,	N						
57		2/22/2023 10:19:10 AM	7			40.3	0	149.7	149.7	-18.57	-18.65	Change,,,,,,	N						
57		2/23/2023 9:38:29 AM	1			38.9	0.4	144.3	144.5	-17.61	-16.66	Change,,,,,,	N						
57		3/1/2023 3:10:13 PM	6			38.5	0	145.3	144.5	-18.05	-0.17	Change,,,,,,	N						
57		3/9/2023 10:18:59 AM	8			33.5	0	143.2	143.3	-17.15	-17.14	Change,,,,,,	N						
57		3/15/2023 11:03:49 AM	6			1	0	170.5	170.5	-18.12	-18.26	Comments:,,,,,,	N						
57		3/16/2023 10:06:19 AM	1			23.2	3.2	146.4	147.1	-16.39	-16.39	Comments:High O2,,,,,,	N						
57		3/23/2023 9:59:49 AM	7			29.1	1.09	133.5	137.2	-15.30	-15.29		N						
57		3/28/2023 10:14:09 AM	5			29.6	0	144.1	147.2	-14.07	-13.95	Valve Comment:0224544	N						



**Exceedance Detail Report**  
**Date Range: 03/01/2023 to 03/31/2023**

**Report Date: 04/06/2023**  
**Site Name: Bristol Virginia Landfill**

Point ID	Point Name	Record Date	Days Between Readings	Point Status	Effective Date	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	CO Req	Total Days Open	Corrective Action Comments	Corrective Action Due Dates		
						CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)							
57		3/29/2023 12:10:28 PM	1			21.38	2.69	162.1	157.7	-12.15	-12.10	Change;Well	N	86				
<b>BRTLGW59</b>				<b>Active</b>				<b>&gt;= 145</b>	<b>&gt;= 145</b>	<b>&gt;= 0</b>	<b>&gt;= 0</b>				<b>NESHAP AAAA HOV 145</b>	<b>5 Day</b>	<b>15 Day</b>	<b>120 Day</b>
59		3/28/2023 10:05:58 AM	0			37.48	0.04	160.7	160.3	-7.28	-7.58	Comment:1366950;Valve	N		good reading on 03/29/2023	4/1/2023	4/11/2023	7/25/2023
59		3/29/2023 12:19:23 PM	1			31.17	2.15	119.3	119.4	-2.54	-2.54	Change;Well	N	2				
<b>BRTLGW67</b>				<b>Active</b>				<b>&gt;= 145</b>	<b>&gt;= 145</b>	<b>&gt;= 0</b>	<b>&gt;= 0</b>				<b>NESHAP AAAA HOV 145</b>	<b>5 Day</b>	<b>15 Day</b>	<b>120 Day</b>
67		3/1/2023 2:33:06 PM	0			25.6	0.3	150.1	149.8	-18.97	-18.97	Comments:High Temp,,,,,,,,	N		good reading on 03/02/2023	3/5/2023	3/15/2023	6/28/2023
67		3/2/2023 9:38:43 AM	1			28.1	0.1	143.9	144.2	-17.39	-17.36	Change,,,,,,,,	N	2				

<b>Points with Exceedances</b>	8		<b>Parameter exceeds rule (Exceedance)</b>
<b>Closed Exceedances</b>	5		
<b>Open Exceedances</b>	3		<b>Parameter in compliance (Exceedance cleared)</b>



## **Attachment 3**

**Enhanced Monitoring Record Forms and Analytical Results**



## ENHANCED MONITORING RECORD FORM

- FORM TO BE COMPLETED IF ANY WELLHEAD TEMPERATURES OVER 145F THAT CANNOT BE CORRECTED IN 7 DAYS
- WEEKLY MONITORING MUST BEGIN WITHIN 7 DAYS OF EXCEEDANCE FOR CO AND VISUAL OBSERVATIONS
- TEMPERATURES AT OR ABOVE 165F REQUIRE ANNUAL DOWNHOLE TEMPERATURE MONITORING (10FT INTERVALS)
- TEMPERATURES AT OR ABOVE 170F REQUIRE 24-HOUR PADEP NOTIFICATION; IMMEDIATELY CONTACT ENGINEERS IN THIS CASE

Landfill Name: Bristol

Technician: Ryan Seymour

Well ID	Date & Time	GEM Reading			If Temp >145F					If Temp ≥165F	If Temp ≥170F	Comments
		CH4 (%)	O2 (%)	Well Temp (°F)	Gas Sample Collected	Pickup Scheduled?	Visible Emissions (e.g. smoke)?	Smoldering Ash Observed?	Damage to Well?	Downhole Temp Monitoring Performed?	Contacted Engineers for Notification?	
		Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
37	2023-03-09 11:35:00	19.4	6.4	149.0	yes	yes	no	no	no	no	no	No comment



## ENHANCED MONITORING RECORD FORM

- FORM TO BE COMPLETED IF ANY WELLHEAD TEMPERATURES OVER 145F THAT CANNOT BE CORRECTED IN 7 DAYS
- WEEKLY MONITORING MUST BEGIN WITHIN 7 DAYS OF EXCEEDANCE FOR CO AND VISUAL OBSERVATIONS
- TEMPERATURES AT OR ABOVE 165F REQUIRE ANNUAL DOWNHOLE TEMPERATURE MONITORING (10FT INTERVALS)
- TEMPERATURES AT OR ABOVE 170F REQUIRE 24-HOUR PADEP NOTIFICATION; IMMEDIATELY CONTACT ENGINEERS IN THIS CASE

Landfill Name: **Bristol**

Technician: **Logan Culhane**

Well ID	Date & Time	GEM Reading			If Temp >145F					If Temp ≥165F	If Temp ≥170F	Comments
		CH4 (%)	O2 (%)	Well Temp (°F)	Gas Sample Collected	Pickup Scheduled?	Visible Emissions (e.g. smoke)?	Smoldering Ash Observed?	Damage to Well?	Downhole Temp Monitoring Performed?	Contacted Engineers for Notification?	
					Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
37	2023-03-23 13:00:00	16.4	5.5	144.4	no	no	no	no	no	no	no	Second read under temp
51	2023-03-23 13:13:00	13.7	5	167.3	yes	yes	no	no	no	no	no	N/A

## ENHANCED MONITORING RECORD FORM

- FORM TO BE COMPLETED IF ANY WELLHEAD TEMPERATURES OVER 145F THAT CANNOT BE CORRECTED IN 7 DAYS
- WEEKLY MONITORING MUST BEGIN WITHIN 7 DAYS OF EXCEEDANCE FOR CO AND VISUAL OBSERVATIONS
- TEMPERATURES AT OR ABOVE 165F REQUIRE ANNUAL DOWNHOLE TEMPERATURE MONITORING (10FT INTERVALS)
- TEMPERATURES AT OR ABOVE 170F REQUIRE 24-HOUR PADEP NOTIFICATION; IMMEDIATELY CONTACT ENGINEERS IN THIS CASE

Landfill Name: **Bristol**

Technician: **Logan Culhane**

Well ID	Date & Time	GEM Reading			If Temp >145F					If Temp ≥165F	If Temp ≥170F	Comments
		CH4 (%)	O2 (%)	Well Temp (°F)	Gas Sample Collected	Pickup Scheduled?	Visible Emissions (e.g. smoke)?	Smoldering Ash Observed?	Damage to Well?	Downhole Temp Monitoring Performed?	Contacted Engineers for Notification?	
					Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
37	2023-03-29 11:52:00	15.08	6.37	150.6	yes	yes	no	no	no	no	no	N/A
57	2023-03-29 12:10:00	21.38	2.69	157.7	yes	yes	no	no	no	no	no	N/A
51	2023-03-29 12:25:00	5.67	1.54	169.2	yes	yes	no	no	no	no	no	N/A



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## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C0229

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 3, 2023 11:20
	4330 Lewis Road, Suite 1	Date Issued:	March 10, 2023 16:26
	Harrisburg, PA 17111	Project Number:	7223016
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/03/2023 11:20. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Enthalpy Analytical, Inc.



TNI Accredited  
VELAP ID 460021



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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C0229

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4330 Lewis Road, Suite 1      Date Issued: March 10, 2023 16:26  
Harrisburg, PA 17111      Project Number: 7223016  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23C0229-01	Air	03/02/2023 08:48	03/03/2023 11:20





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Harrisburg, PA 17111

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Project Number: 7223016

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 37**  
**Sample ID: 23C0229-01**  
Sample Matrix: Air  
Sampled: 3/2/2023 08:48  
Sample Type: LFG

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00184::11073  
Canister Size: 1.4

Initial Vacuum(in Hg): 26  
Final Vacuum(in Hg): 3.4  
Receipt Vacuum(in Hg): 3.4  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	152	90.0	90.0		9	1	3/7/23 12:56	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	11.9	0.45	0.45		9	1	3/7/23 12:56	MER
Carbon dioxide, as received	27.5	0.45	0.45		9	1	3/7/23 12:56	MER
Oxygen (O2), as received	6.58	0.45	0.45		9	1	3/7/23 12:56	MER
Hydrogen (H2), as received	2.78	0.18	0.18		9	1	3/7/23 12:56	MER
Nitrogen (N2), as received	42.5	9.00	9.00		9	1	3/7/23 12:56	MER



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Purchase Order: 07-SO04485

### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			Preparation Method:	No Prep VOC GC Air	
23C0229-01	1.00 mL / 1.00 mL	ALT-145	BGC0223	SGC0222	AG00026
23C0229-01	1.00 mL / 1.00 mL	EPA 3C	BGC0223	SGC0222	AG00026



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### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source		%REC		RPD		Qual
	Result	Limit		Units	Result	%REC	Limits	RPD	Limit	

#### Batch BGC0223 - No Prep VOC GC Air

##### Blank (BGC0223-BLK1)

Prepared & Analyzed: 03/07/2023

Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Carbon Monoxide	<	10.0	ppmv							

##### LCS (BGC0223-BS1)

Prepared & Analyzed: 03/07/2023

Methane	4020	0.05	ppmv	5000	80.3	80-120				
Methane	4020	500	ppmv	5000	80.3	0-200				
Carbon dioxide	4380	500	ppmv	5000	87.5	0-200				
Carbon dioxide	4380	0.05	ppmv	5000	87.5	80-120				
Oxygen (O2)	5120	500	ppmv	5000	102	0-200				
Oxygen (O2)	5120	0.05	ppmv	5000	102	80-120				
Hydrogen (H2)	5990	200	ppmv	5100	117	0-200				
Nitrogen (N2)	5370	2000	ppmv	5000	107	0-200				
Nitrogen (N2)	5370	1	ppmv	5000	107	80-120				
Hydrogen (H2)	5990	0.02	ppmv	5100	117	80-120				
Carbon Monoxide	4900	10	ppmv	5000	98.1	0-200				
Carbon Monoxide	4900	0.001	ppmv	5000	98.1	80-120				

##### Duplicate (BGC0223-DUP1)

Source: 23C0229-01

Prepared & Analyzed: 03/07/2023

Methane	121000	4500	ppmv	119000	1.21	25				
Methane	12.1	0.45	Vol%	11.9	1.21	5				
Carbon dioxide	279000	4500	ppmv	275000	1.57	25				
Carbon dioxide	27.9	0.45	Vol%	27.5	1.57	5				
Oxygen (O2)	6.64	0.45	Vol%	6.58	0.826	5				
Oxygen (O2)	66400	4500	ppmv	65800	0.826	25				
Nitrogen (N2)	430000	18000	ppmv	425000	1.04	25				
Nitrogen (N2)	43.0	9.00	Vol%	42.5	1.04	5				
Hydrogen (H2)	28100	1800	ppmv	27800	0.923	25				
Hydrogen (H2)	2.81	0.18	Vol%	2.78	0.923	5				



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Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

#### Batch BGC0223 - No Prep VOC GC Air

Duplicate (BGC0223-DUP1)		Source: 23C0229-01			Prepared & Analyzed: 03/07/2023		
Carbon Monoxide	156	90.0	ppmv	152	2.74	25	
Carbon Monoxide	0.02	0.009	Vol%	0.02	2.74	5	

Duplicate (BGC0223-DUP2)		Source: 23C0258-01			Prepared & Analyzed: 03/07/2023		
Methane	41.1	0.45	Vol%	41.0	0.266	5	
Methane	411000	4500	ppmv	410000	0.266	25	
Carbon dioxide	40.2	0.45	Vol%	40.1	0.335	5	
Carbon dioxide	402000	4500	ppmv	401000	0.335	25	
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5	
Oxygen (O2)	<	4500	ppmv	<4500	NA	25	
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25	
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5	
Hydrogen (H2)	97600	1800	ppmv	96900	0.705	25	
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5	
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25	

Duplicate (BGC0223-DUP3)		Source: 23C0258-02			Prepared & Analyzed: 03/07/2023		
Methane	41.8	0.45	Vol%	42.2	0.919	5	
Methane	418000	4500	ppmv	422000	0.919	25	
Carbon dioxide	453000	4500	ppmv	454000	0.353	25	
Carbon dioxide	45.3	0.45	Vol%	45.4	0.353	5	
Oxygen (O2)	<	4500	ppmv	<4500	NA	25	
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5	
Hydrogen (H2)	28000	1800	ppmv	28100	0.437	25	
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25	
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5	
Hydrogen (H2)	2.80	0.18	Vol%	2.81	0.437	5	
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25	
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5	



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 7223016

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<i>EPA 3C in Air</i>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		

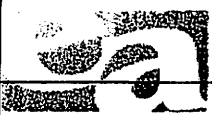
Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

### Qualifiers and Definitions

RPD Relative Percent Difference  
 Qual Qualifiers  
 -RE Denotes sample was re-analyzed  
 PF Preparation Factor  
 MDL Method Detection Limit  
 LOQ Limit of Quantitation  
 ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.



# ENTHALPY

## Air Chain of Custody Record

## Turn Around Time (rush by advanced notice only)

Lab No: \_\_\_\_\_ Standard: \_\_\_\_\_ 5 Day:  3 Day: \_\_\_\_\_  
 Page: 1 of 1 2 Day: \_\_\_\_\_ 1 Day: \_\_\_\_\_ Custom TAT: \_\_\_\_\_

### Enthalpy Analytical - Richmond

1941 Reymet Road, Richmond, VA 23237  
 Phone 804-358-8295

### CUSTOMER INFORMATION

Company: SCS Field Services  
 Report To: Tom Lock / Mike Gibbons  
 Email: [tlock@scsengineers.com](mailto:tlock@scsengineers.com)  
 Address: [mgibbons@scsengineers.com](mailto:mgibbons@scsengineers.com)  
 Phone: 703-254-4664  
 Fax: \_\_\_\_\_

### PROJECT INFORMATION

Name: Bristol Landfill  
 Number: 7223016  
 P.O. #: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Global ID: \_\_\_\_\_  
 Sampled By: \_\_\_\_\_

Special Instructions:  
 EPA 3C for Methane, Carbon Dioxide, Oxygen, Nitrogen, and Hydrogen.  
 CO via EPA ALT-145.  
 Returned empty canisters marked (No Sample).

*Ryan Seymour*

03/07/23 - MCK  
 - Typo ON canister #11078, #11078 => **11073**  
 - CANISTER OUTGAS VACUUM = 21.0", Receiving Vacuum = 3.9" Hg

### Analysis Requested

EPA ALT-145 (CO)	EPA 3C (CH <sub>4</sub> , CO <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , H <sub>2</sub> )																	
X	X																	

Sample ID	Type	Equipment Information			Sampling Information														
	(I) Indoor (A) Ambient (SV) Soil Vapor (S) Source	Canister ID	Size (1L, 3L, 6L, 15L)	Flow Controller ID	Sample Start Date	Sample Start Time	Vacuum Start ("Hg)	Sample End Date	Sample End Time	Vacuum End ("Hg)									
1	37	LFG	11078	1L	063-00491	3/2/2023	8:45AM	26	3/2/2023	8:48	9								
2	no sample taken		279																
3																			
4																			
5																			
6	SCS Field Services	23C0229																	
7	Bristol																		
8	Recd: 03/03/2023	Due: 03/10/2023																	
9																			
10																			

	Signature	Print Name	Company / Title	Date / Time
1	Relinquished By: Ryan Seymour	Ryan Seymour	field tech	3/2/23 11:00AM
1	Received By: <i>Fedex E</i>			
2	Relinquished By: <i>Fedex E</i>			
2	Received By: <i>Carroll</i>			3/3/23 1120
3	Relinquished By:			
3	Received By:			



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C0229

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 3, 2023 11:20  
Date Issued: March 10, 2023 16:26

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 7223016

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Sample Conditions Checklist

Samples Received at:	20.30°C
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments



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## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C0611

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 10, 2023 11:15
	4330 Lewis Road, Suite 1	Date Issued:	March 17, 2023 15:45
	Harrisburg, PA 17111	Project Number:	07223016.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/10/2023 11:15. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

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VELAP ID 460021





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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C0611

Client Name: SCS Field Services - Harrisburg, PA      Date Received: March 10, 2023 11:15  
4330 Lewis Road, Suite 1      Date Issued: March 17, 2023 15:45  
Harrisburg, PA 17111      Project Number: 07223016.00  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23C0611-01	Air	03/09/2023 11:28	03/10/2023 11:15



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 37**  
**Sample ID: 23C0611-01**  
Sample Matrix: Air  
Sampled: 3/9/2023 11:28  
Sample Type: LV

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00461::14300  
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.6  
Final Vacuum(in Hg): 2.4  
Receipt Vacuum(in Hg): 2.4  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	129	90.0	90.0		9	1	3/14/23 11:43	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	11.1	0.45	0.45		9	1	3/14/23 11:43	MER
Carbon dioxide, as received	23.5	0.45	0.45		9	1	3/14/23 11:43	MER
Oxygen (O2), as received	9.36	0.45	0.45		9	1	3/14/23 11:43	MER
Hydrogen (H2), as received	2.35	0.18	0.18		9	1	3/14/23 11:43	MER
Nitrogen (N2), as received	47.8	18.0	18.0		18	1	3/14/23 13:46	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	3/14/23 11:43	MER

#### Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M <sup>3</sup>			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	52800	1560	3890		170000	5000	12000	7780	1	3/15/23 13:59	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	101				80-120					3/15/23 13:59	



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis</b>			<b>Preparation Method:</b>	<b>No Prep VOC GC Air</b>	
23C0611-01	1.00 mL / 1.00 mL	ALT-145	BGC0500	SGC0482	AG00026
23C0611-01	1.00 mL / 1.00 mL	EPA 3C	BGC0500	SGC0482	AG00026
23C0611-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGC0500	SGC0482	AG00026

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>No Prep VOC Air</b>	
23C0611-01	400 mL / 400 mL	EPA TO-15	BGC0346	SGC0540	AC30128
23C0611-01RE1	400 mL / 400 mL	EPA TO-15	BGC0346	SGC0540	AC30128



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## Certificate of Analysis

Final Report

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Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit Units			%REC	Limits			

#### Batch BGC0346 - No Prep VOC Air

##### Blank (BGC0346-BLK1)

Prepared & Analyzed: 03/09/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.90 ppbv 5.00 98.0 80-120

##### LCS (BGC0346-BS1)

Prepared & Analyzed: 03/09/2023

1,1,1-Trichloroethane	5.38	0.5	ppbv	5.00	108	70-130
1,1,1,2-Tetrachloroethane	5.67	0.5	ppbv	5.00	113	70-130
1,1,2-Trichloro-1,2,2-trifluoroethane	5.16	0.5	ppbv	5.00	103	70-130
1,1,2-Trichloroethane	5.32	0.5	ppbv	5.00	106	70-130
1,1-Dichloroethane	4.99	0.5	ppbv	5.00	99.8	70-130
1,1-Dichloroethylene	5.17	0.5	ppbv	5.00	103	70-130
1,2,4-Trimethylbenzene	5.64	0.5	ppbv	5.00	113	70-130
1,2-Dibromoethane (EDB)	5.63	0.5	ppbv	5.00	113	70-130
1,2-Dichlorobenzene	5.91	0.5	ppbv	5.00	118	70-130
1,2-Dichloroethane	5.32	0.5	ppbv	5.00	106	70-130
1,2-Dichloropropane	5.25	0.5	ppbv	5.00	105	70-130
1,2-Dichlorotetrafluoroethane	5.44	0.5	ppbv	5.00	109	70-130
1,3,5-Trimethylbenzene	5.61	0.5	ppbv	5.00	112	70-130
1,3-Butadiene	4.79	0.5	ppbv	5.00	95.8	70-130
1,3-Dichlorobenzene	5.86	0.5	ppbv	5.00	117	70-130
1,4-Dichlorobenzene	5.90	0.5	ppbv	5.00	118	70-130
1,4-Dioxane	5.41	0.5	ppbv	5.00	108	70-130
2-Butanone (MEK)	4.57	0.5	ppbv	5.00	91.4	70-130
4-Methyl-2-pentanone (MIBK)	5.35	0.5	ppbv	5.00	107	70-130
Allyl chloride	4.84	0.5	ppbv	5.00	96.8	70-130
Benzene	5.21	0.5	ppbv	5.00	104	70-130
Benzyl Chloride	5.49	0.5	ppbv	5.00	110	70-130
Bromodichloromethane	5.02	0.5	ppbv	5.00	100	70-130
Bromoform	1.34	0.5	ppbv	5.00	26.8	70-130
Bromomethane	5.71	0.5	ppbv	5.00	114	70-130
Carbon Disulfide	5.16	0.5	ppbv	5.00	103	70-130

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## Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	Limits	RPD	Limit	

#### Batch BGC0346 - No Prep VOC Air

##### LCS (BGC0346-BS1)

Prepared & Analyzed: 03/09/2023

Carbon Tetrachloride	5.36	0.5	ppbv	5.00	107	70-130			
Chlorobenzene	5.59	0.5	ppbv	5.00	112	70-130			
Chloroethane	5.32	0.5	ppbv	5.00	106	70-130			
Chloroform	5.07	0.5	ppbv	5.00	101	70-130			
Chloromethane	5.06	0.5	ppbv	5.00	101	70-130			
cis-1,2-Dichloroethylene	5.11	0.5	ppbv	5.00	102	70-130			
cis-1,3-Dichloropropene	5.47	0.5	ppbv	5.00	109	70-130			
Cyclohexane	5.24	0.5	ppbv	5.00	105	70-130			
Dichlorodifluoromethane	5.16	0.5	ppbv	5.00	103	70-130			
Ethyl acetate	5.38	0.5	ppbv	5.00	108	70-130			
Ethylbenzene	5.53	0.5	ppbv	5.00	111	70-130			
Heptane	5.03	0.5	ppbv	5.00	101	70-130			
Hexane	5.06	0.5	ppbv	5.00	101	70-130			
m+p-Xylenes	11.2	1	ppbv	10.0	112	70-130			
Methylene chloride	4.67	1	ppbv	5.00	93.4	70-130			
Methyl-t-butyl ether (MTBE)	5.17	0.5	ppbv	5.00	103	70-130			
Naphthalene	5.24	0.5	ppbv	5.00	105	60-140			
o-Xylene	5.55	0.5	ppbv	5.00	111	70-130			
Propylene	5.02	1	ppbv	5.00	100	70-130			
Styrene	5.59	0.5	ppbv	5.00	112	70-130			
Tetrachloroethylene (PCE)	5.61	0.5	ppbv	5.00	112	70-130			
Tetrahydrofuran	5.16	0.5	ppbv	5.00	103	70-130			
Toluene	5.36	0.5	ppbv	5.00	107	70-130			
trans-1,2-Dichloroethylene	5.13	0.5	ppbv	5.00	103	70-130			
trans-1,3-Dichloropropene	5.55	0.5	ppbv	5.00	111	70-130			
Trichloroethylene	5.40	0.5	ppbv	5.00	108	70-130			
Trichlorofluoromethane	5.27	0.5	ppbv	5.00	105	70-130			
Vinyl acetate	4.77	0.5	ppbv	5.00	95.4	70-130			
Vinyl bromide	4.79	0.5	ppbv	5.00	95.8	70-130			
Vinyl chloride	5.21	0.5	ppbv	5.00	104	70-130			
Surr: 4-Bromofluorobenzene (Surr)	5.14		ppbv	5.00	103	70-130			



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## Certificate of Analysis

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4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

#### Batch BGC0346 - No Prep VOC Air

##### LCS Dup (BGC0346-BSD1)

Prepared & Analyzed: 03/09/2023

1,1,1-Trichloroethane	5.38	0.5	ppbv	5.00	108	70-130	0.00	25	
1,1,1,2-Tetrachloroethane	5.70	0.5	ppbv	5.00	114	70-130	0.528	25	
1,1,1,2-Trichloro-1,2,2-trifluoroethane	5.17	0.5	ppbv	5.00	103	70-130	0.194	25	
1,1,2-Trichloroethane	5.35	0.5	ppbv	5.00	107	70-130	0.562	25	
1,1-Dichloroethane	4.97	0.5	ppbv	5.00	99.4	70-130	0.402	25	
1,1-Dichloroethylene	5.19	0.5	ppbv	5.00	104	70-130	0.386	25	
1,2,4-Trimethylbenzene	5.63	0.5	ppbv	5.00	113	70-130	0.177	25	
1,2-Dibromoethane (EDB)	5.60	0.5	ppbv	5.00	112	70-130	0.534	25	
1,2-Dichlorobenzene	5.85	0.5	ppbv	5.00	117	70-130	1.02	25	
1,2-Dichloroethane	5.31	0.5	ppbv	5.00	106	70-130	0.188	25	
1,2-Dichloropropane	5.22	0.5	ppbv	5.00	104	70-130	0.573	25	
1,2-Dichlorotetrafluoroethane	5.53	0.5	ppbv	5.00	111	70-130	1.64	25	
1,3,5-Trimethylbenzene	5.60	0.5	ppbv	5.00	112	70-130	0.178	25	
1,3-Butadiene	4.62	0.5	ppbv	5.00	92.4	70-130	3.61	25	
1,3-Dichlorobenzene	5.88	0.5	ppbv	5.00	118	70-130	0.341	25	
1,4-Dichlorobenzene	5.88	0.5	ppbv	5.00	118	70-130	0.340	25	
1,4-Dioxane	5.43	0.5	ppbv	5.00	109	70-130	0.369	25	
2-Butanone (MEK)	4.58	0.5	ppbv	5.00	91.6	70-130	0.219	25	
4-Methyl-2-pentanone (MIBK)	5.42	0.5	ppbv	5.00	108	70-130	1.30	25	
Allyl chloride	4.93	0.5	ppbv	5.00	98.6	70-130	1.84	25	
Benzene	5.26	0.5	ppbv	5.00	105	70-130	0.955	25	
Benzyl Chloride	5.39	0.5	ppbv	5.00	108	70-130	1.84	25	
Bromodichloromethane	5.04	0.5	ppbv	5.00	101	70-130	0.398	25	
Bromoform	1.35	0.5	ppbv	5.00	27.0	70-130	0.743	25	L
Bromomethane	5.66	0.5	ppbv	5.00	113	70-130	0.880	25	
Carbon Disulfide	5.17	0.5	ppbv	5.00	103	70-130	0.194	25	
Carbon Tetrachloride	5.35	0.5	ppbv	5.00	107	70-130	0.187	25	
Chlorobenzene	5.59	0.5	ppbv	5.00	112	70-130	0.00	25	
Chloroethane	5.28	0.5	ppbv	5.00	106	70-130	0.755	25	
Chloroform	5.08	0.5	ppbv	5.00	102	70-130	0.197	25	
Chloromethane	5.05	0.5	ppbv	5.00	101	70-130	0.198	25	
cis-1,2-Dichloroethylene	5.11	0.5	ppbv	5.00	102	70-130	0.00	25	
cis-1,3-Dichloropropene	5.42	0.5	ppbv	5.00	108	70-130	0.918	25	



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	Limits	RPD	Limit	

#### Batch BGC0346 - No Prep VOC Air

##### LCS Dup (BGC0346-BSD1)

Prepared & Analyzed: 03/09/2023

Cyclohexane	5.28	0.5	ppbv	5.00	106	70-130	0.760	25	
Dichlorodifluoromethane	5.15	0.5	ppbv	5.00	103	70-130	0.194	25	
Ethyl acetate	5.36	0.5	ppbv	5.00	107	70-130	0.372	25	
Ethylbenzene	5.53	0.5	ppbv	5.00	111	70-130	0.00	25	
Heptane	5.05	0.5	ppbv	5.00	101	70-130	0.397	25	
Hexane	5.05	0.5	ppbv	5.00	101	70-130	0.198	25	
m+p-Xylenes	11.2	1	ppbv	10.0	112	70-130	0.626	25	
Methylene chloride	4.71	1	ppbv	5.00	94.2	70-130	0.853	25	
Methyl-t-butyl ether (MTBE)	5.17	0.5	ppbv	5.00	103	70-130	0.00	25	
Naphthalene	5.18	0.5	ppbv	5.00	104	60-140	1.15	25	
o-Xylene	5.51	0.5	ppbv	5.00	110	70-130	0.723	25	
Propylene	5.01	1	ppbv	5.00	100	70-130	0.199	25	
Styrene	5.63	0.5	ppbv	5.00	113	70-130	0.713	25	
Tetrachloroethylene (PCE)	5.62	0.5	ppbv	5.00	112	70-130	0.178	25	
Tetrahydrofuran	5.17	0.5	ppbv	5.00	103	70-130	0.194	25	
Toluene	5.34	0.5	ppbv	5.00	107	70-130	0.374	25	
trans-1,2-Dichloroethylene	5.13	0.5	ppbv	5.00	103	70-130	0.00	25	
trans-1,3-Dichloropropene	5.58	0.5	ppbv	5.00	112	70-130	0.539	25	
Trichloroethylene	5.42	0.5	ppbv	5.00	108	70-130	0.370	25	
Trichlorofluoromethane	5.12	0.5	ppbv	5.00	102	70-130	2.89	25	
Vinyl acetate	4.80	0.5	ppbv	5.00	96.0	70-130	0.627	25	
Vinyl bromide	4.81	0.5	ppbv	5.00	96.2	70-130	0.417	25	
Vinyl chloride	5.23	0.5	ppbv	5.00	105	70-130	0.383	25	

Surr: 4-Bromofluorobenzene (Surr) 5.12 ppbv 5.00 102 70-130



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

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4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD	Limit	Qual
	Result	Limit			Units	%REC				

#### Batch BGC0500 - No Prep VOC GC Air

##### Blank (BGC0500-BLK1)

Prepared & Analyzed: 03/14/2023

Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Carbon Monoxide	<	10.0	ppmv							
Carbon Monoxide	<	0.001	Vol%							

##### LCS (BGC0500-BS1)

Prepared & Analyzed: 03/14/2023

Methane	4690	500	ppmv	5000	93.9	0-200				
Methane	4690	0.05	ppmv	5000	93.9	80-120				
Carbon dioxide	5230	500	ppmv	5000	105	0-200				
Carbon dioxide	5230	0.05	ppmv	5000	105	80-120				
Oxygen (O2)	5110	500	ppmv	5000	102	0-200				
Oxygen (O2)	5110	0.05	ppmv	5000	102	80-120				
Nitrogen (N2)	5370	2000	ppmv	5000	107	0-200				
Hydrogen (H2)	5910	200	ppmv	5100	116	0-200				
Hydrogen (H2)	5910	0.02	ppmv	5100	116	80-120				
Nitrogen (N2)	5370	1	ppmv	5000	107	80-120				
Carbon Monoxide	4880	10	ppmv	5000	97.7	0-200				
Carbon Monoxide	4880	0.001	ppmv	5000	97.7	80-120				

##### Duplicate (BGC0500-DUP1)

Source: 23C0611-01

Prepared & Analyzed: 03/14/2023

Methane	11.0	0.45	Vol%		11.1	0.199	5			
Methane	110000	4500	ppmv		110000	0.199	25			
Carbon dioxide	23.7	0.45	Vol%		23.5	1.06	5			
Carbon dioxide	237000	4500	ppmv		235000	1.06	25			
Oxygen (O2)	9.38	0.45	Vol%		9.36	0.200	5			
Oxygen (O2)	93800	4500	ppmv		93600	0.200	25			
Hydrogen (H2)	2.34	0.18	Vol%		2.35	0.278	5			
Nitrogen (N2)	469000	18000	ppmv		469000	0.0733	25			
Hydrogen (H2)	23400	1800	ppmv		23500	0.278	25			
Carbon Monoxide	0.01	0.009	Vol%		0.01	1.39	5			
Carbon Monoxide	131	90.0	ppmv		129	1.39	25			





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## Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1  Harrisburg, PA 17111	Date Received:	March 10, 2023 11:15
		Date Issued:	March 17, 2023 15:45
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<b>EPA 3C in Air</b>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
<b>EPA TO-15 in Air</b>			
Benzene	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

### Qualifiers and Definitions

L LCS recovery is outside of established acceptance limits  
 RPD Relative Percent Difference  
 Qual Qualifiers  
 -RE Denotes sample was re-analyzed  
 PF Preparation Factor  
 MDL Method Detection Limit  
 LOQ Limit of Quantitation  
 ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.

**AIR ANALYSIS**  
**CHAIN OF CUSTODY**

Equipment due 3/30/2023

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:		INVOICE CONTACT:	SITE NAME: Bristol
ADDRESS:		INVOICE ADDRESS:	PROJECT NUMBER: 07223016.00
PHONE #:		INVOICE PHONE #:	P.O. #:
FAX #:	EMAIL:	Pretreatment Program:	
Is sample for compliance reporting? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Regulatory State: VA	Is sample from a chlorinated supply? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	PWS I.D. #:
SAMPLER NAME (PRINT): Ryan Seymour		SAMPLER SIGNATURE: Ryan Seymour	
		Turn Around Time: Circle: 10	5 Days or ___ Day(s)
Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other LV			063-23B-0014

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information			Matrix (See Codes)	ANALYSIS				
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):				Barometric Pres. (in Hg):			Alt 145 CO	EPA 3C	Benzene by TO-15		
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)					Final Canister Vacuum (in Hg)	Ending Sample Temp °F
1) 37	063-00411		14300	1.4	230126-02	21.6	2.4	3/9/23	11:24 Am	28	149	3/9/23	11:20 Am	9	149	LG	x	x	x
2)			14308	1.4	230126-02	21.6										LG	x	x	x
3)																			
4)																			

RELINQUISHED:	RECEIVED: <i>Fox Ex G</i>	DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED: <i>Fox Ex G</i>	RECEIVED: <i>MSL</i>	DATE / TIME: 3/10/23 1115	Level I <input type="checkbox"/>	<b>SCS Field Services 23C0611</b> <b>Bristol</b> <b>Recd: 03/10/2023 Due: 03/17/2023</b>
RELINQUISHED:	RECEIVED:	DATE / TIME	Level II <input type="checkbox"/>	
RELINQUISHED:	RECEIVED:	DATE / TIME	Level III <input type="checkbox"/>	
RELINQUISHED:	RECEIVED:	DATE / TIME	Level IV <input type="checkbox"/>	

310 20.3 no seal no VC

v130325002



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Sample Conditions Checklist

Samples Received at:	20.30°C
How were samples received?	FedEx Ground
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments



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## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C1038

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 17, 2023 11:14
	4330 Lewis Road, Suite 1	Date Issued:	March 23, 2023 17:20
	Harrisburg, PA 17111	Project Number:	07223016.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/17/2023 11:14. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars  
Technical Director

### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Enthalpy Analytical, Inc.





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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C1038

Client Name: SCS Field Services - Harrisburg, PA      Date Received: March 17, 2023 11:14  
4330 Lewis Road, Suite 1      Date Issued: March 23, 2023 17:20  
Harrisburg, PA 17111      Project Number: 07223016.00  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23C1038-01	Air	03/16/2023 10:00	03/17/2023 11:14
57	23C1038-02	Air	03/16/2023 10:10	03/17/2023 11:14



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## Certificate of Analysis

Final Report

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Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 37**  
**Sample ID: 23C1038-01**  
Sample Matrix: Air  
Sampled: 3/16/2023 10:00  
Sample Type: LV

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00306::11293  
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.6  
Final Vacuum(in Hg): 3.8  
Receipt Vacuum(in Hg): 3.8  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	168	90.0	90.0		9	1	3/17/23 16:02	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	13.4	0.45	0.45		9	1	3/17/23 16:02	MER
Carbon dioxide, as received	31.0	0.45	0.45		9	1	3/17/23 16:02	MER
Oxygen (O2), as received	6.22	0.45	0.45		9	1	3/17/23 16:02	MER
Hydrogen (H2), as received	3.08	0.18	0.18		9	1	3/17/23 16:02	MER
Nitrogen (N2), as received	41.1	9.00	9.00		9	1	3/17/23 16:02	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	3/17/23 16:02	MER

#### Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M <sup>3</sup>			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	62500	1560	3890		200000	5000	12000	7780	1	3/21/23 14:41	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	94.6				80-120					3/21/23 14:41	



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## Certificate of Analysis

Final Report

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4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 57**  
**Sample ID: 23C1038-02**  
Sample Matrix: Air  
Sampled: 3/16/2023 10:10  
Sample Type: LV

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00322::12383  
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.6  
Final Vacuum(in Hg): 3.4  
Receipt Vacuum(in Hg): 3.4  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	855	90.0	90.0		9	1	3/17/23 16:56	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	20.1	0.45	0.45		9	1	3/17/23 16:56	MER
Carbon dioxide, as received	55.1	0.45	0.45		9	1	3/17/23 16:56	MER
Oxygen (O2), as received	1.27	0.45	0.45		9	1	3/17/23 16:56	MER
Hydrogen (H2), as received	13.5	1.08	1.08		54	1	3/20/23 15:24	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	3/17/23 16:56	MER
Carbon Monoxide, as received	0.09	0.009	0.009		9	1	3/17/23 16:56	MER

#### Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M <sup>3</sup>			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	208000	2330	5830		670000	7500	19000	11700	1	3/21/23 16:14	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	95.8				80-120					3/21/23 16:14	



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## Certificate of Analysis

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Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis</b>			<b>Preparation Method:</b>	<b>No Prep VOC GC Air</b>	
23C1038-01	1.00 mL / 1.00 mL	ALT-145	BGC0500	SGC0658	AG00026
23C1038-02	1.00 mL / 1.00 mL	ALT-145	BGC0500	SGC0658	AG00026
23C1038-01	1.00 mL / 1.00 mL	EPA 3C	BGC0500	SGC0658	AG00026
23C1038-02	1.00 mL / 1.00 mL	EPA 3C	BGC0500	SGC0658	AG00026
23C1038-02RE1	1.00 mL / 1.00 mL	EPA 3C	BGC0718	SGC0713	AG00026
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>No Prep VOC Air</b>	
23C1038-01	400 mL / 400 mL	EPA TO-15	BGC0743	SGC0734	AC30195
23C1038-02	400 mL / 400 mL	EPA TO-15	BGC0743	SGC0734	AC30195





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## Certificate of Analysis

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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit			Units	%REC			

#### Batch BGC0743 - No Prep VOC Air

##### Blank (BGC0743-BLK1)

Prepared & Analyzed: 03/21/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.90 ppbv 5.00 98.0 80-120

##### LCS (BGC0743-BS1)

Prepared & Analyzed: 03/21/2023

1,1,1-Trichloroethane	4.96	0.5	ppbv	5.00	99.2	70-130		
1,1,1,2-Tetrachloroethane	5.19	0.5	ppbv	5.00	104	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	4.64	0.5	ppbv	5.00	92.8	70-130		
1,1,2-Trichloroethane	4.93	0.5	ppbv	5.00	98.6	70-130		
1,1-Dichloroethane	4.59	0.5	ppbv	5.00	91.8	70-130		
1,1-Dichloroethylene	4.66	0.5	ppbv	5.00	93.2	70-130		
1,2,4-Trimethylbenzene	5.23	0.5	ppbv	5.00	105	70-130		
1,2-Dibromoethane (EDB)	5.12	0.5	ppbv	5.00	102	70-130		
1,2-Dichlorobenzene	5.48	0.5	ppbv	5.00	110	70-130		
1,2-Dichloroethane	4.96	0.5	ppbv	5.00	99.2	70-130		
1,2-Dichloropropane	4.90	0.5	ppbv	5.00	98.0	70-130		
1,2-Dichlorotetrafluoroethane	4.70	0.5	ppbv	5.00	94.0	70-130		
1,3,5-Trimethylbenzene	5.20	0.5	ppbv	5.00	104	70-130		
1,3-Butadiene	4.57	0.5	ppbv	5.00	91.4	70-130		
1,3-Dichlorobenzene	5.35	0.5	ppbv	5.00	107	70-130		
1,4-Dichlorobenzene	5.37	0.5	ppbv	5.00	107	70-130		
1,4-Dioxane	5.47	0.5	ppbv	5.00	109	70-130		
2-Butanone (MEK)	4.55	0.5	ppbv	5.00	91.0	70-130		
4-Methyl-2-pentanone (MIBK)	5.13	0.5	ppbv	5.00	103	70-130		
Allyl chloride	4.49	0.5	ppbv	5.00	89.8	70-130		
Benzene	4.93	0.5	ppbv	5.00	98.6	70-130		
Benzyl Chloride	4.84	0.5	ppbv	5.00	96.8	70-130		
Bromodichloromethane	4.62	0.5	ppbv	5.00	92.4	70-130		
Bromoform	0.98	0.5	ppbv	5.00	19.6	70-130		L
Bromomethane	4.81	0.5	ppbv	5.00	96.2	70-130		
Carbon Disulfide	4.50	0.5	ppbv	5.00	90.0	70-130		



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Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

#### Batch BGC0743 - No Prep VOC Air

##### LCS (BGC0743-BS1)

Prepared & Analyzed: 03/21/2023

Carbon Tetrachloride	4.91	0.5	ppbv	5.00	98.2	70-130			
Chlorobenzene	5.05	0.5	ppbv	5.00	101	70-130			
Chloroethane	4.62	0.5	ppbv	5.00	92.4	70-130			
Chloroform	4.66	0.5	ppbv	5.00	93.2	70-130			
Chloromethane	4.61	0.5	ppbv	5.00	92.2	70-130			
cis-1,2-Dichloroethylene	4.69	0.5	ppbv	5.00	93.8	70-130			
cis-1,3-Dichloropropene	5.12	0.5	ppbv	5.00	102	70-130			
Cyclohexane	4.95	0.5	ppbv	5.00	99.0	70-130			
Dichlorodifluoromethane	4.66	0.5	ppbv	5.00	93.2	70-130			
Ethyl acetate	4.90	0.5	ppbv	5.00	98.0	70-130			
Ethylbenzene	5.17	0.5	ppbv	5.00	103	70-130			
Heptane	4.82	0.5	ppbv	5.00	96.4	70-130			
Hexane	4.82	0.5	ppbv	5.00	96.4	70-130			
m+p-Xylenes	10.3	1	ppbv	10.0	103	70-130			
Methylene chloride	4.91	1	ppbv	5.00	98.2	70-130			
Methyl-t-butyl ether (MTBE)	4.81	0.5	ppbv	5.00	96.2	70-130			
Naphthalene	4.58	0.5	ppbv	5.00	91.6	60-140			
o-Xylene	5.10	0.5	ppbv	5.00	102	70-130			
Propylene	4.57	1	ppbv	5.00	91.4	70-130			
Styrene	5.18	0.5	ppbv	5.00	104	70-130			
Tetrachloroethylene (PCE)	5.05	0.5	ppbv	5.00	101	70-130			
Tetrahydrofuran	4.93	0.5	ppbv	5.00	98.6	70-130			
Toluene	4.97	0.5	ppbv	5.00	99.4	70-130			
trans-1,2-Dichloroethylene	4.72	0.5	ppbv	5.00	94.4	70-130			
trans-1,3-Dichloropropene	5.27	0.5	ppbv	5.00	105	70-130			
Trichloroethylene	4.95	0.5	ppbv	5.00	99.0	70-130			
Trichlorofluoromethane	4.68	0.5	ppbv	5.00	93.6	70-130			
Vinyl acetate	4.76	0.5	ppbv	5.00	95.2	70-130			
Vinyl bromide	4.66	0.5	ppbv	5.00	93.2	70-130			
Vinyl chloride	4.65	0.5	ppbv	5.00	93.0	70-130			
Surr: 4-Bromofluorobenzene (Surr)	5.10		ppbv	5.00	102	70-130			



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## Certificate of Analysis

Final Report

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4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS Dup (BGC0743-BSD1)

Prepared & Analyzed: 03/21/2023

1,1,1-Trichloroethane	5.00	0.5	ppbv	5.00	100	70-130	0.803	25	
1,1,2,2-Tetrachloroethane	5.12	0.5	ppbv	5.00	102	70-130	1.36	25	
1,1,2-Trichloro-1,2,2-trifluoroethane	4.68	0.5	ppbv	5.00	93.6	70-130	0.858	25	
1,1,2-Trichloroethane	5.02	0.5	ppbv	5.00	100	70-130	1.81	25	
1,1-Dichloroethane	4.62	0.5	ppbv	5.00	92.4	70-130	0.651	25	
1,1-Dichloroethylene	4.68	0.5	ppbv	5.00	93.6	70-130	0.428	25	
1,2,4-Trimethylbenzene	5.18	0.5	ppbv	5.00	104	70-130	0.961	25	
1,2-Dibromoethane (EDB)	5.08	0.5	ppbv	5.00	102	70-130	0.784	25	
1,2-Dichlorobenzene	5.42	0.5	ppbv	5.00	108	70-130	1.10	25	
1,2-Dichloroethane	4.98	0.5	ppbv	5.00	99.6	70-130	0.402	25	
1,2-Dichloropropane	4.90	0.5	ppbv	5.00	98.0	70-130	0.00	25	
1,2-Dichlorotetrafluoroethane	4.84	0.5	ppbv	5.00	96.8	70-130	2.94	25	
1,3,5-Trimethylbenzene	5.11	0.5	ppbv	5.00	102	70-130	1.75	25	
1,3-Butadiene	4.48	0.5	ppbv	5.00	89.6	70-130	1.99	25	
1,3-Dichlorobenzene	5.35	0.5	ppbv	5.00	107	70-130	0.00	25	
1,4-Dichlorobenzene	5.32	0.5	ppbv	5.00	106	70-130	0.935	25	
1,4-Dioxane	5.57	0.5	ppbv	5.00	111	70-130	1.81	25	
2-Butanone (MEK)	4.55	0.5	ppbv	5.00	91.0	70-130	0.00	25	
4-Methyl-2-pentanone (MIBK)	5.25	0.5	ppbv	5.00	105	70-130	2.31	25	
Allyl chloride	4.41	0.5	ppbv	5.00	88.2	70-130	1.80	25	
Benzene	4.96	0.5	ppbv	5.00	99.2	70-130	0.607	25	
Benzyl Chloride	4.77	0.5	ppbv	5.00	95.4	70-130	1.46	25	
Bromodichloromethane	4.66	0.5	ppbv	5.00	93.2	70-130	0.862	25	
Bromoform	0.97	0.5	ppbv	5.00	19.4	70-130	1.03	25	L
Bromomethane	4.96	0.5	ppbv	5.00	99.2	70-130	3.07	25	
Carbon Disulfide	4.51	0.5	ppbv	5.00	90.2	70-130	0.222	25	
Carbon Tetrachloride	4.95	0.5	ppbv	5.00	99.0	70-130	0.811	25	
Chlorobenzene	5.03	0.5	ppbv	5.00	101	70-130	0.397	25	
Chloroethane	4.70	0.5	ppbv	5.00	94.0	70-130	1.72	25	
Chloroform	4.67	0.5	ppbv	5.00	93.4	70-130	0.214	25	
Chloromethane	4.58	0.5	ppbv	5.00	91.6	70-130	0.653	25	
cis-1,2-Dichloroethylene	4.76	0.5	ppbv	5.00	95.2	70-130	1.48	25	
cis-1,3-Dichloropropene	5.14	0.5	ppbv	5.00	103	70-130	0.390	25	



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1038

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	Limits	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS Dup (BGC0743-BSD1)

Prepared & Analyzed: 03/21/2023

Cyclohexane	4.96	0.5	ppbv	5.00	99.2	70-130	0.202	25	
Dichlorodifluoromethane	4.65	0.5	ppbv	5.00	93.0	70-130	0.215	25	
Ethyl acetate	4.88	0.5	ppbv	5.00	97.6	70-130	0.409	25	
Ethylbenzene	5.14	0.5	ppbv	5.00	103	70-130	0.582	25	
Heptane	4.83	0.5	ppbv	5.00	96.6	70-130	0.207	25	
Hexane	4.78	0.5	ppbv	5.00	95.6	70-130	0.833	25	
m+p-Xylenes	10.3	1	ppbv	10.0	103	70-130	0.777	25	
Methylene chloride	4.88	1	ppbv	5.00	97.6	70-130	0.613	25	
Methyl-t-butyl ether (MTBE)	4.79	0.5	ppbv	5.00	95.8	70-130	0.417	25	
Naphthalene	4.32	0.5	ppbv	5.00	86.4	60-140	5.84	25	
o-Xylene	5.06	0.5	ppbv	5.00	101	70-130	0.787	25	
Propylene	4.75	1	ppbv	5.00	95.0	70-130	3.86	25	
Styrene	5.15	0.5	ppbv	5.00	103	70-130	0.581	25	
Tetrachloroethylene (PCE)	5.02	0.5	ppbv	5.00	100	70-130	0.596	25	
Tetrahydrofuran	4.96	0.5	ppbv	5.00	99.2	70-130	0.607	25	
Toluene	5.05	0.5	ppbv	5.00	101	70-130	1.60	25	
trans-1,2-Dichloroethylene	4.71	0.5	ppbv	5.00	94.2	70-130	0.212	25	
trans-1,3-Dichloropropene	5.27	0.5	ppbv	5.00	105	70-130	0.00	25	
Trichloroethylene	5.03	0.5	ppbv	5.00	101	70-130	1.60	25	
Trichlorofluoromethane	4.72	0.5	ppbv	5.00	94.4	70-130	0.851	25	
Vinyl acetate	4.69	0.5	ppbv	5.00	93.8	70-130	1.48	25	
Vinyl bromide	4.70	0.5	ppbv	5.00	94.0	70-130	0.855	25	
Vinyl chloride	4.73	0.5	ppbv	5.00	94.6	70-130	1.71	25	

Surr: 4-Bromofluorobenzene  
(Surr)

5.07 ppbv 5.00 101 70-130



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## Certificate of Analysis

Final Report

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4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

#### Batch BGC0500 - No Prep VOC GC Air

##### Blank (BGC0500-BLK1)

Prepared & Analyzed: 03/14/2023

Methane	<	0.05	Vol%						
Carbon dioxide	<	0.05	Vol%						
Oxygen (O2)	<	0.05	Vol%						
Nitrogen (N2)	<	1.00	Vol%						
Hydrogen (H2)	<	0.02	Vol%						
Carbon Monoxide	<	10.0	ppmv						
Carbon Monoxide	<	0.001	Vol%						

##### LCS (BGC0500-BS1)

Prepared & Analyzed: 03/14/2023

Methane	4690	500	ppmv	5000	93.9	0-200			
Methane	4690	0.05	ppmv	5000	93.9	80-120			
Carbon dioxide	5230	500	ppmv	5000	105	0-200			
Carbon dioxide	5230	0.05	ppmv	5000	105	80-120			
Oxygen (O2)	5110	500	ppmv	5000	102	0-200			
Oxygen (O2)	5110	0.05	ppmv	5000	102	80-120			
Hydrogen (H2)	5910	200	ppmv	5100	116	0-200			
Nitrogen (N2)	5370	2000	ppmv	5000	107	0-200			
Nitrogen (N2)	5370	1	ppmv	5000	107	80-120			
Hydrogen (H2)	5910	0.02	ppmv	5100	116	80-120			
Carbon Monoxide	4880	10	ppmv	5000	97.7	0-200			
Carbon Monoxide	4880	0.001	ppmv	5000	97.7	80-120			

##### Duplicate (BGC0500-DUP1)

Source: 23C0611-01

Prepared & Analyzed: 03/14/2023

Methane	11.0	0.45	Vol%		11.1	0.199	5		
Methane	110000	4500	ppmv		111000	0.199	25		
Carbon dioxide	237000	4500	ppmv		235000	1.06	25		
Carbon dioxide	23.7	0.45	Vol%		23.5	1.06	5		
Oxygen (O2)	93800	4500	ppmv		93600	0.200	25		
Oxygen (O2)	9.38	0.45	Vol%		9.36	0.200	5		
Hydrogen (H2)	2.34	0.18	Vol%		2.35	0.278	5		
Nitrogen (N2)	469000	18000	ppmv		469000	0.0733	25		
Hydrogen (H2)	23400	1800	ppmv		23500	0.278	25		
Carbon Monoxide	0.01	0.009	Vol%		0.01	1.39	5		
Carbon Monoxide	131	90.0	ppmv		129	1.39	25		



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1038

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting			Spike	Source	%REC			RPD	Qual
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

#### Batch BGC0500 - No Prep VOC GC Air

Duplicate (BGC0500-DUP2)				Source: 23C1038-01	Prepared & Analyzed: 03/17/2023		
Methane	134000	4500	ppmv		134000	0.654	25
Methane	13.4	0.45	Vol%		13.4	0.654	5
Carbon dioxide	30.7	0.45	Vol%		31.0	0.911	5
Carbon dioxide	307000	4500	ppmv		310000	0.911	25
Oxygen (O2)	6.21	0.45	Vol%		6.22	0.209	5
Oxygen (O2)	62100	4500	ppmv		62200	0.209	25
Hydrogen (H2)	3.00	0.18	Vol%		3.08	2.63	5
Nitrogen (N2)	40.9	9.00	Vol%		41.1	0.473	5
Hydrogen (H2)	30000	1800	ppmv		30800	2.63	25
Nitrogen (N2)	409000	18000	ppmv		411000	0.473	25
Carbon Monoxide	0.02	0.009	Vol%		0.02	0.428	5
Carbon Monoxide	169	90.0	ppmv		168	0.428	25

Duplicate (BGC0500-DUP3)				Source: 23C1038-02	Prepared & Analyzed: 03/17/2023		
Methane	204000	4500	ppmv		201000	1.59	25
Methane	20.4	0.45	Vol%		20.1	1.59	5
Carbon dioxide	55.9	0.45	Vol%		55.1	1.40	5
Carbon dioxide	559000	4500	ppmv		551000	1.40	25
Oxygen (O2)	1.28	0.45	Vol%		1.27	0.951	5
Oxygen (O2)	12800	4500	ppmv		12700	0.951	25
Nitrogen (N2)	<	9.00	Vol%		<9.00	NA	5
Hydrogen (H2)	138000	1800	ppmv		136000	1.74	25
Nitrogen (N2)	43900	18000	ppmv		43400	1.19	25
Carbon Monoxide	874	90.0	ppmv		855	2.27	25
Carbon Monoxide	0.09	0.009	Vol%		0.09	2.27	5

#### Batch BGC0718 - No Prep VOC GC Air

Blank (BGC0718-BLK1)				Prepared & Analyzed: 03/20/2023		
Methane	<	0.05	Vol%			
Carbon dioxide	<	0.05	Vol%			
Oxygen (O2)	<	0.05	Vol%			
Hydrogen (H2)	<	0.02	Vol%			
Nitrogen (N2)	<	1.00	Vol%			
Carbon Monoxide	<	0.001	Vol%			



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1038

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

#### Batch BGC0718 - No Prep VOC GC Air

##### LCS (BGC0718-BS1)

Prepared & Analyzed: 03/20/2023

Methane	4760	0.05	ppmv	5000	95.2	80-120			
Carbon dioxide	5840	0.05	ppmv	5000	117	80-120			
Oxygen (O2)	5190	0.05	ppmv	5000	104	80-120			
Nitrogen (N2)	5430	1	ppmv	5000	109	80-120			
Hydrogen (H2)	5830	0.02	ppmv	5100	114	80-120			
Carbon Monoxide	4950	0.001	ppmv	5000	99.0	80-120			

##### Duplicate (BGC0718-DUP1)

Source: 23C1051-01

Prepared & Analyzed: 03/20/2023

Methane	38.3	0.45	Vol%		38.5		0.499	5
Carbon dioxide	42.1	0.45	Vol%		42.3		0.546	5
Oxygen (O2)	<	0.45	Vol%		<0.45		NA	5
Nitrogen (N2)	11.4	9.00	Vol%		11.5		0.554	5
Hydrogen (H2)	2.39	0.18	Vol%		2.40		0.567	5
Carbon Monoxide	<	0.009	Vol%		<0.009		NA	5

##### Duplicate (BGC0718-DUP2)

Source: 23C1051-02

Prepared & Analyzed: 03/20/2023

Methane	38.3	0.45	Vol%		38.4		0.171	5
Carbon dioxide	38.6	0.45	Vol%		38.6		0.0315	5
Oxygen (O2)	<	0.45	Vol%		<0.45		NA	5
Nitrogen (N2)	<	9.00	Vol%		<9.00		NA	5
Carbon Monoxide	<	0.009	Vol%		<0.009		NA	5

##### Duplicate (BGC0718-DUP3)

Source: 23C1051-03

Prepared & Analyzed: 03/21/2023

Methane	36.9	0.45	Vol%		37.2		0.658	5
Carbon dioxide	38.2	0.45	Vol%		38.4		0.498	5
Oxygen (O2)	<	0.45	Vol%		<0.45		NA	5
Nitrogen (N2)	14.1	9.00	Vol%		14.2		0.849	5
Carbon Monoxide	<	0.009	Vol%		<0.009		NA	5



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1038

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Qual
	Result	Limit			Units	%REC		

#### Batch BGC0718 - No Prep VOC GC Air

Duplicate (BGC0718-DUP4)	Source: 23C1051-04			Prepared & Analyzed: 03/21/2023		
Methane	37.3	0.45	Vol%	37.7	0.902	5
Carbon dioxide	45.2	0.45	Vol%	45.6	0.771	5
Oxygen (O2)	0.53	0.45	Vol%	0.55	2.83	5
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Hydrogen (H2)	4.46	0.18	Vol%	4.51	1.11	5
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

#### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<b>EPA 3C in Air</b>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
<b>EPA TO-15 in Air</b>			
Benzene	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023





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## Certificate of Analysis

Final Report

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4330 Lewis Road, Suite 1

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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Qualifiers and Definitions

L LCS recovery is outside of established acceptance limits

RPD Relative Percent Difference

Qual Qualifiers

-RE Denotes sample was re-analyzed

PF Preparation Factor

MDL Method Detection Limit

LOQ Limit of Quantitation

ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.

