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Division of Waste Management
Solid Waste Section
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Permit Amendment Application

Wilson County Westside C&D Landfill (Permit 98-09) Continued Operations Wilson County, North Carolina



*County of Wilson
North Carolina*

Prepared For:

**Wilson County Solid Waste Management Department
113 E. Nash Street
Wilson, North Carolina 27894**

Prepared By:

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January 2010

Revised December 2010

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PERMIT AMENDMENT APPLICATION

**Wilson County
Westside C&D Landfill
Wilson, North Carolina**

Prepared for:
**Wilson County Solid Waste Management Department
Wilson, North Carolina**

RSG Project No. WESTSIDE-08-1

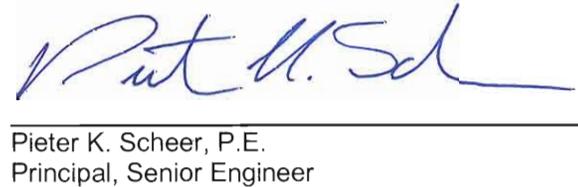
Statement of Compliance with Engineering Plan Requirements:

The engineering elements of this Permit Application have been prepared by the undersigned Professional Engineer licensed to practice engineering in accordance with NCGS 89C and the Administrative Rules developed thereunder. It is my opinion that the design described in the application meets the intent of the 15A NCAC 13B.0531 et seq. of the Solid Waste Management Rules.



Gary W. Ahlberg, P.E.
Consulting Engineer





Pieter K. Scheer, P.E.
Principal, Senior Engineer



January 2010


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WILSON COUNTY WESTSIDE C&D LANDFILL

PERMIT AMENDMENT APPLICATION

TABLE OF CONTENTS

A guide to specific North Carolina Solid Waste Management (15A NCAC 13B.0500), Sedimentation Control (15A NCAC 4) rules addressed in each section of this document is shown in italics after each section.

EXECUTIVE SUMMARY

ATTACHMENT A	FACILITY AND ENGINEERING PLAN <i>(15A NCAC 13B.0537, .0539)</i>
ATTACHMENT B	TECHNICAL SPECIFICATIONS <i>(15A NCAC 13B.0539)</i>
ATTACHMENT C	CONSTRUCTION QUALITY ASSURANCE MANUAL <i>(15A NCAC 13B.0541)</i>
ATTACHMENT D	OPERATION PLAN <i>(15A NCAC 13B.0542)</i>
ATTACHMENT E	CLOSURE AND POST-CLOSURE PLAN <i>(15A NCAC 13B.0543)</i>
ATTACHMENT F	EROSION AND SEDIMENTATION CONTROL PLAN <i>(15A NCAC 13B.0540 and 15A NCAC 4)</i>
ATTACHMENT G	PERMIT AMENDMENT DRAWINGS <i>(15A NCAC 13B.0537, .0539, .0540, .0542, and .0543, and 15A NCAC 4)</i>
ATTACHMENT H	WATER QUALITY MONITORING PLAN <i>(15A NCAC 13B.0538)</i>
ATTACHMENT I	SOLID WASTE MANAGEMENT FACILITIES

**WESTSIDE C&D LANDFILL
PERMIT AMENDMENT
EXECUTIVE SUMMARY**

OVERVIEW

The following is a Permit Amendment Application submitted on behalf of Wilson County for continued operations of the County's Westside construction and demolition debris (C&D) Landfill. This submittal follows the 2004 Construction Plan Application prepared by Gary W. Ahlberg, P.E.¹ and incorporates the Closure and Post Closure Plan from the July 2008 Continued Operations submittal. All pertinent siting and facility criteria are defined in the existing permit record for SW Permit 98-09 Westside C&D Landfill. No expansion to the constructed footprint is proposed in this Permit Amendment; Phase delineation is updated for the Permit to Operate.

The Westside C&D Landfill, which has 3 contiguous cells over approximately 10.5 acres, has already been built to its maximum extent laterally. At the projected gate rate of 20,000 tons/year, the landfill has approximately 7 years of remaining volume (from the April 2010 survey) to designed final contours. The Operation Plan for Phase 2, continues landfill disposal to an estimated peak elevation for 5-years of permitted capacity (100,000 tons). The estimated closure date for this unit is 2017.

Partial final cover is expected to be deployed over the perimeter slopes during Phase 2 Operations. As approved by the SWS (October 2009) the components of the final cover system will consist of the following components (top-down):

Regulatory Final Cover System (.0543 (c) (1)):

- an 18-inch thick vegetative soil layer; and
- an 18-inch thick soil liner with a permeability of no more than 1×10^{-5} cm/sec (“compacted soil barrier”).

An update to the Operation Plan for Phase 3 is planned prior to Closure. The permit plans will be updated for any applicable new requirements as specified in the Permit Conditions. If the permit requirements and site and operational conditions remain unchanged from this submittal, the approved plan documents incorporated herein shall be sufficient to continue operations to pre-final cover grades for Closure implementation. Future site and operational conditions include, but may not be limited to, the facility plan, the operations plan (acceptable waste streams and other solid waste activities in addition to C&DLF), and environmental media monitoring conditions (water quality monitoring and landfill gas monitoring).

¹ Gary W. Ahlberg, P.E. (2004), “Construction Plan Application for Wilson County Westside C&D Landfill Facility, Wilson, North Carolina”, dated August 2004 (revised September 2004), approved by NC DWM in September 2004.

As requested by the SWS, other waste management activities at the Wilson County Landfill Site and associated with the Westside C&D Landfill are included in this submittal as components of the facility's approved plan. All the activities included in this submittal are existing services previously approved in permit decisions, and are updated for relocation and new regulatory requirements. Additionally, the Water Quality Monitoring Plan approved in the Permit to Construct is reproduced in a separate attachment.

REGULATORY REFERENCES

This submittal has been prepared in accordance with the requirements of the North Carolina Solid Waste Management Rules (15A NCAC 13B 0.5000 et. seq.) and the North Carolina Sedimentation Control Rules (15A NCAC 4) which are enforced by the Division of Waste Management (DWM) and the Division of Land Quality, respectively, of the North Carolina Department of Environment and Natural Resources.

PERMIT DOCUMENTS

The existing permit record documents are amended to include the following attachments, including any drawings and figures there in:

- Facility and Engineering Plan;
- Technical Specifications;
- Construction Quality Assurance (CQA) Manual;
- Operation Plan;
- Closure and Post-Closure Plan;
- Erosion and Sedimentation Control Plan*;
- Permit Amendment Drawings;
- Water Quality Monitoring Plan; and
- Solid Waste Management Facilities.

** No changes are proposed for these documents from the approved 2004 submittal.*

**Attachment A
Facility and Engineering Plan**

**Wilson County Westside C&D Landfill
Wilson County, North Carolina**

Prepared for:
Wilson County Solid Waste Management Dept.
Wilson, North Carolina

**June 2010
Revised Dec 2010**



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**WILSON COUNTY WESTSIDE C&D LANDFILL
FACILITY AND ENGINEERING PLAN**

TABLE OF CONTENTS

		<u>Page</u>
1.0	OVERVIEW	1
2.0	FACILITY SERVICES AND WASTE STREAM	1
2.1	Facility Services	1
2.2	Types of Waste	1
2.3	Disposal Rates and Anticipated Variances	1
2.4	Service Area	2
2.5	Procedures for Waste Segregation	2
2.6	Equipment Requirements	2
3.0	LANDFILL CAPACITY	2
3.1	Total Operating Capacity and Life Expectancy	2
3.2	Airspace Utilization Factor	3
4.0	AVAILABLE SOIL RESOURCES AND REQUIRED SOIL QUANTITIES	3
4.1	Earthwork Quantities	3
4.2	Periodic Cover	3
4.3	Final Cover Soil	3
4.4	Soil Summary	3
5.0	FACILITY DESIGN CRITERIA	3
5.1	Horizontal Separation Requirements	3
5.2	Vertical Separation Requirements	4
6.0	CONTAINMENT AND ENVIRONMENTAL CONTROL SYSTEMS	4
6.1	Landfill Subgrade	4
6.2	Final Cover System	4
6.3	Erosion and Sedimentation Control	4
6.4	Landfill Gas Control	4
6.5	Access and Roadways	5
7.0	SLOPE STABILITY AND SETTLEMENT	5

Table Of Contents (Continued)

TABLES

Table 1	Summary of Landfill Capacity and Life Expectancy
Table 2	Soil Summary

APPENDICES

Appendix A	Landfill Design Calculations
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WILSON COUNTY WESTSIDE C&D LANDFILL

FACILITY AND ENGINEERING PLAN

1.0 OVERVIEW

Wilson County, North Carolina currently owns and operates a solid waste management facility located between US Highway 264 and NC Highway 42 near Wilson. The facility can be accessed both from the south (off of Landfill Road) and from the north (NC Highway 42). The main access to the facility is from NC Highway 42, where the County recently constructed a new scale house and convenience center. As a component of the Wilson County facility, the active Westside landfill site is permitted under NC Permit 98-09 for the disposal of construction and demolition debris (C&D) waste. The County also conducts several other solid waste management activities at the facility. Refer to **Section 2.1 and Attachment I**, which describes facility services.

The County has operated the Westside C&D Landfill under the current permit since October 4, 2004. This plan presents information describing the continued operations of the Westside C&D Landfill.

2.0 FACILITY SERVICES AND WASTE STREAM

2.1 Facility Services

Currently, the following activities or services are provided at the Wilson County Landfill facility, as delineated in the **S1 Facility Site Plan** drawing in **Attachment G** and described in **Attachment I**:

- Scales and office/scale house building
- Convenience Center
- Maintenance Building
- C&D landfill and Inert Debris Area
- White goods and scrap metal storage Area
- Wood waste processing Area.
- Compost Area

2.2 Types of Waste

C&D waste and inert debris are accepted at the Wilson County Westside Landfill facility. Wastes are routed to the landfill or other areas as appropriate.

2.3 Disposal Rate and Anticipated Variances

Based on actual waste disposed from the start of operations (10/4/2004) through the most recent survey (April 2010), the total capacity utilized is 187,000 cubic yards containing approximately 136,000 tons. The Westside landfill unit is

permitted to receive an average of approximately 20,000 tons per year of C&D waste from Wilson County over its active life. Actual annual and daily amounts of C&D waste are expected to vary.

2.4 Service Area

The landfill facility currently serves the population of Wilson County.

2.5 Procedures for Waste Segregation

The scalehouse weighmaster directs acceptable solid wastes to the designated facilities at the Wilson County Landfill. Waste screening is fully defined in **Attachment D- Operations Plan**. A brief description of procedures for waste segregation is as follows.

Wastes are primarily segregated at the scale. The weighmaster is trained and supervised by the Operator to classify and segregate the waste stream to specific facilities. C&D waste and oversized land clearing stumps and logs (too large for grinding) are directed to the landfill. Asbestos waste is managed at the designated area within the C&D landfill unit. Inert debris is segregated in a stockpile for storage and reclamation. . Wood wastes and yard wastes are directed toward the wood waste storage and processing area. Yard trash is directed to the composting area. White Goods are directed to the storage area for recycling. All other solid wastes not permitted at the facility are rejected and directed to the convenience center (residential MSW, tires, recycling) or the MSW transfer facility, SW Permit 98-09 Black Creek Road Transfer Facility.

2.6 Equipment Requirements

The County will maintain on-site equipment required to perform the necessary landfill activities. The County currently uses a Terex 375E compactor, Komatsu D39 bulldozer, Komatsu WA200-5 loader, and Bobcat T-300 in their day to day operation of the C&D landfill unit. Periodic maintenance of all landfilling equipment, and minor and major repair work will be performed in the landfill's maintenance building.

3.0 LANDFILL CAPACITY

3.1 Total Operating Capacity and Life Expectancy

Drawing C3 (Attachment G), identifies the final configurations for the C&D landfill. The exterior side slopes will be at a 4H to 1V slope and the top elevation will be at approximately 150 feet. **Drawing C4** provides final grades for Phase 2 of landfill operations, based on the April 2010 topography, 100,000 tons and maintained AUF = 0.725.

The estimated total gross operating capacity, net capacity (accounts for periodic and final cover), disposal area, and life expectancy for the landfill are shown in **Table 1** and the attached **Capacity and Service Life calculation**. Total site capacity from CAD volumetric analysis is 433,560 cubic yards.

Based on the April 2010 survey, the Phase 2 grading plan provides approximately five (5) years of operating capacity. An additional two (2) years of capacity remains for Phase 3 to reach final grades for closure.

3.2 Airspace Utilization Factor

The capacities obtained above were based on site conditions surveyed on August 26, 2008 and tonnage reports for the operating period. The airspace utilization factor includes waste and cover soils placed in a surveyed volume. The AUF for the Westside site is currently 0.725 tons/cy; an estimated waste density of 1,631 pounds per cubic yard (0.82 tons/cy) is based on an assumed 8:1 soil volume. These values were based on an evaluation of a survey of the landfill performed on August 26, 2008. More recent survey analysis (April 2010) indicates that the 0.725 AUF is accurate for remaining capacity planning calculations.

4.0 AVAILABLE SOIL RESOURCES AND REQUIRED SOIL QUANTITIES

The soils required to construct the proposed landfill will be removed from on-site borrow sources identified in the Site Plan and containing in excess of 200,000 cubic yards.

4.1 Periodic Cover

Assuming the previously mentioned waste to cover soil ratio of 8:1, the estimated quantity of soil that will be required for use as periodic cover during C&D landfill operations is shown in **Table 2**.

4.2 Final Cover Soil

On the basis of an average 3 foot thickness, the estimated in-place volumes of the compacted soil barrier (18-inch minimum thickness) and vegetative soil layer (18-inch minimum thickness) components of the final cover system are shown in **Table 2**.

4.3 Soil Summary

The above soil quantities are summarized in **Table 2**. Available on-site borrow

sources are anticipated to have an adequate supply of soil to meet the expected needs. See Operations Plan for soil resources available.

5.0 FACILITY DESIGN CRITERIA

The Wilson County C&D landfill is designed and operates in accordance with Section .0542 of the North Carolina Administrative Code, Title 15A, Chapter 13, Subchapter 13B including the following requirements.

5.1 Horizontal Separation Requirements

The horizontal separation requirement between the disposal boundary (edge of waste) and the property lines is a more than 50 feet (as required for existing facilities) (for this site, the minimum buffer exceeds 200 feet), the minimum buffer between private residences and wells and the disposal boundary is 500 feet, and the minimum buffer between any surface water (stream, river, creek) and the disposal boundary is 50 feet.

5.2 Vertical Separation Requirements

The landfill subgrade elevations have been designed (and constructed) to meet the minimum requirement of four feet (post-settlement) above the seasonal high groundwater table and bedrock.

6.0 CONTAINMENT AND ENVIRONMENTAL CONTROL SYSTEMS

Technical specifications and a project construction quality assurance (CQA) manual for the following materials can be found in **Attachments B and C**, respectively.

6.1 Landfill Subgrade

The subgrade for the landfill has previously been completed.

6.2 Final Cover System

The components of the final cover system will consist of the following components (top-down):

Regulatory Final Cover System (.0543 (c) (1)):

- An 18-inch thick vegetative soil layer; and
- an 18-inch thick soil liner with a permeability of no more than 1×10^{-5} cm/sec (compacted soil barrier).

The final cover system will be placed on prepared intermediate cover at a maximum slope of 4H:1V. Top slopes will be approximately 12.5%. A landfill gas (LFG) control system and surface water control devices will also be incorporated into the final cover. The final cover surface will be vegetated upon completion of the final cover installation according to the project seeding specifications.

6.3 Erosion and Sedimentation Control

The Erosion and Sedimentation Control measures have been designed and maintained to manage the run-off generated by the 24-hour, 25-year storm event, and conform to the requirements of the Sedimentation Pollution Control Law (15A, NCAC, 4) (see **Attachment F**).

6.4 Landfill Gas Control

Landfill gas control will consist of 10 passive wells/vents as shown on **Figure 1 (Attachment G)**. Due to a number of factors (the limited depth to groundwater, the distance to site structures, and the existence of wetlands around much of the property), perimeter monitoring of gas from the C&D landfill is limited to the northern site boundary. See LFG 1 for proposed monitoring location.

6.5 Access and Roadways

The new scalehouse and site entrance on NC 42 will be used as the primary access to the Westside unit. The site roads will provide for all-weather access to the Westside unit, and other waste management facilities. Access roads will be maintained to site monitoring locations.

7.0 SLOPE STABILITY AND SETTLEMENT

Both the slope stability of the waste mass and settlement of the landfill subgrade were previously addressed in the 2004 Construction Plan Application. The results of these analyses indicate that the final C&D landfill configuration is stable and that the required vertical separation beneath the landfill will be maintained after settlement.

**TABLE 1
SUMMARY OF LANDFILL CAPACITY AND LIFE EXPECTANCY**

Unit	Area (Ac.)	Capacity (CY)	Life Expectancy
Phase 1	10.5	187,000	----
Phase 2	-----	134,600	5 years
Phase 3	-----	61,160	2.1 years
Final Cover	-----	50,800	----
Total Gross	-----	433,560	7.1 years

Notes:

1. The capacity is based on an AUF = 0.725 Tons/CY, including cover soil.
2. Life expectancy is based on an assumed average disposal rate of 20,000 tons/year and is projected from April 15, 2010 (date of most recent survey). See attached Service Life calculation.

**TABLE 2
SOIL SUMMARY**

Material	Quantity (CY)
Periodic Cover	(25,257)
Final Cover Soil	
Compacted Soil Barrier	(25,410)
Vegetative Soil Layer	(25,410)
Total:	(76,077)

Notes:

1. Volumes estimated from August 26, 2008.
2. Available on-site soil resources exceed 200,000 CY.

Technical Specifications

**Wilson County Westside C&D Landfill
Wilson County, North Carolina**

Prepared for:

Wilson County Solid Waste Management Dept.
Wilson, North Carolina

January 2010



14 N. BOYLAN AVENUE
RALEIGH, NORTH CAROLINA 27603
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WILSON COUNTY WESTSIDE C&D LANDFILL

TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

<u>Section No.</u>	<u>Specification</u>
02222	Excavation
02223	Embankment
02250	Soil Liner
02258	Vegetative Soil Layer
02930	Revegetation

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SECTION 02222

EXCAVATION

Excavation: Excavation includes excavating, sealing, hauling, scraping, undercutting, removal of accumulated surface water or ground water, stockpiling, and all necessary and incidental items as required for bringing the landfill and related structures to the specified lines and grades.

A. DESCRIPTION

1. General:

The Contractor shall furnish all labor, material, and equipment required to complete Excavation of the project area in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Embankment CQA Manual	02223 Attached

3. Quality Assurance:

Quality Assurance during Excavation will be provided by the Owner as described in the accompanying Project CQA Manual.

4. Definitions:

- a. Excavation: shall consist of the removal and satisfactory disposal and/or stockpiling of materials located within the limits of construction including widening cuts and shaping of slopes necessary for the preparation of roadbeds, landfill slope areas, cutting of any ditches, channels, waterways, entrances, and other work incidental thereto.
- b. Borrow: shall consist of approved on-site material required for the construction of embankments/fills or for other portions of the work.

- c. Select Borrow: shall consist of approved off-site material required for the construction of embankments/fills, roadway subgrade, backfilling, or for other portions of the work as shown on Contract Drawings or in these Specifications. The Contractor shall make his own arrangements for obtaining select borrow and pay all costs involved.
- d. Unsuitable Material: is any in-place or excavated material which contains undesirable materials, or is in a state which is not appropriate; in the opinion of the CQA Engineer, for the intended use or support of planned structures, embankment, or excavation. This may include but not be limited to organic material, waste/refuse, soft, or wet material not meeting required specifications, etc.
- e. Unsuitable Materials Excavation (Overexcavation): shall consist of the removal and satisfactory disposal of all unsuitable material located within the limits of construction. Where excavation to the finished grade section shown results in a subgrade or slopes of unsuitable material, the Contractor shall overexcavate such material to below the grade shown on the Contract Drawings or as directed by the Engineer and CQA Engineer.

B. MATERIALS

Excavation shall include the removal of all soil, weathered rock, boulders, conduits, pipe, and all other obstacles encountered and shown on the Contract Drawings or specified herein.

C. SUBMITTALS

The Contractor shall submit the following to the CQA Engineer before approval is given to proceed:

1. Descriptive information on Excavation equipment to be used.

D. CONSTRUCTION

1. The Contractor shall conduct Excavation activities in such a manner that erosion of disturbed areas and off site sedimentation is absolutely minimized.
2. The Contractor shall excavate to the lines and grades shown on the Contract Drawings and stockpile all suitable excavated materials. As the excavation is made, the materials will be examined and identified to the CQA Engineer.

The Contractor will perform all surveys necessary to establish and verify lines and grades for all Excavation, including pipe excavations, soil overexcavation, and anchor trenches.

3. Stockpiling:

The Contractor shall stockpile the materials in appropriate stockpiles as approved by the CQA Engineer.

Stockpiles shall be properly sloped and the surfaces sealed by the Contractor at the end of each working day, or during the day in the event of heavy rain, to the satisfaction of the Engineer.

4. The Contractor shall protect all existing facilities and structures including, but not limited to, existing utilities, monitoring wells, signs, grade stakes, etc. during the grading and stockpiling operations.
5. All excavations shall be made in the dry and in such a manner and to such widths as will give ample room for properly constructing and inspecting the structures and/or piping they are to contain and for such sheeting, timbering, pumping, and drainage as may be required.
6. The Contractor shall be responsible for the control of surface and subsurface water when necessary.
7. Excavation slopes shall be flat enough to avoid sloughs and slides that will cause disturbance of the subgrade or damage of adjacent areas. Slides and overbreaks which occur due to negligence, carelessness, or improper construction techniques on the part of the Contractor shall be removed and disposed of by the Contractor as directed by the Engineer at no additional cost to the Owner.
8. The intersection of slopes with natural ground surfaces, including the beginning and ending of cut slopes, shall be uniformly rounded. All protruding roots and other vegetation shall be removed from slopes.
9. The bottom of all excavations for structures and pipes shall be examined by the CQA Engineer for bearing value and the presence of unsuitable material. If, in the opinion of the CQA Engineer, additional Excavation is required due to the low bearing value of the subgrade material, or if the in-place materials are soft, yielding, pumping and wet, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted structural fill, or material directed by the CQA Engineer. No payment will be made for subgrade disturbance caused by inadequate Dewatering or improper construction methods.
10. Any areas excavated below design subgrade elevations by the Contractor, unless directed by the CQA Engineer, shall be brought back to design elevations at no cost to the Owner. The Contractor shall place and compact such material in accordance with Section 02223, Embankment, of these Specifications.

11. The Contractor shall dispose of excess or unsuitable excavation materials on-site at location(s) approved by the Owner.
12. The Contractor shall properly level-off bottoms of all excavations. Proof-rolling shall be conducted with appropriate equipment.
13. Upon reaching subgrade elevations shown in excavation areas, the Contractor shall scarify subgrade soils to a minimum depth of 6" and obtain the CQA Engineer's approval of quality. If unsuitable materials are encountered at the subgrade elevation, perform additional excavations as approved by the CQA Engineer to remove unsuitable materials.

14. Overexcavation and Backfill:

Where subgrade materials are determined to be unsuitable, such materials shall be removed by the Contractor to the lengths, widths and depths approved by the CQA Engineer and backfilled with suitable material in accordance with Section 02223, Embankment, of these Specifications unless further excavation or earthwork is required. No additional payment will be made for such excavation and backfill 1 foot or less than the finished subgrade. Unsuitable material excavation greater than 1 foot beneath the finished subgrade shall be made on a unit price basis for excavation and backfill, only as approved by the Engineer and CQA Engineer prior to the work. Unit price for overexcavation and backfill greater than 1 foot in depth shall include disposal of unsuitable materials.

15. All cuts shall be brought to the grade and cross section shown on the Contract Drawings, or established by the Engineer, prior to final inspection.

16. The Contractor shall protect finished lines and grades of completed excavation against excessive erosion, damage from trafficking, or other causes and shall repair any damage at no additional cost to the Owner.

17. Trench Excavation:

- a. All pipe Excavation and trenching shall be done in strict accordance with these Specifications, all applicable parts of the OSHA Regulations, 29 CFR 1926, Subpart P, and other applicable regulations. In the event of any conflicts in this information, safe working conditions as established by the appropriate OSHA guidelines shall govern.
- b. The minimum trench widths shall be as indicated on the Contract Drawings. Enlargements of the trench shall be made as needed to give ample space for operations at pipe joints. The width of the trench shall be limited to the maximum dimensions shown on the Contract Drawings,

except where a wider trench is needed for the installation of and work within sheeting and bracing.

- c. Except where otherwise specified, excavation slopes shall be flat enough to avoid slides which will cause disturbance of the subgrade, damage to adjacent areas, or endanger the lives or safety of persons in the vicinity.
- d. Hand excavation shall be employed wherever, in the opinion of the Engineer, it is necessary for the protection of existing utilities, poles, trees, pavements, obstructions, or structures.
- e. No greater length of trench in any location shall be left open, in advance of pipe laying, than shall be authorized or directed by the Engineer and, in general, such length shall be limited to approximately one hundred (100) feet.
- f. Pipe Bedding: All pipe bedding shall be as shown on the Contract Drawings, unless otherwise specified herein.

18. Sheeting and Bracing:

- a. The Contractor shall furnish, place, and maintain such sheeting and bracing which may be required to support sides of Excavation or to protect pipes and structures from possible damage and to provide safe working conditions in accordance with current OSHA requirements. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports put in at the sole expense of the Contractor. The Contractor shall be responsible for the adequacy of all sheeting and bracing used and for all damage resulting from sheeting and bracing failure or from placing, maintaining, and removing it.
- b. The Contractor shall exercise caution in the installation and removal of sheeting to insure that excessive or unusual loadings are not transmitted to any new or existing structure. The Contractor shall promptly repair at his expense any and all damage that can be reasonably attributed to sheeting installation or removal.
- c. All sheeting and bracing shall be removed upon completion of the work.

19. If grading operations are suspended for any reason whatsoever, partially completed cut and fill slopes shall be brought to the required slope and the work of seeding and mulching or other required erosion and sedimentation control operations shall be performed at the Contractor's sole expense.

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SECTION 02223

EMBANKMENT

Embankment: Embankment is the on-site compacted fill that provides the foundation and the berms for the containment area, the subgrade for some access roadways and structures, and backfill around structures and piping.

A. DESCRIPTION

1. General:

The Contractor shall furnish all labor, material, and equipment to complete Embankment including borrowing, hauling, screening, discing, drying, compaction, control of surface and subsurface water, final grading, sealing, and all necessary and incidental items as detailed or required to complete the Embankment, all in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Excavation	02222
CQA Manual	Attached

3. Reference Standards:

The latest revision of the following standards of the American Society of Testing and Materials (ASTM) are hereby made a part of these Specifications.

ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³).
ASTM D 1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
ASTM D 2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

ASTM D 2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
ASTM D 2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).
ASTM D 2937	Standard Test Method for Density of Soil in Place by the Drive Cylinder Method.
ASTM D 4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method.
ASTM D 4959	Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method.
ASTM D 6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

4. Quality Assurance:

Quality Assurance during placement of Embankment will be provided by the Owner as described in the accompanying Project CQA Manual.

5. Definitions:

- a. Embankment: Shall include construction of all site earthwork including roadways, subgrade, perimeter berm embankments, including preparation of the areas upon which materials are to be placed. Embankment may also be referred to as structural and/or controlled fill. All Embankment materials may be either (off-site) Select Borrow or (on-site) Borrow unless otherwise noted on Contract Drawings or specified by the Engineer.
- b. Prepared Subgrade: The ground surface after clearing, grubbing, stripping, excavation, scarification, and/or compaction, and/or proof rolling to the satisfaction of the CQA Engineer.
- c. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes. Well-graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters. Well-graded is used to define a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

- d. Unclassified Fill: The nature of materials to be used is not identified or described herein but must be approved by the Engineer prior to use.

B. MATERIALS

1. Embankment materials shall consist of clean well-graded natural soil classified as SW, SM, SM-SC, SC, ML, CL-ML, or CL (ASTM D 2488) containing no topsoil or other deleterious material. Other material classifications may be approved by the Engineer.
2. Stones or rock fragments shall not exceed one half the maximum lift thickness as compacted in any dimension. Isolated rocks shall be a maximum of 24-inches in any dimension.

C. SUBMITTALS

The Contractor shall submit the following to the CQA Engineer before approval is given to proceed:

1. Descriptive information on compaction equipment to be used for construction of Embankment.
2. Descriptive information on the location and source of any off-site borrow material to be used for Embankment, where applicable. Information shall include Standard Proctor curves (ASTM D698) for each borrow material.

D. CONSTRUCTION

1. The Contractor shall conduct Embankment activities in such a manner that erosion of disturbed areas and off-site sedimentation is absolutely minimized.
2. All placement and compaction of Embankment shall be performed only when the CQA Engineer is informed by the Contractor of intent to perform such work.
3. Embankment shall be placed and compacted to the lines and grades shown on the Contract Drawings. Placement of Embankment outside the construction limits shall occur only as directed and approved by the Engineer.

The Contractor will perform all surveys necessary to establish and verify lines and grades for all Embankment.

4. The Contractor shall protect all existing facilities including, but not limited to, utilities and monitoring wells.

5. Subgrade Preparation:

- a. The CQA Engineer shall inspect the exposed subgrade prior to placement of Embankment to assure that all rocks, topsoil, vegetation, roots, debris, or other deleterious materials have been removed.
- b. Prior to placement of Embankment, the exposed subgrade shall be proofrolled using a static smooth-drum roller, loaded tandem axle dump truck, or other suitable equipment in the presence of the CQA Engineer. Any soft or unsuitable materials revealed before or during the in-place compaction shall be removed as directed by the CQA Engineer and replaced with suitable Embankment.

6. Surfaces on which Embankment is to be placed, shall be scarified or stepped in a manner which will permit bonding of the Embankment with the existing surface.

7. The Contractor shall be responsible for preparing the materials for the Embankment, including but not limited to, in-place drying or wetting of the soil necessary to achieve the compaction criteria of these Specifications.

8. The Contractor shall be responsible for the control of surface and subsurface water, when necessary.

9. Embankment materials shall be placed in a manner permitting drainage and in continuous, approximately horizontal layers.

10. Compaction Requirements:

- a. The Contractor shall compact Embankment in accordance with the requirements shown in Table 1 of this section. If Embankment does not meet the specified requirements, the Contractor shall rework the material, as may be necessary and continue compaction to achieve these requirements, or remove and replace the material to achieve the specified requirements, at Contractor's expense.
- b. Each lift shall be compacted prior to placement of succeeding lifts. In confined areas, mechanical equipment, suitable for small areas and capable of achieving the density requirements, shall be required.
- c. Lift compaction shall be performed with an appropriately heavy, properly ballasted, penetrating-foot or smooth-drum vibratory compactor depending on soil type. Compaction equipment shall be subject to approval by the CQA Engineer.

11. Embankment that becomes excessively eroded, soft, or otherwise unsuitable shall be removed or repaired by the Contractor as directed by the CQA Engineer, at no cost to the Owner.
12. The exposed surface of Embankment shall be rolled with a smooth-drum roller at the end of each work day to protect from adverse weather conditions.
13. Where Embankment is to be placed and compacted on slopes that are steeper than 3:1, the subgrade shall be benched to a minimum depth of 6 inches and the Embankment shall be placed in horizontal lifts.
14. Backfilling for Structures and Piping:
 - a. All structures, including manholes and pipes shall be backfilled with Embankment as shown in the Contract Drawings and as described in these Specifications.
 - b. Where sheeting is used, the Contractor shall take all reasonable measures to prevent loss of support beneath and adjacent to pipes and existing structures when sheeting is removed. If significant volumes of soil cannot be prevented from clinging to the extracted sheets, the voids shall be continuously backfilled as rapidly as possible. The Contractor shall thereafter limit the depth below subgrade that sheeting will be driven in similar soil conditions or employ other appropriate means to prevent loss of support.
 - c. When backfilling around structures, do not backfill until concrete has sufficiently cured (as determined by the CQA Engineer) and is properly supported. Place backfill in a manner to avoid displacement or damage of structures.

TABLE 1: REQUIRED EMBANKMENT PROPERTIES

ITEM	Required % Standard Proctor (ASTM D698) ²	Required Moisture Content ³	Maximum Lift Thickness (Compacted) (inches)
Embankment	95	As Required for Compaction	8
Embankment Beneath Structures and Roads ¹	98		8
Backfill Around Structures	95		8
Backfill in Pipe Trenches	95		6
Unclassified Fill	N/A	N/A	N/A

Notes:

1. Embankment beneath structures shall be considered to include a zone 10 feet out from the foundation of the structure extending down to the natural ground on a 45° slope. Embankment beneath roads shall be considered to include all embankment placed within 2 vertical feet of the final wearing surface and shall also include shoulders.
2. Determine field density using ASTM D 6938, ASTM D 1556, ASTM D 2167, or ASTM D 2937.
3. Determine field moisture content using ASTM D 6938, ASTM D 2216, ASTM D 4643, or ASTM D 4959.
4. The Engineer may allow exceptions to the above criteria for areas outside of the containment area which are not subject to significant long-term loads.

END OF SECTION

SECTION 02250

SOIL LINER

<p><u>Soil Liner:</u> The Soil Liner serves as a hydraulic containment barrier in the final cover system.</p>

A. DESCRIPTION

1. General:

- a. The Contractor shall furnish all labor, material, and equipment to complete installation of the Soil Liner including borrowing, hauling, screening, mixing, stockpiling, discing, compacting, drying or wetting, removal of surface water, removal of all previously placed material affected by adverse weather conditions or construction disturbance, final grading and sealing, and all necessary and incidental items as detailed or required to complete the Soil Liner, all in accordance with the Contract Drawings and these Specifications.

- b. The Contractor shall provide suitable soil from an on-site or off-site borrow site that meets all requirements outlined in these Specifications for Soil Liner.

Off-site borrow sources shall be approved in advance by the Engineer. The Contractor shall be responsible for all submittals required for Engineer approval of off-site borrow sources.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Vegetative Soil Layer	02258

3. Reference Standards:

The latest revision of the following standards of the American Society of Testing and Materials (ASTM) are hereby made a part of these Specifications.

ASTM D 422 Standard Test Method for Particle Size Analysis of Soils.

ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³).
ASTM D 1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
ASTM D 2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
ASTM D 2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
ASTM D 2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).
ASTM D 2937	Standard Test Method for Density of Soil in Place by the Drive Cylinder Method.
ASTM D 4318	Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
ASTM D 4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method.
ASTM D 4959	Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method.
ASTM D 5084	Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
ASTM D 6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

4. Quality Assurance:

Quality Assurance during placement of Soil Liner will be provided by the Owner.

B. MATERIALS

All material for Soil Liner shall conform to the requirements shown in Table 1 of this section.

C. SUBMITTALS

The Contractor shall submit the following to the CQA Engineer:

1. Before approval is given to proceed with test fill construction, the Contractor shall submit descriptive information on compaction equipment to be used for construction of the Soil Liner.
2. Off-Site Borrow Sources (If Applicable):
 - a. For each off-site borrow source for Soil Liner soils, the Contractor shall provide the following information at least four weeks prior to placement of the Soil Liner:

- (1) The name, location, and owner of proposed borrow site, including a topographic map and location map of the site.
- (2) A certification submitted by an independent Registered Professional Engineer that the proposed borrow site contains a minimum of double the in-place volume of Soil Liner required to complete the work.
- (3) A certification submitted by an independent Registered Professional Engineer that the proposed borrow soils meet the requirements for Soil Liner outlined in these Specifications. Certification shall include the following minimum testing and test frequency:

<u>Test</u>	<u>Min. Number of Tests</u>
Atterberg Limits (ASTM D 4318)	10
Grain Size (with Hydrometer) (ASTM D 422)	10
Standard Proctor (ASTM D 698)	5
Natural Moisture Content (ASTM D 2216)	10
Hydraulic Conductivity (Lab Remolded) (ASTM D 5084)	5

Testing samples for certification shall be obtained from well distributed locations within the proposed borrow area. All test data shall be submitted with the soil certification.

- b. The Contractor shall be responsible for maintaining quality of the Soil Liner borrow source throughout construction and shall ensure that the borrow soil meets the project criteria outlined in these Specifications. The

Contractor shall cooperate with the CQA Engineer so that the CQA Engineer has unlimited access to the borrow area during construction for the purposes of sampling and testing borrow soil.

- c. If the borrow source does not meet the requirements outlined in these Specifications, the Contractor shall be responsible for providing an alternative borrow source at no cost to the Owner.

D. CONSTRUCTION

1. General:

- a. All placement and compaction of Soil Liner shall be performed only when the CQA Engineer is informed by the Contractor of intent to perform such work.
- b. The Contractor shall place and compact the Soil Liner to the lines and grades shown on the Contract Drawings with the exception that a 0.15 foot overbuild at the Contractor's expense is allowed. Thickness requirements are minimum values. The Contractor will perform all surveys necessary to establish and verify lines and grades for all Soil Liner.

2. Borrow Soils:

- a. The Contractor may haul borrow soil to an on-site stockpile area. Unless otherwise allowed by the Engineer, borrow soil cannot be hauled directly to the containment area for placement and compaction unless each load is monitored and approved by the CQA Engineer prior to loading at the borrow site.
- b. Any borrow soil not meeting the requirements for Soil Liner shall be rejected and removed from the project site by the Contractor at no cost to the Owner.

3. Test Fill Construction:

The Contractor shall construct a test fill prior to construction of Soil Liner. The test fill shall be at least 20 feet wide by 50 feet long and shall be compacted in lifts to the full design thickness. The Contractor shall use materials and equipment for test fill construction that the Contractor intends to use during construction.

No Soil Liner construction may be performed until the test fill construction is confirmed to be adequate in accordance with the Project CQA Manual.

The Contractor shall amend construction techniques or equipment in order to meet all criteria outlined for Soil Liner in these Specifications at no cost to the Owner.

4. Subgrade Preparation:

- a. The CQA Engineer shall inspect the exposed subgrade prior to placement of Soil Liner to assure that all rocks, topsoil, vegetation, roots, debris, or other deleterious materials have been removed.
- b. Prior to placement of Soil Liner, the exposed subgrade shall be proofrolled using a static smooth-drum roller, loaded tandem axle dump truck, or other suitable equipment in the presence of the CQA Engineer. Any soft or unsuitable subgrade materials revealed before or during the in-place compaction shall be removed as directed by the CQA Engineer and replaced with Soil Liner.

5. Placement and Compaction:

- a. All Soil Liner shall be placed in loose lifts no greater than the height of the feet on compaction equipment to be used. The loose Soil Liner shall be free from clods or rocks which exceed the sizes in Table 1. Where excessive sized clods do occur, the Contractor shall break up the clods using methods approved by the CQA Engineer.
- b. Lift compaction shall be performed with an appropriately heavy, properly ballasted, penetrating-foot compactor. Compaction equipment shall be the same as used in the test fill, unless otherwise approved by the Engineer.

Each lift shall be compacted prior to placement of succeeding lifts. The maximum lift thickness shall be as shown in Table 2. In confined areas, mechanical equipment, suitable for small areas and capable of achieving the density requirements, shall be required.

- c. The exposed surface of Soil Liner shall be protected from adverse weather conditions or desiccation of the soil. This is commonly done by rolling the surface of the Soil Liner with a smooth-drum roller at the end of each work day. Alternative means of protecting the Soil Liner may be employed by the Contractor.
- d. The in-place Soil Liner shall conform to the requirements shown in Table 2 of this section. If Soil Liner does not meet the specified requirements, the Contractor shall rework the material, as may be necessary and continue compaction to achieve these requirements, or remove and replace the material to achieve the specified requirements, at Contractor's expense.

- e. Any Soil Liner surface which is smooth, has a moisture content outside of the specified moisture content range, as defined by ASTM D 698, or exhibits evidence of desiccation cracking $\frac{1}{2}$ inch deep or greater, shall be scarified to a depth of 1 to 3 inches and brought to a proper moisture content prior to placement of a subsequent lift. This includes any Soil Liner surface that was previously seal rolled for protection.
- f. No Soil Liner shall be placed or compacted when soil temperatures are so low as to produce ice lenses in the Soil Liner borrow soil.
- g. Soil Liner placed on side slopes shall be placed and compacted in lifts which are parallel to the slope. Lift criteria shall be as described herein.
- h. Locations of control stakes, in-place density tests, thickness checks, or other samples in the Soil Liner shall be patched with compacted Soil Liner or sodium bentonite compacted and hydrated in the holes.

6. Surveying:

After completion of a segment of Soil Liner, but before installation of subsequent layers, the Soil Liner shall be surveyed (by test pit or hand auger) on a 100 foot grid to ensure the minimum specified thickness of Soil Liner has been achieved.

TABLE 1: SOIL LINER MATERIAL REQUIREMENTS

PROPERTY	TEST METHOD	VALUE
Visual Classification	ASTM D 2488	Clean natural fine-grained soil free from organics, debris, or other detrimental material. Soil type as required to achieve the hydraulic conductivity criteria.
Clod Size	-----	Maximum = ¾ inch (or less if required to achieve hydraulic conductivity criteria)
Gradation	ASTM D 422	Max. = 1½ inches
Atterberg Limits	ASTM D 4318	As required based on soil type.
Hydraulic Conductivity (Lab Remolded) (Compacted Soil Barrier)	ASTM D 5084 ³	$\leq 1 \times 10^{-5}$ cm/s at a density of $\geq 95\%$ maximum standard dry density and a moisture content \geq optimum moisture content ⁴

TABLE 2: IN-PLACE SOIL LINER REQUIREMENTS

PROPERTY	TEST METHOD	VALUE
Density	ASTM D 6938 ¹	≥ 95% maximum standard dry density ⁴
Moisture Content	ASTM D 6938 ²	≥ optimum moisture content ⁴
Maximum Lift Thickness (Compacted): (Compacted Soil Barrier)	-----	9 inches
Hydraulic Conductivity (Shelby Tube): (Compacted Soil Barrier)	ASTM D 5084 ³	≤ 1 x 10 ⁻⁵ cm/s
Completed Thickness: (Compacted Soil Barrier)	Survey	18 inches minimum

Notes:

1. Optionally use ASTM D 1556, ASTM D 2167, or ASTM D 2937.
2. Optionally use ASTM D 2216, ASTM D 4643, or ASTM D 4959.
3. Maximum effective confining pressure and maximum hydraulic gradient as follows.
Backpressure as recommended by ASTM D 5084. Modifications of the maximum hydraulic gradient may be allowed by the Engineer depending on actual hydraulic conductivity values.

Material	Maximum Effective Confining Pressure (psi)	Maximum Hydraulic Gradient
Compacted Soil Barrier ($k \leq 1 \times 10^{-5}$ cm/s)	5	15

4. Or as otherwise determined by remolded samples to achieve hydraulic conductivity criteria.

END OF SECTION

SECTION 02258

VEGETATIVE SOIL LAYER

Vegetative Soil Layer (VSL): The Vegetative Soil Layer (VSL) is placed in the final cover system in order to support permanent vegetative cover.

A. DESCRIPTION

1. General:

The Contractor shall furnish all labor, material, and equipment to complete installation of the VSL for the landfill cover, including borrowing, hauling, spreading, and final grading and all necessary and incidental items as detailed or required to complete the VSL, all in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Soil Liner	02250

3. Quality Assurance:

Quality Assurance during placement of Vegetative Soil Layer will be provided by the Owner.

B. MATERIALS

Soil that meets all of the following requirements shall be classified as select soil fill for use in construction of the VSL.

1. Soil materials used in the VSL shall be reasonably free of gypsum, ferrous, and/or calcareous concretions and nodules, refuse, roots, or other deleterious substances.
2. The VSL shall be uniform, smooth, and free of debris, rock, plant materials, and other foreign material larger than 3 inches in diameter. The material should contain no sharp edges. This material must be capable of supporting growth of vegetative cover.

C. SUBMITTALS

The Contractor shall submit the following to the CQA Engineer:

1. Before approval is given to proceed, the Contractor shall submit descriptive information on placement equipment to be used in construction of the VSL.

D. CONSTRUCTION

1. All placement and compaction of VSL shall be performed only when the CQA Engineer is informed by the Contractor of intent to perform such work.
2. VSL shall be placed as specified below:
 - a. The VSL, including topsoil, shall be placed and spread using tracked equipment. The CQA Engineer shall approve the equipment used to place the VSL.
 - b. VSL shall be placed and compacted to the lines and grades shown on the Contract Drawings with the exception that a 0.15 foot overbuild at Contractor's expense is allowed. The Contractor will perform all surveys necessary to establish and verify lines and grades for all VSL.
 - c. VSL shall be compacted by tracking the final lift with tracked equipment.
3. After the specified thickness has been achieved and verified, the Contractor shall proceed immediately with seeding.
4. Surveying:

After completion of a segment of VSL, the VSL shall be surveyed (by test pit or hand auger) on a 100 foot grid to ensure the minimum specified thickness of VSL has been achieved.

END OF SECTION

SECTION 02930

REVEGETATION

Revegetation: Revegetation includes permanent Revegetation of all site areas disturbed by the Contractor whether inside the Contract Limits or not.

A. DESCRIPTION

1. General:

The Contractor shall furnish all labor, material, and equipment to complete Revegetation in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Vegetative Soil Layer	02258

3. Warranty:

The Contractor shall be responsible for the satisfactory establishment and growth of a permanent stand of vegetation for a period of one year following the final seeding as judged by the Engineer. During this period, the Contractor shall be responsible for the maintenance items described in Paragraph D.4 (Maintenance) of this Specification.

B. MATERIALS

1. Limestone: Unless otherwise defined by specific soil tests, supply agricultural grade ground limestone conforming to the current "Rules, Regulations, and Standards of the Fertilizer Board of Control."

2. Fertilizer: Unless otherwise defined by specific soil tests, supply commercial fertilizer of 10-10-10 analysis, meeting applicable requirements of State and Federal law. Do not use cyanamic compounds of hydrated lime. Deliver fertilizer in original containers labeled with content analysis.

3. Grass Seed: Supply fresh, clean, new-crop seed as specified in Table 1 of this section. Do not use seed which is wet, moldy, or otherwise damaged. Deliver

seed in standard sealed containers labeled with producer's name and seed analysis, and in accord with US Department of Agriculture Rules and Regulations under Federal Seed Act.

4. Mulch: Supply clean, seed-free, threshed straw of oats, wheat, barley, rye, beans, or other locally available mulch material.
 - a. Do not use mulch containing a quantity of matured, noxious weed seeds or other species that will be detrimental to seeding, or provide a menace to surrounding land.
 - b. Do not use mulch material which is fresh or excessively brittle, or which is decomposed and will smother or retard growth of grass.
5. Binder: Supply emulsified asphalt or synthetic binder.
6. Water: Supply potable, free of substances harmful to growth.

C. SUBMITTALS

The Contractor shall submit the following to the Engineer:

1. Results of soil tests performed and proposed modifications, if any, to the specified requirements.
2. Certificates for each grass seed mixture, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed. Certify that each container of seed delivered is fully labeled in accordance with Federal Seed Act and equals or exceeds specification requirements.
3. Copies of invoices for fertilizer, showing grade furnished and total quantity applied.

D. CONSTRUCTION

1. The Contractor shall establish a smooth, healthy, uniform, close stand of grass from the specified seed. Prior to Revegetation, the Contractor shall adequately test the soils to be revegetated to ensure the adequacy of the specified requirements. Any modifications to these requirements deemed necessary after the review of soil test results, shall be at the Contractor's sole expense. The Engineer will perform the observations to determine when successful Revegetation is achieved.

2. Soil Preparation:

- a. Limit preparation to areas which will be planted soon after preparation.
- b. Loosen surface to minimum depth of four (4) inches.
- c. Remove stones, sticks, roots, rubbish and other extraneous matter over three (3) inches in any dimension.
- d. Spread lime uniformly over designated areas at the rate specified in Table 1 of this section.
- e. After application of lime, prior to applying fertilizer, loosen areas to be seeded with double disc or other suitable device if soil has become hard or compacted. Correct any surface irregularities in order to prevent pocket or low areas which will allow water to stand.
- f. Distribute fertilizer uniformly over areas to be seeded at the rate specified in Table 1 of this section.
 - (1) Use suitable distributor.
 - (2) Incorporate fertilizer into soil to depth of a least two (2) inches.
 - (3) Remove stones or other substances which will interfere with turf development or subsequent mowing.
- g. Grade seeded areas to smooth, even surface with loose, uniformly fine texture.
 - (1) Roll and rake, remove ridges and fill depressions, as required to meet finish grades.
 - (2) Fine grade just prior to planting.

3. Seeding:

- a. Use approved mechanical power driven drills or seeders, mechanical hand seeders, or other approved equipment.
- b. Distribute seed evenly over entire area at the rate specified in Table 1 of this section.

- c. Stop work when work extends beyond most favorable planting season for species designated, or when satisfactory results cannot be obtained because of drought, high winds, excessive moisture, or other factors.
- d. Resume work only when favorable condition develops, or as directed by the Engineer.
- e. Lightly rake seed into soil followed by light rolling or cultipacking.
- f. Immediately protect seeded areas against erosion by mulching or placing rolled erosion control products, where applicable.
 - (1) Spread mulch in a continuous blanket at the rate specified in Table 1 of this section.
 - (2) Immediately following spreading mulch, secure with evenly distributed binder at the rate specified in Table 1 of this section.

4. Maintenance:

The Contractor shall be responsible for maintaining all seeded areas through the end of his warranty period. The Contractor shall provide, at his expense, protection of all seeded areas against damage at all times until acceptance of the work. Maintenance shall include, but not be limited to, the following items:

- a. Regrade and revegetate all eroded areas until adequately stabilized by grass.
- b. Remulch with new mulch in areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose. Anchor as required to prevent displacement.
- c. Replant bare areas using same materials specified.

TABLE 1: SEEDING SCHEDULE

MATERIAL	SEED TYPE	APPLICATION RATE ¹
Lime	-----	4,000 lbs/acre
Fertilizer	-----	1,000 lbs/acre
Seed Permanent:	Tall Fescue Pensacola Bahiagrass Sericea Lespedeza ² Kobe Lespedeza Seasonal Nurse Crop	80 lbs/acre 50 lbs/acre 30 lbs/acre 10 lbs/acre See Note 3
Temporary:	See Note 4	See Note 4
Mulch	-----	4,000 - 5,000 lbs/acre
Binder	-----	150 gallons/acre

Notes:

1. Application rates and/or chemical analysis shall be confirmed or established by a soil test(s).
2. From Sept. 1 - March 1, use unscarified Sericea seed.
3. Use seasonal nurse crop in accordance with seeding dates as stated below:

April 15 - August 15	10 lbs/acre German Millet or 15 lbs/acre Sudangrass
August 16 - April 14	25 lbs/acre Rye (grain).
4. For temporary seeding, follow the guidelines of the NC Erosion and Sediment Control Planning and Design Manual.

END OF SECTION

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Construction Quality Assurance Manual

**Wilson County Westside C&D Landfill
Wilson County, North Carolina**

Prepared for:

**Wilson County Solid Waste Management Dept.
Wilson, North Carolina**

January 2010



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RALEIGH, NORTH CAROLINA 27603
NC LIC. NO. C-0828 (ENGINEERING)

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WILSON COUNTY WESTSIDE C&D LANDFILL
CONSTRUCTION QUALITY ASSURANCE MANUAL

TABLE OF CONTENTS

		<u>Page</u>
1.0	GENERAL	
1.1	Introduction	1.0-1
1.2	Definitions Relating to Construction Quality	1.0-1
1.2.1	Construction Quality Assurance (CQA)	1.0-1
1.2.2	Construction Quality Control (CQC)	1.0-2
1.2.3	CQA Certification Document	1.0-2
1.2.4	Discrepancies Between Documents	1.0-2
1.3	Parties to Construction Quality Assurance	1.0-2
1.3.1	Description of the Parties	1.0-2
	1.3.1.1 Owner	1.0-2
	1.3.1.2 Engineer	1.0-2
	1.3.1.3 Contractor	1.0-3
	1.3.1.4 CQA Engineer	1.0-3
	1.3.1.5 Soils CQA Laboratory	1.0-4
1.3.2	Qualifications of the Parties	1.0-4
	1.3.2.1 Contractor	1.0-4
	1.3.2.2 CQA Engineer	1.0-4
	1.3.2.3 Soils CQA Laboratory	1.0-5
1.4	Scope of Construction Quality Assurance Manual	1.0-5
1.5	Units	1.0-5
1.6	References	1.0-5
1.7	CQA Meetings	1.0-5
1.7.1	Soil Liner CQA Meeting	1.0-6
1.7.2	CQA Progress Meetings	1.0-6
1.7.3	Problem or Work Deficiency Meetings	1.0-7
1.8	Control Versus Record Testing	1.0-7
1.8.1	Control Testing	1.0-7
1.8.2	Record Testing	1.0-7
2.0	CQA DOCUMENTATION	
2.1	Documentation	2.0-1
2.2	Daily CQA Report	2.0-1
2.3	CQA Progress Reports	2.0-2
2.4	CQA Photographic Reporting	2.0-2
2.5	Deficiencies	2.0-3
2.6	Design And/Or Project Technical Specification Changes	2.0-3

Table of Contents (Continued)

	<u>Page</u>
2.7	Final CQA Report 2.0-3
2.8	Storage of Records 2.0-4
3.0	EARTHWORK CQA
3.1	Introduction 3.0-1
3.2	Embankment Material Approval 3.0-1
3.2.1	Control Tests 3.0-1
3.3	Subgrade Approval 3.0-1
3.4	Earthwork Construction 3.0-1
3.4.1	Construction Monitoring 3.0-1
3.4.2	Control Tests 3.0-2
3.4.3	Record Tests 3.0-2
3.4.3.1	Record Test Failure 3.0-2
3.4.4	Judgmental Testing 3.0-2
3.5	Deficiencies 3.0-2
4.0	SOIL LINER CQA
4.1	Introduction 4.0-1
4.2	Soil Liner Material Approval 4.0-1
4.2.1	Control Tests 4.0-1
4.3	Subgrade Approval 4.0-1
4.4	Test Fill Construction 4.0-1
4.4.1	Control Tests 4.0-2
4.4.2	Record Tests 4.0-2
4.4.3	Test Fill Completion 4.0-2
4.5	Soil Liner Construction 4.0-2
4.5.1	Construction Monitoring 4.0-2
4.5.2	Control Tests 4.0-3
4.5.3	Record Tests 4.0-3
4.5.3.1	Record Test Failure 4.0-3
4.5.4	Judgmental Testing 4.0-4
4.5.5	Perforations in Soil Liner 4.0-4
4.6	Deficiencies 4.0-4
5.0	FINAL COVER SYSTEM CQA
5.1	Introduction 5.0-1
5.2	Final Cover System Material Approval 5.0-1
5.2.1	Corrugated Polyethylene (CPE) Pipe 5.0-1
5.2.2	Landfill Gas (LFG) System Components 5.0-1
5.2.3	Vegetative Soil Layer 5.0-2

Table of Contents (Continued)

	<u>Page</u>
5.3 Final Cover System Installation	5.0-2
5.4 Deficiencies	5.0-3

APPENDICES

Appendix A	Reference List of Test Methods
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SECTION 1.0 GENERAL

1.1 INTRODUCTION

This Construction Quality Assurance (CQA) Manual has been prepared to provide the Owner, (Design) Engineer, and CQA Engineer the means to govern the construction quality and to satisfy landfill certification requirements under current solid waste management regulations.

More specifically, this CQA Manual addresses the soils components of the final cover system. The final cover system consists of a landfill gas (LFG) system, compacted soil barrier, and overlying vegetative soil layer.

The CQA Manual is divided into the following sections:

- Section 1.0 General
- Section 2.0 CQA Documentation
- Section 3.0 Earthwork CQA
- Section 4.0 Soil Liner CQA
- Section 5.0 Final Cover System CQA

1.2 DEFINITIONS RELATING TO CONSTRUCTION QUALITY

1.2.1 Construction Quality Assurance (CQA)

In the context of this Manual, Construction Quality Assurance is defined as a planned and systematic program employed by the Owner to assure conformity of the final cover system installation with the project drawings and the project specifications. CQA is provided by the CQA Engineer as a representative of the Owner and is independent from the Contractor and all manufacturers. The CQA program is designed to provide adequate confidence that items or services meet contractual and regulatory requirements and will perform satisfactorily in service.

1.2.2 Construction Quality Control (CQC)

Construction Quality Control refers to actions taken by manufacturers, fabricators, installers, and/or the Contractor to ensure that the materials and the workmanship meet the requirements of the project drawings and the project specifications.

1.2.3 CQA Certification Document

At the completion of construction, a certification document will be prepared by the CQA Engineer and submitted to State Solid Waste Regulators. The certification report will include all CQA testing performed by the CQA Engineer.

1.2.4 Discrepancies Between Documents

The Contractor is instructed to bring discrepancies to the attention of the CQA Engineer who shall then notify the Engineer for resolution. The Engineer has the sole authority to determine resolution of discrepancies existing within the Contract Documents (this may also require the approval of State Solid Waste Regulators). Unless otherwise determined by the Engineer, the more stringent requirement shall be the controlling resolution.

1.3 PARTIES TO CONSTRUCTION QUALITY ASSURANCE

1.3.1 Description of the Parties

The parties to Construction Quality Assurance and Quality Control include the Owner, Engineer, Contractor, CQA Engineer, and Soils CQA Laboratory.

1.3.1.1 Owner

The Owner is Wilson County, who owns and/or is responsible for the facility.

1.3.1.2 Engineer

The Engineer is responsible for the engineering design, drawings, and project specifications for the final cover system. The Engineer is an official representative of the Owner. The Engineer serves as communications coordinator for the project, initiating the meetings outlined in **Section 1.7**. The Engineer will also be responsible for proper resolution of all quality issues that arise during construction. The Engineers are BlackRock Engineers and Richardson Smith Gardner & Associates, Inc.

1.3.1.3 Contractor

The Contractor is responsible for the construction of the final cover system. The Contractor is responsible for the overall CQC on the project and coordination of submittals to the CQA Engineer. Additional responsibilities of the Contractor are defined by the project specifications.

1.3.1.4 CQA Engineer

The CQA Engineer is a representative of the Owner, is independent from the Contractor, and is responsible for observing, testing, and documenting activities related to the CQA of the earthworks at the site and the installation of the soil component of the final cover system. The CQA Engineer may make field observations and review submittals for the Engineer and is responsible for notifying the Owner and Engineer of all quality issues that arise during construction. The

CQA Engineer is also responsible for issuing a facility certification report, sealed by a Professional Engineer registered in The State of North Carolina.

1.3.1.5 Soils CQA Laboratory

The Soils CQA Laboratory is a party, independent from the Owner, that is responsible for conducting geotechnical tests on conformance samples of soils and aggregates used in structural fills and the final cover system. The services of the Soils CQA Laboratory are coordinated by the CQA Engineer and are paid for by the Owner.

1.3.2 Qualifications of the Parties

The following qualifications are required of all parties involved with the installation and CQA of all materials for the final cover system. Where applicable, these qualifications must be submitted by the Contractor to the Owner and Engineer for review and approval.

1.3.2.1 Contractor

Qualifications of the Contractor are specific to the construction contract and independent of this CQA Manual.

1.3.2.2 CQA Engineer

The CQA Engineer will act as the Owner's Quality Assurance Representative. The CQA Engineer will perform CQA testing to satisfy the requirements of this CQA Manual and will prepare the CQA certification document. The CQA Engineer will have experience in the CQA aspects of the construction and testing of final cover system, and be familiar with ASTM and other related industry standards. The activities of the CQA Engineer will be performed under the supervision of a Registered Professional Engineer.

1.3.2.3 Soils CQA Laboratory

The Soils CQA Laboratory will have experience in testing structural fills, soil liners, and aggregates, and be familiar with ASTM and other applicable test standards. The Soils CQA Laboratory will be capable of providing test results within 24 hours or a reasonable time after receipt of samples depending on the test(s) to be conducted, as agreed to at the outset of the project by affected parties, and will maintain that standard throughout the installation.

1.4 SCOPE OF CONSTRUCTION QUALITY ASSURANCE MANUAL

The scope of this CQA Manual includes the CQA of the soils components of the final cover system for the subject facility. The CQA for the selection, evaluation, and placement of the soils is included in the scope.

1.5 UNITS

In this CQA Manual, all properties and dimensions are expressed in U.S. units.

1.6 REFERENCES

The CQA Manual includes references to the most recent version of the test procedures of the American Society of Testing and Materials (ASTM). **Appendix A** contains a list of these procedures.

1.7 CQA MEETINGS

To facilitate the specified degree of quality during installation, clear, open channels of communication are essential. To that end, meetings are critical.

1.7.1 Soil Liner CQA Meeting

Prior to the start of the soil liner system construction a CQA Meeting will be held. This meeting will include all parties then involved, including the Engineer, the CQA Engineer, and the Contractor.

The purpose of this meeting is to begin planning for coordination of tasks, anticipate any problems which might cause difficulties and delays in construction, and, above all, review the CQA Manual to all of the parties involved. It is very important that the rules regarding testing, repair, etc., be known and accepted by all.

This meeting should include all of the activities referenced in the project specifications.

The meeting will be documented by the Engineer and minutes will be transmitted to all parties.

1.7.2 CQA Progress Meetings

Progress meetings will be held between the Engineer, the CQA Engineer, the Contractor, and representatives from any other involved parties at the frequency dictated in the project specifications or, at a minimum, once per month during active construction. These meetings will discuss current progress, planned activities for the next week, and any new business or revisions to the work. The CQA Engineer will log any problems, decisions, or questions arising at this meeting in his daily or periodic reports. Any matter requiring

action which is raised in this meeting will be reported to the appropriate parties. These meetings will be documented by the Engineer and minutes will be transmitted to affected parties.

1.7.3 Problem or Work Deficiency Meetings

A special meeting will be held when and if a problem or deficiency is present or likely to occur. At a minimum, the meeting will be attended by the Engineer, the CQA Engineer, the Contractor, and representatives from any other involved parties. The purpose of the meeting is to define and resolve the problem or work deficiency as follows:

- define and discuss the problem or deficiency;
- review alternative solutions; and
- implement an action plan to resolve the problem or deficiency.

The meeting will be documented by the Engineer and minutes will be transmitted to affected parties.

