

Smith, George

From: Elizabeth Kennelley <ekennelley@jonesedmunds.com>
Sent: Thursday, December 07, 2017 2:27 PM
To: Morgan, Steve
Cc: Henry.Norris@citrusbocc.com; Ray Oates
Subject: Emailing: 2017.12_05_Citrus_WACS 39859_17Q4 LFG Mon Report.pdf
Attachments: 2017.12_05_Citrus_WACS 39859_17Q4 LFG Mon Report.pdf

Good Afternoon Steve,

Attached is the Fourth Quarter 2017 LFG Monitoring Report for the Citrus County Central Landfill (WACS 39859).

Please let us know if you have any problems opening the attachment or have questions or comments concerning the report.

Thank you,

Elizabeth D. Kennelley, MS, CEPM
Project Scientist

Jones Edmunds & Associates, Inc.
730 NE Waldo Road Gainesville, FL 32641
352.377.5821 ext. 1416
www.jonesedmunds.com

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2017.12_05_Citrus_WACS 39859_17Q4 LFG Mon Report.pdf

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December 5, 2017

Mr. Steve Morgan
Solid Waste Section
Department of Environmental Protection
13051 N Telecom Pkwy
Temple Terrace, FL 33637-0926

RE: Citrus County Central Landfill
Landfill Gas Monitoring Results – Fourth Quarter 2017
FDEP Permit No.: 21375-025-SO-01
Jones Edmunds Project Number: 03860-069-01

Dear Mr. Morgan:

Enclosed are the Fourth Quarter 2017 landfill gas monitoring results for the Citrus County Central Landfill conducted on November 20 and 21, 2017. The calibration log is also enclosed with this letter.

There were no detections of Methane in any of the landfill gas monitoring probes at any depths or in any of the on-site structures. However, elevated levels of carbon dioxide and decreased levels of oxygen were detected in most of the landfill gas monitoring probes indicating the presence of landfill gas in the probes.

Based on the initial sampling results from the probes at varying depths, Methane does not exceed 100% of the LEL at the compliance boundary and the site is in compliance with the landfill gas migration rule.

Methane was above 100% of the LEL in some of the groundwater monitoring wells and MW-9, MW-15, MW-17, and PZ-1 had measureable concentrations of Methane in them below 100% of the LEL. The groundwater wells that had Methane concentrations above 100% of the LEL are discussed below:

- MW-3: Methane concentration of 42% Volume, MW-3 is one of the background wells and is located on the southeast corner of the site.
 - LFG Probes GP-16 and GP-20 are east of MW-3. There was no Methane detected in these probes.
 - LFG Probes GP-15 and GP-30 are south of MW-3. There was no Methane detected in these probes.
 - LFG Probes GP-20 and GP-30 include tubing to 105 feet.
 - The Methane observed in MW-3 appears to be delineated.

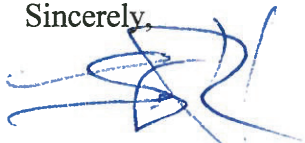
- MW-5: Methane concentration of 7.5% Volume, MW-5 is one of the piezometers/intermediate wells located in the middle of the site between the active and closed landfills.
 - There are no LFG Probes near this groundwater well.
- MW-6: Methane concentration of 36% Volume, MW-6 is one of the piezometers/intermediate wells located in the middle of the site between the active and closed landfills.
 - There are no LFG Probes near this groundwater well.
- MW-7: Methane concentration of 41% Volume, MW-7 is one of the background wells and is located on the east side of the active landfill near Phase 2.
 - LFG Probes GP-18 and GP-21 are northeast of MW-7. There was no Methane detected in these probes.
 - LFG Probe GP-17 is southeast of MW-3. There was no Methane detected in this probe.
 - The Methane observed in MW-7 appears to be delineated.
- MW-16: Methane concentration of 78% Volume, MW-16 is one of the piezometers/intermediate wells located in the middle of the site between the active and closed landfills.
 - There are no LFG Probes near this groundwater well.
- MW-20: Methane concentration of 41% Volume, MW-20 is the detection well north of the Phase 3 Active Landfill.
 - There are no LFG Probes near this groundwater well as it is in the center of the site.
- MW-21: Methane concentration of 7.5% Volume, MW-21 is one of the compliance wells and is located north of the closed landfill area.
 - Newly installed Groundwater Monitoring well MW-22 is north of MW-21 and screened at the same interval. No Methane was measured in MW-22.
 - LFG Probes GP-2, GP-24, and GP-25 are north of MW-21 near the property boundary. There was no Methane detected in these probes.
 - The Methane observed in MW-21 appears to be delineated.
- PZ-2: Methane concentration of 7% Volume, PZ-2 is one of the piezometers associated with the initial Rule 62-780 investigation. It is located north of the closed landfill area between MW-18 and MW-22.
 - LFG Probes GP-2, GP-24, and GP-25 are northeast of PZ-2 near the property boundary. There was no Methane detected in these probes.

