

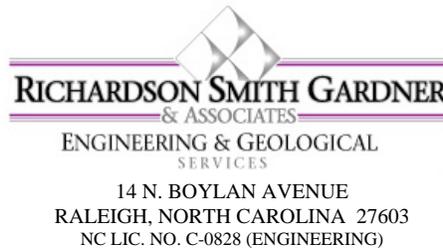
Construction Quality Assurance Report

Holly Grove Landfill Landfill Gas Collection System Lexington, North Carolina

Prepared For:

**Davidson Gas Producers, LLC
425 S. Main Street
Ann Arbor, Michigan 48104**

Prepared By:



October 2010

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CONSTRUCTION QUALITY ASSURANCE REPORT

Holly Grove Landfill Landfill Gas Collection System

Prepared for:
Davidson Gas Producers, LLC
Ann Arbor, MI

To the Attention of:
Mr. Marcus A. Bilinski, P.E.

RSG Project No. DTE-10-1



10/27/10

Pieter K. Scheer, P.E.
Project Manager

October 2010



14 N. BOYLAN AVENUE
RALEIGH, NORTH CAROLINA 27603
NC LIC. NO. C-0828 (ENGINEERING)

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**DAVIDSON GAS PRODUCERS, LLC
HOLLY GROVE LANDFILL
LANDFILL GAS COLLECTION SYSTEM**

CONSTRUCTION QUALITY ASSURANCE REPORT

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**DAVIDSON GAS PRODUCERS, LLC
HOLLY GROVE LANDFILL
LANDFILL GAS COLLECTION SYSTEM**

CONSTRUCTION QUALITY ASSURANCE REPORT

1.0 INTRODUCTION

This Construction Quality Assurance (CQA) Report has been prepared to document the CQA activities performed during the construction of a landfill gas (LFG) collection system (GCCS) for the Holly Grove Landfill, which consists of two separate unlined disposal units (Area I and Area II). This landfill is part of the Davidson County Landfill facility, which is located on Davidson County Landfill Road near Lexington, North Carolina. The facility is owned and operated by Davidson County under State Solid Waste Permit No. 29-06. Davidson Gas Producers, LLC owns and operates the landfill gas system under agreement with the County. An approval for construction of the GCCS was issued by the North Carolina Division of Waste Management (NCDWM) on June 23, 2010 (see **Appendix A**).

2.0 PROJECT DESCRIPTION

2.1 General

The GCCS was designed by Richardson Smith Gardner & Associates, Inc. (RSG). The GCCS includes the following components:

- LFG extraction wells (6 in Area I; 5 in Area II);
- HDPE collection and header piping;
- Condensate pump stations at low points along the header piping (CPS-1, 2, and 3); and
- Connection to the existing LFG collection system on the Phase 1 landfill unit (existing active collection system).

2.2 Reference Documents

The GCCS was constructed in accordance with the following documents.

Construction Documents - Holly Grove Landfill - GCCS:

Includes technical specifications and construction drawings prepared by Richardson Smith Gardner & Associates and dated June, 2010.

Permit Modification (NC Permit No. 29-06) - Holly Grove Landfill - GCCS:

Includes technical specifications, CQA manual, and permit drawings prepared by Richardson Smith Gardner & Associates and dated June, 2010 (Approved by NCDWM - June 23, 2010).

2.3 Project Participants

The following parties were involved in the construction and CQA of GCCS:

2.3.1 Owner

Davidson Gas Producers, LLC (DTE Biomass Energy)
425 S. Main Street
Ann Arbor, MI 48104
Phone: (734) 913-2978
Fax: (734) 668-1541

Contact: Marcus A. Bilinski, P.E., Project Manager

2.3.2 County

Davidson County Integrated Solid Waste Management Department
1242 Old Highway 29
Thomasville, NC 27360
Phone: (336) 242-2284
Fax: (336) 249-7524

Contacts: Charlie Brushwood, Director
Steven Sink, Landfill Manager

2.3.3 Engineer/CQA Engineer

Richardson Smith Gardner & Associates, Inc. (RSG)
14 N. Boylan Ave.
Raleigh, NC 27603
Phone: (919) 828-0577
Fax: (919) 828-3899

Contacts: Pieter Scheer, P.E., Project Manager
Frank Terry, Field Services Manager
Randy Berarducci, Field Technician
Byron Hackney, Field Technician

2.3.4 CQA Testing - Earthwork

Geotechnics
2200 Westinghouse Blvd., Suite 103
Raleigh, NC 27604
Phone: (919) 876-0405
Fax: (919) 876-0460

Contact: Mike Smith, Regional Manager

2.3.5 Contractors

LFG Well Drilling:

American Environmental Group, Ltd.
3600 Brecksville Road, Suite 100
Richfield, OH 44286
Phone: (330) 659-5930
Fax: (330) 659-5931

Contact: Jeff Enochs, Drilling Manager

GCCS Piping:

Piedmont Industrial Services, Inc. (Piedmont)
1680 Lowery Street
Winston-Salem, NC 27101
Phone: (336) 722-6505
Fax: (336) 722-6529

Contact: Todd Scott, Project Manager

2.3.6 Contractor's Surveyor

Michael Green Associates
4513 West Old Hwy 64
Lexington, NC 27295
Phone: (336) 248-8102

Contact: Michael Green, PLS, Project Manager

3.0 SUMMARY OF CONSTRUCTION ACTIVITIES

3.1 Landfill Gas (LFG) Extraction Wells

The installation of LFG extraction wells began on July 1, 2010. The well installation was performed by American Environmental Group (AEG) under contract to Davidson Gas Producers. A total of 5 extraction wells were installed on Area I (W302 - W306) and 4 extraction wells on Area II (W402 - W405) of the Holly Grove Landfill. These new wells supplemented one test well previously installed by AEG in August 2009 (W301 on Area I and W401 on Area II). The extraction wells were drilled to the depths shown in the table below. Well logs are provided in **Appendix B**. Also, the installation of extraction wells required the repair of the existing final cover system as described in **Section 3.3** below.

AS-BUILT EXTRACTION WELL SCHEDULE				
Well ID	Ground Surface Elevation	Depth (feet)	Bottom Elevation	Length of Perforated Pipe (feet)
Area I Wells				
W301*	814.4	66	748.4	40
W302	802.4	53	749.4	36
W303	813.1	64	749.1	47
W304	812.1	62	750.1	45
W305	812.2	64	748.2	47
W306	812.8	60	752.8	43
Total Length of Perforated Pipe (feet):				258
Area II Wells				
W401*	745.7	40	705.7	25
W402	747.5	41	706.5	24
W403	751.3	41	710.3	26
W404	737.2	31	706.2	20
W405	729.5	23	706.5	10
Total Length of Perforated Pipe (feet):				105

*Well installed in August 2009

3.2 Landfill Gas (LFG) Collection System Piping

The installation of LFG collection system piping began on July 13, 2010. The piping installation was performed by Piedmont Industrial Services (Piedmont) under contract to Davidson Gas Producers.

A total of approximately 950 LF of 4" and 2,500 LF of 6" diameter HDPE piping was installed on Areas I and II to connect extraction wells to a header pipe leading to the Phase 1 landfill unit. The installation of this piping required the repair of the existing final cover system as described in **Section 3.3** below.

A total of approximately 1,850 LF of 8" diameter and 2,600 LF of 10" diameter HDPE piping was installed as the header pipe leading to the Phase 1 landfill unit. Along the header pipe, three condensate pump stations (CPS-1, 2, and 3) were installed at low

points in the line. Davidson Gas Producers plans to install pneumatic pumps in these pump stations at a later date.

3.3 Repair of Final Cover System

The installation of the LFG extraction wells and the collection piping within the limits of the Area I and Area II landfill units required the disturbance of the existing final cover of each unit. Repairs were performed as follows:

Area I (2' Soil Cover):

The Area I landfill unit has a final cover system consisting of 2 feet of soil. Penetrations of this cover for the installation of extraction wells were repaired with a bentonite seal and soil cover which were observed to be at least 2 feet in thickness. Additionally, collection piping buried within the limits of Area I were covered with a minimum of 2 feet of soil cover (as observed by CQA personnel), thereby re-establishing the final cover.

Area II - Top Slopes (GCL with Overlying 18" of Soil Cover):

The top slopes of the Area II landfill unit has a final cover system consisting of 18" of soil cover over a geosynthetic clay liner (GCL). Penetrations of this cover for the installation of extraction wells were repaired with a bentonite seal (2 feet in thickness) and soil cover. Additionally, penetrations near the limits of the GCL for the installation of the collection piping were also repaired using a bentonite seal. Elsewhere on the top slopes, the collection piping was buried in the soil cover such that the GCL was not disturbed.

Area II - Side Slopes (18" Thick Soil Barrier with Overlying 12" of Soil Cover):

The side slopes of the Area II landfill unit has a final cover system consisting of a 6" thick soil cover over an 18" thick soil barrier ($k \leq 1 \times 10^{-5}$ cm/sec) layer. Penetrations of this cover for the installation of extraction wells were repaired with a bentonite seal (2 feet in thickness) and soil cover. Additionally, penetrations of this cover for the installation of the collection piping were repaired by re-constructing the soil barrier layer (where disturbed) and adding soil cover. Earthwork testing was conducted to document this repair as described in **Section 5.0** below.

3.4 Photographic Documentation

Photos documenting the construction of the GCCS can be found in **Appendix C**.

4.0 CQA PROGRAM

4.1 Scope of Services

In satisfying the requirements of the site's approved CQA Manual, the following activities were performed:

- Review of submittals from the Contractor for conformance with project specification and CQA requirements.
- Observation and documentation of the installation of LFG wells and system piping and appurtenances.
- Field and/or laboratory testing of the repair of the Area II final cover system.
- Review/Preparation of record drawings.
- Preparation of the final CQA report.

5.0 EARTHWORK CQA

The criteria for repair of the Area II soil barrier layer per the project specifications included the following:

- Materials: Soil type as required to achieve the hydraulic conductivity criteria with no organics, debris, or other detrimental material;
- Clod Size: Max. ¾ inch;
- Gradation: Max. = ½ inch (finished soil liner surface) and Max. = 1½ inches (below finished soil liner surface);
- Lift Thickness: 9-inch* max. (compacted).
- Density: Minimum 95% Maximum Standard Proctor Dry Density (ASTM D 698);
- Moisture Content: ≥ optimum moisture content (ASTM D 698);
- Hydraulic Conductivity: ≤ 1 x 10⁻⁵ cm/sec; and
- Thickness: 18 inches min.

*Due to the slopes involved and a relatively narrow trench width, two 9-inch thick lifts were allowed.

A total of 14 moisture/density tests (12 nuclear/2 drive cylinder) were conducted on the soil barrier replaced in the trench by Geotechnics. The average compaction and moisture content from these tests was 97.7% of maximum dry density and 2.5% above optimum moisture, respectively (standard Proctor data: max. dry density = 106.1 pcf/optimum moisture content = 16.9%). There were two tests with slightly low compaction (93.1 to 94.4%), but both tests had a moisture content of 2% or greater above optimum. Three tests were below optimum moisture (-1.0%, -0.7%, and -0.2%), but each were compacted to 99% or greater. Thus, these tests were judged to be acceptable. Additionally, hydraulic conductivity tests were performed (1 per lift) which demonstrated values below the maximum allowable value of 1.0 x 10⁻⁵ cm/sec (first lift result = 2.8 x 10⁻⁶ cm/sec.; second lift result = 2.3 x 10⁻⁷ cm/sec.).

Other tests performed on an on-going basis during construction included a visual classification of soil (ASTM D 2488) and monitoring of clod size and loose lift thickness. The results of field and laboratory testing of the soil barrier can be found in **Appendix E**. The minimum thickness of the soil barrier was observed by CQA personnel. Additionally, existing soil barrier was observed in the bottom of the trenches.

RSG also observed the backfill and compaction of the LFG header piping. Based on our observations, the bottom of the trench and backfill materials appeared to be free of sharp stones or other material that would be potentially damaging to the piping. Satisfactory compaction of the trench was verified by trafficking of the finished grade.

6.0 LANDFILL GAS (LFG) COLLECTION SYSTEM CQA

6.1 Material Approval

RSG reviewed and approved the landfill gas collection system product submittals provided by Piedmont. The selected materials included the following:

HDPE Pipe/Fittings:	Vacuum/Gravity Piping: Flying W Plastics, Inc. (FWP) (DR 17) - 4", 6", 8" & 10" Diam. Condensate Force Main: FWP (DR 11) - 2" Diam. Air Line: FWP (DR 11) - 1.25" Diam. Water Line: FWP (DR 11) - 2" Diam.
Valves:	Asahi/America, Inc. Type 57 Butterfly Valves: Lever Operated - 6" Gear Operated - 10"
Condensate Pump Stations:	Fabricated by ISCO Industries

Copies of submittal information for these products can be found in **Appendix F1**.

6.2 Contractor CQC Testing

During construction of the GCCS, Piedmont performed pressure testing of all HDPE piping. Pressure testing of collection, header, and condensate force main piping was conducted using low pressure air in accordance with ASTM F 1417. Documentation of the successful testing can be found in **Appendix F2**.

7.0 RECORD DRAWINGS

The following record (as-built) drawings depicting the construction of the GCCS can be found in **Appendix G**:

- As-Built Collection System; and
- As-Built Details.

8.0 PROJECT CERTIFICATION

Based on the observations and results of the CQA program documented herein, it is our professional opinion that the construction of the Holly Grove Landfill GCCS was completed in accordance with the following:

- i. The Project CQA Manual;
- ii. The conditions of the Permit;
- iii. The requirements of 15A NCAC 13B.1624; and
- iv. Acceptable engineering practices.

RICHARDSON SMITH GARDNER & ASSOCIATES, INC.



Pieter K. Scheer, P.E.
Project Manager



10/27/10

Appendix A

Relevant Approvals

1. NC DENR Approval Letter (June 23, 2010)

**Construction Quality Assurance Report
Holly Grove Landfill
Landfill Gas Collection System
Lexington, North Carolina**

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North Carolina Department of Environment and Natural Resources

Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

June 23, 2010

Charles Brushwood, Director
Davidson County Integrated Solid Waste
220 Landfill Road
Lexington, NC 27292

Re: Landfill Gas to Energy Project
Holly Grove Landfill
Davidson County, North Carolina
Permit No. 29-02, Doc ID No. 10924

Dear Mr. Brushwood:

The documents for a MSW Landfill Modification (DIN 10922) have been submitted to the Division of Waste Management, Solid Waste Section on your behalf by your consultant Richardson Smith Gardner & Associates. It was received on June 9, 2010. This Permit Modification is for construction of a landfill gas collection system on Areas I and II of the Holly Grove Landfill.

In accordance with GS 130A-295.8(e), the Section has reviewed your application and found it to be complete. A determination of completion means that the application includes all required components. Also, in this case the installation of the extraction wells and collection system may proceed.

Once construction is complete an "Authorization to Operate" or Post Closure Permit will be issued pending receipt and approval of the following:

1. A construction schedule and completion report to include, but not limited to:
 - a. A description of the tasks completed, party involved, material & equipment used, wastes disposal for this project;
 - b. Landfill gas extraction well logs;
 - c. Pipe leaking test results;
 - d. Color photographs to show the major construction features;
 - e. Daily construction log/document and non-conformance or variance reports;

- f. QA/QC testing results;
 - g. As-built drawings (surveyed-in locations of wells & valves);
 - h. A copy of the updated air quality permit approved by the Division of Air Quality; and
 - i. Certification from a professional engineer registered in the State of North Carolina that the completion of construction meets the design specification and function.
2. Updated Operations Plan which incorporates the requirements and protocols of operation, inspection, monitoring, and maintenance of the landfill gas collection and control systems (LFGCCS). In addition, the Plan should include emergency procedures covering, at a minimum, fire and inclement weather.
3. The costs associated with operation, inspection, and maintenance of the LFGCCS program should be addressed in the Post-Closure Plan. Additionally, the post-closure care cost estimates and financial assurance mechanism should be revised accordingly.

Should you have any questions regarding this letter or wish to discuss the matter further, please contact me at (704) 235-2163, or by email at john.murray@ncdenr.gov.

Sincerely,



John Murray, P.E.
Regional Engineer
Solid Waste Section

cc: Jason Watkins, DWM
Hugh Jernigan, DWM
Edward F. Mussler, III, P.E., DWM
Pieter K. Scheer, P.E., Richardson Smith Gardner & Associates, Inc

Appendix B

LFG Extraction Well Logs

**Construction Quality Assurance Report
Holly Grove Landfill
Landfill Gas Collection System
Lexington, North Carolina**

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Well Log

PROJECT NAME Davidson Landfill

DATE: 8/20/2009

PROJECT# 10109011

Drilling	Well As build
W-301 WELL NUMBER OR NAME	
66 LINEAR FEET OF DRILLING	
66 LINEAR FEET OF COMPLETION	
0 LINEAR FEET OF ABANDONMENT	
Time in: <u>7:30am</u> Time out: <u>9:30am</u>	
Weather conditions: <u>Sunny</u>	
Site conditions: <u>Good</u>	
Rig hrs: <u>2</u>	
Service: <u>Radiator Grease</u>	
NOTES: <u>Holly Grove Site Test Wells</u>	
Total Benching Time:	

Monitoring Log				Well Boring Log				
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp
7:00	Good	0	0	0-8	Dirt	Low	Dry	82
8:00	Good	0	0	8-20	Standard	Low	Dry	84
9:00	Good	0	0	20-30	Dirt / Standard	Low	Dry	89
10:00				30-40	Standard	Low	Dry	84
11:00				40-50	Fiber / Standard	Mod	Dry	89
12:00				50-60	Standard	Low	Dry	90
1:00				60-66	Fiber / Standard	Mod	Dry	84
2:00								
3:00								
4:00	GWA notes: Well appears to be in overfill placed 1991 on top surface of oldest unit. Fiber layers trap heat and increases temp in waste directly below, then dissipates. Low static pressure, initial flux rate = 20 cfm, expect low flow.							
5:00								
6:00								
Notes								
northing								
easting								

CLIENT REPRESENTATIVE _____ DATE _____

Ernie Jackson II 8/20/2009
 AEGL SITE SUPERVISOR DATE

NAME & TITLE _____



Well Log

PROJECT NAME Davidson County
 PROJECT# 101-10-012

DATE: 7/2/2010

Drilling	Well Asbuild
W303 WELL NUMBER OR NAME	
64 LINEAR FEET OF DRILLING	
64 LINEAR FEET OF COMPLETION	
LINEAR FEET OF ABANDONMENT	
Time in: 6:40 Time out: 9:30	
Weather conditions: Cloudy	
Site conditions: Dry	
Rig hrs:	
Service: Radiator Grease	

Monitoring Log				Well Boring Log					
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp	
10:45 AM				1-10	Soil Msw	Slight	Dry	83	
11:45 AM				10-20	Msw	Slight	Dry	82	
12:45 PM				20-30	Msw Soil	Slight	Dry	87	
1:45 PM				30-40	Wood Soil	Slight	Dry	89	
2:45 PM				40-50	Fiber	Slight	Dry	90	
3:45 PM				50-60	Fiber	Slight	Dry	91	
4:45 PM				60-64	Msw Depth	Slight	Dry	93	
5:45 PM				70-80					
				80-90					
				90-100					
Notes									

CLIENT REPRESENTATIVE _____ DATE _____

Detin Moore 7/2/2010
 AEGL SITE SUPERVISOR DATE

NAME & TITLE _____



Well Log

PROJECT NAME Davidson County
 PROJECT# 101-10-012

DATE: 7/1/2010

Drilling	Well Asbuild
W304 WELL NUMBER OR NAME 62 LINEAR FEET OF DRILLING 62 LINEAR FEET OF COMPLETION _____ LINEAR FEET OF ABANDONMENT Time in: <u>7:35</u> Time out: <u>10:25</u> Time in: _____ Time out: _____ Weather conditions: <u>Cloudy</u> Site conditions: <u>Dry</u> Rig hrs: _____ Service: <u>Raidiator Grease</u>	

Monitoring Log				Well Boring Log				
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp
10:45 AM				1-10	Soil Msw	Slight	Dry	85
11:45 AM				10-20	Msw	Slight	Dry	87
12:45 PM				20-30	Msw Soil	Slight	Dry	90
1:45 PM				30-40	Wood Soil	Slight	Dry	86
2:45 PM				40-50	Fiber	Slight	Dry	92
3:45 PM				50-60	Fiber	Slight	Dry	91
4:45 PM				60-62	Fiber Depth	Slight	Dry	90
5:45 PM				70-80				
				80-90				
				90-100				
Notes								

CLIENT REPRESENTATIVE _____ DATE _____
 NAME & TITLE _____

Detin Moore 7/1/2010
 AEGL SITE SUPERVISOR DATE



Well Log

PROJECT NAME Davidson County

DATE: 7/1/2010

PROJECT# 101-10-012

Drilling	Well Asbuild
W306 WELL NUMBER OR NAME _____ 60 LINEAR FEET OF DRILLING 60 LINEAR FEET OF COMPLETION _____ LINEAR FEET OF ABANDONMENT Time in: 1:50 Time out: 4:55 Time in: _____ Time out: _____ Weather conditions: Cloudy Site conditions: Dry Rig hrs: _____ Service: Radiator Grease	<p>surface 813</p> <p>TOP 0</p> <p>1</p> <p>3</p> <p>11</p> <p>13</p> <p>14</p> <p>16</p> <p>59</p> <p>60</p> <p>36 inch well bore</p>

Monitoring Log				Well Boring Log				
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp
10:45 AM				1-10	Soil Msw	Slight	Dry	83
11:45 AM				10-20	Msw	Slight	Dry	82
12:45 PM				20-30	Msw Soil	Slight	Dry	86
1:45 PM				30-40	Wood Soil	Slight	Dry	89
2:45 PM				40-50	Fiber	Slight	Dry	90
3:45 PM				50-60	Soil Depth	Slight	Dry	91
4:45 PM				60-70				
5:45 PM				70-80				
				80-90				
				90-100				
Notes								

CLIENT REPRESENTATIVE _____ DATE _____

Detin Moore 7/1/2010
 AEGL SITE SUPERVISOR DATE

NAME & TITLE _____



Well Log

PROJECT NAME Davidson Landfill

DATE: 8/20/2009

PROJECT# 10109011

Drilling	Well As build
W-401 WELL NUMBER OR NAME	
40 LINEAR FEET OF DRILLING	
40 LINEAR FEET OF COMPLETION	
0 LINEAR FEET OF ABANDONMENT	
Time in: 10am Time out: 11am	
Weather conditions: Sunny / Rain	
Site conditions: Good / Fair	
Rig hrs: 1	
Service: Radiator Grease	
NOTES: Holly Grove Site Test Wells Thunderstorms & Lightning in mid afternoon.	
Total Benching Time:	

