

January 18, 2013

Mr. John Murray, P.E.  
Regional Engineer  
NC DENR - Division of Waste Management  
610 E. Center Ave.  
 Mooresville, NC 28115

**RE: Davidson County C&D Landfill (Permit No. 29-06)  
Phase 4 Construction  
Construction Quality Assurance (CQA) Report**

Dear John:

On behalf of Davidson County, Smith Gardner, Inc. (S+G) would like to submit the enclosed construction quality assurance (CQA) report for the construction of the Phase 4 construction and demolition debris (C&D) landfill unit for your review.

Should you have any questions or comments on this report, please contact me at your earliest convenience.

Sincerely,  
**SMITH GARDNER, INC.**



Pieter K. Scheer, P.E.  
Project Manager  
[pieter@smithgardnerinc.com](mailto:pieter@smithgardnerinc.com)

Enclosure

cc: Charlie Brushwood, Davidson County  
Steven Sink, Davidson County  
Ed Mussler, P.E., NCDWM  
Hugh Jernigan, NCDWM

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# Construction Quality Assurance Report

## Davidson County C&D Landfill – Phase 4 Davidson County, North Carolina

Prepared for:

**Davidson County Integrated Solid Waste Management Department  
Thomasville, North Carolina**



**January 2013**

Prepared by:

NC LIC. NO. C-0828 (ENGINEERING)

# SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



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# Construction Quality Assurance Report

## Davidson County C&D Landfill - Phase 4 Davidson County, North Carolina

Prepared For:

**Davidson County Integrated Solid Waste Management Department  
Davidson County, North Carolina**

**S+G Project No. DAVDCO-10-2**



Pieter K. Scheer, P.E.  
Project Manager



**January 2013**

NC LIC. NO. C-0828 (ENGINEERING)

**SMITH+GARDNER**

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

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# Davidson County C&D Landfill - Phase 4 Davidson County, North Carolina

## Construction Quality Assurance Report

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## 1.0 OVERVIEW

This Construction Quality Assurance (CQA) Report has been prepared to document the CQA activities performed during the construction of Phase 4 of the Davidson County Construction and Demolition Debris (C&D) Landfill in Lexington, North Carolina. The landfill is located on Landfill Road off of Roy Lopp Road and is owned and operated by Davidson County under State Solid Waste Permit No. 29-06. A Permit to Construct for Phase 4 was issued by the North Carolina Division of Waste Management (NCDWM) on July 18, 2011.

## 2.0 PROJECT DESCRIPTION

### 2.1 General

Phase 4 is an unlined C&D landfill unit designed by Smith Gardner, Inc. (S+G), formerly Richardson Smith Gardner & Associates, Inc. (RSG). Phase 4 consists of approximately 1.7 acres (inside waste limits) located to the southeast of the existing Phase 1 and 2 units, which were completed in 2001 and 2006, respectively. The Phase 4 construction consisted of site and subgrade preparation activities, installation of drainage and erosion control measures, and construction of a perimeter berm.

### 2.2 Reference Documents

Phase 4 was constructed in accordance with the following documents:

**Construction Documents – Davidson County C&D Landfill - Phase 4:**

Includes technical specifications, CQA manual, and drawings prepared by Richardson Smith Gardner & Associates, Inc. (RSG) (as revised through April 2011).

**Permit To Construct Application – Davidson County C&D Landfill - Phase 4:**

Includes technical specifications, CQA manual, and permit drawings prepared by RSG as revised through April 2011 (Permit to Construct issued by NCDWM on July 18, 2011 (copy of permit provided in **Appendix A**)).

**Erosion and Sedimentation Control Plan for Davidson County C&D Landfill -**

**Phases 3 & 4** prepared by RSG dated June 2011. Letter of approval correspondence dated June 28, 2011 from Land Quality Section (copy of approval letter provided in **Appendix A**).

## 2.3 Project Participants

The following parties were involved in the construction and CQA of Phase 4:

### 2.3.1 Owner

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

Contact: Charlie Brushwood, Director  
Steven Sink, Landfill Manager

Note: For this project, the County performed as the contractor.

### 2.3.2 Engineer/CQA Engineer

Smith Gardner, Inc. (S+G)  
14 N. Boylan Ave.  
Raleigh, NC 27603  
Phone: (919) 828-0577  
Fax: (919) 828-3899

Contacts: Pieter Scheer, P.E., Project Manager

### 2.3.3 CQA Testing - Earthwork & Construction Monitoring

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

Contacts: Mike Smith, Regional Manager

### 2.3.4 Surveyor

Michael Green Associates, P.A.  
4513 W. Old Highway 64  
Lexington, NC 27295  
Phone: (336) 248-8102

Contacts: Michael Green, PLS, Project Manager

### **3.0 SUMMARY OF CONSTRUCTION ACTIVITIES**

Major elements of the project are discussed below. Photos documenting the construction of Phase 4 can be found in **Appendix B**. Prior to beginning work on the subgrade, a project Pre-Construction Meeting was held on May 3, 2012. A summary of this meeting can be found in **Appendix C**.

#### **3.1 Site Preparation**

The site preparation for Phase 4 began with the abandonment of affected wells and piezometers (**Appendix D**). Construction of Phase 4 began with the surveying/staking of the limits of construction and the initiation of site preparation activities by County forces.

#### **3.2 Erosion and Sedimentation Control Measures**

The construction of erosion and sedimentation control measures took place in conjunction with project activities and under the approval issued by the Land Quality Section of the NC Division of Land Resources. Initially silt fencing was installed followed by the construction of Sediment Basin No. 2 to the southeast of Phase 4. Permanent drainage channels were added as areas were brought to grade. Once areas reached final grade, the areas were vegetated in accordance with project requirements.

#### **3.3 Earthwork**

Once the site was staked, excavation and stockpiling activities were performed. Suitable soils identified for use as structural fill were excavated and placed and compacted or were temporarily stockpiled. Much of the material required for structural fill came from the Phase 4 excavation. However, some additional structural fill material was required from the County's active borrow area adjacent to the Phase 2 MSW landfill unit in order to complete the subgrade contours and perimeter berm.

During construction and upon completion of the Phase 4 subgrade, Mr. Pieter Scheer, P.E. visited the site and examined the subgrade in accordance with the requirements of 15A NCAC 13B.0540. As anticipated based on the site investigations performed for the permit to construct, no evidence of competent bedrock was observed in excavations made to reach subgrade elevations.

An as-built drawing showing completed subgrade elevations is provided in **Appendix F**.

## 4.0 CQA PROGRAM

### 4.1 Scope of Services

In satisfying the requirements of the Project CQA Manual for Phase 4, the following activities were performed:

- Observation and documentation of construction of prepared subgrade and structural fill.
- Field and/or laboratory testing of structural fill.
- Review/preparation of record drawing.
- Preparation of the final CQA report.

## 5.0 EARTHWORK CQA

The criteria for construction of structural fill per the project specifications included the following:

Materials:	SW*, SM, SM-SC, SC, ML, MH, ML-CL, CL, or CH (ASTM D 2488) with no topsoil or other deleterious material and no stones or rocks in excess of one half the lift thickness as compacted;
Density:	Minimum 95% Maximum Standard Proctor Dry Density (ASTM D 698);
Moisture Content:	As necessary for compaction; and
Lift Thickness:	8-inch max. (compactd).

\*Within the limits of the landfill, SW (well-graded sand) soils are not allowed in the upper two feet of the subgrade (see **Section 5.1**).

The number and results of material control and record tests performed on the structural fill are summarized in **Table 1**. Other tests performed on an on-going basis during construction included a visual classification of soils (ASTM D 2488) and monitoring of loose lift thickness. Note that the number of tests required was based on an approximate quantity of 3,900 CY of material placed (in-place measure). The results of field and laboratory testing of structural fill can be found in **Appendix E**. An as-built drawing showing completed subgrade elevations as compared with design grades and bedrock contours (controlling surface for separation criteria) is provided in **Appendix F**.

### 5.1 Soil Types in Upper Two Feet of Landfill Subgrade

For this site, no SW, SP, or coarser soil types (as defined using ASTM D 2488) were found to be present within the Phase 4 limits based on prior site investigation activities and testing performed as part of construction. Additionally, borrow soil utilized for construction was classified as SC or SM. These soil types meet the requirements of 15A NCAC 13B.0540 for the upper two feet of the landfill subgrade.

## 6.0 RECORD DRAWING

The following record (as-built) drawing depicting the construction of Phase 4 can be found in Appendix F:

- Subgrade Verification (prepared by S+G using surveyed elevations by Michael Green Associates).

## 7.0 PROJECT CERTIFICATION

Based on the observations and results of the CQA program documented herein, it is our professional opinion that the construction of Phase 4 of the Davidson County C&D Landfill was completed in accordance with the following:

- i. The Project CQA Manual;
- ii. The conditions of the Permit to Construct Phase 4;
- iii. The requirements of 15A NCAC 13B.0540; and
- iv. Acceptable engineering practices.

**SMITH GARDNER, INC.**



Pieter K. Scheer, P.E.  
Project Manager



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**TABLE 1  
SUMMARY OF MATERIAL CONTROL  
AND RECORD TESTS  
STRUCTURAL FILL**

	Property		
	Control Tests	Record Tests	
	Moisture-Density Relationship (Proctor)	In-Place Density	In-Place Moisture Content
<b>Units</b>	-----	% Std. Proctor	%
<b>Test Method</b>	ASTM D 698	ASTM D 2922 <sup>1</sup>	ASTM D 3017 <sup>2</sup>
<b>Required Test Frequency</b>	5,000 CY per each soil	20,000 ft <sup>2</sup> per lift & 1 per 500 LF of Berms (<200 ft. base width) (+/- 1 Per 500 CY)	20,000 ft <sup>2</sup> per lift & 1 per 500 LF of Berms (<200 ft. base width) (+/- 1 Per 500 CY)
<b>No. of Tests Required</b>	1	8	8
<b>No. of Tests Performed</b>	2	28	28
<b>Specified Value</b>	-----	≥ 95% Std. Proctor	As Required for Density
<b>Minimum Value</b>	-----	95	-4.8% Opt.
<b>Maximum Value</b>	-----	102	5.2% Opt.
<b>Average Value</b>	-----	98	-0.8% Opt.
<b>Quantity of Structural Fill (In-Place):</b>		3,900 CY	

Notes:

1. Nuclear density values verified periodically by sand cone (ASTM D 1556), rubber balloon (ASTM D 2167), and/or drive cylinder (ASTM D 2937) test methods.
2. Nuclear moisture values verified periodically by oven (ASTM D 2216), microwave oven (ASTM D 4643), and/or direct heating (ASTM D 4959) test methods.

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## **Appendix A**

### **Reference Documents (Permits & Approvals)**

**Construction Quality Assurance Report  
Davidson County C&D Landfill - Phase 4  
Davidson County, 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

STATE OF NORTH CAROLINA  
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES  
DIVISION OF WASTE MANAGEMENT  
SOLID WASTE SECTION

**MUNICIPAL SOLID WASTE LANDFILL FACILITY**  
**Permit No. 29-06**

DAVIDSON COUNTY INTEGRATED SOLID WASTE MANAGEMENT  
is hereby issued a

**PERMIT TO CONSTRUCT**  
C&D LANDFILL UNIT PHASE 4

**PERMIT TO OPERATE**  
MSW LANDFILL UNIT PHASE 2  
C&D LANDFILL UNIT PHASES 1 - 3  
HHW COLLECTION FACILITY

Located at 220 Davidson County Landfill Road, Davidson County, in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit. The legal description of the site is identified on the deeds recorded for this property listed in Attachment No. 1 of this permit.

cn=Edward F. Mussler III, P.  
E., o=Solid Waste Section,  
ou=NC DWM, email=ed.  
mussler@ncdenr.gov, c=US  
2011.07.18.10:21:18 -04'00'

Edward F. Mussler, III, P.E.,  
Permitting Branch Supervisor  
Solid Waste Section

## ATTACHMENT 1

### PART I: PERMITTING HISTORY

1. On October 8, 1993 a Permit to Construct was issued for MSW landfill unit Phase 1, Area 3.
2. On June 22, 1994 a modification was made to the Permit to Construct for an alternative Construction Quality Assurance plan.
3. On June 24, 1994 a modification was made to the Permit to Construct for an alternative plan to verify clay liner thickness.
4. On July 14, 1994 a modification was made to the Permit to Construct for a repair and reconstruction plan.
5. On September 28, 1994 a Permit to Operate was issued for MSW landfill unit Phase 1, Area 3.
6. On January 17, 1995 a Permit to Operate was issued for MSW landfill unit Phase 1, Area 3 – Cell B.
7. On February 20, 1995 a Permit to Construct was issued for MSW landfill unit Phase 1, Area 1.
8. On August 21, 1995 a Permit Renewal was issued for MSW landfill unit Phase 1, Area 1.
9. On March 13, 1996 a Permit to Operate was issued for the operation of MSW landfill unit Phase 1, Area 1.
10. On August 18, 1999 an amendment was made to the Permit to Construct for the addition of MSW landfill unit Phase 1, Area 2 – Cell 1.
11. On May 30, 2000 a Permit to Operate was issued for MSW landfill unit Phase 1, Area 2 – Cell 1.
12. On June 22, 2001 a modification was made to the Permit to Operate for the operation of a permanent Household Hazardous Waste unit.
13. On November 20, 2001 a modification was made to the Permit to Operate for the operation of C&D landfill unit Phase 1.
14. On May 15, 2002 a modification was made to the Permit to Operate for operation of a Mobile Home Deconstruction unit and the use of synthetic tarps as an alternative daily cover.
15. On June 24, 2003 a modification was made to the Permit to Operate for operation of MSW landfill unit Phase 1, Area 2 – Cell 2.

16. On April 10, 2006 an amendment was made to the Permit to Operate for the operation of C&D landfill unit Phase 2.
17. On September 28, 2007 an amendment was made to the Permit to Construct for the construction of MSW landfill unit Phase 2, Area 1.
18. On December 8, 2008 a modification was made to the Permit to Operate for operation of MSW landfill unit Phase 2, Area 1, partial closure of Phase 1, Areas 1 and 3 and the closure modification and regarding plan for Phase 1.
19. On July 18, 2011 an amendment was made to the Permit for the five-year renewal of operations including the operation of C&D landfill unit Phase 3 (vertical expansion) and the construction of C&D landfill unit Phase 4.

<b>No.</b>	<b>Permit Type</b>	<b>Date Issued</b>	<b>DIN</b>
1.	Permit to Construct	October 8, 1993	
2.	Permit Modification	June 22, 1994	
3.	Permit Modification	June 24, 1994	
4.	Permit Modification	July 14, 1994	
5.	Permit to Operate	September 28, 1994	
6.	Permit to Operate	January 17, 1995	
7.	Permit to Construct	February 20, 1995	
8.	Permit Renewal	August 21, 1995	
9.	Permit Renewal	March 13, 1996	
10.	Permit Amendment	August 18, 1999	
11.	Permit to Operate	May 30, 2000	
12.	Permit Modification	June 22, 2001	
13.	Permit Modification	November 20, 2001	
14.	Permit Modification	May 15, 2002	
15.	Permit Modification	June 24, 2003	
16.	Permit Amendment	April 10, 2006	
17.	Permit Amendment	September 28, 2007	
18.	Permit Modification	December 8, 2008	
<b>19.</b>	<b>Permit Amendment</b>	<b>July 18, 2011</b>	<b>14136</b>

## PART II: LIST OF DOCUMENTS FOR THE APPROVED PLAN

*(Note: Numbering is modified to be independent for each Part)*

### GENERAL FACILITY

Documents 1-25 contained in previous permits.

26. *Davidson County Landfill Partial Closure Construction Quality Assurance Certification Report*, Prepared by: Joyce Engineering, Greensboro, NC. November 2005. (Doc. Id. No. RCO724)
27. *Request for Permit Modification Davidson County MSW Landfill – Phase 1*, Prepared by: Richardson Smith Gardner & Associates, Raleigh, NC. Prepared for: Davidson County Integrated Solid Waste Management Department. March 11, 2008.
28. *Operations Manual*. Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Davidson County. April 2011. Revised July 2011. DIN 14361.

### MUNICIPAL SOLID WASTE LANDFILL

Documents 26-40 contained in previous permits.

- 40 a. *Construction Quality Assurance Report, Davidson County MSW Landfill – Phase 2 Area 1*. Prepared by G. N. Richardson & Associates, Raleigh, NC. Prepared for: Davidson County Integrated Solid Waste Management Department. June 2008. Revised through November 13, 2008.

### CONSTRUCTION AND DEMOLITION LANDFILL

Documents 41-43 contained in previous permits.

44. *Permit to Construct Application, Davidson County C&D Landfill Phase 2, Lexington, North Carolina*, dated April 2005 with revisions dated July 1, 2005, and subsequent supporting hydrogeological information received on August 23, 2005, and August 30, 2005, prepared by G. N. Richardson & Associates on behalf of Davidson County. The application includes 11 plan sheets entitled Construction and Demolition Debris (C&D) Landfill Phase 2 Engineering Drawings bearing a certification date on each page of 4/29/05.
45. *Construction Quality Assurance Report, Davidson County C&D Landfill -Phase 2*, dated February 2006, prepared by G. N. Richardson & Associates.
46. *Permit Amendment Application, Davidson County C&D Landfill, Phases 3 & 4*. Prepared for: Davidson County. April 2009. DIN 12223.
47. *Permit Amendment Application, Davidson County C&D Landfill, Phases 3 & 4*. Prepared for: Davidson County. April 2009. Revised April 2011. DIN 13912.

48. *Landfill Gas Monitoring Plan, Davidson County C&D Landfill*. Prepared for: Davidson County. April 2011. DIN 14308.
49. *Design Hydrogeologic Report, Davidson County C&D Landfill, Phases 1 through 4*. Prepared for: Davidson County. April 2009. Revised April 2011. DIN 14309.

LAND CLEARING AND INERT DEBRIS LANDFILL

*Not Applicable*

MISCELLANEOUS FACILITIES

Household Hazardous Waste Permanent Collection Facility

46. *Application for Permanent HHW Facility*. Submitted by: Davidson County. May 15, 2001. Revised June 22, 2001.

Mobile Home Recycling Documents

47. *Operations Manual, Davidson County C&D Landfill - Mobile Home Deconstruction*. Prepared by: G.N. Richardson & Associates, Raleigh, NC. May 2002.

PART III: PROPERTIES APPROVED FOR THE SOLID WASTE FACILITY

Davidson County, N.C. Register of Deeds				
Book	Page	Acreage	Parcel ID Number	Grantee
N/A	N/A	364.8±	6746-04-84-5291	Davidson County
N/A	N/A	73.2±	6756-03-20-2916	Davidson County
		438.0±	Total Facility Acreage	

Notes:

- Deed book references are from the Davidson County Register of Deeds office GIS website (<http://webgis.co.davidson.nc.us/website/davidsongis/viewer.htm>) accessed July, 2011.

PART IV: GENERAL PERMIT CONDITIONS

- This permit is issued by the North Carolina Department of Environment and Natural Resources, Division of Waste Management, Solid Waste Section (Section). In accordance with North Carolina Solid Waste Management Rule 15A NCAC 13B.0201(d), a solid waste management facility permit shall have two parts: a Permit to Construct and a Permit to Operate. The Permit to Construct must be implemented in accordance with Attachment 2 of this permit. The Permit to Operate must be implemented in accordance with Attachment 3 of this permit.

2. The persons to whom this permit is issued (“permittee”) are the owners and operators of the solid waste management facility.
3. (Intentionally blank)
4. When this property is sold, leased, conveyed, or transferred in any manner, the deed or other instrument of transfer shall contain in the description section in no smaller type than that used in the body of the deed or instrument, a statement that the property has been used as a sanitary landfill and a reference by book and page to the recordation of the permit.
5. By initiating construction or receiving waste at this facility the permittee shall be considered to have accepted the terms and conditions of this permit.
6. Construction and operation of this solid waste management facility must be in accordance with the Solid Waste Management Rules, 15A NCAC 13B, Article 9 of the Chapter 130A of the North Carolina General Statutes (NCGS 130A-290, et seq.), the conditions contained in this permit; and the approved plan. Should the approved plan and the rules conflict, the Solid Waste Management Rules shall take precedence unless specifically addressed by permit condition.
7. This permit is issued based on the documents submitted in support of the application for permitting the facility including those identified in Attachment 1, “List of Documents for Approved Plan,” and which constitute the approved plan for the facility. Where discrepancies exist, the most recent submittals and the Conditions of Permit shall govern.
8. This permit may be transferred only with the approval of the Section, through the issuance of a new or substantially amended permit in accordance with applicable statutes and rules. In accordance with NCGS 130A-295.2(g) the permittee must notify the Section thirty (30) days prior to any significant change in the identity or business structure of either the owner or the operator, including but not limited to a proposed transfer of ownership of the facility or a change in the parent company of the owner or operator of the facility.
9. The permittee is responsible for obtaining all permits and approvals necessary for the development of this project including approval from appropriate agencies for a General or Individual NPDES Stormwater Discharge Permit. Issuance of this permit does not remove the permittee’s responsibilities for compliance with any other local, state or federal rule, regulation or statute.

