CDM Camp Dresser & McKee

Henderson County

Construction & Demolition Debris Landfill Construction

June 1999

JUN 2001
Received
Solid Waste
Section

HENDERSON COUNTY
FOUNDED 1838

Carmen Johnson
Fac/Perm/Co ID# 45-01
Date 7/23/13
Doc ID#
DIN

APPROVED
DIVISION OF SOLID WASTE MANAGEMENT
DATE 6/12/2001 BY TAD
PERMIT # 45-01
RALEIGH CENTRAL FILE COPY

Permit Application

CDM Camp Dresser & McKee

consulting
engineering
construction
operations

5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
Tel: 919 787-5620 Fax: 919 781-5730

April 3, 2001

Ms. Ellen Lorscheider
North Carolina Department of Environment and Natural Resources
Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

Subject: Revised Section 3
Water Quality Monitoring Plan
Construction Permit Application
Henderson County Construction and Demolition Landfill

Dear Ms Lorscheider:

On behalf of Henderson County, Camp Dresser & McKee (CDM) is submitting a revised Section 3, including Sheet 3-1, from the Water Quality Monitoring Plan. Please replace the existing Section 3 and Sheet 3-1 with the revised version in the Construction Permit Application. The WQMP was revised per your review comments provided in your email dated March 21, 2001. The revisions include converting existing piezometer P-1 to the new background monitoring well, converting existing piezometer P-14 to a new downgradient monitoring well, and the addition of a new monitoring well downgradient of the sump area. Also, piezometer nests, P-15 and P-16, will remain in-place for future sampling purposes if needed.

We hope that you find the information provided in this submittal to be sufficient to answer any and all of your questions, comments, and concerns. If you have any further questions or comments, please contact me at (919) 787-5620.

Very truly yours,

CAMP DRESSER & McKEE

Timothy Grant

Timothy D. Grant, P.G.

NORTH CAROLINA LICENSED SEAL 1412 GEOLOGIST TIMOTHY DAVID GRANT

Timothy D Grant

4-3-01

cc: Gary Tweed, Henderson County
Tim Jewett, SWS
Joe Wiseman, CDM

CDM Camp Dresser & McKee

consulting
engineering
construction
operations

5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
Tel: 919 787-5620 Fax: 919 781-5730

March 15, 2001

Mr. Tim Jewette
North Carolina Department of Environment and Natural Resources
Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

Subject: Revised Facility Plan, Water Quality Monitoring Plan and Permit Drawings
Henderson County Construction and Demolition Landfill

Dear Mr. Jewette:

On behalf of Henderson County, Camp Dresser & McKee (CDM) is submitting revised copies of the Facility Plan, Water Quality Monitoring Plan and Permit Drawings for the Henderson County Phase 1 Construction and Demolition Landfill, Construction Permit Application. These drawings were revised as per your comments dated March 7, 2001 that were addressed to Tim Grant.

We hope that you find the information provided in this submittal to be sufficient to answer any and all of your questions, comments, and concerns, and demonstrate the suitability of this site for a Construction and Demolition Debris landfill. If you have any further questions or comments, please contact me at (919) 787-5620.

Very truly yours,

CAMP DRESSER & MCKEE

NORTH CAROLINA PROFESSIONAL SEAL 3/15/01 ENGINEER THOMAS M. YANOSCHAK

Thomas M. Yanoschak, P.E.

cc: Gary Lewis, Henderson County
Jim Coffey, SWS
Joe Wiseman, CDM
Bill Taylor, CDM

N:\Henderson - 10002\new-c&d 31155\Construction Permit Application\5-15 transmittal letter.doc

CDM Camp Dresser & McKee

consulting
engineering
construction
operations

5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
Tel: 919 787-5620 Fax: 919 781-5730

February 7, 2001

Mr. Tim Jewette
North Carolina Department of Environment and Natural Resources
Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

Subject: Revised Facility Plan, Water Quality Monitoring Plan and Permit Drawings
Henderson County Construction and Demolition Landfill

Dear Mr. Jewette:

On behalf of Henderson County, Camp Dresser & McKee (CDM) is submitting revised copies of the Facility Plan, Water Quality Monitoring Plan and Permit Drawings for the Henderson County Phase 1 Construction and Demolition Landfill, Construction Permit Application. The revised Facility Plan includes updated landfill capacity calculations reflecting the new Phase 1 airspace. The updated Water Quality Monitoring Plan provides supplemental information to the original plan presented in the June 1999 Construction Permit. The modified Permit Drawings reflect the new Phase 1 landfill footprint and closure grades.

The above stated revisions were based on initial review comments from the Solid Waste Section (SWS) and subsequent meetings. The Additional Geologic and Hydrogeologic Study, which supplements the initial Geologic and Hydrogeologic Study presented in the Site Plan Application submitted in June 1999, and the response to comments document submitted in April 2000 are under separate cover.

We hope that you find the information provided in this submittal to be sufficient to answer any and all of your questions, comments, and concerns, and demonstrate the suitability of this site for a Construction and Demolition Debris landfill. If you have any further questions or comments, please contact me at (919) 787-5620.

Very truly yours,

CAMP DRESSER & McKEE

Thomas M. Yanoschak, P.E.

cc: Gary Tweed, Henderson County
Jim Coffey, SWS
Joe Wiseman, CDM
Bill Taylor, CDM

Post-it® Fax Note 7672 | No. of Pages 2 | Today's Date 7-13-00 | Time

To Tim Jewett | From Ellen Lorscheider

Company | Company

Location | Location | Dept. Charge

Fax # | Telephone # | Fax # | Telephone #

Comments | Original Disposition: ☐ Destroy ☐ Return ☐ Call for pickup

I'm sending this "No" letter out tomorrow unless I hear something from you.

RECEIVED
N.C. Dept. of EHN
JUL 13 2000
Winston-Salem Regional Office

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

July 13, 2000

Mr. Gary Tweed
Henderson County
802 Storry Mountain Road
Hendersonville, NC 28739

RE: Henderson County, Construction and Demolition Landfill Site
Receipt of letter regarding Initial Review of Site Application

Dear Mr. Tweed,

A review had been completed of the Construction and Demolition Debris Landfill Site Permit Application. The review is according to Rules 15A NCAC 13B .0503(1) and .0504(1) in order to determine if the site proposed is suitable for disposal of construction and demolition waste.

A previous letter from me, dated February 17, 2000, was sent which contained several comments regarding the hydrogeological suitability of the site and the type of information necessary in order for the Solid Waste Section to deem it suitable according to the rules. A response letter from Tim Grant of CDM, dated April 3, 2000, has been received and the information contained within it was accessed in order to determine the suitability of the site. While some of the questions regarding site suitability were addressed the issue of monitorability of this site remains. The hydrogeological characterization is insufficient to ensure that the groundwater can be adequately monitored in order to detect contamination before it leaves the landfill property.

The groundwater is noted, in piezometers P-2, P-7 and P-9 within the proposed footprint to be moving within the rock. Using these and other piezometers and monitoring wells on this property, CDM has shown on the cross-sections (Sheet 4-5) that the overall flow of groundwater beneath the landfill is within the rock. The existing ground surface in the central portion of the landfill

FIRST

1646 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1646
401 OBERLIN ROAD, SUITE 150, RALEIGH, NC 27605
PHONE 919-733-4996 FAX 919-715-3605

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HENDERSON COUNTY

OFFICE OF THE COUNTY ENGINEER

Gary T. Tweed, P.E.
County Engineer

October 6, 1999

Mr. Bill Taylor, P.E.
Camp Dresser & McKee
5400 Glenwood Ave.
Suite 300
Raleigh, N.C. 27612

JUN 2000
Received
Solid Waste
Section

Ref: Proposed C & D Landfill
Henderson County Solid Waste Facility
Henderson County, North Carolina

Dear Mr. Taylor:

In follow up to our meeting with the Solid Waste Section staff on Monday, enclosed please find two copies each of the following documents:

1- Resolution adopted by the Board of Commissioners authorizing the submittal of the C& D Permit Application.

2-A copy of the erosion control approval issued for the borrow pit area where the proposed C&D Landfill is to be located.

3- A copy from the aerial tax map showing the homes closest to the proposed C&D area and scaled distances to same. I have also enclosed a copy of the full aerial tax map for your use.

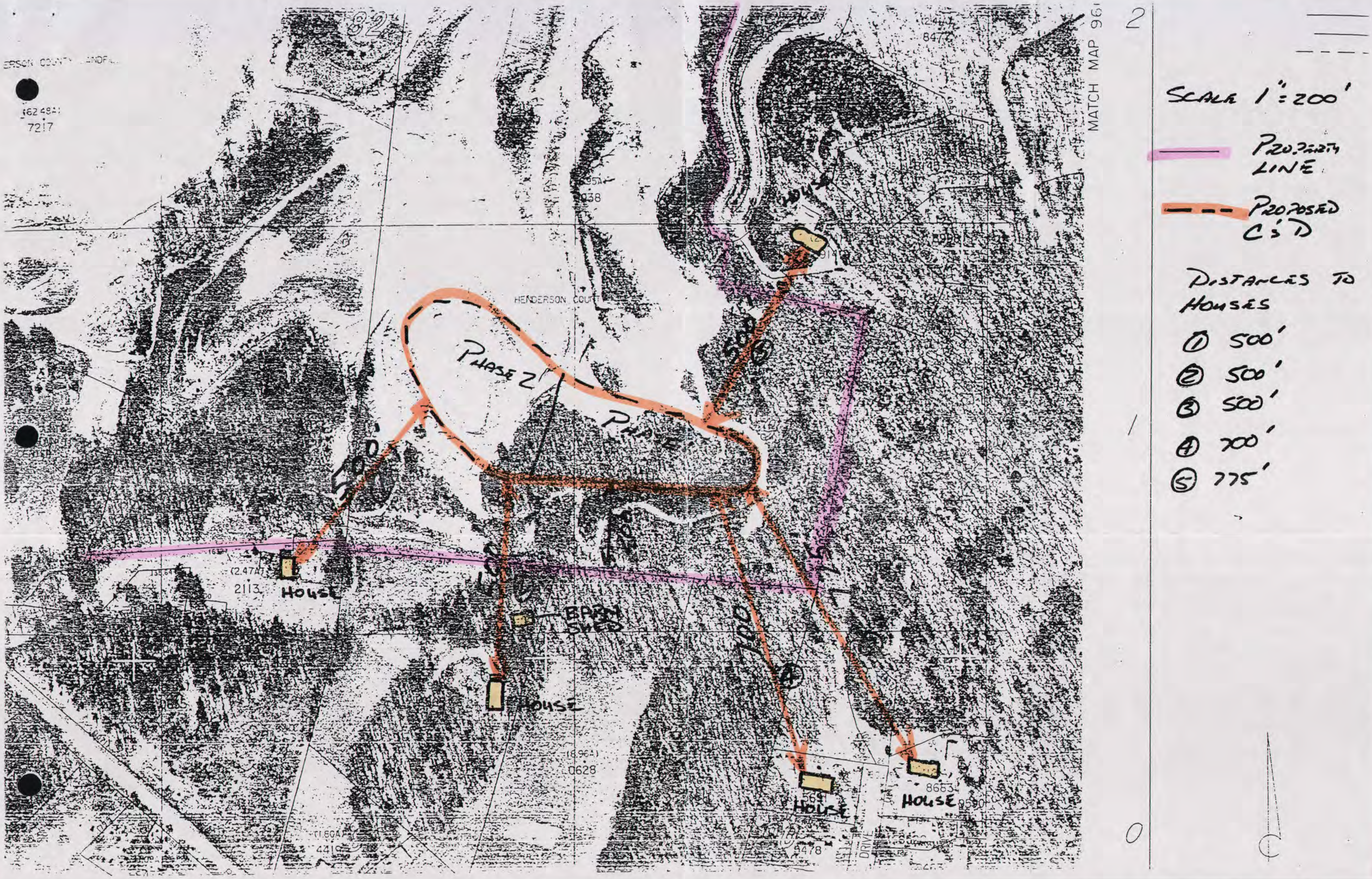
4- A copy of the 1985 site approval issued for a MSW expansion into the borrow pit area. Area overlaps into the proposed C&D area.

Once you have received full comments from the State, I will be glad to discuss with you. Should you have any questions, please contact my office at 828-698-5115.

Sincerely,

Gary T. Tweed, P.E.

802 Stoney Mountain Road • Hendersonville, North Carolina 28791 • (828) 698-5115 • FAX: (828) 697-5599



ERSON COUNTY LANDFIL
MATCH MAP 96
HENDERSON COURT
PHASE 2
PHASE
HOUSE
HOUSE
HOUSE
HOUSE
BARN SHED
SCALE 1" = 200'
PROPERTY LINE
PROPOSED C & D
DISTANCES TO HOUSES
① 500'
② 500'
③ 500'
④ 700'
⑤ 775'

HENDERSON COUNTY

RESOLUTION TO APPROVE THE HENDERSON COUNTY CONSTRUCTION & DEMOLITION DEBRIS LANDFILL

Resolution authorizing the Henderson County Solid Waste Department to file an application with the Solid Waste Section of the North Carolina Department of Environment and Natural Resources for a construction and demolition debris landfill permit.

WHEREAS, N.C. Administrative Code .0504(1)(e)(l) requires approval of the Board of Commissioners of the county in which the site is located. Approval of the site may be in the form of either a resolution or a vote on a motion.

WHEREAS, this board has approved that the Construction & Demolition Debris Landfill should be sited on the existing Stoney Mountain Road Landfill owned by Henderson County, shown on the attached map.

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners for the County of Henderson as follows:

1. That the Henderson County Solid Waste Department shall cause to be filed an application with the Solid Waste Section of the North Carolina Department of Environment and Natural Resources for a construction and demolition debris landfill permit at the above referenced site.

2. That this resolution shall become effective upon its adoption.

Adopted on the 4th day of October 1999.

ATTEST

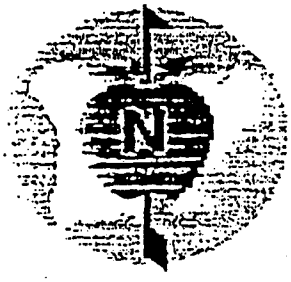
BOARD OF COMMISSIONERS FOR
THE COUNTY OF HENDERSON

Elizabeth W. Corn

Bragg Hawk

Henderson County
MapView.CD
Version 2.3

1 Inch = 528.6632 Feet.
Date: 6/10/99



[redacted]ap is prepared for the inventory of real property found [redacted]ins jurisdiction, and is compiled from recorded deeds, [redacted]nd other public records and data. Users of this map [redacted] are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this map. The County and mapping company assume no legal responsibility for the information contained on this map.

State of North Carolina
Department of Environment,
Health and Natural Resources
Asheville Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Nann B. Guthrie, Regional Manager

DEHNR
LAND QUALITY SECTION

TO GARY TWEED
COPY TO
RECORD
AND MR

COPY

LETTER OF APPROVAL
August 9, 1994

Mr. David Thompson
Henderson Co. Manager
100 N. King Street
Hendersonville, NC 28739

Dear Mr. Thompson:

This office has reviewed the erosion and sedimentation control plan submitted for the project listed below. We find the plan to be acceptable and hereby issue this Letter of Approval with modifications and/or performance reservations. A list of the modifications required and/or reservations is attached. This approval is conditioned upon the incorporation or addition of these items to the plan. Please be advised that Title 15A, North Carolina Administrative Code 4B.0017(a), requires that a copy of the approved soil erosion control plan be on file at the job site. Also, you should consider this letter to give the Notice required by NCGS §113A-61(d) of our right of periodic inspection to ensure compliance with the approved plan.

The State's Sedimentation Pollution Control Program is a performance-oriented program requiring protection of the natural resources and adjoining properties. If, following commencement of this project, it is determined that the plan is inadequate to meet the requirements of NCGS §113A-51 to 66, this office may require revisions to the plan and implementation of the revisions to ensure compliance with the Act.

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. Your cooperation is appreciated.

Sincerely,

for Dennis G. Owenby
Asst. Regional Engineer

DGO:a
cc: Mr. Gary Tweed
Project name: Stoney Mtn. Road Landfill
Location: Henderson County
Date received: 7/28/94
[illegible] submittal (✓) Revision ( )

CERTIFICATE OF PLAN APPROVAL

The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environment, Health, and Natural Resources in accordance with North Carolina General Statute 113A - 57 (4) and 113A - 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0007 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0027(b).

Stoney Mtn. Rd. Landfill - Henderson Co.

