

21375



**Board of County Commissioners**  
**DEPARTMENT OF PUBLIC WORKS**  
**SOLID WASTE MANAGEMENT DIVISION**

P.O. Box 340, Lecanto, Florida 34460  
Telephone: (352) 527-7670 FAX: (352) 527-7672  
email: landfillinfo@booccitrus.fl.us  
TDD Telephone: (352) 527-5303  
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April 13, 2007

Susan J. Pelz, P.E. *4/23/07*  
Solid Waste Section  
Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637-0926

**Dept. of Environmental  
Protection**

**APR 16 2007**

Re: Citrus County Central Landfill  
Permit No. 21375-008-SO/01  
Landfill gas monitoring results

**Southwest District**

Dear Ms. Pelz:

The attached report was prepared by SCS Engineers for the County and reports the results of gas monitoring for the 1st quarter of 2007. This monitoring is in accordance with Specific Conditions F2 and F3 of the referenced permit. Methane was detected in concentrations that would violate standards in probes GS-2E, GS-3E and GS-2S, although those probes are no longer at the boundary, since the sublease extension was implemented. Some of the statements in the SCS report incorrectly indicate that the sublease is still pending, which is not the case.

Please note, that both the "old" and "new" probes are included in this report. Following approval of the proposed permit modification, many of the old probes will be abandoned and only those probes included in the new monitoring network will be tested.

Please contact me if you have questions or require additional information.

Yours truly,

*Susan J Metcalfe*  
Susan Metcalfe, P.G.  
Director

SM

Attachment

CC: Michael Arnold, Assistant Director, Public Works Department (w/o attachments)  
John Banks, SCS Engineers, Tampa (w/o attachments)

**MAR 2007  
EVENT**

## SCS ENGINEERS

March 29, 2007  
File No. 09204067.08

Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

FLORIDA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION  
APR 16 2007  
SOUTHWEST DISTRICT  
TAMPA

Subject: Landfill Gas Monitoring Report, First Quarter 2007  
Central Landfill, Citrus County, Florida

Dear Susie:

SCS Engineers (SCS) is submitting to you the results of the first quarter landfill gas (LFG) monitoring at Citrus County Central Landfill. SCS conducted this monitoring in accordance with our scope of services dated August 31, 2006. Provided below is a description of our activities, summary of the monitoring results, and recommendations.

### BACKGROUND

The site has 62 permanent LFG monitoring probes, 60 of which surround the closed 60-acre landfill. The remaining two permanent probes are located to the south and to the east of the Phase 1 landfill area. Of the 60 probes around the closed landfill, 29 are located to the east of the closed landfill, between the toe of the landfill and the main access road. The others are spaced fairly evenly across the north, west, and south sides of the closed landfill near the fence line. Several probes are located outside the fence line to the west and south of the property.

As part of the County's gas migration investigation, three interim monitoring probes were installed on the eastern and southern perimeters of the Phase 1 landfill area in October 2003. An additional 10 interim monitoring probes were installed in July 2004 as part of a supplemental gas migration investigation.

Attachment 1 includes a site map that shows the LFG monitoring probe locations. Interim monitoring probe GS-2S, which was located on the south end of Phase 1, was previously destroyed by landfill maintenance activities and has not been replaced.

In November and December of 2005, eighteen permanent monitoring probes were installed along the proposed property boundary of the site. Once the property boundary agreement is established with the Florida Division of Forestry and Florida Department of Environmental Protection (FDEP), the new 18 monitoring probes will be the only LFG compliance points at the site; the remaining 62 permanent LFG probes and 12 interim probes will be abandoned in place.



Rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires the following:

- The methane concentration in on- or off-site structures may not exceed 25 percent of the lower explosive limit (LEL). The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on- or off-site structures is 1.25 percent methane by volume.
- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent methane by volume).

This quarterly monitoring was conducted in accordance with Rule 62-701.530(2)(c), F.A.C.

## **MONITORING RESULTS**

On March 22, 2007, SCS personnel monitored the LFG monitoring probes and on-site structures. SCS used a Landtec GEM-2000 gas monitor to measure gas composition in the monitoring probes and on-site structures. The GEM-2000 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The instrument was calibrated prior to use and once more throughout the sampling event.

### **LFG Monitoring Probes**

SCS monitored the 92 permanent and interim monitoring probes for gas composition, and the resulting data are shown in the three-page Table 1 in Attachment 2. The readings obtained from the probes along the facility property line (i.e., those probes along the north, west and south sides of the closed landfill, and the five probes near Phase 1) are shown on Page 1 of Table 1. Page 2 of the same table includes the probes along the east side of the 60-acre closed landfill. Page 3 of Table 1 shows the readings obtained from the 18 new probes along the proposed property boundary and readings taken at the structures.

### **Probes at Facility Perimeter--**

As shown on Page 1 of Table 1, methane exceeding the regulatory limit of five percent methane by volume was detected in permanent monitoring probe GS-1E at a concentration of 11.1 percent

Methane detected in the interim probes is summarized below. Note that of the interim probes at which methane was detected, only GS-2E and GS-3E are located at the facility property boundary.

- GS-3S: 22.7 percent methane by volume
- GS-2E: 11.2 percent methane

Ms. Susan Metcalfe, P.G.

March 29, 2007

Page 3

- GS-3E: 5.6 percent methane

#### **Probes Along East Side of Closed Landfill--**

Page 2 of Table 1 presents the data collected from the 29 LFG monitoring probes along the east side of the 60-acre closed landfill. The methane concentration in these probes varied from zero to 50.3 percent by volume. Methane was detected in 9 of the 29 probes along the east side of the closed landfill. Of the nine probes that contained methane, four of the probes contained greater than 5 percent methane. As stated in past quarterly reports and explained below, methane concentrations above the LEL are not considered regulatory exceedances in these probes since they are not located at the property boundary. These data indicate the presence of subsurface LFG at the edge of the landfill near facility structures such as the leachate treatment plant and scale house. However, monitoring at these on-site structures shows that LFG is not migrating into the buildings.

#### **Probes along the Proposed Property Boundary--**

Page 3 of Table 1 represents the data collected from the 18 new LFG monitoring probes spaced along the proposed facility property boundary. As part of the remedial investigation, the County has negotiated with the Division of Forestry to relocate the landfill property boundary. As stated above, once the new boundary is approved by FDEP, these 18 probes will be the LFG monitoring compliance points for the facility. The data on Page 3 of Table 1 show that methane was not detected in any of the new 18 monitoring probes.

#### **Monitoring of On-Site Structures**

No methane was detected in the scalehouse, administration building, leachate treatment facility, or firing range as shown in Table 1 of Attachment 1. Floor plans of the scale house and the administration building are included in Attachment 1.

SCS monitored in the restrooms of the administration building, as well as in select closets, the break room, conference room, and hallways. In the scalehouse, SCS monitored the main work area, cabinets, the restroom, and at electrical outlets. Monitoring of the leachate treatment facility included around the base of structures, at the control panel, and inside the electrical room.

At the firing range, SCS monitored the floor joints, electrical outlets, and the base of slabs or posts that penetrated the ground.

#### **CONCLUSIONS**

Permanent probes GS-1E and interim probe, GS-2E, and GS-3E along the eastern perimeter of the landfill exceeded the five percent methane by volume requirement, as stated above. The



Ms. Susan Metcalfe, P.G.  
March 29, 2007  
Page 4

County was notified by SCS personnel, and subsequently notified the FDEP as stipulated in Rule 62-701.530(3)(a), F.A.C. The County previously submitted a LFG migration remediation plan, which has since been incorporated into Consent Agreement OGC File No. 05-1078, and the provisions of the plan are currently being implemented.

Regarding the 29 LFG monitoring probes along the east side of the 60-acre closed landfill, since these probes are not located at the property boundary; they are not considered compliance probes. A high methane concentration in any of these 29 probes does not necessarily demonstrate that the concentration of methane at the property boundary is above the regulatory limit of five percent by volume. Instead, these probes allow the County to identify if LFG is migrating laterally from the landfill, which might potentially pose a concern at on-site structures. No methane was detected in the administration building, scale house, or leachate treatment plant.

SCS is providing you two signed and sealed originals of this submittal. Please keep one for your files and forward the other to the FDEP Southwest District office at the following address:

Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, Florida 33637-0926

SCS appreciates the opportunity to assist you with this work. Please call us at (800) 569-9702 if you have any questions or would like additional information.

Sincerely,



No. 64771 3/29/07

Lindsey E. Kennelly, P.E.  
Project Engineer  
SCS ENGINEERS



Raymond J. Dever, P.E., BCEE  
Vice President  
SCS ENGINEERS

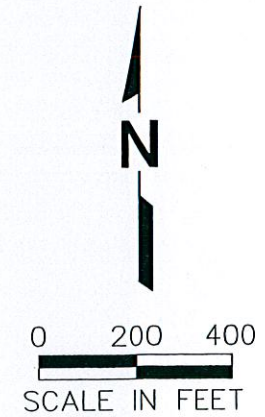
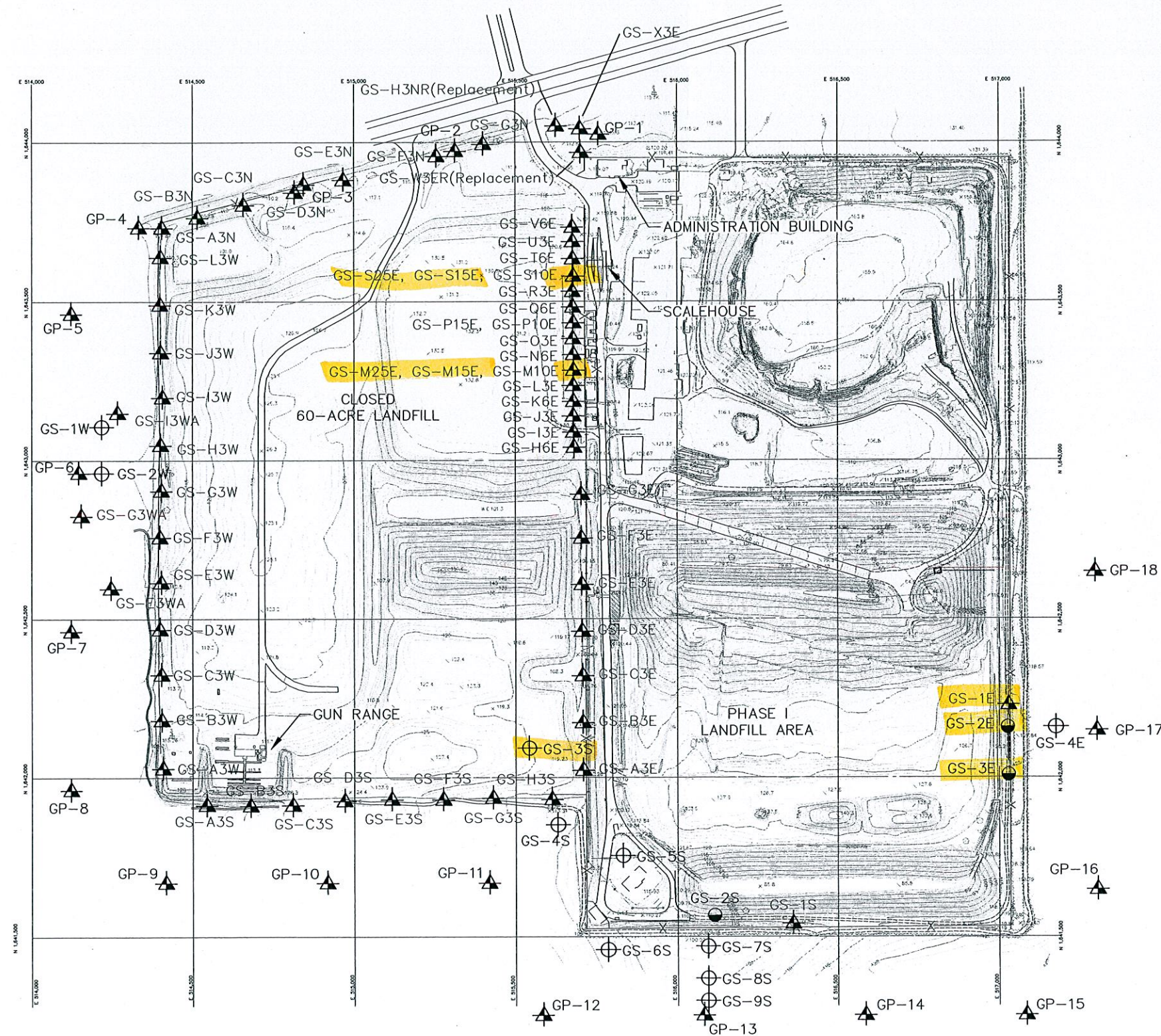
LEK/RJD:imm

Attachments

**ATTACHMENT 1**  
**MONITORING LOCATIONS**



G:\PROJECT\Citrus\09199056.08\995608GasMonOriginal.dwg Mar 23, 2007 - 10:36am Layout Name: GasMonPlan By: codd



- LEGEND**
- GS-C3S ▲ EXISTING LFG MONITORING PROBE
  - GS-2E ● INTERIM LFG MONITORING PROBE INSTALLED 10/7/03 TO 10/9/03
  - GS-1W ⊕ INTERIM LFG MONITORING PROBE INSTALLED THE WEEK OF JULY 12, 2004
  - GP-1 ▲ LFG MONITORING PROBE INSTALLED IN NOVEMBER/DECEMBER 2005

Figure 1. Landfill Gas Monitoring Probe Locations, Central Landfill, Citrus County, Florida



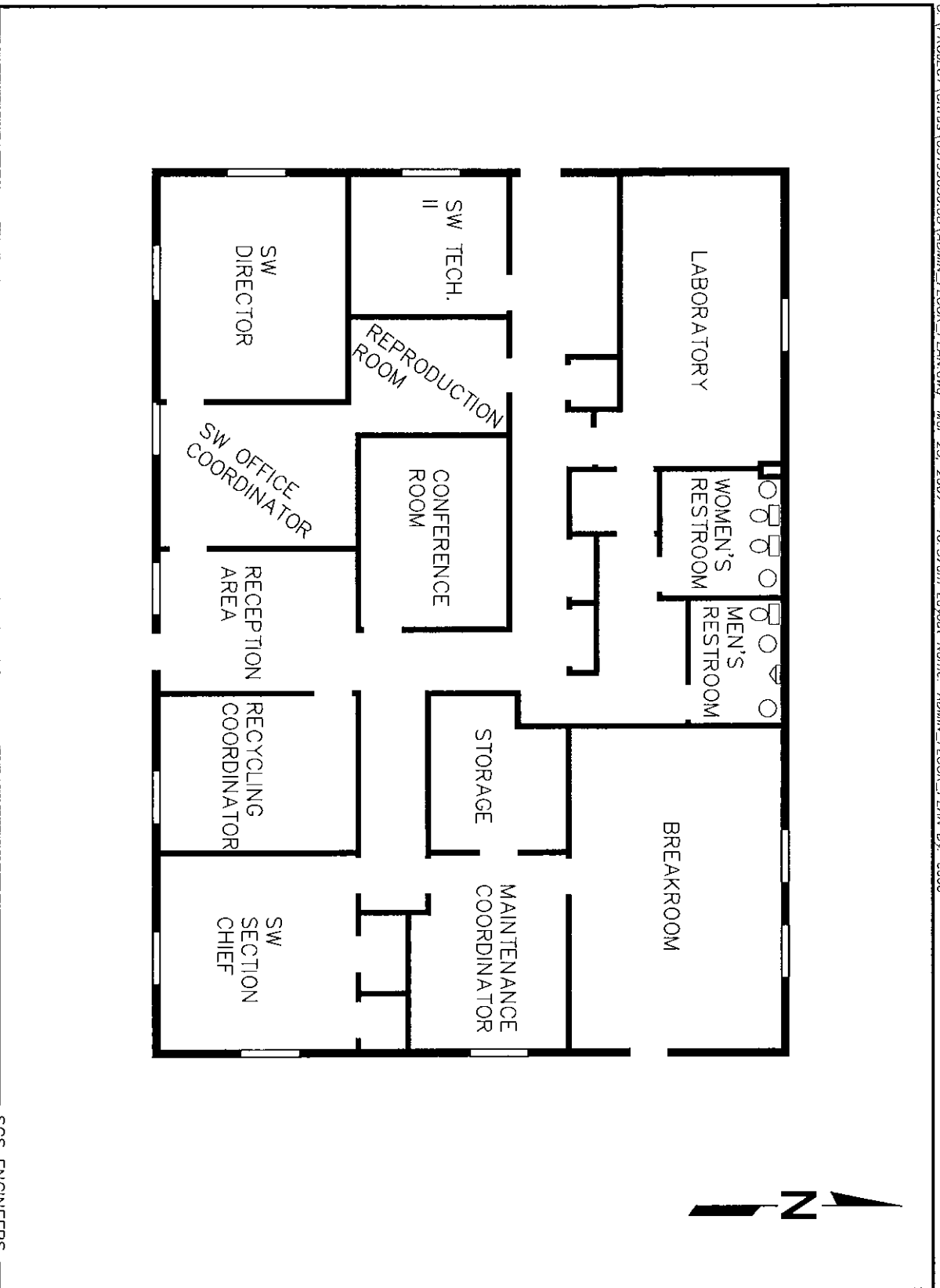


Figure 2. Administration Building Floor Plan



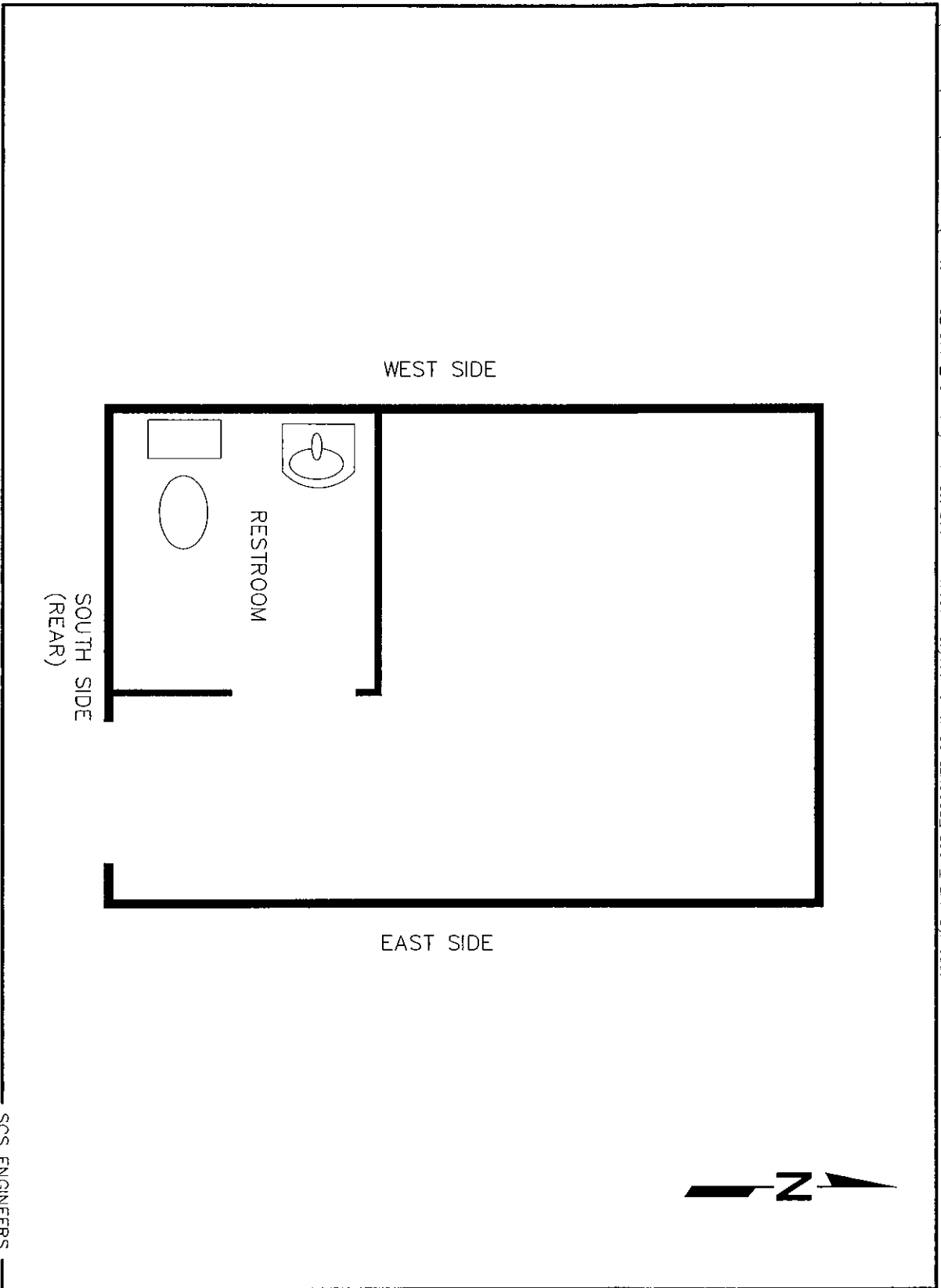


Figure 3. Scalehouse Floor Plan

**ATTACHMENT 2**  
**LFG MONITORING RESULTS**

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, FIRST QUARTER 2007**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name: Citrus County Central Landfill Date: March 22, 2007  
 Project No.: 09204067.08 Weather: Clear, 81F  
 Personnel: I. McKoy (SCS) Comments: Barometric Pressure 30"  
 Method of Calibration: calibration gas

90 vol

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
GS-H3NR	0.0	0.2	20.6	79.2	
GS-G3N	0.0	0.2	20.7	79.1	
GS-F3N	0.0	0.1	20.7	79.2	
GS-E3N	0.0	0.2	20.9	78.9	
GS-D3N	0.0	0.2	20.8	79.0	
GS-C3N	0.0	0.1	20.8	79.1	
GS-B3N	0.0	0.1	21.0	78.9	
GS-A3N	0.0	0.1	20.8	79.1	
GS-L3W	0.0	0.2	20.8	79.0	
GS-J3W	0.0	1.2	19.4	79.4	
GS-K3W	0.0	0.2	20.8	79.0	
GS-I3W	0.0	3.0	11.1	85.9	
GS-I3WA	0.0	1.2	18.5	80.3	
GS-H3W	0.0	4.9	15.4	79.7	
GS-G3W	0.1	3.9	13.1	82.9	
GS-F3W	0.0	1.1	19.4	79.5	
GS-E3W	0.0	4.9	12.8	82.3	
GS-E3WA	0.0	1.1	18.8	80.1	
GS-D3W	0.0	1.0	19.6	79.4	
GS-C3W	0.0	0.6	19.3	80.1	
GS-B3W	0.0	0.7	20.3	79.0	
GS-A3W	0.0	1.2	18.4	80.4	
GS-A3S	0.0	1.3	18.5	80.2	
GS-B3S	0.0	1.3	18.6	80.1	
GS-C3S	0.0	4.0	17.2	78.8	
GS-D3S	0.0	2.7	18.2	79.1	
GS-E3S	0.0	1.5	17.9	80.6	
GS-F3S	0.0	2.5	18.1	79.4	
GS-G3S	0.0	0.9	19.4	79.7	
GS-H3S	0.0	0.7	19.9	79.4	
GS-1S	0.0	0.3	16.1	83.6	
GS-1E	11.1	15.0	2.9	71.0	
Interim Probes					
GS-1W	0.0	1.4	18.5	80.1	
GS-2W	0.0	0.6	19.2	80.2	
GS-2S	---	---	---	---	Probe Destroyed
GS-G3WA	0.0	0.3	19.6	80.1	
GS-3S	22.7	13.3	11.0	53.0	
GS-4S	0.0	0.4	16.1	83.4	
GS-5S	0.0	0.2	20.3	79.5	
GS-6S	0.0	0.3	18.9	80.8	
GS-7S	0.0	0.1	18.6	81.3	
GS-8S	0.0	0.1	19.5	80.4	
GS-9S	0.0	0.2	19.5	80.3	
GS-2E	11.2	17.8	2.4	68.6	
GS-3E	5.6	13.2	1.4	79.8	
GS-4E	0.0	0.3	19.5	80.2	

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, FIRST QUARTER 2007**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	<u>Citrus County Central Landfill</u>	Date:	<u>March 22, 2007</u>
Project No.:	<u>09204067.08</u>	Weather:	<u>Clear, 81F</u>
Personnel:	<u>I. McKoy (SCS)</u>	Comments:	<u>Barometric Pressure 30"</u>
Method of Calibration:	<u>calibration gas</u>		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
GS-A3E	0.0	1.8	18.6	79.6	
GS-B3E	0.0	3.1	17.9	79.0	
GS-C3E	0.0	1.5	19.5	79.0	
GS-D3E	0.0	0.6	19.5	79.9	
GS-E3E	0.0	0.7	18.9	80.4	
GS-F3E	0.0	0.7	19.4	79.9	
GS-G3E	0.0	0.6	19.7	79.7	
GS-H6E	0.0	1.5	18.5	80.0	
GS-I3E	0.0	0.5	19.7	79.8	
GS-J3E	0.0	0.6	20.0	79.4	
GS-K6E	0.0	0.8	19.6	79.6	
GS-L3E	0.1	1.5	19.2	79.2	
GS-M10E	1.5	2.8	14.9	80.8	
GS-M15E	6.7	2.5	17.2	73.6	
GS-M25E	50.3	25.7	1.8	22.2	
GS-N6E	0.2	1.4	19.3	79.1	
GS-O3E	0.0	0.4	19.1	80.5	
GS-P10E	0.0	1.0	19.6	79.4	
GS-P15E	0.0	0.5	19.9	79.6	
GS-Q6E	1.5	1.5	16.8	80.2	
GS-R3E	0.0	0.3	19.7	80.0	
GS-S10E	0.2	0.4	20.0	79.4	
GS-S15E	20.1	6.5	11.4	62.0	
GS-S25E	14.9	5.7	14.2	65.2	
GS-T6E	0.0	0.9	19.7	79.4	
GS-U3E	0.0	0.4	19.7	79.9	
GS-V6E	0.0	0.4	19.6	80.0	
GS-W3ER	0.0	1.0	18.8	80.2	
GS-X3E	0.0	0.3	19.7	80.0	



**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, FIRST QUARTER 2007**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	<u>Citrus County Central Landfill</u>	Date:	<u>March 22, 2007</u>
Project No.:	<u>09204067.08</u>	Weather:	<u>Clear, 81F</u>
Personnel:	<u>I. McKoy (SCS)</u>	Comments:	<u>Barometric Pressure 30"</u>
Method of Calibration:	<u>calibration gas</u>		

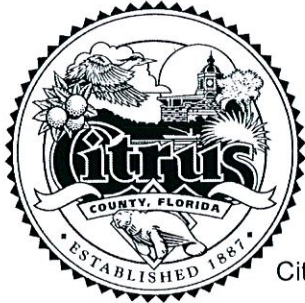
Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
Probes at Proposed Property Boundary					
GP-1	0.0	1.2	18.4	80.3	
GP-2	0.0	0.1	20.9	79.0	
GP-3	0.0	0.2	20.8	79.0	
GP-4	0.0	1.8	18.5	79.7	
GP-5	0.0	0.4	19.5	80.0	
GP-6	0.0	2.8	17.5	79.7	
GP-7	0.0	2.3	17.7	80.0	
GP-8	0.0	1.0	19.7	80.3	
GP-9	0.0	1.7	18.5	81.0	
GP-10	0.0	0.7	19.1	80.2	
GP-11	0.0	0.5	19.4	80.2	
GP-12	0.0	1.2	18.4	80.3	
GP-13	0.0	0.4	16.1	83.4	
GP-14	0.0	0.5	18.5	80.9	
GP-15	0.0	0.4	18.8	80.7	
GP-16	0.0	0.2	19	80.7	
GP-17	0.0	0.3	19.2	80.4	
GP-18	0.0	0.9	19.8	79.3	

On Site	CH <sub>4</sub> (%)	% LEL
Scalehouse	0.0	0.0
Shop	0.0	0.0
Office	0.0	0.0
Treatment	0.0	0.0
Firing Range	0.0	0.0

Notes:

- 1 : % Lower Explosive Limit (LEL) of methane (CH<sub>4</sub>) is 5%.
- 2 : On-site structions can not exceed 25% LEL (25% LEL = 1.25% CH<sub>4</sub>) per Rule 62-701.530(1)(a), F.A.C.
- 3 : CH<sub>4</sub> at the landfill property boundary can not exceed the LEL of 5% CH<sub>4</sub> per Rule 62-701.530(1)(b), F.A.C.
- 4 : Page 1 of the table includes only the wells along the north, west, and south of the 60-acre closed landfill, as well as the interim probes near Phase 1.
- 5 : The wells on page 2 are located along the east side of the 60-acre closed landfill, and not at the facility property boundary.
- 6 : Wells GS-1E and GS-1S are located adjacent to the Phase 1 landfill.
- 7 : The probes on page 3 are located on the outside of the property boundary located along the North-West, West, South and East sides of the site.

logged in  
gas spreadsheet  
21375



**Board of County Commissioners  
DEPARTMENT OF PUBLIC WORKS  
SOLID WASTE MANAGEMENT DIVISION**

P.O. Box 340, Lecanto, Florida 34460  
Telephone: (352) 527-7670 FAX: (352) 527-7672  
email: landfillinfo@bocc.citrus.fl.us  
TDD Telephone: (352) 527-5303  
Citrus Springs/Dunnellon/Inglis/Yankeetown area Toll Free (352) 489-2120

October 26, 2006

Susan J. Pelz, P.E.  
Solid Waste Section  
Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637-0926

**Dept. of Environmental  
Protection**

**OCT 30 2006**

Re: Citrus County Central Landfill  
Permit No. 21375-008-SO/01  
Landfill gas monitoring results and Consent Agreement requirements status

**Southwest District**

Dear Ms. Pelz:

The attached report was prepared by SCS Engineers for the County and reports the results of gas monitoring for the 4th quarter of 2006. This monitoring is in accordance with Specific Conditions F2 and F3 of the referenced permit. Methane was detected in concentrations that violate standards in probe GS-2E only. Following approval of the items described below, that location will no longer be a compliance boundary.

The sublease extension required by Consent Agreement OGC Case No 05-1078 was granted by Forestry and State Lands and has been submitted to your office. After discussion with your office prior to submitting the related minor permit modification application, Jones Edmunds & Associates is revising that document, which will be submitted within 30 days. Approval of that request will modify both the groundwater and gas monitoring programs and the compliance boundary. The report of the gas migration investigation required by the Consent Agreement has been submitted to your office. Monitoring at both the locations contained in the existing permit and at the locations proposed in the permit modification will be included in the monitoring program in the interim. No other actions are proposed at this time.

Please contact me if you have questions or require additional information.

Yours truly,

Susan Metcalfe, P.G.  
Director

SM

Attachment

CC: Glenn W. McCracken, Director, Public Works Department (w/o attachments)  
John Banks, SCS Engineers, Tampa (w/o attachments)  
John Locklear, JEA, Gainesville (with attachments)

## SCS ENGINEERS

October 24, 2006  
File No. 09204067.08

Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

FLORIDA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION  
OCT 30 2006  
SOUTHWEST DISTRICT  
TAMPA

Subject: Landfill Gas Monitoring Report, Fourth Quarter 2006  
Central Landfill, Citrus County, Florida

Dear Susie:

SCS Engineers (SCS) is submitting to you the results of the fourth quarter landfill gas (LFG) monitoring at Citrus County Central Landfill. SCS conducted this monitoring in accordance with our scope of services dated August 31, 2006. Provided below is a description of our activities, summary of the monitoring results, and recommendations.

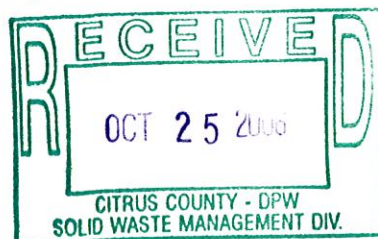
### BACKGROUND

The site has 62 permanent LFG monitoring probes, 60 of which surround the closed 60-acre landfill. The remaining two permanent probes are located to the south and to the east of the Phase 1 landfill area. Of the 60 probes around the closed landfill, 29 are located to the east of the closed landfill, between the toe of the landfill and the main access road. The others are spaced fairly evenly across the north, west, and south sides of the closed landfill near the fence line. Several probes are located outside the fence line to the west and south of the property.

As part of the County's gas migration investigation, three interim monitoring probes were installed on the eastern and southern perimeters of the Phase 1 landfill area in October 2003. An additional 10 interim monitoring probes were installed in July 2004 as part of a supplemental gas migration investigation.

Attachment 1 includes a site map that shows the LFG monitoring probe locations. Interim monitoring probe GS-2S, which was located on the south end of Phase 1, was previously destroyed by landfill maintenance activities and has not been replaced.