- LFG Probes GP-3, GP-27, and GP-26 are all northwest of PZ-2 near the property boundary. There was no Methane detected in these probes.
- The Methane observed in PZ-2 appears to be delineated.

The results from the initial measurements conducted in the new landfill gas monitoring probes along with the existing probes retrofitted with tubing installed to varying depths indicate that the site is in compliance with the landfill gas migration rules.

If you have any questions regarding this information, please contact me at (352) 377-5821.

Sincerely,



Troy D. Hays, PG
Sr. Manager/Vice President

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xc: Ray Oates, Citrus County

**LANDFILL GAS MONITORING RESULTS
CITRUS COUNTY CENTRAL LANDFILL**

FOURTH QUARTER 2017

General Data								
Date:	11/20/2017 & 11/21/2017			Sampler:		Steve Messick		
Start Time:	10:00 AM on 11/20/2017 & 9:05 AM on 11/21/2017			Sky Conditions:		Clear on 11/20/2017 & Cloudy on 11/21/2017		
Air Temperature (deg C):	17°C on 11/20/2017 & 18°C on 11/21/2017			Measuring Device:		Eagle RKI (SN E084039)		
Sampling Data								
Station I.D.	Date Sampled	Time Sampled	Depth of Intake (Feet)	O2 %Volume	CO2 %Volume	Methane		Station Type
						Peak Recorded Concentration as % LEL	Peak Recorded Concentration as % Volume	
GP-1	11/20/2017	14:26	20	18.7	2.6	0.0	-	Gas Well
GP-1	11/20/2017	14:29	40	18.2	3.0	0.0	-	Gas Well
GP-2	11/20/2017	14:07	20	17.9	3.0	0.0	-	Gas Well
GP-2	11/20/2017	14:10	40	16.5	4.2	0.0	-	Gas Well
GP-3	11/20/2017	13:48	20	19.4	1.4	0.0	-	Gas Well
GP-3	11/20/2017	13:50	40	19.7	1.2	0.0	-	Gas Well
GP-4	11/20/2017	10:03	20	19.4	2.0	0.0	-	Gas Well
GP-4	11/20/2017	10:06	40	18.3	3.2	0.0	-	Gas Well
GP-5	11/20/2017	10:15	20	19.2	2.2	0.0	-	Gas Well
GP-5	11/20/2017	10:18	40	18.4	3.4	0.0	-	Gas Well
GP-6	11/20/2017	10:22	20	19.3	2.0	0.0	-	Gas Well
GP-6	11/20/2017	10:26	40	20.9	0.4	0.0	-	Gas Well
GP-7	11/20/2017	10:31	20	20.0	1.4	0.0	-	Gas Well
GP-7	11/20/2017	10:34	40	19.7	1.6	0.0	-	Gas Well
GP-8	11/20/2017	10:37	20	20.0	1.2	0.0	-	Gas Well
GP-8	11/20/2017	10:40	40	19.0	1.2	0.0	-	Gas Well
GP-9	11/20/2017	10:44	20	20.2	1.4	0.0	-	Gas Well
GP-9	11/20/2017	10:46	40	19.9	1.6	0.0	-	Gas Well
GP-10	11/20/2017	10:49	20	16.0	5.4	0.0	-	Gas Well
GP-10	11/20/2017	10:52	40	14.2	7.0	0.0	-	Gas Well
GP-11	11/20/2017	10:56	20	19.7	1.6	0.0	-	Gas Well
GP-11	11/20/2017	10:59	40	18.4	1.4	0.0	-	Gas Well
GP-12	11/20/2017	11:03	25	20.0	1.4	0.0	-	Gas Well
GP-12	11/20/2017	11:06	50	19.7	1.6	0.0	-	Gas Well
GP-12	11/20/2017	11:09	75	19.8	1.2	0.0	-	Gas Well
GP-13	11/20/2017	11:13	25	18.9	1.6	0.0	-	Gas Well
GP-13	11/20/2017	11:16	50	18.3	1.8	0.0	-	Gas Well
GP-13	11/20/2017	11:19	75	18.4	1.8	0.0	-	Gas Well
GP-14	11/20/2017	11:22	25	20.0	0.8	0.0	-	Gas Well
GP-14	11/20/2017	11:25	50	19.4	1.0	0.0	-	Gas Well

