

**BIDDING AND CONTRACT DOCUMENTS FOR
CABARRUS COUNTY, NORTH CAROLINA
CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL
PHASE 1L EXPANSION PROJECT**

CDM PROJECT NO. 1278-77070



ADDENDUM NO. 1

Date Issued: October 11, 2010

Bidders on this Project are hereby notified that this Addendum shall be attached to and made a part of the above named Bidding and Contract Documents dated September 2010.

The following items are issued to add to, modify, and clarify the Bidding and Contract Documents. These items shall have full force and effect as the Bidding and Contract Documents, and cost involved shall be included in the bid prices. Bids, to be submitted on the specified bid date, shall conform to the additions and revisions listed herein.

Acknowledge receipt of the Addendum by inserting its number and date on the appropriate page of the bid forms (i.e., page 00300-1). Failure to do so may subject the bidder to disqualification.

PREBID CONFERENCE MINUTES

See General Comments below.

PLANHOLDER'S LIST

The Planholder's List is attached (Attachment No. 1) and made part of this Addendum.

PROJECT MANUAL

Section 00020 – Notice to Bidders

1. Delete the third paragraph in its entirety and replace with the following paragraphs:

“Substantial Completion for the entire landfill expansion is **150 calendar days** from Notice to Proceed (NTP). The Owner and Engineer will work closely with the Contractor to determine if the entire landfill expansion can be completed within the 150 days and permitted airspace provided, or if the phased approach will need to be implemented. In order to provide the Contractor with ample notice regarding the implementation of a phased approach, the Owner will decide within **45 calendar days** of NTP whether or not to implement the phased approach. If the phased approach is implemented, Contractor shall have Subcell A substantially complete within **120 calendar days** of

NTP. The remaining work shall be substantially complete within 150 calendar days. All work shall reach final completion within **180 calendar days** from Notice to Proceed. “

Section 11342 - Powder Epoxy Coated Steel Bolted Leachate Storage Tank

1. Add the Boring Log in Attachment No. 2 to Section 11342 as Appendix A.

GENERAL COMMENTS

Compiled during non-mandatory Pre-bid Conference on October 6, 2010:

1. *The Specifications call for air-cooled stormwater pump. Are water-cooled pumps acceptable?*

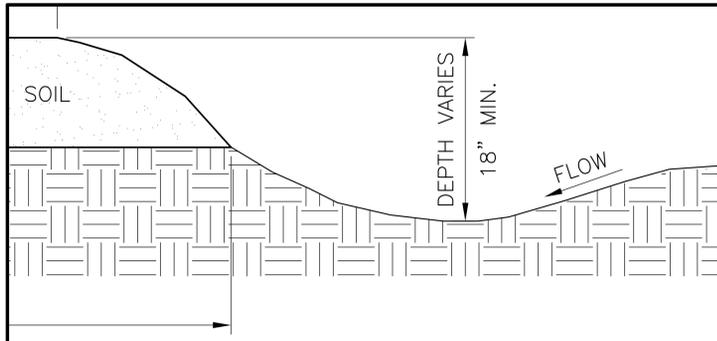
Response: Yes. Water cooled pumps are acceptable. Section 11314 will be revised and provided in Addendum No. 2.

2. The geotechnical memorandum is made available to the plan holders as Attachment No. 3. This document is for information purpose only and will not part of the Contract Documents.

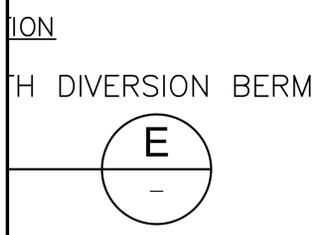
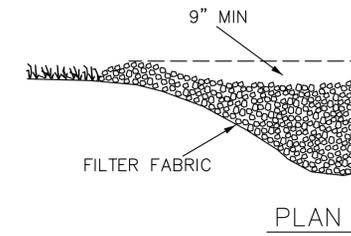
DRAWINGS

Sheet No. D-4

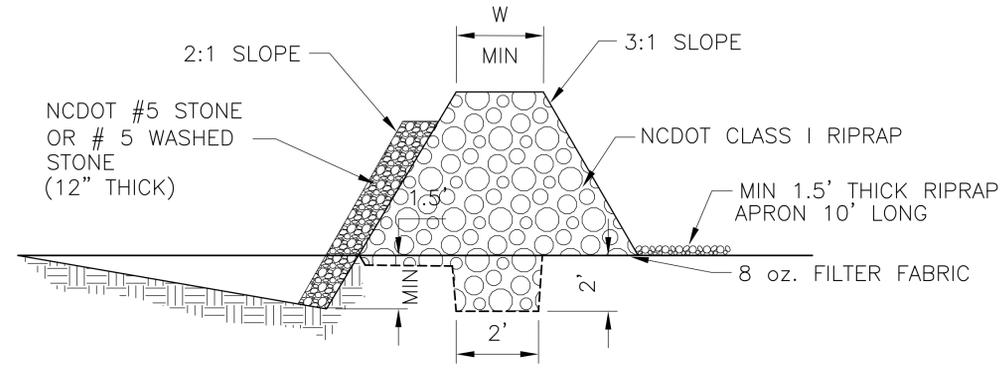
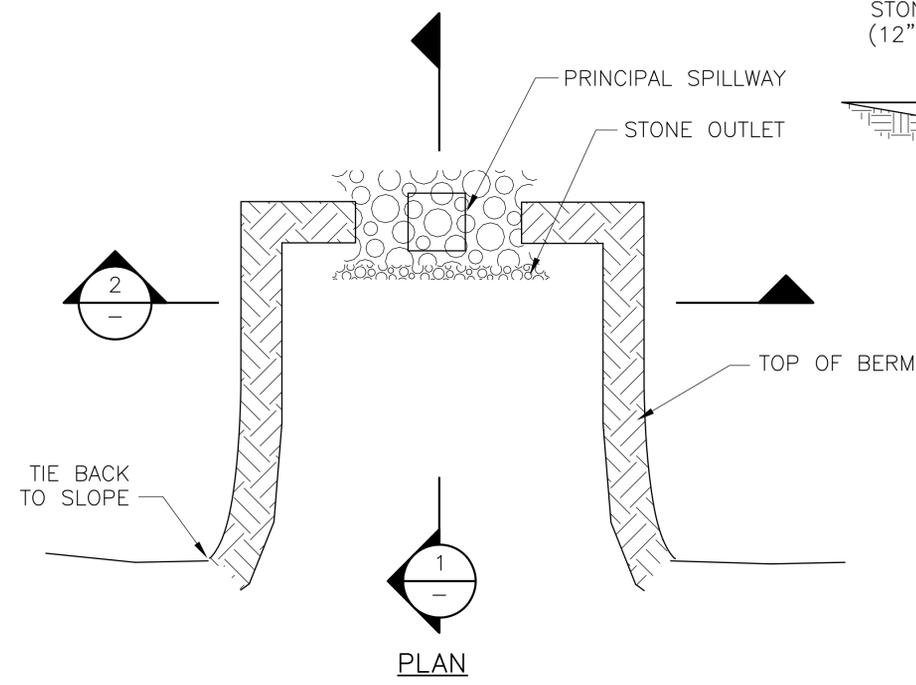
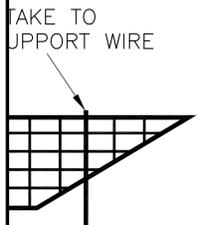
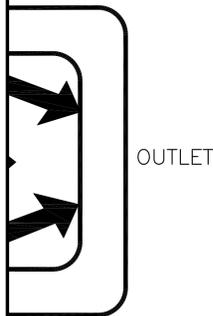
1. Detail H – Update the surface area and the bottom width of Sediment Trap No. 2 as shown on the attached Figure No. 1.