**AIR ANALYSIS  
CHAIN OF CUSTODY**

Equipment due 3/30/2023

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: <b>Same</b>	PROJECT NAME/Quote #: <b>Bristol</b>
CONTACT:		INVOICE CONTACT:	SITE NAME: <i>Bristol</i>
ADDRESS:		INVOICE ADDRESS:	PROJECT NUMBER: <i>07223014.00</i>
PHONE #:		INVOICE PHONE #:	P.O. #:
FAX #:	EMAIL:	Pretreatment Program:	
Is sample for compliance reporting? <b>YES</b> NO	Regulatory State: <b>VA</b>	Is sample from a chlorinated supply? YES <b>NO</b>	PWS I.D. #:
SAMPLER NAME (PRINT): <i>Ryan Seymour</i>		SAMPLER SIGNATURE: <i>Ryan Seymour</i>	
		Turn Around Time: Circle: 10 <b>5 Days</b> or ___ Day(s)	
Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other <b>LV</b>			<b>063-23B-0014</b>

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg): <b>30.04</b>	Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)		Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Alt 145 CO	EPA 3C
1) <i>37</i>			11293	1.4	230202-02	21.6	3.8	<i>3/16/23</i>	<i>9:58 AM</i>	<i>28</i>	<i>148</i>	<i>20:00 AM</i>	<i>3/16/23</i>	<i>10</i>	<i>148</i>	LG	x	x	x
2) <i>57</i>			12383	1.4	230202-02	21.6	3.4	<i>3/16/23</i>	<i>10:08 AM</i>	<i>28</i>	<i>146</i>	<i>10:10</i>	<i>3/16/23</i>	<i>10</i>	<i>147</i>	LG	x	x	x
3)			12418	1.4	230202-02	21.6										LG	x	x	x
4)			14294	1.4	230126-02	21.6										LG	x	x	x

*20.3°C 310 note noseal*

RELINQUISHED: <i>Ryan Seymour</i>	DATE / TIME: <i>3/16/23</i>	RECEIVED:	DATE / TIME:	QC Data Package	LAB USE ONLY
RELINQUISHED:	DATE / TIME: <i>5:25pm</i>	RECEIVED: <i>RedEx G</i>	DATE / TIME:	Level I <input type="checkbox"/>	
RELINQUISHED: <i>RedEx G</i>	DATE / TIME:	RECEIVED: <i>William Miller</i>	DATE / TIME: <i>3/17/23 1114</i>	Level II <input type="checkbox"/>	
				Level III <input type="checkbox"/>	
				Level IV <input type="checkbox"/>	

**SCS Field Services 23C1038  
Bristol**  
Recd: 03/17/2023 Due: 03/24/2023

v130325002

*Extra Box no sample collected. Old Box found.*



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C1038

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1  Harrisburg, PA 17111	Date Received:	March 17, 2023 11:14
		Date Issued:	March 23, 2023 17:20
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

### Sample Conditions Checklist

Samples Received at:	20.30°C
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments



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## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C1352

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 24, 2023 10:00
	4330 Lewis Road, Suite 1	Date Issued:	March 29, 2023 16:48
	Harrisburg, PA 17111	Project Number:	[none]
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/24/2023 10:00. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

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VELAP ID 460021



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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA      Date Received: March 24, 2023 10:00  
4330 Lewis Road, Suite 1      Date Issued: March 29, 2023 16:48  
Harrisburg, PA 17111      Project Number: [none]  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
51	23C1352-02	Air	03/23/2023 13:33	03/24/2023 10:00



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 51**  
**Sample ID: 23C1352-02**  
Sample Matrix: Air  
Sampled: 3/23/2023 13:33  
Sample Type: LV

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00084::12418  
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.6  
Final Vacuum(in Hg): 12  
Receipt Vacuum(in Hg): 6.4  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	554	90.0	90.0		9	1	3/27/23 12:20	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	12.6	0.45	0.45		9	1	3/27/23 12:20	MER
Carbon dioxide, as received	44.3	0.45	0.45		9	1	3/27/23 12:20	MER
Oxygen (O2), as received	5.35	0.45	0.45		9	1	3/27/23 12:20	MER
Hydrogen (H2), as received	8.90	0.54	0.54		27	1	3/27/23 15:04	MER
Nitrogen (N2), as received	19.2	9.00	9.00		9	1	3/27/23 12:20	MER
Carbon Monoxide, as received	0.06	0.009	0.009		9	1	3/27/23 12:20	MER

#### Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M <sup>3</sup>			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	162000	2330	5830		520000	7500	19000	11700	1	3/28/23 10:50	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	101				80-120					3/28/23 10:50	



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Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis</b>			<b>Preparation Method:</b>	<b>No Prep VOC GC Air</b>	
23C1352-02	1.00 mL / 1.00 mL	ALT-145	BGC0954	SGC0940	AG00026
23C1352-02	1.00 mL / 1.00 mL	EPA 3C	BGC0954	SGC0940	AG00026
23C1352-02RE1	1.00 mL / 1.00 mL	EPA 3C	BGC0954	SGC0940	AG00026
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>No Prep VOC Air</b>	
23C1352-02	400 mL / 400 mL	EPA TO-15	BGC0743	SGC0974	AC30195





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Project Number: [none]

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Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit Units			%REC	Limits			

#### Batch BGC0743 - No Prep VOC Air

##### Blank (BGC0743-BLK1)

Prepared & Analyzed: 03/21/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.90 ppbv 5.00 98.0 80-120

##### LCS (BGC0743-BS1)

Prepared & Analyzed: 03/21/2023

1,1,1-Trichloroethane	4.96	0.5	ppbv	5.00	99.2	70-130
1,1,1,2-Tetrachloroethane	5.19	0.5	ppbv	5.00	104	70-130
1,1,2-Trichloro-1,2,2-trifluoroethane	4.64	0.5	ppbv	5.00	92.8	70-130
1,1,2-Trichloroethane	4.93	0.5	ppbv	5.00	98.6	70-130
1,1-Dichloroethane	4.59	0.5	ppbv	5.00	91.8	70-130
1,1-Dichloroethylene	4.66	0.5	ppbv	5.00	93.2	70-130
1,2,4-Trimethylbenzene	5.23	0.5	ppbv	5.00	105	70-130
1,2-Dibromoethane (EDB)	5.12	0.5	ppbv	5.00	102	70-130
1,2-Dichlorobenzene	5.48	0.5	ppbv	5.00	110	70-130
1,2-Dichloroethane	4.96	0.5	ppbv	5.00	99.2	70-130
1,2-Dichloropropane	4.90	0.5	ppbv	5.00	98.0	70-130
1,2-Dichlorotetrafluoroethane	4.70	0.5	ppbv	5.00	94.0	70-130
1,3,5-Trimethylbenzene	5.20	0.5	ppbv	5.00	104	70-130
1,3-Butadiene	4.57	0.5	ppbv	5.00	91.4	70-130
1,3-Dichlorobenzene	5.35	0.5	ppbv	5.00	107	70-130
1,4-Dichlorobenzene	5.37	0.5	ppbv	5.00	107	70-130
1,4-Dioxane	5.47	0.5	ppbv	5.00	109	70-130
2-Butanone (MEK)	4.55	0.5	ppbv	5.00	91.0	70-130
4-Methyl-2-pentanone (MIBK)	5.13	0.5	ppbv	5.00	103	70-130
Allyl chloride	4.49	0.5	ppbv	5.00	89.8	70-130
Benzene	4.93	0.5	ppbv	5.00	98.6	70-130
Benzyl Chloride	4.84	0.5	ppbv	5.00	96.8	70-130
Bromodichloromethane	4.62	0.5	ppbv	5.00	92.4	70-130
Bromoform	0.98	0.5	ppbv	5.00	19.6	70-130
Bromomethane	4.81	0.5	ppbv	5.00	96.2	70-130
Carbon Disulfide	4.50	0.5	ppbv	5.00	90.0	70-130

L





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### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	%REC	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS (BGC0743-BS1)

Prepared & Analyzed: 03/21/2023

Carbon Tetrachloride	4.91	0.5	ppbv	5.00	98.2	70-130			
Chlorobenzene	5.05	0.5	ppbv	5.00	101	70-130			
Chloroethane	4.62	0.5	ppbv	5.00	92.4	70-130			
Chloroform	4.66	0.5	ppbv	5.00	93.2	70-130			
Chloromethane	4.61	0.5	ppbv	5.00	92.2	70-130			
cis-1,2-Dichloroethylene	4.69	0.5	ppbv	5.00	93.8	70-130			
cis-1,3-Dichloropropene	5.12	0.5	ppbv	5.00	102	70-130			
Cyclohexane	4.95	0.5	ppbv	5.00	99.0	70-130			
Dichlorodifluoromethane	4.66	0.5	ppbv	5.00	93.2	70-130			
Ethyl acetate	4.90	0.5	ppbv	5.00	98.0	70-130			
Ethylbenzene	5.17	0.5	ppbv	5.00	103	70-130			
Heptane	4.82	0.5	ppbv	5.00	96.4	70-130			
Hexane	4.82	0.5	ppbv	5.00	96.4	70-130			
m+p-Xylenes	10.3	1	ppbv	10.0	103	70-130			
Methylene chloride	4.91	1	ppbv	5.00	98.2	70-130			
Methyl-t-butyl ether (MTBE)	4.81	0.5	ppbv	5.00	96.2	70-130			
Naphthalene	4.58	0.5	ppbv	5.00	91.6	60-140			
o-Xylene	5.10	0.5	ppbv	5.00	102	70-130			
Propylene	4.57	1	ppbv	5.00	91.4	70-130			
Styrene	5.18	0.5	ppbv	5.00	104	70-130			
Tetrachloroethylene (PCE)	5.05	0.5	ppbv	5.00	101	70-130			
Tetrahydrofuran	4.93	0.5	ppbv	5.00	98.6	70-130			
Toluene	4.97	0.5	ppbv	5.00	99.4	70-130			
trans-1,2-Dichloroethylene	4.72	0.5	ppbv	5.00	94.4	70-130			
trans-1,3-Dichloropropene	5.27	0.5	ppbv	5.00	105	70-130			
Trichloroethylene	4.95	0.5	ppbv	5.00	99.0	70-130			
Trichlorofluoromethane	4.68	0.5	ppbv	5.00	93.6	70-130			
Vinyl acetate	4.76	0.5	ppbv	5.00	95.2	70-130			
Vinyl bromide	4.66	0.5	ppbv	5.00	93.2	70-130			
Vinyl chloride	4.65	0.5	ppbv	5.00	93.0	70-130			
Surr: 4-Bromofluorobenzene (Surr)	5.10		ppbv	5.00	102	70-130			



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### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS Dup (BGC0743-BSD1)

Prepared & Analyzed: 03/21/2023

1,1,1-Trichloroethane	5.00	0.5	ppbv	5.00	100	70-130	0.803	25	
1,1,1,2-Tetrachloroethane	5.12	0.5	ppbv	5.00	102	70-130	1.36	25	
1,1,2-Trichloro-1,2,2-trifluoroethane	4.68	0.5	ppbv	5.00	93.6	70-130	0.858	25	
1,1,2-Trichloroethane	5.02	0.5	ppbv	5.00	100	70-130	1.81	25	
1,1-Dichloroethane	4.62	0.5	ppbv	5.00	92.4	70-130	0.651	25	
1,1-Dichloroethylene	4.68	0.5	ppbv	5.00	93.6	70-130	0.428	25	
1,2,4-Trimethylbenzene	5.18	0.5	ppbv	5.00	104	70-130	0.961	25	
1,2-Dibromoethane (EDB)	5.08	0.5	ppbv	5.00	102	70-130	0.784	25	
1,2-Dichlorobenzene	5.42	0.5	ppbv	5.00	108	70-130	1.10	25	
1,2-Dichloroethane	4.98	0.5	ppbv	5.00	99.6	70-130	0.402	25	
1,2-Dichloropropane	4.90	0.5	ppbv	5.00	98.0	70-130	0.00	25	
1,2-Dichlorotetrafluoroethane	4.84	0.5	ppbv	5.00	96.8	70-130	2.94	25	
1,3,5-Trimethylbenzene	5.11	0.5	ppbv	5.00	102	70-130	1.75	25	
1,3-Butadiene	4.48	0.5	ppbv	5.00	89.6	70-130	1.99	25	
1,3-Dichlorobenzene	5.35	0.5	ppbv	5.00	107	70-130	0.00	25	
1,4-Dichlorobenzene	5.32	0.5	ppbv	5.00	106	70-130	0.935	25	
1,4-Dioxane	5.57	0.5	ppbv	5.00	111	70-130	1.81	25	
2-Butanone (MEK)	4.55	0.5	ppbv	5.00	91.0	70-130	0.00	25	
4-Methyl-2-pentanone (MIBK)	5.25	0.5	ppbv	5.00	105	70-130	2.31	25	
Allyl chloride	4.41	0.5	ppbv	5.00	88.2	70-130	1.80	25	
Benzene	4.96	0.5	ppbv	5.00	99.2	70-130	0.607	25	
Benzyl Chloride	4.77	0.5	ppbv	5.00	95.4	70-130	1.46	25	
Bromodichloromethane	4.66	0.5	ppbv	5.00	93.2	70-130	0.862	25	
Bromoform	0.97	0.5	ppbv	5.00	19.4	70-130	1.03	25	L
Bromomethane	4.96	0.5	ppbv	5.00	99.2	70-130	3.07	25	
Carbon Disulfide	4.51	0.5	ppbv	5.00	90.2	70-130	0.222	25	
Carbon Tetrachloride	4.95	0.5	ppbv	5.00	99.0	70-130	0.811	25	
Chlorobenzene	5.03	0.5	ppbv	5.00	101	70-130	0.397	25	
Chloroethane	4.70	0.5	ppbv	5.00	94.0	70-130	1.72	25	
Chloroform	4.67	0.5	ppbv	5.00	93.4	70-130	0.214	25	
Chloromethane	4.58	0.5	ppbv	5.00	91.6	70-130	0.653	25	
cis-1,2-Dichloroethylene	4.76	0.5	ppbv	5.00	95.2	70-130	1.48	25	
cis-1,3-Dichloropropene	5.14	0.5	ppbv	5.00	103	70-130	0.390	25	



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	Limits	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS Dup (BGC0743-BSD1)

Prepared & Analyzed: 03/21/2023

Cyclohexane	4.96	0.5	ppbv	5.00	99.2	70-130	0.202	25	
Dichlorodifluoromethane	4.65	0.5	ppbv	5.00	93.0	70-130	0.215	25	
Ethyl acetate	4.88	0.5	ppbv	5.00	97.6	70-130	0.409	25	
Ethylbenzene	5.14	0.5	ppbv	5.00	103	70-130	0.582	25	
Heptane	4.83	0.5	ppbv	5.00	96.6	70-130	0.207	25	
Hexane	4.78	0.5	ppbv	5.00	95.6	70-130	0.833	25	
m+p-Xylenes	10.3	1	ppbv	10.0	103	70-130	0.777	25	
Methylene chloride	4.88	1	ppbv	5.00	97.6	70-130	0.613	25	
Methyl-t-butyl ether (MTBE)	4.79	0.5	ppbv	5.00	95.8	70-130	0.417	25	
Naphthalene	4.32	0.5	ppbv	5.00	86.4	60-140	5.84	25	
o-Xylene	5.06	0.5	ppbv	5.00	101	70-130	0.787	25	
Propylene	4.75	1	ppbv	5.00	95.0	70-130	3.86	25	
Styrene	5.15	0.5	ppbv	5.00	103	70-130	0.581	25	
Tetrachloroethylene (PCE)	5.02	0.5	ppbv	5.00	100	70-130	0.596	25	
Tetrahydrofuran	4.96	0.5	ppbv	5.00	99.2	70-130	0.607	25	
Toluene	5.05	0.5	ppbv	5.00	101	70-130	1.60	25	
trans-1,2-Dichloroethylene	4.71	0.5	ppbv	5.00	94.2	70-130	0.212	25	
trans-1,3-Dichloropropene	5.27	0.5	ppbv	5.00	105	70-130	0.00	25	
Trichloroethylene	5.03	0.5	ppbv	5.00	101	70-130	1.60	25	
Trichlorofluoromethane	4.72	0.5	ppbv	5.00	94.4	70-130	0.851	25	
Vinyl acetate	4.69	0.5	ppbv	5.00	93.8	70-130	1.48	25	
Vinyl bromide	4.70	0.5	ppbv	5.00	94.0	70-130	0.855	25	
Vinyl chloride	4.73	0.5	ppbv	5.00	94.6	70-130	1.71	25	

Surr: 4-Bromofluorobenzene  
(Surr)

5.07 ppbv 5.00 101 70-130



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Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

#### Batch BGC0954 - No Prep VOC GC Air

##### Blank (BGC0954-BLK1)

Prepared & Analyzed: 03/27/2023

Methane	<	0.05	Vol%						
Carbon dioxide	<	0.05	Vol%						
Oxygen (O2)	<	0.05	Vol%						
Nitrogen (N2)	<	1.00	Vol%						
Hydrogen (H2)	<	0.02	Vol%						
Carbon Monoxide	<	10.0	ppmv						
Carbon Monoxide	<	0.001	Vol%						

##### LCS (BGC0954-BS1)

Prepared & Analyzed: 03/27/2023

Methane	4640	500	ppmv	5000	92.8	0-200			
Methane	4640	0.05	ppmv	5000	92.8	80-120			
Carbon dioxide	5400	500	ppmv	5000	108	0-200			
Carbon dioxide	5400	0.05	ppmv	5000	108	80-120			
Oxygen (O2)	5060	500	ppmv	5000	101	0-200			
Oxygen (O2)	5060	0.05	ppmv	5000	101	80-120			
Nitrogen (N2)	5300	2000	ppmv	5000	106	0-200			
Hydrogen (H2)	5910	200	ppmv	5100	116	0-200			
Hydrogen (H2)	5910	0.02	ppmv	5100	116	80-120			
Nitrogen (N2)	5300	1	ppmv	5000	106	80-120			
Carbon Monoxide	4840	10	ppmv	5000	96.8	0-200			
Carbon Monoxide	4840	0.001	ppmv	5000	96.8	80-120			

##### Duplicate (BGC0954-DUP1)

Source: 23C1352-02

Prepared & Analyzed: 03/27/2023

Methane	125000	4500	ppmv	126000	1.28	25			
Methane	12.5	0.45	Vol%	12.6	1.28	5			
Carbon dioxide	43.3	0.45	Vol%	44.3	2.29	5			
Carbon dioxide	433000	4500	ppmv	443000	2.29	25			
Oxygen (O2)	53000	4500	ppmv	53500	0.925	25			
Oxygen (O2)	5.30	0.45	Vol%	5.35	0.925	5			
Hydrogen (H2)	91700	1800	ppmv	91800	0.0737	25			
Nitrogen (N2)	190000	18000	ppmv	192000	0.971	25			
Nitrogen (N2)	19.0	9.00	Vol%	19.2	0.971	5			
Carbon Monoxide	552	90.0	ppmv	554	0.407	25			
Carbon Monoxide	0.06	0.009	Vol%	0.06	0.407	5			



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Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD	Limit	Qual
	Result	Limit			Units	%REC				

#### Batch BGC0954 - No Prep VOC GC Air

Duplicate (BGC0954-DUP2)			Source: 23C1480-01	Prepared & Analyzed: 03/28/2023		
Methane	183000	4500	ppmv	180000	1.38	25
Methane	18.3	0.45	Vol%	18.0	1.38	5
Carbon dioxide	208000	4500	ppmv	207000	0.499	25
Carbon dioxide	20.8	0.45	Vol%	20.7	0.499	5
Oxygen (O2)	52500	4500	ppmv	52000	0.938	25
Oxygen (O2)	5.25	0.45	Vol%	5.20	0.938	5
Hydrogen (H2)	<	1800	ppmv	<1800	NA	25
Nitrogen (N2)	516000	18000	ppmv	509000	1.41	25
Hydrogen (H2)	<	0.18	Vol%	<0.18	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

Duplicate (BGC0954-DUP3)			Source: 23C1480-02	Prepared & Analyzed: 03/28/2023		
Methane	325000	4500	ppmv	328000	0.944	25
Methane	32.5	0.45	Vol%	32.8	0.944	5
Carbon dioxide	348000	4500	ppmv	352000	1.05	25
Carbon dioxide	34.8	0.45	Vol%	35.2	1.05	5
Oxygen (O2)	6030	4500	ppmv	6040	0.0403	25
Oxygen (O2)	0.60	0.45	Vol%	0.60	0.0403	5
Hydrogen (H2)	76600	1800	ppmv	77500	1.19	25
Nitrogen (N2)	156000	18000	ppmv	157000	1.04	25
Nitrogen (N2)	15.6	9.00	Vol%	15.7	1.04	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<i>EPA 3C in Air</i>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
<i>EPA TO-15 in Air</i>			
Benzene	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

### Qualifiers and Definitions

- L LCS recovery is outside of established acceptance limits
- RPD Relative Percent Difference
- Qual Qualifiers
- RE Denotes sample was re-analyzed
- PF Preparation Factor
- MDL Method Detection Limit
- LOQ Limit of Quantitation
- ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.

**AIR ANALYSIS**  
**CHAIN OF CUSTODY**

Equipment due 3/30/2023

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:		INVOICE CONTACT:	SITE NAME:
ADDRESS:		INVOICE ADDRESS:	PROJECT NUMBER:
PHONE #:		INVOICE PHONE #:	P.O. #:
FAX #:	EMAIL:	Pretreatment Program:	
Is sample for compliance reporting? <b>YES</b> NO		Regulatory State: <b>VA</b>	Is sample from a chlorinated supply? YES <b>NO</b> PWS I.D. #:
SAMPLER NAME (PRINT):		SAMPLER SIGNATURE:	Turn Around Time: Circle: 10 <b>5 Days</b> or ___ Day(s)

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other LV **063-23B-0014**

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				ANALYSIS				
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (In Hg):		Barometric Pres. (In Hg):		Barometric Pres. (In Hg):		Ending Sample Temp °F	Matrix (See Codes)	Alt 145 CO	EPA 3C	Benzene by TO-15	
1)			11293	1.4	230202-02	21.6		DIDN'T SAMPLE							LG	X	X	X	
2) 37			<del>12289</del> 14308	1.4	<del>230202-02</del> 230126-02	21.6		3/23/23	<del>NO</del>	27	145.3	3/23/23	1:28 pm	10	145.3	LG	X	X	X
3) 51			12418	1.4	230202-02	21.6		3/23/23	1:30 pm	27	106.4	3/23/23	1:49 pm	12	106.5	LG	X	X	X
4) 46*			14294	1.4	230126-02	21.6		3/23/23	1:25 pm	27	145.3	3/23/23	1:28 pm	10	145.3	LG	X	X	X

ID 46 IS APPROVED FOR THIS TEMP. PLEASE CANCEL ANALYSIS + DEFUSE. THANKS! 310

RELINQUISHED: Fedex E	RECEIVED: Fed ex E	DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED: Fedex E	RECEIVED: <i>[Signature]</i>	DATE / TIME: 3/24/23 1000	Level I <input type="checkbox"/>	20.9
RELINQUISHED:	RECEIVED:	DATE / TIME:	Level II <input type="checkbox"/>	no ICP
			Level III <input type="checkbox"/>	no sent
			Level IV <input type="checkbox"/>	SCS Field Services 23C1352
				Bristol
				Recd: 03/24/2023 Due: 03/31/2023



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1  Harrisburg, PA 17111	Date Received:	March 24, 2023 10:00
		Date Issued:	March 29, 2023 16:48
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

### Sample Conditions Checklist

Samples Received at:	20.90°C
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments

Analysis for sample -03: 46 not required per Tom Lock via email. MRS 03/24/213 1332





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## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C1681

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 30, 2023 16:03
	4330 Lewis Road, Suite 1	Date Issued:	April 6, 2023 17:34
	Harrisburg, PA 17111	Project Number:	07223016.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/30/2023 16:03. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Enthalpy Analytical, Inc.



TNI Accredited  
VELAP ID 460021



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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C1681

Client Name: SCS Field Services - Harrisburg, PA      Date Received: March 30, 2023 16:03  
4330 Lewis Road, Suite 1      Date Issued: April 6, 2023 17:34  
Harrisburg, PA 17111      Project Number: 07223016.00  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
51	23C1681-01	Air	03/29/2023 12:25	03/30/2023 16:03
57	23C1681-02	Air	03/29/2023 12:14	03/30/2023 16:03
37	23C1681-03	Air	03/29/2023 11:59	03/30/2023 16:03



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## Certificate of Analysis

Final Report

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Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 51**  
  
**Sample ID: 23C1681-01**  
Sample Matrix: Air  
Sampled: 3/29/2023 12:25  
  
Sample Type: LG

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00475::15039  
Canister Size: 1.4

Initial Vacuum(in Hg): 27  
Final Vacuum(in Hg): 2.2  
Receipt Vacuum(in Hg): 2.2  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	1430	90.0	90.0		9	1	4/3/23 11:17	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	4.48	0.45	0.45		9	1	4/3/23 11:17	MER
Carbon dioxide, as received	62.3	0.45	0.45		9	1	4/3/23 11:17	MER
Oxygen (O2), as received	1.84	0.45	0.45	C	9	1	4/3/23 11:17	MER
Hydrogen (H2), as received	25.8	1.62	1.62		81	1	4/3/23 14:25	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	4/3/23 11:17	MER
Carbon Monoxide, as received	0.14	0.009	0.009		9	1	4/3/23 11:17	MER



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## Certificate of Analysis

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Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 57**  
**Sample ID: 23C1681-02**  
Sample Matrix: Air  
Sampled: 3/29/2023 12:14  
Sample Type: LG

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00473::15043  
Canister Size: 1.4

Initial Vacuum(in Hg): 27  
Final Vacuum(in Hg): 4.6  
Receipt Vacuum(in Hg): 4.6  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	884	90.0	90.0		9	1	4/3/23 12:08	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	18.5	0.45	0.45		9	1	4/3/23 12:08	MER
Carbon dioxide, as received	48.2	0.45	0.45		9	1	4/3/23 12:08	MER
Oxygen (O2), as received	3.57	0.45	0.45	C	9	1	4/3/23 12:08	MER
Hydrogen (H2), as received	11.1	1.08	1.08		54	1	4/3/23 14:10	MER
Nitrogen (N2), as received	16.9	9.00	9.00		9	1	4/3/23 12:08	MER
Carbon Monoxide, as received	0.09	0.009	0.009		9	1	4/3/23 12:08	MER



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## Certificate of Analysis

Final Report

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4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 37**  
**Sample ID: 23C1681-03**  
Sample Matrix: Air  
Sampled: 3/29/2023 11:59  
Sample Type: LG

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00268::13370  
Canister Size: 1.4

Initial Vacuum(in Hg): 28  
Final Vacuum(in Hg): 3.0  
Receipt Vacuum(in Hg): 3.0  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	167	90.0	90.0		9	1	4/3/23 13:00	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	12.3	0.45	0.45		9	1	4/3/23 13:00	MER
Carbon dioxide, as received	28.6	0.45	0.45		9	1	4/3/23 13:00	MER
Oxygen (O2), as received	6.13	0.45	0.45	C	9	1	4/3/23 13:00	MER
Hydrogen (H2), as received	3.07	0.18	0.18		9	1	4/3/23 13:00	MER
Nitrogen (N2), as received	43.1	9.00	9.00		9	1	4/3/23 13:00	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	4/3/23 13:00	MER



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### Certificate of Analysis

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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis</b>			<b>Preparation Method:</b>	<b>No Prep VOC GC Air</b>	
23C1681-01	1.00 mL / 1.00 mL	ALT-145	BGC1179	SGD0023	AG00026
23C1681-02	1.00 mL / 1.00 mL	ALT-145	BGC1179	SGD0023	AG00026
23C1681-03	1.00 mL / 1.00 mL	ALT-145	BGC1179	SGD0023	AG00026
23C1681-01	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026
23C1681-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026
23C1681-02	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026
23C1681-02RE1	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026
23C1681-03	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026



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Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source		%REC		RPD		Qual
	Result	Limit		Units	Result	%REC	Limits	RPD	Limit	

#### Batch BGC1179 - No Prep VOC GC Air

##### Blank (BGC1179-BLK1)

Prepared & Analyzed: 03/31/2023

Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Carbon Monoxide	<	10.0	ppmv							
Carbon Monoxide	<	0.001	Vol%							

##### LCS (BGC1179-BS1)

Prepared & Analyzed: 03/31/2023

Methane	4740	500	ppmv	5000	94.9	0-200				
Methane	4740	0.05	ppmv	5000	94.9	80-120				
Carbon dioxide	4400	500	ppmv	5000	88.0	0-200				
Carbon dioxide	4400	0.05	ppmv	5000	88.0	80-120				
Oxygen (O2)	5150	500	ppmv	5000	103	0-200				
Oxygen (O2)	5150	0.05	ppmv	5000	103	80-120				
Hydrogen (H2)	5880	200	ppmv	5100	115	0-200				
Nitrogen (N2)	5450	2000	ppmv	5000	109	0-200				
Nitrogen (N2)	5450	1	ppmv	5000	109	80-120				
Hydrogen (H2)	5880	0.02	ppmv	5100	115	80-120				
Carbon Monoxide	4940	10	ppmv	5000	98.8	0-200				
Carbon Monoxide	4940	0.001	ppmv	5000	98.8	80-120				

##### Duplicate (BGC1179-DUP1)

Source: 23C1537-01

Prepared & Analyzed: 03/31/2023

Methane	325000	4500	ppmv		328000	0.935	25			
Methane	32.5	0.45	Vol%		32.8	0.934	5			
Carbon dioxide	372000	4500	ppmv		376000	1.15	25			
Carbon dioxide	37.2	0.45	Vol%		37.6	1.15	5			
Oxygen (O2)	<	4500	ppmv		<4500	NA	25			
Oxygen (O2)	<	0.45	Vol%		<0.45	NA	5			
Hydrogen (H2)	151000	1800	ppmv		152000	0.704	25			
Nitrogen (N2)	10.9	9.00	Vol%		11.0	0.809	5			
Nitrogen (N2)	109000	18000	ppmv		110000	0.809	25			



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1681

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting			Spike	Source	%REC			RPD	Qual
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

#### Batch BGC1179 - No Prep VOC GC Air

Duplicate (BGC1179-DUP1)				Source: 23C1537-01	Prepared & Analyzed: 03/31/2023		
Carbon Monoxide	182	90.0	ppmv	180	1.19	25	
Carbon Monoxide	0.02	0.009	Vol%	0.02	1.19	5	

Duplicate (BGC1179-DUP2)				Source: 23C1537-02	Prepared & Analyzed: 03/31/2023		
Methane	354000	4500	ppmv	356000	0.576	25	
Methane	35.4	0.45	Vol%	35.6	0.576	5	
Carbon dioxide	368000	4500	ppmv	367000	0.218	25	
Carbon dioxide	36.8	0.45	Vol%	36.7	0.218	5	
Oxygen (O2)	4500	4500	ppmv	4500	0.0320	25	
Oxygen (O2)	0.45	0.45	Vol%	0.45	0.0320	5	
Hydrogen (H2)	103000	1800	ppmv	104000	0.362	25	
Nitrogen (N2)	98700	18000	ppmv	99200	0.445	25	
Nitrogen (N2)	9.87	9.00	Vol%	9.92	0.445	5	
Carbon Monoxide	0.01	0.009	Vol%	0.01	3.98	5	
Carbon Monoxide	113	90.0	ppmv	118	3.98	25	

Duplicate (BGC1179-DUP3)				Source: 23C1537-03	Prepared & Analyzed: 03/31/2023		
Methane	51100	4500	ppmv	49600	2.91	25	
Methane	5.11	0.45	Vol%	4.96	2.91	5	
Carbon dioxide	365000	4500	ppmv	366000	0.168	25	
Carbon dioxide	36.5	0.45	Vol%	36.6	0.168	5	
Oxygen (O2)	<	4500	ppmv	<4500	NA	25	
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5	
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25	
Hydrogen (H2)	656000	1800	ppmv	654000	0.289	25	
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5	
Carbon Monoxide	545	90.0	ppmv	545	0.0825	25	
Carbon Monoxide	0.05	0.009	Vol%	0.05	0.0825	5	





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## Certificate of Analysis

Final Report

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Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting			Spike	Source	%REC			RPD	Qual
	Result	Limit	Units	Level	Result	%REC	Limits	RPD		

#### Batch BGC1179 - No Prep VOC GC Air

Duplicate (BGC1179-DUP4)				Source: 23C1537-04	Prepared & Analyzed: 03/31/2023		
Methane	495000	4500	ppmv		494000	0.197	25
Methane	49.5	0.45	Vol%		49.4	0.197	5
Carbon dioxide	358000	4500	ppmv		358000	0.0120	25
Carbon dioxide	35.8	0.45	Vol%		35.8	0.0119	5
Oxygen (O2)	<	4500	ppmv		<4500	NA	25
Oxygen (O2)	<	0.45	Vol%		<0.45	NA	5
Hydrogen (H2)	51000	1800	ppmv		50400	1.03	25
Nitrogen (N2)	<	18000	ppmv		<18000	NA	25
Nitrogen (N2)	<	9.00	Vol%		<9.00	NA	5
Carbon Monoxide	100	90.0	ppmv		103	2.13	25
Carbon Monoxide	0.01	0.009	Vol%		0.01	2.13	5

Duplicate (BGC1179-DUP5)				Source: 23C1681-01	Prepared & Analyzed: 04/03/2023		
Methane	44500	4500	ppmv		44800	0.529	25
Methane	4.45	0.45	Vol%		4.48	0.529	5
Carbon dioxide	61.7	0.45	Vol%		62.3	0.827	5
Carbon dioxide	617000	4500	ppmv		623000	0.827	25
Oxygen (O2)	1.82	0.45	Vol%		1.84	0.913	5
Oxygen (O2)	18200	4500	ppmv		18400	0.913	25
Nitrogen (N2)	<	9.00	Vol%		<9.00	NA	5
Nitrogen (N2)	62700	18000	ppmv		63500	1.24	25
Hydrogen (H2)	261000	1800	ppmv		264000	0.954	25
Carbon Monoxide	1420	90.0	ppmv		1430	0.785	25
Carbon Monoxide	0.14	0.009	Vol%		0.14	0.785	5

Duplicate (BGC1179-DUP6)				Source: 23C1681-02	Prepared & Analyzed: 04/03/2023		
Methane	185000	4500	ppmv		185000	0.0304	25
Methane	18.5	0.45	Vol%		18.5	0.0304	5
Carbon dioxide	484000	4500	ppmv		482000	0.269	25
Carbon dioxide	48.4	0.45	Vol%		48.2	0.269	5
Oxygen (O2)	35800	4500	ppmv		35700	0.0408	25
Oxygen (O2)	3.58	0.45	Vol%		3.57	0.0408	5
Hydrogen (H2)	119000	1800	ppmv		119000	0.0497	25
Nitrogen (N2)	168000	18000	ppmv		169000	0.0671	25
Nitrogen (N2)	16.8	9.00	Vol%		16.9	0.0671	5



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1681

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD Limit	Qual
	Result	Limit			Units	%REC		

#### Batch BGC1179 - No Prep VOC GC Air

**Duplicate (BGC1179-DUP6)** Source: 23C1681-02 Prepared & Analyzed: 04/03/2023

Carbon Monoxide	890	90.0	ppmv	884	0.629	25
Carbon Monoxide	0.09	0.009	Vol%	0.09	0.629	5

**Duplicate (BGC1179-DUP7)** Source: 23C1681-03 Prepared & Analyzed: 04/03/2023

Methane	12.3	0.45	Vol%	12.3	0.00188	5
Methane	123000	4500	ppmv	123000	0.00187	25
Carbon dioxide	284000	4500	ppmv	286000	0.721	25
Carbon dioxide	28.4	0.45	Vol%	28.6	0.721	5
Oxygen (O2)	60900	4500	ppmv	61300	0.625	25
Oxygen (O2)	6.09	0.45	Vol%	6.13	0.625	5
Hydrogen (H2)	30700	1800	ppmv	30700	0.201	25
Nitrogen (N2)	429000	18000	ppmv	431000	0.466	25
Nitrogen (N2)	42.9	9.00	Vol%	43.1	0.466	5
Hydrogen (H2)	3.07	0.18	Vol%	3.07	0.201	5
Carbon Monoxide	166	90.0	ppmv	167	0.216	25
Carbon Monoxide	0.02	0.009	Vol%	0.02	0.216	5

#### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<i>EPA 3C in Air</i>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C1681

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12069	04/01/2024
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
SCDHEC	South Carolina Dept of Health and Environmental	93016	06/14/2023
VELAP	NELAP-Virginia Certificate #12333	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

#### Qualifiers and Definitions

C Continuing calibration verification response for this analyte is outside specifications.

RPD Relative Percent Difference

Qual Qualifiers

-RE Denotes sample was re-analyzed

PF Preparation Factor

MDL Method Detection Limit

LOQ Limit of Quantitation

ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside ± 10% of the absolute.

**AIR ANALYSIS**  
**CHAIN OF CUSTODY**

Equipment due 4/11/2023

Page 2 of 2

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:		INVOICE CONTACT:	SITE NAME:
ADDRESS:		INVOICE ADDRESS:	PROJECT NUMBER: 07223616.00
PHONE #:		INVOICE PHONE #:	P.O. #:
FAX #:	EMAIL:	Pretreatment Program:	
Is sample for compliance reporting? <b>NO</b>		Regulatory State: VA	Is sample from a chlorinated supply? YES <b>NO</b>
PWS I.D. #:		Turn Around Time: Circle: 10 <b>5 Days</b> or __ Day(s)	
SAMPLER NAME (PRINT): Logan Culhane		SAMPLER SIGNATURE:	

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other \_\_\_\_\_

063-23C-0004

CLIENT SAMPLE I.D.	Regulator Info		Canister Information					Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS		
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F		Alt 145 CO	3C	HV
1) 51			15039	1.4	230307-01	20	2.2	3/29/23	12:23 pm	27	169.8	3/29/23	12:25 pm	9	169.8	LG	x	x	x
2) 57			15043	1.4	230307-01	20	4.6	3/29	12:12 pm	27	162.1	3/29/23	12:14 pm	9	157.7	LG	x	x	x
3) 37			13370	1.4	230307-01	20	3.0	3/29	11:54	28	150.6	3/29/23	11:59	10	150.6	LG	x	x	x
4)																			

310 noise noise 21.0°C

RELINQUISHED:	DATE / TIME: 3/29 4:15pm	RECEIVED: Fedex	DATE / TIME:	QC Data Package
RELINQUISHED: Fedex	DATE / TIME:	RECEIVED:	DATE / TIME: 3/30/23 11:03	Level I <input type="checkbox"/>
RELINQUISHED:	DATE / TIME:	RECEIVED:	DATE / TIME:	Level II <input type="checkbox"/>
				Level III <input type="checkbox"/>
				Level IV <input type="checkbox"/>

**LAB USE ONLY**

SCS Field Services 23C1681  
Bristol

Recd: 03/30/2023 Due: 04/06/2023

v130325002



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C1681

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1  Harrisburg, PA 17111	Date Received:	March 30, 2023 16:03
		Date Issued:	April 6, 2023 17:34
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

### Sample Conditions Checklist

Samples Received at:	21.00°C
How were samples received?	FedEx Ground
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments

## **Attachment 4**

Daily Logs

# SCS FIELD SERVICES

# DAILY LOG

**JOB NO.** 07223016.00    **TASK NO.** 00001    **DATE** 3.2.2023    **PROJECT NAME** BRISTOL

**TEMP** 60    **WEATHER** overcast    **B.P.** 29.84    **WIND** 7mph NE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	9					
Logan Culhane	9					
				DAILY TOTAL	18	

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS
GEM 5000	2	Day	MX4	4	Day
Truck	2	Day	Generator	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CAL (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
5000	500399	50		20.9	35	

**SUMMARY** Scs was on site for monthly monitoring and blower flare check.  
I calibrated my gem. I bump tested Mx4.

Blower reading: CH4: 33.3%    CO2: 33.3%    O2: 4.6%    BAL: 28.8%    VAC: -24.50    FLOW: 336 SCFM

221 reading: CH4: 28.5%    CO2: 20.3%    O2: 9.9%    BAL: 41.3%    VAC: -24.52    FLOW: 336 SCFM

Today we monitored the rest of the quarry. The usual exceedance was 37 at 149 degrees

57 and 67 were 144 degrees so we did not perform a sample for either well because they were under 145.

Shipped off samples at fedex

Also shipped off 20 temperature sensors

Prepared by:  
Ryan Seymour

ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.

# SCS FIELD SERVICES

# DAILY LOG

**JOB NO.** 07223016.00    **TASK NO.** 00001    **DATE** 3/7/2023    **PROJECT NAME** BRISTOL

**TEMP** 55    **WEATHER** Clear    **B.P.** 30.04    **WIND** 11 SSE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	8					
Billy Bellew						
Logan Culhane	8					
Zack Barton				DAILY TOTAL	16	

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	2	Day	MX4	4	Day	
Truck	2	Day	Generator	1	Day	

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CAL (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
5000	500399	50		20.9	35	

<b>SUMMARY</b>	Blower/flare check. Tune 221 wellfield. Start 588 wellfield tuning. Weld 2" cap on open J trap below northside cleanouts.
	Break down and clean usable fittings. Update GEM comments and wellhead sizes

Blower reading: CH4: 35.9%    CO2: 34%    O2: 4.1%    BAL: 26%    VAC: 24.58    FLOW: 270 SCFM
221 reading: CH4: 25.5%    CO2: 18.9%    O2: 10.6%    BAL: 45%    VAC: 24.43    FLOW: 270 SCFM

Prepared by: \_\_\_\_\_ ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.



# SCS FIELD SERVICES

# DAILY LOG

JOB NO. 07223016.00 TASK NO. 00001 DATE 3.8.23 PROJECT NAME BRISTOL

TEMP 37 WEATHER clear B.P. 30.07 WIND 5 mph SW

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	8					
Logan Calhane	8					
				DAILY TOTAL	16	

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS
GEM 5000	2	Day	MX4	4	Day
Truck	2	Day	Generator	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CAL (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
5000	500399	50		20.9	35	

**SUMMARY** Scs was on site for monthly monitoring and blower flare check.  
I calibrated my gem. I bump tested Mx4.

Blower reading: CH4: 34.5% CO2: 31.7% O2: 4.3% BAL: 29.5% VAC: -24.44 FLOW: 0 SCFM

221 reading: CH4: 24.3% CO2: 19.0% O2: 10.7% BAL: 46.0% VAC: -24.35 FLOW: 0 SCFM

We are investigating why the flow is zero at the flare. We have a very small flame coming out of the flare.

Billy and Zack are looking into the sumps in the quarry.

While monitoring the 588 we lost vacuum to 12 wells in the south side.

After we opened a 4 inch butterfly valve by GW 61 it restored vacuum. Restored flow to 450 SCFM at the blower.

We suspect the reason for the flare having zero flow this morning is because of that valve being closed by GW 61.

31R needs a new impact test port. (not replaced yet)

We did not finish monitoring the 588 because we had to investigate pressure.

49 too tall to make adjustment.

54 and 55 need new temperature test port. 55 needs a new well head

Blower reading finish: CH4: 35.9% CO2: 37.5% O2: 4.1% BAL: 22.5% VAC:-24.48 FLOW: 450 SCFM

Prepared by:  
Ryan Seymour

ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.

# SCS FIELD SERVICES

# DAILY LOG

**JOB NO.** 07223016.00      **TASK NO.** 00001      **DATE** 3.9.23      **PROJECT NAME** BRISTOL

**TEMP** 57      **WEATHER** clear      **B.P.** 30.27      **WIND** 3 mph SW

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	8					
Logan Culhane	8					
				DAILY TOTAL	16	

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	2	Day	MX4	4	Day	
Truck	2	Day	Generator	1	Day	

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CAL ( %-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
5000	500399	50		20.9	35	

**SUMMARY** Scs was on site for monthly monitoring and blower flare check.  
I calibrated my gem. I bump tested Mx4.

**Blower reading: CH4: 30.0%      CO2: 30.0%      O2: 6.6%      BAL: 33.4%      VAC: -24.52      FLOW: 335 SCFM**

**221 reading: CH4: 25.7%      CO2: 18.8%      O2: 11.1%      BAL: 44.3%      VAC: -24.42      FLOW: 335 SCFM**

We monitored the rest of the 588.  
GW 37 was the only exceedance at 149 degrees  
GW 46 was was also at 145 but I made an adjustment and brought the temperature down to 144.8 degrees  
GW 56 needs new exhaust hose  
GW 40 needs a new flex hose it's pinched  
GW 53 needs updated sample port (fixed)

We investigated a leak somewhere on the 588. We isolated the valve by GW 61 and that seemed to solve the O2 problem.  
But the took the new collectors and 4 wells off vacuum so the leak is somewhere on that line.  
We will reconvene tomorrow to pin point the leak.

Prepared by:  
Ryan Seymour

ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.

# SCS FIELD SERVICES

# DAILY LOG

JOB NO. 07223016.00 TASK NO. 00001 DATE 3/16/23 PROJECT NAME BRISTOL

TEMP WEATHER B.P. WIND

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Logan Culhane	8					
Billy Bellew						
Ryan Seymour						
Zack Barton						
			DAILY TOTAL			

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS
GEM 5000	2	Day	MX4	4	Day
Truck	2	Day	Generator	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
5000	500399	50		20.9	35	

**SUMMARY** Blower/flare check. Gas sampling on GW 37 and GW 57. Recheck @ GW29. Walkthrough 588 bumping pumps and gathering notes for the 3pm call. 3pm call. Finish building ID set for Envision.

Blower reading: CH4: %	CO2: %	O2: %	BAL: %	VAC:	FLOW: SCFM
221 reading: CH4: %	CO2: %	O2: %	BAL: %	VAC:	FLOW: SCFM

Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.

# SCS FIELD SERVICES

# DAILY LOG

JOB NO. 07223016.00 TASK NO. 00001 DATE 3/20/23 PROJECT NAME BRISTOL

TEMP WEATHER B.P. WIND

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Logan Culhane	5					
Billy Bellew						
Ryan Seymour						
Zac Barton	5			DAILY TOTAL	10	

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	2	Day	MX4	4	Day	
Truck	2	Day	Generator	1	Day	

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
5000	500399	50		20.9	35	

**SUMMARY** Blower/flare check. Bump test mx4s. High O2 at flare. Replace 1.75 orifice plates with 1.25 at side slope wells 1L, 2L, and 2U.  
 Flare recheck shows O2 improvement. More investigation needed to dial in O2. Gather and move equipment and parts down to

Blower reading: CH4: % CO2: % O2: % BAL: % VAC: FLOW: SCFM

221 reading: CH4: % CO2: % O2: % BAL: % VAC: FLOW: SCFM

shed in anticipation of connex arriving. Meet with and arrange placement of restroom facility with contractor. Unload Grainger shipment.

Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.

# SCS FIELD SERVICES

# DAILY LOG

JOB NO. 07223016.00 TASK NO. 00002 DATE 3/20/23 PROJECT NAME BRISTOL

TEMP \_\_\_\_\_ WEATHER \_\_\_\_\_ B.P. \_\_\_\_\_ WIND \_\_\_\_\_

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Logan Culhane	3					
Billy Bellew						
Ryan Seymour						
Zac Barton	3					
			DAILY TOTAL			

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS
GEM 5000	2	Day	MX4	4	Day
Truck	2	Day	Generator	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
5000	500399	50		20.9	35	

**SUMMARY** Noticed 25 PSI air pressure throughout 588. Meet with Brandon to discuss issue. Frozen 2" airline discovered outside connex. Isolate with poly valve and bleed off 588. Make cut. Blow out blockage using air pressure controlled by poly valve. Gather material and fuse line. Repressurize line. Pickup work area.

Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.

# SCS FIELD SERVICES

# DAILY LOG

**JOB NO.** 07223016.00    **TASK NO.** 00001    **DATE** 3/21/2023    **PROJECT NAME** BRISTOL

**TEMP** 49    **WEATHER** Clear    **B.P.** 30.41    **WIND** 2 NE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Logan Culhane	8					
Billy Bellew						
Ryan Seymour						
Zac Barton						
			DAILY TOTAL			

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	2	Day	MX4	4	Day	
Truck	2	Day	Generator	1	Day	

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
Envision	ENV2302261B	50		11	35	

**SUMMARY** Blower/flare check. CAP and blower/flare mobile forms. Coordinate connex drop off. Walkthrough 588. Bump and check pumps. GW68, GW58, GW50, and GW65 now pumping. Set orifice plate size and GPS coordinates in Envision

Blower reading: CH4: 28.09%    CO2: 34.66%    O2: 6.4%    BAL: 30.85%    VAC: 24.57    FLOW: 770 SCFM

221 reading: CH4: %    CO2: %    O2: %    BAL: %    VAC:    FLOW: SCFM

Wellhead repairs @ GW38 and GW48. Wellhead and pump head repairs @ GW66. Conversations with gas plant regarding start up.


Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.

# SCS FIELD SERVICES

# DAILY LOG

**JOB NO.** 07223016.00    **TASK NO.** 00001    **DATE** 3/23/2023    **PROJECT NAME** BRISTOL

**TEMP** 58    **WEATHER** Cloudy    **B.P.** 30.16    **WIND** 6 NE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Logan Culhane	8					
Billy Bellew						
Ryan Seymour						
Zac Barton						
			DAILY TOTAL			

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS
GEM 5000	2	Day	MX4	4	Day
Truck	2	Day	Generator	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
Envision	ENV2302261B	50		11	35	

**SUMMARY** Blower/flare check. Bump test mx4s. Wellfield readings in 588. Gas sampling in 588. Coordinate header isolation with construction crew. Bump and backflush GW57 and GW58. Pumps now pumping. Drop off samples at Fedex. 3pm call.

