RECEIVED

MAR 6 1997

SOLID WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE

BK4624PG0772

005715

26-L
PERMIT

RECEIVED
97 MAR -6 AM 10:43
GEORGE E. TATUM
REGISTER OF DEEDS
CUMBERLAND CO., N.C

CERTIFIED COPY OF SOLID WASTE PERMIT

I do hereby certify that the attached permit is an exact and true copy of Permit Number **26-L.**

LCID N26-L Permit Snow Hill LCID Landfill

James C. Coffey
James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

North Carolina

Johnston County

I, Sue S. Hodge, a Notary Public for said County and State, do hereby certify that James C. Coffey, Supervisor, Permitting Branch, personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and seal, this the 5 day of March, 1997.

SUE S. HODGE NOTARY PUBLIC JOHNSTON COUNTY, N.C.

Sue S. Hodge
Notary Public

My commission expires 10/21, 19~~--~~2000.

The foregoing Certificate(s) of Sue S. Hodge

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.

GEORGE E. TATUM REGISTER OF DEEDS FOR CUMBERLAND COUNTY,

By _____ Deputy/~~Assistant~~ Register of Deeds

PERMIT # 26-L
Dated Issued: February 28, 1997

SOLID WASTE PERMIT

MR. LACIE C. TEW(LAND OWNER)

AND

McDONALD GRADING COMPANY, INC.(OPERATOR)

is hereby issued a permit to CONSTRUCT AND OPERATE PHASE 1 of a

LAND CLEARING AND INERT DEBRIS LANDFILL

located at S.R. 2219, Nouth of Claude Lee Road and West of Interstate 95, in the Rockfish Township, Cumberland County, North Carolina in accordance with Article 9, Chapter 130A of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit. The facility is located and described by the legal description in the Appendix - Section I of the permit application and page five of this permit.

James C. Coffey

James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

PERMIT NUMBER: **26-L**
PERMIT ISSUED: February 28, 1997
FACILITY NAME: SNOW HILL LAND CLEARING AND INERT DEBRIS LANDFILL

CONDITIONS OF PERMIT

1. This permit is issued for a period not to exceed five years from date of issuance. This permit is for the construction and operation of the landfill (PHASE 1) according to the approved plans. Any revisions of these approved plans must be approved by the North Carolina Solid Waste Section.

2. Amendments or revisions to the NC Solid Waste Management Rules or any violation of groundwater standards may necessitate modification of the approved plans or closure of the facility.

3. **This permit shall not be effective unless the certified copy is filed in the Register of Deeds office and indexed in the grantor index under the name of the owner of the land in the county or counties in which the land is located.** The certified copy of the permit, affixed with the Register's seal and the date, book, and page number of recording shall be returned to the Division of Solid Waste Management, within **THIRTY (30)** working days, from date received. Please send the recorded permit copy to:

   SOLID WASTE SECTION
   225 GREEN STREET; SUITE 601
   FAYETTEVILLE, NORTH CAROLINA 28301
   ATTN: JIM BARBER

4. When this property is sold, leased, conveyed, or transferred, the deed or other instrument of transfer shall contain in the deed description section in no smaller type than that used in the body of the deed or instrument a statement that the property has been used as a land clearing and inert debris landfill.

5. This facility is permitted to receive land clearing waste, yard trash, untreated and unpainted wood, and inert debris such as rock, brick, concrete, concrete block, and uncontaminated soil. Waste acceptance requirements may be affected by future revisions and amendments to the NC General Statutes, or to the NC Solid Waste Management Rules.

6. Waste shall be placed a minimum of four (4) feet above the seasonal high water table.

7. This facility shall conform to the operational requirements of the NC Solid Waste Management Rules, 15A NCAC 13B .0566, and to the operational plan required by 15A NCAC 13B .0565(4).

PERMIT NUMBER: **26-L**
PERMIT ISSUED: February 28, 1997
FACILITY NAME: SNOW HILL LAND CLEARING & INERT DEBRIS LANDFILL

8. This permit is not transferable.

9. The following requirements shall be met **prior** to receiving solid waste, at the site:

   a. A site inspection and pre-operative meeting shall be conducted by a representative of the Solid Waste Section.

   b. A sign shall be posted at the entrance as required by the NC Solid Waste Management Rules Operational Requirements, 15A NCAC 13B .0566 (16).

   c. Structural fill shall be completed in the southeast corner of Phase 1, in accordance with plan sheet 2 of 2 dated 20 February 1997 and consistent with S&ME, Inc. permit application dated 24 January 1997. Certification by the design engineer that the required fill materials have been placed in accordance with the approved plans report will be required.

10. Ground water quality at this facility is subject to the classification and remedial action provisions of 15 NCAC 2L.

11. An approved sedimentation and erosion control plan shall be obtained prior to the beginning of earth disturbing activities and all such activities shall be conducted in accordance with the Sedimentation Pollution Control Act of 1973 (15 NCAC 4) along with any other state, federal or local requirements.

12. No excavation, within the footprint of the disposal area (PHASE 1), is permitted at this facility. All earth work shall be in accordance with the approved plan and consistent with the soils information in the permit application dated 24 January 1997 by S&ME, Inc..

ATTACHMENTS LIST

1. Permit application and Operations Plan for Snow Hill Mine Site Land Clearing and Inert Debris Landfill dated 24 January 1997.

2. Test Pit Location Plan, dated 12 December 1996, received 28 January 1997.

3. Cross Section Plan sheet, dated 9 January 1997, received 21 February 1997.

4. Proposed Final Contours sheet, dated 9 January 1997, received 21 February 1997.

5. Affidavit from Land owner Lacie Tew dated 28 February 1997.

6. Affidavit from Landfill Operator, McDonald Grading Co. Inc., dated 28 February 1997.

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Waste Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

DEHNR

February 28, 1997

Mr. Lacie C. Tew, Land owner
S.R. 2219
Fayetteville, North Carolina

Mr. Jerry F. McDonald, President
McDonald Grading Co., Inc.
2515 Murchison Road
Fayetteville, North Carolina 28301

Subject: Snow Hill Land Clearing and Inert Debris Landfill
Located North of Claude Lee Road and West of I-95
Rockfish Township, Cumberland County, North Carolina
Permit # **26-L**

Dear Mr. Tew and McDonald:

Enclosed please find a Solid Waste Permit, Conditions of the Solid Waste Permit, and a Certified Copy of the Solid Waste Permit for the above referenced Land Clearing & Inert Debris(LCID)landfill. This is a PERMIT TO CONSTRUCT AND OPERATE Phase 1 as shown on the cross section sheet of the approved plans.

Please note Condition No. 3. This permit shall not be effective unless the certified copy is filed in the Register of Deeds office and the copy is returned to the Solid Waste Section, within thirty (30) working days, from date received, with the page and book number, date of recordation, and Register's seal.

Also note Condition No. 9, which requires that we hold a pre-operative meeting prior to the acceptance of waste at the site. Please contact Ikie Guyton, Waste Management Specialist, when you are ready to schedule a meeting.

P.O. Box 27687,
Raleigh, North Carolina 27611-7687
Voice 919-733-4996

NC Reduce Reuse Recycle

FAX 919-715-3605

Mr. Guyton can be reached in our Fayetteville Regional Office, 225 Green St.- Suite 601; Fayetteville, North Carolina 28301 (phone # 910-486-1191). If you have questions about your permit, please contact me at (910) 486-1191.

Sincerely,

Jim Barber
Eastern Area Engineer
Solid Waste Section

cc: Jim Coffey
Terry Dover
Ikie Guyton
Cumberland County Solid Waste
Raleigh Central File: Permit # 26-L

CERTIFIED COPY OF SOLID WASTE PERMIT

I do hereby certify that the attached permit is an exact and true copy of Permit Number **26-L**.

James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

North Carolina

Johnston County

I, Sue S. Hodge, a Notary Public for said County and State, do hereby certify that James C. Coffey, Supervisor, Permitting Branch, personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and seal, this the 5 day of March, 1997.

Notary Public

My commission expires 10/21, ~~19~~ 2000.

PERMIT # 26-L
Dated Issued: February 28, 1997

SOLID WASTE PERMIT

MR. LACIE C. TEW(LAND OWNER)

AND

McDONALD GRADING COMPANY, INC.(OPERATOR)

is hereby issued a permit to CONSTRUCT AND OPERATE PHASE 1 of a

LAND CLEARING AND INERT DEBRIS LANDFILL

located at S.R. 2219, Nouth of Claude Lee Road and West of Interstate 95, in the Rockfish Township, Cumberland County, North Carolina in accordance with Article 9, Chapter 130A of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit. The facility is located and described by the legal description in the Appendix - Section I of the permit application and page five of this permit.

James C. Coffey

James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

PERMIT NUMBER: **26-L**
PERMIT ISSUED: February 28, 1997
FACILITY NAME: SNOW HILL LAND CLEARING AND INERT DEBRIS LANDFILL

CONDITIONS OF PERMIT

1. This permit is issued for a period not to exceed five years from date of issuance. This permit is for the construction and operation of the landfill (PHASE 1) according to the approved plans. Any revisions of these approved plans must be approved by the North Carolina Solid Waste Section.

2. Amendments or revisions to the NC Solid Waste Management Rules or any violation of groundwater standards may necessitate modification of the approved plans or closure of the facility.

3. **This permit shall not be effective unless the certified copy is filed in the Register of Deeds office and indexed in the grantor index under the name of the owner of the land in the county or counties in which the land is located.** The certified copy of the permit, affixed with the Register's seal and the date, book, and page number of recording shall be returned to the Division of Solid Waste Management, within **THIRTY (30)** working days, from date received. Please send the recorded permit copy to:

   SOLID WASTE SECTION
   225 GREEN STREET; SUITE 601
   FAYETTEVILLE, NORTH CAROLINA 28301
   ATTN: JIM BARBER

4. When this property is sold, leased, conveyed, or transferred, the deed or other instrument of transfer shall contain in the deed description section in no smaller type than that used in the body of the deed or instrument a statement that the property has been used as a land clearing and inert debris landfill.

5. This facility is permitted to receive land clearing waste, yard trash, untreated and unpainted wood, and inert debris such as rock, brick, concrete, concrete block, and uncontaminated soil. Waste acceptance requirements may be affected by future revisions and amendments to the NC General Statutes, or to the NC Solid Waste Management Rules.

6. Waste shall be placed a minimum of four (4) feet above the seasonal high water table.

7. This facility shall conform to the operational requirements of the NC Solid Waste Management Rules, 15A NCAC 13B .0566, and to the operational plan required by 15A NCAC 13B .0565(4).

8. This permit is not transferable.

9. The following requirements shall be met **prior** to receiving solid waste, at the site:

   a. A site inspection and pre-operative meeting shall be conducted by a representative of the Solid Waste Section.

   b. A sign shall be posted at the entrance as required by the NC Solid Waste Management Rules Operational Requirements, 15A NCAC 13B .0566 (16).

   c. Structural fill shall be completed in the southeast corner of Phase 1, in accordance with plan sheet 2 of 2 dated 20 February 1997 and consistent with S&ME, Inc. permit application dated 24 January 1997. Certification by the design engineer that the required fill materials have been placed in accordance with the approved plans report will be required.

10. Ground water quality at this facility is subject to the classification and remedial action provisions of 15 NCAC 2L.

11. An approved sedimentation and erosion control plan shall be obtained prior to the beginning of earth disturbing activities and all such activities shall be conducted in accordance with the Sedimentation Pollution Control Act of 1973 (15 NCAC 4) along with any other state, federal or local requirements.

12. No excavation, within the footprint of the disposal area (PHASE 1), is permitted at this facility. All earth work shall be in accordance with the approved plan and consistent with the soils information in the permit application dated 24 January 1997 by S&ME, Inc..

ATTACHMENTS LIST

1. Permit application and Operations Plan for Snow Hill Mine Site Land Clearing and Inert Debris Landfill dated 24 January 1997.

2. Test Pit Location Plan, dated 12 December 1996, received 28 January 1997.

3. Cross Section Plan sheet, dated 9 January 1997, received 21 February 1997.

4. Proposed Final Contours sheet, dated 9 January 1997, received 21 February 1997.

5. Affidavit from Land owner Lacie Tew dated 28 February 1997.

6. Affidavit from Landfill Operator, McDonald Grading Co. Inc., dated 28 February 1997.

SOLID WASTE SECTION DATABASE TRACKING FORM

Circle one: Add New Facility Edit Existing Facility Add C&D Unit
(only list permit # and info. that has changed)

SW SITES DATABASE

PERMIT NUM: (10) _____
SITE NAME: (40) SNOW HILL LCID L.F.
SITE ADDRESS: (30) CLAUDE LEE ROAD
SITE CITY: (25) FAYETTEVILLE COUNTY: CUMBERLAND

FACILTY TYPE DATABASE

FACILITY TYPE (circle one): (LF) I T TP MRF C YW

WASTE TYPE :
(check only the main type of waste received)

MSW	
IND	
CD	
LCID	✓
MED	
TIRE	
TIRE COLL	
OTHER (list)	

FACILITY INFO DATABASE

STATUS: (OPEN) CLOSED INACTIVE
LINED: YES (NO)
PUB/PRIV: PUBLIC (PRIVATE)
REGIONAL: YES (NO)
IF REGIONAL, LIST COUNTIES _____

APPLICANT DATABASE

APPLICANT NAME: (25) MR. JERRY F. MCDONALD
APPLICANT TITLE: (30) PRESIDENT
APPLICANT ROAD: (30) 2515 MURCHISON ROAD
APPLICANT CITY: (20) FAYETTEVILLE STATE:(2) NC ZIP: (10) 28301
APPLICANT PHONE: 910-488-6483 APPLICANT FAX: 910 - 630 - 1493
CONTACT NAME: (25) STEVE WATERS
CONTACT TITLE: (30) SAFETY DIRECTOR
CONTACT ROAD: (30) 2515 MURCHISON ROAD
CONTACT CITY: (20) FAYETTEVILLE STATE:(2) NC ZIP: (10) 28301
CONTACT PHONE: 910-488-6483 CONTACT FAX: 910-630-1493
OPERATOR NAME:(25) STEVE WATERS
OPERATOR TITLE:(30) SAME
OPERATOR ROAD:(30) SAME
OPERATOR CITY: (20) SAME STATE:(2) _ ZIP: (10) _____
OPERATOR PHONE: _____

Signature: _____ Date Completed: 2/24/97

updated May 10, 1996

S&ME

February 20, 1997

North Carolina Department of Environment,
Health and Natural Resources
Division of Waste Management
225 Green Street
Suite 601
Fayetteville, North Carolina 28301

ATTENTION: Mr. Jim Barber - Eastern Area Engineer

Reference: **REVISED DRAWINGS - SNOW HILL MINE SITE**
Land Clearing Inert Debris (LCID) Landfill
Fayetteville, North Carolina
S&ME Job No. 1034-96-131

Gentlemen:

On behalf of McDonald Grading Company,Inc., S&ME, Inc. submits the attached revised drawings for the above referenced proposed LCID landfill. The revisions to the drawings were requested by Mr. Jim Barber of the Division of Waste Management during a meeting with Mr. Dave Wasiela of S&ME on February 18, 1997. The revisions include denoting maximum fill slopes of 4H:1V, addressing staged vegetation, noting facility sign location and splitting the originally proposed LCID landfill into two phases; I and II. These revised drawings replace the originals in the "Permit Application for Snow Hill Mine Site Land Clearing Inert Debris Landfill" dated January 24, 1997.

S&ME, Inc. 9751 Southern Pine Boulevard, Charlotte, North Carolina 28273, (704) 523-4726, Fax (704) 525-3953
Mailing address: P.O. Box 7668, Charlotte, North Carolina 28241-7668

If you should have any questions or require additional information concerning this letter or the attached revised drawings, please contact us.

Sincerely,

S&ME, Inc.

2-20-97

David W. Wasiela, P.E.
Project Engineer
N.C. Registration No. 20770

Dan E. Brewer, P.E.
Landfill Services Manager
N.C. Registration No. 17582

cc: Mr. Steve Waters - McDonald Grading

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

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary

DEHNR

February 20, 1997

Mr. Jerry F. McDonald, President
McDonald Grading Co., Inc.
2515 Murchison Rd.
Fayetteville, NC 28301

Re: Approval of Soil Erosion and Sediment Control Plan
Snow Hill Mine LCID Landfill
Cumberland County, NC

Dear Mr. McDonald:

The review of the above referenced erosion control plan has been completed.

The plan has been found to be acceptable subject to the following stipulations:

1. Permanent stabilization of the finished slopes may be difficult due to the height and length of slopes. If this occurs, other means of conveyance for the stormwater runoff will be necessary.

2. Enclosed is a Certificate of Plan Approval which must be displayed at the job site.

3. This project is subject to the National Pollutant Discharge Elimination System (NPDES) for point source stormwater discharges from construction activities. Enclosed is a copy of the necessary permit information. Please contact Mr. Ken Averitte, Division of Environmental Management, at (910) 486-1541 for further assistance regarding this permit.

4. In order to ensure the early coordination and implementation of the erosion control plan for this project, it is requested that a preconstruction conference be held. As a minimum, representatives of the owner, engineer, contractor, and this office should attend, subject to the availability of staff. Please notify Dennis Shackelford of this office as to when this conference is scheduled.

Wachovia Building, Suite 714, Fayetteville
North Carolina 28301-5043
Voice 910-486-1541

NC Reduce Reuse Recycle

FAX 910-486-0707

This permit allows for a land disturbance, as called for on the application plan, not to exceed 13 acres and/or the limits of the submitted plans. Exceeding these limits will be a violation of this permit and would require a revised plan and additional application fee. Amendments to the plan should be submitted to this office under the same procedures as followed for the original plan. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B.0029.

Title 15, Section 4B .0017 (A) of the North Carolina Administrative Code reqires that a copy of the approved plan be on file at the job site and that inspections of the project be made by this office to ensure compliance with the approved plan.

We look forward to working with you on this project.

Sincerely,

for Joseph E Glass

Gerald Lee
Assistant Regional Engineer
Land Quality Section

GL/bt

Enclosure

cc: Ken Averitte
David W. Wasiela, P.E.
Ken Sykes
Jim Barber

Project Name: Snow Hill Mine LCID Landfill

Location: Cumberland County, NC

Submitted By: S&ME, Inc.

Date Received By LQS: January 27, 1997

River Basin: Cape Fear

ATTACHMENT # 3

AFFIDAVIT

Affiant, LACY TEW, deposes and affirms that he is the fee simple owner of real property located at S.R. 2219 APPROX. ½ MILE WEST OF I-95 IN ROCKFISH Township, in CUMBERLAND, County, North Carolina.

MCDONALD GRADING CO., INC., is applying for a permit to operate a landfill on my property. I, the land owner, have knowledge of the applicant's plans to dispose of solid waste on the land and I specifically grant permission for the operation of the landfill. I have read and understand North Carolina General Statute §130A-309.27 which statute assigns joint and several liability to me as owner of the landfill and to the operator of the landfill for the improper operation and closure of the landfill, as provided by law. I understand that I am financially responsible to the State for fulfilling all regulatory requirements related to the operation of the landfill, for closure and post-closure care of the landfill, for any violations of regulatory requirements, and for any environmental damage resulting from the landfill including, but not limited to, environmental clean up costs. I understand that I am legally liable to third parties for any damages to persons or property caused by the landfill. I also have read and understand North Carolina General Statute §130A-301 and 15A North Carolina Administrative Code 13B .0204, which statute and rule requires that I must file a copy of the landfill permit with the Register of Deeds in CUMBERLAND County for recordation and indexing in the Grantor Index under my name as property owner. When the land on which the landfill is located is sold, leased, conveyed, or transferred in any manner, the deed or other instrument of transfer shall contain a statement in the description section in no smaller type than that used in the body of the instrument that the property has been used as a sanitary landfill and a reference by book and page number to the recordation of the permit.

This the 28th day of February, 19 97.

Lacy C Tew
(Seal)

North Carolina
Cumberland County

Subscribed and sworn before me, this the 28th day of February, 19 97.

(Official Seal)

Ellen M Sweet
Notary Public

My commission expires 10-11, 19 97.

Certification by Operator:

I certify that the information provided by me in this application is true, accurate, and complete to the best of my knowledge. The application and operational requirements of the solid waste management facility will comply with the requirements of Sections .0564, .0565 and .0566 of 15A NCAC 13B North Carolina Solid Waste Management Rules. The facility and operations of the facility will also comply with all applicable Federal, State, and Local laws, rules, regulations, and ordinances. I have informed the land owner of my plans to operate a solid waste management facility for the disposal of Land Clearing and Inert Debris waste on the property located on Claude Lee Road and described by the deed in Book 1117 and Pages 274 & 275, dated 2 June 1965; Cumberland County, North Carolina and the land owner has specifically granted permission for the operation of the solid waste management facility for the disposal of Land Clearing and Inert Debris waste. I further understand that North Carolina General Statute 130A-22 provides for administrative penalties of up to five thousand dollars ($5,000.00) per day per each violation of the Solid Waste Management Rules. I further understand that the Solid Waste Management Rules may be revised or amended in the future and that the facility's siting and operation will be required to comply with all such revisions or amendments.

MCDONALD GRADING CO., INC.
Corporation Name (Print)

2/28/97
Date

(Corporate Seal)

Attest:

JERRY F. MCDONALD, PRESIDENT
President or Vice-President Name(Print)

MARSHA S. MCDONALD
Corporate Secretary Name(Print)

Jerry F McDonald
President or Vice-President Signature

Marsha S McDonald
Corporate Secretary Signature

NORTH CAROLINA
Cumberland County

I, Ellen M Sulcer, Notary Public for said County and State, do hereby certify that JERRY F McDONALD MARSHA S McDONALD personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 28th day of February, 1997.

(Official Seal)

Ellen M Sulcer
Notary Public

My commission expires 10-11, 1997.

LAND CLEARING AND INERT DEBRIS LANDFILL CHECKLIST

File Name SNOW HILL LCID L.F.

- [x] Application Received — Date 1/28/97
- [x] ~~Acknowledgement Letter~~ — Date —
  - [x] Written Report
  - [x] Siting Aerial Photo/Map
  - [x] Plans, Details, and Specifications
  - [x] Operations Plan
  - [x] Zoning Letter
  - [x] Legal Description or Recording Map
- [ ] Completeness Letter & Comments — Date
  - [x] SITE MTG. W/ DAVE W. OF SOME W/ITEMS TO ADDRESS
  - [ ] ON DWG'S. (2/18/97)
  - [ ]
  - [x] P.T.C. / P.T.O ISSUE 2/28/97
- [ ] Completeness Items Received — Date
- [ ] Technical Review Letter & Comments — Date
  - [x] DELIVERED PERMIT TO McDOUGALS GRADING. 3/6/97
  - [ ]
  - [ ]
  - [ ]
- [ ] Technical Review Completed — Date
- [ ] Issue Permit Number: 26-L — Date 2-28-97
  - [ ] Cover Letter
  - [ ] Original Permit
  - [ ] Original Permit Conditions
  - [ ] Original Legal Description or Recording Map
  - [ ] Notary Certification for Permit Copy
  - [ ] Certified Copy Permit
  - [ ] Certified Copy Permit Conditions
  - [ ] Certified Copy Legal Description or Recording Map
  - [ ] Original Plans To Applicant
  - [ ] Plans and Permit To Central Files
  - [ ] Plans and Permit To Regional Office
  - [ ] Plans and Permit To Waste Management Specialist
  - [ ] Solid Waste System Information Form
- [x] Receive Filing From Register of Deeds — Date 3/6/97

LCID LANDFILL CHECKLIST

File Name Snow Hill LCID L.F.

.0564 SITING CRITERIA FOR LAND CLEARING AND INERT DEBRIS (LCID) LANDFILLS

The following siting criteria shall apply for Land Clearing and Inert Debris (LCID) landfills:

CHECK RULE →

- ☑ (1) Facilities or practices, shall not be located in the 100-year floodplain.
- ☑ (2) Facilities or practices shall not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife.
- ☑ (3) Facilities or practices shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species as identified in 50 CFR Part 17 which is hereby incorporated by reference including any subsequent amendments and editions. This material is available for inspection at the Department of Environment, Health, and Natural Resources, Division of Solid Waste Management, 401 Oberlin Road, Raleigh, North Carolina 27605 where copies can be obtained at no cost.
- ☑ (4) Facilities or practices shall not damage or destroy an archaeological or historical site.
- ☑ (5) Facilities or practices shall not cause an adverse impact on a state park, recreation or scenic area, or any other lands included in the state nature and historic preserve.
- ☑ (6) Facilities shall not be located in any wetland as defined in the Clean Water Act, Section 404(b).
- ☑ (7) It must be shown that adequate suitable soils are available for cover, either from on or off site.
- ☑ (8) Land Clearing and Inert Debris landfills shall meet the following surface and ground water requirements:
  - ☑ (a) Facilities or practices shall not cause a discharge of pollutants into 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.
  - ☑ (b) Facilities or practices shall not cause a discharge of dredged materials or fill material into waters of the state that is in violation of the requirements under Section 404 of the Clean Water Act, as amended.
  - ☑ (c) Facilities or practices shall not cause non-point source pollution of waters of the state that violates assigned water quality standards.

(d) Waste in landfills with a disposal area greater than two acres shall be placed a minimum of four feet above the seasonal high water table, except where an alternative separation is approved by the Division.

(e) Waste in landfills with a disposal area less than two acres shall be placed above the seasonal high water table.

(9) The facility shall meet the following minimum buffer requirements:

(a) 50 feet from the waste boundary to all surface waters of the state as defined in G.S. 143-212.

(b) 100 feet from the disposal area to property lines, residential dwellings, commercial or public buildings, and wells.

(c) Buffer requirements may be adjusted as necessary to insure adequate protection of public health and the environment.

(10) The facility shall meet all requirements of any applicable zoning ordinance.

.0565 APPLICATION REQUIREMENTS FOR LAND CLEARING AND INERT DEBRIS (LCID) LANDFILLS

Five sets of plans, maps, and reports shall be required with each application. The seal of a professional engineer is required when submitting plans for a Land Clearing and Inert Debris (LCID) landfill.

(1) The following information is required in order to review and approve the siting of a Land Clearing and Inert Debris (LCID) landfill:

SPECIAL USE PERMIT

(a) An approval letter from the unit of local government having zoning authority over the area where the facility is to be located stating that the site meets all of the requirements of the local zoning ordinance, or that the site is not zoned.

(b) Location on a county road map.

(c) Information showing that the bottom elevation of the waste shall be four feet above the seasonal high water table. Seasonal high water table elevations shall be obtained from on site test borings, test pits, or from other geological or water table investigations, studies, or reports from the immediate area of the proposed facility.

(d) A written report indicating that the facility shall comply with all the requirements set forth under Rule .0564.

(e) A copy of the deed or other legal description of the site that would be sufficient as a description in an instrument of conveyance, showing property owner's name.

(f) Any other information pertinent to the suitability of the proposed facility.

(2) The following shall be provided on a map or aerial photograph with a scale of at least one inch equals four hundred feet showing the area within one-fourth mile of the site:

☑(a) Entire property or portion thereof owned or leased by the person providing the disposal site.

