



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

FW: EMO - 22 0331 - Hall (EPA) - Bristol (Reg# 11184) - 03/31/2022 Status Report

1 message

Crystal Bazyk <crystal.bazyk@deq.virginia.gov>
 To: Angela Sells <angela.p.sells@deq.virginia.gov>
 Cc: Susan Blalock <susan.blalock@deq.virginia.gov>

Fri, Apr 1, 2022 at 12:36 PM

From: Don Marickovich <dmarickovich@daa.com>
Sent: Thursday, March 31, 2022 6:51 PM
To: Crystal Bazyk <crystal.bazyk@deq.virginia.gov>; hall.kristen@epa.gov
Cc: Randall Eads <CityManager@bristolva.org>; Sam Hess <sam.hess@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>
Subject: EMO - 22 0331 - Hall (EPA) - Bristol (Reg# 11184) - 03/31/2022 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 March 31, 2022 status report on the existing wells, well drilling operations, and the expansion of the gas collection system.

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	146	146		147	145	146	146	145	146	

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)

January 2022 Monitoring Dates

Gas Well	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		

*

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
42																									
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		

WW

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																	
39	90	87.6	93.5	101	95	97.9	95.7	96.7	96.6																	
37		152.6	154.8	153	153.8	163.5			154.3																	
40	40	40	40.1	53	40	45	20	20	40																	
46	126	112.5	115	112	102.7	104.5	70	90	64.7																	
47	150	135.8	132.1	132	83.2	70.4	58	49.8	54.3																	
42																										
31R		150	150.5	150	148.9	151.6			150.3																	
49		35.7							135.9																	
51		180.4	179.1	174	183.9	137			94.1																	
52																										
54		149.5	150	151	149.8	150.6			130.9																	
57				144																						
60		119.5							112																	
61		100.9							100.7																	
64		136.8							140.5																	
65		131.8							132.6																	
67																										

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. Are 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 monthly monitoring as all high temperature wells have had four consecutive weekly samples with the CO results below 100 ppm. These wells will be sampled monthly.

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															

31		ND	ND																						
31R					ND	ND	ND	ND	ND																
37				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 then installed in four wells with the fifth pump expected to be installed during this week.

The next bi-weekly status report will be provided by April 15, 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

4/4/22, 7:02 AM

Commonwealth of Virginia Mail - FW: EMO - 22 0331 - Hall (EPA) - Bristol (Reg# 11184) - 03/31/2022 Status Report

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2 attachments



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

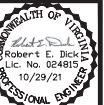
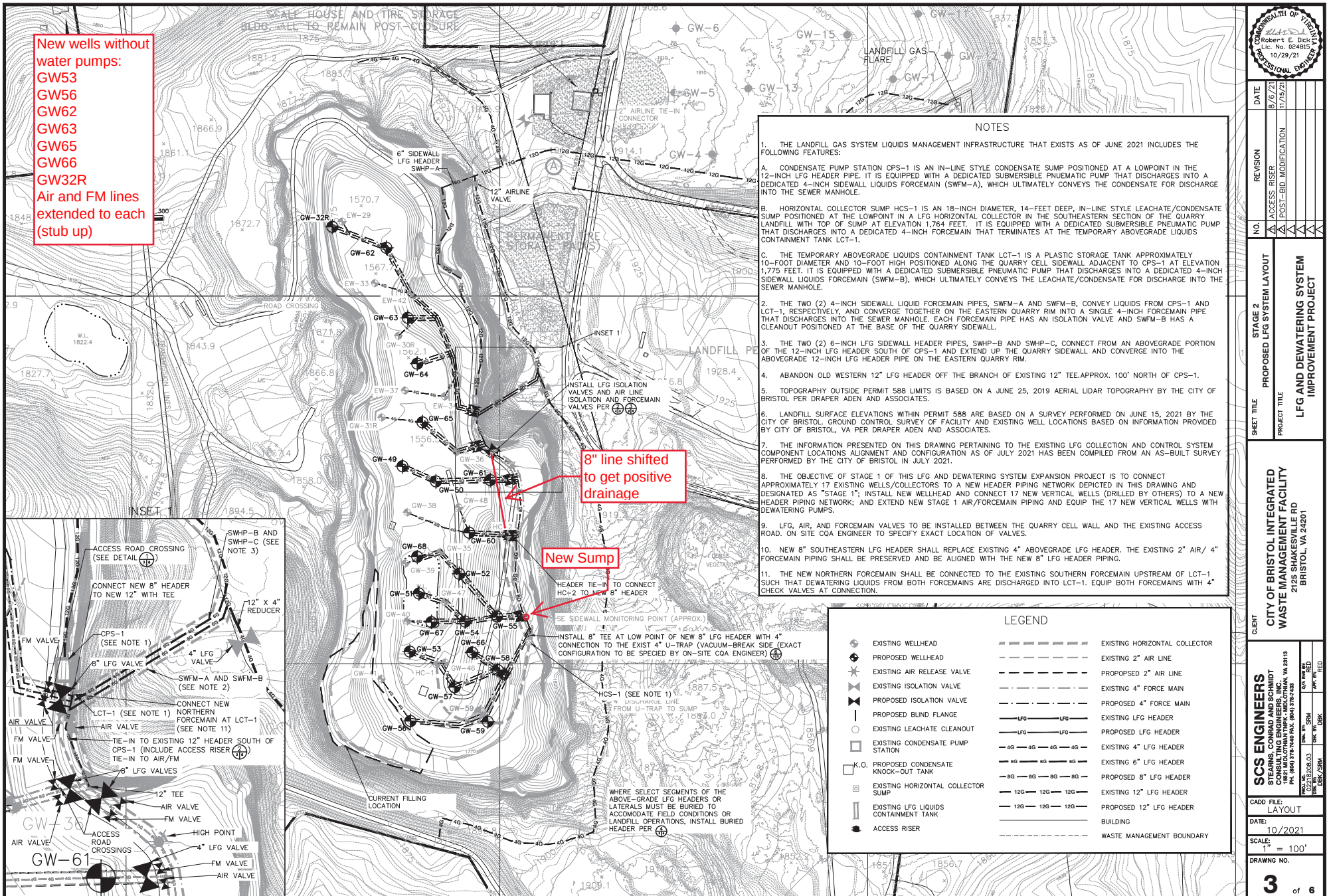
5243K



LFG Sys Improvements - Wells.Pumps.pdf

116K

New wells without
water pumps:
GW53
GW56
GW62
GW63
GW65
GW66
GW32R
Air and FM lines
extended to each
(stub up)



DATE	8/6/21
REVISION	10/29/21
NO.	1
ACCESS RISK	1
POST-BID MODIFICATION	1

STAGE 2	PROPOSED LFG SYSTEM LAYOUT
PROJECT TITLE	LFG AND DEWATERING SYSTEM IMPROVEMENT PROJECT

CITY OF BRISTOL INTEGRATED FACILITY
WASTE MANAGEMENT FACILITY
2128 SHAKESVILLE RD
BRISTOL, VA 24201

CLIENT	SCS ENGINEERS STEVENSON, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 1881 MIDCOTWAY PKWY, MIDCOT, VA 23113 (804) 751-1100 FAX (804) 751-1101 WWW.SCS-VA.COM
CADD FILE	LAYOUT
DATE	10/2021
SCALE	1" = 100'
DRAWING NO.	3

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