Commonwealth of Virginia

Blalock, Susan <susan.blalock@deq.virginia.gov>

FW: EMO - 22 0415 - Hall (EPA) - Bristol (Reg# 11184) - 04/15/2022 Status Report

1 message

Crystal Bazyk <crystal.bazyk@deq.virginia.gov> Fri, Apr 15, 2022 at 7:34 PM
To: Jeffrey Hurst <jeff.hurst@deq.virginia.gov>, Stacy Bowers <stacy.bowers@deq.virginia.gov>, Susan Blalock <susan.blalock@deq.virginia.gov>

From: Don Marickovich <dmarickovich@daa.com>
Sent: Friday, April 15, 2022 4:02 PM
To: Crystal Bazyk <crystal.bazyk@deq.virginia.gov>; hall.kristen@epa.gov
Cc: Randall Eads <CityManager@bristolva.org>; zac.mitchell@bristolva.org; Ernie Hoch <ehoch@daa.com>; Anthony Tomlin <atomlin@daa.com>; jeff.hurst@deq.virginia.gov; Bowers, Stacy <stacy.bowers@deq.virginia.gov>; Willard, Erin <Willard.ErinM@epa.gov>; Wendy Karably <wkarably@daa.com>; Cynthia Garrett <cgarrett@daa.com>; Carrie Blankenship <CBlankenship@daa.com>; Dick, Bob <BDick@scsengineers.com>; King, Brandon <BKing@scsengineers.com>; Lock, Tom <TLock@scsengineers.com>; Mike Lawless <mlawless@daa.com>
Subject: EMO - 22 0415 - Hall (EPA) - Bristol (Reg# 11184) - 04/15/2022 Status Report
Importance: High

Ms. Hall and Ms. Bazyk,

In accordance with EPA's letter, "Approval of Higher Operating Temperature Values of Landfill Gas Wells and Submission of Gas Treatment Alternatives at the Bristol Virginia Integrated Solid Waste Facility" from August 2021, I am providing the April 15, 2022 status report on the existing wells, well drilling operations, expansion of the gas collection system, and continuing operating and monitoring results.

Existing/New Well Temperatures

During August to December 2021, existing wells 39, 40, 46, and 47 were monitored periodically for temperature. Starting on October 21st the staff also began monitoring gas well 37 and gas well 35 on November 19th. Monitoring results are provided in the tables below. Temperatures marked as "ok" were below the 145-degree threshold. Temperatures in red are above 145-degrees. Staff began monitoring the new wells for temperature on December 1st. In the last four tables below, temperatures are provided for any well, new or previously existing, that have had temperatures above 145-degrees.

Temperature Data (Fahrenheit)																									
Gas Well	August Monitoring Dates																								
	2	3	4	5	6	7	8	9	10	11	12	13	14	16	17	18	19	21	23	24	25	27	28	30	31
39	104.4	100.1	99.5	100.8	107.8	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
37																									
40	156.5	165.8	165.7	170.5	172.6	171.5	172.5	176.3	173.1	175.2	183.8	178	175.5	177.6	176.5	163.8	162.9	94.8	84.6	69.1	72.1	70.4	72.2	96.5	86.3
46	183.2	184.7	181.3	182.3	183.4	184	184.9	170.3	168.6	179.8	186.7	178.6	172.6	170.1	183.8	183.4	181.5	183	167.1	178.2	181.7	148.6	168.1	172.6	170.8
47	194.3	196.5	196.9	197.3	196.4	194.8	195.6	195.9	195.1	195.7	195.9	197.5	197.2	196.5	194.2	194.7	194.3	194.8	193.3	193.1	193.4	190.5	178.7	178.6	180.3

Temperature Data (Fahrenheit)																									
Gas Well	September Monitoring Dates																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
39	ok	ok	ok	ok			ok	ok	ok	ok	ok		ok	ok	ok	ok				ok	ok	ok	ok	ok	
37																									
40	94.8	117.5	118.2	121.4			135.5	142.6	157.3	162.5	174.7		178.8	178.6	175.3	173.7				110.4	112.8	145.5	147.9	146.3	
46	145.9	175.3	176.9	177.5			187.7	188.6	187.5	187.2	184.8		183.6	181.3	178.3	180.7				181.2	181.7	182.3	181.9	182.4	
47	179.4	180.2	180.7	179.3			190.2	194.5	192.6	188.2	182.5		178.2	183.5	187.2	184.8				184.5	185.3	186.4	187.3	185.2	

Temperature Data (Fahrenheit)																									
Gas Well	September/October Monitoring Dates																								
	26	27	28	29	30	10/1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
39		ok	ok	ok	ok	ok			ok	ok	ok		ok			ok		ok	ok	ok	ok		ok	ok	120.5
37																									
40		152.5	154.7	151.5	157.2	162.4			161.4	158.9	159.4		158.1			160.2		159.9	161.6	161.1	161		160.8	158.8	157.7
46		182.7	180.3	179.5	180.2	184.3			184.9	183.2	183.7		180.2			182.5		181.4	182.1	183.4	181.4		175.2	171.3	161.1
47		189.4	188.3	187.2	186.9	187.2			187.3	188.5	188.7		186.9			187.3		186.8	188.4	187.1	186.9		186.9	187.1	186.3

Temperature Data (Fahrenheit)																									
Gas Well	October/November Monitoring Dates																								
	21	22	23	24	25	26	27	28	29	30	31	11/1	2	3	4	5	6	7	8	9	10	11	12	13	14
39	121.6	119.6	120.6		121.1	119.4	117.7	116.6	118.3	116		116	115	112	110	109	108		107	105	104	104	103	103	
37	147	144.6	145.8		146.3	146.8	146.3	145.9	144.8	146		146	145	145	144				147					146	

																146	146			145	146	146	145			
40	147.1	148.4	147.2		145.7	144.5	141.8	139.9	140.7	137		136	135	131	127	125	122		120	117	117	114	112	109		
46	166.8	182.1	182.7		183.4	184.9	184.4	184.7	183.4	183		183	180	180	182	183	183		183	182	182	179	178	177		
47	185.8	185.3	186.5		187.1	187.4	185.7	185.5	184.7	184		184	184	184	184	184	183		183	183	182	182	182	184		

