

Lowery, Jason B - DNR

From: Todd Watermolen <btoddwatermolen@gmail.com>
Sent: Tuesday, December 19, 2017 2:24 PM
To: Lowery, Jason B - DNR; Demers, Gerald L - DNR; Wentland, Thomas A - DNR
Cc: Perugini, Frank (frank@escmidwest.com); escstaff@yahoo.com
Subject: Fwd: Delafield Landfill - December 2017 monitoring
Attachments: Delafield Gas Extraction Well 12.15.17 Yellow.pdf; Delafield Gas Extraction Well 12.15.17 Yellow.xlsx; Delafield Gas Extraction Well 12.18.17 Green.pdf; Delafield Gas Extraction Well 12.18.17 Green.xlsx; Delafield Gas Extraction Well 12.18.17 Orange.pdf; Delafield Gas Extraction Well 12.18.17 Orange.xlsx; Delafield Gas Extraction Well 12.18.17 Yellow.pdf; Delafield Gas Extraction Well 12.18.17 Yellow.xlsx; Delafield Gas Probe 12.15.17.pdf; Delafield Gas Probe 12.15.17.xlsx

----- Forwarded message -----

From: Environmental Sampling Corp. <escstaff@yahoo.com>
Date: Tue, Dec 19, 2017 at 9:50 AM
Subject: Delafield Landfill - December 2017 monitoring
To: "btoddwatermolen@gmail.com" <btoddwatermolen@gmail.com>
Cc: "frank@escmidwest.com" <frank@escmidwest.com>, ESC Staff <escstaff@yahoo.com>

Hello Jason, Jerry and Tom,

Please find the attached field readings for the wellfield and gas probe monitoring conducted at Delafield Landfill on 12/15, 12/18 and 12/1.

Please note the following monitoring data and associated issues.

- Gas probes MP-01 orange and MP-09 yellow are out of compliance with NR-500 regulatory standards. subsurface landfill migration is occurring at these monitoring probes.
- Gas well EW-2 (near the marina) also had positive pressure. The control valve for the well was exercised to bring vacuum, but was unsuccessful. There is an issue with the gas extraction system in this area of the site. After the new blower is installed, ESC will re-balance the system in attempt to get more vacuum to that side of the wellfield.
- The three wells that were remediated(G-2, EW-19, EW-20) have vacuum, which is big improvement. However, the orifice plates appear to be restricting the vacuum at these wells. ESC recommends removing the orifice plates.
- A number of wells have high oxygen (near ambient air quality) which likely indicates a air leak near the surface. ESC recommends taking a look at these wells in spring to further evaluate.
- ESC recommends that the wells and probes be monitored again within the next 20 days. This amount of time should allow the remediated wells to equilibrate, and hopefully improve the gas probe readings at MP-01.
- The active gas extraction system routinely shuts down, due to the flame in the flare going out.

Please review the data and provide feedback on how the WDNR would like to proceed.

Thank you and Merry Christmas,

Sincerely,

Todd Watermolen and Frank Perugini

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS EXTRACTION WELLS MONITORING LOG**

YELLOW ZONE

Date & Time: 12/15/2017 12:30 PM
 Temp (°F): 28° F Current Conditions/Rel. Humidity: Cloudy / 56%
 Barometric Pressure (in. Hg): 29.88 Trend: R (circle one)
 Condition of Ground Surface/Recent Precipitation: Snow Cover/ Flurry
 Monitored By: Scott Freimark (ESC)
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/15/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check - Start Time: 12:30 Field Check - End Time: 15:30