In November and December of 2005, eighteen permanent monitoring probes were installed along the proposed property boundary of the site. Once the property boundary agreement is established with the Florida Division of Forestry and Florida Department of Environmental Protection (FDEP), the new 18 monitoring probes will be the only LFG compliance points at the site; the remaining 62 permanent LFG probes and 12 interim probes will be abandoned in place.





Rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires the following:

- The methane concentration in on- or off-site structures may not exceed 25 percent of the lower explosive limit (LEL). The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on- or off-site structures is 1.25 percent methane by volume.
- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent methane by volume).

This quarterly monitoring was conducted in accordance with Rule 62-701.530(2)(c), F.A.C.

## **MONITORING RESULTS**

On October 4, 2006, SCS personnel monitored the LFG monitoring probes and on-site structures. SCS used a Landtec GEM-500 gas monitor to measure gas composition in the monitoring probes and on-site structures. The GEM-500 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The instrument was calibrated prior to use and once more throughout the sampling event.

### **LFG Monitoring Probes**

SCS monitored the 92 permanent and interim monitoring probes for gas composition, and the resulting data are shown in the three-page Table 1 in Attachment 2. The readings obtained from the probes along the facility property line (i.e., those probes along the north, west and south sides of the closed landfill, and the five probes near Phase 1) are shown on Page 1 of Table 1. Page 2 of the same table includes the probes along the east side of the 60-acre closed landfill. Page 3 of Table 1 shows the readings obtained from the 18 new probes along the proposed property boundary and readings taken at the structures.

### **Probes at Facility Perimeter--**

As shown on Page 1 of Table 1, methane exceeding the regulatory limit of five percent methane by volume was detected in permanent monitoring probe GS-2E at a concentration of 12 percent by volume

### **Probes Along East Side of Closed Landfill--**

Page 2 of Table 1 presents the data collected from the 29 LFG monitoring probes along the east side of the 60-acre closed landfill. The methane concentration in these probes varied from zero to 36.6 percent by volume. Methane was detected in 11 of the 29 probes along the east side of the closed landfill. Of the eleven probes that contained methane, four of the probes contained



greater than 5 percent methane. As stated in past quarterly reports and explained below, methane concentrations above the LEL are not considered regulatory exceedances in these probes since they are not located at the property boundary. These data indicate the presence of subsurface LFG at the edge of the landfill near facility structures such as the leachate treatment plant and scale house. However, monitoring at these on-site structures shows that LFG is not migrating into the buildings.

#### **Probes along the Proposed Property Boundary--**

Page 3 of Table 1 represents the data collected from the 18 new LFG monitoring probes spaced along the proposed facility property boundary. As part of the remedial investigation, the County has negotiated with the Division of Forestry to relocate the landfill property boundary. As stated above, once the new boundary is approved by FDEP, these 18 probes will be the LFG monitoring compliance points for the facility. The data on Page 3 of Table 1 show that methane was not detected in any of the new 18 monitoring probes.

#### **Monitoring of On-Site Structures**

No methane was detected in the scalehouse, administration building, leachate treatment facility, or firing range as shown in Table 1 of Attachment 1. Floor plans of the scale house and the administration building are included in Attachment 1.

SCS monitored in the restrooms of the administration building, as well as in select closets, the break room, conference room, and hallways. In the scalehouse, SCS monitored the main work area, cabinets, the restroom, and at electrical outlets. Monitoring of the leachate treatment facility included around the base of structures, at the control panel, and inside the electrical room.

At the firing range, SCS monitored the floor joints, electrical outlets, and the base of slabs or posts that penetrated the ground.

#### **CONCLUSIONS**

Interim probe GS-2E along the eastern perimeter of the landfill exceeded the five percent methane by volume requirement, as stated above. The County was notified by SCS personnel, and subsequently notified the FDEP as stipulated in Rule 62-701.530(3)(a), F.A.C. The County previously submitted a LFG migration remediation plan, which has since been incorporated into Consent Agreement OGC File No. 05-1078, and the provisions of the plan are currently being implemented.

Regarding the 29 LFG monitoring probes along the east side of the 60-acre closed landfill, since these probes are not located at the property boundary; they are not considered compliance probes. A high methane concentration in any of these 29 probes does not necessarily

Ms. Susan Metcalfe, P.G.  
October 24, 2006  
Page 4

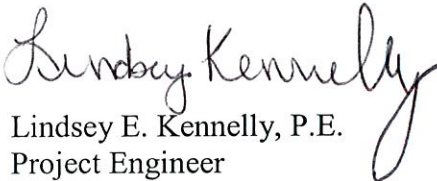
demonstrate that the concentration of methane at the property boundary is above the regulatory limit of five percent by volume. Instead, these probes allow the County to identify if LFG is migrating laterally from the landfill, which might potentially pose a concern at on-site structures. No methane was detected in the administration building, scale house, or leachate treatment plant.

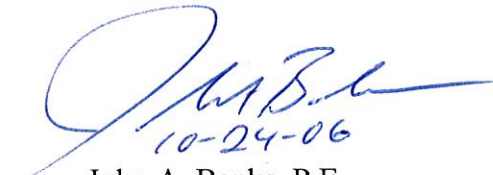
SCS is providing you two signed and sealed originals of this submittal. Please keep one for your files and forward the other to the FDEP Southwest District office at the following address:

Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, Florida 33637-0926

SCS appreciates the opportunity to assist you with this work. Please call us at (800) 569-9702 if you have any questions or would like additional information.

Sincerely,

  
Lindsey E. Kennelly, P.E.  
Project Engineer  
SCS ENGINEERS

  
John A. Banks, P.E.  
Project Director  
SCS ENGINEERS

LEK/JAB:imm

Attachments

**ATTACHMENT 1**  
**MONITORING LOCATIONS**





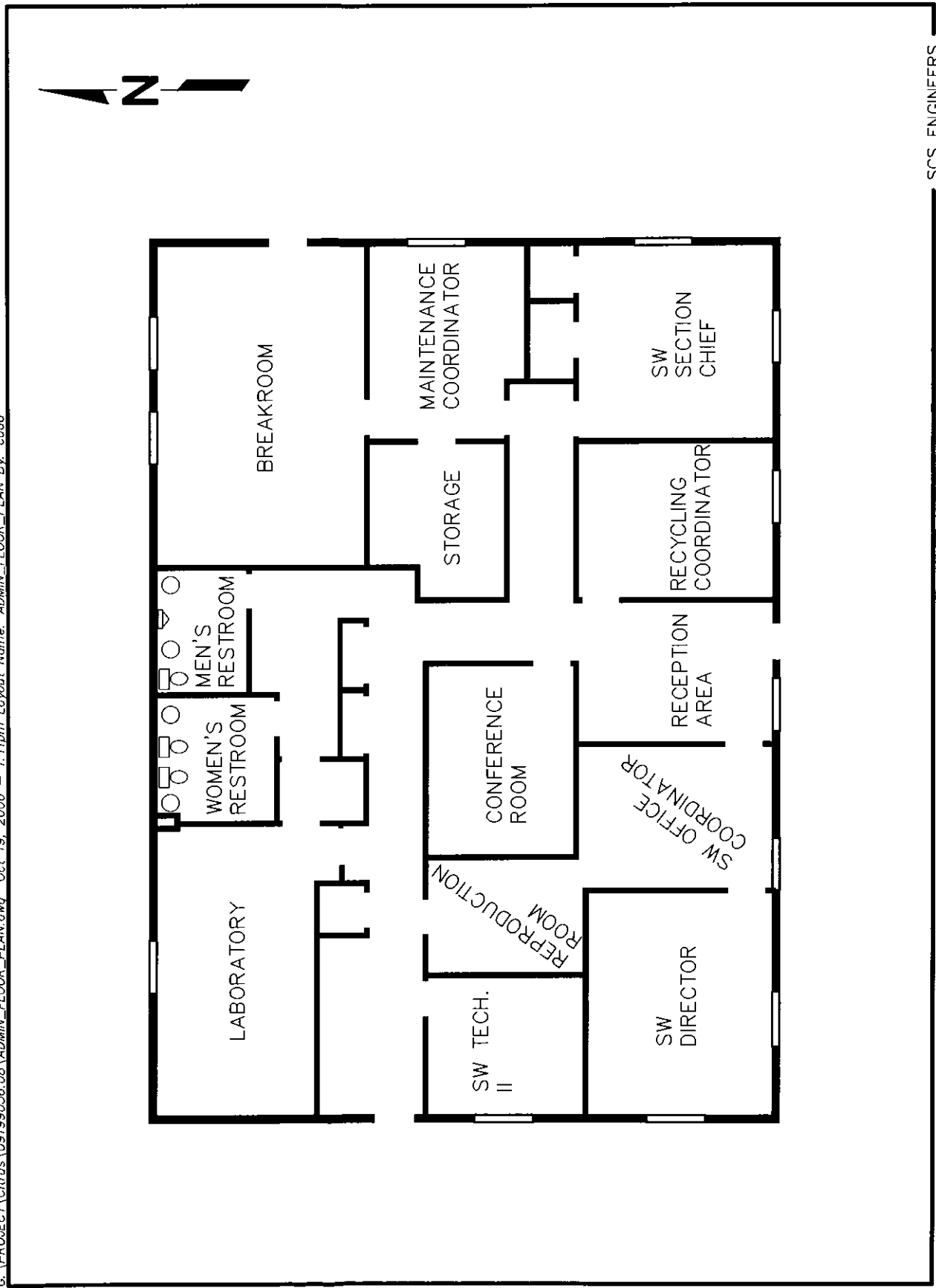


Figure 2. Administration Building Floor Plan

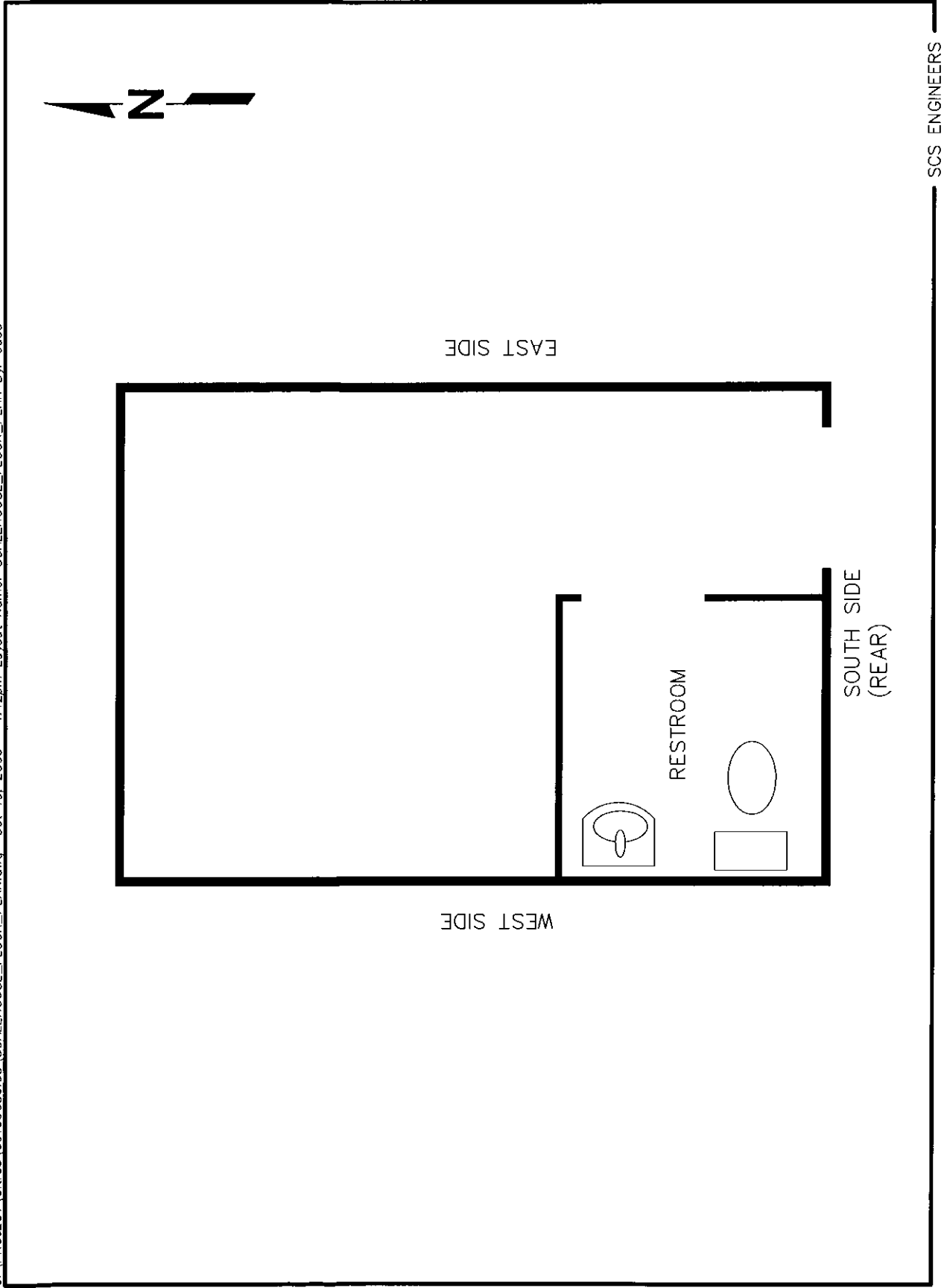


Figure 3. Scalehouse Floor Plan

**ATTACHMENT 2**  
**LFG MONITORING RESULTS**

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, THIRD QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name: Citrus County Central Landfill  
 Project No.: 09204067.08  
 Personnel: L. McKoy (SCS)  
 Method of Calibration: calibration gas

Date: October 4, 2006  
 Weather: Sunny  
 Comments: Barometric Pressure 29"

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
GS-H3NR	0.0	0.3	20.0	79.7	
GS-G3N	0.0	0.3	19.8	79.9	
GS-F3N	0.0	0.3	20.0	79.7	
GS-E3N	0.0	0.0	20.3	79.7	
GS-D3N	0.0	0.2	20.0	79.8	
GS-C3N	0.0	0.3	19.9	79.8	
GS-B3N	0.0	0.3	19.9	79.8	
GS-A3N	0.0	0.2	20.0	79.8	
GS-L3W	0.0	0.3	19.8	79.9	
GS-J3W	0.0	0.2	19.3	80.5	
GS-K3W	0.0	0.0	19.6	80.4	
GS-I3W	0.0	0.2	19.2	80.6	
GS-I3WA	0.0	1.5	18.0	80.5	
GS-H3W	0.0	5.8	13.9	80.3	
GS-G3W	0.3	12.9	4.9	81.9	
GS-F3W	0.0	4.9	15.5	79.6	
GS-E3W	0.1	12.5	6.3	81.1	
GS-E3WA	0.0	1.5	18.1	80.4	
GS-D3W	0.0	2.1	17.9	80.0	
GS-C3W	0.0	3.2	17.2	79.6	
GS-B3W	0.0	0.7	18.8	80.5	
GS-A3W	0.0	0.0	19.0	81.0	
GS-A3S	0.0	3.1	16.9	80.0	
GS-B3S	0.0	4.0	16.2	79.8	
GS-C3S	0.0	6.2	15.2	78.6	
GS-D3S	0.0	4.1	16.0	79.9	
GS-E3S	0.0	2.9	16.1	81.0	
GS-F3S	0.0	2.9	16.4	80.7	
GS-G3S	0.0	1.8	17.7	80.5	
GS-H3S	0.0	1.0	18.5	80.5	
GS-1S	0.0	3.5	12.4	83.7	
GS-1E	4.6	9.0	10.8	75.6	
Interim Probes					
GS-1W	0.0	1.5	18.0	80.5	
GS-2W	0.0	0.9	18.4	80.7	
GS-2S	--	--	--	--	Probe Destroyed
GS-G3WA	0.0	0.3	19.0	80.7	
GS-3S	26.4	20.3	7.9	45.4	
GS-4S	0.0	5.0	15.0	80.0	
GS-5S	11.3	11.1	14.1	63.7	
GS-6S	0.0	4.8	15.0	80.2	
GS-7S	0.0	2.0	16.5	81.5	
GS-8S	0.0	0.2	19.5	80.3	
GS-9S	0.0	0.2	19.3	80.5	
GS-2E	12.0	20.7	1.7	65.6	
GS-3E	1.1	4.1	13.9	80.9	
GS-4E	0.0	5.1	13.7	81.2	

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, THIRD QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name: Citrus County Central Landfill  
 Project No.: 09204067.08  
 Personnel: I. McKoy (SCS)  
 Method of Calibration: calibration gas

Date: October 4, 2006  
 Weather: Sunny  
 Comments: Barometric Pressure 29"

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
GS-A3E	1.1	4.4	14.3	80.2	
GS-B3E	0.0	6.0	13.6	80.4	
GS-C3E	0.0	5.2	13.2	81.6	
GS-D3E	0.0	2.2	16.7	81.1	
GS-E3E	0.0	1.1	18.6	80.3	
GS-F3E	0.0	0.2	19.5	80.3	
GS-G3E	0.0	1.0	18.9	80.1	
GS-H6E	0.0	1.5	19.0	79.5	
GS-I3E	0.0	1.4	18.7	79.9	
GS-J3E	0.1	1.1	19.5	79.3	
GS-K6E	0.0	1.2	19.1	79.7	
GS-L3E	0.0	4.5	17.8	77.7	
GS-M10E	4.3	4.7	15.7	75.3	
GS-M15E	6.9	4.3	16.6	72.2	
GS-M25E	36.6	19.7	6.5	37.2	
GS-N6E	0.2	2.6	18.4	78.8	
GS-O3E	0.0	4.6	17.0	78.4	
GS-P10E	0.0	1.1	18.8	80.1	
GS-P15E	0.0	0.2	19.7	80.1	
GS-Q6E	0.1	3.5	18.1	78.3	
GS-R3E	0.0	1.5	18.8	79.7	
GS-S10E	0.4	0.2	19.7	79.7	
GS-S15E	19.5	12.3	12.4	55.8	
GS-S25E	16.3	13.1	11.4	59.2	
GS-T6E	0.2	1.3	19.1	79.4	
GS-U3E	0.0	1.0	19.2	79.8	
GS-V6E	0.0	2.7	17.2	80.1	
GS-W3ER	0.0	1.8	17.8	80.4	
GS-X3E	0.0	0.3	18.9	80.8	



**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, THIRD QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name: Citrus County Central Landfill

Date: October 4, 2006

Project No.: 09204067.08

Weather: Sunny

Personnel: I. McKoy (SCS)

Comments: Barometric Pressure 29"

Method of Calibration: calibration gas

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
Probes at Proposed Property Boundary					
GP-1	0.0	4.6	15.5	79.9	
GP-2	0.0	0.6	19.8	79.8	
GP-3	0.0	0.3	19.7	80.0	
GP-4	0.0	1.6	18.1	80.3	
GP-5	0.0	0.6	19.0	80.4	
GP-6	0.0	1.4	18.4	80.3	
GP-7	0.0	1.6	18.0	80.4	
GP-8	0.0	0.8	18.8	80.4	
GP-9	0.0	0.8	18.8	80.4	
GP-10	0.0	2.0	17.5	80.5	
GP-11	0.0	0.5	18.9	80.6	
GP-12	0.0	1.1	18.3	80.6	
GP-13	0.0	0.3	18.5	81.0	
GP-14	0.0	0.3	19.2	80.5	
GP-15	0.0	0.1	19.4	80.5	
GP-16	0.0	0.7	18.9	80.5	
GP-17	0.0	0.3	18.5	81.2	
GP-18	0.0	0.8	18.7	80.5	

On Site	CH <sub>4</sub> (%)	% LEL
Scalehouse	0.0	0.0
Shop	0.0	0.0
Office	0.0	0.0
Treatment	0.0	0.0
Firing Range	0.0	0.0

Notes:

- 1 : % Lower Explosive Limit (LEL) of methane (CH<sub>4</sub>) is 5%.
- 2 : On-site structions can not exceed 25% LEL (25% LEL = 1.25% CH<sub>4</sub>) per Rule 62-701.530(1)(a), F.A.C.
- 3 : CH<sub>4</sub> at the landfill property boundary can not exceed the LEL of 5% CH<sub>4</sub> per Rule 62-701.530(1)(b), F.A.C.
- 4 : Page 1 of the table includes only the wells along the north, west, and south of the 60-acre closed landfill, as well as the interrim probes near Phase 1.
- 5 : The wells on page 2 are located along the east side of the 60-acre closed landfill, and not at the facility property boundary.
- 6 : Wells GS-1E and GS-1S are located adjacent to the Phase 1 landfill.
- 7 : The probes on page 3 are located on the outside of the property boundary located along the North-West, West, South and East sides of the site.

# Analytical Results Summary for Landfill Gas Monitoring Samples Collected at Class I Landfill

Facility Name -- Citrus Central Landfill

Sampling Frequency -- Quarterly

County -- Citrus

	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL		Methane
	1/27/2005	1/27/2005	2/14/2005	4/12/2005	8/24/2005	11/16/2005	2/26/2006	6/21/2006	9/7/2006		Date Sampled
	2/2/2005	2/16/2005	4/4/2005	5/12/2005	8/29/2005	1/19/2006	3/22/2006	7/7/2006	9/29/2006		Date Received
Gas Monitoring			1/30/1900		9/7/2005	9/21/2006	9/22/2006	9/22/2006	10/2/2006		Date Reviewed
Point Id		30.05	30.13	30.02		30.13	30.16	30.12	29		Barometric Pressure
East of 60 acres:											Notes
GS-2E	102	102	74	92	144	156	178	184	226		temporary LFG probe
GS-3E		26	16	20		76	92	6	0		temporary LFG probe
GS-4E		0	NR	0		0	0	0	0		temporary LFG probe
GS-A3E		NR	0	2		0	0	0	6		
GS-B3E		NR	0	0		0	0	0	0		
GS-C3E		NR	0	0		0	0	0	0		
GS-D3E		NR	0	0		0	0	0	0		
GS-E3E		NR	0	0		0	0	0	0		
GS-F3E		NR	0	6		0	0	0	0		
GS-G3E		NR	0	0		0	0	0	0		
GS-H6E		NR	0	0		60	0	72	0		
GS-J3E		NR	0	0		0	0	0	0		
GS-K3E		NR	334	0		372	0	16	2		
GS-L3E		NR	4	0		0	0	94	0		
GS-M10E		NR	0	0		0	0	0	0		
GS-M15E		NR	2	10		6	4	10	134		
GS-M25E		NR	330	470		214	212	156	659		
GS-N6E		NR	394	1122		832	0	762	939		
GS-O3E		NR	0	0		0	0	288	6		
GS-P10E		NR	0	0		0	0	0	0		
GS-P15E		NR	0	0		0	0	74	0		
GS-Q6E		NR	0	0		0	0	0	0		
GS-R3E		NR	534	398		320	0	426	2		
GS-S2E		NR	0	0		0	0	0	0		
GS-S2E		NR									temporary LFG probe
GS-S2E		NR									temporary LFG probe
GS-S3E		NR									temporary LFG probe
GS-S10E		NR	0	62		16	0	0	48		
GS-S15E		NR	414	400		492	402	532	804		
GS-S25E		NR	488	858		426	868	584	842		
GS-T6E		NR	454	0		370	0	18	0		
GS-U3E		NR	0	0		0	0	0	0		
GS-V6E		NR	0	0		0	0	0	0		
GS-W3E		NR									
GS-W3ER			0	0		0	0	0	0		
GS-X3E		NR	0	0		0	0	0	0		
North of 60 acres:											
GS-A3N		NR	0	0		0	0	0	0		
GS-B3N		NR	0	0		0	0	0	0		
GS-C3N		NR	0	0		0	0	0	0		
GS-D3N		NR	0	0		0	0	0	0		
GS-E3N		NR	0	0		0	0	0	0		
GS-F3N		NR	0	0		0	0	0	0		
GS-G3N		NR	0	0		0	0	0	0		
GS-H3NR		NR	0	0		0	0	0	0		
West of 60 acres:											
GS-1W		0		0		0	0	0	0		temporary LFG probe
GS-2W		0		0		0	0	0	0		temporary LFG probe
GS-A3W		0	0	0		0	0	0	0		
GS-B3W		0	0	0		0	0	0	0		
GS-C3W		0	0	0		0	0	0	0		
GS-D3W		0	0	0		0	0	0	0		
GS-E3W		0	4	18		0	0	0	0		
GS-E3WA		0	0	0		0	0	0	0		
GS-F3W		0	0	0		0	0	0	0		
GS-G3W		10	6	0		30	0	0	0		
GS-G3WA		0	0	0		0	0	0	0		
GS-H3W		0	0	0		0	0	0	0		
GS-I3W		0	0	26		0	0	0	0		
GS-I3WA		0	0	0		2	0	0	0		
GS-J3W		0	0	0		0	0	0	0		
GS-K3W		0	0	0		0	0	0	0		
GS-L3W		0	0	0		0	0	0	0		

Analytical Results Summary for Landfill Gas Monitoring Samples Collected at Class 1 Landfill

Facility Name -- Citrus Central Landfill

Sampling Frequency -- Quarterly

County -- Citrus

	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL		Methane
	1/27/2005	1/27/2005	2/14/2005	4/22/2005	8/24/2005	11/16/2005	2/26/2006	6/21/2006	9/7/2006		Date Sampled
	2/7/2005	2/16/2005	4/4/2005	5/12/2005	8/29/2005	11/19/2005	3/22/2006	7/7/2006	9/29/2006		Date Received
Gas Monitoring			1/30/1900		9/7/2005	9/21/2006	9/22/2006	9/22/2006	10/2/2006		Date Reviewed
Point Id		30.05	30.13	30.02		30.13	30.16	30.12	29		Barometric Pressure
South of 60 acres:											
GS-2S		damaged		damaged		damaged	damaged	damaged	damaged		temporary LFG probe
GS-3S		494		460		378	558	640	0		temporary LFG probe
GS-4S		4		0		0	0	0	0		temporary LFG probe
GS-5S		NR				218	916	228	0		temporary LFG probe
GS-5Sa		322		810							
GS-5Sb		924		878							
GS-6S		0		0		0	0	0	0		temporary LFG probe
GS-7S		0		0		0	0	0	0		temporary LFG probe
GS-8S		0		0		0	0	0	0		temporary LFG probe
GS-9S		0		0		0	0	0	0		temporary LFG probe
GS-A3S		0	0	0		0	0	0	0		
GS-B3S		0	0	0		0	0	0	0		
GS-C3S		0	0	0		0	0	0	0		
GS-D3S		0	0	0		0	0	0	0		
GS-E3S		0	0	0		0	0	0	0		
GS-F3S		0	0	0		0	0	0	0		
GS-G3S		0	0	0		0	0	0	0		
GS-H3S		0	0	0		0	0	0	0		
GS-S2S		NR									temporary LFG probe
GS-S2S											temporary LFG probe
GS-S2S											temporary LFG probe
GS-S2S											temporary LFG probe
Assessment Gas Probes (per paragraph 10 and Exhibit B of Consent Order No. 05-1078):											
GP-1							0	0	0		GP-1 through GP-18
GP-2							0	0	0		installed 11/14/05 to 12/22/05
GP-3							0	0	0		
GP-4							0	0	0		
GP-5							0	0	0		
GP-6							0	0	0		
GP-7							0	0	0		
GP-8							0	0	0		
GP-9							0	0	0		
GP-10							0	0	0		
GP-11							0	0	0		
GP-12							0	0	0		
GP-13							0	0	0		
GP-14							0	0	0		
GP-15							0	0	0		
GP-16							0	0	submerged		completely submerged under water
GP-17							0	0	0		
GP-18							0	0	0		
80 Acre Points:											
GS-1E		0	0	218	206	224	94	8	112		
GS-1S		0	0	48		0	0	0	0		
at Leachate Plant:											
Ele. Rm.		NR	0	0		0	0	0	0		
at Scalehouse:			0	0		0	0	0	0		
point One		NR									
point Two		NR									
point Three		NR									
at Firing Range						0	0	0	0		
at Admin. Bldg:											
SHOP		NR	0	0		0	0	0	0		
OFFICE		NR	0	0		0	0	0	0		

NR=Not Received

vallet 4d - no balo  
to get well used  
above middle



**Board of County Commissioners**  
**DEPARTMENT OF PUBLIC WORKS**  
**SOLID WASTE MANAGEMENT DIVISION**

P.O. Box 340, Lecanto, Florida 34460  
Telephone: (352) 527-7670 FAX: (352) 527-7672  
email: landfillinfo@bocc.citrus.fl.us  
TDD Telephone: (352) 527-5303  
Citrus Springs/Dunnellon/Ingles/Yankeetown area Toll Free (352) 489-2120

21315

September 26, 2006

Susan J. Pelz, P.E.  
Solid Waste Section  
Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637-0926

Dept. of Environmental  
Protection

SEP 29 2006

Southwest District

Re: Citrus County Central Landfill  
Permit No. 21375-008-SO/01  
Landfill gas monitoring results and Consent Agreement requirements status

Dear Ms. Pelz:

The attached report was prepared by SCS Engineers for the County and reports the results of gas monitoring for the 3rd quarter of 2006. This monitoring is in accordance with Specific Conditions F2 and F3 of the referenced permit. Methane was detected in concentrations that violate standards in probe GS-1E and GS-2E.

The sublease extension required by Consent Agreement OGC Case No 05-1078 was granted by Forestry and State Lands and has been submitted to your office. We expect to deliver the minor permit modification application, also required by the Consent Agreement, to your office this week. Approval of that request will modify both the groundwater and gas monitoring programs. The report of the gas migration investigation required by the Consent Agreement has been submitted to your office. Monitoring at both the locations contained in the existing permit and at the locations proposed in the permit modification will be included in the monitoring program in the interim. No other actions are proposed at this time.

Please contact me if you have questions or require additional information.

Yours truly,

Susan Metcalfe, P.G.  
Director

SM

Attachment

CC: Glenn W. McCracken, Director, Public Works Department (w/o attachments)  
John Banks, SCS Engineers, Tampa (w/o attachments)



**SCS ENGINEERS**

September 22, 2006  
File No. 09199056.08

Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

Subject: Landfill Gas Monitoring Report, Third Quarter 2006  
Central Landfill, Citrus County, Florida

Dear Susie:

SCS Engineers (SCS) is submitting to you the results of the third quarter landfill gas (LFG) monitoring at Citrus County Central Landfill. SCS conducted this monitoring in accordance with our scope of services dated December 9, 2003. Provided below is a description of our activities, summary of the monitoring results, and recommendations.

**BACKGROUND**

The site has 62 permanent LFG monitoring probes, 60 of which surround the closed 60-acre landfill. The remaining two permanent probes are located to the south and to the east of the Phase 1 landfill area. Of the 60 probes around the closed landfill, 29 are located to the east of the closed landfill, between the toe of the landfill and the main access road. The others are spaced fairly evenly across the north, west, and south sides of the closed landfill near the fence line. Several probes are located outside the fence line to the west and south of the property.

As part of the County's gas migration investigation, three interim monitoring probes were installed on the eastern and southern perimeters of the Phase 1 landfill area in October 2003. An additional 10 interim monitoring probes were installed in July 2004 as part of a supplemental gas migration investigation.

Attachment 1 includes a site map that shows the LFG monitoring probe locations. Interim monitoring probe GS-2S, which was located on the south end of Phase 1, was previously destroyed by landfill maintenance activities and has not been replaced.

In November and December of 2005, eighteen permanent monitoring probes were installed along the proposed property boundary of the site. Once the property boundary agreement is established with the Florida Division of Forestry and Florida Department of Environmental Protection (FDEP), the new 18 monitoring probes will be the only LFG compliance points at the site; the remaining 62 permanent LFG probes and 12 interim probes will be abandoned in place.





Rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires the following:

- The methane concentration in on- or off-site structures may not exceed 25 percent of the lower explosive limit (LEL). The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on- or off-site structures is 1.25 percent methane by volume.
- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent methane by volume).

This quarterly monitoring was conducted in accordance with Rule 62-701.530(2)(c), F.A.C.

## **MONITORING RESULTS**

On September 7, 2006, SCS personnel monitored the LFG monitoring probes and on-site structures. SCS used a Landtec GEM-500 gas monitor to measure gas composition in the monitoring probes and on-site structures. The GEM-500 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The instrument was calibrated prior to use and once more throughout the sampling event.

### **LFG Monitoring Probes**

SCS monitored the 92 permanent and interim monitoring probes for gas composition, and the resulting data are shown in the three-page Table 1 in Attachment 2. The readings obtained from the probes along the facility property line (i.e., those probes along the north, west and south sides of the closed landfill, and the five probes near Phase 1) are shown on Page 1 of Table 1. Page 2 of the same table includes the probes along the east side of the 60-acre closed landfill. Page 3 of Table 1 shows the readings obtained from the 18 new probes along the proposed property boundary and readings taken at the structures.

