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PHASE 2

HYDROGEOLOGIC AND GEOTECHNICAL SITE CHARACTERIZATION FOR A PROPOSED LANDFILL

Weyerhauser Paper Company
Plymouth, N.C.

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EXECUTIVE SUMMARY

Background data have been collected to design a new landfill that will replace the existing facility in three to five years. Samples of subsurface soils from the site proposed for the new landfill were collected and tested. Physical property testing indicated that on-site, clayey soils could be used as cap and liner construction material. Two aquifers were identified and characterized on the site. An issue to be resolved during the conceptual design of the landfill will be whether to construct the facility above the water table, or to dewater the shallow aquifer and construct the landfill in a deep excavation.

Hydrogeology

The site is underlain by unconsolidated silts, sands, and clays. A clay layer at an approximate 20 foot depth separates the surface aquifer from a deeper, confined aquifer over a portion of the site. Ground water in both aquifers flows from the south of the site toward Welch Creek on the west and Little Mill Creek on the north. Ground water percolates slowly downward into the lower aquifer on the eastern side of the site, but appears to move upward toward the surface along the creek to the west.

Soil Properties

An acceptable amount of settlement caused by consolidation of underlying soils due to loading by the new landfill is expected. Shallow soils, primarily interbedded silts, and sands, containing clay appear to be suitable for use as liner or final cap material. There are indications of sufficient clayey soils on-site to justify preparation of an estimate of quantities available for use in landfill construction.

Implications for Landfill Design

The data obtained from this investigation suggest that the following options for the design of the landfill should be evaluated.

1) Limiting the landfill subgrade to the shallow subsurface above the water table;
2) Dewatering the shallow aquifer above the major clay unit and constructing the bottom of the landfill near the top of the deep clay layer;
3) Using on-site clay for construction materials.

The first alternative would offer significantly less airspace for long-term waste disposal.

The second alternative would offer more airspace, but would require a variance from North Carolina Regulatory Standards which require a four foot separation between waste and the water table.

Section 1
INTRODUCTION

1.1 Background

The Weyerhaeuser Company Plymouth Mill maintains a State-permitted landfill for the disposal of boiler ash and process wastes. The landfill is located on Weyerhaeuser-owned property adjacent to the mill in Plymouth, North Carolina, as shown on Figure 1. A five-year permit to complete a vertical expansion for the existing landfill was recently obtained.

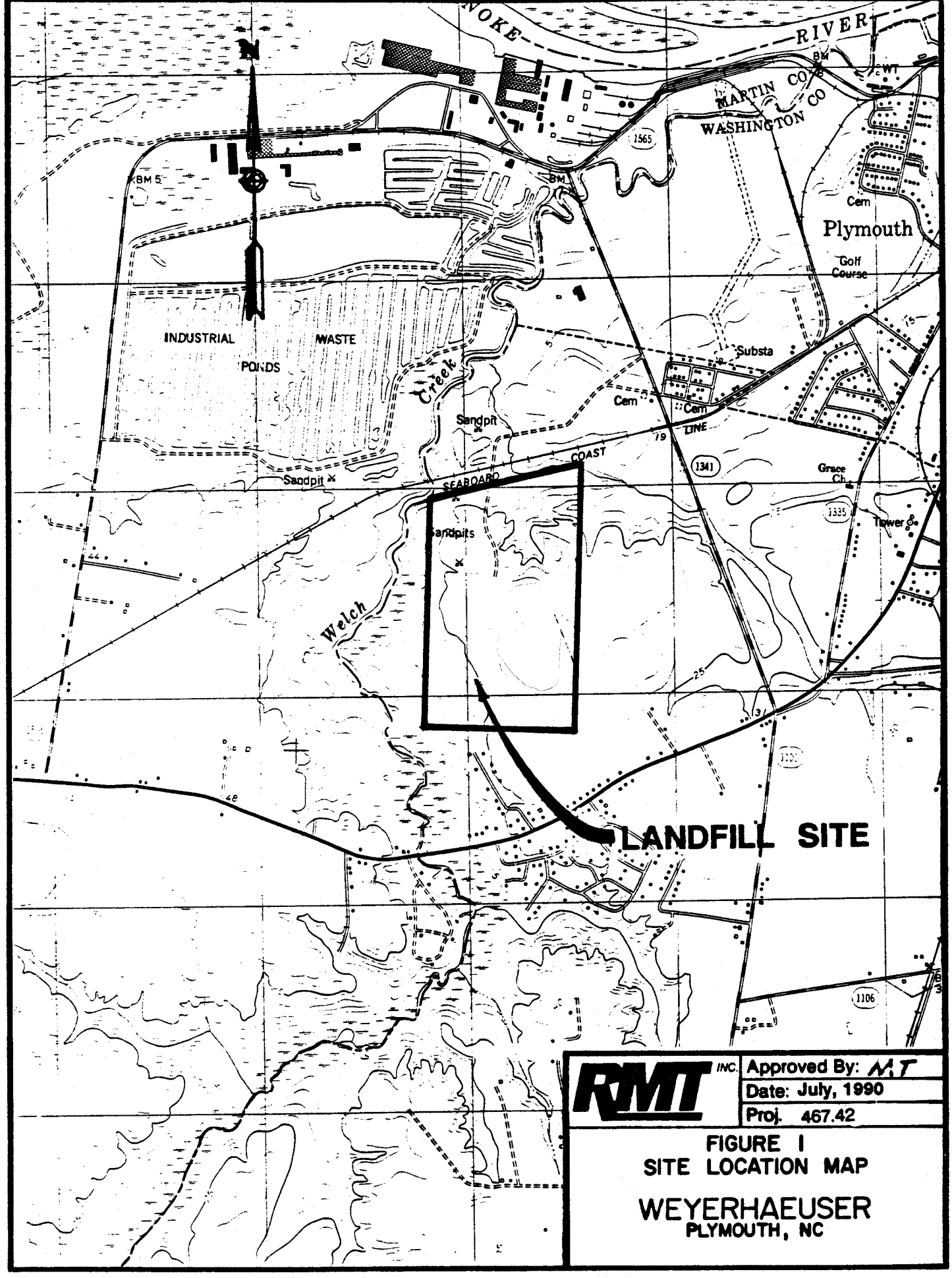
Weyerhaeuser is currently developing plans for a new landfill that will be located adjacent to the existing facility, as shown on Plate 1. The first step in the permitting process, approval of the site for use as a landfill, was granted by the North Carolina Department of Human Resources (NCDHR) as part of Solid Waste Management, Permit No. 94-01. Weyerhaeuser is in the process of preparing the second part of a North Carolina landfill permit which is the construction plan application.

RMT, Inc., has been retained by Weyerhaeuser to investigate subsurface conditions on the site to provide baseline data for use in the development of the construction plan application. A Preliminary Site Characterization was conducted during the summer of 1989. In April 1990, Phase 2 of the Site Characterization was conducted to provide the subsurface data needed to design the new landfill.

1.2 Objectives of Investigation

The objectives of the field investigation were as follows:

- Characterize the geologic and hydrologic conditions of the proposed landfill site to provide engineering design criteria and to meet the requirements of NCAC 10G.0504(1)(c), and
- Determine the following on-site soils characteristics:
  - Permeability,
  - Settlement,
  - Construction/compaction properties, and
  - Borrow potential for liner and cover material.



RMT INC.

Approved By: M.T

Date: July, 1990

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FIGURE I
SITE LOCATION MAP

WEYERHAEUSER
PLYMOUTH, NC

TELEDYNE POST N32003

1.3 Scope

This report presents the data collected during Phase 2 of the Site Characterization, and discusses the implications of that data for designing the new landfill. It contains hydrogeologic and geotechnical information needed to prepare a construction plan application. It is not intended to be used as a substitute for the site plan application required by NCAC 10G.0504(1)(b).

This study of hydrogeological and geotechnical characteristics includes:

- Testing of selected soil samples, including standard penetration, grain size distribution, soil classification, moisture content, dry density, Atterberg limits, *in situ* and remolded permeability, and compaction;
- Field observation of geologic features;
- Tabulation of water table elevations; and
- Settlement analysis.

Recommendations for engineering design criteria and construction of the new landfill were developed from an analysis of the data obtained during the study. These recommendations cover the following design issues:

- Depth of the landfill excavation,
- Separation between the base of the landfill and the water table,
- Excavation and fill slopes,
- Liner selection,
- Potential use of on-site soils for liner and cap construction,
- Identification of alternate construction materials,
- Construction constraints, and
- Construction requirements, including quality control procedures.

1.4 Qualification

The RMT evaluation of hydrogeologic and geotechnical conditions was based on knowledge of the site derived from data obtained during this investigation. The general subsurface conditions utilized in our evaluation have been based on interpolation of subsurface data between the borings, wells, and test pits. In evaluating the subsurface data, we have examined previous correlations between

penetration resistances and foundation bearing pressures conserved in soil conditions similar to the Plymouth site. If the project information is incorrect or if the structure location (horizontal or vertical) dimensions are changed, please contact RMT so that the recommendations in Section 3 can be reviewed. The discovery of any site or subsurface conditions during construction which deviate from the data generated during this investigation should be reported to RMT for evaluation. The assessment of site environmental conditions or the presence of pollutants in the soil, rock and ground water of the site was beyond the scope of this investigation.

Section 2
FINDINGS AND CONCLUSIONS

Based on the following findings, RMT concludes that this site is suitable for construction of a landfill. In support of this conclusion, the investigation results indicated the following:

1. The soils encountered in borings and test pit excavations consisted of sands, silts, and clays. The dominant soil type logged in the shallow subsurface was silty sand, but many of the silty sand beds were interbedded with or interlaminated with clayey sands and clays. In most cases, the sand is fine-grained. Medium and coarse-grained sand was occasionally found at depths greater than 10 feet.

2. In spite of the overall heterogeneous character of the sediments on the site, the following generalizations apply:
   - The upper stratigraphic intervals in the northeastern part of the pine plantation area tend to contain more clay than the same interval in other areas of the site;
   - The upper ten feet of soil in TP-15, TP-6, TP-3, and OW-3 contain virtually no clay; and
   - A blue-green clay unit that was encountered at a depth of approximately 20 feet, was observed throughout most of the east-central part of the site, in the vicinity of the pine plantation. This unit was penetrated by three borings at thicknesses ranging from 15.5 to 18 feet.

3. Two acquifers were identified on-site. A shallow water table acquifer exists throughout the site, and, in the east-central part of the site, a confined acquifer, separated from the water table aquifer by the blue-green clay aquitard. The landfill could be placed in a deep excavation while maintaining the four foot minimum separation between the base of the landfill and the water table required by North Carolina regulations. This would be accomplished by dewatering the shallow aquifer.

4. The shallow water table generally mimics topography across the site. Although no record of water table fluctuations exists for this site, the water table would be expected

to fluctuate with seasonal variations in precipitation. The design of the landfill should anticipate these fluctuations.

5. Downward ground water gradients exist in the area underlain by the deep clay unit. This suggests that leachate migrating from the proposed landfill will tend to infiltrate downward through the deep clay unit. Leaching data (Waste Characterization and Analysis, RMT, July 1990) indicate that the wastes could potentially release certain metals to the environment. Adequate environmental barriers will be needed to control such releases and monitoring systems will be required to determine if any have occurred.

6. Penetration tests and laboratory strength testing indicate that the underlying soils on the site will provide adequate subgrade support for a landfill with acceptable settlement characteristics.

7. Some on-site soils could be used for liner and cap material. Tests on selectively collected composite samples showed that recompacted soils classified as CL, ML, and SC achieved maximum permeabilities ranging between 1.9×10^{-8} and 5×10^{-8} cm/sec. These permeabilities exceed the desired maximum liner permeability of 1×10^{-7} cm/sec. Although an estimate of available quantities was not attempted, the data indicate that at least a portion of the required liner or cap material might be available on-site.

Section 3
RECOMMENDATIONS

Based on the findings and conclusions of this investigation, RMT makes the following recommendations:

1. Proceed with designing the landfill.

2. Consider the following elements:
   - The two design options, deep or shallow excavation, should be evaluated based on ground water configuration;
   - Ground water control measures should be included in either design option;
   - A detailed dewatering analysis should be prepared prior to deep excavation design;
   - Shear strength data from the Preliminary Site Characterization for a Proposed Landfill, RMT, October 1989, should be used;
   - Stability of embankments should be checked during construction.

3. Estimate the available quantities of soils suitable for use as liner or cap material.

4. Identify an off-site source of clay soil.

5. Collect ongoing water level and precipitation measurements to evaluate seasonal water table fluctuations.

Section 4
FIELD INVESTIGATION

4.1 Subsurface Investigation

To supplement information collected during the preliminary site investigation, three monitoring wells and seven observation wells were installed, five soil borings were drilled, and sixteen test pits were excavated on-site. Resulting soil and water level data have been used to provide a more detailed interpretation of on-site soil stratigraphy and ground water flow conditions. Lithologic logs from wells, borings and test pits are included in Appendices A and B. Well construction diagrams are included in Appendix C.

4.1.1 Soil Sampling and Analysis

Sampling activities were conducted to assess the type, distribution, and geotechnical characteristics of soils at the site. Data was compiled and analyzed to assess the suitability of on-site soils for use as landfill liner or cover material. The information was collected to define the areas of the site that would provide a natural separation between shallow and deep aquifers.

Soil samples were collected on a continuous basis from the soil borings with a split barrel sampler. Undisturbed samples were collected from selected intervals using thin-walled tube samplers (*i.e.*, Shelby tube). Continuous split barrel soil samples were also collected from each of the well boreholes to ten feet below ground surface and then at five foot intervals to total boring depth.

The laboratory coefficient of permeability was measured for undisturbed soil samples. These samples were collected from shallow and intermediate depths relative to the projected landfill excavation base, and from the upper part of the deep clay unit.

Scoop samples were collected from each different soil unit within a test pit, unless the equivalent unit had been previously sampled. In addition to scoop samples, bulk samples were collected wherever predominantly clay units were encountered in the test pits. Bulk samples were tested for grain size (ASTM D422) and Atterberg limits (ASTM D4318). Moisture-density tests (ASTM D155) were also performed on cohesive soil samples. Split

barrel, scoop, and bulk samples, were visually classified in the field by an RMT hydrogeologist in accordance with the Unified Soil Classification System. Selected soil samples were subsequently analyzed in the laboratory (Appendix D). The results were checked against visual classifications and changes were made when necessary.

Selected split barrel and scoop samples from boreholes and test pits were analyzed for geotechnical properties. The analytical results are tabulated and included in Appendix D along with supporting documentation.

4.1.2 Borings

Five soil borings (SB-5 through SB-9) were drilled to 20 feet. The locations of the soil borings are shown on Plate 1. The soil borings were located to collect information regarding the distribution, type, and geotechnical characteristics of shallow subsurface soils. Borings were drilled with hollow stem augers (approximately six inch O.D., three inch I.D.). Upon completion, each boring was grouted from total depth to land surface with a Portland cement/bentonite grout slurry.

Well borings were drilled by two methods: hollow stem auger and mud rotary. Shallow observation wells (OW-2 through OW-7) were drilled to depths ranging from 13.2 to 23.3 feet. Small diameter augers (6 inch) were employed during soil sampling to minimize potential problems with flowing sands, a common phenomenon in the Coastal Plain physiographic province. After reaching total depth, each boring was overdrilled using ten inch O.D. hollow stem augers for well construction.

The four deep wells, MW-1A, MW-6A, MW-8, and OW-1 were drilled using the mud rotary method. These wells were drilled to determine the thickness and occurrence of the deep clay unit encountered in monitoring wells MW-1, MW-5, and MW-7, and soil borings SB-2, SB-3, and SB-4 during the Preliminary Site Characterization Phase. The drilling was begun using a 5 and 7/8 inch tricone bit. After encountering the top of the deep clay unit in MW-1, MW-8, and OW-1, the borehole was overdrilled with a ten inch tricone bit. Then six inch diameter schedule 40 PVC casing was installed, and the annulus was grouted to ground surface using a tremie line. The borehole was advanced through the clay unit using a 5 and 7/8 inch tricone

bit. The entire borehole for MW-6A was drilled using a 5 and 7/8 inch tricone bit since the deep clay unit was not encountered.

4.1.3 Test Pit Excavations

Sixteen test pits were excavated on-site to supplement geotechnical information from the borings and permit collection of clay samples for geotechnical analysis. The pits ranged in depth from five to ten feet. The test pits provided larger scale observation of soil stratigraphic and textural relationships than could be obtained from soil borings. Water table observations were also documented from some of the test pits.

4.2 Monitoring Well Installation

Three monitoring wells (MW-1A, MW-6A, and MW-8) were installed on-site. Monitoring wells MW-1A, MW-6, MW-8, and observation well OW-1 were installed to monitor the water level of the deep confined aquifer, and provide information regarding the distribution and characteristics of on-site clays. The locations of the four wells are shown on Plate 1. Wells MW-1A, MW-6A, and OW-1 were installed as deep companion wells to the existing MW-1, MW-6, and MW-7 wells, respectively. Monitoring well MW-8 was installed as a deep companion well to observation well OW-4. Monitoring wells MW-1A and MW-8, and observation well OW-1 were drilled to a sufficient depth to set five foot screens in the aquifer beneath the blue green clay unit. The deep clay unit was not encountered while drilling MW-6A. Therefore, this well was installed to a depth of 50 feet.

Once the deep boreholes were advanced to the desired depth, two inch diameter schedule 40 PVC casing and screen with threaded, flush joints were installed through the surface casing. The screens were five feet in length and machine slotted with .010 inch openings. After the screen and casing had been placed at the desired depth, the annular space above the sand pack was sealed with bentonite pellets. The remaining annular space was grouted to the land surface. A Portland cement slurry containing approximately five to eight percent powdered bentonite was used for the monitoring wells. A Volcay® gel was used for the observation well. Lockable steel protective covers were placed over the monitoring wells and secured in the grout column. No cover was placed over OW-1 to permit well removal at a later date. A concrete pad was framed and poured around each monitoring well. The wells were developed by pumping with a positive displacement PVC pump.

Prior to drilling each borehole, the drill rig and downhole tools were decontaminated by steam cleaning. Well casing, screen, and all development equipment were also decontaminated by steam cleaning before use.

In addition to the deep wells, six shallow water table observation wells, OW-2 through OW-7, were installed on-site for the purpose of providing water table data and data regarding soil type and distribution. The locations of OW-2 through OW-7 are shown on Plate 1. The observation wells differ from the monitoring wells by the absence of a steel protective cover and the use of Volclay® grout in lieu of a Portland cement grout. The observation wells were constructed in this manner to facilitate removal at a later date. The wells were constructed through the hollow stem augers as they were withdrawn from the boreholes. The procedures and materials used were similar to deep observation well, OW-1; however, no surface casing was installed and 10 foot screens were used to bracket the observed water table. Table 1 summarizes the details of the well construction.

4.3 Hydraulic Conductivity Testing

In-situ hydraulic conductivity tests were performed on the ten ground water monitoring and observation wells by inducing water displacement with a ten foot long, solid PVC slug. After introducing the slug, the water level was allowed to equilibrate. The slug was then removed causing the water level to drop beneath the elevation of the static water table. The recovery was monitored closely with pressure transducers and an Enviro-Labs Model EL-200 data logger. Hydraulic conductivities were calculated using the Bouwer and Rice (1976) method for those wells in the unconfined aquifer, and the Naval Facilities Engineering Command (1971) method for those in the confined aquifer. The calculations and graphs are included as Appendix E.

TABLE 1
SUMMARY OF WELL CONSTRUCTION DATA

WEYERHAEUSER
PLYMOUTH, NORTH CAROLINA

	WELL NUMBER									
	MW-1A	MW-6A	MW-8	OW-1	OW-2	OW-3	OW-4	OW-5	OW-6	OW-7
Date Installed	4-18-90	4-19-90	4-23-90	4-20-90	4-25-90	4-18-90	4-22-90	4-24-90	4-24-90	4-25-90
Well Diameter (inches)	2	2	2	2	2	2	2	2	2	2
Well Material	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Screen Slot Size (inches)	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Ground Elevation[1]	34.97	11.52	34.30	34.52	32.05	42.63	34.34	30.90	31.32	21.57
Top of Casing Elevation[1]	37.58	13.39	36.12	36.89	33.61	45.50	36.85	33.99	34.09	24.35
Top of Bentonite Seal (feet below ground surface)	32.9	37.0	29.0	29.5	0.8	7.0	2.5	7.0	11.0	10.5
Gravel Pack Zone (feet below ground surface)	36.9-44.0	42.0-50.0	34.0-43.0	36.1-44.7	3.0-13.2	9.0-21.0	4.0-15.8	8.5-19.9	13.1-25.0	12.0-23.3
Screen Zone (feet below ground surface)	39.0-44.0	45.0-50.0	38.0-43.0	39.7-44.7	3.2-13.2	11.0-21.0	5.8-15.8	9.9-19.9	15.0-25.0	13.3-23.3
Total Boring Depth (feet below ground surface)	46.0	52.0	45.0	47.0	22.0	23.0	16.5	22.0	27.0	26.0

[1] Elevations are feet above Mean Sea Level (MSL).

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Section 5
SITE GEOLOGY

5.1 Soils

The soils encountered in borings and test pit excavations consisted of sands, silts, and clays. The dominant soil type logged was silty sand, but many of the silty sand beds were interbedded and interlaminated with clayey sands and clays. In most cases, the sand was fine-grained. Medium and coarse-grained sands were occasionally found at depths greater than 10 feet. The sands varied in color; orange brown, brown, dark gray, and purple gray sands were common.

Tan and orange brown silty sands were the most common and were often difficult to distinguish from clayey sands and interbedded clays. There were some silty sand beds which are mottled with clay. In these beds, the silty sand was often orange brown and the intermingled clays were light gray.

Many of the clays were orange brown, though light and dark gray units were also encountered. A blue-green clay unit was distinct in that it was generally thick, largely homogenous, and moderately stiff. Laboratory analyses show that this clay unit contained a large amount of silt.

A second distinctive unit, only penetrated in the lower eleven feet of MW-6A (41 to 52 feet), consisted of approximately five feet of gray clayey silt overlying six feet of gray silty sand. The silty sand section contained abundant broken and whole fossil specimens of gastropods, pelecypods, and corals.

5.2 Sedimentary Units

In many instances, the upper six inches to one foot of soil is a brown or black humic silty sand (topsoil). The underlying one to two feet is frequently a fine-grained silty sand to poorly graded sand (SP). The next fifteen feet of soil generally consists of silty sand containing variable amounts of clay, interbedded with clays and clayey sands of variable thickness. The different soil types are not homogeneous units of common thickness and spatial distribution. This limits the reliability of the stratigraphic interpretations depicted on the cross-sections (Plates 2 and 3), with regard to providing an accurate assessment of depth to, and volume of, clay soils in areas between points of control. Often the upper part of this approximately fifteen foot thick, stratigraphic interval is a clay or clayey layer. Measured thicknesses ranged from less than one foot to approximately five feet before grading into a predominantly silty sand.

In spite of the overall heterogeneous character of the sediment described above, some generalizations can be drawn from the observations made during this investigation. First, the upper stratigraphic interval tends to contain more clay in the northeastern part of the pine plantation (*e.g.*, TP-2, SB-5, TP-1). Second, the upper ten feet of soil in TP-15, TP-6, TP-3, and OW-3 was largely devoid of clay. Finally, the deep blue-green clay unit, penetrated over a thickness as great as twenty feet, has been observed throughout most of the east-central part of the site in the vicinity of the plantation. This clay unit extends northeastward toward Little Mill Creek. The unit was not encountered near the northeastern and western site boundaries, in wells OW-7 and MW-6A, but was encountered in the following wells and soil borings: MW-1, MW-1A, MW-7, SB-2, SB-3, SB-4, MW-8, OW-1, SB-5, OW-5, and OW-6.

5.3 Stratigraphic Relationships

Several lines of evidence suggest a predominantly marine/nearshore depositional environment for the sediments penetrated on-site. The gray silty sand interval in the base of MW-6A, which contains corals and other marine fossils, indicates a marine environment. Scattered occurrences of sand-sized shell fragments in sandy units also suggest this interpretation for at least a part of the shallower section. The thickness and largely uniform texture and color of the deep clay unit combined with these other characteristics are consistent with a marine/nearshore interpretation.

Two possible explanations for the distribution of the deep clay aquitard are that it terminates laterally as a depositional pinch-out, or that it is an erosional unconformity. The apparent abrupt termination of such a thick, uniform unit is best explained by the latter. Both the western and northeastern sides of the site are bounded by creeks; Welch Creek to the west and Little Mill Creek to the northeast. The cutbanks of the creeks could have scoured out the clay unit and left in its place reworked sands, silts, and clays. There is evidence for this in OW-5 and OW-6. These lateral stratigraphic relationships are illustrated on Plates 2 and 3.

The occurrence of this blue-green clay near the base of OW-5, which is interbedded with orange, brown, and gray clays with some sand, suggests reworking of the unit as depicted in cross-section A-A'. Similarly, the blue-green and brown mottled clay in the base of OW-6 also appears to be reworked. Its nonuniform color and elevation relative to MW-8 to the south, support this interpretation.

Section 6
HYDROGEOLOGY

6.1 Aquifer Identification

A water table aquifer and a confined aquifer were identified during the course of the field investigation. The two aquifers are separated by a deep clay aquitard which was encountered in the east-central part of the site. Ground water below the deep clay unit is confined, as evidenced by water levels in the deep wells that rise above the base of the confining unit. Hydraulic conductivity values calculated from the shallow unconfined aquifer range from 1.1×10^{-1} cm/sec to 4.3×10^{-6} cm/sec. Hydraulic conductivities from the deep wells range from 3.5×10^{-2} cm/sec to 7.2×10^{-5} cm/sec. The highest value was calculated from OW-7 conductivity data. The hydraulic conductivity values from the deep confined aquifer range from 3.5×10^{-2} cm/sec to 4.0×10^{-3} cm/sec. The ranges from both aquifers are consistent with the generalization that the sediments beneath the deep clay are more sandy than the sediment above. Hydraulic conductivity values for all wells are summarized in Table 2.

6.2 Water Table

Ground water levels were measured on May 24, 1990 and June 14, 1990. Results are presented in Table 3. Maps characterizing the water table and potentiometric surface, included as Plates 4 and 5, were prepared using the June 1990 water levels. The potentiometric surface is based on data points from the deep wells in the four nested well pairs, and can be illustrated as a simple westward dipping plane. By contrast, the water table configuration suggests that there are essentially three areas with three different flow characteristics: western, northeastern, and central divide.

The central ground water divide area lies largely in the vicinity of the active plantation. It is characterized by the lowest average gradient of the three areas at 4.3×10^{-3} ft/ft. This low gradient area appears to represent a transition in flow direction between the northeastern and western areas. The division in flow is marked by an axis approximated by a northwest-southeast line connecting MW-1 and MW-5. The gradient increases on either side of the axis in the transition with the northeastern and western areas. The MW-7/OW-5 well pair that lies east of the axis in the transition between the central divide and northeastern areas also displays a lower gradient characteristic of the rest of the central divide area, 7.1×10^{-3} ft/ft.

TABLE 2

SUMMARY OF IN-SITU HYDRAULIC CONDUCTIVITY TEST RESULTS

WEYERHAEUSER
PLYMOUTH, NC

MAY 22-23, 1990

WELL DESIGNATION	HYDRAULIC CONDUCTIVITY (cm/sec)
OW-1	3.5×10^{-2}
OW-2	3.0×10^{-4}
OW-3	3.8×10^{-3}
OW-4	1.1×10^{-3}
OW-5	6.9×10^{-6}
OW-6	4.3×10^{-6}
OW-7	1.1×10^{-1}
MW-1A	4.0×10^{-3}
MW-6A	7.2×10^{-5}
MW-8	6.0×10^{-3}
MW-1[1]	2.1×10^{-3}
MW-2[1]	2.5×10^{-2}
MW-3[1]	2.5×10^{-3}
MW-4[1]	3.3×10^{-3}
MW-5[1]	1.5×10^{-3}
MW-6[1]	1.4×10^{-3}
MW-7[1]	3.3×10^{-4}

[1] Measured during Preliminary Site Characterization Phase.

TABLE 3

SUMMARY OF WATER LEVEL ELEVATIONS [1]
WEYERHAEUSER - PLYMOUTH

WELL ID	WATER LEVEL ELAVATION MAY 24, 1990	WATER LEVEL ELEVATION JUNE 14, 1990
MW-1	32.87	31.92
MW-1A[2]	7.68	11.80
MW-2	NM	6.85
MW-3	NM	4.25
MW-4	NM	3.84
MW-5	NM	26.73
MW-6	3.54	3.25
MW-6A	4.08	3.36
MW-7	NM	27.35
MW-8[2]	8.21	7.72
OW-1[2]	9.78	9.71
OW-2	26.56	25.55
OW-3	27.59	27.50
OW-4	22.88	23.04
OW-5	19.82	19.61
OW-6	7.22	7.71
OW-7	5.41	5.28

[1] - All elevations are feet above Mean Sea Level.
[2] - Screened in lower aquifer

TABLE 4

GROUND WATER FLOW RATES

WEYERHAEUSER
PLYMOUTH, NC

Well Pair	Horizontal Gradient	Average Hydraulic Conductivity	Ground Water Velocity[1]
MW-1A/MW-6A[2]	$3.5X10^{-3}$ ft/ft	$2.04X10^{-3}$ cm/sec	.02 ft/day (7.4 ft/yr)
MW-1/MW-6	$1.2X10^{-2}$ ft/ft	$1.75X10^{-3}$ cm/sec	.06 ft/day (21.7 ft/yr)
[3]MW-1/OW-2	$4.9X10^{-3}$ ft/ft	$1.20X10^{-3}$ cm/sec	.02 ft/day (6.1 ft/yr)
[3]MW-1/OW-3	$3.0X10^{-3}$ ft/ft	$2.95X10^{-3}$ cm/sec	.03 ft/day (9.2 ft/yr)
[4]OW-2/MW-6	$2.0X10^{-2}$ ft/ft	$8.50X10^{-4}$ cm/sec	.05 ft/day (17.6 ft/yr)
[4]MW-2/OW-3	$2.2X10^{-2}$ ft/ft	$1.44X10^{-2}$ cm/sec	.90 ft/day (327.8 ft/yr)
[4]MW-3/MW-5	$1.9X10^{-2}$ ft/ft	$2.00X10^{-3}$ cm/sec	.11 ft/day (39.3 ft/yr)
[4]MW-4/MW-5	$1.8X10^{-2}$ ft/ft	$2.40X10^{-3}$ cm/sec	.12 ft/day (44.7 ft/yr)
[5]MW-5/OW-6	$3.1X10^{-2}$ ft/ft	$7.52X10^{-4}$ cm/sec	.07 ft/day (24.1 ft/yr)
[5]OW-4/OW-6	$3.3X10^{-2}$ ft/ft	$5.52X10^{-4}$ cm/sec	.05 ft/day(18.8 ft/yr)
[5]OW-5/OW-7	$1.4x10^{-2}$ ft/ft	$5.50x10^{-2}$ cm/sec	2.19 ft/day (796.7 ft/yr)
MW-7/OW-5	$7.1X10^{-3}$ ft/ft	$1.68X10^{-4}$ cm/sec	.003 ft/day (1.2 ft/yr)

[1] Darcy Velocity
[2] Deep Wells
[3] Central divided area
[4] Western area
[5] Northeastern area

TABLE 5

SUMMARY OF VERTICAL GROUND WATER GRADIENTS

WEYERHAEUSER
PLYMOUTH, NC

MONITORING WELL PAIR	GRADIENT [1]
MW - 1 / MW - 1A	- 0.774
OW - 4 / MW - 8	- 0.613
MW - 7 / OW - 1	- 0.678
MW - 6 / MW - 6A	+ 0.003

[1] + Denotes upward flow gradient.
- Denotes downward flow gradient.

appears to dictate the area where a negative ground water gradient is likely to exist. This suggests that any leachate escaping from the proposed landfill will tend to infiltrate downward towards the deep clay unit.

Section 7
ENGINEERING PROPERTIES OF SOILS

7.1 Compressibility

To estimate the settlement characteristics of the soil beneath the proposed landfill, the compressibility of the clay layer (encountered at about 20 feet deep over most of the site) was measured by performing consolidation tests on two undisturbed samples. The samples were of silty clay (ML) from a 22 to 24 foot depth in MW-1A, and clayey plastic silt (MH) from 20 to 22 foot depth in OW-1.

The compression index (C_c) and the recompression index (C_r) determined from consolidation testing are used to estimate the field settlement due to consolidation. These indices are directly proportional to settlement. As the index values increase, settlement calculations indicate a greater settlement potential. The C_c values for OW-1 and MW-1A were calculated to be 0.48 and 0.49, respectively. The C_r values for the OW-1 and MW-1A samples were calculated to be 0.15 and 0.14, respectively.

The coefficient of consolidation (C_v) was calculated for each consolidation test. A C_v value was calculated by Casagrande and Fadum's logarithm-of-time method for each load during each test. The 1 ton per square foot load C_v values for the OW-1 and MW-1A samples were calculated to be 0.1 and 9.2 square feet per day, respectively. The results of the consolidation tests are summarized in Table 6, and settlement computations are presented in Appendix G.

In summary, the consolidation testing at OW-1 and MW-1A indicate that the soil is an over-consolidated clay (*i.e.*, it has a pre-consolidation pressure greater than the existing overburden pressure). This also suggests that the recompression index (C_r) be used to calculate settlement once the height and contact pressure from the landfill is known.

A second component of settlement caused by the weight of the landfill, would be from the compression of the near surface soils (from the ground surface to the clay layer at 20 feet). These soils are predominately sands and silts with some clayey layers in the upper 10 feet. The standard penetration tests indicated generally loose to medium compact conditions. Experience indicates that these soils will behave similar to over-consolidated clay. Settlement would occur quickly, i.e., as the load was applied. An estimate of the compression index for the sands and silty sands would be C_c = 0.05 to 0.06 for loose, and C_c = 0.02 to 0.03 for dense. The medium compact soils would fall

TABLE 6

WEYERHAEUSER CO.
PLYMOUTH, NORTH CAROLINA

Summary of Consolidation Testing

Sample	Sample Depth (feet)	Consolidation Moisture (%)	P-200 (%)	Plasticity Index (%)	Classification	C_c	C'	CR	CV (@ 1 ton per ft^2
MW-1A	22-24	44.5	88.8	14	ML	0.48	0.15	0.21	0.1
OW-1	20-22	46	88.7	20	MH	0.49	0.14	0.23	9.2

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between these values. In other words, the sands and silty sands are probably about 1/3 less compressible than the clay layer at 20 feet, which itself is not very compressible.

7.2 Permeability

Undisturbed soil samples were taken at MW-1A , MW-8, OW-1, OW-2, OW-3, and SB-9 in order to classify site soils and measure the laboratory coefficient of permeability. Permeability test results on undisturbed soils are presented in Table 7. The results indicated that the more clayey and silty soils are relatively impermeable. ($K = 9.6 \times 10^{-7}$ to 1.7×10^{-8} cm/sec). The more sandy materials that classify as SM are more permeable ($K = 2.3 \times 10^{-4}$ to 1.3×10^{-5} cm/sec).

7.3 Clay Borrow Results

The clay borrow investigation consisted of collecting 9, five-gallon soil samples from 16 test pits spread across the proposed landfill site. Soil samples were taken at depths ranging from 0.5 to 8.5 feet. Grain size analysis and Atterberg Limits were performed on each of the 14 soil samples collected from the test pits. The results of test pit sampling are summarized in Table 8.

Soil samples from the test pits were composited based on the soil classification. Modified Proctor curves were then prepared on the composited samples to determine the optimum moisture and density of each soil group. Permeability tests were also performed on each of the recompacted composite samples. The moisture contents of the composite permeability samples were varied from 0 to 5 percent above the optimum moisture content in order to determine the effect on the permeability of the samples. The results of this analysis are presented in Table 9.

Recompacted soils classified as CL and SC achieved maximum permeabilities ranging between 1.9×10^{-8} and 5×10^{-8} cm/sec. This permeability exceeds the desired liner permeability requirements of 1×10^{-7} cm/sec. Based on the results of the permeability tests, the CL and SC soils compacted to a density of approximately 90 percent Modified Proctor or greater, and placed at a moisture content greater than the optimum moisture content, should achieve a desirable permeability for a liner or barrier layer.

TABLE 7

WEYERHAEUSER CO.
PLYMOUTH, NORTH CAROLINA

Soil Summary

Sample Location	Depth (feet)	Permeability Moisture (%)	P-200 (%)	Placity Index (%)	Classification	Permeability (cm/s)
MW-1A	22-24	36.7	88.8	14	ML	1.7×10^{-8}
MW-8	2-4	24.9	65.6	20	CL	2.4×10^{-8}
MW-8	20-22	35.4	89.7	24	CH	4.7×10^{-8}
OW-1	4-6 8-10 20-22	25.7 31.1 38.5	61.4 33.1 88.7	17 NP 20	CL SM MH	9.6×10^{-7} 1.3×10^{-5} 2.5×10^{-8}
OW-2	13-15	33.3	60.0	16	CL	1.1×10^{-7}
OW-3	9-11	24.9	62.5	19	CL	1.7×10^{-7}
OW-3	15-16.5	16.1	15.1	NP	SM	2.3×10^{-4}
SB-9	18-20	19.6	33.6	NP	SC-SM	4.4×10^{-5}

NP - Non Plastic

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TABLE 8

WEYERHAEUSER CO.
PLYMOUTH, NORTH CAROLINA

Summary of Index Test Results

Sample Number	Sample Depth		Water content Percent	P-200 (Percent)	Atterberg Limits			Classification
	Top (ft)	Bottom (ft)			Liquid Limit	Plastic Limit	Plastic Index	
TP 1-3	1.1	2.6	25.6	77.9	55.0	25.0	30	CH
TP 2-5	6	6.5	19.7	24.2	--*	--	--	SC-SM
TP 4-2	4.5	5.2	19.9	44.5	35.0	18.0	17.0	SC
TP 6-1	8	9	14.0	15.5	--	--	--	SM
TP 7-1	6	6.5	26.4	55.3	40	19	21	CL
TP 8-1	5	6	23.8	63.9	43	21	22	CL
TP 8-3	8	8.5	8.1	7.0	--	--	--	SP-SM
TP 9-2	2.7	3	18.7	38.9	27.0	16.0	11.0	SC
TP 9-3	4	5	20.3	39.4	26.0	18.0	8.0	SC
TP 10-2	3	5	19.3	37.4	28.0	16.0	12.0	SC
TP 11-1	1.8	4	17.5	42.8	29.0	16.0	13.0	SC
TP 11-2	5.5	7	15.8	10.8	--	--	--	SP-SM
TP 14-3	6.5	7	27.1	56.9	35.0	17.0	18.0	CL
TP 16-1	0.4	1.8	25.2	66.0	48.0	22.0	26.0	CL

* - Nonplastic

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TABLE 9

WEYERHAEUSER CO.
PLYMOUTH, NORTH CAROLINA

Hydraulic Conductivity
Test Results

Sample	Composite Source	Maximum Modified Dry Density (PCF)	Optimum Moisture Content (%)	Percent Compaction (%)	Percent Above Optimum Moisture (%)	Hydraulic Conductivity (cm/s)
TP1-3	TP1-3	112.7	17.2	89.4	-0.5	1.1×10^{-7}
				90.2	+3.9	1.1×10^{-8}
Composite 1	TP9-3, 10-2, and 11-1	122.8	11.1	89.6	-0.2	3.5×10^{-6}
				89.2	+2.9	1.1×10^{-5}
				89.3	+5.8	2.8×10^{-8}
Composite 2	TP4-2, 14-3	119.4	13.2	88.6	+1.0	5.6×10^{-6}
				89.7	+4.6	1.9×10^{-8}
Composite 3	TP7-1, 8-1	117.3	13.5	89.3	+0.1	2.3×10^{-7}
				88.9	+5.3	5.0×10^{-8}

7.4 Shear Strength

The shear strength of the subgrade soils will be a factor in evaluating the embankment stability of the landfill. Shear strength testing was not performed as part of this investigation since the borings indicated soil conditions that are similar to those investigated for the adjacent landfill vertical expansion (RMT report dated September 28, 1989). Based on the shear strength testing performed as part of that investigation, RMT recommends the following estimates for drained, shear strength:

- Sands, silty sands (SP, SM), loose to medium compact, $\emptyset = 30°$, $C = 0$.
- Clayey sands, clayey silts, silty clay (SC, ML, CL), $\emptyset = 25°$, $C = 200$ psf.

Section 8
IMPLICATIONS FOR LANDFILL DESIGN

As discussed in Section 7, the near surface sands, silts and interbedded clay layers, and the underlying clay layer encountered at 20 feet, are not excessively compressible, and have good shear strength or subgrade support properties. These results indicate that the site has favorable soil conditions for the construction and support of the proposed landfill.

A major consideration for the design and operation of a landfill is the shallow ground water characteristics indicated in the wells and test pits. The depth to ground water from the ground surface varied from four to eighteen feet below the ground surface, and generally conformed to the surface topography. Thus, the presence of shallow ground water will complicate the construction of a landfill where the design calls for excavations greater than four feet (depending on the location on the site). The following presentation and discussion outlines the opportunities and implications of both a shallow design and a deeper landfill excavation design.

8.1 Subgrade Support

The soil borings indicate that the upper fifteen feet of surface sand, silt, and clay layers generally had N-values of six to ten blows or more. This indicates a loose to medium compact soil. The landfill bottom is anticipated to be situated in these soils. Based on RMT experience, these soils will generally provide adequate subgrade support for berms and embankments associated with the landfill, as well as support for construction equipment used during landfill excavation. Based on the strength parameters presented in Section 7, RMT recommends that an embankment stability analysis be performed once the landfill geometry (height, slopes, grades)is developed.

A second issue related to subgrade support is settlement. Excessive differential settlement is undesirable because it would result in warping and damage to any leachate collection system. Settlement of the landfill is composed of 1) the compression of the underlying soils due to the weight of the fill, and 2) the compression of the fill itself caused by its own weight. The test borings and wells did not indicate the presence of any soft compressible, thick clays that would cause excessive settlement. The thick, clay layer encountered at approximately 20 feet, was tested and found to be over-consolidated and relatively incompressible. Loose to medium compact sands and silts are generally not that compressible. Therefore, the data indicate that settlement caused by the weight of

a landfill would be tolerable (within the range of normal landfill design). Once the height and geometry of the landfill is determined, maximum, minimum, and differential settlements should be calculated (based on data presented in Section 7) to aid in the design of a leachate collection system.

Some very loose or soft near-surface soil layers were encountered. In general, these soil conditions did not predominate. RMT does not anticipate that these soil conditions will adversely affect the bearing capacity or settlement of the underlying sub-soils for support of the landfill. However, if soft or very loose soil conditions were encountered at construction levels, they would likely not support construction equipment and would need to be undercut and replaced locally.

8.2 Landfill Design Options

As discussed in Section 6, two aquifers were identified on the site. Shallow ground water was encountered at depths of four to eighteen feet below the ground surface. A second, deeper, aquifer was encountered at elevations of fifteen to ten feet MSL.

8.2.1 At-grade Design Option

In a shallow design, the bottom elevation of the landfill would be established several feet above the seasonal high water table. If the shallow option is selected, the civil design should anticipate the need for local dewatering at the bottom of the excavation. This could be accomplished by trenches, french drains, or pumping from sumps in the excavation where shallow ground water is encountered.

The landfill design should also include ground water control systems to accommodate fluctuations in the water table. These systems should not be designed to keep water out, but to control ground water flow by drainage methods. Such methods could include perimeter, open drainage ditches, and interior drainage trenches with pipes and grated, protective filters.

8.2.2 Deep Excavation Design Option

A ground water dewatering and control system would be needed to place the landfill in a deeper excavation. One way to accomplish this dewatering system would be to intercept the shallow ground water table on the upgradient side of the site by using either well points or a deep perimeter trench.

Well points, although relatively easy to install, would probably not be workable in the silty and clay layers that were encountered in the borings on this site. Well points work the best in clean sands, but tend to choke off in the "dirtier" sands containing silt and clay.

If a deep perimeter trench is selected, the engineering design should call for construction in such a manner that the trench would always drain by gravity to the creek. The trench could possibly be designed so that it would serve as the perimeter edge of the initial cells. Once the trench was constructed, permanent dewatering could be installed prior to the installation of any liner materials.

If the deeper excavation is selected, RMT recommends that a detailed dewatering analysis be prepared. The analysis should include a flow model that would predict dewatering flow rates under steady state conditions. The sequencing of the dewatering and excavation will be critical. The plan should address:

1. A construction phasing and methods to accomplish the dewatering scheme .
2. A permanent dewatering design.
3. The additional costs of dewatering.

8.3 Liner

Atterberg testing and permeability testing indicate that the shallow soils contain strata with sufficient amounts of finer material (silts and clays) to be considered for usage as relatively impermeable natural soil liners and cap material. The hydraulic conductivity test results show that permeabilities of 5.0×10^{-8} centimeters per second were achieved with the CL and ML soils, when compacted to 88 percent to 90 percent of Modified Proctor and at a moisture content 4 - 5 percent above the optimum.

A problem with use of on-site clay and silty soils is that the thickness and continuity of the clay layers is not uniform across the site. A few sample locations, such as test pit #6, did not exhibit any clay or silt layers. Also, the clay layers are interspersed with more sandy layers that would be less suitable for liner or cap material. It may prove to be difficult to sort these clays in the field. However, from a cost point of view, it would be desirable for Weyerhaeuser to use these clay soils where practical. Therefore, it is suggested that a strategy for usage of the relatively impermeable, natural on-site soils be as follows:

1. General excavation of the site should be carefully monitored (under the direction of a geotechnical engineer) by a full-time soils technician experienced with the USCS classification system. The technician would classify the soil as it was excavated and segregate the clay and silty soils from the sandy soils.

2. Construction of liner with on-site soils should be monitored carefully and performance tested to confirm that the desired permeability is achieved.

3. An alternate source of low permeability clay of sufficient quantity should be identified.

4. If the installation with on-site ML/CL soils does not achieve the desired permeability, or if quantities are insufficient, then the alternate source would be utilized.

This approach would utilize on-site materials to their best advantage, but would provide an alternative if on-site soils proved to be inadequate.

The monitoring of liner material is a critical aspect. Placement and compaction need to be carefully observed and conformance tests should be performed. RMT recommends that a test series include field Atterberg Limits and compaction. Test frequency should be one test per 20,000 feet^2 per lift. Permeability tests and grain size tests should be performed on samples from the in-place liner at least every 100,000 feet^2 per lift or when materials change substantially. Compaction requirements for the liner should be established at 95 percent Standard Proctor and at least 4 percent greater than optimum moisture content.

Since the quantities of on-site material suitable for liner construction are not assured, RMT recommends that an alternate borrow material be identified and confirmed for quantity and performance (compaction, Atterberg Limits, grain size, and permeability).

An alternate liner material may include the addition of bentonite clay to the on-site silty sand (SM) soils. This is accomplished by blending the bentonite with the natural soils by either spreading and discing, or by a pug mill operation. Generally, three to five percent by dry weight bentonite added to a soil will achieve acceptable permeabilities for most soil liners.

8.4 Excavation and Grading

RMT recommends that the top soil generally present on the site be excavated and stock-piled for future use as vegetative cover.

The natural sandy, silty, and clay soils encountered throughout the upper fifteen feet will be useful for embankment construction. RMT recommends that earthwork design be based on embankment slopes of 3:1. RMT further recommends that natural soils be compacted at 95 percent of Standard Proctor at plus or minus 3 percent of optimum for use as structural compacted fill and embankments. Compacted backfill should be placed in loose lifts not exceeding nine inches, and then compacted with multiple passes of a sheepsfoot roller. RMT recommends that compaction or density tests be performed every 10,000 square feet per lift to ensure that proper compaction is achieved.

Natural site soils removed from below the ground water level may be somewhat wetter than optimum moister content for compaction. They likely will need to be dried prior to usage as compacted fill. Natural sandy soils will probably dry upon gravity drainage in stock piles. However, finer-grained soils will likely require dewatering by mechanical aeration, such as discing and air drying.

Materials that were encountered in the backhoe test pits and soil borings are amenable to conventional excavation methods such as scrapers, dozers, backhoes, and drag lines.

Soils will tend to pump under heavy equipment when excavation grade gets to within two feet or less of the ground water table. Traffic will tend to increase this problem. Typically, drainage trenches are installed to lower the ground water level in the area of construction. In areas of relatively loose soil conditions, soil may need to be undercut and replaced with compacted backfill in order to operate heavy construction equipment.

Excavation slopes should be maintained at approximately 3:1 horizontal to vertical. Excavation slopes of 3:1 that lie below the ground water level prior to dewatering may not be stable, and some sloughing may occur. Slopes that are above the ground water table, either naturally or after dewatering, will probably be stable a slopes steeper than 3:1. Once a grading plan is developed, RMT recommends that a stability analysis be performed for those excavated slopes planned for steeper than 3:1, or deeper than twenty feet.

APPENDIX A

RMT INC.
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LOG OF TEST BORING REFERENCE SHEET

SAMPLE TYPES

SS	Split Spoon
UD	Undisturbed
AU	Auger
BULK	Bulk
RC	Rock Cuttings

PENETRATION RESISTANCE

SANDS	
0 - 4	Very Loose
5 - 10	Loose
11 - 20	Firm
21 - 30	Very Firm
31 - 50	Dense
Over 50	Very Dense

SILTS & CLAYS	
0 - 2	Very Soft
3 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very Stiff
Over 30	Hard

VISUAL CLASSIFICATION OF SOILS

- GRAVEL, WELL GRADED; POORLY SORTED (GW)
- GRAVEL, POORLY GRADED; WELL SORTED (GP)
- SILTY GRAVELS (GM)
- CLAYEY GRAVEL (GC)
- SAND, WELL GRADED; POORLY SORTED (SW)
- SAND, POORLY GRADED; WELL SORTED (SP)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- INORGANIC SILTS WITH SLIGHT PLASTICITY (ML)
- CLAYS--INORGANIC; LOW TO MEDIUM PLASTICITY (CL)
- CLAY, HIGH PLASTICITY (CH)
- INORGANIC SILTS WITH ELASTICITY (MH)
- PEAT--ORGANIC SOILS (PT)
- SLUDGE (FILL)
- WASTE AND/OR TRASH (AF)
- NO DESCRIPTION

STANDARD PENETRATION TEST

4-7-6	blows of hammer required to drive sample tube, 6" intervals
WOH	weight of hammer

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽

AT COMPLETION ▼

VISUAL CLASSIFICATION OF ROCK TYPES

- SHALE (SHALE)
- LIMESTONE (LIME)
- DOLOMITE (DOLO)
- GNEISS (GNEISS)
- SCHIST (SCH)

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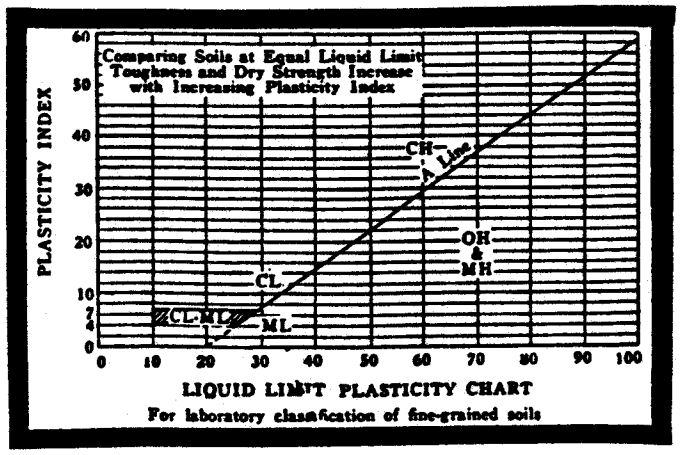
UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions 1	Major Divisions 2		Group Symbols 3	Typical Names 4	Field Identification Procedures (Excluding particles larger than 3 inches and basing fractions on estimated weights) 5			Information Required for Describing Soils 6
Coarse-grained Soils: More than half of material is larger than No. 200 sieve size. The No. 200 sieve size is about the smallest particle visible to the naked eye.	Gravels: More than half of coarse fraction is larger than No. 4 sieve size. (For visual classification, the ¼-in. size may be used as equivalent to the No. 4 sieve size)	Clean Gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.			For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			
		Gravels with Fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.	Nonplastic fines or fines with low plasticity. (for identification procedures see ML below)			Give typical name; indicate approximate percentages of sand and gravel, max. size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbol in parentheses.
			GC	Clayey gravels, gravel-sand-clay mixtures.	Plastic fines (for identification procedures see CL below).			
	Sands: More than half of coarse fraction is smaller than No. 4 sieve size.	Clean Sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.			
			SP	Poorly-graded sands, gravelly sands, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			Example: Silty sand, gravelly; about 20% hard, angular gravel particles ½-in. maximum size; rounded and subangular sand grains coarse to fine; about 15% nonplastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM).
		Sands with Fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.	Nonplastic fines or fines with low plasticity. (for identification procedures see ML below)			
			SC	Clayey sands, sand-clay mixtures.	Plastic fines (for identification procedures see CL below).			
Fine-grained Soils: More than half of material is smaller than No. 200 sieve size.					Identification Procedures on Fraction Smaller than No. 40 Sieve Size			
					Dry Strength (Crushing characteristics)	Dilatancy (Reaction to shaking)	Toughness (Consistency near PL)	
	Silts and Clays: Liquid limit less than 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	None to slight	Quick to slow	None	Give typical name, indicate degree and character of plasticity, amount and maximum size of coarse grains, color in wet condition, odor if any, local or geologic name, and other pertinent descriptive information; and symbol in parentheses.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high	None to very slow	Medium	
			OL	Organic silts and organic silty clays of low plasticity.	Slight to medium	Slow	Slight	For undisturbed soils and information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions.
	Silts and Clays: Liquid limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Slight to medium	Slow to none	Slight to medium	
			CH	Inorganic clays of high plasticity, fat clays.	High to very high	None	High	
			OH	Organic clays of medium to high plasticity, organic silts.	Medium to high	None to very slow	Slight to medium	Example: Clayey silt, brown, slightly plastic, small percentage of fine sand, numerous vertical root holes, firm and dry in place, loess, (ML).
Highly Organic Soils			Pt	Peat and other highly organic soils.	Readily identified by color, odor, spongy feel and frequently by fibrous texture.			

Component	Size Range
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve



LIQUID LIMIT PLASTICITY CHART
For laboratory classification of fine-grained soils

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

LOG OF TEST BORING REFERENCE SHEET

SAMPLE TYPES

SS	Split Spoon
UD	Undisturbed
AU	Auger
BULK	Bulk
RC	Rock Cuttings

PENETRATION RESISTANCE

SANDS

0 - 4	Very Loose
5 - 10	Loose
11 - 20	Firm
21 - 30	Very Firm
31 - 50	Dense
Over 50	Very Dense

SILTS & CLAYS

0 - 2	Very Soft
3 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very Stiff
Over 30	Hard

VISUAL CLASSIFICATION OF SOILS

- GRAVEL, WELL GRADED; POORLY SORTED (GW)
- GRAVEL, POORLY GRADED; WELL SORTED (GP)
- SILTY GRAVELS (GM)
- CLAYEY GRAVEL (GC)
- SAND, WELL GRADED; POORLY SORTED (SW)
- SAND, POORLY GRADED; WELL SORTED (SP)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- INORGANIC SILTS WITH SLIGHT PLASTICITY (ML)
- CLAYS--INORGANIC; LOW TO MEDIUM PLASTICITY (CL)
- CLAY, HIGH PLASTICITY (CH)
- INORGANIC SILTS WITH ELASTICITY (MH)
- PEAT--ORGANIC SOILS (PT)
- SLUDGE (FILL)
- WASTE AND/OR TRASH (AF)
- NO DESCRIPTION

STANDARD PENETRATION TEST

4-7-6	blows of hammer required to drive sample tube, 6" intervals
WOH	weight of hammer

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽

AT COMPLETION ▼

VISUAL CLASSIFICATION OF ROCK TYPES

- SHALE (SHALE)
- LIMESTONE (LIME)
- DOLOMITE (DOLO)
- GNEISS (GNEISS)
- SCHIST (SCH)

RMT INC.

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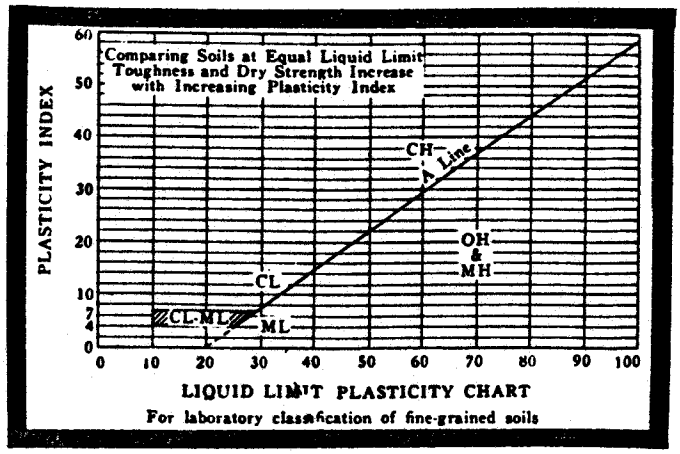
UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions 1	Major Divisions 2		Group Symbols 3	Typical Names 4	Field Identification Procedures (Excluding particles larger than 3 inches and basing fractions on estimated weights) 5			Information Required for Describing Soils 6
Coarse-grained Soils. More than half of material is larger than No. 200 sieve size. The No. 200 sieve size is about the smallest particle visible to the naked eye.	Gravels. More than half of coarse fraction is larger than No. 4 sieve size. (For visual classification, the ¼-in. size may be used as equivalent to the No. 4 sieve size)	Clean Gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.			For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			
		Gravels with Fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.	Nonplastic fines or fines with low plasticity. (for identification procedures see ML below)			
			GC	Clayey gravels, gravel-sand-clay mixtures.	Plastic fines (for identification procedures see CL below).			Give typical name; indicate approximate percentages of sand and gravel, max. size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbol in parentheses.
	Sands. More than half of coarse fraction is smaller than No. 4 sieve size.	Clean Sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.			
			SP	Poorly-graded sands, gravelly sands, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			Example: Silty sand, gravelly; about 20% hard, angular gravel particles ½-in. maximum size; rounded and subangular sand grains coarse to fine; about 15% nonplastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM).
		Sands with Fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.	Nonplastic fines or fines with low plasticity. (for identification procedures see ML below)			
			SC	Clayey sands, sand-clay mixtures.	Plastic fines (for identification procedures see CL below).			
Fine-grained Soils. More than half of material is smaller than No. 200 sieve size.	Silts and Clays. Liquid limit less than 50				Identification Procedures on Fraction Smaller than No. 40 Sieve Size			
					Dry Strength (Crushing characteristics)	Dilatancy (Reaction to shaking)	Toughness (Consistency near PL)	
			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	None to slight	Quick to slow	None	Give typical name, indicate degree and character of plasticity, amount and maximum size of coarse grains, color in wet condition, odor if any, local or geologic name, and other pertinent descriptive information; and symbol in parentheses.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high	None to very slow	Medium	
	Silts and Clays. Liquid limit greater than 50		OL	Organic silts and organic silty clays of low plasticity.	Slight to medium	Slow	Slight	For undisturbed soils and information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions.
			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Slight to medium	Slow to none	Slight to medium	
			CH	Inorganic clays of high plasticity, fat clays.	High to very high	None	High	
			OH	Organic clays of medium to high plasticity, organic silts.	Medium to high	None to very slow	Slight to medium	Example: Clayey silt, brown, slightly plastic, small percentage of fine sand, numerous vertical root holes, firm and dry in place, loess, (ML).
Highly Organic Soils			Pt	Peat and other highly organic soils.	Readily identified by color, odor, spongy feel and frequently by fibrous texture.			

Component	Size Range
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve



LIQUID LIMIT PLASTICITY CHART

For laboratory classification of fine-grained soils

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. SB-5
SHEET NO. 1 OF 1
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 30.5
DRILLING METHOD HSA
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	3-3-4-4	50			CLAY (CL) - stiff; trace sand (fine grained); tan, orange; interbedded with SILTY SAND (SM); clayey; tan, orange.
2	SS	4-4-6-5	50			SILTY SAND (SM) - fine grained; trace clay; tan. 4.0
3	SS	5-4-4-4	65		5	SILT (ML) - as determined from laboratory analysis.
4	SS	1-1-2-3	85			SILTY SAND (SM) - fine grained; some clay laminae (gray); tan, orange.
5	SS	3-5-4-3	100	▽		- no clay. 10.0
6	SS	2-1-2-3	60		10	SILTY SAND (SM) - fine grained; trace clay; gray.
7	SS	1-1-1-1	90			
8	SS	WOH 3-3	100		15	15.0 SILTY CLAY (CL) - stiff; micaceous; blue gray.
9	SS	3-4-4-5	100			
10	SS	2-3-4-5	90			BORING TERMINATED AT 20.0 FEET

GENERAL NOTES

DATE STARTED 26 APR 90
DATE COMPLETED 26 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 8.0 FT. BGS
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 4-26-90/1230 DEPTH 4.5 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. SB-5
SHEET NO. 1 OF 1
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 30.5
DRILLING METHOD HSA
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	3-3-4-4	50			CLAY (CL) - stiff; trace sand (fine grained); tan, orange; interbedded with SILTY SAND (SM); clayey; tan, orange.
2	SS	4-4-6-5	50			SILTY SAND (SM) - fine grained; trace clay; tan. 4.0
3	SS	5-4-4-4	65		5	SILT (ML) - as determined from laboratory analysis.
4	SS	1-1-2-3	85			SILTY SAND (SM) - fine grained; some clay laminae (gray); tan, orange.
5	SS	3-5-4-3	100	▽		- no clay. 10.0
6	SS	2-1-2-3	60		10	SILTY SAND (SM) - fine grained; trace clay; gray.
7	SS	1-1-1-1	90			
8	SS	WOH 3-3	100		15	15.0
9	SS	3-4-4-5	100			SILTY CLAY (CL) - stiff; micaceous; blue gray.
10	SS	2-3-4-5	90			BORING TERMINATED AT 20.0 FEET

GENERAL NOTES

DATE STARTED 26 APR 90
DATE COMPLETED 26 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 8.0 FT. BGS
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 4-26-90/1230 DEPTH 4.5 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. SB-6
SHEET NO. 1 OF 1
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 37.2
DRILLING METHOD HSA
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	1-2-2-4	85			SILTY SAND (SM) - fine grained; humic dark gray. .7
2	SS	3-4-5-6	75			SILTY SAND (SM) - fine grained; light gray.
						SILTY SAND (SM) - fine grained; clayey; orange; light gray mottling.
3	SS	3-4-4-4	70		5	CLAYEY SAND (SC) - fine grained; firm; color as above. 5.0
4	SS	5-3-2-5	0			SILTY SAND (SM) - fine grained; gray.
5	SS	1-4-3-2	10			
6	SS	2-2-9-14	75		10	SILTY SAND (SM) - fine grained; clayey; light gray and orange mottled. 11.0
7	SS	5-10-10-8	70			SILTY SAND (SM) - fine to medium grained; some shell fragments; orange, gray.
8	SS	3-4-3-2	75		15	- trace clay; 15.0-15.5 ft.
9	SS	1-2-2-3	85			SILTY SAND (SM) - fine grained; clayey in some zones; dark gray, brown at base.
10	SS	7-14-15-12	75			SILTY SAND (SM) - fine to medium grained; trace clay; gray, tan.
						BORING TERMINATED AT 20.0 FEET

GENERAL NOTES

DATE STARTED 26 APR 90
DATE COMPLETED 29 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 5.0 FT. BGS
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME DEPTH

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. SB-7
SHEET NO. 1 OF 2
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 38.4
BOREHOLE DIA. 6 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD HSA

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	2-3-3-3	75			SILTY SAND (SM) - fine grained; brown, tan. - some clay; 1.1 - 1.45 ft.
2	SS	3-4-4-6	85			CLAY (CL) - sandy (very fine grained); tan. 2.5
3	SS	5-3-3-4	95		5	CLAYEY SAND (SC) - fine grained; mottled gray and tan. 4.0
4	SS	3-1-2-4	85			SILTY SAND (SM) - fine grained; trace clay; tan and gray mottled. - clayey; gray; 5.3-6.0 ft. - CLAY (CL); 7.2-7.5 ft.
5	SS	3-3-3-1	75			- wet; 8.0 ft.
6	SS	5-8-16-19	100		10	11.1
7	SS	2-3-7-10	85			SILTY SAND (SM) - fine grained; trace shell fragments; tan and gray mottled.
8	SS	3-2-1-1	100		15	- no shell fragments; tan; 15.5-15.9 ft. 15.9
9	SS	WOH 2-2	100			CLAYEY SAND (SC) - fine grained; gray; some clay. 16.5
10	SS	1-2-2-2	100			CLAY (CH) - dark gray; with SAND (SP)/SILTY SAND (SM); fine to medium grained 17.2-18.0 ft. 18.8
						CLAYEY SAND (SC) - fine to medium grained; dark

GENERAL NOTES

DATE STARTED 17 APR 90
DATE COMPLETED 17 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 8.0 FT. BGS
AT COMPLETION ▼ 5.0 FT. BGS
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 4-26-90/1305 DEPTH 4.5 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. SB-7
SHEET NO. 2 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 38.4
DRILLING METHOD HSA
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
						gray; some organics 19.5-20.0 ft.
						BORING TERMINATED AT 20.0 FEET
					25	
					30	
					35	
					40	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. SB-8
SHEET NO. 1 OF 2

PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 39.9
DRILLING METHOD HSA
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	4-3-3-3	85			SILTY SAND (SM) - fine grained; gray; humic 0-.3 ft.
2	SS	3-4-3-4	85			
3	SS	5-6-4-4	85		5	SILTY SAND (SM) - fine grained; some clay; mottled white, tan, gray; with interbedded CLAYEY SAND (SC); fine grained; gray.
4	SS	4-5-7-7	95			
5	SS	3-4-5-6	90			
6	SS	3-2-2-2	100	▽	10	
						SILTY SAND (SM) - fine grained; gray.
7	SS	3-3-5-6	75			- fine to medium grained; with some CLAYEY SAND (SC); mottled tan and light gray; 12.8-16.0 ft.
8	SS	5-6-11-9	100		15	
						16.0
9	SS	11-3-2-3	100			SILTY SAND (SM) - fine to medium grained; trace clay; dark gray, tan.
						18.0
10	SS	WOH-1-2-2	100			SAND (SP) - fine to coarse grained; tan. 18.5
						SAND (SM) - fine grained; some clay; dark gray; with SILTY CLAY (CL); stiff; trace sand (fine grained); gray; 19.75-20.2 ft.

