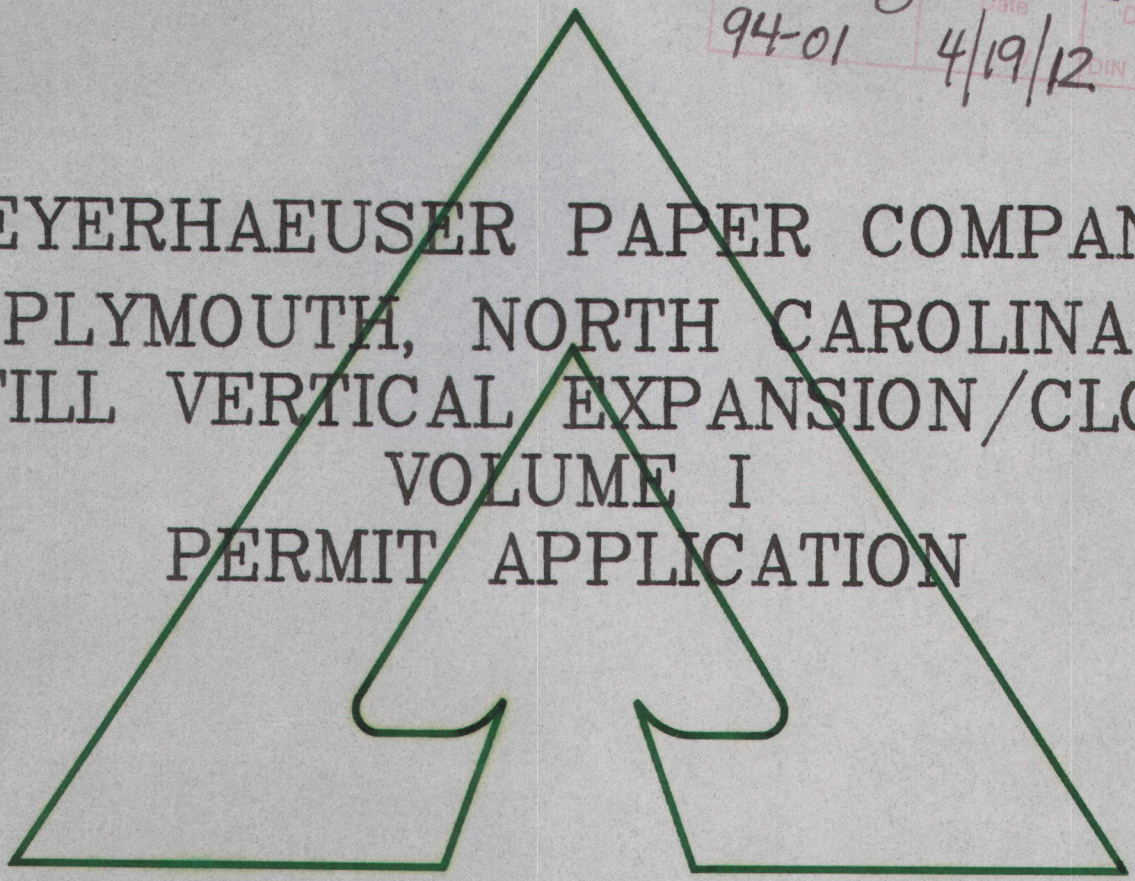
Carmen Johnson
94-01 4/19/12

WEYERHAEUSER PAPER COMPANY
PLYMOUTH, NORTH CAROLINA
LANDFILL VERTICAL EXPANSION/CLOSURE
VOLUME I
PERMIT APPLICATION



APRIL, 1989
REVISED DECEMBER, 1989

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APPROVED
SOLID & HAZARDOUS WASTE MGMT. BRANCH
DATE APPROVED 01/19/90

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SOLID WASTE BRANCH

PERMIT APPLICATION
FOR
LANDFILL VERTICAL EXPANSION/CLOSURE
FOR
WEYERHAEUSER PAPER COMPANY
PLYMOUTH, NORTH CAROLINA

A PRESENTATION TO THE NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT, HEALTH AND
NATURAL RESOURCES
DIVISION OF SOLID WASTE

April, 1989
Revised December, 1989

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

FIGURES

TABLES

APPENDICES

EXECUTIVE SUMMARY

This report, appendices, and accompanying plans have been prepared for the Weyerhaeuser Paper Company's Plymouth Pulp and Paper Mill for presentation to the North Carolina Department of Environmental Health and Natural Resources (DEHNR), Division of Solid Waste. The report consists of two volumes. Volume I describes the vertical expansion design, interim operations and closure. Volume II includes the Appendices that contain supporting documentation. Information on ground water conditions was presented in a report titled "Ground Water Quality Assessment for the Existing Landfill" submitted to DEHNR on October 3, 1989. These documents form the basis for a modification to DEHNR Solid Waste Permit No. SR 1341 that will allow for a vertical expansion of the existing land disposal area. These plans have been prepared in accordance with 10 NCAC 10G, Section .0504.

Weyerhaeuser Paper Company currently disposes of solid wastes generated by the Plymouth Paper and Wood Products Facilities in a state-permitted solid waste landfill. The active landfill, located in Washington County approximately one mile south of the manufacturing complex, covers approximately 38 acres. Solid wastes disposed at the landfill include wastes generated by pulp and paper manufacturing, ash from combustion of coal and wood fiber, and wood wastes, such as bark, chips, and discarded pallets.

The existing landfill will soon reach its waste disposal capacity. To meet long-term solid waste disposal needs, Weyerhaeuser is in the process of developing and implementing plans for a new landfill. To meet the solid waste disposal needs of the Plymouth Mill while designing, permitting, and constructing the new landfill, Weyerhaeuser has retained RMT to prepare an Interim Operations Plan for vertically expanding the existing landfill. This

vertical expansion will provide Weyerhaeuser with up to five years additional waste disposal capacity.

Major findings and conclusions presented in this Interim Operations Plan are summarized as follows:

Waste Characteristics

- Samples of coal ash, hog fuel ash, dregs, lime mud, and grits were chemically characterized by Weyerhaeuser using the Toxicity Characteristic Leaching Procedure (TCLP). RMT's experience with wastes similar to those analyzed by Weyerhaeuser is that TCLP results are similar to those of EP Toxicity leaching tests. Concentrations of metals in the TCLP extracts were below levels used to classify wastes as hazardous according to the characteristics of EP Toxicity.

- Further, the leaching tests show that the wastes exhibit low leaching potential for primary drinking water parameters.

- On the basis of available waste testing provided by Weyerhaeuser and RMT's experience with similar wastes, the wastes disposed in the landfill appear to have relatively low potential to cause significant adverse effects on ground water or surface water when properly managed according to sound basic landfill principles. These principles include erosion and drainage control, minimizing infiltration from precipitation, and avoiding placement of the waste in direct contact with surface water or ground water.

- During routine operations, up to 990 cubic yards of waste are disposed in the landfill each day. Fly ash and wood waste are the major waste components, both by volume and weight.

Hydrogeology

- Data collected during the ground water quality assessment indicate that the depth to ground water is between 4 and 18 feet below the land surface.

- The direction of shallow ground water flow is generally to the west toward Welch Creek. Shallow ground water probably discharges to Welch Creek to the west and Little Mill Creek to the northeast. Ground water flow rates range from approximately 20 ft/yr to 150 ft/yr. There are no public or private water supply wells within one-third mile of the site.

- The site is within the Coastal Plain physiographic province. Site soils consist of interbedded lenses of clayey silts, silty to sandy clays, and silty to clayey sands.

- Analytical data from ground water samples do not indicate that activities at the landfill have had significant impact on ground water quality.

Engineering Modifications

- The interim operation of the landfill consists solely of vertical expansion; no lateral expansion beyond existing waste limits is proposed.

- Interim operation is summarized as follows:

  - Initial site preparation will consist of regrading the existing waste pile to provide 3:1 side slopes, constructing perimeter surface water runoff and erosion control features, and capping and revegetating the existing exterior slopes (Stage I).

  - After the initial site preparation, solid wastes will be placed on top of the existing landfill in a uniform lift over the entire landfill surface to form the terraces shown on the drawings (Stages II and III).

  - Wastes will be placed in layers and compacted by the bulldozer used for spreading wastes.

  - The outer slope of the waste will be a maximum of 3:1 and will be terraced every 20 feet to control erosion.

  - Once a Stage has been completed, the outer slopes of that section will be covered with on-site clayey soils, topsoiled, and revegetated.

  - Solid wastes will continue to be placed and compacted to reach the final elevations with allowance for cover soils.

  - The final grade at the top of the landfill will be graded with a minimum 5% slope to promote runoff, capped with on-site clayey soils, and seeded.

- Storm water management and erosion control features include:

  - Runoff from the landfill will be collected by a system of perimeter ditches and routed to sedimentation ponds.

- The sedimentation ponds allow for settling of suspended soil particles from storm water runoff, and will serve as retention ponds to control the rate of runoff from the landfill area.

1. INTRODUCTION

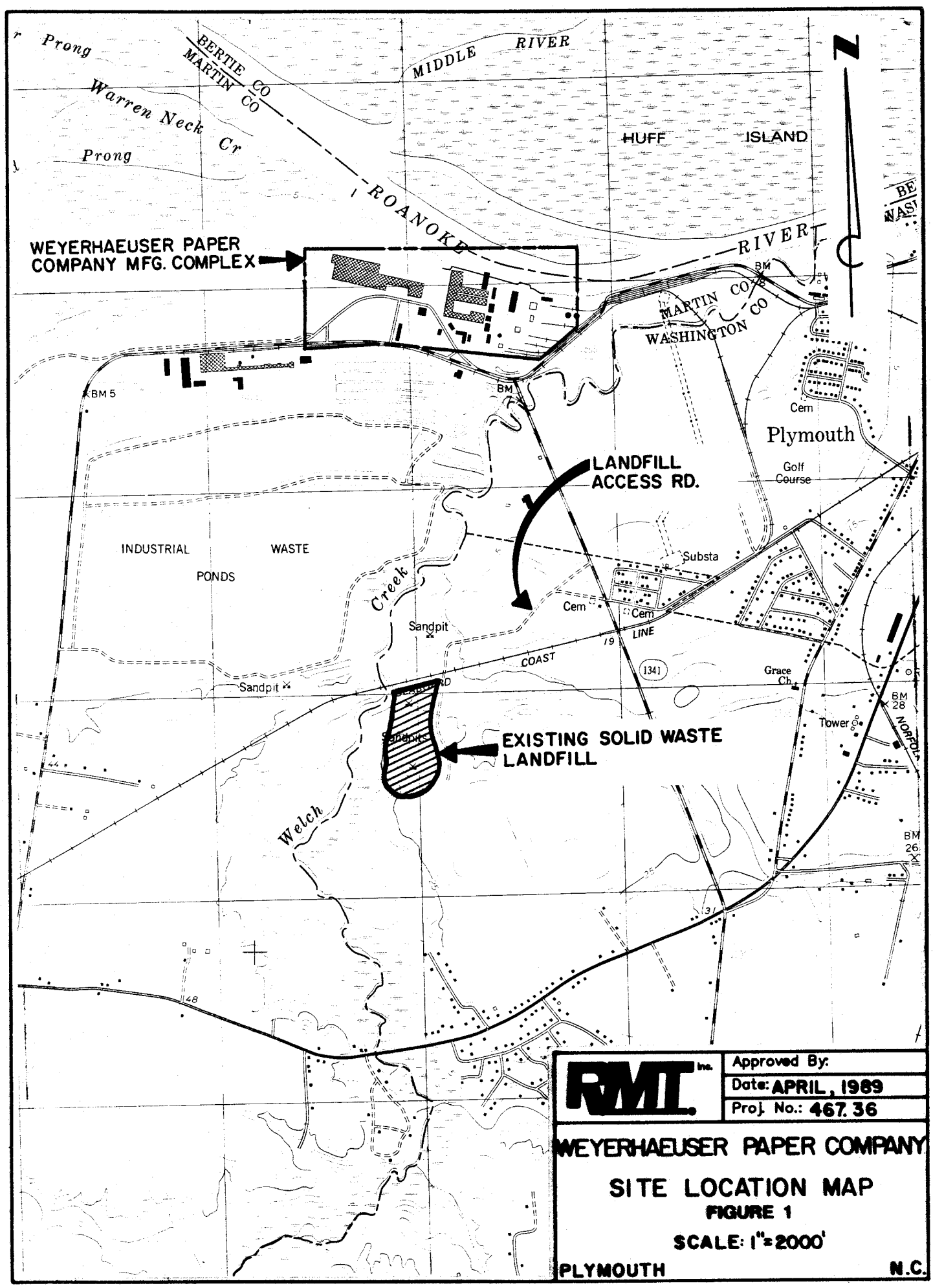
1.1. Purpose

The Weyerhaeuser Paper Company (Weyerhaeuser) is currently disposing solid waste that is generated at its Plymouth, North Carolina, facility in a state permitted landfill. This active landfill covers approximately 38 acres of a 300-acre parcel of land owned by Weyerhaeuser. The landfill is located approximately one mile south of the manufacturing facility as shown in Figure 1. In order to continue operation of this landfill, it is necessary that an application be submitted to conform with North Carolina Statute 10 NCAC 10G, Section .0504 for a vertical expansion of the landfill. This document includes information and drawings required to be submitted with the application.

1.2 Landfill Vertical Expansion

Vertical expansion of the existing Weyerhaeuser landfill is proposed in order to meet short-term disposal requirements. The expansion will be contained within the horizontal boundary of the existing landfill. Integral to the expansion program are modifications to the existing side slopes and phased closure of the facility.

The basic expansion concept includes three stages: Stage I consists of modifications to the existing unimproved slopes, construction of perimeter ditches, and provision of erosion control features including two new sedimentation ponds. Stage I construction is shown on Drawing No. 46736-C003. Stage II consists of operating the landfill by placing waste in a controlled manner by the landfill operator on a daily basis until waste surface elevations have been raised approximately 20 feet. When Stage II is


Prong
BERTIE CO
MARTIN CO
MIDDLE RIVER
Warren Neck Cr
Prong
HUFF ISLAND
ROANOKE RIVER
WEYERHAEUSER PAPER COMPANY MFG. COMPLEX
MARTIN CO
WASHINGTON CO
BM
BM 5
Cem
Plymouth
LANDFILL ACCESS RD.
Golf Course
INDUSTRIAL WASTE PONDS
Creek
Substa
Cem
Sandpit
LINE
COAST
19
1341
Grace Ch
Tower
BM 28
NORFOLK
EXISTING SOLID WASTE LANDFILL
Welch
BM 26
N
RMT Inc.
Approved By:
Date: APRIL, 1989
Proj. No.: 467.36
WEYERHAEUSER PAPER COMPANY
SITE LOCATION MAP
FIGURE 1
SCALE: 1"=2000'
PLYMOUTH N.C.

complete, the exterior slopes of Stage II will be capped and seeded. Stage II construction is shown on Drawing No. 46736-C004. Stage III consists of continued placement of solid waste over the landfill surface until final elevations are reached. This stage includes the installation of the soil cap over the remainder of the landfill. The final grades for the landfill are shown on Drawing No. 46736-C005.

Stage I will be monitored by an experienced geotechnical technician.

1.3 Operational Responsibility

Overall responsibility for landfill operation is assigned to the Manager of Technical Services at the Weyerhaeuser Complex (919-793-8186).

1.4 Facility Description

The Plymouth complex consists of an integrated Kraft process pulp and paper mill, and a wood products plant. Paper products include bleached fluff pulp, paperboard (linerboard, corrugated medium), and fine paper. The wood products plant produces plywood, lumber, and decorative wood products.

Pulping operations involve Kraft process digestion of mixed hardwoods and softwoods for production of bleached and unbleached products. A secondary fiber operation, which recovers fibers from baled waste paper products, supplies pulp used for paperboard production.

1.5 Site Description

1.5.1. Site Geology

The Weyerhaeuser facility lies within the Atlantic Coastal Plain physiographic province. The Coastal Plain consists of an eastward

thickening series of sediments, ranging in age from Cretaceous to Recent. This province is characterized as a broad, level, east-southeastward sloping plain, which was formerly an ocean floor (Nelson, 1964). During the Pleistocene Epoch (two to three million years ago), the ocean encroached upon and inundated the land to the present 270 foot contour line (Mundorff, 1946). Ocean levels receded and advanced several times during the Pleistocene, each advancement at a lower level than the previous one. As a result, a series of terraces were formed, representing coastal deposition areas of previous ocean levels. The Plymouth facility is located near the scarp formed between the lowest, and geologically most recent, terrace, the Pamlico, and the Talbot Terrace (Nelson, 1964). Throughout most of the area, sediments of Pleistocene and Recent age form a layer 25 to 100 feet thick topping the older deposits (Nelson, 1964). Specific formations are described in Table 1.

The subsurface geology of the area surrounding the existing landfill has been characterized by eleven exploratory borings that were installed during the ground water quality assessment. Ground water monitoring wells were constructed at seven of the boring locations. Additional subsurface investigations were performed for the Stability and Materials Evaluation report. Investigation results are included in Appendix A, Stability and Materials Evaluation Report (Volume II).

