

June 5, 2012

Ms. Saara Ali Bureau of Landfill and Recycling Management NJDEP – DIVISION OF SOLID AND HAZARDOUS WASTE 401 East State Street, P.O. Box 414 Trenton, New Jersey 08625-0414

Re: Quarterly Landfill Gas Survey –2<sup>nd</sup> Quarter 2012

Legler Landfill, Facility No. 1511A

Jackson Township, Ocean County, New Jersey

FPA No. 08E004A

Dear Ms. Ali:

### INTRODUCTION

This report presents the testing procedures and analytical results of the Quarterly Landfill Gas (LFG) survey conducted by French & Parrello Associates, P.A. (FPA) on May 15, 2012, at Legler Landfill and surrounding properties, Jackson Township, Ocean County, New Jersey. The subject landfill is identified as New Jersey Department of Environmental Protection (NJDEP) Facility No. 1511A.

### BACKGROUND

As part of the Closure and Post-Closure Plan Approval dated February 21, 1996, and Corrective Action Plan dated March 2002, methane gas surveys are to be conducted around the landfill perimeter to monitor potential lateral, offsite gas migration. Since 2000, methane gas concentrations have increased in the western portion and southwestern corner of the landfill. As a result, the NJDEP directed Jackson Township to perform quarterly offsite gas surveys to monitor methane gas migration.

Pursuant to the NJDEP letter received April 1, 2009, monitoring is required to be conducted during days of falling barometric pressure in order to accurately monitor gas migration. Barometric pressure data was gathered from the Rutgers Weather and Climate Network station located in Cream Ridge, NJ, approximately 13.5 miles from the Subject Property. Additionally, pursuant to the NJDEP letter dated June 23, 2010, the delineation protocol has been modified. Gas sampling points between each well are no longer required; however, whenever methane gas is detected within one of the onsite gas monitoring wells, three additional sampling points are required.



One point is required 25 feet on either side of the well and the third point is required 25 feet behind (offsite) of the well. In the event methane gas is detected in one of the delineation samples, the same delineation protocol is to be used until methane gas is no longer detected. Delineation samples were collected on the boundary of Block 37, Lot 1, and Block 38, Lot 16.02, and expanded outward from the onsite sampling points.

### LANDFILL GAS TESTING PROCEDURES

Gas sampling was performed at 54 gas sampling locations: 23 gas monitoring wells, 29 temporary gas sampling points (GSPs) and two flares. The wells were sampled immediately after removing the locked, metal protective caps by inserting dedicated three-foot, 3/16-inch, white polyethylene tubing through pre-drilled holes in the plastic well caps. The tubing was attached to the LANDTEC GEM-2000 Gas Extraction Monitor (GEM-2000) which instantaneously analyzed the LFG. GSP samples were collected utilizing an AMS Soil Sampling Kit. A slam bar and soil gas probe were utilized to penetrate the soil to an approximate depth of two and one-half feet. Dedicated 3/16-inch inside diameter, polyethylene tubing was pre-fed through the probe, and the GEM-2000 was utilized to instantaneously analyze LFG. GSPs are located primarily along the property boundary 25 feet on each side of the wells containing detectable concentrations of methane gas. On February 4, 2008, four-inch PVC ball valves equipped with fabricated conversion nipples, were installed on the Flares. These valves ensure a sealed connection to the LANDTECH GEM-2000 while sampling.

Offsite gas sampling was conducted on Block 38, Lots 16.02 and 18, as well as Block 37, Lot 1. Samples were collected in 25-foot intervals behind the onsite locations where methane LELs were detected above 0%. Offsite sampling included 11 GSP locations. Each gas sample was analyzed for percent methane, percent oxygen, percent carbon dioxide and methane LEL. Sampling locations are displayed on Drawing No. 1.

### **GAS TESTING RESULTS**

### **Onsite Gas Testing Results**

Methane gas was detected in 15 locations onsite, 11 of which were in excess of the 25 percent LEL: Well #8, Well #13, GSP #13b, Well #15, Well #17, GSP #18a, Well #19, GSP #19b, GSP #19bb, and Flare Two (F-2). (Survey results are presented in Table No. 1). A comparison of the most recent monitoring results with the historical results shows no indication of additional methane migration. Changes in onsite methane gas concentrations, since September 2006, are presented in Table No. 2 and graphically on Figure No. 1. Changes in onsite LEL, since September 2006, are presented in Table No. 3, and graphically on Figure No. 2.