New Gas Well Installation

Temperature Data (Fahrenheit)																									
Gas Well	November/December Monitoring Dates																								
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	12/1	2	3	4	5	6	7	8	9
35					112	110	110	121	117	111	132	128	128	121	123	135	127	125	124	134	120	130	121	124	132
39	102	102	100	100	103	90	93	98	98	99	115	113	112	110	110	111	108	109	112	113	110	111	109	104	108
37	145	144	144	143	141	145	144	141	140	139	154	141	144	149	148	145	140	143	144	152	150	145	151	151	144
40	104	96	94	89	89	79	74	78	90	108	120	119	123	121	120	93	119	108	89	82	78	88	119	124	125
46	177	179	180		181	182	189	190	188	190	186	187	183	181	180	179	191	189	182	190	160	173	183	179	180
47	184	186	186		189	189	188	189	189	189	185	183	185	183	183	189	190	187	180	184	183	182	182	179	174
60																	162	158		145	170	162	161	162	163
64				153	150	149	152	150	145	158						145	144.6	144.8		148	148	148	149	144	150

Temperature Data (Fahrenheit)																									
Gas Well	December 2021/January 2022 Monitoring Dates																								
	10	11	12	13	14**	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	01/1	2	3
35	**131**	**130**	**98**	**101**	**45**	**88**	**97**	**106**	**111**	**106**	**103**	**106**	**105**	**118**	**110**	**110**	**110**	**114**	**119**	**106**	**109**	**78**	**75**	**60**	**65**
39	**110**	**118**	**103**	**109**	**60**	**94**	**104**	**106**	**107**	**106**	**106**	**106**	**107**	**110**	**70**	**110**	**110**	**107**	**118**	**109**	**111**				
37	144	151	150	150	70	150	152	149	152	149	152	153	154	150	150	150	150	153	154	155	152	150	148	150	150

40	**119**	**130**	**125**	**117**	**60**	**115**	**111**	**117**	**117**	**118**	**114**	**113**	**111**	**110**	**100**	**100**	**90**	**117**	**119**	**117**	**116**				**130**
46	**193**	**170**	**182**	**180**	**80**	**190**	**185**	**187**	**182**	**179**	**191**	**187**	**189**	**183**	**190**	**190**	**190**	**179**	**197**	**194**	**195**	**190**	**190**	**190**	**180**
47	**160**	**178**	**163**	**171**	**130**	**150**	**169**	**174**	**192**	**185**	**183**	**185**	**187**	**183**	**195**	**200**	**190**	**194**	**193**	**191**	**192**	**180**	**180**	**180**	**180**
42				146	80	140	143	144	144	147	146	144	140	140	140	140	140	143	143	137					
31R				148	132	149	149	147	149	147	148	149	149	150	150	150	150	148	149	145	149	149	146	150	145
49	140			153	100	140	140	142	140	143	138							140	134	137	135	140	141		
54	141			146	60	140	149	146	144	145	148	149	151	150	150	150	150	152	154	148	143	150	151	150	150
60	157	158	153	150	80	150	154	165	171	168	162	164	153	150	140	150	150	149	147	141	135	140	140	140	120
61				163	60	120	142	129	119	122	119							122			109				
64	148	151	146	150	95	149	151	147	148	149	149	149	150	150	150	150	150	151	152	151	150	150	151	145	150

Temperature Data (Fahrenheit)																									
Gas Well	January 2022 Monitoring Dates																								
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
35	**54**	**54**	**50**	**25**	**30**	**40**	**30**	**30**	**50**	**50**	**50**	**50**	**55**		**40**	**40**	**40**	**30**	**33**	**32**	**30**	**40**	**32**	**30**	**30**
39	**85**	**85**	**84**	**80**	**85**	**50**	**40**	**50**	**80**	**80**	**80**	**80**	**84**		**40**	**80**	**85**	**85**	**84**	**82**	**80**	**80**	**75**	**40**	**100**
37	153	153	150	150	150	50	130	145	150	150	150	150	155		160	150	155	153	149	150	150	150	150	150	150
40	**123**	**123**	**120**	**120**	**105**	**50**	**100**	**120**	**140**	**140**	**140**	**145**	**140**			**55**	**50**	**50**	**45**	**36**	**27**	**120**	**120**	**120**	**110**
46	**196**	**196**	**185**	**185**	**171**	**150**	**170**	**190**	**195**	**180**	**180**	**180**	**185**		**200**	**191**	**190**	**190**	**191**	**189**	**190**	**190**	**190**	**205**	**190**
47	**185**	**185**	**185**	**185**	**185**	**190**	**190**	**190**	**191**	**180**	**185**	**187**	**180**		**180**	**190**	**190**	**180**	**184**	**188**	**190**	**180**	**182**	**180**	**182**
42	134						90	120	140	140	140	145	140		140	145	130	140	138	141	140	130	130		
31R	150	145	150	150	140	115	145	145	145	150	150	155	150		150	150	155	145	144	147	151	150	150	150	150
49	140	104	134	140	140	100	140	140	140	140	140	145	140		135	134	145	140	143	141	140	140	140	140	140
52	121	98	122				132								130	136					150	130	130		

54	150	147	140	140	145	40	140	150	150	150	155	155	150		60	144	155	140							
57	140	95	132				140	130	140	140	140	150	150		40	138	140	140			180	150	145	150	120
60	120	120	116				130								130	130					130				
61	103	143	106				60								50	152	165				120				
64	153	151	147	150	145	100	153	160	150	153	150	150	155		150	148	145	130			150	150	150		
65	140	136	132				130								140	134	150	150	152	143	140	140	130	150	150
67			135				140	140	140	140	140	145	140		80	158			152	150	150	140	140		

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Temperature Data (Fahrenheit)																									
Gas Well	January/February 2022 Monitoring Dates																								
	29	30	31	02/01	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
35	**21**	**22**	**50**	**40**	**40**	**44**	**43**	**27**	**22**	**50**	**50**	**50**	**60**	**54**	**60**	**60**	**30**	**50**	**40**	**50**	**50**	**39**	**50**	**45**	**56**
39	**90**	**101**	**100**	**90**	**100**	**115**	**90**	**70**	**76**	**90**	**100**	**90**	**115**	**110**	**112**	**115**	**115**	**120**	**115**	**115**	**120**	**109**	**112**	**110**	**119**
37			150	150	150	150	150			150	155	150	150	154			150	150	150	160	150				154
40	**119**	**119**	**120**	**125**	**120**	**120**	**115**	**119**	**119**	**120**	**115**	**121**	**115**	**120**	**115**	**110**	**115**	**120**	**120**	**40**	**45**	**42**	**60**	**52**	**40**
46	**191**	**191**	**191**	**170**	**190**	**190**	**200**	**182**	**191**	**190**	**191**	**200**	**190**	**185**	**190**	**185**	**190**	**180**	**200**	**180**	**180**	**188**	**182**	**186**	**186**
47	**170**	**180**	**180**	**170**	**175**	**175**	**170**	**169**	**170**	**175**	**172**	**170**	**180**	**180**	**180**	**180**	**170**	**171**	**170**	**171**	**165**	**170**	**172**	**170**	**172**
42			140	140	141																				
31R			150	150	150	150	150			150	150	150	150	150			150	150	150	150	150				151
49			140	140	135					140							130								138
51			130							180	150	140					130								125
52			170	170	165	162	158			150	165	170	140	140			75	130							131
54			150	150	150	150	150			140							145		150		150				150
57			130							140							130								144