Monitoring Log				Well Boring Log				
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp
7:00				0-12	Dirt	Low	Dry	82
8:00				12-18	Standard	Low	Dry	84
9:00				18-32	Fiber	Low	Dry	84
10:00	Good	0	0	32-40	Standard	Mod	Dry	86
11:00	Good	0	0					
12:00								
1:00								
2:00								
3:00								
4:00								
5:00	GWA notes:							
6:00	Unexpected 10-ft soil cap covering lower unit, closed Oct 1993 with GCL top liner reported (not observed). Gas show in bottom 5'. Initial flux > 30 cfm. Adjacent to old vent (<100'). Cap should support higher wellhead vacuum.							
Notes								
northing								
easting								

CLIENT REPRESENTATIVE _____ DATE _____

Ernie Jackson II 8/20/2009
AEGL SITE SUPERVISOR DATE

NAME & TITLE _____



Well Log

PROJECT NAME Davidson County LF

DATE: 7/6/2010

PROJECT# 101-10-012

Drilling	Well Asbuild
W402 WELL NUMBER OR NAME	
<u>41</u> LINEAR FEET OF DRILLING	
<u>41</u> LINEAR FEET OF COMPLETION	
<u>0</u> LINEAR FEET OF ABANDONMENT	
Weather conditions: <u>Sunny</u>	
Site conditions: <u>DRY</u>	
Rig hrs: _____	
Service: <u>Raidiator Grease</u>	
NOTES:	

Monitoring Log				Well Boring Log				
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp
8:30 AM				0-1	dirt			
9:30 AM				1-10	HHT	none	dry	85
10:30 AM				10-20	Fiber/HHT	none	dry	88
11:30 AM				20-30	HHT	none	dry	90
12:30 PM				30-41	HHT	none	dry	92
1:30 PM				40-50				
2:30 PM				50-60				
3:30 PM				60-70				
				70-80				
				80-90				
				90-100				
				100-110				
Notes				110-120				

CLIENT REPRESENTATIVE _____ DATE _____

Wade Tufford 7/6/2010
AEGL SITE SUPERVISOR DATE

NAME & TITLE _____



Well Log

PROJECT NAME Davidson County LF
 PROJECT# 101-10-012

DATE: 7/6/2010

Drilling	Well Asbuild
W403 WELL NUMBER OR NAME 41 LINEAR FEET OF DRILLING 41 LINEAR FEET OF COMPLETION 0 LINEAR FEET OF ABANDONMENT Weather conditions: Sunny Site conditions: DRY Rig hrs: Service: Raidiator Grease NOTES:	<p style="text-align: right;">6 in sch 40 cap</p> <p style="text-align: right;">5 ft</p> <p style="text-align: right;">TOP 0</p> <p style="text-align: right;">Site Supplied Backfill 0.5</p> <p style="text-align: right;">Bentonite 2 feet hydrated 2.5</p> <p style="text-align: right;">Length of Solid below surface 14</p> <p style="text-align: right;">clean on site clay backfill 9</p> <p style="text-align: right;">Bentonite 2 feet hydrated 11</p> <p style="text-align: right;">Soil 12</p> <p style="text-align: right;">Isolation Ring above 14</p> <p style="text-align: right;">Length of Gravel Pack 29</p> <p style="text-align: right;">Length of Perf .Pipe 26</p> <p style="text-align: right;">style of pipe 6" Sch 80 PVC</p> <p style="text-align: right;">Bore diameter 36"well bore 40</p> <p style="text-align: right;">Bottom of bore 41</p> <p style="text-align: right;">36 inch well bore</p>

Monitoring Log				Well Boring Log				
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp
8:30 AM				0-1	dirt			
9:30 AM				1-10	HHT	none	dry	85
10:30 AM				10-20	Fiber/HHT	none	dry	88
11:30 AM				20-30	HHT	none	dry	90
12:30 PM				30-41	HHT	none	dry	92
1:30 PM				40-50				
2:30 PM				50-60				
3:30 PM				60-70				
				70-80				
				80-90				
				90-100				
				100-110				
Notes				110-120				

CLIENT REPRESENTATIVE _____ DATE _____

Wade Tufford 7/6/2010
 AEGL SITE SUPERVISOR DATE

NAME & TITLE _____



Well Log

PROJECT NAME Davidson County LF
PROJECT# 101-10-012

DATE: 7/6/2010

Drilling	Well Asbuild
W404 WELL NUMBER OR NAME	
<u>31</u> LINEAR FEET OF DRILLING	
<u>31</u> LINEAR FEET OF COMPLETION	
<u>0</u> LINEAR FEET OF ABANDONMENT	
Weather conditions: <u>Sunny</u>	
Site conditions: <u>DRY</u>	
Rig hrs: _____	
Service: <u>Raidiator Grease</u>	
NOTES:	

Monitoring Log				Well Boring Log				
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp
8:30 AM				0-1	dirt			
9:30 AM				1-10	HHT	none	dry	85
10:30 AM				10-20	Fiber/HHT	none	dry	88
11:30 AM				20-31	HHT	none	dry	99
12:30 PM				30-41				
1:30 PM				40-50				
2:30 PM				50-60				
3:30 PM				60-70				
				70-80				
				80-90				
				90-100				
				100-110				
Notes				110-120				

 CLIENT REPRESENTATIVE DATE

 NAME & TITLE

 Wade Tufford 7/6/2010
 AEGL SITE SUPERVISOR DATE



Well Log

PROJECT NAME Davidson County LF
 PROJECT# 101-10-012

DATE: 7/6/2010

Drilling	Well Asbuild
W405 WELL NUMBER OR NAME 23 LINEAR FEET OF DRILLING 23 LINEAR FEET OF COMPLETION 0 LINEAR FEET OF ABANDONMENT Weather conditions: Sunny Site conditions: DRY Rig hrs: Service: Raidiator Grease NOTES:	

Monitoring Log				Well Boring Log				
Time	OXYGEN	H2S	LEL / CO	Depth	Composition	Degree of Decomp.	Degree of Moisture	Temp
8:30 AM				0-1	dirt			
9:30 AM				1-10	HHT	none	dry	85
10:30 AM				10-23	Fiber/HHT	none	dry	88
11:30 AM				20-30				
12:30 PM				30-41				
1:30 PM				40-50				
2:30 PM				50-60				
3:30 PM				60-70				
				70-80				
				80-90				
				90-100				
				100-110				
Notes				110-120				

CLIENT REPRESENTATIVE _____ DATE _____
 NAME & TITLE _____

Wade Tufford 7/6/2010
 AEGL SITE SUPERVISOR DATE

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Appendix C

Photographic Documentation

**Construction Quality Assurance Report
Holly Grove Landfill
Landfill Gas Collection System
Lexington, North Carolina**

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PHOTOGRAPHIC LOG

Client Name:
Davidson County Gas Producers, LLC

Site Location:
Holly Grove Landfill, Davidson County, NC

Project No.:
DTE 10-1

Photo No.
1

Date:
July 2,
2010

Direction Photo Taken:

Northwest

Description:

Drilling of LFG extraction wells in the Area I landfill unit.



Photo No.
2

Date:
July 2,
2010

Direction Photo Taken:

NA

Description:

Installation of LFG extraction well in Area I during placement of upper bentonite seal.



PHOTOGRAPHIC LOG

Client Name:
Davidson County Gas Producers, LLC

Site Location:
Holly Grove Landfill, Davidson County, NC

Project No.:
DTE 10-1

Photo No.
3

Date:
July 16,
2010

Direction Photo Taken:

East

Description:

View of installation of the 6" HDPE (DR 17) piping in Area II.



Photo No.
4

Date:
July 16,
2010

Direction Photo Taken:

Northwest

Description:

View of temporary air pressure valve installed on top of a LFG extraction well in Area II. The air pressure gauge was used to perform low pressure testing per ASTM F-1417.



PHOTOGRAPHIC LOG

Client Name:
Davidson County Gas Producers, LLC

Site Location:
Holly Grove Landfill, Davidson County, NC

Project No.:
DTE 10-1

Photo No.
5

Date:
July 18,
2010

Direction Photo Taken:

West

Description:

Installation of capped LFG extraction well in Area II prior to installation of wellhead.



Photo No.
6

Date:
July 23,
2010

Direction Photo Taken:

East

Description:

LFG header piping on west slope of Area I.



PHOTOGRAPHIC LOG

Client Name:
Davidson County Gas Producers, LLC

Site Location:
Holly Grove Landfill, Davidson County, NC

Project No.:
DTE 10-1

Photo No.
7

Date:
July 21,
2010

Direction Photo Taken:

South

Description:

LFG piping installation along Davidson County Landfill Road, near old landfill scale/scale house.



Photo No.
8

Date:
August 2,
2010

Direction Photo Taken:

South

Description:

Installation of Condensate Pump Station No. 1 (CPS-1) to north of the County convenience center.



PHOTOGRAPHIC LOG

Client Name:
Davidson County Gas Producers, LLC

Site Location:
Holly Grove Landfill, Davidson County, NC

Project No.:
DTE 10-1

Photo No.
9

Date:
August 4,
2010

Direction Photo Taken:

North

Description:

Installation of isolation valve and valve box north of CPS-1.



Photo No.
10

Date:
August 4,
2010

Direction Photo Taken:

NA

Description:

View of isolation valve box north of CPS-1.



PHOTOGRAPHIC LOG

Client Name:
Davidson County Gas Producers, LLC

Site Location:
Holly Grove Landfill, Davidson County, NC

Project No.:
DTE 10-1

Photo No.
11

Date:
August 6,
2010

Direction Photo Taken:

North

Description:

View of installation of LFG piping along Davidson County Landfill Road.



Photo No.
12

Date:
August
10, 2010

Direction Photo Taken:

Southeast

Description:

View of installation of LFG piping along Davidson County Landfill Road looking toward CPS-2.



PHOTOGRAPHIC LOG

Client Name:
Davidson County Gas Producers, LLC

Site Location:
Holly Grove Landfill, Davidson County, NC

Project No.:
DTE 10-1

Photo No.
13

Date:
August
16, 2010

**Direction Photo
Taken:**

East

Description:

View of installation of LFG piping near road crossing to south of existing scale/scale house.



Photo No.
14

Date:
August
19, 2010

**Direction Photo
Taken:**

N/A

Description:

Installation of CPS-2.



PHOTOGRAPHIC LOG

Client Name: Davidson County Gas Producers, LLC		Site Location: Holly Grove Landfill, Davidson County, NC	Project No.: DTE 10-1
Photo No. 15	Date: August 25, 2010		
Direction Photo Taken: West			
Description: Installation of CPS-3.			

Photo No. 16	Date: August 25, 2010		
Direction Photo Taken: Northwest			
Description: View of the road crossing and installation of LFG piping at the connection point to the existing active LFG collection system (Phase 1 landfill unit).			

PHOTOGRAPHIC LOG

Client Name:
Davidson County Gas Producers, LLC

Site Location:
Holly Grove Landfill, Davidson County, NC

Project No.:
DTE 10-1

Photo No.
17

Date:
August
27, 2010

**Direction Photo
Taken:**

Northwest

Description:

View of isolation valve and temporary connection to the existing active LFG system (Phase 1 landfill unit).



Photo No.
18

Date:
August
27, 2010

**Direction Photo
Taken:**

North

Description:

View of completed LFG extraction well in Area I.



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Appendix D

CQA Reports

**Construction Quality Assurance Report
Holly Grove Landfill
Landfill Gas Collection System
Lexington, North Carolina**

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DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	AEG	General Contractor's Rep.: Deatin Moore (Driller)
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: Frank Terry	Rep: Byron Hackney	Rep:
Arrived: 7:00 AM	Arrived: 7:20 AM	Arrived:
Departed: 6:00 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Off-Road Truck, 1 CAT Track Hoe, 1 Soilmec Drill Rig		
Contractor's Personnel:		
Materials Received:		
<u>Material(s)</u>	<u>Description</u>	
Visitor Information:		
<u>Firm Name(s)</u>	<u>Representative's Name</u>	<u>Representative's Title</u>
HR Green	Dave DuFour	Construction Superintendant
Important Conversation(s):		
<u>Conversation(s)</u>	<u>Description</u>	
w/Driller w/Driller	Driller is unaware that benching will be required at W302, W404, W405 Roll-off supplied by Steve(Davidson) for trash removal	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> Well locations not staked out upon arrival. Marked out location of W304 w/data supplied by P.Scheer to allow driller to begin work. Surveyor arrived approx. 8AM and staked out remaining wells Driller encountered fiberglass material (as expected from previous drilling) at/about 35'-40' from grade, has to repeatedly lay bucket down to remove fibers from kelly bars Drilling starts on Area I approx 8:30am Found newspaper dated 1990 Wells completed today: 304,305,306 . . . 		
Prepared By:	Frank Terry	Date : 7/1/10
		Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	AEG	General Contractor's Rep.: Deatin Moore (Driller)
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	7:00 AM	Arrived:
Departed:	7:00 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Off-Road Truck, 1 CAT Track Hoe, 1 Soilmec Drill Rig		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
w/scalehouse operator	scale & last load hours	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ AEG hired local trucking company to haul trash from Holly Grove to active fill area (Phase 2) ▪ Driller had to build soil bench to locate rig over well 302 (approx. 10:00-10:30) ▪ Driller encountered fiberglass material (as expected from previous drilling) at/about 35'-40' from grade, has to repeatedly lay bucket down to remove fibers from kelly bars ▪ Wells completed today: 302,303 ▪ ▪ ▪ ▪ 		
Prepared By:	Frank Terry	Date : 7/2/10
		Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	AEG	General Contractor's Rep.: Wade (driller)
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	7:00 AM	Arrived:
Departed:	5:30 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Off-Road Truck, 1 CAT Track Hoe, 1 Soilmec Drill Rig		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendant
Important Conversation(s):		
Conversation(s)	Description	
w/driller w/P.Scheer	drilling out of vent well @ well 403, benching required @ well 404,405 vent well construction	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ Relief crew arrived yesterday, all new workers ▪ Soil Benching placed at wells 404,405 ▪ Found newspaper dated 1992 ▪ Hit refusal at 41' in well 403 ▪ Based on cap & cover condition (6' soil and geosynthetic), solid pipe was reduced at well 403 by 2' ▪ Wells completed today: 402-405 ▪ ▪ 		
Prepared By:	Frank Terry	Date : 7/6/10
		Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: FT	Rep: Lindsay Quant	Rep:
Arrived: 7:45 AM	Arrived: 7:45 AM	Arrived:
Departed: 5:00 PM	Departed: 5:00 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 2 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
w/T.Scott	Routing of pipe over drain & water lines in trench near scale house	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ Pipeline trenching continuing heading towards old scalehouse ▪ PIS encounters old abandoned concrete drain pipe (approx. 18"D) and active corrugated plastic drain pipe (approx.12"D) in trench. ▪ PIS hit water line. 4"sch. 40 PVC @ approx. 3:30PM ▪ Water left off over night ▪ ▪ ▪ ▪ 		
Prepared By: Frank Terry	Date : 7/21/10	Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	8:00 AM	Arrived:
Departed:	5:30 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 2 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Condensate Pump Stations	CPS-2,3 are not fitted with bottom inlet piping per design	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendant
Important Conversation(s):		
Conversation(s)	Description	
w/T.Scott w/J.Jomp	Pipe bedding & backfill in trench area that contained waste (must use clean material) Revised header/lateral routing on Area 1 (302-303)	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ Trenching continues on Area 1 ▪ Water line repaired by OH Plumbing first thing this morning ▪ Encountered demolition waste (apparent road fill material) in pipeline trench at about station 10+20 ▪ PIS hauling waste to C&D disposal area ▪ PIS clears waste in trench at near station 10+80 ▪ PIS inadvertently hit hydrant near old scale house while backfilling trench. Pipe is capped off & OH Plumbing called for repair. ▪ ▪ 		
Prepared By:	Frank Terry	Date : 7/22/10
Reviewed By:		PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	7:50 AM	Arrived:
Departed:	5:00 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Overcast	Dry	High: 80 Low: 70
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 2 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendant
Important Conversation(s):		
Conversation(s)	Description	
w/J.Jomp	Revised header/lateral routing on Area 1 (302-303)	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ Trenching continues on Area 1 ▪ Trenching continues on pipeline ▪ ▪ ▪ ▪ ▪ ▪ 		
Prepared By:	Frank Terry	Date : 7/28/10
		Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	8:00 AM	Arrived:
Departed:	4:30 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 2 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ Trenching continues on Area 1 ▪ Trenching continues on pipeline ▪ ▪ ▪ ▪ ▪ ▪ 		
Prepared By:	Frank Terry	Date : 7/29/10
		Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	8:00 AM	Arrived:
Departed:	4:30 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 2 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> Trenching continues on Area 1, from well 304 down to tie in with header loop Pipeline trenching stopped until Area 1 header is completed to bottom of slope 		
Prepared By:	Frank Terry	Date : 7/30/10
		Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: FT	Rep:	Rep:
Arrived: 8:00 AM	Arrived:	Arrived:
Departed: 5:30 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Overcast	Wet	High: 80 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 2 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ PIS backfilling Area 1 (upper sections) & removing trench waste ▪ PIS fusing Area 1 header loop connection (completed 2PM) ▪ PIS begins trenching Area 2/pipeline/CPS-1 section (11AM) ▪ ▪ ▪ ▪ ▪ 		
Prepared By: Frank Terry	Date : 8/2/10	Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: FT	Rep: P.Scheer	Rep:
Arrived: 8:00 AM	Arrived: 10:00 AM	Arrived:
Departed: 4:30 PM	Departed: 11:30 AM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 2 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> • PIS working on Area 2/pipeline/CPS-1 section (11AM) • CPS-1 set (1PM), waiting for EF coupling to complete install • PIS hand digging to locate water line in pipeline trench • Area 2 header & pipeline in trench @ CPS shifted considerably (+/- 10") due to heat over the course of the day, offsetting pipe/valve alignments. Advised PIS to wait until AM to bolt-up valves & backfill immediately • • • • 		
Prepared By: Frank Terry	Date : 8/3/10	Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: FT	Rep:	Rep:
Arrived: 8:00 AM	Arrived:	Arrived:
Departed: 3:30 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 1 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> Area 2 header & pipeline have realigned and PIS is completing bolt up at CPS-1 CPS-1 completed and backfilled in compacted lifts PIS safe digging around station 19+00 to establish trench routing near water line markout Reviewed location of Area 1 isolation valve w/Jason. Moved valve further upslope to keep valve & protective culvert out of drainage swale. 		
Prepared By: Frank Terry	Date : 8/4/10	Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	8:30 AM	Arrived:
Departed:	3:30 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 1 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendant
Important Conversation(s):		
Conversation(s)	Description	
w/P.Scheer & B.Hackney	Compaction testing in pipeline trench based on availability of technician @ High Point	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ Trenching continuing (10" pipe) at station 19+00 ▪ Area 1 Y to pipeline connection being assembled and fused ▪ PIS hit water line at approx. station 18+00, repaired by OH plumbing at 9:30am ▪ PIS potholing adjacent to road & guardrail to try and locate water line ▪ Water line not found, continuing trench ▪ Pressure tested (Areas 1 & 2,CPS-1, Pipeline), test successful ▪ Heavy thunderstorms arriving at 4:30-5:00 ▪ 		
Prepared By:	Frank Terry	Date : 8/5/10
		Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	7:45 AM	Arrived:
Departed:	3:30 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Overcast	Dry	High: 90 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 1 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ PIS pumping trench due to heavy rains last night ▪ GPR locating service onsite to assist with location of utilities ▪ PIS installed 12" plastic drain pipe through pipeline berm near Area 2. Stormwater runoff is damaging berm. Advised them to place stone at inlet of pipe. ▪ Trenching extends around bend in road @ guardrail ▪ ▪ ▪ ▪ 		
Prepared By:	Frank Terry	Date : 8/6/10
		Reviewed By: PKS



RICHARDSON SMITH GARDNER & ASSOCIATES
 Engineering and Geological Services
 14 N. Boylan Avenue Tel: 919-828-0577
 Raleigh, NC 27603 Fax: 919-828-3899

Log No.: 1
 Day: Saturday
 Date: 8/7/10
 Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	Holy Grove LF Gas Collection System	RSG Project No.: DTE 10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson Co., N.C.	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: Randy Berarducci	Rep:	Rep:
Arrived: 9:30 AM	Arrived:	Arrived:
Departed: 1:00 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Clear	dry	High: 95 Low: 80
Contractor's Equipment:		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
Important Conversation(s):		
Conversation(s)	Description	
Description of Daily Activities and Events:		
<p>I spoke with Todd Scott (Piedmont Industrial Services) about the relocation of Condensate Pump Station 2. It was decided on 8/6/10 that a more suitable and secure location would be slightly up hill from the original location and behind the landfill fence line. Adjustments in depth of pipe will be necessary to accommodate the new location.</p> <ul style="list-style-type: none"> I observed the trenching and backfilling of the LFG Header Line, Condensate Force Main, and Compressed Air Supply piping up to Station 21+00. I observed Todd Scott excavate a test pit at the new Condensate Pump Station location. The following soil observations were made: 0'-2' - Topsoil / 2'-8' Brownish-Orange Sandy Clay / 8'-11' Brown to Gray Sandy Clay Trace Sandstone RSG Rep. departed site. 		
<p>Prepared By: William R. Berarducci Date: 8/7/10 Reviewed By: PKS</p>		



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 Engineering and Geological Services
 14 N. Boylan Avenue Tel: 919-828-0577
 Raleigh, NC 27603 Fax: 919-828-3899

Log No.: 1
 Day: Tuesday
 Date: 8/10/10
 Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	Holy Grove LF Gas Collection System	RSG Project No.: DTE 10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson Co., N.C.	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: Randy Berarducci	Rep:	Rep:
Arrived: 12:45 PM	Arrived:	Arrived:
Departed: 3:30 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Clear - Partly Cloudy	dry	High: 95 Low: 90
Contractor's Equipment:		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
Important Conversation(s):		
Conversation(s)	Description	
Pieter Scheer	Approval to make Second Road Crossing Pipe Trench all ABC Stone.	
Description of Daily Activities and Events:		
<p>I spoke with Todd Scott (Piedmont Industrial Services), he had concerns about the flexing the 10" LFG Pipe into the CMP for the second road crossing. The pie trench was to close the road and did not allow for enough flexible bend. I contacted Pieter Scheer (RSG) and he approved altering the trench to allow the flex bend. The trench will now be entirely filled and compacted with ABC Stone back up to the asphalt surface.</p> <ul style="list-style-type: none"> I observed the trenching and backfilling of the LFG Header Line, Condensate Force Main, and Compressed Air Supply piping up to Station 30+00. 		
<ul style="list-style-type: none"> RSG Rep. departed site. 		
<p>Prepared By: William R. Berarducci Date: 8/10/10 Reviewed By: PKS</p>		

