

Permit No.	Date	Document ID No.
06-03	July 14, 2010	11131



RICHARDSON SMITH GARDNER & ASSOCIATES

Engineering and Geological Services

July 13, 2010

Mr. Allen Gaither
Environmental Engineer II
NC DENR - Solid Waste Section
2090 U.S. Highway 70
Swannanoa, North Carolina 28778

RE: Phase 3 Cells 1 and 2 Construction Report
Avery County C & D Landfill
NC Solid Waste Permit No. 06-03

Dear Mr. Gaither:

On behalf of Avery County, Richardson Smith Gardner & Associates (RSG) is hereby submitting the **enclosed** Phase 3 Cells 1 and 2 Construction Quality Assurance (CQA) Report (two (2) hard copies and one (1) electronic) at the above referenced site for your review and approval. Additionally, please find an updated financial assurance estimate (**attached**) to include the permitted areas for Phases 1, 2, and 3 (Cells 1 and 2). Upon approval of this estimate, the County will update their financial test.

We appreciate your attention and we are prepared to respond immediately to any questions or concerns regarding this application. Please feel free to contact us by phone at (919) 828-0577 or by email below.

Sincerely,

Richardson Smith Gardner & Associates, Inc.

Richard M. Sheehan, E.I.
Staff Engineer, Ext. 139
richard@rsgengineers.com



Stacey A. Smith, P.E.
Project Manager, Ext. 127
stacey@rsgengineers.com

SAS/rms

Att.

Cc: Mr. Henry "Buddy" Norris, Avery County Solid Waste Department
Mr. Bill Wagner, NCDENR
File

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DATE: 13-Jul-10
BY: SAS

Avery County C&D Landfill (NC SW Permit No. 06-03)
Engineer's Closure Construction Cost Estimate

Item No.	Item Description	Unit	Contractor			Comments
			Quantity	Unit Price	Total Price	
Closure Area (Horizontal Plan) ---->		AC	7.19			
1.0	Pre-Construction			Subtotal	\$18,595.00	
1.1	Construction Documents & Bidding	AC	7	\$15k + \$500/AC	\$18,595.00	RSG Estimate
2.0	Construction				\$320,314.50	References 1 and 2.
2.1	Surveys and Layout	AC	7	\$1,000.00	\$7,190.00	RSG Historical Estimate
2.2	Mobilization	AC	7	\$1,000.00	\$7,190.00	~4% of Construction Cost
2.3	Site Preparation (repairs to intermediate cover layer)	AC	7	\$1,000.00	\$7,190.00	Assumed estimate for repair of erosion rills.
2.4	18" On-site Low Permeability Soil	CY	17,400	\$8.00	\$139,198.40	RSG Estimate
2.5	18" Vegetative Support Layer	CY	17,400	\$4.50	\$78,299.10	RSG Estimate
2.6	Landfill Gas Venting System	AC	7	\$2,500.00	\$17,975.00	RSG Estimate
2.7	Cap Drainage Structures (berms, piping, etc.)	AC	7	\$5,000.00	\$35,950.00	RSG Historical Estimate
2.8	Erosion & Sediment Control (grading, silt fence, maintenance, etc.)	AC	7	\$800.00	\$5,752.00	RSG Historical Estimate
2.9	Revegetation	AC	7	\$3,000.00	\$21,570.00	Site Historical Estimate
3.0	Quality Assurance, Certification, & Deed Notation				\$47,061.50	
3.1	Field Monitoring	AC	7	\$3,000.00	\$21,570.00	RSG Estimate
3.2	Laboratory Testing	AC	7	\$2,500.00	\$17,975.00	RSG Estimate
3.3	Engineering Certification	AC	7	\$5k + \$250/AC	\$6,797.50	RSG Estimate
3.4	Surveying and Deed Notation	AC	7	\$100.00	\$719.00	RSG Historical Estimate
4.0	Miscellaneous Costs to Close				\$8,987.50	
4.1	Erosion and Stormwater Control (outside landfill footprint)	AC	7	\$1,000.00	\$7,190.00	RSG Historical Estimate
4.2	Engineering and Reporting	AC	7	\$250.00	\$1,797.50	RSG Historical Estimate
5.0	Total Closure Costs					
Construction Estimate ---->					\$394,959	
Cost per Acre ---->					\$54,932	
Total Estimate ---->					\$394,959 (2010\$) (See Note 1)	

Notes:

- All costs are presented in current dollars and should be increased at an inflation rate of prescribed by the NCDENR Division of Waste Management per <http://portal.ncdenr.org/web/wm/sw/financialassurance> if additional review is not performed annually.
- This ESTIMATE has been prepared for financial assurance purposes only and shall not be considered a replacement for an actual bid from a licensed contractor and is considered acceptable within a +/- 10% of the Total Estimate value.

References:

- Avery County Construction and Demolition Landfill Phase III Permit to Construct Application by Richardson Smith Gardner & Associates, Inc. dated February 2009 with revisions through August 2009.
- Correspondence dated March 17, 2010 regarding approval of the site suitability including lateral expansion of Phase 2 following purchase of the Lechler parcel to Mr. Buddy Norris, Avery County from Mr. Zinith Barbee, NCDENR.

■ Denotes values calculated in spreadsheet.

**Avery County C&D Landfill (NC SW Permit No. 06-03)
Engineer's Post Closure Estimate**

Item	Quantity	Unit	Comments
Groundwater Monitoring			
Monitoring wells	4	wells	Reference 1
Surface water point	2	points	Reference 1
Sampling frequency	2	events	Reference 1
Field sampling, collection, and shipping	\$800	per event	RSG estimate
Laboratory Analysis	\$325	per well	RSG estimate
Data review, statistics, and reporting	\$2,000	per event	RSG estimate
Maintenance and repair	\$1,000	per well	RSG historical estimate
Subtotal Cost	\$13,500	per year	
Landfill Gas Management			
Control System Vents	7	vents	Per Ref. 1 (pro-rated @ one (1) per acre)
Sub-Surface Monitoring Probes	4	probes	Per Ref. 1
Control system monitoring, maintenance and repair	\$50	per vent per year	RSG estimate
Semi-Annual Perimeter Monitoring	\$50	per probe per year	RSG estimate
Subtotal Cost	\$560	per year	Averaged over post-closure period
Final Cover Management			
Area of maintenance	7.19	acres	Extends to area immediately around landfill.
Mowing	\$100	per acre	Site historical estimate
Erosion and sediment control maintenance	\$200	per acre	Site historical estimate
Topdressing (seed & fertilizer)	\$150	per acre	Site historical estimate
Vector and rodent control	\$10	per acre	Site historical estimate
Maintenance mobilization	\$1,000	per year	Site historical estimate
Subtotal Cost	\$4,307	per year	
Administration, Inspections, and Reporting			
Administration and record keeping	\$1,000	per year	Site historical estimate
Inspection	\$1,000	per year	Site historical estimate
Miscellaneous engineering	\$1,500	per year	Site historical estimate
Subtotal Cost	\$3,500	per year	
Total Post-Closure Costs			
Estimated Average Annual Costs	\$21,867	per year (2010\$)	
Number of Years for Post-Closure	30	years (see Note 1)	
Total Post Closure Costs	\$656,007	(2010\$) (See Note 2)	

Notes:

- All costs are presented in current dollars and should be increased at an inflation rate of prescribed by the NCDENR Division of Waste Management per <http://portal.ncdenr.org/web/wm/sw/financialassurance> if additional review is not performed annually.
- This ESTIMATE has been prepared for financial assurance purposes only and shall not be considered a replacement for an actual bid from a licensed contractor and is considered acceptable within a +/- 10% of the Total Estimate value.

References:

- Avery County Construction and Demolition Landfill Phase III Permit to Construct Application by Richardson Smith Gardner & Associates, Inc. dated February 2009 with revisions through August 2009.

Denotes values calculated in spreadsheet.

Construction Quality Assurance Report

Avery County C&D Landfill NC Solid Waste Permit No. 06-03 Phase III – Cells 1 & 2 Construction

Prepared for:



Avery County
175 Linville Street
Newland, North Carolina

Prepared by:



14 N. BOYLAN AVENUE
RALEIGH, NORTH CAROLINA 27603

NC LIC. No. C0828 (ENGINEERING)

July 2010



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CONSTRUCTION QUALITY ASSURANCE REPORT

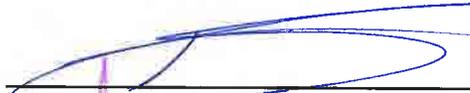
AVERY COUNTY C&D LANDFILL Phase 3 - Cells 1 & 2 Construction NC Solid Waste Permit No. 06-03 Avery County, North Carolina

Prepared for:



Avery County C&D Landfill
Spruce Pine, North Carolina

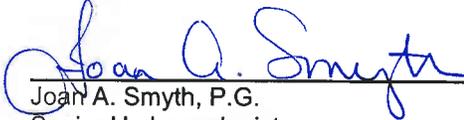
RSG Project No. Avery-09-4


Richard M. Sheehan, E.I.
Project Engineer

7/13/10


Stacey A. Smith, P.E.
Project Manager




Joan A. Smyth, P.G.
Senior Hydrogeologist

7/13/10



July 2010

**CONSTRUCTION QUALITY ASSURANCE REPORT
 AVERY COUNTY C&D LANDFILL
 PHASE 3 - CELLS 1 & 2 CONSTRUCTION**

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TABLES

Table 1 Summary of Material Control and Record Tests - Structural Fill

APPENDICES

Appendix A Facility Permits

- A.1 Permit to Construct - Phase 3 - Cell 1
- A.2 Stormwater Management Plan Permit Approval
- A.3 Trout Stream Buffer Zone Waiver
- A.4 General Permit (Regional and Nationwide) - U.S. Army Corps of Engineers

Appendix B As-Built Surveys

Appendix C Construction Photographs

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Appendix E	Material Testing
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1.0 INTRODUCTION

This Construction Quality Assurance (CQA) Report has been prepared to document the CQA activities performed during the construction of Phase 3 - Cells 1 and 2 (as shown in **Figure 1**) at the Avery County Construction and Demolition (C&D) landfill in Spruce Pine, North Carolina.

The landfill is located at 2175 Brushy Creek Road, Spruce Pine, NC, approximately 1.8 miles northeast of the intersection of Highway 19 East and Brushy Creek Road or 1.5 miles northeast from the Avery County Airport. The landfill is owned and operated by Avery County under NC Solid Waste Permit No. 06-03. The most current Permit To Construct was issued on October 16, 2009. A copy of the current Permit to Construct is provided in **Appendix A.1**.

2.0 REFERENCE DOCUMENTS

Phase 3 - Cells 1 and 2 were constructed in accordance with the following documents with modifications provided herein as **Appendix A**.

1. **Construction Permit - Avery County Construction and Demolition Landfill - Permit No. 06-03 - Permit To Construct C&D Landfill Phase 3** by NCDENR Division of Waste Management, Solid Waste Section, dated October 16, 2009. (A copy of the permit is provided in **Appendix A.1**)
2. **Phase III Permit to Construct Application** - prepared by Richardson Gardner & Associates (RSGA) dated February 17, 2009, revised August 7, 2009.
3. **Stormwater Management Plan** - Avery County C&D Landfill Permit 06-03, prepared by Richardson Smith Gardner & Associates (RSGA) dated May 2009, approved by NCDENR Division of Land Resources, Land Quality Section, August 19, 2009. (A copy of the permit is provided in **Appendix A.2**)
4. **Trout Stream Buffer Zone Waiver** - Approval granted by NCDENR Division of Land Resources, Land Quality Section, May 1, 2009. (A copy of the permit is provided in **Appendix A.3**)
5. **General Permit (Regional and Nationwide) Verification - U.S. Army Corps of Engineers Permit No. 2008-03130** issued November 9, 2008. (A copy of the permit is provided in **Appendix A.4**)

3.0 SCOPE OF PROJECT

The Avery County C&D facility permit for Phase 3 includes a total footprint of approximately 2.1 acres. Prior to the construction of Phase 3 - Cells 1 and 2, a pre-construction meeting was held and a summary of these minutes can be found **Appendix G**. Construction of Phase 3 - Cells 1 & 2 includes a lined area of approximately **1.27 acres**, located immediately between existing Phases 1 and 2 and north of the existing access road that transverses the site.

Construction of Cells 1 and 2 disposal area included (from subgrade up):

- Approximately 540 feet of underdrain installed over the existing stream, consisting of NCDOT No. 57 stone column which is 25 feet in width by five (5) feet in height (at a minimum) and is wrapped with a six (6) ounce Type-S geotextile fabric;
- Minimum of one (1) foot of soil cover;
- Geosynthetic Clay Liner (GCL) installed over the footprint of all underdrain areas and extends 10 feet past boundaries of underdrain with a two (2) foot turndown;
- Minimum of two (2) feet of soil cover.

In addition to the construction within the disposal area, Cells 1 and 2 construction included:

- Temporary diversion channels;
- Temporary diversion berms;
- Temporary side slope swale over Phase 2;
- Culvert pipes and drop inlets;
- Central access road construction;
- Stream buffer restoration (including pipe removal); and,
- Site entrance landscaping.

A summary of major milestones associated with the construction of Cell 1 is provided in **Table A** (below).

Table A - Major Milestones Cell 1 Construction

Date	Task
December 4, 2009	Project Pre-Construction Meeting
December 7, 2009	Contractor Mobilization
December 20, 2010	Erosion & Sediment Control
February 16, 2010	Access Road Construction
February 25, 2010	Underdrain Installation
March 25, 2010	Underdrain Completed
April 10, 2010	GCL Placement
April 11, 2010	Protective Cover Placement Complete
June 8, 2010	Stormwater Measures Complete
June 10, 2010	Access Road Complete
June 26, 2010	Final Completion

4.0 PROJECT PARTICIPANTS

The following major parties were involved in the Cell 1C-2 construction:

Owner	<u>Avery County Solid Waste Department</u> 175 Linville Street Newland, NC 28657 Phone: (828) 737-5420 Contact: Henry “Buddy” Norris, Solid Waste Director buddy.norris@ncmail.net
Engineer	<u>Richardson Smith Gardner & Associates, Inc.</u> 14 N. Boylan Avenue Raleigh, NC 27603 Phone: (919) 828-0577 Fax: (919) 828-3899 Contacts: Richard Sheehan, E.I., Staff Engineer richard@rsgengineers.com Stacey Smith, P.E., Project Manager stacey@rsgengineers.com Joan A. Smyth, P.G. joan@rsgengineers.com
Contractor	<u>Blue Ridge Grading & Trucking, Inc.</u> 20 East US HWY 19E Bypass Burnsville, NC 28714 Phone: (828) 678-3600 Fax: (838) 678-3601 Contacts: T. Russell Fox, President ah334@yahoo.com Ryan Hoilman, Superintendent
Surveying	<u>Ed Holmes and Associates Land Surveyors, PA</u> 1567 Patton Avenue Asheville, NC 28806 Phone: (828) 225-6562 Fax: (828) 225-6579 Contacts: Marvin Secrest, PLS marvin@edholmessurveying.com

Soil Testing

Kessel Engineering Group
582 Hendersonville Road
Suite One, Lower Level
Asheville, NC 28803
Phone: (828) 277-6351
Fax: (828) 277-6355
Contacts: Bill Daley, Field Technician
bill@thekesselgroup.com

Regulatory Agency

North Carolina Department of Environment and Natural Resources - Solid Waste Section
2090 U.S. Highway 70
Swannanoa, NC 28778
Phone: (828) 296-4500
Contacts: Allen Gaither, Environmental Engineer
allen.gaither@ncdenr.gov
Bill Wagner, Environmental Senior Specialist
bill.wagner@ncdenr.gov

5.0 CONSTRUCTION SUMMARY

5.1 Site Preparation

The construction of Phase 3 - Cells 1 and 2 began in December 2009 with the surveying/staking of clearing limits, the initiation of clearing and grubbing areas to be used as a borrow source, and erosion and sedimentation control measures taken to eliminate the potential of impacting the stream areas. The construction activities also initiated with excavating the stream impact area in order to install the stone column and allowing all base waters to continue to flow.

5.2 Erosion and Sedimentation Control Measures

The construction of erosion and sedimentation control measures began in conjunction with site clearing activities and under site permits issued by the Land Quality Section of the NCDENR Division of Land Resources (**Reference Document 3**). Silt fencing was added where required in cleared areas as well as areas needing additional protection. Temporary diversion berms, temporary diversion channels, and culverts were added as areas were brought to grade.