Blower reading: CH4: 30.31%    CO2: 32.84%    O2: 5.41%    BAL: 31.44%    VAC: 24.64    FLOW: 328 SCFM
221 reading: CH4: 21.33%    CO2: 16.78%    O2: 11.87%    BAL: 50.02%    VAC: 24.55    FLOW: 328 SCFM

Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

I understand that when performing a one person job assignment, I am acting as my own supervisor.

# SCS FIELD SERVICES

# DAILY LOG

JOB NO. 07223016.00 TASK NO. 00001 DATE 3/24/2023 PROJECT NAME BRISTOL

TEMP \_\_\_\_\_ WEATHER \_\_\_\_\_ B.P. \_\_\_\_\_ WIND \_\_\_\_\_

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Logan Culhane	8					
Billy Bellew						
Ryan Seymour						
Zac Barton						
			DAILY TOTAL			

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS
GEM 5000	2	Day	MX4	4	Day
Truck	2	Day	Generator	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CAL (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
Envision	ENV2302261B	50		11	35	

SUMMARY	Blower/flare check. Take valve measurements at flare for Mike. Meet with Austin and review truck and monthly equipment logs.
	Install pump @ EW54. Pump length 69'. Counter #0106317. Pumping. Liquid level of EW54 was 27.7'. Added kanaflex clamps.
Blower reading:	CH4: 31%    CO2: 31.3%    O2: 5.5%    BAL: 32.2%    VAC: 24.65    FLOW: 700SCFM
221 reading:	CH4: 20.9%    CO2: 18.8%    O2: 11.9%    BAL: 48.4%    VAC: 24.62    FLOW: 700SCFM
Pressure wash UTV. Coordinate plans with construction crew and gas plant regarding future lateral work. Pickup Envision shipment.	
Safety and harassment training. Set up combination locks for connex and storage shed.	

Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

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# SCS FIELD SERVICES

# DAILY LOG

**JOB NO.** 07223016.00    **TASK NO.** 00001    **DATE** 3/27/2023    **PROJECT NAME** BRISTOL

**TEMP** 55    **WEATHER** Cloudy    **B.P.** 29.90    **WIND** 5 NE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Logan Culhane	8					
Billy Bellew						
Ryan Seymour						
Zac Barton						
			DAILY TOTAL			

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	2	Day	MX4	4	Day	
Truck	2	Day	Generator	1	Day	

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
Envision	ENV2302261B	50		11	35	

**SUMMARY** Blower/flare check. Bump test mx4s. Pick up around building. Change filters on respirators. Walkthrough 221. GW8 fernco blown off. Secure fernco connection to well. Meet with Recovery drilling to discuss shipments and timelines.

Blower reading: CH4: 29.27%    CO2: 27.64%    O2: 7.08%    BAL: 36.01%    VAC: 24.59    FLOW: 230 SCFM

221 reading: CH4: 20.83%    CO2: 18.39%    O2: 13.09%    BAL: 47.69%    VAC: 24.49    FLOW: 230 SCFM

Conversation with Mike Martin regarding PumpOne order progress. CAP and blower mobile forms. Build new tri tubing for GW 51 @ 88'.

Pull old pump and tri tubing. Drop new pump and tri tubing. Pumping. Counter #0244985.


Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

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# SCS FIELD SERVICES

# DAILY LOG

**JOB NO.** 07223016.00      **TASK NO.** 00001      **DATE** 3/28/2023      **PROJECT NAME** BRISTOL

**TEMP** 46      **WEATHER** Cloudy      **B.P.** 30.15      **WIND** 4 SW

SCS-FS LABOR	HOURS	OT	HOURS	OT
Logan Culhane	8			
Billy Bellew	8			
Ryan Seymour	8			
Zac Barton	8		DAILY TOTAL	32

EQUIP, SVCS, , MLG	QTY	UNITS	QTY	UNITS
GEM 5000	2	Day	4	Day
Truck	2	Day	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
Envision	ENV2302261B	50		11	35	

**SUMMARY** Blower/flare check. Bump test mx4s. 588 wellfield readings. 3 samples needed GW59, GW57, and GW37. Walkthrough 221 to ensure no wellheads were blown off. Investigate North and South side cleanouts for possible O2 intrusions. Drop off truck for oil change. Prep new FM tees for 588 with teflon. GW24 and GW25 have been removed. Could not get readings. Need confirmation if wells were decommissioned. Bleed FM pressure at isolation valves and wells.

Blower reading: CH4: 28.38%      CO2: 37.47%      O2: 6.93%      BAL: 27.22%      VAC: 24.68      FLOW: 700 SCFM
221 reading: CH4: 20.15%      CO2: 22.90%      O2: 13.42%      BAL: 43.53%      VAC: 24.49      FLOW: 700 SCFM
No vacuum @ GW29, GW32, and GW32R. Possible valve closed due to construction below GW34. Will confirm and attempt to restore.
GW59 backflushed pump and adjusted counter. Now pumping. Counter #1366800
GW57 air line was disconnected. Connect pump and turn on. Now pumping. Counter #0224500
HC01 drop orifice plate from 1.0 to 0.75
GW54 bump pump and increase air pressure. Now pumping. Counter #0152697
GW35 tape leaking sample port.
GW51 foam at sample ports, unable to get reading. Backflush pump and increase air pressure. Now pumping. Adjusted counter. Counter #0256814
EW68 bump pump. Now pumping. Counter #1831535
GW49 foam blowing out of exhaust. Pump shut down
GW50 bump pump. Now pumping. Counter #0839985.
GW61 bump pump. Now pumping. Counter #0212104
GW65 bump and backflush pump. Foam blowing out of exhaust. Pump shut down.
Blower reading: CH4: 29.50%      CO2: 39.34%      O2:6.05%      BAL:25.11%      VAC: 25.05      FLOW:740 SCFM
221 reading: CH4: 20.42%      CO2: 24.51%      O2:12.91%      BAL: 42.16%      VAC: 24.78      FLOW: 740 SCFM

# SCS FIELD SERVICES

# DAILY LOG

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Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

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# SCS FIELD SERVICES

# DAILY LOG

JOB NO. 07223016.00 TASK NO. 00001 DATE 3/29/23 PROJECT NAME BRISTOL

TEMP 36 WEATHER Cloudy B.P. 30.29 WIND 2 S

SCS-FS LABOR	HOURS	OT	HOURS	OT
Logan Culhane	8			
Billy Bellew	8			
Ryan Seymour	8			
Zac Barton	8		DAILY TOTAL	32

EQUIP, SVCS, , MLG	QTY	UNITS	QTY	UNITS
GEM 5000	2	Day	4	Day
Truck	2	Day	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
Envision	ENV2302261B	50		11	35	

**SUMMARY** Blower/flare check. Bump test mx4s. Conversations with Brandon regarding construction, drilling, and pump updates. Mileage and equipment logs. Expansion joint flange bolts wiggled out from flare. Reinstall usable bolts. Cut all thread bolts to fit missing spots.

Blower reading: CH4: 27.61% CO2: 35.81% O2: 6.42% BAL: 30.16% VAC: 24.50 FLOW: 330 SCFM

221 reading: CH4: 20.06% CO2: 17.83% O2: 13.37% BAL: 48.74% VAC: 24.24 FLOW: 330 SCFM

Review maps. Open isolation valve between GW64 and GW34 more to restore vacuum @ GW29 and GW32R. Finish 588 readings. Gas samples on GW37, GW51, and GW57. Fill out chain of custody and box up samples. Ship at FedEx. Bump and check pumps.

Build new tri tubing and drop pump @ GW60. Counter #0163945

Build and prep pump and tri tubing to be dropped.

Blower reading: CH4: 30.09% CO2: 32.14% O2: 4.81% BAL: 32.96% VAC: 24.91 FLOW: 860 SCFM

221 reading: CH4: 20.99% CO2: 17.40% O2: 10.54% BAL: 51.07% VAC: 24.77 FLOW: 860 SCFM

Prepared by:  
Logan Culhane

ACCEPTED BY: \_\_\_\_\_

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# SCS FIELD SERVICES

# DAILY LOG

**JOB NO.** 07223016.00      **TASK NO.** 00001      **DATE** 3/30/2023      **PROJECT NAME** BRISTOL

**TEMP** 37      **WEATHER** Clear      **B.P.** 30.32      **WIND** 3 W

SCS-FS LABOR	HOURS	OT	HOURS	OT
Logan Culhane	8			
Billy Bellew				
Ryan Seymour	8			
Zac Barton	8		DAILY TOTAL	24

EQUIP, SVCS, , MLG	QTY	UNITS	QTY	UNITS
GEM 5000	2	Day	4	Day
Truck	2	Day	1	Day

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	O2 LOW CALE (%-VOL)	CO2 (%-VOL)	H2S (PPM)
MODEL	S/N					
Envision	ENV2302261B	50		11	35	

SUMMARY	Blower reading: CH4: 26.26%    CO2: 28.92%    O2: 6.94%    BAL: 37.88%    VAC: 24.55    FLOW: 420SCFM
	221 reading: CH4: 18.57%    CO2: 20.20%    O2: 12.16%    BAL: 49.07%    VAC: 24.3    FLOW: 420SCFM

Blower/flare check. Bump test mx4s. Conversation with Brandon regarding abandonment points and plans related to drilling and new infrastructure

Sort through PumpOne order and organize parts.

GW52 install pump and replace flex hose.

GW62 pull and swap pump

Finish replacing bolts and washers @ blower. Pick up work area. 3pm weekly call

Blower reading: CH4: %    CO2: %    O2: %    BAL: %    VAC:    FLOW: SCFM


221 reading: CH4: %    CO2: %    O2: %    BAL: %    VAC:    FLOW: SCFM

Prepared by:  
Logan Culhane

ACCEPTED BY:

\_\_\_\_\_

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Appendix C  
Semi-Monthly Temperature Update Memos

April 10, 2023  
File No. 02218208.04

## MEMORANDUM

TO: Kristin Hall, EPA Region III  
Tracy Blalock, VDEQ-SWRO

FROM: D. Brandon King, SCS Engineers  
Quinn Bernier, SCS Engineers

SUBJECT: Semi-Monthly Status Update – March 1<sup>st</sup> through March 15<sup>th</sup>, 2023  
Bristol Integrated Waste Management Facility, Bristol, Virginia

SCS is submitting this semi-monthly status update to satisfy the conditions of compliance provision #2 of the Environmental Protection Agency (EPA) Region III letter, *Approval of Higher Operating Temperature Values for Landfill Gas Wells and Submission of Gas Treatment Alternatives at the Bristol Virginia Integrated Solid Waste Management Facility*, dated 8/23/21. Accordingly, this memo is a summary of temperature monitoring activities as well as work accomplished during the semi-monthly monitoring period of 3/1/23 through 3/15/23.

## TEMPERATURE MONITORING

### Automated Wellhead Temperature Measurements

Twenty-five (25) individual landfill gas (LFG) wellheads in the Permit #588 Landfill have automated temperature sensors installed. VDEQ and USEPA have been receiving Daily Gas Well Temperature Reports with data from these automated temperature sensors since 12/1/22.

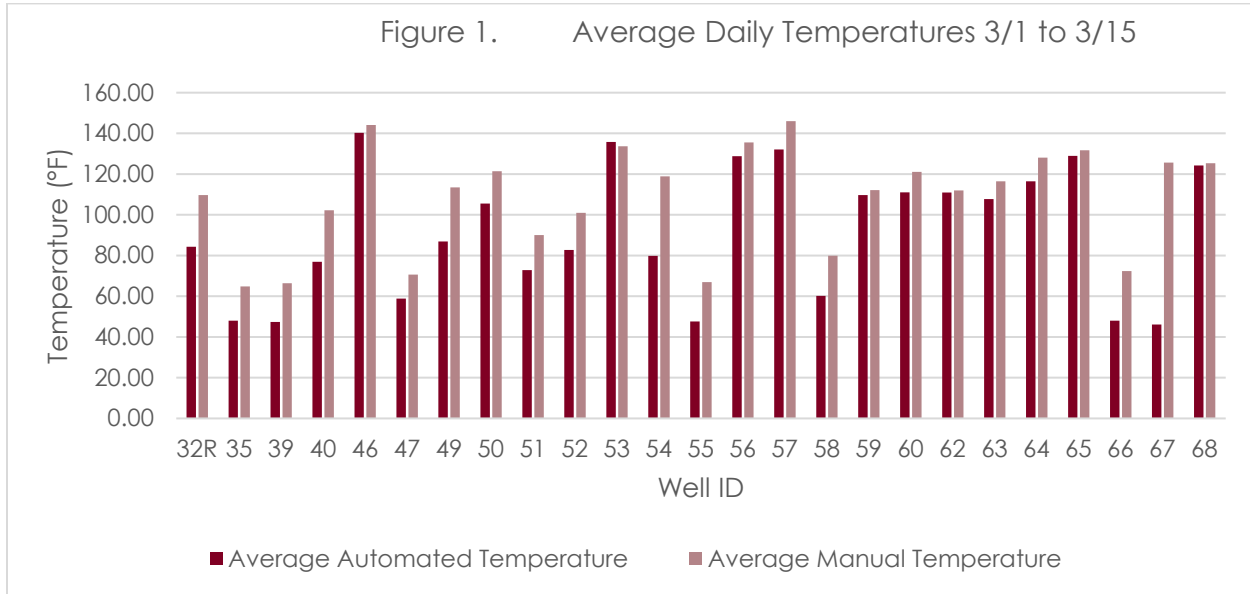
During the period of monitoring described in this memorandum, all 25 wellheads now have 2-inch automated sensors. SCS believes that the new 2-inch sensors measure temperature with more accuracy than the 1-inch sensors that were used in the majority of the 25 wells prior to March 1.

SCS reviewed the automated hourly temperature measurements from 3/1/23 to 3/15/23, and identified the following trends:

- **Temperatures over 145°F:** Temperatures over the NESHAP AAAA compliance threshold of 145°F were recorded at GW-46, GW-53 and GW-57. At GW-53, these instances were sporadic. Temperatures greater than 145°F persisted for approximately three days (3/13-3/15) at GW-57, but at GW-46 temperatures at or around 145°F throughout the monitoring period.
- **Error at GW-67:** Because negative temperatures were recorded for approximately 8 days of this reporting period, SCS assumes there was an error in the wellhead's new 2-inch temperature sensor. This skews the data in Figure 1, but appears to be resolved as of 3/10/23.



- **Temperature Trends by Location:** As shown in Figure 1, the wells with the highest average temperatures were GW-46, GW-53, GW-56, and GW-57. Only GW-46 and GW-53 are located in close proximity, however all of these wells are in the southern portion of the landfill.



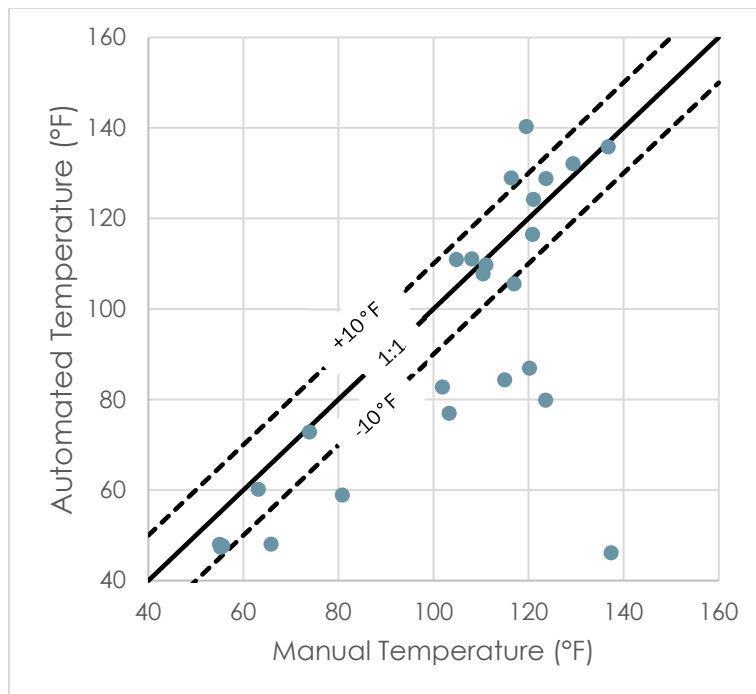
## Manual Daily Temperature Monitoring

Manual temperature measurements are being made daily by field staff with a GEM5000 or equivalent LFG analyzer. The manual measurements are used to verify the automated wellhead temperature sensors and to provide temperature data for the 13 wellheads without automated sensors.

Comparing the difference between manual temperature measurements and automated temperature measurements in Figure 2, the new 2-inch sensors appear to have improved correlation in some wells, but not in others. At wells with little correlation between measurement methods, SCS suspects errors similar to those in the automated sensor at GW-67. SCS also reviewed LFG flow data to assess the effect of low LFG flow on correlation between manual and automated temperature measurements, but did not notice any correlation. A list of wells with a temperature difference of greater than  $\pm 10^{\circ}\text{F}$  has been sent to field staff to check for any physical causes.



Figure 2. Manual vs. Automated Temperature Comparison



All daily temperatures recorded manually are provided in **Attachment A**.

### Monthly Regulatory Wellhead Temperature Measurements

Routine monthly temperature monitoring for purposes of complying with 40 CFR 60.36f(a)(5) was conducted 3/1/23, 3/7/23, and 3/15/23. Temperatures greater than 145°F continue to be recorded consistently in GW-37, and new temperature exceedances were measured at GW-57 and GW-67. See Table 2 for a list of the status of all exceedances recorded during this monitoring period.

Table 2. March Temperature Exceedance Summary

Well ID	Initial Exceedance Date	Last date/temperature measured	Duration of Exceedance	Status as of 2/28/23
GW-37	4/6/22	3/15/23 147.7 °F	10 months	HOV request submitted 3/8/22
GW-57	3/1/23	See below	8 days	Resolved 3/9/23
GW-57	3/15/23	3/15/23 170.5 °F	1 day	Ongoing, within 15-day timeline
GW-67	3/1/23	3/15/23 123.1 °F	1 day	Resolved 3/2/23

## Work Accomplished During Monitoring Period

### LFG Sampling

SCS collected LFG samples from well GW-37 using 1.5-L Summa canisters on 3/2/23 and 3/9/23 to fulfill the requirement in 40 CFR 63.1961(a)(5) for temperature exceedances lasting more than 7 days. The samples were sent to Enthalpy Analytical for lab analysis of carbon monoxide (CO) and hydrogen (H<sub>2</sub>) content. Lab results are summarized in Table 3. Full laboratory analytical data is included in **Attachment B** for further detail.

Table 2. LFG Wellhead Sampling Summary

Sample Date	GW-37	
	CO (ppmv)	H2 (Vol. %)
3/2/23	152	2.78
3/9/23	129	2.35

The presence of hydrogen in samples from GW-37 and GW-53 indicates that combustion reactions are unlikely. The carbon monoxide measurements were all greater than 100 ppmv, indicating that continued weekly CO sampling should continue per 40 CFR 63.1961(a)(5)(viii) until the temperature exceedance is corrected or CO is less than 100 ppmv for four consecutive weekly samples.

### Construction Activities

SCS-Field Services (SCS-FS) continued trenching activities along the quarry sidewall to install the lower collector section of the Sidewall Odor Mitigation System (SOMS). SCS-FS placed linear low density polyethelene (LLDPE) geomembrane and geotextile in the lower collector to replace sidewall liner that had been damaged prior to SOMS construction. Following the installation of the replacement liner, perforated pipe and aggregate was placed in the trench. Construction progressed primarily on the eastern side of the quarry.

SCS-FS then started working on a section of the northern SOMS from the quarry entrance along the access road, in an effort to get ahead and prepare for Chesapeake Containment Systems (Chesapeake). Chesapeake will tie the SOMS into the existing liner, cover the lower collector, and extend the liner 40-feet from the sidewall. Chesapeake began liner work on 3/15/23 beginning just south of the Phase I Pilot Study area along the western sidewall heading towards the southwest corner.

SCS-FS reconfigured the LFG piping of the four Pilot Study Phase I horizontal collectors into the main LFG collection and control system (LFGCCS) adjacent to GW-49 to improve LFG collection. Since connection to the main LFGCCS, LFG quality measured at the Pilot Study Phase I collectors is variable, sometimes less than 10% methane and others greater than 40% methane. Since the reconfiguration, SCS is still in the process of tuning these collectors to establish more consistent LFG quality.

### Weekly SEM

SCS is continuing weekly surface emissions monitoring (SEM) per the Plan of Action Report dated 7/6/22. No exceedances of the 500-ppmv threshold were recorded during the weekly SEM event held on 3/9/23 and 3/15/23.

The City has placed intermediate cover throughout the Permit No. 588 Landfill and installed well bore skirts at 19 select LFG wells exhibiting methane exceedances at pipe penetrations during past weekly SEM events. The actions appear to be working based on the results of the weekly SEM events during this monitoring period.

### **LFG System O&M**

SCS, the City, and their O&M contractor continued to coordinate on procurement pump parts to better facilitate routine pump maintenance. O&M continued to tune the new QED 1-inch wellheads on the Permit #221 Landfill.

Pump One cleaned, serviced, and returned the six pumps removed in February to the Bristol Landfill. The O&M contractor reinstalled the pumps and took note of additional pump replacement parts warranted. The O&M contractor has also repaired and/or replaced pump cycle stroke counters as needed and recorded pump cycle stroke counter data weekly.

Please contact SCS or City personnel if you have any questions or require additional information.

cc: Randall Eads, City of Bristol  
Jon Hayes, City of Bristol  
Jeff Hurst, VDEQ-SWRO  
Tom Lock, SCS Field Services

David Cochran, City of Bristol  
Erin Willard, EPA Region III  
Stacy Bowers, VDEQ-SWRO  
Robert E. Dick, P.E., SCS Engineers

## Attachment A

City of Bristol Daily LFG Well Temperature Readings

Note	Well Depth	Date Drill	Phase	Month	March	March	March	March	March	March	March	March	March	March	March	March	March	March	
				Day	Vednesda	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Vednesda	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Vednesda
				Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				Well Number															
ADI	102	10/16/2016	Old Well	<b>35</b>	72	73	74	74	73	72	76		64		70	73	47	37	38
ADI	70	9/6/2017	Old Well	<b>39</b>	73	75	76	76	74	74	80		65		74	75	44	44	33
ADI	100	9/7/2017	Old Well	<b>40</b>	109	107	109	109	109	116	120		99		115	113	76	87	60
ADI	110	10/4/2016	Old Well	<b>46</b>	145	146	147	146	146	140	140		145		140	141	146	146	146
ADI	120	10/4/2016	Old Well	<b>47</b>	96	98	98	49	48	56	59		74		65	67	77	76	55
6	120	9/17/2013	Old Well	<b>29</b>	92	92	92	91	92	90	100		95		100	123	68	54	54
7	100	8/23/2017	Old Well	<b>30R</b>	130	131	134	133	133	135	135		128		130	127	100	95	97
8	120	8/30/2017	Old Well	<b>31R</b>	125	126	128	128	126	128	129		131		81	83	108	105	106
9	70	7/29/2016	Old Well	<b>32</b>	75	75	96	70	70	75	80		82		126	124	86	86	79
10	100	7/28/2016	Old Well	<b>33</b>	120	120	122	121	120	125	128		127		125	123	118	118	118
11	100	7/30/2016	Old Well	<b>34</b>	119	118	118	118	118	120	122		126		127	129	110	105	104
12	100	8/1/2016	Old Well	<b>36</b>	Too Tall	Too Tall	Too Tall	Too Tall	Too Tall	Too Tall	Too Tall		Too Tall		Too Tall	Too Tall	49	37	39
13	100	8/24/2017	Old Well	<b>37</b>	150	150	150	150	150	150	150		150		147	137	149	149	149
14	50	8/25/2017	Old Well	<b>38</b>	92	90	91	91	93	95	96		97		96	101	90	87	87
15	75	9/8/2017	Old Well	<b>41</b>	90	91	91	91	90	92	95		94		93	96	55	45	47
16	57	9/8/2017	Old Well	<b>42</b>	74	72	77	75	75	76	80		81		80	83	118	117	117
17	110	10/7/2016	Old Well	<b>48</b>	72	73	72	72	72	74	76		77		75	77	41	32	32
1	120	10/1/2021	New Well	<b>32R</b>	119	120	122	121	119	120	127		92		121	119	79	84	83
2	110	10/1/2021	New Well	<b>49</b>	Too Tall	Too Tall	Too Tall	Too Tall	Too Tall	Too Tall	Too Tall		127		Too Tall	Too Tall	110	104	113
3	96	10/1/2021	New Well	<b>50</b>	121	122	122	122	122	124	125		121		122	124	117	118	118
4	114	10/1/2021	New Well	<b>51</b>	92	94	95	95	95	96	99		104		95	98	74	66	68
5	109	10/1/2021	New Well	<b>52</b>	109	110	111	111	111	112	112		99		110	113	82	71	62
6	91	10/1/2021	New Well	<b>53</b>	137	135	136	136	133	130	130		142		136	129	136	122	136
7	91	10/1/2021	New Well	<b>54</b>	131	132	133	132	131	133	135		94		130	126	106	97	66
8	104	10/1/2021	New Well	<b>55</b>	75	76	76	76	71	76	80		65		81	84	44	37	29
9	109	10/1/2021	New Well	<b>56</b>	132	130	180	131	131	130	134		135		130	131	135	131	132
10	103	10/1/2021	New Well	<b>57</b>	144	144	145	144	144	140	140		136		140	143	152	162	164
11	92	10/1/2021	New Well	<b>58</b>	74	73	74	74	74	73	76		69		74	72	112	112	82
12	72	10/1/2021	New Well	<b>59</b>	111	112	113	111	111	112	114		113		110	112	113	112	114
13	120	10/1/2021	New Well	<b>60</b>	128	129	126	126	126	127	125		113		120	124	110	110	110
14	105	10/1/2021	New Well	<b>61</b>	115	114	115	115	112	115	116		111		115	111	88	83	82
15	120	10/1/2021	New Well	<b>62</b>	117	117	115	117	117	118	102		111		105	107	111	109	110
16	117	10/1/2021	New Well	<b>63</b>	123	120	122	122	123	124	122		118		115	117	109	99	100
17	120	10/1/2021	New Well	<b>64</b>	133	130	128	131	131	130	134		116		125	124	132	130	121
18	100	10/1/2021	New Well	<b>65</b>	134	131	130	133	133	135	132		131		130	129	132	132	130
19	102	10/1/2021	New Well	<b>66</b>	78	78	79	80	81	90	95		69		85	87	44	39	36
20	100	10/1/2021	New Well	<b>67</b>	135	132	130	130	129	128	127		125				118	110	118
21	75	10/1/2021	New Well	<b>68</b>	126	125	126	126	126	128	128		125				123	123	123

Attachment B  
Laboratory Analytical Reports



1941 Reymet Road • Richmond, Virginia 23237 • Tel: (804)-358-8295 Fax: (804)-358-8297

## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C0229

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 3, 2023 11:20
	4330 Lewis Road, Suite 1	Date Issued:	March 10, 2023 16:26
	Harrisburg, PA 17111	Project Number:	7223016
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/03/2023 11:20. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C0229

Client Name: SCS Field Services - Harrisburg, PA      Date Received: March 3, 2023 11:20  
4330 Lewis Road, Suite 1      Date Issued: March 10, 2023 16:26  
Harrisburg, PA 17111      Project Number: 7223016  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23C0229-01	Air	03/02/2023 08:48	03/03/2023 11:20





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## Certificate of Analysis

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Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 37**  
**Sample ID: 23C0229-01**  
Sample Matrix: Air  
Sampled: 3/2/2023 08:48  
Sample Type: LFG

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00184::11073  
Canister Size: 1.4

Initial Vacuum(in Hg): 26  
Final Vacuum(in Hg): 3.4  
Receipt Vacuum(in Hg): 3.4  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	152	90.0	90.0		9	1	3/7/23 12:56	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	11.9	0.45	0.45		9	1	3/7/23 12:56	MER
Carbon dioxide, as received	27.5	0.45	0.45		9	1	3/7/23 12:56	MER
Oxygen (O2), as received	6.58	0.45	0.45		9	1	3/7/23 12:56	MER
Hydrogen (H2), as received	2.78	0.18	0.18		9	1	3/7/23 12:56	MER
Nitrogen (N2), as received	42.5	9.00	9.00		9	1	3/7/23 12:56	MER



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### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			Preparation Method:	No Prep VOC GC Air	
23C0229-01	1.00 mL / 1.00 mL	ALT-145	BGC0223	SGC0222	AG00026
23C0229-01	1.00 mL / 1.00 mL	EPA 3C	BGC0223	SGC0222	AG00026



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### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source		%REC		RPD		Qual
	Result	Limit		Units	Result	%REC	Limits	RPD	Limit	

#### Batch BGC0223 - No Prep VOC GC Air

##### Blank (BGC0223-BLK1)

Prepared & Analyzed: 03/07/2023

Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Carbon Monoxide	<	10.0	ppmv							

##### LCS (BGC0223-BS1)

Prepared & Analyzed: 03/07/2023

Methane	4020	0.05	ppmv	5000	80.3	80-120				
Methane	4020	500	ppmv	5000	80.3	0-200				
Carbon dioxide	4380	500	ppmv	5000	87.5	0-200				
Carbon dioxide	4380	0.05	ppmv	5000	87.5	80-120				
Oxygen (O2)	5120	500	ppmv	5000	102	0-200				
Oxygen (O2)	5120	0.05	ppmv	5000	102	80-120				
Hydrogen (H2)	5990	200	ppmv	5100	117	0-200				
Nitrogen (N2)	5370	2000	ppmv	5000	107	0-200				
Nitrogen (N2)	5370	1	ppmv	5000	107	80-120				
Hydrogen (H2)	5990	0.02	ppmv	5100	117	80-120				
Carbon Monoxide	4900	10	ppmv	5000	98.1	0-200				
Carbon Monoxide	4900	0.001	ppmv	5000	98.1	80-120				

##### Duplicate (BGC0223-DUP1)

Source: 23C0229-01

Prepared & Analyzed: 03/07/2023

Methane	121000	4500	ppmv	119000	1.21	25				
Methane	12.1	0.45	Vol%	11.9	1.21	5				
Carbon dioxide	279000	4500	ppmv	275000	1.57	25				
Carbon dioxide	27.9	0.45	Vol%	27.5	1.57	5				
Oxygen (O2)	6.64	0.45	Vol%	6.58	0.826	5				
Oxygen (O2)	66400	4500	ppmv	65800	0.826	25				
Nitrogen (N2)	430000	18000	ppmv	425000	1.04	25				
Nitrogen (N2)	43.0	9.00	Vol%	42.5	1.04	5				
Hydrogen (H2)	28100	1800	ppmv	27800	0.923	25				
Hydrogen (H2)	2.81	0.18	Vol%	2.78	0.923	5				



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### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

#### Batch BGC0223 - No Prep VOC GC Air

Duplicate (BGC0223-DUP1)		Source: 23C0229-01			Prepared & Analyzed: 03/07/2023		
Carbon Monoxide	156	90.0	ppmv	152	2.74	25	
Carbon Monoxide	0.02	0.009	Vol%	0.02	2.74	5	

Duplicate (BGC0223-DUP2)		Source: 23C0258-01			Prepared & Analyzed: 03/07/2023		
Methane	41.1	0.45	Vol%	41.0	0.266	5	
Methane	411000	4500	ppmv	410000	0.266	25	
Carbon dioxide	40.2	0.45	Vol%	40.1	0.335	5	
Carbon dioxide	402000	4500	ppmv	401000	0.335	25	
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5	
Oxygen (O2)	<	4500	ppmv	<4500	NA	25	
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25	
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5	
Hydrogen (H2)	97600	1800	ppmv	96900	0.705	25	
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5	
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25	

Duplicate (BGC0223-DUP3)		Source: 23C0258-02			Prepared & Analyzed: 03/07/2023		
Methane	41.8	0.45	Vol%	42.2	0.919	5	
Methane	418000	4500	ppmv	422000	0.919	25	
Carbon dioxide	453000	4500	ppmv	454000	0.353	25	
Carbon dioxide	45.3	0.45	Vol%	45.4	0.353	5	
Oxygen (O2)	<	4500	ppmv	<4500	NA	25	
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5	
Hydrogen (H2)	28000	1800	ppmv	28100	0.437	25	
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25	
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5	
Hydrogen (H2)	2.80	0.18	Vol%	2.81	0.437	5	
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25	
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5	



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### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<i>EPA 3C in Air</i>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		

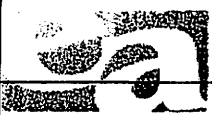
Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

### Qualifiers and Definitions

RPD Relative Percent Difference  
 Qual Qualifiers  
 -RE Denotes sample was re-analyzed  
 PF Preparation Factor  
 MDL Method Detection Limit  
 LOQ Limit of Quantitation  
 ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.



# ENTHALPY

## Air Chain of Custody Record

## Turn Around Time (rush by advanced notice only)

Lab No: \_\_\_\_\_ Standard: \_\_\_\_\_ 5 Day:  3 Day: \_\_\_\_\_  
 Page: 1 of 1 2 Day: \_\_\_\_\_ 1 Day: \_\_\_\_\_ Custom TAT: \_\_\_\_\_

### Enthalpy Analytical - Richmond

1941 Reymet Road, Richmond, VA 23237  
 Phone 804-358-8295

### CUSTOMER INFORMATION

### PROJECT INFORMATION

Company: SCS Field Services Name: Bristol Landfill  
 Report To: Tom Lock / Mike Gibbons Number: 7223016  
 Email: [tlock@scsengineers.com](mailto:tlock@scsengineers.com) P.O. #: \_\_\_\_\_  
 Address: [mgibbons@scsengineers.com](mailto:mgibbons@scsengineers.com) Address: \_\_\_\_\_  
 Phone: 703-254-4664 Global ID: \_\_\_\_\_  
 Fax: \_\_\_\_\_ Sampled By: \_\_\_\_\_

Special Instructions:  
 EPA 3C for Methane, Carbon Dioxide, Oxygen, Nitrogen, and Hydrogen.  
 CO via EPA ALT-145.  
 Returned empty canisters marked (No Sample).

*Ryan Seymour*

03/07/23 - MCK  
 - Typo ON canister #11078, #11078 => 11073  
 - CANISTER OUTGOING VACUUM = 21.0", RECEIVING VACUUM = 3.9" Hg

### Analysis Requested

Sample ID	Type	Equipment Information			Sampling Information							EPA ALT-145 (CO)	EPA 3C (CH <sub>4</sub> , CO <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , H <sub>2</sub> )	Analysis Requested					
	(I) Indoor (A) Ambient (SV) Soil Vapor (S) Source	Canister ID	Size (1L, 3L, 6L, 15L)	Flow Controller ID	Sample Start Date	Sample Start Time	Vacuum Start ("Hg)	Sample End Date	Sample End Time	Vacuum End ("Hg)									
1	37	LFG	11078	1L	063-00491	3/2/2023	8:45AM	26	3/2/2023	8:48	9	X	X						
2	no sample taken		279																
3																			
4																			
5																			
6	<b>SCS Field Services 23C0229</b> <b>Bristol</b> <b>Recd: 03/03/2023 Due: 03/10/2023</b> <small>v130325002</small>																		
7										20.3°C									
8										310									
9										no ice									
10										no seal									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	<i>Ryan Seymour</i>	Ryan Seymour	field tech	3/2/23 11:00AM
1 Received By:	<i>Fedex E</i>			
2 Relinquished By:	<i>Fedex E</i>			
2 Received By:	<i>Carroll</i>			3/3/23 1120
3 Relinquished By:				
3 Received By:				



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Purchase Order: 07-SO04485

### Sample Conditions Checklist

Samples Received at:	20.30°C
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments



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## Certificate of Analysis

### *Final Report*

Laboratory Order ID 23C0611

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 10, 2023 11:15
	4330 Lewis Road, Suite 1	Date Issued:	March 17, 2023 15:45
	Harrisburg, PA 17111	Project Number:	07223016.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/10/2023 11:15. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

#### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

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TNI Accredited  
VELAP ID 460021





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Harrisburg, PA 17111      Project Number: 07223016.00  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23C0611-01	Air	03/09/2023 11:28	03/10/2023 11:15



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### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 37**  
**Sample ID: 23C0611-01**  
Sample Matrix: Air  
Sampled: 3/9/2023 11:28  
Sample Type: LV

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00461::14300  
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.6  
Final Vacuum(in Hg): 2.4  
Receipt Vacuum(in Hg): 2.4  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	129	90.0	90.0		9	1	3/14/23 11:43	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	11.1	0.45	0.45		9	1	3/14/23 11:43	MER
Carbon dioxide, as received	23.5	0.45	0.45		9	1	3/14/23 11:43	MER
Oxygen (O2), as received	9.36	0.45	0.45		9	1	3/14/23 11:43	MER
Hydrogen (H2), as received	2.35	0.18	0.18		9	1	3/14/23 11:43	MER
Nitrogen (N2), as received	47.8	18.0	18.0		18	1	3/14/23 13:46	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	3/14/23 11:43	MER

#### Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M <sup>3</sup>			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	52800	1560	3890		170000	5000	12000	7780	1	3/15/23 13:59	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	101				80-120					3/15/23 13:59	



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### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis</b>			<b>Preparation Method:</b>	<b>No Prep VOC GC Air</b>	
23C0611-01	1.00 mL / 1.00 mL	ALT-145	BGC0500	SGC0482	AG00026
23C0611-01	1.00 mL / 1.00 mL	EPA 3C	BGC0500	SGC0482	AG00026
23C0611-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGC0500	SGC0482	AG00026

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>No Prep VOC Air</b>	
23C0611-01	400 mL / 400 mL	EPA TO-15	BGC0346	SGC0540	AC30128
23C0611-01RE1	400 mL / 400 mL	EPA TO-15	BGC0346	SGC0540	AC30128



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### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit Units			%REC	Limits			

#### Batch BGC0346 - No Prep VOC Air

##### Blank (BGC0346-BLK1)

Prepared & Analyzed: 03/09/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.90 ppbv 5.00 98.0 80-120

##### LCS (BGC0346-BS1)

Prepared & Analyzed: 03/09/2023

1,1,1-Trichloroethane	5.38	0.5	ppbv	5.00	108	70-130		
1,1,1,2-Tetrachloroethane	5.67	0.5	ppbv	5.00	113	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	5.16	0.5	ppbv	5.00	103	70-130		
1,1,2-Trichloroethane	5.32	0.5	ppbv	5.00	106	70-130		
1,1-Dichloroethane	4.99	0.5	ppbv	5.00	99.8	70-130		
1,1-Dichloroethylene	5.17	0.5	ppbv	5.00	103	70-130		
1,2,4-Trimethylbenzene	5.64	0.5	ppbv	5.00	113	70-130		
1,2-Dibromoethane (EDB)	5.63	0.5	ppbv	5.00	113	70-130		
1,2-Dichlorobenzene	5.91	0.5	ppbv	5.00	118	70-130		
1,2-Dichloroethane	5.32	0.5	ppbv	5.00	106	70-130		
1,2-Dichloropropane	5.25	0.5	ppbv	5.00	105	70-130		
1,2-Dichlorotetrafluoroethane	5.44	0.5	ppbv	5.00	109	70-130		
1,3,5-Trimethylbenzene	5.61	0.5	ppbv	5.00	112	70-130		
1,3-Butadiene	4.79	0.5	ppbv	5.00	95.8	70-130		
1,3-Dichlorobenzene	5.86	0.5	ppbv	5.00	117	70-130		
1,4-Dichlorobenzene	5.90	0.5	ppbv	5.00	118	70-130		
1,4-Dioxane	5.41	0.5	ppbv	5.00	108	70-130		
2-Butanone (MEK)	4.57	0.5	ppbv	5.00	91.4	70-130		
4-Methyl-2-pentanone (MIBK)	5.35	0.5	ppbv	5.00	107	70-130		
Allyl chloride	4.84	0.5	ppbv	5.00	96.8	70-130		
Benzene	5.21	0.5	ppbv	5.00	104	70-130		
Benzyl Chloride	5.49	0.5	ppbv	5.00	110	70-130		
Bromodichloromethane	5.02	0.5	ppbv	5.00	100	70-130		
Bromoform	1.34	0.5	ppbv	5.00	26.8	70-130		L
Bromomethane	5.71	0.5	ppbv	5.00	114	70-130		
Carbon Disulfide	5.16	0.5	ppbv	5.00	103	70-130		



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 10, 2023 11:15  
Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	Limits	RPD	Limit	

#### Batch BGC0346 - No Prep VOC Air

##### LCS (BGC0346-BS1)

Prepared & Analyzed: 03/09/2023

Carbon Tetrachloride	5.36	0.5	ppbv	5.00	107	70-130			
Chlorobenzene	5.59	0.5	ppbv	5.00	112	70-130			
Chloroethane	5.32	0.5	ppbv	5.00	106	70-130			
Chloroform	5.07	0.5	ppbv	5.00	101	70-130			
Chloromethane	5.06	0.5	ppbv	5.00	101	70-130			
cis-1,2-Dichloroethylene	5.11	0.5	ppbv	5.00	102	70-130			
cis-1,3-Dichloropropene	5.47	0.5	ppbv	5.00	109	70-130			
Cyclohexane	5.24	0.5	ppbv	5.00	105	70-130			
Dichlorodifluoromethane	5.16	0.5	ppbv	5.00	103	70-130			
Ethyl acetate	5.38	0.5	ppbv	5.00	108	70-130			
Ethylbenzene	5.53	0.5	ppbv	5.00	111	70-130			
Heptane	5.03	0.5	ppbv	5.00	101	70-130			
Hexane	5.06	0.5	ppbv	5.00	101	70-130			
m+p-Xylenes	11.2	1	ppbv	10.0	112	70-130			
Methylene chloride	4.67	1	ppbv	5.00	93.4	70-130			
Methyl-t-butyl ether (MTBE)	5.17	0.5	ppbv	5.00	103	70-130			
Naphthalene	5.24	0.5	ppbv	5.00	105	60-140			
o-Xylene	5.55	0.5	ppbv	5.00	111	70-130			
Propylene	5.02	1	ppbv	5.00	100	70-130			
Styrene	5.59	0.5	ppbv	5.00	112	70-130			
Tetrachloroethylene (PCE)	5.61	0.5	ppbv	5.00	112	70-130			
Tetrahydrofuran	5.16	0.5	ppbv	5.00	103	70-130			
Toluene	5.36	0.5	ppbv	5.00	107	70-130			
trans-1,2-Dichloroethylene	5.13	0.5	ppbv	5.00	103	70-130			
trans-1,3-Dichloropropene	5.55	0.5	ppbv	5.00	111	70-130			
Trichloroethylene	5.40	0.5	ppbv	5.00	108	70-130			
Trichlorofluoromethane	5.27	0.5	ppbv	5.00	105	70-130			
Vinyl acetate	4.77	0.5	ppbv	5.00	95.4	70-130			
Vinyl bromide	4.79	0.5	ppbv	5.00	95.8	70-130			
Vinyl chloride	5.21	0.5	ppbv	5.00	104	70-130			
Surr: 4-Bromofluorobenzene (Surr)	5.14		ppbv	5.00	103	70-130			



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### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

#### Batch BGC0346 - No Prep VOC Air

##### LCS Dup (BGC0346-BSD1)

Prepared & Analyzed: 03/09/2023

1,1,1-Trichloroethane	5.38	0.5	ppbv	5.00	108	70-130	0.00	25	
1,1,1,2-Tetrachloroethane	5.70	0.5	ppbv	5.00	114	70-130	0.528	25	
1,1,1,2-Trichloro-1,2,2-trifluoroethane	5.17	0.5	ppbv	5.00	103	70-130	0.194	25	
1,1,2-Trichloroethane	5.35	0.5	ppbv	5.00	107	70-130	0.562	25	
1,1-Dichloroethane	4.97	0.5	ppbv	5.00	99.4	70-130	0.402	25	
1,1-Dichloroethylene	5.19	0.5	ppbv	5.00	104	70-130	0.386	25	
1,2,4-Trimethylbenzene	5.63	0.5	ppbv	5.00	113	70-130	0.177	25	
1,2-Dibromoethane (EDB)	5.60	0.5	ppbv	5.00	112	70-130	0.534	25	
1,2-Dichlorobenzene	5.85	0.5	ppbv	5.00	117	70-130	1.02	25	
1,2-Dichloroethane	5.31	0.5	ppbv	5.00	106	70-130	0.188	25	
1,2-Dichloropropane	5.22	0.5	ppbv	5.00	104	70-130	0.573	25	
1,2-Dichlorotetrafluoroethane	5.53	0.5	ppbv	5.00	111	70-130	1.64	25	
1,3,5-Trimethylbenzene	5.60	0.5	ppbv	5.00	112	70-130	0.178	25	
1,3-Butadiene	4.62	0.5	ppbv	5.00	92.4	70-130	3.61	25	
1,3-Dichlorobenzene	5.88	0.5	ppbv	5.00	118	70-130	0.341	25	
1,4-Dichlorobenzene	5.88	0.5	ppbv	5.00	118	70-130	0.340	25	
1,4-Dioxane	5.43	0.5	ppbv	5.00	109	70-130	0.369	25	
2-Butanone (MEK)	4.58	0.5	ppbv	5.00	91.6	70-130	0.219	25	
4-Methyl-2-pentanone (MIBK)	5.42	0.5	ppbv	5.00	108	70-130	1.30	25	
Allyl chloride	4.93	0.5	ppbv	5.00	98.6	70-130	1.84	25	
Benzene	5.26	0.5	ppbv	5.00	105	70-130	0.955	25	
Benzyl Chloride	5.39	0.5	ppbv	5.00	108	70-130	1.84	25	
Bromodichloromethane	5.04	0.5	ppbv	5.00	101	70-130	0.398	25	
Bromoform	1.35	0.5	ppbv	5.00	27.0	70-130	0.743	25	L
Bromomethane	5.66	0.5	ppbv	5.00	113	70-130	0.880	25	
Carbon Disulfide	5.17	0.5	ppbv	5.00	103	70-130	0.194	25	
Carbon Tetrachloride	5.35	0.5	ppbv	5.00	107	70-130	0.187	25	
Chlorobenzene	5.59	0.5	ppbv	5.00	112	70-130	0.00	25	
Chloroethane	5.28	0.5	ppbv	5.00	106	70-130	0.755	25	
Chloroform	5.08	0.5	ppbv	5.00	102	70-130	0.197	25	
Chloromethane	5.05	0.5	ppbv	5.00	101	70-130	0.198	25	
cis-1,2-Dichloroethylene	5.11	0.5	ppbv	5.00	102	70-130	0.00	25	
cis-1,3-Dichloropropene	5.42	0.5	ppbv	5.00	108	70-130	0.918	25	



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## Certificate of Analysis

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4330 Lewis Road, Suite 1

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Date Issued: March 17, 2023 15:45

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	Limits	RPD	Limit	

#### Batch BGC0346 - No Prep VOC Air

##### LCS Dup (BGC0346-BSD1)

Prepared & Analyzed: 03/09/2023

Cyclohexane	5.28	0.5	ppbv	5.00	106	70-130	0.760	25	
Dichlorodifluoromethane	5.15	0.5	ppbv	5.00	103	70-130	0.194	25	
Ethyl acetate	5.36	0.5	ppbv	5.00	107	70-130	0.372	25	
Ethylbenzene	5.53	0.5	ppbv	5.00	111	70-130	0.00	25	
Heptane	5.05	0.5	ppbv	5.00	101	70-130	0.397	25	
Hexane	5.05	0.5	ppbv	5.00	101	70-130	0.198	25	
m+p-Xylenes	11.2	1	ppbv	10.0	112	70-130	0.626	25	
Methylene chloride	4.71	1	ppbv	5.00	94.2	70-130	0.853	25	
Methyl-t-butyl ether (MTBE)	5.17	0.5	ppbv	5.00	103	70-130	0.00	25	
Naphthalene	5.18	0.5	ppbv	5.00	104	60-140	1.15	25	
o-Xylene	5.51	0.5	ppbv	5.00	110	70-130	0.723	25	
Propylene	5.01	1	ppbv	5.00	100	70-130	0.199	25	
Styrene	5.63	0.5	ppbv	5.00	113	70-130	0.713	25	
Tetrachloroethylene (PCE)	5.62	0.5	ppbv	5.00	112	70-130	0.178	25	
Tetrahydrofuran	5.17	0.5	ppbv	5.00	103	70-130	0.194	25	
Toluene	5.34	0.5	ppbv	5.00	107	70-130	0.374	25	
trans-1,2-Dichloroethylene	5.13	0.5	ppbv	5.00	103	70-130	0.00	25	
trans-1,3-Dichloropropene	5.58	0.5	ppbv	5.00	112	70-130	0.539	25	
Trichloroethylene	5.42	0.5	ppbv	5.00	108	70-130	0.370	25	
Trichlorofluoromethane	5.12	0.5	ppbv	5.00	102	70-130	2.89	25	
Vinyl acetate	4.80	0.5	ppbv	5.00	96.0	70-130	0.627	25	
Vinyl bromide	4.81	0.5	ppbv	5.00	96.2	70-130	0.417	25	
Vinyl chloride	5.23	0.5	ppbv	5.00	105	70-130	0.383	25	

Surr: 4-Bromofluorobenzene  
(Surr)

5.12 ppbv 5.00 102 70-130



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit			Units	%REC			

#### Batch BGC0500 - No Prep VOC GC Air

##### Blank (BGC0500-BLK1)

Prepared & Analyzed: 03/14/2023

Methane	<	0.05	Vol%						
Carbon dioxide	<	0.05	Vol%						
Oxygen (O2)	<	0.05	Vol%						
Nitrogen (N2)	<	1.00	Vol%						
Hydrogen (H2)	<	0.02	Vol%						
Carbon Monoxide	<	10.0	ppmv						
Carbon Monoxide	<	0.001	Vol%						

##### LCS (BGC0500-BS1)

Prepared & Analyzed: 03/14/2023

Methane	4690	500	ppmv	5000	93.9	0-200			
Methane	4690	0.05	ppmv	5000	93.9	80-120			
Carbon dioxide	5230	500	ppmv	5000	105	0-200			
Carbon dioxide	5230	0.05	ppmv	5000	105	80-120			
Oxygen (O2)	5110	500	ppmv	5000	102	0-200			
Oxygen (O2)	5110	0.05	ppmv	5000	102	80-120			
Nitrogen (N2)	5370	2000	ppmv	5000	107	0-200			
Hydrogen (H2)	5910	200	ppmv	5100	116	0-200			
Hydrogen (H2)	5910	0.02	ppmv	5100	116	80-120			
Nitrogen (N2)	5370	1	ppmv	5000	107	80-120			
Carbon Monoxide	4880	10	ppmv	5000	97.7	0-200			
Carbon Monoxide	4880	0.001	ppmv	5000	97.7	80-120			

##### Duplicate (BGC0500-DUP1)

Source: 23C0611-01

Prepared & Analyzed: 03/14/2023

Methane	11.0	0.45	Vol%		11.1	0.199	5		
Methane	110000	4500	ppmv		111000	0.199	25		
Carbon dioxide	23.7	0.45	Vol%		23.5	1.06	5		
Carbon dioxide	237000	4500	ppmv		235000	1.06	25		
Oxygen (O2)	9.38	0.45	Vol%		9.36	0.200	5		
Oxygen (O2)	93800	4500	ppmv		93600	0.200	25		
Hydrogen (H2)	2.34	0.18	Vol%		2.35	0.278	5		
Nitrogen (N2)	469000	18000	ppmv		469000	0.0733	25		
Hydrogen (H2)	23400	1800	ppmv		23500	0.278	25		
Carbon Monoxide	0.01	0.009	Vol%		0.01	1.39	5		
Carbon Monoxide	131	90.0	ppmv		129	1.39	25		





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## Certificate of Analysis

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4330 Lewis Road, Suite 1

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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<b>EPA 3C in Air</b>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
<b>EPA TO-15 in Air</b>			
Benzene	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

### Qualifiers and Definitions

- L LCS recovery is outside of established acceptance limits
- RPD Relative Percent Difference
- Qual Qualifiers
- RE Denotes sample was re-analyzed
- PF Preparation Factor
- MDL Method Detection Limit
- LOQ Limit of Quantitation
- ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.

**AIR ANALYSIS**  
**CHAIN OF CUSTODY**

Equipment due 3/30/2023

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:		INVOICE CONTACT:	SITE NAME: Bristol
ADDRESS:		INVOICE ADDRESS:	PROJECT NUMBER: 07223016.00
PHONE #:		INVOICE PHONE #:	P.O. #:
FAX #:	EMAIL:	Pretreatment Program:	
Is sample for compliance reporting? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Regulatory State: VA	Is sample from a chlorinated supply? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	PWS I.D. #:
SAMPLER NAME (PRINT): Ryan Seymour		SAMPLER SIGNATURE: Ryan Seymour	
		Turn Around Time: Circle: 10	5 Days or ___ Day(s)
Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other LV			063-23B-0014

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information			Matrix (See Codes)	ANALYSIS				
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):				Barometric Pres. (in Hg):			Alt 145 CO	EPA 3C	Benzene by TO-15		
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)					Final Canister Vacuum (in Hg)	Ending Sample Temp °F
1) 37	063-00411		14300	1.4	230126-02	21.6	21.6	3/9/23	11:24 Am	28	149	3/9/23	11:20 Am	9	149	LG	x	x	x
2)			14308	1.4	230126-02	21.6										LG	x	x	x
3)																			
4)																			

RELINQUISHED:	RECEIVED: <i>Fox Ex G</i>	DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED: <i>Fox Ex G</i>	RECEIVED: <i>MSL</i>	DATE / TIME: 3/10/23 1115	Level I <input type="checkbox"/>	<b>SCS Field Services 23C0611</b> <b>Bristol</b> <b>Recd: 03/10/2023 Due: 03/17/2023</b>
RELINQUISHED:	RECEIVED:	DATE / TIME:	Level II <input type="checkbox"/>	
RELINQUISHED:	RECEIVED:	DATE / TIME:	Level III <input type="checkbox"/>	
RELINQUISHED:	RECEIVED:	DATE / TIME:	Level IV <input type="checkbox"/>	

310 20.3 no seal no VC

v130325002



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C0611

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1  Harrisburg, PA 17111	Date Received:	March 10, 2023 11:15
		Date Issued:	March 17, 2023 15:45
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

### Sample Conditions Checklist

Samples Received at:	20.30°C
How were samples received?	FedEx Ground
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments

April 10, 2023  
File No. 02218208.04

## MEMORANDUM

TO: Kristin Hall, EPA Region III  
Tracy Blalock, VDEQ-SWRO

FROM: D. Brandon King, SCS Engineers  
Quinn Bernier, SCS Engineers

SUBJECT: Semi-Monthly Status Update – March 16<sup>th</sup> through March 31<sup>st</sup>, 2023  
Bristol Integrated Waste Management Facility, Bristol, Virginia

SCS is submitting this semi-monthly status update to satisfy the conditions of compliance provision #2 of the Environmental Protection Agency (EPA) Region III letter, *Approval of Higher Operating Temperature Values for Landfill Gas Wells and Submission of Gas Treatment Alternatives at the Bristol Virginia Integrated Solid Waste Management Facility*, dated 8/23/21. Accordingly, this memo is a summary of temperature monitoring activities as well as work accomplished during the semi-monthly monitoring period of 3/16/23 through 3/31/23.