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	8:30 AM	Arrived:
Departed:	1:30 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 95 Low: 75
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 1 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
w/M. Bilinski & D DuFour	Discussed Phase 1 final cover project work (suspended due to delayed material), will not be back onsite until Monday 8/16. DuFour will observe PIS work until then.	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> ▪ Trenching continuing (10" pipe) ▪ Pis saw cut road crossing at main entrance to scale area, trenching through asphalt ▪ PIS encounters orange phone line marker tape and hand digs to locate apparent dead line. Locating Service technician onsite, rechecks utility mark out. ▪ Checked CPS inlet installation performed by ISCO yesterday. Appears to be satisfactory, socketed, gusseted, & extruded 6" stub w/90 and riser ▪ ▪ ▪ ▪ 		
Prepared By:	Frank Terry	Date : 8/12/10
		Reviewed By: PKS



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 Engineering and Geological Services
 14 N. Boylan Avenue Tel: 919-828-0577
 Raleigh, NC 27603 Fax: 919-828-3899

Log No.: 1
 Day: Tuesday
 Date: 8/16/10
 Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	Holy Grove LF Gas Collection System	RSG Project No.: DTE 10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson Co., N.C.	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: Randy Berarducci	Rep:	Rep:
Arrived: 7:30 AM	Arrived:	Arrived:
Departed: 1:30 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Clear	dry	High: 94 Low: 78
Contractor's Equipment:		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
Important Conversation(s):		
Conversation(s)	Description	
David DuFour	Piedmont Found an existing culvert while trenching, David received approval from the LF Operations Management to remove the culvert since it was abandoned.	
Description of Daily Activities and Events:		
<p>I spoke with Todd Scott (Piedmont Industrial Services) and David DuFour (Howard R. Green Company), while entrenching the LFG Pipe an old existing culvert was found approximately 2' under ground. A discussion was made to go under the culvert but due to previously encountered phone and power lines in the same proximity the trench could not be dug to a lower elevation. David DuFour contacted the County and Charlie Brushwood came out to observe the pipe. It was determined that the pipe was an old abandoned shop drain that was no longer in use and could be removed.</p> <ul style="list-style-type: none"> I observed the trenching and backfilling of the LFG Header Line, Condensate Force Main, and Compressed Air Supply piping up to Station 33+00. Including the road crossing at Station 32+50. 		
<ul style="list-style-type: none"> RSG Rep. departed site. 		
<p>Prepared By: William R. Berarducci Date : 8/16/10 Reviewed By: PKS</p>		

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: FT	Rep:	Rep:
Arrived: 9:00 AM	Arrived:	Arrived:
Departed: 4:30 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Sunny, Clear	Dry	High: 92 Low: 80
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 1 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
J.Jomp	CPS2 & 3 configuration, 6" riser will be connected w/EF couplings as per P.Scheer	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> • PIS moving 10" pipe from stockpile to working area near maintenance bldg. • PIS trenching near STA 36+00 • PIS trench is shallow (18" over pipe) for approx 40' near STA 36+00, advised to return to correct depth (24" over pipe) for the remainder of the run. • PIS offsite @ 4PM • • • • 		
Prepared By: Frank Terry	Date : 8/17/10	Reviewed By: PKS

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	DTE - Holly Grove LF LFG Collection System	RSG Project No.: DTE-10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson County, NC	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jason Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep:	FT	Rep:
Arrived:	7:30 AM	Arrived:
Departed:	3:00 PM	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Overcast	Dry	High: 85 Low: 80
Contractor's Equipment:		
1 Tri-Axle Dump Truck, 1 Track Hoe, 1 Skid Steer Loader, 1 Mini-Track Hoe		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
HR Green	Dave DuFour	Construction Superintendent
Important Conversation(s):		
Conversation(s)	Description	
Description of Daily Activities and Events:		
<ul style="list-style-type: none"> Discussed CPS 3 location with Dufour/Jomp/Scott. Surveyed location puts CPS on a culvert. PIS to grub area to locate culvert. PIS fusing 10" pipe and backfilling/compacting ABC material in driveway area between 36+00 and 37+00 		
Prepared By:	Frank Terry	Date : 8/18/10
		Reviewed By: PKS



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 Engineering and Geological Services
 14 N. Boylan Avenue Tel: 919-828-0577
 Raleigh, NC 27603 Fax: 919-828-3899

Log No.: 1
 Day: Tuesday
 Date: 8/24/10
 Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION			
Project Name:	Holy Grove LF Gas Collection System	RSG Project No.:	DTE 10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski	
Site Location:	Davidson Co., N.C.		
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jomp	
Subcontractor(s):		Subcontractor's Rep.(s):	
DAILY INFORMATION			
RSG Representative(s) Time(s) on Site:			
Rep: Randy Berarducci	Rep: Pieter Scheer	Rep:	
Arrived: 7:30 AM	Arrived: 10:25 AM	Arrived:	
Departed: 2:30 PM	Departed: 11:30 AM	Departed:	
Weather Conditions:	Ground Conditions:	Temperature:	
Cloudy (a.m.) - Heavy Rain (p.m.)	Dry-Wet	High: 88	
		Low: 76	
Contractor's Equipment:			
Contractor's Personnel:			
Materials Received:			
Material(s)		Description	
Visitor Information:			
Firm Name(s)	Representative's Name	Representative's Title	
RSG Engineers	Pieter Scheer	Project Manager	
Important Conversation(s):			
Conversation(s)		Description	
David DuFour/Pieter Scheer		Piedmont encountered bedrock at 12' depth installing CPS-3.	
Description of Daily Activities and Events:			
<p>I spoke with Todd Scott (Piedmont Industrial Services) and David DuFour (Howard R. Green Company), while excavating the placement location of CPS-3, bedrock was encountered at approximately 12'-12.5 feet. I contacted Pieter Scheer (RSG) to get approval of the depth. Pieter informed WRB that 12' would be deep enough and adjustments would need to be made to the condensate drop out, and when the condensate pumps were installed (future) adjustments would have to be made to accommodate the shorter depth of installation.</p> <ul style="list-style-type: none"> I observed the trenching and backfilling of the LFG Header Line, Condensate Force Main, and Compressed Air Supply piping up to Station 40+00. I observed the low pressure air test fro the Gas Header/Air line/Condensate Line, from CPS-1 to CPS-3, pressure was maintained and passed (see low pressure test logs prepared by RSG). 			
<ul style="list-style-type: none"> RSG Rep. departed site at 2:30 due to heavy rain. 			
<p>Prepared By: William R. Berarducci Date: 8/24/10 Reviewed By: PKS</p>			



DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	Holy Grove LF Gas Collection System	RSG Project No.: DTE 10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson Co., N.C.	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: Randy Berarducci	Rep:	Rep:
Arrived: 7:30 AM	Arrived:	Arrived:
Departed: 4:30 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Cloudy	Wet	High: 94 Low: 78
Contractor's Equipment:		
Contractor's Personnel:		
Materials Received:		
<u>Material(s)</u>	<u>Description</u>	
Visitor Information:		
<u>Firm Name(s)</u>	<u>Representative's Name</u>	<u>Representative's Title</u>
Important Conversation(s):		
<u>Conversation(s)</u>	<u>Description</u>	
Todd Scott/Frank Terry	WRB received clarification of the anchor trench crossing.	
David DuFour/Todd Scott	Road crossing relocation.	
Pieter Scheer	Pieter Scheer informed WRB about condensate/cleanout connection.	
Description of Daily Activities and Events:		
<p>I spoke with Todd Scott (Piedmont Industrial Services) and Frank Terry (RSG) about the anchor trench crossing and downpipe connection of the LFG Header pipe. After discussion in the field, it was determined to place Two (2) - 22.5 Elbows in the header pipe to achieve the proper crossing of the anchor trench, and also to allow the pipe to daylight in the proper orientation to allow connection to the LFG Downpipe from the Davidson Co. MSW LF.</p> <p>I spoke with David DuFour (Howard R. green Co.) and Todd Scott (Piedmont Industrial Systems) about the realignment of the road crossing. It was agreed previously by RSG personnel to allow the road crossing to continue straight from CP-3 and cross the road rather than bending the pipe around the perimeter road for future connection. This will allow DTE to connect the LFG header pipe to the existing flare system to start pulling gas for carbon credits.</p> <p>I spoke with Pieter Scheer (RSG) about connecting the condensate force main to the existing cleanout in the Davidson Co. MSW LF. Pieter wanted to connect to the HDPE pipe below the PVC cleanout. WRB will speak with Chuck Ralston (SCS Field Services) 8/26/10.</p> <ul style="list-style-type: none"> I observed the trenching and backfilling of the LFG Header Line, Condensate Force Main, and Compressed Air Supply piping up to Station 43+00, including the placement of the CMP for the LF Perimeter Road crossing. RSG Rep. departed site. 		
Prepared By: William R. Berarducci		
Date: 8/25/10		
Reviewed By: PKS		



RICHARDSON SMITH GARDNER & ASSOCIATES
Engineering and Geological Services
 14 N. Boylan Avenue Tel: 919-828-0577
 Raleigh, NC 27603 Fax: 919-828-3899

Log No.: 1
 Day: Thursday
 Date: 8/26/10
 Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	Holy Grove LF Gas Collection System	RSG Project No.: DTE 10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson Co., N.C.	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: Randy Berarducci	Rep:	Rep:
Arrived: 7:30 AM	Arrived:	Arrived:
Departed: 5:00 PM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Cloudy	Wet-Moist	High: 96 Low: 78
Contractor's Equipment:		
Contractor's Personnel:		
Materials Received:		
<u>Material(s)</u>	<u>Description</u>	
Visitor Information:		
<u>Firm Name(s)</u>	<u>Representative's Name</u>	<u>Representative's Title</u>
Important Conversation(s):		
<u>Conversation(s)</u>	<u>Description</u>	
Pieter Scheer/Chuck Ralston	Condensate force main connection to existing cleanout location.	
Description of Daily Activities and Events:		
<p>WRB spoke with Chuck Ralston (SCS Field Services) and Chuck advised WRB that the cleanouts were temporary and when the cap was being placed all of the cleanouts will be replaced with HDPE. Without knowing the exact elevation of the cap, Chuck agreed that SCS will make the connection to the cleanout when the liner and piping were installed for the cap of the MSW LF.</p> <ul style="list-style-type: none"> I observed the low pressure air test fro the Gas Header/Air line/Condensate Line, from Area 1/Area 2 to the connection point in the Davidson Co. MSW LF, pressure was maintained and passed (see low pressure test log prepared by RSG). RSG Rep. departed site. 		
<p>Prepared By: William R. Berarducci Date : 8/26/10 Reviewed By: PKS</p>		



DAILY CQA REPORT

PROJECT INFORMATION		
Project Name:	Holy Grove LF Gas Collection System	RSG Project No.: DTE 10-1
Client Name:	Davidson Gas Producers, LLC	Client Contact(s): Marcus Bilinski
Site Location:	Davidson Co., N.C.	
General Contractor:	Piedmont Industrial Services	General Contractor's Rep.: Todd Scott/Jomp
Subcontractor(s):		Subcontractor's Rep.(s):
DAILY INFORMATION		
RSG Representative(s) Time(s) on Site:		
Rep: Randy Berarducci	Rep:	Rep:
Arrived: 7:30 AM	Arrived:	Arrived:
Departed: 10:00 AM	Departed:	Departed:
Weather Conditions:	Ground Conditions:	Temperature:
Partly Cloudy	Moist	High: 80 Low: 76
Contractor's Equipment:		
Contractor's Personnel:		
Materials Received:		
Material(s)	Description	
Visitor Information:		
Firm Name(s)	Representative's Name	Representative's Title
Important Conversation(s):		
Conversation(s)	Description	
Pieter Scheer/David DuFour	Connection of the Holy grove LF to the DTE Flare System.	
Description of Daily Activities and Events:		
<p>WRB spoke with David DuFour (Howard R. Green Co.) and Pieter Scheer (RSG), the connection to existing closed Holy Grove LF is complete and DTE will now start priming the system to pull gas for Carbon Credit.</p> <ul style="list-style-type: none"> I observed the installation of the gas shut off valve, which connected the Holy Grove LF to the existing DTE Gas System. I observed the installation of the remaining vertical wellheads for Area 1 and Area 2 of the Holy Grove LF. RSG Rep. departed site. 		
Prepared By: William R. Berarducci		
Date: 8/27/10		
Reviewed By: PKS		

Appendix E

Earthwork CQA Data

**Construction Quality Assurance Report
Holly Grove Landfill
Landfill Gas Collection System
Lexington, North Carolina**

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	R.S.G & ASSOCIATES	Boring No.	NA
Client Reference	HOLLY GROVE LF - AREA II COVER REPAIR	Depth (ft)	NA
Project No.	2010-695-01	Sample No.	SAMPLE 1
Lab ID	2010-695-01-02	Soil Description	BROWN LEAN CLAY (Minus No. 40 sieve material, Airdried)

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

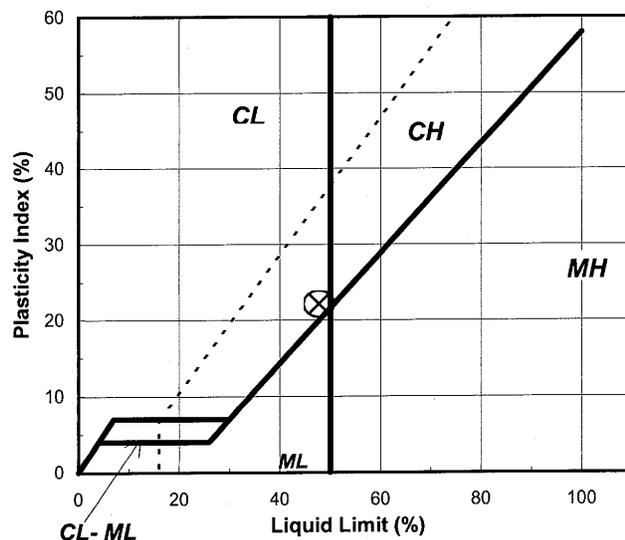
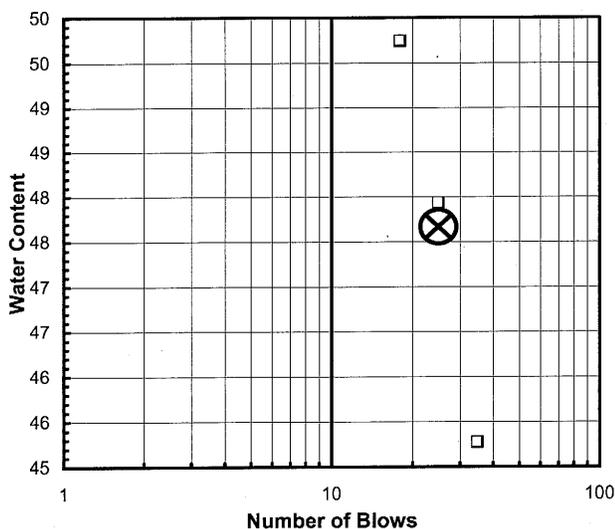
Liquid Limit Test	1	2	3	
Tare Number	R	C	H	M U L T I P O I N T
Wt. of Tare & WS (gm)	23.88	23.82	23.68	
Wt. of Tare & DS (gm)	21.15	21.04	20.84	
Wt. of Tare (gm)	15.12	15.24	15.13	
Wt. of Water (gm)	2.7	2.8	2.8	
Wt. of DS (gm)	6.0	5.8	5.7	
Moisture Content (%)	45.3	47.9	49.7	
Number of Blows	35	25	18	

Plastic Limit Test	1	2	Range	Test Results
Tare Number	N	K		Liquid Limit (%) 48 Plastic Limit (%) 26 Plasticity Index (%) 22 USCS Symbol CL
Wt. of Tare & WS (gm)	21.88	21.34		
Wt. of Tare & DS (gm)	20.55	20.08		
Wt. of Tare (gm)	15.28	15.21		
Wt. of Water (gm)	1.3	1.3		
Wt. of DS (gm)	5.3	4.9		
Moisture Content (%)	25.2	25.9	-0.6	

Note: The acceptable range of the two Moisture contents is ± 2.6

Flow Curve

Plasticity Chart



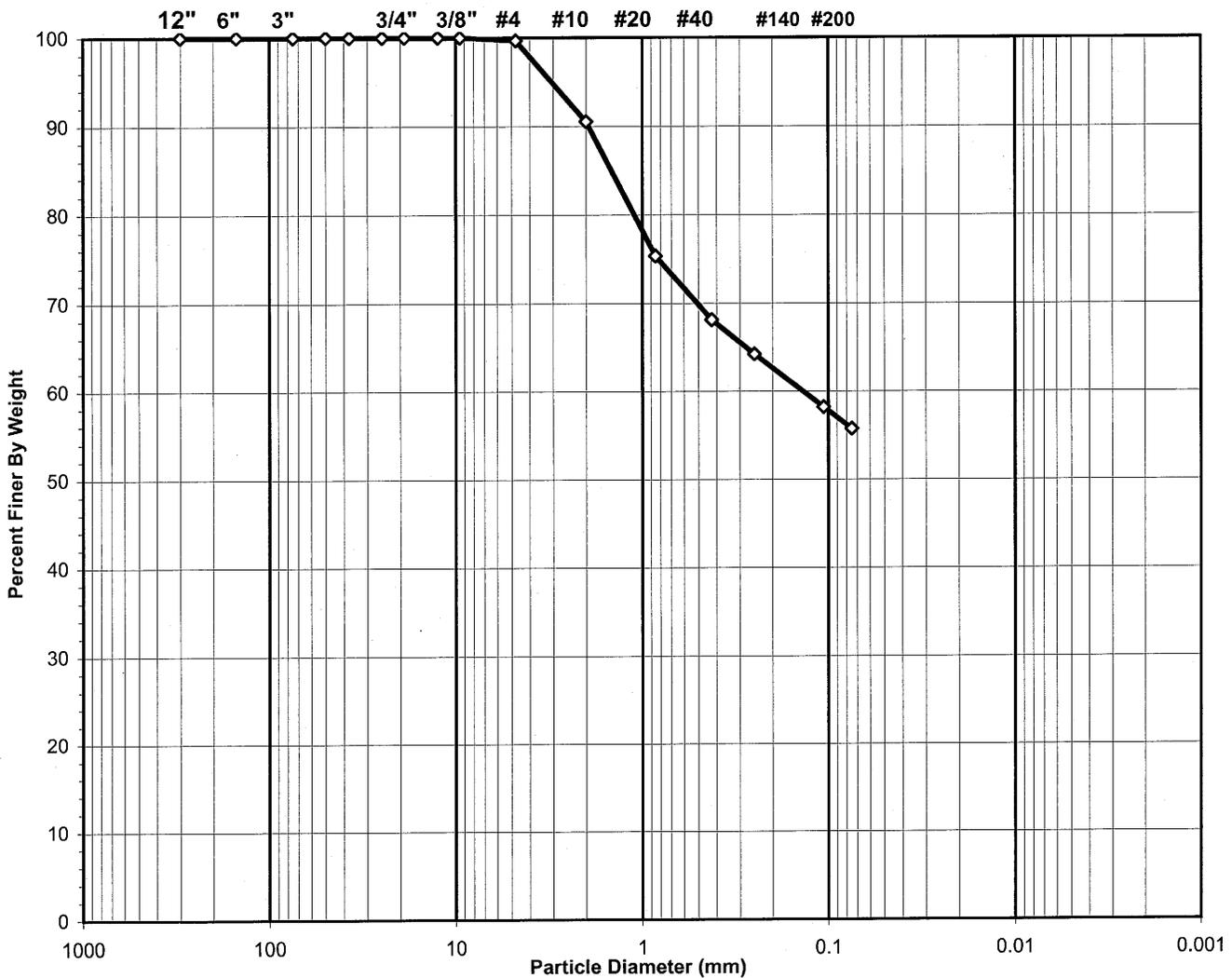
Tested By SD Date 7/19/2010 Checked By GEM Date 7-22-10

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SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	R.S.G & ASSOCIATES	Boring No.	NA
Client Reference	HOLLY GROVE LF - AREA II COVER REPAIR	Depth (ft)	NA
Project No.	2010-695-01	Sample No.	SAMPLE 1
Lab ID	2010-695-01-02	Soil Color	BROWN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **CL, TESTED**

USCS Classification **SANDY LEAN CLAY**

Tested By JBD Date 7/21/2010 Checked By *GEM* Date 7-22-10

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	R.S.G & ASSOCIATES	Boring No.	NA
Client Reference	HOLLY GROVE LF - AREA II COVER REPAIR	Depth (ft)	NA
Project No.	2010-695-01	Sample No.	SAMPLE 1
Lab ID	2010-695-01-02	Soil Color	BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	215	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	658.12	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	593.98	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	172.32	Weight of Tare (gm)	NA
Weight of Water (gm)	64.14	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	421.66	Weight of Dry Soil (gm)	NA
Moisture Content (%)	15.2	Moisture Content (%)	NA

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	421.66
Dry Weight - 3/4" Sample (gm)	186.7	Weight of minus #200 material (gm)	235.00
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	186.66
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.0	0.0	100.0	100.0
6"	150	0.00	0.0	0.0	100.0	100.0
3"	75	0.00	0.0	0.0	100.0	100.0
2"	50	0.00	0.0	0.0	100.0	100.0
1 1/2"	37.5	0.00	0.0	0.0	100.0	100.0
1"	25.0	0.00	0.0	0.0	100.0	100.0
3/4"	19.0	0.00	0.0	0.0	100.0	100.0
1/2"	12.50	0.00	0.0	0.0	100.0	100.0
3/8"	9.50	0.00	0.0	0.0	100.0	100.0
#4	4.75	1.35	0.3	0.3	99.7	99.7
#10	2.00	38.64	9.2	9.5	90.5	90.5
#20	0.850	63.89	15.2	24.6	75.4	75.4
#40	0.425	30.50	7.2	31.9	68.1	68.1
#60	0.250	16.38	3.9	35.8	64.2	64.2
#140	0.106	25.50	6.0	41.8	58.2	58.2
#200	0.075	10.40	2.5	44.3	55.7	55.7
Pan	-	235.00	55.7	100.0	-	-