Gas Extraction Well ID	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Initial Vacuum/ Pressure Well (in. water)	Adjusted Vacuum/ Pressure Well (in. water)	Vacuum/ Pressure Header (in. water)	Valve Setting	Flow	Comments
EW-7											
EW-6											
EW-2											
HMP-8											
EW-1											
EW-22											
EW-21											
G-1											
HMP-7											
EW-20	12/15/2017 14:25	45.9	36.7	0.2	17.2	-5.62	-5.6	-12.91	10	NA	Manhole removed, new gas header installed, Orifice plate issue
EW-19	12/15/2017 13:40	38	33	0	29	-2.18	-2.2	-6.25	10	NA	Manhole removed, new gas header installed, Orifice plate issue
G-2											
EW-18	12/15/2017 13:50	42	30.4	0	27.6	-2.92	-2.92	-13.03	10	NA	Manhole removed, new gas header installed, Orifice plate issue
HMP-6											
CS-3											
Blower - Inlet (Initial)	12/15/2017 12:44	37.2	28.4	0.2	34.2	NA	NA	-16.48	NA	335	
Blower - Outlet (Initial)	12/15/2017 13:50	38.3	28.6	0.4	32.7	NA	NA	+5.86	NA	335	
Blower - Inlet (Final)	12/15/2017 15:31	29.3	26.3	2.1	42.3	NA	NA	-16.68	NA	325	
Blower - Outlet (Final)	12/15/2017 15:34	29.5	26.4	2	42.1	NA	NA	+5.95	NA	325	

COMMENTS:

- Gas wells with positive pressure
- Gas wells with low header pressure <10.0"
- Gas wells with high CH₄ quality >50%
- Gas wells with low CH₄ quality <20%

Gas Collection System was re-started at 12:30 upon my arrival
Gas Quality improved at the blower/flare since the repairs.
Not a valve issue at the three wells listed above, it is an orifice plate issue not allowing sufficient vacuum across. The hole is too small.

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS EXTRACTION WELLS MONITORING LOG**

GREEN ZONE

Date & Time: 12/18/17 13:15
 Temp (°F): 35°F Current Conditions/Rel. Humidity: Cloudy \87%
 Barometric Pressure (in. Hg): 29.85 Trend: ☺ R (circle one)
 Condition of Ground Surface/Recent Precipitation: Damp - Fog
 Monitored By: SRF-ESC
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/18/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check – Start Time: 13:15 Field Check – End Time: 14:25

Gas Extraction Well ID	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Initial Vacuum/ Pressure Well (in. water)	Adjusted Vacuum/ Pressure Well (in. water)	Vacuum/ Pressure Header (in. water)	Valve Setting	Flow	Comments
HMP-3	12/18/2017 13:13	23.6	23.5	3.2	49.7	NA	NA	-11.65	NA	NA	
EW-4	12/18/2017 13:17	22.5	24.6	0	52.9	-1.48	-1.5	-11.6	No change	5	
EW-24	12/18/2017 13:21	3.8	17.6	5.1	73.5	-0.47	-0.46	-11.52	No change	<1	Manhole cover doesn't close
EW-5	12/18/2017 13:23	0.1	0.2	22.1	77.6	-0.03	-0.04	0	No change	0	
EW-25	12/18/2017 13:29	12.6	21.6	0.5	65.3	-0.7	-0.7	-11.41	No change	<1	Manhole cover doesn't close
EW-12	12/18/2017 13:34	16.4	21.7	0.1	61.8	-1.21	-1.21	-11.37	No change	<1	
EW-13	12/18/2017 13:38	2.8	19.4	0.2	77.6	-0.28	-0.27	-11.37	No change	<1	Manhole cover doesn't close
HMP-4	12/18/2017 13:41	27.3	24.9	3.5	44.3	NA	NA	-11.2	NA	NA	
EW-14	12/18/2017 13:46	14.7	18	3.4	63.9	-1.2	-1.2	-11.07	No change	2.5	
G-4	12/18/2017 13:51	6.2	3.7	19.1	71	-0.11	-0.12	-11.98	No change	1	No protective casing
EW-15	12/18/2017 13:55	10.6	19.4	1.5	68.5	-1.08	-1.08	-11.06	No change	2.5	Manhole cover doesn't close
G-3	12/18/2017 14:01	9.1	6.6	13.9	70.4	-2.7	-2.71	-10.72	No change	<1	Manhole cover doesn't close Valve issue
EW-16	12/18/2017 14:05	14.4	13.1	12.7	59.8	-0.31	-0.32	-10.89	No change	1	
HMP-5	12/18/2017 14:09	32.5	28.3	1.9	37.3	NA	NA	-10.85	NA	NA	
EW-17	12/18/2017 14:18	6.5	4.2	19.6	69.7	-0.17	-0.16	-10.47	No change	<1	
CS-2	No readings collected, no sampling port installed										
Blower - Inlet (Final)	12/18/2017 14:36	25.5	24.1	3.3	47.1	NA	NA	-15.95	NA	330	
Blower - Outlet (Final)	12/18/2017 14:39	25.6	24.1	3.2	47.1	NA	NA	+6.36	NA	330	