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Sampling Data								
Station I.D.	Date Sampled	Time Sampled	Depth of Intake (Feet)	O2 %Volume	CO2 %Volume	Methane		Station Type
						Peak Recorded Concentration as % LEL	Peak Recorded Concentration as % Volume	
GP-14	11/20/2017	11:28	75	19.4	1.0	0.0	-	Gas Well
GP-15	11/20/2017	11:35	25	20.2	1.2	0.0	-	Gas Well
GP-15	11/20/2017	11:37	50	20.0	1.2	0.0	-	Gas Well
GP-15	11/20/2017	11:40	75	20.2	1.2	0.0	-	Gas Well
GP-16	11/20/2017	11:46	25	19.4	1.2	0.0	-	Gas Well
GP-16	11/20/2017	11:49	50	19.3	1.4	0.0	-	Gas Well
GP-16	11/20/2017	11:51	75	19.3	1.4	0.0	-	Gas Well
GP-17	11/20/2017	11:58	25	16.1	4.4	0.0	-	Gas Well
GP-17	11/20/2017	12:00	50	16.1	4.2	0.0	-	Gas Well
GP-17	11/20/2017	12:03	75	16.5	3.8	0.0	-	Gas Well
GP-18	11/20/2017	12:07	25	19.8	1.2	0.0	-	Gas Well
GP-18	11/20/2017	12:09	50	19.7	1.2	0.0	-	Gas Well
GP-18	11/20/2017	12:11	75	19.8	1.2	0.0	-	Gas Well
GP-19	11/20/2017	12:17	25	20.0	1.2	0.0	-	Gas Well
GP-19	11/20/2017	12:19	50	20.0	1.2	0.0	-	Gas Well
GP-19	11/20/2017	12:22	75	19.9	1.2	0.0	-	Gas Well
GP-20	11/20/2017	11:54	105	17.7	1.4	0.0	-	Gas Well
GP-21	11/20/2017	12:14	115	20.6	0.0	0.0	-	Gas Well
GP-22	11/20/2017	14:33	70	17.4	0.0	0.0	-	Gas Well
GP-23	11/20/2017	14:36	100	12.1	2.4	0.0	-	Gas Well
GP-24	11/20/2017	14:16	70	9.0	0.0	0.0	-	Gas Well
GP-25	11/20/2017	14:13	100	16.6	1.0	0.0	-	Gas Well
GP-26	11/20/2017	13:55	70	15.0	3.4	0.0	-	Gas Well
GP-27	11/20/2017	13:59	100	16.5	2.8	0.0	-	Gas Well
GP-28	11/20/2017	10:00	70	18.3	0.4	0.0	-	Gas Well
GP-29	11/20/2017	10:10	100	20.9	0.0	0.0	-	Gas Well
GP-30	11/20/2017	15:19	105	18.2	1.4	0.0	-	Gas Well
Admin Building	11/21/2017	12:03	-	20.9	0.0	0.0	-	Structure
Mod Bldg	11/21/2017	12:26	-	20.9	0.0	0.0	-	Structure
Shop	11/21/2017	12:18	-	20.9	0.0	0.0	-	Structure