☑(b) Location of all homes, buildings, public or private utilities, roads, wells, watercourses, water or other impoundments, and any other applicable features or details.

☑(c) 100-year flood plain boundaries, if any.

☑(d) Wetland boundaries, if any.

☑(e) Historical or archaeological sites, if any.

☑(f) Park, scenic, or recreation area boundaries, if any.

☑(3) Development and design plans and details, at a scale of at least one inch equals one hundred feet with one inch equals forty feet preferred, and specifications containing the following information shall be submitted with the application for a proposed Land Clearing and Inert Debris (LCID) landfill:

☑(a) Property or site boundary, fully dimensioned with bearings and distances, tied to North Carolina grid coordinates where reasonably feasible.

☑(b) Easements and right-of-ways.

☑(c) Existing pertinent on site and adjacent structures such as houses, buildings, wells, roads and bridges, water and sewer utilities, septic fields, and storm drainage features.

☑(d) Proposed and existing roads, points of ingress and egress along with access control such as gates, fences, or berms.

☑(e) Buffer and set back lines along with the buffered boundary or feature.

☑(f) Springs, streams, creeks, rivers, ponds, and other waters and impoundments.

☑(g) Wetlands, if any.

☑(h) Boundary of the proposed waste area.

☑(i) Existing topography with contours at a minimum of five foot intervals. Where necessary, a smaller interval shall be utilized to clarify existing topographic conditions.

☐(j) Proposed excavation, grading, and final contours at a minimum of five foot intervals. Where necessary, a smaller interval shall be utilized to clarify proposed grading. Excavation, grading, and fill material side slopes shall not exceed three to one (3:1).

☑(k) Where on site borrow for operational and final cover is proposed, indicate the borrow excavation and grading plan with contours at a minimum of five foot intervals. Where necessary, a smaller interval shall be utilized to clarify proposed grading.

☑(l) Proposed surface water control features and devices such as ~~slope~~ drains, storm water pipes, inlets, culverts, and channels.

NEED TO SHOW 3:1 SLOPE ON X-SECTION

CHECK SCALE.

EXISTING BORROW PIT ADJACENT TO SITE OWNED BY McDONALD GRADING.

CALL JOE GLASS

WAITING FOR SOIL LTR.

☐(m) Information showing that the project meets the requirements of 15A NCAC 4, Sedimentation Control Rules.

CHECK TEXT FOR [redacted] INFO ON FILL IN WASTE DIRT AREA.

☑(n) Location of test borings or test pits, if used to determine the seasonal high water table elevation, shall be shown on the plans.

☑(o) A minimum of two cross-sections, one each along each major axis, per operational area showing:

- ☑(i) Original elevations.
- ☑(ii) Proposed excavation. (NO EXCAVATION TO TAKE PLACE)
- ☑(iii) Proposed final elevations.

SHOW X-SECTION THRU FILL & SOIL ABOVE H_2O TABLE?

☑(4) An operational plan addressing the requirements under Rule .0566 and containing the following information shall be submitted with the application for a proposed Land Clearing and Inert Debris (LCID) landfill:

☑(a) Name, address, and phone number of individual responsible for operation and maintenance of the facility.

☑(b) Projected use of the land after completion.

NEED CELLS/PHASE FOR FIVE YR.

☐(c) Description of systematic usage of disposal area, operation, orderly development and closure of the landfill. (WEST TO EAST)

☐(d) Type, source, and quantity of waste to be accepted.

QUANTITY ESTIMATES FOR ITEM "C"

☐(e) An emergency contingency plan, including fire fighting procedures.

ADD FIRE DEPT ?

.0566 OPERATIONAL REQUIREMENTS FOR LAND CLEARING AND INERT DEBRIS (LCID) LANDFILLS

Land Clearing and Inert Debris (LCID) landfills shall meet the following operational requirements:

☑(1) Operational plans shall be approved and followed as specified for the facility.

☑(2) The facility shall only accept those solid wastes which it is permitted to receive.

☑(3) Solid waste shall be restricted to the smallest area feasible and compacted as densely as practical into cells.

☑(4) Adequate soil cover shall be applied monthly, or when the active area reaches one acre in size, whichever occurs first.

☑(5) 120 calendar days after completion of any phase of disposal operations, or upon revocation of a permit, the disposal area shall be covered with a minimum of one foot of suitable soil cover sloped to allow surface water runoff in a controlled manner. The Division may require further action in order to correct any condition which is or may become injurious to the public health, or a nuisance to the community.

☑(6) Adequate erosion control measures, structures, or devices shall be utilized to prevent silt from leaving the site and to prevent excessive on site erosion.

SOIL APPROVED PLAN. DATED 2/20/97

☑(7) Provisions for a ground cover sufficient to restrain erosion must be accomplished within 30 working days or 120 calendar days upon completion of any phase of landfill development.

☑(8) The facility shall be adequately secured by means of gates, chains, berms, fences, etc. to prevent unauthorized access except when an operator is on duty. An attendant shall be on duty at all times while the landfill is open for public use to assure compliance with operational requirements and to prevent acceptance of unauthorized wastes.

☑(9) Access roads shall be of all-weather construction and properly maintained.

☑(10) Surface water shall be diverted from the working face and shall not be impounded over waste.

☑(11) Solid waste shall not be disposed of in water.

☑(12) Open burning of solid waste is prohibited.

☑(13) The concentration of explosive gases generated by the facility shall not exceed:

- ☐(a) Twenty-five percent of the lower explosive limit for the gases in facility structures.
- ☐(b) The lower explosive limit for the gases at the property boundary.

NEED BRIEF DISCUSSION.

☑(14) Leachate shall be properly managed on site through the use of current best management practices.

☑(15) Should the Division deem it necessary, ground water or surface water monitoring, or both, may be required as provided for under Rules .0601 and .0602 of this Subchapter.

☐(16) A sign shall be posted at the facility entrance showing the contact name and number in case of an emergency and the permit number. The permit number requirement is not applicable for facilities not requiring an individual permit.

NEED SIGN, SHOW ON SITE PLAN.

SOLID WASTE MANAGEMENT FACILITY
PERMIT APPLICATION TRACKING SYSTEM

General Information

Applicant:_____

Address:_____ Phone Number:_____

_____ Fax Number:_____

Facility Location:_____

Type of Facility:_____ Type of Waste:_____

Consultant:_____

Address:_____ Phone Number:_____

_____ Fax Number:_____

Preliminary Assistance	

Site Suitability Application	
Site Application Received	
Completeness Review Letter Sent	
Additional Information Received	
DEM Copy Sent (Ground Water Quality, Air Quality, Water Quality)	
DEM Comments Received	
Geology & Hydrology Review Initiated	
Geology & Hydrology Comments Received	
Technical Review Letter Sent	
Additional Information Received	
Site Suitability Letter Issued	

Construction Plan Application	
Construction Application Received	
Completeness Review Letter Sent	
Additional Information Received	
Land Quality Copy Sent (Erosion Control)	
Land Quality Approval Received (Erosion Control Permit)	
Geology and Hydrology Review Initiated	
Geology & Hydrology Comments Received	
Technical Review Letter Sent	
Additional Information Received	
Construction Permit Issued	
Construction Permit - Recorded Copy Received	

Operational Permit Application	
Operational Permit Application	
Completeness Review Letter Sent	
Additional Information Received	
Geology and Hydrology Review Initiated	
Geology and Hydrology Comments Received	
NPDES or Non-Discharge Permit Issued	
Storm Water Discharge Permit Issued	
Technical Review Letter Sent	
Additional Information Received	
Operational Permit Issued	

Pertinent Activity and Comments	

Pertinent Activity and Comments	

APPROVED
DIVISION OF SOLID WASTE MANAGEMENT
DATE 2/28/97 BY DOE

26-L
CENTRAL FILE COPY

RECEIVED
JAN 28 1997
SOLID WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE

PERMIT APPLICATION FOR
SNOW HILL MINE SITE
LAND CLEARING INERT DEBRIS LANDFILL
Fayetteville, North Carolina
S&ME Job No. 1034-96-131

Prepared For:

NCDEHNR - Division of Waste Management
Fayetteville, North Carolina

Prepared By:

S&ME, Inc.
P.O. Box 7668
Charlotte, N.C. 28241-7668

January 24, 1997

S&ME

January 24, 1997

North Carolina Department of Environment,
Health and Natural Resources
Division of Waste Management
225 Green Street
Suite 601
Fayetteville, North Carolina 28301

ATTENTION: Mr. Jim Barber - Eastern Area Engineer

Reference: **PERMIT APPLICATION - SNOW HILL MINE SITE**
Land Clearing Inert Debris (LCID) Landfill
Fayetteville, North Carolina
S&ME Job No. 1034-96-131

Gentlemen:

On behalf of McDonald Grading Company,Inc., S&ME, Inc. submits this Permit Application for the above referenced proposed LCID landfill. Included in this application is the necessary information to satisfy the North Carolina Solid Waste Management Rules, Sections .0564, .0565 and .0566 of 15A NCAC 13B as amended through January 4, 1994. Section 1.0 of this application package addresses the requirements within Rules .0564 and .0565 while Section 2.0 addresses the requirements of Rule .0566.

S&ME, Inc. 9751 Southern Pine Boulevard, Charlotte, North Carolina 28273, (704) 523-4726, Fax (704) 525-3953
Mailing address: P.O. Box 7668, Charlotte, North Carolina 28241-7668

Please contact us if you have any questions or need additional information regarding this application.

Sincerely,

S&ME, Inc.

1-24-97

David W. Wasiela, P.E.
Project Engineer
N.C. Registration No. 20770

Dan E. Brewer, P.E.
Landfill Services Manager
N.C. Registration No. 17582

cc: Mr. Steve Waters - McDonald Grading

TABLES OF CONTENTS

1.0 SITING CRITERIA

1.1 Introduction

McDonald Grading Co., Inc. is proposing to permit a Land Clearing & Inert Debris (LCID) landfill on the Snow Hill Mine site located in Cumberland County, North Carolina. The site is located near Fayetteville, North Carolina, north of Claude Lee Road and west of Interstate 95 within the Rockfish Township limits of Cumberland County. A legal description of the property is contained within the special use permit issued to McDonald Grading Co., Inc. by the Cumberland County Board of Adjustment. A copy of the special use permit is located in Appendix I. The LCID landfill will be operated by McDonald Grading Co., Inc.

The proposed LCID landfill area is located in the eastern portion of the mining site on a previously mined area of the property. The proposed landfill area encompasses approximately 13 acres. Since the proposed fill area will extend beyond two acres, a LCID landfill permit will be required to begin reclamation and disposal operations. The information contained within this application has been prepared to conform to the siting and design criteria of the Solid Waste Management Rules .0564 and .0565.

1.2 Floodplain Boundary

The Snow Hill Mine Site does not include any 100-year floodplain areas according to the "Application for a Mining Permit" prepared by McDonald Grading and dated May 16, 1995. S&ME personnel reviewed the FEMA flood maps for this area and found the site to be in ZONE C indicating "Area of Minimal Flooding". A copy of the mining permit and permit application are included in Appendix I. As required by the Division of Solid Waste

Management Rules .0564 (1), the proposed LCID landfill area is not located in a floodplain.

1.3 Endangered Species

As required by the North Carolina Solid Waste Management Rules .0564 (2) and (3), the proposed LCID landfill is not located in an area that will threaten an endangered species or result in destruction or adverse modification of the critical habitat of an endangered species. The absence of endangered or threatened species and habitats was verified by the North Carolina Wildlife Resources Commission in a letter dated June 2, 1995. A staff biologist from the Commission visited the site on May 26, 1995 to inspect site conditions. A copy of the letter from the Wildlife Resources Commission is located in Appendix I.

1.4 Archeological, State Nature and Historic Preserve

As required by the North Carolina Solid Waste Management Rules .0564(4) and (5), the proposed landfill site will not damage or destroy an archeological or historical site nor is the site a potential adverse impact to a State park, recreation or scenic area, or any other lands included in the state nature and historic preserve. The absence of archeological and historical sites is verified in a letter from the North Carolina Department of Cultural Resources dated June 11, 1995 and is included in Appendix I.

1.5 Wetlands

The Snow Hill Mine site does not include any wetlands areas. As required by the Division of Solid Waste Management Rules .0564(6), the proposed LCID landfill area is not located in a wetlands area. The North Carolina Wildlife Resources Commission verified that

neither wetlands nor surface waters were present at the site in a letter dated June 2, 1995. A copy of this letter is included in Appendix I.

1.6 Borrow Soil

Due to the previous and on-going mining operations at the site, suitable borrow soils for cover material are readily available. Additional off-site borrow soils are also available to the proposed LCID landfill operator from various construction projects.

1.7 Groundwater Separation

As required by the North Carolina Solid Waste Management Rules .0564 (8)(d), waste must be placed a minimum of four feet above the seasonal high groundwater table. The proposed LCID landfill will be founded on-grade as depicted by the existing contours shown on the Test Pit Locations Plan included in Appendix IV. In order to verify appropriate groundwater separation, six test pits were excavated by McDonald Grading Co., Inc. at locations within the site boundaries. An S&ME, Inc. project engineer measured the depth to groundwater at each test pit on October 17, 1996. Measurements at the test pits indicate groundwater levels at 4.5 to 7.5 feet below grade. The test pit locations and depth to groundwater are shown on the Test Pit Locations Plan in Appendix IV of this application. Groundwater levels are not anticipated to rise during and following the proposed landfill development due to increasing runoff and reducing infiltration of rainfall.

1.8 Buffer Requirements

As required by North Carolina Solid Waste Management Rules .0564 (9), the waste limits of the proposed LCID landfill area are 100-feet from the property boundaries. The proposed landfill area is located approximately 300-feet from the nearest natural drainage feature or surface water (Big Sandy Run). Residential dwellings, commercial or public buildings and wells are not located within 100 feet of the property boundary.

1.9 Local Zoning Requirements

As required by the North Carolina Solid Waste Management Rules .0564 (10), the local government zoning ordinances must be met. A letter from the Cumberland County Board of Adjustment in regards to the proposed LCID landfill is presented in Appendix I. The original Mining Permit (26-20) identifies the entire Snow Hill Mine site.

1.10 Stormwater and Erosion & Sedimentation Control

As required by the North Carolina Solid Waste Management Rules .0564 (8)(a) there shall be no violations of the National Pollutant Discharge Elimination System (NPDES) under Section 402 of the Clean Water Act. S&ME prepared a Notice of Intent (NOI) for NPDES General Permit NCG 010000 on behalf of McDonald Grading. The NOI has been submitted to the Division of Water Quality, NPDES Group. A copy of the NOI is included in Appendix III.

The area proposed for LCID landfill development was reclaimed and released from the mining permit area in 1995. Therefore, a new erosion and sedimentation (E&S) control plan has been produced and submitted to the Land Quality Section for approval. The

locations of E&S devices are shown on the Proposed Final Contours Plan in Appendix IV. Supporting calculations and E&S details are included in Appendix III.

1.11 1/4 Mile Vicinity Map

A 1/4 Mile radius vicinity map has been produced by enlarging the U.S.G.S. Quadrangle titled Hope Mills, N.C. and locating the site on the map. A campground containing a well is located approximately 500 feet north of the site boundary and is hydrogeologically side gradient of the proposed LCID landfill. No other structures exist within 1/4 mile of the site boundaries. Big Sandy Run is located approximately 300 feet east of the site flowing south and east to the Cape Fear River. The 100-year floodplain is not shown on the map because the site is in ZONE C indicating an "Area of minimal flooding" as shown on the FEMA maps for this area. Therefore, a 100-year floodplain elevation has not been established for this area. Wetlands, historical and archeological sites, parks and scenic and recreational areas do not exist. A copy of the 1/4 Mile Radius Map is included in Appendix II.

1.12 Development and Design Drawings

Drawings meeting the requirements of Rule .0565(3) are included in Appendix IV. The drawings include a Test Pit Location Plan that also shows existing site conditions, a Proposed Final Contour Plan and a Cross Sections plan. The existing topography and test pit locations were developed using surveying methods by Michael Tate, R.L.S. The test pit numbers and depth to groundwater are shown at each test pit location. Erosion and sedimentation control devices and locations of cross sections are shown on the Proposed Final Contours Plan.

2.0 OPERATIONS PLAN

The proposed LCID landfill will be owned and operated by McDonald Grading Co., Inc. Operation of the landfill will be the responsibility of Mr. Steve Waters of McDonald Grading Co., Inc., 2515 Murchison Road, Fayetteville, North Carolina 28301, phone (910) 488-6483.

2.1 Waste Description

LCID waste is defined in Solid Waste Management Rules 15A NCAC 13B .0100 as solid waste which is generated solely from land clearing activities such as stumps, trees, limbs, brush, grass and other naturally occurring vegetative material and inert debris such as concrete, asphalt, brick, concrete block, uncontaminated soil, gravel and rock and unpainted/untreated wood.

2.2 Site Operations

LCID waste will be obtained from McDonald Grading Co., Inc. for disposal. Waste will be placed in the landfill generally west to east. Loads will be dumped and compacted in-place by a wheel loader. Waste will not be disposed in areas of ponded water. Waste placement will be restricted to as small an area as practical. Waste will be covered at least every thirty days, if not sooner, with appropriate soil or fill cover.

Waste will be covered with 6-inches of soil monthly or when the active area reaches ~~two~~ ONE acres in size, whichever occurs first. Upon completion of disposal operations, the disposal area will be covered with a minimum two feet of compacted soil cover.

D.V.W 2/18/97

Wastes will be inspected at the landfill entrance by McDonald Grading Co., Inc. personnel trained to identify unacceptable wastes. Personnel will be on duty at all times the landfill is open. A sign at the landfill entrance will be posted and will provide an emergency contact name and number. The facility permit number and a list of acceptable wastes will be clearly printed on the sign.

Access to the site is limited by dense wooded vegetation and topography around most of the site. Fences with gates limit access at the entrance of the site on Claude Lee Road. Access roads to the LCID landfill area will be maintained and repaired when necessary.

2.3 Fire Control

Open burning of waste within the LCID landfill limits is prohibited. Open burning may be conducted within the mining operation limits in accordance with Sections .1903 (Permissible Open Burning Without a Permit) and .1904 (Air Curtain Burners) of the North Carolina Administrative Code S 32. Fires should be controlled by smothering with bare earth. Soil should be stockpiled adjacent to the active area for fire control.

2.4 Explosive Gas Monitoring

Gas Monitoring is not anticipated to be required at this time due to the waste stream consisting solely of land clearing and inert debris.

2.5 Erosion and Sedimentation Control

Prior to LCID waste placement on site, sedimentation and erosion control structures will be constructed at the locations shown on the Proposed Final Contours Plan in Appendix IV. Waste placement should be planned to provide positive drainage to the sediment basin. Temporary ditches may become necessary as the site is developed to provide drainage to the sediment basin. Temporary ditches should be installed whenever necessary to avoid ponding water.

Areas greater than two acres that reach final elevations and have received final cover shall be stabilized with an erosion resistant grass cover. Filling operations will be year round. Thus, seeding requirements will be adjusted on a seasonal basis. Seeding will be conducted in accordance with the seeding specifications shown in the Permanent Seeding Specifications in Appendix III of this Application. Embankment slopes shall be periodically inspected for erosion. All seeded areas will be fertilized, seeded as necessary, and mulched according to the seeding specifications to maintain a suitable vegetative cover.

The erosion control structures shall be inspected following every run-off producing rainfall and at least once a week. Repairs should be made immediately. Sediments accumulated in the basin should be removed when the level of sediment reaches approximately 1/2 of the structures' height. Trash or debris collected within the structure's spillways shall be removed immediately.

2.6 Site Closure

Upon completion of disposal activities, a final soil cover should be placed over the entire landfill. The final cover should be placed to a minimum thickness of ~~two~~ one D.W.W. 2/18/97 feet. The completed LCID landfill area should be graded in accordance with the existing mining permit and the Proposed Final Contours Plan.

Placement of the final cover shall begin within 30 days of final receipt of waste unless otherwise approved by the Division of Waste Management. Following closure activities, the area will be maintained until construction activities cease. If the area is not further developed it will be maintained as grass land or incorporated into the final use plan for the entire mining operation site.

Appendix

I

SCHEDULE OF RECLAMATION COSTS
(based upon range of $500 - $5,000 per affected acre)

COMMODITY CODES: SG = Sand and/or Gravel, GS = Gemstone, Borrow = borrow/fill dirt, CS = Crushed Stone, DS = Dimension Stone, FS = Feldspar, MI = Mica, LI = Lithium, PF = Pyrophyllite, OL = Olivine, KY = Kyanite/Sillimanite/Andalusite, PH = Phosphate, CL = Clay/Shale, PE = Peat, AU = Gold, TI = Titanium, and OT = Others

Type	Tailings/ Sediment Ponds	Stockpiles	Wastepiles	Processing Area/Haul Roads	Mine Excavations
SG, GS, Borrow	$ 500 (L)/acre 1500 (FI)	$ 1800/acre	$ 2000/acre	$ 1800/acre	$ 500 (L)/acre 2000 (PD)
CS, DS, FS, MI, LI, PF, OL, KY	500 (L) 1500 (FI)	1800	2000	2000	500 (L) 2500 (PD)
PH, CL	1000 (L) 2500 (FI)	2500	5000	5000	2000 (L) 5000 (PD)
PE, AU, TI, OT	1000 (L) 2500 (FI)	2500	3000	3500	2000 (L) 5000 (PD)

(L) = reclamation to a lake and revegetating sideslopes
(FI) = reclamation by filling in and revegetating
(PD) = reclamation by grading for positive drainage and revegetating

AS PER NCAC 15A 5B.0003, IF YOU DISAGREE WITH THE BOND AMOUNT DETERMINED BY THE BOND CALCULATION WORKSHEET PROVIDED IN THE MINING PERMIT APPLICATION FORM, YOU MAY SUBMIT AN ESTIMATE OF RECLAMATION COSTS FROM A THIRD-PARTY CONTRACTOR. SAID ESTIMATE MUST BE ATTACHED TO THE APPLICATION ONCE IT HAS BEEN COMPLETED. YOU WILL BE NOTIFIED AS SOON AS POSSIBLE OF THE DIRECTOR'S FINAL BOND DETERMINATION.

* In lieu of a surety bond from an insurance company, the applicant may file with the Department a cash deposit, an irrevocable standby letter of credit, or an assignment of a savings account in a North Carolina bank on an assignment form prescribed by the Department. The amount of land approved to be affected and unreclaimed must not exceed the bonded amount.

5/94

LETTER FROM THE
NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

North Carolina Wildlife Resources Commission

512 N. Salisbury Street, Raleigh, North Carolina 27604-1188, 919-733-3391
Charles R. Fullwood, Executive Director

FAX TRANSMITTAL # of Pages 2
TO: DAVE WASIELA FROM: STEVE WATERS
CO: S+ME McDONALD GRADING CO., INC.
DEPT. PHONE: (910) 488-6483
FAX # 704 525-3953 FAX # (910) 630-1493
COMMENTS

MEMORANDUM

TO: Susan B. Edwards
Mining Program Secretary
Land Quality Section

FROM: Frank McBride, Manager
Habitat Conservation Program

Frank McBride

DATE: June 2, 1995

SUBJECT: Mining Permit Renewal Request for McDonald Grading Co., Inc.; Snow Hill Pit, Cumberland County, North Carolina. Permit No. 26-20

Staff biologists with the Wildlife Resources Commission have reviewed the Mining Permit Renewal Request for the Snow Hill Pit and are familiar with habitat values associated with the project area. A site visit was made on May 26, 1995. Our comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et. seq.) and the North Carolina Mining Act of 1971 (as amended, 1982; G.S. 74-76 et seq., 15 NCAC 5).

McDonald Grading Co., Inc. is requesting renewal of the permit for Snow Hill Mine. Permit renewal will allow deeper excavation over a 22.38 acre, previously-mined site. The project does not involve wetlands or surface waters.

We recommend that the applicant contact the local County Forest Ranger (NC Forest Service) and obtain Forest Tree Seedlings consisting of the "Wildlife Packet for Eastern North Carolina". Each packet contains approximately 100 seedlings of a variety of tree species beneficial to wildlife. We recommend that all berms and spoil roads be planted with these seedlings in addition to the reclamation plan enclosed in the application.

Thank you for the opportunity to comment on this project. If you need to discuss these comments or need additional assistance, please call Bennett Wynne at (919) 522-9736.

BW/fm

cc: McDonald Grading Company, Inc.
Bennett Wynne, Coastal Fisheries Coordinator
William Wescott, Coastal Habitat Coordinator
Keith Ashley, District 4 Fisheries Biologist
Tom Padgett, District 4 Wildlife Biologist

LETTER FROM THE

NORTH CAROLINA DEPARTMENT OF CULTURAL RESOURCES

North Carolina Department of Cultural Resources
109 East Jones Street • Raleigh, North Carolina 27611

James G. Martin, Governor

Patric Dorsey, Secretary

June 11, 1985

MEMORANDUM

TO: James D. Simons
Land Quality Section
Division of Land Resources, DNRCD

FROM: David Brook, Deputy State
Historic Preservation Officer

RECEIVED
JUN 12 198
LAND QUALITY

SUBJECT: Application for Mining Permit
Snow Hill pit, McDonald Grading Co., Inc., Cumberland County, ER 85-8056

Thank you for giving us the opportunity to review and comment on the above project pursuant to Chapter 74, Article 7 of the North Carolina General Statutes.

Because of the location and topographic situation of the proposed project area, it is unlikely that any archaeological sites which may be eligible for inclusion in the National Register of Historic Places will be affected by the proposed borrowing. We therefore recommend that no archaeological investigation be conducted in connection with this project.