5.3 Underdrain Installation

Upon initiating construction, excavation occurred in the Phase 3 - Cells 1 and 2 area in order to install the underdrain. If unsuitable material or soft saturated soils were encountered, these areas were undercut and backfilled with clean structural material. As depicted in the construction drawings, the underdrain consists of a No. 57 stone column 25 feet in width by 5 feet in height (at a minimum). The stone column is wrapped with a

Type GT-S geotextile fabric. The underdrain area was then covered with a minimum of one (1) feet of approved subgrade material. Geosynthetic Clay Liner (GCL) was then installed over all areas of underdrain extending 10 feet behind all areas of stone and trenched in two (2) feet. A minimum of two (2) feet of prepared subgrade was then placed over the GCL as the cell was brought to grade.

5.4 General Earthwork

Once the underdrain was installed most embankment activities began with placement of soil in the cell and road areas. Fill material was placed in the cell in lifts beginning from the north end and working towards the south end. In conjunction with the placement of fill material in the cell, structural fill was also placed in order to bring the access road to grade.

Once fill placement reached plan grades and elevations, the cell area was surveyed by Ed Holmes and Associates Land Surveyors, PA to document subgrade elevations. An as-built drawing showing completed elevations is provided in **Appendix B**.

Kessel Engineering provided both field and laboratory testing in accordance with the Construction Quality Assurance Manual further discussed in **Section 7.0** of this report.

5.5 Buffer Restoration Areas

All proposed Buffer Restoration Areas were cleaned from silt, seeded, and matted in accordance with the project drawings and specifications. According to planting recommendations, the ideal time for planting is in November. Therefore planting in the stream buffer areas was postponed and shall be done under a separate scope of work.

5.6 Photographic Documentation

Photographs documenting the construction of Phase 3 - Cells 1 and 2 can be found in **Appendix C**.

6.0 CQA PROGRAM

6.1 Scope of Services

In satisfying the requirements of the Project CQA Manual for the construction project, the following activities were performed:

- Observation and documentation of construction of erosion and sediment control measures, excavation and structural fill activities.
- Field and/or laboratory testing of structural fill.
- Review of submittals from the Contractor for conformance with project specification and CQA requirements.
- Preparation of the final CQA report.

7.0 EARTHWORK CQA

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

- Materials: SM, SP, SC, ML, MH, CL-ML, 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 (98% under roads and structures) (ASTM D 698);
- Moisture Content: As necessary for compaction; and
- Lift Thickness: 8-inch max. (compacted).

The number and results of material control and record tests performed on the structural fill by Kessel Engineering is summarized in **Table 1 (Structural Fill)**. 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 19,400 CY of material placed (in-place measure). The results of field and laboratory testing of structural fill can be found in **Appendix D**.

8.0 GEOSYNTHETIC CLAY LINER (GCL) CQA

8.1 Material Approval

The proposed geosynthetic clay liner (GCL) product was reviewed by the CQA Engineer. The proposed GCL was Bentomat ST, manufactured by Colloid Environmental Technologies Company (CETCO), of Arlington Heights, Illinois. Due to a shortage of Bentomat ST in completing the GCL portion of this project, two (2) additional rolls of Bentomat DN were ordered and installed. RSG reviewed and approved the Bentomat DN product which met or exceeded all specifications. The rolls were manufactured at CETCO's facility in Farimont, Georgia. Copies of selected product submittals for these products are presented in **Appendix E.1**.

8.2 Manufacturer's Quality Control Submittals

The manufacturer's quality control submittals for the specific rolls to be delivered to the site were reviewed prior to shipping the GCL. Copies of these certificates are in **Appendix E.1**. Based on the manufacturer's conformance tests, all material met or exceeded the project specifications.

8.3 Material Control Testing

The GCL is a permanent barrier which was placed above the stone underdrain. There is a minimum of one (1) foot of soil material separating the top of the underdrain from the

GCL material. Control testing for this material was performed by Geotechnics in Pittsburgh, Pennsylvania. Copies of the test data can be found in **Appendix E.1**.

9.0 DRAINAGE AGGREGATE CQA

9.1 Material Approval

RSG reviewed and approved the drainage aggregate product submittals provided by Blue Ridge Grading & Trucking, Inc. The selected stone was a No. 57 stone as supplied by Vulcan Materials Company of Spruce Pine, North Carolina.

9.2 Manufacturer's Quality Control Submittals

RSG reviewed and approved Vulcan's carbonate content and gradation certificates upon delivery to the site. Copies of these certificates can be found in **Appendix E.2**.

10.0 GEOTEXTILE CQA

10.1 Material Approval

RSG reviewed and approved the geotextile product submittals provided by Blue Ridge Grading & Trucking, Inc. The selected material was TerraTex NO6 (Type GT-S geotextile) as supplied by Boone Geo-matrix Supply of Boone, North Carolina and manufactured by Skaps. A copy of the TerraTex N06 geotextile product specification sheet can be found in **Appendix E.3**.

10.2 Manufacturer's Quality Control Submittals

RSG reviewed and approved Terra Tex's (provided by Skaps) quality control certificates upon delivery to the site (see **Appendix E.3**).

11.0 MODIFICATIONS

During construction, it is typically necessary to make modifications to the design and construction documents to accommodate field conditions, enhance design components, and/or improve constructability based on practical considerations. In the case of Phase 3 - Cell 1, the following design modifications were issued and are included in **Appendix F**:

1. Design Modification No. 1 issued March 30, 2010 to address construction areas in which additional undercut of unsuitable materials was required as well as extend underdrain in areas where seepage was encountered.

12.0 AS-BUILT SURVEY

After the completion of construction, an as-built survey was conducted by Ed Holmes and Associates Land Surveyors, PA and compared with permitted contours. All final grading, within the limits of certification, were within tolerances (± 0.15 feet). An as-built drawing is provided in **Appendix B**.

13.0 PROJECT CERTIFICATION

13.1 Geologist's Certification

Upon completion of excavation and grading of the designed subgrade at the Avery County C&D Landfill Phase 3 - Cells 1 and 2, Ms. Joan A. Smyth, P.G. conducted an inspection of the site. Her inspection indicated the soils at the grade elevations are consistent with those encountered during site drilling (silts clays and sands). No unexpected soil types or geologic features were encountered during construction or at the designed grade.

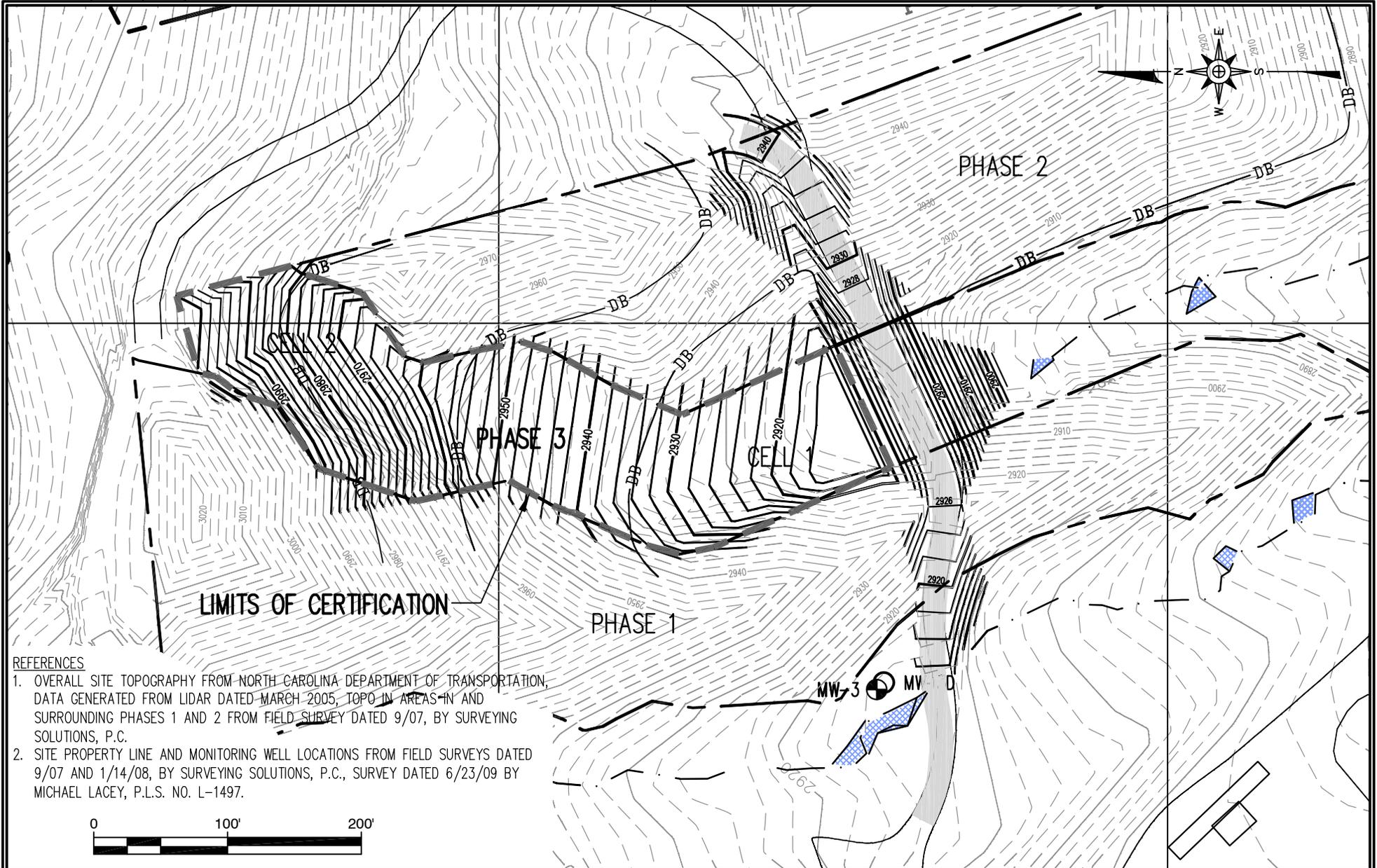
13.2 Engineer's Certification

Based on the observations and results of the CQA program documented herein, it is our professional opinion that the construction of Cells 1 and 2 of Phase 3 of the Avery 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 3;
- iii. Acceptable engineering practices.

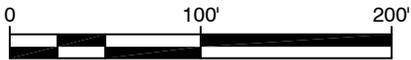
FIGURE 1

Limits of Certification



REFERENCES

1. OVERALL SITE TOPOGRAPHY FROM NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, DATA GENERATED FROM LIDAR DATED MARCH 2005, TOPO IN AREAS IN AND SURROUNDING PHASES 1 AND 2 FROM FIELD SURVEY DATED 9/07, BY SURVEYING SOLUTIONS, P.C.
2. SITE PROPERTY LINE AND MONITORING WELL LOCATIONS FROM FIELD SURVEYS DATED 9/07 AND 1/14/08, BY SURVEYING SOLUTIONS, P.C., SURVEY DATED 6/23/09 BY MICHAEL LACEY, P.L.S. NO. L-1497.



**AVERY COUNTY C&D LANDFILL
PHASE III - CELL 1
LIMITS OF CERTIFICATION**

DRAWN BY: C.T.J.	CHECKED BY: S.A.S.	SCALE: AS SHOWN	FIGURE NO. 1
DATE: Jul. 2010	PROJECT NO. AVERY 09-4	FILE NAME AVERY-A0141	



**RICHARDSON SMITH GARDNER
& ASSOCIATES**

14 N. Boylan Ave.
Raleigh, N.C. 27603

NC LIC. NO. C-0828 (Engineering)
www.rsgengineers.com

ph: 919-828-0577
fax: 919-828-3899

TABLE 1

Summary of Material Control and Record Tests - Structural Fill

**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
Units	-----	% Std. Proctor	%
Test Method	ASTM D 698	ASTM D 2922	ASTM D 3017
Required Test Frequency	5,000 CY per each soil	20,000 ft ² per lift & 1 per 500 LF of Berms (<200 ft. base width)	20,000 ft ² per lift & 1 per 500 LF of Berms < 200 base width)
No. of Tests Required	4	32	32
No. of Tests Performed	4	52	52
Specified Value	-----	≥ 95% Std. Proctor	As Required for Density
Minimum Value	-----	95.0	- 1.6% Opt.
Maximum Value	-----	100.0	+ 5.1% Opt.
Average Value	-----	96.8	+ 1.6 % Opt.
Quantity of Structural Fill (In-Place):		19,400 CY	

Notes:

All soil test data provided by Kessel Engineering and reviewed by RSG Engineers.

APPENDIX A

Facility Permits

APPENDIX A.1

Permit to Construct - Phase 3 - Cell 1



Facility Permit No: 06-03
Permit to Construct and Operate
Construction & Demolition Debris Landfill
Avery County
October 16, 2009
Doc ID: 8705
Page 1 of 12

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

SOLID WASTE MANAGEMENT LANDFILL FACILITY
Permit No. 06-03

AVERY COUNTY
is hereby issued a

PERMIT TO OPERATE
CONSTRUCTION & DEMOLITION DEBRIS LANDFILL PHASES 1 AND 2
PERMIT TO CONSTRUCT
CONSTRUCTION & DEMOLITION DEBRIS LANDFILL PHASE 3

Located at 2175 Brushy Creek Road, Spruce Pine, North Carolina in Avery 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.

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

ATTACHMENT 1

PART I: PERMITTING HISTORY

1. On October 25, 1996 a Permit to Construct/Operate was issued for a Construction and Demolition Debris landfill.
2. On October 16, 2009 an amendment was made to the permit for construction of Phase 3 and continued operation of Phases 1 and 2 for waste mitigation and relocation purposes.

Permit Type	Date Issued	DIN
Original Permit to Construct/Operate	October 25, 1996	
Permit Amendment	October 16, 2009	8705

PART II: LIST OF DOCUMENTS FOR THE APPROVED PLAN

NO.	DOCUMENT DESCRIPTION	DOCUMENT ID NO.
1.	<i>Trout Stream Buffer Variance Request and 401/404 Nationwide Permit No. 39 Application, Avery County C&D Landfill Expansion.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. September 2008.	5911
2.	<i>Transition Application, Avery County Landfill.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. October 23, 2008.	6095
3.	<i>Waste Relocation and Mitigation Plan, Avery County C&D Landfill.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. October 2008.	6097
4.	<i>Response to Comments-Transition Application.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. January 9, 2009.	6625
5.	<i>Permit To Construct Application, Phase III, Avery County C&D Landfill.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. February 2009.	6894
6.	<i>Letter of Approval with Modifications, Avery County C&D Landfill-Stormwater Management Plan.</i> Prepared by: Starr Silvis. Prepared for: Division of Land Resources, Land Quality Section. June 9, 2009.	7943
7.	<i>Response to Engineering Technical Review, Permit To Construct, Construction and Demolition Landfill Phase III.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. August 7, 2009.	8220

8.	<i>Stormwater Management Plan Modification, Permit To Construct, Avery County C&D Landfill Expansion.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. August 31, 2009.	8557
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PART III: PROPERTIES APPROVED FOR THE SOLID WASTE FACILITY

Avery County, N.C. Register of Deeds				
Book	Page	Acreage	Grantee	Parcel No.
266	646	±78.12	Avery County	182100088310
Total Site Acreage: ±78.12 acres				

Notes:

1. Deed book references are from the Avery County Register of Deeds office GIS website (<http://arcims.webgis.net/nc/avery/default.asp>) accessed September, 2009.

PART IV: GENERAL PERMIT CONDITIONS

1. 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 October 16, 2009. 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 at the facility 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 of any landfill unit/cell 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. (Intentionally blank)
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 3 consisting of approximately 2.1 acres with a calculated gross capacity of approximately 129,000 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 Division of Air Quality and local fire department must approve the activity prior to burning.
20. The following conditions must be met prior to operation of the Phase 3:
 - a. The Permittee must obtain a Permit to Operate for Phase 3 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 3.
 - f. The 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

ATTACHMENT 3
CONDITIONS OF PERMIT TO OPERATE

PART I: GENERAL FACILITY CONDITIONS

1. (Intentionally blank)
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 and maintained with permanent physical markers.