GENERAL NOTES

DATE STARTED 17 APR 90
DATE COMPLETED 17 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 10.5 FT. BGS
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 4-26-90/1235 DEPTH 12.0 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. SB-8
SHEET NO. 2 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 39.9
DRILLING METHOD HSA
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
						BORING TERMINATED AT 20.2 FEET
					25	
					30	
					35	
					40	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. SB-9
SHEET NO. 1 OF 1
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 37.7
DRILLING METHOD HSA
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	1-2-2-3	60			SILTY SAND (SM) - fine grained; light brown; some humus.
2	SS	4-4-5-5	65			SILTY SAND (SM) - fine grained; clayey; orange.
3	SS	4-4-6-5	60		5	CLAYEY SAND (SC) - fine grained; tan; orange and gray mottling; CLAY (CL); 4.0-4.5 ft.; and 6.0-6.7 ft.; color as above. 6.7
4	SS	4-9-13-10	85			SILTY SAND (SM) - fine grained; tan; tan and gray mottled.
5	SS	5-5-5-4	65			
6	SS	4-4-4-5	65		10	
7	SS	3-5-4-5	90		▽	
8	SS	2-1-1-WOH	100		15	- increased clay 15.0
9	SS	WOH-2-2	100			SILTY CLAY (CL) - soft; wet; dark gray; trace sand (fine grained); 15.9-16.0 ft. 17.2
10	UD		100			SILTY CLAY (CL) - trace fine grained sand; orange; gray; micaceous; gray; blue green at 18.0 ft.
						SILTY SAND (SM) - fine grained; purple gray. BORING TERMINATED AT 20.0 FEET

GENERAL NOTES

DATE STARTED 26 APR 90
DATE COMPLETED 26 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 12.0 FT. BGS
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 4-26-90/1235 DEPTH 13.0 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-1
SHEET NO. 1 OF 3
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 34.5
DRILLING METHOD MUD ROTARY
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	4-6-6-6	50			SILT (ML) - some very fine sand; brown. .5
						CLAY (CL) - trace fine grained sand; stiff; tan.
2	UD		0			CLAY (CL) - sandy (fine grained); silty; tan, gray, orange.
						- Increasing sand.
3	UD		100			
					5	
						6.0
4	SS	2-2-3-4	75			SILTY SAND (SM) - fine grained; trace clay; interlaminated gray and orange.
5	UD		65			- interlaminated with silty clay; micaceous; gray.
					10	
						- gray
6	SS	4-3-10-18	75			
						- more clayey
					15	
						- fine to medium grained; gray
7	SS	9-4-2-2	50			17.8
						SILTY SAND (SM) - as above, interbedded with CLAY (CL); silty; stiff; slightly micaceous; blue green and tan.
8	SS	3-4	100			SILTY CLAY (CL) - stiff; slightly micaceous; blue

GENERAL NOTES

DATE STARTED 20 APR 90
DATE COMPLETED 21 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ N/A
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-4-90/1120 DEPTH 23.85 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-1
SHEET NO. 2 OF 3

PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 34.5
DRILLING METHOD MUD ROTARY
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
9	UD		100			green, tan.
						SILT (MH) - as determined from laboratory analysis.
					25	
10	SS	33-5-6-6	85			Change to 5 7/8 in. bit at 21.5 ft.
11	SS	3-3-4-6	100			
					30	
12	SS	4-4-4-5	100			
13	SS	3-4-4-6	100			SILTY CLAY (CL) - as above; with trace fine grained sand.
					35	
						SILTY SAND (SM) - fine grained; gray. 37.3
14	SS	23-43-47-54	50			SILTY SAND (SM) - fine to medium grained; trace coarse grained sand; laminated; tan; trace shell fragments.
					40	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-1
SHEET NO. 3 OF 3
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 34.5
BOREHOLE DIA. 10 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD MUD ROTARY

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
15	SS	28-32-41-52	65		45	
					50	BORING TERMINATED AT 47.0 FEET
					55	
					60	
					65	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-2
SHEET NO. 1 OF 2
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 32.1
BOREHOLE DIA. 10 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD HSA

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY	MOISTURE			
NO.	TYPE	BLOWS			DEPTH	
1	SS	2-1-1-1	75			SILTY SAND (SM) - fine grained; gray, black; humic. .5
2	SS	3-2-2-4	90			SILTY SAND (SM) - fine grained; tan. SILTY SAND (SM) - fine grained; clayey; mottled tan and gray. 4.0
3	SS	1-4-3-2	100		5	SILTY SAND (SM) - as above; trace clay. 7.5
4	SS	2-2-1-1	100			
5	SS	WOH-1	90		10	CLAY (CL) - trace sand (fine grained); soft; dark gray; interbedded with CLAYEY SAND (SC); dark gray; fine grained. 15.0
6	UD		100			
7	SS	12-8-4-4	50		15	SILTY SAND (SM) - fine grained; gray and tan. CLAYEY SAND (SC) - fine grained; slightly micaceous; light gray; interlaminated with SILTY SAND (SM); fine grained; orange-brown, tan.

GENERAL NOTES

DATE STARTED 25 APR 90
DATE COMPLETED 25 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 3.3 FT.
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-3-90 DEPTH 5.95 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-2
SHEET NO. 2 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 32.1
DRILLING METHOD HSA
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
8	SS	4-2-4-5	100			
						BORING TERMINATED AT 22.0 FEET
					25	
					30	
					35	
					40	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-3
SHEET NO. 1 OF 2

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD HSA

PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 42.6
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	2-1-2-1	50			SILTY SAND (SM) - fine grained; tan.
2	SS	3-2-2-2	75			CLAYEY SAND (SC) - fine grained; tan. 3.0
3	SS	3-3-5-7	90			SILTY SAND (SM) - fine grained; some roots; trace black organics; some gray mottle.
					5	
4	SS	6-7-6-7	85			8.0
5	SS	3-4	100			CLAYEY SAND (SC) - fine grained; tan, gray; interbedded with SILTY SAND (SM); fine grained; tan.
6	UD		100			9.0
					10	SILTY CLAY (CL) - as determined from laboratory analysis.
7	SS	3-5-5-4	80			CLAYEY SAND (SC) - fine grained; tan; gray; interbedded with SILTY SAND (SM); fine grained; tan.
					15	
8	UD		75			

GENERAL NOTES

DATE STARTED 18 APR 90
DATE COMPLETED 19 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 13.0 FT. BGS
AT COMPLETION ▼ 13.5 FT. BGS
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-4-90 DEPTH 14.65 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-3
SHEET NO. 2 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 42.6
DRILLING METHOD HSA
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
						- fine to medium grained;21.0 to 21.2 ft. 21.2
9	SS	1-1-3-4	100			CLAY (CH) - moderately stiff; light gray; some clayey sand; fine grained; gray. 22.5
						SILTY SAND (SM) - fine to medium grained; tan; interlaminated with CLAYEY SAND (SC); fine grained; gray.
					25	
						BORING TERMINATED AT 23.0 FEET
					30	
					35	
					40	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-4
SHEET NO. 1 OF 1
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 34.3
DRILLING METHOD HSA
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
					5	No soil samples collected. See boring MW-8 for lithology.
					10	
					15	
						BORING TERMINATED AT 16.5 FEET

GENERAL NOTES

DATE STARTED 22 APR 90
DATE COMPLETED 22 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-2-90 DEPTH 10.8 FT. BGS.

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-5
SHEET NO. 1 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 30.9
DRILLING METHOD HSA
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	3-3-4-5	50			CLAY (CL) - trace sand (fine grained); brown, orange, green-gray.
2	SS	5-6-8-9	70			SILTY SAND (SM) - fine grained; interlaminated with clay, as above; gray-tan. 4.3
3	SS	5-6-6-6	90		5	SILTY SAND (SM) - fine grained; mottled tan and orange.
4	SS	4-5-5-5	100			
5	SS	4-2-1-2	100		∇	- as above with gray clay; 9.0-9.8 ft. 9.8
					10	SILTY CLAY (CL) - gray-purple; some fine grained sand; trace of CLAYEY SAND (SC).
6	SS	2-2-3-5	75		15	18.4
7	SS	3-3-6-6	100			SILTY CLAY (CL) - trace of sand (fine grained); micaceous; blue-green.

GENERAL NOTES

DATE STARTED 24 APR 90
DATE COMPLETED 24 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ∇ 9.0 FT.
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 4-25-90/0715 DEPTH 10.4 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-5
SHEET NO. 2 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 30.9
DRILLING METHOD HSA
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
8	SS	6-10-8-7	90			20.8
						SILTY CLAY (CL) - sandy (fine to medium grained); gray, light brown, orange; laminated; some mottled. 21.8
						BORING TERMINATED AT 22.0 FEET
					25	
					30	
					35	
					40	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-6
SHEET NO. 1 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 31.3
DRILLING METHOD HSA
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	3-3-5-5	50			SILTY SAND (SM) - fine grained; clayey; tan. .2
2	SS	4-3-3-3	65			CLAY (CL) - silty; trace of fine grained sand; tan.
						SILTY SAND (SM) - fine grained; clayey; mottled tan and gray. 3.0
3	SS	3-3-5-4	90			
					5	SILTY SAND (SM) - fine grained; trace clay; tan and gray mottled.
4	SS	4-5-4-4	75			- clay in thin laminations; 6.0-7.0 ft.
						- gray with black laminae interbedded with tan-orange; 7.0-7.5 ft.
5	SS	3-2-3-4	100			SILTY SAND (SM) - fine grained; tan and gray mottled; interbedded with CLAY (CL); silty; sandy (fine grained).
					10	
						SILTY CLAY (CL) - trace fine grained sand; gray. 13.8
6	SS	3-5-8-6	100			
						SILTY SAND (SM) - fine grained; clayey; gray. 14.5
					15	
						SILTY SAND (SM) - fine grained; gray. 17.7
7	SS	4-5-7-7	100			SILTY CLAY (CL) - trace mica; brittle; light brown.
					▼	

GENERAL NOTES

DATE STARTED 23 APR 90
DATE COMPLETED 24 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽
AT COMPLETION ▼ 18.8 FT. BGS
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-3-90/0940 DEPTH DRY

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-6
SHEET NO. 2 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 31.3
DRILLING METHOD HSA
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
8	SS	4-5-7-8	100			
						SILTY CLAY (CL) - stiff; micaceous; blue green and brown mottled.
9	SS	5-4-5-7	100		25	
						BORING TERMINATED AT 27.0 FEET
					30	
					35	
					40	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-7
SHEET NO. 1 OF 2
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 21.6
BOREHOLE DIA. 10 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD HSA

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	2-2-3-3	75			SILTY SAND (SM) - fine grained; humic; light brown. .8
2	SS	4-4-3-5	75			CLAYEY SAND (SC) - fine grained; moderately stiff; orange.
						SILTY SAND (SM) - fine grained; orange-brown.
3	SS	5-4-4-7	75			4.9
					5	CLAY (CL) - stiff; gray, brown, mottled. 5.5
4	SS	3-5-8-11	100			SILTY SAND (SM) - fine grained; orange-brown. 6.2
5	SS	4-13-14-15	60			CLAY (CL) - stiff; gray, brown, mottled. 8.0
					10	SAND (SP) - fine grained; white, brown and black laminations. 13.3
6	SS	4-8-11-10	75			SILTY SAND (SM) - fine grained; trace medium grained; laminated; tan, orange-brown.
					▽ 15	
						SILTY SAND (SM) - fine to medium grained; with white shell fragments; light gray to tan.
7	SS	5-7-7-8	50			

GENERAL NOTES

DATE STARTED 25 APR 90
DATE COMPLETED 25 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 15.0 FT. BGS
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-2-90 DEPTH 15.8 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. OW-7
SHEET NO. 2 OF 2
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 21.6
DRILLING METHOD HSA
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
8	SS	2-2-5-6	100		25	- trace clay
						BORING TERMINATED AT 26.0 FEET
					30	
					35	
					40	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-1A
SHEET NO. 1 OF 3
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 35.0
BOREHOLE DIA. 10 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD MUD ROTARY

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	4-3-3-4	100			SILTY SAND (SM) - fine grained; gray. 1.0
2	SS	3-2-3-3	75			CLAYEY SAND (SC) - fine grained; tan, gray. 2.8
3	SS	2-2-1-2	75		5	SILTY SAND (SM) - fine grained sand; trace clay; orange, tan. - scattered clay zones; 4.0-5.5 ft.
4	SS	2-1-1-WOH	100			7.4
5	SS	5-2-7-10	100			SILTY SAND (SM) - fine grained; clayey; gray. 9.0
6	UD		0		10	SILTY SAND (SM) - fine to medium grained; gray; clayey zone 9.5 to 9.8 ft; some wood fragments.
7	SS	3-8-10-14	75		15	SILTY SAND (SM) - fine grained; gray. 18.5
						CLAY (CH) - stiff; gray-brown. 19.0
						SILTY SAND (SM) - fine to medium grained; gray; coarsening downward.

GENERAL NOTES

DATE STARTED 17 APR 90
DATE COMPLETED 18 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ N/A
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-3-90/1020 DEPTH 23.0 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-1A
SHEET NO. 2 OF 3
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 35.0
BOREHOLE DIA. 10 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD MUD ROTARY

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
8	SS	11-12-5-5	100			SILTY CLAY (CL) - very stiff; light blue green.
9	UD		100			CLAYEY SILT (ML) - as determined from laboratory analysis. Change to 5 7/8 in. bit at 23.0 ft.
						SILTY CLAY (CL) - very stiff; light blue green.
					25	- trace medium grained sand
10	SS	4-4-5-6	100			CLAYEY SILT (ML) - as determined from laboratory analysis.
					30	SILTY CLAY (CL) - trace sand (medium grained); very stiff; light blue green.
11	SS	3-4-5-6	20			
					35	
						SAND (SP-SM) - fine to medium grained; some coarse sand; gray.
12	SS	20-41-50/5	50			
					40	
						SILTY SAND (SM) - fine to medium grained, some coarse; with quartz pebbles; gray.

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-1A
SHEET NO. 3 OF 3
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 35.0
DRILLING METHOD MUD ROTARY
BOREHOLE DIA. 10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
						44.5
13	SS	28-32-39-33	100		45	SILTY SAND (SM) - fine to medium grained; trace coarse sand; laminated; trace shell fragments; tan, some dark brown.
						BORING TERMINATED AT 46.0 FEET
					50	
					55	
					60	
					65	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-6A
SHEET NO. 1 OF 3
PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 11.5
DRILLING METHOD MUD ROTARY
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
1	SS	2-2-1-2	65			SILTY SAND (SM) - very fine grained; light brown, some tan mottle.
2	SS	3-2-2-3	50			SILTY SAND (SM) - very fine grained; clayey; tan. 2.5
3	SS	3-5-5-4	50			SILTY SAND (SM) - as above; no clay. 4.5
					5	SILTY SAND (SM) - fine grained; humic; tan, dark brown.
4	SS	2-3-5-7	40			6.7
						SILTY SAND (SM) - fine grained; light gray.
5	SS	6-9-10-4	50			CLAYEY SAND (SC) - fine to medium grained; trace coarse sand; tan-gray. 8.5
					10	SILTY SAND (SM) - fine to medium grained; mottled black, brown, tan, gray.
6	SS	4-4-3-5	75			SILTY SAND (SM) - fine to medium grained; trace coarse grained sand; tan; and alternating (< .1 foot) SILT (ML) laminae; clayey; micaceous; gray.
					15	
7	SS	6-8-8-9	75			SILTY SAND (SM) - fine grained; tan; some black heavy mineral laminae.

GENERAL NOTES

DATE STARTED 19 APR 90
DATE COMPLETED 19 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ N/A
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-3-90 DEPTH 7.2 FT. BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-6A
SHEET NO. 2 OF 3
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 11.5
BOREHOLE DIA. 6 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD MUD ROTARY

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
8	SS	8-9-8-9	65			24.0
					25	CLAYEY SAND (SC) - fine grained; micaceous; silty; light gray, brown.
9	SS	8-8-16-50/4"	82			SILTY SAND (SM) - fine to coarse grained; tan, gray; with black laminations; interbedded (approx. 0.5 foot) with CLAY (CL); sandy (fine to medium grained); micaceous; gray green, brown mottle.
10	SS	88/6"	100		30	SILTY SAND (SM) - fine to medium grained; brown to dark brown; some CLAYEY SAND (SC). -laminated; 33.0-35.0 ft.
11	SS	11-15-22-27	50			
					35	
12	SS	17-25-30-24	50			- trace clay, mica.
					40	
						SILT (ML) - clayey; some very fine grained sand; gray (Yorktown Fm.?)
13	SS	5-7-8-9	100			

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-6A
SHEET NO. 3 OF 3

PROJECT NAME WEYERHAEUSER
PROJECT NO. 467.42
LOCATION PLYMOUTH, NC
INSTALLATION
CONTRACTOR LAW ENGINEERING
SURFACE ELEV. 11.5
DRILLING METHOD MUD ROTARY
BOREHOLE DIA. 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
					45	
						SILTY SAND (SM) - fine grained sand; fine to very coarse shell hash (gastropods, pelecypods, corals); gray.
14	SS	15-21-19-19	90			
15	SS	16-13-32-50	100		50	
						BORING TERMINATED AT 52.0 FEET
					55	
					60	
					65	

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-8
SHEET NO. 1 OF 3
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 34.3
BOREHOLE DIA. 10 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD MUD ROTARY

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY	MOISTURE			
NO.	TYPE	BLOWS			DEPTH	
1	SS	6-6-7-10	50			SILTY SAND (SM) - fine grained; trace clay; brown. .4
2	UD		50			CLAY (CL) - silty; trace fine grained sand; orange, gray mottle.
3	SS	6-8-9-10	65		5	SILTY SAND (SM) - fine grained; trace clay in occasional thin partings (< .1 foot); mottled tan and orange. - no clay; 7.0-7.2 feet
4	SS	6-7-7-8	60			
5	SS	6-6-8-9	50		10	SILTY SAND (SM) - fine grained; interlaminated orange and gray, black (heavy minerals); trace clay.
6	SS	9-15-23-17	50		15	- no clay; 13.0-15.0 ft.
7	SS	3-3-3-5	90			SILTY CLAY (CL) - stiff; trace mica; mottled brown and blue green.

GENERAL NOTES

DATE STARTED 21 APR 90
DATE COMPLETED 23 APR 90
RIG MOBILE B-56
CREW CHIEF TODD JOHNSON
LOGGED BTG CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ N/A
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME 5-1-90 DEPTH 26.8 FT.BGS

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-8
SHEET NO. 2 OF 3
PROJECT NO. 467.42
INSTALLATION
SURFACE ELEV. 34.3
BOREHOLE DIA. 10 IN.

PROJECT NAME WEYERHAEUSER
LOCATION PLYMOUTH, NC
CONTRACTOR LAW ENGINEERING
DRILLING METHOD MUD ROTARY

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	BLOWS			DEPTH	
8	UD		100			CLAY (CH) - as determined from laboratory analysis.
9	SS	18-5-4-4	100		25	Change to 5 7/8 in. bit at 20.2 ft.
10	SS	3-3-5-7	100		30	SILT (ML) - some clay; as determined from laboratory analysis.
						CLAYEY SAND (SC) - fine grained; some zones more sandy.
11	SS	4-5-5-12	90		35	36.5
12	SS	23-31-32-44	75			SILTY SAND (SM) - fine grained; trace clay; gray, blue green. 36.8
					40	SILTY SAND (SM) - fine grained; trace clay; tan, gray, some black.
13	SS	11-15-	50			- some medium grained sand.

APPENDIX B

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-1

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-2-90

CONTRACTOR Hopkins

METHOD Backhoe

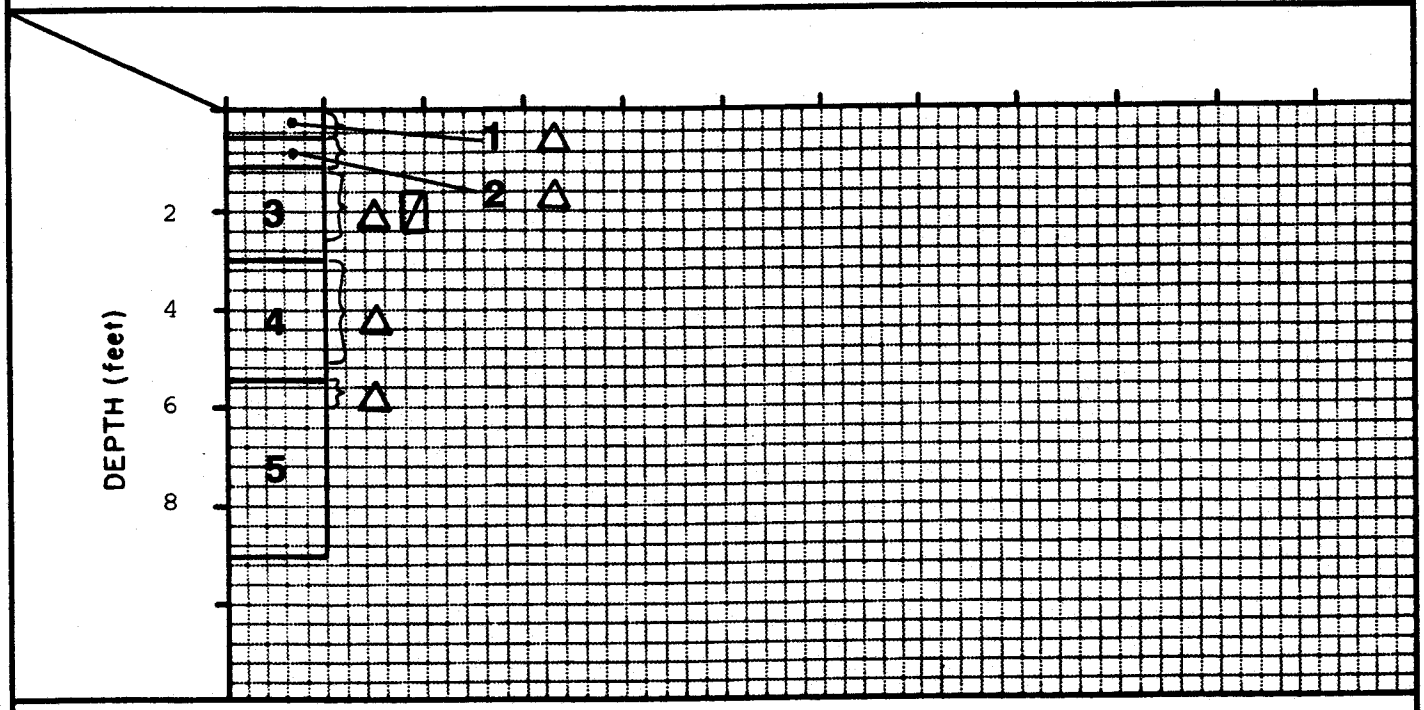
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; trace clay; tan; (some topsoil, black).
2) CLAYEY SAND (SC); fine grained; orange-brown.
3) CLAY (CH); orange-brown mottled with gray.
4) SILTY SAND (SM); fine grained; some thin clay laminae in upper foot; orange-gray.
5) SILTY SAND/CLAYEY SAND (SM-SC); fine grained; mottled orange and light gray.

LEGEND:

△ Jar Sample ▨ Bulk Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-2

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-1-90

CONTRACTOR Hopkins

METHOD Backhoe

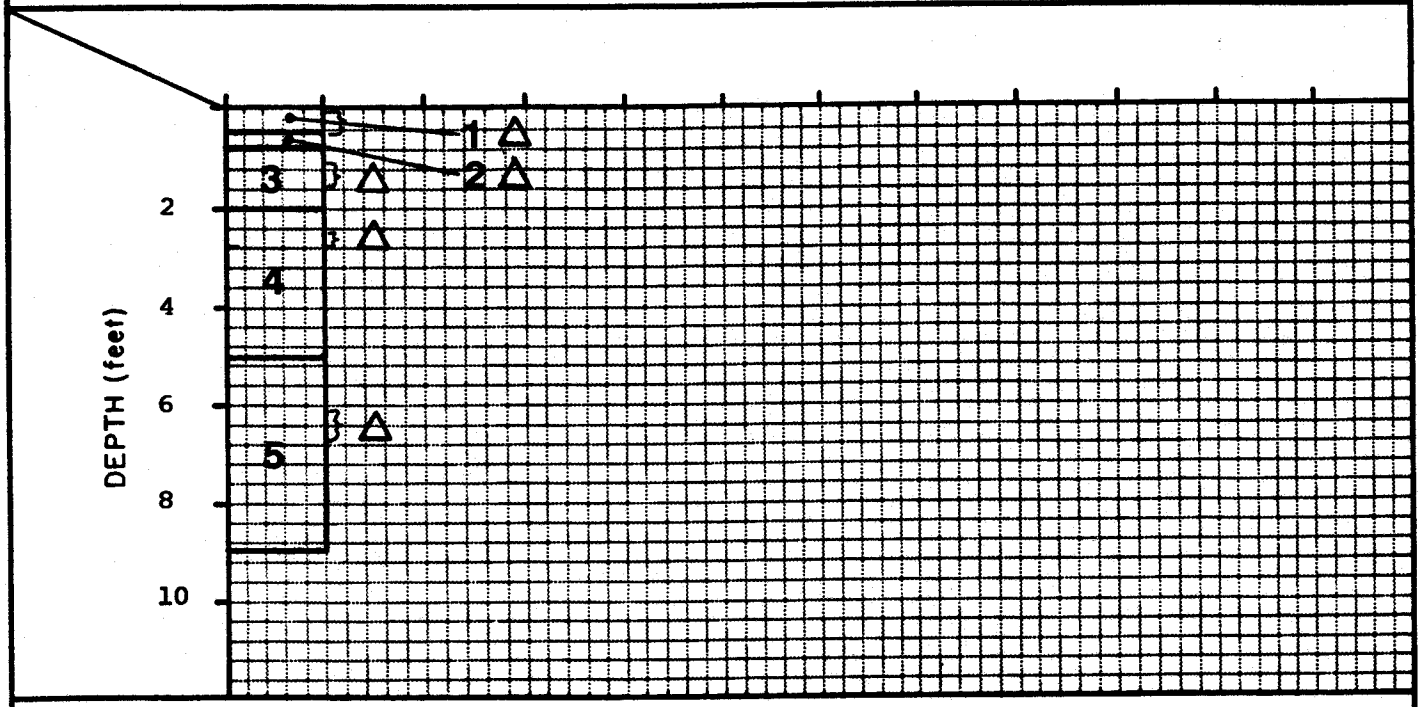
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND/SANDY SILT (SM-ML) ; gray; (topsoil).
2) SILTY SAND (SM); fine grained; light brown, tan.
3) SILTY SAND/CLAYEY SAND (SM-SC); fine grained.
4) CLAY (CL); sandy (fine grained); orange-brown, some gray.
5) CLAYEY SAND (SC); very fine grained; gray brown.

LEGEND:

△ Jar Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-3

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, NC

DATE 5-1-90

CONTRACTOR Hopkins

METHOD Backhoe

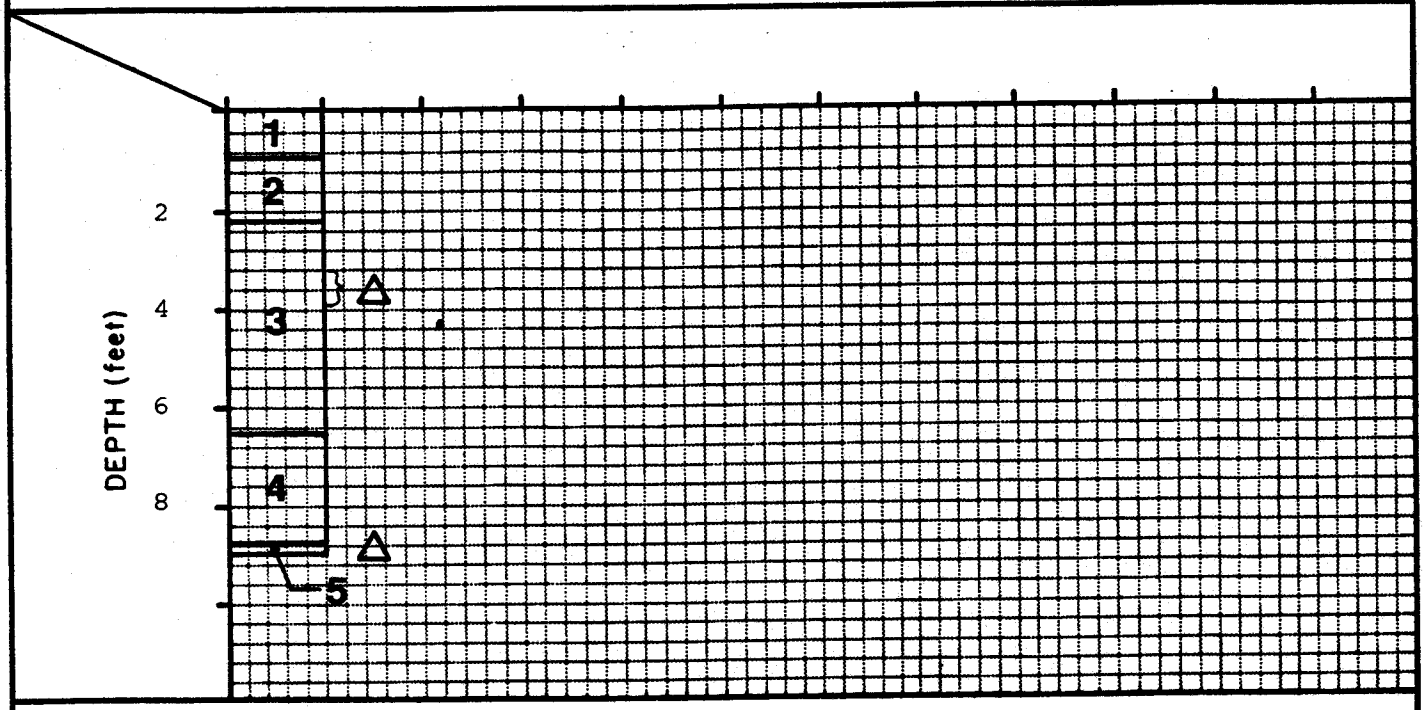
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; gray, (topsoil).
2) SAND/SILTY SAND (SP-SM); fine grained; tan.
3) SILTY SAND (SM); fine grained; trace clay below 3.2 feet; orange, gray.
4) SAND/SILTY SAND (SP-SM); fine grained; orange, white, tan.
5) CLAY (CL); fine grained sand, mottled gray and orange.

LEGEND:

△ Jar Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-4

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, NC

DATE 5-2-90

CONTRACTOR Hopkins

METHOD Backhoe

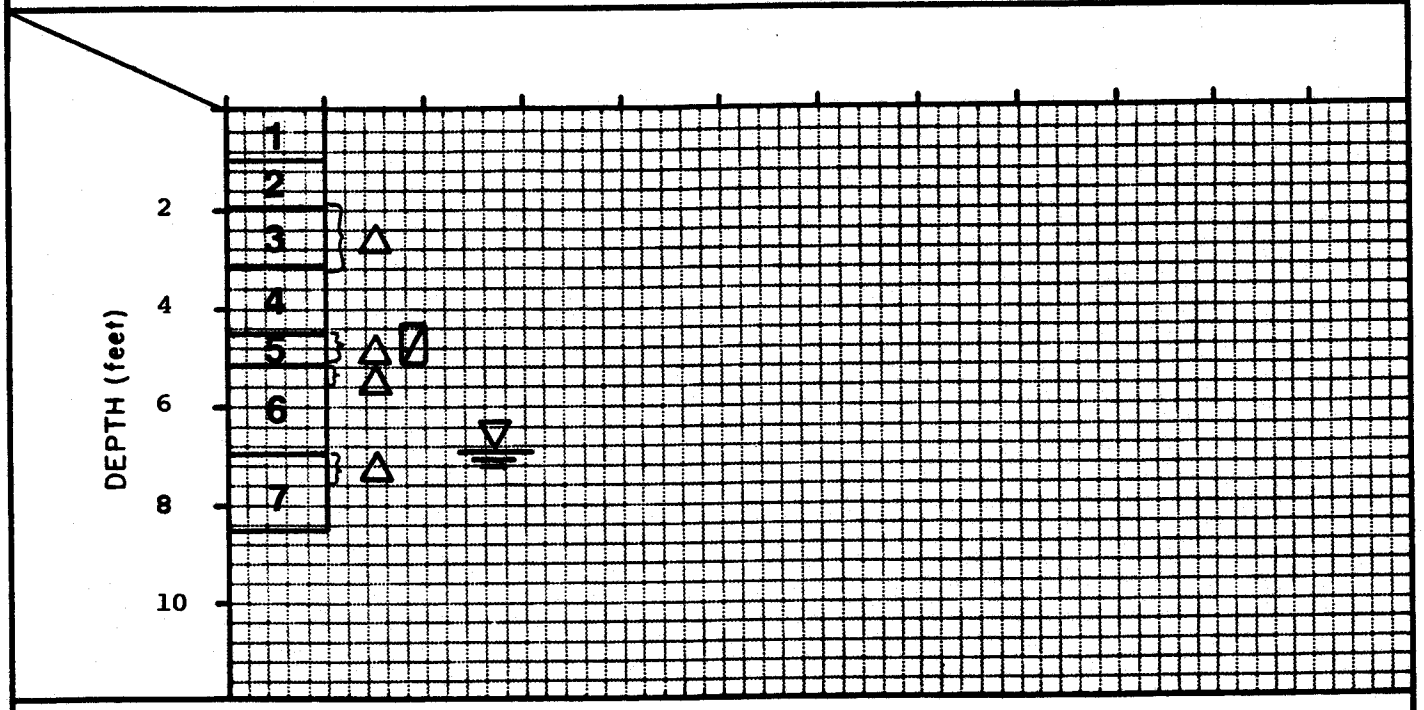
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; gray; (topsoil).
2) SAND/SILTY SAND (SP-SM); fine grained; tan.
3) SILTY SAND/CLAYEY SAND (SM-SC); fine grained; orange-brown.
4) SILTY SAND (SM); fine grained; orange.
5) CLAYEY SAND(SC)/SILTY SAND (SC-SM); fine grained; interlaminated gray and orange-brown.
6) SILTY SAND (SM); fine grained; trace clay; orange, tan.
7) SAND/SILTY SAND (SP-SM); fine grained; clayey (7.5 to 8.0 feet); light gray.

LEGEND:

△ Jar Sample

▨ Bulk Sample

▽ Water Level While Excavating

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-5

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-2-90

CONTRACTOR Hopkins

METHOD Backhoe

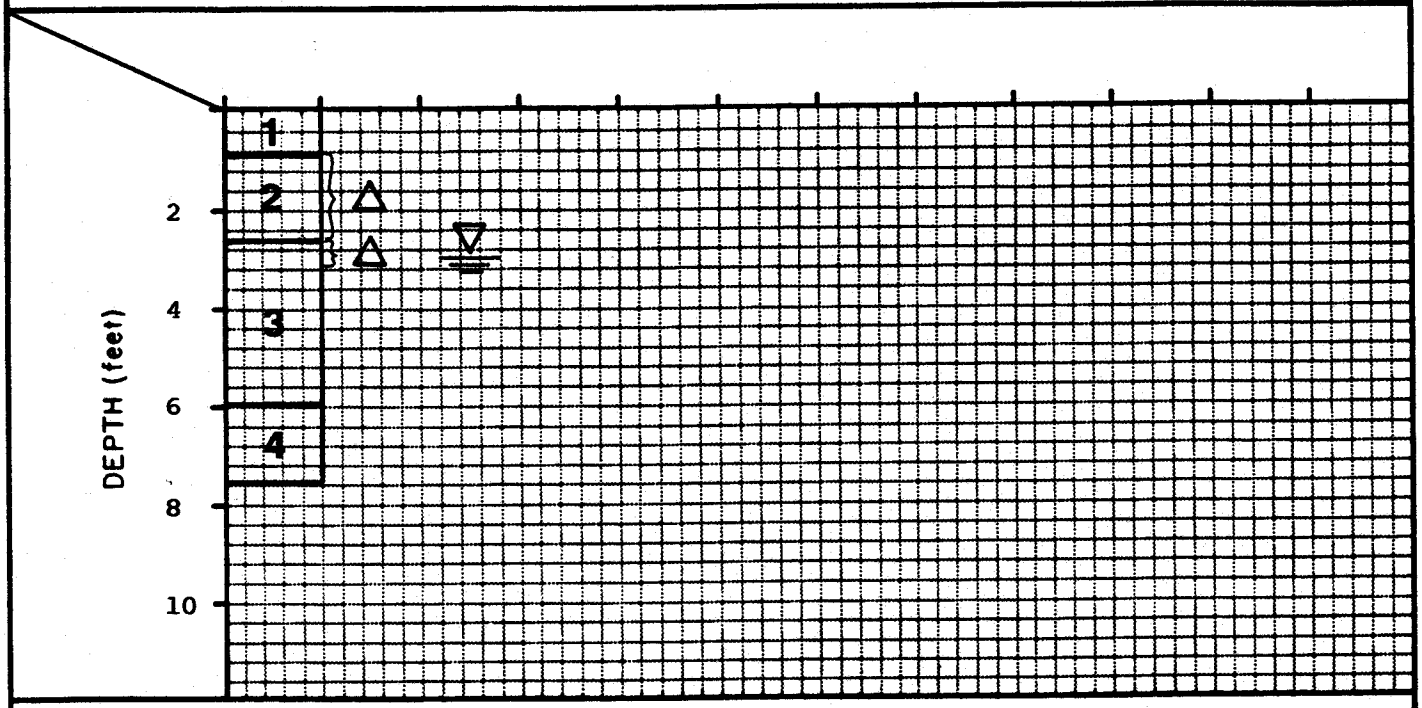
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; brown; (topsoil).
2) SILTY SAND (SM); fine grained; brown-light gray.
3) SILTY SAND/CLAYEY SAND (SM-SC); fine grained; mottled light gray, orange.
4) SILTY SAND (SM); as above; trace clay.

LEGEND:

△ Jar Sample

▽ Water Level While Excavating

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-6

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-1-90

CONTRACTOR Hopkins

METHOD Backhoe

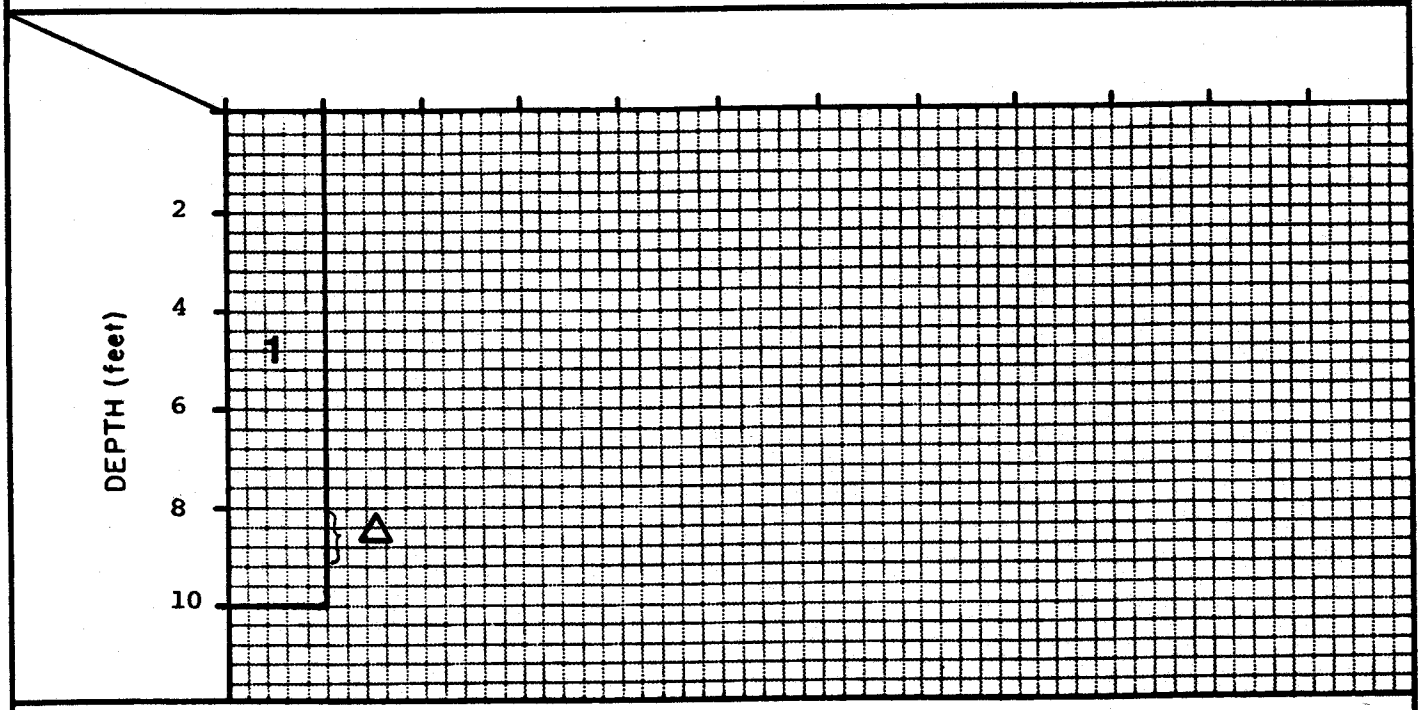
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SAND/SILTY SAND (SP-SM); fine grained; tan, orange-brown, white.

LEGEND:

△ Jar Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-7

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-1-90

CONTRACTOR Law Engineering

METHOD Backhoe

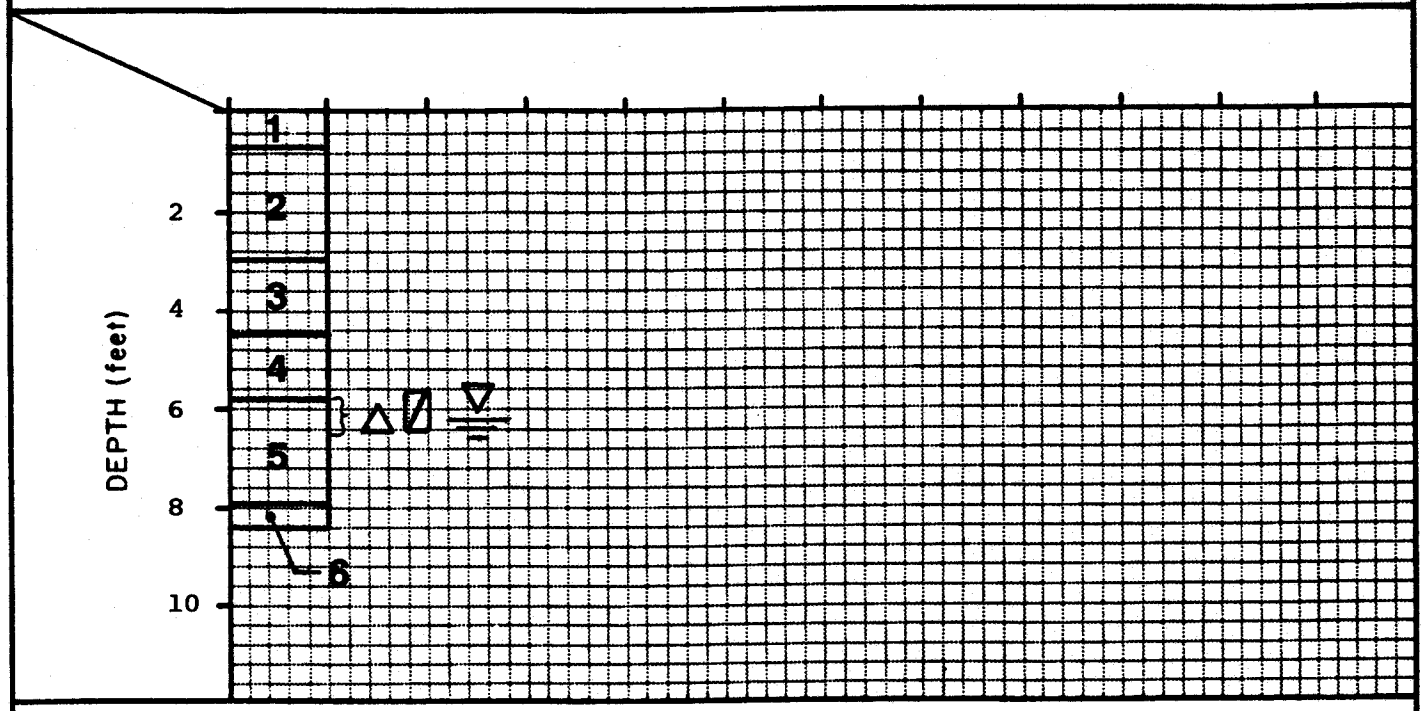
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; dark gray (topsoil).

2) SAND/SILTY SAND (SP-SM); fine grained; light brown, tan.

3) SILTY SAND (SM); fine grained; orange-brown.

4) SILTY SAND (SM); as above with trace clay.

5) CLAY/CLAYEY SAND (CL-SC); fine grained; mottled orange and gray.

6) SILTY SAND (SM); fine grained; orange.

LEGEND:

△ Jar Sample

▨ Bulk Sample

▽ Water Level While Excavating

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-8

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-1-90

CONTRACTOR Hopkins

METHOD Backhoe

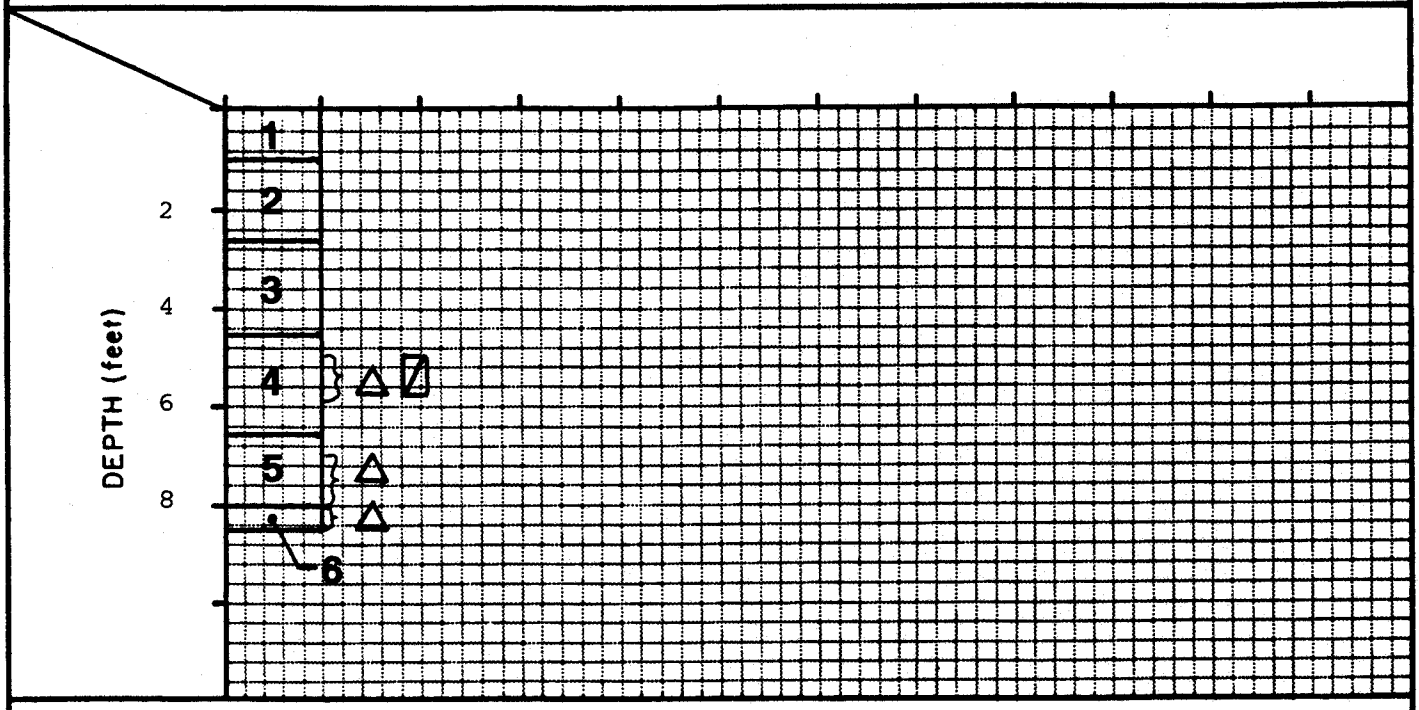
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; dark gray; (topsoil)
2) SAND/SILTY SAND (SP-SM); fine grained; tan
3) SILTY SAND/CLAYEY SAND (SM-SC); fine grained; orange.
4) CLAY (CL); trace sand (fine grained); gray and orange-brown mottled.
5) SILTY SAND (SM); fine grained; trace clay; orange.
6) SAND (SP); fine grained; white.

LEGEND:

△ Jar Sample

▨ Bulk Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-9

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-1-90

CONTRACTOR Hopkins

METHOD Backhoe

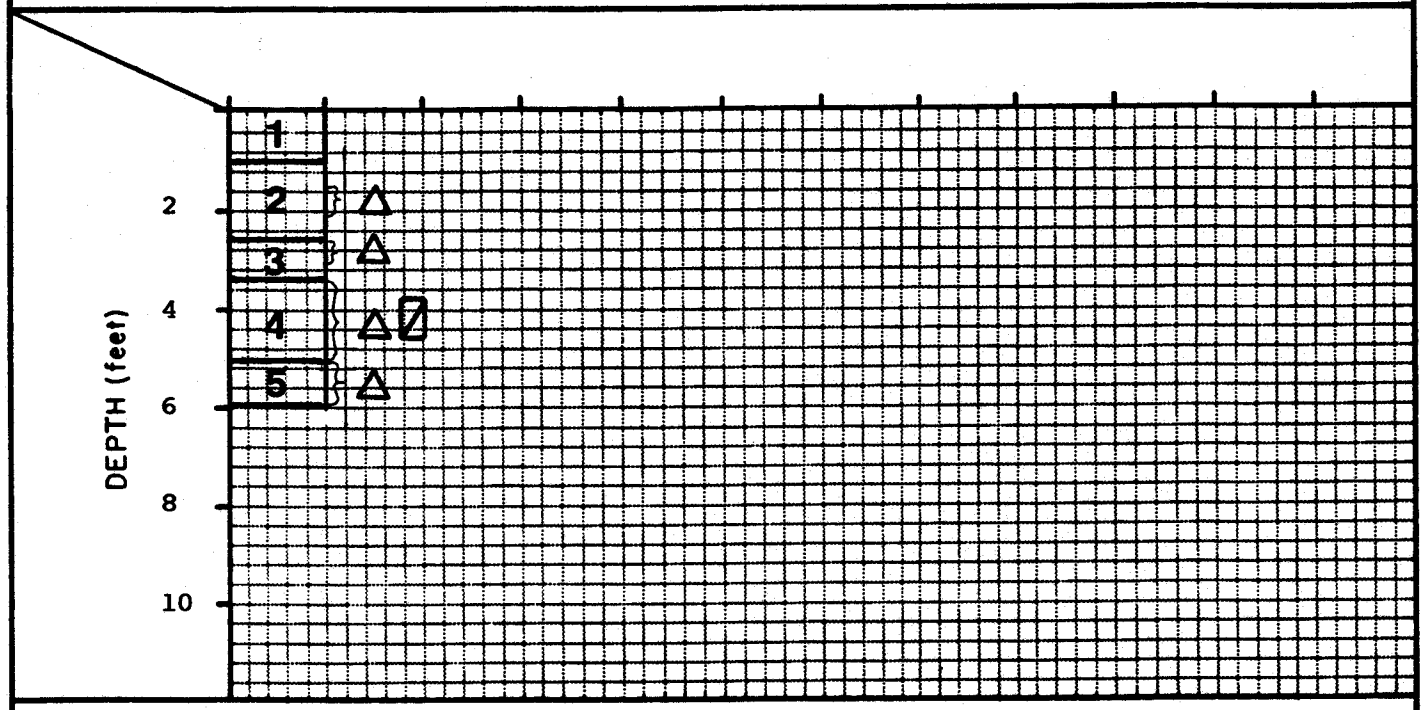
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; brown, black.
2) SAND/SILTY SAND (SP-SM); fine grained; light brown, gray.
3) CLAYEY SAND (SC); fine grained; orange-brown.
4) CLAYEY SAND (SC); fine grained; gray, orange-brown.
5) SILTY SAND (SM); fine grained; saturated; tan and gray mottled.

LEGEND:

△ Jar Sample ▨ Bulk Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-10

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-1-90

CONTRACTOR Hopkins

METHOD Backhoe

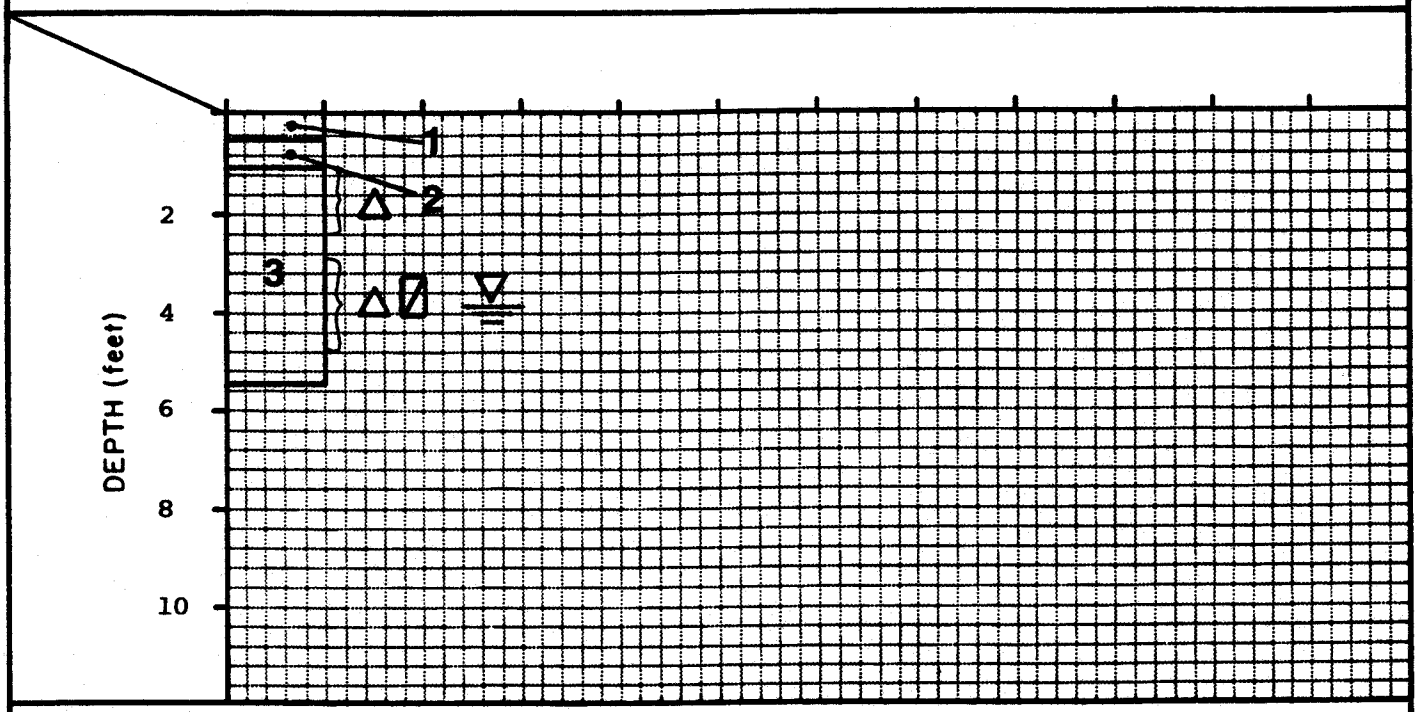
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); brown, black; roots; (topsoil)
2) SAND/SILTY SAND (SP-SM); fine grained; light brown
3) CLAYEY SAND (SC); fine grained; silty; orange-brown, and gray mottled - more silty, less clayey, below 4.0 feet.

LEGEND:

△ Jar Sample

▨ Bulk Sample

▽ Water Level While Excavating

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-11

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-1-90

CONTRACTOR Hopkins

METHOD Backhoe

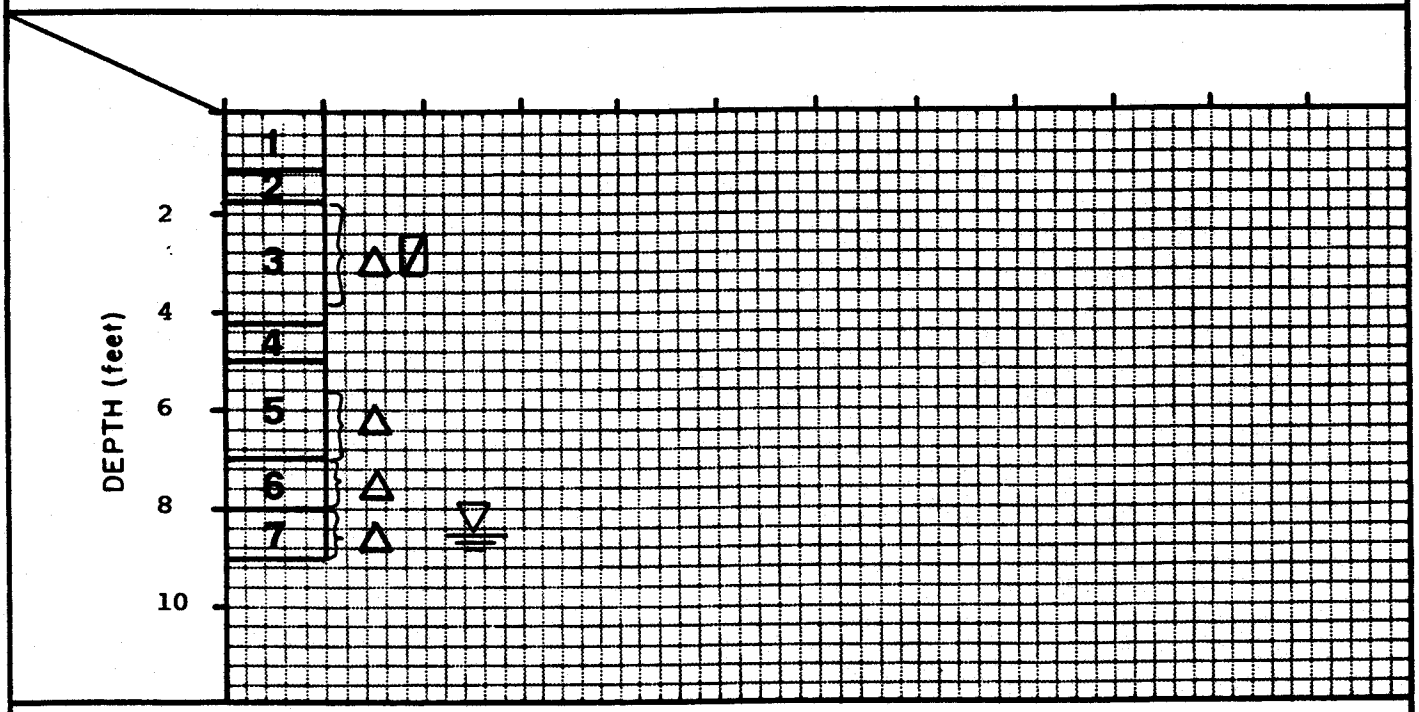
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; gray; (topsoil).
2) SAND/SILTY SAND (SP-SM); fine grained; tan.
3) CLAYEY SAND (SC); fine grained; mottled orange-brown and gray.
4) SILTY SAND (SM); fine grained; trace clay; mottled as above (more gray).
5) SAND/SILTY SAND (SP-SM); fine grained; orange.
6) SILT (ML-MH); trace sand (fine grained); trace clay; orange-gray mottle.
7) SAND/SILTY SAND (SP-SM); fine grained; mottled as above.