Thank you for your cooperation and consideration. If you have questions concerning the above comments, please contact Ms. Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

DB:slw

END

APPENDIX I

SITING CRITERIA INFORMATION

Special Use Permit Issued by Cumberland County July 24, 1996

Mining Permit No. 26-20 issued by NCDEHNR - Division of Land Resources
Issued October 18, 1995

Mining Permit Application Submitted by McDonald Grading Company, Inc.
Dated May 16, 1995

Letter from the North Carolina Department of Cultural Resources
Dated June 11, 1985

Letter from the North Carolina Wildlife Resources Commission
Dated June 2, 1995

SPECIAL USE PERMIT ISSUED BY

CUMBERLAND COUNTY JULY 24, 1996

CUMBERLAND COUNTY BOARD OF ADJUSTMENT

130 Gillespie Street
Fayetteville, NC 28302
(910) 678-7600

July 24, 1996

MEMO TO: CUMBERLAND COUNTY INSPECTIONS DEPARTMENT

FROM: FRANCES JACKSON, SECRETARY
CUMBERLAND COUNTY BOARD OF ADJUSTMENT

SUBJECT: CASE NO. P96-27-C. AN APPLICATION BY MCDONALD GRADING CO., INC. FOR A SPECIFIED CONDITIONAL USE PERMIT AS PROVIDED FOR BY THE CUMBERLAND COUNTY CODE OF ORDINANCES, ARTICLE III, SECTION 3.1, TABLE 1-J TO ALLOW A PRIVATELY OWNED AND OPERATED SOLID WASTE DISPOSAL FACILITY IN AN M(P) PLANNED INDUSTRIAL DISTRICT FOR AN AREA LOCATED EAST OF CLAUDE LEE ROAD, SOUTH OF LAZY ACRES DRIVE. (COUNTY ORDINANCE)

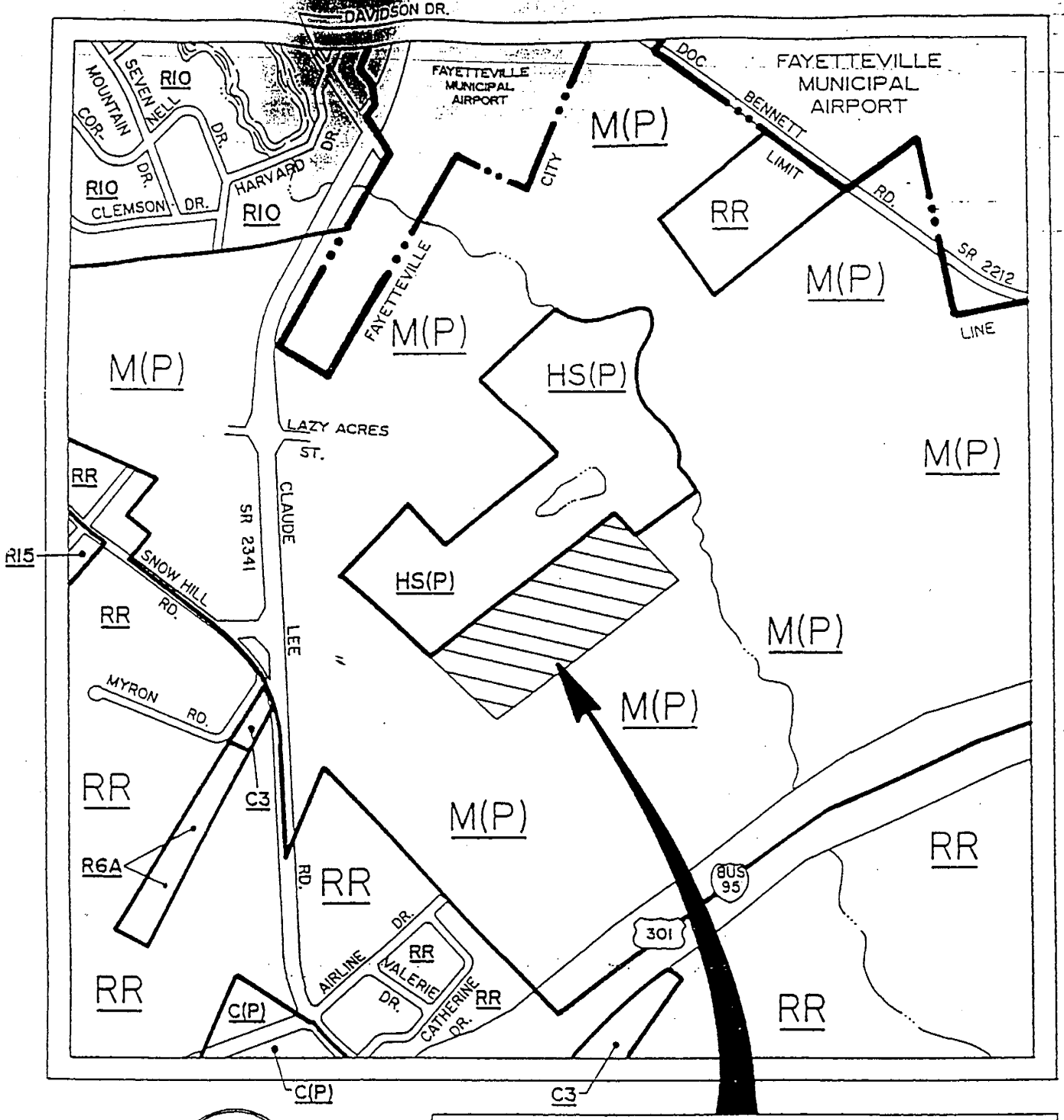
The Cumberland County Board of Adjustment met July 18, 1996 and voted to approve the application subject to the following conditions:

1. That the hours of operation will be from 7:30 a.m. to 5:00 p.m. Monday-Friday and occasionally on Saturday with controlled access to the site during hours of operations.
2. That the 100 foot buffer strip remain;
3. That the conditions in the application to be complied with the Solid Waste Management Department;
4. That the waste be limited only to Solid Waste as defined by the Division of Solid Waste Management in the County.
5. That all local land use, zoning and subdivision requirements be complied with at all times;
6. That a semi-annual report on tonnages or cubic yards processed be submitted to the Cumberland County Solid Waste Management Department;
7. That all letter requirements, NC State DEHNR, Division of Solid Waste Management, dated May 4, 1992, must be complied with and copies of all correspondence with NC State DEHNR be submitted to the Cumberland County Solid Waste Management Department.

FVJ:bjc

cc: Ervin Baer, Attorney
P.O. Box 35110
Fayetteville, NC 28303

Steve Waters
McDonald Grading Co. Inc.
2515 Murchison Road
Fayetteville, NC 28301



NORTH

1000 0 1000

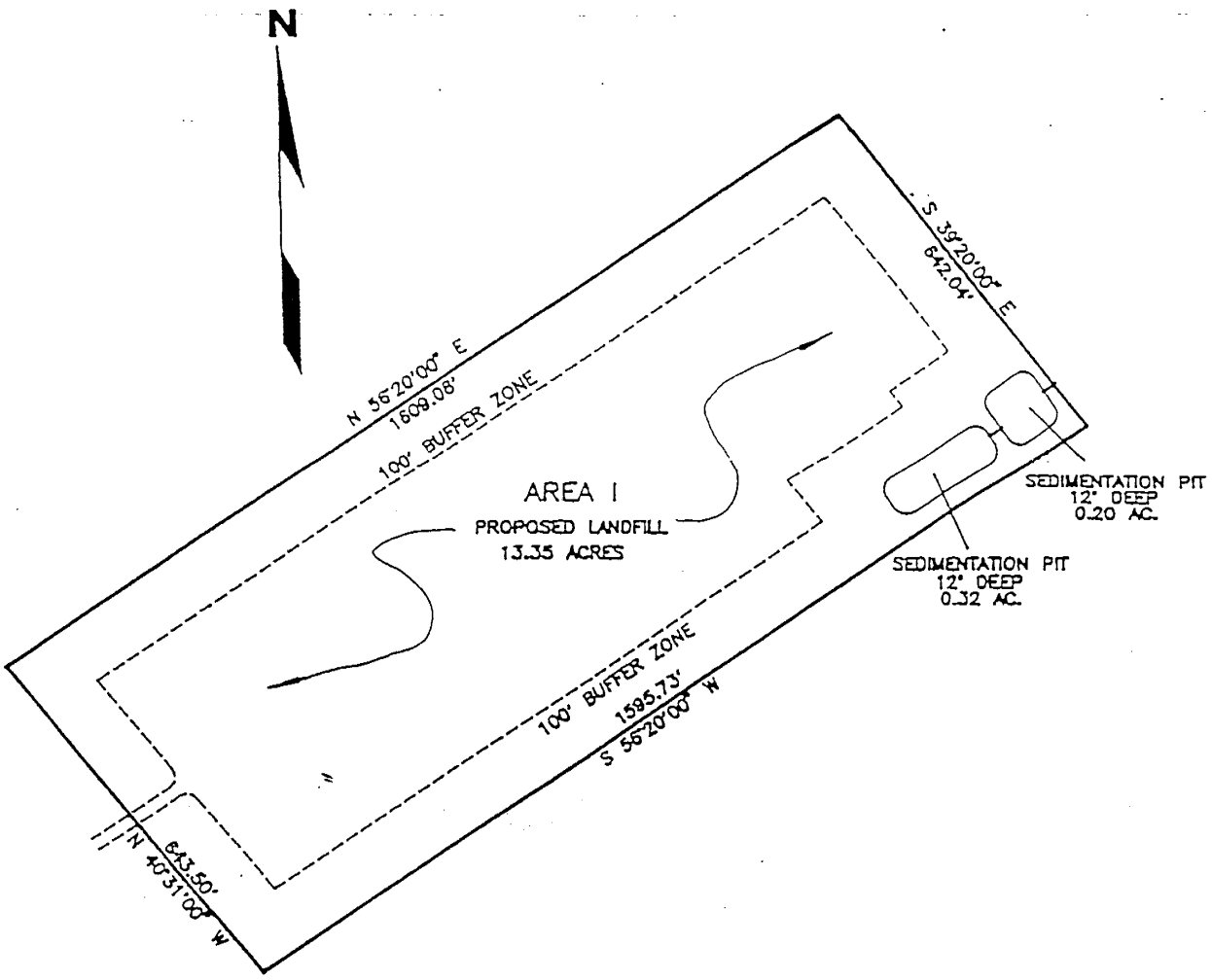
SCALE IN FEET

SPECIFIED CONDITIONAL USE PERMIT

ACREAGE: 23.3 AC.±	HEARING NO: P96-27-C	
ORDINANCE: COUNTY	HEARING DATE	ACTION
GOVERNING BOARD		

PIN: 0434-34-7586

DW



SPECIFIED CONDITIONAL USE PERMIT

CASE NO: P96-27-C ZONED: M(P) SCALE: 1" = 300'

ACREAGE: 23.30 AC± REQUEST: TO ALLOW A PRIVATELY OWNED AND OPERATED SOLID WASTE DISPOSAL FACILITY.

Form WD-101-WARRANTY DEED — For Sale by James Williams & Co., Yadkinville, N. C.

NORTH CAROLINA, CUMBERLAND COUNTY

THIS DEED, made this 2nd day of June, A. D. 19 65

by DOCK A. GARDNER, ERNEST R. MURPHY,

and ETHEL MURPHY LEE

of Cumberland County and State of North Carolina

of the first part, to LACIE C. TEW AND WIFE,

SHIRLEY ANN TEW; ROBERT W. PETERSON AND WIFE,

LELA T. PETERSON

of Cumberland County and State of North Carolina

of the second part:

WITNESSETH, That said parties of the first part,

, in consideration of

other good and valuable considerations and the sum of Ten Dollars

to them paid by said parties of the second part,

the receipt of which is hereby acknowledged have bargained and sold, and by these presents

do grant, bargain, sell and convey to said parties of the second part,

their

heirs and assigns, a certain tract or parcel of land in Rockfish Township

Cumberland County, State of North Carolina, adjoining

the lands of James McCall

and others, and bounded as follows, viz:

BEGINNING at a stake with pine pointers, the easternmost corner of Lot 2, said stake being located North 39 degrees 20 minutes West 19.54 chains from the southeast corner of the original tract, and running thence as the original line South 39 degrees 20 minutes East 9.74 chains to a stake in said line; thence South 56 degrees 20 minutes West as the line of Lot 4, 23.44 chains to a stake with blackjack pointers in James McCall's line; thence as his line North 41 degrees 45 minutes West 9.75 chains to a stake with blackjack pointers, a corner of Lot 2; thence as the line of Lot 2 North 56 degrees 20 minutes East 24.38 chains to the Beginning, containing 23.3 acres, more or less. And being Lot 3 in the division of the lands claimed by the heirs of Simeon Murphy; the parties of the first part being all of the heirs of Liddy Murphy Gardner, deceased.

The grantees shall have the right of ingress and egress on foot or by vehicle from the land hereby conveyed to the public road running from Highway No. 301 to Big Sandy Run Creek, over and across intervening property owned by grantors in this division.

BOOK 1117 PAGE 274

Liddy Murphy Gardner

The above described lands were conveyed to grantors by deed dated March 20, 1959, from Henrietta Murphy et al See Book 775, Page 213

TO HAVE AND TO HOLD the aforesaid tract or parcel of land, and all privileges and appurtenances thereto belonging, to the said parties of the second part, their heirs and assigns, to their only use and behoof forever.

And the said parties of the first part, for themselves and their heirs, executors and administrators, covenant with said parties of the second part and their heirs and assigns, that they are seized of said premises in fee and have the right to convey in fee simple; that the same are free and clear from all encumbrances, and that they do hereby forever warrant and will forever defend the said title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the said parties of the first part have hereunto set their hands and seals, the day and year first above written.

Dock A. Gardner (SEAL)

Ernest R. Murphy (SEAL)

ATTEST: Ethel Murphy Lee (SEAL)

(SEAL)

STATE OF NORTH CAROLINA Cumberland County.

I, Alice B. Murphy, Notary Public, do hereby certify that DOCK A. GARDNER, ERNEST R. MURPHY and ETHEL MURPHY LEE his wife, personally appeared before me this day and acknowledged the due execution of the annexed Deed of Conveyance.

Witness my hand and notarial seal, this 2nd day of June A. D. 1965.

Alice B. Murphy N. P. (Seal)

My commission expires Jan. 26, 1966

STATE OF NORTH CAROLINA Cumberland County.

The foregoing certificate of Alice B. Murphy a Notary Public of Cumberland County, State of North Carolina, is adjudged to be correct. Let the instrument, with the certificates, be registered.

Witness my hand and official seal, this 2nd day of June, A. D. 1965

Barbara Bell Clerk Superior Court.

North Carolina: Cumberland County
Received 2 day June 1965 at 3:15 P.M
Recorded 3 day of June 1965 Book 1117 Page 273
D. Wilson Clark Register of Deeds

MINING PERMIT NO. 26-20

ISSUED BY NCDEHNR - DIVISION OF LAND RESOURCES

OCTOBER 18, 1995

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Land Resources

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Charles Gardner, P.G., P.E.
Director and State Geologist

October 18, 1995

Mr. Stephen Waters
McDonald Grading Company, Inc.
2515 Murchison Road
Fayetteville, North Carolina 28301

Re: Permit No. 26-20
Snow Hill Pit
Cumberland County

Dear Mr. Waters:

Your application for renewal of the above referenced mining permit has been approved. A copy of the renewed permit is enclosed.

The conditions in the permit renewal were based primarily upon the initial application. Modifications were made as indicated by the renewal request and as required to insure compliance with The Mining Act of 1971. The new expiration date is October 18, 2005.

An inspection was made of the above mine on September 26, 1995 in accordance with G.S. 74-56 of the Mining Act of 1971.

The 15.25 acre portion of Area I, as delineated on the revised mine map received by the Land Quality Section on September 22, 1995, was found to be satisfactorily reclaimed. Therefore, you are released from further reclamation responsibility for this area with respect to the Mining Act of 1971.

As a reminder, your permitted acreage at this site is 55.37 acres and the amount of land you are approved to disturb is 45.93 acres.

Please review the renewed permit and advise this office at (919) 733-4574 should you have any questions concerning this matter.

Very truly yours,

Charles H. Gardner, P.G., P.E.

CHG/tls
Enclosure
cc: Mr. Joseph E. Glass, P.E.
Ms. Barbara Rote-WRC, w/attachments

DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES

DIVISION OF LAND RESOURCES

LAND QUALITY SECTION

P E R M I T

for the operation of a mining activity

In accordance with the provisions of G.S. 74-46 through 68, "The Mining Act of 1971," Mining Permit Rule 15A NCAC 5 B, and other applicable laws, rules and regulations

Permission is hereby granted to:

McDonald Grading Company, Inc.

Snow Hill Pit

Cumberland County - Permit No. 26-20

for the operation of a

Sand Pit

which shall provide that the usefulness, productivity and scenic values of all lands and waters affected by this mining operation will receive the greatest practical degree of protection and restoration.

MINING PERMIT EXPIRATION DATE: October 18, 2005

In accordance with the application for this mining permit, which is hereby approved by the Department of Environment, Health and Natural Resources, hereinafter referred to as the Department, and in conformity with the approved Reclamation Plan attached to and incorporated as part of this permit, provisions must be made for the protection of the surrounding environment and for reclamation of the land and water affected by the permitted mining operation. This permit is expressly conditioned upon compliance with all the requirements of the approved Reclamation Plan. However, completed performance of the approved Reclamation Plan is a separable obligation, secured by the bond or other security on file with the Department, and may survive the expiration, revocation or suspension of this permit.

This permit is not transferable by the permittee with the following exception: If another operator succeeds to the interest of the permittee in the permitted mining operation, by virtue of a sale, lease, assignment or otherwise, the Department may release the permittee from the duties imposed upon him by the conditions of his permit and by the Mining Act with reference to the permitted operation, and transfer the permit to the successor operator, provided that both operators have complied with the requirements of the Mining Act and that the successor operator agrees to assume the duties of the permittee with reference to reclamation of the affected land and posts a suitable bond or other security.

In the event that the Department determines that the permittee or permittee's successor is not complying with the Reclamation Plan or other terms and conditions of this permit, or is failing to achieve the purposes and requirements of the Mining Act, the Department may give the operator written notice of its intent to modify, revoke or suspend the permit, or its intent to modify the Reclamation Plan as incorporated in the permit. The operator shall have right to a hearing at a designated time and place on any proposed modification, revocation or suspension by the Department. Alternatively and in addition to the above, the Department may institute other enforcement procedures authorized by law.

Definitions

Wherever used or referred to in this permit, unless the context clearly indicates otherwise, terms shall have the same meaning as supplied by the Mining Act, N.C.G.S. 74-49.

Modifications

April 2, 1990: This permit has been modified to include Area II (32 acres) as delineated on the revised mine map dated February, 1990.

December 9, 1993: This permit has been modified to allow mining in the areas designated as the "3.0 Acres In Use" and the "10.0 Acres Future Expansion" on the mine map dated February 1990 and revised October 4, 1993. Furthermore, this modification also allows the buffers between the Barnhill Contracting Company Webb Pit (Mining Permit No. 26-31) and this mining permit to be mined.

October 18, 1995: This permit has been modified to release 15.25 acres of previously mined land in Area I as indicated on the revised mine map received by the Land Quality Section on September 22, 1995.

Expiration Date

This permit shall be effective from the date of its issuance until October 18, 2005.

Conditions

This permit shall be subject to the provisions of the Mining Act, N.C.G.S. 74-46, et. seq., and to the following conditions and limitations:

OPERATING CONDITIONS:

1. A. Any wastewater processing or mine dewatering shall be in accordance with the permitting requirements and rules promulgated by the N.C. Environmental Management Commission.

   B. Any stormwater runoff from the affected areas at the site shall be in accordance with any applicable permit requirements and regulations promulgated by the Environmental Protection Agency and enforced by the N.C. Environmental Management Commission. It shall be the permittee's responsibility to contact the Water Quality Section, Division of Environmental Management, to secure any necessary stormwater permits or other approval documents.

2. A. Any mining process producing air contamination emissions shall be subject to the permitting requirements and rules promulgated by the N.C. Environmental Management Commission.

   B. During mining operations, water trucks or other means that may be necessary shall be utilized to prevent dust from leaving the permitted area.

3. A. Sufficient buffer shall be maintained between any affected land and any adjoining waterway to prevent sedimentation of that waterway from erosion of the affected land and to preserve the integrity of the natural watercourse.

   B. All buffers shall be maintained as indicated on the revised mine map received by the Land Quality Section on September 22, 1995.

   C. Any mining activity affecting waters of the State, waters of the U. S., or wetlands shall be in accordance with the requirements and regulations promulgated and enforced by the N. C. Environmental Management Commission.

4. A. Adequate mechanical barriers including but not limited to diversions, earthen dikes, silt check dams, silt retarding structures, rip rap pits, or ditches shall be provided in the initial stages of any land disturbance and maintained to prevent sediment from discharging onto adjacent surface areas or into any lake or natural watercourse in proximity to the affected land.

   B. All drainage from the affected area around the mine excavation shall be diverted internal to said excavation or into the existing sedimentation pits.

5. All mining permit boundaries (55.37 acres) shall be permanently marked at the site on 100 foot intervals unless the line of sight allows for larger spacing intervals.

6. The angle for graded slopes and fills shall be no greater than the angle which can be retained by vegetative cover or other adequate erosion control measure, structure, or device. In any event, exposed slopes or any excavated channels, the erosion of which may cause off-site damage because of siltation, shall be planted or otherwise provided with ground cover, devices or structures sufficient to restrain such erosion.

7. The affected land shall be graded so as to prevent collection of pools of water that are, or likely to become, noxious or foul. Necessary structures such as drainage ditches or conduits shall be constructed or installed when required to prevent such conditions.

8. Existing vegetation or vegetated earthen berms shall be maintained between the mine and public thoroughfares whenever practical to screen the operation from the public.

9. A. Sufficient buffer shall be maintained between any excavation and any adjoining permit boundary or right-of-way to prevent caving of that property and to allow grading of the side-slopes to the required angle.

   B. As indicated in the letter from Mr. Steve Waters with McDonald Grading Company, Inc. dated September 8, 1993, the buffers along the common permit boundaries between Barnhill Contracting Company's Webb Pit (Mining Permit No. 26-31) and the McDonald Grading Company's Snow Hill Pit shall be mined. <u>If for any reason either company does not completely mine through their respective buffer, 50 foot wide buffers shall be re-established and maintained by both companies along the common permit boundaries.</u>

   C. In areas except as noted in item 9B above, a 50 foot undisturbed buffer shall be maintained along all permit boundaries.

10. A physical barrier consisting of a fence or earthen berm, etc., shall be maintained around the perimeter of any highwall.

11. Refuse Disposal

A. No on-site disposal of refuse or other solid waste that is generated outside of the mining permit area shall be allowed within the boundaries of the mining permit area unless authorization to conduct said disposal has first been obtained from both the Division of Solid Waste Management and the Land Quality Section, Department of Environment, Health and Natural Resources. The method of disposal shall be consistent with the approved reclamation plan.

B. Mining refuse as defined by G.S. 74-49 (14) of The Mining Act of 1971 generated on-site and directly associated with the mining activity may be disposed of in a designated refuse area. All other waste products must be disposed of in a disposal facility approved by the Division of Solid Waste Management. No petroleum products, acids, solvents or their storage containers or any other material that may be considered hazardous shall be disposed of within the permitted area.

12. An Annual Reclamation Report shall be submitted on a form supplied by the Department by February 1 of each year until reclamation is completed and approved.

13. The operator shall notify the Department in writing of the desire to delete, modify or otherwise change any part of the mining, reclamation, or erosion/sediment control plan contained in the approved application for a mining permit and any approved revisions to it. Approval to implement such changes must be obtained from the Department prior to on-site implementation of the revisions.

14. The security which was posted pursuant to N.C.G.S. 74-54 in the form of a $168,300.00 surety bond is sufficient to cover the operation as indicated on the approved application. This security must remain in force for this permit to be valid. The total affected land shall not exceed the bonded acreage.

15. A. Authorized representatives of the Division of Archives and History shall be granted access to the site to determine the presence of significant archaeological resources.

B. Pursuant to N. C. G. S. 70 Article 3, "The Unmarked Human Burial and Human Skeletal Remains Protection Act," should the operator or any person in his employ encounter human skeletal remains, immediate notification shall be provided to the county medical examiner and the chief archaeologist, North Carolina Division of Archives and History.

APPROVED RECLAMATION PLAN

The Mining Permit incorporates this Reclamation Plan, the performance of which is a condition on the continuing validity of that Mining Permit. Additionally, the Reclamation Plan is a separable obligation of the permittee, which continues beyond the terms of the Mining Permit.

The approved plan provides:

Minimum Standards As Provided By G.S. 74-53

1. The final slopes in all excavations in soil, sand, gravel and other unconsolidated materials shall be at such an angle as to minimize the possibility of slides and be consistent with the future use of the land.

2. Provisions for safety to persons and to adjoining property must be provided in all excavations in rock.

3. All overburden and spoil shall be left in a configuration which is in accordance with accepted conservation practices and which is suitable for the proposed subsequent use of the land.

4. No small pools of water shall be allowed to collect or remain on the mined area that are, likely to become noxious, odious or foul.

5. The revegetation plan shall conform to accepted and recommended agronomic and reforestation practices as established by the North Carolina Agricultural Experiment Station and the North Carolina Forest Service.

6. Permittee shall conduct reclamation activities pursuant to the Reclamation Plan herein incorporated. These activities shall be conducted according to the time schedule included in the plan, which shall to the extent feasible provide reclamation simultaneous with mining operations and in any event, provide reclamation at the earliest practicable time after completion or termination of mining on any segment of the permit area and shall be completed within two years after completion or termination of mining.

RECLAMATION CONDITIONS:

1. Provided further, and subject to the Reclamation Schedule, the planned reclamation shall be to regrade and satisfactorily revegetate any disturbed areas.

2. The specifications for surface gradient restoration to a surface suitable for the planned future use are as follows:

   A. All sideslopes shall be graded to a 2 horizontal to 1 vertical or flatter slope.

   B. All settling ponds and sediment control basins shall be backfilled, graded, and stabilized or cleaned out and made into acceptable lake areas.

   C. The processing, stockpile, and other disturbed areas neighboring the mine excavation shall be leveled and smoothed.

   D. Compacted surfaces shall be disced, subsoiled or otherwise prepared before revegetation.

   E. No contaminants shall be permanently disposed of at the mine site. On-site disposal of waste shall be in accordance with Operating Condition No. 11.A. and B.

   F. The affected land shall be graded to prevent the collection of noxious or foul water.

3. Revegetation Plan:

   After site preparation, all disturbed land areas shall be revegetated as per the following:

   Permanent Seeding Specifications

Dates	Species	Rate, Lbs/Acre
February 15- April 1	Kobe Lespedeza	10
	Bahiagrass	50
	Redtop	1
	Winter rye (grain)	15
April 1- July 31	Common Bermuda	50
August 1- October 25	Lespedeza (unscarified)	30
	German millet	40
October 25- February 15	Rye (grain- temporary)	120

   Soil Amendments

   Lime- 2000 lbs/acre or follow recommendations from a soil test.

   Fertilizer- 1000 lbs/acre 8-8-8 or 10-10-10, or follow recommendations from a soil test.

   Mulch- All seeded areas shall be mulched using small grain straw at a rate of 2000 lbs/acre and anchored appropriately.

In addition, the permittee shall consult with a professional wildlife biologist with the N.C. Wildlife Resources Commission and the local County Ranger with the N.C. Forest Service to enhance post-project wildlife habitat at the site.

4. Reclamation Schedule

Reclamation shall be conducted simultaneously with mining to the extent feasible. In any event, reclamation shall be initiated as soon as feasible after completion or termination of mining of any mine segment under permit. Final reclamation, including revegetation, shall be completed within two years of completion or termination of mining.

This permit, issued July 30, 1985 and modified April 2, 1990 and December 9, 1993, is hereby renewed this 18th day of October, 1995 pursuant to G.S. 74-52.

Charles H. Gardner, Director
Division of Land Resources
By Authority of the Secretary
Of the Department of Environment, Health and Natural Resources

MINING PERMIT APPLICATION

SUBMITTED BY MCDONALD GRADING COMPANY, INC.

REVISED PERMIT APPLICATION

REVISED 8/94

GES 2+3 REVISED 06/29/95 TO REFLECT TEA 3 ON MINE MAP

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

LAND QUALITY SECTION

APPLICATION FOR A MINING PERMIT

(PLEASE PRINT OR TYPE)

1. Name of Mine SNOW HILL PIT County CUMBERLAND
2. Name of Applicant* MCDONALD GRADING COMPANY, INC.
3. Permanent address for receipt of official mail** 2515 MURCHISON ROAD
   FAYETTEVILLE NC 28301
   Telephone (910) 488-6483
4. Mine Office Address 2515 MURCHISON ROAD, FAYETTEVILLE, NC @*#)!
   Telephone (910) 488-6483
5. Mine Manager JERRY MCDONALD

We hereby certify that all details contained in this Permit Application are true and correct to the best of our knowledge. We fully understand that any willful misrepresentation of facts will be cause for permit revocation.