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Sampling Data								
Station I.D.	Date Sampled	Time Sampled	Depth of Intake (Feet)	O2 %Volume	CO2 %Volume	Methane		Station Type
						Peak Recorded Concentration as % LEL	Peak Recorded Concentration as % Volume	
Scale House	11/21/2017	12:14	-	20.9	0.0	0.0	-	Structure
Treatment Facility	11/21/2017	12:00	-	20.9	0.0	0.0	-	Structure
Firing Range	11/21/2017	11:33	-	20.9	0.0	0.0	-	9 Structures
Haz Waste Drop off Center	11/21/2017	9:05	-	20.9	0.0	0.0	-	3 Structures
MW-1R	11/20/2017	14:39	100	18.0	2.8	0.0	-	Groundwater Well
MW-2	11/20/2017	12:27	100	20.6	0.4	0.0	-	Groundwater Well
MW-3	11/21/2017	8:57	100	5.9	32.2	-	42.0	Groundwater Well
MW-5	11/21/2017	9:43	100	7.0	22.8	-	7.5	Groundwater Well
MW-6	11/21/2017	9:35	100	6.9	24.6	-	36.0	Groundwater Well
MW-7	11/21/2017	8:50	100	6.0	32.2	-	41.0	Groundwater Well
MW-8R	11/21/2017	11:04	100	10.5	14.4	0.0	-	Groundwater Well
MW-9	11/21/2017	10:56	100	6.5	8.0	36.0	-	Groundwater Well
MW-10	11/20/2017	14:59	100	9.8	17.4	0.0	-	Groundwater Well
MW-11	11/20/2017	9:52	100	20.9	0.0	0.0	-	Groundwater Well
MW-12	11/20/2017	9:34	100	18.4	3.0	0.0	-	Groundwater Well
MW-13	11/20/2017	9:22	100	20.9	0.2	0	-	Groundwater Well
MW-14	11/20/2017	9:00	100	20.9	0.0	0.0	-	Groundwater Well
MW-15	11/20/2017	9:05	100	10.8	11.6	26	-	Groundwater Well
MW-16	11/21/2017	9:08	100	4.5	35.6	-	78.0	Groundwater Well
MW-17	11/20/2017	9:12	100	10.7	11.6	24.0	-	Groundwater Well
MW-18	11/21/2017	10:29	100	14.0	8.8	0.0	-	Groundwater Well
MW-18D	11/21/2017	10:19	100	15.0	6.8	0.0	-	Groundwater Well
MW-19	11/20/2017	15:03	100	11.7	16.6	0.0	-	Groundwater Well
MW-19D	11/21/2017	10:37	100	13.8	9.0	0.0	-	Groundwater Well
MW-20	11/21/2017	9:20	100	6.6	26.2	-	41.0	Groundwater Well
MW-21	11/21/2017	11:50	100	3.7	26.4	-	7.5	Groundwater Well
MW-22	11/20/2017	14:22	100	9.2	7.8	0.0	-	Groundwater Well
MW-AA	11/20/2017	9:29	100	18.5	3.0	0.0	-	Groundwater Well
MW-B	11/21/2017	11:12	100	11.6	14.8	0.0	-	Groundwater Well
MW-E	11/20/2017	9:44	100	20.9	0.0	0.0	-	Groundwater Well

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Sampling Data								
Station I.D.	Date Sampled	Time Sampled	Depth of Intake (Feet)	O2 %Volume	CO2 %Volume	Methane		Station Type
						Peak Recorded Concentration as % LEL	Peak Recorded Concentration as % Volume	
PZ-1	11/21/2017	10:47	100	6.4	7.8	37	-	Groundwater Well
PZ-2	11/21/2017	10:11	100	6.7	23.7	-	7	Groundwater Well

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Citrus County Landfill DATE 11/20/17
INSTRUMENT (MAKE/MODEL#) Eagle Multi-Gas Detector INSTRUMENT # GNV 80023*
Instrument Calibration Date 11/11/16 Reference Meter Book Eagle Meter Book 1

PARAMETER: [check only one]

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL CI ☐ DO ☒ OTHER LANDFILL GAS

STANDARDS: [Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]

Standard A 15.01 % Methane (Volume), 15.05 % CO₂ (Volume), Balance Nitrogen

Standard Source Airgas Lot # 122-124598242-1

Standard B Zero Air (0 % Methane) (0% CO₂) (% O₂)

Standard Source Airgas Lot # 53-400483127-1

Standard C % LEL Methane, % CO₂ (Volume), 0% O₂ (Volume), Bal Nitrogen

Standard Source _____ Lot # _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	CH ₄ STD VALUE (% Vol)	CO ₂ STD VALUE (% Vol)	O ₂ STD VALUE (% Vol)	INSTRUMENT RESPONSE (%) DEVIATION (LIMITS +/- 5%)						CALIB- RATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
						CH ₄		CO ₂		O ₂				
						RES	DEV	RES	DEV	RES	DEV			
17/11/20	0845	A	15.01	15.05	—	15.0	<1	15.0	<1	—	—	Yes	Init.	Am
	0850	B	—	—	21.0	—	—	—	—	21.0	<1	Yes	Init.	Am
	1232	A	15.01	15.05	—	15.0	<1	15.4	<3	—	—	Yes	Cont.	Am
	1235	B	—	—	21.0	—	—	—	—	20.9	<1	Yes	Cont.	Am
	1337	A	15.01	15.05	—	15.0	<1	15.2	<1	—	—	Yes	Cont.	Am
	1340	B	—	—	21.0	—	—	—	—	20.9	<1	Yes	Cont.	Am
	1604	A	15.1	15.5	—	15.0	<1	15.4	<3	—	—	Yes	Cont.	Am
	1606	B	—	—	21.0	—	—	—	—	20.9	<1	Yes	Cont.	Am
17/11/21	0835	A	15.01	15.05	—	15.0	<1	15.0	<1	—	—	Yes	Init.	Am
	0837	B	—	—	21.0	—	—	—	—	20.9	<1	Yes	Init.	Am
	1230	A	15.01	15.05	—	15.5	<4	15.2	<1	—	—	Yes	Cont.	Am
	1232	B	—	—	21.0	—	—	—	—	20.9	<1	Yes	Cont.	Am

* Eagle SN E084039