### **Probes at Facility Perimeter--**

As shown on Page 1 of Table 1, methane exceeding the regulatory limit of five percent methane by volume was detected in permanent monitoring probe GS-1E at a concentration of 5.6 percent by volume. Methane was also detected in the interim probe GS-2E located at the property boundary at a concentration of 11.3 percent.

### **Probes Along East Side of Closed Landfill--**

Page 2 of Table 1 presents the data collected from the 29 LFG monitoring probes along the east side of the 60-acre closed landfill. The methane concentration in these probes varied from zero

to 46.5 percent by volume. Methane was detected in 10 of the 29 probes along the east side of the closed landfill. Of the ten probes that contained methane, five of the probes contained greater than 5 percent methane. As stated in past quarterly reports and explained below, methane concentrations above the LEL are not considered regulatory exceedances in these probes since they are not located at the property boundary. These data indicate the presence of subsurface LFG at the edge of the landfill near facility structures such as the leachate treatment plant and scale house. However, monitoring at these on-site structures shows that LFG is not migrating into the buildings.

#### **Probes along the Proposed Property Boundary--**

Page 3 of Table 1 represents the data collected from the 18 new LFG monitoring probes spaced along the proposed facility property boundary. As part of the remedial investigation, the County has negotiated with the Division of Forestry to relocate the landfill property boundary. As stated above, once the new boundary is approved by FDEP, these 18 probes will be the LFG monitoring compliance points for the facility. The data on Page 3 of Table 1 show that methane was not detected in any of the new 18 monitoring probes.

#### **Monitoring of On-Site Structures**

No methane was detected in the scalehouse, administration building, leachate treatment facility, or firing range as shown in Table 1 of Attachment 1. Floor plans of the scale house and the administration building are included in Attachment 1.

SCS monitored in the restrooms of the administration building, as well as in select closets, the break room, conference room, and hallways. In the scalehouse, SCS monitored the main work area, cabinets, the restroom, and at electrical outlets. Monitoring of the leachate treatment facility included around the base of structures, at the control panel, and inside the electrical room.

At the firing range, SCS monitored the floor joints, electrical outlets, and the base of slabs or posts that penetrated the ground.

#### **CONCLUSIONS**

Permanent probe GS-1E and interim probe, GS-2E, along the eastern perimeter of the landfill exceeded the five percent methane by volume requirement, as stated above. The County was notified by SCS personnel, and subsequently notified the FDEP as stipulated in Rule 62-701.530(3)(a), F.A.C. The County previously submitted a LFG migration remediation plan, which has since been incorporated into Consent Agreement OGC File No. 05-1078, and the provisions of the plan are currently being implemented.

Ms. Susan Metcalfe, P.G.  
September 22, 2006  
Page 4

Regarding the 29 LFG monitoring probes along the east side of the 60-acre closed landfill, since these probes are not located at the property boundary; they are not considered compliance probes. A high methane concentration in any of these 29 probes does not necessarily demonstrate that the concentration of methane at the property boundary is above the regulatory limit of five percent by volume. Instead, these probes allow the County to identify if LFG is migrating laterally from the landfill, which might potentially pose a concern at on-site structures. No methane was detected in the administration building, scale house, or leachate treatment plant.

SCS is providing you two signed and sealed originals of this submittal. Please keep one for your files and forward the other to the FDEP Southwest District office at the following address:

Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, Florida 33637-0926

SCS appreciates the opportunity to assist you with this work. Please call us at (800) 569-9702 if you have any questions or would like additional information.

Sincerely,



Lindsey E. Kennelly, P.E.  
Project Engineer  
SCS ENGINEERS



John A. Banks, P.E.  
Project Director  
SCS ENGINEERS

LEK/JAB:lek

Attachments

**ATTACHMENT 1**  
**MONITORING LOCATIONS**

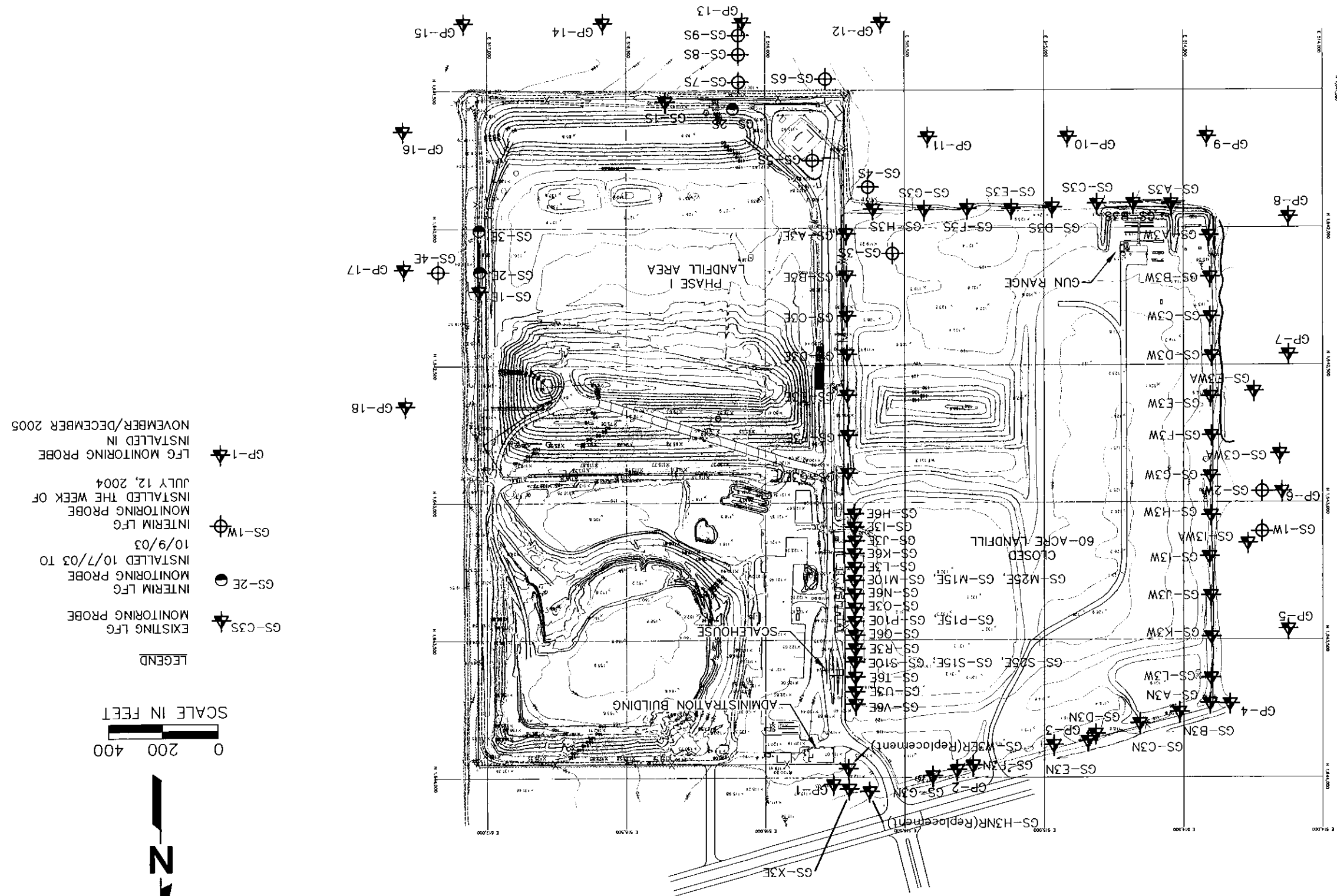


Figure 1. Landfill Gas Monitoring Probe Locations, Central Landfill, Citrus County, Florida



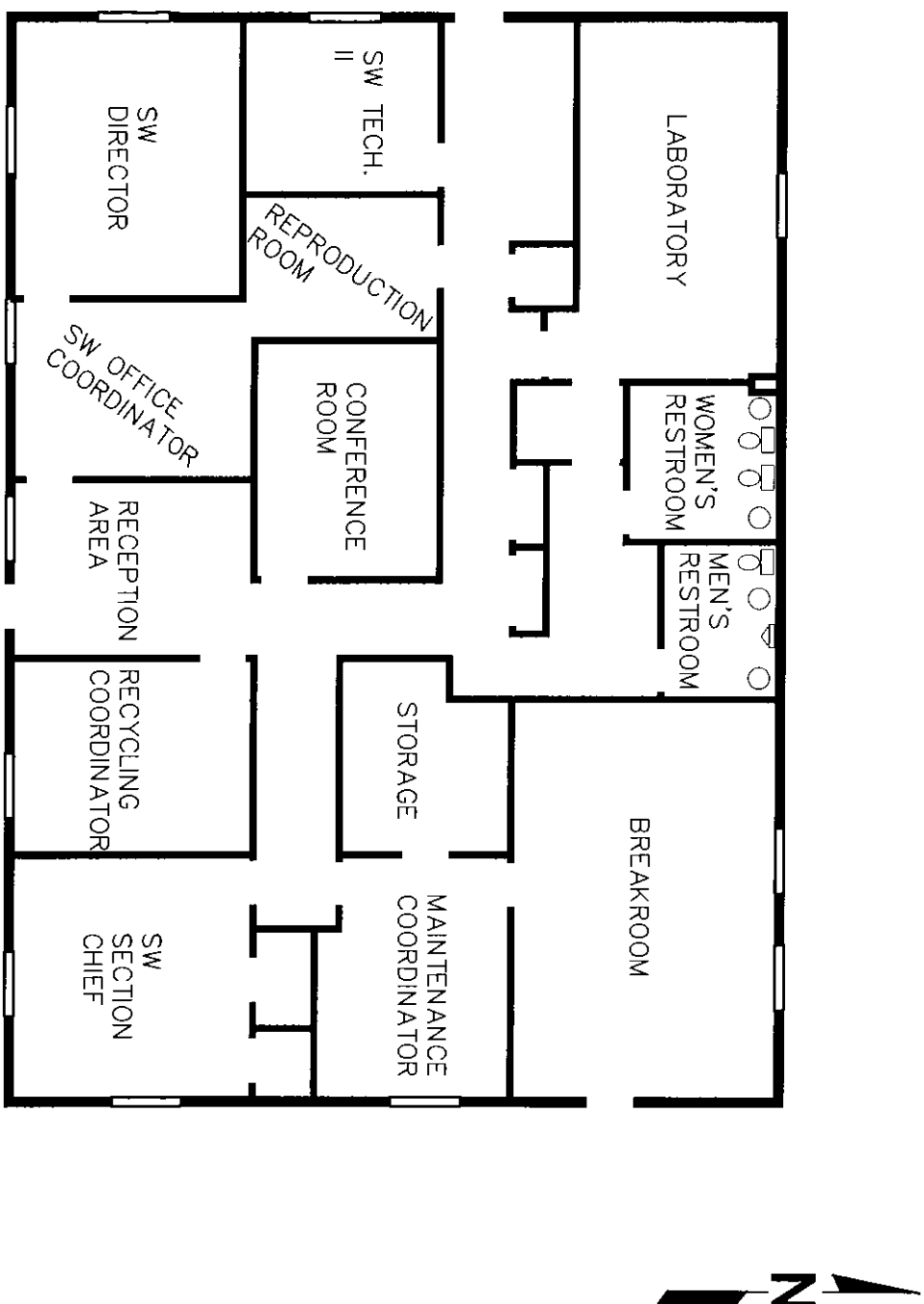


Figure 2. Administration Building Floor Plan

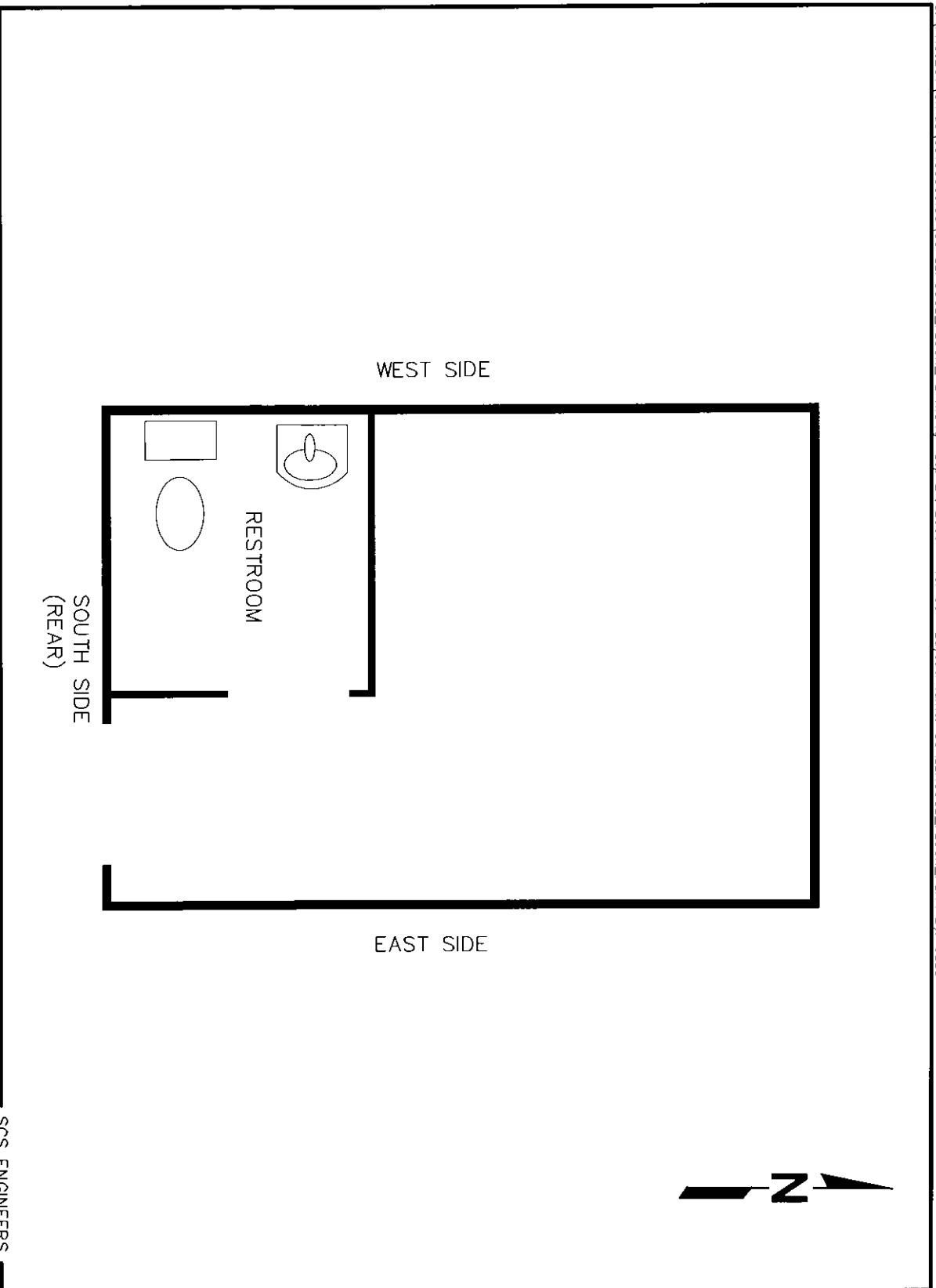


Figure 3. Scalehouse Floor Plan

**ATTACHMENT 2**  
**LFG MONITORING RESULTS**

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, THIRD QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	September 7, 2006
Project No.:	09199056.08	Weather:	Thunderstorms, 81F
Personnel:	I. McKoy (SCS)	Comments:	Barometric Pressure 29"
Method of Calibration:	calibration gas		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
GS-H3NR	0.0	0.6	19.6	79.8	
GS-G3N	0.0	0.6	19.6	79.8	
GS-F3N	0.0	0.7	19.7	79.6	
GS-E3N	0.0	0.1	19.7	80.2	
GS-D3N	0.0	0.3	19.5	80.2	
GS-C3N	0.0	0.5	19.4	80.1	
GS-B3N	0.0	0.7	19.4	79.9	
GS-A3N	0.0	0.3	19.6	80.1	
GS-L3W	0.0	0.3	19.5	80.2	
GS-J3W	0.0	2.2	17.9	79.9	
GS-K3W	0.0	0.4	19.6	80.0	
GS-I3W	0.0	1.6	18.2	80.2	
GS-I3WA	0.0	2.4	18.0	79.6	
GS-H3W	0.0	0.6	20.0	79.4	
GS-G3W	0.0	0.2	20.0	79.8	
GS-F3W	0.0	0.6	19.7	79.7	
GS-E3W	0.0	4.5	17.4	78.1	
GS-E3WA	0.0	2.3	18.3	79.4	
GS-D3W	0.0	4.5	17.1	78.4	
GS-C3W	0.0	4.6	17.8	77.6	
GS-B3W	0.0	3.5	17.8	78.7	
GS-A3W	0.0	3.0	17.9	79.1	
GS-A3S	0.0	0.0	20.4	79.6	
GS-B3S	0.0	0.0	20.6	79.4	
GS-C3S	0.0	9.6	13.1	77.3	
GS-D3S	0.0	5.3	15.6	79.1	
GS-E3S	0.0	5.7	14.0	80.3	
GS-F3S	0.0	5.0	14.7	80.3	
GS-G3S	0.0	4.8	15.0	80.2	
GS-H3S	0.0	0.9	18.4	80.7	
GS-1S	0.0	0.1	19.6	80.3	
GS-1E	5.6	13.7	8.0	72.7	
Interim Probes					
GS-1W	0.0	1.9	18.5	79.6	
GS-2W	0.0	1.3	19.0	79.7	
GS-2S	--	--	--	--	Probe Destroyed
GS-G3WA	0.0	0.8	19.5	79.7	
GS-3S	0.0	0.8	20.0	79.2	
GS-4S	0.0	0.3	20.0	79.7	
GS-5S	0.0	0.1	19.8	80.1	
GS-6S	0.0	3.9	15.7	80.4	
GS-7S	0.0	1.7	17.5	80.8	
GS-8S	0.0	0.2	19.9	79.9	
GS-9S	0.0	0.2	19.8	80.0	
GS-2E	11.3	21.3	1.8	65.6	
GS-3E	0.0	0.1	19.7	80.2	
GS-4E	0.0	0.5	19.8	80.0	

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, THIRD QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	<u>Citrus County Central Landfill</u>	Date:	<u>September 7, 2006</u>
Project No.:	<u>09199056.08</u>	Weather:	<u>Thunderstorms, 81F</u>
Personnel:	<u>I. McKoy (SCS)</u>	Comments:	<u>Barometric Pressure 29"</u>
Method of Calibration:	<u>calibration gas</u>		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
GS-A3E	0.3	3.2	16.7	79.8	
GS-B3E	0.0	9.6	11.6	78.8	
GS-C3E	0.0	5.3	14.1	80.6	
GS-D3E	0.0	4.2	17.7	78.1	
GS-E3E	0.0	8.8	14.1	77.1	
GS-F3E	0.0	0.2	19.3	80.5	
GS-G3E	0.0	1.1	18.9	80.0	
GS-H6E	0.0	1.0	19.6	79.4	
GS-I3E	0.0	1.1	18.5	80.4	
GS-J3E	0.1	0.2	19.5	80.2	
GS-K6E	0.0	0.8	19.3	79.9	
GS-L3E	0.0	3.9	18.1	78.0	
GS-M10E	6.7	8.8	14.2	70.3	
GS-M15E	32.5	25.2	4.5	37.8	
GS-M25E	46.5	27.6	3.7	22.2	
GS-N6E	0.3	0.2	19.2	80.3	
GS-O3E	0.0	9.5	15.5	75.0	
GS-P10E	0.0	1.6	18.2	80.2	
GS-P15E	0.0	0.3	19.2	80.5	
GS-Q6E	0.1	2.7	18.0	79.2	
GS-R3E	0.0	1.9	18.0	80.1	
GS-S10E	2.4	2.0	18.7	76.9	
GS-S15E	40.2	28.4	4.4	27.0	
GS-S25E	42.1	31.9	1.2	24.8	
GS-T6E	0.0	0.6	19.2	80.2	
GS-U3E	0.0	1.4	19.0	79.6	
GS-V6E	0.0	0.1	19.5	80.4	
GS-W3ER	0.0	2.1	18.6	79.3	
GS-X3E	0.0	0.8	19.6	79.6	



**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, THIRD QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	September 7, 2006
Project No.:	09199056.08	Weather:	Thunderstorms, 81F
Personnel:	I. McKoy (SCS)	Comments:	Barometric Pressure 29"
Method of Calibration:	calibration gas		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Comments
Probes at Proposed Property Boundary					
GP-1	0.0	3.5	17.1	79.4	
GP-2	0.0	0.3	19.6	80.1	
GP-3	0.0	0.7	18.9	80.5	
GP-4	0.0	0.1	20.2	79.7	
GP-5	0.0	0.2	20.0	79.8	
GP-6	0.0	0.1	20.3	79.5	
GP-7	0.0	0.1	19.8	79.6	
GP-8	0.0	0.3	19.9	79.8	
GP-9	0.0	1.0	19.6	79.4	
GP-10	0.0	0.8	19.2	80.0	
GP-11	0.0	0.5	19.2	80.3	
GP-12	0.0	0.1	20.1	79.8	
GP-13	0.0	0.1	20.1	79.7	
GP-14	0.0	0.1	20.2	79.7	
GP-15	0.0	0.0	19.9	80.1	
GP-16	--	--	--	--	Completely submerged under water
GP-17	0.0	0.2	19.9	80.0	
GP-18	0.0	0.1	19.8	80.1	

On Site	CH <sub>4</sub> (%)	% LEL
Scalehouse	0.0	0.0
Shop	0.0	0.0
Office	0.0	0.0
Treatment	0.0	0.0
Firing Range	0.0	0.0

Notes:

- 1 : % Lower Explosive Limit (LEL) of methane (CH<sub>4</sub>) is 5%.
- 2 : On-site structions can not exceed 25% LEL (25% LEL = 1.25% CH<sub>4</sub>) per Rule 62-701.530(1)(a), F.A.C.
- 3 : CH<sub>4</sub> at the landfill property boundary can not exceed the LEL of 5% CH<sub>4</sub> per Rule 62-701.530(1)(b), F.A.C.
- 4 : Page 1 of the table includes only the wells along the north, west, and south of the 60-acre closed landfill, as well as the interim probes near Phase 1.
- 5 : The wells on page 2 are located along the east side of the 60-acre closed landfill, and not at the facility property boundary.
- 6 : Wells GS-1E and GS-1S are located adjacent to the Phase 1 landfill.
- 7 : The probes on page 3 are located on the outside of the property boundary located along the North-West, West, South and East sides of the site.

**Analytical Results Summary for Landfill Gas Monitoring Samples Collected at Class I Landfill**

Facility Name -- Citrus Central Landfill

Sampling Frequency -- Quarterly

County -- Citrus

	%LEL	%LEL	%LEL	%LEL	%LEL	%LEL	%LEL	%LEL			Methane
	1/27/2005	1/27/2005	2/14/2005	4/22/2005	8/24/2005	11/16/2005	2/26/2006	6/21/2006			Date Sampled
	2/2/2005	2/16/2005	4/4/2005	5/12/2005	8/29/2005	1/19/2006	3/22/2006	7/7/2006			Date Received
Gas Monitoring			1/30/1900		9/7/2005	9/21/2006	9/22/2006	9/22/2006			Date Reviewed
Point Id		30.05	30.13	30.02		30.13	30.16	30.12			Barometric Pressure
East of 60 acres:											Notes
GS-2E	102	102	74	92	144	156	178	184			temporary LFG probe
GS-3E		26	16	20		76	92	6			temporary LFG probe
GS-4E		0	NR	0		0	0	0			temporary LFG probe
GS-A3E		NR	0	2		0	0	0			
GS-B3E		NR	0	0		0	0	0			
GS-C3E		NR	0	0		0	0	0			
GS-D3E		NR	0	0		0	0	0			
GS-E3E		NR	0	0		0	0	0			
GS-F3E		NR	0	6		0	0	0			
GS-G3E		NR	0	0		0	0	0			
GS-H6E		NR	0	0		60	0	72			
GS-I3E		NR	0	0		0	0	0			
GS-J3E		NR	334	0		372	0	16			
GS-K6E		NR	4	0		0	0	94			
GS-L3E		NR	0	0		0	0	0			
GS-M10E		NR	2	10		6	4	10			
GS-M15E		NR	330	470		214	212	356			
GS-M25E		NR	394	1122		832	0	762			
GS-N6E		NR	0	0		0	0	283			
GS-O3E		NR	0	0		0	0	0			
GS-P10E		NR	38	0		278	0	74			
GS-P15E		NR	0	0		0	0	0			
GS-Q6E		NR	514	398		320	0	426			
GS-R3E		NR	0	0		0	0	0			
GS-S2E		NR									temporary LFG probe
GS-S2E		NR									temporary LFG probe
GS-S2E		NR									temporary LFG probe
GS-S3E		NR									temporary LFG probe
GS-S10E		NR	0	62		16	0	0			
GS-S15E		NR	414	400		492	402	532			
GS-S25E		NR	488	558		426	868	584			
GS-T6E		NR	454	0		370	0	18			
GS-U3E		NR	0	0		0	0	0			
GS-V6E		NR	0	0		0	0	0			
GS-W3E		NR									
GS-W3ER			0	0		0	0	0			
GS-X3E		NR	0	0		0	0	0			
North of 60 acres:											
GS-A3N		NR	0	0		0	0	0			
GS-B3N		NR	0	0		0	0	0			
GS-C3N		NR	0	0		0	0	0			
GS-D3N		NR	0	0		0	0	0			
GS-E3N		NR	0	0		0	0	0			
GS-F3N		NR	0	0		0	0	0			
GS-G3N		NR	0	0		0	0	0			
GS-H3NR		NR	0	0		0	0	0			
West of 60 acres:											
GS-1W		0		0		0	0	0			temporary LFG probe
GS2W		0		0		0	0	0			temporary LFG probe
GS-A3W		0	0	0		0	0	0			
GS-B3W		0	0	0		0	0	0			
GS-C3W		0	0	0		0	0	0			
GS-D3W		0	0	0		0	0	0			
GS-E3W		0	4	18		0	0	0			
GS-E3WA		0	0	0		0	0	0			
GS-F3W		0	0	0		0	0	0			
GS-G3W		10	6	0		30	0	0			
GS-G3WA		0	0	0		0	0	0			
GS-H3W		0	0	0		0	0	0			
GS-I3W		0	0	26		0	0	0			
GS-I3WA		0	0	0		2	0	0			
GS-J3W		0	0	0		0	0	0			
GS-K3W		0	0	0		0	0	0			
GS-L3W		0	0	0		0	0	0			

**Analytical Results Summary for Landfill Gas Monitoring Samples Collected at Class I Landfill**

Facility Name -- Citrus Central Landfill

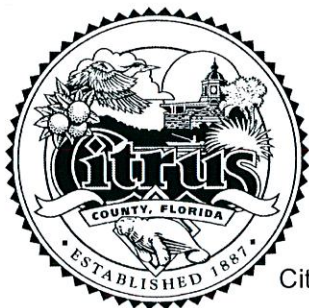
Sampling Frequency -- Quarterly

County -- Citrus

	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL			Methane
	1/27/2005	1/27/2005	2/14/2005	4/22/2005	8/24/2005	11/16/2005	2/26/2006	6/21/2006			Date Sampled
	2/2/2005	2/16/2005	4/4/2005	5/12/2005	8/29/2005	1/19/2006	3/22/2006	7/7/2006			Date Received
Gas Monitoring			1/30/1900		9/7/2005	9/21/2006	9/22/2006	9/22/2006			Date Reviewed
Point Id		30.05	30.13	30.02		30.13	30.16	30.12			Barometric Pressure
South of 60 acres:											
GS-2S		damaged		damaged		damaged	damaged	damaged			temporary LFG probe
GS-3S		494		460		378	558	640			temporary LFG probe
GS-4S		4		0		0	0	0			temporary LFG probe
GS-5S		NR				218	916	228			temporary LFG probe
GS-5Sa		322		810							
GS-5Sb		924		378							
GS-6S		0		0		0	0	0			temporary LFG probe
GS-7S		0		0		0	0	0			temporary LFG probe
GS-8S		0		0		0	0	0			temporary LFG probe
GS-9S		0		0		0	0	0			temporary LFG probe
GS-A3S		0	0	0		0	0	0			
GS-B3S		0	0	0		0	0	0			
GS-C3S		0	0	0		0	0	0			
GS-D3S		0	0	0		0	0	0			
GS-E3S		0	0	0		0	0	0			
GS-F3S		0	0	0		0	0	0			
GS-G3S		0	0	0		0	0	0			
GS-H3S		0	0	0		0	0	0			
GS-S2S		NR									temporary LFG probe
GS-S2S											temporary LFG probe
GS-S2S											temporary LFG probe
GS-S2S											temporary LFG probe
Assessment Gas Probes (per paragraph 10 and Exhibit B of Consent Order No. 05-1078):											
GP-1							0	0			GP-1 through GP-18
GP-2							0	0			installed 11/14/05 to 12/22/05
GP-3							0	0			
GP-4							0	0			
GP-5							0	0			
GP-6							0	0			
GP-7							0	0			
GP-8							0	0			
GP-9							0	0			
GP-10							0	0			
GP-11							0	0			
GP-12							0	0			
GP-13							0	0			
GP-14							0	0			
GP-15							0	0			
GP-16							0	0			
GP-17							0	0			
GP-18							0	0			
80 Acre Points:											
GS-1E		0	0	218	206	224	94	8			
GS-1S		0	0	48		0	0	0			
at Leachate Plant:											
Ele. Rm.		NR	0	0		0	0	0			
at Scalehouse:			0	0		0	0	0			
point One		NR									
point Two		NR									
point Three		NR									
at Firing Range						0	0	0			
at Admin. Bldg:											
SHOP		NR	0	0		0	0	0			
OFFICE		NR	0	0		0	0	0			

NR=Not Received

21375 ✓



**Board of County Commissioners**  
**DEPARTMENT OF PUBLIC WORKS**  
**SOLID WASTE MANAGEMENT DIVISION**

P.O. Box 340, Lecanto, Florida 34460  
Telephone: (352) 527-7670 FAX: (352) 527-7672  
email: landfillinfo@bocc.citrus.fl.us  
TDD Telephone: (352) 527-5303

Citrus Springs/Dunnellon/Inglis/Yankeetown area Toll Free (352) 489-2120

July 3, 2006

Susan J. Pelz, P.E.  
Solid Waste Section  
Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637-0926

Dept. of Environmental  
Protection

JUL 07 2006

Re: Citrus County Central Landfill  
Permit No. 21375-008-SO/01  
Landfill gas monitoring results

Southwest District

Dear Ms. Pelz:

The attached report was prepared by SCS Engineers for the County and reports the results of gas monitoring for the 2nd quarter of 2006. This monitoring is in accordance with Specific Conditions F2 and F3 of the referenced permit. Methane was detected in concentrations that violate standards in probe GS 2E only.

The report of the gas migration investigation required by Consent Agreement OGC Case No 05-1078 has been submitted to your office. The changes to the current monitoring locations proposed in that report will be implemented after the permit modification is approved. Monitoring at both the locations contained in the existing permit and in the proposed locations will be included in the monitoring program in the interim. No other actions are proposed at this time.

We are still in the process of working with Forestry and State Lands to obtain the sublease extension that will be needed before we can modify the permit. We have sent all of the information for donation of land to State Lands, which is one of the terms of obtaining the sublease. We have not heard back from them as yet as to their timetable for executing the sublease and transfer of property.

Please contact me if you have questions or require additional information.

Yours truly,

*Susan J. Metcalfe*

Susan Metcalfe, P.G.  
Director

SM

Attachment

CC: Glenn W. McCracken, Director, Public Works Department (w/o attachments)  
John Banks, SCS Engineers, Tampa (w/o attachments)

GAS RESULTS  
2nd Qtr  
7/7/06

Printed on Recycled Paper



**SCS ENGINEERS**

June 28, 2006  
File No. 09199056.08

Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

Subject: Landfill Gas Monitoring Report, Second Quarter 2006  
Central Landfill, Citrus County, Florida

Dear Susie:

SCS Engineers (SCS) is submitting to you the results of the second quarter landfill gas (LFG) monitoring at Citrus County Central Landfill. SCS conducted this monitoring in accordance with our scope of services dated December 9, 2003. Provided below is a description of our activities, summary of the monitoring results, and recommendations.

**BACKGROUND**

The site has 62 permanent LFG monitoring probes, 60 of which surround the closed 60-acre landfill. The remaining two permanent probes are located to the south and to the east of the Phase 1 landfill area. Of the 60 probes around the closed landfill, 29 are located to the east of the closed landfill, between the toe of the landfill and the main access road. The others are spaced fairly evenly across the north, west, and south sides of the closed landfill near the fence line. Several probes are located outside the fence line to the west and south of the property.

