

**THE FLETCHER GROUP**  
Engineering and Environmental Solutions

October 28, 1999

Fac/Perm/Co. ID	Date	Doc ID#
10	08/16/1999	JIN

Mr. Mark Poindexter  
North Carolina Department of Environment and Natural Resources  
Division of Waste Management  
401 Oberlin Road  
Raleigh, North Carolina

Subject: Jackson County Landfill  
Landfill Gas Evaluation



Dear Mr. Poindexter:

This report addresses the recently completed landfill gas (LFG) evaluation at the Jackson County landfill. The data were collected between January and September 1999. Data collection and the subsequent evaluation were conducted in accordance with agreements made between Jackson County and the North Carolina Department of Environment and Natural Resources (DENR) during a meeting on May 19, 1999.

In summary, the existing passive LFG venting system installed in March 1999 has not achieved regulatory compliance. The methane gas concentration in some property boundary monitoring points continues to exceed 100 percent of the Lower Explosive Limit (LEL). However, the gas concentration is decreasing in some of these points. In general, the data collected to date do not display distinct trends and are insufficient to evaluate the effectiveness of the gas venting system. It is recommended that gas monitoring continue for an additional six months to better evaluate the effectiveness of the landfill gas venting system.

## BACKGROUND

Since approximately 1996, Jackson County (County) has been monitoring the concentration of LFG in a series of shallow probes installed near the perimeter of the closed landfill in Dillsboro. This monitoring is required by the DENR. It is conducted in accordance with the criteria specified in the *Transition Plan* dated March 1994. The *Transition Plan*, which was also required by DENR, describes the detailed procedures that were used to close the landfill. The plan also describes the required monitoring procedures.

On January 27, 1999, The Fletcher Group, on behalf of the County, began an evaluation of landfill gas as it is related to groundwater quality. As part of that evaluation, The Fletcher Group obtained permission from the owners of Western Builders and other adjacent property owners to monitor their property for LFG.

## PROCEDURES

Measurements recorded by The Fletcher Group were obtained using a LANDTEC landfill gas meter (Model GA-90 or GEM 500). These meters both measure methane, oxygen, carbon dioxide, and combustible gases (as a percentage of the Lower Explosive Limit (LEL)). Initially, the LFG evaluation

included fitting five monitoring wells and nine gas probes with specially constructed PVC caps that allow measurement of gas concentrations without mixing the gas with ambient air. In addition, two other points were monitored during January: one groundwater monitoring well located on the Western Builders property and one offsite spring located north of the landfill. The LFG measurements obtained during the initial evaluation, as well as those collected subsequently, are summarized in the attached tables and graphs.

On January 27, 1999 LFG was detected in concentrations greater than the LEL at several locations on County property and in the groundwater monitoring well on the Western Builders property. The Fletcher Group also measured LFG in ambient air approximately eight inches from the well head. The concentration of LFG at this location was eight percent of the LEL. This concentration is well below the explosive range.

DENR regulation 15A NCAC 13B .1626(4)(c)(i) requires that, "*Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health...*" The County met this requirement by, in part, taking the following actions:

1. Notified DENR on January 28, 1999. A telephone message was left for Mr. Mark Poindexter, and Mr. Jim McElduff spoke with Mr. Larry Rose.
2. Monitored nearby structures for combustible gases on January 28, 1999. In addition to County-owned structures, The Fletcher Group monitored several locations on the Western Builders property:
  - The casing of the groundwater monitoring well (where methane was detected in concentrations greater than 100 percent of the LEL),
  - The ambient space within eight inches of the well,
  - The breathing zone above the well,
  - Near the northern boundary of the Western Builders property,
  - Near the catch basin behind the shop, and,
  - In a trench drain adjacent to the property.

Combustible gases were detected only in the monitoring well casing and within eight inches of the closed well.

3. Notified Mr. Roger Bartlett, of Western Builders, of the explosive nature of vapors in the well on January 28, 1999. The onsite groundwater monitoring well was secured the following day with a lock that is controlled by Jackson County.
4. Requested a proposal from McGill Associates (McGill) for the upgrade of the LFG gas control system. This request for proposal was discussed during a telephone conversation between Mr. Jeff Bishop of McGill and Mr. Jim McElduff of The Fletcher Group on February 3, 1999.

Between March 15 and 19, 1999, The Fletcher Group oversaw installation of LFG probes in 18 locations near the landfill. Each of these probes was monitored monthly between May and September 1999 using the GA-90 or GEM-500. Table 1 lists the monitoring points and Figure 1 illustrates the locations of the permanent gas monitoring probes and wells.

Jackson County awarded a contract to McGill on March 24, 1999 for construction of additional LFG control structures. ~~Five LFG venting trenches were installed between March 29 and April 9, 1999.~~

On May 17, 1999, Mr. Chad Parker, a Jackson County Solid Waste Department employee, used a County-owned combustible gas meter (GasTech Model GP-204) to measure concentrations at various locations on the Western Builders property. Mr. Parker reported that no combustible gases were detected on the Western Builders property during that monitoring event.

## FINDINGS

Tables and graphs are enclosed that include all of the LFG data collected by The Fletcher Group during the period of January through September 1999.

The data reveal several critical points:

- The methane concentration in nine monitoring points (MW-3, MW-4, GP-2, GP-3, GP-5, GP-6, GP-15s, GP-15ds and GP-16s) is above 100 percent of the LEL as of the September 1999 measurements.
- Five of the monitoring points with a methane gas concentration greater than 100 percent of the LEL are either property boundary monitoring points or located offsite. These monitoring points are GP-2, GP-3, GP-5, GP-15s, and GP-15d.
- Five of the monitoring points with methane concentrations above 100 percent of the LEL show a decreasing gas concentration trend. These monitoring points are GP-2, GP-3, GP-6, GP-15s, and GP-16s.
- A trend of increasing methane concentration was observed at two monitoring points; one property boundary monitoring point (GP-5) and one offsite monitoring point (GP-15d).

## CONCLUSIONS

Based upon the data collected since January 1999, the passive LFG venting system appears to be having an effect on gas concentrations in the monitoring points around the landfill. However, interpretation of the data collected is difficult due to the lack of long term comprehensive data. The data are insufficient to determine whether the existing gas venting system will reduce the gas concentration to compliance limits at the landfill boundaries.

## RECOMMENDATIONS

The following recommendations are based upon the data discussed in this letter and the DENR requirements for monitoring and management of landfill gas:

1. Extend landfill gas data collection to encompass one full year. Monthly monitoring of landfill gas indicator parameters should continue until at least April 2000 to develop a sufficient data set with which to evaluate appropriate corrective action(s).

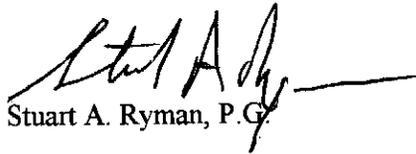
?  
Too long. Need to begin corrective action now. Already off-site. Public Health threat too great to delay.

Mr. Mark Poindexter  
October 28, 1999  
Page 4 of 4

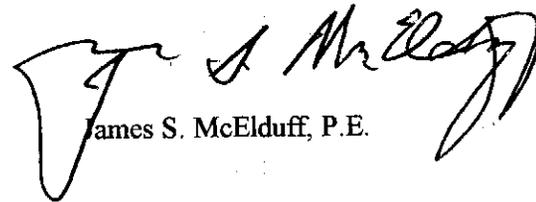
2. In April 2000, evaluate one year's worth of landfill gas data to identify trends and assess possible influences on gas concentrations.
3. After completing the data evaluation, determine if additional gas control measures are necessary.
4. If additional gas control measures are necessary, complete a benefit / cost analyses of various alternatives and develop recommendations.

Jackson County appreciates your assistance with this project. Please call if you have any questions.

Sincerely,



Stuart A. Ryman, P.G.



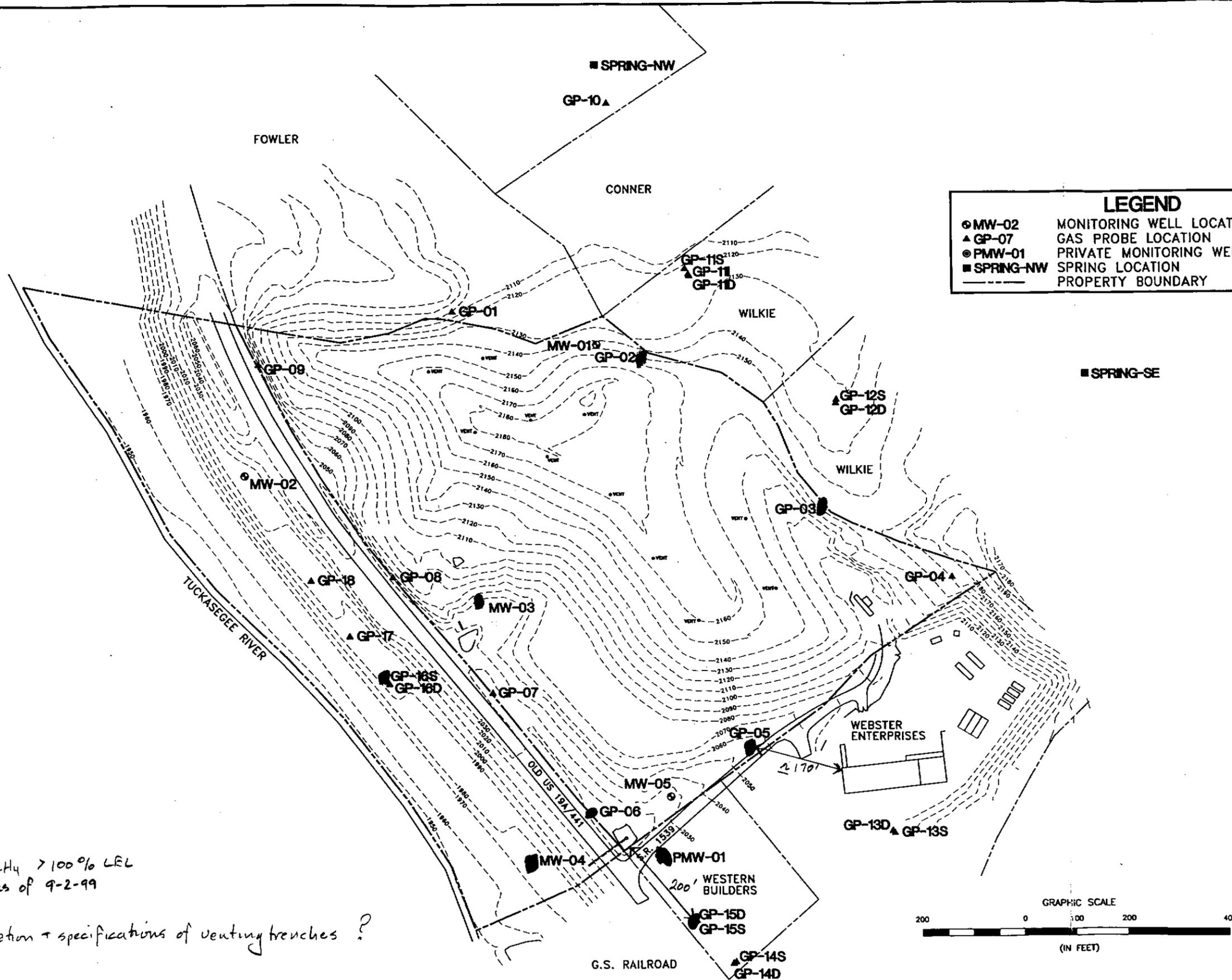
James S. McElduff, P.E.

enclosures:     Figure  
                     Tables  
                     Plots

cc:                Jay Denton / Jackson County

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  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100

**FIGURE**



● = CH<sub>4</sub> > 100% LEL  
as of 9-2-99

Location + specifications of venting trenches ?

**NOTES:**  
1. TOPOGRAPHY IS FOR REPRESENTATIVE PURPOSES ONLY AND NOT FOR CONSTRUCTION. THIS TOPOGRAPHY WAS OBTAINED FROM MCGILL ASSOCIATES AND IS BASED ON A COMPILATION OF AN AERIAL SURVEY AND SEVERAL LAND SURVEYS.

**THE FLETCHER GROUP**  
Engineering and Environmental Solutions  
ASHEVILLE, NORTH CAROLINA

**FIGURE 1**  
MONITORING WELL AND GAS PROBE LOCATION MAP  
JACKSON COUNTY LANDFILL  
JACKSON COUNTY, NORTH CAROLINA

**TABLES**

**Table 1****Jackson County Landfill****Landfill Gas Monitoring Locations**

<b>Monitoring Location</b>	<b>Frequency</b>
MW-1	Monthly
MW-2	Monthly
MW-3	Monthly
MW-4	Monthly
MW-5	Monthly
GP-1	Monthly
GP-2	Monthly
GP-3	Monthly
GP-4	Monthly
GP-5	Monthly
GP-6	Monthly
GP-7	Monthly
GP-8	Monthly
GP-9	Monthly
GP-10	Monthly
GP-11s	Monthly
GP-11i	Monthly
GP-11d	Monthly
GP-12s	Monthly
GP-12d	Monthly
GP-13s	Monthly
GP-13d	Monthly
GP-14s	Monthly
GP-14d	Monthly
GP-15s	Monthly
GP-15d	Monthly
GP-16s	Monthly
GP-16d	Monthly
GP-17	Monthly
GP-18	Monthly
Western Builders Monitoring Well (PMW-01)	Twice
Ambient Air Near Well	Once
Well Head at Cap	Once
NW Corner of Western Builders' Property	Once
Catch Basin Behind Shop	Once
Trench Drain Adjacent to Property	Once
Bulla Spring	Once
Beneath the Scale House	Once
Beneath the Scale	Once
Webster Enterprise Outside	Once
Webster Enterprise Inside	Once
Mr. Johnny Conner (under house)	Once
Frank Wilkie's Well	Once
Frank Wilkie's Basement	Once
Frank Wilkie's Garage	Once

**Table 2**  
**Jackson County Landfill**  
**Landfill Gas Concentration Trends**

Monitoring Point	Trend Analysis	
	Above 100% LEL (as of September 2, 1999)	Recent % LEL Trend
MW-1	No	Variable
MW-2	No	Stable
[REDACTED]	[REDACTED]	Variable
[REDACTED]	[REDACTED]	Variable
MW-5	No	Stable
GP-1	No	Decreasing
[REDACTED]	[REDACTED]	Decreasing
[REDACTED]	[REDACTED]	Decreasing
GP-4	No	Stable
[REDACTED]	[REDACTED]	Increasing
[REDACTED]	[REDACTED]	Decreasing
GP-7	No	Stable
GP-8	No	Stable
GP-9	No	Stable
GP-10	No	Stable
GP-11s	No	Stable
GP-11i	No	Variable
GP-11d	No	Decreasing
GP-12s	No	Stable
GP-12d	No	Stable
GP-13s	No	Stable
GP-13d	No	Stable
GP-14s	No	Stable
GP-14d	No	Stable
[REDACTED]	[REDACTED]	Decreasing
[REDACTED]	[REDACTED]	Increasing
[REDACTED]	[REDACTED]	Decreasing
GP-16d	No	Decreasing
GP-17	No	Stable
GP-18	No	Stable

**Notes:**

1. "Variable" indicates the percent LEL fluctuates, or the changes are insignificant.
2. "Stable" indicates the percent LEL has been relatively constant during the monitoring period.
3. "Increasing" or "Decreasing" describes the data trend for recent months, since the installation of the vent trenches.
4. A decreasing trend is identified only where methane concentrations in at least two of the most recent months show a consecutive decrease.

**Table 3****Jackson County Landfill****Miscellaneous Landfill Gas Measurements**

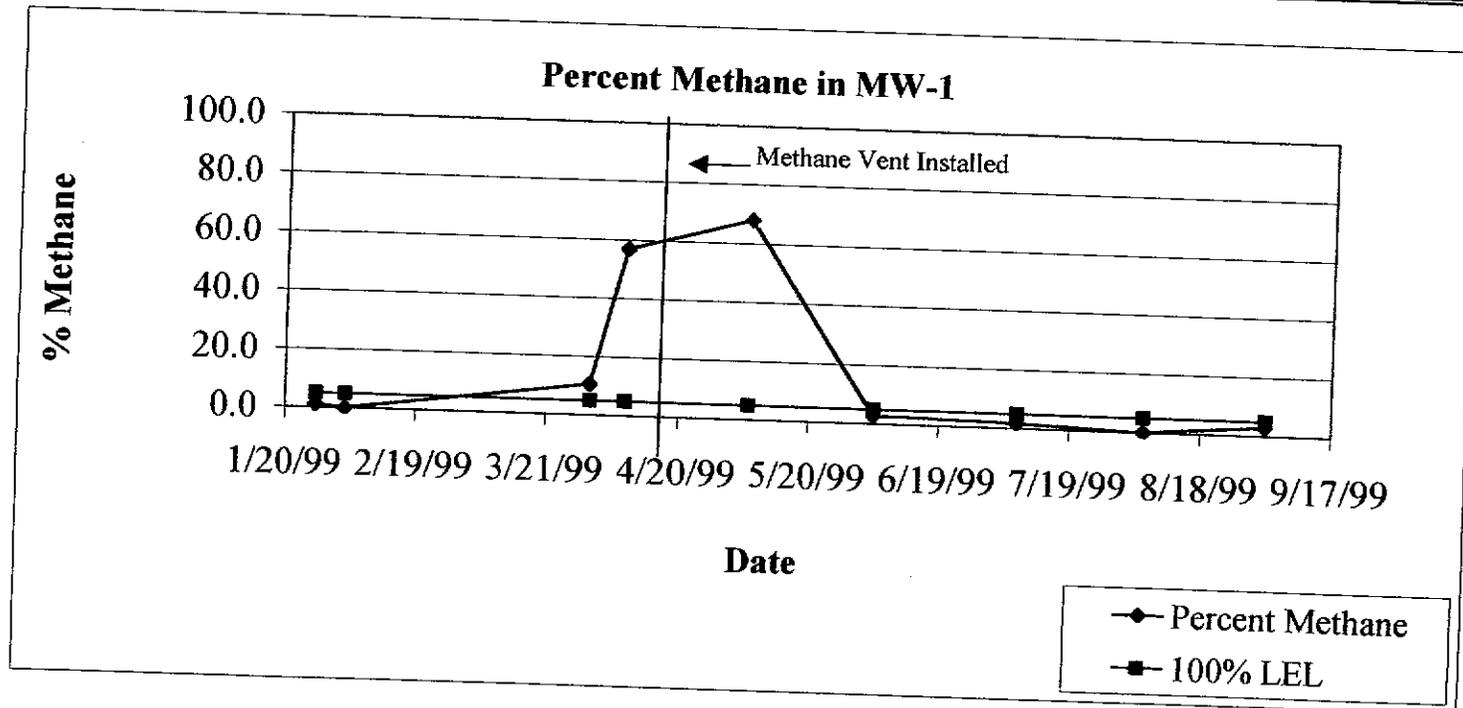
Monitoring Point	Date	Time	LEL Meter % LEL	% Methane	% CO2	% O2	Notes
Western Builders Monitoring Well (PMW-01)	1/27/99	15:50	586	26.6	11.5	13.6	Loose Cap
	2/3/99	14:18	950	46.9	23.9	6.7	Tight Cap
Ambient Air Near Well	1/28/99	17:30	0	0	0	20.5	
Well Head at Cap	1/28/99	17:30	8	Did not measure	Did not measure	Did not measure	
NW Corner of Western Builders' Property	1/28/99	17:35	0	Did not measure	Did not measure	Did not measure	
Catch Basin Behind Shop	1/28/99	17:36	0	Did not measure	Did not measure	Did not measure	
Trench Drain Adjacent to Property	1/28/99	17:40	0	Did not measure	Did not measure	Did not measure	
Bulla Spring	1/27/99	13:50	0	0	0.0	20.2	
Beneath the Scale House	2/3/99	15:20	0	0	0.0	20.9	
Beneath the Scale	2/3/99	15:25	0	0	0.0	21.2	
Webster Enterprise Outside	2/3/99	16:00	0	0	0.0	20.8	
Webster Enterprise Inside	2/3/99	16:05	0	0	0.0	20.8	
Johnny Conner (under house)	2/3/99	15:40	0	0	0.0	21.1	
Frank Wilkie's Well	2/3/99	16:20	0	0	0.0	21.0	
Frank Wilkie's Basement	2/3/99	16:15	0	0	0.0	20.7	
Frank Wilkie's Garage	2/3/99	16:15	0	0	0.0	20.7	