In general, the borings and test pit excavations encountered a relatively thin (1 to 5 foot) surface layer of silts underlain by interbedded layers of silty clay and clayey to silty sand. The interbedded sands and clays were in turn underlain in the west half of

TABLE 1

Geologic Formations in Eastern North Carolina

SYSTEM	SERIES	FORMATION	DESCRIPTION	WATER SUPPLY
QUATERNARY	RECENT PLEISTOCENE	UNDIFFERENTIATED	Chiefly interbedded sands and clays, with beds of shells occurring locally. Comprises a surficial layer over the entire area, ranging in thickness from 20 to 100 feet.	Present source of many domestic and farm supplies through dug and driven wells, and capable of yielding small to moderate supplies throughout the area. Water is soft, relatively high in iron and locally corrosive.
TERTIARY	MIOCENE	YORKTOWN FORMATION	Blue-gray marls, sands and shell beds interbedded with massive, dark gray, sandy clays. Extends over entire area, ranging in thickness from about 50 feet in the western part to about 300 feet in the eastern part.	Developed extensively as a source of domestic supplies and is the principal aquifer in Hyde and Tyrrell Counties, east of the project area. Water is fairly hard, but generally of good quality otherwise.
		UNNAMED FORMATION	Brown phosphatic sand and silt with thin layers of olive-green sandy clay. Limited data on areal extent and thickness.	Has not been developed as a source of supply, but potentially a source of moderate quantities of good quality water in some areas.

TABLE 1 (con't)

Geologic Formations in Eastern North Carolina

SYSTEM	SERIES	FORMATION	DESCRIPTION	WATER SUPPLY
TERTIARY (continued)	EOCENE	CASTLE HAYNE LIMESTONE	White to light gray, porous, shell limestone, partially dolomitized at some places; white to gray calcareous sands and clays. Apparently extends throughout the area, ranging in thickness from about 120 feet to more than 400 feet.	Highly productive artesian aquifer, yielding several hundred gpm to individual wells. Principal aquifer in western Washington County. Water is hard with hydrogen sulfide common, and may be salty.
	PALEOCENE	BEAUFORT FORMATION	Glauconitic sands, clayey sands with beds of marl and shells occurring locally. Probably extends throughout the area, but data available limited.	Possible source of water supply in Washington County.
CRETACEOUS		PEEDEE FORMATION BLACK CREEK FORMATION TUSCALOOSA FORMATION	Clay, sand and sandy clay: some gravel; characteristically lenticular, often cross-bedded, drab, brown and reddish colors common.	The formations of Cretaceous age are not considered a source of potable water in the area.

the site by a clay unit. The depth of the clay unit ranged from 17 to 27 feet below ground surface.

Baildown permeability tests were conducted on all seven wells and hydraulic conductivity values calculated. Conductivity values ranged from 25 x 10^{-2} cm/sec to 3.3 x 10^{-4} cm/sec.

1.5.2 Ground Water Resources

Surficial sediments of Pleistocene and Recent age comprise the unconfined or water table aquifer of the area. Typically, the water table is within 4 to 18 feet of the surface. Water table configuration maps have been prepared. The maps indicate that local ground water flow in the area of existing data is generally to the west toward Welch Creek. Ground water flow rates were calculated based on horizontal hydraulic gradients between three well pairs and the hydraulic conductivity values. The flow rates ranged from approximately 20 feet/year to 150 feet/year.

Water from the shallow aquifer contains iron and is soft and corrosive. This aquifer is declining in importance as a source of domestic ground water supplies in areas where artesian aquifers are available as water sources (Nelson, 1964). Discussions with well owners and drillers in the area indicated that domestic water supply wells in the area are commonly 100-200 feet deep.

1.5.3 Site Setting

The landfill site is bounded physically to the north by the Seaboard Coast Line Railroad, immediately to the east by the landfill

access road, to the west by Welch Creek, and to the south by a pine forest (Figure 1).

The landfill is located more than a mile south of the production plant and is isolated from developed areas. The closest group of private dwellings is located approximately 1,800 feet south of the active landfill. Trowbridge Road, the nearest state highway, is also about 3,000 feet from the landfill.

Access to the site is provided by an existing roadway totally located on Weyerhaeuser property and extending from Trowbridge Road to the site. A security gate is located at the entrance off the highway. The road has moderate grades with an irregular surface. The roadway surface adjacent to the landfill is in fair condition. This access road requires minor upgrade; but is otherwise adequate for the type of vehicular traffic anticipated at this facility.

The site lies within the Welch Creek drainage basin. A major portion of the site drains directly to Welch Creek on the west. The remainder drains toward the northeast into Little Mill Creek which flows into Welch Creek north of the landfill site within Weyerhaeuser property. No data was collected in the area of Little Mill Creek to confirm the ground water flow direction. Welch Creek continues northerly and discharges to the Roanoke River.

The existing landfill site is shown on Drawing No. 46736-C002. There is an earthen berm along the western and northern boundaries of the facility. This berm was used for containment purposes during initial landfill construction. The exposed side slopes of this berm are

vegetated and there are no visual signs of erosion or instability. The top of the berm on the westerly side varies in elevation from 36 feet above mean sea level (MSL) at the northerly end to 46 feet MSL at the southerly end. The elevation at the top of the berm on the north side of the landfill is ±28 feet MSL.

The existing side slopes on the east and south side of the landfill are comprised of waste material. The gradient of these side slopes is irregular and ranges from 4:1 to 2:1. These unimproved side slopes exhibit signs of minor erosion, but no sloughing indicative of slope instability has been observed.

An aerial topographic survey was completed based on photography taken on December 23, 1987. Topographic mapping prepared from this data indicated that the northern two-thirds of the landfill was filled, at that time, to an elevation ranging from 50 feet to 53 feet MSL. Numerous waste piles covered the northern-most quarter. Two depressions appeared in the southerly section of the landfill: one about 24 feet below adjacent fill grade; and the other about 10 feet below the adjacent fill grade. Ash residue had been concentrated in the shallower, eastern-most depression.

Since the photograph was taken, an estimated 660,000 cy of material have been deposited through the end of 1989. It is estimated that the average elevation at this date throughout the landfill lies between 50 feet and 55 feet MSL. The contours shown on Drawing No. 46736-C002 have been modified to reflect the apparent grade at the top of the landfill at this time. Outside the limits of the landfill the contours reflect the grade existing on December 23, 1987.

Four apparent drainage basins have been delineated within the active landfill area and labeled Areas 1 through 4, respectively, on Drawing No. 46736-C002. The runoff from the confines of the landfill is characterized typically by sheet flow directed from the center toward the exterior. Runoff from Area 1 appears to be collected by a ditch which parallels the existing access road and is directed north toward the Railroad R.O.W. Runoff from Area 2 appears to be collected by a swale on the top of the existing berm and is directed to the depression (labeled Low Area "A" on Drawing No. 46736-C002) located at the northwest corner of the landfill. Runoff from Area 3 appears to be characterized by sheet flow over the berm in a westerly direction. The majority of the runoff from Area 4 appears to flow in a southerly direction. The estimated acreage of the four drainage basins is indicated below:

Drainage Basin Designation	Area (acres)
Area 1	10.6
Area 2	9.9
Area 3	4.2
Area 4	13.3

2. SOLID WASTE CHARACTERIZATION

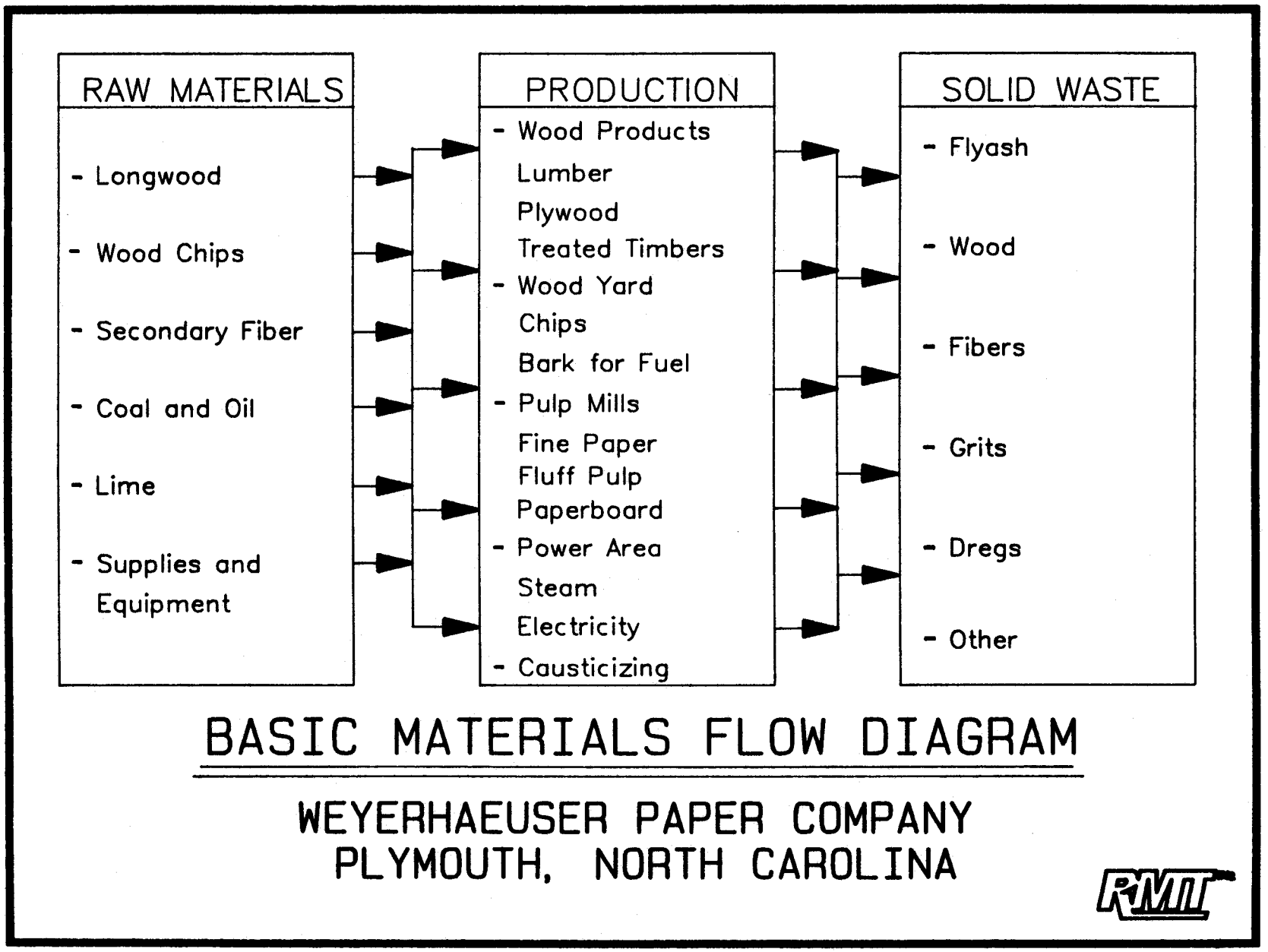
2.1 Production Processes

Weyerhaeuser Paper Company's Plymouth Mill is one of the nation's largest integrated pulp and paper mills. The mill produces bleached fluff pulp, fine paper, liner board, and corrugated medium. Weyerhaeuser also operates a wood products facility at the Plymouth complex for manufacturing plywood, lumber and treated wood products. The mill operates throughout the year, with one major shutdown period for annual maintenance, repairs, and mill improvements. Figure 2 depicts a generalized materials flow diagram that identifies major raw materials, production processes, and solid wastes.

Pulp for paper making is produced on-site by a Kraft process digestion of mixed hardwood and softwood. Longwood is purchased and stored on-site prior to debarking and chipping. Additionally, Weyerhaeuser purchases chipped wood. Bark and undersized wood chips are burned, along with coal, in the mill's power plant. No. 6 Fuel Oil is used as a backup fuel. Some of the wood waste produced is unsuitable as boiler fuel and is disposed in the landfill.

The Kraft process involves cooking wood chips at elevated temperature and pressure in an alkaline solution called white liquor. In the digesters, cellulose fibers are separated from other wood components such as lignin, turpentine, and resins. At the end of the digestion cycle, the solution is passed through a series of screens and washers to separate the fiber stock from the liquid components. The solution remaining after the fibers have been removed is known as black liquor.

FIGURE 2


RAW MATERIALS
- Longwood
- Wood Chips
- Secondary Fiber
- Coal and Oil
- Lime
- Supplies and Equipment
PRODUCTION
- Wood Products
Lumber
Plywood
Treated Timbers
- Wood Yard
Chips
Bark for Fuel
- Pulp Mills
Fine Paper
Fluff Pulp
Paperboard
- Power Area
Steam
Electricity
- Causticizing
SOLID WASTE
- Flyash
- Wood
- Fibers
- Grits
- Dregs
- Other
BASIC MATERIALS FLOW DIAGRAM
WEYERHAEUSER PAPER COMPANY
PLYMOUTH, NORTH CAROLINA
RMII

Washed fiber stock is stored and thickened. Stock to be used for fine paper and fluff pulp production is bleached. Stock to be used for unbleached products is combined with pulp from Weyerhaeuser's secondary fiber operation, which recycles paper products. Final processing of bleached or unbleached stock occurs on one of the mill's five paper machines. Most broke and butt end rolls are repulped. Broke and butt end rolls unsuitable for repulping are sent to the landfill.

Black liquor contains a substantial quantity of the chemicals used to formulate white liquor. Recovery of the chemicals in the black liquor is necessary to make the pulping process economically competitive. The recovery process consists of concentrating the liquor removed from the stock washers in a series of evaporators. The concentrated liquor contains sufficient amounts of combustible material for burning in a recovery boiler. Due to the high temperatures in the recovery boiler, non-combustible materials form a molten smelt which falls into dissolving tanks at the bottom of the boiler. The dissolved smelt is called green liquor.

Green liquor is purified in a clarifier. Solids settled in the clarifier, called "dregs", are sent to the landfill. The clarified green liquor is further processed by the addition of lime in the slaker. "Grits", a dark green waste, are formed by the slaking process.

A slurry is formed by the addition of lime to the green liquor. This slurry is eventually separated in the white liquor clarifiers. The overflow of the white liquor clarifiers is the white liquor used in the cooking process. This completes the chemical recovery cycle. Solids settled in the white liquor clarifiers, primarily calcium carbonate, are washed, filtered, and then burned in a kiln to make lime (carbon dioxide driven off). The lime

is used in the slaking process. Lime mud is sent to the landfill occasionally from a cleanup.

2.2 Quantification

Major sources of solid waste to the existing landfill include:

- Fly Ash - consists of burned coal and bark from the hog fuel boilers.
- Wood Waste - consists of logs, bark, scrap plywood, pallets, etc.
- Fiber Waste - consists of paperboard trash, secondary fiber rejects, and fine paper butt rolls and broke.
- Grits - consists of waste from the lime slaker.
- Dregs - consists of waste from the clarifiers.
- Other consists of demolition debris and miscellaneous mill trash.

The actual volume of solid waste generated each day varies. Several individual audits of the current landfill indicate a range from 220 tons per day to 790 tons per day. Based on the data of uncompacted truck counts collected by Weyerhaeuser in 1987 and 1988, the average daily residue based on yearly generation figures is 300 tons (990 cy) per day of operation. The results of the landfill audits conducted by Weyerhaeuser are included in Appendix B, Solid Waste Audits (Volume II), and summarized in Table 2.

TABLE 2

Summary - Solid Waste Audits (1987 and 1988 data)
Waste volumes are based on truck counts of uncompacted wastes.

Waste Type	Average Quantity Tons/Day	Average Quantity Yds^3/Day	% by Weight	% by Volume
Routine Daily Operations				
Fly Ash (boilers)	167	402	55	41
Wood (logs, bark, pallets)	83	464	27	47
Fiber Waste	14	36	5	3
Slaker Grits	11	26	4	2
Green Liquor Dregs	11	22	4	2
Other	16	40	5	5
Routine Daily Totals	302	990	100	100
Peak Operations (includes wastes deposited occasionally)				
Routine Daily Totals	302	990		
Demolition Waste	45	45		
Peak Daily Totals	347	1,035		

2.3 Chemical Properties

Chemical analyses were conducted by Weyerhaeuser on samples of the following:

- Dregs
- Lime Mud
- Grits
- Coal Ash
- Hog Fuel Ash

Leaching tests, using the TCLP procedure, were conducted by Weyerhaeuser on samples of these wastes. RMT's experience is that for wastes such as those generated by Weyerhaeuser, leaching tests using the TCLP procedure produce results similar to those analyzed using the EP Toxicity procedure. Concentrations of metals and pesticides in the TCLP extract were below levels used to classify wastes as hazardous according to the characteristic of EP Toxicity. Laboratory results of Weyerhaeuser's data are included in Appendix C, Test Results-Waste Analysis (Volume II), and summarized in Table 3.

TABLE 3

Toxicity Characteristic Leaching Procedure (TCLP)
Analyses of Various Solid Wastes
Generated by Weyerhaeuser Paper Company,
Plymouth, N. C. (Concentrations in mg/L)

Parameter*	Dregs	Lime Mud	Grits	Coal Ash	Hog Fuel Ash
Ag	<0.02	<0.02	<0.02	<0.02	<0.02
As	<0.1	<0.1	<0.1	<0.1	<0.1
Ba	0.8	0.7	1.1	<0.5	1.0
Cd	<0.02	<0.02	<0.02	<0.02	<0.02
Cr	<0.02	<0.02	<0.02	<0.02	<0.02
Pb	<0.1	<0.1	<0.1	<0.1	<0.1
S	<0.2	<0.2	<0.2	<0.2	<0.2
Hg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bis(2-chloroethyl)ether	<0.005	-	-	-	-
O-Cresol	<0.01	-	-	-	-
M-Cresol	<0.01	-	-	-	-
P-Cresol	<0.01	-	-	-	-
1,2-Dichlorobenzene	<0.005	-	-	-	-
1,4-Dichlorobenzene	<0.005	-	-	-	-
1,3-Dichlorobenzene	<0.005	-	-	-	-
2,4-Dinitrotoluene	<0.005	-	-	-	-
Hexachlorobenzene	<0.005	-	-	-	-
Hexachlorobutadiene	<0.005	-	-	-	-
Hexachloroethane	<0.005	-	-	-	-
Nitrobenzene	<0.005	-	-	-	-
Pentachlorophenol	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	0.046	0.070	0.029	<0.01	<0.01
2,3,4,6-Tetrachlorophenol	<0.05	-	-	-	-
2,4,5-Trichlorophenol	<0.01	-	-	-	-
2,4,6-Trichlorophenol	<0.01	-	-	-	-

* Metals concentrations in TCLP extract.