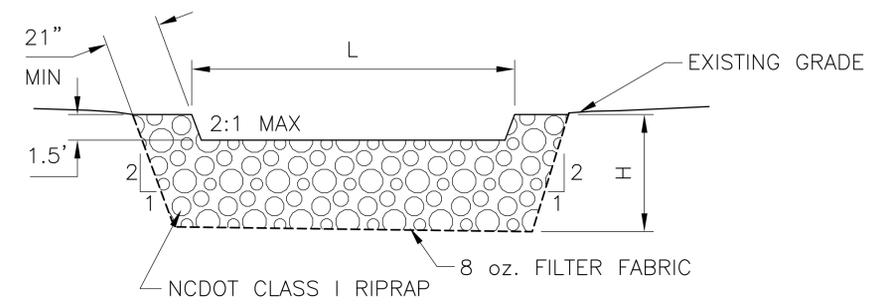
TEMPORARY SEDIMENT TRAPS							
SED TRAP NO.	DEPTH OF POOL (FT)	SURFACE AREA (FT ²)	WEIR LENGTH, L (FT)	WEIR WIDTH, W (FT)	EMBANKMENT HEIGHT, H (FT)	BOTTOM WIDTH (FT)	NO POROUS BAFFLES
ST-1	2.0	870	4	5	3.5	20	3
ST-2	2.0	290	4	5	3.5	14	3



NOTE:
1. BOTTOM WIDTH IS FROM TOE OF SLOPE TO TOE OF SLOPE OF TRAP.



SECTION 1
NTS



SECTION 2
NTS

TEMPORARY SEDIMENT TRAP
DETAIL H
NTS

BASIN

SHEET NO.	LOCATION	ADDENDUM NO.	FIGURE NO.
		D-4	1

Attachment No. 1

**Cabarrus County, NC
Construction and Demolition
Debris Landfill Phase 1L Expansion Project
Bidder's List
CDM Project No. 1278-77070**

Contractor	Contact Name	Contractor Type?
Cabarrus County Solid Waste Management	Rick Payne, Solid Waste Director	
4441 Irish Potato Road	Phone: 704-791-5567	
Concord, NC 28025	Fax: 704-795-3917	
rapayne@cabarruscounty.us		
AGC Plan Room-Charlotte	Chelsea Andujar	
1100 Euclid Ave.	Phone: 704-372-1450	
Charlotte, NC 28203	Fax: 704-940-0265	
candujar@carolinasagc.org		
McGraw-Hill Construction Dodge	Susan Goodman	
800 Clanton Road, Ste. G	Phone: 704-525-6924	
Charlotte, NC 28217-2201	Fax: 704-521-9346	
susan_goodman@mcgrawhill.com		
CDM-Raleigh	Farouk Banna	
5400 Glenwood, Ave., Ste. 300	Phone: 919-787-5620	
Raleigh, NC 27612	Fax: 919-781-5730	
banna@cdm.com		
CDM-Raleigh	Bob Brossoie	
5400 Glenwood, Ave., Ste. 300	Phone: 919-787-5620	
Raleigh, NC 27612	Fax: 919-781-5730	
brossoiere@cdm.com		
CDM- Charlotte	Martin Sanford	
301 South McDowell Street, Ste. 512	Phone: 704-342-4546	
Charlotte, NC 28204	Fax: 704-342-2296	
martinsd@cdm.com		
T&K Construction	Jamie Jenkins	General Contractor
235 Country Road 1242	Phone: 256-734-6611	
Vinemont, AL 35179	Fax: 256-734-4977	
jamie@tandkconstruction.com		
Earnhardt Grading, Inc. (EGI)	Mark LeGrand	General Contractor
7525 Old Plank Road	Phone: 704-601-4290	
Stanley, NC 28164	Fax: 704-601-4295	
mark@earnhardtgrading.com		
Sargent Corporation	Troy Corey	General Contractor
4820 Southpoint Drive, Ste. 205	Phone: 540-898-8362	
Fredericksburg, VA 22407	Fax: 540-898-8364	
troycorey@sargent-corp.com		
Thalle Construction Company	Mary Eagens	General Contractor
900 NC 86 North	Phone: 919-241-1620	
Hillsborough, NC 27278	Fax: 919-241-1659	
meagans@thalle.com		
Shamrock Environmental, Inc.	Rick Wigal	General Contractor
503 Patton Avenue	Phone: 336-375-1989	
Greensboro, NC 27406	Fax: 336-282-2499	
rwigal@shamrockenviro.com		

**Cabarrus County, NC
Construction and Demolition
Debris Landfill Phase 1L Expansion Project
Bidder's List
CDM Project No. 1278-77070**

Contractor	Contact Name	Contractor Type?
J.T. Russell & Sons, Inc.	Nathan Russell	General Contractor
1721 US 52 North	Phone: 704-982-2225	
Albermarle, NC 28001	Fax: 704-986-2270	
nathanrussell@jtrussellandsons.com		
Triangle Grading and Paving	Stephanie Griffin	General Contractor
1521 S. Huffman Mill Road	Phone: 336-584-1745	
Burlington, NC 27215	Fax: 336-584-0145	
sgriffin@trianglegradingpaving.com		
Blythe Construction Company	Todd Price	General Contractor
2911 N. Graham Street	Phone: 704-375-8474	
Charlotte, NC 28206	Fax: 704-375-7814	
todd.price@blytheconstruction.com		
N/S Carolina Storage Systems, Inc.	Ed Yarboro	General Contractor
838 Wallace Grove Drive	Phone: 704-482-2401	
Shelby, NC 28150	Fax: 704-487-1909	
nscarolina@carolina.rr.com		

Attachment No. 2

APPENDIX A
BORING LOGS



BOREHOLE LOG

B-1

Client: Cabarrus County
Project Location: Cabarrus County, NC

Project Name: C&D Landfill Expansion - Phase I
Project Number: 1278-78073

Drilling Contractor: SAEDACCO
Drilling Method/Rig: 4 1/4" ID HSA/Diedrich D-50
Drillers: Stefan Smith
Drilling Date: Start: 7-15-10 **End:** 7-15-10