## PLOTS

**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

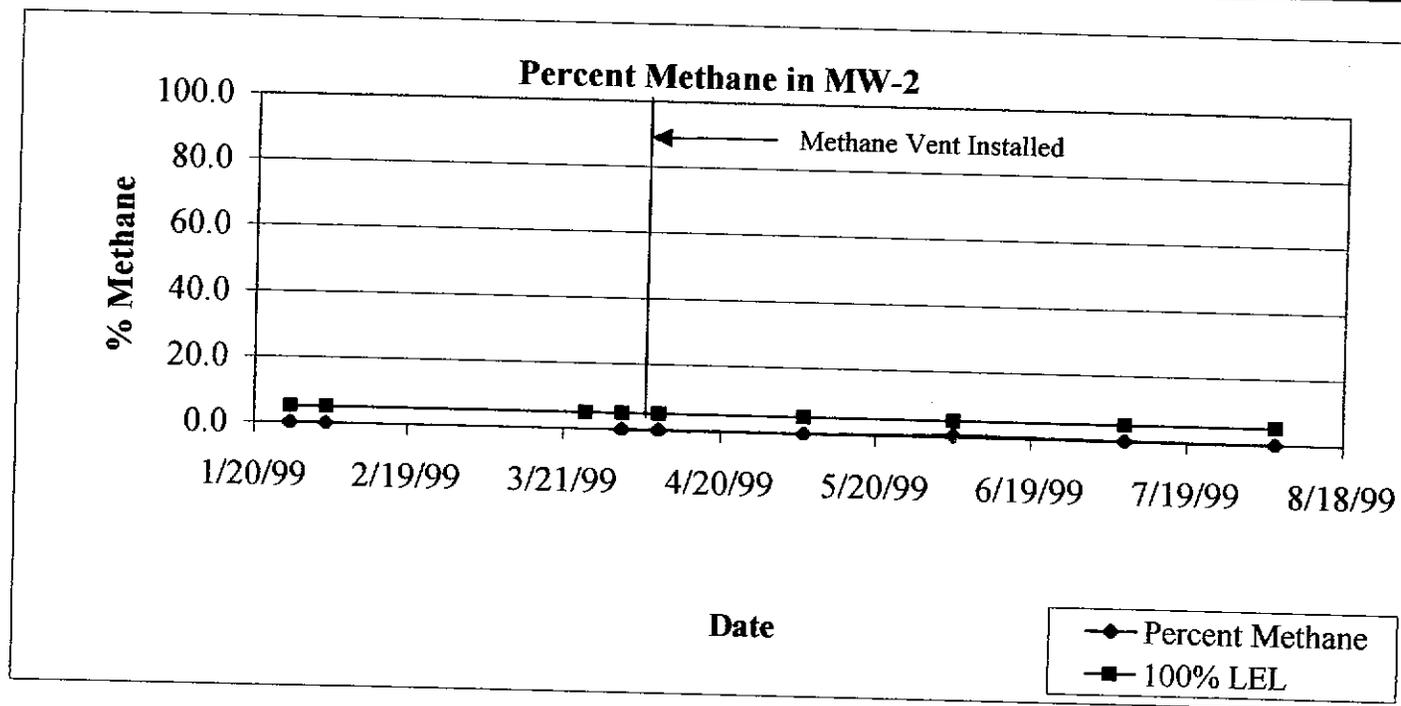
Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
MW-1	1/27/99	11:50	24		1.1	1.4	20.4	Not measured	
	2/3/99	14:45	0		0.0	0.0	20.4	Not measured	
	3/25/99	11:35							No cap due to pumping test
	3/31/99	14:10	210		10.5	7.8	17.2	0.13	Needs pressure cap
	4/8/99	10:00	>1000 @ 26 seconds		Peaked @ 65.0 @ 60 seconds 57.0 @ 180 seconds	39.1	5.5	0.11	Pressure cap installed, Readings recorded at 180 seconds, DTW = 94.60' TOC
	5/6/99	9:45	>1000 @ 30 seconds		68.0	32.0	6.3	0.00	Readings recorded at 180 seconds
	6/4/99	8:55	58		2.9	1.9	19.5	0.00	Readings recorded at 180 seconds
	7/7/99	9:45	34		1.7	1.1	20.2	0.00	Readings recorded at 180 seconds
	8/5/99	9:00	0		0.0	0.0	20.5	-0.02	Readings recorded after 2 purge volumes, DTW = 92.82 ft @ 11:15
	9/2/99	12:25	60		3.0	2.0	19.1	0.1	Readings recorded after 2 purge volumes, DTW = 92.70 ft

Not Measured = readings not taken



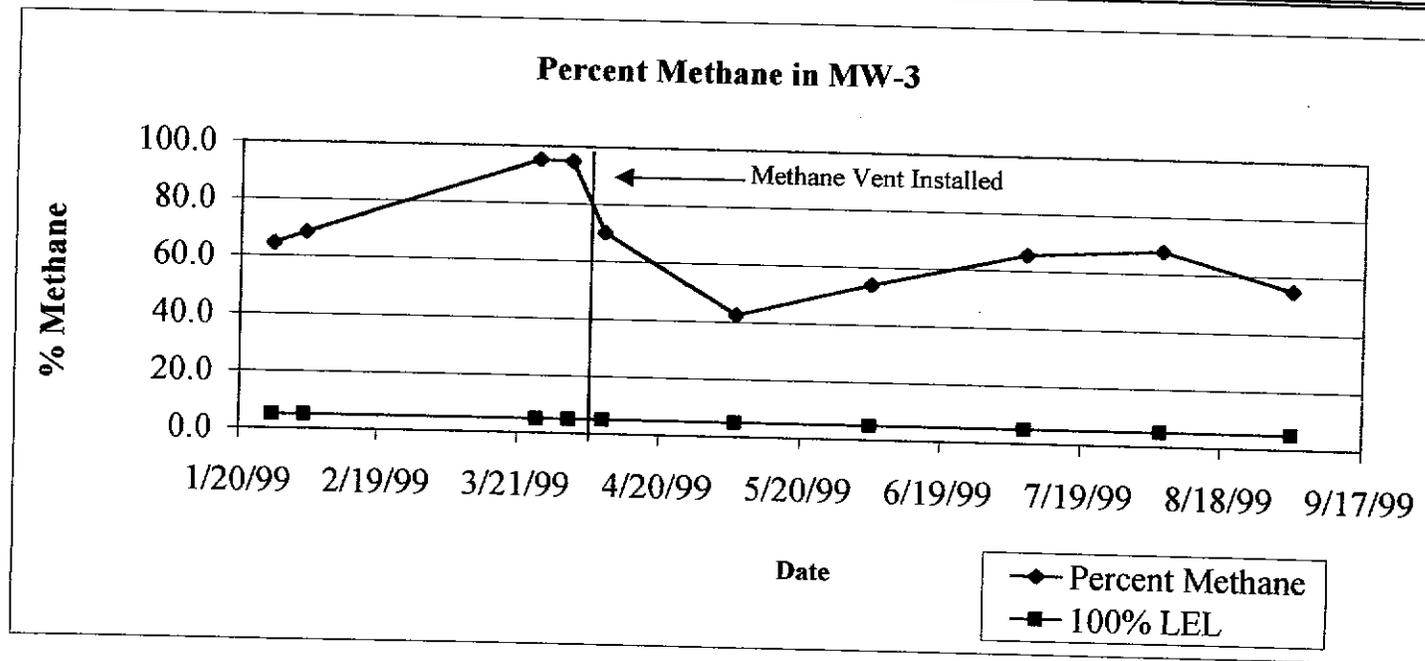
**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
MW-2	1/27/99	16:30	0		0.0	0.0	20.8	Not measured	
	2/3/99	13:46	0		0.0	0.0	19.8	Not measured	
	3/25/99	13:16							
	4/1/99	10:30	Did not record		0.0	0.0	20.6	0.65	Needs pressure cap
	4/8/99	14:20	Did not record		0.0	0.0	20.6	-0.01	Pressure cap installed (3/31/99), Readings stable at 120 seconds, DTW = 25.70' TOC
	5/6/99	14:20	Did not record		0.0	0.4	19.9	0.00	Slight vacuum--readings recorded at 180 seconds
	6/4/99	12:25	12		0.6	0.4	20.0	0.00	Readings recorded at 180 seconds
	7/7/99	13:40	4		0.2	0.3	20.9	0.00	Readings recorded at 180 seconds
	8/5/99	13:50	0		0.0	0.1	20.9	0.03	Readings recorded after 2 purge volumes, DTW = 26.33 ft @ 15:25
	9/2/99	-	-	-	-	-	-	-	Not Measured, water above screen, DTW=26.83 ft



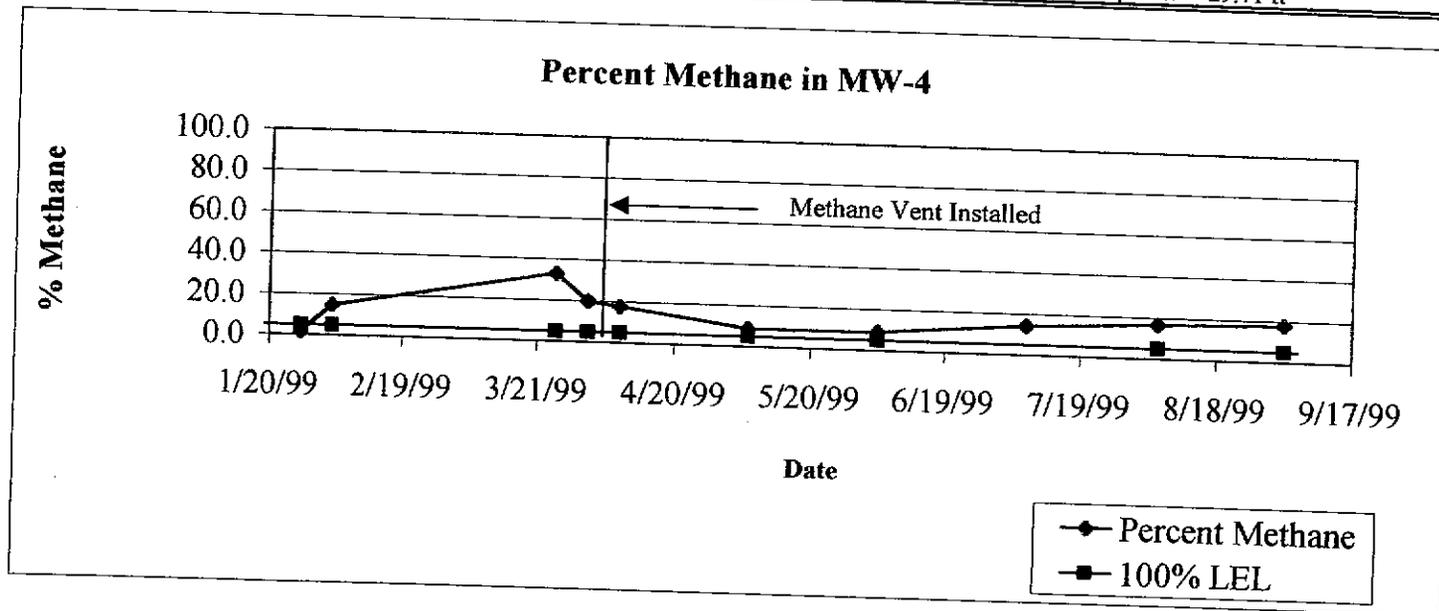
**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
MW-3	1/27/99	16:10	>1000		64.6	26.6	0.6		
	2/3/99	13:53	>1000		68.5	27.7	0.0	Not measured	
	3/25/99	13:00	>1000 @ 15 seconds		95.4	33.1	0.9	0.23	High pressure - peak reading recorded at 24
	4/1/99	10:00	>1000 @ 20 seconds		95.0	34.9	0.2	0.15	Readings recorded at 180 seconds, DTW = 51.61' TOC
	4/8/99	13:50	>1000 @ 15 seconds		70.1	26.8	4.4	0.30	Readings recorded at 180 seconds
	5/6/99	13:50	850		42.5	15.9	7.2	0.15	Readings recorded at 180 seconds
	6/4/99	11:55	>1000 @ 23 seconds		54.0	21.2	3.9	0.14	Readings recorded at 180 seconds
	7/7/99	13:00	>1000 @ 60 seconds		65.7	23.9	3.0	0.25	Readings recorded at 180 seconds
	8/5/99	13:20	>1000 @ 35 seconds		68.0	24.9	1.0	0.20	Readings recorded after 2 purge volumes, DTW = 52.20 ft @ 15:30
	9/2/99	16:40	>1000 @ 22 seconds		55.0	20.4	2.9	0.19	Readings recorded after 2 purge volumes, DTW = 52.55 ft



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

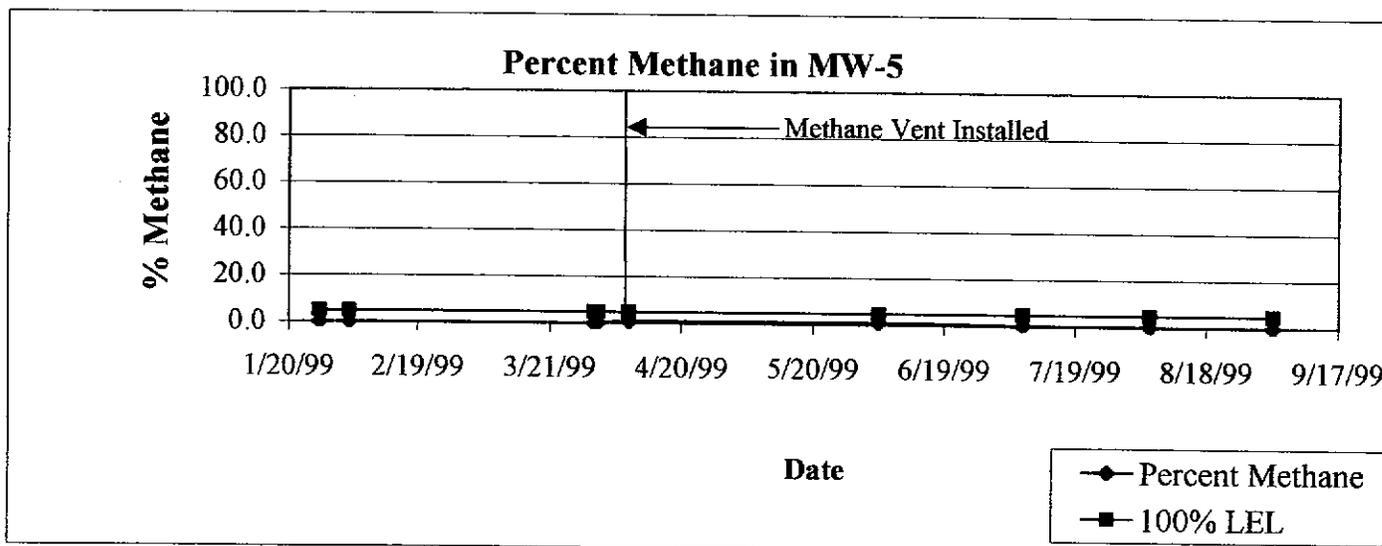
Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
MW-4	1/27/99	16:35	34		1.7	2.4	19.5	Not measured	
	2/3/99	15:50	286		14.5	17.0	12.1	Not measured	
	3/25/99	14:05	748 @ 30 seconds, 680 steady		35.0 + @ 30 seconds - 33.0 +/- steady	40.8	4.6	0.02	Can watch pressure fluctuate - peak gas reading recorded at 30 seconds then drops
	4/1/99	11:15	400		20.0	27.9	9.6	0.30	Readings recorded at 180 seconds, DTW = 22.90' TOC
	4/8/99	15:10	Peaked @ 520 @ 40 seconds, 350 @ 180 seconds		17.7	23.4	11.4	0.00	Readings recorded at 180 seconds
	5/6/99	14:50	178		8.7	7.8	15.4	0.00	Readings recorded at 180 seconds
	6/4/99	12:55	180		9.0	8.0	15.3	0.00	Readings recorded at 180 seconds
	7/7/99	14:30	28		14.1	13.2	13.7	0.00	Readings recorded at 18.5 minutes
	8/5/99	14:30	330		16.5	13.4	13.3	0.00	Readings recorded after 2 purge volumes, DTW = 29.00 ft @ 15:50
	9/2/99	17:50	360		18.0	19.5	8.7	0.00	Readings recorded after 2 purge volumes, DTW = 29.71 ft



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
MW-5	1/27/99	15:40	2		0.1	0.2	20.3	Not measured	Screened entirely below the water table
	2/3/99	14:24	0		0.0	0.0	21.0	Not measured	
	3/25/99	14:20							Needs pressure cap, Did not check
	3/31/99	16:20	Peaked @ 66 @ 20 seconds		0.1	0.6	20.2	0.10	Pressure cap installed
	4/1/99	9:30	6.0		0.3	0.4	20.3	0.12	Readings recorded at 180 seconds, DTW = 48.24' TOC
	4/8/99	12:40	16.0		0.8	0.5	20.0	0.16	Readings recorded at 180 seconds
	5/6/99	12:45	24.0		1.2	1.5	19.5	0.00	Readings recorded at 180 seconds
	6/4/99	10:55	Peaked @ 118 @ 20seconds, 24 @ 180 seconds		1.2	0.9	19.6	0.00	Readings recorded at 180 seconds
	7/7/99	12:10	4		0.2	0.0	20.7	0.02	Readings recorded at 180 seconds
	8/5/99	12:50	4		0.2	0.0	20.8	0.00	Readings recorded after 2 purge volumes, DTW = 48.22 ft @ 16:00
	9/2/99	15:20	0		0.0	0.0	19.9	0.01	Readings recorded after 2 purge volumes, DTW = 48.40 ft