As part of the County's gas migration investigation, three interim monitoring probes were installed on the eastern and southern perimeters of the Phase 1 landfill area in October 2003. An additional 10 interim monitoring probes were installed in July 2004 as part of a supplemental gas migration investigation.

Attachment 1 includes a site map that shows the LFG monitoring probe locations. Interim monitoring probe GS-2S, which was located on the south end of Phase 1, was previously destroyed by landfill maintenance activities and has not been replaced.

In November and December of 2005, eighteen permanent monitoring probes were installed along the proposed property boundary of the site. Once the property boundary agreement is established with the Florida Division of Forestry, the new 18 monitoring probes will be the only LFG compliance points at the site; the remaining 62 permanent LFG probes and 12 interim probes will be abandoned in place.





Rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires the following:

- The methane concentration in on- or off-site structures may not exceed 25 percent of the lower explosive limit (LEL). The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on- or off-site structures is 1.25 percent methane by volume.
- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent methane by volume).

This quarterly monitoring was conducted in accordance with Rule 62-701.530(2)(c), F.A.C.

## **MONITORING RESULTS**

On June 21, 2006, SCS personnel monitored the LFG monitoring probes and on-site structures. SCS used a Landtec GEM-500 gas monitor to measure gas composition in the monitoring probes and on-site structures. The GEM-500 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The instrument was calibrated prior to use and in the middle of the afternoon.

### **LFG Monitoring Probes**

SCS monitored the 92 permanent and interim monitoring probes for gas composition, and the resulting data are shown in the three-page Table 1 in Attachment 2. The readings obtained from the probes along the facility property line (i.e., those probes along the north, west and south sides of the closed landfill, and the five probes near Phase 1) are shown on Page 1 of Table 1. Page 2 of the same table includes the probes along the east side of the 60-acre closed facility. Page 3 of Table 1 shows the readings obtained from the 18 new probes along the proposed property boundary and readings taken at the structures.

### **Probes at Facility Perimeter--**

As shown on Page 1 of Table 1, methane exceeding the regulatory limit of five percent methane by volume was not detected in any of the permanent monitoring probes. Methane was detected in permanent perimeter probe GS-1E at a concentration of 0.4 percent.

Methane detected in the interim probes is summarized below. Note that of the interim probes at which methane was detected, only GS-2E and GS-3E are located at the facility property boundary.

- GS-3S: 32 percent methane by volume
- GS-5S: 11.4 percent methane
- GS-2E: 9.2 percent methane

- GS-3E: 0.3 percent methane

#### **Probes Along East Side of Closed Landfill--**

Page 2 of Table 1 presents the data collected from the 29 LFG monitoring probes along the east side of the 60-acre closed landfill. The methane concentration in these probes varied from zero to 38.1 percent by volume. Methane was detected in 12 of the 29 probes along the east side of the closed landfill. Of the twelve probes that contained methane, six of the probes contained greater than 5 percent methane. As stated in past quarterly reports and explained below, methane concentrations above the LEL are not considered regulatory exceedances in these probes since they are not located at the property boundary. These data indicate the presence of subsurface LFG at the edge of the landfill near facility structures such as the leachate treatment plant and scale house. However, monitoring at these on-site structures shows that LFG is not migrating into the buildings.

#### **Probes along the Proposed Property Boundary--**

Page 3 of Table 1 represents the data collected from the 18 new LFG monitoring probes spaced along the proposed facility property boundary. As part of the remedial investigation, the County is negotiating with the Division of Forestry to relocate the landfill property boundary. As stated above, once the boundary is expanded, these 18 probes will be the LFG monitoring compliance points for the facility. The data on Page 3 of Table 1 show that methane was not detected in any of the 18 monitoring probes.

#### **Monitoring of On-Site Structures**

No methane was detected in the scale house, administration building, leachate treatment facility, or firing range as shown in Table 1 of Attachment 1. Floor plans of the scale house and the administration building are included in Attachment 1.

SCS monitored in the restrooms of the administration building, as well as in select closets, the break room, conference room, and hallways. In the scale house, SCS monitored the main work area, cabinets, the restroom, and at electrical outlets. Monitoring of the leachate treatment facility included around the base of structures, at the control panel, and inside the electrical room.

At the firing range, SCS monitored the floor joints, electrical outlets, and the base of slabs or posts that penetrated the ground.

Ms. Susan Metcalfe, P.G.  
June 28, 2006  
Page 4

## CONCLUSIONS

One interim probe, GS-2E, along the eastern perimeter of the landfill exceeded the five percent methane by volume requirement, as stated above. The County was immediately notified by SCS personnel, and subsequently notified the Florida Department of Environmental Protection (FDEP) as stipulated in Rule 62-701.530(3)(a), F.A.C. The County previously submitted a LFG migration remediation plan, which has since been incorporated into Consent Agreement OGC File No. 05-1078, and the provisions of the plan are currently being implemented.

Regarding the 29 LFG monitoring probes along the east side of the 60-acre closed landfill, since these probes are not located at the property boundary; they are not considered compliance probes. A high methane concentration in any of these 29 probes does not necessarily demonstrate that the concentration of methane at the property boundary is above the regulatory limit of five percent by volume. Instead, these probes allow the County to identify if LFG is migrating laterally from the landfill, which might potentially pose a concern at on-site structures. No methane was detected in the administration building, scale house, or leachate treatment plant.

SCS is providing you two signed and sealed originals of this submittal. Please keep one for your files and forward the other to the FDEP Southwest District office at the following address:

Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, Florida 33637-0926

SCS appreciates the opportunity to assist you with this work. Please call us at (800) 569-9702 if you have any questions or would like additional information.

Sincerely,



Lindsey E. Kennelly, P.E.  
Project Engineer  
SCS ENGINEERS



John A. Banks, P.E.  
Project Director  
SCS ENGINEERS

LEK/JAB:lek

Attachments

**ATTACHMENT 1**  
**MONITORING LOCATIONS**

G:\PROJECT\Citrus\09199056.08\995608CostMonitorOriginal.dwg Jun 28, 2006 - 9:19am Layout Name: GasMonPlan By: 2226lek

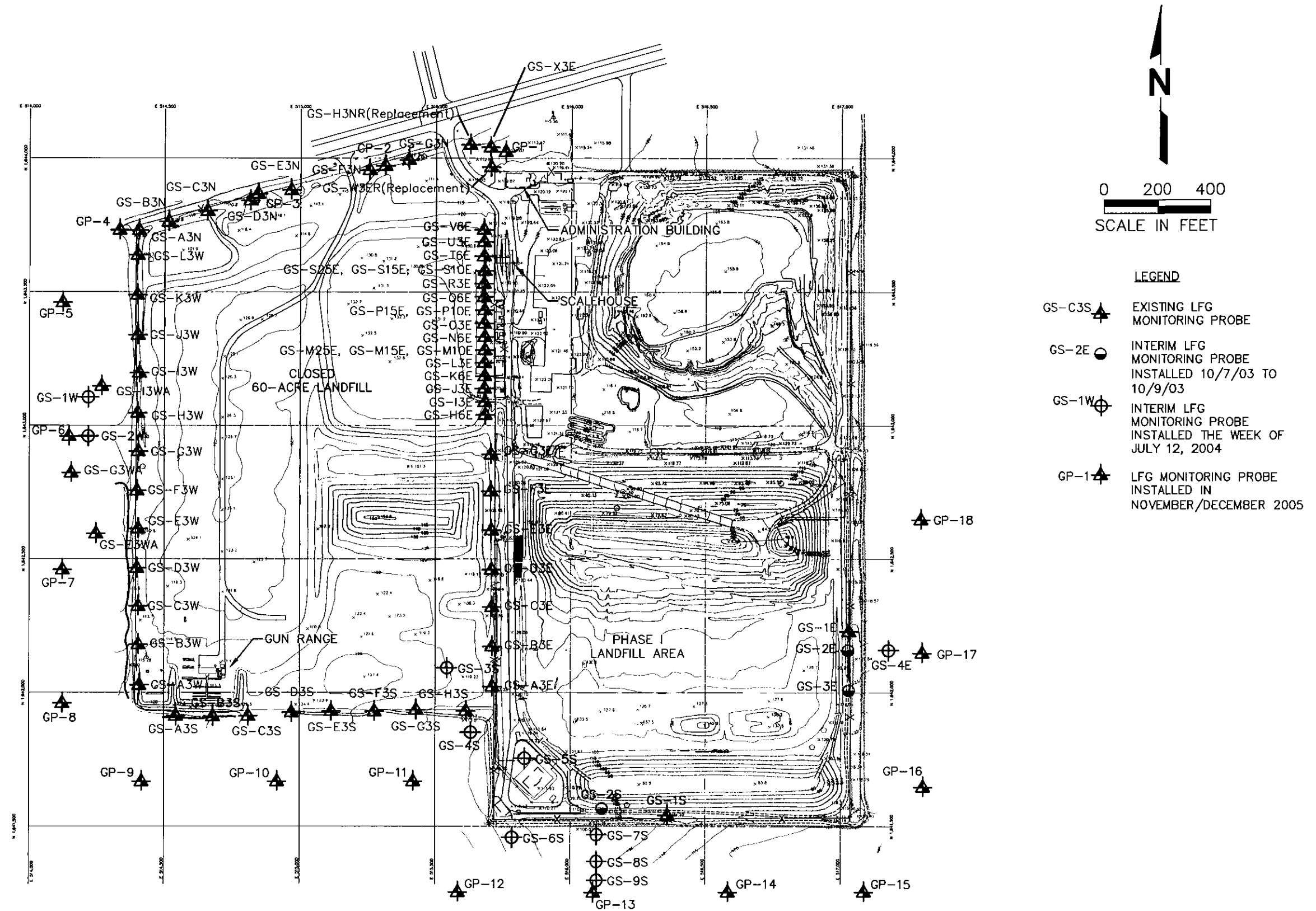
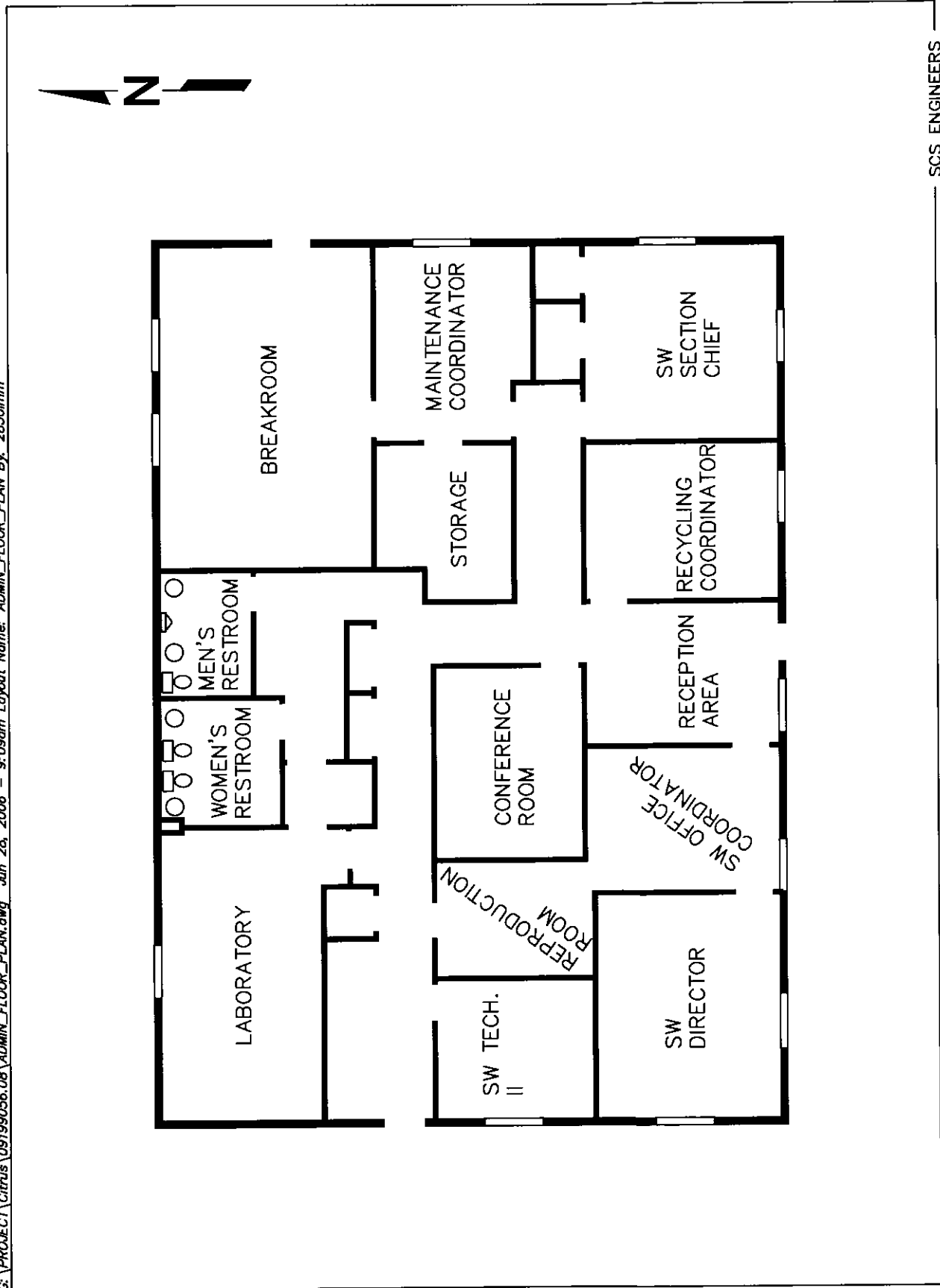


Figure 1. Landfill Gas Monitoring Probe Locations, Central Landfill, Citrus County, Florida



SCS ENGINEERS

Figure 2. Administration Floor Plan



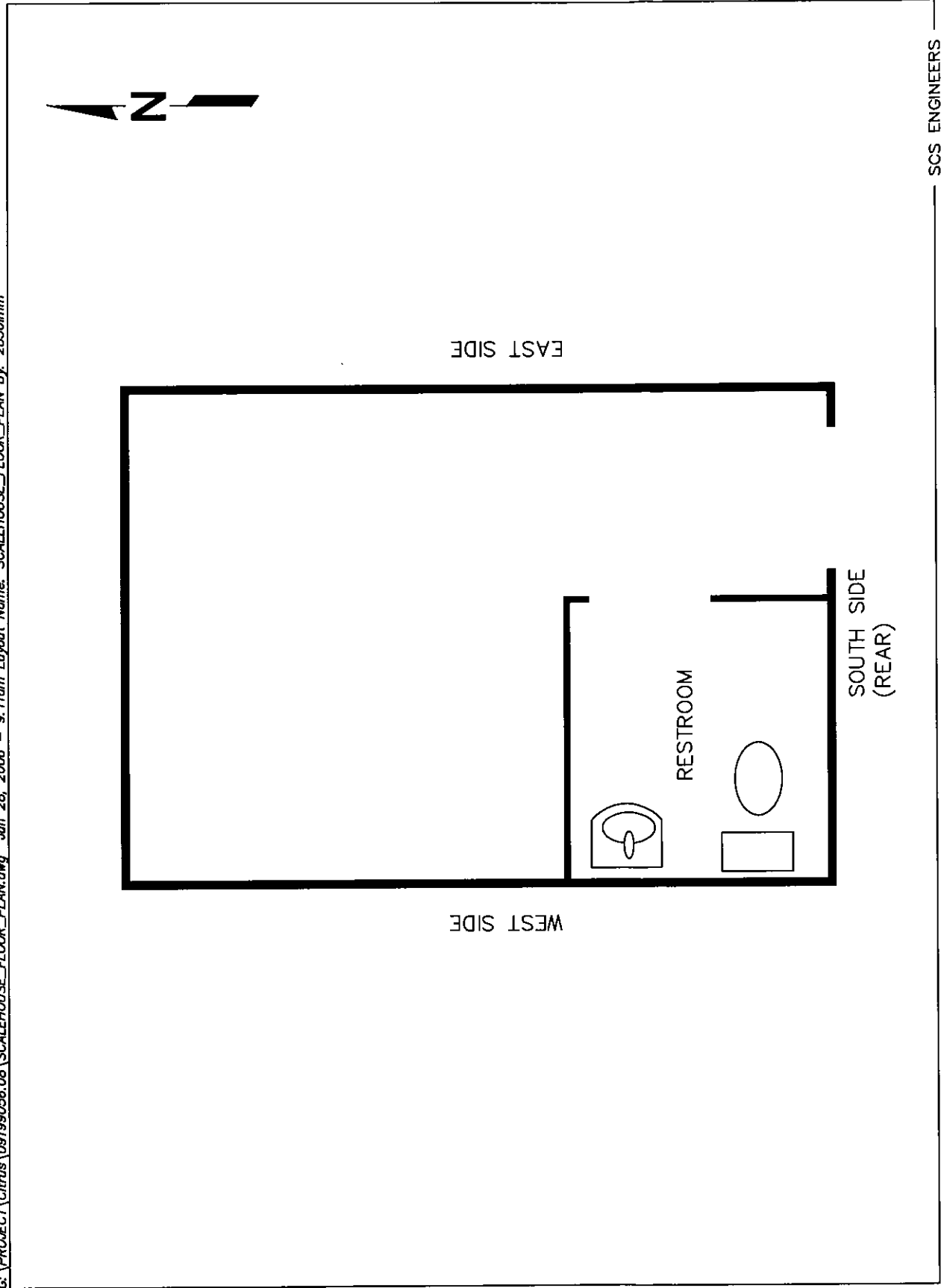


Figure 3. Scalehouse Floor Plan

**ATTACHMENT 2**  
**LFG MONITORING RESULTS**

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, SECOND QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	June 21, 2006
Project No.:	09199056.08	Weather:	Sunny, 93F
Personnel:	I. McKoy (SCS)	Comments:	Barometric Pressure 30.12"
Method of Calibration:	calibration gas		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GS-H3NR	0.0	0.3	19.4	80.3	0.0	
GS-G3N	0.0	0.3	19.3	80.4	0.0	
GS-F3N	0.0	0.8	19.6	79.6	0.0	
GS-E3N	0.0	0.0	20.4	79.6	0.0	
GS-D3N	0.0	0.3	19.8	79.9	0.0	
GS-C3N	0.0	0.5	19.8	79.7	0.0	
GS-B3N	0.0	0.6	19.9	79.5	0.0	
GS-A3N	0.0	0.3	20.1	79.6	0.0	
GS-I3W	0.0	1.2	19.3	79.5	0.0	
GS-J3W	0.0	1.6	18.5	79.9	0.0	
GS-K3W	0.0	0.3	19.9	79.8	0.0	
GS-I3W	0.0	7.6	12.2	80.2	0.0	
GS-I3WA	0.0	0.9	19.4	79.7	0.0	
GS-H3W	0.0	11.5	8.9	79.6	0.0	
GS-G3W	0.0	10.4	11.4	78.2	0.0	
GS-G3WA	0.0	0.9	20.0	79.1	0.0	
GS-F3W	0.0	12.1	8.2	79.7	0.0	
GS-E3W	0.0	12.9	6.8	80.3	0.0	
GS-E3WA	0.0	1.6	18.4	80.0	0.0	
GS-D3W	0.0	4.0	17.9	78.1	0.0	
GS-C3W	0.0	4.2	16.6	79.2	0.0	
GS-B3W	0.0	2.0	18.3	79.7	0.0	
GS-A3W	0.0	3.9	16.1	80.0	0.0	
GS-A3S	0.0	4.1	15.9	80.0	0.0	
GS-B3S	0.0	4.3	15.8	79.9	0.0	
GS-C3S	0.0	7.0	13.2	79.8	0.0	
GS-D3S	0.0	8.6	12.8	78.6	0.0	
GS-E3S	0.0	2.7	17.5	79.8	0.0	
GS-F3S	0.0	2.7	17.6	79.7	0.0	
GS-G3S	0.0	3.0	17.5	79.5	0.0	
GS-H3S	0.0	1.6	18.9	79.5	0.0	
GS-IS	0.0	4.4	11.9	83.7	0.0	
GS-IE	0.4	1.3	18.2	80.1	0.0	
Interim Probes						
GS-1W	0.0	0.6	19.3	80.1	0.0	
GS-2W	0.0	0.8	19.6	79.6	0.0	
GS-2S	--	--	--	--	--	Probe destroyed.
GS-3S	32.0	26.8	8.5	32.7	0.0	
GS-4S	0.0	3.2	18.5	78.3	0.0	
GS-5S	11.4	9.7	14.6	64.3	0.0	
GS-6S	0.0	3.7	15.8	80.5	0.0	
GS-7S	0.0	1.5	17.9	80.6	0.0	
GS-8S	0.0	0.3	19.6	80.1	0.0	
GS-9S	0.0	0.3	19.6	80.1	0.0	
GS-2E	9.2	19.2	1.7	69.9	0.0	
GS-3E	0.3	2.0	17.5	80.2	0.0	
GS-4E	0.0	2.2	15.1	82.7	0.0	

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, SECOND QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	June 21, 2006
Project No.:	09199056.08	Weather:	Sunny, 93F
Personnel:	I. McKoy (SCS)	Comments:	Barometric Pressure 30.12"
Method of Calibration:	calibration gas		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GS-A3E	0.0	0.9	19.8	79.3	0.0	
GS-B3E	0.0	5.0	16.7	78.3	0.0	
GS-C3E	0.0	3.6	17.1	79.3	0.0	
GS-D3E	0.0	5.0	15.1	79.9	0.0	
GS-E3E	0.0	4.6	16.3	79.1	0.0	
GS-F3E	0.0	0.6	20.0	79.4	0.0	
GS-G3E	0.0	1.0	19.4	79.6	0.0	
GS-H6E	3.6	17.1	0.4	78.9	0.0	
GS-I3E	0.0	1.8	19.0	79.2	0.0	
GS-J3E	0.8	4.3	17.1	77.8	0.0	
GS-K6E	4.7	13.8	6.1	75.4	0.0	
GS-L3E	0.0	1.8	18.8	79.4	0.0	
GS-M10E	0.5	1.3	18.9	79.3	0.0	
GS-M15E	17.8	14.6	9.4	58.2	0.0	
GS-M25E	38.1	24.5	3.7	33.7	0.0	
GS-N6E	14.4	16.4	9.5	59.7	0.0	
GS-O3E	0.0	1.7	19.0	79.3	0.0	
GS-P10E	3.7	7.4	14.0	74.9	0.0	
GS-P15E	0.0	0.6	20.0	79.4	0.0	
GS-Q6E	21.3	27.0	0.9	50.8	0.0	
GS-R3E	0.0	1.7	19.0	79.3	0.0	
GS-S10E	0.0	0.3	20.0	79.7	0.0	
GS-S15E	26.6	21.4	5.4	46.6	0.0	
GS-S25E	29.2	24.8	3.3	42.7	0.0	
GS-T6E	0.9	6.4	16.2	76.5	0.0	
GS-U3E	0.0	1.4	19.1	79.5	0.0	
GS-V6E	0.0	0.5	20.2	79.3	0.0	
GS-W3ER	0.0	1.7	18.0	80.3	0.0	
GS-X3E	0.0	0.9	19.2	79.9	0.0	

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, SECOND QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

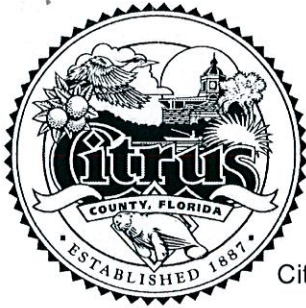
Project Name:	Citrus County Central Landfill	Date: June 21, 2006
Project No.:	09199056.08	Weather: Sunny, 93F
Personnel:	I. McKoy (SCS)	Comments: Barometric Pressure 30.12"
Method of Calibration:	calibration gas	

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
Probes at Proposed Property Boundary						
GP-1	0.0	2.6	17.2	80.2	0.0	
GP-2	0.0	0.2	20.3	79.5	0.0	
GP-3	0.0	0.2	19.4	80.4	0.0	
GP-4	0.0	1.2	19.0	79.8	0.0	
GP-5	0.0	0.6	19.8	79.6	0.0	
GP-6	0.0	0.8	19.7	79.5	0.0	
GP-7	0.0	0.2	19.9	79.9	0.0	
GP-8	0.0	0.3	19.5	80.2	0.0	
GP-9	0.0	0.7	19.4	79.9	0.0	
GP-10	0.0	0.7	19.8	79.5	0.0	
GP-11	0.0	0.7	19.3	80.0	0.0	
GP-12	0.0	1.0	18.6	80.4	0.0	
GP-13	0.0	0.9	16.8	82.3	0.0	
GP-14	0.0	0.7	18.7	80.6	0.0	
GP-15	0.0	0.8	18.9	80.3	0.0	
GP-16	0.0	0.3	19.4	80.3	0.0	
GP-17	0.0	0.8	18.6	80.6	0.0	
GP-18	0.0	0.6	19.0	80.4	0.0	

On-Site Structures	CH <sub>4</sub> (%)	% LEL <sup>1</sup>
Scale House	0.0	0.0
Shop	0.0	0.0
Office	0.0	0.0
Firing Range	0.0	0.0
Treatment	0.0	0.0

Notes:

- 1 : % Lower Explosive Limit (LEL) of methane (CH<sub>4</sub>) is 5%.
- 2 : On-site structures can not exceed 25% LEL (25% LEL = 1.25% CH<sub>4</sub>) per F.A.C. 62-701.530(1)(a).
- 3 : CH<sub>4</sub> at the landfill property boundary can not exceed the LEL of 5% CH<sub>4</sub> per F.A.C. 62-701.530(1)(b).
- 4 : Page 1 of the table includes only the wells along the north, west, and south of the 60-acre closed landfill, as well as the interim probes near Phase 1.
- 5 : The wells on page 2 are located along the east side of the 60-acre closed landfill, and not at the facility property boundary.
- 6 : Wells GS-1E and GS-1S are located adjacent to the Phase 1 landfill.



**Board of County Commissioners**  
**DEPARTMENT OF PUBLIC WORKS**  
**SOLID WASTE MANAGEMENT DIVISION**

P.O. Box 340, Lecanto, Florida 34460  
Telephone: (352) 527-7670 FAX: (352) 527-7672  
email: landfillinfo@bocc.citrus.fl.us  
TDD Telephone: (352) 527-5303  
Citrus Springs/Dunnellon/Inglis/Yankeetown area Toll Free (352) 489-2120

21375

March 17, 2006

Susan J. Pelz, P.E. *3/23/06*  
Solid Waste Section  
Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637-0926

Re: Citrus County Central Landfill  
Permit No. 21375-008-SO/01  
Landfill gas monitoring results



Dear Ms. Pelz:

The attached report was prepared by SCS Engineers for the County and reports the results of gas monitoring for the 1st quarter of 2006. This monitoring is in accordance with Specific Conditions F2 and F3 of the referenced permit. Methane was detected in concentrations that violate standards in probe GS 2E only.

The report of the gas migration investigation required by Consent Agreement OGC Case No 05-1078 has been submitted to your office. The changes to the current monitoring locations proposed in that report will be implemented after the permit modification is approved. We are still in the process of working with Forestry and State Lands to obtain the sublease extension that will be needed before we can modify the permit. No other actions are proposed at this time. Monitoring will continue according to the current permit requirements in the interim.

Please contact me if you have questions or require additional information.

Yours truly,

*Susan Metcalfe*

Susan Metcalfe, P.G.  
Director

SM

CC: Glenn McCracken, Director, Public Works Department  
John Banks, SCS Engineers, Tampa

GAS RESULTS  
1st Qtr  
3/22/06



**SCS ENGINEERS**

March 15, 2006  
File No. 09199056.08

Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

Subject: Landfill Gas Monitoring Report, First Quarter 2006  
Central Landfill, Citrus County, Florida

Dear Susie:

SCS Engineers (SCS) is submitting to you the results of the first quarter landfill gas (LFG) monitoring at Citrus County Central Landfill. SCS conducted this monitoring in accordance with our scope of services dated December 9, 2003. Provided below is a description of our activities, summary of the monitoring results, and recommendations.

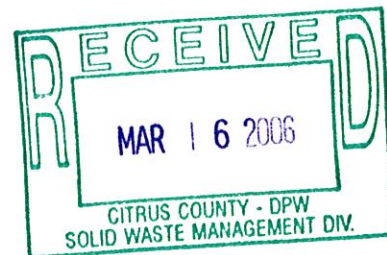
**BACKGROUND**

The site has 62 permanent LFG monitoring probes, 60 of which surround the closed 60-acre landfill. The remaining two permanent probes are located to the south and to the east of the Phase 1 landfill area. Of the 60 probes around the closed landfill, 29 are located to the east of the closed landfill, between the toe of the landfill and the main access road. The others are spaced fairly evenly across the north, west, and south sides of the closed landfill near the fence line. Several probes are located outside the fence line to the west and south of the property.

As part of the County's gas migration investigation, three interim monitoring probes were installed on the eastern and southern perimeters of the Phase 1 landfill area in October 2003. An additional 10 interim monitoring probes were installed in July 2004 as part of a supplemental gas migration investigation.

Attachment 1 includes a site map that shows the LFG monitoring probe locations. Interim monitoring probe GS-2S, which was located on the south end of Phase 1, was previously destroyed by landfill maintenance activities and has not been replaced.

In November and December of 2005, eighteen permanent monitoring probes were installed along the proposed property boundary of the site. Once the property boundary agreement is established with the Florida Division of Forestry, the new 18 monitoring probes will be the only LFG compliance points at the site; the remaining 62 permanent LFG probes and 12 interim probes will be abandoned in place.



Rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires the following:

- The methane concentration in on- or off-site structures may not exceed 25 percent of the lower explosive limit (LEL). The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on- or off-site structures is 1.25 percent methane by volume.
- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent methane by volume).

This quarterly monitoring was conducted in accordance with Rule 62-701.530(2)(c), F.A.C.

## **MONITORING RESULTS**

On February 24, 2006, SCS personnel monitored the LFG monitoring probes and on-site structures. SCS used a Landtec GEM-500 gas monitor to measure gas composition in the monitoring probes and on-site structures. The GEM-500 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The instrument was calibrated prior to use and in the middle of the afternoon.

### **LFG Monitoring Probes**

SCS monitored the 92 permanent and interim monitoring probes for gas composition, and the resulting data are shown in the three-page Table 1 in Attachment 2. The readings obtained from the probes along the facility property line (i.e., those probes along the north, west and south sides of the closed landfill, and the five probes near Phase 1) are shown on Page 1 of Table 1. Page 2 of the same table includes the probes along the east side of the 60-acre closed facility. Page 3 of Table 1 shows the readings obtained from the 18 new probes along the proposed property boundary and readings taken at the structures.

### **Probes at Facility Perimeter--**

As shown on Page 1 of Table 1, methane exceeding the regulatory limit of five percent methane by volume was not detected in any of the permanent monitoring probes. Methane was detected in permanent perimeter probe GS-1E at a concentration of 4.7 percent.

Methane detected in the interim probes is summarized below. Note that of the interim probes at which methane was detected, only GS-2E and GS-3E are located at the facility property boundary.

- GS-3S: 27.9 percent methane by volume
- GS-5S: 45.8 percent methane

- GS-2E: 8.9 percent methane
- GS-3E: 4.6 percent methane

#### **Probes Along East Side of Closed Landfill--**

Page 2 of Table 1 presents the data collected from the 29 LFG monitoring probes along the east side of the 60-acre closed landfill. The methane concentration in these probes varied from zero to 43.4 percent by volume. Methane was detected in 4 of the 29 probes along the east side of the closed landfill. Of the four probes that contained methane, three of the probes contained greater than 5 percent methane. As stated in past quarterly reports and explained below, methane concentrations above the LEL are not considered regulatory exceedances in these probes since they are not located at the property boundary. These data indicate the presence of subsurface LFG at the edge of the landfill near facility structures such as the leachate treatment plant and scale house. However, monitoring at these on-site structures shows that LFG is not migrating into the buildings.

#### **Probes along the Proposed Property Boundary--**

Page 3 of Table 1 represents the data collected from the 18 new LFG monitoring probes spaced along the proposed facility property boundary. As part of the remedial investigation, the County is negotiating with the Division of Forestry to relocate the landfill property boundary. As stated above, once the boundary is expanded, these 18 probes will be the LFG monitoring compliance points for the facility. The data on Page 3 of Table 1 show that methane was not detected in any of the 18 monitoring probes.

#### **Monitoring of On-Site Structures**

No methane was detected in the scale house, administration building, leachate treatment facility, or firing range as shown in Table 1 of Attachment 1. Floor plans of the scale house and the administration building are included in Attachment 1.

SCS monitored in the restrooms of the administration building, as well as in select closets, the break room, conference room, and hallways. In the scale house, SCS monitored the main work area, cabinets, the restroom, and at electrical outlets. Monitoring of the leachate treatment facility included around the base of structures, at the control panel, and inside the electrical room.