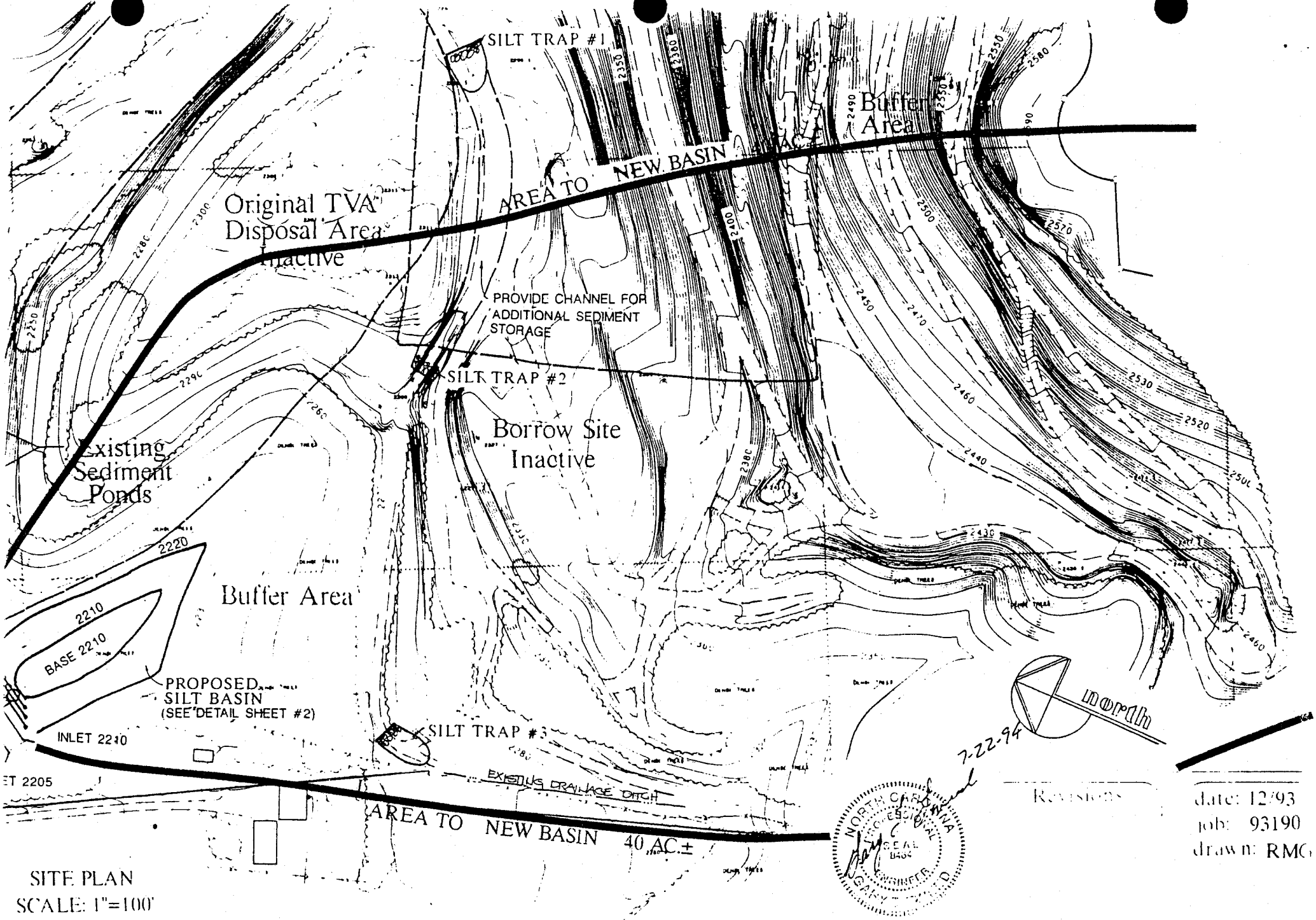
Project Name and Location

8/9/94

Date of Plan Approval

RA Phelps

Regional Engineer



SITE PLAN
SCALE: 1"=100'

Joe Wisemann

697-4000

North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
Phillip J. Kirk, Jr., Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director
919/733-3446

January 29, 1985

Mr. William T. Drake, Chairman
Henderson County Commissioners
244 Second Avenue, East
Hendersonville, N.C. 28739

RE: Henderson County Landfill Expansion

Dear Mr. Drake:

Based on the additional information submitted by Laughter, Venezia and Associates for the referenced subject, site approval is issued in accordance with G.S. 130A-290.

Due to the urgency of this notification, conditions of approval will be spelled out in a letter to follow. However, the disposal area is limited to the area as shown on enclosure.

If you have any questions, please advise.

Sincerely,

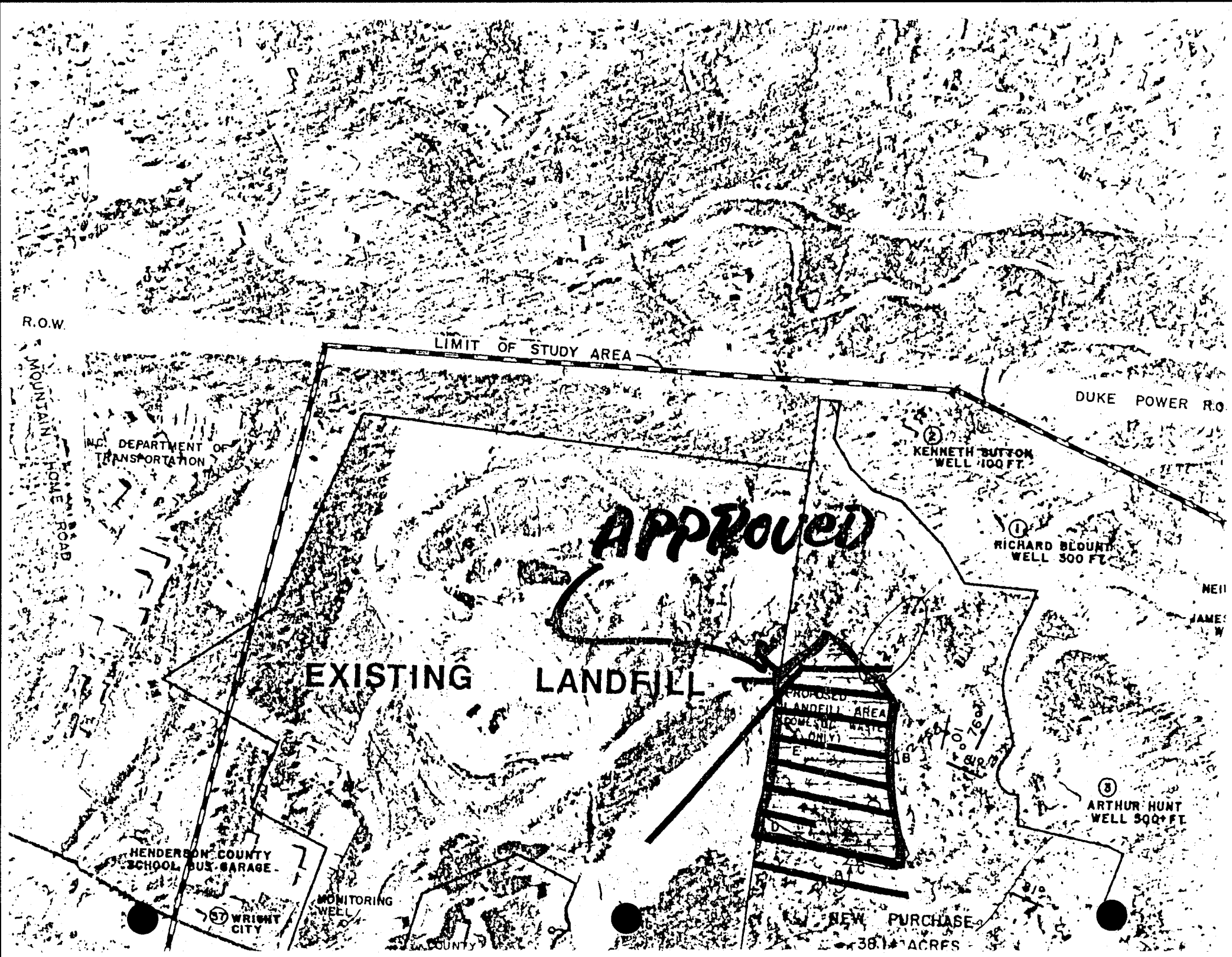
for J. Gordon Layton

William L. Meyer, Head
Solid & Hazardous Waste Management Branch
Environmental Health Section

WLM:nlp

cc: Mr. Jon H. Laughter
Mr. J. W. Moore, Jr.

Enclosure


R.O.W.
MOUNTAIN HOME ROAD
LIMIT OF STUDY AREA
DUKE POWER R.O.
N.C. DEPARTMENT OF TRANSPORTATION
KENNETH BUTTON WELL 100 FT.
RICHARD BLOUNT WELL 300 FT.
APPROVED
EXISTING LANDFILL
PROPOSED LANDFILL AREA (COMMERCIAL WASTE ONLY)
ARTHUR HUNT WELL 300+ FT.
HENDERSON COUNTY SCHOOL BUS GARAGE
WRIGHT CITY
MONITORING WELL
NEW PURCHASE
38.1 ACRES

North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
Phillip J. Kirk, Jr., Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director
919/733-3446

February 4, 1985

Mr. William T. Drake, Chairman
Henderson County Commissioners
244 Second Avenue, East
Hendersonville, N.C. 28739

RE: HENDERSON COUNTY LANDFILL EXPANSION

Dear Mr. Drake:

In accordance with the January 29, 1985 approval letter the following conditions are imposed:

1. Groundwater monitoring wells shall be installed in bedrock at the four (4) locations as shown on attached sheet. Installation shall be performed by August 1, 1985. The well shall be cased and sealed into rock to an adequate depth to yield 3-5 gallons per minute, and shall be finished in accordance with DHS well standard. After construction the well must be properly developed. The well shall be located as close to the drainage feature as practical.

2. The landfill bottom shall be no closer than ten (10) feet to bedrock and at least six (6) feet higher than water elevations by Froehling and Robertson (Table 1). The bottom shall be scarifier and recompacted to a depth of 6 inches.

If you have any questions concerning this matter, contact Gary Babb at (919) 733-2178.

Sincerely,

William L. Meyer

William L. Meyer, Head
Solid & Hazardous Waste Management Branch
Environmental Health Section

WLM/plg

Enclosure

cc: J. W. Moore
Julian Foscue
Jon Laughter

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CDM Camp Dresser & McKee

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5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
Tel: 919 787-5620 Fax: 919 781-5730

August 26, 1999

Mr. Timothy Jewett
Solid Waste Section
North Carolina Department of Environment and Natural Resources
585 Waughtown Street
Winston-Salem, North Carolina 27107

Subject: Henderson County C&D Landfill
Construction Permit Application Revisions

Dear Tim:

On behalf of Henderson County, North Carolina, Camp Dresser & McKee (CDM) submitted to you the above referenced for your review on June 30, 1999. However, at the request of Henderson County, the Construction and Grading Plan (Sheet C-2) has been revised the reduce the amount of earthwork required to be performed by County forces during construction of the landfill.

Enclosed please find the revised Sheet C-2 and revised earthwork calculation portions of the report text. CDM requests that you replace the original Sheet C-2 and report text with the enclosed and use this information as the basis of your review.

I would also like to point out that the County is rapidly running out of permitted C&D disposal area and needs this new area permitted as soon as possible. If there is anything we can do to help facilitate your review, please do not hesitate to contact me.

Thank you for your time and attention to this matter.

Very truly yours,

CAMP DRESSER & McKEE

William K. Taylor

William K. Taylor, P.E.

cc: G. Tweed, Henderson County
M. Brinchek, CDM

CDM Camp Dresser & McKee

consulting
engineering
construction
operations

5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
Tel: 919 787-5620 Fax: 919 781-5730

June 30, 1999

Mr. Tim Jewett
North Carolina Department of Environment and Natural Resources
Solid Waste Section
585 Waughtown Street
Winston-Salem, North Carolina 27107

Subject: Henderson County
Construction and Demolition Debris Landfill Construction Permit Application

Dear Mr. Jewett:

On behalf of Henderson County, Camp Dresser and McKee (CDM) is submitting the attached Henderson County Construction and Demolition Debris (C&D) Landfill Construction Permit Application for your review and approval. The Permit Application has been prepared in accordance with the North Carolina Solid Waste Management Rules 15A NCAC 13B, Section .0503, .0504, and .0505.

The proposed facility is located within the property limits of the existing Henderson County MSW Landfill located at 802 Stoney Mountain Road in Hendersonville, North Carolina. The proposed facility is sited in a former borrow area and is not contiguous with the footprint of the old MSW disposal area.

The County currently operates a C&D landfill on top of the closed MSW landfill but will run out of capacity by the end of August, 1999. Since the continued and uninterrupted disposal of C&D at the Henderson County landfill is critical to the operation of this facility, CDM requests a meeting with you to discuss this Application during the week of July 12, 1999. Mr. Gary Tweed, Henderson County Engineer, would also like to be present during this meeting. We hope that this meeting will help facilitate a rapid review and approval of this Application.

Thank you for your prompt attention to this matter. If you have any questions or need additional information, please do not hesitate to call me. We will be contacting you soon to arrange for the above referenced meeting.

Very truly yours,

CAMP DRESSER & McKEE

William K. Taylor

William K. Taylor

xc: Gary Tweed, Henderson County

O:\reports\henderson\c&d\cpa-let.wpd

HENDERSON COUNTY
NORTH CAROLINA

Chairman:	Mr. Grady Hawkins
Vice Chairman:	Mr. William Moyer
Commissioner:	Mr. Marilyn Gordon
Commissioner:	Ms. Renee Kumor
Commissioner:	Mr. Donald G. Ward, III
County Manager:	Mr. David E. Nicholson
County Engineer:	Mr. Gary Tweed, P.E.
Supervisor, Solid Waste Department:	Mr. Gary Corn

Henderson County Construction & Demolition Debris Landfill Construction Permit Application

---

NORTH CAROLINA LICENSED SEAL 1412 GEOLOGIST TIMOTHY DAVID GRANT

Timothy D. Grant

6-29-99

NORTH CAROLINA PROFESSIONAL SEAL 15486 ENGINEER JOSEPH T. WISEMAN, JR.

June 1999

CAMP DRESSER & McKEE
Raleigh, North Carolina

environmental engineers, scientists, planners, & management consultants **CDM**

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SECTION 1
FACILITY REPORT

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER THOMAS M. YANOSCHAK

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Section 1
Facility Report
1.1 Introduction

This Facility Plan, consisting of a Facility Report and Facility Drawings, has been prepared for the proposed Henderson County Construction and Demolition (C&D) Debris Landfill. This plan has been prepared to comply with the requirements set forth in the North Carolina Solid Waste Management Rules 15A NCAC 13B.0503 and .0504.

The proposed Henderson County C&D Debris Landfill is located within the existing 122 + acre Solid Waste Management Facility and is southeast of the closed out Henderson County unlined sanitary landfill. Henderson County has been using the proposed C&D property for borrow material in their daily C&D landfill operations. The site is partially bounded to the south by Stoney Mountain Road and to the west by residential land. All surrounding land is zoned as residential.

The Phase 1 C&D disposal area is approximately 2.7 acres.

1.1.1 Legal Description - 15A NCAC 13B .0504(2)(h)(i)

The C&D landfill facility is part of a larger parcel of land that has been previously zoned for waste disposal. A copy of the deed for the complete parcel of land formerly known as the Bayless property is in Attachment 1.1.

1.1.2 Person Responsible for Operation and Maintenance of Construction and Demolition (C&D) Landfill - 15A NCAC 13B .0504(2)(h)(ii)

Mr. Gary Tweed, P.E.
Henderson County, County Engineer
802 Stoney Mountain Road
Hendersonville, North Carolina 28791
Phone: (828) 698-5115

1.1.3 Projected Land Use - 15A NCAC 13B .0504(2)(h)(iii)

Upon completion of the C&D landfilling operations, the landfill will be closed in accordance with the appropriate North Carolina Solid Waste Management Rules. The facility will be gated and access will be restricted. No other use for the property is planned at this time.

1.2 Waste Stream - 15A NCAC 13B .0504(1)(g)

The majority of C&D waste generated in Henderson County is the result of commercial and residential construction. The County currently accepts C&D waste in their existing C&D landfill, located north of the proposed C&D facility on top of the closed out unlined sanitary landfill.