60			120							115							115								116
61										130							101								116
64			150	150	150	140				150	150	150	150	148			141	140	140	140	140				145
65			130							130							90								134
67			140	140	140					150	150	160	150	150			150	150	140	140	140				147

Gas

Temperature Data (Fahrenheit)																									
Gas Well	January/February 2022 Monitoring Dates																								
	23	24	25	26	27	28	03/01	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
35	**54**	**52**	**61**	**42**	**45**	**36**	**40.2**	**373**	**70.2**	**49.1**	**50**	**104**	**66.5**	**42.3**	**46.6**	**64**	**53.9**	**30.1**	**24.2**	**33.5**	**40.1**	**51.5**	**47.4**	**47.5**	**55**
39	**113**	**107**	**91**	**77**	**77**	**96**	**98.5**	**108**	**104.8**	**101.3**	**100**	**55**	**108.1**	**90.9**	**86.1**	**89**	**87.9**	**60.8**	**21.1**	**86.9**	**87.9**	**85.8**	**93.9**	**93.7**	**95**
37	154	154	154			154	149.4	154	155.1	154.5			154.7	151.1	151.8	154.4	154.7			148.9	153.3	153.7	155.2	154.6	
40	**53**	**40**	**41**	**40**	**40**	**40**	**40**	**56**	**83**	**88.5**	**40**	**45**	**60**	**60**	**45**	**56**	**40**	**20**	**15**	**20**	**25**	**20**	**69**	**25.1**	**40**
46	**185**	**187**	**188**	**191**	**195**	**187**	**161.1**	**186.7**	**188.9**	**187.7**	**188**	**187**	**187.5**	**155.7**	**165.3**	**167.2**	**177.6**	**139**	**90**	**134**	**136.4**	**132.8**	**129.4**	**126.7**	**125**
47	**167**	**175**	**162**	**159**	**161**	**142**	**137.9**	**137**	**128.7**	**90.3**	**116**	**128**	**172.9**	**160.8**	**163.3**	**168.1**	**157**	**158.3**	**149.5**	**164.3**	**162**	**161.8**	**163.7**	**154.1**	**156**
31R	151	150	150			150	149.3	154	155.1	154.5			154.7	151.1	151.8	154.4	154.7			148.9	150.7	150.4	150.3	150.1	
49						137							136.9							134.8			135.6		
51						102							133.8							164	167.5	167.5	177.2		
52						134																			
54	150	148	148	150																			149.2		
57	143	140	142			144		138.3															144.7		
60						121							115.2							119.8			120.8		
61						100							97.9							101.8			103.7		
64	143	141	138			135	119.5	140.7	142.4				140	141.7	140.3	139.9	145.6			140.9	141.8	142.1	142.2		

65						127							132.2							131.6			134.2		
67	145	145	144.8										150.4										149.7		

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Temperature Data (Fahrenheit)																									
Gas Well	January/February 2022 Monitoring Dates																								
	20	21	22	23	24	25	26	27	28	29	30	31	04/01	2	3	4	5	6	7	8	9	10	11	12	13
35	**50**	**36**	**49.3**	**67**	**55**	**50.6**	**37**	**39**	**34.1**	**38.4**	**43.7**	**60.9**	**43.7**	**46.1**	**55.5**	**58**	**58.2**	**86**	**72**	**67**	**46**	**63**	**79.6**	**82**	
39	**90**	**87.6**	**93.5**	**101**	**95**	**97.9**	**95.7**	**96.7**	**96.6**	**99.4**	**103.5**	**102.1**	**98.5**	**75.9**	**81.7**	**84**	**95.7**	**102**	**101**	**98**	**110**	**114**	**114.2**	**117**	
37		152.6	154.8	153	153.8	163.5			154.3	154.7	159	155.4	154.8			155	155.3	155	155				152.3	154	
40	**40**	**40**	**40.1**	**53**	**40**	**45**	**20**	**20**	**40**	**28**	**35**	**46**	**39**	**40**	**41**	**48**	**114**	**113**	**117**	**105**	**90**	**95**	**122.2**	**125**	
46	**126**	**112.5**	**115**	**112**	**102.7**	**104.5**	**70**	**90**	**64.7**	**67**	**113.8**	**112.8**	**135.6**	**85.7**	**110.8**	**62**	**119.5**	**127**	**125**				**131.8**	**128**	
47	**150**	**135.8**	**132.1**	**132**	**83.2**	**70.4**	**58**	**49.8**	**54.3**	**69.5**	**77.8**	**79.7**	**56.6**	**46.9**	**68**	**56**	**71.9**	**86**	**91**	**85**	**54**	**52**	**78.6**	**72**	
31R		150	150.5	150	148.9	151.6			150.3	150.3	150.6	150.6	150.8			151	151.2	152	153				152.3	154	
49		35.7							135.9							138		136					132.4		
51		180.4	179.1	174	183.9	137			94.1							62							112.7		
52																118							133.4		
54		149.5	150	151	149.8	150.6			130.9							151	150.8	152					152.4		
55											135					156	161.6	142					144.4		
57				144												152							142.3		
60		119.5							112		119.6					119							118.2		
61		100.9							100.7							104							101.2		
64		136.8							140.5	142.2	141.4		141.3			140							142.3		
65		131.8							132.6			133.7				132							125.2		
67											147.6												141.1		

Wells 35, 39, 40, 46 and 47 (in green) are approved to operate at temperatures about 145-degrees. Gas wells 32R and 49 through 68 are the new wells installed in the fall of 2021. On March 8, 2022, a request to operate gas wells GW-31R, 37, 52, 64, and 67 at higher temperature values was submitted to the EPA for approval.

**There was no system vacuum on December 14th.

2021 Gas Well Installation

Aptim was contracted to install new wells. Well drilling began September 10, 2021. Approximately one well per day was drilled and installed; with stoppages due to mechanical issues. A total of 17 wells had initially been planned to be installed. However, as the drilling proceeded, the City decided to install 4 additional wells; 66, 67, 68, and 32R for a total of 21. The as-built locations of all 21 wells are shown on the attached drawing.