46739.tbl/47/cdf89

3. VERTICAL EXPANSION

3.1 Design Criteria

3.1.1 Capacity

Based on the Waste Audit prepared by Weyerhaeuser, it is projected that an average of 1000 cy of residue will be delivered to the site each day resulting in a yearly uncompacted volume of 330,000 cy. Waste minimization measures completed or in process at the mill may result in some reductions in waste volume. The net available space for waste placement provided by this expansion program is designed to meet Weyerhaeuser's waste disposal needs for up to five years.

The vertical expansion will provide additional landfill volume (airspace) of approximately 1,400,000 cy (Appendix D, Design Calculations, Volume II). The landfill cap will fill approximately 120,000 cy leaving 1,280,000 cy for solid waste. Assuming a yearly compacted volume of 300,000 cy, the vertical expansion will provide approximately 4.3 years of capacity from February, 1989. Further waste minimization may extend the useful life of the landfill.

3.1.2 Side Slopes

Slopes comprised of waste material will be 3:1 or flatter. Terraces will typically be provided at 20' vertical intervals. These terraces serve to increase slope stability and intercept storm water runoff, decreasing the potential for erosion of the finished slope. The terraces also improve accessibility for maintenance should the need arise.

A stability analysis was made and is presented in the Stability and Materials Evaluation Report, Appendix A. It is concluded from the results of this analysis that the recommended slopes have an acceptable safety factor in excess of 2.0 for the vertical expansion to an elevation of 90 ft MSL.

3.1.3 Drainage

The minimum cross-slope will be 5%. This slope will promote positive drainage without inducing excessive velocity.

The perimeter ditch and terrace ditches will have a minimum gradient of 0.25% and a maximum gradient of 8.0%. Sections of ditches where the runoff velocity exceeds 4.0 fps will be lined with crushed stone. All other ditch sections will be seeded and lined with erosion control netting.

All storm water inlets and piping will be designed for the 10-year storm event. Pipe material will be high density polyethylene. Refer to Drawing No. 46736-C011 for typical drainage details. A summary of these data are contained in Table 4.

TABLE 4
Drainage Summary

Contributing Areas	Acreage	From Structure	To Structure	Pipe Size	Q_{10} cfs
A	7.9	DI-6	DI-2	18"	8.6
B	3.5	DI-1	DI-2	18"	4.3
C	4.2	DI-3	DI-4	18"	5.1
A, B, H	19.3	DI-2	DI-4	18"	22.7
A, B, C, H, I	27.1	DI-4	DI-5	24"	32.7
A, B, C, G, H, I	33.9	DI-5	HW-1	30"	41.4
F	1.7	DI-7	DI-8	18"	4.4
E, F	3.0	DI-8	HW-3	18"	8.0
D, E, F	4.7	HW-3	Ditch "D"	-	12.6
D, E, F, J	6.5	Ditch "D"	Pond #2	-	17.5

3.1.4 Erosion Control/Storm Water Management

Sedimentation ponds are designed in accordance with the Soil Conservation Service (SCS) Technical Release No. 60 requirements for permanent ponds. The principal spillway controls the 10-year, 24-hour storm event with no flow passing through the emergency spillway. The emergency spillway is designed to pass the 100-year, 24-hour storm event.

One foot is added to the crest of the 100-year event for freeboard, and 5% of the embankment height is added to the freeboard elevation to determine the top of dam elevation. A sediment storage volume of 0.50 acre-inches (67 cy)/acre of disturbance is provided in each pond.

The design storm events were developed using the procedures detailed in National Engineering Handbook (NEH), Chapter 4. The hydrographs were generated using the Type II, 24-hour distribution and antecedent moisture condition II. The curve number selected for the waste area was 70. Although largely unvegetated, the material is uncompacted. The large flat areas on top of the landfill allow for a significant amount of infiltration. This curve number, 70, was selected to balance the effect of the unvegetated surface with the permeability of the in-place waste.

Sediment traps are designed to hold 0.50 acre-inches (67 cy)/acre of disturbance. The overflow spillway length in feet is equal to six times the watershed area (acres).

Sedimentation pond design results are summarized in Table 5. Refer to Drawing Nos. 46736-C006, C009 and C010 for plans and

TABLE 5

Sedimentation Pond Summary

Pond #	Drainage Area(AC)	Inflow (cfs) Q10	Q100	Bottom El. (MSL)	Sediment Volume (AC-Ft)	Riser Size (in.)	Riser El. (MSL)	Principal Size(in)	Spill. Q10(cfs)	Emerg. El(MSL)	Spill. Flow Depth (ft.)
1	33.9	47.3	87.5	5	1.67	18	8	12	6.6	11.0	1.26
2	20.3	42.6	72.9	13	0.80	18	16	12	8.1	22.2	1.68

-SCS Curve number method used for runoff and time of concentration.
-Riser elevation set above sediment storage level.
-Emergency Spillway Elevation set above the crest of the 10 year event.
-Curve Number - 70.

details of erosion control measures. Refer to Appendix D for Design Calculations for Erosion Control and Storm Drainage.

3.1.5 Access Roads

The maximum gradient of the new access road from the existing road up to the surface of the waste will be 8 percent. This new access road will have a minimum width of 20', a minimum turning radius of 300', and a granular travel surface.

3.1.6 Dust Control

The existing fire control system will be maintained to provide a source of water for dust control. During Stage I construction, the Contractor will be responsible for supplying suitable dust control equipment.

3.2 Operational Plan

3.2.1 General Procedures

Solid waste will continue to be delivered from the plant by truck and placed in designated areas at the landfill. Logs, demolition debris, pallets, and other materials that cannot be readily incorporated in a compacted lift or have excessive moisture content, will be isolated near the center of the landfill.

The general operational concept is to construct lifts working from north to south over the entire landfill surface area. In any one area, no more than eight compacted lifts will be placed before the entire surface is brought up to the same elevation. The primary residues, ash

and bark, are to be mixed at grade into a homogeneous mass and compacted in approximately 12" lifts. Dregs and grits should be blended into the ash and bark by spreading these materials into thin lifts when they are delivered to the landfill. Likewise,the same procedure will be followed for placement of mill trash. Compaction should be accomplished by repeated passes of the dozer to achieve a compact waste fill. Testing of the existing ash and bark materials indicated that sufficient compaction is being achieved with the current dozer operation. This compaction results in shear strengths that are adequate to achieve a stable landfill slope of 3 horizontal to 1 vertical.

3.2.2 Stage I

Stage I consists of modifications to the existing unimproved slopes, construction of perimeter ditches, and provision of erosion control features, including construction of new sedimentation ponds.

Erosion control measures to be implemented are shown on Drawing No. 46736-C006, Erosion Control Plan. New ponds will be completed prior to beginning other earthwork operations. Calculations are included in Appendix D.

A perimeter ditch will be installed at the toe of the slope of the landfill, on the south and east side, to collect runoff from the landfill. This ditch will be topsoiled, seeded, and mulched immediately upon completion of shaping operations. On the west and north side, a perimeter ditch will be incorporated in a terrace to be constructed at

the top of existing earthen berms. Any fill required for this terrace or the perimeter ditches will be sandy silt obtained from the borrow area.

The face of the existing earthen berm will not be disturbed. The existing landfill slopes on the east and south sides are constructed of waste materials. These slopes will be modified such that any section steeper than 3:1 will be cut back to 3:1 or flatter. Shaping of sections which require placement of fill against the existing slope will employ benching techniques to improve stability of the completed slope.

The proposed grades for Stage I construction are shown on Drawing No. 46736-C003.

Generally the landfill will be graded in Stage I such that the slopes are prepared to an elevation of 56' MSL at the north end and an elevation 50' MSL at the south end with a general slope from north to south.

3.2.3 Stage II

Stage II consists of controlled operation of the landfill (by Weyerhaeuser) to raise the surface approximately 20 feet above the Stage I surface. Wastes will be placed in 12 inch lifts and compacted utilizing the dozer used for spreading waste materials. Operation will proceed from north to south with no more than 8 lifts placed in one area of the landfill prior to raising the entire surface to the same elevation.

Cover material will be placed on the exterior slopes when Stage II is complete. Terraces have been proposed at 20 foot vertical intervals to intercept runoff and to improve slope stability.

The landfill will extend vertically with a 3:1 side slope on the exterior face from the existing elevation at the top of the present landfill. The grades for the Stage II operation are shown on Drawing No. 46736-C004.

3.2.4 Stage III

Stage III consists of the continued operation of the landfill to raise the elevation of the waste materials to final grades. As in Stage II, wastes will be placed in 12 inch lifts and compacted by the dozer used for spreading waste materials. After the landfill capacity is reached, the final cap will be installed on the exterior slopes of Stage III and over the top of the landfill surface. The finish grades are shown on Drawing No. 46736-C005. Earthwork calculations are presented in Appendix D.

3.2.5 Equipment and Personnel

Equipment and personnel during Stage I and during placement of cover in Stages II and III will be supplied by a contractor. It is expected that the equipment to be utilized will include a grader, a compactor, and a dozer (D-9).

A geotechnical technician will monitor construction activities during Stage I and during placement of cover in Stages II and III.

4. CLOSURE

4.1 Cap

Closure of the landfill will be phased. Material from an on-site "borrow" area will be used for cover. Refer to Section 5.1 for discussion of borrow area. The cap will consist of a 1.5 foot layer of borrow material. Borrow material has been classified as a sandy, silty clay (select clay fill). This layer will be placed in thin (3" to 4") lifts spread from a low to a high point and compacted on the prepared landfill surface to a minimum of 90 percent of the Standard Proctor maximum dry density at 4 to 6% above optimum moisture content. An additional six-inch layer of topsoil will be placed over the clayey material.

The side slopes of the landfill will be covered immediately upon completion of each stage of operation. The cover material will be obtained directly from the borrow area. The operation of the borrow area will be coordinated with the closure operation. The cap over the top of the landfill will be placed after the landfill has reached its design capacity.

Seeding, fertilizing, mulching, and/or erosion protection fabric installation operations will follow topsoil placement. Fabric will be used to line the perimeter ditches and placed on all finished slopes that are steeper than 4:1. The hydroseeding method will be used for seeding, fertilizing, and mulching and will conform to requirements of NC DOT.

Based on preliminary analysis using the US EPA HELP Model and assuming hydraulic conductivities for the proposed borrow material, the following percolation rates are predicted:

Cap Design	Borrow Material Permeability	Barrier Zone Percolation Rate*
6" Topsoil, 18" Clay/Sand	$1x10^{-6}$	7"/yr

* order of magnitude estimate

The proposed cap, consisting of 6 inches of topsoil over 18 inches of borrow material, should be 98 percent effective, based on the barrier zone percolation rate predicted by the HELP Model and given an annual rainfall of 45"/year.

4.2 Maintenance

The contractor will be responsible for all maintenance of the cover for one complete growing season. If temporary seed mixtures are used due to the time of year, the contractor will be responsible for top seeding and maintenance of the permanent mixture for one growing season.

After this initial period, inspections will be made after major rainfall events. A small stockpile of topsoil will be retained at the borrow area. Any erosion detected will be repaired in a timely manner.

5. BORROW AREA

5.1 Site Description

The proposed borrow area comprises a 26-acre tract of land that is located to the east of the existing landfill, and immediately north of the unpaved road leading east from the equipment fuel station area (as shown on the Plot Plan, Drawing No. 46736-C001). The distance from the eastern limits of the landfill to the western boundary of the borrow area is approximately 200 feet. An area of approximately 11 acres located south of the designated borrow area has been identified as a reserve borrow site.

The site is undeveloped woodland covered with moderate to dense woods and thick brush; several unpaved roads have been cut through the area.

The topography can be described as a north-south ridge almost central to the site, a large swale to the west, and several smaller swales to the east. Elevations range from 8' to 34' MSL.

The borrow area was investigated with six test pits, and three hand auger borings. Soil samples obtained from the test pits were analyzed in the laboratory for classification properties (Atterberg limits, grain size, moisture content and unit weight), compaction properties, and permeability. The results of the field and laboratory investigations are presented in the Stability and Materials Evaluation Report in Appendix A. In summary, the investigation indicated that clay soils are present beneath a 2 foot (approximate) surficial silty sand and topsoil layer. An average thickness of approximately 4 to 5 feet was encountered. These clay soils contained varying amounts of sand and silt and were generally classified as CL or CH based on the Unified Soil Classification System. Laboratory permeability tests on remolded compacted samples resulted in measured values of K_f equal to

1×10^{-7} cm/sec or less. Based on the test program, it is expected that the proposed borrow area contains sufficient $K_f \leq 1 \times 10^{-6}$ cm/sec clay borrow soils.

It is anticipated that these sandy clays and clayey silts may be interbedded with layers of sand; therefore, the borrow excavation operation and placement of the clay cap will be observed by an experienced soils technician to identify the clay material to be used.

Ground water was not encountered in the test pits at the time they were made. Then test pits were made during a period of normal rainfall. Based on these observations, it is not expected that the long-term ground water table is above the bottom of the clay layer (approximately 6 feet below existing ground surface).

5.2 Borrow Operations

Removal of material from the borrow area will be planned so as to minimize the period that the borrow area is disturbed and subject to erosion. Only sufficient area to yield material required for placement as cover material in the proposed landfill expansion will be cleared and excavated. Contractor will be required to schedule borrow operations to minimize stockpiling of materials. All stockpiles are to be located within the limits of clearing indicated on Drawing No. 46739-C007. All stockpiles will be neatly shaped with a minimum cross slope of 2 percent. Side slopes will be 3:1 or flatter. Stockpiles not used for periods greater than 30 days will receive temporary seeding. The disturbed area should be limited to the boundary defined on Drawing No. 46736-C007.

All erosion control measures will be installed prior to earthwork operations and maintained on a regular basis. Refer to Table 6 for a summary of the design for temporary sediment traps to be installed in the borrow area.

Borrow materials will be classified by a geotechnical engineer as either topsoil, select clay fill (sandy, silty clay), general fill material (silty sands or sandy silts), or unsuitable fill material. Borrow materials will be selected to meet the requirements of the earthwork operations at the landfill. Excess excavated material will be stockpiled.

Topsoil (top 12 inches of soil profile) will be stripped and stockpiled in the location shown on Drawing No. 46736-C007. Approximately 41,600 cy. of topsoil are available in the borrow area. 20,800 cy will be used for final cover at the landfill; 20,800 cy will remain in the stockpile and be used in final surface treatment of the borrow area. The remainder of topsoil needed at the landfill for closure will be obtained from the reserve borrow area and the new landfill site.

Select clay fill material (CL or CH), that underlays the topsoil, will then be excavated and transported to the landfill area. Generally the clay occurs within 1 to 2 feet of the ground surface and extends to 5 or 6 feet below the ground surface.

The borrow operations will be observed by an experienced geotechnical technician. As a minimum one soil sample will be collected for every 2,500 cubic yards (cy) of select clay fill removed and placed. Each sample will be analyzed for P200 content, Atterberg limits and moisture content. Additionally, one undisturbed Shelby tube sample will be obtained for every 3,500 cy of select clay fill placed in order to perform a lab permeability

TABLE 6

Borrow Area Sediment Traps

Outlet	Area Designation	Acreage Contributing	Acreage Disturbed	Crest Elev(MSL)	Top Berm Elev. (MSL)	Sediment Storage (Cubic Yds)	Q_{10} (cfs)	L (Ft)	H (Ft)
1	A	1.9	1.9	21.0	24.0	127.3	13.7	12	4
2	B	1.0	1.0	18.0	19.0	67.0	7.9	6	4
3	F	0.8	0.8	21.0	22.0	53.6	7.9	5	4
4	C	3.8	3.8	18.0	19.0	254.6	22.8	23	5
5	D	2.1	2.1	21.0	22.0	140.7	13.7	13	4
6	E	2.9	2.9	19.0	20.0	194.3	18.7	18	5
7	G	5.0	4.8	9.0	10.0	321.6	29.1	30	4
8	H	1.3	1.3	22.0	23.0	87.1	10.0	8	4

Refer to Drawing No. 46739-C007 for location of sediment traps.

test. The frequency of samples will be increased if the soils technician determines that the material might not meet the specification.

After removal of the desired material, the area will be graded so that it is free draining with a minimum cross-slope of 2 percent and a maximum side slope of 4 horizontal to 1 vertical. Existing drainage patterns will be maintained. Typically, the final graded surface will be approximately parallel to and 4 feet below the existing surface. However, the actual depth of removal may vary depending on the quality of material excavated. Material excavated from the zone of removal and classified as General Fill Material but in excess of the quantity required for the earthwork operations at the landfill shall be stockpiled for final grading of the borrow area. A summary of types and quantities of materials required from the borrow area for closure operations is presented in Table 7.

