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**SOLID WASTE SECTION
ASHEVILLE REGIONAL OFFICE**

June 26, 2008

Mr. Ming-Tai Chao, P.E.
Solid Waste Permitting Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

RE: Application For Continued Operation
Construction & Demolition Landfill Unit 2
Madison County Landfill
Madison County, North Carolina
Permit # 58-03

Dear Mr. Chao:

On behalf of Madison County, McGill Associates is pleased to present to you this application request for continued operation of the Unit 2 Construction & Demolition Landfill (C&DLF) at the Madison County Landfill. C&DLF Unit 2 received a Permit to Operate on October 19, 2006 and has an estimated lifetime capacity to receive wastes until 2022. Madison County intends to close C&DLF Unit 1 and is in the process of finalizing the C&DLF Unit 1 Closure Plan. Enclosed is the Closure and Post-Closure Plan (1 hard copy and 1 electronic copy) for C&DLF Unit 2, which includes information pertaining to the required Financial Assurance. Additional Financial Assurance information will be provided to you from Madison County as the County completes its FY2008 accounting after June 30, 2008.

E n g i n e e r i n g • P l a n n i n g • F i n a n c e

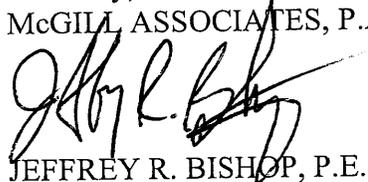
McGill Associates, P.A. • P.O. Box 2259, Asheville, NC 28802 • 55 Broad Street, Asheville, NC 28801

828-252-0575 • Fax: 828-252-2518

Mr. Ming-Tai Chao
June 26, 2008
Page 2

We look forward to working with you to obtain approval for continued operation of the Madison County C&DLF Unit 2. Please let us know if you have any questions regarding this submittal or if you require additional information.

Sincerely,
McGILL ASSOCIATES, P.A.



JEFFREY R. BISHOP, P.E.
Senior Project Manager

Enclosures

cc: ✓ Allen Gaither, NCDENR Solid Waste Section, w/1 copy of enc
Ed Mussler, NCDENR Solid Waste Section, w/o enc
Jim Huff, Madison County Director of Solid Waste, w/1 copy of enc

CLOSURE AND POST-CLOSURE PLAN

**MADISON COUNTY LANDFILL
CONSTRUCTION AND DEMOLITION LANDFILL
UNIT 2**

MADISON COUNTY, NORTH CAROLINA

JEFFREY R. BISHOP, P.E.



Engineering • Planning • Finance
Asheville, North Carolina



June 2008

08.00700

CLOSURE AND POST-CLOSURE PLAN

Madison County Landfill Construction & Demolition Landfill Unit 2 Madison County, North Carolina

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Figure:

Figure 1: Site Plan – June 2008

CLOSURE AND POST-CLOSURE PLAN
Madison County Landfill
Construction & Demolition Landfill-Unit 2
Madison County, North Carolina

Chapter 1
Overview

The final cap system for Unit 2 of the Construction and Demolition Landfill (CDLF) located at the Madison County Landfill Facility will be constructed in a progressive manner. As substantial areas of the landfill are brought to final grade, the cap system will be constructed in order to minimize infiltration of stormwater, control erosion, and establish and maintain a vegetated cap. The proposed CDLF Unit 2, which covers a total area of approximately 4.3 acres, is estimated to reach capacity in 2022.

1.1 Cap Construction

A detail of the final cap is shown in Figure 1. The cross-section will consist of an 18-inch low permeable layer and a vegetative supportive layer with a minimum thickness of 18 inches.

1.2 Methane Gas Removal System

Since the majority of the materials disposed of in the CDLF, Unit 2 will be non-organic in nature, there is not a methane gas removal system currently proposed for this project.

1.3 Final Cover

The final cover layer will be a total of 18-inches thick. The soil cover will provide support for native vegetation and protect the low permeability barrier.

1.3a - Materials Required

A grass cover is proposed for the Landfill to provide the required cover while minimizing cap maintenance. The surface will be prepared by fertilizing and placing seed in accordance with the North Carolina Erosion and Sediment Control Standards. The final cover will be constructed of native soils. Although the material will not be required to have a specific classification or permeability, it should be a cohesive soil capable of supporting native vegetation. The upper 6 inches of the final cover should be topsoil.

i. Fertilizer:

The final cover material shall be tested prior to spreading to determine the amount of fertilizer that should be added to achieve optimum growth potential of the required vegetative cover.