Below is the summary of the gas wells Installed:

Summary of Gas Well Installation							
Gas Well	September/October 2021						
	Date Installed	Design Depth (ft)	Actual Depth (ft)	Max. Waste Temp. (°F)	Decomposition	Water Content	Comments
49	10/4/2021	120	110	162	High	Wet	Hit Refusal
50	9/24/2021	120	96	151	High	Wet	Hit Refusal
51	9/21/2021	120	114	150	High	Wet	Hit Refusal
52	9/22/2021	120	108.7	149	High	Wet	Hit Refusal
53	9/15/2021	120	91	148	High	Wet	Hit Refusal
54	9/16/2021	120	91	169	High	Wet	Hit Refusal
55	9/29/2021	120	104	151	High	wet	Hit Refusal
56	9/25/2021	120	109	150	High	Wet	Hit Refusal
57	9/20/2021	120	103	148	High	Wet	Hit Refusal
58	9/27/2021	120	92	146	High	Wet	Hit Refusal
59	9/17/2021	120	72	147	High	Wet	Hit Refusal
60	9/30/2021	120	120	152	High	Wet	Design Depth
61	10/1/2021	120	105	175	High	Wet	Hit Refusal
62	10/13/2021	120	120	168	High	Wet	Design Depth
63	10/12/2021	117	110	141	High	Wet	Hit Refusal

64	10/2/2021	120	120	158	High	Wet	Design Depth
65	10/11/2021	120	100	142	High	Wet	Hit Refusal
66	10/7/2021	120	102	142	High	Wet	Hit Refusal
67	10/8/2021	120	100	156	High	Wet	Hit Refusal
68	10/15/2021	120	75	133	High	Wet	Hit Refusal
32R	10/14/2021	120	120	168	High	Dry	Design Depth

Drilling operations were completed on October 15th.

Gas Collection System Expansion

The City contracted with SCS Field Services to expand the gas collection system (GCS) to connect the 21 new gas wells. Construction began November 6th. The construction was substantially complete on December 15th. All 21 new gas wells have been connected to the GCS. The wellheads on these new wells have been opened and are currently undergoing tuning and balancing, and associated air pressure and water discharge lines have been extended to them. Gas well pumps have been installed in 14 of these new wells and are operational; the remaining 7 gas wells (53, 56, 62, 63, 65, 66, 32R) did not have any significant water in them after installation. Please see the attached table which presents measured well depths and monitored water levels in each well.

Gas Rental Blower Flare Station/Existing Blower Flare Station Control Upgrades

A trailer mounted, 6-inch candlestick, Perennial Energy Inc. rental blower flare station was delivered to the site, connected to the GCS, and became operational during the week of December 13th. The flare station, with a design flow rate of about 750 SCFM will be used along with the existing flare station to treat the additional flow from the GCS during periods when the Ingenco plant is not operational. In addition, during the week of December 13th, Ingenco/Parnel upgraded the control system of the existing flare station so that both the station and Ingenco can and now do operate at the same time.

Remediation of the Western Chimney

The City initiated a plan to remediate the LFG flowing out of the “western chimney”. This plan is to intercept the LFG from behind the vertical liner (before the LFG exists above the liner), pipe it to a blower (which draws a vacuum behind the liner) which discharges to a single solar powered flare for treatment. The piping system, the blower and the flare are installed. The staff has been having difficulty getting the flare to light as the methane concentration appears to be too low to burn. The staff has brought in propane to augment the flow from the chimney and has been able to get the flare burning intermittently.

Carbon Monoxide Monitoring of Gas Wells

Starting in January 2022, weekly sampling for carbon monoxide (CO) at gas wells with temperatures greater than 145°F was initiated. Below is a table with the results so far. Initial samples were taken on January 13th. However, these samples have been lost in transit and have not been found. Please note that gas wells 46 and 47 are HOV approved wells. CO monitoring of these two wells was to gather data for information purposes. The low CO concentrations indicate that there is no subsurface fire in the quarry landfill. Currently there are no gas wells that require weekly monitoring as all high temperature wells have had four consecutive weekly samples with the CO results below 100 ppm. The applicable wells will now be sampled monthly. Gas wells 31R and 37 were sampled for CO and Method 3C parameters on April 6th. The analysis report is provided as the third attachment to this email.

Carbon Monoxide Concentrations (ppmv)																									
Gas Well	2022 Sampling Dates																								
	01/19	01/26	02/02	02/04	02/09	02/16	02/23	03/02	3/09	4/06															

31		ND	ND																						
31R					ND	ND	ND	ND	ND	ND															
37				ND	ND	ND	ND	ND		ND															
46		2210			ND																				
47		2010			1210																				
52				296	129																				
54	112																								
61		ND																							
64	137	103	126		ND	ND	ND																		
67		ND	ND		ND	ND	ND																		

N Non Detect - ND

Gas Well Jetting

A number of the new wells had silt built up in the bottom of them; thereby reducing their ability to pull gas and water out of them. Carlson Environmental Consultants was on-site during March and jetted five gas wells; 53, 56, 62, 63 and 65; which increased their effective depth. Well pumps were initially installed in four wells with the fifth pump installed in gas well 53 on March 31st.

The next bi-weekly status report will be provided by April 30, 2022. If you have any questions on the information provided, please contact either me or Mr. Ernest Hoch at (540) 537-0404 or via email at ehoch@daa.com.