1.8 CONTROL VERSUS RECORD TESTING

1.8.1 Control Testing

In the context of this CQA Manual, Control Tests are those tests performed on a material prior to its actual use in construction to demonstrate that it can meet the requirements of the project plans and specifications. Control Test data may be used by the Engineer as the basis for approving alternative material sources.

1.8.2 Record Testing

Record Tests are those tests performed during the actual placement of a material to demonstrate that its in-place properties meet or exceed the requirements of the project drawings and specifications.

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SECTION 2.0 CQA DOCUMENTATION

2.1 DOCUMENTATION

An effective CQA plan depends largely on recognition of construction activities that should be monitored and on assigning responsibilities for the monitoring of each activity. This is most effectively accomplished and verified by the documentation of quality assurance activities. The CQA Engineer will document that quality assurance requirements have been addressed and satisfied.

The CQA Engineer will provide the Owner and Engineer with his daily and weekly progress reports including signed descriptive remarks, data sheets, and logs to verify that required CQA activities have been carried out. These reports will also identify potential quality assurance problems. The CQA Engineer will also maintain at the job site a complete file of project drawings, reports, project specifications, a CQA Manual, checklists, test procedures, daily logs, and other pertinent documents.

2.2 DAILY CQA REPORT

The CQA Engineer's reporting procedures will include preparation of a daily report which, at a minimum, will include the following information, where applicable:

- a unique identifying sheet number for cross referencing and document control;
- date, project name, location, and other identification;
- data on weather conditions;
- a reduced-scale Site Plan showing all proposed work areas and test locations;
- descriptions and locations of ongoing construction;
- descriptions and specific locations of areas, or units, of work being tested and/or observed and documented;
- locations where tests and samples were taken;
- a summary of test results;
- calibrations or recalibrations of test equipment, and actions taken as a result of recalibration;
- off-site materials received, including quality verification documentation;

- decisions made regarding acceptance of units of work, and/or corrective actions to be taken in instances of substandard quality;
- summaries of pertinent discussions with the Contractor; and
- the CQA Engineer's signature.

The daily report must be completed at the end of each CQA Engineer's shift, prior to leaving the site. This information will be submitted weekly to and reviewed by the Owner and Engineer.

2.3 CQA PROGRESS REPORTS

The CQA Engineer will prepare a summary progress report each week, or at time intervals established at the pre-construction meeting. As a minimum, this report will include the following information, where applicable:

- a unique identifying sheet number for cross-referencing and document control;
- the date, project name, location, and other information;
- a summary of work activities during the progress reporting period;
- a summary of construction situations, deficiencies, and/or defects occurring during the progress reporting period;
- summary of all test results, failures and retests, and
- signature of the CQA Engineer.

The CQA Engineer's progress reports must summarize the major events that occurred during that week. Critical problems that occur shall be communicated verbally to the Engineer immediately as well as being included in the weekly reports. The CQA Engineer's weekly report must be submitted to the Owner and Engineer no later than the Monday following the week reported.

2.4 CQA PHOTOGRAPHIC REPORTING

Photographs will be taken by the CQA Engineer at regular intervals during the construction process and in all areas deemed critical by the CQA Engineer.

These photographs will serve as a pictorial record of work progress, problems, and mitigation activities. These records will be presented to the Engineer upon completion of the project.

In lieu of photographic documentation, videotaping may be used to record work progress, problems, and mitigation activities. The Engineer may require that a portion of the

documentation be recorded by photographic means in conjunction with videotaping.

2.5 DEFICIENCIES

The Owner and Engineer will be made aware of any significant recurring nonconformance with the project specifications. The Engineer will then determine the cause of the non-conformance and recommend appropriate changes in procedures or specification. When this type of evaluation is made, the results will be documented, and any revision to procedures or project specifications will be approved by the Owner and Engineer.

2.6 DESIGN AND/OR PROJECT TECHNICAL SPECIFICATION CHANGES

Design and/or project specification changes may be required during construction. In such cases, the CQA Engineer will notify the Engineer. The Engineer will then notify the appropriate agency, if necessary.

Design and/or project specification changes will be made only with the written agreement of the Engineer, and will take the form of an addendum to the project specifications. All design changes will include a detail (if necessary) and state which detail it replaces in the plans.

2.7 FINAL CQA REPORT

At the completion of each major construction activity at the landfill unit, the CQA Engineer will certify all required forms, observation logs, field and laboratory testing data sheets including sample location plans, etc. The CQA Engineer will also provide a final report which will certify that the work has been performed in compliance with the plans and project technical specifications, and that the supporting documents provide the necessary information.

The CQA Engineer will also provide summaries of all the data listed above with the report. The Record Drawings will include scale drawings depicting the location of the construction and details pertaining to the extent of construction (e.g., depths, plan dimensions, elevations, soil component thicknesses, etc.). All surveying and base maps required for development of the Record Drawings will be done by the Contractor's Construction Surveyor. These documents will be certified by the Contractor and delivered to the CQA Engineer and included as part of the final CQA (Certification) report.

It may be necessary to prepare interim certifications, as allowed by the regulatory agency to expedite completion and review.

At a minimum, the items shown in **Table 2.1** will be included in the Final CQA Report. Note that some items may not be applicable to all projects.

2.8 STORAGE OF RECORDS

All handwritten data sheet originals, especially those containing signatures, will be stored by the CQA Engineer in a safe repository on site. Other reports may be stored by any standard method which will allow for easy access. All written documents will become property of the Owner.

TABLE 2.1: FINAL CQA REPORT GENERAL OUTLINE (FINAL COVER SYSTEM)

- 1.0 Introduction
- 2.0 Project Description
- 3.0 CQA Program
 - 3.1 Scope of Services
 - 3.2 Personnel
- 4.0 Earthwork CQA
- 5.0 Final Cover System CQA
- 6.0 Soil Liner CQA
- 7.0 Summary and Conclusions
- 8.0 Project Certification

Appendices

- Appendix A Design Clarifications/Modifications
- Appendix B Photographic Documentation
- Appendix C CQA Reporting
 - C1. CQA Reports
 - C2. CQA Meeting Minutes
- Appendix D Earthwork CQA Data
 - D1. CQA Test Results - Control Tests
 - D2. CQA Test Results - Record Tests
- Appendix E Final Cover System CQA Data
 - E1. CQA Test Results - Vegetative Soil Layer
- Appendix F Soil Liner CQA Data
 - F1. CQA Test Results - Control Tests
 - F2. CQA Test Results - Record Tests
- Appendix G Record Drawings
 - G1. Compacted Soil Liner As-Built
 - G2. Vegetative Soil Layer As-Built

SECTION 3.0 EARTHWORK CQA

3.1 INTRODUCTION

This section of the CQA Manual addresses earthwork (excavation and embankment) and outlines the soils CQA program to be implemented with regard to material approval, subgrade approval, field control and record tests, and resolution of problems.

3.2 EMBANKMENT MATERIAL APPROVAL

All material to be used as compacted embankment shall be approved in advance by the CQA Engineer. Approval is based upon successful completion of CQA control testing outlined below. Such testing can be performed either during excavation and stockpiling or from existing stockpiles prior to use.

3.2.1 Control Tests

The procedure for CQA testing during excavation and stockpiling (including existing stockpiles) is outlined below.

Each load of soil will be examined either at the borrow source or the stockpile area. Any unsuitable material will be rejected or routed to separate stockpiles consistent with its end use. Appropriate entries will be made in the daily log.

During stockpiling operations, control tests, as shown on **Table 3.1**, will be performed by the CQA Engineer prior to placement of any compacted embankment.

3.3 SUBGRADE APPROVAL

The CQA Engineer will verify that the compacted embankment subgrade is constructed in accordance with the project specifications.

3.4 EARTHWORK CONSTRUCTION

3.4.1 Construction Monitoring

- A. Earthwork shall be performed as described in the project specifications.
- B. Only soil previously approved by the CQA Engineer (see **Section 3.2**) shall be used in construction of the compacted embankment. Unsuitable material will be removed prior to acceptance by the CQA Engineer.
- C. All required field density and moisture content tests shall be completed before the overlying lift of soil is placed. The surface preparation (e.g. wetting, drying,

scarification, etc.) shall be completed before the CQA Engineer will allow placement of subsequent lifts.

- D. The CQA Engineer will monitor protection of the earthwork during and after construction.

3.4.2 Control Tests

The control tests, as shown on **Table 3.2**, will be performed by the CQA Engineer prior to placement of compacted embankment.

3.4.3 Record Tests

The record tests, as shown on **Table 3.2**, will be performed by the CQA Engineer during placement of compacted embankment.

3.4.3.1 Record Test Failure

Recompaction of the failed area shall be performed and retested until the area meets or exceeds requirements outlined in the specifications.

3.4.4 Judgmental Testing

During construction, the frequency of control and/or record testing may be increased at the discretion of the CQA Engineer when visual observations of construction performance indicate a potential problem. Additional testing for suspected areas will be considered when:

- the rollers slip during rolling operation;
- the lift thickness is greater than specified;
- the fill material is at an improper moisture content;
- fewer than the specified number of roller passes are made;
- dirt-clogged rollers are used to compact the material;
- the rollers may not have used optimum ballast;
- the fill materials differ substantially from those specified; or
- the degree of compaction is doubtful.

3.5 DEFICIENCIES

The CQA Engineer will immediately determine the extent and nature of all defects and deficiencies and report them to the Owner and Engineer. All defects and deficiencies will be documented by the CQA Engineer. The Contractor shall correct defects and deficiencies to the satisfaction of the CQA Engineer. The CQA Engineer will observe all retests on repaired defects.

**TABLE 3.1: CQA TESTING PROGRAM FOR EMBANKMENT
MATERIAL APPROVAL**

PROPERTY	TEST METHOD	MINIMUM TEST FREQUENCY
CONTROL TESTS:		
Visual Classification	ASTM D 2488	Each Soil
Moisture-Density Relationship	ASTM D 698	5,000 CY per Each Soil

TABLE 3.2: CQA TESTING PROGRAM FOR COMPACTED EMBANKMENT

PROPERTY	TEST METHOD	MINIMUM TEST FREQUENCY
CONTROL TESTS: (See Table 3.1)		
RECORD TESTS:		
Lift Thickness	-----	Each Lift
In-Place Density	ASTM D 6938 ¹	20,000 ft ² per lift & 1 per 500 LF/lift of Berms (< 200 ft. base width)
Moisture Content	ASTM D 6938 ²	20,000 ft ² per lift & 1 per 500 LF/lift of Berms (< 200 ft. base width)

Notes:

1. Optionally use ASTM D 1556, ASTM D 2167, or ASTM D 2937. For every 10 nuclear density tests perform at least 1 density test by ASTM D 1556, ASTM D 2167, or ASTM D 2937 as a verification of the accuracy of the nuclear testing device.
2. Optionally use ASTM D 2216, ASTM D 4643, or ASTM D 4959. For every 10 nuclear moisture tests perform at least 1 moisture test by ASTM D 2216, ASTM D 4643, or ASTM D 4959 as a verification of the accuracy of the nuclear testing device.

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SECTION 4.0 SOIL LINER CQA

4.1 INTRODUCTION

This section of the CQA Manual addresses the soil liner component of the final cover system and outlines the soils CQA program to be implemented with regard to material approval, subgrade approval, test fill construction, field and laboratory control and record tests, and resolution of problems.

4.2 SOIL LINER MATERIAL APPROVAL

All material to be used as soil liner shall be approved in advance by the CQA Engineer. Approval is based upon successful completion of CQA control testing outlined below. Such testing can be performed either during excavation and stockpiling or from existing stockpiles prior to use.

4.2.1 Control Tests

The procedure for CQA testing during excavation and stockpiling (including existing stockpiles) is outlined below.

Each load of soil will be examined either at the borrow source or the stockpile area. Any unsuitable material will be rejected or routed to separate stockpiles consistent with its end use. Appropriate entries will be made in the daily log.

During stockpiling operations, control tests, as shown on **Table 4.1**, will be performed by the CQA Engineer prior to placement of any soil liner material.

4.3 SUBGRADE APPROVAL

The CQA Engineer will verify that the soil liner subgrade is constructed in accordance with the project specifications.

4.4 TEST FILL CONSTRUCTION

A test fill meeting the requirements of the project specifications will be constructed using the same construction methods, equipment, and material to be used for the soil liner component. The test fill construction will be conducted prior to or coincide with the beginning of construction of the soil liner component.

Construction equipment and methods will be reviewed by the CQA Engineer prior to test fill placement.

4.4.1 Control Tests

The control tests, as shown on **Table 4.2**, will be performed by the CQA Engineer prior to placement of soil liner material in the test fill.

4.4.2 Record Tests

The record tests, as shown on **Table 4.2**, will be performed by the CQA Engineer during placement of soil liner material in the test fill.

4.4.3 Test Fill Completion

The test fill program is completed when the Contractor has shown that the soil liner constructed using the same construction methods, equipment, and material to be used in construction of the soil liner will satisfy project specifications. No soil liner can be placed until the test fill program is completed.

4.5 SOIL LINER CONSTRUCTION

4.5.1 Construction Monitoring

- A. Soil liner shall be placed as described in the applicable section(s) of the project specifications using the construction methods, equipment, and material demonstrated in the test fill construction.
- B. Only soil previously approved by the CQA Engineer (see **Section 4.2**) shall be used in construction of the soil liner. Unsuitable material will be removed prior to acceptance by the CQA Engineer.
- C. All required field density and moisture content tests shall be completed before the overlying lift of soil is placed. The surface preparation (e.g. wetting, drying, scarification, etc.) shall be completed before the CQA Engineer will allow placement of subsequent lifts.
- D. The CQA Engineer will monitor protection of the soil liner during and after construction.
- E. The liner surface shall be sprinkled with water as needed to prevent desiccation. Should desiccation occur, the last lift shall be reconstructed in accordance with the project specifications. Standing water should not be present on the soil liner.
- F. Frost heave or other damage due to freezing shall require lift reconstruction in accordance with the project specifications.
- G. All cracks and voids shall be filled and the surface made uniform. This shall be

accomplished by final dressing of the soil liner with smooth-drum rollers and hand raking. No rubber tired vehicles are permitted on the final dressed surface unless authorized by the CQA Engineer.

4.5.2 Control Tests

The control tests, as shown on **Table 4.3**, will be performed by the CQA Engineer prior to placement of soil liner material.

4.5.3 Record Tests

The record tests, as shown on **Table 4.3** and as described below, will be performed by the CQA Engineer during placement of soil liner material.

- A. Each lift will be checked visually for soil clods, rocks, debris, plant materials and other foreign material. Any such material which does not meet specified requirements shall be identified and removed prior to and during the compaction process.
- B. The thickness of the loose lift will be measured at random locations after spreading and leveling is completed. Loose lift thickness should not exceed the depth of penetration of the compaction feet.
- C. Moisture content will be monitored by the CQA Engineer prior to compaction. If the soil is drier than the specified minimum moisture content, water will be added and the lift will be disced to distribute the moisture evenly.

Results of testing will be certified within 7 days of soil liner placement.

4.5.3.1 Record Test Failure

The following procedures shall be used in the event of density or hydraulic conductivity test failure:

- A. Failed Density Test: Recomposition of the failed area shall be performed and retested until the area meets or exceeds requirements outlined in the specifications.
- B. Failed Hydraulic Conductivity Test: The area of failure shall be localized and reconstructed in accordance with the project specifications. This area will be retested as outlined within the plan by the CQA Engineer. Optionally, at least five replicate samples shall be obtained and tested by the Contractor in the immediate vicinity of the failed test. If all five samples pass, then the initial failing test will be discounted. However, should the replicate samples confirm the failure of the soil liner to meet

specifications, the area of failure shall be localized, reconstructed, and retested as described above.

4.5.4 Judgmental Testing

During construction, the frequency of control and/or record testing may be increased at the discretion of the CQA Engineer when visual observations of construction performance indicate a potential problem. Additional testing for suspected areas will be considered when:

- the rollers slip during rolling operation;
- the lift thickness is greater than specified;
- the fill material is at an improper moisture content;
- fewer than the specified number of roller passes are made;
- dirt-clogged rollers are used to compact the material;
- the rollers may not have used optimum ballast;
- the fill materials differ substantially from those specified; or
- the degree of compaction is doubtful.

4.5.5 Perforations In Soil Liner

All holes shall be patched with compacted soil liner (if allowed by the project specifications) or sodium bentonite compacted and hydrated in the holes.

4.6 DEFICIENCIES

The CQA Engineer will immediately determine the extent and nature of all defects and deficiencies and report them to the Owner and Engineer. All defects and deficiencies will be documented by the CQA Engineer. The Contractor shall correct defects and deficiencies to the satisfaction of the CQA Engineer. The CQA Engineer will observe all retests on repaired defects.

TABLE 4.1: CQA TESTING PROGRAM FOR SOIL LINER MATERIAL APPROVAL

PROPERTY	TEST METHOD	MINIMUM TEST FREQUENCY
CONTROL TESTS:		
Visual Classification	ASTM D 2488	Each Soil
Moisture Content	ASTM D 2216	2,000 CY per Each Soil
Grain Size Analysis	ASTM D 422	2,000 CY per Each Soil
Atterberg Limits	ASTM D 4318	2,000 CY per Each Soil
Moisture-Density Relationship	ASTM D 698	5,000 CY per Each Soil
Hydraulic Conductivity - Lab Remolded	ASTM D 5084 ³	10,000 CY per Each Soil

TABLE 4.2: CQA TESTING PROGRAM FOR SOIL LINER TEST FILL

PROPERTY	TEST METHOD	MINIMUM TEST FREQUENCY
CONTROL TESTS: (See Table 4.1)		
Moisture-Density Relationship	ASTM D 698 ⁴	1 per lift
Hydraulic Conductivity - Lab Remolded	ASTM D 5084 ^{3,4}	1 per lift
RECORD TESTS:		
Lift Thickness	-----	Each Lift
Atterberg Limits	ASTM D 4318	1 per lift
Grain Size Analysis	ASTM D 422	1 per lift
In-Place Density	ASTM D 2922 ¹	3 per lift
Moisture Content	ASTM D 6938 ²	3 per lift
Hydraulic Conductivity - Undisturbed (Shelby Tube)	ASTM D 6938 ³	1 per lift

TABLE 4.3: CQA TESTING PROGRAM FOR SOIL LINER

PROPERTY	TEST METHOD	MINIMUM TEST FREQUENCY
CONTROL TESTS: (See Table 4.1)		
RECORD TESTS:		
Lift Thickness	-----	Each Lift
In-Place Density	ASTM D 6938 ¹	10,000 ft ² per lift
Moisture Content	ASTM D 6938 ²	10,000 ft ² per lift
Hydraulic Conductivity - Undisturbed (Shelby Tube)	ASTM D 5084 ³	40,000 ft ² per lift

Notes:

1. Optionally use ASTM D 1556, ASTM D 2167, or ASTM D 2937. For every 10 nuclear density tests perform at least 1 density test by ASTM D 1556, ASTM D 2167, or ASTM D 2937 as a verification of the accuracy of the nuclear testing device.
2. Optionally use ASTM D 2216, ASTM D 4643, or ASTM D 4959. For every 10 nuclear moisture tests perform at least 1 moisture test by ASTM D 2216, ASTM D 4643, or ASTM D 4959 as a verification of the accuracy of the nuclear testing device.
3. Maximum effective confining pressure and hydraulic gradient as required by the project specifications. Backpressure as recommended by ASTM D 5084.
4. These tests performed on the test fill may count toward the minimum frequencies established in **Table 4.1**.

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SECTION 5.0 FINAL COVER SYSTEM CQA

5.1 INTRODUCTION

This section of the CQA Manual addresses the landfill gas (LFG) system and the vegetative soil layer of the final cover system. By reference to **Section 4.0** of this CQA Manual, this section also addresses the compacted soil barrier that is included in the final cover system. This section outlines the CQA program to be implemented with regard to material approval, construction monitoring, and resolution of problems.

5.2 FINAL COVER SYSTEM MATERIAL APPROVAL

The CQA Engineer shall verify that the following are provided and installed in accordance with the project drawings, specifications, and this CQA Manual.

5.2.1 LFG System Components

- A. Receipt of Contractor's submittals on LFG system components.
- B. Review of submittals for LFG system components for conformity to the project specifications.

5.2.2 Compacted Soil Barrier

The CQA program for compacted soil barrier is presented in **Section 4.0** of this CQA Manual.

5.2.3 Vegetative Soil Layer

- A. Review the proposed source of vegetative soil layer for conformance with the project specifications.
- B. Conduct material control tests in accordance with **Table 5.1**.

5.3 FINAL COVER SYSTEM INSTALLATION

The CQA Engineer will monitor and document the construction of all final cover system components for compliance with the project specifications. Monitoring the construction work for the components of the final cover system includes the following:

- verify location and depth of LFG wells; and
- verify location of all piping.

5.4 DEFICIENCIES

The CQA Engineer will immediately determine the extent and nature of all defects and deficiencies and report them to the Owner and Engineer. All defects and deficiencies will be documented by the CQA Engineer. The Contractor shall correct defects and deficiencies to the satisfaction of the CQA Engineer. The CQA Engineer will observe all retests on repaired defects.

TABLE 5.1: CQA TESTING PROGRAM FOR FINAL COVER SYSTEM

COMPONENT	PROPERTY	TEST METHOD	MINIMUM TEST FREQUENCY
CONTROL TESTS:			
Vegetative Soil Layer:	Visual Classification	ASTM D 2488	Each Load
	Grain Size Analysis	ASTM D 422	5,000 CY
	Atterberg Limits	ASTM D 4318	5,000 CY

Appendix A

Reference List of Test Methods

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CQA MANUAL
APPENDIX A: REFERENCE LIST OF TEST METHODS

American Society American Society of Testing and Materials (ASTM):

ASTM D 422	Standard Test Method for Particle Size Analysis of Soils.
ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³).
ASTM D 1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
ASTM D 2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
ASTM D 2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
ASTM D 2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).
ASTM D 2937	Standard Test Method for Density of Soil in Place by the Drive Cylinder Method.
ASTM D 4318	Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
ASTM D 4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method.
ASTM D 4959	Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method.
ASTM D 5084	Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
ASTM D 6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

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**Attachment D
Operation Plan**

**Wilson County Westside C&D Landfill
Wilson County, North Carolina**

Prepared for:
Wilson County Solid Waste Management Dept.
Wilson, North Carolina

December 2010



BlackRock Engineers, Inc.
PO Box 58
Wilmington, NC 28402

TABLE OF CONTENTS

1.0	OPERATION PLAN	1
1.1	PHASES OF OPERATION	1
1.2	BASE EMBANKMENT	1
1.3	ROUTINE OPERATIONS	1
1.4	WASTE ACCEPTANCE.....	1
1.4.1	<i>Approved Waste Types</i>	1
1.4.2	<i>Waste Exclusions</i>	2
1.4.3	<i>Waste Screening</i>	4
1.5	COVER REQUIREMENTS	7
1.6	COMPACTION REQUIREMENTS	7
1.7	DISEASE VECTOR CONTROL	8
1.8	STORMWATER MANAGEMENT	8
1.9	ACCESS CONTROL.....	8
1.10	AIR CRITERIA.....	9
1.11	RECORDKEEPING REQUIREMENTS	11
1.12	COVER SOIL INFORMATION	12
1.13	ASBESTOS DISPOSAL REQUIREMENTS	13
1.13.1	<i>General Conditions</i>	13
1.13.2	<i>Definitions</i>	13
1.13.3	<i>Signage</i>	14
1.13.4	<i>Disposal Area and Cover</i>	15
1.13.5	<i>Asbestos Recordkeeping</i>	15

1.0 OPERATION PLAN

This Section provides a detailed plan for operation of the CDLF. All operations shall be in compliance with 15A NCAC 13B Rule .0542.

1.1 PHASES OF OPERATION

In general, the landfill will be constructed in 10-foot lifts, with the intermediate slopes following the current topography. At an annual disposal rate of 20,000 tons/year and a waste:soil ratio = 8:1, the peak intermediate fill elevation will be 132 msl under the Phase 2 Operation Plan included in the Permit Drawings. The peak elevation may be adjusted for variation in Airspace Utilization Factors containing an estimated 100,000 tons for the 5-year Phase 2 period.

1.2 BASE EMBANKMENT

In addition to the base soil layer, construction of the initial landfill lift shall include a perimeter embankment or toe dike. The peak elevation of the toe dike is approximately 5 feet. Waste placement shall be at least 3 feet below the top of the dike to allow for stormwater control during operations and final cover construction at closure. Final cover will tie-in to this toe dike.

1.3 ROUTINE OPERATIONS

Following completion of the base lift, routine waste placement and compaction operations shall be practiced. Lift progression shall establish a maximum side slope at 4:1, and the top grade should follow the planned 1-2% surface grade, sloped from the center to the lower perimeter. The waste shall be adequately compacted with a compactor.

1.4 WASTE ACCEPTANCE

1.4.1 Approved Waste Types

Wastes typically generated by construction and demolition activities shall be accepted at the CDLF. Other waste types categorically approved by the Division

for C&D landfills, will also be accepted for disposal. Specific approval must be received from the Division for other waste types that Wilson County may want to accept for disposal; typically, this will require a demonstration to the Division that the waste type is "Inert Debris". The Inert Debris evaluation may require chemical analysis to document that potential leaching from the material will not exceed 15A NCAC 2L Groundwater Standards. Asbestos waste is received on a project specific basis and is directed for separate burial in the Inert Debris Unit as delineated in Figure 5, or a marked area of the C&D unit (see Section 1.13).

1.4.2 Waste Exclusions

As specified in .0542(e) Waste Exclusions, the following wastes must not be disposed of in a C&DLF unit:

- (1) Containers such as tubes, drums, barrels, tanks, cans, and bottles unless they are empty and perforated to ensure that no liquid, hazardous or municipal solid waste is contained therein,
- (2) Garbage as defined in G.S. 130A-290(a)(7),
- (3) Hazardous waste as defined in G.S. 130A-290(a)(8), to also include hazardous waste from conditionally exempt small quantity generators,
- (4) Industrial solid waste unless a demonstration has been made and approved by the Division that the landfill meets the requirements of Rule .0503(2)(d)(ii)(A),
- (5) Liquid wastes,
- (6) Medical waste as defined in G.S. 130A-290(a)(18),
- (7) Municipal solid waste as defined in G.S. 130A-290(a)(18a),
- (8) Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761,
- (9) Radioactive waste as defined in G.S. 104E-5(14),
- (10) Septage as defined in G.S. 130A-290(a)(32),
- (11) Sludge as defined in G.S. 130A-290(a)(34),
- (12) Special wastes as defined in G.S. 130A-290(a)(40),
- (13) White goods as defined in G.S. 130A-290(a)(44), and

- (14) Yard trash as defined in G.S. 130A-290(a)(45),
- (15) The following wastes cannot be received if separate from C&DLF waste: lamps or bulbs including but not limited to halogen, incandescent, neon or fluorescent; lighting ballast or fixtures; thermostats and light switches; batteries including but not limited to those from exit and emergency lights and smoke detectors; lead pipes; lead roof flashing; transformers; capacitors; and copper chrome arsenate (CCA) and creosote treated woods.
- (16) Waste accepted for disposal in a C&DLF unit must be readily identifiable as C&D waste and must not have been shredded, pulverized, or processed to such an extent that the composition of the original waste cannot be readily ascertained except as specified in Subparagraph (17) of this Paragraph.
- (17) C&D waste that has been shredded, pulverized or otherwise processed may be accepted for disposal from a facility that has received a permit from an authorized regulatory authority which specifies such activities are inspected by the authority, and whose primary purpose is recycling and reuse of the C&D material. A waste screening plan and waste acceptance plan must be made available to the Division upon request.
- (18) The owner or operator of a C&DLF must not knowingly dispose any type or form of C&D waste that is generated within the boundaries of a unit of local government that by ordinance:
- (A) Prohibits generators or collectors of C&D waste from disposing that type or form of C&D waste.
- (B) Requires generators or collectors of C&D waste to recycle that type or form of C&D waste.
- (19) Wooden Pallets. Only pallets generated in C&D activities may be disposed of in a C&DLF, not pallets generated in industrial or commercial

activities. When practical, pallets included in C&D loads shall be separated and removed to the wood processing area.

1.4.3 Waste Screening

In addition to C&D waste, the Wilson County Landfill receives other waste types at the facility entrance. The Weighmaster directs specific waste types, such as Land Clearing and Inert Debris, asbestos, and yard waste to specific management areas. The solid waste management areas are identified with signs. Signs will be posted for routing of C&D waste to the Westside facility.

A waste screening program similar to the current program shall be maintained for C&D operations. The facility shall only accept those solid wastes which it is permitted to receive. The operator shall monitor loads periodically (simple random sampling at least one load every two weeks) to identify non-conforming wastes, including municipal solid waste, industrial waste, and hazardous waste. In simple random sampling, the operator shall determine the day for inspection based on management needs for the week. On the day of the random inspection, the operator will determine the truck number or time of day for the inspection. The Operator may select a replacement if a common driver or hauling company is selected more than twice a year for random sampling. A typical load inspection form is attached to the Operation Plan.

If a suspect load is identified, an inspection will be conducted in an area prepared near the working face. This staging area will be graded to contain and segregate the wastes if necessary.

Personnel Training and Preparation

The following facility personnel shall receive Awareness Level Training by a qualified consultant to identify non-conforming wastes: Weighmaster, Compactor Operators, and the Heavy Equipment Supervisor. The Supervisor will lead waste

inspections and ensure that the staging area is properly prepared, inspectors are outfitted with the appropriate Personal Protective Equipment, and records are properly maintained.

Identifying Excluded Wastes

When conducting waste inspections, personnel should look for municipal waste, and industrial containers with hazard labels, liquids, powders and dusts, sludges, bright or unusual colors, and be aware of chemical odors. No liquids will be allowed in the landfill. Suspect wastes will be required to perform the paint filter test. Hazardous waste exhibits the following properties:

1. Ignitability Flash Point of less than 140 degrees Fahrenheit
2. Corrosivity pH of less than or equal to 2.0 or greater than or equal to 12.5
3. Reactivity Explosive, reactive with water or corrosive materials
4. Toxicity Exhibits Toxic Chemical Leaching Process (TCLP) constituent above regulatory level.

Key Personnel

The following names and telephone numbers shall be posted in the Scalehouse:

1. County Emergency Management Supervisor – Gordon Deno (252)399-2830
2. SWS Regional Waste Management Specialist - Ben Barnes (919)621-3680 or (919)508-8400.

Procedures for Handling Excluded Wastes

If possible the hauler in violation shall be detained at the site and required to remove the non-conforming wastes from the facility. If wastes are identified and off-loaded from the vehicle, the inspector shall notify the County Emergency Management Supervisor for coordinating containment, temporary storage, and disposal. If waste is temporarily stored on-site, the maximum storage period is dictated by the amount of waste present. The SWS shall be notified within 24

hours of the attempted disposal of unauthorized waste. The following definitions exist for hazardous waste management.

1. CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR: Generates less than 220 pounds of hazardous waste in any calendar month.
2. SMALL QUANTITY GENERATOR: Generates between 220 and 2200 pounds of hazardous waste in a given calendar month.
3. LARGE QUANTITY GENERATOR: Generates greater than 2200 pounds of hazardous waste in any given calendar month, or greater than 2.2 pounds of acutely hazardous waste in a calendar month.

When possible the operator shall remove non-conforming wastes within 30 days. If the maximum storage period exceeds 90 days, the operator must request approval from the DEHNR Hazardous Waste Section.

Containers holding hazardous waste must be maintained in good condition and clearly labeled with the words "HAZARDOUS WASTE". If a container is not in good condition or begins to leak, the contents must be transferred to a good container. Containers must be constructed or lined with materials which will not react with the waste being stored. Containers holding hazardous waste must always be closed during storage. Containers must not be handled in such a manner which may rupture or damage container. Areas where containers are stored must be inspected on a weekly basis. A log of inspections must be maintained at the facility for a three year period.

Recordkeeping

The following records shall be maintained for waste inspections and haulers that are refused entry:

1. Vehicle and Driver Identification
2. Amount and Source of Waste
3. Date and Time of Inspection

4. Observations of Inspection
5. Required Notifications for Confirmed Waste

1.5 COVER REQUIREMENTS

Due to the non-putrescible nature of the waste, the working lift shall be typically covered on a weekly basis. The uncovered working area shall not exceed one-half acre. The top portion of the lift shall receive a minimum cover of six inches. As the side slopes are completed, an intermediate 12-inch soil cover shall be placed and compacted. Except as provided in .0542 (f)(3), areas which will not have additional wastes placed on them for three months or more, but where final termination of disposal operations has not occurred, must be covered and stabilized with vegetative ground cover or other stabilizing material.

Regulated asbestos waste approved for receipt in the designated asbestos cell shall be covered immediately with 6-inch soil layer.

The Operator shall maintain a log of cover application, noting the date of cover and any conditions that require repair or additional cover due to the presence of leachate or exposed waste. Identified leachate seeps shall be identified on a map, numbered, and staked in the field for future inspection. At least one foot of additional soil shall be added to patch any isolated leachate seeps. Location of any patched leachate seeps in the perimeter slope should be numbered/flagged for periodic (weekly) inspection, and following storm events greater than 1-inch daily observed. At least once a month, the entire perimeter of the unit shall be inspected for erosion and adequate cover conditions.

1.6 COMPACTION REQUIREMENTS

C&DLF units must restrict solid waste into the smallest area feasible. Solid waste must be compacted as densely as practical into cells. Appropriate methods such as fencing and diking must be provided within the area to confine solid waste which is subject to be blown by the wind. At the conclusion of each

operating day, all windblown material resulting from the operation must be collected and disposed of by the owner and operator.

1.7 DISEASE VECTOR CONTROL

Wilson County must prevent or control on-site populations of disease vectors using techniques appropriate for the protection of human health and the environment. For purposes of this requirement, "disease vectors" means any rodents, flies, mosquitoes, or other animals or insects, capable of transmitting disease to humans. Disease vectors are controlled primarily by application of cover soils, and proper surface grading to eliminate ponding water.

1.8 STORMWATER MANAGEMENT

Management of stormwater and erosion control are integrated concepts for the landfill. Lift progression from upslope to downslope positions simplifies stormwater management for daily operations. Stormwater shall be directed away from the working face of the landfill to the perimeter stormwater berm or a temporary diversion. During operations, multiple temporary downdrains will convey drainage from the intermediate landfill surface to the perimeter channel network. Mulching or temporary seeding shall be utilized as necessary to stabilize the site; areas of the landfill that are not planned to receive additional waste within 90 days shall be stabilized with temporary cover.

1.9 ACCESS CONTROL

The facility is designed to limit access and comply with the following general safety requirements for CDLFs.

- (a) *The CDLF shall be adequately secured by means of gates, chains, berms, fences and other security measures approved by the Division to prevent unauthorized entry.*
- (b) *An attendant shall be on duty at the site at all times while it is open for public use to ensure compliance with operational requirements.*
- (c) *The access road to the site shall be of all-weather construction and*

- maintained in good condition.*
- (d) Dust control measures shall be implemented when necessary.*
 - (e) Signs providing information on dumping procedures, the hours during which the site is open for public use, the permit number and other pertinent information specified in the permit conditions shall be posted at the site entrance.*
 - (f) Signs shall be posted stating that no hazardous or liquid waste can be received.*
 - (g) Traffic signs or markers shall be provided as necessary to promote an orderly traffic pattern to and from the discharge area and to maintain efficient operating conditions.*
 - (h) The removal of solid waste from a sanitary landfill is prohibited unless the owner or operator approves and the removal is not performed on the working face.
 - (i) Barrels and drums shall not be disposed of unless they are empty and perforated sufficiently to ensure that no liquid or hazardous waste is contained therein, except fiber drums containing asbestos (asbestos area).**

1.10 AIR CRITERIA

The operator has an established relationship with Wilson County Emergency Management and their local Fire Department for controlling accidental fires. Hot loads should be unloaded in an area of the facility with at least 1 foot of soil cover and must be completely cool before transfer to the working face. The weighmaster shall be alert for smoke from disposal vehicles. If a “hot load” is detected, the vehicle shall be directed to a covered portion of the landfill for off-loading. The load shall be monitored and allowed to burn out prior to spreading the waste to cool. The fire department shall be notified (911) to monitor/extinguish the fire.

In addition to contingency plans for accidental fires (noted above), the operator shall comply with the following requirements:

- (a) *Owners or operators of all landfills must ensure that the units do not violate any applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the U.S. EPA Administrator pursuant to Section 110 of the Clean Air Act, as amended.*
- (b) *Open burning of solid waste, except for the infrequent burning of land clearing debris generated on site or debris from emergency clean-up operations, is prohibited at all CDLF units. Any such infrequent burning must be approved by the Division, with notation to the operating record of approval date and the name of the DWM personnel who approved the type of the open burning. The Division of Air Quality and local fire department must approve the activity prior to burning.*
- (c) Equipment shall be provided to control accidental fires or arrangements shall be made with the local fire protection agency to immediately provide fire-fighting services when needed. Landfill equipment shall include fire extinguishers. Cover soil is typically stockpiled near the working face and available for use in smothering a hot spot.
- (d) Fires that occur require verbal notice to the Division within 24 hours and written notification shall be submitted within 15 days. Written notification must include the suspected cause of fire or explosion, the response taken to manage the incident, and the action(s) to be taken to prevent the future occurrence of fire or explosion.

1.11 RECORDKEEPING REQUIREMENTS

The Operating Record for the Wilson Westside CDLF shall be maintained at the Director's Office for the Department of Solid Waste Management. The operator shall continue to maintain records for C&D disposal according to the Rules and North Carolina Laws. A copy of all permit documents, plans, and Solid Waste Permits (PTC/PTO) will be placed in the Operating Record, with the following:

- (A) records of random waste inspections, monitoring results, certifications of training, and training procedures required by Rule .0544;
- (B) amounts by weight of solid waste received at the facility to include, consistent with G.S. 130A-309.09D, county of generation;
- (C) any demonstration, certification, finding, monitoring, testing, or analytical data required by Rules .0544 through .0545;
- (D) any closure or post-closure monitoring, testing, or analytical data as required by Rule .0543;
- (E) any cost estimates and financial assurance documentation required by Rule .0546;
- (F) notation of date and time of placement of cover material (Landfill Cover Log) ; and
- (G) all audit records, compliance records and inspection reports.

All information contained in the operating record must be furnished to the Division according to the permit or upon request, or be made available for inspection by the Division.

1.12 COVER SOIL INFORMATION

Soil materials for base fill, temporary, intermediate and final cover applications will be obtained from dedicated off-site borrow sources. In 1996, Wilson County purchased the 226 acre Tucker Farm as a soil borrow site for landfill construction projects. Just recently, Wilson County acquired the 76 acre Mohesky Farm joining the Tucker Farm and the Westside site. The Mohesky site was purchased as a supplemental borrow site for landfill construction. Altogether, approximately 50 acres of borrow area are currently undeveloped and provide adequate soil resources for current and proposed landfill projects. An average excavation of 2 feet will provide over 165,000 cubic yards estimated for base construction, operational cover, and final cover. Typical excavation depths at the Tucker Site are in excess of 5 feet.

In addition to the Tucker and Mohesky sites, Wilson County owns an additional 23 Acres approved by the NC LQS for borrow soil. This borrow site is contiguous and north of the Mohesky site. At a nominal cut of 5 feet this site could yield 185,000 cubic yards of soil for temporary and final cover.

The Westside site was formerly the borrow site for landfill operations. Beginning in 1998, the Tucker Farm provided soils for intermediate cover, clay liner, and vegetative soil layer construction for closure of the MSWLF units. Presently, the Tucker site continues to supply soils for C&D landfill construction at the facility. Located between the Westside and Tucker sites, soils on the Mohesky Farm are typical of the local area. According to the SCS Soil Survey of Wilson County North Carolina, the mapped soil series include Wagram, Gritney, Altavista, and Tarboro Coastal Plain sediments. Several geotechnical investigations have been conducted on the Tucker site to define soil properties for landfill construction.

1.13 ASBESTOS DISPOSAL REQUIREMENTS

1.13.1 General Conditions

Wilson County may receive asbestos-containing waste materials that have been properly packaged to eliminate dust generation according to the following federal requirements in 40 CFR 61. See Section 1.9 for common access control. See the following sections for definitions, signage, location of the separate disposal area, daily cover, and specific recordkeeping requirements. A typical Asbestos waste generator manifest is attached to this Section.

1.13.2 Definitions

Asbestos-containing waste materials means mill tailings or any waste that contains commercial asbestos and is generated by a source subject to the provisions of this subpart. This term includes filters from control devices, friable asbestos waste material, and bags or other similar packaging contaminated with commercial asbestos. As applied to demolition and renovation operations, this term also includes regulated asbestos-containing material waste and materials contaminated with asbestos including disposable equipment and clothing.

Regulated asbestos-containing material (RACM) means (a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.

1.13.3 Signage

The asbestos area shall be marked by signs conforming to the minimum federal requirements, at 100 meter (328 feet) intervals around the area or closer and bend points, conform to the minimum dimensions for 51 cm×36 cm (20&inch;×14&inch;) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and displaying the following warnings :

LEGEND	NOTATION FORMAT
ASBESTOS WASTE DISPOSAL SITE	2.5 cm (1 inch) Sans Serif, Gothic or Block
DO NOT CREATE DUST	1.9 cm (3/4 inch) Sans Serif, Gothic or Block
BREATHING ASBESTOS IS HAZARDOUS TO YOUR HEALTH	14 Point Gothic

Spacing between any two lines must be at least equal to the height of the upper of the two lines.

TYPICAL SIGNAGE FOR ASBESTOS DISPOSAL AREA



1.13.4 Disposal Area and Cover

A map shall be maintained locating the active asbestos fill area within the Westside C&D landfill unit or Inert Debris unit. Location of the asbestos area shall consider future gas vent drilling, and buffer those planned locations.

At the end of each operating day, or at least once every 24-hour period while the site is in continuous operation, the asbestos-containing waste material that has been deposited at the site during the operating day or previous 24-hour period shall be covered with at least 15 centimeters (6 inches) of compacted soil.

1.13.5 Asbestos Recordkeeping

Receipt of asbestos for disposal requires the maintenance of the following records and notifications.

(1) Maintain waste shipment records, using a form similar to the attachment, and include the following information:

- (i) The name, address, and telephone number of the waste generator.
- (ii) The name, address, and telephone number of the transporter(s).
- (iii) The quantity of the asbestos-containing waste material in cubic meters (cubic yards).
- (iv) The presence of improperly enclosed or uncovered waste, or any asbestos-containing waste material not sealed in leak-tight containers. Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site, by the following working day, the presence of a significant amount of improperly enclosed or uncovered waste. Submit a copy of the waste shipment record along with the report.
- (v) The date of the receipt.

(2) As soon as possible and no longer than 30 days after receipt of the waste, send a copy of the signed waste shipment record to the waste generator.

(3) Upon discovering a discrepancy between the quantity of waste designated on the waste shipment records and the quantity actually received, attempt to reconcile the discrepancy with the waste generator. If the discrepancy is not resolved within 15 days after receiving the waste, immediately report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site. Describe the discrepancy and attempts to reconcile it, and submit a copy of the waste shipment record along with the report.

(4) Retain a copy of all records and reports required by this Section for at least 2 years.

(f) Maintain, until closure, records of the location, depth and area, and quantity in cubic meters (cubic yards) of asbestos-containing waste material within the disposal site on a map or diagram of the disposal area.

g) Upon closure, comply with all the provisions of §61.151.

(h) Submit to the Administrator, upon closure of the facility, a copy of records of asbestos waste disposal locations and quantities.

(i) Furnish upon request, and make available during normal business hours for inspection by the Administrator, all records required under this section.

(j) Notify the Administrator in writing at least 45 days prior to excavating or otherwise disturbing any asbestos-containing waste material that has been deposited at a waste disposal site and is covered. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice:

(1) Scheduled starting and completion dates.

(2) Reason for disturbing the waste.

(3) Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos-containing waste material. If deemed necessary, the Administrator may require changes in the emission control procedures to be used.

(4) Location of any temporary storage site and the final disposal site.

WASTE SCREENING FORM

Day / Date: _____ Time Weighed in: _____
Truck Owner: _____ Driver Name: _____
Truck Type: _____ Vehicle ID / Tag No: _____
Weight _____ Tare: _____

Waste Generator / Source: _____

Reason Load Inspected:	Random Inspection _____	Staff Initials _____
	Detained at Scales _____	Staff Initials _____
	Detained by Operating Staff _____	Staff Initials _____

Inspection Location: _____

Approved Waste Determination Form Present? Yes ___ No ___ N/A ___

Description of Load: _____

A. Load Accepted (signature) _____ Date _____
End of Record to File for Accepted Load

B. Load Not Accepted (signature) _____ Date _____

Reason Load Not Accepted (complete only if load not accepted)

Description of Suspicious Contents: Color _____
Haz. Waste Markings _____
Texture _____

Est. Cu. Yds. Present in Load _____ Est. Tons Present in Load _____

Wilson County Emergency Management Contacted? Yes ___ No ___

Company or Authority Contacted? _____

Hazardous Materials Present: _____

Hauler Notified (if waste not accepted) _____ Phone: _____ Time Contacted: _____
Other Observations: _____

Final Disposition
Signed _____ Date _____
Waste Screening Inspector or Environmental Officer

Attach related correspondence to this form.
File completed form in Operating Record.

METHOD 9095B

PAINT FILTER LIQUIDS TEST

1.0 SCOPE AND APPLICATION

1.1 This method is used to determine the presence of free liquids in a representative sample of waste.

1.2 The method is used to determine compliance with 40 CFR 264.314 and 265.314.

2.0 SUMMARY OF METHOD

2.1 A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5-min test period, the material is deemed to contain free liquids.

3.0 INTERFERENCES

3.1 Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

3.2 Temperature can affect the test results if the test is performed below the freezing point of any liquid in the sample. Tests must be performed above the freezing point and can, but are not required to, exceed room temperature of 25 °C.

4.0 APPARATUS AND MATERIALS

4.1 Conical paint filter -- Mesh number 60 +/- 5% (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden.

4.2 Glass funnel -- If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 in. of the filter mesh to protrude should be used to support the filter. The funnel should be fluted or have a large open mouth in order to support the paint filter yet not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

4.3 Ring stand and ring, or tripod.

4.4 Graduated cylinder or beaker -- 100-mL.

5.0 REAGENTS

5.1 None.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

A 100-mL or 100-g representative sample is required for the test. If it is not possible to obtain a sample of 100 mL or 100 g that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. However, when larger samples are used, analysts shall divide the sample into 100-mL or 100-g portions and test each portion separately. If any portion contains free liquids, the entire sample is considered to have free liquids. If the sample is measured volumetrically, then it should lack major air spaces or voids.

7.0 PROCEDURE

7.1 Assemble test apparatus as shown in Figure 1.

7.2 Place sample in the filter. A funnel may be used to provide support for the paint filter. If the sample is of such light bulk density that it overflows the filter, then the sides of the filter can be extended upward by taping filter paper to the inside of the filter and above the mesh. Settling the sample into the paint filter may be facilitated by lightly tapping the side of the filter as it is being filled.

7.3 In order to assure uniformity and standardization of the test, material such as sorbent pads or pillows which do not conform to the shape of the paint filter should be cut into small pieces and poured into the filter. Sample size reduction may be accomplished by cutting the sorbent material with scissors, shears, a knife, or other such device so as to preserve as much of the original integrity of the sorbent fabric as possible. Sorbents enclosed in a fabric should be mixed with the resultant fabric pieces. The particles to be tested should be reduced smaller than 1 cm (i.e., should be capable of passing through a 9.5 mm (0.375 inch) standard sieve). Grinding sorbent materials should be avoided as this may destroy the integrity of the sorbent and produce many "fine particles" which would normally not be present.

7.4 For brittle materials larger than 1 cm that do not conform to the filter, light crushing to reduce oversize particles is acceptable if it is not practical to cut the material. Materials such as clay, silica gel, and some polymers may fall into this category.

7.5 Allow sample to drain for 5 min into the graduated cylinder.

7.6 If any portion of the test material collects in the graduated cylinder in the 5-min period, then the material is deemed to contain free liquids for purposes of 40 CFR 264.314 and 265.314.

8.0 QUALITY CONTROL

8.1 Duplicate samples should be analyzed on a routine basis.

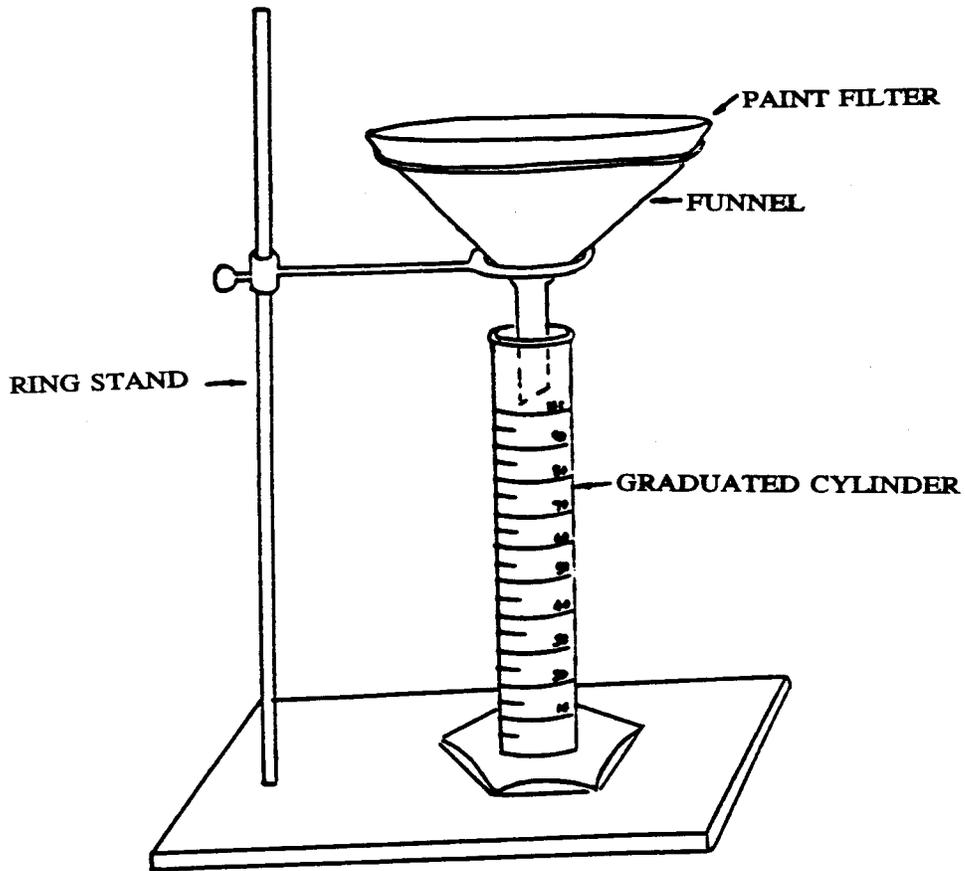
9.0 METHOD PERFORMANCE

9.1 No data provided.

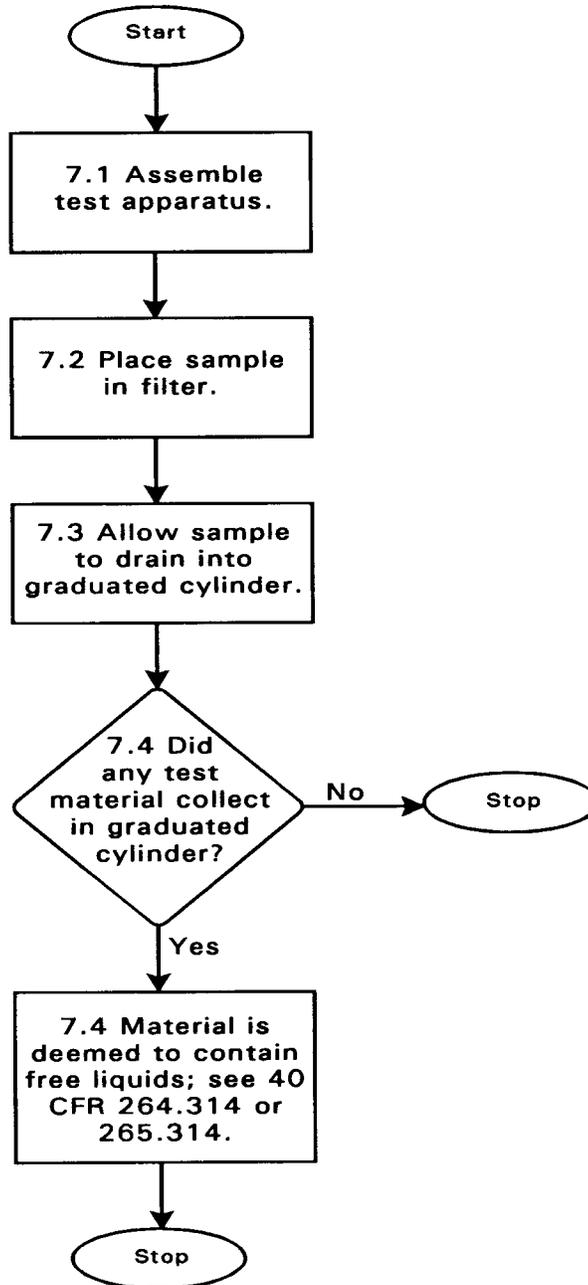
10.0 REFERENCES

10.1 None provided.

FIGURE 1
PAINT FILTER TEST APPARATUS



METHOD 9095B
PAINT FILTER LIQUIDS TEST



Generator	1. Work site name and mailing address		Owner's name	Owner's telephone no.
	2. Operator's name and address			Operator's telephone no.
	3. Waste disposal site (WDS) name, mailing address, and physical site location			WDS phone no.
	4. Name, and address of responsible agency			
	5. Description of materials		6. Containers No. Type	7. Total quantity m ³ (yd ³)
	8. Special handling instructions and additional information			
	9. OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.			
	Printed/typed name & title		Signature	Month Day Year
	10. Transporter 1 (Acknowledgment of receipt of materials)			
Transporter	Printed/typed name & title		Signature	Month Day Year
	Address and telephone no.			
	11. Transporter 2 (Acknowledgment of receipt of materials)			
	Printed/typed name & title		Signature	Month Day Year
Address and telephone no.				
Disposal Site	12. Discrepancy indication space			
	13. Waste disposal site owner or operator: Certification of receipt of asbestos materials covered by this manifest except as noted in item 12.			
	Printed/typed name & title		Signature	Month Day Year

(Continued)

Figure 4. Waste Shipment Record

INSTRUCTIONS

Waste Generator Section (Items 1-9)

1. Enter the name of the facility at which asbestos waste is generated and the address where the facility is located. In the appropriate spaces, also enter the name of the owner of the facility and the owner's phone number.
2. If a demolition or renovation, enter the name and address of the company and authorized agent responsible for performing the asbestos removal. In the appropriate spaces, also enter the phone number of the operator.
3. Enter the name, address, and physical site location of the waste disposal site (WDS) that will be receiving the asbestos materials. In the appropriate spaces, also enter the phone number of the WDS. Enter "on-site" if the waste will be disposed of on the generator's property.
4. Provide the name and address of the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program.
5. Indicate the types of asbestos waste materials generated. If from a demolition or renovation, indicate the amount of asbestos that is
 - Friable asbestos material
 - Nonfriable asbestos material
6. Enter the number of containers used to transport the asbestos materials listed in item 5. Also enter one of the following container codes used in transporting each type of asbestos material (specify any other type of container used if not listed below):
 - DM - Metal drums, barrels
 - DP - Plastic drums, barrels
 - BA - 6 mil plastic bags or wrapping
7. Enter the quantities of each type of asbestos material removed in units of cubic meters (cubic yards).
8. Use this space to indicate special transportation, treatment, storage or disposal or Bill of Lading information. If an alternate waste disposal site is designated, note it here. Emergency response telephone numbers or similar information may be included here.
9. The authorized agent of the waste generator must read and then sign and date this certification. The date is the date of receipt by transporter.

NOTE: The waste generator must retain a copy of this form.

(continued)

Transporter Section (Items 10 & 11)

10. & 11. Enter name, address, and telephone number of each transporter used, if applicable. Print or type the full name and title of person accepting responsibility and acknowledging receipt of materials as listed on this waste shipment record for transport. Enter date of receipt and signature.

NOTE: The transporter must retain a copy of this form.

Disposal Site Section (Items 12 & 13)

12. The authorized representative of the WDS must note in this space any discrepancy between waste described on this manifest and waste actually received as well as any improperly enclosed or contained waste. Any rejected materials should be listed and destination of those materials provided. A site that converts asbestos-containing waste material to nonasbestos material is considered a WDS.
13. The signature (by hand) of the authorized WDS agent indicates acceptance and agreement with statements on this manifest except as noted in item 12. The date is the date of signature and receipt of shipment.

NOTE: The WDS must retain a completed copy of this form. The WDS must also send a completed copy to the operator listed in item 2.

Closure and Post-Closure Plan

**Wilson County Westside C&D Landfill
Wilson County, North Carolina**

Prepared for:

**Wilson County Solid Waste Management Dept.
Wilson, North Carolina**

January 2010



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

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WILSON COUNTY WESTSIDE C&D LANDFILL

CLOSURE AND POST-CLOSURE PLAN

TABLE OF CONTENTS

	<u>Page</u>
1.0 CLOSURE PLAN	
1.1 Overview	1.0-1
1.2 Maximum Closure Area and Waste Capacity	1.0-1
1.3 Final Cover System	1.0-1
1.4 Landfill Gas System	1.0-2
1.5 Surface Water Systems	1.0-2
1.5.1 Incremental Operation	1.0-2
1.5.2 Required Maintenance	1.0-2
1.6 Closure Schedule	1.0-2
1.7 Closure Verification	1.0-3
2.0 POST-CLOSURE PLAN	
2.1 Overview	2.0-1
2.2 Post-Closure Contact	2.0-1
2.3 Post-Closure Use	2.0-1
2.4 Maintenance	2.0-2
2.4.1 Repair of Security Control Devices	2.0-2
2.4.2 Erosion Damage Repair and Vegetation	2.0-2
2.4.3 Correction of Settlement, Subsidence, and Displacement	2.0-2
2.4.4 Repair of Run-On/Run-Off Control Structures	2.0-2
2.4.5 Landfill Gas System	2.0-2
2.4.6 Groundwater Monitoring Wells	2.0-3
2.4.7 Leachate Seeps	2.0-3
2.5 Monitoring Plan	2.0-3
2.5.1 Inspection Frequencies	2.0-4
2.5.2 Inspection Activities	2.0-4
2.5.3 Record Keeping	2.0-4
2.6 Engineering Certification	2.0-4
3.0 CLOSURE/POST-CLOSURE COST ANALYSIS	
3.1 Overview	3.0-1
3.2 Estimated Closure Costs	3.0-1
3.3 Estimated Post-Closure Costs	3.0-1
3.4 Financial Assurance Mechanism	3.0-1

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SECTION 1.0 CLOSURE PLAN

1.1 OVERVIEW

This plan is intended to serve as a guide for the proposed closure. A formalized Closure Plan for each landfill unit (or incremental portion thereof) will be submitted to the Solid Waste Section of the North Carolina Department of Environment and Natural Resources Division of Waste Management (DWM) for approval prior to beginning closure construction.

1.2 MAXIMUM CLOSURE AREA AND WASTE CAPACITY

The following are the estimated areas and capacity for each landfill unit to be closed under this plan.

Landfill Unit	Closure Area (Acres) ¹	Gross Capacity (CY) ¹	Net (Waste) Capacity (CY/Tons) ¹
C&D Landfill Unit			
Cells 1-3	10.5	433,560	319,060 CY 215,000 Tons

Notes:

1. Values from approved Construction Plan Application prepared by Gary W. Ahlberg, P.E., dated December 2003. Note that the gross capacity reported is from bottom of waste (top of subgrade) to top of final cover.

1.3 FINAL COVER SYSTEM

The final cover systems for the C&D landfill unit will consist of the following components (top-down):

C&D Landfill Units:

- an 18-inch thick vegetative soil layer; and
- an 18-inch thick soil liner with a hydraulic conductivity of no more than 1×10^{-5} cm/sec ("compacted soil barrier").

The final cover system will be placed on prepared intermediate cover at a maximum slope of 4H:1V. Surface water control devices and landfill gas (LFG) components will also be incorporated into the final cover of each landfill unit. The final cover surface will be vegetated upon completion of the final cover installation according to the project seeding specifications.

Refer to the appropriate permit application for a detailed discussion and details related to the design of the final cover system for each landfill unit.

1.4 LANDFILL GAS SYSTEM

For the C&D landfill unit, a landfill gas system is provided in the final cover design. This system includes a system of collection wells or vents placed within the waste to capture and passively vent the gas.

Refer to the appropriate permit application for a detailed discussion and details related to the design of the landfill gas system for each landfill unit.

1.5 SURFACE WATER SYSTEMS

Precipitation falling on the cover will infiltrate into the cover or run off the cover. Short-term the run-off runs down the surface of the intermediate cover. Long-term the run-off is collected in a series of drainage breaks built into the areas covered by final cover. These drainage breaks are provided along side slopes (rain gutters and/or diversion berms). Water captured by rain gutters or diversion berms is routed toward one of the down pipes. Flow in the down pipes is routed to the base of the landfill and to one of the site sediment basins.

Refer to the appropriate permit application for a detailed discussion and details related to the design of surface water systems for each landfill unit.

1.5.1 Incremental Operation

During much of the life of the landfill, surface run-off will be handled by the intermediate cover system. Operations must strive to provide operational grading that encourages run-off from the intermediate cover to drain to the perimeter channels along the perimeter berms or to areas covered by final cover. Corrugated polyethylene (CPE) piping and temporary soil diversion berms must be installed if required to accomplish this run-off routing.

1.5.2 Required Maintenance

The surface water systems must be inspected annually and immediately after every major storm. Sediment build-up in the drainage features/devices must be cleaned out on a regular basis to promote run-off. Sediments removed can be used as daily or intermediate cover.

1.6 CLOSURE SCHEDULE

Closure activities must begin on the following schedule:

C&D Landfill Units (15A NCAC 13B.0543(c)(5)):

- No later than 30 days after the date on which the C&DLF unit receives the known final receipt of wastes;

- No later than 30 days after the date that a 10 acre or greater area of waste, is within in 15 feet of final design grades; or
- No later than one year after the most recent receipt of wastes, if the C&DLF unit has remaining capacity.