COMMENTS:

- Gas wells with positive pressure
- Gas wells with low header pressure <10.0"
- Gas wells with high CH₄ quality >50%
- Gas wells with low CH₄ quality <20%

Gas Collection System was re-started at 10:30 upon my arrival. System had been relite on Sunday 12/17/17 and was only down for approximately 2 hours.
 Gas Quality improved at the blower/flare since the repairs.
 Vacuum issue at several wells not a valve issue but rather an issue with the orifice plate restricting vacuum. The hole in the orifice plate is too small

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS EXTRACTION WELLS MONITORING LOG**

ORANGE ZONE

Date & Time: 12/18/17 12:25
 Temp (°F): 35°F Current Conditions/Rel. Humidity: Cloudy, Foggy 98%
 Barometric Pressure (in. Hg): 29.92 Trend: F (circle one)
 Condition of Ground Surface/Recent Precipitation: Damp - Fog
 Monitored By: SRF-ESC
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/18/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check – Start Time: 12:25 Field Check – End Time: 14:30

Gas Extraction Well ID	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Initial Vacuum/ Pressure Well (in. water)	Adjusted Vacuum/ Pressure Well (in. water)	Vacuum/ Pressure Header (in. water)	Valve Setting	Flow	Comments
EW-9	12/18/2017 12:28	37.3	27.8	0	34.9	-5.47	-5.46	-12.62	10 No change	NA	Orifice plate issue, Full open
EW-8	12/18/2017 12:33	34.4	26.6	2.8	36.2	-1.89	-1.88	-13.55	<1 No change	NA	Valve issue
G-5	12/18/2017 12:39	24.1	22.8	3.2	49.9	-5.01	-5	-13.48	3 No change	NA	
G-6	12/18/2017 12:43	19.3	12.7	12.9	55.1	-0.34	-0.34	-12.59	<1 No change	NA	
G-7	12/18/2017 12:47	15.7	12.7	12.7	58.9	-0.04	-0.03	-12.33	<1 No change	NA	
G-8	12/18/2017 12:52	12.4	9.1	16.6	61.9	-0.5	-0.49	-12.07	<1 No change	NA	
HMP-2	12/18/2017 12:55	25.3	24.8	2.8	47.1	NA	NA	-12.06	NA	NA	Pro casing needs repair
EW-10	12/18/2017 13:01	37.4	32.7	0	29.9	-1.29	-1.29	-12.59	10 No change	NA	Manhole cover doesn't close, orifice plate issue, Full open
EW-11	12/18/2017 13:05	13.1	26.5	0	60.4	-0.04	-0.05	-11.62	1 No change	NA	Manhole cover doesn't close
EW-23	12/18/2017 13:09	4.4	12.4	12.3	70.9	-0.1	-0.1	-11.65	<1 No change	NA	
CS-1	12/18/2017 14:31	4	4.3	19.1	72.6	NA	NA	-12.69	NA	NA	
Blower - Inlet (Initial)	12/18/2017 11:00	24.4	24.5	2.3	48.8	NA	NA	-16.2	NA	315	
Blower - Outlet (Initial)	12/18/2017 11:03	25.7	24.8	2.2	47.3	NA	NA	+6.30	NA	315	

COMMENTS:

Gas wells with positive pressure
Gas wells with low header pressure <10.0"
Gas wells with high CH ₄ quality >50%
Gas wells with low CH ₄ quality <20%

Gas Collection System was re-started at 10:30 upon my arrival. System had been relite on Sunday 12/17/17 and was only down for approximately 2 hours.

Gas Quality improved at the blower/flare since the repairs.