Thank you,

Don Marickovich

Senior Design Engineer

Draper Aden Associates

Engineering • Surveying • Environmental Services

Lasting Positive Impact®

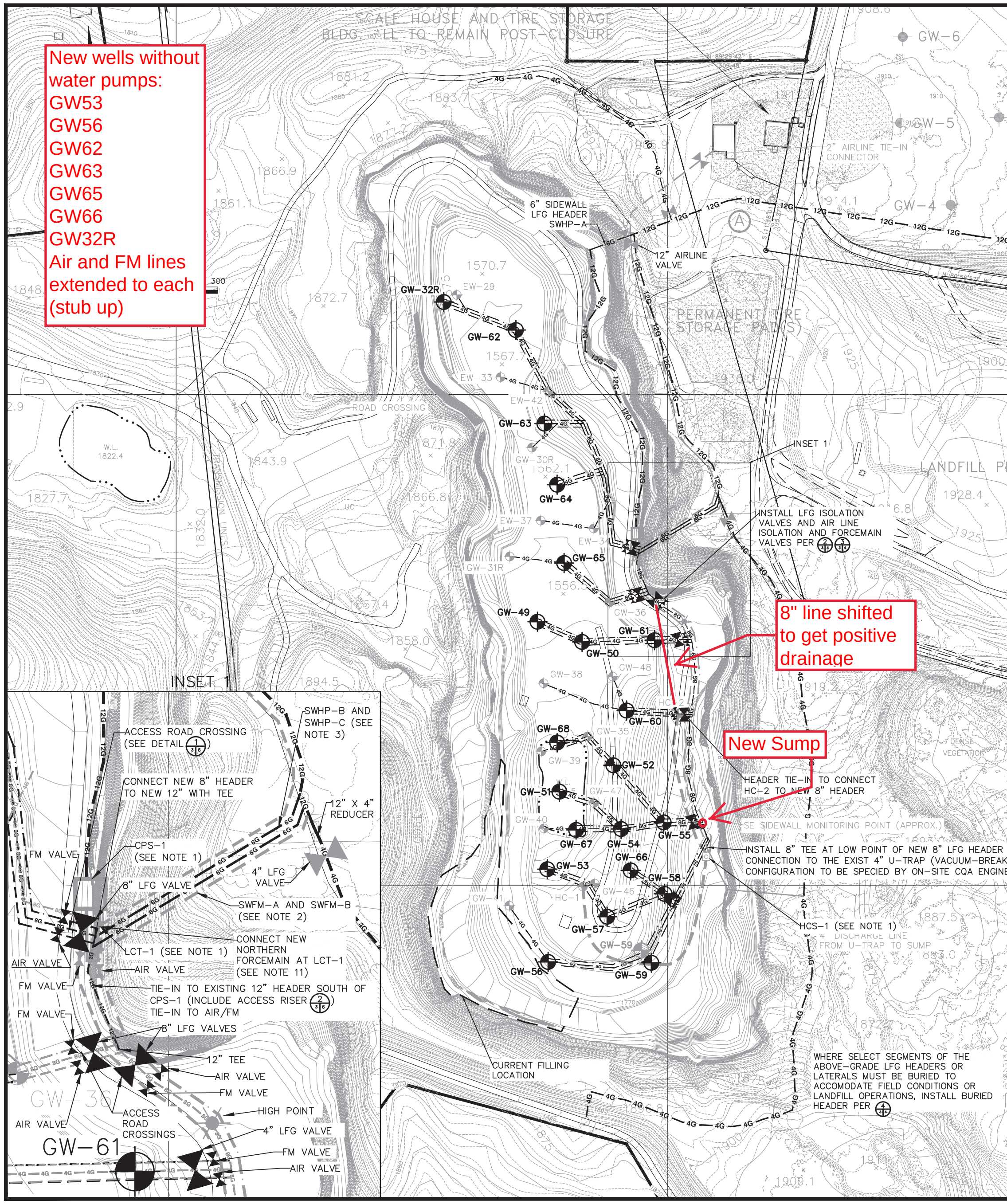
Phone: 757.300.2608 • Mobile: 757.837.5206

3 attachments

Bristol - Construction Bid Drawings 2.5_11-15-21 - Sht 3 wdk annotated.pdf
5243K

LFG Sys Improvements - Wells.Pumps.pdf
116K

22D0556_2 EA_TO15_Air_MDL-dev 04 15 2022 1430 - 31R and 37.pdf
643K



NOTES

1. THE LANDFILL GAS SYSTEM LIQUIDS MANAGEMENT INFRASTRUCTURE THAT EXISTS AS OF JUNE 2021 INCLUDES THE FOLLOWING FEATURES:

A. CONDENSATE PUMP STATION CPS-1 IS AN IN-LINE STYLE CONDENSATE SUMP POSITIONED AT A LOWPOINT IN THE 12-INCH LFG HEADER PIPE. IT IS EQUIPPED WITH A DEDICATED SUBMERSIBLE PNUEMATIC PUMP THAT DISCHARGES INTO A DEDICATED 4-INCH SIDEWALL LIQUIDS FORCEMAIN (SWFM-A), WHICH ULTIMATELY CONVEYS THE CONDENSATE FOR DISCHARGE INTO THE SEWER MANHOLE.

B. HORIZONTAL COLLECTOR SUMP HCS-1 IS AN 18-INCH DIAMETER, 14-FEET DEEP, IN-LINE STYLE LEACHATE/CONDENSATE SUMP POSITIONED AT THE LOWPOINT IN A LFG HORIZONTAL COLLECTOR IN THE SOUTHEASTERN SECTION OF THE QUARRY LANDFILL WITH TOP OF SUMP AT ELEVATION 1,764 FEET. IT IS EQUIPPED WITH A DEDICATED SUBMERSIBLE PNEUMATIC PUMP THAT DISCHARGES INTO A DEDICATED 4-INCH FORCEMAIN THAT TERMINATES AT THE TEMPORARY ABOVEGRADE LIQUIDS CONTAINMENT TANK LCT-1.

C. THE TEMPORARY ABOVEGRADE LIQUIDS CONTAINMENT TANK LCT-1 IS A PLASTIC STORAGE TANK APPROXIMATELY 10-FOOT DIAMETER AND 10-FOOT HIGH POSITIONED ALONG THE QUARRY CELL SIDEWALL ADJACENT TO CPS-1 AT ELEVATION 1,775 FEET. IT IS EQUIPPED WITH A DEDICATED SUBMERSIBLE PNEUMATIC PUMP THAT DISCHARGES INTO A DEDICATED 4-INCH SIDEWALL LIQUIDS FORCEMAIN (SWFM-B), WHICH ULTIMATELY CONVEYS THE LEACHATE/CONDENSATE FOR DISCHARGE INTO THE SEWER MANHOLE.

2. THE TWO (2) 4-INCH SIDEWALL LIQUID FORCEMAIN PIPES, SWFM-A AND SWFM-B, CONVEY LIQUIDS FROM CPS-1 AND LCT-1, RESPECTIVELY, AND CONVERGE TOGETHER ON THE EASTERN QUARRY RIM INTO A SINGLE 4-INCH FORCEMAIN PIPE THAT DISCHARGES INTO THE SEWER MANHOLE. EACH FORCEMAIN PIPE HAS AN ISOLATION VALVE AND SWFM-B HAS A CLEANOUT POSITIONED AT THE BASE OF THE QUARRY SIDEWALL.

3. THE TWO (2) 6-INCH LFG SIDEWALL HEADER PIPES, SWHP-B AND SWHP-C, CONNECT FROM AN ABOVEGRADE PORTION OF THE 12-INCH LFG HEADER SOUTH OF CPS-1 AND EXTEND UP THE QUARRY SIDEWALL AND CONVERGE INTO THE ABOVEGRADE 12-INCH LFG HEADER PIPE ON THE EASTERN QUARRY RIM.

4. ABANDON OLD WESTERN 12" LFG HEADER OFF THE BRANCH OF EXISTING 12" TEE.APPROX. 100' NORTH OF CPS-1.

5. TOPOGRAPHY OUTSIDE PERMIT 588 LIMITS IS BASED ON A JUNE 25, 2019 AERIAL LIDAR TOPOGRAPHY BY THE CITY OF BRISTOL PER DRAPER ADEN AND ASSOCIATES.