## TEMPERATURE MONITORING

### Automated Wellhead Temperature Measurements

Twenty-five (25) individual landfill gas (LFG) wellheads in the Permit #588 Landfill have automated temperature sensors installed. VDEQ and USEPA have been receiving Daily Gas Well Temperature Reports with data from these automated temperature sensors since 12/1/22.

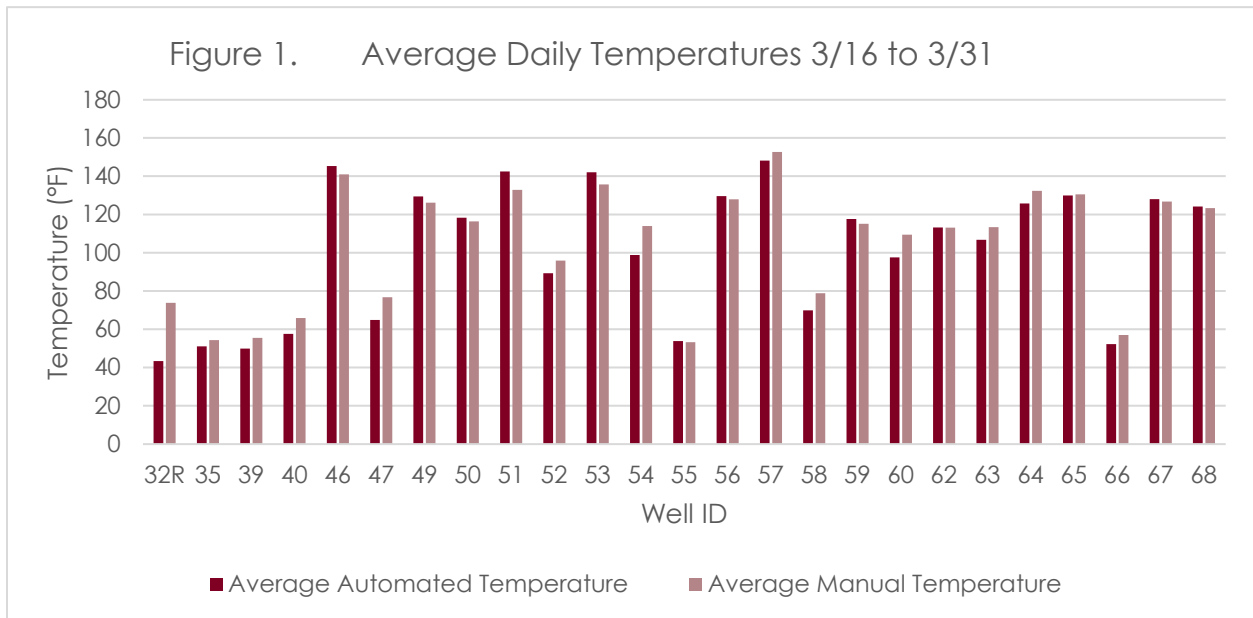
Since March 1, 2023, all 25 wellheads have 2-inch automated sensors. SCS believes that the new 2-inch sensors measure temperature with more accuracy than the 1-inch sensors that were used in the majority of the 25 wells prior to March 1.

SCS reviewed the automated hourly temperature measurements from 3/16/23 to 3/31/23, and identified the following trends:

- **Temperatures over 145 °F:** Temperatures over the NESHAP AAAA compliance threshold of 145 °F were recorded at seven wells during this monitoring period. This represents generally higher temperatures across the wellfield than usual. Temperatures greater than 145 °F were recorded most consistently at EW-46, however the highest temperatures were measured at EW-51 (up to 188 °F at times). Field staff believe that the general increase in wellfield temperatures suggests the wellfield may be over-tuned, meaning that applied vacuum at wellheads is greater than necessary. This may have caused the higher oxygen concentrations observed at the blower/flare station and increased well temperatures.
- **Low temperatures at certain wells:** Average temperatures between 40 °F and 60 °F at certain wells generally correlated with low LFG flow rates measured during monthly wellfield monitoring events. These low temperatures are likely close to ambient because little to no LFG is passing through the wellhead where the sensors are placed.



- **Temperature Trends by Location:** Not all of the wells with the highest temperatures, for example over 145°F, were collocated. Of the wells with the highest temperatures during this monitoring period, EW-46, EW-51, and EW-57, were the closest to each other; generally located in the southwestern corner of the landfill.

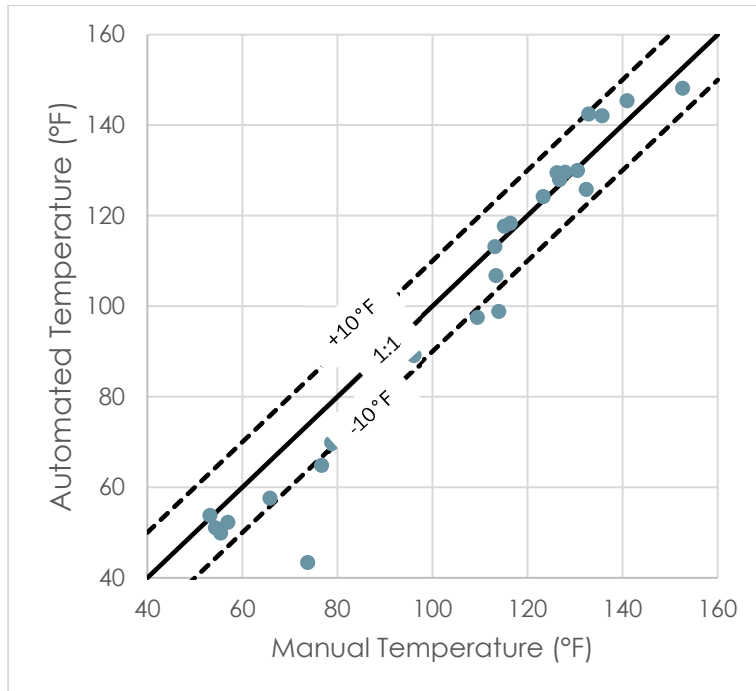


### Manual Daily Temperature Monitoring

Manual temperature measurements are being made daily by field staff with a GEM5000 or equivalent LFG analyzer. The manual measurements are used to verify the automated wellhead temperature sensors and to provide temperature data for the 13 wellheads without automated sensors.

Comparing the difference between manual temperature measurements and automated temperature measurements in Figure 2, the new 2-inch sensors appear to have overall improved correlation with manual measurements. This supports SCS' previous suspicion that continued differences between temperature measurement methods were due to troubleshooting the first two weeks of operation of the 2-inch automated sensors in early March. However, EW-32R continued to show significant differences. The sensor at this well should be investigated further for potential physical issues that may be causing it to record temperatures much lower than manually measured temperatures.

Figure 2. Manual vs. Automated Temperature Comparison



All daily temperatures recorded manually are provided in **Attachment A**.

### Monthly Regulatory Wellhead Temperature Measurements

Routine monthly temperature monitoring for purposes of complying with 40 CFR 60.36f(a)(5) was conducted 3/1/23, 3/7/23, and 3/15/23. During this monitoring period, temperature exceedances were resolved at GW-37 and GW-57, and new temperature exceedances were measured at GW-37, GW-51, GW-57, and GW-59. See Table 2 for a list of the status of all exceedances recorded during this monitoring period.

Table 2. March Temperature Exceedance Summary

Well ID	Initial Exceedance Date	Last date/temperature measured	Duration of Exceedance	Status as of 3/31/23
GW-37	4/6/22	3/23/23 144.9 °F	10 months	New exceedance, see below
GW-37	3/28/23	3/29/23 150.6 °F	4 days	Ongoing, within 15-day timeline
GW-51	3/23/23	3/29/23 169.8 °F	9 days	Ongoing, within 15-day timeline
GW-57	3/15/23	3/23/23 133.5 °F	9 days	New exceedance, see below
GW-57	3/28/23	3/29/23 162.1 °F	4 days	Ongoing, within 15-day timeline
GW-59	3/28/23	3/29/23 119.3 °F	1 day	Resolved

## Work Accomplished During Monitoring Period

### LFG Sampling

SCS collected LFG samples from wells GW-37 and GW-53 using 1.5-L Summa canisters on 3/16/23, and well EW-51 on 3/23/23 to fulfill the requirement in 40 CFR 63.1961(a)(5) for temperature exceedances lasting more than 7 days. The samples were sent to Enthalpy Analytical for lab analysis of carbon monoxide (CO) and hydrogen (H<sub>2</sub>) content. Lab results are summarized in Table 3. Full laboratory analytical data is included in **Attachment B** for further detail.

Table 2. LFG Wellhead Sampling Summary

Sample Date	GW-37		GW-51		GW-57	
	CO (ppmv)	H2 (Vol. %)	CO (ppmv)	H2 (Vol. %)	CO (ppmv)	H2 (Vol. %)
3/16/23	168	3.08			855	13.5
3/23/23			554	8.90		
3/29/23	167	3.07	1430	25.8	884	11.1

The presence of hydrogen in all of the samples collected during this monitoring period indicates that combustion reactions are unlikely. The carbon monoxide measurements were all greater than 100 ppmv, indicating that continued weekly CO sampling should continue per 40 CFR 63.1961(a)(5)(viii) until the temperature exceedance is corrected or CO is less than 100 ppmv for four consecutive weekly samples.

### Construction Activities

SCS-Field Services (SCS-FS) continued trenching activities along the quarry sidewall for the Odor Mitigation System (SOMS), from the northern section along the entrance access road towards the northeast corner of the landfill. SCS-FS isolated and cut sections of the existing LFG header, removing a section of 12-inch LFG header between the sidewall and condensate sump CPS-1 to install the lower horizontal collector from the northeast corner down the eastern sidewall back to CPS-1. SCS-FS also trenched and installed the lower horizontal collector along a short stretch of the northwest sidewall just north of the Phase I Pilot Study section back to the quarry entrance.

Chesapeake Containment Systems (Chesapeake) began liner work on 3/15/23 beginning just south of the Phase I Pilot Study area along the western sidewall and heading south



*Drilling EW-70, installed SOMS liner in the background*

along the perimeter of the landfill. Chesapeake tied the SOMS into the existing liner, covered the lower collector, and extended the liner 40-feet from the sidewall in all areas where SCS-FS has installed the SOMS.

Bentonite and other materials were delivered to the Landfill in anticipation of vertical well drilling (LFG System Phase I). SCS and the City staked out the 34 proposed LFG extraction well locations. The 18 near-sidewall LFG wells are to be constructed using 8-inch CPVC pipe, while 16 deep interior LFG wells are to be constructed using 304 stainless steel pipe. The driller and LFG System Phase I contractor mobilized and had a Pre-Construction meeting with the City and SCS on 3/28/23. The drilling contractor commenced drilling activities on 3/29/23 subsequent to the City's press release. The contractor drilled five of the CPVC LFG extraction wells in the northeast section of the quarry by the end of this monitoring period.

### **Weekly SEM**

SCS is continuing weekly surface emissions monitoring (SEM) per the Plan of Action Report dated 7/6/22. No exceedances of the 500-ppmv threshold were recorded during the weekly SEM event held on 3/23/23. One exceedance was recorded at the pipe penetration of EW-52 during the weekly event conducted on 3/29/23. This point will be remonitored pending corrective actions.

The City has placed intermediate cover throughout the Permit No. 588 Landfill and installed well bore skirts at 19 select LFG wells exhibiting methane exceedances at pipe penetrations during past weekly SEM events. The actions appear to be working based on the results of the weekly SEM event during this monitoring period and may be employed to resolve the new exceedance at EW-52 if needed.

### **LFG System O&M**

The City's O&M contractor received a variety of pump replacement parts from Pump One to assist O&M with pulling and switching out pneumatic pumps. Pump One also provided a custom pump cleaning and testing station to the City. O&M is now rebuilding several pumps with the new pump supplies. In addition, air regulators, tri-tubing, and other pump appurtenances are being replaced where needed with the pump replacement parts. O&M is replacing outdated flexible tubing at select wellheads with Solarguard flex tubing. The City has ordered a dozen new QED 2-inch wellheads to assist with wellfield tuning activities on the Permit #588 Landfill.

Please contact SCS or City personnel if you have any questions or require additional information.

cc: Randall Eads, City of Bristol  
Jon Hayes, City of Bristol  
Jeff Hurst, VDEQ-SWRO  
Tom Lock, SCS Field Services

David Cochran, City of Bristol  
Erin Willard, EPA Region III  
Stacy Bowers, VDEQ-SWRO  
Robert E. Dick, P.E., SCS Engineers



## Attachment A

City of Bristol Daily LFG Well Temperature Readings

Note	Well Depth	Date Drill	Phase	Month	March	March	March	March	March	March	March	March	March	March	March	March	March	March	March	
				Day	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Vednesda	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Vednesda	Thursday	Friday
				Date	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
				Well Number																
ADI	102	10/16/2016	Old Well	35	58	52	39	28	60	54	45	61	79	60	41	64	56	62	62	48
ADI	70	9/6/2017	Old Well	39	49	50	41	50	45	49	44	60	81	58	41	71	77	63	62	46
ADI	100	9/7/2017	Old Well	40	100	85	58	40	54	54	47	61	88	70	51	76	67	76	72	54
ADI	110	10/4/2016	Old Well	46	146	146	138	140	77	146	146	147	147	145	140	147	148	147	148	147
ADI	120	10/4/2016	Old Well	47	91	87	80	70	59	60	59	74	88	88	80	72	83	73	103	60
6	120	9/17/2013	Old Well	29	77	72	56	46	70	65	72	76	78	72	64	66	74	76	103	100
#REF!	100	8/23/2017	Old Well	30R	101	104			101	98	95	122	124	128	112	115	126	128	127	125
#REF!	120	8/30/2017	Old Well	31R	126	130	103	126	128	125	127	128	132	132	130	134	135	130	133	132
#REF!	70	7/29/2016	Old Well	32	75	70	36	30	72	70	74	70	78	82	78	88	80	82	80	81
#REF!	100	7/28/2016	Old Well	33	120	121	119	119	122	122	119	120	122	120	124	126	123	124	124	122
#REF!	100	7/30/2016	Old Well	34	107	127	120	112	128	126	125	125	125	130	112	115	118	118	112	110
#REF!	100	8/1/2016	Old Well	36	53	53	40	38	54	52	55	60	67	64	62	70	77	71	76	78
#REF!	100	8/24/2017	Old Well	37	149	150	143	146	150	150	149	153	150	150	150	149	150	149	149	150
#REF!	50	8/25/2017	Old Well	38	90	91	90	85	93	90	92	95	100	98	99	100	108	102	100	98
#REF!	75	9/8/2017	Old Well	41	76	64	58	28	65	64	66	67	69	74	60	66	73	71	75	77
#REF!	57	9/8/2017	Old Well	42	119	120	117	118	122	125	124	112	116	112	99	68	709	110	112	112
#REF!	110	10/7/2016	Old Well	48	52	49	36	40	43	44	48	50	70	60	42	52	52	56	65	61
1	120	10/1/2021	New Well	32R	61	55	60	60	60	49	79	64	78	62	48	61	59	133	126	125
2	110	10/1/2021	New Well	49	133	86	120	120	131	132	129	131	132	125	124	131	133	131	132	129
3	96	10/1/2021	New Well	50	121	94	119	119	117	118	117	118	119	112	118	118	118	118	118	118
4	114	10/1/2021	New Well	51	76	100	182	176	158	188	173	172	96	88	56	84	88	185	167	137
5	109	10/1/2021	New Well	52	85	91	80	85	86	85	87	95	102	92	68	94	88	91	163	142
6	91	10/1/2021	New Well	53	144	152	132	56	133	146	140	145	150	138	130	149	142	138	141	135
7	91	10/1/2021	New Well	54	111	103	100	90	67	72	69	88	149	160	139	124	141	150	147	113
8	104	10/1/2021	New Well	55	50	52	39	20	34	27	47	62	84	62	50	73	60	69	70	52
9	109	10/1/2021	New Well	56	133	134	142	120	89	132	131	132	134	125	130	130	129	129	128	128
10	103	10/1/2021	New Well	57	164	173	170	170	138	152	140	155	145	140	139	142	163	151	159	141
11	92	10/1/2021	New Well	58	110	60	112	110	47	74	68	86	87	62	48	83	117	75	76	46
12	72	10/1/2021	New Well	59	114	117	110	110	54	116	117	107	111	105	109	159	149	124	121	119
13	120	10/1/2021	New Well	60	109	112	110	110	107	108	109	110	112	112	104	110	110	110	110	108
14	105	10/1/2021	New Well	61	90	97	88	81	95	110	105	106	110	130	122	116	137	130	135	132
15	120	10/1/2021	New Well	62	111	112	111	115	112	112	112	112	115	112	112	116	115	116	114	113
16	117	10/1/2021	New Well	63	119	116	100	90	99	107	107	115	170	100	92	115	111	125	126	122
17	120	10/1/2021	New Well	64	140	140	120	139	125	127	125	140	130	140	124	129	139	132	139	129
18	100	10/1/2021	New Well	65	133	133	125	130	130	129	130	130	131	130	128	131	133	131	134	130
19	102	10/1/2021	New Well	66	58	52	39	30	54	49	46	62	83	64	49	66	64	69	78	48
20	100	10/1/2021	New Well	67	133	138	115	110	131	128	137	138	134	110	110	145	125	119	127	128
21	75	10/1/2021	New Well	68	124	124	122	121	124	125	124	124	125	120	120	124	123	125	125	123

Attachment B  
Laboratory Analytical Reports



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## Certificate of Analysis

### *Final Report*

Laboratory Order ID 23C1038

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 17, 2023 11:14
	4330 Lewis Road, Suite 1	Date Issued:	March 23, 2023 17:20
	Harrisburg, PA 17111	Project Number:	07223016.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/17/2023 11:14. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars  
Technical Director

#### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Enthalpy Analytical, Inc.





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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C1038

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4330 Lewis Road, Suite 1      Date Issued: March 23, 2023 17:20  
Harrisburg, PA 17111      Project Number: 07223016.00  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23C1038-01	Air	03/16/2023 10:00	03/17/2023 11:14
57	23C1038-02	Air	03/16/2023 10:10	03/17/2023 11:14



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 37**  
**Sample ID: 23C1038-01**  
Sample Matrix: Air  
Sampled: 3/16/2023 10:00  
Sample Type: LV

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00306::11293  
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.6  
Final Vacuum(in Hg): 3.8  
Receipt Vacuum(in Hg): 3.8  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	168	90.0	90.0		9	1	3/17/23 16:02	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	13.4	0.45	0.45		9	1	3/17/23 16:02	MER
Carbon dioxide, as received	31.0	0.45	0.45		9	1	3/17/23 16:02	MER
Oxygen (O2), as received	6.22	0.45	0.45		9	1	3/17/23 16:02	MER
Hydrogen (H2), as received	3.08	0.18	0.18		9	1	3/17/23 16:02	MER
Nitrogen (N2), as received	41.1	9.00	9.00		9	1	3/17/23 16:02	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	3/17/23 16:02	MER

#### Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M <sup>3</sup>			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	62500	1560	3890		200000	5000	12000	7780	1	3/21/23 14:41	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	94.6				80-120					3/21/23 14:41	



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Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 57**  
**Sample ID: 23C1038-02**  
Sample Matrix: Air  
Sampled: 3/16/2023 10:10  
Sample Type: LV

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00322::12383  
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.6  
Final Vacuum(in Hg): 3.4  
Receipt Vacuum(in Hg): 3.4  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	855	90.0	90.0		9	1	3/17/23 16:56	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	20.1	0.45	0.45		9	1	3/17/23 16:56	MER
Carbon dioxide, as received	55.1	0.45	0.45		9	1	3/17/23 16:56	MER
Oxygen (O2), as received	1.27	0.45	0.45		9	1	3/17/23 16:56	MER
Hydrogen (H2), as received	13.5	1.08	1.08		54	1	3/20/23 15:24	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	3/17/23 16:56	MER
Carbon Monoxide, as received	0.09	0.009	0.009		9	1	3/17/23 16:56	MER

#### Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M <sup>3</sup>			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	208000	2330	5830		670000	7500	19000	11700	1	3/21/23 16:14	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	95.8				80-120					3/21/23 16:14	



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Purchase Order: 07-SO04485

### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis</b>			<b>Preparation Method:</b>	<b>No Prep VOC GC Air</b>	
23C1038-01	1.00 mL / 1.00 mL	ALT-145	BGC0500	SGC0658	AG00026
23C1038-02	1.00 mL / 1.00 mL	ALT-145	BGC0500	SGC0658	AG00026
23C1038-01	1.00 mL / 1.00 mL	EPA 3C	BGC0500	SGC0658	AG00026
23C1038-02	1.00 mL / 1.00 mL	EPA 3C	BGC0500	SGC0658	AG00026
23C1038-02RE1	1.00 mL / 1.00 mL	EPA 3C	BGC0718	SGC0713	AG00026
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>No Prep VOC Air</b>	
23C1038-01	400 mL / 400 mL	EPA TO-15	BGC0743	SGC0734	AC30195
23C1038-02	400 mL / 400 mL	EPA TO-15	BGC0743	SGC0734	AC30195





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Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit Units			%REC	Limits			

#### Batch BGC0743 - No Prep VOC Air

##### Blank (BGC0743-BLK1)

Prepared & Analyzed: 03/21/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.90 ppbv 5.00 98.0 80-120

##### LCS (BGC0743-BS1)

Prepared & Analyzed: 03/21/2023

1,1,1-Trichloroethane	4.96	0.5	ppbv	5.00	99.2	70-130
1,1,1,2-Tetrachloroethane	5.19	0.5	ppbv	5.00	104	70-130
1,1,2-Trichloro-1,2,2-trifluoroethane	4.64	0.5	ppbv	5.00	92.8	70-130
1,1,2-Trichloroethane	4.93	0.5	ppbv	5.00	98.6	70-130
1,1-Dichloroethane	4.59	0.5	ppbv	5.00	91.8	70-130
1,1-Dichloroethylene	4.66	0.5	ppbv	5.00	93.2	70-130
1,2,4-Trimethylbenzene	5.23	0.5	ppbv	5.00	105	70-130
1,2-Dibromoethane (EDB)	5.12	0.5	ppbv	5.00	102	70-130
1,2-Dichlorobenzene	5.48	0.5	ppbv	5.00	110	70-130
1,2-Dichloroethane	4.96	0.5	ppbv	5.00	99.2	70-130
1,2-Dichloropropane	4.90	0.5	ppbv	5.00	98.0	70-130
1,2-Dichlorotetrafluoroethane	4.70	0.5	ppbv	5.00	94.0	70-130
1,3,5-Trimethylbenzene	5.20	0.5	ppbv	5.00	104	70-130
1,3-Butadiene	4.57	0.5	ppbv	5.00	91.4	70-130
1,3-Dichlorobenzene	5.35	0.5	ppbv	5.00	107	70-130
1,4-Dichlorobenzene	5.37	0.5	ppbv	5.00	107	70-130
1,4-Dioxane	5.47	0.5	ppbv	5.00	109	70-130
2-Butanone (MEK)	4.55	0.5	ppbv	5.00	91.0	70-130
4-Methyl-2-pentanone (MIBK)	5.13	0.5	ppbv	5.00	103	70-130
Allyl chloride	4.49	0.5	ppbv	5.00	89.8	70-130
Benzene	4.93	0.5	ppbv	5.00	98.6	70-130
Benzyl Chloride	4.84	0.5	ppbv	5.00	96.8	70-130
Bromodichloromethane	4.62	0.5	ppbv	5.00	92.4	70-130
Bromoform	0.98	0.5	ppbv	5.00	19.6	70-130
Bromomethane	4.81	0.5	ppbv	5.00	96.2	70-130
Carbon Disulfide	4.50	0.5	ppbv	5.00	90.0	70-130

L



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Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	%REC	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS (BGC0743-BS1)

Prepared & Analyzed: 03/21/2023

Carbon Tetrachloride	4.91	0.5	ppbv	5.00	98.2	70-130			
Chlorobenzene	5.05	0.5	ppbv	5.00	101	70-130			
Chloroethane	4.62	0.5	ppbv	5.00	92.4	70-130			
Chloroform	4.66	0.5	ppbv	5.00	93.2	70-130			
Chloromethane	4.61	0.5	ppbv	5.00	92.2	70-130			
cis-1,2-Dichloroethylene	4.69	0.5	ppbv	5.00	93.8	70-130			
cis-1,3-Dichloropropene	5.12	0.5	ppbv	5.00	102	70-130			
Cyclohexane	4.95	0.5	ppbv	5.00	99.0	70-130			
Dichlorodifluoromethane	4.66	0.5	ppbv	5.00	93.2	70-130			
Ethyl acetate	4.90	0.5	ppbv	5.00	98.0	70-130			
Ethylbenzene	5.17	0.5	ppbv	5.00	103	70-130			
Heptane	4.82	0.5	ppbv	5.00	96.4	70-130			
Hexane	4.82	0.5	ppbv	5.00	96.4	70-130			
m+p-Xylenes	10.3	1	ppbv	10.0	103	70-130			
Methylene chloride	4.91	1	ppbv	5.00	98.2	70-130			
Methyl-t-butyl ether (MTBE)	4.81	0.5	ppbv	5.00	96.2	70-130			
Naphthalene	4.58	0.5	ppbv	5.00	91.6	60-140			
o-Xylene	5.10	0.5	ppbv	5.00	102	70-130			
Propylene	4.57	1	ppbv	5.00	91.4	70-130			
Styrene	5.18	0.5	ppbv	5.00	104	70-130			
Tetrachloroethylene (PCE)	5.05	0.5	ppbv	5.00	101	70-130			
Tetrahydrofuran	4.93	0.5	ppbv	5.00	98.6	70-130			
Toluene	4.97	0.5	ppbv	5.00	99.4	70-130			
trans-1,2-Dichloroethylene	4.72	0.5	ppbv	5.00	94.4	70-130			
trans-1,3-Dichloropropene	5.27	0.5	ppbv	5.00	105	70-130			
Trichloroethylene	4.95	0.5	ppbv	5.00	99.0	70-130			
Trichlorofluoromethane	4.68	0.5	ppbv	5.00	93.6	70-130			
Vinyl acetate	4.76	0.5	ppbv	5.00	95.2	70-130			
Vinyl bromide	4.66	0.5	ppbv	5.00	93.2	70-130			
Vinyl chloride	4.65	0.5	ppbv	5.00	93.0	70-130			
Surr: 4-Bromofluorobenzene (Surr)	5.10		ppbv	5.00	102	70-130			



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1038

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4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS Dup (BGC0743-BSD1)

Prepared & Analyzed: 03/21/2023

1,1,1-Trichloroethane	5.00	0.5	ppbv	5.00	100	70-130	0.803	25	
1,1,1,2-Tetrachloroethane	5.12	0.5	ppbv	5.00	102	70-130	1.36	25	
1,1,1,2-Trichloro-1,2,2-trifluoroethane	4.68	0.5	ppbv	5.00	93.6	70-130	0.858	25	
1,1,2-Trichloroethane	5.02	0.5	ppbv	5.00	100	70-130	1.81	25	
1,1-Dichloroethane	4.62	0.5	ppbv	5.00	92.4	70-130	0.651	25	
1,1-Dichloroethylene	4.68	0.5	ppbv	5.00	93.6	70-130	0.428	25	
1,2,4-Trimethylbenzene	5.18	0.5	ppbv	5.00	104	70-130	0.961	25	
1,2-Dibromoethane (EDB)	5.08	0.5	ppbv	5.00	102	70-130	0.784	25	
1,2-Dichlorobenzene	5.42	0.5	ppbv	5.00	108	70-130	1.10	25	
1,2-Dichloroethane	4.98	0.5	ppbv	5.00	99.6	70-130	0.402	25	
1,2-Dichloropropane	4.90	0.5	ppbv	5.00	98.0	70-130	0.00	25	
1,2-Dichlorotetrafluoroethane	4.84	0.5	ppbv	5.00	96.8	70-130	2.94	25	
1,3,5-Trimethylbenzene	5.11	0.5	ppbv	5.00	102	70-130	1.75	25	
1,3-Butadiene	4.48	0.5	ppbv	5.00	89.6	70-130	1.99	25	
1,3-Dichlorobenzene	5.35	0.5	ppbv	5.00	107	70-130	0.00	25	
1,4-Dichlorobenzene	5.32	0.5	ppbv	5.00	106	70-130	0.935	25	
1,4-Dioxane	5.57	0.5	ppbv	5.00	111	70-130	1.81	25	
2-Butanone (MEK)	4.55	0.5	ppbv	5.00	91.0	70-130	0.00	25	
4-Methyl-2-pentanone (MIBK)	5.25	0.5	ppbv	5.00	105	70-130	2.31	25	
Allyl chloride	4.41	0.5	ppbv	5.00	88.2	70-130	1.80	25	
Benzene	4.96	0.5	ppbv	5.00	99.2	70-130	0.607	25	
Benzyl Chloride	4.77	0.5	ppbv	5.00	95.4	70-130	1.46	25	
Bromodichloromethane	4.66	0.5	ppbv	5.00	93.2	70-130	0.862	25	
Bromoform	0.97	0.5	ppbv	5.00	19.4	70-130	1.03	25	L
Bromomethane	4.96	0.5	ppbv	5.00	99.2	70-130	3.07	25	
Carbon Disulfide	4.51	0.5	ppbv	5.00	90.2	70-130	0.222	25	
Carbon Tetrachloride	4.95	0.5	ppbv	5.00	99.0	70-130	0.811	25	
Chlorobenzene	5.03	0.5	ppbv	5.00	101	70-130	0.397	25	
Chloroethane	4.70	0.5	ppbv	5.00	94.0	70-130	1.72	25	
Chloroform	4.67	0.5	ppbv	5.00	93.4	70-130	0.214	25	
Chloromethane	4.58	0.5	ppbv	5.00	91.6	70-130	0.653	25	
cis-1,2-Dichloroethylene	4.76	0.5	ppbv	5.00	95.2	70-130	1.48	25	
cis-1,3-Dichloropropene	5.14	0.5	ppbv	5.00	103	70-130	0.390	25	



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	Limits	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS Dup (BGC0743-BSD1)

Prepared & Analyzed: 03/21/2023

Cyclohexane	4.96	0.5	ppbv	5.00	99.2	70-130	0.202	25	
Dichlorodifluoromethane	4.65	0.5	ppbv	5.00	93.0	70-130	0.215	25	
Ethyl acetate	4.88	0.5	ppbv	5.00	97.6	70-130	0.409	25	
Ethylbenzene	5.14	0.5	ppbv	5.00	103	70-130	0.582	25	
Heptane	4.83	0.5	ppbv	5.00	96.6	70-130	0.207	25	
Hexane	4.78	0.5	ppbv	5.00	95.6	70-130	0.833	25	
m+p-Xylenes	10.3	1	ppbv	10.0	103	70-130	0.777	25	
Methylene chloride	4.88	1	ppbv	5.00	97.6	70-130	0.613	25	
Methyl-t-butyl ether (MTBE)	4.79	0.5	ppbv	5.00	95.8	70-130	0.417	25	
Naphthalene	4.32	0.5	ppbv	5.00	86.4	60-140	5.84	25	
o-Xylene	5.06	0.5	ppbv	5.00	101	70-130	0.787	25	
Propylene	4.75	1	ppbv	5.00	95.0	70-130	3.86	25	
Styrene	5.15	0.5	ppbv	5.00	103	70-130	0.581	25	
Tetrachloroethylene (PCE)	5.02	0.5	ppbv	5.00	100	70-130	0.596	25	
Tetrahydrofuran	4.96	0.5	ppbv	5.00	99.2	70-130	0.607	25	
Toluene	5.05	0.5	ppbv	5.00	101	70-130	1.60	25	
trans-1,2-Dichloroethylene	4.71	0.5	ppbv	5.00	94.2	70-130	0.212	25	
trans-1,3-Dichloropropene	5.27	0.5	ppbv	5.00	105	70-130	0.00	25	
Trichloroethylene	5.03	0.5	ppbv	5.00	101	70-130	1.60	25	
Trichlorofluoromethane	4.72	0.5	ppbv	5.00	94.4	70-130	0.851	25	
Vinyl acetate	4.69	0.5	ppbv	5.00	93.8	70-130	1.48	25	
Vinyl bromide	4.70	0.5	ppbv	5.00	94.0	70-130	0.855	25	
Vinyl chloride	4.73	0.5	ppbv	5.00	94.6	70-130	1.71	25	

Surr: 4-Bromofluorobenzene 5.07 ppbv 5.00 101 70-130  
(Surr)



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Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

#### Batch BGC0500 - No Prep VOC GC Air

##### Blank (BGC0500-BLK1)

Prepared & Analyzed: 03/14/2023

Methane	<	0.05	Vol%						
Carbon dioxide	<	0.05	Vol%						
Oxygen (O2)	<	0.05	Vol%						
Nitrogen (N2)	<	1.00	Vol%						
Hydrogen (H2)	<	0.02	Vol%						
Carbon Monoxide	<	10.0	ppmv						
Carbon Monoxide	<	0.001	Vol%						

##### LCS (BGC0500-BS1)

Prepared & Analyzed: 03/14/2023

Methane	4690	500	ppmv	5000	93.9	0-200			
Methane	4690	0.05	ppmv	5000	93.9	80-120			
Carbon dioxide	5230	500	ppmv	5000	105	0-200			
Carbon dioxide	5230	0.05	ppmv	5000	105	80-120			
Oxygen (O2)	5110	500	ppmv	5000	102	0-200			
Oxygen (O2)	5110	0.05	ppmv	5000	102	80-120			
Hydrogen (H2)	5910	200	ppmv	5100	116	0-200			
Nitrogen (N2)	5370	2000	ppmv	5000	107	0-200			
Nitrogen (N2)	5370	1	ppmv	5000	107	80-120			
Hydrogen (H2)	5910	0.02	ppmv	5100	116	80-120			
Carbon Monoxide	4880	10	ppmv	5000	97.7	0-200			
Carbon Monoxide	4880	0.001	ppmv	5000	97.7	80-120			

##### Duplicate (BGC0500-DUP1)

Source: 23C0611-01

Prepared & Analyzed: 03/14/2023

Methane	11.0	0.45	Vol%		11.1	0.199	5		
Methane	110000	4500	ppmv		111000	0.199	25		
Carbon dioxide	237000	4500	ppmv		235000	1.06	25		
Carbon dioxide	23.7	0.45	Vol%		23.5	1.06	5		
Oxygen (O2)	93800	4500	ppmv		93600	0.200	25		
Oxygen (O2)	9.38	0.45	Vol%		9.36	0.200	5		
Hydrogen (H2)	2.34	0.18	Vol%		2.35	0.278	5		
Nitrogen (N2)	469000	18000	ppmv		469000	0.0733	25		
Hydrogen (H2)	23400	1800	ppmv		23500	0.278	25		
Carbon Monoxide	0.01	0.009	Vol%		0.01	1.39	5		
Carbon Monoxide	131	90.0	ppmv		129	1.39	25		



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Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting			Spike	Source	%REC			RPD	Qual
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

#### Batch BGC0500 - No Prep VOC GC Air

Duplicate (BGC0500-DUP2)				Source: 23C1038-01	Prepared & Analyzed: 03/17/2023		
Methane	134000	4500	ppmv		134000	0.654	25
Methane	13.4	0.45	Vol%		13.4	0.654	5
Carbon dioxide	30.7	0.45	Vol%		31.0	0.911	5
Carbon dioxide	307000	4500	ppmv		310000	0.911	25
Oxygen (O2)	6.21	0.45	Vol%		6.22	0.209	5
Oxygen (O2)	62100	4500	ppmv		62200	0.209	25
Hydrogen (H2)	3.00	0.18	Vol%		3.08	2.63	5
Nitrogen (N2)	40.9	9.00	Vol%		41.1	0.473	5
Hydrogen (H2)	30000	1800	ppmv		30800	2.63	25
Nitrogen (N2)	409000	18000	ppmv		411000	0.473	25
Carbon Monoxide	0.02	0.009	Vol%		0.02	0.428	5
Carbon Monoxide	169	90.0	ppmv		168	0.428	25

Duplicate (BGC0500-DUP3)				Source: 23C1038-02	Prepared & Analyzed: 03/17/2023		
Methane	204000	4500	ppmv		201000	1.59	25
Methane	20.4	0.45	Vol%		20.1	1.59	5
Carbon dioxide	55.9	0.45	Vol%		55.1	1.40	5
Carbon dioxide	559000	4500	ppmv		551000	1.40	25
Oxygen (O2)	1.28	0.45	Vol%		1.27	0.951	5
Oxygen (O2)	12800	4500	ppmv		12700	0.951	25
Nitrogen (N2)	<	9.00	Vol%		<9.00	NA	5
Hydrogen (H2)	138000	1800	ppmv		136000	1.74	25
Nitrogen (N2)	43900	18000	ppmv		43400	1.19	25
Carbon Monoxide	874	90.0	ppmv		855	2.27	25
Carbon Monoxide	0.09	0.009	Vol%		0.09	2.27	5

#### Batch BGC0718 - No Prep VOC GC Air

Blank (BGC0718-BLK1)				Prepared & Analyzed: 03/20/2023			
Methane	<	0.05	Vol%				
Carbon dioxide	<	0.05	Vol%				
Oxygen (O2)	<	0.05	Vol%				
Hydrogen (H2)	<	0.02	Vol%				
Nitrogen (N2)	<	1.00	Vol%				
Carbon Monoxide	<	0.001	Vol%				



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Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

#### Batch BGC0718 - No Prep VOC GC Air

##### LCS (BGC0718-BS1)

Prepared & Analyzed: 03/20/2023

Methane	4760	0.05	ppmv	5000	95.2	80-120			
Carbon dioxide	5840	0.05	ppmv	5000	117	80-120			
Oxygen (O2)	5190	0.05	ppmv	5000	104	80-120			
Nitrogen (N2)	5430	1	ppmv	5000	109	80-120			
Hydrogen (H2)	5830	0.02	ppmv	5100	114	80-120			
Carbon Monoxide	4950	0.001	ppmv	5000	99.0	80-120			

##### Duplicate (BGC0718-DUP1)

Source: 23C1051-01

Prepared & Analyzed: 03/20/2023

Methane	38.3	0.45	Vol%		38.5		0.499	5
Carbon dioxide	42.1	0.45	Vol%		42.3		0.546	5
Oxygen (O2)	<	0.45	Vol%		<0.45		NA	5
Nitrogen (N2)	11.4	9.00	Vol%		11.5		0.554	5
Hydrogen (H2)	2.39	0.18	Vol%		2.40		0.567	5
Carbon Monoxide	<	0.009	Vol%		<0.009		NA	5

##### Duplicate (BGC0718-DUP2)

Source: 23C1051-02

Prepared & Analyzed: 03/20/2023

Methane	38.3	0.45	Vol%		38.4		0.171	5
Carbon dioxide	38.6	0.45	Vol%		38.6		0.0315	5
Oxygen (O2)	<	0.45	Vol%		<0.45		NA	5
Nitrogen (N2)	<	9.00	Vol%		<9.00		NA	5
Carbon Monoxide	<	0.009	Vol%		<0.009		NA	5

##### Duplicate (BGC0718-DUP3)

Source: 23C1051-03

Prepared & Analyzed: 03/21/2023

Methane	36.9	0.45	Vol%		37.2		0.658	5
Carbon dioxide	38.2	0.45	Vol%		38.4		0.498	5
Oxygen (O2)	<	0.45	Vol%		<0.45		NA	5
Nitrogen (N2)	14.1	9.00	Vol%		14.2		0.849	5
Carbon Monoxide	<	0.009	Vol%		<0.009		NA	5



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Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Qual
	Result	Limit			Units	%REC		

#### Batch BGC0718 - No Prep VOC GC Air

Duplicate (BGC0718-DUP4)	Source: 23C1051-04			Prepared & Analyzed: 03/21/2023		
Methane	37.3	0.45	Vol%	37.7	0.902	5
Carbon dioxide	45.2	0.45	Vol%	45.6	0.771	5
Oxygen (O2)	0.53	0.45	Vol%	0.55	2.83	5
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Hydrogen (H2)	4.46	0.18	Vol%	4.51	1.11	5
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

#### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<b>EPA 3C in Air</b>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
<b>EPA TO-15 in Air</b>			
Benzene	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023





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### Qualifiers and Definitions

L LCS recovery is outside of established acceptance limits

RPD Relative Percent Difference

Qual Qualifiers

-RE Denotes sample was re-analyzed

PF Preparation Factor

MDL Method Detection Limit

LOQ Limit of Quantitation

ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.

**AIR ANALYSIS**  
**CHAIN OF CUSTODY**

Equipment due 3/30/2023

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: <b>Same</b>	PROJECT NAME/Quote #: <b>Bristol</b>
CONTACT:		INVOICE CONTACT:	SITE NAME: <i>Bristol</i>
ADDRESS:		INVOICE ADDRESS:	PROJECT NUMBER: <i>07223014.00</i>
PHONE #:		INVOICE PHONE #:	P.O. #:
FAX #:	EMAIL:	Pretreatment Program:	
Is sample for compliance reporting? <b>YES</b> NO	Regulatory State: <b>VA</b>	Is sample from a chlorinated supply? YES <b>NO</b>	PWS I.D. #:
SAMPLER NAME (PRINT): <i>Ryan Seymour</i>		SAMPLER SIGNATURE: <i>Ryan Seymour</i>	
Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other <u>LV</u>		Turn Around Time: Circle: 10 <b>5 Days</b> or ___ Day(s)	
<b>063-23B-0014</b>			

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg): <i>30.04</i>	Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Barometric Pres. (in Hg): <i>30.04</i>	Stop Date		Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Alt 145 CO
1) <i>37</i>			11293	1.4	230202-02	21.6	3.8	<i>3/16/23</i>	<i>9:58 AM</i>	<i>28</i>	<i>148</i>	<i>20:00 AM</i>	<i>3/16/23</i>	<i>10</i>	<i>148</i>	LG	x	x	x
2) <i>57</i>			12383	1.4	230202-02	21.6	3.4	<i>3/16/23</i>	<i>10:08 AM</i>	<i>28</i>	<i>146</i>	<i>10:10</i>	<i>3/16/23</i>	<i>10</i>	<i>147</i>	LG	x	x	x
3)			12418	1.4	230202-02	21.6										LG	x	x	x
4)			14294	1.4	230126-02	21.6										LG	x	x	x

*20.3°C 310 note noseal*

RELINQUISHED: <i>Ryan Seymour</i>	DATE / TIME: <i>3/16/23</i>	RECEIVED:	DATE / TIME:	QC Data Package	LAB USE ONLY
RELINQUISHED:	DATE / TIME: <i>5:25pm</i>	RECEIVED: <i>RedEx G</i>	DATE / TIME:	Level I <input type="checkbox"/>	
RELINQUISHED: <i>RedEx G</i>	DATE / TIME:	RECEIVED: <i>William Miller</i>	DATE / TIME: <i>3/17/23 1114</i>	Level II <input type="checkbox"/>	
				Level III <input type="checkbox"/>	
				Level IV <input type="checkbox"/>	

**SCS Field Services 23C1038**  
**Bristol**  
**Recd: 03/17/2023 Due: 03/24/2023**

v130325002

*Extra Box no sample collected. Old Box found.*



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C1038

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 17, 2023 11:14  
Date Issued: March 23, 2023 17:20

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Sample Conditions Checklist

Samples Received at:	20.30°C
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments



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## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C1352

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 24, 2023 10:00
	4330 Lewis Road, Suite 1	Date Issued:	March 29, 2023 16:48
	Harrisburg, PA 17111	Project Number:	[none]
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/24/2023 10:00. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

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TNI Accredited  
VELAP ID 460021



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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA      Date Received: March 24, 2023 10:00  
4330 Lewis Road, Suite 1      Date Issued: March 29, 2023 16:48  
Harrisburg, PA 17111      Project Number: [none]  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
51	23C1352-02	Air	03/23/2023 13:33	03/24/2023 10:00



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 51**  
**Sample ID: 23C1352-02**  
Sample Matrix: Air  
Sampled: 3/23/2023 13:33  
Sample Type: LV

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00084::12418  
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.6  
Final Vacuum(in Hg): 12  
Receipt Vacuum(in Hg): 6.4  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	554	90.0	90.0		9	1	3/27/23 12:20	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	12.6	0.45	0.45		9	1	3/27/23 12:20	MER
Carbon dioxide, as received	44.3	0.45	0.45		9	1	3/27/23 12:20	MER
Oxygen (O2), as received	5.35	0.45	0.45		9	1	3/27/23 12:20	MER
Hydrogen (H2), as received	8.90	0.54	0.54		27	1	3/27/23 15:04	MER
Nitrogen (N2), as received	19.2	9.00	9.00		9	1	3/27/23 12:20	MER
Carbon Monoxide, as received	0.06	0.009	0.009		9	1	3/27/23 12:20	MER

#### Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M <sup>3</sup>			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	162000	2330	5830		520000	7500	19000	11700	1	3/28/23 10:50	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	101				80-120					3/28/23 10:50	



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis</b>			<b>Preparation Method:</b>	<b>No Prep VOC GC Air</b>	
23C1352-02	1.00 mL / 1.00 mL	ALT-145	BGC0954	SGC0940	AG00026
23C1352-02	1.00 mL / 1.00 mL	EPA 3C	BGC0954	SGC0940	AG00026
23C1352-02RE1	1.00 mL / 1.00 mL	EPA 3C	BGC0954	SGC0940	AG00026
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>No Prep VOC Air</b>	
23C1352-02	400 mL / 400 mL	EPA TO-15	BGC0743	SGC0974	AC30195





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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit Units			%REC	Limits			

#### Batch BGC0743 - No Prep VOC Air

##### Blank (BGC0743-BLK1)

Prepared & Analyzed: 03/21/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.90 ppbv 5.00 98.0 80-120

##### LCS (BGC0743-BS1)

Prepared & Analyzed: 03/21/2023

1,1,1-Trichloroethane	4.96	0.5	ppbv	5.00	99.2	70-130
1,1,1,2-Tetrachloroethane	5.19	0.5	ppbv	5.00	104	70-130
1,1,2-Trichloro-1,2,2-trifluoroethane	4.64	0.5	ppbv	5.00	92.8	70-130
1,1,2-Trichloroethane	4.93	0.5	ppbv	5.00	98.6	70-130
1,1-Dichloroethane	4.59	0.5	ppbv	5.00	91.8	70-130
1,1-Dichloroethylene	4.66	0.5	ppbv	5.00	93.2	70-130
1,2,4-Trimethylbenzene	5.23	0.5	ppbv	5.00	105	70-130
1,2-Dibromoethane (EDB)	5.12	0.5	ppbv	5.00	102	70-130
1,2-Dichlorobenzene	5.48	0.5	ppbv	5.00	110	70-130
1,2-Dichloroethane	4.96	0.5	ppbv	5.00	99.2	70-130
1,2-Dichloropropane	4.90	0.5	ppbv	5.00	98.0	70-130
1,2-Dichlorotetrafluoroethane	4.70	0.5	ppbv	5.00	94.0	70-130
1,3,5-Trimethylbenzene	5.20	0.5	ppbv	5.00	104	70-130
1,3-Butadiene	4.57	0.5	ppbv	5.00	91.4	70-130
1,3-Dichlorobenzene	5.35	0.5	ppbv	5.00	107	70-130
1,4-Dichlorobenzene	5.37	0.5	ppbv	5.00	107	70-130
1,4-Dioxane	5.47	0.5	ppbv	5.00	109	70-130
2-Butanone (MEK)	4.55	0.5	ppbv	5.00	91.0	70-130
4-Methyl-2-pentanone (MIBK)	5.13	0.5	ppbv	5.00	103	70-130
Allyl chloride	4.49	0.5	ppbv	5.00	89.8	70-130
Benzene	4.93	0.5	ppbv	5.00	98.6	70-130
Benzyl Chloride	4.84	0.5	ppbv	5.00	96.8	70-130
Bromodichloromethane	4.62	0.5	ppbv	5.00	92.4	70-130
Bromoform	0.98	0.5	ppbv	5.00	19.6	70-130
Bromomethane	4.81	0.5	ppbv	5.00	96.2	70-130
Carbon Disulfide	4.50	0.5	ppbv	5.00	90.0	70-130

L





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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	%REC	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS (BGC0743-BS1)

Prepared & Analyzed: 03/21/2023

Carbon Tetrachloride	4.91	0.5	ppbv	5.00	98.2	70-130			
Chlorobenzene	5.05	0.5	ppbv	5.00	101	70-130			
Chloroethane	4.62	0.5	ppbv	5.00	92.4	70-130			
Chloroform	4.66	0.5	ppbv	5.00	93.2	70-130			
Chloromethane	4.61	0.5	ppbv	5.00	92.2	70-130			
cis-1,2-Dichloroethylene	4.69	0.5	ppbv	5.00	93.8	70-130			
cis-1,3-Dichloropropene	5.12	0.5	ppbv	5.00	102	70-130			
Cyclohexane	4.95	0.5	ppbv	5.00	99.0	70-130			
Dichlorodifluoromethane	4.66	0.5	ppbv	5.00	93.2	70-130			
Ethyl acetate	4.90	0.5	ppbv	5.00	98.0	70-130			
Ethylbenzene	5.17	0.5	ppbv	5.00	103	70-130			
Heptane	4.82	0.5	ppbv	5.00	96.4	70-130			
Hexane	4.82	0.5	ppbv	5.00	96.4	70-130			
m+p-Xylenes	10.3	1	ppbv	10.0	103	70-130			
Methylene chloride	4.91	1	ppbv	5.00	98.2	70-130			
Methyl-t-butyl ether (MTBE)	4.81	0.5	ppbv	5.00	96.2	70-130			
Naphthalene	4.58	0.5	ppbv	5.00	91.6	60-140			
o-Xylene	5.10	0.5	ppbv	5.00	102	70-130			
Propylene	4.57	1	ppbv	5.00	91.4	70-130			
Styrene	5.18	0.5	ppbv	5.00	104	70-130			
Tetrachloroethylene (PCE)	5.05	0.5	ppbv	5.00	101	70-130			
Tetrahydrofuran	4.93	0.5	ppbv	5.00	98.6	70-130			
Toluene	4.97	0.5	ppbv	5.00	99.4	70-130			
trans-1,2-Dichloroethylene	4.72	0.5	ppbv	5.00	94.4	70-130			
trans-1,3-Dichloropropene	5.27	0.5	ppbv	5.00	105	70-130			
Trichloroethylene	4.95	0.5	ppbv	5.00	99.0	70-130			
Trichlorofluoromethane	4.68	0.5	ppbv	5.00	93.6	70-130			
Vinyl acetate	4.76	0.5	ppbv	5.00	95.2	70-130			
Vinyl bromide	4.66	0.5	ppbv	5.00	93.2	70-130			
Vinyl chloride	4.65	0.5	ppbv	5.00	93.0	70-130			
Surr: 4-Bromofluorobenzene (Surr)	5.10		ppbv	5.00	102	70-130			



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS Dup (BGC0743-BSD1)

Prepared & Analyzed: 03/21/2023

1,1,1-Trichloroethane	5.00	0.5	ppbv	5.00	100	70-130	0.803	25	
1,1,2,2-Tetrachloroethane	5.12	0.5	ppbv	5.00	102	70-130	1.36	25	
1,1,2-Trichloro-1,2,2-trifluoroethane	4.68	0.5	ppbv	5.00	93.6	70-130	0.858	25	
1,1,2-Trichloroethane	5.02	0.5	ppbv	5.00	100	70-130	1.81	25	
1,1-Dichloroethane	4.62	0.5	ppbv	5.00	92.4	70-130	0.651	25	
1,1-Dichloroethylene	4.68	0.5	ppbv	5.00	93.6	70-130	0.428	25	
1,2,4-Trimethylbenzene	5.18	0.5	ppbv	5.00	104	70-130	0.961	25	
1,2-Dibromoethane (EDB)	5.08	0.5	ppbv	5.00	102	70-130	0.784	25	
1,2-Dichlorobenzene	5.42	0.5	ppbv	5.00	108	70-130	1.10	25	
1,2-Dichloroethane	4.98	0.5	ppbv	5.00	99.6	70-130	0.402	25	
1,2-Dichloropropane	4.90	0.5	ppbv	5.00	98.0	70-130	0.00	25	
1,2-Dichlorotetrafluoroethane	4.84	0.5	ppbv	5.00	96.8	70-130	2.94	25	
1,3,5-Trimethylbenzene	5.11	0.5	ppbv	5.00	102	70-130	1.75	25	
1,3-Butadiene	4.48	0.5	ppbv	5.00	89.6	70-130	1.99	25	
1,3-Dichlorobenzene	5.35	0.5	ppbv	5.00	107	70-130	0.00	25	
1,4-Dichlorobenzene	5.32	0.5	ppbv	5.00	106	70-130	0.935	25	
1,4-Dioxane	5.57	0.5	ppbv	5.00	111	70-130	1.81	25	
2-Butanone (MEK)	4.55	0.5	ppbv	5.00	91.0	70-130	0.00	25	
4-Methyl-2-pentanone (MIBK)	5.25	0.5	ppbv	5.00	105	70-130	2.31	25	
Allyl chloride	4.41	0.5	ppbv	5.00	88.2	70-130	1.80	25	
Benzene	4.96	0.5	ppbv	5.00	99.2	70-130	0.607	25	
Benzyl Chloride	4.77	0.5	ppbv	5.00	95.4	70-130	1.46	25	
Bromodichloromethane	4.66	0.5	ppbv	5.00	93.2	70-130	0.862	25	
Bromoform	0.97	0.5	ppbv	5.00	19.4	70-130	1.03	25	L
Bromomethane	4.96	0.5	ppbv	5.00	99.2	70-130	3.07	25	
Carbon Disulfide	4.51	0.5	ppbv	5.00	90.2	70-130	0.222	25	
Carbon Tetrachloride	4.95	0.5	ppbv	5.00	99.0	70-130	0.811	25	
Chlorobenzene	5.03	0.5	ppbv	5.00	101	70-130	0.397	25	
Chloroethane	4.70	0.5	ppbv	5.00	94.0	70-130	1.72	25	
Chloroform	4.67	0.5	ppbv	5.00	93.4	70-130	0.214	25	
Chloromethane	4.58	0.5	ppbv	5.00	91.6	70-130	0.653	25	
cis-1,2-Dichloroethylene	4.76	0.5	ppbv	5.00	95.2	70-130	1.48	25	
cis-1,3-Dichloropropene	5.14	0.5	ppbv	5.00	103	70-130	0.390	25	