LEGEND:

△ Jar Sample

▨ Bulk Sample

▽ Water Level While Excavating

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-12

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-2-90

CONTRACTOR Hopkins

METHOD Backhoe

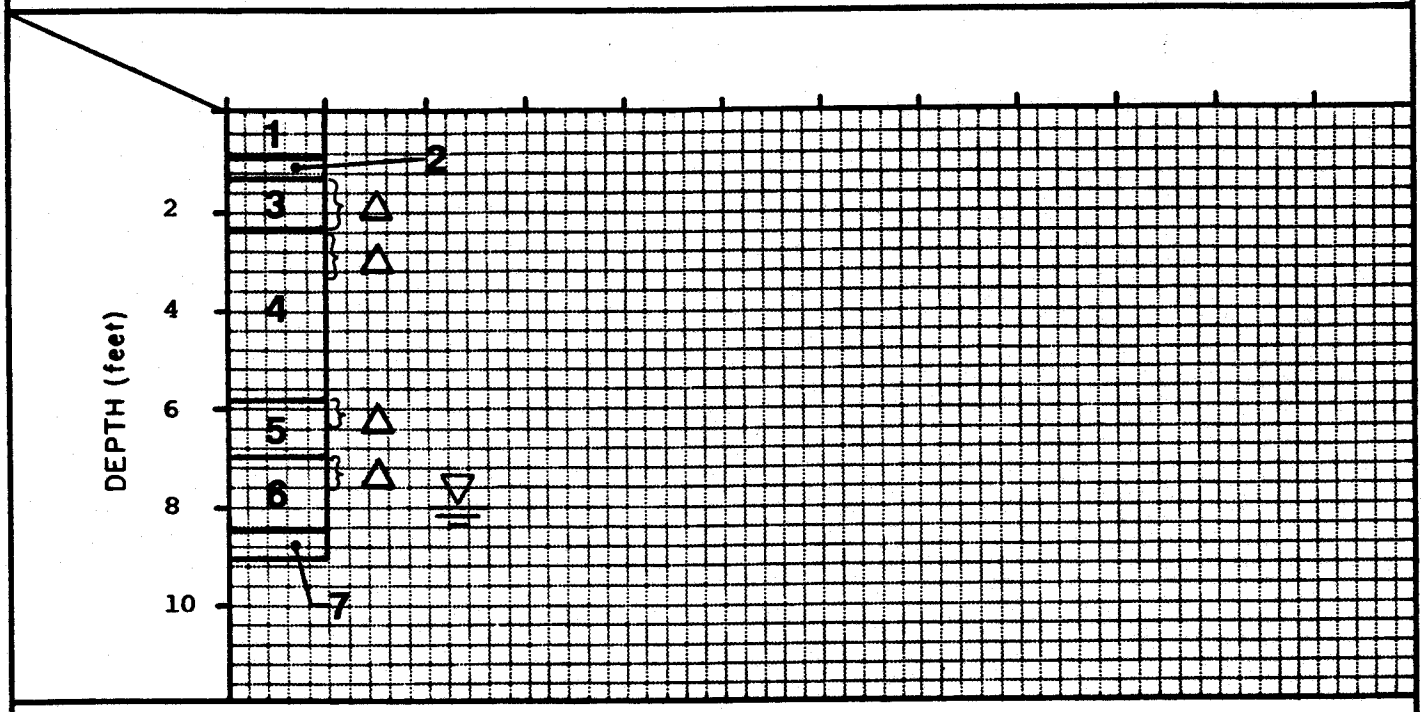
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; gray; (topsoil).
2) SAND/SILTY SAND (SP-SM); fine grained; tan.
3) CLAYEY SAND (SC); fine grained; orange-brown.
4) SILTY SAND (SM); fine grained; orange-brown.
5) SILTY SAND (SM); as above; interlaminated with sandy clay (fine grained); gray.
6) SILTY SAND (SM); fine grained; tan, orange-brown.
7) SILTY SAND (SM); fine grained; tan, grey mottled.

LEGEND:

△ Jar Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-13

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-2-90

CONTRACTOR Hopkins

METHOD Backhoe

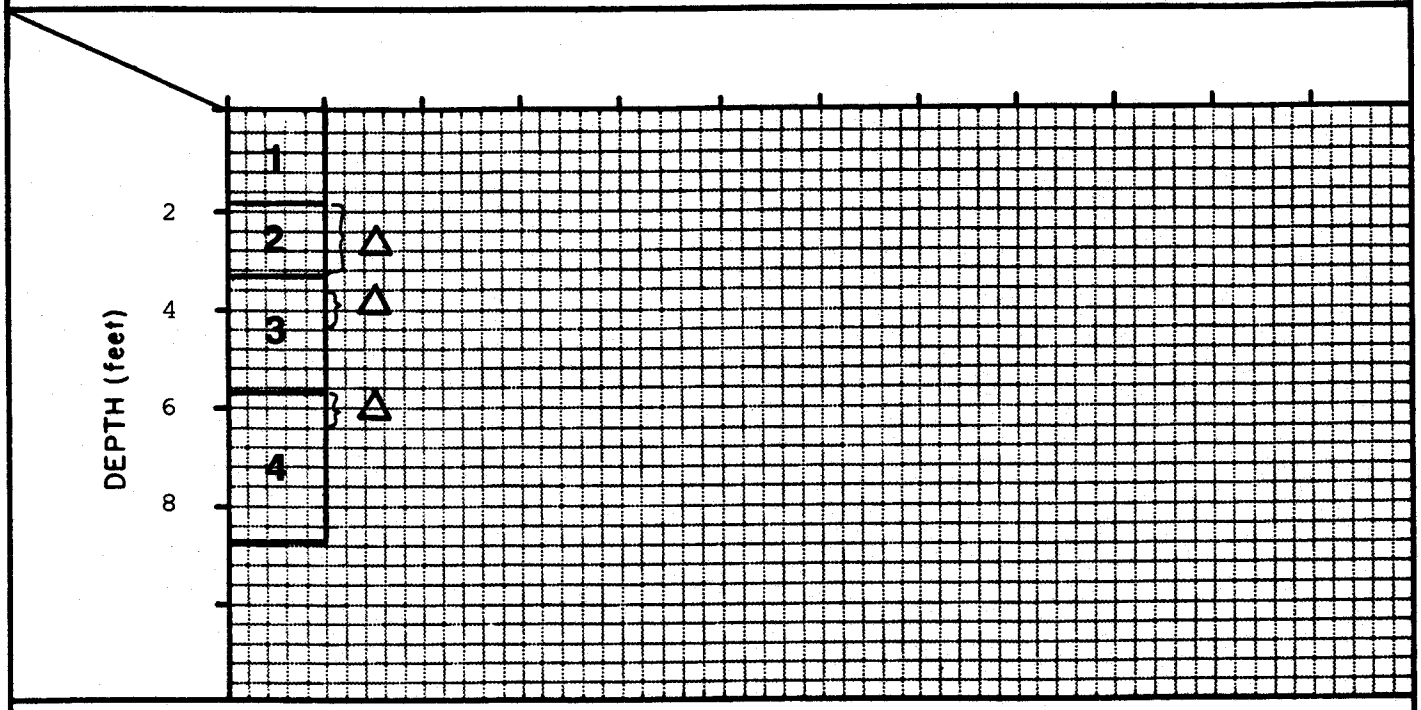
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; tan, gray; mixed with topsoil, roots in upper foot.
2) CLAYEY SAND (SC); very fine grained; orange.
3) SILTY SAND (SM); very fine grained; orange.
4) SILTY SAND (SM); fine grained; mottled gray, orange, red (5.7-7.0 ft.)

LEGEND:

△ Jar Sample

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-14

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-2-90

CONTRACTOR Hopkins

METHOD Backhoe

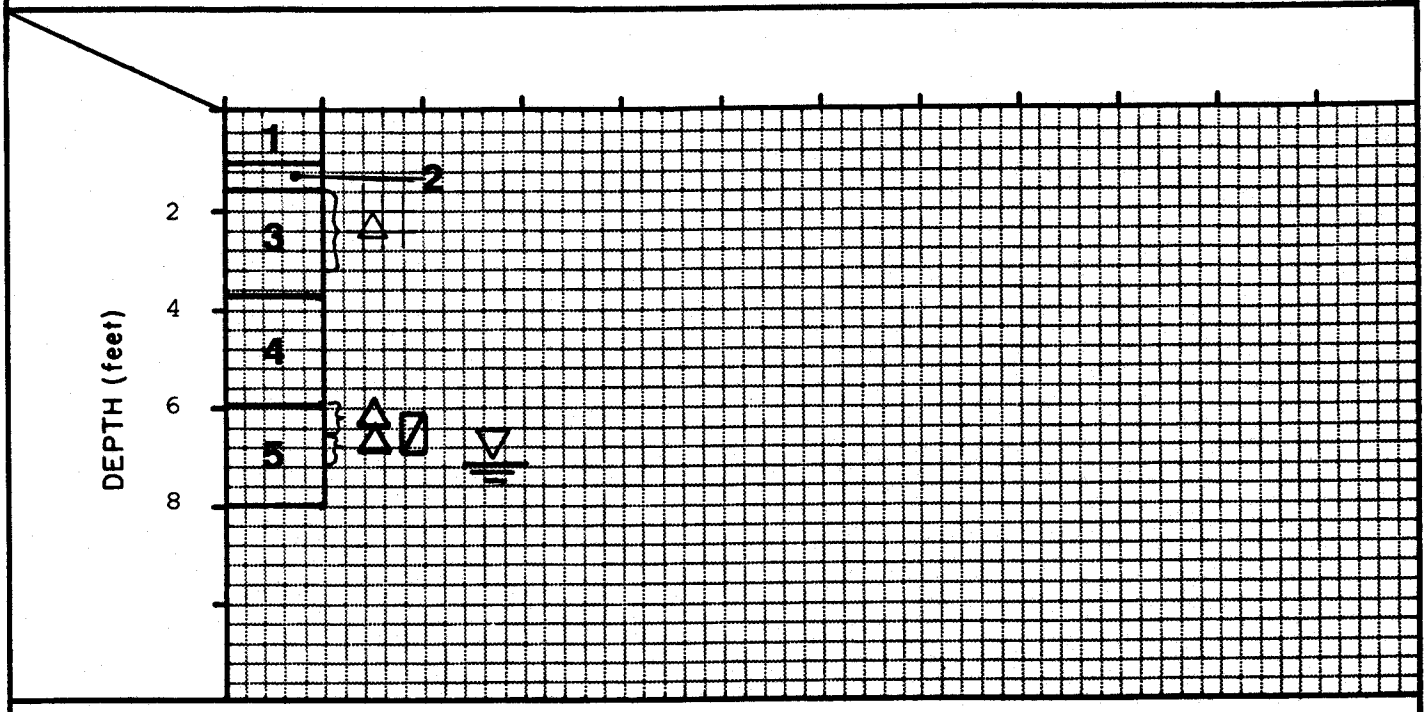
WIDTH 2-3 ft.

LOGGED BY BTC

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; top soil; gray.
2) SAND (SP)/SILTY SAND (SM); fine grained; tan.
3) CLAYEY SAND (SC); fine grained; orange-brown.
4) SILTY SAND (SM); fine grained; orange-brown; trace clay.
5) CLAY (CL); some fine grained; silty and clayey sand, mottled orange-brown, and gray.

LEGEND:

△ Jar Sample

▨ Bulk Sample

▽ Water Level While Excavating

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-15

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-2-90

CONTRACTOR Hopkins

METHOD Backhoe

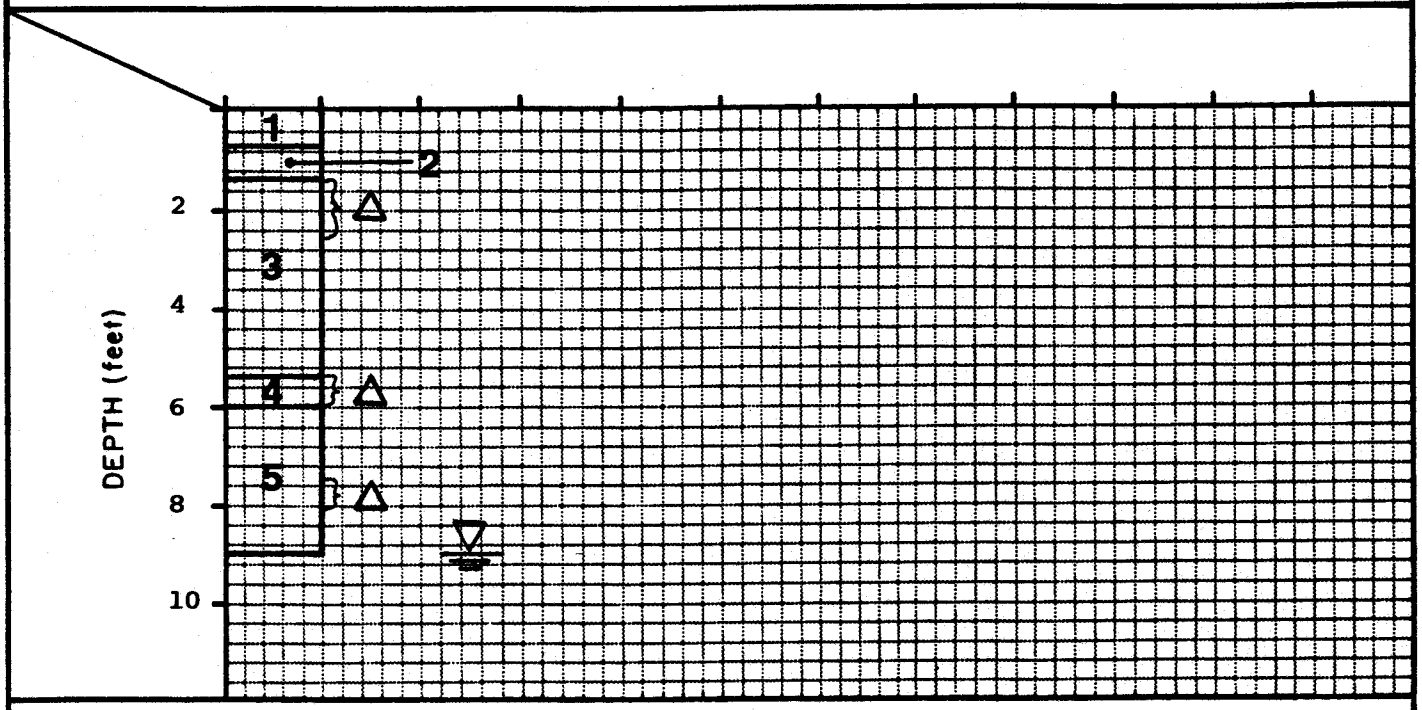
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; brown; (topsoil).
2) SILTY SAND (SM); fine grained, tan.
3) SILTY SAND (SM); fine grained; some clay near top; orange.
4) CLAYEY SAND (SC); fine grained; light brown, gray, orange mottled.
5) SAND/SILTY SAND (SP-SM); fine grained; orange, grading to gray.

LEGEND:

△ Jar Sample

▽ Water Level While Excavating

LOG OF TEST PIT OR EXCAVATION

RMT INC.

PIT NUMBER TP-16

PROJECT NAME Weyerhaeuser

PROJECT NUMBER 467.42

LOCATION Plymouth, N.C.

DATE 5-2-90

CONTRACTOR Hopkins

METHOD Backhoe

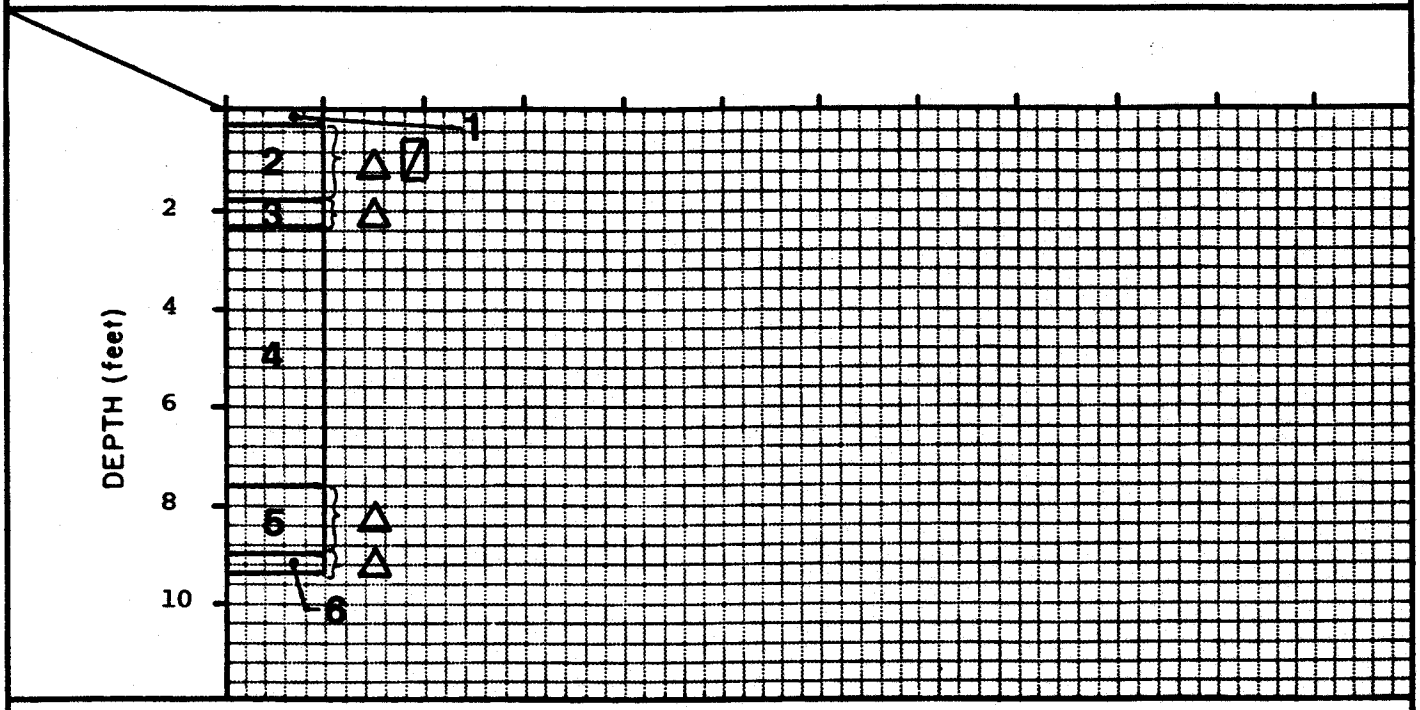
WIDTH 2-3 ft.

LOGGED BY BTG

CHECKED BY

PAGE 1 OF 1

GRAPHIC REPRESENTATION OF EXCAVATION



ORIENTATION

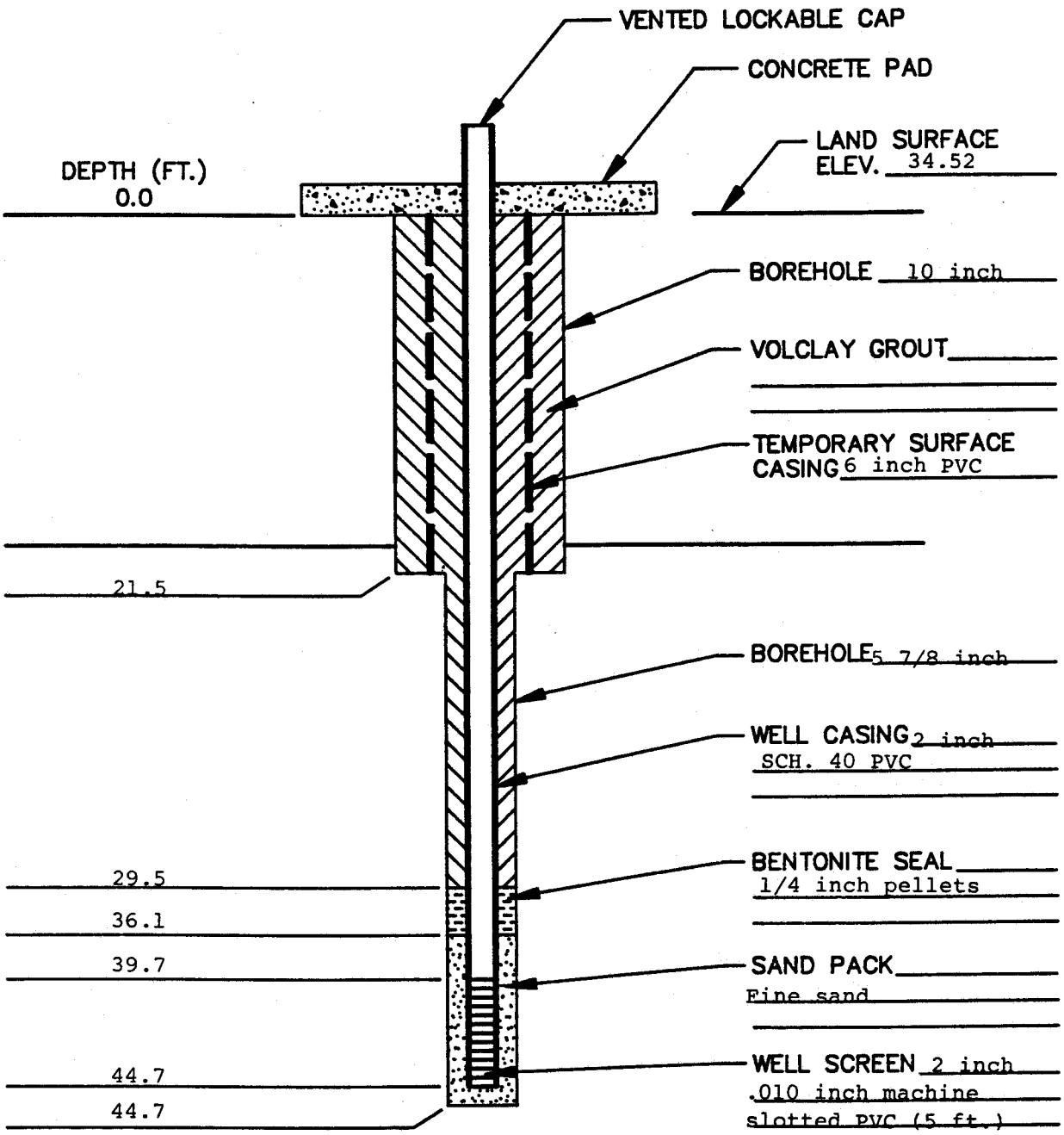
DESCRIPTION OF UNITS

1) SILTY SAND (SM); fine grained; gray; (topsoil).
2) CLAY (CL); trace fine grained sand; stiff; orange.
3) CLAYEY SAND/SILTY SAND (SC-SM); fine grained; orange.
4) SILTY SAND (SM); fine grained; orange and gray mattle.
5) SILTY SAND (SM); fine grained; clayey; mostly light gray, mottled with orange.
6) CLAY (CL); gray with orange mottle.

LEGEND:

△ Jar Sample ▨ Bulk Sample

APPENDIX C



OBSERVATION WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

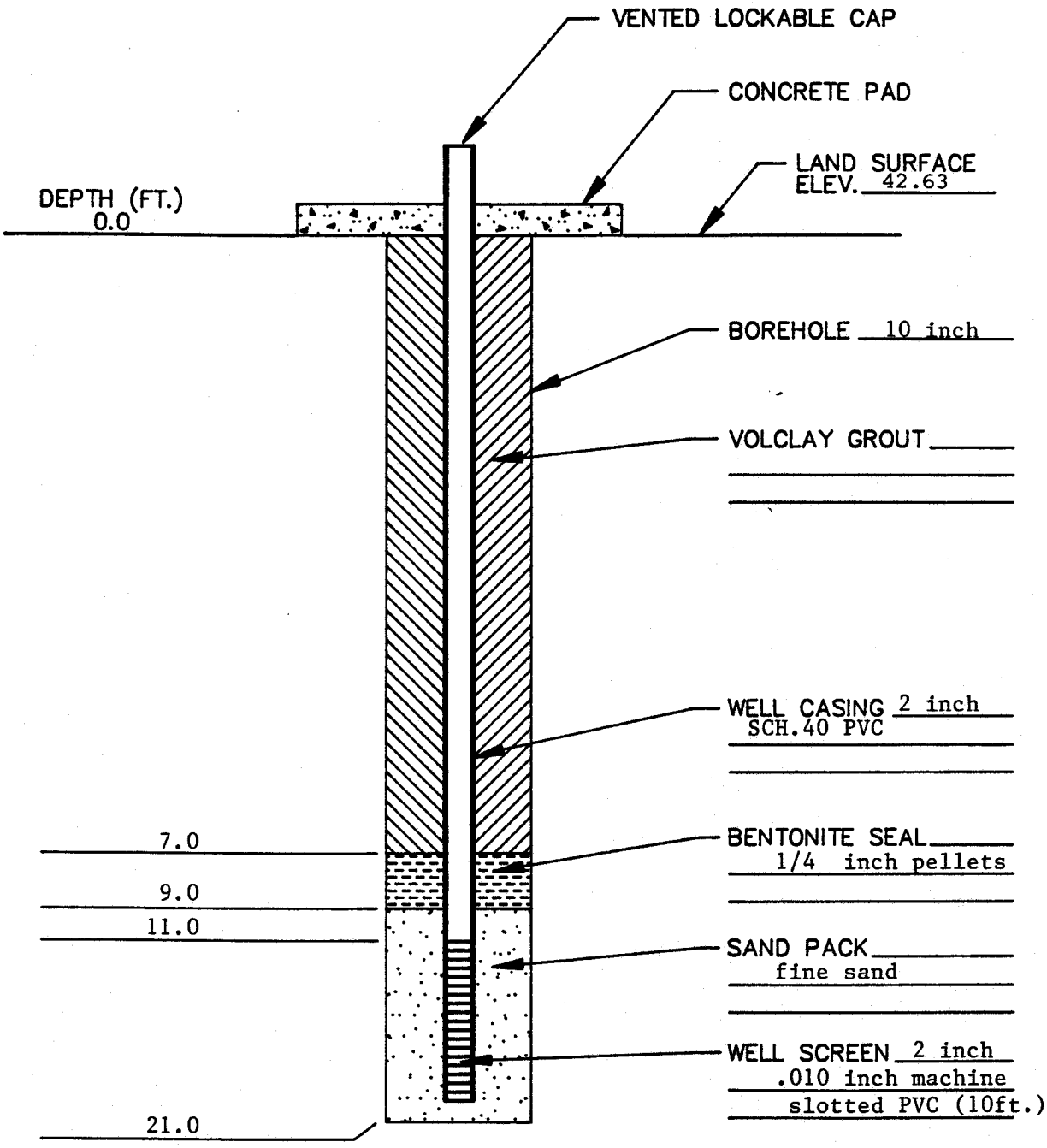
PROJECT NO. 467.42

WELL NO. OW-1 DATE INSTALLED 4-20-90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT INC.



OBSERVATION WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

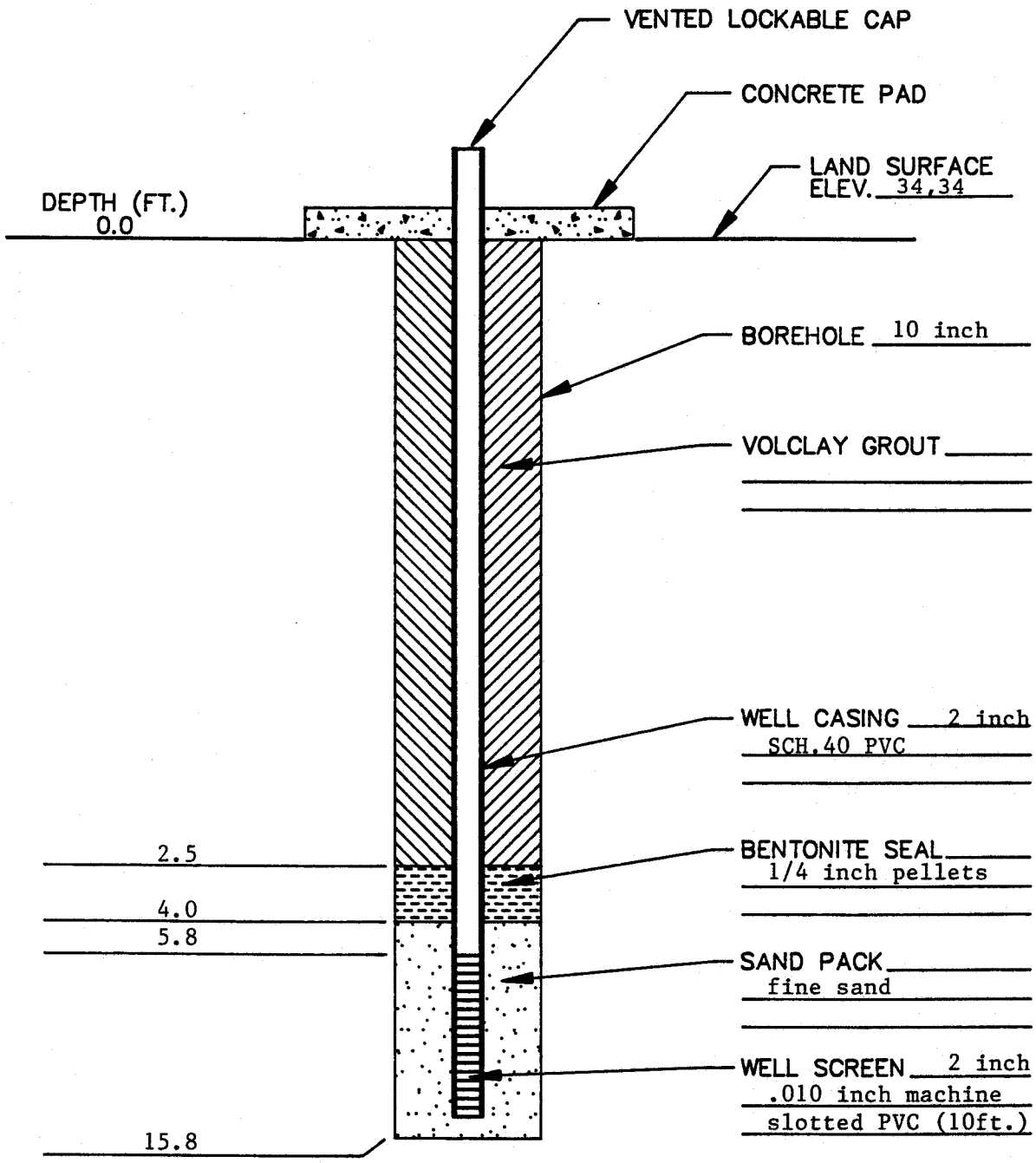
PROJECT NO. 467.42

WELL NO. OW-3 DATE INSTALLED 4/18/90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT INC.



OBSERVATION WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

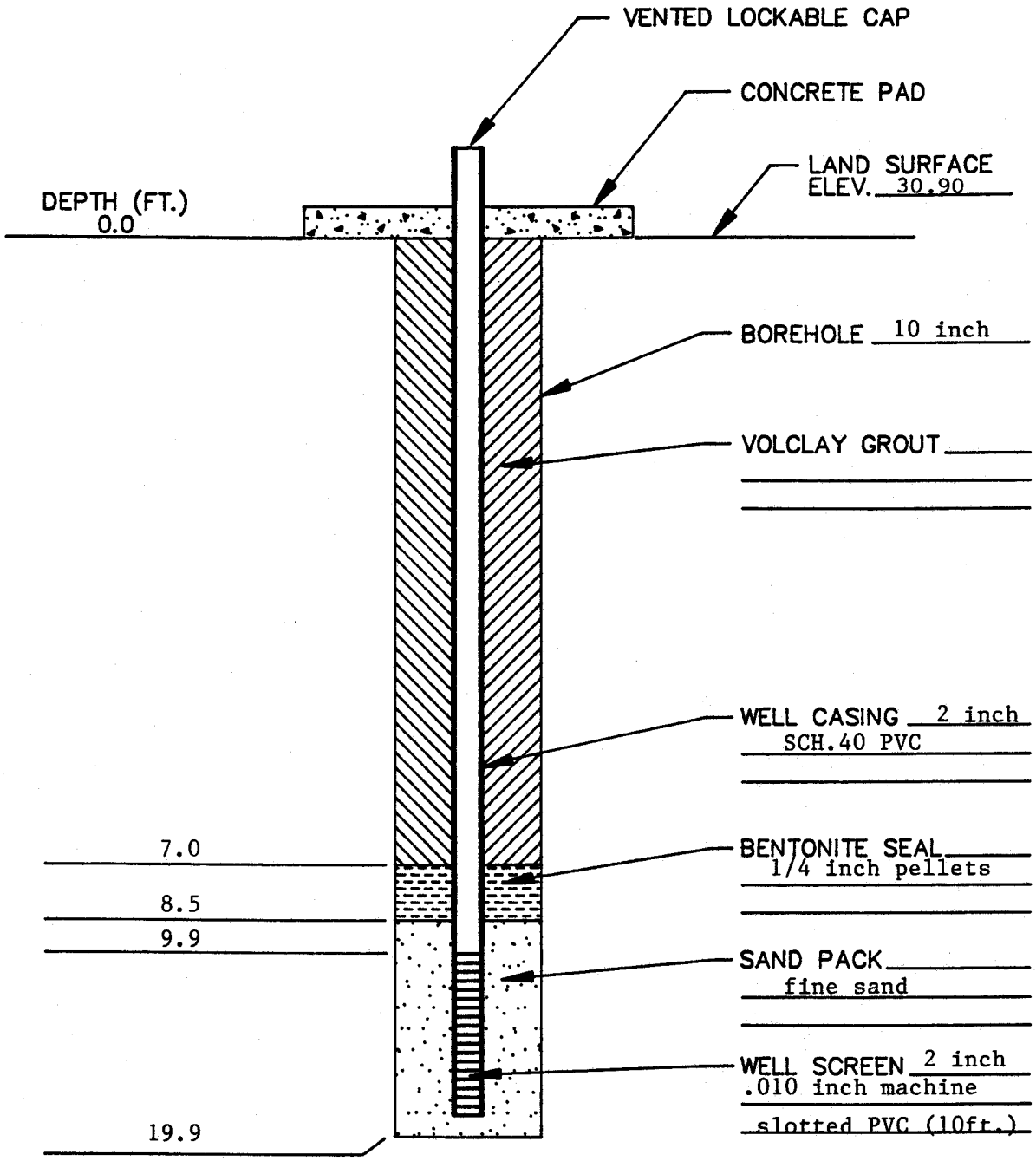
PROJECT NO. 467.42

WELL NO. OW-4 DATE INSTALLED 4/22/90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT INC.



OBSERVATION WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

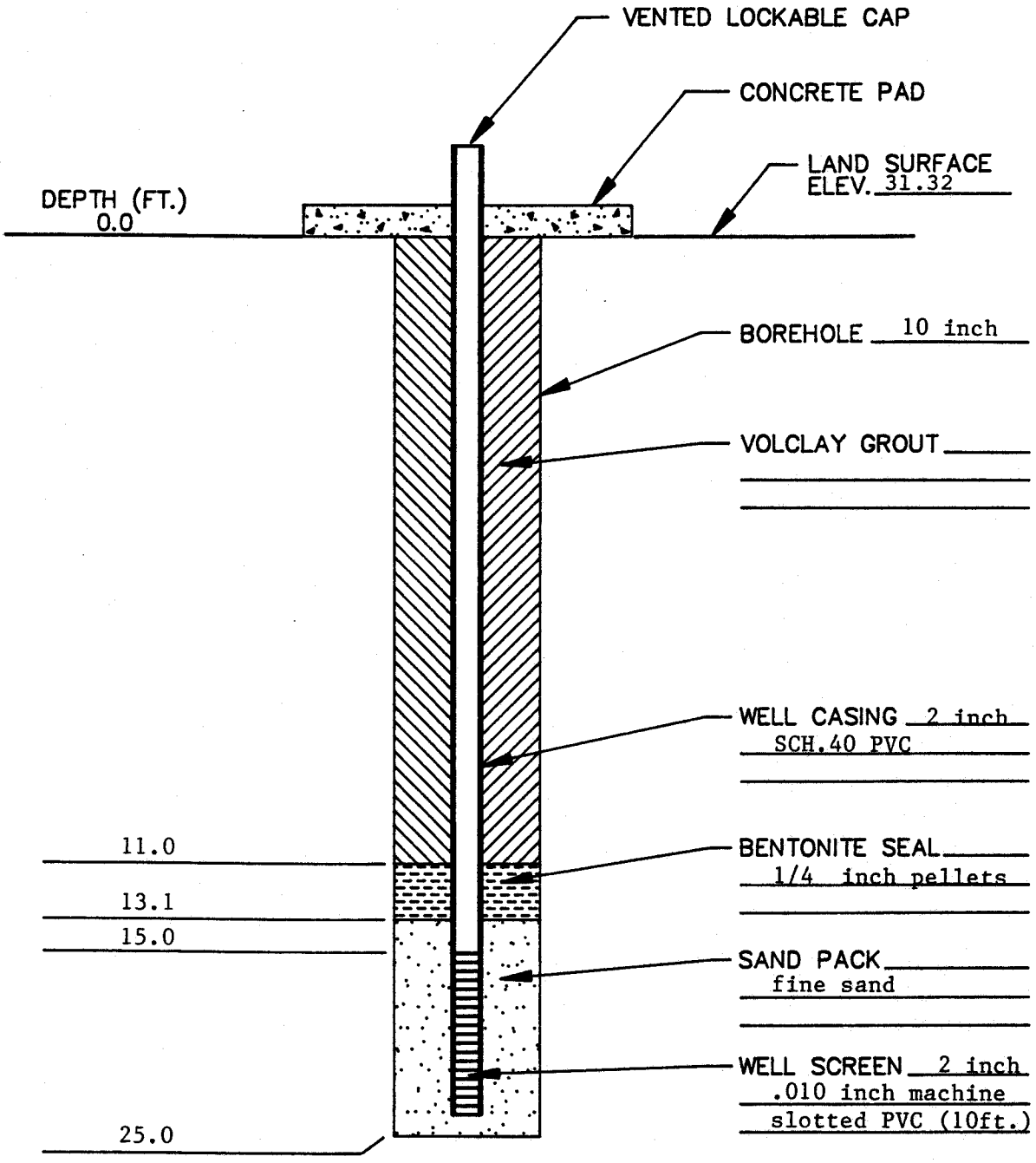
PROJECT NO. 467.42

WELL NO. OW-5 DATE INSTALLED 4/24/90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT INC.



OBSERVATION WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

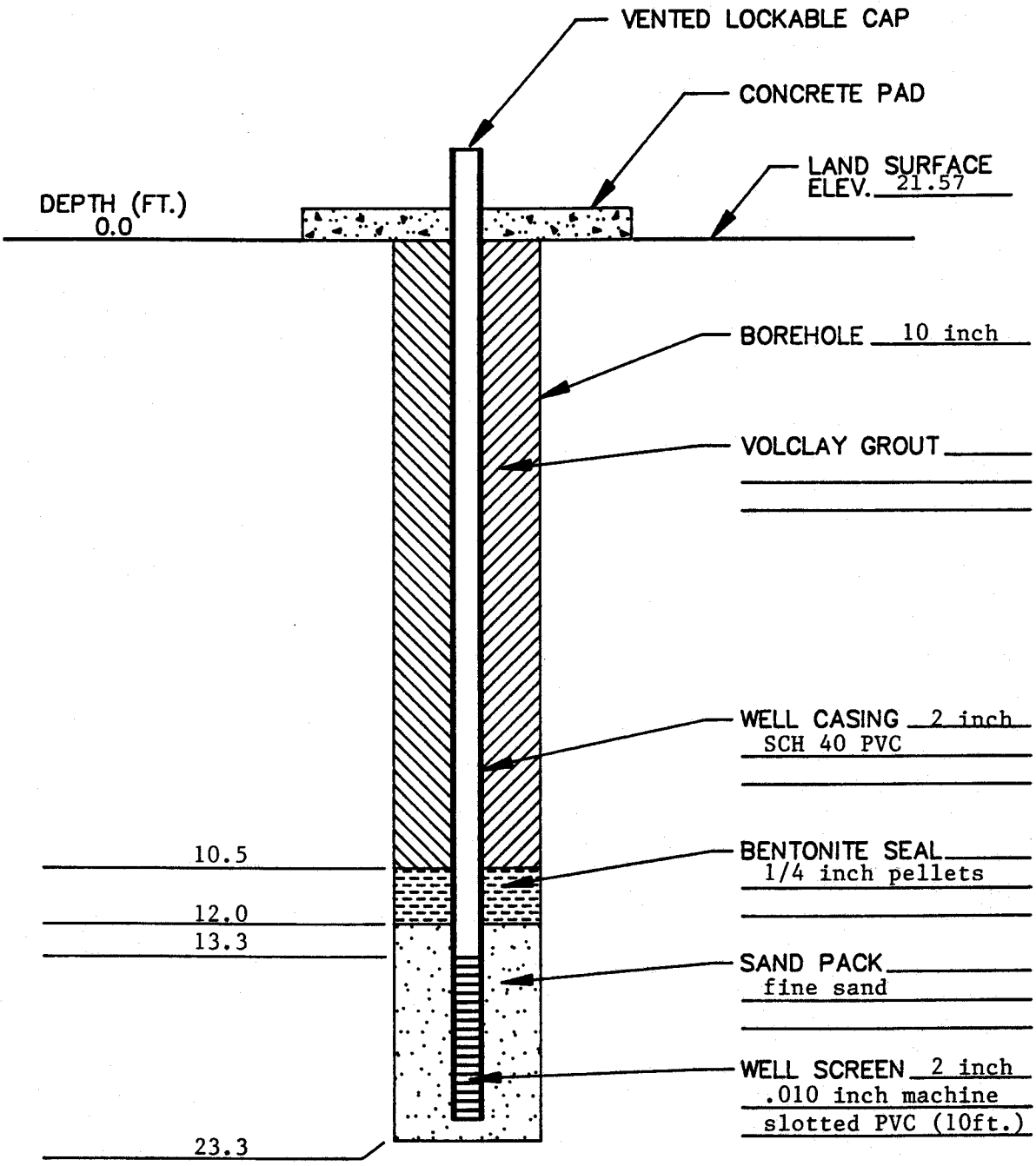
PROJECT NO. 467.42

WELL NO. OW-6 DATE INSTALLED 4/24/90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT INC.



OBSERVATION WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

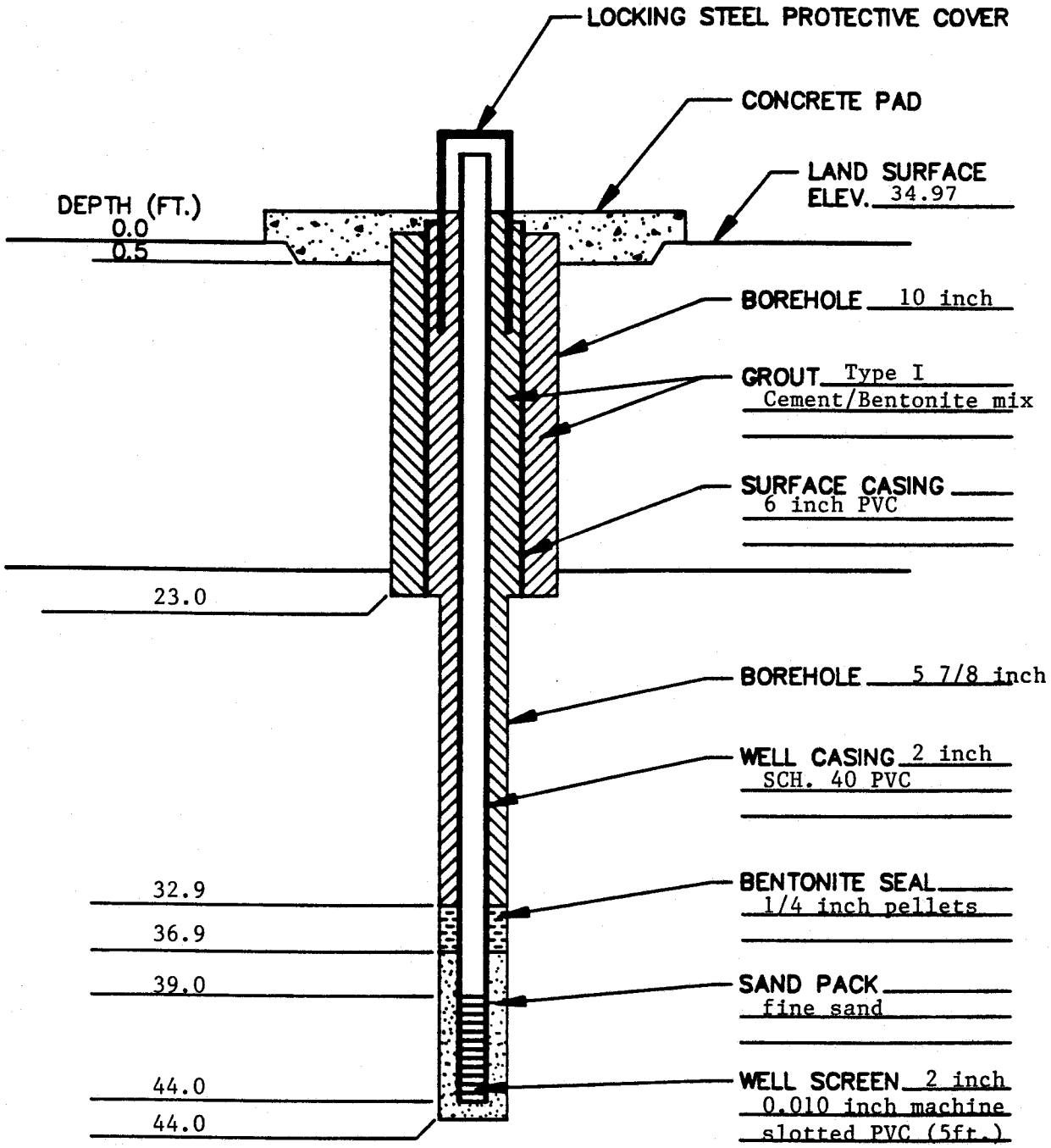
PROJECT NO. 467.42

WELL NO. OW-7 DATE INSTALLED 4/25/90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT INC.



MONITORING WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

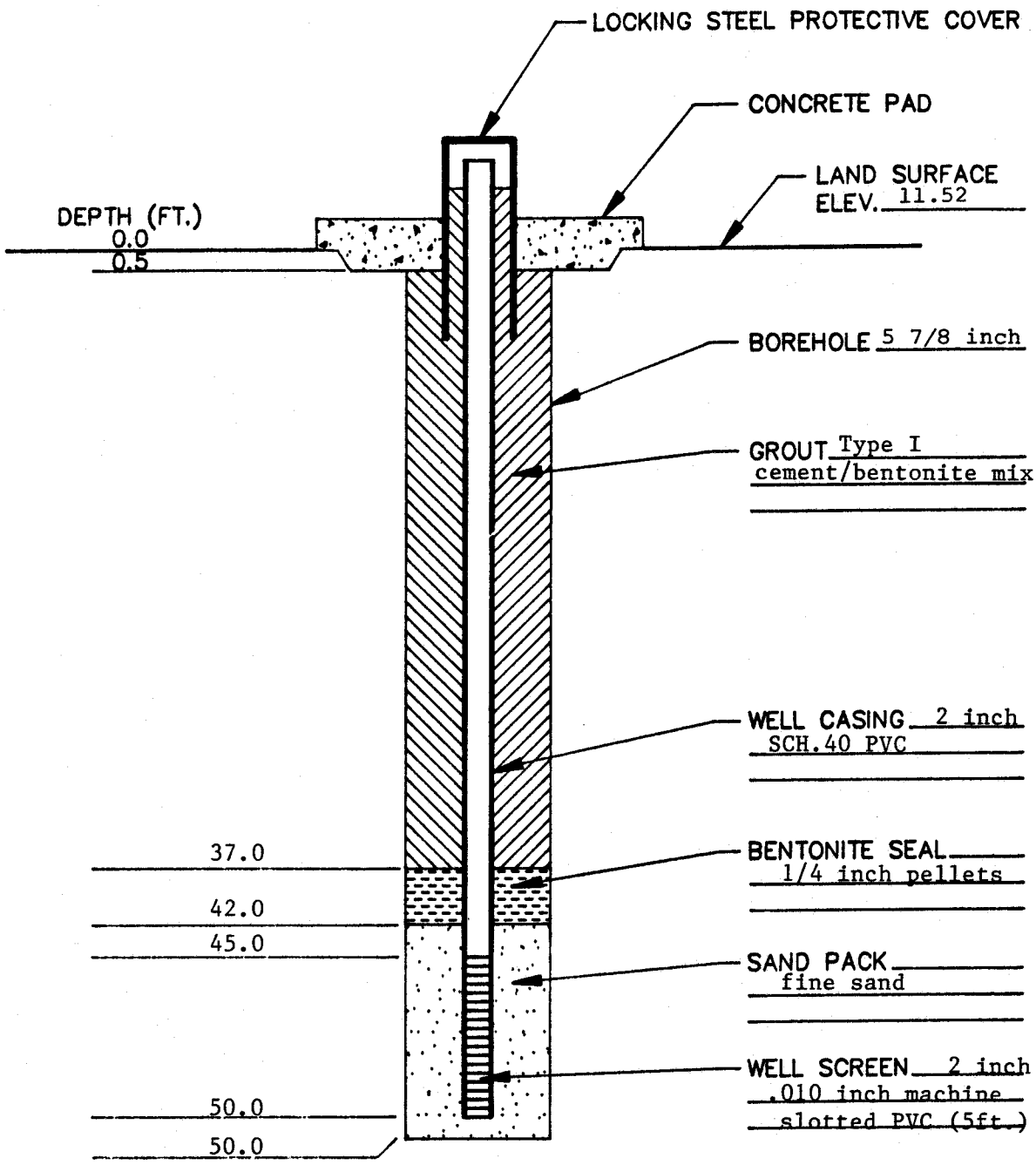
PROJECT NO. 467.42

WELL NO. MW-1A DATE INSTALLED 4/18/90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT INC.



WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

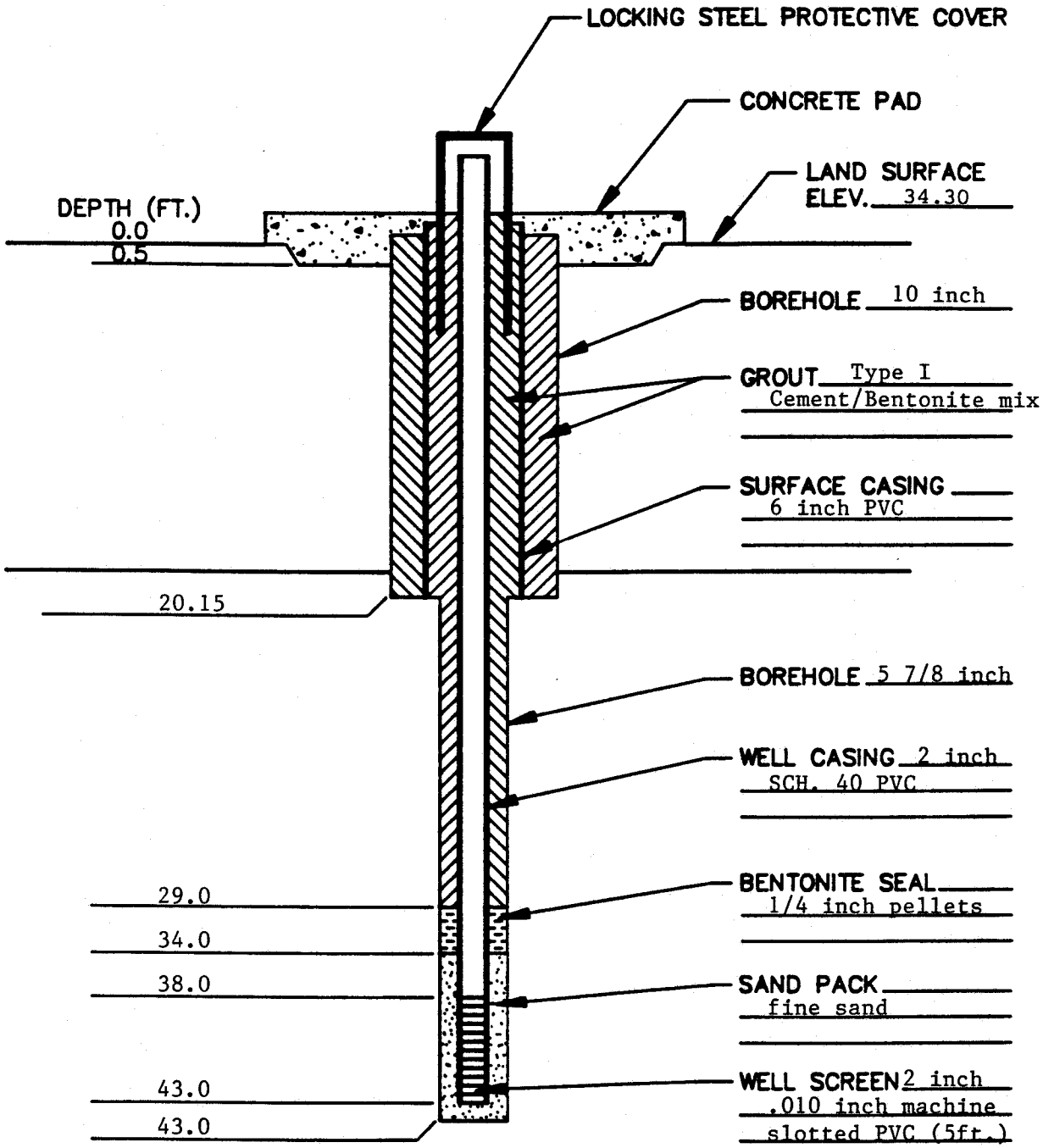
PROJECT NO. 467.42

WELL NO. MW-6A DATE INSTALLED 4/19/90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT



MONITORING WELL CONSTRUCTION DIAGRAM

Not To Scale

PROJECT Weyerhaeuser

PROJECT NO. 467.42

WELL NO. MW-8 DATE INSTALLED 4/23/90

DRILLING CONTRACTOR Law Engineering

RMT GEOLOGIST B. Grothaus

RMT INC.

APPENDIX D

TABULATION OF SOIL TEST DATA ON SAMPLES FROM WELLS AND BORINGS

SAMPLE	DEPTH (ft)		INDICES			GRAIN SIZE (%)				ATTERBERG LIMITS				MOD.PROCTOR		PERMEABILITY			CONSOLIDATION		
LOCATION	TOP	BOT	% M	DD	Gs	GRVL	SAND	SILT	CLAY	LL	PL	PI	CLASS	MDD	OMC	% M	DD	k	% M	DD	Cc
MW-1A	22	24	----	----	2.64	0.0	11.2	55.2	33.6	46.0	32.0	14.0	ML	----	----	36.7	84.1	1.7E-08	44.5	78.1	0.49
MW-1A	38	30	34.0	86.0	2.71	0.0	10.1	57.3	32.6	48.0	28.0	20.0	ML	----	----	----	----	----	----	----	----
MW-1A	38	39.5	14.3	----	2.63	0.7	92.9	3.0	3.4	NON-PLASTIC			SP-SM	----	----	----	----	----	----	----	----
MW-8	20	22	36.7	----	2.67	0.0	10.3	80.6	9.1	51.0	27.0	24.0	CH	----	----	35.4	84.4	4.7E-08	----	----	----
MW-8	29	31	39.9	79.6	2.67	0.0	9.3	70.6	20.1	NON-PLASTIC			ML	----	----	----	----	----	----	----	----
MW-8	2	4	----	----	2.59	0.0	34.4	12.0	53.6	39.0	19.0	20.0	CL	----	----	24.9	95.7	2.4E-08	----	----	----
OW-1	4	6	----	----	2.59	0.0	38.6	14.8	46.6	35.0	18.0	17.0	CL	----	----	25.7	93.8	9.6E-07	----	----	----
OW-1	8	10	----	----	2.65	0.0	66.9	18.2	14.9	NON-PLASTIC			SM	----	----	31.1	88.8	1.3E-05	----	----	----
OW-1	20	22	29.6	----	2.62	0.0	11.3	65.6	23.1	53.0	33.0	20.0	MH	----	----	38.5	79.9	2.5E-08	46	75.9	0.48
OW-2	13	15	----	----	2.67	0.0	40.0	28.8	31.2	33.0	17.0	16.0	CL	----	----	33.3	85.9	1.1E-07	----	----	----
OW-3	8	9	16.2	----	2.65	0.0	70.6	6.1	23.3	21.0	16.0	5.0	SC-SM	----	----	----	----	----	----	----	----
OW-3	9	11	----	----	2.61	0.0	37.5	23.5	39.0	37.0	18.0	19.0	CL	----	----	24.9	96.3	1.7E-07	----	----	----
OW-3	15	16.5	----	----	2.64	0.0	84.9	3.7	11.4	NON-PLASTIC			SC	----	----	16.1	106.6	2.3E-04	----	----	----
SB-5	4	6	----	----	2.45	----	----	----	----	28.0	24.0	4.0	ML	----	----	----	----	----	----	----	----

KEY: %M - percent moisture
DD - dry density
Gs - specific gravity
GRVL - gravel
LL - liquid limit
PL - plastic limit
PI - plasticity index
CLASS - USCS classification
MDD - maximum dry density
OMC - optimum moisture content
k - hydraulic conductivity
Cc - compression index

TABULATION OF SOIL TEST DATA ON SAMPLES FROM TEST PITS

SAMPLE	DEPTH (ft)		INDICES			GRAIN SIZE (%)				ATTERBERG LIMITS				MOD.PROCTOR		PERMEABILITY			CONSOLIDATION		
LOCATION	TOP	BOT	% M	DD	Gs	GRVL	SAND	SILT	CLAY	LL	PL	PI	CLASS	MDD	OMC	% M	DD	k	% M	DD	Cc
TP1-3	1.1	2.6	25.6	----	----	0.0	22.1	22.5	55.4	55.0	25.0	30.0	CH	112.7	17.2	----	----	----	----	----	----
	1.1	2.6	----	----	2.63	----	----	----	----	51.0	43.0	8.0	MH/ML	----	----	----	----	----	----	----	----
TP1-5	5.5	6	----	----	2.46	----	----	----	----	NON-PLASTIC			SM	----	----	----	----	----	----	----	----
TP3-1	3.2	3.8	----	----	2.60	----	----	----	----	NON-PLASTIC			SM	----	----	----	----	----	----	----	----
TP2-5	6	6.5	19.7	----	2.62	0.0	75.8	4.8	19.4	NON-PLASTIC			SC	----	----	----	----	----	----	----	----
TP4-2	4.5	5.2	19.9	----	----	0.0	55.5	5.4	39.1	35.0	18.0	17.0	SC	----	----	----	----	----	----	----	----
	4.5	5.2	----	----	----	----	----	----	----	40.0	56.0	NP	SM	----	----	----	----	----	----	----	----
TP6-1	8	9	14.0	----	2.69	0.0	84.5	4.1	11.4	NON-PLASTIC			SM	----	----	----	----	----	----	----	----
TP7-1	6	6.5	26.4	----	----	0.0	44.7	12.8	42.5	40.0	19.0	21.0	CL	----	----	----	----	----	----	----	----
	6	6.5	----	----	----	----	----	----	----	40.0	19.0	21.0	ML	----	----	----	----	----	----	----	----
TP8-1	5	6	23.8	----	----	0.0	36.1	16.9	47.0	43.0	21.0	22.0	CL	----	----	----	----	----	----	----	----
	5	6	----	----	----	----	----	----	----	45.0	54.0	NP	ML	----	----	----	----	----	----	----	----
TP8-3	8	8.5	8.1	----	2.61	0.0	93.0	1.5	5.5	NON-PLASTIC			SP-SM	----	----	----	----	----	----	----	----
TP9-2	2.7	3	18.7	----	2.65	0.0	61.1	9.8	29.1	27.0	16.0	11.0	SC	----	----	----	----	----	----	----	----
TP9-3	4	5	20.3	----	----	0.0	60.6	11.7	27.7	26.0	18.0	8.0	SC	----	----	----	----	----	----	----	----
	3.5	5	----	----	----	----	----	----	----	26.0	15.0	11.0	SC	----	----	----	----	----	----	----	----
TP10-2	3	5	19.3	----	----	0.0	62.6	6.6	30.8	28.0	16.0	12.0	SC	----	----	----	----	----	----	----	----
	3	5	----	----	----	----	----	----	----	25.0	12.0	13.0	SC	----	----	----	----	----	----	----	----
TP11-1	1.8	4	17.5	----	----	0.0	57.2	13.9	28.9	29.0	16.0	13.0	SC	----	----	----	----	----	----	----	----
	1.8	4	----	----	----	----	----	----	----	30.0	10.0	20.0	SC	----	----	----	----	----	----	----	----
TP11-2	5.5	7	15.8	----	2.69	0.0	89.2	1.0	9.8	NON-PLASTIC			SP-SM	----	----	----	----	----	----	----	----
TP14-3	6.5	7	27.1	----	----	0.0	43.1	15.8	41.1	35.0	17.0	18.0	CL	----	----	----	----	----	----	----	----
	6.5	7	----	----	----	----	----	----	----	29.0	15.0	14.0	CL	----	----	----	----	----	----	----	----
TP16-1	0.4	1.8	25.2	----	----	0.0	34.0	12.5	53.5	48.0	22.0	26.0	CL	----	----	----	----	----	----	----	----
	0.4	1.8	----	----	----	----	----	----	----	49.0	18.0	31.0	CL	----	----	----	----	----	----	----	----

TABULATION OF SOIL TEST DATA ON BULK AND COMPOSITE SAMPLES

SAMPLE LOCATION	DEPTH (ft)		INDICES			GRAIN SIZE (%)				ATTERBERG LIMITS				MOD.PROCTOR		PERMEABILITY			CONSOLIDATION		
	TOP	BOT	% M	DD	Gs	GRVL	SAND	SILT	CLAY	LL	PL	PI	CLASS	MDD	OMC	% M	DD	k	% M	DD	Cc
TP1-3	1.1	2.6	----	----	----	----	----	----	----	----	----	----	----	----	----	16.7	100.7	1.1E-07	----	----	----
	1.1	2.6	----	----	----	----	----	----	----	----	----	----	----	----	----	21.1	101.7	1.1E-08	----	----	----
COMPOSITE #	----	----	----	----	----	----	----	----	----	----	----	----	----	122.8	11.1	10.9	110.0	3.5E-06	----	----	----
	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	14.0	109.5	1.1E-05	----	----	----
	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	16.9	109.7	2.8E-08	----	----	----
COMPOSITE #	----	----	----	----	----	----	----	----	----	----	----	----	----	119.4	13.2	14.2	105.8	5.6E-06	----	----	----
	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	17.8	107.1	1.9E-08	----	----	----
COMPOSITE #	----	----	----	----	----	----	----	----	----	----	----	----	----	117.3	13.5	13.6	104.7	2.3E-07	----	----	----
	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	18.8	104.3	5.0E-08	----	----	----

SAMPLE	DEPTH (ft)		INDICES			GRAIN SIZE (%)				ATTERBERG LIMITS				MOD.PROCTOR		PERMEABILITY			CONSOLIDATION		
LOCATION	TOP	BOT	% M	DD	Gs	GRVL	SAND	SILT	CLAY	LL	PL	PI	CLASS	MDD	OMC	% M	DD	k	% M	DD	Cc
MW-1A	22	24	----	----	2.64	0.0	11.2	55.2	33.6	46.0	32.0	14.0	ML	----	----	36.7	84.1	1.7E-08	44.5	78.1	0.49
MW-1A	38	30	34.0	86.0	2.71	0.0	10.1	57.3	32.6	48.0	28.0	20.0	ML	----	----	----	----	----	----	----	----
MW-1A	38	39.5	14.3	----	2.63	0.7	92.9	3.0	3.4	NON-PLASTIC			SP-SM	----	----	----	----	----	----	----	----
MW-8	20	22	36.7	----	2.67	0.0	10.3	80.6	9.1	51.0	27.0	24.0	CH	----	----	35.4	84.4	4.7E-08	----	----	----
MW-8	29	31	39.9	79.6	2.67	0.0	9.3	70.6	20.1	NON-PLASTIC			ML	----	----	----	----	----	----	----	----
MW-8	2	4	----	----	2.59	0.0	34.4	12.0	53.6	39.0	19.0	20.0	CL	----	----	24.9	95.7	2.4E-08	----	----	----
OW-1	4	6	----	----	2.59	0.0	38.6	14.8	46.6	35.0	18.0	17.0	CL	----	----	25.7	93.8	9.6E-07	----	----	----
OW-1	8	10	----	----	2.65	0.0	66.9	18.2	14.9	NON-PLASTIC			SM	----	----	31.1	88.8	1.3E-05	----	----	----
OW-1	20	22	29.6	----	2.62	0.0	11.3	65.6	23.1	53.0	33.0	20.0	MH	----	----	38.5	79.9	2.5E-08	46	75.9	0.48
OW-2	13	15	----	----	2.67	0.0	40.0	28.8	31.2	33.0	17.0	16.0	CL	----	----	33.3	85.9	1.1E-07	----	----	----
OW-3	8	9	16.2	----	2.65	0.0	70.6	6.1	23.3	21.0	16.0	5.0	SC-SM	----	----	----	----	----	----	----	----
OW-3	9	11	----	----	2.61	0.0	37.5	23.5	39.0	37.0	18.0	19.0	CL	----	----	24.9	96.3	1.7E-07	----	----	----
OW-3	15	16.5	----	----	2.64	0.0	84.9	3.7	11.4	NON-PLASTIC			SC	----	----	16.1	106.6	2.3E-04	----	----	----
SB-5	4	6	----	----	2.45	----	----	----	----	28.0	24.0	4.0	ML	----	----	----	----	----	----	----	----