6. LANDFILL SURFACE ELEVATIONS WITHIN PERMIT 588 ARE BASED ON A SURVEY PERFORMED ON JUNE 15, 2021 BY THE CITY OF BRISTOL. GROUND CONTROL SURVEY OF FACILITY AND EXISTING WELL LOCATIONS BASED ON INFORMATION PROVIDED BY CITY OF BRISTOL, VA PER DRAPER ADEN AND ASSOCIATES.

7. THE INFORMATION PRESENTED ON THIS DRAWING PERTAINING TO THE EXISTING LFG COLLECTION AND CONTROL SYSTEM COMPONENT LOCATIONS ALIGNMENT AND CONFIGURATION AS OF JULY 2021 HAS BEEN COMPILED FROM AN AS-BUILT SURVEY PERFORMED BY THE CITY OF BRISTOL IN JULY 2021.

8. THE OBJECTIVE OF STAGE 1 OF THIS LFG AND DEWATERING SYSTEM EXPANSION PROJECT IS TO CONNECT APPROXIMATELY 17 EXISTING WELLS/COLLECTORS TO A NEW HEADER PIPING NETWORK DEPICTED IN THIS DRAWING AND DESIGNATED AS "STAGE 1"; INSTALL AND CONNECT 17 NEW VERTICAL WELLS (DRILLED BY OTHERS) TO A NEW HEADER PIPING NETWORK; AND EXTEND NEW STAGE 1 AIR/FORCEMAIN PIPING AND EQUIP THE 17 NEW VERTICAL WELLS WITH DEWATERING PUMPS.

9. LFG, AIR, AND FORCEMAIN VALVES TO BE INSTALLED BETWEEN THE QUARRY CELL WALL AND THE EXISTING ACCESS ROAD. ON SITE CQA ENGINEER TO SPECIFY EXACT LOCATION OF VALVES.

10. NEW 8" SOUTHEASTERN LFG HEADER SHALL REPLACE EXISTING 4" ABOVEGRADE LFG HEADER. THE EXISTING 2" AIR/ 4" FORCEMAIN PIPING SHALL BE PRESERVED AND BE ALIGNED WITH THE NEW 8" LFG HEADER PIPING.

11. THE NEW NORTHERN FORCEMAIN SHALL BE CONNECTED TO THE EXISTING SOUTHERN FORCEMAIN UPSTREAM OF LCT-1 SUCH THAT DEWATERING LIQUIDS FROM BOTH FORCEMAINS ARE DISCHARGED INTO LCT-1. EQUIP BOTH FORCEMAINS WITH 4" CHECK VALVES AT CONNECTION.

LEGEND

EXISTING WELLHEAD	EXISTING HORIZONTAL COLLECTOR
PROPOSED WELLHEAD	EXISTING 2" AIR LINE
EXISTING AIR RELEASE VALVE	PROPOSED 2" AIR LINE
EXISTING ISOLATION VALVE	EXISTING 4" FORCE MAIN
PROPOSED ISOLATION VALVE	PROPOSED 4" FORCE MAIN
PROPOSED BLIND FLANGE	EXISTING LFG HEADER
EXISTING LEACHATE CLEANOUT	PROPOSED LFG HEADER
EXISTING CONDENSATE PUMP STATION	EXISTING 4" LFG HEADER
K.O. PROPOSED CONDENSATE KNOCK-OUT TANK	EXISTING 6" LFG HEADER
EXISTING HORIZONTAL COLLECTOR SUMP	PROPOSED 8" LFG HEADER
EXISTING LFG LIQUIDS CONTAINMENT TANK	EXISTING 12" LFG HEADER
ACCESS RISER	PROPOSED 12" LFG HEADER
	BUILDING
	WASTE MANAGEMENT BOUNDARY

COMMONWEALTH OF VIRGINIA
Robert E. Dick
Lic. No. 024815
10/29/21
PROFESSIONAL ENGINEER

NO.	REVISION	DATE
1	ACCESS RISER	8/6/21
2	POST-BID MODIFICATION	11/15/21

SHEET TITLE: STAGE 2 PROPOSED LFG SYSTEM LAYOUT

PROJECT TITLE: LFG AND DEWATERING SYSTEM IMPROVEMENT PROJECT

CLIENT: CITY OF BRISTOL INTEGRATED WASTE MANAGEMENT FACILITY
2125 SHAKESVILLE RD
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
15521 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
PH. (804) 378-7440 FAX. (804) 378-7433

PROJ. NO. 02218208.03 | DSN. BY: DBK/SRM | DWN. BY: SRM | CHK. BY: DBK | Q/A RVW BY: RED | APP. BY: RED

CADD FILE: LAYOUT

DATE: 10/2021

SCALE: 1" = 100'

DRAWING NO. 3 of 6

Bristol LFG System Improvements - 2021
Gas Well & Pump Installation Table - 12/20/21

Well Numbers	Well Depth Drilled (below GS)	Total Casing Length (incl. stick-up)	Casing Material	Depth measured inside well casing (below TOC)	Filled-in Thickness (ft)	Measured Water Level (below TOC)	Water Column Thickenss (ft)	Pump Depth
GW-49	110	110	STEEL	100	10	43	57	90
GW-50	96	105	PVC	93	12	36	57	83
GW-51	114	120	CPVC	105	15	39	66	95
GW-52	109	120	CPVC	103	17	45	58	93
GW-53	91	100	CPVC	38	62	NA	0	no pump
GW-54	91	100	CPVC	85	15	32	53	75
GW-55	104	110	STEEL	90	20	33	57	80
GW-56	109	120	PVC	58	62	NA	0	no pump
GW-57	103	110	CPVC	100	10	43	57	90
GW-58	92	100	PVC	92	8	29	63	82
GW-59	72	80	PVC	74	6	36	38	64
GW-60	120	130	CPVC	98	32	43	55	88
GW-61	105	115	CPVC	102	13	37	65	92
GW-62	120	130	CPVC	83	47	NA	0	no pump
GW-63	117	127	CPVC	64	63	NA	0	no pump
GW-64	120	130	PVC	123	7	85	38	113
GW-65	100	110	PVC	44	66	NA	0	no pump
GW-66	102	110	STEEL	33	77	32	1	no pump
GW-67	100	110	STEEL	104	6	42	62	94
GW-68	75	85	PVC	78	7	36	42	68
GW-32R	120	130	CPVC	126	4	117	9	no pump

Note: Measurements taken by SCS Field Services during LFG System Connections Construction

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Final Report

Laboratory Order ID 22D0556

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	April 8, 2022 10:31
	4330 Lewis Road, Suite 1	Date Issued:	April 15, 2022 14:30
	Harrisburg, PA 17111	Project Number:	07220028.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04251

Client Site I.D.: Bristol CO in Air

Enclosed are the results of analyses for samples received by the laboratory on 04/08/2022 10:31. 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.