The quality of fertilizer and all operations in connection with the furnishing of this material shall comply with the requirements of the North Carolina Fertilizer Law and regulations adopted by the North Carolina Board of Agriculture.

Fertilizer shall be 10-10-10 grade. Upon written approval of the Engineer a different grade of fertilizer may be used, provided the rate of application is adjusted to provide the same amounts of plant food.

During handling and storing, the fertilizer shall be cared for in such a manner that it will be protected against hardening, caking, or loss of plant food values. Any hardened or caked fertilizer shall be pulverized to its original conditions before being used.

ii. Lime

The final cover material shall be tested prior to spreading to determine the amount of lime that should be added to achieve optimum growth potential of the required vegetative cover.

The quality of lime and all operations in connection with the furnishing of this material shall comply with the requirements of the North Carolina Lime Law and regulations adopted by the North Carolina Board of Agriculture.

During the handling and storing, the lime shall be cared for in such a manner that it will be protected against hardening and caking. Any hardened or caked lime shall be pulverized to its original condition before being used.

Lime shall be agriculture grade ground dolomitic limestone. It shall contain not less than 85% of the calcium and magnesium carbonates and shall be of such fineness that at least 90% will pass a No. 10 sieve and at least 50% will pass a No. 100 sieve.

iii. Seed:

The quality of seed and all operations in connection with the furnishing of this material shall comply with the requirements of the North Carolina Seed Law and regulations adopted by the North Carolina Board of Agriculture.

Seed shall have been approved by the North Carolina Department of Agriculture or any agency approved by the Engineer before being sown, and no seed will be accepted with a date of test more than nine (9) months prior to the date of sowing. Such testing however, will not relieve the Contractor from responsibility for furnishing and sowing seed that meets these specifications at the time of sowing. When a low percentage of germination causes the quality of the seed to fall below the minimum pure live seed specified, the Contractor may elect,

subject to the approval of the Engineer, to increase the rate of seeding sufficiently to obtain the minimum pure live seed contents specified, provided that such an increase in seeding does not cause the quantity of noxious weed seed per square yard to exceed the quantity that would be allowable at the regular rate of seed.

During handling and storing, the seed shall be cared for in such a manner that it will be protected from damage by heat, moisture, rodents, or other causes.

Seed shall be entirely free from bulblets or seed of Johnson Grass, Nutgrass, Sandbur, Wild Onion, Wild Garlic, and Bermuda Grass. The specifications for restricted noxious weed seed refers to the number per pound, singly or collectively, of Blessed Thistle, Wild Radish, Canada Thistle, Corncockle, Field Bindweed, Quackgrass, Dodders, Dock, Horsenettle, Bracted Plantain, Buckhorn or Wild Mustard; but in no case shall the number of Blessed Thistle or Wild Radish exceed 27 seeds of each per pound. No tolerance on weed seed will be allowed.

iv. Mulch:

Straw mulch shall be threshed straw of oats, rye or wheat free from matured seed of obnoxious weeds or other species which would grow and be detrimental to the specified grass.

1.3b - Construction Requirements

Final cover shall be placed according to the following requirements:

- i.** The final 6 inches of final cover shall be spread by utilizing small equipment with a relatively low ground pressure. This will reduce the potential of the underlying layers of the final cap being damaged. Prior to placing final soil layer, shape the underlying soil layer to graded lines and cross sections to provide for 6 inches of vegetative supportive soil. Clear the underlying soil layer of materials larger than 2" in diameter.
- ii.** After alignment of the underlying soil, loosen and till to a depth of 6 inches by disking, harrowing, rototilling, or other approved methods to assure that the final soil layer properly adheres to the underlying soil layer.
- iii.** After the condition of the underlying soil layer has been approved by the on-site CQA personnel, place and spread final layer to achieve required depth after compaction; rake and remove materials larger than 2 inches. Compact with approved roller equipment, grade to finished tolerances, and prepare the seedbed in accordance with the approved CDLF Unit 2, Technical Specifications.

Seed, fertilizer and lime shall be applied according to the following:

Seed shall be applied by means of a hydro-seeder or other approved methods. The rates of application of seed, fertilizer and limestone shall be as stated below, unless pre-construction testing is contrary to these rates and can be documented.