- End of Section -

## ATTACHMENT 2 CONDITIONS OF PERMIT TO CONSTRUCT

### PART I: GENERAL FACILITY CONDITIONS

1. The issuance date of the Permit to Construct is **July 18, 2011**. The initial, substantial, construction authorized by this Permit to Construct must commence within 18 months from the issuance date of this permit. If substantial construction does not begin within 18 months from the issuance date of this permit, then the permit to construct shall expire. Substantial construction includes, but is not limited to, issuance of construction contracts, mobilization of equipment on site, and construction activities including installation of sedimentation and erosion control structures. The permittee may reapply for the permit to construct prior to the expiration date. The re-application will be subject to the statutes and rules in effect on that date and may be subject to additional fees.
2. Construction of all solid waste management units within this facility must be in accordance with the pertinent approved plans and only for those phases of development approved for construction as described in Attachment I, Part II List of Documents for the Approved Plan.
3. The permittee must conduct a preconstruction meeting prior to initiating construction of any unit/cell and must notify the Section at least 10 days prior to the meeting.
4. Modifications or revisions of the approved documents or changes during construction require approval by the Section, and may constitute a permit modification and be subject to a permitting fee.

### Geologic, Groundwater, Surface water, Landfill Gas, and Monitoring Requirements

5. Samples from new ground water monitoring wells and surface water stations shall be sampled for constituents listed in the approved Monitoring Plan and submitted to the Section prior to receiving the Permit to Operate.
6. Prior to construction of the phase or cell(s) within the phase, all piezometers, borings, probes, landfill gas monitoring wells, and groundwater monitoring wells within the footprint must be properly abandoned in accordance with 15A NCAC 2C.0113(b), entitled "Abandonment of Wells."
7. In areas where soil is to be undercut, abandoned piezometers, monitoring wells and borings must not be grouted to pregrade land surface, but to the proposed base grade surface to prevent having to cut excess grout and possibly damage the wells.
8. A Licensed Geologist must report any pertinent geological feature(s) exposed during phase or cell excavation. Prior to placing any landfill liner, the geologist must submit to the Section hydrogeologist a written report that includes an accurate description of the

exposed geological feature(s), subsurface soil condition, and effect of the geological feature(s) on the design, construction, and operation of the cell, phase, or unit.

9. A Licensed Geologist must supervise installation of groundwater monitoring wells, landfill gas monitoring wells and probes, and surface water sampling stations.
10. Any modification to the approved water quality and landfill gas monitoring, sampling, and analysis plans must be submitted to the Section Hydrogeologist for review.
11. Within 30 days of completed construction of any new groundwater and/or landfill gas monitoring well, a well construction record (GW-1 form), typical well schematic, boring log, field log and notes, and description of well development activities must be submitted to the Section.
12. The permittee must provide a legible plan sheet-sized, scaled topographical map with a legend, showing the location and identification of all new, existing, and abandoned wells, probes, and piezometers after installation of groundwater and landfill gas monitoring wells.
13. Within thirty (30) days of the completed permanent abandonment of a groundwater or landfill gas monitoring well, the well abandonment record (GW-30 form) and any additional information included in the abandonment record) must be submitted to the Section. The well abandonment records must be submitted to the Solid Waste Section in accordance with 15A NCAC 2C.0114(b) and be certified by a Licensed Geologist.

#### Erosion and Sedimentation Control Requirements

14. All required sedimentation and erosion control measures must be installed and operable to mitigate excessive on-site erosion and to prevent silt from leaving the area of the landfill unit during the service life of the facility.
15. All earth disturbing activities must be conducted in accordance with the Sedimentation Pollution Control Act of 1973 (15 NCAC 4) and consistent with any other local, state or federal requirements.
16. Facility construction, operations or practices must not cause or result in a discharge of pollution, dredged material, and/or fill material into waters of the state in violation of the requirements under Sections 401 and 404 of the Clean Water Act, as amended.
17. Modifications to the approved sedimentation and erosion control activities require approval by the North Carolina Land Quality Section. The Section must be notified of any sedimentation and erosion control plan modifications.

#### PART II: MUNICIPAL SOLID WASTE LANDFILL UNIT SPECIFIC CONDITIONS

*Not Applicable*

### PART III: CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS

18. Pursuant to the NC Solid Waste Management Rules (Rule) 15A NCAC 13B.0201(c) and (d)(1), this permit approves construction for Phase 4 consisting of approximately 1.7 acres with a calculated gross capacity of approximately 49,849 cubic yards.
19. Pursuant to the NC Solid Waste Management Rule (Rule) 15A NCAC 13B.542(i)(2) burning of land-clearing debris generated on site as a result of construction activities requires approval by the Section prior to initiating the burn. In addition, the Facility must ensure the activity is in compliance with all air pollution and open burning laws, regulations, and ordinances.
20. The following conditions must be met prior to operation of the Phase 4:
  - a. The Permittee must obtain a Permit to Operate for Phase 4 from the Section in accordance with 15A NCAC 13B.0201(d).
  - b. Construction Quality Assurance (CQA) documentation as well as a certification by the project engineer that the landfill was built in accordance with approved plans and the conditions of the permit must be submitted to the Section for review and approval.
  - c. The Permittee must contact the appropriate regional environmental specialist and permitting engineer to determine whether the Section chooses to hold a pre-operative meeting with key landfill personnel and representatives of the Section.
  - d. The edge of the waste footprint must be identified with permanent physical markers.
  - e. A permit activity fee (Modification) must be paid prior to receiving the Permit to Operate for Phase 4.
  - f. The revised Financial Assurance instrument for approved Closure and Post-closure Care costs must be submitted to the Section.

### PART IV: LAND CLEARING AND INERT DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS

*Not Applicable*

### PART V: MISCELLANEOUS SOLID WASTE MANAGEMENT SPECIFIC CONDITIONS

*Not Applicable*

- End of Section -

**ATTACHMENT 3**  
**CONDITIONS OF PERMIT TO OPERATE**

**PART I: GENERAL FACILITY CONDITIONS**

1. The Permit to Operate shall expire **July 18, 2016**. Pursuant to 15A NCAC 13B.0201(g), no later than **February 18, 2016**, the owner or operator must submit a request to the Section for permit review prepared in accordance with Section .1603(a)(2) or (3) as applicable, and must update pertinent facility plans including, but not limited to, the facility operation and waste screening plans.
2. All sedimentation and erosion control activities must be conducted in accordance with the Sedimentation Control Act N.C.G.S. 113A-50, et seq., and rules promulgated under 15A NCAC 4.
3. The edge of the waste footprint for all disposal units must be identified with permanent physical markers.
4. Financial assurance as required by state rules and statutes must be continuously maintained for the duration of the facility in accordance with applicable rules and statutes. Closure and Post-Closure cost estimates and financial instruments must be updated annually.
5. Closure or partial closure of any unit must be in accordance with the Closure Plans described in the approved plans and applicable rules and statutes. Revised Closure Plans must be submitted to the Division at least 90 days prior to implementation.

**Operational Requirements**

6. This facility is permitted to receive non-hazardous solid waste generated within Davidson County, consistent with the local government waste management plan and with local government approval and as defined in G.S. 130-290 (a)(18a) and (35), except where prohibited by the N. C. General Statutes Article 9 of Chapter 130A, and the rules adopted by the Commission for Health Services.
7. The facility operator must complete an approved operator training course in compliance with G.S. 130A-309.25.
  - a. A responsible individual certified in landfill operations must be on-site during all operating hours of the facility at all times while open for public use to ensure compliance with operational requirements.

- b. All pertinent landfill-operating personnel must receive training and supervision necessary to properly operate the landfill units in accordance with G.S. 130A-309.25 and addressed by memorandum dated November 29, 2000.
8. The use of different alternative daily cover requires approval, prior to implementation, by the Solid Waste Section. Requests for alternative daily cover approval must include a plan detailing the comprehensive use and a demonstration of the effectiveness of the alternative daily cover. The plan must be developed according to Section guidelines. Plans which are approved by the Section will be incorporated into, and made a part of, the approved documents listed in Attachment 1.
  - a. The use of a fabric reinforced tarp as an alternate daily cover is approved and subject to the terms and conditions of operation as set forth in the plan.
9. The facility must maintain records for all solid waste materials accepted as alternative cover material and used as alternate daily cover. The records must include: the date of receipt, weight of material, general description of the material, identity of the generator and transporter, and county of origin. Such records must be made available to the Solid Waste Section upon request.

#### Monitoring and Reporting Requirements

10. Groundwater, surface water, and landfill gas monitoring locations must be established and monitored as identified in the approved plans.
11. A licensed geologist must be present to supervise the installation of groundwater monitoring wells. The exact locations, screened intervals, and nesting of the wells must be established after consultation with the SWS Hydrogeologist at the time of well installation.
12. Ground water monitoring wells and surface water sampling locations must be sampled for Appendix I constituents at least semi-annually according to the specifications outlined in the approved water quality monitoring plan and the current policies and guidelines of the Section in effect at the time of sampling.
13. Landfill gas monitoring wells must be sampled for explosive gases at least quarterly and according to specifications outlined in 15A NCAC 13B.544(d), entitled "Gas Control Plan", and current policies and guidelines of the Section in effect at the time of sampling.
14. Reports of the analytical data for each monitoring event must be submitted to the Section within 120 days of the respective sampling event. Analytical data must be submitted in a manner prescribed by the Section. Records of all groundwater, surface water, and leachate analytical data must be kept as part of the permanent facility record.

15. Untreated leachate must be sampled and analyzed at least semi-annually concurrently with the groundwater water and surface water sampling, one sample per event. The leachate must be analyzed for all Appendix I constituents, pH, specific conductance, BOD, COD, nitrates, sulfates, and phosphates. Test results must be submitted to the Section along with groundwater and surface water test results. In the event leachate is recirculated, additional leachate sampling may be required.
16. A readily accessible unobstructed path must be cleared and maintained so that four-wheel vehicles may access monitoring well locations at all times.
17. A field log book which details all development, sampling, repair, and all other pertinent activities associated with each monitoring well and all sampling activities associated with each surface water and leachate sampling location must be kept as part of the permanent facility record.
18. All well construction records and soil boring logs for new wells must be submitted to the Solid Waste Section Hydrogeologist for review within 30 days of completion.
19. Copies of this permit, the approved plans, and all records required to be maintained by the permittee must be maintained at the facility and made available to the Section upon request during normal business hours.
20. The owner or operator must maintain a record of the amount of solid waste received at the landfill unit, compiled on a monthly basis. Scales must be used to weigh the amount of waste received.
21. On or before August 1 annually, the Permittee must submit an annual facility report to the Solid Waste Section, on forms prescribed by the Section.
  - a. The reporting period shall be for the previous year beginning July 1 and ending June 30.
  - b. The annual facility report must list the amount of waste received and landfilled in tons and be compiled:
    - i) On a monthly basis.
    - ii) By county, city or transfer station of origin.
    - iii) By specific waste type.
    - iv) By disposal location within the facility.
    - v) By diversion to alternative management facilities.
  - c. A measurement of volume utilized in the landfill cells must be performed during the second quarter of the calendar year. The date and volumes, in cubic yards, must be included in the report.

- d. The amount of waste, in tons from scale records, disposed in landfill cells from October 8, 1993 through the date of the annual volume survey must be included in the report.
- e. The completed report must be forwarded to the Regional Waste Management Specialist for the facility by the date due on the prescribed annual facility report form.
- f. A copy of the completed report must be forwarded to each county manager for each county from which waste was received at the facility. Documentation that a copy of the report has been forwarded to the county managers must be sent to the Regional Waste Management Specialist by the date due on the prescribed annual facility report form

**PART II: MUNICIPAL SOLID WASTE LANDFILL UNIT SPECIFIC CONDITIONS**

- 22. This permit approves the continued operation of Phase 2, Area 1 of the municipal solid waste landfill, as well as the onsite environmental management and protection facilities as described in the approved plans.
- 23. This permit is for operational approval of a five year permitted disposal capacity of 903,896 cubic yards. This capacity is based on an average annual disposal rate of approximately 133,000 tons (approximately 475 tons per day based on 280 operating days per year) as set forth in Attachment 1, Part II: “List of Documents for the Approved Plan”. The maximum variance should be in accordance with GS 130A-294(b1)(1) and consistent with local government approval.
- 24. The following table lists the dimensions and details for the MSW landfill units. Gross capacity is defined as the volume of the landfill calculated from the elevation of the initial waste placement through the top of the final cover, including any periodic cover.

MSW Unit	Acres	Gross capacity (cubic yards)	Status
Phase 1, Areas 1 - 3	31.9	2,291,403	Complete
Phase 2, Area 1	14.7	903,896	Operational
Phase 2, Area 2	12.8	575,940	Future
Phase 2, Area 3	17.1	1,526,949	Future
Phase 2, Areas 4 - 5 (Option A)	19.0	2,309,242	Future
Phase 2, Areas 4 - 6 (Option B)	28.7	3,453,458	Future
Total (Option A)	63.6	7,869,804	
Total (Option B)	73.3	9,014,020	

25. The following, at a minimum, must not be accepted for disposal at the facility: hazardous waste, yard trash, liquid wastes, regulated medical waste, sharps not properly packaged, PCB waste as defined in 40 CFR 761, and wastes banned from disposal in North Carolina by G.S. 130A-309.10(f).
26. The permittee must not knowingly dispose of any type or form of municipal solid waste that is generated within the boundaries of a unit of local government that by ordinance:
  - a. Prohibits generators or collectors of municipal solid waste from disposing of that type or form of municipal solid waste.
  - b. Requires generators or collectors of municipal solid waste to recycle that type or form of municipal solid waste.
27. The use of leachate recirculation as a leachate management tool requires approval by the Section prior to implementation. Requests for leachate recirculation approval must include a comprehensive management plan developed according to Section guidelines and which is consistent with the approved operation plan. Plans which are approved by the Section will be incorporated into, and made a part of, the approved documents listed in Attachment 1.
28. Prior to disposal in a new cell previously separated from the active disposal cell by rainwater and leachate separation devices involving rainwater flaps welded to the liner and/or disconnected leachate lines, a construction certification shall be placed in the facility operating record. The certification must describe the proper removal of temporary rainwater devices and reconnection of leachate collection lines in accordance with Attachment 1, Part II. The document must also contain a statement of certification by the facility's trained landfill operator, N. C. registered professional engineer, or other person approved by the Section, that the construction was properly completed according to the approved plans.
29. The proper removal of geotextile covering the gravel column, occurring with the progression of fill, shall be documented by the facility's trained landfill operator, or other person approved by the Section, in accordance with Attachment 1, Part II, of this permit, and the documentation shall be placed in the facility's operating record.
30. The facility is permitted to co-dispose of wastewater treatment sludge generated within the facility's approved service area, and subject to the terms and procedures of the approved plan.
31. The leachate collection system must be maintained in accordance with 15A NCAC 13B.1626(12)(a). The plan shall include provisions for periodic cleaning and visual inspection. Documentation of the inspections, and cleaning and monitoring must be

included in the operating records of the facility and provided to the Department upon request.

32. Closure or partial closure of any MSWLF unit must be in accordance with the Closure Plans described in the approved plans and 15A NCAC 13B.1629. Final Closure Plans must be submitted to the Division at least 90 days prior to implementation.

**PART III: CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS**

33. This permit approves the continued operation of Phases 1, 2 and 3 as well as the onsite environmental management and protection facilities as described in the approved plans.
34. This permit is for operational approval of a five year permitted disposal capacity of 101,840 cubic yards. This capacity is based on an average annual disposal rate of approximately 10,000 cubic yards (approximately 45 tons per day based on 280 operating days per year) as set forth in Attachment 1, Part II: "List of Documents for the Approved Plan". The maximum variance should be in accordance with GS 130A-294(b1)(1) and consistent with local government approval.
35. The following table lists the details for the landfill units. Gross capacity is defined as the volume of the landfill calculated from the elevation of the initial waste placement through the top of the final cover, including any periodic cover.

C&D Unit	Acres*	Gross capacity (cubic yards)	Status
Phases 1 & 2	Ph 1 = 2.6 Ph 2 = 3.3	217,563	Operational
Phase 3	N/A	41,340	Operational
Phase 4	1.7	49,849	Not Constructed
Total	7.6	308,752	

36. The following, at a minimum, must not be accepted for disposal at the facility: hazardous waste, yard trash, liquid wastes, regulated medical waste, sharps not properly packaged, PCB waste as defined in 40 CFR 761, and wastes banned from disposal in North Carolina by G.S. 130A-309.10(f).
37. The permittee must not knowingly dispose of any type or form of municipal solid waste that is generated within the boundaries of a unit of local government that by ordinance:
  - a. Prohibits generators or collectors of municipal solid waste from disposing of that type or form of municipal solid waste.

- b. Requires generators or collectors of municipal solid waste to recycle that type or form of municipal solid waste.
38. Closure or partial closure of any landfill unit must be in accordance with the Closure Plans described in the approved plans. Final Closure Plans must be submitted to the Division at least 90 days prior to implementation.

#### PART IV: LAND CLEARING AND INERT DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS

*Not Applicable*

#### PART V: MISCELLANEOUS SOLID WASTE MANAGEMENT SPECIFIC CONDITIONS

##### General Conditions

- 39. Wastes received and product stored shall be maintained in reasonably sized piles with adequate fire breaks and lanes in accordance with the approved operational plans and the pertinent rules.
- 40. Surface water shall be diverted from all operational and storage areas to prevent standing water in operational areas and under or around storage piles. Water that comes in contact with solid waste shall be contained on-site or properly treated prior to discharge.
- 41. These areas shall be operated and maintained with sufficient dust control measures to minimize airborne emissions and to prevent dust from becoming a nuisance or safety hazard.
- 42. These areas shall be operated and maintained in a manner so as to minimize odors, prevent the creation of a nuisance, potential health hazard, or a potential fire hazard.
- 43. Effective vector control measures shall be applied as necessary to control flies, rodents, insects, or vermin.

##### Operational Conditions – White Goods

- 44. The facility is permitted to receive white goods as defined in North Carolina General Statute Article 9, Chapter 130A-290(44).
- 45. The facility must manage white goods according to the Operation Plan included in Attachment 1, Part II "List of Documents for the Approved Plan". This document is included in the approved plan. Any revisions to the approved plan shall be approved by the North Carolina Division of Waste Management (DWM), Solid Waste Section, prior to implementation.

46. White goods collection areas shall provide for the proper removal of chlorofluorocarbon refrigerants.

Operational Conditions – Scrap Tires

47. The facility is permitted to receive tires and scrap tires as defined in North Carolina General Statute Article 9, Chapter 130A-309.53(6) & (7).
48. Scrap tire collection areas shall be operated in accordance with the requirements of 15A NCAC 13B.1107.
49. The facility must manage tires according to the Operation Plan included in Attachment 1, Part II, "List of Documents for the Approved Plan". This document is included in the approved plan. Any revisions to the approved plan shall be approved by the North Carolina Division of Waste Management (DWM), Solid Waste Section, prior to implementation.

Operational Conditions – Household Hazardous Waste (HHW)

50. This permit is for operation of a Permanent Household Hazardous Waste Collection Facility.
51. This permanent household hazardous waste collection facility is permitted to receive household hazardous waste (HHW) generated by homeowners and conditionally exempt small quantity generators of Davidson County. Unacceptable HHW that shall not be collected at this facility includes radioactive waste, explosives, and infectious waste.
52. This facility shall conform to all operating procedures in the approved plan, 15A NCAC 13B.0400, and the current Section policies and guidelines for HHW Collection Facilities.
53. Household Hazardous Waste Identification Number NCPH02901011 shall be used to ship wastes off site for recycling, treatment or disposal.
54. The permittee shall maintain records for the amount of HHW received at the facility and the amounts shipped off-site for recycling, treatment, and disposal. Records must be compiled on a monthly basis and maintained at the facility for inspection upon request by Solid Waste Section personnel.
55. On or before August 1 of each year, the permittee shall report to the Solid Waste Section, the amount of HHW waste (in pounds) received at this facility and the amounts shipped off-site for recycling, reuse, and/or disposal. The reporting period shall be for the previous year, beginning July 1 and ending June 30.
56. A copy of this permit and the approved plan shall be maintained at the facility. Copies of this permit shall be forwarded to the local fire department, local hospitals, and other appropriate emergency agencies.