TNI Accredited
VELAP ID 460021

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Submitted To:	Tom Lock	Purchase Order:	07-SO04251

Client Site I.D.: Bristol CO in Air

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
31R	22D0556-01	Air	04/06/2022 15:31	04/08/2022 10:31
37	22D0556-02	Air	04/06/2022 15:37	04/08/2022 10:31

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Client Site I.D.:	Bristol CO in Air	Purchase Order:	07-SO04251

ANALYTICAL RESULTS

Project Location:

Field Sample #: 31R

Sample ID: 22D0556-01

Sample Matrix: Air

Sampled: 4/6/2022 15:31

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 11298

Canister Size: 1.4

Initial Vacuum(in Hg): 20

Final Vacuum(in Hg): 9.8

Receipt Vacuum(in Hg): 9.8

Flow Controller Type: Passive

Flow Controller ID: PG001

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

Analyte	Result (ppmv)	MDL (ppmv)	LOQ (ppmv)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	ND	90.0	90.0		9	1	4/14/22 13:29	DFH

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

Analyte	Result (Vol%)	MDL (Vol%)	LOQ (Vol%)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	23.3	0.45	0.45		9	1	4/14/22 13:29	DFH
Carbon dioxide, as received	35.6	0.45	0.45		9	1	4/14/22 13:29	DFH
Oxygen (O2), as received	1.71	0.45	0.45		9	1	4/14/22 13:29	DFH
Hydrogen (H2), as received	0.61	0.18	0.18		9	1	4/14/22 13:29	DFH
Nitrogen (N2), as received	34.5	0.45	0.45		9	1	4/14/22 13:29	DFH
Carbon Monoxide, as received	ND	0.009	0.009		9	1	4/14/22 13:29	DFH

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol CO in Air	Purchase Order:	07-SO04251

ANALYTICAL RESULTS

Project Location:

Field Sample #: 37

Sample ID: 22D0556-02

Sample Matrix: Air

Sampled: 4/6/2022 15:37

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 12401

Canister Size: 1.4

Initial Vacuum(in Hg): 20

Final Vacuum(in Hg): 10.2

Receipt Vacuum(in Hg): 10.2

Flow Controller Type: Passive

Flow Controller ID: PG001

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

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	ND	90.0	90.0		9	1	4/14/22 14:31	DFH

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

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	12.6	0.45	0.45		9	1	4/14/22 14:31	DFH
Carbon dioxide, as received	17.6	0.45	0.45		9	1	4/14/22 14:31	DFH
Oxygen (O2), as received	7.19	0.45	0.45		9	1	4/14/22 14:31	DFH
Hydrogen (H2), as received	0.30	0.18	0.18		9	1	4/14/22 14:31	DFH
Nitrogen (N2), as received	53.0	0.90	0.90		18	1	4/15/22 9:56	DFH
Carbon Monoxide, as received	ND	0.009	0.009		9	1	4/14/22 14:31	DFH

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol CO in Air	Purchase Order:	07-SO04251

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**	
22D0556-01	1.00 mL / 1.00 mL	ALT-145	BFD0539	SFD0495	AG00026
22D0556-02	1.00 mL / 1.00 mL	ALT-145	BFD0539	SFD0495	AG00026
22D0556-01	1.00 mL / 1.00 mL	EPA 3C	BFD0539	SFD0495	AG00026
22D0556-02	1.00 mL / 1.00 mL	EPA 3C	BFD0539	SFD0495	AG00026
22D0556-02RE1	1.00 mL / 1.00 mL	EPA 3C	BFD0539	SFD0537	AG00026

ENTHALPY ANALYTICAL

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFD0539 - No Prep VOC GC Air										
Blank (BFD0539-BLK1)					Prepared & Analyzed: 04/14/2022					
Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Nitrogen (N2)	<	0.05	Vol%							
Carbon Monoxide	<	10.0	ppmv							
Carbon Monoxide	<	0.001	Vol%							
LCS (BFD0539-BS1)					Prepared & Analyzed: 04/14/2022					
Methane	4520	0.05	ppmv	5000		90.3	70-130			
Methane	4520	500	ppmv	5000		90.3	0-200			
Carbon dioxide	4680	500	ppmv	5000		93.6	0-200			
Carbon dioxide	4680	0.05	ppmv	5000		93.6	70-130			
Oxygen (O2)	4760	500	ppmv	5000		95.3	0-200			
Oxygen (O2)	4760	0.05	ppmv	5000		95.3	70-130			
Hydrogen (H2)	5260	200	ppmv	5100		103	0-200			
Nitrogen (N2)	4870	500	ppmv	5000		97.5	0-200			
Nitrogen (N2)	4870	0.05	ppmv	5000		97.5	70-130			
Hydrogen (H2)	5260	0.02	ppmv	5100		103	70-130			
Carbon Monoxide	4650	10	ppmv	5000		93.0	0-200			
Carbon Monoxide	4650	0.001	ppmv	5000		93.0	70-130			
Duplicate (BFD0539-DUP1)				**Source: 22D0556-01**	Prepared & Analyzed: 04/14/2022					
Methane	233000	4500	ppmv		233000			0.156	25	
Methane	23.3	0.45	Vol%		23.3			0.156	5	
Carbon dioxide	358000	4500	ppmv		356000			0.489	25	
Carbon dioxide	35.8	0.45	Vol%		35.6			0.489	5	
Oxygen (O2)	17400	4500	ppmv		17100			1.34	25	
Oxygen (O2)	1.74	0.45	Vol%		1.71			1.34	5	
Nitrogen (N2)	346000	4500	ppmv		345000			0.252	25	
Nitrogen (N2)	34.6	0.45	Vol%		34.5			0.252	5	
Hydrogen (H2)	6110	1800	ppmv		6120			0.265	25	