Operational Requirements

4. This facility is permitted to receive solid waste generated within Avery County, consistent with the local government waste management plan and with local government approval except where prohibited by the N. C. General Statutes Article 9 of Chapter 130A, and the rules adopted by the Commission for Health Services.
5. The C&D landfill units are permitted to receive the following waste types:
 - a. "Construction or demolition debris" as defined in NCGS 130A-290 (a)(4) means solid waste resulting solely from construction, remodeling, repair or demolition operations on pavement, buildings, or other structures, but does not include inert debris, land-clearing debris or yard debris.
 - b. "Inert debris" as defined in NCGS 130A-290 (a)(14) means solid waste that consists solely of material such as concrete, brick, concrete block, uncontaminated soil, rock, and gravel.
 - c. "Land-clearing debris" as defined in NCGS 130A-290 (a)(15) means solid waste that is generated solely from land-clearing activities, such as stumps and tree trunks.
 - d. "Asphalt" in accordance with NCGS 130-294(m).
6. 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.
7. 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.
8. 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

9. Groundwater, surface water, and landfill gas monitoring locations must be established and monitored as identified in the approved plans.
10. A licensed geologist must be present to supervise installation of groundwater and landfill gas monitoring wells and probes. The location, screen interval, spacing, diameter, depth, seal, cap, clustering and nesting, and other criteria for the wells must be established after consultation with the SWS Hydrogeologist at the time of well installation.
11. 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.
12. 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.
13. 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, surfacewater, landfill gas, and leachate analytical data must be kept as part of the permanent facility record.
14. A readily accessible unobstructed path must be cleared and maintained so that four-wheel vehicles may access monitoring well locations at all times.

15. 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 groundwater, surfacewater, landfill gas, and leachate sampling location must be kept as part of the permanent facility record.
16. All well construction records and soil boring logs for new wells and probes must be submitted to the Solid Waste Section Hydrogeologist for review within 30 days of completion.
17. 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.
18. 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.
19. 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

Not Applicable

PART III: CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS

- 20. This permit approves the continued operation of Phases 1 and 2, as well as the onsite environmental management and protection facilities as described in the approved plans.
- 21. The facility is only approved to receive material generated during waste relocation in accordance with the Waste Relocation and Mitigation Plan as listed in Attachment 1, Part II: List of Documents for the Approved Plan, Document No. 3.
- 22. 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.

MSW Unit	Acres	Gross capacity (cubic yards)	Status
Phase 1	2.95	10,800	Closed
Phase 2	2.06	11,500	Closed
Phase 3, Cell 1	0.84	49,000	Future
Phase 3, Cell 2	0.36	47,000	Future
Phase 3, Cell 3	0.90	33,000	Future
Total	7.11	151,300	

- 23. 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).
- 24. 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.

25. 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 pursuant to 15A NCAC 13B .1628.
26. 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

Not Applicable

- *End of Permit Conditions* -

APPENDIX A.2

Stormwater Management Plan Permit Approval



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

September 14, 2009

LETTER OF APPROVAL WITH MODIFICATIONS

Avery County
ATTN: Henry C. Norris, Solid Waste Director
Post Office Box 640
Newland, North Carolina 28657

RE: Project Name: Avery County C&D Landfill –
Stormwater Management Plan – Modification

Acres Approved: 15
Project ID: AVERY-2009-003
County: Avery
Street and City: Brushy Creek Road, Toe River
River Basin: Catawba
Stream Classification: c, Tr
Latitude: 35.9619 Longitude: -81.9719
Submitted By: Richardson, Smith, Gardner & Associates, Inc
Date Received by LQS: 5/20/2009 and 9/1/2009
Plan Type: Revision

Dear Mr. Norris:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable with modifications and hereby issue this letter of Approval With Modifications. The Modifications Required for Approval are listed on the attached page. 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.

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

2090 US Highway 70, Swannanoa, North Carolina, 28778-8211
Telephone 828-296-4500 Fax 828-299-7043
www.enr.state.nc.us

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One
North Carolina
Naturally

North Carolina's Sedimentation Pollution Control Program is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, it is determined that 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 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 have 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 **William Beck** or myself if you plan to have a pre-construction conference.

Your cooperation is appreciated.

Sincerely,



Starr Silvis, PE
Land Quality Section

Enclosures: Certificate of Approval
Modifications Required for Approval
NPDES Permit

cc: Richardson, Smith, Gardner & Associates, Inc

MODIFICATIONS REQUIRED FOR APPROVAL

Project Name: Avery County C&D Landfill - Stormwater Management Plan - Modification
Project ID: AVERY-2009-003
County: Avery
Reviewed By: Starr Silvis, PE

1. Diversions are necessary to direct flow into Sediment Basin 4. All flow must be directed into the inlet of the sediment basin.
2. Appropriate sediment control measures in accordance with *The State of North Carolina Erosion and Sediment Control Planning and Design Manual* shall be constructed in the area between the creek and Phase 2 upslope of the road crossing and in the vicinity of the road crossing.
3. This plan approval is valid for portions of the project outside the required trout buffer zone. Work may not be initiated inside the trout buffer zone without written approval from the director of the Division of Land Resources. A copy of Trout Buffer Zone Waiver dated May 1, 2009, is on file in the Asheville Regional Office.
4. All silt fence shall be designed and constructed in accordance with *The State of North Carolina Erosion and Sediment Control Planning and Design Manual Practice Standards and Specification 6.62*.
5. Rolled erosion control fabric is required on all slopes completed between the dates of October 15th and March 15th.
6. Skimmer sediment basins shall be designed and constructed in accordance with *The State of North Carolina Erosion and Sediment Control Planning and Design Manual Practice Standards and Specification 6.64*.

APPENDIX A.3

Trout Stream Buffer Zone Waiver



North Carolina Department of Environment and Natural Resources

Division of Land Resources

Land Quality Section

James D. Simons, P.G., P.E.
Director and State Geologist

Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

May 1, 2009

Avery County
Attention: Henry C. Norris, Jr.
P.O Box 640
175 Linville Street
Newland, NC 28657

Subject: Trout Buffer Zone Waiver
Avery County C&D Landfill
Avery County

Dear Mr. Norris:

This office has received your plan for Avery County C&D Landfill, in Avery County, North Carolina. Your plan was submitted to this office for approval because of the proposed encroachments into the buffer zone of designated trout waters. In accordance with NCGS 113A-57(1) and Title 15A NCAC 4B .0125(c) this letter will serve as written approval to encroach on the buffer zone of Unnamed Tributary of Brushy Creek, Class C Trout. This authority has been delegated to me by the Director, Division of Land Resources, James D. Simons, in accordance with NCGS 143B-10. The following conditions will apply to this approval:

1. This approval is based on the plans received April 30, 2009.
2. This approval does not absolve the permittee from compliance with the surface water quality turbidity standard. More protective erosion and sedimentation control measures may be required in order to comply with this water quality standard.

Avery County
May 1, 2009
Page 2 of 2

Your cooperation in protecting our environment is most appreciated. If you have any questions about this approval, please contact me at gray.hauser@ncmail.net or (919) 733-4574.

Sincerely,

A handwritten signature in black ink, appearing to read "T. Gray Hauser, Jr.", written in a cursive style.

T. Gray Hauser, Jr., PE
State Sedimentation Specialist

cc: Janet Boyer, PE, Asheville Regional Engineer
Thomas B. Maier, PE, Richardson Smith Gardner & Associates

APPENDIX A.4

General Permit (Regional and Nationwide) - U.S. Army Corps of Engineers

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action ID. 2008-03130

County: Avery

USGS Quad: Linville Falls

**MODIFICATION TO GENERAL PERMIT (REGIONAL AND NATIONWIDE)
VERIFICATION**

Property Owner / Authorized Agent: Avery County Solid Waste/ Attn: Buddy Norris

Address: P.O. Box 305

Newland, NC 28657

Telephone No.: 828-737-5420

Size and location of property (water body, road name/number, town, etc.): The site is located at 2175 Brushy Creek Road, near Ingles, Avery County, North Carolina.

Description of projects area and activity: This is a modification to an existing permit per the attached request submitted on November 13, 2009. This modification authorizes changes to buffer restoration from 0.74 to 0.72 acres and changes from 40 to 80 linear feet of stream daylighting/restoration. The permit conditions attached to the original verification dated November 9, 2008 still apply.

Applicable Law: Section 404 (Clean Water Act, 33 USC 1344)
 Section 10 (Rivers and Harbors Act, 33 USC 403)
Authorization: Regional General Permit Number:
Nationalwide Permit Number: 39

Your work is authorized by the above referenced permit provided it is accomplished in strict accordance with the attached conditions and your submitted plans. Any violation of the attached conditions or deviation from your submitted plans may subject the permittee to a stop work order, a restoration order and/or appropriate legal action.

This verification will remain valid until the expiration date identified below unless the nationwide authorization is modified, suspended or revoked. If, prior to the expiration date identified below, the nationwide permit authorization is reissued and/or modified, this verification will remain valid until the expiration date identified below, provided it complies with all requirements of the modified nationwide permit. If the nationwide permit authorization expires or is suspended, revoked, or is modified, such that the activity would no longer comply with the terms and conditions of the nationwide permit, activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon the nationwide permit, will remain authorized provided the activity is completed within twelve months of the date of the nationwide permit's expiration, modification or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend or revoke the authorization.

Activities subject to Section 404 (as indicated above) may also require an individual Section 401 Water Quality Certification. You should contact the NC Division of Water Quality (telephone (919) 733-1786) to determine Section 401 requirements.

For activities occurring within the twenty coastal counties subject to regulation under the Coastal Area Management Act (CAMA), prior to beginning work you must contact the N.C. Division of Coastal Management.

This Department of the Army verification does not relieve the permittee of the responsibility to obtain any other required Federal, State or local approvals/permits.

If there are any questions regarding this verification, any of the conditions of the Permit, or the Corps of Engineers regulatory program, please contact Tasha McCormick at 828-271-7980.

Corps Regulatory Official Tasha McCormick 

Date: November 24, 2009

Expiration Date of Verification: November 24, 2010

Permit Number: 2008-03130
Permit Type: NW39 Modification
Name of County: Avery
Name of Permittee: Avery County Solid Waste/ Attn: Buddy Norris
Date of Issuance: November 24, 2009
Project Manager: Tasha McCormick

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Attention: CESAW-RG-A
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

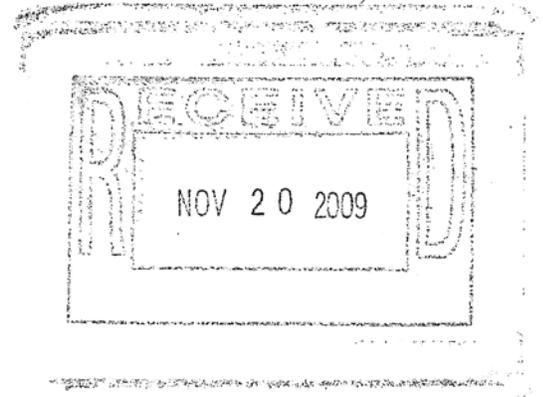
I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

November 13, 2009

Ms. Tasha Alexander
Asheville Regulatory Field Office
U.S. Army Corps of Engineers
151 Patton Avenue
Room 208
Asheville, North Carolina 28801-5006



**RE: Modification Request
Nationwide Permit 39 Pre-Construction Notification
Avery County Landfill Expansion
Newland, North Carolina**

Dear Ms. Alexander;

The purpose of this letter is to request a minor modification of the existing Clean Water Act Section 404 Nationwide Permit (NWP) for the Avery County Landfill expansion (USACE Action ID 2008-03130, DWQ No. 08-1464). As discussed via phone and email correspondence, the proposed changes to the mitigation plan are provided in this letter and on the attached plan sheet. We have included the original mitigation plan sheet as well as the revised plan sheet for comparison purposes. No other changes are proposed to the original permit application.

During the final design and permitting of this project through the NC Division of Waste Management that has occurred in the time since the NWP was issued, there has been a change in the area of waste removal that was required to take place for compliance with solid waste rules. The original proposed buffer restoration was to occur in areas where waste was historically placed beyond permitted boundaries. As can be seen on the attached drawing, there is a reduction in waste removal (and therefore buffer restoration area) on the west side of the stream below the landfill expansion, as the waste in that area was not required to be relocated.

In order to not significantly decrease buffer restoration proposed in the NWP and trout buffer variance, we are proposing to daylight another small existing stream crossing upstream of the one in the original application and restore the buffer in that area instead. This would serve three purposes:

- Provide similar buffer restoration to what was originally proposed: An overall change from 0.74 to 0.72 acres
- Provide an additional 40 feet of stream daylighting/restoration: An overall change from 40 to 80 linear feet
- Enhance stormwater/erosion control on the site by eliminating a potential erosion location at the additional stream crossing.

Based on the 404 and 401 approvals for this project, this change is not decreasing any mitigation component as the buffer restoration was not specifically called out as mitigation. The only change to mitigation would be an increase in the stream daylighting footage and location.

As discussed previously, in order to complete this work an extension of the mitigation schedule through May 30, 2010 is also requested. This extension is necessary due to the time needed to require other pertinent permits this year, and the lack of adequate and predictable planting conditions in the winter months in Avery County.

We would appreciate your consideration of this information during the review of this request. Please contact me at 919-606-1065 or phil.may@carolinaeco.com if you have any questions or require further information.

Sincerely,
Carolina Ecosystems, Inc.

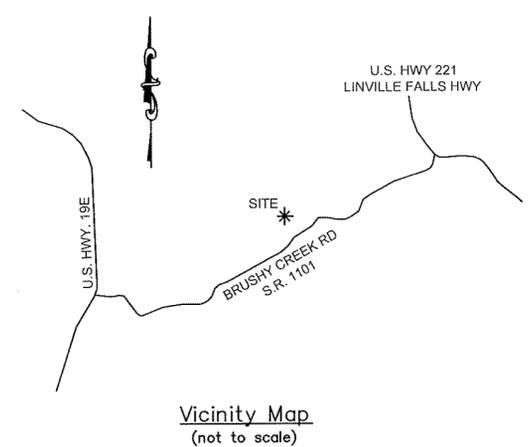
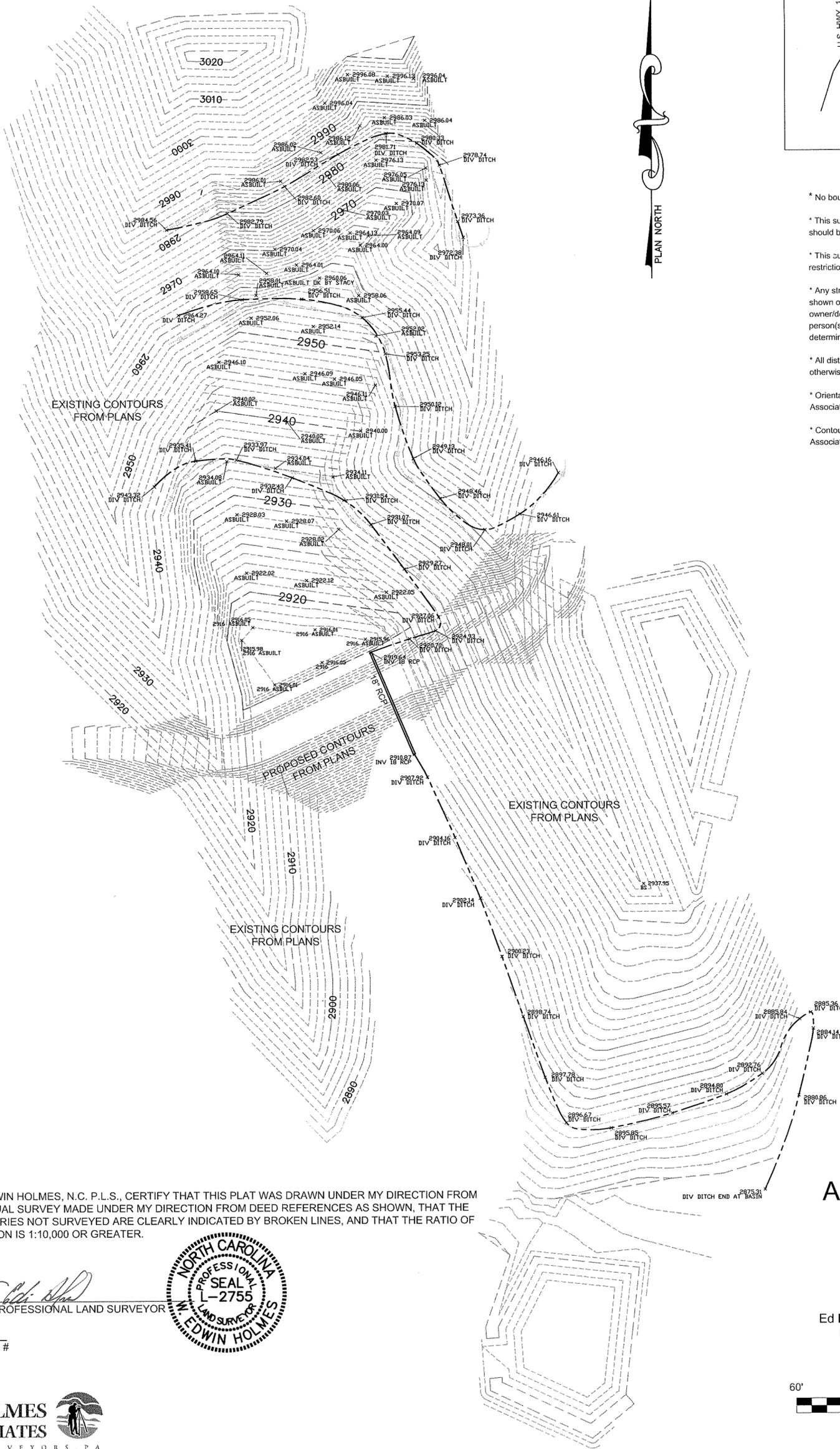