SAMPLE LOCATION	DEPTH (ft)		INDICES			GRAIN SIZE (%)				ATTERBERG LIMITS				MOD.PROCTOR		PERMEABILITY			CONSOLIDATION		
	TOP	BOT	% M	DD	Gs	GRVL	SAND	SILT	CLAY	LL	PL	PI	CLASS	MDD	OMC	% M	DD	k	% M	DD	Cc
TP1-3	1.1	2.6	25.6	----	----	0.0	22.1	22.5	55.4	55.0	25.0	30.0	CH	112.7	17.2	----	----	----	----	----	----
	1.1	2.6	----	----	2.63	----	----	----	----	51.0	43.0	8.0	MH/ML	----	----	----	----	----	----	----	----
TP1-5	5.5	6	----	----	2.46	----	----	----	----	NON-PLASTIC			SM	----	----	----	----	----	----	----	----
TP3-1	3.2	3.8	----	----	2.60	----	----	----	----	NON-PLASTIC			SM	----	----	----	----	----	----	----	----
TP2-5	6	6.5	19.7	----	2.62	0.0	75.8	4.8	19.4	NON-PLASTIC			SC	----	----	----	----	----	----	----	----
TP4-2	4.5	5.2	19.9	----	----	0.0	55.5	5.4	39.1	35.0	18.0	17.0	SC	----	----	----	----	----	----	----	----
	4.5	5.2	----	----	----	----	----	----	----	40.0	56.0	NP	SM	----	----	----	----	----	----	----	----
TP6-1	8	9	14.0	----	2.69	0.0	84.5	4.1	11.4	NON-PLASTIC			SM	----	----	----	----	----	----	----	----
TP7-1	6	6.5	26.4	----	----	0.0	44.7	12.8	42.5	40.0	19.0	21.0	CL	----	----	----	----	----	----	----	----
	6	6.5	----	----	----	----	----	----	----	40.0	19.0	21.0	ML	----	----	----	----	----	----	----	----
TP8-1	5	6	23.8	----	----	0.0	36.1	16.9	47.0	43.0	21.0	22.0	CL	----	----	----	----	----	----	----	----
	5	6	----	----	----	----	----	----	----	45.0	54.0	NP	ML	----	----	----	----	----	----	----	----
TP8-3	8	8.5	8.1	----	2.61	0.0	93.0	1.5	5.5	NON-PLASTIC			SP-SM	----	----	----	----	----	----	----	----
TP9-2	2.7	3	18.7	----	2.65	0.0	61.1	9.8	29.1	27.0	16.0	11.0	SC	----	----	----	----	----	----	----	----
TP9-3	4	5	20.3	----	----	0.0	60.6	11.7	27.7	26.0	18.0	8.0	SC	----	----	----	----	----	----	----	----
	3.5	5	----	----	----	----	----	----	----	26.0	15.0	11.0	SC	----	----	----	----	----	----	----	----
TP10-2	3	5	19.3	----	----	0.0	62.6	6.6	30.8	28.0	16.0	12.0	SC	----	----	----	----	----	----	----	----
	3	5	----	----	----	----	----	----	----	25.0	12.0	13.0	SC	----	----	----	----	----	----	----	----
TP11-1	1.8	4	17.5	----	----	0.0	57.2	13.9	28.9	29.0	16.0	13.0	SC	----	----	----	----	----	----	----	----
	1.8	4	----	----	----	----	----	----	----	30.0	10.0	20.0	SC	----	----	----	----	----	----	----	----
TP11-2	5.5	7	15.8	----	2.69	0.0	89.2	1.0	9.8	NON-PLASTIC			SP-SM	----	----	----	----	----	----	----	----
TP14-3	6.5	7	27.1	----	----	0.0	43.1	15.8	41.1	35.0	17.0	18.0	CL	----	----	----	----	----	----	----	----
	6.5	7	----	----	----	----	----	----	----	29.0	15.0	14.0	CL	----	----	----	----	----	----	----	----
TP16-1	0.4	1.8	25.2	----	----	0.0	34.0	12.5	53.5	48.0	22.0	26.0	CL	----	----	----	----	----	----	----	----
	0.4	1.8	----	----	----	----	----	----	----	49.0	18.0	31.0	CL	----	----	----	----	----	----	----	----

SAMPLE LOCATION	DEPTH (ft)		INDICES			GRAIN SIZE (%)				ATTERBERG LIMITS				MOD.PROCTOR		PERMEABILITY			CONSOLIDATION		
	TOP	BOT	% M	DD	Gs	GRVL	SAND	SILT	CLAY	LL	PL	PI	CLASS	MDD	OMC	% M	DD	k	% M	DD	Cc
TP1-3	1.1	2.6	----	----	----	----	----	----	----	----	----	----	----	----	----	16.7	100.7	1.1E-07	----	----	----
	1.1	2.6	----	----	----	----	----	----	----	----	----	----	----	----	----	21.1	101.7	1.1E-08	----	----	----
COMPOSITE	----	----	----	----	----	----	----	----	----	----	----	----	----	122.8	11.1	10.9	110.0	3.5E-06	----	----	----
	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	14.0	109.5	1.1E-05	----	----	----
	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	16.9	109.7	2.8E-08	----	----	----
COMPOSITE	----	----	----	----	----	----	----	----	----	----	----	----	----	119.4	13.2	14.2	105.8	5.6E-06	----	----	----
	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	17.8	107.1	1.9E-08	----	----	----
COMPOSITE	----	----	----	----	----	----	----	----	----	----	----	----	----	117.3	13.5	13.6	104.7	2.3E-07	----	----	----
	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	18.8	104.3	5.0E-08	----	----	----

RMT Soils Laboratory - Moisture Content Determination

PROJECT: WEYERHAEUSER

					by	date
		Tech:	GTF	06/12/90	QC	6-12-90
JOB #:	467.42	Input:	GTF	06/12/90	QA	6-12-90

BORING	SAMPLE	DEPTH	TARE	WET WT	DRY WT	% MOISTURE
TP16-1		0.4-1.8	79.89	286.02	244.48	25.2
TP1-3		1.1-2.6	80.18	297.49	253.20	25.6
TP8-1		5.0-6.0'	77.05	324.41	276.78	23.8
TP7-1		6.0-6.5'	77.90	362.82	303.27	26.4
TP14-3		6.5-7.0'	77.41	369.55	307.23	27.1
TP4-2		4.5-5.2'	77.45	325.85	284.64	19.9
TP11-1		1.8-4.0'	78.71	395.45	348.33	17.5
TP9-3		4.0-5.0'	78.58	420.67	363.05	20.3
TP10-2		3.0-5.0'	78.07	381.69	332.64	19.3

RMT Soils Laboratory - Moisture Content Determination

PROJECT: WEYERHAEUSER

					by	date
		Tech:	JPH	06/27/90	QC	6/27/90
JOB #:	467.42	Input:	HJW	06/27/90	QA	6/27/90

BORING	SAMPLE	DEPTH	TARE	WET WT	DRY WT	% MOISTURE
OW-1		20-22'	80.50	333.69	275.86	29.6
MW-8		20-22'	76.49	404.25	316.21	36.7

RMT Soils Laboratory - Moisture Content Determination

PROJECT: Weyerhaeuser

					by	date
		Tech:	GTF	5/18/90	QC	5-21-90
JOB #:	467.42	Input:	JPH	05/21/90	QA	6-4-90

BORING	SAMPLE	DEPTH	TARE	WET WT	DRY WT	% MOISTURE
OW-3	S5		76.55	145.05	135.48	16.2
TP2-5		6.0-6.5'	77.21	174.92	158.81	19.7
TP9-2		2.7-3.0'	77.99	141.74	131.69	18.7
TP8-3		8.0-8.5'	78.58	362.79	341.41	8.1
MW1A	S8		77.01	128.56	115.49	34.0
MW-8	S8		77.80	135.62	119.14	39.9
TP11-2		5.5-7.0'	76.05	374.65	333.80	15.8
MW-1A	S10		78.92	351.21	317.23	14.3
TP6-1		8-9'	76.87	398.27	358.68	14.0

RMT Soils Laboratory - Dry Density Determination

PROJECT: Weyerhaeuser

JOB #: 462.42

Tech: JPH 5/18/90 QC

Input: GTF 05/21/90 QA

	by	date
QC	AJW	5-21-90
QA	JPH	6-4-90

BORING #	MW-1A	MW-8
SAMPLE #	S8	S8
DEPTH		
% MOISTURE	34.0	39.9
WET DENSITY	115.3	111.3
DRY DENSITY	86.0	79.6
TARE WT	77.01	77.8
WET WT+TARE	128.56	135.62
DRY WT+TARE	115.49	119.14
TARE WT	0	0
DIAMETER	1.45	1.45
HEIGHT	3.42	2.87
WET WT+TARE	171.0	138.6

RMT Soils Laboratory - Specific Gravity Determination

PROJECT: WEYERHAEUSER

JOB #: 467.42

Tech: GTF 06/0890
Input: GTF 06/12/90

QC GHP 6/8/90
QA JFE 6/12/90

FLASK VOL @20 C	250	
AIR REMOVAL	VACUUM	
BORING #	OW-1	MW-8
SAMPLE #		
DEPTH	4-6'	2-4'
WT FLASK+H20	355.25	352.51
WT DRY SOIL	26.92	26.35
WT FLASK+SOIL+H20	371.8	368.69
TEMP C	22	22
SPECIFIC GRAVITY	2.59	2.59

RMT Soils Laboratory - Specific Gravity Determination

PROJECT: Weyerhaeuser

JOB #: 467.42

Tech: GTF 6-4-90
Input: GTF 06/04/90

QC [illegible] 6-6-90
QA [illegible] 6-3-90

FLASK VOL @20 C 250
AIR REMOVAL VACUUM

BORING #	OW-3	TP2-5	TP9-2	MW-1A	MW-8
SAMPLE #					
DEPTH	S-5	6.0-6.5'	2.7-3.0'	S8	S8
WT FLASK+H20	355.14	352.48	351.38	354.05	353.52
WT DRY SOIL	26.41	26.87	26.22	25.83	26.30
WT FLASK+SOIL+H20	371.6	369.1	367.69	370.36	369.99
TEMP C	21.5	21.5	21.5	21.5	21.5
SPECIFIC GRAVITY	2.65	2.62	2.65	2.71	2.67

RMT Soils Laboratory - Specific Gravity Determination

PROJECT: Weyerhaeuser

JOB #: 467.42

Tech: GTF 5-29-90
Input: GTF 05/30/90

QC GTF 6/4/90
QA JOH 6/4/90

FLASK VOL @20 C	250	
AIR REMOVAL	VACUUM	
BORING #	OW-1	MW-8
SAMPLE #		
DEPTH	8-10'	20-22'
WT FLASK+H20	352.37	351.45
WT DRY SOIL	26.2	27.24
WT FLASK+SOIL+H20	368.68	368.5
TEMP C	22	22
SPECIFIC GRAVITY	2.65	2.67

RMT Soils Laboratory - Specific Gravity Determination

PROJECT: Weyerhaeuser

JOB #: 467.42

Tech: GAP 5/22/90 QC GTF 5-23-90
Input: GAP 05/22/90 QA JDL 6-4-90

FLASK VOL @20 C	250 ml			
AIR REMOVAL	VACUUM			
BORING #	TP-8-3	TP-11-2	MW-1A	TP-6-1
SAMPLE #			S10	
DEPTH	8-8.5'	5.5-7.0'		8-9.0'
WT FLASK+H20	355.43	352.63	351.63	353.99
WT DRY SOIL	25.33	20.88	25	25.16
WT FLASK+SOIL+H20	371.06	365.74	367.13	369.81
TEMP C	21.5	21.5	21.5	21.5
SPECIFIC GRAVITY	2.61	2.69	2.63	2.69

RMT Soils Laboratory - Specific Gravity Determination

PROJECT: Weyerhaeuser

JOB #: 467.42

Tech: GTF 5-31-90

Input: GTF 05/31/90

QC GAP 6/4/90

QA JDH 6/4/90

FLASK VOL @20 C 250

AIR REMOVAL VACUUM

BORING #	MW-1A	SB-9
SAMPLE #		
DEPTH	22-24.0'	18-20.2'
WT FLASK+H20	355.22	352.39
WT DRY SOIL	26.82	27.16
WT FLASK+SOIL+H20	371.89	369.19
TEMP C	22	22
SPECIFIC GRAVITY	2.64	2.62

RMT Soils Laboratory - Specific Gravity Determination

PROJECT: Weyerhaeuser

JOB #: 467.42

Tech: GTF 6-4-90

Input: GTF 06/04/90

QC NW 6-6-90

QA JPH 6-26-90

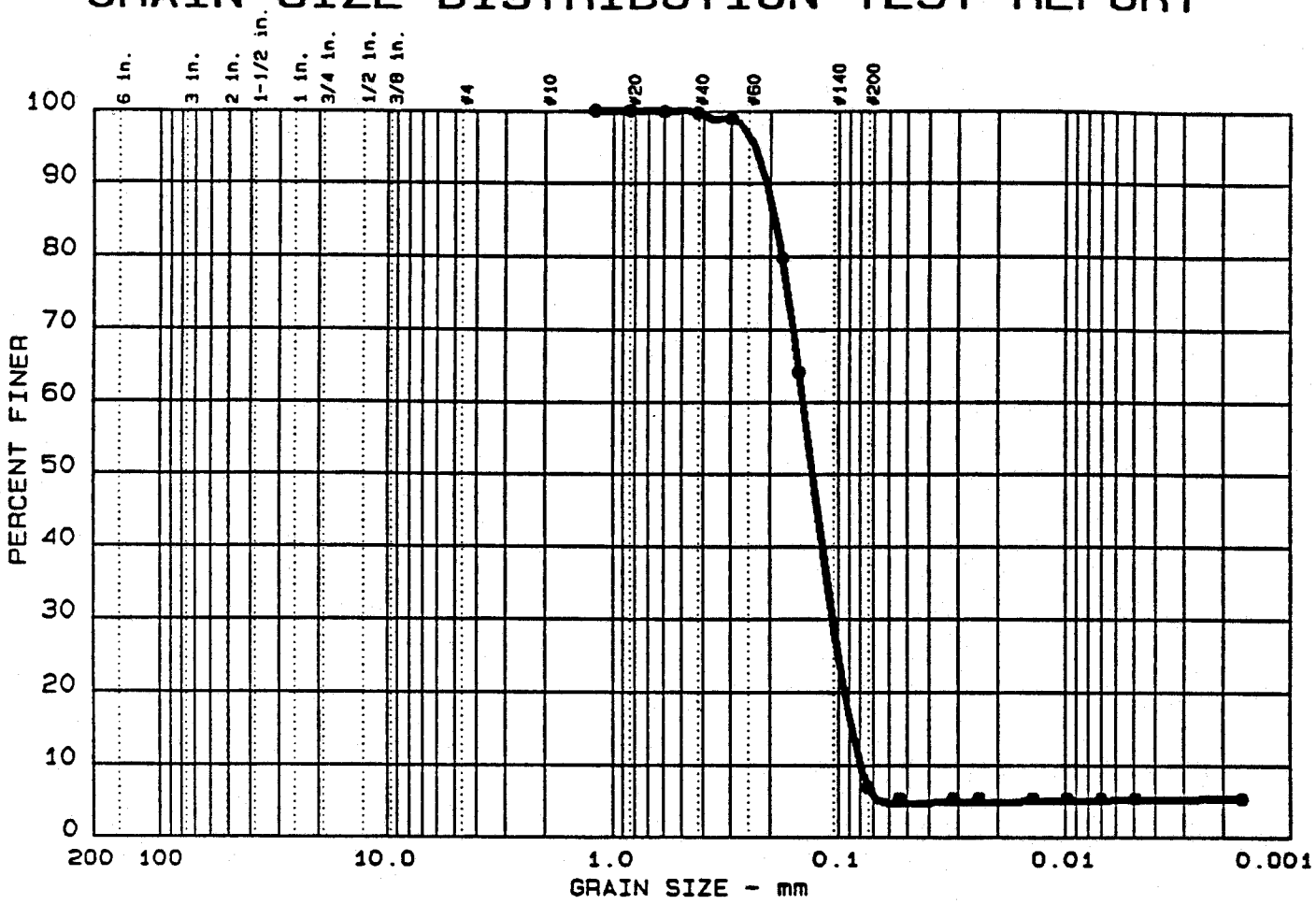
FLASK VOL @20 C 250

AIR REMOVAL VACUUM

BORING #	OW-3	OW-3	OW-2	OW-1
SAMPLE #				
DEPTH	9-11.0'	15-16.5'	13-15.0'	20-22.0'
WT FLASK+H20	355.28	352.56	351.49	354.05
WT DRY SOIL	29.24	26.02	28.75	26.78
WT FLASK+SOIL+H20	373.34	368.74	369.47	370.62
TEMP C	21.5	21.5	21.5	21.5
SPECIFIC GRAVITY	2.61	2.64	2.67	2.62

✓ JAH 6-28-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	14	0.0	0.0	93.0	1.5	5.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.19	0.14	0.13	0.105	0.0872	0.0795	0.98	1.8

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP8-3 8.0-8.5'

Date: 5-22-90

Remarks:

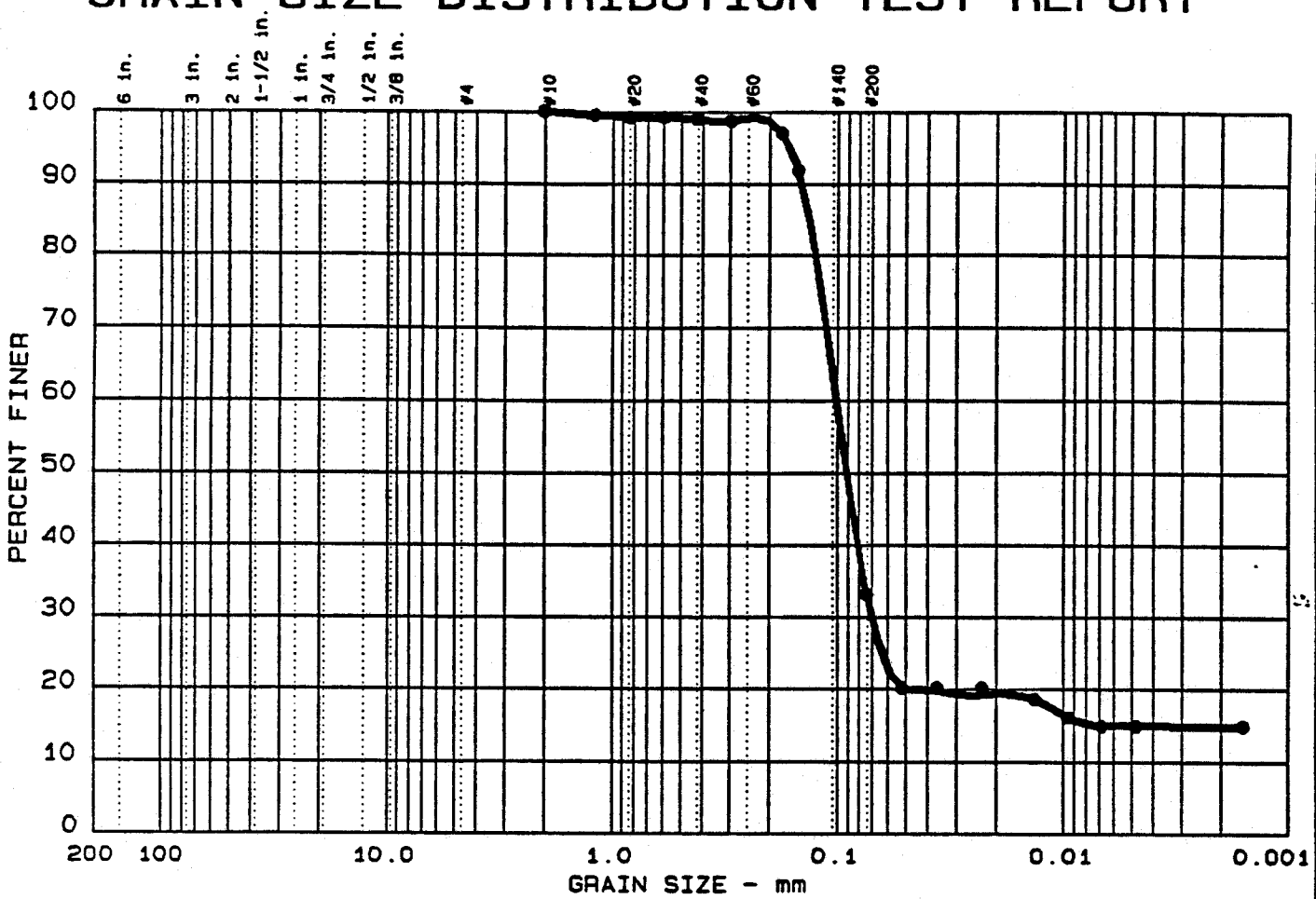
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ JPK 6-25-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	13	0.0	0.0	66.9	18.2	14.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.13	0.10	0.09	0.070	0.0070			

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: OW-1 8-10'

Date: 6-1-90

Remarks:

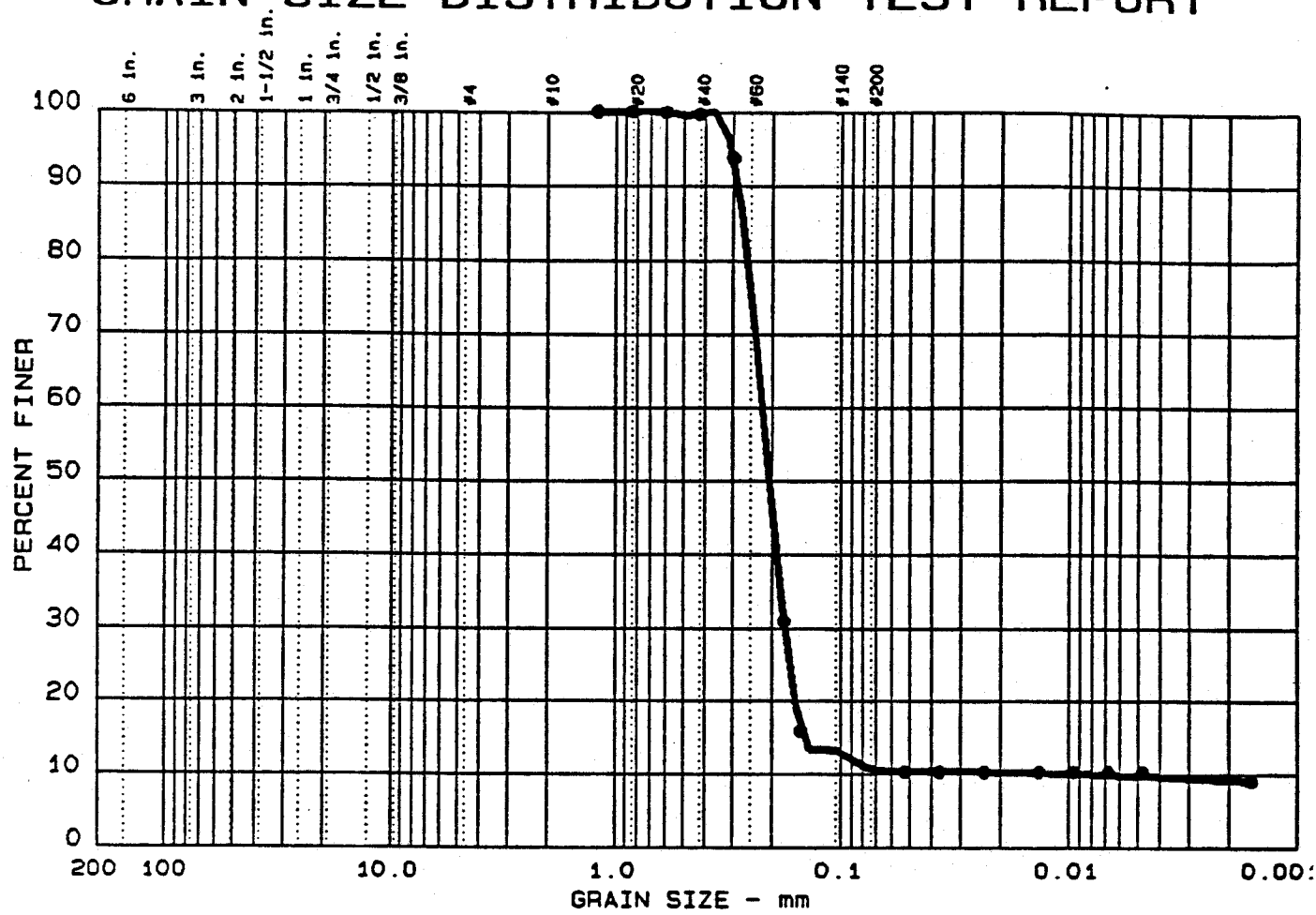
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ 1/1 6-27

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	13	0.0	0.0	89.2	1.0	9.8

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.27	0.22	0.20	0.176	0.1459	0.0082	17.08	26.8

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP11-2 5.5-7.0'

Date: 5-22-90

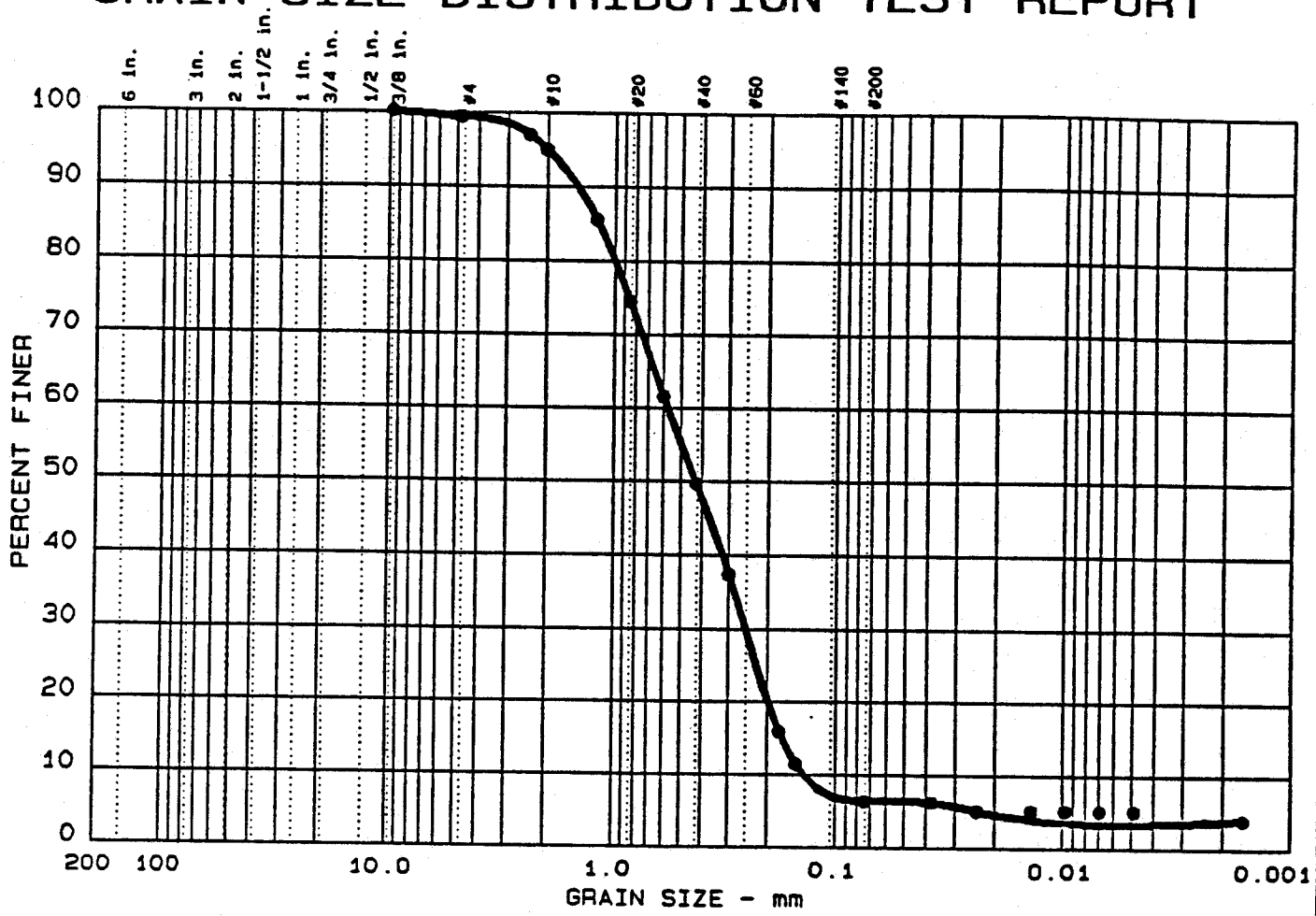
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	0.7	92.9	3.0	3.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			1.16	0.57	0.42	0.250	0.1710	0.1358	0.81	4.2

	MATERIAL DESCRIPTION	USCS	AASHTO
●			

Project No.: 467.42
Project: WEYERHAEUSER
● Location: MW-1A S-10

Date: 5-22-90

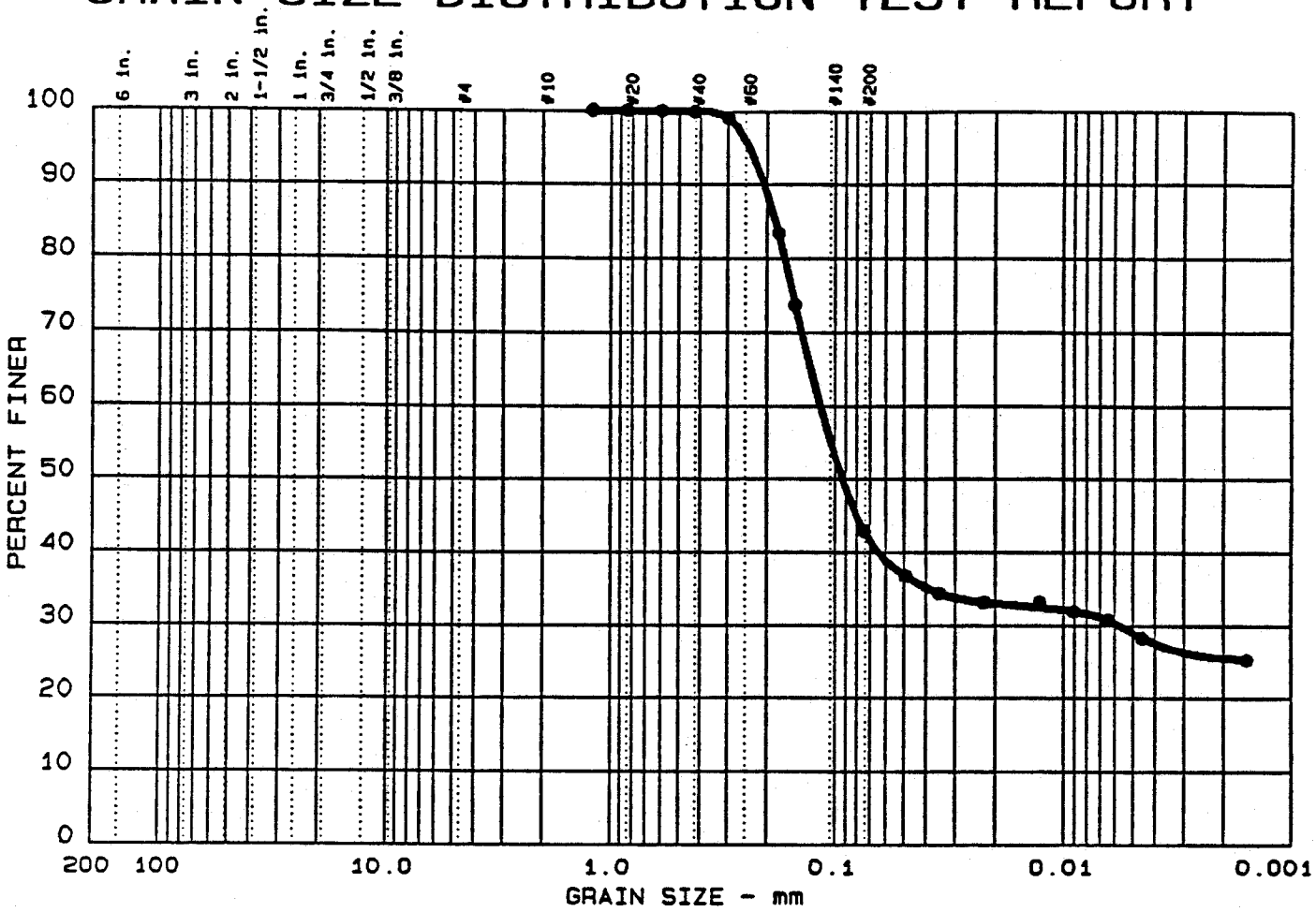
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	10	0.0	0.0	57.2	13.9	28.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	29	13	0.18	0.12	0.09	0.006				

MATERIAL DESCRIPTION	USCS	AASHTO
●	CL	

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP11-1 1.8-4.0'

Date: 6-8-90

Remarks:

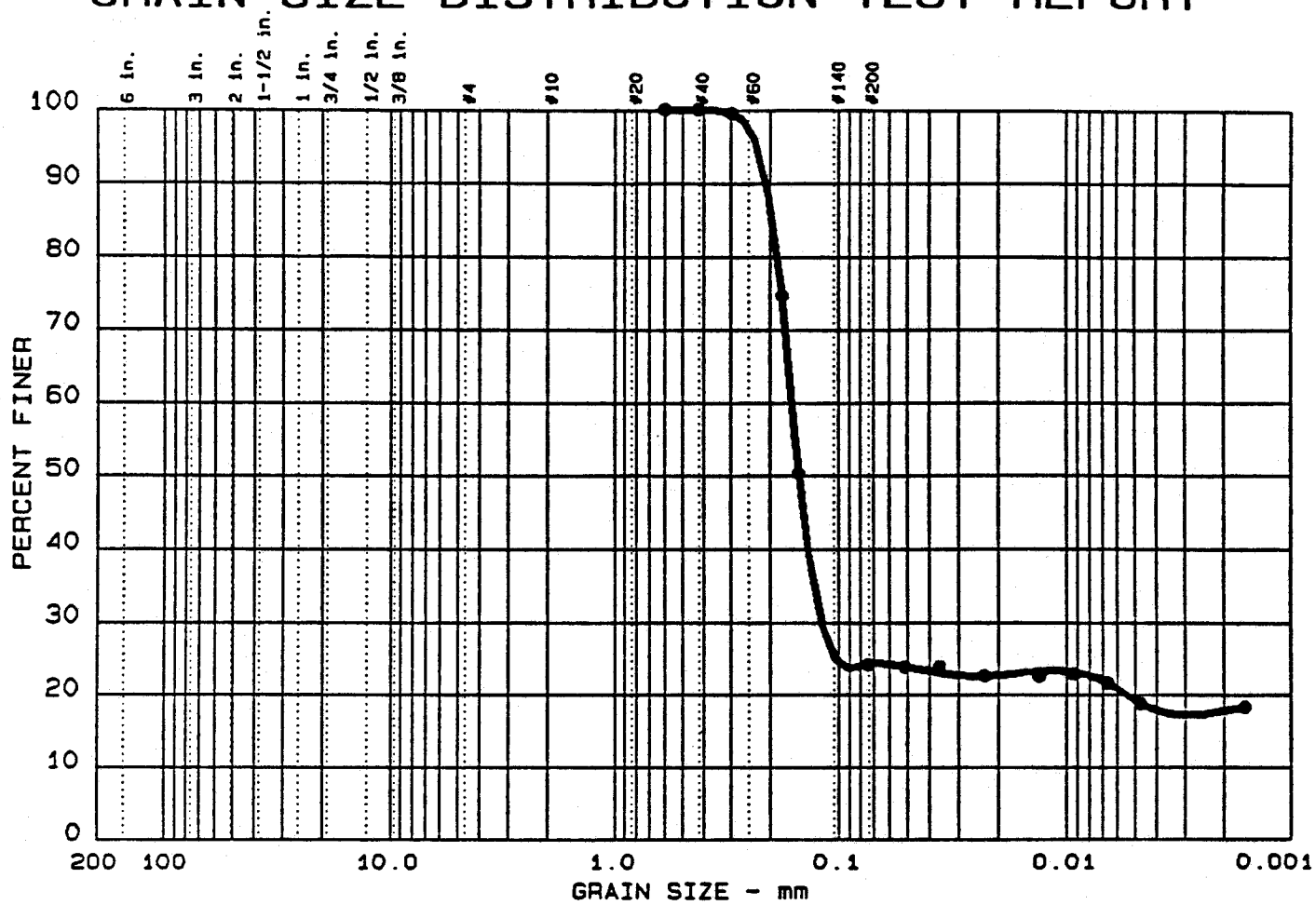
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT. INC.

Figure No. _____

✓ JM 6-20-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.0	75.8	4.8	19.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.19	0.16	0.15	0.118				

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP2-5 6.0-6.5'

Date: 6-8-90

Remarks:

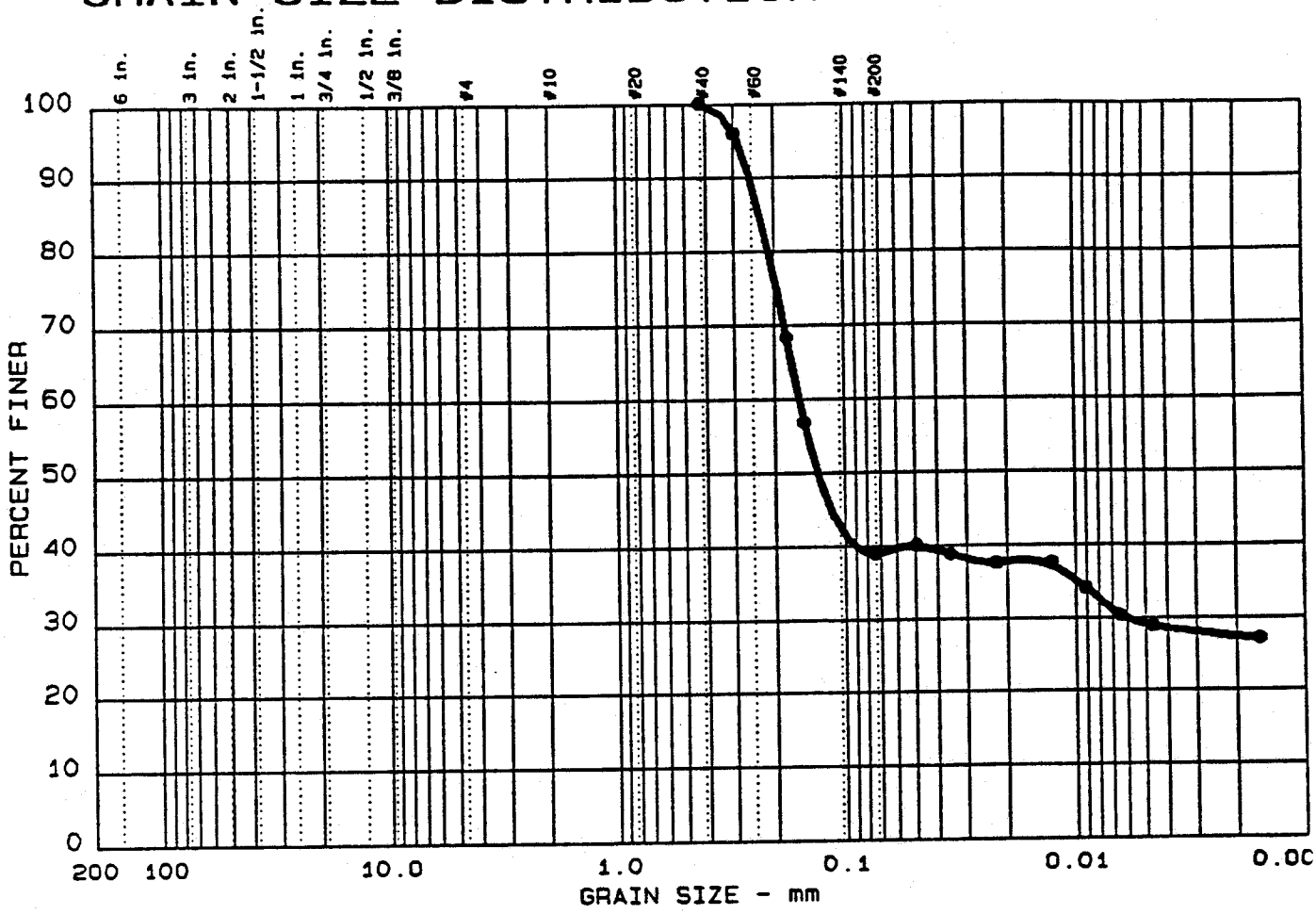
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ JM 6-20-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	5	0.0	0.0	61.1	9.8	29.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.23	0.16	0.13	0.006				

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP9-2 2.7-3.0'

Date: 6-8-90

Remarks:

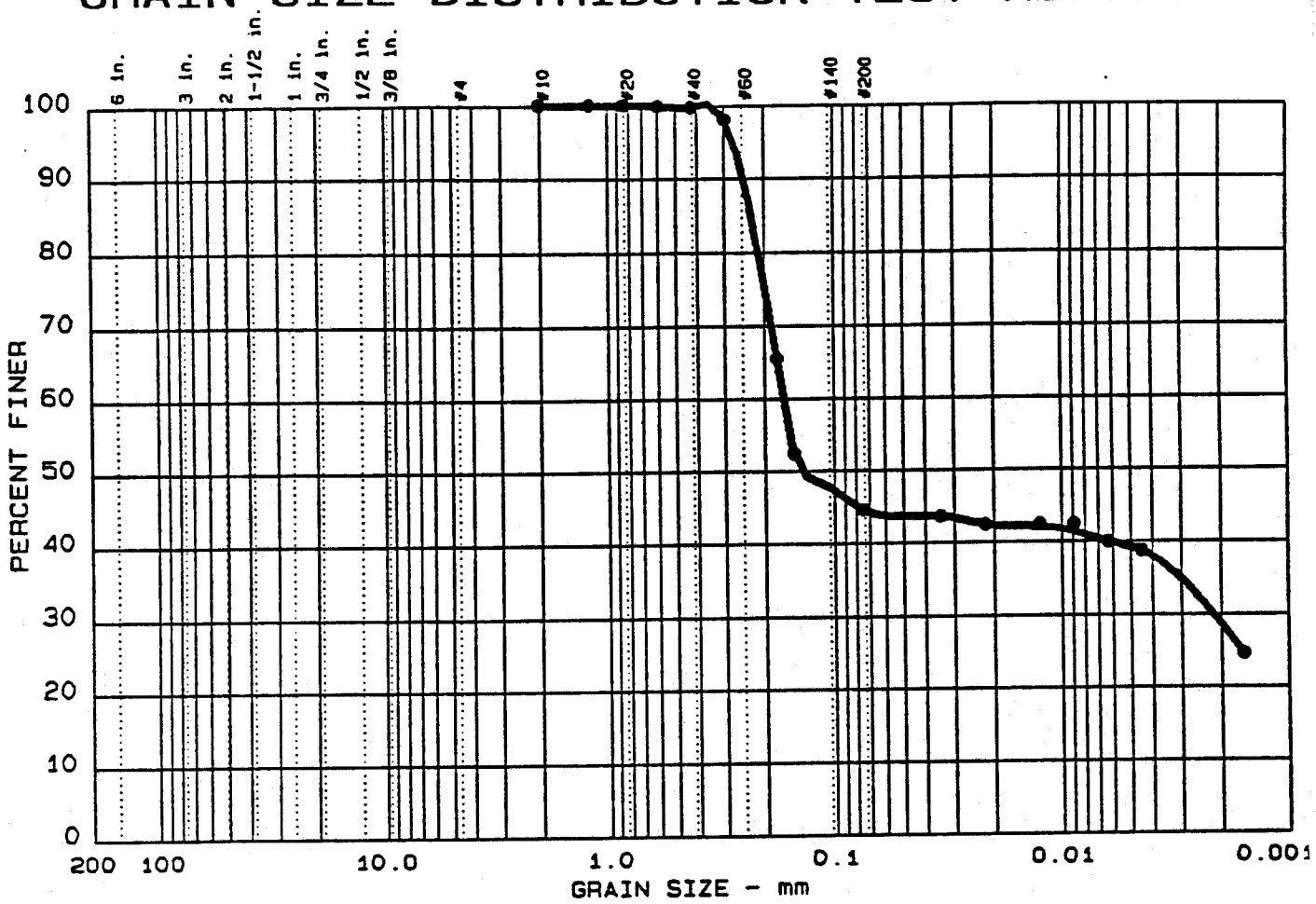
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT. INC.

Figure No. _____

✓ JPF 6-12-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	0.0	55.5	5.4	39.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	35	17	0.23	0.17	0.14	0.002				

MATERIAL DESCRIPTION	USCS	AASHTO
●	CL	

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP4-2 4.5-5.2

Date: 6-8-90

Remarks:

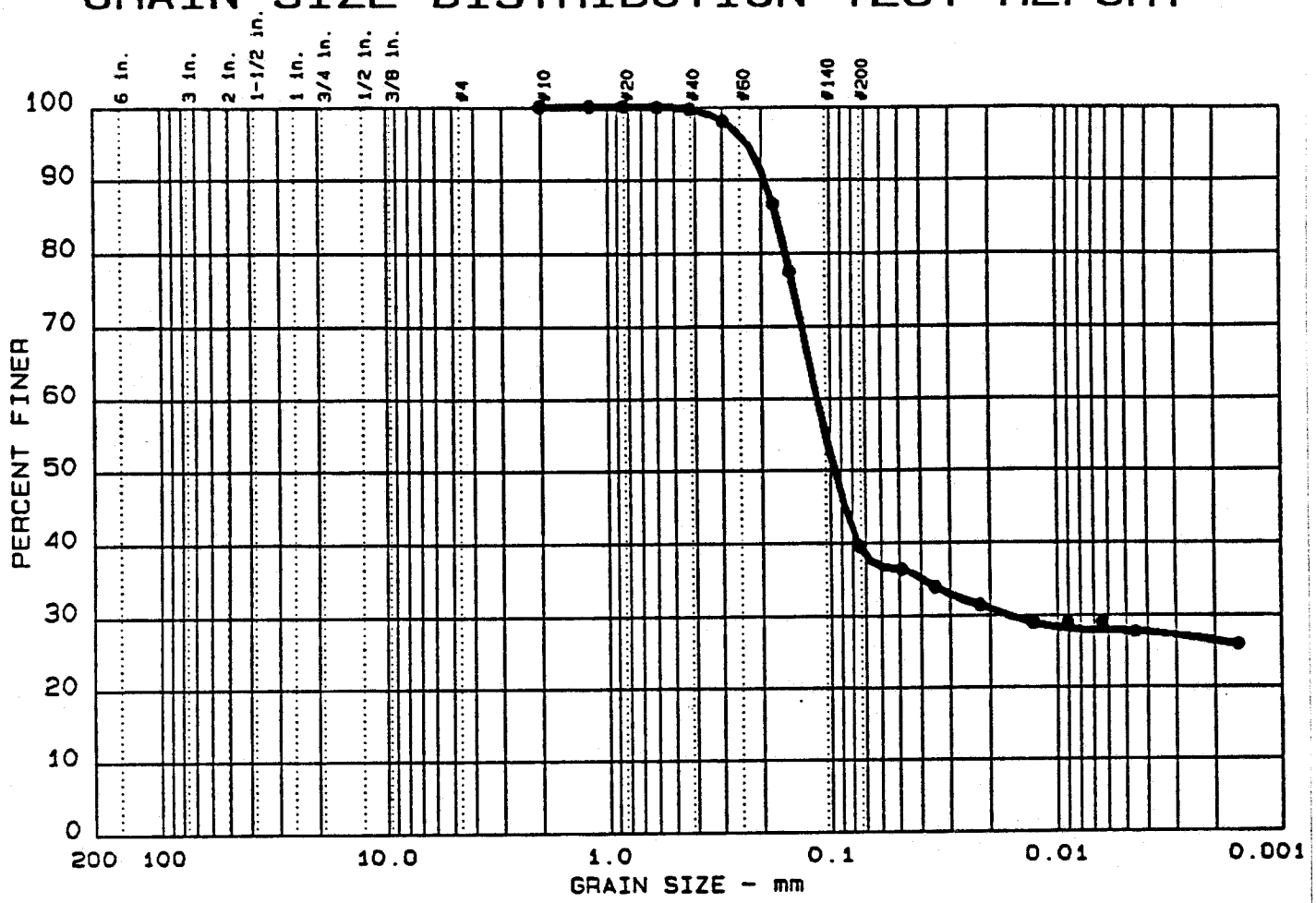
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. ———

✓ JPH 6-12-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	9	0.0	0.0	60.6	11.7	27.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	26	8	0.17	0.11	0.10	0.017				

MATERIAL DESCRIPTION	USCS	AASHTO
●	CL	

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP9-3 4.0-5.0'

Date: 6-8-90

Remarks:

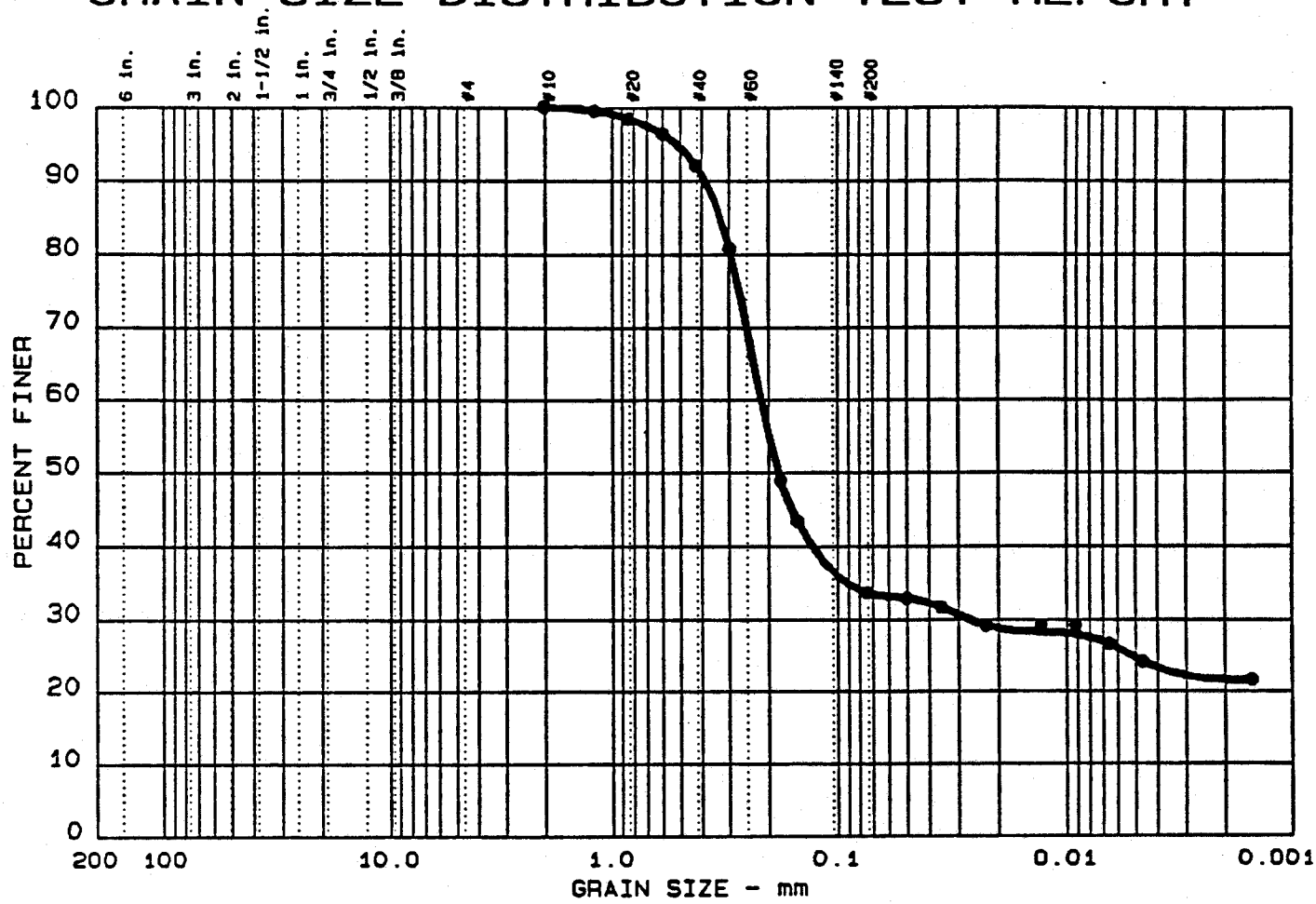
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ SPI 6.27.9.

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	66.4	8.9	24.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.33	0.22	0.18	0.026				

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: SB-9 18-20'

Date: 5-29-90

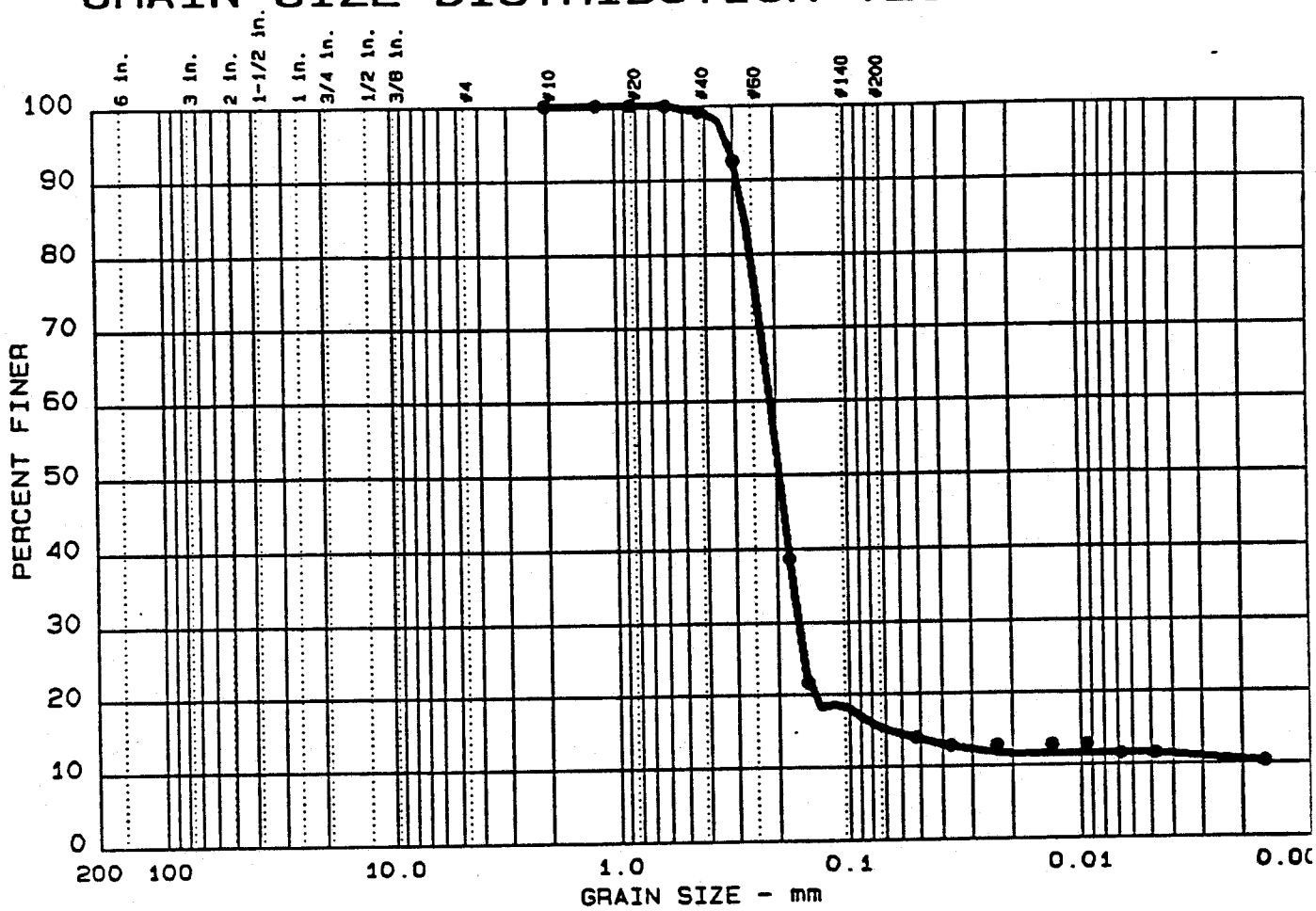
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT. INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	16	0.0	0.0	84.5	4.1	11.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.27	0.21	0.19	0.164	0.0669			

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP6-1 8-9.0'

Date: 5-22-90

Remarks:

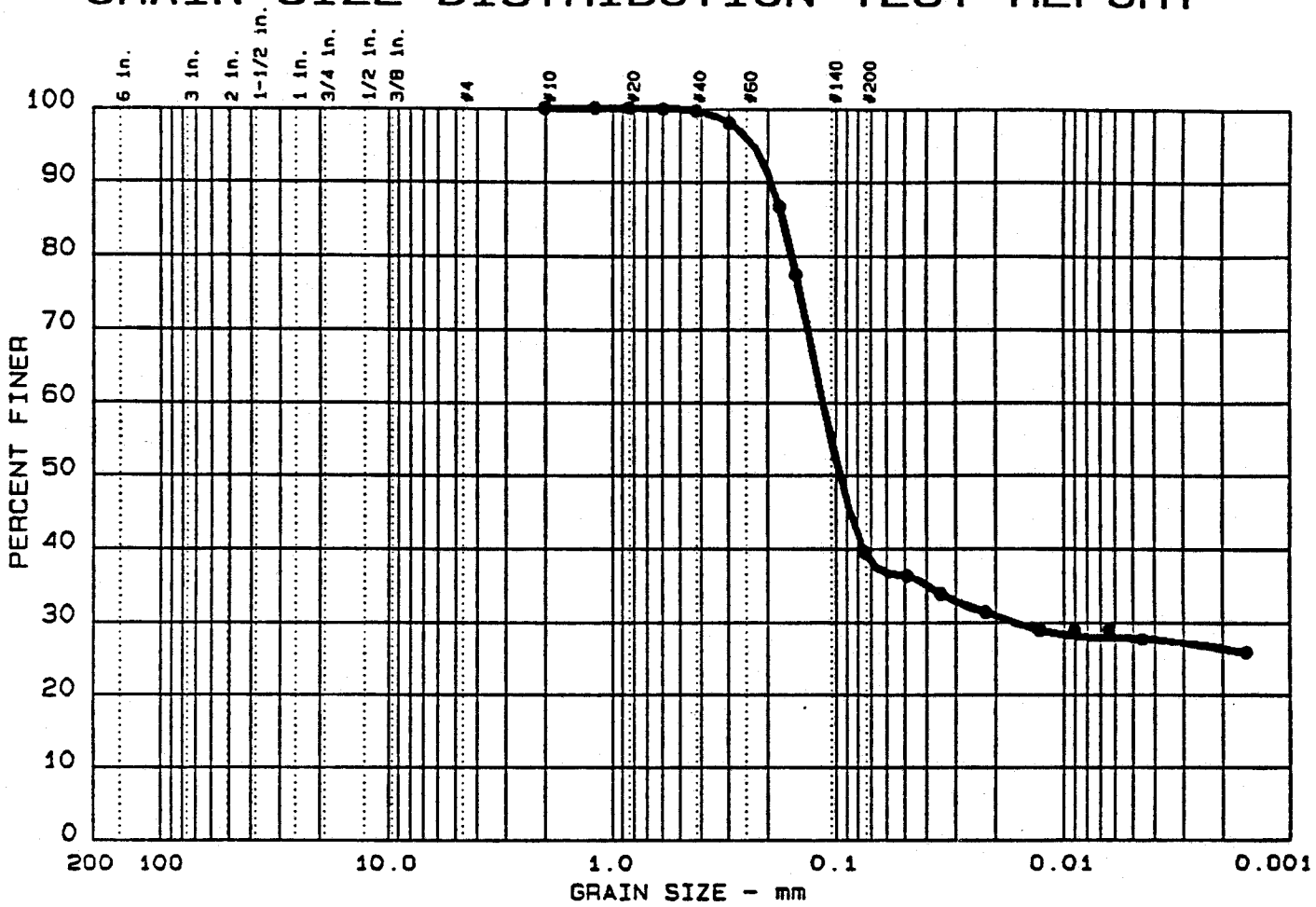
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT. INC.