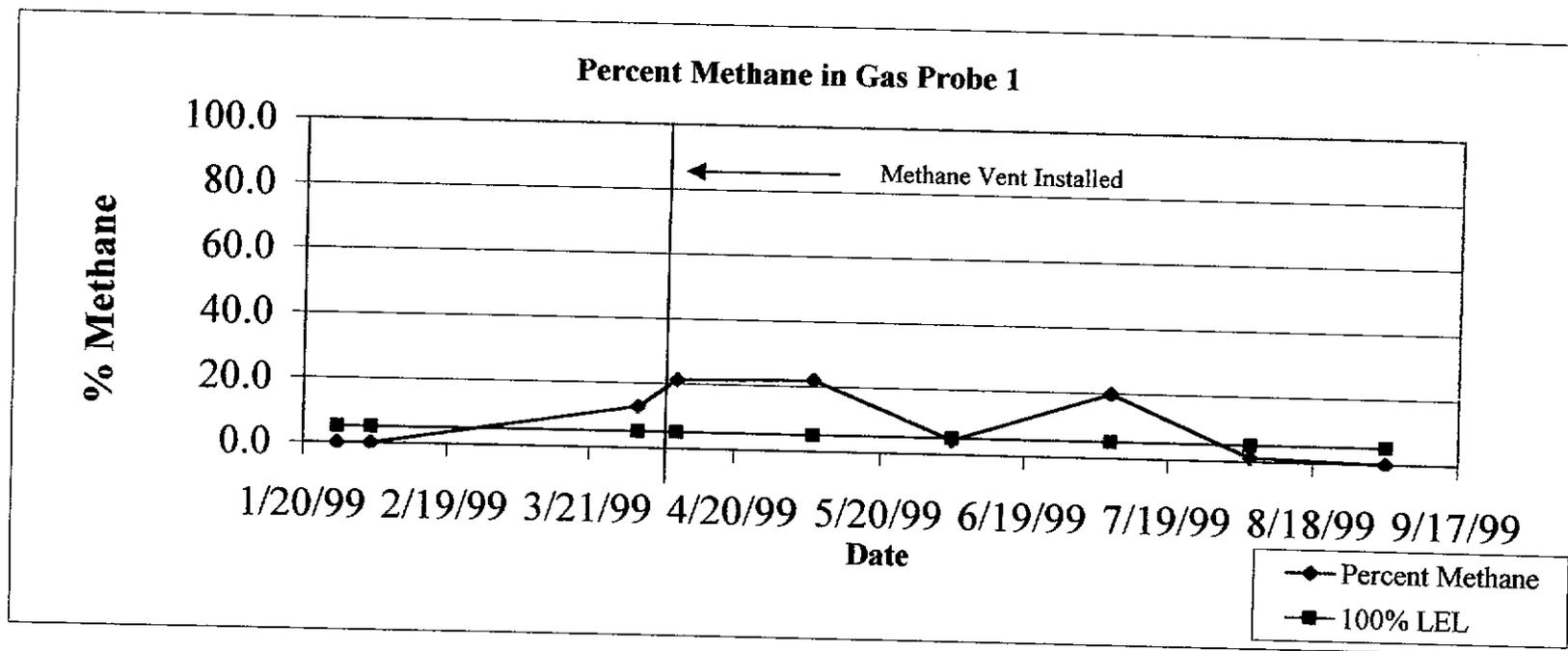
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
Gas Probe 1	1/27/99	14:20	0		0.0	8.4	3.1	Not measured	
	2/3/99	14:51	0		0.0	5.8	10.6	Not measured	
	3/25/99								
	3/31/99	11:44	246		12.8	15.5	0.0	0.00	Did not check
	4/8/99	9:45	428		21.2	17.3	0.0	0.01	Readings recorded @ 180 seconds, locked 3/31/99
	5/6/99	9:30	440		22.0	18.0	0.0	0.00	Readings recorded at 180 seconds
	6/4/99	8:45	90		4.5	17.5	0.0	0.00	Readings recorded at 180 seconds
	7/7/99	9:30	396		19.8	25.1	0.3	0.00	Readings recorded at 180 seconds
	8/5/99	8:45	26		1.3	21.5	0.4	0.00	Readings recorded at 2 purge volumes
	9/2/99	12:15	0		0.0	9.2	11.9	0.00	Readings recorded at 2 purge volumes

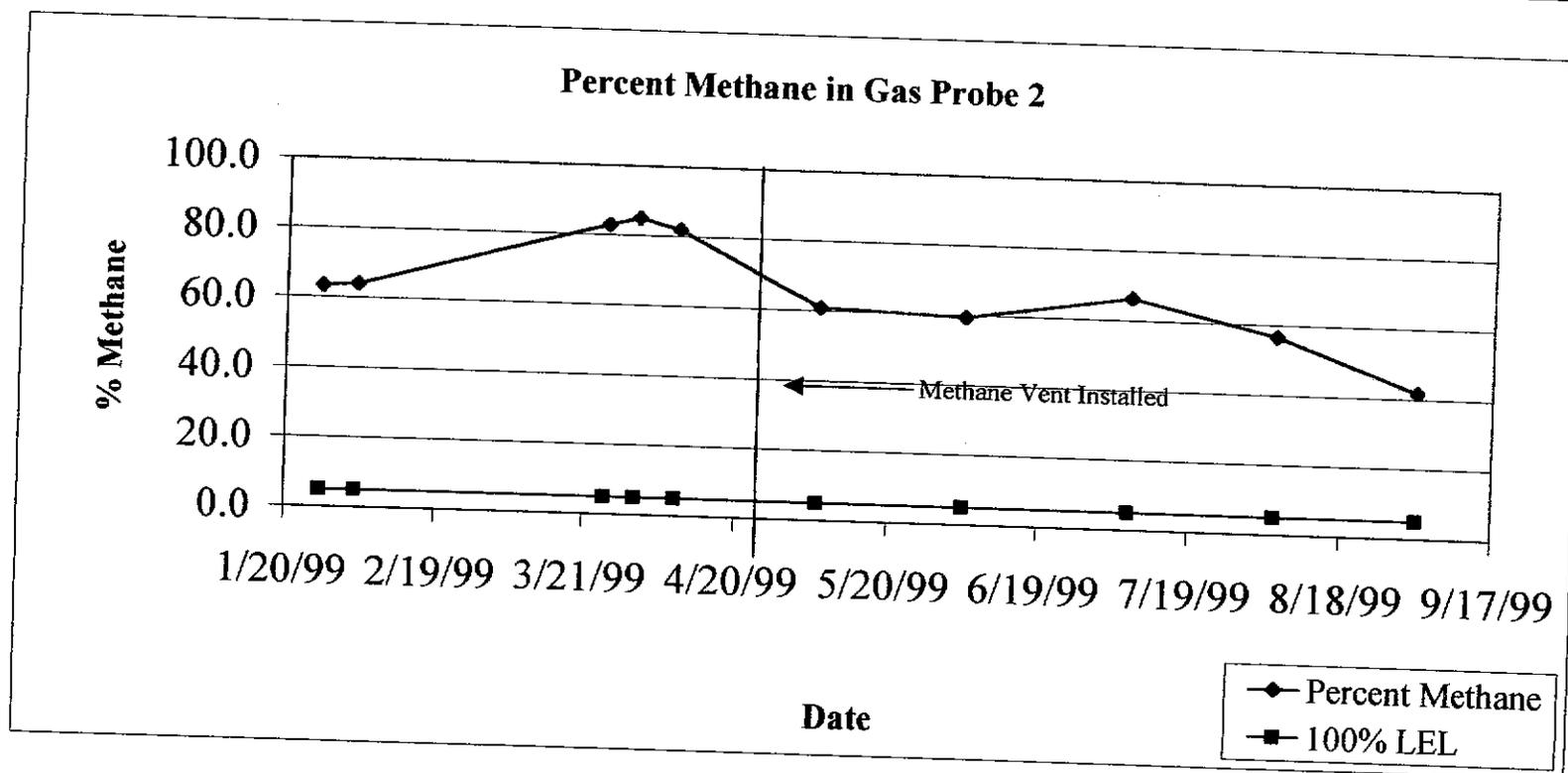
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 2	1/27/99	14:50	>1000		63.5				
	2/3/99	15:00	>1000		64.0	39.8	0.0	Not measured	
	3/25/99	11:42	>1000 @ 20 seconds		83.0	40.6	0.0	Not measured	
	3/31/99	12:05	>1000 @ 18 seconds		85.0	53.5	0.0	0.00	Peak at 40 seconds - then stable
	4/8/99	10:10	>1000 @ 25 seconds		82.0	55.6	0.0	0.00	Checked for vacuum, readings recorded at 180 seconds, locked on 3/31/99
	5/6/99	10:00	>1000 @ 40 seconds		61.0	58.0	0.0	0.00	Readings recorded at 180 seconds
	6/4/99	9:05	>1000 @ 23 seconds		59.4	44.7	0.0	0.00	Readings recorded at 180 seconds
	7/7/99	10:00	>1000 @ 70 seconds		66.3	42.3	0.0	0.00	Readings recorded at 180 seconds
	8/5/99	9:15	>1000 @ 42 seconds		56.7	33.6	0.2	0.00	Readings recorded at 180 seconds
	9/2/99	12:40	834		41.7	39.9	0.0	0.00	Readings recorded after 2 purge volumes
					35.5	0.3	0.00	Readings recorded after 2 purge volumes	

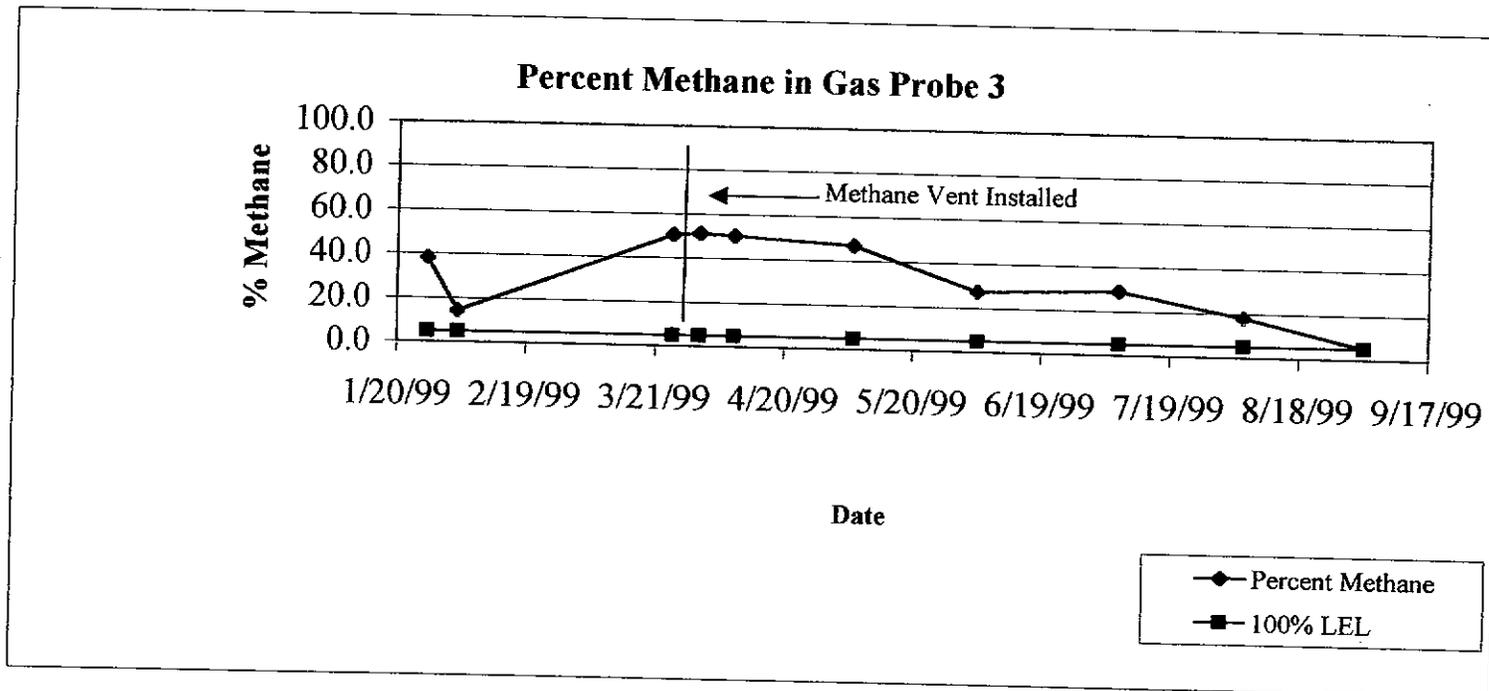
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 3	1/27/99	15:00	766		38.2	29.8	0.0	Not measured	
	2/3/99	15:07	282		14.2	9.5	13.8	Not measured	
	3/25/99	11:53	>1000 @ 60 seconds		50.7	41.0	1.1	-0.02	Vacuum - peak @ 70 seconds - then stable
	3/31/99	12:20	>1000 @ 48 seconds		Peaked @ 53.5 @ 110 seconds, 51.2 @ 180 seconds	37.6	1.9	0.00	Readings recorded at 180 seconds, Locked on 3/31/99
	4/8/99	10:20	>1000 @ 40 seconds		50.4	40.8	2.0	0.10	Readings recorded at 180 seconds
	5/6/99	10:15	940		47.0	36.5	0.0	0.00	Readings recorded at 180 seconds
	6/4/99	9:15	550		27.5	28.6	2.6	0.00	Readings recorded at 180 seconds
	7/7/99	10:10	580		29.0	32.4	2.0	0.00	Readings recorded at 180 seconds
	8/5/99	9:30	362		18.1	26.1	2.5	0.00	Readings recorded after 2 purge volumes
	9/2/99	12:50	104		5.2	18.7	4.4	0.00	Readings recorded after 2 purge volumes

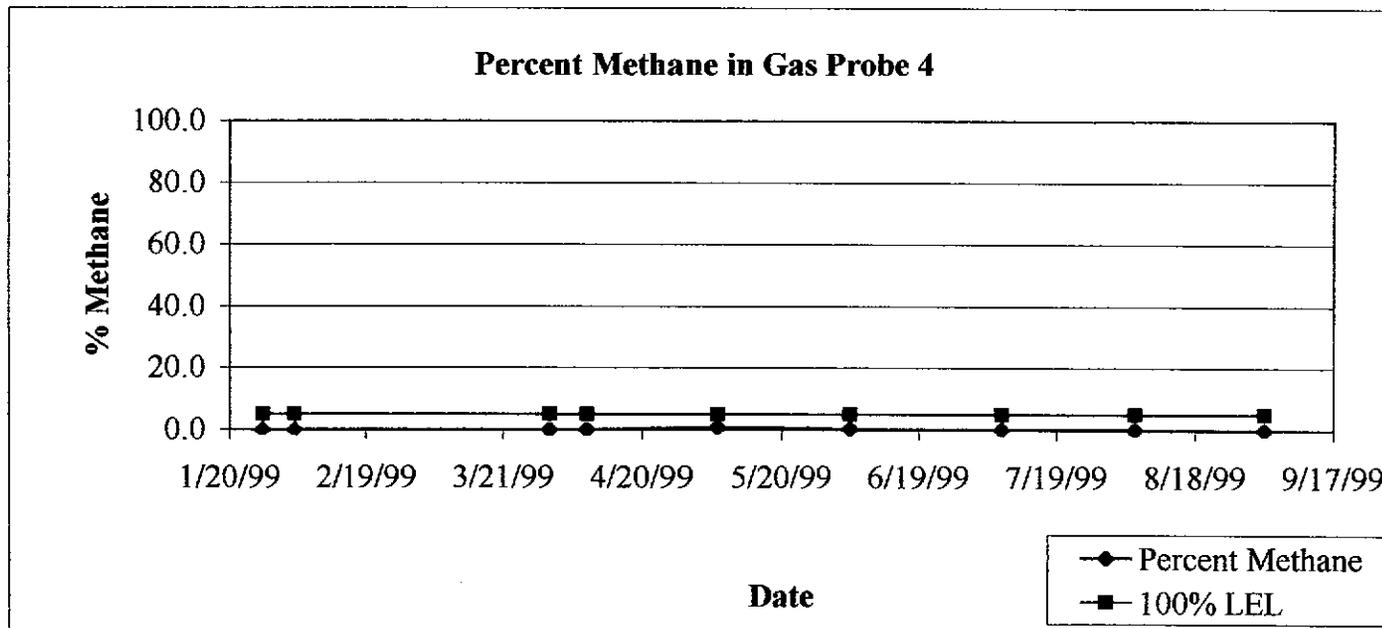
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
Gas Probe 4	1/27/99	15:10	0		0.0	0.5	20.0	Not measured	
	2/3/99	15:15	0		0.0	0.6	19.8	Not measured	
	3/25/99								Did not check
	3/31/99	12:35	Did not record		1.8 @ 20 seconds 0.0 @ 160 seconds	0.6	20.6	0.00	Reading recorded at 160 seconds
	4/8/99	10:30	Peaked @ 34 @ 20 seconds		0.0	0.9	19.7	0.00	Readings recorded at 180 seconds
	5/6/99	10:30	16.0		0.8	1.1	9.2	0.00	Readings recorded at 180 seconds
	6/4/99	9:25	Peaked @ 24 @ 20 seconds, 6 @ 180 seconds		0.3	1.1	19.4	0.00	Readings recorded at 180 seconds
	7/7/99	10:20	2		0.1	1.8	18.7	0.00	Readings recorded at 180 seconds
	8/5/99	9:45	2		0.1	1.3	19.7	0.00	Readings recorded after 2 purge volumes
	9/2/99	13:00	0		0.0	0.5	19.3	0.00	Readings recorded after 2 purge volumes