Philip May
Senior Environmental Scientist

Cc: Stacey Smith, P.E., Richardson, Smith, Gardner & Associates, Inc.
Buddy Norris, Avery County Solid Waste Director
Linda Wiggs, NCDWQ Asheville Regional Office
Ian McMillan, NCDWQ 401 Permitting Unit
File

APPENDIX B

As-Built Survey



NOTES

- * No boundary survey of the subject property was conducted at this time.
- * This survey was prepared without benefit of abstract title and matters of title should be referred to an attorney-at-law.
- * This survey may be subject to all rights-of-way, easements, reservations and restrictions, written and unwritten, recorded and unrecorded.
- * Any streams, creeks, ponds, lakes, wetlands, etc. located on this property, shown or not shown hereon, may be subject to buffer areas. It is the owner/developer's responsibility to have the areas designated by person(s)/firm(s) authorized, by the proper authorities, to make such determination.
- * All distances shown hereon are horizontal ground distances unless otherwise noted.
- * Orientation based upon site plans provided by Richardson Smith Gardner & Associates.
- * Contours as shown were taken from site plans provided by Smith Gardner & Associates.

I, W. EDWIN HOLMES, N.C. P.L.S., CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY DIRECTION FROM AN ACTUAL SURVEY MADE UNDER MY DIRECTION FROM DEED REFERENCES AS SHOWN, THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED BY BROKEN LINES, AND THAT THE RATIO OF PRECISION IS 1:10,000 OR GREATER.

W. Edwin Holmes
N.C. PROFESSIONAL LAND SURVEYOR

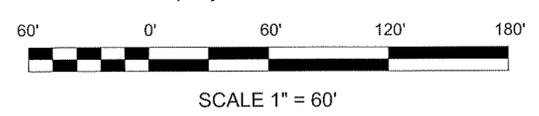


L-2755
LICENSE #

As-Built Survey for
Avery County Landfill

REFERENCES
PIN 182100088310
DEED BOOK 266, PAGE 646
Hinterland Township, Avery County, N.C.
DATE: 6-23-2010 DRAWN BY: P. White
JOB #10005 CHECKED BY: W. E. Holmes

W. Edwin Holmes, PLS
Ed Holmes & Associates Land Surveyors, PA
P.O. Box 17335 Asheville, NC 28816
828.225.6562
Company Licensure # C-2806



APPENDIX C

Construction Photographs



Photo 1 - Initial Condition (December 2009)



Photo 2 - Underdrain Excavation (February 2010)



Photo 3 - Stream Protection on South Side of Access Road (December 2009)



Photo 4 - Culvert Pipe Installation (April 2010)



Photo 5 - Stone Underdrain (March 2010)



Photo 6 - Geosynthetic Clay Liner (GCL) Installation (April 2010)



Photo 7 - Access Road (June 2010)



Photo 8 - Stream Restoration (June 2010)



Photo 9 - Diversion Berms (June 2010)

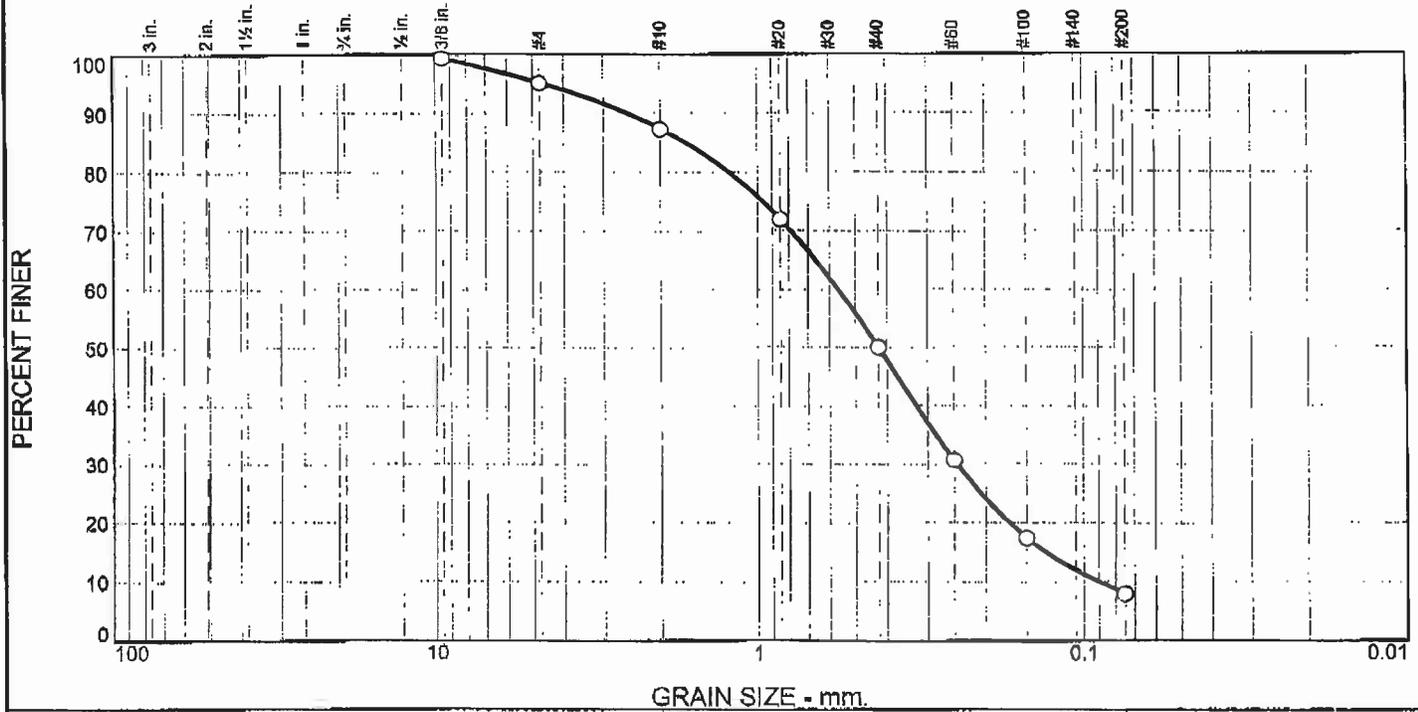


Photo 10 - Phase 3 - Cell 1 Area at Design Grade (June 2010)

APPENDIX D

Earthwork Data

Particle Size Distribution Report



% +3"	% Gravel	% Sand	% Fines
		Coarse	Fine
		37.2	42.0
			8.0

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8	99.3		
#4	95.1		
#10	87.2		
#20	71.9		
#40	50.0		
#60	30.7		
#100	17.4		
#200	8.0		

* (no specification provided)

Material Description

Brown Gray, Micaceous, Silty, Medium to Coarse SAND

Atterberg Limits (ASTM D 4318)

PL= _____ LL= _____ PI= _____

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-1-b

Coefficients

D ₉₀ = 2.5698	D ₈₅ = 1.6900	D ₆₀ = 0.5661
D ₅₀ = 0.4250	D ₃₀ = 0.2447	D ₁₅ = 0.1311
D ₁₀ = 0.0902	C _u = 6.28	C _c = 1.17

Remarks

Date Received: _____ Date Tested: _____

Tested By: _____

Checked By: Bernie Kessel

Title: Principal Engineer

Source of Sample: On Site
Sample Number: 1

Date Sampled: 2-24-10

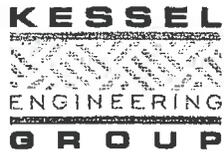
Kessel Engineering Group
Asheville, NC

Client: Blue Ridge Grading
Project: Avery County C&D Landfill

Project No: JA10-1821-01

Figure #1

Tested By: _____



FIELD DENSITY TEST REPORT

Project Name: Avery County C&D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 4/12/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	2							
Maximum Density	100.5							
Optimum Moisture	20.1							
ASTM Procedure	D-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
4	Proctor Check	DT		25.0	95.2	2		95
		DT		21.0	97.8	2	97	95
		DT		19.7	98.8	2	98	95
				19.5	100.5			

OK

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

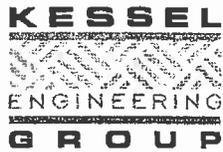
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

KESSEL ENGINEERING GROUP, PLLC

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WWW.THEKESSELGROUP.COM



FIELD DENSITY TEST REPORT

Project Name: Avery County C&D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 4/15/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	2							
Maximum Density	100.5							
Optimum Moisture	20.1							
ASTM Procedure	D-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
2	Proctor Check	DT	-16.0	19.8 19.0	98.5 99.4	2	98	95

Note: Test results represent only the test locations and elevations indicated on the report.

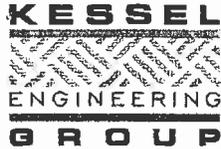
***Test Methods:**

DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D LandfillClient: Blue Ridge GradingProject No: JA10-1821-01Test Date: 4/22/2010

MAXIMUM TEST INFORMATION								
Proctor No.	2							
Maximum Density	100.5							
Optimum Moisture	20.1							
ASTM Procedure	D-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	South Road	DT	-14.0	20.7	97.9	2	97	95
2	South Road	DT	-14.0	21.8	98.3	2	98	95
3	Cell North End	DT	-1.0	21.1	99.1	2	99	95
4	Center of Cell	DT	-1.0	20.2	98.1	2	98	95
5	Proctor Check			19.3	100.9			

Note: Test results represent only the test locations and elevations indicated on the report.

***Test Methods:**

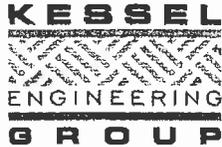
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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WWW.THEKESSELGROUP.COM



FIELD DENSITY TEST REPORT

Project Name: Avery County C&D LandfillClient: Blue Ridge GradingProject No: JA10-1821-01Test Date: 4/22/2010

EXAMPLE OF TEST INFORMATION								
Proctor No.	2							
Maximum Density	100.5							
Optimum Moisture	20.1							
ASTM Procedure	D-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	South Road	DT	-13.0	20.4	97.7	2	97	95
2	Proctor Check			19.6	100.2			

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

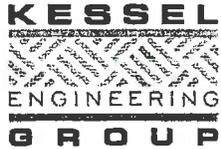
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 5/10/2010

MAXIMUM DENSITY PENETRATION								
Proctor No.	2							
Maximum Density	100.5							
Optimum Moisture	20.1							
ASTM Procedure	D-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	West Side of South Access Road	DT	-12.0	22.5	94.0	2		95
2	East Side of South Access Road	DT	-12.0	27.3	91.3	2		95
3	Proctor Check			19.0	99.4			

RE-TESTED
5-20-10
SMB

OK - WITH IN WASTE LIMIT
RMS

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

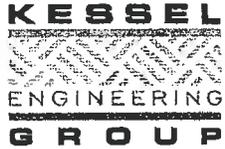
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 5/13/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	3							
Maximum Density	105.0							
Optimum Moisture	18.4							
ASTM Procedure	C-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	Moisture Check			23.8				
2	East Side of South Access Road	DT		23.5	94.3	3	95	95
3	West Side of Access Road	DT		23.1	99.1	3	95	95
4	Moisture Check			25.5				
5	Check Plug			15.6	100.3			

OK WITH IN WASTE LIMITS
P.M.C.

RE-TESTED
5/20/10
HUS

Note: Test results represent only the test locations and elevations indicated on the report.

***Test Methods:**

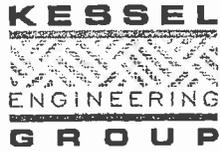
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D LandfillClient: Blue Ridge GradingProject No: JA10-1821-01Test Date: 5/14/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	1	2	3	4				
Maximum Density	96.9	100.5	105.0	105.1				
Optimum Moisture	20.5	20.1	18.4	18.8				
ASTM Procedure	D-698	D-698	C-698	D-698				

KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	Moisture Check			25.0				
2	Cell Check			21.1				
3	Moisture Check							

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

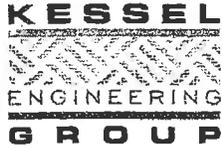
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 5/19/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	3							
Maximum Density	105.0							
Optimum Moisture	18.4							
ASTM Procedure	C-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	East Side of South Access Road	DT	-12.0	23.8	99.5	3	95	95
2	West Side of South Access Road	DT	-12.0	27.2	96.0	3	95	95
3	Center of Cell	DT	-1.0	24.7	95.9	3	95	95
4	Moisture Check			26.8				
5	Check Plug			17.5	105.0			

OK WITHIN WASTE LIMIT
 RE-TESTED 5/20/10
 RE-TESTED 6/8/10
 RLS

Note: Test results represent only the test locations and elevations indicated on the report.