Figure No. _____

✓ JPM 6-12-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	9	0.0	0.0	60.6	11.7	27.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	26	8	0.17	0.11	0.10	0.017				

MATERIAL DESCRIPTION	USCS	AASHTO
●	CL	

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP9-3 4.0-5.0'

Date: 6-8-90

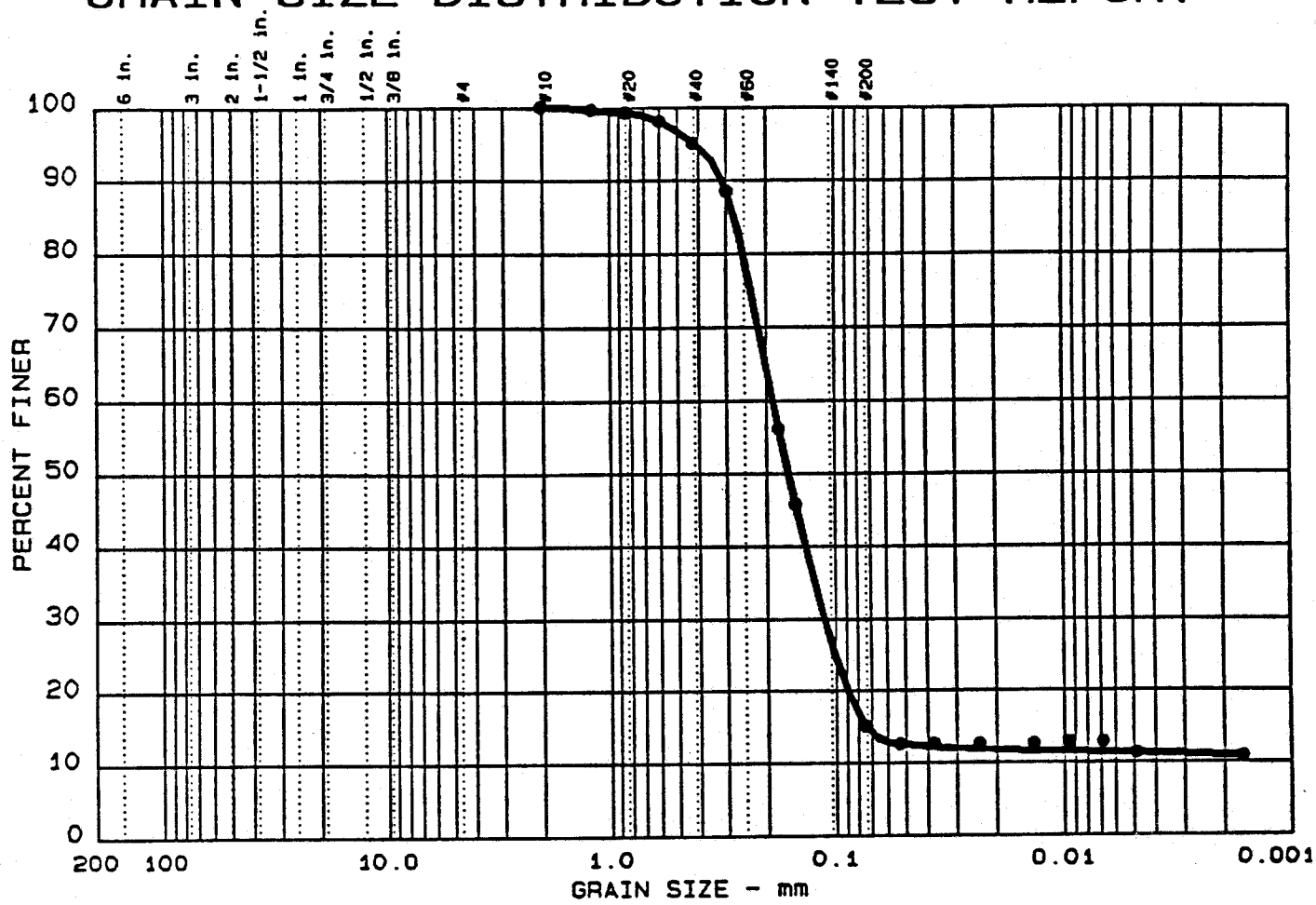
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	20	0.0	0.0	84.9	3.7	11.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.27	0.19	0.16	0.112	0.0729			

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: OW-3 15-16.5'

Date: 6-6-90

Remarks:

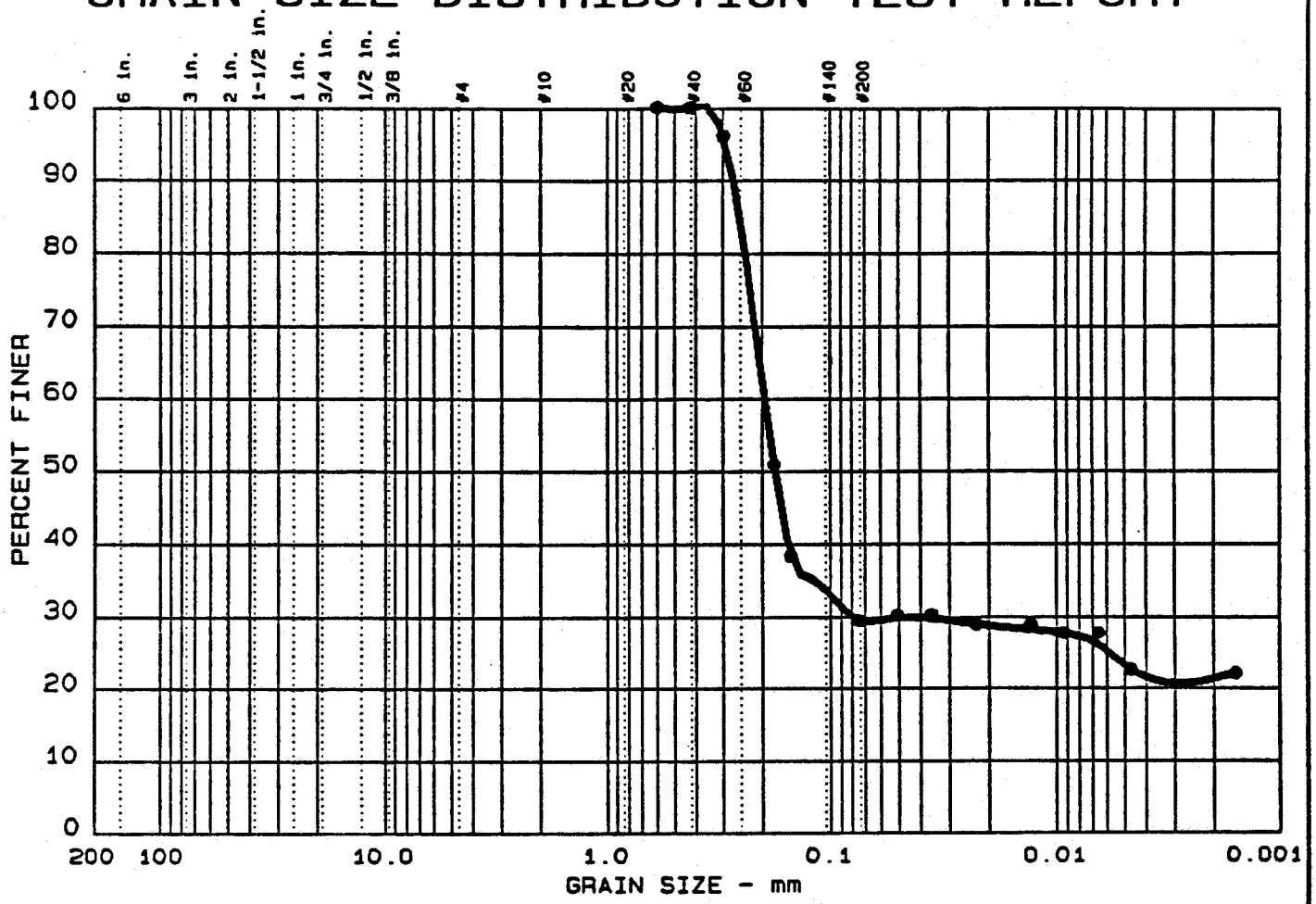
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ 6-20-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	4	0.0	0.0	70.6	6.1	23.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.25	0.19	0.18	0.079				

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: OW-3 S5

Date: 6-8-90

Remarks:

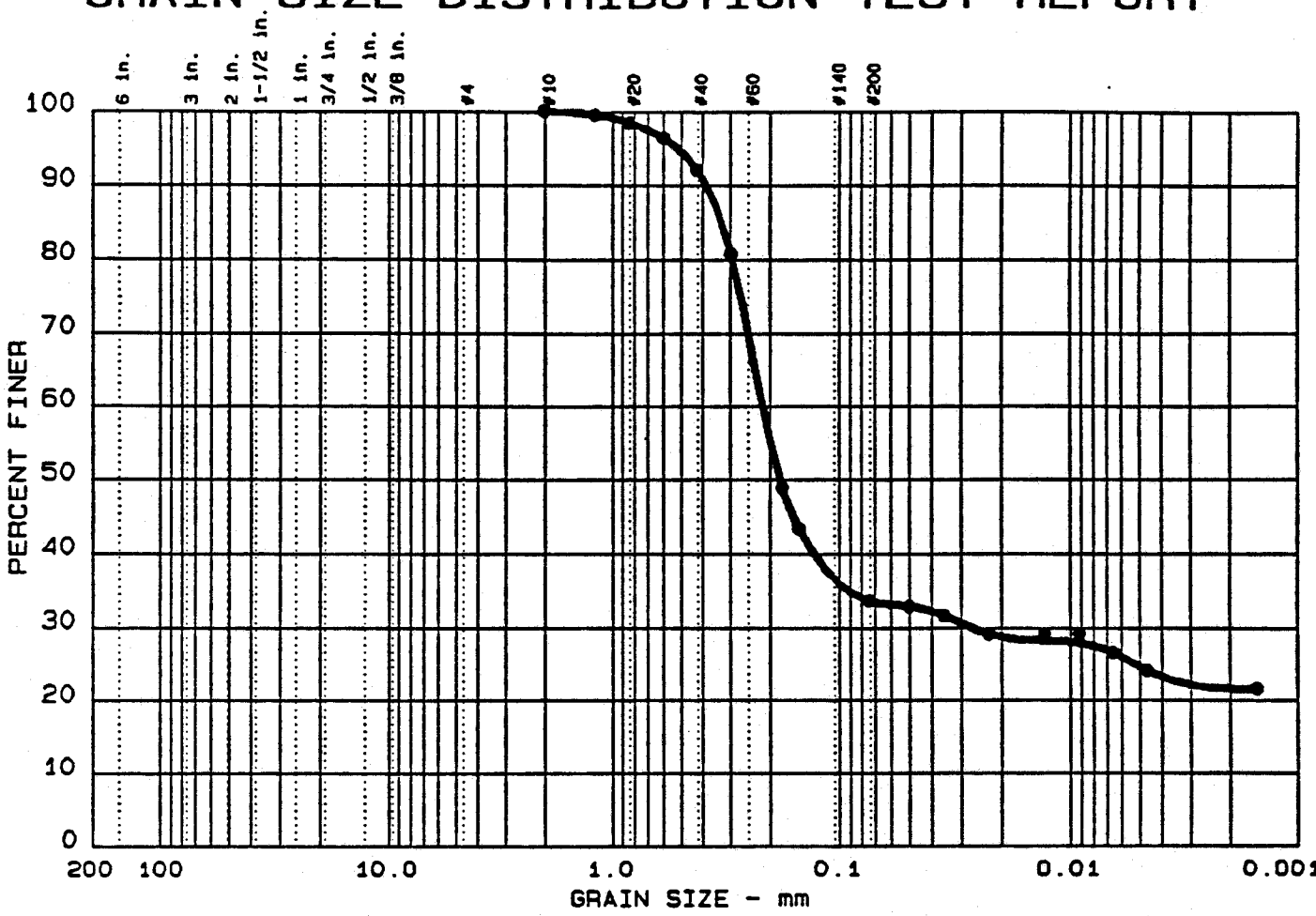
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ JPI 6-27-9.

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	66.4	8.9	24.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.33	0.22	0.18	0.026				

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: SB-9 18-20'

Date: 5-29-90

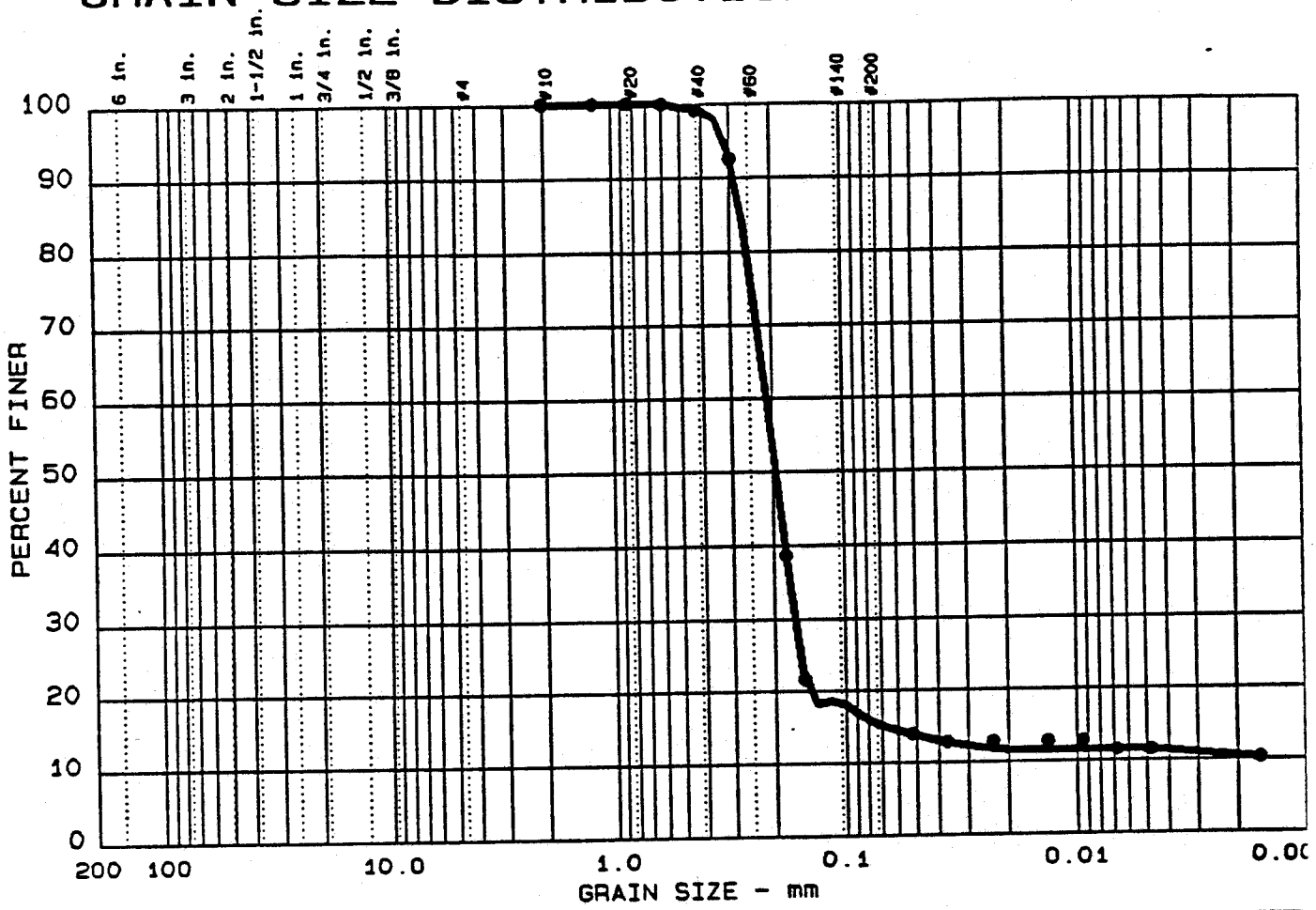
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	16	0.0	0.0	84.5	4.1	11.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.27	0.21	0.19	0.164	0.0669			

	MATERIAL DESCRIPTION	USCS	AASHTO
●			

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP6-1 8-9.0'

Date: 5-22-90

Remarks:

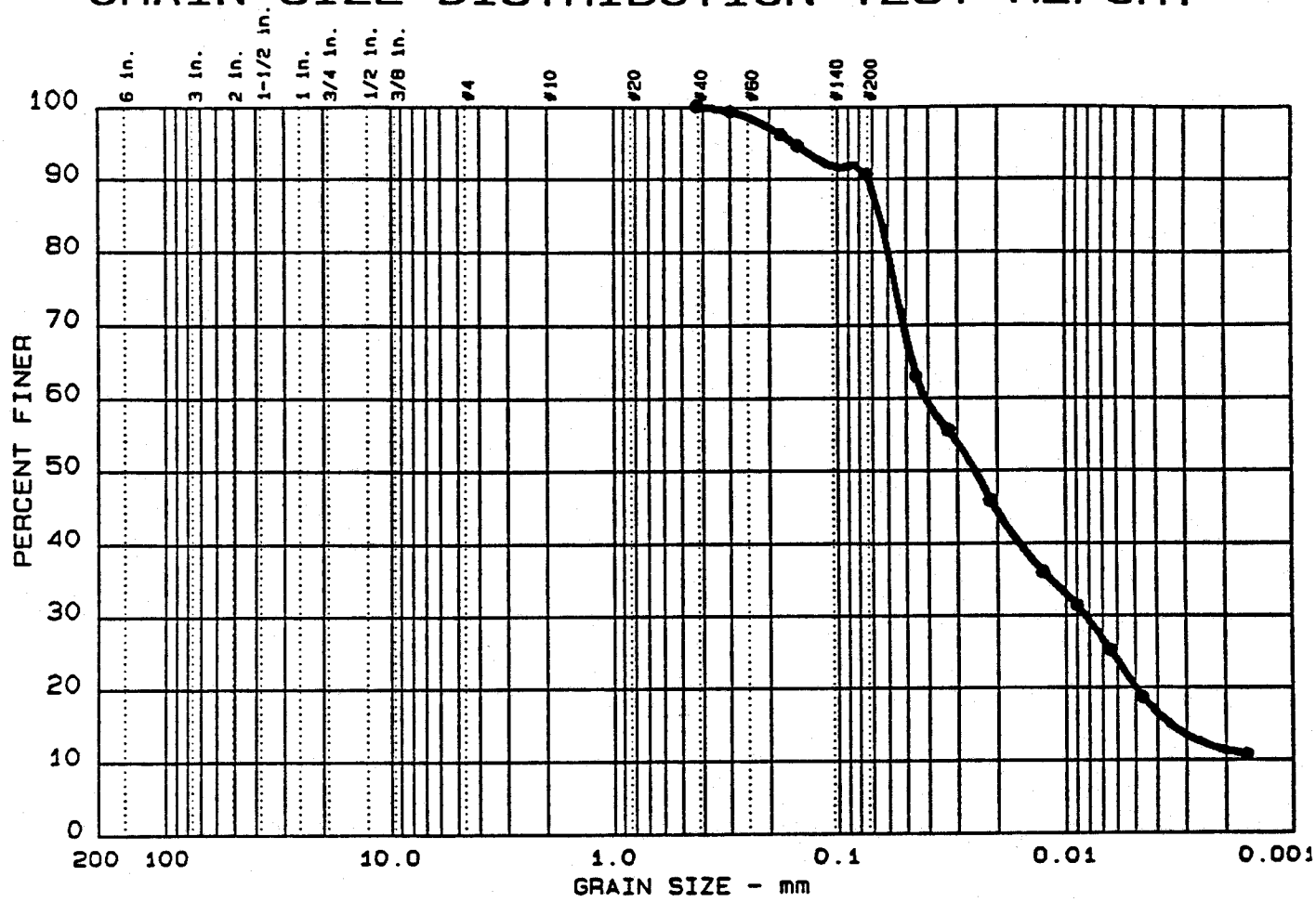
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT. INC.

Figure No. _____

✓ JPH 6-20-9.

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	9.3	70.6	20.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.03	0.008	0.0035			

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: MW-8 S8

Date: 6-8-90

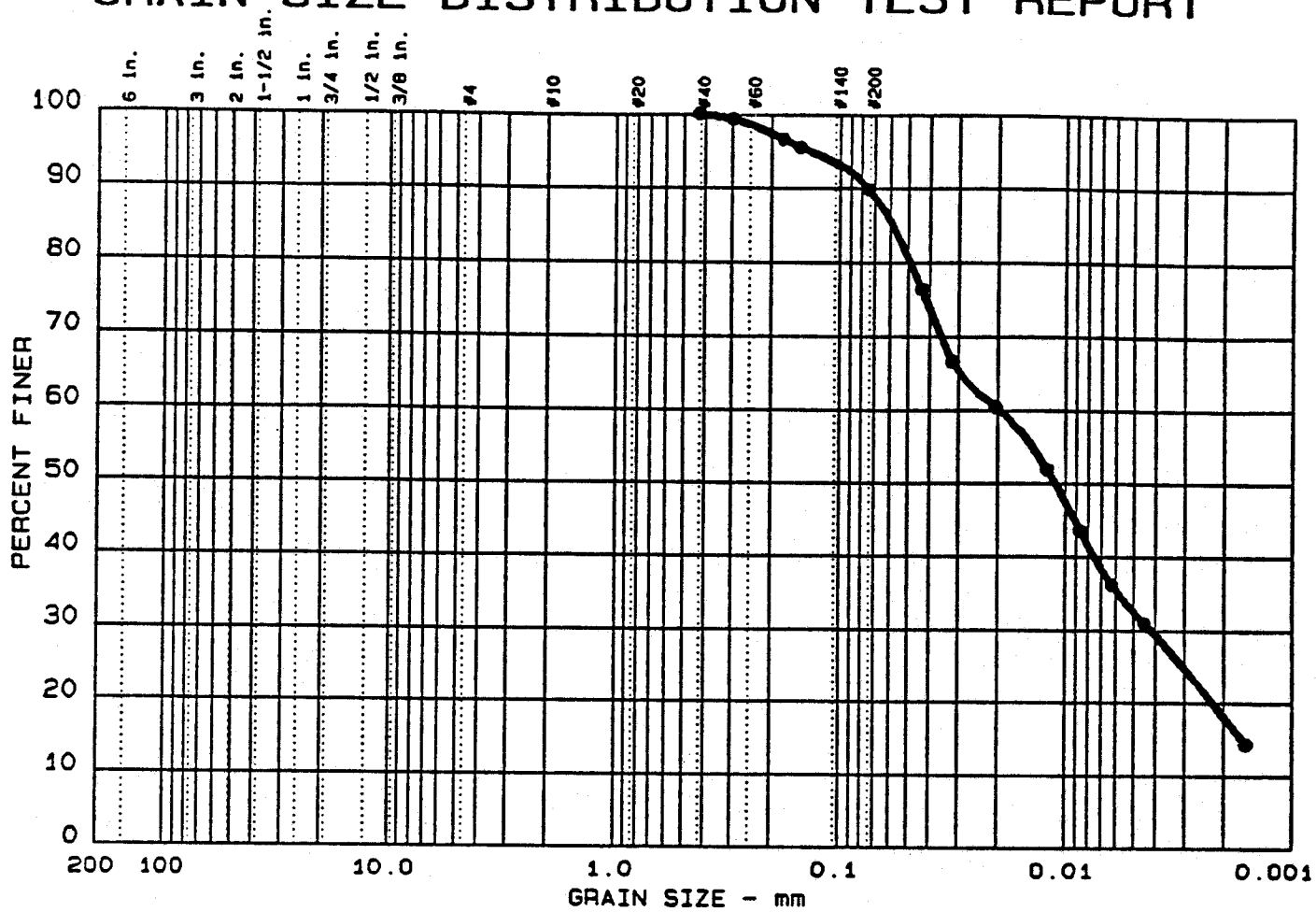
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT. INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	0.0	10.1	57.3	32.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.01	0.004	0.0016			

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: MW-1A SB

Date: 6-8-90

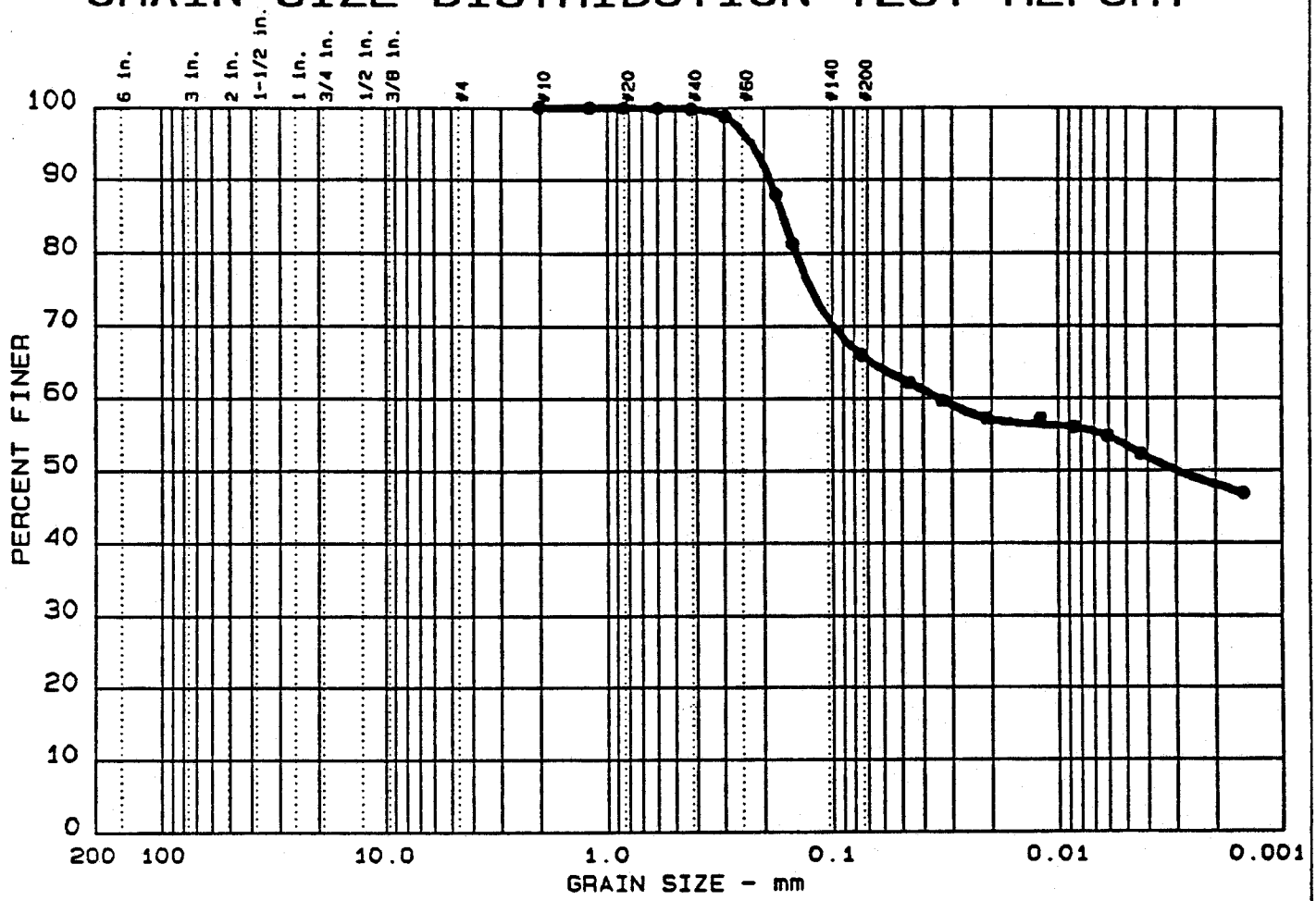
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT -
RMT, INC.

Figure No. _____

✓ DN 6-12-9.

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	16	0.0	0.0	34.0	12.5	53.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	48	26	0.16		0.00					

MATERIAL DESCRIPTION	USCS	AASHTO
●	CL	

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP16-1 .4-1.8'

Date: 6-8-90

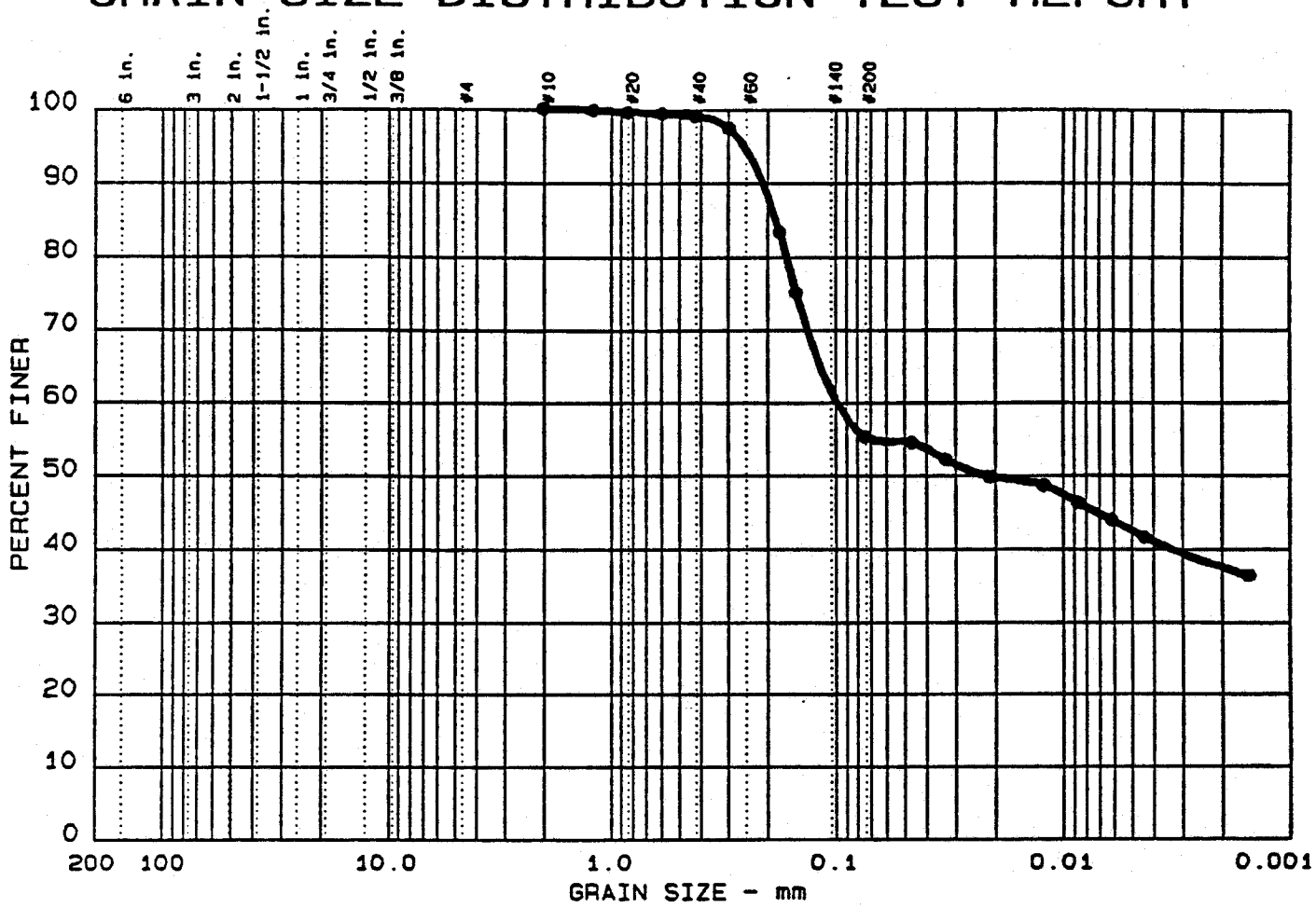
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	13	0.0	0.0	44.7	12.8	42.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	40	21	0.18	0.10	0.02					

	MATERIAL DESCRIPTION	USCS	AASHTO
●		CL	

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP7-1 6.0-6.5'

Date: 6-8-90

Remarks:

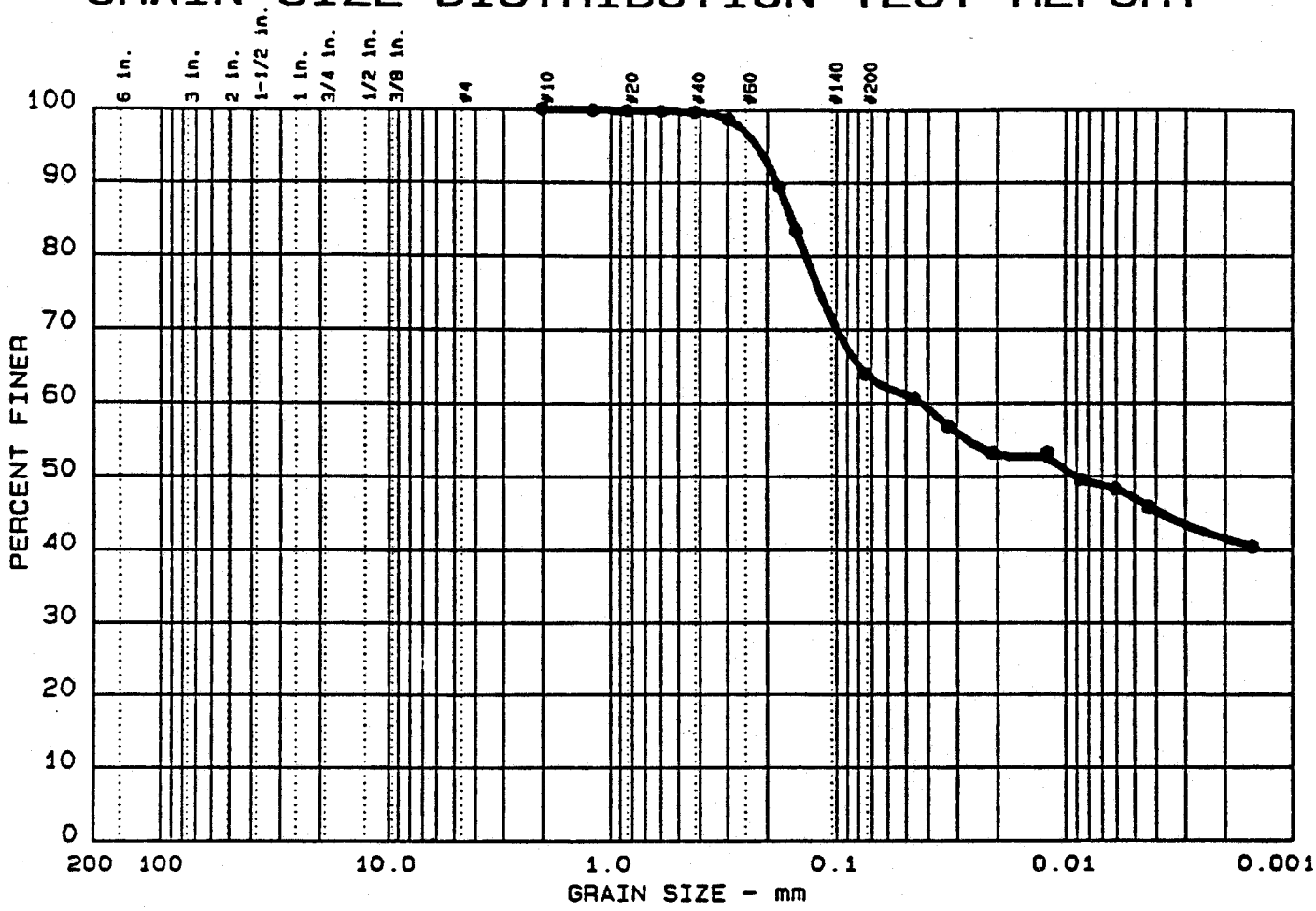
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ 6-12-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	14	0.0	0.0	36.1	16.9	47.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	43	22	0.15		0.01					

MATERIAL DESCRIPTION	USCS	AASHTO
●	CL	

Project No.: 457.42
Project: WEYERHAEUSER
● Location: TP8-1 5.0-6.0'

Date: 6-8-90

Remarks:

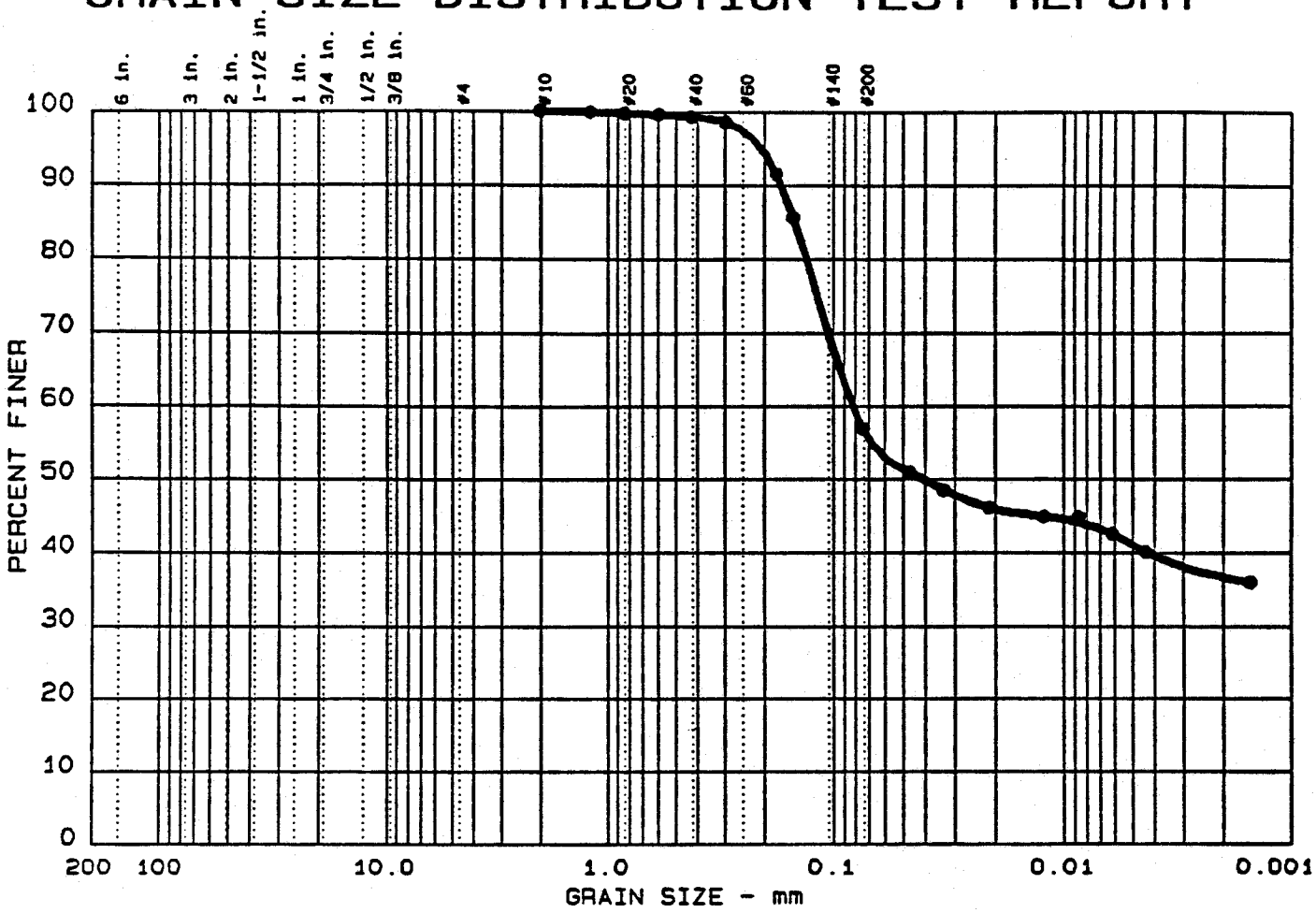
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ JB 6-12-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	12	0.0	0.0	43.1	15.8	41.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●	35	18	0.15	0.08	0.04					

MATERIAL DESCRIPTION	USCS	AASHTO
●	CL	

Project No.: 467.42
Project: WEYERHAEUSER
● Location: TP14-3 5.5-7.0'

Date: 6-8-90

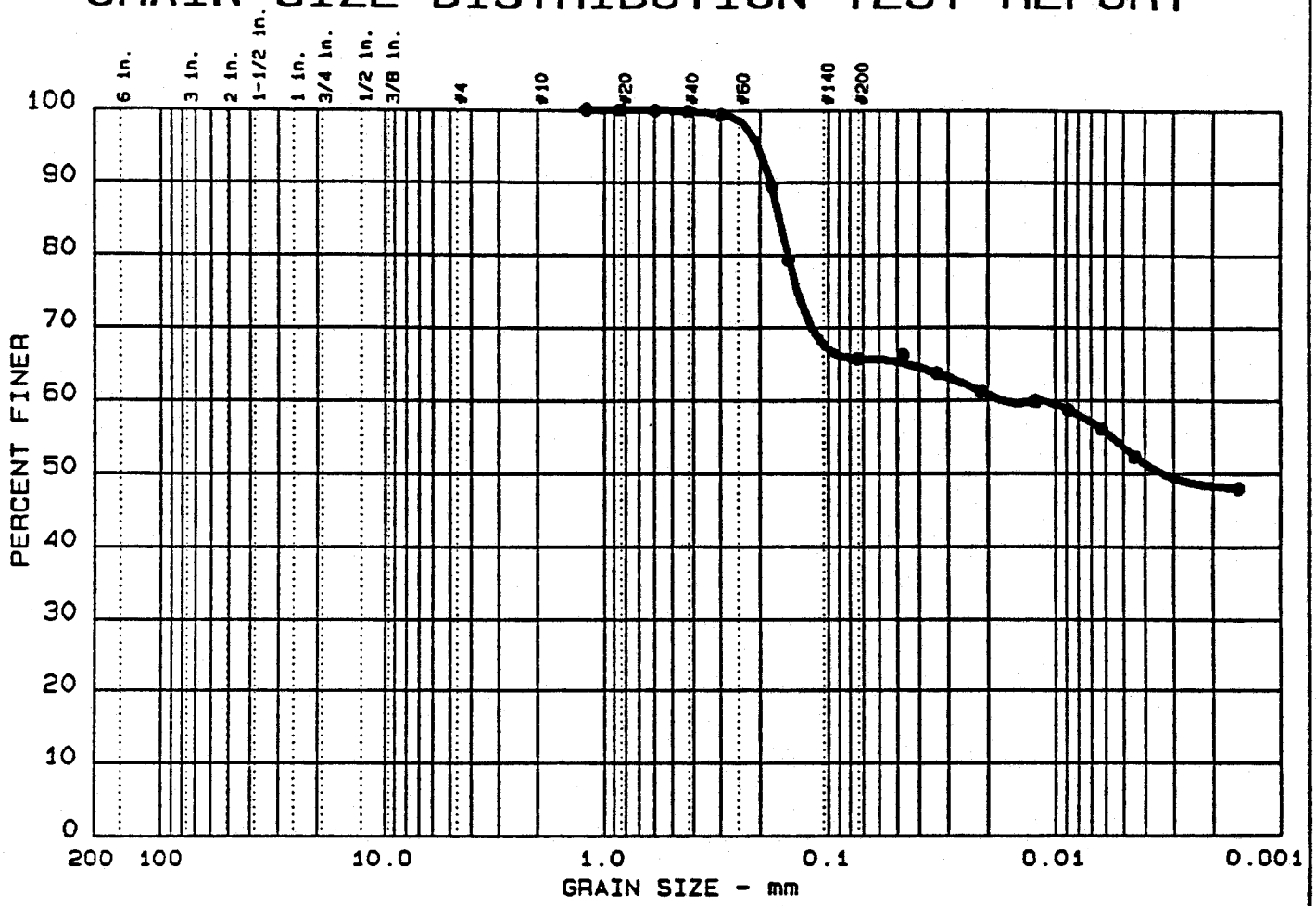
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	7	0.0	0.0	34.4	12.0	53.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.16		0.00					

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: MW-8 2-4.0'

Date: 6-8-90

Remarks:

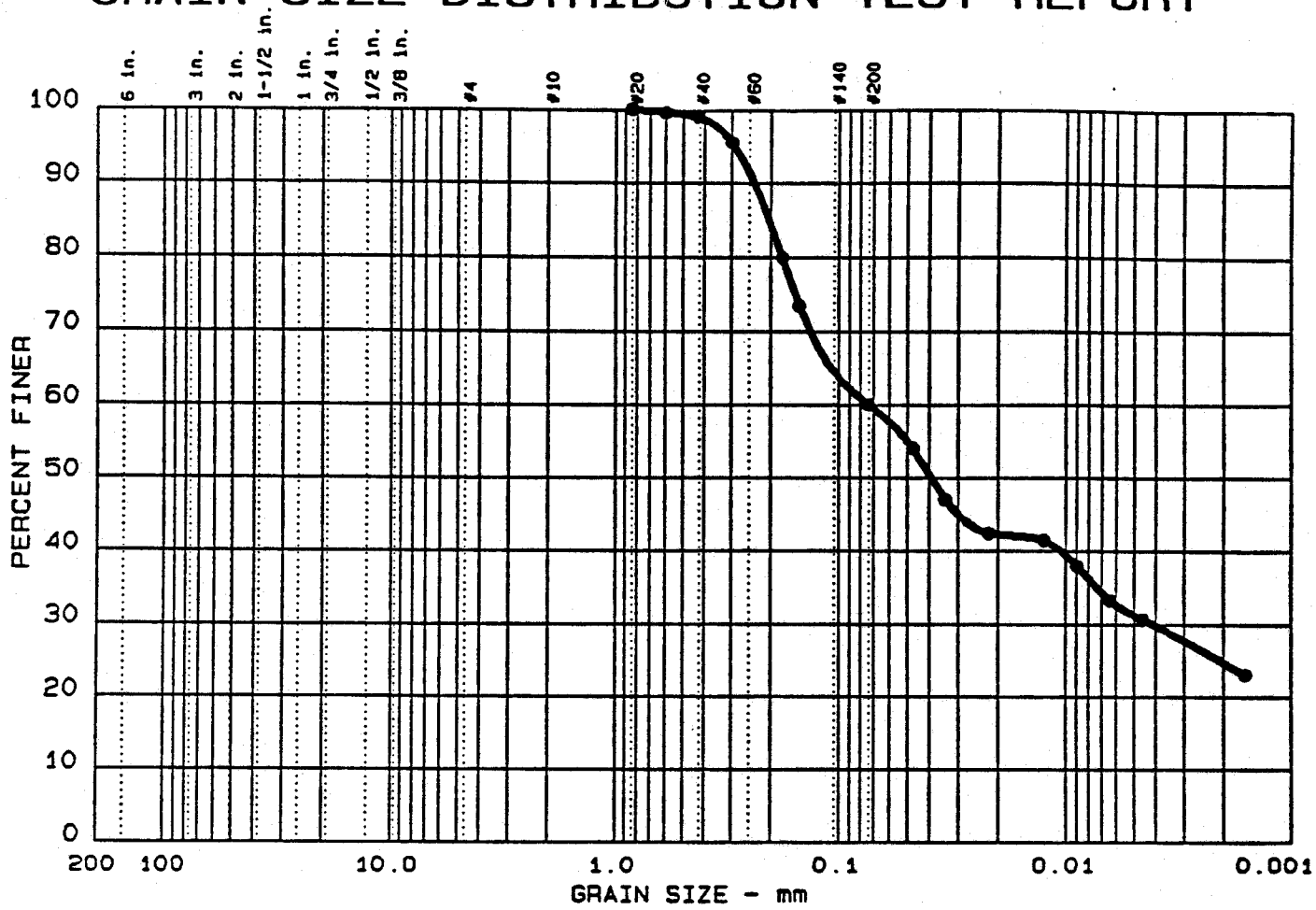
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

6-6-90 6-20-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	17	0.0	0.0	40.0	28.8	31.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.20		0.04	0.004				

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: OW-2 13-15'

Date: 6-6-90

Remarks:

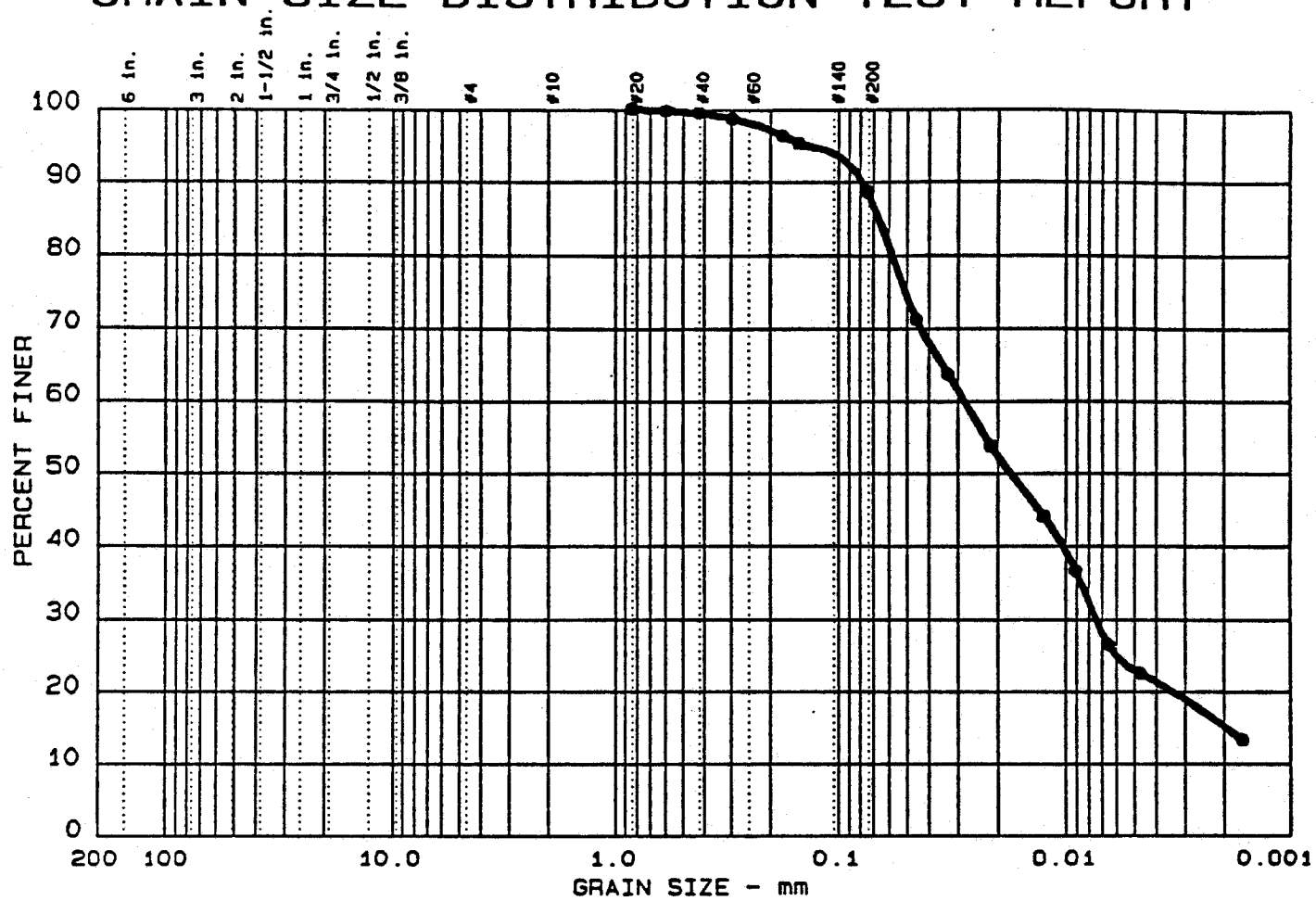
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

6-6-90 ✓ 6-20-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	18	0.0	0.0	11.3	65.6	23.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.02	0.007	0.0019			

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: DW-1 20-22'

Date: 6-6-90

Remarks:

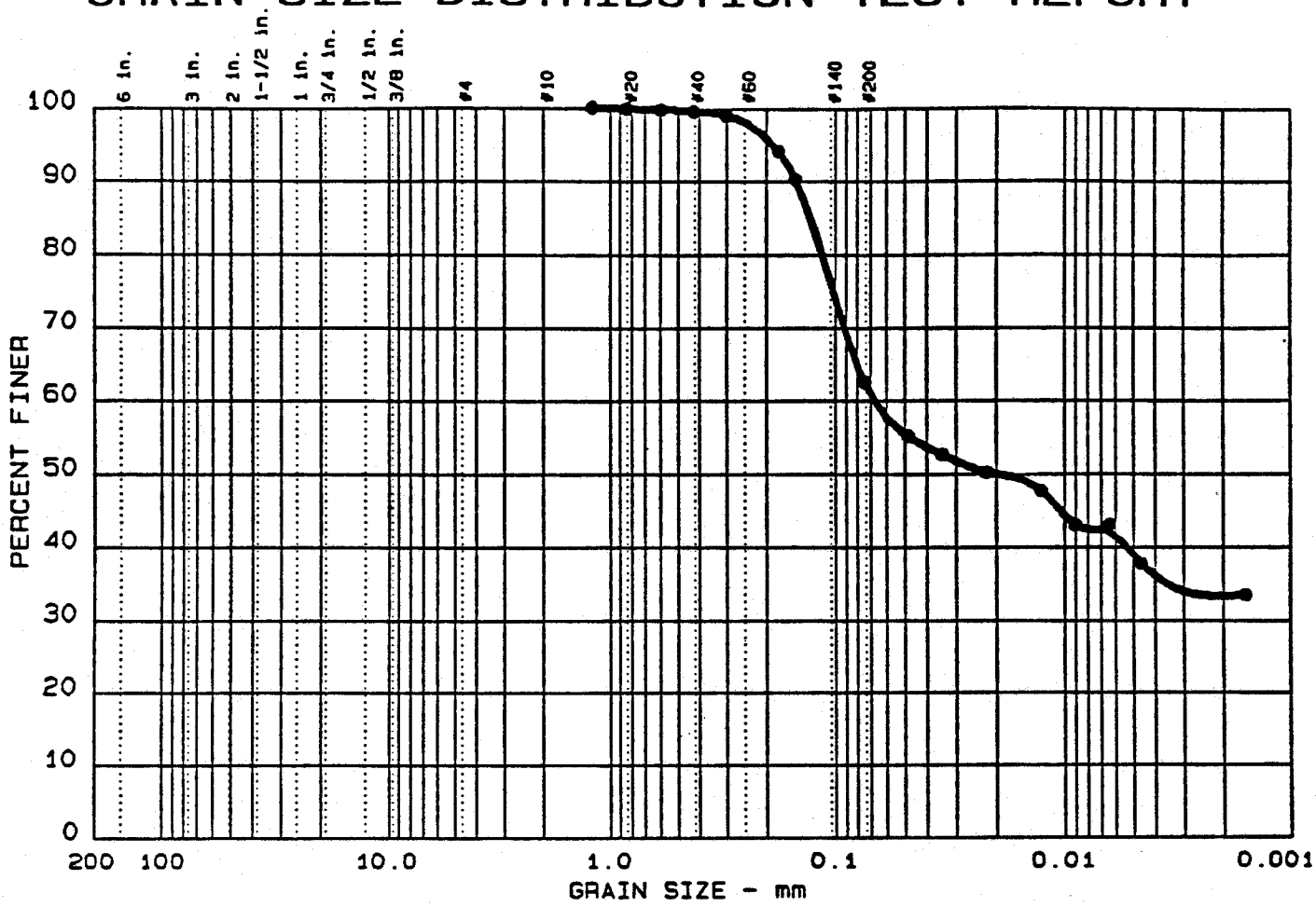
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

6-2-90 JH 5-20-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	19	0.0	0.0	37.5	23.5	39.0

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.13		0.02					

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 457.42
Project: WEYERHAEUSER
● Location: OW-3 9-11.0'

Date: 6-6-90

Remarks:

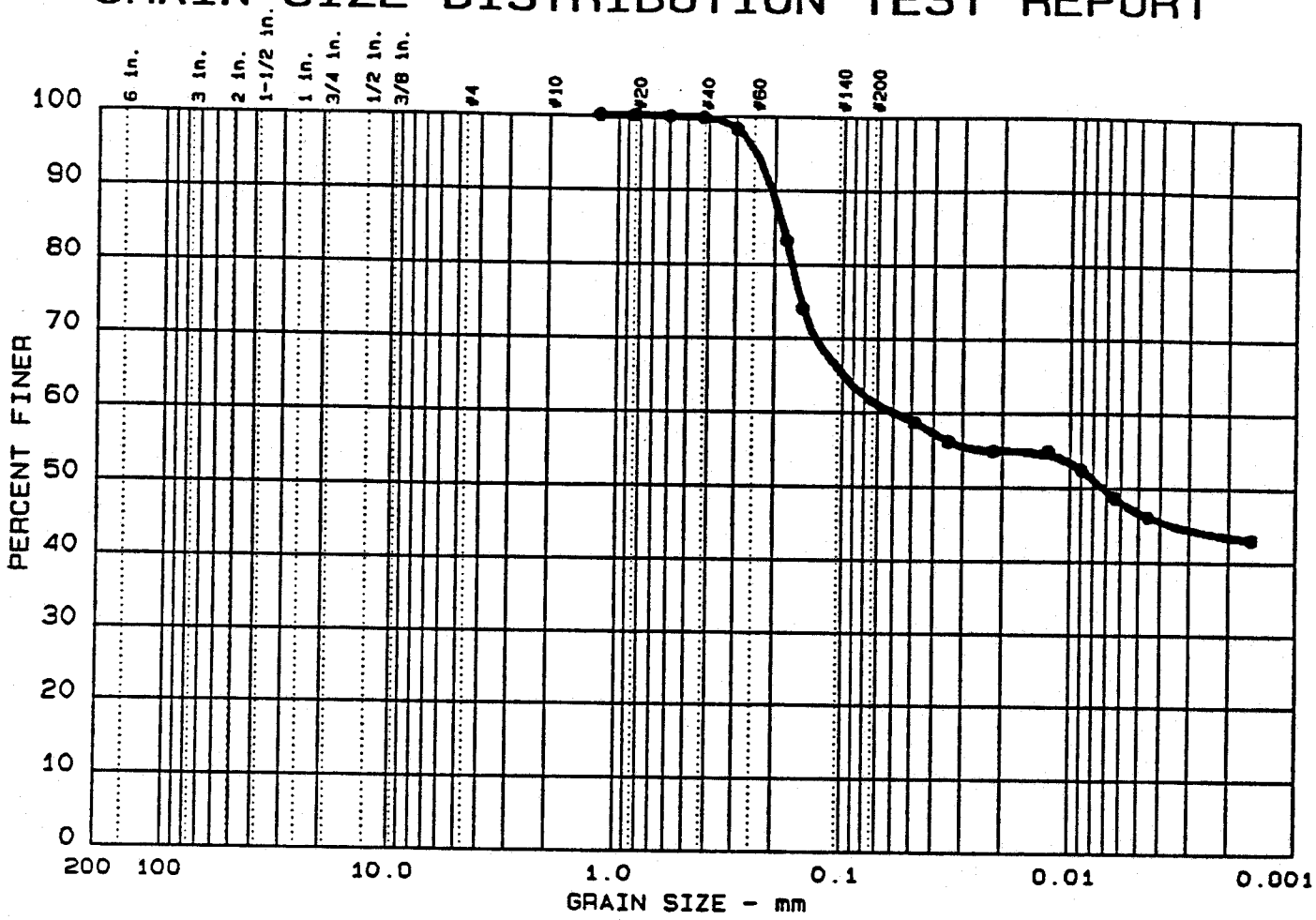
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ 6-20-9

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	6	0.0	0.0	38.6	14.8	46.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.18		0.01					

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 457.42
Project: WEYERHAEUSER
● Location: OW-1 4-6.0'

Date: 6-8-90

Remarks:

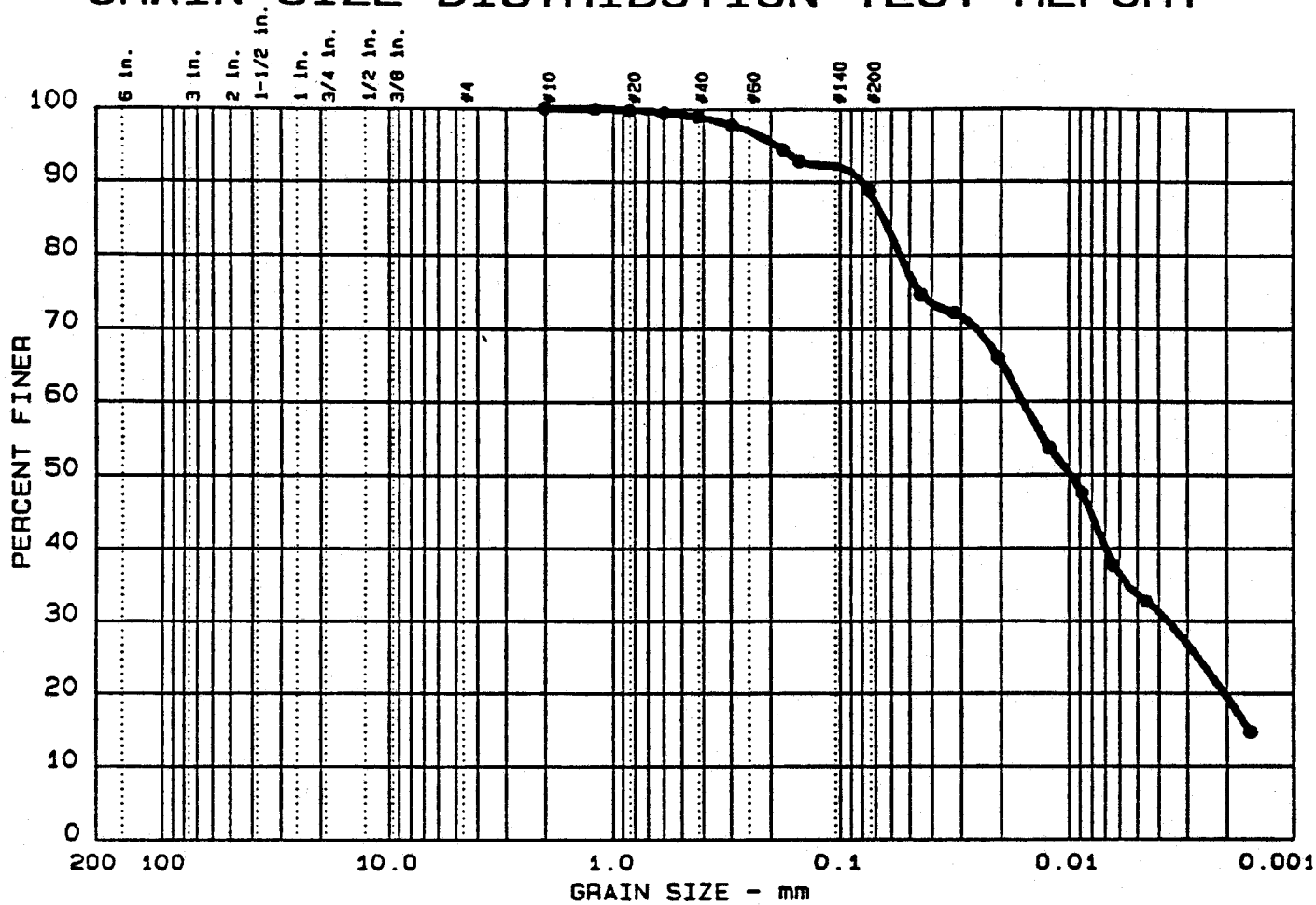
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT. INC.

Figure No. _____

✓ JAI 6-27-9

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	10	0.0	0.0	11.2	55.2	33.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.01	0.004	0.0016			

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: MW-1A 22-24.0'

Date: 6-1-90

Remarks:

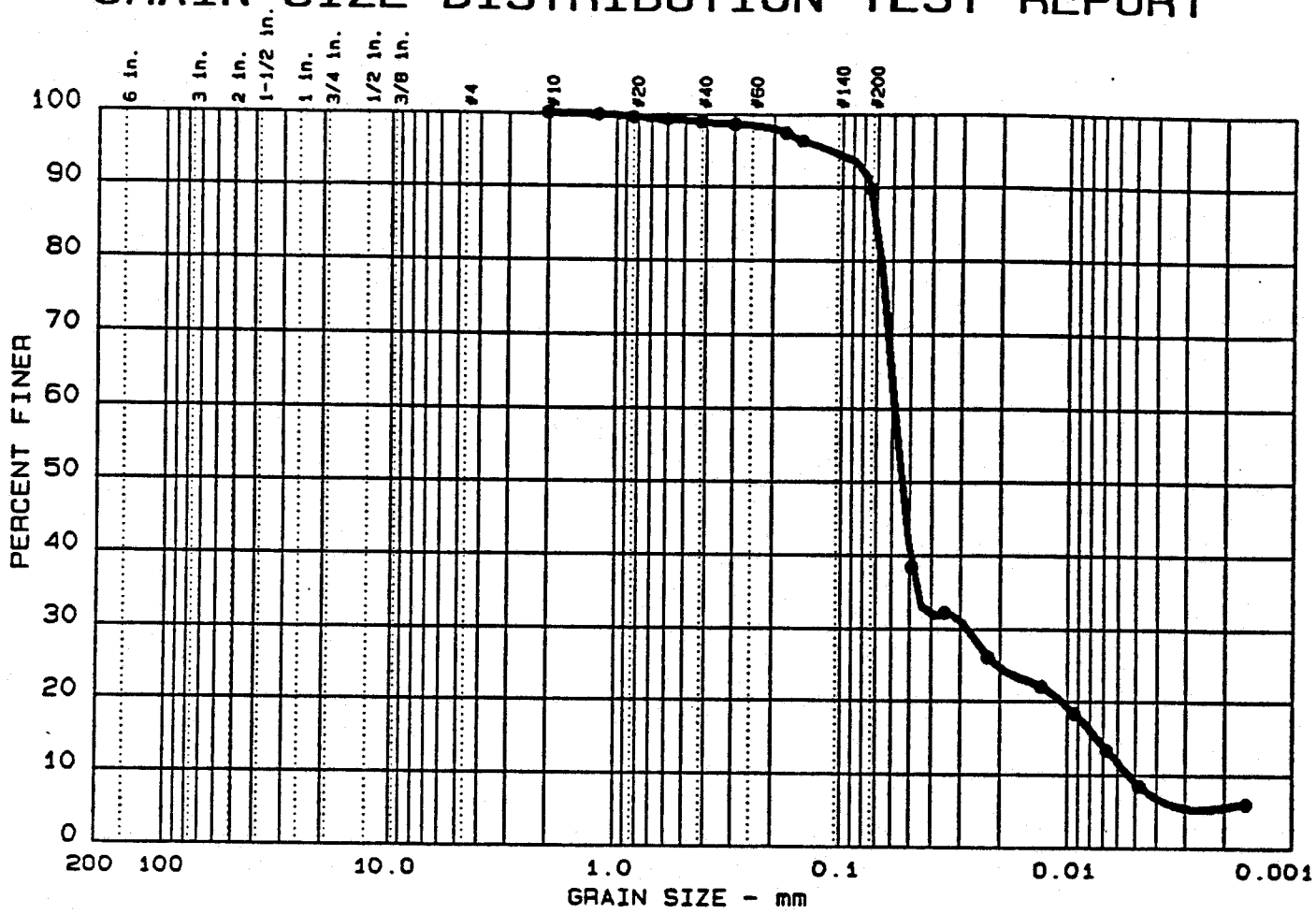
GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

✓ GTF 6-26-90
✓ pp 6-27-90

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	12	0.0	0.0	10.3	80.6	9.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.05	0.028	0.0073	0.0053	2.47	10.9

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: 467.42
Project: WEYERHAEUSER
● Location: MW-8 20-22.0'

Date: 6-1-90

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

RMT, INC.