Tested By JBD Date 7/21/2010 Checked By GAM Date 7-22-10

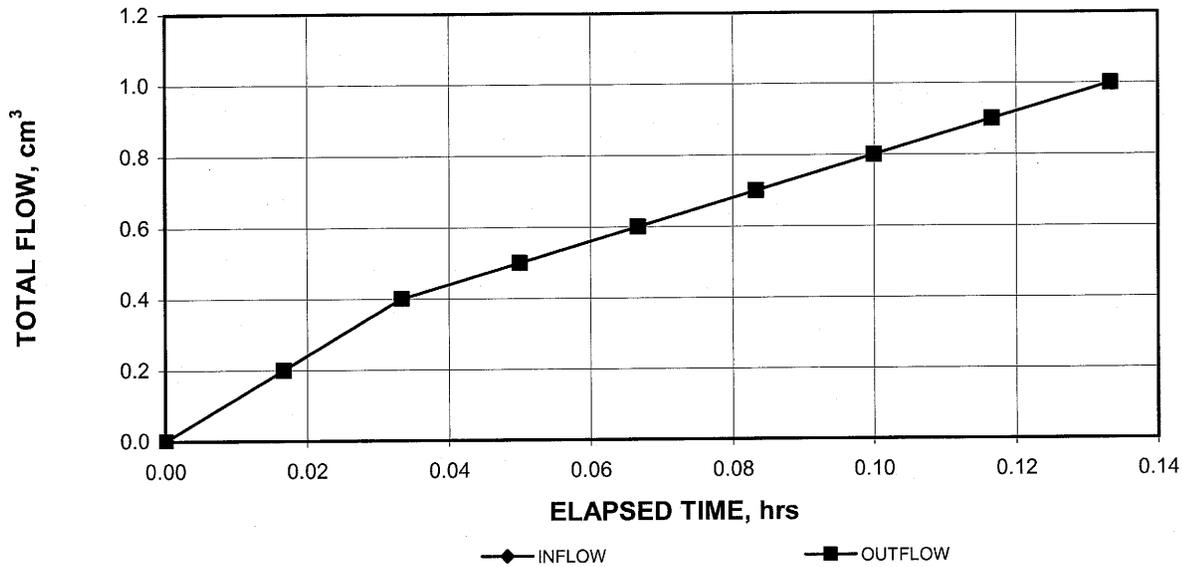
PERMEABILITY TEST

ASTM D 5084-03
(SOP-S22A & S22B)

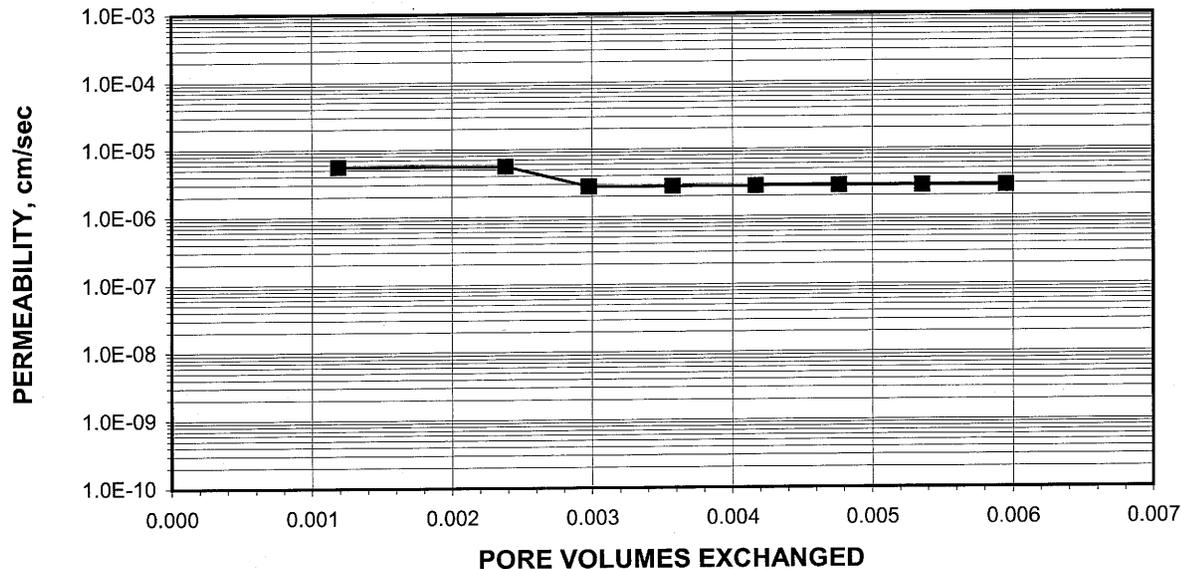
Client	R.S.G & ASSOCIATES	Boring No.	TRENCH BACKFILL
Client Project	HOLLY GROVE LF - AREA II COVER REPAIR	Depth (ft.)	LIFT 1
Project No.	2010-695-01	Sample No.	ST-01-L1
Lab ID No.	2010-695-01-01		

AVERAGE PERMEABILITY = 2.8E-06 cm/sec @ 20°C
 AVERAGE PERMEABILITY = 2.8E-08 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: TMS Date: 7/19/2010 Checked By: *GAM* Date: 7-22-10

PERMEABILITY TEST

ASTM D 5084-03
(SOP-S22A & S22B)

Client R.S.G & ASSOCIATES
Client Project HOLLY GROVE LF - AREA II COVER REPAIR
Project No. 2010-695-01
Lab ID No. 2010-695-01-01

Boring No. TRENCH BACKFILL
Depth (ft.) LIFT 1
Sample No. ST-01-L1

Specific Gravity 2.70 Assumed
Sample Condition Undisturbed

Visual Description: BROWN/ORANGE SILTY SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	813	806
Wt. of Tare & WS (gm.)	357.56	429.47
Wt. of Tare & DS (gm.)	320.66	362.54
Wt. of Tare (gm.)	112.27	102.14
Wt. of Water (gm.)	36.90	66.93
Wt. of DS (gm.)	208.39	260.40
Moisture Content (%)	17.7	25.7

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	702.60	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.)(gm.)	702.60	750.33
Length 1 (in.)	3.835	3.669
Length 2 (in.)	3.832	3.845
Length 3 (in.)	3.886	3.794
Top Diameter (in.)	2.840	2.836
Middle Diameter (in.)	2.825	2.842
Bottom Diameter (in.)	2.825	2.817
Average Length (in.)	3.85	3.77
Average Area (in. ²)	6.29	6.30
Sample Volume (cm ³)	396.95	388.99
Unit Wet Wt. (gm./ cm ³)	1.77	1.93
Unit Wet Wt. (pcf)	110.5	120.4
Unit Dry Wt. (pcf)	93.9	95.8
Unit Dry Wt. (gm./ cm ³)	1.50	1.53
Void Ratio, e	0.80	0.76
Porosity, n	0.44	0.43
Pore Volume (cm ³)	175.9	167.9
Total Wgt. Of Sample After Test		735.31

Tested By: TMS

Date: 7/19/2010 Checked By: *GEM*

Date: 7-22-10

PERMEABILITY TEST

ASTM D 5084-03
(SOP-S22A & S22B)



Client R.S.G & ASSOCIATES
 Client Project HOLLY GROVE LF - AREA II COVER REPAIR
 Project No. 2010-695-01
 Lab ID No. 2010-695-01-01

Boring No. TRENCH BACKFILL
 Depth (ft.) LIFT 1
 Sample No. ST-01-L1

Pressure Heads (Constant)

Top Cap (psi) 48.6
 Bottom Cap (psi) 50.0
 Cell (psi) 55.0
 Total Pressure Head (cm) 98.4
 Hydraulic Gradient 10.28

Final Sample Dimensions

Sample Length (cm), L 9.57
 Sample Diameter (cm) 7.19
 Sample Area (cm²), A 40.63
 Inflow Burette Area (cm²), a-in 0.877
 Outflow Burette Area (cm²), a-out 0.886
 B Parameter (%) 95

AVERAGE PERMEABILITY = 2.8E-06 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.8E-08 m/sec @ 20°C

DATE	TIME		ELAPSED TIME	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD	FLOW	TEMP.	INCREMENTAL PERMEABILITY
(mm/dd/yy)	(hr)	(min)	t (hr)	(cm ³)	(cm ³)	h (cm)	(0 flow) (1 stop)	(°C)	@ 20°C (cm/sec)
7/19/2010	14	7	0.00	0.0	0.0	125.1	0	24.9	NA
7/19/2010	14	8	0.02	0.2	0.2	124.7	0	24.9	5.5E-06
7/19/2010	14	9	0.03	0.4	0.4	124.2	0	24.9	5.6E-06
7/19/2010	14	10	0.05	0.5	0.5	124.0	0	24.9	2.8E-06
7/19/2010	14	11	0.07	0.6	0.6	123.8	0	24.9	2.8E-06
7/19/2010	14	12	0.08	0.7	0.7	123.5	0	24.9	2.8E-06
7/19/2010	14	13	0.10	0.8	0.8	123.3	0	24.9	2.8E-06
7/19/2010	14	14	0.12	0.9	0.9	123.1	0	24.9	2.8E-06
7/19/2010	14	15	0.13	1.0	1.0	122.9	1	24.9	2.8E-06

Tested By: TMS

Date: 7/19/2010

Checked By: *GM*

Date: 7-22-10

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PERMEABILITY TEST

ASTM D 5084-03
(SOP-S22A & S22B)

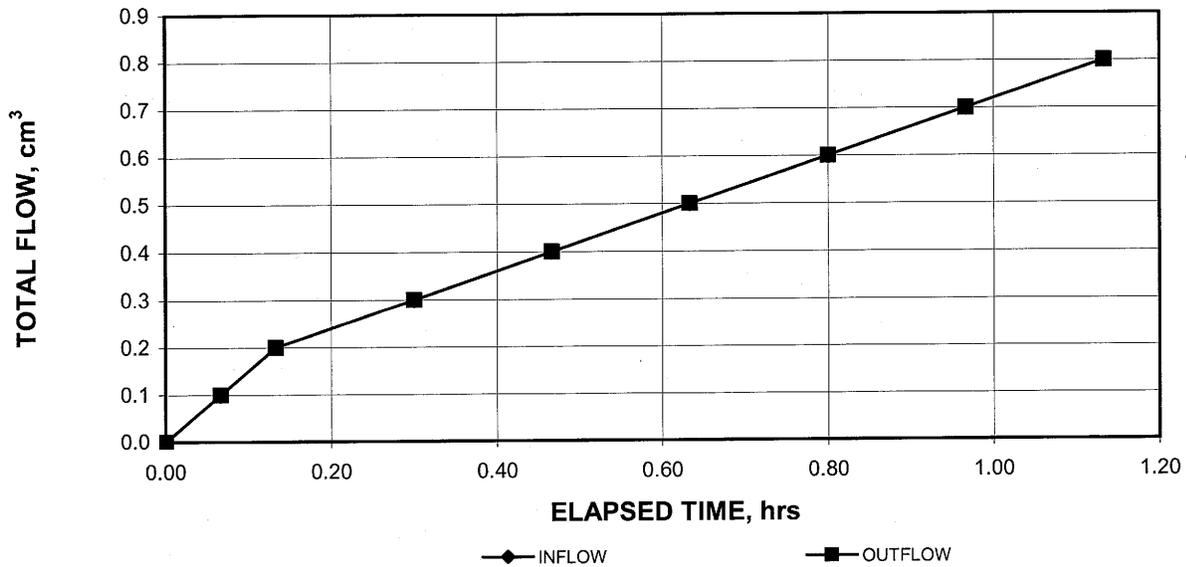
Client
Client Project
Project No.
Lab ID No.

R.S.G. & ASSOCIATES
HOLLY GROVE LF. AREA II COVER REPAIR
2010-695-03
2010-695-03-01

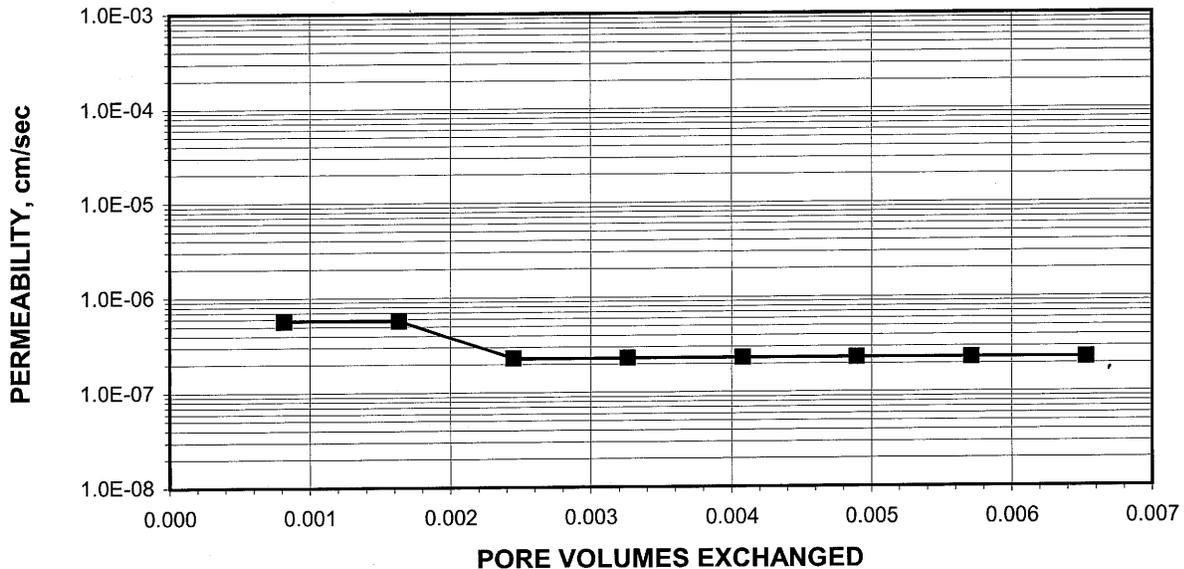
Boring No. TRENCH BACKFILL
Depth (ft.) LIFT 2
Sample No. ST-03-L2R

AVERAGE PERMEABILITY = 2.3E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.3E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: TMS

Date: 7/27/2010

Checked By: GAM

Date: 7-28-10

PERMEABILITY TEST

ASTM D 5084-03
(SOP-S22A & S22B)

Client	R.S.G. & ASSOCIATES	Boring No.	TRENCH BACKFILL
Client Project	HOLLY GROVE LF. AREA II COVER REPAIR	Depth (ft.)	LIFT 2
Project No.	2010-695-03	Sample No.	ST-03-L2R
Lab ID No.	2010-695-03-01		
		Specific Gravity	2.70 Assumed
		Sample Condition	Undisturbed

Visual Description: REDDISH BROWN SILTY SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	801	809
Wt. of Tare & WS (gm.)	441.79	470.85
Wt. of Tare & DS (gm.)	395.85	416.05
Wt. of Tare (gm.)	106.97	114.89
Wt. of Water (gm.)	45.94	54.80
Wt. of DS (gm.)	288.88	301.16
Moisture Content (%)	15.9	18.2

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	670.64	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.)(gm.)	670.64	683.91
Length 1 (in.)	3.180	3.155
Length 2 (in.)	3.215	3.195
Length 3 (in.)	3.221	3.197
Top Diameter (in.)	2.838	2.880
Middle Diameter (in.)	2.865	2.878
Bottom Diameter (in.)	2.856	2.845
Average Length (in.)	3.21	3.18
Average Area (in. ²)	6.39	6.46
Sample Volume (cm ³)	335.79	336.82
Unit Wet Wt. (gm./ cm ³)	2.00	2.03
Unit Wet Wt. (pcf)	124.7	126.7
Unit Dry Wt. (pcf)	107.6	107.2
Unit Dry Wt. (gm./ cm ³)	1.72	1.72
Void Ratio, e	0.57	0.57
Porosity, n	0.36	0.36
Pore Volume (cm ³)	121.5	122.5
Total Wgt. Of Sample After Test		688.49

Tested By: TMS

Date: 7/27/2010

Checked By: *eam*

Date: 7-28-10

PERMEABILITY TEST

ASTM D 5084-03
(SOP-S22A & S22B)



Client	R.S.G. & ASSOCIATES	Boring No.	TRENCH BACKFILL
Client Project	HOLLY GROVE LF. AREA II COVER REPAIR	Depth (ft.)	LIFT 2
Project No.	2010-695-03	Sample No.	ST-03-L2R
Lab ID No.	2010-695-03-01		

Pressure Heads (Constant)

Top Cap (psi)	48.6
Bottom Cap (psi)	50.0
Cell (psi)	55.0
Total Pressure Head (cm)	98.4
Hydraulic Gradient	12.18

Final Sample Dimensions

Sample Length (cm), L	8.08
Sample Diameter (cm)	7.28
Sample Area (cm ²), A	41.67
Inflow Burette Area (cm ²), a-in	0.877
Outflow Burette Area (cm ²), a-out	0.886
B Parameter (%)	97

AVERAGE PERMEABILITY = 2.3E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.3E-09 m/sec @ 20°C

DATE (mm/dd/yy)	TIME		ELAPSED TIME t (hr)	TOTAL INFLOW (cm ³)	TOTAL OUTFLOW (cm ³)	TOTAL HEAD h (cm)	FLOW (0 flow) (1 stop)	TEMP. (°C)	INCREMENTAL PERMEABILITY @ 20°C (cm/sec)
	(hr)	(min)							
7/27/2010	8	52	0.00	0.0	0.0	125.3	0	24.7	NA
7/27/2010	8	56	0.07	0.1	0.1	125.1	0	24.7	5.7E-07
7/27/2010	9	0	0.13	0.2	0.2	124.9	0	24.7	5.7E-07
7/27/2010	9	10	0.30	0.3	0.3	124.7	0	24.7	2.3E-07
7/27/2010	9	20	0.47	0.4	0.4	124.4	0	24.7	2.3E-07
7/27/2010	9	30	0.63	0.5	0.5	124.2	0	24.7	2.3E-07
7/27/2010	9	40	0.80	0.6	0.6	124.0	0	24.7	2.3E-07
7/27/2010	9	50	0.97	0.7	0.7	123.8	0	24.7	2.3E-07
7/27/2010	10	0	1.13	0.8	0.8	123.5	1	24.7	2.3E-07

Tested By: TMS

Date: 7/27/2010

Checked By: *GDM*

Date: 7-28-10

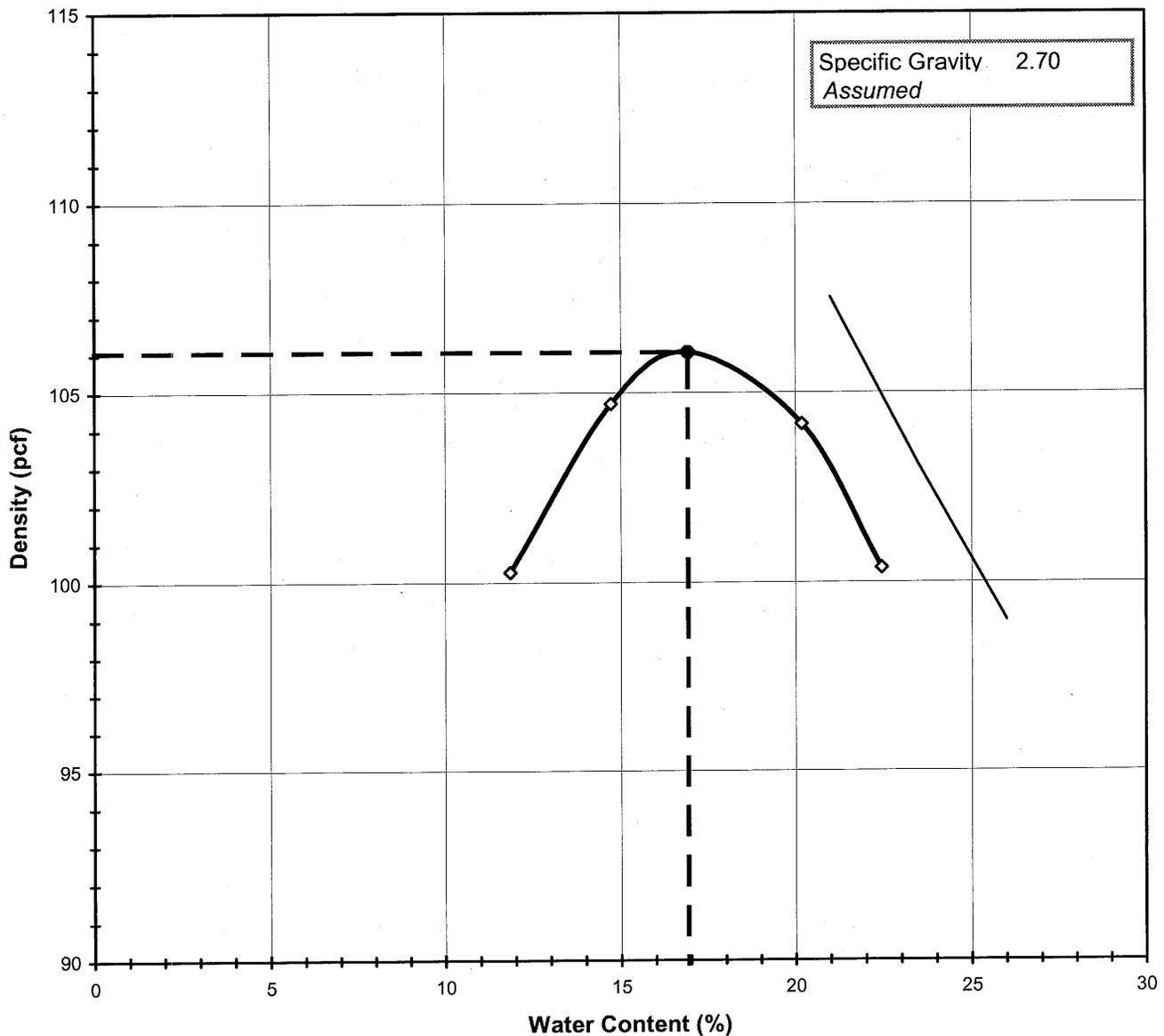
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MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	R.S.G. & ASSOCIATES	Boring No.	LFG BACKFILL
Client Reference	HOLLY GROVE LF AREA II COVER REPAIR	Depth (ft)	6-18
Project No.	2010-695-05	Sample No.	1
Lab ID	2010-695-05-01	Test Method	STANDARD
Visual Description	RED BROWN SANDY SILT		

Optimum Water Content 16.9
Maximum Dry Density 106.1



Tested By **SD** Date **10/11/2010** Checked By **CEM** Date **10-12-10**

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	R.S.G. & ASSOCIATES	Boring No.	LFG BACKFILL
Client Reference	HOLLY GROVE LF AREA II COVER REPAIR	Depth (ft)	6-18
Project No.	2010-695-05	Sample No.	1
Lab ID	2010-695-05-01		

Visual Description RED BROWN SANDY SILT

Total Weight of the Sample (gm)	18324
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType	STANDARD	
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type	MECHANICAL	
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4303
Volume of the Mold(cc)		941