***Test Methods:**

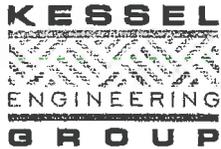
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 5/20/2010

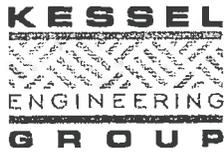
MAXIMUM DENSITY INFORMATION								
Proctor No.	3							
Maximum Density	105.0							
Optimum Moisture	18.4							
ASTM Procedure	C-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	East Side of South Access Road	DT	-12.0	25.0	95.9	3	95	95
2	West Side of South Access Road	DT	-12.0	22.4	99.7	3	95	95
3	South End of Cell	DT	SG	24.2	96.6	3	95	95
4	East Side of South Access Road	DT	-14.0	20.7	104.6	3	100	95
5	Moisture Check			24.6				
6	West Side of South Access Road	DT	-9.0	21.6	100.0	3	95	95
7	East Side of South Access Road	DT	-9.0	23.6	100.3	3	96	95
8	Check Plug			18.7	104.2			

OK WITH IN WASTE LIMITS
RMS

RE-TESTED 6/8/10
RMS

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:
 DT: Drive Tube (ASTM D 2937)
 SC: Sand Cone (ASTM 1556)
 NG: Nuclear Gauge (ASTM D 2922)



FIELD DENSITY TEST REPORT

Project Name: Avery County C&D LandfillClient: Blue Ridge GradingProject No: JA10-1821-01Test Date: 5/24/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.		2						
Maximum Density		100.5						
Optimum Moisture		20.1						
ASTM Procedure		D-698						
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	East Side Access Road	DT	-7.0	21.7	93.8	2		95
2	West Side Access Road	DT	-7.0	21.7	95.9	2	95	95
3	Check Plug			19.9	99.4			

OK WITH-DY LHM15
OF WETT
TRLS

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 5/27/2010

MAXIMUM DENSITY IN OBSERVATION								
Proctor No.		3						
Maximum Density		105.0						
Optimum Moisture		18.4						
ASTM Procedure		C-698						
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	East Side of South Access Road	DT	-5.0	20.6	98.8	3		95
2	West Side of South Access Road	DT	-5.0	20.9	100.8	3	96	95
3	Check Plug			17.4	104.9			

OK WITHIN WASTE LIMITS
RMS

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

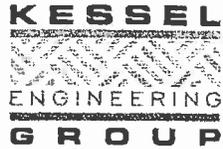
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D LandfillClient: Blue Ridge GradingProject No: JA10-1821-01Test Date: 6/8/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	3							
Maximum Density	105.0							
Optimum Moisture	18.4							
ASTM Procedure	C-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	Cell (See Sketch)	DT		20.4	100.2	3	95	95
2	Check Plug			15.8	105.0			

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

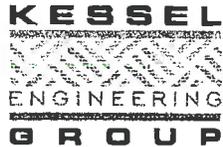
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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FIELD DENSITY TEST REPORT

Project Name: Avery County C&D LandfillClient: Blue Ridge GradingProject No: JA10-1821-01Test Date: 6/8/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	3							
Maximum Density	105.0							
Optimum Moisture	18.4							
ASTM Procedure	C-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	South Entrance Road West (See Sketch)	DT	-1.0	18.6	105.1	3	100+	98
2	South Entrance Road West (See Sketch)	DT		17.9	105.1	3	100+	98
3	South Entrance Road East (See Sketch)	DT	-1.0	22.9	99.9	3		98
4	South Entrance Road East (See Sketch)	DT		22.3	100.1	3		98
5	Cell (See Sketch)	DT	-1.0	20.4	102.3	3	97	95
6	Cell (See Sketch)	DT	-1.0	20.8	102.0	3	97	95
7	Cell (See Sketch)	DT	-1.0	21.1	100.6	3	96	95
8	Cell (See Sketch)	DT	-1.0	20.5	100.9	3	96	95
9	Cell (See Sketch)	DT	-1.0	20.0	100.8	3	96	95
10	Cell (See Sketch)	DT	-1.0	20.2	102.4	3	98	95
11	Cell (See Sketch)	DT		21.2	99.8	3	95	95
12	Cell (See Sketch)	DT		21.0	101.2	3	96	95
13	Cell (See Sketch)	DT		20.7	99.4	3		95
14	Cell (See Sketch)	DT		20.9	100.3	3	96	95
15	Cell (See Sketch)	DT		20.1	101.2	3	96	95

RE-TESTED
6/15/10
OK
RMS

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

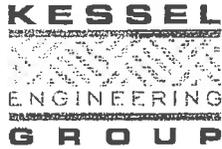
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

KESSEL ENGINEERING GROUP, PLLC

582 HENDERSONVILLE ROAD SUITE ONE | ASHEVILLE NC 28803 | P:(828) 277-6351 F:(828) 277-6355
WWW.THEKESSELGROUP.COM



FIELD DENSITY TEST REPORT

Project Name: Avery County C&D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 6/15/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	4							
Maximum Density	105.1							
Optimum Moisture	18.8							
ASTM Procedure	D-698							
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	West End of South Access Road	DT	SG	20.1	102.2	4		98
2	West End of South Access Road	DT	SG	19.8	103.0	4	98	98
3	East End of South Access Road	DT	SG	18.9	103.0	4	98	98
4	East End of South Access Road	DT	SG	20.5	102.3	4		98
5	West End of South Access Road	DT	SG	20.6	101.3	4		98
6	West End of South Access Road	DT	SG	20.3	102.8	4	98	98
7	East End of South Access Road	DT	SG	19.9	102.9	4	98	98
8	East End of South Access Road	DT	SG	19.7	102.2	4		98

OK RE-TESTED 6/15/10 RUS

OK RE-TESTED 6/15/10 RUS

RE-TESTED 6/15/10 RUS

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

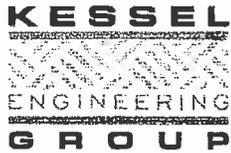
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

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WWW.THEKESSELGROUP.COM



FIELD DENSITY TEST REPORT

Project Name: Avery County C & D LandfillClient: Blue Ridge GradingProject No: JA10-1821-01Test Date: 6/16/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	1	2	3	4				
Maximum Density	96.9	100.5	105.0	105.1				
Optimum Moisture	20.5	20.1	18.4	18.8				
ASTM Procedure	D-698	D-698	D-698	D-698				

KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
25	See Attached Drawing for Test Locations	NG	3.4	21.2	102.1	4	97	95
26	See Attached Drawing for Test Locations	NG	4.0	21.8	100.7	4	96	95
27	See Attached Drawing for Test Locations	NG	4.8	21.4	101.5	4	97	95

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

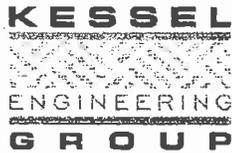
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

KESSEL ENGINEERING GROUP, PLLC

582 HENDERSONVILLE ROAD SUITE ONE | ASHEVILLE NC 28903 | P: (828) 277-6351 | F: (828) 277-6355
WWW.THEKESSELGROUP.COM



FIELD DENSITY TEST REPORT

 Project Name: Avery County C & D Landfill

 Client: Blue Ridge Grading

 Project No: JA10-1821-01

 Test Date: 6/16/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	1	2	3	4				
Maximum Density	96.9	100.5	105.0	105.1				
Optimum Moisture	20.5	20.1	18.4	18.8				
ASTM Procedure	D-698	D-698	D-698	D-698				

KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
13	See Attached Drawing for Test Locations	NG	3.4	22.8	95.4	2	95	95
14	See Attached Drawing for Test Locations	NG	-4.0	24.5	95.0	2	95	95
15	See Attached Drawing for Test Locations	NG	-4.8	20.8	98.6	2	98	95
16	See Attached Drawing for Test Locations	NG	-8.0	118.8	103.9	4	99	95
17	See Attached Drawing for Test Locations	NG	-1.4	19.3	100.2	4	95	95
18	See Attached Drawing for Test Locations	NG	-2.0	21.7	100.8	4	96	95
19	See Attached Drawing for Test Locations	NG	-2.8	20.2	102.4	4	97	95
20	See Attached Drawing for Test Locations	NG	-8.0	20.2	100.6	4	96	95
21	See Attached Drawing for Test Locations	NG	1.4	22.9	99.8	4	95	95
22	See Attached Drawing for Test Locations	NG	2.0	22.8	102.2	4	97	95
23	See Attached Drawing for Test Locations	NG	2.8	21.9	100.3	4	95	95
24	See Attached Drawing for Test Locations	NG	3.4	21.2	102.1	4	97	95

Note: Test results represent only the test locations and elevations indicated on the report.

***Test Methods:**

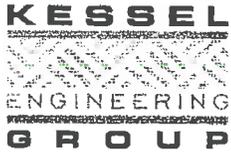
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

KESSEL ENGINEERING GROUP, PLLC

582 HENDERSONVILLE ROAD SUITE ONE | ASHEVILLE NC 28803 | P: (828) 277-6351 | F: (828) 277-6355
WWW.THEKESSELGROUP.COM



FIELD DENSITY TEST REPORT

Project Name: Avery County C & D Landfill

Client: Blue Ridge Grading

Project No: JA10-1821-01

Test Date: 6/16/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	1	2	3	4				
Maximum Density	96.9	100.5	105.0	105.1				
Optimum Moisture	20.5	20.1	18.4	18.8				
ASTM Procedure	D-698	D-698	D-698	D-698				

KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	See Attached Drawing for Test Locations	NG	-8.0	22.4	100.8	4	96	95
2	See Attached Drawing for Test Locations	NG	-1.4	21.4	100.8	4	96	95
3	See Attached Drawing for Test Locations	NG	-2.0	20.4	103.2	4	98	95
4	See Attached Drawing for Test Locations	NG	-2.8	22.0	95.8	4	95	95
5	See Attached Drawing for Test Locations	NG	-3.4	24.2	96.5	2	96	95
6	See Attached Drawing for Test Locations	NG	-4.0	23.8	95.2	2	95	95
7	See Attached Drawing for Test Locations	NG	-8.0	22.3	100.7	2	100	95
8	See Attached Drawing for Test Locations	NG	1.4	18.5	101.9	4	97	95
9	See Attached Drawing for Test Locations	NG	2.0	21.1	95.4	4	95	95
10	See Attached Drawing for Test Locations	NG	2.8	19.8	99.1	2	99	95
11	See Attached Drawing for Test Locations	NG	3.4	22.8	95.4	2	95	95
12	See Attached Drawing for Test Locations	NG	-4.0	24.5	95.0	2	95	95

RE-TESTED
6/16/10
RMS

RE-TESTED
6/16/10
RMS

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

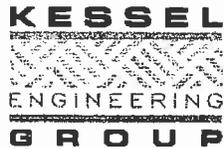
DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

KESSEL ENGINEERING GROUP, PLLC

582 HENDERSONVILLE ROAD SUITE ONE | ASHEVILLE NC 28803 | P:(828) 277-6351 F:(828) 277-6355
WWW.THEKESSELGROUP.COM



FIELD DENSITY TEST REPORT

Project Name: Avery County C&D LandfillClient: Blue Ridge GradingProject No: JA10-1821-01Test Date: 6/16/2010

MAXIMUM DENSITY INFORMATION								
Proctor No.	2	4						
Maximum Density	100.5	105.1						
Optimum Moisture	20.1	18.8						
ASTM Procedure	D-698	D-698						
KEG Test No.	Location	Test Method*	Depth/Elevation (ft)	Moisture Content (%)	Dry Density (pcf)	Proctor No.	Percent Comp.	Percent Comp. Required
1	Check Plug			17.2	105.0	4		
2	Check Plug			18.6	100.0	2		
3	See Attached Drawing for Test Locations	DT	-8.0	22.4	101.0	4	96	95
4	See Attached Drawing for Test Locations	DT	-8.0	22.3	100.9	4	96	95
5	See Attached Drawing for Test Locations	DT	-2.8	20.2	102.0	4	97	95

Note: Test results represent only the test locations and elevations indicated on the report.

*Test Methods:

DT: Drive Tube (ASTM D 2937)

SC: Sand Cone (ASTM 1556)

NG: Nuclear Gauge (ASTM D 2922)

KESSEL ENGINEERING GROUP, PLLC

582 HENDERSONVILLE ROAD SUITE ONE | ASHEVILLE NC 28803 | P:(828) 277-6351 F:(828) 277-6355
WWW.THEKESSELGROUP.COM

APPENDIX E

Material Testing

APPENDIX E.1

Geosynthetic Clay Liner (GCL)



Date: 3/3/2010
Purchase Order: 056515
ORDER NUMBER: 000257877

John Covert
ACF Environmental

Richmond, VA 23234
jcovert@acfenvironmental.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to ACF Environmental.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant



**GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE**

PROJECT NAME: Avery County LF
CUSTOMER P.O.: 056515
ORDER NUMBER: 000257877
PREPARED FOR: ACF Environmental

CONTENTS:

- Product Certifications
- GCL Order packing list and MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121
Telephone: (770) 387-7773
E-Mail: melanie.king@cetco.com



PRODUCT CERTIFICATIONS

PROJECT NAME: Avery County LF
CUSTOMER P.O.: 056515
ORDER NUMBERS: 000257877
PREPARED FOR: ACF Environmental

The GCL manufactured for the above-referenced order number(s) is certified to meet the values listed in the tables below:

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT ST

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf typ (@ 200 psf normal load)
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5 0E-9 cm/s Max
ASTM D 5887	GCL Index Flux	Weekly	1.0E-8 m3/m2/s Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility.
All tensile testing is in the machine direction using ASTM D 6768. All peel strength testing is performed using ASTM D 6496. Upon request tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

NEEDLE DETECTION AND REMOVAL PROCEDURE

CETCO hereby affirms that all Bentomat[®] geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat[®] to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.

Melanie King
Quality Assurance Coordinator



GCL PACKING LIST AND MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 000257877

GCL								Geotextiles				Clay
CV-BENTOMAT ST								N/W-WHITE			WOVEN	CV-CG 50
Order	GCL Lot #	GCL Roll #	Length	Width	Weight	Sq Ft	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
000257877	201006CV	184	150	15	2616	2250	182	201006CV	00000497	00000496	WEA012246-1	947097B
000257877	201006CV	196	150	15	2630	2250	182	201006CV	00000497	00000496	WEA012246-1	947097B
000257877	201006CV	205	150	15	2636	2250	182	201006CV	00000497	00000496	WEA012246-1	947096A
000257877	201006CV	206	150	15	2632	2250	182	201006CV	00000508	00000501	WEA012246-1	947096A
000257877	201006CV	207	150	15	2630	2250	182	201006CV	00000508	00000501	WEA013043-12	947096A
000257877	201006CV	208	150	15	2640	2250	182	201006CV	00000508	00000501	WEA013043-12	947096A
000257877	201006CV	210	150	15	2632	2250	182	201006CV	00000508	00000501	WEA013043-12	947096A
000257877	201006CV	211	150	15	2636	2250	182	201006CV	00000508	00000501	WEA013043-12	947096A
000257877	201006CV	224	150	15	2596	2250	216	201006CV	00000509	00000501	WEA013043-12	947096A
000257877	201006CV	225	150	15	2586	2250	216	201006CV	00000509	00000501	WEA013043-12	947096A
000257877	201006CV	228	150	15	2608	2250	216	201006CV	00000510	00000501	WEA013043-12	947096A
000257877	201006CV	237	150	15	2576	2250	233	201006CV	00000438	00000434	WEA013043-4	947096A
Total sq ft:							27000	Total Number of Rolls Certified: 12				



GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 000257877 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength 6496
ASTM Test Method:			D 5993	D 6768	D 6496
Required Value:			0.75 lb /sq ft Min	30 lbs/in MARV	3.5 lbs/in Min
CV-BENTOMAT ST	201006CV	182	0.87	69.5	8.4
CV-BENTOMAT ST	201006CV	216	0.80	69.5	5.8
CV-BENTOMAT ST	201006CV	233	0.88	69.5	11.3

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 000257877

has been tested by American Colloid Company and yielded the following test results.

Clay Lot #	Moist	Swell	Fluid Loss
ASTM Test Method:	D 2216	D 5890	D 5891
Required Value:	12% Max	24 ml/2g Min	18 ml Max
947096A	11.60	26.00	15.60
947097B	11.60	25.00	13.40



GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 000257877 was manufactured with geotextiles which were tested with the following results.

BASE GEOTEXTILE				COVER GEOTEXTILE			
Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs	Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
MTX 1213	WEA012246-1	3.6	158.9	CV-NON-WOVEN	00000434	6.4	35.6
MTX 1213	WEA013043-12	3.6	180.8	CV-NON-WOVEN	00000496	6.9	66.0
MTX 1213	WEA013043-4	3.6	169.9	CV-NON-WOVEN	00000501	6.5	60.7

Certifications from our suppliers are on file at our production facility.

An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab

P A C K I N G L I S T

CETCO
 2870 FORBS AVENUE
 HOFFMAN ESTATES IL 60192

ORDER NO:.. 000257877
 ORDER DATE: 12/18/2009
 SHIP DATE:.. 3/05/2010

SOLD TO: 551
 ATLANTIC CONSTRUCTION FABRICS
 2831 CARDWELL ROAD

SHIP FROM:.. CETCO CARTERSVILLE
 FRT TERMS:.. PREPAID & ADD
 SHIP VIA:.. NAT'W BOYD

RICHMOND VA 23234

SHIP TO: 320
 AVERY COUNTY LANDFILL
 C/O LANDSAVER ENVIRONMENTAL
 2175 BRUSHY CREEK RD.

SPRUCE PINE NC 28777

PO: 056515

PRODUCT	SIZE U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
CV-BENTOMAT ST	SFT SF	201006CV	00000184	150.0	15.0	2250.0	2616.0
CV-BENTOMAT ST	SFT SF	201006CV	00000196	150.0	15.0	2250.0	2630.0
CV-BENTOMAT ST	SFT SF	201006CV	00000205	150.0	15.0	2250.0	2636.0
CV-BENTOMAT ST	SFT SF	201006CV	00000206	150.0	15.0	2250.0	2632.0
CV-BENTOMAT ST	SFT SF	201006CV	00000207	150.0	15.0	2250.0	2630.0
CV-BENTOMAT ST	SFT SF	201006CV	00000208	150.0	15.0	2250.0	2640.0
CV-BENTOMAT ST	SFT SF	201006CV	00000210	150.0	15.0	2250.0	2632.0
CV-BENTOMAT ST	SFT SF	201006CV	00000211	150.0	15.0	2250.0	2636.0
CV-BENTOMAT ST	SFT SF	201006CV	00000224	150.0	15.0	2250.0	2596.0
CV-BENTOMAT ST	SFT SF	201006CV	00000225	150.0	15.0	2250.0	2586.0
CV-BENTOMAT ST	SFT SF	201006CV	00000228	150.0	15.0	2250.0	2608.0
CV-BENTOMAT ST	SFT SF	201006CV	00000237	150.0	15.0	2250.0	2576.0

ORDER TOTALS.....