Prior to beginning closure of any landfill unit, the County will notify the DWM that a notice of the intent to close the unit has been placed in the operating record.

All closure activities shall be completed within 180 days. Exemptions and extensions may be approved by the DWM.

1.7 CLOSURE VERIFICATION

The following procedures will be implemented following closure:

- A Construction Quality Assurance (CQA) report will be submitted to the DWM. This report will describe the observations and tests used before, during, and upon completion of construction to ensure that the construction materials meet the final cover design specifications and the construction and certification requirements. The CQA report will contain as-built drawings.
- A signed certification from a registered Professional Engineer verifying that closure has been completed in accordance with the closure plan will be submitted to the DWM.
- At least one sign notifying all persons of the closing of the landfill (or incremental portions thereof) and that wastes are no longer accepted will be posted. Suitable barriers will be installed as necessary at former access points to prevent new waste from being deposited.
- Within 90 days, a survey plat, prepared by a registered Professional Land Surveyor, indicating the location and dimensions of landfill disposal areas, will be prepared.
- A notation will be recorded on the deed (through the County Register of Deed's Office) notifying any potential purchaser of the property that the land has been used as a landfill facility and that future use is restricted under the approved closure plan. A copy of the deed notation as recorded will be filed with the operating record and notification will be provided to the DWM.

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SECTION 2.0 POST-CLOSURE PLAN

2.1 OVERVIEW

This Post-Closure Plan has been developed to outline steps to be taken to ensure the integrity of the landfill during its post-closure care period. The post-closure care period will last at least 30 years after final closure and, at a minimum, will consist of the following:

- Maintaining the integrity and effectiveness of final cover system;
- Performing groundwater and surface water monitoring;
- Maintaining and operating a gas monitoring system; and
- Maintaining run-on/run-off controls.

No wastes will remain exposed after closure of the landfill. Access to the closed site by the public will not pose a health hazard.

2.2 POST-CLOSURE CONTACT

All correspondence and questions concerning the post-closure care of the landfill should be directed to:

Wilson County Solid Waste Management Department
Attn: Andy Davis, Director
P.O. Box 1728
Wilson, NC 27894
Phone: (252) 399-2823.

2.3 POST-CLOSURE USE

After filling operations cease at the landfill and the landfill is officially closed in accordance with the Closure Plan, each landfill unit will be maintained as a grassy hill. Wilson County will maintain control of the property and prevent public access to it during the post-closure period.

There may be (an) access road(s) on the final cover to allow proper maintenance during post-closure. Precise location of the access road(s) will be determined as a part of operations. Low ground pressure and rubber tire vehicles will be used for maintenance. Additionally, the County will maintain access to all site monitoring locations through the post-closure period.

2.4 MAINTENANCE

2.4.1 Repair of Security Control Devices

All security control devices will be inspected and maintained as necessary to ensure access to the site is controlled. Locks, vehicular gates, and fencing will be replaced if functioning improperly. Warning signs will be kept legible at all times and will be replaced if damaged by inclement weather or vandalism.

2.4.2 Erosion Damage Repair and Vegetation

If erosion of the final cover occurs during post-closure, the affected area will be repaired and revegetated as necessary. If necessary, rolled erosion control products (RECPs) will be used to expedite rapid revegetation of slopes and to secure topsoil in place. Revegetation (including fertilization and seeding) will be performed in accordance with the most recently approved erosion and sedimentation control plan and the North Carolina Erosion and Sediment Control Planning and Design Manual.

Mowing of the final cover surfaces will occur approximately once per year in order to help maintain a healthy stand of grasses and to cut down saplings and woody-stemmed plants.

2.4.3 Correction of Settlement, Subsidence, and Displacement

Minimum slopes of 5 percent will be maintained after settlement in order to prevent ponding and allow for proper drainage without infiltration. If vertical or horizontal displacement occurs due to differential settlement, cracks will be filled with appropriate material and final cover will be reestablished. Excessive vertical displacement is not anticipated.

2.4.4 Repair of Run-On/Run-Off Control Structures

All drainage swales, ditches, and perimeter channels will be repaired, cleaned, or realigned in order to maintain their original condition. Any culverts that are damaged will be repaired or replaced. Sediment basins/ponds will be cleaned out when sediment has reached design cleanout levels.

2.4.5 Landfill Gas System

While gas production from the waste is expected to be very low, a passive venting system is proposed for final closure. Surrounding groundwater levels and buffer areas minimize the potential for gas migration.

The landfill gas system will be maintained by the County and operated in accordance with any site air quality permits. Proper operation of the system is verified through testing at

the landfill gas monitoring wells.

If gas wells/vents do not function as a result of irregular settlement, accumulation of liquids (condensate, leachate, water), binding or corrosion, additional and/or replacement wells/vents can be installed if necessary.

2.4.6 Groundwater Monitoring Wells

Procedures outlined in the current Water Quality Monitoring (WQM) Plan or subsequent revision will take precedence; however, a brief description follows. All groundwater monitoring wells have been installed with concrete pads and protective casings to prevent accidental damage by vehicles and equipment. The wells are also equipped with a locking cap to discourage vandalism. Groundwater wells will be inspected regularly (at the time of sampling) to ensure integrity. Persons inspecting a well should look at the overall condition of the well, for signs of well tampering, and cracking or degradation of the concrete pad. Should a well require replacement, the defective well should be abandoned in accordance with specifications provided in the WQM Plan and a new well installed at a location that is approved by the DWM.

2.4.7 Leachate Seeps

If evidence of leachate seeps is observed, the County will take the following actions. Depending on the circumstances, various combinations of actions may be appropriate.

1. If leachate is observed outside of the limits of waste disposal areas, notify the DWM.
2. Contain the flow of leachate using soil berms and/or excavation.
3. Excavate the area of seepage to attempt to allow flow into the underlying waste (i.e. break-up soil layers that may be causing the seep.).
4. For contained leachate that will not flow into underlying waste, a pump may be required to route the leachate to a tanker truck for proper disposal off-site.
5. The use of soil (particularly clay) to plug the seepage may be successful in the case where flows are minor.
6. Remove and dispose of impacted cover soils accordingly.
7. Repair landfill cover as necessary.

2.5 MONITORING PLAN

The closed unit will be monitored for a minimum of 30 years. Inspections of the closed landfill will be scheduled to ensure the integrity and effectiveness of the final cover system, surface water systems, groundwater monitoring system, landfill gas system, and to protect human health and the environment.

2.5.1 Inspection Frequencies

Inspections to be conducted during the post-closure care period will occur regularly as shown in **Table 2.1**.

2.5.2 Inspection Activities

Inspections will include examination of the security control devices for signs of deterioration or vandalism to ensure access to the site is limited to authorized persons. Each disposal area will be checked to ensure the integrity of the final cover system is maintained, erosion damage is repaired, vegetative cover persists, and that cover settlement, subsidence, and displacement are minimal. Additionally, the condition of the groundwater and gas monitoring systems and permanent benchmarks will be checked.

A report of findings will be made to the responsible party, including recommendations for actions deemed necessary to ensure the site continues to meet the closure performance standard.

2.5.3 Record Keeping

Records of inspections and repairs will be kept on file by the County throughout the post-closure period.

2.6 ENGINEERING CERTIFICATION

Following completion of the post-closure care period for each landfill unit, the County will notify the DWM that a certification, signed by a registered professional engineer, verifying that post-closure care has been completed in accordance with the post-closure plan, has been placed in the operating record.

TABLE 2.1: POST-CLOSURE INSPECTION FREQUENCIES

INSPECTION ACTIVITY	YEAR 1	YEARS 2-30
Security Control Devices	Quarterly	Quarterly
Vegetative Cover Condition	Quarterly ¹	Quarterly
Surface Water Systems	Quarterly ¹	Quarterly
Erosion Damage	Quarterly ¹	Quarterly
Cover Drainage System	Quarterly ¹	Semi-Annually
Cover Settlement, Subsidence, and Displacement	Quarterly ¹	Semi-Annually
Landfill Gas System	Quarterly ³	Semi-Annually ³
Groundwater Monitoring System	Semi-Annually	Semi-Annually ²
Benchmark Integrity	Annually	Annually

Notes:

1. These items will be inspected after each large storm event (i.e. ≥ 1 inch in any 24 hours).
2. Or in accordance with groundwater monitoring schedule described in the current Water Quality Monitoring Plan.
3. Or in accordance with the current Landfill Gas Management Plan and/or air quality permit(s), if applicable.

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SECTION 3.0 CLOSURE/POST-CLOSURE COST ANALYSIS

3.1 OVERVIEW

The purpose of this section is to provide a written estimate in current dollars of all costs associated with all activities specified in the written closure and post-closure plans which have been developed for the C&D landfill unit of the Wilson County Landfill.

3.2 ESTIMATED CLOSURE COSTS

Table 3.1 summarizes the estimated costs for complete closure of the C&D landfill unit. The cost estimate is based on a third party providing the necessary services and includes labor in the unit prices given. The estimated closure costs will be reviewed and updated as required to reflect adjustments for inflation, increased costs in construction or materials, or any other adjustments to the Closure Plan.

3.3 ESTIMATED POST-CLOSURE COSTS

Table 3.2 summarizes the estimated costs for the post-closure care maintenance activities for the C&D landfill unit. The cost estimate is based on a third party providing the necessary services and includes labor in the unit prices given. The estimated post-closure costs will be reviewed and updated as required to reflect adjustments for inflation, rising costs of anticipated post-closure care, or any other adjustments to the Post-Closure Plan.

3.4 FINANCIAL ASSURANCE MECHANISM

Wilson County intends to continue to use the Local Government Financial Test to demonstrate financial assurance for this facility.

TABLE 3.1: C&D UNIT - CLOSURE COST ESTIMATE¹

ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST (2010 \$)
Surface Preparation	10.5	Acre	\$2,000	\$21,000
Landfill Gas Wells/Vents	10.5	Acre	\$3,000	\$31,500
Compacted Soil Barrier (18")	25,500	CY	\$7.00	\$178,500
Vegetative Soil Layer (18")	25,500	CY	\$4.00	\$102,000
Erosion Control (Diversion Berms, Down Pipes, Drainage Channels, Etc.)	10.5	Acre	\$5,000	\$52,500
Revegetation	10.5	Acre	\$1,500	\$15,750
Surveying	10.5	Acre	\$2,000	\$21,000
Subtotal:				\$422,250
Bonds, Mobilization, & Insurance	(4% of Subtotal):			\$16,890
Subtotal:				\$439,140
Contingency (10%):				\$43,914
Construction Subtotal:				\$483,054
Engineering	10.5	Acre	\$2,000	\$21,000
CQA	10.5	Acre	\$6,500	\$68,250
TOTAL:				\$572,304

Notes:

1. Assumes closure of 10.5 acres (Cells 1-3).

TABLE 3.2: C&D UNIT - POST-CLOSURE COST ESTIMATE¹

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL (2010 \$)
Site Inspection And Record Keeping	20	HR	\$75	\$1,500
Revegetation (5% Total Area)	0.5	Acre	\$1,500	\$750
Mowing (once per year)	11	Acre	\$100	\$1,100
Erosion Control	1	LS	\$2,000	\$2,000
Gates/Fences/Access	1	LS	\$1,500	\$1,500
Groundwater/Surface Water Monitoring & Reporting (4 Long-Term Wells - Semi-Annual)	4	Each	\$1,200	\$9,600
Methane Monitoring & Reporting (Semi-Annual After Year 1)	2	Each	\$1,500	\$3,000
Subtotal:				\$19,450
Contingency (10%):				\$1,945
ANNUAL TOTAL:				\$21,395
30-YEAR TOTAL:				\$641,850

Notes:

1. Assumes post-closure of Cell 1-3 (10.5 Ac.).

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ATTACHMENT F

EROSION AND SEDIMENTATION CONTROL PLAN

No changes to the Erosion and Sedimentation Control Plan approved as part of the 2004 Construction Plan Application are proposed. Attached is a copy of the approved plan.

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EROSION AND SEDIMENTATION CONTROL PLAN
WESTSIDE C&D LANDFILL FACILITY
WILSON COUNTY DEPARTMENT OF SOLID WASTE
WILSON COUNTY, NORTH CAROLINA

1. Purpose

Wilson County currently operates a landfill for the disposal of construction and demolition debris generated in the County. Located east of Wilson, North Carolina, the proposed Westside Construction and Demolition Landfill Facility (CDLF) is adjacent and generally west of the existing landfill facility. The Westside facility property is 100.00 Acres owned by Wilson County and described as Tract 1 in the attached Recombination Plat for the Wilson County Landfill, prepared by Herring Sutton and Associates; a vicinity map is included in the plat. When originally purchased by the County as a dedicated landfill borrow site in 1990, the site contained 127.98 Acres and was described as the Williamson Borrow Site. While the Williamson Borrow Site was depleted in the mid 1990's, Wilson County has continued to use the property for soil stockpiles and other solid waste management activities. Land disturbing activities were originally approved by the NC Division of Land Resources on March 19, 1990; see attached Letter of Approval. The original Erosion and Sedimentation Control Plan includes permanent structures which continue to operate on the site. This plan evaluates existing conditions and the suitability of existing structures, and specifies new temporary and permanent measures to maintain compliance with the Sedimentation Pollution Control Act of 1973. Pursuant to the North Carolina Sedimentation Pollution Control Act, Wilson County is requesting review and approval of this plan by the North Carolina DENR DLR Land Quality Section.

The proposed Westside waste boundary is 10.5 Acres, and is defined as the landfill footprint. Limited to a portion of the originally disturbed borrow area, the construction limits include perimeter channels and access roads for a total disturbed area of 19.4 Acres. A NC DENR permit fee of \$1,000.00 is attached for plan review, with the Financial Responsibility and Ownership Form completed by Wilson County. The landfill will receive C&D waste and additional wastes compatible with the facility design. The estimated 5-year disposal capacity is approximately 100,000 tons. The calculated total landfill capacity is 215,000 tons yielding an estimated project life of 10 years. No additional borrow activities are proposed on the Westside site.

Prior to landfill operation, a compacted soil layer shall be constructed for the landfill base. The landfill base will be constructed in 3 contiguous cells within the first 5-year operating period. Previous restoration grading activities have established suitable condition to begin Cell 1 (2 Acres) landfill operations. Using existing grassed swales and temporary ditches, all of Cell 1 drainage is directed to the existing West Sediment Basin for control prior to discharge to Buck Branch. Plan approval is necessary for construction of new permanent channels and restoration of the Main Sediment Basin. All cover soils will be imported from Wilson County's dedicated landfill borrow site located to the west of the Westside Facility, identified as the Tucker Borrow Site and approved by the NC DLR in 1995.

2. Plan Elements

The S&EC Plan for the borrow site includes narrative descriptions, attachments, and drawings including the following elements:

- Vicinity Map
- Site Development/Existing Conditions Drawing
- Site Erosion and Sedimentation Control Drawings
- Detail Drawings for Specified Practices and S&EC Structures
- Design Calculations and Assumptions
- Vegetation Specifications for Temporary and Permanent Stabilization
- Construction Schedule
- Financial/Ownership Form.

3. Site Conditions

3.1. Facility Property

Attached to this report is a recombination plat of the Wilson County Landfill prepared by the surveyor, defining two tracts for the separate landfill facilities. The plat includes a vicinity map providing the general location of site to the east of the City of Wilson, and accessed via Landfill Road (SR 1503). Tract 2 contains 196.45 Acres and defines the property for the MSW Landfill Facility; this is provided for reference only in this application. By dedication and maintenance of a 50-foot buffer from the MSW Landfill Facility, the Westside CDLF is separate and apart from the MSW Facility.

Tract 1 contains the 100.00 Acres which delineates the Westside C&D landfill site proposed for this permit, and an additional 3.76 Acre buffer property. The site is in Gardners Township of Wilson County and bisected by the extraterritorial jurisdiction (ETJ) of the City of Wilson, North Carolina. The property boundary presented in site drawings and figures for this report is the 100.00 Acres delineated in the recombination plat by the surveyor.

The site's western boundary is established by the center-line run of Buck Branch. The adjoining properties on the west and east are owned by Wilson County. To the west, Wilson County recently purchased the 76.43 Ac property identified as the Mohesky Farm. The Mohesky Farm provides potential future off-site borrow resources for Wilson County landfill projects; NC DLR approval is required prior to development. Continuing upstream along Toisnot Swamp from the Mohesky Farm is the Tucker Borrow Site. The Tucker Borrow Site was purchased by Wilson County in 1995 and is the active borrow site for current landfill projects. The only surrounding property not owned by Wilson County is farmland located upslope and generally north of the site.

3.2. Topographic Mapping and GIS Resources

Topographic mapping (2-foot contour interval) for the site was included in the 1998 project completed by GeoData Corporation, of Zebulon, North Carolina. The 1998 topography is generally representative of current ground conditions. In order to provide updated mapping for

landfill construction, HSA surveyed the construction limits for the Westside landfill and mapped one-foot contours in July 2003. Floodplain, zoning, subdivision, and local property boundary (plat) data was provided by Wilson County's Mapping/GIS Department.

Topographic relief on the site is gradually sloping north to south, toward Buck Branch and Toisnot Swamp. The slope increases upgradient of the landfill footprint to the northern property boundary. Ditches were constructed with borrow site operation to convey stormwater to an existing sedimentation basins west and south of the footprint.

3.3. Soils

According to the SCS Soil Survey of Wilson County North Carolina, the mapped soil series include Wagram, Gritney, Altavista, and Tarboro Coastal Plain sediments. Within the construction limits, these soils have been removed by borrow operations and mostly clay soils, or sandy clays are exposed at the surface.

3.4. Wetlands

Jurisdictional wetlands are present within the floodplain regions bordering the surface waters on-site. According to a field delineation performed in 1994 and reviewed by the U.S. Army Corps of Engineers, wetlands on-site are contained within the existing woodland areas shown on the drawings. An approximate wetland boundary is illustrated on the map. These wetland areas will not be disturbed by construction activities on the site. According to the irregular relief within the swamp areas, surface water accumulating in the wetland areas likely form runs which drain to the streams.

3.5. Surface Waters

The site contains one stream and one intermittent stream. The site's western boundary is established by the center-line run of Buck Branch. Buck Branch is a named stream on the USGS Quadrangle Map for the area. Along the eastern site boundary, an intermittent stream is present in the vegetated area. This stream is identified as such on the Local Area Map. Both Buck Branch and the intermittent stream feed into Toisnot Swamp. All surface waters in the local area are classified by NC Surface Water Standards as Class C waters. Toisnot Swamp is a major tributary stream and groundwater discharge feature in the area. This site is subject to the Neuse Buffer requirements, which is illustrated on the drawings.

4. Design Procedures and Goals

The sediment and erosion control plan is designed based on the guidelines and procedures set forth in the North Carolina Erosion and Sediment Control Planning and Design Manual (E&SCP&DM) and "Elements of Urban Stormwater Design" (EOUSD), by H. Rooney Malcom, P.E. Drawing No. 2 – Drainage Plan illustrates the features of the S&EC plan for the site. Design calculations and a construction sequence for S&EC measures are attached to this report.

In accordance with the NC Sedimentation Pollution Control Act, all S&EC structures specified for the borrow site are designed for the 10-year storm event. Ditches and channels are oversized to allow for some sediment accumulation during construction. In general, this plan follows the

guidelines established in the North Carolina Erosion and Sediment Control Planning and Design Manual (E&SCP&DM).

Sedimentation and erosion occurs when cleared areas are allowed to remain disturbed for extended periods of time without a vegetative cover being established. Once vegetation has been established on the disturbed areas, the erosion potential is minimized and temporary sedimentation and erosion control measures may be removed. A seeding plan for disturbed areas is specified for permanent borrow area stabilization.

In general, this plan describes the various types of erosion control measures used on the site and specifies the design of channels, velocity controls, temporary sediment trap and permanent basin structures. Both the temporary and permanent erosion and sedimentation control devices employed in this project use a combination of filtration and settling to remove silt/sediment from stormwater.

All stormwater flow volumes are calculated using the Rational Method based on a 10-year storm event. Runoff coefficients for various ground cover conditions are referenced to Table 8.03a in the E&SCP&DM. Rainfall intensities used in the Rational Method are derived from Table 8.03d E&SCP&DM, using times of concentration calculated with the Kirpich Equation. Drainage areas, slope gradients and distances were determined using computer aided design techniques.

4.1. Phased Development of Landfill

The landfill base will be constructed in three cells over the initial 4 years of operation. Drainage from Cell 1 and the northwest landfill quadrant is controlled by the existing West Sediment Basin. Prior to construction of Cell 2, the Main Basin requires construction of a new access road for restoration and future maintenance. The embankments for the loop access road create the outboard bank for a perimeter channel loop around the landfill. For constructability, these permanent channels (PC) are constructed with a 7-ft base, and depths of 1-2 feet. Final Grade plans include diversion berms to capture drainage from the top landfill surface and route to the perimeter channels via permanent slope drains.

4.2. Permanent Structures

Design calculations are attached for all channels and ditches. Channel lining materials are specified for use according to the manufacturer's properties and recommendations for construction. At locations where temporary downpipes or permanent slope drains and culverts discharge, channel segments are improved with armoured rip rap lining to control flow dynamics. The design utilizes conventional liner materials to stabilize channels. The channels direct run-off to the sediment basins. The design incorporates the two (2) existing basins.

Design for the permanent sediment basins is consistent with E&SCP&DM Section 6.60. The structure provides a volume of 1800 ft³/acre of disturbed area and meets the surface area requirements set forth in E&SCP&DM. E&SCP&DM guidelines for permanent basins include riser/barrel principal spillways and emergency weir-type spillways. The principal spillway must be met with one foot of driving head. The crest of the emergency spillway is set one foot above the invert of the riser and must pass the peak run-off from the 10-year storm event with one foot of freeboard to crest of berm. The riser/barrel and emergency spillways were designed using spreadsheet based on methods provided in EOUSD. The riser/barrel assembly must be

constructed with an anchor displacing a buoyant weight of at least 1.1 times the weight of water displaced by the riser. The riser must also be provided with a method of dewatering the basin.

The existing Area A basin provides storage capacity that greatly exceeds the required 1800 ft³/acre design volume. This impoundment has been in-place for several decades and the surface features are in excellent condition, with well established vegetation. Based on its performance as an existing, functional structure, no spillway modifications are proposed for its use as a sediment basin. Evidently, when the transmission lines were constructed at this location, a rock trench was installed to drain impounded water through the embankment. The constructed swale under the transmission lines acts as an emergency spillway; however no flow condition has been observed where the water level from the impoundment has breached the swale. Superior vegetation is established in the swale and construction activities would compromise the established growth. If conditions prove otherwise, the S&EC plan would be modified to fit the feature with a standard riser/barrel principal spillway and reinforced emergency spillway.

4.3. Temporary Structures

The design utilizes existing grassed swales and temporary diversion ditching to convey stormwater to permanent channels and the control structures. Ditch design is standardized across the site to establish clear operating requirements for soil borrow operations. Ditch depth allows for sedimentation during construction, with a minimum freeboard of 6 inches. These measures are designed to provide temporary erosion control until permanent vegetative cover is established.

5. Maintenance and Sediment Disposal

All sedimentation and erosion control devices will be inspected at regular intervals and immediately following any significant rainfall event. Repairs will then be made as needed and accumulated sediment removed if necessary. All sediments which are removed during cleaning operations will be located in an area which is isolated from storm drainage and stabilized with vegetative cover.

Design allows for at least 6 inches of sediment to accumulate in channels and ditches. If accumulation exceeds 6 inches, sediment must be removed from channel or ditch. For the sediment basins and traps, sediment/silt will be removed prior to one-half of the basin volume becoming filled with sediment. A level gauge shall be set in each basin for monitoring sediment accumulation.

6. Vegetation Plan

Vegetative cover must be established as soon as possible in inactive areas of the landfill. The landfill will be constructed in 5-10 lifts, which establish intermediate elevations. Areas at intermediate grade are covered with 12 inches of soil and seeded for stabilization. At final grade, a final cover is constructed on the perimeter slopes and top landfill surface. The final cover design is a 2-foot soil layer, with a 6-in topsoil surface, vegetated with native grasses. Temporary seeding may be used when cover is required in a season outside the best dates for permanent seeding. Seeding requirements are included in the project details.

Prior to any seeding operation, the soil shall be limed, fertilized, and disked. Soil testing shall be performed to determine the specific nutrient requirements of the soil. Adequate nutrient inputs are critical to establishing good vegetation in exposed subsoils. Incorporating the appropriate amounts of organic matter into the soil by using composted materials can also help to establish a good seed bed. Mulch or compost shall be used to protect permanent seeding applications.

7. GENERAL CONSTRUCTION SCHEDULE

1. Inspect existing West Basin and clean as necessary to limits shown on Drawings.
2. Install TC-2 V ditch and perimeter landfill toe dikes for Cell 1 operation.
3. Evaluate existing swale TC-1 for performance, replace with PC-1 if necessary.
4. Improve main haul road and extend into Cell 1 landfill operation.
5. Construct access roads along west perimeter of Cell 1, PC-1 segments, and RCP1.
6. Extend access roads, PC-1 and PC-2 along west perimeter to access and restore Main Basin ahead of Cell 2 base construction.
7. Restore Main Basin as shown on Drawings.
8. Construct Haul Road and Roadside Ditch as lifts progress.
9. Install access roads and PC-3 along east perimeter to Main Basin.
10. Install temporary downpipes for top landfill surface as lifts progress.
11. Seed intermediate cover areas on landfill.
12. When Phase 1 operations are complete, install partial final cover on completed perimeter slopes.
13. Continue use of temporary measures to convey landfill operational drainage to perimeter channels and basins.
14. When Phase 2 operations are complete, install remaining final cover on perimeter slopes and top landfill surface, including stormwater berms and permanent slope drains.
15. Clean channels and basins, maintain until vegetation is full established through facility post closure plan.

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ATTACHMENT G

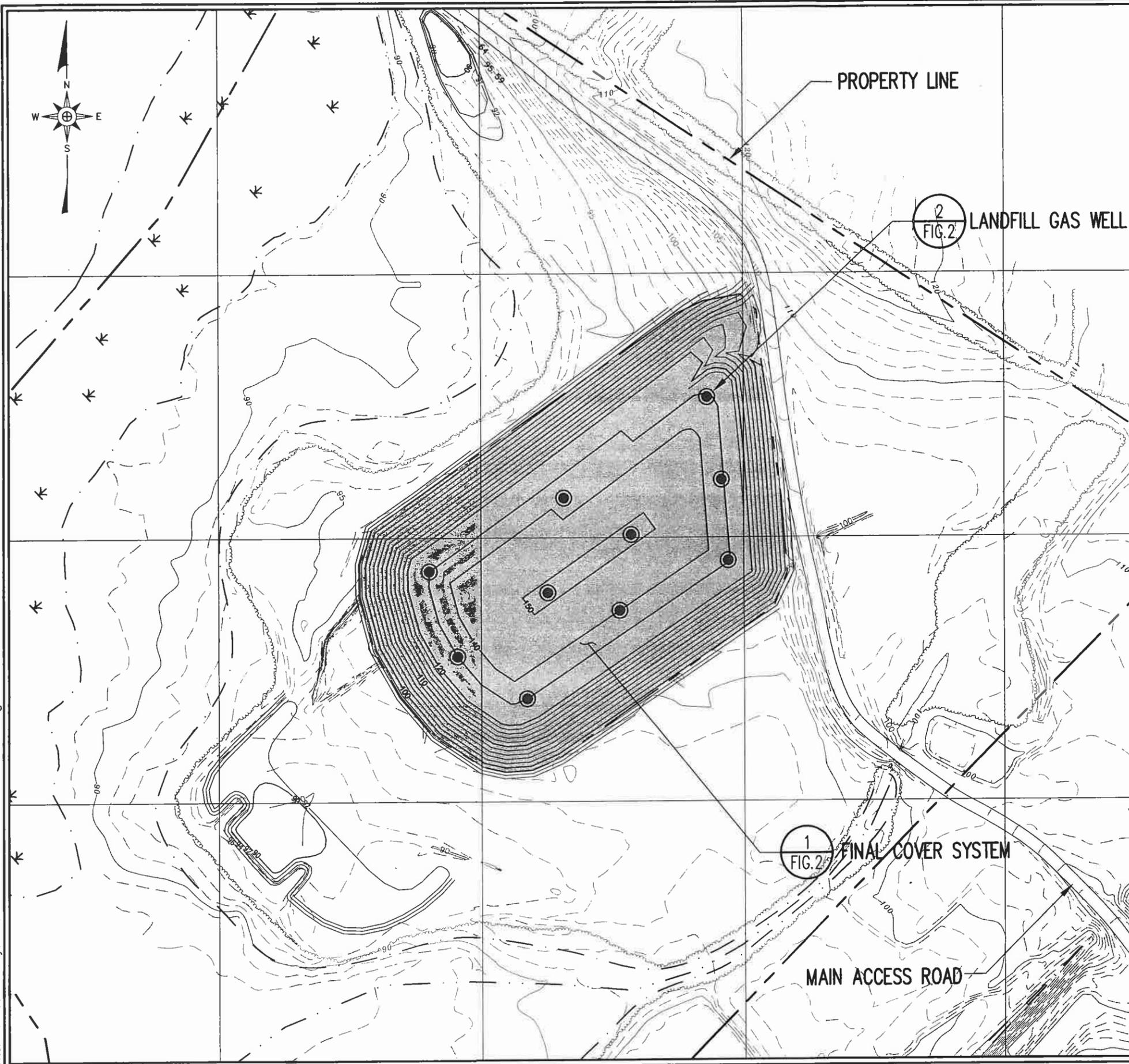
PERMIT AMENDMENT DRAWINGS

Figures 1 and 2 are added to the 2004 Approved Construction Plan Drawings. Drawing D1 is not used for Phase 2; superseded by Figure 4. Figure 3 is not used; superseded by Dwg S1.

Supplemental to Attachment G, additional Figures and Drawings are included for the General Wilson County Landfill Site Plan (S1), Updated mapping and Cross-sections (Figures 4 and 5), Phase 2 Grading, and Landfill Gas Monitoring, and T&P Bartlett E&SC Plans.

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LEGEND

- EXISTING 10' CONTOUR (SEE REFERENCE 1)
- EXISTING 2' CONTOUR
- PROPOSED GRADING 10' CONTOUR (SEE REFERENCE 2)
- PROPOSED GRADING 2' CONTOUR
- PROPERTY LINE (SEE REFERENCE 2)
- WETLAND AREA (SEE REFERENCE 2)
- STREAM (SEE REFERENCE 2)
- AREA TO CLOSE (±10.5 AC.)
- PROPOSED LANDFILL GAS WELL OR VENT

NOTES

1. THE COUNTY WILL EVALUATE GAS PRESSURES UPON INSTALLATION OF THE FINAL COVER SYSTEM AND WILL INSTALL A NUMBER OF WELLS/VENTS AS NECESSARY TO ADEQUATELY RELIEVE GAS PRESSURE.

REFERENCES

1. TOPOGRAPHY FROM DRAWING "FINAL COVER PLAN", DATED 9/1/04, PREPARED BY GARY W. AHLBERG, P.E.
2. SITE PROPERTY LINE, WELLS, FINAL COVER GRADES, WETLAND AREAS, STREAMS AND FEATURES FROM DRAWING "FINAL COVER PLAN", DATED 9/1/04, PREPARED BY GARY W. AHLBERG, P.E.



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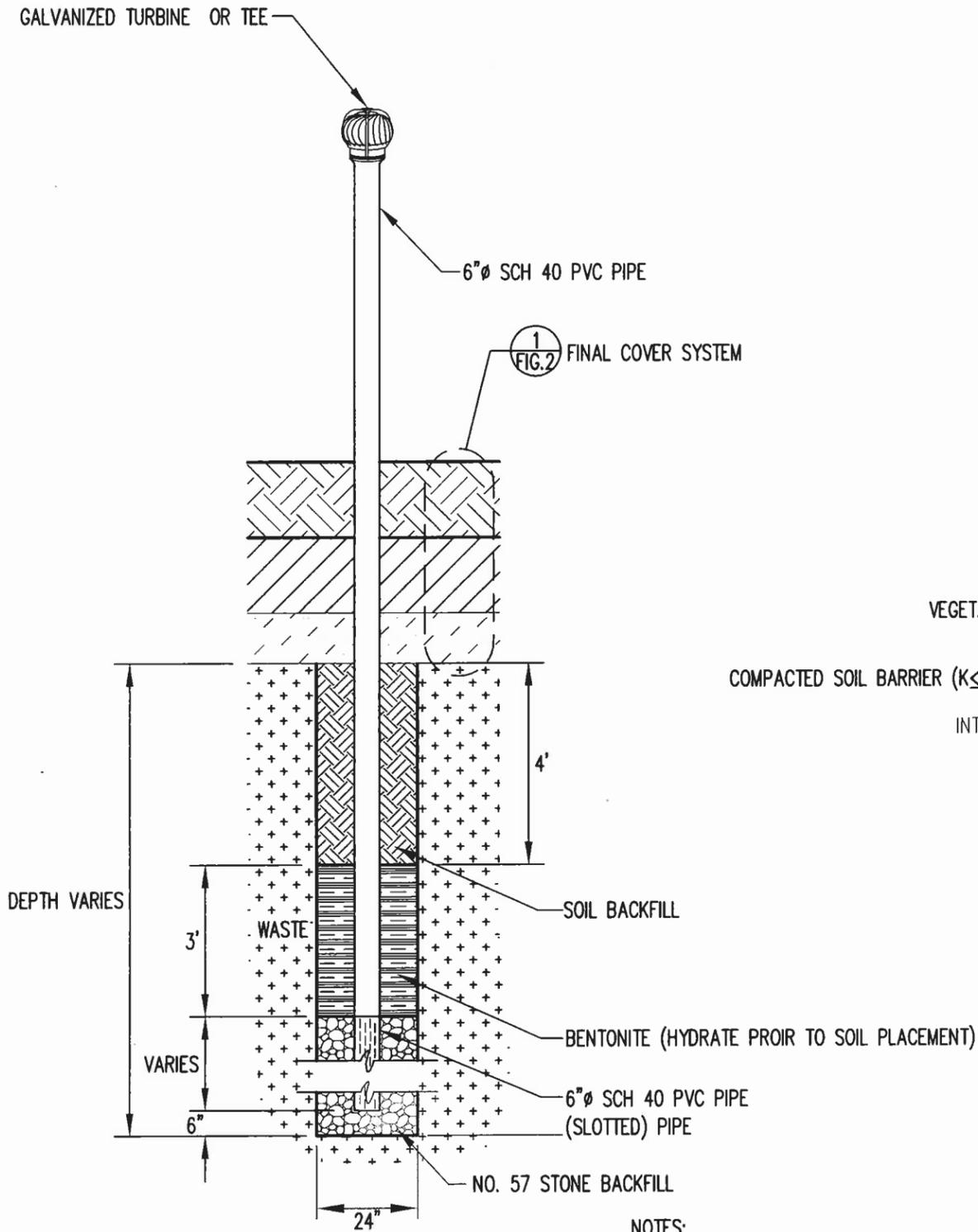


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PH: 919-823-4377
FAC: 919-823-3899

FIGURE NO.	1	FILE NAME	WESTSIDE-B0001
SCALE:	AS SHOWN	PROJECT NO.	WESTSIDE 08-1
CHECKED BY:		DATE:	Nov. 2009
DRAWN BY:	J.A.L.		

TITLE:
**WILSON COUNTY
WESTSIDE C&D LANDFILL
CLOSURE AREA**

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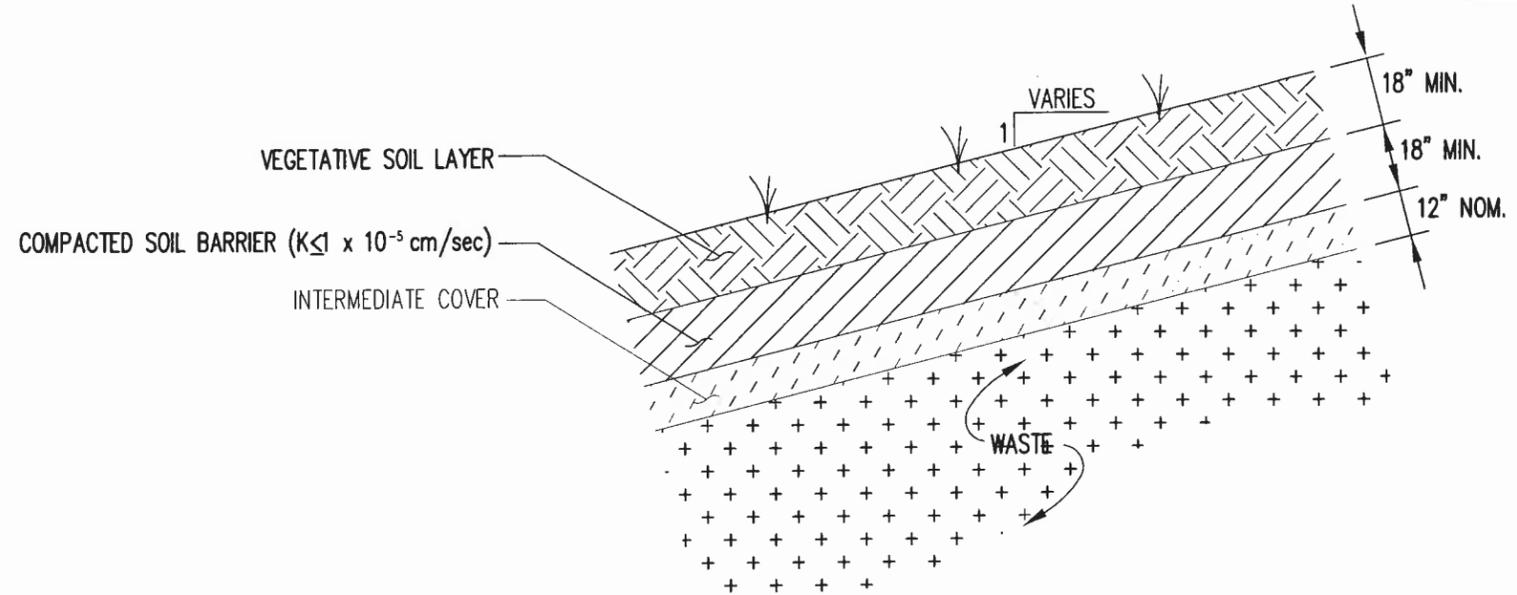
TYPICAL LANDFILL GAS WELL

DETAILS
NOT TO SCALE

2
FIG.2

NOTES:

1. AS AN ALTERNATIVE TO WELLS, GAS COLLECTION TRENCHES MAY BE INSTALLED JUST BELOW THE FINAL COVER. TRENCHES SHALL CONSIST OF PERFORATED PIPE BEDDED IN NO. 57 STONE AND WRAPPED IN A NONWOVEN GEOTEXTILE. TRENCHES SHALL HAVE NOMINAL SIZE OF 6' WIDE x 20' LONG x 2' DEEP.



FINAL COVER SYSTEM

DETAILS
NOT TO SCALE

1
FIG.2

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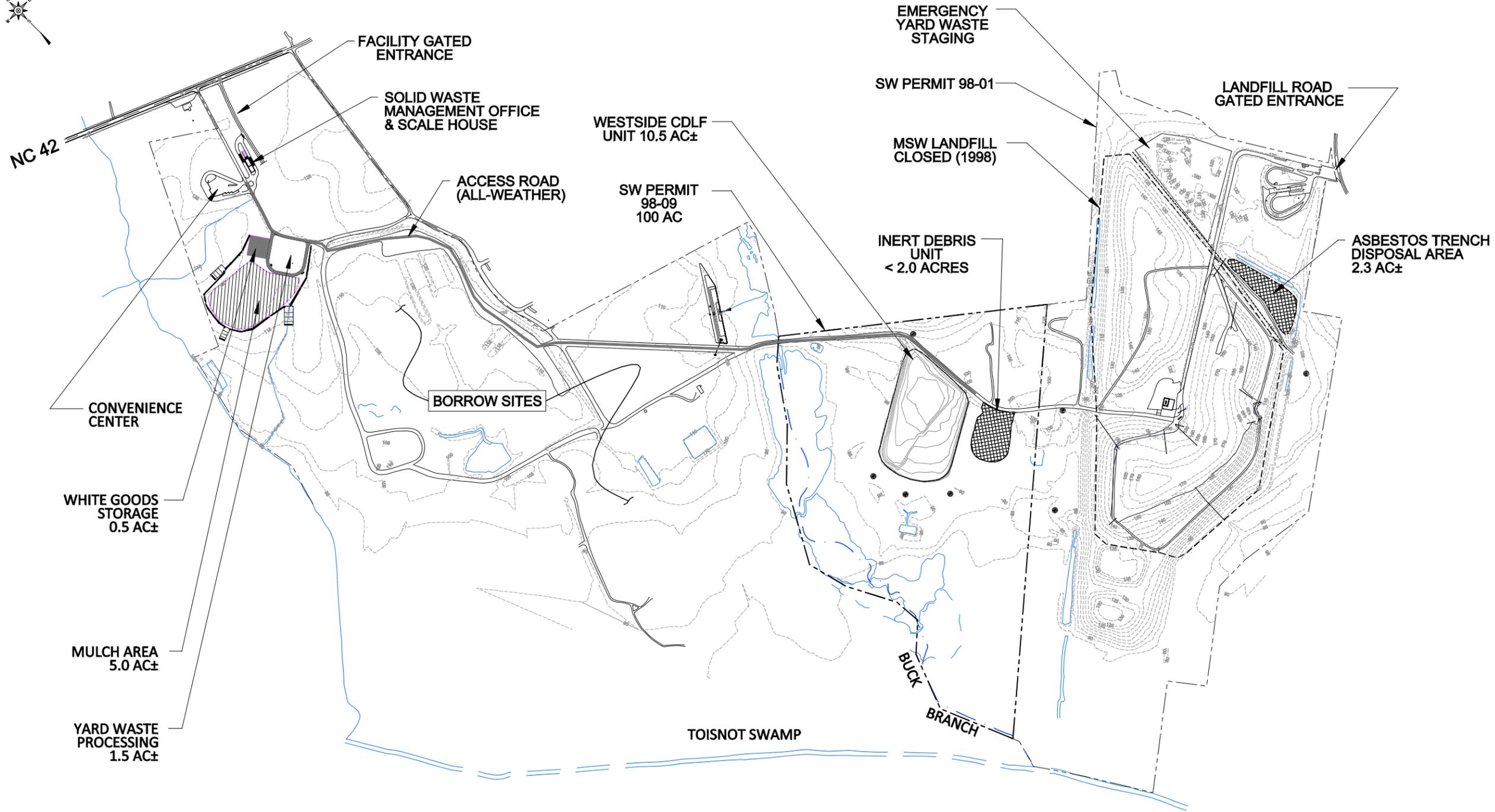


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FAX: 919.828.3899

FIGURE NO.	2	FILE NAME	WESTSIDE-B0002
SCALE:	AS SHOWN	PROJECT NO.	WESTSIDE 08-1
CHECKED BY:		DATE:	Nov. 2009
DRAWN BY:	J.A.L.		

WILSON COUNTY
WESTSIDE C&D LANDFILL
DETAILS

TITLE:



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 PHONE: 910.232.6696

FIGURE NO. **3**

SCALE: **AS SHOWN**

CHECKED BY: **G.W.A.**

PROJECT NO. **WCL10-07**

FILE NAME **WCL-0001**

DATE: **06.21.10**

**WILSON COUNTY LANDFILL
 SITE PLAN**

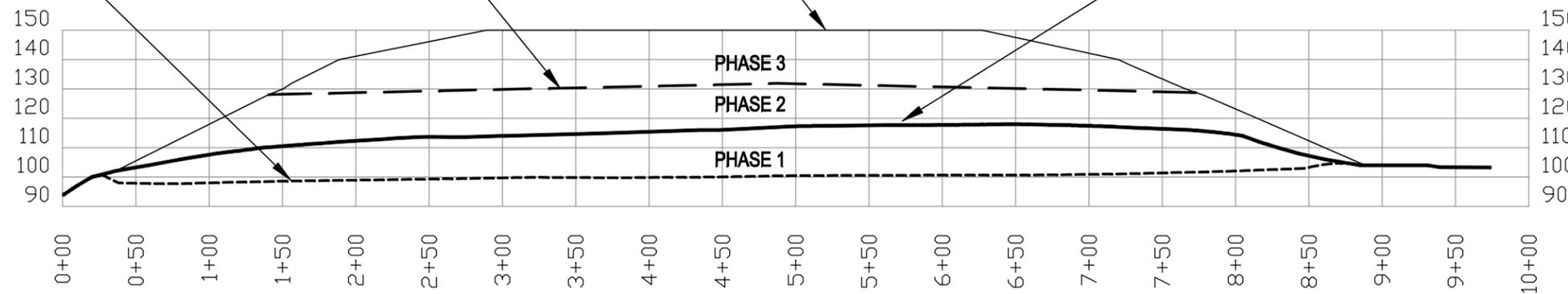
TITLE:

BASE GRADE
AS-BUILT

ESTIMATED PHASE 2
INTERMEDIATE GRADE

PROPOSED
FINAL COVER

EXISTING GRADE
APRIL 2010



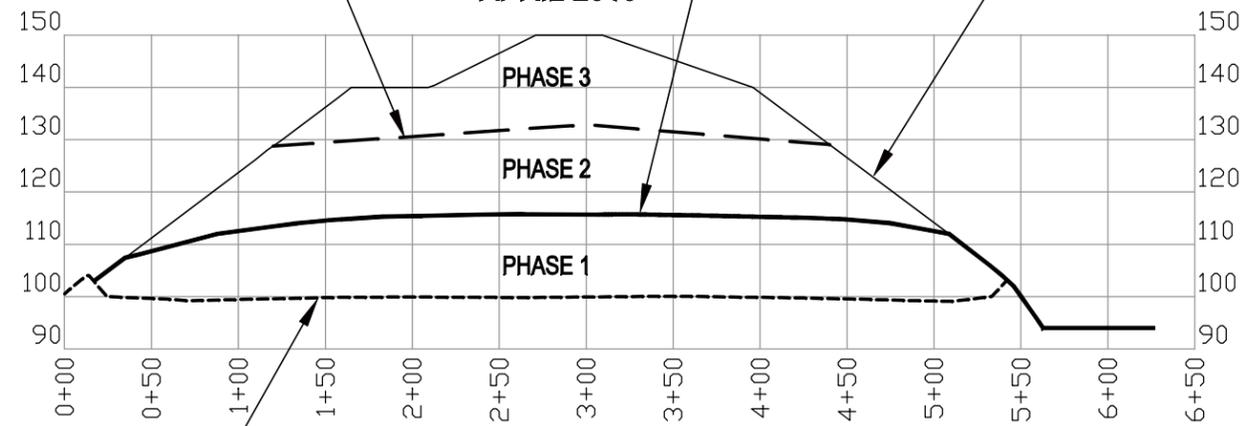
SECTION A



ESTIMATED PHASE 2
INTERMEDIATE GRADE

EXISTING GRADE
APRIL 2010

PROPOSED
FINAL COVER

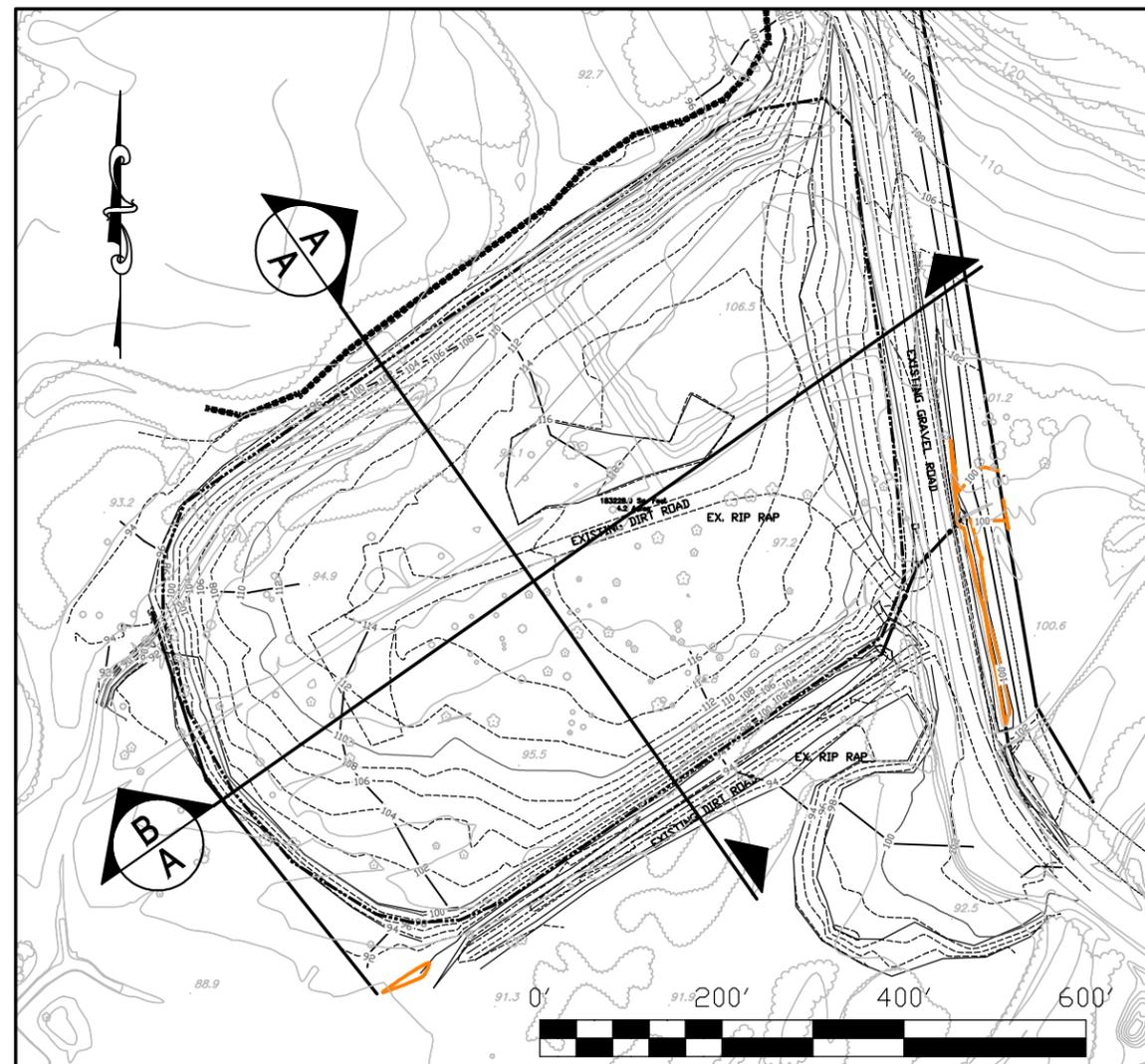


SECTION B



REFERENCE NOTE:

- EXISTING GRADE APRIL 2010 SURVEYED BY BARTLETT ENGINEERING WILSON, N.C. NC SURVEYOR LIC. # L-4741



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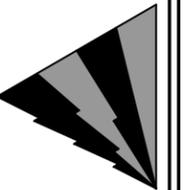


FIGURE NO.

4

SCALE:

AS SHOWN

CHECKED BY:

G.W.A.

DRAWN BY:

J.W.G.

PROJECT NO.

WGL10-07

DATE:

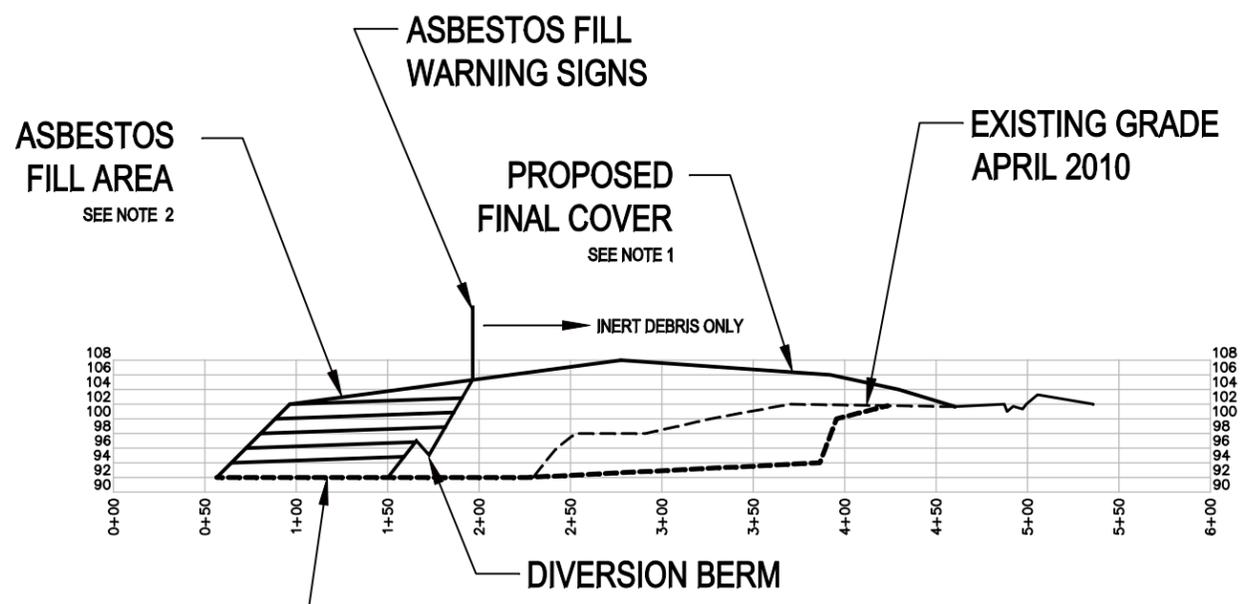
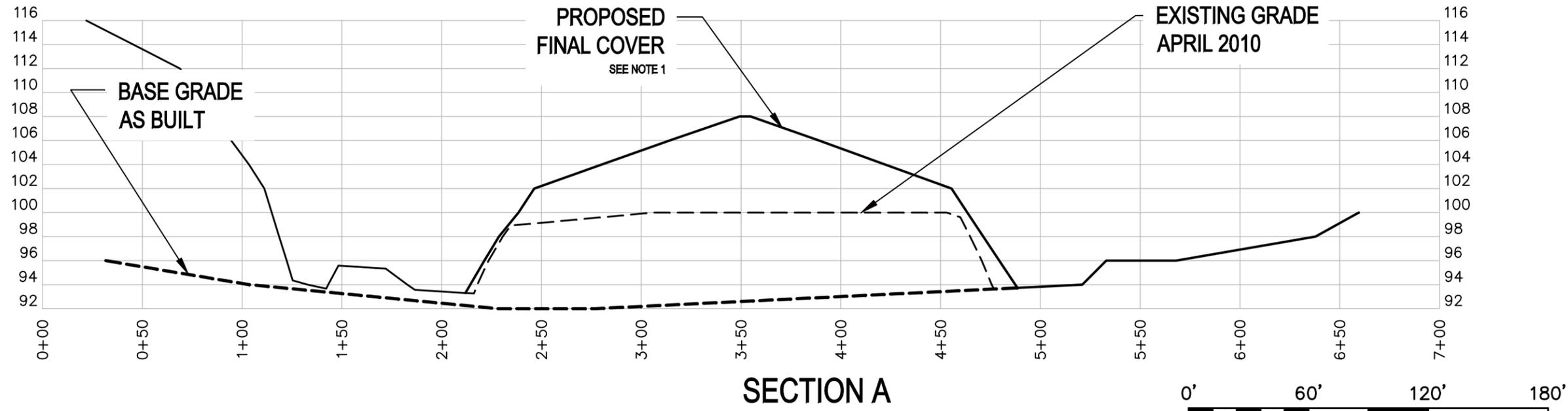
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FILE NAME

WCL-0001

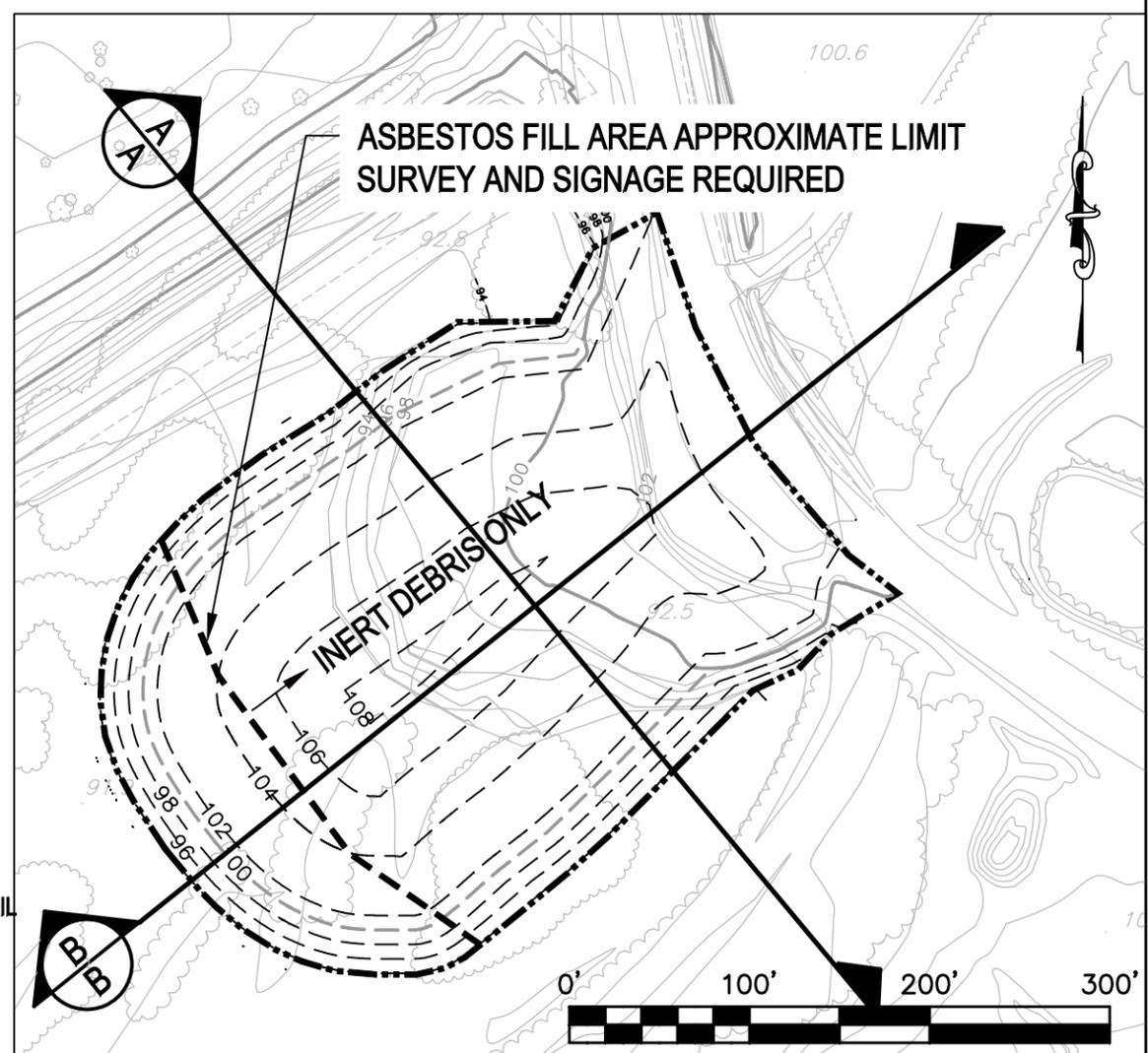
**WILSON COUNTY LANDFILL
WESTSIDE C&D UNIT
CROSS SECTIONS**

TITLE:



SECTION B

- NOTE:**
1. FINAL COVER. A 2-FT. VEGETATED SOIL LAYER SHALL BE PLACED AS FINAL COVER, INCLUDING A 6-INCH TOPSOIL LAYER. SEE DWG C4 GRADING PLAN.
 2. ASBESTOS MATERIAL SHALL BE COVERED WITH A MINIMUM 6" LAYER OF SOIL COVER IMMEDIATELY FOLLOWING PLACEMENT AS PER OPERATION PLAN.
- REFERENCE NOTE:**
1. EXISTING GRADE APRIL 2010 SURVEYED BY BARTLETT ENGINEERING WILSON, N.C. NC SURVEYOR LIC. #



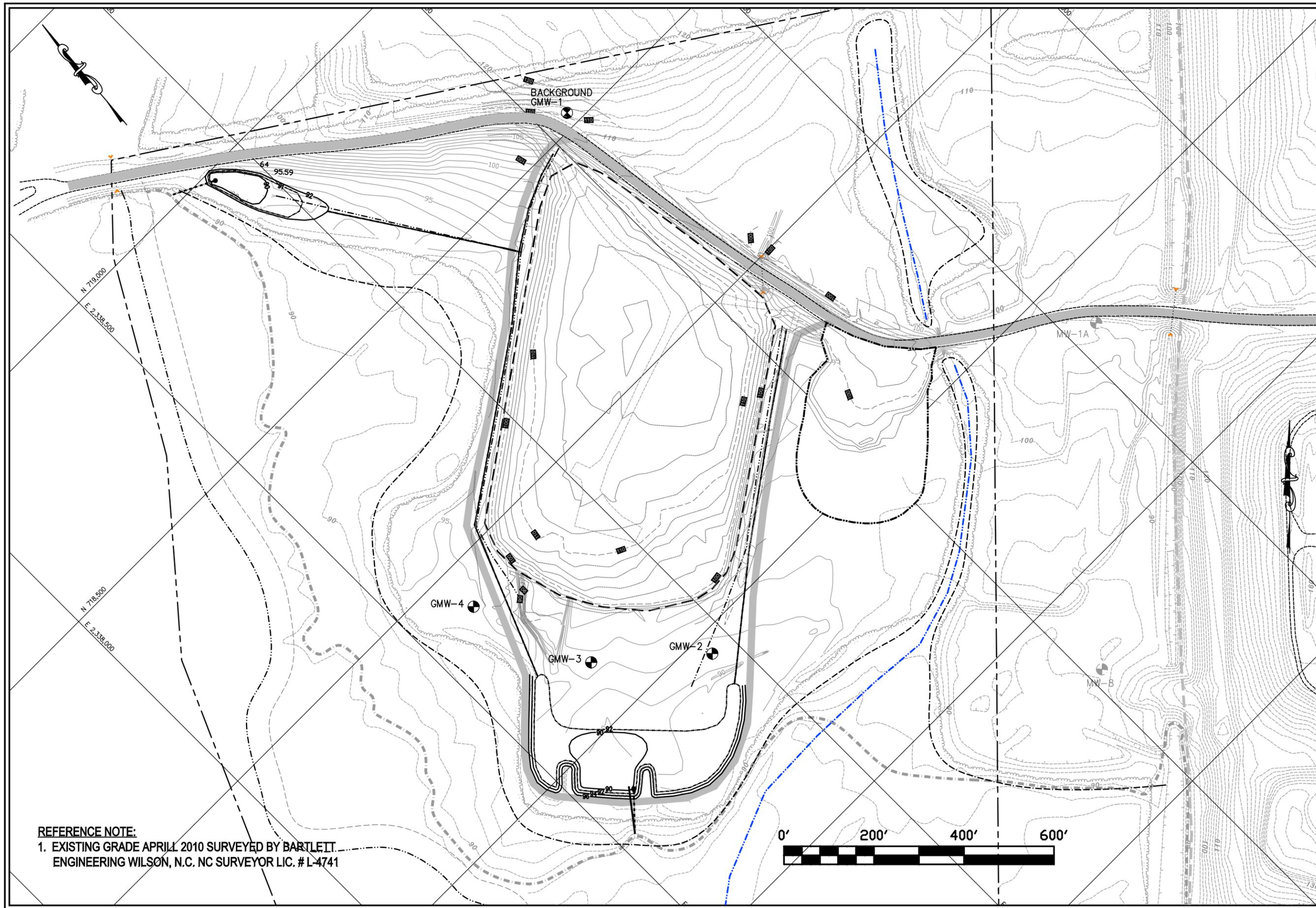
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FIGURE NO.	5	FILE NAME	
SCALE:	AS SHOWN	PROJECT NO.	WCL10-07
CHECKED BY:	G.W.A.	DATE:	01.04.11
DRAWN BY:	J.W.G.		