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RECEIVED JUN 29 2011

North Carolina Department of Environment and Natural Resources

**Division of Land Resources**

**Land Quality Section**

James D. Simons, PG, PE  
Director and State Geologist

Beverly Eaves Perdue, Governor  
Dee Freeman, Secretary

June 28, 2011

**LETTER OF APPROVAL**

Attn: Charles Brushwood  
Davidson County  
913 Greensboro Street  
Lexington, NC 27293

RE: Project Name: DAVIDSON COUNTY LANDFILL C&D PHASE 2  
Project ID: DAVID-2005-040 Acres Approved: 6.20  
County: Davidson, OLD 29, THOMASVILLE  
River Basin: Yadkin-PeeDee Stream Classification: Other  
Submitted By: Richardson, Smith, Gardner & Associates  
Date Received by LQS: June 20, 2011  
Plan Type: Revised

Dear Sir or Madam:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable and hereby issue this Letter of Approval. The enclosed Certificate of Approval must be posted at the job site. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0129.

Title 15A NCAC 4B .0118(a) requires that a copy of the approved erosion control plan be on file at the job site. Also, this letter gives the notice required by G.S. 113A-61.1(a) of our right of periodic inspection to insure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Act is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State

Letter of Approval  
Project :- DAVIDSON COUNTY LANDFILL C&D PHASE 2  
June 28, 2011

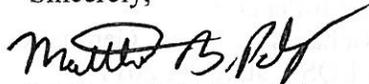
water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCG010000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you provided. You are requested to file an amended form if there is any change in the information included on the form. In addition, it would be helpful if you notify this office of the proposed starting date for this project. Please notify us if you plan to have a preconstruction conference.

Your cooperation is appreciated.

Sincerely,



Matthew B. Poling, PE  
Assistant Regional Engineer  
Land Quality Section

Enclosures: Certificate of Approval  
NPDES Permit

cc: Attn: Pieter K. Scheer, PE  
Richardson, Smith, Gardner & Associates  
14 North Boylan Avenue  
Raleigh, NC 27603

WSRO FILE  
DWQ

# CERTIFICATE OF PLAN APPROVAL



The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environment and Natural Resources in accordance with North Carolina General Statute 113A - 57 (4) and 113A - 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b).

**Davidson County Landfill C&D Phase #2**

Project Name and Location

**DAVID-2005-010**



**Matthew B. Rhy**  
Asst. Regional Engineer

**6/20/2011**

Date of Plan Approval

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## **Appendix B**

### **Photographic Log**

**Construction Quality Assurance Report  
Davidson County C&D Landfill - Phase 4  
Davidson County, North Carolina**

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<b>Client Name:</b> Davidson County, North Carolina	<b>Site Location:</b> Lexington, North Carolina	<b>Project No.</b> DAVDCO-10-2
--	--	-----------------------------------

<b>Photo No.</b> <b>1</b>	<b>Date:</b> 7/5/12
------------------------------	------------------------

**Direction Photo Taken:**  
  
Southeast

**Description:**  
  
Phase 4 subgrade  
(viewed from south end  
of Phase 1)



<b>Photo No.</b> <b>2</b>	<b>Date:</b> 7/5/12
------------------------------	------------------------

**Direction Photo Taken:**  
  
Southwest

**Description:**  
  
Phase 4 subgrade



<b>Client Name:</b> Davidson County, North Carolina		<b>Site Location:</b> Lexington, North Carolina	<b>Project No.</b> DAVDCO-10-2
<b>Photo No.</b> <b>3</b>	<b>Date:</b> 7/5/12		
<b>Direction Photo Taken:</b> South			
<b>Description:</b> Culvert at low end of Phase 4			

<b>Photo No.</b> <b>4</b>	<b>Date:</b> 7/5/12		
<b>Direction Photo Taken:</b> Southwest			
<b>Description:</b> Excavation to subgrade contours at south end of Phase 4			

**Client Name:**  
Davidson County, North Carolina

**Site Location:**  
Lexington, North Carolina

**Project No.**  
DAVDCO-10-2

**Photo No.**  
**5**

**Date:**  
8/23/12

**Direction Photo Taken:**

Northwest

**Description:**

Phase 4 subgrade



**Photo No.**  
**6**

**Date:**  
8/23/12

**Direction Photo Taken:**

North

**Description:**

Phase 4 subgrade



<b>Client Name:</b> Davidson County, North Carolina		<b>Site Location:</b> Lexington, North Carolina	<b>Project No.</b> DAVDCO-10-2
<b>Photo No.</b> <b>7</b>	<b>Date:</b> 8/23/12		
<b>Direction Photo Taken:</b> Northeast			
<b>Description:</b> Upper portion of Phase 4 subgrade			

<b>Photo No.</b> <b>8</b>	<b>Date:</b> 8/23/12		
<b>Direction Photo Taken:</b> Northeast			
<b>Description:</b> Low end of Phase 4 subgrade			

<b>Client Name:</b> Davidson County, North Carolina		<b>Site Location:</b> Lexington, North Carolina	<b>Project No.</b> DAVDCO-10-2
<b>Photo No.</b> <b>9</b>	<b>Date:</b> 9/25/12		
<b>Direction Photo Taken:</b> Northeast			
<b>Description:</b> Sediment Basin No. 2			

<b>Photo No.</b> <b>10</b>	<b>Date:</b> 9/25/12		
<b>Direction Photo Taken:</b> North			
<b>Description:</b> Construction of perimeter berm at north end of Phase 4			

<b>Client Name:</b> Davidson County, North Carolina	<b>Site Location:</b> Lexington, North Carolina	<b>Project No.</b> DAVDCO-10-2
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<b>Photo No.</b> <b>11</b>	<b>Date:</b> 1/15/13
-------------------------------	-------------------------

<b>Direction Photo Taken:</b>  North
--

<b>Description:</b>  Completed Phase 4
--



<b>Photo No.</b> <b>12</b>	<b>Date:</b> 1/15/13
-------------------------------	-------------------------

<b>Direction Photo Taken:</b>  Northwest
--

<b>Description:</b>  Completed Phase 4
--



## **Appendix C**

### **CQA Meeting Minutes**

**Construction Quality Assurance Report  
Davidson County C&D Landfill - Phase 4  
Davidson County, North Carolina**

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## MEMORANDUM

Date: May 10, 2012  
 To: Distribution and Meeting Attendees  
 From: Pieter K. Scheer, P.E.  
**RE: Davidson County C&D Landfill – Phase 4  
 Pre-Construction & Subgrade CQA Meeting**

**Attendees:**

Pieter Scheer	RSG	(919) 828-0577 (o) (919) 815-9377 (c)	<a href="mailto:pieter@rsgengineers.com">pieter@rsgengineers.com</a>
Charlie Brushwood	Davidson County	(336) 242-2284 (o) (336) 240-0303 (c)	<a href="mailto:Charlie.Brushwood@DavidsonCountyNC.gov">Charlie.Brushwood@DavidsonCountyNC.gov</a>
Michael Green	Michael Green Assocs.	(336) 248-8102	<a href="mailto:mgas@lexcominc.net">mgas@lexcominc.net</a>
John Murray	NC DENR	(704) 235-2163	<a href="mailto:john.murray@ncdenr.gov">john.murray@ncdenr.gov</a>
Hugh Jernigan	NC DENR	(336) 771-5093	<a href="mailto:hugh.jernigan@ncdenr.gov">hugh.jernigan@ncdenr.gov</a>

**Meeting Summary:**

A pre-construction meeting was held Thursday May 3<sup>rd</sup> at the site to discuss the plans for the construction of Phase 4. The meeting began at 11:15 p.m. and lasted approximately 1 hour. During the meeting, the following items were discussed:

**A. County Work Sequencing**

- E&SC Measures are In-Place
- Staking – Michael Green Associates
- Earthwork Schedule: County to begin soon and plans to perform some excavation work initially before placing structural fill. The County will coordinate with RSG for testing of structural fill.
- Earthwork Quantities – See attached isopach drawing showing cuts in red and fills in green.

**B. Designation of Responsible Personnel**

- Davidson County (Owner and Builder)

Charlie Brushwood, Solid Waste Director  
 Steven Sink, Landfill Supervisor

- RSG (Design and CQA Engineer)  
Pieter Scheer, Project Manager  
Soil Technician - Geotechnics
- NC DENR - Division of Waste Management (DWM)  
John Murray, DWM Permitting Engineer  
Hugh Jernigan, DWM Waste Management Specialist

**C. Record Documents and Certification Report**

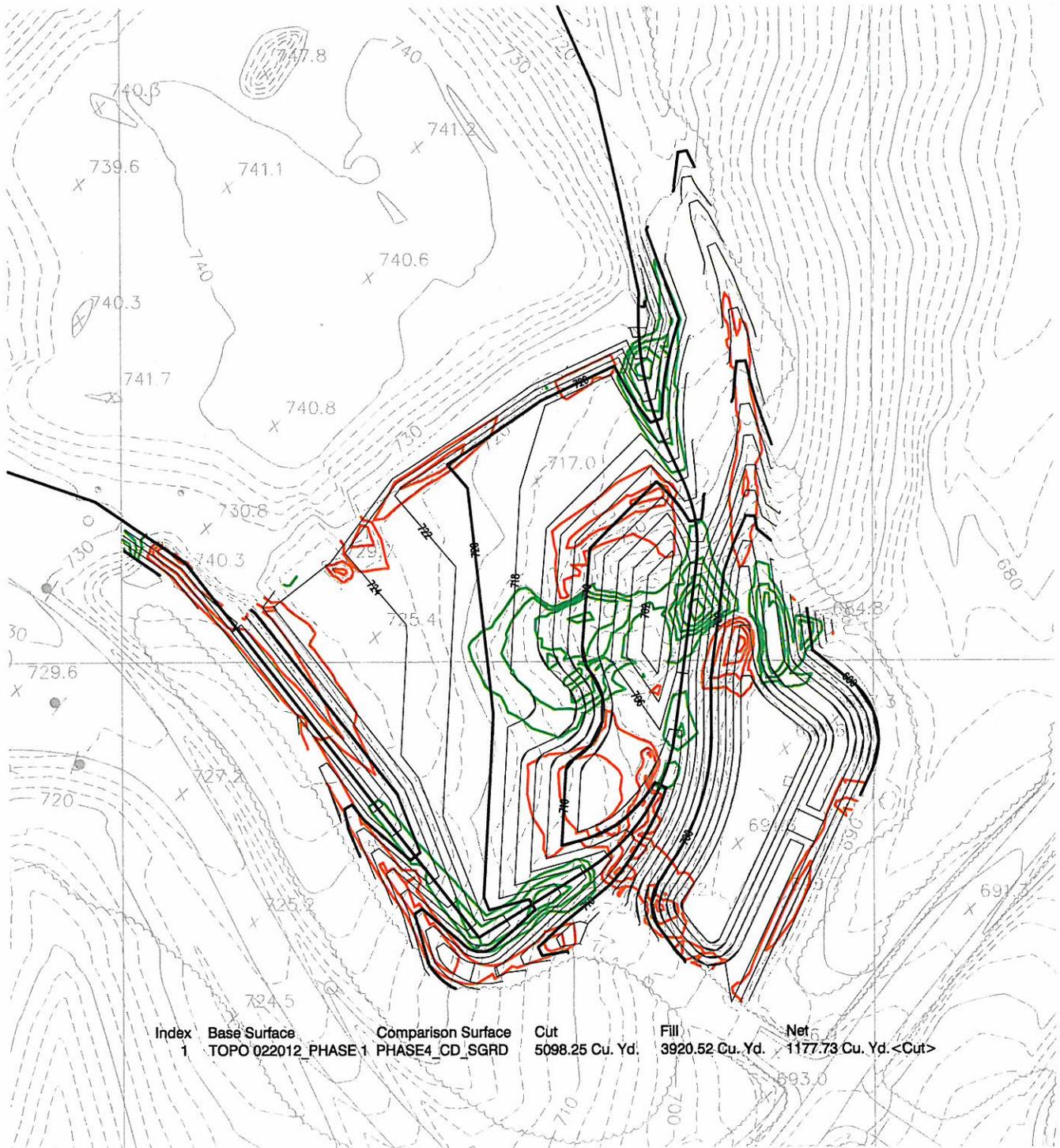
- RSG and Geotechnics will perform and document all quality assurance testing.
- RSG will prepare the certification report which will include test information.
- Michael Green will perform as-built survey.

**D. Construction Quality Assurance**

- Earthwork testing and subgrade verification will follow the attached specification and CQA requirements.

Attachment: Isopach Drawing Showing Phase 4 Earthwork  
Earthwork Specification & CQA Requirements

cc: Charlie Brushwood, Davidson County  
Steven Sink, Davidson County  
Michael Green, Michael Green Associates  
John Murray, P.E., NC DENR-DWM  
Hugh Jernigan, NC DENR-DWM



## **CQA MEETING**

### **EARTHWORK – SPECIFICATION & CQA REQUIREMENTS**

#### **1. Review of Specification Requirements**

Earthwork (Perimeter Berm and Subgrade):

- Compaction Requirements:  $\geq 95\%$  Std. Proctor; moisture content as required to obtain compaction
- Surveying: Verify elevation and slope of completed subgrade
- Upper 2 Feet of Subgrade Must be SC, SM, ML, CL, MH, or CH

#### **2. Review of CQA Requirements**

A. Control Tests on Subgrade Material (Samples to be Taken on Initial Visit)

- Moisture-Density Testing: 1 per 5,000 CY (2 Tests)

B. Approval of Subgrade

- Visual Inspection (by P.G. (Joan)) and review of survey information)

C. CQA Testing

- Moisture-Density Testing Per CQA Frequency
- Verification of Subgrade Soil Type (Atterberg Limits & Grain Size Analysis on Upper 2 feet)

## **Appendix D**

### **Piezometer/Well Abandonment Documentation**

**Construction Quality Assurance Report  
Davidson County C&D Landfill - Phase 4  
Davidson County, North Carolina**

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# MEMORANDUM

<b>Date:</b>	January 14, 2013
<b>To:</b>	File
<b>From:</b>	Joan Smyth, P.G. Smith Gardner, Inc.
<b>RE:</b>	<b>Well Abandonment at Davidson County C&amp;D Landfill</b>

On September 7, 2011 one piezometer (B-8) and one monitoring well (MW-4A) were abandoned at the Davidson County C&D landfill in accordance with 15A NCAC 13B.0113. In each case, the protective steel casing and the uppermost six feet of PVC casing were removed. The remainder of each well was grouted from bottom to top using a tremie pipe. The well abandonment records for these locations are **attached**. These were the only two wells located within the Phase 3 and 4 footprint of the C&D landfill.

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# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2089

### 1. WELL CONTRACTOR:

David C Barron  
 Well Contractor (Individual) Name  
R.D.L. Drilling  
 Well Contractor Company Name  
P.O. Box 121  
 STREET ADDRESS  
Tobaccoville N.C. 27050  
 City or Town State Zip Code  
336-577-9970  
 Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) B-8  
 STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
 COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
 DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
 WELL USE (Check applicable use):  Monitoring  Residential  
 Municipal/Public  Industrial/Commercial  Agricultural  
 Recovery  Injection  Irrigation  
 Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY Davidson QUADRANGLE NAME \_\_\_\_\_  
 NEAREST TOWN: Lexington N.C.  
220 Landfill Rd. 27292  
 (Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
 TOPOGRAPHIC / LAND SETTING:  
 Slope  Valley  Flat  Ridge  Other  
 (Check appropriate setting)

LATITUDE 35 50.455  
 LONGITUDE 80 10.464  
 May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source:  GPS  Topographic map  
 (Location of well must be shown on a USGS topo map and attached to this form if not using GPS.)

### 4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID #(if applicable) \_\_\_\_\_  
 NAME OF FACILITY Davidson Co. C&D Landfill  
 STREET ADDRESS 220 Landfill Rd.  
Lexington N.C. 27292  
 City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME Charlie Brushwood  
 STREET ADDRESS 1242 Old Hwy 29  
27360 Thomasville N.C.

### 5. WELL DETAILS:

a. Total Depth: 51 ft. Diameter: 2" in.  
 b. Water Level (Below Measuring Point): 30.85 ft.  
 Measuring point is 3' ft. above land surface.

### 6. CASING:

Length Diameter  
 a. Casing Depth (if known): 41' ft. 2" in.  
 b. Casing Removed: 6' ft. 2" in.

### 7. DISINFECTION:

1 TSP  
 (Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

**Neat Cement** **Sand Cement**  
 Cement 232 lb. Cement \_\_\_\_\_ lb.  
 Water 15 gal. Water \_\_\_\_\_ gal.

**Bentonite**  
 Bentonite 9 lb.  
 Type:  Slurry  Pellets  
 Water 5 gal.

**Other**  
 Type material \_\_\_\_\_  
 Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Pump Cement from Bottom of well to Top. Removed casing and 6' of 2" casing

### 10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 9-7-11

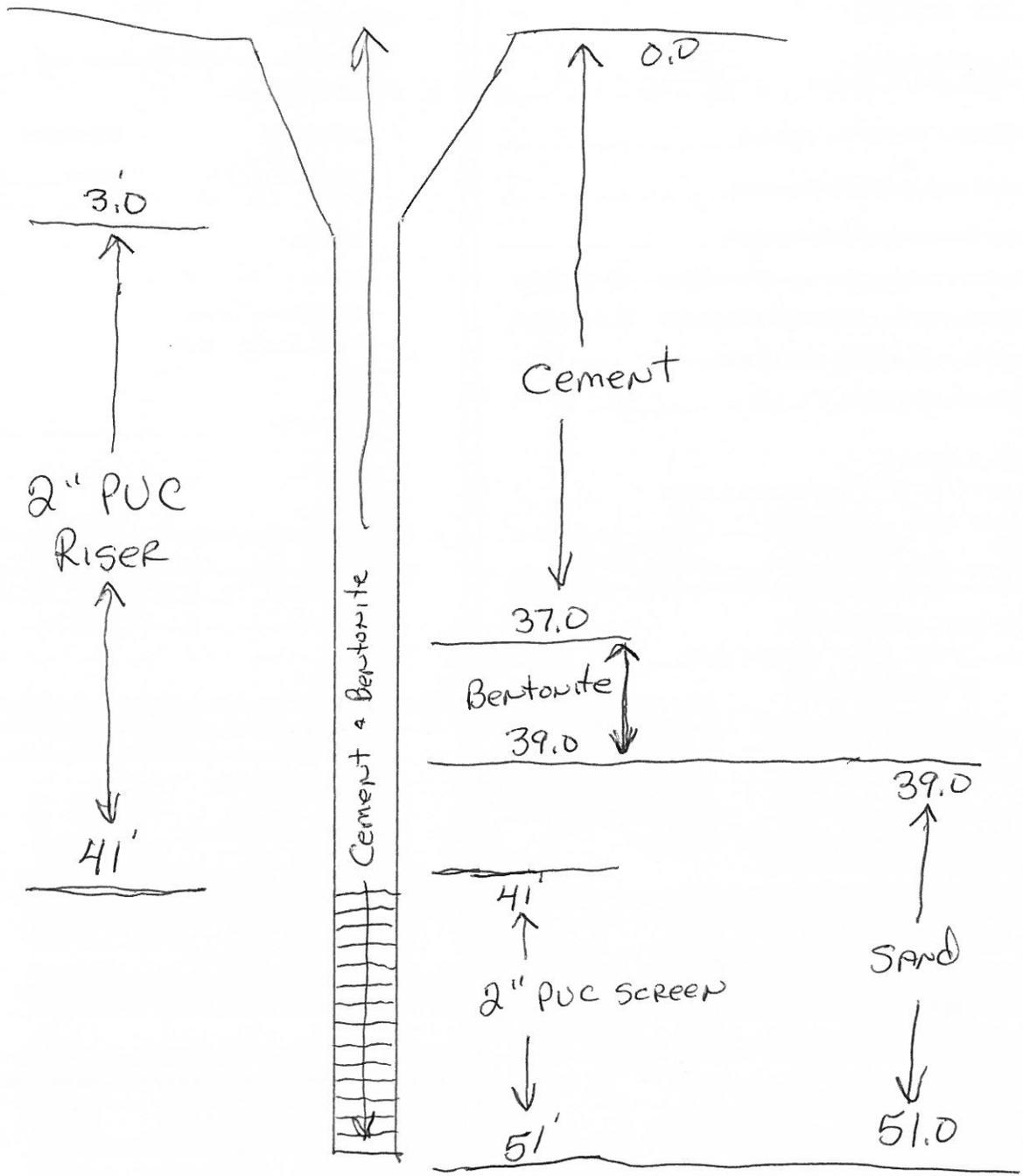
I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

David Barron 9-7-11  
 SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE  
 (The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

David Barron  
 PRINTED NAME OF PERSON ABANDONING THE WELL

B-8





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2089

### 1. WELL CONTRACTOR:

DAVID C BARRON  
 Well Contractor (Individual) Name  
R.D.L. DRILLING  
 Well Contractor Company Name  
P.O. Box 121  
 Street Address  
Tobaccoville N.C. 27050  
 City or Town State Zip Code  
336 577-9970  
 Area code Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) MW4A  
 STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
 COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
 DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
 WELL USE (Check applicable use)  Monitoring  Residential  
 Municipal/Public  Industrial/Commercial  Agricultural  
 Recovery  Injection  Irrigation  
 Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY DAVIDSON QUADRANGLE NAME \_\_\_\_\_  
 NEAREST TOWN: Lexington N.C.  
220 Landfill Rd. 27292  
 (Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope  Valley  Flat  Ridge  Other \_\_\_\_\_  
 (Check appropriate setting)

LATITUDE 35.50.456 ° DMS OR ~~35.50.456~~

LONGITUDE 80.10.491 ° DMS OR ~~80.10.491~~

Latitude/longitude source:  GPS  Topographic map  
 (location of well must be shown on a USGS topo map and attached to this form if not using GPS)

### 4a. FACILITY - The name of the business where the well is located. Complete 4a: (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
 NAME OF FACILITY DAVIDSON Co. C+D Landfill  
 STREET ADDRESS 220 Landfill Rd.  
Lexington N.C. 27292  
 City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME Charlie Brushwood  
 STREET ADDRESS 1242 Old Hwy 29, Thomasville  
27360

### 5. WELL DETAILS:

a. Total Depth 60' ft. Diameter: 2" in.  
 b. Water Level (Below Measuring Point): 45.7 ft.  
 Measuring point is 3' ft. above land surface.