Surface Elevation (ft.):
Total Depth (ft.): 55
Depth to Initial Water Level (ft. BGS): 18
Abandonment Method: Grouted to Ground Surface
Field Screening Instrument: None
Logged By: D. Forbes

Borehole Coordinates:
 N E

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description	
			0		2			6-inch-thick TOPSOIL.	
SS	S-1	24/24		11	3		ML	Dry, stiff, reddish brown, SILT, trace sand, clay. -RESIDUAL SOIL-	
					8				
					13				Dry, very stiff, reddish brown, SILT, trace sand, clay.
SS	S-2	24/24		20	5				
					8				Dry, very stiff, reddish brown, SILT, trace sand, clay.
					12				
SS	S-3	24/24	5	19	5				
					8			Dry, very stiff, reddish brown, SILT, trace sand, clay.	
					11				
					11				
SS	S-4	24/24		12	3		ML	Dry, stiff, orange and reddish brown, SILT, little sand, trace clay.	
					5				
					7				
					9				
SS	S-5	24/20		12	3			Dry, stiff, orange and reddish brown, SILT, little sand, trace clay.	
					5				
					7				
					9				
			10						
SS	S-6	24/24		8	3			Moist, medium stiff to stiff, orange, reddish brown, and black mineralization, SILT, little sand, trace clay.	
					4				
					4				
					6				

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
 HSA - Hollow Stem Auger
 SSA - Solid Stem Auger
 HA - Hand Auger
 AR - Air Rotary
 DTR - Dual Tube Rotary
 FR - Foam Rotary
 MR - Mud Rotary
 RC - Reverse Circulation
 CT - Cable Tool
 JET - Jetting
 D - Driving
 DTC - Drill Through Casing

SAMPLING TYPES:
 AS - Auger/Grab Sample
 CS - California Sampler
 BX - 1.5" Rock Core
 NX - 2.1" Rock Core
 GP - Geoprobe
 HP - Hydro Punch
 SS - Split Spoon
 ST - Shelby Tube
 WS - Wash Sample
OTHER:
 AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
 Split spoon = 2 inches OD, 24 inches long

Reviewed by: I. S. Akbas

Date: 7-22-10



BOREHOLE LOG

B-1

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			15				ML	
SS	S-7	24/24		5	2 2 3 5			Moist to wet, medium stiff, orange, reddish brown, and black mineralization, SILT, little sand, trace clay.
			20					
SS	S-8	24/24		5	1 2 3 5		ML	Wet, medium stiff, light brown, orangish brown, and black mineralization, SILT, little clay, trace sand.
			25					
SS	S-9	24/24		6	2 3 3 6			Wet, medium stiff, light brown, orangish brown, and black mineralization, SILT, little clay, trace sand.
			30					
SS	S-10	24/24		8	1 3 5 8			Wet, medium stiff to stiff, light brown, orangish brown, and black mineralization, SILT, little clay, trace sand.
			35					
					3 5		ML	Wet, stiff, light brown to brown and orangish brown, SILT, little sand, trace clay.

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10



BOREHOLE LOG

B-1

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
SS	S-11	24/24		13	8 10		ML	<p>Wet, hard, light brown to brown and orangish brown, SILT, little sand, trace clay.</p> <p>Wet, hard, light brown to brown and orangish brown, SILT, little sand, trace clay.</p> <p>Weathered rock from 48.5 to 49.5 feet below ground surface.</p> <p>Wet, very dense, gray, WEATHERED ROCK FRAGMENTS. -PARTIALLY WEATHERED ROCK-</p> <p>Boring terminated at 55 feet below ground surface.</p>
			40					
SS	S-12	24/24		42	8 19 23 28			
			45					
SS	S-13	24/24		83	21 45 38 37			
			50					
SS	S-14	6/6		>50	38 50/0"		PWR	
			55					
			60					

BOREHOLE CABARRUS - TANK.GPJ CDM_CORP.GDT 10/7/10



BOREHOLE LOG

B-2

Client: Cabarrus County
Project Location: Cabarrus County, NC

Project Name: C&D Landfill Expansion - Phase I
Project Number: 1278-78073

Drilling Contractor: SAEDACCO
Drilling Method/Rig: 2 1/4" ID HSA/Diedrich D-50
Drillers: Stefan Smith
Drilling Date: Start: 8-12-10 **End:** 8-12-10

Surface Elevation (ft.):
Total Depth (ft.): 53.9
Depth to Initial Water Level (ft. BGS): 24.8
Abandonment Method: Grouted to Ground Surface
Field Screening Instrument: None
Logged By: I. S. Akbas

Borehole Coordinates:
 N E

Sample Type	Sample Number	Sample Advance/Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
SS	S-1	24/24	0	11	4		SM	Dry, medium dense, light orangish brown, fine SAND, little silt, trace roots. -RESIDUAL SOIL-
					5			
					6			
SS	S-2	24/24	13	8		SM	Dry, medium dense, light brown to light grayish brown, fine SAND, little to some silt.	
				6				
				7				
SS	S-3	24/24	5	9		SM/ML	Dry, loose, orangish to reddish brown, fine SAND and SILT.	
				4				
				4				
SS	S-4	24/24	17	8		SM	Dry, medium dense, orangish to reddish brown, fine SAND and SILT.	
				7				
				10				
SS	S-5	24/24	16	5		SM	Dry, medium dense, greenish to brownish gray and black mineralization, fine SAND and SILT.	
				8				
				8				
SS	S-6	24/24	10	16		SM	Dry, medium dense, greenish to brownish gray and black mineralization, fine SAND and SILT.	
				7				
				9				
SS	S-7	24/24	18	5		SM	Dry to moist, medium dense, light grayish and greenish brown, fine SAND, some silt.	
				9				
				9				

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
 HSA - Hollow Stem Auger
 SSA - Solid Stem Auger
 HA - Hand Auger
 AR - Air Rotary
 DTR - Dual Tube Rotary
 FR - Foam Rotary
 MR - Mud Rotary
 RC - Reverse Circulation
 CT - Cable Tool
 JET - Jetting
 D - Driving
 DTC - Drill Through Casing

SAMPLING TYPES:
 AS - Auger/Grab Sample
 CS - California Sampler
 BX - 1.5" Rock Core
 NX - 2.1" Rock Core
 GP - Geoprobe
 HP - Hydro Punch
 SS - Split Spoon
 ST - Shelby Tube
 WS - Wash Sample
OTHER:
 AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
 Split spoon = 2 inches OD, 24 inches long

Reviewed by: J. Wen

Date: 8-18-10



BOREHOLE LOG

B-2

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			15				SM	
SS	S-8	24/24		13	8 6 7 13			Moist, medium dense, light grayish and greenish brown, fine SAND, some silt, weak cementation.
			20					
SS	S-9	24/24		38	7 13 25 33			Moist, dense, light greenish to brownish gray, fine SAND, little to some silt, trace rock fragments, weak cementation.
			25					
SS	S-10	24/24		25	3 11 14 20			Moist, medium dense, light greenish and grayish brown, fine SAND, some silt.
			30					
SS	S-11	24/24		19	4 7 12 15			Moist, medium dense, grayish green, brown, and black mineralization, fine SAND, some silt.
			35					
					7 8			Moist, medium dense, light greenish brown, fine SAND, some silt.