**WILSON COUNTY LANDFILL
INERT DEBRIS UNIT
CROSS SECTIONS**

TITLE:



REFERENCE NOTE:
 1. EXISTING GRADE APRIL 2010 SURVEYED BY BARTLETT
 ENGINEERING WILSON, N.C. NC SURVEYOR LIC. # L-4741

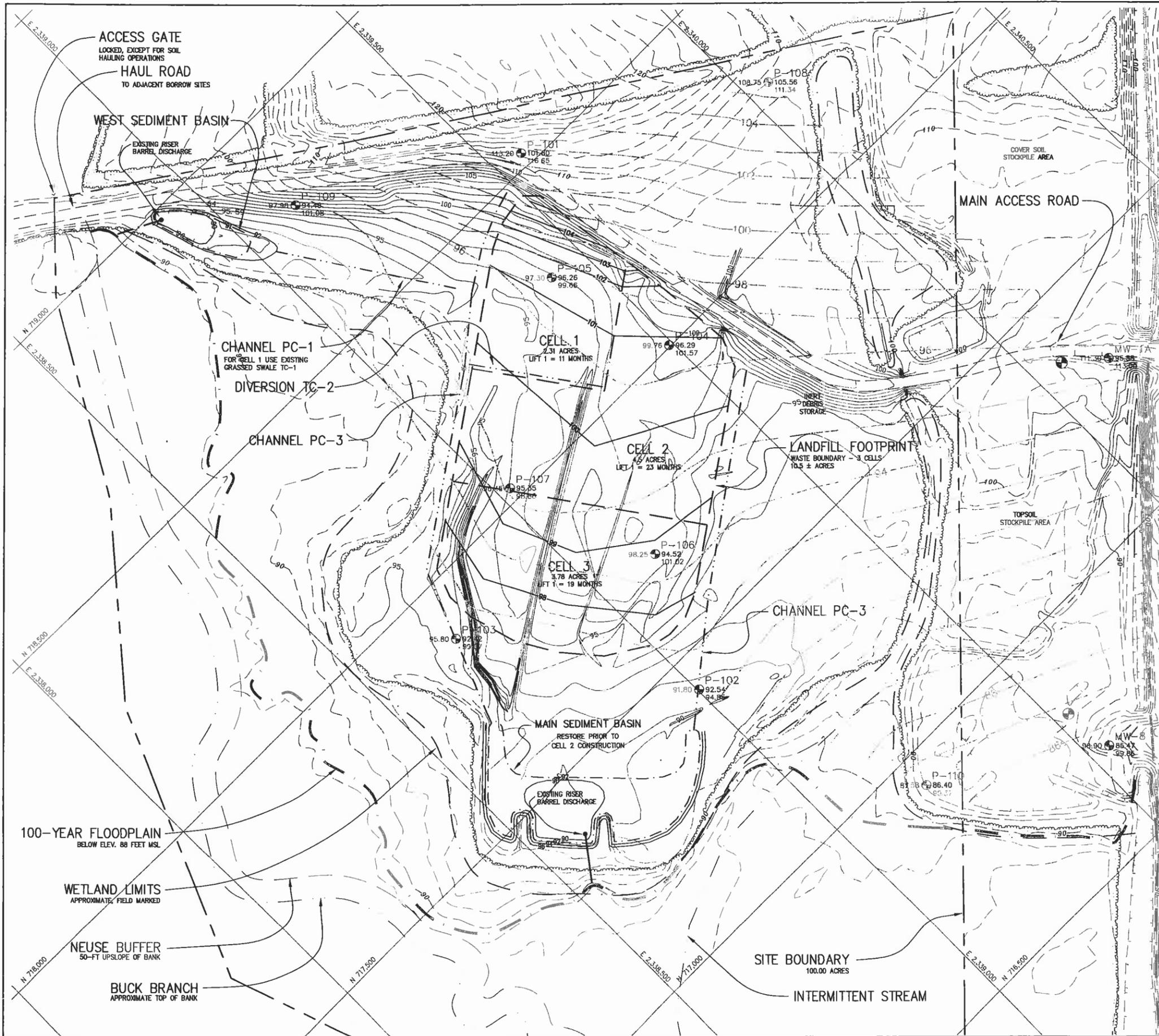
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FIGURE NO.	6
SCALE:	AS SHOWN
CHECKED BY:	G.W.A.
PROJECT NO.	WCL10-07
FILE NAME	WCL-0001
DATE:	06.21.10

TITLE:

**WILSON COUNTY LANDFILL
 EXISTING CONDITIONS**



CONSTRUCTION NOTES:

- PURPOSE:** THIS FACILITY PLAN FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, IS PREPARED FOR A PERMIT TO CONSTRUCT ISSUED BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 136.
- BASE GRADE:** AN AVERAGE 2-FOOT LAYER OF COMPACTED SOIL WILL BE ADDED TO THE EXISTING GRADE WITHIN THE FOOTPRINT. UNDER THE INITIAL 5-YEAR PERMIT TO CONSTRUCT, THE COMPACTED SOIL LAYER WILL BE CONSTRUCTED IN THREE TO FOUR LIFTS WITH SOILS APPROVED BY THE ENGINEER. WHERE THE BASE LAYER THICKNESS EXCEEDS 2 FEET, A LEVELING LIFT SHALL BE PLACED PRIOR TO THE THREE LIFTS (8-IN NOMINAL). AT AN AVERAGE LAYER THICKNESS OF 3.0 FEET, THE REQUIRED SOIL VOLUME FOR BASE CONSTRUCTION IS APPROXIMATELY 50,000 CUBIC YARDS.
- CELL 1 EXISTING CONDITIONS:** AS REPRESENTED IN THIS DRAWING AND ACCORDING TO THE DESIGN REQUIREMENTS OF THE ENGINEERING PLAN, BASE GRADE FOR CELL 1 WAS CONSTRUCTED DURING SITE GRADE RESTORATION ACTIVITIES PERFORMED IN SEPTEMBER 2003. GRADES HAVE BEEN VERIFIED BY THE PROJECT NC LICENSED SURVEYOR. BORINGS AND PIEZOMETERS INSTALLED IN THE CELL 1 AREA HAVE BEEN ABANDONED BY A NC LICENSED WELL DRILLER, IN ACCORDANCE WITH PROJECT REQUIREMENTS AND 15A NCAC 2C. UPON INSPECTION BY THE PROJECT ENGINEER AND ISSUANCE OF A PERMIT TO OPERATE BY THE NC SOLID WASTE SECTION, CELL 1 IS APPROVED FOR OPERATION. DOCUMENTATION OF CONSTRUCTION SHALL BE PLACED IN THE OPERATING RECORD AND SEALED BY THE PROJECT ENGINEER.
- GROUNDWATER SEPARATION:** BASE GRADES ARE A MINIMUM OF 4.5 ABOVE THE SEASONAL HIGH GROUNDWATER TABLE.

LEGEND

- BASE GRADE
1-FOOT CONTOURS
- POTENTIOMETRIC CONTOUR
OBSERVED SEASONAL HIGH LEVEL 11/19/02
- WESTSIDE SITE BOUNDARY
- LANDFILL FOOTPRINT
10.5 ACRES
- EXISTING LANDFILL LIMITS
- 100-YEAR FLOODPLAIN
- NEUSE BUFFER
- SURFACE WATER
- WETLAND BOUNDARY
- 2003 TOPOGRAPHY 1-FT CONTOUR
WITHIN CONSTRUCTION LIMITS
- 1998 TOPOGRAPHY 2-FT CONTOUR
SITE PERIMETER AREA
- DRAINAGE CHANNEL
- GROUNDWATER MONITORING WELL
GMW-4

PERMIT ISSUE
NOT FOR CONSTRUCTION

GRAPHIC SCALE
(IN FEET)
1 inch = 100 FT

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gah@carolina.earthlink.net

PROJECT: WESTSIDE C&D LANDFILL CONSTRUCTION PLAN PERMIT WILSON, NORTH CAROLINA

PREPARED FOR: WILSON COUNTY DEPARTMENT OF SOLID WASTE 113 E. NASH STREET WILSON, NORTH CAROLINA 27894

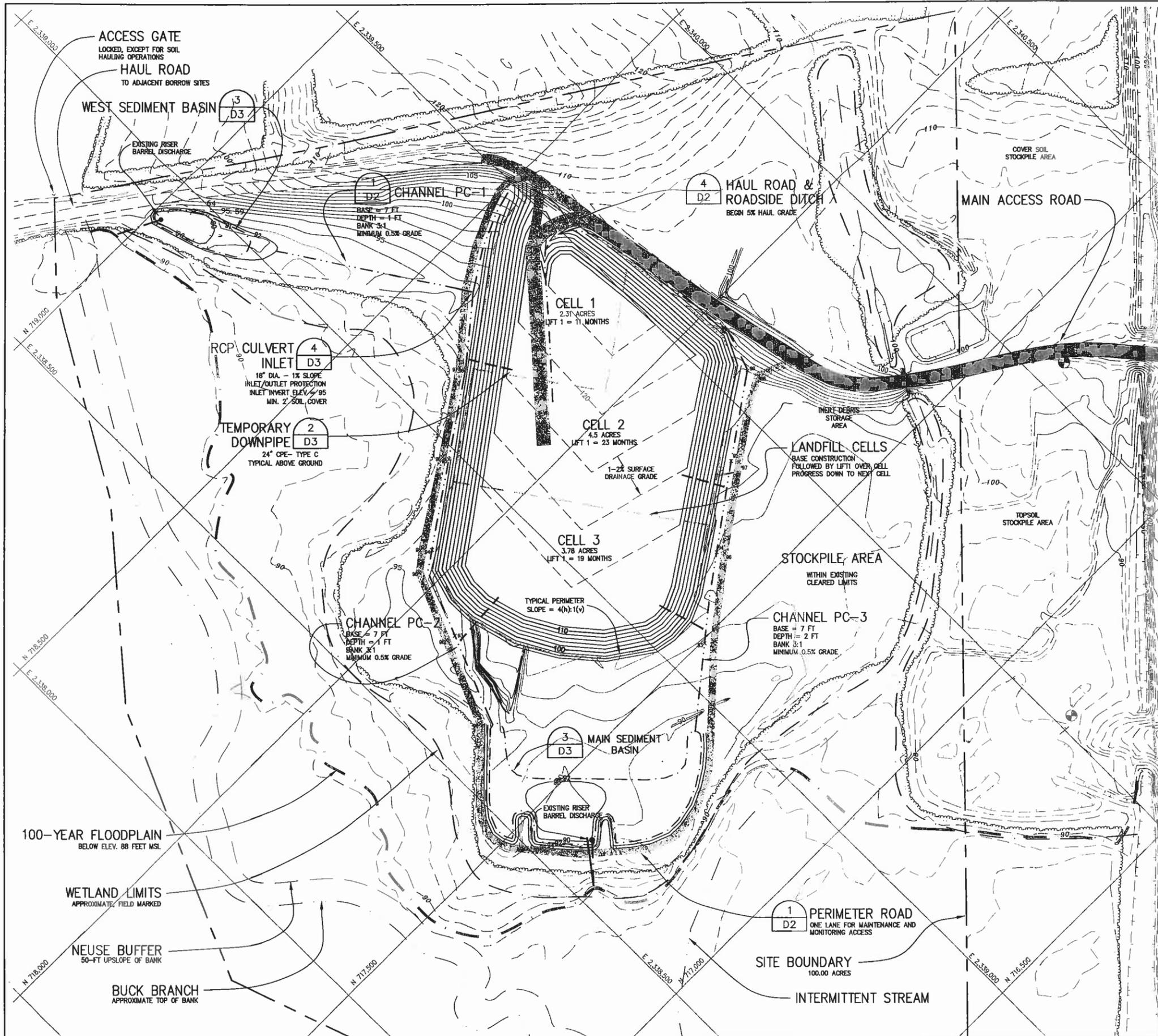
NO.	DESCRIPTION	DATE
REVISIONS		

BASE GRADE PLAN

SCALE: 1"=100'
DATE: 9/01/04
DRN. BY: GWA
CHECKED BY: CWA

PROJECT NO:

DRAWING NO. C1

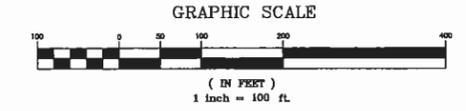


CONSTRUCTION NOTES:

- PURPOSE.** THIS PLAN FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, IS PREPARED FOR A PERMIT TO CONSTRUCT ISSUED BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 13B.
- WASTE STREAM AND DISPOSAL RATE.** THE LANDFILL WILL RECEIVE CONSTRUCTION AND DEMOLITION WASTE GENERATED WITHIN WILSON COUNTY, NORTH CAROLINA. OTHER WASTE TYPES APPROVED BY THE DIVISION FOR DISPOSAL: SEE PERMIT CONDITIONS OR AGENCY CORRESPONDENCE FOR SPECIFIC APPROVED WASTE TYPES, INCLUDING SPLIT TIRES AND TOBACCO DUST. THE ESTIMATED AVERAGE ANNUAL DISPOSAL RATES IS 20,000 TONS/YEAR.
- ACCESS CONTROL.** NATURAL TOPOGRAPHIC AND VEGETATIVE CONDITIONS AND CONTROL MEASURES LIMIT PUBLIC ACCESS TO THE SITE. WILSON COUNTY WILL MAINTAIN THE GATED ENTRANCE TO THE EXISTING MSW FACILITY. ACCESS TO THE WESTSIDE SITE WILL BE CONTROLLED VIA THE EXISTING MANNED SCALEHOUSE DURING OPERATING HOURS.
- LANDFILL OPERATIONAL GRADE.** THE LANDFILL WILL BE OPERATED IN 5 TO 10-FOOT LIFTS, PROGRESSING EVENLY ACROSS THE FOOTPRINT. AT THE INTERMEDIATE HEIGHT OF 10 FEET ABOVE BASE GRADE, THE ENTIRE 10.5 ACRE FOOTPRINT PROVIDES APPROXIMATELY 4 YEARS OF CAPACITY. INTERMEDIATE GRADE WITH A 1-2% SURFACE SLOPE SOILS SHALL BE MAINTAINED TO DIVERT STORMWATER OFF THE LANDFILL.
- LANDFILL CAPACITY AND CELL CONSTRUCTION SCHEDULE.** THE BASE SOIL LAYER SHALL BE CONSTRUCTED IN THREE CELLS. THE OPERATING LIFE FOR EACH INITIAL LIFT OVER A CELL AREA IS ESTIMATED AT 5 MONTHS/ACRE AS FOLLOWS:
 CELL 1 - 2.31 ACRES: 11 MONTHS
 CELL 2 - 4.50 ACRES: 23 MONTHS
 CELL 3 - 3.78 ACRES: 19 MONTHS
- COVER SOILS.** DUE TO THE NON-PUTRESCIBLE NATURE OF THE WASTE, THE WORKING LIFT SHALL BE TYPICALLY COVERED ON A WEEKLY BASIS. THE TOP PORTION OF THE LIFT SHALL RECEIVE A MINIMUM COVER OF SIX INCHES. AS SECTIONS OF THE PERIMETER SLOPES ARE COMPLETED, THE 24-INCH FINAL COVER VSL SHALL BE PLACED AND COMPACTED. THE TOTAL SOIL VOLUME REQUIRED FOR THE WESTSIDE C&D LANDFILL PROJECT IS APPROXIMATELY 165,000 CUBIC YARDS. BASED ON AN AVERAGE EXCAVATION DEPTH OF 5 FEET BELOW THE EXISTING LAND SURFACE FROM THE 50 ACRES AVAILABLE FROM THE TUCKER AND MOHESKY SITES, THE MINIMUM ESTIMATE OF REMAINING SOIL RESOURCES FOR THE OFF-SITE BORROW AREAS IS 400,000 CUBIC YARDS. THE ENGINEER SHALL SPECIFY SOIL PROPERTIES FOR SPECIFIC LANDFILL APPLICATIONS.
- FILL PROGRESSION.** LANDFILL OPERATIONS ARE DESIGNED TO FILL THE CELLS IN SEQUENTIAL ORDER, WITH A TOP-DOWN PROGRESSION. SURFACE DRAINAGE SHALL BE MAINTAINED FROM THE CENTER TOWARD THE PERIMETER SLOPES. TEMPORARY DOWNPIPES SHALL BE USED TO CONVEY SURFACE DRAINAGE TO CHANNELS.
- PERIMETER SLOPES.** EXCEPT FOR SOIL EMBANKMENTS, PERIMETER SLOPES SHALL BE CONSTRUCTED AT A MAXIMUM GRADE OF 4(h):1(v).
- INERT DEBRIS STORAGE (IDS) AREA.** INERT DEBRIS MAY BE STORED TEMPORARILY FOR FUTURE USE IN HAUL OR ACCESS ROAD BASE CONSTRUCTION. NO LAND CLEARING DEBRIS OR OTHER WASTES ARE ALLOWED IN THE IDS AREA.

LEGEND

- 24" CPP TYPE C-DOWNDRAIN
- WESTSIDE SITE BOUNDARY
- LANDFILL CELLS
C1+C2+C3=10.59 ACRES TOTAL
- EXISTING LANDFILL LIMITS
- 100-YEAR FLOODPLAIN
- NEUSE BUFFER
- SURFACE WATER
- WETLAND BOUNDARY
- P1 INTERMEDIATE GRADE 2-FT CONTOUR
- FINAL GRADE 2-FT CONTOUR
- 2003 TOPOGRAPHY 1-FT CONTOUR
- 1998 TOPOGRAPHY 2-FT CONTOUR
- DRAINAGE CHANNEL



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 910.232.6696
 gah@earthlink.net

PROJECT:
 WESTSIDE C&D LANDFILL
 CONSTRUCTION PLAN PERMIT
 WILSON, NORTH CAROLINA

PREPARED FOR:
 WILSON COUNTY
 DEPARTMENT OF SOLID WASTE
 113 E. NASH STREET
 WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE
REVISIONS		

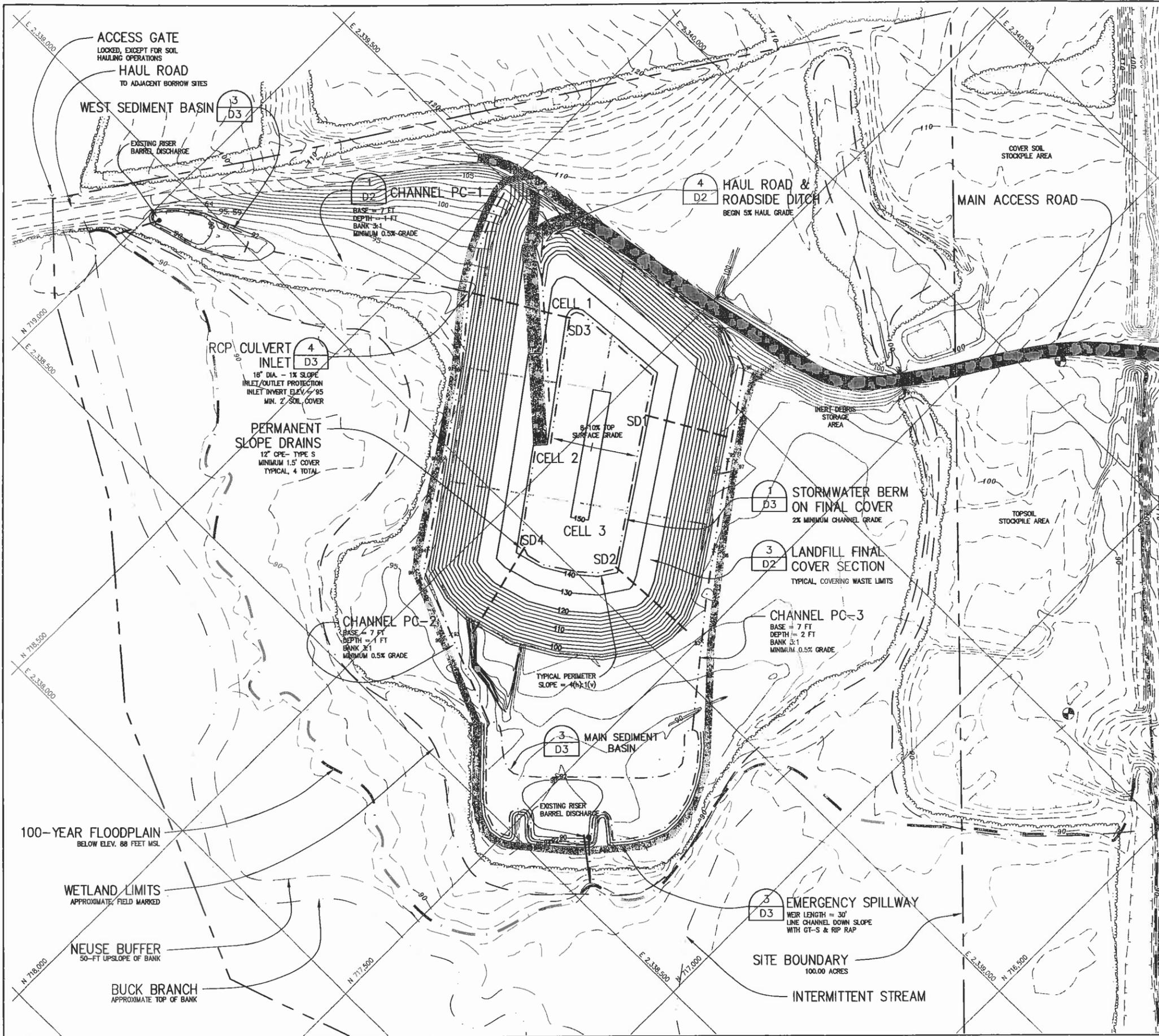
PHASE 1 OPERATION PLAN

SCALE: 1"=100'
 DATE: 9/01/04
 DRN. BY: GWA
 CHECKED BY: GWA
 PROJECT NO:

DRAWING NO.

C2

**PERMIT ISSUE
 NOT FOR CONSTRUCTION**



CONSTRUCTION NOTES:

- PURPOSE.** THIS FACILITY PLAN FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, IS PREPARED FOR A PERMIT TO CONSTRUCT ISSUED BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 136.
- ACCESS CONTROL.** NATURAL TOPOGRAPHIC AND VEGETATIVE CONDITIONS AND CONTROL MEASURES LIMIT PUBLIC ACCESS TO THE SITE. WILSON COUNTY WILL MAINTAIN LOCATED GATES AT THE WEST AND MAIN ENTRANCES TO THE FACILITY.
- FINAL GRADE.** DESIGN GRADES PROVIDED ARE FOR TOP OF FINAL COVER. ANY ADJUSTMENTS TO INCREASE THE FINAL COVER THICKNESS WILL REQUIRE MODIFICATION TO INTERMEDIATE COVER GRADES TO ALLOW FOR FINAL COVER CONSTRUCTION.
- ALL CHANNELS** SHALL BE STABILIZED WITH EXCELSIOR CURLEX 2 MATTING OR EQUIVALENT TO SECURE SEED AND ESTABLISH GRASSED CHANNEL. OUTLET PROTECTION SHALL BE CONSTRUCTED WITH D50 = 6-9 INCH RIP RAP, UNDERLAD WITH G1-S.
- CLOSURE AND POST CLOSURE.** WHEN OPERATIONS HAVE REACHED FINAL DESIGN GRADE, THE LANDFILL WILL BE COVERED WITH AT LEAST TWO FEET OF COMPACTED SOIL COVER. THE FINAL SOIL COVER WILL BE VEGETATED WITH NATIVE GRASSES ACCORDING TO THE SITE'S VEGETATION PLAN. INSPECTIONS WILL BE CONDUCTED PERIODICALLY TO OBSERVE THE INTEGRITY OF THE FINAL COVER. REPAIRS WILL BE MADE AS NECESSARY TO RESTORE THE VEGETATIVE SOIL COVER.

LEGEND

- 24" CPP TYPE C--DOWNDRAIN
- WESTSIDE SITE BOUNDARY
- LANDFILL CELLS
C1+C2+C3=10.59 ACRES TOTAL
- EXISTING LANDFILL LIMITS
- 100-YEAR FLOODPLAIN
- NEUSE BUFFER
- SURFACE WATER
- WETLAND BOUNDARY
- FINAL COVER GRADE 2-FT CONTOUR
- FINAL COVER GRADE 10-FT CONTOUR
- 2003 TOPOGRAPHY 1-FT CONTOUR
- 1998 TOPOGRAPHY 2-FT CONTOUR
- DRAINAGE CHANNEL



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GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

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 WILSON, NORTH CAROLINA

PREPARED FOR:
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 113 E. NASH STREET
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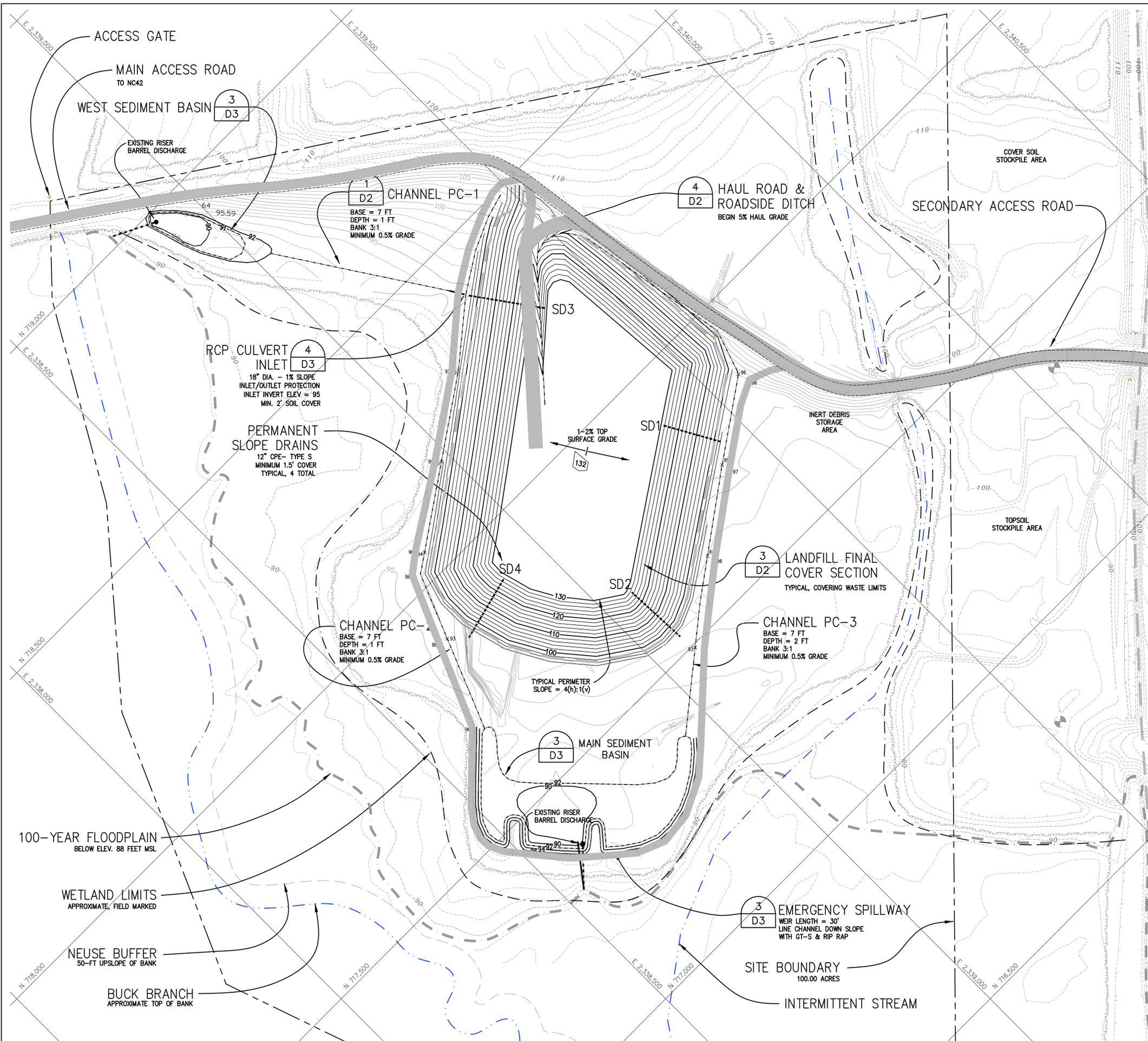
NO.	DESCRIPTION	DATE
REVISIONS		

FINAL COVER PLAN

SCALE: 1"=100'
 DATE: 9/01/04
 DRN. BY: GWA
 CHECKED BY: GWA

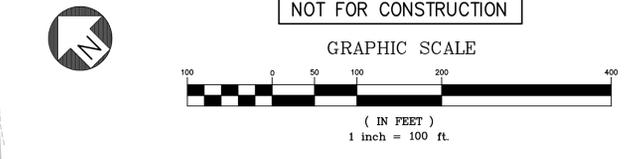
PROJECT NO:

DRAWING NO.
C3



- CONSTRUCTION NOTES:**
- PURPOSE.** THIS PHASE 2 OPERATION PLAN FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, IS PREPARED FOR A PERMIT TO OPERATE ISSUED BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 13B. THIS OPERATION PLAN PROVIDES CAPACITY FOR 110,000 TONS; TOP ELEVATION MAY BE ADJUSTED BASED ON ACTUAL AIRSPACE UTILIZATION FACTOR FOR TONAGE.
 - ACCESS CONTROL.** NATURAL TOPOGRAPHIC AND VEGETATIVE CONDITIONS AND CONTROL MEASURES LIMIT PUBLIC ACCESS TO THE SITE. WILSON COUNTY WILL MAINTAIN LOCATED GATES AT THE WEST AND MAIN ENTRANCES TO THE FACILITY.
 - FINAL GRADE.** DESIGN GRADES PROVIDED ARE FOR TOP OF FINAL COVER. ANY ADJUSTMENTS TO INCREASE THE FINAL COVER THICKNESS WILL REQUIRE MODIFICATION TO INTERMEDIATE COVER GRADES TO ALLOW FOR FINAL COVER CONSTRUCTION.
 - ALL CHANNELS SHALL BE STABILIZED WITH EXCELSIOR CURLEX 2 MATTING OR EQUIVALENT TO SECURE SEED AND ESTABLISH GRASSED CHANNEL. OUTLET PROTECTION SHALL BE CONSTRUCTED WITH D50 = 6-9 INCH RIP RAP, UNDERLAID WITH GT-S.**
 - CLOSURE AND POST CLOSURE.** WITH COMPLETION OF PERIMETER SLOPES TO INTERMEDIATE GRADE (PLAN - 3FT.), PARTIAL FINAL COVER MAY BE CONSTRUCTED AS SPECIFIED BY THE ENGINEER. FINAL COVER WILL BE COMPLETED FOLLOWING PHASE 3, SEE DRAWING C3 FINAL GRADE PLAN. THE FINAL SOIL COVER WILL BE VEGETATED WITH NATIVE GRASSES ACCORDING TO THE SITE'S VEGETATION PLAN. INSPECTIONS WILL BE CONDUCTED PERIODICALLY TO OBSERVE THE INTEGRITY OF THE FINAL COVER. REPAIRS WILL BE MADE AS NECESSARY TO RESTORE THE VEGETATIVE SOIL COVER.

- LEGEND**
- WESTSIDE SITE BOUNDARY
 - EXISTING LANDFILL LIMITS
 - 100-YEAR FLOODPLAIN
 - NEUSE BUFFER
 - SURFACE WATER
 - WETLAND BOUNDARY
 - FINAL COVER GRADE 2-FT CONTOUR
 - FINAL COVER GRADE 10-FT CONTOUR
 - 2003 TOPOGRAPHY 1-FT CONTOUR
 - 1998 TOPOGRAPHY 2-FT CONTOUR
 - DRAINAGE CHANNEL



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 NC LIC. # C-2819

PROJECT: WESTSIDE C&D LANDFILL CONSTRUCTION PLAN WILSON, NORTH CAROLINA

PREPARED FOR: WILSON COUNTY DEPARTMENT OF SOLID WASTE 113 E. NASH STREET WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE
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PHASE 2 GRADING PLAN

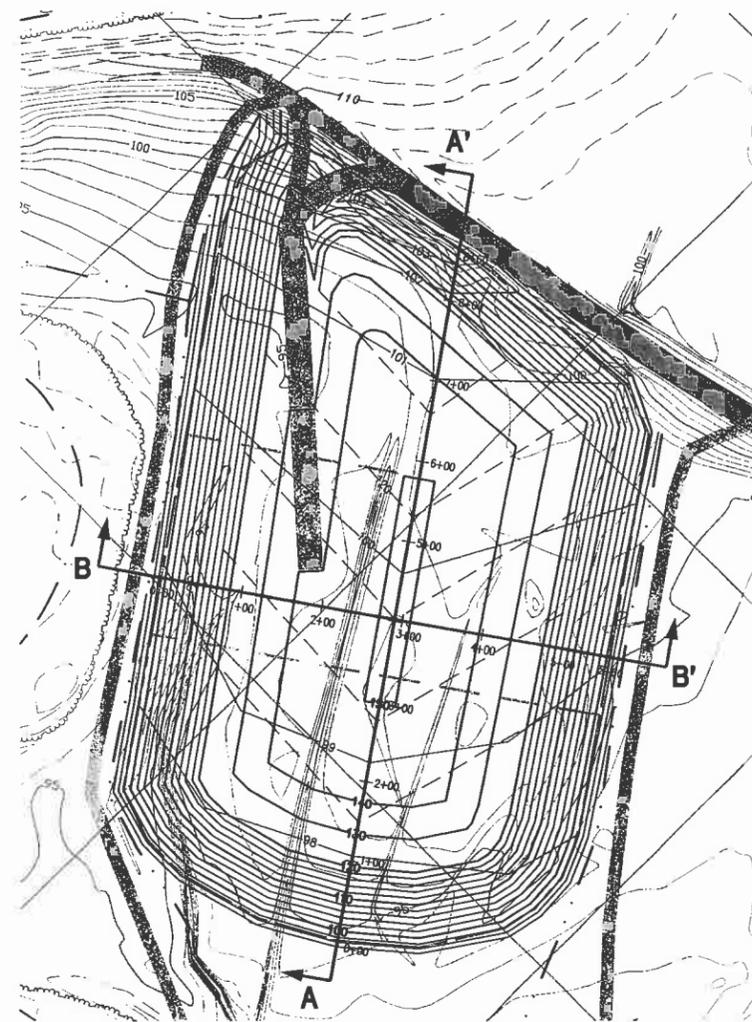
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 DATE: 06.21.10
 DRN. BY: JWG
 CHECKED BY: GWA

PROJECT NO: WCL10-07

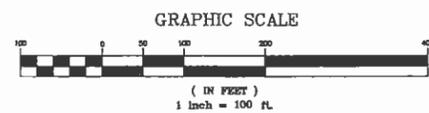
DRAWING NO. **C4**

PERMIT ISSUE
NOT FOR CONSTRUCTION

NOT USED FOR PHASE 2
SEE FIGURE 4

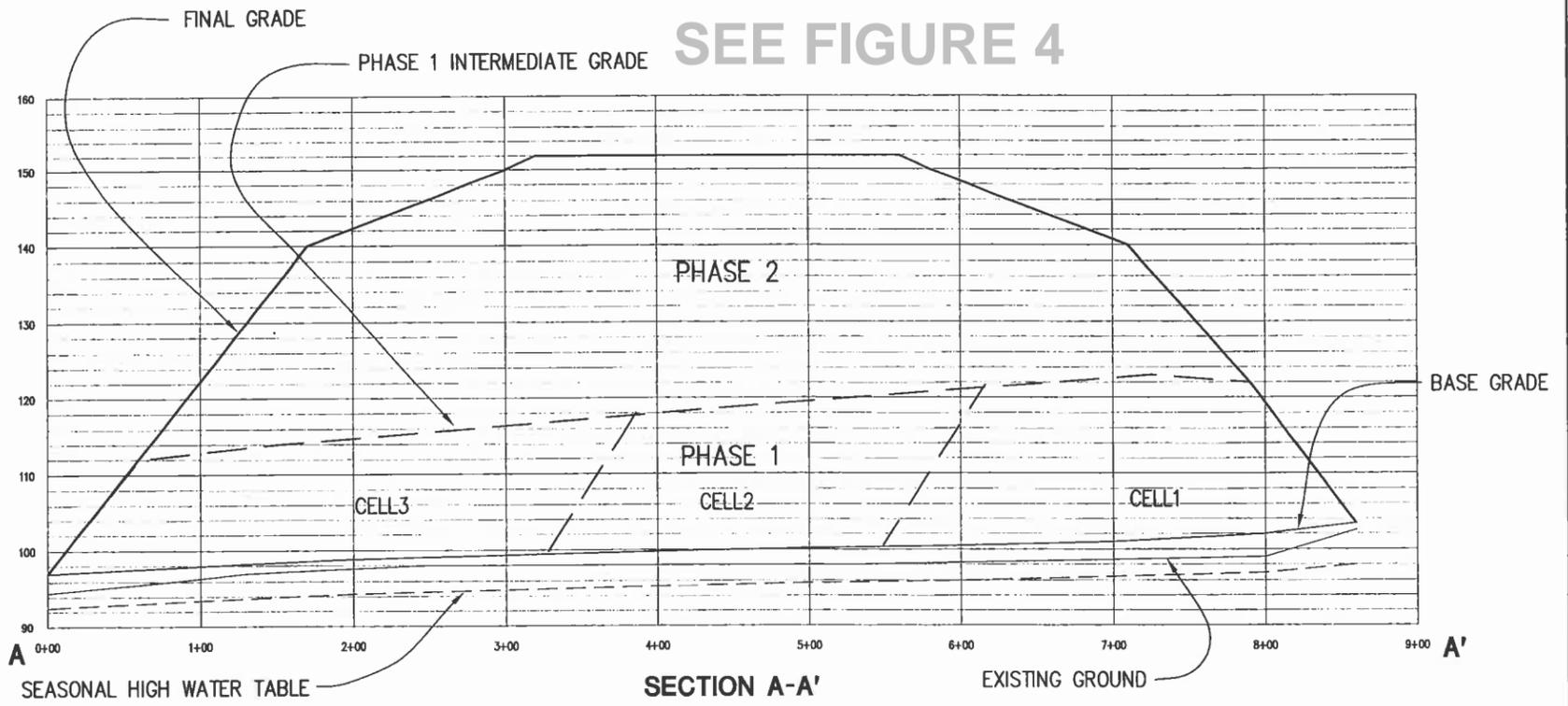


PLAN SECTION ALIGNMENT
SCALE 1" = 100'



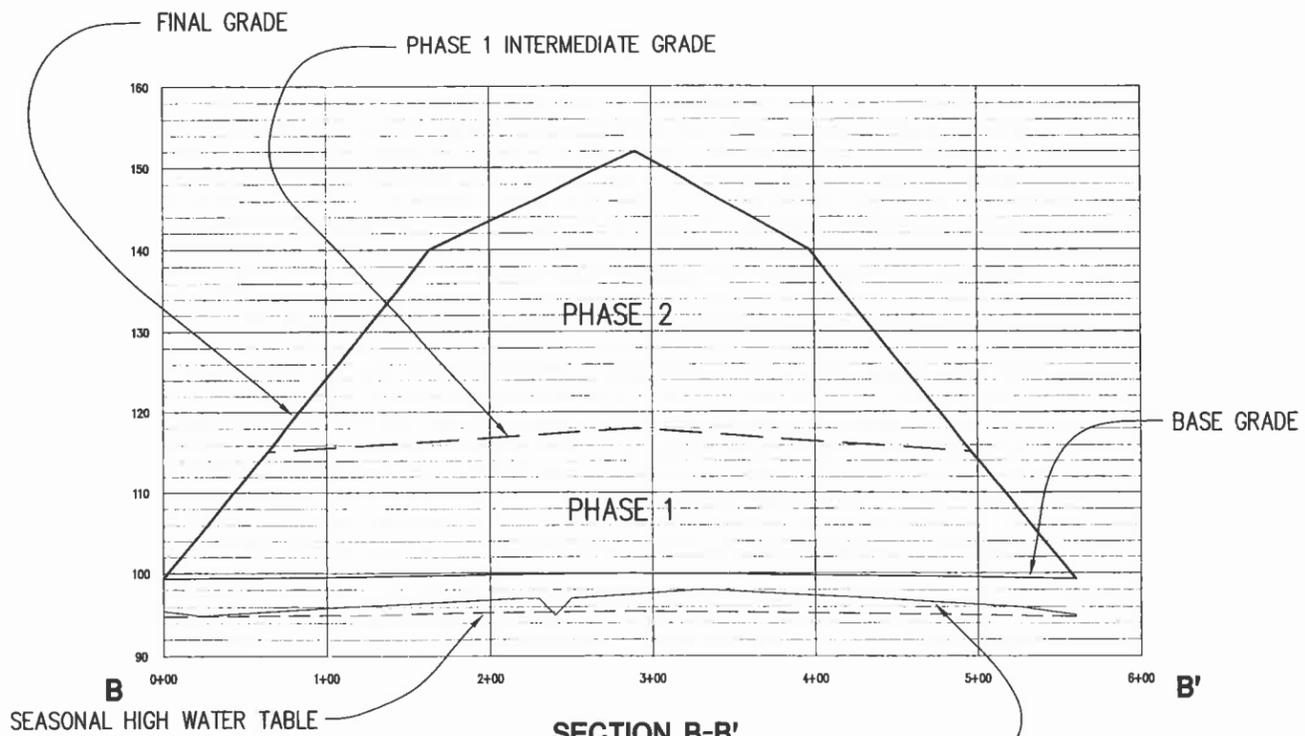
LEGEND

- LANDFILL FOOTPRINT
10.5 ACRES
- LANDFILL BASE GRADE 1-FT CONTOUR
- P1 INTERMEDIATE GRADE 2-FT CONTOUR
- FINAL GRADE 2-FT CONTOUR
- 2003 TOPOGRAPHY 1-FT CONTOUR
- 1998 TOPOGRAPHY 2-FT CONTOUR
- DRAINAGE CHANNEL



SECTION A-A'

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'



SECTION B-B'

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'

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LANDFILL
CROSS
SECTIONS

SCALE: 1" = 100'
DATE: 9/01/04
DRN. BY: GWA
CHECKED BY: GWA

PROJECT NO:

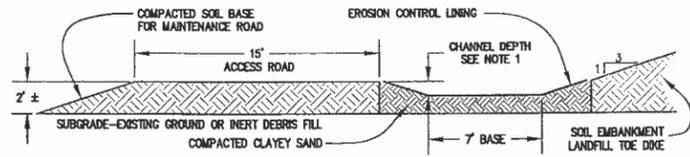
DRAWING NO.

D1

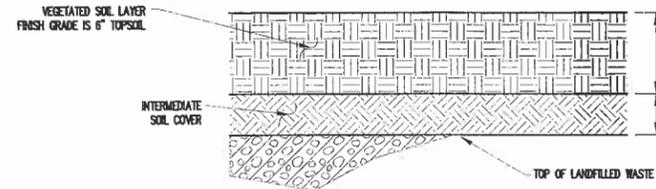
NOTES:

1. TYPICAL CHANNEL DEPTH IS 1 FOOT. PC-3 DEPTH IS 2 FEET. APPARENT DEPTH INCREASES WITHIN 300 FEET OF CHANNEL DISCHARGE TO THE MAIN BASIN DUE TO FIXED ELEVATION OF ACCESS ROAD AT 96.0.

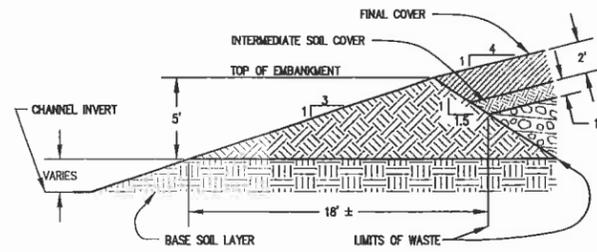
2. RECP LINING IS EXCELSIOR CURLEX 2 OR EQUIVALENT, INSTALLED ACCORDING TO MANUFACTURERS GUIDELINES.



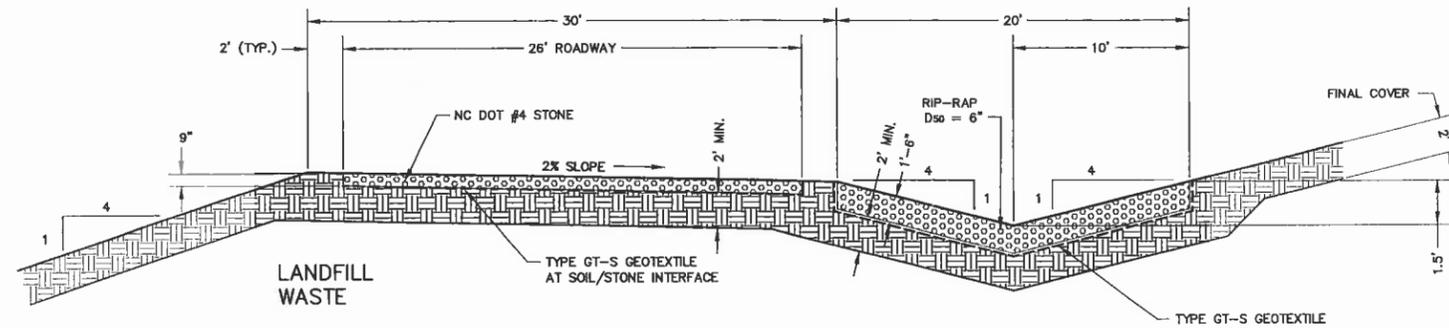
1 - ACCESS ROAD & PERIMETER CHANNEL
SCALE: 1" = 5'



3 - TYPICAL LANDFILL FINAL COVER SECTION
SCALE: 1" = 2'-0"



2 - LANDFILL PERIMETER TOE DIKE
SCALE: 1" = 5'



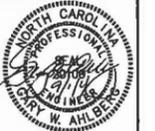
4 - HAUL ROAD AND ROADSIDE DITCH
NOT TO SCALE

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DETAILS

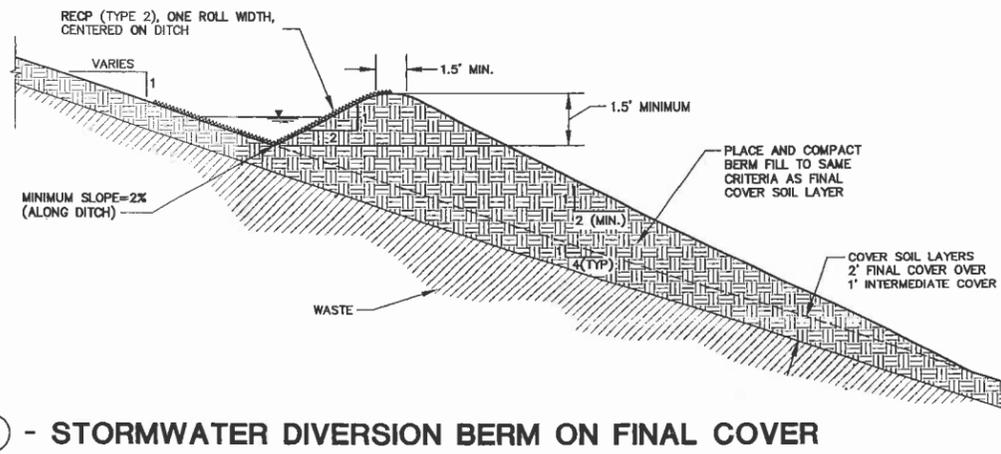
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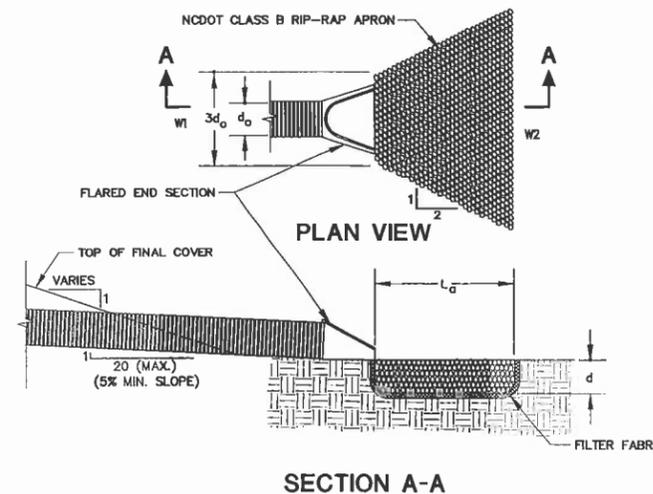
DRAWING NO.

D2

PERMIT ISSUE
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1 - STORMWATER DIVERSION BERM ON FINAL COVER
NOT TO SCALE

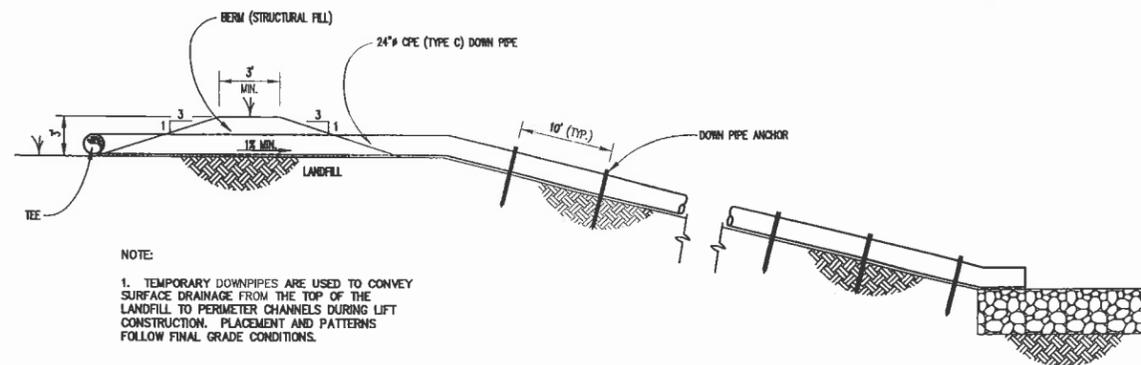


4 - SLOPE DRAIN/CULVERT OUTLET
NOT TO SCALE

NOTES:

1. L_0 IS THE LENGTH OF THE RIP-RAP APRON (MIN. $4d_0$).
2. $d=1.5$ TIMES THE MAXIMUM SPECIFIED STONE DIAMETER (MIN. 12").
3. d_0 =PIPE DIAMETER.
4. IN A WELL-DEFINED CHANNEL, EXTEND THE APRON UP THE CHANNEL BANKS TO THE TOP OF THE BANK.
5. AN APPROVED FILTER FABRIC SHALL BE INSTALLED BETWEEN THE RIP-RAP AND SOIL FOUNDATION, WITH THE EDGES ANCHORED, PER MANUFACTURER'S GUIDELINES.
6. OUTLET PROTECTION SHALL CONFORM TO NC EROSION AND SEDIMENT CONTROL STANDARDS AND SPECIFICATIONS.

CULVERT DIAMETER	LENGTH	DEPTH	WIDTH 1	WIDTH 2
d_0	L_0	D	W1	W2
1	4	1.25	3	7
1.5	6	1.25	4.5	10.5



NOTE:

1. TEMPORARY DOWNPIPES ARE USED TO CONVEY SURFACE DRAINAGE FROM THE TOP OF THE LANDFILL TO PERIMETER CHANNELS DURING LIFT CONSTRUCTION. PLACEMENT AND PATTERNS FOLLOW FINAL GRADE CONDITIONS.

2 - TEMPORARY DOWNPIPE
NOT TO SCALE - TYPICAL

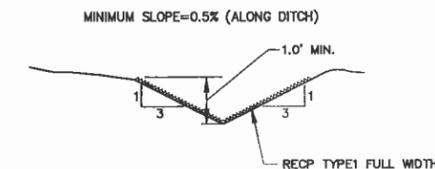
SEEDING REQUIREMENTS

1. SEEDBED PREPARATION. APPLY LIME AND FERTILIZER AT RATES LISTED IN (2) AND INCORPORATE INTO THE TOP 4-6 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. HYDROSEEDING MAY BE USED FOR APPLICATION.
2. SOIL AMENDMENTS. THE FOLLOWING LIME AND FERTILIZER APPLICATION RATES ARE MINIMUM REQUIREMENTS. CONTRACTOR SHOULD TEST SOIL FOR DETERMINING SPECIFIC RATES.

AGRICULTURAL LIME	1.5 TONS/ACRE
5-10-10 FERTILIZER	0.5 TON/ACRE
3. SEED. LEGUME SEED SHALL BE INOCULATED WITH RHIZOBIUM BACTERIA. ALL SEED SHALL BE "CERTIFIED SEED". APPLY SEED UNIFORMLY AND MULCH WITH STRAW OR WOOD FIBER MULCH AT A RATE OF 1 TON/ACRE.
4. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, NC LAND QUALITY SECTION. INCLUDING HYDROSEEDING, ALL SEEDING APPLICATIONS SHALL BE CONSISTENT WITH THE REQUIREMENTS PROVIDED IN THE ESCPD MANUAL. UPON REQUEST, ENGINEER SHALL PROVIDE CONTRACTOR WITH SPECIFIC SECTIONS.