1.2.1 Population and Areas Served By Facility - 15A NCAC 13B .0504(1)(g)(i)

Based on the most recent census data, the 1998 population of Henderson County was estimated to be 80,800. According to population projections prepared by the North Carolina Office of State Planning, the population of Henderson County is expected to rise to 101,900 by the year 2020. The Henderson County C&D Facility will serve the residents of Henderson County. Henderson County, approximately 374 square miles in area, includes all or portions of the municipalities of Fletcher, Mountain Home, Balfour, Hendersonville, Etowzh, Valley Hill, Barker Heights, East Flat Rock and Saluda.

1.2.2 Type, Quantity, and Source of Waste - 15A NCAC 13B .0504(1)(g)(ii)

Based on historical records of transported waste and projected population increases, it is estimated that the initial amount of C&D waste to be received at the facility for Phase 1 will be approximately 7,000 tons per year. Only C&D waste and land clearing debris generated within Henderson County will be disposed of in the facility.

1.2.3 Equipment Requirements - 15A NCAC 13B .0504(1)(g)(iii)

All equipment previously used at the existing Henderson County C&D debris landfill is in good working condition and will continue to be used at the proposed C&D facility. The equipment is county-owned and includes the following:

- Bulldozer
- Motor Grader
- Steel Wheeled Compactor
- Front End Loader

1.3 Operation, Development, and Completion - 15A NCAC 13B .0504(2)(h)(v)

Construction operations of the Phase I area will begin with Henderson County bringing base grades to design grades. Once design grades are reached, Henderson County will begin C&D filling operations in the low area of Phase I, located in the southwest portion of the site and proceed north. Construction and demolition debris will be brought to the fill area via the access road and deposited on the working face. The waste will be compacted with a steel-wheeled compactor making a minimum of four passes.

Upon completion of daily operations, the waste will be covered with a minimum six inches of compacted cover soil on a weekly basis or more frequently as conditions dictate. The cover soil will be taken from the borrow area. Once Phase 1 has reached

final grades, it will be closed and capped. The final cover cap will be 18 inches of compacted soil and six inches of topsoil.

1.4 Landfill Capacity

1.4.1 Earthwork Calculations - 15A NCAC 13B .0504(2)(h)(vi)

1.4.1.1 Total Airspace

The Earthworks module of Softdesk software was used to estimate the total airspace between the base (excavation) grades and the top of the proposed final cover grades. The total computed airspace is 54,000 cubic yards (CY).

1.4.1.2 Final Cover Soil Required

The final cover material volume required to construct the 2-foot thick cover system for the C&D landfill (2.7 acre total surface area) is 8,700 CY.

1.4.1.3 Daily and Intermediate Cover Soil Required

It is anticipated that a 4:1 waste to cover ratio will be achieved. Daily and intermediate cover required is computed to be 45,300 CY x 20% cover = 9,060 CY.

1.4.1.4 Available Net Airspace for C&D Disposal

Net airspace for disposal of C&D debris is computed to be 54,000 CY – 8,700 CY – 9,060 CY = 36,240 CY.

1.4.2 C&D Landfill Operating Life - 15A NCAC 13B .0504(2)(h)(iv)

Available airspace for C&D debris = 36,240 CY.

Converting to weight (assuming 1,200 lb/CY density for C&D debris):

36,240 CY x 1,200 lb/CY x 1 ton/2000 lb = 21,740 tons of C&D debris.

Henderson County provided CDM with the following information:

Annual disposal rate for C&D debris = 7,000 tons/year.

Operating life of C&D disposal unit = 21,740 tons x 1 yr/7,000 tons = 3 years.

1.4.3 Net Balance of On-Site Soils

The Earthworks Module of Softdesk software was used to estimate the earthwork cut and fill volumes associated with the construction of the access road and C&D landfill base grades. The estimated cut and fill volumes (in-place) are:

Cut soil volume: 23,950 CY Cut

Fill soil volume: 8,650 CY Fill

Volume of soil needed = fill soil + intermediate cover soil + final cover - cut soil

2,820 CY = 8,650 + 9,060 CY + 8,700 CY – 23,590 CY

Including cut material, an additional 2,820 CY of material will be needed in order to complete Phase 1 construction, operation and closure. The additional material needed will be excavated and hauled from either one of two areas. The two areas the County proposes to use for daily landfill operations consist of approximately four (4) acres directly below the proposed C&D area and approximately four (4) acres in the southwest corner of the Henderson County Site. Both locations have approximately fifteen (15) to twenty (20) feet of potential borrow material which is more than adequate for all C&D landfill operations.

1.5 Containment and Environmental Control Systems

The design concept of the new landfill facility is to maximize the disposal capacity of the site while providing containment of the disposed waste in order to protect the groundwater and other environmental features. The following narrative is a discussion of the compliance with design requirements in Rule 0.503(2) .

1.5.1 Explosive Gases - 15A NCAC 13B .0503(2)(a)

Organic waste received at the C&D landfill will be limited to wood waste. Since the decomposition of wood waste is relatively slow and limited, the rate and total magnitude of the generation of explosive gases should be relatively low.

1.5.2 Public Access - 15A NCAC 13B .0503(2)(b)

The Operations Plan describes the security measures that will be used to prevent unrestricted public access to the site.

1.5.3 Surface Water Requirements - 15 A NCAC 13B .0503(2)(c)

In accordance with 15A NCAC 13B .0503(2)(c)(i), the C&D debris landfill shall not cause a discharge of pollutants into the waters of the state that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES), under Section 402 of the Clean Water Act, as amended.

In accordance with 15A NCAC 13B .0503(2)(c)(ii), the C&D disposal landfill shall not cause a discharge of dredged material or fill material into the waters of the state that is in violation of the requirements under Section 404 of the Clean Water Act, as amended.

In accordance with 15A NCAC 13B .0503(2)(c)(iii), the C&D debris landfill shall not cause non-point source pollution of waters of the state that violates assigned water quality standards.

The Henderson County C&D disposal facility shall continue maintaining existing erosion and sedimentation control devices in accordance with the approved Sediment and Erosion Control Plan. Because the C&D disposal facility is located within an existing borrow area which was previously permitted and because the C&D facility

will not be expanded outside the perimeter of the permitted area there will not be a need for installing further erosion and sedimentation control devices.

1.5.4 Ground Water Requirements - 15A NCAC 13B .0503(2)(d)

All base grades shall be a minimum of four feet above the seasonal high ground water elevation in accordance with 15A NCAC 13B .0503(2)(d)(i). Base grades were designed to be 6 feet above the seasonal high groundwater elevation. Sheet 3-2 provides the potentiometric contour map overlaid on the proposed base grades to show separation. Sheet 3-2 is included in the Additional Hydrogeologic Investigation, which has been submitted under separate cover. The potentiometric contours were constructed from the November 8, 2000 water level measurements and are representative of the seasonal high water table.

The seasonal high water table was determined by analysis of precipitation data for 1947 through 1997 for a station at Asheville, NC and also for a station at the Hendersonville Airport. The precipitation data is summarized in Table 1-1. The average annual precipitation in Hendersonville, North Carolina is 56.06 inches. Average monthly precipitation ranges from a low of 3.98 inches in October to a high of 6.03 inches in August. Long-term monthly precipitation summary statistics are provided in Table 1-1. Precipitation summary statistics for Asheville, North Carolina are also included.

In nearby Hendersonville and Asheville, North Carolina, rainfall amounts prior to and during the investigation were extremely low. Therefore, the highest water levels measured during the period 1994 through 2000 at the monitoring wells surrounding the adjacent closed MSW landfill were used to derive the seasonal high water table. The November 8, 2000 water elevations for piezometers at the proposed site were adjusted upward by a factor that is a function of their relative elevation on the mountainside. This was done because records show that water levels in the lower elevation monitoring wells change less than water levels in wells at higher elevations. Table 1-2 and Figure 1-1 show the relationships between precipitation and water levels for monitoring wells MW-5 and MW-9. From the graphs it is apparent that the highest recorded water level in MW-5 and MW-9 occurred during the months of April, May and June of 1996. The highest recorded value for these three months was used to estimate the seasonal high water table at the proposed site.

Because MW-5 and MW-9 are the closest regularly sampled wells to the proposed C&D landfill, and since they are located at elevations above and below the proposed landfill, they were used to estimate the seasonally high water table. Table 1-3 shows the adjustment of water levels in the piezometers for topographic elevation to estimate the seasonal high water table. The seasonal high water table estimate is based on the fact that wells at higher topographic elevation respond proportionally more to changes in rainfall than do wells at lower elevation.

TABLE 1-1
SUMMARY OF PRECIPITATION DATA
HENDERSON COUNTY C&D LANDFILL

Station Name	ASHEVILLE	Latitude	35:36:00	Start Year	1947
Station ID	301	Longitude	082:32:00	End Year	1997
Param	Precipitation	Elevation	2240	Num Years	51
State	NORTH CAROLINA				
County	BUNCOMBE				

	January	February	March	April	May	June	July	August	September	October	November	December	Year
# Days	1581	1440	1580	1530	1580	1527	1581	1549	1499	1550	1499	1550	18466
Avg Day	0.091	0.109	0.128	0.105	0.105	0.113	0.102	0.124	0.103	0.085	0.094	0.089	0.104
# Months	51	51	51	51	51	51	51	50	50	50	50	50	50
SDev Month	1.372	1.454	1.764	1.393	1.612	1.724	1.391	2.042	1.92	1.741	1.465	1.389	6.154
Min Month	0.58	0.21	0.71	0.23	0.59	0.61	0.6	0.62	0.07	0	0.68	0.07	23.05
Max Month	6.31	6.34	8.95	6.76	7.33	7.81	6.74	8.88	8.24	8.46	7.15	6.11	51.68
Avg Month	2.815	3.118	3.965	3.151	3.261	3.393	3.163	3.829	3.076	2.636	2.819	2.758	37.93
Skew Month	0.814	-0.07	0.574	0.237	0.282	0.777	0.356	0.555	0.88	0.937	1.133	0.431	0.022
Kurt Month	3.086	2.313	2.961	2.821	2.201	3.163	2.793	2.322	3.048	3.855	4.015	3.062	2.521
M Min Year	1981	1978	1985	1976	1951	1986	1983	1980	1985	1963	1960	1965	1988
M Max Year	1954	1984	1975	1957	1959	1989	1949	1964	1959	1964	1948	1983	1989

Station Name	HENDERSONVILLE 1 NE	Latitude	35:20:00	Start Year	1948
Station ID	3976	Longitude	082:27:00	End Year	1997
Param	Precipitation	Elevation	2160	Num Years	50
State	NORTH CAROLINA				
County	HENDERSON				

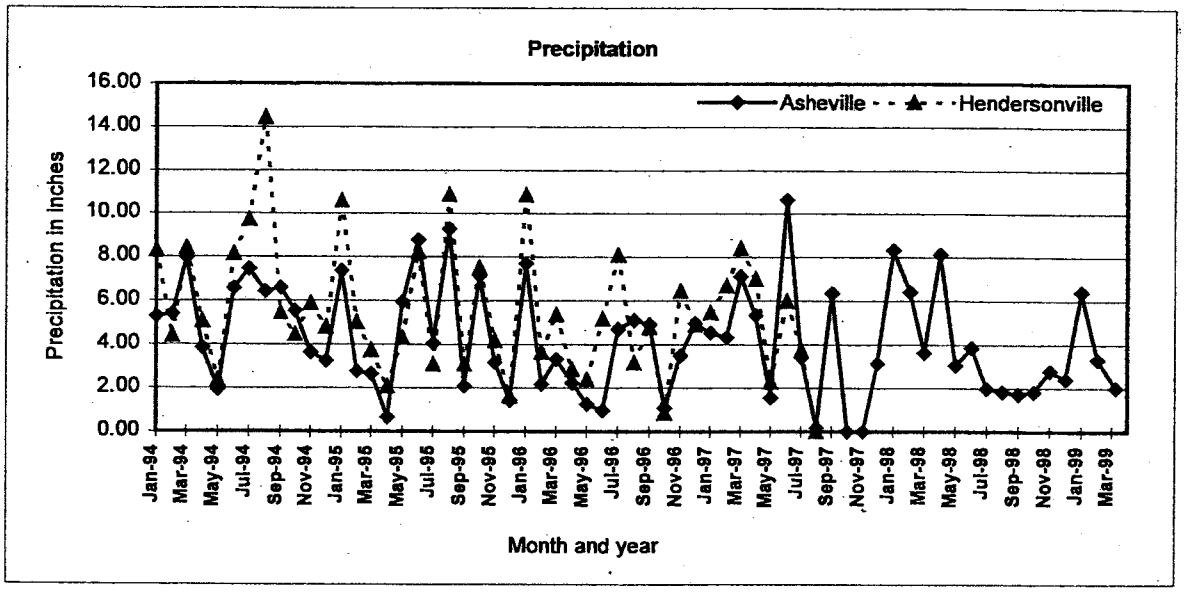
	January	February	March	April	May	June	July	August	September	October	November	December	Year
# Days	1495	1378	1510	1468	1517	1470	1519	1519	1470	1516	1438	1486	17786
Avg Day	0.144	0.155	0.187	0.142	0.146	0.164	0.162	0.194	0.143	0.129	0.143	0.141	0.155
# Months	48	49	49	49	49	49	49	49	49	49	48	48	46
SDev Month	2.289	2.141	2.603	2.156	2.307	2.588	2.499	3.817	2.59	2.543	2.383	2.372	9.889
Min Month	0.39	0.46	1.08	0.13	1.19	0.64	1.16	0.99	0.16	0.13	0.76	0.23	35.59
Max Month	10.84	9.16	11.67	8.65	11.18	11.92	12.71	18.12	10.22	10.1	12.54	10.63	81.12
Avg Month	4.413	4.423	5.756	4.271	4.529	4.921	5.035	6.027	4.303	3.977	4.274	4.368	56.059
Skew Month	0.94	0.033	0.457	0.146	0.729	0.761	1.016	0.994	0.529	0.637	1.195	0.67	0.243
Kurt Month	3.76	2.271	2.447	2.231	3.118	3.101	3.77	3.579	2.551	2.703	4.643	3.297	2.705
M Min Year	1981	1978	1985	1976	1988	1993	1986	1981	1984	1963	1960	1965	1988
M Max Year	1996	1966	1952	1957	1976	1989	1949	1961	1977	1971	1948	1973	1994

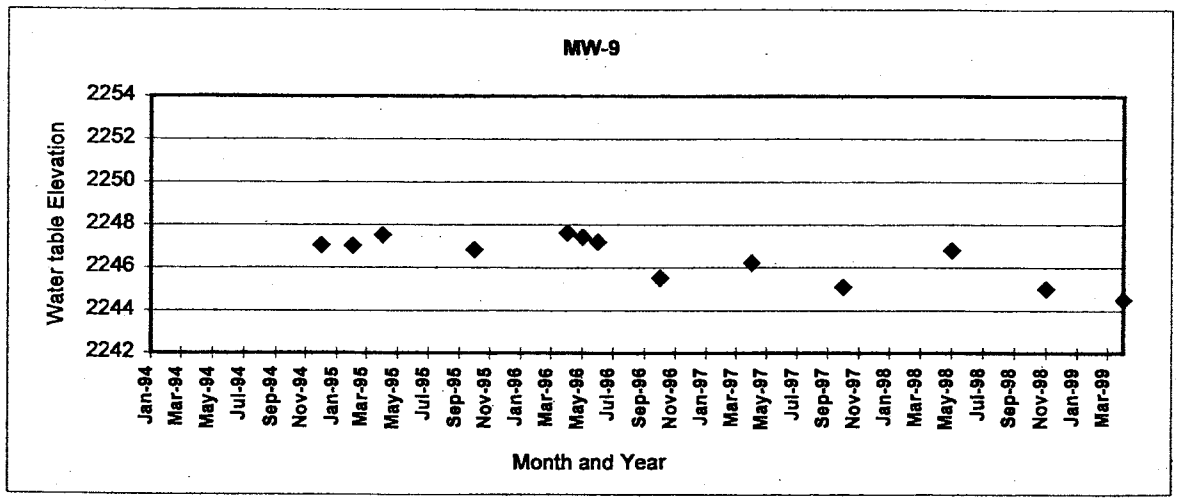
Table 1-2
Monthly Precipitation and Measured Groundwater Elevations - 1994 - 1999
Stoney Mountain Road Landfill Vicinity, Hendersonville, North Carolina