### OFFSITE GAS MONITORING RESULTS

During the May 15, 2012 landfill gas monitoring event, methane gas was not detected at offsite locations. Field analysis results of the offsite gas survey are presented in Table No. 4. A comparison of the most recent monitoring results with the historical results indicates an overall decreasing trend of LELs. Changes in offsite methane gas concentrations, since April 2009, are presented in Table No. 5, and graphically on Figure No. 3. Changes in offsite LEL, since April 2009, are presented in Table No. 6 and graphically on Figure No. 4.

### CONCLUSIONS AND RECOMMENDATIONS

Pursuant to the NJDEP letter received April 1, 2009, FPA conducted the first quarter gas monitoring event on a day with falling barometric pressure. Barometric pressure data is presented in Table No. 7. The most current quarterly gas survey indicates a decreasing trend in LELs when compared to historic surveys. LELs were not detected above the acceptable regulatory percentage in offsite sampling locations during the May 15, 2012 monitoring event.

Should you have any questions or comments, please do not hesitate to contact us.

Very truly yours,

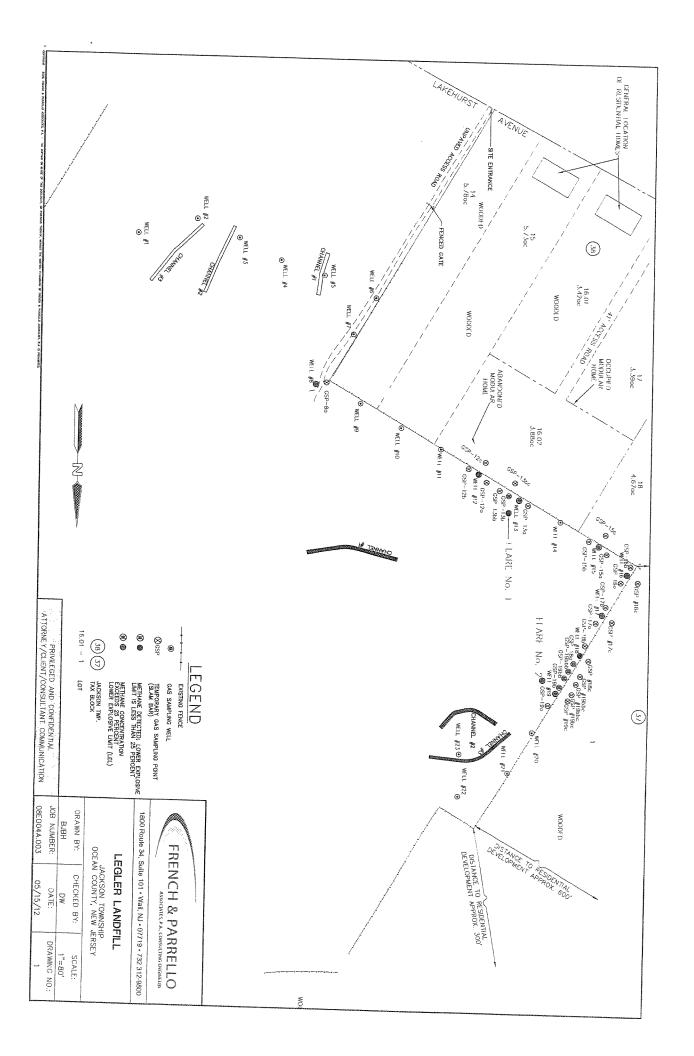
FRENCH & PARRELLO ASSOCIATES, P.A.