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GCMS - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	Limits	RPD	Limit	

#### Batch BGC0743 - No Prep VOC Air

##### LCS Dup (BGC0743-BSD1)

Prepared & Analyzed: 03/21/2023

Cyclohexane	4.96	0.5	ppbv	5.00	99.2	70-130	0.202	25	
Dichlorodifluoromethane	4.65	0.5	ppbv	5.00	93.0	70-130	0.215	25	
Ethyl acetate	4.88	0.5	ppbv	5.00	97.6	70-130	0.409	25	
Ethylbenzene	5.14	0.5	ppbv	5.00	103	70-130	0.582	25	
Heptane	4.83	0.5	ppbv	5.00	96.6	70-130	0.207	25	
Hexane	4.78	0.5	ppbv	5.00	95.6	70-130	0.833	25	
m+p-Xylenes	10.3	1	ppbv	10.0	103	70-130	0.777	25	
Methylene chloride	4.88	1	ppbv	5.00	97.6	70-130	0.613	25	
Methyl-t-butyl ether (MTBE)	4.79	0.5	ppbv	5.00	95.8	70-130	0.417	25	
Naphthalene	4.32	0.5	ppbv	5.00	86.4	60-140	5.84	25	
o-Xylene	5.06	0.5	ppbv	5.00	101	70-130	0.787	25	
Propylene	4.75	1	ppbv	5.00	95.0	70-130	3.86	25	
Styrene	5.15	0.5	ppbv	5.00	103	70-130	0.581	25	
Tetrachloroethylene (PCE)	5.02	0.5	ppbv	5.00	100	70-130	0.596	25	
Tetrahydrofuran	4.96	0.5	ppbv	5.00	99.2	70-130	0.607	25	
Toluene	5.05	0.5	ppbv	5.00	101	70-130	1.60	25	
trans-1,2-Dichloroethylene	4.71	0.5	ppbv	5.00	94.2	70-130	0.212	25	
trans-1,3-Dichloropropene	5.27	0.5	ppbv	5.00	105	70-130	0.00	25	
Trichloroethylene	5.03	0.5	ppbv	5.00	101	70-130	1.60	25	
Trichlorofluoromethane	4.72	0.5	ppbv	5.00	94.4	70-130	0.851	25	
Vinyl acetate	4.69	0.5	ppbv	5.00	93.8	70-130	1.48	25	
Vinyl bromide	4.70	0.5	ppbv	5.00	94.0	70-130	0.855	25	
Vinyl chloride	4.73	0.5	ppbv	5.00	94.6	70-130	1.71	25	

Surr: 4-Bromofluorobenzene 5.07 ppbv 5.00 101 70-130  
(Surr)



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

#### Batch BGC0954 - No Prep VOC GC Air

##### Blank (BGC0954-BLK1)

Prepared & Analyzed: 03/27/2023

Methane	<	0.05	Vol%						
Carbon dioxide	<	0.05	Vol%						
Oxygen (O2)	<	0.05	Vol%						
Nitrogen (N2)	<	1.00	Vol%						
Hydrogen (H2)	<	0.02	Vol%						
Carbon Monoxide	<	10.0	ppmv						
Carbon Monoxide	<	0.001	Vol%						

##### LCS (BGC0954-BS1)

Prepared & Analyzed: 03/27/2023

Methane	4640	500	ppmv	5000	92.8	0-200			
Methane	4640	0.05	ppmv	5000	92.8	80-120			
Carbon dioxide	5400	500	ppmv	5000	108	0-200			
Carbon dioxide	5400	0.05	ppmv	5000	108	80-120			
Oxygen (O2)	5060	500	ppmv	5000	101	0-200			
Oxygen (O2)	5060	0.05	ppmv	5000	101	80-120			
Nitrogen (N2)	5300	2000	ppmv	5000	106	0-200			
Hydrogen (H2)	5910	200	ppmv	5100	116	0-200			
Hydrogen (H2)	5910	0.02	ppmv	5100	116	80-120			
Nitrogen (N2)	5300	1	ppmv	5000	106	80-120			
Carbon Monoxide	4840	10	ppmv	5000	96.8	0-200			
Carbon Monoxide	4840	0.001	ppmv	5000	96.8	80-120			

##### Duplicate (BGC0954-DUP1)

Source: 23C1352-02

Prepared & Analyzed: 03/27/2023

Methane	125000	4500	ppmv	126000	1.28	25			
Methane	12.5	0.45	Vol%	12.6	1.28	5			
Carbon dioxide	43.3	0.45	Vol%	44.3	2.29	5			
Carbon dioxide	433000	4500	ppmv	443000	2.29	25			
Oxygen (O2)	53000	4500	ppmv	53500	0.925	25			
Oxygen (O2)	5.30	0.45	Vol%	5.35	0.925	5			
Hydrogen (H2)	91700	1800	ppmv	91800	0.0737	25			
Nitrogen (N2)	190000	18000	ppmv	192000	0.971	25			
Nitrogen (N2)	19.0	9.00	Vol%	19.2	0.971	5			
Carbon Monoxide	552	90.0	ppmv	554	0.407	25			
Carbon Monoxide	0.06	0.009	Vol%	0.06	0.407	5			



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## Certificate of Analysis

Final Report

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4330 Lewis Road, Suite 1

Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD	RPD	Limit	Qual
	Result	Limit			%REC	Limits				

#### Batch BGC0954 - No Prep VOC GC Air

Duplicate (BGC0954-DUP2)			Source: 23C1480-01	Prepared & Analyzed: 03/28/2023		
Methane	183000	4500	ppmv	180000	1.38	25
Methane	18.3	0.45	Vol%	18.0	1.38	5
Carbon dioxide	208000	4500	ppmv	207000	0.499	25
Carbon dioxide	20.8	0.45	Vol%	20.7	0.499	5
Oxygen (O2)	52500	4500	ppmv	52000	0.938	25
Oxygen (O2)	5.25	0.45	Vol%	5.20	0.938	5
Hydrogen (H2)	<	1800	ppmv	<1800	NA	25
Nitrogen (N2)	516000	18000	ppmv	509000	1.41	25
Hydrogen (H2)	<	0.18	Vol%	<0.18	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

Duplicate (BGC0954-DUP3)			Source: 23C1480-02	Prepared & Analyzed: 03/28/2023		
Methane	325000	4500	ppmv	328000	0.944	25
Methane	32.5	0.45	Vol%	32.8	0.944	5
Carbon dioxide	348000	4500	ppmv	352000	1.05	25
Carbon dioxide	34.8	0.45	Vol%	35.2	1.05	5
Oxygen (O2)	6030	4500	ppmv	6040	0.0403	25
Oxygen (O2)	0.60	0.45	Vol%	0.60	0.0403	5
Hydrogen (H2)	76600	1800	ppmv	77500	1.19	25
Nitrogen (N2)	156000	18000	ppmv	157000	1.04	25
Nitrogen (N2)	15.6	9.00	Vol%	15.7	1.04	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5



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## Certificate of Analysis

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Date Received: March 24, 2023 10:00  
Date Issued: March 29, 2023 16:48

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: [none]

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<i>EPA 3C in Air</i>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
<i>EPA TO-15 in Air</i>			
Benzene	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

### Qualifiers and Definitions

L	LCS recovery is outside of established acceptance limits
RPD	Relative Percent Difference
Qual	Qualifiers
-RE	Denotes sample was re-analyzed
PF	Preparation Factor
MDL	Method Detection Limit
LOQ	Limit of Quantitation
ppbv	parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.

**AIR ANALYSIS**  
**CHAIN OF CUSTODY**

Equipment due 3/30/2023

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:		INVOICE CONTACT:	SITE NAME:
ADDRESS:		INVOICE ADDRESS:	PROJECT NUMBER:
PHONE #:		INVOICE PHONE #:	P.O. #:
FAX #:	EMAIL:	Pretreatment Program:	
Is sample for compliance reporting? <b>YES</b> NO		Regulatory State: <b>VA</b>	Is sample from a chlorinated supply? YES <b>NO</b> PWS I.D. #:
SAMPLER NAME (PRINT):		SAMPLER SIGNATURE:	Turn Around Time: Circle: 10 <b>5 Days</b> or __ Day(s)

 Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other LV 063-23B-0014

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (In Hg):				Barometric Pres. (In Hg):				Alt 145 CO	EPA 3C	Benzene by TO-15	
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)					Ending Sample Temp °F
1)			11293	1.4	230202-02	21.6									LG	X	X	X	
2) 37			14308 <del>12289</del>	1.4	230126-02 <del>230202-02</del>	21.6		3/23/23	1:23	DID NOT SAMPLE		3/23/23	NO Sample	143	LG	X	X	X	
3) 51			12418	1.4	230202-02	21.6		3/23/23	1:30pm	27	106.4	3/23/23	1:39pm	12	166.5	LG	X	X	X
4) 46*			14294	1.4	230126-02	21.6		3/23/23	1:25pm	27	145.3	3/23/23	1:28pm	10	145.3	LG	X	X	X

ID 46 IS APPROVED FOR THIS TEMP. PLEASE CANCEL ANALYSIS + DEFUSE. THANKS! 310

RELINQUISHED: Fedex E	RECEIVED: Fed ex E	DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED: Fedex E	RECEIVED: <i>[Signature]</i>	DATE / TIME: 3/24/23 1000	Level I <input type="checkbox"/>	20.9 no ICP no sent <b>SCS Field Services 23C1352</b> <b>Bristol</b> Recd: 03/24/2023 Due: 03/31/2023
RELINQUISHED:	RECEIVED:	DATE / TIME:	Level II <input type="checkbox"/>	
RELINQUISHED:	RECEIVED:	DATE / TIME:	Level III <input type="checkbox"/>	
RELINQUISHED:	RECEIVED:	DATE / TIME:	Level IV <input type="checkbox"/>	



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### Certificate of Analysis

Final Report

Laboratory Order ID 23C1352

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1  Harrisburg, PA 17111	Date Received:	March 24, 2023 10:00
		Date Issued:	March 29, 2023 16:48
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

### Sample Conditions Checklist

Samples Received at:	20.90°C
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments

Analysis for sample -03: 46 not required per Tom Lock via email. MRS 03/24/213 1332





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## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C1681

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	March 30, 2023 16:03
	4330 Lewis Road, Suite 1	Date Issued:	April 6, 2023 17:34
	Harrisburg, PA 17111	Project Number:	07223016.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

Enclosed are the results of analyses for samples received by the laboratory on 03/30/2023 16:03. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

Ted Soyars

Technical Director

### End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

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TNI Accredited  
VELAP ID 460021



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## Certificate of Analysis

### Final Report

Laboratory Order ID 23C1681

Client Name: SCS Field Services - Harrisburg, PA      Date Received: March 30, 2023 16:03  
4330 Lewis Road, Suite 1      Date Issued: April 6, 2023 17:34  
Harrisburg, PA 17111      Project Number: 07223016.00  
Submitted To: Tom Lock      Purchase Order: 07-SO04485  
Client Site I.D.: Bristol

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
51	23C1681-01	Air	03/29/2023 12:25	03/30/2023 16:03
57	23C1681-02	Air	03/29/2023 12:14	03/30/2023 16:03
37	23C1681-03	Air	03/29/2023 11:59	03/30/2023 16:03



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1681

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 51**  
  
**Sample ID: 23C1681-01**  
Sample Matrix: Air  
Sampled: 3/29/2023 12:25  
  
Sample Type: LG

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00475::15039  
Canister Size: 1.4

Initial Vacuum(in Hg): 27  
Final Vacuum(in Hg): 2.2  
Receipt Vacuum(in Hg): 2.2  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	1430	90.0	90.0		9	1	4/3/23 11:17	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	4.48	0.45	0.45		9	1	4/3/23 11:17	MER
Carbon dioxide, as received	62.3	0.45	0.45		9	1	4/3/23 11:17	MER
Oxygen (O2), as received	1.84	0.45	0.45	C	9	1	4/3/23 11:17	MER
Hydrogen (H2), as received	25.8	1.62	1.62		81	1	4/3/23 14:25	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	4/3/23 11:17	MER
Carbon Monoxide, as received	0.14	0.009	0.009		9	1	4/3/23 11:17	MER



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## Certificate of Analysis

Final Report

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Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 57**  
**Sample ID: 23C1681-02**  
Sample Matrix: Air  
Sampled: 3/29/2023 12:14  
Sample Type: LG

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00473::15043  
Canister Size: 1.4

Initial Vacuum(in Hg): 27  
Final Vacuum(in Hg): 4.6  
Receipt Vacuum(in Hg): 4.6  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	884	90.0	90.0		9	1	4/3/23 12:08	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	18.5	0.45	0.45		9	1	4/3/23 12:08	MER
Carbon dioxide, as received	48.2	0.45	0.45		9	1	4/3/23 12:08	MER
Oxygen (O2), as received	3.57	0.45	0.45	C	9	1	4/3/23 12:08	MER
Hydrogen (H2), as received	11.1	1.08	1.08		54	1	4/3/23 14:10	MER
Nitrogen (N2), as received	16.9	9.00	9.00		9	1	4/3/23 12:08	MER
Carbon Monoxide, as received	0.09	0.009	0.009		9	1	4/3/23 12:08	MER



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## Certificate of Analysis

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4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### ANALYTICAL RESULTS

Project Location:  
**Field Sample #: 37**  
**Sample ID: 23C1681-03**  
Sample Matrix: Air  
Sampled: 3/29/2023 11:59  
Sample Type: LG

Sample Description/Location:  
Sub Description/Location:  
Canister ID: 063-00268::13370  
Canister Size: 1.4

Initial Vacuum(in Hg): 28  
Final Vacuum(in Hg): 3.0  
Receipt Vacuum(in Hg): 3.0  
Flow Controller Type: Passive  
Flow Controller ID:

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis ALT-145

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	167	90.0	90.0		9	1	4/3/23 13:00	MER

#### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis EPA 3C

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	12.3	0.45	0.45		9	1	4/3/23 13:00	MER
Carbon dioxide, as received	28.6	0.45	0.45		9	1	4/3/23 13:00	MER
Oxygen (O2), as received	6.13	0.45	0.45	C	9	1	4/3/23 13:00	MER
Hydrogen (H2), as received	3.07	0.18	0.18		9	1	4/3/23 13:00	MER
Nitrogen (N2), as received	43.1	9.00	9.00		9	1	4/3/23 13:00	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	4/3/23 13:00	MER



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis</b>			<b>Preparation Method:</b>	<b>No Prep VOC GC Air</b>	
23C1681-01	1.00 mL / 1.00 mL	ALT-145	BGC1179	SGD0023	AG00026
23C1681-02	1.00 mL / 1.00 mL	ALT-145	BGC1179	SGD0023	AG00026
23C1681-03	1.00 mL / 1.00 mL	ALT-145	BGC1179	SGD0023	AG00026
23C1681-01	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026
23C1681-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026
23C1681-02	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026
23C1681-02RE1	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026
23C1681-03	1.00 mL / 1.00 mL	EPA 3C	BGC1179	SGD0023	AG00026



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Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source		%REC		RPD		Qual
	Result	Limit		Units	Result	%REC	Limits	RPD	Limit	

#### Batch BGC1179 - No Prep VOC GC Air

##### Blank (BGC1179-BLK1)

Prepared & Analyzed: 03/31/2023

Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Carbon Monoxide	<	10.0	ppmv							
Carbon Monoxide	<	0.001	Vol%							

##### LCS (BGC1179-BS1)

Prepared & Analyzed: 03/31/2023

Methane	4740	500	ppmv	5000	94.9	0-200				
Methane	4740	0.05	ppmv	5000	94.9	80-120				
Carbon dioxide	4400	500	ppmv	5000	88.0	0-200				
Carbon dioxide	4400	0.05	ppmv	5000	88.0	80-120				
Oxygen (O2)	5150	500	ppmv	5000	103	0-200				
Oxygen (O2)	5150	0.05	ppmv	5000	103	80-120				
Hydrogen (H2)	5880	200	ppmv	5100	115	0-200				
Nitrogen (N2)	5450	2000	ppmv	5000	109	0-200				
Nitrogen (N2)	5450	1	ppmv	5000	109	80-120				
Hydrogen (H2)	5880	0.02	ppmv	5100	115	80-120				
Carbon Monoxide	4940	10	ppmv	5000	98.8	0-200				
Carbon Monoxide	4940	0.001	ppmv	5000	98.8	80-120				

##### Duplicate (BGC1179-DUP1)

Source: 23C1537-01

Prepared & Analyzed: 03/31/2023

Methane	325000	4500	ppmv	328000	0.935	25				
Methane	32.5	0.45	Vol%	32.8	0.934	5				
Carbon dioxide	372000	4500	ppmv	376000	1.15	25				
Carbon dioxide	37.2	0.45	Vol%	37.6	1.15	5				
Oxygen (O2)	<	4500	ppmv	<4500	NA	25				
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5				
Hydrogen (H2)	151000	1800	ppmv	152000	0.704	25				
Nitrogen (N2)	10.9	9.00	Vol%	11.0	0.809	5				
Nitrogen (N2)	109000	18000	ppmv	110000	0.809	25				



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## Certificate of Analysis

Final Report

Laboratory Order ID 23C1681

Client Name: SCS Field Services - Harrisburg, PA  
4330 Lewis Road, Suite 1

Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

#### Batch BGC1179 - No Prep VOC GC Air

Duplicate (BGC1179-DUP1)		Source: 23C1537-01			Prepared & Analyzed: 03/31/2023		
Carbon Monoxide	182	90.0	ppmv	180	1.19	25	
Carbon Monoxide	0.02	0.009	Vol%	0.02	1.19	5	

Duplicate (BGC1179-DUP2)		Source: 23C1537-02			Prepared & Analyzed: 03/31/2023		
Methane	354000	4500	ppmv	356000	0.576	25	
Methane	35.4	0.45	Vol%	35.6	0.576	5	
Carbon dioxide	368000	4500	ppmv	367000	0.218	25	
Carbon dioxide	36.8	0.45	Vol%	36.7	0.218	5	
Oxygen (O2)	4500	4500	ppmv	4500	0.0320	25	
Oxygen (O2)	0.45	0.45	Vol%	0.45	0.0320	5	
Hydrogen (H2)	103000	1800	ppmv	104000	0.362	25	
Nitrogen (N2)	98700	18000	ppmv	99200	0.445	25	
Nitrogen (N2)	9.87	9.00	Vol%	9.92	0.445	5	
Carbon Monoxide	0.01	0.009	Vol%	0.01	3.98	5	
Carbon Monoxide	113	90.0	ppmv	118	3.98	25	

Duplicate (BGC1179-DUP3)		Source: 23C1537-03			Prepared & Analyzed: 03/31/2023		
Methane	51100	4500	ppmv	49600	2.91	25	
Methane	5.11	0.45	Vol%	4.96	2.91	5	
Carbon dioxide	365000	4500	ppmv	366000	0.168	25	
Carbon dioxide	36.5	0.45	Vol%	36.6	0.168	5	
Oxygen (O2)	<	4500	ppmv	<4500	NA	25	
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5	
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25	
Hydrogen (H2)	656000	1800	ppmv	654000	0.289	25	
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5	
Carbon Monoxide	545	90.0	ppmv	545	0.0825	25	
Carbon Monoxide	0.05	0.009	Vol%	0.05	0.0825	5	





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Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting			Spike	Source	%REC			RPD	Qual
	Result	Limit	Units	Level	Result	%REC	Limits	RPD		

#### Batch BGC1179 - No Prep VOC GC Air

Duplicate (BGC1179-DUP4)				Source: 23C1537-04	Prepared & Analyzed: 03/31/2023			
Methane	495000	4500	ppmv		494000		0.197	25
Methane	49.5	0.45	Vol%		49.4		0.197	5
Carbon dioxide	358000	4500	ppmv		358000		0.0120	25
Carbon dioxide	35.8	0.45	Vol%		35.8		0.0119	5
Oxygen (O2)	<	4500	ppmv		<4500		NA	25
Oxygen (O2)	<	0.45	Vol%		<0.45		NA	5
Hydrogen (H2)	51000	1800	ppmv		50400		1.03	25
Nitrogen (N2)	<	18000	ppmv		<18000		NA	25
Nitrogen (N2)	<	9.00	Vol%		<9.00		NA	5
Carbon Monoxide	100	90.0	ppmv		103		2.13	25
Carbon Monoxide	0.01	0.009	Vol%		0.01		2.13	5

Duplicate (BGC1179-DUP5)				Source: 23C1681-01	Prepared & Analyzed: 04/03/2023			
Methane	44500	4500	ppmv		44800		0.529	25
Methane	4.45	0.45	Vol%		4.48		0.529	5
Carbon dioxide	61.7	0.45	Vol%		62.3		0.827	5
Carbon dioxide	617000	4500	ppmv		623000		0.827	25
Oxygen (O2)	1.82	0.45	Vol%		1.84		0.913	5
Oxygen (O2)	18200	4500	ppmv		18400		0.913	25
Nitrogen (N2)	<	9.00	Vol%		<9.00		NA	5
Nitrogen (N2)	62700	18000	ppmv		63500		1.24	25
Hydrogen (H2)	261000	1800	ppmv		264000		0.954	25
Carbon Monoxide	1420	90.0	ppmv		1430		0.785	25
Carbon Monoxide	0.14	0.009	Vol%		0.14		0.785	5

Duplicate (BGC1179-DUP6)				Source: 23C1681-02	Prepared & Analyzed: 04/03/2023			
Methane	185000	4500	ppmv		185000		0.0304	25
Methane	18.5	0.45	Vol%		18.5		0.0304	5
Carbon dioxide	484000	4500	ppmv		482000		0.269	25
Carbon dioxide	48.4	0.45	Vol%		48.2		0.269	5
Oxygen (O2)	35800	4500	ppmv		35700		0.0408	25
Oxygen (O2)	3.58	0.45	Vol%		3.57		0.0408	5
Hydrogen (H2)	119000	1800	ppmv		119000		0.0497	25
Nitrogen (N2)	168000	18000	ppmv		169000		0.0671	25
Nitrogen (N2)	16.8	9.00	Vol%		16.9		0.0671	5



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Harrisburg, PA 17111

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Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

#### Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD Limit	Qual
	Result	Limit			Units	%REC		

#### Batch BGC1179 - No Prep VOC GC Air

Duplicate (BGC1179-DUP6)	Source: 23C1681-02			Prepared & Analyzed: 04/03/2023		
Carbon Monoxide	890	90.0	ppmv	884	0.629	25
Carbon Monoxide	0.09	0.009	Vol%	0.09	0.629	5

Duplicate (BGC1179-DUP7)	Source: 23C1681-03			Prepared & Analyzed: 04/03/2023		
Methane	12.3	0.45	Vol%	12.3	0.00188	5
Methane	123000	4500	ppmv	123000	0.00187	25
Carbon dioxide	284000	4500	ppmv	286000	0.721	25
Carbon dioxide	28.4	0.45	Vol%	28.6	0.721	5
Oxygen (O2)	60900	4500	ppmv	61300	0.625	25
Oxygen (O2)	6.09	0.45	Vol%	6.13	0.625	5
Hydrogen (H2)	30700	1800	ppmv	30700	0.201	25
Nitrogen (N2)	429000	18000	ppmv	431000	0.466	25
Nitrogen (N2)	42.9	9.00	Vol%	43.1	0.466	5
Hydrogen (H2)	3.07	0.18	Vol%	3.07	0.201	5
Carbon Monoxide	166	90.0	ppmv	167	0.216	25
Carbon Monoxide	0.02	0.009	Vol%	0.02	0.216	5

#### Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<i>EPA 3C in Air</i>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		



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## Certificate of Analysis

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Purchase Order: 07-SO04485

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12069	04/01/2024
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
SCDHEC	South Carolina Dept of Health and Environmental	93016	06/14/2023
VELAP	NELAP-Virginia Certificate #12333	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

### Qualifiers and Definitions

C Continuing calibration verification response for this analyte is outside specifications.

RPD Relative Percent Difference

Qual Qualifiers

-RE Denotes sample was re-analyzed

PF Preparation Factor

MDL Method Detection Limit

LOQ Limit of Quantitation

ppbv parts per billion by volume

TIC Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside  $\pm 10\%$  of the absolute.

**AIR ANALYSIS**  
**CHAIN OF CUSTODY**

Equipment due 4/11/2023

Page 2 of 2

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: Same		PROJECT NAME/Quote #: Bristol	
CONTACT:		INVOICE CONTACT:		SITE NAME:	
ADDRESS:		INVOICE ADDRESS:		PROJECT NUMBER: 07223616.00	
PHONE #:		INVOICE PHONE #:		P.O. #:	
FAX #:		EMAIL:		Pretreatment Program:	
Is sample for compliance reporting? <b>NO</b>		Regulatory State: <b>VA</b>		Is sample from a chlorinated supply? YES <b>NO</b>	
PWS I.D. #:		Turn Around Time: Circle: 10 <b>5 Days</b>		or ___ Day(s)	
SAMPLER NAME (PRINT): Logan Culhane		SAMPLER SIGNATURE:			

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other \_\_\_\_\_

063-23C-0004

CLIENT SAMPLE I.D.	Regulator Info		Canister Information					Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS		
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Barometric Pres. (in Hg):	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Alt 145 CO	3C		HV		
1) 51			15039	1.4	230307-01	20	2.2	3/29/23	12:23 pm	27	169.8	3/29/23	12:25 pm	9	169.8	LG	x	x	x
2) 57			15043	1.4	230307-01	20	4.6	3/29	12:12 pm	27	162.1	3/29/23	12:14 pm	9	157.7	LG	x	x	x
3) 37			13370	1.4	230307-01	20	3.0	3/29	11:54	28	150.6	3/29/23	11:59	10	150.6	LG	x	x	x
4)																			

310 noise noise 21.0°C

RELINQUISHED:	DATE / TIME: 3/29 4:15pm	RECEIVED: Fedex	DATE / TIME: 3/30/23 11:03
RELINQUISHED: Fedex	DATE / TIME:	RECEIVED:	DATE / TIME:
RELINQUISHED:	DATE / TIME:	RECEIVED:	DATE / TIME:

**LAB USE ONLY**

Level I

Level II

Level III

Level IV

SCS Field Services 23C1681  
Bristol

Recd: 03/30/2023 Due: 04/06/2023

v130325002



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### Certificate of Analysis

Final Report

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Date Received: March 30, 2023 16:03  
Date Issued: April 6, 2023 17:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

### Sample Conditions Checklist

Samples Received at:	21.00°C
How were samples received?	FedEx Ground
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

### Work Order Comments

## Appendix D

### Solid Waste Permit 588 Daily Borehole Temperature Averages

# Solid Waste Permit 588 Daily Borehole Temperature Averages

March 2023

**SCS ENGINEERS**

02218208.05 | May 25, 2023

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

## Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 1

Date	Depth from Surface					
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft
1-Mar	206.7	207.0	207.1	207.1	207.5	229.8
2-Mar	206.3	206.5	207.0	207.1	207.4	229.7
3-Mar	206.1	206.3	206.5	206.6	206.9	230.4
4-Mar	206.4	206.5	206.6	206.8	207.2	231.6
5-Mar	206.9	207.1	207.4	207.5	207.7	233.3
6-Mar	206.7	207.0	207.4	207.5	207.6	234.7
7-Mar	206.7	206.9	207.0	207.2	207.5	235.6
8-Mar	206.5	206.8	207.3	207.3	207.5	236.2
9-Mar	206.7	207.1	207.3	207.3	207.5	236.9
10-Mar	206.1	206.4	206.7	206.8	207.1	236.3
11-Mar	206.4	206.4	206.5	206.5	207.2	236.4
12-Mar	206.0	206.0	206.3	206.4	207.0	236.6
13-Mar	206.1	206.3	206.5	206.5	207.0	237.1
14-Mar	206.2	206.4	206.6	206.7	207.0	237.1
15-Mar	206.7	206.8	207.3	207.3	207.6	237.6
16-Mar	206.8	206.8	207.0	207.2	207.6	238.0
17-Mar	206.0	206.0	206.3	206.3	206.9	237.8
18-Mar	206.3	206.4	206.5	206.6	207.1	237.4
19-Mar	206.3	206.3	206.7	206.9	207.3	237.1
20-Mar	206.7	206.9	207.3	207.4	207.6	237.7
21-Mar	207.1	207.4	207.7	207.8	208.0	238.6
22-Mar	207.0	207.1	207.3	207.4	208.0	238.3
23-Mar	207.1	207.3	207.5	207.5	208.0	239.1
24-Mar	206.8	207.2	207.4	207.5	207.7	239.2
25-Mar	206.0	207.0	207.1	207.3	207.7	239.2
26-Mar	206.8	207.5	207.6	207.5	208.0	239.6
27-Mar	206.5	207.1	207.3	207.3	207.6	240.0
28-Mar	206.4	207.0	207.3	207.1	207.5	241.1
29-Mar	206.7	207.0	207.3	207.3	207.7	242.0
30-Mar	206.9	207.5	207.7	207.6	207.8	241.6
31-Mar	206.4	207.0	207.2	207.2	207.7	242.5
<b>Average</b>	<b>206.5</b>	<b>206.8</b>	<b>207.1</b>	<b>207.1</b>	<b>207.5</b>	<b>237.1</b>



## Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 2

Date	Depth from Surface					
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft
1-Mar	176.4	240.7	241.5	268.2	256.0	268.6
2-Mar	174.9	240.5	241.3	268.1	256.0	268.4
3-Mar	173.8	240.5	241.5	268.2	256.1	268.5
4-Mar	171.9	240.1	241.0	268.3	256.0	268.5
5-Mar	169.8	239.3	240.1	268.2	255.9	268.6
6-Mar	168.2	238.9	239.8	268.2	256.2	268.5
7-Mar	166.4	237.8	238.6	268.5	256.4	268.3
8-Mar	164.8	236.2	237.4	268.0	255.8	267.9
9-Mar	163.6	235.7	236.8	268.4	256.2	268.5
10-Mar	163.1	235.0	236.2	268.2	256.2	268.2
11-Mar	162.5	234.6	236.1	268.3	256.2	268.4
12-Mar	161.9	234.3	235.5	268.0	256.0	268.0
13-Mar	161.2	234.3	235.6	268.0	256.0	268.1
14-Mar	161.0	234.4	235.5	268.0	256.0	268.0
15-Mar	160.9	234.6	236.0	268.3	256.4	268.1
16-Mar	160.7	234.9	236.2	268.3	256.4	268.4
17-Mar	160.5	234.5	235.8	267.9	256.0	268.0
18-Mar	160.1	234.4	235.8	268.2	256.2	268.2
19-Mar	159.7	234.3	235.5	267.8	256.0	267.9
20-Mar	159.3	234.2	235.4	267.8	256.0	268.0
21-Mar	159.4	235.1	236.2	268.1	256.2	268.3
22-Mar	159.0	234.6	235.8	268.0	256.0	268.0
23-Mar	159.2	235.2	236.5	268.5	256.5	268.5
24-Mar	159.3	235.2	236.5	268.5	256.6	268.6
25-Mar	158.6	235.5	236.8	268.5	256.7	268.6
26-Mar	158.6	235.6	236.9	268.4	256.6	268.6
27-Mar	158.3	235.0	236.9	268.5	256.6	268.6
28-Mar	157.8	235.1	236.4	267.9	256.2	268.0
29-Mar	157.6	235.2	236.6	268.0	256.6	268.2
30-Mar	157.5	235.4	236.8	268.0	256.5	268.3
31-Mar	157.0	235.1	236.6	267.8	256.2	267.9
<b>Average</b>	<b>162.7</b>	<b>236.0</b>	<b>237.2</b>	<b>268.2</b>	<b>256.2</b>	<b>268.3</b>

### Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 3

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Mar	206.8	208.1	208.5	252.8	262.8	268.9	270.2	257.1
2-Mar	206.1	208.8	211.4	252.3	262.6	268.7	269.9	256.8
3-Mar	206.3	206.5	207.3	252.9	262.8	269.1	270.3	256.7
4-Mar	206.2	206.6	207.8	250.8	262.2	268.2	269.3	256.0
5-Mar	206.3	207.1	208.5	250.7	261.8	267.8	269.1	255.7
6-Mar	206.1	207.5	208.7	250.9	261.9	268.0	269.2	255.8
7-Mar	206.5	207.5	208.5	250.8	262.1	268.3	269.4	255.9
8-Mar	206.3	209.8	210.3	250.3	261.6	268.0	269.2	256.2
9-Mar	206.2	210.3	211.7	250.7	261.9	268.2	269.3	258.0
10-Mar	205.9	207.6	208.6	250.5	261.9	268.0	269.1	257.7
11-Mar	206.0	206.4	207.3	250.5	262.0	268.2	269.3	257.5
12-Mar	205.1	205.9	207.0	250.4	261.7	268.1	269.3	258.2
13-Mar	205.6	206.1	207.1	250.2	261.8	268.0	269.0	258.3
14-Mar	206.2	206.4	207.3	250.3	262.0	268.0	269.3	258.5
15-Mar	206.1	206.5	207.7	250.2	261.6	267.8	269.0	258.6
16-Mar	206.2	206.8	208.0	250.9	262.0	268.1	269.5	258.8
17-Mar	205.3	205.8	207.3	250.5	261.8	267.8	269.0	257.8
18-Mar	206.0	206.4	207.2	245.0	262.5	268.7	269.5	257.3
19-Mar	206.3	206.5	207.5	242.2	262.3	268.6	269.4	256.7
20-Mar	206.0	206.0	207.8	249.8	261.9	267.9	269.3	256.6
21-Mar	206.6	206.8	208.2	251.3	262.5	268.6	269.8	257.1
22-Mar	205.8	206.2	208.0	250.2	262.2	268.0	269.1	256.6
23-Mar	206.4	206.7	208.2	249.8	262.7	268.7	269.8	256.8
24-Mar	206.2	206.8	208.1	251.9	262.9	268.9	270.0	256.9
25-Mar	206.8	207.0	207.3	252.7	263.4	270.0	271.0	256.8
26-Mar	207.4	217.5	215.4	253.7	263.8	270.3	271.5	256.9
27-Mar	207.1	211.3	218.1	246.3	263.6	270.0	271.0	256.6
28-Mar	206.3	211.2	211.8	249.0	262.9	269.1	270.2	256.3
29-Mar	207.5	219.0	219.5	253.4	263.7	270.0	271.3	256.0
30-Mar	206.5	206.6	208.1	246.4	263.0	269.0	270.0	256.1
31-Mar	206.6	212.7	213.3	250.0	263.2	269.3	270.5	255.8
<b>Average</b>	<b>206.3</b>	<b>208.2</b>	<b>209.4</b>	<b>250.2</b>	<b>262.4</b>	<b>268.6</b>	<b>269.7</b>	<b>257.0</b>

## Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 4

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Mar	175.6	207.0	207.0	207.5	243.3	249.7	245.5	171.9
2-Mar	175.0	206.9	207.0	210.2	244.2	250.1	245.2	172.0
3-Mar	175.0	206.3	206.4	229.8	245.2	250.7	245.3	172.1
4-Mar	174.4	205.8	206.2	234.0	245.7	251.0	245.2	171.7
5-Mar	174.4	204.4	204.6	235.2	246.6	251.6	245.3	171.6
6-Mar	174.5	204.9	205.0	235.9	247.2	252.0	245.4	171.8
7-Mar	174.2	204.8	205.1	236.4	247.7	252.5	245.4	171.7
8-Mar	173.3	204.4	204.5	236.1	247.7	252.5	245.1	171.4
9-Mar	173.3	205.0	205.4	236.9	248.8	253.3	245.5	171.9
10-Mar	171.6	205.2	205.2	237.1	249.1	253.3	245.3	172.0
11-Mar	171.3	205.3	205.3	237.3	249.3	253.5	245.3	171.8
12-Mar	170.8	204.3	204.8	237.6	249.3	253.9	245.0	172.0
13-Mar	170.6	204.9	205.5	238.0	249.7	254.1	245.0	171.9
14-Mar	170.3	205.5	206.0	237.6	250.0	254.0	245.0	171.9
15-Mar	170.7	206.5	206.9	237.5	250.5	254.7	245.3	171.8
16-Mar	170.4	206.9	207.0	237.3	251.0	255.1	245.6	172.0
17-Mar	170.2	206.0	206.1	236.6	251.0	255.3	245.2	172.1
18-Mar	170.3	206.3	206.5	230.3	251.2	255.4	245.3	172.1
19-Mar	170.1	206.7	206.8	208.5	251.1	255.4	245.1	172.1
20-Mar	170.1	207.3	207.4	209.2	251.1	255.8	245.4	171.8
21-Mar	170.0	207.6	207.6	209.9	251.6	256.5	245.6	172.5
22-Mar	169.9	207.2	207.3	208.6	251.3	256.7	245.4	172.2
23-Mar	170.0	207.5	207.5	207.8	251.7	257.0	245.8	172.7
24-Mar	170.0	207.3	207.4	207.4	251.5	257.3	246.0	172.8
25-Mar	170.5	207.0	207.0	207.4	251.0	257.4	246.0	172.9
26-Mar	172.9	207.1	206.8	207.2	249.3	258.2	246.0	172.7
27-Mar	175.1	207.2	205.9	207.7	247.7	258.0	246.3	173.0
28-Mar	175.0	207.2	206.3	206.6	245.1	256.8	245.6	172.8
29-Mar	176.6	207.3	206.9	206.9	239.3	256.1	245.5	172.8
30-Mar	179.1	207.5	207.5	207.6	237.5	254.7	245.7	173.0
31-Mar	185.5	207.0	207.3	207.2	233.4	254.3	245.6	172.7
<b>Average</b>	<b>172.9</b>	<b>206.3</b>	<b>206.3</b>	<b>222.4</b>	<b>247.7</b>	<b>254.4</b>	<b>245.4</b>	<b>172.2</b>

## Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 5

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Mar	146.3	207.0	207.2	207.4	226.6	244.3	251.9	189.7
2-Mar	146.0	206.8	207.0	207.0	226.5	244.2	251.7	189.5
3-Mar	145.5	206.2	206.4	206.7	226.8	244.3	251.7	189.6
4-Mar	145.3	206.5	206.9	207.1	227.3	244.3	251.4	189.4
5-Mar	145.3	207.2	207.5	207.5	227.7	244.5	251.5	189.6
6-Mar	145.6	207.2	207.3	207.4	227.7	244.5	251.5	189.6
7-Mar	145.2	207.0	207.1	207.5	227.8	244.5	251.3	189.5
8-Mar	145.4	207.3	207.3	207.4	227.3	244.3	250.7	189.4
9-Mar	145.3	207.3	207.3	207.6	228.2	244.8	251.0	189.7
10-Mar	145.6	206.6	206.9	207.3	227.7	244.9	250.9	189.5
11-Mar	145.0	206.5	206.6	207.3	228.0	244.8	250.5	189.5
12-Mar	144.1	206.0	206.0	206.5	227.7	244.8	250.0	189.2
13-Mar	144.6	206.3	206.4	207.0	227.4	244.3	250.1	189.3
14-Mar	145.0	206.8	206.9	207.0	227.0	244.0	250.0	189.3
15-Mar	145.3	207.3	207.4	207.5	227.3	243.8	250.0	189.5
16-Mar	145.5	207.2	207.2	207.4	227.5	244.0	250.0	189.8
17-Mar	145.0	206.0	206.2	206.7	227.0	243.9	249.7	189.7
18-Mar	145.0	206.4	206.5	207.0	227.0	243.7	249.5	189.6
19-Mar	144.7	207.1	207.2	207.3	227.2	243.7	249.4	189.5
20-Mar	144.6	207.4	207.5	207.5	226.7	243.4	249.5	189.6
21-Mar	144.5	207.5	207.5	207.8	228.2	243.9	249.5	190.0
22-Mar	144.1	207.1	207.2	207.8	228.3	244.0	249.2	190.0
23-Mar	144.4	207.4	207.4	207.7	228.6	244.3	249.5	190.4
24-Mar	144.4	207.3	207.3	207.4	228.4	244.4	249.6	190.4
25-Mar	144.2	206.8	207.0	207.3	228.0	244.2	249.5	190.3
26-Mar	144.0	207.1	207.2	207.5	227.8	243.8	249.4	190.3
27-Mar	143.0	207.2	207.2	207.4	227.8	243.8	249.4	190.4
28-Mar	143.3	207.0	207.2	207.4	227.0	243.0	248.8	190.0
29-Mar	143.5	207.3	207.4	207.5	226.5	242.2	248.9	190.3
30-Mar	143.7	207.5	207.5	207.7	227.0	242.5	248.8	190.5
31-Mar	143.0	207.0	207.0	207.4	226.9	242.0	248.7	190.0
<b>Average</b>	<b>144.7</b>	<b>207.0</b>	<b>207.0</b>	<b>207.3</b>	<b>227.4</b>	<b>244.0</b>	<b>250.1</b>	<b>189.8</b>

## Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 6

Date	Depth from Surface				
	25 ft	50 ft	75 ft	100 ft	125 ft
1-Mar	206.5	235.6	236.0	238.7	240.5
2-Mar	206.3	235.8	236.0	238.8	240.1
3-Mar	205.9	235.8	235.8	238.8	240.2
4-Mar	206.6	236.0	236.2	239.1	240.4
5-Mar	207.0	235.8	236.0	238.9	240.2
6-Mar	206.8	235.9	236.0	239.0	240.3
7-Mar	207.0	235.7	236.1	238.8	240.3
8-Mar	207.3	235.4	235.5	238.4	239.6
9-Mar	207.3	235.8	236.1	238.8	240.2
10-Mar	206.5	235.9	236.1	238.7	240.0
11-Mar	206.4	235.7	236.2	238.6	240.1
12-Mar	206.0	235.9	236.0	238.3	240.0
13-Mar	206.5	235.9	236.0	238.3	240.0
14-Mar	207.0	235.6	236.0	238.4	239.8
15-Mar	207.5	235.8	236.3	238.8	239.9
16-Mar	207.1	235.8	236.5	238.8	240.3
17-Mar	206.1	235.9	236.0	238.8	240.0
18-Mar	206.7	236.3	236.3	239.0	240.3
19-Mar	207.3	236.3	236.3	239.0	240.2
20-Mar	207.5	236.5	236.6	239.0	240.5
21-Mar	207.7	236.7	236.8	239.4	240.6
22-Mar	207.3	236.2	236.6	239.1	240.1
23-Mar	207.5	236.9	237.1	239.7	240.8
24-Mar	207.3	237.2	237.3	239.7	240.9
25-Mar	207.2	237.3	237.4	240.0	241.2
26-Mar	207.3	237.2	237.3	239.8	240.8
27-Mar	207.1	237.3	237.3	239.8	240.9
28-Mar	191.4	236.6	236.9	239.5	240.5
29-Mar	179.8	236.8	237.0	239.5	240.7
30-Mar	178.9	236.8	236.9	239.7	240.8
31-Mar	179.3	236.8	236.8	239.5	240.6
<b>Average</b>	<b>203.7</b>	<b>236.2</b>	<b>236.4</b>	<b>239.0</b>	<b>240.3</b>

## Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 7

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Mar	171.4	225.8	225.9	239.5	243.9	242.0	236.5	228.5
2-Mar	169.5	225.6	226.0	239.3	244.0	242.0	236.2	228.1
3-Mar	167.7	225.6	226.0	239.3	244.0	242.1	236.3	228.2
4-Mar	167.1	225.1	225.8	239.4	244.0	242.2	236.5	228.0
5-Mar	169.0	225.1	225.7	239.5	243.8	242.0	236.5	227.9
6-Mar	168.5	225.5	225.5	239.4	243.9	242.2	236.5	227.6
7-Mar	169.1	225.3	225.5	239.0	243.8	242.2	236.3	227.6
8-Mar	169.7	224.6	225.1	238.6	243.5	241.9	235.6	227.2
9-Mar	170.2	225.0	225.3	239.1	244.0	242.4	236.4	227.5
10-Mar	169.3	225.0	225.2	239.0	244.0	242.2	236.2	227.3
11-Mar	169.3	224.3	224.8	238.8	244.0	242.2	236.2	227.4
12-Mar	168.9	224.0	224.2	238.7	243.9	242.0	236.0	227.0
13-Mar	168.0	224.0	224.3	239.0	244.0	242.0	235.8	226.8
14-Mar	168.1	224.0	224.0	239.0	243.9	242.0	235.5	226.6
15-Mar	168.5	223.6	224.0	239.0	244.0	242.1	235.6	226.4
16-Mar	168.6	223.2	223.5	239.1	244.4	242.2	235.5	226.1
17-Mar	168.5	222.5	223.0	239.0	244.0	242.0	235.0	225.5
18-Mar	168.3	223.7	224.1	239.0	244.2	242.2	235.1	225.4
19-Mar	167.8	224.3	224.3	238.5	244.0	242.2	235.0	225.2
20-Mar	167.5	224.5	224.5	238.7	243.9	241.9	234.8	224.9
21-Mar	167.4	224.5	224.6	239.2	244.5	242.4	235.2	225.2
22-Mar	167.1	224.1	224.4	239.0	244.0	242.0	235.0	224.8
23-Mar	167.3	224.8	224.9	239.5	244.5	242.5	235.3	225.3
24-Mar	167.4	225.3	225.2	239.6	244.5	242.5	235.5	225.5
25-Mar	166.2	225.3	225.8	239.8	244.5	242.6	235.5	225.4
26-Mar	165.8	225.7	226.0	239.7	244.5	242.6	235.5	225.2
27-Mar	166.4	225.7	226.3	240.0	244.5	242.5	235.5	225.4
28-Mar	166.0	225.4	225.5	239.5	244.3	242.3	234.8	224.6
29-Mar	166.0	225.4	225.6	239.7	244.5	242.4	234.9	224.7
30-Mar	166.2	225.5	225.7	239.8	244.6	242.5	234.9	224.8
31-Mar	165.9	225.0	225.5	239.7	244.1	242.1	234.7	224.1
<b>Average</b>	<b>168.0</b>	<b>224.7</b>	<b>225.0</b>	<b>239.2</b>	<b>244.1</b>	<b>242.2</b>	<b>235.6</b>	<b>226.3</b>


## Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 8

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Mar	171.4	175.6	175.8	176.1	178.4	181.4	181.8	179.8
2-Mar	171.6	175.5	176.0	176.0	178.3	181.2	182.0	180.0
3-Mar	171.9	175.4	175.8	176.0	178.0	181.1	181.9	180.0
4-Mar	172.3	175.3	175.5	175.6	177.7	181.0	181.5	179.5
5-Mar	172.4	175.4	175.5	175.5	177.8	181.2	181.5	179.7
6-Mar	172.3	175.4	175.6	175.7	178.1	181.1	181.5	179.6
7-Mar	172.1	175.5	175.7	176.2	178.2	181.2	181.5	179.6
8-Mar	171.9	175.3	175.5	176.1	178.3	181.1	181.4	179.4
9-Mar	171.1	175.7	176.1	176.4	178.7	181.5	182.0	179.9
10-Mar	171.0	175.5	176.0	176.2	178.3	181.2	182.0	180.0
11-Mar	171.3	175.4	176.1	176.2	178.3	181.3	181.8	180.0
12-Mar	171.4	175.3	175.9	176.0	178.0	181.0	181.8	179.8
13-Mar	171.7	175.3	176.0	176.0	178.2	181.1	181.6	179.8
14-Mar	170.8	175.2	176.0	176.0	178.0	181.0	181.6	179.6
15-Mar	171.4	175.5	176.1	176.2	178.4	181.3	181.6	179.6
16-Mar	171.9	175.8	176.3	176.5	178.5	181.6	181.9	179.8
17-Mar	171.8	175.7	176.0	176.0	177.9	181.0	181.8	179.9
18-Mar	172.6	175.3	175.8	175.8	177.7	181.1	181.4	179.6
19-Mar	172.6	175.3	176.0	175.8	177.9	181.1	181.3	179.5
20-Mar	172.4	175.4	175.9	175.8	178.2	181.3	181.5	179.5
21-Mar	172.6	175.7	176.3	176.3	178.3	181.4	181.8	179.8
22-Mar	173.0	175.8	176.1	176.1	178.1	181.1	181.9	179.9
23-Mar	173.0	176.2	176.3	176.3	178.4	181.4	182.2	180.3
24-Mar	172.8	176.2	176.4	176.2	178.5	181.5	182.0	180.2
25-Mar	172.5	176.2	176.5	176.2	178.7	181.8	182.1	180.1
26-Mar	172.6	176.2	176.4	176.4	178.6	181.5	182.0	180.0
27-Mar	172.6	176.3	176.4	176.5	178.9	181.8	182.2	180.3
28-Mar	172.7	176.1	176.3	176.4	178.6	181.6	181.9	180.0
29-Mar	173.1	176.3	176.3	176.4	178.5	181.5	181.9	179.8
30-Mar	173.2	176.3	176.5	176.5	178.8	181.6	182.1	180.0
31-Mar	173.0	176.0	176.3	176.6	178.6	181.6	182.0	180.0
<b>Average</b>	<b>172.2</b>	<b>175.7</b>	<b>176.1</b>	<b>176.1</b>	<b>178.3</b>	<b>181.3</b>	<b>181.8</b>	<b>179.8</b>

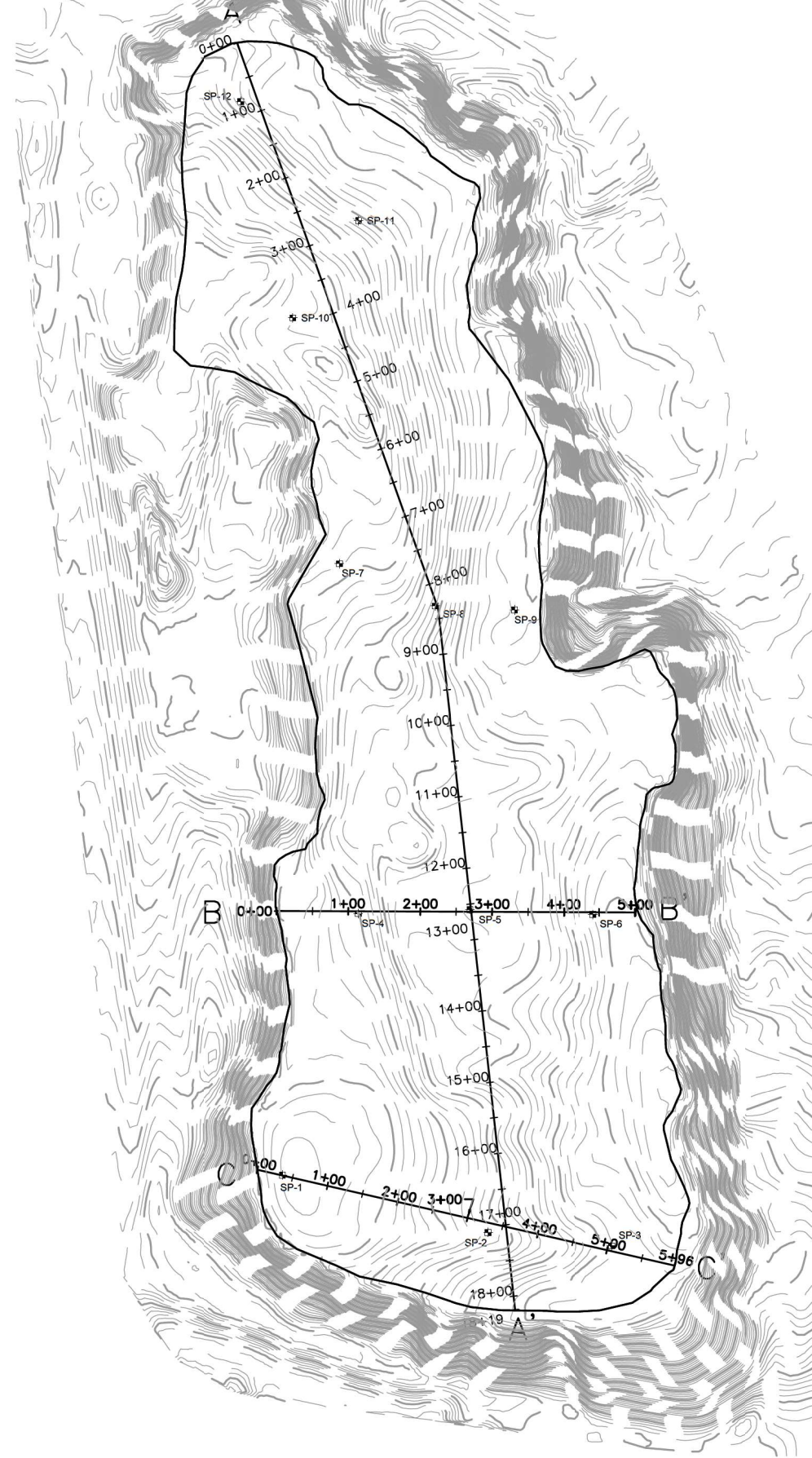
## Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 9