***Signature Jerry F McDonald Date MAY 16, 1995

Print Name JERRY F. MCDONALD

Title PRESIDENT, MCDONALD GRADING COMPANY, INC.

* This will be the name that the mining permit will be issued to and the name that must be indicated on the reclamation bond or other security that corresponds to this site.

** The Land Quality Section must be notified of any changes in the permanent address or telephone number.

*** Signature of company officer required.

G.S. 74-51 provides that the Department shall grant or deny an application for a permit within 60 days of receipt of a complete application or, if a public hearing is held, within 30 days following the hearing and the filing of any supplemental information required by the Department. **All questions must be addressed and all required maps provided before this application can be considered complete. Attach additional sheets as needed.**

APPLICATION FOR A MINING PERMIT

■ NOTE: All of the following questions must be thoroughly answered with regards to your mining operation for the intended life of the mine. All responses must be clearly conveyed on a corresponding, detailed mine map.

A. GENERAL CHARACTERISTICS OF THE MINE

Answer all of the following that apply:

1. a. If this is an application for a NEW permit, indicate the total acreage at the site to be covered by the permit (this is the acreage that the "new permit" fee will be based upon):_____

Of this acreage, how much is owned and how much is leased? Acres owned:_____ Acres leased:_____ Property owner if leased:_____

b. If this is an application for RENEWAL of a mining permit, indicate the mining permit number and the total (overall) acreage covered by the existing permit: Mining Permit No.: 26-20 Total permitted acreage (this is the acreage that the "renewal" fee will be based upon): 70.62 ACRES TO INCLUDE AREAS I,II,AND III.

c. If this is an application for a MODIFICATION to a mining permit, indicate the mining permit number and the total (overall) acreage covered by the existing permit: Mining Permit No.:_____ Total permitted acreage:_____

Does the modification involve acreage within the previously approved permitted boundary? Yes___ No___. If yes, indicate the acreage to be covered by this modification (this is the acreage that the "major modification" fee will be based upon):_____

Does the modification involve acreage outside the previously approved permitted boundary? Yes___ No___. If yes, indicate the additional acreage to be covered by this modification:_____ (NOTE: you must complete all of Section F. of this application form entitled Notification of Adjoining Landowners).

Of this acreage to be added to the permit, will any portion of this acreage be affected (disturbed, ground cover removed) by the mining operation? Yes___ No___ (if no, a "minor modification" fee of $50.00 is required, despite the "undisturbed" acreage to be added). If yes, indicate the acreage to be affected within the acreage to be added to the permit (the total acreage to be added to the permit is the acreage that the "major modification" fee will be based upon):_____

d. If this is an application for TRANSFER of a mining permit, indicate the mining permit number and the total (overall) acreage covered by the existing permit: Mining Permit No.:_____ Total permitted acreage:_____

■ SEE THE FEE SCHEDULE AT THE END OF THIS FORM FOR THE PROPER FEE AMOUNT TO BE PAID FOR THE REQUESTED PERMIT ACTION(S) AND CORRESPONDING ACREAGE NOTED ABOVE

2. Indicate the approximate longitude and latitude, in degrees-minutes-seconds, of the center of the mine site: LONGITUDE (dd-mm-ss): 78° - 53' - 25" Quadrangle: NA
LATITUDE (dd-mm-ss): 34° - 58' - 07" NAD 27

3. Name of all materials mined: SAND AND CLAY

APPLICATION FOR A MINING PERMIT

4. Mining method: Hydraulic Dredge _____ Front-end Loader & Truck __X__ Shovel & Truck ___
Dragline & Truck _____ Self-loading Scraper _____ Other (explain) _____

5. a. Expected maximum depth of mine (feet) __15'__ Reference elevation: 167
b. Expected average depth of mine (feet) ____12'____

6. Has any area(s) at this site been mined in the past? Yes_X_ No____ If no, proceed to Question 7.
a. Acreage of previously affected land(s) at present site that has not been reclaimed: 70.62 acres (identify all areas on your mine map(s)).
b. When and by whom was this activity conducted? MCDONALD GRADING HAS MINED OUT AREA I AND IS IN PROCESS OF RECLAIMING AND RELEASING
c. Acreage of previously affected land at present site that has been reclaimed: ____0____ acres (identify all areas on your mine map(s)).
d. When and by whom was this activity conducted? NA
e. Do you wish to exclude any areas noted in 6a or c from this permit application? Yes____ No__X__. If yes, how much? _____ acres (identify all areas on your mine map(s)).

7. Present (pre-mining) use of the land (estimate acreage for each):
Cropland _____acres Pasture _____acres Forestry _____acres Fish/Wildlife _____acres
Recreation _____acres Other 70.62 acres (Specify use: NATURAL WOODLANDS AND GRASSY)AREA

8. Proposed land use after mining and reclamation has been completed (estimate acreage for each):
Cropland _____acres Pasture _____acres Forestry _____acres Fish/Wildlife _____acres
Recreation _____acres Other 70.62 acres (Specify use: POSSIBLE DEVELOPMENT)

9. Number of years for which the permit is requested (10 years maximum): ____10____

B. MAPS

1. **Four (4) copies** of the county highway maps and **four (4) copies** of all mine maps and reclamation maps shall be submitted with each permit application.

County highway maps may be obtained from:

Location Department
State Highway Commission
Raleigh, North Carolina 27602
(919) 733-7600

Clearly label and mark the location of your mining operation on the county highway maps.

2. Mine maps must be accurate and appropriately scaled drawings, aerial photographs or enlarged topographic maps of the entire mine site. **All aspects of the mine site must be clearly labeled on the maps along with their corresponding (approximate) acreage. As a reminder, mining permits can only be issued for up to 10 years; thus, all mine and reclamation maps must only denote those activities that are intended to be conducted during the life of the mining permit.** All maps must be of a scale sufficient (see minimum requirements listed below) to clearly illustrate the following, <u>at a minimum</u>:

   a. Property lines of the tract or tracts of land on which the proposed mining activity is to be located including easements and rights-of-way.
   b. Existing or proposed permit boundaries.
   c. Initial and ultimate limits of clearing and grading.d.Outline and width of all buffer zones (both undisturbed and unexcavated).
   e. Outline and acreage of all pits/excavations.
   f. Outline and acreage of all stockpile areas.
   g. Outline and acreage of all temporary and/or permanent overburden disposal areas.
   h. Location and acreage of all processing plants (processing plants may be described as to location and distance from mine if sufficiently far removed).
   i. Locations and names of all streams, rivers and lakes.
   j. Outline and acreage of all settling and/or processing wastewater ponds.
   k. Location and acreage of all planned and existing access roads and on-site haul roads.
   l. Location of planned and existing on-site buildings.
   m. Location and dimensions of all proposed sediment and erosion control measures.
   n. Location of 100 year floodplain limits and wetland boundaries.
   o. Names of owners of record, both public and private, of all adjoining land.
   p. Map legend:

      1. Name of applicant
      2. Name of mine
      3. North arrow
      4. County
      5. Scale
      6. Symbols used and corresponding names
      7. Date prepared and revised
      8. Name and title of person preparing map

Map scales must, at a minimum, meet the following guidelines:

PERMITTED ACREAGE	MAP SCALE
0-99 Acres	1 inch = 50 feet
100-499 Acres	1 inch = 100 feet
500+ Acres	1 inch = 200 feet

APPLICATION FOR A MINING PERMIT

A table/chart must be provided on the mine map that clearly lists the approximate acreage of tailings/sediment ponds, stockpiles, wastepiles, processing area/haul roads, mine excavation and any other major aspect of the mining operation that is proposed to be affected/disturbed during the life of the mining permit. A table/chart similar to the following will be acceptable:

CATEGORY	AFFECTED ACREAGE
Tailings/Sediment Ponds	AREA 1 (.52AC) AREA II (.33AC)
Stockpiles	1.73 AC
Wastepiles	0
Processing Area/Haul Roads	.56AC
Mine Excavation	AREA 1 (0 AC.) AREA II (33.79 AC)
Other (STORAGE AREA)	.06 AC

NOTE: IN ADDITION TO THE ABOVE, THE MAPS MUST ALSO INCLUDE ANY SITE-SPECIFIC INFORMATION THAT IS PROVIDED IN THE ANSWERS TO THE FOLLOWING QUESTIONS IN THIS APPLICATION FORM (PLEASE NOTE THE ITALICIZED QUESTIONS/STATEMENTS THROUGHOUT THE FORM). THIS APPLICATION WILL NOT BE CONSIDERED COMPLETE WITHOUT ALL RELEVANT ITEMS BEING ADEQUATELY ADDRESSED ON THE MINE MAPS.

APPLICATION FOR A MINING PERMIT

C. PROTECTION OF NATURAL RESOURCES

1. a. Will the operation involve washing the material mined, recycling process water, or other waste water handling? Yes_____ No__X___. If yes, briefly describe all such processes including any chemicals to be used.

b. Will the operation involve discharging fresh or waste water from the mine or plant? Yes_____ No__X___. *If yes, briefly describe the nature of the discharge and locate all proposed discharge points (along with their method of stabilization) on your mine map(s).*

c. Will any part of the proposed mine excavation(s) extend below the water table? Yes___ No__X. If yes, do you intend to dewater the excavation(s)? Yes___ No____. If yes, what impact, if any, will mine dewatering have on neighboring wells? *Locate all existing wells on the mine map(s) that lie within 500 feet of the proposed excavation area.* Provide data to support any conclusions or statements made. Indicate whether the proposed mine locale is served by a public water system or private wells.

d. If the mine will extend below the water table, what is the pre-mining depth (in feet) to the seasonal high and low ground water tables? High _____ft. Low _____ft. What is the source of this information?

NA

e. If you answered yes to any of the above questions, provide evidence that you have applied for or obtained the appropriate water quality permit(s) (i.e., non-discharge, NPDES, etc.) from the Division of Environmental Management, Water Quality Section.

NA

2. a. Will the operation involve crushing or any other air contaminant emissions? Yes_____ No__X__. If yes, indicate evidence that you have applied for or obtained an air quality permit issued by the Division of Environmental Management, Air Quality Section, or local governing body.

   b. How will dust from stockpiles, haul roads, etc., be controlled?
   NEW HAUL ROAD TO BE CONSTRUCTED IN 1995 IS PROPOSED TO BE COVERED WITH HIGHWAY MILLINGS TO CONTROL DUST. WATER WILL BE PUT ON TRAVEL AREAS IN THE MINE VIA WATER TRUCK TO KEEP DOWN DUST AS NEEDED.

3. Describe in detail the chronological sequence of land disturbing activities and *reference the sequence to the mine map(s).* Attach additional sheets as needed.
   AREA I OF MINE MAP IS MINED OUT AND INTENDED TO BE RELEASED IN 1995. A 12' to 15'CUT IS EXPECTED TO BE MADE ACROSS THE AREA LOCATED ON THE MINE MAP AS 22.38 ACRES OPEN EXCAVATION IN AREA II OVER THE LIFE OF THE PERMIT. IF THIS AREA IS MINED OUT PRIOR TO THE END OF THIS PERMIT THEN IT IS INTENDED TO START MINING IN THE 11.74 ACRES LABELLED AS FUTURE EXCAVATION AREA.

4. Describe specific erosion control measures to be installed prior to land disturbing activities and during mining to prevent offsite sedimentation *(include specific plans for sediment and erosion control for mine excavation(s), waste piles, access/mine roads and process areas)*, and give a detailed sequence of installation and schedule for maintenance of the measures. *Locate and label all sediment and erosion control measures on the mine map(s) and provide typical cross-sections/construction details of each measure.* Engineering designs and calculations shall be required when needed to justify the adequacy of any proposed measures.
   THERE ARE TWO SEDIMENTATION PONDS BEING MAINTAINED IN AREA I ON THE MAP. THE PONDS WERE BUILT SOMETIME DURING THE MID 80'S WHEN WE STARTED MINING THAT AREA AND HAVE BEEN MAINTAINED CONSTANTLY. THEY ARE CLEANED OUT PERIODICALLY AS NEEDED. THESE TWO PONDS SERVE ALL OF AREA I AS WELL AS A LARGE PART OF AREA II.
   THERE WERE TWO SEDIMENTATION PONDS BUILT IN AREA II OF THE MAP IN 1994. THESE TWO PONDS ARE INTENDED TO OFFER SOME RELIEF TO THE PONDS IN AREA I AS WE MAKE OUR CUT ACROSS THE OPEN EXCAVATION PORTION OF AREA II. THESE TWO PONDS WILL ALSO BE CLEANED OUT PERIODICALLY AS NEEDED.

5. a. How wide a buffer will be maintained between any mining activity and any adjoining permit boundary or right-of-way? Buffers must be located within the permit boundaries. Buffers along permit boundaries must be, at a minimum, unexcavated buffers. *Show all buffer locations and widths on the mine map(s).*

A BUFFER ZONE OF 50 FEET WILL BE MAINTAINED ALONG ALL BOUNDARY LINES WITH THE EXCEPTION OF BOUNDARY LABELLED N 27' 45' 00" E THAT IS BEING MINED SIMULTANEOUSLY BY BARNHILL CONTRACTING. PERMISSION FOR THIS WAS GRANTED IN MODIFICATION TO OUR PERMIT IN 1993.

b. How wide a buffer will be maintained between any land disturbing activities within the permit boundaries and any natural watercourses and wetlands? Buffers along natural watercourses and wetlands must be undisturbed. *Show all buffer locations and widths on the mine map(s).*

NA

6. a. Describe methods to prevent landslide or slope instability adjacent to adjoining permit boundaries during mining.

WE INTEND TO MAINTAIN AT LEAST 2/1 SLOPES FROM INSIDE PIT TO ADJOINING PROPERTY LINES. WE INTEND TO CONSTANTLY MONITOR AND MAINTAIN VEGETATION ON ALL SLOPES BY SPREADING TOP SOIL ON SLOPES THEN FERTILIZING, LIMING, SEEDING, AND MULCHING SLOPES AS NEEDED.

b. Describe other methods to be taken during mining to prevent physical hazard to any neighboring dwelling house, public road, public, commercial or industrial building from any mine excavation. *Locate all such structures on the mine map if they are within 300 feet of any proposed excavation.*

THERE ARE NO BUILDINGS, DWELLINGS, OR ROADS AFFECTED BY THIS MINING OPERATION.

c. Describe what kind of barricade will be used to prevent inadvertent public access along any high wall area and when it will be implemented. Vegetated earthen berms, appropriate fencing and adequate boulder barriers may be acceptable high wall barricades. *A construction detail/cross-section and location of each type of barricade to be used must be indicated on the mine map(s).*

IT IS OUR INTENT TO SLOPE ALL BANKS AS THE MINING OPERATION PROGRESSES IN ORDER TO PREVENT HAVING ANY HIGH WALL AREAS.

d. *Provide a cross-section on the mine map(s) for all fill slopes (berms, wastepiles, overburden disposal areas, etc.), clearly indicating the intended side slope gradient, installation of any benches and/or slope drains (with supporting design information) if needed, and the method of final stabilization.*

NA

e. *In excavation(s) of unconsolidated (non-rock) materials, specify the angle of all cut slopes including specifications for benching and sloping. Cross-sections for all cut slopes must be provided on the mine map(s).*

AT LEAST 2/1 SLOPES WILL BE MAINTAINED WHERE SLOPING IS NECESSARY OR AS DIRECTED BY DEHNR.

f. In hardrock excavations, specify proposed bench widths and heights in feet. *Provide cross-sections of the mine excavation clearly noting the angles of the cut slopes, widths of all safety benches and mine benches, and the expected maximum depth of the excavation.*

NA

7. Are acid producing minerals or soils present? Yes_____ No_X_. How will acid water pollution from the excavation, stockpiles and waste areas be controlled?

8. Describe specific plans (including a schedule of implementation) for screening the operation from public view such as maintaining or planting trees, bushes or other vegetation, building berms or other measures. *Show the location of all visual screening on the mine map(s) and provide cross-sections through all proposed berms or proposed spacings, sizes and species for tree plantings.*

THE AREA TO BE MINED IS SURROUNDED BY NATURAL WOODED AREA.

9. Will explosives be used? Yes____ No__X__. If yes, specify the types of explosive(s) and describe what precaution(s) will be used to prevent physical hazard to persons or neighboring property from flying rocks or excessive air blasts or ground vibrations. *Locate the nearest offsite occupied structure(s) to the proposed excavation(s) on the mine map and indicate its approximate distance to the proposed excavation.*

10. Will fuel tanks, solvents, or other chemical reagents be stored on-site? Yes__X__ No_____. *If yes, describe these materials, how they will be stored and method of containment in case of spill. Indicate the location(s) of all storage facilities on the mine map(s).*

THERE IS A 280 GALLON FUEL TANK LOCATED INSIDE A 70'X70' FENCED AREA SHOWN ON THE MINE MAP AS STORAGE AREA IN THE FUTURE EXCAVATION AREA. THE TANK IS SITTING ON A 6'X6'X6" CONCRETE PAD SURROUNDED BY CONCRETE BLOCK WALLS THAT EXTEND ABOVE THE TANK TO PROTECT IT FROM VANDALISM AND ALSO TO CONTAIN ANY FUEL IN THE EVENT OF RUPTURED OR DAMAGED TANK.

11. Are any processing waste, overburden or other such mine wastes to be disposed of off-site? Yes____ No__X__. If yes, describe in detail what these wastes are and how they will be disposed. *Attach a separate site map(s) showing the location(s) of the disposal area(s). Include all specifications for erosion and sediment control.*

APPLICATION FOR A MINING PERMIT

D. RECLAMATION PLAN

1. Describe your intended plan for the final reclamation and subsequent use of all affected lands and indicate the general methods to be used in reclaiming this land. *This information must be illustrated on a reclamation map and must correspond directly with the information provided on the mine map(s).*

ALL AFFECTED LANDS WILL BE GRADED SO AS TO PROVIDE FOR ADEQUATE DRAINAGE. THESE AREAS WILL BE PLANTED WITH APPROVED GROUND COVER VEGETATION AND CLOSELY MONITORED FOR THOROUGH COVERAGE. ALL SIDE SLOPES WILL BE PLANTED WITH APPROVED GROUND COVER AND MAINTAINED UNTIL RELEASED.

2. a. Is an excavated or impounded body of water to be left as a part of the reclamation? Yes_____ No_X_____. *If yes, illustrate the location of the body(s) of water on the reclamation map and provide a scaled cross-section(s) through the proposed body(s) of water.* The minimum average water depth must be at least 4 feet unless information is provided to indicate that a more shallow water body will be productive and beneficial at this site. Will the body(s) of water be stocked with fish? Yes_____ No_____. If yes, specify species.

b. Describe provisions for prevention of noxious, odious or foul water collecting or remaining in mined areas. *Provide details and locations of any permanent water outlets on the reclamation map.*

ALL AFFECTED LANDS WILL BE GRADED SO WATER WILL FAN OUT OVER A LARGE AREA AND DRAIN TOWARD SEDIMENTATION PONDS. THE SEDIMENTATION PONDS HAVE SANDY FLOORS FOR WATER TO SOAK THROUGH AND THEY WILL BE CLEANED OUT ROUTINELY.

3. Describe provisions for safety to persons and to adjoining property in all completed excavations in rock including what kind of permanent barricade will be left. *Construction details and locations of all permanent barricades must be shown on the reclamation map.*

NA

4. Indicate the method(s) of reclamation of overburden, refuse, spoil banks or other such on-site mine waste areas, including specifications for benching and sloping. *Final cross-sections and locations for such areas must be provided on the reclamation map.*

THERE IS NOT EXPECTED TO BE ANY OVERBURDEN, REFUSE, SPOIL BANKS, OR ON SITE MINE WASTE. ALL BRUSH RESULTING FROM ANY CLEARING OF FUTURE EXCAVATION AREA WILL BE BURNED ON SITE UPON RECEIPT OF BURNING PERMIT FROM LOCAL AUTHORITIES. ALL STRIPPINGS ACCUMULATED WILL BE STOCK PILED IN AREA LABELLED ON MINE MAP AND USED AS GROUND COVER ONCE AREA IS READY FOR RECLAIMATION.

5. a. Describe reclamation of processing facilities, stockpile areas, and on-site roadways.

STOCK PILE AREAS AND ON SITE ROADWAYS WILL BE GRADED TO FACILITATE PROPER DRAINAGE AND PLANTED WITH APPROVED GROUND COVER VEGETATION AND MAINTAINED PENDING RELEASE.

b. Will any on-site roadways be left as part of the reclamation? Yes_____ No__X__. *If yes, identify such roadways on the reclamation map and provide details on permanent ditch line stabilization.*

6. Describe the method of reclamation of settling ponds and/or sediment control basins.

RECLAMATION BY GRADING FOR POSITIVE DRAINAGE AND REVEGETATING.

7. Describe the method of control of contaminants and disposal of scrap metal, junk machinery, cables, or other such waste products of mining. (Note definition of refuse in The Mining Act of 1971). No off-site generated waste shall be disposed of on the mine site without prior written approval from the NC Department of Environment, Health, and Natural Resources, Land Quality Section and either the Division of Solid Waste Management (DSWM) or local governing body. If a disposal permit has been issued by DSWM for the site, a copy of said permit must be attached to this application. *All temporary and permanent refuse disposal areas must be clearly delineated on the mine map(s) and reclamation map, along with a list of items to be disposed in said areas.*

NA

8. Indicate the method of restoration or establishment of any permanent drainage channels to a condition minimizing erosion, siltation and other pollution. *Provide design information, including typical cross-sections, of any permanent channels to be constructed as part of the reclamation plan. Indicate the location(s) of all permanent channels on the reclamation map.*

NA

9. Provide a schedule of reclamation that indicates the sequence of reclamation and approximate time frame. *If reclamation is to be accomplished concurrently with mining, then clearly indicate on the mine map(s) and reclamation map each segment that is to be mined and reclaimed during each year of the permit. Add drawings showing typical cross-sections and final features of the proposed reclamation.*

THE 19.05 ACRES OF AREA I HAVE BEEN MINED OUT SINCE THE EARLY 90'S. AT THE BEGINNING OF 1995 THIS AREA WAS REGRADED FOR BETTER DRAINAGE AND RESEEDED. WE ARE NOW WAITING TO GET THROUGH THE GROWING SEASON IN ORDER TO GET THIS AREA RELEASED.
THE 4.45 ACRES OF AREA I IS WHERE THE SEDIMENT PONDS ARE LOCATED. ALSO THE SLOPES ALONG THAT PROPERTY LINE ARE IN THE PROCESS OF BEING REPAIRED AND RESEEDED SO THAT AREA CAN BE RELEASED IN THE NEAR FUTURE.

THE 22.38 ACRES OF AREA II IS THE AREA THAT IS BEING EXCAVATED AT THE PRESENT TIME AND THROUGHOUT THE TIME OF THIS PERMIT. WE INTEND TO RECLAIM PARTS OF THIS AREA AS WE GET FINISHED MINING IT.
THE 11.74 ACRES OF AREA II IS FUTURE EXCAVATION AREA AND HAS NOT BEEN DISTURBED FOR THE MOST PART. IT WILL ONLY BE MINED IF WE USE UP THE 22.38 ACRES CURRENTLY BEING EXCAVATED.

APPLICATION FOR A MINING PERMIT
RECLAMATION PLAN

10. Describe your plan for revegetation or other surface treatment of the affected areas. This plan must include recommendations for time of seeding and the amount and type of seed, fertilizer, lime and mulch per acre and general seeding instructions for permanent revegetation and, if necessary, temporary revegetation. Revegetation utilizing pine seedlings only is not acceptable. NOTE: Revegetation Plan must be approved and signed by one of the following:

(a) Authorized representatives of the local Soil and Water Conservation District having jurisdiction over lands in question;
(b) Authorized representatives of the Office of Forest Resources, Department of Environment, Health, and Natural Resources;
(c) County Agricultural Extension chairmen or Research and Extension personnel headquartered at North Carolina State University in the School of Agriculture and Life Sciences;
(d) North Carolina licensed landscape architects;
(e) Private consulting foresters referred by the Office of Forest Resources, Department of Environment, Health, and Natural Resources;
(f) Others as may be approved by the Department.

LIME - RATE OF APPLICATION: (1.) 3,000 LB/ACRE (2) 2,000 LB/ACRE
FERTILIZER - ANALYSIS AND RATE OF APPLICATION: (1.) 10-10-10 500LB/ACRE
SEED - TYPES(S) AND RATE OF APPLICATION INCLUDING SEEDING SCHEDULE: (2) 10-10-10 1,000LB/ACRE

(1.) PERMANENT SEEDING		(2) TEMPORARY SEEDING	
BEHIAGRASS	50LB/ACRE	RYE GRASS	120LB/ACRE
LESPEDEZA	30LB/ACRE		
BERMUDAGRASS	10LB/ACRE		
APRIL 1 - JULY 15		AUGUST 15 - DECEMBER 30	

MULCH - TYPE AND RATE OF APPLICATION: STRAW AT RATE OF 4,000 LB/ACRE

OTHER VEGETATIVE COVERS: STRIPPINGS AND TOP SOIL AS AVAILABLE

Revegetation and/or ~~reforestation~~ plan approved by:

Signature Larry Simpson Date 4-21-95

Print Name LARRY SIMPSON

Title DISTRICT TECHN.

Agency CUMBERLAND SOIL & WATER CONSERVATION DISTRICT

APPLICATION FOR A MINING PERMIT

E. DETERMINATION OF AFFECTED ACREAGE AND BOND

The following bond calculation worksheet is to be used to establish an appropriate bond (based upon a range of $500 to $5,000 per affected acre) for each permitted mine site based upon the acreage approved by the Department to be affected during the life of the mining permit.

Please insert the approximate acreage, for each aspect of the mining operation, that you intend to affect during the life of this mining permit (in addition, please insert the appropriate reclamation cost/acre for each category from the Schedule of Reclamation Costs provided with this application form):

CATEGORY	AFFECTED ACREAGE		RECLAMATION COST/ACRE	RECLAMATION COST
Tailings/Sediment Ponds	.85 Ac.	X	$ 1,500.00 /Ac.	= $ 1,275.00
Stockpiles	1.73 Ac.	X	$ 1,800.00 /Ac.	= $ 3,114.00
Wastepiles	0 Ac.	X	$ 0 /Ac.	= $ 0
Processing Area/Haul Roads	.56 Ac.	X	$ 1,800.00 /Ac.	= $ 1,008.00
Mine Excavation	42.79 Ac.	X	$ 2,000.00 /Ac.	= $ 85,580.00
Other	0 Ac.	X	$ 0 /Ac.	= $ 0
TOTAL ACREAGE:	45.93 Ac.		SUBTOTAL COST:	$ 90,977.00

Additional Reclamation Cost Factors:

a. Inflation:
- ☐ for permit life of 1 to 5 years: SUBTOTAL COST X 0.10 = $ _____
- ☒ for permit life of 6 to 10 years: SUBTOTAL COST X 0.25 = $ 22,744.25

b. Mobilization: SUBTOTAL COST X 0.40 = $ 36,390.80

c. Administration: SUBTOTAL COST X 0.20 = $ 18,195.40

a + b + c = $ 77,330.45 + SUBTOTAL COST = $ 168,307.45

TOTAL RECLAMATION BOND COST: = $ 168,300.00
(round down to the nearest $100.00)

APPLICATION FOR A MINING PERMIT

F. NOTIFICATION OF ADJOINING LANDOWNERS

The "Notice" form, or a facsimile thereof, attached to this application must be sent certified or registered mail to **all landowners who are adjoining (contiguous to) the permit boundaries as indicated on the mine map(s).** The only exception to the above is if another means of notice is approved in advance by the Director, Division of Land Resources.