===== =====
 27000.0 31418.0

TOTAL ITEMS.....

12



Shippers No : 000257877 [Previous Page](#)

Straight Bill of Lading - Original

Loader: DPARR Time In: 3/3/10-14:35:33 Time Out: 3/3/10-14:55:11

Carrier: boyd brothers
Consigned To :
 AVERY COUNTY LANDFILL
 C/O LANDSAVER ENVIRONMENTAL
 2175 BRUSHY CREEK RD.
 SPRUCE PINE NC 28777
 Phone: 804.335.6462

CETCO 2870 FORBS AVENUE
 HOFFMAN ESTATES IL 60192
Deliver Date : 03/03/2010
Ship Date : 03/04/2010 **Via:** NATI
 FOB ORIGIN

Sold To : 551 **Ship To :** 320
 Consigned PO: 056515
 Truck #: 7221 Trailer #: 49996/

Shipping Plant: CETCO CARTERSVILLE 218 INDUSTRIAL PARK ROAD
 CARTERSVILLE GA 30121
Product Lots: Seal #: --enter here-- **Container #:**

Global Comments: ALL SHIPMENTS LOADED ON FLATBED OR OPEN TOP TRAILERS MUST BE COVERED WITH ADEQUATE TARPAULIN PRIOR TO HIGHWAY MOVEMENT. CARRIER WILL BE HELD FULLY RESPONSIBLE FOR LOSS OR DAMAGE OCCURRING TO UNPROTECTED LOADS. LOADS MAY NOT BE UNTARPED FOR ANY REASON PRIOR TO DELIVERY TO THE CUSTOMER UNTARPING THE LOAD MAY RESULT IN REJECTION OF THE MATERIAL AND LIABILITY TO THE CARRIER

Customer Comments:

Order Comments: CALL MARK TILLEY 24 HRS PRIOR TO DELIVERY AT 804.335.6462 deliver Thursday 3/4/10

Quantity	HM	Product Size / Description	Weight
27000.0000 SF		BENTOMAT ST CLOTH,FABRIC OR PIECE GOODS,NOI,OTHER THAN FOR THE MANUFACTURE OF CLOTHING: CLASS 65 / ITEM 49265 SUB 10 palletized	31418.0000
20.0000 EACH		COMMODITY GRANULAR-50 (10902/024) CLAY-BENTONITE-GROUND CLASS 50 ITEM 48170 / 3295232 3295232 palletized	1000.0000

Gross: 0.0000 Tare: 0.0000 **Total:** 32418

Subject to section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges

If the charges are to be prepaid, write or stamp here, "Prepaid."

Prepaid

Shipper liable for the linehaul charges only. COD charges to be paid by Consignee

Phone:
Fax:
Attn:

CETCO

Mark with an "X" to designate hazardous materials as defined in title 49 of the code of Federal Regulations. Received Subject to the classifications and lawfully filed tariffs in effect on the date of issued of this billing of lading, the property described above in apparent good order, except as noted (contents and conditions of contents of packages unknown) marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of the said property over all or any portion of the said route to destination, and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Uniform Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, set forth in the classification of tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns. **Carrier:**

This is to certify that the above named materials are properly classified, described, packaged, and labeled and are in proper condition for transportation according to the applicable regulations of the department of Transportation.

Per

Placards Required? Yes / No Supplied? Yes / No



Page ~~110~~^{1/5}
2 Additions
Rolls
Used

Date: 9/4/2009
Purchase Order: 055128
ORDER NUMBER: 025487901

Sean Simonpietri
ACF Environmental

Richmond, VA 23234
sean@landsaver.net

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to ACF Environmental.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

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Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant



**GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE**

PROJECT NAME: White Oak Village
CUSTOMER P.O.: 055128
ORDER NUMBER: 025487901
PREPARED FOR: ACF Environmental

CONTENTS:

- Daily production and needle detection certification
- GCL property specifications
- Order packing list
- GCL MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121

Telephone: (770) 387-7773
Fax:
E-Mail: melanie.king@cetco.com



PRODUCTION CERTIFICATION

PROJECT NAME: White Oak Village
CUSTOMER P.O.: 055128
PREPARED FOR: ACF Environmental

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

NEEDLE REMOVAL AND DETECTION PROCEDURE

CETCO hereby affirms that all Bentomat[®] geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat[®] to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.

A handwritten signature in cursive script that reads "Melanie King".

Melanie King
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)



Ship Date: 09/03/2009

Order Number: 025487901

Prepared For: ACF Environmental

The GCL raw materials and GCL finished product manufactured for the above-referenced order number(s) are hereby certified to achieve the properties listed in the tables below.

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT DN

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft (3.6 kg/sq m) Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	50 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf (48 kPa) typ @ 200 psf
ASTM D 3887	GCL Hydraulic Conductivity	Weekly	5 x 10 ⁻⁹ cm/ sec Max
ASTM D 5887	GCL Index Flux	Weekly	1 x 10 ⁻⁸ m ³ /m ² /sec Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	3.5 lbs/in Min
ASTM D4632*	Grab Strength*modified with 4-inch grips	200,000 sq ft (20,000 sq m)	150 lbs (660 N) MARV
ASTM D4632*	Peel Strength*modified with 4-inch grips	40,000 sq ft (4000 sq m)	15 lbs (65 N) Min

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility. All tensile testing is in the machine direction.

FABRIC SUPPLIER REQUIREMENTS FOR BENTOMAT DN

Raw Material	test method	mass per area	units
Nonwoven Cover Fabric	ASTM D 5261	6.0	oz/yd ²
Bentomat DN Base Nonwoven Fabric	ASTM D 5261	6.0	oz/yd ²

Fabric certifications from our raw material suppliers are on file at our production facility.



CETCO's MQA laboratory is GAI-accredited (www.geosynthetic-institute.org/gai/lab.html).

Melanie King

Melanie King
 Quality Assurance Coordinator
 CETCO Cartersville Plant



GCL ORDER PACKING LIST

GCL shipped for certification package number 025487901

Order	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
025487901	CV-BENTOMAT DN	200924CV	00001509	150	14.5	2175	2794
025487901	CV-BENTOMAT DN	200926CV	00001953	150	14.5	2175	3274
025487901	CV-BENTOMAT DN	200932CV	00003145	150	14.5	2175	2938
025487901	CV-BENTOMAT DN	200932CV	00003171	150	14.5	2175	2980
→ 025487901	CV-BENTOMAT DN	200933CV	00003716	150	14.5	2175	2822
025487901	CV-BENTOMAT DN	200933CV	00003734	150	14.5	2175	2772
025487901	CV-BENTOMAT DN	200934CV	00003771	150	14.5	2175	2862
025487901	CV-BENTOMAT DN	200934CV	00003857	150	14.5	2175	2844
→ 025487901	CV-BENTOMAT DN	200934CV	00003909	150	14.5	2175	2842
025487901	CV-BENTOMAT DN	200934CV	00003923	150	14.5	2175	2908
025487901	CV-BENTOMAT DN	200934CV	00003965	150	14.5	2175	2910
Totals:				1650	159.5	23925	31946
Total Number of Rolls Certified: 11							

CONFORMANCE TEST RESULTS



CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES, INC.
 CLIENT PROJECT: AVERY CO. C&D LANDFILL
 PHASE 3 CELL 1
 PROJECT NO.: L10019-01
 LAB ID NO.: L10019-01-01
 MATERIAL: CETCO BENTOMAT ST
 ROLL NO: NP

BENTONITE CONTENT ASTM D3776 & ASTM D5993	SPECIMEN	TOTAL WT. AS REC'D	TOTAL WT. DRY	TOTAL WT. AS REC'D	TOTAL WT. DRY	WT. BACKING	AS REC'D Bent Cont	DRY Bent Cont	MOISTURE CONTENT	Bent Cont 12% m.c.	
		grams	grams	psf	psf	psf (1)	psf	psf	%	psf	
	1	50.7	44.1	1.01	0.87	0.070	0.94	0.80	16	0.90	
	2	55.9	48.1	1.11	0.95	0.070	1.04	0.88	17	0.99	
	3	70.2	59.6	1.39	1.18	0.070	1.32	1.11	19	1.24	
	4	54.2	45.7	1.07	0.91	0.070	1.00	0.84	20	0.94	
	5	63.9	53.0	1.27	1.05	0.070	1.20	0.98	22	1.10	
AVERAGE:								0.92	19	1.03	

TEST	ASTM METHOD	UNITS	SPECIMEN NO.					AVG	STD
			1	2	3	4	5		
PEEL STRENGTH	D 6496	MD-lbs/in	8.7	6.9	7.8	6.0	8.7	7.6	1.17

* NOTES:1) Weight of carrier (geotextile) provided by CETCO spec. info: .

CHECKED BY: BF

DATE: 3-31-10

GCL INDEX FLUX & PERMEABILITY TEST

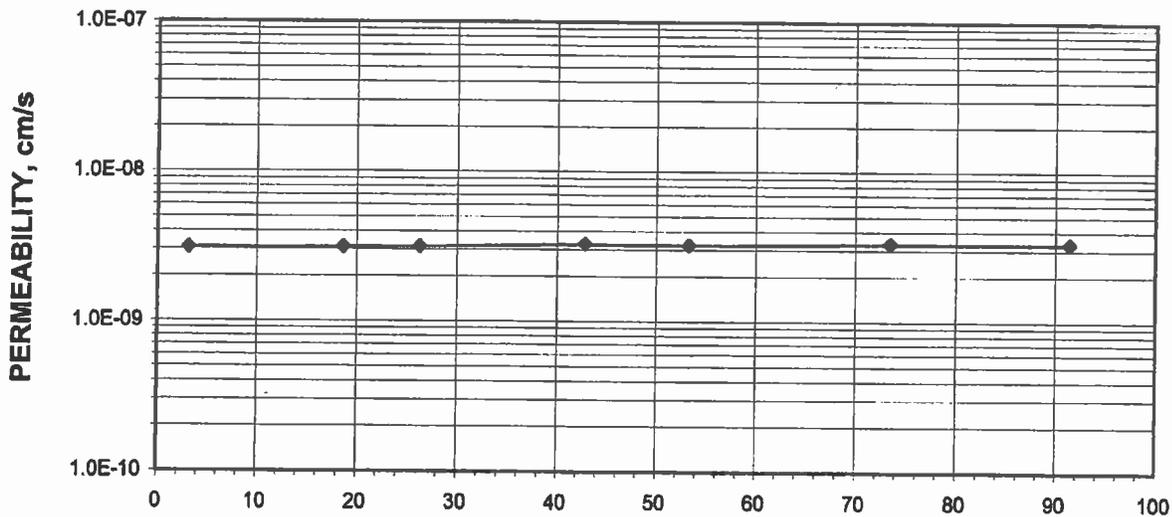
ASTM D 5887
(SOP-G52)



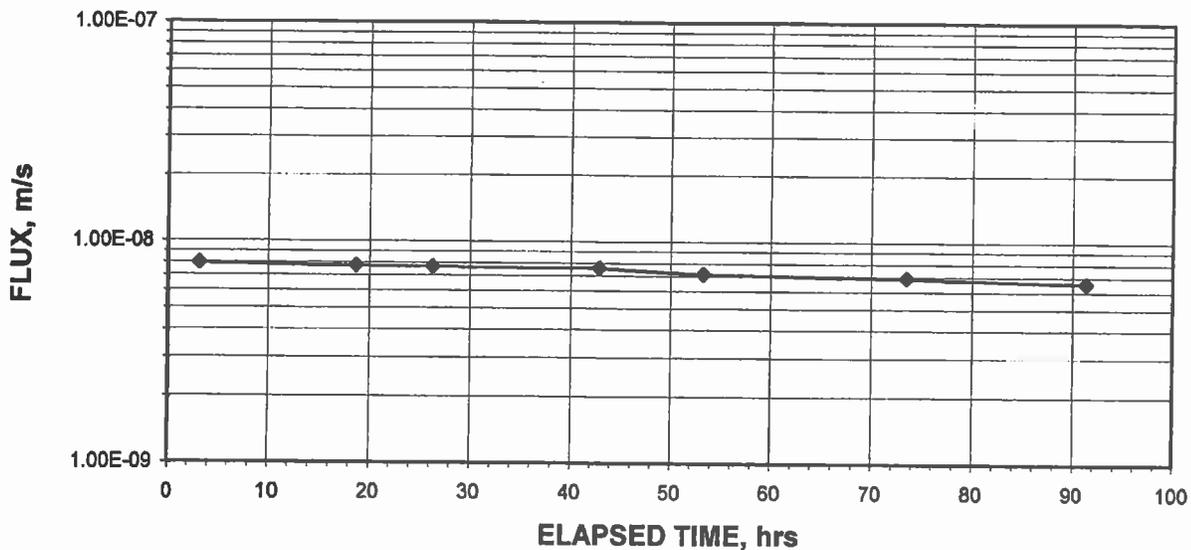
Lab ID No.	L10019-01-01	Material	GCL
Client	Richardson Smith Gardner & Associates	Roll I.D.:	NA
Client Project	Avery Co. C&D LF -Phase 3 Cell 1	Lot No.:	NA
Project No.	L10019-01	Sample No.	NA

AVERAGE FLUX = 6.86E-09 m/s
AVERAGE PERMEABILITY = 3.30E-09 cm/s @ 20°C

PERMEABILITY VS. ELAPSED TIME



FLUX VS. ELAPSED TIME



Checked By: *KB* Date: *4-6-10*

GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)



Lab ID No.	L10019-01-01	Tested by: JPK	Date: 3/30/2010
Client	Richardson Smith Gardner & Associates		
Client Project	Avery Co. C&D LF -Phase 3 Cell 1	Checked by: KB	Date: 4-6-10
Project No.	L10019-01		
Material	GCL		
Roll I.D.:	NA		
Lot No.:	NA		
Sample No.	NA		

Permeant: DEAIRED, DEIONIZED WATER

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	41	12
Wt. of Tare & GCL ² (gm.)	75.36	92.17
Wt. of Tare & Dry GCL ² (gm.)	65.91	45.03
Wt. of Tare (gm.)	10.85	10.94
Wt. of Water (gm.)	9.45	47.14
Wt. of Dry GCL (gm.) ²	55.06	34.09
GCL Moisture Content (%)	17.2	138.3

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of GCL (gm.) ²	46.44	94.45 (Calculated)
Clay Component Thickness 1 (in.) ¹	0.124	0.270
Clay Component Thickness 2 (in.) ¹	0.136	0.265
Clay Component Thickness 3 (in.) ¹	0.127	0.253
Average Clay Component Thickness (in.)	na	0.263
Average Clay Component Thickness (mm)	na	6.672
Specimen Dia. (in)	4.000	4.000
Specimen Area (in. ²)	12.57	12.57
Specimen Area (m ²)	0.00811	0.00811
Mass/Unit Area of GCL(gm./m ²) ²	5,726	11,646
Mass/Unit Area of GCL(psf) ²	1.17	2.38
Mass/Unit Area of Dry GCL(gm./m ²) ²	4,887	
Mass/Unit Area of Dry GCL(psf) ²	1.00	

*NOTES: 1) Direct visual measurement of exposed clay at specimen perimeter.
2) Includes weight of the textile carriers.

GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)



Lab ID No. L10019-01-01
 Client Richardson Smith Gardner & Associates
 Client Project Avery Co. C&D LF -Phase 3 Cell 1
 Project No. L10019-01
 Material GCL
 Roll I.D.: NA
 Sample No. NA

Final Sample Dimensions

Pressure Heads (Constant)		Sample Length (cm), L	0.667
Top Cap (psi)	75.0	Sample Diameter (cm)	10.16
Bottom Cap (psi)	77.0	Sample Area (cm ²), A	78.50
Cell (psi)	80.0	Inflow Burette Area (cm ²), a-in	0.856
Total Head (cm)	140.6	Outflow Burette Area (cm ²), a-out	0.855

AVERAGE FLUX = 6.86E-09 m/s
AVERAGE PERMEABILITY = 3.30E-09 cm/s @ 20oC

DATE (m-d-y)	ELAPSED TIME t (hr)	TOTAL INFLOW (cm ³)	TOTAL OUTFLOW (cm ³)	RATIO $\frac{\Delta IN}{\Delta OUT}$ (3 readings)	TOTAL HEAD h (cm)	TEMP. (°C)	INCREMENTAL	
							FLUX @ 20°C (m/sec)	PERMEABILITY @ 20°C (cm/sec)
4/1/2010	0.0	0.0	0.0	NA	167.5	21.0	NA	NA
4/1/2010	3.1	0.8	0.6	NA	165.8	21.2	7.95E-09	3.08E-09
4/2/2010	18.7	4.4	3.8	1.16	157.9	20.9	7.74E-09	3.11E-09
4/2/2010	26.3	6.1	5.4	1.10	154.1	21.6	7.67E-09	3.14E-09
4/3/2010	42.9	9.8	8.8	1.08	145.8	20.9	7.58E-09	3.29E-09
4/3/2010	53.3	12.0	10.8	1.09	140.9	20.9	7.15E-09	3.24E-09
4/4/2010	73.5	16.1	14.6	1.09	131.7	20.5	6.91E-09	3.33E-09
4/5/2010	91.4	19.5	17.8	1.07	124.0	21.0	6.54E-09	3.32E-09

Checked By: *KB* Date: *4-16-10*

APPENDIX E.2

Drainage Aggregate



Quality Test Report

Plant 148-Spruce Pine
 Product 057-NC #57
 Specification NC #57



Sample Information

Sample No 1588147197
 Date Sampled 12/02/2009 15:02
 Date Completed 12/02/2009 15:02
 Sampled By Randall Robinson
 Tested By Randall Robinson
 Type Shipping
 Method Split Sample
 Location
 Process
 Ledge
 Other

Weather
 Temp
 Split Sample
 Resample
 Borehole
 Depth Top/Bottom

Sequence QC-50
 Code

Test Note

Gradation Results

Unit	Moist Mass	Dry Mass	Wash Mass	Moisture %	Wash Loss %	Procedure		
lb		33.95						
Sieve	Mass Retained	Cum Mass Retained	Ind % Retained	% Retained	% Passing	Target	Specification	Comment
1 1/2" (37.5mm)	0.0	0.0	0.0	0.0	100.0		100-100	
1" (25mm)	0.0	0.0	0.0	0.0	100.0		95-100	
3/4" (19mm)	4.6	4.6	13.4	13.4	86.6			
1/2" (12.5mm)	17.3	21.9	51.0	64.4	35.6		25-60	
3/8" (9.5mm)	7.2	29.1	21.2	85.6	14.4			
#4 (4.75mm)	2.8	31.9	8.2	93.8	6.2		0-10	
#8 (2.36mm)	0.6	32.5	1.9	95.7	4.3		0-5	

APPENDIX E.3

Geotextile



June 23, 2010

REF: TerraTex N06 Nonwoven Geotextile Order # 048-17632 (Invoice # 64059027)

This is to certify that TerraTex N06 is a nonwoven geotextile made up of polypropylene fibers. These fibers are needed to form a stable and durable network such that the fibers retain their relative position. It is non-biodegradable and resistant to most soil chemicals, acids and alkali with a pH range of 3 to 12. TerraTex N06 is manufactured to meet or exceed the following minimum average roll values:

PROPERTY	UNIT	ASTM TEST METHOD	Minimum Average Roll Values
Weight (Typical)	oz/yd ² (g/m ²)	ASTM D5261	6.0 (203)
Grab Tensile	lbs (kN)	ASTM D4632	160 (0.711)
Grab Elongation	%	ASTM D4632	50
Trapezoid Tear	lbs (kN)	ASTM D4533	65 (0.289)
Puncture Resistance	lbs (kN)	ASTM D4833	90 (0.40)
CBR Puncture	lbs (kN)	ASTM D6241	410 (1.82)
Mullen Burst	psi (kPa)	ASTM D3786	315 (2170)
Permittivity	sec ⁻¹	ASTM D4491	1.6
Water Flow	gpm/ft ² (l/min/m ²)	ASTM D4491	110 (4480)
A.O.S.	U.S. Sieve (mm)	ASTM D4751	70 (0.212)
U.V. Resistance	%/hrs	ASTM D4355	70/500

Attached: Quality Control Test Data

Sincerely,

Keith Harris
Technical Director

I, Salli B. John, Notary, hereby acknowledge that Keith Harris personally appeared before me this day and signed the foregoing instrument.

Notary

Expiration Date: November 1, 2014

815 Buxton Street Winston Salem, NC 27101
888 - 239 - 4539 • Fax: 336 - 747 - 1652
www.hanesgeo.com info@hanesgeo.com

SALLI B. JOHN
NOTARY PUBLIC
FORSYTH COUNTY, NC
MY COMMISSION EXPIRES NOV. 1, 2014

Product : TerraTex N06

ROLL # ASTM METHOD UNITS TARGET	WEIGHT* D8281 oz/sq yd 8.00	MD TENSILE D4632 lbs. 160	MD ELONG D4632 % 50	XMD TENSILE D4632 lbs 160	XMD ELONG D4632 % 50	MD TRAP D4533 lbs. 65	XMD TRAP D4533 lbs 65	PUNCTURE D4833 lbs. 90	AOS D4761 US Sieve 70	WATER FLOW D4491 gpm/ft ² 110	PERMITTIVITY D4491 sec ⁻¹ 1.60
030258215	5.76	162	57	184	62	69	84	93	70	133	1.77
030258225	6.41	166	63	188	66	73	92	97	70	133	1.77
030258226	6.41	166	63	188	66	73	92	97	70	133	1.77
030258228	6.41	166	63	188	66	73	92	97	70	133	1.77
030258229	6.41	166	63	188	66	73	92	97	70	133	1.77
030258230	5.79	160	55	182	60	67	86	91	70	133	1.77
030258231	5.79	160	55	182	60	67	86	91	70	133	1.77
030258232	5.79	160	55	182	60	67	86	91	70	133	1.77
030258233	5.79	160	55	182	60	67	86	91	70	133	1.77
030258234	5.79	160	55	182	60	67	86	91	70	133	1.77
030258238	6.43	168	61	190	68	67	86	91	70	133	1.77
030258239	6.43	168	61	190	68	67	86	91	70	133	1.77
030258240	5.81	164	59	180	64	75	94	99	70	133	1.77
030258241	5.81	164	59	180	64	75	94	99	70	133	1.77
030258242	5.81	164	59	180	64	75	94	99	70	133	1.77
030258243	5.81	164	59	180	64	75	94	99	70	133	1.77
030258244	5.81	164	59	180	64	75	94	99	70	133	1.77
030258245	6.45	170	65	184	70	75	94	99	70	133	1.77
030258246	6.45	170	65	184	70	75	94	99	70	133	1.77
030258247	6.45	170	65	184	70	75	94	99	70	133	1.77
030258248	6.45	170	65	184	70	75	94	99	70	133	1.77
030258249	6.45	170	65	184	70	75	94	99	70	133	1.77
030258250	5.85	161	56	186	61	70	88	95	70	133	1.77
030258251	5.85	161	56	186	61	70	88	95	70	133	1.77
030258252	5.85	161	56	186	61	70	88	95	70	133	1.77
030258253	5.85	161	56	186	61	70	88	95	70	133	1.77
030258254	5.85	161	56	186	61	70	88	95	70	133	1.77
030258255	6.13	167	62	181	67	70	88	95	70	133	1.77
030258256	6.13	167	62	181	67	70	88	95	70	133	1.77
030258257	6.13	167	62	181	67	70	88	95	70	133	1.77

* Weight is typical. All other values are MARV.

APPENDIX F

Design Modifications



Project:	Avery County C&D Landfill Phase III - Cell 1 Construction Avery County, North Carolina
Owner:	Avery County Solid Waste Attn: Buddy Norris 175 Linville Street Newland, North Carolina 28657
Contractor:	Blue Ridge Grading & Trucking, Inc. ATTN: Russell Fox 20 E. US Hwy 19E Bypass Burnsville, North Carolina 28714

Regulatory Review Required (Y/N): Y
 *If Yes, see below.

Reference(s):
 Underdrain Profile Drawing No. X1

Description of Modification(s):
 During excavation of the underdrain and general clearing some unsuitable materials were encountered at the southern end of Cell 1. Therefore, overexcavation was performed. Additionally, areas of groundwater seepage were encountered and required "bridging" with fabric wrapped stone drain as shown on attached drawing. Additionally, additional groundwater seepage was encountered through northern section of cell also covered with fabric wrapped stone drain. In all areas of stone drain and underdrain, GCL is to be extended a minimum of ten (10) feet beyond limits of fabric drains as shown on the attached drawing.

Reason for Modification(s):
 This modification was generated in response to a combination of unsuitable soils and sediments which settled just upstream of existing road and drainage culvert and areas where groundwater seepage was encountered and hindered fill placement.

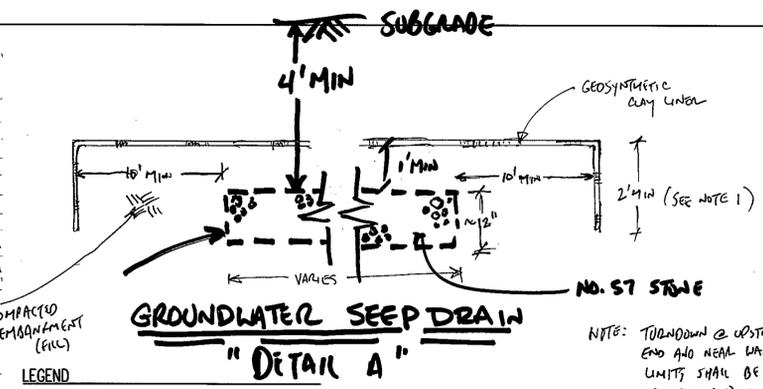
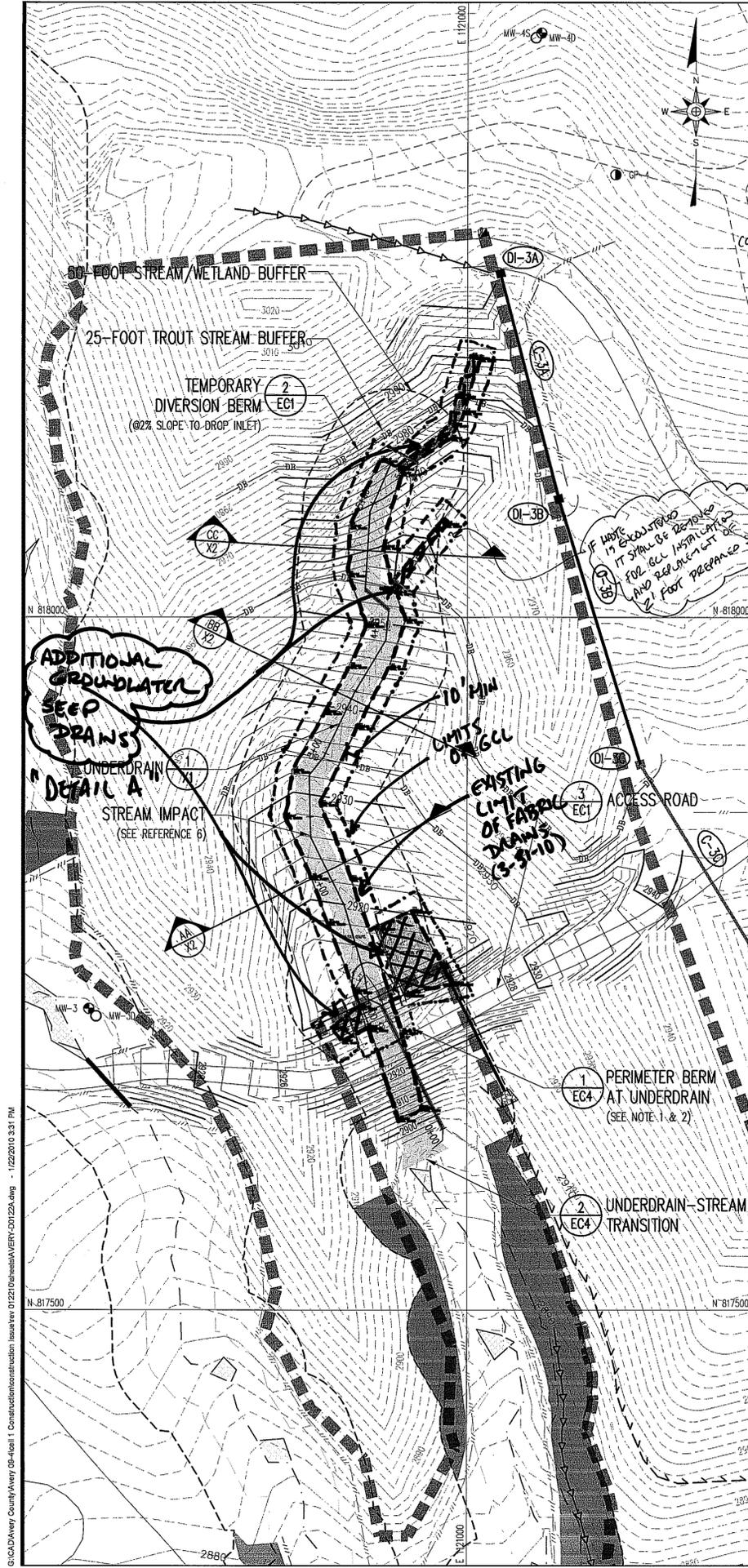
Attachments:
 Drawings X1.

Comments:

Regulatory Agency: NCDENR - Division of Waste Management
 ATTN: Allen Gaither
 Asheville Regional Office
 Swannanoa, North Carolina

(Handwritten Signature)
By: Stacey A. Smith, P.E.
Title: Project Manager
Date: March 31, 2010

Distribution: Owner Contractor Field File Regulatory Agency



LEGEND

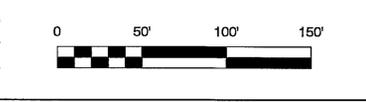
2840	EXISTING 10' CONTOUR (SEE REFERENCE 1)
	EXISTING 2' CONTOUR
3000	PROPOSED 10' CONTOUR
	PROPOSED 2' CONTOUR
---	PROPERTY LINE (SEE REFERENCE 2)
■	WASTE LIMITS
---	SILT FENCE
---	SILT FENCE (EXISTING)
DB	DIVERSION BERM
---	DIVERSION CHANNEL
---	SIDE SLOPE SWALE
---	APPROX. STREAM LOCATION (SEE REFERENCE 3, 5)
---	WETLANDS (SEE REFERENCE 3)
---	50-FOOT STREAM AND WETLAND BUFFER
---	25-FOOT TROUT STREAM BUFFER
---	PROPOSED BUFFER RESTORATION AREAS
○	MONITORING WELL
○	PIEZOMETER
○	PROPOSED GAS PROBE
(C-3A)	CULVERT
(DI-3A)	DROP INLET
■	PROPOSED LIMIT OF WASTE MARKER

NOTE

- CONTRACTOR SHALL PREPARE PIPE REMOVAL, UNDERDRAIN INSTALLATION, AND BACKFILL WORK PLAN PRIOR TO DISTURBANCE OF THIS AREA. NO WORK SHALL OCCUR UNTIL APPROVAL IS GRANTED BY THE ENGINEER.
- WATER DISCHARGED FROM DISTURBED AREAS DURING INSTALLATION OF THE UNDERDRAIN SYSTEM SHALL BE TREATED WITH FLOCCULANT BEFORE DISCHARGING INTO A SPECIAL STILLING BASIN (OR SEDIMENT BASIN NO. 3) FOLLOWING THE DESIGN CRITERIA IN THE NC EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, "PRACTICE STANDARD AND SPECIFICATION 6.86, FLOCCULANTS."