NOTES:

1. TC-2 IS INSTALLED AS A TEMPORARY DIVERSION ROUTING ALL CELL 1 RUNOFF TO THE WEST BASIN.



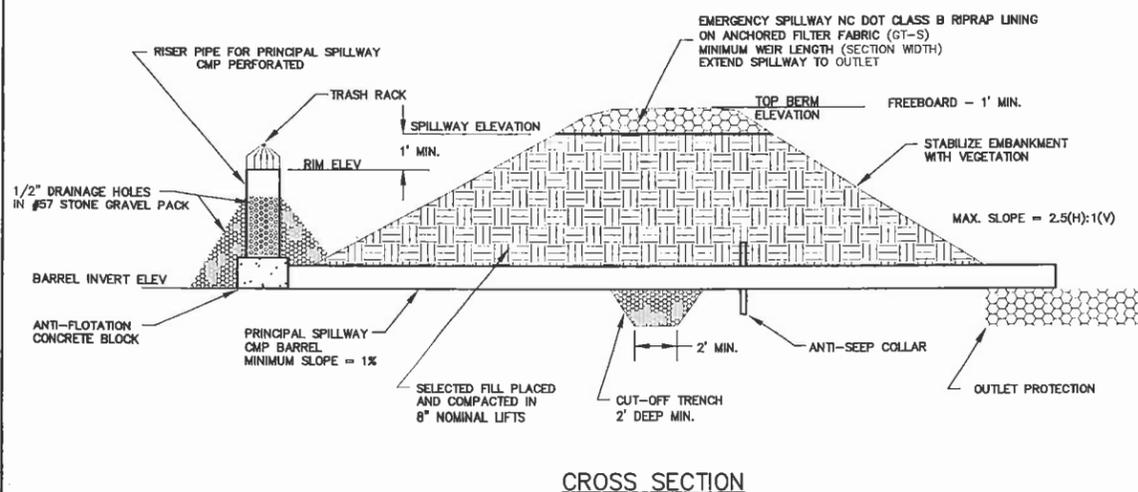
5 - V-DITCH TC-2
NOT TO SCALE

TABLE 1: SEDIMENT BASIN DATA

BASIN	MAIN	WEST
Q 10-YR	85	26
VOLUME (CF)	84,050	17,000
SURFACE AREA (SF)	57,800	12,000
RISER DIA.	36"	15"
RIM ELEVATION	92	91
BARREL DIA.	30"	12"
INVERT ELEV.	87	88
SPILLWAY ELEV.	94	92
TOP OF BERM	96	94
WEIR LENGTH	30'	20'

TABLE 2: SEEDING SCHEDULE

APPLICATION AREA	SEEDING MIX	RATE (lb/acre)	BEST DATES	POSSIBLE DATES
Gross Lined Channels	Tall Fescue	100	late Aug - Oct	Feb - mid April
	Millet	100	Mar - Aug	
Borrow Areas	Tall fescue	80	8/15 - 9/15 or 2/15 - 3/21	8/20 - 10/25 or 2/1 - 4/15
	Sericea lespedeza	25		
Landfill - temporary	Tall fescue	80	8/15 - 9/15 or 2/15 - 3/21	8/20 - 10/25 or 2/1 - 4/15
	Sericea lespedeza	25		
Landfill - final	Tall fescue	80	2/15 - 3/20 or 9/1 - 9/30	2/15 - 4/30 or 9/1 - 10/31
	Kobe lespedeza	40		



CROSS SECTION

3 - SEDIMENT BASIN
NOT TO SCALE

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CONSTRUCTION PLAN PERMIT
WILSON, NORTH CAROLINA

PREPARED FOR:
WILSON COUNTY
DEPARTMENT OF SOLID WASTE
113 E. NASH STREET
WILSON, NORTH CAROLINA 27894

NO. DESCRIPTION DATE

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DETAILS

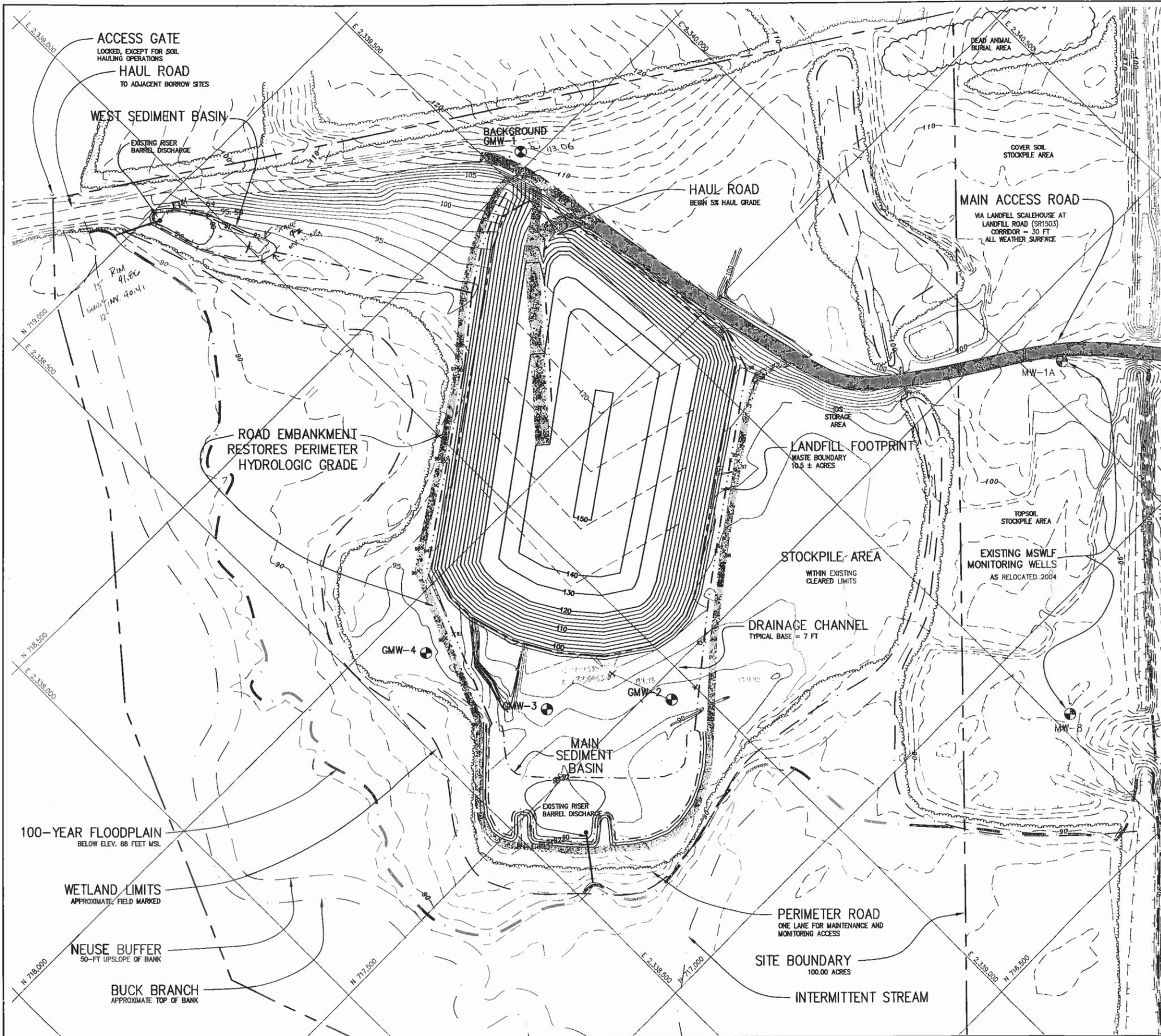
SCALE: AS SHOWN
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PERMIT ISSUE
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D3



CONSTRUCTION NOTES:

- PURPOSE:** THIS FACILITY PLAN FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, IS PREPARED FOR A PERMIT TO CONSTRUCT ISSUED BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 13B.
- FACILITY DESCRIPTION:** THE PROPOSED FACILITY PROPERTY IS 100.00 ACRES OWNED BY WILSON COUNTY. THE PROPOSED WASTE BOUNDARY IS 10.5 ACRES, AND IS DEFINED AS THE LANDFILL FOOTPRINT. IN ADDITION TO THE LANDFILL, THE PLAN ALSO DELINEATES SEDIMENT BASINS, ROADS, EARTHEN EMBANKMENTS, AND BUFFER ZONES. THE ESTIMATED FACILITY LIFE IS 10.8 YEARS.
- WASTE STREAM AND DISPOSAL RATE:** THE LANDFILL WILL RECEIVE CONSTRUCTION AND DEMOLITION WASTE GENERATED WITHIN WILSON COUNTY, NORTH CAROLINA. OTHER WASTE TYPES APPROVED BY THE DIVISION FOR DISPOSAL; SEE PERMIT CONDITIONS OR AGENCY CORRESPONDENCE FOR SPECIFIC APPROVED WASTE TYPES, INCLUDING SPLIT TIRES AND TOBACCO DUST. THE ESTIMATED AVERAGE ANNUAL DISPOSAL RATES IS 20,000 TONS/YEAR.
- ACCESS CONTROL:** NATURAL TOPOGRAPHIC AND VEGETATIVE CONDITIONS AND CONTROL MEASURES LIMIT PUBLIC ACCESS TO THE SITE. WILSON COUNTY WILL MAINTAIN THE GATED ENTRANCE TO THE EXISTING MSW FACILITY. ACCESS TO THE WESTSIDE SITE WILL BE CONTROLLED VIA THE EXISTING MANNED SCALEHOUSE DURING OPERATING HOURS.
- LOCAL GOVERNMENT APPROVAL:** THE PROPOSED LAND USE HAS BEEN APPROVED BY THE CITY OF WILSON AND WILSON COUNTY, ESTABLISHING PRIOR APPROVAL FOR THE DIVISION'S LANDFILL PERMIT.
- HYDROLOGIC GRADE RESTORATION:** APPROXIMATELY 1000 LINEAR FEET OF SOIL EMBANKMENT FILL WILL BE PLACED TO RESTORE HYDROLOGIC CONDITIONS AND ESTABLISH STORMWATER CONTROL FOR THE LANDFILL CONSTRUCTION LIMITS. THE MINIMUM PEAK ELEVATION FOR THE EMBANKMENT FILL IS 94 MSL.
- BASE GRADE:** AN AVERAGE 2-FOOT LAYER OF COMPACTED SOIL WILL BE ADDED TO THE EXISTING GRADE WITHIN THE FOOTPRINT. UNDER THE INITIAL 5-YEAR PERMIT TO CONSTRUCT, THE COMPACTED SOIL LAYER WILL BE CONSTRUCTED IN THREE TO FOUR LIFTS WITH SOILS APPROVED BY THE ENGINEER. AT AN AVERAGE LAYER THICKNESS OF 3.0 FEET, THE REQUIRED SOIL VOLUME FOR BASE CONSTRUCTION IS APPROXIMATELY 50,000 CUBIC YARDS. SEE ENGINEERING PLAN AND BASE GRADE PLAN DRAWING C1 FOR REQUIREMENTS.
- LANDFILL OPERATIONAL GRADE:** THE LANDFILL WILL BE OPERATED IN 5 TO 10-FOOT LIFTS, PROGRESSING EVENLY ACROSS THE FOOTPRINT. AT THE INTERMEDIATE HEIGHT OF 10 FEET ABOVE BASE GRADE, THE ENTIRE 10.5 ACRE FOOTPRINT PROVIDES APPROXIMATELY 4 YEARS OF CAPACITY. SOILS FOR COVER CONSTRUCTION ARE AVAILABLE FROM THE DEDICATED BORROW SITES ADJACENT TO THE SITE AND OWNED BY WILSON COUNTY.
- LANDFILL CAPACITY AND PROJECT LIFE:** THE FINAL GRADING PLAN FOR THE LANDFILL'S CONCEPTUAL DESIGN PROVIDES 433,560 CUBIC YARDS OF AIRSPACE FOR LANDFILL OPERATION AND FINAL COVER CONSTRUCTION. USING AN IN-PACE DENSITY OF 0.86 TONS/CUBIC YARD AND A 1:8 SOIL TO WASTE RATIO (1:167), THE AVERAGE DISPOSAL RATE OF 20,000 TONS/YEAR YIELDS A PROJECT LIFE = 10.8 YEARS.
- COVER SOILS:** DUE TO THE NON-PUTRESCIBLE NATURE OF THE WASTE, THE WORKING LIFT SHALL BE TYPICALLY COVERED ON A WEEKLY BASIS. THE TOP PORTION OF THE LIFT SHALL RECEIVE A MINIMUM COVER OF SIX INCHES. AS SECTIONS OF THE PERIMETER SLOPES ARE COMPLETED, THE 24-INCH FINAL COVER VSL SHALL BE PLACED AND COMPACTED. THE TOTAL SOIL VOLUME REQUIRED FOR THE WESTSIDE C&D LANDFILL PROJECT IS APPROXIMATELY 165,000 CUBIC YARDS. BASED ON AN AVERAGE EXCAVATION DEPTH OF 5 FEET BELOW THE EXISTING LAND SURFACE FROM THE 50 ACRES AVAILABLE FROM THE TUCKER AND MOHESKY SITES, THE MINIMUM ESTIMATE OF REMAINING SOIL RESOURCES FOR THE OFF-SITE BORROW AREAS IS 400,000 CUBIC YARDS. THE ENGINEER SHALL SPECIFY SOIL PROPERTIES FOR SPECIFIC LANDFILL APPLICATIONS.
- WATER QUALITY MONITORING PLAN:** THE DETECTION MONITORING NETWORK INCLUDES FOUR GROUNDWATER MONITORING WELLS. OVERALL, ONE UPGRADIENT AND THREE DOWNGRADIENT LOCATIONS PROVIDE A MONITORING WELL DENSITY OF 1 DETECTION STATION PER 3.5 ACRES OF LANDFILL AREA. DOWNGRADIENT WELL INSTALLATIONS ARE SPACED EQUALLY ACROSS A 125-FOOT OFFSET (REVIEW BOUNDARY) TO THE LANDFILL FOOTPRINT. COMPLETION INTERVALS SHALL BE WITHIN THE UPPERMOST 10-15 FEET OF THE SEASONAL HIGH WATER TABLE AND SHALL TARGET THE TAN AND ORANGE SAND UNITS IN THE CHARACTERIZED STRATIGRAPHY. GROUND SURFACE ELEVATIONS LEADING TO (HW DRIVE PATH) AND SURROUNDING THE WELLS SHALL BE AT LEAST 93 FEET MSL.
- CLOSURE AND POST CLOSURE:** WHEN OPERATIONS HAVE REACHED FINAL DESIGN GRADE, THE LANDFILL WILL BE COVERED WITH AT LEAST TWO FEET OF COMPACTED SOIL COVER. THE FINAL SOIL COVER WILL BE VEGETATED WITH NATIVE GRASSES ACCORDING TO THE SITE'S VEGETATION PLAN. INSPECTIONS WILL BE CONDUCTED PERIODICALLY TO OBSERVE THE INTEGRITY OF THE FINAL COVER. REPAIRS WILL BE MADE AS NECESSARY TO RESTORE THE VEGETATIVE SOIL COVER.

LEGEND

- WESTSIDE SITE BOUNDARY
- LANDFILL FOOTPRINT
10.5 ACRES
- EXISTING LANDFILL LIMITS
- 100-YEAR FLOODPLAIN
- NEUSE BUFFER
- SURFACE WATER
- WETLAND BOUNDARY
- P1 INTERMEDIATE GRADE 2-FT CONTOUR
- FINAL GRADE 2-FT CONTOUR
- 2003 TOPOGRAPHY 1-FT CONTOUR
- 1998 TOPOGRAPHY 2-FT CONTOUR
- DRAINAGE CHANNEL
- ⊕ GMW-4 GROUNDWATER MONITORING WELL

**PERMIT ISSUE
NOT FOR CONSTRUCTION**

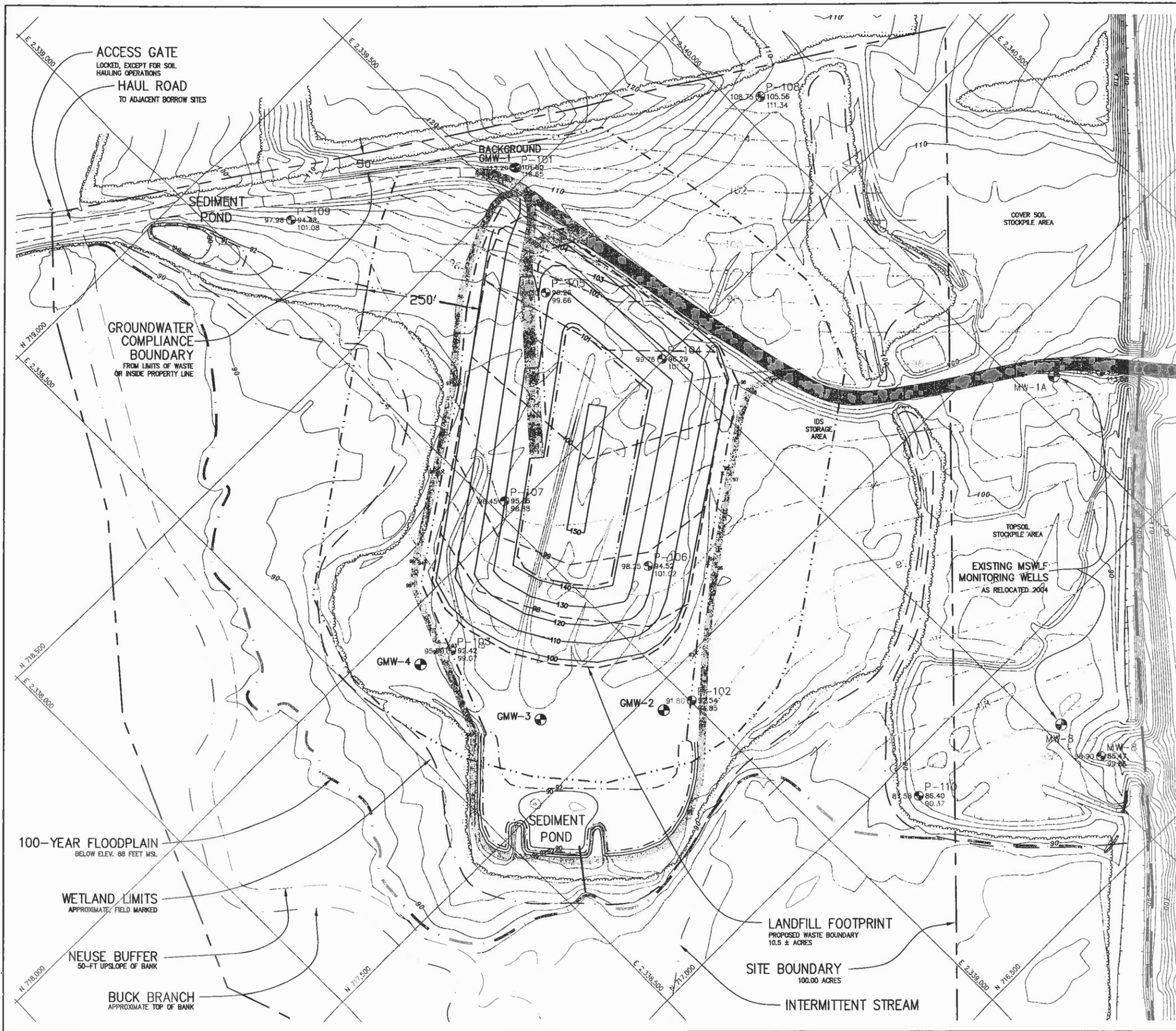
GRAPHIC SCALE
1" = 100'
1 inch = 100 ft

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PROJECT: WESTSIDE C&D LANDFILL CONSTRUCTION PLAN PERMIT WILSON, NORTH CAROLINA

PREPARED FOR: WILSON COUNTY DEPARTMENT OF SOLID WASTE 113 E. NASH STREET WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE
REVISIONS		
WESTSIDE FACILITY PLAN		
SCALE: 1"=100'		
DATE: 9/01/04		
DRN. BY: GWA		
CHECKED BY: GWA		
PROJECT NO:		
DRAWING NO. F1		



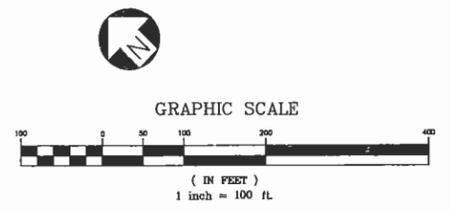
NOTES:

- PURPOSE.** THIS DETECTION MONITORING PLAN IS PROPOSED FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, PREPARED FOR APPROVAL BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 13B. THE PLAN WAS PREPARED UNDER THE SUPERVISION OF MR. GARY D. BABB, PG.
- TOPOGRAPHIC FEATURES.** SITE TOPOGRAPHY IS FROM AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY GEODATA CORP., ZEBULON, NC. MAPPED CONDITIONS FROM MARCH 1998 ARE GENERALLY REPRESENTATIVE OF EXISTING CONDITIONS (JULY 2003). REFERENCE DRAWING SC1 FOR STREAM, WETLAND, FLOODPLAIN, AND OTHER SOURCES.
- WESTSIDE C&D LANDFILL SITE.** THE 100.00 ACRE SITE PROPERTY BOUNDARY ILLUSTRATED ON THIS DRAWING IS REPRESENTATIVE OF THE "RECOMBINATION PLAN FOR THE WESTSIDE C&D LANDFILL SITE" PREPARED BY HERRING-SUTTON & ASSOCIATES, P.C. (WILSON, NORTH CAROLINA), APRIL 2003.
- MONITORING NETWORK.** EXISTING WELL P-101 SHALL BE DESIGNATED AS THE UPGRADIENT BACKGROUND WELL GMW-1. THREE NEW WELLS WILL BE INSTALLED IN THE UPPER 15-20 FEET OF THE IN-SITU SOIL. DOWNGRADIENT WELL INSTALLATIONS ARE SPACED EQUALLY ACROSS A 125-FOOT OFFSET (REVIEW BOUNDARY) TO THE LANDFILL FOOTPRINT. GROUND SURFACE ELEVATIONS LEADING TO (4W DRIVE PATH) AND SURROUNDING THE WELLS SHALL BE AT LEAST 93 FEET MSL.
- PIEZOMETER ABANDONMENT.** ALL PIEZOMETERS SHALL BE ABANDONED ACCORDING TO 15A NCAC 2C, WITH ASSOCIATED DOCUMENTATION.
- SURVEY DATA.** NORTH CAROLINA REGISTERED LAND SURVEYORS, HERRING SUTTON & ASSOCIATES, WILSON, NORTH CAROLINA, SHALL SURVEY THE LOCATION AND ELEVATION POSITIONS OF EACH WELL AFTER INSTALLATION.
- MONITORING SYSTEM DESIGN.** THE LANDFILL BASE DESIGN INCLUDES CONSTRUCTION OF A COMPACTED SOIL LAYER THAT WILL PROVIDE FOR VERTICAL SEPARATION FROM THE SEASONAL HIGH WATER TABLE AND CONTROL INFILTRATION FROM THE LANDFILL BASE. DEEPER IN THE SURFICIAL AQUIFER, THE PRESENCE OF LOW-PERMEABILITY CLAYS DEPOSITED IN HORIZONTAL LENSES SIGNIFICANTLY LIMITS VERTICAL GROUNDWATER FLOW POTENTIAL. MOST IMPORTANTLY, THE PREFERENTIAL LATERAL GROUNDWATER FLOW IN THE UNCONFINED SURFICIAL AQUIFER SANDS TOWARD A GROUNDWATER DISCHARGE ZONE PRESENTS HYDROGEOLOGIC CONDITIONS THAT CAN BE EFFECTIVELY MONITORED WITH SHALLOW GROUNDWATER MONITORING WELLS. DUE TO THE EXTENT OF WETLANDS AND DENSE VEGETATION SURROUNDING BUCK BRANCH, SURFACE WATER MONITORING IS NOT A NECESSARY COMPONENT OF THE SITE'S DETECTION MONITORING SYSTEM.
- DETECTION INTERVAL IN THE SURFICIAL AQUIFER.** COMPLETION INTERVALS SHALL BE WITHIN THE UPPERMOST 10-15 FEET OF THE SEASONAL HIGH WATER TABLE AND SHALL TARGET THE TAN AND ORANGE SAND UNITS IN THE CHARACTERIZED STRATIGRAPHY.

LEGEND

- GMW-2 MONITORING WELL**
DETECTION MONITORING STATION
- POTENTIOMETRIC CONTOUR**
1-FOOT CONTOUR INTERVAL, 19 NOV 02
- BASE CONTOUR 1-FOOT**
1-FOOT CONTOUR INTERVAL, 19 NOV 02
- WESTSIDE SITE BOUNDARY**
- LANDFILL FOOTPRINT**
PROPOSED 10.5 ACRES
- EXISTING LANDFILL LIMITS**
OFFSITE MSWLF UNIT
- 100-YEAR FLOODPLAIN**
- NEUSE BUFFER**
- SURFACE WATER**
- WETLAND BOUNDARY**
- CONTOUR 2-FOOT** MAR98 MAPPING
- CONTOUR 10-FOOT** MAR98 MAPPING
- GROUND ELEVATION**
- WELL COORDINATES ON CENTER**
- BORING/PIEZO ID**
- WATER ELEVATION AT INSTALLATION 11/19/02**
- TOP OF CASING SURVEYED ELEVATION**

PERMIT ISSUE
NOT FOR CONSTRUCTION



Babb & Associates, P.A.
P.O. BOX 37897
RALEIGH, NORTH CAROLINA 27627

GARY W. AHLBERG, P.E.
P.O. BOX 58
WILMINGTON, NORTH CAROLINA 28402
910.232.6696
gahw@earthlink.net

PROJECT:
WESTSIDE C&D LANDFILL
CONSTRUCTION PLAN APPLICATION
WILSON, NORTH CAROLINA

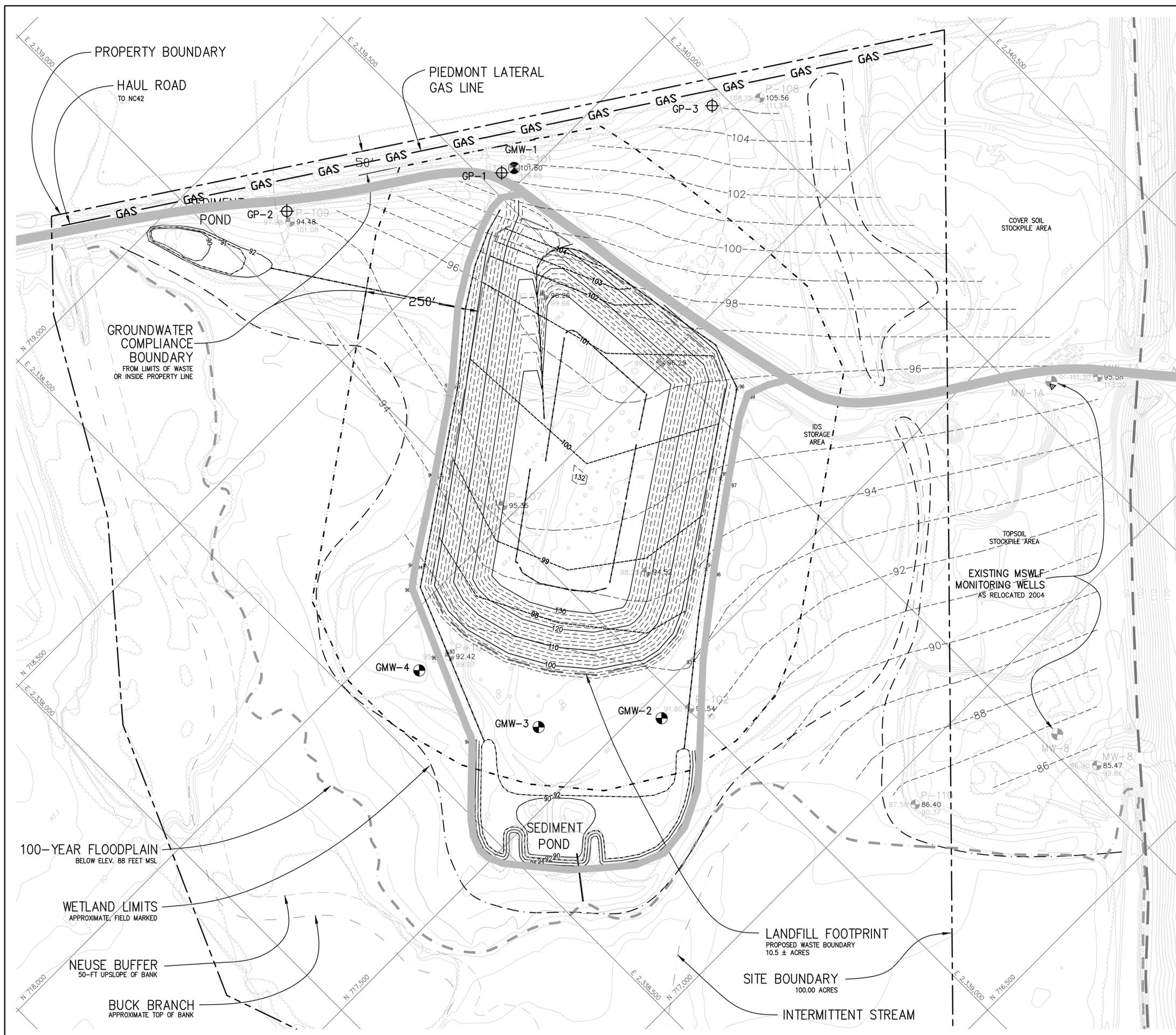
PREPARED FOR:
WILSON COUNTY
DEPARTMENT OF SOLID WASTE
113 E. NASH STREET
WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE
REVISIONS		

GROUNDWATER MONITORING PLAN

SCALE: 1"=100'
DATE: 09/01/04
DRN. BY: GWA
CHECKED BY: GDB

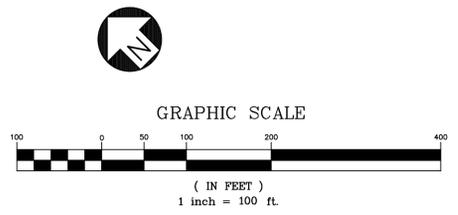
PROJECT NO:
DRAWING NO. M1



- NOTES:**
1. PURPOSE. THIS GAS DETECTION MONITORING PLAN IS PROPOSED FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, PREPARED FOR APPROVAL BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 13B.
 2. TOPOGRAPHIC FEATURES. SITE TOPOGRAPHY IS FROM AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY GEODATA CORP., ZEBULON, NC. MAPPED CONDITIONS FROM MARCH 1998 ARE GENERALLY REPRESENTATIVE OF EXISTING CONDITIONS (JULY 2003). REFERENCE DRAWING SC1 FOR STREAM, WETLAND, FLOODPLAIN, AND OTHER SOURCES.
 3. WESTSIDE C&D LANDFILL SITE. THE 100.00 ACRE SITE PROPERTY BOUNDARY ILLUSTRATED ON THIS DRAWING IS REPRESENTATIVE OF THE "RECOMBINATION PLAT FOR THE WESTSIDE C&D LANDFILL SITE" PREPARED BY HERRING-SUTTON & ASSOCIATES, P.C. (WILSON, NORTH CAROLINA), APRIL 2003.
 4. GAS PROBE. GAS MONITORING PROBES SHALL BE INSTALLED WITH A TOTAL DEPTH JUST ABOVE THE WATER TABLE.
 5. EXPLOSIVE GAS MONITORING. EXPLOSIVE GAS CONCENTRATIONS SHALL BE MONITORED QUARTERLY AND RECORDED AS A PERCENTAGE OF THE LOWER EXPLOSIVE LIMIT (LEL).
 6. GAS PROBE INSTALLATION AND MONITORING SHALL CONFORM TO THE CURRENT SWS GUIDANCE, EQUIPMENT MANUFACTURER'S RECOMMENDATIONS, AND ACCEPTED STANDARDS OF PRACTICE.
 7. INSTALLATION AND SURVEY RECORDS, AND MONITORING RESULTS SHALL BE PLACED IN THE OPERATING RECORD AND SUBMITTED TO THE SWS IN ACCORDANCE WITH PERMIT CONDITIONS.

- LEGEND**
- GP-1 GAS PROBE PROPOSED LOCATION
 - GMW-2 MONITORING WELL DETECTION MONITORING STATION
 - POTENTIOMETRIC CONTOUR 1-FOOT CONTOUR INTERVAL, 19 NOV 02
 - BASE CONTOUR 1-FOOT 1-FOOT CONTOUR INTERVAL, 19 NOV 02
 - WESTSIDE SITE BOUNDARY
 - LANDFILL FOOTPRINT PROPOSED 10.5 ACRES
 - EXISTING LANDFILL LIMITS OFFSITE MSWLF UNIT
 - 100-YEAR FLOODPLAIN
 - NEUSE BUFFER
 - SURFACE WATER
 - WETLAND BOUNDARY
 - CONTOUR 2-FOOT MAR98 MAPPING
 - CONTOUR 10-FOOT MAR98 MAPPING
 - GROUND ELEVATION
 - WELL COORDINATES ON CENTER
 - BORING/PIEZO ID WATER ELEVATION AT INSTALLATION 11/19/02
 - TOP OF CASING SURVEYED ELEVATION

**PERMIT ISSUE
NOT FOR CONSTRUCTION**



BLACKROCK ENGINEERS, INC.
 POST OFFICE BOX 58
 WILSON, NORTH CAROLINA 28401
 107 PLUMTREE LANE
 CASTLE HAYNE, NORTH CAROLINA 28429
 PHONE: 910.232.6696
 NC LIC. # C-2919

PROJECT:
 WESTSIDE C&D LANDFILL
 CONSTRUCTION PLAN
 WILSON, NORTH CAROLINA

PREPARED FOR:
 WILSON COUNTY
 DEPARTMENT OF SOLID WASTE
 113 E. NASH STREET
 WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE
REVISIONS		

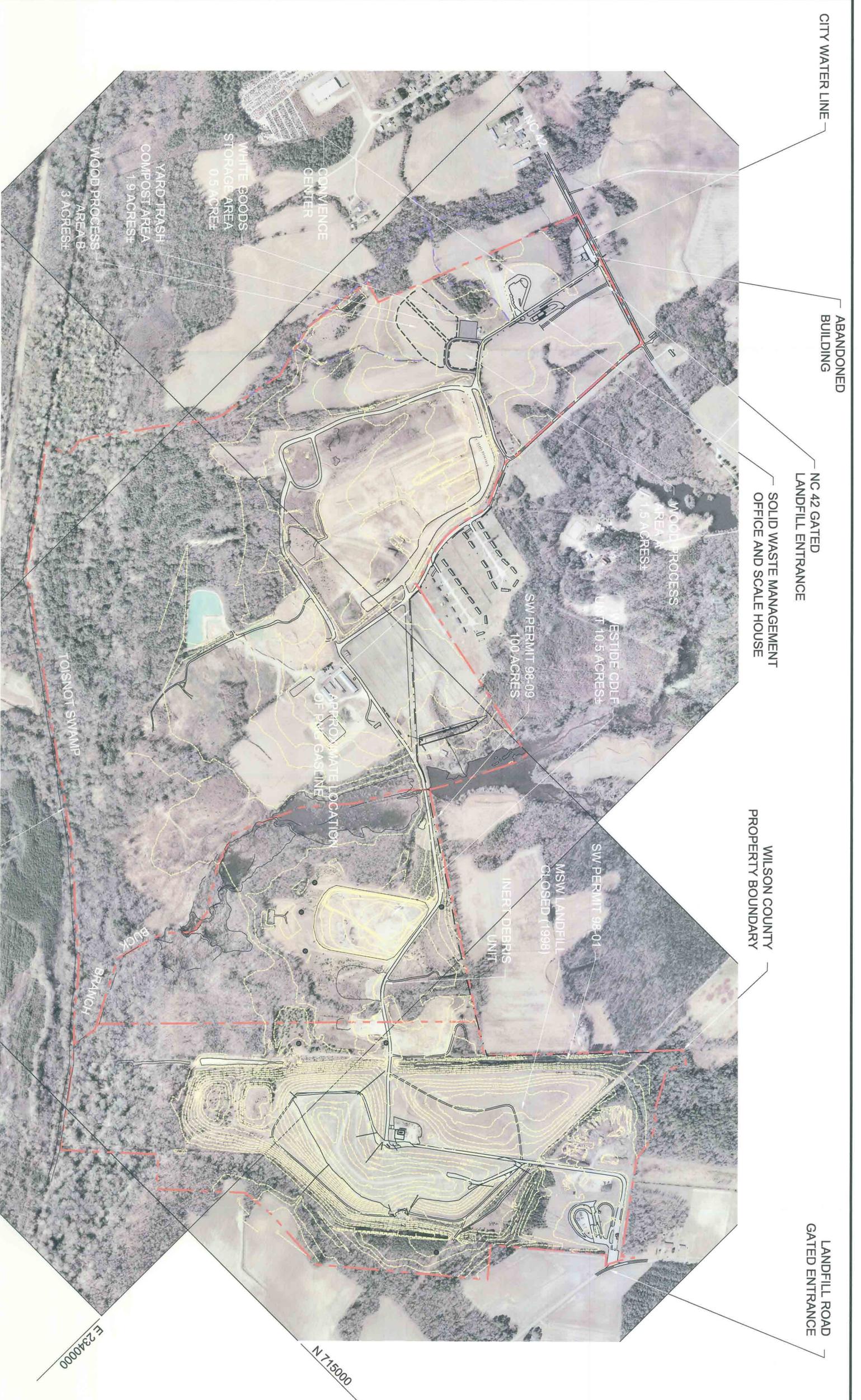


**GAS
MONITORING
PLAN**

SCALE: 1"=100'
 DATE: 11.24.10
 DRN. BY: JWG
 CHECKED BY: GWA

PROJECT NO:
 WCL10-07

DRAWING NO.
LFG1



- FACILITY NOTES:**
1. THE WILSON COUNTY LANDFILL FACILITY INCLUDES 709 ACRES, INCORPORATING THE FOLLOWING SITES AND AREAS:
 INDIANT ALL-CLOSED SANITARY LANDFILL (SW PERMIT 98-01)
 WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL AND NEXT DEBRIS UNIT (SW PERMIT 98-09)
 WOOD PROCESSING AREAS
 YARD TRASH COMPOST AREA
 WHITE GOODS STORAGE AREA
 SOIL BORROW SITES
 MAINTENANCE AND ADMINISTRATION BUILDINGS
 CONVENIENCE CENTER
 2. THE SITE IS SECURED BY LOCKING GATES, FENCES, AND BARRIERS TO PREVENT UNAUTHORIZED ACCESS.
 3. THE MAIN FACILITY ENTRANCE IS LOCATED ON NC 42
 4. ALL WILSON COUNTY PROPERTY IS CURRENTLY ZONED A1.

**WILSON COUNTY
PROPERTY BOUNDARY**

- LEGEND**
- PROPERTY BOUNDARY
 - - - SURFACE WATER
 - 5-FOOT CONTOURS

NO.	DATE	REVISION

BLACKROCK ENGINEERS, INC.

POST OFFICE BOX 58
 WILMINGTON, NORTH CAROLINA 28401
 107 PLUMTREE LANE
 CASTLE HAYNE, NORTH CAROLINA 28429
 PHONE: 910.232.6696
 NC LICENSE # C-2919



PROJECT TITLE:
 WILSON COUNTY LANDFILL
 2400 NC HWY 42 EAST
 WILSON, NC

DRAWING TITLE:
 WILSON COUNTY LANDFILL
 FACILITY SITE PLAN

DESIGNED BY: G.W.A.	DRAWN BY: J.W.G.
CHECKED BY: G.W.A.	PROJECT NO.:
SCALE: 1"=400'	DATE: 11.11.10
TITLE NAME: WCL1007.D0001_AERIAL	SHEET NO.:
1	S1



WILSON COUNTY LANDFILL

2400 NC Highway 42 East, Gardeners Township Wilson County, North Carolina

DEVELOPER/OWNER:

WILSON COUNTY
PO BOX 1728
WILSON, NC 27893

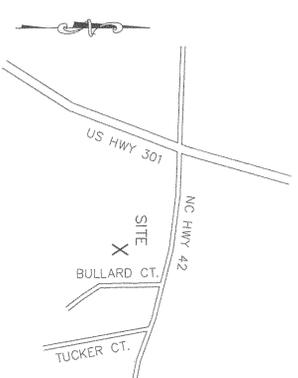
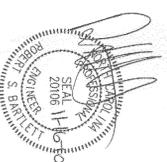
PREPARED BY:

BARTLETT ENGINEERING & SURVEYING, PC
1906 NASH STREET NORTH
WILSON, NORTH CAROLINA 27893-1726

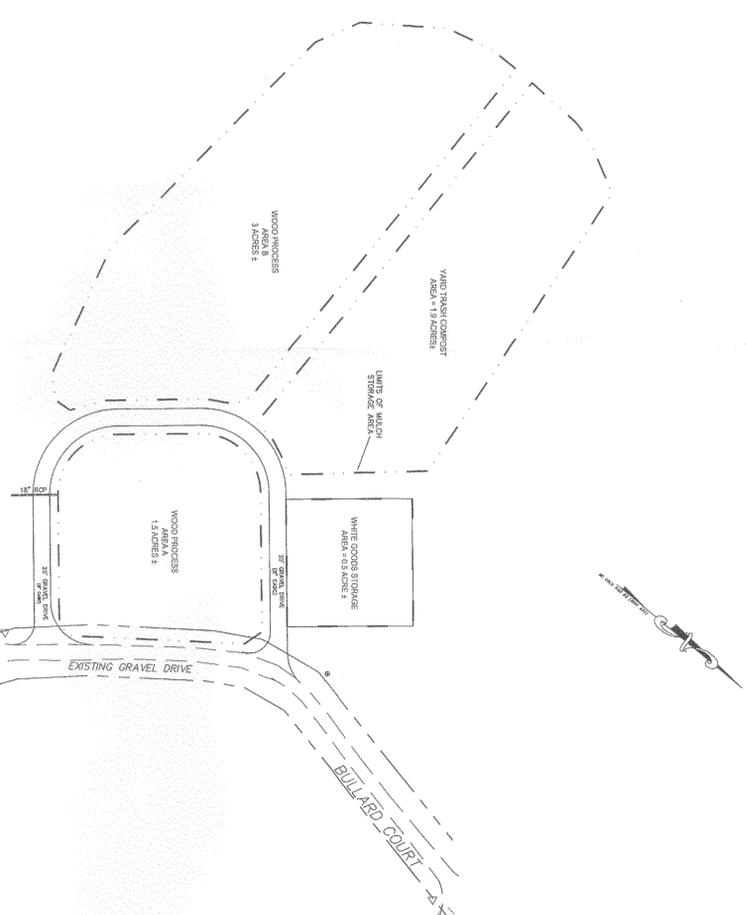
SHEET INDEX

SP1	OVERALL MAP
SP2	SITE PLAN
SP3	GRADING / SEDIMENTATION AND EROSION CONTROL
SP4	CONSTRUCTION PLAN
DT1	DETAILS AND CALCULATIONS

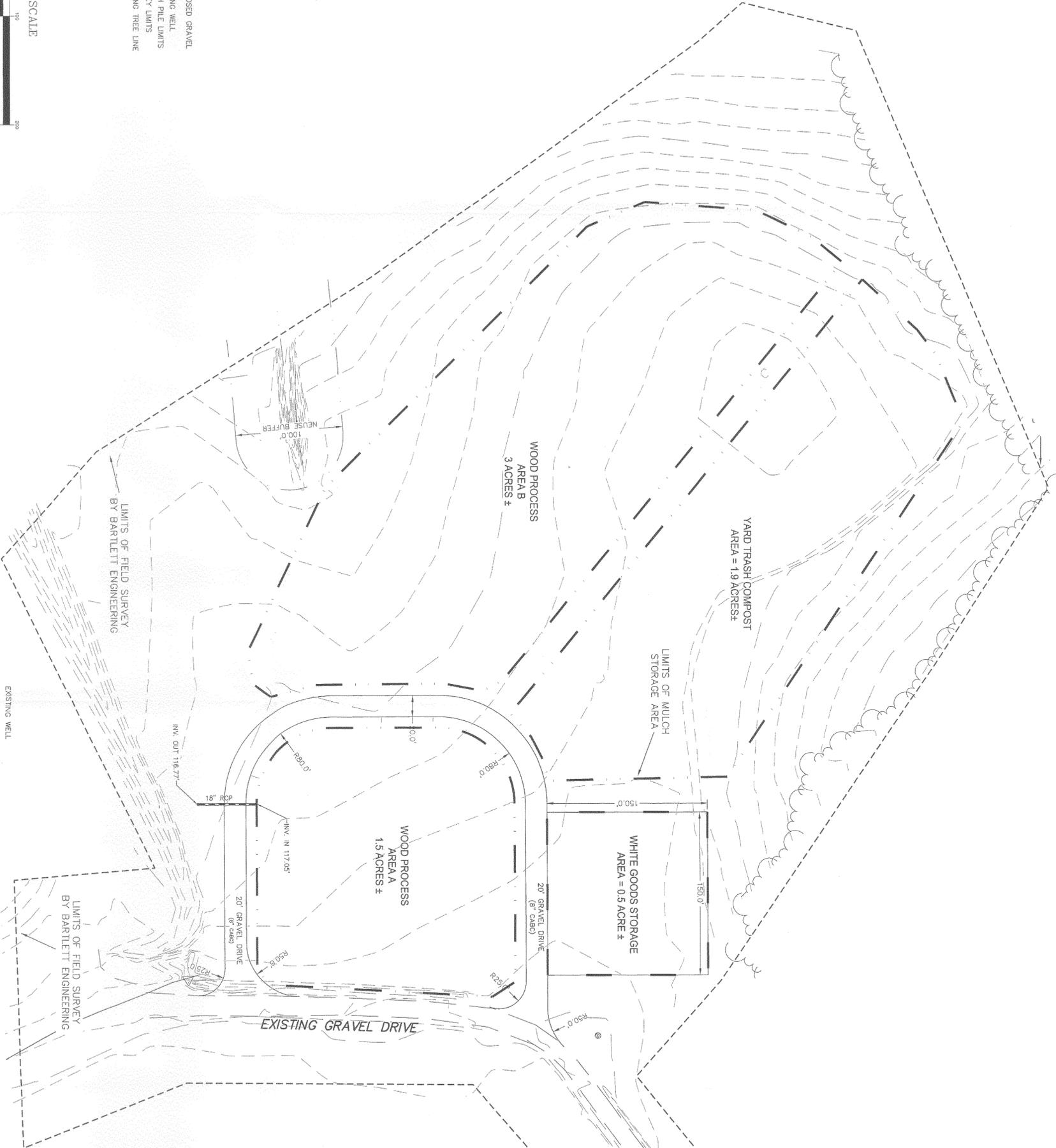
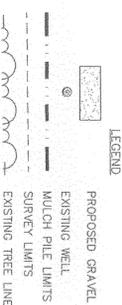
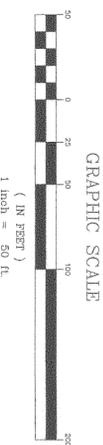
SITE DATA	709± ACRES
TOTAL AREA	AR
ZONING	FRONT35'
MIN. BLDG. LINES	SIDE 15'
REFERENCE:	REAR 30'
	DB 1562 PG. 165
	DB 1577 PG. 567
	DB 1950 PG. 792
	DB 2150 PG. 709
	DB 2338 PG. 867



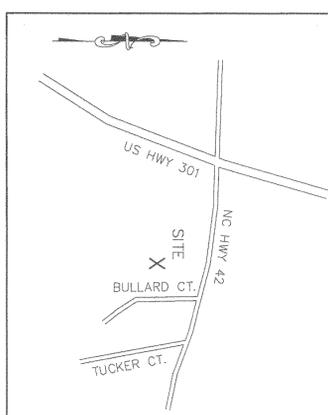
VICINITY MAP
NO SCALE



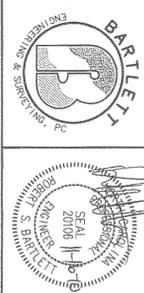
LOCATION MAP
NO SCALE



THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING SUCH UTILITIES IN THE AREA. THE AREA HAS BEEN SERVICED OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



LOCATION MAP
NO SCALE



BARTLETT
ENGINEERING & SURVEYING, PC
1906 NASH STREET NORTH
WILSON, N.C. 27893-1726
TELE: (252) 399-0704
FAX: (252) 399-0904
EMAIL: info@bartletteng.com

SITE PLAN

WILSON COUNTY LANDFILL
(MULCH STORAGE, YARD WASTE COLLECTION, WHITE GOODS COLLECTION AREAS)
2400 NC HIGHWAY 42 EAST

DATE: OCT. 2009
SCALE: 1" = 50'
REVISIONS:

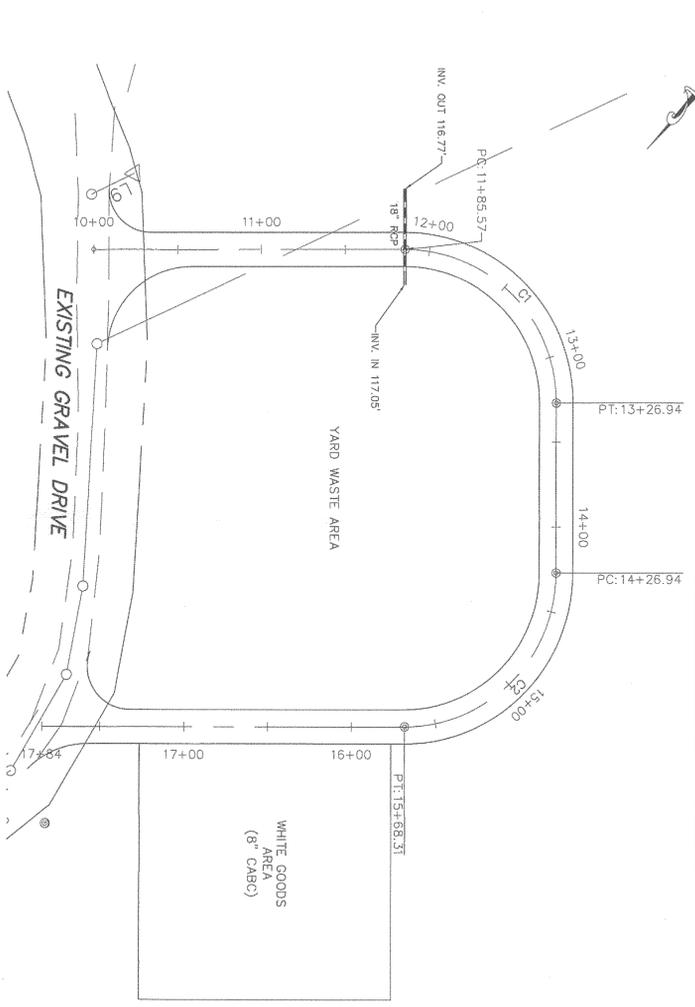
PROJECT: 09158
CLIENT CODE: WC
CADDLE: 09158P2
DRAWN BY: GP/AR/JM
CHECKED BY: TB/KLP

GARDNERS TOWNSHIP
NORTH CAROLINA
PIN # 3732-52-9078

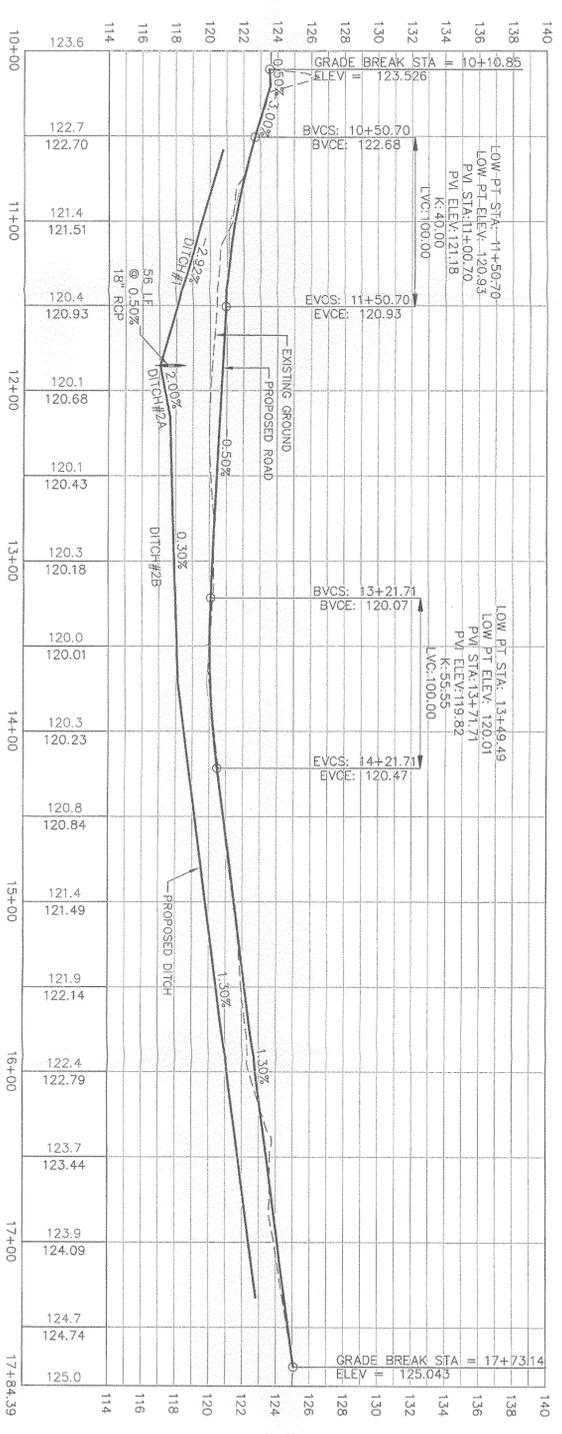
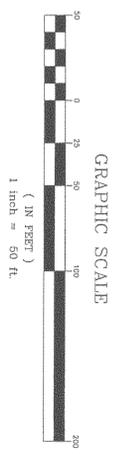
WILSON COUNTY
ZONE: AR
SHEET SP2



CURVE	LENGTH	RAIUS	DELTA	TANGENT	CHORD BEG.	CHORD END
C1	141.37	90.00	90°00'00"	90.00	N84°40'31"W	127.28
C2	141.37	90.00	90°00'00"	90.00	N5°19'29"E	127.28



GRAVEL DRIVE 20' EP-EP PLAN VIEW



CONTRACTOR RESPONSIBLE FOR COMPLYING WITH ALL REQUIREMENTS/CONDITIONS OF ALL ENCROACHMENTS & PERMITS INCLUDING PROVIDING BONDS/INSURANCE IF REQUIRED. CONTRACTOR IS RESPONSIBLE FOR COORDINATING REQUIRED INSPECTIONS BY NCDOT AND/OR WITH MUNICIPALITY.

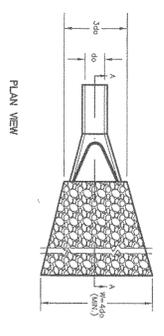
EROSION CONTROL NOTES-

1. SEEDING AND MULCHING TO BE APPLIED WITHIN 15 WORKING DAYS OF ALL LAND DISTURBING ACTIVITIES NOT PREVIOUSLY STABILIZED.
2. SILT FENCE TO BE INSTALLED AS SHOWN ON PLANS OR AS DEMAND NECESSARY BY VISUAL OBSERVATION.

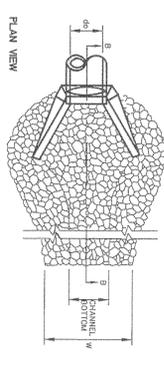
LOCATION, QUANTITY AND PLACEMENT OF DRAINAGE PIPES AND EROSION CONTROL DEVICES MAY VARY TO BETTER CONFORM TO FIELD CONDITIONS.

UTILITIES SHOWN ON PLANS ARE LOCATED APPROXIMATELY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING UTILITIES AND SERVICES WHETHER SHOWN ON PLANS OR NOT. CONTRACTOR TO BE RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF THESE FACILITIES IF DAMAGED.

TYPE A
PIPE OUTLET TO FLAT AREA WITH NO DERIVED CHANNEL.

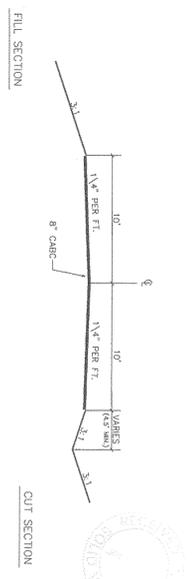


TYPE B
PIPE OUTLET TO WELL-DERIVED CHANNEL.

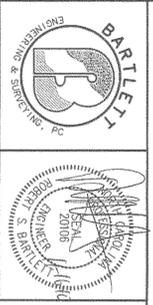


MAINTENANCE:
KEEP OUTLETS OPEN/CLEAR AFTER HEAVY RAIN TO PREVENT BACKFLOW OF WATER INTO DRAINAGE CHANNELS. MAINTAINERS SHALL MAKE ALL NEEDED REPAIRS TO PREVENT CHANNEL DAMAGE.

OUTLET PROTECTION NO SCALE



PROPOSED 20' EP-EP ROAD SECTION
No Scale



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WILSON, N.C. 27783-1726
TELE: (252) 399-0704
FAX: (252) 399-0804
EMAIL: info@bartletteng.com

CONSTRUCTION PLANS

WILSON COUNTY LANDFILL
(MULCH STORAGE, YARD WASTE COLLECTION, WHITE GOODS COLLECTION AREAS)
2400 NC HIGHWAY 42 EAST

DATE: OCT. 2009
SCALE: H:1"=50' V:1"=5'
REVISIONS: Δ NC DENR COMMENTS 11-12-09

PROJECT: 09158 WC
CLIENT CODE: 091581P2
FIELD BOOK: BF
SURVEY BY: TBK/RJP
GARDNERS TOWNSHIP
NORTH CAROLINA
ZONE: AR
PIN # 3732-52-9078
SHEET SP4

Monitoring Plan

**Wilson County Westside C&D Landfill
Wilson County, North Carolina**

Prepared for:

**Wilson County Solid Waste Management Dept.
Wilson, North Carolina**

June 2010

Revised December 2010



BlackRock Engineers, Inc.
PO Box 58
Wilmington, NC 28402

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TABLE OF CONTENTS

1.0	WATER QUALITY MONITORING PLAN	1-1
1.1	Regional Geology and Groundwater Use.....	1-2
1.1.1	<i>Regional Geology.....</i>	<i>1-2</i>
1.1.2	<i>Original Site Conditions.....</i>	<i>1-3</i>
1.1.3	<i>Groundwater Use.....</i>	<i>1-3</i>
1.2	Existing Site Hydrogeological Conditions.....	1-3
1.3	Monitoring System Design	1-5
1.3.1	<i>Groundwater Monitoring System.....</i>	<i>1-6</i>
1.3.2	<i>Piezometer Abandonment.....</i>	<i>1-7</i>
1.3.3	<i>Background Sampling.....</i>	<i>1-8</i>
1.4	Sampling and Analysis Procedures.....	1-8
1.4.1	<i>Sampling Equipment and Containers.....</i>	<i>1-8</i>
1.4.2	<i>Cleaning Procedures.....</i>	<i>1-8</i>
1.4.3	<i>Purging Procedures.....</i>	<i>1-8</i>
1.4.4	<i>Groundwater Sample Collection Procedure.....</i>	<i>1-9</i>
1.4.5	<i>Field QA/QC Procedures.....</i>	<i>1-10</i>
1.4.6	<i>Laboratory QA/QC Procedures.....</i>	<i>1-11</i>
1.5	Field Logbook	1-12
1.6	Record Keeping and Reporting.....	1-12
1.6.1	<i>Sampling Reports.....</i>	<i>1-12</i>
1.7	Well Abandonment/Rehabilitation	1-13
1.8	Additional Well Installations	1-13

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Certification

The water quality monitoring plan for this facility has been prepared by a qualified geologist/engineer who is licensed to practice in the State of North Carolina. The plan has been prepared based on first-hand knowledge of site conditions and familiarity with North Carolina solid waste rules and industry standard protocol. This certification is made in accordance with North Carolina Solid Waste Regulations, indicating this Water Quality Monitoring Plan should provide early detection of any release of hazardous constituents to the uppermost aquifer, so as to be protective of public health and the environment. No other warranties, expressed or implied, are made.

Signed Gary D. Babb
Printed Gary D. Babb
Date June 21, 2010



Not valid unless this document bears the seal of the above mentioned licensed professional.

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1.0 WATER QUALITY MONITORING PLAN

This Water Quality Monitoring Plan (WQMP) is designed to address regulatory requirements as set forth in the Rules and to establish the compliance boundary for groundwater quality for the Westside C&D facility. The monitoring plan considers information and data gathered from previous and current studies of the Westside Site, adjacent MSWLF and Tucker Borrow Site and the Wilson County vicinity. Items that are addressed in this WQMP are:

- o Regional Geology
- o Existing Site Conditions
- o Monitoring System Design
- o Sampling and Analysis Procedures

Prepared under the supervision of Mr. Gary D. Babb, P.G., the final WQMP is presented in this Section. Based on the data and information provided, the monitoring system has been designed to provide early detection of any release of hazardous constituents to the uppermost aquifer, so as to be protective of the public health and the environment. Design of the monitoring system considers regional geology, data and conclusions from geologic and hydrogeologic investigations of the Westside Site and adjacent properties owned by Wilson County, characteristics of the waste, and the applicable state and federal rules and guidelines published for monitoring of RCRA Subtitle D facilities.

1.1 Regional Geology and Groundwater Use

1.1.1 Regional Geology

The Westside C&D facility is located in the western portion of the Carolina Coastal Plain near the Fall Line. The Fall Line is the province boundary between the Piedmont and the Coastal Plain provinces. It represents a significant change in lithology which in turn reflects a change in stream gradients. Lithology in the Piedmont province is primarily igneous and metamorphic while the Coastal Plain province is primarily sedimentary. In general, rivers and streams in the Piedmont Province have higher flow rates with well defined channels while Coastal Plain rivers and streams are meandering with lesser defined channels resulting in swamps and bays. These streams, swamps, and bays are the major discharge point of the uppermost aquifer. Downgradient from the CDLF footprint, Toisnot Swamp and Buck Branch are regional streams that form the property boundary for the Westside site and adjoining Wilson County properties (Mohesky Farm and MSWLF).

The Carolina Coastal Plain is underlain by flat-lying to very gently eastward dipping sedimentary strata which overlay a foundation of crystalline rocks. These sediments were deposited during repeated marine transgressive and regressive cycles due to fluctuations in sea level caused by expansion and recession of glacial ice caps during the Pliocene and early Pleistocene epochs (approximately 2 to 5 million years ago).

Sediments in the area of the Westside C&D facility are classified as being in the Yorktown Formation. Information gathered from the 1985 edition of the Geologic Map of North Carolina and The Geology of the Carolina, published in 1991, sites that sediments of the Yorktown Formation are fossiliferous clay with varying amounts of fine-grained sand, silty sand, sandy silt, silty clay, and bluish gray shell material. These types of deposits are found mainly north of the Neuse River and are commonly concentrated in lenses and vary in vertical and horizontal

dimensions. The topography of the Coastal Plain is characterized by flat to gently undulating relief.

1.1.2 Original Site Conditions

The Westside Site is a depleted borrow site for the Wilson County Landfill. The borrow site operation was completed in the mid 1990's. Prior to excavation the upland portion of the site was agricultural land, bounded by woodlands which still incorporate wetlands adjacent to Buck Branch and the intermittent stream present on-site.

1.1.3 Groundwater Use

The primary use of groundwater in the Coastal Plain region is for agricultural operations and for residential water supply. Expansion of city water and sewer systems will eventually make agriculture operations the primary user of groundwater in this region. Ms. Georgia Boulo, with the Wilson County Environmental Health Department, stated that presently, groundwater usage is 50 percent agriculture and 50 percent residential. She also stated that once planned expansion of the Wilson water and sewer system is complete, residential groundwater usage will likely decrease to approximately 5 percent and agriculture usage will increase to approximately 95 percent. Currently, the City of Wilson is capable of providing water services to residents in the landfill area through a 12 inch water line along SR 1503 - Landfill Road.

1.2 Existing Site Hydrogeological Conditions

The geologic and hydrogeologic investigations for the Westside CDLF were implemented in three phases to progressively define existing site conditions relevant to site suitability, and monitoring and engineering design. All data and evaluation of the hydrogeologic conditions are presented in the Site Plan documents and Addendum No. 1. A summary of the investigations is provided in this section relative to monitoring system design.

As shown in the USGS topographic map for the area, the major groundwater recharge feature for the Westside C&D facility is a topographic high (130± feet mean sea level) located approximately 4,000 feet northeast of the facility. The major groundwater discharge features influencing groundwater flow direction on the site are the Toisnot Swamp and Buck Branch. The existing MSWLF facility is generally located to the east of the proposed CDLF footprint and is separated by a deep drainage canal that intercepts the uppermost aquifer.

In general, the site geology conforms to the regional Coastal Plain characteristics. The depositional environment is influenced by Buck Branch and Toisnot Swamp, where fluvial sediments are mixed with marine sediments in an estuarine setting. Where these streams once flowed into the Atlantic Ocean, a much broader river was likely present. Swift currents during flood conditions may have deposited lenticular beds of sand and other sediments. Incoming tidal currents rework the stream sediments, creating alternating layers of continental and marine sediments.

On the Westside Site, all groundwater level measurements and the modeled potentiometric surfaces through the course of investigation indicate that the general groundwater flow direction from the CDLF footprint to the southwest towards Toisnot Swamp. Based on the analysis of site stratigraphy and comparing aquifer testing results with laboratory clay unit permeability testing, it is clear that the potential for groundwater flow is highest through the water bearing sand layers in the uppermost 15 feet of the aquifer. The marine clays present a confining or semi-confining layer limiting potential vertical groundwater flow. Furthermore, the elevation of the wetlands adjacent to Buck Branch relative to the mapped potentiometric surface indicates an area of extensive groundwater discharge surrounding the stream.

As determined from the soil boring logs, the site stratigraphy is best illustrated in hydrogeologic profiles C and D, presented in Figure 4 of the Site Plan. The local stratigraphy is characterized by relatively thin layers of continental and marine silt, sand, and clay in varying textures and colors. Figure 4 illustrates the uniformities and unconformities associated with the depositional environment. Typically, the color of fluvial sediments are tan, brown, light grey or orange. With the unconformities expected in the depositional environment, the typical profile includes a lean clay overlying poorly graded sands, interbedded with thin clay and clayey sand lenses. The water bearing zone is present in coarse and well graded sand layers, typically beneath surficial clay. Below the fluvial sediments, a marine clay layer is consistently encountered. This marine clay unit is typically dark grey, fat, and laminated with microlenses of fine sand. Below the marine clay, a dark greenish grey silty clayey sand with shell fragments overlies the residual, fully weathered bedrock. As evidence of the site's proximity to the regional fall line, bedrock was encountered approximately 30-35 feet below the disturbed land surface, at an elevation of 60 to 64 feet mean sea level. Dip of the marine sediments mirror the southwest groundwater flow direction.

1.3 Monitoring System Design

Design of the monitoring system for the Westside Site considers the site an regional hydrogeologic conditions with the base design for the landfill unit. The site's adjacent, upgradient position to major stream features in the area (Buck Branch and Toisnot Swamp) provide relative hydrogeologic isolation in a groundwater discharge area. The landfill base design includes construction of a compacted soil layer that will provide for vertical separation from the seasonal high water table and control infiltration from the landfill base. Deeper in the surficial aquifer, the presence of low-permeability clays deposited in horizontal lenses significantly limits vertical groundwater flow potential. Most importantly, the preferential lateral groundwater flow in the unconfined surficial aquifer sands toward a groundwater discharge zone presents hydrogeologic conditions that can be

effectively monitored with shallow groundwater monitoring wells. Due to the extent of wetlands and dense vegetation surrounding Buck Branch, surface water monitoring is not a necessary component of the site's detection monitoring system.

1.3.1 Groundwater Monitoring System

Proposed monitoring well locations are shown on Drawing M1, Groundwater Monitoring Plan. Based on the geology and hydrogeology Section *and* the criteria for establishing the relevant point of compliance, the following detection monitoring stations are recommended for the WQMP.

The Westside WQMP will include a total of four groundwater monitoring wells to establish the relevant point of compliance. The following is a discussion of existing monitor well status, field conditions, and proposed location of the groundwater monitoring system for the proposed Westside C&D facility. The detection monitoring system utilizes one existing well (P-101) and requires installation of three additional downgradient wells. Overall, one upgradient and three downgradient locations provide a monitoring well density of 1 detection station per 3.5 Acres of landfill area. Downgradient well installations are spaced equally across a 125-foot offset (review boundary) to the landfill footprint. Completion intervals shall be within the uppermost 10-15 feet of the seasonal high water table and shall target the tan and orange sand units in the characterized stratigraphy. Ground surface elevations leading to (4W drive path) and surrounding the wells shall be at least 93 feet msl.

TABLE 1-1
MONITORING WELL NETWORK

WELL ID	TD	TOS	BOS	COMMENT	WELL TYPE	MONITORING SCHEDULE
GMW-1	20	10	20	UPGRADIENT	2	SEMI-ANNUAL
GMW-2	16	6	16	SOIL	2	SEMI-ANNUAL
GMW-3	17	7	17	SOIL	2	SEMI-ANNUAL
GMW-4	17	7	17	SOIL	2	SEMI-ANNUAL

Note:

All wells shall be constructed in accordance with 15A NCAC 2C .0108. All new and existing wells were surveyed to a known datum to provide groundwater elevations to determine flow characteristics. Ground surface and top of casing elevations were also surveyed to provide information for potentiometric maps of the uppermost aquifer at the facility. Accuracy requirements for the survey are ± 0.01 ft for elevation, and ± 0.1 ft for horizontal location.