Figure No. _____

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: Weyerhaeuser

			By	Date
	Tech: GTF	06/01/90	QC GMP	6/4/90
JOB #: 467.42	Input: GTF	06/01/90	QA JPL	6/4/90

JOB #: 467.42

BORING: TP-11-2 DEPTH: 5.5-7.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.28	115.33		115.09
BLOWS		25	24		
WET WT		131.67	133.07		134.38
DRY WT		126.22	127.17		129.65
% WATER		49.8	49.6		32.5

BORING	TP-11-2
DEPTH	5.5-7.0'
% WATER	
LL	50
PL	32
PI	18
CLASS	MH

JOB #: 467.42

BORING: MW-1A DEPTH: 22-24'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.21	114.69		115.29
BLOWS		28	28		
WET WT		137.89	139.61		142.24
DRY WT		130.84	131.75		135.69
% WATER		45.7	46.7		32.1

BORING	MW-1A
DEPTH	22-24'
% WATER	
LL	46
PL	32
PI	14
CLASS	ML

JOB #: 467.42

BORING: SB-9 DEPTH: 18-20.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE					
BLOWS					
WET WT		NON-PLASTIC MATERIAL			
DRY WT					
% WATER					

BORING	SB-9
DEPTH	18-20.0'
% WATER	
LL	
PL	0
PI	
CLASS	NP

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: Weyerhaeuser

JOB #: 467.42

Tech: GTF 05/31/90 QC GAP 6/4/90
Input: GTF 05/31/90 QA [illegible] 6/4/90

JOB #: 467.42

BORING: OW-1 DEPTH: 8-10.0'

BORING	OW-1
DEPTH	8-10.0'
% WATER	
LL	
PL	0
PI	
CLASS	NP

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE					
BLOWS					
WET WT		NON-PLASTIC MATERIAL			
DRY WT					
% WATER					

JOB #: 467.42

BORING: MW-8 DEPTH: 20-22.0'

BORING	MW-8
DEPTH	20-22.0'
% WATER	
LL	51
PL	27
PI	24
CLASS	CH

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.88	115.43		114.87
BLOWS		26	26		
WET WT		139.72	141.45		137.27
DRY WT		131.76	132.71		132.56
% WATER		50.4	50.8		26.6

JOB #: 467.42

BORING: OW-3 DEPTH: S-5

BORING	OW-3
DEPTH	S-5
% WATER	
LL	21
PL	16
PI	5
CLASS	CL-ML

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.06	115.39		115.21
BLOWS		26	28		
WET WT		144.26	142.02		129.26
DRY WT		139.10	137.38		127.34
% WATER		21.6	21.4		15.8

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: Weyerhaeuser

JOB #: 467.42

			By	Date
Tech: GTF	05/31/90	QC	GMP	6/4/90
Input: GTF	05/31/90	QA	JVA	6/4/90

JOB #: 467.42

BORING: TP-2-5 DEPTH: 6.0-6.5'

	BORING	TP-2-5
	DEPTH	6.0-6.5'
	% WATER	
	LL	
	PL	0
	PI	
	CLASS	NP

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE					
BLOWS					
WET WT		NON-PLASTIC MATERIAL			
DRY WT					
% WATER					

JOB #: 467.42

BORING: TP-9-2 DEPTH: 2.7-3.0'

	BORING	TP-9-2
	DEPTH	2.7-3.0'
	% WATER	
	LL	27
	PL	16
	PI	11
	CLASS	CL

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		114.90	115.41		115.20
BLOWS		20	22		
WET WT		139.11	137.68		137.82
DRY WT		133.85	132.90		134.62
% WATER		27.0	26.9		16.5

JOB #: 467.42

BORING: MW-1A DEPTH: S8

	BORING	MW-1A
	DEPTH	S8
	% WATER	
	LL	48
	PL	28
	PI	20
	CLASS	ML

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.35	115.29		115.06
BLOWS		26	28		
WET WT		135.44	134.75		136.91
DRY WT		128.93	128.46		132.10
% WATER		48.2	48.4		28.2

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: WEYERHAEUSER

JOB #: 467.42

			By	Date
Tech: GTF	06/06/90	QC	GAP	6/19/90
Input: GTF	06/06/90	QA	JPI	6/20/90

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: OW-3 DEPTH: 15-16.5'

BORING	OW-3
DEPTH	15-16.5'
% WATER	
LL	
PL	0
PI	
CLASS	NP

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE					
BLOWS					
WET WT		NON-PLASTIC MATERIAL			
DRY WT					
% WATER					

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: OW-3 DEPTH: 9-11'

BORING	OW-3
DEPTH	9-11'
% WATER	
LL	37
PL	18
PI	19
CLASS	CL

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		116.19	115.22		115.14
BLOWS		25	24		
WET WT		142.00	139.34		137.07
DRY WT		135.00	132.83		133.68
% WATER		37.2	36.8		18.3

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: OW-1 DEPTH: 20-22'

BORING	OW-1
DEPTH	20-22'
% WATER	
LL	53
PL	33
PI	20
CLASS	MH

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.17	115.00		115.29
BLOWS		21	22		
WET WT		136.80	140.81		137.45
DRY WT		129.23	131.80		131.90
% WATER		52.7	52.8		33.4

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: WEYERHAEUSER

			By	Date
	Tech: GTF	05/22/90	QC GAP	6/18/90
JOB #: 467.42	Input: GTF	06/12/90	QA JW	7/13/90

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: MW-8 DEPTH: S8

Natural Moisture	LIQUID LIMIT	OVEN LL	PLASTIC LIMIT
TARE			
BLOWS			
WET WT	NON-PLASTIC MATERIAL		
DRY WT			
% WATER			

BORING	MW-8
DEPTH	S8
% WATER	
LL	
PL	0
PI	
CLASS	NP

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: MW-1A DEPTH: S10

Natural Moisture	LIQUID LIMIT	OVEN LL	PLASTIC LIMIT
TARE			
BLOWS			
WET WT	NON-PLASTIC MATERIAL		
DRY WT			
% WATER			

BORING	MW-1A
DEPTH	S10
% WATER	
LL	
PL	0
PI	
CLASS	NP

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: WEYERHAEUSER

			By	Date
	Tech: GTF	06/06/90	QC GAP	6/18/90
JOB #: 467.42	Input: GTF	06/06/90	QA JPJ	6/20/90

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: OW-2 DEPTH: 13-15'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.13	115.10		115.13
BLOWS		23	23		
WET WT		138.09	139.67		135.37
DRY WT		132.31	133.54		132.40
% WATER		33.3	32.9		17.2

BORING	OW-2
DEPTH	13-15'
% WATER	
LL	33
PL	17
PI	16
CLASS	CL

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: OW-1 DEPTH: 4-6.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.34	115.28		115.43
BLOWS		26	23		
WET WT		138.22	139.39		138.38
DRY WT		132.24	133.06		134.90
% WATER		35.6	35.2		17.9

BORING	OW-1
DEPTH	4-6.0'
% WATER	
LL	35
PL	18
PI	17
CLASS	CL

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: MW-8 DEPTH: 2-4.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.41	115.88		115.35
BLOWS		24	23		
WET WT		136.87	144.38		144.95
DRY WT		130.85	136.33		140.18
% WATER		38.8	39.0		19.2

BORING	MW-8
DEPTH	2-4.0'
% WATER	
LL	39
PL	19
PI	20
CLASS	CL

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: WEYERHAEUSER

JOB #: 467.42

			By	Date
Tech: GTF	06/08/90	QC	JPH	6-12-90
Input: GTF	06/28/90	QA	JPH	6-12-90

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP11-1 DEPTH: 1.8-4.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		116.04	115.49		115.08
BLOWS		22	21		
WET WT		141.72	139.70		137.07
DRY WT		135.89	134.21		134.05
% WATER		28.9	28.7		15.9

BORING	TP11-1
DEPTH	1.8-4.0'
% WATER	
LL	29
PL	16
PI	13
CLASS	CL

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP9-3 DEPTH: 4.0-5.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		114.76	115.87		115.45
BLOWS		20	22		
WET WT		144.03	146.80		138.72
DRY WT		137.80	140.35		135.18
% WATER		26.3	25.9		17.9

BORING	TP9-3
DEPTH	4.0-5.0'
% WATER	
LL	26
PL	18
PI	8
CLASS	CL

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP10-2 DEPTH: 3.0-5.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.29	115.05		115.24
BLOWS		25	25		
WET WT		145.48	144.20		138.53
DRY WT		138.79	137.80		135.25
% WATER		28.5	28.1		16.4

BORING	TP10-2
DEPTH	3.0-5.0'
% WATER	
LL	28
PL	16
PI	12
CLASS	CL

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: WEYERHAEUSER

				By	Date
	Tech:	GTF	06/08/90	QC JPL	6-12-90
JOB #: 467.42	Input:	GTF	06/28/90	QA JPL	6-12-90

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP7-1 DEPTH: 6.0-6.5'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.27	114.69		115.28
BLOWS		22	23		
WET WT		141.93	143.17		142.98
DRY WT		134.24	134.87		138.58
% WATER		39.9	40.7		18.9

BORING	TP7-1
DEPTH	6.0-6.5'
% WATER	
LL	40
PL	19
PI	21
CLASS	CL

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP14-3 DEPTH: 6.5-7.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.32	115.08		115.49
BLOWS		27	25		
WET WT		142.78	139.35		136.79
DRY WT		135.65	133.06		133.67
% WATER		35.4	35.0		17.2

BORING	TP14-3
DEPTH	6.5-7.0'
% WATER	
LL	35
PL	17
PI	18
CLASS	CL

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP4-2 DEPTH: 4.5-5.2'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.25	115.39		115.81
BLOWS		21	25		
WET WT		142.42	145.07		136.71
DRY WT		135.25	137.30		133.53
% WATER		35.1	35.5		17.9

BORING	TP4-2
DEPTH	4.5-5.2'
% WATER	
LL	35
PL	18
PI	17
CLASS	CL

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: WEYERHAEUSER

			By	Date
	Tech: GTF	06/01/90	QC JAJ	6/4/90
JOB #: 467.42	Input: GTF	06/01/90	QA JJ	6/4/90

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: MW-1A DEPTH: 22-24'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.21	114.69		115.29
BLOWS		28	28		
WET WT		137.89	139.61		142.24
DRY WT		130.84	131.75		135.69
% WATER		45.7	46.7		32.1

BORING	MW-1A
DEPTH	22-24'
% WATER	
LL	46
PL	32
PI	14
CLASS	ML

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: SB-9 DEPTH: 18-20.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE					
BLOWS					
WET WT		NON-PLASTIC MATERIAL			
DRY WT					
% WATER					

BORING	SB-9
DEPTH	18-20.0'
% WATER	
LL	
PL	0
PI	
CLASS	NP

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP11-2 DEPTH: 5.5-7.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE					
BLOWS					
WET WT		NON-PLASTIC MATERIAL			
DRY WT					
% WATER					

BORING	TP11-2
DEPTH	5.5-7.0'
% WATER	
LL	
PL	0
PI	
CLASS	NP

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: WEYERHAEUSER

			By	Date
	Tech: GTF	06/01/90	QC	6-4-90
JOB #: 467.42	Input: GTF	06/01/90	QA	6-4-90

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP6-1 DEPTH: 8-9'

Natural Moisture	LIQUID LIMIT	OVEN LL	PLASTIC LIMIT
TARE			
BLOWS			
WET WT	NON-PLASTIC MATERIAL		
DRY WT			
% WATER			

BORING	TP6-1
DEPTH	8-9'
% WATER	
LL	
PL	0
PI	
CLASS	NP

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP8-3 DEPTH: 8-8.5'

Natural Moisture	LIQUID LIMIT	OVEN LL	PLASTIC LIMIT
TARE			
BLOWS			
WET WT	NON-PLASTIC MATERIAL		
DRY WT			
% WATER			

BORING	TP8-3
DEPTH	8-8.5'
% WATER	
LL	
PL	0
PI	
CLASS	NP

RMT Soils Laboratory - Atterberg Limit Determination

PROJECT: WEYERHAEUSER

				By	Date
	Tech:	GTF	06/08/90	QC JEN	6-12-90
JOB #: 467.42	Input:	GTF	06/28/90	QA JEN	6-12-90

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP16-1 DEPTH: 0.4-1.8'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.00	114.99		115.37
BLOWS		25	23		
WET WT		139.93	139.99		140.29
DRY WT		131.81	131.89		135.85
% WATER		48.3	47.5		21.7

BORING	TP16-1
DEPTH	0.4-1.8'
% WATER	
LL	48
PL	22
PI	26
CLASS	CL

PROJECT: WEYERHAEUSER JOB #: 467.42

BORING: TP1-3 DEPTH: 1.1-2.6'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.23	115.42		115.08
BLOWS		23	22		
WET WT		140.36	139.41		137.37
DRY WT		131.36	130.81		132.95
% WATER		55.2	55.0		24.7

BORING	TP1-3
DEPTH	1.1-2.6'
% WATER	
LL	55
PL	25
PI	30
CLASS	CH

PROJECT: WEYERHAEUSER JOB #: 467.42

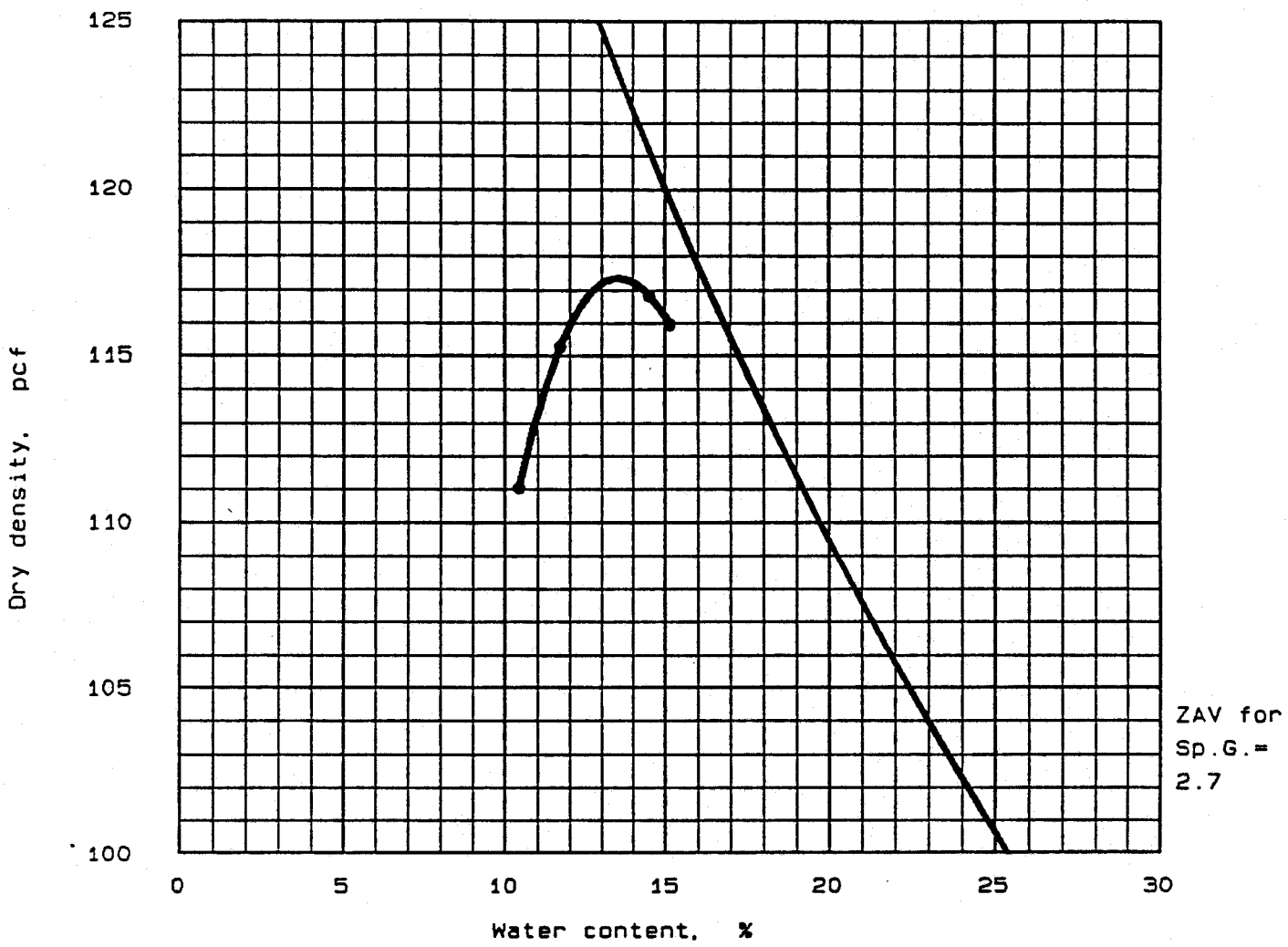
BORING: TP8-1 DEPTH: 5.0-6.0'

	Natural Moisture	LIQUID LIMIT		OVEN LL	PLASTIC LIMIT
TARE		115.07	114.90		115.22
BLOWS		23	24		
WET WT		138.92	143.14		137.98
DRY WT		131.74	134.67		134.07
% WATER		42.6	42.6		20.7

BORING	TP8-1
DEPTH	5.0-6.0'
% WATER	
LL	43
PL	21
PI	22
CLASS	CL

JPN 6-18-90

PROCTOR TEST REPORT



"Modified" Proctor, ASTM D 1557, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 13.5 % Maximum dry density = 117.3 pcf	

Project No.: 467.42

Project: WEYERHAEUSER

Location: TP-8-1, 5.0'-6.0'; TP-7-1, 6.0'-6.5'

Date: 6-18-1990

Remarks:

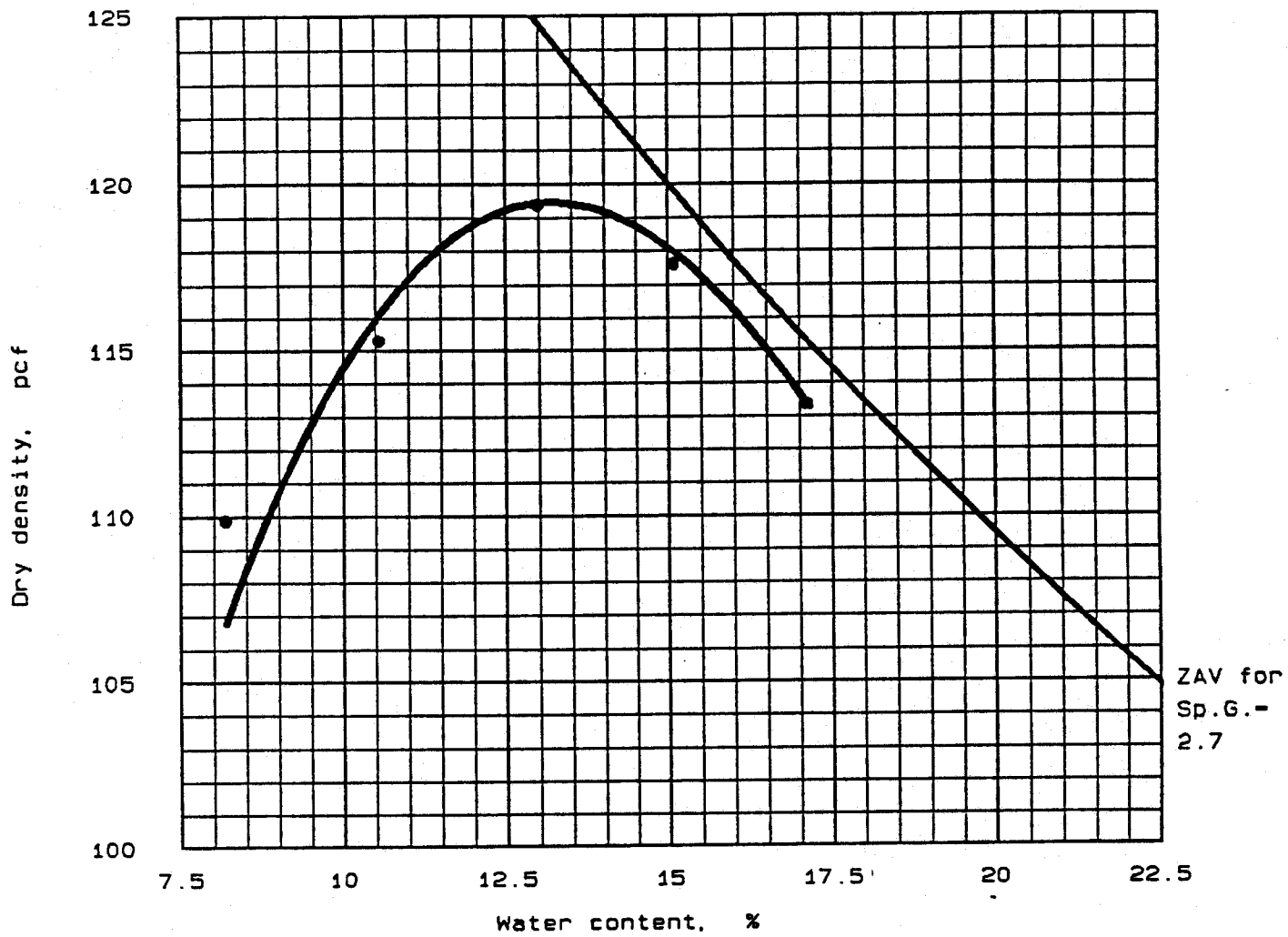
PROCTOR TEST REPORT

RMT Inc.

Figure No. _____

✓ JPA 6-16-90

PROCTOR TEST REPORT



"Modified" Proctor, ASTM D 1557, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 13.2 % Maximum dry density = 119.4 pcf	

Project No.: 467.42

Project: WEYERHAEUSER

Location: TP4-2 4.5-5.2'

TP14-3 6.5-7.0'

Date: 6-15-1990

Remarks:

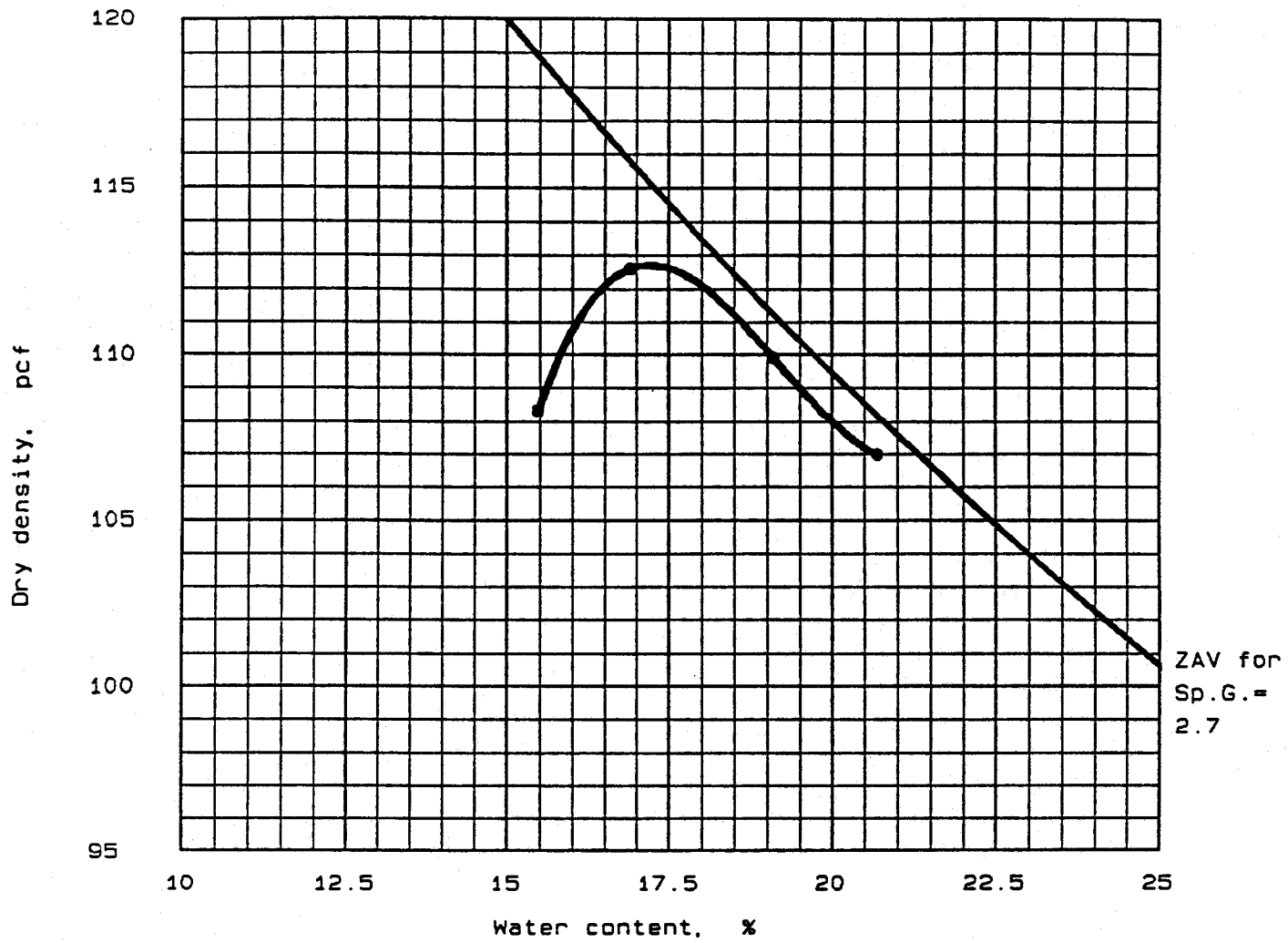
PROCTOR TEST REPORT

RMT Inc.

Figure No. _____

✓ JCA 6/16/90

PROCTOR TEST REPORT



"Modified" Proctor, ASTM D 1557, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 17.2 % Maximum dry density = 112.7 pcf	

Project No.: 467.42

Project: WEYERHAEUSER

Location: TP1-3 1.1-2.6'

Date: 6-14-1990

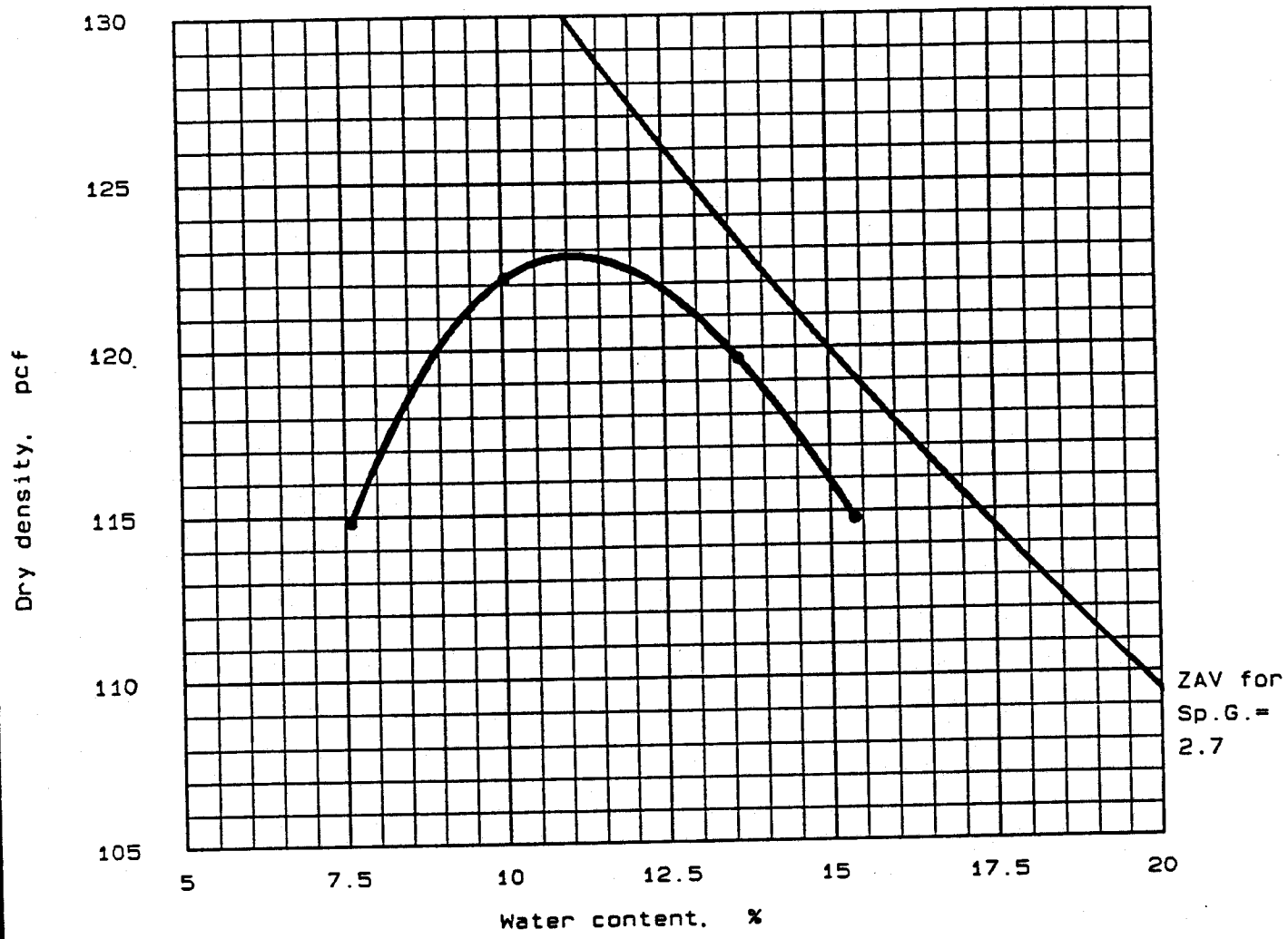
Remarks:

PROCTOR TEST REPORT

RMT Inc.

Figure No. _____

PROCTOR TEST REPORT



"Modified" Proctor, ASTM D 1557, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 11.1 % Maximum dry density = 122.8 pcf	

Project No.: 467.42

Project: WEYERHAEUSER

Location: TP11-1 1.8-4.0 TP9-3 4.0-5.0'
TP10-2 3.0-5.0

Date: 6-21-1990

Remarks:

PROCTOR TEST REPORT

RMT Inc.

Figure No. _____

✓ JPI 6-27-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: MW-1A 22-24.0'
:
Visual Descript:

Date: 21-Jun-90
Tech: HJW
File: WER1
Cell #: 9S

INPUT VALUES

	INIT.	FINAL			
Sample Dia. (in)	2.87	2.86	Permeant:	WATER	
Sample Ht. (in)	2.39	2.39	Permeant Specific Gravity:	1.00	
Tare & Wet (g)	221.0	549.9	Sample Specific Gravity:	2.64	EST.
Tare & Dry (g)	192.5	422.7	Confining Pressure (psi):	100.0	
Tare (g)	115.0	78.7	Burette Diameter (in):	0.250	
Sample Wt. (g)	466.7	471.3	Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	36.7	37.0	MAXIMUM GRADIENT:	11.2
WET DENS. (pcf)	115.0	116.9	AVERAGE GRADIENT:	10.2
DRY DENS. (pcf)	84.1	85.4	MAX. EFFECT. STRESS (psi):	6.3
SATURATION (%)	101.1	105.0	MIN. EFFECT. STRESS (psi):	4.6
			AVE. EFFECT. STRESS (psi):	5.1

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	5	30	8	19	0	95	95	7.30	4.55	98.70			
90	5	31	7	46	21	95	95	20.20	8.40	96.30	23.2	1.9E-08	
90	6	1	7	38	20	95	95	23.80	11.50	93.75	9.7	1.8E-08	
90	6	1	16	20	22	95	95	24.90	12.65	92.90	15.0	1.8E-08	
90	6	4	7	39	21	95	95	48.80	19.70	87.50	13.3	1.7E-08	
90	6	5	8	9	21	95	95	50.00	22.00	85.60	9.5	1.7E-08	1
90	6	6	7	38	21	95	95	52.50	24.00	83.80	5.3	1.7E-08	1
90	6	7	7	47	20	95	95	53.00	25.85	82.10	4.2	1.6E-08	1

Average Kv for those rows with a 1 in the Ave. column 1.7E-08 cm/sec
6.6E-09 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ GTF 6-21-90
✓ JPH 6-27-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: MW-8 20-22.0'
:
Visual Descript: BLUE GRAY SILTY CLAY

Date: 21-Jun-90
Tech: HJW
File: WER2
Cell #: 10S

INPUT VALUES

	INIT.	FINAL			
Sample Dia. (in)	2.87	2.86	Permeant:	WATER	
Sample Ht. (in)	2.37	2.35	Permeant Specific Gravity:	1.00	
Tare & Wet (g)	224.6	569.2	Sample Specific Gravity:	2.67	EST.
Tare & Dry (g)	196.0	445.6	Confining Pressure (psi):	100.0	
Tare (g)	115.3	103.2	Burette Diameter (in):	0.250	
Sample Wt. (g)	460.2	466.0	Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	35.4	36.1	MAXIMUM GRADIENT:	16.1
WET DENS. (pcf)	114.3	117.6	AVERAGE GRADIENT:	8.8
DRY DENS. (pcf)	84.4	86.4	MAX. EFFECT. STRESS (psi):	6.1
SATURATION (%)	97.2	103.8	MIN. EFFECT. STRESS (psi):	4.7
			AVE. EFFECT. STRESS (psi):	5.4

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	5	29	8	32	0	95	95	20.35	3.00	97.85			
90	5	29	15	25	22	95	95	20.60	5.70	95.55	8.0	5.0E-08	
90	5	30	8	3	21	95	95	23.30	11.40	90.40	5.1	4.9E-08	
90	5	31	8	47	21	95	95	21.10	18.30	84.20	5.3	4.6E-08	
90	6	1	7	37	20	95	95	21.50	23.80	79.00	2.8	4.9E-08	
90	6	1	16	19	22	95	95	20.00	25.70	77.40	8.6	4.8E-08	1
90	6	4	7	45	21	95	95	22.60	35.55	68.35	4.2	4.5E-08	1
90	6	4	13	57	0	95	95	21.90	2.85	99.20			
90	6	5	8	10	21	95	95	21.80	9.40	93.50	6.9	4.7E-08	1

Average Kv for those rows with a 1 in the Ave. column 4.7E-08 cm/sec
1.8E-08 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ JJP 6-27-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: OW-1, 8-10.0'
:
Date: 21-Jun-90
Tech: HJW
File: WER3
Cell #: 17S
Visual Descript: YELLOW GRAY CLAYEY SILTY SAND

INPUT VALUES

	INIT.	FINAL			
Sample Dia. (in)	2.87	2.87	Permeant:	WATER	
Sample Ht. (in)	2.33	2.26	Permeant Specific Gravity:	1.00	
Tare & Wet (g)	274.1	555.6	Sample Specific Gravity:	2.65	EST.
Tare & Dry (g)	236.4	448.3	Confining Pressure (psi):	100.0	
Tare (g)	115.0	103.2	Burette Diameter (in):	0.250	
Sample Wt. (g)	460.6	452.5	Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	31.1	31.1	MAXIMUM GRADIENT:	17.0
WET DENS. (pcf)	116.4	117.9	AVERAGE GRADIENT:	12.7
DRY DENS. (pcf)	88.8	89.9	MAX. EFFECT. STRESS (psi):	6.1
SATURATION (%)	95.6	98.2	MIN. EFFECT. STRESS (psi):	4.7
			AVE. EFFECT. STRESS (psi):	5.4

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	5	29	8	19	0	95	95	22.30	3.00	101.10			
90	5	29	10	26	0	95	95	22.40	4.20	100.50			
90	5	29	10	31	21	95	95	22.40	9.80	94.70	-1.8	9.1E-06	
90	5	29	10	38	21	95	95	22.30	16.40	88.00	-0.8	8.8E-06	
90	5	29	10	46	21	95	95	22.30	22.40	82.00	0.0	8.3E-06	
90	5	29	10	54	21	95	95	22.20	27.20	77.10	-1.0	8.1E-06	
90	5	29	11	10	21	95	95	22.20	34.30	70.00	0.0	7.6E-06	
90	5	30	8	45	0	95	95	25.00	2.60	98.80			
90	5	30	8	49	21	95	95	25.20	13.90	87.00	-2.2	2.5E-05	
90	5	30	9	3	21	95	95	25.20	22.00	78.80	-0.6	6.5E-06	
90	5	30	9	12	21	95	95	25.10	27.90	72.80	-0.8	9.5E-06	
90	5	31	8	0	0	95	95	22.90	2.90	101.80			
90	5	31	8	7	21	95	95	23.20	12.80	91.40	-2.5	1.2E-05	
90	5	31	8	14	21	95	95	23.20	20.10	84.00	-0.7	1.1E-05	
90	5	31	8	21	21	95	95	23.20	25.70	78.70	2.8	9.7E-06	
90	6	1	8	7	0	95	95	23.50	3.00	100.35			
90	6	1	8	13	20	95	95	23.80	11.70	91.20	-2.5	1.2E-05	1
90	6	1	8	18	20	95	95	23.80	17.40	85.40	-0.9	1.1E-05	1
90	6	1	8	22	0	95	95	23.80	19.70	83.70			
90	6	1	8	28	20	95	95	23.80	26.20	76.80	-3.0	1.4E-05	1

Average Kv for those rows with a 1 in the Ave. column 1.3E-05 cm/sec
5.0E-06 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ JFV 6-27-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: OW-3, 9-11.0'
:
Date: 21-Jun-90
Tech: HJW
File: WER6
Cell #: 12S
Visual Descript: TANNISH GRAY SILTY CLAY WITH SAND LENSES

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.87	2.87
Sample Ht. (in)	2.38	2.36
Tare & Wet (g)	265.2	597.0
Tare & Dry (g)	235.3	496.4
Tare (g)	115.2	106.3
Sample Wt. (g)	486.1	490.8

Permeant:	TAP WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.61	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	24.9	25.8
WET DENS. (pcf)	120.3	122.5
DRY DENS. (pcf)	96.3	97.4
SATURATION (%)	94.0	100.0

MAXIMUM GRADIENT:	14.8
AVERAGE GRADIENT:	11.3
MAX. EFFECT. STRESS (psi):	6.2
MIN. EFFECT. STRESS (psi):	4.8
AVE. EFFECT. STRESS (psi):	5.4

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	1	7	41	0	95	95	15.80	4.30	98.45			
90	6	1	12	35	22	95	95	15.70	11.75	91.30	2.1	2.2E-07	
90	6	1	16	18	22	95	95	14.40	16.15	87.25	4.1	1.9E-07	
90	6	4	11	40	0	95	95	17.20	3.15	98.30			
90	6	4	13	39	21	95	95	16.80	6.40	95.20	2.4	2.2E-07	
90	6	5	8	11	21	95	95	16.70	24.50	77.50	1.1	1.8E-07	
90	6	6	7	47	0	95	95	18.30	3.90	98.80			
90	6	6	9	40	20	95	95	18.30	6.90	95.85	0.8	2.2E-07	
90	6	7	7	48	20	95	95	18.20	27.50	75.85	1.5	1.7E-07	
90	6	8	8	4	0	95	95	17.80	2.65	99.10			
90	6	8	9	57	21	95	95	17.90	5.65	96.20	1.7	2.1E-07	
90	6	8	16	45	21	95	95	16.71	14.20	87.85	1.2	1.9E-07	
90	6	11	8	14	0	95	95	18.10	4.30	98.30			
90	6	11	9	17	20	95	95	18.10	5.70	96.90	0.0	1.8E-07	
90	6	11	10	18	20	95	95	17.90	7.00	95.70	4.0	1.7E-07	
90	6	11	11	21	21	95	95	17.95	8.25	94.40	-2.0	1.8E-07	1
90	6	11	12	58	21	95	95	17.30	10.00	92.70	1.4	1.6E-07	1
90	6	11	14	41	21	95	95	17.15	11.95	90.85	2.6	1.7E-07	1
90	6	12	8	7	21	95	95	17.50	26.45	76.80	1.6	1.6E-07	1

Average Kv for those rows with a 1 in the Ave. column 1.7E-07 cm/sec
6.6E-08 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ JPM 6-27-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: MW-8A, 2-4.0'
:
Visual Descript: TAN MOTTLED SILTY CLAY

Date: 21-Jun-90
Tech: HJW
File: WER10
Cell #: 18S

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.87	2.85
Sample Ht. (in)	2.38	2.36
Tare & Wet (g)	483.2	591.0
Tare & Dry (g)	386.9	489.8
Tare (g)	0.0	102.8
Sample Wt. (g)	483.2	488.1

Permeant:	TAP WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.65	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

	INIT.	FINAL
MOISTURE (%)	24.9	26.2
WET DENS. (pcf)	119.5	123.5
DRY DENS. (pcf)	95.7	97.9
SATURATION (%)	90.6	100.6

MAXIMUM GRADIENT:	11.5
AVERAGE GRADIENT:	9.7
MAX. EFFECT. STRESS (psi):	6.3
MIN. EFFECT. STRESS (psi):	4.9
AVE. EFFECT. STRESS (psi):	5.5

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	5	7	59	0	95	95	10.00	1.75	101.75			
90	6	5	13	3	22	95	95	8.70	3.40	100.25	4.8	4.0E-08	
90	6	6	7	36	21	95	95	12.10	8.00	95.80	1.7	3.4E-08	
90	6	7	7	44	20	95	95	12.30	12.75	91.35	3.3	2.9E-08	
90	6	8	8	0	20	95	95	12.30	16.60	87.40	-1.3	2.8E-08	
90	6	8	16	48	21	95	95	10.90	17.90	86.60	23.8	2.2E-08	
90	6	11	8	20	20	95	95	12.60	25.50	79.00	0.0	2.5E-08	1
90	6	11	13	1	21	95	95	12.00	25.95	78.50	-5.3	2.5E-08	1
90	6	12	8	5	21	95	95	12.00	27.75	76.80	2.9	2.3E-08	1

Average Kv for those rows with a 1 in the Ave. column 2.4E-08 cm/sec
9.6E-09 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ JPN 6-27-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: OW-1, 4-6.0'
:
Date: 21-Jun-90
Tech: HJW
File: WER9
Cell #: 15S

Visual Descript: TAN SILTY CLAY WITH SAND LENSES

INPUT VALUES

	INIT.	FINAL			
Sample Dia. (in)	2.87	2.84	Permeant:	TAP WATER	
Sample Ht. (in)	2.37	2.34	Permeant Specific Gravity:	1.00	
Tare & Wet (g)	169.1	551.4	Sample Specific Gravity:	2.59	EST.
Tare & Dry (g)	158.1	449.2	Confining Pressure (psi):	100.0	
Tare (g)	115.2	77.5	Burette Diameter (in):	0.250	
Sample Wt. (g)	474.7	473.9	Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	25.7	27.5	MAXIMUM GRADIENT:	16.4
WET DENS. (pcf)	117.9	121.8	AVERAGE GRADIENT:	14.5
DRY DENS. (pcf)	93.8	95.5	MAX. EFFECT. STRESS (psi):	6.1
SATURATION (%)	92.2	102.9	MIN. EFFECT. STRESS (psi):	4.7
			AVE. EFFECT. STRESS (psi):	5.4

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	5	8	7	0	95	95	22.40	2.65	102.15			
90	6	5	10	34	22	95	95	21.70	14.80	90.00	-0.0	7.3E-07	
90	6	5	12	45	22	95	95	21.45	22.65	82.20	0.3	6.8E-07	
90	6	5	14	7	22	95	95	21.60	26.50	78.25	-1.3	6.6E-07	
90	6	6	7	44	0	95	95	24.90	2.40	102.20			
90	6	6	9	41	21	95	95	24.90	11.55	92.80	-1.3	6.7E-07	
90	6	7	8	28	0	95	95	25.20	2.40	101.60			
90	6	7	9	5	20	95	95	25.20	6.70	97.10	-2.3	9.6E-07	
90	6	8	7	59	0	95	95	25.00	2.80	101.75			
90	6	8	8	49	20	95	95	25.00	8.50	95.70	-3.0	9.7E-07	
90	6	8	10	48	21	95	95	25.10	15.25	89.05	0.7	5.4E-07	
90	6	11	8	54	0	95	95	25.00	3.80	101.00			
90	6	11	9	14	20	95	95	25.70	6.25	98.50	-1.0	1.0E-06	1
90	6	11	9	28	20	95	95	25.70	7.80	96.90	-1.6	9.5E-07	1
90	6	11	9	48	20	95	95	25.60	10.00	94.70	-0.0	9.7E-07	1
90	6	11	10	2	20	95	95	25.60	11.50	93.25	1.7	9.7E-07	1
90	6	11	10	15	20	95	95	25.50	12.80	91.90	-1.9	9.7E-07	1
90	6	11	10	31	20	95	95	25.50	14.20	90.40	-3.4	9.0E-07	1

Average Kv for those rows with a 1 in the Ave. column 9.6E-07 cm/sec
3.8E-07 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ JPN 6-27-90

RMT, Inc.
Falling Head Permeability Test

Job:	WEYERHAEUSER	Date:	21-Jun-90
Job #:	467.42	Tech:	HJW
Sample:	OW-3 15-16.5'	File:	WER5
:		Cell #:	15S
Visual Descript:	TAN FINE TO MEDIUM SAND TO SILTY SAND		

INPUT VALUES

	INIT.	FINAL			
Sample Dia. (in)	2.87	2.87	Permeant:	TAP WATER	
Sample Ht. (in)	2.37	2.32	Permeant Specific Gravity:	1.00	
Tare & Wet (g)	255.4	617.0	Sample Specific Gravity:	2.64	EST.
Tare & Dry (g)	236.0	530.4	Confining Pressure (psi):	100.0	
Tare (g)	115.8	106.3	Burette Diameter (in):	0.250	
Sample Wt. (g)	498.3	510.7	Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	16.1	20.4	MAXIMUM GRADIENT:	16.3
WET DENS. (pcf)	123.8	129.6	AVERAGE GRADIENT:	10.7
DRY DENS. (pcf)	106.6	107.6	MAX. EFFECT. STRESS (psi):	6.2
SATURATION (%)	78.0	101.6	MIN. EFFECT. STRESS (psi):	4.8
			AVE. EFFECT. STRESS (psi):	5.5

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	5	31	8	58	0	95	95	14.20	3.80	101.30			
90	5	31	8	58.5	21	95	95	14.20	16.60	88.50	0.0	2.3E-04	
90	5	31	8	59	21	95	95	14.20	25.90	79.20	0.0	2.2E-04	
90	5	31	8	59.5	21	95	95	14.20	32.60	72.50	0.0	2.2E-04	
90	5	31	11	41	0	95	95	14.40	5.70	100.60			
90	5	31	11	41.5	21	95	95	14.40	18.10	88.20	0.0	2.3E-04	
90	5	31	11	42	21	95	95	14.40	27.60	78.70	0.0	2.4E-04	
90	5	31	11	42.5	21	95	95	14.40	34.30	72.00	-0.0	2.3E-04	
90	6	1	8	5	0	95	95	15.80	4.25	100.25			
90	6	1	8	5.5	20	95	95	15.80	16.50	88.00	0.0	2.2E-04	1
90	6	1	8	6	20	95	95	15.80	26.10	78.40	0.0	2.3E-04	1
90	6	1	8	6.5	20	95	95	15.80	33.10	71.40	0.0	2.3E-04	1

Average Kv for those rows with a 1 in the Ave. column 2.3E-04 cm/sec
9.0E-05 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ 6-18
✓ JH 6-20-90

RMT, Inc.
Falling Head Permeability Test

Job:	WEYERHAEUSER	Date:	18-Jun-90
Job #:	467.42	Tech:	HJW
Sample:	OW-2, 13'-15.0'	File:	WER8
:		Cell #:	13S
Visual Descript:			

INPUT VALUES

	INIT.	FINAL		
Sample Dia. (in)	2.87	2.83	Permeant:	TAP WATER
Sample Ht. (in)	2.34	2.22	Permeant Specific Gravity:	1.00
Tare & Wet (g)	454.8	546.5	Sample Specific Gravity:	2.67
Tare & Dry (g)	341.2	444.3	Confining Pressure (psi):	100.0
Tare (g)	0.0	103.1	Burette Diameter (in):	0.250
Sample Wt. (g)	454.8	443.4	Burette Zero (cm):	100.0

CALCULATED VALUES

MOISTURE (%)	33.3	29.9	MAXIMUM GRADIENT:	17.3
WET DENS. (pcf)	114.5	121.0	AVERAGE GRADIENT:	14.2
DRY DENS. (pcf)	85.9	93.1	MAX. EFFECT. STRESS (psi):	6.4
SATURATION (%)	94.5	101.2	MIN. EFFECT. STRESS (psi):	4.9
			AVE. EFFECT. STRESS (psi):	5.6

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	4	9	23	0	95	95	2.60	2.00	102.20			
90	6	4	13	34	21	95	95	2.40	5.60	98.40	-2.7	1.1E-07	
90	6	5	8	0	21	95	95	3.70	18.10	86.20	1.2	1.0E-07	
90	6	5	12	47	22	95	95	2.50	20.75	83.60	1.0	1.0E-07	
90	6	6	7	35	21	95	95	6.00	29.05	75.40	0.6	9.9E-08	
90	6	7	7	42	20	95	95	6.90	36.80	67.90	1.6	1.0E-07	
90	6	7	8	27	0	95	95	6.90	2.10	102.20			
90	6	8	7	57	20	95	95	7.60	19.30	85.00	-0.0	1.1E-07	
90	6	8	16	45	21	95	95	7.60	23.95	80.50	1.6	1.0E-07	
90	6	11	8	24	0	95	95	10.00	4.00	101.30			
90	6	11	10	56	20	95	95	9.50	6.15	99.05	-2.3	1.1E-07	1
90	6	11	13	2	21	95	95	9.10	7.80	97.40	0.0	1.1E-07	1
90	6	11	14	39	21	95	95	9.00	9.00	96.15	-2.0	1.0E-07	1
90	6	12	8	4	21	95	95	9.75	20.20	85.10	0.7	1.0E-07	1

Average Kv for those rows with a 1 in the Ave. column 1.1E-07 cm/sec
4.2E-08 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: TP1-3, 1.1'-2.6'
:
Visual Descript:

Date: 28-Jun-90
Tech: GAP
File: WEYREM1
Cell #: 11S

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.50	2.50
Sample Ht. (in)	2.32	2.34
Tare & Wet (g)	152.8	457.4
Tare & Dry (g)	146.3	378.3
Tare (g)	115.4	76.8
Sample Wt. (g)	368.1	380.6

Permeant:	TAP WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.70	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

	INIT.	FINAL
MOISTURE (%)	21.1	26.2
WET DENS. (pcf)	123.1	126.2
DRY DENS. (pcf)	101.7	100.0
SATURATION (%)	86.7	103.4

MAXIMUM GRADIENT:	14.6
AVERAGE GRADIENT:	13.4
MAX. EFFECT. STRESS (psi):	6.3
MIN. EFFECT. STRESS (psi):	5.0
AVE. EFFECT. STRESS (psi):	5.6

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	20	7	47	0	95	95	4.65	3.50	97.40			
90	6	20	15	34	23	95	95	4.00	4.55	96.60	13.5	2.1E-08	
90	6	21	7	17	21	95	95	5.75	6.00	96.00	41.5	1.2E-08	
90	6	22	7	35	21	95	95	6.30	7.90	94.80	22.6	1.2E-08	
90	6	25	10	11	21	95	95	5.60	12.80	91.15	14.6	1.1E-08	1
90	6	26	8	25	23	95	95	4.60	14.05	90.10	8.7	1.1E-08	1
90	6	27	6	5	21	95	95	3.90	15.30	89.15	13.6	1.1E-08	1
90	6	27	13	32	22	95	95	2.50	15.70	88.85	14.3	1.1E-08	1

Average Kv for those rows with a 1 in the Ave. column 1.1E-08 cm/sec
4.4E-09 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: TP1- 3, 1.1'-2.6'
:
Visual Descript:

Date: 28-Jun-90
Tech: GAP
File: WEYREM4
Cell #: 6P

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.50	2.50
Sample Ht. (in)	2.32	2.36
Tare & Wet (g)	153.8	464.5
Tare & Dry (g)	148.3	382.2
Tare (g)	115.5	79.6
Sample Wt. (g)	351.3	384.9

Permeant:	TAP WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.72	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

	INIT.	FINAL
MOISTURE (%)	16.7	27.2
WET DENS. (pcf)	117.5	126.6
DRY DENS. (pcf)	100.7	99.5
SATURATION (%)	66.2	104.8

MAXIMUM GRADIENT:	16.3
AVERAGE GRADIENT:	12.4
MAX. EFFECT. STRESS (psi):	6.3
MIN. EFFECT. STRESS (psi):	4.8
AVE. EFFECT. STRESS (psi):	5.5

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	20	7	29	0	95	95	3.40	1.40	98.15			
90	6	20	15	29	23	95	95	4.80	7.45	93.20	10.0	1.3E-07	
90	6	20	16	7	23	95	95	4.80	7.90	92.85	12.5	1.2E-07	
90	6	21	7	10	21	95	95	5.50	16.75	85.20	7.3	1.2E-07	
90	6	22	7	21	21	95	95	8.00	27.15	75.70	4.5	1.2E-07	
90	6	25	9	45	0	95	95	15.15	1.80	101.00			
90	6	25	10	18	21	95	95	15.25	2.20	100.50	-11.1	1.4E-07	
90	6	25	10	46	21	95	95	15.30	2.45	100.20	-9.1	1.0E-07	
90	6	26	8	17	23	95	95	16.10	14.70	88.20	1.0	1.1E-07	1
90	6	26	10	48	22	95	95	17.00	15.90	87.00	-0.0	1.1E-07	1
90	6	26	13	27	22	95	95	17.00	17.05	85.80	-2.1	1.1E-07	1
90	6	27	5	57	21	95	95	17.20	23.80	79.20	1.1	1.1E-07	1

Average Kv for those rows with a 1 in the Ave. column 1.1E-07 cm/sec
4.3E-08 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: TP4-2, 4.5'-5.2'
: TP14-3, 6.5'-7.0'
Visual Descript:

Date: 28-Jun-90
Tech: GAP
File: WEYREM2
Cell #: 7S

INPUT VALUES

	INIT.	FINAL			
Sample Dia. (in)	2.50	2.49	Permeant:	TAP WATER	
Sample Ht. (in)	2.32	2.32	Permeant Specific Gravity:	1.00	
Tare & Wet (g)	156.1	467.0	Sample Specific Gravity:	2.65	EST.
Tare & Dry (g)	150.0	400.1	Confining Pressure (psi):	100.0	
Tare (g)	116.0	79.7	Burette Diameter (in):	0.250	
Sample Wt. (g)	377.2	387.3	Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	17.8	20.9	MAXIMUM GRADIENT:	15.2
WET DENS. (pcf)	126.2	130.6	AVERAGE GRADIENT:	13.3
DRY DENS. (pcf)	107.1	108.0	MAX. EFFECT. STRESS (psi):	6.3
SATURATION (%)	86.7	104.3	MIN. EFFECT. STRESS (psi):	4.9
			AVE. EFFECT. STRESS (psi):	5.5

Date YY MM DD	Time HH MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90 6 20	7 45	0	95	95	5.30	1.90	97.00			
90 6 20	15 34	23	95	95	5.60	3.00	95.60	-12.0	2.8E-08	
90 6 21	7 17	21	95	95	8.70	4.80	94.40	20.0	1.7E-08	
90 6 22	7 34	21	95	95	10.45	7.50	92.10	8.0	2.0E-08	1
90 6 25	10 7	21	95	95	12.65	14.55	85.90	6.4	1.9E-08	1
90 6 26	8 24	23	95	95	12.20	16.45	84.10	2.7	2.0E-08	1

Average Kv for those rows with a 1 in the Ave. column 1.9E-08 cm/sec
7.6E-09 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

2CU
6-28-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: TP4-2, 4.5'-5.2'
: TP14-3, 6.5'-7.0'
Visual Descript:

Date: 28-Jun-90
Tech: GAP
File: WEYREM6
Cell #: 4P

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.50	2.49
Sample Ht. (in)	2.32	2.33
Tare & Wet (g)	150.1	468.7
Tare & Dry (g)	145.7	397.6
Tare (g)	115.2	80.4
Sample Wt. (g)	361.3	388.3

Permeant:	TAP WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.70	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

	INIT.	FINAL
MOISTURE (%)	14.2	22.4
WET DENS. (pcf)	120.9	130.4
DRY DENS. (pcf)	105.8	106.5
SATURATION (%)	64.7	103.9

MAXIMUM GRADIENT:	13.6
AVERAGE GRADIENT:	10.5
MAX. EFFECT. STRESS (psi):	6.2
MIN. EFFECT. STRESS (psi):	4.8
AVE. EFFECT. STRESS (psi):	5.4

Date YY MM DD	Time HH MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90 6 20	7 24	0	95	95	10.75	2.40	98.50			
90 6 20	15 23	0	95	95	13.50	3.20	100.20			
90 6 20	15 49	23	95	95	13.30	17.90	85.40	-0.3	6.9E-06	
90 6 20	16 8	23	95	95	13.40	25.00	77.80	-3.4	6.4E-06	
90 6 21	7 27	0	95	95	15.35	2.50	98.60			
90 6 21	7 58	21	95	95	15.20	18.00	82.90	-0.6	6.3E-06	
90 6 21	8 30	21	95	95	15.40	28.85	72.10	0.2	6.3E-06	
90 6 22	7 19	0	95	95	17.20	2.20	98.80			
90 6 22	7 51	21	95	95	17.85	17.50	83.00	-1.6	6.0E-06	
90 6 22	14 31	0	95	95	18.55	1.65	98.60			
90 6 22	14 35	21	95	95	18.60	3.90	96.10	-5.3	6.2E-06	
90 6 22	14 46	21	95	95	18.70	9.80	90.10	-0.8	6.2E-06	
90 6 22	14 50	21	95	95	18.70	11.60	88.30	0.0	5.7E-06	1
90 6 22	14 59	21	95	95	18.60	15.15	84.80	0.7	5.3E-06	1
90 6 22	15 34	21	95	95	18.50	26.90	73.00	-0.2	5.9E-06	1

Average Kv for those rows with a 1 in the Ave. column 5.6E-06 cm/sec
2.2E-06 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

6-28-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: TP8-1, 5.0'-6.0'
: TP7-1, 6.0'-6.5'
Visual Descript:

Date: 28-Jun-90
Tech: GAP
File: WEYREM7
Cell #: 3P

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.50	2.51
Sample Ht. (in)	2.32	2.35
Tare & Wet (g)	160.7	467.2
Tare & Dry (g)	153.4	391.2
Tare (g)	115.1	78.6
Sample Wt. (g)	370.7	388.7

Permeant:	TAP WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.65	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

	INIT.	FINAL
MOISTURE (%)	18.8	24.3
WET DENS. (pcf)	124.0	127.3
DRY DENS. (pcf)	104.3	102.4
SATURATION (%)	85.4	104.9

MAXIMUM GRADIENT:	10.2
AVERAGE GRADIENT:	9.6
MAX. EFFECT. STRESS (psi):	6.4
MIN. EFFECT. STRESS (psi):	4.6
AVE. EFFECT. STRESS (psi):	5.4

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	20	7	21	0	95	95	2.60	1.10	98.50			
90	6	20	15	3	23	95	95	2.60	17.40	95.90	72.5	2.3E-07	
90	6	20	15	15	0	95	95	33.30	4.30	99.95			
90	6	20	16	9	23	95	95	32.70	5.40	99.40	33.3	1.6E-07	
90	6	21	8	27	0	95	95	24.60	4.50	99.70			
90	6	22	7	37	0	95	95	8.90	8.25	98.45			
90	6	22	9	50	21	95	95	7.20	13.10	96.90	51.6	2.7E-07	
90	6	22	15	0	0	95	95	8.60	1.35	97.30			
90	6	22	15	30	21	95	95	7.60	2.80	97.35	107.1	2.4E-07	
90	6	22	16	15	21	95	95	5.20	5.95	97.20	90.9	3.9E-07	
90	6	25	10	46	0	95	95	22.40	10.00	96.90			
90	6	25	14	37	21	95	95	20.50	13.00	95.70	42.9	1.1E-07	
90	6	26	8	16	23	95	95	21.20	22.80	85.50	-2.0	1.3E-07	
90	6	26	10	43	22	95	95	19.50	25.60	85.00	69.7	1.8E-07	
90	6	26	11	0	0	95	95	24.00	21.40	83.90			
90	6	26	13	25	0	95	95	25.30	21.00	83.00			
90	6	26	15	0	22	95	95	25.70	21.15	82.60	-45.5	4.6E-08	
90	6	26	17	0	22	95	95	25.65	21.50	82.15	-12.5	5.4E-08	
90	6	27	5	56	21	95	95	26.60	23.50	79.60	-12.1	5.0E-08	1
90	6	27	8	50	22	95	95	27.50	24.00	79.05	-4.8	5.4E-08	1
90	6	27	13	30	22	95	95	27.50	24.70	78.30	-3.4	4.7E-08	1

Average Kv for those rows with a 1 in the Ave. column 5.0E-08 cm/sec
2.0E-08 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: TP8-1, 5.0'-6.0'
: TP7-1, 6.0'-6.5'
Visual Descript:

Date: 28-Jun-90
Tech: GAP
File: WEYREM3
Cell #: 16S

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.50	2.51
Sample Ht. (in)	2.32	2.36
Tare & Wet (g)	155.4	469.7
Tare & Dry (g)	150.6	393.2
Tare (g)	115.5	78.6
Sample Wt. (g)	355.7	391.1

Permeant:	TAP WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.70	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	13.6	24.3
WET DENS. (pcf)	119.0	127.6
DRY DENS. (pcf)	104.7	102.6
SATURATION (%)	60.4	102.3

MAXIMUM GRADIENT:	16.6
AVERAGE GRADIENT:	11.6
MAX. EFFECT. STRESS (psi):	6.4
MIN. EFFECT. STRESS (psi):	4.9
AVE. EFFECT. STRESS (psi):	5.5

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	20	7	44	0	95	95	1.70	1.90	98.70			
90	6	20	15	32	23	95	95	1.80	12.40	87.40	-3.7	2.7E-07	
90	6	20	16	5	23	95	95	1.75	13.00	86.75	-4.0	2.5E-07	
90	6	21	7	16	21	95	95	4.50	26.30	73.20	-0.9	2.5E-07	
90	6	22	7	34	21	95	95	6.40	37.65	61.30	-2.4	2.3E-07	
90	6	25	10	3	0	95	95	8.45	2.50	101.25			
90	6	25	10	48	21	95	95	8.05	3.50	99.75	-20.0	2.8E-07	
90	6	26	8	23	23	95	95	7.80	24.85	78.15	-0.6	2.3E-07	1
90	6	26	13	30	22	95	95	6.60	28.30	74.65	-0.7	2.3E-07	1
90	6	27	6	4	0	95	95	7.70	1.80	101.60			
90	6	27	7	32	22	95	95	7.80	3.70	99.50	-5.0	2.3E-07	1

Average Kv for those rows with a 1 in the Ave. column 2.3E-07 cm/sec
9.0E-08 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ JPA 6-28-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER Date: 28-Jun-90
Job #: 467.42 Tech: GAP
Sample: TP11-1,1.8-4.0';TP9-3,4-5' File: WEYREM9
: TP10-2, 3.0'-5.0' Cell #: 1P
Visual Descript:

INPUT VALUES

	INIT.	FINAL			
Sample Dia. (in)	2.50	2.50	Permeant:	TAP WATER	
Sample Ht. (in)	2.32	2.29	Permeant Specific Gravity:	1.00	
Tare & Wet (g)	163.4	467.8	Sample Specific Gravity:	2.65	EST.
Tare & Dry (g)	156.5	409.3	Confining Pressure (psi):	100.0	
Tare (g)	115.4	80.1	Burette Diameter (in):	0.250	
Sample Wt. (g)	383.4	387.7	Burette Zero (cm):	100.0	