TABLE 7

Summary of Borrow Quantities Required for Closure Operations

Item	Cubic Yards
Material for Cap on Landfill Terraces	11,300
Material for Cap on Perimeter of Landfill (Slopes)	44,800
Material for Cap on Top of Landfill	34,600
Topsoil Volume on Landfill Terraces	3,800
Topsoil Volume on Perimeter of Landfill (Slopes)	14,900
Topsoil Volume on Top of Landfill	11,600
Total Volume of Cap Material	90,700*
Total Volume of Topsoil	30,300*

*Volumes indicated are in-place. An increase in quantities of 25% should be added to account for losses from excavation to placement at the landfill, and to allow for non-uniformity of the prepared subgrade.

After final grading operations in the borrow area, the subgrade will then be prepared and topsoil spread from the stockpile over the area to a

minimum thickness of 4 to 6 inches. The prepared surface will be scarified to a depth of 2 inches prior to spreading the topsoil.

Finally, the area will be fertilized, seeded and mulched in accordance with North Carolina Department of Transportation specifications. Completed areas should be revegetated in a timely manner so as to minimize erosion of the finished surface.

6. MONITORING

During the course of the ground water quality assessment, ground water samples were collected from seven monitoring wells and analyzed for the parameters listed in Table 8. The results indicated that there has been no significant adverse impact on the quality of ground water directly attributable to on-site activities. A ground water monitoring program has been proposed, that will consist of annual sampling to begin in January, 1990.

TABLE 8

Sampling Parameters

Indicators	Inorganics	Dissolved Metals
Field pH	Chloride	Arsenic
Field Conductivity	Sulfate	Barium
TOX	Nitrate (as N)	Cadmium
TOC	Alkalinity	Chromium, total
COD	Fluoride	Lead
BOD		Mercury
TDS		Selenium
		Silver
		Zinc
		Iron
		Manganese
		Copper

RMT INC.

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Greenville, SC 29606
Phone:803-281-0030
FAX: 803-281-0288

March 26, 1990

Mr. James C. Coffey
North Carolina Department of Environment,
Health, & Natural Resources
Division of Solid Waste
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

Subject: Survey Datum Reference - Permit Application for the Landfill Vertical Expansion/Closure - Weyerhaeuser Paper Company, Plymouth, North Carolina

Dear Jim:

Enclosed are four copies of the "Plot Plan - General Notes, Standard Legend, & Abbreviations", RMT Drawing No. 46736-C001, Revision F, from the Permit Application for the Landfill Vertical Expansion/Closure at Weyerhaeuser Paper Company, Plymouth, North Carolina. On the original submittal, General Note 1 on this drawing stated that the coordinates and bearings were based on the North Carolina State Plan Coordinate System, NAD 83. The actual survey datum reference used to generate the drawing coordinates was NAD 27. We have revised the note to reflect this change.

When the original aerial photography at the site was performed in 1987, Aero-Metric Engineering used NAD 27 as the reference datum. As a result, the original drawing coordinates were based on NAD 27. In 1989, new monuments were set at the site by a local survey firm that used NAD 83 (the latest reference system). In order to maintain the original coordinate system on which all our design documents were based, we converted the new monument coordinates to the NAD 27 grid.

Please review this letter and the enclosed revised drawing and let me know if you need further information or clarification.

Sincerely,

RMT, Inc.

Chuck Sherron
Project Manager

Enclosures
cc: Mr. L. T. Hardison
Mr. John Pritchard
Mr. G. L. Miller
Mr. Richard Gay
Ms. Diane Hardison
Mr. Stan Duncan
Mr. Hal Copenhaver
File 467.39(T)

chuck\wp\survdatm.ltr/cts90

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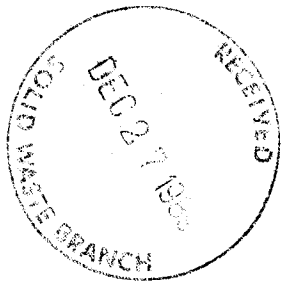

December 20, 1989

Mr. James C. Coffey
North Carolina Department of Environment,
Health, & Natural Resources
Division of Solid Waste
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

Subject: Permit Application for the Landfill Vertical Expansion/Closure
Weyerhaeuser Paper Company, Plymouth, North Carolina
RMT Project No. 467.39

Dear Jim:

Enclosed are three copies of the Permit Application for the Landfill Vertical Expansion/Closure at Weyerhaeuser Paper Company, Plymouth, North Carolina for your review. Weyerhaeuser will send one complete copy of the permit application directly to the Land Resources office in Washington County for review of the erosion control design.

The permit application has been revised to address several changes made in the landfill plan since the original submittal. These changes include:

- The erosion control plan including drainage systems and sedimentation basins has been redesigned as a result of the establishment of a wetland boundary around the existing site. The new design includes two sedimentation basins instead of the original three and redirects surface water to these two basins.

- The original submittal called for the construction of berms using solid waste and then filling within those berms until final grades are reached. The new design calls for construction of the landfill with solid wastes in compacted lifts until final grades are reached.

Each of the enclosed permit applications consists of two 3-ring binders and one set of 13 drawings. This submittal is intended to replace the entire original application.

If you have any questions or comments, please call.

Sincerely,

RMT, Inc.

Chuck Sherron
Project Manager

Enclosures
cc: Mr. L. T. Hardison
Mr. John Pritchard
Mr. G. L. Miller
Mr. Richard Gay
Ms. Diane Hardison
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File 467.39(T)

RMT INC.

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September 13, 1989

North Carolina Department of Environment,
Health, and Natural Resources
Solid Waste Management Division
Solid Waste Section
P.O. Box 27687
Raleigh, North Carolina 27611-7687

Attention: Mr. Gary W. Ahlberg
Environmental Engineer

Re: DHR Correspondence dated June 20, 1989, regarding agency's completeness review for Amendment to Permit No. 94-01, Item No. 2

Dear Mr. Ahlberg:

This letter contains the information requested in the above referenced letter regarding cover material's physical and engineering properties, and availability. As noted in the vertical expansion application, the final cover design is based on minimizing the amount of surface-water which could possibly percolate into the closed landfill. Minimization of infiltration will be realized by a combination of construction and materials features. Finished grades of not less than 5% will be maintained to promote surface drainage of impinging precipitation; drainage ditches and overside drains will convey the runoff off the landfill before ponding can occur. The properties of the soil used to construct the percolation-barrier portion of the final cover will effect the extent to which impinging rain is drained.

Final cover materials' characterization and availability were investigated by a combination of field investigations and laboratory testing of representative samples. Field investigation consisted of excavating six (6) test pits and drilling two (2) borings to evaluate near surface stratigraphy in the designated borrow area. Test pits TP-21 through TP-26 were excavated by backhoes to depths ranging from five feet to seven feet below existing grade; hand auger borings HA-15 and HA-16 were completed to depths of 11 feet and 11.5 feet, respectively. Approximate investigation locations are shown on Figure 1. Geologic descriptions of the soils encountered are presented on the logs included herein as Attachment 1.

Table 1 summarizes the laboratory index and physical properties test results for representative samples obtained from the proposed final cover material borrow area. Index properties testing shows that the available soils are predominantly fine grained (finer than 0.074 mm in size), generally comprised of more than 20% clay-sizes, from moderate to high in plasticity,

typically plot above the "A" line as shown on Figure 2, and generally classified as CL to CH soils according to the Unified Soil Classification System (USCS). As a point of reference, investigators generally agree that soils exhibiting moderate plasticity, with liquid limits ranging between 35% to 60%, and with not less than 50% finer than 0.074 mm in size (passing the No. 200 sieve) are suitable for the construction of earthen liners for hazardous waste containment (from USEPA,1988,unpublished). Given this state-of-the-practice guideline, it is not surprising then that the laboratory tests performed for this study substantiate the empirical guidelines and lead to the conclusion that the available borrow materials are suitable for final cover construction.

Laboratory permeability tests were performed on selected samples obtained from the borrow area to determine their saturated hydraulic conductivity (k). All testing was performed on bulk samples compacted to approximately 90% of the standard Proctor maximum dry density, remolded at moisture contents wet of the standard Proctor optimum, and tested in a flexible-walled permeameter by the back-pressure saturation method. With the exception of the silty sand sample, the saturated hydraulic conductivity for the proposed cover materials is less than 1×10^{-6} cm/sec. Laboratory permeability test results are included on Table 1. It should be noted that the permeability test performed on the sample composited from TP-21 and TP-22 was determined to have a k value of 4×10^{-8} cm/sec which is typical of natural materials of like gradation and plasticity.

From the above described laboratory results, it is evident that on site materials conforming to the previously defined materials recommendation were determined to have saturated hydraulic conductivities of better than 1×10^{-6} cm/sec when compacted at moisture contents several percent wet of the standard Proctor optimum. Final cover material will be based on a performance criteria such that the materials placed have an in-place k not greater than 1×10^{-6} cm/sec. Conformance with this performance criteria will be verified by a combination of field and laboratory tests in combination with construction observation.

It has been calculated that about 90,000 c.y., as measured after placement, will be required for construction of the percolation barrier portion of the final cover. The quantity of materials meeting the above stated requirement for after-placement permeability not greater than 1×10^{-6} cm/sec is estimated to be 125,000 bank-yards. After placement volume is estimated to be nearly 109,000 cubic yards (c.y.) based on a shrinkage factor of 15% to allow for the difference between borrow-source and placement densities and some waste. Furthermore, this available volume estimate is based on the interpretation that excluding the surficial one foot of topsoil, which will be stockpiled for use as vegetative cover, an average of 4.5 feet of soil can be reasonably obtained from the approximately 17.5 acre borrow area which will either meet or can be blended to meet the previously noted

material recommendations. Actual depths are expected to vary from 2.5 feet at location TP-22 to 5.5 feet at location TP-26. Descriptions of the soils encountered during test pit excavations are provided on the attached Test Pit Logs.

As noted previously, borrow materials meeting these recommendations are suitable for construction of a percolation barrier having an in-place saturated hydraulic conductivity of less than 1 x 10^{-6} cm/sec, the design basis.

We trust the above discussion and attachments provide sufficient information regarding the questions noted in the Branch's letter of June 20, 1989. Please feel free to call either myself or Jim G. Kahle if there are any questions or require additional information regarding the percolation barrier materials planned for final closure of the vertical expansion at Weyerhaeuser's Plymouth Mill landfill.

Sincerely,

RMT, Inc.

James G. Kahle

James G. Kahle, P.E.
Sr. Geotechnical Engineer

C. T. Sherman, Jr.

C. T. Sherron, Jr.
Project Manager

cc: Mr. G. L. Miller
Mr. J. R. Zeiler
Mr. L. T. Hardison
Mr. Richard Gay
Mr. John Pritchard
Ms. Diane Hardison
Mr. Stan Duncan
File 467.38(c)

Attachment: (1)

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TABLE 1

WEYERHEAUSER - PLYMOUTH, N.C.

Laboratory Testing/Samples Summary

					<----- INDEX PROPERTIES ------>							POROSITY	<-COMPACTION->		<--- Permeability Testing Summary ---->				
LOCATION	DEPTH (ft)	IN SITU PROPS %w	Dry Wt	USCS	SPECIF GRAV	LL	PI	SAND+ (%)	SILT (%)	CLAY (%)	e	n	O.M.C. (%)	Max DD (pcf)	R.M.C. (%)	Dry Wt (pcf)	Rel OMC (+/-)	Rc (%)	kv (cm/sec)
TP-21	1.5	13.3	115.8	CL															
TP-21	1.5-2.0	18.1	101	CL	2.64	29	11	20	38	42	0.587	0.370	15.8	112.4	17.9	103.8	2.1	92.3	3.6E-08
TP-21	3.5	28.4	93.7	CL-CH															
TP-21	3.5-4.5	29.2	-	CH	2.62	55	28	22	20	58	0.905	0.475	23.2	97.3	28.8	85.8	5.6	88.2	1.6E-08
TP-22	3 - 4	19.7	-	SM	2.64	23	2	73	7	20	0.615	0.381	14.8	110.6	19.8	102.0	5.0	92.2	5.3E-05
TP-24	3 -3.5	31.6	-	CH	2.68	61	31	27	17	56	0.918	0.479	24.4	96.4	27.1	87.2	2.7	90.5	7.3E-08
TP-26	3 -3.5	20.1	-	SC	2.67	36	14	56	9	35	0.697	0.411	17.7	106.3	20.4	98.2	2.7	92.4	2.2E-05
					2.67						0.659	0.397			23.2	100.4	5.5	94.4	8.6E-09
TP-26	5 -5.5	20.7	-	CL	2.7	36	15	49	15	36	0.710	0.415	19.5	106.6	20.6	98.5	1.1	92.4	1.0E-06
					2.7						0.714	0.417			24.8	98.3	5.3	92.2	1.0E-08
TP-21/22[1]		-	-	<~CL>	2.63	-	-	~47	~14	~39	0.811	0.448	~19.0	~104.0	22.9	90.6	~3.9	~87.1	4.2E-08

NOTE:

1 Test Sample a composite made up of approximately aqual amounts taken from TP-21 (3.5'-4.5') and TP-22 (3'-4'). Where practicable test properties averaged and distinguished by "~" preceding value noted.

ATTACHMENT 1

TEST PIT AND HAND AUGER BORING LOGS

Weyerhaeuser
Paper
Company

P.O. BOX 787
PLYMOUTH, NORTH CAROLINA 27962
(919) 793-8111

December 1, 1989

Mr. Jim Coffey
Division of Solid Waste Management
P 0 Box 27687
Raleigh, NC 27611

RE: WEYERHAEUSER COMPANY LANDFILL

Dear Jim:

This letter is to confirm the meeting held in your office on November 20, 1989 between you, Gary Ahlberg, Terry Dover and myself to discuss the landfill currently in operation at Weyerhaeuser Company in Plymouth and the proposed lined landfill. As discussed, several changes have been made in the landfill plan since submittal of a vertical expansion application for the existing site. These changes were identified as follows:

1) Sedimentation basins have been relocated and reduced from three to two as a result of the establishment of a wetland boundary around the existing site.

2) Construction of the site with berms constructed of on-site materials has been changed to construction of the site with on-site materials in compacted lifts.

3) Final slopes have been modified to redirect surface water to modified sedimentation basin locations.

Land Quality Section will be contacted by Weyerhaeuser to inform the agency of changes in the erosion control plan section of the landfill application. The Groundwater Monitoring Plan submitted has been re-reviewed by Bobby Lutfy and some specific parts of the protocol are questionable. Weyerhaeuser will receive a letter in the near future from Bobby Lutfy addressing the shortcomings of the plan.

To address the above noted plan changes, resubmittal of new permit drawings and a revised application should be made to eliminate the need to request an amendment to permit when

issued. All previously reviewed application information will be replaced with the revised permit application and drawings. Review of Weyerhaeuser's application will be a continuation of the previous submittal.

Since a 300+ acre tract was approved at an earlier date for landfilling of solid waste, a site plan application is not needed as part of the permit application for the proposed new lined landfill. Information under .0504(1) is required to the extent that would be necessary to design and construct the proposed landfill.

Wells should be installed to adequately determine groundwater flow. Detection monitoring wells may be installed in phases as the landfill is developed.

No additional waste characterization is needed as the waste streams remain the same as the current landfill. Analyses needed to determine compatibility with liner material will be included in the design criteria. In the event additional testing is done, EP Toxicity data will be submitted and not TCLP. Should TCLP become the standard, EP Toxicity data will not be included.

To complete the application for a permit to construct a new landfill at the Plymouth Mill, a construction plan application will be submitted for your review.

Thank you and your staff for taking the time to review Weyerhaeuser's Plymouth facility's landfill needs with me. If you have questions please call me at 919-793-8693.

Sincerely,

Richard L. Gay

Richard L. Gay
Environmental Supervisor

RLG:dmc

xc: John Pritchard
Diane Hardison
Luke Miller
Chuck Sherron

resubmitted for revisions 12/89

State of North Carolina
Department of Natural Resources and Community Development
Northeastern Region
1424 Carolina Avenue, Washington, North Carolina 27889

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Lorraine G. Shinn
Regional Manager

LETTER OF APPROVAL

DIVISION OF LAND RESOURCES
LAND QUALITY SECTION
May 8, 1989

Weyerhaeuser Paper Company
Attention: Mr. Paul J. Schmitt, Vice President
P.O. Box 787
Plymouth, North Carolina 27962

RE: Landfill Vertical Expansion
Plymouth - Washington County
Date Received: May 2, 1989
Responsible Party: Weyerhaeuser Paper Company

Gentlemen:

This office has reviewed the erosion and sedimentation control plan submitted for the project as referenced above. We find the plan to be acceptable and hereby issue this letter of approval.

Please be advised that NCAC Title 15 4B.0017(A) requires that a copy of the approved soil erosion control plan be on file at the job site, and that inspections over the life of the project will be made to ensure compliance with the approved plan.

The state's sedimentation pollution control program is a performance oriented program requiring protection of the natural resources and adjoining properties. If, following commencement of this project, it is determined that the plan is inadequate to meet the requirements of G.S. 113A 51-66, this office may require revisions in the plan and its implementation so as to comply with the state law.

In recognizing the desirability of early coordination of sedimentation control, we believe that it would be beneficial if a pre-construction conference can be arranged to discuss the approved erosion and sedimentation control plan for this project. It would be appreciated if you would contact this office and let either Harry Bailey or me know the date of construction start-up and date of the pre-construction conference.