At the firing range, SCS monitored the floor joints, electrical outlets, and the base of slabs or posts that penetrated the ground.

Ms. Susan Metcalfe, P.G.  
March 15, 2006  
Page 4

## **EAGLE NEST DETERMINATION**

During the site visit, SCS met with a representative from the Division of Forestry regarding the eagle nest located to the south of the active landfill on Forestry property. The nest which was deemed active, with two eaglets present. The Division of Forestry representative witnessed SCS monitoring GP-14 and GP-15, which are within the primary zone of the nest, to determine if the monitoring was too intrusive to the eagles. During the monitoring, the eagles did not appear disturbed. The Division of Forestry representative authorized SCS to monitor the LFG monitoring probes, but requested that a vehicle not be driven in the primary zone of the nest.

## **CONCLUSIONS**

One interim probe, GS-2E, along the eastern perimeter of the landfill exceeded the five percent methane by volume requirement, as stated above. The County was immediately notified by SCS personnel, and subsequently notified the Florida Department of Environmental Protection (FDEP) as stipulated in Rule 62-701.530(3)(a), F.A.C. The County previously submitted a LFG migration remediation plan, which has since been incorporated into Consent Agreement OGC File No. 05-1078, and the provisions of the plan are currently being implemented.

Regarding the 29 LFG monitoring probes along the east side of the 60-acre closed landfill, since these probes are not located at the property boundary; they are not considered compliance probes. A high methane concentration in any of these 29 probes does not necessarily demonstrate that the concentration of methane at the property boundary is above the regulatory limit of five percent by volume. Instead, these probes allow the County to identify if LFG is migrating laterally from the landfill, which might potentially pose a concern at on-site structures. No methane was detected in the administration building, scale house, or leachate treatment plant.

SCS is providing you two signed and sealed originals of this submittal. Please keep one for your files and forward the other to the FDEP Southwest District office at the following address:

Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, Florida 33637-0926

Ms. Susan Metcalfe, P.G.  
March 15, 2006  
Page 5

SCS appreciates the opportunity to assist you with this work. Please call us at (800) 569-9702 if you have any questions or would like additional information.

Sincerely,

A handwritten signature in blue ink that reads "Lindsey Kennelly". The signature is fluid and cursive, with the first name "Lindsey" and last name "Kennelly" clearly distinguishable.

Lindsey E. Kennelly, E.I.T.  
Project Engineer

A handwritten signature in blue ink that reads "Ray J. Dever". The signature is cursive and stylized, with the first name "Ray" and last name "Dever" clearly distinguishable.

Raymond J Dever, P.E., DEE  
Vice President  
SCS ENGINEERS

LEK/RJD:lek

Attachments

**ATTACHMENT 1**  
**MONITORING LOCATIONS**



G:\PROJECT\Citrus\09199056.08\995608GasMonOriginal.dwg Mar 14, 2006 - 4:44pm Layout Name: GasMonPlan Br. 22261ek

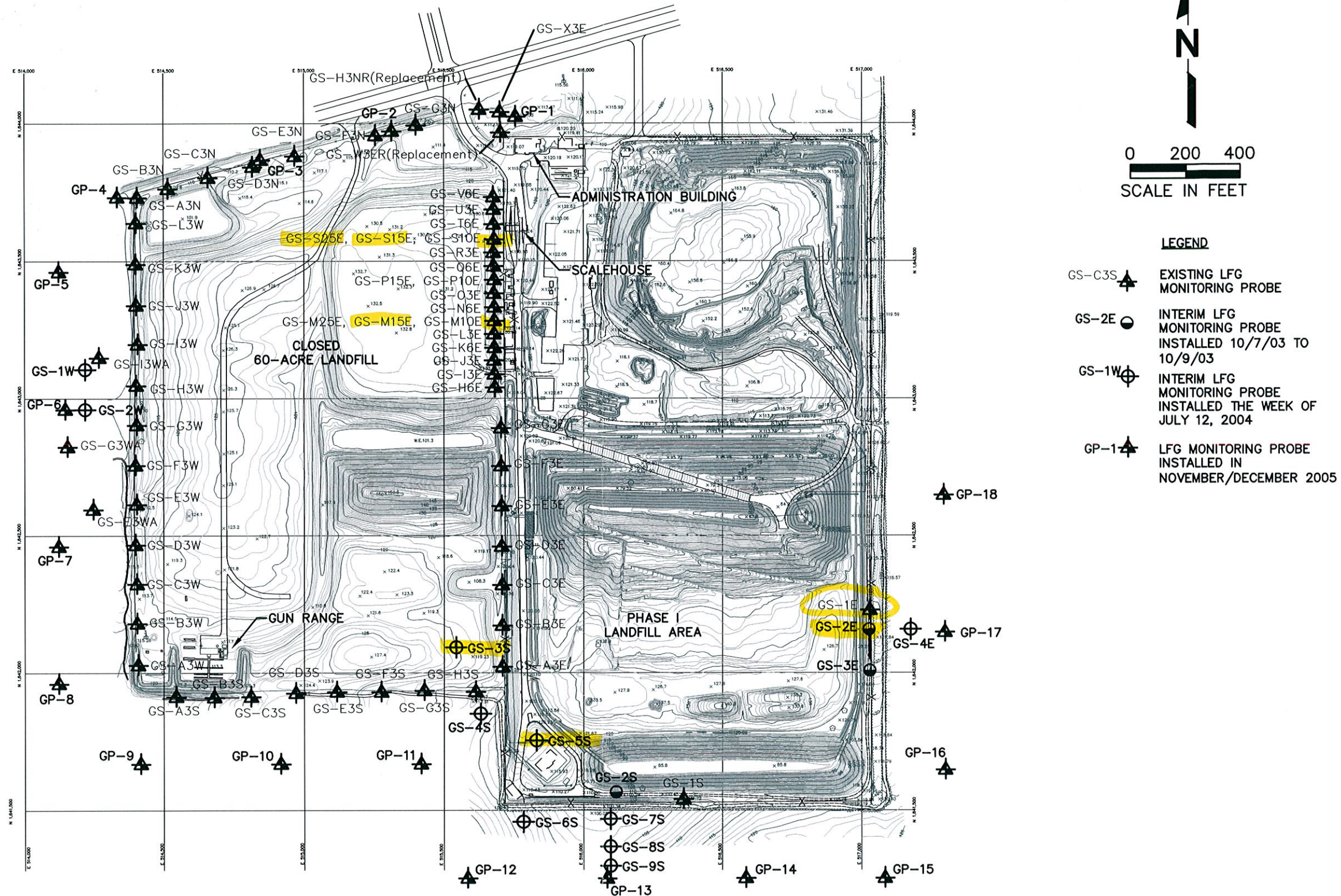


Figure 1. Landfill Gas Monitoring Probe Locations, Central Landfill, Citrus County, Florida



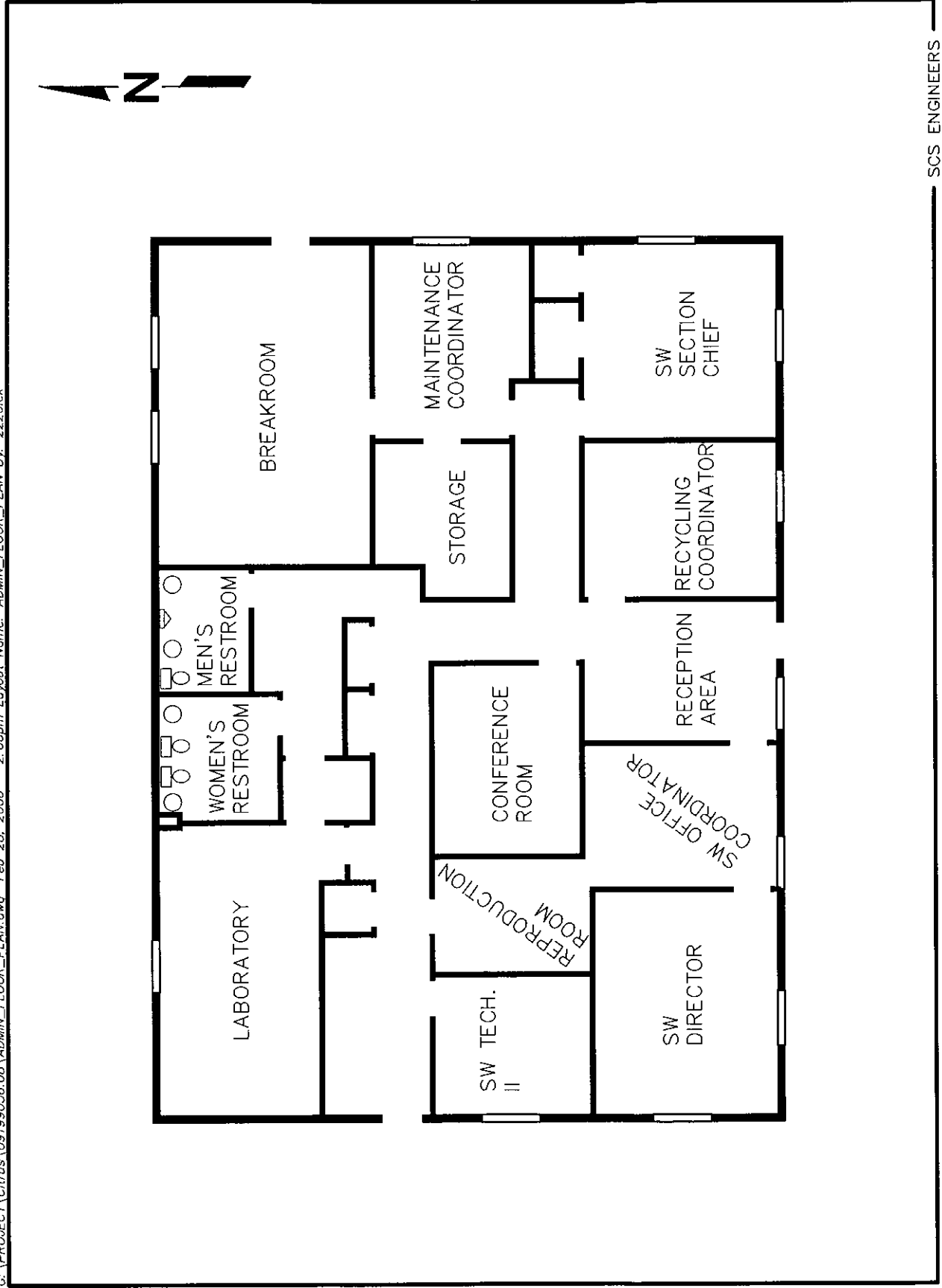


Figure 2. Administration Floor Plan

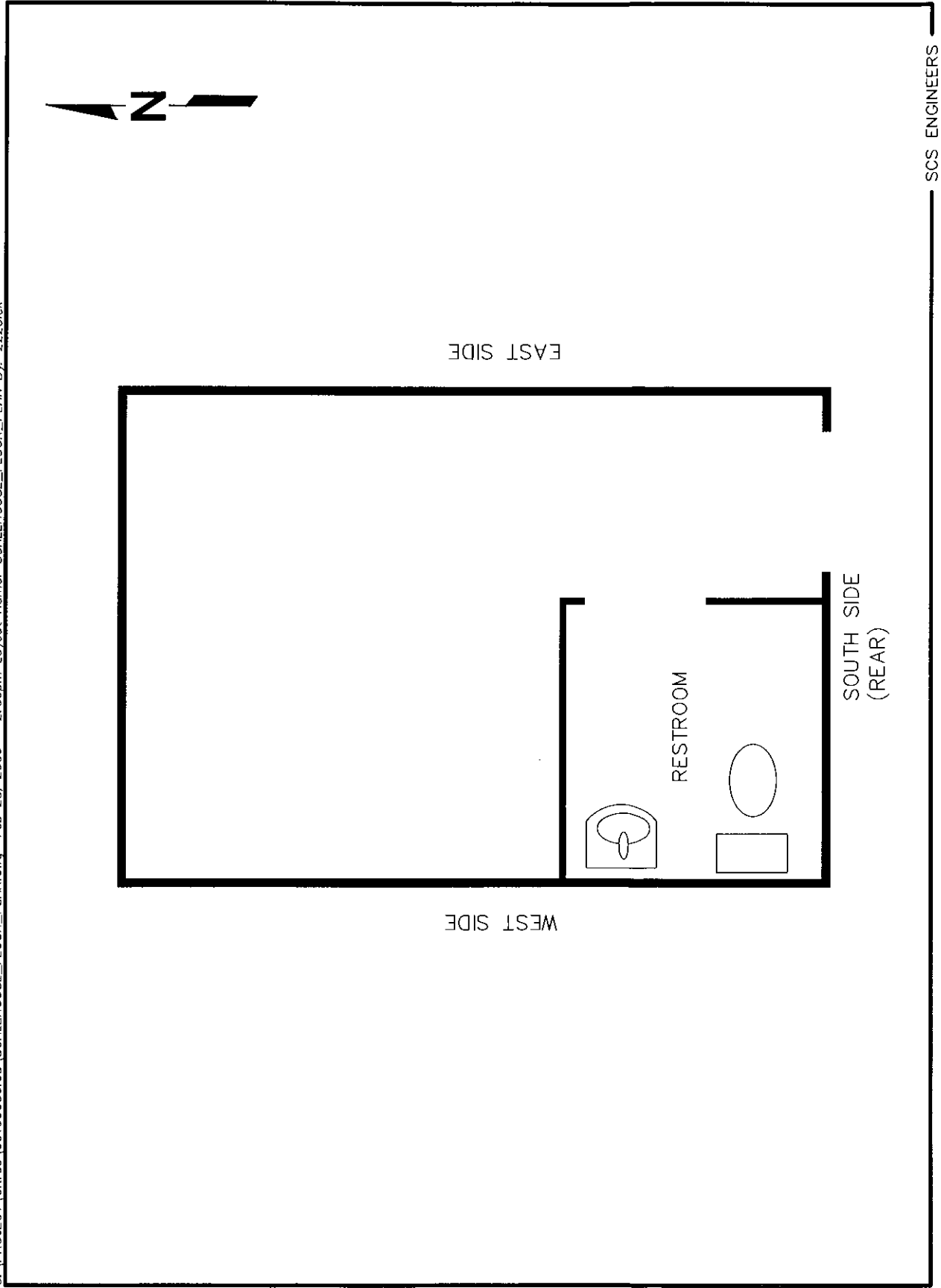


Figure 3. Scalehouse Floor Plan

**ATTACHMENT 2**  
**LFG MONITORING RESULTS**

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, FIRST QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	February 24, 2006
Project No.:	09199056.08	Weather:	Partially Cloud, Breezy, 61F
Personnel:	L. Kennelly (SCS)	Comments:	Barometric Pressure 30.16"
Method of Calibration:	calibration gas		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GS-H3NR	0.0	0.4	20.8	78.8	0.0	
GS-G3N	0.0	0.4	20.8	78.8	0.0	
GS-F3N	0.0	0.4	20.8	78.8	0.0	
GS-E3N	0.0	0.0	20.9	79.1	0.0	
GS-D3N	0.0	0.3	20.9	78.8	0.0	
GS-C3N	0.0	0.3	20.9	78.8	0.0	
GS-B3N	0.0	0.4	20.9	78.7	0.0	
GS-A3N	0.0	0.2	20.9	78.9	0.0	
GS-L3W	0.0	0.4	20.8	78.8	0.0	
GS-J3W	0.0	1.5	19.7	78.8	0.0	
GS-K3W	0.0	0.4	20.8	78.8	0.0	
GS-I3W	0.0	2.8	18.7	78.5	0.0	
GS-I3WA	0.0	2.2	19.2	78.6	0.0	
GS-H3W	0.0	3.4	18.6	78.0	0.0	
GS-G3W	0.0	3.9	18.2	77.9	0.0	
GS-G3WA	0.0	0.7	20.4	78.9	0.0	
GS-F3W	0.0	2.8	19.3	77.9	0.0	
GS-E3W	0.0	3.5	17.8	78.7	0.0	
GS-E3WA	0.0	1.6	19.9	78.5	0.0	
GS-D3W	0.0	2.5	19.3	78.2	0.0	
GS-C3W	0.0	3.8	18.2	78.0	0.0	
GS-B3W	0.0	0.7	20.7	78.6	0.0	
GS-A3W	0.0	2.2	19.2	78.6	0.0	
GS-A3S	0.0	3.2	18.3	78.5	0.0	
GS-B3S	0.0	3.1	18.5	78.4	0.0	
GS-C3S	0.0	4.4	17.5	78.1	0.0	
GS-D3S	0.0	3.1	18.9	78.0	0.0	
GS-E3S	0.0	2.8	19.2	78.0	0.0	
GS-F3S	0.0	1.4	20.3	78.3	0.0	
GS-G3S	0.0	1.9	19.8	78.3	0.0	
GS-H3S	0.0	1.2	20.4	78.4	0.0	
GS-1S	0.0	5.2	14.8	80.0	0.0	
GS-1E	4.7	18.6	0.3	76.4	0.0	
Interim Probes						
GS-1W	0.0	2.2	19.2	78.6	0.0	
GS-2W	0.0	1.9	19.5	78.6	0.0	
GS-2S	--	--	--	--	--	Probe destroyed.
GS-3S	27.9	22.0	7.6	42.5	0.0	
GS-4S	0.0	2.5	18.9	78.6	0.0	
GS-5S	45.8	35.4	0.0	18.8	0.0	
GS-6S	0.0	4.6	16.3	79.1	0.0	
GS-7S	0.0	3.1	16.8	80.1	0.0	
GS-8S	0.0	0.3	20.7	79.0	0.0	
GS-9S	0.0	0.5	20.4	79.1	0.0	
GS-2E	8.9	19.3	1.4	70.4	0.0	
GS-3E	4.6	17.3	1.1	77.0	0.0	
GS-4E	0.0	3.3	14.6	82.1	0.0	

**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, FIRST QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	February 24, 2006
Project No.:	09199056.08	Weather:	Partially Cloud, Breezy, 61F
Personnel:	L. Kennelly (SCS)	Comments:	Barometric Pressure 30.16"
Method of Calibration:	calibration gas		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GS-A3E	0.0	0.1	21.0	78.9	0.0	
GS-B3E	0.0	2.5	19.7	77.8	0.0	
GS-C3E	0.0	1.5	20.4	78.1	0.0	
GS-D3E	0.0	2.0	20.0	78.0	0.0	
GS-E3E	0.0	1.8	20.2	78.0	0.0	
GS-F3E	0.0	0.1	21.0	78.9	0.0	
GS-G3E	0.0	0.6	20.8	78.6	0.0	
GS-H6E	0.0	1.6	19.8	78.6	0.0	
GS-I3E	0.0	0.7	20.7	78.6	0.0	
GS-J3E	0.0	0.7	20.8	78.5	0.0	
GS-K6E	0.0	1.0	20.7	78.3	0.0	
GS-L3E	0.0	1.2	20.8	78.0	0.0	
GS-M10E	0.2	0.8	20.6	78.4	0.0	
GS-M15E	10.6	10.2	14.2	65.0	0.0	
GS-M25E	0.0	0.5	20.7	78.8	0.0	
GS-N6E	0.0	3.4	20.1	76.5	0.0	
GS-O3E	0.0	2.6	19.3	78.1	0.0	
GS-P10E	0.0	0.5	20.8	78.7	0.0	
GS-P15E	0.0	0.9	20.8	78.3	0.0	
GS-Q6E	0.0	1.6	20.2	78.2	0.0	
GS-R3E	0.0	1.1	20.1	78.8	0.0	
GS-S10E	0.0	0.2	20.9	78.9	0.0	
GS-S15E	20.1	12.8	12.5	54.6	0.0	
GS-S25E	43.4	31.8	1.4	23.4	0.0	
GS-T6E	0.0	0.6	20.4	79.0	0.0	
GS-U3E	0.0	1.3	20.4	78.3	0.0	
GS-V6E	0.0	0.1	20.7	79.2	0.0	
GS-W3ER	0.0	1.2	20.3	78.5	0.0	
GS-X3E	0.0	0.8	20.5	78.7	0.0	



**TABLE 1**  
**LANDFILL GAS MIGRATION MONITORING, FIRST QUARTER 2006**  
**CENTRAL LANDFILL, CITRUS COUNTY**

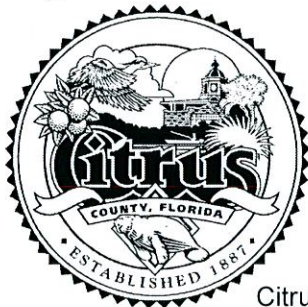
Project Name:	Citrus County Central Landfill	Date:	February 24, 2006
Project No.:	09199056.08	Weather:	Partially Cloud, Breezy, 61F
Personnel:	L. Kennelly (SCS)	Comments:	Barometric Pressure 30.16"
Method of Calibration:	calibration gas		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
Probes at Proposed Property Boundary						
GP-1	0.0	2.4	19.5	78.1	0.0	
GP-2	0.0	0.0	20.9	79.1	0.0	
GP-3	0.0	0.1	20.9	79.0	0.0	
GP-4	0.0	2.1	19.7	78.2	0.0	
GP-5	0.0	1.0	20.3	78.7	0.0	
GP-6	0.0	3.1	18.7	78.2	0.0	
GP-7	0.0	2.2	19.5	78.3	0.0	
GP-8	0.0	0.4	20.5	79.1	0.0	
GP-9	0.0	0.5	20.5	79.0	0.0	
GP-10	0.0	5.6	14.3	80.1	0.0	
GP-11	0.0	0.4	20.5	79.1	0.0	
GP-12	0.0	1.7	19.7	78.6	0.0	
GP-13	0.0	0.1	20.7	79.2	0.0	
GP-14	0.0	0.3	20.6	79.1	0.0	
GP-15	0.0	0.2	20.9	78.9	0.0	
GP-16	0.0	1.4	20.0	78.6	0.0	
GP-17	0.0	2.0	19.2	78.8	0.0	
GP-18	0.0	0.0	20.8	79.2	0.0	

On-Site	CH <sub>4</sub>	% LEL <sup>1</sup>
Scale House	0.0	0.0
Shop	0.0	0.0
Office	0.0	0.0
Firing Range	0.0	0.0
Treatment	0.0	0.0

**Notes:**

- 1 : % Lower Explosive Limit (LEL) of methane (CH<sub>4</sub>) is 5%.
- 2 : On-site structions can not exceed 25% LEL (25% LEL = 1.25% CH<sub>4</sub>) per F.A.C. 62-701.530(1)(a).
- 3 : CH<sub>4</sub> at the landfill property boundary can not exceed the LEL of 5% CH<sub>4</sub> per F.A.C. 62-701.530(1)(b).
- 4 : Page 1 of the table includes only the wells along the north, west, and south of the 60-acre closed landfill, as well as the interim probes near Phasc 1.
- 5 : The wells on page 2 are located along the east side of the 60-acre closed landfill, and not at the facility property boundary.
- 6 : Wells GS-1E and GS-1S are located adjacent to the Phase 1 landfill.



**Board of County Commissioners**  
**DEPARTMENT OF PUBLIC WORKS**  
**SOLID WASTE MANAGEMENT DIVISION**

P.O. Box 340, Lecanto, Florida 34460

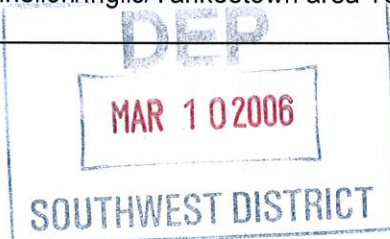
Telephone: (352) 527-7670 FAX: (352) 527-7672

email: landfillinfo@bocc.citrus.fl.us

TDD Telephone: (352) 527-5303

Citrus Springs/Dunnellon/Inglis/Yankeetown area Toll Free (352) 489-2120

March 7, 2006



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

**Re: Citrus County Central Landfill – Permit No. 21375-008-SO/01**  
**Landfill Gas Monitoring**

Dear Mr. Morgan,

Attached please find the letter from SCS Engineers which reports exceedences of the standard for methane concentration at the landfill boundary, as previously reported to you via e-mail 2/27/06.

The complete report will follow at a later date.

Sincerely,

Susan J. Metcalfe  
Director

CC: Cathy Winter, Contract Services Specialist  
30 day file

**SCS ENGINEERS**

February 28, 2006  
File No. 09199056.08

Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

Subject: Notification of Methane Monitoring Exceedance  
Central Landfill, Citrus County, Florida

Dear Susie:

During the first quarter landfill gas (LFG) monitoring at the Central Landfill, methane was detected at the property boundary in concentrations above the regulatory limit. As you know, the regulatory limit for methane concentration at the property boundary is 5 percent by volume. **SCS Engineers (SCS) detected methane concentrations of 8.9 percent by volume in LFG monitoring probe GS-2E, which is located on the east side of the open landfill.** No methane was detected in any of the on-site structures.

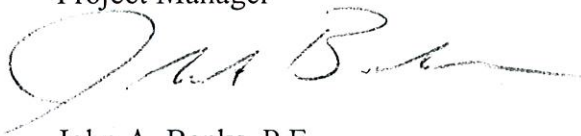
Please notify the Florida Department of Environmental Protection (FDEP) immediately that the monitoring results indicate a methane concentration of greater than five percent at the property boundary, and that a LFG remediation investigation is ongoing.

Please call us if you have any questions or need additional information.

Sincerely,

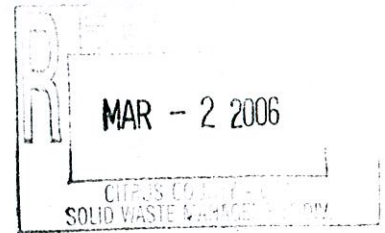


David H. Penoyer, P.E.  
Project Manager



John A. Banks, P.E.  
Project Director  
SCS ENGINEERS

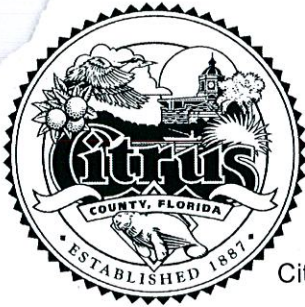
DHP/JAB:lek



References the  
1st Qtr 2006  
received 3/22/06  
sampled 2/24/06

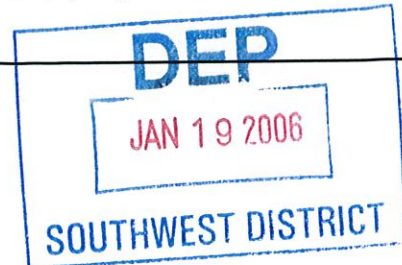






**Board of County Commissioners**  
**DEPARTMENT OF PUBLIC WORKS**  
**SOLID WASTE MANAGEMENT DIVISION**

P.O. Box 340, Lecanto, Florida 34460  
Telephone: (352) 527-7670 FAX: (352) 527-7672  
email: landfillinfo@bocc.citrus.fl.us  
TDD Telephone: (352) 527-5303  
Citrus Springs/Dunnellon/Ingles/Yankeetown area Toll Free (352) 489-2120



January 13, 2006

Susan J. Pelz, P.E. *8/23/06*  
Solid Waste Section  
Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637-0926

Re: Citrus County Central Landfill  
Permit No. 21375-008-SO/01  
Landfill gas monitoring results

Dear Ms. Pelz:

The attached report was prepared by SCS Engineers for the County and reports the results of gas monitoring for the 4<sup>th</sup> quarter of 2005. This monitoring is in accordance with Specific Conditions F2 and F3 of the referenced permit. Methane was detected in concentrations that violate standards in GS-1E and GS 2E.

The report of the gas migration investigation required by Consent Agreement OGC Case No 05-1078 was submitted to your office recently. The changes to the current monitoring locations proposed in that report will be implemented after the permit modification is approved. No other actions are proposed at this time. Monitoring will continue according to the current permit requirements in the interim.

Please contact me if you have questions or require additional information.

Yours truly,

*Susan Metcalfe*

Susan Metcalfe, P.G.  
Director

SM

CC: Glenn McCracken, Director, Public Works Department  
John Banks, SCS Engineers, Tampa

GAS RESULTS  
4th Qtr 05  
1/19/06

## SCS ENGINEERS

December 29, 2005  
File No. 09199056.08

Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

Subject: Landfill Gas Monitoring Report, Fourth Quarter 2005  
Central Landfill, Citrus County, Florida

Dear Susie:

SCS Engineers (SCS) is submitting to you the results of the fourth quarter landfill gas (LFG) monitoring at Citrus County Central Landfill. SCS conducted this monitoring in accordance with our scope of services dated December 9, 2003. Provided below is a description of our activities, summary of the monitoring results, and recommendations.

### BACKGROUND

The site has 62 permanent LFG monitoring probes, 60 of which surround the closed 60-acre landfill. The remaining two permanent probes are located to the south and to the east of the Phase 1 landfill area. Of the 60 probes around the closed landfill, 29 are located to the east of the closed landfill, between the toe of the landfill and the main access road. The others are spaced fairly evenly across the north, west, and south sides of the closed landfill near the fence line. Several probes are located outside the fence line to the west and south of the property.

As part of the County's gas migration investigation, three interim monitoring probes were installed on the eastern and southern perimeters of the Phase 1 landfill area in October 2003. An additional 10 interim monitoring probes were installed in July 2004 as part of a supplemental gas migration investigation.

Attachment 1 includes a site map that shows the LFG monitoring probe locations. Interim monitoring probe GS-2S, which was located on the south end of Phase 1, was previously destroyed by landfill maintenance activities and has not been replaced.

Rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires the following:

- The methane concentration in on- or off-site structures may not exceed 25 percent of the lower explosive limit (LEL). The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on- or off-site structures is 1.25 percent methane by volume.



- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent methane by volume).

This quarterly monitoring was conducted in accordance with Rule 62-701.530(2)(c), F.A.C.

## **MONITORING RESULTS**

On November 16, 2005, SCS personnel monitored the LFG monitoring probes and on-site structures. SCS used a Landtec GEM-500 gas monitor to measure gas composition in the monitoring probes and a Thermo Gas Tech Series GT402 to monitor on-site structures. The GEM-500 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The Gas Tech is a handheld instrument that measures combustible gas, among other hazardous gases, as a percentage of the LEL as well as on a parts per million (ppm) basis. Both instruments were calibrated prior to use.

### **LFG Monitoring Probes**

SCS monitored the 73 permanent and interim monitoring probes for gas composition, and the resulting data are shown in the two-page Table 1 in Attachment 2. The readings obtained from the probes along the facility property line (i.e., those probes along the north, west and south sides of the closed landfill, and the five probes near Phase 1) are shown on Page 1 of Table 1. Page 2 of the same table includes the probes along the east side of the 60-acre closed facility and readings taken at the structures.

### **Probes at Facility Perimeter--**

As shown on Page 1 of Table 1, methane exceeding the regulatory limit of five percent methane by volume was detected in permanent monitoring probe GS-1E. The methane reading in monitoring probe GS-1E was 11.2 percent. Methane was also detected in permanent perimeter probes GS-G3W, at a concentration of 1.5 percent, and GS-I3Wa, at a concentration of 0.1 percent, but these readings are below the regulatory limit.

Methane detected in the interim probes is summarized below. Note that of the interim probes at which methane was detected, only GS-2E and GS-3E are located at the facility property boundary.

- GS-3S: 18.9 percent methane by volume
- GS-5S: 10.9 percent methane
- GS-2E: 7.8 percent methane
- GS-3E: 3.8 percent methane



### **Probes Along East Side of Closed Landfill--**

Page 2 of Table 1 presents the data collected from the 29 LFG monitoring probes along the east side of the 60-acre closed landfill. The methane concentration in these probes varied from zero to 41.6 percent by volume. Methane was detected in 11 of the 29 probes along the east side of the closed landfill. Of the eleven probes that contained methane, eight of the probes contained greater than 5 percent methane. As stated in past quarterly reports and explained below, methane concentrations above the LEL are not considered regulatory exceedances in these probes since they are not located at the property boundary. These data indicate the presence of subsurface LFG at the edge of the landfill near facility structures such as the leachate treatment plant and scale house. However, monitoring at these on-site structures shows that LFG is not migrating into the buildings.

### **Monitoring of On-Site Structures**

No methane was detected in the scale house, administration building, leachate treatment facility, or firing range. The monitoring results are located in Table 1 of Attachment 1. Floor plans of the scale house and the administration building are included in Attachment 1.

SCS monitored in the restrooms of the administration building, as well as in select closets, the break room, conference room, and hallways. In the scale house, SCS monitored the main work area, cabinets, the restroom, and at electrical outlets. Monitoring of the leachate treatment facility included around the base of structures, at the control panel, and inside the electrical room.

At the firing range, SCS monitored the floor joints, electrical outlets, and the base of slabs or posts that penetrated the ground.