	Precipitation (inches per month)		Groundwater Elevations (feet above mean sea level)			
	Asheville	Hendersonville		MW-9		MW-5
Jan-94	5.27	8.27	Jan-94		Jan-94	
Feb-94	5.38	4.38	Feb-94		Feb-94	
Mar-94	7.95	8.38	Mar-94		Mar-94	
Apr-94	3.84	5.04	Apr-94		Apr-94	
May-94	1.91	2.35	May-94		May-94	
Jun-94	6.56	8.1	Jun-94		Jun-94	
Jul-94	7.44	9.7	Jul-94		Jul-94	
Aug-94	6.41	14.41	Aug-94		Aug-94	
Sep-94	6.58	5.42	Sep-94		Sep-94	
Oct-94	5.53	4.44	Oct-94		Oct-94	
Nov-94	3.63	5.85	Nov-94		Nov-94	
Dec-94	3.24	4.78	Dec-94	2,247.04	Dec-94	2,337.18
Jan-95	7.35	10.57	Jan-95		Jan-95	
Feb-95	2.76	4.99	Feb-95	2,247.01	Feb-95	2,339.05
Mar-95	2.63	3.71	Mar-95		Mar-95	
Apr-95	0.65	2.05	Apr-95	2,247.51	Apr-95	2,341.01
May-95	5.94	4.27	May-95		May-95	
Jun-95	8.76	8.21	Jun-95		Jun-95	
Jul-95	4.04	3.07	Jul-95		Jul-95	
Aug-95	9.28	10.86	Aug-95		Aug-95	
Sep-95	2.08	3.06	Sep-95		Sep-95	
Oct-95	7.14	7.49	Oct-95	2,246.83	Oct-95	2,341.20
Nov-95	3.17	4.15	Nov-95		Nov-95	
Dec-95	1.43	1.6	Dec-95		Dec-95	
Jan-96	7.68	10.84	Jan-96		Jan-96	
Feb-96	2.16	3.63	Feb-96		Feb-96	
Mar-96	3.31	5.34	Mar-96		Mar-96	
Apr-96	2.22	2.83	Apr-96	**2,247.61**	Apr-96	2,343.32
May-96	1.25	2.37	May-96	2,247.42	May-96	2,343.27
Jun-96	0.96	5.14	Jun-96	2,247.18	Jun-96	**2,343.80**
Jul-96	4.68	8.06	Jul-96		Jul-96	
Aug-96	5.1	3.14	Aug-96		Aug-96	
Sep-96	4.91	4.77	Sep-96		Sep-96	
Oct-96	1.08	0.83	Oct-96	2245.51	Oct-96	2339.4
Nov-96	3.48	6.41	Nov-96		Nov-96	
Dec-96	4.96	4.88	Dec-96		Dec-96	
Jan-97	4.52	5.44	Jan-97		Jan-97	
Feb-97	4.31	6.66	Feb-97		Feb-97	
Mar-97	7.1	8.38	Mar-97		Mar-97	
Apr-97	5.32	6.97	Apr-97	2246.22	Apr-97	2338.72
May-97	1.54	2.26	May-97		May-97	
Jun-97	10.64	5.95	Jun-97		Jun-97	
Jul-97	3.39	3.73	Jul-97		Jul-97	
Aug-97	0.17	NA	Aug-97		Aug-97	
Sep-97	6.33	NA	Sep-97		Sep-97	
Oct-97	0	NA	Oct-97	2,245.11	Oct-97	2,337.14
Nov-97	0	NA	Nov-97		Nov-97	
Dec-97	3.13	NA	Dec-97		Dec-97	
Jan-98	8.31	NA	Jan-98		Jan-98	
Feb-98	6.4	NA	Feb-98		Feb-98	
Mar-98	3.61	NA	Mar-98		Mar-98	
Apr-98	8.12	NA	Apr-98		Apr-98	
May-98	3.04	NA	May-98	2,246.79	May-98	2,342.30
Jun-98	3.84	NA	Jun-98		Jun-98	
Jul-98	1.97	NA	Jul-98		Jul-98	
Aug-98	1.82	NA	Aug-98		Aug-98	
Sep-98	1.71	NA	Sep-98		Sep-98	
Oct-98	1.82	NA	Oct-98		Oct-98	
Nov-98	2.79	NA	Nov-98	2,245.01	Nov-98	2,337.28
Dec-98	2.4	NA	Dec-98		Dec-98	
Jan-99	6.4	NA	Jan-99		Jan-99	
Feb-99	3.3	NA	Feb-99		Feb-99	
Mar-99	2	NA	Mar-99		Mar-99	
Apr-99		NA	Apr-99	2,244.48	Apr-99	2,333.11

NA = Data has not yet been made available.

Figure1-1
Monthly Precipitation and Measured Groundwater Elevations - 1994 - 1999
Stoney Mountain Road Landfill Vicinity, Hendersonville, North Carolina





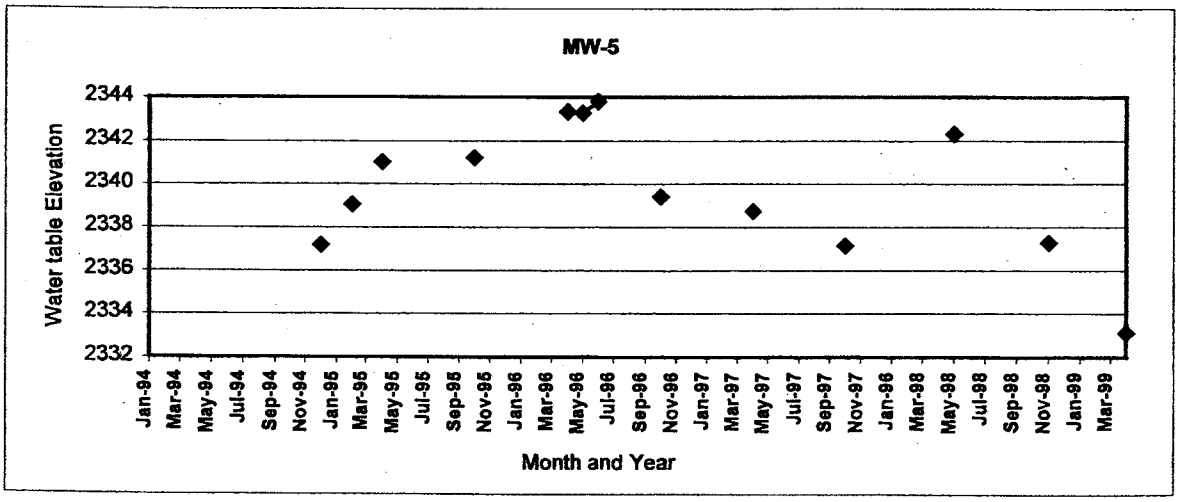


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TABLE 1-3
SEASONAL HIGH WATER TABLE ESTIMATION
SUMMARY OF GROUNDWATER ELEVATIONS AND ADJUSTMENTS
HENDERSON COUNTY C&D LANDFILL

Piezometer Designation	TOC Elevation (MSL)	Ground Elevation (MSL)	Groundwater Elevation (MSL)					F = 10.69 - E	G + F	E = (C * D)	C	D = -AVG. OF A/B
			Apr-95	Apr-96	Jun-96	May-98	G 20-Apr-99	W.S. elev. difference high to Apr-99 (Adjusted for topo. elev.)	Seasonal high WT	Adjustment for topo elev above or below MW-5	Topo elev difference above or below MW-5	Ratio of WT difference from MW-5 to topo difference from MW-5
P-01S	2404.55	2402.63	NA	NA	NA	NA	2367.55	11.48	***2379.03***	-0.79	-15.84	0.05
P-01D	2404.95	2402.83	NA	NA	NA	NA	2361.13	11.49	***2372.62***	-0.80	-16.04	0.05
P-02	2344.35	2342.57	NA	NA	NA	NA	2330.91	8.48	***2339.39***	2.21	44.22	0.05
P-03	2300.09	2297.97	NA	NA	NA	NA	2249.62	6.25	***2255.87***	4.44	88.82	0.05
P-04S	2301.95	2300.10	NA	NA	NA	NA	2277.90	6.36	***2284.26***	4.33	86.69	0.05
P-04D	2300.09	2298.38	NA	NA	NA	NA	2258.14	6.27	***2264.41***	4.42	88.41	0.05
P-07	2333.11	2331.28	NA	NA	NA	NA	2281.20	7.91	***2289.11***	2.78	55.53	0.05
P-09	2354.65	2353.02	NA	NA	NA	NA	2340.81	9.00	***2349.81***	1.69	33.77	0.05
P-11	2296.52	2294.17	NA	NA	NA	NA	2264.18	6.06	***2270.24***	4.63	92.62	0.05
MW-4	2456.91	2456.30	NA	NA	NA	NA	2372.66	14.17	***2386.83***	-3.48	-69.51	0.05
MW-5*	2389.82	2386.79	2341.01	2343.32	**2343.80**	2342.30	2333.11	10.69	**2343.80**	A	B	A /B
MW-6	2205.39	2202.39	NA	NA	NA	**2196.61**	2195.19	1.42	**2196.61**	9.27	184.40	0.050
MW-7	2210.66	2207.77	NA	NA	NA	**2193.19**	2191.77	1.42	**2193.19**	9.27	179.02	0.052
MW-8	2235.87	2232.97	**2213.82**	NA	NA	NA	2210.72	3.1	**2213.82**	7.59	153.82	0.049
MW-9	2260.01	2256.95	2247.51	**2247.61**	2247.18	2246.79	2244.48	3.13	**2247.61**	7.56	129.84	0.058

Notes: * = Reference well

bold = measured seasonal high water table

bold italic = estimated seasonal high water table

NA - No data available
P - Piezometer
TOC - Top of casing
MSL - Mean Sea Level
NM - Not Measured

Using the topographic and water table elevation of MW-5 as a reference point, a comparison with actual water level data at MW-6, MW-7, MW-8 and MW-9 shows a ratio of 0.05 ft./ft. can be used to estimate the change in water table elevation based on the difference in topographic elevation of the wells. For example, MW-6 is located at an elevation 184.4 ft. below MW-5. The difference in the November 8, 2000 water level and the measured seasonal high water level of May and June 1996 was 10.69 ft. and 1.42 ft. for MW-5 and MW-6 respectively. Therefore MW-5, located at the higher elevation, varied by 9.27 ft. more than MW-6. Dividing this difference (9.27 ft.), by the difference between the topographic elevation of the two wells, gives a ratio of 0.05 ft./ft. Using this approach the seasonal high water table elevation for the piezometers was estimated (see Table 1-3 for additional explanation).

1.5.5 Open Burning - 15A NCAC 13B .0503(2)(e)

In accordance with 15A NCAC 13B .0503(2)(e), no open burning of solid waste will be allowed on site.

1.5.6 Buffer Requirements - 15A NCAC 13B .0503(2)(f)

In accordance with 15A NCAC 13B .0503(2)(f)(i), there is a minimum buffer of fifty feet between all property lines and disposal areas.

In accordance with 15A NCAC 13B .0503(2)(f)(ii), there is a minimum buffer of 500 feet between all private dwellings and wells and disposal areas.

In accordance with 15A NCAC 13B .0503(2)(f)(iii), there is a minimum buffer of fifty feet between streams and disposal areas.

1.5.7 Compliance with the Sedimentation Pollution Control Act of 1973 (15A NCAC 4) - 15A NCAL 13B .0503(2)(g) and .0504(2)(h)(vii), (ix) and (x)

1.5.7.1 Temporary and Permanent Erosion Control Measures

Sedimentation and erosion control measures are as shown on Sheet C-2.

1.5.7.2 Seeding Specifications and Schedules

Temporary Seeding

Temporary seeding shall provide protection for areas that will be left disturbed for longer than 30 days and no more than 1 year, during which time permanent stabilization should be initiated.

Grading shall be completed before preparing seedbeds and all necessary erosion control structures shall be installed such as dikes, waterways and basins. If soils become compacted during grading, loosen them to a depth of 6-8 inches, using a ripper, harrow, or chisel plow.

Evenly apply seed using a cyclone seeder (broadcast), drill, cultipacker seeder, or hydroseeder. Small grains should be planted no more than 1 inch deep, and grasses

and legumes no more than ½ inch. Broadcast seed must be covered by raking or chain dragging, and then lightly firmed with the roller or cultipacker.

Temporary Seeding Recommendations for Late Fall to Early Spring:

Seeding Mixture Species	Rate (lb/acre)
Tall Fescue	120
Abruzzi Rye	25
(Kobe in Coastal Plain)	

Seeding Dates
November 1 - March 1

Soil Amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Temporary Seeding Recommendations for Summer:

Seeding Mixture Species	Rate (lb/acre)
Browntop Millet	40

Seeding Dates
June 1 - September 1

Soil Amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10- fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Temporary Seeding Recommendations for Fall:

Seeding Mixture Species	Rate (lb/acre)
Serrica Lespedeza	70

Seeding Dates
September 1 - March 1

Soil Amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 1,000 lb/acre 10-10-10 fertilizer

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Repair and refertilize damaged areas immediately.

Permanent Seeding
(Seeding No. 1CP for well to poorly drained soils, low maintenance).

Areas to be stabilized with permanent vegetation must be seeded or planted within 30 working days or 120 calendar days after final grade is reached, unless temporary stabilization is applied.

Areas designated for permanent seeding shall be grassed as described below:

Seeding Mixture	Rate (lb/acre)
Tall fescue	80
Pensacola Bahiagrass	50
Sericea lespedeza	30
Kobe lespedeza	10

Seeding Notes:

1. From September 1 - March 1, use unscarified sericea seed.

2. On poorly drained sites omit sericea and increase Kobe to 30 lb/acre

3. Where a neat appearance is desired, omit sericea and increase Kobe to 40 lb/acre.

Soil Amendments
Apply lime and fertilizer according to soil tests, or apply 3,000-5,000 lb/acre ground agricultural limestone (use the lower rate on sandy soils) and 1,000 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
If growth is less than fully adequate, refertilize in the second year, according to soil tests or topdress with 500 lb/acre 10-10-10 fertilizer. Mow as much as needed when sericea is omitted from the mixture. Reseed, fertilize, and mulch damaged areas immediately.

Seedbed Preparation (SP)
SP-1 Fill slopes 3:1 or steeper to be seeded with a hydraulic seeder (permanent seedings)

1) Leave the last 4-6 inches of fill loose and uncompacted, allowing rocks, roots, large clods and other debris to remain on the slope.

2) Roughen slope faces by making grooves 2-3 inches deep, perpendicular to the slope.

3) Spread lime evenly over slopes.

SP-2 Fill slopes 3:1 or steeper (temporary seedings)

1) Leave a loose, uncompacted surface. Remove large clods, rocks, and debris.

2) Spread lime and fertilizer evenly at the specified rates.

3) Incorporate amendments by roughening or grooving soil surface on the contour.

SP-3 High maintenance turf

1) Remove rocks and debris that could interfere with tillage and the production of a uniform seedbed.

2) Apply lime and fertilizer evenly. Incorporate to a depth of 2-4 inches with a farm disk or chisel plow.

3) Loosen the subgrade immediately prior to spreading topsoil by disking or scarifying to a depth of at least 2 inches.

4) Spread topsoil to a depth of 2-4 inches and cultipack.

5) Disk or harrow and rake to produce a uniform and well-pulverized surface.

6) Loosen surface just prior to applying seed.

SP-4 Gentle or flat slopes where topsoil is used.

1) Remove rocks and debris.

2) Apply line and fertilizer spread evenly and incorporate into the top 6" with a disk, chisel plow, or rotary tiller.

3) Break up large clods and rake into a loose, uniform seedbed.

4) Rake to loosen surface just prior to applying seed.

Seeding Methods (SM)
SM-1 Fill slopes steeper than 3:1 (permanent seeding)
Use hydraulic seeding equipment to apply seed and fertilizer, a wood fiber mulch at 90 lb/1000 ft2, and mulch tackifier.

SM-2 Gentle to flat slopes on temporary seedings
1) Broadcast seed at the recommended rate with a cyclone seeder, drop spreader, or cultipacker seeder.

2) Rake seed into the soil and lightly pack to establish good contact.

Mulch (MU)
MU-1 Steep slopes (3:1 or greater)
In mid-summer, late fall or winter, apply 100 lb/1,000 ft2 grain straw, anchor with 0.1 gal/yd2 (11 gal/1,000 ft2 asphalt). In spring or early fall use 90 lb/1,000 ft2 wood fiber in a hydroseeder slurry.

MU-2 High-maintenance vegetation and temporary seedings
Apply 90 lb/1,000 ft2 (4000 lb/acre) grain straw and tack with 0.1 gal/yd2 asphalt (11 gal/1,000 ft2).