The land-disturbing activity described in this plan is also subject to the Environmental Management Commission's review regarding regulations to implement stormwater controls in coastal counties (15 NCAC 2H Section .1000). You will be contacted by a member of the Division of Environmental Management's Water Quality staff if additional information regarding stormwater controls is required.

Sincerely,

Patrick H. McClain, P.E.
Assistant Regional Engineer

PHMcC:mgr

cc: Gary Ahlberg, Dept. of Human Resources

LOG OF TEST PIT OR EXCAVATION

RMT INC.®

PIT NUMBER TP-21

PROJECT NAME Weyerhaeuser — PROJECT NUMBER 467.38

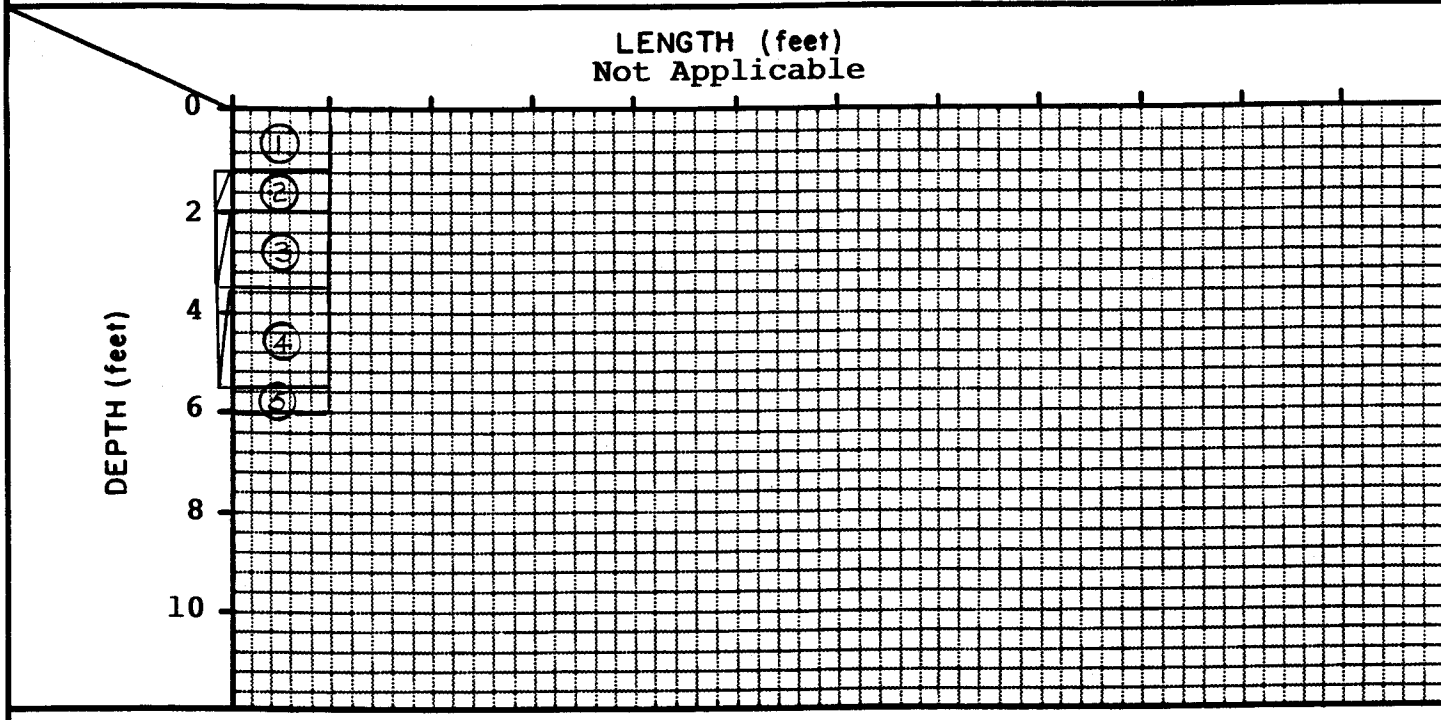
LOCATION Plymouth, NC — DATE June 28, 1989

CONTRACTOR Hopkins

METHOD Backhoe — WIDTH

LOGGED BY DEMc — CHECKED BY BB — PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILT (ML) - gray-brown; sandy; topsoil; organics; piece of glass at 12 inches.

2) SILTY CLAY (CL) - tan; stiff; some fine grained sand; moist.

3) SILTY CLAY (CL) - gray to tan; firm; trace of sand; grading less silty with depth.

4) CLAY (CH) - gray with brown mottling; firm; some silt; some fine grained sand; moist.

5) SILTY SAND (SM) - tan; fine grained; trace of clay.

LEGEND:

Bulk Sample Jar Sample Drive Tube Sample

LOG OF TEST PIT OR EXCAVATION

PIT NUMBER TP-22

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.38

LOCATION Plymouth, NC

DATE June 28, 1989

CONTRACTOR Hopkins

METHOD Backhoe

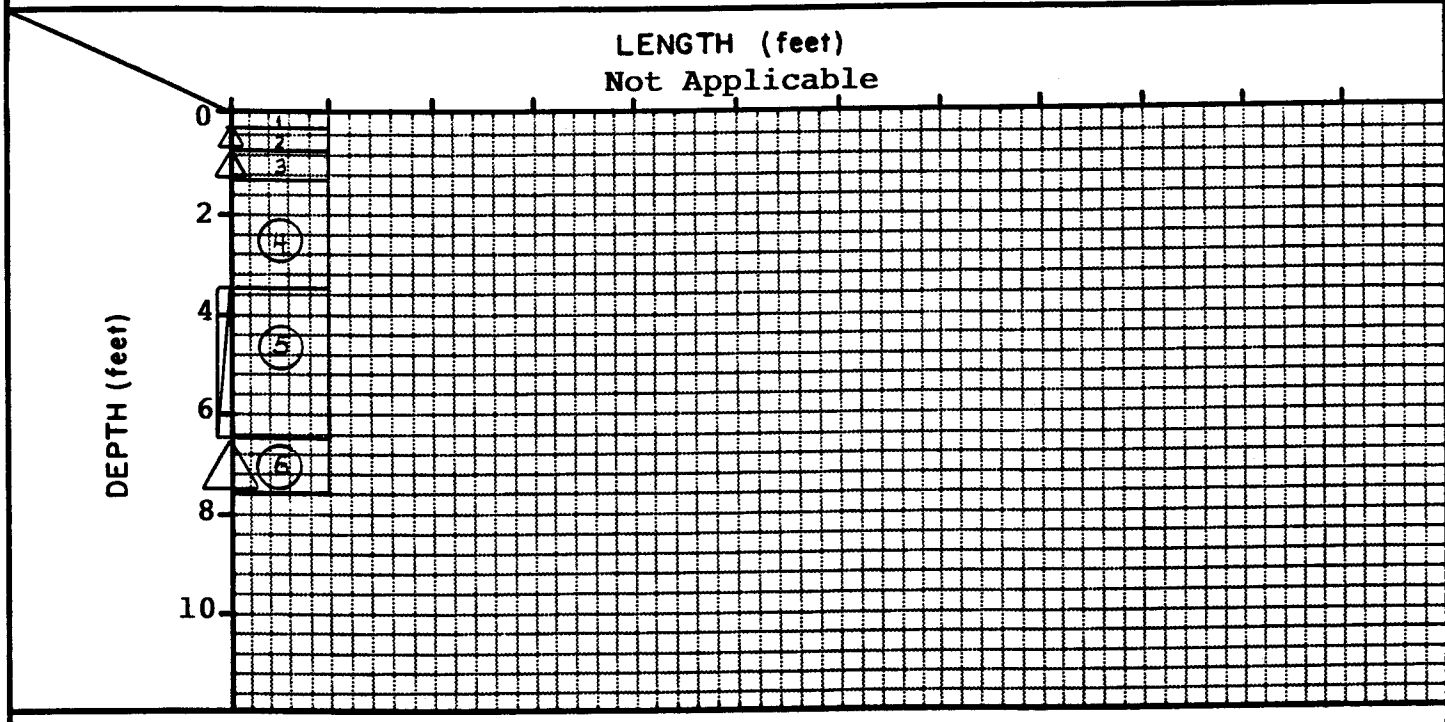
WIDTH

LOGGED BY DEMc

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILT (ML) - dark brown; sandy; topsoil; with organics.

2) SILT (ML) - gray-tan; trace of clay; firm; some organics.

3) SILTY SAND (SM) - orange-brown; firm to hard; trace of clay.

4) SILTY CLAY (CL) - orange-brown; firm; trace of sand; micaceous.

5) SILTY SAND (SM) - orange-brown; fine grained; some clay; thin silty clay layers, gray.

6) SILTY SAND (SM) - light gray; some orange-brown; fine grained; micaceous.

LEGEND:

Bulk Sample

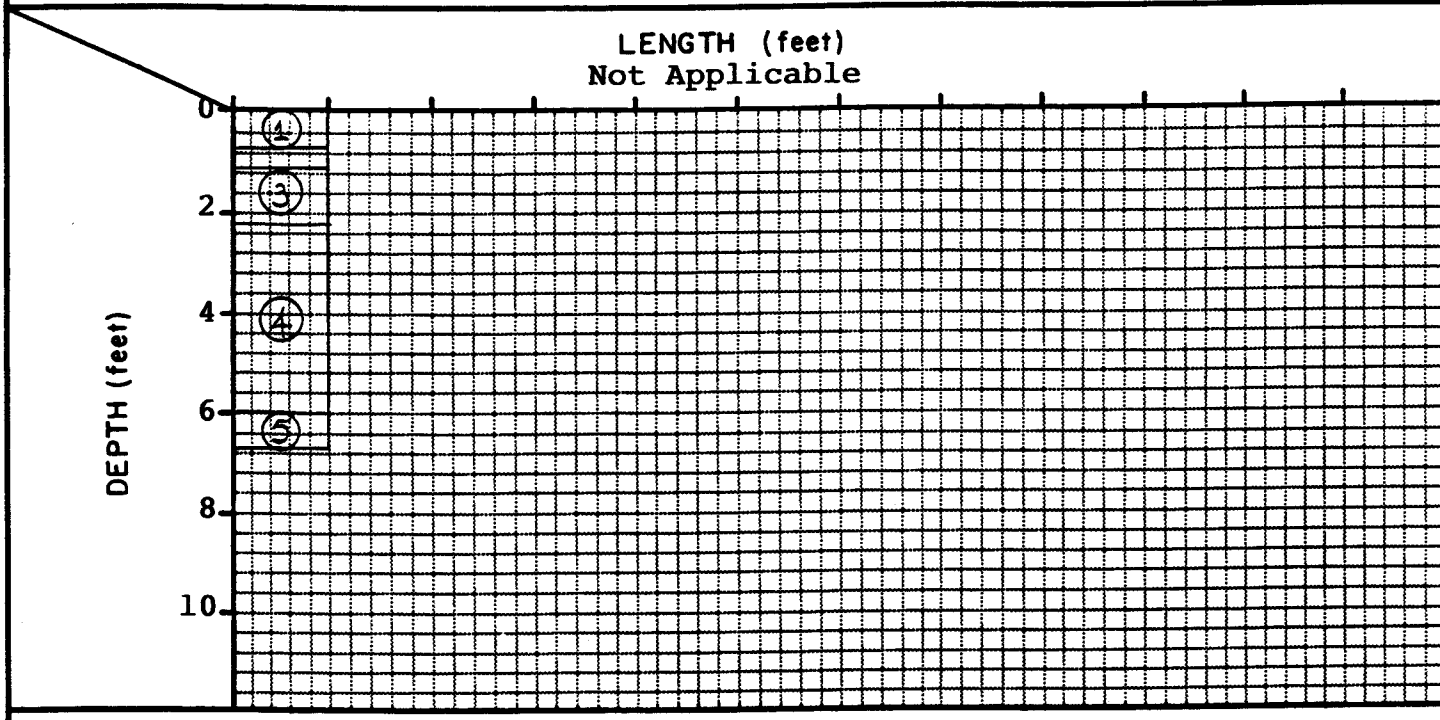
Jar Sample

LOG OF TEST PIT OR EXCAVATION

PIT NUMBER TP-23

PROJECT NAME Weyerhaeuser
PROJECT NUMBER 467.38
LOCATION Plymouth, NC
DATE June 28, 1989
CONTRACTOR Hopkins
METHOD Backhoe
WIDTH
LOGGED BY DEMc
CHECKED BY
PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILT (ML) - gray-brown; topsoil; with organics.

2) SILT (ML) - tan to gray-brown; soft to firm; some organics.

3) SILTY SAND (SM) - light orange-brown; firm; fine grianed; trace of clay.

4) SILTY CLAY (CL) - orange-brown; color change at 4 ft. to gray with brown mottling; stiff.

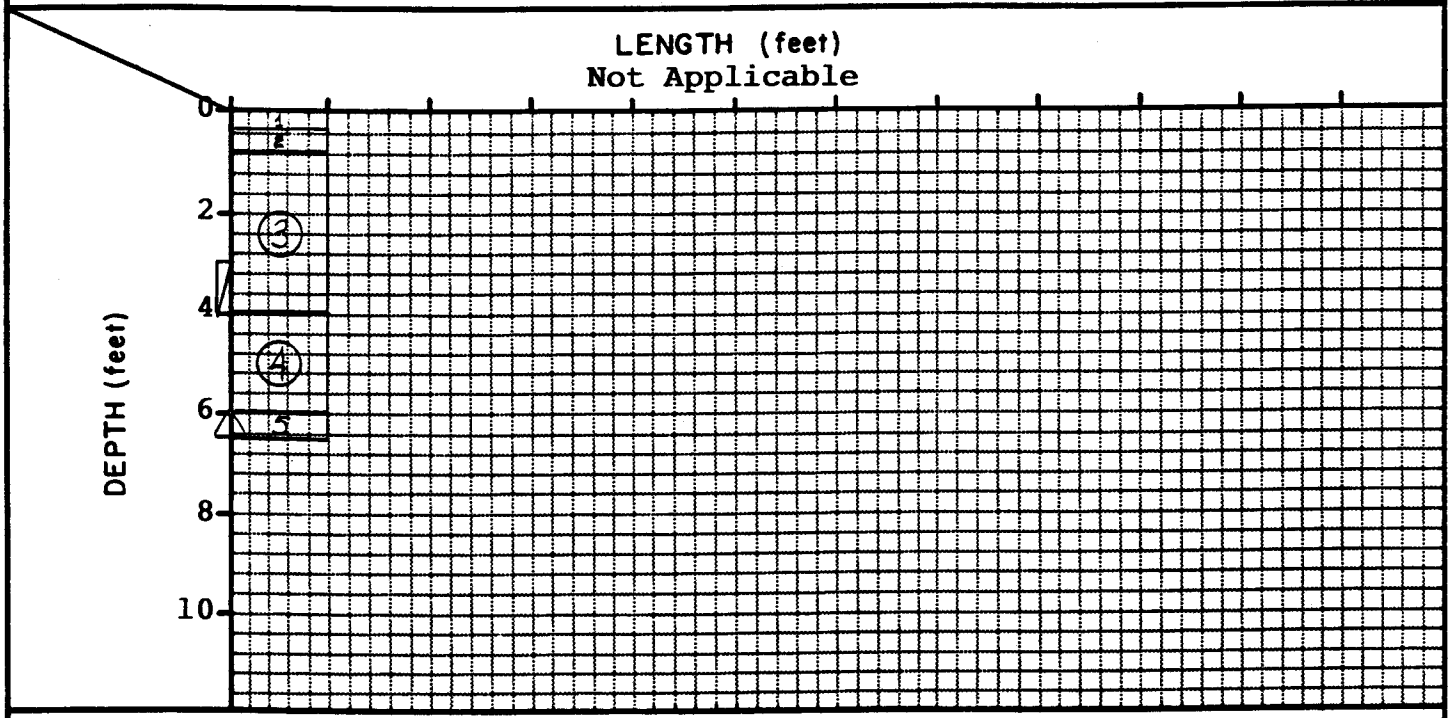
5) SILTY SAND (SM) - light orange-brown to light gray; fine grained; with thin gray clay galls.

LOG OF TEST PIT OR EXCAVATION

PIT NUMBER TP-24

PROJECT NAME Weyerhaeuser
PROJECT NUMBER 467.38
LOCATION Plymouth, NC
DATE June 28, 1989
CONTRACTOR Hopkins
METHOD Backhoe
WIDTH
LOGGED BY DEMc
CHECKED BY ZB
PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILT (ML) - gray-brown; topsoil; with organics.

2) SILT (ML) - brown to light orange-brown; firm; trace of clay.

3) CLAY (CH) - light orange-brown; soft to firm; thin stringers (< 0.1 ft.) of SANDY CLAY (CL).

4) CLAYEY SAND (SC) - light orange-brown to brown-gray; fine grained; soft.

5) SILTY SAND (SM) - orange-brown; fine grained; with thin clay galls scattered throughout.