All rates are in pounds per acre:

Fertilizer - 1000 lbs. per acre

Lime - 4,000 lbs. per acre

KY-31 Fescue - 100 lbs. per acre

Straw mulch - 60 to 80 bales

For summer seeding the following shall be added:

- German Millet - 10 lbs. per acre
- Sudangrass - 15 lbs. per acre

For winter seeding the following shall be added:

- Rye grain - 15 lbs. per acre

For steep slopes the following shall be added:

- Sericea Lespedeza - 40 lbs. per acre

Equipment to be used for the application, covering or compaction of limestone, fertilizer, and seed shall have been approved by the Engineer before being used on the project. Approval may be revoked at any time if equipment is not maintained in satisfactory working condition, or if the equipment operation damages the seed. Limestone, fertilizer, and seed shall be applied within 24 hours after completion of seedbed preparation unless otherwise permitted by the Engineer, but no limestone or fertilizer shall be distributed and no seed shall be sown when the Engineer determines that weather and soil conditions are unfavorable for such operations.

Limestone may be applied as a part of the seedbed preparation, provided it is immediately worked into the soil. If not so applied, limestone and fertilizer shall be distributed uniformly over the prepared seedbed at the specific rate of application and then harrowed, raked, or otherwise thoroughly worked or mixed into the seedbed.

Seed shall be distributed uniformly over the seedbed at the required rate of application, and immediately harrowed, dragged, raked, or otherwise worked so as to cover the seed with a layer of soil. The depth of covering shall be as directed by the Engineer. If two kinds of seed are to be used which require different depths of covering, they shall be sown separately.

When a hydraulic seeder is used for application of seed and fertilizer, the seed shall not remain in water containing fertilizer for more than 30 minutes prior to application unless otherwise permitted by the Engineer.

Immediately after seed has been properly covered, the seedbed shall be compacted in the manner and degree approved by the Engineer.

Mulch shall be applied according to the following:

It shall be spread uniformly at the rate given above and in a continuous blanket over the areas specified.

Before mulch is applied on cut or fill slopes which are 3:1 or flatter, and ditch slopes, the Contractor shall remove and dispose of all exposed stones in excess of 2 inches in diameter and all roots or other debris which will prevent proper contact of the mulch with the soil.

Mulch shall be applied within 24 hours after the completion of the seeding unless otherwise permitted by the Engineer. Care shall be exercised to prevent displacement of soil or seed or other damage to the seeded area during the mulching operations.

Mulch shall be uniformly spread by hand or by approved mechanical spreaders or blowers that will provide an acceptable application. An acceptable application will be that which will allow some sunlight to penetrate and air to circulate but also partially shade the ground, reduce erosion, and conserve soil moisture.

Mulch shall be held in place by applying a sufficient amount of approved binding material to assure that the mulch is properly held in place. The rate and method of application of binding material shall meet the approval of the Engineer. Where the binding material is not applied directly with the mulch, it shall be applied immediately following the mulch operation.

The Contractor shall take sufficient precautions to prevent mulch from entering drainage structures through displacement by wind, water, or other causes and shall promptly remove any blockage to drainage facilities that may occur.

1.3c - Construction Quality Assurance Requirements

Madison County will ensure that the materials described above are utilized for the final cover and that their placement is done in accordance with the above detailed Construction Requirements. The project engineer will ensure that the materials and methods described above are utilized to construct the final cover system, and that all requirements of the Site Specific Construction Quality Assurance Plan are met.

Chapter 2 On-Site Inventory

2.0 On-Site Waste Inventory

The original disposal airspace for the C&DLF Unit 2 is 152,470 c.y. This is calculated from the record drawing elevations for the base of the landfill to the top of cap contours shown in the permit drawings. The volume of the cap is 3 ft. x 187,600 sq. ft., or 20,850 c.y. Therefore, the net available airspace for disposal of construction and demolition waste and daily and intermediate cover for Unit 2 is 131,600 c.y. At the time of closure, assuming a waste compaction density of 0.5 tons per cubic yard, the amount of construction and demolition waste on site is estimated to be 65,800 tons.

Chapter 3

Closure Schedule

3.0 Closure Schedule

3.1 Notification of Division of Solid Waste

Prior to beginning closure of the Construction and Demolition Landfill Unit 2, Madison County will notify the Division of Solid Waste of the intent to close the landfill.

Probable Date: Fall 2022

3.2 Begin Closure

Madison County will begin closure activities of the CDLF Unit 2 no later than 30 days after the date on which the CDLF unit receives the known final receipt of wastes or, if the CDLF unit has remaining capacity and there is a reasonable likelihood that the CDLF unit will receive additional wastes, no later than one year after the most recent receipt of wastes. Extensions beyond the one-year deadline for beginning closure may be granted by the Division if the owner or operator demonstrates that the CDLF unit has the capacity to receive additional wastes and the owner or operator has taken and will continue to take all steps necessary to prevent threats to human health and the environment from the unclosed CDLF unit.