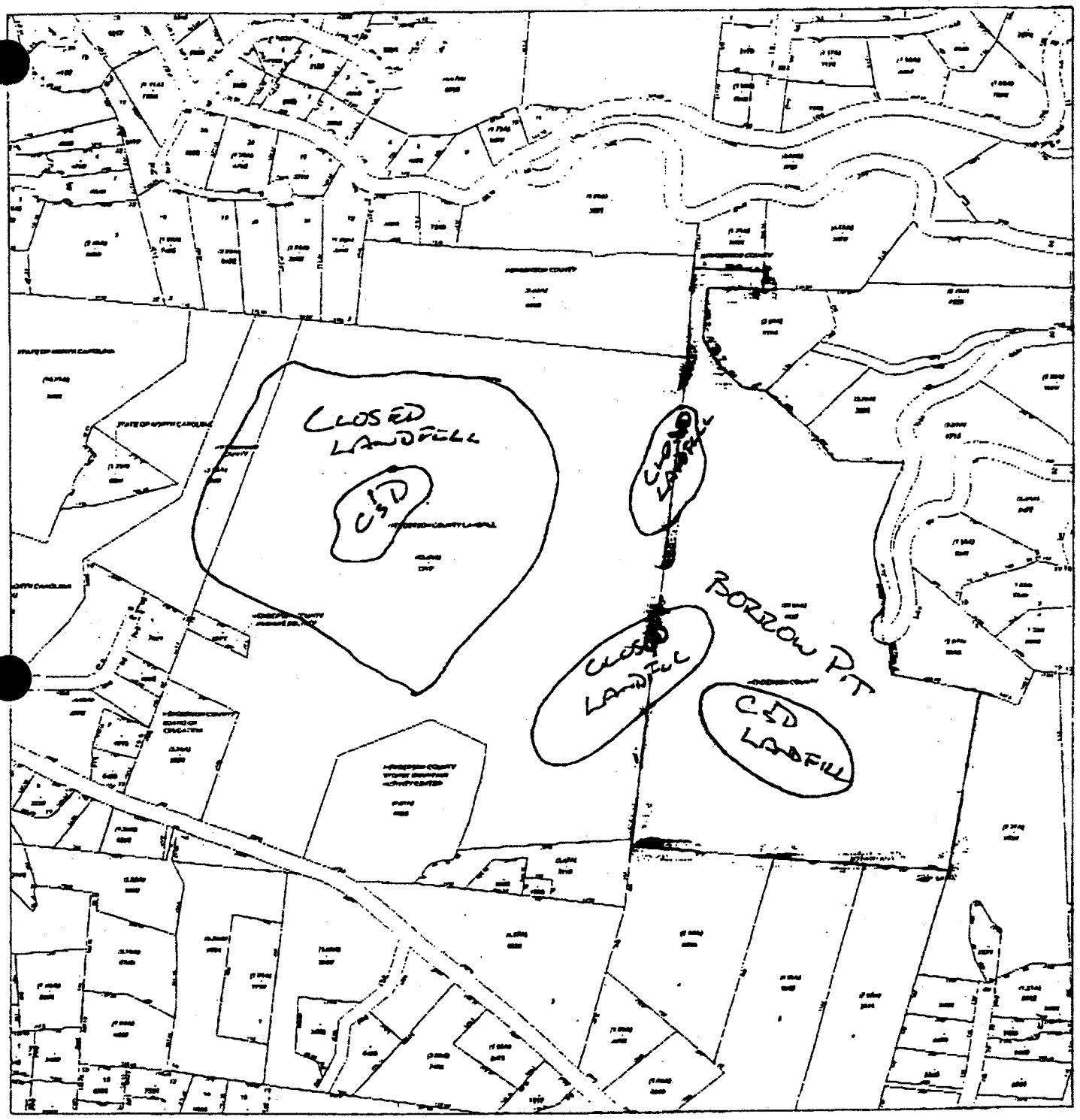
MU-3 Grass-lined channels
Install erosion control mat in the channel, line the entire channel up to the top of the bank and secure according to manufacturer's specifications. Install only when specified.

On channel shoulders, apply 100 lb/1,000 ft2 grain straw and anchor with 0.1 gal/yd2 (11 gal/1,000 ft2) asphalt.

Maintenance (MA)
MA-1 Refertilize in late winter or early spring the following year. Mow as desired.

MA-2 Fertilize with 40 lb/acre (1 lb/1,000 ft2) nitrogen in winter and again the following fall.

MA-3 Inspect and repair mulch and lining. Refertilize in late winter of the following year with 150 lb/acre 10-10-10 (3.5 lb/1,000 ft2) nitrogen in March. If cover is needed through the following summer, overseed with 50 lb/acre.



Henderson County MapView.CD Version 2.3

1 Inch = 528.6632 Feet.
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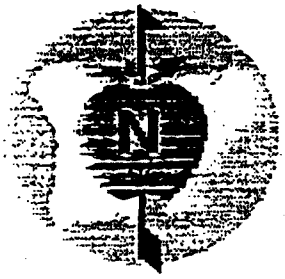

This map is prepared for the inventory of real property found within this jurisdiction, and is compiled from recorded deeds, plats, and other public records and data. Users of this map are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this map. The County and mapping company assume no legal responsibility for the information contained on this map.

17

STATE OF NORTH CAROLINA

Real Estate Excise Tax 116.00

Filed and recorded in the Register of Deeds Office for Henderson County, N. C. this 13 day of June, 19 85 at 10:50 o'clock A.M. in Book 660 at page 17.

Ruby A. Maxwell
Register of Deeds
By: Betty June Tulle, Deputy

116.00
Excise Tax

Recording Time, Book and Page

Tax Lot No. ..... Parcel Identifier No. .....

Verified by ..... County on the ..... day of ..... 19.....

by .....

Mail after recording to Don H. Garren, Attorney at Law, 422 N. Church Street, Hendersonville, NC 28739

This instrument was prepared by Jackson, Jackson & Pennington

Brief description for the Index

NORTH CAROLINA GENERAL WARRANTY DEED

THIS DEED made this 6th day of June, 19 85, by and between

GRANTOR	GRANTEE
PAUL BAYLESS and wife WILMA BAYLESS	HENDERSON COUNTY BOARD OF COMMISSIONERS County Building 244 2nd Ave. East Hendersonville, N. C. 28739

Enter in appropriate block for each party: name, address, and, if appropriate, character of entity, e.g. corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in the City of ..... Hendersonville Township, Henderson County, North Carolina and more particularly described as follows:

Please see Exhibit "A" attached hereto and fully incorporated herein by reference for a description of the property conveyed by this instrument.

N. C. Bar Assoc. Forms No. 3 © 1976, Revised © 1977 Printed by Permission of the N. C. Bar Assoc. - 1987

EXHIBIT "A"

BEGINNING at a planted stone, the northeastern corner of other property owned by the Grantee as shown on the plat entitled "County Home" recorded in Plat Cabinet C, Slide 21 (formerly Plat Book 5, Page 113), Henderson County Registry, all as shown on the plat of survey hereinafter referred to and running thence N 06-34-49 E, 247.98 feet to an iron pin in the southern margin of the Duke Power Company right of way recorded in Deed Book 441, at Page 589, Henderson County Registry; running thence the same call N 06-34-49 E, 129.37 feet to the northern margin of said right of way; running thence with the margin of said right of way S 87-45-55 E, 253.39 feet to an iron pin; running thence S 00-04-09W, 64.58 feet; running thence N 87-14-27 W, 192.32 feet; running thence S 07-06-51 W, 66.39 feet to an iron pin in the southern margin of the aforesaid Duke Power Company right of way; running thence S 07-06-51 W, 126.86 feet; running thence S 29-50-50 E, 113.35 feet; running thence S 46-35-50 E, 114.35 feet; running thence S 41-38-18 E, 8.29 feet to an iron pin; running thence S 76-19-04 E, 91.09 feet to an iron pin; running thence S 45-12-26 E, 199.01 feet to an iron pin; running thence S 31-27-12 E, 159.93 feet to an iron pin; running thence S 86-11-25 E, 245.31 feet; running thence S 06-23-40 W, 17.01 feet; running thence S 17-38-02 W, 41.40 feet; running thence S 24-17-19 W, 121.68 feet; running thence S 19-37-35 W, 81.10 feet; running thence along and with the arc of a curve to the left having a radius of 235.61 feet, a distance of 134.37 feet; running thence S 13-02-56 E, 133.68 feet; running thence along and with the arc of a curve to the right, having a radius of 65.80 feet, a distance of 57.11 feet; running thence S 36-41-07 W, 34.70 feet; running thence along and with the arc of a curve to the left having a radius of 65.74 feet, a distance of 153.64 feet; running thence S 03-19-00 E, 107.92 feet; running thence S 78-19-51 E, 320.46 feet to a rock; running thence S 65-16-48 E, 59.19 feet to an iron pin; running thence S 15-26-22 W, 691.37 feet to an iron pin; running thence N 84-11-51 W, 1148.78 feet to an iron pin in the line of property now or formerly owned by Roger Crisp; running thence along and with the line of Crisp and other property of the grantee N 06-34-49 E, 1832.10 feet to the Point and Place of BEGINNING containing 38.59 acres as shown on the plat of survey prepared by Laughter, Venezia and Associates, P.A., entitled "Henderson County Landfill," Job No. 85-181, dated April, 1985.

18

The property hereinabove described was acquired by Grantor by instrument recorded in .....

.....(a portion of) Deed Book 426, Page 517.....

A map showing the above described property is recorded in Plat Book ..... page.....

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever except for the exceptions hereinafter stated. Title to the property hereinabove described is subject to the following exceptions:

Subject to the right of way to Duke Power Company recorded in Deed Book 441, Page 589, Henderson County Registry.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officers and its seal to be hereunto affixed by authority of its Board of Directors, the day and year first above written.

.....
(Corporate Name)

By: .....

.....President

ATTEST:

.....Secretary (Corporate Seal)

USE BLACK INK ONLY

Paul Bayless (SEAL)
PAUL BAYLESS

Wilma Bayless (SEAL)
WILMA BAYLESS

.....(SEAL)

.....(SEAL)

SEAL-STAMP

NORTH CAROLINA, HENDERSON County.

I, a Notary Public of the County and State aforesaid, certify that PAUL BAYLESS and WILMA BAYLESS Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this 6 day of JUNE, 19 85.

My commission expires: 5/1/90 Cynthia J. Payne Notary Public

Use Black Ink

SEAL-STAMP

NORTH CAROLINA, ...County.

I, a Notary Public of the County and State aforesaid, certify that .....

personally came before me this day and acknowledged that ..... he is ..... Secretary of

..... a North Carolina corporation, and that by authority duly given and as the act of the corporation, the foregoing instrument was signed in its name by its ..... President, sealed with its corporate seal and attested by ..... as its ..... Secretary.

Witness my hand and official stamp or seal, this .....day of ....., 19.....

My commission expires ..... Notary Public

Use Black Ink

The foregoing Certificate(s) of Cynthia J. Payne

.....

.....

is/are certified to be correct. This instrument and this certificate are duly registered at the date and time and in the Book and Page shown on the first page hereof.

Ruby J. Maxwell REGISTER OF DEEDS FOR Henderson COUNTY

By Betty Jane Tuller Deputy/Assistant Register of Deeds

N.C. Bar Assoc. Form No. 3 © 1976, Revised © 1977 Jerry Williams Co., Inc. Box 181, Tarboro, N.C. 27886
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Section 1
Introduction

1.1 Purpose

The purpose of this Operations Plan is to provide Henderson County Solid Waste Management Facility staff with a manual that will serve as a guide for safe and efficient operation of the new Construction and Demolition (C&D) debris disposal facility that is proposed for construction. The Operations Plan has been prepared in accordance with the North Carolina Solid Waste Rule 15A NCAC 13B .0505, Operational Requirements for Sanitary Landfills, and therefore addresses the following issues:

- Plan and Permit Requirements;
- Spreading and Compacting Requirements;
- Cover Requirements;
- Erosion Control Requirements;
- Drainage Control Requirements;
- Vegetation Requirements;
- Water Protection Requirements;
- Access and Security Requirements;
- Sign Requirements;
- Safety Requirements;
- Waste Acceptance and Disposal Requirements; and,
- Miscellaneous Requirements.

1.2 Construction Plans

In accordance with 15A NCAC 13B .0505(1)(a) and (b), construction plans shall be approved and followed and specified monitoring and reporting requirements shall be met.

Section 2
Spreading and Compacting of Waste

2.1 Solid Waste Working Area

In accordance with 15A NCAC 13B .0505(2)(a), operators shall restrict solid waste within the C&D landfill to the smallest area feasible. The working face is defined as the area where waste is unloaded, inspected, spread, compacted, and ultimately covered with cover material. The working face shall be wide enough to prevent a backlog of vehicles waiting to unload and to allow adequate working space for landfill equipment. At a maximum, the width of the working face shall not exceed 100 feet.

2.2 Solid Waste Compaction

In accordance with 15A NCAC 13B .0505(2)(b), solid waste shall be compacted as densely as practical into cells. After solid waste is discharged from vehicles, it shall be inspected for unacceptable items and subsequently spread on the working face not steeper than four feet horizontal to one foot vertical in layers not to exceed two-foot thickness. All areas of each layer shall be compacted by at least four passes of a compactor in order to achieve a minimum waste density of approximately 1200 lb/cubic yard.

Section 3
Cover Material Requirements

3.1 Daily Cover

In accordance with 15A NCAC 13B .0505(3)(a), solid waste shall be covered after each day of operation with a compacted layer of at least six inches of suitable soil cover to control disease vectors, fires , odors, blowing litter, and scavenging. The daily cover must:

- be capable of covering solid waste after it is placed without change in its properties and without regard to weather;
- be capable of allowing loaded vehicles to successfully maneuver over it after placement;
- be noncombustible; and,
- not include rock fragments that are greater than six inches in diameter.

Henderson County will use only suitable soil as daily cover; alternative cover material will not be used.

3.2 Intermediate Cover

In accordance with 15A NCAC 13B .0505(3)(b), areas which will not have additional waste placed on them for 12 months or more, but where final termination of waste disposal has not occurred, shall be covered with a minimum of one foot of intermediate cover. The composition standards of the intermediate cover shall be the same as for daily cover in addition to being capable of supporting the germination of vegetative cover.

3.3 Final Cover

In accordance with 15A NCAC 13B .0505(3)(c), after final termination of disposal operations at the site or major part thereof, or upon revocation of a permit, the area shall be covered with at least two feet of suitable compacted earth.

Section 4
Erosion Control Requirements

4.1 Control of Sediment

In accordance with 15A NCAC 13B .0505(4)(a), adequate erosion control measures shall be practiced to prevent silt from leaving the site. Sediment laden runoff shall be diverted to one of two sedimentation ponds as shown on the Facility Plan.

4.2 On-site Erosion Control

Henderson County will continue maintaining the existing permitted erosion control measures for the duration of this project.

Section 5
Drainage Control Requirements

5.1 Surface Water Diverted from Operational Area

In accordance with 15A NCAC 13B .0505(5)(a), surface water shall be diverted from the operational area. Excessive surface water at the working face creates difficulties for maneuvering equipment and prevents the operator from achieving maximum compaction of the waste. To divert surface runoff away from the working face, temporary diversion berms shall be installed on the current lift, up-gradient from the working face and in other locations as dictated by the direction of grade. The area between the temporary berm and the working face should be limited to one acre to prevent excessive ponding. The soil cover in the areas beyond the diversion berms shall be uniformly graded and compacted to prevent the formation of erosion channels. In the event that channels do form, the cover shall be promptly repaired. During the formation of the initial lift of each disposal unit, additional measures shall be employed to divert surface water.

5.2 Surface Water Shall not be Impounded Over Waste

In accordance with 15A NCAC 13B .0505(5)(b) and (c), surface water shall not be impounded over or in waste. Completed areas shall be adequately sloped to allow surface water runoff in a controlled manner.

Section 6
Vegetation Requirements

6.1 Vegetative Cover

In accordance with 15A NCAC 13B .0505(6)(a), within six months after final termination of disposal operations at the site or a major part thereof or upon revocation of a permit, the area shall be stabilized with native grasses.

In accordance with 15A NCAC 13B .0505(6)(b), temporary seeding will be used as necessary to stabilize the site.

6.2 Seeding

Riprap, hayables, or other acceptable temporary methods of erosion control may be required until permanent cover is established. Areas where final grade has been reached can be stabilized by mulching until a vegetative cover is established. Soil mulching can be achieved using wood chips, straw, hay, asphalt emulsion, jute matting, and synthetic fibers. Mulches allow for greater water retention; reduce the amount of runoff; retain seeds, fertilizer, and lime in place; and, improve soil moisture and temperature conditions.