LEGEND:

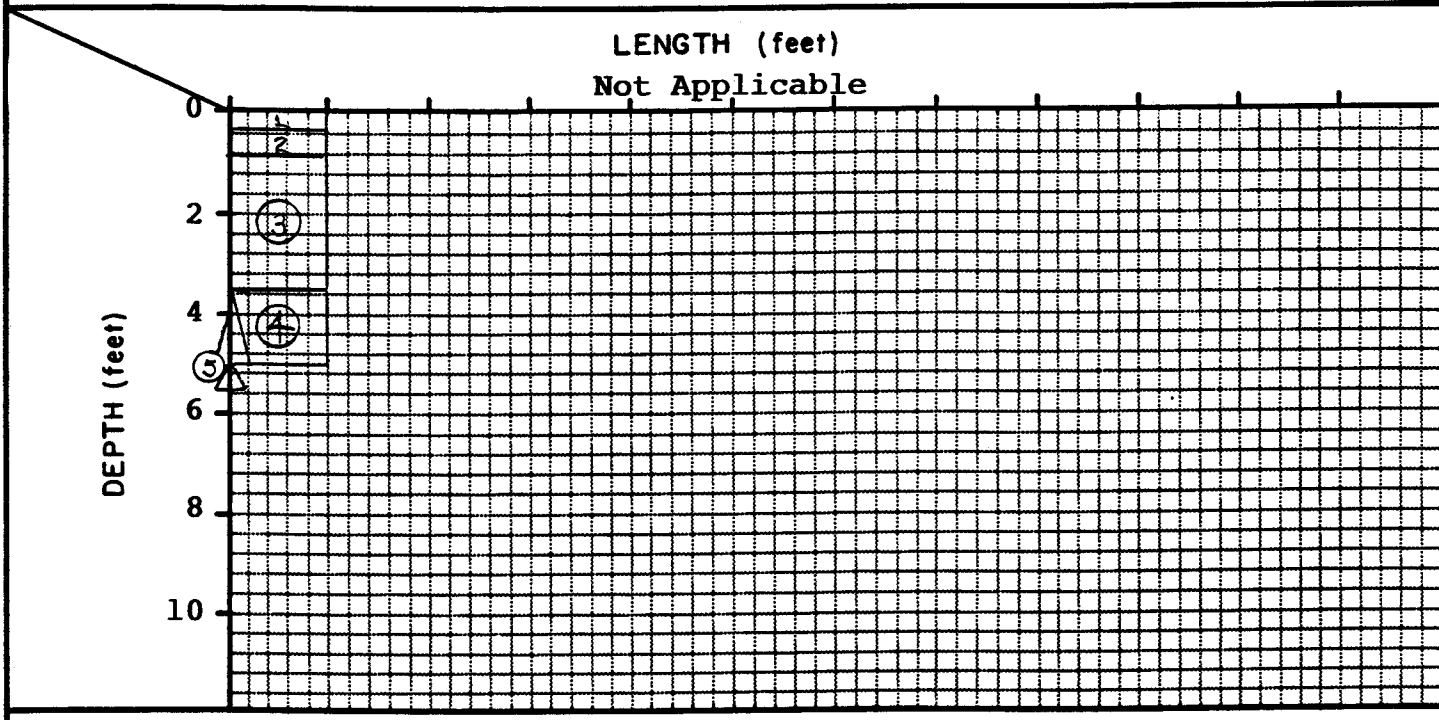
Bulk Sample △ Jar Sample

LOG OF TEST PIT OR EXCAVATION

PIT NUMBER TP-25

PROJECT NAME Weyerhaeuser
PROJECT NUMBER 467.38
LOCATION Plymouth, NC
DATE June 28, 1989
CONTRACTOR Hopkins
METHOD Backhoe
WIDTH
LOGGED BY DEMc
CHECKED BY
PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILT (ML) - gray-brown; soft; topsoil; with organics.

2) SILTY SAND to SILT (SM-ML) - gray-brown; firm; trace of clay.

3) SILTY CLAY (CL) - orange-brown; firm to soft.

4) CLAYEY SAND (SC) - orange-brown to light gray; soft to firm.

5) SILTY SAND (SM) - orange-brown to gray; soft; fine grained; scattered clay galls.

LEGEND:

Bulk Sample Jar Sample

LOG OF TEST PIT OR EXCAVATION

PIT NUMBER TP-26

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.38

LOCATION Plymouth, NC

DATE June 28, 1989

CONTRACTOR Hopkins

METHOD Backhoe

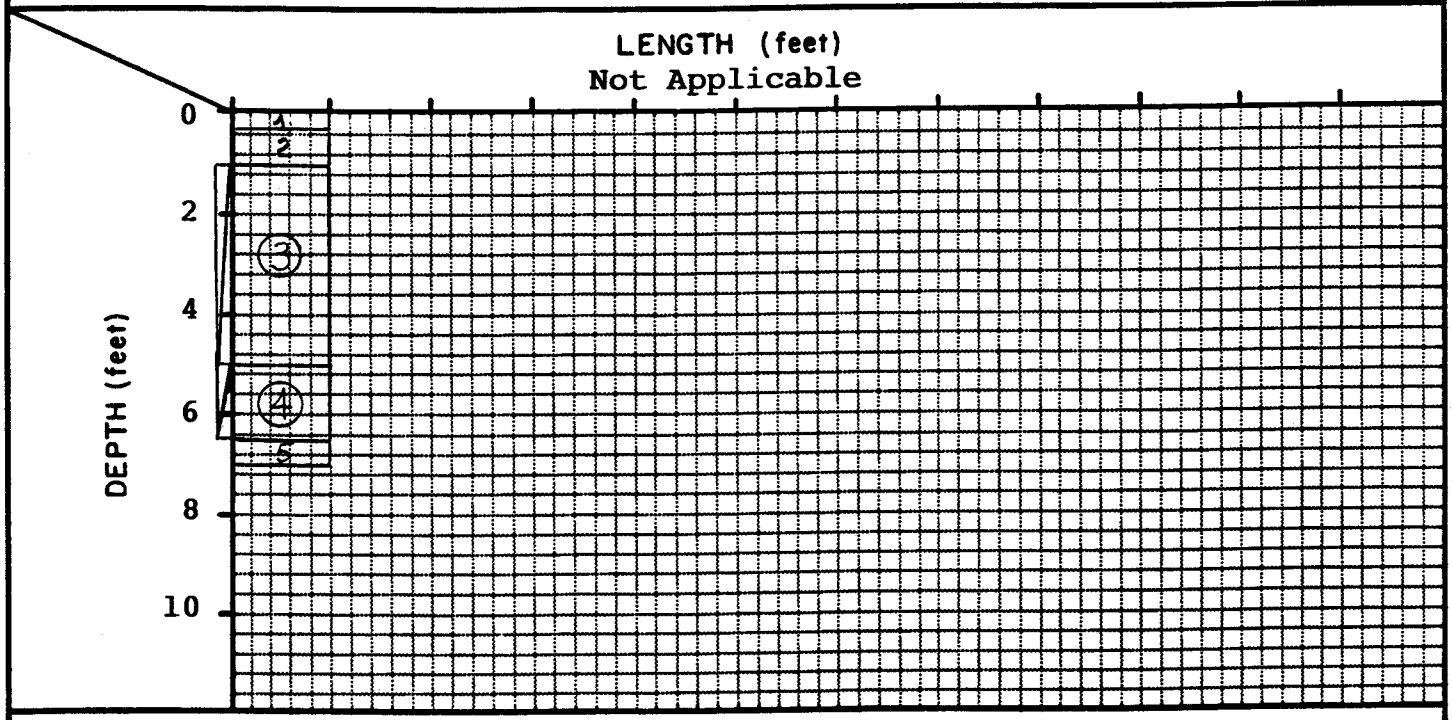
WIDTH

LOGGED BY DEMc

CHECKED BY JB

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILT (ML) - gray-brown; topsoil.

2) SILT (ML) - brown-gray to orange-brown; trace of clay.

3) SILTY CLAY (CL) -orange-brown; with few scattered, thin (1") SILTY SANDS (SM).

4) CLAYEY SAND (SC) - orange-brown; fine grained; with scattered clayey zones.

5) SILTY SAND (SM) - orange-brown; fine grained; trace of clay; scattered clay galls.

LEGEND:

Bulk Sample Jar Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP @ GB-6

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.37

LOCATION Plymouth, NC

DATE June 28, 1989

CONTRACTOR Hopkins

METHOD Backhoe

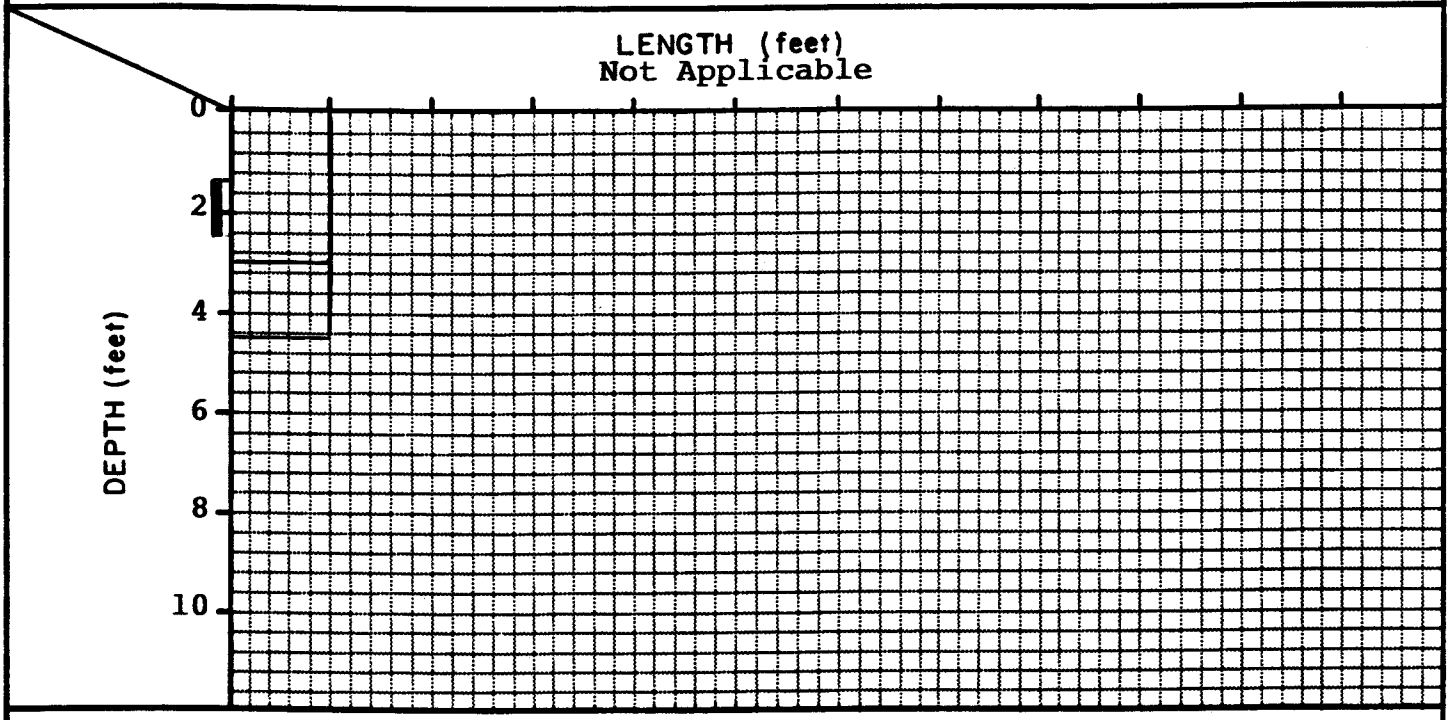
WIDTH

LOGGED BY DEMc

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) Dark gray ash with layers of sawdust; very compact to slightly cemented; moist.

2) Wood waste.

HA - 15

Date: 9/08/89 — Depth of Casing (ft): 11.2
By: Z.B. — Casing Stickup (ft): 2.2
G.W. @ completion (ft): 10.9

Location:
In borrow area approximately 275' north of TP-22 and 180' west of TP-23, at intersection of two interior access roads. Elevation estimated to be 35 feet msl from topo.

DEPTH (ft)	SAMPLED (ft)	USCS	DESCRIPTION
0.00	0	SP-SM	SAND, fine, some silt, Dk.Br. (10YR3/3),
0.25			dry, trace fine roots.
0.50			-Lt.Br. (10YR8/3), dry to moist below 6"
0.75			
1.00	1	CL	CLAY, sandy, trace silt, stiff, Br.Y.
1.25			(10YR6/8), dry-moist, very tough, w/ occ.
1.50			R.Br. (10R3/6) silt pockets.
1.75			
2.00			
2.25			
2.50			
2.75			
3.00			
3.25			
3.50			
3.75			
4.00			
4.25			
4.50	4.5	SP-SM	SAND, fine, some silt, Lt.Br. (10YR8/3),
4.75			dry-moist.
5.00			
5.25			
5.50			
5.75			
6.00			-moist below 6'
6.25			
6.75			
7.00			-occ. clay pocket below 7'
7.25			
7.50			
7.75			
8.00	8	CH-CL	CLAY, silty, very stiff, Lt.G. (N7),
8.25			dry-moist, very tough.
8.50	8.5	SP	SAND, med to fine, trace clay pockets,
9.00			Lt.G. (N7), dry-moist, n.p.
9.50			-R.Br. (10R3/6), silty, and wet below 9.5'
9.75			-grading coarser w/ depth
10.50	10.5	SW	SAND, well, trace silt, R.Br. (10R3/6),
10.75			wet, w/ occ. fine gravel.
11.00	11	---------	T.D.

HA - 16

Date: 9/08/89 — Depth of Casing (ft): 11.5
By: Z.B. — Casing Stickup (ft): 1.0
G.W. @ completion (ft): 6.3

Location:
In borrow area approximately 500' north of TP-24 along main access road at top of knoll just beyond access road leading to TP-26; Elevation estimated to be 24' msl from topo.

DEPTH (ft)	SAMPLED (ft)	USCS	DESCRIPTION
0.00	0	SP-SM	SAND, fine, some silt, Dk.Br. (10YR3/3),
0.25			dry, some fine roots.
0.50			-Lt.Br. (10YR8/3), dry to moist below 6"
0.75			
1.00	1	CL-CH	CLAY, trace sand, trace silt, stiff, R.Br.
1.25			(10R3/6), dry-moist, tough.
1.50			
1.75			
2.00			
2.25			
2.50			
2.75			
3.00		CL	-CLAY and SAND @ 3'
3.25			
3.50			
3.75			
4.00			-Lt.G. (N7) w/ R.Br. (10R3/6) mottling and
4.25			trace fine SAND partings @ 4'
4.50			
4.75			
5.00			
5.25			
5.50			-very stiff and purplish gray below 5.5'
5.75			
6.00			-w/ R.Br. (10R3/6) mottling and ferrous
6.25			stains @ 6'
6.50			
6.75			
7.00			-Lt.G. (N7) w/ SILT partings @ 7'
7.25			
7.50			
7.75			
8.00	8	SP	SAND, med to fine, Lt.Br. (10YR8/3), dry+,
8.25			w/ ferrous staining.
8.50			
8.75			-increasingly well; graded with depth
9.00			-medium SAND @ 9'
9.25			
9.50		SW	-Lt.G (N7) and coarse to medium below 9.5'
9.75			

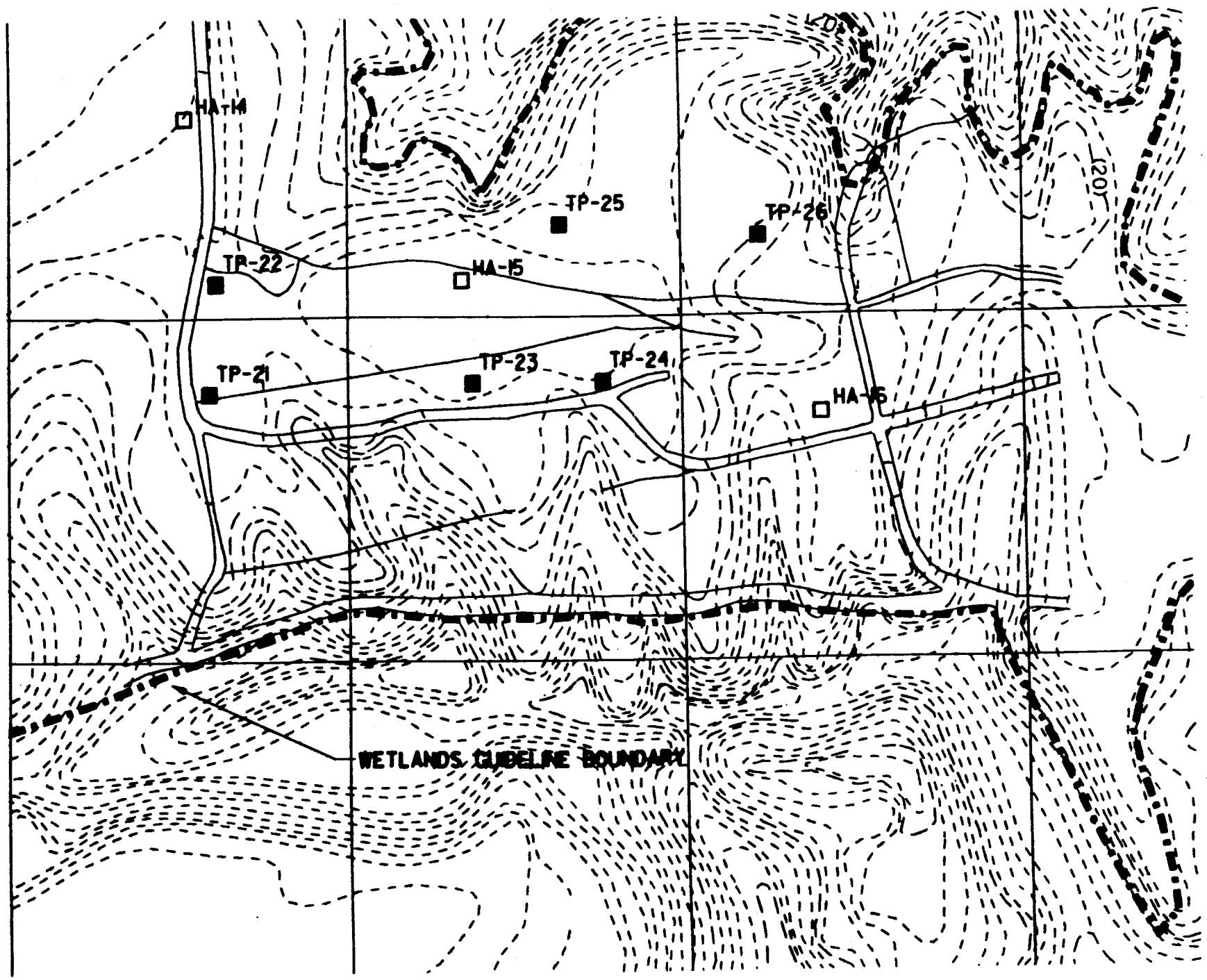
HA - 16 (continued)

Date: 9/08/89
By: Z.B.