Bryan Heller

Environmental Scientist

cc: Dan Burke - Jackson Township Engineer

**DRAWINGS** 



## TABLE 1

MAY 15, 2012 - ONSITE GAS SURVEY RESULTS LEGLER LANDFILL (FACILITY No. 1511A) JACKSON TOWNSHIP, OCEAN COUNTY, NEW JERSEY

Well No./ Gas Sampling Point	Percent Methane	Percent Lower Explosive Limit	Percent Carbon Dioxide	Percent Oxygen	Comments
Well # 1	0.0%	0.0%	0.4%	19.3%	
Well # 2	0.0%	0.0%	2.4%	18.0%	
Well #3	0.0%	0.0%	0.4%	19.9%	
Well # 4	0.0%	0.0%	3.2%	16.4%	
Well # 5	0.0%	0.0%	2.8%	16.1%	
Well #6	0.0%	0.0%	1.5%	17.7%	
Well # 7	0.0%	0.0%	3.3%	15.1%	
Well #8	6.4%	128.0%	12.9%	3.4%	
GSP #8a	0.0%	0.0%	7.9%	8.7%	
Well # 9	0.0%	0.0%	7.5%	8.5%	
Well # 10	0.0%	0.0%	9.7%	7.7%	
Well # 11	0.0%	0.0%	4.9%	15.8%	
Well # 12	0.6%	12.0%	13.9%	3.0%	
GSP # 12a	0.0%	0.0%	0.5%	19.5%	
GSP # 12b	0.0%	0.0%	1.4%	20.1%	
Well # 13	31.5%	630.0%	19.5%	0.0%	
GSP # 13a	0.0%	0.0%	2.3%	18.5%	
GSP # 13b	2.5%	50.0%	4.9%	15.4%	
GSP # 13bb	0.0%	0.0%	9.6%	7.4%	
Well # 14	0.0%	0.0%	11.3%	7.6%	
Well # 15	5.3%	106.0%	18.1%	0.2%	
GSP # 15a	0.0%	0.0%	2.2%	19.0%	
GSP # 15b	0.0%	0.0%	1.9%	18.8%	
Well # 16	0.5%	10.0%	11.5%	5.5%	
GSP # 16a	0.0%	0.0%	2.7%	18.1%	
GSP # 16b	0.0%	0.0%	3.3%	16.7%	
Well # 17	9.9%	198.0%	16.7%	0.3%	
GSP # 17a	0.0%	0.0%	5.0%	15.8%	
GSP # 17b	0.0%	0.0%	1.0%	19.7%	
Nell # 18	0.3%	6.0%	15.2%	1.2%	
GSP # 18a	15.9%	318.0%	17.7%	1.8%	Delineation connects to GSP # 19bbb.
GSP # 18b	0.0%	0.0%	2.5%	18.4%	
Vell # 19	16.9%	338.0%	18.9%	0.0%	
GSP # 19a	0.0%	0.0%	3.5%	15.2%	
SSP # 19b	9.2%	184.0%	8.7%	11.5%	
SSP # 19bb	47.3%	946.0%	19.4%	0.1%	
SSP # 19bbb	20.7%	414.0%	18.6%	0.8%	
Vell # 20	0.0%	0.0%	6.2%	13.3%	
Vell # 21	0.0%	0.0%	3.3%	18.2%	
Vell # 22	0.0%	0.0%	0.3%	20.4%	
Vell # 23	0.0%	0.0%	6.9%	10.0%	
lare (F-1)	0.9%	18.0%	6.5%	12.1%	
lare (F-2)	40.0%	800.0%	23.5%	0.2%	

Notes: Background methane levels approximately 0.1% methane Bold values exceed regulatory acceptable levels (25% LEL)

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# TABLE 2 ONSITE METHANE GAS CONCENTRATIONS FROM SEPTEMBER 2006 TO MAY 2012 LEGLER LANDFUL (FACILITY No. 15.11A) JACKSON TOWNISHP, CCEAN COUNTY, NEW JERSEY

316 (L.C)	(a/e (F-1)	Vell-23	SP-22 @ 5'	Vell-22	Vell-21	3SP-20a	Vell-20	3SP-19bbb	SD 19hbb	GSP-190	GSP-19aaa	GSP-19aa	GSP-19a	Well-19	GSP-1888	GSP-18a	Well-18	GSP-17b	GSP-17a	Well-17	GSD-168	Well-16	GSP-15bb	GSP-15b	GSP-15a	GSP-14b	GSP-14a	Well-14	GSP-13bbb	GCD-130	GSP-13aa	GSP-13a	Well-13	GSP-12a	Wall-12	GSP-11a	Wall-11	GSP-10a	Well-10	38P-9a	Well-9	GSP-Bab	GSP-8a	Well-8	Well-7	Well-6	Well-5	P. IIOAN	Well-2	Well-1	Wild Sundules serv
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## TABLE 2 ONSITE LOWER EXPLOSIVE LIMITS FROM SEPTEMBER 2006 TO MAY 2012 LEGLER LANDFILL FACULITY No. 1511A) JACKSON TOWNSHP, OCEAN COUNTY, NEW JERSEY

MAY 15, 2012 - OFFSITE GAS SURVEY RESULTS
LEGLER LANDFILL (FACILITY NO. 1511A)
JACKSON TOWNSHIP, OCEAN COUNTY, NEW JERSEY