### 6. CASING:

	Length	Diameter
a. Casing Depth (if known):	<u>45'</u> ft.	<u>2"</u> in.
b. Casing Removed:	<u>6'</u> ft.	<u>2"</u> in.

### 7. DISINFECTION: 1 TSP

(Amount of 65% 75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

Neat Cement	Sand Cement
Cement <u>252</u> lb.	Cement _____ lb.
Water <u>15</u> gal.	Water _____ gal.

### Bentonite

Bentonite 9 lb.  
 Type:  Slurry  Pellets  
 Water 5 gal.

### Other

Type material \_\_\_\_\_  
 Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Pump Cement from Bottom of well to Top. Removed casing and 6' of 2" casing

### 10. WELL DIAGRAM : Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used

### 11. DATE WELL ABANDONED 9-7-11

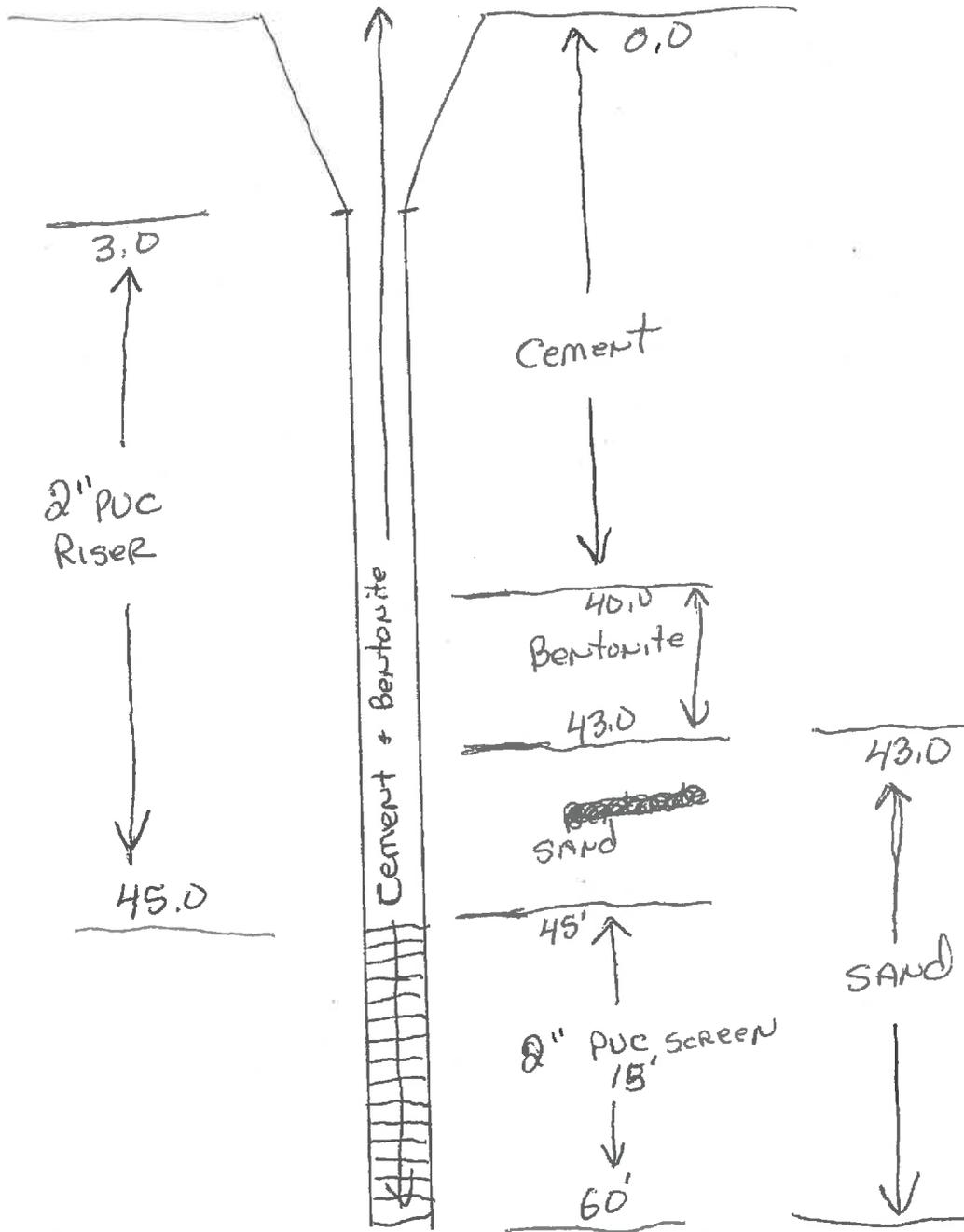
I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

David C Barron 9-7-11  
 SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE  
 (The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

DAVID C BARRON  
 PRINTED NAME OF PERSON ABANDONING THE WELL

MW # 4A



## **Appendix E**

### **Earthwork CQA Data**

**Construction Quality Assurance Report  
Davidson County C&D Landfill - Phase 4  
Davidson County, North Carolina**

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## STRUCTURAL FILL CONTROL TEST SUMMARY

**Project Name:** Davidson County C&DLF - Phase 4  
**Project Number:** DAVDCO-10-2  
**Contractor:** Davidson County

### Grain Size Analysis (ASTM D 422) Test Results:

Test Number	+3" (%)	Pass #4 (%)	Pass #200 (%)	Gravel (%)	Sand (%)	Silt/Clay (%)	USGS Classification
01-01	100.0	89.8	38.3	10.2	51.5	38.3	SC
04-01	100.0	88.7	46.7	11.3	42.0	46.7	SM
04-02	100.0	77.6	41.0	22.4	36.6	41.0	SM

### Atterberg Limits (ASTM D 4318) Test Results:

Test Number	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USGS Classification
01-01	35	22	13	SC
04-01	33	25	8	SM
04-02	31	24	7	SM

### Moisture-Density Relationship (ASTM D 698) Test Results:

Test Number	Optimum Water Content (%)	Maximum Dry Density (pcf)
01-01	13.5	118.7
04-01	14.4	115.0
04-02	12.3	124.5

### Number of Tests Performed:

Grain Size Analysis: 3  
 Atterberg Limits: 3  
 Moisture Density Relationship: 3

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June 21, 2012

Project No. 2012-686-01

Mr. Pieter Scheer, P.E.  
Richardson Smith Gardner & Associates  
14 N. Boylan Ave.  
Raleigh, NC 27603

Transmittal  
Laboratory Test Results  
Davidson County Landfill C & D

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was faxed to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens which were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,  
**Geotechnics, Inc.**

  
Michael P. Smith  
Regional Manager

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***

## MOISTURE CONTENT

ASTM D 2216-10 (SOP-S1)

Client R.S.G. & ASSOCIATES  
Client Reference DAVIDSON CO. LF C & D  
Project No. 2012-686-01

Lab ID .001  
Boring No. NA  
Depth (ft) NA  
Sample No. 1

Tare Number 200  
Wt. of Tare & WS (gm) 791.11  
Wt. of Tare & DS (gm) 721.84  
Wt. of Tare (gm) 171.61  
Wt. of Water (gm) 69.27  
Wt. of DS (gm) 550.23

**Water Content (%) 12.6**

Notes : NA

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Tested By JBD Date 6/19/2012 Checked By GEM Date 6-21-12  
page 1 of 1 DCN: CT-S1 DATE 6-30-98 REVISION: 2 Z:\Data Sheets\WATCONT W Header.XLS\Sheet1

### ATTERBERG LIMITS

ASTM D 4318-10 / AASHTO T89-10 (SOP - S4A)

Client	R.S.G. & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-01	Sample No.	1
Lab ID	2012-686-01-01	Soil Description	<b>BROWN LEAN CLAY</b> (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.*

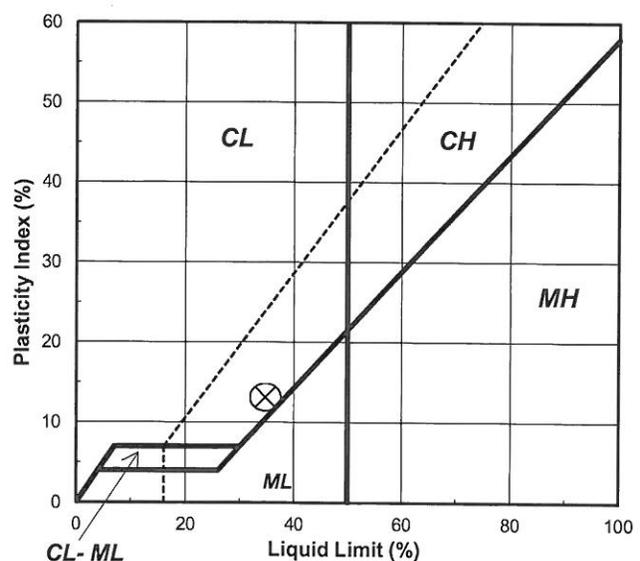
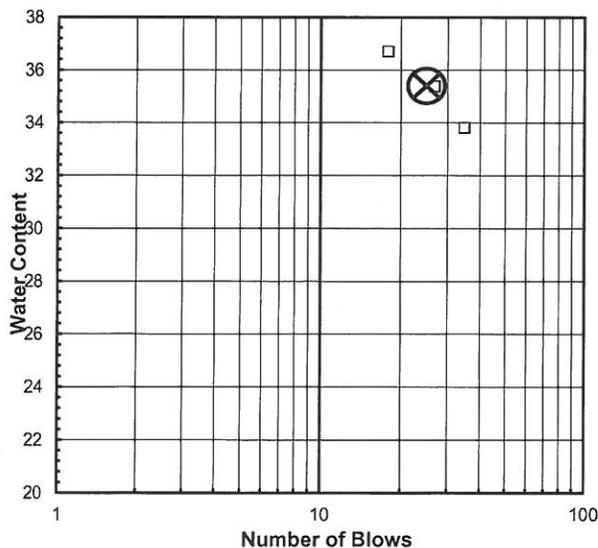
Liquid Limit Test	1	2	3	
Tare Number	A-O	17	Z-4	<b>M U L T I P O I N T</b>
Wt. of Tare & WS (gm)	32.88	33.41	31.52	
Wt. of Tare & DS (gm)	28.47	28.72	27.24	
Wt. of Tare (gm)	15.42	15.46	15.57	
Wt. of Water (gm)	4.4	4.7	4.3	
Wt. of DS (gm)	13.1	13.3	11.7	
<b>Moisture Content (%)</b>	<b>33.8</b>	<b>35.4</b>	<b>36.7</b>	
<b>Number of Blows</b>	<b>35</b>	<b>27</b>	<b>18</b>	

Plastic Limit Test	1	2	Range	Test Results	
Tare Number	W-5	V-2		Liquid Limit (%)	35
Wt. of Tare & WS (gm)	23.16	22.81		Plastic Limit (%)	22
Wt. of Tare & DS (gm)	21.79	21.54		Plasticity Index (%)	13
Wt. of Tare (gm)	15.61	15.60		USCS Symbol	CL
Wt. of Water (gm)	1.4	1.3			
Wt. of DS (gm)	6.2	5.9			
<b>Moisture Content (%)</b>	<b>22.2</b>	<b>21.4</b>	<b>0.8</b>		

*Note: The acceptable range of the two Moisture contents is  $\pm 2.6$*

Flow Curve

Plasticity Chart



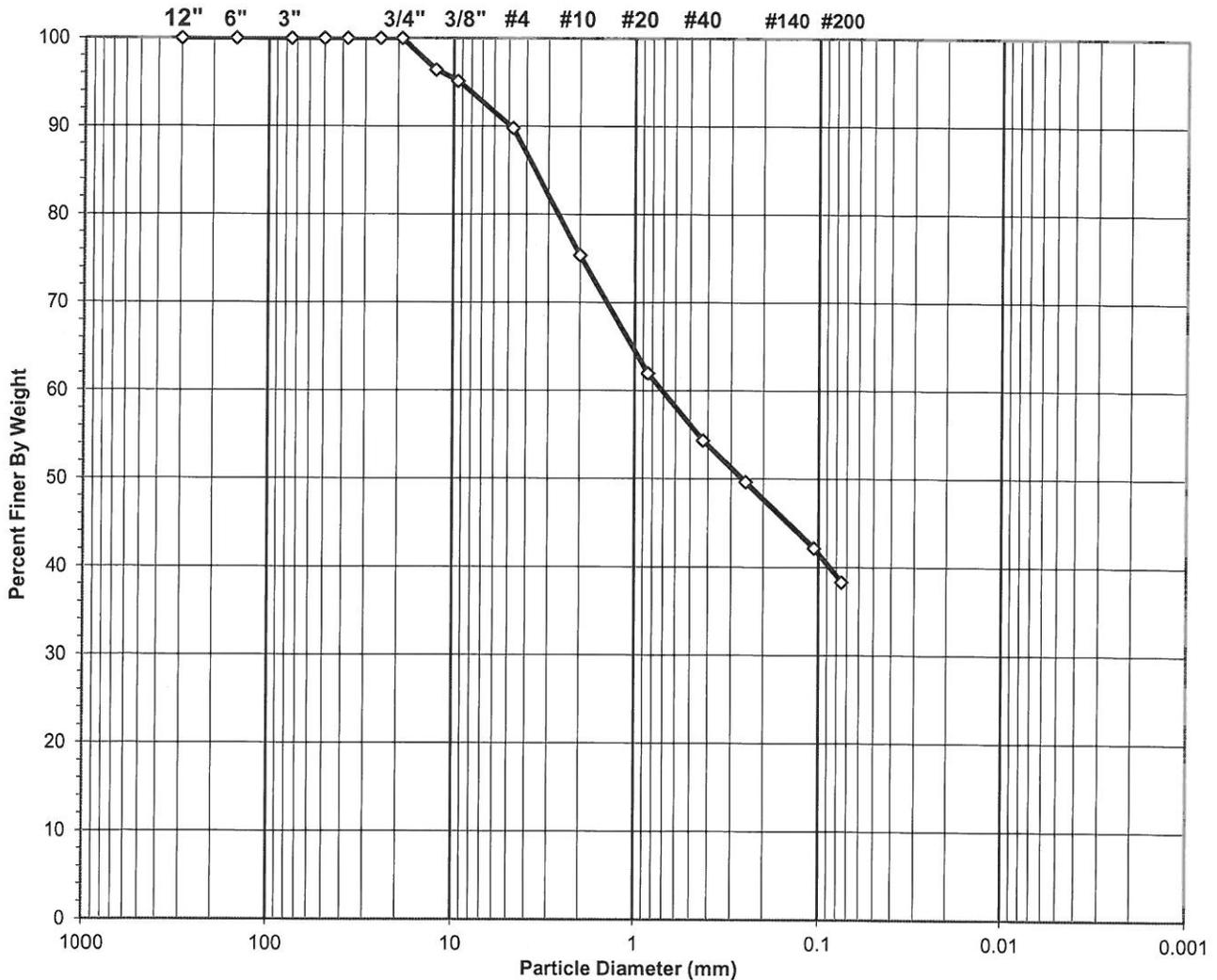
Tested By CG Date 6/20/2012 Checked By Gam Date 6-21-12

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

Client	R.S.G. & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-01	Sample No.	1
Lab ID	2012-686-01-01	Soil Color	<b>BROWN</b>

<b>USCS</b>	<b>SIEVE ANALYSIS</b>		<b>HYDROMETER</b>
	gravel	sand	silt and clay



**USCS Symbol**      **SC, TESTED**

**USCS Classification** **CLAYEY SAND**

Tested By **JBD**      Date **6/20/2012**      Checked By **GEM**      Date **6-21-12**

### WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-01	Sample No.	1
Lab ID	2012-686-01-01	Soil Color	<b>BROWN</b>

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	200	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	791.11	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	721.84	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.61	Weight of Tare (gm)	NA
Weight of Water (gm)	69.27	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	550.23	Weight of Dry Soil (gm)	NA
<b>Moisture Content (%)</b>	<b>12.6</b>	<b>Moisture Content (%)</b>	<b>NA</b>

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	550.23
Dry Weight - 3/4" Sample (gm)	339.3	Weight of minus #200 material (gm)	210.98
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	339.25
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	19.64	3.6	3.6	96.4	96.4
3/8"	9.50	7.00	1.3	4.8	95.2	95.2
#4	4.75	29.50	5.4	10.2	89.8	89.8
#10	2.00	79.26	14.4	24.6	75.4	75.4
#20	0.850	73.62	13.4	38.0	62.0	62.0
#40	0.425	42.04	7.6	45.6	54.4	54.4
#60	0.250	25.83	4.7	50.3	49.7	49.7
#140	0.106	41.31	7.5	57.8	42.2	42.2
#200	0.075	21.05	3.8	61.7	38.3	38.3
Pan	-	210.98	38.3	100.0	-	-

Tested By JBD Date 6/20/2012 Checked By *GAM* Date *6-21-12*



## MOISTURE - DENSITY RELATIONSHIP

ASTM D698-07e1 SOP-S12

Client	R.S.G. & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-01	Sample No.	1
Lab ID	2012-686-01-01		

Visual Description      BROWN CLAYEY SAND

Total Weight of the Sample (gm)	40376
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	7
Oversize Material	Not included
Procedure Used	B

TestType	<b>STANDARD</b>	
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		4287
Volume of the Mold(cc)		941

### Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	6211	6278	6329	6268	6225
Wt. of Mold (gm)	4287	4287	4287	4287	4287
Wt. of WS	1924	1991	2041	1980	1938
Mold Volume (cc)	941	941	941	941	941

### Moisture Content / Density

	813	8010	827	824	SS-1
Tare Number	813	8010	827	824	SS-1
Wt. of Tare & WS (gm)	489.00	502.70	468.50	521.90	541.30
Wt. of Tare & DS (gm)	455.00	464.10	426.60	464.70	466.40
Wt. of Tare (gm)	112.10	135.70	136.10	135.60	93.70
Wt. of Water (gm)	34.00	38.60	41.90	57.20	74.90
Wt. of DS (gm)	342.90	328.40	290.50	329.10	372.70

Wet Density (gm/cc)	2.04	2.12	2.17	2.10	2.06
Wet Density (pcf)	127.6	132.0	135.3	131.3	128.5
<b>Moisture Content (%)</b>	<b>9.9</b>	<b>11.8</b>	<b>14.4</b>	<b>17.4</b>	<b>20.1</b>
<b>Dry Density (pcf)</b>	<b>116.1</b>	<b>118.1</b>	<b>118.3</b>	<b>111.9</b>	<b>107.0</b>

### Zero Air Voids

<b>Moisture Content (%)</b>	15.0	19.0	22.0
<b>Dry Unit Weight (pcf)</b>	119.9	111.4	105.7