A copy of a tax map (or other alternative acceptable to the Department) must be mailed with the completed "Notice" form **(the proposed overall permit boundaries and the names and locations of all owners of record of land adjoining said boundaries must be clearly denoted on the tax map).**

The "Affidavit of Notification" attached to this application must be completed, notarized and submitted to the Department, with the remainder of the completed application form, before the application will be considered complete.

NOTE: THIS SECTION MUST BE COMPLETED FOR ALL APPLICATIONS FOR NEW MINING PERMITS AND FOR PERMIT MODIFICATIONS THAT ADD ADJACENT LAND TO A MINING PERMIT.

■ SEE THE NEXT TWO PAGES FOR THE "NOTICE" FORM AND THE "AFFIDAVIT OF NOTIFICATION"

NOTICE

Pursuant to provisions G.S. 74-50 of The Mining Act of 1971, Notice is hereby given that

_____ has applied on _____
(Applicant Name) (Date)

to the Land Quality Section, Division of Land Resources, North Carolina Department of Environment, Health, and Natural Resources, P. O. Box 27687, Raleigh, North Carolina 27611, for (check one):

(a) a new surface mining permit ☐

(b) a modification to add adjacent land to an existing surface mining permit ☐

The applicant proposes to mine _____ on _____ acres located
(Mineral, Ore) (Number)

_____ _____ of _____
(Miles) (Direction) (Nearest Town)

off/near road _____ in _____
(Road Number/Name) (Name of County)

SEE ATTACHED MAP FOR PROPOSED PERMIT BOUNDARIES AND CORRESPONDING ADJOINING LANDOWNER NAMES AND LOCATIONS

In accordance with G.S. 74-50, the mine operator is required to make a reasonable effort to notify all owners of record of land **adjoining (contiguous)** to the proposed mine site (permit boundaries), and to notify the chief administrative officer of the county or municipality in which the site is located. Any person may file written comment(s) to the Department at the above address within thirty (30) days of the issuance of this Notice or the filing of the application for a permit, whichever is later. Should the Department determine that a significant public interest exists relative to G.S. 74-51, a public hearing will be held within 60 days of the end of the 30-day comment period specified above.

A copy of the permit application materials are on file and available for public review during normal business hours at the above listed address as well as at the appropriate regional office. For further information call (919) 733-4574. Please note that the Department will consider any relevant written comments/documentation within the provisions of the Mining Act of 1971 throughout the application review process until a final decision is made on the application.

_____
(Addressee's Name and Address)

_____
(Date of Issuance of this Notice/Mailed to Addressee)

_____
(Name of Applicant)

_____
(Address of Applicant)

APPLICATION FOR A MINING PERMIT

AFFIDAVIT OF NOTIFICATION

I, _____, an applicant, or an agent, or employee of an applicant, for a new Mining Permit, or a modification of an existing Mining Permit that adds adjacent land to the Mining Permit, from the N.C. Department of Environment, Health, and Natural Resources, being first duly sworn, do hereby attest that the following are known owners of record, both private and public, of the land adjoining the proposed mining permit boundaries and that notice of the pending application has been caused to be mailed, by certified or registered mail, to said owners of record at their addresses shown below, such notice being given on a form provided by the Department:

(Adjoining Landowner Name)	(Address)
_____	_____
_____	_____
_____	_____

(Attach additional list if necessary)

I do also attest that the following individual is the chief administrative officer of the county or municipality in which the proposed mining site is located and that notice of the pending application has been caused to be mailed, by certified or registered mail, to said office at the following address:

(Chief Administrative Officer Name)	(Address)
_____	_____

The above attestation was made by me while under oath to provide proof satisfactory to the Department that a reasonable effort has been made to notify the owners of record of the adjoining land and the chief administrative officer of the county or municipality in compliance with N.C.G.S. 74-50 and 15A N.C.A.C. 5B .0004(d). I understand that it is the responsibility of the applicant to retain the receipts of mailing showing that the above notices were caused to be mailed and to provide them to the Department upon request.

_____ _____

Date Signature of Applicant

If person executing Affidavit is an agent or employee of an applicant, provide the following information: (Name of applicant) _____; (title of person executing Affidavit) _____.

I, _____, a Notary Public of the County of _____, State of North Carolina, do hereby certify that _____ personally appeared before me this day and under oath acknowledged that the above Affidavit was made by him/her.

Witness my hand and notarial seal, this _____ day of _____, 19_____.

_____

Notary

My Commission expires: _____

APPLICATION FOR A MINING PERMIT

G. LAND ENTRY AGREEMENT

We hereby grant to the Department or its appointed representatives the right of entry and travel upon our lands or operation during regular business hours for the purpose of making necessary field inspections or investigations as may be reasonably required in the administration of the Mining Act of 1971.

We further grant to the Department or its appointed representatives the right to make whatever entries on the land as may be reasonably necessary and to take whatever actions as may be reasonably necessary in order to carry out reclamation which the operator has failed to complete in the event a bond forfeiture is ordered pursuant to G.S. 74-59.

LANDOWNER:	APPLICANT
Signature Lacie C. Tew	Signature * Jerry F. McDonald
Print Name: LACIE C. TEW	Print Name: JERRY F. MCDONALD
Address RT. 30 BOX 317 F.	Title: PRESIDENT, MCDONALD GRADING CO., INC.
FAYETTEVILLE, N.C. 28306	Company: MCDONALD GRADING COMPANY INC.
Telephone (910) 483-7549	Mine Name: SNOW HILL MINE

*Signature must be the same as the individual who signed Page 1 of this application.

Four (4) copies of the completed application, four (4) copies of all mine maps and reclamation maps, and the appropriate processing fee (see next page for fee schedule) in the form a check or money order payable to the North Carolina Department of Environment, Health, and Natural Resources must be sent to the Land Quality Section Central Office at the address listed on the front cover of this application form.

Inquiries regarding the status of the review of this application should be directed to the Mining Program staff at (919) 733-4574.

MINING

*A nonrefundable permit application processing fee is required when filing for a new mining permit, a major permit modification or a renewal permit as follows:

TYPE	ACRES**	NEW PERMIT	MAJOR MODIFICATION	RENEWAL
Clay	1 but less than 25	$500	$250	$250
	25 but less than 50	1000	500	500
	50 or more	1500	500	500
Sand & Gravel, Gemstone, and Borrow Pits	1 but less than 5	150	100	100
	5 but less than 25	250	100	100
	25 but less than 50	500	250	500
	50 or more	1000	500	500
Quarry, Industrial Minerals, Dimension Stone	1 but less than 10	250	100	100
	10 but less than 25	1000	250	500
	25 but less than 50	1500	500	500
	50 or more	2500	500	500
Peat & Phosphate	1 or more	2500	500	500
Gold (Heap Leach), Titanium & Others	1 or more	2500	500	500

*A nonrefundable $50.00 permit application processing fee is required for minor permit modifications. Minor permit modifications include ownership transfers, name changes, bond substitutions and permit renewals where the mine is inactive and fully stabilized. A minor permit modification also includes lands added to a permitted area, outside of the minimum permit buffer zone requirements, where no plans for mining related disturbance of the added lands have been approved. All other changes are considered major modifications.

**Acres for new permits and renewal permits means the total acreage at the site. Acres for major modification of permits means that area of land affected by the modification within the permitted mine area, or any additional land that is to be disturbed and added to an existing permitted area, or both.

3/94

LAND QUALITY SECTION HEADQUARTERS

Francis M. Nevils, Jr., P.E.
Section Chief
512 N. Salisbury Street
P. O. Box 27687
Raleigh, NC 27611

James D. Simons, P.G., P.E. - Chief Engineer
S. Craig Deal, P.E. - State Sediment Specialist
David H. Ward - Assistant State Sediment Specialist
Tracy E. Davis, P.E. - State Mining Specialist
Judy Wehner - Assistant State Mining Specialist
Tony L. Sample - Assistant State Mining Specialist
James K. Loumas, P.E. - State Dam Safety Engineer
Jack H. Palmer, E.I.T. - Assist. State Dam Safety Eng.

William (Toby) Vinson - Sediment Education Specialist

Secretaries

Roxanna Evans - Lead Secretary
Stephanie Lane - Sediment & Dams
Susan Edwards - Mining

Courier - 52-01-00
(919) 733-4574
FAX # (919) 733-2876

LAND QUALITY SECTION REGIONAL OFFICES

ASHEVILLE

RICHARD PHILLIPS, P.E.
Interchange Bldg.
59 Woodfin Place
Asheville, NC 28801

COURIER - 06-78-16
(704) 251-6208 - (52)
FAX # (704) 251-6452

Avery	Buncombe	Burke
Caldwell	Cherokee	Clay
Graham	Haywood	Henderson
Jackson	Macon	Madison
McDowell	Mitchell	Polk
Rutherford	Swain	Transylvania
Yancey		

FAYETTEVILLE

JOE GLASS, P.E.
Wachovia Bldg.
Suite 714
Fayetteville, NC 28301

COURIER - 14-56-25
(910) 486-1541 (53)
FAX # (910) 486-0707

Anson	Montgomery	Scotland
Bladen	Moore	
Cumberland	Richmond	
Harnett	Robeson	
Hoke	Sampson	

MOORESVILLE

JERRY COOK
919 North Main Street
Mooresville, NC 28115

COURIER - 13-21-08
(704) 663-1699 - (54)
FAX # (704) 663-6040

Alexander	Lincoln
Cabarrus	Mecklenburg
Catawba	Rowan
Cleveland	Stanly
Gaston	Union
Iredell	

WILMINGTON

DAN SAMS, P.E.
127 Cardinal Drive, Ext.
Wilmington, NC 28405-3845

COURIER - 04-16-33
(910) 395-3900 (57)
FAX # (910) 350-2004

Brunswick	New Hanover
Carteret	Onslow
Columbus	Pender
Duplin	

WINSTON-SALEM

DOUG MILLER, P.E.
585 Waughtown Street
Winston-Salem, NC 27107

COURIER - 09-55-01
(910) 771-4600
FAX # (910) 771-4631

Alamance	Alleghany	Ashe
Caswell	Davidson	Davie
Forsyth	Guilford	Rockingham
Randolph	Stokes	Surry
Watauga	Wilkes	Yadkin

WASHINGTON

FLOYD WILLIAMS, P.G.
1424 Carolina Avenue
Washington, NC 27889

COURIER - 16-04-01
(919) 946-6481 (56)
FAX # (919) 975-3716

Beaufort	Bertie	Camden	Chowan
Craven	Currituck	Dare	Gates
Greene	Hertford	Hyde	Jones
Lenoir	Martin	Pamlico	Pasquotank
Perquimans	Pitt	Tyrrell	
Washington	Wayne		

RALEIGH

JOHN HOLLEY, P.E.
3800 Barrett Drive
P. O. Box 27687
Raleigh, NC 27611

INTEROFFICE
(919) 571-4700 - (55)
FAX # (919) 571-4718

Chatham	Durham	Edgecombe
Franklin	Granville	Halifax
Johnston	Lee	Nash
Northampton	Orange	Person
Vance	Wake	
Warren	Wilson	

REVISED 1/95

APPENDIX II

1/4 MILE RADIUS VICINITY MAP

III

APPENDIX III

EROSION & SEDIMENTATION CONTROL AND STORMWATER MANAGEMENT

- Erosion & Sedimentation Control Specifications

Erosion & Sedimentation Control Supporting Calculations

Erosion & Sedimentation Control Financial Responsibility Form

NPDES Notice of Intent (NOI) Form for
General Permit NCG 010000

EROSION & SEDIMENTATION CONTROL SPECIFICATIONS

Temporary Sediment Basin
Grass Lined Channel
Outlet Stabilization
Permanent Seeding

The above referenced specifications are taken from the North Carolina Erosion and Sediment Control Planning and Design Manual, September 1, 1988

TEMPORARY SEDIMENT BASIN

SNOW HILL MINE LCID LANDFILL

SEDIMENT BASIN SUMMARY

		NOTES
DISTURBED ACREAGE	13 AC	
PEAK DISCHARGE FOR 25-YR STORM	46.8 CFS	
STORAGE REQUIRED	23400 CF	
STORAGE AVAILABLE	40460 CF	
BARREL		EXISTING
CMP DIAMETER	18 IN	EXISTING
LENGTH	40 FT	EXISTING
PEAK DISCHARGE	14.7 CFS	
RISER		
CMP DIAMETER	24 IN	
BOTTOM OF RISER ELEVATION	124 MSL	
TOP OF RISER ELEVATION	129 MSL	
ANTI-SEEP COLLAR	3 FT X 3 FT	EXISTING
ANTI FLOTATION BLOCK	4 FT X 4 FT X 2 FT	CONCRETE
EMERGENCY SPILLWAY		VEGETATED
BOTTOM OF SPILLWAY ELEVATION	130 MSL	
BOTTOM WIDTH	28 FT	
TOP WIDTH	40 FT	
SIDE SLOPES	3H:1V	
STAGE	0.65 FT	
FREEBOARD	1.35 FT	
SPILLWAY DEPTH	2 FT	
PEAK DISCHARGE	32.1 CFS	
SEDIMENT CLEANOUT ELEVATION	127 MSL	

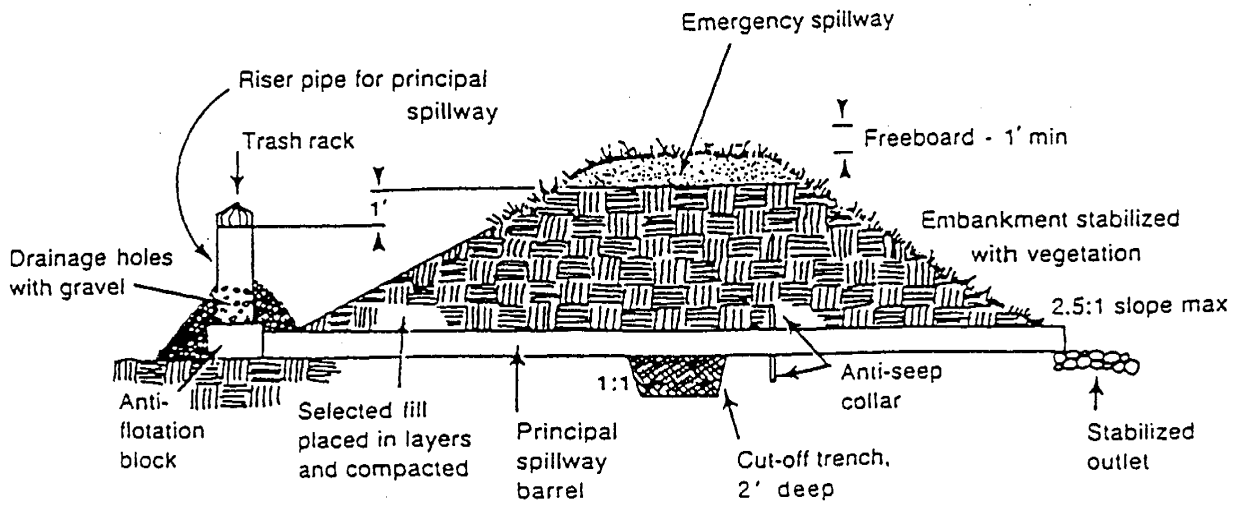


Figure 6.61b Section through embankment and basin controls.

6.61

SEDIMENT BASIN

Definition

An earthen embankment suitably located to capture sediment.

Purpose

To retain sediment on the construction site and prevent sedimentation in off-site streams, lakes, and drainageways.

Conditions Where Practice Applies

Special limitation—This practice applies only to the design and installation of sediment basins where failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use of public roads or utilities. Regardless of hazard classification, structures larger than 15 ft or higher, and having a maximum storage capacity of 10 acre-ft or more are subject to the N.C. Dam Safety Act.

Sediment basins are needed where erosion control measures are not adequate to prevent off-site sedimentation. Specific criteria for installation of a sediment basin are as follows:

- Keep the drainage area less than 100 acres.
- Ensure that basin location provides a convenient concentration point for sediment-laden flows from the area served.
- Ensure that basin location allows access for sediment removal and proper disposal under all weather conditions.
- Keep the basin life limited to 3 years, unless it is designed as a permanent structure.
- Do not locate sediment basins in perennial streams.

Planning Considerations

Select key locations for sediment basins during initial site evaluation. Install basins before any site grading takes place within the drainage area.

Select basin sites to capture sediment from all areas that are not treated adequately by other sediment traps. Always consider access for cleanout and disposal of the trapped sediment. Locations where a pond can be formed by constructing a low dam across a natural swale are generally preferred to sites that require excavation. If practical, divert sediment-free runoff away from the basin.

Sediment trapping efficiency is primarily a function of sediment particle size and the ratio of basin surface area to inflow rate. Therefore, design the basin to have a large surface area for its volume. Figure 6.61a shows the relationship between the ratio of surface area to peak inflow rate and trap efficiency observed by Barfield and Clar (1985).

Sediment basins with an expected life greater than 3 years should be designed as permanent structures. In these cases, the structure should be designed by a qualified professional engineer experienced in the design of dams. Permanent ponds and artificial lakes are beyond the scope of this practice standard. USDA

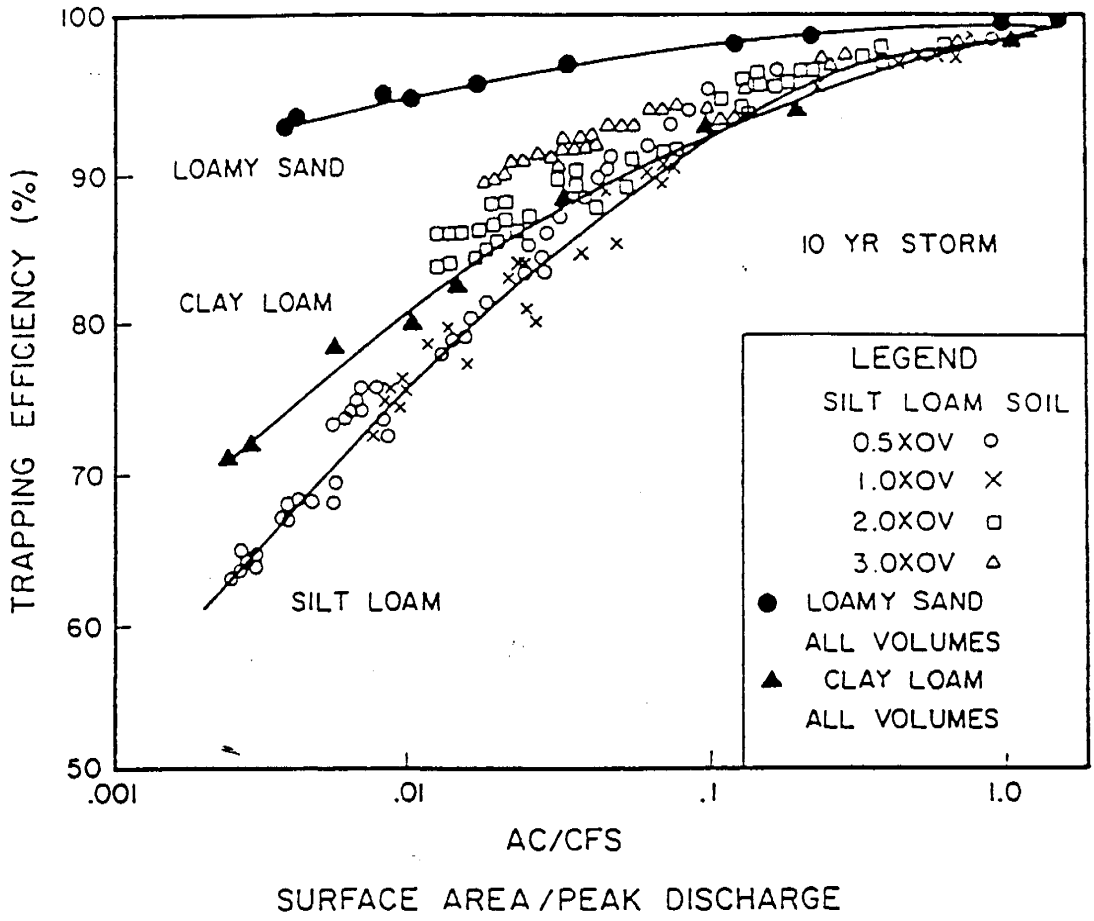


Figure 6.61a Graph showing the relationship between the ratio of surface area to peak inflow rate and trap efficiency. (source: Barfield and Clar)

Soil Conservation Service Practice Standard Ponds Code No. 378 provides criteria for design of permanent ponds.

Design Criteria

Drainage areas—Limit drainage areas to 100 acres.

Design basin life—Ensure a design basin life of 3 years or less.

Dam height—Limit dam height to 15 ft. Dams 15 ft or higher and with storage volume of 10 acre-ft or more are governed by the N.C. Dam Safety Act. Height of a dam is measured from the top of the dam to the lowest point at the downstream toe. Volume is measured to the top of the dam.

Basin locations— Select areas that:

- provide capacity for storage of sediment from as much of the planned disturbed area as practical;
- exclude runoff from undisturbed areas, where practical;
- provide access for sediment removal throughout the life of the project;

- interfere minimally with construction activities.

Surface area—Recent studies (Barfield and Clar, 1985) indicate that the following relationship between surface area and peak inflow rate gives a trapping efficiency greater than 75% for most sediment in the Coastal Plain and Piedmont regions:

$$A = 0.01q$$

Where A is basin surface area in acres and q is peak inflow rate in cfs. Area is measured at design capacity of the principal spillway.

Basin shape—Ensure that the flow length to basin width ratio is greater than 2:1 to improve trapping efficiency. This basin shape may be attained by site selection, excavation, or installing baffles. Length is measured at the elevation of the principal spillway.

Storage volume—Ensure that the sediment storage volume of the basin, as measured to the elevation of the crest of the principal spillway, is at least 1,800 ft^3/acre for the disturbed area draining into the basin (1800 ft^3 is equivalent to 1/2 inch of sediment per acre of basin drainage area). Where possible, the entire drainage basin is used for this computation, rather than the disturbed area alone, to help ensure adequate trapping efficiency.

Remove sediment from the basin when approximately one-half of the storage volume has been filled.

Spillway capacity—The spillway system must carry the peak runoff from the 10-yr storm with a minimum 1 ft freeboard in the emergency spillway. Base runoff computations on the disturbed soil cover conditions expected during the effective life of the structure.

Principal spillway—Construct the principal spillway with a vertical riser connected to a horizontal barrel that extends through the embankment and outlets beyond the downstream toe of the dam, or an equivalent design.

- Capacity—Ensure a minimum capacity of 0.2 cfs/acre of drainage area, with the water surface at the emergency spillway crest elevation.

Sediment cleanout elevation—Show the distance from the top of the riser to the pool level when the basin is 50% full. This elevation should also be marked in the field with a permanent stake set at this ground elevation (not the top of the stake).

Crest elevation—Keep the crest elevation of the riser a minimum of 1 ft below the crest elevation of the emergency spillway.

Riser and Barrel—Keep the minimum barrel size at 8 inches for corrugated metal pipe or 6 inches for smooth wall pipe to facilitate installation and reduce potential for failure from blockage. Ensure that the pipe is capable of withstanding the maximum external loading without yielding, buckling, or cracking. To improve the efficiency of the principal spillway system, make the cross-sectional area of the riser at least 1.5 times that of the barrel.

Pipe Connections—Ensure that all conduit connections are watertight.

Rod and lug type connector bands with gaskets are preferred for corrugated metal pipe to assure watertightness under maximum loading and internal pressure. Do not use dimple (universal) connectors under any circumstances.

Basin dewatering—Many new techniques are available for dewatering sediment basins. A single hole placed just above the sediment cleanout level will dewater the basin slowly and not interfere with trap efficiency.

The size of the dewatering hole may be approximated as follows:

$$A_o = \frac{A_s \times \sqrt{2h}}{T \times C_d \times 20{,}428}$$

where:

A_o = surface area of the dewatering hole, ft^2
A_s = surface area of the basin, ft^2
h = head of water above the hole, ft
C_d = coefficient of contraction for an orifice, approximately 0.6, and
T = detention time or time needed to dewater the basin, hours (recommended 10 hours).

NOTE: Perforating the riser with multiple holes with a combined surface area equal to A_o is acceptable. Perforated risers that dewater the basin rapidly may interfere with sediment trapping.

The basin may also be dewatered by perforating the lower half of the riser with 1/2-inch holes with a spacing of approximately 3 inches in each outside valley. Cover the perforated section with 2 ft of 1/2 - 3/4-inch gravel. Use NCDOT Standard #57, or #5 washed stone when it is available.

It is important that a suitable trash guard be installed to prevent the dewatering holes from becoming clogged.

- Trash guard—Install a trash guard on the top of the riser to prevent trash and other debris from clogging the conduit. A combination anti-vortex device and trash guard improves the efficiency of the principal spillway and protects against trash intake.
- Protection against piping—Install at least one watertight anti-seep collar with a minimum projection of 1.5 ft around the barrel of principal spillway conduits, 8 inches or larger in diameter. Locate the anti-seep collar slightly downstream from the dam center line. A properly designed drainage diaphragm installed around the barrel may be used instead of an anti-seep collar when it is appropriate.
- Protection against flotation—Secure the riser by an anchor with buoyant weight greater than 1.1 times the water displaced by the riser.
- Outlet— Protect the outlet for the barrel against erosion.

Discharge velocities must be within allowable limits for the receiving stream *(References: Outlet Protection)*.

Emergency spillway—Construct the entire flow area of the emergency spillway in undisturbed soil (not fill). Make the cross section trapezoidal with side slopes of 3:1 or flatter. Make the control section of the spillway straight and at least 20 ft long. The inlet portion of the spillway may be curved to improve alignment, but ensure that the outlet section is straight due to supercritical flow in this portion.

- Capacity—The minimum design capacity of the emergency spillway must be the peak rate of runoff from the 10-yr storm, less any reduction due to flow in the principal spillway. In no case should freeboard of the emergency spillway be less than 1 ft above the design depth of flow.
- Velocity—Ensure that the velocity of flow discharged from the basin is nonerosive for the existing conditions. When velocities exceed that allowable for the receiving areas, provide outlet protection (*References: Outlet Protection*).