Well No./ Gas Sampling Point	Percent Methane	Percent Lower Explosive Limit	Percent Lower Percent Carbon Explosive Limit Dioxide	Percent Oxygen	Comments
GSP # 12c	%0.0	%0.0	7.8%	8.9%	
GSP # 13c	-			-	*
GSP # 13bc	%0.0	%0.0	%8.9	10.3%	
GSP # 15c	%0.0	%0.0	7.6%	9.3%	
GSP # 16c	%0.0	%0.0	3.2%	16.8%	
GSP # 17c	%0.0	%0.0	2.8%	16.3%	
GSP # 18c	%0.0	%0'0	3.4%	15.7%	
GSP # 18ac	%0.0	%0.0	2.7%	15.8%	
GSP # 19c	%0.0	%0.0	5.6%	15.7%	
GSP # 19bc	%0.0	%0.0	3.8%	15.2%	
GSP # 19bbc	%0.0	%0.0	4.7%	12.5%	
GSP # 19bbbc	%0.0	%0.0	3.9%	15.6%	

## Notes:

<sup>\* -</sup> Due to a large berm located offsite behind Well-13, sampling at the GSP # 13c location could not be conducted. Bold values exceed regulatory acceptable levels (25% LEL)

OFFSITE METHANE GAS CONCENTATIONS FROM APRIL 2009 TO MAY 2012 LEGLER LANDENEL (FACILITY No. 15114) JACKSON TOWNSHIP, OCEAN COUNTY, NEW JERSEY

% CH4 (5-12)	NS	NS	9,000	NS	•,	0.0%	NS	NS	NS	%0:0	NS	%0.0	0.0%	0.0%	%0.0	%0.0	NS	NS	0.0%	0.0%	0.0%	NS	
% CH4 (3-12)	NS	NS	0.0%	NS	*:	NS	NS	NS	NS	0.0%	NS	%0.0	0.0%	NS	NS	%0:0	NS	SS	0.0%	%0.0	NS	NS	_
% CH4	NS	SN	SN	NS	,,,	1,6%**	0.0%	NS	NS	NS	NS	SN	NS	SN	NS	%0.0	NS	NS	0.0%	%0.0	SS	NS	
% CH4	SN	0.0%	%0.0	NS	• • •	SN	NS	0.0%	NS	%0.0	NS	SN	0.0%	SN	NS	0.0%	0.0%	0.0%	%0.0	%0:0	%0:0	%0.0	
% CH4	NS	SN	NS	NS	• ;	NS	NS	SN	SN	%0.0	SN	NS	0.0%	0.0%	%0.0	0.0%	%0'0	SN	%0:0	0.0%	0.0%	NS	
%, CH4	0.0%	0.0%	0.0%	NS	•,	NS	NS	0.0%	NS	0.0%	NS	0.0%	0.0%	%0.0	NS	0.0%	SN	NS	0.0%	0.0%	SN	NS	
% CH4 (11:10)	NS	SN	%0.0	SN	• 1	NS	NS	NS	NS	NS	NS	NS	NS	NS	SN	0.0%	%0.0	NS	0.0%	%0'0	%0'0	NS	
% CH4	NS	NS	%0.0	NS	• .	SN	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.0%	NS	NS	0.0%	SN	NS	SN	
% CH4 (4:10)	%0.0	0.0%	2.0%	0.0%		NS	NS	NS	NS	0.0%	NS	0.0%	%0.0	%000	SN	0,0%	NS	NS	NS	NS	SN	NS	
% CH4	%00	%0.0	%00	NS		NS	NS	NS	0.0%	NS	SN	NS	%00	NS	%00	0.0%	NS	NS	NS	NS	NS	SN	
% CH4 (18.09)	SN	:500	0.5%	NS	****	NS	SN	NS	NS	0.0%	%0.0	SN	0.0%	0.1%	SN	0.1%	NS	NS	NS	NS	NS	NS	
% CH4	SN	SN	%000	NS		SN	SN	SN	SN	SN	(C)	SN	7500	NS	SN	%0 O	NS	NS	SN	NS	NS	NS	Commence of the Control of the Contr
% CH4	NIS	NS	7000	SN	*:	SN	SN	NS	SN	%00	SN	NS	7000	NS	SIN	2000	NS	SN	SN	NS	NS		-
Gas Montoring Well/ Gas	(200 020) (20) va (200	Meil 40 (25) (250 40c)	Well-10 (20 / 100)	Mall.19 (50)	Well.12 (95) (GSP.13c)	GCD-13h (3C) (GCD-13hc)	GCD-13bb (25) (GCD-13bbc)	Well-14 (25) (GSP-14c)	GCD, 159 (95)	Well 15 (251) (3SP-15c)	GSD-16a (25)	(Mell.16 /05") (GCD,16c)	Mail 47 (95) (90) 170)	(ACE 18 (25) (35) 115)	CCD 195 (25)	Mell. 10 (951) (GSP # 1951)	(3SP.19a (25) (GSP # 19ac)	GSD, 10aa (95') (GSP # 10aan)	GSP-19h (251) (GSP # 19hc)	GSP-19hb (25) (GSP # 19hbc)	GSP-19bbb (25') (GSP # 19bbbc)	GSP-19bbbb (25") (GSP # 19bbbbc)	the state of the s