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	5995	6115	6174	6191	6157
Wt. of Mold (gm)	4303	4303	4303	4303	4303
Wt. of WS	1692	1812	1871	1888	1854
Mold Volume (cc)	941	941	941	941	941

Moisture Content / Density

	300	K-7	310	398	306
Tare Number					
Wt. of Tare & WS (gm)	491.30	479.90	537.20	468.20	499.00
Wt. of Tare & DS (gm)	451.05	432.49	475.25	403.75	423.71
Wt. of Tare (gm)	111.50	110.60	110.20	84.50	88.40
Wt. of Water (gm)	40.25	47.41	61.95	64.45	75.29
Wt. of DS (gm)	339.55	321.89	365.05	319.25	335.31

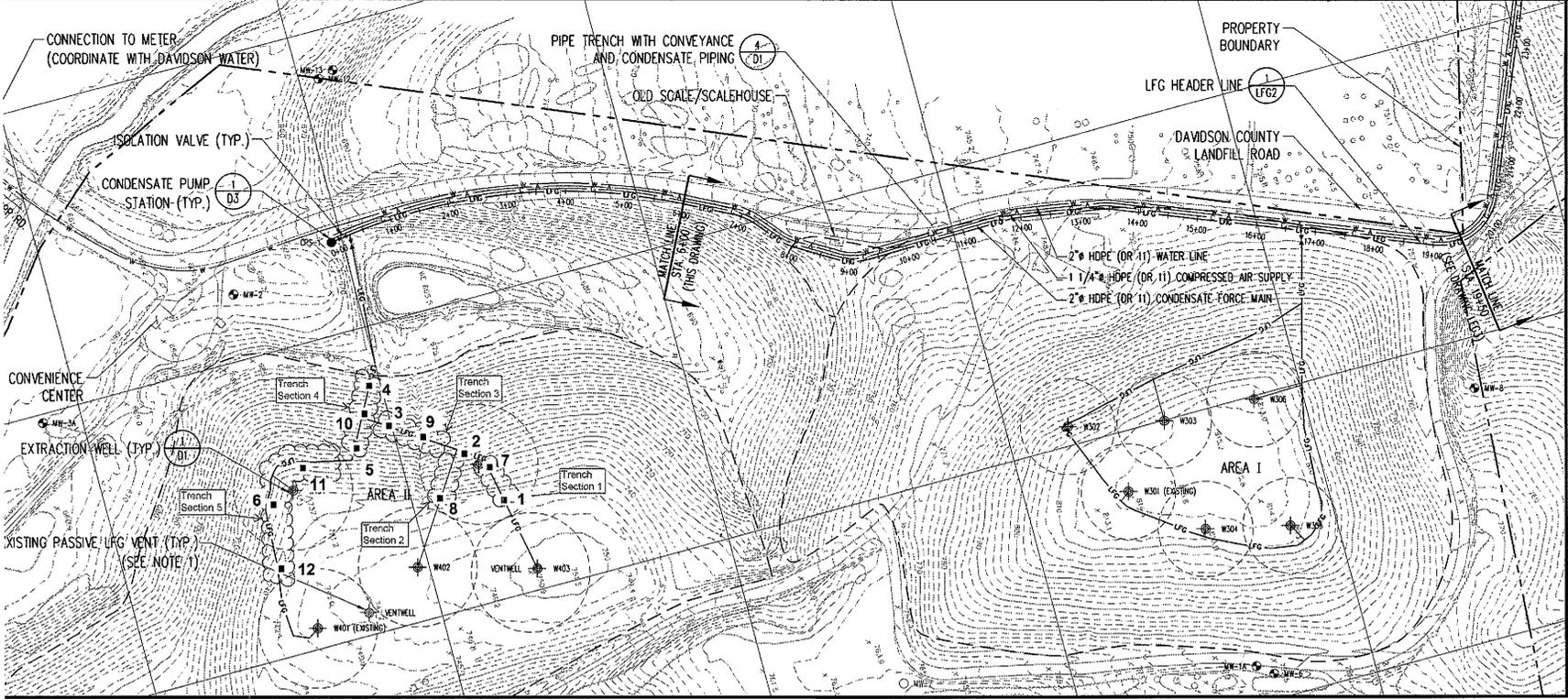
Wet Density (gm/cc)	1.80	1.93	1.99	2.01	1.97
Wet Density (pcf)	112.2	120.1	124.1	125.2	122.9
Moisture Content (%)	11.9	14.7	17.0	20.2	22.5
Dry Density (pcf)	100.3	104.7	106.1	104.2	100.4

Zero Air Voids

Moisture Content (%)	21.0	23.5	26.0
Dry Unit Weight (pcf)	107.5	103.1	99.0

Tested By SD Date 10/11/2010 Checked By CAM Date 10-12-10

10-7-10



LEGEND

- EXISTING 10' CONTOUR (SEE REFERENCE 1)
- EXISTING 2' CONTOUR
- - - PROPERTY LINE
- - - APPROXIMATE EXISTING WASTE LIMITS (UNLINED UNITS)
- LFG LANDFILL GAS (LFG) HEADER PIPE (SEE NOTE 2)
- LANDFILL GAS (LFG) LATERAL PIPE
- 2" HDPE (OR 11) CONDENSATE FORCE MAIN
- 1 1/4" HDPE (OR 11) COMPRESSED AIR SUPPLY
- 2" HDPE (OR 11) WATER LINE
- MW-80 EXISTING MONITORING WELL
- ▲ SW-3 EXISTING SURFACE WATER SAMPLING POINT
- CS-1 CONDENSATE SUMP
- EXISTING PASSIVE LFG VENT

LEGEND

- - - EXISTING GROUND SURFACE (SEE REFERENCE 1)
- PROPOSED LANDFILL GAS HEADER PIPE

REFERENCES

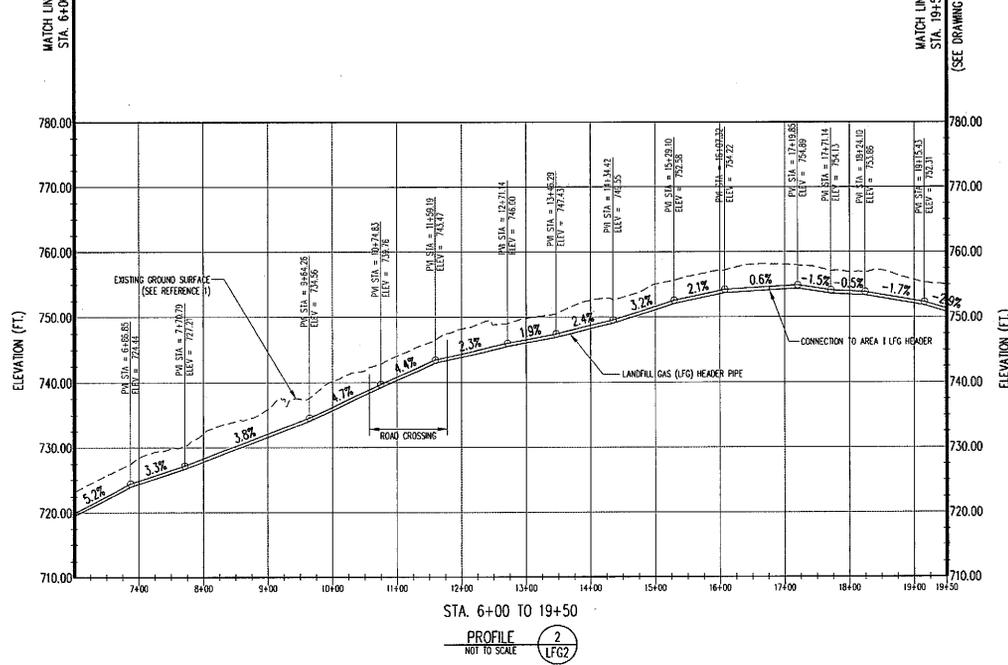
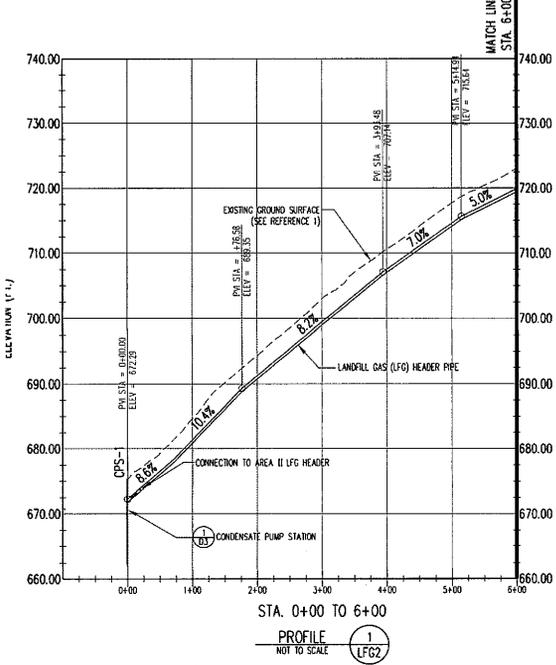
- OVERALL TOPOGRAPHY PER NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, CONTOUR AND ELEVATION DATA GENERATED FROM LIGHT DETECTION AND RANGING (LIDAR) DATA OBTAINED FROM THE NORTH CAROLINA FLOOD HAZARDING PROGRAM AND DATED SEPTEMBER 2004. TOPOGRAPHY IN C&D AND MSW AREAS FROM SPATIAL DATA, AERIAL, DATED 5/13/09.
- TOPOGRAPHY IN PHASE 1, AREA 1 AND 2, PROVIDED BY MICHAEL GREEN ASSOCIATES, SURVEY DATED 2/9/10.

0 100' 200' 300'

0 10 20 30'

DATE: _____
SCALE: _____
SHEET: _____

Davidson-Holly Grove LF CRND-02 10/7/2010



0 100' 200' 300'

0 10 20 30'

DATE: _____
SCALE: _____
SHEET: _____



Client: RSG & Assoc.
Project Name : Davidson - Holly Grove Cover Repair
Project Number : 2010-695

Report Number : CRND-02
Date (s) : 10.7.10

Drive Cylinder - ASTM D 2937

Test Information

Test Number :	DC-01	DC-02
Nuclear Test Number :	CRND-01	CRND-06
Location:	GAS PIPE	GAS PIPE
Depth (ft):	LIFT 1	LIFT 1
Date :	10.7.10	10.7.10

Mold

Cylinder ID	1	1
Weight of Cylinder (lbs.)	1.32	1.32
Volume of Cylinder (ft ³)	0.033	0.033

Specimen

Wt. of Cylinder & WS (lbs.)	5.31	5.32
Wt. of Cylinder (lbs.)	1.32	1.32
Wt. of WS	3.99	4.00
Cylinder Volume (ft ³)	0.033	0.033

Moisture / Density

Tare Number	DW-03	DW-03
Wt. of Tare & WS (gm)	520.22	473.84
Wt. of Tare & DS (gm)	457.20	406.34
Wt. of Tare (gm)	109.00	109.00
Wt. of Water (gm)	63.02	67.50
Wt. of DS (gm)	348.20	297.34

Wet Density (pcf):	120.9	121.2
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Moisture Content (%):	18.1	22.7
Dry Density (pcf):	102.4	98.8

Geotechnics Representative :

David Wright

MPS

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Appendix F

Landfill Gas Collection System CQA Data

- F1. Manufacturer's Product Data Submittals**
- F2. CQC Test Results - Pressure Testing**

**Construction Quality Assurance Report
Holly Grove Landfill
Landfill Gas Collection System
Lexington, North Carolina**

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Flying "W" Plastics

P. O. Box 759

Glenville, West Virginia 26351

(800) 327-4735

IPS PipeData

Pipe Size	200 PSI - SDR-9			160 PSI - SDR-11			130 PSI - SDR-13.5			100 PSI - SDR-17			80 PSI - SDR-21		
	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)
1/2"	0.093	0.64	0.10	0.076	0.67	0.08	0.062	0.70	0.07						
3/4"	0.117	0.80	0.15	0.095	0.84	0.12	0.078	0.88	0.10	0.062	0.91	0.08			
1"	0.146	1.00	0.23	0.120	1.06	0.20	0.097	1.10	0.16	0.077	1.15	0.13			
1-1/4"	0.184	1.26	0.37	0.151	1.34	0.31	0.123	1.39	0.26	0.098	1.45	0.21			
1-1/2"	0.211	1.45	0.49	0.173	1.53	0.41	0.141	1.60	0.34	0.112	1.66	0.27			
2"	0.264	1.81	0.76	0.216	1.91	0.64	0.176	2.00	0.53	0.140	2.07	0.43			
2-1/2"	0.319	2.19	1.12	0.261	2.32	0.94	0.213	2.42	0.78	0.169	2.51	0.63			
3"	0.389	2.67	1.66	0.318	2.82	1.39	0.259	2.95	1.15	0.206	3.06	0.93			
4"	0.500	3.44	2.74	0.409	3.63	2.29	0.333	3.79	1.91	0.265	3.93	1.54	0.167	3.14	0.76
5"	0.618	4.25	4.18	0.506	4.49	3.51	0.412	4.68	2.91	0.327	4.86	2.35	0.214	4.04	1.26
6"	0.736	5.06	5.93	0.602	5.34	4.97	0.491	5.58	4.13	0.390	5.79	3.34	0.265	5.00	1.93
8"	0.958	6.59	10.05	0.784	6.96	8.43	0.639	7.27	7.00	0.507	7.54	5.66	0.315	5.95	2.74
10"	1.194	8.21	15.62	0.977	8.67	13.09	0.796	9.06	10.88	0.632	9.40	8.79	0.411	7.75	4.64
12"	1.417	9.74	21.97	1.159	10.29	18.41	0.944	10.74	15.30	0.750	11.16	12.36	0.512	9.66	7.20
14"	1.556	10.70	26.49	1.273	11.30	22.20	1.037	11.80	18.45	0.824	12.25	14.90	0.607	11.46	10.13
													0.667	12.58	12.22

DIPS PipeData

Pipe Size	200 PSI - SDR-9			160 PSI - SDR-11			130 PSI - SDR-13.5			100 PSI - SDR-17			80 PSI - SDR-21		
	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)
4"	0.533	3.66	3.11	0.436	3.87	2.61	0.356	4.04	2.17	0.282	4.20	1.75	0.229	4.31	1.44
6"	0.767	5.27	6.43	0.627	5.57	5.39	0.511	5.81	4.48	0.406	6.03	3.62	0.329	6.20	2.97
8"	1.006	6.91	11.07	0.823	7.30	9.28	0.670	7.62	7.71	0.532	7.92	6.23	0.431	8.13	5.11
10"	1.233	8.48	16.65	1.009	8.96	13.95	0.822	9.35	11.60	0.653	9.71	9.37	0.529	9.97	7.68
12"	1.467	10.09	23.55	1.200	10.65	19.73	0.978	11.12	16.40	0.776	11.55	13.25	0.629	11.86	10.86
14"	1.700	11.69	31.64	1.391	12.35	26.51	1.133	12.89	22.03	0.900	13.39	17.80	0.729	13.75	14.59

Pipe weights are calculated in accordance with PPI TR-7. Average ID is calculated using nominal OD and minimum wall plus 6% for u in estimating fluid flows. Actual inside diameter will vary. Pipe dimensions are in accordance with applicable ASTM standards. The listed SDR's are standard and stocking sizes, please call for other SDR requirements.



Flying W Plastics, Inc.

Product Specification

Flying “W” Plastics certifies its Titan Supreme, CTS, SIDR Potable Water Pipes and Geo-thermal Pipes to be manufactured from select PE3608 (PE3408) high density polyethylene copolymers (see typical properties below) and meet specifications set forth in ASTM D-2239, ASTM D-2737, and ASTM D3350. This material meets all of the requirements of ASTM 1248-81A for type PE34 Class C Product. It has outstanding properties of a high hoop stress and a high level of environmental stress crack resistance. These copolymers have NSF 14 and AWWA C901 certification for potable water applications, comply with ANSI/NSF Standard 61 health effects requirement, and are recognized by the Plastics Pipe Institute as having a pipe material designation code of PE3608, PE3408 and PE80.

TYPICAL PROPERTIES ¹	English Values	SI Values	ASTM Method
Density (Black)	-	0.955 g/cc	D 4883
Melt Index ²	-	12.5 g/cc	D 1238
Tensile Strength @ Yield (2 in/min) @ Break (2 in/min)	3300 psi 4500 psi	22.8 MPa 31.0 MPa	D 638 D 638
Elongation @ Break (2 in/min)	>600%	>600%	D 638
Flexural Modulus ³	120,000 psi	827 MPa	D 790
Notched Izod Impact Strength	6 ft-lbf/in	0.32 kJ/m	D 256
Hardness (Shore D)	68	68	D 2240
Vicat Softening Point	259 °F	126 °C	D 1525
Brittleness Temperature	<-180 °F	<-118 °C	D 746
Hydrostatic Design Basis @ 23 °C @ 60 °C	1600 psi 800 psi	11.0 MPa 5.5 MPa	D 2837 D 2837
Minimum Required Strength	-	8.0 MPa	ISO 9080
Environmental Stress Crack Resistance ⁴	>2000 hrs	>2000 hrs	D 1693
Environmental Stress Crack Resistance ⁵	>5000 hrs	>5000 hrs	D 1693
Pipe ring ESCR ⁶	>5000 hrs	>5000 hrs	F 1248
Notch Tensile (PENT)	>100 hrs	>100 hrs	F 1473
Carbon Black Concentration	2.3%	2.3%	D 1603
Cell Classification	345464C	345464C	D 3350

¹Typical properties will vary within specification limits
²190 degrees C/21,100g
³2% Secant-Method 1

⁴Condition B, 10%
⁵Condition C
⁶Two inch, SIDR 19



Type 57 Butterfly Valve

Standard Features (Sizes 1-1/2" – 14")

- Standard model (1-1/2" – 14") has PVC Body and PP Disc for superior chemical resistance and elevated temperature capabilities
- 316/403 stainless steel shaft has full engagement over the entire length of the disc and is a non-wetted part.
- Only solid and abrasion-resistant plastic disc and elastomeric liner are wetted parts.
- ISO bolt circle on top flange–no body or stem modifications required for accessories.
- Stem retainer–PP retainer to prevent stem removal.
- Seat over tightening protection–Molded body stops and seat stress relief area.
- Spherical disc design offers increased Cv, ultimate sealing and high cycle life.

Options

- Pneumatically and electrically actuated with accessories
- Alternate discs:
 - (I) PVC : 1-1/2" – 14"
 - (II) PVDF : 1-1/2" – 14"
- Plasgear™ gear operators for 1-1/2" - 6"
- Lug style (stainless steel 304 or 316) for blocking and end-of-line applications
- Stems in 316 stainless steel, titanium, Hastelloy C®.
- 2" square nut on stem (1-1/2" - 8" only)
- 2" square nut on gear operator (All sizes)
- Stem extensions (Single stem and two-piece stem)
- Locking devices (Gear Type – Standard on Lever)
- Chain operators
- Manual limit switch - Asahi P-Series
- Tandem arrangements (Patented by A/A, Inc.)

Specifications

Sizes: Lever: 1-1/2" – 8"
 Gear: 8" – 14"

Models: Wafer Style

Operators: Lever and Gear

Bodies: PVC, PP and PVDF

Discs: PVC, PP and PVDF

Seats: EPDM, FKM, and Nitrile

Seals: Same as seating material

Stems: 403 and 316 stainless steel, Titanium, Hastelloy C® ‡

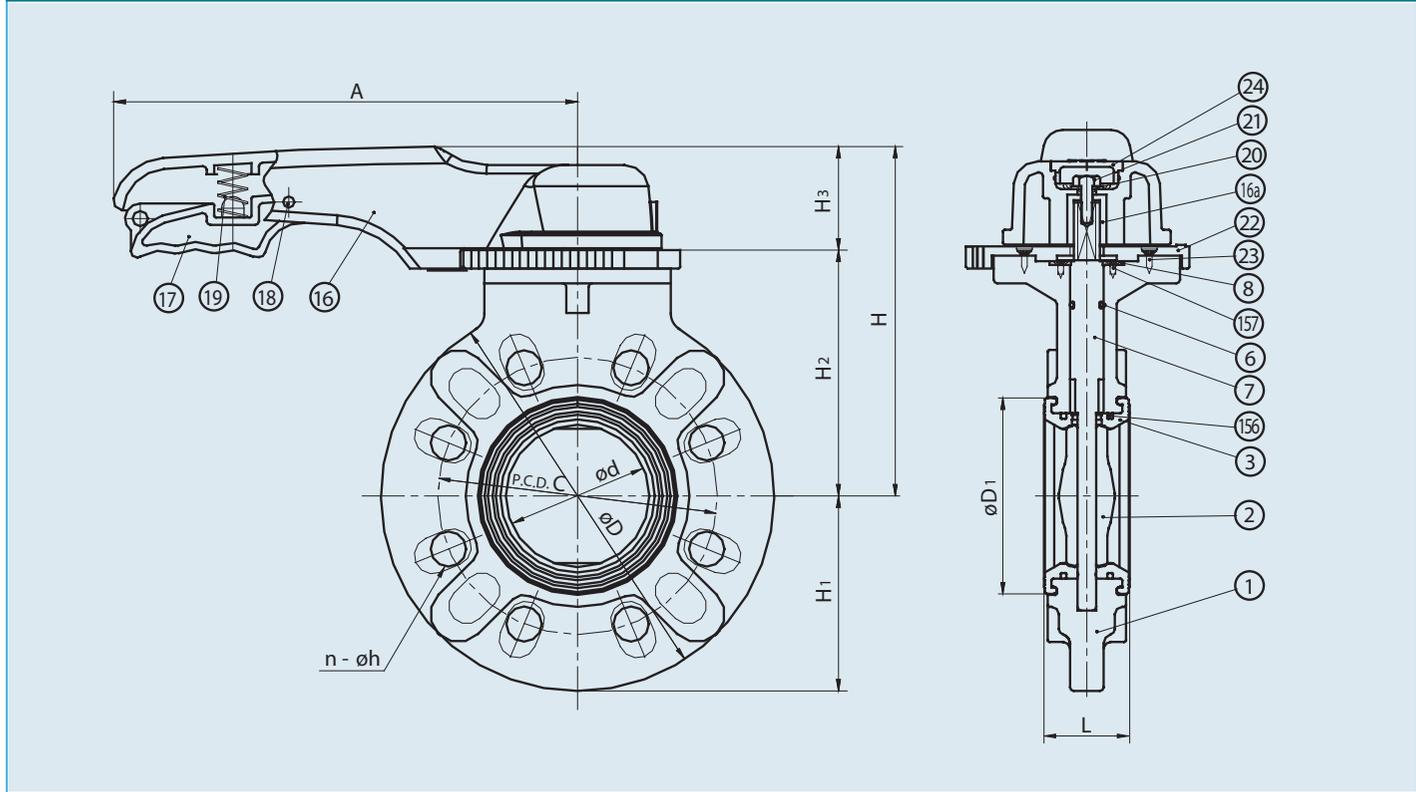
‡ Trademark of Cabot Corporation

Parts List (Lever: Sizes 1-1/2" – 8")