REFERENCES

- OVERALL SITE TOPOGRAPHY FROM NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, DATA GENERATED FROM LIDAR DATED MARCH 2005, TOPO IN AREAS IN AND SURROUNDING PHASES 1 AND 2 FROM FIELD SURVEY DATED 9/07, BY SURVEYING SOLUTIONS, P.C. PHASE 1 AREA NORTH OF GRAVEL ACCESS ROAD TOPOGRAPHY FROM FIELD SURVEY BY SURVEYING SOLUTIONS, P.C., DATED 10/8/09. PHASE 1 AREA SOUTH OF GRAVEL ACCESS ROAD AND PHASE 2 TOPOGRAPHY FROM FIELD SURVEY BY APPALACHIAN PROFESSIONAL LAND SURVEYORS AND CONSULTANTS, P.A., DATED 1/11/10 AND REVISED 1/19/10.
- SITE PROPERTY LINE AND MONITORING WELL LOCATIONS FROM FIELD SURVEYS DATED 9/07 AND 1/14/08, BY SURVEYING SOLUTIONS, P.C.
- STREAM AND WETLAND LOCATIONS IN NORTHERN SECTOR OF SITE OBTAINED FROM GPS FIELD SURVEY DATED 4/07, BY CAROLINA ECOSYSTEMS, INC.
- STREAMS AND WETLANDS NEAR PHASE 1 AND 2 FROM FIELD SURVEY DATED 2/18/08 BY SURVEYING SOLUTIONS, P.C.
- BRUSHY CREEK LOCATION FROM AVERY COUNTY GIS DEPARTMENT.
- ALL IMPACT AREAS ARE UNDER APPROVAL OF ACTION ID 2008-03130 NATIONWIDE PERMIT NO. 39 BY THE US ARMY CORP OF ENGINEERS DATED NOVEMBER 9, 2008 AND NC DIVISION OF WATER QUALITY DATED NOVEMBER 21, 2008 DWQ PROJECT NO. #08-1464.
- POTABLE WELL LOCATIONS ARE APPROXIMATE.
- POTENTIOMETRIC SURFACE SHOWN WAS OBTAINED FROM DRAWING, AVERY COUNTY C&D LANDFILL POTENTIOMETRIC MAP SPRING '09, CREATED BY RICHARDSON SMITH GARDNER AND ASSOCIATES IN JULY 2009.

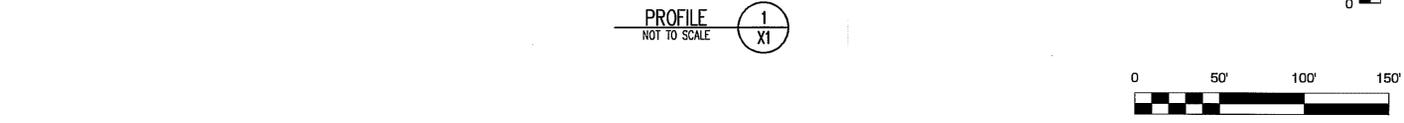
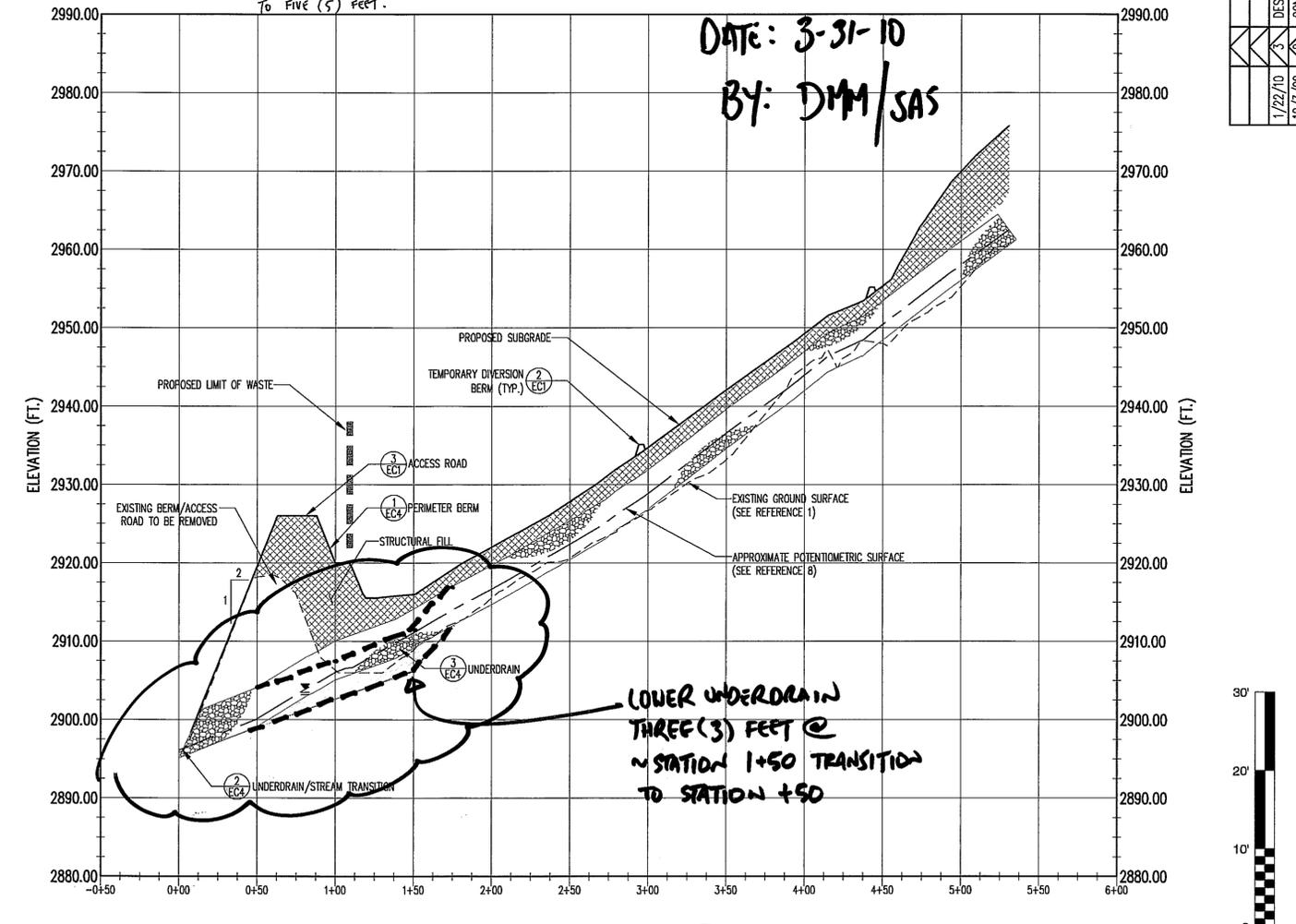


DESIGN MODIFICATION NO. 1

AVERY COUNTY

GROUNDWATER SEEP MODIFICATION

DATE: 3-31-10
BY: DIM/SAS



LEGEND

---	EXISTING GROUND SURFACE (SEE REFERENCE 1)
---	PROPOSED SUBGRADE
---	POTENTIOMETRIC SURFACE (SEE REFERENCE 8)

SAFETY NOTE:
Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

ISSUED FOR CONSTRUCTION

DESIGN CLARIFICATION NO. 2
CONSTRUCTION ISSUE
DATE
NO.
REVISION

1/22/10
12/5/09

RICHARDSON SMITH GARDNER & ASSOCIATES
14 N. Boykin Ave.
Raleigh, N.C. 27603
PH: 919-928-4877
FAX: 919-928-8899
www.rsgengineers.com

UNDERDRAIN PROFILE

PROJECT TITLE: AVERY COUNTY C&D LANDFILL PHASE III - CELL 1 CONSTRUCTION DRAWINGS

DESIGNED BY: S.A.S.	DRAWN BY: C.T.J.
CHECKED BY:	PROJECT NO.: AVERY 09-4
SCALE: AS SHOWN	DATE: OCT. 2009
FILE NAME: AVERY-D0122A	
SHEET NO.: 5	DRAWING NO.: X1

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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

April 1, 2010

Mr. Buddy Norris
Avery County – Solid Waste Director
PO Box 640
Newland, North Carolina 28657

Subject: Design Modification #1
Avery County CDLF, Phase 3
Avery County, Permit #06-03, Document ID No. 10252

Mr. Norris:

The Division of Waste Management, Solid Waste Section (Section) has reviewed the document titled *Design Modification #1* (DIN10251). The document was submitted on your behalf by Richardson, Smith, Gardner and Associates and was received in the Asheville Regional Office on March 31, 2010.

This letter serves as an authorization of the under-drain design modification as presented. There are no permit conditions associated with this activity so no permit modification will be required and no permit fee assessed. However, any CQA testing procedures previously planned for the under-drain system must be expanded to include the extended areas. In addition, as with all design modifications, the changes must be included on as-built drawings to be submitted with the CQA documentation. Finally, you must notify the Section if the proposed activity changes significantly from the information submitted.

If you should have any questions regarding this matter please contact me at (828) 296-4703, or by email at allen.gaither@ncdenr.gov.

Sincerely,

Allen Gaither
Environmental Engineer

Cc: Mr. Stacey Smith – RSG
Mr. Bill Wagner – SWS/ARO
Mr. Zinith Barbee – SWS/RCO

APPENDIX G

Pre-Construction Meeting Minutes

MEMORANDUM

TO: Distribution
FROM: Don Misenheimer
DATE: December 22, 2009
SUBJECT: Avery County C&D Landfill (Phase III – Cell 1 Construction)
 Pre-Construction Meeting Summary - December 4, 2009

A pre-construction meeting was held at the Avery County C&D Landfill on December 4, 2009 at 10:30 a.m. The meeting ended around 11:30 p.m. after a tour of the project area.

Attendees:

<u>Name/Company/Agency</u>	<u>Email Address</u>	<u>Phone</u>
Stacey Smith (RSG)	stacey@rsgengineers.com	919-828-0577
Don Misenheimer (RSG)	don@rsgengineers.com	919-828-0577
Buddy Norris (Avery Co. SW)	buddy.norris@ncmail.net	828-737-5420
Bob Crenshaw (Avery Co. SW)	avery.sw@ncmail.net	828-737-5420
Ryan Holiman (Blue Ridge G&T)	ah334@yahoo.com	828-682-5779
Bill Wagner (NCDENR-DWM)	bill.wagner@ncmail.net	828-296-4705

Introduction

Mr. Smith introduces himself and the meeting attendees as they arrive and provides an overview of the Avery County C&D Landfill, Phase III – Cell 1 Construction project. During the discussion of the project, the following items were discussed:

Project Background/Pre-Bid Meeting

Mr. Smith explains that this project is a just a portion of the full site build-out, which is expected to take around 30 years. A project presently concluding has relocated the waste which was out of limits, into Phases 1 and 2 (located on either side of the proposed impacted stream). Phase III will be filled over Phases I and II, producing final grades, and then move up the mountain. Construction of Cell 1 of Phase III of the full build is the scope of this project. Mr. Smith introduces Mr. Ryan Holiman of Blue Ridge Grading & Trucking as the Contractor selected to perform the work for this project.

Mr. Smith states that Mr. Bob Crenshaw of Avery County will be on site the majority of the time during this project. Mr. Henry “Buddy Norris, Solid Waste Director, will be on site often as well. RSG will be on-site at least once a month for progress meetings and at critical times throughout the project, such as underdrain and GCL placement.

Mr. Smith states that Mr. Don Misenheimer will distribute a contact list for this project including key State employees. It is key to note that Mr. Bill Beck (DLQ) is the inspector on this site, Ms. Starr Silvis (DLQ) is the State engineer

Mr. Smith states that the project may include some unexpected issues, but we want to communicate and respond. Mr. Wagner agrees and states that if something out of the ordinary arises, notify him as we can deal with things if he knows about them while they are happening.

Scheduling/work sequencing

Mr. Smith states that work scheduling and sequencing will be critical for this project and essential for communication. Scheduling should be the first thing submitted. RSG recommended the use of bar charts, and Mr. Holiman agreed. Scheduling should be updated at each progress meeting.

Mr. Don Misenheimer (RSG) will be on-site once a month to perform a site visit, to meet with the Contractor and Mr. Henry "Buddy" Norris or Mr. Bob Crenshaw. Throughout the month, problems that arise and items that need to be presented to the State, should be recorded then presented during this monthly meeting with Mr. Misenheimer.

Designation of responsible personnel

Mr. Holiman stated that the superintendent for the job would either be Mr. Russell Fox, or himself. Mr. Holiman also identified by Russell Fox as the owner of Blue Ridge Trucking & Grading Inc (Blue Ridge).

Mr. Holiman stated that Blue Ridge will likely have the following personnel/equipment on site for this project:

- 4-5 employees
- 2 trucks, 2 dozers, 2 backhoes, and rollers.

Mr. Holiman identified Boone Geometrics as the GCL supplier, and Land Saver Environmental as the GCL installer.

Mr. Holiman identified Ed Holdings as his chosen surveyor. Mr. Smith states that RSG can provide hard and digital copies of the drawings to Mr. Holdings. Chris Jones (RSG) may be contacted to obtain these drawings at chris@rsgengineers.com. Mr. Holiman stated that he would contact Mr. Misenheimer for these drawings/files.

Contract Administration

RSG has provided copies of the contract documents and the "Construction Issue" drawings, both in hard copy and digital form. If additional copies are needed, please make RSG aware and we can provide via email or mail.

Mr. Smith states that if anything out of scope or requires a change order during the course of the project, make RSG aware before any decisions are made. Any change orders or deviations from the Contract Documents must be approved/signed off on. It is not the intention of RSG to hold up the Contractor in performing the work. RSG plans to respond to and resolve any issues that arrive quickly.

Submittals

In the Specifications, included in the contract documents, there are a series of submittals. Please submit these as required for approval. Submitting these documents align RSG with the Contractor and provide an easy check that materials etc. are meeting the design specifications. As RSG signs off on these submittals, protection is provided to the Contractor and the County.

Payment Requests

Mr. Smith states that generally we will cut off requests at the 25th of the month. The Contractor should send the requests to RSG who will review for agreement with the work performed and the contract documents. RSG will then provide a recommendation to Mr. Norris for his approval. In turn, Mr. Norris will send the form to Avery County for payment.

Project hours/Security Measures/ Rain Gauges

The Landfill operating hours are M-F 8:00 am - 4:30 pm and Saturday 9:00 am - 1:00 pm. Mr. Holiman states that he plans to operate M-F 7:30 am until later than the landfill is open. Mr. Holiman states that work may be conducted on Saturdays if the project falls behind. Mr. Norris states that a key will be provided, and requests that if the Contractor arrives before County employees, the gate be closed. Mr. Norris also requests that the Contractor signs in with the scale house each day.

The County maintains a rain gauge and records events. The Contractor should also record events using its on rain gauge. The Contractor should compare with the County's measurements and any discrepancies should be worked out early in the project.

Safety

Mr. Smith discusses the importance of safety measures that should be taken on site. Due to a large factor of unknowns, unexpected dangers could arise. Hydrogen sulfide (H₂S) gas is a concern in this type of landfill. This gas can overtake a person quickly and should be monitored.

Mr. Holiman identifies Mr. Russell Fox as the safety officer, and states that safety meetings will be held once a week.

Housekeeping procedures

It is important to stay on top of the organization of the project and the site. RSG is aware that issues will likely arise due to time, terrain, and with the stream. If problems are documented, reported, and taken care of, there should be no problem. Remember that State officials will be visiting the site regularly.

General regard for community relations

Be aware of the community and surrounding neighbors. Mr. Norris states that the "good neighbor policy" should be followed. If any problems arise, contact the County.

Stream Restoration

Phil May of Carolina Ecosystems (sub-contractor to RSG) will describe the restoration process once the project progresses to that point. RSG will be in contact with Mr. May and will keep him updated on the project.

Action Items

1. Mr. Holiman should submit a written plan for the installation of the underdrain and the stormwater management associated with this. Other submittals should be prepared.
2. Blue Ridge should speak with Linda Wiggs (DWQ) about the underdrain.
3. Mr. Misenheimer should distribute a contact list for this project.

Conclusion

The meeting was adjourned at approximately 11:30 p.m.

Next Meeting

The next meeting (monthly meeting with Don Misenheimer RSG) is tentatively scheduled for the first week of January.

Cc: Distribution:
Ryan Holiman, Blue Ridge Grading and Trucking
Buddy Norris, Avery Co. SW
Bob Crenshaw, Avery Co. SW
Bill Wagner, NCDENR-DWM
Stacey Smith, P.E., RSG
Phil May, Carolina Ecosystems
File

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