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10



BOREHOLE LOG

B-2

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
SS	S-12	24/24		25	17 34		SM	
			40					
SS	S-13	23/23		53	5 21 32 50/5"		PWR	Wet (spoon), very dense, brown, fine SAND, little to some silt, weak cementation. -PARTIALLY WEATHERED ROCK-
			45					
SS	S-14	22/22		54	3 17 37 50/4"			Wet (spoon), very dense, brownish gray, fine SAND, little silt.
			50					
SS	S-15	11/11		>50	23 50/5"			Wet, very dense, brownish gray, fine to medium SAND, little rock fragments, trace silt.
			55					
			60					
								Boring terminated upon split-spoon refusal at 53.9 feet below ground surface.

BOREHOLE CABARRUS - TANK.GPJ CDM_CORP.GDT 10/7/10



BOREHOLE LOG

B-3

Client: Cabarrus County
Project Location: Cabarrus County, NC

Project Name: C&D Landfill Expansion - Phase I
Project Number: 1278-78073

Drilling Contractor: SAEDACCO
Drilling Method/Rig: 2 1/4" ID HSA/Diedrich D-50
Drillers: Stefan Smith
Drilling Date: Start: 8-12-10 **End:** 8-12-10

Surface Elevation (ft.):
Total Depth (ft.): 43.4
Depth to Initial Water Level (ft. BGS): 33.6
Abandonment Method: Grouted to Ground Surface
Field Screening Instrument: None
Logged By: I. S. Akbas

Borehole Coordinates:
 N E

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			0				SM	
SS	S-1	24/24		11	5 5 6 8	[Graphic Log: Dotted pattern]	SM	Dry, medium dense, orangish to reddish brown, fine SAND, little silt. -RESIDUAL SOIL-
SS	S-2	24/24	5	11	4 5 6 8		SP-SM	Dry, medium dense, light orangish brown and white mottled, fine SAND, trace to little silt.
SS	S-3	24/24		14	6 6 8 11			Dry, medium dense, light grayish brown, fine SAND, trace silt, clay clusters.
SS	S-4	24/24		12	2 5 7 10			Dry, medium dense, light brownish gray, fine SAND, trace silt.
			10					
SS	S-5	24/24		22	5 8 14 20		SM	Moist, medium dense, brownish to greenish gray, fine SAND, little silt.

BOREHOLE CABARRUS - TANK.GPJ CDM_CORP.GDT 10/7/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
 HSA - Hollow Stem Auger
 SSA - Solid Stem Auger
 HA - Hand Auger
 AR - Air Rotary
 DTR - Dual Tube Rotary
 FR - Foam Rotary
 MR - Mud Rotary
 RC - Reverse Circulation
 CT - Cable Tool
 JET - Jetting
 D - Driving
 DTC - Drill Through Casing

SAMPLING TYPES:
 AS - Auger/Grab Sample
 CS - California Sampler
 BX - 1.5" Rock Core
 NX - 2.1" Rock Core
 GP - Geoprobe
 HP - Hydro Punch
 SS - Split Spoon
 ST - Shelby Tube
 WS - Wash Sample
OTHER:
 AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
 Split spoon = 2 inches OD, 24 inches long

Reviewed by: J. Wen

Date: 8-18-10



BOREHOLE LOG

B-3

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			15				SM	
SS	S-6	24/24		24	5 9 15 13		SP-SM	Moist, medium dense, light brownish gray, fine SAND, trace to little silt.
			20					
SS	S-7	24/24		25	6 9 16 32		SM	Moist, medium dense, grayish brown and black mineralization, fine SAND, some silt.
			25					
SS	S-8	24/24		27	4 12 15 34			Moist, medium dense, grayish and greenish brown, fine SAND, little silt.
			30					
SS	S-9	21/21		75	5 32 43 50/3"		PWR	Moist, very dense, grayish and greenish brown, fine SAND, little silt. -PARTIALLY WEATHERED ROCK-
			35					
SS	S-10	17/17		>50	10 30			Dry, very dense, light grayish brown, fine SAND, trace silt.

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10



BOREHOLE LOG

B-3

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			40		50/5"		PWR	
SS	S-11	5/5		>50	50/5"			Dry, very dense, light brownish gray, fine SAND, trace rock fragments.
			45					Boring terminated upon split-spoon refusal at 43.4 feet below ground surface.
			50					
			55					
			60					

Attachment No. 3



Memorandum

To: *Martin Sanford, P.E.*

From: *Danielle Neamtu, P.E.*
Sacit Akbas, P.E.

Date: *October 11, 2010*

Subject: *Geotechnical Design Memorandum*
Proposed Primary Leachate Storage Tank
CDM Project No. 1278-77070



Purpose

The purpose of this geotechnical design memorandum is to provide geotechnical engineering recommendations for design and construction of the proposed primary leachate storage tank at the Cabarrus County Construction and Demolition (C&D) Landfill on Irish Potato Road in Cabarrus County, North Carolina.

Project Information

Camp Dresser & McKee (CDM) has been retained by Cabarrus County to provide design services for the C&D Landfill Phase I Expansion project in Cabarrus County, North Carolina. The proposed 150,000-gallon primary leachate storage tank has an outside diameter of 33 feet with 81-foot-diameter secondary containment, as shown on **Figure 1**.

Site Conditions

Site Description

The tank site is bounded by the existing C&D landfill to the south, the landfill access road to the east, and woods to the west and north. The existing grades gradually increases towards east from EL. 755 to EL. 760 based on North American Vertical Datum of 1988 (NAVD-88).

Geotechnical Explorations

The subsurface explorations consisted of three (3) Standard Penetration Test (SPT) soil borings, B-1 through B-3.