### **CONCLUSIONS**

One permanent probe, GS-1E and one interim probe, GS-2E, along the eastern perimeter of the landfill exceeded the five percent methane by volume requirement, as stated above. The County was immediately notified by SCS personnel, and subsequently notified the Florida Department of Environmental Protection (FDEP) as stipulated in Rule 62-701.530(3)(a), F.A.C. The County previously submitted a LFG migration remediation plan, which has since been incorporated into Consent Agreement OGC File No. 05-1078, and the provisions of the plan are currently being implemented.

Regarding the 29 LFG monitoring probes along the east side of the 60-acre closed landfill, since these probes are not located at the property boundary; they are not considered compliance probes. A high methane concentration in any of these 29 probes does not necessarily demonstrate that the concentration of methane at the property boundary is above the regulatory limit of five percent by volume. Instead, these probes allow the County to identify if LFG is

Ms. Susan Metcalfe, P.G.

December 29, 2005

Page 4

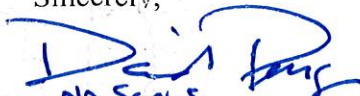
migrating laterally from the landfill, which might potentially pose a concern at on-site structures. No methane was detected in the administration building, scale house, or leachate treatment plant.

SCS is providing you two signed and sealed originals of this submittal. Please keep one for your files and forward the other to the FDEP Southwest District office at the following address:

Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, Florida 33637-0926

SCS appreciates the opportunity to assist you with this work. Please call us at (800) 569-9702 if you have any questions or would like additional information.

Sincerely,



NO. 56065  
12/29/05

David H. Penoyer, P.E.  
Project Manager



Raymond J Dever, P.E., DEE  
Vice President  
SCS ENGINEERS

DHP/RJD:lek

Attachments

**ATTACHMENT 1**  
**MONITORING LOCATIONS**



G:\PROJECT\Citrus\09199056.08\995608GasMonitorinal.dwg Jan 12, 2006 - 4:24pm Layout Name: GasMonPlan Br. 22261ek

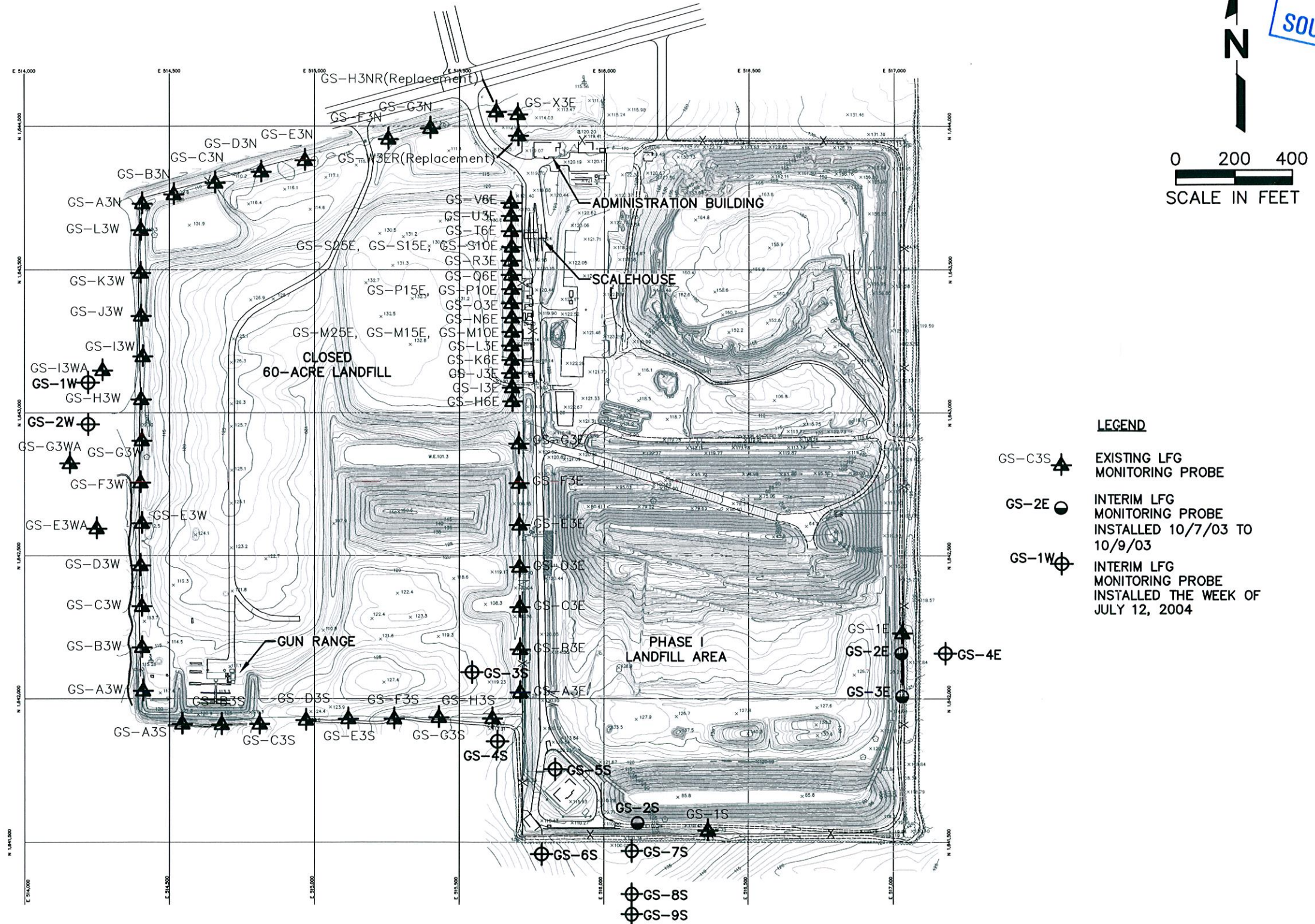


Figure 1. Landfill Gas Monitoring Probe Locations, Central Landfill, Citrus County, Florida

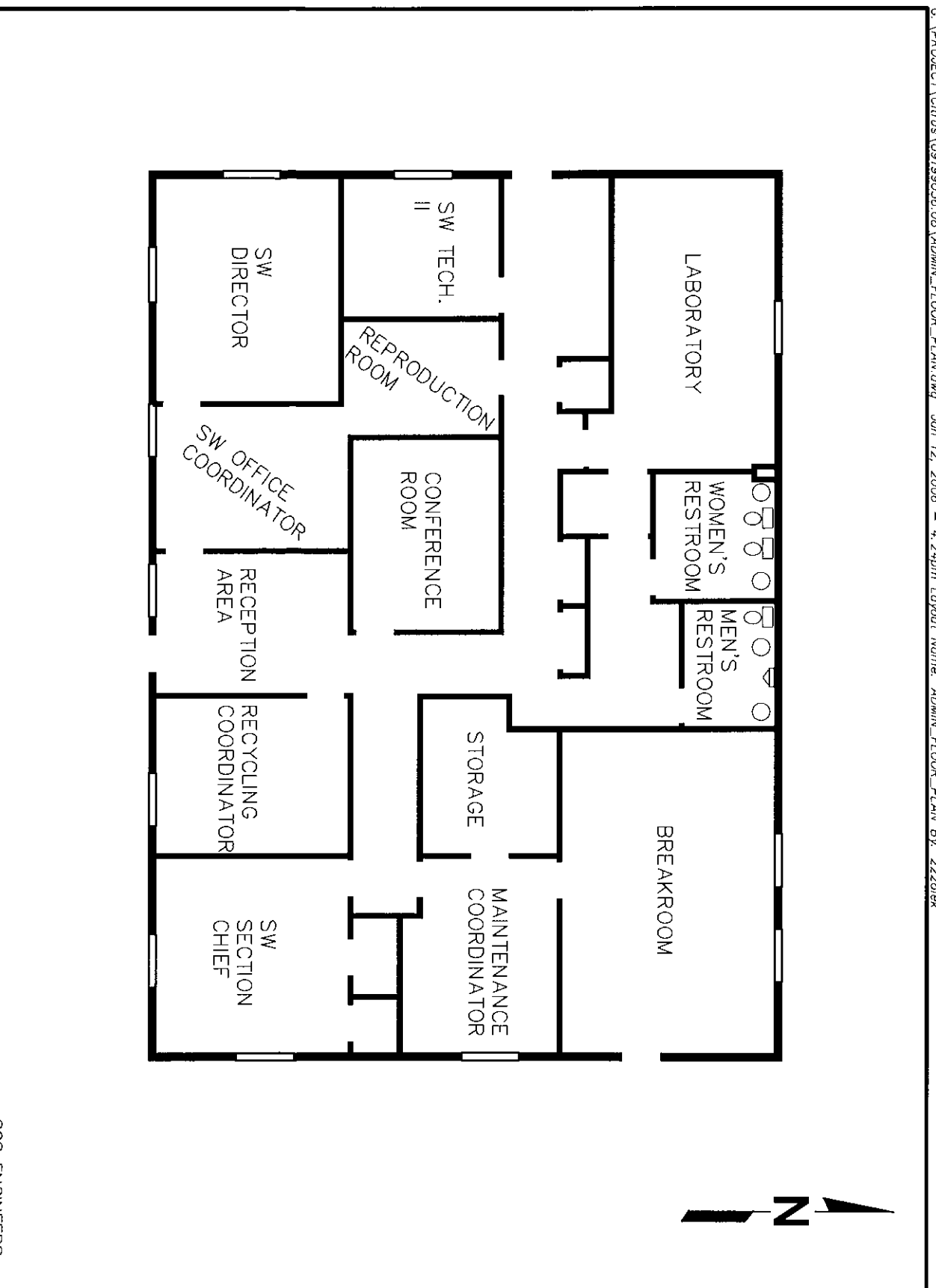


Figure 2. Administration Floor Plan

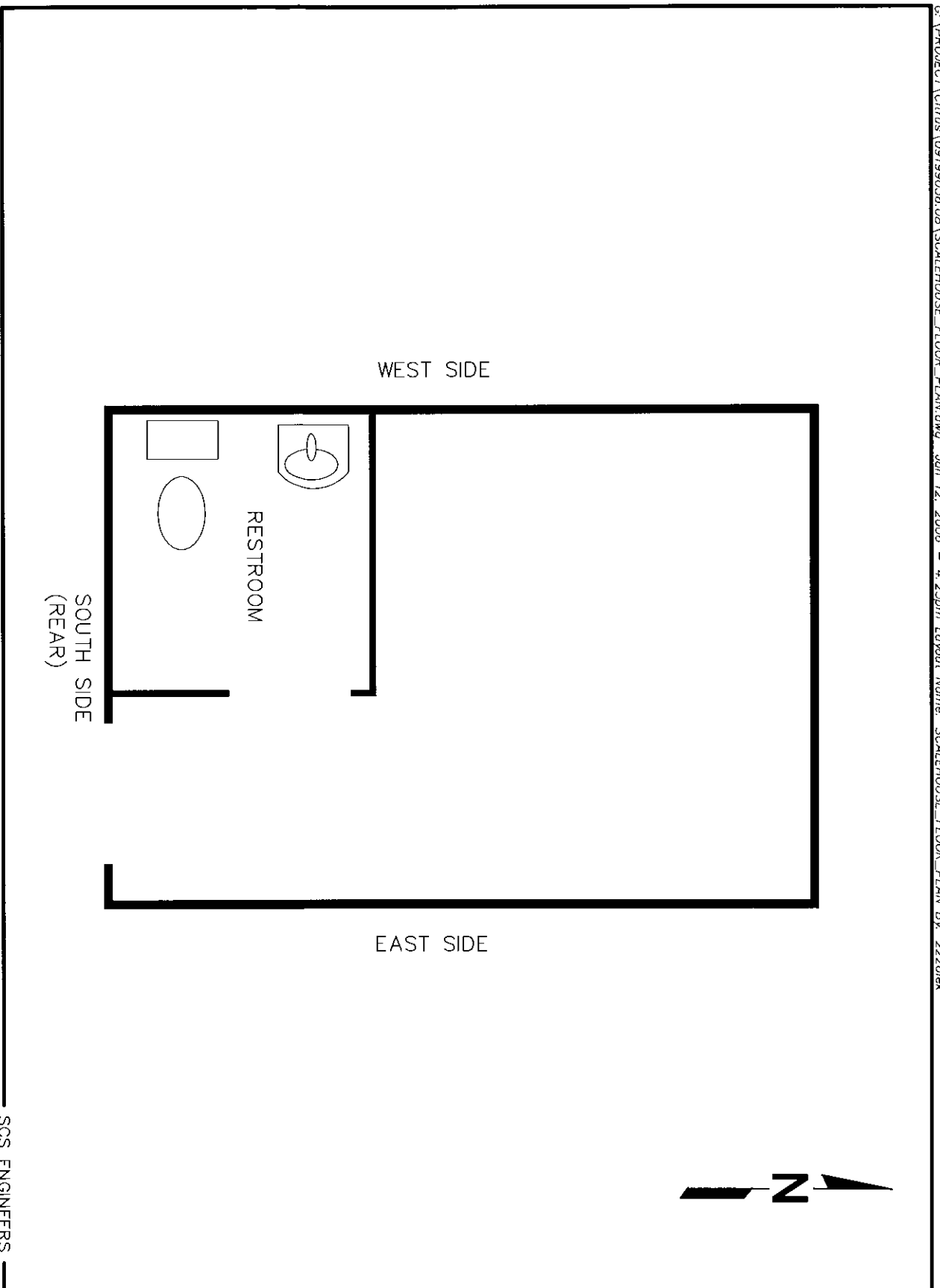


Figure 3. Scalehouse Floor Plan



**ATTACHMENT 2**  
**LFG MONITORING RESULTS**

**TABLE 1**  
**LANDFILL GAS MIGRATION INVESTIGATION**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	November 16, 2005
Project No.:	09199056.08	Weather:	Clear, 70° F
Personnel:	J. Bever (SCS)	Comments:	Barometric Pressure 30.13 inch
Method of Calibration:	calibration gas		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GS-H3NR	0.0	0.2	20.4	79.4	0.0	
GS-G3N	0.0	0.2	20.5	79.3	0.0	
GS-F3N	0.0	0.2	20.5	79.3	0.0	
GS-E3N	0.0	0.1	20.6	79.3	0.0	
GS-D3N	0.0	0.2	20.5	79.3	0.0	
GS-C3N	0.0	0.2	20.4	79.4	0.0	
GS-B3N	0.0	0.2	20.3	79.5	0.0	
GS-A3N	0.0	0.2	20.4	79.4	0.0	
GS-L3W	0.0	0.2	20.4	79.4	0.0	
GS-J3W	0.0	0.5	20.1	79.4	0.0	
GS-K3W	0.0	1.5	18.9	79.6	0.0	
GS-I3W	0.0	8.2	12.0	79.8	0.0	
GS-I3WA	0.1	1.8	19.1	79.0	0.0	
GS-H3W	0.0	5.4	14.5	80.1	0.0	
GS-G3W	1.5	5.4	13.9	79.2	0.2	
GS-G3WA	0.0	0.6	20.4	79.0	0.0	
GS-F3W	0.0	1.8	19.2	79.0	0.0	
GS-E3W	0.0	5.0	15.3	79.7	0.0	
GS-E3WA	0.0	1.5	19.5	79.0	0.0	
GS-D3W	0.0	2.0	18.8	79.2	0.0	
GS-C3W	0.0	5.9	13.9	80.2	0.0	
GS-B3W	0.0	0.0	0.0	0.0	0.0	
GS-A3W	0.0	2.0	19.0	79.0	0.0	
GS-A3S	0.0	3.0	17.7	79.3	0.0	
GS-B3S	0.0	3.1	18.0	78.9	0.0	
GS-C3S	0.0	4.5	16.5	79.0	0.0	
GS-D3S	0.0	3.0	17.7	79.3	0.0	
GS-E3S	0.0	2.7	17.8	79.5	0.0	
GS-F3S	0.0	2.5	18.1	79.4	0.0	
GS-G3S	0.0	1.8	18.7	79.5	0.0	
GS-H3S	0.0	1.8	19.4	78.8	0.0	
GS-1S	0.0	9.4	3.5	87.1	0.0	
GS-1E	11.2	21.8	0.5	66.5	0.0	Recheck: 10.9% CH <sub>4</sub>
Interim Probes						
GS-1W	0.0	0.2	20.8	79.0	0.0	
GS-2W	0.0	0.9	19.6	79.5	0.0	
GS-2S	--	--	--	--	--	Probe destroyed.
GS-3S	18.9	15.7	11.4	54.0	0.5	
GS-4S	0.0	3.1	17.3	79.6	0.0	
GS-5S	10.9	9.4	14.4	65.3	0.6	
GS-6S	0.0	2.7	18.9	78.4	0.0	
GS-7S	0.0	2.3	18.4	79.3	0.0	
GS-8S	0.0	2.7	17.3	80.0	0.0	
GS-9S	0.0	2.3	19.1	78.6	0.0	
GS-2E	7.8	18.3	1.9	72.0	0.3	
GS-3E	3.8	16.2	1.4	78.6	0.3	
GS-4E	0.0	1.4	20.5	78.1	0.0	

**TABLE 1**  
**LANDFILL GAS MIGRATION INVESTIGATION**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	<u>Citrus County Central Landfill</u>	Date:	<u>November 16, 2005</u>
Project No.:	<u>09199056.08</u>	Weather:	<u>Clear, 70° F</u>
Personnel:	<u>J. Bever (SCS)</u>	Comments:	<u>Barometric Pressure 30.13 inch</u>
Method of Calibration:	<u>calibration gas</u>		

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GS-A3E	0.0	1.3	19.3	79.4	0.1	
GS-B3E	0.0	8.2	11.2	80.6	0.0	
GS-C3E	0.0	2.3	18.4	79.3	0.0	
GS-D3E	0.0	3.0	17.5	79.5	0.1	
GS-E3E	0.0	5.0	15.9	79.1	0.0	
GS-F3E	0.0	0.8	19.9	79.3	0.0	
GS-G3E	0.0	1.4	20.2	78.4	0.0	
GS-H6E	3.0	7.0	12.2	77.8	0.0	
GS-I3E	0.0	0.9	20.0	79.1	0.0	
GS-J3E	18.6	12.3	7.8	61.3	0.0	
GS-K6E	0.0	1.1	19.1	79.8	0.0	
GS-L3E	0.0	1.3	19.8	78.9	0.0	
GS-M10E	0.3	1.2	19.7	78.8	0.0	
GS-M15E	10.7	10.7	12.7	65.9	0.1	
GS-M25E	41.6	24.6	5.2	28.6	0.7	
GS-N6E	0.0	4.4	13.0	82.6	0.0	
GS-O3E	0.0	0.7	20.2	79.1	0.0	
GS-P10E	13.9	8.6	13.7	63.8	0.0	
GS-P15E	0.0	1.0	20.2	78.8	0.0	
GS-Q6E	16.0	16.8	10.1	57.1	0.0	
GS-R3E	0.0	0.6	20.1	79.3	0.0	
GS-S10E	0.8	0.8	19.9	78.5	0.1	
GS-S15E	24.6	19.5	8.7	47.2	0.3	
GS-S25E	21.3	20.2	8.3	50.2	0.0	
GS-T6E	18.5	20.0	6.5	55.0	0.0	
GS-U3E	0.0	2.0	19.5	78.5	0.0	
GS-V6E	0.0	8.3	12.2	79.5	0.0	
GS-W3ER	0.0	--	--	--	--	Remaining data lost.
GS-X3E	0.0	--	--	--	--	Remaining data lost.

On-Site Structures	CH <sub>4</sub> (%)	% LEL <sup>1</sup>
Scale House	0.0	0.0
Shop	0.0	0.0
Office	0.0	0.0
Firing Range	0.0	0.0
Leachate Treatment Plant	0.0	0.0

Notes:

- 1 : % Lower Explosive Limit (LEL) of methane (CH<sub>4</sub>) is 5%.
- 2 : On-site structures can not exceed 25% LEL (25% LEL = 1.25% CH<sub>4</sub>) per F.A.C. 62-701.530(1)(a).
- 3 : CH<sub>4</sub> at the landfill property boundary can not exceed the LEL of 5% CH<sub>4</sub> per F.A.C. 62-701.530(1)(b).
- 4 : Page 1 of the table includes only the wells along the north, west, and south of the 60-acre closed landfill, as well as the interim probes near Phase 1.
- 5 : The wells on page 2 are located along the east side of the 60-acre closed landfill, and not at the facility property boundary.
- 6 : Wells GS-1E and GS-1S are located adjacent to the Phase 1 landfill.

Citrus Co  
gas file

**Pelz, Susan**

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**From:** Susan Metcalfe [Susan.Metcalfe@bocc.citrus.fl.us]  
**Sent:** Thursday, August 25, 2005 10:22 AM  
**To:** Morgan, Steve; Pelz, Susan  
**Cc:** Thomas Dick  
**Subject:** Landfill gas monitoring

This is to report exceedences of the standard for methane in two wells that were monitored yesterday. GS-1E and GS 2E both contained more than 5% methane. I will follow up with a letter.

Susan Metcalfe, Director  
Citrus County Solid Waste Management Division  
P.O. Box 340  
Lecanto, FL 34460

352-527-7670 phone  
352-527-7672 fax

## SECTION 9

### LANDFILL GAS MONITORING (RULE 62-701.500(9), F.A.C.)

The landfill gas (LFG) monitoring plan is being updated as part of this operation plan to include a new network of monitoring probes and more comprehensive monitoring of on-site structures. This LFG monitoring program for the Central Landfill has been prepared in accordance with Rule 62-701.530, F.A.C. As described below, the plan includes monitoring for subsurface LFG migration at the facility property boundary adjacent to the active landfill (Phases 1/1A and 2) and the closed 60-acre landfill, and in on-site structures. The LFG monitoring program is designed to confirm compliance with the requirements of Rule 62-701.530(1)(a)1, F.A.C., which requires the following:

- The methane concentration in on- or off-site structures may not exceed 25 percent of the lower explosive limit (LEL). The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on- or off-site structures is 1.25 percent methane by volume.
- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent methane by volume).

As explained below, the monitoring plan was prepared based on site-specific conditions.

#### 9.1 BACKGROUND INFORMATION

The existing gas monitoring probe network consists of a number of probes, many of which are located within the interior of the property or are as shallow as three feet deep. These probes are no longer considered appropriate for use in meeting compliance with the requirement to monitor for gas concentration at the property boundary.

##### 9.1.1 Landfill Areas

The landfill areas on site include the closed 60-acre landfill and the active Phase 1/1A and Phase 2 landfill cells. The closed 60-acre landfill is an unlined landfill that has been capped with a geosynthetic membrane and protective soil cover. The depth of waste in the closed 60-acre landfill is approximately 40 feet below ground surface. The Phase 1/1A and Phase 2 landfill areas have a geomembrane bottom liner system, and the bottom depth of refuse is approximately 80 feet below ground surface. Groundwater is present approximately 110 feet below ground surface, and the soil at the site is primarily silty and clayey sand.

### 9.1.2 Historical Landfill Gas Monitoring Results

In the past, quarterly monitoring has shown the presence of subsurface methane to the east of Phase 1/1A and in various shallow monitoring probes along the west and south of the closed 60-acre landfill. In response to these detections, Citrus County conducted a LFG migration investigation to identify the areas in which methane was present at or near the property boundary. This investigation consisted of installing a series of temporary monitoring probes along the west, south, and east property boundaries. Subsurface gas concentrations were monitored at various depths during, and again after completion of, the probe installation. Monthly and quarterly monitoring of the probes was also conducted in order to build a database of readings, and determine if the detections were anomalous, or indicative of persistent gas migration. Results of those investigations have been submitted to FDEP under separate cover, and are also on file with Citrus County.

### 9.1.3 Landfill Gas Remediation Plan and Monitoring Results

In response to methane readings that exceeded the regulatory limit of five percent methane at the property line in the fourth quarter of 2003, Citrus County submitted a LFG remediation plan to FDEP on December 1, 2003. During the 2003 fourth quarter event, methane was detected at the following probes and concentrations at the property boundary:

- GS-G3W (6.7 percent methane by volume)
- GS-H3W (8.8 percent)
- GS-1E (5.2 percent)

Probes GS-G3W and GS-H3W are located along the western property boundary, and GS-1E is located on the east side of the site. Because historically these probes had not contained such high methane concentrations, and because there was no immediate safety risk due to the methane, SCS recommended an LFG migration investigation along the property line before implementing any remedial actions. The purpose of the proposed investigation was to attempt to define the limits of the subsurface methane, and better determine from which areas of the landfill property the LFG was originating.

#### 9.1.3.1 Initial Three-Month Investigation--

As a result, Citrus County implemented monthly monitoring of the permanent and temporary LFG monitoring probes adjacent to Phase 1, and all of the probes along the west and south property boundaries. This investigative monitoring was conducted for three months. On April 14, 2004, SCS issued a follow-up report summarizing the results of the three-month long LFG migration investigation, which was forwarded to FDEP on May 3, 2004 by Citrus County. During that three-month period, methane was either absent, or detected in concentrations less than 1 percent at the property boundary during the first two events. However, during the third event on March 24, 2004, methane was detected near the eastern and southern property boundary near the Phase 1 landfill area in GS-1E (2.2 to 2.6 percent by volume), GS-2E (1.2 percent), and GS-2S (8.0 percent). In addition, on April 30, 2004, during the second quarterly monitoring event, methane was detected above the regulatory limit in GS-G3W (8.4 percent) and GS-2S (6.8

*Jan - March  
sounds like*



percent). These probes are located along the west and south property boundaries, respectively. Methane was detected below the regulatory limit in April 2004 at GS-H3W, GS-E3W, GS-1E, GS-2E, and GS-3E.

#### 9.1.3.2 Supplemental Six-Month Investigation--

As outlined in the May 3, 2004 letter from Citrus County to FDEP, the County proposed an additional investigation to better determine the extent of the gas migration, particularly along the south and west property boundaries. Additional data near the southern boundary would assist in identifying whether the source of the methane on the south side of the site was related to:

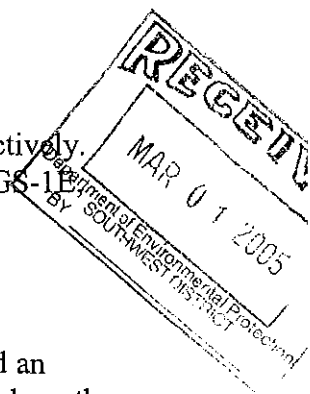
- The unlined landfill cells from the closed site,
- Septage ponds that were located in the southeast portion of the closed landfill or in the southwest corner of the active landfill property until about 1990, or
- The lined active landfill.

To accomplish this additional investigation, SCS installed nine additional temporary/interim LFG monitoring probes as described below:

- West Property Boundary – Probes GS-1W and GS-2W were installed to the west of existing probes GS-G3W, GS-H3W, and GS-I3W.
- South Property Boundary – Probe GS-4S was installed near the southeast corner of the closed 60-acre landfill, and probes GS-6S, GS-7S, GS-8S, and GS-9S were installed south of the southwest corner of the Phase 1 landfill.
- East Property Boundary – Probe GS-4E was installed east of existing probes GS-1E and GS-2E.
- Interior of Property – Probes GS-3S and GS-5S were installed in areas where septage ponds were previously located, in order to gauge the methane concentration in those parts of the site.

Along the west, south, and east, the new probes were installed approximately 50 to 200 feet outside the current property boundary.

Monthly monitoring of these probes and the existing probes along the west, south, and east property boundaries was conducted from September 2004 through February 2005. The data collected during those six rounds of monitoring show that methane is not present in the new probes installed outside the existing property boundary. In addition, in February 2005, methane concentrations did not exceed the regulatory limit in any of the existing or interim probes around the west, south, or east property boundaries.



#### **9.1.4 Proposed Landfill Gas Migration Remediation Plan**

The proposed remedial action for the exceedance of the regulatory limit for methane is to install additional monitoring points outside the current compliance boundary to determine the extent of additional property control to acquire. Once the new monitoring points are assessed, the County will formerly expand the compliance boundary for gas monitoring beyond the current property boundary. The land surrounding the site, as well as the land on which sits the closed 60-acre landfill, is owned by the State of Florida Division of Forestry. Citrus County has a long-term lease for the 60-acre closed landfill parcel. Because this is state-owned land, purchase of the land for the purpose of expanding the facility boundary is not a viable option. Therefore, Citrus County has coordinated with local Division of Forestry officials who manage the land, and is in the process of negotiating with the Division of Forestry in Tallahassee to obtain an expanded easement or lease agreement. The County expects that this will result in a type of lease agreement that allows the County to move the compliance boundary and the gas monitoring probes farther onto the surrounding land, while maintaining access for Division of Forestry employees.

#### **9.2 PROPOSED COMPLIANCE BOUNDARY**

Citrus County proposes to establish a compliance boundary beyond the limits of the existing facility boundary. Attachment 9-1 shows the approximate locations of the proposed new LFG monitoring probes. Upon satisfactory assessment of the new probe locations a new compliance boundary that is offset from the existing property line on the west, south, and east will be established. No extension of the compliance boundary to the north of the site is necessary. The proposed LFG monitoring probes will be maintained within this new boundary.

#### **9.3 PROPOSED LANDFILL GAS MONITORING PROBES**

The proposed gas monitoring probe network includes 18 permanent probes spaced approximately 500 feet apart along the north, west and south sides of the closed 60-acre landfill, and the south and east sides of the active landfill. New probes will initially be installed approximately 200 ft. outside the existing fence line, which would be within the expanded compliance boundary.

##### **9.3.1 Monitoring Probe Construction**

In accordance with the provisions of Rule 62-701.530(2)(b), F.A.C., the proposed monitoring probes are designed to extend to depths equal to the base of the landfilled waste. The 11 probes surrounding the closed 60-acre landfill (i.e., GP-1 through GP-11) will be approximately 40 feet deep, which is equal to the maximum estimated depth of the closed landfill. Probes GP-12 through GP-18 will be installed to depths of approximately 80 feet, which is consistent with the depth of waste in Phases 1/1A and 2. Attachment 9-2 provides a detail of the proposed probe construction.

Each probe will be installed with a direct push-type rig to create a borehole approximately two inches in diameter. A retractable tip will be used on the pilot probe so that subsurface gas

concentrations can be measured at 10-foot intervals during the borings. Gas concentrations will be measured using handheld field monitoring equipment. The data collected during installation will be included in the daily logs and maintained on file with Citrus County. As shown on Attachment 9-2, probes will be constructed of 1-inch diameter schedule 40 PVC pipe. The perforated section of the probe will begin five feet below ground surface and extend to the bottom of the borehole. From five feet below ground surface to the top of the probe will be solid-wall pipe. A bentonite plug will be installed two feet below ground surface to help seal the borehole. A threaded cap with a labcock or quick-connect monitoring port will be installed at the top of each probe, and protective casings will be installed around the above-grade portion of the probes.

A well schedule for the proposed probes is provided below in Table 9-1.

**TABLE 9-1. PROPOSED WELL SCHEDULE  
LANDFILL GAS MONITORING PROBES, CENTRAL LANDFILL**

Probe ID No.	Probe Depth (ft)	Length of Slotted Pipe (ft)	Solid Pipe Length Below Grade (ft)	Solid Pipe Length Above Grade (ft)
GP-1	40	35	5	3
GP-2	40	35	5	3
GP-3	40	35	5	3
GP-4	40	35	5	3
GP-5	40	35	5	3
GP-6	40	35	5	3
GP-7	40	35	5	3
GP-8	40	35	5	3
GP-9	40	35	5	3
GP-10	40	35	5	3
GP-11	40	35	5	3
GP-12	80	75	5	3
GP-13	80	75	5	3
GP-14	80	75	5	3
GP-15	80	75	5	3
GP-16	80	75	5	3
GP-17	80	75	5	3
GP-18	80	75	5	3

### **9.3.2 Incorporation of Interim Probes**

Three existing probes that were installed during the LFG migration investigation will remain in service and be incorporated into the new gas monitoring network. Each of these probes were installed consistent with the design criteria listed above, except for the installation of bentonite plugs and protective casings, which will be installed concurrent with the installation of the new

probes. Existing interim probe GS-2W will be renamed GP-6, GS-8S will be renamed GP-13, and GS-4E will be renamed GP-17.

### **9.3.3 Abandonment of Existing Monitoring Probes**

All existing monitoring probes, except for the interim probes that will be converted to permanent probes, will be abandoned in place.

### **9.3.4 Future Monitoring Probes**

Attachment 9-1 includes the locations of five future monitoring probes along the north east property line near the existing soil stockpile area. Because waste is not disposed of in this area, there is no need to install probes in this portion of the site. However, if the landfill is expanded to the north of Phase 2, Citrus County will install these probes to monitor for potential LFG migration adjacent to future landfill areas.