PARTS			
NO.	DESCRIPTION	PCS.	MATERIAL
1	Body	1	PVC, PP, PVDF
2	Disc	1	PVC, PP, PVDF
3	Seat	1	EPDM, FKM, NBR
6	O-Ring (C)	1	EPDM, FKM, NBR
7	Stem	1	Stainless Steel 316
8	Stem Retainer	1	PP
16	Handle	1	PP
16a	Metal Insert in Handle	1	Stainless Steel 316L
17	Handle Lever	1	PPG
18	Pin	1	PPG
19	Spring	1	Stainless Steel 304
20	Washer (A)	1	Stainless Steel 304
21	Bolt (B)	1	Stainless Steel 304
22	Locking Plate	1	PPG
23	Screw (B)	4	Stainless Steel 304
24	Cap (A)	1	PP
156	Liner Stabilization Ring	2	Stainless Steel (SCS13)
157	Screw (F)	4	Stainless Steel 304



Type 57 – Lever Operated Butterfly Valves



Dimensions (Lever: Sizes 1-1/2" – 8")

NOMINAL SIZE		ANSI CLASS 150											
INCHES	mm	d	C	n	h	D	D1	L	H	H1	H2	H3	A
1 1/2	40	1.77	3.88	4	0.62	5.91	2.83	1.54	6.14	2.95	3.94	2.20	8.66
2	50	2.20	4.75	4	0.75	6.50	3.23	1.65	6.54	3.25	4.33	2.20	8.66
2 1/2	65	2.72	5.50	4	0.75	7.28	3.78	1.81	6.93	3.64	4.72	2.20	8.66
3	80	3.03	6.00	4	0.75	8.31	4.17	1.81	7.52	4.15	5.31	2.20	9.84
4	100	4.02	7.50	8	0.75	9.37	5.31	2.20	8.11	4.69	5.91	2.20	9.84
5	125	5.08	8.50	8	0.88	10.39	6.69	2.60	9.33	5.20	6.61	2.72	12.60
6	150	5.91	9.50	8	0.88	11.22	7.52	2.80	9.92	5.61	7.20	2.72	12.60
8	200	7.68	11.75	8	0.88	13.39	9.53	3.43	11.14	6.69	8.43	2.72	15.75

Cv Values

NOMINAL SIZE		Cv (at various opening degrees)		
INCHES	mm	30°	60°	90°
1 1/2	40	4	43	71
2	50	7	73	120
2 1/2	65	15	153	250
3	80	18	183	300
4	100	28	287	470
5	125	49	506	830
6	150	66	671	1100
8	200	150	1525	2500

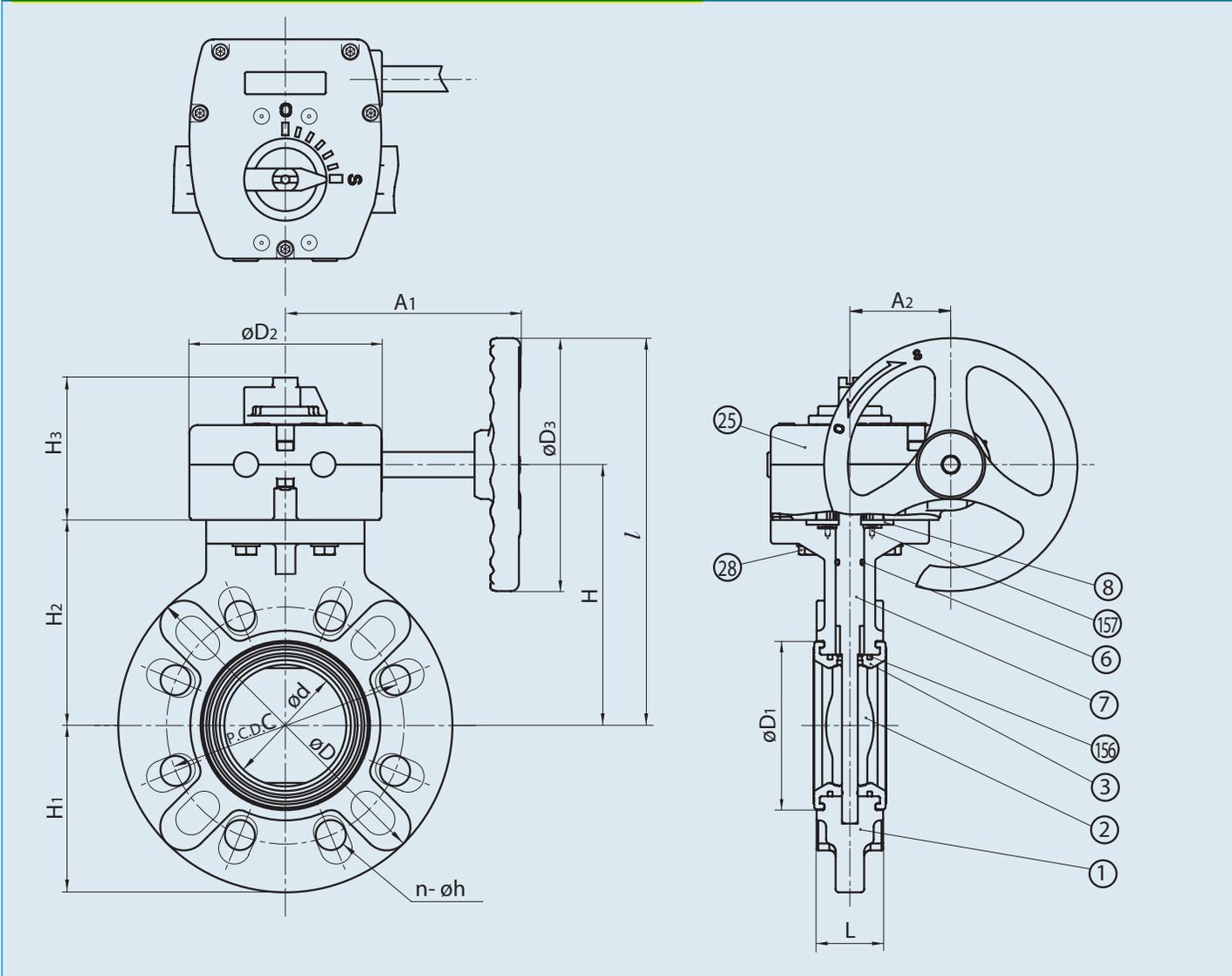
Pressure vs. Temperature (PSI, WATER, NON-SHOCK)* Wt. (LBS) / Vacuum Service

BODY		PVC			PP			PVDF			NOMINAL SIZE	PVC	PP	PVDF	NOMINAL SIZE		VACUUM SERVICE (INCHES OF MERCURY)	
DISC		PP			PP			PVDF							INCHES	mm		
NOMINAL SIZE		30° F	121° F	141° F	-5° F	141° F	-5° F	141° F	176° F	211° F	INCHES	mm	PVC	PP	PVDF	INCHES	mm	VACUUM SERVICE (INCHES OF MERCURY)
INCHES	mm	120° F	140° F	175° F	140° F	175° F	140° F	175° F	210° F	250° F								
1 1/2	40	150	70	30	150	100	150	100	85	75	1 1/2	40	3	3	3	1 1/2	40	-29.92
2	50	150	70	30	150	100	150	100	85	75	2	50	4	3	4	2	50	-29.92
2 1/2	65	150	70	30	150	100	150	100	85	75	2 1/2	65	4	3	4	2 1/2	65	-29.92
3	80	150	70	30	150	100	150	100	85	75	3	80	5	4	5	3	80	-29.92
4	100	150	45	30	150	100	150	100	85	75	4	100	6	5	7	4	100	-29.92
5	125	150	45	30	150	100	150	100	85	75	5	125	11	9	13	5	125	-29.92
6	150	150	45	30	150	100	150	100	85	75	6	150	13	10	15	6	150	-29.92
8	200	150	40	20	150	85	150	85	75	60	8	200	21	16	25	8	200	-29.92

* For lug style data consult factory

Type 57 – Gear Operated

Butterfly Valves



Dimensions (Sizes 1-1/2" – 14") (NOTE: GEAR OPERATED VALVE IS STANDARD 8" – 14"; SIZES 1-1/2" – 6" ARE OPTIONS.)

NOMINAL SIZE		ANSI CLASS 150																		Wheel Cycles	Gear Box Model No.
INCHES	mm	d	C	n	h	D	D1	D2	D3	L	H	H1	H2	H3	l	A1	A2				
1 1/2	40	1.77	3.88	4	0.62	5.91	2.83	4.80	6.30	1.54	5.12	2.95	3.74	3.54	8.27	6.57	2.52	9.5	241		
2	50	2.20	4.75	4	0.75	6.50	3.23	4.80	6.30	1.65	5.51	3.25	4.13	3.54	8.66	6.57	2.52	9.5			
2 1/2	65	2.72	5.50	4	0.75	7.28	3.78	4.80	6.30	1.81	5.91	3.64	4.53	3.54	9.06	6.57	2.52	9.5			
3	80	3.03	6.00	4	0.75	8.31	4.17	4.80	6.30	1.81	6.50	4.15	5.12	3.54	9.65	6.57	2.52	9.5			
4	100	4.02	7.50	8	0.75	9.37	5.31	4.80	6.30	2.20	7.09	4.69	5.71	3.54	10.24	6.57	2.52	9.5			
5	125	5.08	8.50	8	0.88	10.39	6.69	4.80	6.30	2.60	7.68	5.20	6.30	3.54	10.83	6.57	2.52	9.5			
6	150	5.91	9.50	8	0.88	11.22	7.52	4.80	6.30	2.80	8.27	5.61	6.89	3.54	11.42	6.57	2.52	9.5			
8	200	7.68	11.75	8	0.88	13.39	9.53	4.80	6.30	3.43	9.49	6.69	8.11	3.54	12.64	6.57	2.52	9.5	243		
10	250	9.84	14.25	12	1.00	16.57	11.89	4.80	6.30	4.33	10.87	8.31	9.49	3.62	14.02	6.57	2.52	9.5			
12	300	11.93	17.00	12	1.00	19.21	14.17	7.40	11.81	5.08	13.39	9.61	11.73	4.25	19.29	9.53	3.90	9.5			
14	350	13.82	18.75	12	1.12	21.22	15.47	7.40	11.81	5.08	14.45	10.63	12.80	4.25	20.35	9.53	3.90	9.5			

Type 57 – Gear Operated Butterfly Valves

Parts List (Gear: Sizes 1-1/2" – 14")

PARTS			
NO.	DESCRIPTION	PCS.	MATERIAL
1	Body	1	PVC, PP, PVDF
2	Disc	1	PVC, PP, PVDF
3	Seat	1	EPDM, FKM, NBR
6	O-Ring (C)	1	EPDM, FKM, NBR
7	Stem	1	Stainless Steel 316, 403
8	Stem Retainer	1	PP
25	Gear Box	1	Plasgear™
28	Bolt (C)	4	Stainless Steel 304
156	Liner Stabilization Ring	2	Stainless Steel (SCS13)
157	Screw (F)	4	Stainless Steel 304

Sample Specification

All solid thermoplastic butterfly valves sizes 1-1/2" thru 14" shall be of the TYPE 57 lined body design and bubble-tight seal (meeting or exceeding Class VI as defined by American National Standard Institute) with only the liner and disc as wetted parts. The lever handle (sizes 1-1/2" thru 8") shall have a molded provision for a padlock. Gear operators shall be worm gear design, self locking Plasgear.™ The spherical disc design for higher Cv values shall be of solid, abrasion-resistant plastic. Liner shall be molded and formed around the body, functioning as gasket seals with convex ring design on each side of the valve for lower bolt tightening torque and valve body shall have molded body stops and seat relief area to prevent over tightening of mating flanges. Stem shall be of 316/403 stainless steel, non wetted, have engagement over the full length of the disc and be locked into valve body by PP stem retainer. Valves shall have a molded ISO bolt pattern on top flange for actuator mount. PVC shall conform to ASTM D1784 Cell Classification 12454-A, PP conforming to ASTM D4101 Cell Classification PPO210B67272, and PVDF conforming to ASTM D 3222 Cell Classification Type II. All PVC PP and PVDF body valves shall be rated to 150 psi at 70 degrees F, sizes 1-1/2" thru 10" and 100 psi for sizes 12" and 14". Butterfly valves shall be wafer style, as manufactured by Asahi/America Inc.

Troubleshooting

What if fluid still flows when the valve is closed?

1. Make sure lever or gear is in a fully closed position (gear type may require travel stop adjustment).
2. Liner is damaged or worn. Replace liner.
3. Disc is damaged or abraded. Change disc.
4. Foreign material is caught between seat and disc. Remove the substance.
5. Mating flange bolts either over-tightened or unevenly tightened. Retighten properly.

What if fluid leaks outside between seat and mating flange?

1. Seat damage. Change seat.
2. Mating flange bolts not tightened with proper torque or unevenly tightened. Retighten to the appropriate torque.

What if valve does not operate smoothly?

1. Foreign material is caught between disc and seat. Remove the material and clean.
2. Lever or gearbox is damaged. Replace.
3. Mating flange bolts over-tightened. Retighten.

Caution

- Never remove valve from pipeline under pressure.
- Always wear protective gloves and goggles.

Cv Values

NOMINAL SIZE		Cv (at various opening degrees)		
INCHES	mm	30°	60°	90°
8	200	150	1525	2500
10	250	232	2355	3860
12	300	342	3477	5700
14	350	386	3928	6440

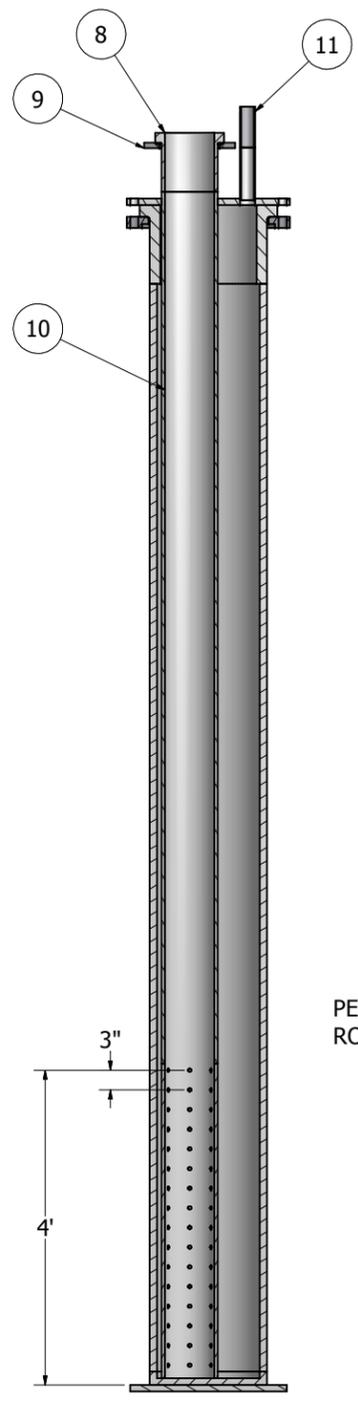
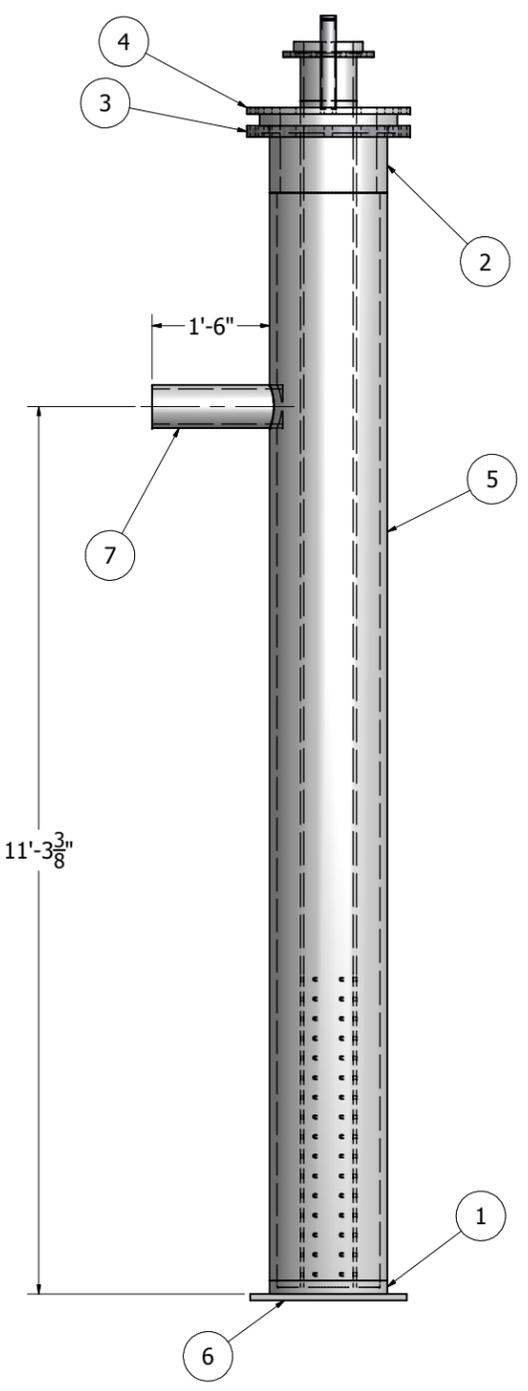
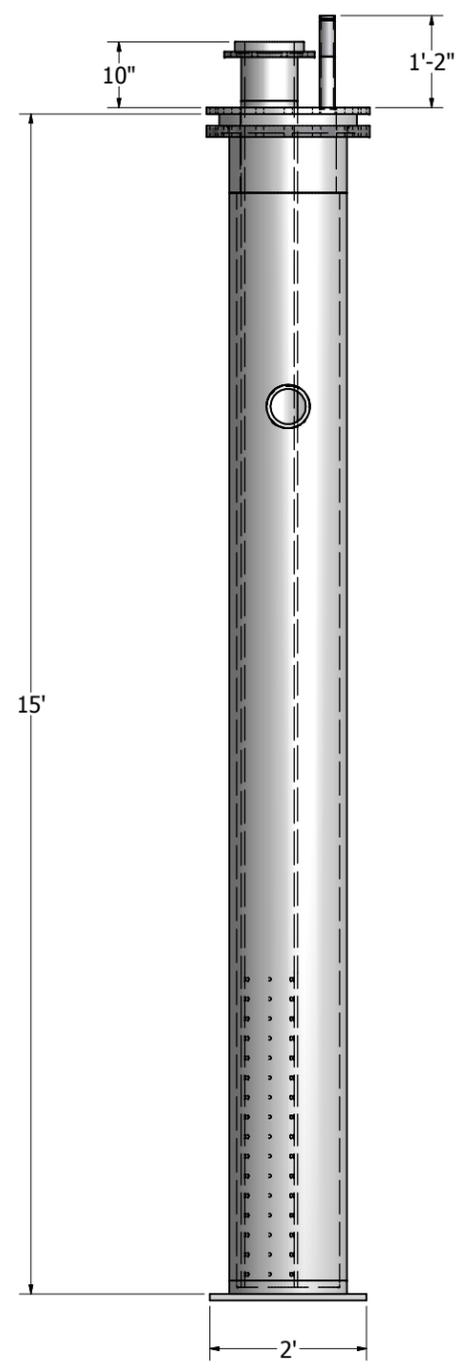
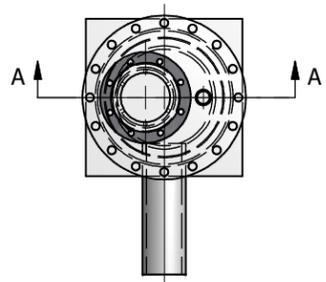
Pressure vs. Temperature (PSI, WATER, NON-SHOCK)* Wt. (LBS) /Vacuum Service

BODY		PVC			PP		PVDF			NOMINAL SIZE	PVC	PP	PVDF	NOMINAL SIZE	VACUUM SERVICE (INCHES OF MERCURY)			
DISC		PP			PVDF			INCHES	mm							INCHES	mm	
NOMINAL SIZE		30° F	121° F	141° F	-5° F	141° F	-5° F			141° F	176° F	211° F	INCHES	mm	INCHES			mm
INCHES	mm	120° F	140° F	175° F	140° F	175° F	140° F	175° F	210° F	250° F								
8	200	150	40	20	150	85	150	85	75	60	8	200	24	20	28	8	200	-29.92
10	250	150	40	20	150	85	150	85	75	60	10	250	33	27	41	10	250	-29.92
12	300	100	30	15	100	60	100	60	45	30	12	300	62	53	76	12	300	-23.62
14	350	100	30	7	100	45	100	45	30	15	14	350	67	58	81	14	350	-23.62

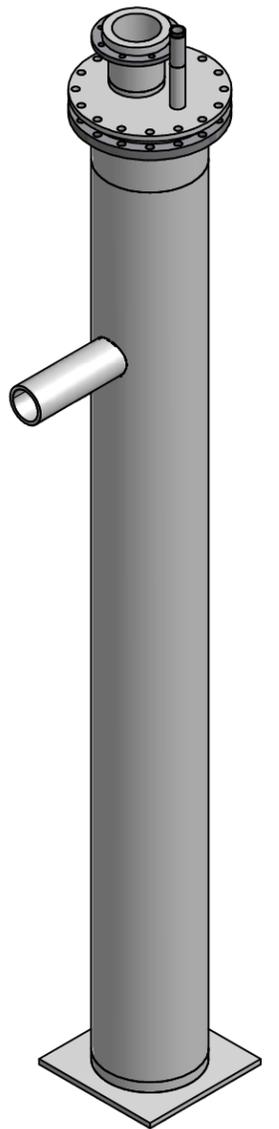
* For lug style data consult factory

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PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	40181710	18" LOW PRESSURE END CAP
2	1	50181111	18" DR 11 FLANGE ADAPTER
3	1	53180012	18" S.S. BACKUP RING
4	1	49180010	18" HDPE BLIND FLANGE FROM 1" SHEET 25" OD w/(16) 1.25" BH ON 22.75" BC
5	14 ft	10181116	18" DR 11 HDPE PIPE
6	4 sq ft	29010012	HDPE BASE PLATE FROM 1" SHEET 2' SQ
7	2 ft	10061716	6" DR 17 HDPE PIPE OUTLET
8	1	50081710	8" DR 17 FLANGE ADAPTER
9	1	53080013	8" S.S. BACKUP RING
10	15 ft	10081717	8" DR 17 HDPE PIPE
11	1	53029999	2" S.S. MALE CAMLOCK WITH CAP



PERFORATE BOTTOM 4' OF 8" PIPE w/ 4 ROWS OF 1/2" DIA. HOLES, 3" C-C



	CUSTOMER NAME:		PIEDMONT INDUSTRIAL SERVICES
	DRAWING TITLE:		
DRAWN: NLA DATE: 6/29/2010 TERRITORY REPRESENTATIVE: STEVE LINGAFELTER ORDER #	APPROVED BY:	SCALE:	REV #/ DATE
FILE LOCATION:		SHEET 1 OF 1	

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Pressure Test Report

Test Time Calculator: NOTE - This formula should be used for pipes with nominal diameters from 4" to 30". Consult with pipe/fitting manufacturer if pipe size is outside of this range.