Vacuum issue at several wells not a valve issue but rather an issue with the orifice plate restricting vacuum. The hole in the orifice plate is too small

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS EXTRACTION WELLS MONITORING LOG**

YELLOW ZONE

Date & Time: 12/18/17 10:30
 Temp (°F): 35°F Current Conditions/Rel. Humidity: Cloudy, Foggy 98%
 Barometric Pressure (in. Hg): 29.92 Trend: F (C) D (circle one)
 Condition of Ground Surface/Recent Precipitation: Damp - Fog
 Monitored By: SRF-ESC
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/18/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check – Start Time: 10:45 Field Check – End Time: 12:20

Gas Extraction Well ID	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Initial Vacuum/ Pressure Well (in. water)	Adjusted Vacuum/ Pressure Well (in. water)	Vacuum/ Pressure Header (in. water)	Valve Setting	Flow	Comments
EW-7	12/18/2017 11:12	37.4	28	0	34.6	-0.8	-0.8	-9.35	10 No change	NA	Manhole cover doesn't close, Orifice plate issue, full open
EW-6	12/18/2017 11:17	18.4	24	2.7	54.9	-1.14	-1.15	-7.5	2 No change	NA	
EW-2	12/18/2017 11:20	65.4	34.4	0.2	0	+0.11	+0.11	-8.87	10 No change	NA	No protective cover, No header vacuum
HMP-8	12/18/2017 11:24	25.7	24.4	3.6	46.3	NA	NA	-8.78	NA	NA	
EW-1	12/18/2017 11:31	30.7	29.6	0.1	39.6	-1.12	-1.13	-9.44	10 No change	NA	Orifice plate issue, Full open
EW-22	12/18/2017 11:36	7.6	22.2	1.5	68.7	-1.32	-1.32	-8.37	1 No change	NA	Surge, mice
EW-21	12/18/2017 11:42	16.2	24.1	2.6	57.1	-2.94	-2.72	-8.66	5/4 Decreased	NA	Surge, mice
G-1	12/18/2017 11:47	34.7	21.4	7.9	36	-1.32	-1.32	-8.61	10 No change	NA	Manhole cover doesn't close, new port needed, Orifice plate issue, full open
HMP-7	12/18/2017 11:52	0.7	1.6	22.1	75.6	NA	NA	-8.38	NA	NA	Gas quality issue
EW-20	12/18/2017 12:02	29.6	33.7	0	36.7	-5.53	-5.51	-12.54	10 No change	NA	Manhole removed, new gas header installed, Orifice plate issue, full open
EW-19	12/18/2017 12:06	30.9	30.4	0	38.7	-2.2	-2.24	-13.27	10 No change	NA	Manhole removed, new gas header installed, Orifice plate issue, full open
G-2	12/18/2017 12:11	65.9	31.5	0.4	2.2	-1.45	-1.48	-11.35	10 No change	NA	Manhole removed, Orifice plate issue, full open
EW-18	12/18/2017 12:15	38.8	29.5	0	31.7	-2.39	-2.4	-10.37	10 No change	NA	Manhole removed, Orifice plate issue, full open
HMP-6	12/18/2017 12:21	16.7	13.1	13.4	56.8	NA	NA	-10.7	NA	NA	
CS-3	12/18/2017 11:54	0.1	0.1	22.9	76.9	NA	NA	-8.4	NA	NA	
Blower - Inlet (Initial)	12/18/2017 11:00	24.4	24.5	2.3	48.8	NA	NA	-16.2	NA	315	
Blower - Outlet (Initial)	12/18/2017 11:03	25.7	24.8	2.2	47.3	NA	NA	+6.30	NA	315	

COMMENTS:

Gas wells with positive pressure
Gas wells with low header pressure <10.0"
Gas wells with high CH ₄ quality >50%
Gas wells with low CH ₄ quality <20%

Gas Collection System was re-started at 10:30 upon my arrival. System had been relite on Sunday 12/17/17 and was only down for approximately 2 hours.

Gas Quality improved at the blower/flare since the repairs.

Vacuum issue at several wells not a valve issue but rather an issue with the orifice plate restricting vacuum. The hole in the orifice plate is too small

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS EXTRACTION WELLS MONITORING LOG**

GREEN ZONE

Date & Time: 12/1/17 11:55
 Temp (°F): 45°F Current Conditions/Rel. Humidity: Cloudy 43%
 Barometric Pressure (in. Hg): 30.14 Trend: ↻ (circle one)
 Condition of Ground Surface/Recent Precipitation: Dry - None
 Monitored By: SRF-ESC
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/1/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check – Start Time: 11:55 Field Check – End Time: 13:20