Embankment—

- Cut-off trench—Excavate a trench at the centerline of the embankment. Ensure that the trench is in undisturbed soil and extends through the length of the embankment to the elevation of the riser crest at each end. A minimum of 2 ft depth is recommended.
- Top width—The minimum top width of the dam is shown in Table 6.61a.
- Freeboard—Ensure that the minimum difference between the design water elevation in the emergency spillway and the top of the settled embankment is 1 ft.
- Side slopes—Make the side slopes of the impoundment structure 2.5:1 or flatter (Figure 6.61b).
- Allowance for settlement—Increase the constructed height of the fill at least 10% above the design height to allow for settlement.
- Erosion protection—Stabilize all areas disturbed by construction (except the lower 1/2 of the sediment pool) by suitable means immediately after completing the basin (*References: Surface Stabilization*).

  Design information included in the Appendices may be used to develop final plans for sediment basins (*References: Appendices*).

Trap efficiency—Improve sediment basin trapping efficiency by employing the following considerations in the basin design:

- Surface area—In the design of the settling pond, allow the largest surface area possible. Studies of Barfield and Clar (1985) indicate that surface area (in acres) should be larger than 0.01 times the peak inflow rate in cfs.
- Length—Maximize the length-to-width ratio of the basin to prevent short circuiting, and ensure use of the entire design settling area.

Table 6.61a
Acceptable Dimensions for Basin Embankment

Fill Height	Minimum Top Width
less than 10 ft	8.0 ft
10 feet to 15 ft	10.0 ft

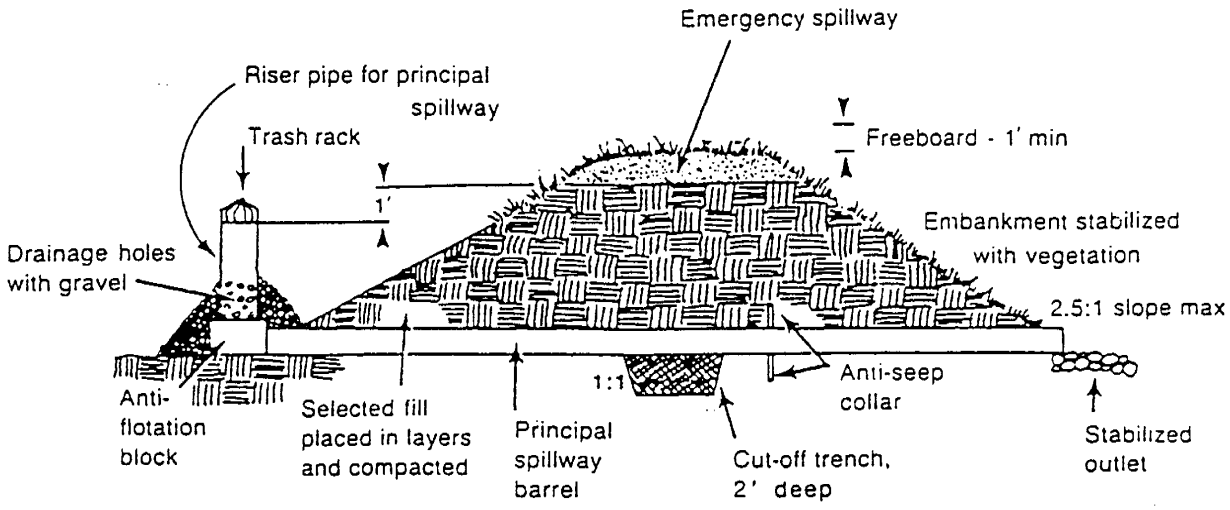


Figure 6.61b Section through embankment and basin controls.

- Inlets—Locate the sediment inlets to the basin the greatest distance from the principal spillway.
- Dewatering—Allow the maximum reasonable detention period before the basin is completely dewatered—at least 10 hours.
- Inflow rate—Reduce the inflow velocity and divert all sediment-free runoff.

Construction Specifications

1. Site preparations—Clear, grub, and strip topsoil from areas under the embankment to remove trees, vegetation, roots, and other objectionable material. To facilitate sediment cleanout and restoration, clear the pool area of all brush, trees, and other objectionable materials. Stockpile all topsoil or soil containing organic matter for use on the outer shell of the embankment to facilitate vegetative establishment. Place temporary sediment control measures below the basin as needed.

2. Cut-off trench—Excavate a cut-off trench along the centerline of the earth fill embankment. Cut the trench to stable soil material, but in no case make it less than 2 ft deep. The cut-off trench must extend into both abutments to at least the elevation of the riser crest. Make the minimum bottom width wide enough to permit operation of excavation and compaction equipment but in no case less than 2 ft. Make side slopes of the trench no steeper than 1:1. Compaction requirements are the same as those for the embankment. Keep the trench dry during backfilling and compaction operations.

3. Embankment—Take fill material from the approved areas shown on the plans. It should be clean mineral soil, free of roots, woody vegetation, rocks, and other objectionable material. Scarify areas on which fill is to be placed before placing fill. The fill material must contain sufficient moisture so it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Place fill material in 6 to 8-inch continuous layers over the entire length of the fill area and then compact it. Com-

paction may be obtained by routing the construction hauling equipment over the fill so that the entire surface of each layer is traversed by at least one wheel or tread track of the heavy equipment, or a compactor may be used. Construct the embankment to an elevation 10% higher than the design height to allow for settling.

4. Conduit spillways—Securely attach the riser to the barrel or barrel stub to make a watertight structural connection. Secure all connections between barrel sections by approved watertight assemblies. Place the barrel and riser on a firm, smooth foundation of impervious soil. Do not use pervious material such as sand, gravel, or crushed stone as backfill around the pipe or anti-seep collars. Place the fill material around the pipe spillway in 4-inch layers and compact it under and around the pipe to at least the same density as the adjacent embankment. **Care must be taken not to raise the pipe from firm contact with its foundation when compacting under the pipe haunches.**

Place a minimum depth of 2 ft of hand-compacted backfill over the pipe spillway before crossing it with construction equipment. Anchor the riser in place by concrete or other satisfactory means to prevent flotation. In no case should the pipe conduit be installed by cutting a trench through the dam after the embankment is complete.

5. Emergency spillway—Install the emergency spillway in undisturbed soil. The achievement of planned elevations, grade, design width, and entrance and exit channel slopes are critical to the successful operation of the emergency spillway.

6. Inlets—Discharge water into the basin in a manner to prevent erosion. Use diversions with outlet protection to divert sediment-laden water to the upper end of the pool area to improve basin trap efficiency (*References: Runoff Control Measures* and *Outlet Protection*).

7. Erosion control—Construct the structure so that the disturbed area is minimized. Divert surface water away from bare areas. Complete the embankment before the area is cleared. Stabilize the emergency spillway embankment and all other disturbed areas above the crest of the principal spillway immediately after construction (*References: Surface Stabilization*).

8. Safety—Sediment basins may attract children and can be dangerous. Avoid steep side slopes, and fence and mark basins with warning signs if trespassing is likely. **Follow all state and local requirements.**

Maintenance

Check sediment basins after periods of significant runoff. Remove sediment and restore the basin to its original dimensions when sediment accumulates to one-half the design depth.

Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Make all necessary repairs immediately. Remove all trash and other debris from the riser and pool area.

References

Surface Stabilization
6.10, Temporary Seeding
6.11, Permanent Seeding
6.12, Sodding
6.13, Trees, Shrubs, Vines, and Ground Covers

Runoff Control Measures
6.20, Temporary Diversions
6.21, Permanent Diversions
6.22, Perimeter Dike

Outlet Protection
6.41, Outlet Stabilization Structure

Appendices
8.03, Estimating Runoff
8.07, Sediment Basin Design

GRASS LINED CHANNEL

S&ME

JOB NO. 1034-96-131

SHEET NO. _____

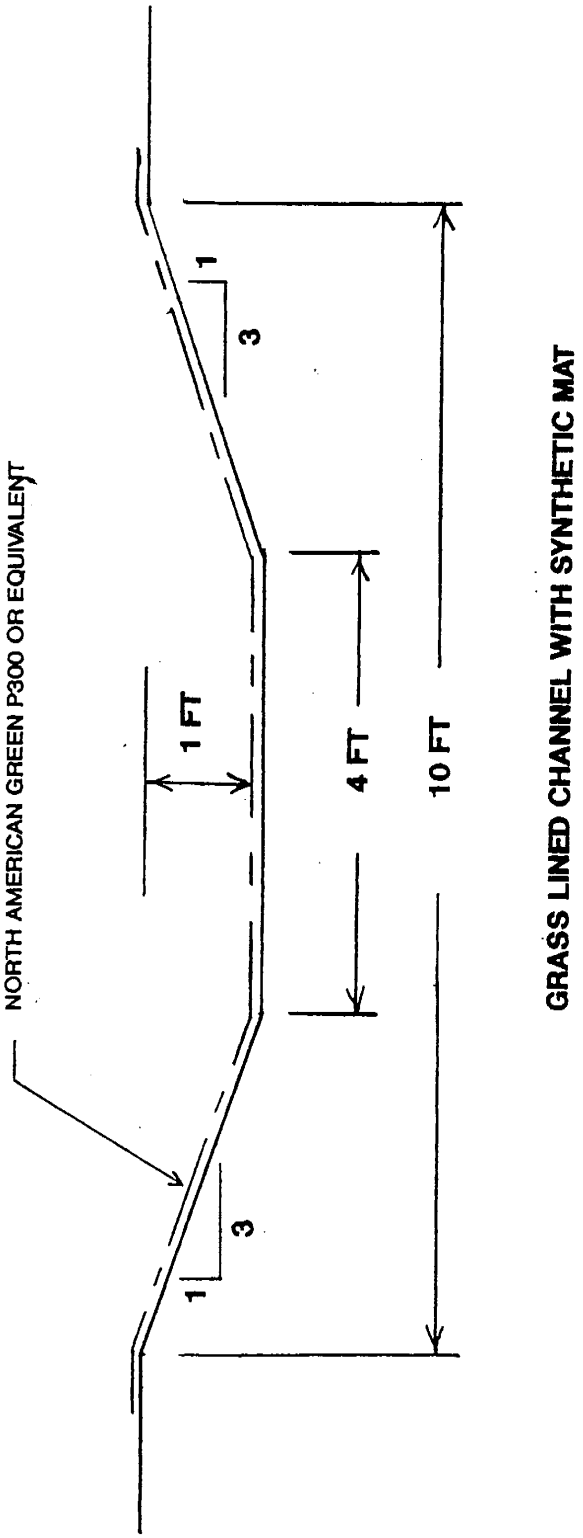
DATE _____

JOB NAME SNOW HILL MINE - LCID LANDFILL

COMPUTED BY DWW

SUBJECT GRASS LINED CHANNEL

CHECKED BY _____



6.30 GRASS-LINED CHANNELS

GL

Definition

A channel with vegetative lining constructed to design cross section and grade for conveyance of runoff.

Purpose

To convey and dispose of concentrated surface runoff without damage from erosion, deposition, or flooding.

Conditions Where Practice Applies

This practice applies to construction sites where:

- concentrated runoff will cause damage from erosion or flooding;
- a vegetative lining can provide sufficient stability for the channel cross section and grade;
- slopes are generally less than 5%;
- space is available for a relatively large cross section.

Typical uses include roadside ditches, channels at property boundaries, outlets for diversions, and other channels and drainage of low areas.

Planning Considerations

LOCATION

Generally, channels should be located to conform with and use the natural drainage system. Channels may also be needed along development boundaries, roadways, and backlot lines. Avoid channels crossing watershed boundaries or ridges.

Plan the course of the channel to avoid sharp changes in direction or grade. Site development should conform to natural features of the land and use natural drainageways rather than drastically reshape the land surface. Major reconfiguration of the drainage system often entails increased maintenance and risk of failure.

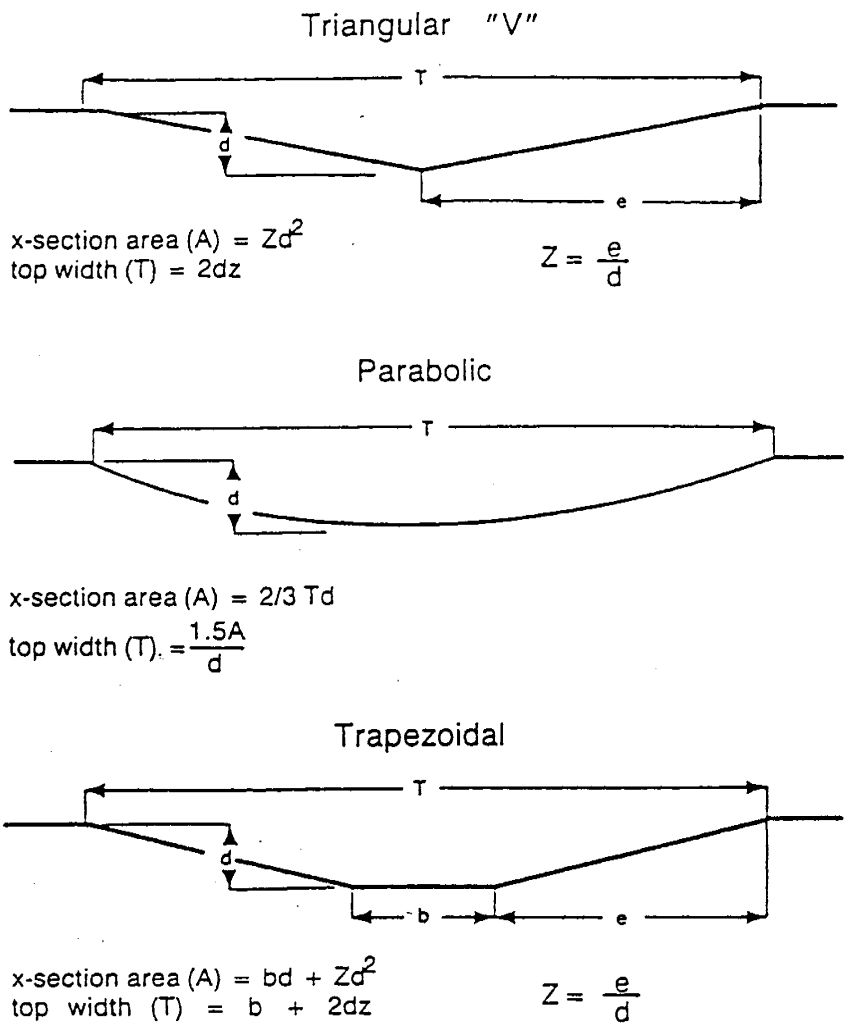
Grass-lined channels must not be subject to sedimentation from disturbed areas.

An established grass-lined channel resembles natural drainage systems and, therefore, is usually preferred if design velocities are below 5 ft/sec. Velocities up to 6 ft/sec can be safely used under certain conditions (Table 8.05a, *Appendix 8.05*).

Establishment of a dense, resistant vegetation is essential. Construct and vegetate grass-lined channels early in the construction schedule before grading and paving increase the rate of runoff.

Geotextile fabrics or special mulch protection such as fiberglass roving or straw and netting provide stability until the vegetation is fully established. These protective liners must be used whenever design velocities exceed 2 ft/sec for bare soil conditions. It may also be necessary to divert water from the channel until vegetation is established or to line the channel with sod. Sediment traps may be needed at channel inlets and outlets.

Figure 6.30a Cross section geometry of triangular, parabolic, and trapezoidal channels.



Hydraulic grade line—Examine the design water surface if the channel system becomes complex.

Side slopes—Grassed channel side slopes generally are constructed 3:1 or flatter to aid in the establishment of vegetation and for maintenance. Side slopes of V-shaped channels are usually constructed 6:1 or flatter along roadways for safety.

Depth and width—The channel depth and width are proportioned to meet the needs of drainage, soil conditions, erosion control, carrying capacity and site conditions. Construct channels a minimum of 0.2 ft larger around the periphery to allow for soil bulking during seedbed preparations and sod buildup.

Grade—Either a uniform or gradually increasing grade is preferred to avoid sedimentation. Where the grade is excessive, grade stabilization structures may be required or channel linings of riprap or paving should be considered (Practice 6.82, *Grade Stabilization Structure*).

V-shaped grass channels generally apply where the quantity of water is small, such as in short reaches along roadsides. The V-shaped cross section is least desirable because it is difficult to stabilize the bottom where velocities may be high.

Parabolic grass channels are often used where larger flows are expected and space is available. The swale-like shape is pleasing and may best fit site conditions.

Trapezoidal grass channels are used where runoff volumes are large and slope is low so that velocities are nonerosive to vegetated linings.

Subsurface drainage, or riprap channel bottoms, may be necessary on sites that are subject to prolonged wet conditions due to long duration flows or high water tables (Practice 6.81, *Subsurface Drain* and Practice 6.31, *Riprap-lined and Paved Channels).*

OUTLETS

Outlets must be stable. Where channel improvement ends, the exit velocity for the design flow must be nonerosive for the existing field conditions. Stability conditions beyond the property boundary should always be considered (Practice 6.41, *Outlet Stabilization Structure*).

AREA

Where urban drainage area exceeds 10 acres, it is recommended that grass-lined channels be designed by an engineer experienced in channel design.

Design Criteria

Capacity—As a minimum, grass-lined channels should carry peak runoff from the 10-yr storm without eroding. Where flood hazard exists, increase the capacity according to the potential damage. Channel dimensions may be determined by using design tables with appropriate retardance factors or by Manning's formula using an appropriate "n" value. When retardance factors are used, the capacity is usually based on retardance "C" and stability on retardance "D" (*References: Appendix, 8.05*).

Velocity—The allowable design velocity for grass-lined channels is based on soil conditions, type of vegetation, and method of establishment (Table 8.05a, *Appendix 8.05*).

If design velocity of a channel to be vegetated by seeding exceeds 2 ft/sec, a temporary channel liner is required. The design of the liner may be based on peak flow from a 2-yr storm. If vegetation is established by sodding, the permissible velocity for established vegetation shown in Table 8.05a may be used and no temporary liner is needed. Whether a temporary lining is requried or not permanent channel linings must be stable for the 10-yr storm. A design approach based on erosion resistance of various liner materials developed by the Federal Highway Administration is presented in *Appendix 8.05*.

Cross section—The channel shape may be parabolic, trapezoidal, or V-shaped, depending on need and site conditions (Figure 6.30a).

Drainage—Install subsurface drains in locations with high water tables or seepage problems that would inhibit establishment of vegetation in the channel. Stone channel bottom lining may be needed where prolonged low flow is anticipated.

Outlets—Evaluate the outlets of all channels for carrying capacity and stability and protect them from erosion by limiting the exit velocity (Practice 6.41, *Outlet Stabilization Structure*).

Sedimentation protection—Protect permanent grass channels from sediment produced in the watershed, especially during the construction period. This can be accomplished by the effective use of diversions, sediment traps, protected side inlets, and vegetative filter strips along the channel.

Construction Specifications

1. Remove all trees, brush, stumps, and other objectionable material from the foundation area and dispose of properly.

2. Excavate the channel and shape it to neat lines and dimensions shown on the plans plus a 0.2-ft overcut around the channel perimeter to allow for bulking during seedbed preparations and sod buildup.

3. Remove and properly dispose of all excess soil so that surface water may enter the channel freely.

4. The procedure used to establish grass in the channel will depend upon the severity of the conditions and selection of species. Protect the channel with mulch or a temporary liner sufficent to withstand anticipated velocities during the establishment period (*Appendix 8.05*).

Maintenance

During the establishment period, check grass-lined channels after every rainfall. After grass is established, periodically check the channel; check it after every heavy rainfall event. Immediately make repairs. It is particularly important to check the channel outlet and all road crossings for bank stability and evidence of piping or scour holes. Remove all significant sediment accumulations to maintain the designed carrying capacity. Keep the grass in a healthy, vigorous condition at all times, since it is the primary erosion protection for the channel (Practice 6.11, *Permanent Seeding*).

References

Surface Stabilization
6.11, Permanent Seeding
6.12, Sodding
6.14, Mulching

Outlet Protection
6.41, Outlet Stabilization Structure

Other Related Practices
6.81, Subsurface Drain
6.82, Grade Stabilization Structure

Appendices

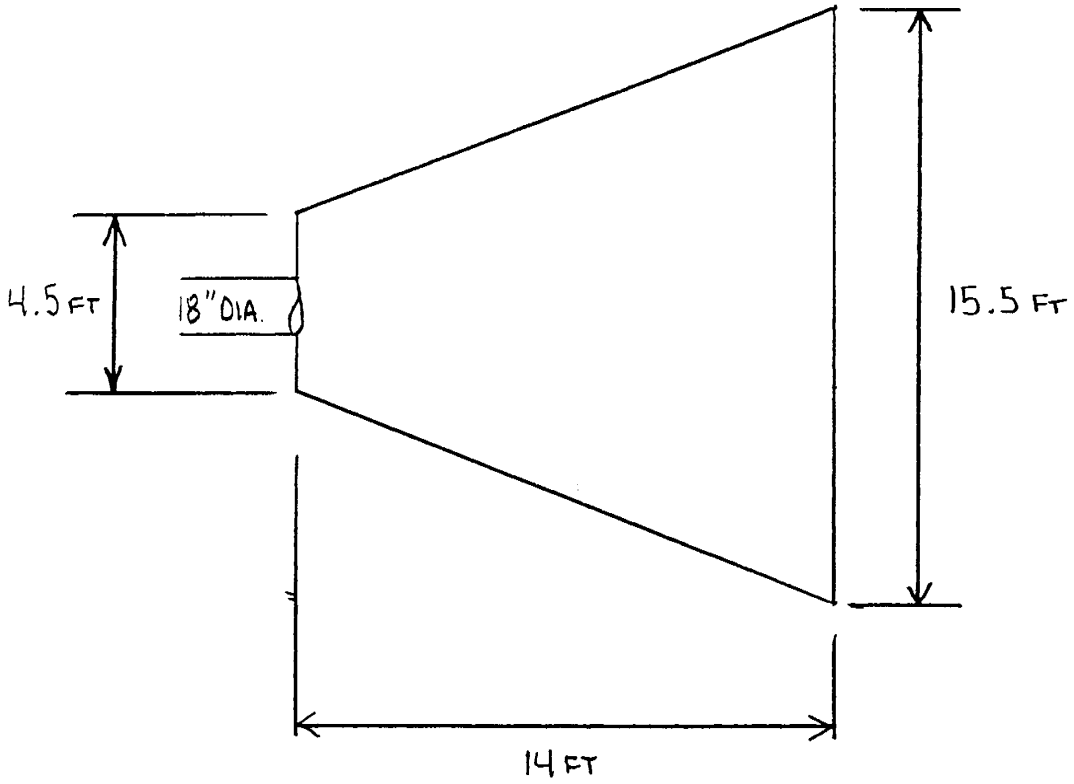
8.02, Vegetation Tables
8.03, Estimating Runoff
8.05, Design of Stable Channels and Diversions

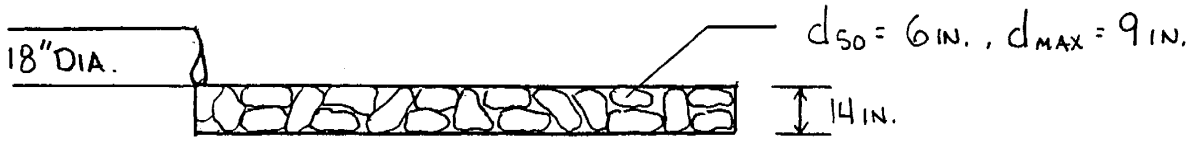
OUTLET STABILIZATION

S&ME

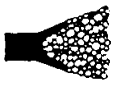
JOB NO. 1034-96-131
SHEET NO. 2
DATE 1/21/97

JOB NAME SNOW HILL MINE - LC10
COMPUTED BY DWW
SUBJECT OUTLET STABILIZATION FOR SEDIMENT BASIN
CHECKED BY





6.41 OUTLET STABILIZATION STRUCTURE



Definition

A structure designed to control erosion at the outlet of a channel or conduit.

Purpose

To prevent erosion at the outlet of a channel or conduit by reducing the velocity of flow and dissipating the energy.

Conditions Where Practice Applies

This practice applies where the discharge velocity of a pipe, box culvert, diversion, open channel, or other water conveyance structure exceeds the permissible velocity of the receiving channel or disposal area.

Planning Considerations

The outlets of channels, conduits, and other structures are points of high erosion potential, because they frequently carry flows at velocities that exceed the allowable limit for the area downstream. To prevent scour and undermining, an outlet stabilization structure is needed to absorb the impact of the flow and reduce the velocity to non-erosive levels. A riprap-lined apron is the most commonly used practice for this purpose because of its relatively low cost and ease of installation. The riprap apron should be extended downstream until stable conditions are reached even though this may exceed the length calculated for design velocity control.

Riprap-stilling basins or plunge pools reduce flow velocity rapidly. They should be considered in lieu of aprons where overfalls exit at the ends of pipes or where high flows would require excessive apron length. Consider other energy dissipators such as concrete impact basins or paved outlet structures where site conditions warrant, (Figure 6.41a).

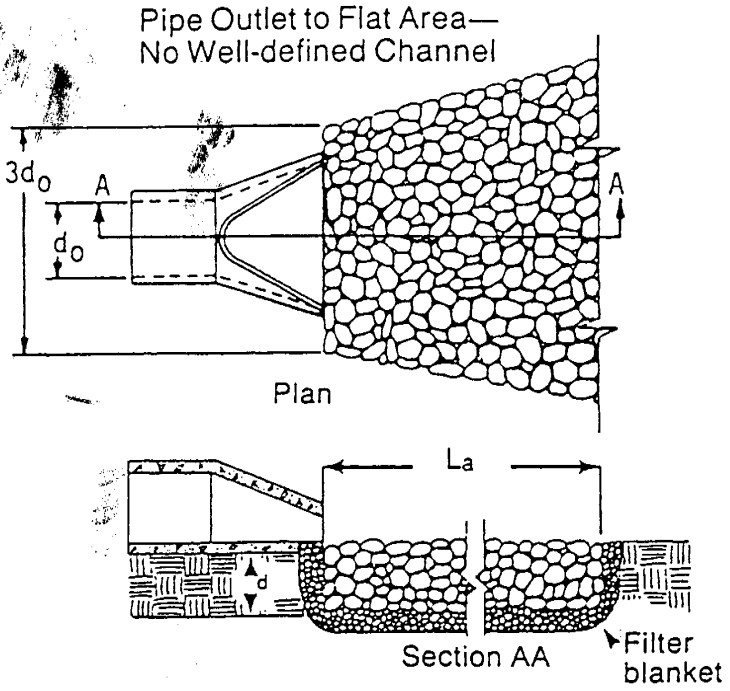
Design Criteria

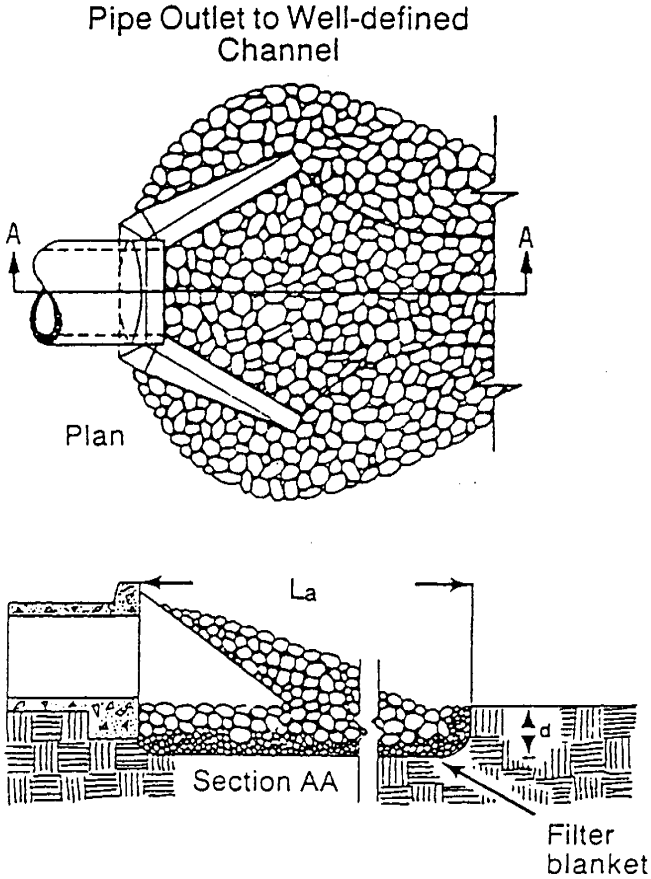
Design procedures for riprap outlet structures are presented in *Appendix 8.06*. The criteria for design of riprap outlets are:

Capacity—10-yr, peak runoff or the design discharge of the water conveyance structure, whichever is greater.