The SPT soil borings were drilled by South Atlantic Environmental Drilling and Construction Co. Inc. (SAEDACCO) of Fort Mill, South Carolina on July 15, 2010 and August 12, 2010. The approximate boring locations were measured in the field by CDM personnel by tape

measurements from the existing access road. The geotechnical test borings were drilled with a Diedrich D50 all-terrain drilling rig. SPT soil borings were advanced to depths of 43.4 to 55.0 feet using hollow stem augers. In general, split-spoon sampling was conducted in each boring continuously from the ground surface to 10 feet below ground surface and at five-foot intervals thereafter. Split-spoon samples were collected in general accordance with ASTM D1586 (2-inch-diameter sampler driven 24 inches by blows from a 140-pound hammer falling freely for a 30-inch drop). The number of blows required to drive the sampler each 6-inch increment was recorded and the Standard Penetration Resistance (N-value) was determined as the sum of the blows over the 2nd and 3rd 6-inch-increments. Representative soil samples were taken from each split-spoon sample and stored in bags for later review.

A CDM representative observed the SPT soil borings in the field and visually classified the soil samples in accordance with the Burmeister Soil Identification System. Each soil sample was also given a Unified Soil Classification System (USCS) designation. Geotechnical test boring logs, prepared by CDM, are included in **Attachment A**.

Groundwater levels in the borings were estimated from the condition of the samples obtained and water levels measured in the borings at the end of drilling. Laboratory testing was not performed at this time, but soil samples collected during the exploration are available at the CDM's storage location.

Subsurface Conditions

In general, the SPT soil borings encountered residual soils underlain by partially weathered rock (PWR). Subsurface conditions generally consist of the following, in order of their occurrence below ground surface:

- Up to six inches of topsoil;
- 33 to 52.5 feet of residual soils, consisting of loose to dense SAND with varying amounts of silt and medium stiff to hard SILT with varying amounts of sand and clay.
- Partially weathered rock (PWR), consisting of very dense sand with varying amounts of silt and rock fragments.

SPT soil borings were terminated at depths ranging from 43.4 to 55 feet below ground surface. Top of PWR varied from approximately 33 to 53 feet below ground surface.

Groundwater levels measured at the end of drilling ranged from 18.0 to 33.6 feet below ground surface at the exploration locations.

A summary of subsurface conditions encountered in the SPT soil borings is presented in **Table 1**.

Table 1: Summary of Subsurface Conditions

Boring Number	Total Drilling Depth (feet)	Approximate Strata Thickness (feet)			Approximate Depth to Groundwater (feet)
		Topsoil	Residual Soil	Partially Weathered Rock	
B-1	55.0	0.5	52.5	> 2.0	18.0
B-2	53.9	N/E	43	> 10.9	24.8
B-3	43.4	N/E	33	> 10.4	33.6

Abbreviations:

- N/E Not encountered.
- > Indicates strata not fully penetrated.

Variations in Subsurface Conditions

Interpretation of general soil conditions presented herein is based on soil and groundwater conditions observed at the SPT soil boring locations. However, subsurface conditions may vary between exploration locations. If conditions are found to be different from assumed, recommendations contained in this memorandum should be re-evaluated by CDM and confirmed in writing.

Groundwater levels are expected to fluctuate with season, temperature, climate, construction in the area, and other factors. Actual conditions during construction may be different from those observed at the time of the explorations.

Geotechnical Design Recommendations

General

Based upon the geotechnical explorations at the proposed primary leachate storage tank site, a residual soil layer consisting of loose to dense sand with varying amounts of silt and medium stiff to hard silt with varying amounts of sand and clay extends from ground surface to a depth of 33 to 53 feet. In general, the residual soils encountered at the site are considered suitable for shallow foundation systems. However, it should be noted that the thickness of the residual soils over PWR is greatest at SPT soil boring B-1 and the residual soils in this boring tend to be more loose/soft than the other boring locations. It is anticipated that the total and differential settlements resulting from the foundation load of the proposed leachate tank mat foundation would be unacceptable at this location. Therefore, the proposed tank has been sited closest to boring B-3, where the residual soils are more stiff and the depth to PWR is most shallow.

Foundation Recommendations

The proposed primary leachate storage tank is anticipated to bear on a shallow foundation system consisting of 6-inch-thick membrane slab and a thickened wall footing. The tank manufacturer will be responsible for foundation design.

Based upon preliminary foundation information from the tank manufacturer, the mat foundation may exert an average bearing pressure of 1,850 pounds per square foot (psf) across the entire mat. For the proposed tank location, as shown in Figure 1, the average bearing pressure for the 33-foot-diameter mat foundation may result in up to 1.5 and 0.5 inches of total and differential settlement, respectively. These settlements are considered to be within an acceptable range for the proposed tank. The tank manufacturer's foundation engineer will be responsible for foundation design based upon the actual tank loads and allowable settlement criteria.

Groundwater Conditions

Design groundwater can be assumed to be 15 feet below ground surface for the proposed tank site.

Seismic Considerations

For purposes of determining design earthquake forces, in accordance with the 2009 North Carolina Building Code, the soils may be considered a site class "D".

Based on the SPT N-values of the subgrade soils, the soils are not considered susceptible to liquefaction.

Preliminary Construction Considerations

General

The purpose of this section is to discuss issues related to geotechnical aspects of construction as required for development of the project specifications. Included are anticipated methods of construction and identification of potential construction-related problems.

Excavation

The Contractor will be responsible for the excavation work in accordance with the applicable federal and state laws and regulations, including OSHA.

Excavation will be required for installation of the wall footings at the primary leachate storage tank. It is anticipated that all excavations will be in overburden soils, which can be excavated using conventional earth moving equipment. The Contractor will be responsible for selection and design of the means and methods of excavation.

Care should be taken to avoid excess traffic on the excavated subgrade prior to placement of the concrete foundations. Sand and gravel subgrades should be proof rolled with at least two

passes of a vibratory compactor prior to placement of structural fill or concrete foundations. Silt and clay subgrades, if encountered, should be excavated within the final 6 inches using a smooth-edge bucket or hand excavation.

Dewatering

Dewatering and drainage systems are not anticipated to be required for the proposed excavations. However, the Contractor will be responsible for designing and implementing a dewatering system, if needed, to maintain a dry and undisturbed subgrade. To avoid disturbance to the subgrade, the groundwater elevation should be maintained a minimum of 2 feet below the subgrade level during the entire period of excavation and fill or concrete placement.

The Contractor should take care to avoid disturbance of the exposed subgrade soils by scheduling excavations to limit the duration of open cuts, sloping the bottoms of the excavations to facilitate drainage, and providing berms to limit surface runoff into the excavations. In addition, excavated material to be reused as backfill should be stockpiled in such a manner that promotes runoff and limits saturation of the materials.

Fill Placement

The site plan indicates placement of up to 4.5 feet of fill in the proposed tank area to facilitate access and provide a level grade. Fill placed within the zone of influence of the tank foundations, defined as 1 foot outside the tank foundation and following a line extending outward and downward at a 1H:1V, should be structural fill. Fill placed beneath roadways should be select fill, as specified in the Contract Documents. Common fill is acceptable for use in areas not designated for structural or select fill.