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1. Not Sampled

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1. Mote to a large berm located offsite behind Well 13, sampling at the GSP-13 (25) location could not be

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1. Mote to a large berm located offsite behind Well 13, sampling at the GSP-13 (25) location could not be ground surface. The red for monitoring events, the rod was only approximately between 17 and 37 leet below the ground surface, however, the rod was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 17 and 37 leet below the ground surface. The red was only approximately between 18 and 18 an

TABLE 6

OFFSITE LOWER EXPLOSIVE LIMITS FROM APRIL 2009 TO MAY 2012
LEGLER LANDFILL (FACILITY No. 1511A)
JACKSON TOWNSHIP, OCEAN COUNTY, NEW JERSEY

The second secon	(8.12)	NS	NS	0.0%	SS		0.0% MS	ON UN	SN	%0.0	%0.0	%0.0	0.0%	0.0%	S	0.0%	NS%	NS	%0.0	0.0%	%0.0	NS
	(3-42)	NS	NS	0.0%	SN2	SIN	SNS	SZ	SN	0.0%	%0.0	0.0%	SN	SN	NS	%0.0	SN	SN	%0.0	%0'0	NS	NS
	(10-11)	NS	0.0%	%O:O	2 *	SN	SN	0.0%	NS	%0.0	NS	0.0%	NS	NS	NS	%0:0	%0.0	0.0%	0.0%	%0.0	0.0%	%0.0
LEC.		SS	S S	SN SN		NS	NS	NS	NS	%0'0	NS	%0.0	%0:0	%0.0	NS	%0.0	%0.0	NS	%0.0	0.0%	0.0%	NS
199	(3-11)	0.0%	0.0%	SN	*,	NS	NS	%0.0	NS	%0.0	0.0%	%0'0	0.0%	0.0%	0.0%	0.0%	ON.	NO.	0.0%	0.0%	SN	SS
737	(11:10)	n v	0.0%	NS	*,	NS	NS	NS	NS	SN	SS	200	N CZ	CN	190	0.0%	0,0,0	, io	0,076	0.0.0	0.0%	ON.
TET	(7:10)	SN	0.0%	NS	•	SS	NS	S S	SS	SN	ON C	022	ON NO	S N	2000	NS.	S N	7600	SNS	OIN	202	ON.
ii.	0.0%	0.0%	40.0%	%0:0		SS	SN	N C	NO O	0.0%	0.0%	0.0%	SN	SN	%00	SN	SN	SN	NS	NS	SZ	
LEL.	0.0%	%0:0	%0:0	NS	- 012	CN CIA	ON ON	/NO 0	NS.	SN	%00	NS	NS	NS	0.0%	NS	NS	NS	NS	NS	NS	
Tell	NS	%0:0	1.0%	SN.	SN ON	SIN ON	SN	S.N.	0.0%	0.0%	0.0%	1.0%	NS	NS	%0:0	NS	NS	NS	NS	NS	NS	
LEL (9-09)	NS	NS	0.0%	*	SN	SN	NS	NS	NS	NS	%0'0	NS	SN	NS	%0.0	NS	NS	NS	NS	NS	NS	
LEL (4-09)	NS	NS	%0.0 NS	CN.	NS	NS	NS	NS	0.0%	NS	%0.0	NS	NS	NS	0.0%	SN	NS	SS	NS	NS	NS	
Gas Monitoring Well/ Gas Sampling Point	GSP-8a (25") (GSP-8ac)	Well-12 (25) (GSP-10c)	Well-12 (501)	Well-13 (25') (GSP-13c)	GSP-13b (25') (GSP-13bc)	GSP-13bb (25') (GSP-13bbc)	Well-14 (25') (GSP-14c)	GSP-15a (25')	Well-15 (25') (GSP-15c)	Well-16 (25') (GSP-16c)	Well-17 (25') (GSP-17c)	Well-18 (25) (GSP-18c)	GSP-18a (25) (GSP-18ac)	Meii 10 (25) (35P-18bc)	Weii-19 (25) (GSP-190)	GSP-19a (25) (GSP-19aC)	GCD 10h (25) (GOP 1940)	GSD 10hh (251) (GSP-1900)	GSP 10hbb (25) (GSP-1900c)	(20) (30F-19000c)	GSL-190000 (25) (GSP-190000)	
Gas Mo Sa	GSP-82	Well-12	>	Well-13	GSP-13C	GSP-13bt	Well-14	38	Well-15	Well-16	Weil-1/	RL-IIII A	GSP-188	Most 100	Well-19	GSD-1835	GCD 105	105 dob	GAP. 1990	1000 - 100 O	000061-150	