In accordance with 15A NCAC 2C **.0108**, the wells will be constructed of schedule 40 PVC and installed with wash drilling methods (sands) in accordance with standard monitoring well installation procedures by a NC licensed driller. Split spoon samples will be collected at a minimum of five-foot intervals to document lithology; more frequent sampling may be directed during installation.

1.3.2 Piezometer Abandonment

All existing piezometers within the landfill footprint and as directed by the engineer shall be abandoned in accordance with 15A NCAC 2C. Abandonment may utilize either bentonite or cement grout, or a combination of the two materials. Abandonment shall be documented with standard documentation and included in the pre-operative submittal.

1.3.3 Background Sampling

Prior to beginning landfill operations, one set of background samples shall be collected for the monitoring network. These baseline results will be submitted to the agency according to the plan reporting procedures. Following background sampling, routine detection monitoring

1.4 Sampling and Analysis Procedures

1.4.1 Sampling Equipment and Containers

Disposable Teflon bailers will be utilized for groundwater sample collection. Samplers will wear clean disposable vinyl or latex gloves during the sampling process. Bailing line shall be nylon, Teflon coated wire, or single stranded stainless steel wire. Groundwater sample containers will be obtained from the laboratory prior to sample collection. The laboratory will provide pre-cleaned sample containers with the appropriate preservatives.

1.4.2 Cleaning Procedures

Prior to beginning sampling, field equipment should be deconned in the office laboratory. Documentation of proper cleaning protocol must be provided with disposable bailers. Between wells, field decontamination for field equipment will consist of a five step process: 1) deionized or distilled water rinse, 2) wash with a phosphate free soap/water mixture, 3) deionized or distilled water rinse, 4) isopropyl alcohol rinse or 10% nitric acid or 10% hydrochloric acid rinse, and 5) deionized or distilled water rinse. Clean unused disposable Teflon bailers will be used for monitor well sample collection and will not require decontamination.

1.4.3 Purging Procedures

Prior to the purging of any groundwater monitoring wells the water levels in all wells will be determined. The water levels are to be determined by using an electric water level meter. Any one of several commercial models of water level meters are

acceptable for this purpose. The meter chosen for use will be able to determine the depth to groundwater to at least the nearest 0.01 foot. The water level for each well is to be recorded in the bound field notebook at the time of measurement. During the water level measurement procedure the personnel performing the measurement will wear clean protective gloves (i.e. disposable vinyl or latex gloves). The water level meter will be decontaminated between each well location by a distilled water rinse. The reference point for groundwater level measurements will be the top of the northern side of the inner well casing.

Due to the relatively shallow groundwater level on-site, each groundwater monitoring well will be purged with disposable Teflon bailers. Each well will be purged of approximately three to five well volumes of water or until dry prior to sampling. In order to determine the volume of water to be purged from each well the volume of one well casing volume will need to be determined. This volume is calculated by subtracting the depth to the water table from the total depth of the well to give the volume of standing water in the well casing. Then by using Table 1 (attached) the approximate volume of water in the well casing may be estimated. This volume is then multiplied by three, four or five to give the total purge volume necessary for each well. Once this volume is calculated the well may then be purged. Purging may need to be continued past the 3 to 5 volumes if pH and spec conductance are not initially stabilized.

1.4.4 Groundwater Sample Collection Procedure

Upon completion of the purging procedure and stabilization of field parameters, groundwater samples may be collected. Samples will be collected using disposable Teflon bailers. Separate bailers may be used during the purging and sampling processes. Samples will be poured directly from the bailer into the laboratory supplied containers that they are to be transported to laboratory. Under no circumstances will an intermediate sample container be used, i.e. jar, beaker, etc., and then transferred to the sample container. Water samples will not be filtered.

Groundwater sample containers should be labeled prior to filling. Sample containers have a tendency to "sweat" when filled with groundwater, this makes it difficult to affix a label to the container. The sample label should be covered with a clear tape, which should be wrapped around the sample container. This prevents the label from detaching from the container during sample storage and shipment.

Each sample container should have its own label. The label should indicate at a minimum, the sample location (i.e. GMW-1), date and time of collection, and project site. Other pertinent sample information such as sample location, collector, etc. should be recorded in the field notes.

Samples will be placed in a sample cooler containing ice immediately after collection. After collection, samples are to be transported to the laboratory either in person or by some form of accepted courier service (Federal Express, etc). When practical, samples should be delivered to lab on the collection day.

1.4.5 Field QA/QC Procedures

Each sample will be recorded on a Chain-of-Custody record at the time of collection. A sample Chain-of-Custody form is attached to this plan for reference. The Chain-of-Custody form will contain sample and well identification, signature(s) of the sample collector and others who accept the samples from the collector, date and time of sample collection, requested laboratory analytical parameters, and other pertinent information or special requests etc.

One trip blank per sampling event will be collected and one equipment blank sample will be collected for each day that groundwater monitor wells are sampled. Blank samples will be analyzed for all constituents that are being analyzed in the groundwater and surface water quality samples.

1.4.6 Laboratory QA/QC Procedures

All water samples will be analyzed by a North Carolina certified laboratory for Appendix I VOCs and RCRA metals along with specific conductance, pH, and temperature. The laboratories will be certified for drinking water analysis and for the constituents being analyzed. The following is a list of the analytical parameters to be analyzed for this project. Each parameter has an appropriate EPA method number associated with the parameter. Samples are to be analyzed by the listed method or by an equivalent acceptable method. A copy of the laboratory Quality Assurance/Quality Control measures may be provided on request (100 pages). All analysis shall be in accordance with methods listed in the publication SW-846.

- o Inorganic Constituents

<u>Metals</u>	<u>Method</u>	<u>SWSL***</u>
Antimony	SW-846 Method 6010	0.006 mg/L
Arsenic	SW-846 Method 6010	0.010 mg/L
Barium	SW-846 Method 6010	0.10 mg/L
Beryllium	SW-846 Method 6020	0.001 mg/L
Cadmium	SW-846 Method 6020	0.001 mg/L
Chromium	SW-846 Method 6010	0.01 mg/L
Cobalt	SW-846 Method 6010	0.01 mg/L
Copper	SW-846 Method 6010	0.01 mg/L
Lead	SW-846 Method 6010	0.01 mg/L
Nickel	SW-846 Method 6010	0.05 mg/L
Selenium	SW-846 Method 6010	0.01 mg/L
Silver	SW-846 Method 6010	0.01 mg/L
Thallium	SW-846 Method 6020	0.0055 mg/L
Vanadium	SW-846 Method 6020	0.025 mg/L
Zinc	SW-846 Method 6010	0.01 mg/L

- o Organic Parameters
Volatile Organic Compounds (EPA Method SW-846 8240 or 8260**) *Added volatile compound: Tetrahydrofuran*

- o Field Parameters
 - Specific Conductance
 - pH
 - Temperature

* All metals analysis will be performed by acceptable methodology as described in EPA SW-846

** Specific constituents listed for these methods are not listed here, please refer to the EPA publication SW-846 for the complete list of volatile and semi-volatile parameters listed for the above references methods.

*** Solid Waste Section Limit

1.5 Field Logbook

The field technician will keep an up-to-date logbook documenting important information pertaining to the technician's field activities. The field logbook will document the following:

- Site Name and Location
- Date and Time of Sampling
- Climatic Conditions During Sampling Event
- Sampling Point/Well Identification Number
- Well Static Water Level
- Height of Water Column in Well
- Purged Water Volume and Well Yield (High or Low)
- Observations on Purging and Sampling Event
- Time of Sample Collection
- Temperature, pH, Turbidity, and Conductivity Readings
- Signature of Field Technician.

1.6 Record Keeping and Reporting

1.6.1 Sampling Reports

Copies of all laboratory analytical data will be forwarded to the DWM within 45 calendar days of the sample collection date. The analytical data submitted will specify the date of sample collection, the sampling point identification and include a map of sampling locations. Should a significant concentration of contaminants be detected in ground and surface water, as defined in North Carolina Solid Waste Rules, Ground Water Quality Standards, or Surface Water Quality Standards, the owner/operator of the landfill shall notify the DWM and will place a notice in the landfill records as to which constituents were detected.

Monitoring data will be compared to compliance standards established by Groundwater Standards 15A NCAC 2L .0202 and 15A NCAC 13B. If a standard is exceeded in any well, additional samples or assessment monitoring will begin following notification of the Division. In response to non-compliance data results, the Division of Solid Waste Management will be notified with a plan of action to further investigate, verify or assess the source of the observed contaminants.

1.7 Well Abandonment/Rehabilitation

Should wells become irreversibly damaged or require rehabilitation, the DWM shall be notified. If monitoring wells and/or piezometers are damaged irreversibly they shall be abandoned according to 15A NCAC 2C .0113, with notification to the Division. The abandonment procedure in unconsolidated materials will consist of over-drilling and/or pulling the well casing and plugging the well with an impermeable, chemically-inert sealant such as neat cement grout and/or bentonite clay (HolePlug or 15A NCAC 2L approved materials). For bedrock well completions the abandonment will consist of plugging the interior well riser and screen with an impermeable neat cement grout and/or bentonite cement grout.

1.8 Additional Well Installations

The data will be analyzed to verify the correct placement of wells and determine locations for future monitoring wells, if necessary. Any additional well installations will be carried out in accordance with DWM directives. If the potentiometric maps reveal that the depths, location, or number of wells is insufficient to monitor potential releases of solid waste constituents from the solid waste management area, new well locations and depths will be submitted to the DWM for approval.

All monitoring wells shall be installed under the supervision of a geologist or engineer who is registered in North Carolina and who will certify to the DWM that the installation complies with the North Carolina Regulations. Upon installation of future wells the registered geologist or engineer will submit the documentation for the construction of each well within 30 days after well construction.

TABLE 1-2

CONVERSION OF FEET OF WATER
TO
VOLUME IN GALLONS
FOR A TWO INCH I.D. WELL CASING

FEET OF WATER	1	2	3	4	5	6	7	8	9	10
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VOLUME IN GALLONS	0.2	0.4	0.5	0.7	0.9	1.0	1.2	1.4	1.5	1.7
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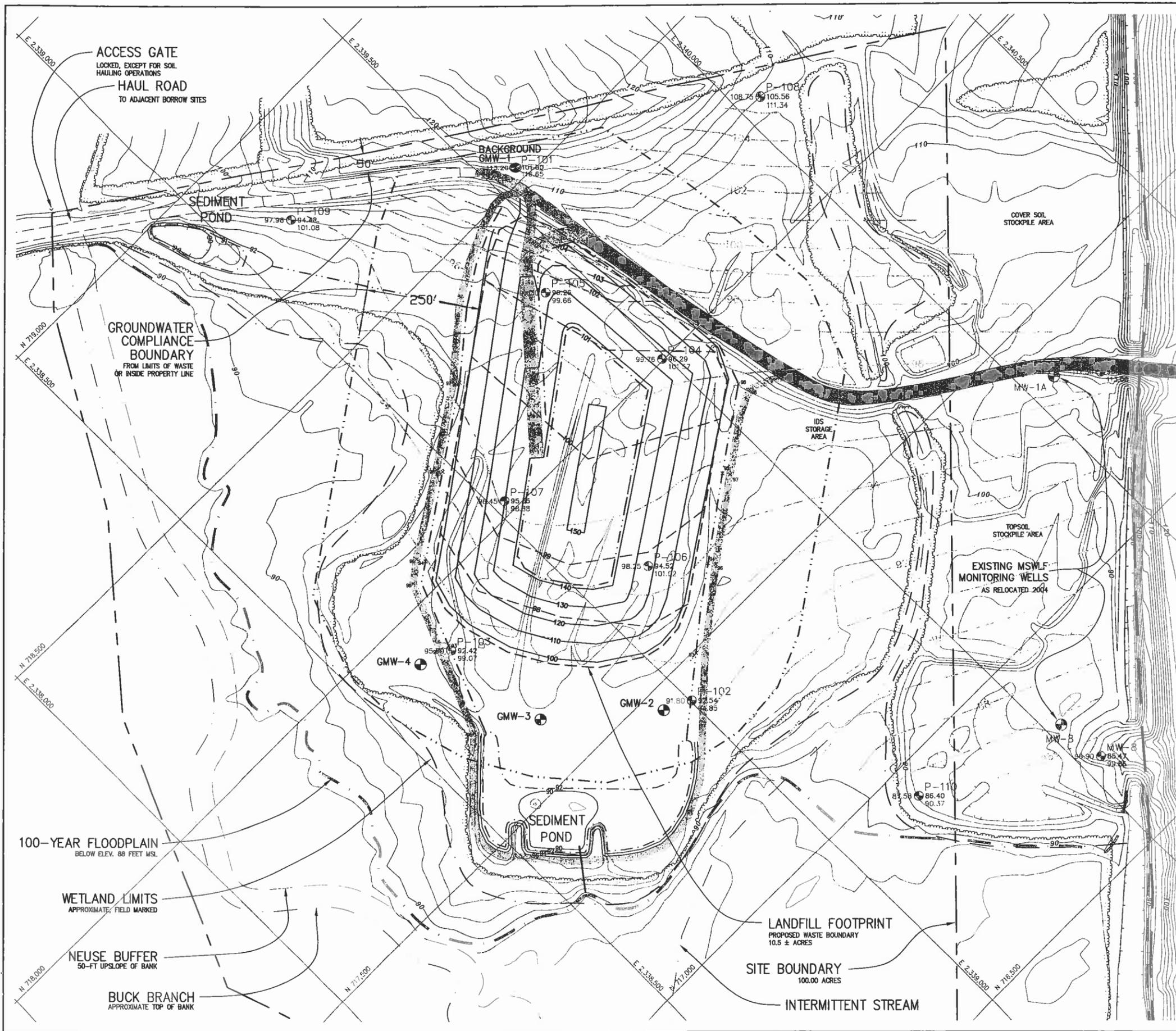
FEET OF WATER	15	20	25	30	35	40	45	50	55	60
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VOLUME IN GALLONS	2.5	3.3	4.1	4.9	5.8	6.6	7.4	8.2	9.0	9.8
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FEET OF WATER	65	70	75	80	85	90	95	100	105	110
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VOLUME IN GALLONS	10.7	11.5	12.3	13.1	13.9	14.7	15.5	16.4	17.2	18.0
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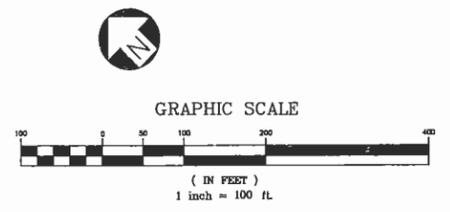
NOTES:

- PURPOSE.** THIS DETECTION MONITORING PLAN IS PROPOSED FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, PREPARED FOR APPROVAL BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 13B. THE PLAN WAS PREPARED UNDER THE SUPERVISION OF MR. GARY D. BABB, PG.
- TOPOGRAPHIC FEATURES.** SITE TOPOGRAPHY IS FROM AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY GEODATA CORP., ZEBULON, NC. MAPPED CONDITIONS FROM MARCH 1998 ARE GENERALLY REPRESENTATIVE OF EXISTING CONDITIONS (JULY 2003). REFERENCE DRAWING SC1 FOR STREAM, WETLAND, FLOODPLAIN, AND OTHER SOURCES.
- WESTSIDE C&D LANDFILL SITE.** THE 100.00 ACRE SITE PROPERTY BOUNDARY ILLUSTRATED ON THIS DRAWING IS REPRESENTATIVE OF THE "RECOMBINATION PLAN FOR THE WESTSIDE C&D LANDFILL SITE" PREPARED BY HERRING-SUTTON & ASSOCIATES, P.C. (WILSON, NORTH CAROLINA), APRIL 2003.
- MONITORING NETWORK.** EXISTING WELL P-101 SHALL BE DESIGNATED AS THE UPGRADIENT BACKGROUND WELL GMW-1. THREE NEW WELLS WILL BE INSTALLED IN THE UPPER 15-20 FEET OF THE IN-SITU SOIL. DOWNGRADIENT WELL INSTALLATIONS ARE SPACED EQUALLY ACROSS A 125-FOOT OFFSET (REVIEW BOUNDARY) TO THE LANDFILL FOOTPRINT. GROUND SURFACE ELEVATIONS LEADING TO (4W DRIVE PATH) AND SURROUNDING THE WELLS SHALL BE AT LEAST 93 FEET MSL.
- PIEZOMETER ABANDONMENT.** ALL PIEZOMETERS SHALL BE ABANDONED ACCORDING TO 15A NCAC 2C, WITH ASSOCIATED DOCUMENTATION.
- SURVEY DATA.** NORTH CAROLINA REGISTERED LAND SURVEYORS, HERRING-SUTTON & ASSOCIATES, WILSON, NORTH CAROLINA, SHALL SURVEY THE LOCATION AND ELEVATION POSITIONS OF EACH WELL AFTER INSTALLATION.
- MONITORING SYSTEM DESIGN.** THE LANDFILL BASE DESIGN INCLUDES CONSTRUCTION OF A COMPACTED SOIL LAYER THAT WILL PROVIDE FOR VERTICAL SEPARATION FROM THE SEASONAL HIGH WATER TABLE AND CONTROL INFILTRATION FROM THE LANDFILL BASE. DEEPER IN THE SURFICIAL AQUIFER, THE PRESENCE OF LOW-PERMEABILITY CLAYS DEPOSITED IN HORIZONTAL LENSES SIGNIFICANTLY LIMITS VERTICAL GROUNDWATER FLOW POTENTIAL. MOST IMPORTANTLY, THE PREFERENTIAL LATERAL GROUNDWATER FLOW IN THE UNCONFINED SURFICIAL AQUIFER SANDS TOWARD A GROUNDWATER DISCHARGE ZONE PRESENTS HYDROGEOLOGIC CONDITIONS THAT CAN BE EFFECTIVELY MONITORED WITH SHALLOW GROUNDWATER MONITORING WELLS. DUE TO THE EXTENT OF WETLANDS AND DENSE VEGETATION SURROUNDING BUCK BRANCH, SURFACE WATER MONITORING IS NOT A NECESSARY COMPONENT OF THE SITE'S DETECTION MONITORING SYSTEM.
- DETECTION INTERVAL IN THE SURFICIAL AQUIFER.** COMPLETION INTERVALS SHALL BE WITHIN THE UPPERMOST 10-15 FEET OF THE SEASONAL HIGH WATER TABLE AND SHALL TARGET THE TAN AND ORANGE SAND UNITS IN THE CHARACTERIZED STRATIGRAPHY.

LEGEND

- GMW-2 MONITORING WELL**
DETECTION MONITORING STATION
- POTENTIOMETRIC CONTOUR**
1-FOOT CONTOUR INTERVAL, 19 NOV 02
- BASE CONTOUR 1-FOOT**
1-FOOT CONTOUR INTERVAL, 19 NOV 02
- WESTSIDE SITE BOUNDARY**
- LANDFILL FOOTPRINT**
PROPOSED 10.5 ACRES
- EXISTING LANDFILL LIMITS**
OFFSITE MSWLF UNIT
- 100-YEAR FLOODPLAIN**
- NEUSE BUFFER**
- SURFACE WATER**
- WETLAND BOUNDARY**
- CONTOUR 2-FOOT** MAR98 MAPPING
- CONTOUR 10-FOOT** MAR98 MAPPING
- GROUND ELEVATION**
- WELL COORDINATES ON CENTER**
- BORING/PIEZO ID**
- WATER ELEVATION AT INSTALLATION 11/19/02**
- TOP OF CASING SURVEYED ELEVATION**

PERMIT ISSUE
NOT FOR CONSTRUCTION



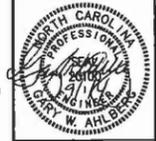
Babb & Associates, P.A.
P.O. BOX 37897
RALEIGH, NORTH CAROLINA 27627

GARY W. AHLBERG, P.E.
P.O. BOX 58
WILMINGTON, NORTH CAROLINA 28402
910.232.6696
gahw@earthlink.net

PROJECT:
WESTSIDE C&D LANDFILL
CONSTRUCTION PLAN APPLICATION
WILSON, NORTH CAROLINA

PREPARED FOR:
WILSON COUNTY
DEPARTMENT OF SOLID WASTE
113 E. NASH STREET
WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE
REVISIONS		



GROUNDWATER MONITORING PLAN

SCALE: 1"=100'
DATE: 09/01/04
DRN. BY: GWA
CHECKED BY: GDB

PROJECT NO:

DRAWING NO.

M1

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ATTACHMENT H-1

EXPLOSIVE GAS
MONITORING PLAN

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1.0 EXPLOSIVE GAS MONITORING PLAN

This Explosive Gas Monitoring Plan is designed to address regulatory requirements as set forth in the Rules to detect explosive gases that may be generated by decomposition of Construction and Demolition wastes in the Westside C&D landfill unit. The monitoring plan is designed to detect explosive gases that may accumulate in on-site enclosed structures or migrate in unsaturated soils toward the property boundary.

Attached to this plan is project Drawing LFG1, illustrating the proposed site characteristics relevant to gas monitoring and including the proposed gas monitoring system. As described in the site study permit documents and water quality monitoring plan, the surficial soils above the seasonal high water table have been excavated and removed from the site for historic landfill soil cover use. Sandy clay soil was placed and compacted to construct the landfill base grade and establish a 4' separation from the seasonal high water table. Offset and downgradient or side gradient to the landfill unit, wetlands draining to the adjacent streams limit potential gas migration. The upgradient boundary to the northeast of the landfill unit is the only property boundary subject to gas migration monitoring. No structures are present on the Westside site.

Generally, gas wells are boreholes installed in the landfill to vent or recover landfill gas. For gas monitoring purposes, three gas monitoring probes GP-1, GP-2, and GP-3 are proposed at approximate 500-foot spacing inside the upgradient property line and adjacent Piedmont Natural Gas service line. The gas probes construction will be similar to Type II groundwater monitoring wells with locking steel casings set in a concrete pad, protecting 2" Sch40 pipe, with .010" slotted screen and sand backfill from a depth of 2 feet below grade to just above the observed water table

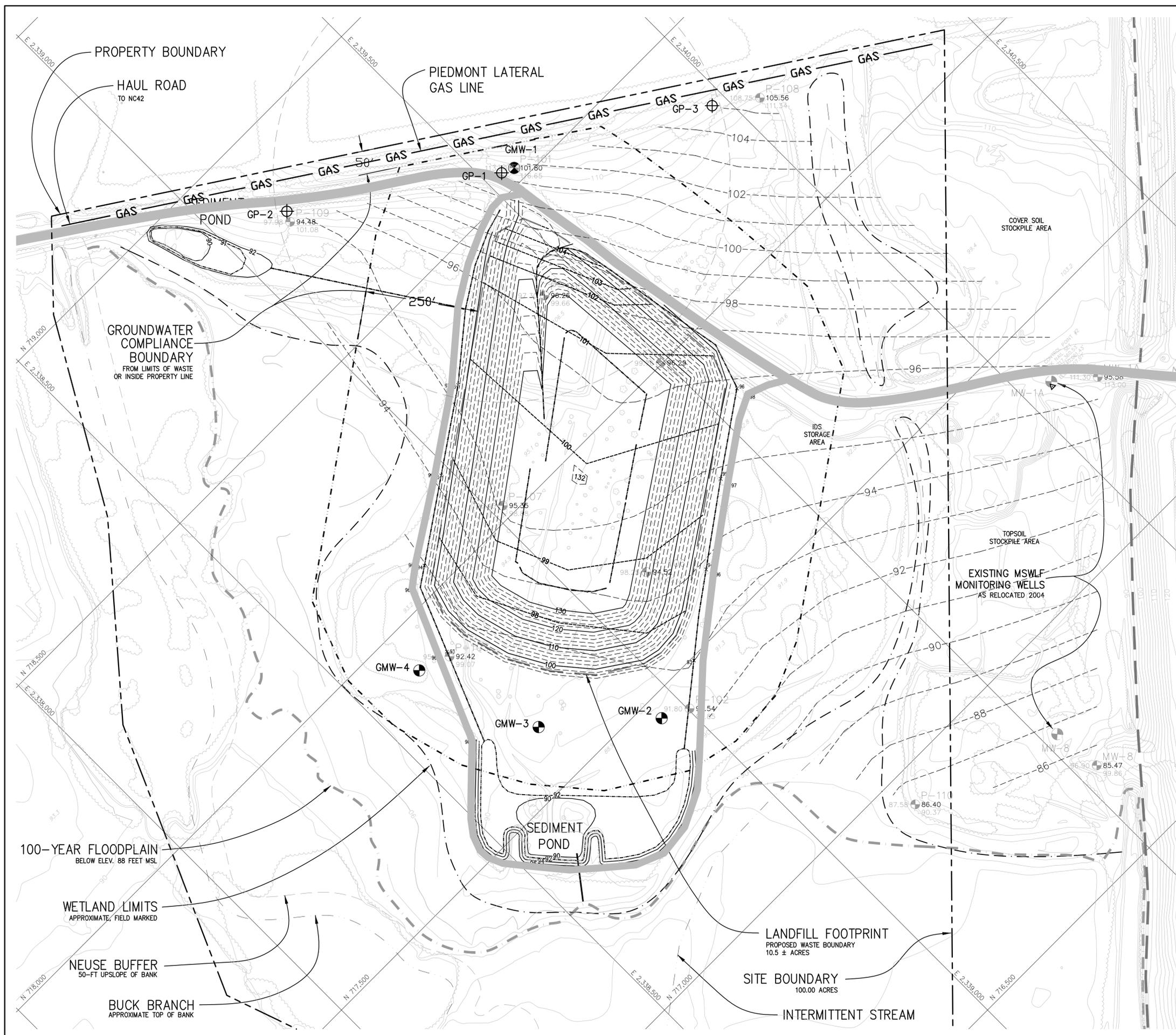
(less than 15 feet total depth). The top of casing will be slip capped and fitted with a quick-connect, valve or hose barb to connect the monitoring equipment.

The gas probes and any future on-site structures shall be monitored by Wilson County quarterly for the presence of explosive gases measured in % Lower Explosive Limit. The monitoring equipment shall meet industry standards for measuring % LEL for explosive gases and shall be calibrated according to manufacturer's procedures prior to each monitoring event. At least two observations should be obtained for repeatable results at each monitoring location. The sampling location, date, time, staff initials and observed % LEL shall be recorded and maintained in the operating record. Due to the local gas line present along the property boundary, it is recommended that any the total explosive gas concentration be measured to identify the potential sources triggering action. Landfill gas is generally less than 60% explosive gas by volume, where pipeline gas will be greater than 60% total explosive concentration. The following .0544 rules apply to gas monitoring at the C&DLF facility.

- (1) Owners and operators must ensure that:
 - (A) the concentration of methane gas or other explosive gases generated by the facility does not exceed 25 percent of the lower explosive limit in on-site facility structures (excluding gas control or recovery system components);
 - (B) the concentration of methane gas or other explosive gases does not exceed the lower explosive limit for methane or other explosive gases at the facility property boundary; and
 - (C) the facility does not release methane gas or other explosive gases in any concentration that can be detected in offsite structures.
- (2) Owners and operators of all C&DLF units must implement a routine methane monitoring program to ensure that the standards of this Paragraph are met.
 - (A) The type of monitoring must be determined based on soil conditions, the hydrogeologic conditions under and surrounding the facility, hydraulic conditions on and surrounding the facility, the location of facility structures and property boundaries, and the location of all off-site structures adjacent to property boundaries.

- (B) The frequency of monitoring shall be quarterly or as approved by the Division.
- (3) If methane or explosive gas levels exceeding the limits specified in Subparagraph (d)(1) of this Rule are detected, the owner and operator must:
 - (A) immediately take all steps necessary to ensure protection of human health and notify the Division;
 - (B) within seven days of detection, place in the operating record the methane or explosive gas levels detected and a description of the steps taken to protect human health; and
 - (C) within 60 days of detection, implement a remediation plan for the methane or explosive gas releases, place a copy of the plan in the operating record, and notify the Division that the plan has been implemented. The plan must describe the nature and extent of the problem and the proposed remedy.
- (4) Based on the need for an extension demonstrated by the operator, the Division may establish alternative schedules for demonstrating compliance with Parts (3)(B) and (3)(C) of this Paragraph.
- (5) For purposes of this section, "lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25 C and atmospheric pressure.

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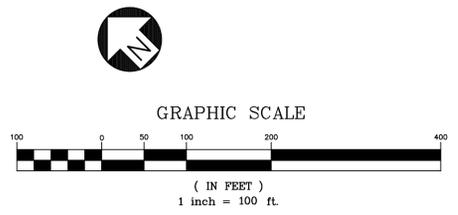


- NOTES:**
- PURPOSE.** THIS GAS DETECTION MONITORING PLAN IS PROPOSED FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, PREPARED FOR APPROVAL BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 13B.
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 - WESTSIDE C&D LANDFILL SITE.** THE 100.00 ACRE SITE PROPERTY BOUNDARY ILLUSTRATED ON THIS DRAWING IS REPRESENTATIVE OF THE "RECOMBINATION PLAT FOR THE WESTSIDE C&D LANDFILL SITE" PREPARED BY HERRING-SUTTON & ASSOCIATES, P.C. (WILSON, NORTH CAROLINA), APRIL 2003.
 - GAS PROBE.** GAS MONITORING PROBES SHALL BE INSTALLED WITH A TOTAL DEPTH JUST ABOVE THE WATER TABLE.
 - EXPLOSIVE GAS MONITORING.** EXPLOSIVE GAS CONCENTRATIONS SHALL BE MONITORED QUARTERLY AND RECORDED AS A PERCENTAGE OF THE LOWER EXPLOSIVE LIMIT (LEL).
 - GAS PROBE INSTALLATION AND MONITORING** SHALL CONFORM TO THE CURRENT SWS GUIDANCE, EQUIPMENT MANUFACTURER'S RECOMMENDATIONS, AND ACCEPTED STANDARDS OF PRACTICE.
 - INSTALLATION AND SURVEY RECORDS,** AND MONITORING RESULTS SHALL BE PLACED IN THE OPERATING RECORD AND SUBMITTED TO THE SWS IN ACCORDANCE WITH PERMIT CONDITIONS.

LEGEND

	GP-1	GAS PROBE PROPOSED LOCATION
	GMW-2	MONITORING WELL DETECTION MONITORING STATION
	GA	POTENTIOMETRIC CONTOUR 1-FOOT CONTOUR INTERVAL, 19 NOV 02
	100	BASE CONTOUR 1-FOOT 1-FOOT CONTOUR INTERVAL, 19 NOV 02
		WESTSIDE SITE BOUNDARY
		LANDFILL FOOTPRINT PROPOSED 10.5 ACRES
		EXISTING LANDFILL LIMITS OFFSITE MSWLF UNIT
		100-YEAR FLOODPLAIN
		NEUSE BUFFER
		SURFACE WATER
		WETLAND BOUNDARY
		CONTOUR 2-FOOT MAR98 MAPPING
		CONTOUR 10-FOOT MAR98 MAPPING
		GROUND ELEVATION
		WELL COORDINATES ON CENTER
		BORING/PIEZO ID
		WATER ELEVATION AT INSTALLATION 11/19/02
		TOP OF CASING SURVEYED ELEVATION

PERMIT ISSUE
NOT FOR CONSTRUCTION



BLACKROCK ENGINEERS, INC.
POST OFFICE BOX 58
WILSON, NORTH CAROLINA 28401
107 PLUMTREE LANE
CASTLE HAYNE, NORTH CAROLINA 28429
PHONE: 910.232.6696
NC LIC. # C-2919

PROJECT:
WESTSIDE C&D LANDFILL
CONSTRUCTION PLAN
WILSON, NORTH CAROLINA

PREPARED FOR:
WILSON COUNTY
DEPARTMENT OF SOLID WASTE
113 E. NASH STREET
WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE
REVISIONS		



GAS MONITORING PLAN

SCALE: 1"=100'
DATE: 11.24.10
DRN. BY: JWG
CHECKED BY: GWA

PROJECT NO:
WCL10-07

DRAWING NO.
LFG1

ATTACHMENT I

SOLID WASTE MANAGEMENT FACILITIES

Dec 2010 Revision incorporates information for approval of other solid waste management facilities at the Wilson County Landfill Site; see also Attachment G for Site Plan drawing.

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TABLE OF CONTENTS

1.0	SOLID WASTE MANAGEMENT FACILITIES	1
1.1	CONTROLLED ACCESS.....	1
1.2	CONVENIENCE CENTER.....	1
1.3	WOOD WASTE PROCESSING.....	2
1.4	MULCH COMPOST.....	2
1.5	WHITE GOODS.....	3
1.6	INERT DEBRIS.....	4
2.0	USED TIRE COLLECTION	5
2.1	GENERAL REQUIREMENTS.....	5
2.2	OPERATION AND MANAGEMENT PLAN.....	5
3.0	WOOD PROCESSING AND MULCH COMPOST	7
3.1	OVERVIEW.....	7
3.2	WASTE TYPES.....	7
3.3	WASTE ACCEPTANCE.....	8
3.4	WASTE SEGREGATION.....	8
3.5	WOOD PROCESSING AND COMPOST OPERATIONS.....	9
3.6	FINAL PRODUCT.....	19
3.7	TROUBLESHOOTING.....	20

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1.0 SOLID WASTE MANAGEMENT FACILITIES

This report provides a general plan for solid waste management (SWM) activities associated with site operation of the Westside CDLF. Attachment G includes Dwg S1 - Facility Site Plan with aerial photography that delineates all SWM activities on the County Property and identifies pertinent characteristics of the surrounding land. Attached to this report is a zoning compliance letter that documents approval of solid waste management activities in accordance with the Wilson County Zoning Ordinance. Descriptions of activities at the following SWM facilities, located at the Wilson County Landfill site include:

- Convenience Center
- Wood Waste Processing
- Mulch Compost
- White Goods Storage
- Inert Debris Area

1.1 CONTROLLED ACCESS

Access to the site is controlled via security fencing, locking gates, and physical barriers. Primary access is from NC 42, where the weighmaster initially screens and directs customers to the appropriate management area. In general, all SWM activities are limited to the following operating hours:

- Monday – Friday 8:00 a.m. to 5:00 p.m.
- Saturday 8:00 a.m. to 12:00 p.m.

1.2 CONVENIENCE CENTER

The convenience center is open for use by Wilson County residents to deliver recycled materials, used tires, and municipal solid waste for transfer to permitted facilities. Signage identifies materials for segregation in the appropriate container. Containers are hauled and replaced as they are filled, typically twice a week. Sedimentation and erosion control for the Convenience Center and

Scalehouse Offices are NC LQS approved by an individual plan. MSW is hauled by the County to ***Black Creek Road Transfer Facility, SW Permit #98-08T.***

1.3 WOOD WASTE PROCESSING

Stumps and wood waste exceeding 2 feet in diameter are typically routed to the C&D landfill for disposal. All other wood wastes are stockpiled for periodic processing by a contractor at the wood on-site wood processing site. Approximately 2,000 tons of wood waste is processed quarterly. The contractor typically recovers a majority of the wood waste as wood chips used as commercial biomass fuel. The residual wood fines are combined with yard trash and windrowed in the yard waste compost area. The residual soil generated from processing is stockpiled separately as topsoil for use in landfill cover operations or public distribution. Wood Processing operations are described in Section 3 with Mulch Compost.

1.4 MULCH COMPOST

Residuals from wood processing are typically composted with yard trash. The mulch or compost product is primarily used on County property as a soil amendment. The mulch compost operation is designed to meet the criteria of a small Type 1 composting facility according to 15A NCAC 13B .1402. The facility typically processes and stores less than 2,000 CY of yard waste per quarter, and the compost area will not exceed 2 Acres. The maximum processing and storage criteria for a small Type 1 compost site is 6,000 CY per quarter. The mulch and compost operation is described in Section 3.

The yard trash is primarily grass, leaves and small branches. Sedimentation and erosion control for the wood waste, yard trash, and white goods areas are LQS approved by an individual plan (attached Bartlett Plans). The yard trash site will be operated in accordance with .1406 for Type 1 compost.

1.5 WHITE GOODS

White goods and scrap metal are stored on an all weather surface as shown on the Site Plan. Any white goods with refrigeration units are segregated for Freon removal by the white goods contractor at his facilities at:

United Salvage & Auto, Inc.

Operation Manager : Scott Sawyer

11476 HWY 903

Halifax, NC 27839

Recyclable metals are removed from the site monthly, with storage generally limited to approximately 2,000 tons or less at any time. Recordkeeping for white goods is performed according to all state requirements.

1.6 INERT DEBRIS

For large demolition projects or similar activities, inert debris is segregated from the C&D landfill and stored in the Inert Debris Unit, located on the Westside CDLF Site. Inert debris is recovered for on-site projects as beneficial fill, on a limited basis. The Inert Debris Unit is approximately 2 Acres and is covered consistent with 15A NCAC 13B .0566. The Inert Debris unit is recorded with the Westside CDLF Permit 98-09.

The Inert Debris unit operation shall conform to the following standards:

- Adequate soil cover (6-in minimum layer) shall be applied monthly, or when the active area reaches one acre in size, whichever occurs first.
- 120 calendar days after completion of any phase of disposal operations, or upon revocation of a permit, the disposal area shall be covered with a minimum of one foot of suitable soil cover sloped to allow surface water runoff in a controlled manner.
- Adequate erosion control measures, structures, or devices shall be utilized to prevent silt from leaving the site and to prevent excessive on site erosion.
- Provisions for a ground cover sufficient to restrain erosion must be accomplished within 30 working days or 120 calendar days upon completion of any phase of landfill development.
- Surface water shall be diverted from the working face and shall not be impounded over waste.
- Edge of Waste markers shall be set to define the limits of the Inert Debris Unit.

As an option for DWM approval, the inert debris area could be divided to provide a separate asbestos area. If approved in the permit, operations shall conform to the operational requirements of the Westside Operations Plan, Section 1.13.

2.0 USED TIRE COLLECTION

2.1 GENERAL REQUIREMENTS

The used tire collection site is accessed via the main NC 42 gate for the Westside C&D Landfill. Waste screening and fire control conform to the facility operation plan in Attachment D. In accordance with .1105 (g), the tire collection site is deemed permitted under SW Permit 98-09.

2.2 OPERATION AND MANAGEMENT PLAN

Used Tires shall be collected and stored in 18-wheel trailers at the convenience center. Two trailers will be on-site at all times. Tires shall be removed monthly by the scrap tire hauler. The site meets the following .1106 pertinent requirements for used tire collection, where:

- (3) The site and proposed plan shall comply with all requirements of the local zoning ordinance.
- (4) The site shall be served by an access road which shall be kept passable for any motor vehicle, including fire trucks, at all times.
- (8) Access to the site shall be controlled through the use of fences, gates, berms, natural barriers or other means.
- (10) The provider of fire protection services for the site shall be identified in the permit application. Wilson County Emergency Management Services provides fire service to the site via 911 calls.

The following operational practices shall be used to manage the tire trailer storage.

1. Whole and sliced scrap tires, and other scrap tires capable of holding water shall be covered upon receipt with a water shedding material or disposed of, processed or removed from the site within ten days of receipt. Sliced scrap tires stacked concave-side down are not required to be covered.

2. No operations involving the use of open flames, blow torches or highly flammable substances shall be conducted within 50 feet of scrap tires. According to the posted signage, smoking is prohibited at the tire collection site.
3. A fire safety survey shall be conducted annually by local fire protection authorities or other persons as approved by the Division.
4. Communication equipment shall be maintained at the scrap tire collection site to assure that the site operator can contact local fire protection authorities (911) in case of a fire.
5. Two fire extinguishers shall be maintained on-site at the collection trailer to provide immediate control of any observed combustion.

Wilson County contracts the hauling and disposal of scrap tires with a registered contractor. Current information for the contractor is included in the operating record for:

Company name: Central Carolina Holding,LLC
Contact Thomas Womble
Address 1616 Mckoy Town Road, Cameron, NC 28326
Phone 1-800-232-0035
NC Tire Hauler or Recycler Registration No. 4304-TIRELF-1992

3.0 WOOD PROCESSING AND MULCH COMPOST

3.1 OVERVIEW

This section describes the Wood processing and mulch composting operations associated with the Wilson County Landfill Facility. The primary purpose of wood waste processing is to recover wood chips to be reused as biomass fuel, also commonly known as “hog fuel,” for commercial power boilers. The residuals from the recovery operation are composted with segregated yard trash to produce a mulch compost product. A soil fraction from grinding land clearing debris is recovered and reused as “topsoil” (not composted).

The general areas for wood waste processing are illustrated in the attached Wood Processing Site Drawing. There are two areas for storing and processing wood waste, designated Areas A and B. Additionally, a small Type 1 compost facility is included in this operations report for processing yard waste and generating mulch compost. If nutrient testing is completed and indicates plant food value, Wilson County may distribute a compost product. The primary intended product of the compost process is a fine mulch for use by the County and made available to the public. The mulch product made available to the public will not claim any plant nutrient value.

3.2 WASTE TYPES

The proposed processing center will only accept and process organic materials. The materials acceptable for processing on the site include delivered materials as follows:

- Land clearing waste such as stumps, trees, limbs, brush, grass, and other naturally occurring vegetative materials;

- Site clearing debris;
- Yard trash;
- High carbon nitrogen (C:N) yard waste such as brush, tree limbs, and similar vegetative matter with C:N ratios greater than 75;
- Untreated and unpainted wood wastes that have not been glued, treated with preservatives, painted, stained, or varnished (i.e. engineered wood products); and
- Other wastes as approved by the Division of Waste Management.

All other identified wastes will be removed and disposed in accordance with the Landfill's Waste Acceptance and Screening Plan.

3.3 WASTE ACCEPTANCE

All material received for processing will be monitored upon entrance to the site in accordance with the Landfill's Waste Acceptance and Screening Plan. The Wilson County Solid Waste Facility is designed to receive up to 6,000 cubic yards (raw) per quarter from off-site. The typical quarterly waste volume is 2,000 cubic yards. Approximately 60% of the wood waste processed is recovered as hog fuel wood chips.

3.4 WASTE SEGREGATION

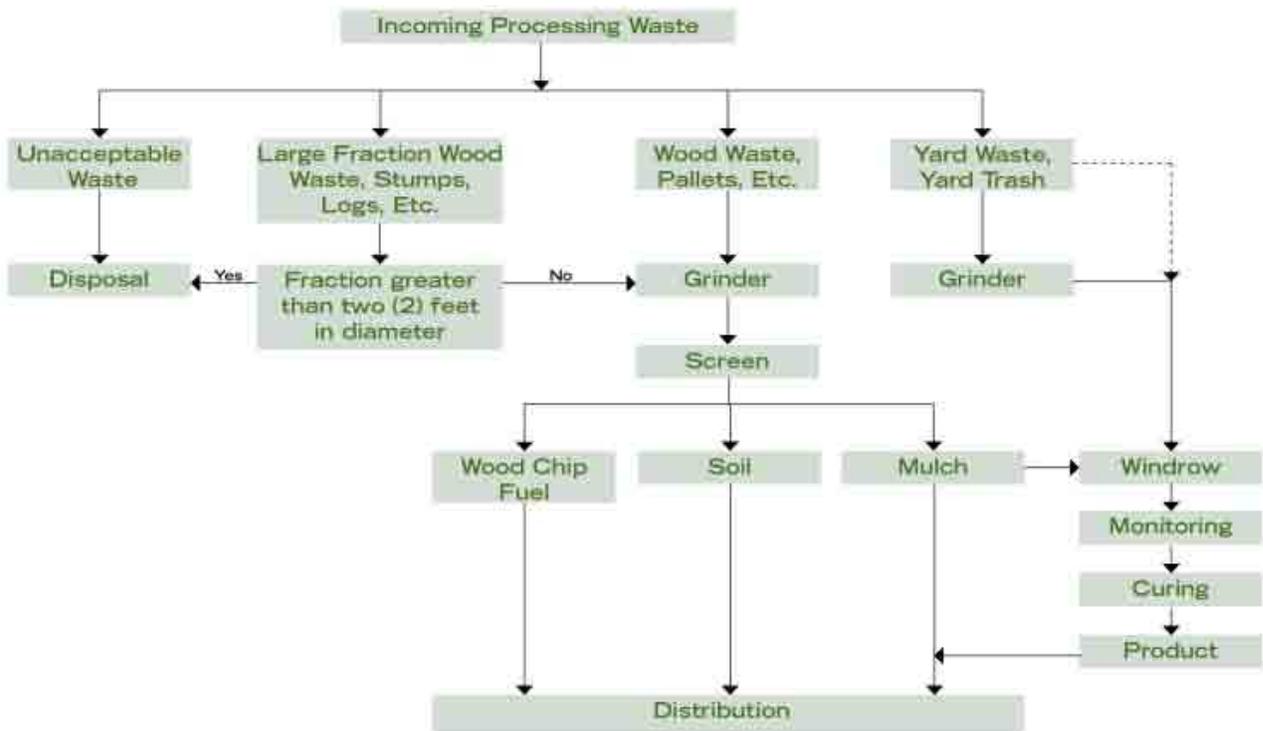
Subsequent to acceptance and initial screening at the scalehouse, site specific waste screening will be further implemented at the wood processing area to assure that prohibited wastes are not processed. If any non-acceptable wastes are identified, these wastes will be placed into a stockpile or container and removed from the site for disposal at a solid waste facility permitted to accept the particular waste. All records and receipts for this disposal shall be kept in the waste screening operating record for the Wilson County Landfill.

Yard trash is piled and processed separately from the wood waste material in the compost operation. If the delivered load is suspected of containing yard trash, it shall be placed in the yard trash pile for composting.

3.5 WOOD PROCESSING AND COMPOST OPERATIONS

The recycling process involves a flow through of organic materials. Generally, the process includes sorting of the material into small and large fraction materials for grinding and screening. The processing products include hog fuel wood chips, top soil and mulch compost. This section provides discussion on the major components of the process. Please refer below to **Figure 1** for a flowchart outlining the overall process.

Figure 1. Recycling Process Flowchart



3.5.1 Design Criteria

The primary purpose of wood processing is to recover wood chips to be reused as biomass fuel, also commonly known as “hog fuel,” for commercial power boilers. The residuals from the recovery operation are composted with segregated yard trash to produce a mulch compost product. A soil fraction from grinding land clearing debris is recovered and reused as “topsoil” (not composted).

The general areas for wood waste processing are illustrated in the attached Wood Processing Site Drawing. There are two areas for storing and processing wood waste, designated Areas A and B. A schematic of the processing equipment and areas is generally illustrated in attached Figure 2; the location of piles and equipment may vary based on the actual volume of material processed and to optimize operations and overall safety.

The designed Operating Capacity for the processing facility is to be up to 6,000 cubic yards (raw) of material undergoing processing per quarter. Based on the anticipated equipment (listed below), the site is capable of processing as much as 35,600 cubic yards per quarter (limited by the grinding operation) providing an acceptable factor of safety.

Separate from the wood processing areas, a small Type 1 compost facility is included in this operations report for storing and treating yard waste and generating mulch compost. If nutrient testing is completed and indicates plant food value, Wilson County may distribute a compost product. The primary intended product of the compost process is a fine mulch for use by the County and made available to the public. The mulch product made available to the public will not claim any plant nutrient value.

Prior to beginning compost operations, soil and groundwater conditions shall be evaluated by a qualified professional. The evaluation shall be documented in the facility operating record to demonstrate compliance with the following design requirements in 15A NCAC 13B .1404 (10) for a Type 1 compost area:

- (A) A site shall not contravene groundwater standards as established under 15A NCAC 2L;
- (B) Portions of a site used for waste receipt and storage, active composting, and curing shall have a soil texture finer than loamy sand and the depth to the seasonal high water table shall be maintained at least 12 inches for a Type 1 or 2 facility and 24 inches for a Type 3 facility, unless a pad is provided;
- (D) A pad is not required for storage of finished product that is dried so as to pass the Paint Filter Liquids Test (EPA Method 9095), and for which the storage area is prepared in such a manner that water does not collect around the base of the stored material, and where the depth to the seasonal high watertable is maintained at least 12 inches.

3.5.2 Equipment Requirements

The anticipated equipment requirements for operation and maintenance of the site are listed in the following table.

Description	Primary Function (Allocation)
1) Excavator	Sorting
2) Front End Loader	loading and mixing

Description	Primary Function (Allocation)
3) Grinder (Contracted)	grinding/shredding of bulky wastes, stumps, limbs, etc.
4) Screening Equipment (Contracted)	processing material to uniform consistency and sorting of various gradations.
5) Dump Truck	hauling material around site.

3.5.3 Grinding

The grinding operations will be conducted as needed to facilitate the recycling operations. The facility intends to utilize a single grinder to process the collected material. When the wood waste stockpile is approximately 2,000 cubic yards, grinding will be conducted by the wood contractor in a designated area separate from public access, and as determined by the landfill operator. The material will be directed to the grinders as per the material size. Yard waste grinding will be batched separately to the grinder and placed in the compost area for subsequent treatment.

It is anticipated that grinding and chipping will be conducted on a quarterly basis as materials are available. Grinders and chippers pose both maintenance and safety hazards. Therefore, please refer to the manufacturer's safety and or maintenance literature prior to operating equipment at the site.

3.5.4 Screening

Typically, the grinding operation is completed and then replaced by the contractor's screening equipment. The facility intends to utilize a single screening machine to process the ground materials. Screening is conducted primarily to recover the oversized wood chips as recycled hog fuel. The residual mulch material ranges in particle size depending on the screen size and grinding equipment, typically resulting in 5/8" to 2" mulch. Finer material (< 5/8") screened from land clearing debris is stockpiled as topsoil. The material not passing the screen, "overs" (>2"), are stored in the material storage area and will either be re-ground and chipped for additional screening, sold as "enhanced mulch", re-ground and recycled back into the compost facility to be used in new windrows, or disposed in the C&D facility. The finished product is stored on site in a loading area until ready for delivery. Three (3) finished products are anticipated as follows:

- Wood Chip Hog Fuel;
- Soil/Topsoil; and
- Mulch Compost.

Screening machines pose both maintenance and safety hazards. Therefore, please refer to the manufacturer's safety and or maintenance literature prior to operating equipment at the site.

3.5.5 Compost Management

3.5.5.1 Mixing & Windrow/Pile Formation

The ground products will be either separated into mulch piles or placed in composting windrows or piles using a front end loader.

The dimensions anticipated for the triangular compost piles will be approximately eight (8) feet in height and have a maximum base diameter of 15 feet.

3.5.5.2 Active Composting

The active compost process is achieved once the compost temperatures have gone from mesophylic temperatures (< 110 degrees Fahrenheit) to thermophylic temperatures (> 110 degrees Fahrenheit) until it has matured (gone back down to its original mesophylic state). During active composting, the windrows or piles will be turned periodically to keep them from going into an anaerobic (oxygen deprived) state. It is anticipated that the compost process will take approximately 24 weeks (six (6) months) from start to finish.

While in the active composting phase, the facility will maintain the windrows/piles at or above 131 degrees Fahrenheit for at least (3) days and aerate as needed to maintain elevated temperatures compliant with 15A NCAC 13B .1406. If for some reason a windrow reaches temperatures in excess of 160 degrees Fahrenheit, the windrows will be turned and/or moisture added to reduce the temperature to a normal operating condition.

3.5.5.3 Storing Compost

The compost which has been determined to be matured finished product (3-day: 131° F) will be maintained in the windrow or placed in the curing pile. The curing pile (approximately 400 CY) shall be

continue to be monitored with the windrow schedule. Typically, the storage piles will not exceed eight (8) feet in height and 50 feet in diameter to maintain product integrity. Final compost product shall be transferred to a distribution pile as needed (approximately 50 CY) adjacent to public access for directly loading vehicles. All piles will have a minimum 25 foot horizontal separation for fire protection.

3.5.5.4 Compost Monitoring

The process control parameters which will be monitored during composting are moisture content, temperature, oxygen content, and pH balance.

Moisture content of a compost mix is important because the microorganisms responsible for biodegradation of the waste need water to survive and grow. The desired moisture content of the compost mix is between 40% and 60%. Moisture can be monitored with two methods; the “squeeze” test in the field which will be performed routinely (typically daily), and the microwave oven method. The “squeeze” moisture test is done by grabbing a handful of compost from the interior of the pile in a area that is well mixed. If the material appears dry and crumbles after squeezing then it is too dry. If the material retains its clumped shape after squeezing without releasing excess water and leaves the hand damp then it is approximately between 40% and 60% which is the desired moisture content. The microwave oven test is a more accurate test. This method is accomplished by a few simple steps:

1. Weigh out a wet sample taken directly from a windrow.
2. Weigh the sample after it is dried in a microwave oven.

3. Find the weight of water evaporated by subtracting the wet sample weight from the dry sample weight.
4. Finally calculate the moisture content percentage by dividing the weight of water evaporated by the weight of the wet (original) sample and multiplying by 100 to get a percentage.

Temperature is one of the primary measures for testing compost because the heat produced during the process is directly related to microbial activity. After the initial turning/mixing process, windrows will remain undisturbed for the first three (3) to five (5) days to allow temperatures and microbial activity to increase. Once temperatures have maintained at or above 131 degrees Fahrenheit for at least three (3) days, the windrows will be turned. Temperature will be monitored and recorded on a daily basis to ensure that the compost has achieved adequate thermophylic levels while not exceeding 160 degrees Fahrenheit. Temperature testing will be performed at one (1) and three (3) foot depths and 20 foot intervals along both sides of all windrows.

Generally, five (5) percent oxygen concentration is considered the minimum for sustained aerobic composting. Wilson County operators will ensure adequate oxygen content in compost piles by maintaining structural porosity within the windrows. This will be accomplished by inspecting the incoming waste after the grinding and screening process to ensure the consistency of the compost material. If a windrow is inspected and found to be too dense, not porous enough, it will be “fluffed” either by turning or combining some cured compost with the volumetrically-reduced compost.

As a soil amendment, the pH level of a compost product is an important factor in determining what types of plants are suitable for any given compost. pH testing will be performed using a soil pH

test kit that employs a color coding system to determine the pH of the compost once mixed with a solution.

3.5.5.5 Curing

Once the compost process has completed its active phase, a curing phase is initiated to insure that the final compost material has reached stability. Compost stability is defined as the point at which the rate of oxygen consumption is reduced so that anaerobic or odorous conditions are not produced to the extent of that they cause problems with the storage and end use of the product. The stability of the compost signifies the completion of the product. Only stable compost shall be moved the final product pile. Stable compost shall be considered mature as determined by the Solvita test at an index value greater than 5.

3.5.5.6 Product Testing

Proper compost product sampling and testing is important to determine compliance with the applicable regulations of the North Carolina Department of Environment and Natural Resources (NCDENR) and to assure its customers they are manufacturing a quality product. If the final product has no declared nutrient value it will be distributed as a mulch product. If Wilson County distributes the final product as compost, representative samples should be obtained and tested by a qualified laboratory before any final compost product is released for sale.

The following procedure is required for sampling the compost:

1. Collect samples from areas of the compost pile that are representative of the general appearance and will avoid collecting atypically moist samples (> 60% moisture). If the samples are suspected of being too moist after they are collected new samples must be collected.
2. A representative compost sample will be collected from appropriate sampling locations and consist of no less than five (5) point samples. All samples will be taken at least 15 inches inside the windrow.
3. All samples will then be added to a sterilized five (5) gallon bucket and mixed thoroughly for subsequent testing.

Some of the compost samples collected, according to the sampling procedure above, should be tested and examined by the facility to ensure that the compost meets minimum requirements for pathogenic organisms, is free from offensive odor, and contains no sharp particles that would cause injury to persons handling the compost. If directions are provided with the compost product it shall have unrestricted applications and distributions. All product distribution as compost shall be in accordance with 15 NCAC 13B.1407(d)(3) for a Type 1 facility. Mulch and compost products used by Wilson County on the facility property do not require testing prior to use.

The final compost product may be distributed/sold to the public if it is determined to be of suitable quality. Before any compost product is sold or given away with a declared nutrient value it will be tested pursuant to 15 NCAC 13B.1407. The samples to be tested will be obtained according to the sampling procedure above and processed using the following protocol:

1. Sample will be chilled immediately upon collection and preparation.
2. They will then be bagged and labeled in water tight bags/containers and packed in a cooler with cooling packs.
3. Finally, the samples will be shipped to a approved laboratory for delivery within 24 hours only to be accepted by the laboratory if received at or below four (4) degrees Celsius.

3.5.6 Access and Roadways

The site has been designed to provide all-weather access to the processing area.

3.6 FINAL PRODUCT

Once the processing is completed to meet the specifications of this plan, on-site storage will be necessary until the product can be delivered. The area designated for the finished products will be accessible for both equipment involved in the storage as well as the equipment involved in loading the finished product off-site. The storage areas provide a buffer between processing operations and truck loading operations to maintain a safe controlled working environment.

Areas designated for storage will be protected against excessive runoff, soil loss or erosion by providing surface water diversions, silt fence, applying mulch products, or other best management practices (BMP's). The stockpiles shall not exceed heights beyond the limits of equipment available on-site or in such quantities as to provide a fire hazard due to decomposition (i.e. for the mulch product).

3.7 TROUBLESHOOTING

The final product must be maintained and monitored to prevent fire potential and to maintain an acceptable product. Typical problems and solutions have been provided in **Table 3.2**. This table may be updated from time to time to include additional information about the specific process at this site.

TABLE 3.2 TROUBLESHOOTING

Condition	Reason	Check	Remedy
PILE TEMPERATURE TOO HIGH (>150 °F)	INSUFFICIENT AERATION	IS PILE MOIST?	TURN PILE OR AERATE
	PILE IS TOO LARGE	HEIGHT > 8 FEET?	DECREASE PILE HEIGHT
EXTREMELY HIGH TEMPERATURE (>170 °F)	SPONTANEOUS COMBUSTION	LOW MOISTURE? BURNT SMELL?	DECREASE PILE SIZE, ADD WATER TO SMOLDERING SECTION, AND COMBINE WITH OTHER PILES
ODORS IN PILE	PILES ARE TOO LARGE	HEIGHT > 8 FEET OR WIDTH > 20 FEET ?	DECREASE PILE SIZE
NON-UNIFORM TEXTURE	POOR MIXING	ORIGINAL RAW MATERIALS DISCERNIBLE?	SCREEN PRODUCT & IMPROVE MIXING



Wilson County Planning Department

Mark M. Johnson, AICP, CZO, CFM
Director

2201 Miller Road, South • PO Box 1728 • Wilson, NC 27894-1728 • Fax: (252) 399-2770

Planning/Inspections
252-399-2965

Mapping/GIS
252-399-2846

Wilson County Transportation Services
252-399-2817

October 27, 2010

Mr. Andy Davis

Wilson County Solid Waste Director

Wilson, NC 27894-1728

Subject: Zoning Compliance Letter

Andy, per your request and as required under 15A NCAC 13B.1405(a)(2), I am submitting this letter of zoning compliance for landfill parcel identified by the following PIN numbers; 3732-52-9078, 3732-62-8665 and 3731-59-7732.

The property on which the Wilson County landfill is located is zoned A-R. Landfill operations are permitted in A-R zones under the provisions of a Special Use Permit. The Wilson County landfill is currently operating under Special Use Permit, SU 2007-03. This special use permit allows a landfill operation on the above subject properties.

The proposed managing, processing and storage of yard waste compost and white goods, are considered part of landfill operations and is therefore permitted at under the existing Special Use Permit.

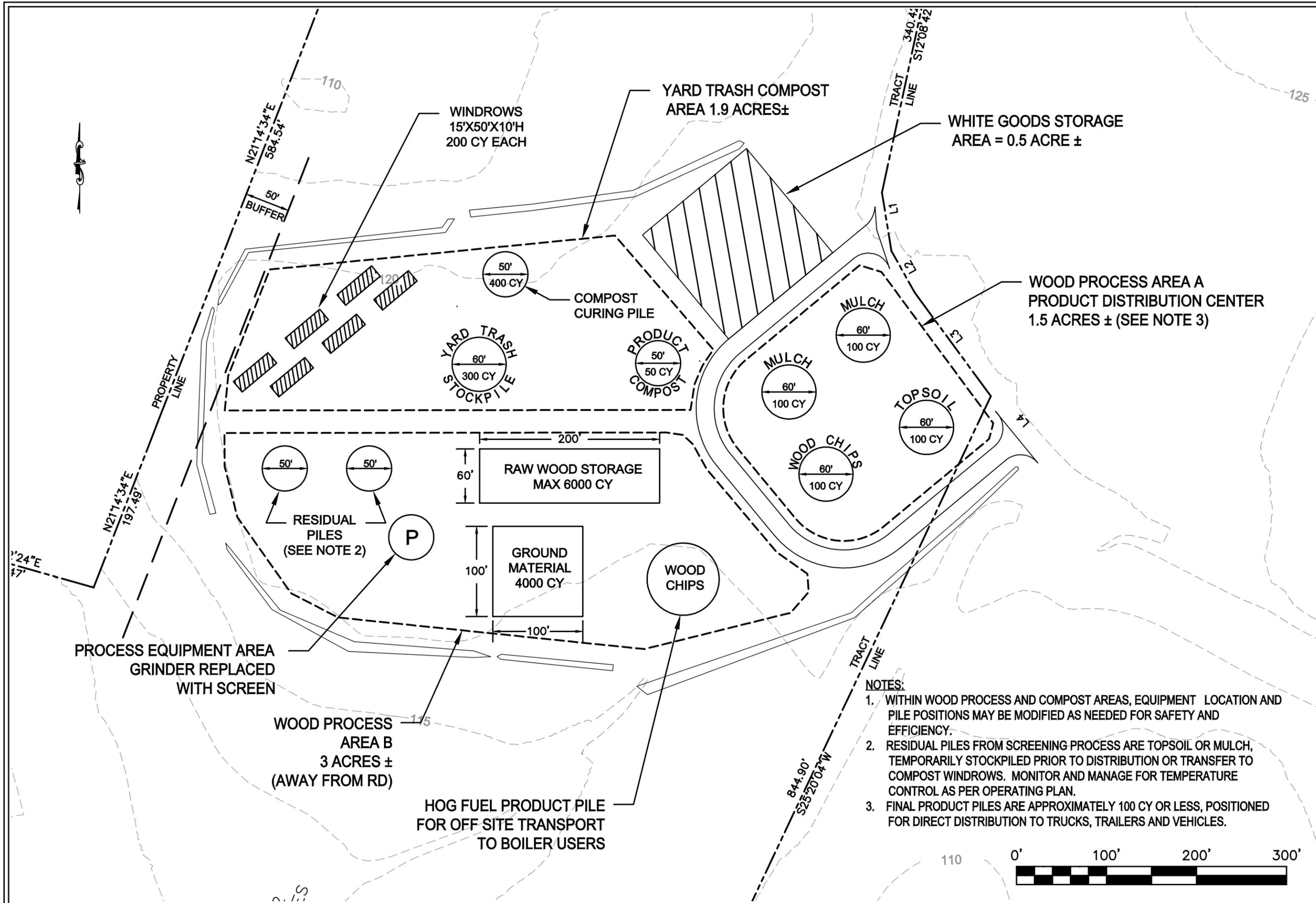
If you need additional information please do not hesitate to contact me.