CALCULATED VALUES

MOISTURE (%)	16.9	17.8	MAXIMUM GRADIENT:	15.8
WET DENS. (pcf)	128.3	131.4	AVERAGE GRADIENT:	13.1
DRY DENS. (pcf)	109.7	111.6	MAX. EFFECT. STRESS (psi):	6.3
SATURATION (%)	88.2	97.6	MIN. EFFECT. STRESS (psi):	5.0
			AVE. EFFECT. STRESS (psi):	5.5

Date YY MM DD	Time HH MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90 6 20	7 17	0	95	95	4.80	2.80	98.50			
90 6 20	15 2	23	95	95	7.20	4.15	96.50	-19.4	3.7E-08	
90 6 20	16 10	23	95	95	7.00	4.30	96.20	-33.3	3.5E-08	
90 6 21	7 4	21	95	95	8.60	6.75	93.90	3.2	2.9E-08	1
90 6 22	7 11	21	95	95	11.20	10.30	90.40	0.7	2.8E-08	1
90 6 25	8 55	21	95	95	16.75	19.20	81.60	0.6	2.7E-08	1

Average Kv for those rows with a 1 in the Ave. column 2.8E-08 cm/sec
1.1E-08 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: TP11-1,1.8-4.0';TP9-3,4'-5'
: TP10-2,3.0'-5.0'
Visual Descript:

Date: 28-Jun-90
Tech: GAP
File: WEYREM5
Cell #: 5P

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.50	2.50
Sample Ht. (in)	2.32	2.33
Tare & Wet (g)	156.5	480.6
Tare & Dry (g)	151.5	416.9
Tare (g)	115.4	79.6
Sample Wt. (g)	373.5	401.0

Permeant:	TAP WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.70	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

	INIT.	FINAL
MOISTURE (%)	14.0	18.9
WET DENS. (pcf)	124.9	133.6
DRY DENS. (pcf)	109.5	112.4
SATURATION (%)	70.5	102.0

MAXIMUM GRADIENT:	15.0
AVERAGE GRADIENT:	8.1
MAX. EFFECT. STRESS (psi):	6.3
MIN. EFFECT. STRESS (psi):	4.8
AVE. EFFECT. STRESS (psi):	5.5

Date YY MM DD	Time HH MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90 6 20	7 26	0	95	95	3.85	2.80	98.00			
90 6 20	15 26	0	95	95	7.35	4.20	102.30			
90 6 20	15 50	22	95	95	7.30	24.90	80.85	-1.8	1.2E-05	
90 6 20	16 7	23	95	95	7.40	34.15	71.40	-1.1	1.2E-05	
90 6 21	7 28	0	95	95	9.90	2.90	98.20			
90 6 21	7 57	21	95	95	9.80	26.00	74.50	-1.3	1.1E-05	
90 6 21	8 31	21	95	95	10.00	39.20	61.30	0.0	1.1E-05	
90 6 22	7 20	0	95	95	12.40	3.00	98.80			
90 6 22	7 52	21	95	95	12.40	27.40	73.70	-1.4	1.1E-05	
90 6 22	14 32	0	95	95	13.10	2.40	98.70			
90 6 22	14 35	21	95	95	13.15	5.95	94.45	-9.0	1.4E-05	
90 6 22	14 47	21	95	95	13.20	16.55	83.60	-1.2	1.1E-05	1
90 6 22	14 57	21	95	95	13.10	23.40	76.80	0.4	1.1E-05	1
90 6 22	15 35	21	95	95	13.10	38.70	61.40	-0.3	1.1E-05	1

Average Kv for those rows with a 1 in the Ave. column 1.1E-05 cm/sec
4.4E-06 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements

✓ JPA 6-25-90

RMT, Inc.
Falling Head Permeability Test

Job: WEYERHAEUSER
Job #: 467.42
Sample: TP11-1,1.8-4.0';TP9-3,4-5'
: TP10-2,3.0-5.0'
Visual Descript:

Date: 28-Jun-90
Tech: GAP
File: WEYREM8
Cell #: 2P

INPUT VALUES

	INIT.	FINAL
Sample Dia. (in)	2.50	2.50
Sample Ht. (in)	2.32	2.28
Tare & Wet (g)	157.7	465.1
Tare & Dry (g)	153.6	399.7
Tare (g)	115.5	78.8
Sample Wt. (g)	364.6	386.4

Permeant:	DEAIRED WATER	
Permeant Specific Gravity:	1.00	
Sample Specific Gravity:	2.70	EST.
Confining Pressure (psi):	100.0	
Burette Diameter (in):	0.250	
Burette Zero (cm):	100.0	

CALCULATED VALUES

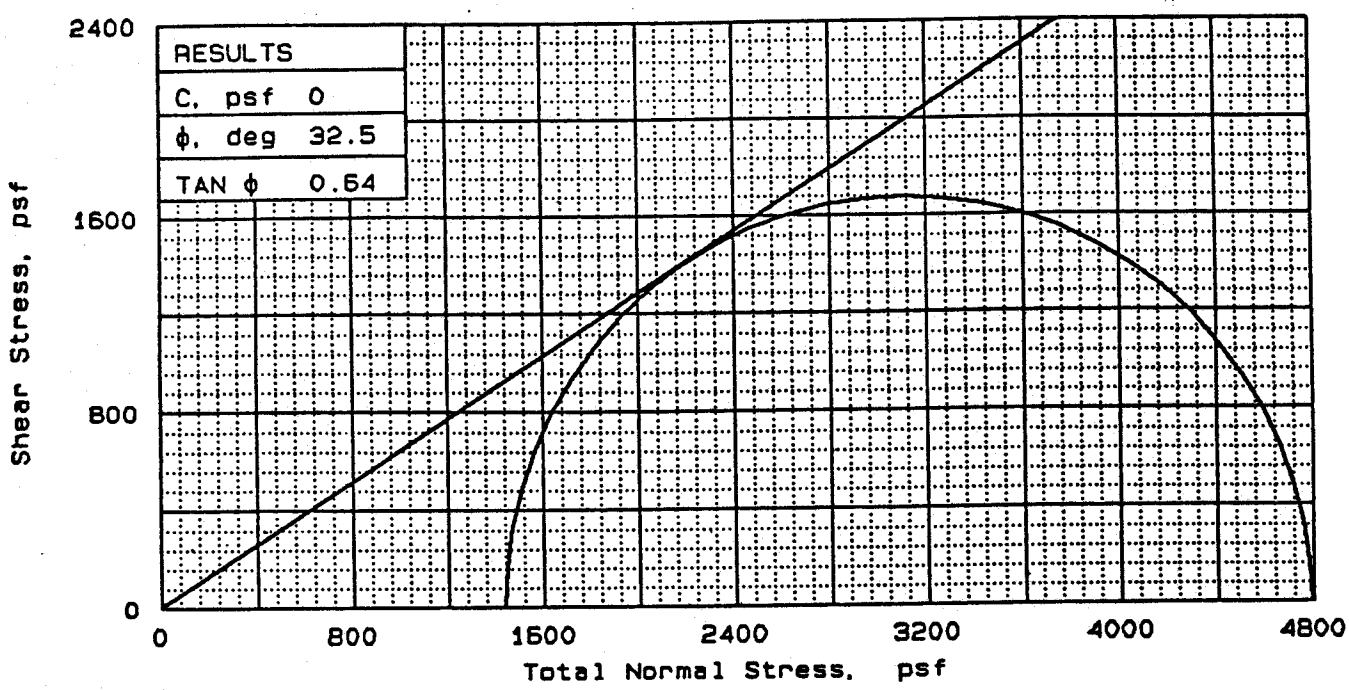
	INIT.	FINAL
MOISTURE (%)	10.9	20.4
WET DENS. (pcf)	122.0	131.5
DRY DENS. (pcf)	110.0	109.2
SATURATION (%)	55.3	101.5

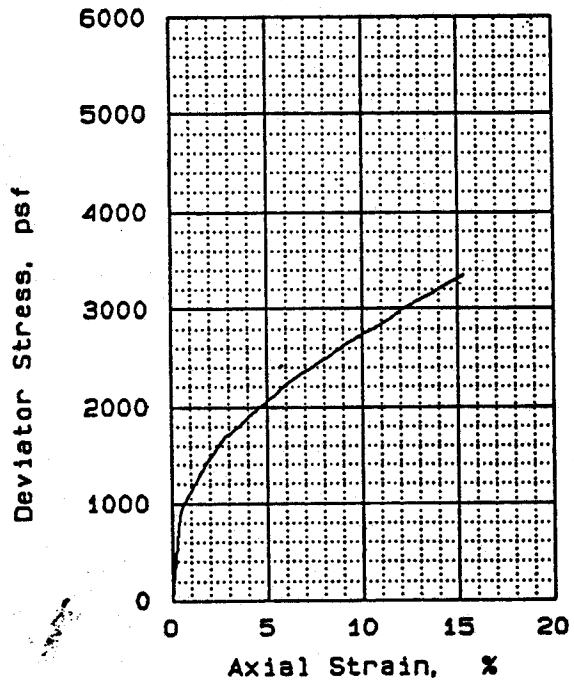
MAXIMUM GRADIENT:	10.6
AVERAGE GRADIENT:	8.4
MAX. EFFECT. STRESS (psi):	6.4
MIN. EFFECT. STRESS (psi):	4.6
AVE. EFFECT. STRESS (psi):	5.4

Date YY	MM	DD	Time HH	MM	Temp *	Press.(psi) BOT	TOP	Readings (cm) CHAM	BOT	TOP	Flow Dif. %	Kv cm/sec	Ave. 0,1
90	6	20	7	19	0	95	95	2.50	2.20	99.20			
90	6	20	15	1	0	95	95	9.00	5.50	102.60			
90	6	21	7	8	0	95	95	13.90	17.70	100.20			
90	6	21	8	10	21	95	95	14.15	38.70	79.60	1.0	5.5E-06	
90	6	21	8	28	21	95	95	14.30	42.30	76.10	1.4	5.1E-06	
90	6	22	7	13	0	95	95	20.50	1.40	99.60			
90	6	22	7	50	21	95	95	20.60	15.35	85.60	-0.2	4.4E-06	
90	6	22	14	28	0	95	95	22.20	1.50	98.80			
90	6	22	14	34	21	95	95	22.30	4.10	96.10	-1.9	4.5E-06	
90	6	22	14	39	21	95	95	22.40	6.40	93.80	0.0	5.0E-06	
90	6	22	14	49	21	95	95	22.50	10.00	90.30	1.4	4.1E-06	
90	6	22	14	59	21	95	95	22.40	13.20	87.20	1.6	3.9E-06	
90	6	22	15	30	21	95	95	22.40	20.55	80.00	1.0	3.4E-06	
90	6	25	8	59	21	95	95	33.40	2.80	101.30	-9.1	-6.2E-08	
90	6	25	9	10	21	95	95	33.55	7.15	96.90	-0.6	4.1E-06	
90	6	25	9	23	21	95	95	33.55	11.20	93.10	3.2	3.4E-06	
90	6	25	9	37	21	95	95	33.70	15.80	88.60	1.1	4.1E-06	
90	6	25	9	48	21	95	95	33.65	18.80	85.60	0.0	3.8E-06	
90	6	25	9	58	21	95	95	33.60	21.60	82.85	0.9	4.2E-06	
90	6	25	10	15	21	95	95	33.75	25.35	79.15	0.7	3.7E-06	1
90	6	25	10	32	21	95	95	33.70	28.55	76.15	3.2	3.5E-06	1
90	6	25	10	44	21	95	95	33.75	30.50	74.20	-0.0	3.4E-06	1
90	6	25	11	2	21	95	95	33.70	33.20	71.60	1.9	3.5E-06	1

Average Kv for those rows with a 1 in the Ave. column 3.5E-06 cm/sec
1.4E-06 in/sec

Termination determined by stable Kv and low flow differential
* A zero in this column starts a series of measurements





SAMPLE NO.		1	2
INITIAL	WATER CONTENT, %	105.9	
	DRY DENSITY, pcf	32.2	
	SATURATION, %	73.3	
	VOID RATIO	2.950	
	DIAMETER, in	2.87	
	HEIGHT, in	6.50	
AT TEST	WATER CONTENT, %	86.3	
	DRY DENSITY, pcf	46.1	
	SATURATION, %	100.0	
	VOID RATIO	1.761	
	DIAMETER, in	2.40	
	HEIGHT, in	6.47	
BACK PRESSURE, psf		8640	
CELL PRESSURE, psf		10080	
FAILURE STRESS, psf		3351	
PORE PRESSURE, psf		9576	
STRAIN RATE, %/min.		1.000	
ULTIMATE STRESS, psf			
PORE PRESSURE, psf			
$\bar{\sigma}_1$ FAILURE, psf		3855	
$\bar{\sigma}_3$ FAILURE, psf		504	

TYPE OF TEST:
CU with pore pressures
SAMPLE TYPE: REMOLDED
DESCRIPTION:

LL= PL= PI=
SPECIFIC GRAVITY= 2.04
REMARKS:

FIG. NO.

CLIENT: WEYERHAEUSER

PROJECT: WEYERHAEUSER

SAMPLE LOCATION: SLUDGE @ 45% SOLIDS

PROJ. NO.: 467.41 DATE: 6-29-90

TRIAXIAL COMPRESSION TEST

RMT, INC.

APPENDIX E

RMT, INC.

HYDROCON - 1.01
HYDRAULIC CONDUCTIVITY
Bouwer and Rice Method

Well: OW-2

PROJECT NAME: WeyCo
USER NAME: CVC
PROJECT NUMBER: 467.42
DATE: 1 June 1990
FIELD WORK DATE(S): 23 May 1990

Rw - BORING RADIUS (IN): 2.37
Rc - WELL RADIUS (IN): 1
L - SCREEN LENGTH (FT): 10
D - AQUIFER THICKNESS (FT): 19
H - SCREEN BASE TO WATER TABLE (FT): 7.5
STATIC WATER LEVEL READING (FT): 7.2
START TIME (H,M,S): 0,0,0

Rc was corrected for response in well screen filter material to 1.544 inches

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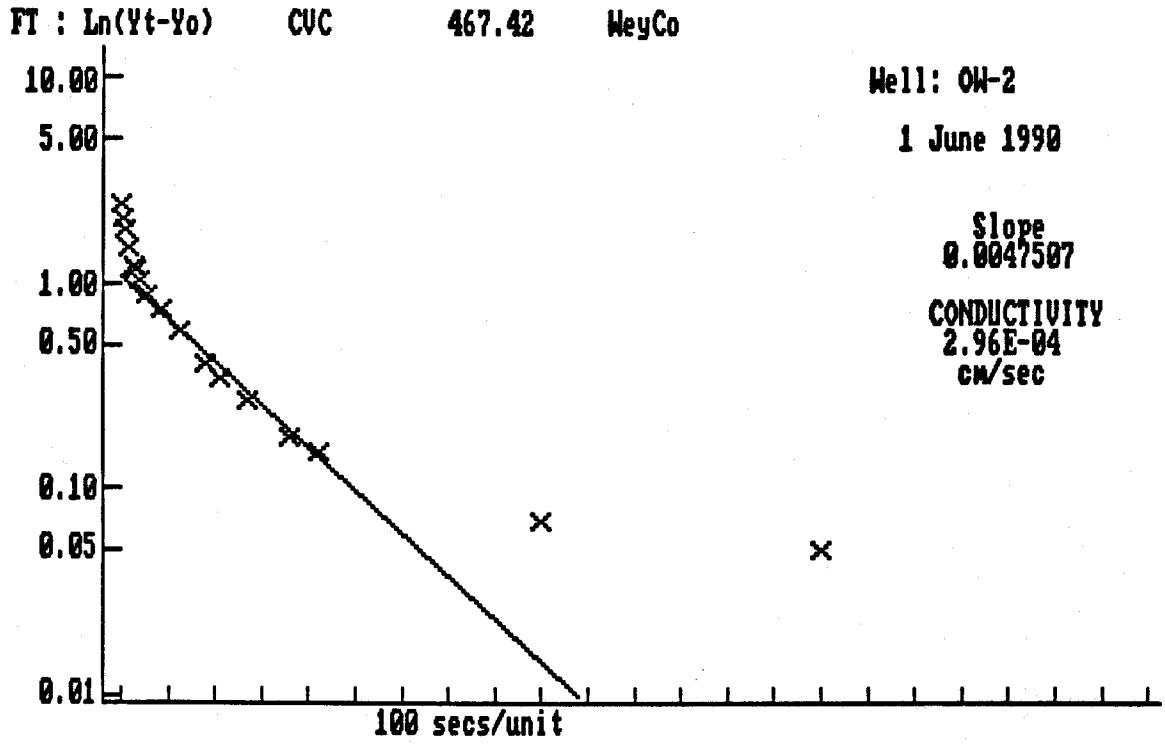
TIME (H,M,S)	DEPTH (FT)
0,0,0	9.59
0,0,2	9.28
0,0,7	9
0,0,15	8.71
0,0,28	8.39
0,0,30	8.35
0,0,40	8.21
0,0,55	8.09
0,1,25	7.95
0,2,5	7.79
0,3,0	7.61
0,3,30	7.55
0,4,30	7.47
0,6,0	7.38
0,7,0	7.35
0,15,0	7.27
0,25,0	7.25

(1/t) (ln(Yo/Yt))= 0.0047507

PARTIALLY PENETRATING: A= 3.07 B= 0.52

HYDRAULIC CONDUCTIVITY: 9.71E-06 ft/sec
2.96E-04 cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
10.00
5.00
1.00
0.50
0.10
0.05
0.01
100 secs/unit
Well: OW-2
1 June 1990
Slope
0.0047507
CONDUCTIVITY
2.96E-04
cm/sec

RMT, INC.

HYDROCON - 1.01
HYDRAULIC CONDUCTIVITY
Bouwer and Rice Method

Well: OW-3

PROJECT NAME: WeyCo
PROJECT NUMBER: 467.42
FIELD WORK DATE(S): 23 May 1990

USER NAME: CVC
DATE: 1 June 1990

Rw - BORING RADIUS (IN): 5.7
L - SCREEN LENGTH (FT): 10
H - SCREEN BASE TO WATER TABLE (FT): 6.2
START TIME (H,M,S): 0,0,0

Rc - WELL RADIUS (IN): 1
D - AQUIFER THICKNESS (FT): 14.7
STATIC WATER LEVEL READING (FT): 17.9

Rc was corrected for response in well screen filter material to 3.232 inches

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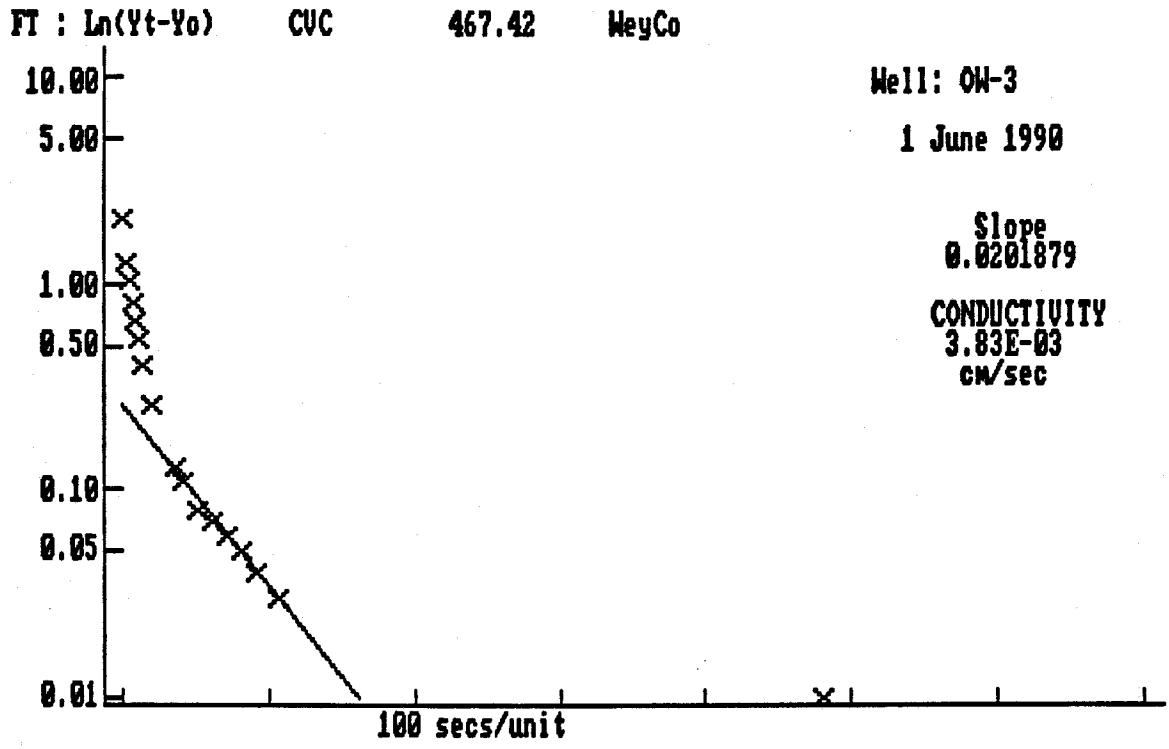
TIME (H,M,S)	DEPTH (FT)
0,0,0	19.99
0,0,3	19.16
0,0,5	18.91
0,0,7	18.72
0,0,9	18.56
0,0,11	18.43
0,0,14	18.31
0,0,20	18.16
0,0,36	18.03
0,0,41	18.01
0,0,51	17.98
0,1,1	17.97
0,1,11	17.96
0,1,21	17.95
0,1,31	17.94
0,1,46	17.93
0,8,1	17.91

(1/t) (ln(Yo/Yt))= 0.0201879

PARTIALLY PENETRATING: A= 2.23 B= 0.35

HYDRAULIC CONDUCTIVITY: 1.26E-04 ft/sec
3.83E-03 cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
10.00
5.00
1.00
0.50
0.10
0.05
0.01
100 secs/unit
Well: OW-3
1 June 1990
Slope
0.0201879
CONDUCTIVITY
3.83E-03
cm/sec

RMT, INC.

HYDROCON - 1.01
HYDRAULIC CONDUCTIVITY
Bouwer and Rice Method

Well: OW-5

PROJECT NAME: WeyCo
PROJECT NUMBER: 467.42
FIELD WORK DATE(S): 22 MAY 1990

USER NAME: CVC
DATE: 7 June 1990

Rw - BORING RADIUS (IN): 4.49
L - SCREEN LENGTH (FT): 10
H - SCREEN BASE TO WATER TABLE (FT): 9.61
START TIME (H,M,S): 0,0,0

Rc - WELL RADIUS (IN): 1
D - AQUIFER THICKNESS (FT): 9.61
STATIC WATER LEVEL READING (FT): 14

Rc was corrected for response in well screen filter material to 2.598 inches

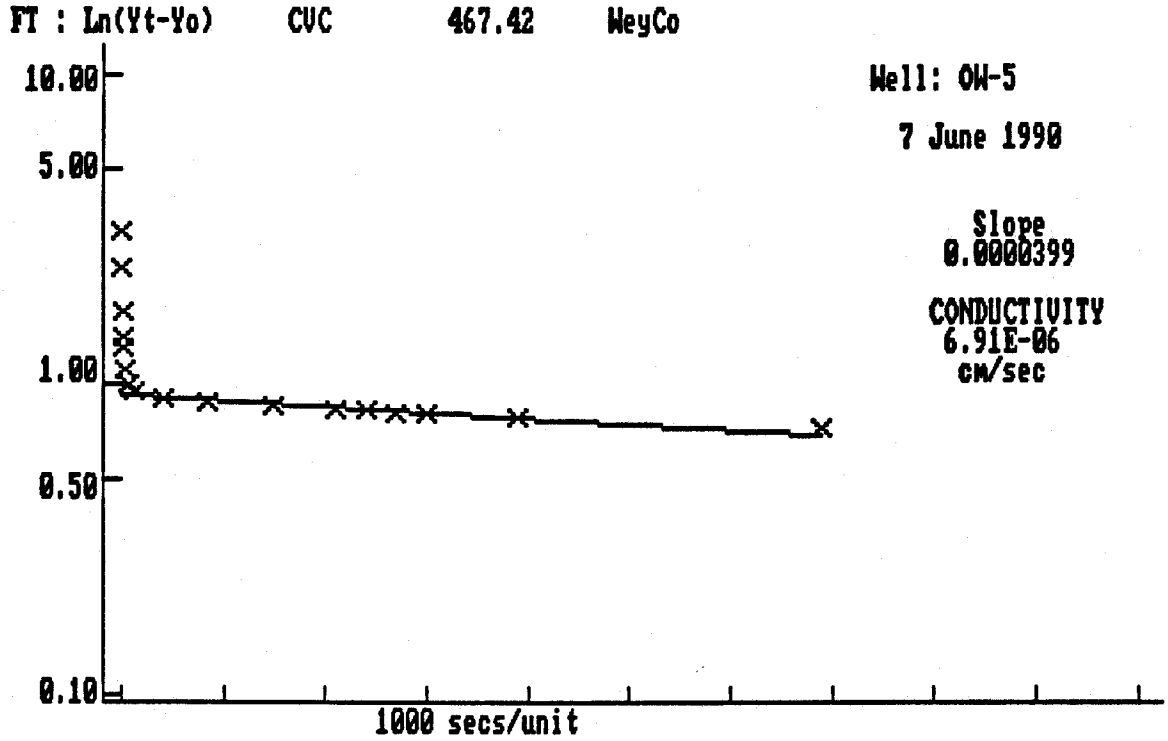
---

TIME (H,M,S)	DEPTH (FT)
0,0,0	17.1
0,0,6	16.36
0,0,15	15.73
0,0,21	15.44
0,0,25	15.3
0,0,35	15.12
0,1,5	15
0,2,0	14.95
0,7,0	14.9
0,14,0	14.87
0,25,0	14.85
0,35,0	14.83
0,40,0	14.82
0,45,0	14.81
0,50,0	14.8
1,5,0	14.79
1,55,0	14.73

(1/t) (ln(Yo/Yt))= 0.0000399

FULLY PENETRATING: C= 1.97

HYDRAULIC CONDUCTIVITY: 2.27E-07 ft/sec
6.91E-06 cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
10.00
5.00
1.00
0.50
0.10
1000 secs/unit
Well: OW-5
7 June 1990
Slope
0.0000399
CONDUCTIVITY
6.91E-06
cm/sec

RMT, INC.

HYDROCON - 1.01
HYDRAULIC CONDUCTIVITY
Bouwer and Rice Method

Well: OW-6

PROJECT NAME: WeyCo
PROJECT NUMBER: 467.42
FIELD WORK DATE(S): 22 MAY 1990

USER NAME: CVC
DATE: 7 June 1990

Rw - BORING RADIUS (IN): 1.31
L - SCREEN LENGTH (FT): 10
H - SCREEN BASE TO WATER TABLE (FT): 1.35
START TIME (H,M,S): 0,0,0

Rc - WELL RADIUS (IN): 1
D - AQUIFER THICKNESS (FT): 6.85
STATIC WATER LEVEL READING (FT): 26.95

Rc was corrected for response in well screen filter material to 1.102 inches

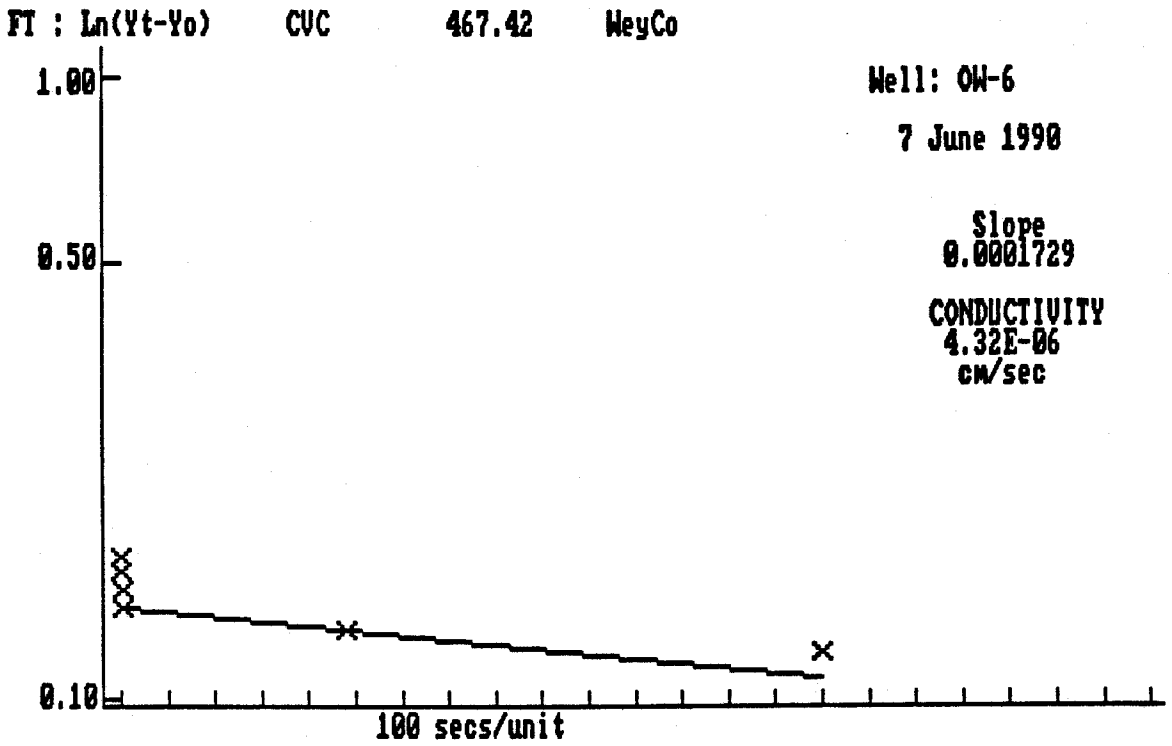
---

TIME (H,M,S)	DEPTH (FT)
0,0,0	27.12
0,0,1	27.11
0,0,2	27.1
0,0,3	27.09
0,8,0	27.08
0,25,0	27.07

(1/t) (ln(Yo/Yt))= 0.0001729

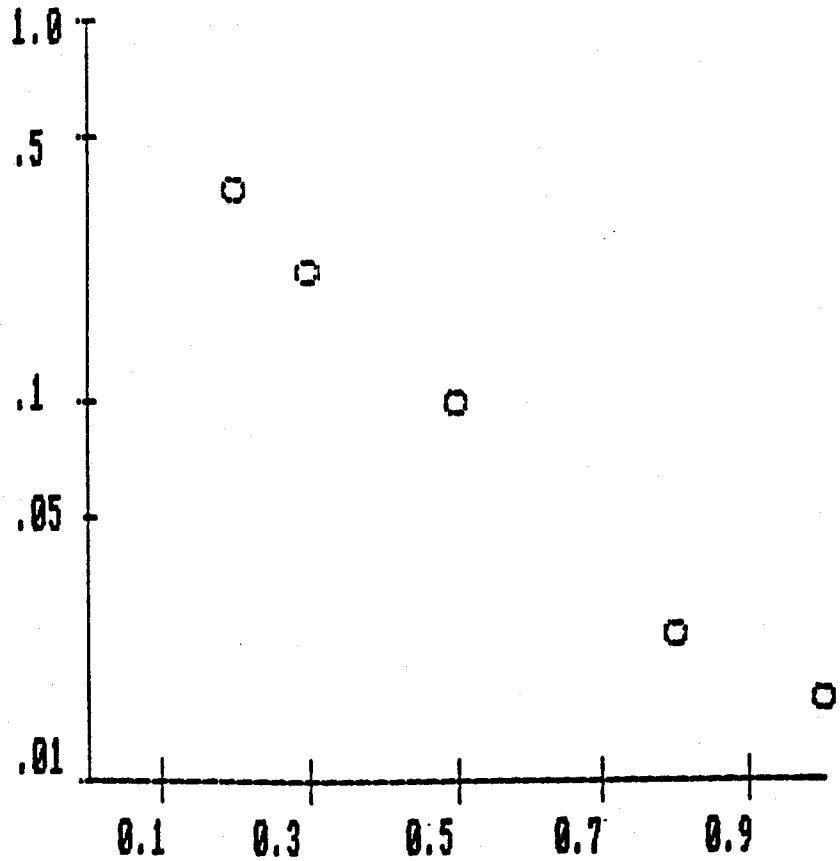
PARTIALLY PENETRATING: A= 4.15 B= 0.75

HYDRAULIC CONDUCTIVITY: 1.42E-07 ft/sec
4.32E-06 cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
1.00
0.50
0.10
Well: OW-6
7 June 1990
Slope
0.0001729
CONDUCTIVITY
4.32E-06
cm/sec
100 secs/unit

WEYERHAEUSER-PLYMOUTH

MW-1A



X AXIS:
TIME, min

Y AXIS:
LOG (H/H0)

RMT, INC.

HYDROCON - 1.01
HYDRAULIC CONDUCTIVITY
Bouwer and Rice Method

Well: MW-6A

PROJECT NAME: WeyCo
PROJECT NUMBER: 467.42
FIELD WORK DATE(S): 23 May 1990

USER NAME: CVC
DATE: 1 June 1990

Rw - BORING RADIUS (IN): 3
L - SCREEN LENGTH (FT): 5
H - SCREEN BASE TO WATER TABLE (FT): 43.94
START TIME (H,M,S): 0,0,0

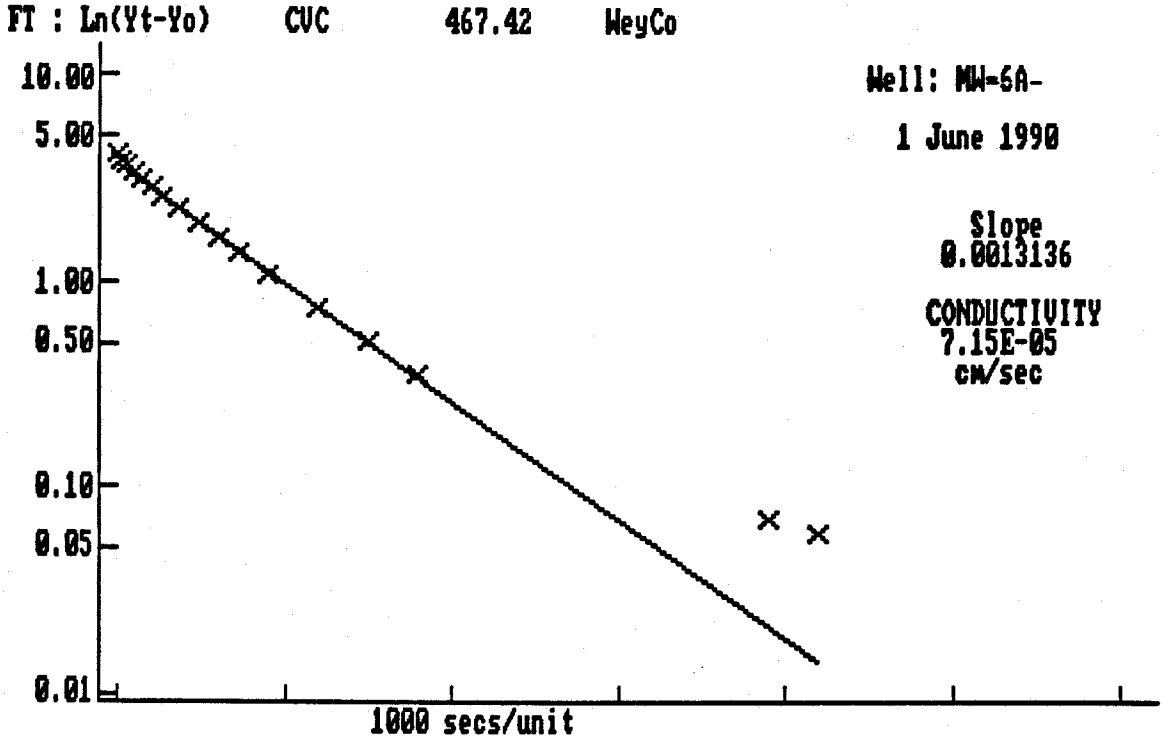
Rc - WELL RADIUS (IN): 1
D - AQUIFER THICKNESS (FT): 55
STATIC WATER LEVEL READING (FT): 9.92

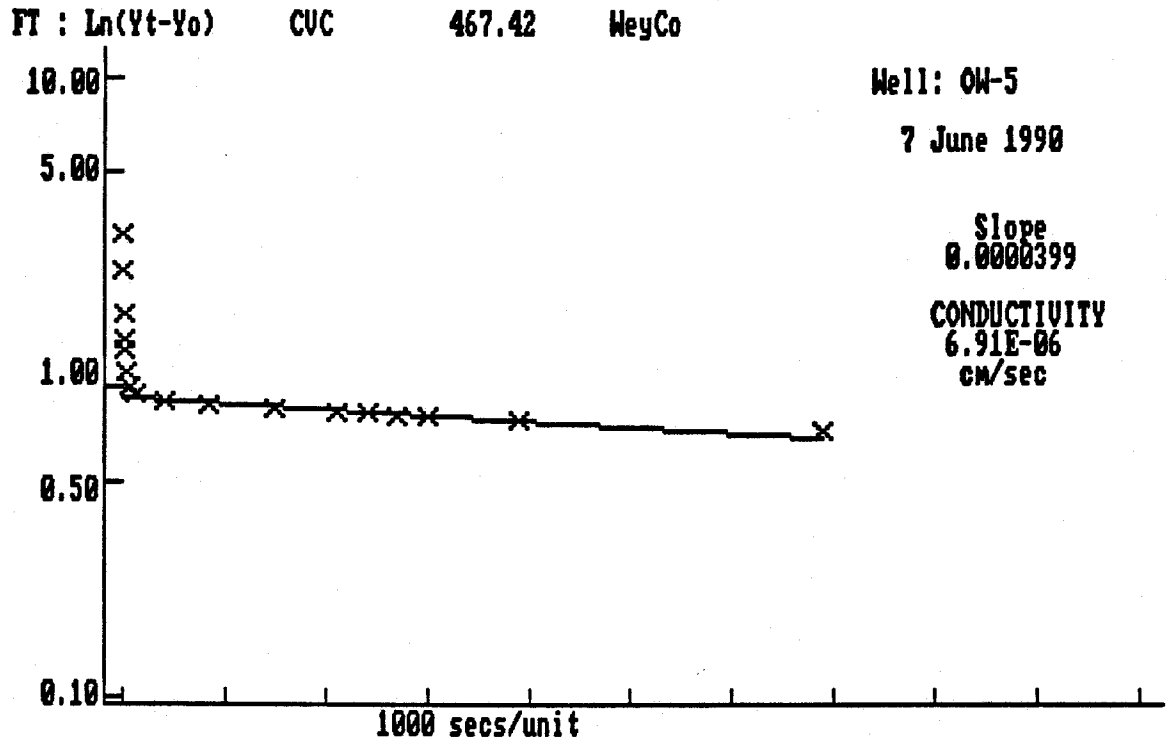
TIME (H,M,S)	DEPTH (FT)
0,0,0	13.99
0,0,17	13.74
0,0,56	13.48
0,1,36	13.25
0,2,26	12.99
0,3,26	12.72
0,4,26	12.48
0,5,56	12.16
0,7,56	11.81
0,9,56	11.51
0,11,56	11.29
0,14,56	11
0,19,56	10.66
0,24,56	10.43
0,29,56	10.28
1,4,56	9.99
1,9,56	9.98

(1/t) (ln(Yo/Yt))= 0.0013136

PARTIALLY PENETRATING: A= 2.20 B= 0.35

HYDRAULIC CONDUCTIVITY: 2.34E-06 ft/sec
7.15E-05 cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
10.00
5.00
1.00
0.50
0.10
0.05
0.01
1000 secs/unit
Well: MW-6A-
1 June 1990
Slope
0.0013136
CONDUCTIVITY
7.15E-05
cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
10.00
5.00
1.00
0.50
0.10
1000 secs/unit
Well: OW-5
7 June 1990
Slope
0.0000399
CONDUCTIVITY
6.91E-06
cm/sec

RMT, INC.

HYDROCON - 1.01
HYDRAULIC CONDUCTIVITY
Bouwer and Rice Method

Well: OW-6

PROJECT NAME: WeyCo
PROJECT NUMBER: 467.42
FIELD WORK DATE(S): 22 MAY 1990

USER NAME: CVC
DATE: 7 June 1990

Rw - BORING RADIUS (IN): 1.31
L - SCREEN LENGTH (FT): 10
H - SCREEN BASE TO WATER TABLE (FT): 1.35
START TIME (H,M,S): 0,0,0

Rc - WELL RADIUS (IN): 1
D - AQUIFER THICKNESS (FT): 6.85
STATIC WATER LEVEL READING (FT): 26.95

Rc was corrected for response in well screen filter material to 1.102 inches

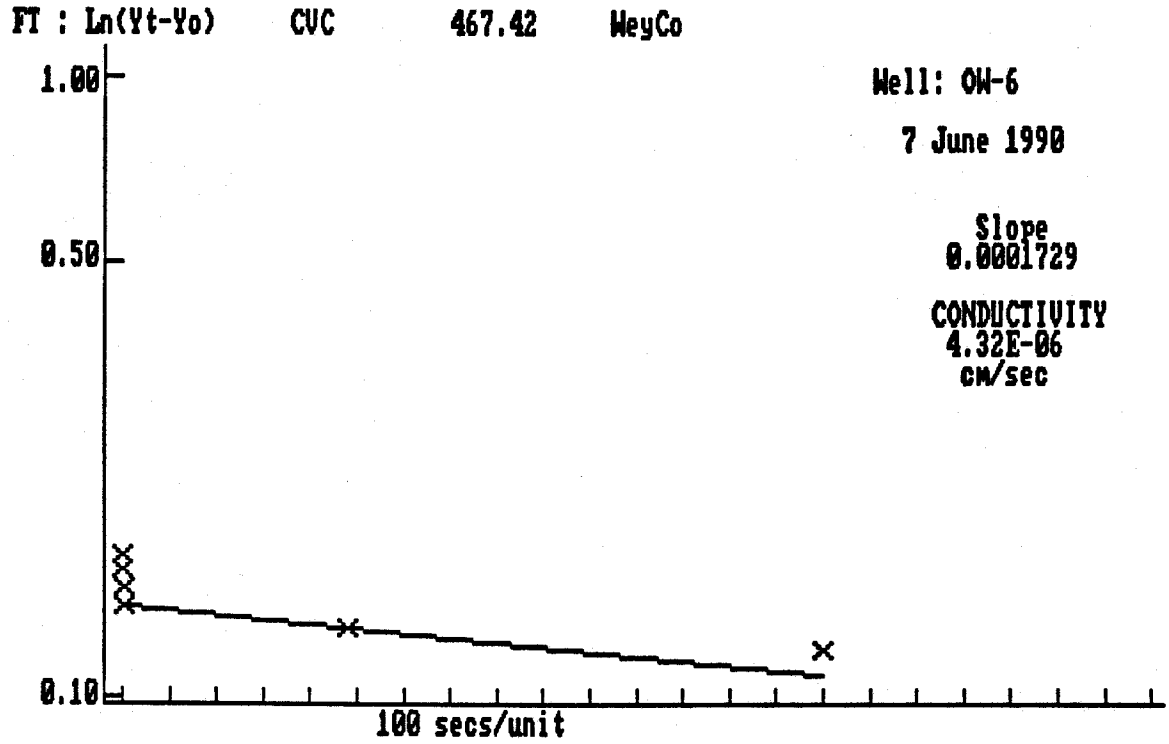
---

TIME (H,M,S)	DEPTH (FT)
0,0,0	27.12
0,0,1	27.11
0,0,2	27.1
0,0,3	27.09
0,8,0	27.08
0,25,0	27.07

(1/t) (ln(Yo/Yt))= 0.0001729

PARTIALLY PENETRATING: A= 4.15 B= 0.75

HYDRAULIC CONDUCTIVITY: 1.42E-07 ft/sec
4.32E-06 cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
1.00
0.50
0.10
Well: OW-6
7 June 1990
Slope
0.0001729
CONDUCTIVITY
4.32E-06
cm/sec
100 secs/unit

RMT, INC.

HYDROCON - 1.01
HYDRAULIC CONDUCTIVITY
Bouwer and Rice Method

Well: OW-7

PROJECT NAME: WeyCo
PROJECT NUMBER: 467.42
FIELD WORK DATE(S): 22 May 1990

USER NAME: CVC
DATE: 1 June 1990

Rw - BORING RADIUS (IN): 8.06
L - SCREEN LENGTH (FT): 10
H - SCREEN BASE TO WATER TABLE (FT): 7.7
START TIME (H,M,S): 0,0,0

Rc - WELL RADIUS (IN): 1
D - AQUIFER THICKNESS (FT): 20
STATIC WATER LEVEL READING (FT): 18.94

Rc was corrected for response in well screen filter material to 4.493 inches

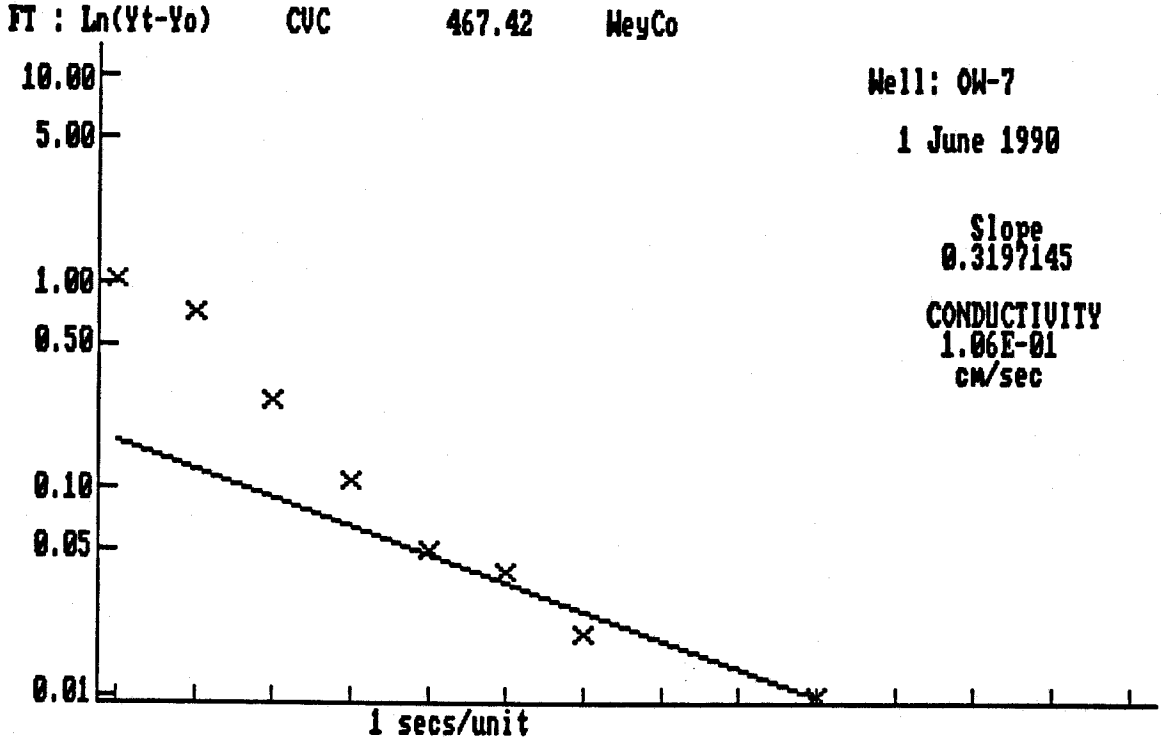
---

TIME (H,M,S)	DEPTH (FT)
0,0,0	19.95
0,0,1	19.65
0,0,2	19.21
0,0,3	19.05
0,0,4	18.99
0,0,5	18.98
0,0,6	18.96
0,0,9	18.95

(1/t) (ln(Yo/Yt))= 0.3197145

PARTIALLY PENETRATING: A= 2.00 B= 0.30

HYDRAULIC CONDUCTIVITY: 3.48E-03 ft/sec
1.06E-01 cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
Well: OW-7
1 June 1990
Slope
0.3197145
CONDUCTIVITY
1.06E-01
cm/sec
10.00
5.00
1.00
0.50
0.10
0.05
0.01
1 secs/unit

Weyerhaeuser-Plymouth.....MW-1A

TIME (seconds)	WATER LEVEL (feet)	DRAWDOWN (feet)	H/HO
12	27.17	1.33	.3643836
18	26.66	0.82	.2246576
30	26.2	0.36	9.863042E-02
48	25.93	0.09	2.465793E-02
60	25.9	0.06	1.643848E-02

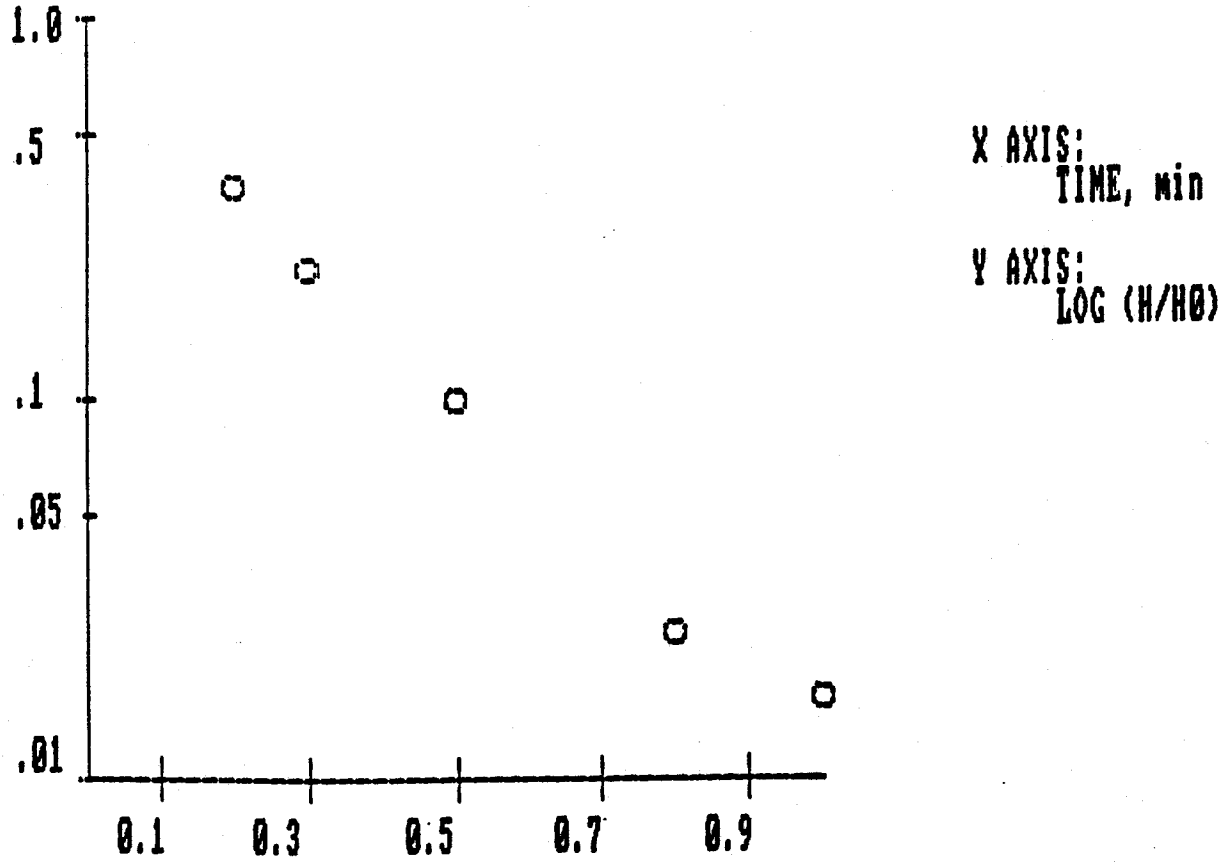
CONFINED AQUIFER, PARTIALLY PENETRATING CONDITION

K = 0.40E-02 cm/sec
= 84.3 gpd/ft2
= 0.13E-03 ft/sec
= 11.3 ft/day

REGRESSION COEFFICIENT = -.9941326

WEYERHAEUSER-PLYMOUTH

MW-1A



RMT, INC.

HYDROCON - 1.01
HYDRAULIC CONDUCTIVITY
Bouwer and Rice Method

Well: MW-6A

PROJECT NAME: WeyCo
PROJECT NUMBER: 467.42
FIELD WORK DATE(S): 23 May 1990

USER NAME: CVC
DATE: 1 June 1990

Rw - BORING RADIUS (IN): 3
L - SCREEN LENGTH (FT): 5
H - SCREEN BASE TO WATER TABLE (FT): 43.94
START TIME (H,M,S): 0,0,0

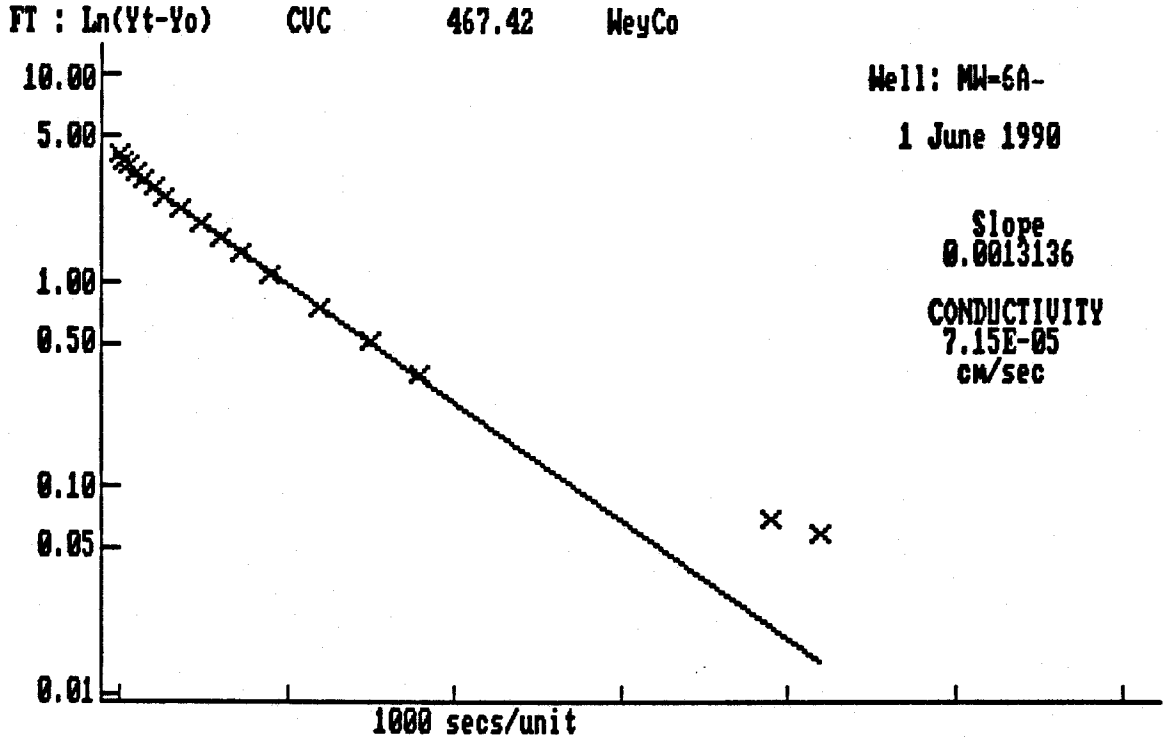
Rc - WELL RADIUS (IN): 1
D - AQUIFER THICKNESS (FT): 55
STATIC WATER LEVEL READING (FT): 9.92

TIME (H,M,S)	DEPTH (FT)
0,0,0	13.99
0,0,17	13.74
0,0,56	13.48
0,1,36	13.25
0,2,26	12.99
0,3,26	12.72
0,4,26	12.48
0,5,56	12.16
0,7,56	11.81
0,9,56	11.51
0,11,56	11.29
0,14,56	11
0,19,56	10.66
0,24,56	10.43
0,29,56	10.28
1,4,56	9.99
1,9,56	9.98

(1/t) (ln(Yo/Yt))= 0.0013136

PARTIALLY PENETRATING: A= 2.20 B= 0.35

HYDRAULIC CONDUCTIVITY: 2.34E-06 ft/sec
7.15E-05 cm/sec


FT : Ln(Yt-Yo)
CVC
467.42
WeyCo
10.00
5.00
1.00
0.50
0.10
0.05
0.01
1000 secs/unit
Well: MW-6A-
1 June 1990
Slope
0.0013136
CONDUCTIVITY
7.15E-05
cm/sec

Weyerhaeuser-Plymouth.....MW-8

TIME (seconds)	WATER LEVEL (feet)	DRAWDOWN (feet)	H/HO
0	31.04	3.09	1
6	29.74	1.79	.579287
12	28.93	0.98	.3171521
18	28.52	0.57	.1844655
24	28.27	0.32	.1035599
30	28.2	0.25	.0809056
42	28.03	0.08	2.589048E-02

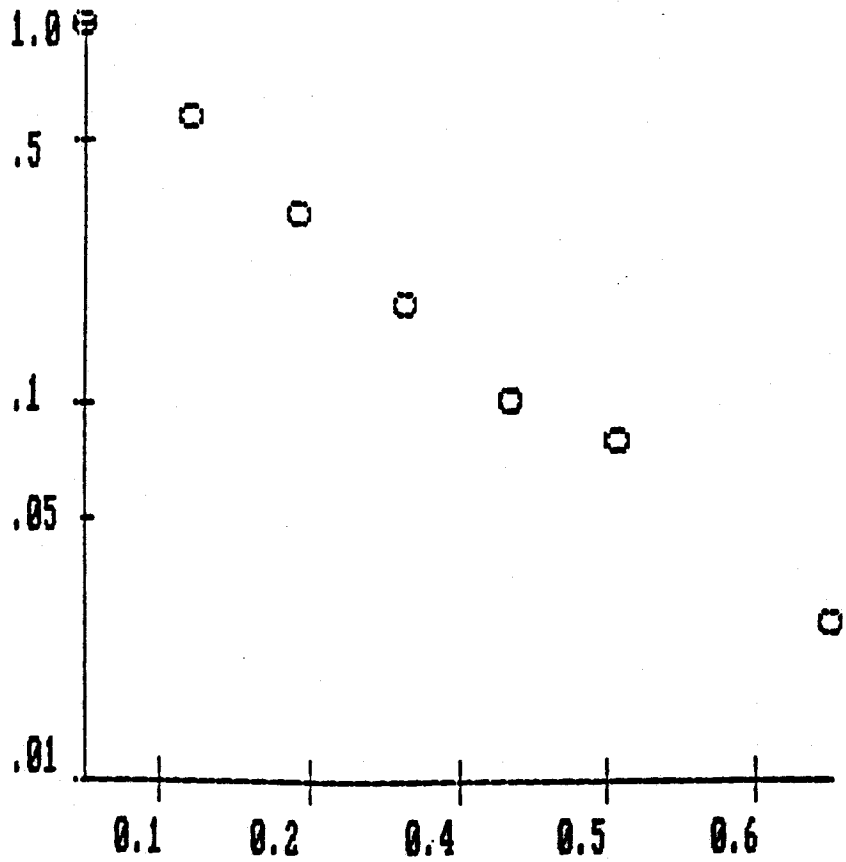
CONFINED AQUIFER, PARTIALLY PENETRATING CONDITION

K = 0.57E-02 cm/sec
= 121.1 gpd/ft2
= 0.19E-03 ft/sec
= 16.2 ft/day

REGRESSION COEFFICIENT = -.9972722

WEYERHAEUSER-PLYMOUTH

MW-8



X AXIS:
TIME, min

Y AXIS:
LOG (H/H0)

APPENDIX F

Hydraulic Conductivity

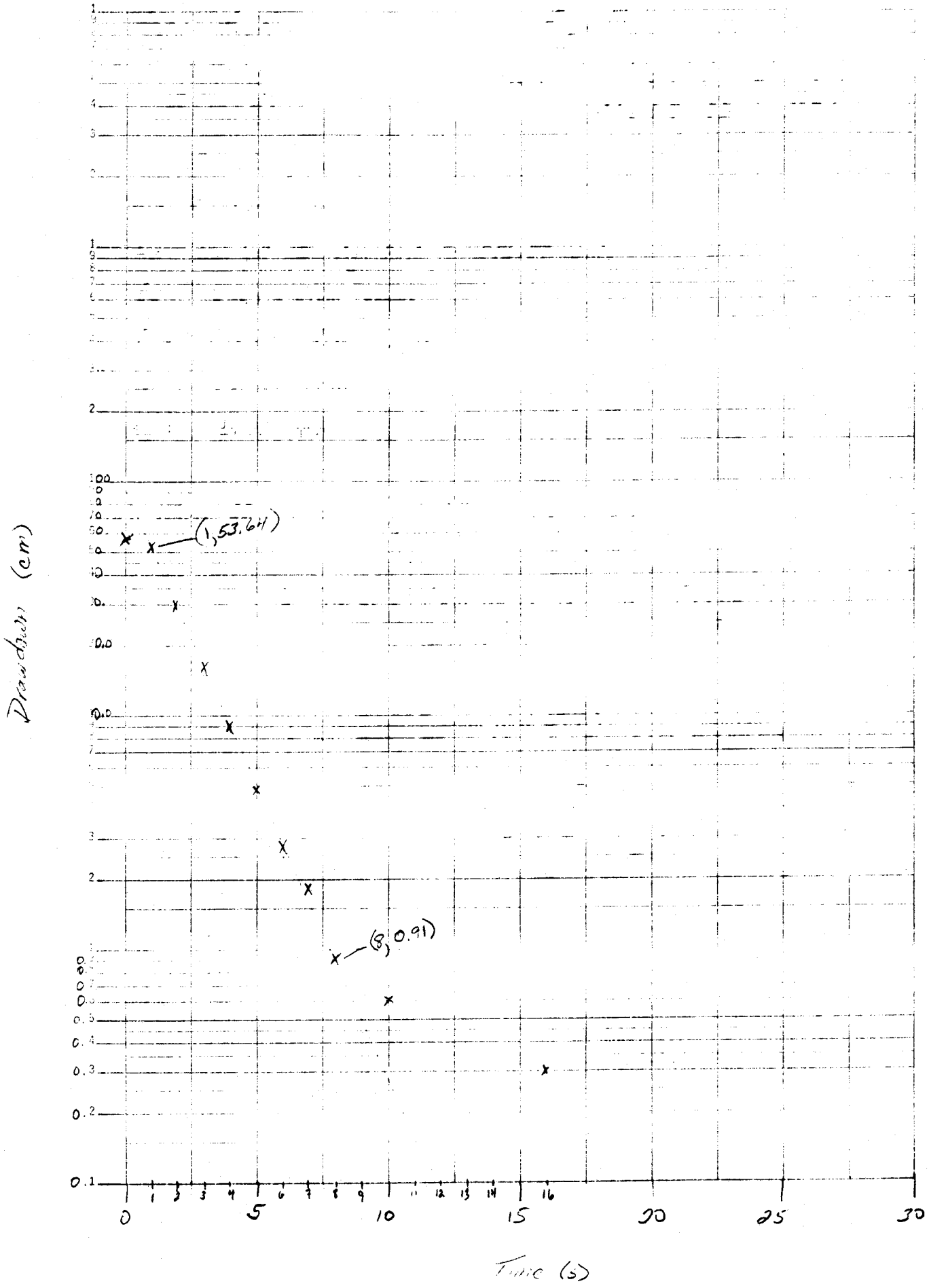
Well: OW-1
Project Name: WeyCo
Project Number: 467.42
Field Work Date: 23-May-1990

$$k = \frac{r^2 \ln(L_2/R)}{2L_2\,(t_2-t_1)} \ln\frac{S_1}{S_2}$$

$r = 2.54$ cm
$R = 2.54$ cm
$L_2 = 246.89$ cm
$t_1 = 1$ s
$t_2 = 8$ s
$S_1 = 53.64$ cm
$S_2 = 0.91$ cm

$$k = 3.4829 \times 10^{-2}$$

OW-1



WORKSHEET FOR CALCULATING VERTICAL GROUND WATER FLOW RATES

PROJECT/CLIENT: WeyCo
PROJECT NO.: 467.42
WELL PAIR: MW-7/OW-1
DATE: June 14,1990
BY: CVC

DATA INPUTS	Shallow Well	Deep Well
Ground Surface Elevation:	34.20	34.52
Depth to the bottom of the bentonite seal:	8.00	36.10
Elevation of the bottom of the bentonite seal:(E1)	26.20	-1.58
Depth to the bottom of the well screen:	20.10	44.70
Elevation of the bottom of the well screen:(E2)	14.10	-10.18
Water table elevation:(E3)	27.35	9.71

SHALLOW WELL		DEEP WELL	
E1 or E3	26.20	E1 or E3	-1.58
E2	14.10	E2	-10.18
E3	27.35	E3	9.71

where:

E1 = Elevation of the bottom of the bentonite seal
E2 = Elevation of the bottom of the well screen
E3 = Water table elevation

THE VERTICAL GROUND WATER FLOW GRADIENT IS -0.67767

WORKSHEET FOR CALCULATING VERTICAL GROUND WATER FLOW RATES

PROJECT/CLIENT: WeyCo
PROJECT NO.: 467.42
WELL PAIR: OW-4/MW-8
DATE: June 14,1990
BY: CVC

DATA INPUTS	Shallow Well	Deep Well
Ground Surface Elevation:	34.34	34.30
Depth to the bottom of the bentonite seal:	4.00	34.00
Elevation of the bottom of the bentonite seal:(E1)	30.34	0.30
Depth to the bottom of the well screen:	15.80	43.00
Elevation of the bottom of the well screen:(E2)	18.54	-8.70
Water table elevation:(E3)	23.04	7.72

SHALLOW WELL		DEEP WELL	
E1 or E3	23.04	E1 or E3	0.30
E2	18.54	E2	-8.70
E3	23.04	E3	7.72

where:

E1 = Elevation of the bottom of the bentonite seal
E2 = Elevation of the bottom of the well screen
E3 = Water table elevation

THE VERTICAL GROUND WATER FLOW GRADIENT IS -0.61304

WORKSHEET FOR CALCULATING VERTICAL GROUND WATER FLOW RATES

PROJECT/CLIENT: WeyCo
PROJECT NO.: 467.42
WELL PAIR: MW-1/1A
DATE: June 14,1990
BY: CVC

DATA INPUTS	Shallow Well	Deep Well
Ground Surface Elevation:	34.78	34.97
Depth to the bottom of the bentonite seal:	8.50	36.90
Elevation of the bottom of the bentonite seal:(E1)	26.28	-1.93
Depth to the bottom of the well screen:	20.00	44.00
Elevation of the bottom of the well screen:(E2)	14.78	-9.03
Water table elevation:(E3)	31.92	11.80

SHALLOW WELL		DEEP WELL	
E1 or E3	26.28	E1 or E3	-1.93
E2	14.78	E2	-9.03
E3	31.92	E3	11.80

where:

E1 = Elevation of the bottom of the bentonite seal
E2 = Elevation of the bottom of the well screen
E3 = Water table elevation

THE VERTICAL GROUND WATER FLOW GRADIENT IS -0.77354

WORKSHEET FOR CALCULATING VERTICAL GROUND WATER FLOW RATES

PROJECT/CLIENT: WEYCO - Plymouth
PROJECT NO.: 467.42
WELL PAIR: MW-6/6A
DATE: June 14, 1990
BY: DAB

DATA INPUTS	Shallow Well	Deep Well
Ground Surface Elevation:	11.22	11.52
Depth to the bottom of the bentonite seal:	7.80	42.00
Elevation of the bottom of the bentonite seal:(E1)	3.42	-30.48
Depth to the bottom of the well screen:	20.00	50.00
Elevation of the bottom of the well screen:(E2)	-8.78	-38.48
Water table elevation:(E3)	3.25	3.36

SHALLOW WELL		DEEP WELL	
E1 or E3	3.25	E1 or E3	-30.48
E2	-8.78	E2	-38.48
E3	3.25	E3	3.36

where:

E1 = Elevation of the bottom of the bentonite seal
E2 = Elevation of the bottom of the well screen
E3 = Water table elevation

THE VERTICAL GROUND WATER FLOW GRADIENT IS 0.003468

APPENDIX G

COMPUTATION SHEET

RMT INC.