6.2.1 Temporary Seeding

Temporary seeding shall be applied as follows:

LATE WINTER & EARLY SPRING

Seeding Mixture	Rate (lb/acre)	Seeding Dates
Tall fescue Abruzzi Rye	120 25	November 1 - March 1

Soil Amendments	Rate (lb/acre)
Agricultural limestone Fertilizer (10-10-10) Mulch	2000 750 4000

SUMMER

Seeding Mixture	Rate (lb/acre)	Seeding Dates
Browntop millet	40	June 1 - September 1

Soil Amendments	Rate (lb/acre)
Agricultural limestone	2000
Fertilizer (10-10-10)	750
Mulch	4000

FALL

Seeding Mixture	Rate (lb/acre)	Seeding Dates
Sericea lespedeza	70	September 1 - March 1

Soil Amendments	Rate (lb/acre)
Agricultural limestone	2000
Fertilizer (10-10-10)	1000
Mulch	4000

6.2.2 Permanent Seeding

Permanent seeding shall be applied as follows:

Seeding Mixture	Rate (lb/acre)	Seeding Dates
Tall fescue	80	Early Spring
Pensacola Bahiagrass	50	Feb. 15 - Mar. 20
Sericea lespedeza	30	Fall
Kobe lespedeza	10	Sept. 1 - Sept. 30

Soil Amendments	Rate (lb/acre)
Agricultural limestone	3000-5000
Fertilizer (10-10-10)	1000
Mulch	4000

Section 7
Water Protection Requirements

7.1 Waste Shall Not Be Disposed of in Water

In accordance with 15A NCAC 13B .0505(7)(a)&(b), the separation distance of four feet between waste and water table shall be maintained, and solid waste shall not be disposed of in water.

7.2 Leachate Collection

Leachate collection is not required at C&D disposal facilities.

Section 8
Access and Security Requirements

8.1 Landfill Access and Security

In accordance with 15A NCAC 13B .0505(8)(a), the Henderson County C&D landfill must be adequately secured by means of gates, chains, berms, fences, and other security measures approved by the Division of Solid Waste Management, to prevent unauthorized entry.

All vehicles disposing of waste at the facility will enter and leave through the access control gate. All waste entering the landfill must be weighed at the scale where a full time Scale Operator verifies compliance with operation requirements. Unauthorized vehicle access to the site is to be prevented by a locked gate when the landfill is closed.

8.2 Attendant

In accordance with 15A NCAC 13B .0505(8)(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.

A full-time Scale Operator will be located in the scale house during operating hours. The Scale Operator will verify compliance with operation requirements.

8.3 Access Road

In accordance with 15A NCAC 13B .0505(8)(c), the access road to the site shall be of all-weather construction and maintained in good condition. Potholes, ruts, and debris on the road will receive immediate attention in order to avoid damage to vehicles. The access road will be regraded as necessary to maintain positive slope for adequate drainage.

8.4 Dust Control

In accordance with 15A NCAC 13B .0505(8)(d), dust control measures shall be implemented where necessary. Minimum dust control will include a water truck for wetting of dusty roads. Petroleum products shall not be used for dust control.

Section 9
Sign Requirements

9.1 Signs

In accordance with 15A NCAC 13B .0505(9)(a), a sign providing information on dumping procedures, the hours during which the site is open for public use, the permit number and other pertinent information shall be posted at the site entrance.

In accordance with 15A NCAC 13B .0505(9)(b), signs shall be clearly posted stating that no hazardous, municipal, yard waste, or liquid waste can be received.

In accordance with 15A NCAC 13B .0505(9)(c), traffic signs or markers shall be provided as necessary to promote an orderly traffic pattern to and from the discharge area to maintain efficient operating conditions.

Section 10
Safety Requirements

10.1 Open Burning

In accordance with 15A NCAC 13B .0505(10)(a), open burning of solid waste is prohibited.

10.2 Fires

In accordance with 15A NCAC 13B .0505(10)(b), 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.

In accordance with 15A NCAC 13B .0505(10)(c), all fires that occur shall be reported to the Division of Solid Waste Management within 24 hours and a written notification shall be submitted within 15 days.

10.3 Waste Removal

In accordance with 15A NCAC 13 B .0505(10)(d), the removal of solid waste from the landfill is prohibited unless the owner/operator approves the removal and it is not performed on the working face.

10.4 Barrel and Drum Disposal

In accordance with 15A NCAC 13 B .0505(10)(e), 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.

Section 11
Waste Acceptance and Disposal Requirements

11.1 Waste Definitions

Asbestos Waste - any waste material that is determined to contain asbestos.

Construction/Demolition Waste - solid waste resulting solely from construction, remodeling, repairs or demolition of buildings, structures, or pavement but does not include inert, land-clearing or yard waste.

Hazardous Waste - any solid waste that is defined as hazardous in 15A NCAC 13A 261.3 and that is not excluded from the regulation as a hazardous waste from conditionally exempt small quantity generators as defined within 15A NCAC 13A 261.5.

Inert Debris - any solid waste which consists solely of material that is virtually inert, such as brick, concrete, rock, and uncontaminated soil.

Land Clearing Debris - solid waste which is generated solely from land clearing activities such as stumps, trees, limbs, brush, grass, and other naturally occurring vegetative material.

Liquid Waste - any waste material that is determined to contain free liquid by Method 9095 (Paint Filter Test).

Treatment or Processing Waste - any waste that is residual solid from a wastewater treatment or pretreatment facility.

11.2 Acceptable Waste

In accordance with 15A NCAC 13B .0505(11)(a), the landfill shall only accept those solid wastes which it is permitted to receive. The landfill operator shall notify the Division of Solid Waste Management within 24 hours of attempted disposal of any waste the landfill is not permitted to receive, including waste from outside the area the landfill is permitted to serve.

In accordance with the North Carolina Solid Waste Management Rules, the Henderson County C&D Landfill is seeking to be permitted to dispose of the following using normal operating procedures:

Construction /Demolition Waste - This waste is to be disposed in accordance with State and Federal regulations and permit conditions.

Section 12
Miscellaneous Requirements

12.1 Vector Control

In accordance with 15A NCAC 13B .0505(12)(a), effective vector control measures shall be applied to control flies, rodents, and other insects or vermin when necessary.

The materials that are to be disposed of in the C&D facility will be non-petrucible and, therefore, unlikely to attract nuisance vectors. Therefore, it is not anticipated that additional vector control, other than daily cover will be required.

12.2 Controlling Wind Blown Material

In accordance with 15A NCAC 13B .0505(12)(b), appropriate methods such as fencing and diking shall be provided within the area to confine solid waste subject to be blown by the wind. At the conclusion of each day of operation, all windblown material resulting from the operation shall be collected and returned to the area by the owner or operator.

The material to be disposed of in the C&D facility is unlikely to be of the size and weight to be windblown; therefore, it is not anticipated that means of controlling wind blown material will be required. However, should blowing litter become a problem, portable litter screens shall be placed downwind of the working face as needed. The screens shall be kept as close to the working face as possible without unduly interfering with landfill operations. The screens shall be moved promptly when required by change in wind direction or progress of the fill.

SECTION 3
WATER QUALITY MONITORING PLAN

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Section 1
Introduction

1.1 Purpose

The purpose of this Water Quality Monitoring Plan is to address the requirements in 15A NCAC 13B Rule .0504(1)(g)(iv), Rule .0504(2)(a)(v), Rule .0601 and .0602 and to present a plan for groundwater and surface water monitoring for the Henderson County C&D Landfill. The Water Quality Monitoring Plan includes information on the proposed groundwater monitoring network, surface water monitoring plan, sampling and analysis requirements. The groundwater monitoring network was designed based on information obtained from recent and previous subsurface investigations and a review of literature pertaining to regional geology and groundwater resources. A detailed discussion of the geological and hydrogeological conditions at the site is presented in the Site Plan Application (CDM 1999, 2000).

1.2 Scope

The Water Quality Monitoring Plan includes the following elements in accordance with Rules .0504 and .0600 of the North Carolina Administrative Code:

- Design and installation of a groundwater monitoring system, based on site-specific information, to yield groundwater samples from the uppermost aquifer that represent the quality of the background groundwater that has not been affected by landfill activities or other man-made activities and to monitor for, if any, landfill releases of contaminants.
- Design of surface water monitoring system, based on site-specific information, to yield surface water samples from the drainages from the site, if necessary.
- Monitoring wells designed and constructed in accordance with the applicable North Carolina Well Construction Standards as found in 15A NCAC 2C.
- A Sampling and Analysis Plan that includes procedures and techniques for sample collection, sample preservation and shipment, analytical procedures, chain-of-custody procedures, and quality assurance and quality control.

Section 2
Geologic and Hydrogeologic Setting

2.1 Introduction

The landfill property encompasses an area of 120 acres located in Henderson County, about one mile west-northwest of the town of Hendersonville, North Carolina. The area is characterized by steep slopes into incised minor drainages and into narrow secondary drainages between mountains and foothills. Elevations range from 2100 feet msl up to more than 2500 feet msl. The proposed C&D landfill property is in a former borrow area of bare ground surrounded by reforested coniferous forest with thickets and slopes with planted tall grasses.

The average annual precipitation in Hendersonville, North Carolina is 56.06 inches. Average monthly precipitation ranges from a low of 3.98 inches in October to a high of 6.03 inches in August.

2.2 Geology

The Site is located within the western Inner Piedmont at the margin of the Piedmont Plateau and Blue Ridge Physiographic Provinces. In general the Inner Piedmont rocks in the vicinity of the proposed C&D landfill consist of Hendersonville augen gneiss with reported slightly to moderately metamorphosed intrusive rocks with granitoid enriched zones.

The area has been mapped by the North Carolina Geological Survey (NCGS 1995). This mapping shows that the Site is entirely underlain by Henderson gneiss. Outcrop of bedrock on-site results from erosion and extensive borrow of saprolite soil material from a previously deeply weathered profile.

Structural Geology

The Brevard fault, located approximately 25 miles to the west, is the most significant structural feature in the vicinity of the Henderson County site. The Tumblebug Creek thrust, located approximately 3 miles north, is also significant regionally, however, no locally significant faulting is known to exist. A site fracture trace analysis showed linament orientations of near vertical and a site dominant fracture direction of N60°W.

Drilling Observations

Three lithologic distinctions have been made at the proposed C&D Landfill site based on observations from the subsurface investigations. These are:

- Silty Sand Saprolite
- Partially Weathered Rock (PWR)
- Henderson Augen Gneiss bedrock

2.3 Hydrogeology

Groundwater within the inner piedmont generally occurs in the pore spaces of the soil materials, within the saprolite and/or within the pore spaces and relic fractures of the PWR and/or within bedrock fractures. The groundwater system is recharged by infiltrated precipitation falling on interstream (upland) areas. A portion of this water moves through the soil materials and is discharged to nearby springs and streams in adjacent valleys. Another portion migrates through the soil materials and into saprolite and fractures within the PWR in the saturated zone. This groundwater continues to move through the saprolite, partially weathered rock and fractures within bedrock, depending upon the degree of interconnection, to deeper adjacent valleys where it is discharged.

Groundwater production wells in Henderson County are reported to have a potential average yield of 17 to 20 gallons per minute for 6-inch diameter wells that are an average of 154 ft deep into metamorphosed materials (Daniel, C.C, III 1987).

Based on data from the six wells of the existing groundwater monitoring system and existing piezometric data, the major groundwater recharge feature for the Henderson County (closed) MSW landfill complex is the topographically high area located on the northeastern portion of the site and immediately northeast adjacent to that site. The groundwater discharge features that influence groundwater flow direction on that site are several tributary streams flowing off the mountain into Mill Pond Creek. Groundwater level measurements collected semi-annually from 1994 to 2000 indicate that the general groundwater flow direction on that facility is to the southwest, toward Mill Pond Creek. However, the presence of the tributary streams influence localized groundwater flow.

Section 3
Proposed Monitoring Network for Groundwater and Surface Water

3.1 Introduction

This section presents the proposed groundwater and surface water monitoring network for the new C&D facility area. Section 3.2 presents proposed monitoring well locations, Section 3.3 discusses monitoring well installation and construction specifications, Section 3.4 discusses reporting, and Section 3.5 is the surface water quality monitoring plan.

3.2 Monitoring Well Locations

The SWS regulations require that upgradient monitoring well(s) be located such that groundwater samples collected from the uppermost aquifer provide an indication of background groundwater quality. Downgradient wells must be located in similar geologic units as that of upgradient wells so that groundwater quality data can be compared. Proposed new downgradient monitoring well locations for the C&D are shown on Sheet 3-1. Table 3-1 provides additional details on the proposed monitoring well locations and estimated completion depths.

The existing piezometer, P-1s, will be converted into a monitoring well and will serve as the background well for the new facility. The screened interval is located in the gray to brown silty sand. P-1s will be renamed as MW-10. Existing piezometer P-1d will be left in place in the event that it needs to be sampled.

A new monitoring well, MW-11, will be located west of the landfill, downgradient of the sump area. This well will be completed in saprolite material. Groundwater is anticipated to be encountered at 25 to 30 feet below land surface (bls). Subsurface data (P-11) in the area did not encounter bedrock and was advanced to 40 feet below land surface (bls).

Existing piezometer P-3 will be converted to monitoring well MW-12. This well will be located downgradient of the western portion of the landfill and will be screened in a combination of saprolite and PWR. Bedrock was not encountered in this area. P-3 was advanced to a depth of 60 ft bls. Groundwater is typically encountered at 50 to 55 feet bls.

Existing piezometer P-14 will be converted to monitoring well MW-13. This well will be located downgradient of the central portion of the landfill and will be screened in bedrock. Bedrock was encountered at 51 feet bls. Groundwater is typically encountered at 55 feet bls.

The SWS has requested that P-16/16d and P-15/15d remain in place, so that they can be used as monitoring wells in the future if needed. Both well locations are within the 250 ft compliance boundary.

MW-12 is the western-most monitoring well location required, due to the groundwater flow directions indicated by the piezometric contours shown on Sheet 3-1. Sampling results from existing MW-9 and proposed MW-12 (P-3) should allow for separate monitoring of the existing inactive TVA waste cell and the proposed new C&D landfill. Analytical results from samples collected from P-3 and P-11 indicate that there is no hydraulic or contaminant cross-flow from the existing waste cell to the proposed new C&D landfill site. No volatile organic compounds were detected in either sample.

Since the saprolite, the partially weathered rock and the bedrock essentially behave as a single aquifer system, a series of groundwater monitoring wells installed in the uppermost aquifer should be effective in providing detection of a release from the facility. The saturated zone should be of sufficient thickness to account for seasonal fluctuations in the water table. Proper placement of the well screen will allow a sufficient quantity of water to be available for sampling throughout the year, in both wet and dry years. The top of the screen interval will be placed at the estimated seasonal high water table, as discussed in the Hydrogeologic Investigation Report (Section 4) and Facility Design Section of this Construction Application, unless this placement would cause the water table, at the time of construction, to be less than seven feet above the bottom of the well screen.

3.3 Monitor Well Installation and Construction

The monitoring wells will be constructed in accordance with standard industry procedures and will meet the requirements of 15A NCAC 2C. The monitoring wells will be installed into saprolite and PWR by advancing the borehole through the water table using hollow-stem augering techniques. Soil samples will be collected at five-foot intervals with a split spoon sampler in accordance with ASTM D-1586. Soil lithology will be described in the field by an onsite geologist to develop a borehole log. Hollow stem augering will be terminated at a depth 10 ft below the first apparent water bearing zone or 15 ft below the estimated seasonal high groundwater level, which ever is deeper. Should it become necessary to advance a borehole into bedrock, air rotary drilling methods will be used. All of the proposed monitoring well locations, with the exception of MW-11 are existing piezometers which will be converted to monitoring wells by addition of steel protective covers and 2 ft by 2 ft concrete pads.

The monitoring wells will be constructed using 2-inch ID PVC well casing with threaded flush joints. The shallow monitoring wells will be constructed with 10 to 15 feet of 0.010-inch slot screen at the end of the casing string placed so that the top is at the seasonal high water table or it brackets the water table at time of construction,

allowing 5 to 7 feet of water in the bottom of the well screen at the seasonal low groundwater table.

The PVC casing string will extend approximately two feet above ground surface. A sand pack will be placed around the screen interval to a maximum of two feet above the top of the screen. A two-foot thick bentonite seal consisting of hydrated bentonite pellets will be placed on top of the sand to hydraulically seal the completion interval. The remainder of the annulus will be sealed with a bentonite-Portland cement grout to ground surface.