Tailwater depth—Determine the depth of tailwater immediately below the pipe outlet based on the design discharge plus other contributing flows. If the tailwater depth is less than half the diameter of the outlet pipe and the receiving stream is sufficiently wide to accept the divergence of flow, it is classed as a **minimum tailwater condition**. If the tailwater depth is greater than half the pipe diameter, it is classed as a **maximum tailwater condition**. Pipes that outlet onto broad flat areas with no defined channel may be assumed to have a minimum tailwater condition unless site conditions indicate otherwise (Figure 6.41b).

Apron size—The apron length and width can be determined according to the tailwater condition. If the water conveyance structure discharges directly into a well-defined channel, extend the apron across the channel bottom and up the channel banks to an elevation of 0.5 ft above the maximum tailwater depth or to the top of the bank, whichever is less (Figure 6.41c).





Notes

1. L_a is the length of the riprap apron.
2. d = 1.5 times the maximum stone diameter but not less than 6".
3. In a well-defined channel extend the apron up the channel banks to an elevation of 6" above the maximum tailwater depth or to the top of the bank, whichever is less.
4. A filter blanket or filter fabric should be installed between the riprap and soil foundation.

Figure 6.41c Riprap outlet protection (modified from Va SWCC).

Thickness—Make the minimum thickness of riprap 1.5 times the maximum stone diameter.

Stone quality—Select stone for riprap from field stone or quarry stone. The stone should be hard, angular, and highly weather-resistant. The specific gravity of the individual stones should be at least 2.5.

Filter—Install a filter to prevent soil movement through the openings in the riprap. The filter should consist of a graded gravel layer or a synthetic filter cloth. Design filter blankets by the method described in Practice 6.15, *Riprap*.

Construction Specifications

1. Ensure that the subgrade for the filter and riprap follows the required lines and grades shown in the plan. Compact any fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the riprap thickness.

2. The riprap and gravel filter must conform to the specified grading limits shown on the plans.

3. Filter cloth, when used, must meet design requirements and be properly protected from punching or tearing during installation. Repair any damage by removing the riprap and placing another piece of filter cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive, replace the entire filter cloth.

4. Riprap may be placed by equipment, but take care to avoid damaging the filter.

5. The minimum thickness of the riprap should be 1.5 times the maximum stone diameter.

6. Riprap may be field stone or rough quarry stone. It should be hard, angular, highly weather-resistant and well graded.

7. Construct the apron on zero grade with no overfall at the end. Make the top of the riprap at the downstream end level with the receiving area or slightly below it.

8. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron.

9. Immediately after construction, stabilize all disturbed areas with vegetation (Practices 6.10, *Temporary Seeding*, and 6.11, *Permanent Seeding*).

Maintenance

Inspect riprap outlet structures after heavy rains to see if any erosion around or below the riprap has taken place or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.

References

Surface Stabilization

6.10, Temporary Seeding
6.11, Permanent Seeding
6.15, Riprap

Appendix

8.06, Design of Riprap Outlet Protection

PERMANENT SEEDING

Permanent Seeding Specifications

Dates	Species	Rate, lbs./Acre
February 15 - April 1	Kobe Lespedeza	10
	Bahiagrass	50
	Redtop	1
	Winter rye (grain)	15
April 1 - July 31	Common Bermuda	50
August 1 - October 25	Lespedeza (unscarified)	30
	German millet	40
October 25 - February 15	Rye (grain-temporary)	120

Soil Amendments

Lime - 2,000 lbs./acre or follow recommendations from a soil test.

Fertilizer - 1,000 lbs./acre 8-8-8 or 10-10-10, or follow recommendations from a soil test.

Mulch - All seeded areas shall be mulched using small grain straw at a rate of 2,000 lbs./acre and anchored properly.

Note: The above seeding specification is copied from NCDEHNR - Division of Land Resources, Mining Permit No. 26-20 issued to McDonald Grading Company, Inc. dated October 18, 1995.

EROSION & SEDIMENTATION CONTROL
SUPPORTING CALCULATIONS

SNOW HILL MINE LCID LANDFILL

SEDIMENT BASIN SUMMARY

		NOTES
DISTURBED ACREAGE	13 AC	
PEAK DISCHARGE FOR 25–YR STORM	46.8 CFS	
STORAGE REQUIRED	23400 CF	
STORAGE AVAILABLE	40460 CF	
BARREL		EXISTING
CMP DIAMETER	18 IN	EXISTING
LENGTH	40 FT	EXISTING
PEAK DISCHARGE	14.7 CFS	
RISER		
CMP DIAMETER	24 IN	
BOTTOM OF RISER ELEVATION	124 MSL	
TOP OF RISER ELEVATION	129 MSL	
ANTI–SEEP COLLAR	3 FT X 3 FT	EXISTING
ANTI FLOTATION BLOCK	4 FT X 4 FT X 2 FT	CONCRETE
EMERGENCY SPILLWAY		VEGETATED
BOTTOM OF SPILLWAY ELEVATION	130 MSL	
BOTTOM WIDTH	28 FT	
TOP WIDTH	40 FT	
SIDE SLOPES	3H:1V	
STAGE	0.65 FT	
FREEBOARD	1.35 FT	
SPILLWAY DEPTH	2 FT	
PEAK DISCHARGE	32.1 CFS	
SEDIMENT CLEANOUT ELEVATION	127 MSL	

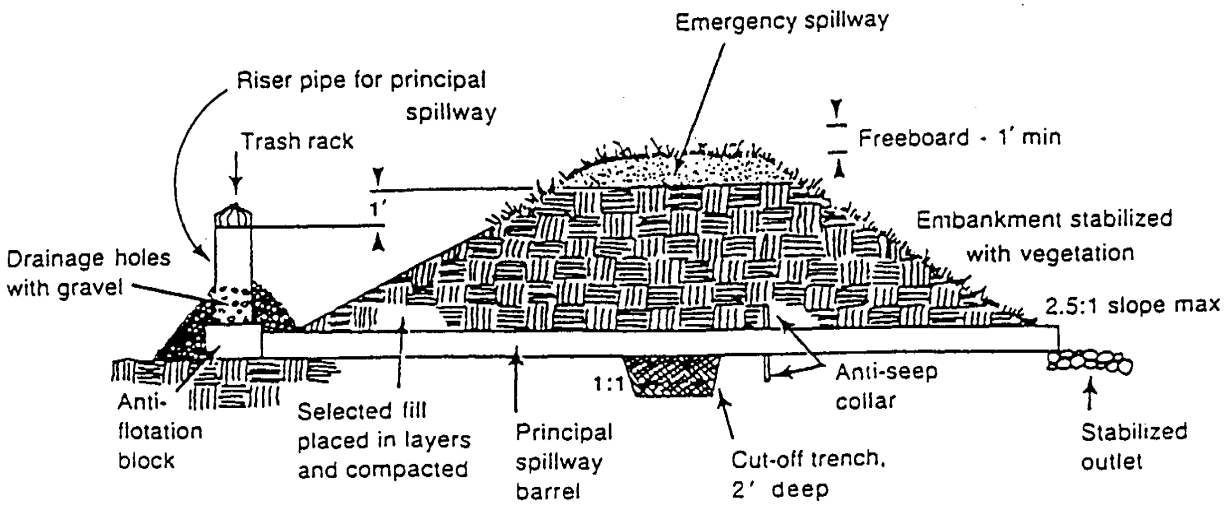


Figure 6.61b Section through embankment and basin controls.

S&ME

JOB NO. 1034-96-131
SHEET NO. 1
DATE 1/20/97

JOB NAME SNOW HILL MINE - LCID
SUBJECT E&S PLAN - SEDIMENT BASIN

COMPUTED BY DWW
CHECKED BY MAJ

- TOTAL DISTURBED ACREAGE => 12.9 AC ≈ 13 AC
- DESIGN STORM ⇒ LANDFILL : 25-YR STORM RALEIGH
- USE RATIONAL METHOD TO COMPUTE PEAK DISCHARGE

RUNOFF COEFFICIENT, C BARE PACKED EARTH, SMOOTH/ROUGH

C = 0.5 REF: TABLE 8.03(a) NC E&S DESIGN MANUAL

TIME OF CONCENTRATION, t_c

HEIGHT ABOVE OUTLET, H = 202 FT - 130 FT = 72 FT
LENGTH, L = 15.2 IN x 100 FT/IN = 1,520 FT

t_c = 7 MIN REF: FIGURE 8.03(a) NC E&S DESIGN MANUAL

RAINFALL INTENSITY (i')

i_{25} = 7.2 IN/HR REF: FIGURE 8.03(e) NC E&S DESIGN MANUAL

PEAK DISCHARGE => $Q = CiA = 0.5\ (7.2)(13) = 46.8$ CFS

- BASIN STORAGE AVAILABLE

UTILIZE EXISTING STRUCTURES; 2 SEDIMENT PITS
BREECH EMBANKMENT BETWEEN THE TWO PITS
DETERMINE AVAILABLE STORAGE BELOW 130 MSL

ELEV.	PLANIMETER (IN²)	AREA (FT²)	AVG. AREA (FT²)	HEIGHT (FT)	VOLUME (FT³)
124	0.326	3,260			
			3,955	2	7,910
126	0.465	4,650			
			6,200	2	12,400
128	0.775	7,750			
			10,075	2	20,150
130	1.240	12,400			

TOTAL 40,460 FT³

S&ME

JOB NO. 1034-96-131
SHEET NO. 2
DATE 1/20/97

JOB NAME SNOW HILL MINE - LCID
SUBJECT E&S PLAN - SEDIMENT BASIN

COMPUTED BY DWW
CHECKED BY MMG

- BASIN STORAGE REQUIRED => 1,800 FT³/AC

  1,800 FT³/AC x 13 AC = 23,400 FT³

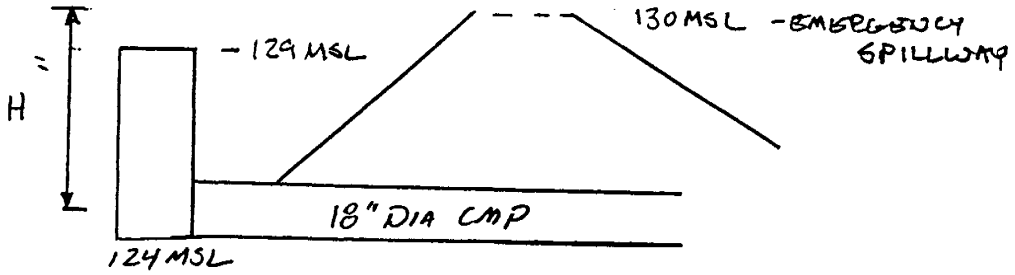
- BASIN STORAGE AVAILABLE => 40,460 FT³ > REQUIRED => 23,400 FT³ OK

- CHECK BASIN SHAPE LENGTH : WIDTH RATIO

  LENGTH = 300 FT, WIDTH = 90 FT ≈ 3:1 > 2:1 OK

- PRINCIPAL SPILLWAY

  - BARREL, EXISTING 18" DIA CMP 40 FT LONG



HEAD ABOVE BARREL, H = (130 - 124) - 0.75 FT = 5.25 FT ≈ 5 FT

Q BARREL = 12.23 CFS REF: TABLE 8.07(a) NC E&S DESIGN MANUAL

CORRECTION FOR LENGTH = 40 FT => 12.23 CFS (1.2) = 14.7 CFS REF: TABLE 8.07(a) NC E&S DESIGN MANUAL

- SELECT RISER FOR 18" CMP BARREL

  CHOOSE 24" DIA CMP FROM FIGURES 8.07(b) NC E&S DESIGN MANUAL

  24" RISER W/ 1 FT HEAD, Q = 20 CFS > 14.7 CFS OK BARREL CONTROLS

S&ME

JOB NO. 1034-96-131
SHEET NO. 3
DATE 1/20/97

JOB NAME SNOW HILL MINE - LCID
SUBJECT B'S ALAN - SEDIMENT BASIN

COMPUTED BY DWW
CHECKED BY MAG

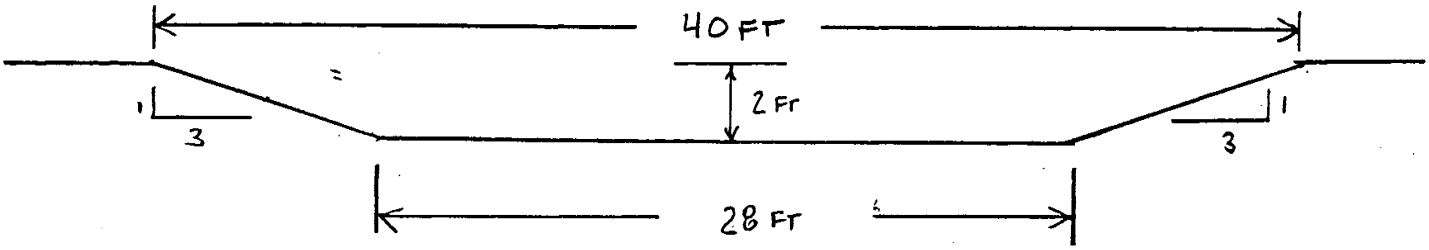
- DESIGN EMERGENCY SPILLWAY

$Q = Q_{LS} - Q_{BARREL} = 46.8\ CFS - 14.7\ CFS = 32.1\ CFS$

USE TABLE 8.07(d) FROM NC E'S DESIGN MANUAL FOR VEGETATED SPILLWAYS EXCAVATED IN VERY ERODIBLE SOILS

$Q \approx 35\ CFS$ EXIT SLOPE = 4:1%

BOTTOM WIDTH = 28 FT
STAGE ≈ 0.65 FT
FREEBOARD = 1.35 FT



- ANTI-SEEP COLLAR => 1.5 FT + 1.5 FT x 1.5 FT + 1.5 FT

=> 3 FT x 3 FT

- ANTI FLOTATION BLOCK

DISPLACED WATER AT PEAK => $\pi(1')^2 \times 7\ FT = 22\ FT^3$

=> $22\ FT^3\ (62.4\ lb/FT^3) = 1{,}372\ lb$

CONCRETE ≈ $150\ lb/FT^3$ @ 2 FT THICK

REQUIRED VOLUME = $1{,}372\ lb / 150\ lb/FT^3 = 9.1\ FT^3$

REQUIRED SURFACE AREA = $9.1\ FT^3 / 2\ FT = 4.5$

BLOCK = $(4\ FT \times 4\ FT) - \pi(1\ FT)^2 = \underline{12.8\ FT^2 > 4.5\ OK}$

ANTI FLOTATION BLOCK => 4 FT x 4 FT x 2 FT

Table 8.03a
Value of Runoff Coefficient (C) for Rational Formula

Land Use	C	Land Use	C
Business:		Lawns:	
Downtown areas	0.70-0.95	Sandy soil, flat, 2%	0.05-0.10
Neighborhood areas	0.50-0.70	Sandy soil, ave., 2-7%	0.10-0.15
		Sandy soil, steep, 7%	0.15-0.20
Residential:		Heavy soil, flat, 2%	0.13-0.17
Single-family areas	0.30-0.50	Heavy soil, ave., 2-7%	0.18-0.22
Multi units, detached	0.40-0.60	Heavy soil, steep, 7%	0.25-0.35
Multi units, attached	0.60-0.75		
Suburban	0.25-0.40	Agricultural land:	
		Bare packed soil	
Industrial:		Smooth	0.30-0.60
Light areas	0.50-0.80	Rough	0.20-0.50
Heavy areas	0.60-0.90	Cultivated rows	
		Heavy soil no crop	0.30-0.60
Parks, cemeteries	0.10-0.25	Heavy soil with crop	0.20-0.50
		Sandy soil no crop	0.20-0.40
Playgrounds	0.20-0.35	Sandy soil with crop	0.10-0.25
		Pasture	
Railroad yard areas	0.20-0.40	Heavy soil	0.15-0.45
		Sandy soil	0.05-0.25
Unimproved areas	0.10-0.30	Woodlands	0.05-0.25
Streets:			
Asphalt	0.70-0.95		
Concrete	0.80-0.95		
Brick	0.70-0.85		
Drives and walks	0.75-0.85		
Roofs	0.75-0.85		

NOTE: The designer must use judgment to select the appropriate C value within the range for the appropriate land use. Generally, larger areas with permeable soils, flat slopes, and dense vegetation should have lowest C values. Smaller areas with slowly permeable soils, steep slopes, and sparse vegetation should be assigned highest C values.

Source: American Society of Civil Engineers

The overland flow portion of flow time may be determined from Figure 8.03a. The flow time (in minutes) in the channel can be estimated by calculating the average velocity in feet per minute and dividing the length (in feet) by the average velocity.

Step 4. Determine the rainfall intensity, frequency, and duration (Figures 8.03b through 8.03g—source: North Carolina State Highway Commission; Jan. 1973). Select the chart for the locality closest to your location. Enter the "duration" axis of the chart with the calculated time of concentration, Tc. Move vertically until you intersect the curve of the appropriate design storm, then move horizontally to read the rainfall intensity factor, i, in inches per hour.

Step 5. Determine peak discharge, Q (ft^3/sec), by multiplying the previously determined factors using the rational formula (Sample Problem 8.03a).

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: Snow Hill Mine LCID

Comment: North Diversion Ditch

Solve For Depth

Given Input Data:

Bottom Width.....	4.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.043
Channel Slope....	0.0400 ft/ft
Discharge.....	25.50 cfs

⇒ VEGETATED EXCAVATED CLASS "D"

Computed Results:

Depth.....	0.82 ft
Velocity.....	4.80 fps
Flow Area.....	5.32 sf
Flow Top Width...	8.93 ft
Wetted Perimeter.	9.20 ft
Critical Depth...	0.86 ft
Critical Slope...	0.0329 ft/ft
Froude Number....	1.10 (flow is Supercritical)

DEPTH = 0.82 FT

SET DITCH DEPTH = 1 FT

Table 8.05d
Maximum Permissible Velocities for Unprotected Soils in Existing Channels.

Materials	Maximum Permissible Velocities (fps)
Fine Sand (noncolloidal)	2.5
Sand Loam (noncolloidal)	2.5
Silt Loam (noncolloidal)	3.0
Ordinary Firm Loam	3.5
Fine Gravel	5.0
Stiff Clay (very colloidal)	5.0
Graded, Loam to Cobbles (noncolloidal)	5.0
Graded, Silt to Cobbles (colloidal)	5.5
Alluvial Silts (noncolloidal)	3.5
Alluvial Silts (colloidal)	5.0
Course Gravel (noncolloidal)	6.0
Cobbles and Shingles	5.5
Shales and Hard Pans	6.0

Sample Problem 8.05a
Design of a grass-lined channel.

Given:

Design Q_{10} = 16.6 cfs

Proposed channel grade = 2%
Proposed vegetation: Tall fescue
Soil: Creedmoor (easily erodible)
Permissible velocity, V_p = 4.5 ft/s (Table 8.05a)
Retardance class: "B" uncut, "D" cut (Table 8.05c).
Trapezoidal channel dimensions:
designing for low retardance condition (retardance class D)
design to meet V_p.

Find:

Channel dimensions

Solution:

Make an initial estimate of channel size
$A = Q/V$; 16.6 cfs/4.5 ft/sec = 3.69 ft^2

Try bottom width = 3.0 ft

$Z = 3$
$A = bd + Zd^2$
$P = b + 2d\sqrt{Z^2 + 1}$

An iterative solution using Figure 8.05a to relate flow depth to Manning's *n* proceeds as follows: Manning's equation is used to check velocities

d (ft)	A (ft^2)	R (ft)	n	V (fps)	Q (cfs)	Comments
0.8	4.32	0.54	0.043	3.25	14.0	$V<V_p$ OK, $Q<Q_{10}$, (too small, try deeper channel)
0.9	5.13	0.59	0.042	3.53	18.10	$V<V_p$, OK, $Q>Q_{10}$, OK

Now design for high retardance (class B):

Try d = 1.5 ft and trial velocity, V_t = 3.0 ft/sec

d (ft)	A (ft^2)	R (ft)	V_t (fps)	n	V (fps)	Q (cfs)	Comments
1.5	11.25	0.90	3.0	0.08	2.5		reduce Vt
			2.0	0.11	1.8		reduce V_t
			1.6	0.12	1.6	18	$Q>Q_{10}$ OK

Channel summary:

Trapezoidal shape, Z=3, b=3 ft, d=1.5 ft, grade = 2%

Table 8.05g
Permissible Shear Stresses for Riprap and Temporary Liners

Lining Category	Permissible Unit Shear Stress, T_d Lining Type	(lb/ft^2)
Temporary	Woven Paper Net	0.15
	Jute Net	0.45
	Fiberglass Roving:	
	Single	0.60
	Double	0.85
	Straw with Net	1.45
	Curled Wood mat	1.55
	Synthetic Mat	2.00
	d_{50} Stone Size (inches)	
Gravel Riprap	1	0.40
	2	0.80
Rock Riprap	6	2.50
	9	3.80
	12	5.00
	15	6.30
	18	7.50
	21	8.80
	24	10.00

Design Procedure-Temporary Liners

The following is a step-by-step procedure for designing a temporary liner for a channel. Because temporary liners have a short period of service, the design Q may be reduced. For liners that are needed for six months or less, the 2-yr frequency storm is recommended.

Step 1. Select a liner material suitable for site conditions and application. Determine roughness coefficient from manufacturer's specifications or Table 8.05c.

Step 2. Calculate the normal flow depth using Manning's equation (Figure 8.05d). Check to see that depth is consistent with that assumed for selection of Manning's n in Figure 8.05d.

Step 3. Calculate shear stress at normal depth.

Step 4. Compare computed shear stress with the permissible shear stress for the liner.

Step 5. If computed shear is greater than permissible shear, adjust channel dimensions to reduce shear or select a more resistant lining and repeat steps 1 through 4.

Design of a channel with temporary lining is illustrated in Sample Problem 8.05b.

Tractive Force Procedure

The design of riprap-lined channels and temporary channel linings is based on analysis of tractive force.

NOTE: This procedure is for uniform flow in channels and is *not* to be used for design of deenergizing devices.

To calculate the required size of an open channel, assume the design flow is uniform and does not vary with time. Since actual flow conditions change through the length of a channel, subdivide the channel into design reaches as appropriate.

PERMISSIBLE SHEAR STRESS

The permissible shear stress, T_d, is the force required to initiate movement of the lining material. Permissible shear stress for the liner is not related to the erodibility of the underlying soil. However, if the lining is eroded or broken, the bed material will be exposed to the erosive force of the flow.

COMPUTING NORMAL DEPTH

The first step in selecting an appropriate lining is to compute the design flow depth (the normal depth) and determine the shear stress.

Normal depths can be calculated by Manning's equation as shown for trapezoidal channels in Figure 8.05d. Values of the Manning's roughness coefficient for different ranges of depth are provided in Table 8.05e for temporary linings and Table 8.05f for riprap. The coefficient of roughness generally decreases with increasing flow depth.

Table 8.05e
Manning's Roughness Coefficients for Temporary Lining Materials

	n value for Depth Ranges		
	0-0.5 ft	0.5-2.0 ft	>2.0 ft
Lining Type			
Woven Paper Net	0.016	0.015	0.015
Jute Net	0.028	0.022	0.019
Fiberglass Roving	0.028	0.021	0.019
Straw with Net	0.065	0.033	0.025
Curled Wood Mat	0.066	0.035	0.028
Synthetic Mat	0.036	0.025	0.021

Table 8.05c
Retardance Classification for Vegetal Covers

Retardance	Cover	Condition
A	Reed canarygrass	Excellent stand, tall (average 36")
	Weeping lovegrass	Excellent stand, tall (average 30")
B	Tall fescue	Good stand, uncut, (average 18")
	Bermudagrass	Good stand, tall (average 12")
	Grass-legume mixture (tall fescue, red fescue, sericea lespedeza)	Good stand, uncut
	Grass mixture (timothy, smooth bromegrass or orchardgrass)	Good stand, uncut (average 20")
	Sericea lespedeza	Good stand, not woody, tall (average 19")
	Reed canarygrass	Good stand, cut (average 12-15")
	Alfalfa	Good stand, uncut (average 11")
C	Tall fescue	Good stand (8-12")
	Bermudagrass	Good stand, cut (average 6")
	Bahiagrass	Good stand, uncut (6-8")
	Grass-legume mixture-- summer (orchardgrass, redtop and annual lespedeza)	Good stand, uncut (6-8")
	Centipedegrass	Very dense cover (average 6")
	Kentucky bluegrass	Good stand, headed (6-12")
	Redtop	Good stand, uncut (15-20")
D	Tall fescue	Good stand, cut (3-4")
	Bermudagrass	Good stand, cut (2.5")
	Bahiagrass	Good stand, cut (3-4")
	Grass-legume mixture-- fall-spring (orchard-grass, redtop, and annual lespedeza)	Good stand, uncut (4-5")
	Red fescue	Good stand, uncut (12-18")
	Centipedegrass	Good stand, cut (3-4")
	Kentucky bluegrass	Good stand, cut (3-4")
E	Bermudagrass	Good stand, cut (1.5")
	Bermudagrass	Burned stubble

Modified from: USDA-SCS, 1969. Engineering Field Manual.

Step 10. For grass-lined channels once the appropriate channel dimensions have been selected for low retardance conditions, repeat steps 6 through 8 using a higher retardance class, corresponding to tall grass. Adjust capacity of the channel by varying depth where site conditions permit.

NOTE 1: If design velocity is greater than 2.0 ft/sec., a temporary lining may be required to stabilize the channel until vegetation is established. The temporary liner may be designed for peak flow from the 2-yr storm. If a channel requires temporary lining, the designer should analyze shear stresses in the channel to select the liner that provides protection and promotes establishment of vegetation. For the design of temporary liners, use tractive force procedure.