Note.

NS - Not Sampled

Bold values exceed regulatory acceptable levels (25% LEL)

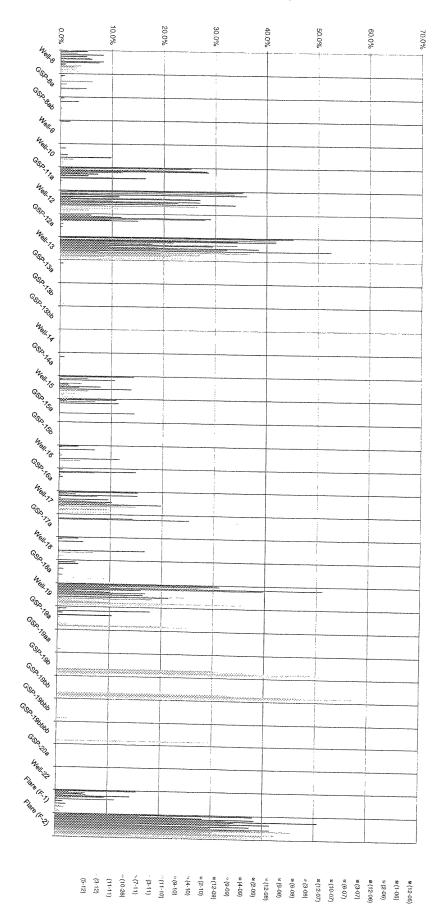
- Due to a large berm located offsite behind Well-13, sampling at the GSP-13 (25') location could not be

MAY 2012 - BAROMETRIC PRESSURE DATA LEGLER LANDFILL (FACILITY No. 1511A) JACKSON TOWNSHIP, OCEAN COUNTY, NEW JERSEY TABLE 7

Weather Station Location	State	Date & Time	Time Interval	Temperature	Precipitation	Wind Speed	Wind Direction	Barometric Pressure
Cream Ridge	Z	5/14/2012 10:00	24 hours prior	65	0	0	S	30.15
Cream Ridge	Z	5/14/2012 22:00	12 hours prior	65	0	2	SSW	30.10
Cream Ridge	ſΝ	5/15/2012 0:00	10 hours prior	63	0	1	SSE	30.10
Cream Ridge	2	5/15/2012 2:00	8 hours prior	63	0	4	SSE	30.07
Cream Ridge	Z	5/15/2012 4:00	6 hours prior	63	0	4	SSE	30.03
Cream Ridge	2	5/15/2012 6:00	4 hours prior	61	0	4	SSE	30.03
Cream Ridge	Z	5/15/2012 8:00	2 hours prior	63	0	7	S	30.02
Cream Ridge	2	3/28/2012 10:00	During Monitoring	63	0.03	4	SSE	30.02
Cream Ridge	2	3/28/2012 11:00	During Monitoring	62	0.28	4	SSE	30.02
Cream Ridge	N	3/28/2012 12:00	During Monitoring	64	0.03	£	SE	30
Cream Ridge	Ž	3/28/2012 13:00	During Monitoring	64	0.02	æ	SE	29.98
Cream Ridge	2	3/28/2012 14:00	During Monitoring	99	0.05	9	s	29.97
Cream Ridge	2	3/28/2012 15:00	During Monitoring	89	0	4	SSW	29.94
Cream Ridge	Z	3/28/2012 16:00	During Monitoring	70	0	7	WSW	29.93

Notes: Bold Cells indicate the times which FPA conducted the gas monitoring event

Figure 1
Changes in Onsite Methane Concentrations



Sample Locations

Sample Dates