A protective outer casing with a lockable cap will be placed over the PVC casing and into the grout, extending 2.5 to 3 feet below ground surface. Figure 3-1 shows the construction details of the proposed monitoring wells.

Following completion, the monitor well will be developed to remove the residual effects of drilling. The well will be developed using a combination of surging and overpumping. All drilling and downhole equipment will be decontaminated by steam cleaning between borings. All well casing will also be decontaminated by steam cleaning. Well development equipment will be decontaminated by washing in a non-phosphate detergent solution followed by a potable water rinse, then a distilled water rinse, and allowed to air dry.

The horizontal location of all new monitor wells will be surveyed in State Plane Coordinates by a Registered Land Surveyor to the nearest 0.1 foot. The vertical control or elevation of the top of PVC casing (the well measuring point) will be surveyed to the nearest 0.01 foot accuracy to mean sea level (msl). The height of the well measuring point above ground surface will be measured. Bore logs and well completion diagrams for P-1s (MW-10), P-3 (MW-12) and P-14 (MW-13), in addition to P-16/16d and P-15/15d are provided in Appendix A of the Geological and Hydrogeological Study in the Site Application (CDM 1999, 2001).

3.4 Reporting

Following installation and development of the newly constructed monitoring wells, a record of well installation, boring logs, and initial sampling results will be filed with the SWS within 30 days of installation.

3.5 Surface Water Quality Monitoring Plan

A new surface water sampling location, SW-2, will be incorporated into monitoring network. SW-2 will be located approximately 90 ft downgradient, south of the proposed C&D Landfill in the intermittent stream at approximately topographic contour 2320 ft msl. This stream is reported by Henderson County personnel to be intermittent, flowing only in the aftermath of precipitation events. Therefore, flow may not be available for sampling during every sampling event.

Table 3-1

Water Quality Monitoring Plan Wells
Henderson County C&D Landfill

Well	Drilling Method	Screen Interval Depth (feet)*		Screen Interval Elevation (ft msl) *		Rationale
		top	bottom	top	bottom	
MW-10	HSA	35	45	2367.63	2357.63	Background Well in saprolite/PWR (convert P-1s)
MW-11	HSA	25**	35**	2263**	2253**	Down-gradient of western sump in saprolite/PWR
MW-12	HSA	50	60	2244.97	2234.97	Down-gradient of western portion of landfill in saprolite/PWR (convert P-3)
MW-13	HSA	77	92	2221.16	2206.16	Down-gradient of central portion of landfill in bedrock (convert P-14)

* The screen interval depths and elevations are actual. Construction diagrams for each well are provided.
Top of screen will be placed at seasonal high water table level or deeper, to provide a minimum of five feet of water column within the screen at the time of construction.

** The screen interval depths and elevations are anticipated.

Drawing at End of File

Section 4
Sampling and Analysis Plan

4.1 Introduction

To demonstrate a plan to comply with Rule .0601 and the Sampling and Analysis Requirements (for) Construction and Demolition Landfills memorandum dated January 1995, Henderson County, the owner/operator is providing as part of the groundwater monitoring program, a groundwater and surface water sampling and analysis (S&A) plan. The S&A plan is designed to provide accurate results of groundwater quality at the upgradient and downgradient sampling locations. The S&A plan will address the following subjects:

- Groundwater sample collection
- Sample preservation and shipment
- Analytical procedures
- Chain-of-custody
- Quality assurance/quality control (QA/QC)

4.2 Groundwater and Surface Water Sample Collection

Upon completion of well construction, development, and a well stabilization period, the sampling plan will be instituted. Groundwater samples will be collected from each of the monitoring wells and from the surface water sampling locations. The proposed frequency of sampling will include one sample to be collected from each monitoring well prior to the facility receiving waste. These samples will comprise the baseline sampling. Groundwater samples from each of the monitoring wells will be collected on a semi-annual basis. Surface water samples will also be collected on a semi-annual basis.

Static Water Level Measurements

Static water level elevations will be measured prior to any purging or sampling activities. Static water level data will be used to monitor changes in site hydrogeologic conditions. The following measurements will be recorded in a dedicated field book prior to sample collection:

- Height of the well measuring point above ground surface
- Depth of water in the well from the TOC measuring point (to the nearest 0.01 foot)
- Total depth of the well
- Height of the water column in the well casing

An electronic water level indicator will be used to accurately measure water elevations to within 0.01 foot within the same day in as short a period of time as possible. Each well will have a permanent, easily identified reference point from which all water level measurements will be taken. The reference point will be marked and the elevation surveyed by a North Carolina Registered Land Surveyor.

Monitoring Well Evacuation

Following measurement of the static water level, the wells will then be purged of all stagnant water. The stagnant water, which is not representative of true aquifer conditions, will be removed to ensure that fresh formation water can be sampled. A minimum of three well casing volumes will be removed prior to sampling the well. The well volume for 2-inch diameter wells will be calculated using the following equation: one well volume in gallons equals the height of the water column (in feet) times 0.1632 (slightly less than 0.5 gallons per foot water for 3 casing volumes). During the well purging process, field measurements (pH, temperature, and specific conductance) will be collected at regular intervals, and reported in a tabular format. The well will be purged until field measurements stabilize within approximately 10 percent between subsequent readings or until the well is dry. Stabilization of these measurements will indicate that fresh formation water is present in the well. Field measurements of pH, temperature, and conductivity will be obtained by use of a Horiba Water Quality Meter or equivalent. If the well is purged to dryness, the samples will be collected after a sufficient volume of water has entered the well to allow collection of the sample. Wells will be purged using a decontaminated teflon bailer with new nylon rope or an acceptable pumping device approved by the SWS. Field measurements collected during purging activities will be recorded in the field logbook.

Sample Collection

After purging activities are complete, groundwater samples will be collected for laboratory analysis. The wells will be sampled using laboratory decontaminated teflon bailers equipped with new nylon rope. Bailers will be used for one well only. Field decontamination of bailers will not be permitted. If disposable bailers are used, they will be constructed of teflon and certification of decontamination will be provided. Disposable bailers will only be used if laboratory decontaminated standard teflon bailers or dedicated sampling systems are not available. The bailers will be lowered slowly into the well to minimize sample agitation. Sample water will be placed directly into sample bottles provided by the analytical laboratory, using the following method:

1. Retrieve bailer and slowly transfer sample water to the appropriate sample container. The bailer should not be allowed to touch the sample container.

2. The sample container for the volatile organic compounds should be filled first, leaving no headspace or air bubbles. The container should then be tightly sealed.

The sample container may have preservative added by the laboratory or preservative may be added in the field before closing the sample container.

3. The sample container for the metals should then be filled. This container should be filled to the bottle shoulder and have head space to allow for preservative addition.

Surface water samples will be obtained from areas of minimal turbulence and aeration. The following procedure will be implemented regarding sampling of surface waters:

1. Hold the bottle near the bottom with one hand, and with the other, remove the cap.

2. Push the sample container slowly into the water and tilt up towards the current to fill. A depth of about six inches is satisfactory. Avoid breaching the surface while filling the container.

3. The container should be moved slowly, in a lateral direction, if there is little current movement.

4. If the stream depths are too shallow to allow submersion of the sample container, a pool may be scooped out of the channel bottom and allowed to clear prior to sampling.

5. Lift the container from the water and place the uncontaminated cap on the container.

The wells and surface water stations will be sampled in the order of potential for increasing contamination levels beginning with the upgradient (background) sampling locations. The individual water samples will be collected, bottled and preserved (as necessary) in the order of parameter volatility. The collection order for the samples will be as follows:

- Volatile organic compounds (VOCs)

- Total metals

The samples will be transferred from the sampling equipment directly into a prepared sample container provided by the laboratory. Field filtering of samples is not permitted. There will be a specific size and type of container provided for each constituent to be analyzed. For VOC analysis, the containers provided will be 40-ml glass vials. For metals analysis, the samples will be collected in 0.5-liter HDPE bottles. Extra containers will be provided in case of accidental breakage. All field personnel will wear protective latex disposable gloves in order to prevent extrinsic contamination from clothing, body oils, dirt, and other various contaminants. Sample

documentation requirements to ensure sample integrity, will include sample locations, date and time of sample collection, proper analysis, and preservative (if applicable) will also be provided.

Decontamination Procedures
All sampling and purging equipment that will come in contact with the well casing and water will be decontaminated per specifications in the North Carolina Water Quality Guidance Document for Solid Waste Facilities. All sampling equipment will be laboratory cleaned. The following decontamination procedures will be used for teflon sampling equipment as outlined in the North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities:

1. Clean item with tap water and phosphate-free laboratory detergent (Liquinox or equivalent), using a brush if necessary to remove particulate matter and surface films.

2. Rinse thoroughly with tap water.

3. Rinse with 10% nitric or 10% hydrochloric acid.

4. Rinse thoroughly with deionized or distilled water and allow to air dry.

5. Rinse thoroughly with high grade isopropanol and allow to air dry

6. Rinse with deionized or distilled water and allow to air dry.

7. Wrap with aluminum foil, if necessary, to prevent contamination of equipment during storage or transport.

4.3 Sample Preservation and Shipment

In order to ensure sample integrity, preservation and shipment procedures will be carefully monitored. Generally, ice and chemical additives will be used as sample preservatives, as recommended by the commercial laboratory. For VOC analysis, hydrochloric acid will be used as the preservation method as well as maintaining the samples at a temperature of 4°C. Nitric acid will be used as the preservative for samples needing metals analysis. If the analytical laboratory is located some distance from the site, samples shall be shipped via a 24-hour delivery service to ensure holding times are not exceeded. Shipment of samples will be coordinated with the laboratory. Proper storage and transport conditions must be maintained in order to preserve the integrity of the sample. Once taken, samples will be placed on ice and cooled to a temperature of 4°C. Samples are to be packed in coolers so as to inhibit breakage or accidental spills. Custody seals will be placed on the outside of the cooler, in a manner to detect tampering of the samples. The laboratory shall immediately notify the owner/operator of any samples that arrive with custody seals broken.

4.4 Analytical Procedures

The samples taken from each well and from the surface water sampling locations will be analyzed for the constituents listed in the latest version of the North Carolina Appendix I list. The analytical procedures for the indicated parameters will be conducted using the following methods:

Analysis	EPA Method Number
Volatile organic compounds	8260
Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc	6010

4.5 Chain-of-Custody

It is imperative that an accurate record of sample collection, transport, analysis, and disposal be maintained and documented. Therefore, chain-of-custody procedures will be instituted and followed throughout the sampling program. It is necessary to establish documentation to trace sample possession from the time of collection until disposal. The chain-of-custody program shall include the following requirements:

- A chain-of-custody record that notes the date and time of collection as well as sampling personnel shall accompany samples.
- All samples shall be properly labeled to prevent misidentification of samples.
- Field notes shall be included to provide pertinent information about each sample.
- A sample analysis sheet shall accompany all samples to the laboratory.
- Sample custody seals shall be used to indicate any tampering of samples.
- All records pertaining to the shipment of a sample shall be retained (freight bills, post office receipts, and bills of lading).

The laboratory shall not accept samples for analysis without a correctly prepared chain-of-custody form. The laboratory shall be responsible for maintaining chain-of-custody of the sample(s) from time of receipt to disposal. The chain-of-custody form shall be signed by each individual who possesses the samples.

To prevent sample misidentification, a label will be affixed to each sample container in a manner as to prevent the label from becoming dislodged during transport which will contain the following information:

- Sample identification number.

- Name and signature of sample collector
- Date and time of collection
- Place of collection
- Parameters requested

In addition the container itself should be labeled with the sample identification number, at a minimum, to allow for identification should the label fall off.

4.6 Quality Assurance/Quality Control

The reliability and validity of the field and analytical laboratory data will be monitored as part of the QA/QC program used in the laboratory. Sample blanks will be collected to check sampling protocol and to account for any changes that occur after sampling. The QA/QC program will stipulate the use of standards and laboratory blanks for identification of matrix interferences.

Equipment Rinsate Blanks
To evaluate the effectiveness of the decontamination procedures, equipment rinsate blanks will be collected. The sample will be collected by passing distilled water through the sampling equipment after decontamination has been completed. Equipment blanks will be collected at a minimum of one per day of groundwater sampling activities.

Trip/Travel Blanks
A trip/ travel blank shall be prepared to account for any sample contamination that may occur during transport to and from the site. The sample will be prepared in the laboratory with deionized or distilled water and shall accompany the sample shipping container to the field. The trip/travel blank shall remain unopened until receipt by the lab for analysis. One trip blank will be submitted per sampling event.

Section 5
References

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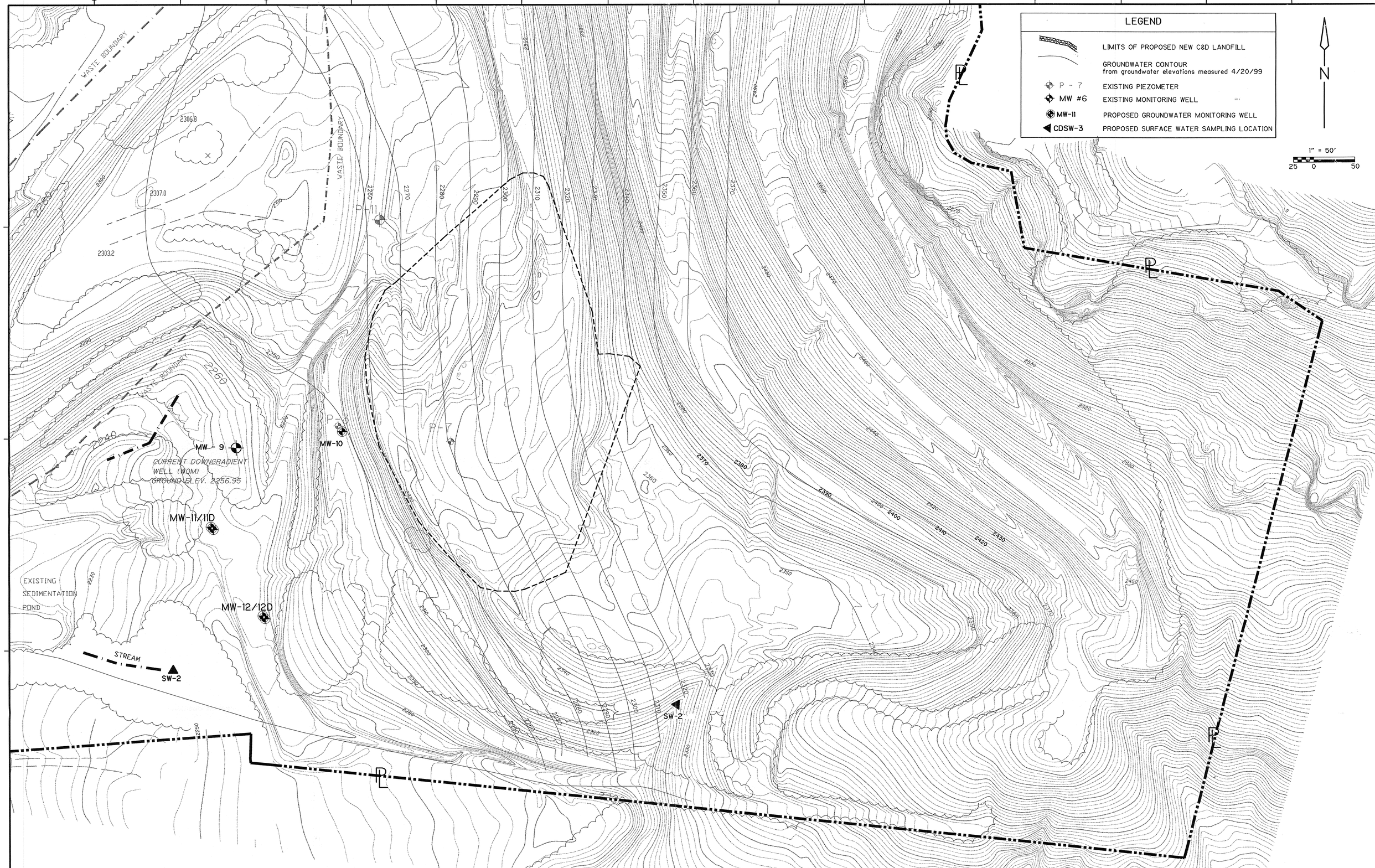
NCGS (North Carolina Geological Survey) 1985. Geologic Map of North Carolina.

NCGS 1995. Studies of Inner Piedmont Geology with a focus on the Columbus Promontory.