## **9.4 MONITORING OF ON-SITE STRUCTURES**

In order to ensure the safety of workers inside and around permanent structures on site, ambient air will be monitored on a quarterly basis in on-site structures in accordance with the requirements of Rule 62-701.530(2)(a), F.A.C. As stated above, and in Rule 62-701.530(1)(a), F.A.C., the methane concentration in on- or off-site structures may not exceed 25 percent of the LEL, or 1.25 percent methane by volume. The following gas monitoring will be performed in structures at the facility.

- Explosive gas alarms located in the scale house building and leachate treatment plant electrical room will provide continuous monitoring for unacceptable concentrations of explosive gas. These monitors are designed to sound an alarm when methane concentrations exceed 25 percent of the LEL. The signal remains on as long as gas is present, and a red alarm light stays on after an alarm condition in order to alert personnel that methane was detected during their absence. Log sheets will be kept at each location to record when the alarm has been triggered, and each alarm will be calibrated or replaced on a regular basis according to the schedule recommended by the manufacturer.
- On a quarterly basis the following structures will be monitored:
  - Administration building
  - Scale house
  - Leachate treatment plant
  - Gun ranges

Monitoring will consist of using handheld instruments to monitor for combustible gases at all slab penetrations, floor drains, cracks in the slabs, along baseboards, in electrical boxes and outlets, and in enclosed spaces such as closets and ground-level cabinets.

## 9.5 GAS MONITORING PROCEDURES

The monitoring procedures for the probes and on-site structures are outlined below.

### 9.5.1 Monitoring Procedures for Probes

Each probe will be monitored on a quarterly basis for static pressure and methane concentration, or combustible gases using an instrument calibrated to methane. Methane will be measured and recorded in terms of a percent by volume in air or as a percentage of the LEL. The monitoring equipment will be calibrated each day prior to the monitoring.

The general procedure for monitoring at each probe will be as follows:

1. Record meteorological conditions including ambient temperature and barometric pressure.
2. Calibrate the methane monitoring equipment.
3. Purge any calibration gas or gas from previous probes from the methane monitoring instrument.
4. Zero the pressure gauge.
5. Prior to monitoring, note any damage to the probe, and repair if necessary. Failure to repair damage to the above ground casing, cap, or monitoring probe can affect the validity of the monitoring results.
6. Attach the sampling hose to the pressure meter and the labcock valve on the monitoring probe.
7. Record the time of monitoring for the probe.
8. Open the labcock valve.
9. Measure and record the pressure in the probe.
10. Close the labcock valve.
11. Connect the methane monitoring instrument to the sampling hose.
12. Open the labcock valve.
13. Turn on the meter and observe the gas concentration readings, noting any spikes in concentration.
14. After the gas concentration readings stabilize, record the steady-state reading, making note of any spike that occurred prior to reaching a steady-state reading. Note that per Rule 62-701.530(2)(b), F.A.C., purging of the probe is not allowed.
15. Remove the instrument and hose, and close the labcock valve.
16. Repeat steps 3 through 15 for each probe.



Any problems encountered during monitoring, observations, or other pertinent information that could impact the interpretation of the data shall be recorded.

### **9.5.2 Monitoring Procedures for On-Site Structures**

The following on-site structures will be monitored for methane or combustible gas on a quarterly basis using handheld field instruments in accordance with Rule 62-701.530(2)(a), F.A.C.:

- Administration building
- Scale house
- Leachate treatment plant
- Gun ranges

Methane will be monitored and recorded in terms of the percent by volume in air or as a percentage of the LEL, and the monitoring equipment will be calibrated each day prior to the monitoring.

The general locations for monitoring at each structure will be as described below.

#### **9.5.2.1 Administration Building--**

A handheld meter will be used to monitor for methane at each of the following locations:

- Along the baseboards in each of the rooms, closets, and hallways
- In all ground-level cabinets
- At the floor drains in the bathrooms
- At all electrical outlets in each room and hallway
- At electrical panels inside and outside the building
- At outdoor electrical outlets

#### **9.5.2.2 Scale House--**

A handheld meter will be used to monitor for methane in the scale house at each of the following locations:

- Along the baseboards
- At any cracks in the concrete slab or flooring
- In all ground-level cabinets
- At all electrical outlets inside and outside of the building
- At electrical panels inside and outside the building

#### **9.5.2.3 Leachate Treatment Plant--**

Methane concentration will be checked at the following locations at the leachate treatment plant:

- At any cracks in the concrete slab or flooring

- In any ground-level cabinets
- At all electrical outlets inside and outside of the building
- At electrical panels inside and outside the building

#### **9.5.2.4 Gun Ranges--**

There are two gun ranges on site that are operated by the Withlacoochee Technical Institute on the closed 60-acre landfill. At both gun ranges, the following locations will be monitored for methane.

- At cracks in the concrete slabs
- At all electrical outlets and switches
- At all slab penetrations, such as support posts for the roofs of the firing platforms

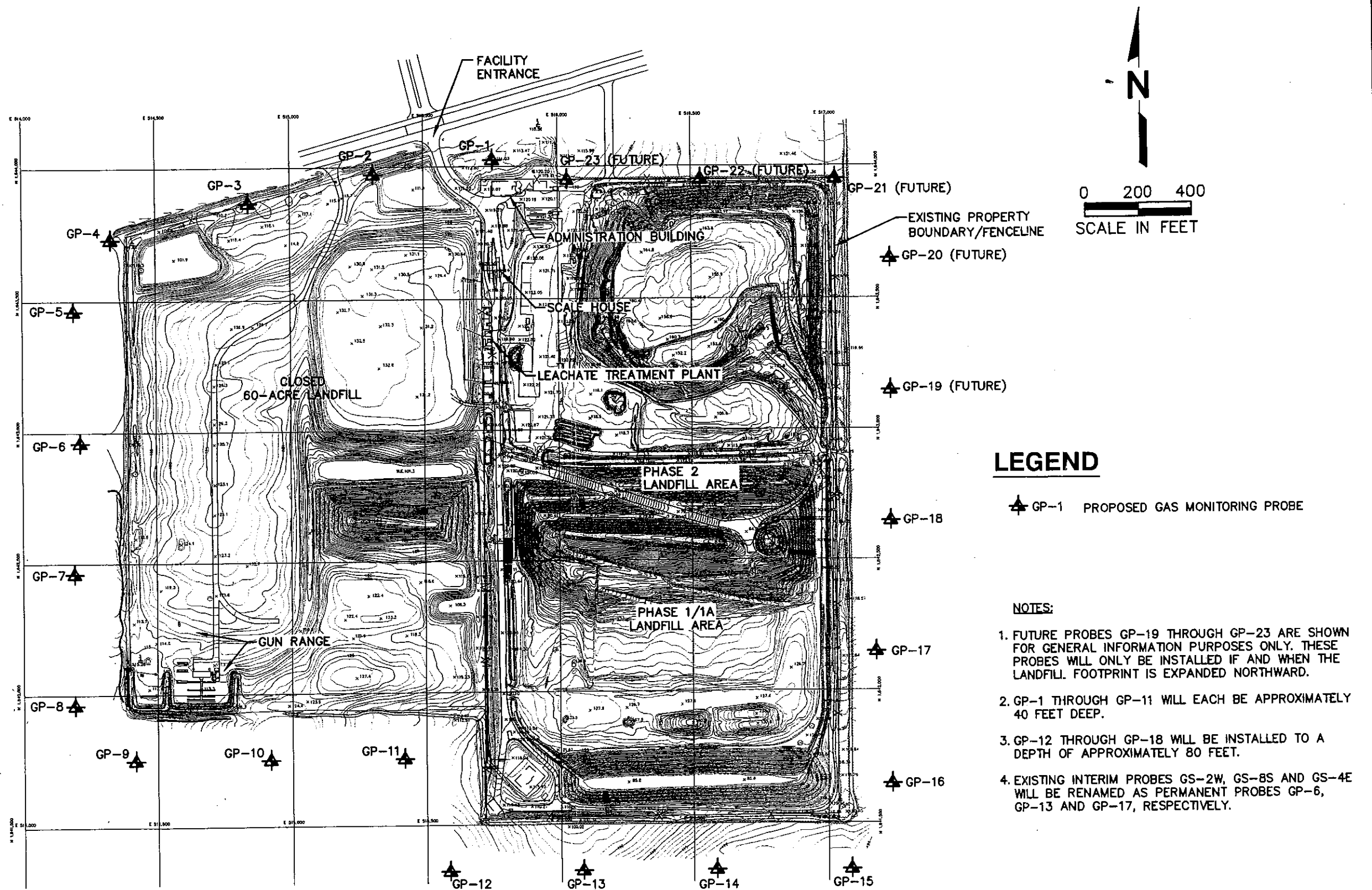
### **9.6 REPORTING**

Results of the monitoring will be reported to FDEP quarterly. A copy of the proposed monitoring form is included as Attachment 9-3 to this plan.

If the results of the monitoring show that combustible gas concentrations exceed the limits specified in Rule 620710.530(1)(a), F.A.C., Citrus County will take the following actions:

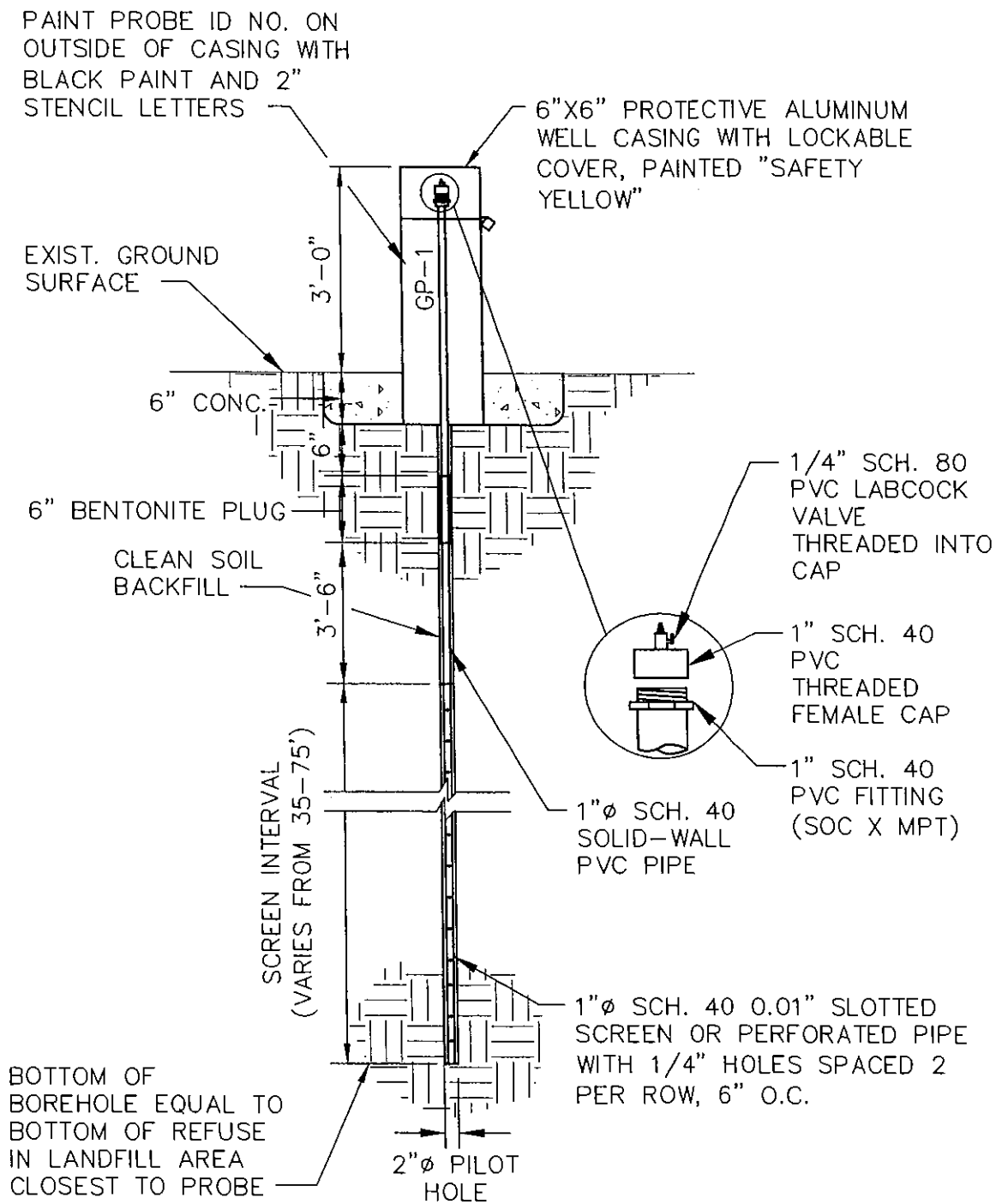
- Immediately take all necessary steps to ensure protection of human health and notify FDEP of the exceedances.
- Within seven days of the detections, submit to FDEP for approval a gas remediation plan. The gas remediation plan must describe the nature and extent of the problem and the proposed remedy. The remedy must be completed within 60 days of detection unless otherwise approved by FDEP.

G:\PROJECT\09199056.13\995613GasMon.dwg Feb 16, 2005 - 2:58pm Layout Name: Attachment 9-1 Br Administrator



Attachment 9-1. Proposed Landfill Gas Monitoring Probe Locations, Central Landfill, Citrus County, Florida.

G:\PROJECT\09199056\13\99561\LFGProbe.dwg Feb 14, 2005 - 4:21pm Layout Name: Monitoring Probe Plan Bx 1012b1



SCS ENGINEERS

Attachment 9-2. Proposed LFG Monitoring Probe Detail, Central Landfill, Citrus County.



**BOARD OF COUNTY COMMISSIONERS  
DEPARTMENT OF PUBLIC WORKS  
SOLID WASTE MANAGEMENT DIVISION**  
P.O. Box 340, Lecanto, Florida 34460

Telephone: (352) 527-7670 FAX (352) 527-7672  
Citrus Springs/Dunnellon/Inglis/Yankeetown Area  
Toll Free (352) 489-2120  
TTY Telephone: (352) 527-5214

**TELECOPIER MESSAGE**

DATE:

6/15/05

TIME:

11:20

NO. OF PAGES

9

INCLUDING COVER SHEET:

TO:

Danielle Nichols

FDEP

813-744-6125

FROM:

Susie Metcalf

SUBJECT:

3rd quarter 2004 LF gas  
monitoring report

MESSAGE:

as requested

**Board of County Commissioners****DEPARTMENT OF PUBLIC WORKS****SOLID WASTE MANAGEMENT DIVISION**

P.O. Box 340, Lecanto, Florida 34460

Telephone: (352) 527-7670 FAX: (352) 527-7672

email: landfillinfo@bocc.citrus.fl.us

TDDTelephone: (352) 527-5214

Citrus Springs/Dunnellon/Inglis/Yankeetown area Toll Free (352) 489-2120

---

October 11, 2004

Susan J. Pelz, P.E.  
Solid Waste Section  
Department of Environmental Protection  
3804 Coconut Palm Drive  
Tampa, Florida 33619

Re: Citrus County Central Landfill  
Permit No. 21375-003-SO  
Landfill Gas Monitoring (Third Quarter) and Migration Investigation (Monthly –September)

Dear Ms. Pelz:

SCS Engineers prepared the attached landfill gas monitoring report for Citrus County. During the third quarter of 2004, there were two monitoring points among the permanent gas monitoring wells that exceeded the regulatory limit of 5% methane, both along the west side of the closed landfill. That information was reported to Withlacoochee Technical Institute who operate the firing range on the closed landfill and to the Division of Forestry who manage the adjacent state forest property.

Coinciding with the third quarter monitoring event, SCS also monitored those new probes that were installed to investigate landfill gas migration. A copy of that report is also attached. Methane was not detected above regulatory levels in any offsite temporary probes during this event. One probe, GS-2S, was destroyed by heavy equipment working on stormwater management following Hurricane Frances. We do not intend to replace that probe. The gas monitors located in the cabinets below the sinks in the landfill office each were in alarm condition following Hurricane Frances and Jeanne. We believe this was due to power interruptions rather than the presence of gas.

Sincerely,

Susan Metcalfe, P.G.  
Director

Enclosures – SCS Reports dated October 5, 2004

CC: Tom Dick, Assistant Director, Public Works Department  
John Banks, SCS Engineers, Tampa  
David Penoyer, SCS Engineers, Tampa  
Eber Brown, WTI  
Erin Albury, Forestry

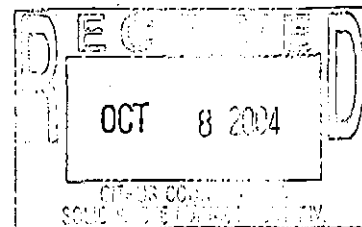


Environmental Consultants

3012 U.S. Highway 30  
Suite 700  
Tampa, FL 33619-2242813 621-0080  
FAX 813 623-6757**SCS ENGINEERS**

October 5, 2004

File No. 09199056.08



Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

Subject: Round 1 Landfill Gas Monitoring Results, Temporary Monitoring Probes  
Central Landfill, Citrus County, Florida

Dear Susie:

SCS Engineers (SCS) is submitting to you the results of the landfill gas (LFG) monitoring for the temporary monitoring probes at Citrus County Central Landfill. Three temporary monitoring probes were installed in October 2003 and 10 additional probes were installed in July 2004. These temporary monitoring probes are located on the west and south sides of the closed landfill and the south and east sides of the active Phase 1 landfill. Attachment 1 includes a site map that shows the LFG monitoring well locations.

On September 20, 2004, SCS personnel monitored the temporary LFG monitoring probes; this monitoring event corresponded with the third quarter monitoring for the permanent monitoring probes. SCS used a Landtec GEM-500 gas monitor to measure gas composition in the monitoring probes. The GEM-500 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The GEM-500 was calibrated prior to use.

The data collected from the probes are shown in Attachment 2. Methane exceeding the regulatory limit of 5 percent methane by volume was detected in monitoring well GS-5S, with a methane concentration of 47.1 percent by volume. Other probes in which methane was detected at concentrations below the regulatory limit are: GS-2E (2.6 percent by volume), GS-3E (0.7 percent by volume), GS-4S (4.9 percent by volume), and GS-6S (1.6 percent by volume). Monitoring probe GS-2S was not monitored because it was destroyed during site operations resulting from recent storm events.

The temporary monitoring probes are part of the LFG migration investigation being conducted by the County. The readings from these probes are used to evaluate the extent of the lateral migration off the property boundary. During this monitoring event, LFG was present on the south and east sides of the Phase 1 landfill. SCS will continue to monitor these probes.

Ms. Susan Metcalfe, P.G.  
October 5, 2004  
Page 2

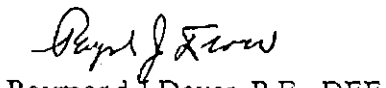
SCS appreciates the opportunity to assist you with this work. Please call us if you have any questions or would like additional information.

Sincerely,



No. 56065

David H. Penoyer, P.E.  
Project Manager



Raymond J Dever, P.E., DEE  
Vice President  
SCS ENGINEERS

DHP/RJD:lek

Attachments

**ATTACHMENT 1**  
**MONITORING LOCATIONS**

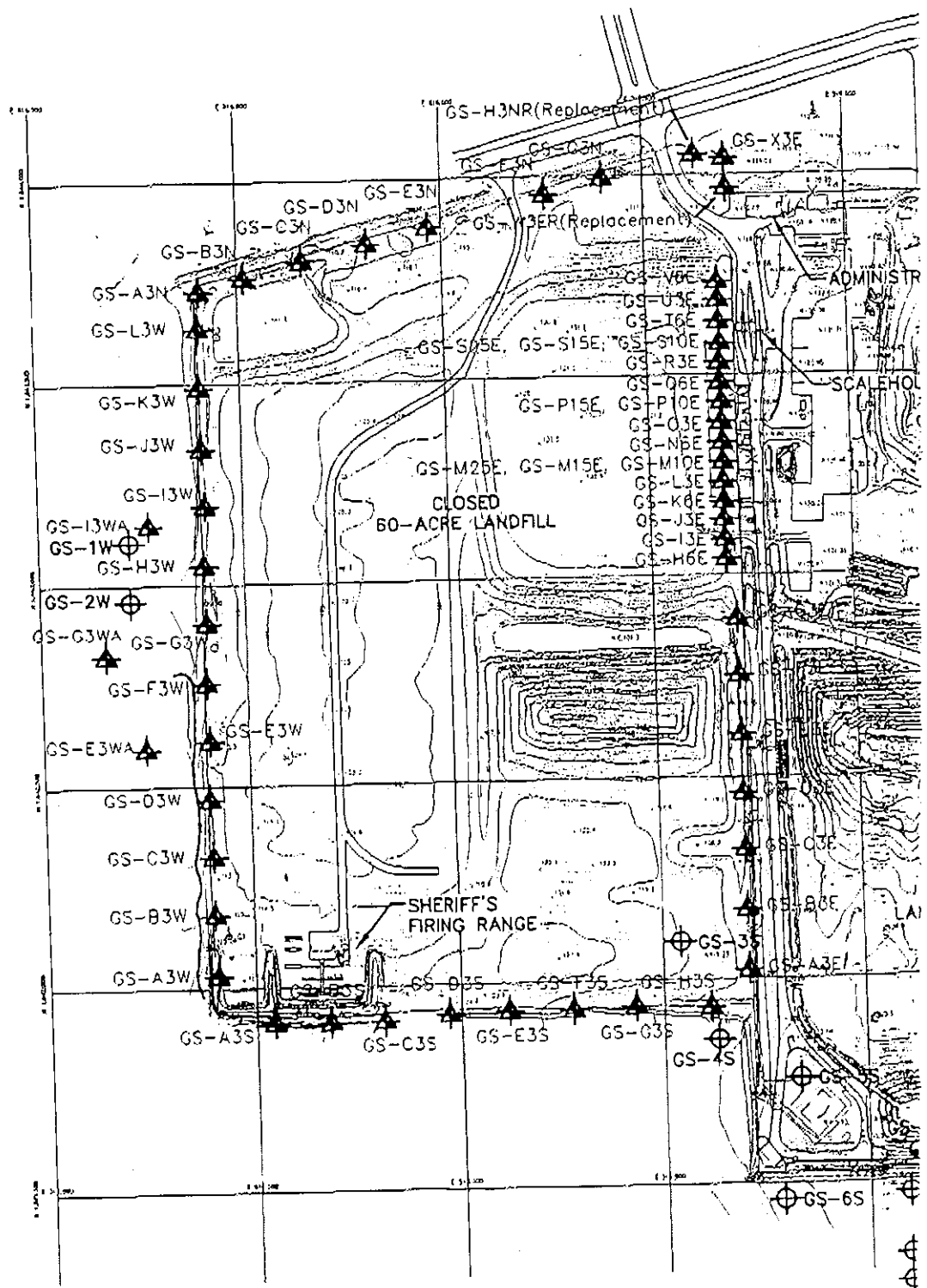
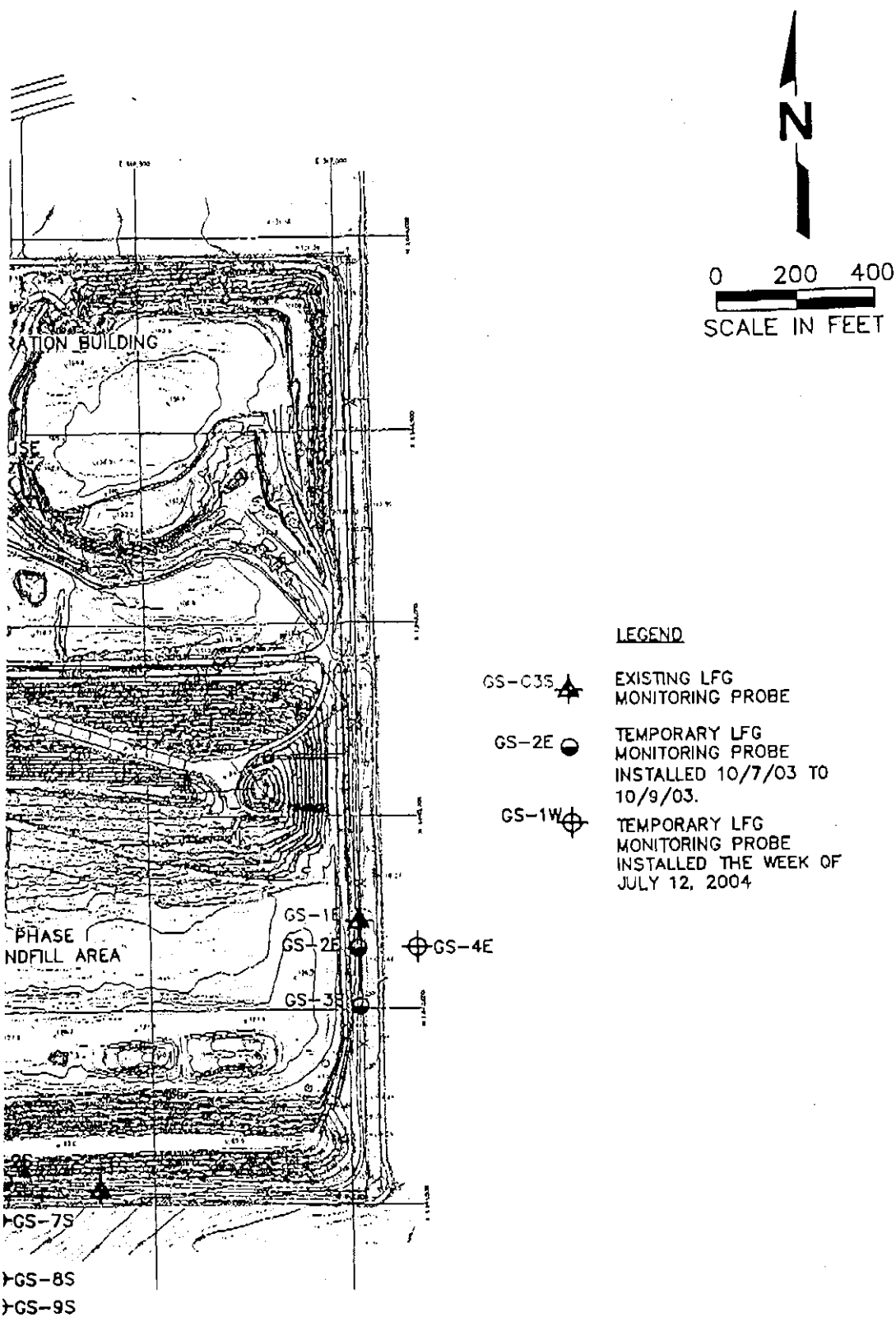


Figure 1. Landfill Gas Investigation, -Landfill Gas Monitoring



SCS ENGINEERS

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**ATTACHMENT 2**  
**LFG MONITORING RESULTS**



**TABLE 1**  
**LANDFILL GAS MONITORING RESULTS, TEMPORARY LFG PROBES**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	September 20, 2004
Project No.:	09199056.08	Weather:	74°; overcast/mostly cloudy
Personnel:	J. Bever (SCS)	Comments:	Barometric pressure: 30.03 in Hg at 12:30
Method of Calibration:	calibration gas		29.99 in Hg at 1:30
			29.98 in Hg at 3:00

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GS-1W	0.0	3.1	16.0	80.9	0.0	
GS-2W	0.0	2.2	17.3	80.5	0.0	
GS-2S	N/A	N/A	N/A	N/A	N/A	Damaged, unable to monitor
GS-3S	0.0	0.8	20.3	78.9	0.0	
GS-4S	4.9	21.7	0.0	73.4	0.0	
GS-5S	47.1	32.5	2.3	78.1	0.0	
GS-6S	1.6	18.8	0.9	78.7	0.0	
GS-7S	0.0	1.5	20.2	78.3	0.0	
GS-8S	0.0	0.8	19.8	79.4	0.0	
GS-9S	0.0	1.1	17.1	81.8	0.0	
GS-2E	2.6	14.9	1.9	80.6	0.0	
GS-3E	0.7	11.6	2.8	84.9	0.0	
GS-4E	0.0	3.0	12.9	84.1	0.0	



**BOARD OF COUNTY COMMISSIONERS  
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TO:

Danielle Nichols

FDEP

813-744-6125

FROM:

Susie Metcalfe

SUBJECT:

Quarterly Gas Monitoring Report

MESSAGE:

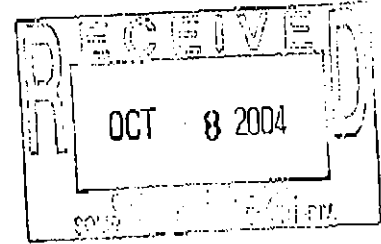
The previous report was the  
monthly report

Environmental Consultants

3012 U.S. Highway 30 North  
Suite 700  
Tampa, FL 33619-2242813 621-0080  
FAX 813 623-6757**SCS ENGINEERS**

October 5, 2004

File No. 09199056.08



Ms. Susan J. Metcalfe, P.G., Director  
Citrus County Department of Public Works  
Division of Solid Waste Management  
P.O. Box 340  
Lecanto, Florida 34460

Subject: Landfill Gas Monitoring Report, Third Quarter 2004  
Central Landfill, Citrus County, Florida

Dear Susie:

SCS Engineers (SCS) is submitting to you the results of the third quarter landfill gas (LFG) monitoring at Citrus County Central Landfill. SCS conducted this monitoring in accordance with our scope of services dated December 9, 2003. Provided below is a description of our activities, summary of the monitoring results, and recommendations.

**BACKGROUND**

The site has 62 permanent LFG monitoring probes, 60 of which surround the closed 60-acre landfill. The remaining two permanent probes are located to the south and to the east of the Phase 1 landfill area. Of the 60 probes around the closed landfill, 29 are located to the east of the closed landfill, between the toe of the landfill and the main access road. The others are spaced fairly evenly across the north, west, and south sides of the closed landfill near the fence line. Several probes are located outside the fence line to the west and south of the property.

As part of the County's gas migration investigation, three temporary monitoring probes were installed on the eastern and southern perimeters of the Phase 1 landfill area in early October of 2003. Additional monitoring probes installed in July 2004 are part of a supplemental monitoring program and are not included in this quarterly monitoring report.

Attachment 1 includes a site map that shows the LFG monitoring probe locations. Temporary monitoring probe GS-2S, which was located on the south end of Phase 1, was damaged by recent storms, and therefore was not monitored.

Rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires the following:

- The methane concentration in on- or off-site structures may not exceed 25 percent of the lower explosive limit (LEL). The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on- or off-site structures is 1.25 percent methane by volume.

Ms. Susan Metcalfe, P.G.

October 5, 2004

Page 2

- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent methane by volume).

This quarterly monitoring was conducted in accordance with Rule 62-701.530(2)(c), F.A.C.

## **MONITORING RESULTS**

On September 20, 2004, SCS personnel monitored the LFG monitoring probes and on-site structures. SCS used a Landtec GEM-500 gas monitor to measure gas composition in the monitoring probes and a Thermo Gas Tech Series GT402 to monitor on-site structures. The GEM-500 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The Gas Tech is a handheld instrument that measures combustible gas, among other hazardous gases, as a percentage of the LEL as well as on a parts per million (ppm) basis. Both instruments were calibrated prior to use.

### **LFG Monitoring Probes**

SCS monitored the 65 monitoring probes for gas composition, and the resulting data are shown in the two-page Table 1 in Attachment 2. The readings obtained from the probes along the facility property line (i.e., those probes along the north, west and south sides of the closed landfill, and the five probes near Phase 1) are shown on Page 1 of Table 1. Page 2 of the same table includes the probes along the east side of the 60-acre closed facility and readings taken at the structures.

### **Probes at Facility Perimeter--**

As shown on Page 1 of Table 1, methane exceeding the regulatory limit of 5 percent methane by volume was detected in monitoring probes GS-C3W and GS-I3W. The methane readings in monitoring probes GS-C3W and GS-I3W were 11.6 and 11.1 percent, respectively. Other probes in which methane was detected at concentrations below the regulatory limit are: GS-F3W (0.2 percent by volume), GS-G3W (0.1 percent), GS-2E (2.6 percent), and GS-3E (0.7 percent).

### **Probes Along East Side of Closed Landfill--**

Page 2 of Table 1 presents the data collected from the 27 LFG monitoring probes along the east side of the 60-acre closed landfill. The methane concentration in these probes varied from zero to 52.3 percent by volume. Methane was detected in 10 of the 29 probes along the east side of the closed landfill. Of the 10 probes that contained methane, four of the probes contained greater than 5 percent methane. As stated in past quarterly reports and explained below, the concentrations that were above the LEL are not considered regulatory exceedances since these probes are not located at the property boundary. This data indicates the presence of subsurface

Ms. Susan Metcalfe, P.G.  
October 5, 2004  
Page 3

LFG at the edge of the landfill near facility structures such as the leachate treatment plant and scale house. However, monitoring at these on-site structures shows that LFG is not migrating into the buildings.