Probable Date: Fall 2022

3.3 Completion of Closure

Madison County will complete closure activities of the CDLF Unit 2, in accordance with the closure plan within 180 days following the beginning of closure. Extensions of the closure period may be granted by the Division if the owner or operator demonstrates that closure will, of necessity, take longer than 180 days and they have taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed CDLF unit.

Probable Date: Spring 2023

3.4 Recording of Closure

Following closure of the CDLF Unit 2, Madison County will record a notation on the deed to the landfill facility property, or some other instrument that is normally examined during a title search, and notify the Division that the notation has been recorded.

The notation on the deed must in perpetuity notify any potential purchaser of the property that:

1. The land has been previously used as a landfill facility; and

2. Its use is restricted under the Division of Solid Waste approved Closure Plan

Probable Date: Summer 2023

3.5 Engineer's Certification

Following closure, Madison County shall notify the Division of Solid Waste that a certification, signed by the project engineer verifying that closure has been completed in accordance with the closure plan, has been placed in the operating record.

Chapter 4

Financial Assurance

4.0 Financial Assurance

The Financial Assurance provision of Section .0546 of the Solid Waste Management Rules (15A NCAC 13B) requires that owners and operators of Construction and Demolition Landfills (CDLF) must provide for certain minimum measures to insure that the funds to meet the requirements of the regulations governing closure, post-closure and corrective action activities are available in the event that these actions are not taken by the owner or operator.

4.1 North Carolina Solid Waste Rule, Section .0546

In general, Section .0546 provides that the owner and/or operator must:

1. Provide accurate third-party cost estimates for the closure, post-closure care, and potential corrective actions.
2. Select a mechanism for demonstrating financial assurance.
3. Maintain the selected mechanism in compliance with the provisions of Section .0546 throughout the period for which the owner/operator is subject to the provisions of the North Carolina Solid Waste Management Rules (15A NCAC 13B).

The Rule provides for the following alternative mechanisms for demonstrating financial assurance:

1. Trust Fund.
2. Surety bond Guaranteeing Payment or Performance.
3. Letter of Credit.
4. Insurance.
5. Capital Reserve Fund.
6. Local Government Financial Test.
7. Multiple Mechanisms.

Madison County has reviewed the requirements associated with each of these mechanisms and assessed the costs related to their use as the County's financial assurance mechanism. Although the relative cost of these mechanisms does not appear to vary significantly, there are various factors associated with their availability and practicality, which make certain of the mechanisms less attractive than others.

4.2 Local Government Financial Test

Therefore, Madison County has elected to adopt the LOCAL GOVERNMENT FINANCIAL TEST. The Local Government Financial Test is attractive because the County's excellent financial conditions makes passing the test quite feasible. Madison County has not had any difficulties passing the LOCAL GOVERNMENT FINANCIAL TEST in recent years and there are not any circumstances that would indicate that this would change.

Chapter 5
Post Closure Plan

5.0 Post Closure Plan

5.1 Inspections

Inspections of the final cover will be performed according to the table below and the condition of the facility will be recorded with notes, maps, and photographs. Madison County personnel will be on-site to perform inspections on a frequent basis.

The inspection will take notice of:

1. Eroded banks
2. Patches of dead vegetation
3. Animal burrows
4. Subsidence (settlement)
5. Cracks along the cover.
6. Catch basins and stormwater control facilities
7. Ground water monitoring wells

Areas showing subsidence, cracking, signs of erosion or damage are to be repaired.

Schedule of Inspections

Years (Following closure)	Minimum Yearly Inspections
0-2	4
3-30	2

5.2 Maintenance

The vegetative cover will be mowed at least one time a year. In the early stages of development, fertilization will be applied annually as needed.

Seeding of any patches of dead vegetation and proper filling and compaction of any portion of the cap showing subsidence, cracking, or other signs of erosion will be conducted in a timely manner.

Proper repair of any potential erosion problems found to be present during inspection of catch basins, piping, pipe inlets and outlets, and other stormwater control facilities will be conducted in a timely manner.