Depth of Casing (ft): 11.5
Casing Stickup (ft): 1.0
G.W. @ completion (ft): 6.3

Location:
Approximately 500 feet north of TP-24 at top of knoll just beyond access road leading to TP-26; Elevation estimated to be 24' msl from topo.

DEPTH (ft)	SAMPLED (ft)	USCS	DESCRIPTION
10.00			
10.25			
10.50	10.5	CL	CLAY, silty, very stiff, Lt.G. (N7),
10.75			moist, very tough.
11.00			
11.25			
11.50	11.5		---------T.D.; dry at completion



LEGEND

TP- ■ APPROXIMATE TEST PIT LOCATION

HA- □ APPROXIMATE HAND AUGER BORING LOCATION

RMT INC.

Approved By: JG

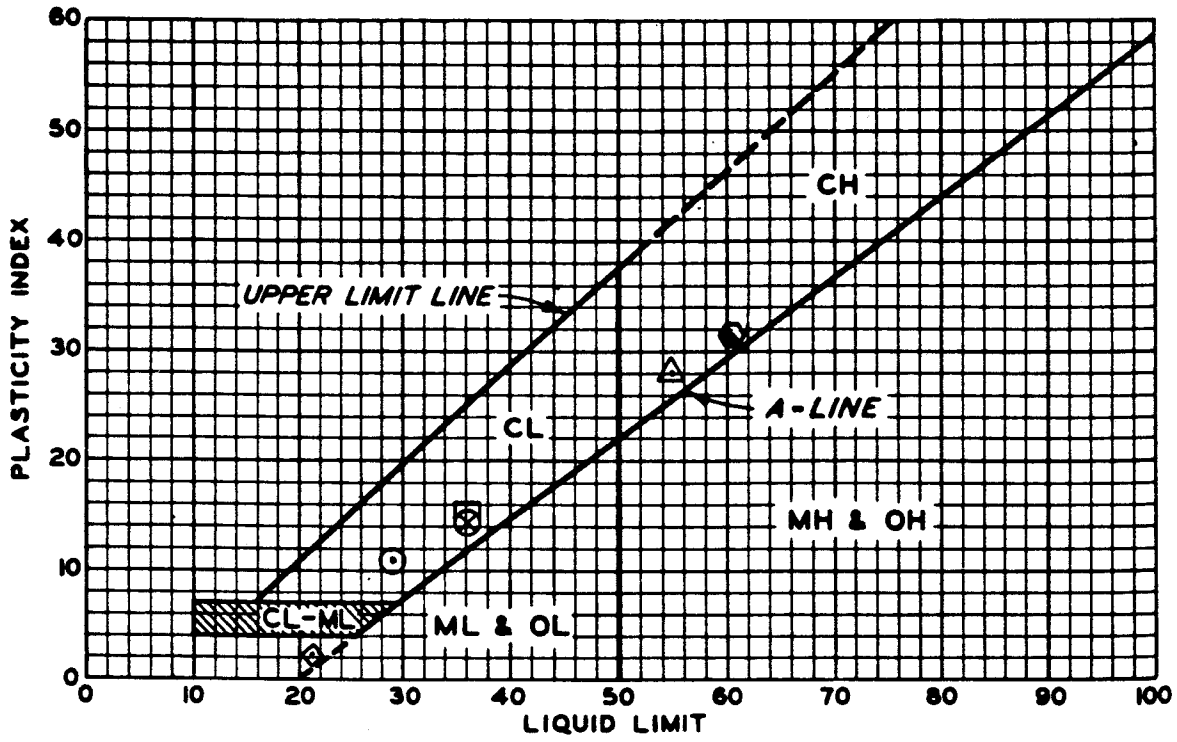
Date: SEPT. 15, 1989

Proj. No.: 467.38

FIGURE 1

WEYERHAEUSER
PLYMOUTH, NC

BORROW AREA
INVESTIGATION LOCATIONS



SYMBOL	LOCATION	DEPTH	LL	PL	PI
⊙	TP–21	1.5–2.0	29	18	11
△	TP–21	3.5–4.5	55	27	28
◇	TP–22	3–4	23	21	2
◐	TP–24	3.0–3.5	61	30	31
⊗	TP–26	3.0–3.5	36	22	14
□	TP–26	5.0–5.5	36	21	15

RMT INC.

Approved By:

Date: SEPT., 1989

Proj. No.: 467.38

FIGURE 2

WEYERHAEUSER
PLYMOUTH, NC

ATTERBERG LIMITS PLOT

RMT INC.

100 Verdae Boulevard
P.O. Box 16778
Greenville, SC 29606
Phone:803-281-0030
FAX: 803-281-0288

July 18, 1989

Mr. Gary W. Ahlberg
North Carolina Department of
Human Resources
Division of Health Services
P.O. Box 2091
Raleigh, NC 27602-2091

Re: Weyerhaeuser, Plymouth, NC
Amendment to Permit No. 94-01
RMT Project No. 467.36

Dear Sir:

The completeness letter from your office, dated June 20, 1989, identified three items to be addressed before your agency's review can continue. These items have been addressed in the following manner:

1) Item 1 required that the plans be sealed by a registered engineer. Four sets of sealed drawings are enclosed.

2) Item 2 required additional soils testing at the borrow site. A sampling and testing program is underway and results will be submitted when the program is complete.

3) Item 3 required information concerning the abandonment of the 10" temporary slope drain. This information is now provided on DWG. No. C004.

If you require additional information for this application, please call me.

Sincerely,

RMT, Inc.

C. T. Sherron
Project Manager

Attachment

cc: Mr. G. L. Miller
Mr. J. R. Zeiler
Mr. L. T. Hardison
Mr. Richard Gay
Mr. John Pritchard
Ms. Diane Hardison
Mr. Stan Duncan
File 467.36

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

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

April 28, 1989

Mr. Floyd Williams
1502 N. Market Street
P.O. Box 1507
Washington, N.C. 27889

RE: Soil Erosion and Sedimentation Control Plan - Weyerhaeuser Paper Company, Plymouth Landfill Vertical Expansion/Closure

Dear Mr. Williams:

Please review the enclosed construction plans for the referenced landfill to determine if the proposed land disturbing activities are in compliance with NCAC Title 15 Chapter 4.

All comments from your review will be incorporated into the conditions of permit.

If there are any questions, please call me at (919) 733-0692.

Sincerely,

Gary W. Ahlberg
Environmental Engineer
Solid Waste Branch
Solid Waste Management Section

GWA/mj

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

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

June 20, 1989

C. T. Sherron, P.E.
RMT, Inc.
P. O. Box 16778
Greenville, SC 29606

RE: Completeness Letter - Weyerhauser, Plymouth, NC,
Amendment to Permit No. 94-01

Dear Mr. Sherron:

The Solid Waste Branch has completed its preliminary review of the referenced project, submitted by RMT, Inc., in behalf of the Weyerhauser Paper Company. In accordance with the N.C. Solid Waste Management Rules, 10 NCAC 10G, the following requirements must be completed to continue the agency's review:

1) .0202(a)(3): The plans shall bear an imprint of the registration seal of the engineer, in accordance with N.C.G.S. Chapter 89E. The drawings must be stamped.

2) .0503(1)(d): Availability of adequate suitable soils, and
.0504(1)(i)(F): Remolded sample of cover soils that provide:
I) saturated hydraulic conductivity,
II) total porosity,
III) atterbery limits.
Laboratory testing results for the "cap" soil shall establish physical and objective parameters for borrow area management. Based on these parameters, calculations must indicate available quantities meet/exceed required quantities (including allowances for shrinkage, etc...) to demonstrate "availability". These requirements correspond to #5 in the document "Design Requirements for Vertical Expansion of Existing Sanitary Landfills".

3) 0.504(2)(h)(xi): Other pertinent information. Please document the provisions for the engineered abandonment of the 10-inch temporary slope drain, located in the southern portion of the landfill.

If you have any questions in regard to these requirements, please contact me at (919) 733-0692.

Sincerely,

Gary W. Ahlberg
Environmental Engineer
Solid Waste Branch
Solid Waste Management Section

GWA/gbf

cc: Jim Coffey
Diane Hardison

Weyerhaeuser
Paper
Company

P.O. BOX 787
PLYMOUTH, NORTH CAROLINA 27962
(919) 793-8111

June 7, 1989

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Bill Hocutt
Solid Waste Branch
Solid Waste Management Section
Division of Health Services
Dept. of Human Resources
P O Box 2091
Raleigh, NC 27602-2091

Dear Mr. Hocutt:

SUBJECT: WASTE DETERMINATION FOR "DREGS", "GRITS", "LIME MUD" AND "LIME"

In regard to the proposed amendment to Permit No. 94-01 for Weyerhaeuser's industrial landfill in Plymouth, NC, and per Gary Ahlberg's request of May 16, 1989, a standard waste determination form has been completed for grits, dregs, and lime mud. These forms are enclosed with this letter for your review. Also included, is a completed form for lime since lime is also disposed of in the landfill.

Through conversation with Richard Gay on May 15, 1989, Gary stated that no laboratory analysis results were necessary for your evaluation of the proper disposal for these different wastes. This was contingent upon the assumption that the descriptions of the chemical and physical processes involved in forming the wastes would provide the necessary information for evaluation. Therefore, no laboratory analysis are included with the enclosed forms. However, pH tests were conducted for each waste type. The resulting pH's are indicated in Section B of each form.

Should you have any questions or further requests concerning the information provided here, please call Richard Gay at (919)793-8693 or me (919) 793-8611.

Sincerely,

Diane Hardison

Diane Hardison
Environmental Engineer

DH/dmc

Enclosures

xc: Gary Ahlberg
John Pritchard
Richard Gay
Chuck Sherron

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
SOLID WASTE MANAGEMENT SECTION
SOLID WASTE BRANCH

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works Sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the wastes environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rule". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. Incomplete waste determination forms will be returned to the generator without review. An asterisk(*) denotes information required for Publicly Owned Treatment Works.

A * GENERAL INFORMATION

1. Name, telephone number and mailing address of facility or person generating waste WEYERHAEUSER PAPER COMPANY
   PO BOX 787, PLYMOUTH, NC 27962
   (919) 793-8611

2. Specific location of waste (i.e. SR. #, county, city, etc...) SR 1341/TROWBRIDGE ROAD, PLYMOUTH, WASHINGTON COUNTY

3. What is the waste? Lime Mud

4. What volume of disposal will there be? ~11 yd^3/4-6 months

5. What frequency of disposal will there be? ~7 loads/4-6 months

6. Explain either the manufacturing process or how the waste was generated. "SEE ATTACHED"

B INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)? If yes, list number. No

*2. Does the waste exhibit any of the four characteristics as defined by .0029(d) (i.e., 40 CFR 261.21-261.24)? (Attach laboratory results for EP Toxicity, Reactivity, Ignitability, Corrosivity.) No pH = 8.7 (from grab sample)

C INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in .0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes, what constituents and what concentration? (Attach laboratory results) No

2. What other constituents are present and in what concentration? (Attach laboratory results) N/A

3. Will the handling and disposal of this waste create dust emissions which may cause a health hazard or nuisance to landfill personnel. No

*4. Does the waste pass the "paint filter" test for free liquids (Method 9095 in S.W. 846)? (Attach laboratory results) Yes

*5. Which solid waste management facility is the request for (name of landfill and permit number, incinerator, etc...)? Weyerhaeuser's Industrial Landfill, Permit No. 94-01

*6. Specify how the waste will be delivered - in bulk or containers (i.e. barrels, bags, etc.) Lime mud is delivered to landfill in dump trucks.

"I hereby certify that the information submitted in regard to Lime mud (name of waste) is true and correct to the best of my knowledge and belief."

(print name) RICHARD L. GAY
(signature) Richard L. Gay
(title) ENVIRONMENTAL SUPERVISOR
(date) 6-7-89

All questions concerning this "Procedure" should be directed to the Solid Waste Branch at (919) 733-0692. Answer specific questions in space provided. Attach additional sheets if necessary.

Complete all information, sign, and submit to:

Division of Health Services
Solid Waste Branch
P.O. Box 2091
Raleigh, N.C. 27602-2091

Attn: Waste Determination

DHS Form 3151 SWB REV. 9/88

ATTACHMENTS

Black liquor (liquid by-product from cooking wood chips) contains a substantial quantity of the chemicals used to formulate white liquor (liquid ingredient for cooking wood chips, mostly NaOH and Na_2S). The chemicals are recovered in a process which consists of concentrating the liquor removed from stock washers in a series of evaporators. The concentrated liquor contains sufficient amounts of combustible material for burning in a recovery boiler. Due to the high temperatures in the recovery boiler, non-combustible materials form a molten smelt which falls into dissolving tanks at the bottom of the boiler. The dissolved smelt is called green liquor ($Na_2S + Na_2CO_3 + H_2O$).

Green liquor is purified in a clarifier. Solids settled in the clarifier, "dregs", are sent to the landfill. The clarified green liquor is further processed by the addition of lime in the slaker. "Grits", a dark green waste, are formed by the slaking process and sent to the landfill.

The causticizing process involves the flow of the slaked lime/ liquor slurry from the slaker through a series of agitation tanks. White liquor and a lime mud slurry are produced during causticizing.

Lime mud, calcium carbonate and water, is separated from white liquor during the white liquor clarification process. Solids settle in the white liquor clarifiers and exit as lime mud underflow. Lime mud is washed, filtered, dewatered, and finally burned in the kiln to make lime.

Lime mud is sent to the landfill only when more is generated than can be stored or a major cleanup is underway. Dumping lime mud to the landfill is not a routine operation and seldom occurs.

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
SOLID WASTE MANAGEMENT SECTION
SOLID WASTE BRANCH

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works Sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the wastes environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rule". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. Incomplete waste determination forms will be returned to the generator without review. An asterisk(*) denotes information required for Publicly Owned Treatment Works.

A * GENERAL INFORMATION

1. Name, telephone number and mailing address of facility or person generating waste WEYERHAEUSER PAPER COMPANY
   PO BOX 787, PLYMOUTH, NC 27962
   (919) 793-8611

2. Specific location of waste (i.e. SR. #, county, city, etc...) SR 1341/TROWBRIDGE ROAD, PLYMOUTH, WASHINGTON COUNTY

3. What is the waste? Grits

4. What volume of disposal will there be? 26 yd^3/day

5. What frequency of disposal will there be? ~ 1-2 loads/day

6. Explain either the manufacturing process or how the waste was generated. "SEE ATTACHMENT"

B INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)? If yes, list number. No

*2. Does the waste exhibit any of the four characteristics as defined by .0029(d) (i.e., 40 CFR 261.21-261.24)? (Attach laboratory results for EP Toxicity, Reactivity, Ignitability, Corrosivity.) No pH = 12.4 (from grab sample)

C INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in .0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes, what constituents and what concentration? (Attach laboratory results) No

2. What other constituents are present and in what concentration? (Attach laboratory results) NA

3. Will the handling and disposal of this waste create dust emissions which may cause a health hazard or nuisance to landfill personnel. No

*4. Does the waste pass the "paint filter" test for free liquids (Method 9095 in S.W. 846)? (Attach laboratory results) No

*5. Which solid waste management facility is the request for (name of landfill and permit number, incinerator, etc...)? Weyerhaeuser's Industrial Landfill, Permit No. 94-01

*6. Specify how the waste will be delivered - in bulk or containers (i.e. barrels, bags, etc.) Grits are delivered to the landfill in a large dumpster bin and are dumped. The empty bin is replaced at the slaker for refilling.

"I hereby certify that the information submitted in regard to Grits (name of waste) is true and correct to the best of my knowledge and belief."

(print name) Richard L. Gay
(signature) Richard L. Gay
(title) Environmental Supervisor
(date) 6-7-89

All questions concerning this "Procedure" should be directed to the Solid Waste Branch at (919) 733-0692. Answer specific questions in space provided. Attach additional sheets if necessary.