SHEET 1. OF 11.

744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

PROJECT / PROPOSAL NAME	PREPARED By:	Date:	CHECKED By:	Date:	PROJECT/PROPOSAL NO.
WEYERHAEUSER - PLYMOUTH	D. GENTHE	7/3/90	JOH	7/3/90	467.42

CONSOLIDATION TEST RESULTS:

PROBLEM: ESTIMATE THE SAMPLE OVERBURDEN PRESSURE & DETERMINE IF THE GIVEN SAMPLES ARE NORMALLY CONSOLIDATED OR OVERCONSOLIDATED

ASSUME: * IN-SITU OVERBURDEN SOILS DENSITY = 115 pcf.

NOTE SHELBY TUBE SAMPLES OW-1 @ 20-22 feet AND MW-1A @ 22-24 feet INDICATED DENSITIES OF 111 pcf AND 113 pcf, RESPECTIVELY.

* WATERTABLE NEAR SURFACE.

SOLUTION:

AT 24 FEET BELOW SURFACE.

$$24' * (115 \text{ pcf} - 62.4 \text{ pcf}) = 1262 \text{ psf}$$

GIVEN: CONSOLIDATION TEST RESULTS

OW-1 @ 20-22' ⇒ COMPRESSION INDEX, C_c = 0.48
RECOMPRESSION INDEX, C_R = 0.15
INITIAL VOID RATIO, e_o = 1.3
PRECONSOLIDATION PRESSURE, P_c = 1.3 tsf
OVERBURDEN PRESSURE, P_o = 0.6 tsf

$P_c > P_o$ ✓ ∴ OVERCONSOLIDATED CLAY

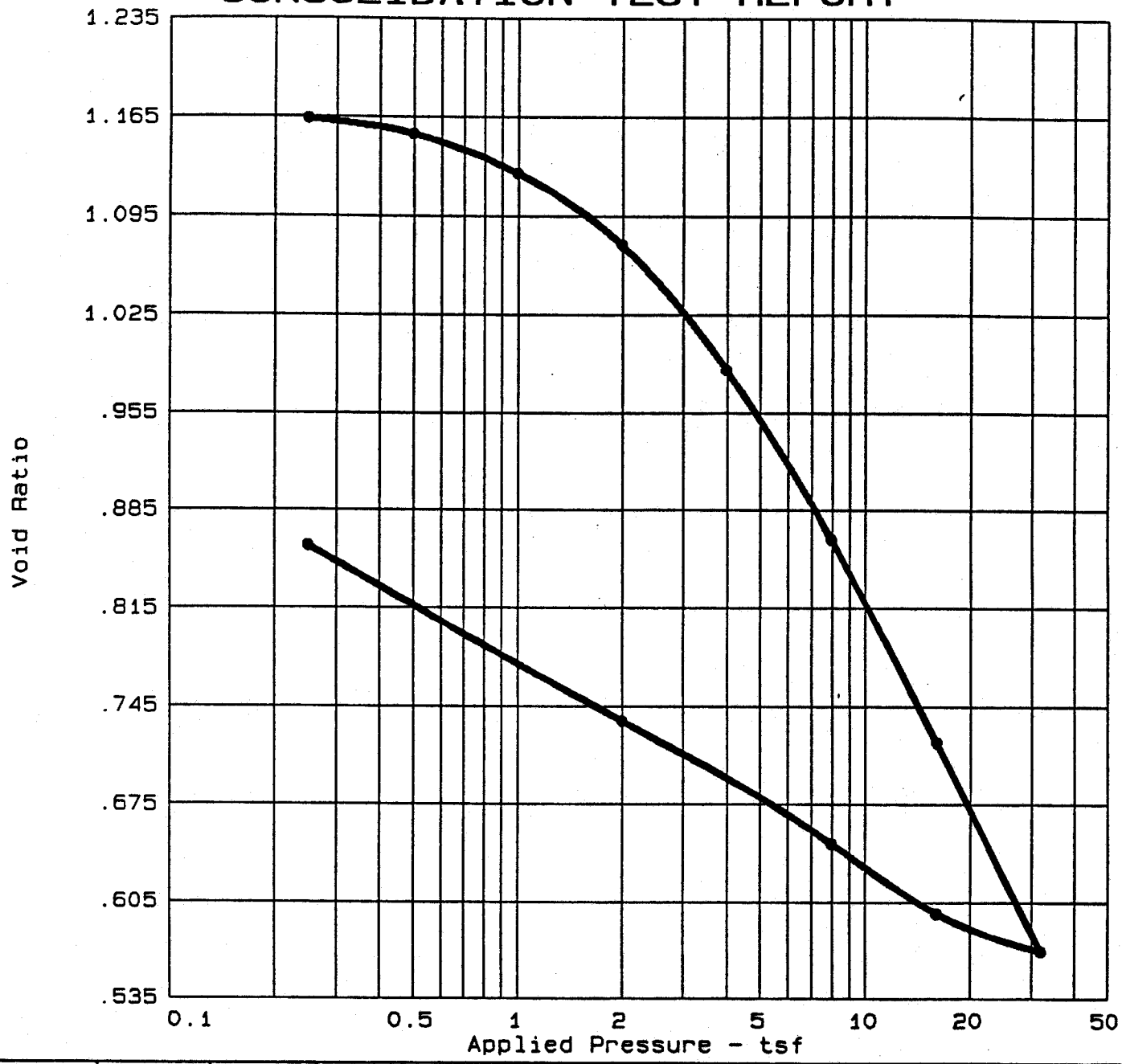
MW-1A @ 22-24' ⇒ C_c = 0.49
C_R = 0.14
e_o = 1.2
P_c = 3.0 tsf
P_o = ~0.6 tsf

$P_c > P_o$ ✓ ∴ OVERCONSOLIDATED CLAY.

-GTF 7-6-90

GA✓ JOH 7-9-90

CONSOLIDATION TEST REPORT



Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
	103.2 %	44.5	78.1			2.71	1.1673

TEST RESULTS	MATERIAL DESCRIPTION
	BLUE GRAY SILTY CLAY

Project No.: 467.42
Project: WEYERHAEUSER
Location: MW-1A, 22-24.0'

Date: 6-04-90

Remarks:
Initial Dial Reading
= 1.019 inches

CONSOLIDATION TEST REPORT

RMT, INC.

Fig. No.

✓ GTF 07/1/90

07:24, 6-21-1990 CONSOLIDATION TEST PROJECT DATA Test No. 17

Project Number: 467.42
Project: WEYERHAEUSER
Date: 6-04-90
Location 1: MW-1A, 22-24.0'
2:
Remarks 1:
2:
3:
4:
5:
Material 1: BLUE GRAY SILTY CLAY
description 2:
Classification:
Liquid limit:
Plasticity index:
Figure Number:

CONSOLIDATION TEST SPECIMEN DATA

TOTAL SAMPLE		BEFORE TEST		AFTER TEST	
Wet w+t	= 145.29 g.	Oedometer No.	= 2	Wet w+t	= 214.53 g.
Dry w+t	= 100.58 g	Machine No.	= N/A	Dry w+t	= 181.02 g.
Tare wt.	= 0.00 g.	Spec. Gravity	= 2.71 EST.	Tare wt.	= 80.44 g.
Height	= 1.00 in.	Height	= 1.00 in.		
Diameter	= 2.50 in.	Diameter	= 2.50 in.		
Weight	= 145.29 g.				
Moisture	= 44.5 %	Ht. Solids	= 0.46 in.	Moisture	= 33.3 %
Wet Den.	= 112.8 pcf	Dry wt.	= 100.58 g.	Dry wt.	= 100.58 g. *
Dry Den.	= 78.1 pcf	Void ratio	= 1.1673	Void ratio	= 0.8592
		Saturation	= 103.2 %	Saturation	= 105. %

Specific Gravity Reported in report is from a separate sample in same tube.

* Final dry weight used in calculations

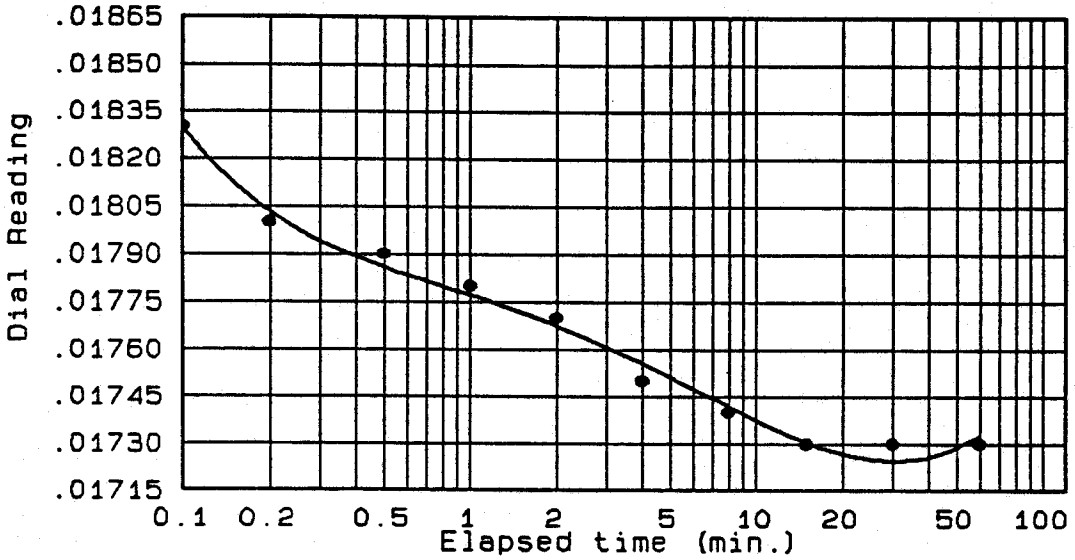
CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
Initial	1.01900			1.1673	
0.25	1.01730	0.0000	1.01730	1.1637	0.2 Consol.
0.50	1.01230	0.0000	1.01230	1.1528	0.7 Consol.
1.00	0.99940	0.0000	0.99940	1.1249	2.0 Consol.
2.00	0.97600	0.0000	0.97600	1.0742	4.3 Consol.
4.00	0.93520	0.0000	0.93520	0.9857	8.4 Consol.
8.00	0.87880	0.0000	0.87880	0.8635	14.0 Consol.
16.00	0.81210	0.0000	0.81210	0.7189	20.7 Consol.
32.00	0.74290	0.0000	0.74290	0.5689	27.6 Consol.
16.00	0.75550	0.0000	0.75550	0.5963	26.4 Consol.

Dial Reading vs. Time

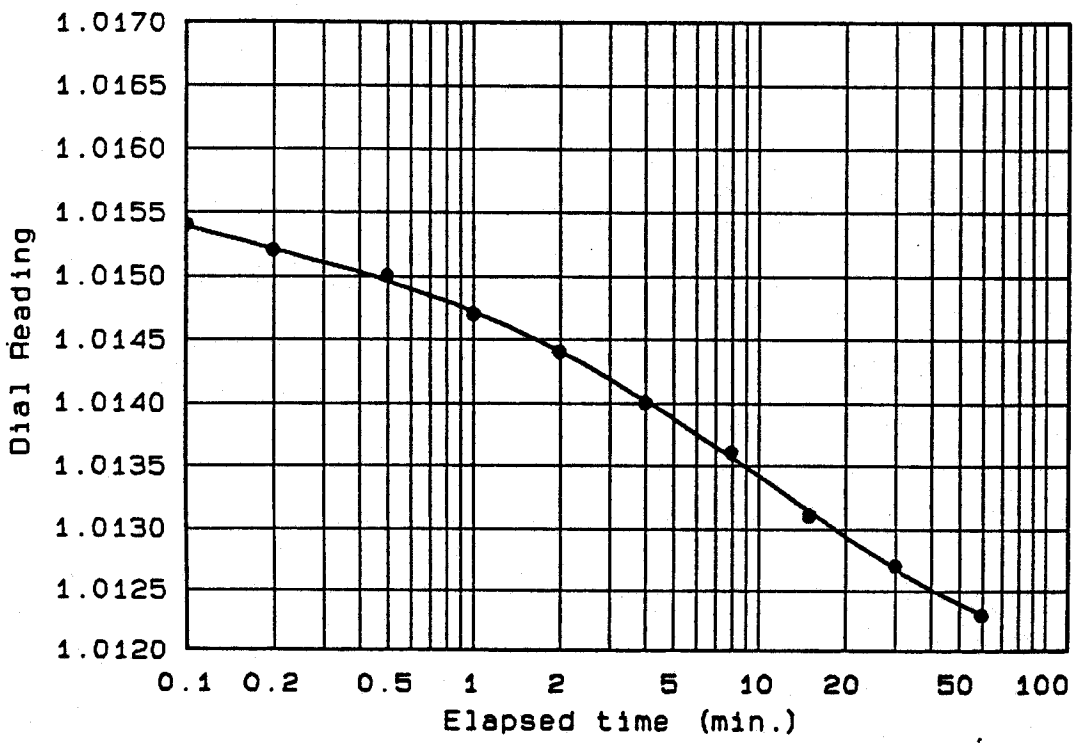
Project No.: 467.42
Project: WEYERHAEUSER
Location: MW-1A, 22-24.0'

Date: 6-04-90



Load No.= 1
Load= 0.25 tsf
D_0 = 1.0187
D_{50} = 1.0179
D_{100}= 1.0172
T_{50}= 0.29 min.

C_v @ T_{50} =
0.17 in.^{2}/min.



Load No.= 2
Load= 0.50 tsf
D_0 = 1.0158
D_{50} = 1.0142
D_{100}= 1.0127
T_{50}= 2.76 min.

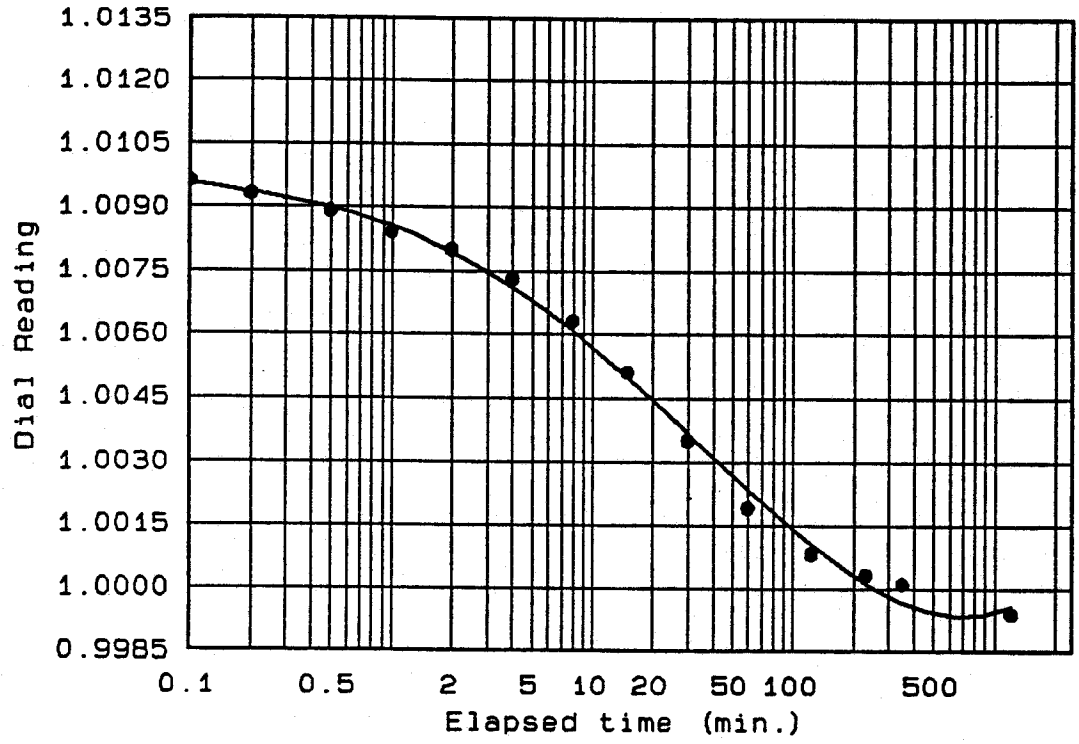
C_v @ T_{50} =
0.02 in.^{2}/min.

RMT, INC.

Dial Reading vs. Time

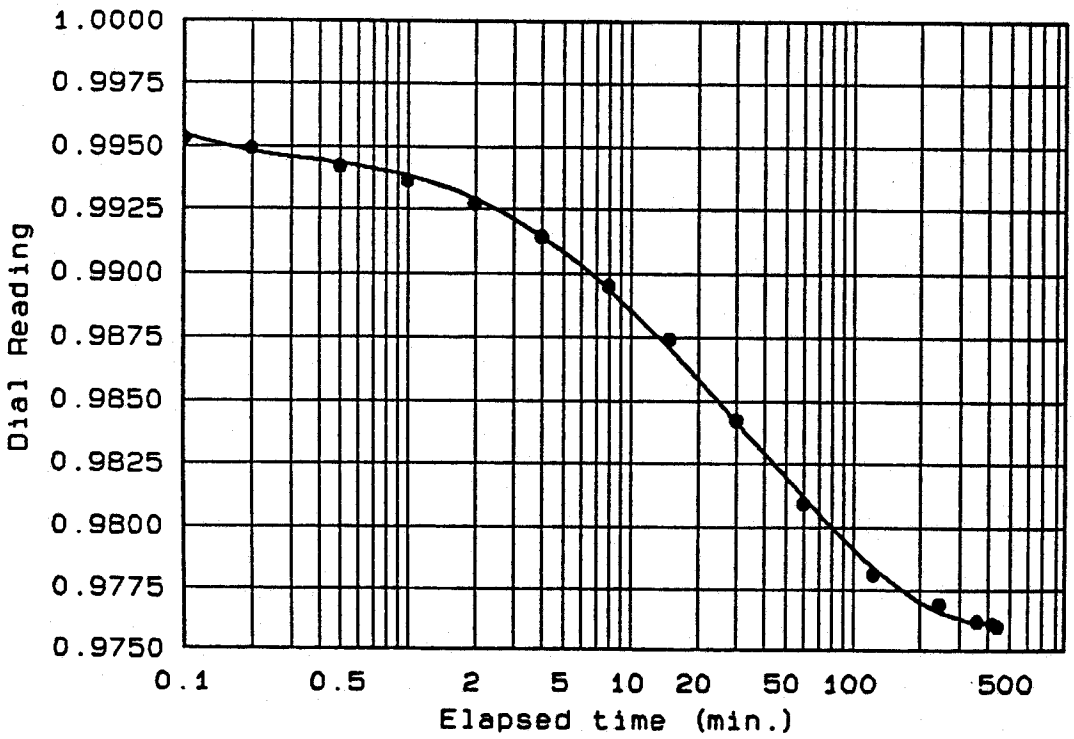
Project No.: 467.42
Project: WEYERHAEUSER
Location: MW-1A, 22-24.0'

Date: 6-04-90



Load No.= 3
Load= 1.00 tsf
D_0 = 1.0100
D_{50} = 1.0047
D_{100}= 0.9994
T_{50}= 17.13 min.

C_v @ T_{50} =
0.003 in.^{2}/min. ✓



Load No.= 4
Load= 2.00 tsf
D_0 = 0.9965
D_{50} = 0.9862
D_{100}= 0.9759
T_{50}= 18.29 min.

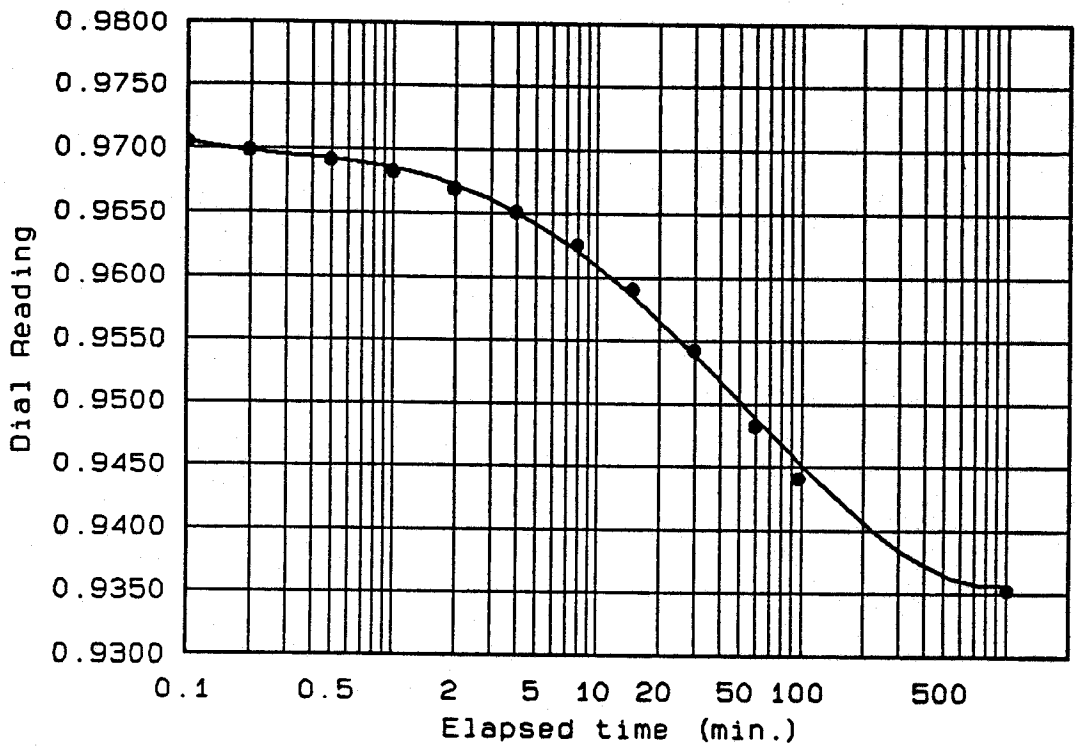
C_v @ T_{50} =
0.003 in.^{2}/min. ✓

RMT, INC.

Dial Reading vs. Time

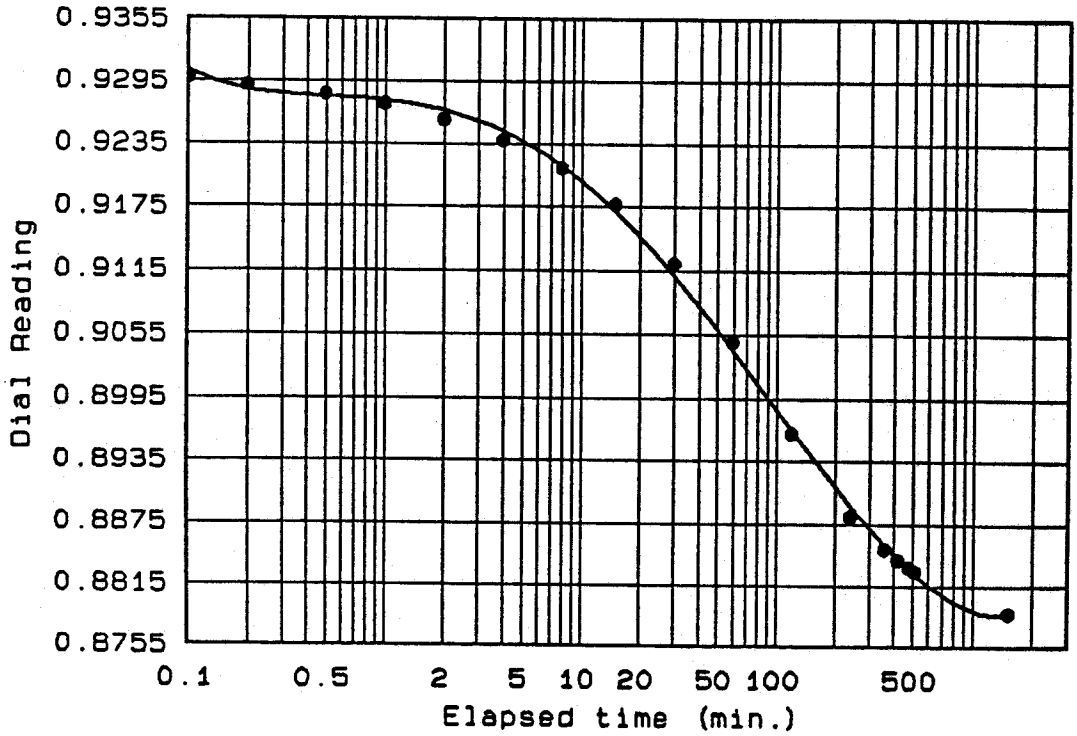
Project No.: 467.42
Project: WEYERHAEUSER
Location: MW-1A, 22-24.0'

Date: 6-04-90



Load No.= 5
Load= 4.00 tsf
D_0 = 0.9717
D_{50} = 0.9547
D_{100}= 0.9377
T_{50}= 26.55 min.

C_v @ T_{50} =
0.002in.^{2}/min.



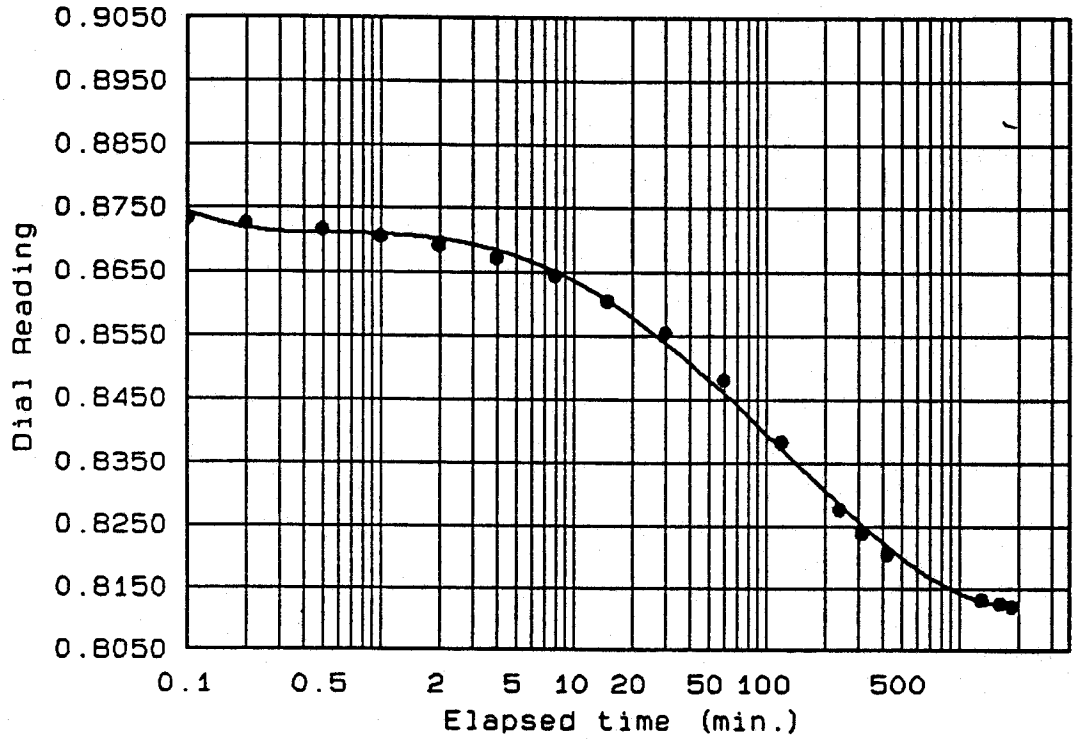
Load No.= 6
Load= 8.00 tsf
D_0 = 0.9330
D_{50} = 0.9076
D_{100}= 0.8822
T_{50}= 42.52 min.

C_v @ T_{50} =
0.001in.^{2}/min.

Dial Reading vs. Time

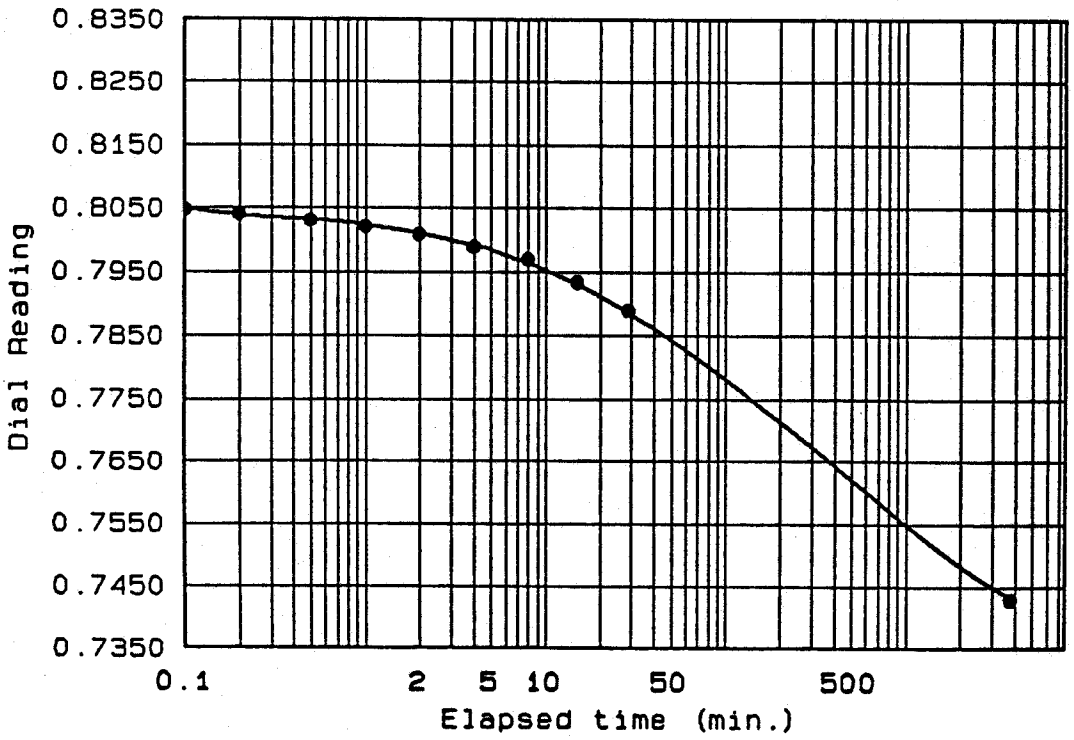
Project No.: 467.42
Project: WEYERHAEUSER
Location: MW-1A, 22-24.0'

Date: 6-04-90



Load No.= 7
Load= 16.00 tsf
D_0 = 0.8775
D_{50} = 0.8453
D_{100}= 0.8131
T_{50}= 63.69 min.

C_v @ T_{50} =
0.0005 in.^{2}/min.



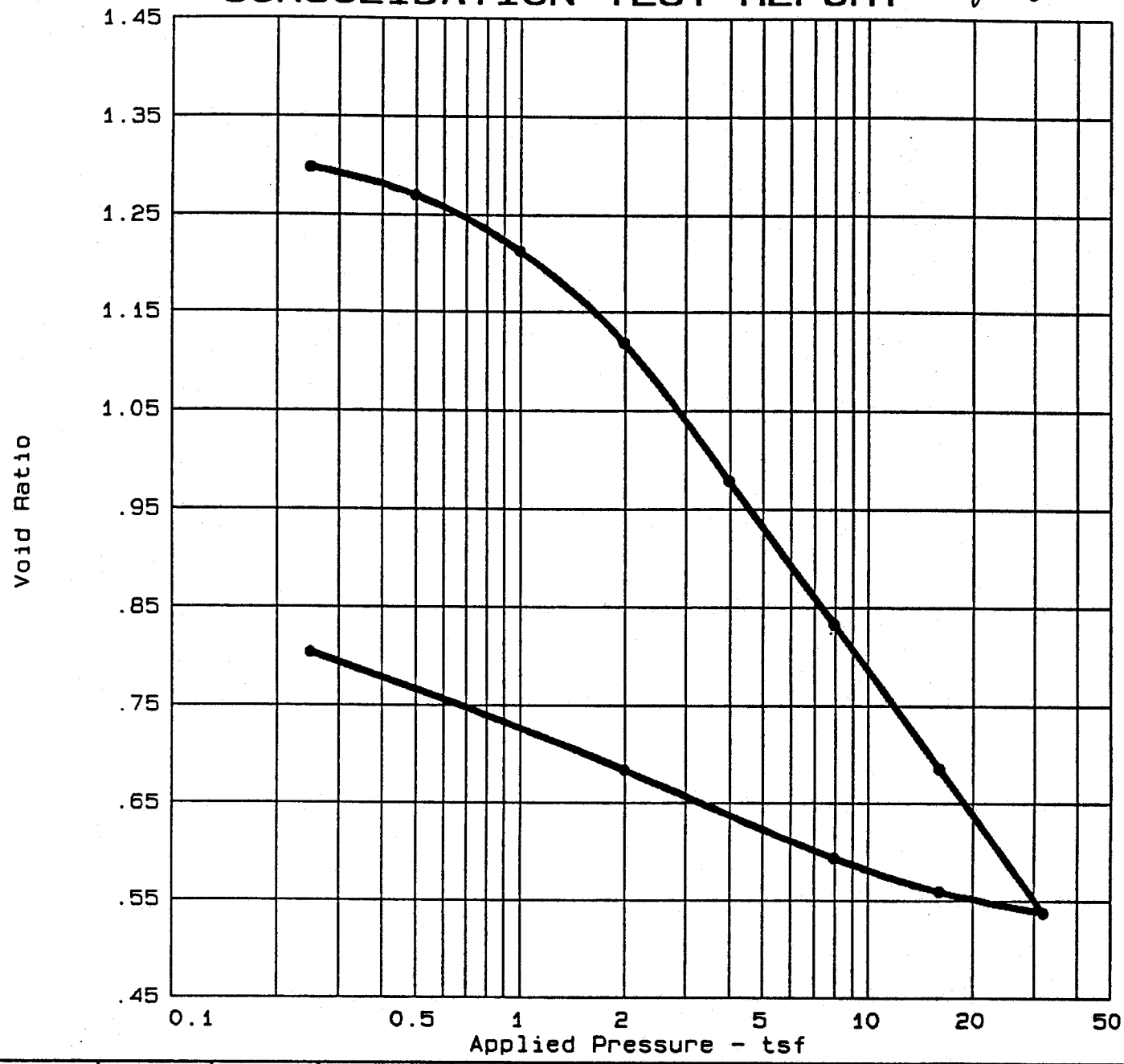
Load No.= 8
Load= 32.00 tsf
D_0 = 0.8064
D_{50} = 0.7795
D_{100}= 0.7525
T_{50}= 86.67 min.

C_v @ T_{50} =
0.0003 in.^{2}/min.

✓ GTF 6-21-90
✓ JPM 6-27-90

CONSOLIDATION TEST REPORT

✓ RAV JDA 6-27-90



Swell press.	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
	98.6 %	46.0	75.9			2.81	1.3119

TEST RESULTS	MATERIAL DESCRIPTION
	BLUE GRAY SILTY CLAY

Project No.: 467.42
Project: WEYERHAEUSER
Location: OW-1, 20-22.0'

Date: 6-04-90

Remarks:
Initial Dial Reading =
= 1.03530

CONSOLIDATION TEST REPORT

RMT, INC.

Fig. No._____

07:41, 6-21-1990 CONSOLIDATION TEST PROJECT DATA Test No. 16

Project Number: 467.42
Project: WEYERHAEUSER
Date: 6-04-90
Location 1: OW-1, 20-22.0'
2:
Remarks 1:
2:
3:
4:
5:
Material 1: BLUE GRAY SILTY CLAY
description 2:
Classification:
Liquid limit:
Plasticity index:
Figure Number:

CONSOLIDATION TEST SPECIMEN DATA

TOTAL SAMPLE		BEFORE TEST		AFTER TEST	
Wet w+t	= 142.76 g.	Oedometer No.	= 1	Wet w+t	= 206.52 g.
Dry w+t	= 97.77 g	Machine No.	= N/A	Dry w+t	= 177.87 g.
Tare wt.	= 0.00 g.	Spec. Gravity	= 2.81 EST.	Tare wt.	= 80.10 g.
Height	= 1.00 in.	Height	= 1.00 in.		
Diameter	= 2.50 in.	Diameter	= 2.50 in.		
Weight	= 142.76 g.				
Moisture	= 46.0 %	Ht. Solids	= 0.43 in.	Moisture	= 29.3 %
Wet Den.	= 110.8 pcf	Dry wt.	= 97.77 g.	Dry wt.	= 97.77 g. *
Dry Den.	= 75.9 pcf	Void ratio	= 1.3119	Void ratio	= 0.8033
		Saturation	= 98.6 %	Saturation	= 102. %

Specific Gravity Reported in report is from a separate sample in same tube.

* Final dry weight used in calculations

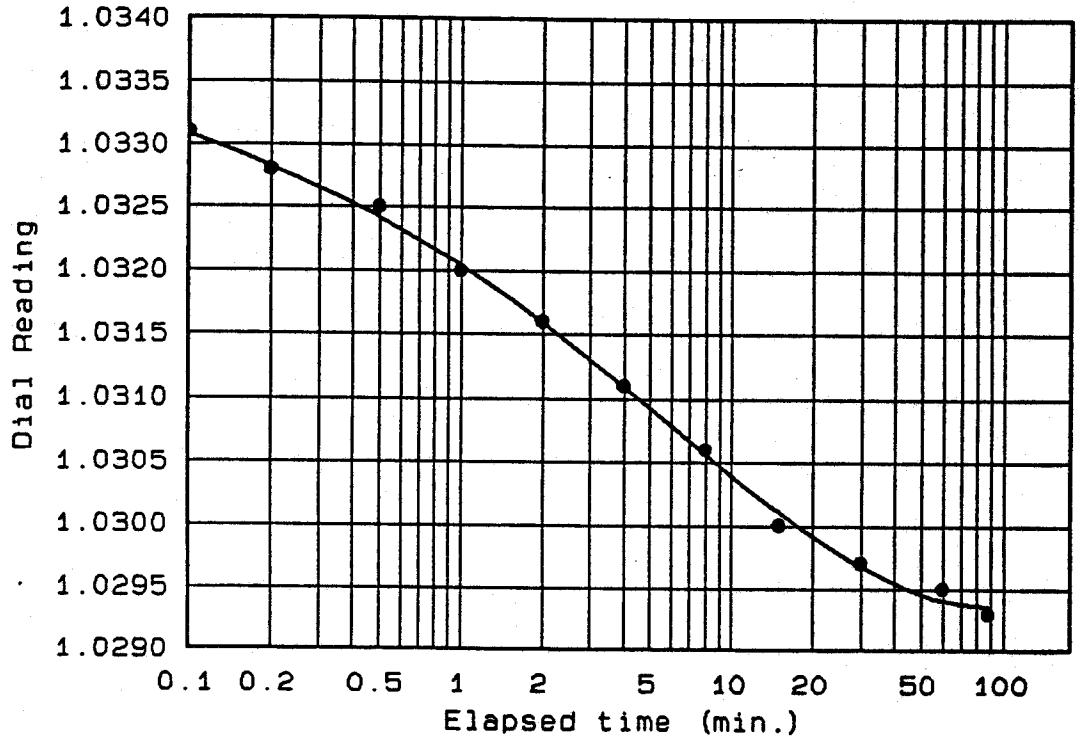
CONSOLIDATION TEST READINGS SUMMARY

LOAD (tsf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/CONSOL.
Initial	1.03530			1.3119	
0.25	1.02930	0.0000	1.02930	1.2980	0.6 Consol.
0.50	1.01720	0.0000	1.01720	1.2701	1.8 Consol.
1.00	0.99200	0.0000	0.99200	1.2118	4.3 Consol.
2.00	0.95150	0.0000	0.95150	1.1182	8.4 Consol.
4.00	0.89090	0.0000	0.89090	0.9781	14.4 Consol.
8.00	0.82800	0.0000	0.82800	0.8327	20.7 Consol.
16.00	0.76430	0.0000	0.76430	0.6854	27.1 Consol.
32.00	0.70000	0.0000	0.70000	0.5367	33.5 Consol.
16.00	0.70940	0.0000	0.70940	0.5585	32.6 Consol.

Dial Reading vs. Time

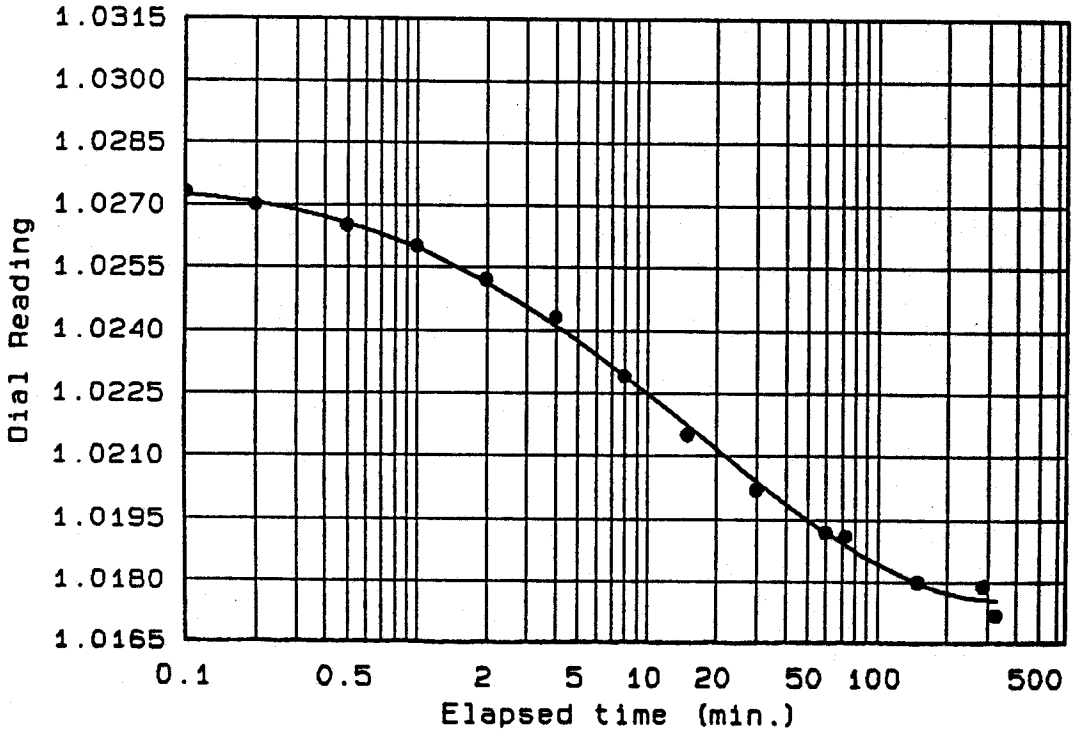
Project No.: 467.42
Project: WEYERHAEUSER
Location: DW-1, 20-22.0'

Date: 6-04-90



Load No.= 1
Load= 0.25 tsf
D_0 = 1.0336
D_{50} = 1.0316
D_{100}= 1.0295
T_{50}= 2.11 min.

C_v @ T_{50} =
0.023 in.^{2}/min.



Load No.= 2
Load= 0.50 tsf
D_0 = 1.0278
D_{50} = 1.0227
D_{100}= 1.0177
T_{50}= 8.79 min.

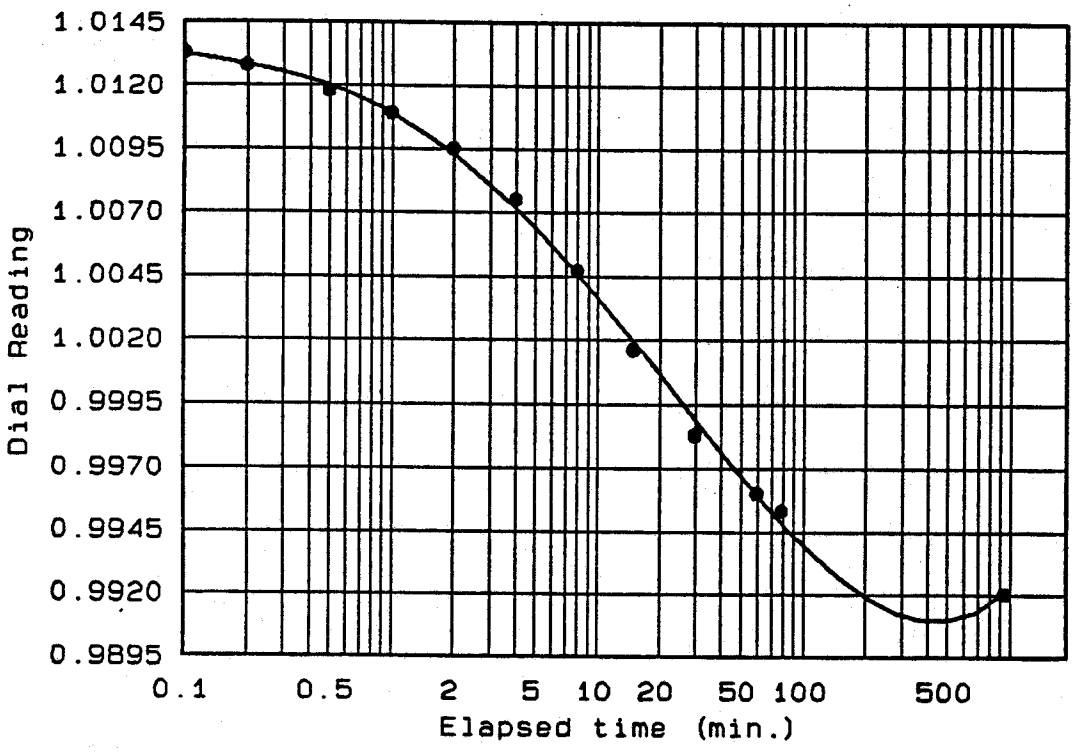
C_v @ T_{50} =
0.005
~~0.01~~ in.^{2}/min.

RMT, INC.

Dial Reading vs. Time

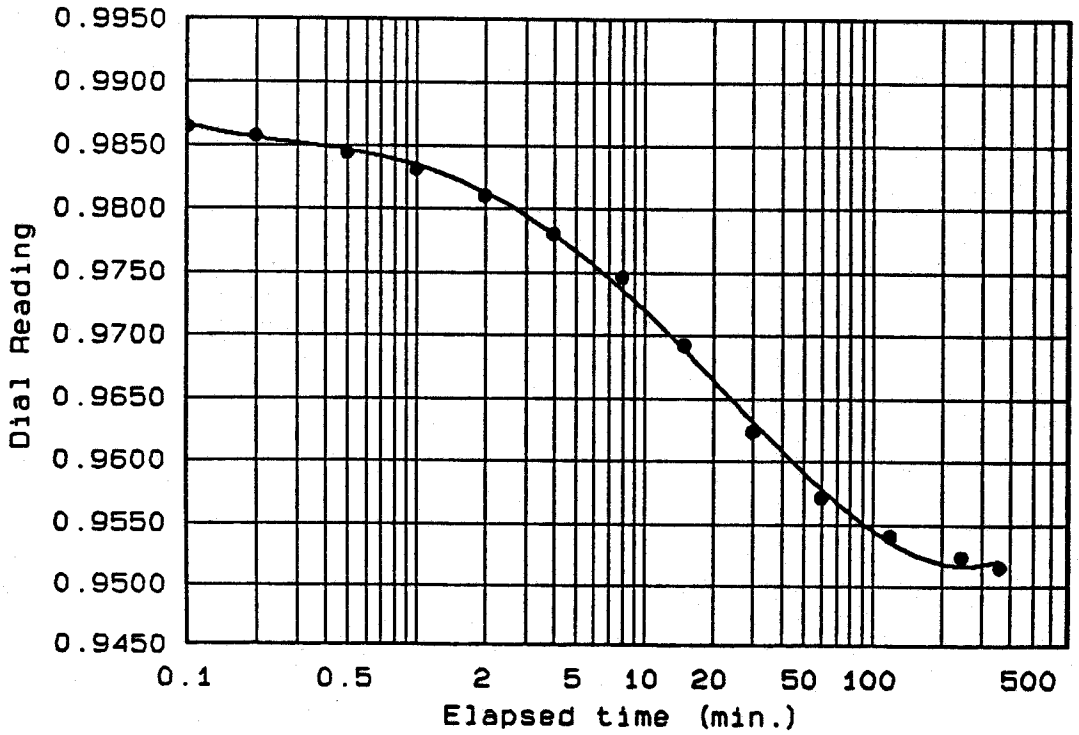
Project No.: 467.42
Project: WEYERHAEUSER
Location: OW-1, 20-22.0'

Date: 6-04-90



Load No.= 3
Load= 1.00 tsf
D_0 = 1.0142
D_{50} = 1.0033
D_{100}= 0.9925
T_{50}= 10.86 min.

C_v @ T_{50} =
0.004 in.^{2}/min. ✓



Load No.= 4
Load= 2.00 tsf
D_0 = 0.9883
D_{50} = 0.9695
D_{100}= 0.9507
T_{50}= 13.74 min.

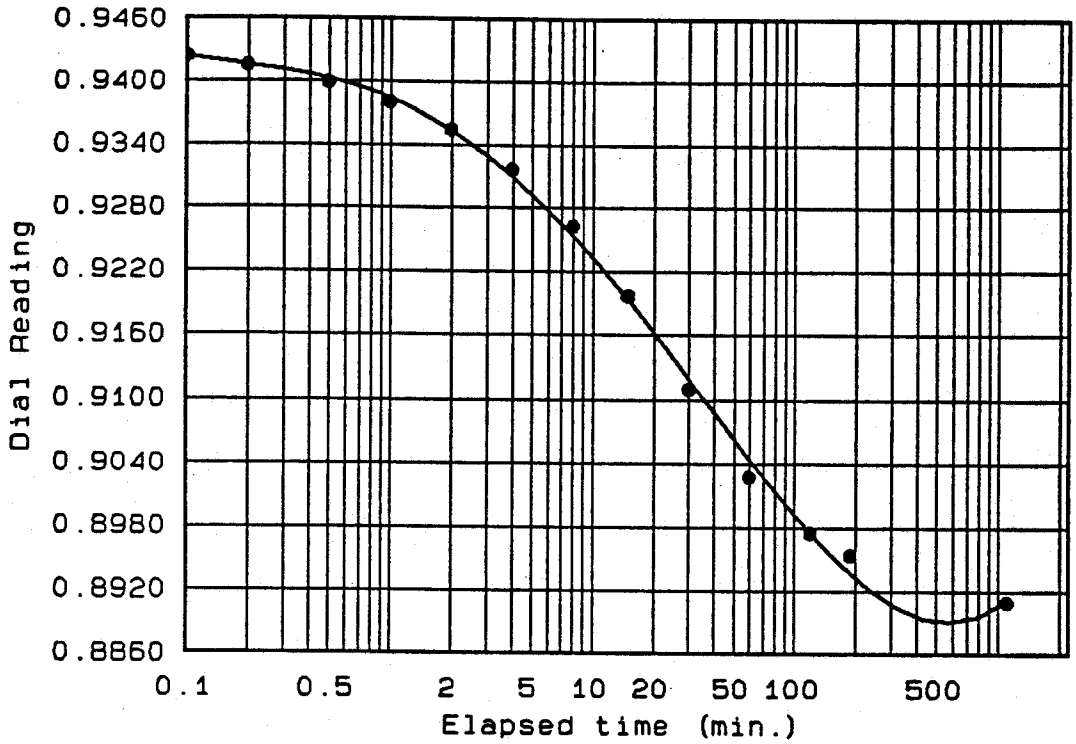
C_v @ T_{50} =
0.003 in.^{2}/min.

RMT, INC. O

Dial Reading vs. Time

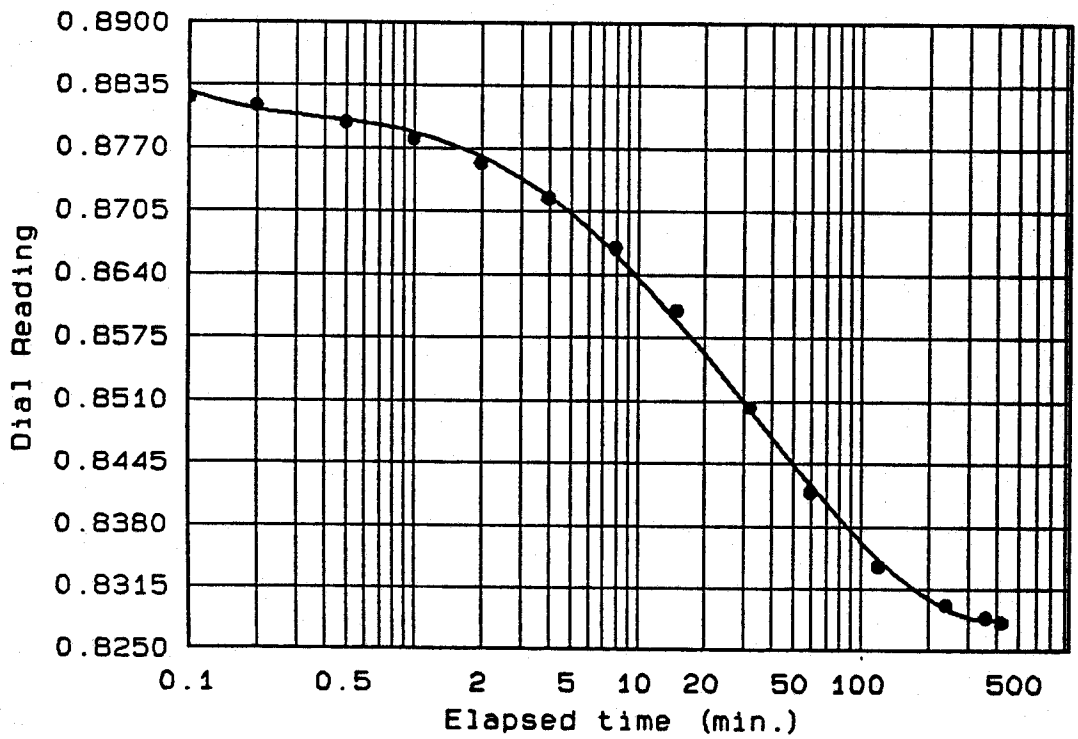
Project No.: 467.42
Project: WEYERHAEUSER
Location: OW-1, 20-22.0'

Date: 6-04-90



Load No.= 5
Load= 4.00 tsf
D_0 = 0.9440
D_{50} = 0.9174
D_{100}= 0.8908
T_{50}= 17.89 min.

C_v @ T_{50} =
0.002 in.^{2}/min.



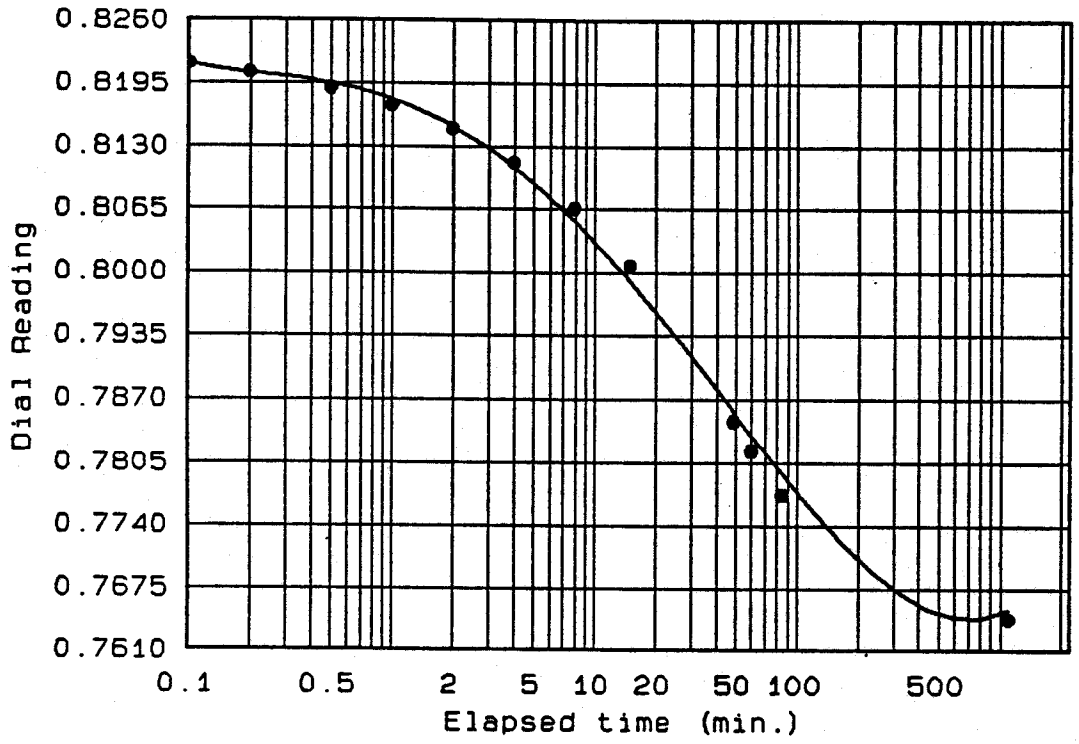
Load No.= 6
Load= 8.00 tsf
D_0 = 0.8855
D_{50} = 0.8567
D_{100}= 0.8280
T_{50}= 18.69 min.

C_v @ T_{50} =
0.002 in.^{2}/min.

Dial Reading vs. Time

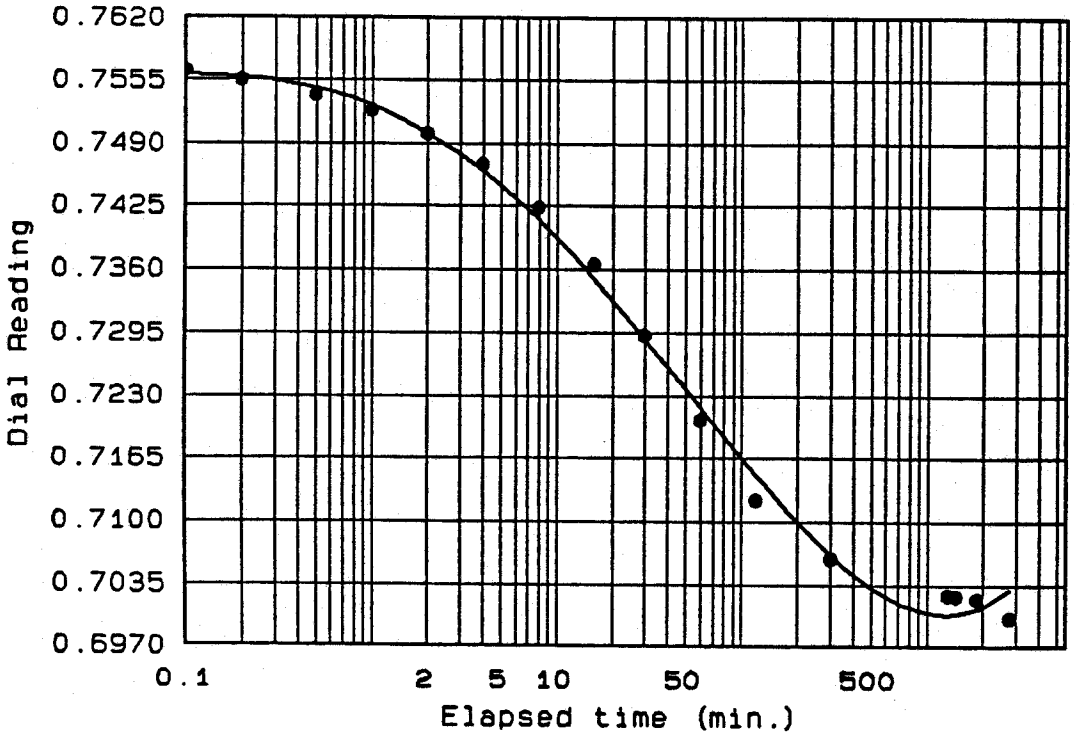
Project No.: 467.42
Project: WEYERHAEUSER
Location: DW-1, 20-22.0'

Date: 6-04-90



Load No.= 7
Load= 16.00 tsf
D_0 = 0.8232
D_{50} = 0.7946
D_{100}= 0.7661
T_{50}= 22.50 min.

C_v @ T_{50} =
0.001 in.^{2}/min.



Load No.= 8
Load= 32.00 tsf
D_0 = 0.7572
D_{50} = 0.7267
D_{100}= 0.6961
T_{50}= 37.25 min.

C_v @ T_{50} =
0.001 in.^{2}/min.

Drawings Under Seperate Cover