Tested By    CG      Date    6/19/2012    Checked By    GEM      Date    6-21-12



July 9, 2012

Project No. 2012-686-04

Mr. Pieter Scheer, P.E.  
Richardson Smith Gardner & Associates  
14 N. Boylan Ave.  
Raleigh, NC 27603

**Transmittal**  
**Laboratory Test Results**  
**Davidson County Landfill C & D**

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was faxed to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens which were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectively submitted,  
**Geotechnics, Inc.**

Michael P. Smith  
Regional Manager

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***

## MOISTURE CONTENT

ASTM D 2216-10 (SOP-S1)

Client	RSG & ASSOCIATES
Client Reference	DAVIDSON CO. LF C & D
Project No.	2012-686-04

Lab ID	.001	.002
Boring No.	NA	NA
Depth (ft)	NA	NA
Sample No.	MSW BORROW	ROADWAY BORROW
Tare Number	SS-2	828
Wt. of Tare & WS (gm)	405.19	373.59
Wt. of Tare & DS (gm)	377	339.33
Wt. of Tare (gm)	99.46	136.01
Wt. of Water (gm)	28.19	34.26
Wt. of DS (gm)	277.54	203.32
<b>Water Content (%)</b>	<b>10.2</b>	<b>16.9</b>

Notes : NA

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Tested By	BW	Date	6/27/2012	Checked By	GAM	Date	6-29-12
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page 1 of 1 DCN: CT-S1 DATE 6-30-98 REVISION: 2 Z:\Data Sheets\WATCONT W Header.XLS\Sheet1

## ATTERBERG LIMITS

ASTM D 4318-10

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	MSW BORROW
Lab ID	2012-686-04-01	Soil Description	<b>REDDISH BROWN SILT</b>

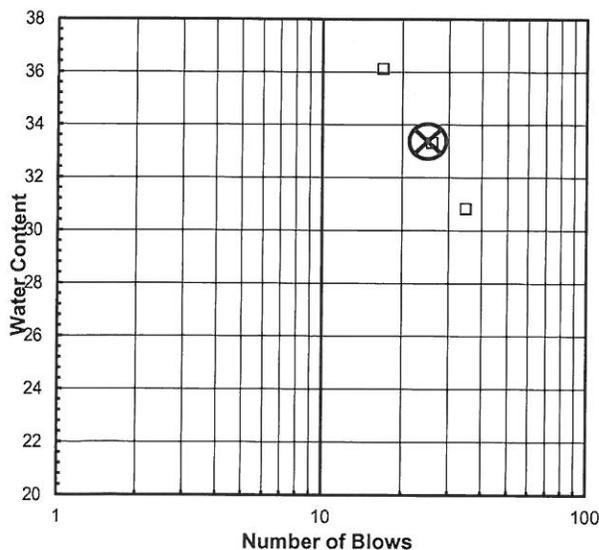
**Note:** The USCS symbol used with this test refers only to the minus No. 40 sieve material. (Minus No. 40 sieve material, Airdried) sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

Liquid Limit Test	1	2	3	M U L T I P O I N T
Tare Number	A-O	W-5	Z-4	
Wt. of Tare & WS (gm)	30.38	30.21	31.94	
Wt. of Tare & DS (gm)	26.85	26.56	27.60	
Wt. of Tare (gm)	15.39	15.60	15.58	
Wt. of Water (gm)	3.5	3.7	4.3	
Wt. of DS (gm)	11.5	11.0	12.0	
<b>Moisture Content (%)</b>	<b>30.8</b>	<b>33.3</b>	<b>36.1</b>	
<b>Number of Blows</b>	<b>35</b>	<b>26</b>	<b>17</b>	

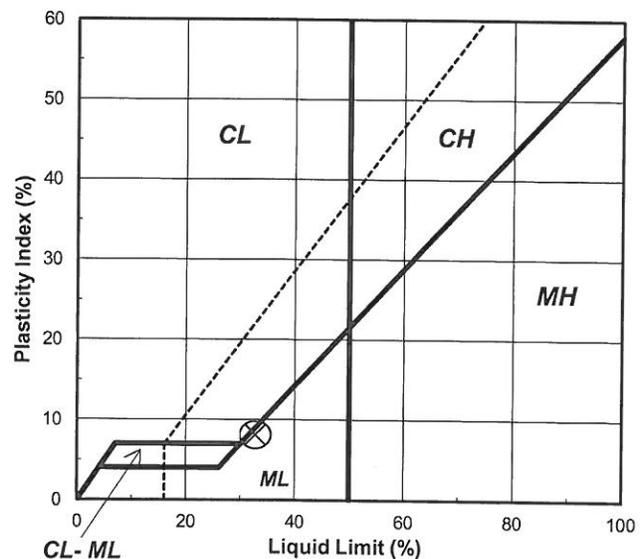
Plastic Limit Test	1	2	Range	Test Results
Tare Number	17	V-2		
Wt. of Tare & WS (gm)	22.78	22.25		<b>Liquid Limit (%)</b> <b>33</b>
Wt. of Tare & DS (gm)	21.30	20.89		<b>Plastic Limit (%)</b> <b>25</b>
Wt. of Tare (gm)	15.47	15.58		<b>Plasticity Index (%)</b> <b>8</b>
Wt. of Water (gm)	1.5	1.4		<b>USCS Symbol</b> <b>ML</b>
Wt. of DS (gm)	5.8	5.3		
<b>Moisture Content (%)</b>	<b>25.4</b>	<b>25.6</b>	<b>-0.2</b>	

*Note: The acceptable range of the two Moisture contents is  $\pm 2.6$*

Flow Curve



Plasticity Chart



Tested By JBD      Date 7/6/2012      Checked By GEM      Date 7-9-12

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## ATTERBERG LIMITS

ASTM D 4318-10

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	ROADWAY BOR
Lab ID	2012-686-04-02	Soil Description	<b>GRAY SILT</b>

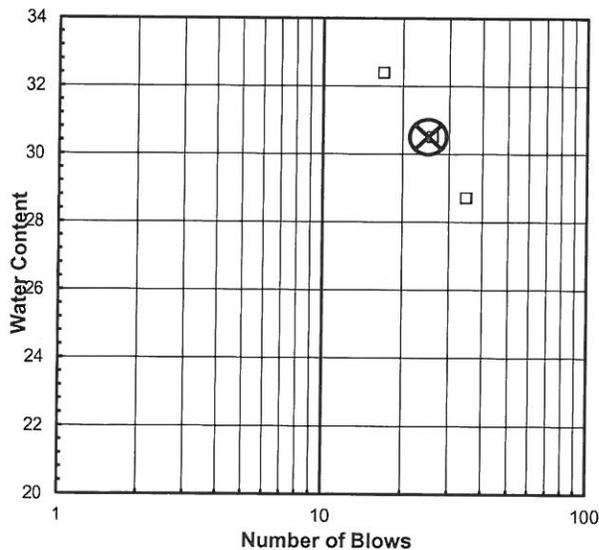
*Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.* (Minus No. 40 sieve material, Airdried)

Liquid Limit Test	1	2	3	M U L T I P O I N T
Tare Number	M	V	P	
Wt. of Tare & WS (gm)	29.01	33.52	29.07	
Wt. of Tare & DS (gm)	25.91	29.26	25.68	
Wt. of Tare (gm)	15.11	15.29	15.21	
Wt. of Water (gm)	3.1	4.3	3.4	
Wt. of DS (gm)	10.8	14.0	10.5	
<b>Moisture Content (%)</b>	<b>28.7</b>	<b>30.5</b>	<b>32.4</b>	
<b>Number of Blows</b>	<b>35</b>	<b>26</b>	<b>17</b>	

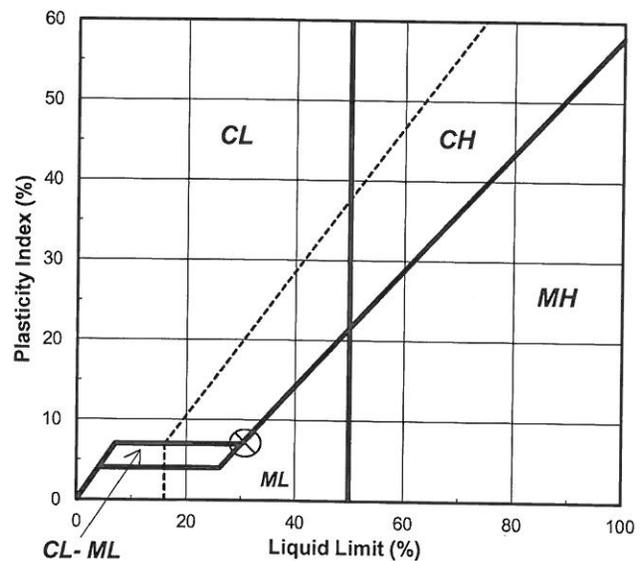
Plastic Limit Test	1	2	Range	Test Results	
Tare Number	X	C		Liquid Limit (%)	31
Wt. of Tare & WS (gm)	22.38	22.21		Plastic Limit (%)	24
Wt. of Tare & DS (gm)	21.05	20.89		Plasticity Index (%)	7
Wt. of Tare (gm)	15.47	15.22		USCS Symbol	ML
Wt. of Water (gm)	1.3	1.3			
Wt. of DS (gm)	5.6	5.7			
<b>Moisture Content (%)</b>	<b>23.8</b>	<b>23.3</b>	<b>0.6</b>		

*Note: The acceptable range of the two Moisture contents is  $\pm 2.6$*

Flow Curve



Plasticity Chart



Tested By JBD Date 7/5/2012 Checked By GJM Date 7-9-12

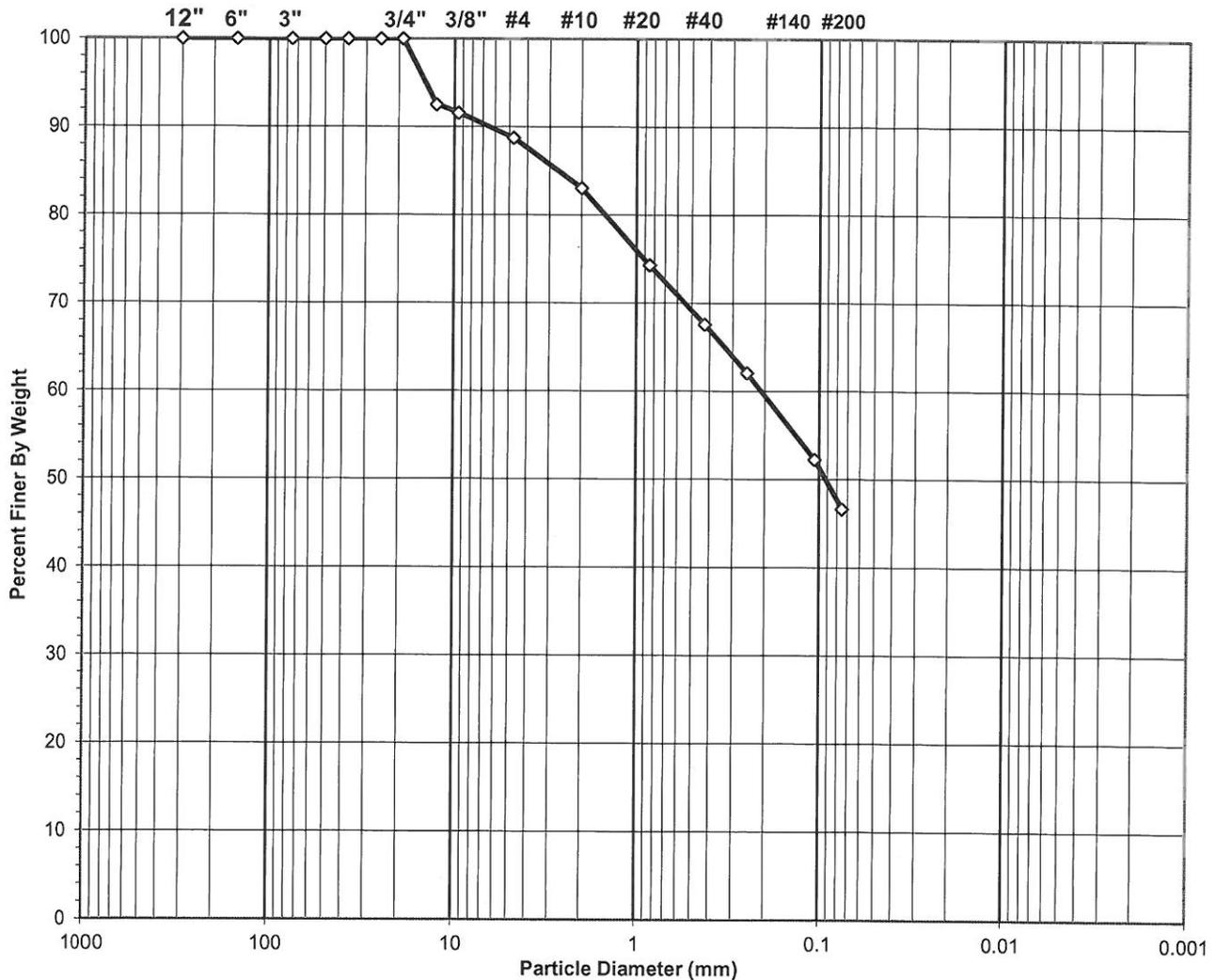
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**SIEVE ANALYSIS**  
ASTM D 422-63 (2007)

Client RSG & ASSOCIATES  
 Client Reference DAVIDSON CO. LF C & D  
 Project No. 2012-686-04  
 Lab ID 2012-686-04-01

Boring No. NA  
 Depth (ft) NA  
 Sample No. MSW BORROW  
 Soil Color REDDISH BROWN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **SM, TESTED**

USCS Classification **SILTY SAND**

Tested By SFS Date 7/3/2012 Checked By *gan* Date 7-9-12

## WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	MSW BORROW
Lab ID	2012-686-04-01	Soil Color	REDDISH BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	835	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	997.76	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	922.09	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	254.98	Weight of Tare (gm)	NA
Weight of Water (gm)	75.67	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	667.11	Weight of Dry Soil (gm)	NA
<b>Moisture Content (%)</b>	<b>11.3</b>	<b>Moisture Content (%)</b>	<b>NA</b>

Wet Weight - 3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	667.11
Dry Weight - 3/4" Sample (gm)	355.9	Weight of minus #200 material (gm)	311.22
Wet Weight + 3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	355.89
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

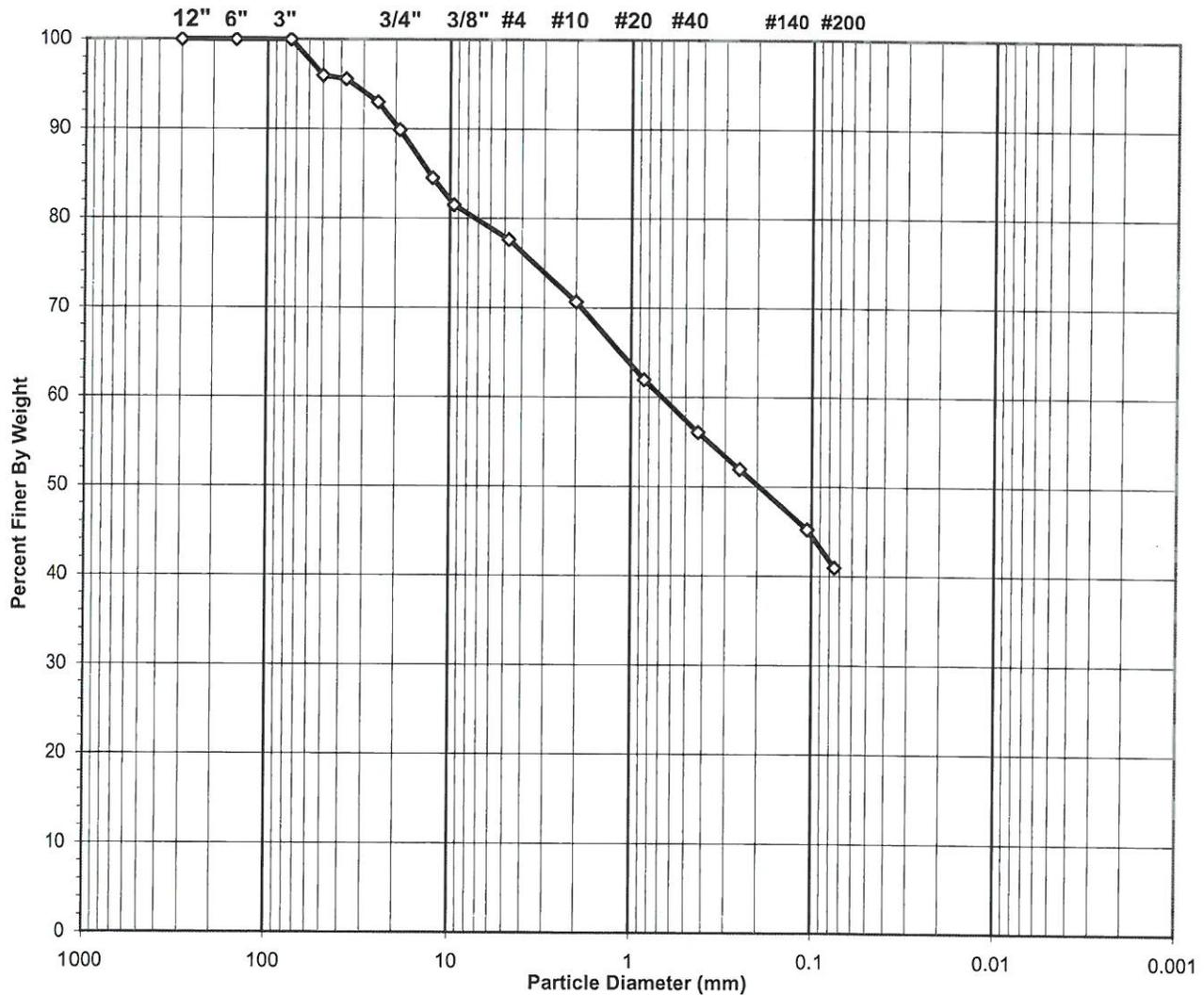
Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.0	0.0	100.0	100.0
6"	150	0.00	0.0	0.0	100.0	100.0
3"	75	0.00	0.0	0.0	100.0	100.0
2"	50	0.00	0.0	0.0	100.0	100.0
1 1/2"	37.5	0.00	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	49.72	7.5	7.5	92.5	92.5
3/8"	9.50	6.34	1.0	8.4	91.6	91.6
#4	4.75	19.05	2.9	11.3	88.7	88.7
#10	2.00	37.80	5.7	16.9	83.1	83.1
#20	0.850	58.37	8.7	25.7	74.3	74.3
#40	0.425	44.89	6.7	32.4	67.6	67.6
#60	0.250	36.70	5.5	37.9	62.1	62.1
#140	0.106	65.59	9.8	47.7	52.3	52.3
#200	0.075	37.43	5.6	53.3	46.7	46.7
Pan	-	311.22	46.7	100.0	-	-

Tested By SFS Date 7/3/2012 Checked By *GJM* Date 7-9-12

**SIEVE ANALYSIS**  
ASTM D 422-63 (2007)

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	ROADWAY BORROW
Lab ID	2012-686-04-02	Soil Color	GRAY

<b>USCS</b>	<b>SIEVE ANALYSIS</b>		<b>HYDROMETER</b>
	gravel	sand	silt and clay



**USCS Symbol** SM, TESTED

**USCS Classification** SILTY SAND WITH GRAVEL

Tested By BW Date 7/2/2012 Checked By *MB* Date *7/10*

## WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	ROADWAY BORROW
Lab ID	2012-686-04-02	Soil Color	GRAY

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	831	Tare No.	834
Wgt. Tare + Wet Specimen (gm)	783.00	Wgt. Tare + Wet Specimen (gm)	2503.82
Wgt. Tare + Dry Specimen (gm)	707.85	Wgt. Tare + Dry Specimen (gm)	2474.43
Weight of Tare (gm)	262.30	Weight of Tare (gm)	260.24
Weight of Water (gm)	75.15	Weight of Water (gm)	29.39
Weight of Dry Soil (gm)	445.55	Weight of Dry Soil (gm)	2214.19
<b>Moisture Content (%)</b>	<b>16.9</b>	<b>Moisture Content (%)</b>	<b>1.3</b>

Wet Weight - 3/4" Sample (gm)	21006.4	Weight of the Dry Specimen (gm)	445.55
Dry Weight - 3/4" Sample (gm)	17974.7	Weight of minus #200 material (gm)	202.99
Wet Weight + 3/4" Sample (gm)	2048.09	Weight of plus #200 material (gm)	242.56
Dry Weight + 3/4" Sample (gm)	2021.26		
Total Dry Weight Sample (gm)	19995.9	<b>J - Factor (Percent Finer than 3/4")</b>	<b>0.8989</b>