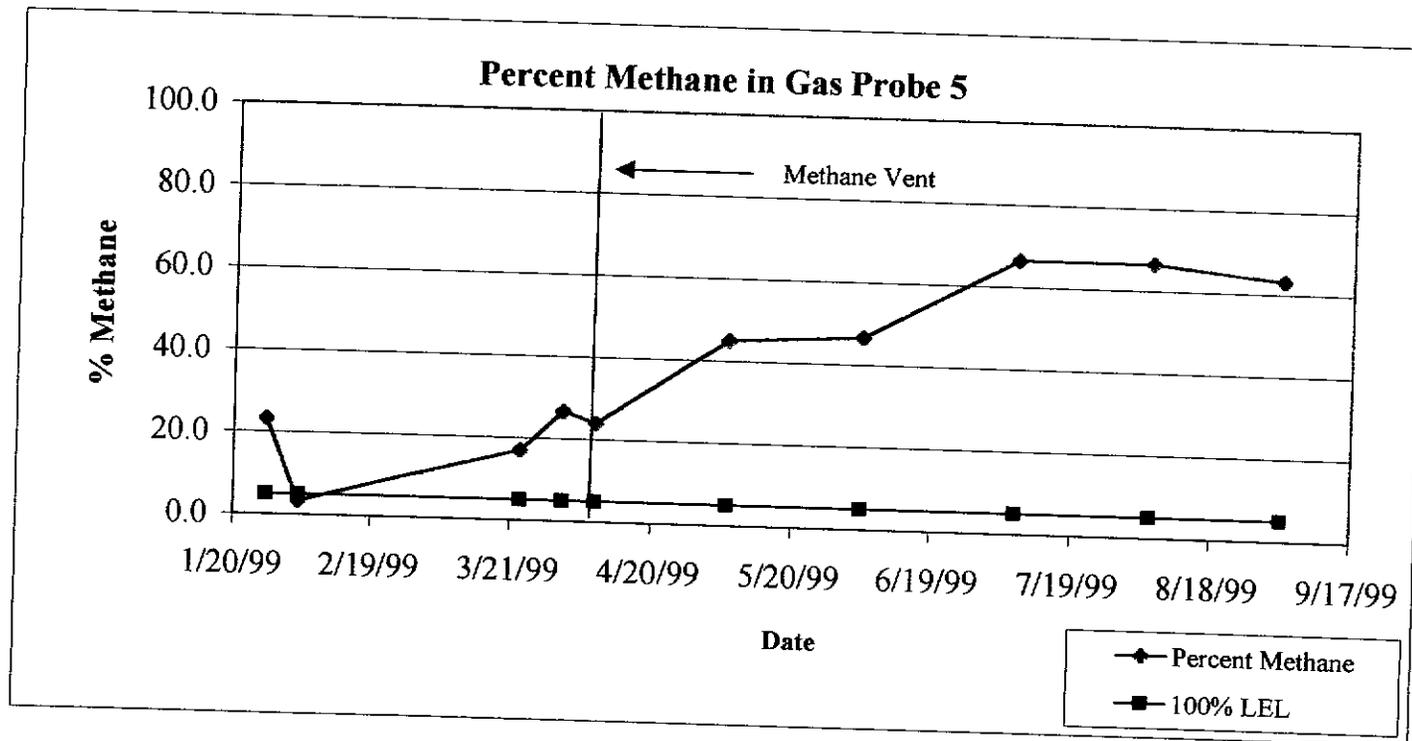
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 5	1/27/99	15:20	480		23.3				
	2/3/99	14:27	50		3.4	6.4	4.7	Not measured	
	3/23/99	16:00	386		19.1 / 17.0	0.7	19.0	Not measured	
	3/25/99	15:25				5.0	7.1	Did not check	50 seconds peak / steady
	3/31/99	15:15	Did not record					-0.24	Strong vacuum
	4/1/99	9:00	536		26.7	7.2	2.7	-0.90	Strong vacuum
	4/8/99	12:30	484		24.0	8.8	0.4	2.00	Readings recorded at 180 seconds
	5/6/99	12:35	900		45.0	11.2	0.0	-0.26	Vacuum - readings recorded at 180 seconds
	6/4/99	10:45	920		46.6	12.4	0.9	>5.000	Pressure, readings recorded at 180 seconds
	7/7/99	12:00	>1000 @ 60 seconds		66.6	15.5	0.3	2.50	Pressure, readings recorded at 180seconds
	8/5/99	12:00	>1000 @ 30 seconds		66.5	16.9	0.1	>5.0	Pressure, readings recorded at 180 seconds
9/2/99	15:15	>1000 @ 28 seconds		63.2	25.4	0.4	0.04	Readings recorded after 2 purge volumes	
							0.05	Readings recorded after 2 purge volumes	

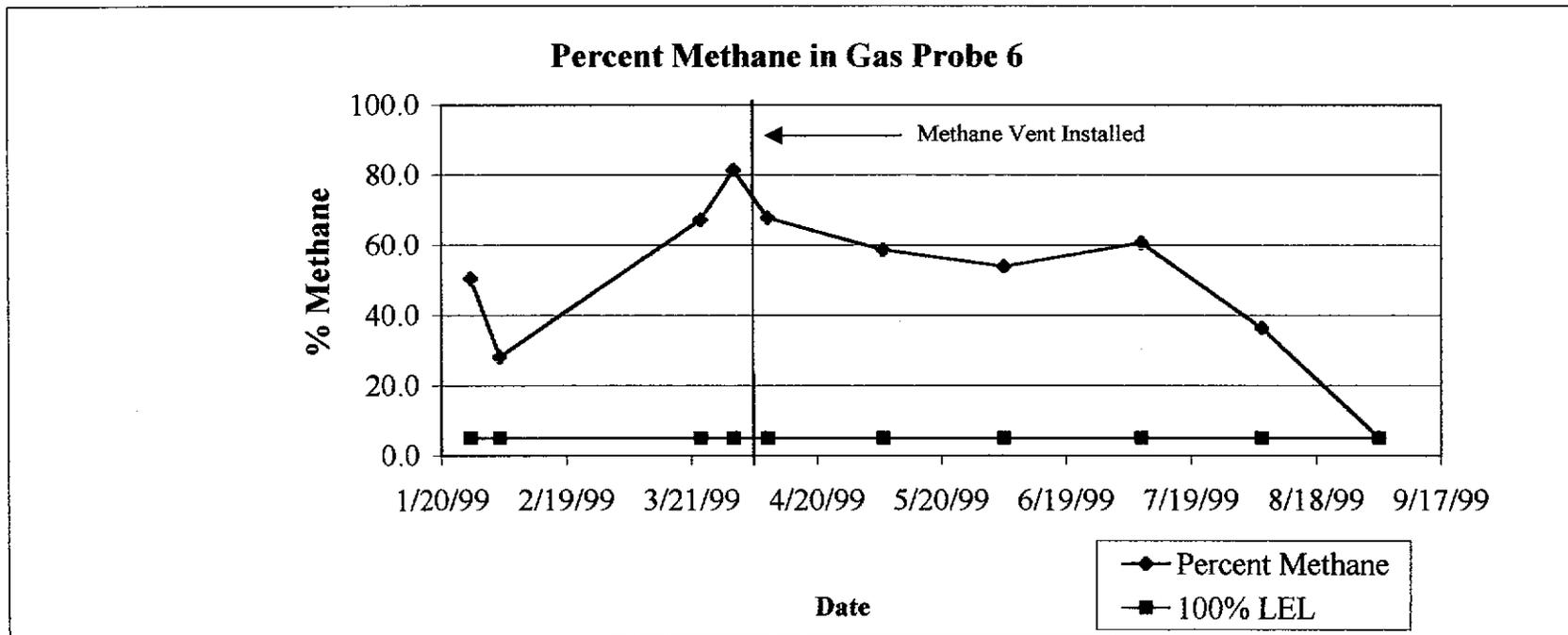
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
Gas Probe 6	1/27/99	16:00	>1000		50.5	25.2	1.9	Not measured	
	2/3/99	14:07	562		28.1	23.1	1.7	Not measured	
	3/23/99	16:17	>1000 @ 19 seconds		67.2	42.9	0.9	Not measured	Over 1000% LEL in 19 seconds - peak reading recorded at 60 seconds
	3/25/99	15:55						0.00	GP-6 checked twice - no pressure or vacuum
	3/31/99	16:10	>1000 @ 26 seconds		81.4	37.7	0.1	0.00	Readings recorded at 180 seconds
	4/8/99	12:50	>1000 @ 20 seconds		67.8	44.0	0.1	0.00	Readings recorded at 180 seconds
	5/6/99	12:50	>1000 @ 36 seconds		58.6	34.4	0.0	0.00	Readings recorded at 180 seconds
	6/4/99	11:05	>1000 @ 37 seconds		54.0	33.1	0.0	0.00	Readings recorded at 180 seconds
	7/7/99	12:20	>1000 @ 60 seconds		60.8	38.8	0.2	0.00	Readings recorded at 180 seconds
	8/5/99	13:00	728		36.4	30.7	0.2	0.00	Readings recorded after 2 purge volumes
	9/2/99	15:30	104		5.2	17.6	3.3	0.00	Readings recorded after 2 purge volumes

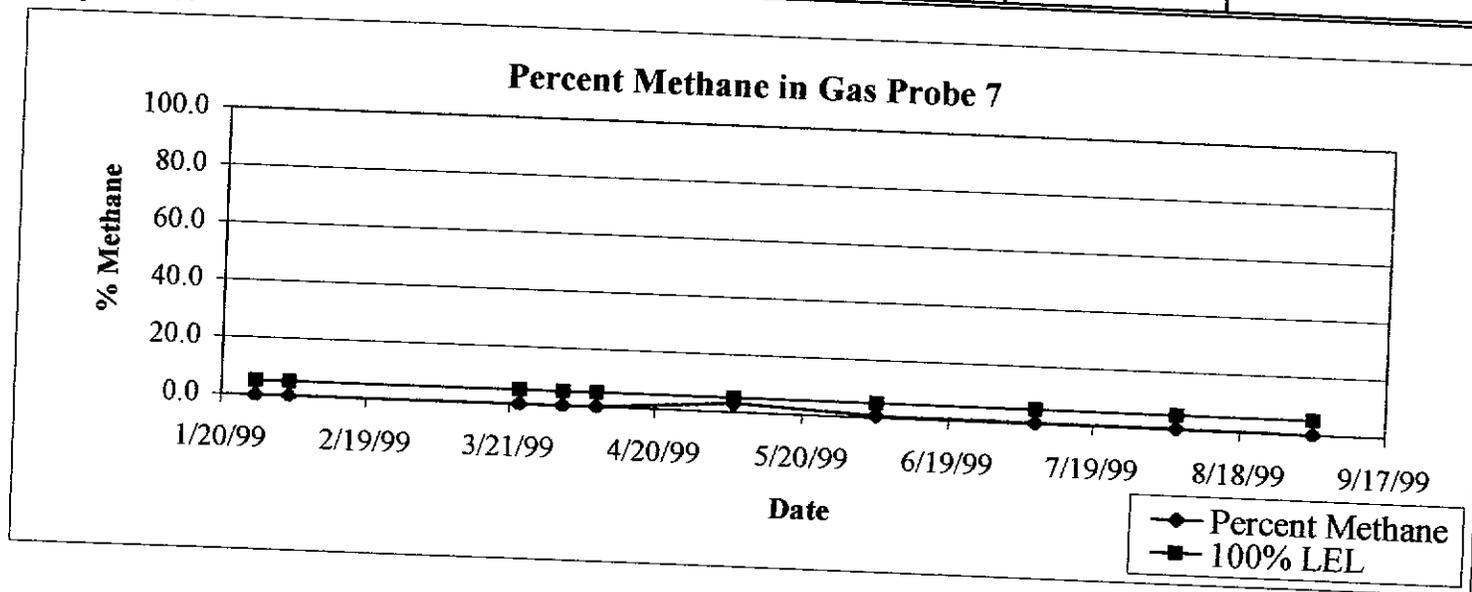
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL %	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 7	1/27/99	16:05	0					
	2/3/99	14:00	0	0.0	0.9	19.8	Not measured	
	3/23/99	16:08	Did not record	0.0	1.0	18.6	Not measured	
	3/25/99			0.0	2.2	18.5	Not measured	Steady at 60 seconds
	4/1/99	9:45	Did not record	0.0	Peaked @ 0.20 @ 60 seconds	20.5	0.00	No pressure or vacuum
							0.00	Readings recorded at 120 seconds
	4/8/99	13:40	Peaked @ 6 @ 20 seconds	0.0	3.8	16.2	0.00	Readings recorded at 180 seconds
	5/6/99	13:40	Peaked @ 60 @ 20 seconds	3.0	0.0	19.5	0.06	Readings recorded at 180 seconds
	6/4/99	11:45	14	0.7	5.8	13.0	0.00	Readings recorded at 180 seconds
	7/7/99	13:10	6	0.3	7.6	13.2	0.00	Readings recorded at 180 seconds
	8/5/99	13:10	6	0.3	9.9	11.5	0.00	Readings recorded after 2 purge volumes
	9/2/99	16:30	Peaked @ 18 @ 25 secs, 0 @ 204 seconds	0.0	6.7	13.6	0.00	Readings recorded after 2 purge volumes

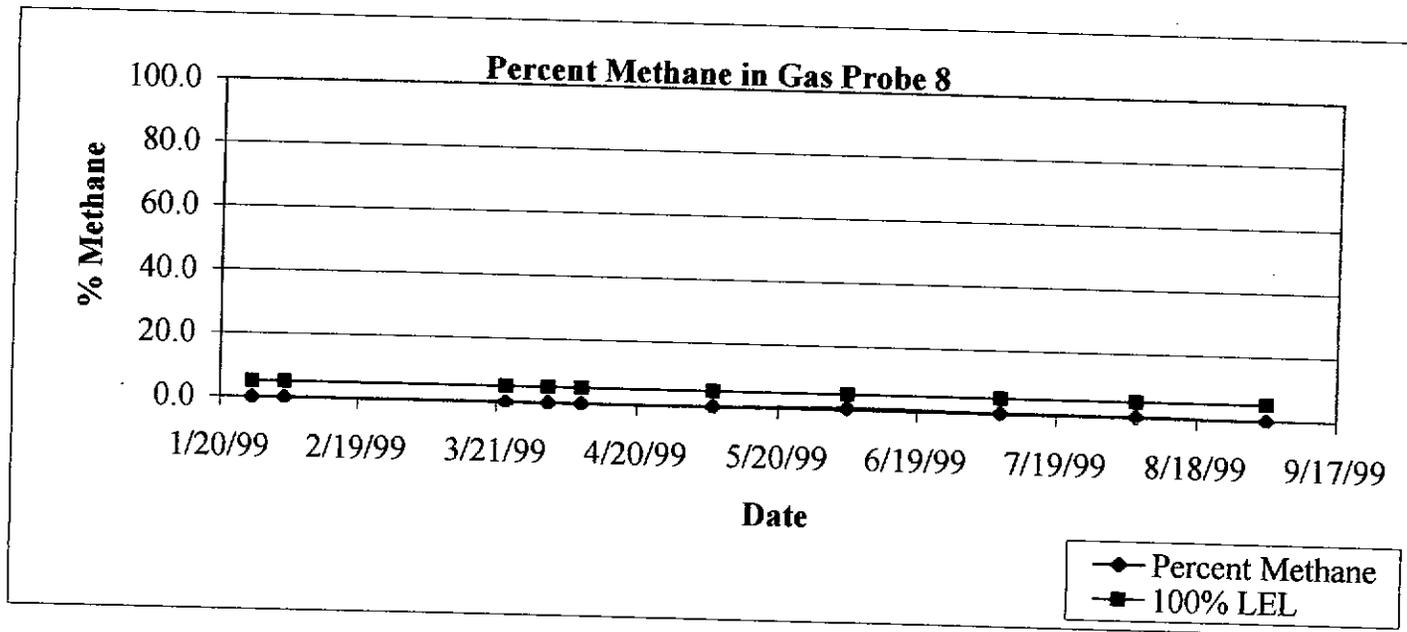
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 8	1/27/99	16:15	0		0.0	1.4	19.3	Not measured	
	2/3/99	13:37	0		0.0	2.4	15.6	Not measured	
	3/23/99	16:22	26/0		1.3/0.0	0.4	20.6	Not measured	Peak reading at 20 seconds - drops back to 0 methane by 45 seconds
	3/25/99								
	4/1/99	10:10	Did not record		2.2@20seconds	2.0	11.3	0.00	Did not check
	4/8/99	14:00	Peaked @ 18 @ 11 seconds		0.0	0.0	20.6	0.00	Readings recorded at 180 seconds
	5/6/99	14:00	2		0.1	3.2	9.2	0.00	Readings recorded at 180 seconds
	6/4/99	12:05	Peaked @ 108 @ 20 seconds, 12 @ 180 seconds		0.6	0.3	19.7	0.00	Readings recorded at 180 seconds
	7/7/99	13:20	6		0.3	1.8	15.4	0.00	Readings recorded at 180 seconds
	8/5/99	13:30	6		0.3	0.0	20.9	0.00	Readings recorded after 2 purge volumes
	9/2/99	17:00	0		0.0	6.7	13.6	0.00	Readings recorded after 2 purge volumes

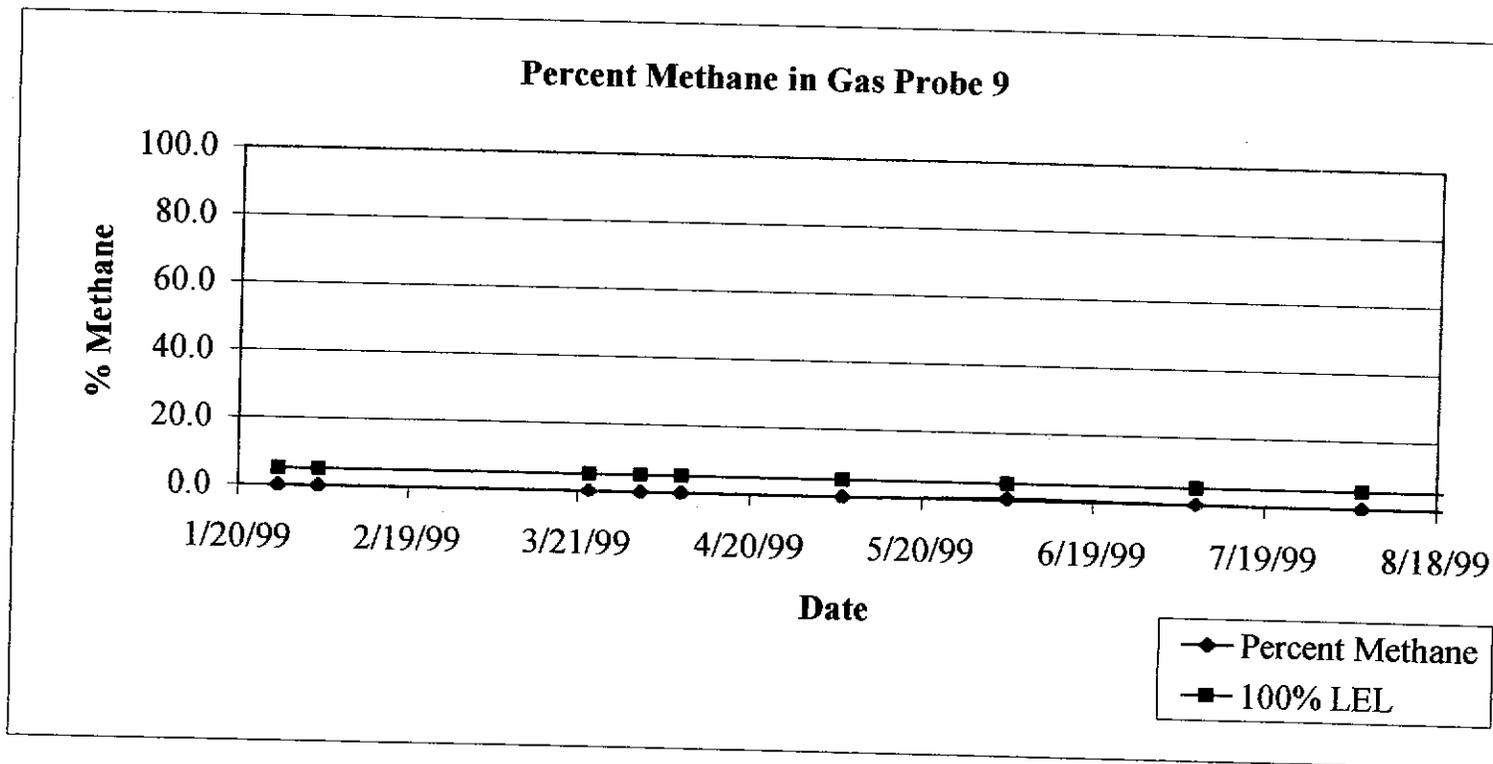
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 9	1/27/99	16:25	0		0.0	0.0	20.4	Not measured	
	2/3/99	13:33	0		0.0	0.1	20.3	Not measured	
	3/23/99	16:30	Did not record		0.0	0.0	20.8	Not measured	60 seconds - steady
	3/25/99								Did not check
	4/1/99	10:20	Did not record		0.0	0.2	20.5	0.00	Stable at 120 seconds
	4/8/99	14:10	Did not record		Peaked @ 0.2 @ 10 seconds	0.2	20.2	0.00	Readings recorded at 180 seconds
	5/6/99	14:10	Did not record		0.0	0.7	18.5	0.00	Readings recorded at 180 seconds
	6/4/99	12:15	12		0.6	0.3	18.4	0.00	Readings recorded at 180 seconds
	7/7/99	13:30	4		0.2	0.5	18.9	0.00	Readings recorded at 180 seconds
	8/5/99	13:40	0		0.0	0.7	19.1	0.00	Readings recorded after 2 purge volumes
	9/2/99	17:10	0		0.0	0.1	18.3	0.00	Readings recorded after 2 purge volumes