REV. NO.	DATE	DRWN	CHKD	REMARKS
1	3/01	WMB	MC	REVISED LIMITS OF WASTE

DESIGNED BY: M. COLONE
DRAWN BY:
SHEET CHK'D BY: T. GRANT
CROSS CHK'D BY:
APPROVED BY:
DATE: FEBRUARY 2001

CDM Camp Dresser & McKee
environmental services
offices worldwide
5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
Tel: (919) 787-5620 Fax: (919) 781-5730

HENDERSON COUNTY
NORTH CAROLINA

CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL
HENDERSON COUNTY SOLID WASTE MANAGEMENT

WATER QUALITY MONITORING PLAN

PROJECT NO. 25625
FILE NAME: SHEET1.DWG

SHEET NO.
3-1

LEGEND

- PROPERTY LINE
- ACTIVE C&D LANDFILL BOUNDARY
- WASTE BOUNDARY
- EXISTING INTERMEDIATE CONTOURS
- EXISTING INDEX CONTOURS
- EXISTING STREAMS
- TREE LINE
- FENCE LINE
- PROPOSED C&D LANDFILL LIMITS

NOTES:

1. C&D AREA IS WITHIN THE LIMITS OF EXISTING BORROW AREA THEREFORE NO FURTHER SEDIMENTATION AND EROSION CONTROL FEATURES ARE NECESSARY. ALL STORMWATER WILL BE DIVERTED TO EXISTING SEDIMENT PONDS WHICH ARE ADEQUATELY SIZED TO HANDLE STORMWATER FLOW.
2. DATE OF TOPOGRAPHIC SURVEY: 2/26/98.

NORTH CAROLINA PROFESSIONAL SEAL 16824 ENGINEER THOMAS M. YANOSCHAK

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	3/01	WMB	TY	REVISED LIMITS OF WASTE

DESIGNED BY: M. BRINCHEK
DRAWN BY: JSK/WMB
SHEET CHK'D BY: T. GRANT
CROSS CHK'D BY: T. YANOSCHAK
APPROVED BY:
DATE: FEBRUARY 2001

CDM Camp Dresser & McKee
consulting engineering construction operations
5400 Glenwood Avenue, Suite 300 Raleigh, North Carolina 27612
Tel: (919) 787-5620 Fax: (919) 781-5730

HENDERSON COUNTY
NORTH CAROLINA

HENDERSON COUNTY SOLID WASTE MANAGEMENT FACILITY CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL

EXISTING CONDITIONS AS OF 2/26/98

PROJECT NO. 1002-2562
FILE NAME: C-1.dwg

SHEET NO.
C-1

EXISTING ACCESS ROAD

STORMWATER DIVERSION BERM

P - 11
TOC ELEV 2296.52
BR ELEV 2255

DRAINAGE FOR PHASE I

EXISTING 24" DIA CONCRETE CULVERT

RIP RAP LINED CHANNEL TO HANDLE PHASE I STORMWATER

TIE INTO EXISTING CHANNEL

P - 3
TOC ELEV 2300.09
BR ELEV 2238

P - 7
TOC ELEV 2333.11
BR ELEV 2300

PHASE 1

P - 1D
TOC ELEV 2404.95
BR ELEV 2356

P - 1S
TOC ELEV 2404.55
BR ELEV 2356

200' BUFFER

EXISTING SEDIMENTATION BASIN

P - 9
TOC ELEV 2354.65
BR ELEV 2337

P - 2
TOC ELEV 2344.35
BR ELEV 2328

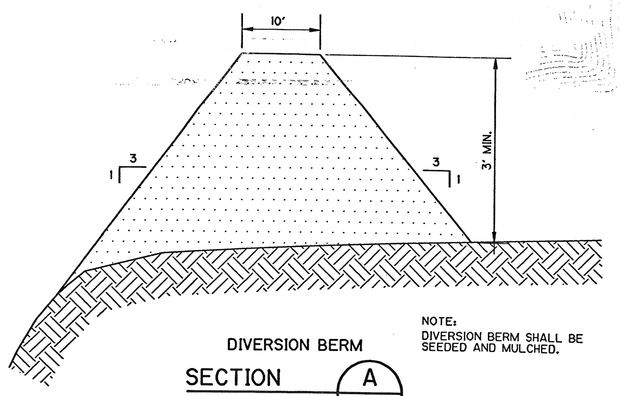
200'

P - 4D
TOC ELEV 2300.09
BR ELEV 2256

P - 4S
TOC ELEV 2301.95
BR ELEV 2256

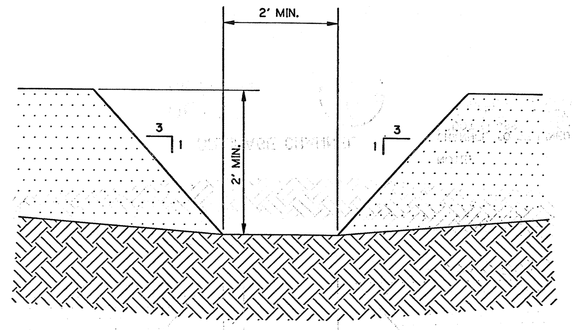
N

1" = 50'
25 0 50



DIVERSION BERM
SECTION A
NOT TO SCALE

NOTE:
DIVERSION BERM SHALL BE SEEDED AND MULCHED.



DRAINAGE CHANNEL
DETAIL A
NOT TO SCALE

NOTE:
CHANNEL TO BE LINED WITH NCDOT CLASS I RIP RAP WITH UNDERLYING 10 OZ/SY NONWOVEN GEOTEXTILE.

LEGEND

- EXISTING INTERMEDIATE CONTOURS
- EXISTING INDEX CONTOURS
- PROPOSED INTERMEDIATE CONTOURS
- PROPOSED INDEX CONTOURS
- PROPOSED ACCESS ROAD
- DIVERSION BERM
- PROPERTY LINE
- BUFFER LINE
- LIMITS OF WASTE
- DRAINAGE
- P - 9 PEIZOMETER LOCATION

NOTE: C&D AREA IS WITHIN THE LIMITS OF EXISTING BORROW AREA AND THEREFORE NO FURTHER SEDIMENTATION AND EROSION CONTROL FEATURES ARE NECESSARY. ALL STORMWATER WILL BE DIVERTED TO EXISTING SEDIMENT PONDS WHICH ARE SIZED TO HANDLE STORMWATER FLOW.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16697 ZACHARY M. YANOSCHAK

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	3/01	WMB	TY	REVISED LIMITS OF WASTE

DESIGNED BY: M. BRINCHEK
DRAWN BY: JSK/WMB
SHEET CHK'D BY: T. GRANT
CROSS CHK'D BY: T. YANOSCHAK
APPROVED BY:
DATE: FEBRUARY 2001

CDM Camp Dresser & McKee
consulting engineering construction operations
5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
Tel: (919) 787-5620 Fax: (919) 781-5730

HENDERSON COUNTY
NORTH CAROLINA

HENDERSON COUNTY SOLID WASTE MANAGEMENT FACILITY
CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL

GRADING PLAN

PROJECT NO. 1002-25625
FILE NAME: C-2.dwg

SHEET NO.
C-2

EXISTING ACCESS ROAD

STORMWATER DIVERSION BERM

P - 11
TOC ELEV 2296.52
BR ELEV 2255

EXISTING 24" DIA CONCRETE CULVERT

RIP RAP LINED CHANNEL TO HANDLE PHASE II STORMWATER

P - 3
TOC ELEV 2300.09
BR ELEV 2238

P - 7
TOC ELEV 2363.11
BR ELEV 2300

PHASE 1

4:1 SLOPE

P - 1D
TOC ELEV 2404.95
BR ELEV 2356

P - 1S
TOC ELEV 2404.55
BR ELEV 2356

200' BUFFER

PHASE 2

EXISTING SEDIMENTATION BASIN

P - 9
TOC ELEV 2354.65
BR ELEV 2337

P - 2
TOC ELEV 2344.35
BR ELEV 2328

200'

P - 4D
TOC ELEV 2300.09
BR ELEV 2256

P - 4S
TOC ELEV 2301.95
BR ELEV 2256

N

1" = 50'
25 0 50

LEGEND

- EXISTING INTERMEDIATE CONTOURS
- EXISTING INDEX CONTOURS
- PROPOSED INTERMEDIATE CONTOURS
- PROPOSED INDEX CONTOURS
- PROPOSED ACCESS ROAD
- DIVERSION BERM
- PROPERTY LINE
- BUFFER LINE
- DRAINAGE
- 2340 — PROPOSED FINAL INDEX CONTOUR

NOTE: C&D AREA IS WITHIN THE LIMITS OF EXISTING BORROW AREA THEREFORE NO FURTHER SEDIMENTATION AND EROSION CONTROL FEATURES ARE NECESSARY. ALL STORMWATER WILL BE DIVERTED TO EXISTING SEDIMENT PONDS WHICH ARE ADEQUATELY SIZED TO HANDLE STORMWATER FLOW.

NORTH CAROLINA PROFESSIONAL SEAL 18887 ENGINEER THOMAS M. YANOSCHAK

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	3/01	WMB	TY	REVISED LIMITS OF WASTE

DESIGNED BY: M. BRINCHEK
DRAWN BY: JSK/WMB
SHEET CHK'D BY: T. GRANT
CROSS CHK'D BY: T. YANOSCHAK
APPROVED BY:
DATE: FEBRUARY 2001

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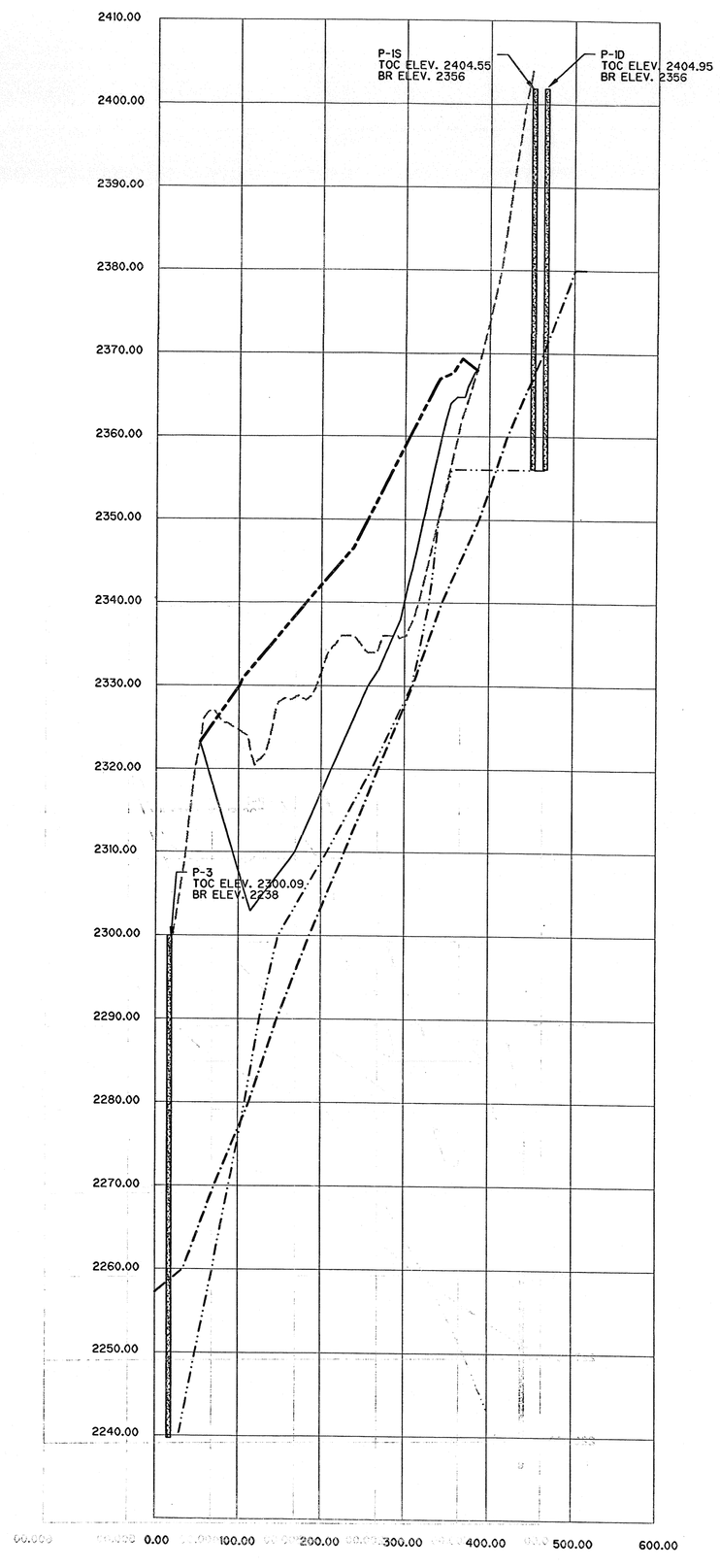
HENDERSON COUNTY
NORTH CAROLINA

HENDERSON COUNTY SOLID WASTE MANAGEMENT FACILITY CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL

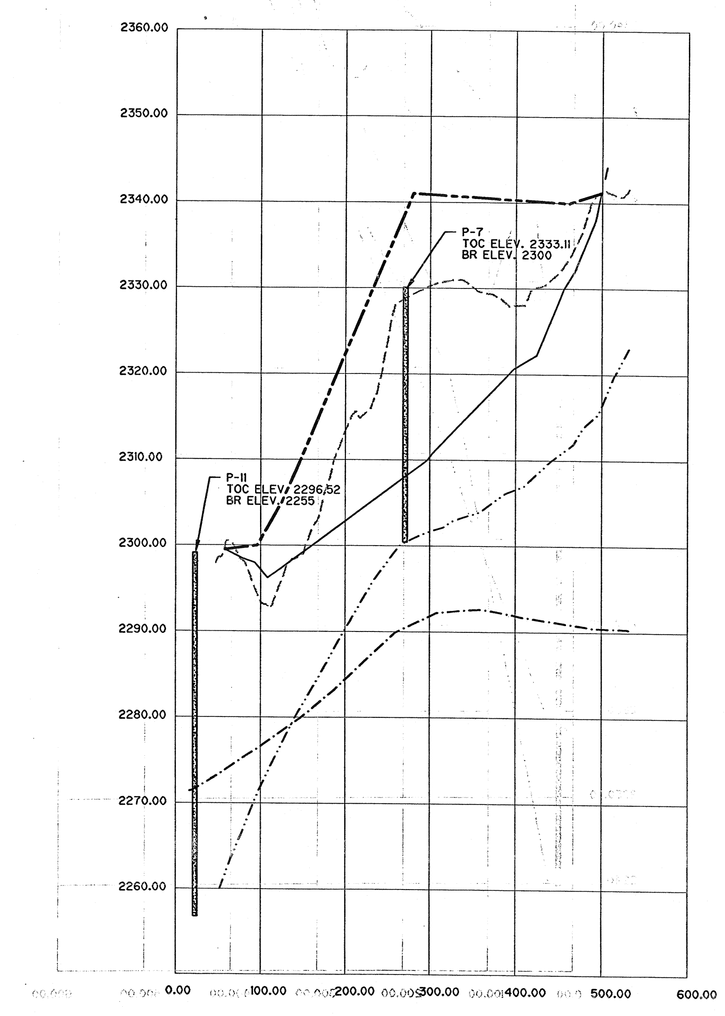
PHASE 1 CLOSURE PLAN

PROJECT NO. 1002-25625
FILE NAME: C-3.dwg

SHEET NO.
C-3



SECTION 1 / C-3
HORIZ. 1" = 100'
VERT. 1" = 10'



SECTION 2 / C-3
HORIZ. 1" = 100'
VERT. 1" = 10'

LEGEND

- GROUNDWATER ELEVATION
- BEDROCK ELEVATION
- PROPOSED BASE GRADES
- EXISTING SURFACE
- PROPSED FINAL CAP

NOTE:
PEIZOMETER LOCATIONS ARE APPROXIMATE.

NORTH CAROLINA PROFESSIONAL SEAL 18882 ENGINEER MARISA M. YANOSCHAK

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	3/01	WMB	TY	REVISED LIMITS OF WASTE

DESIGNED BY: M. BRINCHEK
DRAWN BY: JSK/WMB
SHEET CHK'D BY: T. GRANT
CROSS CHK'D BY: T. YANOSCHAK
APPROVED BY:
DATE: FEBRUARY 2001

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HENDERSON COUNTY
NORTH CAROLINA

HENDERSON COUNTY SOLID WASTE MANAGEMENT FACILITY
CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL

CROSS SECTIONS

PROJECT NO. 10002-25625
FILE NAME: c-4.dwg

SHEET NO.
C-4