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	818.38	4.0	4.0	96.0	96.0
1 1/2"	37.5	80.36	0.4	4.4	95.6	95.6
1"	25	518.48	2.6	7.0	93.0	93.0
3/4"	19	630.87	3.1	10.1	89.9	89.9
1/2"	12.5	26.66	6.0	6.0	94.0	84.5
3/8"	9.5	15.11	3.4	9.4	90.6	81.5
#4	4.75	19.05	4.3	13.7	86.3	77.6
#10	2	34.48	7.7	21.4	78.6	70.7
#20	0.85	43.22	9.7	31.1	68.9	61.9
#40	0.425	29.10	6.5	37.6	62.4	56.1
#60	0.25	20.48	4.6	42.2	57.8	51.9
#140	0.106	33.35	7.5	49.7	50.3	45.2
#200	0.075	21.11	4.7	54.4	45.6	41.0
Pan	-	202.99	45.6	100.0	-	-

**Notes :** (\*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample  
 (\*\*) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen

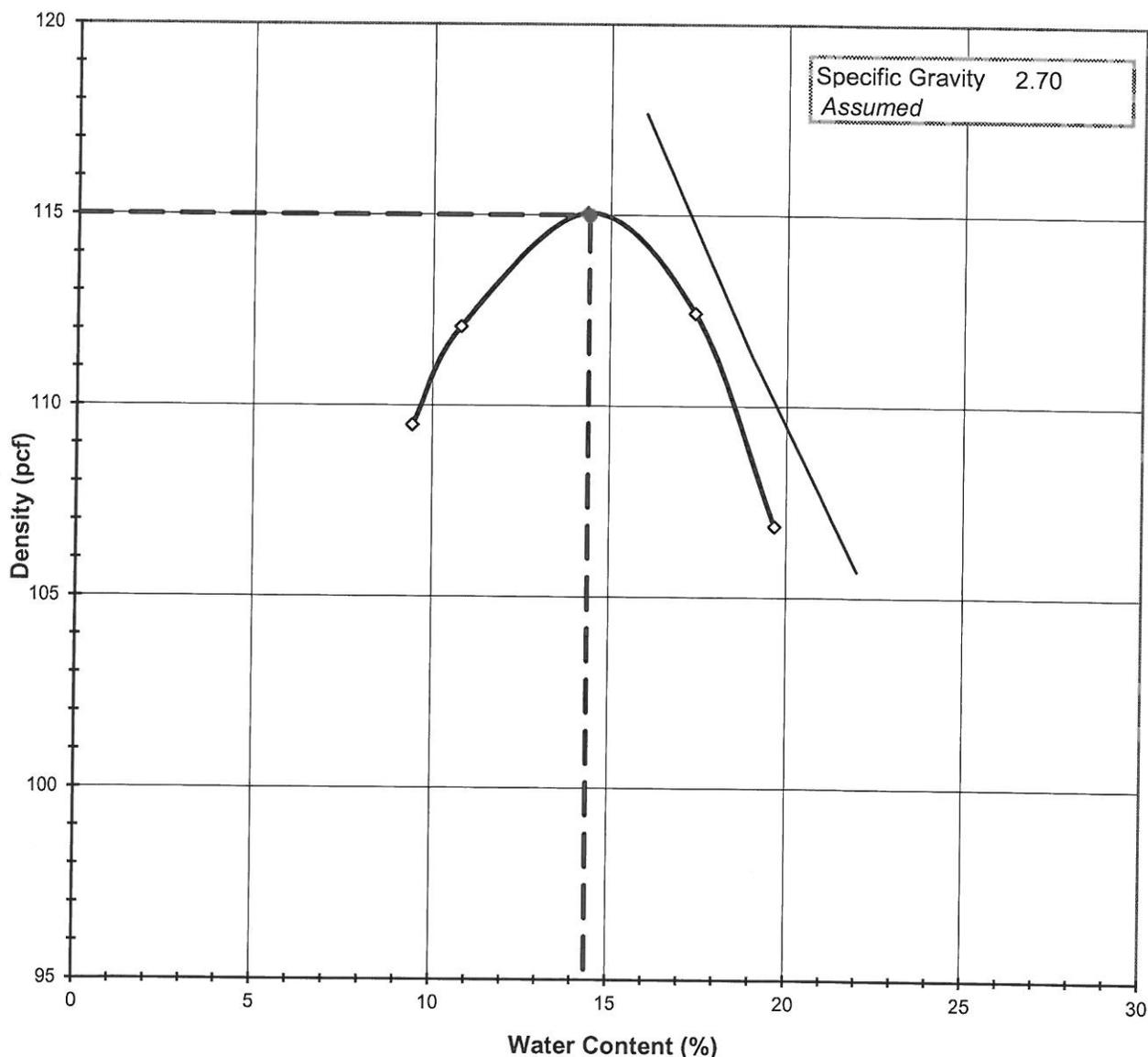
Tested By BW Date 7/2/2012 Checked By [Signature] Date 7/10

### MOISTURE DENSITY RELATIONSHIP

ASTM D698-07e1

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO.LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	MSW BORROW
Lab ID	2012-686-04-01	Test Method	<b>STANDARD</b>
Visual Description	REDDISH BROWN SILT		

**Optimum Water Content 14.4**  
**Maximum Dry Density 115.0**



Tested By SFS Date 7/4/2012 Checked By GAM Date 7-10-12

## MOISTURE - DENSITY RELATIONSHIP

ASTM D698-07e1

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO.LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	MSW BORROW
Lab ID	2012-686-04-01		

Visual Description      REDDISH BROWN SILT

Total Weight of the Sample (gm)	18800
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	C

TestType	<b>STANDARD</b>	
Rammer Weight (lbs)	5.5	
Rammer Drop (in)	12	
Rammer Type	MECHANICAL	
Machine ID	R	174
Mold ID	R	173
Mold diameter	6"	
Weight of the Mold	5551	
Volume of the Mold(cc)	2122	

### Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	9626	9774	10025	10040	9900
Wt. of Mold (gm)	5551	5551	5551	5551	5551
Wt. of WS	4075	4222	4474	4489	4349
Mold Volume (cc)	2122	2122	2122	2122	2122

### Moisture Content / Density

Tare Number	312	314	305	312	304
Wt. of Tare & WS (gm)	345.09	460.85	636.48	486.15	561.27
Wt. of Tare & DS (gm)	322.60	424.23	567.26	426.57	487.21
Wt. of Tare (gm)	84.38	84.82	84.73	84.41	110.66
Wt. of Water (gm)	22.49	36.62	69.22	59.58	74.06
Wt. of DS (gm)	238.22	339.41	482.53	342.16	376.55

Wet Density (gm/cc)	1.92	1.99	2.11	2.12	2.05
Wet Density (pcf)	119.8	124.2	131.6	132.0	127.9
<b>Moisture Content (%)</b>	<b>9.4</b>	<b>10.8</b>	<b>14.3</b>	<b>17.4</b>	<b>19.7</b>
<b>Dry Density (pcf)</b>	<b>109.5</b>	<b>112.1</b>	<b>115.1</b>	<b>112.4</b>	<b>106.9</b>

### Zero Air Voids

Moisture Content (%)	16.0	19.0	22.0
Dry Unit Weight (pcf)	117.7	111.4	105.7

Tested By    SFS      Date    7/4/2012      Checked By    *GEM*      Date    7-10-12

## MOISTURE - DENSITY RELATIONSHIP (Corrected for Oversize Particles)

ASTM D 4718-87, D 698-07e1

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	ROADWAY BORROW
Lab ID	2012-686-04-02		

Visual Description      GRAY SILTY SAND WITH GRAVEL

Total Weight of the Sample (gm)	23250
As Received Water Content(%)	NA
Assumed Specific Gravity(gm/cc)	2.72

TestType	<b>STANDARD</b>	
Rammer Weight (lbs)	5.5	
Rammer Drop (in)	12	
Rammer Type	Mechanical	
Machine ID	R	174
Mold ID	R	173
Mold diameter	6"	
Weight of the Mold	5551	
Volume Of the Mold	2122	

Percent Retained on 3/4" (Dry)	9.60
Percent Retained on 3/8" (Dry)	NA
Percent Retained on #4 (Dry)	NA
Oversize Material	Not included
Procedure Used	C

### Mold/Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	9888	10044	10219	10132	10066
Wt. of Mold (gm)	5551	5551	5551	5551	5551
Wt. of WS	4338	4494	4669	4581	4515
Mold Volume (cc)	2122	2122	2122	2122	2122

### Moisture Content/Density

	310	311	310	312	307
Tare Number	310	311	310	312	307
Wt. of Tare & WS (gm)	509.22	447.64	448.39	416.84	499.38
Wt. of Tare & DS (gm)	479.28	411.38	409.19	370.12	440.52
Wt. of Tare (gm)	110.33	84.48	110.36	84.39	110.46
Wt. of Water (gm)	29.94	36.26	39.20	46.72	58.86
Wt. of DS (gm)	368.95	326.90	298.83	285.73	330.06

Wet Density (gm/cc)	2.04	2.12	2.20	2.16	2.13
Wet Density (pcf)	127.6	132.2	137.3	134.7	132.8
<b>Moisture Content (%)</b>	<b>8.1</b>	<b>11.1</b>	<b>13.1</b>	<b>16.4</b>	<b>17.8</b>
<b>Dry Density (pcf)</b>	<b>118.0</b>	<b>119.0</b>	<b>121.4</b>	<b>115.8</b>	<b>112.7</b>

### Zero Air Voids

<b>Moisture Content (%)</b>	12.0	15.0	18.5
<b>Dry Unit Weight (pcf)</b>	128.0	120.5	112.9

Tested By SFS      Date 7/5/2012      Checked By MM      Date 7/10

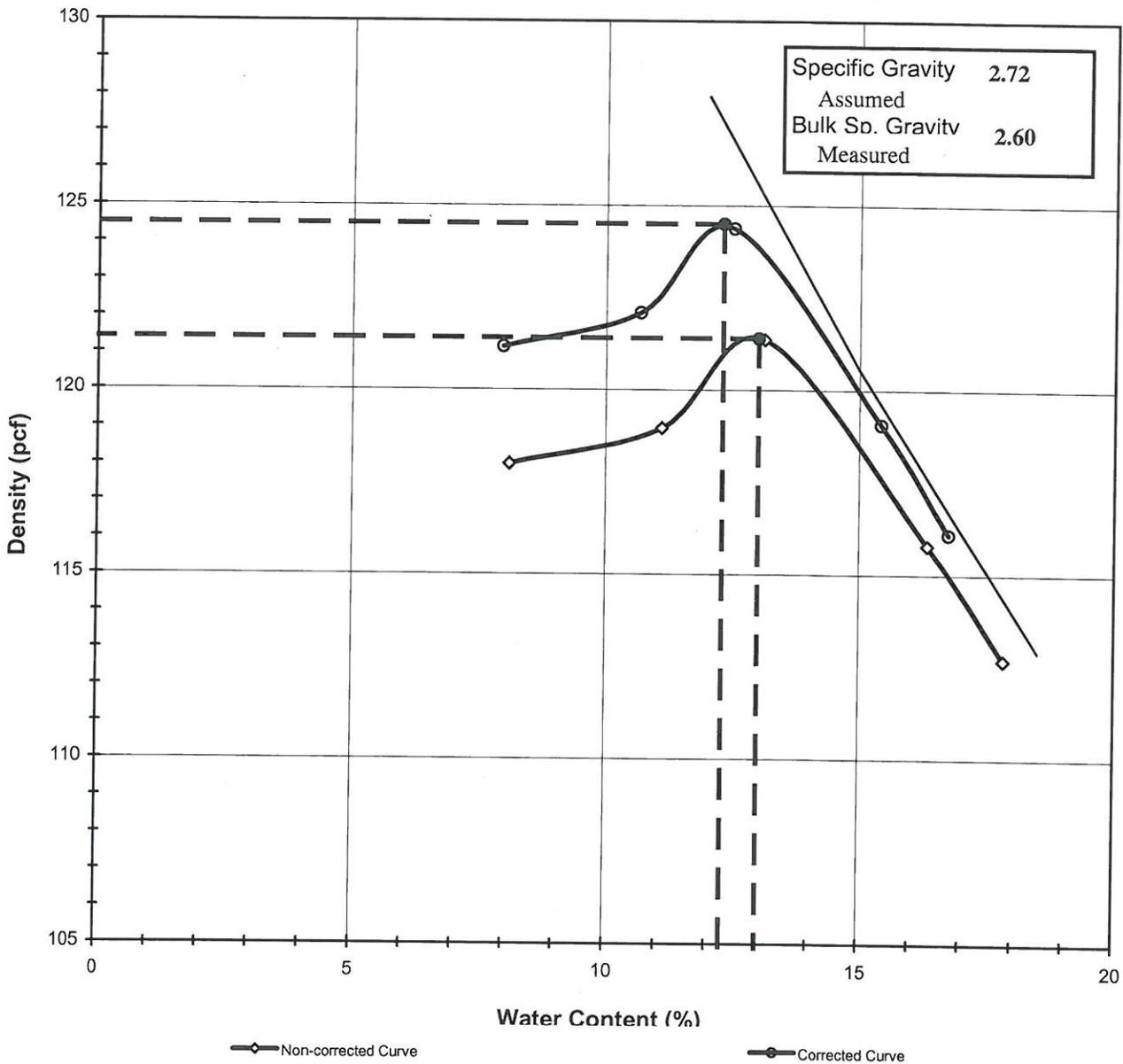
## MOISTURE - DENSITY RELATIONSHIP (Corrected for Oversize Particles)

ASTM D 4718-87, D 698-07e1

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	DAVIDSON CO. LF C & D	Depth (ft)	NA
Project No.	2012-686-04	Sample No.	ROADWAY BORROW
Lab ID	2012-686-04-02	Test Method	STANDARD

Visual Description      GRAY SILTY SAND WITH GRAVEL

<b>Optimum Water Content</b>	<b>13.0</b>	<b>Corrected Water Content</b>	<b>12.3</b>
<b>Maximum Dry Density</b>	<b>121.4</b>	<b>Corrected Dry Density</b>	<b>124.5</b>



Tested By SFS      Date 7/5/2012      Checked By WJK      Date 7/10

**STRUCTURAL FILL  
RECORD TEST SUMMARY**

**Project Name:** Davidson County C&DLF - Phase 4  
**Project Number:** DAVDCO-10-2  
**Contractor:** Davidson County

<b>In-Place Moisture-Density Test Results:</b>										
Test Number	Date	Test Method*	In-Situ Values		Reference Values (ASTM D 698)		Compaction (%)	Difference From Optimum Moisture (%)	Pass/Fail	Location/Comment
			Dry Density (pcf)	Moisture Content (%)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
1	6/13/12	N	112.9	15.5	118.7	13.5	95	2.0	PASS	
1	6/15/12	N	86.4	22.3	118.7	13.5	73	8.8	FAIL	See Re-Test on 6/27
2	6/15/12	N	116.2	14.5	118.7	13.5	98	1.0	PASS	
3	6/15/12	N	106.5	14.4	118.7	13.5	90	0.9	FAIL	See Re-Test on 6/27
1	6/27/12	N	120.0	18.7	118.7	13.5	101	5.2	PASS	Re-Test of #1 on 6/15
2	6/27/12	N	116.0	15.9	118.7	13.5	98	2.4	PASS	Re-Test of #3 on 6/15
3	6/27/12	N	115.3	13.5	118.7	13.5	97	0.0	PASS	
DC-01	6/27/12	DC	115.4	13.0	118.7	13.5	97	-0.5	PASS	
4	6/27/12	N	114.5	14.4	118.7	13.5	96	0.9	PASS	
DC-01	8/14/12	DC	117.5	9.4	118.7	13.5	99	-4.1	PASS	
DC-02	8/14/12	DC	120.9	11.8	118.7	13.5	102	-1.7	PASS	
DC-03	8/14/12	DC	113.6	14.2	118.7	13.5	96	0.7	PASS	
DC-04	8/15/12	DC	118.1	12.6	118.7	13.5	99	-0.9	PASS	
DC-05	8/15/12	DC	118.7	13.9	118.7	13.5	100	0.4	PASS	
DC-06	8/15/12	DC	113.1	12.0	118.7	13.5	95	-1.5	PASS	
DC-07	8/17/12	DC	112.9	12.0	118.7	13.5	95	-1.5	PASS	
DC-08	8/17/12	DC	122.0	7.5	124.5	12.3	98	-4.8	PASS	
DC-09	8/17/12	DC	116.9	10.2	118.7	13.5	98	-3.3	PASS	
1	9/25/12	N	116.7	8.7	118.7	13.5	98	-4.8	PASS	
2	9/25/12	N	119.4	10.6	118.7	13.5	101	-2.9	PASS	
3	9/25/12	N	121.3	11.5	124.5	12.3	97	-0.8	PASS	
4	9/25/12	N	120.8	11.4	124.5	12.3	97	-0.9	PASS	
DC-01	9/25/12	DC	121.0	9.7	124.5	12.3	97	-2.6	PASS	
1	10/10/12	N	119.5	10.7	124.5	12.3	96	-1.6	PASS	
2	10/10/12	N	121.5	10.7	124.5	12.3	98	-1.6	PASS	



Day: Wednesday  
 Date: 6.13.12  
 Log No.: 1  
 Page: 1 of 1



### Daily Field Report

<b>Project Name:</b>	Davidson County LF C&D	<b>Project No.:</b>	2012-686-01-01
<b>Client Name:</b>	Richardson Smith Gardner & Associates	<b>Client Contact:</b>	Mr. Pieter Scheer
<b>Site Location:</b>	Lexington, NC	<b>Time on Site:</b>	<b>Arrived:</b> 1000 <b>Departed:</b> 1500
<b>General Contractor:</b>	Davidson County	<b>Superintendent:</b>	Mr. Steve Sink
Other Firms / Sub-Contractor Represented On Site			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
<b>Weather Conditions:</b>	Sunny and Hot	<b>Temperature:</b>	80's
<b>Contractor's Equipment:</b>	1- 953C Bucket loader, 1- Cat 345B Excavator, 1- Cat 826C Trash Compactor		
<b>Contractor's Personnel:</b>	Mr. Steve Sink, Landfill Manager and operator Mark		
Description of Daily Activities & Events			
<ul style="list-style-type: none"> <li>At the request of Mr. Pieter Scheer of RSG the undersigned arrived on-site to observe the construction of a new C&amp;D cell at the the Davidson County C&amp;D Landfill in Lexington, N.C. Upon arrival met with Mr. Steven Sink Land-fill Manager to discuss the cutting and filling needed to be done to complete building the cell.</li> </ul> <p>Steve indicated that over the last two days that the site received about one inch of rain. The lower area of the cell had the most water (2 to 3 inches of standing water) from run-off. A southern portion of the cell had been previously cut of 3 to 5 feet of soil forming a berm. The soil had been stockpiled adjacent to the cell. This soil (moist to wet, brown, clayey fine to medium sand with sand rock-CL/ML) was used to fill the low area.</p> <p><b>Work Accomplished</b></p> <ul style="list-style-type: none"> <li>The contractor first removed the surface vegetation (grass and major wet soil) from the berms and bottom of the fill area. Once completed-three 6 to 8 inch lifts of on-site stockpiled soil was placed at the bottom and low areas of the cell. Each lift placed was rolled using the tracks of the machines used spreading the soil and the trash compactor. A total of 8 to 10 passes using the machinery was made over the fill area.</li> </ul> <p>While compacting the area some pumping was observed due to the rain and wet conditions previously reported. Steve Sink Landfill Manager stated that he will keep equipment off the soil to allow it to dry. Area will be tested. Steve informed me that there will be no work tomorrow. Work was scheduled to resume on Friday.</p> <ul style="list-style-type: none"> <li>The undersigned took photographs of the site and fill operations.</li> <li>One 5 gallon bucket of soil stockpiled used to fill the cell was collected and returned to the office for testing.</li> </ul>			
<b>Prepared By:</b>	JAS	<b>Date:</b>	6.13.12
		<b>Checked By:</b>	<i>MWS</i>
		<b>Date:</b>	6/28