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Mar	121.0	147.8	146.6	151.1	149.7	132.9	118.0	109.4
2-Mar	120.5	148.0	146.4	151.2	149.7	132.7	116.7	109.3
3-Mar	120.5	147.6	146.3	151.2	149.8	132.7	116.7	109.8
4-Mar	119.5	147.3	146.0	151.0	149.5	132.5	116.4	109.8
5-Mar	121.1	147.2	146.1	150.8	149.6	132.6	116.7	109.8
6-Mar	120.5	147.7	146.6	151.0	149.6	132.6	116.8	109.9
7-Mar	119.8	146.9	145.7	150.8	149.6	132.6	116.8	109.8
8-Mar	119.8	146.3	145.3	150.3	149.2	132.1	116.4	109.4
9-Mar	120.0	147.0	145.9	150.8	149.7	132.5	117.0	110.0
10-Mar	119.5	146.3	145.1	150.3	149.3	132.2	117.0	109.9
11-Mar	119.6	145.7	144.5	150.1	149.3	132.3	116.6	109.5
12-Mar	120.0	146.0	145.0	150.0	149.0	132.0	116.3	109.0
13-Mar	119.5	146.3	145.4	150.3	149.1	132.1	116.3	109.3
14-Mar	119.6	146.2	145.2	150.0	148.9	132.0	116.0	109.0
15-Mar	120.6	147.5	146.4	150.7	148.9	132.1	116.6	109.5
16-Mar	120.5	147.3	146.1	150.9	149.2	132.1	116.9	109.7
17-Mar	120.4	147.1	145.8	150.8	149.2	132.1	117.0	109.4
18-Mar	120.0	146.8	145.6	150.5	149.3	132.2	117.3	109.4
19-Mar	120.7	146.7	145.6	150.3	149.0	131.9	117.2	109.1
20-Mar	121.3	147.4	146.5	150.6	149.0	131.8	117.1	108.8
21-Mar	121.3	147.5	146.4	151.0	149.3	132.2	117.9	109.1
22-Mar	121.1	147.1	146.0	150.8	149.3	132.1	117.7	109.1
23-Mar	121.6	147.8	146.5	151.4	150.0	132.8	118.4	109.5
24-Mar	121.5	147.7	146.5	151.6	150.5	133.0	118.6	109.5
25-Mar	121.6	147.8	146.6	151.5	150.3	132.9	118.5	109.4
26-Mar	121.8	147.8	146.6	151.4	150.2	132.6	118.7	109.2
27-Mar	122.0	147.9	146.8	151.4	150.3	132.8	118.8	109.3
28-Mar	121.5	147.6	146.6	151.2	149.5	132.4	118.3	108.6
29-Mar	121.9	148.0	147.1	151.3	149.7	132.5	118.5	108.6
30-Mar	122.4	148.8	147.8	151.8	149.9	132.7	118.8	108.7
31-Mar	122.5	147.8	146.7	151.3	149.5	132.1	118.2	108.2
<b>Average</b>	<b>120.8</b>	<b>147.3</b>	<b>146.1</b>	<b>150.9</b>	<b>149.5</b>	<b>132.4</b>	<b>117.4</b>	<b>109.3</b>





Appendix E  
Monthly Topography Analysis



- LEGEND**
- MAJOR CONTOURS (EVERY 10')
  - MINOR CONTOURS (EVERY 2')
  - APPROX. SIDEWALL LOCATION
  - SP-XX SETTLEMENT PLATE

**NOTES:**

1. GRADES SHOWN AS CONTOUR LINES ONLY WITHIN THE PERMIT 588 BOUNDARY REPRESENT THE TOPOGRAPHY CAPTURED ON MARCH 8, 2023 BY SCS ENGINEERS.
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD-83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD-88



SHEET TITLE  
**MARCH 2023 LANDFILL TOPO**

PROJECT TITLE  
**MONTHLY TOPOGRAPHY ANALYSIS  
SOLID WASTE PERMIT #588**

CLIENT  
**CITY OF BRISTOL INTEGRATED SOLID  
WASTE MANAGEMENT FACILITY**  
2655 VALLEY DRIVE  
BRISTOL, VIRGINIA 24201

**SCS ENGINEERS**  
STEARNS, CONRAD AND SCHMIDT  
CONSULTING ENGINEERS, INC.  
53 SOUTH MAIN STREET, NEWPORT, NJ 08065  
PH. (609) 654-4000 SCSENGINEERS.COM

PROJ. NO. \_\_\_\_\_  
DWN. BY: SCSB     D/A R/W BY: C.J.W.  
CHK. BY: C.J.W.     APP. BY: C.J.W.  
SRB

CADD FILE: \_\_\_\_\_

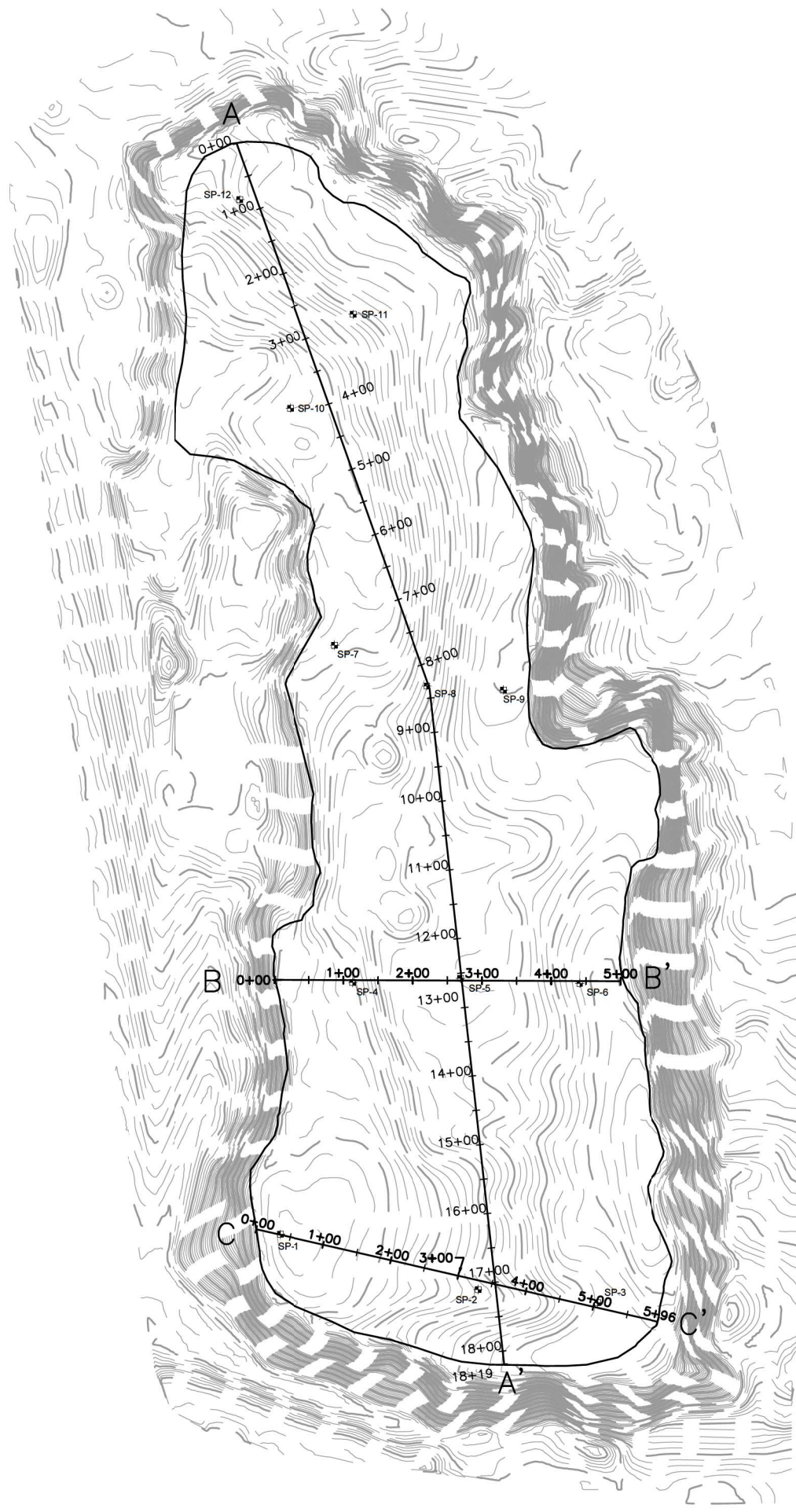
DATE:  
**3/30/2023**

SCALE:  
**1" = 100'**

DRAWING NO.  
**1** of **5**

NO.	REVISION	DATE

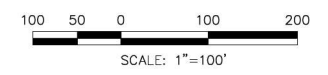




- LEGEND**
- MAJOR CONTOURS (EVERY 10')
  - MINOR CONTOURS (EVERY 2')
  - APPROX. SIDEWALL LOCATION
  - SP-XX SETTLEMENT PLATE

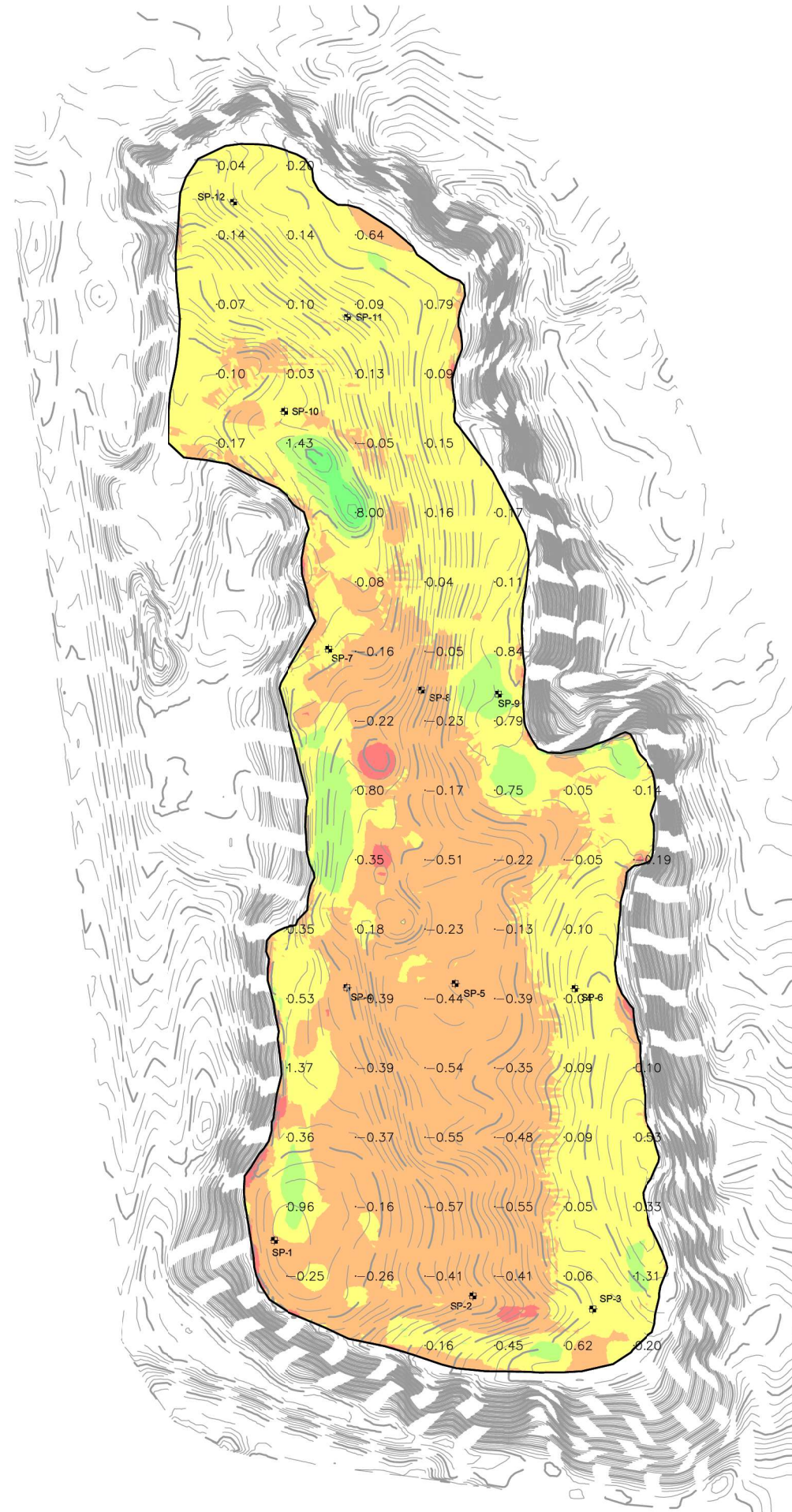
**NOTES:**

1. GRADES SHOWN AS CONTOUR LINES ONLY WITHIN THE PERMIT 588 BOUNDARY REPRESENT THE TOPOGRAPHY CAPTURED ON FEBRUARY 7, 2023 BY SCS ENGINEERS.
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD-83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD-88



NO.	REVISION	DATE		
<				
SHEET TITLE <b>FEBRUARY 2023 LANDFILL TOPO</b>			PROJECT TITLE <b>MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588</b>	
CLIENT <b>CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY</b> 2655 VALLEY DRIVE BRISTOL, VIRGINIA 24201			<b>SCS ENGINEERS</b> STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 53 SOUTH MAIN STREET, NEWPORT, NJ 08065 PH. (609) 654-4000 SCSENGINEERS.COM	
DWN. BY:	CHK. BY:	O/A R/W BY:	APP. BY:	CJW
SRB	SCB	CJW	CJW	CJW
CADD FILE:				
DATE: 3/30/2023				
SCALE: 1" = 100'				
DRAWING NO. <b>2</b> of <b>5</b>				





Volume  
 Base Surface 2-7-23 TOPO  
 Comparison Surface 3-9-23 TOPO  
 Cut volume 3788.50 Cu. Yd.  
 Fill volume 6294.35 Cu. Yd.  
 Net Fill 2505.85 Cu. Yd.

Elevation Changes		
Color	Min. Elevation	Max. Elevation
Red	-5.00'	-1.00'
Orange	-1.00'	0.00'
Yellow	0.00'	1.00'
Light Green	1.00'	5.00'
Dark Green	5.00'	10.00'

**NOTES:**

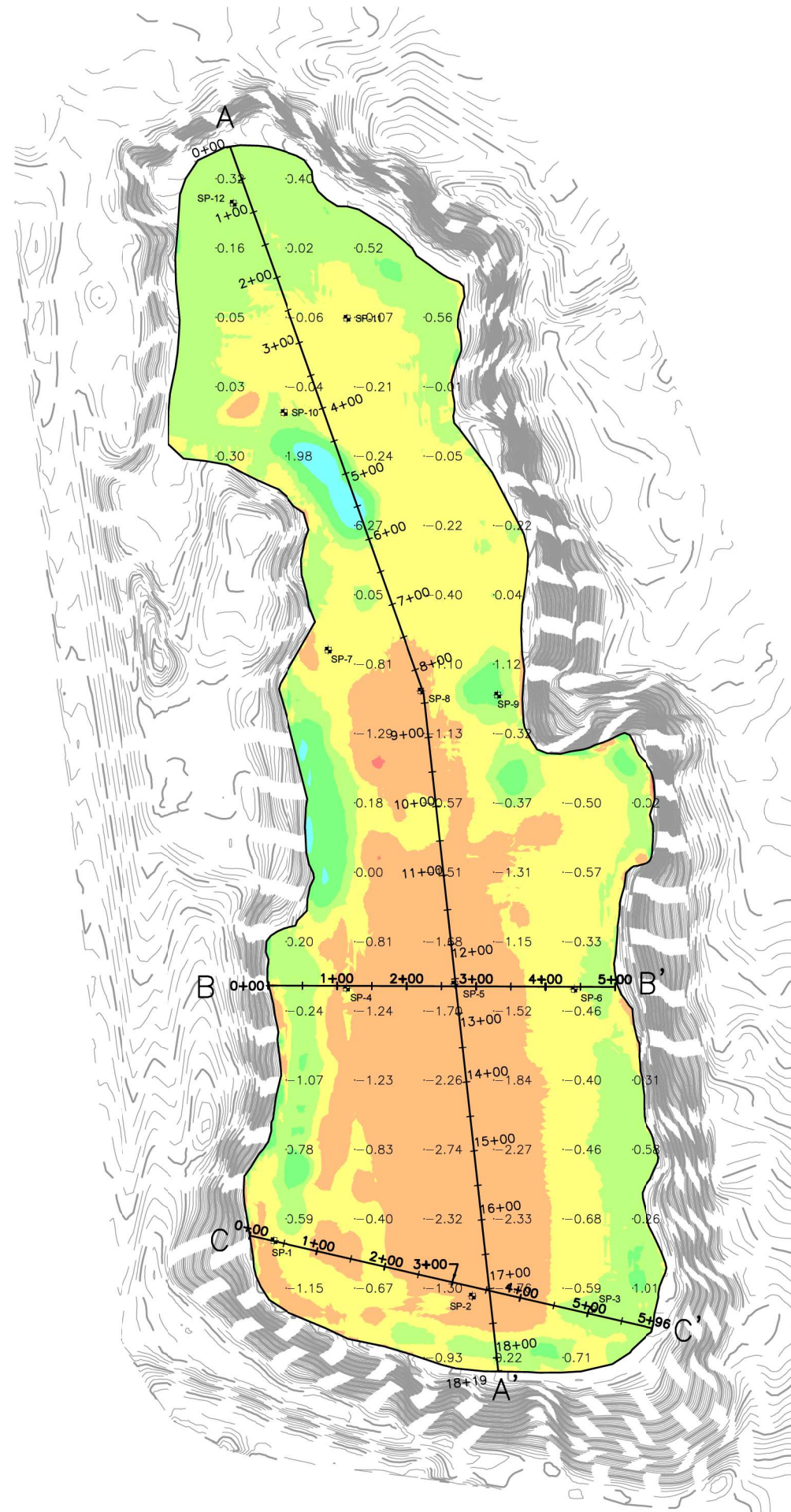
1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AREIAL TOPOGRAPHY DATA CAPTURED ON FEBRUARY 7, 2023 AND THE AERIAL TOPOGRAPHY DATA CAPTURED ON MARCH 9, 2023 BY SCS ENGINEERS. POSITIVE VALUE (+) INDICATES FILL AND NEGATIVE VALUES (-) INDICATE CUT (SETTLEMENT). VALUES ARE ROUNDED TO THE NEAREST FOOT.
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. SETTLEMENT PLATE LOCATIONS AND COORDINATES ARE BASED ON A SITE SPECIFIC COORDINATE SYSTEM.
4. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD-83 (2011)
5. THE VERTICAL DATUM IS BASED UPON NAVD-88



- LEGEND**
- MAJOR CONTOURS (EVERY 10')
  - MINOR CONTOURS (EVERY 2')
  - APPROX. SIDEWALL LOCATION
  - ★ SP-XX SETTLEMENT PLATE

NO.	REVISION	DATE			
SHEET TITLE		PROJECT TITLE			
VOLUME CHANGE MARCH 2023		MONTHLY TOPOGRAPHY ANALYSIS			
		SOLID WASTE PERMIT #588			
CLIENT		CLIENT ADDRESS			
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY		2655 VALLEY DRIVE BRISTOL, VIRGINIA 24201			
SCS ENGINEERS		SCS ENGINEERS PROJECT INFORMATION			
STEARNES, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.		PROJ. NO. 2227.0208.05			
53 SOUTH MAIN STREET, NEWPORT, NJ 08065		DWN. BY: SRB			
PH. (609) 654-4000 SCSENGINEERS.COM		CHK. BY: C.J.W.			
		APP. BY: C.J.W.			
CADD FILE:					
DATE: 3/30/2023					
SCALE: 1"=100'					
DRAWING NO. 3 of 5					





Volume			
Base Surface Comparison	Surface	12-2-22 TOPO	
	Surface	3-9-23 TOPO	
Cut volume	18659.30	Cu. Yd.	
Fill volume	6170.88	Cu. Yd.	
Net Cut	12488.42	Cu. Yd.	

Number	Minimum Elevation	Maximum Elevation	Color
1	-10.000	-5.000	Red
2	-5.000	-1.000	Orange
3	-1.000	0.000	Yellow
4	0.000	1.000	Light Green
5	1.000	5.000	Green
6	5.000	10.000	Light Blue

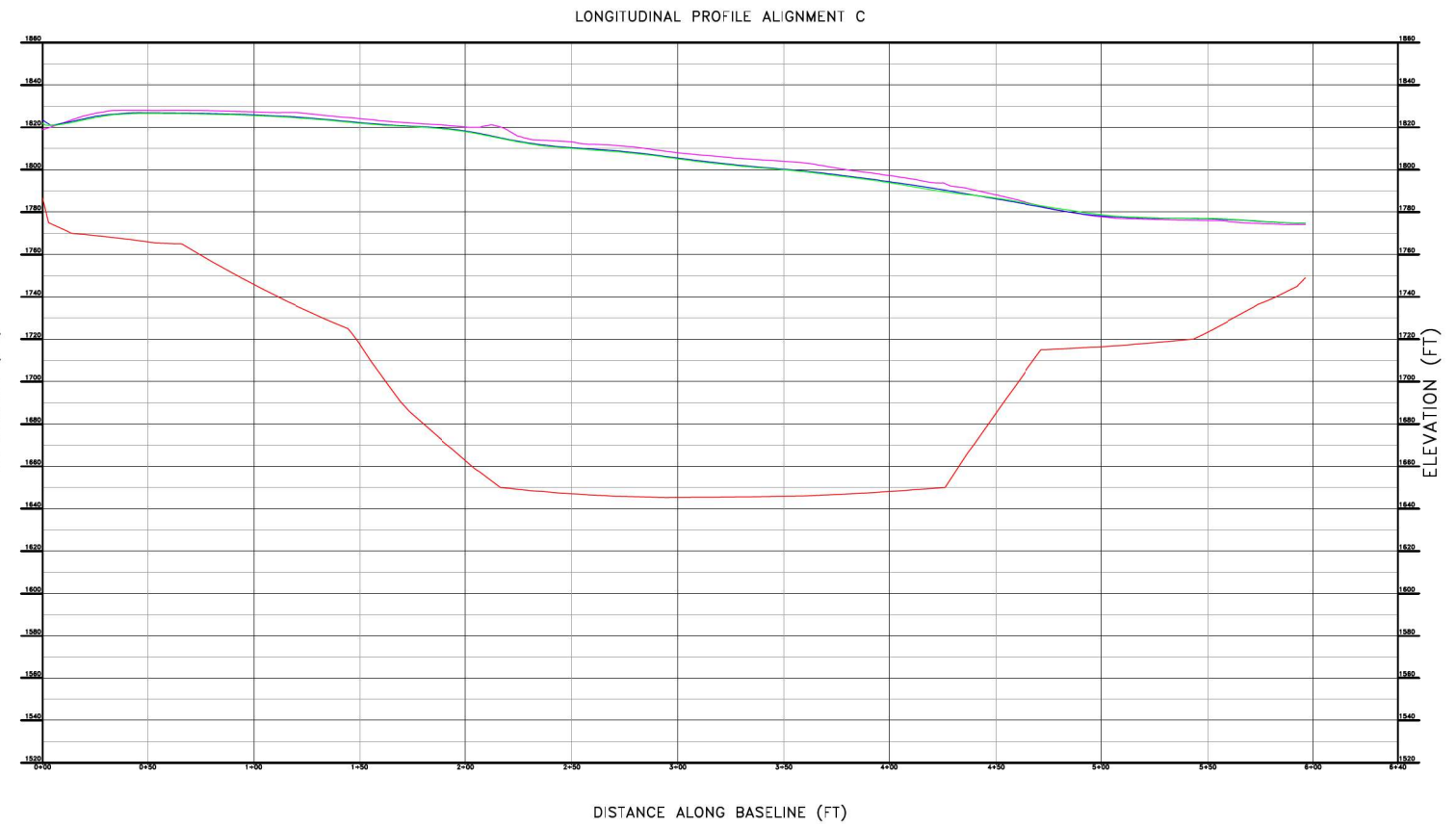
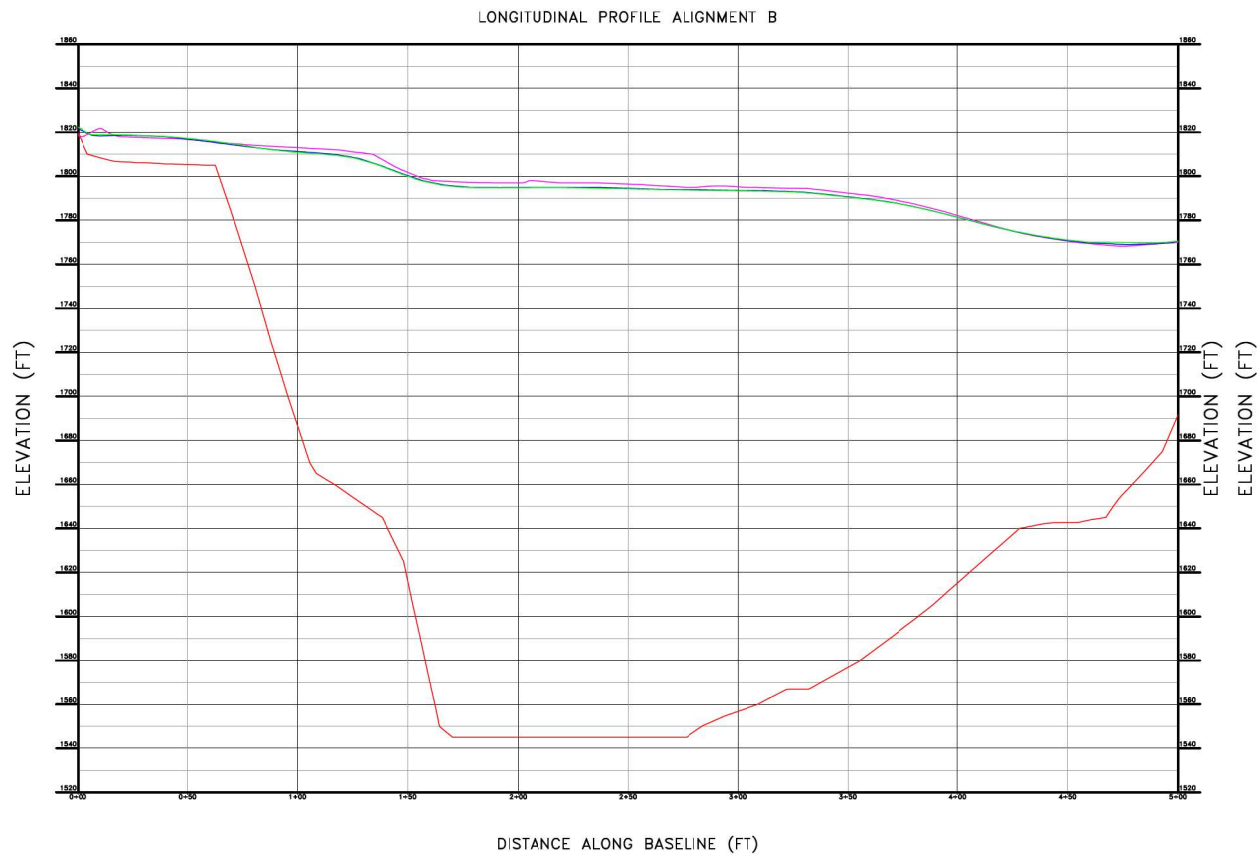
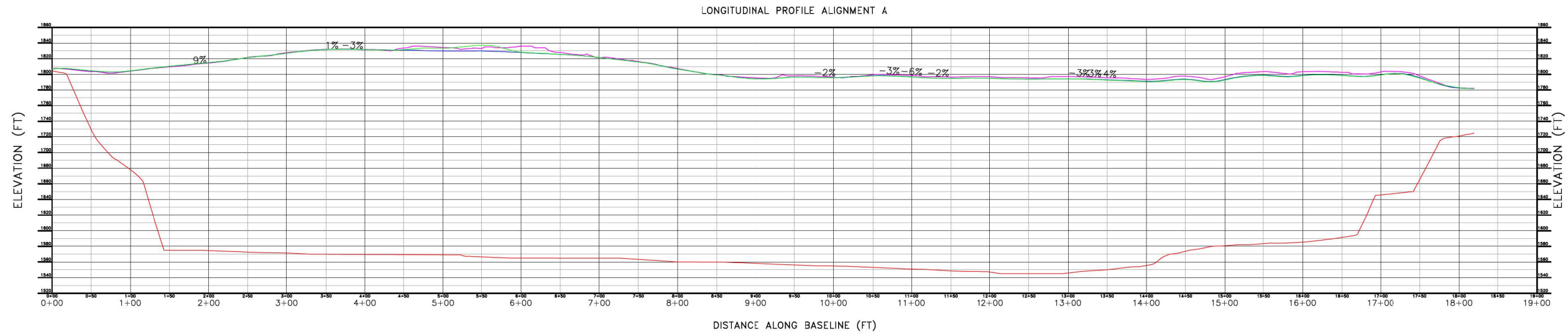
**NOTES:**

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AERIAL TOPOGRAPHY DATA CAPTURED ON DECEMBER 2, 2022 AND THE AERIAL TOPOGRAPHY DATA CAPTURED ON MARCH 9, 2023 BY SCS ENGINEERS. POSITIVE VALUE (+) INDICATES FILL AND NEGATIVE VALUES (-) INDICATE CUT (SETTLEMENT). VALUES ARE ROUNDED TO THE NEAREST FOOT.
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. SETTLEMENT PLATE LOCATIONS AND COORDINATES ARE BASED ON A SITE SPECIFIC COORDINATE SYSTEM.
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5. THE VERTICAL DATUM IS BASED UPON NAVD-88

- LEGEND**
- MAJOR CONTOURS (EVERY 10')
  - MINOR CONTOURS (EVERY 2')
  - APPROX. SIDEWALL LOCATION
  - ★ SP-XX SETTLEMENT PLATE



DATE					
REVISION					
NO.	NO.	NO.	NO.	NO.	NO.
SHEET TITLE	MARCH VOLUME CHANGE	MARCH 2023 TO DECEMBER 2022			
PROJECT TITLE	MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588				
CLIENT	CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY 2655 VALLEY DRIVE BRISTOL, VIRGINIA 24201				
SCS ENGINEERS	STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 53 SOUTH MAIN STREET, NEWTON, NJ 08865 PH. (609) 654-4000 SCSENGINEERS.COM				
PROJ. NO.	DWN. BY:	CHK. BY:	APP. BY:	CJW	CJW
02276208.05	SRB	SRB	SRB	CJW	CJW
CADD FILE:					
DATE:					
3/30/2023					
SCALE:					
1"=100'					
DRAWING NO.					
<b>4</b> of <b>5</b>					



- LEGEND**
- BOTTOM LINER GRADES
  - OCTOBER 2022 FLYOVER TOPO
  - FEBRUARY 2023 FLYOVER TOPO
  - MARCH 2023 FLYOVER TOPO

NO.	REVISION	DATE
△		
△		
△		
△		
△		

**PROFILES**


SHEET TITLE  
PROJECT TITLE  
**MONTHLY TOPOGRAPHY ANALYSIS  
SOLID WASTE PERMIT #588**

CLIENT  
**CITY OF BRISTOL INTEGRATED SOLID  
WASTE MANAGEMENT FACILITY**  
2655 VALLEY DRIVE  
BRISTOL, VIRGINIA 24201

**SCS ENGINEERS**  
STEARNS, CONRAD AND SCHMIDT  
CONSULTING ENGINEERS, INC.  
53 SOUTH MAIN STREET, NEWPORT, NJ 08085  
PH: (609) 654-4000 SCSENGINEERS.COM

PROJ. NO. 22276208.05  
ISS. DATE 3/30/23  
DWN. BY: SRB  
CHK. BY: C.J.W.  
APP. BY: C.J.W.

CADD FILE:  
DATE: 3/30/2023  
SCALE: AS NOTED  
DRAWING NO.



Appendix F  
Sample Collection Log and Lab Report



City of Bristol SWP 588 Landfill  
Dual Phase LFG-EW Sample Collection Log

Location ID	Sample Date	Sample Time	Temperature (°C)	pH (s.u.)	Specific Conductance (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Observations
EW-49									
EW-50									
EW-51									
EW-52									
EW-53									
EW-54									
EW-55									
EW-56									
EW-57									
EW-58	030623	1045	34.9	7.33	9.80	0.97	-271.7	7390	
EW-59	030623	1033	55.0	7.59	17.08	2.29	-77.2	7100	Highly odorous Dark grey/black grey foamy head
EW-60									
EW-61									
EW-62									
EW-63									
EW-64									
EW-65									
EW-67									
EW-68									

Sampler:

A. Minnick

Samples Shipped By: Courier

Log Checked By:

J. Robb (SCS)

Laboratory: Enthalpy Analytical



City of Bristol SWP 588 Landfill  
Dual Phase LFG-EW Liquid Level Measurement Log

Date	3/6/2023							
Personnel	A. Minnick, N. Gathings							
Location ID	Date	Well Casing Depth (ft)	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Suckup (ft)	Liquid Column Thickness (ft)	Comments
EW-49	3/6/2023	96.15	90	439652	---	5.49	---	Stickup Too Tall
EW-50	3/6/2023	77.70	83	793509	30.04	2.71	47.66	
EW-51	3/6/2023	92.80	95	---	32.04	3.32	60.76	No Cycle Counter
EW-52	3/6/2023	98.70	93	---	---	2.41	---	No Pump
EW-53	3/6/2023	100.70	---	1852600	11.76	3.61	88.94	
EW-54	3/6/2023	82.70	75	---	---	4.32	---	No Pump
EW-55	3/6/2023	90.40	90	529010	24.03	5.28	66.37	No Airhose
EW-56	3/6/2023	58.50	58	---	---	---	---	No Pump
EW-57	3/6/2023	107.40	71	---	---	3.69	---	No Pump
EW-58	3/6/2023	84.50	82	1615442	17.21	4.98	67.29	
EW-59	3/6/2023	73.40	64	1121029	30.05	3.41	43.35	
EW-60	3/6/2023	81.80	70	---	---	2.52	---	No Pump
EW-61	3/6/2023	87.80	66	212085	28.21	3.53	59.59	
EW-62	3/6/2023	110.60	80	113994	55.90	3.62	54.70	
EW-63	3/6/2023	62.10	64	48068	42.24	4.09	19.86	No Airhose
EW-64	3/6/2023	109.00	113	98033	62.80	6.41	46.20	Lines Disconnected
EW-65	3/6/2023	88.40	50	3871	39.28	5.23	49.12	Lines Disconnected
EW-67	3/6/2023	107.75	62.5	347157	35.77	4.21	71.98	
EW-68	3/6/2023	73.57	68	1813225	30.28	3.29	43.29	

--- = not applicable/available

Well casing depths measured on 12/20-21/2022 from top of PVC.

Well casing suckup - measured on 01/17/2023.

Log Checked By: J. Robb



1941 Reymet Road • Richmond, Virginia 23237 • Tel: (804)-358-8295 Fax: (804)-358-8297

## Certificate of Analysis

*Final Report*

Laboratory Order ID 23C0397

Client Name: SCS Engineers-Winchester  
296 Victory Road  
Winchester, VA 22602

Date Received: March 8, 2023 8:00  
Date Issued: April 4, 2023 15:37  
Project Number: 02218208.15 Task 1  
Purchase Order:

Submitted To: Jennifer Robb

Client Site I.D.: City of Bristol Landfill

Enclosed are the results of analyses for samples received by the laboratory on 03/08/2023 08:00. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars  
Technical Director

**End Notes:**

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Enthalpy Analytical.

**Analysis Detects Report**

 Client Name: SCS Engineers-Winchester  
 Client Site ID: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Laboratory Sample ID: 23C0397-01

Client Sample ID: EW-58

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01RE1	SW6010D	1.07		0.0100	0.0200	1	mg/L
Barium	01	SW6010D	0.406		0.0050	0.0100	1	mg/L
Chromium	01RE1	SW6010D	0.213		0.0080	0.0100	1	mg/L
Nickel	01RE1	SW6010D	0.1254		0.0070	0.0100	1	mg/L
Zinc	01	SW6010D	0.0689		0.0100	0.0100	1	mg/L
2-Butanone (MEK)	01	SW8260D	257		30.0	100	10	ug/L
Acetone	01	SW8260D	375		70.0	100	10	ug/L
Benzene	01	SW8260D	1540		4.00	10.0	10	ug/L
Ethylbenzene	01	SW8260D	131		4.00	10.0	10	ug/L
Tetrahydrofuran	01	SW8260D	353		100	100	10	ug/L
Toluene	01	SW8260D	182		5.00	10.0	10	ug/L
Xylenes, Total	01	SW8260D	240		10.0	30.0	10	ug/L
Ammonia as N	01	EPA350.1 R2.0	667		73.1	100	1000	mg/L
BOD	01	SM22 5210B-2011	1570		0.2	2.0	1	mg/L
COD	01	SM22 5220D-2011	1690		500	500	1	mg/L
TKN as N	01	EPA351.2 R2.0	879		33.6	100	200	mg/L
Total Recoverable Phenolics	01	SW9065	0.400		0.030	0.050	1	mg/L

**Analysis Detects Report**

Client Name: SCS Engineers-Winchester  
 Client Site ID: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Laboratory Sample ID: 23C0397-02      Client Sample ID: EW-59

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	02RE1	SW6010D	1.00		0.0100	0.0200	1	mg/L
Barium	02	SW6010D	0.683		0.0050	0.0100	1	mg/L
Chromium	02RE1	SW6010D	0.188		0.0080	0.0100	1	mg/L
Nickel	02RE1	SW6010D	0.1033		0.0070	0.0100	1	mg/L
Zinc	02	SW6010D	0.0538		0.0100	0.0100	1	mg/L
2-Butanone (MEK)	02	SW8260D	2770		30.0	100	10	ug/L
Acetone	02RE1	SW8260D	6810		700	1000	100	ug/L
Benzene	02	SW8260D	727		4.00	10.0	10	ug/L
Ethylbenzene	02	SW8260D	71.5		4.00	10.0	10	ug/L
Tetrahydrofuran	02	SW8260D	464		100	100	10	ug/L
Toluene	02	SW8260D	98.1		5.00	10.0	10	ug/L
Xylenes, Total	02	SW8260D	111		10.0	30.0	10	ug/L
Ammonia as N	02	EPA350.1 R2.0	1480		73.1	100	1000	mg/L
BOD	02	SM22 5210B-2011	9190		0.2	2.0	1	mg/L
COD	02	SM22 5220D-2011	10600		2000	2000	200	mg/L
TKN as N	02	EPA351.2 R2.0	1920		33.6	100	200	mg/L
Total Recoverable Phenolics	02	SW9065	13.9		0.300	0.500	10	mg/L

Note that this report is not the "Certificate of Analysis". This report only lists the target analytes that displayed concentrations that exceeded the detection limit specified for that analyte. For a complete listing of all analytes requested and the results of the analysis see the "Certificate of Analysis".

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**Certificate of Analysis**Client Name: SCS Engineers-Winchester  
Client Site I.D.: City of Bristol Landfill  
Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-58	23C0397-01	Ground Water	03/06/2023 10:45	03/08/2023 08:00
EW-59	23C0397-02	Ground Water	03/06/2023 10:33	03/08/2023 08:00
Trip Blank	23C0397-03	Ground Water	01/09/2023 14:30	03/08/2023 08:00

Analysis for Volatile Fatty Acids was subcontracted to Weck. The subcontracted results are attached at the end of this Certificate of Analysis.

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Client Sample ID: EW-58

Laboratory Sample ID: 23C0397-01

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
<b>Metals (Total) by EPA 6000/7000 Series Methods</b>												
Silver	01	7440-22-4	SW6010D	03/10/2023 12:30	03/13/2023 12:51	BLOD		0.0050	0.0100	1	mg/L	AB
Arsenic	01RE1	7440-38-2	SW6010D	03/10/2023 12:30	03/20/2023 14:30	1.07		0.0100	0.0200	1	mg/L	ACM
Barium	01	7440-39-3	SW6010D	03/10/2023 12:30	03/13/2023 12:51	0.406		0.0050	0.0100	1	mg/L	AB
Cadmium	01	7440-43-9	SW6010D	03/10/2023 12:30	03/13/2023 12:51	BLOD		0.0020	0.0040	1	mg/L	AB
Chromium	01RE1	7440-47-3	SW6010D	03/10/2023 12:30	03/20/2023 14:30	0.213		0.0080	0.0100	1	mg/L	ACM
Copper	01	7440-50-8	SW6010D	03/10/2023 12:30	03/13/2023 12:51	BLOD		0.0080	0.0100	1	mg/L	AB
Mercury	01	7439-97-6	SW7470A	03/09/2023 11:10	03/09/2023 14:14	BLOD		0.00020	0.00020	1	mg/L	SGT
Nickel	01RE1	7440-02-0	SW6010D	03/10/2023 12:30	03/20/2023 14:30	0.1254		0.0070	0.0100	1	mg/L	ACM
Lead	01	7439-92-1	SW6010D	03/10/2023 12:30	03/13/2023 12:51	BLOD		0.0060	0.0100	1	mg/L	AB
Selenium	01	7782-49-2	SW6010D	03/10/2023 12:30	03/13/2023 12:51	BLOD		0.0400	0.0500	1	mg/L	AB
Zinc	01	7440-66-6	SW6010D	03/10/2023 12:30	03/13/2023 12:51	0.0689		0.0100	0.0100	1	mg/L	AB
<b>Volatile Organic Compounds by GCMS</b>												
2-Butanone (MEK)	01	78-93-3	SW8260D	03/09/2023 17:33	03/09/2023 17:33	257		30.0	100	10	ug/L	RJB
Acetone	01	67-64-1	SW8260D	03/09/2023 17:33	03/09/2023 17:33	375		70.0	100	10	ug/L	RJB
Benzene	01	71-43-2	SW8260D	03/09/2023 17:33	03/09/2023 17:33	1540		4.00	10.0	10	ug/L	RJB
Ethylbenzene	01	100-41-4	SW8260D	03/09/2023 17:33	03/09/2023 17:33	131		4.00	10.0	10	ug/L	RJB
Toluene	01	108-88-3	SW8260D	03/09/2023 17:33	03/09/2023 17:33	182		5.00	10.0	10	ug/L	RJB
Xylenes, Total	01	1330-20-7	SW8260D	03/09/2023 17:33	03/09/2023 17:33	240		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	01	109-99-9	SW8260D	03/09/2023 17:33	03/09/2023 17:33	353		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	01	96.8 %	70-120	03/09/2023 17:33	03/09/2023 17:33							
Surr: 4-Bromofluorobenzene (Surr)	01	92.2 %	75-120	03/09/2023 17:33	03/09/2023 17:33							
Surr: Dibromofluoromethane (Surr)	01	94.7 %	70-130	03/09/2023 17:33	03/09/2023 17:33							
Surr: Toluene-d8 (Surr)	01	98.3 %	70-130	03/09/2023 17:33	03/09/2023 17:33							

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Client Sample ID: EW-58

Laboratory Sample ID: 23C0397-01

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
<b>Semivolatile Organic Compounds by GCMS</b>												
Anthracene	01	120-12-7	SW8270E	03/09/2023 08:50	03/09/2023 17:25	BLOD		117	234	1	ug/L	KCS
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	01	194 %	5-136	03/09/2023 08:50	03/09/2023 17:25							S
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	01	65.5 %	9-117	03/09/2023 08:50	03/09/2023 17:25							
<i>Surr: 2-Fluorophenol (Surr)</i>	01	26.0 %	5-60	03/09/2023 08:50	03/09/2023 17:25							
<i>Surr: Nitrobenzene-d5 (Surr)</i>	01	67.5 %	5-151	03/09/2023 08:50	03/09/2023 17:25							
<i>Surr: Phenol-d5 (Surr)</i>	01	25.0 %	5-60	03/09/2023 08:50	03/09/2023 17:25							
<i>Surr: p-Terphenyl-d14 (Surr)</i>	01	74.5 %	5-141	03/09/2023 08:50	03/09/2023 17:25							

## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Client Sample ID: EW-58

Laboratory Sample ID: 23C0397-01

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
<b>Wet Chemistry Analysis</b>												
Ammonia as N	01	7664-41-7	EPA350.1 R2.0	03/13/2023 14:04	03/13/2023 14:04	667		73.1	100	1000	mg/L	MKS
BOD	01	E1640606	SM22 5210B-2011	03/08/2023 09:57	03/08/2023 09:57	1570		0.2	2.0	1	mg/L	TMB
COD	01	NA	SM22 5220D-2011	03/10/2023 09:30	03/10/2023 09:30	1690		500	500	1	mg/L	MGC
Nitrate as N	01	14797-55-8	Calc.	03/16/2023 12:19	03/16/2023 12:19	BLOD		1.04	5.10	100	mg/L	LTN
Nitrate+Nitrite as N	01	E701177	SM22 4500-NO3F- 2011	03/16/2023 12:19	03/16/2023 12:19	BLOD		0.04	0.10	1	mg/L	NBT
Nitrite as N	01	14797-65-0	SM22 4500-NO2B- 2011	03/08/2023 09:05	03/08/2023 16:44	BLOD		1.00	5.00	100	mg/L	LTN
Total Recoverable Phenolics	01	NA	SW9065	03/10/2023 16:52	03/10/2023 16:52	0.400		0.030	0.050	1	mg/L	MAH
TKN as N	01	E17148461	EPA351.2 R2.0	03/16/2023 11:43	03/16/2023 11:43	879		33.6	100	200	mg/L	AAL



## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Client Sample ID: EW-59

Laboratory Sample ID: 23C0397-02

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
<b>Metals (Total) by EPA 6000/7000 Series Methods</b>												
Silver	02	7440-22-4	SW6010D	03/10/2023 12:30	03/13/2023 12:52	BLOD		0.0050	0.0100	1	mg/L	AB
Arsenic	02RE1	7440-38-2	SW6010D	03/10/2023 12:30	03/20/2023 14:35	1.00		0.0100	0.0200	1	mg/L	ACM
Barium	02	7440-39-3	SW6010D	03/10/2023 12:30	03/13/2023 12:52	0.683		0.0050	0.0100	1	mg/L	AB
Cadmium	02	7440-43-9	SW6010D	03/10/2023 12:30	03/13/2023 12:52	BLOD		0.0020	0.0040	1	mg/L	AB
Chromium	02RE1	7440-47-3	SW6010D	03/10/2023 12:30	03/20/2023 14:35	0.188		0.0080	0.0100	1	mg/L	ACM
Copper	02	7440-50-8	SW6010D	03/10/2023 12:30	03/13/2023 12:52	BLOD		0.0080	0.0100	1	mg/L	AB
Mercury	02	7439-97-6	SW7470A	03/09/2023 11:10	03/09/2023 14:16	BLOD		0.00040	0.00040	1	mg/L	SGT
Nickel	02RE1	7440-02-0	SW6010D	03/10/2023 12:30	03/20/2023 14:35	0.1033		0.0070	0.0100	1	mg/L	ACM
Lead	02	7439-92-1	SW6010D	03/10/2023 12:30	03/13/2023 12:52	BLOD		0.0060	0.0100	1	mg/L	AB
Selenium	02	7782-49-2	SW6010D	03/10/2023 12:30	03/13/2023 12:52	BLOD		0.0400	0.0500	1	mg/L	AB
Zinc	02	7440-66-6	SW6010D	03/10/2023 12:30	03/13/2023 12:52	0.0538		0.0100	0.0100	1	mg/L	AB

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Client Sample ID: EW-59

Laboratory Sample ID: 23C0397-02

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
<b>Volatile Organic Compounds by GCMS</b>												
2-Butanone (MEK)	02	78-93-3	SW8260D	03/09/2023 18:22	03/09/2023 18:22	2770		30.0	100	10	ug/L	RJB
Acetone	02RE1	67-64-1	SW8260D	03/09/2023 18:46	03/09/2023 18:46	6810		700	1000	100	ug/L	RJB
Benzene	02	71-43-2	SW8260D	03/09/2023 18:22	03/09/2023 18:22	727		4.00	10.0	10	ug/L	RJB
Ethylbenzene	02	100-41-4	SW8260D	03/09/2023 18:22	03/09/2023 18:22	71.5		4.00	10.0	10	ug/L	RJB
Toluene	02	108-88-3	SW8260D	03/09/2023 18:22	03/09/2023 18:22	98.1		5.00	10.0	10	ug/L	RJB
Xylenes, Total	02	1330-20-7	SW8260D	03/09/2023 18:22	03/09/2023 18:22	111		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	02	109-99-9	SW8260D	03/09/2023 18:22	03/09/2023 18:22	464		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	02	92.8 %	70-120	03/09/2023 18:22	03/09/2023 18:22							
Surr: 4-Bromofluorobenzene (Surr)	02	93.2 %	75-120	03/09/2023 18:22	03/09/2023 18:22							
Surr: Dibromofluoromethane (Surr)	02	93.4 %	70-130	03/09/2023 18:22	03/09/2023 18:22							
Surr: Toluene-d8 (Surr)	02	98.4 %	70-130	03/09/2023 18:22	03/09/2023 18:22							
Surr: 1,2-Dichloroethane-d4 (Surr)	02RE1	98.3 %	70-120	03/09/2023 18:46	03/09/2023 18:46							
Surr: 4-Bromofluorobenzene (Surr)	02RE1	96.3 %	75-120	03/09/2023 18:46	03/09/2023 18:46							
Surr: Dibromofluoromethane (Surr)	02RE1	95.1 %	70-130	03/09/2023 18:46	03/09/2023 18:46							
Surr: Toluene-d8 (Surr)	02RE1	98.5 %	70-130	03/09/2023 18:46	03/09/2023 18:46							
<b>Semivolatile Organic Compounds by GCMS</b>												
Anthracene	02	120-12-7	SW8270E	03/09/2023 08:50	03/10/2023 14:20	BLOD		51.0	102	10	ug/L	KCS
Surr: 2,4,6-Tribromophenol (Surr)	02	79.6 %	5-136	03/09/2023 08:50	03/10/2023 14:20							
Surr: 2-Fluorobiphenyl (Surr)	02	30.0 %	9-117	03/09/2023 08:50	03/10/2023 14:20							
Surr: 2-Fluorophenol (Surr)	02	12.7 %	5-60	03/09/2023 08:50	03/10/2023 14:20							
Surr: Nitrobenzene-d5 (Surr)	02	69.0 %	5-151	03/09/2023 08:50	03/10/2023 14:20							
Surr: Phenol-d5 (Surr)	02	0.100 %	5-60	03/09/2023 08:50	03/10/2023 14:20							DS
Surr: p-Terphenyl-d14 (Surr)	02	23.4 %	5-141	03/09/2023 08:50	03/10/2023 14:20							

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Client Sample ID: EW-59

Laboratory Sample ID: 23C0397-02

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
<b>Wet Chemistry Analysis</b>												
Ammonia as N	02	7664-41-7	EPA350.1 R2.0	03/13/2023 14:04	03/13/2023 14:04	1480		73.1	100	1000	mg/L	MKS
BOD	02	E1640606	SM22 5210B-2011	03/08/2023 09:59	03/08/2023 09:59	9190		0.2	2.0	1	mg/L	TMB
COD	02	NA	SM22 5220D-2011	03/10/2023 09:30	03/10/2023 09:30	10600		2000	2000	200	mg/L	MGC
Nitrate as N	02	14797-55-8	Calc.	03/16/2023 12:21	03/16/2023 12:21	BLOD		1.04	5.10	100	mg/L	LTN
Nitrate+Nitrite as N	02	E701177	SM22 4500-NO3F- 2011	03/16/2023 12:21	03/16/2023 12:21	BLOD		0.04	0.10	1	mg/L	NBT
Nitrite as N	02	14797-65-0	SM22 4500-NO2B- 2011	03/08/2023 09:05	03/08/2023 16:44	BLOD		1.00	5.00	100	mg/L	LTN
Total Recoverable Phenolics	02	NA	SW9065	03/15/2023 16:21	03/15/2023 16:21	13.9		0.300	0.500	10	mg/L	MAH
TKN as N	02	E17148461	EPA351.2 R2.0	03/16/2023 11:44	03/16/2023 11:44	1920		33.6	100	200	mg/L	AAL

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Client Sample ID: Trip Blank

Laboratory Sample ID: 23C0397-03

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
<b>Volatile Organic Compounds by GCMS</b>												
2-Butanone (MEK)	03	78-93-3	SW8260D	03/09/2023 11:51	03/09/2023 11:51	BLOD		3.00	10.0	1	ug/L	RJB
Acetone	03	67-64-1	SW8260D	03/09/2023 11:51	03/09/2023 11:51	BLOD		7.00	10.0	1	ug/L	RJB
Benzene	03	71-43-2	SW8260D	03/09/2023 11:51	03/09/2023 11:51	BLOD		0.40	1.00	1	ug/L	RJB
Ethylbenzene	03	100-41-4	SW8260D	03/09/2023 11:51	03/09/2023 11:51	BLOD		0.40	1.00	1	ug/L	RJB
Toluene	03	108-88-3	SW8260D	03/09/2023 11:51	03/09/2023 11:51	BLOD		0.50	1.00	1	ug/L	RJB
Xylenes, Total	03	1330-20-7	SW8260D	03/09/2023 11:51	03/09/2023 11:51	BLOD		1.00	3.00	1	ug/L	RJB
Tetrahydrofuran	03	109-99-9	SW8260D	03/09/2023 11:51	03/09/2023 11:51	BLOD		10.0	10.0	1	ug/L	RJB
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	03	94.0 %	70-120	03/09/2023 11:51	03/09/2023 11:51							
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	03	94.8 %	75-120	03/09/2023 11:51	03/09/2023 11:51							
<i>Surr: Dibromofluoromethane (Surr)</i>	03	95.8 %	70-130	03/09/2023 11:51	03/09/2023 11:51							
<i>Surr: Toluene-d8 (Surr)</i>	03	99.3 %	70-130	03/09/2023 11:51	03/09/2023 11:51							