Foundation Preparation

If unacceptable soils, including unengineered fill, are encountered at the foundation depth, they should be excavated to firm subgrade and backfilled with compacted structural fill. A geotechnical engineer should be present during foundation excavation to confirm that suitable subgrade conditions are present. Subgrade excavation and foundation preparation should be performed in-the-dry.

The bottom of the proposed wall is anticipated to bear 2.5 feet below finished grade underlain by a 6-inch-thick crushed stone layer. The bottom of tank slab is anticipated to be 6 inches below finished grade. The depth of foundation between the wall and tank slab should be backfilled with crushed stone underlain by a non-woven Mirafi 160N, or equivalent, geotextile fabric.

Materials

Crushed Stone

Crushed stone should consist of hard, durable, angular or subangular particles of proper size and gradation, and should be free of sand, loam, clay, excess fines, and other deleterious materials. The material should conform to NCDOT No. 57 stone.

Structural Fill

Material used as structural fill should consist of soil free of organic material, loam, wood, trash, debris, frozen soil, or other deleterious material which may be unstable or which cannot be properly compacted. Structural fill should consist of select material with the following gradation:

U.S. Standard Sieve Size	Percent Passing by Weight
1 ½ inches	100
No. 4	20-90
No. 40	5-75
No. 200	0-40

Structural fill should have a maximum liquid limit of 30 percent and maximum plasticity index of 10 percent when tested in accordance with ASTM D4318 with a maximum dry density of at least 95 pcf, as determined in accordance with ASTM D698.

Structural fill should be placed in layers no thicker than 8 inches, as placed, and compacted with suitable compaction equipment to at least 98 percent of maximum dry density as determined by ASTM D698. Lift thickness should be reduced to 4 inches in confined areas accessible only to hand-guided compaction equipment.

Common Fill

Common fill should consist of soil free of organic material, topsoil, wood, debris, frozen soil, highly micaceous silt, or other deleterious material that cannot be properly compacted. It should contain stones no larger than three inches in the largest dimension and have no more than 60 percent of material passing the No. 200 sieve. Common fill should have a maximum liquid limit of 50 percent and maximum plasticity index of 15 percent when tested in accordance with ASTM D4318. It should be placed in layers not to exceed 12 inches, as placed, and compacted with suitable vibratory compaction equipment to at least 95 percent of maximum dry density as determined by ASTM D698. Lift thickness should be reduced to 6 inches in confined areas accessible only to hand-guided compaction equipment.

Select common fill should meet the requirements listed above, but should contain stones no larger than 2 inches.

Filter Fabric

The filter fabric used to separate the crushed stone bedding material from the underlying structural fill material should be a Mirafi 160N or equivalent.

Construction Monitoring

It is recommended that a qualified geotechnical engineer or an experienced technician under the direction of the geotechnical engineer be present during construction to confirm that the Contractor complies with the intent of these recommendations. Specifically, the field representative would undertake the following responsibilities:

- Confirm that the subgrade conditions encountered are suitable for support of the proposed structure; and
- Observe, test, and document placement and compaction of fill and backfill material where appropriate.

In addition, the field representative should be present to identify and provide a response should conditions encountered differ from those assumed for preparation of this memorandum.

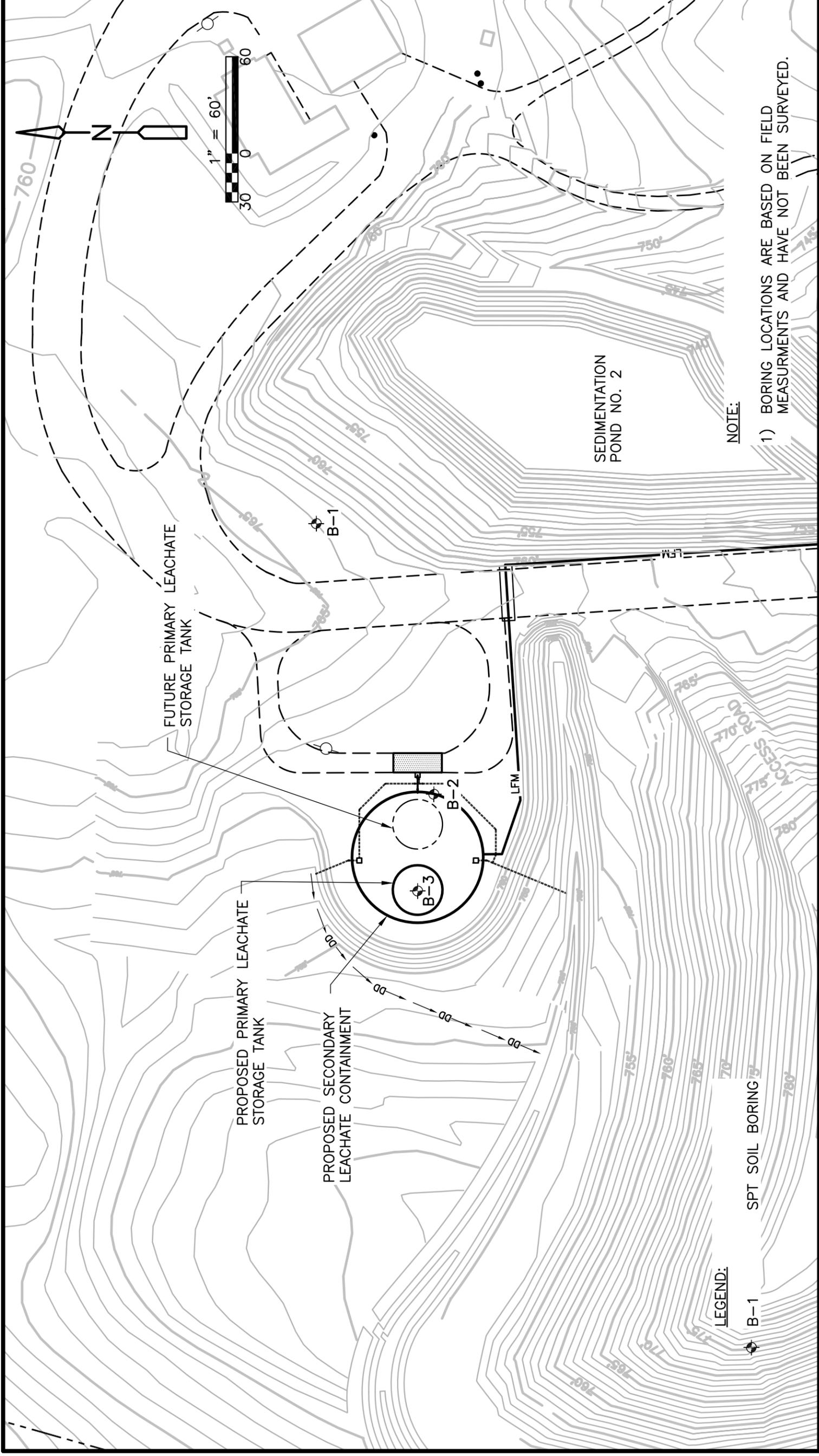
Limitations

This memorandum has been prepared for specific application to the subject project in accordance with generally accepted geotechnical engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design, or location of structures are planned, the conclusions and preliminary recommendations presented in this memorandum should not be considered valid, unless changes are reviewed and conclusions of this memorandum are modified or verified in writing.