Time test (*T*) is determined using the following formula from **Section 9.2 of ASTM standard F 1417 - 92**, and modified for **0.5 psig**, as directed in **Section 9.5** of the standard. Input 1) pipe diameter and 2) length for the section tested in the shaded cells below. For multiple diameters, perform this calculation for each pipe diameter being tested, and take the sum total *T*.

$$T = (0.085 DK/Q)/2$$

where:

D = 10 nominal pipe size, inches*
L = 11222 length of test section, feet
K = 47.02018 0.000419 DL (not less than 1.0)
Q = 0.0015 leak rate in cfm/square feet of internal surface = 0.0015 CFM/SF
T =

13322.38	seconds
222.04	minutes
3.70	hours

Pressure Test Field Log

Contractor or Company: Piedmont Industrial Service

Pipe Line Description: SDR 11 (2"), SDR 17 (4", 6", 8', 10", 18")
 (material, thickness rating, etc.)

Section Tested: From: Area I - Area II (Holy Grove Closed Landfill)

To: Station 43+85 Davidson County Landfill Phase 1 (Inactive)

Test Section: Diameter: See Notes * Length: See Notes*

Test Start Time/Date: 1:15 PM Maximum Start Pressure (psig): 3.5

Test End Time/Date: 5:00 PM Maximum End Pressure (psig): 3.25

Total Test Time: 3 Hours 45 Minutes Total Pressure Drop (psig): 0.25

Test Result (circle one): Pass (pressure drop less than 0.5 psig)
 Fail (pressure drop greater than 0.5 psig)

Leak Location (if Fail):

Notes:

* During the low pressure test for the entire system, the total time was calculated by adding the times required for the total length of each diameter of pipe in the system. The time shown above represents a testing time for a 10" diameter of pipe, excluding the Condensate Pump Stations. The total length calculated represents the entire length of all pipes combined in the LFG system.

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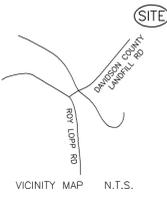
Appendix G

Record Drawings

1. **Holly Grove LFG Collection System As-Built
(4 Sheets) (Michael Green Associates, P.A.)**
2. **As-Built Details**

**Construction Quality Assurance Report
Holly Grove Landfill
Landfill Gas Collection System
Lexington, North Carolina**

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TIE TO LANDFILL CONTROL DATUM

TOWER 101 (TOP BOLT SE CORNER)
 N: 763,248.44'
 E: 1,650,365.45'
 ELEVATION: 731.59'
 ALL DISTANCES SHOWN ARE HORIZONTAL.

BEARING AND DISTANCE FROM
 TOWER 101 TO TOWER 102
 N 63°29'02"E 783.71'

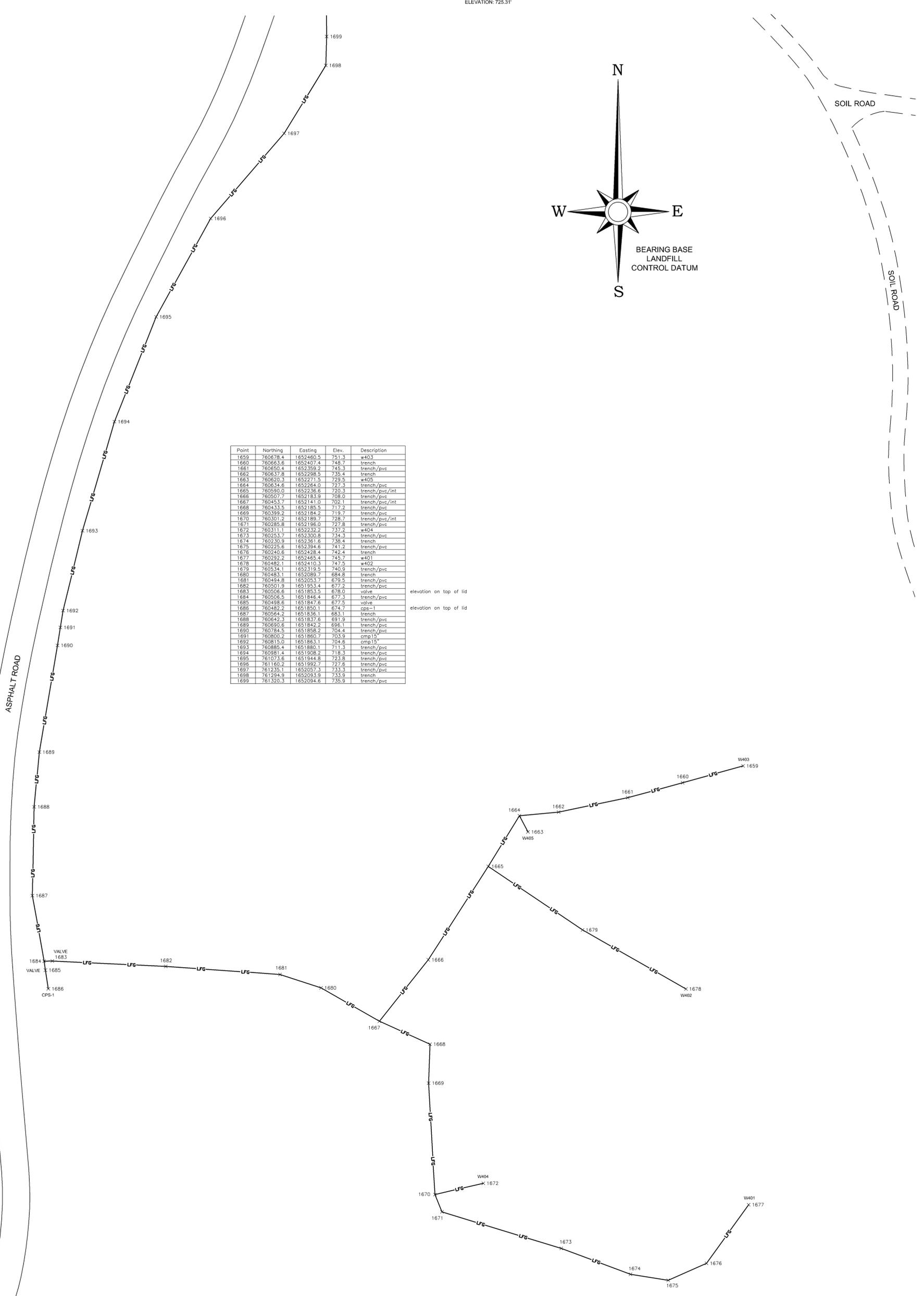
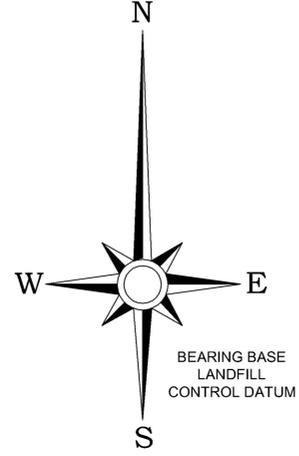
TOWER 102 (TOP BOLT NW CORNER)
 N: 763,598.33'
 E: 1,651,066.72'
 ELEVATION: 725.31'

NORTH CAROLINA, DAVIDSON COUNTY



I, MICHAEL D. GREEN, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK AS SHOWN HEREON); THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION IN DEED BOOK AS SHOWN HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1:10,000+- THAT THE GLOBAL POSITIONING SYSTEM (GPS) OBSERVATIONS WERE PERFORMED TO THE GEOSPATIAL POSITIONING ACCURACY STANDARDS, PART 2: STANDARDS FOR GEODETIC NETWORKS AT THE 2CM ACCURACY CLASSIFICATION (95% CONFIDENCE) USING RTK NETWORK AND TRADITIONAL TRAVERSE; AND MEETS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (21 NCAC 59.1600) WITNESS MY ORIGINAL SIGNATURE AND SEAL THIS 22nd DAY OF SEPTEMBER, 2016.

PROFESSIONAL LAND SURVEYOR *Michael D. Green* L-3604 NC



Point	Northing	Easting	Elev.	Description
1659	760678.4	1652463.3	751.3	w403
1660	760663.6	1652407.4	748.7	trench
1661	760650.4	1652359.2	745.3	trench/pvc
1662	760637.8	1652298.5	735.4	trench
1663	760620.3	1652271.5	729.5	w405
1664	760634.6	1652264.0	727.3	trench/pvc
1665	760596.0	1652236.6	720.3	trench/pvc/int
1666	760507.7	1652153.9	708.0	trench/pvc
1667	760453.7	1652141.0	702.1	trench/pvc/int
1668	760433.5	1652185.3	717.2	trench/pvc
1669	760399.2	1652184.2	719.7	trench/pvc
1670	760301.2	1652189.7	728.7	trench/pvc/int
1671	760285.8	1652196.0	727.8	trench/pvc
1672	760311.1	1652232.2	732.2	w404
1673	760253.7	1652300.8	734.3	trench/pvc
1674	760230.9	1652361.6	738.4	trench
1675	760225.6	1652394.6	741.2	trench/pvc
1676	760240.6	1652428.4	742.4	trench
1677	760292.2	1652465.4	745.7	w401
1678	760492.1	1652410.3	747.5	w402
1679	760534.1	1652319.5	740.9	trench/pvc
1680	760483.1	1652089.7	684.8	trench
1681	760494.8	1652053.7	679.5	trench/pvc
1682	760501.9	1651953.4	677.2	trench/pvc
1683	760506.6	1651853.3	678.0	valve
1684	760506.5	1651846.4	677.3	trench/pvc
1685	760498.6	1651847.6	677.5	valve
1686	760482.2	1651850.1	674.7	cps-1
1687	760464.2	1651838.1	683.1	trench
1688	760642.3	1651837.6	691.9	trench/pvc
1689	760690.6	1651842.2	696.1	trench/pvc
1690	760784.5	1651858.2	704.4	trench/pvc
1691	760800.2	1651860.7	703.9	cmp 15
1692	760815.0	1651863.1	704.6	cmp 15
1693	760985.4	1651860.1	711.3	trench/pvc
1694	760981.4	1651908.2	718.3	trench/pvc
1695	761073.6	1651944.8	723.8	trench/pvc
1696	761160.2	1651992.7	727.6	trench/pvc
1697	761235.1	1652057.3	733.3	trench/pvc
1698	761294.9	1652093.9	735.9	trench
1699	761320.3	1652094.6	735.9	trench/pvc

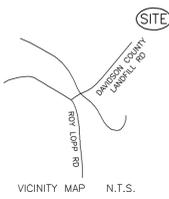
elevation on top of lid
 elevation on top of lid

NOTE:
 1) LFG HEADER LOCATED FROM EXISTING TRENCH.
 2) ALL ELEVATIONS SHOWN ARE GROUND ELEVATIONS.

SHEET NO. 1

NOTE: THIS PROPERTY IS SUBJECT TO ANY FACTS (PRIOR AGREEMENTS, CONVEYANCES, OR EASEMENTS OF RECORD) THAT MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.

SURVEY FOR: DAVIDSON COUNTY LANDFILL LFG HEADER AS-BUILT					
SURV'D MDG	DRAWN MDG	TOWNSHIP THOMASVILLE	COUNTY DAVIDSON	STATE N.C.	DEED BOOK PAGE
TAX REFERENCE 16-355-0-000-0009					
JOB NO. 3506	DWG. 3506	DATE 09-22-10			
MICHAEL GREEN ASSOCIATES, P.A. CONSULTANTS - LAND PLANNERS - SURVEYORS P.O. BOX 539 • LEXINGTON, N.C. 27293 • 336-248-8102			SCALE 1" = 40'		



TIE TO LANDFILL CONTROL DATUM

TOWER 101 (TOP BOLT SE CORNER)
 N: 763,248.44
 E: 1,650,365.45
 ELEVATION: 791.55'
 ALL DISTANCES SHOWN ARE HORIZONTAL.

BEARING AND DISTANCE FROM
 TOWER 101 TO TOWER 102
 N 63°29'02"E 783.71'

TOWER 102 (TOP BOLT NW CORNER)
 N: 763,598.33
 E: 1,651,066.72
 ELEVATION: 725.31'



NORTH CAROLINA, DAVIDSON COUNTY

I, MICHAEL D. GREEN, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK AS SHOWN HEREON); THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION IN DEED BOOK AS SHOWN HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1:10,000; THAT THE GLOBAL POSITIONING SYSTEM (GPS) OBSERVATIONS WERE PERFORMED TO THE GEOSPATIAL POSITIONING ACCURACY STANDARDS, PART 2: STANDARDS FOR GEODETIC NETWORKS AT THE 2CM ACCURACY CLASSIFICATION (95% CONFIDENCE) USING RTK NETWORK AND TRADITIONAL TRAVERSE; AND MEETS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (21 NCAC 58.1600). WITNESS MY ORIGINAL SIGNATURE AND SEAL THIS 22ND DAY OF SEPTEMBER, 2010.

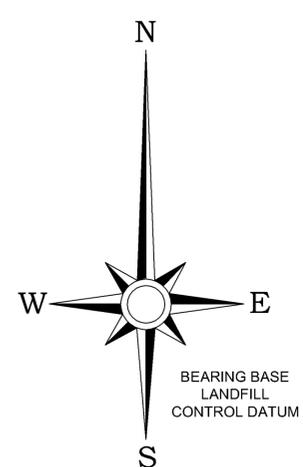
PROFESSIONAL LAND SURVEYOR *Michael D. Green* L-3604 NC

Point	Northing	Easting	Elev.	Description
1698	761294.9	1652093.9	733.9	trench
1699	761320.3	1652094.6	735.9	trench/pvc
1700	761429.8	1652094.0	741.0	trench/pvc
1701	761532.7	1652104.0	744.5	trench/pvc
1702	761628.8	1652115.9	749.0	trench/pvc
1703	761712.9	1652127.9	750.5	trench/pvc
1704	761809.8	1652155.4	753.0	trench/pvc
1705	761907.0	1652186.9	755.6	trench/pvc
1706	762002.2	1652216.7	757.9	trench/pvc
1707	762096.5	1652249.8	758.0	trench/pvc
1708	762189.4	1652280.6	758.0	trench/pvc
1709	762216.8	1652303.3	757.8	trench/pvc
1710	762233.6	1652310.5	757.6	trench/pvc/mt
1711	762182.2	1652330.1	760.8	valve
1712	762122.3	1652359.6	770.4	trench
1713	762051.3	1652375.2	781.5	trench/pvc/mt
1714	761990.8	1652388.8	787.0	trench/pvc
1715	761891.7	1652398.9	792.9	trench/pvc
1716	761792.0	1652410.8	797.0	trench/pvc
1717	761740.7	1652424.7	798.8	trench/pvc/mt
1718	761761.3	1652499.9	813.1	w303
1719	761697.0	1652442.3	799.8	trench/pvc
1720	761602.9	1652476.3	803.2	trench/pvc
1721	761602.6	1652471.8	802.4	w302
1722	761619.8	1652521.9	811.1	trench/pvc
1723	761659.2	1652613.4	813.9	trench/pvc
1724	761673.6	1652599.5	814.4	w301
1725	761737.2	1652680.3	812.4	trench/pvc
1726	761770.1	1652703.5	812.2	trench/pvc
1727	761770.8	1652699.9	812.1	w304
1728	761820.8	1652733.1	810.7	trench/pvc
1729	761886.1	1652763.9	809.9	trench
1730	761913.2	1652770.6	809.4	trench/pvc
1731	761961.2	1652764.0	808.9	trench/pvc/mt
1732	761921.7	1652726.2	812.2	w305
1733	761985.8	1652721.4	808.2	trench/pvc
1734	761986.5	1652622.1	806.2	trench/pvc
1735	762009.3	1652523.2	803.3	trench/pvc
1736	762009.8	1652508.3	802.3	trench/pvc/mt
1737	761919.2	1652504.3	812.8	w306
1738	762027.8	1652438.9	795.2	trench
1739	762282.6	1652328.6	786.1	trench
1740	762319.6	1652311.4	786.2	trench
1741	762344.4	1652329.5	785.4	trench
1742	762364.9	1652312.5	783.9	trench/pvc
1743	762398.5	1652272.7	749.3	trench
1744	762420.7	1652227.2	745.3	trench/pvc
1745	762462.3	1652136.2	733.6	trench/pvc

elevation on top of lid

ASPHALT ROAD

SOIL ROAD



NOTE: THIS PROPERTY IS SUBJECT TO ANY FACTS (PRIOR AGREEMENTS, CONVEYANCES, OR EASEMENTS OF RECORD) THAT MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.

SURVEY FOR: DAVIDSON COUNTY LANDFILL LFG HEADER AS-BUILT						
SURV/D	DRAWN	TOWNSHIP	COUNTY	STATE	DEED BOOK	PAGE
MDG	MDG	THOMASVILLE	DAVIDSON	N.C.		
TAX REFERENCE						
16-355-0-000-0009						
JOB NO.	DWG.	DATE	SCALE 1" = 40'			
3506	3506	09-22-10				

NOTE:
 1) LFG HEADER LOCATED FROM EXISTING TRENCH.
 2) ALL ELEVATIONS SHOWN ARE GROUND ELEVATIONS.

SHEET NO. 2

MICHAEL GREEN ASSOCIATES, P.A.
 CONSULTANTS - LAND PLANNERS - SURVEYORS
 P.O. BOX 539 • LEXINGTON, N.C. 27293 • 336-248-8102

TIE TO LANDFILL CONTROL DATUM

TOWER 101 (TOP BOLT SE CORNER)
 N: 763,240.44
 E: 1,650,365.45
 ELEVATION: 731.59
 ALL DISTANCES SHOWN ARE HORIZONTAL.

BEARING AND DISTANCE FROM
 TOWER 101 TO TOWER 102
 N 63°29'02"E 783.71'

TOWER 102 (TOP BOLT NW CORNER)
 N: 763,598.33
 E: 1,651,066.72
 ELEVATION: 725.31'



NORTH CAROLINA, DAVIDSON COUNTY
 I, MICHAEL D. GREEN, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK AS SHOWN HEREON); THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS BRAIN FROM INFORMATION IN DEED BOOK AS SHOWN HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1:10,000; THAT THE GLOBAL POSITIONING SYSTEM (GPS) OBSERVATIONS WERE PERFORMED TO THE GEOSPATIAL POSITIONING ACCURACY STANDARDS, PART 2: STANDARDS FOR GEODETIC NETWORKS AT THE 2CM ACCURACY CLASSIFICATION (95% CONFIDENCE) USING RTK NETWORK AND TRADITIONAL TRAVERSE; AND MEETS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (21 N.C.A.C. 36.1600). WITNESS MY ORIGINAL SIGNATURE AND SEAL THIS 22nd DAY OF SEPTEMBER, 2010.

PROFESSIONAL LAND SURVEYOR *Michael D. Green* 3604 NC



Point	Northing	Easting	Elev.	Description
1745	762462.3	1652136.2	733.6	trench/pvc
1746	762496.1	1652040.1	722.8	trench/pvc
1747	762536.1	1651955.1	711.0	trench/pvc
1748	762581.2	1651852.3	704.6	ep/cut
1749	762593.3	1651827.6	703.9	ep/cut
1750	762601.1	1651809.8	703.5	co
1751	762598.3	1651807.4	703.5	cpes2
1752	762522.4	1651774.8	707.3	trench/pvc
1753	762689.2	1651705.4	715.7	trench/pvc
1754	762763.7	1651644.2	722.1	trench/pvc
1755	762851.7	1651593.1	725.7	trench/pvc
1756	762909.9	1651563.5	726.8	trench
1757	762944.8	1651535.6	727.8	ep/cut
1758	762963.0	1651482.3	728.1	ep/cut
1759	762970.0	1651457.3	728.9	trench/pvc
1760	762971.9	1651443.5	728.9	ep/cut
1761	762973.1	1651410.6	728.8	ep/cut
1762	762969.1	1651357.1	731.7	trench/pvc
1763	762964.9	1651298.5	732.8	ep/cut
1764	762961.1	1651268.7	733.9	ep/cut
1765	762960.0	1651255.7	734.9	trench/pvc
1766	762946.2	1651154.8	737.7	ep/cut
1767	762946.1	1651126.1	736.6	ep/cut
1768	762946.0	1651120.7	739.1	trench/pvc
1769	762944.9	1651101.0	740.2	trench
1770	762960.3	1651064.9	740.7	trench
1771	762950.0	1651022.1	740.9	trench/pvc
1772	763067.7	1650954.7	731.3	trench/pvc
1773	763125.8	1650886.3	728.9	trench

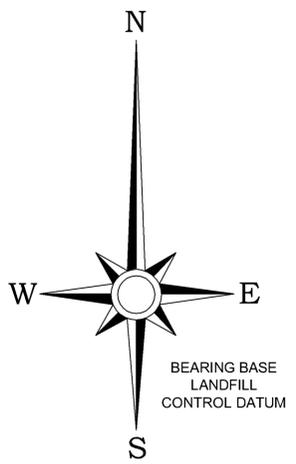
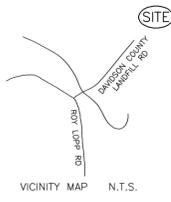
NOTE:
 1) LFG HEADER LOCATED FROM EXISTING TRENCH.
 2) ALL ELEVATIONS SHOWN ARE GROUND ELEVATIONS.

SHEET NO. 3

NOTE: THIS PROPERTY IS SUBJECT TO ANY FACTS (PRIOR AGREEMENTS, CONVEYANCES, OR EASEMENTS OF RECORD) THAT MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.