Gas Extraction Well ID	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Initial Vacuum/ Pressure Well (in. water)	Adjusted Vacuum/ Pressure Well (in. water)	Vacuum/ Pressure Header (in. water)	Valve Setting	Flow	Comments
HMP-3	12/1/2017 11:54	18.7	20.9	3.2	57.2	NA	NA	-11.65	NA	NA	
EW-4	12/1/2017 11:58	24.1	24.1	0.2	51.6	-1.64	-1.64	-13	5 No change	NA	
EW-24	12/1/2017 12:08	4	17.3	4.7	74	-0.65	-0.5	-13	1 / <1 Decreased	NA	Manhole cover doesn't close
EW-5	12/1/2017 12:11	0	0.2	21.7	78.1	-0.01	-0.01	-13	0 No change	NA	
EW-25	12/1/2017 12:16	12.6	21.4	0.9	65.1	-0.91	-0.75	-13.25	1 / <1 Decreased	NA	
EW-12	12/1/2017 12:19	18.1	22	0.1	59.8	-1.35	-1.35	-13.45	1 No change	NA	
EW-13	12/1/2017 12:25	1	17.6	3.7	77.7	-0.62	-0.2	-13.63	1 / <1 Decreased	NA	Manhole cover doesn't close
HMP-4	12/1/2017 12:29	24.3	21.5	4	50.2	NA	NA	-13.5	NA	NA	
EW-14	12/1/2017 12:33	13.4	17.7	3.3	65.6	-1.47	-1.55	-13.46	2/2.5 Increased	NA	Increased to assist with gas probe MP-09 methane
G-4	12/1/2017 12:45	4.4	3.3	19.2	73.1	-0.44	-0.46	-13.56	1 No change	NA	
EW-15	12/1/2017 12:52	9.9	18.3	2.2	69.6	-1.56	-1.76	-14.02	2/2.5 Increased	NA	Manhole cover doesn't close Increased to assist with gas probe MP-09 methane
G-3	12/1/2017 13:05	15	7.2	14.4	63.4	-4.51	-2.35	-13.67	1 / <1 Decreased	NA	Manhole cover doesn't close Valve issue
EW-16	12/1/2017 13:09	14.9	13.2	12.2	59.7	-0.47	-0.46	-13.8	1 No change	NA	
HMP-5	12/1/2017 13:12	43.5	29.9	0.3	26.3	NA	NA	-13.72	NA	NA	
EW-17	12/1/2017 13:22	22.1	21.8	6.5	49.6	-0.1	-0.1	-13.68	<1 No change	NA	
CS-2	No readings collected, no samplng port installed										
Blower - Inlet (Final)	12/1/2017 14:27	27	23.9	3.1	46	NA	NA	-17.23	NA	315	
Blower - Outlet (Final)	12/1/2017 14:30	26.3	23.2	3.6	46.9	NA	NA	+5.71	NA	315	

COMMENTS:

Gas wells with positive pressure

Gas wells with low header pressure <10.0"

Gas wells with high CH₄ quality >50%

Gas wells with low CH₄ quality <20%

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS EXTRACTION WELLS MONITORING LOG**

ORANGE ZONE

Date & Time: 12/1/17 8:45
 Temp (°F): 35°F Current Conditions/Rel. Humidity: Sunny 43%
 Barometric Pressure (in. Hg): 30.14 Trend: F (circle one)
 Condition of Ground Surface/Recent Precipitation: Dry - None
 Monitored By: SRF-ESC
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/1/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check – Start Time: 8:45 Field Check – End Time: 14:40