### **Monitoring of On-Site Structures**

No methane was detected in the scale house, administration building, leachate treatment facility, or firing range. The monitoring results are located in Table 1 of Attachment 1. Floor plans of the scale house and the administration building are included in Attachment 1.

SCS monitored in the restrooms of the administration building, as well as in select closets, the break room, conference room, and hallways. In the scale house, SCS monitored the main work area, cabinets, the restroom, at electrical outlets, and at the electrical box outside the building. Monitoring of the leachate treatment facility included all enclosed spaces and around the base of structures.

At the Sheriff's firing range, SCS monitored the floor joints, conduit, electrical outlets, and the base of slabs or posts that penetrated the ground.

### **CONCLUSIONS**

Two probes, GS-C3W and GS-I3W, along the perimeter of the landfill exceeded the five percent methane by volume requirement, as stated above. The County was immediately notified by SCS personnel, and subsequently notified the Florida Department of Environmental Protection (FDEP) as stipulated in Rule 62-701.530(3)(a), F.A.C. The County is currently conducting a landfill gas investigation regarding the extent of the gas migration. The methane exceedances at GS-C3W and GS-I3W will be accounted for in the investigation and remediation plans for the site.

Regarding the 27 LFG monitoring probes along the east side of the 60-acre closed landfill, since these probes are not located at the property boundary; they are not considered compliance probes. A high methane concentration in any of these 27 probes does not necessarily demonstrate that the concentration of methane at the property boundary is above the regulatory limit of 5 percent by volume. Instead, these probes allow the County to identify if LFG is migrating laterally from the landfill, which might potentially pose a concern at on-site structures. No methane was detected in the administration building, scale house, or leachate treatment plant.

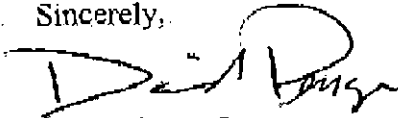
Ms. Susan Metcalfe, P.G.

October 5, 2004

Page 4

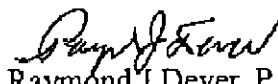
Please forward a copy of these results to the FDEP Southwest District office. SCS appreciates the opportunity to assist you with this work. Please call us if you have any questions or would like additional information.

Sincerely,



No. 56065

David H. Penoyer, P.E.  
Project Manager



Raymond J Dever, P.E., DEE  
Vice President  
SCS ENGINEERS

DHP/RJD:lek

Attachments



**ATTACHMENT 1**  
**MONITORING LOCATIONS**

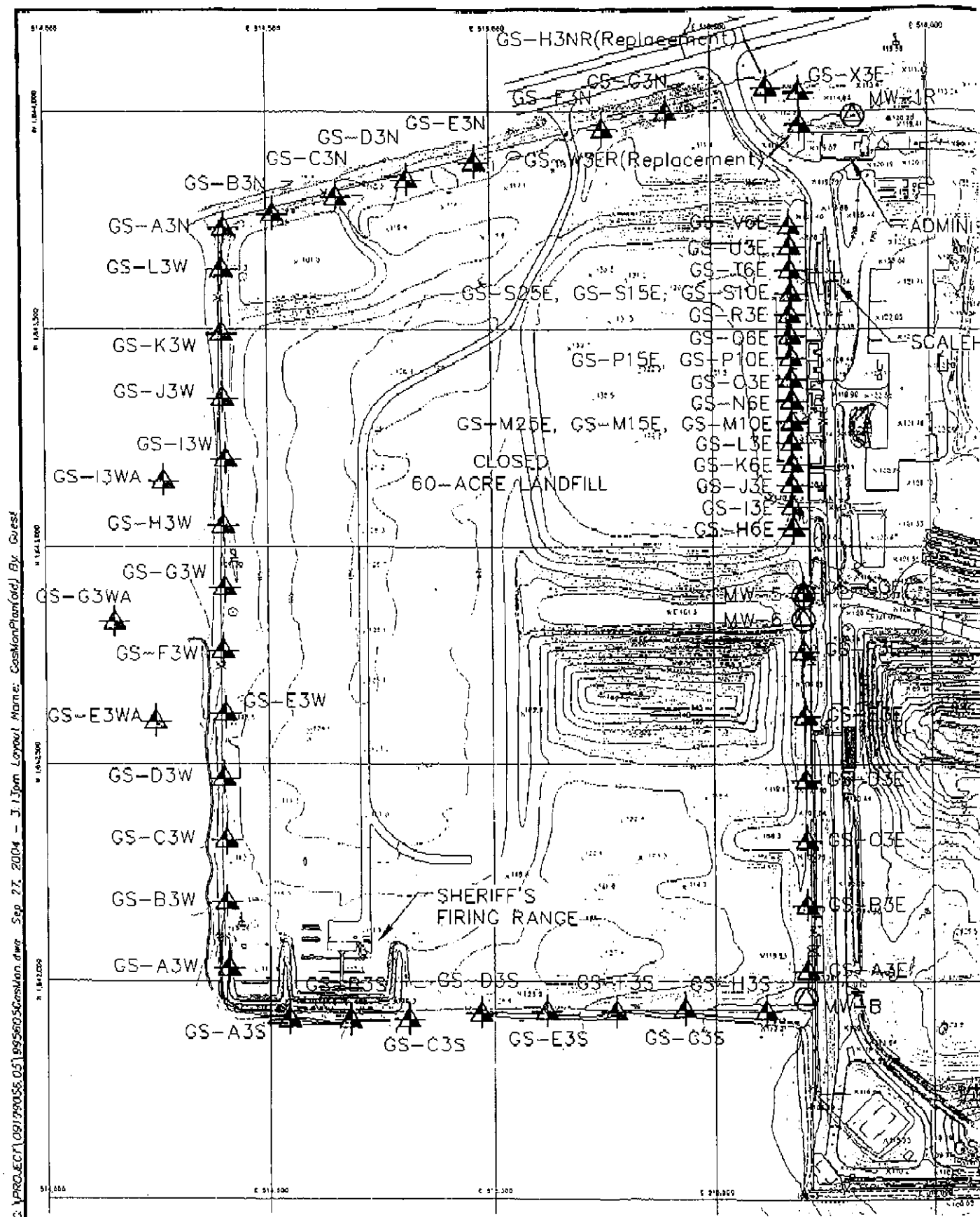
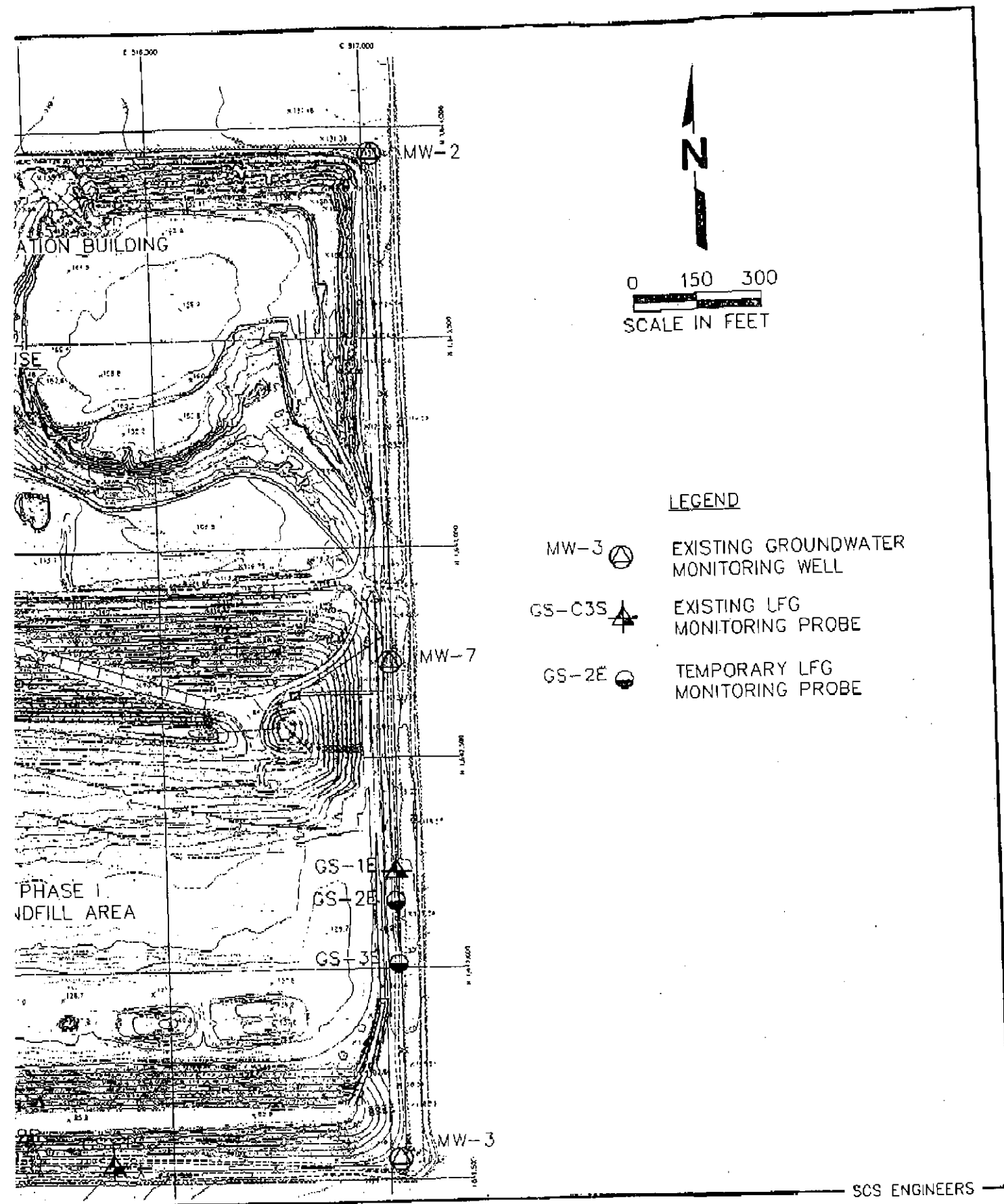
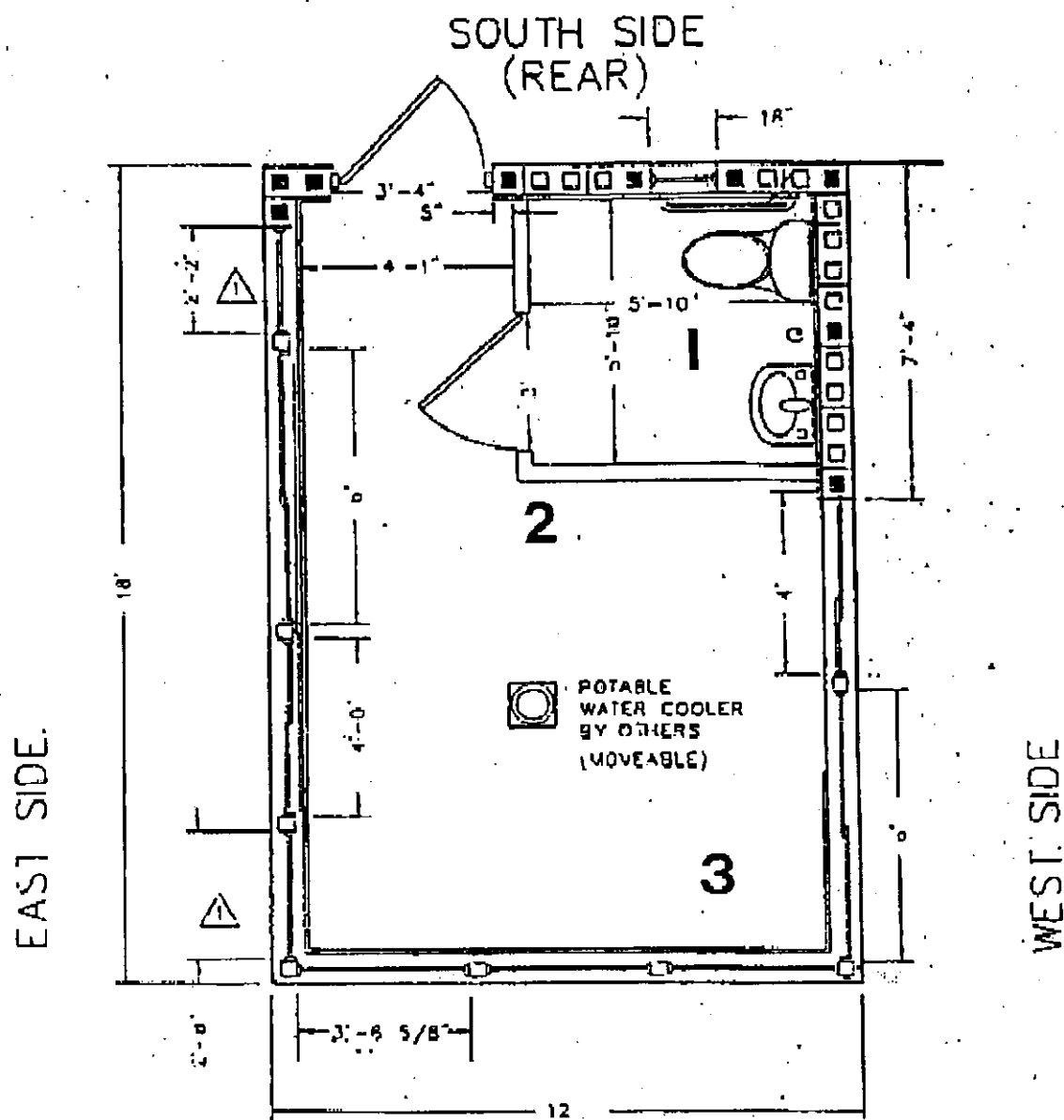


Figure 1. Landfill Gas Monitoring Probe 1



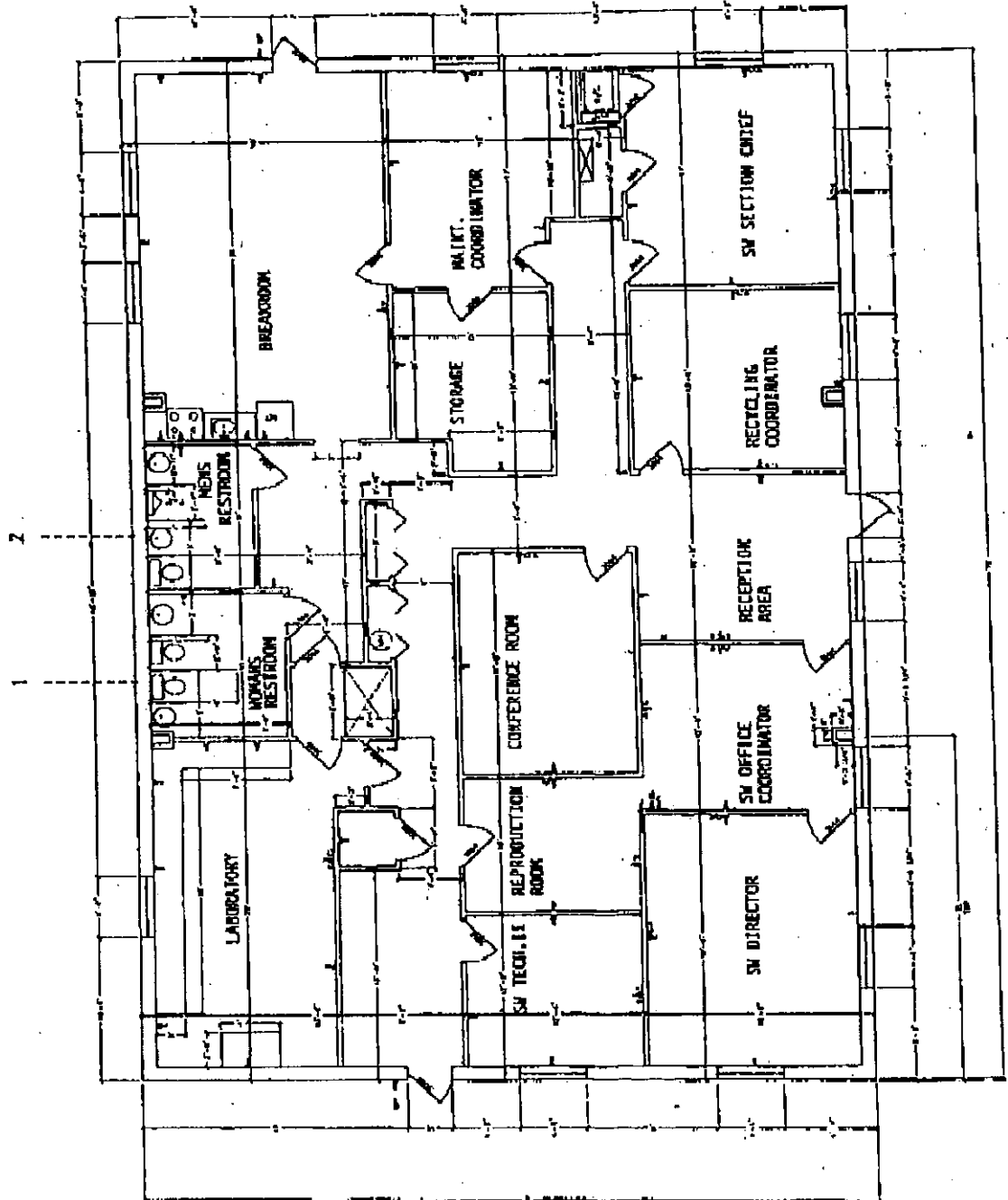
ocations, Central Landfill, Citrus County, Florida



# FLOOR PLAN

SCALEHOUSE - GAS MONITORING POINTS

- 1 - BATHROOM FLOOR DRAIN
- 2 - ELEC. CONNECTIONS FOR SCALE METER - WEST SIDE
- 3 - ELEC. CONNECTIONS FOR SCALE METER - EAST SIDE



CITRUS COUNTY CENTRAL LANDFILL ADMINISTRATIVE BUILDING

**ATTACHMENT 2**  
**LFG MONITORING RESULTS**



**TABLE I  
LANDFILL GAS MIGRATION INVESTIGATION  
CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	September 20, 2004
Project No.:	09199056.08	Weather:	74°, overcast/mostly cloudy
Personnel:	J. Bever (SCS)	Comments:	Barometric pressure: 30.03 in Hg at 12:30
Method of Calibration:	calibration gas		29.99 in Hg at 1:30
			29.98 in Hg at 3:00

Well No.	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	Balance (%)	Pressure (in-w.c.)	Comments
GS-H3NR	0.0	0.3	20.3	79.4	0.0	
GS-G3N	0.0	0.3	20.2	79.5	0.0	
GS-F3N	0.0	0.3	20.3	79.4	0.0	
GS-E3N	0.0	0.3	20.3	79.4	0.0	
GS-D3N	0.0	0.3	20.7	79.0	0.0	
GS-C3N	0.0	0.3	20.6	79.1	0.0	
GS-B3N	0.0	0.6	20.2	79.2	0.0	
GS-A3N	0.0	0.5	20.5	79.0	0.0	
GS-L3W	0.0	0.6	20.3	79.1	0.0	
GS-J3W	0.0	2.3	17.3	80.4	0.0	
GS-K3W	0.0	1.3	20.0	78.7	0.0	
GS-I3W	11.1	11.5	5.4	72.0	0.0	Recheck showed a methane reading of 10.5.
GS-B3WA	0.0	4.4	16.4	79.2	0.0	
GS-H3W	0.0	5.0	15.4	79.6	0.0	
GS-G3W	0.1	5.1	15.2	79.6	0.0	Recheck showed a methane reading of 0.1.
GS-G3WA	0.0	1.4	19.8	78.8	0.0	
GS-F3W	0.2	3.3	17.0	79.5	0.0	Recheck showed a methane reading of 0.2.
GS-E3W	0.0	3.4	12.7	81.9	0.0	
GS-E3WA	0.0	3.1	17.9	79.0	0.0	
GS-D3W	0.0	2.2	18.8	79.0	0.0	
GS-C3W	11.6	8.4	13.3	64.7	0.0	Recheck showed a methane reading of 11.0.
GS-B3W	0.0	2.7	18.4	78.9	0.0	
GS-A3W	0.0	5.4	15.1	79.5	0.0	
GS-A3S	0.0	9.2	11.4	79.4	0.0	
GS-B3S	0.0	9.7	10.8	79.5	0.0	
GS-C3S	0.0	5.6	12.5	81.9	0.0	
GS-D3S	0.0	0.0	20.6	79.4	0.0	
GS-E3S	0.0	0.0	20.5	79.5	0.0	
GS-F3S	0.0	2.7	16.4	80.9	0.0	
GS-G3S	0.0	3.3	16.4	80.3	0.0	
GS-H3S	0.0	2.8	18.1	79.1	0.0	
GS-I3S	0.0	2.3	19.7	78.0	0.0	
GS-IE	0.0	0.2	20.5	79.3	0.0	
Temporary Probes						
GS-2S	N/A	N/A	N/A	N/A	N/A	Well blew down due to hurricane, unable to monitor.
GS-2E	2.6	14.9	1.9	80.6	0.0	
GS-3E	0.7	11.6	2.8	84.9	0.0	

**TABLE 1**  
**LANDFILL GAS MIGRATION INVESTIGATION**  
**CENTRAL LANDFILL, CITRUS COUNTY**

Project Name:	Citrus County Central Landfill	Date:	September 20, 2004
Project No.:	09199056.08	Weather:	74°; overcast/mostly cloudy
Personnel:	J. Bever (SCS)	Comments:	Barometric pressure: 30.03 in Hg at 12:30
Method of Calibration:	calibration gas		29.99 in Hg at 1:30

**TABLE 1 (continued)**

GS-A3E	2.0	10.2	8.0	79.8	0.0	Recheck showed a methane reading of 1.7.
GS-B3E	0.0	3.6	16.5	79.9	0.0	
GS-C3E	0.0	1.3	18.6	80.1	0.0	
GS-D3E	0.0	1.7	17.9	80.4	0.0	
GS-E3E	0.0	1.0	19.3	79.7	0.0	
GS-F3E	0.0	1.0	19.4	79.6	0.0	
GS-G3E	0.0	1.4	19.1	79.5	0.0	
GS-H6E	0.1	0.8	19.3	79.8	0.0	
GS-I3E	0.0	0.2	20.9	78.9	0.0	
GS-J3E	0.0	0.3	20.8	78.9	0.0	
GS-K6E	0.0	1.0	20.0	79.0	0.0	
GS-L3E	0.0	0.6	20.8	78.6	0.0	
GS-M10E	0.1	1.3	20.4	78.2	0.0	
GS-M15E	38.5	23.3	6.8	31.4	0.0	Recheck showed a methane reading of 37.4.
GS-M25E	47.4	25.3	5.7	21.6	0.0	Recheck showed a methane reading of 38.4.
GS-N6E	0.1	1.1	20.4	78.4	0.0	
GS-O3E	0.0	2.4	19.5	78.1	0.0	
GS-P10E	0.0	1.4	19.6	79.0	0.0	
GS-P15E	0.0	0.6	20.7	78.7	0.0	
GS-Q6E	0.0	2.6	18.8	78.6	0.0	
GS-R3E	0.0	1.0	20.6	78.4	0.0	
GS-S10E	0.1	2.4	20.2	77.3	0.0	
GS-S15E	44.9	32.7	4.2	18.2	0.0	Recheck showed a methane reading of 42.7.
GS-S25E	52.3	37.9	0.8	9.0	0.0	Recheck showed a methane reading of 48.9.
GS-T6E	0.3	3.2	18.4	78.1	0.0	Recheck showed a methane reading of 0.2.
GS-U3E	0.0	3.1	18.9	78.0	0.0	
GS-V6E	0.0	0.2	20.2	79.6	0.0	
GS-W3ER	0.0	1.2	20.0	78.8	0.0	
GS-X3E	0.0	1.2	20.0	78.8	0.0	

On-Site Structures	CH <sub>4</sub> (%)	% LEL <sup>1</sup>
Scale House	0.0	0.0
Shop	0.0	0.0
Office	0.0	0.0
Firing Range	0.0	0.0
Leachate Treatment Plant	0.0	0.0

**Notes:**

- 1: % Lower Explosive Limit (LEL) of methane (CH<sub>4</sub>) is 5%.
- 2: On-site structures can not exceed 25% LEL (25% LEL = 1.25% CH<sub>4</sub>) per Rule 62-701.530(1)(a), F.A.C.
- 3: CH<sub>4</sub> at the landfill property boundary can not exceed the LEL of 5% CH<sub>4</sub> per Rule 62-701.530(1)(b), F.A.C.
- 4: Page 1 of the table includes only the wells along the north, west, and south of the 60-acre closed landfill, as well as the two wells near Phase 1.
- 5: The wells on page 2 are located along the east side of the 60-acre closed landfill, and not at the facility property boundary.
- 6: Wells GS-1E and GS-1S are located adjacent to the Phase 1 landfill.
- 7: Wells GS-2S, GS-2E, and GS-3E are temporary monitoring probes installed in October of 2003.

Florida Department of  
**Environmental Protection**

Southwest District

CONVERSATION RECORD

Date 6/15/05 Subject gw monitoring  
Time 9:30 rtn call 2x later Permit No. 21375-003-SO  
Same morning County Citrus  
Susan Metcalfe Phone No. 352-527-7670

Representing Citrus Co. LF

☐ Phoned Me ☒ Was Called ☐ Scheduled Meeting ☐ Unscheduled Meeting

Other Individuals in Conversation/Meeting \_\_\_\_\_

Summary of Conversation/Meeting:

It is unclear which submittals are  
quarterly or monthly  
requested Q3 '04 data (sampled 9/20/04) She will fax.  
verified Forestry contact is Keith Mousel  
GS-5S 5Sa & 5Sb are both "5S" just different  
depths so not shown separately on maps

(unclear from corresp.) - I inquired when they believed the 6 month investigation  
started. She says probes were put in 7/12-17/04  
& the 6 monthly samplings were 9/20, 10/13, 11/4,  
12/7, 1/27/05, & 2/14/05

Signature Danielle Nioche

Title ESI

## Analytical Results Summary for Landfill Gas Monitoring Samples Collected at Class I/III Landfills

Facility Name -- Citrus Central Landfill  
County -- Citrus

Sampling Frequency -- Quarterly

	% LEL															Methane
	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	% LEL	
	2/14/28/2004	3/24/2004	4/30/2004	7/12-17/04	9/20/2004	10/13/2004	11/4/2004	12/7/2004	12/7/2004	1/27/2005	1/27/2005	2/14/2005	4/22/2005	5/12/2005		Date Sampled
	5/5/2004	4/15/2004	5/24/2004	8/12/2004	10/14/2004	10/25/2004	11/12/2004	12/17/2004	1/24/2005	2/2/2005	2/16/2005	4/4/2005	5/12/2005			Date Received
Gas Monitoring	5/14/2004	11/24/2004	11/24/2004		11/24/2004			12/22/2004					1/30/1900			Date Reviewed
Point Id	30.39	30.36	29.8		30.03	29.77	29.95	30.06							30.02	Barometric Pressure
East of 60 acres:																Notes
GS-2E			16		52	114	120	5.8	J	102		74	92			temporary LFG probe
GS-3E			10		14	40	44		u	26	16	20				temporary LFG probe
GS-4E				4	0			0	s	N	0	NR	0			temporary LFG probe
GS-A3E	0				40	472	6	0	t	o	NR	0	2			
GS-B3E	0				0			0			NR	0	0			
GS-C3E	0				0			0			NR	0	0			
GS-D3E	0				0			0			NR	0	0			
GS-E3E	0				0			0			NR	0	0			
GS-F3E	0				0			0			NR	0	6			
GS-G3E	0				0			0			NR	0	0			
GS-H6E	0				2			5			NR	0	0			
GS-I3E	0				0			0			NR	0	0			
GS-J3E	0				0			14			NR	334	0			
GS-K6E	0				0			11.2			NR	4	0			
GS-L3E	0				0			0			NR	0	0			
GS-M10E	0				2			40			NR	2	10			
GS-M15E	0				770			25.9			NR	330	470			
GS-M25E	0				948			54.1			NR	394	1122			
GS-N6E	0				2			0.4			NR	0	0			
GS-O3E	0				0			0			NR	0	0			
GS-P10E	0				0			25.3			NR	38	0			
GS-P15E	0				0			0			NR	0	0			
GS-Q6E	0				0			28.3			NR	534	398			
GS-R3E	0				0			0			NR	0	0			
GS-S2E	0	24						NR			NR					temporary LFG probe
GS-S2E		2						NR			NR					temporary LFG probe
GS-S2E		2						NR			NR					temporary LFG probe
GS-S3E	0	0						NR			NR					temporary LFG probe
GS-S10E		0			2			0.5			NR	0	62			
GS-S15E		84			898			32.3			NR	414	400			
GS-S25E		0			1046			37.9			NR	488	558			
GS-T6E	0				6			23.7			NR	454	0			
GS-U3E	0				0			0			NR	0	0			
GS-V6E	0				0			0			NR	0	0			
GS-W3E	0	0			0			0			NR	0	0			
GS-W3ER												0	0			
GS-X3E	0	0			0			0			NR	0	0			
North of 60 acres:																
GS-A3N	0	0	0		0			0			NR	0	0			
GS-B3N	0	0	0		0			0			NR	0	0			
GS-C3N	0	0	0		0			0			NR	0	0			
GS-D3N	0	0	0		0			0			NR	0	0			
GS-E3N	0	0	0		0			0			NR	0	0			
GS-F3N	0	0	0		0			0			NR	0	0			
GS-G3N	0	0	0		0			0			NR	0	0			
GS-H3NR	0	0	0		0			0			NR	0	0			
West of 60 acres:																
GS-1W					0			0			0		0			temporary LFG probe
GS-2W					0			0			0		0			temporary LFG probe
GS-A3W	0	0	0		0			0			0	0	0			
GS-B3W	0	0	0		0			0			0	0	0			
GS-C3W	0	0	0		232	200	64	0			0	0	0			
GS-D3W	0	0	0		0			0			0	0	0			
GS-E3W	0	0	8		0	116	140	0			0	4	18			
GS-E3WA	0	0	0		0			0			0	0	0			
GS-F3W	0	0	0		4			0			0	0	0			
GS-G3W	4	0						123			10	6	0			
GS-G3W	2	0						3.2				0	0			
GS-G3W	2	0						3.2				0	0			
GS-G3W	2	0	168		2			3.2				0	0			
GS-G3WA	0	0	0		0			0			0	0	0			
GS-H3W	0	0	56		0			12			0	0	0			
GS-I3W	0	0	0		222	306		0			0	0	26			
GS-B3WA	0	0	0		0			0			0	0	0			
GS-J3W	0	0	0		0			0			0	0	0			
GS-K3W	0	0	0		0			0			0	0	0			
GS-L3W	0	0	0		0			0			0	0	0			
South of 60 acres:																
GS-2S			136		damaged			NA			NS		damaged			temporary LFG probe
GS-3S				838 @ 40ft.	0	672	450	36.8			494		450			temporary LFG probe (interior)
GS-4S					98	10	4	0.2			4		0			temporary LFG probe
GS-5S				274 @ 36ft.	942	886	344	14.7			NR					temporary LFG probe
GS-5Sa											322		810			
GS-5Sb											924		578			not offsite
GS-6S				GS-6Sa 18%	32		2	0			0		0			temporary LFG probe
GS-7S				177 @ 72ft.	0			0			0		0			temporary LFG probe
GS-8S				36 @ 62ft.	0			0			0		0			temporary LFG probe
GS-9S					0			0			0		0			temporary LFG probe
GS-A3S	0	0	0		0			0			0	0	0			
GS-B3S	0	0	0		0			0			0	0	0			
GS-C3S	0	0	0		0			0			0	0	0			
GS-D3S	0	0	0		0			0			0	0	0			
GS-E3S	0	0	0		0	108		0			0	0	0			
GS-F3S	0	0	0		0	6		0			0	0	0			
GS-G3S	0	0	0		0			NR			0	0	0			
GS-H3S	0	0	0		0			NR			0	0	0			
GS-S2S	0	160						NR			NR					temporary LFG probe
GS-S2S		160						NR								temporary LFG probe
GS-S2S		16						NR								temporary LFG probe
GS-S2S		18						NR								temporary LFG probe
80 Acre Points:																
GS-1E	0	48	90		0	194	182	7.9			0	0	218			
GS-1E		44						7.9					218			
GS-1E		48						7.9					218			
GS-1E		48						7.9					218			
GS-1E		48						7.9					218			
GS-1S	0	0	0		0			0			0	0	48			
at Leachate Plant:																
Ele. Rm.					0			0			NR		0	0		
at Scalehouse:					0								0	0		
point One								0			NR					
point Two								0			NR					
point Three								0			NR					
at Admin. Bldg:					0											
SHOP								0			NR		0	0		
OFFICE								0			NR		0	0		

NR=Not Received