The recommendations submitted in this memorandum are based in part upon the data obtained from the referenced borings. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it may be necessary to re-evaluate the recommendations of the memorandum.

Attachments

- Figure 1 – Proposed Primary Leachate Storage Tank Site
- Attachment A – SPT Soil Boring Logs



NOTE:
 1) BORING LOCATIONS ARE BASED ON FIELD MEASUREMENTS AND HAVE NOT BEEN SURVEYED.

LEGEND:

⊕ B-1

SPT SOIL BORING'S

PROJECT NO. 1278-77070
 DATE 10/08/10

CABARRUS COUNTY
 NORTH CAROLINA

**CONSTRUCTION PLAN
 PHASE 1L EXPANSION
 CABARRUS COUNTY C&D LANDFILL**

**PROPOSED PRIMARY LEACHATE
 STORAGE TANK SITE**

Figure No.
 1



Attachment A
SPT Soil Boring Logs



BOREHOLE LOG

B-1

Client: Cabarrus County
Project Location: Cabarrus County, NC

Project Name: C&D Landfill Expansion - Phase I
Project Number: 1278-78073

Drilling Contractor: SAEDACCO
Drilling Method/Rig: 4 1/4" ID HSA/Diedrich D-50
Drillers: Stefan Smith
Drilling Date: Start: 7-15-10 **End:** 7-15-10

Surface Elevation (ft.):
Total Depth (ft.): 55
Depth to Initial Water Level (ft. BGS): 18
Abandonment Method: Grouted to Ground Surface
Field Screening Instrument: None
Logged By: D. Forbes

Borehole Coordinates:
 N E

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description	
			0		2			6-inch-thick TOPSOIL.	
SS	S-1	24/24		11	3		ML	Dry, stiff, reddish brown, SILT, trace sand, clay. -RESIDUAL SOIL-	
					8				
					13				Dry, very stiff, reddish brown, SILT, trace sand, clay.
SS	S-2	24/24		20	5				
					8				Dry, very stiff, reddish brown, SILT, trace sand, clay.
					12				
SS	S-3	24/24	5	19	5				
					8			Dry, very stiff, reddish brown, SILT, trace sand, clay.	
					11				
					11				
SS	S-4	24/24		12	3		ML	Dry, stiff, orange and reddish brown, SILT, little sand, trace clay.	
					5				
					7				
					9				
SS	S-5	24/20		12	3			Dry, stiff, orange and reddish brown, SILT, little sand, trace clay.	
					5				
					7				
					9				
			10						
SS	S-6	24/24		8	3			Moist, medium stiff to stiff, orange, reddish brown, and black mineralization, SILT, little sand, trace clay.	
					4				
					4				
					6				

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
 HSA - Hollow Stem Auger
 SSA - Solid Stem Auger
 HA - Hand Auger
 AR - Air Rotary
 DTR - Dual Tube Rotary
 FR - Foam Rotary
 MR - Mud Rotary
 RC - Reverse Circulation
 CT - Cable Tool
 JET - Jetting
 D - Driving
 DTC - Drill Through Casing

SAMPLING TYPES:
 AS - Auger/Grab Sample
 CS - California Sampler
 BX - 1.5" Rock Core
 NX - 2.1" Rock Core
 GP - Geoprobe
 HP - Hydro Punch
 SS - Split Spoon
 ST - Shelby Tube
 WS - Wash Sample
OTHER:
 AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
 Split spoon = 2 inches OD, 24 inches long

Reviewed by: I. S. Akbas

Date: 7-22-10



BOREHOLE LOG

B-1

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			15				ML	
SS	S-7	24/24		5	2 2 3 5			Moist to wet, medium stiff, orange, reddish brown, and black mineralization, SILT, little sand, trace clay.
			20					
SS	S-8	24/24		5	1 2 3 5		ML	Wet, medium stiff, light brown, orangish brown, and black mineralization, SILT, little clay, trace sand.
			25					
SS	S-9	24/24		6	2 3 3 6			Wet, medium stiff, light brown, orangish brown, and black mineralization, SILT, little clay, trace sand.
			30					
SS	S-10	24/24		8	1 3 5 8			Wet, medium stiff to stiff, light brown, orangish brown, and black mineralization, SILT, little clay, trace sand.
			35					
					3 5		ML	Wet, stiff, light brown to brown and orangish brown, SILT, little sand, trace clay.

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10



BOREHOLE LOG

B-1

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
SS	S-11	24/24		13	8 10		ML	<p>Wet, hard, light brown to brown and orangish brown, SILT, little sand, trace clay.</p> <p>Wet, hard, light brown to brown and orangish brown, SILT, little sand, trace clay.</p> <p>Weathered rock from 48.5 to 49.5 feet below ground surface.</p> <p>Wet, very dense, gray, WEATHERED ROCK FRAGMENTS. -PARTIALLY WEATHERED ROCK-</p> <p>Boring terminated at 55 feet below ground surface.</p>
			40					
SS	S-12	24/24		42	8 19 23 28			
			45					
SS	S-13	24/24		83	21 45 38 37			
			50					
SS	S-14	6/6		>50	38 50/0"		PWR	
			55					
			60					

BOREHOLE CABARRUS - TANK.GPJ CDM_CORP.GDT 10/7/10



BOREHOLE LOG

B-2

Client: Cabarrus County
Project Location: Cabarrus County, NC

Project Name: C&D Landfill Expansion - Phase I
Project Number: 1278-78073

Drilling Contractor: SAEDACCO
Drilling Method/Rig: 2 1/4" ID HSA/Diedrich D-50
Drillers: Stefan Smith
Drilling Date: Start: 8-12-10 **End:** 8-12-10

Surface Elevation (ft.):
Total Depth (ft.): 53.9
Depth to Initial Water Level (ft. BGS): 24.8
Abandonment Method: Grouted to Ground Surface
Field Screening Instrument: None
Logged By: I. S. Akbas