Day: Friday  
 Date: 6.15.12  
 Log No.: 2  
 Page: 1 of 1



### Daily Field Report

<b>Project Name:</b>	Davidson County LF C&D	<b>Project No.:</b>	2012-686
<b>Client Name:</b>	Richardson Smith Gardner & Associates	<b>Client Contact:</b>	Mr. Pieter Scheer
<b>Site Location:</b>	Lexington, NC	<b>Time on Site:</b>	Arrived: 830 Departed: 1430
<b>General Contractor:</b>	Davidson County	<b>Superintendent:</b>	Mr. Steve Sink
<b>Other Firms / Sub-Contractor Represented On Site</b>			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
<b>Weather Conditions:</b>	Sunny and Hot	<b>Temperature:</b>	70 to 80's
<b>Contractor's Equipment:</b>	1- 953C Bucket loader, 1- Cat 345B Excavator, 1- Cat 826C Trash Compactor		
<b>Contractor's Personnel:</b>	Mr. Steve Sink, Landfill Manager and operator Mark		
<b>Description of Daily Activities &amp; Events</b>			
<p>• <b>Work Accomplished</b></p> <p>The contractor continued to removed the surface vegetation (grass and weeds) from the berms and interior slope of the fill area. Once completed-three 6 to 8 inch lifts of on-site stockpiled soil was placed at the bottom and low areas of the cell. Each lift placed was rolled using the tracks of the machines used spreading the soil and the trash compactor. A total of 8 to 10 passes using the machinery was made over the fill area.</p> <p>Geotechnics representative J. Schiff performed moisture/density testing of previously placed and newly placed and compacted fill. Results are attached.</p> <p>The undersigned took photographs of the site and fill operations.</p> <p>The undersigned departed the site at 1430 and returned to the office.</p>			
<b>Prepared By:</b>	JAS	<b>Date:</b>	6.15.12
		<b>Checked By:</b>	<i>MDS</i>
		<b>Date:</b>	<i>4/28</i>



Day: Wednesday  
 Date: 6.27.12  
 Log No.: 3  
 Page: 1 of 1



### Daily Field Report

<b>Project Name:</b>	Davidson County LF C&D	<b>Project No.:</b>	2012-686-01
<b>Client Name:</b>	Richardson Smith Gardner & Associates	<b>Client Contact:</b>	Mr. Pieter Scheer
<b>Site Location:</b>	Lexington, NC	<b>Time on Site:</b>	Arrived: 830 Departed: 1430
<b>General Contractor:</b>	Davidson County	<b>Superintendent:</b>	Steve Sink
<b>Other Firms / Sub-Contractor Represented On Site</b>			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
<b>Weather Conditions:</b>	Sunny	<b>Temperature:</b>	95 degrees
<b>Contractor's Equipment:</b>	1-Cat 345B Backhoe, 1-Cat 953C loader, 1-trash compactor		
<b>Contractor's Personnel:</b>	Mark-Machine operator		
<b>Description of Daily Activities &amp; Events</b>			
<ul style="list-style-type: none"> <li>▪ Geotechnics rep. James Schiff arrived on-site and made contact with Steve Sink, Operations manager of the Davidson land fill. Mr. Sink indicated that last week surveyor were out and laid out grade stakes for the new cell. In the low areas of the cell the stakes showed up to 4 feet of fill needed to be placed and compacted.</li> <li>▪ Site area was previously sealed to prevent runoff while no site activates took place. The site had been sealed by running the tracks of the backhoe prior to the stoppage of work.</li> <li>▪ Two nuclear density tests (ND-1 and ND-2) were performed on two previously placed lifts. The tests were performed at 1 and 2 feet below existing ground surface.</li> <li>▪ Two additional 8 to 12 inch lifts of on-site fill (brown, moist, fine silty, clayey sand (SC) was placed and compacted using the trash compactor and tracks of the backhoe. Six to eight passes of the machines were tracked over each lift. Two nuclear density tests (ND-3 and ND-4) were taken of these lifts.</li> <li>▪ In anticipation of not having enough fill to complete the job, Mr. Steve Sink brought the undersigned over to there municipal landfill where a 5 gallon bucket of soil used for covering the C&amp;D fill was collected for testing back at Geotechnics lab.</li> <li>▪ Drive cylinder, water contact samples were obtained for gauge verification and proctor selection.</li> <li>▪ The undersigned departed the site at 2:30 and returned to the office where soil samples were submitted for soil testing.</li> </ul>			
<b>Prepared By:</b>	JAS	<b>Date:</b>	6/30/2012
<b>Checked By:</b>	<i>MMS</i>	<b>Date:</b>	7/2



Client: R.S.G & ASSOCIATES  
Project Name : DAVIDSON CO. LF C&D  
Project Number : 2012-686-01



Report Number : FDR-03  
Date (s) : 6/27/12

## Drive Cylinder - ASTM D 2937

### Test Information

Test Number : DC-01  
Nuclear Test Number : ND-03  
Location:  
Depth (ft): LIFT 1  
Date : 27-Jun

### Mold

Cylinder ID 6  
Weight of Cylinder (lbs.) 0.531  
Volume of Cylinder (ft<sup>3</sup>) 0.01

### Specimen

Wt. of Cylinder & WS (lbs.) 1.84  
Wt. of Cylinder (lbs.) 0.53  
Wt. of WS 1.30  
Cylinder Volume (ft<sup>3</sup>) 0.010

### Moisture / Density

Tare Number 800  
Wt. of Tare & WS (gm) 472.53  
Wt. of Tare & DS (gm) 430.25  
Wt. of Tare (gm) 103.90  
Wt. of Water (gm) 42.28  
Wt. of DS (gm) 326.35

Wet Density (pcf): 130.4

Moisture Content (%): 13.0  
Dry Density (pcf): 115.4

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Geotechnics Representative : J SCHIFF

*JAS*

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Day: Tuesday  
 Date: 8.14.12  
 Log No.: 4  
 Page: 1 of 1



### Daily Field Report

<b>Project Name:</b> Davidson County Landfill	<b>Project No.:</b> 2012
<b>Client Name:</b> Smith + Gardner Engineering	<b>Client Contact:</b> Pieter Scheer
<b>Site Location:</b> Lexington, NC	<b>Time on Site:</b> Arrived: 8:30 AM Departed: 3:15PM
<b>General Contractor:</b> Davidson County Landfill	<b>Superintendent:</b> Steven Sinks

#### Other Firms / Sub-Contractor Represented On Site

<u>Firm / Sub-Contractor</u>	<u>Representative's Name and Title</u>

**Weather Conditions:** Sunny **Temperature:** 93

**Contractor's Equipment:** CAT D4H Bulldozer (1), CAT 826C quad drum sheepsfoot compactor (1), CAT 345B excavator (1).

**Contractor's Personnel:** 2

#### Description of Daily Activities & Events

- Geotechnics representative arrived at jobsite.
- Operator placed fill material in embankment area @ phase 4 of landfill.
- Fill was placed, compacted, then tested for required compaction.
- Drive cylinder testing method was performed.
- Geotechnics representative departed jobsite.

**Prepared By:** AG **Date:** 8.14.12 **Checked By:** *AMS* **Date:** 8/24

Day: Wed  
 Date: 8.15.12  
 Log No.: 5  
 Page: 1 of 1



### Daily Field Report

<b>Project Name:</b>	Davidson County Landfill	<b>Project No.:</b>	2012
<b>Client Name:</b>	Smith + Gardner Engineering	<b>Client Contact:</b>	Pieter Scheer
<b>Site Location:</b>	Lexington, NC	<b>Time on Site:</b>	<b>Arrived:</b> 9:00 AM <b>Departed:</b> 1:00PM
<b>General Contractor:</b>	Davidson County Landfill	<b>Superintendent:</b>	Steven Sinks

#### Other Firms / Sub-Contractor Represented On Site

<u>Firm / Sub-Contractor</u>	<u>Representative's Name and Title</u>

**Weather Conditions:** Sunny **Temperature:** 90

**Contractor's Equipment:** CAT D4H Bulldozer (1), CAT 826C quad drum sheepsfoot compactor (1), CAT 345B excavator (1).

**Contractor's Personnel:** 2

#### Description of Daily Activities & Events

- Geotechnics representative arrived at jobsite.
- Operator placed fill material in embankment and berm area @ phase 4 of landfill.
- Fill was placed, compacted, then tested for required compaction.
- Drive cylinder testing method was performed.
- Geotechnics representative departed jobsite.

**Prepared By:** AG **Date:** 8.15.12 **Checked By:** *MWS* **Date:** 8/24

Day: Friday  
 Date: 8.17.12  
 Log No.: 6  
 Page: 1 of 1



### Daily Field Report

<b>Project Name:</b> Davidson County Landfill	<b>Project No.:</b> 2012
<b>Client Name:</b> Smith + Gardner Engineering	<b>Client Contact:</b> Pieter Scheer
<b>Site Location:</b> Lexington, NC	<b>Time on Site:</b> Arrived: 9:15 AM Departed: 1:00PM
<b>General Contractor:</b> Davidson County Landfill	<b>Superintendent:</b> Steven Sinks

#### Other Firms / Sub-Contractor Represented On Site

<u>Firm / Sub-Contractor</u>	<u>Representative's Name and Title</u>

**Weather Conditions:** Sunny **Temperature:** 87

**Contractor's Equipment:** CAT D4H Bulldozer (1), CAT 826C quad drum sheepsfoot compactor (1), CAT 345B excavator (1).

**Contractor's Personnel:** 2

#### Description of Daily Activities & Events

- Geotechnics representative arrived at jobsite.
- Operator placed fill material in embankment and berm area @ phase 4 of landfill.
- Fill was placed, compacted, then tested for required compaction.
- Drive cylinder testing method was performed.
- Geotechnics representative departed jobsite.

**Prepared By:** AG **Date:** 8.17.12 **Checked By:** *MS* **Date:** 8/24



Client: Smith + Gardner Engineering  
 Project Name : Davidson County LF  
 Project Number :



Report Number : **FDR-04**  
 Date (s) : 8.13-8.19.12

**Drive Cylinder - ASTM D 2937**

**Test Information**

Test Number :	DC-01	DC-02	DC-03
Nuclear Test Number :			
Location:	Phase 4	Phase 4	Phase 4
Depth (ft):	1.0'SG	1.0'SG	SG
Date :	8.14.12	8.14.12	8.14.12

**Mold**

Cylinder ID	#2	#2	#2
Weight of Cylinder (lbs.)	1.33	1.33	1.33
Volume of Cylinder (ft <sup>3</sup> )	0.033	0.033	0.033

**Specimen**

Wt. of Cylinder & WS (lbs.)	5.57	5.79	5.61
Wt. of Cylinder (lbs.)	1.33	1.33	1.33
Wt. of WS	4.24	4.46	4.28
Cylinder Volume (ft <sup>3</sup> )	0.033	0.033	0.033

**Moisture / Density**

Tare Number	#887	#887	#887
Wt. of Tare & WS (gm)	278.00	373.80	156.00
Wt. of Tare & DS (gm)	254.20	355.00	136.60
Wt. of Tare (gm)	0.00	195.20	
Wt. of Water (gm)	23.80	18.80	19.40
Wt. of DS (gm)	254.20	159.80	136.60
Wet Density (pcf):	128.5	135.2	129.7
Moisture Content (%):	9.4	11.8	14.2
Dry Density (pcf):	117.5	120.9	113.6

Geotechnics Representative : Abram Gaeta

*AG*

**Client:** Smith & Gardner Engineering  
**Project Name :** Davidson County Landfill  
**Project Number :**



**Report Number :** FDR-04  
**Date (s) :** 8.15.12

### Drive Cylinder - ASTM D 2937

#### Test Information

Test Number :	DC-04	DC-05	DC-06
Nuclear Test Number :			
Location:	Phase 4	Phase 4	Phase 4
Depth (ft):	3.0'SG	1.0'SG	2.0'SG
Date :	8.15.12	8.15.12	8.15.12

#### Mold

Cylinder ID	#2	#2	#2
Weight of Cylinder (lbs.)	1.33	1.33	1.33
Volume of Cylinder (ft <sup>3</sup> )	0.033	0.033	0.033

#### Specimen

Wt. of Cylinder & WS (lbs.)	5.72	5.79	5.51
Wt. of Cylinder (lbs.)	1.33	1.33	1.33
Wt. of WS	4.39	4.46	4.18
Cylinder Volume (ft <sup>3</sup> )	0.033	0.033	0.033

#### Moisture / Density

Tare Number	#887	#887	#887
Wt. of Tare & WS (gm)	235.20	200.40	204.60
Wt. of Tare & DS (gm)	208.80	176.00	182.60
Wt. of Tare (gm)	0.00		
Wt. of Water (gm)	26.40	24.40	22.00
Wt. of DS (gm)	208.80	176.00	182.60
Wet Density (pcf):	133.0	135.2	126.7
Moisture Content (%):	12.6	13.9	12.0
Dry Density (pcf):	118.1	118.7	113.0

Geotechnics Representative : Abram Gaeta

*AGS*

**Client:** Smith & Gardner Engineering  
**Project Name :** Davidson County Landfill  
**Project Number :**



**Report Number :** FDR-04  
**Date (s) :** 8.17.12

**Drive Cylinder - ASTM D 2937**

**Test Information**

Test Number :	DC-07	DC-08	DC-09
Nuclear Test Number :			
Location:	Phase 4	Phase 4	Phase 4
Depth (ft):	1.0'SG	SG	SG
Date :	8.17.12	8.17.12	8.17.12

**Mold**

Cylinder ID	#2	#2	#2
Weight of Cylinder (lbs.)	1.33	1.33	1.33
Volume of Cylinder (ft <sup>3</sup> )	0.033	0.033	0.033

**Specimen**

Wt. of Cylinder & WS (lbs.)	5.50	5.66	5.58
Wt. of Cylinder (lbs.)	1.33	1.33	1.33
Wt. of WS	4.17	4.33	4.25
Cylinder Volume (ft <sup>3</sup> )	0.033	0.033	0.033

**Moisture / Density**

Tare Number	#887	#887	#887
Wt. of Tare & WS (gm)	200.20	208.20	206.00
Wt. of Tare & DS (gm)	178.20	193.60	187.00
Wt. of Tare (gm)	0.00		
Wt. of Water (gm)	22.00	14.60	19.00
Wt. of DS (gm)	178.20	193.60	187.00
Wet Density (pcf):	126.4	131.2	128.8
Moisture Content (%):	12.3	7.5	10.2
Dry Density (pcf):	112.5	122.0	116.9

Geotechnics Representative : Abram Gaeta

*AG*

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Day: Tuesday  
 Date: 9/25/2012  
 Log No.: 7  
 Page: 1 of 1



### Daily Field Report

<b>Project Name:</b> Davidson County LF C&D	<b>Project No.:</b> 2012-686
<b>Client Name:</b> Richardson Smith Gardner & Associates	<b>Client Contact:</b> Mr. Pieter Scheer
<b>Site Location:</b> Lexington, NC	<b>Time on Site:</b> Arrived: 915 Departed: 1230
<b>General Contractor:</b> Davidson County	<b>Superintendent:</b> Steve Sink
<b>Other Firms / Sub-Contractor Represented On Site</b>	
<u>Firm / Sub-Contractor</u>	<u>Representative's Name and Title</u>
<b>Weather Conditions:</b> Sunny	<b>Temperature:</b> 80
<b>Contractor's Equipment:</b> 1-Cat 345B Backhoe, 1-Cat D4 Dozer, 1-Cat 825 Sheepsfoot compactor	
<b>Contractor's Personnel:</b> Mark-Machine operator	
<b>Description of Daily Activities &amp; Events</b>	
<ul style="list-style-type: none"> <li>▪ Geotechnics rep. arrived on-site and made contact with Steve Sink, Operations manager of the Davidson land fill.</li> <li>▪ Fill was place on East Berm of Phase 4</li> <li>▪ 8 to 12 inch lift of fill (brown, moist, fine silty, clayey sand (SC) was placed and compacted using the trash compactor and tracks of the backhoe.</li> <li>▪ Perfomed 4 Nuclear Moisture/Density tests and all met the 95% density required</li> <li>▪ Not having enough fill to complete the job, Mr. Steve Sink indicated he would need to haul more material to the fill site and would contact us for further testing in a couple days.</li> <li>▪ Drive cylinder, sample was obtained for gauge verification and proctor selection.</li> <li>▪ The undersigned departed the site at 12:30 and returned to the office where drive cylinder soil samples were submitted for soil testing.</li> </ul>	
<b>Prepared By:</b> MB	<b>Date:</b> 9/25/2012 <b>Checked By:</b> <i>MB</i> <b>Date:</b> 9/26



Davidson Co. L.F.

2012 -

9-25-12

*G. M. & B. Bledley*

**LEGEND**

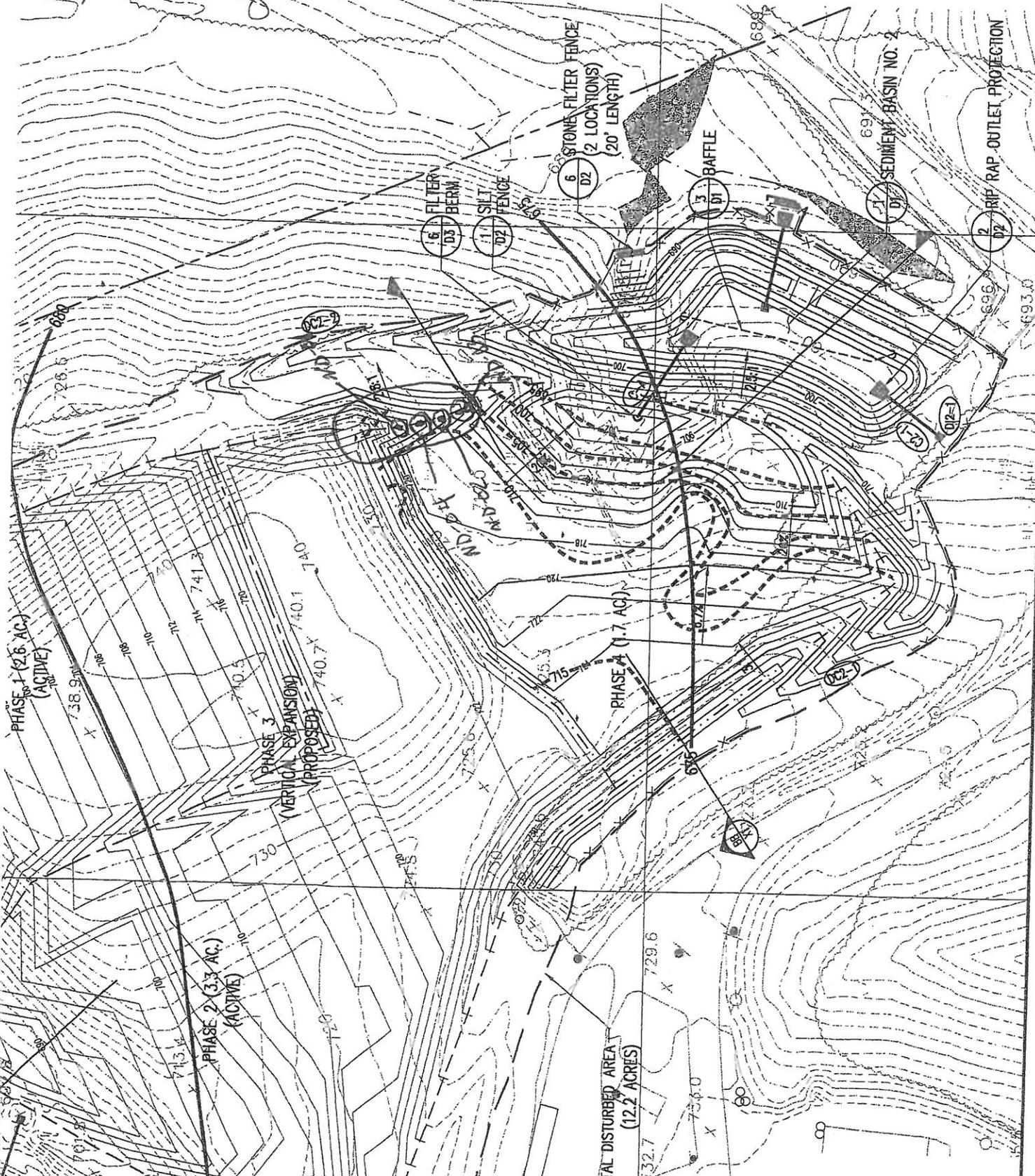
- EXISTING 10' CONTOUR (SEE REF)
- EXISTING 2' CONTOUR
- PROPOSED 10' CONTOUR (SEE A)
- PROPOSED 2' CONTOUR
- TOP OF BEDROCK CONTOUR
- SEASONAL HIGH GROUNDWATER SURFACE CONTOUR
- PROPERTY LINE
- LIMIT OF UWER EXISTING LINED
- APPROXIMATE EXISTING WASTE UNITS (UNBOUND UNITS)
- PROPOSED LANDFILL AREAS
- LIMIT OF DISTURBANCE
- SILT FENCE
- WETLAND BOUNDARY (SEE REF)
- STREAM (SEE REFERENCE 2)

**NOTES**

1. GRADES SHOWN REPRESENT SURGRADE ELEVATIONS.
2. CULVERT A (C-A) IS A TEMPORARY PIPE FOR DRAINAGE PRIOR TO THE PLACEMENT OF WASTE. THIS CULVERT SHALL BE REMOVED BY EITHER REMOVING ONE OR MORE SECTIONS LEAVING THE REMAINING PIPE COMPLETELY OR BY REMOVING THE PIPE IN ITS ENTIRETY AND REPAIRING THE BERM.