5.3 Planned Use and Personal Contact

Preliminary proposals for the planned use of the landfill facility, following Closure are inconclusive. No definite plan has been determined as of yet. Most likely, the area will be restricted to landfill maintenance personnel only, thus insuring little or no damage to the final cap system. The person to contact regarding the facility during the Post-Closure period is:

Mr. Jim Huff, Solid Waste Director
Madison County Solid Waste Department
271 Craig Rudisill Road
Marshall, North Carolina 28753
Telephone (828) 649-2311

5.4 Water Quality Monitoring Plan

A Design Hydrogeologic Report and Environmental Monitoring Plan for the Construction and Demolition Landfill Unit 2 were prepared by Bunnell-Lammons Engineering, Inc as part of the Permit to Construct package. This environmental monitoring plan will continue to be utilized by Madison County Landfill Staff ground and surface water monitoring.

5.5 Engineer's Certification

Following completion of the post-closure care period, Madison County shall notify the Division of Solid Waste that a certification, signed by the Project Engineer verifying that post-closure care has been completed in accordance with this post-closure plan, has been placed in the operating record.

Chapter 6
Closure and Post Closure Cost Estimates

6.0 Closure and Post Closure Cost Analysis and Summary

6.1 Closure Costs Estimate

Unit 2 (4.3 ACRES) – Closure

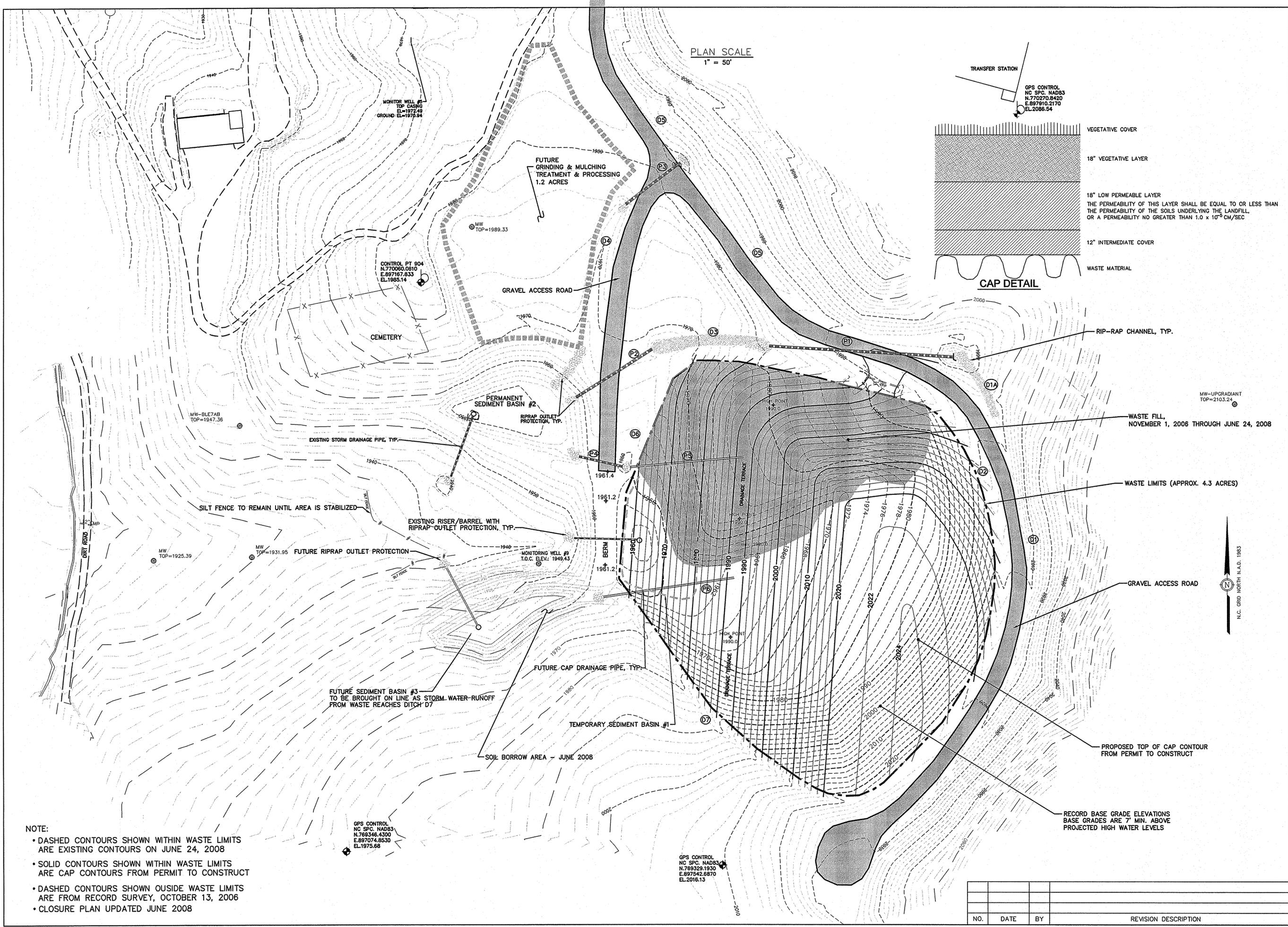
Item 1	Earthwork	<u>Unit Cost</u>	<u>Total</u>
a.	10,340 C.Y. 18" Vegetative Cover	\$6.00 /C.Y.	\$62,040
b.	10,340 C.Y. 18" Low Permeability layer	\$8.00 /C.Y.	\$82,720
Item 2	Sedimentation and Erosion Control		
a.	4.3 AC. Grassing	\$1,800.00 /A.C.	\$7,740
b.	750 Tons Rip Rap	\$51.00 /Tons	\$38,250
c.	1,000 L.F. Synthetic Lined Channels	\$15.30 /L.F.	\$15,300
Item 3	Engineering		
a.	Design		\$35,000
b.	Construction Quality Assurance		\$30,000
Item 4	Permit Fee		\$1,500
Item 5	Contingency (10%)		<u>\$29,000</u>
	Total		<u>\$275,450</u>