Borehole Coordinates:
 N E

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
SS	S-1	24/24	0	11	4		SM	Dry, medium dense, light orangish brown, fine SAND, little silt, trace roots. -RESIDUAL SOIL-
					5			
					6			
SS	S-2	24/24	-	13	8		SM	Dry, medium dense, light brown to light grayish brown, fine SAND, little to some silt.
					6			
					7			
SS	S-3	24/24	5	9	4		SM/ML	Dry, loose, orangish to reddish brown, fine SAND and SILT.
					4			
					5			
SS	S-4	24/24	-	17	8		SM	Dry, medium dense, orangish to reddish brown, fine SAND and SILT.
					7			
					10			
SS	S-5	24/24	-	16	5		SM	Dry, medium dense, greenish to brownish gray and black mineralization, fine SAND and SILT.
					8			
					8			
SS	S-6	24/24	10	16	5		SM	Dry, medium dense, greenish to brownish gray and black mineralization, fine SAND and SILT.
					7			
					9			
SS	S-7	24/24	-	18	5		SM	Dry to moist, medium dense, light grayish and greenish brown, fine SAND, some silt.
					9			
					9			

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
 HSA - Hollow Stem Auger
 SSA - Solid Stem Auger
 HA - Hand Auger
 AR - Air Rotary
 DTR - Dual Tube Rotary
 FR - Foam Rotary
 MR - Mud Rotary
 RC - Reverse Circulation
 CT - Cable Tool
 JET - Jetting
 D - Driving
 DTC - Drill Through Casing

SAMPLING TYPES:
 AS - Auger/Grab Sample
 CS - California Sampler
 BX - 1.5" Rock Core
 NX - 2.1" Rock Core
 GP - Geoprobe
 HP - Hydro Punch
 SS - Split Spoon
 ST - Shelby Tube
 WS - Wash Sample
OTHER:
 AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
 Split spoon = 2 inches OD, 24 inches long

Reviewed by: J. Wen

Date: 8-18-10



BOREHOLE LOG

B-2

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			15				SM	
SS	S-8	24/24		13	8 6 7 13			Moist, medium dense, light grayish and greenish brown, fine SAND, some silt, weak cementation.
			20					
SS	S-9	24/24		38	7 13 25 33			Moist, dense, light greenish to brownish gray, fine SAND, little to some silt, trace rock fragments, weak cementation.
			25					
SS	S-10	24/24		25	3 11 14 20			Moist, medium dense, light greenish and grayish brown, fine SAND, some silt.
			30					
SS	S-11	24/24		19	4 7 12 15			Moist, medium dense, grayish green, brown, and black mineralization, fine SAND, some silt.
			35					
					7 8			Moist, medium dense, light greenish brown, fine SAND, some silt.

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10



BOREHOLE LOG

B-2

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
SS	S-12	24/24		25	17 34		SM	
			40					
SS	S-13	23/23		53	5 21 32 50/5"		PWR	Wet (spoon), very dense, brown, fine SAND, little to some silt, weak cementation. -PARTIALLY WEATHERED ROCK-
			45					
SS	S-14	22/22		54	3 17 37 50/4"			Wet (spoon), very dense, brownish gray, fine SAND, little silt.
			50					
SS	S-15	11/11		>50	23 50/5"			Wet, very dense, brownish gray, fine to medium SAND, little rock fragments, trace silt.
			55					
			60					
								Boring terminated upon split-spoon refusal at 53.9 feet below ground surface.

BOREHOLE CABARRUS - TANK.GPJ CDM_CORP.GDT 10/7/10



BOREHOLE LOG

B-3

Client: Cabarrus County
Project Location: Cabarrus County, NC

Project Name: C&D Landfill Expansion - Phase I
Project Number: 1278-78073

Drilling Contractor: SAEDACCO
Drilling Method/Rig: 2 1/4" ID HSA/Diedrich D-50
Drillers: Stefan Smith
Drilling Date: Start: 8-12-10 **End:** 8-12-10

Surface Elevation (ft.):
Total Depth (ft.): 43.4
Depth to Initial Water Level (ft. BGS): 33.6
Abandonment Method: Grouted to Ground Surface
Field Screening Instrument: None
Logged By: I. S. Akbas

Borehole Coordinates:
 N E

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			0				SM	
SS	S-1	24/24		11	5 5 6 8	[Graphic Log: Dotted pattern]		Dry, medium dense, orangish to reddish brown, fine SAND, little silt. -RESIDUAL SOIL-
SS	S-2	24/24	5	11	4 5 6 8		SP-SM	Dry, medium dense, light orangish brown and white mottled, fine SAND, trace to little silt.
SS	S-3	24/24		14	6 6 8 11			Dry, medium dense, light grayish brown, fine SAND, trace silt, clay clusters.
SS	S-4	24/24		12	2 5 7 10			Dry, medium dense, light brownish gray, fine SAND, trace silt.
			10					
SS	S-5	24/24		22	5 8 14 20		SM	Moist, medium dense, brownish to greenish gray, fine SAND, little silt.

BOREHOLE CABARRUS - TANK.GPJ CDM_CORP.GDT 10/7/10

EXPLANATION OF ABBREVIATIONS

DRILLING METHODS:
 HSA - Hollow Stem Auger
 SSA - Solid Stem Auger
 HA - Hand Auger
 AR - Air Rotary
 DTR - Dual Tube Rotary
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 JET - Jetting
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 BX - 1.5" Rock Core
 NX - 2.1" Rock Core
 GP - Geoprobe
 HP - Hydro Punch
 SS - Split Spoon
 ST - Shelby Tube
 WS - Wash Sample
OTHER:
 AGS - Above Ground Surface

REMARKS

Hammer weight = 140 pounds, drop height = 30 inches
 Split spoon = 2 inches OD, 24 inches long

Reviewed by: J. Wen

Date: 8-18-10



BOREHOLE LOG

B-3

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			15				SM	
SS	S-6	24/24		24	5 9 15 13		SP-SM	Moist, medium dense, light brownish gray, fine SAND, trace to little silt.
			20					
SS	S-7	24/24		25	6 9 16 32		SM	Moist, medium dense, grayish brown and black mineralization, fine SAND, some silt.
			25					
SS	S-8	24/24		27	4 12 15 34			Moist, medium dense, grayish and greenish brown, fine SAND, little silt.
			30					
SS	S-9	21/21		75	5 32 43 50/3"		PWR	Moist, very dense, grayish and greenish brown, fine SAND, little silt. -PARTIALLY WEATHERED ROCK-
			35					
SS	S-10	17/17		>50	10 30			Dry, very dense, light grayish brown, fine SAND, trace silt.

BOREHOLE CABARRUS - TANK.GPJ CDM CORP.GDT 10/7/10



BOREHOLE LOG

B-3

Client: Cabarrus County

Project Name: C&D Landfill Expansion - Phase I

Project Location: Cabarrus County, NC

Project Number: 1278-78073

Sample Type	Sample Number	Sample Advance/ Recovery (inches)	Elev. Depth (feet)	N-Value	Blows per 6-in	Graphic Log	USCS Classification	Material Description
			40		50/5"		PWR	
SS	S-11	5/5		>50	50/5"			Dry, very dense, light brownish gray, fine SAND, trace rock fragments.
			45					Boring terminated upon split-spoon refusal at 43.4 feet below ground surface.
			50					
			55					
			60					