Best Regards,

A handwritten signature in cursive script that reads "Mark M. Johnson".

Mark M. Johnson, AICP

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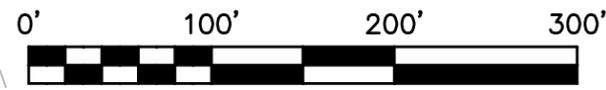


BLACKROCK ENGINEERS, INC.
 POST OFFICE BOX 58
 WILMINGTON, NORTH CAROLINA 28401
 107 PLUMTREE LANE
 CASTLE HAYNE, NORTH CAROLINA 28429
 PHONE: 910.232.6696

FIGURE NO.	2	FILE NAME	T&P SITE
SCALE:	1"=100'	PROJECT NO.	WGL1007
CHECKED BY:	GWA	DATE:	12.14.10
DRAWN BY:	JWG		

**GENERAL LAYOUT
 TREATMENT & PROCESSING SITE
 WILSON COUNTY LANDFILL**

- NOTES:**
1. WITHIN WOOD PROCESS AND COMPOST AREAS, EQUIPMENT LOCATION AND PILE POSITIONS MAY BE MODIFIED AS NEEDED FOR SAFETY AND EFFICIENCY.
 2. RESIDUAL PILES FROM SCREENING PROCESS ARE TOPSOIL OR MULCH, TEMPORARILY STOCKPILED PRIOR TO DISTRIBUTION OR TRANSFER TO COMPOST WINDROWS. MONITOR AND MANAGE FOR TEMPERATURE CONTROL AS PER OPERATING PLAN.
 3. FINAL PRODUCT PILES ARE APPROXIMATELY 100 CY OR LESS, POSITIONED FOR DIRECT DISTRIBUTION TO TRUCKS, TRAILERS AND VEHICLES.



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Attn: Jon Meade



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

December 07, 2009

LETTER OF APPROVAL WITH MODIFICATIONS

County of Wilson
 ATTN :- Ellis Williford
 P.O. Box 1728
 Wilson, NC 27893

RE: Project Name: Wilson Co. Landfill Mulch Area
 Project ID: WILSO-2010-003 Acres Approved: 10.71
 County: Wilson, NC Hwy 42, Wilson, NC
 River Basin: Neuse Stream Classification: Other
 Submitted By: Robert S Bartlett, Bartlett Engineering
 Date Received by LQS: 11/12/09; 12/2/09
 Plan Type: New

Dear Sir or Madam:

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.

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.

Letter of Approval With Modifications
Project - Wilson Co. Landfill Muleh Area
December 07, 2009
Page 2 of 3

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and standards. These laws, regulations, and standards 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 NCG01000 (CONSTRUCTION ACTIVITIES). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Due to the location of this project, it should be noted that a rule to protect and maintain existing buffers along watercourses in the Neuse River Basin became effective on July 22, 1997. The Neuse River Riparian Area Protection and Maintenance Rule (15A NCAC 2B .0233) applies to all perennial and intermittent streams, lakes, ponds and estuaries in the Neuse River Basin with existing vegetation on the adjacent land or "riparian area". In riparian areas with existing vegetation in the first 30 feet directly adjacent to the stream, the rule prohibits land disturbance or new development within the first 30 feet of land next to the water (the remaining 20 feet of the total buffer must be revegetated upon completion of any proposed land-disturbing activity). In riparian areas with existing vegetation that is less than 30 feet wide, the rule prohibits land disturbance or new development within the area that contains the existing vegetation (but not the entire 50 foot riparian area). For more information about this riparian area rule, please contact the Division of Water Quality's Wetland/401 Unit at 919-733-1786, or a Division of Water Quality representative at this regional office.

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 us if you plan to have a preconstruction conference.

Your cooperation is appreciated.

Sincerely,


Karyn Pageau, EIT, CPESC
Assistant Regional Engineer
Land Quality Section

Enclosures: Certificate of Approval
Modifications Required for Approval
NPDES Permit

cc: Robert S Bartlett, PE, Bartlett Engineering, 1906 Nash Street, North Wilson, NC 27893-1726
Danny Smith, DWQ - SWP Supervisor, Raleigh Regional Office

Letter of Approval With Modifications
Project :- Wilson Co. Landfill Mulch Area
December 07, 2009
Page 3 of 3

MODIFICATIONS REQUIRED FOR APPROVAL

Project Name: Wilson Co. Landfill Mulch Area
Project ID: WILSO-2010-003
County: Wilson

1. Provide revised construction entrance detail to show stone size of 2-3 in. and check dam detail to show structural stone size of Class B. Provide 1 copy of drawings revised as a result of requested changes to this office by January 5, 2010 or prior to construction beginning, whichever is sooner.

Letter of Approval With Modifications
Project :- Wilson Co. Landfill Mulch Area
December 07, 2009
Page 2 of 2

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.

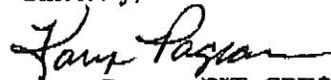
Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCG01000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Due to the location of this project, it should be noted that a rule to protect and maintain existing buffers along watercourses in the Neuse River Basin became effective on July 22, 1997. The Neuse River Riparian Area Protection and Maintenance Rule (15A NCAC 2B .0233) applies to all perennial and intermittent streams, lakes, ponds and estuaries in the Neuse River Basin with existing vegetation on the adjacent land or "riparian area". In riparian areas with existing vegetation in the first 30 feet directly adjacent to the stream, the rule prohibits land disturbance or new development within the first 30 feet of land next to the water (the remaining 20 feet of the total buffer must be revegetated upon completion of any proposed land-disturbing activity). In riparian areas with existing vegetation that is less than 30 feet wide, the rule prohibits land disturbance or new development within the area that contains the existing vegetation (but not the entire 50 foot riparian area). For more information about this riparian area rule, please contact the Division of Water Quality's Wetland/401 Unit at 919-733-1786, or a Division of Water Quality representative at this regional office.

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Sincerely,


Karyn Pageau, EIT, CPESC
Assistant Regional Engineer
Land Quality Section

Enclosures: Certificate of Approval
Modifications Required for Approval
NPDES Permit

cc: Robert S Bartlett, PE, Bartlett Engineering, 1906 Nash Street, North Wilson, NC 27893-1726
Danny Smith, DWQ – SWP Supervisor, Raleigh Regional Office

Enclosures: Certificate of Approval

WILSON COUNTY LANDFILL

2400 NC Highway 42 East, Gardeners Township Wilson County, North Carolina

DEVELOPER/OWNER:

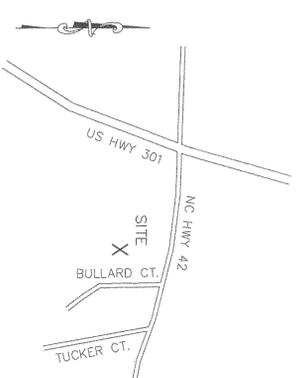
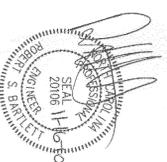
WILSON COUNTY
PO BOX 1728
WILSON, NC 27893

PREPARED BY:

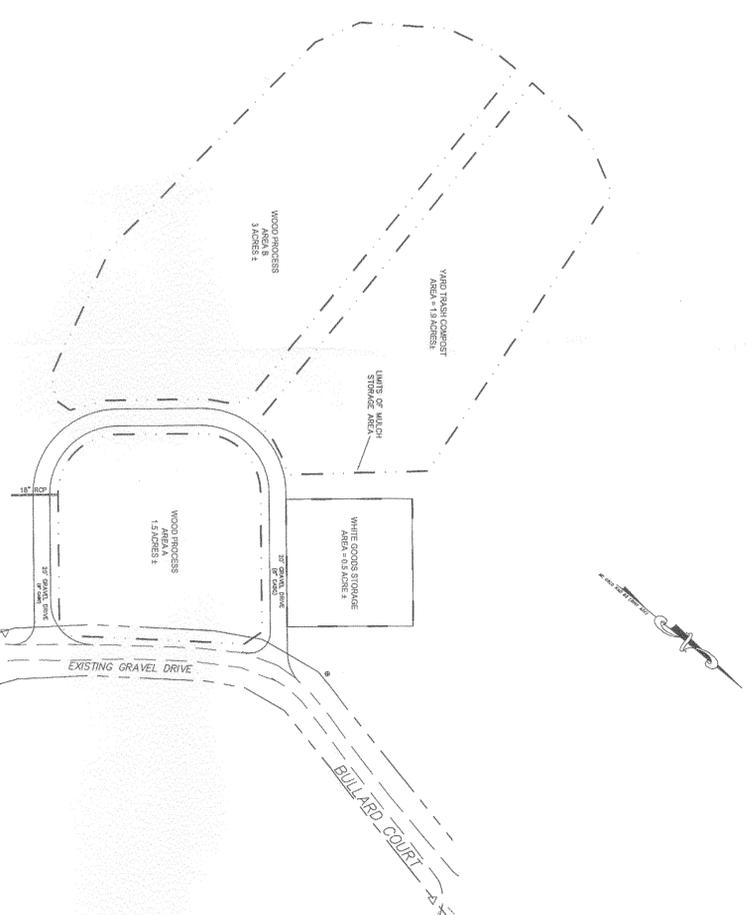
BARTLETT ENGINEERING & SURVEYING, PC
1906 NASH STREET NORTH
WILSON, NORTH CAROLINA 27893-1726

- SHEET INDEX
- SP1 OVERALL MAP
 - SP2 SITE PLAN
 - SP3 GRADING / SEDIMENTATION AND EROSION CONTROL
 - SP4 CONSTRUCTION PLAN
 - DT1 DETAILS AND CALCULATIONS

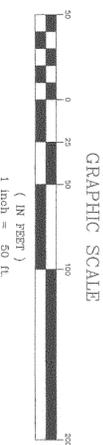
SITE DATA	
TOTAL AREA	709± ACRES
ZONING	AR
MIN. BLDG. LINES	FRONT 35'
	SIDE 15'
	REAR 30'
REFERENCE:	
	DB 1562 PG. 165
	DB 1577 PG. 567
	DB 1950 PG. 792
	DB 2150 PG. 709
	DB 2338 PG. 867



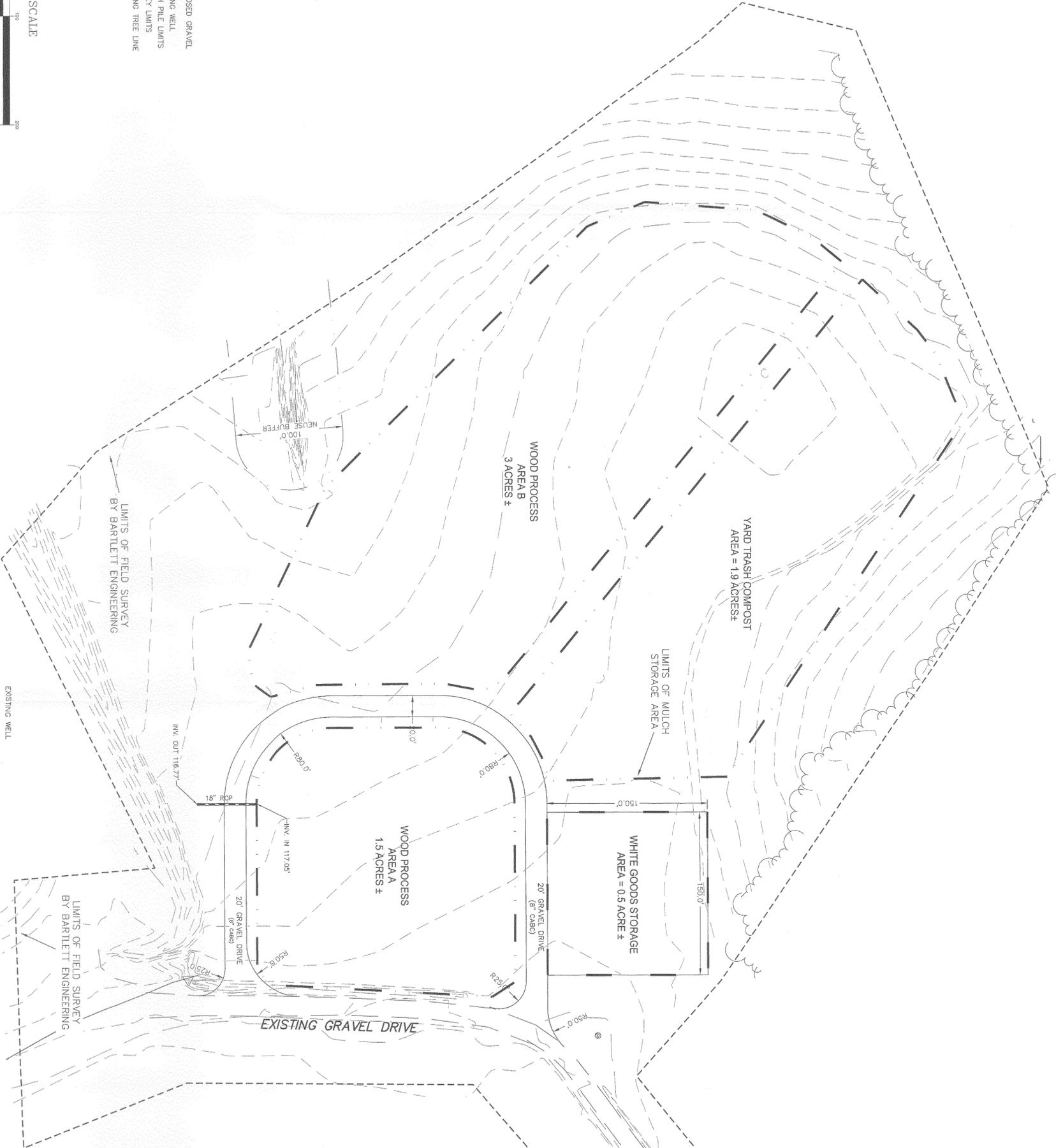
VICINITY MAP
NO SCALE



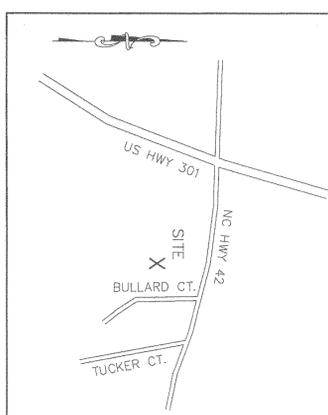
LOCATION MAP
NO SCALE



- LEGEND**
- PROPOSED GRAVEL
 - EXISTING WELL
 - MULCH PILE LIMITS
 - SURVEY LIMITS
 - EXISTING TREE LINE



THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING SUCH UTILITIES IN THE AREA. THE AREA HAS BEEN SERVICED OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



LOCATION MAP
NO SCALE



BARTLETT
ENGINEERING & SURVEYING, PC
1906 NASH STREET NORTH
WILSON, N.C. 27893-1726
TELE: (252) 399-0704
FAX: (252) 399-0904
EMAIL: info@bartletteng.com

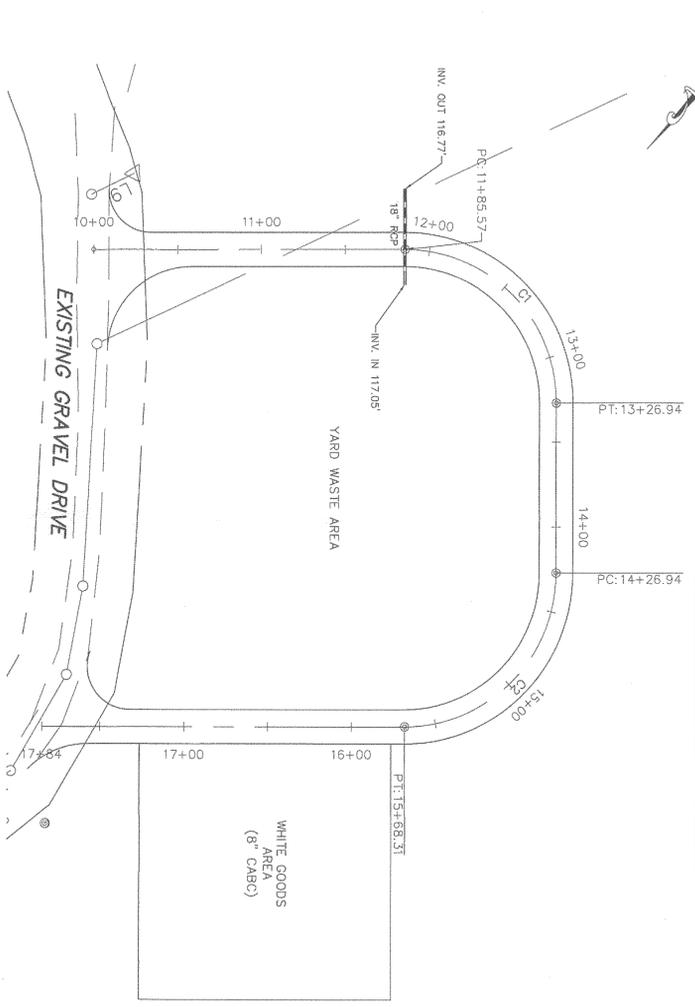
SITE PLAN

WILSON COUNTY LANDFILL
(MULCH STORAGE, YARD WASTE COLLECTION, WHITE GOODS COLLECTION AREAS)
2400 NC HIGHWAY 42 EAST

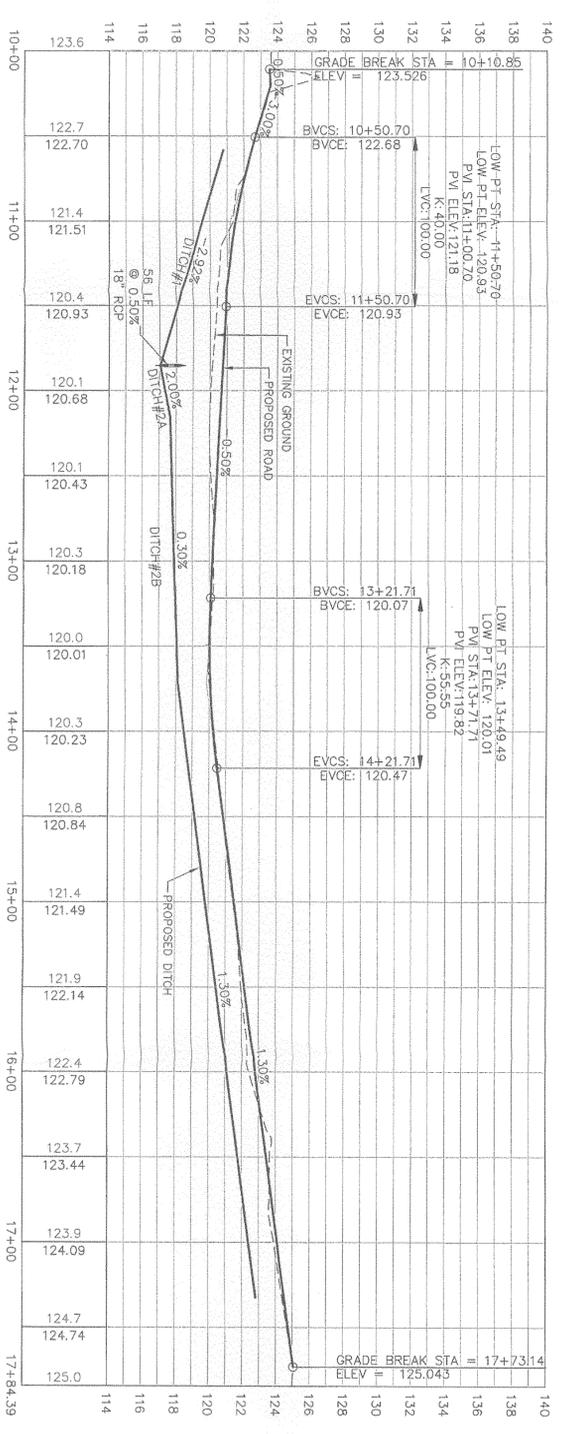
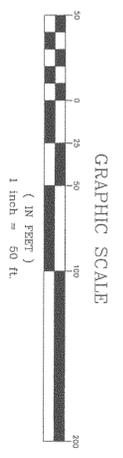
DATE:	OCT. 2009	PROJECT:	09158	GARDNERS TOWNSHIP	WILSON COUNTY
SCALE:	1" = 50'	CLIENT CODE:	WC	NORTH CAROLINA	ZONE: AR
REVISIONS:		DRAWN BY:	GEP/AR/JM	PIN # 3732-52-9078	SHEET SP2
		SURVEY BY:	TB/KPLP		



CURVE	LENGTH	RAIUS	DELTA	TANGENT	CHORD BEG.	CHORD END
C1	141.37	90.00	90°00'00"	90.00	N84°40'31"W	127.28
C2	141.37	90.00	90°00'00"	90.00	N51°19'29"E	127.28



GRAVEL DRIVE 20' EP-EP PLAN VIEW



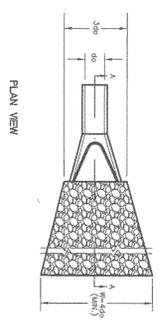
CONTRACTOR RESPONSIBLE FOR COMPLYING WITH ALL REQUIREMENTS/CONDITIONS OF ALL ENCROACHMENTS & PERMITS INCLUDING PROVIDING BONDS/INSURANCE IF REQUIRED. CONTRACTOR IS RESPONSIBLE FOR COORDINATING REQUIRED INSPECTIONS BY NCDOT AND/OR WITH MUNICIPALITY.

EROSION CONTROL NOTES:
1. SEEDING AND MULCHING TO BE APPLIED WITHIN 15 WORKING DAYS OF ALL LAND DISTURBING ACTIVITIES NOT PREVIOUSLY STABILIZED.
2. SILT FENCE TO BE INSTALLED AS SHOWN ON PLANS OR AS DETERMINED NECESSARY BY VISUAL OBSERVATION.

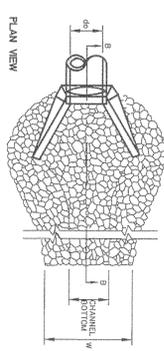
LOCATION, QUANTITY AND PLACEMENT OF DRAINAGE PIPES AND EROSION CONTROL DEVICES MAY VARY TO BETTER CONFORM TO FIELD CONDITIONS.

UTILITIES SHOWN ON PLANS ARE LOCATED APPROXIMATELY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING UTILITIES AND SERVICES WHETHER SHOWN ON PLANS OR NOT. CONTRACTOR TO BE RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF THESE FACILITIES IF DAMAGED.

TYPE A
PIPE OUTLET TO FLAT AREA WITH NO DERIVED CHANNEL.

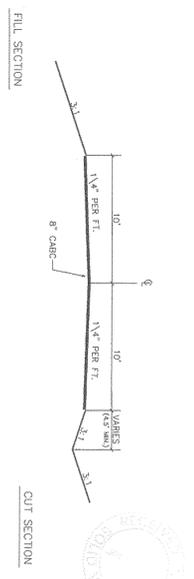


TYPE B
PIPE OUTLET TO WELL-DERIVED CHANNEL.



MAINTENANCE:
KEEP OUTLETS OPEN/CLEAR AFTER HEAVY RAINS TO PREVENT EXCESSIVE WATER FROM BEING DISCHARGED. MAINTAINERS MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

OUTLET PROTECTION NO SCALE



PROPOSED 20' EP-EP ROAD SECTION
No Scale

BARTLETT
ENGINEERING & SURVEYING, PC
1906 NASH STREET NORTH
WILSON, N.C. 27783-1726
E-MAIL: info@bartletteng.com

**CONSTRUCTION
PLANS**

WILSON COUNTY LANDFILL
(MULCH STORAGE, YARD WASTE COLLECTION, WHITE GOODS COLLECTION AREAS)
2400 NC HIGHWAY 42 EAST

DATE: OCT. 2009
SCALE: H:1"=50' V:1"=5'
REVISIONS: Δ NC DEPT. COMMENTS 11-12-09

PROJECT: 09158 WC
CLIENT CODE: 091581P2
FIELD BOOK: BF
SURVEY BY: TBKRPJP

GARDNERS TOWNSHIP
NORTH CAROLINA
ZONE: AR

WILSON COUNTY
AR
PIN # 3732-52-9078
SHEET SP4

Permit No.	Date	Document ID No.
98-09	January 10, 2011	12667

RECEIVED
January 07, 2010 via an e-mail
Solid Waste Section
Raleigh Central Office

Chao, Ming-tai

From: Gary Ahlberg [gary@blackrocke2.com]
Sent: Friday, January 07, 2011 4:36 PM
To: Chao, Ming-tai
Cc: Ritter, Christine; adavis@wilson-co.com
Subject: Re: Fwd: FW: Wilson County Westside C&DLF
Attachments: G-p8 Dwg D1 notation.pdf; H1-Gas Monitoring Plan Final.pdf; I -Westside Facilities Plan-R4 p1-p2.pdf; G Title Revision.pdf; Asbestos Disposal Manifest Form.pdf; D-Operation PlanR2 p15rev.pdf; D-Operation PlanR2 p2rev.pdf; I-Wilson Co Landfill White Goods-Mulch Area S&EC Permit.pdf; G-Figure5 Inert Debris and Asbestos Unit.pdf

Ming,

Attached are the selected revisions and copies of documents you requested for substitution/addition to the existing application Dec 2010 version.

Please call me if you have any questions. Within 10 days, Wilson County will submit a separate letter notifying the SWS and DHS for the closure of the asbestos trench disposal area approved under SWP#98-01 and outlining closure documentation and post closure.

We will publish/transmit one hard copy with draft permit.

Thanks,
Gary

Gary W. Ahlberg, P.E.

BlackRock Engineers, Inc.
5102 Wrightsville Avenue
Wilmington, NC 28403
910.232.6696

On 1/6/2011 11:59 AM, Ritter, Christine wrote:

Hi Gary-

The gas monitoring plan submitted for the Wilson County Westside C&DLF satisfies the minimum Rule requirements for landfill gas monitoring. Please submit the final plan with drawing LFG1 so that we may finalize the permit application.

Thank you,
Christine

From: Gary Ahlberg [<mailto:gary@blackrocke2.com>]
Sent: Tuesday, January 04, 2011 10:33 PM
To: Ritter, Christine
Cc: Chao, Ming-tai; Andy Davis
Subject: Re: Fwd: FW: Wilson County Westside C&DLF

Christine,

Please review this draft and let me know if this is complete for gas monitoring plan at Westside. Final would include drawing LFG1 attached.

Thanks,
Gary

Gary W. Ahlberg, P.E.

BlackRock Engineers, Inc.
5102 Wrightsville Avenue
Wilmington, NC 28403
910.232.6696

On 1/4/2011 12:21 PM, Gary Ahlberg wrote:

Christine,

Thanks for calling me back to discuss your preliminary comments provided to Andy Davis. As we discussed, the explosive gas monitoring plan we submitted was intended to be all on drawing LFG1, as per our notation. In our quest to make the drawing the standalone plan, we have not met the expectations and efforts to standardize these plans.

We understand you would like to see a brief narrative incorporating the rationale for our proposed gas monitoring probes relative to site/geologic criteria. We will add a page of text including the existing notes and a more comprehensive discussion that can be referenced in the future by the compliance group. While monitoring and recordkeeping is required, there is no quarterly report submittal for %LEL observations in compliance. We will provide a draft copy of this text for your review this afternoon.

As I mentioned, we do have some comments on the Draft guidance document that we believe would make it more accurate for explosive gas monitoring. We will provide these comments separately for agency consideration.

Please let me know if I summarized our discussion sufficiently.

Thanks,
Gary

From: Ritter, Christine [<mailto:christine.ritter@ncdenr.gov>]
Sent: Monday, January 03, 2011 4:50 PM
To: Andy Davis
Cc: Chao, Ming-tai; Mussler, Ed
Subject: Wilson County Westside C&DLF

Andy-

There was no landfill gas monitoring plan contained in your most recent submittal to the Solid Waste Section. **15A NCAC 13B .0544 (d) Monitoring Plans and Requirements for C&DLF Facilities** requires a landfill gas monitoring plan. Your December 1, 2010 response to comments and Attachment H-Monitoring Plan contained a drawing with the proposed locations of three gas monitoring probes but included no discussion related to landfill gas monitoring. Please submit a landfill gas monitoring plan in accordance with the above referenced Solid Waste Rule. We previously sent you copies of the NC Solid Waste Section's Landfill Gas Monitoring Guidance document. If you need additional copies, you may access the Solid Waste Section's website at the address below and the specific guidance is located under the Environmental Monitoring section. If you need additional hard copies, let me know and I will send one to you. Please let me know if you have any questions.

Thank you,
Christine

Christine Ritter (christine.ritter@ncdenr.gov)

Hydrogeologist

NC Department of Environment and Natural Resources

Division of Waste Management - Solid Waste Section

1646 Mail Service Center

Raleigh, North Carolina 27699-1646

Tel: 919.508.8506 web: <http://portal.ncdenr.org/web/wm/sw>

Asbestos Waste Disposal Manifest
Example Form

Generator	1. Work site name and mailing address		Owner's name	Owner's telephone no.
	2. Operator's name and address			Operator's telephone no.
	3. Waste disposal site (WDS) name, mailing address, and physical site location			WDS phone no.
	4. Name, and address of responsible agency			
	5. Description of materials		6. Containers No. Type	7. Total quantity m ³ (yd ³)
	8. Special handling instructions and additional information			
	9. OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.			
	Printed/typed name & title		Signature	Month Day Year
	10. Transporter 1 (Acknowledgment of receipt of materials)			
Transporter	Printed/typed name & title		Signature	Month Day Year
	Address and telephone no.			
	11. Transporter 2 (Acknowledgment of receipt of materials)			
	Printed/typed name & title		Signature	Month Day Year
Address and telephone no.				
Disposal Site	12. Discrepancy indication space			
	13. Waste disposal site owner or operator: Certification of receipt of asbestos materials covered by this manifest except as noted in item 12.			
	Printed/typed name & title		Signature	Month Day Year

(Continued)

Figure 4. Waste Shipment Record

INSTRUCTIONS

Waste Generator Section (Items 1-9)

1. Enter the name of the facility at which asbestos waste is generated and the address where the facility is located. In the appropriate spaces, also enter the name of the owner of the facility and the owner's phone number.
2. If a demolition or renovation, enter the name and address of the company and authorized agent responsible for performing the asbestos removal. In the appropriate spaces, also enter the phone number of the operator.
3. Enter the name, address, and physical site location of the waste disposal site (WDS) that will be receiving the asbestos materials. In the appropriate spaces, also enter the phone number of the WDS. Enter "on-site" if the waste will be disposed of on the generator's property.
4. Provide the name and address of the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program.
5. Indicate the types of asbestos waste materials generated. If from a demolition or renovation, indicate the amount of asbestos that is
 - Friable asbestos material
 - Nonfriable asbestos material
6. Enter the number of containers used to transport the asbestos materials listed in item 5. Also enter one of the following container codes used in transporting each type of asbestos material (specify any other type of container used if not listed below):
 - DM - Metal drums, barrels
 - DP - Plastic drums, barrels
 - BA - 6 mil plastic bags or wrapping
7. Enter the quantities of each type of asbestos material removed in units of cubic meters (cubic yards).
8. Use this space to indicate special transportation, treatment, storage or disposal or Bill of Lading information. If an alternate waste disposal site is designated, note it here. Emergency response telephone numbers or similar information may be included here.
9. The authorized agent of the waste generator must read and then sign and date this certification. The date is the date of receipt by transporter.

NOTE: The waste generator must retain a copy of this form.

(continued)

Transporter Section (Items 10 & 11)

10. & 11. Enter name, address, and telephone number of each transporter used, if applicable. Print or type the full name and title of person accepting responsibility and acknowledging receipt of materials as listed on this waste shipment record for transport. Enter date of receipt and signature.

NOTE: The transporter must retain a copy of this form.

Disposal Site Section (Items 12 & 13)

12. The authorized representative of the WDS must note in this space any discrepancy between waste described on this manifest and waste actually received as well as any improperly enclosed or contained waste. Any rejected materials should be listed and destination of those materials provided. A site that converts asbestos-containing waste material to nonasbestos material is considered a WDS.
13. The signature (by hand) of the authorized WDS agent indicates acceptance and agreement with statements on this manifest except as noted in item 12. The date is the date of signature and receipt of shipment.

NOTE: The WDS must retain a completed copy of this form. The WDS must also send a completed copy to the operator listed in item 2.

TYPICAL SIGNAGE FOR ASBESTOS DISPOSAL AREA



1.13.4 Disposal Area and Cover

A map shall be maintained locating the active asbestos fill area within the Westside C&D landfill unit or Inert Debris unit. Location of the asbestos area shall consider future gas vent drilling, and buffer those planned locations.

At the end of each operating day, or at least once every 24-hour period while the site is in continuous operation, the asbestos-containing waste material that has been deposited at the site during the operating day or previous 24-hour period shall be covered with at least 15 centimeters (6 inches) of compacted soil.

1.13.5 Asbestos Recordkeeping

Receipt of asbestos for disposal requires the maintenance of the following records and notifications.

for C&D landfills, will also be accepted for disposal. Specific approval must be received from the Division for other waste types that Wilson County may want to accept for disposal; typically, this will require a demonstration to the Division that the waste type is "Inert Debris". The Inert Debris evaluation may require chemical analysis to document that potential leaching from the material will not exceed 15A NCAC 2L Groundwater Standards. Asbestos waste is received on a project specific basis and is directed for separate burial in the Inert Debris Unit as delineated in Figure 5, or a marked area of the C&D unit (see Section 1.13).

1.4.2 Waste Exclusions

As specified in .0542(e) Waste Exclusions, the following wastes must not be disposed of in a C&DLF unit:

- (1) Containers such as tubes, drums, barrels, tanks, cans, and bottles unless they are empty and perforated to ensure that no liquid, hazardous or municipal solid waste is contained therein,
- (2) Garbage as defined in G.S. 130A-290(a)(7),
- (3) Hazardous waste as defined in G.S. 130A-290(a)(8), to also include hazardous waste from conditionally exempt small quantity generators,
- (4) Industrial solid waste unless a demonstration has been made and approved by the Division that the landfill meets the requirements of Rule .0503(2)(d)(ii)(A),
- (5) Liquid wastes,
- (6) Medical waste as defined in G.S. 130A-290(a)(18),
- (7) Municipal solid waste as defined in G.S. 130A-290(a)(18a),
- (8) Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761,
- (9) Radioactive waste as defined in G.S. 104E-5(14),
- (10) Septage as defined in G.S. 130A-290(a)(32),
- (11) Sludge as defined in G.S. 130A-290(a)(34),
- (12) Special wastes as defined in G.S. 130A-290(a)(40),
- (13) White goods as defined in G.S. 130A-290(a)(44), and

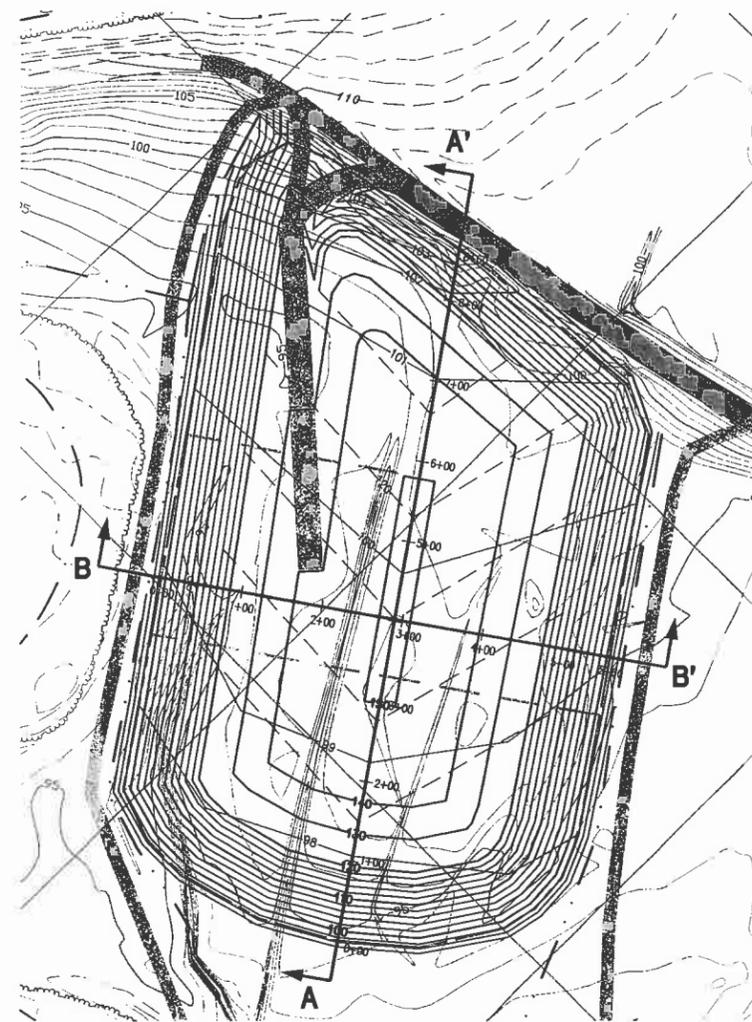
ATTACHMENT G

PERMIT AMENDMENT DRAWINGS

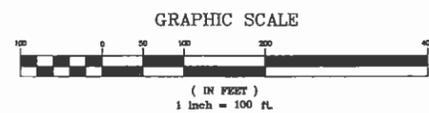
Figures 1 and 2 are added to the 2004 Approved Construction Plan Drawings. Drawing D1 is not used for Phase 2; superseded by Figure 4. Figure 3 is not used; superseded by Dwg S1.

Supplemental to Attachment G, additional Figures and Drawings are included for the General Wilson County Landfill Site Plan (S1), Updated mapping and Cross-sections (Figures 4 and 5), Phase 2 Grading, and Landfill Gas Monitoring, and T&P Bartlett E&SC Plans.

NOT USED FOR PHASE 2
SEE FIGURE 4

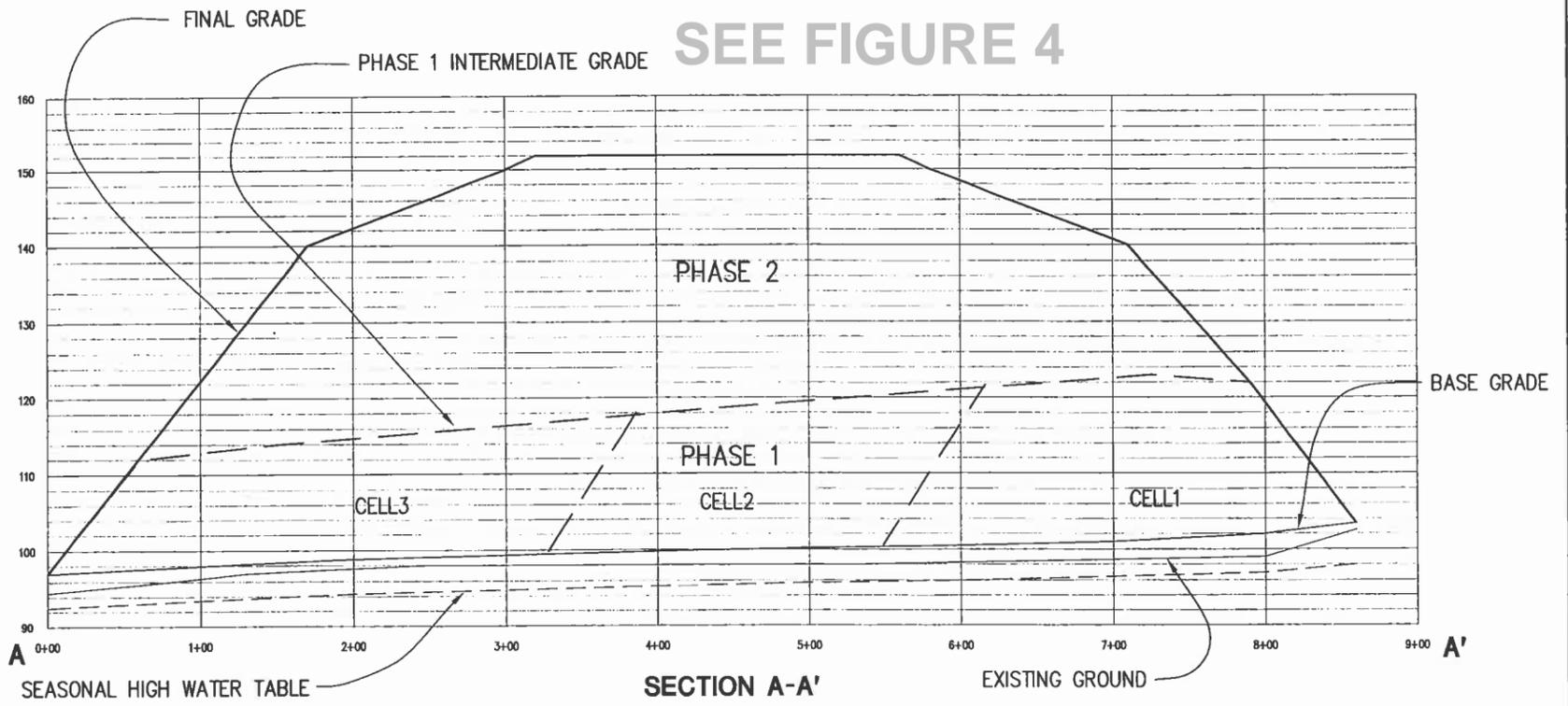


PLAN SECTION ALIGNMENT
SCALE 1" = 100'



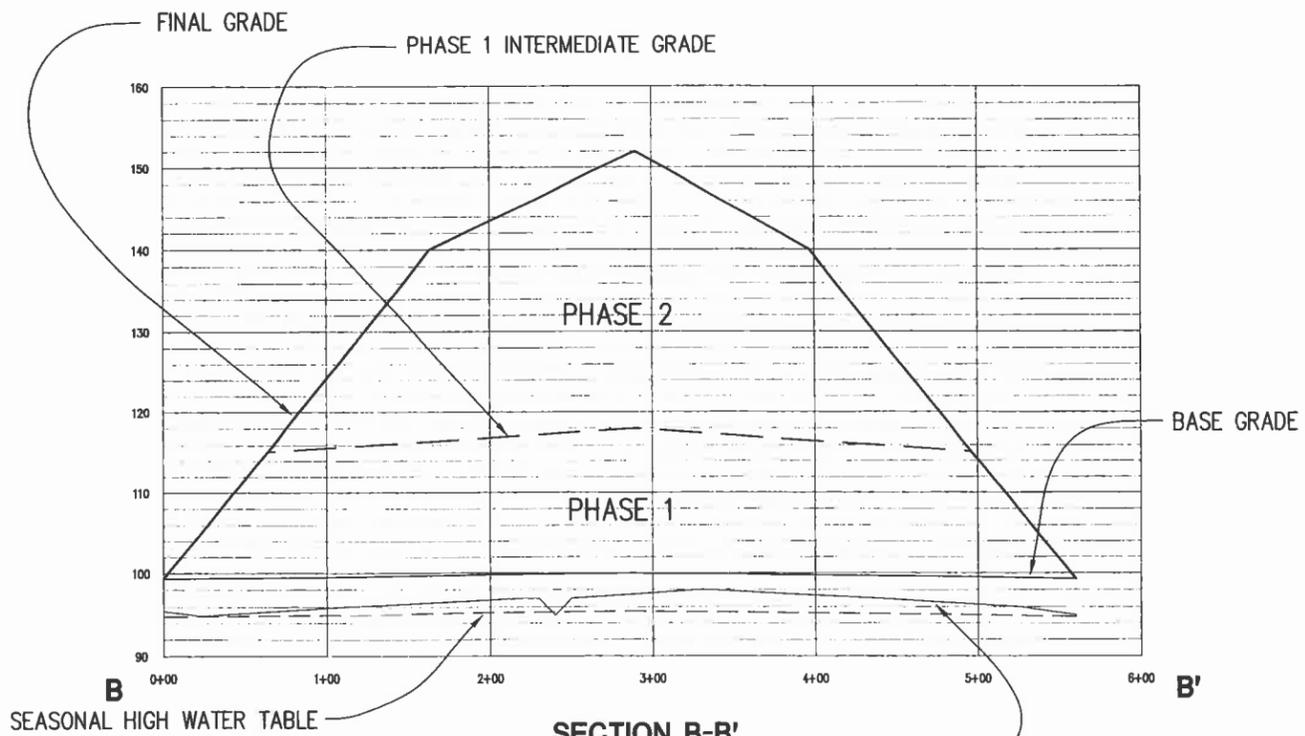
LEGEND

- LANDFILL FOOTPRINT
10.5 ACRES
- LANDFILL BASE GRADE 1-FT CONTOUR
- P1 INTERMEDIATE GRADE 2-FT CONTOUR
- FINAL GRADE 2-FT CONTOUR
- 2003 TOPOGRAPHY 1-FT CONTOUR
- 1998 TOPOGRAPHY 2-FT CONTOUR
- DRAINAGE CHANNEL



SECTION A-A'

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'



SECTION B-B'

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'

PERMIT ISSUE
NOT FOR CONSTRUCTION

GARY W. AHLBERG, P.E.
POST OFFICE BOX 58
WILMINGTON, NORTH CAROLINA 28402
910.232.6696
gahw@earthlink.net

PROJECT:
WESTSIDE C&D LANDFILL
CONSTRUCTION PLAN PERMIT
WILSON, NORTH CAROLINA

PREPARED FOR:
WILSON COUNTY
DEPARTMENT OF SOLID WASTE
113 E. NASH STREET
WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE

REVISIONS



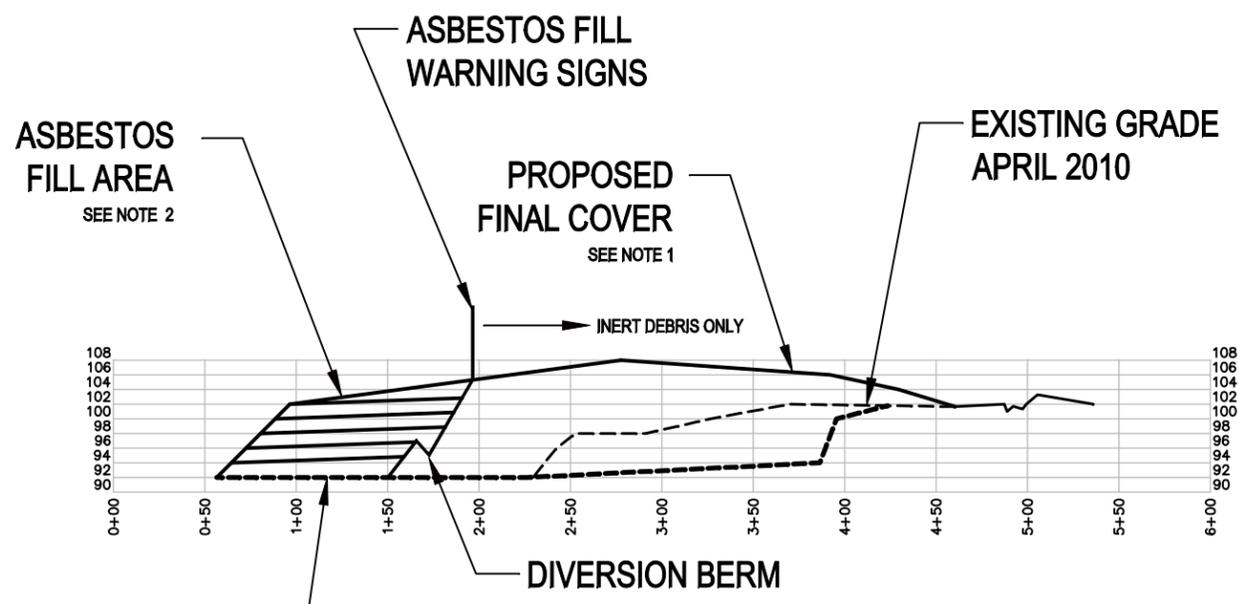
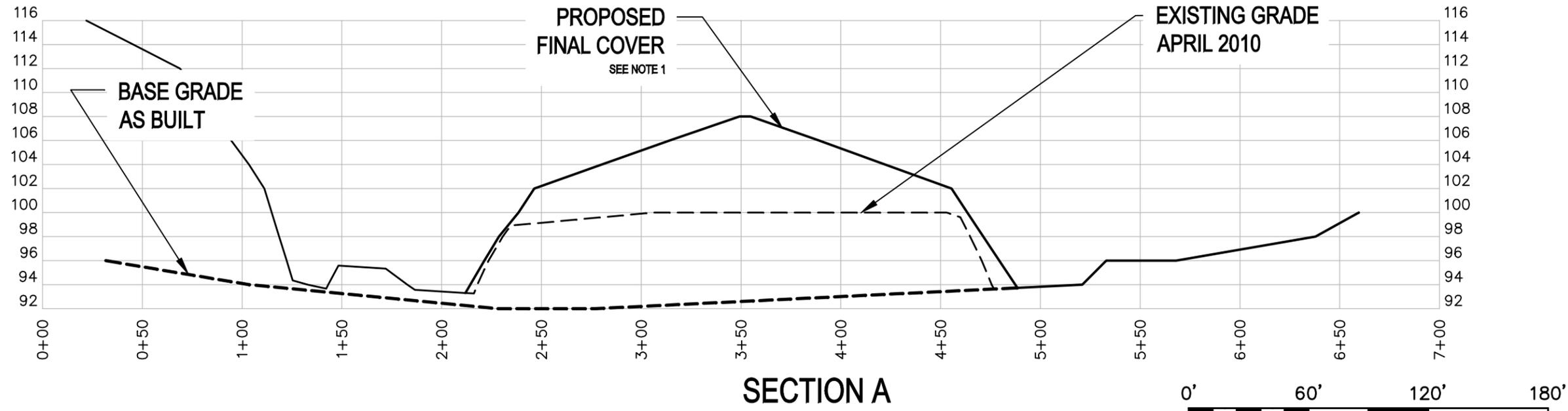
LANDFILL
CROSS
SECTIONS

SCALE: 1" = 100'
DATE: 9/01/04
DRN. BY: GWA
CHECKED BY: GWA

PROJECT NO:

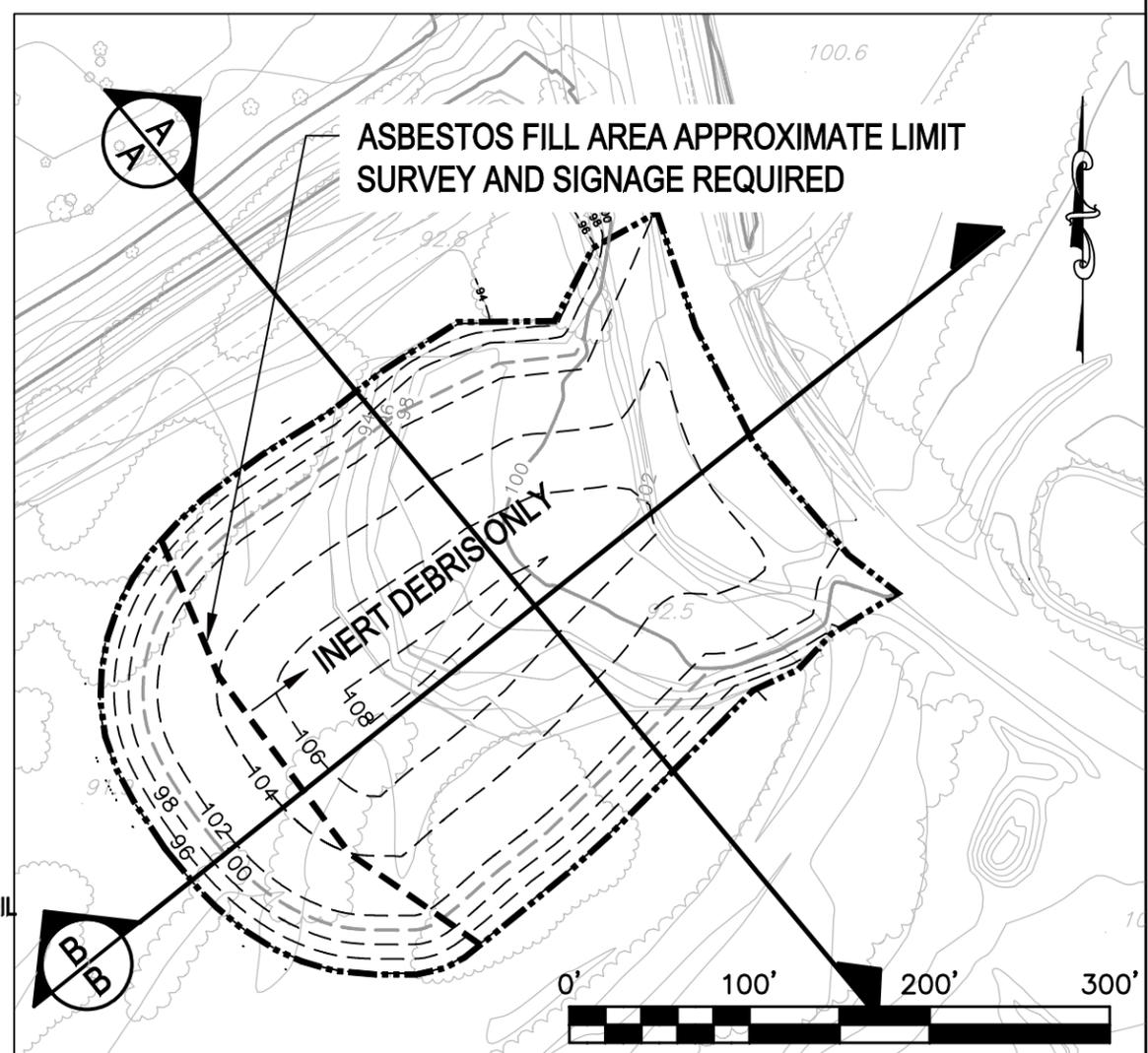
DRAWING NO.

D1



SECTION B

- NOTE:**
1. FINAL COVER. A 2-FT. VEGETATED SOIL LAYER SHALL BE PLACED AS FINAL COVER, INCLUDING A 6-INCH TOPSOIL LAYER. SEE DWG C4 GRADING PLAN.
 2. ASBESTOS MATERIAL SHALL BE COVERED WITH A MINIMUM 6" LAYER OF SOIL COVER IMMEDIATELY FOLLOWING PLACEMENT AS PER OPERATION PLAN.
- REFERENCE NOTE:**
1. EXISTING GRADE APRIL 2010 SURVEYED BY BARTLETT ENGINEERING WILSON, N.C. NC SURVEYOR LIC. #



BLACKROCK ENGINEERS, INC.

POST OFFICE BOX 58
WILMINGTON, NORTH CAROLINA 28401
PHONE: 910.232.6696

FIGURE NO.	5	FILE NAME	
SCALE:	AS SHOWN	PROJECT NO.	WCL10-07
CHECKED BY:	G.W.A.	DATE:	01.04.11
DRAWN BY:	J.W.G.		

**WILSON COUNTY LANDFILL
INERT DEBRIS UNIT
CROSS SECTIONS**

TITLE:

ATTACHMENT H-1

EXPLOSIVE GAS
MONITORING PLAN

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1.0 EXPLOSIVE GAS MONITORING PLAN

This Explosive Gas Monitoring Plan is designed to address regulatory requirements as set forth in the Rules to detect explosive gases that may be generated by decomposition of Construction and Demolition wastes in the Westside C&D landfill unit. The monitoring plan is designed to detect explosive gases that may accumulate in on-site enclosed structures or migrate in unsaturated soils toward the property boundary.

Attached to this plan is project Drawing LFG1, illustrating the proposed site characteristics relevant to gas monitoring and including the proposed gas monitoring system. As described in the site study permit documents and water quality monitoring plan, the surficial soils above the seasonal high water table have been excavated and removed from the site for historic landfill soil cover use. Sandy clay soil was placed and compacted to construct the landfill base grade and establish a 4' separation from the seasonal high water table. Offset and downgradient or side gradient to the landfill unit, wetlands draining to the adjacent streams limit potential gas migration. The upgradient boundary to the northeast of the landfill unit is the only property boundary subject to gas migration monitoring. No structures are present on the Westside site.

Generally, gas wells are boreholes installed in the landfill to vent or recover landfill gas. For gas monitoring purposes, three gas monitoring probes GP-1, GP-2, and GP-3 are proposed at approximate 500-foot spacing inside the upgradient property line and adjacent Piedmont Natural Gas service line. The gas probes construction will be similar to Type II groundwater monitoring wells with locking steel casings set in a concrete pad, protecting 2" Sch40 pipe, with .010" slotted screen and sand backfill from a depth of 2 feet below grade to just above the observed water table

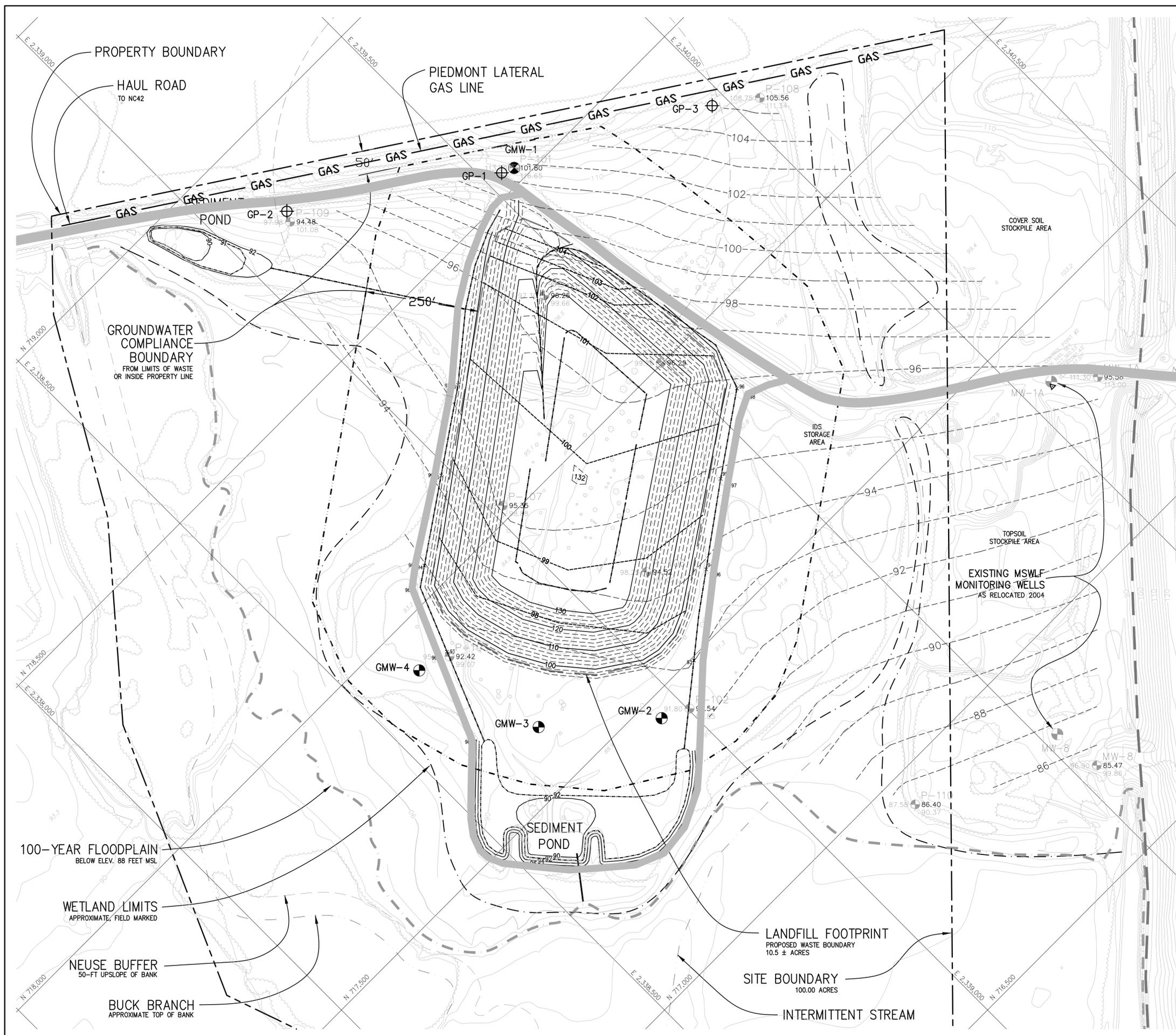
(less than 15 feet total depth). The top of casing will be slip capped and fitted with a quick-connect, valve or hose barb to connect the monitoring equipment.

The gas probes and any future on-site structures shall be monitored by Wilson County quarterly for the presence of explosive gases measured in % Lower Explosive Limit. The monitoring equipment shall meet industry standards for measuring % LEL for explosive gases and shall be calibrated according to manufacturer's procedures prior to each monitoring event. At least two observations should be obtained for repeatable results at each monitoring location. The sampling location, date, time, staff initials and observed % LEL shall be recorded and maintained in the operating record. Due to the local gas line present along the property boundary, it is recommended that any the total explosive gas concentration be measured to identify the potential sources triggering action. Landfill gas is generally less than 60% explosive gas by volume, where pipeline gas will be greater than 60% total explosive concentration. The following .0544 rules apply to gas monitoring at the C&DLF facility.