Gas Extraction Well ID	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Initial Vacuum/ Pressure Well (in. water)	Adjusted Vacuum/ Pressure Well (in. water)	Vacuum/ Pressure Header (in. water)	Valve Setting	Flow	Comments
EW-9	12/1/2017 11:10	40.5	27.7	0.2	31.6	-5.7	-5.7	-13.4	10 No change	NA	Valve issue, Full open
EW-8	12/1/2017 11:00	22.6	24.2	4.7	48.5	-3.46	-3.44	-14	<1 No change	NA	Valve issue
G-5	12/1/2017 11:15	26.8	23.6	2.7	46.9	-4.76	-4.96	-14.17	2 / 3 Increased	NA	
G-6	12/1/2017 11:19	21	13.6	11.3	54.1	-0.31	-0.31	-13.7	<1 No change	NA	
G-7	12/1/2017 11:26	8.5	8.4	14.1	69	+0.02	-0.05	-13.75	0 / <1 Increased	NA	
G-8	12/1/2017 11:31	12.2	9.2	16.1	62.5	-0.54	-0.54	-13.41	<1 No change	NA	
HMP-2	12/1/2017 11:36	22.2	22.8	2.9	52.1	NA	NA	-13.30	NA	NA	Pro casing needs repair, installed new port
EW-10	12/1/2017 11:40	40.2	32.8	0.2	26.8	-1.29	-1.29	-14.31	10 No change	NA	Manhole cover doesn't close, valve issue, Full open
EW-11	12/1/2017 11:45	14.9	26.1	0.1	58.9	+0.01	-0.1	-13.1	<1 / 1 Increased	NA	Manhole cover doesn't close
EW-23	12/1/2017 11:50	4.1	12.7	11.5	71.7	-0.07	-0.07	-13.05	<1 No change	NA	
CS-1	12/1/2017 14:33	2.6	2.8	19.9	74.7	NA	NA	-14.82	NA	NA	
Blower - Inlet (Initial)	12/1/2017 8:49	25.2	23.2	3.2	48.4	NA	NA	-16.82	NA	319	
Blower - Outlet (Initial)	12/1/2017 8:53	24.7	22.7	3.6	49	NA	NA	+6.04	NA	319	

COMMENTS:

- Gas wells with positive pressure
- Gas wells with low header pressure <10.0"
- Gas wells with high CH₄ quality >50%
- Gas wells with low CH₄ quality <20%

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS EXTRACTION WELLS MONITORING LOG**

YELLOW ZONE

Date & Time: 12/1/17 13:25
 Temp (°F): 45°F Current Conditions/Rel. Humidity: Cloudy 43%
 Barometric Pressure (in. Hg): 30.17 Trend: F S (K) (circle one)
 Condition of Ground Surface/Recent Precipitation: Dry - None
 Monitored By: SRF-ESC
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/1/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check – Start Time: 13:25 Field Check – End Time: 14:35

Gas Extraction Well ID	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Initial Vacuum/ Pressure Well (in. water)	Adjusted Vacuum/ Pressure Well (in. water)	Vacuum/ Pressure Header (in. water)	Valve Setting	Flow	Comments
EW-7	12/1/2017 14:23	38	27.7	0.2	34.1	-1.01	-1.01	-10.06	10 No change	NA	Manhole cover doesn't close, Valve Issue, full open
EW-6	12/1/2017 14:20	20.1	24.6	2.5	52.8	-1.41	-1.38	-7.75	2 No change	NA	
EW-2	12/1/2017 14:14	66.1	33.7	0.2	0	+0.04	+0.05	-9.50	10 No change	NA	No protective cover, Vacuum Issue
HMP-8	12/1/2017 14:10	25.2	23.6	3.8	47.4	NA	NA	-9.55	NA	NA	
EW-1	12/1/2017 14:06	32.7	29.6	0.1	37.6	-1.34	-1.34	-10.13	10 No change	NA	Valve Issue, Full open
EW-22	12/1/2017 14:02	6.5	20.5	3.7	69.3	-2.81	-1.45	-8.68	2/1 Decreased	NA	Surge, mice
EW-21	12/1/2017 13:57	17.2	23.3	3.6	55.9	-3.07	-3.07	-8.8	5 No change	NA	Surge, mice
G-1	12/1/2017 13:47	34.2	20.3	8.1	37.4	-1.46	-1.47	-9.21	10 No change	NA	Manhole cover doesn't close, new port needed, Valve Issue, full open
HMP-7	12/1/2017 13:50	3.7	4	19.8	72.5	NA	NA	-8.4	NA	NA	O2 Issue
EW-20	12/1/2017 13:43	67	33	0	0	+0.05	+0.05	+0.04	10 No change	NA	Manhole cover doesn't close, no header vacuum
EW-19	12/1/2017 13:39	61.7	37.3	0	1	+0.05	+0.05	+0.07	10 No change	NA	Manhole cover doesn't close, no header vacuum
G-2	12/1/2017 13:35	67.9	32.1	0	0	+0.06	+0.06	+0.06	10 No change	NA	Manhole cover doesn't close, no header vacuum
EW-18	12/1/2017 13:31	44	30.6	0.1	25.3	-3.07	-3.07	-15.04	10 No change	NA	No manhole cover, Valve Issue, full open
HMP-6	12/1/2017 13:27	11	7.3	16.6	65.1	NA	NA	-13.6	NA	NA	
CS-3	12/1/2017 13:53	0	0.1	22	77.9	NA	NA	+0.01	NA	NA	
Blower - Inlet (Initial)	12/1/2017 8:49	25.2	23.2	3.2	48.4	NA	NA	-16.82	NA	319	
Blower - Outlet (Initial)	12/1/2017 8:53	24.7	22.7	3.6	49	NA	NA	+6.04	NA	319	