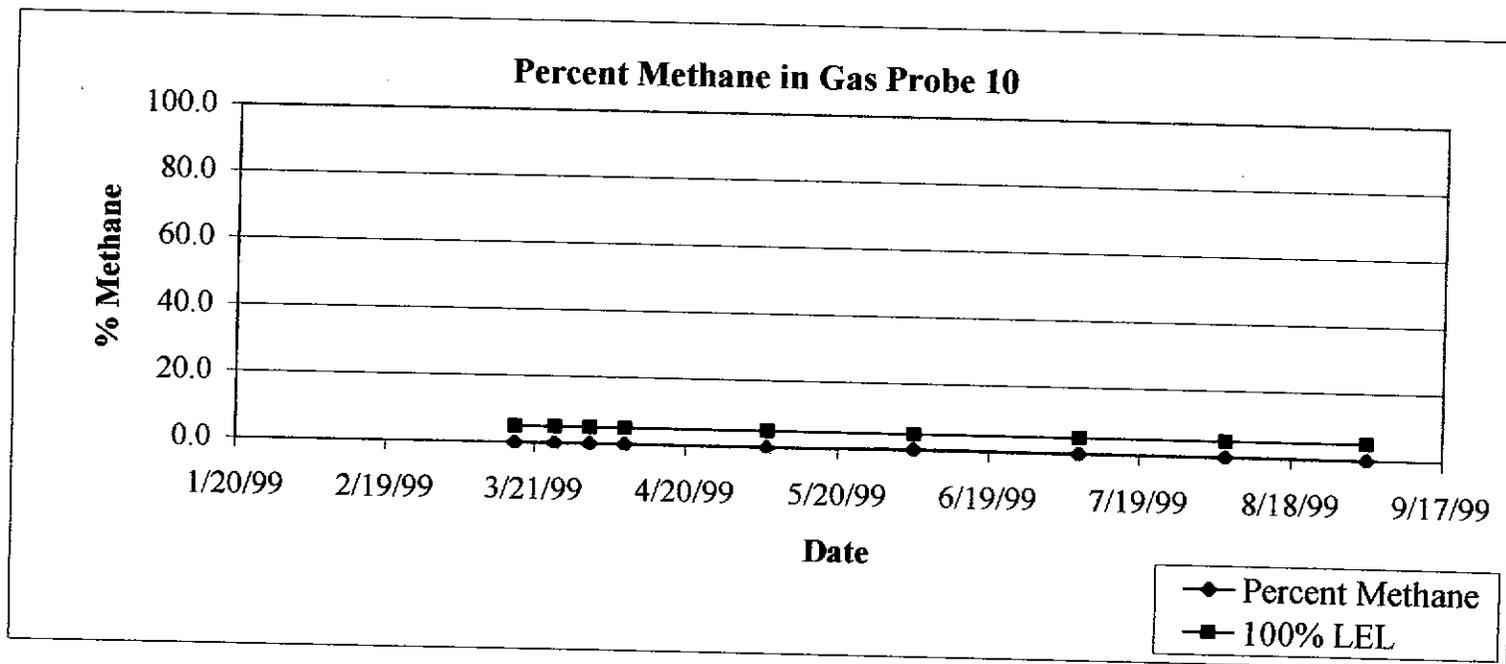
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
Gas Probe 10	3/17/99	15:00	Did not record	0.0	0.0	19.8	Did not check	Reading collected during installation
	3/25/99	14:40	Did not record	0.01 @ 20 seconds	1.4	20.3	Did not record	No pressure - peak @ 20 seconds - Did not record LEL
	4/1/99	11:35	Did not record	0.0	0.0	20.3	0.00	Stable at 120 seconds
	4/8/99	11:40	Did not record	0.0	Peaked @ 0.20 @ 20 seconds	20.0	0.00	Stable at 120 seconds
	5/6/99	11:30	Did not record	Peaked @ 0.1 @ 20 seconds	0.0	19.9	0.00	Readings recorded at 180 seconds
	6/4/99	10:10	6	0.3	0.0	20.1	0.00	Readings recorded at 180 seconds
	7/7/99	11:10	2	0.1	0.0	20.5	0.00	Readings recorded at 180 seconds
	8/5/99	10:50	2	0.1	0.0	20.7	0.00	Readings recorded after 2 purge volumes
	9/2/99	14:15	0	0.0	0.0	20.0	0.00	Readings recorded after 2 purge volumes

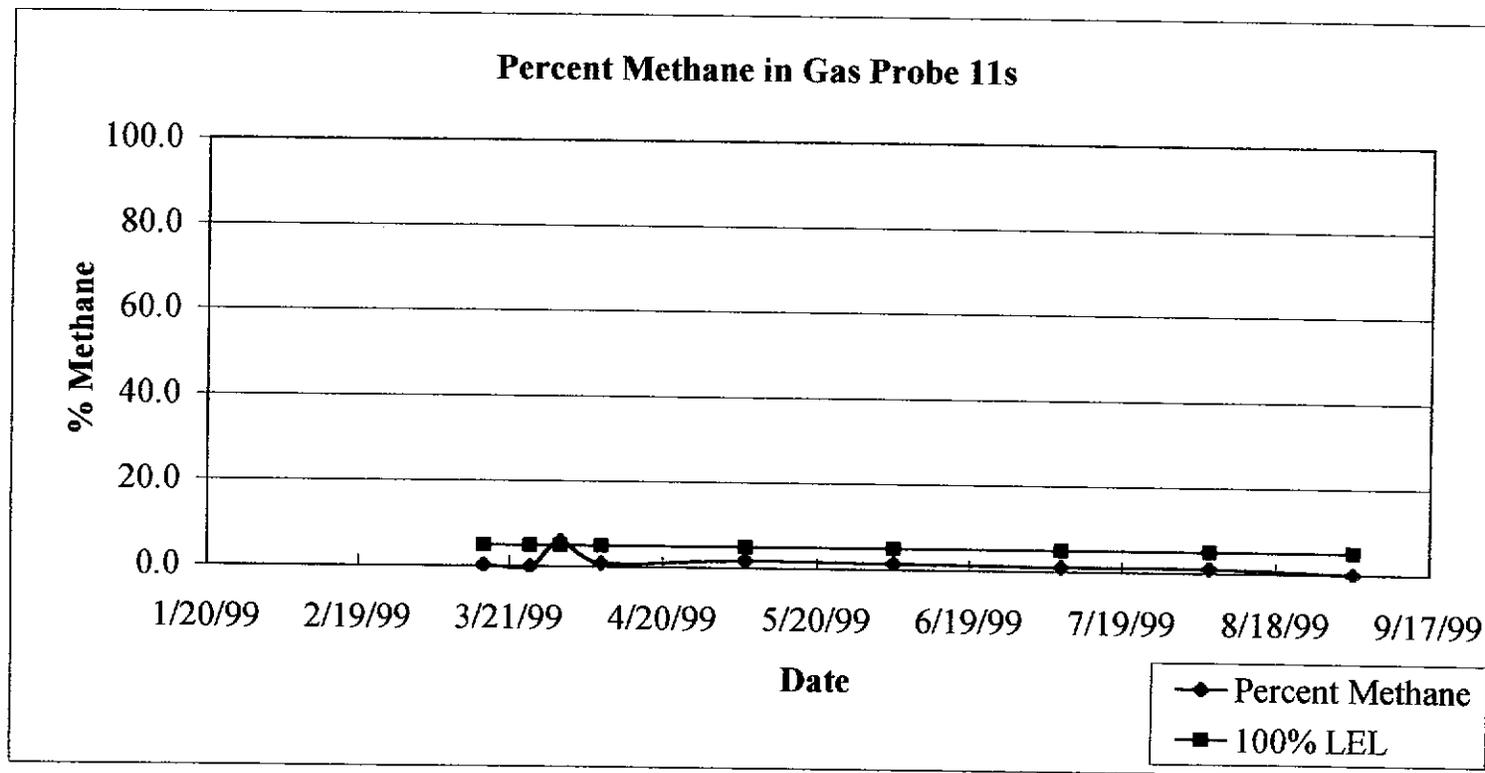
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL %	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 11s	3/16/99	15:05	6	0.3	0.3	20.2	---	Reading collected during installation of the deep probe GP-11d
	3/25/99	11:26	Did not record	0.0	0.0	20.6	0.010+/-	Readings recorded at 180 seconds
	3/31/99	13:45	12	6.0	8.0	19.5	0.00	Readings recorded at 180 seconds
	4/8/99	11:00	16	0.8	0.6	19.4	0.00	Readings recorded at 180 seconds
	5/6/99	11:00	36	1.8	0.8	18.9	0.00	Readings recorded at 180 seconds
	6/4/99	9:55	30	1.5	1.3	18.2	0.00	Readings recorded at 180 seconds
	7/7/99	10:45	22	1.1	1.9	17.8	0.00	Readings recorded at 180 seconds
	8/5/99	10:15	22	1.1	2.9	17.7	0.00	Readings recorded after 2 purge volumes
	9/2/99	13:40	0	0.0	0.0	19.9	0.00	Readings recorded after 2 purge volumes

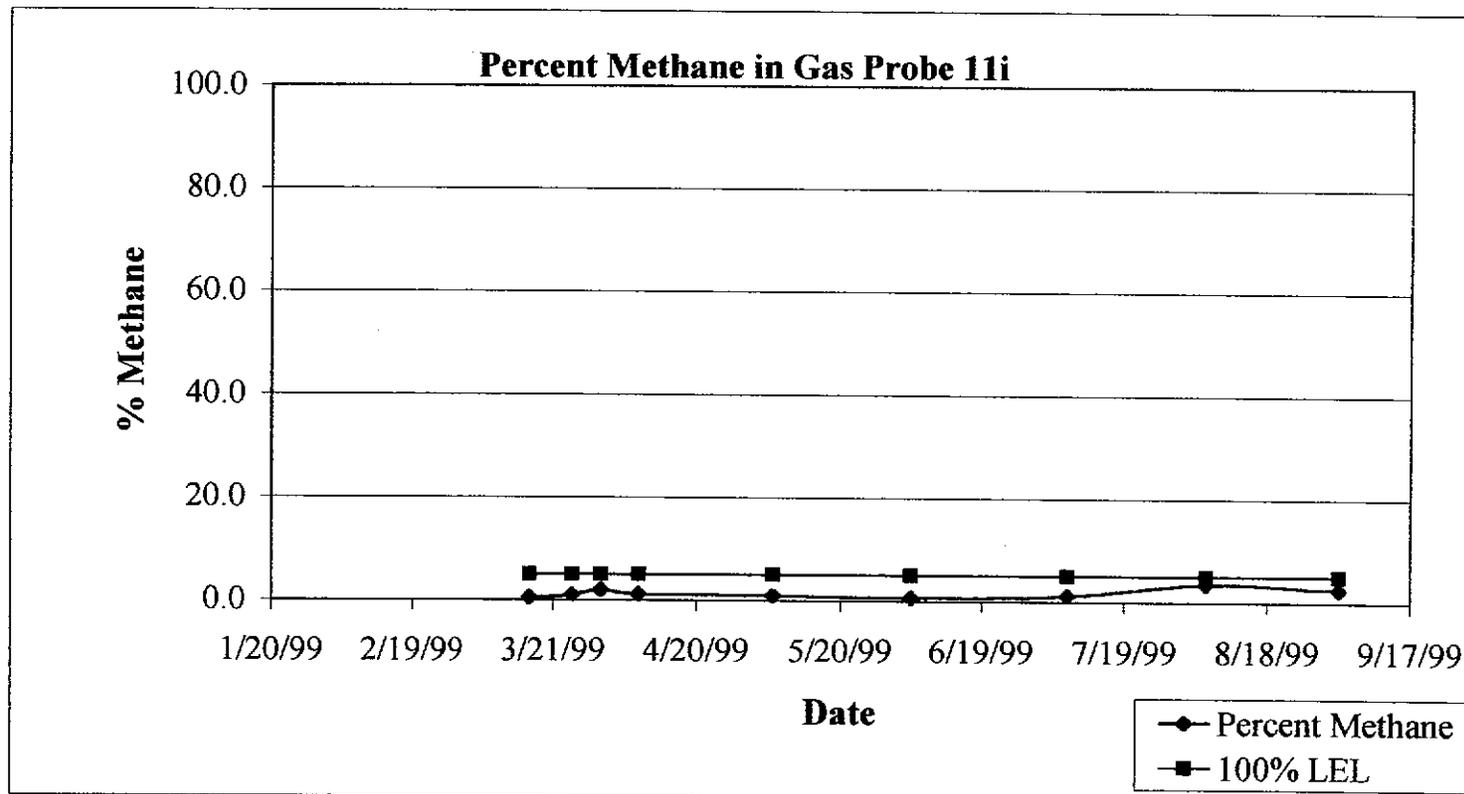
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
Gas Probe 11i	3/16/99	16:30	10		0.5	0.6	20.0	---	Readings collected during installation of the deep probe GP-11d
	3/25/99	11:15	20		1.0	0.5	19.8	0.00	LEL begins climbing at 60 seconds- 180 seconds climbing slowly
	3/31/99	13:50	42		2.0	1.0	19.1	0.17	Readings recorded at 180 seconds
	4/8/99	11:05	24		1.2	0.5	19.3	0.00	Readings recorded at 180 seconds
	5/6/99	11:10	20		1.0	0.0	18.9	0.00	Readings recorded at 180 seconds
	6/4/99	10:00	14		0.7	0.0	18.5	0.02	Readings recorded at 180 seconds
	7/7/99	10:50	24		1.2	0.0	17.8	-0.04	Vacuum - reading recorded at 180 seconds
	8/5/99	10:25	70		3.5	1.0	18.2	0.00	Readings recorded after 2 purge volumes
	9/2/99	13:50	50		2.5	0.5	17.6	0.15	Readings recorded after 2 purge volumes

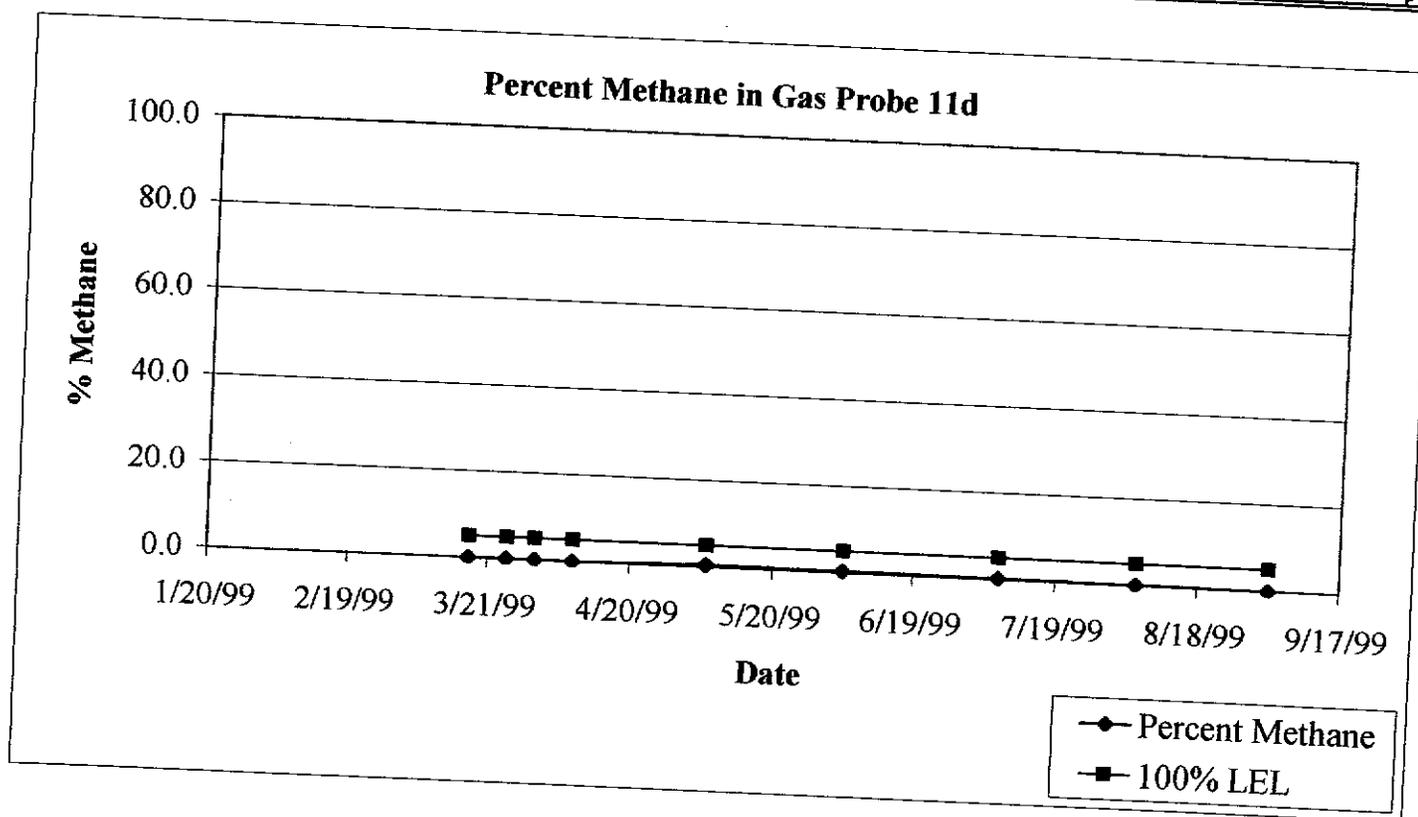
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 11d	3/17/99	8:30	0		0.0	0.2	20.9	---	Readings collected during installation of the deep probe GP-11d
	3/25/99	11:03	0		0.0	0.0	20.8	-0.02	Vacuum - reading recorded at 180 seconds
	3/31/99	13:55	Did not record		0.0	0.1	20.6	0.25	Readings recorded at 180 seconds
	4/8/99	11:15	Did not record		0.0	0.0	20.6	0.00	Readings recorded at 180 seconds
	5/6/99	11:20	10		0.5	0.0	20.2	0.13	Readings recorded at 180 seconds
	6/4/99	10:05	8		0.4	0.0	20.4	0.00	Readings recorded at 180 seconds
	7/7/99	10:55	4		0.2	0.0	20.9	-0.03	Vacuum - readings recorded at 180 seconds
	8/5/99	10:35	2		0.1	0.0	20.6	0.00	Readings recorded after 2 purge volumes
	9/2/99	14:00	0		0.0	0.0	19.8	0.10	Readings recorded after 2 purge volumes