6.2 Post-Closure Costs Estimate

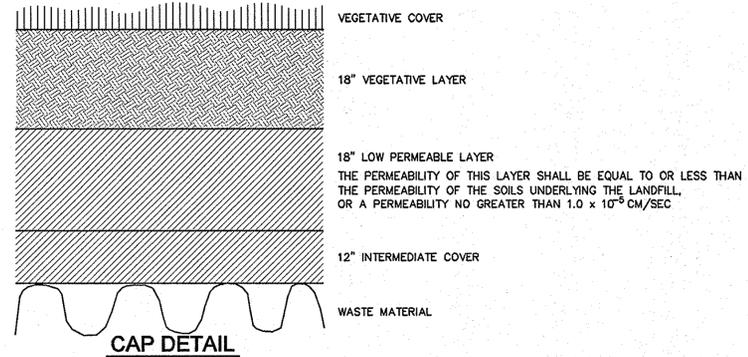
Unit 2 (4.3 ACRES) – Annual Post Closure Care

Item 1	Environmental Monitoring	Unit Cost	Total
a.	2 Wells Groundwater Monitoring (2 sampling events/year, includes final report)	\$500.00/Well	\$2,000
b.	2 Point Surface Water Monitoring (2 sampling events/year, includes final report)	\$500.00/Each	\$2,000
Item 2	Routine Annual Maintenance		
a.	4.3 AC. Grassing Mowing (1 cut/year)	\$50.00 /AC.	\$215
b.	1 Each Repair of Cap (0.25 acre repair, 1 foot depth)	\$2,500 /Each	\$2,500
c.	4.3 AC. Re-seeding	\$1,000 /AC.	\$4,300
Item 3	Annual Permit Fee		\$500
Item 4	Contingency (10%)		<u>\$1,000</u>
		Total Yearly Cost	\$12,515

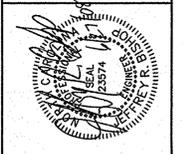
FIGURE 1
Closure Plan



PLAN SCALE
1" = 50'



CAP DETAIL



**CONSTRUCTION & DEMOLITION
LANDFILL UNIT 2
MADISON COUNTY LANDFILL
MADISON COUNTY, NORTH CAROLINA**

JOB NO.: 00.00700
DATE: JUNE 2008
SCALE: 1" = 50'
DESIGNED BY: DAP
CADD BY: DAP
DESIGN REVIEW:
CONST. REVIEW:
00.00700/6-08.dwg
C-D-Submital-6-08.dwg

CLOSURE PLAN

**FIGURE
1**

- NOTE:
- DASHED CONTOURS SHOWN WITHIN WASTE LIMITS ARE EXISTING CONTOURS ON JUNE 24, 2008
 - SOLID CONTOURS SHOWN WITHIN WASTE LIMITS ARE CAP CONTOURS FROM PERMIT TO CONSTRUCT
 - DASHED CONTOURS SHOWN OUTSIDE WASTE LIMITS ARE FROM RECORD SURVEY, OCTOBER 13, 2006
 - CLOSURE PLAN UPDATED JUNE 2008

NO.	DATE	BY	REVISION DESCRIPTION