COMMENTS:

Gas wells with positive pressure
Gas wells with low header pressure <10.0"
Gas wells with high CH ₄ quality >50%
Gas wells with low CH ₄ quality <20%

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS PROBES MONITORING LOG**

Date & Time: 12/1/2017 09:00:00 A.M
 Temp (°F): 35° F Current Conditions/Rel. Humidity: Sunny / 43%
 Barometric Pressure (in. Hg): 30.15 Trend: KSR (circle one)
 Condition of Ground Surface/Recent Precipitation: Dry- None
 Monitored By: Scott Freimark (ESC)
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/1/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check – Start Time: 9:00 Field Check – End Time: 10:40

Probe ID	ID No.	Depth	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Vacuum/ Pressure (in. water)	Comments
MP-01 yellow	355	10	12/1/2017 9:22	0.1	12.9	12.1	74.9	-0.01	
MP-01 orange	356	15	12/1/2017 9:27	41.1	25.8	0.2	32.9	-0.02	
MP-02 yellow	357	10	12/1/2017 9:18	0	19.9	1	79.1	-0.01	
MP-03 yellow	358	10	12/1/2017 9:14	0	0.1	22.4	77.5	+0.02	
MP-03 red	359	25	12/1/2017 9:10	0.6	0.2	22	77.2	+0.03	
MP-04 yellow	360	10	12/1/2017 8:57	0	4	17.3	78.7	+0.01	
MP-04 red	361	27	12/1/2017 9:02	0	5.5	15	79.5	0.00	
MP-05 yellow	362	10	12/1/2017 10:38	0	0.1	21.8	78.1	+0.01	
MP-06 yellow	363	10	12/1/2017 10:22	0	1	21.1	77.9	0.00	
MP-06 orange	364	19	12/1/2017 10:26	0	2.7	18.5	78.8	0.00	
MP-06 red	365	30	12/1/2017 10:32	0	5.2	15.7	79.1	+0.01	
MP-06B yellow	366	11	12/1/2017 10:11	0	1.7	20.5	77.8	0.00	
MP-06B orange	367	22	12/1/2017 10:15	0	3	19.1	77.9	0.00	
MP-06B red	368	34	12/1/2017 10:19	0	4.5	17.2	78.3	+0.01	
MP-07 yellow	369	9	12/1/2017 10:04	0	4.8	18.3	76.9	0.00	
MP-07 red	370	18	12/1/2017 10:08	0	5.2	18.3	76.5	-0.01	
MP-8 yellow	371	10	12/1/2017 9:53	0	1.2	21.4	77.4	0.00	
MP-08 orange	372	30	12/1/2017 9:57	0	2.7	20.1	77.2	-0.02	
MP-08 red	373	50	12/1/2017 10:01	0	5.8	14.6	79.6	-0.01	
MP-09 yellow	374	8	12/1/2017 9:47	9.9	6.2	0.8	83.1	0.00	
MP-09 orange	375	22	12/1/2017 9:50	0	0.1	22.2	77.7	0.00	
MP-10 yellow	376	10	12/1/2017 9:35	0	4.2	18.2	77.6	-0.03	
MP-10 orange	377	23	12/1/2017 9:38	0	5.4	16.5	78.1	-0.01	
MP-10 red	378	38	12/1/2017 9:42	0	7.9	14.3	77.8	-0.02	
Boat Comp.	379	NA	12/1/2017 9:05	0	0.2	21.8	78	+0.02	