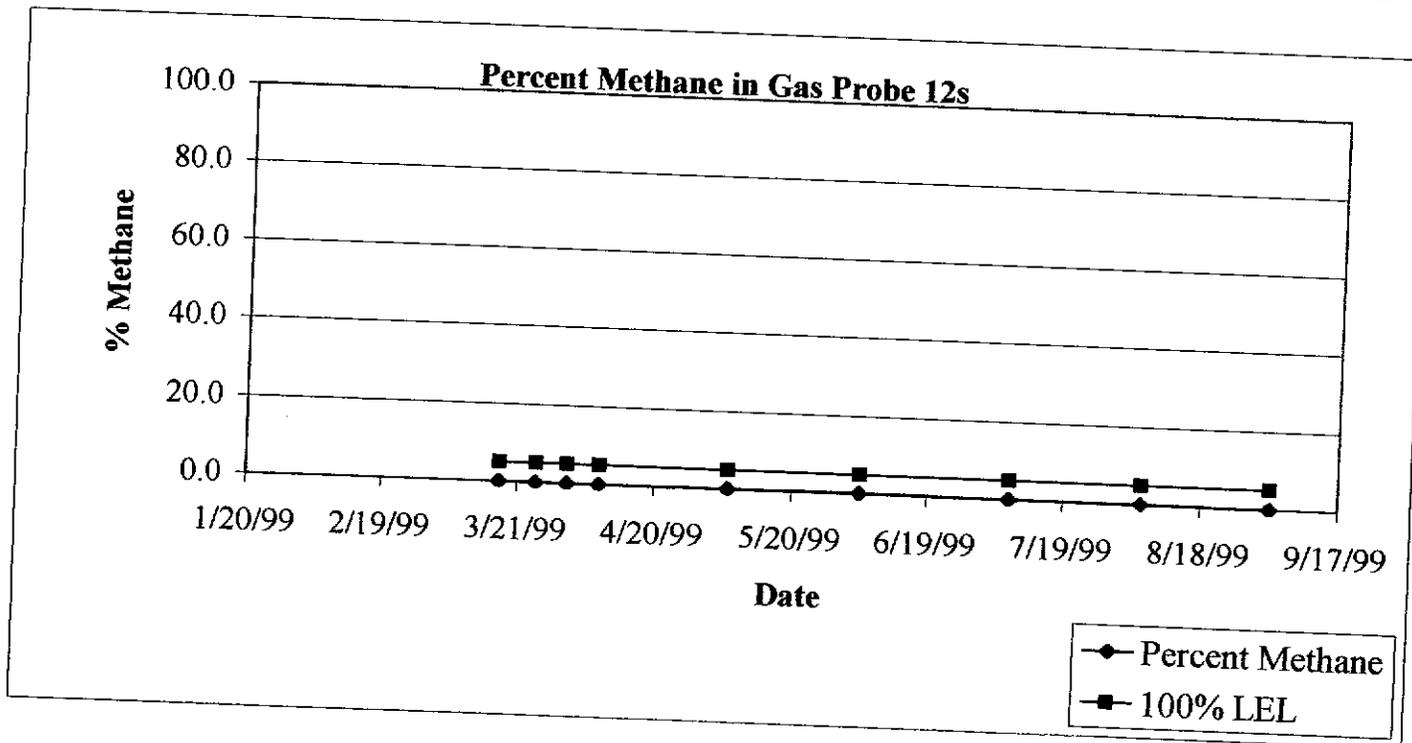
Not Measured = readings not taken



## JACKSON COUNTY LANDFILL SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES

Monitoring Point	Date	Time	LEL Meter LEL %	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 12s	3/17/99	9:45	0					
	3/25/99	14:55	0	0.0	0.0	20.0	Did not check	Installed on 3/16/99
				0.0	0.0	20.5	Did not check	Readings recorded at 120 seconds - very steady
	4/1/99	11:50	Did not record	0.0	0.10 @ 60 seconds	20.5	0.00	Readings recorded at 180 seconds
	4/8/99	10:40	Did not record	0.0	0.0	20.6	0.00	Stable at 120 seconds
	5/6/99	10:40	2	0.1	0.0	20.2	0.00	Readings recorded at 180 seconds
	6/4/99	9:35	4	0.2	0.0	20.5	0.00	Readings recorded at 180 seconds
	7/7/99	10:30	2	0.1	0.0	20.7	0.00	Readings recorded at 180 seconds
	8/5/99	9:55	2	0.1	0.0	20.6	0.00	Readings recorded after 2 purge volumes
	9/2/99	13:10	0	0.0	0.8	18.7	0.00	Readings recorded after 2 purge volumes

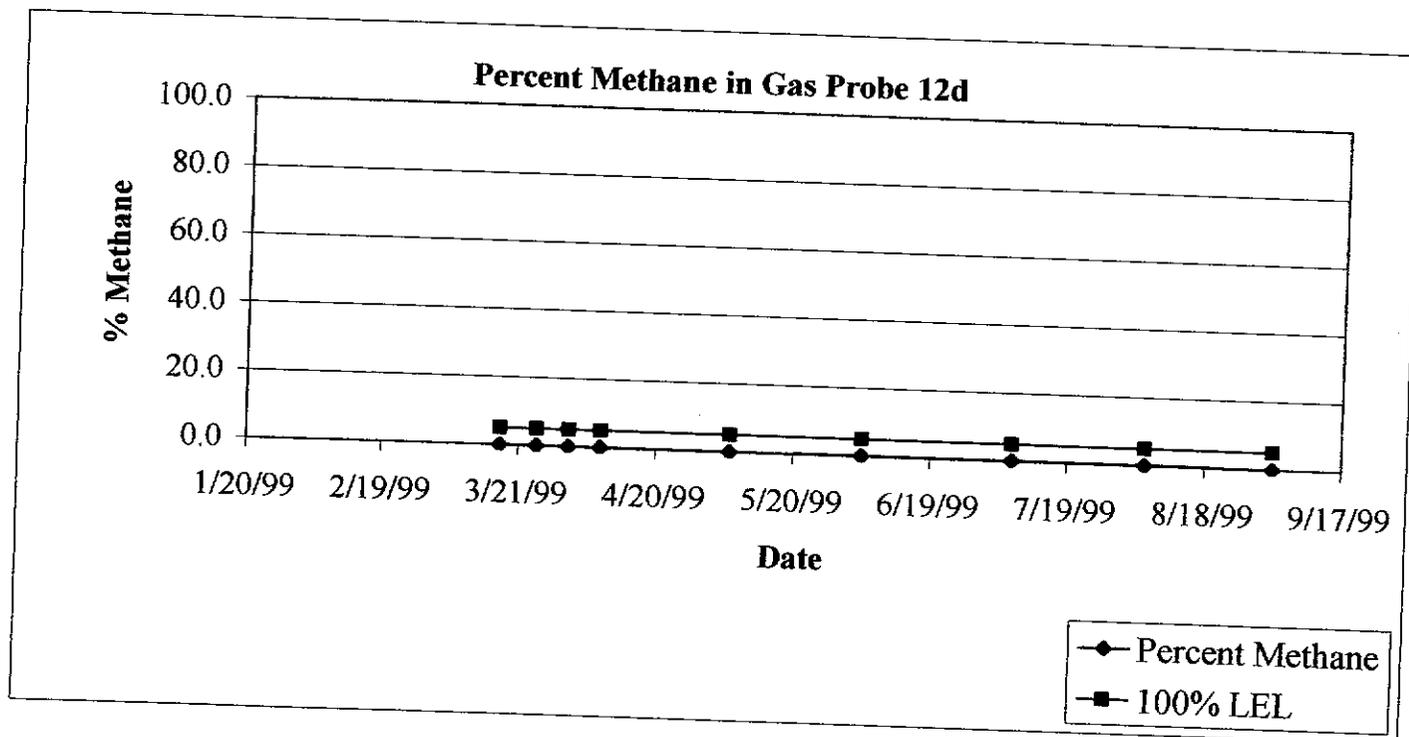
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter %	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 12d	3/17/99	9:50	0	0.0	0.4	19.7		
	3/25/99	14:50	0	0.0	0.06 @ 10seconds, 0.02	19.2	Did not check Did not check	Installed on 3/16/99 Readings recorded at 180 seconds
	4/1/99	11:55	Did not record	0.0	0.4	19.2	0.30	Readings recorded at 180 seconds
	4/8/99	10:55	Did not record	0.0	0.6	18.7	-0.30	Vacuum - readings stable at 120 seconds
	5/6/99	10:50	Did not record	0.0	0.1	19.3	0.00	Readings recorded at 180 seconds
	6/4/99	9:45	4	0.2	0.1	19.6	0.00	Readings recorded at 180 seconds
	7/7/99	10:35	2	0.1	0.0	20.3	0.00	Readings recorded at 180 seconds
	8/5/99	10:05	2	0.1	0.5	19.1	-0.01	Readings recorded after 2 purge volumes
	9/2/99	13:20	0	0.0	0.1	18.2	0.10	Readings recorded after 2 purge volumes

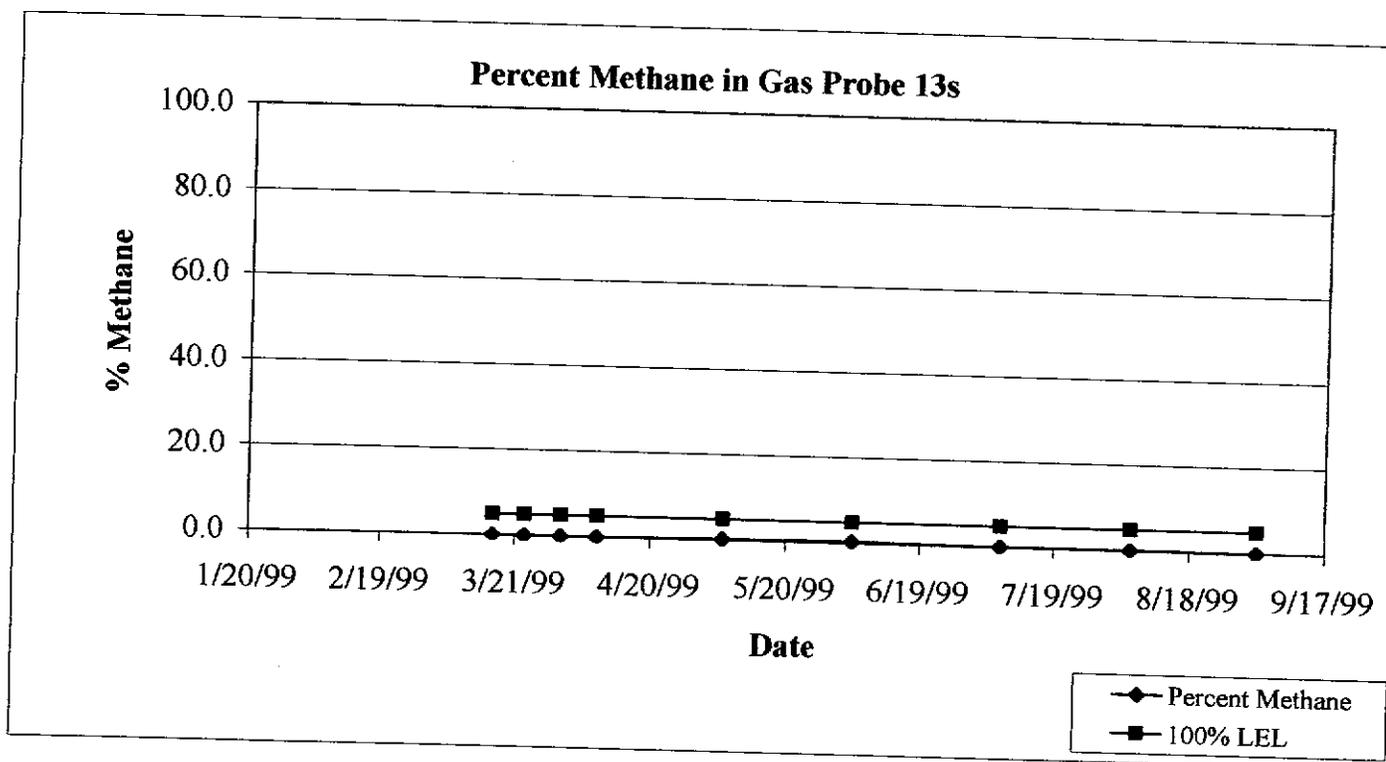
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 13s	3/16/99	8:00	0		0.0	0.2	20.6	Did not check	Installed on 3/15/99
	3/23/99	15:45	0		0.0	0.0	20.6	Not measured	120 seconds
	3/25/99	15:40						0.04	Pressure
	3/31/99	14:50	Did not record		0.0	0.5	20.0	0.01	Readings recorded at 180 seconds
	4/8/99	12:10	Did not record		Peaked @ 0.5 @ 5 seconds	0.3	20.1	0.06	Readings recorded at 180 seconds
	5/6/99	12:25	4		0.2	0.5	19.5	0.00	Readings recorded at 180 seconds
	6/4/99	10:25	8		0.4	0.6	19.3	0.04	Readings recorded at 180 seconds
	7/7/99	11:45	2		0.1	0.8	19.2	0.00	Readings recorded at 180 seconds
	8/5/99	11:30	2		0.1	1.5	18.8	0.02	Readings recorded after 2 purge volumes
	9/2/99	14:50	0		0.0	0.7	18.8	0.00	Readings recorded after 2 purge volumes

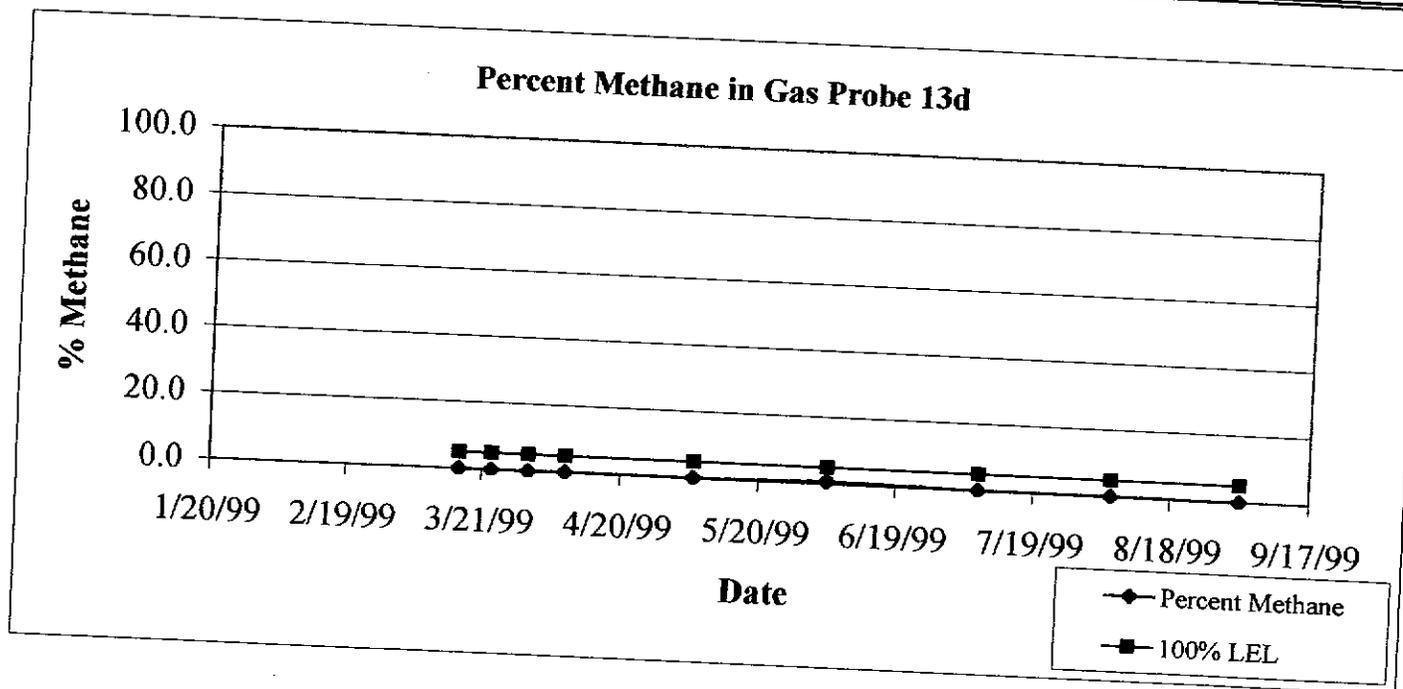
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 13d	3/16/99	8:05	0		0.0				
	3/23/99	15:48	0		0.0	0.0	20.9	Did not check	installed on 3/15/99
	3/25/99	15:50			0.0	0.1	20.4	Not measured	120 seconds
	3/31/99	14:45	Did not record		0.0			0.17	Pressure
	4/8/99	12:15	2		0.1	0.2	20.1	0.06	Readings recorded at 180 seconds, DTW reading taken 4/1/99 = 32.25' TOC
	5/6/99	12:20	2		0.1	0.2	19.9	0.25	Readings recorded at 180 seconds
	6/4/99	10:30	14		0.7	0.2	19.8	0.20	Readings recorded at 180 seconds
	7/7/99	11:50	4		0.2	0.2	20.4	0.06	Readings recorded at 180 seconds
	8/5/99	11:45	4		0.2	0.5	19.6	0.03	Readings recorded at 180 seconds
	9/2/99	15:00	0		0.0	0.1	18.6	0.05	Readings recorded after 2 purge volumes, DTW = 32.10 ft @ 15:00
								0.10	Readings recorded after 2 purge volumes, DTW = 32.90 ft