NOTE 2: Design Tables—Vegetated Channels and Diversions at the end of this section may be used to design grass-lined channels with parabolic cross-sections.

Step 11. Check outlet for carrying capacity and stability. If discharge velocities exceed allowable velocities for the receiving stream, an outlet protection structure will be required (Table 8.05d).

Sample Problem 8.05a illustrates the design of a grass-lined channel.

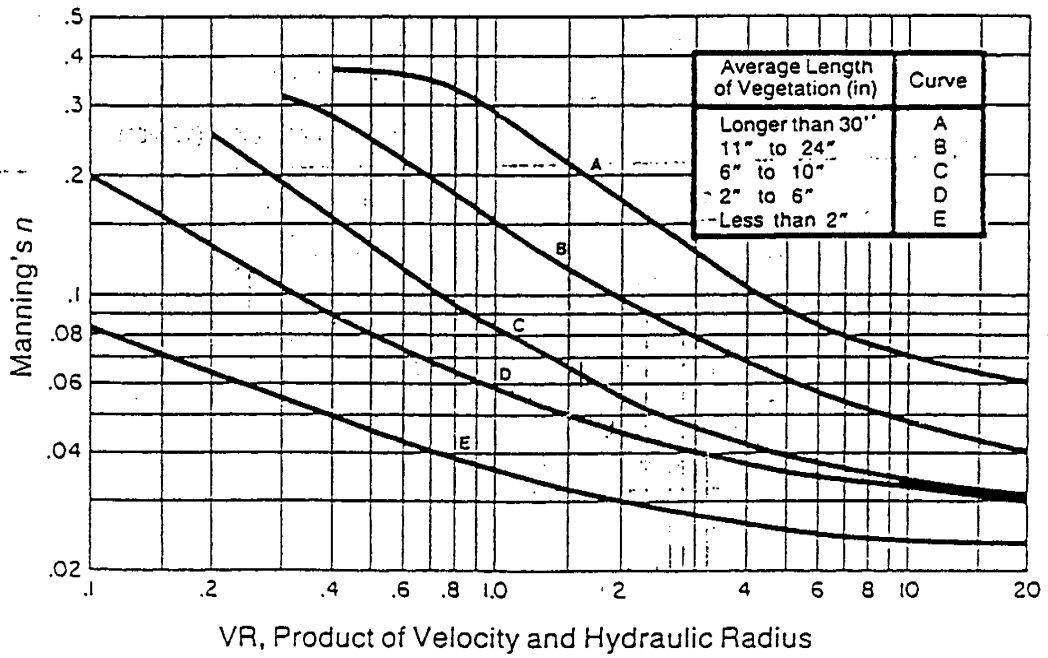


Figure 8.05c Manning's *n* related to velocity, hydraulic radius, and vegetal retardance.

EROSION & SEDIMENTATION CONTROL
FINANCIAL RESPONSIBILITY FORM

RECD JAN 2 4 1997

FINANCIAL RESPONSIBILITY/OWNERSHIP FORM
SEDIMENTATION POLLUTION CONTROL ACT

No person may initiate any land-disturbing activity on one or more contiguous acres as covered by the Act before this form and an acceptable erosion and sedimentation control plan have been completed and approved by the Land Quality Section, N.C. Department of Environment, Health, and Natural Resources. (Please type or print and, if question is not applicable, place N/A in the blank.)

Part A.

1. Project Name Snow Hill Mine LCID Landfill

2. Location of land-disturbing activity: County Cumberland, City or Township Rockfish Twnshp, and Highway / Street S.R. 2219

3. Approximate date land-disturbing activity will be commenced: March 1997

4. Purpose of development (residential, commercial, industrial, etc.) : Industrial

5. Total acreage disturbed or uncovered (including off-site borrow and waste areas) : 13

6. Amount of fee enclosed $ 270.00

7. Has an erosion and sedimentation control plan been filed ? Yes X No _____

8. Person to contact should sediment control issues arise during land-disturbing activity.

Name Mr. Stephen Waters Telephone (910) 488-6483

9. Landowner (s) of Record (Use blank page to list additional owners.):

Lacie C. Tew	
Name (s)	
Rt. 30 Box 317F	
Current Mailing Address	Current Street Address
Fayetteville NC 28309	
City State Zip	City State Zip

10. Recorded in Deed Book No. 1117 Page No. 273

Part B.

1. Person (s) or firms (s) who are financially responsible for this land-disturbing activity (Use the blank page to list additional persons or firms):

McDonald Grading Company, Inc.	
Name of Person (s)or Firm (s)	
2515 Murchison Road	
Mailing Address	Street Address
Fayetteville, NC 28301	
City State Zip	City State Zip
Telephone (910) 488-6483	Telephone

2. (a) If the Financially Responsible Party is not a resident of North Carolina give name and street address of a North Carolina Agent.

Name

Mailing Address | Street Address

City State Zip | City State Zip

Telephone | Telephone

(b) If the Financially Responsible Party is a Partnership or other person engaging in business under an assumed name, attach a copy of the certificate of assumed name. If the Financially Responsible Party is a Corporation give name and street address of the Registered Agent.

Name of Registered Agent

Mailing Address | Street Address

City State Zip | City State Zip

Telephone | Telephone

The above information is true and correct to the best of my knowledge and belief and was provided by me under oath. (This form must be signed by the financially responsible person if an individual or his attorney-in-fact or if not an individual by an officer, director, partner, or registered agent with authority to execute instruments for the finanacially responsible person). I agree to provide corrected information should there be any change in the information provided herein.

Jerry F. McDonald — Type or print name

President — Title or Authority

Signature: X Jerry F McDonald

Date: X 1-22-97

I, Susan M Ammons, a Notary Public of the County of Cumberland State of North Carolina, hereby certify that Jerry F McDonald appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this 22nd day of January, 19 97.

Seal

Susan M Ammons
Notary

My commission expires 1/6/98

Rev 11/90

NPDES NOTICE OF INTENT (NOI) FORM
FOR GENERAL PERMIT NCG010000
GENERAL SITE GRADING

FOR AGENCY USE ONLY		
DATE RECEIVED		
YEAR	MONTH	DAY
CERTIFICATE OF COVERAGE		
DATE ISSUED		
YEAR	MONTH	DAY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

NOTICE OF INTENT REQUESTING COVERAGE UNDER THE CONSTRUCTION ACTIVITIES GENERAL NPDES PERMIT NCG010000 STORMWATER DISCHARGES

Complete this Notice of Intent (NOI) and mail to the following address

North Carolina Division of Environmental Management
Water Quality Section, NPDES Group
P.O. Box 29535
Raleigh, North Carolina, 27626-0535

The NOI must be accompanied with a general permit filing fee of $50.00. The check should be made out to the North Carolina Department of Environment, Health, and Natural Resources.

Applicant Information: (please print or type)

Name: McDonald Grading Company, Inc.

Address: 2515 Murchison Road

City: Fayetteville State: NC

Zip: 28301 Phone: (910) 488-6483

Project Information:

Name of project: Snow Hill Mine - LCID Landfill

City: N/A State: North Carolina

County: Cumberland

Estimated time table of the project:

March 1997 through March 2002

Physical Location

Description:(Street address, state road number, distance and direction from roadway intersection, **and** attach a copy of a county map or USGS quad with the facility marked on the map.) S.R. 2219 (Claude Lee Road) Approx. 1/2 mile west of I-95

[Agency use only: Latitude_____Longitude_____]

Stormwater discharges to

Big Sandy Run

(name of receiving water or, if to a municipal separate storm sewer system, name of the municipal system)

Number of stormwater discharge points? 1

I hereby request coverage under the referenced General Permit. I understand that coverage under this permit will constitute the permit requirements for the discharge(s) and is enforceable in the same manner as an individual permit.

I agree to abide by the following as a part of coverage under this General Permit:

1. I agree to abide by the approved Sedimentation and Erosion Control Plan for this project and to keep a signed copy of the letter of approval of the plan on-site at all times. (A copy of the letter of approval of the plan must be attached to this request.)

2. I agree to not discharge any sanitary wastewater from this construction activity except under the provisions of another NPDES permit specifically issued therefore.

3. I agree that there will be no chemicals added to the discharge.

4. I agree that wastes composed of building materials will be disposed of in accordance with N.C. statutes and rules governing solid waste disposal.

5. I agree that maintenance activities for vehicles and heavy equipment will be performed so as to not result in contamination of the surface or ground waters.

I agree to abide by the provisions as listed above and recognize that the provisions are to be considered as enforceable requirements of the General Permit.

I certify that I am familiar with the information contained in the application and that to the best of my knowledge and belief such information is true, complete, and accurate.

x [signature] — signature

x 1-22-97 — date

Jerry F. McDonald — name of person signing above (printed or typed)

President — title

North Carolina General Statute 143-215.6B (i) provides that: Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under Article 21 or regulations of the Environmental Management Commission implementing that Article, or who falsifies, tampers with or knowingly renders inaccurate any recording or monitoring device or method required to be operated or maintained under Article 21 or regulations of the Environmental Management Commission implementing that Article, shall be guilty of a misdemeanor punishable by a fine not to exceed $10,000, or by imprisonment not to exceed six months, or by both. (18 U.S.C. Section 1001 provides a punishment by a fine of not more than $10,000 or imprisonment not more than 5 years, or both, for similar offense.)

Table 8.07d
Design Table for Vegetated Spillways Excavated in Very Erodible Soils
(side slopes–3 horizontal:1 vertical)

Discharge Q CFS	Slope Range		Bottom Width Feet	Stage Feet
	Minimum Percent	Maximum Percent		
10	3.5	4.7	8	.68
15	3.4	4.4	12	.69
	3.4	5.9	16	.60
20	3.3	3.3	12	.80
	3.3	4.1	16	.70
	3.5	5.3	20	.62
25	3.3	3.3	16	.79
	3.3	4.0	20	.70
	3.5	4.9	24	.64
30	3.3	3.3	20	.78
	3.3	4.0	24	.71
	3.4	4.7	28	.65
	3.4	5.5	32	.61
35	3.2	3.2	24	.77
	3.3	3.9	28	.71
	3.5	4.6	32	.66
	3.5	5.2	36	.62
40	3.3	3.3	28	.76
	3.4	3.8	32	.71
	3.4	4.4	36	.67
	3.4	5.0	40	.64
45	3.3	3.3	32	.76
	3.4	3.8	36	.71
	3.4	4.3	40	.67
	3.4	4.8	44	.64
50	3.3	3.3	36	.75
	3.3	3.8	40	.71
	3.3	4.3	44	.68
60	3.2	3.2	44	.75
	3.2	3.7	48	.72
70	3.3	3.3	52	.75
80	3.1	3.1	56	.78

Example of Use

Given: Discharge, Q = 38 c.f.s. Spillway slope, Exit section (from profile) = 4%.

Find: Bottom Width and Stage in Reservoir.

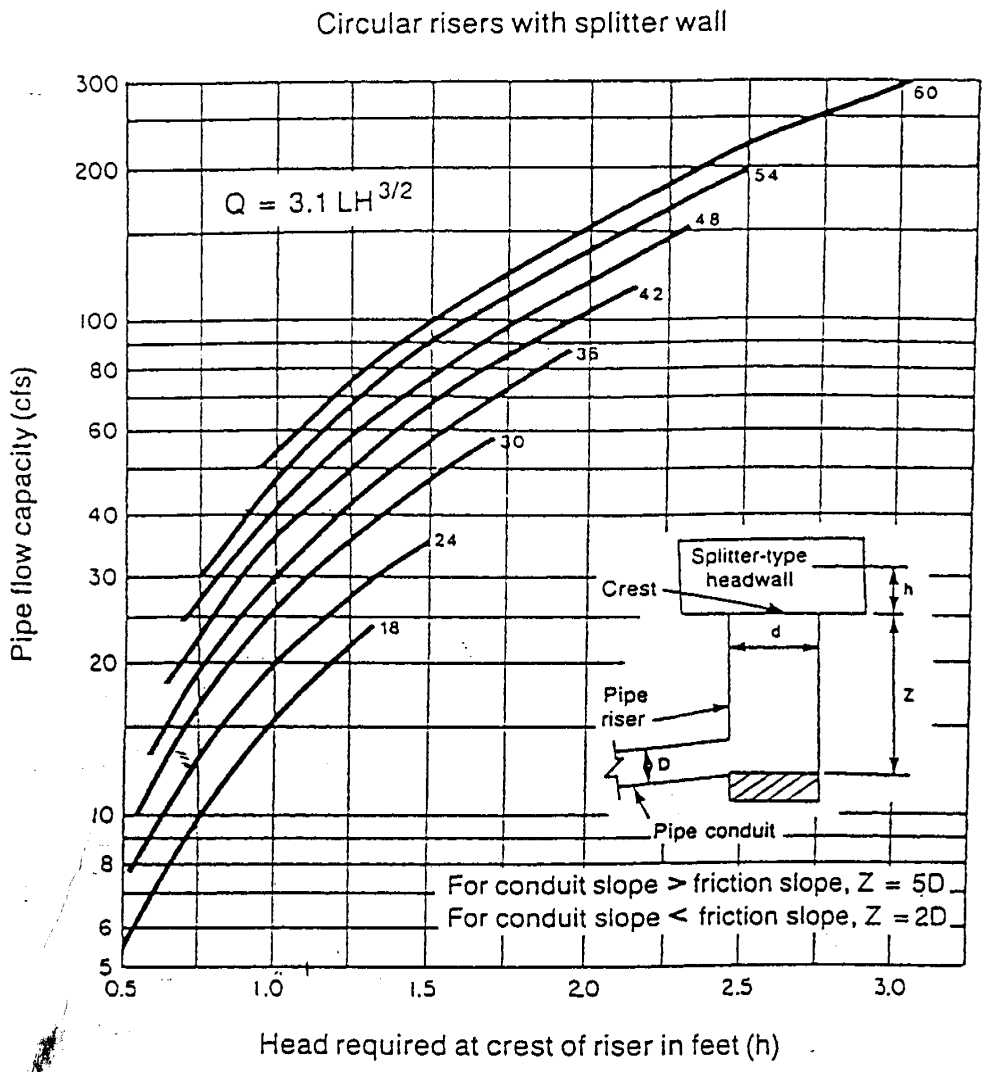
Procedure: Enter table from left at 40 c.f.s. Note that spillway slope (4.0%) falls within slope ranges corresponding to bottom widths of 36 and 40 ft. Use wider bottom width, 40 ft, to minimize velocity. Stage in Reservoir will be 0.64 ft.

Note: Computations based on: Roughness coefficient, n = .040
Maximum velocity = 3.50 ft per sec.

Table 8.07a
Pipe Flow Chart for Design of Corrugated Metal Outlet Conduit
(Q in cubic ft/sec)

For Corrugated Metal Pipe Inlet $K_e + K_b = 1.0$ and 70 feet of Corrugated Metal Pipe Conduit n = 0.025. Note correction factors for other pipe lengths.

Dia. / H	12"	15"	18"	21"	24"	30"	36"	42"
2	2.84	4.92	7.73	11.30	15.60	26.60	40.77	58.12
3	3.48	6.03	9.47	13.84	19.10	32.58	49.93	71.19
4	4.02	6.96	10.94	15.98	22.06	37.62	57.66	82.20
5	4.49	7.78	12.23	17.87	24.66	42.06	64.46	91.90
6	4.92	8.52	13.40	19.57	27.01	46.07	70.60	100.65
7	5.32	9.21	14.47	21.14	29.19	49.77	76.28	108.75
8	5.68	9.84	15.47	22.60	31.19	53.19	81.53	116.23
9	6.03	10.44	16.41	23.97	33.09	56.43	86.49	123.30
10	6.36	11.00	17.30	25.26	34.88	59.48	91.16	129.96
11	6.67	11.54	18.14	26.50	36.59	62.39	95.63	136.33
12	6.96	12.05	18.95	27.68	38.21	65.16	99.87	142.37
13	7.25	12.55	19.72	28.81	39.77	67.83	103.96	148.21
14	7.52	13.02	20.47	29.90	41.27	70.39	107.88	153.80
15	7.78	13.48	21.19	30.95	42.72	72.85	111.66	159.18
16	8.04	13.92	21.88	31.96	44.12	75.24	115.32	164.40
17	8.29	14.35	22.55	32.94	45.48	77.55	118.87	169.46
18	8.53	14.77	23.21	33.90	46.80	79.81	122.33	174.39
19	8.76	15.17	23.84	34.83	48.08	81.99	125.67	179.15
20	8.99	15.56	24.46	35.73	49.33	84.12	128.93	183.80
21	9.21	15.95	25.07	36.62	50.55	86.21	132.13	188.36
22	9.43	16.32	25.65	37.47	51.73	88.22	135.21	192.76
23	9.64	16.69	26.23	38.32	52.90	90.21	138.27	197.12
24	9.85	17.05	26.80	39.14	54.04	92.15	141.24	201.35
25	10.05	17.40	27.35	39.95	55.15	94.05	144.15	205.50
L	Correction Factors For Other Pipe Lengths							
40	1.23	1.22	1.20	1.19	1.16	1.14	1.13	1.11
50	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.07
60	1.07	1.06	1.06	1.05	1.05	1.04	1.04	1.03
70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	0.95	0.95	0.95	0.96	0.96	0.96	0.97	0.97
90	0.90	0.91	0.91	0.92	0.92	0.93	0.94	0.94
100	0.86	0.87	0.88	0.89	0.89	0.90	0.91	0.92



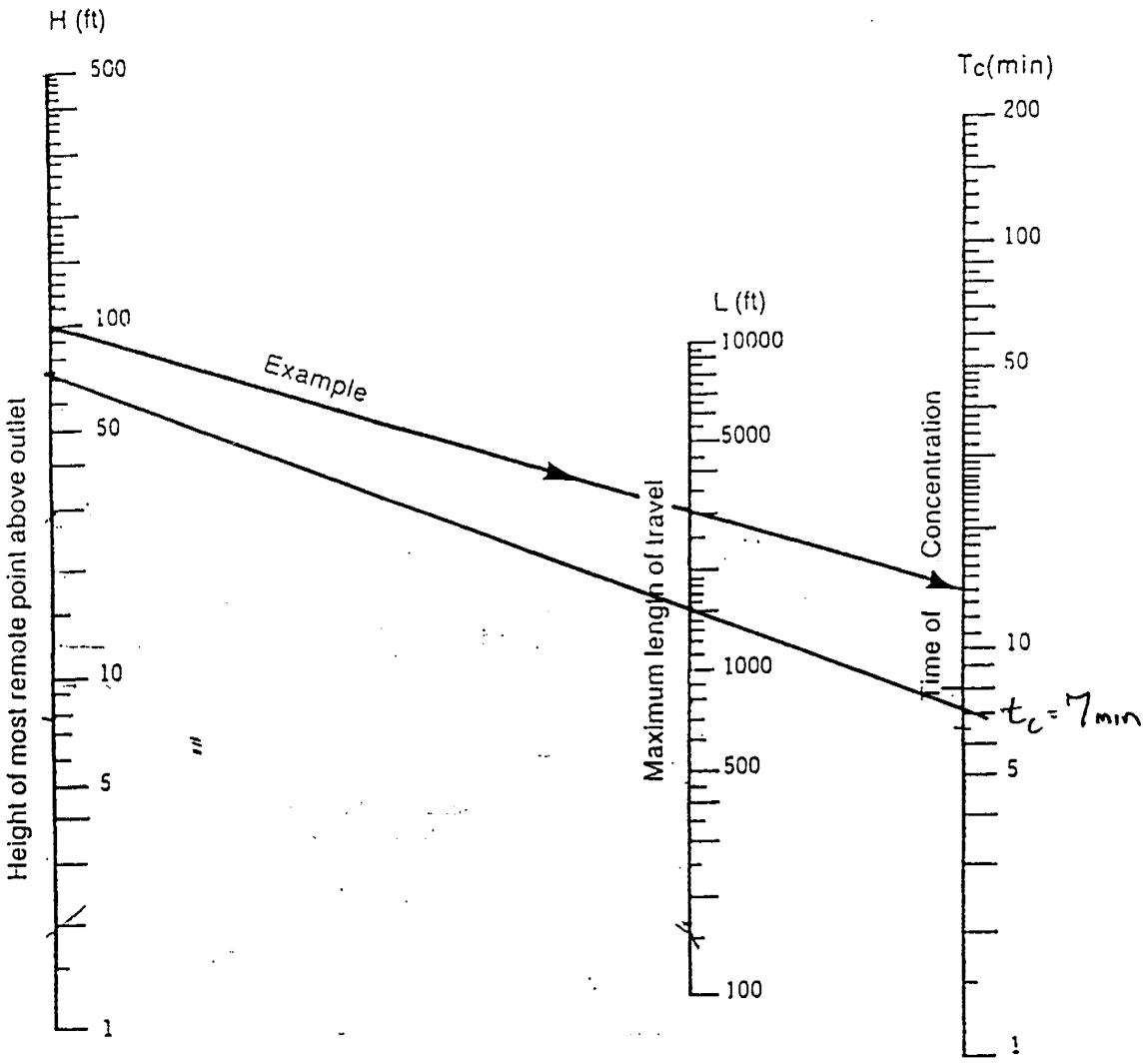
Inlet Proportions	
Pipe Conduit (D) - in	Pipe Riser (D) - in
8-12	18
15	21
18	24
21	30
24	30
30	36
36	48
42	54
48	60

Pipe drop inlet spillway design:

For a given Q and H, refer to Table 8.07a or 8.07b for conduit size. Then determine the riser diameter (d) from the Inlet Proportions Table on this figure. Next, refer to the above curves, using the conduit capacity and riser diameter, and find the head (h) required above the crest of the riser. The height of the riser should not be less than 5D - h, except as noted in the above sketch.

Example - Given: CMP; Q = 20 cfs; H = 14 ft, h max. 1.0 ft; L = 70 ft. From Table 8.07a find conduit size (D) = 18 inches. From Inlet Proportions Table, riser size = 24 inches. Head (h) required for Q = 20 and d = 24 is 1.0 ft.

Figure 8.07b Design chart for riser outlet.



Note:
Use nomograph Tc for natural basins with well-defined channels, for overland flow on bare earth, and for mowed-grass roadside channels.

For overland flow, grassed surfaces, multiply Tc by 2.

For overland flow, concrete or asphalt surfaces, multiply Tc by 0.4.

For concrete channels, multiply Tc by 0.2.

Figure 8.03a Time of concentration of small drainage basins.

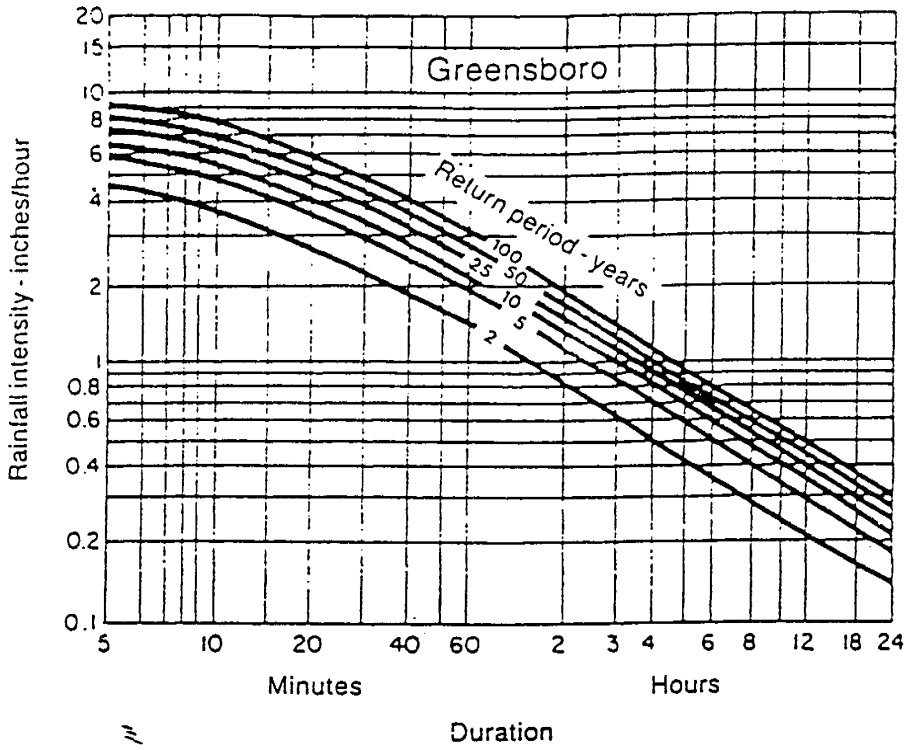


Figure 8.03d Rainfall intensity duration curves—Greensboro.

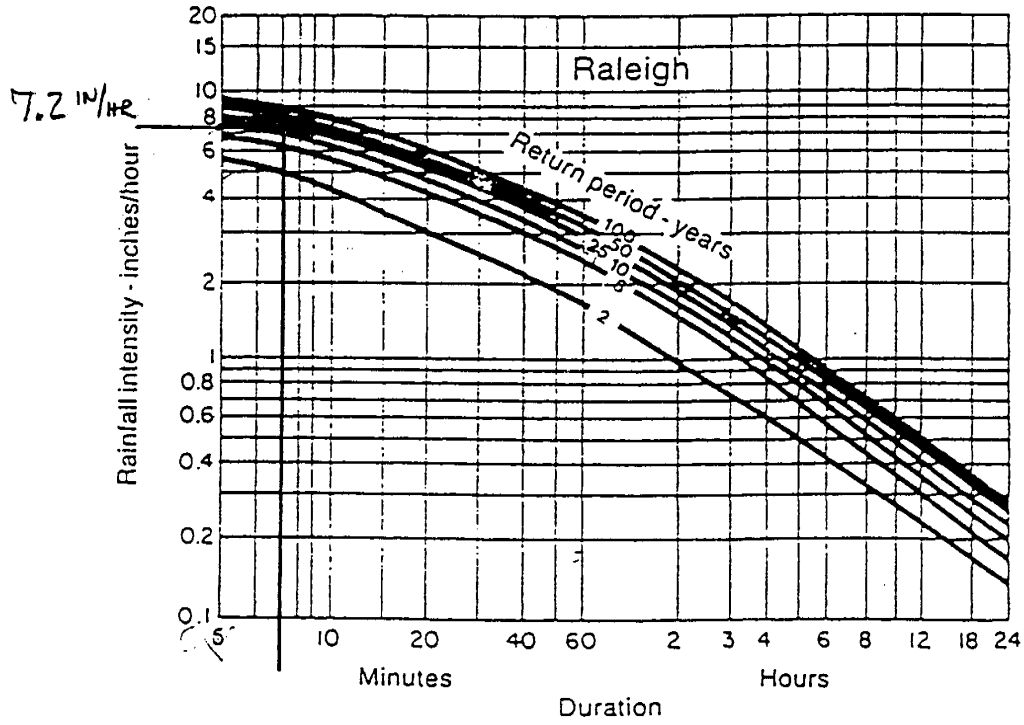


Figure 8.03e Rainfall intensity duration curves—Raleigh.

APPENDIX IV

PLANS

Test Pit Location Plan

Proposed Final Contours Plan

Cross Sections