COMMENTS: Gas Collection System was running upon arrival

Gas probes with positive pressure

**DELAFIELD SANITARY TRANSFER AND LANDFILL #00719
GAS PROBES MONITORING LOG**

Date & Time: 12/15/2017 12:30 PM
 Temp (°F): 28° F Current Conditions/Rel. Humidity: Cloudy / 56%
 Barometric Pressure (in. Hg): 29.88 Trend: ↻ R (circle one)
 Condition of Ground Surface/Recent Precipitation: Snow Cover/ Flurry
 Monitored By: Scott Freimark (ESC)
 Gas Detector Make and Model No.: GEM 5000 Serial No.: G501764
 Date Meter Last Calibrated: 12/15/2017
 Calibration Methane Span Gas: 50% Calibration Oxygen Span Gas: 4%
 Field Check – Start Time: 12:30 Field Check – End Time: 15:30

Probe ID	ID No.	Depth	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Bal (%)	Vacuum/ Pressure (in. water)	Comments
MP-01 yellow	355	10	12/15/2017 13:25	0.7	19.8	9.2	70.3	-0.02	Trapped gas peaked at 10% CH ₄ , Stabilized after 3 Cycles (3 minutes)
MP-01 orange	356	15	12/15/2017 13:30	30.0	25.8	0.1	44.1	-0.01	Stabilized after 4 Cycles (4 minutes)
MP-02 yellow	357	10	12/15/2017 13:20	0.2	19.9	0.1	79.8	0.00	Stabilized after 2 Cycles (2 minutes)
MP-03 yellow	358	10	12/15/2017 13:15	0.0	0.1	22.4	77.5	+0.04	
MP-03 red	359	25	12/15/2017 13:10	0.6	0.2	22.1	77.1	+0.05	Trapped gas peaked at 30% CH ₄ , Stabilized after 4 Cycles (4 minutes)
MP-04 yellow	360	10	12/15/2017 13:00	0.0	2.3	19.3	78.4	-0.01	
MP-04 red	361	27	12/15/2017 13:05	0.0	0.1	21.5	78.4	-0.02	
MP-05 yellow	362	10	12/15/2017 15:27	0.0	0.1	22.4	77.5	+0.03	
MP-06 yellow	363	10	12/15/2017 15:12	0.0	1.1	21.8	77.1	0.00	
MP-06 orange	364	19	12/15/2017 15:16	0.0	2.9	19.9	77.2	+0.02	
MP-06 red	365	30	12/15/2017 15:20	0.0	5.4	16.7	77.9	-0.02	
MP-06B yellow	366	11	12/15/2017 15:00	0.0	1.8	21	77.2	0.00	
MP-06B orange	367	22	12/15/2017 15:04	0.0	3.2	19.8	77	0.00	
MP-06B red	368	34	12/15/2017 15:08	0.0	4.2	18.6	77.2	-0.02	
MP-07 yellow	369	9	12/15/2017 14:54	0.0	4.7	19.3	76	-0.01	
MP-07 red	370	18	12/15/2017 14:56	0.0	4.5	19.8	75.7	-0.01	
MP-8 yellow	371	10	12/15/2017 14:45	0.0	1.7	21	77.3	-0.01	
MP-08 orange	372	30	12/15/2017 14:48	0.0	3.1	19.5	77.4	0.00	
MP-08 red	373	50	12/15/2017 14:53	0.0	6.4	14.2	79.4	0.00	
MP-09 yellow	374	8	12/15/2017 14:07	11.8	6.2	0.8	81.2	+0.02	Stabilized after 3 Cycles (3 minutes)
MP-09 orange	375	22	12/15/2017 14:11	0.0	0.1	22.6	77.3	-0.03	
MP-10 yellow	376	10	12/15/2017 13:55	0.0	4.4	18.3	77.3	+0.01	
MP-10 orange	377	23	12/15/2017 13:58	0.0	5.3	17.6	77.1	0.00	
MP-10 red	378	38	12/15/2017 14:02	0.0	10.8	10.6	78.6	-0.01	
Boat Comp.	379	NA	12/15/2017 13:07	1.4	6.4	14.4	77.8	-0.03	Stabilized after 3 Cycles (3 minutes)

COMMENTS:

Gas probes with positive pressure
 Gas Probes with CH₄%
 Gas Collection System was re-started at 12:30 upon my arrival