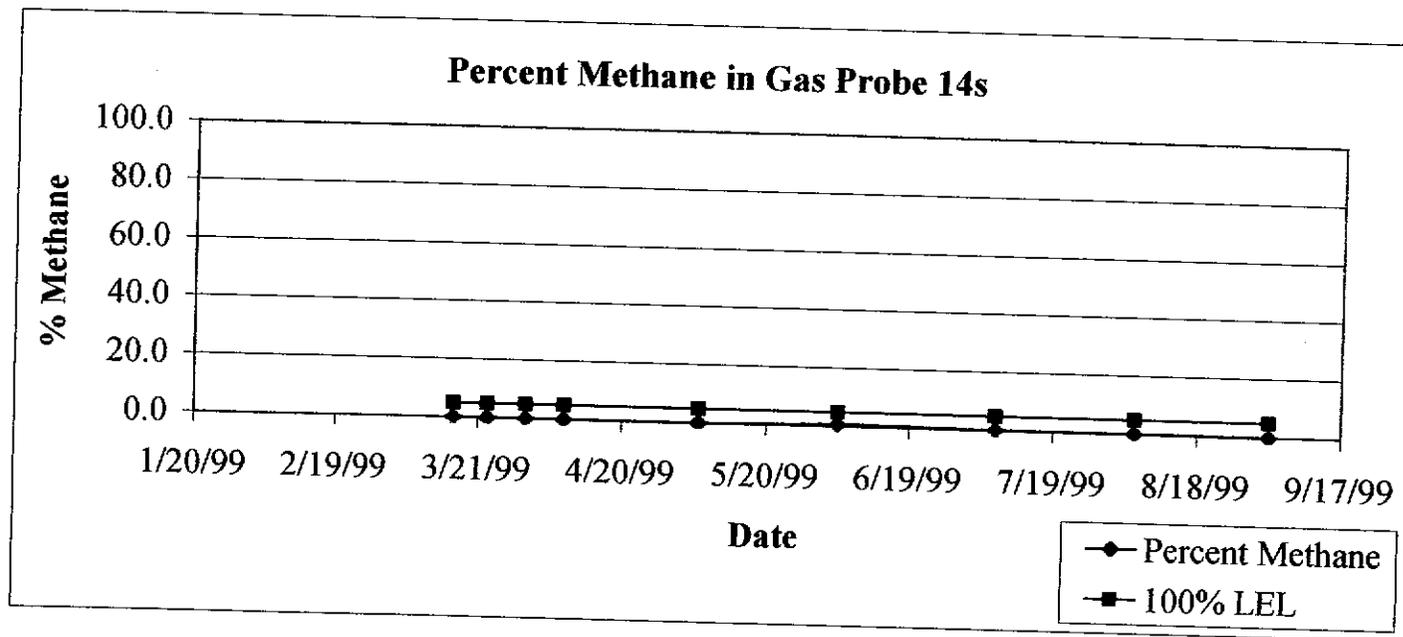
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 14s	3/16/99	8:20	0		0.0	1.8	19.1	Did not check	Installed on 3/15/99
	3/23/99	15:21	0		0.0	1.7	18.8	Not measured	120 seconds
	3/25/99	13:15						-0.01	Slight vacuum
	3/31/99	15:30	Did not record		0.0	2.4	17.3	0.00	Readings recorded at 180 seconds
	4/8/99	13:00	Peaked @ 26 @ 20 seconds		0.0	1.9	18.8	0.00	Readings recorded at 180 seconds
	5/6/99	13:00	Peaked @ 200 @ 25 seconds		Peaked @ 10.0 @ 25 seconds	1.6	17.9	0.00	Readings recorded at 180 seconds
	6/4/99	11:20	14		0.7	2.1	17.6	0.00	Readings recorded at 180 seconds
	7/7/99	12:30	Peaked @ 66 @ 40 seconds, 4 @ 180 seconds		0.2	2.9	17.5	0.00	Readings recorded at 180 seconds
	8/5/99	12:10	4		0.2	3.0	17.7	-0.01	Readings recorded after 2 purge volumes
	9/2/99	15:45	0		0.0	1.8	17.6	0.00	Readings recorded after 2 purge volumes

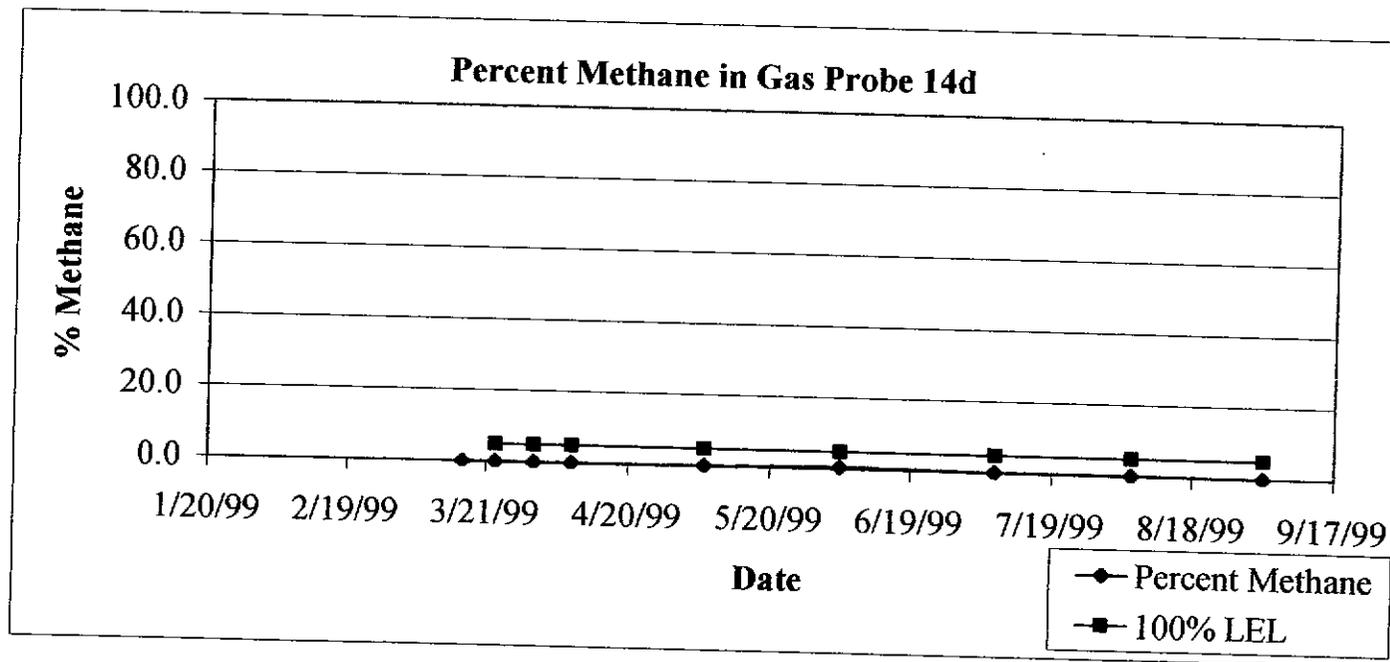
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 14d	3/16/99	8:15	0		0.0	4.0	16.3	Did not check	Installed on 3/15/99 - reading collected at 330 seconds
	3/23/99	14:05	0		0.0	3.8	15.5	Did not check	
	3/25/99	13:12							250 seconds
	3/31/99	15:35	Did not record		0.0	3.4	17.1	0.03	
	4/8/99	13:10	Did not record		0.0	3.0	17.2	0.00	Readings recorded at 180 seconds, DTW reading taken 4/1/99 = 21.80' TOC
	5/6/99	13:10	2		0.1	2.5	17.7	0.00	Readings recorded at 180 seconds
	6/4/99	11:25	12		0.6	2.4	17.4	0.00	Readings recorded at 180 seconds
	7/7/99	12:35	4		0.2	2.9	17.3	-0.01	Vacuum, readings recorded at 180 seconds
	8/5/99	12:20	2		0.1	4.4	15.6	0.00	Readings recorded at 180 seconds
	9/2/99	15:55	0		0.0	4.1	15.3	0.00	Readings recorded after 2 purge volumes, DTW = 21.40 ft @ 15:15
									Readings recorded after 2 purge volumes, DTW = 21.30 ft

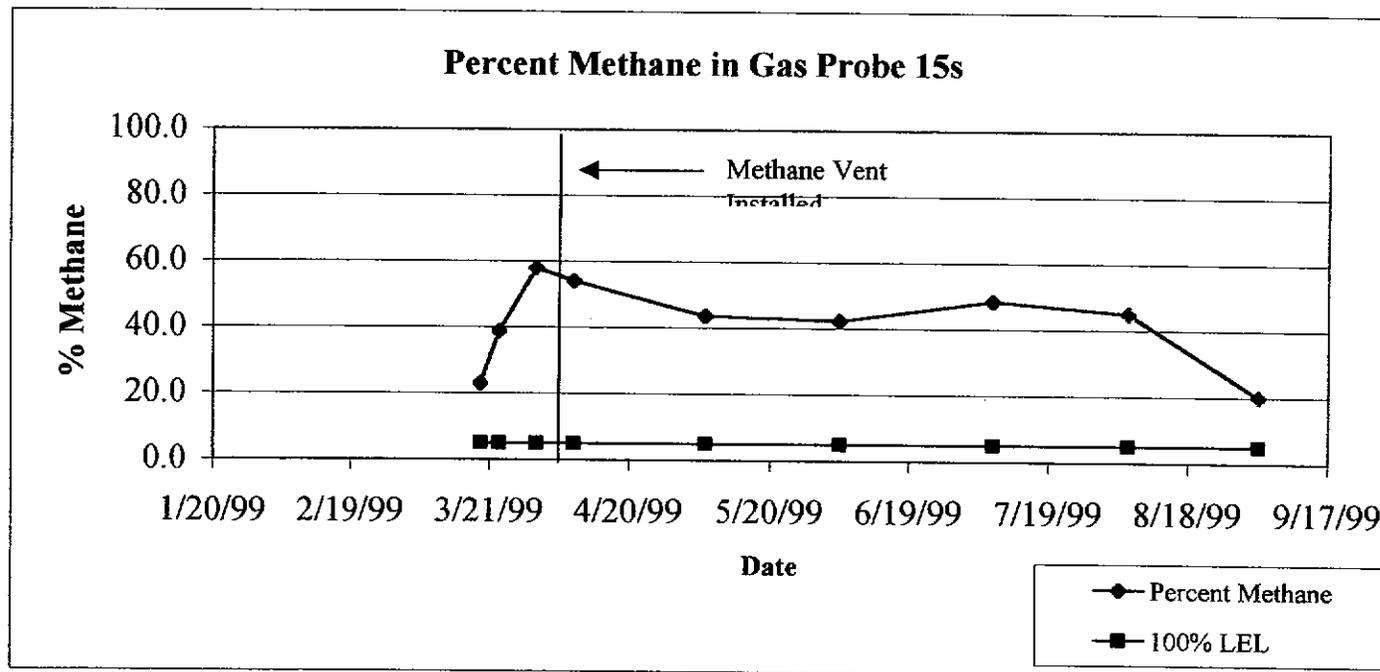
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 15s	3/19/99	9:40	470		23.0	11.9	10.6		Installed on 3/19/99 - checked one hour after installation
	3/23/99	15:30	784		38.7	24.8	2.8	Not measured	120 seconds - methane still increasing
	3/25/99	15:07						0.21	
	3/31/99	16:05	>1000 @ 20 seconds		57.9	28.6	0.0	0.22	Readings recorded at 180 seconds
	4/8/99	13:15	>1000 @ 62 seconds		54.0	31.2	0.2	0.18	Readings recorded at 180 seconds
	5/6/99	13:15	872		43.6	27.9	0.2	0.15	Readings recorded at 180 seconds
	6/4/99	11:10	848		42.4	30.5	0.3	0.10	Readings recorded at 180 seconds
	7/7/99	12:40	968		48.4	37.1	0.3	0.10	Pressure, readings recorded at 4.5 minutes
	8/5/99	12:30	900		45.0	35.0	0.2	0.08	Readings recorded after 2 purge volumes, pressure
	9/2/99	16:05	400		20.0	23.9	4.4	0.10	Readings recorded after 2 purge volumes, pressure

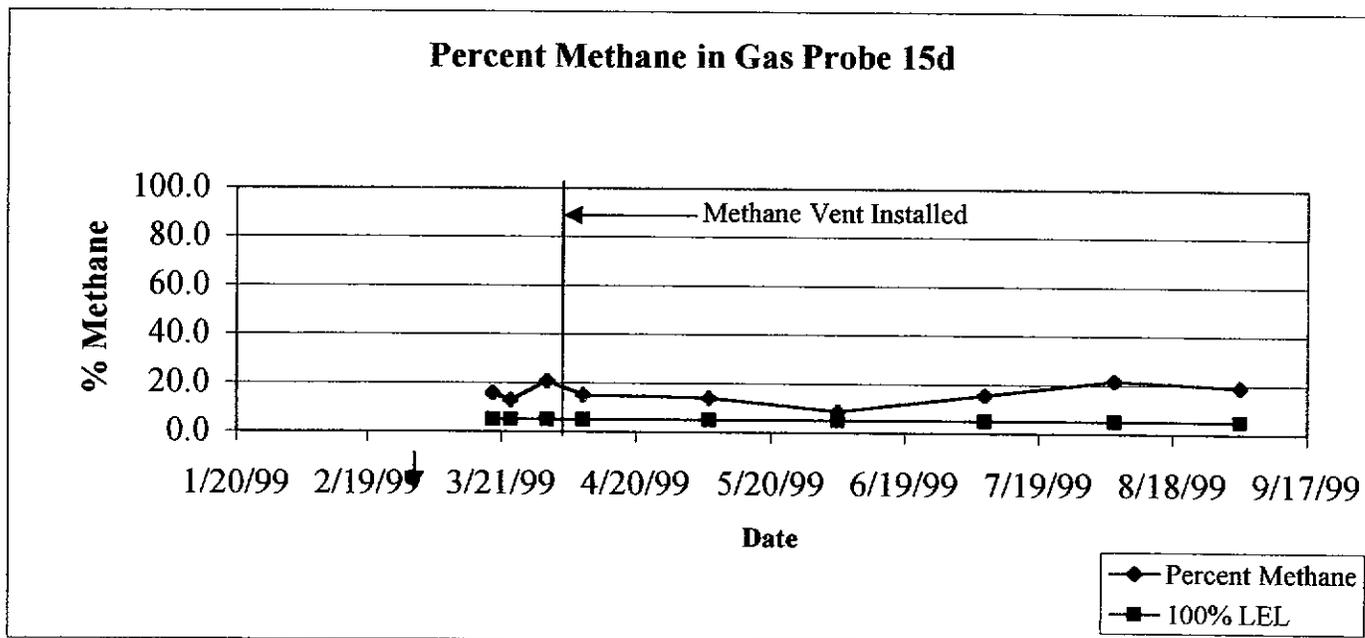
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 15d	3/19/99	9:30	314		15.6	1.5	7.9		Installed on 3/18/99
	3/23/99	15:35	264		13.0	1.7	11.0	Not measured	120 seconds
	3/25/99	15:05						0.22	24 at 120 seconds
	3/31/99	16:00	422		20.7	13.6	3.7	0.20	Readings recorded at 180 seconds, DTW reading taken 4/1/99 = 46.28' TOC
	4/8/99	13:20	300		15.0	12.4	6.2	0.14	Readings recorded at 180 seconds
	5/6/99	13:20	280		14.0	10.2	6.5	0.02	Readings recorded at 180 seconds
	6/4/99	11:15	172		8.6	5.2	12.1	0.09	Pressure, readings recorded at 180 seconds
	7/7/99	12:50	310		15.5	9.9	6.5	0.09	Pressure, readings recorded at 180 seconds
	8/5/99	12:40	432		21.6	14.4	0.6	0.10	Readings recorded after 2 purge volumes, DTW = 46.23 ft @ 15:20
9/2/99	16:15	380		19.0	13.1	0.8	0.14	Readings recorded after 2 purge volumes, DTW = 46.25 ft	

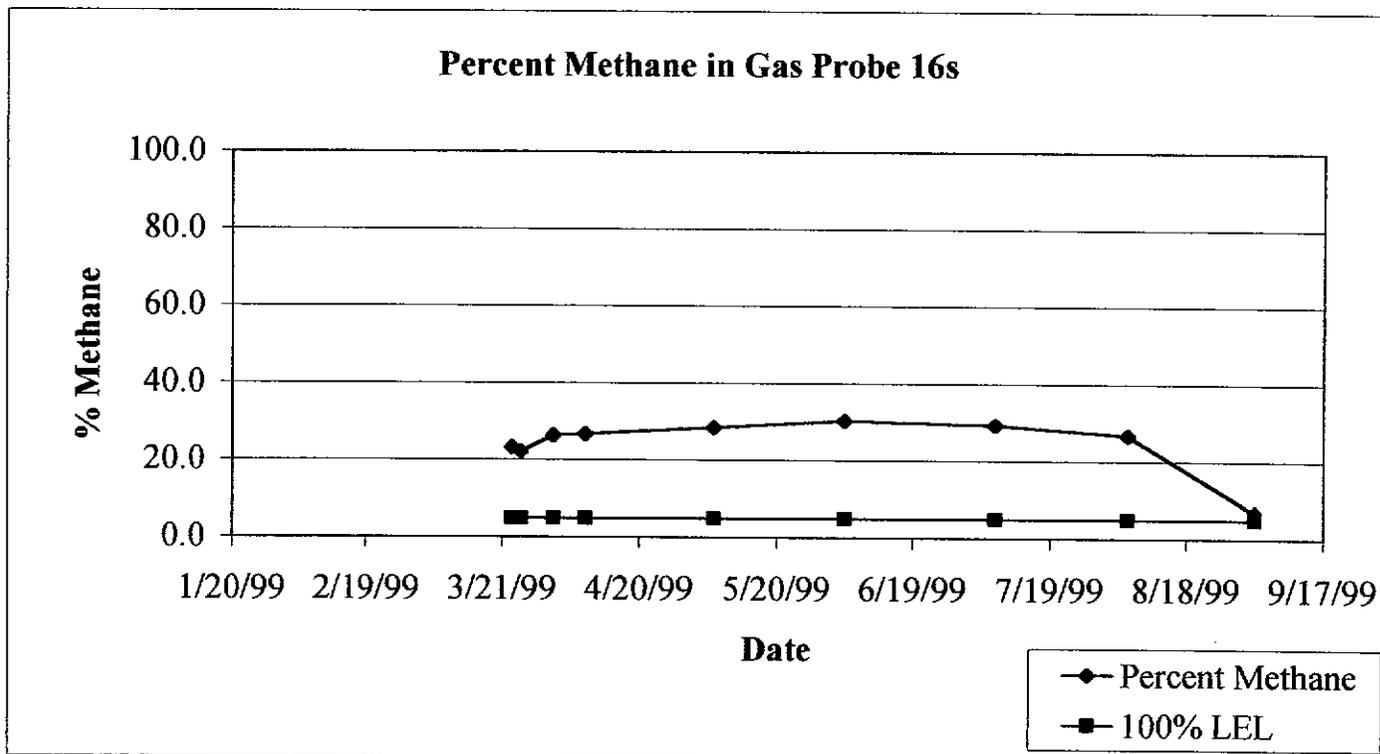
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 16s	3/23/99	16:50	390		19.7/ 23.3	21.5	2.3	Not measured	80 seconds / peak at 130 seconds
	3/25/99	13:45	444		22.2 @ 45 seconds	20.9	2.6	0.00	No pressure - peak at 45 seconds
	4/1/99	10:55	522		26.3	24.1	0.1	0.00	Readings recorded at 180 seconds
	4/8/99	14:50	530		26.8	25.2	0.0	0.00	Readings recorded at 180 seconds
	5/6/99	14:35	570		28.5	28.3	0.0	0.00	Readings recorded at 180 seconds
	6/4/99	12:40	606		30.3	28.8	0.2	0.00	Readings recorded at 180 seconds
	7/7/99	14:00	586		29.3	33.4	0.6	0.00	Readings recorded at 180 seconds
	8/5/99	14:15	530		26.8	25.2	0.0	0.00	Readings recorded after 2 purge volumes
9/2/99	17:35	136		6.8	23.8	0.4	0.00	Readings recorded after 2 purge volumes	