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0322 - SW7470A

**Blank (BGC0322-BLK1)**

Prepared &amp; Analyzed: 03/09/2023

Mercury ND 0.00020 mg/L

**LCS (BGC0322-BS1)**

Prepared &amp; Analyzed: 03/09/2023

Mercury 0.00253 0.00020 mg/L 0.00250 101 80-120

**Matrix Spike (BGC0322-MS1)**

Source: 23C0441-01

Prepared &amp; Analyzed: 03/09/2023

Mercury 0.00217 0.00020 mg/L 0.00250 BLOD 86.8 80-120

**Matrix Spike Dup (BGC0322-MSD1)**

Source: 23C0441-01

Prepared &amp; Analyzed: 03/09/2023

Mercury 0.00205 0.00020 mg/L 0.00250 BLOD 82.1 80-120 5.56 20

### Batch BGC0373 - EPA200.2/R2.8

**Blank (BGC0373-BLK1)**

Prepared: 03/10/2023 Analyzed: 03/13/2023

Arsenic	ND	0.0200	mg/L
Barium	ND	0.0100	mg/L
Cadmium	ND	0.0040	mg/L
Chromium	ND	0.0100	mg/L
Copper	ND	0.0100	mg/L
Lead	ND	0.0100	mg/L
Nickel	ND	0.0100	mg/L
Selenium	ND	0.0500	mg/L
Silver	ND	0.0100	mg/L
Zinc	ND	0.0100	mg/L

**LCS (BGC0373-BS1)**

Prepared: 03/10/2023 Analyzed: 03/13/2023

Arsenic	0.550	0.0200	mg/L	0.500	110	80-120
Barium	0.487	0.0100	mg/L	0.500	97.5	80-120

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0373 - EPA200.2/R2.8

**LCS (BGC0373-BS1)**

Prepared: 03/10/2023 Analyzed: 03/13/2023

Cadmium	0.572	0.0040	mg/L	0.500		114	80-120			
Chromium	0.546	0.0100	mg/L	0.500		109	80-120			
Copper	0.564	0.0100	mg/L	0.500		113	80-120			
Lead	0.572	0.0100	mg/L	0.500		114	80-120			
Nickel	0.5629	0.0100	mg/L	0.500		113	80-120			
Selenium	0.566	0.0500	mg/L	0.500		113	80-120			
Silver	0.0991	0.0100	mg/L	0.100		99.1	80-120			
Zinc	0.525	0.0100	mg/L	0.500		105	80-120			

**Matrix Spike (BGC0373-MS1)**

Source: 23C0431-07

Prepared: 03/10/2023 Analyzed: 03/13/2023

Arsenic	0.558	0.0200	mg/L	0.500	BLOD	112	75-125			
Barium	0.590	0.0100	mg/L	0.500	0.0756	103	75-125			
Cadmium	0.572	0.0040	mg/L	0.500	BLOD	114	75-125			
Chromium	0.558	0.0100	mg/L	0.500	BLOD	112	75-125			
Copper	0.566	0.0100	mg/L	0.500	BLOD	113	75-125			
Lead	0.571	0.0100	mg/L	0.500	BLOD	114	75-125			
Nickel	0.5703	0.0100	mg/L	0.500	0.0082	112	75-125			
Selenium	0.568	0.0500	mg/L	0.500	BLOD	114	75-125			
Silver	0.103	0.0100	mg/L	0.100	BLOD	103	75-125			E
Zinc	0.515	0.0100	mg/L	0.500	BLOD	103	75-125			

**Matrix Spike (BGC0373-MS2)**

Source: 23C0431-08

Prepared: 03/10/2023 Analyzed: 03/13/2023

Arsenic	0.600	0.0200	mg/L	0.500	BLOD	120	75-125			
Barium	0.549	0.0100	mg/L	0.500	BLOD	110	75-125			
Cadmium	0.622	0.0040	mg/L	0.500	BLOD	124	75-125			
Chromium	0.596	0.0100	mg/L	0.500	BLOD	119	75-125			

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
<b>Batch BGC0373 - EPA200.2/R2.8</b>										
<b>Matrix Spike (BGC0373-MS2)</b>										
			<b>Source: 23C0431-08</b>		Prepared: 03/10/2023 Analyzed: 03/13/2023					
Copper	0.620	0.0100	mg/L	0.500	BLOD	124	75-125			
Lead	0.623	0.0100	mg/L	0.500	BLOD	125	75-125			
Nickel	0.6141	0.0100	mg/L	0.500	BLOD	123	75-125			
Selenium	0.611	0.0500	mg/L	0.500	BLOD	122	75-125			
Silver	0.110	0.0100	mg/L	0.100	BLOD	110	75-125			E
Zinc	0.555	0.0100	mg/L	0.500	BLOD	111	75-125			
<b>Matrix Spike Dup (BGC0373-MSD1)</b>										
			<b>Source: 23C0431-07</b>		Prepared: 03/10/2023 Analyzed: 03/13/2023					
Arsenic	0.551	0.0200	mg/L	0.500	BLOD	110	75-125	1.15	20	
Barium	0.578	0.0100	mg/L	0.500	0.0756	100	75-125	2.18	20	
Cadmium	0.568	0.0040	mg/L	0.500	BLOD	114	75-125	0.754	20	
Chromium	0.554	0.0100	mg/L	0.500	BLOD	111	75-125	0.648	20	
Copper	0.562	0.0100	mg/L	0.500	BLOD	112	75-125	0.567	20	
Lead	0.568	0.0100	mg/L	0.500	BLOD	114	75-125	0.439	20	
Nickel	0.5659	0.0100	mg/L	0.500	0.0082	112	75-125	0.775	20	
Selenium	0.564	0.0500	mg/L	0.500	BLOD	113	75-125	0.672	20	
Silver	0.102	0.0100	mg/L	0.100	BLOD	102	75-125	1.08	20	E
Zinc	0.514	0.0100	mg/L	0.500	BLOD	103	75-125	0.194	20	
<b>Matrix Spike Dup (BGC0373-MSD2)</b>										
			<b>Source: 23C0431-08</b>		Prepared: 03/10/2023 Analyzed: 03/13/2023					
Arsenic	0.560	0.0200	mg/L	0.500	BLOD	112	75-125	6.81	20	
Barium	0.507	0.0100	mg/L	0.500	BLOD	101	75-125	7.86	20	
Cadmium	0.580	0.0040	mg/L	0.500	BLOD	116	75-125	6.93	20	
Chromium	0.556	0.0100	mg/L	0.500	BLOD	111	75-125	7.01	20	
Copper	0.578	0.0100	mg/L	0.500	BLOD	116	75-125	7.08	20	
Lead	0.581	0.0100	mg/L	0.500	BLOD	116	75-125	6.91	20	

## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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**Batch BGC0373 - EPA200.2/R2.8**

**Matrix Spike Dup (BGC0373-MSD2)**

**Source: 23C0431-08**

Prepared: 03/10/2023 Analyzed: 03/13/2023

Nickel	0.5738	0.0100	mg/L	0.500	BLOD	115	75-125	6.79	20	
Selenium	0.574	0.0500	mg/L	0.500	BLOD	115	75-125	6.21	20	
Silver	0.104	0.0100	mg/L	0.100	BLOD	104	75-125	5.53	20	E
Zinc	0.512	0.0100	mg/L	0.500	BLOD	102	75-125	8.07	20	



## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0325 - SW5030B-MS

**Blank (BGC0325-BLK1)**

Prepared &amp; Analyzed: 03/09/2023

2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Tetrahydrofuran	ND	10.0	ug/L							
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	48.3		ug/L	50.0		96.6	70-120			
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	47.7		ug/L	50.0		95.4	75-120			
<i>Surr: Dibromofluoromethane (Surr)</i>	47.9		ug/L	50.0		95.9	70-130			
<i>Surr: Toluene-d8 (Surr)</i>	49.1		ug/L	50.0		98.2	70-130			

**LCS (BGC0325-BS1)**

Prepared &amp; Analyzed: 03/09/2023

1,1,1,2-Tetrachloroethane	55.4	0.4	ug/L	50.0		111	80-130			
1,1,1-Trichloroethane	46.7	1	ug/L	50.0		93.5	65-130			
1,1,2,2-Tetrachloroethane	52.1	0.4	ug/L	50.0		104	65-130			
1,1,2-Trichloroethane	47.7	1	ug/L	50.0		95.4	75-125			
1,1-Dichloroethane	41.2	1	ug/L	50.0		82.4	70-135			
1,1-Dichloroethylene	40.1	1	ug/L	50.0		80.1	70-130			
1,1-Dichloropropene	42.8	1	ug/L	50.0		85.5	75-135			
1,2,3-Trichlorobenzene	55.7	1	ug/L	50.0		111	55-140			
1,2,3-Trichloropropane	51.7	1	ug/L	50.0		103	75-125			
1,2,4-Trichlorobenzene	57.9	1	ug/L	50.0		116	65-135			
1,2,4-Trimethylbenzene	51.7	1	ug/L	50.0		103	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	60.0	1	ug/L	50.0		120	50-130			

## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0325 - SW5030B-MS

**LCS (BGC0325-BS1)**

Prepared &amp; Analyzed: 03/09/2023

1,2-Dibromoethane (EDB)	56.0	1	ug/L	50.0		112	80-120			
1,2-Dichlorobenzene	54.8	0.5	ug/L	50.0		110	70-120			
1,2-Dichloroethane	43.9	1	ug/L	50.0		87.8	70-130			
1,2-Dichloropropane	42.7	0.5	ug/L	50.0		85.4	75-125			
1,3,5-Trimethylbenzene	50.0	1	ug/L	50.0		100	75-125			
1,3-Dichlorobenzene	55.7	1	ug/L	50.0		111	75-125			
1,3-Dichloropropane	46.6	1	ug/L	50.0		93.2	75-125			
1,4-Dichlorobenzene	54.4	1	ug/L	50.0		109	75-125			
2,2-Dichloropropane	45.2	1	ug/L	50.0		90.5	70-135			
2-Butanone (MEK)	43.9	10	ug/L	50.0		87.9	30-150			
2-Chlorotoluene	54.1	1	ug/L	50.0		108	75-125			
2-Hexanone (MBK)	55.5	5	ug/L	50.0		111	55-130			
4-Chlorotoluene	54.0	1	ug/L	50.0		108	75-130			
4-Isopropyltoluene	52.9	1	ug/L	50.0		106	75-130			
4-Methyl-2-pentanone (MIBK)	53.6	5	ug/L	50.0		107	60-135			
Acetone	51.8	10	ug/L	50.0		104	40-140			
Benzene	45.7	1	ug/L	50.0		91.3	80-120			
Bromobenzene	58.0	1	ug/L	50.0		116	75-125			
Bromochloromethane	45.6	1	ug/L	50.0		91.2	65-130			
Bromodichloromethane	52.6	0.5	ug/L	50.0		105	75-120			
Bromoform	58.3	1	ug/L	50.0		117	70-130			
Bromomethane	46.3	1	ug/L	50.0		92.6	30-145			
Carbon disulfide	50.9	10	ug/L	50.0		102	35-160			
Carbon tetrachloride	51.8	1	ug/L	50.0		104	65-140			
Chlorobenzene	54.3	1	ug/L	50.0		109	80-120			

## Certificate of Analysis

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0325 - SW5030B-MS

**LCS (BGC0325-BS1)**

Prepared &amp; Analyzed: 03/09/2023

Chloroethane	42.4	1	ug/L	50.0		84.8	60-135			
Chloroform	43.2	0.5	ug/L	50.0		86.5	65-135			
Chloromethane	41.4	1	ug/L	50.0		82.8	40-125			
cis-1,2-Dichloroethylene	42.2	1	ug/L	50.0		84.4	70-125			
cis-1,3-Dichloropropene	37.8	1	ug/L	50.0		75.7	70-130			
Dibromochloromethane	53.1	0.5	ug/L	50.0		106	60-135			
Dibromomethane	50.7	1	ug/L	50.0		101	75-125			
Dichlorodifluoromethane	53.5	1	ug/L	50.0		107	30-155			
Ethylbenzene	53.9	1	ug/L	50.0		108	75-125			
Hexachlorobutadiene	58.2	0.8	ug/L	50.0		116	50-140			
Isopropylbenzene	51.4	1	ug/L	50.0		103	75-125			
m+p-Xylenes	107	2	ug/L	100		107	75-130			
Methylene chloride	44.8	4	ug/L	50.0		89.6	55-140			
Methyl-t-butyl ether (MTBE)	43.7	1	ug/L	50.0		87.3	65-125			
Naphthalene	49.0	1	ug/L	50.0		97.9	55-140			
n-Butylbenzene	52.0	1	ug/L	50.0		104	70-135			
n-Propylbenzene	51.6	1	ug/L	50.0		103	70-130			
o-Xylene	55.6	1	ug/L	50.0		111	80-120			
sec-Butylbenzene	54.2	1	ug/L	50.0		108	70-125			
Styrene	50.5	1	ug/L	50.0		101	65-135			
tert-Butylbenzene	51.2	1	ug/L	50.0		102	70-130			
Tetrachloroethylene (PCE)	51.7	1	ug/L	50.0		103	45-150			
Toluene	48.5	1	ug/L	50.0		97.0	75-120			
trans-1,2-Dichloroethylene	39.0	1	ug/L	50.0		78.1	60-140			
trans-1,3-Dichloropropene	41.9	1	ug/L	50.0		83.7	55-140			

## Certificate of Analysis

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0325 - SW5030B-MS

**LCS (BGC0325-BS1)**

Prepared &amp; Analyzed: 03/09/2023

Trichloroethylene	47.0	1	ug/L	50.0		94.1	70-125			
Trichlorofluoromethane	54.2	1	ug/L	50.0		108	60-145			
Vinyl chloride	51.2	0.5	ug/L	50.0		102	50-145			
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	46.3		ug/L	50.0		92.5	70-120			
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	49.6		ug/L	50.0		99.2	75-120			
<i>Surr: Dibromofluoromethane (Surr)</i>	46.8		ug/L	50.0		93.5	70-130			
<i>Surr: Toluene-d8 (Surr)</i>	50.3		ug/L	50.0		101	70-130			

**Matrix Spike (BGC0325-MS1)**

Source: 23C0431-01

Prepared &amp; Analyzed: 03/09/2023

1,1,1,2-Tetrachloroethane	52.1	0.4	ug/L	50.0	BLOD	104	80-130			
1,1,1-Trichloroethane	43.4	1	ug/L	50.0	BLOD	86.8	65-130			
1,1,2,2-Tetrachloroethane	49.0	0.4	ug/L	50.0	BLOD	98.1	65-130			
1,1,2-Trichloroethane	45.8	1	ug/L	50.0	BLOD	91.7	75-125			
1,1-Dichloroethane	38.3	1	ug/L	50.0	BLOD	76.7	70-135			
1,1-Dichloroethylene	37.6	1	ug/L	50.0	BLOD	75.2	50-145			
1,1-Dichloropropene	39.2	1	ug/L	50.0	BLOD	78.5	75-135			
1,2,3-Trichlorobenzene	53.7	1	ug/L	50.0	BLOD	107	55-140			
1,2,3-Trichloropropane	48.7	1	ug/L	50.0	BLOD	97.4	75-125			
1,2,4-Trichlorobenzene	54.0	1	ug/L	50.0	BLOD	108	65-135			
1,2,4-Trimethylbenzene	48.6	1	ug/L	50.0	BLOD	97.1	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	56.8	1	ug/L	50.0	BLOD	114	50-130			
1,2-Dibromoethane (EDB)	52.7	1	ug/L	50.0	BLOD	105	80-120			
1,2-Dichlorobenzene	51.2	0.5	ug/L	50.0	BLOD	102	70-120			
1,2-Dichloroethane	42.5	1	ug/L	50.0	BLOD	84.9	70-130			
1,2-Dichloropropane	40.0	0.5	ug/L	50.0	BLOD	80.1	75-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0325 - SW5030B-MS

**Matrix Spike (BGC0325-MS1)**

Source: 23C0431-01

Prepared &amp; Analyzed: 03/09/2023

1,3,5-Trimethylbenzene	46.1	1	ug/L	50.0	BLOD	92.2	75-124			
1,3-Dichlorobenzene	52.2	1	ug/L	50.0	BLOD	104	75-125			
1,3-Dichloropropane	44.8	1	ug/L	50.0	BLOD	89.6	75-125			
1,4-Dichlorobenzene	52.1	1	ug/L	50.0	BLOD	104	75-125			
2,2-Dichloropropane	41.5	1	ug/L	50.0	BLOD	82.9	70-135			
2-Butanone (MEK)	48.3	10	ug/L	50.0	BLOD	96.6	30-150			
2-Chlorotoluene	50.8	1	ug/L	50.0	BLOD	102	75-125			
2-Hexanone (MBK)	53.4	5	ug/L	50.0	BLOD	107	55-130			
4-Chlorotoluene	48.8	1	ug/L	50.0	BLOD	97.6	75-130			
4-Isopropyltoluene	49.0	1	ug/L	50.0	BLOD	98.1	75-130			
4-Methyl-2-pentanone (MIBK)	52.3	5	ug/L	50.0	BLOD	105	60-135			
Acetone	49.1	10	ug/L	50.0	BLOD	96.4	40-140			
Benzene	42.5	1	ug/L	50.0	BLOD	85.0	80-120			
Bromobenzene	54.7	1	ug/L	50.0	BLOD	109	75-125			
Bromochloromethane	44.2	1	ug/L	50.0	BLOD	88.3	65-130			
Bromodichloromethane	49.6	0.5	ug/L	50.0	BLOD	99.2	75-136			
Bromoform	55.5	1	ug/L	50.0	BLOD	111	70-130			
Bromomethane	44.7	1	ug/L	50.0	BLOD	89.3	30-145			
Carbon disulfide	49.8	10	ug/L	50.0	BLOD	99.6	35-160			
Carbon tetrachloride	47.4	1	ug/L	50.0	BLOD	94.9	65-140			
Chlorobenzene	50.2	1	ug/L	50.0	BLOD	100	80-120			
Chloroethane	40.2	1	ug/L	50.0	BLOD	80.4	60-135			
Chloroform	40.3	0.5	ug/L	50.0	BLOD	80.7	65-135			
Chloromethane	39.1	1	ug/L	50.0	BLOD	78.2	40-125			
cis-1,2-Dichloroethylene	39.6	1	ug/L	50.0	BLOD	79.3	70-125			

## Certificate of Analysis

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0325 - SW5030B-MS

**Matrix Spike (BGC0325-MS1)**

Source: 23C0431-01

Prepared &amp; Analyzed: 03/09/2023

cis-1,3-Dichloropropene	35.4	1	ug/L	50.0	BLOD	70.9	47-136			
Dibromochloromethane	51.4	0.5	ug/L	50.0	BLOD	103	60-135			
Dibromomethane	48.3	1	ug/L	50.0	BLOD	96.6	75-125			
Dichlorodifluoromethane	51.0	1	ug/L	50.0	BLOD	102	30-155			
Ethylbenzene	49.1	1	ug/L	50.0	BLOD	98.2	75-125			
Hexachlorobutadiene	53.6	0.8	ug/L	50.0	BLOD	107	50-140			
Isopropylbenzene	47.9	1	ug/L	50.0	BLOD	95.8	75-125			
m+p-Xylenes	99.3	2	ug/L	100	BLOD	99.3	75-130			
Methylene chloride	41.2	4	ug/L	50.0	BLOD	82.5	55-140			
Methyl-t-butyl ether (MTBE)	41.7	1	ug/L	50.0	BLOD	83.4	65-125			
Naphthalene	48.8	1	ug/L	50.0	BLOD	97.6	55-140			
n-Butylbenzene	46.8	1	ug/L	50.0	BLOD	93.5	70-135			
n-Propylbenzene	48.4	1	ug/L	50.0	BLOD	96.7	70-130			
o-Xylene	51.6	1	ug/L	50.0	BLOD	103	80-120			
sec-Butylbenzene	50.6	1	ug/L	50.0	BLOD	101	70-125			
Styrene	46.7	1	ug/L	50.0	BLOD	93.4	65-135			
tert-Butylbenzene	47.6	1	ug/L	50.0	BLOD	95.3	70-130			
Tetrachloroethylene (PCE)	45.4	1	ug/L	50.0	0.97	88.9	51-231			
Toluene	45.3	1	ug/L	50.0	BLOD	90.5	75-120			
trans-1,2-Dichloroethylene	36.3	1	ug/L	50.0	BLOD	72.7	60-140			
trans-1,3-Dichloropropene	40.0	1	ug/L	50.0	BLOD	79.9	55-140			
Trichloroethylene	43.9	1	ug/L	50.0	BLOD	87.8	70-125			
Trichlorofluoromethane	49.7	1	ug/L	50.0	BLOD	99.4	60-145			
Vinyl chloride	48.3	0.5	ug/L	50.0	BLOD	96.7	50-145			
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	<i>45.8</i>		<i>ug/L</i>	<i>50.0</i>		<i>91.7</i>	<i>70-120</i>			

## Certificate of Analysis

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0325 - SW5030B-MS

**Matrix Spike (BGC0325-MS1)**

Source: 23C0431-01

Prepared &amp; Analyzed: 03/09/2023

<i>Surr: 4-Bromofluorobenzene (Surr)</i>	49.0		ug/L	50.0		98.0	75-120		
<i>Surr: Dibromofluoromethane (Surr)</i>	46.8		ug/L	50.0		93.5	70-130		
<i>Surr: Toluene-d8 (Surr)</i>	49.4		ug/L	50.0		98.7	70-130		

**Matrix Spike Dup (BGC0325-MSD1)**

Source: 23C0431-01

Prepared &amp; Analyzed: 03/09/2023

1,1,1,2-Tetrachloroethane	50.3	0.4	ug/L	50.0	BLOD	101	80-130	3.55	30	
1,1,1-Trichloroethane	40.5	1	ug/L	50.0	BLOD	81.1	65-130	6.84	30	
1,1,2,2-Tetrachloroethane	49.8	0.4	ug/L	50.0	BLOD	99.7	65-130	1.62	30	
1,1,2-Trichloroethane	45.9	1	ug/L	50.0	BLOD	91.8	75-125	0.196	30	
1,1-Dichloroethane	36.1	1	ug/L	50.0	BLOD	72.2	70-135	5.94	30	
1,1-Dichloroethylene	35.7	1	ug/L	50.0	BLOD	71.5	50-145	5.10	30	
1,1-Dichloropropene	36.9	1	ug/L	50.0	BLOD	73.8	75-135	6.17	30	M
1,2,3-Trichlorobenzene	53.4	1	ug/L	50.0	BLOD	107	55-140	0.448	30	
1,2,3-Trichloropropane	50.0	1	ug/L	50.0	BLOD	99.9	75-125	2.62	30	
1,2,4-Trichlorobenzene	53.6	1	ug/L	50.0	BLOD	107	65-135	0.688	30	
1,2,4-Trimethylbenzene	46.4	1	ug/L	50.0	BLOD	92.9	75-130	4.48	30	
1,2-Dibromo-3-chloropropane (DBCP)	57.8	1	ug/L	50.0	BLOD	116	50-130	1.88	30	
1,2-Dibromoethane (EDB)	52.6	1	ug/L	50.0	BLOD	105	80-120	0.342	30	
1,2-Dichlorobenzene	50.7	0.5	ug/L	50.0	BLOD	101	70-120	0.844	30	
1,2-Dichloroethane	41.3	1	ug/L	50.0	BLOD	82.6	70-130	2.79	30	
1,2-Dichloropropane	39.2	0.5	ug/L	50.0	BLOD	78.5	75-125	2.02	30	
1,3,5-Trimethylbenzene	45.0	1	ug/L	50.0	BLOD	90.0	75-124	2.37	30	
1,3-Dichlorobenzene	50.4	1	ug/L	50.0	BLOD	101	75-125	3.41	30	
1,3-Dichloropropane	45.4	1	ug/L	50.0	BLOD	90.7	75-125	1.31	30	
1,4-Dichlorobenzene	50.0	1	ug/L	50.0	BLOD	100	75-125	4.09	30	

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Enthalpy Analytical

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### Batch BGC0325 - SW5030B-MS

Matrix Spike Dup (BGC0325-MSD1)

Source: 23C0431-01

Prepared &amp; Analyzed: 03/09/2023

2,2-Dichloropropane	39.1	1	ug/L	50.0	BLOD	78.1	70-135	5.94	30	
2-Butanone (MEK)	45.1	10	ug/L	50.0	BLOD	90.2	30-150	6.79	30	
2-Chlorotoluene	49.7	1	ug/L	50.0	BLOD	99.4	75-125	2.15	30	
2-Hexanone (MBK)	53.0	5	ug/L	50.0	BLOD	106	55-130	0.770	30	
4-Chlorotoluene	49.2	1	ug/L	50.0	BLOD	98.3	75-130	0.715	30	
4-Isopropyltoluene	46.7	1	ug/L	50.0	BLOD	93.4	75-130	4.91	30	
4-Methyl-2-pentanone (MIBK)	52.0	5	ug/L	50.0	BLOD	104	60-135	0.709	30	
Acetone	48.5	10	ug/L	50.0	BLOD	95.3	40-140	1.07	30	
Benzene	40.7	1	ug/L	50.0	BLOD	81.4	80-120	4.32	30	
Bromobenzene	53.0	1	ug/L	50.0	BLOD	106	75-125	3.25	30	
Bromochloromethane	42.6	1	ug/L	50.0	BLOD	85.3	65-130	3.50	30	
Bromodichloromethane	48.1	0.5	ug/L	50.0	BLOD	96.2	75-136	3.03	30	
Bromoform	54.8	1	ug/L	50.0	BLOD	110	70-130	1.23	30	
Bromomethane	43.6	1	ug/L	50.0	BLOD	87.2	30-145	2.47	30	
Carbon disulfide	49.1	10	ug/L	50.0	BLOD	98.2	35-160	1.42	30	
Carbon tetrachloride	45.4	1	ug/L	50.0	BLOD	90.8	65-140	4.37	30	
Chlorobenzene	48.5	1	ug/L	50.0	BLOD	97.0	80-120	3.36	30	
Chloroethane	38.4	1	ug/L	50.0	BLOD	76.7	60-135	4.63	30	
Chloroform	39.2	0.5	ug/L	50.0	BLOD	78.4	65-135	2.92	30	
Chloromethane	37.0	1	ug/L	50.0	BLOD	74.1	40-125	5.49	30	
cis-1,2-Dichloroethylene	38.3	1	ug/L	50.0	BLOD	76.6	70-125	3.46	30	
cis-1,3-Dichloropropene	34.6	1	ug/L	50.0	BLOD	69.3	47-136	2.23	30	
Dibromochloromethane	51.2	0.5	ug/L	50.0	BLOD	102	60-135	0.331	30	
Dibromomethane	48.4	1	ug/L	50.0	BLOD	96.7	75-125	0.145	30	
Dichlorodifluoromethane	47.9	1	ug/L	50.0	BLOD	95.8	30-155	6.19	30	



## Certificate of Analysis

 Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0325 - SW5030B-MS

Matrix Spike Dup (BGC0325-MSD1)	Source: 23C0431-01			Prepared & Analyzed: 03/09/2023						
Ethylbenzene	47.0	1	ug/L	50.0	BLOD	94.0	75-125	4.43	30	
Hexachlorobutadiene	52.3	0.8	ug/L	50.0	BLOD	105	50-140	2.46	30	
Isopropylbenzene	45.3	1	ug/L	50.0	BLOD	90.6	75-125	5.64	30	
m+p-Xylenes	93.1	2	ug/L	100	BLOD	93.1	75-130	6.43	30	
Methylene chloride	39.9	4	ug/L	50.0	BLOD	79.7	55-140	3.40	30	
Methyl-t-butyl ether (MTBE)	41.3	1	ug/L	50.0	BLOD	82.7	65-125	0.915	30	
Naphthalene	49.9	1	ug/L	50.0	BLOD	99.9	55-140	2.29	30	
n-Butylbenzene	46.2	1	ug/L	50.0	BLOD	92.4	70-135	1.21	30	
n-Propylbenzene	47.1	1	ug/L	50.0	BLOD	94.2	70-130	2.60	30	
o-Xylene	49.1	1	ug/L	50.0	BLOD	98.2	80-120	4.96	30	
sec-Butylbenzene	48.8	1	ug/L	50.0	BLOD	97.6	70-125	3.70	30	
Styrene	44.8	1	ug/L	50.0	BLOD	89.6	65-135	4.20	30	
tert-Butylbenzene	46.5	1	ug/L	50.0	BLOD	92.9	70-130	2.49	30	
Tetrachloroethylene (PCE)	43.0	1	ug/L	50.0	0.97	84.1	51-231	5.41	30	
Toluene	43.1	1	ug/L	50.0	BLOD	86.2	75-120	4.91	30	
trans-1,2-Dichloroethylene	34.4	1	ug/L	50.0	BLOD	68.7	60-140	5.63	30	
trans-1,3-Dichloropropene	39.1	1	ug/L	50.0	BLOD	78.1	55-140	2.30	30	
Trichloroethylene	42.1	1	ug/L	50.0	BLOD	84.3	70-125	4.11	30	
Trichlorofluoromethane	47.0	1	ug/L	50.0	BLOD	94.0	60-145	5.59	30	
Vinyl chloride	45.3	0.5	ug/L	50.0	BLOD	90.6	50-145	6.45	30	
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	<i>47.0</i>		<i>ug/L</i>	<i>50.0</i>		<i>94.1</i>	<i>70-120</i>			
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	<i>49.2</i>		<i>ug/L</i>	<i>50.0</i>		<i>98.4</i>	<i>75-120</i>			
<i>Surr: Dibromofluoromethane (Surr)</i>	<i>47.4</i>		<i>ug/L</i>	<i>50.0</i>		<i>94.7</i>	<i>70-130</i>			
<i>Surr: Toluene-d8 (Surr)</i>	<i>49.7</i>		<i>ug/L</i>	<i>50.0</i>		<i>99.5</i>	<i>70-130</i>			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0321 - SW3510C/EPA600-MS

**Blank (BGC0321-BLK1)**

Prepared &amp; Analyzed: 03/09/2023

Anthracene	ND	10.0	ug/L							
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	108		ug/L	200		54.0	5-136			
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	36.1		ug/L	100		36.1	9-117			
<i>Surr: 2-Fluorophenol (Surr)</i>	48.4		ug/L	200		24.2	5-60			
<i>Surr: Nitrobenzene-d5 (Surr)</i>	38.4		ug/L	100		38.4	5-151			
<i>Surr: Phenol-d5 (Surr)</i>	30.6		ug/L	200		15.3	5-60			
<i>Surr: p-Terphenyl-d14 (Surr)</i>	32.6		ug/L	100		32.6	5-141			

**LCS (BGC0321-BS1)**

Prepared &amp; Analyzed: 03/09/2023

1,2,4-Trichlorobenzene	26.8	10.0	ug/L	50.0		53.6	57-130			L
1,2-Dichlorobenzene	23.4	10.0	ug/L	50.0		46.8	22-115			
1,3-Dichlorobenzene	22.0	10.0	ug/L	50.0		44.0	22-112			
1,4-Dichlorobenzene	23.5	10.0	ug/L	50.0		47.0	13-112			
2,4,6-Trichlorophenol	25.6	10.0	ug/L	50.0		51.2	52-129			L
2,4-Dichlorophenol	26.7	10.0	ug/L	50.0		53.4	53-122			
2,4-Dimethylphenol	28.4	5.00	ug/L	50.0		56.7	42-120			
2,4-Dinitrophenol	16.4	50.0	ug/L	50.0		32.7	48-127			L
2,4-Dinitrotoluene	34.5	10.0	ug/L	50.0		69.0	10-173			
2,6-Dinitrotoluene	36.0	10.0	ug/L	50.0		72.1	68-137			
2-Chloronaphthalene	25.9	10.0	ug/L	50.0		51.9	65-120			L
2-Chlorophenol	26.9	10.0	ug/L	50.0		53.9	36-120			
2-Nitrophenol	33.7	10.0	ug/L	50.0		67.4	45-167			
3,3'-Dichlorobenzidine	26.2	10.0	ug/L	50.0		52.5	10-213			
4,6-Dinitro-2-methylphenol	35.2	50.0	ug/L	50.0		70.4	53-130			
4-Bromophenyl phenyl ether	37.3	10.0	ug/L	50.0		74.5	65-120			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0321 - SW3510C/EPA600-MS

**LCS (BGC0321-BS1)**

Prepared &amp; Analyzed: 03/09/2023

4-Chlorophenyl phenyl ether	29.4	10.0	ug/L	50.0		58.8	38-145			
4-Nitrophenol	9.19	50.0	ug/L	50.0		18.4	13-129			
Acenaphthene	27.0	10.0	ug/L	50.0		54.0	60-132			L
Acenaphthylene	27.5	10.0	ug/L	50.0		55.0	54-126			
Acetophenone	24.6	20.0	ug/L	50.0		49.2	0-200			
Anthracene	31.0	10.0	ug/L	50.0		61.9	43-120			
Benzidine	ND	50.0	ug/L	50.0			12-309			L
Benzo (a) anthracene	33.0	10.0	ug/L	50.0		66.0	42-133			
Benzo (a) pyrene	35.8	10.0	ug/L	50.0		71.7	32-148			
Benzo (b) fluoranthene	30.9	10.0	ug/L	50.0		61.8	42-140			
Benzo (g,h,i) perylene	41.4	10.0	ug/L	50.0		82.9	10-195			
Benzo (k) fluoranthene	30.5	10.0	ug/L	50.0		61.0	25-146			
bis (2-Chloroethoxy) methane	27.6	10.0	ug/L	50.0		55.2	49-165			
bis (2-Chloroethyl) ether	25.3	10.0	ug/L	50.0		50.6	43-126			
2,2'-Oxybis (1-chloropropane)	26.7	10.0	ug/L	50.0		53.4	63-139			L
bis (2-Ethylhexyl) phthalate	35.0	10.0	ug/L	50.0		70.1	29-137			
Butyl benzyl phthalate	37.1	10.0	ug/L	50.0		74.2	10-140			
Chrysene	33.6	10.0	ug/L	50.0		67.1	44-140			
Dibenz (a,h) anthracene	44.4	10.0	ug/L	50.0		88.8	10-200			
Diethyl phthalate	34.1	10.0	ug/L	50.0		68.3	10-120			
Dimethyl phthalate	31.7	10.0	ug/L	50.0		63.4	10-120			
Di-n-butyl phthalate	35.2	10.0	ug/L	50.0		70.5	10-120			
Di-n-octyl phthalate	27.3	10.0	ug/L	50.0		54.6	19-132			
Fluoranthene	37.3	10.0	ug/L	50.0		74.5	43-121			
Fluorene	30.5	10.0	ug/L	50.0		61.0	70-120			L

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0321 - SW3510C/EPA600-MS

**LCS (BGC0321-BS1)**

Prepared &amp; Analyzed: 03/09/2023

Hexachlorobenzene	49.2	1.00	ug/L	50.0		98.3	10-142			
Hexachlorobutadiene	29.0	10.0	ug/L	50.0		57.9	38-120			
Hexachlorocyclopentadiene	17.4	10.0	ug/L	50.0		34.8	10-76			
Hexachloroethane	25.0	10.0	ug/L	50.0		50.1	55-120			L
Indeno (1,2,3-cd) pyrene	44.4	10.0	ug/L	50.0		88.8	10-151			
Isophorone	17.9	10.0	ug/L	50.0		35.9	47-180			L
Naphthalene	24.9	5.00	ug/L	50.0		49.8	36-120			
Nitrobenzene	28.6	10.0	ug/L	50.0		57.1	54-158			
n-Nitrosodimethylamine	16.0	10.0	ug/L	50.0		32.1	10-85			
n-Nitrosodi-n-propylamine	22.0	10.0	ug/L	50.0		44.0	14-198			
n-Nitrosodiphenylamine	25.6	10.0	ug/L	50.0		51.2	12-97			
p-Chloro-m-cresol	29.8	10.0	ug/L	50.0		59.6	10-142			
Pentachlorophenol	20.8	20.0	ug/L	50.0		41.6	38-152			
Phenanthrene	32.8	10.0	ug/L	50.0		65.6	65-120			
Phenol	12.2	10.0	ug/L	50.5		24.1	17-120			
Pyrene	30.0	10.0	ug/L	50.0		60.0	70-120			L
Pyridine	17.4	10.0	ug/L	50.0		34.8	10-103			
<hr/>										
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	<i>102</i>		ug/L	<i>200</i>		<i>51.1</i>	<i>5-136</i>			
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	<i>27.4</i>		ug/L	<i>100</i>		<i>27.4</i>	<i>9-117</i>			
<i>Surr: 2-Fluorophenol (Surr)</i>	<i>33.4</i>		ug/L	<i>200</i>		<i>16.7</i>	<i>5-60</i>			
<i>Surr: Nitrobenzene-d5 (Surr)</i>	<i>31.9</i>		ug/L	<i>100</i>		<i>31.9</i>	<i>5-151</i>			
<i>Surr: Phenol-d5 (Surr)</i>	<i>23.4</i>		ug/L	<i>200</i>		<i>11.7</i>	<i>5-60</i>			
<i>Surr: p-Terphenyl-d14 (Surr)</i>	<i>32.8</i>		ug/L	<i>100</i>		<i>32.8</i>	<i>5-141</i>			

**Matrix Spike (BGC0321-MS1)**

Source: 23C0421-12

Prepared &amp; Analyzed: 03/09/2023

## Certificate of Analysis

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Enthalpy Analytical

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**Batch BGC0321 - SW3510C/EPA600-MS**

**Matrix Spike (BGC0321-MS1)**

**Source: 23C0421-12**

Prepared & Analyzed: 03/09/2023

1,2,4-Trichlorobenzene	44.5	10.0	ug/L	50.0	BLOD	89.0	44-142			
1,2-Dichlorobenzene	42.9	10.0	ug/L	50.0	BLOD	85.8	22-115			
1,3-Dichlorobenzene	39.8	10.0	ug/L	50.0	BLOD	79.6	22-112			
1,4-Dichlorobenzene	44.3	10.0	ug/L	50.0	BLOD	88.6	13-112			
2,4,6-Trichlorophenol	51.2	10.0	ug/L	50.0	BLOD	102	37-144			
2,4-Dichlorophenol	47.9	10.0	ug/L	50.0	BLOD	95.7	39-135			
2,4-Dimethylphenol	43.7	5.00	ug/L	50.0	BLOD	87.4	32-120			
2,4-Dinitrophenol	56.8	50.0	ug/L	50.0	BLOD	114	39-139			
2,4-Dinitrotoluene	50.4	10.0	ug/L	50.0	BLOD	101	10-191			
2,6-Dinitrotoluene	47.1	10.0	ug/L	50.0	BLOD	94.1	50-158			
2-Chloronaphthalene	46.0	10.0	ug/L	50.0	BLOD	92.0	60-120			
2-Chlorophenol	45.2	10.0	ug/L	50.0	BLOD	90.5	23-134			
2-Nitrophenol	47.7	10.0	ug/L	50.0	BLOD	95.4	29-182			
3,3'-Dichlorobenzidine	22.4	10.0	ug/L	50.0	BLOD	44.7	10-262			
4,6-Dinitro-2-methylphenol	60.6	50.0	ug/L	50.0	BLOD	121	10-181			
4-Bromophenyl phenyl ether	ND	10.0	ug/L	50.0	BLOD		53-127			M
4-Chlorophenyl phenyl ether	45.6	10.0	ug/L	50.0	BLOD	91.3	25-158			
4-Nitrophenol	19.0	50.0	ug/L	50.0	BLOD	38.0	10-132			
Acenaphthene	46.6	10.0	ug/L	50.0	BLOD	93.2	47-145			
Acenaphthylene	45.0	10.0	ug/L	50.0	BLOD	90.1	33-145			
Acetophenone	44.8	20.0	ug/L	50.0	BLOD	89.6	0-200			
Anthracene	46.4	10.0	ug/L	50.0	BLOD	92.8	27-133			
Benzidine	ND	50.0	ug/L	50.0	BLOD		12-309			M
Benzo (a) anthracene	47.7	10.0	ug/L	50.0	BLOD	95.4	33-143			
Benzo (a) pyrene	49.6	10.0	ug/L	50.0	BLOD	99.1	17-163			

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### Batch BGC0321 - SW3510C/EPA600-MS

**Matrix Spike (BGC0321-MS1)**

Source: 23C0421-12

Prepared &amp; Analyzed: 03/09/2023

Benzo (b) fluoranthene	47.8	10.0	ug/L	50.0	BLOD	95.6	24-159			
Benzo (g,h,i) perylene	37.1	10.0	ug/L	50.0	BLOD	74.2	10-219			
Benzo (k) fluoranthene	54.6	10.0	ug/L	50.0	BLOD	109	11-162			
bis (2-Chloroethoxy) methane	42.3	10.0	ug/L	50.0	BLOD	84.6	33-184			
bis (2-Chloroethyl) ether	43.4	10.0	ug/L	50.0	BLOD	86.8	12-158			
2,2'-Oxybis (1-chloropropane)	43.4	10.0	ug/L	50.0	BLOD	86.8	36-166			
bis (2-Ethylhexyl) phthalate	48.2	10.0	ug/L	50.0	BLOD	96.5	10-158			
Butyl benzyl phthalate	41.0	10.0	ug/L	50.0	BLOD	82.1	10-152			
Chrysene	56.6	10.0	ug/L	50.0	BLOD	113	17-169			
Dibenz (a,h) anthracene	46.4	10.0	ug/L	50.0	BLOD	92.8	10-227			
Diethyl phthalate	47.1	10.0	ug/L	50.0	BLOD	94.3	10-120			
Dimethyl phthalate	44.8	10.0	ug/L	50.0	BLOD	89.5	10-120			
Di-n-butyl phthalate	53.6	10.0	ug/L	50.0	BLOD	107	10-120			
Di-n-octyl phthalate	48.9	10.0	ug/L	50.0	BLOD	97.8	10-146			
Fluoranthene	58.7	10.0	ug/L	50.0	BLOD	117	26-137			
Fluorene	48.3	10.0	ug/L	50.0	BLOD	96.6	59-121			
Hexachlorobenzene	41.7	1.00	ug/L	50.0	BLOD	83.4	10-152			
Hexachlorobutadiene	47.9	10.0	ug/L	50.0	BLOD	95.8	24-120			
Hexachlorocyclopentadiene	32.3	10.0	ug/L	50.0	BLOD	64.6	10-90			
Hexachloroethane	45.1	10.0	ug/L	50.0	BLOD	90.1	40-120			
Indeno (1,2,3-cd) pyrene	45.0	10.0	ug/L	50.0	BLOD	89.9	10-171			
Isophorone	25.5	10.0	ug/L	50.0	BLOD	51.0	21-196			
Naphthalene	43.0	5.00	ug/L	50.0	BLOD	85.9	21-133			
Nitrobenzene	54.6	10.0	ug/L	50.0	BLOD	109	35-180			
n-Nitrosodimethylamine	27.3	10.0	ug/L	50.0	BLOD	54.6	10-85			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0321 - SW3510C/EPA600-MS

**Matrix Spike (BGC0321-MS1)**

Source: 23C0421-12

Prepared &amp; Analyzed: 03/09/2023

n-Nitrosodi-n-propylamine	49.8	10.0	ug/L	50.0	BLOD	99.7	10-230			
n-Nitrosodiphenylamine	39.4	10.0	ug/L	50.0	BLOD	78.8	12-111			
p-Chloro-m-cresol	46.1	10.0	ug/L	50.0	BLOD	92.2	10-127			
Pentachlorophenol	43.3	20.0	ug/L	50.0	BLOD	86.6	14-176			
Phenanthrene	54.8	10.0	ug/L	50.0	BLOD	110	54-120			
Phenol	18.3	10.0	ug/L	50.5	BLOD	36.2	10-120			
Pyrene	43.7	10.0	ug/L	50.0	BLOD	87.3	52-120			
Pyridine	29.9	10.0	ug/L	50.0	BLOD	59.8	10-110			
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	<i>96.0</i>		ug/L	<i>200</i>		<i>48.0</i>	<i>5-136</i>			
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	<i>45.8</i>		ug/L	<i>100</i>		<i>45.8</i>	<i>9-117</i>			
<i>Surr: 2-Fluorophenol (Surr)</i>	<i>50.5</i>		ug/L	<i>200</i>		<i>25.2</i>	<i>5-60</i>			
<i>Surr: Nitrobenzene-d5 (Surr)</i>	<i>54.2</i>		ug/L	<i>100</i>		<i>54.2</i>	<i>5-151</i>			
<i>Surr: Phenol-d5 (Surr)</i>	<i>38.1</i>		ug/L	<i>200</i>		<i>19.1</i>	<i>5-60</i>			
<i>Surr: p-Terphenyl-d14 (Surr)</i>	<i>36.8</i>		ug/L	<i>100</i>		<i>36.8</i>	<i>5-141</i>			

**Matrix Spike Dup (BGC0321-MSD1)**

Source: 23C0421-12

Prepared &amp; Analyzed: 03/09/2023

1,2,4-Trichlorobenzene	36.8	10.0	ug/L	50.0	BLOD	73.6	44-142	18.8	20	
1,2-Dichlorobenzene	34.3	10.0	ug/L	50.0	BLOD	68.6	22-115	22.3	20	P
1,3-Dichlorobenzene	32.3	10.0	ug/L	50.0	BLOD	64.6	22-112	20.8	20	P
1,4-Dichlorobenzene	36.4	10.0	ug/L	50.0	BLOD	72.8	13-112	19.6	20	
2,4,6-Trichlorophenol	42.8	10.0	ug/L	50.0	BLOD	85.7	37-144	17.8	20	
2,4-Dichlorophenol	39.6	10.0	ug/L	50.0	BLOD	79.1	39-135	19.0	20	
2,4-Dimethylphenol	36.5	5.00	ug/L	50.0	BLOD	72.9	32-120	18.0	20	
2,4-Dinitrophenol	49.5	50.0	ug/L	50.0	BLOD	99.0	39-139	13.7	20	
2,4-Dinitrotoluene	43.0	10.0	ug/L	50.0	BLOD	85.9	10-191	15.9	20	

## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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**Batch BGC0321 - SW3510C/EPA600-MS**

Matrix Spike Dup (BGC0321-MSD1)	Source: 23C0421-12			Prepared & Analyzed: 03/09/2023						
2,6-Dinitrotoluene	42.2	10.0	ug/L	50.0	BLOD	84.3	50-158	11.0	20	
2-Chloronaphthalene	39.5	10.0	ug/L	50.0	BLOD	78.9	60-120	15.3	20	
2-Chlorophenol	36.7	10.0	ug/L	50.0	BLOD	73.5	23-134	20.7	20	P
2-Nitrophenol	39.6	10.0	ug/L	50.0	BLOD	79.1	29-182	18.7	20	
3,3'-Dichlorobenzidine	18.3	10.0	ug/L	50.0	BLOD	36.5	10-262	20.2	20	P
4,6-Dinitro-2-methylphenol	55.2	50.0	ug/L	50.0	BLOD	110	10-181	9.40	20	
4-Bromophenyl phenyl ether	37.4	10.0	ug/L	50.0	BLOD	74.9	53-127		20	
4-Chlorophenyl phenyl ether	39.9	10.0	ug/L	50.0	BLOD	79.8	25-158	13.4	20	
4-Nitrophenol	17.4	50.0	ug/L	50.0	BLOD	34.7	10-132	9.08	20	
Acenaphthene	39.8	10.0	ug/L	50.0	BLOD	79.5	47-145	15.8	20	
Acenaphthylene	38.7	10.0	ug/L	50.0	BLOD	77.3	33-145	15.2	20	
Acetophenone	37.4	20.0	ug/L	50.0	BLOD	74.8	0-200	18.1	20	
Anthracene	38.9	10.0	ug/L	50.0	BLOD	77.8	27-133	17.5	20	
Benzidine	ND	50.0	ug/L	50.0	BLOD		12-309		20	M
Benzo (a) anthracene	41.1	10.0	ug/L	50.0	BLOD	82.3	33-143	14.8	20	
Benzo (a) pyrene	41.6	10.0	ug/L	50.0	BLOD	83.3	17-163	17.4	20	
Benzo (b) fluoranthene	42.1	10.0	ug/L	50.0	BLOD	84.2	24-159	12.7	20	
Benzo (g,h,i) perylene	32.4	10.0	ug/L	50.0	BLOD	64.8	10-219	13.6	20	
Benzo (k) fluoranthene	42.2	10.0	ug/L	50.0	BLOD	84.5	11-162	25.5	20	P
bis (2-Chloroethoxy) methane	36.8	10.0	ug/L	50.0	BLOD	73.6	33-184	14.0	20	
bis (2-Chloroethyl) ether	35.7	10.0	ug/L	50.0	BLOD	71.5	12-158	19.4	20	
2,2'-Oxybis (1-chloropropane)	35.1	10.0	ug/L	50.0	BLOD	70.2	36-166	21.2	20	P
bis (2-Ethylhexyl) phthalate	41.8	10.0	ug/L	50.0	BLOD	83.6	10-158	14.4	20	
Butyl benzyl phthalate	37.9	10.0	ug/L	50.0	BLOD	75.9	10-152	7.87	20	
Chrysene	46.6	10.0	ug/L	50.0	BLOD	93.3	17-169	19.4	20	



## Certificate of Analysis

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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### Batch BGC0321 - SW3510C/EPA600-MS

Matrix Spike Dup (BGC0321-MSD1)

Source: 23C0421-12

Prepared &amp; Analyzed: 03/09/2023

Dibenz (a,h) anthracene	38.8	10.0	ug/L	50.0	BLOD	77.6	10-227	17.8	20	
Diethyl phthalate	40.3	10.0	ug/L	50.0	BLOD	80.6	10-120	15.7	20	
Dimethyl phthalate	38.8	10.0	ug/L	50.0	BLOD	77.6	10-120	14.3	20	
Di-n-butyl phthalate	44.1	10.0	ug/L	50.0	BLOD	88.2	10-120	19.5	20	
Di-n-octyl phthalate	45.2	10.0	ug/L	50.0	BLOD	90.4	10-146	7.95	20	
Fluoranthene	47.0	10.0	ug/L	50.0	BLOD	94.1	26-137	22.0	20	P
Fluorene	41.5	10.0	ug/L	50.0	BLOD	83.0	59-121	15.1	20	
Hexachlorobenzene	36.1	1.00	ug/L	50.0	BLOD	72.2	10-152	14.4	20	
Hexachlorobutadiene	39.9	10.0	ug/L	50.0	BLOD	79.8	24-120	18.2	20	
Hexachlorocyclopentadiene	26.6	10.0	ug/L	50.0	BLOD	53.1	10-90	19.4	20	
Hexachloroethane	36.1	10.0	ug/L	50.0	BLOD	72.1	40-120	22.2	20	P
Indeno (1,2,3-cd) pyrene	38.8	10.0	ug/L	50.0	BLOD	77.5	10-171	14.9	20	
Isophorone	22.1	10.0	ug/L	50.0	BLOD	44.2	21-196	14.3	20	
Naphthalene	35.8	5.00	ug/L	50.0	BLOD	71.6	21-133	18.2	20	
Nitrobenzene	44.0	10.0	ug/L	50.0	BLOD	88.0	35-180	21.5	20	P
n-Nitrosodimethylamine	14.8	10.0	ug/L	50.0	BLOD	29.5	10-85	59.7	20	P
n-Nitrosodi-n-propylamine	39.9	10.0	ug/L	50.0	BLOD	79.8	10-230	22.1	20	P
n-Nitrosodiphenylamine	34.4	10.0	ug/L	50.0	BLOD	68.8	12-111	13.6	20	
p-Chloro-m-cresol	37.6	10.0	ug/L	50.0	BLOD	75.2	10-127	20.2	20	P
Pentachlorophenol	37.3	20.0	ug/L	50.0	BLOD	74.7	14-176	14.8	20	
Phenanthrene	46.0	10.0	ug/L	50.0	BLOD	91.9	54-120	17.5	20	
Phenol	14.4	10.0	ug/L	50.5	BLOD	28.5	10-120	23.8	20	P
Pyrene	38.2	10.0	ug/L	50.0	BLOD	76.4	52-120	13.4	20	
Pyridine	16.9	10.0	ug/L	50.0	BLOD	33.7	10-110	55.7	20	P
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	<i>82.8</i>		<i>ug/L</i>	<i>200</i>		<i>41.4</i>	<i>5-136</i>			

## Certificate of Analysis

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Date Issued: 4/4/2023 3:37:46PM

Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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**Batch BGC0321 - SW3510C/EPA600-MS**

**Matrix Spike Dup (BGC0321-MSD1)**      **Source: 23C0421-12**      Prepared & Analyzed: 03/09/2023

<i>Surr: 2-Fluorobiphenyl (Surr)</i>	39.0	ug/L	100	39.0	9-117
<i>Surr: 2-Fluorophenol (Surr)</i>	27.4	ug/L	200	13.7	5-60
<i>Surr: Nitrobenzene-d5 (Surr)</i>	44.8	ug/L	100	44.8	5-151
<i>Surr: Phenol-d5 (Surr)</i>	29.7	ug/L	200	14.9	5-60
<i>Surr: p-Terphenyl-d14 (Surr)</i>	29.3	ug/L	100	29.3	5-141

### Certificate of Analysis

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Date Issued: 4/4/2023 3:37:46PM

Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
<b>Batch BGC0274 - No Prep Wet Chem</b>										
<b>Blank (BGC0274-BLK1)</b>				Prepared & Analyzed: 03/08/2023						
BOD	0.4	2.0	mg/L							
<b>LCS (BGC0274-BS1)</b>				Prepared & Analyzed: 03/08/2023						
BOD	220	2	mg/L	198		111	84.6-115.4			
<b>Duplicate (BGC0274-DUP1)</b>				Source: 23C0316-01		Prepared & Analyzed: 03/08/2023				
BOD	5.3	2.0	mg/L		5.3			0.567	20	
<b>Batch BGC0305 - No Prep Wet Chem</b>										
<b>Blank (BGC0305-BLK1)</b>				Prepared & Analyzed: 03/08/2023						
Nitrite as N	ND	0.05	mg/L							
<b>LCS (BGC0305-BS1)</b>				Prepared & Analyzed: 03/08/2023						
Nitrite as N	0.10	0.05	mg/L	0.100		103	80-120			
<b>Matrix Spike (BGC0305-MS1)</b>				Source: 23C0489-02		Prepared & Analyzed: 03/08/2023				
Nitrite as N	0.10	0.05	mg/L	0.100	BLOD	105	80-120			
<b>Matrix Spike Dup (BGC0305-MSD1)</b>				Source: 23C0489-02		Prepared & Analyzed: 03/08/2023				
Nitrite as N	0.10	0.05	mg/L	0.100	BLOD	105	80-120	0.00	20	
<b>Batch BGC0411 - No Prep Wet Chem</b>										
<b>Blank (BGC0411-BLK1)</b>				Prepared & Analyzed: 03/10/2023						
COD	ND	10.0	mg/L							