SURVEY FOR:		DAVIDSON COUNTY LANDFILL LFG HEADER AS-BUILT				
SURV'D	DRAWN	TOWNSHIP	COUNTY	STATE	DEED BOOK	PAGE
MDG	MDG	THOMASVILLE	DAVIDSON	N.C.		
TAX REFERENCE		16-355-0-000-0009				
JOB NO.	F.B.	DATE	SCALE 1" = 40'			
3506	DC	09-22-10				

MICHAEL GREEN ASSOCIATES
 CONSULTANTS - LAND PLANNERS - SURVEYORS
 P.O. BOX 539 - LEXINGTON, N.C. 27293 - 336-248-8102



TIE TO LANDFILL CONTROL DATUM

TOWER 101 (TOP BOLT SE CORNER)
 N: 763,240.44
 E: 1,650,365.45
 ELEVATION: 731.59
 ALL DISTANCES SHOWN ARE HORIZONTAL

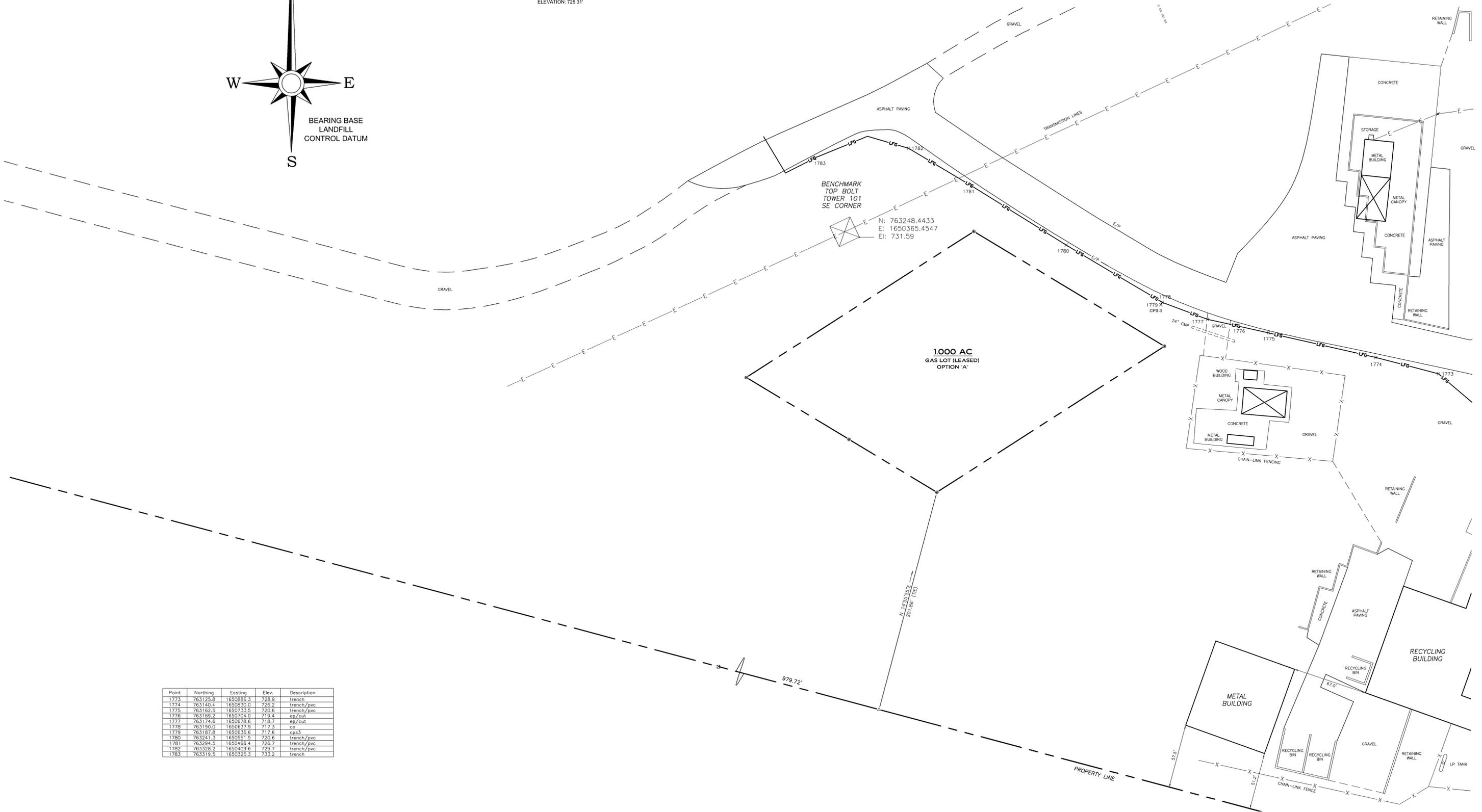
BEARING AND DISTANCE FROM
 TOWER 101 TO TOWER 102
 N 63°29'02"E 783.71'

TOWER 102 (TOP BOLT NW CORNER)
 N: 763,598.33
 E: 1,651,066.72
 ELEVATION: 725.31'

NORTH CAROLINA, DAVIDSON COUNTY

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PROFESSIONAL LAND SURVEYOR *Michael D. Green* 3804 N.C.



Point	Northing	Easting	Elev.	Description
1773	763125.8	1650886.3	728.9	trench
1774	763140.4	1650830.0	726.2	trench/pvc
1775	763162.5	1650733.5	720.6	trench/pvc
1776	763169.2	1650704.0	719.4	ep/cut
1777	763174.6	1650678.6	718.7	ep/cut
1778	763190.0	1650637.9	717.3	cp
1779	763197.8	1650636.6	717.6	cp#3
1780	763241.3	1650551.5	720.6	trench/pvc
1781	763294.5	1650466.4	726.7	trench/pvc
1782	763328.2	1650409.6	729.7	trench/pvc
1783	763319.5	1650325.3	733.2	trench

NOTE:
 1) LFG HEADER LOCATED FROM EXISTING TRENCH.
 2) ALL ELEVATIONS SHOWN ARE GROUND ELEVATIONS.

SHEET NO. 4

NOTE: THIS PROPERTY IS SUBJECT TO ANY FACTS (PRIOR AGREEMENTS, CONVEYANCES, OR EASEMENTS OF RECORD) THAT MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.

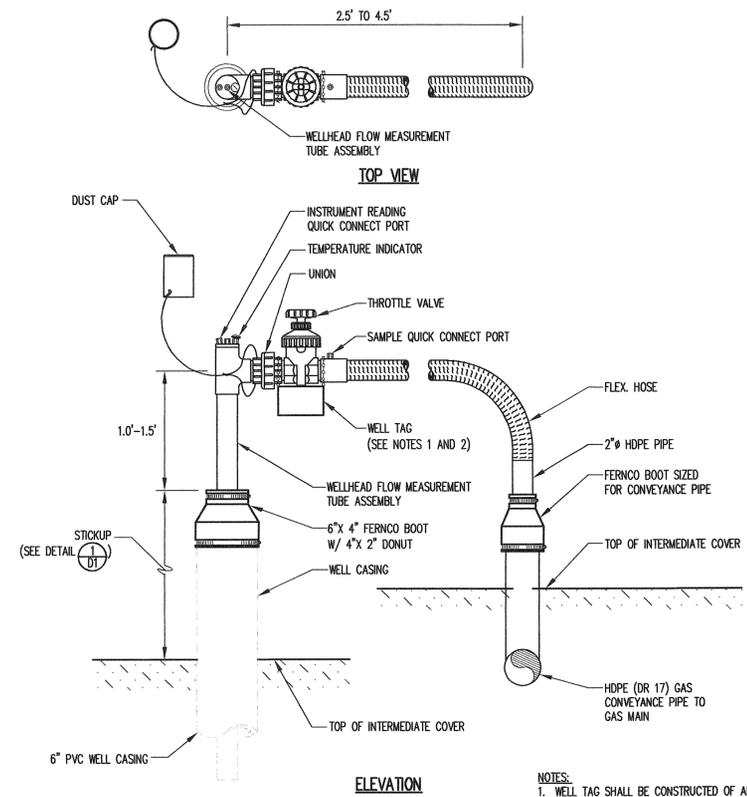
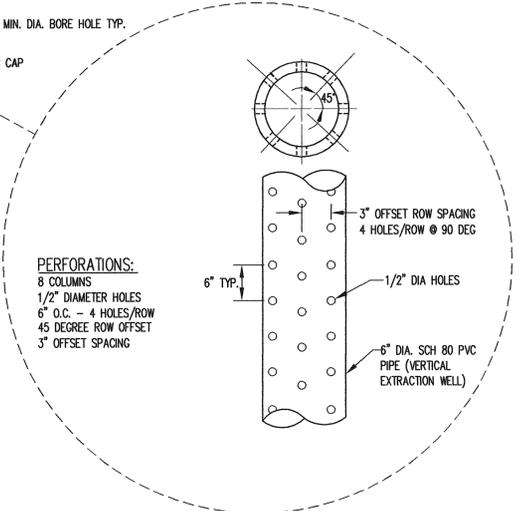
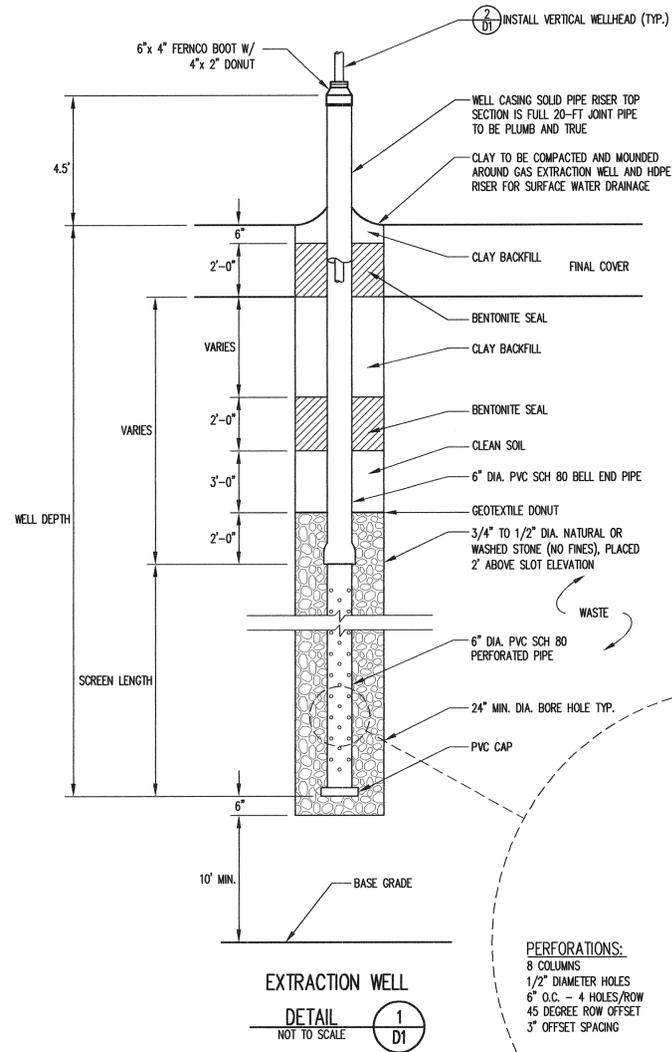
SURVEY FOR: **DAVIDSON COUNTY LANDFILL LFG HEADER AS-BUILT**

SURV'D	DRAWN	TOWNSHIP	COUNTY	STATE	DEED BOOK	PAGE
MDG	MDG	THOMASVILLE	DAVIDSON	N.C.		
TAX REFERENCE						
06-355-0-000-0009						
JOB NO.	F.B.	DATE	SCALE 1" = 40'			
3506	DC	09-22-10				

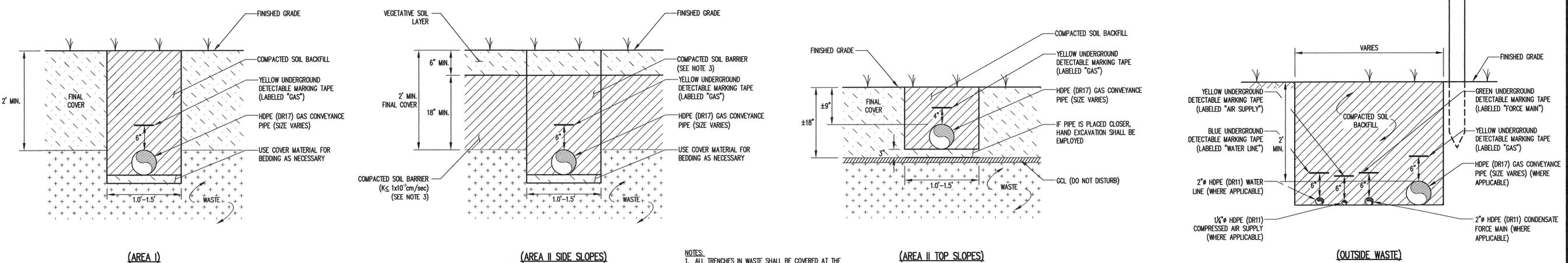
MICHAEL GREEN ASSOCIATES
 CONSULTANTS - LAND PLANNERS - SURVEYORS
 P.O. BOX 539 - LEXINGTON, N.C. 27293 - 336-248-8102

AS-BUILT

RICHARDSON SMITH GARDNER & ASSOCIATES
 14 N. Boylan Ave., Raleigh, N.C. 27603
 PH: 919-928-0577
 FAX: 919-928-3899
 www.rsgengineers.com



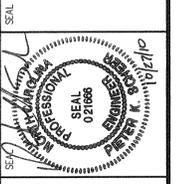
- NOTES:**
- WELL TAG SHALL BE CONSTRUCTED OF ALL WEATHER MATERIALS WITH ENGRAVED INFORMATION SHOWING:
 - WELL ID
 - DATE OF INSTALLATION
 - DEPTH
 - INSTALLER
 - WELL TAG SHALL BE PERMANENTLY AND SECURELY INSTALLED ON THE WELL CASING OR HANGING BY GALVANIZED CHAIN.



- NOTES:**
- ALL TRENCHES IN WASTE SHALL BE COVERED AT THE END OF EACH DAY SUCH THAT NO WASTE IS EXPOSED.
 - PLACE MARKERS EVERY 200' AND AT TURNS OUTSIDE OF WASTE AREAS.
 - PLACE COMPACTED SOIL BARRIER IN TRENCH IN 6" COMPACTED LIFTS.

PIPE TRENCH WITH CONVEYANCE AND CONDENSATE PIPING

G:\CAD\Drawings\DOTIE (A) (RichardsonSmithGardner)\DOTIE-00576.dwg - 10/27/2010 10:49 AM

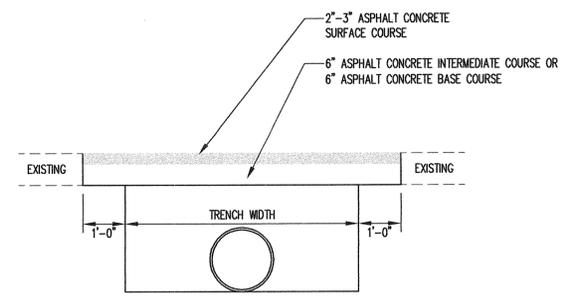


DAVIDSON GAS PRODUCERS, LLC
 HOLLY GROVE LANDFILL
 LFG COLLECTION SYSTEM

AS-BUILT DETAILS (SHEET 1 OF 3)

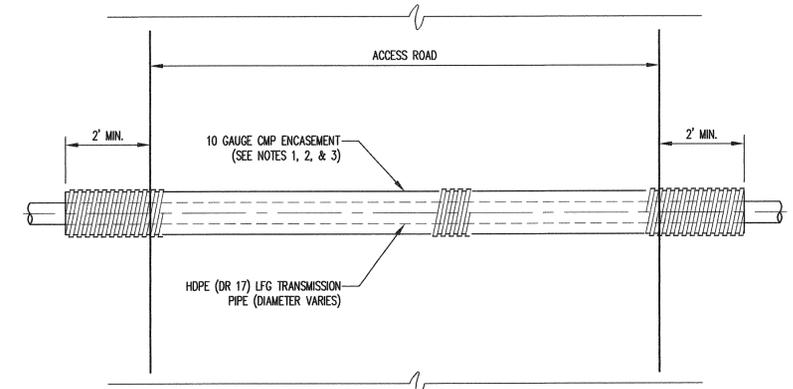
DESIGNED BY: P.K.S.	DRAWN BY: C.T.J.
CHECKED BY: PKS	PROJECT NO.: DTE 10-1
SCALE: AS SHOWN	DATE: OCT. 2010
FILE NAME: DTE-00576	SHEET NO.: 1
DRAWING NO.: D1	

AS-BUILT



PAVEMENT REPAIRS ON ROADS NOT TO BE RESURFACED

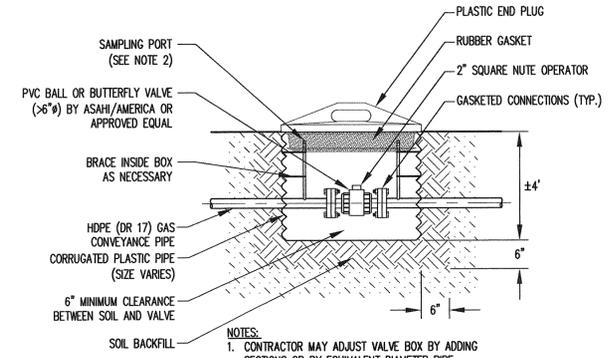
DETAIL 1
NOT TO SCALE D2



- NOTES:
1. CMP ENCASMENT DIAMETER SHALL BE AT LEAST 1.5x PIPE DIAMETER.
 2. MIN. 1.5 FT. COVER REQUIRED OVER CMP.
 3. CONTRACTOR SHALL RESTORE ROAD TO ORIGINAL CONDITION, INCLUDING ASPHALT OR AGGREGATE SURFACING.
 4. THE ENGINEER MAY APPROVE AN ALTERNATE DETAIL FOR ROAD CROSSINGS.

PIPE ENCASMENT AT ROAD CROSSING

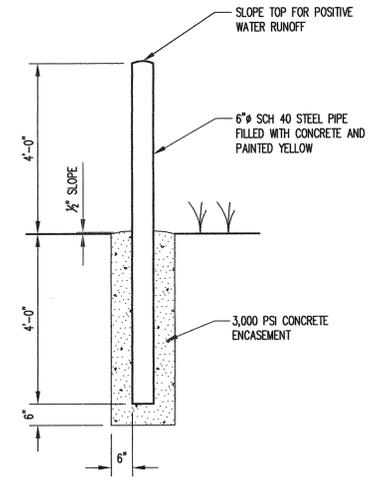
DETAIL 3
NOT TO SCALE D2



- NOTES:
1. CONTRACTOR MAY ADJUST VALVE BOX BY ADDING SECTIONS OR BY EQUIVALENT DIAMETER PIPE. ALTERNATIVE VALVES OR VALVE BOXES MAY BE APPROVED BY ENGINEER.
 2. SAMPLING PORT SHALL BE AS MANUFACTURED BY COLDER PRODUCTS COMPANY (PMC 12 SERIES QUICK CONNECT COUPLINGS).
 3. ADD MARKER ADJACENT TO VALVE BOX PER DETAIL 4/D2.

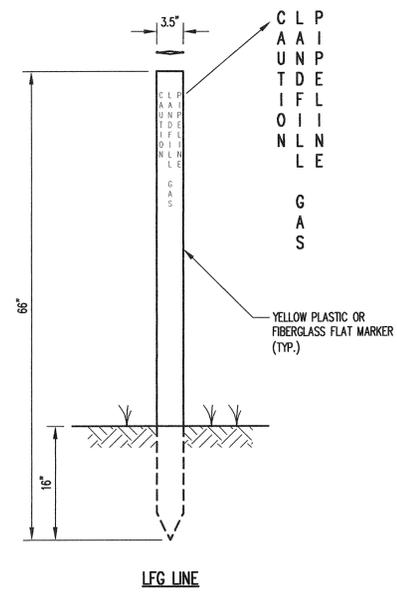
ISOLATION VALVE

DETAIL 5
NOT TO SCALE D2

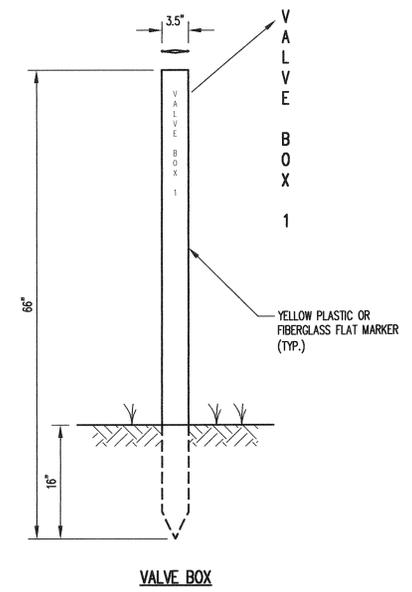


BOLLARD

DETAIL 2
NOT TO SCALE D2

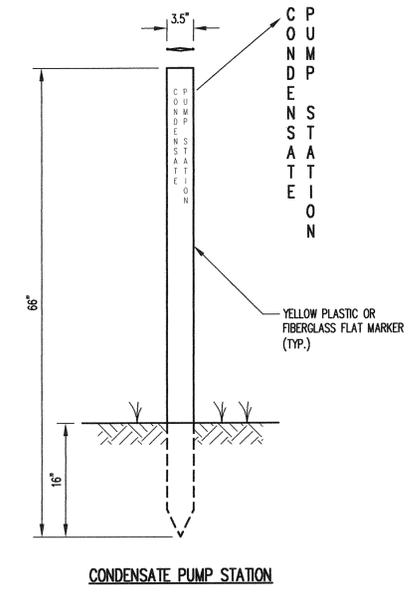


LFG LINE



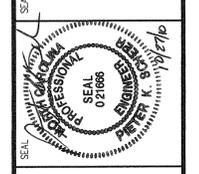
VALVE BOX

MARKERS
DETAIL 4
NOT TO SCALE D2



CONDENSATE PUMP STATION

RICHARDSON SMITH GARDNER & ASSOCIATES
 N.C. Lic. No. C-208 (Engineering)
 www.rengineers.com
 14 N. Boylan Ave., 27603
 Raleigh, N.C.
 ph: 919-428-0577
 fax: 919-428-5889



PROJECT TITLE:
**DAVIDSON GAS PRODUCERS, LLC
 HOLLY GROVE LANDFILL
 LFG COLLECTION SYSTEM**

DRAWING TITLE:
**AS-BUILT DETAILS
 (SHEET 2 OF 3)**

DESIGNED BY: P.K.S.	DRAWN BY: C.T.J.
CHECKED BY: PCS	PROJECT NO.: DTE 10-1
SCALE: AS SHOWN	DATE: OCT. 2010
FILE NAME: DTE-00577	
SHEET NO. 2	DRAWING NO. D2