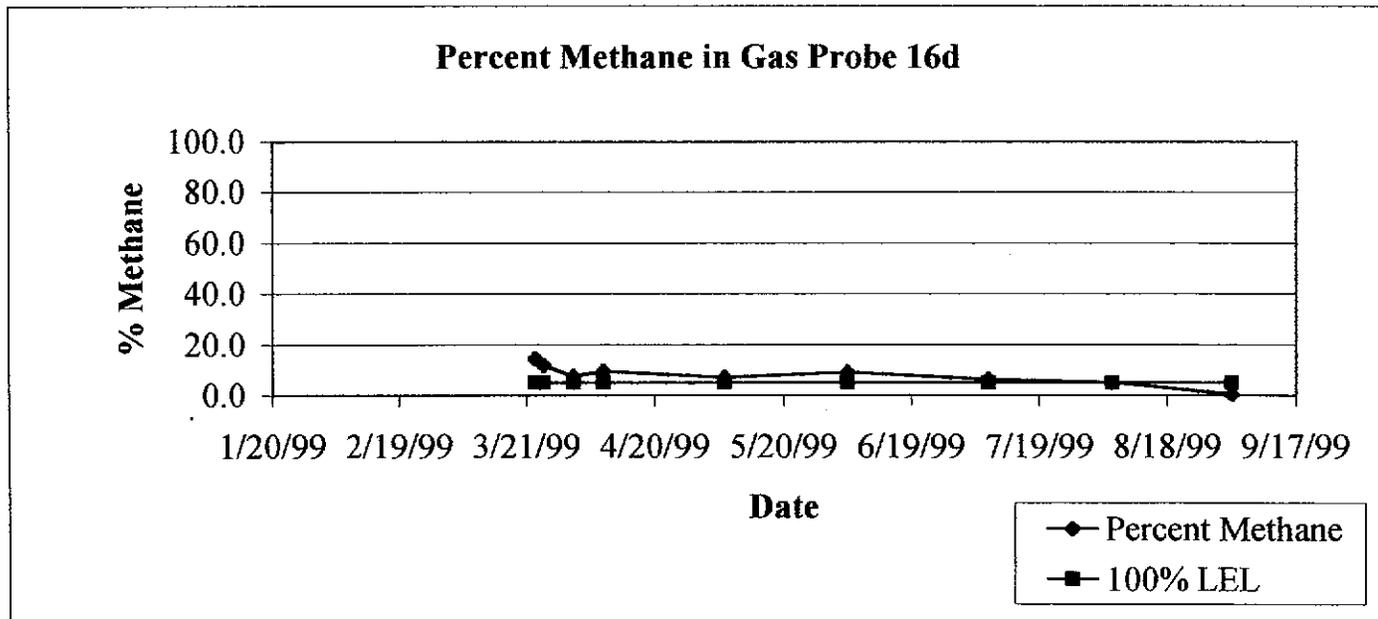
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL  
SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure / Vacuum ("H2O)	Notes
Gas Probe 16d	3/23/99	16:44	242		12.1/ 14.5	3.3	8.8	Not measured	94 seconds / peak at 150 seconds
	3/25/99	13:50	190/236		9.5/11.8	6.5	6.8	0.00	60 seconds = 9.5 - readings recorded at 100 seconds
	4/1/99	11:00	150		7.5	11.6	7.6	0.00	Readings recorded at 180 seconds, DTW reading taken 4/1/99 = 21.90' TOC
	4/8/99	15:00	194		9.6	5.7	11.1	-0.10	Vacuum, readings recorded at 180 seconds
	5/6/99	14:45	142		7.1	13.1	7.7	0.00	Readings recorded at 180 seconds
	6/4/99	12:45	182		9.1	11.7	9.1	0.00	Readings recorded at 180 seconds
	7/7/99	14:05	126		6.3	9.4	12.0	-0.01	Vacuum, readings recorded at 180 seconds
	8/5/99	14:20	100		5.0	3.0	18.1	0.00	Readings recorded after 2 purge volumes, no water in probe
9/2/99	17:40	8		0.4	11.4	6.5	-0.02	Readings recorded after 2 purge volumes, no water in probe	

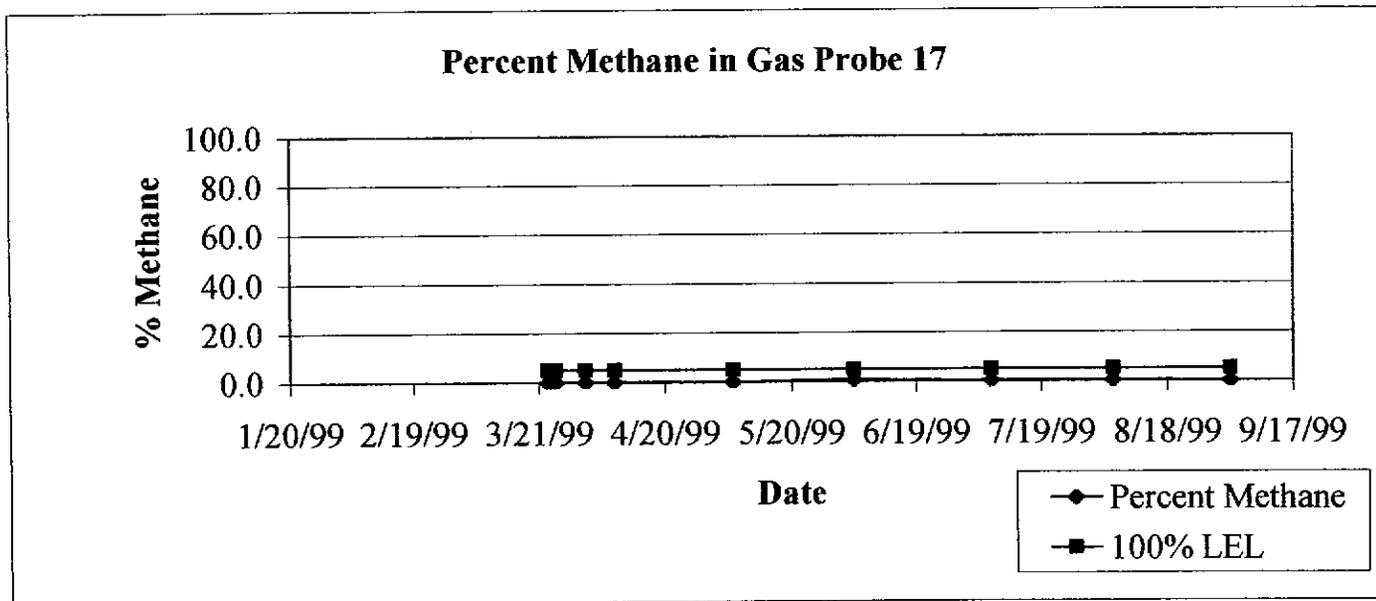
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
Gas Probe 17	3/23/99	17:05	0		0.0	0.0	20.6	Not measured	80 seconds
	3/25/99	13:40	0		0.0	0.1	20.0	-0.02	Vacuum of 0.02 - readings recorded at 90 seconds - peak CH4 of 0.1% @ 20 seconds
	4/1/99	10:45	Did not record		0.0	0.3	19.4	0.00	Readings recorded at 180 seconds, DTW reading taken 4/1/99 = 10.00' TOC *(No H2O)
	4/8/99	14:40	Did not record		0.0	0.3	20.1	0.00	Readings stable at 120 seconds
	5/6/99	14:30	Did not record		0.0	0.7	19.2	0.00	Readings stable at 120 seconds
	6/4/99	12:35	12		0.6	1.5	17.9	0.00	Readings recorded at 180 seconds
	7/7/99	13:50	6		0.3	1.2	19.5	0.00	Readings recorded at 180 seconds
	8/5/99	14:10	6		0.3	2.2	18.8	0.00	Readings recorded after 2 purge volumes, no water in probe
	9/2/99	17:30	0		0.0	1.6	18.2	0.00	Readings recorded after 2 purge volumes, no water in probe

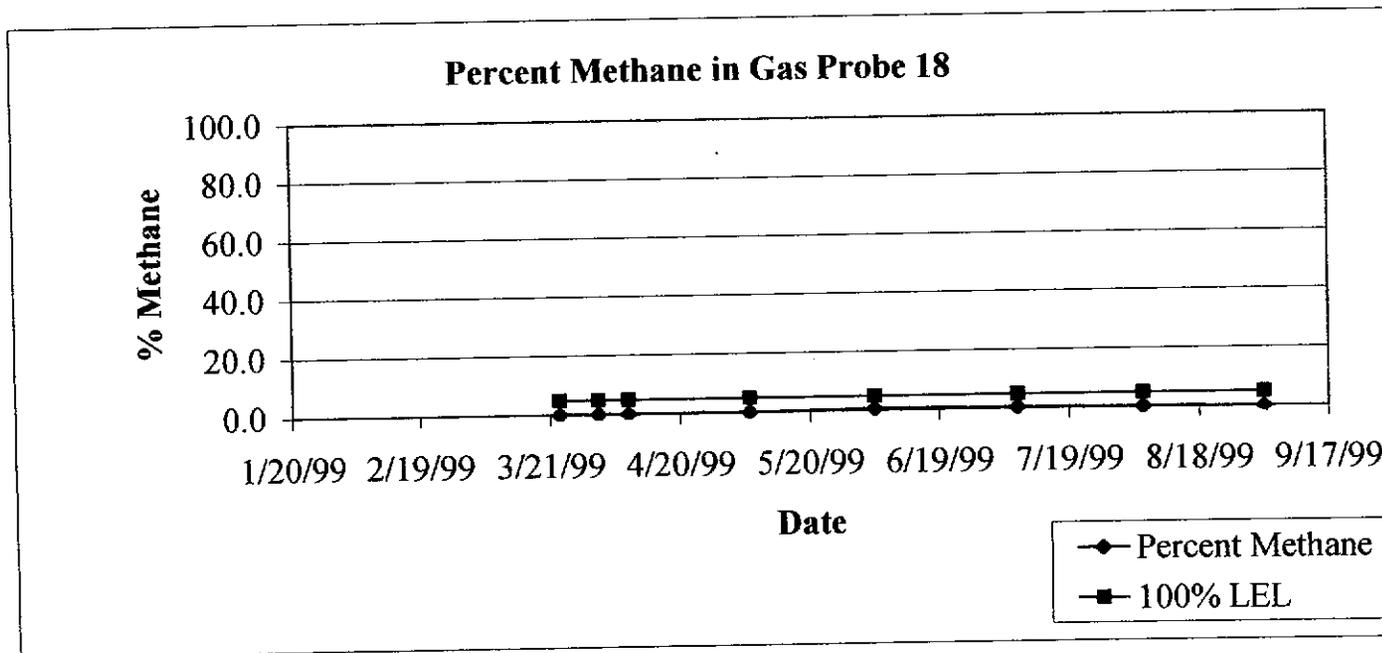
Not Measured = readings not taken



**JACKSON COUNTY LANDFILL**  
**SUMMARY OF GAS MEASUREMENTS IN WELLS AND PROBES**

Monitoring Point	Date	Time	LEL Meter LEL	%	% Methane	% CO2	% O2	Probe Pressure /Vacuum ("H2O)	Notes
Gas Probe 18	3/23/99	16:57	0		0.0	0.1	20.6	Not measured	60 seconds - steady
	3/25/99	13:20							Needs gas cap -- check for water DTW = 30.99' TOC DTB = 32.79' TOC
	4/1/99	10:40	Did not record		0.0	0.1	20.6	0.00	Capped, replaced with pressure cap, stable at 120 seconds
	4/8/99	14:30	Did not record		0.0	0.3	20.5	-0.10	Vacuum---readings stable at 120 seconds
	5/6/99	14:25	Did not record		0.0	0.4	19.7	0.02	Readings stable at 120 seconds
	6/4/99	12:30	12		0.6	1.3	18.9	-0.01	Vacuum, readings recorded at 180 seconds
	7/7/99	13:40	6		0.3	1.8	18.9	0.00	Readings recorded at 180 seconds
	8/5/99	14:00	2		0.1	2.8	18.2	-0.01	Readings recorded after 2 purge volumes, DTW = 31.75 ft @ 15:40, slight vacuum
	9/2/99	17:20	0		0.0	2.1	17.2	0.00	Readings recorded after 2 purge volumes, DTW = 31.75 ft

Not Measured = readings not taken



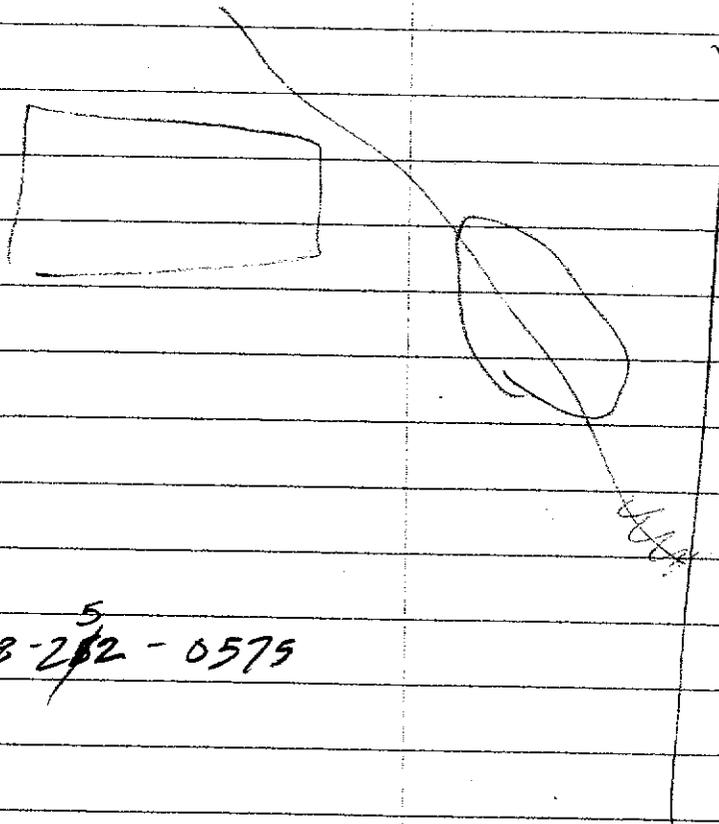
Call Jay:

Continuous monitoring inside building is a requirement until employees aren't there

He will pursue this & call me w/ results 11/29/99

A continuous <sup>methane</sup> monitoring device has been installed in Western Builders facility, per Chad Parker 12/8/99

Jay Denton  
828-586-7581



<sup>5</sup>  
828-282-0575



SOLID WASTE ENGINEERING  
AND MANAGEMENT

Joyce Engineering, Inc.  
436 Spring Garden Street  
Greensboro, N. Carolina 27401  
Tel (910) 230-1992  
Fax (910) 230-1998

M,

I wouldn't give too much slack on this. Migration has been documented off-site in several locations and our rules treat CH<sub>4</sub> as an immediate health threat. They need to do whatever is necessary to stop off-site migration and correct the problem. The downward trend mentioned in the report maybe real but high concentrations of CH<sub>4</sub> still exist.

L

Talked w/ Jay Denton (Chairman  
Co. Commissioners) 11/8/99. Co.  
is preparing to close on  
purchase of Western Builders  
in this week or next.

Jackson Co. LF: June 10/99 review

Does

- Additional property needs to be incorporated into the permit to alleviate a non-compliance situation <sup>for</sup> LFG (see 1st bullet, "Conclusions" section, pg. 3)? OR does the rule read "property line"?

2/22 The Co. has submitted a proposal to incorporate the "Western Builders" property into the site permit (per J. Denton)

- Why was need for justification <sup>why only</sup> ~~for~~

~~the~~ 3 ft. ~~depth~~ trenches were installed.

If most recent results of LFG still show off-site violations, require improvement

to venting/<sup>trench</sup> collection system(s). <sup>Need actual</sup> construction "as built" for trenches.  
per J. Denton - call Jeff Bishop (McGill) for this info.

- If a letter is written give approval to recommendation on pg. 4 of the 6/10/99 report. Write letter containing informed J. Denton all other pts. on the way.

- Are all the gas probes installed by McGill (1-9) 3' deep? 11-11

~~After reviewing~~  
Review comments of 4/22/99 sampling  
episode:

- There either has to be "clean" mws  
DG of site or a demonstration  
(that includes seasonal fluctuations) that  
contaminants are not leaving the site.  
(see fig. 2 in report).  
Rule 2C will prevent any well from  
~~from~~ being installed within 500' of EOW (G.S.  
Railroad)
- Have <sup>gw samples from</sup> the deeper probes been <sup>taken?</sup> sampled?  
What were the results? GP-11D NO  
Are all the gas probes still in place?  
Are there plans for <sup>yes</sup> regular semi-  
annual monitoring <sup>in</sup> of crucial areas  
north is SE of LE? NO Potentiometric  
for Fletcher Group data only
- What have the indicator <sup>(CO<sub>2</sub>, Mg, Na, Cl, sulfate)</sup> parameter results  
revealed? (Indicator parameter standard 1521)

---

- April 2000 report. Will there be  
any new proposals for MWs?