## Certificate of Analysis

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Date Issued: 4/4/2023 3:37:46PM

Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
<b>Batch BGC0411 - No Prep Wet Chem</b>										
<b>LCS (BGC0411-BS1)</b>				Prepared & Analyzed: 03/10/2023						
COD	47.4	10.0	mg/L	50.0		94.9	88-119			
<b>Matrix Spike (BGC0411-MS1)</b>				Source: 23C0451-01 Prepared & Analyzed: 03/10/2023						
COD	54.2	10.0	mg/L	50.0	BLOD	108	72.4-130			
<b>Matrix Spike Dup (BGC0411-MSD1)</b>				Source: 23C0451-01 Prepared & Analyzed: 03/10/2023						
COD	53.2	10.0	mg/L	50.0	BLOD	106	72.4-130	1.92	20	
<b>Batch BGC0423 - No Prep Wet Chem</b>										
<b>Blank (BGC0423-BLK1)</b>				Prepared & Analyzed: 03/10/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							
<b>LCS (BGC0423-BS1)</b>				Prepared & Analyzed: 03/10/2023						
Total Recoverable Phenolics	0.45	0.050	mg/L	0.500		89.2	80-120			
<b>Matrix Spike (BGC0423-MS1)</b>				Source: 23C0427-01 Prepared & Analyzed: 03/10/2023						
Total Recoverable Phenolics	0.54	0.050	mg/L	0.500	BLOD	108	70-130			
<b>Matrix Spike Dup (BGC0423-MSD1)</b>				Source: 23C0427-01 Prepared & Analyzed: 03/10/2023						
Total Recoverable Phenolics	0.52	0.050	mg/L	0.500	BLOD	104	70-130	3.39	20	
<b>Batch BGC0460 - No Prep Wet Chem</b>										
<b>Blank (BGC0460-BLK1)</b>				Prepared & Analyzed: 03/13/2023						
Ammonia as N	ND	0.10	mg/L							

## Certificate of Analysis

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
<b>Batch BGC0460 - No Prep Wet Chem</b>										
<b>LCS (BGC0460-BS1)</b>				Prepared & Analyzed: 03/13/2023						
Ammonia as N	1.98	0.1	mg/L	2.00		99.1	90-110			
<b>Matrix Spike (BGC0460-MS1)</b>				Source: 23C0661-01 Prepared & Analyzed: 03/13/2023						
Ammonia as N	2.03	0.10	mg/L	2.00	0.09	96.6	89.3-131			
<b>Matrix Spike Dup (BGC0460-MSD1)</b>				Source: 23C0661-01 Prepared & Analyzed: 03/13/2023						
Ammonia as N	1.97	0.10	mg/L	2.00	0.09	93.9	89.3-131	2.75	20	
<b>Batch BGC0578 - No Prep Wet Chem</b>										
<b>Blank (BGC0578-BLK1)</b>				Prepared & Analyzed: 03/15/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							
<b>LCS (BGC0578-BS1)</b>				Prepared & Analyzed: 03/15/2023						
Total Recoverable Phenolics	0.45	0.050	mg/L	0.500		90.4	80-120			
<b>Matrix Spike (BGC0578-MS1)</b>				Source: 23C0769-02 Prepared & Analyzed: 03/15/2023						
Total Recoverable Phenolics	0.52	0.050	mg/L	0.500	BLOD	104	70-130			
<b>Matrix Spike Dup (BGC0578-MSD1)</b>				Source: 23C0769-02 Prepared & Analyzed: 03/15/2023						
Total Recoverable Phenolics	0.53	0.050	mg/L	0.500	BLOD	106	70-130	1.90	20	
<b>Batch BGC0587 - No Prep Wet Chem</b>										
<b>Blank (BGC0587-BLK1)</b>				Prepared & Analyzed: 03/16/2023						
TKN as N	ND	0.50	mg/L							

## Certificate of Analysis

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
<b>Batch BGC0587 - No Prep Wet Chem</b>										
<b>LCS (BGC0587-BS1)</b>				Prepared & Analyzed: 03/16/2023						
TKN as N	10.5	0.50	mg/L	10.0		105	90-110			
<b>Matrix Spike (BGC0587-MS1)</b>				Source: 23C0779-02 Prepared & Analyzed: 03/16/2023						
TKN as N	8.74	0.50	mg/L	10.0	BLOD	87.4	90-110			M
<b>Matrix Spike (BGC0587-MS2)</b>				Source: 23C0507-01 Prepared & Analyzed: 03/16/2023						
TKN as N	10.6	0.50	mg/L	10.0	0.39	102	90-110			
<b>Matrix Spike Dup (BGC0587-MSD1)</b>				Source: 23C0779-02 Prepared & Analyzed: 03/16/2023						
TKN as N	6.72	0.50	mg/L	10.0	BLOD	67.2	90-110	26.2	20	M
<b>Matrix Spike Dup (BGC0587-MSD2)</b>				Source: 23C0507-01 Prepared & Analyzed: 03/16/2023						
TKN as N	10.7	0.50	mg/L	10.0	0.39	103	90-110	1.45	20	
<b>Batch BGC0609 - No Prep Wet Chem</b>										
<b>Blank (BGC0609-BLK1)</b>				Prepared & Analyzed: 03/16/2023						
Nitrate+Nitrite as N	ND	0.02	mg/L							
<b>LCS (BGC0609-BS1)</b>				Prepared & Analyzed: 03/16/2023						
Nitrate+Nitrite as N	2.73	0.1	mg/L	2.50		109	90-110			
<b>Matrix Spike (BGC0609-MS1)</b>				Source: 23C0339-01 Prepared & Analyzed: 03/16/2023						
Nitrate+Nitrite as N	3.50	0.1	mg/L	2.50	0.09	136	90-110			M
<b>Matrix Spike Dup (BGC0609-MSD1)</b>				Source: 23C0339-01 Prepared & Analyzed: 03/16/2023						
Nitrate+Nitrite as N	3.46	0.1	mg/L	2.50	0.09	135	90-110	1.06	20	M

## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
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Date Issued: 4/4/2023 3:37:46PM

### Analytical Summary

23C0397-01 Subcontract  
 23C0397-02 Subcontract

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Metals (Total) by EPA 6000/7000 Series Methods</b>			<b>Preparation Method:</b>	<b>EPA200.2/R2.8</b>	
23C0397-01	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0432	AC30141
23C0397-01RE1	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0689	AC30187
23C0397-02	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0432	AC30141
23C0397-02RE1	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0689	AC30187

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Wet Chemistry Analysis</b>			<b>Preparation Method:</b>	<b>No Prep Wet Chem</b>	
23C0397-01	300 mL / 300 mL	SM22 5210B-2011	BGC0274	SGC0427	
23C0397-02	300 mL / 300 mL	SM22 5210B-2011	BGC0274	SGC0427	
23C0397-01	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGC0305	SGC0294	AJ20138
23C0397-02	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGC0305	SGC0294	AJ20138
23C0397-01	0.0400 mL / 2.00 mL	SM22 5220D-2011	BGC0411	SGC0407	AB30171
23C0397-02	2.00 mL / 2.00 mL	SM22 5220D-2011	BGC0411	SGC0407	AB30171
23C0397-01	5.00 mL / 10.0 mL	SW9065	BGC0423	SGC0415	AL20103
23C0397-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGC0460	SGC0461	AC30146
23C0397-02	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGC0460	SGC0461	AC30146
23C0397-02	5.00 mL / 10.0 mL	SW9065	BGC0578	SGC0557	AL20103
23C0397-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
23C0397-02	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
23C0397-01	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGC0609	SGC0599	AC30173
23C0397-02	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGC0609	SGC0599	AC30173

## Certificate of Analysis

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Date Issued: 4/4/2023 3:37:46PM

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Semivolatile Organic Compounds by GCMS</b>			<b>Preparation Method: SW3510C/EPA600-MS</b>		
23C0397-01	1070 mL / 25.0 mL	SW8270E	BGC0321	SGC0358	AL20040
23C0397-02	980 mL / 1.00 mL	SW8270E	BGC0321	SGC0408	AL20040
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GCMS</b>			<b>Preparation Method: SW5030B-MS</b>		
23C0397-01	5.00 mL / 5.00 mL	SW8260D	BGC0325	SGC0351	AB30127
23C0397-02	5.00 mL / 5.00 mL	SW8260D	BGC0325	SGC0351	AB30127
23C0397-02RE1	5.00 mL / 5.00 mL	SW8260D	BGC0325	SGC0351	AB30127
23C0397-03	5.00 mL / 5.00 mL	SW8260D	BGC0325	SGC0351	AB30127
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Metals (Total) by EPA 6000/7000 Series Methods</b>			<b>Preparation Method: SW7470A</b>		
23C0397-01	20.0 mL / 20.0 mL	SW7470A	BGC0322	SGC0341	AC30132
23C0397-02	10.0 mL / 20.0 mL	SW7470A	BGC0322	SGC0341	AC30132



## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
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 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

### QC Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Metals (Total) by EPA 6000/7000 Series Methods</b>			<b>Preparation Method:</b>	<b>EPA200.2/R2.8</b>	
BGC0373-BLK1	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0432	AC30141
BGC0373-BS1	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0432	AC30141
BGC0373-MS1	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0432	AC30141
BGC0373-MS2	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0432	AC30141
BGC0373-MSD1	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0432	AC30141
BGC0373-MSD2	50.0 mL / 50.0 mL	SW6010D	BGC0373	SGC0432	AC30141

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Wet Chemistry Analysis</b>			<b>Preparation Method:</b>	<b>No Prep Wet Chem</b>	
BGC0274-BLK1	300 mL / 300 mL	SM22 5210B-2011	BGC0274	SGC0427	
BGC0274-BS1	300 mL / 300 mL	SM22 5210B-2011	BGC0274	SGC0427	
BGC0274-DUP1	300 mL / 300 mL	SM22 5210B-2011	BGC0274	SGC0427	
BGC0305-BLK1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGC0305	SGC0294	AJ20138
BGC0305-BS1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGC0305	SGC0294	AJ20138
BGC0305-MRL1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGC0305	SGC0294	AJ20138
BGC0305-MS1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGC0305	SGC0294	AJ20138
BGC0305-MSD1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGC0305	SGC0294	AJ20138
BGC0411-BLK1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGC0411	SGC0407	AB30171
BGC0411-BS1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGC0411	SGC0407	AB30171
BGC0411-MRL1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGC0411	SGC0407	AB30171
BGC0411-MS1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGC0411	SGC0407	AB30171
BGC0411-MSD1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGC0411	SGC0407	AB30171
BGC0423-BLK1	5.00 mL / 10.0 mL	SW9065	BGC0423	SGC0415	AL20103

## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Wet Chemistry Analysis</b>			<b>Preparation Method:</b>	<b>No Prep Wet Chem</b>	
BGC0423-BS1	5.00 mL / 10.0 mL	SW9065	BGC0423	SGC0415	AL20103
BGC0423-MRL1	5.00 mL / 10.0 mL	SW9065	BGC0423	SGC0415	AL20103
BGC0423-MS1	5.00 mL / 10.0 mL	SW9065	BGC0423	SGC0415	AL20103
BGC0423-MSD1	5.00 mL / 10.0 mL	SW9065	BGC0423	SGC0415	AL20103
BGC0460-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGC0460	SGC0461	AC30146
BGC0460-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGC0460	SGC0461	AC30146
BGC0460-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGC0460	SGC0461	AC30146
BGC0460-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGC0460	SGC0461	AC30146
BGC0578-BLK1	5.00 mL / 10.0 mL	SW9065	BGC0578	SGC0557	AL20103
BGC0578-BS1	5.00 mL / 10.0 mL	SW9065	BGC0578	SGC0557	AL20103
BGC0578-MRL1	5.00 mL / 10.0 mL	SW9065	BGC0578	SGC0557	AL20103
BGC0578-MS1	5.00 mL / 10.0 mL	SW9065	BGC0578	SGC0557	AL20103
BGC0578-MSD1	5.00 mL / 10.0 mL	SW9065	BGC0578	SGC0557	AL20103
BGC0587-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
BGC0587-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
BGC0587-MRL1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
BGC0587-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
BGC0587-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
BGC0587-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
BGC0587-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGC0587	SGC0596	AC30171
BGC0609-BLK1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGC0609	SGC0599	AC30173
BGC0609-BS1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGC0609	SGC0599	AC30173
BGC0609-MRL1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGC0609	SGC0599	AC30173
BGC0609-MS1	50.0 mL / 50.0 mL	SM22 4500-NO3F-2011	BGC0609	SGC0599	AC30173
BGC0609-MSD1	50.0 mL / 50.0 mL	SM22 4500-NO3F-2011	BGC0609	SGC0599	AC30173

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Semivolatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>SW3510C/EPA600-MS</b>	

## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Semivolatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>SW3510C/EPA600-MS</b>	
BGC0321-BLK1	1000 mL / 1.00 mL	SW8270E	BGC0321	SGC0358	AL20040
BGC0321-BLK2		SW8270E	BGC0321	SGC0360	AL20040
BGC0321-BS1	1000 mL / 1.00 mL	SW8270E	BGC0321	SGC0358	AL20040
BGC0321-MS1	1000 mL / 1.00 mL	SW8270E	BGC0321	SGC0361	AB30070
BGC0321-MSD1	1000 mL / 1.00 mL	SW8270E	BGC0321	SGC0361	AB30070

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Volatile Organic Compounds by GCMS</b>			<b>Preparation Method:</b>	<b>SW5030B-MS</b>	
BGC0325-BLK1	5.00 mL / 5.00 mL	SW8260D	BGC0325	SGC0351	AB30127
BGC0325-BS1	5.00 mL / 5.00 mL	SW8260D	BGC0325	SGC0351	AB30127
BGC0325-MS1	5.00 mL / 5.00 mL	SW8260D	BGC0325	SGC0351	AB30127
BGC0325-MSD1	5.00 mL / 5.00 mL	SW8260D	BGC0325	SGC0351	AB30127

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
<b>Metals (Total) by EPA 6000/7000 Series Methods</b>			<b>Preparation Method:</b>	<b>SW7470A</b>	
BGC0322-BLK1	20.0 mL / 20.0 mL	SW7470A	BGC0322	SGC0341	AC30132
BGC0322-BS1	20.0 mL / 20.0 mL	SW7470A	BGC0322	SGC0341	AC30132
BGC0322-MS1	20.0 mL / 20.0 mL	SW7470A	BGC0322	SGC0341	AC30132
BGC0322-MSD1	20.0 mL / 20.0 mL	SW7470A	BGC0322	SGC0341	AC30132

## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

### Certified Analyses included in this Report

Analyte	Certifications
<b><i>EPA350.1 R2.0 in Non-Potable Water</i></b>	
Ammonia as N	VELAP,NCDEQ,PADEP,WVDEP
<b><i>EPA351.2 R2.0 in Non-Potable Water</i></b>	
TKN as N	VELAP,NCDEQ,WVDEP
<b><i>SM22 4500-NO2B-2011 in Non-Potable Water</i></b>	
Nitrite as N	VELAP,WVDEP
<b><i>SM22 4500-NO3F-2011 in Non-Potable Water</i></b>	
Nitrate+Nitrite as N	VELAP,WVDEP
<b><i>SM22 5210B-2011 in Non-Potable Water</i></b>	
BOD	VELAP,NCDEQ,WVDEP
<b><i>SM22 5220D-2011 in Non-Potable Water</i></b>	
COD	VELAP,NCDEQ,PADEP,WVDEP
<b><i>SW6010D in Non-Potable Water</i></b>	
Arsenic	VELAP,WVDEP
Barium	VELAP,WVDEP,PADEP
Cadmium	VELAP,WVDEP,PADEP
Chromium	VELAP,WVDEP
Copper	VELAP,WVDEP
Lead	VELAP,WVDEP
Nickel	VELAP,WVDEP
Selenium	VELAP,WVDEP
Silver	VELAP,WVDEP,PADEP
Zinc	VELAP,WVDEP
<b><i>SW7470A in Non-Potable Water</i></b>	
Mercury	VELAP,NCDEQ,WVDEP

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## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

### Certified Analyses included in this Report

Analyte	Certifications
<b><i>SW8260D in Non-Potable Water</i></b>	
2-Butanone (MEK)	VELAP,NCDEQ,PADEP,WVDEP
Acetone	VELAP,NCDEQ,PADEP,WVDEP
Benzene	VELAP,NCDEQ,PADEP,WVDEP
Ethylbenzene	VELAP,NCDEQ,PADEP,WVDEP
Toluene	VELAP,NCDEQ,PADEP,WVDEP
Xylenes, Total	VELAP,NCDEQ,PADEP,WVDEP
Tetrahydrofuran	VELAP,PADEP
<b><i>SW8270E in Non-Potable Water</i></b>	
Anthracene	VELAP,PADEP,NCDEQ,WVDEP
<b><i>SW9065 in Non-Potable Water</i></b>	
Total Recoverable Phenolics	VELAP,WVDEP

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## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12069	04/01/2024
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
SCDHEC	South Carolina Dept of Health and Environmental Control Certificate 93016001	93016	06/14/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

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## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
Client Site I.D.: City of Bristol Landfill  
Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

### Qualifiers and Definitions

DS	Surrogate concentration reflects a dilution factor.
E	Estimated concentration, outside calibration range
J	The reported result is an estimated value.
L	LCS recovery is outside of established acceptance limits
M	Matrix spike recovery is outside established acceptance limits
P	Duplicate analysis does not meet the acceptance criteria for precision
S	Surrogate recovery was outside acceptance criteria
RPD	Relative Percent Difference
Qual	Qualifiers
-RE	Denotes sample was re-analyzed
LOD	Limit of Detection
BLOD	Below Limit of Detection
LOQ	Limit of Quantitation
DF	Dilution Factor
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.
PCBs, Total	Total PCBs are defined as the sum of detected Aroclors 1016, 1221, 1232, 1248, 1254, 1260, 1262, and 1268.





1941 REYMET ROAD  
RICHMOND, VIRGINIA 23237  
(804) 358-8295 PHONE  
(804)358-8297 FAX

CHAIN OF CUSTODY

COMPANY NAME: SCS Engineers	INVOICE TO: SAME	PROJECT NAME/Quote #:
CONTACT: Jennifer Robb	INVOICE CONTACT:	SITE NAME: City of Bristol Landfill
ADDRESS: 11260 Roger Bacon Drive, Ste. 300, Reston VA 20190	INVOICE ADDRESS:	PROJECT NUMBER: 02218208.15 Task 1
PHONE #: 703-471-6150	EMAIL: jrobb@scsengineers.com	P.O. #:
Pretreatment Program:		

Is sample for compliance reporting? YES NO Regulatory State: VA Is sample from a chlorinated supply? YES NO PWS I.D. #:

SAMPLER NAME (PRINT): Anthony Mirmick Nicholas Galwitz SAMPLER SIGNATURE: [Signatures] Turn Around Time: 10 Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE)											COMMENTS
											Ammonia - EPA 350.1	BOD - SM22 5210B-2021	COD - SM22 5220D-2011	Nitrate SM22 450-NO3F-2011 (report separately from Nitrite)	Nitrite SM22 450-NO3F-2011	SVOC (Anthracene) 8270	Total Metals (As, Ba, Cd, Cr, Cu, Pb, Ni, Se, Ag, Zn) 6010	TKN - EPA 351.2 R2.0	Mercury - 7470	Total Recoverable Phenolics - 9065	V. Fatty Acids (See List) 8015	
1) EW-58	X					030623 1045			GW	11	X	X	X	X	X	X	X	X	X	X	X	<p>Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol</p> <p>Note VOC 8260 no HCl</p> <p>PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)</p>
2) EW-59	X					030623/033			GW	11	X	X	X	X	X	X	X	X	X	X	X	
3) Trip Blank	X					030623 1430			GW	2												
4)									GW													
5)									GW													
6)									GW													
7)									GW													
8)									GW													
9)									GW													
10)									DI													

SCS-W 23C0397  
City of Bristol Semi-Annual  
Recd: 03/08/2023 Due: 03/22/2023  
v130325002

RELINQUISHED: [Signature]	DATE / TIME: 03/07/23/1200	RECEIVED: LCW	DATE / TIME:	QC Data Package	LAB USE ONLY Therm ID: 271	COOLER TEMP 2.4 °C
RELINQUISHED: LCW	DATE / TIME:	RECEIVED: M Stevens	DATE / TIME: 03/08/23 0800	Level III <input type="checkbox"/>	Custody Seals used and intact? (Y/N)	Received on ice? (Y/N)
RELINQUISHED:	DATE / TIME:	RECEIVED:	DATE / TIME:	Level IV <input type="checkbox"/>		





# Sample Preservation Log

Order ID 2300397

Date Performed: 3/8/23

Analyst Performing Check: CSB

Sample ID	Container ID	Metals			Cyanide			Sulfide			Ammonia			TKN			Phos, Tot			NO3+NO2			DRO			Pesticide (8081/608/508) PCB DW only			SVOC (525/8270/625)			CrVI * **			Pest/PCB (508) / SVOC(525)			COD			Phenolics		
		pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	Res. Cl		final + or -	Res. Cl		final + or -	Received pH	Final pH	pH as Received		Final pH	pH as Received		Final pH				
		<2	Other		>12	Other		>9	Other		<2	Other		<2	Other		<2	Other		<2	Other		<2	Other		+	-	+	-			<2	Other		<2	Other							
01	A		7	<2																																							
01	B								6	<2		6	<2																					6	<2								
01	D																																			6	<2						
01	E																																										
02	A		7	<2																																							
02	B								6	<2		6	<2																						6	<2							
02	D																																				6	<2					
02	E																																										

NaOH ID: \_\_\_\_\_ HNO3 ID: 3A03297 CrVI preserved date/time: \_\_\_\_\_ Analyst Initials: \_\_\_\_\_  
 \* pH must be adjusted between 9.3 - 9.7  
 H2SO4 ID: 2L01944 Na2S2O5 ID: \_\_\_\_\_ Buffer Sof'n ID: \_\_\_\_\_  
 HCL ID: \_\_\_\_\_ Na2SO3 ID: \_\_\_\_\_ 1N NaOH ID: \_\_\_\_\_ 5N NaOH: \_\_\_\_\_

Metals were received with pH = 7. HNO3 was added at 0900 on 08 Mar 2023 by CSB in the Log-In room to bring pH= <2.

\*\*W.Va only certifies DISS CrVI and not T CrVI as an approved analyte under 40CFR136 for waste water.

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**Certificate of Analysis**

Client Name: SCS Engineers-Winchester  
Client Site I.D.: City of Bristol Landfill  
Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

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## Certificate of Analysis

Client Name: SCS Engineers-Winchester  
 Client Site I.D.: City of Bristol Landfill  
 Submitted To: Jennifer Robb

Date Issued: 4/4/2023 3:37:46PM

**Laboratory Order ID: 23C0397**

### Sample Conditions Checklist

Samples Received at:	2.40°C
How were samples received?	Logistics Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	Yes
Are all volatile organic and TOX containers free of headspace?	Yes
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	Yes
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	No

H2SO4-preserved containers for samples -01: EW-58 and -02: EW-59 received with pH 6; H2SO4 added to bring pH to <2. Jennifer Robb notified via email. MRS 03/0823 1130

**Work Orders:** 3C09089

**Report Date:** 4/03/2023

**Project:** 23C0397

**Received Date:** 3/9/2023

**Turnaround Time:** Normal

**Phones:** (804) 358-8295

**Fax:**

**P.O. #:** 042132

**Attn:** JP Verheul

**Billing Code:**

**Client:** Enthalpy Analytical - Richmond VA  
1941 Reymet Road  
Richmond, VA 23237

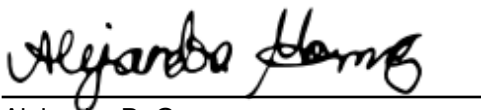
DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • ISO17025 ANAB #L2457.01 • LACSD #10143

*This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.*

Dear JP Verheul,

Enclosed are the results of analyses for samples received 3/09/23 with the Chain-of-Custody document. The samples were received in good condition, at 3.5 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

**Reviewed by:**



Alejandra D. Gomez  
Project Manager



Enthalpy Analytical - Richmond VA  
 1941 Reymet Road  
 Richmond, VA 23237

**Project Number:** 23C0397

**Reported:**

04/03/2023 16:59

**Project Manager:** JP Verheul

## Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
23C0397-01: EW-58	Client	3C09089-01	Water	03/06/23 10:45	
23C0397-02: EW-59	Client	3C09089-02	Water	03/06/23 10:33	

Enthalpy Analytical - Richmond VA  
1941 Reymet Road  
Richmond, VA 23237

**Project Number:** 23C0397  
**Project Manager:** JP Verheul

**Reported:**  
04/03/2023 16:59

## Sample Results

Sample: 23C0397-01: EW-58  
3C09089-01 (Water) Sampled: 03/06/23 10:45 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
<b>Alcohols by GC/FID</b>						
<b>Method:</b> EPA 8015M		<b>Instr:</b> GC09				
<b>Batch ID:</b> W3C2245		<b>Preparation:</b> _NONE (SVOC)		<b>Prepared:</b> 03/27/23 10:03		<b>Analyst:</b> ecs
Acetic acid	ND	500	mg/l	50	03/27/23	M-05
Butyric acid	ND	500	mg/l	50	03/27/23	M-05
Heptanoic acid	ND	500	mg/l	50	03/27/23	M-05
Hexanoic acid	ND	500	mg/l	50	03/27/23	M-05
Isobutyric acid	ND	500	mg/l	50	03/27/23	M-05
Isocaproic acid	ND	500	mg/l	50	03/27/23	M-05
Isovaleric acid	ND	500	mg/l	50	03/27/23	M-05
Propionic acid	ND	500	mg/l	50	03/27/23	M-05
Valeric acid	ND	500	mg/l	50	03/27/23	M-05

## Sample Results

Sample: 23C0397-02: EW-59  
3C09089-02 (Water) Sampled: 03/06/23 10:33 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
<b>Alcohols by GC/FID</b>						
<b>Method:</b> EPA 8015M		<b>Instr:</b> GC09				
<b>Batch ID:</b> W3C2245		<b>Preparation:</b> _NONE (SVOC)		<b>Prepared:</b> 03/27/23 10:03		<b>Analyst:</b> ecs
Acetic acid	640	500	mg/l	50	03/27/23	M-05
Butyric acid	ND	500	mg/l	50	03/27/23	M-05
Heptanoic acid	ND	500	mg/l	50	03/27/23	M-05
Hexanoic acid	ND	500	mg/l	50	03/27/23	M-05
Isobutyric acid	ND	500	mg/l	50	03/27/23	M-05
Isocaproic acid	ND	500	mg/l	50	03/27/23	M-05
Isovaleric acid	ND	500	mg/l	50	03/27/23	M-05
Propionic acid	ND	500	mg/l	50	03/27/23	M-05
Valeric acid	ND	500	mg/l	50	03/27/23	M-05

Enthalpy Analytical - Richmond VA  
1941 Reymet Road  
Richmond, VA 23237

**Project Number:** 23C0397  
**Project Manager:** JP Verheul

**Reported:**  
04/03/2023 16:59

## Quality Control Results

Alcohols by GC/FID

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	Limits	RPD	RPD Limit	Qualifier
<b>Batch: W3C2245 - EPA 8015M</b>										
<b>Blank (W3C2245-BLK1)</b>				<b>Prepared &amp; Analyzed: 03/27/23</b>						
Acetic acid	ND	10	mg/l							
Butyric acid	ND	10	mg/l							
Heptanoic acid	ND	10	mg/l							
Hexanoic acid	ND	10	mg/l							
Isobutyric acid	ND	10	mg/l							
Isocaproic acid	ND	10	mg/l							
Isovaleric acid	ND	10	mg/l							
Propionic acid	ND	10	mg/l							
Valeric acid	ND	10	mg/l							
<b>LCS (W3C2245-BS1)</b>				<b>Prepared &amp; Analyzed: 03/27/23</b>						
Acetic acid	52.0	10	mg/l	50.0	104		50-150			
Butyric acid	48.4	10	mg/l	50.0	97		50-150			
Heptanoic acid	42.8	10	mg/l	50.0	86		50-150			
Hexanoic acid	42.7	10	mg/l	50.0	85		50-150			
Isobutyric acid	48.0	10	mg/l	50.0	96		50-150			
Isocaproic acid	41.9	10	mg/l	50.0	84		50-150			
Isovaleric acid	45.9	10	mg/l	50.0	92		50-150			
Propionic acid	42.6	10	mg/l	50.0	85		50-150			
Valeric acid	45.9	10	mg/l	50.0	92		50-150			
<b>Matrix Spike (W3C2245-MS1)</b>				<b>Source: 3C08046-01</b>		<b>Prepared &amp; Analyzed: 03/27/23</b>				
Acetic acid	65.4	10	mg/l	50.0	ND	131	50-150			
Butyric acid	51.6	10	mg/l	50.0	ND	103	50-150			
Heptanoic acid	44.4	10	mg/l	50.0	ND	89	50-150			
Hexanoic acid	45.7	10	mg/l	50.0	ND	91	50-150			
Isobutyric acid	50.2	10	mg/l	50.0	ND	100	50-150			
Isocaproic acid	43.8	10	mg/l	50.0	ND	88	50-150			
Isovaleric acid	48.6	10	mg/l	50.0	ND	97	50-150			
Propionic acid	47.0	10	mg/l	50.0	ND	94	50-150			
Valeric acid	49.3	10	mg/l	50.0	ND	99	50-150			
<b>Matrix Spike Dup (W3C2245-MSD1)</b>				<b>Source: 3C08046-01</b>		<b>Prepared &amp; Analyzed: 03/27/23</b>				
Acetic acid	58.9	10	mg/l	50.0	ND	118	50-150	11	25	
Butyric acid	45.6	10	mg/l	50.0	ND	91	50-150	12	25	
Heptanoic acid	38.8	10	mg/l	50.0	ND	78	50-150	13	25	
Hexanoic acid	39.0	10	mg/l	50.0	ND	78	50-150	16	25	
Isobutyric acid	43.1	10	mg/l	50.0	ND	86	50-150	15	25	
Isocaproic acid	38.1	10	mg/l	50.0	ND	76	50-150	14	25	
Isovaleric acid	41.8	10	mg/l	50.0	ND	84	50-150	15	25	
Propionic acid	42.5	10	mg/l	50.0	ND	85	50-150	10	25	
Valeric acid	41.6	10	mg/l	50.0	ND	83	50-150	17	25	

Enthalpy Analytical - Richmond VA  
 1941 Reymet Road  
 Richmond, VA 23237

**Project Number:** 23C0397

**Project Manager:** JP Verheul

**Reported:**  
 04/03/2023 16:59

## Quality Control Results

(Continued)

Alcohols by GC/FID (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Batch:** W3C2245 - EPA 8015M (Continued)

**Matrix Spike Dup (W3C2245-MSD1)**

**Source:** 3C08046-01

**Prepared & Analyzed:** 03/27/23



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**Project Manager:** JP Verheul

**Reported:**  
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## Notes and Definitions

Item	Definition
M-05	Due to the nature of matrix interferences, sample was diluted prior to analysis. The MDL and MRL were raised due to the dilution.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ	
Parameter	Monitoring Event	Concentration												
Ammonia as N (mg/L)	November-2022	---	---	---	---	1560	---	1400	1380	---	---	50	50	
	December-2022	1700	2280	2110	---	1410	1310	---	---	1150	1780	100	100	
	January-2023	1520	---	---	1500	---	---	---	1330	---	---	---	50	50
		---	---	---	---	2440	---	---	---	---	---	---	100	100
	February-2023	---	---	---	---	---	---	---	---	---	---	1490	100	100
March-2023	---	---	---	667	1480	---	---	---	---	---	---	73.1	100	
Biological Oxygen Demand (mg/L)	November-2022	---	---	---	---	15700	---	5860	5140	---	---	0.2	2	
	December-2022	6440	12500	11400	---	9240	3330	---	---	8360	6770	0.2	2	
	January-2023	9920	---	---	999	28100	---	---	7060	---	---	0.2	2	
	February-2023	---	---	---	---	---	---	---	---	---	7230	0.2	2	
	March-2023	---	---	---	1570	9190	---	---	---	---	---	---	0.2	2
Chemical Oxygen Demand (mg/L)	November-2022	---	---	---	---	---	---	9790	10800	---	---	1000	1000	
		---	---	---	---	23500	---	---	---	---	---	2000	2000	
	December-2022	7440	---	---	---	---	---	---	---	---	---	---	1000	1000
		---	---	---	---	13200	8000	---	---	20300	14100	---	2000	2000
		---	---	22400	---	---	---	---	---	---	---	---	5000	5000
		---	86800	---	---	---	---	---	---	---	---	---	10000	10000
	January-2023	---	---	---	3630	---	---	---	---	---	---	---	500	500
		14900	---	---	---	---	---	---	---	8430	---	---	2000	2000
	February-2023	---	---	---	---	47600	---	---	---	---	---	---	5000	5000
		---	---	---	---	---	---	---	---	---	---	9210	1000	1000
March-2023	---	---	---	1690	---	---	---	---	---	---	---	500	500	
	---	---	---	---	10600	---	---	---	---	---	---	2000	2000	

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ	
Parameter	Monitoring Event	Concentration												
Nitrate+Nitrite as N (mg/L)	November-2022	---	---	---	---	<b>2.91</b>	---	<b>0.16</b>	<b>0.33</b>	---	---	0.1	0.1	
Nitrate as N (mg/L)	December-2022	---	---	---	---	---	---	---	---	ND	---	0.2	0.2	
		---	---	---	---	---	ND	---	---	---	---	0.2	0.6	
		ND	ND	ND	---	ND	---	---	---	---	---	---	1.1	5.1
		---	---	---	---	---	---	---	---	---	---	ND	1.5	5.5
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	0.35	1.35
		---	---	---	---	---	---	---	---	ND	---	---	1.1	1.1
		<b>3.9</b>	---	---	---	---	---	---	---	---	---	---	2.1	2.1
	February-2023	---	---	---	---	ND	---	---	---	---	---	2.2	2.2	
	March-2023	---	---	---	---	---	---	---	---	---	ND	0.35	1.35	
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	1.04	5.1
Nitrite as N (mg/L)	December-2022	---	---	---	---	---	---	<b>0.12 J</b>	---	---	---	0.1	0.5	
		ND	ND	ND	---	ND	---	---	---	ND	ND	1	5	
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	0.25	1.25
		---	---	---	---	---	---	---	---	ND	---	---	1	1
	February-2023	ND	---	---	---	ND	---	---	---	---	---	2	2	
	March-2023	---	---	---	---	---	---	---	---	---	---	<b>0.48 J</b>	0.25	1.25
March-2023	---	---	---	ND	ND	---	---	---	---	---	---	1	5	
Total Kjeldahl Nitrogen (mg/L)	November-2022	---	---	---	---	---	---	<b>1290</b>	<b>1470</b>	---	---	20	50	
		---	---	---	---	<b>2110</b>	---	---	---	---	---	50	125	
	December-2022	<b>1510</b>	<b>3570</b>	<b>1790</b>	---	<b>1830</b>	<b>1490</b>	---	---	<b>1340</b>	<b>1940</b>	200	500	
	January-2023	<b>1840</b>	---	---	<b>881</b>	---	---	---	<b>1410</b>	---	---	---	20	50
		---	---	---	---	<b>2970</b>	---	---	---	---	---	---	40	100
	February-2023	---	---	---	---	---	---	---	---	---	---	<b>1870</b>	16.8	50
March-2023	---	---	---	<b>879</b>	<b>1920</b>	---	---	---	---	---	---	33.6	100	

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ	
Parameter	Monitoring Event	Concentration										LOD	LOQ	
Total Recoverable Phenolics (mg/L)	November-2022	---	---	---	---	---	---	5.68	3	---	---	0.3	0.5	
		---	---	---	---	28.8	---	---	---	---	---	0.75	1.25	
	December-2022	---	---	---	---	---	8.94	---	---	---	---	0.3	0.5	
		24.9	54.6	28.3	---	32	---	---	---	20.2	36	1.5	2.5	
	January-2023	27.2	---	---	1.3	---	---	---	---	20.2	---	---	0.75	1.25
		---	---	---	---	56.5	---	---	---	---	---	---	1.5	2.5
	February-2023	---	---	---	---	---	---	---	---	---	22.4	---	1.5	2.5
March-2023	---	---	---	0.4	---	---	---	---	---	---	---	0.03	0.05	
	---	---	---	---	13.9	---	---	---	---	---	---	0.3	0.5	
<b>SEMI-VOLATILE ORGANIC COMPOUND (ug/L)</b>														
Anthracene	November-2022	---	---	---	---	---	---	ND	ND	---	---	46.7	93.5	
		---	---	---	---	ND	---	---	---	---	---	93.5	187	
	December-2022	---	---	---	---	ND	ND	---	---	---	ND	9.35	9.35	
		---	ND	---	---	---	---	---	---	---	---	11.7	11.7	
		ND	---	---	---	---	---	---	---	---	---	23.4	23.4	
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	485	971
		---	---	---	---	---	---	---	---	ND	---	---	243	485
		ND	---	---	---	---	---	---	---	---	---	---	253	505
		---	---	---	---	---	---	---	---	---	---	---	490	980
	February-2023	---	---	---	---	---	---	---	---	---	---	---	500	1000
		---	---	---	---	---	---	---	---	---	---	ND	187	374
	March-2023	---	---	---	---	ND	---	---	---	---	---	---	51	102
---		---	---	ND	---	---	---	---	---	---	---	117	234	
<b>TOTAL METAL (mg/L)</b>														
Arsenic	November-2022	---	---	---	---	0.863	---	0.464	1.3	---	---	0.02	0.04	
	December-2022	1.02	0.406	0.174	---	1.69	0.49	---	---	0.159	0.574	0.02	0.04	
	January-2023	0.285	---	---	0.596	0.225	---	---	0.846	---	---	0.01	0.02	
	February-2023	---	---	---	---	---	---	---	---	---	0.29	0.005	0.01	
	March-2023	---	---	---	1.07	1	---	---	---	---	---	0.01	0.02	

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration										LOD	LOQ
<b>TOTAL METALS (mg/L)</b>													
Barium	November-2022	---	---	---	---	<b>0.871</b>	---	<b>0.485</b>	<b>0.36</b>	---	---	0.01	0.02
	December-2022	<b>0.566</b>	<b>0.803</b>	<b>0.978</b>	---	<b>0.438</b>	<b>0.214</b>	---	---	<b>0.856</b>	<b>0.793</b>	0.01	0.02
	January-2023	<b>0.643</b>	---	---	<b>0.683</b>	<b>1.92</b>	---	---	<b>0.554</b>	---	---	0.005	0.01
	February-2023	---	---	---	---	---	---	---	---	---	<b>1.04</b>	0.01	0.05
	March-2023	---	---	---	<b>0.406</b>	<b>0.683</b>	---	---	---	---	---	---	0.005
Cadmium	November-2022	---	---	---	---	ND	---	ND	ND	---	---	0.004	0.008
	December-2022	ND	<b>0.0104</b>	ND	---	ND	ND	---	---	ND	ND	0.004	0.008
	January-2023	ND	---	---	ND	ND	---	---	ND	---	---	0.002	0.004
	February-2023	---	---	---	---	---	---	---	---	---	<b>0.000297 J</b>	0.0001	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	0.002	0.004
Chromium	November-2022	---	---	---	---	<b>0.208</b>	---	<b>0.112</b>	<b>0.354</b>	---	---	0.016	0.02
	December-2022	<b>0.503</b>	<b>1.08</b>	<b>1.76</b>	---	<b>0.274</b>	<b>0.319</b>	---	---	<b>0.499</b>	<b>0.822</b>	0.016	0.02
	January-2023	<b>0.31</b>	---	---	<b>0.488</b>	<b>0.178</b>	---	---	<b>0.155</b>	---	---	0.008	0.01
	February-2023	---	---	---	---	---	---	---	---	---	<b>0.277</b>	0.004	0.01
	March-2023	---	---	---	<b>0.213</b>	<b>0.188</b>	---	---	---	---	---	0.008	0.01
Copper	November-2022	---	---	---	---	ND	---	ND	ND	---	---	0.016	0.02
	December-2022	ND	ND	ND	---	ND	ND	---	---	ND	ND	0.016	0.02
	January-2023	ND	---	---	<b>0.0127</b>	<b>0.0256</b>	---	---	ND	---	---	0.008	0.01
	February-2023	---	---	---	---	---	---	---	---	---	<b>0.00365</b>	0.0003	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	0.008	0.01
Lead	November-2022	---	---	---	---	ND	---	ND	<b>0.017 J</b>	---	---	0.012	0.02
	December-2022	ND	<b>0.0381</b>	ND	---	ND	ND	---	---	ND	ND	0.012	0.02
	January-2023	ND	---	---	ND	ND	---	---	ND	---	---	0.006	0.01
	February-2023	---	---	---	---	---	---	---	---	---	<b>0.006</b>	0.001	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	0.006	0.01

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ	
Parameter	Monitoring Event	Concentration										LOD	LOQ	
<b>TOTAL METALS (mg/L)</b>														
Mercury	November-2022	---	---	---	---	---	---	---	<b>0.00169</b>	<b>0.00053</b>	---	---	0.0004	0.0004
		---	---	---	---	ND	---	---	---	---	---	---	0.0008	0.0008
	December-2022	<b>0.00051</b>	---	---	---	---	---	---	---	---	---	---	0.0004	0.0004
		---	---	<b>0.00118</b>	---	ND	<b>0.00588</b>	---	---	---	<b>0.0048</b>	ND	0.0008	0.0008
	January-2023	---	ND	---	---	ND	---	---	---	---	---	---	0.004	0.004
		ND	---	---	---	---	---	---	---	---	---	---	0.0004	0.0004
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	0.0004	0.0004
	March-2023	---	---	---	---	ND	---	---	---	---	---	---	0.0002	0.0002
---		---	---	---	---	ND	---	---	---	---	---	0.0004	0.0004	
Nickel	November-2022	---	---	---	---	<b>0.0866</b>	---	<b>0.1344</b>	<b>0.173</b>	---	---	0.014	0.02	
	December-2022	<b>0.1722</b>	<b>0.5025</b>	<b>0.2989</b>	---	<b>0.1299</b>	<b>0.287</b>	---	---	<b>0.1853</b>	<b>0.346</b>	0.014	0.02	
	January-2023	<b>0.1074</b>	---	---	<b>0.1442</b>	<b>0.0407</b>	---	---	<b>0.0769</b>	---	---	0.007	0.01	
	February-2023	---	---	---	---	---	---	---	---	---	<b>0.1726</b>	0.001	0.001	
	March-2023	---	---	---	<b>0.1254</b>	<b>0.1033</b>	---	---	---	---	---	0.007	0.01	
Selenium	November-2022	---	---	---	---	ND	---	ND	ND	---	---	0.08	0.1	
	December-2022	ND	ND	ND	---	ND	ND	---	---	ND	ND	0.08	0.1	
	January-2023	ND	---	---	ND	ND	---	---	ND	---	---	0.04	0.05	
	February-2023	---	---	---	---	---	---	---	---	---	<b>0.00199</b>	0.00085	0.001	
	March-2023	---	---	---	ND	ND	---	---	---	---	---	0.04	0.05	
Silver	November-2022	---	---	---	---	ND	---	ND	ND	---	---	0.01	0.02	
	December-2022	ND	<b>0.0187 J</b>	ND	---	ND	ND	---	---	ND	ND	0.01	0.02	
	January-2023	ND	---	---	ND	ND	---	---	ND	---	---	0.005	0.01	
	February-2023	---	---	---	---	---	---	---	---	---	ND	0.00006	0.001	
	March-2023	---	---	---	ND	ND	---	---	---	---	---	0.005	0.01	
Zinc	November-2022	---	---	---	---	ND	---	<b>0.032</b>	<b>0.694</b>	---	---	0.02	0.02	
	December-2022	<b>0.208</b>	<b>29.7</b>	<b>0.162</b>	---	<b>0.0686</b>	<b>0.75</b>	---	---	<b>0.364</b>	<b>0.286</b>	0.02	0.02	
	January-2023	<b>0.133</b>	---	---	<b>0.15</b>	<b>0.074</b>	---	---	<b>0.0752</b>	---	---	0.01	0.01	
	February-2023	---	---	---	---	---	---	---	---	---	<b>0.0851</b>	0.0025	0.005	
	March-2023	---	---	---	<b>0.0689</b>	<b>0.0538</b>	---	---	---	---	---	0.01	0.01	

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration											
<b>VOLATILE FATTY ACIDS mg/L</b>													
Acetic Acid	November-2022	---	---	---	---	---	---	1600	---	---	---	25	100
		---	---	---	---	3500	---	---	150 J	---	---	62	250
	December-2022	1800	---	---	---	---	---	---	---	---	---	62	250
	January-2023	ND	---	---	ND	4400	---	---	ND	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	ND	---	500
March-2023	---	---	---	ND	640	---	---	---	---	---	---	---	500
Butyric Acid	November-2022	---	---	---	---	---	---	430	---	---	---	12	100
		---	---	---	---	830	---	---	ND	---	---	29	250
	December-2022	ND	---	---	---	---	---	---	---	---	---	29	250
	January-2023	ND	---	---	ND	1800	---	---	ND	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	ND	---	500
March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	500
Lactic Acid	November-2022	---	---	---	---	---	---	ND	---	---	---	11	100
		---	---	---	---	ND	---	---	ND	---	---	27	250
December-2022	90 J	---	---	---	---	---	---	---	---	---	---	27	250
Propionic Acid	November-2022	---	---	---	---	---	---	620	---	---	---	11	100
		---	---	---	---	1600	---	---	73 J	---	---	27	250
	December-2022	640	---	---	---	---	---	---	---	---	---	27	250
	January-2023	ND	---	---	ND	2000	---	---	ND	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	ND	---	500
March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	500
Pyruvic Acid	November-2022	---	---	---	---	---	---	46 J	---	---	---	12	100
		---	---	---	---	98 J	---	---	ND	---	---	30	250
December-2022	ND	---	---	---	---	---	---	---	---	---	---	30	250

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration										LOD	LOQ
<b>VOLATILE ORGANIC COMPOUNDS (ug/L)</b>													
2-Butanone (MEK)	November-2022	---	---	---	---	3510	---	---	1140	---	---	30	100
		---	---	---	---	---	---	15600	---	---	---	300	1000
	December-2022	3140	---	---	---	---	3390	---	---	---	---	30	100
		---	26800	27700	---	5670	---	---	---	21700	7150	300	1000
	January-2023	3480	---	---	632	---	---	---	---	---	---	30	100
		---	---	---	---	7840	---	---	5470	---	---	300	1000
February-2023	---	---	---	---	---	---	---	---	---	14400	600	2000	
March-2023	---	---	---	257	2770	---	---	---	---	---	30	100	
Acetone	November-2022	---	---	---	---	---	---	---	4420	---	---	70	100
		---	---	---	---	16100	---	38300	---	---	---	700	1000
	December-2022	8500	---	---	---	---	---	---	---	---	---	1750	2500
		---	53100	49900	---	---	---	---	---	45600	---	3500	5000
	January-2023	---	---	---	1530	---	---	---	---	---	---	70	100
		---	---	---	---	22200	---	---	14000	---	---	700	1000
	February-2023	8130	---	---	---	---	---	---	---	---	1750	2500	
	February-2023	---	---	---	---	---	---	---	---	---	23900	1400	2000
March-2023	---	---	---	375	---	---	---	---	---	---	70	100	
---	---	---	---	6810	---	---	---	---	---	---	700	1000	
Benzene	November-2022	---	---	---	---	7.4 J	---	2860	50.4	---	---	4	10
	December-2022	301	2960	---	---	6.3 J	622	---	---	1750	179	4	10
		---	---	6550	---	---	---	---	---	---	---	40	100
	January-2023	240	---	---	28.7	1620	---	---	167	---	---	4	10
	February-2023	---	---	---	---	---	---	---	---	---	1370	4	10
March-2023	---	---	---	1540	727	---	---	---	---	---	4	10	
Ethylbenzene	December-2022	67.3	172	287	---	ND	48.5	---	---	108	27.4	4	10
	November-2022	---	---	---	---	ND	---	194	16.2	---	---	4	10
	January-2023	65.1	---	---	ND	93.9	---	---	20.8	---	---	4	10
	February-2023	---	---	---	---	---	---	---	---	---	151	4	10
March-2023	---	---	---	131	71.5	---	---	---	---	---	4	10	



### Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration										LOD	LOQ
<b>VOLATILE ORGANIC COMPOUNDS (ug/L)</b>													
Tetrahydrofuran	November-2022	---	---	---	---	309	---	---	176	---	---	100	100
		---	---	---	---	---	---	8530	---	---	---	1000	1000
	December-2022	151	---	---	---	170	1120	---	---	---	663	100	100
		---	5210	19800	---	---	---	---	---	---	6130	1000	1000
	January-2023	183	---	---	566	1810	---	---	352	---	---	100	100
	February-2023	---	---	---	---	---	---	---	---	---	---	3760	2000
March-2023	---	---	---	353	464	---	---	---	---	---	---	100	100
Toluene	November-2022	---	---	---	---	ND	---	214	32.8	---	---	5	10
	December-2022	122	175	195	---	ND	113	---	---	113	48.3	5	10
	January-2023	122	---	---	8 J	139	---	---	35.3	---	---	5	10
	February-2023	---	---	---	---	---	---	---	---	---	224	5	10
	March-2023	---	---	---	182	98.1	---	---	---	---	---	5	10
Xylenes, Total	November-2022	---	---	---	---	ND	---	185	37.8	---	---	10	30
	December-2022	161	222	186	---	ND	112	---	---	197	59.9	10	30
	January-2023	138	---	---	ND	134	---	---	38.1	---	---	10	30
	February-2023	---	---	---	---	---	---	---	---	---	240	10	30
	March-2023	---	---	---	240	111	---	---	---	---	---	10	30

--- = not applicable/available

J = Parameter was detected at a concentration greater than the laboratory's LOD, but less than the laboratory's LOQ. Concentration is considered estimated.

LOD = laboratory's Limit of Detection

LOQ = laboratory's Limit of Quantitation

mg/L = milligrams per liter

ND = Not Detected

ug/L = micrograms per liter

## Appendix G

### Monitoring, Maintenance, and Repair Plan Implementation Letter

March 31, 2023  
File No. 02218208.05

Mr. Jonathan Chapman  
Enforcement Specialist  
VA DEQ – Southwest Regional Office  
355-A Deadmore Street  
Abingdon, Virginia

Subject: Implementation of the Monitoring, Maintenance, and Repair Plan  
Integrated Solid Waste Management Facility – Solid Waste Permit No. 588  
Bristol, Virginia

Dear Mr. Chapman:

SCS Engineers (SCS) and SCS Field Services (SCS-FS) are submitting this letter on behalf of the City of Bristol, Virginia (City) to describe actions that the City has taken to implement the procedures contained in the Monitoring, Maintenance, and Repair Plan (Plan) for the Solid Waste Permit (SWP) No. 588 landfill. The Plan was submitted to the Virginia Department of Environmental Quality (VDEQ) on December 30, 2022. The City has implemented those portions of the plan that are appropriate given the current status of remediation efforts. A summary of implementation activities completed to date includes the following:

- Neither the interim EVOH cover system nor the Final Cover system have been installed at this time. Inspections of the intermediate cover are being completed at least quarterly by City Staff. Records of these inspections are scanned and stored on the landfill computer server in a folder designated for the purpose of storing environmental records.
- SCS is currently performing surface emission monitoring at the landfill on behalf of the City. Locations where measurements indicate the methane is present in concentrations above 500 ppm are investigated and actions are taken to reduce emissions at the location. Monitoring includes both a serpentine route over the surface of the landfill and pipe penetrations. Results of these monitoring events are currently being submitted to VDEQ.
- At this time only soil cover is in place on the SWP No. 588 Landfill. Maintenance of the intermediate cover primary consists of placing additional fill in areas soil cover has been removed through erosion or disturbed by construction activities. Maintenance of the intermediate cover is based on observations documented during quarterly inspections.
- SCS is currently reading stroke counts on the landfill gas liquids extraction wells on a regular basis. Stroke counts are currently documented during surface emissions monitoring events. Based on a review of the stroke count data, SCS-FS schedules the pumps and supporting equipment for maintenance and repairs. Stroke count data and



Mr. Jonathan Chapman

March 31, 2023

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estimates of liquids removed from the system are documented in monthly compliance reports submitted to VDEQ.

- SCS-FS is currently performing monitoring activities on the landfill gas collection system as the City's designated OM&M contractor as described in the Plan. Based on observations during monitoring activities, SCS-FS is also making appropriate repairs to the landfill gas collection system.
- At this time stormwater conveyance features have not been installed on the landfill. Those features will be installed once other remediation activities on the site are completed. Once installed, those features will be inspected at least quarterly. Maintenance and repairs to the stormwater conveyance features will be performed based on observations documented during inspections.

If you have questions, please contact either of the undersigned at the letterhead address.

Sincerely,



Charles J. Warren, PE  
Project Manager  
SCS Engineers



Mike Gibbons  
Project Manager  
SCS Field Services

CJW/MWG

cc: Randall Eads, City of Bristol  
Mike Martin, City of Bristol  
Joey Lamie, City of Bristol  
Jake Chandler, City of Bristol  
Jon Hayes, City of Bristol  
Jeff Hurst, VDEQ  
Susan Blalock, VDEQ  
Stacy Bowers, VDEQ  
Daniel Scott, VDEQ