Complete all information, sign, and submit to:

Division of Health Services
Solid Waste Branch
P.O. Box 2091
Raleigh, N.C. 27602-2091

Attn: Waste Determination

DHS Form 3151 SWB REV. 9/88

ATTACHMENT

caustic soda and sodium sulfide

Black liquor (liquid by-product from cooking wood chips) contains a substantial quantity of the chemicals used to formulate white liquor (liquid ingredient for cooking wood chips, mostly NaOH & Na_2S). The chemicals are recovered in a process which consists of concentrating the liquor removed from stock washers in a series of evaporators. The concentrated liquor contains sufficient amounts of combustible material for burning in a recovery boiler. Due to the high temperatures in the recovery boiler, non-combustible materials form a molten smelt which falls into dissolving tanks at the bottom of the boiler. The dissolved smelt is green liquor ($Na_2S + Na_2CO_3 + H_2O$).

Green liquor is purified in clarifiers where the insoluble materials, dregs, are removed. The clarifying operation is basically of settling and decanting. The clarified green liquor is further processed by the addition of lime (CaO) and water in the slaker. During the slaking process, high temperatures and violent agitation convert lime into slaked lime ($Ca(OH)_2$) . Grits, unreacted particles of lime, settle to the bottom of the slaker. The grits are raked off of the clarifier section of the slaker and disposed of in the land-fill.

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
SOLID WASTE MANAGEMENT SECTION
SOLID WASTE BRANCH

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works Sludges.

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The following information is required for an evaluation. Incomplete waste determination forms will be returned to the generator without review. An asterisk(*) denotes information required for Publicly Owned Treatment Works.

A * GENERAL INFORMATION

1. Name, telephone number and mailing address of facility or person generating waste WEYERHAEUSER PAPER COMPANY
   P O BOX 787, PLYMOUTH, NC 27962
   (919) 793-8111

2. Specific location of waste (i.e. SR. #, county, city, etc...)
   SR 1341/TROWBRIDGE ROAD, PLYMOUTH, WASHINGTON COUNTY

3. What is the waste? Dregs

4. What volume of disposal will there be? 22 yd^3/day

5. What frequency of disposal will there be? ~ 3-6 loads/day

6. Explain either the manufacturing process or how the waste was generated. "SEE ATTACHMENT"

B INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)? If yes, list number. No

*2. Does the waste exhibit any of the four characteristics as defined by .0029(d) (i.e., 40 CFR 261.21-261.24)? (Attach laboratory results for EP Toxicity, Reactivity, Ignitability, Corrosivity.) No pH = 12.0 (from grab sample)

C INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in .0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes, what constituents and what concentration? (Attach laboratory results) No

2. What other constituents are present and in what concentration? (Attach laboratory results) NA

3. Will the handling and disposal of this waste create dust emissions which may cause a health hazard or nuisance to landfill personnel. No

*4. Does the waste pass the "paint filter" test for free liquids (Method 9095 in S.W. 846)? (Attach laboratory results) No

*5. Which solid waste management facility is the request for (name of landfill and permit number, incinerator, etc...)? Weyerhaeuser's Industrial Landfill, Permit No. 94-01

*6. Specify how the waste will be delivered - in bulk or containers (i.e. barrels, bags, etc.) Dregs are delivered to landfill in a large dumpster bin and are dumped. The empty bin is replaced at dregs filter for refillir

"I hereby certify that the information submitted in regard to Dregs (name of waste) is true and correct to the best of my knowledge and belief."

(print name) Richard L. Gay
(signature) Richard L. Gay
(title) Environmental Supervisor
(date) 6-7-94

All questions concerning this "Procedure" should be directed to the Solid Waste Branch at (919) 733-0692. Answer specific questions in space provided. Attach additional sheets if necessary.

Complete all information, sign, and submit to:

Division of Health Services
Solid Waste Branch
P.O. Box 2091
Raleigh, N.C. 27602-2091

Attn: Waste Determination

ATTACHMENT

Black liquor (liquid by-product from cooking wood chips) contains a substantial quantity of the chemicals used to formulate white liquor (liquid ingredient for cooking wood chips, mostly NaOH and Na_2S). These chemicals are recovered in a process which consists of concentrating the liquor removed from stock washers in a series of evaporators. The concentrated liquor contains sufficient amounts of combustible material for burning in a recovery boiler. Due to the high temperatures in the recovery boiler, non-combustible materials form a molten smelt which falls into dissolving tanks at the bottom of the boiler. The dissolved smelt is called green liquor (Na_2S + Na_2CO_3 + H_2O).

Green liquor is purified in a clarifier. Dregs are the insoluble materials which settle and are removed during the clarification process. They consist of unburned carbon and inorganic impurities (mostly calcium and iron compounds).

The clarifying operation is basically of settling and decantation. Dregs removed in the clarifiers are washed with water and filtered through a wire mesh screen in a dregs filter to recover chemicals, primarily, soda (sodium compounds). The wire mesh screen on the filter drum is precoated with lime mud ($CaCO_3$ + H_2O) to make the dregs easier to handle. Filtered dregs scrapped from the mesh screen are disposed of on the landfill.

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
SOLID WASTE MANAGEMENT SECTION
SOLID WASTE BRANCH

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

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A * GENERAL INFORMATION

1. Name, telephone number and mailing address of facility or person generating waste WEYERHAEUSER PAPER COMPANY
PO BOX 787, PLYMOUTH, NC 27962
(919) 793-8611

2. Specific location of waste (i.e. SR. #, county, city, etc...) SR 1341/TROWBRIDGE ROAD, PLYMOUTH, WASHINGTON COUNTY

3. What is the waste? Lime

4. What volume of disposal will there be? ~11 yd^3/3-5 months

5. What frequency of disposal will there be? ~5 loads/3-5 months

6. Explain either the manufacturing process or how the waste was generated. Lime, calcium oxide (CaO), is formed by burning lime mud ($CaCO_3+H_2O$) in the lime kiln. Dumping lime to the landfill is not a routine operation and seldom occurrs. When the lime kiln is completely down for maintenance, lime may be cleaned out of the kiln and disposed of.

B INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)? If yes, list number. No

*2. Does the waste exhibit any of the four characteristics as defined by .0029(d) (i.e., 40 CFR 261.21-261.24)? (Attach laboratory results for EP Toxicity, Reactivity, Ignitability, Corrosivity.) No pH = 7.7 (from grab sample)

C INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in .0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes, what constituents and what concentration? (Attach laboratory results) No

2. What other constituents are present and in what concentration? (Attach laboratory results) NA

3. Will the handling and disposal of this waste create dust emissions which may cause a health hazard or nuisance to landfill personnel. Minimal

*4. Does the waste pass the "paint filter" test for free liquids (Method 9095 in S.W. 846)? (Attach laboratory results) Yes

*5. Which solid waste management facility is the request for (name of landfill and permit number, incinerator, etc...)? Weyerhaeuser IndustrialLandfill, Permit No. 94-01

*6. Specify how the waste will be delivered - in bulk or containers (i.e. barrels, bags, etc.) Lime is delivered to the landfill by dump trucks or in dumpster bins which are emptied at the landfill.

"I hereby certify that the information submitted in regard to Lime (name of waste) is true and correct to the best of my knowledge and belief."

(print name) RICHARD L. GAY
(signature) Richard L. Gay
(title) ENVIRONMENTAL SUPERVISOR
(date) 6-7-89

All questions concerning this "Procedure" should be directed to the Solid Waste Branch at (919) 733-0692. Answer specific questions in space provided. Attach additional sheets if necessary.

Complete all information, sign, and submit to:

Division of Health Services
Solid Waste Branch
P.O. Box 2091
Raleigh, N.C. 27602-2091

Attn: Waste Determination

DHS Form 3151 SWB REV. 9/88

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

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

May 16, 1989

Mr. Richard Gay
Environmental Supervisor
Weyerhauser Paper Company
P.O. Box 787
Plymouth, N.C. 27962

RE: Waste Determination for "dregs", "grits", and "lime mud" - Proposed Amendment to Permit No. 94-01.

Dear Richard:

Pursuant to our phone conversation yesterday, I have enclosed three copies of the standard Waste Determination form.

Please complete this form for each waste referenced above, including all pertinent chemical processes involved in forming the waste and the chemical composition of each waste. This information is properly located in Section A-6. If necessary, please use additional paper to be complete.

If you have any questions, please contact Bill Hocutt at (919) 733-0692.

Sincerely,

Gary W. Ahlberg
Environmental Engineer
Solid Waste Branch
Solid Waste Management Section

GWA/mj

cc: Bill Hocutt
C.T. Sherron

concept for new lined area

Weyerhaeuser
Paper
Company

P.O. BOX 787
PLYMOUTH, NORTH CAROLINA 27962
(919) 793-8111

November 1, 1989

Mr. J. Gordon Layton
Solid Waste Management
P 0 Box 2091
Raleigh, NC 27611

Dear Gordon:

This letter is to confirm the discussion between Terry Dover and myself regarding the submission of a landfill permit application for a new landfill at the Weyerhaeuser Paper Company in Plymouth, NC. The permit application for our new landfill is in the latter engineering phase. A "high-tech" design including a synthetic liner and leachate collection is proposed. The initial design separated our dewatered wastewater treatment sludge to allow disposal in a mono-landfill. Each landfill would have incorporated the same engineering designs as described above. Leachate from each landfill would be collected separately and then combined into one transfer system to the wastewater treatment system.

Dewatered wastewater treatment sludge will comprise approximately 10% of the total solid waste requiring disposal. In addition, we have submitted an application to Environmental Management for a permit to burn the dewatered sludge. With this in mind, one application for a solid waste landfill permit will be submitted to your agency for review. This application will include our current solid waste generation and the additional dewatered sludge that will be generated in 1991 eliminating the mono-landfill for sludge.

If you have questions or concerns please call me at (919)793-8693. Thank you for your cooperation in resolving this matter.

Sincerely,

Richard L. Gay

Richard L. Gay
Environmental Supervisor

RLG:dmc

xc: [redacted]
Terry Dover
Fred Wood
Luke Miller

11/20

Richard Gay

- change in operational / const of dikes, etc
  "progressive lifts" @ 4'

- move sed basin
  calling LQ for revision or ?
Richard checking w/ Reg.

- send copy of changes
- treat as re submittal

607 RMT - Weyerhaeuser

BORROW AREA DEVELOPEMENT

FROM A-D CALCS:

REQ'D MAT'L	YD^3	YD^3	AVAILABLE BORROW
CAP	90,751	85,862	CAP
TOP SOIL	30,251	16,500	TOPSOIL
THEORETICAL	121,002	102,362	TOTAL

ADD 10% TO REQ'D VOLUMES FOR SHRINKAGE

SHOW 1) REQ'D TOPSOIL IS SUPPLEMENTED BY "NEW SITE"

2) CAP MAT'L, AVAILABLE - REQ'D =

= 85,862 - 99,826

= -13,964 yd^3

CLARIFY - METHOD FOR DETERMINING AVAILABLE MAT'L

- MANAGEMENT OF BORROW AREA

1) IS THERE AN ENGINEER (GEOTECH) FOR STAGES I, II, & III

2) DEVELOPE A METHODOLOGY FOR IDENTIFYING SUITABLE CAP MAT'L BY SPECIFIC PARAMETERS

3) BASED ON THIS METHODOLOGY, ESTIMATE AVAILABLE VOLUMES OF CAP MAT'L

4) TO DEMONSTRATE ADEQUATE AVAILABLE SOILS, AVAILABLE > REQ'D. (10% SHRINKAGE OR % PROPOSED)

NEED - sat perm. tests for cap mat'l need actual test, calc/describe value to

-

803 281-0030

SE & SC PLAN APPD.

10202 (3) - STAMPED PLANS

FATE/TEMPORARY SLOPE DRAIN

Weyerh. Borrow Pit

- stockpile topsoil (top 12" profile)
- excavate sandy, silty clays 2.5-5' subg

elc topo estimates

21 acres, 200' from eastern waste boundary

32		B-4 (30)	1-10 (SP)	TP	13 (28)	8.5	red yell cl
26		B-7 (20)	1-8 (CL)		12 (33)	8	"
34	✓	B-8 (33)	1-3.5 (CL)		14 (33)	7.5	"
elc 23?	✓	B-10 (4)	.8-8.0 (CL/CH)		17 (34)	8.5	5' ry cl 3.5 ly s. sand
31?	✓	B-11 (4)	.6-5 (CL)				
33	✓	B-12 (8)	1.0-8 (CL)				

cap and cover (includes 1.5' cap + .5' topsoil) needed = 121 M CY

Shrinkage 10-15%

perm 10^{-8} - 10^{-9} cm/s 95-100 std. proc. max DD

? any recompacted tests

✓ thickness varies 2.5 - 7.2 ~~ft~~

final surface parallel to and 4 below existing g.

apply topsoil 4-6 inches

topsoil available 6-8" inches of top profile

no recompacted sat perm tests

no estimated available volumes / calc 101,640 need 113,450 @ 1.25 x 90,700

GW Monitoring Plan

? are they aware of the compliance boundaries for this site ? monitor closer

the lesser of → 500 from waste boundary

or 50' inside PL

? what/where are screens to be set?

to be revised

Varieties of motifs in Barrow area

silty → sandy clays

clayey silts

silty sands

P.O. Box 529
Louisiana 63349

Top Soil
16,500 yd³

?'s for Weyerhaeuser - Plymouth NC

1) are all these wastes currently going to the landfill?
for how long?

2) is there an alternate name for "dregs" based on the info available to me not apprd.

3) are the generated wastes incidental to an NPDES permit, including fly ash and process wastes?

Weyerhaeuser - Plymouth NC

WD

high temperature = [ ]

Wastes dissolved smelt is green liquor

① dregs insoluble mat'l from ↳($Na_2S + Na_2CO_3 + H_2O$)

→ settled solids is waste

pH = 12.0

pass PFT → no 11 tpd

---

② grits add lime (CaO) + H_2O to clarified green liquor

goes to $Ca(OH)_2$

→ unreacted particles of lime is waste

pH = 12.4

pass PFT → no 11 tpd

---

③ lime mud occasional waste pH = 8.7

will pass PFT

④ lime " " " " pH = 7.7

6/19 Bill on WD

- basis for ~~organics~~ analyzed TCLP extract.
- Se < .2 ppm limit is 0.1 ppm.
- Champion (R. Rapids - DEM LF), went thru haz waste or SWM branch '88. (12 organics analyz
- thru Judy HWB, 12.4 is it haz. / why

Gordon - to Haz waste

if not haz accept @ LF

Weyerhaeuser - Plymouth Permit No. 94-01

on SR. 1341

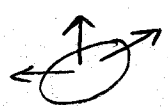
38 acres, permitted cap. @ 1989

rate average 990 yd^3/D 300 tpd

waste types: - manufacturing by-products from pulp & paper

major components { - ash from coal/wood fiber
- bark, chips, & pallets

GW estimated depth 5-15'



level shallow flow to Welch Creek (W) & L. MILL (NE)

no wells w/in ½ mile radius

soils - shallow borings & test pits sufficient "on-site"
Report in A-2, A-3

construction

1) regrade 3:1 H:V slopes
2) berm const. using waste
progression N to S 3:1 slopes 20' terraces
3) cover side slopes/revegetate
4) grade top to min 5% w/ waste & CAP/SEED etc.
5) run-offs control w/ perimeter ditches to sed ponds

? ~~what~~ is wrong w/ LF ~~now~~? purpose of regrade?
2.5:1 slopes etc...

3 Stages

I- modify existing unimproved side slopes
const. per. ditches & EC features to existing ponds

II - elevated perimeter berm w/ slope closure
58% closed berm constructed w/ waste

III - interior filling and surface CAP

resp. individual - Mgr. Tech. Seves, Wyo.
geo. setting
GW use/classif. soft & corrosive ↓ domestic use
domestic → artesian wells
present ave elevation 50-55' MSL

process description fly ash 55% wood waste 27%
waste characterizations
TCLP
Vert. Eqn. ~~Design~~ 3 yrs to close mid 1991

cap & cover 121 MCY

SE&SC ditches min S = .025% max 8.0% w v > 4 fps w/ crushed stone
~~BMPs~~
sed ponds
principal sway 10-year 24 hr duration
emerg. sway 100-year 24 hr duration
w/ 1' freeboard & 5%
sed. storage 0.50 ac-in (67 yd³) / acre of disturbance
RCN = 70

Weyerhaeuser historical

inspections

6/87 permitted w. acceptance
drainage, compact.
'88 in compliance

WASTE TYPES APPVD.

5/2/80 flue gas de-S. sludge & coal ash

4/5/78 appvd. wastes per letter dated 5/4/78

lime mud, lime grits and lime
wood ash
pulp fiber
bark & wood waste
soot
paper
normal industrial waste
garage waste

& dewatered sludge from waste treatment system

4/89 submittal

dregs & grits } 11 tpd + 11 tpd

solids settled after purifying green liquor

slaked ~~not'l~~ after lime is added to green liquor

22 tpd of mat'l pH = 13.0 – 13.1
non-reactive

? predict these wastes are primarily $CaCO_3$
but what else is present.

? can they be neutralized?

? Why TCLP

? reason to believe any of these waste are classified as haz waste

Dregs, Grits, Lime Mud
(pH 13.0 - 13.1)

TCLP test - leaching test for "land-ban" limits @ haz waste fac.

more appropriate - waste characterization, WD process

X - chemical processes involved in forming the waste

X - chemical characterization

- and if determined necessary EP Tox testing.

WD - /

Env. Supv. → Richard Gay

X Plans need to be stamped

existing permit issued 5/4/78
coal ash disposal site 5/2/80 amendment
+ flue gas sludge
- seasonal hi @ 13' MSL GWQ standards exceeded Fe, Mn, Hg; Cr
10 ac borrow pit

Dust control OK

"a tier"?

equip?

cover —
no exposed prtv. wastes
5% 40 yd³ pd 16 tpd