ENTHALPY ANALYTICAL

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFD0539 - No Prep VOC GC Air										
Duplicate (BFD0539-DUP1)			**Source: 22D0556-01**		Prepared & Analyzed: 04/14/2022					
Hydrogen (H2)	0.61	0.18	Vol%		0.61			0.265	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BFD0539-DUP2)			**Source: 22D0556-02**		Prepared & Analyzed: 04/14/2022					
Methane	125000	4500	ppmv		126000			1.09	25	
Methane	12.5	0.45	Vol%		12.6			1.09	5	
Carbon dioxide	175000	4500	ppmv		176000			0.396	25	
Carbon dioxide	17.5	0.45	Vol%		17.6			0.396	5	
Oxygen (O2)	71900	4500	ppmv		71900			0.0468	25	
Oxygen (O2)	7.19	0.45	Vol%		7.19			0.0468	5	
Hydrogen (H2)	3100	1800	ppmv		3030			2.20	25	
Hydrogen (H2)	0.31	0.18	Vol%		0.30			2.20	5	
Nitrogen (N2)	514000	4500	ppmv		516000			0.425	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Duplicate (BFD0539-DUP3)			**Source: 22D0546-01**		Prepared & Analyzed: 04/14/2022					
Methane	527000	4500	ppmv		526000			0.0431	25	
Methane	52.7	0.45	Vol%		52.6			0.0431	5	
Carbon dioxide	35.6	0.45	Vol%		35.7			0.238	5	
Carbon dioxide	356000	4500	ppmv		357000			0.238	25	
Oxygen (O2)	4730	4500	ppmv		4740			0.224	25	
Oxygen (O2)	0.47	0.45	Vol%		0.47			0.224	5	
Hydrogen (H2)	<	1800	ppmv		<1800			NA	25	
Hydrogen (H2)	<	0.18	Vol%		<0.18			NA	5	
Nitrogen (N2)	1.90	0.45	Vol%		1.90			0.0986	5	
Nitrogen (N2)	19000	4500	ppmv		19000			0.0986	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	

1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

Final Report

Laboratory Order ID 22D0556

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	April 8, 2022 10:31 April 15, 2022 14:30
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol CO in Air	Purchase Order:	07-SO04251

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFD0539 - No Prep VOC GC Air										
Duplicate (BFD0539-DUP4)			**Source: 22D0699-01**		Prepared & Analyzed: 04/14/2022					
Methane	40.1	0.45	Vol%		40.2			0.238	5	
Methane	401000	4500	ppmv		402000			0.238	25	
Carbon dioxide	352000	4500	ppmv		354000			0.557	25	
Carbon dioxide	35.2	0.45	Vol%		35.4			0.557	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Hydrogen (H2)	11600	1800	ppmv		11800			1.70	25	
Nitrogen (N2)	6990	4500	ppmv		6910			1.12	25	
Nitrogen (N2)	0.70	0.45	Vol%		0.69			1.12	5	
Hydrogen (H2)	1.16	0.18	Vol%		1.18			1.70	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
EPA 3C in Air			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		

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Code	Description	Laboratory ID	Expires
MADEP	Massachusetts DEP	M-VA913	06/30/2022
MdDOE	Maryland DE Drinking Water	341	12/31/2022
NC	North Carolina DENR	495	07/31/2022
NCDEQ	North Carolina DEQ	495	12/31/2022
NCDOH	North Carolina Department of Health	51714	07/31/2022
NJDEP	NELAP-New Jersey DEP	VA015	06/30/2022
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #007	68-03503	10/31/2022
VELAP	NELAP-Virginia Certificate #11739	460021	06/14/2022
WVDEP	West Virginia DEP	350	05/31/2022

Qualifiers and Definitions

RPD	Relative Percent Difference
Qual	Qualifers
-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.

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 4/4/22

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol CO in Air**
CONTACT: **Tom Lock**	INVOICE CONTACT:	SITE NAME: Bristol Town Landfill
ADDRESS: **4309 Linglestown Road #115 - PA**	INVOICE ADDRESS:	PROJECT NUMBER: 07220028.00
PHONE #:	INVOICE PHONE #:	P.O. #:
FAX #: EMAIL:		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): Ryan DeHart	SAMPLER SIGNATURE:	**Turn Around Time:** Circle: 10 (5 Days) or __ Day

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

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information (Barometric Pres. (in Hg): 27.49): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information (Barometric Pres. (in Hg): 27.49): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	EPA - 3C	
1)	31R	PGod		11298	1.4	BC220316-01	20.0	9.8	4/6/22	3:30pm	18"	149°	4/6/22	3:31pm	7"	149°	LG	x	X	
2)	37	1		12401	1.4	BC220316-01	20.0	10.2	4/6/22	3:36pm	18"	149°	4/6/22	3:37pm	8"	149°	LG	x	X	
3)				12407	1.4	BC220316-01	20.0										LG	x		
4)				12662	1.4	BC220316-01	20.0										LG	x		

20.7°C 310 no ice no seal

RELINQUISHED:	RECEIVED: DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED: Ryan DeHart DATE / TIME 04/06/22 6:38pm	RECEIVED: FedEx DATE / TIME	Level I ☐	063-22C-0011
RELINQUISHED: FedEx DATE / TIME	RECEIVED: DATE / TIME 4/8/22 1031	Level II ☐ Level III ☐ Level IV ☐	

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22D0556

SCS Field Services 22D0556
Carbon Monoxide Monitoring - Br
Recd: 04/08/2022 Due: 04/15/2022

v130325002

ENTHALPY ANALYTICAL
formerly *Air, Water & Soil Laboratories*

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 4/4/22

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol CO in Air**
CONTACT: **Tom Lock**	INVOICE CONTACT:	SITE NAME:
ADDRESS: **4309 Linglestown Road #115 - PA**	INVOICE ADDRESS:	PROJECT NUMBER:
PHONE #:	INVOICE PHONE #:	P.O. #:
FAX #: EMAIL:		Pretreatment Program:
Is sample for compliance reporting? YES NO	**Regulatory State:**	Is sample from a chlorinated supply? YES NO — PWS I.D. #:
SAMPLER NAME (PRINT):	SAMPLER SIGNATURE:	**Turn Around Time:** Circle: **10** **5 Days** **or** __ Day

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

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Canister Information: Size (L)	Canister Information: Cleaning Batch ID	Canister Information: LAB Outgoing Canister Vacuum (in Hg)	Canister Information: LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO		
1)				12663	1.4	BC220316-01	20.0										LG	x		
2)				12664	1.4	BC220316-01	20.0										LG	x		
3)																				
4)																				

20.7°C 310 Note, no seal

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
RELINQUISHED:	DATE / TIME	RECEIVED: FedEx	DATE / TIME
RELINQUISHED: FedEx	DATE / TIME	RECEIVED: [signature]	DATE / TIME 4/8/22 1031

QC Data Package
Level I ☐
Level II ☐
Level III ☐
Level IV ☐

LAB USE ONLY

22D0556

SCS Field Services 22D0556
Carbon Monoxide Monitoring - Br
Recd: 04/08/2022 Due: 04/15/2022

v130325002

Bristol CO in air (9)

ENTHALPY ANALYTICAL

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Certificate of Analysis

Final Report

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol CO in Air	Purchase Order:	07-SO04251

Sample Conditions Checklist

Samples Received at:	**20.70°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