**REFERENCES**

1. OVERALL TOPOGRAPHY PER NORTH CAROLINA DEPARTMENT OF TRANSPORTATION CONTOUR AND ELEVATION DATA GENERAL LIGHT DETECTION AND RANGING (LIDAR) DATA OBTAINED FROM NORTH CAROLINA FLOOD MAPPING PROGRAM AND DATED 5/2004. TOPOGRAPHY IN ACTIVE GAD AND MSW AREAS FROM DATA AERIAL DATED 5/27/10.
2. WETLANDS AND STREAM LOCATIONS ON SOUTHEAST SIDE C LANDFILL FROM DELINEATION PERFORMED BY CAROLINA EQ INC. FEBRUARY 2009, AND SURVEYED BY MICHAEL GREEN ASSOCIATES, P.A., FEBRUARY 2009.



Client: R.S.G & ASSOCIATES  
Project Name : DAVIDSON CO. LF C&D  
Project Number : 2012-686-01



Report Number : **FDR-05**  
Date (s) : 9/25/12

## Drive Cylinder - ASTM D 2937

### Test Information

Test Number : DC-01  
Nuclear Test Number : ND-04  
Location: E. BERM  
Depth (ft): -3'  
Date : 25-Sep

### Mold

Cylinder ID 1  
Weight of Cylinder (lbs.) 1.32  
Volume of Cylinder (ft<sup>3</sup>) 0.033

### Specimen

Wt. of Cylinder & WS (lbs.) 5.70  
Wt. of Cylinder (lbs.) 1.32  
Wt. of WS 4.38  
Cylinder Volume (ft<sup>3</sup>) 0.033

### Moisture / Density

Tare Number 308  
Wt. of Tare & WS (gm) 940.00  
Wt. of Tare & DS (gm) 864.51  
Wt. of Tare (gm) 88.48  
Wt. of Water (gm) 75.49  
Wt. of DS (gm) 776.03

Wet Density (pcf): 132.7

Moisture Content (%): **9.7**  
Dry Density (pcf): **121.0**

Geotechnics Representative :

M BLACKLEY

*MB*

Day: Wednesday  
 Date: 10/10/2012  
 Log No.: 8  
 Page: 1 of 1



### Daily Field Report

<b>Project Name:</b>	Davidson County LF C&D	<b>Project No.:</b>	2012-686
<b>Client Name:</b>	Richardson Smith Gardner & Associates	<b>Client Contact:</b>	Mr. Pieter Scheer
<b>Site Location:</b>	Lexington, NC	<b>Time on Site:</b>	Arrived: 930 Departed: 1140
<b>General Contractor:</b>	Davidson County	<b>Superintendent:</b>	Steve Sink
<b>Other Firms / Sub-Contractor Represented On Site</b>			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
<b>Weather Conditions:</b>	Sunny	<b>Temperature:</b>	70
<b>Contractor's Equipment:</b>	1-Cat 345B Backhoe, 1-Cat D4 Dozer, 1-Cat 825 Sheepsfoot compactor		
<b>Contractor's Personnel:</b>	Mark-Machine operator		
<b>Description of Daily Activities &amp; Events</b>			
<ul style="list-style-type: none"> <li>▪ Geotechnics rep. arrived on-site and made contact with Steve Sink, Operations manager of the Davidson land fill.</li> <li>▪ Fill was place on East Berm of Phase 4</li> <li>▪ 8 to 12 inch lift of fill (brown, moist, fine silty, clayey sand (SC) was placed and compacted using the trash compactor and tracks of the backhoe.</li> <li>▪ Perfomed 2 Nuclear Moisture/Density tests and all met the 95% density required</li> <li>▪ Not having enough fill to complete the job, Mr. Steve Sink indicated he would need to haul more material to the fill site and would contact us for further testing in a couple days.</li> <li>▪ Drive cylinder, sample was obtained for gauge verification and proctor selection.</li> <li>▪ The undersigned departed the site at 11:40 and returned to the office where drive cylinder soil samples were tested.</li> </ul>			
<b>Prepared By:</b>	MB	<b>Date:</b>	10/10/2012
		<b>Checked By:</b>	<i>MM</i>
		<b>Date:</b>	10/17





Client: R.S.G & ASSOCIATES  
Project Name : DAVIDSON CO. LF C&D  
Project Number : 2012-686-01

Report Number : FDR-06  
Date (s) : 10/10/12

### Drive Cylinder - ASTM D 2937

#### Test Information

Test Number : DC-01  
Nuclear Test Number : ND-02  
Location: E. BERM  
Depth (ft): -0-  
Date : 25-Sep

#### Mold

Cylinder ID 1  
Weight of Cylinder (lbs.) 1.32  
Volume of Cylinder (ft<sup>3</sup>) 0.033

#### Specimen

Wt. of Cylinder & WS (lbs.) 5.64  
Wt. of Cylinder (lbs.) 1.32  
Wt. of WS 4.32  
Cylinder Volume (ft<sup>3</sup>) 0.033

#### Moisture / Density

Tare Number 829  
Wt. of Tare & WS (gm) 935.01  
Wt. of Tare & DS (gm) 869.56  
Wt. of Tare (gm) 260.67  
Wt. of Water (gm) 65.45  
Wt. of DS (gm) 608.89

Wet Density (pcf): 130.9

Moisture Content (%): 10.7

Dry Density (pcf): 118.2

Geotechnics Representative :

M BLACKLEY

Project # 2012 P. 484  
 Davidson Co., L.F.  
 10-10-12

MSB

**LEGEND**

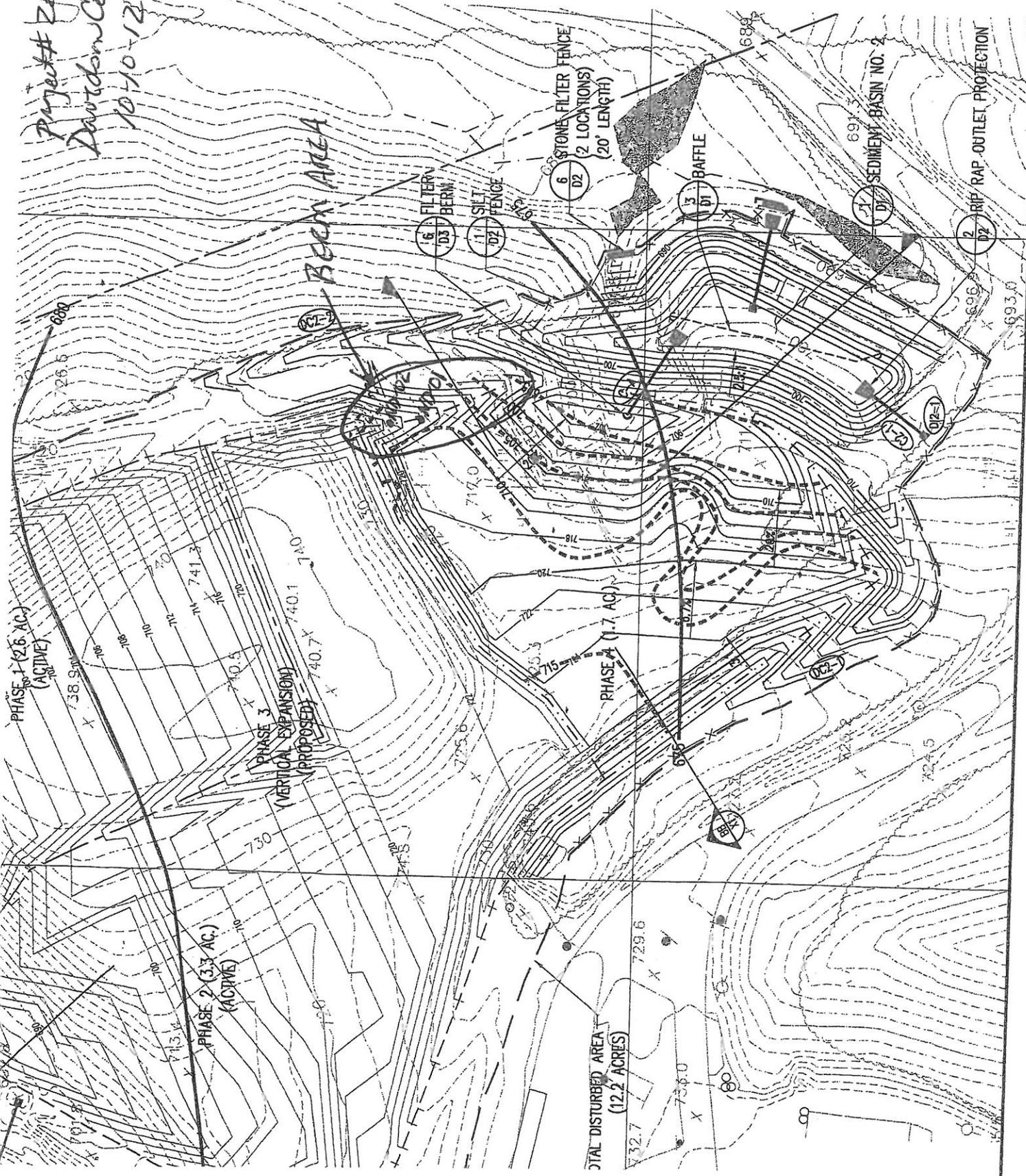
	EXISTING 10' CONTOUR (SEE REF)
	EXISTING 2' CONTOUR
	PROPOSED 10' CONTOUR (SEE 1)
	PROPOSED 2' CONTOUR
	TOP OF BEDROCK CONTOUR
	SEASONAL HIGH GROUNDWATER SURFACE CONTOUR
	PROPERTY LINE
	LIMIT OF LINER (EXISTING LINED)
	APPROXIMATE EXISTING WASTE LIMITS (UNLINED UNITS)
	PROPOSED LANDFILL AREAS
	LIMIT OF DISTURBANCE
	SILT FENCE
	WETLAND BOUNDARY (SEE REF)
	STREAM (SEE REFERENCE 2)

**NOTES**

- GRID'S SHOWN REPRESENT SUBGRADE ELEVATIONS.
- CULVERT A (C-A) IS A TEMPORARY PIPE FOR DRAINAGE C PRIOR TO THE PLACEMENT OF WASTE. THIS CULVERT SHA ABANDONED BY EITHER REMOVING ONE OR MORE SECTIONS GROUTING THE REMAINING PIPE COMPLETELY OR BY REINFORCING PIPE IN ITS ENTIRETY AND REPAIRING THE BERM.

**REFERENCES**

- OVERALL TOPOGRAPHY PER NORTH CAROLINA DEPARTMENT OF TRANSPORTATION AND ELEVATION DATA GENERAL LIGHT DETECTION AND RANGING (DLDR) DATA OBTAINED FROM NORTH CAROLINA FLOOD MAPPING PROGRAM AND DATED 5/2004. TOPOGRAPHY IN ACTIVE GAB AND ASH AREAS FROM DATA AERIAL DATED 5/27/04.
- WETLANDS AND STREAM LOCATIONS ON SOUTHEAST SIDE C LANDFILL FROM REVISION PERFORMED BY CAROLINA ED INC. FEBRUARY 2009. AND STORED BY MICHAEL GREEN ASSOCIATES, P.A., FEBRUARY 2008.



Day: Thurs.  
 Date: 10.23.12  
 Log No.: 8  
 Page: 1 of 1



## Daily Field Report

<b>Project Name:</b> Davidson County C&D LF		<b>Project No.:</b> 2012-686	
<b>Client Name:</b> Smith & Gardner Eng.		<b>Client Contact:</b> Mr. Pieter Scheer	
<b>Site Location:</b> Lexington, NC		<b>Time on Site:</b> Arrived: 10:45am Departed: 2:45pm	
<b>General Contractor:</b> Davidson County		<b>Superintendent:</b> Steven Sink	
<b>Other Firms / Sub-Contractor Represented On Site</b>			
<u>Firm / Sub-Contractor</u>		<u>Representative's Name and Title</u>	
<b>Weather Conditions:</b> Clear		<b>Temperature:</b> 75	
<b>Contractor's Equipment:</b> 1-Cat 345B Trackhoe, 1-Cat 825 Sheepsfoot compactor			
<b>Contractor's Personnel:</b> 1			
<b>Description of Daily Activities &amp; Events</b>			
<ul style="list-style-type: none"> <li>▪ Geotechnics rep. arrived on-site and made contact with Steve Sink, Operations manager of the Davidson land fill.</li> <li>▪ Geotechnics rep. performed three nuclear density tests and one drive cylinder test on fill being placed in the South East corner of the East berm.</li> <li>▪ Mr. Sink was informed of passing density tests.</li> <li>▪ This visit completed the East berm fill area.</li> <li>▪ Geotechnics rep. departed the site.</li> </ul>			
<b>Prepared By:</b> JRB		<b>Date:</b> 10.24.12	
		<b>Checked By:</b>	
		<b>Date:</b> 10.24.12	





**Client:** R.S.G & ASSOCIATES  
**Project Name :** DAVIDSON CO. LF C&D  
**Project Number :** 2012-686-01

**Report Number :** **FDR-07**  
**Date (s) :** 10.23.12

## **Drive Cylinder - ASTM D 2937**

### **Test Information**

**Test Number :** DC-01  
**Nuclear Test Number :** ND-03  
**Location:** E. BERM  
**Depth (ft):** -0-  
**Date :** 10.23.12

### **Mold**

**Cylinder ID** 1  
**Weight of Cylinder (lbs.)** 1.32  
**Volume of Cylinder (ft<sup>3</sup>)** 0.033

### **Specimen**

**Wt. of Cylinder & WS (lbs.)** 5.51  
**Wt. of Cylinder (lbs.)** 1.32  
**Wt. of WS** 4.19  
**Cylinder Volume (ft<sup>3</sup>)** 0.033

### **Moisture / Density**

**Tare Number** 303  
**Wt. of Tare & WS (gm)** 682.63  
**Wt. of Tare & DS (gm)** 627.07  
**Wt. of Tare (gm)** 111.32  
**Wt. of Water (gm)** 55.56  
**Wt. of DS (gm)** 515.75

**Wet Density (pcf):** 127.0

**Moisture Content (%):** **10.8**  
**Dry Density (pcf):** **114.6**

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Geotechnics Representative : M BLACKLEY

Davidson Co. L.F.  
 2012-686  
 10-23-12

MRB

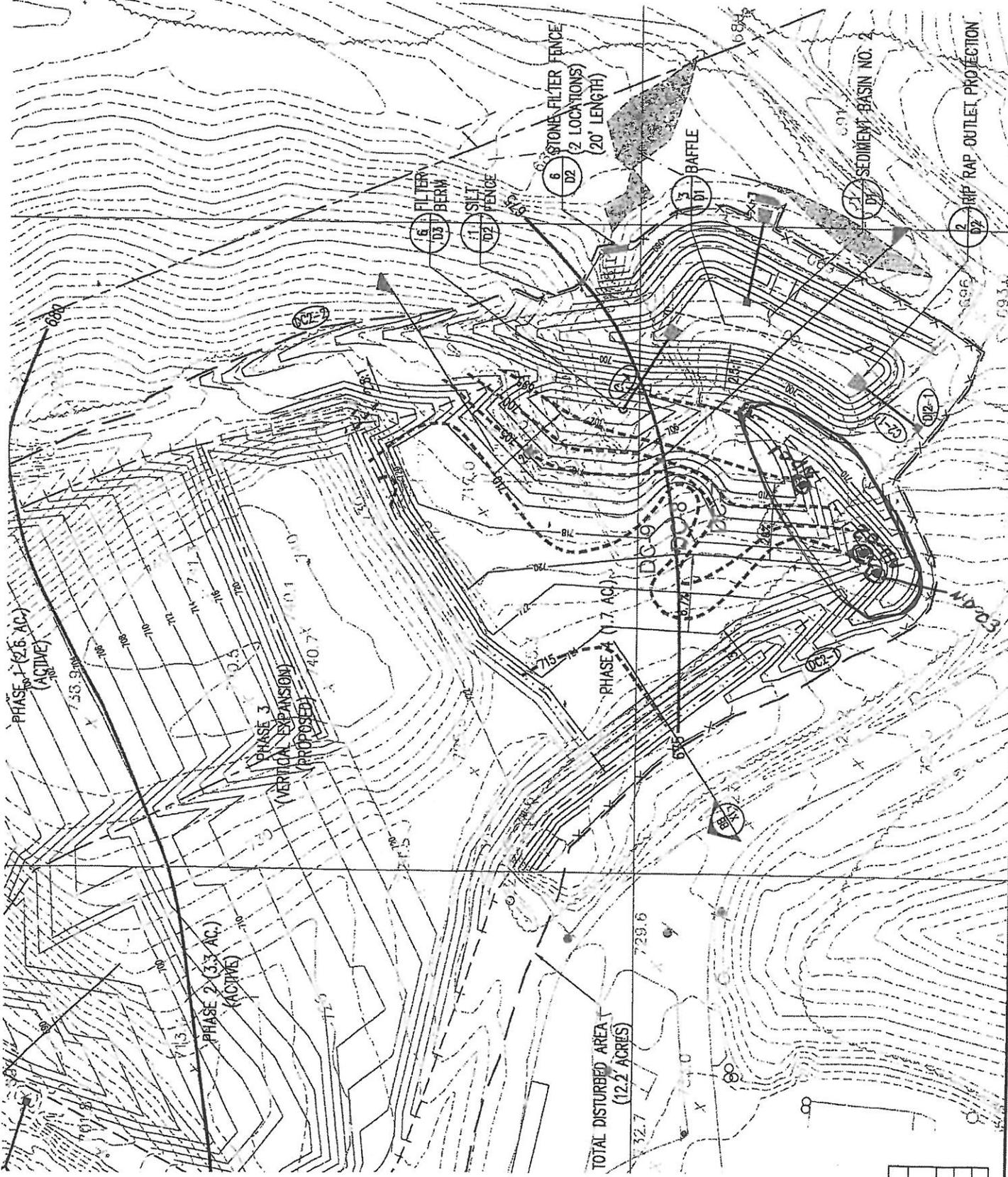
LEGEND	DESCRIPTION
---	EXISTING 10' CONTOUR (SEE REF)
---	EXISTING 2' CONTOUR
---	PROPOSED 10' CONTOUR (SEE 1)
---	PROPOSED 2' CONTOUR
---	TOP OF BEDROCK CONTOUR
---	SEASONAL HIGH GROUNDWATER SURFACE CONTOUR
---	PROPERTY LINE
---	LIMIT OF LNER (EXISTING LINED)
---	APPROXIMATE EXISTING WASTE LIMITS (UNLINKED UNITS)
---	PROPOSED LANDFILL AREAS
---	LIMIT OF DISTURBANCE
---	SILT FENCE
---	WETLAND BOUNDARY (SEE REF)
---	STREAM (SEE REFERENCE 2)

**NOTES**

- GRADES SHOWN REPRESENT SUBGRADE ELEVATIONS
- CULVERT A (C-A) IS A TEMPORARY PIPE FOR DRAINAGE (PRIOR TO THE PLACEMENT OF WASTE) AND SHALL BE ABANDONED BY EITHER REPAIRING ONE OR MORE SECTIONS GROUPING THE REMAINING PIPE COMPLETELY OR BY REPAIRING PIPE IN ITS ENTIRETY AND REPAIRING THE BERM.

**REFERENCES**

- OVERALL TOPOGRAPHY FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, CONTOUR AND ELEVATION DATA GENERAL LIGHT DETECTION AND RANGING (DLDR) DATA OBTAINED IN NORTH CAROLINA FLOOD MAPPING PROGRAM AND DATED 5/2004. TOPOGRAPHY IN ACTIVE CAD AND MSW AREAS FROM DATA AERIAL DATED 5/27/10.
- WETLANDS AND STREAM LOCATIONS ON SOUTHEAST SIDE (LANDFILL FROM DEMONSTRATION PERFORMED BY CAROLINA EC INC., FEBRUARY 2009, AND SURVEYED BY MICHAEL GREEN ASSOCIATES, P.A., FEBRUARY 2009).



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# **Appendix F**

## **Record Drawing**

**Construction Quality Assurance Report  
Davidson County C&D Landfill - Phase 4  
Davidson County, North Carolina**

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