- (1) Owners and operators must ensure that:
 - (A) the concentration of methane gas or other explosive gases generated by the facility does not exceed 25 percent of the lower explosive limit in on-site facility structures (excluding gas control or recovery system components);
 - (B) the concentration of methane gas or other explosive gases does not exceed the lower explosive limit for methane or other explosive gases at the facility property boundary; and
 - (C) the facility does not release methane gas or other explosive gases in any concentration that can be detected in offsite structures.
- (2) Owners and operators of all C&DLF units must implement a routine methane monitoring program to ensure that the standards of this Paragraph are met.
 - (A) The type of monitoring must be determined based on soil conditions, the hydrogeologic conditions under and surrounding the facility, hydraulic conditions on and surrounding the facility, the location of facility structures and property boundaries, and the location of all off-site structures adjacent to property boundaries.

- (B) The frequency of monitoring shall be quarterly or as approved by the Division.
- (3) If methane or explosive gas levels exceeding the limits specified in Subparagraph (d)(1) of this Rule are detected, the owner and operator must:
 - (A) immediately take all steps necessary to ensure protection of human health and notify the Division;
 - (B) within seven days of detection, place in the operating record the methane or explosive gas levels detected and a description of the steps taken to protect human health; and
 - (C) within 60 days of detection, implement a remediation plan for the methane or explosive gas releases, place a copy of the plan in the operating record, and notify the Division that the plan has been implemented. The plan must describe the nature and extent of the problem and the proposed remedy.
- (4) Based on the need for an extension demonstrated by the operator, the Division may establish alternative schedules for demonstrating compliance with Parts (3)(B) and (3)(C) of this Paragraph.
- (5) For purposes of this section, "lower explosive limit" means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25 C and atmospheric pressure.

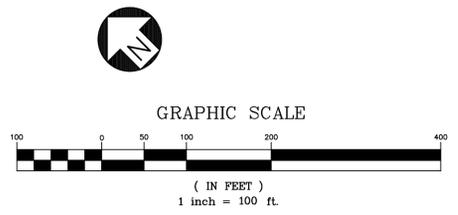
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- NOTES:**
1. PURPOSE. THIS GAS DETECTION MONITORING PLAN IS PROPOSED FOR THE WESTSIDE CONSTRUCTION AND DEMOLITION LANDFILL FACILITY, OWNED BY WILSON COUNTY, NORTH CAROLINA, PREPARED FOR APPROVAL BY THE NC DENR DIVISION OF WASTE MANAGEMENT IN ACCORDANCE WITH THE 15A NCAC 13B.
 2. TOPOGRAPHIC FEATURES. SITE TOPOGRAPHY IS FROM AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY GEODATA CORP., ZEBULON, NC. MAPPED CONDITIONS FROM MARCH 1998 ARE GENERALLY REPRESENTATIVE OF EXISTING CONDITIONS (JULY 2003). REFERENCE DRAWING SC1 FOR STREAM, WETLAND, FLOODPLAIN, AND OTHER SOURCES.
 3. WESTSIDE C&D LANDFILL SITE. THE 100.00 ACRE SITE PROPERTY BOUNDARY ILLUSTRATED ON THIS DRAWING IS REPRESENTATIVE OF THE "RECOMBINATION PLAT FOR THE WESTSIDE C&D LANDFILL SITE" PREPARED BY HERRING-SUTTON & ASSOCIATES, P.C. (WILSON, NORTH CAROLINA), APRIL 2003.
 4. GAS PROBE. GAS MONITORING PROBES SHALL BE INSTALLED WITH A TOTAL DEPTH JUST ABOVE THE WATER TABLE.
 5. EXPLOSIVE GAS MONITORING. EXPLOSIVE GAS CONCENTRATIONS SHALL BE MONITORED QUARTERLY AND RECORDED AS A PERCENTAGE OF THE LOWER EXPLOSIVE LIMIT (LEL).
 6. GAS PROBE INSTALLATION AND MONITORING SHALL CONFORM TO THE CURRENT SWS GUIDANCE, EQUIPMENT MANUFACTURER'S RECOMMENDATIONS, AND ACCEPTED STANDARDS OF PRACTICE.
 7. INSTALLATION AND SURVEY RECORDS, AND MONITORING RESULTS SHALL BE PLACED IN THE OPERATING RECORD AND SUBMITTED TO THE SWS IN ACCORDANCE WITH PERMIT CONDITIONS.

- LEGEND**
- GP-1 GAS PROBE PROPOSED LOCATION
 - GMW-2 MONITORING WELL DETECTION MONITORING STATION
 - POTENTIOMETRIC CONTOUR 1-FOOT CONTOUR INTERVAL, 19 NOV 02
 - BASE CONTOUR 1-FOOT 1-FOOT CONTOUR INTERVAL, 19 NOV 02
 - WESTSIDE SITE BOUNDARY
 - LANDFILL FOOTPRINT PROPOSED 10.5 ACRES
 - EXISTING LANDFILL LIMITS OFFSITE MSWLF UNIT
 - 100-YEAR FLOODPLAIN
 - NEUSE BUFFER
 - SURFACE WATER
 - WETLAND BOUNDARY
 - CONTOUR 2-FOOT MAR98 MAPPING
 - CONTOUR 10-FOOT MAR98 MAPPING
 - GROUND ELEVATION
 - WELL COORDINATES ON CENTER
 - BORING/PIEZO ID WATER ELEVATION AT INSTALLATION 11/19/02
 - TOP OF CASING SURVEYED ELEVATION

**PERMIT ISSUE
NOT FOR CONSTRUCTION**



BLACKROCK ENGINEERS, INC.
 POST OFFICE BOX 58
 WILSON, NORTH CAROLINA 28401
 107 PLUMTREE LANE
 CASTLE HAYNE, NORTH CAROLINA 28429
 PHONE: 910.232.6696
 NC LIC. # C-2919

PROJECT:
 WESTSIDE C&D LANDFILL
 CONSTRUCTION PLAN
 WILSON, NORTH CAROLINA

PREPARED FOR:
 WILSON COUNTY
 DEPARTMENT OF SOLID WASTE
 113 E. NASH STREET
 WILSON, NORTH CAROLINA 27894

NO.	DESCRIPTION	DATE
REVISIONS		



**GAS
MONITORING
PLAN**

SCALE: 1"=100'
 DATE: 11.24.10
 DRN. BY: JWG
 CHECKED BY: GWA

PROJECT NO:
 WCL10-07

DRAWING NO.

LFG1

1.0 SOLID WASTE MANAGEMENT FACILITIES

This report provides a general plan for solid waste management (SWM) activities associated with site operation of the Westside CDLF. Attachment G includes Dwg S1 - Facility Site Plan with aerial photography that delineates all SWM activities on the County Property and identifies pertinent characteristics of the surrounding land. Attached to this report is a zoning compliance letter that documents approval of solid waste management activities in accordance with the Wilson County Zoning Ordinance. Descriptions of activities at the following SWM facilities, located at the Wilson County Landfill site include:

- Convenience Center
- Wood Waste Processing
- Mulch Compost
- White Goods Storage
- Inert Debris Area

1.1 CONTROLLED ACCESS

Access to the site is controlled via security fencing, locking gates, and physical barriers. Primary access is from NC 42, where the weighmaster initially screens and directs customers to the appropriate management area. In general, all SWM activities are limited to the following operating hours:

- Monday – Friday 8:00 a.m. to 5:00 p.m.
- Saturday 8:00 a.m. to 12:00 p.m.

1.2 CONVENIENCE CENTER

The convenience center is open for use by Wilson County residents to deliver recycled materials, used tires, and municipal solid waste for transfer to permitted facilities. Signage identifies materials for segregation in the appropriate container. Containers are hauled and replaced as they are filled, typically twice a week. Sedimentation and erosion control for the Convenience Center and

Scalehouse Offices are NC LQS approved by an individual plan. MSW is hauled by the County to ***Black Creek Road Transfer Facility, SW Permit #98-08T.***

1.3 WOOD WASTE PROCESSING

Stumps and wood waste exceeding 2 feet in diameter are typically routed to the C&D landfill for disposal. All other wood wastes are stockpiled for periodic processing by a contractor at the wood on-site wood processing site. Approximately 2,000 tons of wood waste is processed quarterly. The contractor typically recovers a majority of the wood waste as wood chips used as commercial biomass fuel. The residual wood fines are combined with yard trash and windrowed in the yard waste compost area. The residual soil generated from processing is stockpiled separately as topsoil for use in landfill cover operations or public distribution. Wood Processing operations are described in Section 3 with Mulch Compost.

1.4 MULCH COMPOST

Residuals from wood processing are typically composted with yard trash. The mulch or compost product is primarily used on County property as a soil amendment. The mulch compost operation is designed to meet the criteria of a small Type 1 composting facility according to 15A NCAC 13B .1402. The facility typically processes and stores less than 2,000 CY of yard waste per quarter, and the compost area will not exceed 2 Acres. The maximum processing and storage criteria for a small Type 1 compost site is 6,000 CY per quarter. The mulch and compost operation is described in Section 3.

The yard trash is primarily grass, leaves and small branches. Sedimentation and erosion control for the wood waste, yard trash, and white goods areas are LQS approved by an individual plan (attached Bartlett Plans). The yard trash site will be operated in accordance with .1406 for Type 1 compost.

Attn: Jon Meade



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

December 07, 2009

LETTER OF APPROVAL WITH MODIFICATIONS

County of Wilson
 ATTN :- Ellis Williford
 P.O. Box 1728
 Wilson, NC 27893

RE: Project Name: Wilson Co. Landfill Mulch Area
 Project ID: WILSO-2010-003 Acres Approved: 10.71
 County: Wilson, NC Hwy 42, Wilson, NC
 River Basin: Neuse Stream Classification: Other
 Submitted By: Robert S Bartlett, Bartlett Engineering
 Date Received by LQS: 11/12/09; 12/2/09
 Plan Type: New

Dear Sir or Madam:

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.

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.

Letter of Approval With Modifications
Project - Wilson Co. Landfill Muleh Area
December 07, 2009
Page 2 of 3

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and standards. These laws, regulations, and standards may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

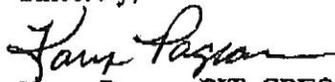
Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCG01000 (CONSTRUCTION ACTIVITIES). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Due to the location of this project, it should be noted that a rule to protect and maintain existing buffers along watercourses in the Neuse River Basin became effective on July 22, 1997. The Neuse River Riparian Area Protection and Maintenance Rule (15A NCAC 2B .0233) applies to all perennial and intermittent streams, lakes, ponds and estuaries in the Neuse River Basin with existing vegetation on the adjacent land or "riparian area". In riparian areas with existing vegetation in the first 30 feet directly adjacent to the stream, the rule prohibits land disturbance or new development within the first 30 feet of land next to the water (the remaining 20 feet of the total buffer must be revegetated upon completion of any proposed land-disturbing activity). In riparian areas with existing vegetation that is less than 30 feet wide, the rule prohibits land disturbance or new development within the area that contains the existing vegetation (but not the entire 50 foot riparian area). For more information about this riparian area rule, please contact the Division of Water Quality's Wetland/401 Unit at 919-733-1786, or a Division of Water Quality representative at this regional office.

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 us if you plan to have a preconstruction conference.

Your cooperation is appreciated.

Sincerely,


Karyn Pageau, EIT, CPESC
Assistant Regional Engineer
Land Quality Section

Enclosures: Certificate of Approval
Modifications Required for Approval
NPDES Permit

cc: Robert S Bartlett, PE, Bartlett Engineering, 1906 Nash Street, North Wilson, NC 27893-1726
Danny Smith, DWQ - SWP Supervisor, Raleigh Regional Office

Letter of Approval With Modifications
Project :- Wilson Co. Landfill Mulch Area
December 07, 2009
Page 3 of 3

MODIFICATIONS REQUIRED FOR APPROVAL

Project Name: Wilson Co. Landfill Mulch Area
Project ID: WILSO-2010-003
County: Wilson

1. Provide revised construction entrance detail to show stone size of 2-3 in. and check dam detail to show structural stone size of Class B. Provide 1 copy of drawings revised as a result of requested changes to this office by January 5, 2010 or prior to construction beginning, whichever is sooner.

Letter of Approval With Modifications
Project :- Wilson Co. Landfill Mulch Area
December 07, 2009
Page 2 of 2

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.

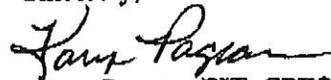
Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCG01000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Due to the location of this project, it should be noted that a rule to protect and maintain existing buffers along watercourses in the Neuse River Basin became effective on July 22, 1997. The Neuse River Riparian Area Protection and Maintenance Rule (15A NCAC 2B .0233) applies to all perennial and intermittent streams, lakes, ponds and estuaries in the Neuse River Basin with existing vegetation on the adjacent land or "riparian area". In riparian areas with existing vegetation in the first 30 feet directly adjacent to the stream, the rule prohibits land disturbance or new development within the first 30 feet of land next to the water (the remaining 20 feet of the total buffer must be revegetated upon completion of any proposed land-disturbing activity). In riparian areas with existing vegetation that is less than 30 feet wide, the rule prohibits land disturbance or new development within the area that contains the existing vegetation (but not the entire 50 foot riparian area). For more information about this riparian area rule, please contact the Division of Water Quality's Wetland/401 Unit at 919-733-1786, or a Division of Water Quality representative at this regional office.

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Your cooperation is appreciated.

Sincerely,


Karyn Pageau, EIT, CPESC
Assistant Regional Engineer
Land Quality Section

Enclosures: Certificate of Approval
Modifications Required for Approval
NPDES Permit

cc: Robert S Bartlett, PE, Bartlett Engineering, 1906 Nash Street, North Wilson, NC 27893-1726
Danny Smith, DWQ - SWP Supervisor, Raleigh Regional Office

Enclosures: Certificate of Approval

Chao, Ming-tai

From: Gary Ahlberg [gary@blackrocke2.com]
Sent: Wednesday, January 12, 2011 12:06 PM
To: Chao, Ming-tai
Subject: Re: Wilson Co Landfill Mulch Area S&E permit

Ming,

Barlett Engineering prepared the approved plans which are included in Attachment G-1 Drawings. The NC LQS approval letter was attached to our recent email correspondence 01.07.11 entitled "I-Wilson White Goods-Mulch S&EC Plan Approval.pdf"

See thread below with Bartlett.

Gary W. Ahlberg, P.E.

BlackRock Engineers, Inc.
5102 Wrightsville Avenue
Wilmington, NC 28403
910.232.6696

On 1/7/2011 3:11 PM, Jon Meade wrote:
[That is correct.](#)

[Thanks, jon](#)

From: Gary Ahlberg [<mailto:gary@blackrocke2.com>]
Sent: Friday, January 07, 2011 2:55 PM
To: Jon Meade
Subject: Re: Wilson Co Landfill Mulch Area S&E permit

So the drawing set we have is the complete plan document, right?
Thanks

Gary W. Ahlberg, P.E.

BlackRock Engineers, Inc.
5102 Wrightsville Avenue
Wilmington, NC 28403
910.232.6696

On 1/6/2011 2:44 PM, Jon Meade wrote:
Andy, Gary,

Attached is the S&E approval letter from DENR. All calculations should appear on the drawings. Let me know if you need any additional info.

Thanks, jon

Jonathan Meade, Ph.D.
Environmental Specialist

BARTLETT ENGINEERING & SURVEYING, PC

1906 Nash Street North
Wilson, North Carolina 27893-1726
252.399.0704 Office
252.399.0804 Fax
252.205.5289 Cell
www.bartlett.us.com

**Our mission ... "TO SERVE OTHERS WITH ALL OUR HEART,
AS IF WORKING FOR THE LORD." Colossians 3:23 (NIV)**

Chao, Ming-tai

From: Gary Ahlberg [gary@blackrocke2.com]
Sent: Wednesday, January 12, 2011 12:05 PM
To: Chao, Ming-tai
Cc: Mussler, Ed; Ritter, Christine; Barnes, Ben
Subject: Re: Fwd: FW: Wilson County Westside C&DLF

Ming,

See **response** by item. Call me to discuss any further clarification required in comments 1-3. We will call you regarding #4.

Regards,
Gary

Gary W. Ahlberg, P.E.

BlackRock Engineers, Inc.
5102 Wrightsville Avenue
Wilmington, NC 28403
910.232.6696

On 1/10/2011 2:38 PM, Chao, Ming-tai wrote:

Gary: I have completed a review of the submittal dated 01/07/2011 via an email message and have some questions need your clarification:

My understanding that there is an Erosion and Sediment Control Plan (ESCP), recently approved by the NC Land Quality Section for the wood T&P and composting area and other recycle unit on the west side the C&DLF area. The 12/22/2010 Comment No. 6 requested for a copy of the ESCP which is not included in the 01/07/2011 submittal. Please provide an electronic copy (CD) of the ESCP.

A forward of our correspondence threadn with design engineer Bartlett to follow separately. The complete plan is included in G-1 Drawings and 01.07.11 copy attachment of NC LQS approval letter.

Section 1.4.1 of the Operations Plan described that asbestos waste will be disposed in the closed "Asbestos Trench Disposal Area" adjacent to the MSWLF. This description is not consistent with that described in Section 1.13 of the Operations Plan – co-disposal asbestos containing wastes (ABS) with C&D wastes or inert debris. Please revise the description of Section 1.4.1 consistent to the descriptions in Section 1.13 of the Operations Plan.

Submitted 01.07.11 as attachment "D-Operations Plan R2 p2rev. All Asbestos disposal is specified in Section 1.13.

Section 1.6 of the Attachment I proposed that "As an option for DWM approval, the inert debris area could be divided to provide a separate asbestos area. If approved in the permit, operations shall be conform to the operational requirements of the Westside Operations Plan, Section 1.13. However, the first paragraph of Section 1.6 proposed that" inert debris is recovered for on-site projects as beneficial fill." If County intends to reclaim beneficial fill from the inert debris unit where is a co-disposal unit for ABS

in the future, County must (a) describe the provisions according to 40 CFR 61 and Solid Waste Management Rule 15A NCAC 13B .0542(c)(2) to protect workers and general public from exposure of the co-disposed ABS while conducting land-disturbing activities and (b) respond the 12/22/2010 Comment No. 7.

As illustrated in 01.07.11 revision to Figure 5, Asbestos disposal is in a discrete area adjacent to the Inert Debris that must be marked with required signage throughout operation so that it is not disturbed by any beneficial fill. The section line illustrates how signage is conservatively placed along any adjacent boundary with C&D waste. The discrete area marked by survey and signage is not co-disposal.

Section 3.5.1 of the Attachment I. It is County's responsibility to demonstrate that the soil texture in the Small Type 1 Composting Unit is finer than loamy sand and that the surface grade receiving wastes maintains at least 12 inches from the seasonal high water table. Please provide data appended to the Attachment I in compliance with Solid Waste Management Rule 15A NCAC 13B .1404(10)(B).

We will call you to discuss this comment further; we believe the current submittal exceeds regulatory requirements for approval of Small Type 1 Composting Unit.

Please contact me if you have any questions of the comments. Thanks.

Ming-Tai Chao, P.E.
Environmental Engineer II
Permitting Branch, Solid Waste Section
Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699-1646
401 Oberlin Road, Suite 150, NC 27605
Tel: 919.508.8507, Fax 919.733.4810
ming.chao@ncdenr.gov
<http://portal.ncdenr.org/web/wm/sw>

E-mail correspondence to and from this address may be subject to the North Carolina Public Records Law and may be disclosed to third parties.

From: Gary Ahlberg [<mailto:gary@blackrocke2.com>]
Sent: Friday, January 07, 2011 4:36 PM
To: Chao, Ming-tai
Cc: Ritter, Christine; adavis@wilson-co.com
Subject: Re: Fwd: FW: Wilson County Westside C&DLF

Ming,

Attached are the selected revisions and copies of documents you requested for substitution/addition to the existing application Dec 2010 version.

Please call me if you have any questions. Within 10 days, Wilson County will submit a separate letter notifying the SWS and DHS for the closure of the asbestos trench disposal area approved under SWP#98-01

and outlining closure documentation and post closure.

We will publish/transmit one hard copy with draft permit.

Thanks,
Gary

Gary W. Ahlberg, P.E.

BlackRock Engineers, Inc.
5102 Wrightsville Avenue
Wilmington, NC 28403
910.232.6696

On 1/6/2011 11:59 AM, Ritter, Christine wrote:

Hi Gary-

The gas monitoring plan submitted for the Wilson County Westside C&DLF satisfies the minimum Rule requirements for landfill gas monitoring. Please submit the final plan with drawing LFG1 so that we may finalize the permit application.

Thank you,
Christine

From: Gary Ahlberg [<mailto:gary@blackrocke2.com>]
Sent: Tuesday, January 04, 2011 10:33 PM
To: Ritter, Christine
Cc: Chao, Ming-tai; Andy Davis
Subject: Re: Fwd: FW: Wilson County Westside C&DLF

Christine,

Please review this draft and let me know if this is complete for gas monitoring plan at Westside. Final would include drawing LFG1 attached.

Thanks,
Gary

Gary W. Ahlberg, P.E.

BlackRock Engineers, Inc.
5102 Wrightsville Avenue
Wilmington, NC 28403
910.232.6696

On 1/4/2011 12:21 PM, Gary Ahlberg wrote:

Christine,

Thanks for calling me back to discuss your preliminary comments provided to Andy Davis. As we discussed, the explosive gas monitoring plan we submitted was intended to be all on drawing LFG1, as per our notation. In our quest to make the drawing the standalone plan, we have not met the expectations and efforts to standardize these plans.

We understand you would like to see a brief narrative incorporating the rationale for our proposed gas monitoring probes relative to site/geologic criteria. We will add a page of text including the existing notes and a more comprehensive discussion that can be referenced in the future by the compliance group. While monitoring and recordkeeping is required, there is no quarterly report submittal for %LEL observations in compliance. We will provide a draft copy of this text for your review this afternoon.

As I mentioned, we do have some comments on the Draft guidance document that we believe would make it more accurate for explosive gas monitoring. We will provide these comments separately for agency consideration.

Please let me know if I summarized our discussion sufficiently.

Thanks,
Gary

From: Ritter, Christine [<mailto:christine.ritter@ncdenr.gov>]
Sent: Monday, January 03, 2011 4:50 PM
To: Andy Davis
Cc: Chao, Ming-tai; Mussler, Ed
Subject: Wilson County Westside C&DLF

Andy-

There was no landfill gas monitoring plan contained in your most recent submittal to the Solid Waste Section. **15A NCAC 13B .0544 (d) Monitoring Plans and Requirements for C&DLF Facilities** requires a landfill gas monitoring plan. Your December 1, 2010 response to comments and Attachment H-Monitoring Plan contained a drawing with the proposed locations of three gas monitoring probes but included no discussion related to landfill gas monitoring. Please submit a landfill gas monitoring plan in accordance with the above referenced Solid Waste Rule. We previously sent you copies of the NC Solid Waste Section's Landfill Gas Monitoring Guidance document. If you need additional copies, you may access the Solid Waste Section's website at the address below and the specific guidance is located under the Environmental Monitoring section. If you need additional hard copies, let me know and I will send one to you. Please let me know if you have any questions.

Thank you,
Christine

Christine Ritter (christine.ritter@ncdenr.gov)
Hydrogeologist
NC Department of Environment and Natural Resources
Division of Waste Management - Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646
Tel: 919.508.8506 web: <http://portal.ncdenr.org/web/wm/sw>

Chao, Ming-tai

From: Chao, Ming-tai
Sent: Wednesday, December 22, 2010 2:41 PM
To: 'Gary Ahlberg'
Subject: Draft comment on the revised Permit application, Wilson County Westside C&DLF, Permit # 98-09
Attachments: DINxxx_3rdcommment_ltr__wilson_c&dLF.pdf

Gary: Please review the attached draft comment letter and call me if you have any questions about the comments. Christine may or may not have any comment on the application. We won't know the answer until she come back to work on next Tuesday or later.

I also wish you and your family have a Merry Christmas and Happy New Year.

Ming



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

Solid Waste Section

December XX, 2010

Mr. Andy Davis
Solid Waste Director
P.O. Box 1728
Wilson, North Carolina 27894

Re: Additional Comments on the revised Permit Amendment Application
Wilson County Westside Construction and Demolition Debris Landfill (C&DLF)
Wilson County, North Carolina
Permit No. 98-09, Document ID No. (Doc ID) 12554

The Division of Waste Management (DWM), Solid Waste Section has reviewed the revised the Permit Amendment Application dated December 2010 (Doc ID 12432), an electronic document (2 CDs) submitted by Blackrock Engineering, Inc., on behalf of Wilson County, in response to the DWM's comments (Doc ID 11305) dated August 10, 2010.

Based on the review, the Solid Waste Section has additional comments on the new (revised) submittal, and your responses to the following comments will expedite the on-going review of the Permit Amendment Application:

Attachment D - Operations Plan

1. (Section 1.4.1) The December 14 2010 response to the DWM Comment No. 4 indicated that Wilson County plans to formally close the inactive Asbestos Trench Disposal Area originally approved under Solid Waste Management Permit No. 98-01. Any asbestos waste approved for receipt at the facility shall be landfilled in a discrete area of the C&D unit. The Section 1.4.1 describes the approaches to disposal of asbestos are inconsistent with the Response and the Section 1.13 – Asbestos Disposal requirements. Please clarify.
2. The December 14 2010 response to the DWM Comment No. 5 indicated that Wilson County intends to close the inactive Asbestos Trench Disposal Area located on the northeast side of the closed MSWLF (Permit No. 98-01). The Solid Waste Section hereby acknowledges receiving the closure notification of this Asbestos Trench Disposal Area from the County and suggests submitting a Closure Verification Report and Post-Closure Plan which shall be prepared in accordance with 40 CFR 61, Subpart M and the recommendations stated in the above-referenced Comment No. 5 dated August 10, 2010. Please also provide the schedule for submitting the plan (the Solid Waste Section suggests thirty days (30) after the County received this letter.)
3. (Section 1.13) Please provide a typical asbestos waste generator manifest to this sub-Section as described in Section 1.13.1.

Attachment G – Permit Amendment Drawings

4. The Figure 3 (previously submitted on June 23, 2010) and Drawing No. D1 (previously submitted on January 28, 2010) are out-of dated and replaced by Figure S1 and Figure 4, respectively. To avoid any confusion in the future, please either remove these two figures from the final copy of the permit application (The new figure number sequence must be updated in the text) or stamp or add “Superseded by Figure XXX” watermarks in the background on both figures.

Attachment H – Monitoring Plan

Christine: Do you have any comments on the LFG Monitoring Plan?

Attachment I – Solid Waste Management Facilities

5. (Section 1.2) Please provide the “permit facilities” information (MSWLF or MSW Transfer Facility Name, Permit Number) which will be receiving the household non-C&D wastes disposed at the Convenience Center by residents in Wilson County.
6. Please provide a copy of the approval letter and a copy of the Erosion and Sediment Control Plan approved by NC LQS for the development and operation of the Solid Waste Management Facilities mentioned in Sections 1.2 & 1.4.
7. (Section 1.6) In the last paragraph, County requests to use a portion of the Inert Debris Unit to dispose of asbestos-containing waste. The County will operate of the asbestos-containing waste disposal unit according to the Section 1.13 of the Operations Plan and 40 CFR 61. For the Solid Waste Section to approve this request, County must:
 - i. Submit the updated drawings (layouts and profiles) to show the disposal limits which are contiguous with other disposal units and not interfere with the existing and future monitoring networks (water quality and landfill gas monitoring).
 - ii. Consider to increase the cover soil thickness and enhance the erosion control measures to avoid potential issue such as waste exposure to the surrounding environments. Since the disposal unit will be a standing alone and aboveground unit.

Please incorporate the requested information and associated documents, revisions, and responses to a new hard copy and an electronic copy of the revised permit application. The SWS appreciates your efforts and cooperation in this matter. If you have any permitting questions, please contact Ming Chao at (919) 508-8507 or Christine Ritter at (919) 508-8506.

Sincerely,

Ming-Tai Chao, P.E.
Environmental Engineer II
Permitting Branch, Solid Waste Section

Christine Ritter
Hydrogeologist
Permitting Branch, Solid Waste Section

cc:

Gary W. Ahlberg, P.E., Blackrock Engineers, Inc.
Donna Wilson, DWM
Ben Barnes, DWM

Ed Mussler, Permitting Branch Supervisor
Dennis Shackelford, DWM
Central File



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

Solid Waste Section

August 10, 2010

Mr. Andy Davis
Solid Waste Director
P.O. Box 1728
Wilson, North Carolina 27894

Re: Additional Comments on Permit Amendment Application
Wilson County Westside Construction and Demolition Debris Landfill (C&DLF)
Wilson County, North Carolina
Permit No. 98-09, Document ID No. (Doc ID) 11305

The Division of Waste Management (DWM), Solid Waste Section has reviewed the revised portions of the Permit Amendment Application dated June 23, 2010 (Doc ID 10925), submitted by Blackrock Engineering, Inc., on behalf of Wilson County, in response to the DWM's comments (Doc ID 9537) dated February 5, 2010. But no official response letter to address the aforementioned DWM's comments is issued by Wilson County. On July 15, 2010, a site visit was conducted with you and representatives from the Solid Waste Section for the purpose of walking over the site and observing current operating conditions of the C&DLF and other miscellaneous waste units.

Based on observations during the site visit and review of the June 23, 2010 revised Permit Amendment Application, the Solid Waste Section has additional comments on the new (revised) submittal, and your responses to the following comments will expedite the on-going review of the Permit Amendment Application:

1. (Executive Summary, Table 1 in Facility & Engineering Plan, Section 1.1 of Operations Plan) Please address the following concerns pertaining to waste disposal rate:
 - i. The disposal rate of 20,000 ton per year (tpy) was determined in the 4 November 2002 Resolution and approved by the Wilson County Board of Commissioners. Therefore, the calculation of life expectancy for the C&DLF shall use the approved disposal rate of 20,000 tpy, not 22,000 tpy. Consequently, the estimated remaining service life, approximately 6.4 years, of the C&DLF is not correct. Please make the necessary corrections by using the correct disposal rate of 20,000 tpy throughout the entire permit application document and provide the revised service life of the landfill.
 - ii. The reported average disposal rate from October 4, 2004 to April 15, 2010 is 22,018 tpy, which is more than ten percent of the approved disposal rate of 20,000 tpy. This variance is considered as a substantial change in accordance with N.C.G.S. 130A-294(b1)(1). If Wilson County intends to adopt this average disposal rate of 22,000 tpy as the new disposal rate in the future waste management and planning, please submit a substantial permit amendment application in accordance with Solid Waste Management Rule (Rule) .0535(c).

2. (Executive Summary, the fourth paragraph) Wilson County proposes that “if the permit requirements remain unchanged from this submittal, the approved plan documents incorporated herein shall be sufficient to continue operations to pre-final cover grade for closure implementation.” This proposal may be acceptable if the site and operational conditions for the future phases are the same as those described in the approved plans for Phase 2 development. The future site and operational conditions include, but are not limited to, the facility plan, the operations plan (acceptable waste streams and other solid waste activities in addition to C&DLF), and environmental media monitoring conditions (water quality monitoring and landfill gas monitoring). Please incorporate the aforementioned requirements to this paragraph.

Attachment A - Facility and Engineering Plan

3. There is an approximately 5-acre mulch area, on the south side of the 2-acre Yard Waste Area as shown on Figure 3. Please address the following concerns:
 - i. Please describe this mulch area and operation activities at this area in the Facility Plan (Attachment A) and Solid Waste Management Facilities (Attachment I).
 - ii. During the July 15, 2010 site visit, Wilson County acknowledged that this “mulch area” would be an area for stockpiling mulch/composting products; therefore, the DWM considers this “mulch area” is a portion of the Yard Waste Area. Because the yard waste composting facility encompasses a total area of approximately 7 acres, the facility is not a Small Type 1 facility but a Large Type 1 facility as defined in the Rule .1402(f)(7). Wilson County must reclassify the yard waste composting facility and submit supplemental information to the permit application in accordance with Rule .1400 et seq. for operating this composting facility.
4. (Section 2.1) Please add Asbestos Trench Disposal Area to the list of “Facility Services” contained in this section and also note the status (active or inactive/closed unit) of this asbestos wastes disposal area.

Attachment D - Operations Plan

5. (Section 1.4.1, on Page 2) During the July 15, 2010 site visit, a Wilson County representative said that the County planned to close the existing Asbestos Trench Disposal Area as shown on Figure No. 3, which would be subject to approval granted by the Wilson County Board of Commissioners. The Asbestos Trench Disposal Area does not currently meet existing landfill buffer requirements and the asbestos disposal area was also cited in the March 11, 2010 DWM Facility Compliance Audit Report as being an “inactive waste disposal site” in accordance with 40 CFR 61.141. Therefore, the DWM strongly recommends that Wilson County permanently close the Asbestos Trench Disposal Area. Upon receiving approval of closing this unit from the Wilson County Board of Commissioners, Wilson County needs to conduct the tasks described below which can be appended to the revised Permit Amendment Application:
 - i. Submit to DWM the closure plan and post-closure care plan that must be prepared in accordance with the requirements stated in 40 CFR 61.151 and .154.
 - ii. In the closure plan, please briefly describe the history of this waste unit including the starting and final dates receiving wastes, areal and vertical limits (including width and depth of trench sizes below ground surface and the final grades), documented total of the in-place waste quantities (in cubic yard and/or tonnage), record-keeping, etc.
 - iii. In the post-closure care plan, please describe the completion of deed recordation of this closed unit, install a warning sign for no disturbance of the closed area, install waste edge markers, and schedule inspections and maintenances according to 40 CFR 61 subpart M.

6. According to the Operations Plan, Wilson County plans to dispose of asbestos waste inside the C&DLF on a project specific basis. Please address the waste acceptance and disposal requirements according to Rule .0542(c)(2) and 40 CFR 61.
7. (Section 1.4.1) Wooden pallets are banned from disposal as defined in the NCGS Article 9, Chapter 130A-290(44a), effective October 1, 2009. Only pallets generated in C&D activities may be disposed of in a C&DLF, not pallets generated in industrial or commercial activities. Because all pallets may be recycled or ground for mulch or boiler fuel, such uses may be added to the waste streams of the on-site yard waste compost unit. Please incorporate the above-mentioned rule requirements or suggestions for the management of wooden pallets in the revised Operations Plan.
8. (Section 1.4.3) Please address the following concerns related to waste screening:
 - i. This sub-section proposes that “the operator shall monitor loads periodically (at least monthly) to identify non-conforming waste....” Because the March 11, 2010 DWM Facility Compliance Audit Report indicates that the County needs to increase the screening frequency, the Solid Waste Section requests the County demonstrate that the proposed waste screening frequency is sufficient and adequate to serve the purpose of the waste screening program. The reviewer recommends that the waste screening frequency be based on the number of waste loads received, the general principal of statistical random sampling, and the frequency adopted in the waste industries. Please clarify.
 - ii. This sub-section proposes that “if a suspect load is identified, an inspection will be conducted in an area prepared near the working face.” This approach is inconsistent with that described in Section 2.5 of the Facility and Engineering Plan (Attachment A). Please clarify.
 - iii. Please provide the typical waste screening/inspection forms appended to the Operations Plan.
 - iv. (Personnel Training and Preparation) Please describe how often the facility personnel are receiving the described training.
 - v. (Identify Excluded Wastes) Please provide the paint filter liquid test (EPA SW-846 Method 9095) document appended to the Operations Plan, and describe who will be responsible for conducting this test.
 - vi. (Key Personnel) Please add the contact information of the local fire department and sheriff’s department.
 - vii. (Key Personnel) According to Wilson County’s web site, Gordon W. Deno is the contact of the Wilson County Emergency Management. Ben Barnes’ phone number is 919-621-3680 or 919-508-8400 for the DWM. Please make necessary corrections.
 - viii. (Procedures for Hauling Excluded Wastes) The tasks, which were described in the last paragraph on page 5 and the first paragraph on Page 6 must be conducted by a person or persons who have been properly trained in accordance with federal and state rules and regulations. “The operator” must be properly defined. Please clarify.
 - ix. (Procedures for Hauling Excluded Wastes) Please provide example copies of the inspection forms.
9. (Section 1.5) Please address the following concerns:
 - i. Provide the information related to cover thickness if the condition that is described in Rule .0542(f)(2) is encountered.

- ii. The minimum frequency for inspection of potential leachate breakout.
 - iii. Add the inspection area including the perimeter of the entire landfill, working faces of the daily cell, and the previously patched areas.
 - iv. The person who will be responsible for conducting the inspection.
10. (Sections 1.9 & 1.10) Please change MSWLF to CDLF throughout the sections.
11. (Section 1.10) Please address the following concerns:
- i. Please provide the mentioned contingency plans which were not provided in the permit application document.
 - ii. Regarding open burning requirements please add:
 - Notation of approval date and the name of the DWM personnel who approved the type of the open burning, and
 - The new requirement (in italic format) to the end of sentence in item (b) "*The Division of Air Quality and local fire department must approve the activity prior to burning.*"
 - iii. Please describe what kinds of equipment, tools, and/or resources are available on site on a daily basis (such as piles of dirt adjacent to the working face, fire extinguishers, etc.)
 - iv. Please describe the written notification for fire or explosion event [Rule .0542(i)(4)].

Attachment E – Closure and Post-closure Plan

12. (Section 1.2) The information on the landfill unit and gross capacity provided in the table of this section is inconsistent with those stated in the Facility and Engineering Plan. Please clarify.

Attachment G – Permit Amendment Drawings

13. The information of the Phase 1 fill grade provided on Figure 5 is inconsistent with that on Figure 4. Please clarify.

14. Please define the "Proposed Final Cover" on Figure 5.

Attachment H – Monitoring Plan

15. A technical review letter dated April 12, 2010 was sent to the facility by the SWS hydrogeologist with comments on the original 2004 Water Quality Monitoring Plan. The letter requested a number of additional items which were not provided in the revised Monitoring Plan dated June 2010. The April 12, 2010 letter requested the facility to develop and submit a landfill gas monitoring plan and a plan was not submitted, only a figure showing the location of one landfill gas probe. Please submit a detailed landfill gas monitoring plan in accordance with the SWS guidance on landfill gas monitoring plan which was provided to you in the April 12, 2010 technical review letter. The placement of the landfill gas monitoring points relative to the Piedmont Gas line north of the landfill is of particular importance as the pipeline can be considered a preferential pathway for the migration of gas. In the event that gas is detected in the vicinity of the pipeline, it would be necessary to determine whether gas was originating from the pipeline or from the landfill. Another important consideration for the development of an adequate landfill gas monitoring plan is the number and spacing of landfill gas monitoring points. Landfill gas monitoring points are to be located around the perimeter of the landfill with spacing between monitoring points of 500 feet or less. Another copy of the SWS Landfill Gas Monitoring guidance document is provided for your convenience.

16. The 2004 Water Quality Monitoring Plan included 16 inorganic constituents while the June 2010 Monitoring Plan included only 8 of those inorganic constituents. Please add the 8 inorganic constituents omitted in the June 2010 Monitoring Plan. Additionally, please add the constituent tetrahydrofuran (THF) to your parameter list. A memorandum was sent out on June 15, 2010 from the NC Solid Waste Section to every C&D landfill owner and operator in North Carolina requiring groundwater and surface water samples collected after January 1, 2011 to be analyzed for THF. A copy of the memorandum is attached.
17. After conducting a site visit to the facility on July 15, 2010, it is agreed that surface water monitoring is not feasible at this time.

Attachment I – Solid Waste Management Facilities

18. (Section 1.2) Please address the following concerns related to scrap/used tire collection area inside the Convenience Center.
 - i. Please provide the site-specific detail for the used/scrap tire operation and management plan according to Rule .1107.
 - ii. The March 11, 2010 DWM Facility Compliance Audit Report stated that the used tires are currently stockpiled on the ground surface. To be in compliance, Wilson County proposed to store the collected tires in trailers prior to off-site transportation. If so, please describe how many trailers will be staged at the landfill facility at any given day and the contractor's contact info, such as company name, phone number, address, a the tire hauler or recycler registration number.
19. (Section 1.2) Please provide the "permit facilities" information (MSWLF or MSW Transfer Facility Name, Permit Number) which will be receiving the household non-C&D wastes disposed at the Convenience Center by residents in Wilson County.
20. (Section 1.3) Please address the following concerns of operation and management of Yard Waste Facility – Large Type 1 facility according to Rules 1400 et seq. At a minimum the following concerns must be properly addressed in Section 1.3:
 - i. Describe the waste stream which can be accepted in this unit (such as yard trash as defined in NCGS 130A-290(a)(45), land-clearing debris as defined in NCGS 130A-290(a)(15), wooden pallet as defined in NCGS 130A-290(a)(44a), and clean unpainted and untreated wood etc.)
 - ii. What BMPs or physical structures will be established or constructed to divert surface water or runoff from the operational, compost curing, and storage areas [Rules .1404 (a)(9) & (c)(2)]?
 - iii. What provisions are there to contain and treat leachate that generated from the composting processes [Rule .1406(4)]?
 - iv. What are the provisions to ensure the requirements stated in Rule .1404(10) can be satisfied? This unit is not covered by any established groundwater monitoring networks (C&DLF and MSWLF).
 - v. Please describe what kind of fire fighting equipment and resources [water and/or piles of dirt] are available on site [Rule .1406(7)]?
 - vi. Please describe the operating practice to prevent fire or facilitate fire fighting (such as the internal and external reporting and notification procedures if a fire occurs and maintaining a minimum distance of 25 feet between the wastes stockpiles and 25 feet distance between stockpile and any other physical structures and the maximum sizes – high and base of each waste stockpile) [Rules .1406(7) & .1404(a)(8)].

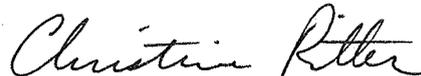
- vii. Has the fire fighting arrangement between the landfill and local fire department been established? If so, please provide the point contact information (name and phone number) of the local fire department, sheriff department and any other parties/agencies needs to report in this Section. The point contact information must be posted on site.
 - viii. Will there be any treatment and process activities (such sorting, screening, grinding, etc.) conducted at this area? If so, please provide the equipment and machinery to be used for the tasks.
21. (Section 1.5) Please address the following concerns of operation and management of the Inert Debris Area:
- i. Please provide the minimum thickness of the soil cover described in the item (4).
 - ii. The wastes may be ultimately disposed at the designated area according to item (4); therefore, the permanent marker shall be installed along the waste footprints. Please add this requirement to the Section 1.5.

Please incorporate the requested information and associated documents, revisions, and responses to a new hard copy and an electronic copy of the revised permit application. The SWS appreciates your efforts and cooperation in this matter. If you have any permitting questions, please contact Ming Chao at (919) 508-8507 or Christine Ritter at (919) 508-8506.

Sincerely,



Ming-Tai Chao, P.E.
Environmental Engineer II
Permitting Branch, Solid Waste Section



Christine Ritter
Hydrogeologist
Permitting Branch, Solid Waste Section

cc:

Gary W. Ahlberg, P.E., Blackrock Engineers, Inc.
Donna Wilson, DWM
Ben Barnes, DWM

Ed Mussler, Permitting Branch Supervisor
Dennis Shackelford, DWM
Central File



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

April 12, 2010

Mr. Andy Davis
Solid Waste Director
PO Box 1728
Wilson, North Carolina 27894

Re: Technical Review of Water Quality Monitoring Plan
Wilson County Westside C&D Landfill Facility
Permit No. 98-09; Document ID No. (DIN) 10337

Dear Mr. Davis:

The NC Solid Waste Section (SWS) has completed a technical review of the Water Quality Monitoring Plan submitted as Attachment H of the January 2010 Permit Amendment Application for the Wilson County Westside C&D Landfill Facility and has the following comments:

The Water Quality Monitoring Plan (WQMP) recently submitted was unchanged from the 2004 WQMP included in the 2004 Construction Plan Application. The WQMP must be updated to meet the requirements of 15A NCAC 13B .0544 MONITORING PLANS AND REQUIREMENTS FOR C&DLF FACILITIES, preferably as a stand-alone document with a set of maps and figures illustrating, at a minimum, the following: site location; site topography; drainage and surface water features including wetlands, creeks, the swamp; potentiometric surface and groundwater flow direction; groundwater monitoring well locations; and surface water sampling locations. In order to detect the effects of the facility operations on surface water in the area, surface water samples must be collected in both upgradient and downgradient locations.

Solid Waste Section Guidelines for Groundwater, Soil and Surface Water Sampling are located at <http://www.wastenotnc.org/swhome/EnvMonitoring/SolidWasteSamplingGuidance>. This guidance document has been updated in the period of time since the last permit was issued for this site.

Additionally, as a requirement of 15A NCAC 13B .0544(d), a gas control plan must be submitted to the SWS for approval. Owners and operators of all C&DLF units must implement a routine methane monitoring program to ensure that the concentration of methane gas or other explosive gases generated by the facility does not exceed 25 percent of the lower explosive limit at the facility property boundary or in on-site facility structures and does not releases any methane gas or other explosive gases in any concentration in off-site structures.

Enclosed is a copy of the draft NC SWS Landfill Gas Monitoring Plan Guidance for assistance in preparing a Landfill Gas Monitoring Plan. The SWS anticipates finalizing this guidance document in the near future and publishing it on our SWS website.

If you have any questions, you may contact me at (919)508-8506.

Sincerely,



Christine Ritter
Hydrogeologist
Solid Waste Section

Enclosure

cc: Ming-Tai Chao, DWM
Ed Mussler, DWM
Ben Barnes, DWM
Dennis Shackleford, DWM
Gary W. Ahlberg, P.E., Blackrock Engineers, Inc.
Pieter K. Scheer, P.E., RSG



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

Solid Waste Section

February 05, 2010

Mr. Andy Davis
Solid Waste Director
P.O. Box 1728
Wilson, North Carolina 27894

Re: Comments on Permit Amendment Application
Wilson County Westside Construction And Demolition Debris Landfill (C&DLF)
Wilson County, North Carolina
Permit No. 98-09, Document ID No. (Doc ID) 9537

Dear Mr. Davis:

On January 28, 2010, the Division of Waste Management (DWM), Solid Waste Section (SWS) received the permit application document, which is titled as:

- *Permit Amendment Application (Application, Wilson County Westside C&D Landfill Facility, (Permit 98-09). Prepared by Blackrock Engineering, Inc., in Wilmington, North Carolina and Richardson Smith Gardner & Associates (RSG) in Raleigh, North Carolina, dated January 2010 (Doc ID 9498).*

The SWS has conducted a review of compliance with the Solid Waste Management Rule (Rule), 15A NCAC 13B .0500 et seq. The SWS hydrogeologist will review the *Water Quality Monitoring Plan* and may request any additional information related to water quality monitoring and hydro-geology in a separate letter upon completion of his or her review. This letter is a review of the engineering related portions of the Application, and the SWS has comments on the application. Your responses to the following comments will expedite the review of the permit application.

Attachment A - Facility and Engineering Plan

- I. (Sections 1.0 & 2.1) Please provide an updated Facility Plan drawing to include:
 - i. The components required by Rules .0537(d) and .542(b).
 - ii. All waste management units (including the LCID area, the new scale house and the Convenience Center) as described in the Section 2.1. [Rule .524(b)(1)(G)]
 - iii. The in-place waste fill contours in Phase 1 based on the recent survey results or the ones dated August 26, 2008.

2. (Section 4.4.2) Is this Yard Waste Processing Area the same waste management unit called Compost Area/ Yard Waste shown on Drawing No. SC1 in the Site Application dated December 2003? Please clarify.
3. (Section 6.2) The descriptions of the final soil cover system are inconsistent with the submitted Closure Plan and Figure 2 in Attachment G. Please clarify.
4. (Sheet 3/7 in Appendix A and Section 2.3) The disposal rate of 20,000 ton per year (tpy) was determined in the 4 November 2002 Resolution approved by the Wilson County Board of Commissioners. Therefore, the calculation of the remaining service life for the C&DLF will be 8.3 years, based on the approved disposal rate of 20,000 tpy, not 25,700 tpy. Please clarify.
5. Note that response to Comment No. 4 may necessitate changes to phase delineation (both texts and drawings) because the each delineated phase shall not exceed approximately five years of operating capacity [Rules .0537(c) & (d) and .542(a)].
6. The Phase 1 has the approved disposal capacity of 100,000 tons, and as of August 26, 2008, the actual quantity of the in-place wastes in Phase 1 is 111,418 tons as shown in Appendix A. Therefore, the reviewer assumes that the Phase 1 area is completed filled, and this permit application is also served as a Permit to Construct Application for Phase 2 (Vertical Expansion). If the assumption is correct, the Facility Plan may need to explicitly describe this intention. Please clarify.

Attachment D - Operations Plan

7. Although the SWS approved the original Operations Plan in 2004, the submitted Operations Plan, as a portion of the Application, must be prepared in accordance with applicable statutes and rules in effect on January 1, 2007. Therefore, the Operations Plan must address the following concerns:
 - i. Management for asbestos wastes disposal [Rule .0542(c)(2)].
 - ii. Identification of wastes prohibited for disposal [Rule .0542(d) & (e)].
 - iii. Cover (periodical and intermediate covers) requirements [Rules .0542(f)(1) & (2)].
 - iv. Provisions for spreading and compacting wastes [Rule .0542(g)].
 - v. Measures for disease vector and litter control [Rule .0542(h)].
 - vi. Requirements for erosion and sediment controls [Rule .0542(k)].
 - vii. Requirements for drainage controls and protection surface water quality from waste disposal activities [Rule .0542(l)].
 - viii. Requirements for Operating Recordkeeping [Rules .0542(n)].
 - ix. Explosive gas control and monitoring plan for on-site structures or confined spaces [Rule .0544(d)].
8. In the Application, in addition to the C&DLF, there are several on-site miscellaneous waste management units: Used Tire Storage Area, White Goods/Scrap Metals Storage Area, the Convenience Center, and Yard Waste Processing (Composting) Area, LCID area. The Operations Plan must describe how the waste units are properly managed in compliance with Solid Waste Management Rules.

- i. Management and operation of the Used Tire Storage Area must be in compliance with Rule .1107.
 - ii. Management and operation of the Yard Waste Processing/ Composting Area must be in compliance with Rules .1400 et seq.
 - iii. Management and operation of LCID area must be in compliance with Rules .0563, .0565, and/or .0566.
9. Additionally, the Operations Plan needs to address the following concerns, but not limited to, for the waste units - White Goods/Scrap Metals Storage Area and the Convenience Center:
- i. Description of the physical dimensions and/or structures of the stockpiles or storage areas, which are shown on the facility, plan drawings (see Comment No. 1).
 - ii. Provisions for fire preventions and routine inspection (including spaces between isles, windrows, or stockpiles).
 - iii. Provisions for waste segregations, disposal approaches, and labeling & marking requirements (for Convenience Center only).
 - iv. Provisions for prevention from surface water to contact wastes.
 - v. Provisions of removal of Freon from white goods.
 - vi. Descriptions of the maximum tonnage of recyclable material will be allowed to store at any time at the facility and of the estimated tonnage per month or per year.
 - vii. The frequency or schedule for off-site removal of the recyclable material.
 - viii. The contact information of a contractor or recycler to handle and/or off-site transportation for the recyclable material.
10. (Section 4.1) The last sentence indicated that “the peak intermediate fill elevation will be 122 msl under the initial 5-year operation phase.” Is this statement matching the 2008 survey results (Appendix A of the Facility & Engineering Plan)? Please clarify.
11. (Section 4.1) Because the remaining service life of the C&DLF may last for 8 more years (see Comment No. 4), up to two 5-year phases, this section needs to describe the incremental phase development of the facility [Rule .0542(a)]. Please revise this section accordingly.
12. (Section 4.4.1) Wooden pallets are banned from disposal as defined in the NCGS Article 9, Chapter 130A-290(44a), effective October 1, 2009. Only pallets generated in C&D activities may be disposed of in a C&DLF, not pallets generated in industrial or commercial activities. All pallets are recyclable; therefore, wooden pallets that are ground for mulch or boiler fuel or other such uses may be added to the waste streams in Yard Waste Processing/Composting Area. Please incorporate the above-mentioned requests to the revised Operations Plan.
13. (Section 4.4.2) Please provide the frequency for the random waste screening.

Attachment E – Closure and Post-closure Plan

14. (Section 1.2) The information of landfill unit and the gross capacity provided in the table of the section is inconsistent with those stated in the Facility and Engineering Plan. Please clarify.

Attachment G – Permit Amendment Drawings

15. (Drawing No. D1) Does the "Phase 1 Intermediated Grade" shown in the cross-sections correlate to the in-place waste capacity/ volumes presented in Appendix A of the Facility and Engineering Plan? Please clarify.

Attachment H – Water Quality Monitoring Plan

16. The submitted Water Quality Monitoring Plan must include the surface water quality monitoring program in accordance with Rules .0544(c) and .0602.

Please incorporate the requested information and associated documents, revisions, and responses to a new hard copy and an electronic copy of the revised permit application. The SWS appreciates your efforts and cooperation in this matter. If you have any permitting questions, please contact myself at (919) 508- 8507.

Sincerely,



Ming-Tai Chao, P.E.
Environmental Engineer II
Permitting Branch, Solid Waste Section

cc:

Pieter K Scheer, P.E., RSG
Gary W. Ahlberg, P.E., Blackrock Engineers, Inc.
Christine Ritter, DWM
Ben Barnes, DWM

Ed Mussler, Permitting Branch Supervisor
Donna Wilson, DWM
Dennis Shackelford, DWM
Central File



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

Solid Waste Section

November 30, 2009

Mr. Andy Davis, Director
Wilson County Solid Waste Department
P.O. Box 1728
Wilson, North Carolina 27894-1728

Re: Permit Application of Wilson County Westside Construction and Demolition Debris Landfill (C&DLF), Phase 1 - Cells 1 through 3 Continued Operations (the Permit Application)
Wilson County, North Carolina
Permit No. 98-09, Document ID No. (Doc ID) 8959

Dear Mr. Davis:

The Division of Waste Management (DWM), Solid Waste Section has reviewed the 20 November 2009 letter and the revised permit modification application (Doc ID 8946), submitted by Richardson Smith Gardner & Associates (RSG) on behalf of Wilson County, to respond the DWM's comments (Doc ID 8713) dated October 2, 2009. Based on this review, the Solid Waste Section has no further comments on the permit modification application at this time. The Solid Waste Section hereby approves cost estimates for closure and pos-closure cares of Cells 1 through 3 at the Wilson County Westside C&DLF. The approved costs, in year 2009 dollar values, are \$572,304.00 for the closure of Phase 1 – Cells 1 through 3 (approximately 10.5 acres) and \$641,850.00 for the 30-year post-closure cares for Phase 1 landfill units. Pursuant to the North Carolina Administrative Code, 15A NCAC 13B .0547(2)(b), within 30 days upon receiving this letter, Wilson County must submit the DWM a financial assurance document in accordance with Rule .0546.

Please be aware that the current Permit to Operate for Phase 1 – Cells 1 through 3 expired on 17 September 2009. To comply with the five-year permit review requirement stated in Rule 15A NCAC 13B .0201(g), Wilson County must submit a permit amendment application and pay the statutorily required permit amendment fee of \$9,000.00 within thirty (30) days upon receiving this letter or propose a date acceptable to the DWM. The permit amendment application must be prepared in accordance with Rule 15A NCAC 13B .0535(b). The permit modification fee of \$1,500.00 that was previously paid for continued operation of Phase 1 – Cells 1 through 3 in accordance with rule .0547(2) and received by the Solid Wastes Section on November 18, 2008 can not be contributed as a portion of the requested permit amendment fee.

Wilson County, furthermore, must provide financial assurance sufficient to cover a minimum required amount of three million dollars (\$3,000,000.00) for potential assessment and corrective action at the facility in accordance with the NCGS 130A-295.2(h), effective August 1, 2009. This financial assurance requirement is in addition to the financial responsibility requirements for site closure, post-closure cares, and corrective actions. Wilson County must submit the requested financial assurance document immediately as it is required before the new permit to operate can be issued. Within the next 12 months, Wilson County will be required to evaluate the solid waste management facility to determine the estimated costs of potential assessment and corrective action based on the criteria established in the above-reference statute. Depending on this determination, the required financial assurance amount in the future may be higher than the minimum amount of three million dollars

If you have any questions regarding permitting processes, please contact me at (919) 508- 8507; and please Donald Herndon at (919) 508-8502 for any financial responsibility and assurance issues.

Sincerely,



Ming-Tai Chao, P.E.
Environmental Engineer II
Permitting Branch, Solid Waste Section

cc:

Pieter K. Scheer, P.E., RSG
Ed Mussler, Permitting Branch Supervisor
Dennis Shackelford, DWM
Donald Herndon, DWM

Gary Ahlberg, P.E. Blackrock Engineers
Donna Wilson, DWM
Ben Barnes, DWM
Central Files



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

Solid Waste Section

October 2, 2009

Mr. Steve Clayton, Director
Wilson County Solid Waste Department
P.O. Box 1728
Wilson, North Carolina 27894-1728

Re: Comments on Permit Application of Wilson County Westside Construction and Demolition Debris Landfill (C&DLF), Cells 1 through 3 Continued Operations (the Permit Application)
Wilson County, North Carolina
Permit No. 98-09, Document ID No. 8713

Dear Mr. Clayton:

This letter constitutes a review of the Permit Application for the above- referenced facility. The Permit Application is titled:

Wilson County Westside C&D Landfill (Permit 98-09) Continued Operations. Prepared by: BlackRock Engineers, Inc., Wilmington, NC and Richardson Smith Gardner & Associates (RSG), Raleigh, NC.
Prepared for: Wilson County. July, 2008. DIN 5152.

The Solid Waste Section of the Division of Waste Management (DWM) conducted a review of compliance with the Solid Waste Management Rule (Rules), 15A NCAC 13B .0547(2) and requests you to provide the following additional information:

Attachment A

1. Please submit a complete Construction Quality Assurance Plan (CQA) in accordance with the requirements of 15 A NCAC 13B .0541.
2. (Soil Liner CQA, Paragraph 5.0 on page 2) The Paragraph 5.G is inconsistent with the proposed final soil cover system. Please clarify.
3. (Soil Liner CQA, Table 3, & Table 3.1 in Attachment B) The proposed CQA testing frequency for hydraulic conductivity (ASTM D 5084) of soil liner is 80,000 square feet per lift. This proposed testing frequency is less than the waste industry standard of 1 test per lift per acre. Please clarify, and the costs for conducting CQA in Table 3.1 may need to be revised.

Attachment B – Closure Plan

4. (Section 1.3 and Figure 2) The Paragraph D.4 of Section 02250 in Attachment A specifies that a subgrade will be properly constructed prior to placement of the soil liner. Please describe this subgrade (or intermediate cover) in Section 1.3 and show the subgrade in Detail 1 of Figure 2.

5. (Section 1.4, Figure 1, & Table 3.1) On Figure 1 there are five (5) landfill gas wells/vents to be installed over the 10.5-acre closed area. Comparing to the waste industry standard of one (1) gas vent per acre of the final cover, the number of the proposed gas vents is not sufficient. Please clarify and add the final number of the proposing gas well/vent to Section 1.4 and Figure 1. The costs of installing the gas system in Table 3.1 may need to be revised as well.
6. (Section 1.6) Please add the closure notification requirements in accordance with Rule 15 A NCAC 13B .0543(c)(4) to the proposed Closure Plan.
7. (Section 1.7) Please describe (i) where to record a notation on the deed and (ii) the requirement of informing the DWM upon completion of placing notation on of deed of landfill facility property.
8. (Table 3.1) Is there a "shrinkage factor" used to calculate the quantity of soil cap system components? What is the assumption of the soil sources - from the on-site or off-site borrow sources? Please clarify.

Attachment B – Post-Closure Plan

9. (Section 2.3) Please add maintenance requirements for the access road to all monitoring points. The costs for road maintenance need to include in the cost estimate Table 3.2.
10. (Section 2.4.2) Please describe the requirements for mowing, re-vegetation, and fertilization (See cost items in Table 3.2) to encourage the growth and establish healthy vegetation on the final cover during the post-closure period.
11. (Section 2.4.4) Please describe the maintenance requirements for the on-site sedimentation pond/basin.

Please incorporate the requested information and associated documents, revisions, and responses to a new hard copy and an electronic copy of the revised permit application. The Solid Waste Section appreciates your efforts and cooperation in this matter. If you have any questions, please contact me at (919) 508-8507.

Sincerely,



Ming-Tai Chao, P.E.
Environmental Engineer II
Permitting Branch, Solid Waste Section

cc:

Pieter K. Scheer, P.E., RSG
Ed Mussler, Permitting Branch Supervisor
Dennis Shackelford, DWM
Central Files

Gary Ahlberg, P.E. Blackrock Engineers
Donna Wilson, DWM
Ben Barnes, DWM



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

Dexter R. Matthews, Director

SOLID WASTE SECTION

July 29, 2008

Mr. Steve Clayton, Director
Wilson County Solid Waste Department
P.O. Box 1728
Wilson, North Carolina 27894-1728

Subject: Determination of Completeness, Construction and Demolition Landfill (C&DLF) Unit,
Wilson County Westside C&DLF, Permit No. 98-09, Wilson County, Document ID No. (DIN) 5337

Dear Mr. Clayton:

On July 11, 2008, the Division of Waste Management (Division) received your permit application for continued operation of Wilson County Westside C&DLF. The report is entitled:

- *Permit Application Wilson County Westside C&DLF (Permit No. 98-09) Continued Operations.* Prepared by: Richardson Smith Gardner & Associates (RSSG), Raleigh, NC & Blackrock Engineers, Inc, Wilmington, NC. Prepared for: Wilson County. July 10, 2008. DIN 5152.

The Division has performed a review of your application for a determination of completeness. Your application has been determined to be complete within the context of NCCGS 130A-295.8(e). A determination of completeness means that the application includes required components, but does not mean that the components provide all the information that is required for the Division to make a decision on the application. The next step is for the Division to review the submittal for compliance with the Solid Waste Management Rules (the Rules), 15A NCAC 13B .0547.

Wilson County is authorized to continue operating the C&DLF Phase 1 (cells 1 & 2) in accordance with your most recent Solid Waste Permit dated July 22, 2005, and the Rules, 15A NCAC 13B.

Should you have any questions regarding this matter you may contact me at (919) 508-8507

Sincerely,


Ming-Tai Zhao, P.E.
Environmental Engineer II

cc: Pieter K. Scheer, P.E., RSSG
Ed Mussler, Permitting Branch Supervisor
Ben Barnes, Environmental Specialist
✓ Central File

Gary Ahlberg, P.E. Blackrock Engineers
Donna Wilson, Environmental Engineer
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