S&ME
ENGINEERING • TESTING
ENVIRONMENTAL SERVICES

S&ME, Inc.
9751 Southern Pine Blvd.
Charlotte, North Carolina
Telephone: 704-523-4726
Fax: 704-525-3953

1. BORING AND SAMPLING IS IN ACCORDANCE WITH ASTM D-1586.
2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-98**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 1 of 1
Boring Depth (ft): **28.0**	Elevation (ft): **721.6**	Driller: **Jay Little, NC Cert No. 2717**	Date Drilled: **4/30/07**
Logged By: **Julie Petersen**	Water Level: **Stabilized Water Level at 12.91 ft bls**		Drilling Method: **Mud Rotary**

Elev. (Feet)	Depth (Feet)	Lith-ology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
720			SOIL/SAPROLITE (M1): Red, Micaceous, Medium to Fine Sandy, **SILT**		
715	5		SOIL/SAPROLITE (M1): Yellowish-Red, Slightly Micaceous, Silty, Medium to Fine **SAND**		
710	10		SOIL/SAPROLITE (M1): Red, Gray, and White Striated, Fine Sandy, **SILT** With Pyrite		
705	15		SOIL/SAPROLITE (M1): Brown and White, Silty, Medium to Fine **SAND** With Manganese Banding and Pyrite (Granitic)		
700	20		WEATHERED ROCK (M2): When Sampled Becomes Brown and White, Silty, Medium to Fine **SAND** With Pyrite		
695	25		SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Moderately Fractured		
			Boring Terminated at 28.00 ft bls **Lithologic Descriptions Obtained From M-98R**		

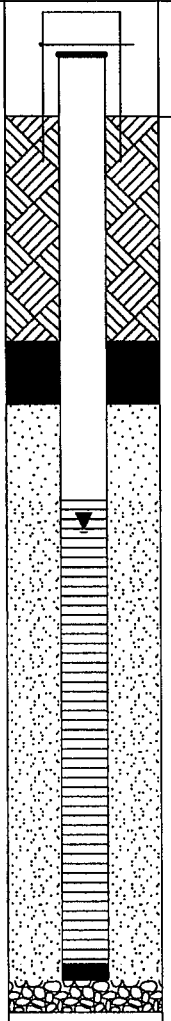
COMPLETION REPORT OF WELL No. M-98

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

WATER LEVEL: **Stabilized Water Level at 12.91 ft bls**
LATITUDE: **35 25 48.56**
LONGITUDE: **80 56 57.33**
TOP OF CASING ELEVATION: **724.50**
DATUM: **MSL**
LOGGED BY: **Julie Petersen**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **Mud Rotary**
DATE DRILLED: **4/30/07**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)
				0.00		721.61
SOIL/SAPROLITE (M1): Red, Micaceous, Medium to Fine Sandy, **SILT**		0				
SOIL/SAPROLITE (M1): Yellowish-Red, Slightly Micaceous, Silty, Medium to Fine **SAND**		5		7.00		714.61
SOIL/SAPROLITE (M1): Red, Gray, and White Striated, Fine Sandy, **SILT** With Pyrite		10		9.00		712.61
SOIL/SAPROLITE (M1): Brown and White, Silty, Medium to Fine **SAND** With Manganese Banding and Pyrite (Granitic)		15				
WEATHERED ROCK (M2): When Sampled Becomes Brown and White, Silty, Medium to Fine **SAND** With Pyrite		20				
SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Moderately Fractured		25		26.50 27.00 28.00		695.11 694.61 693.61



WELL CONSTRUCTION DETAILS

PROTECTIVE CASING
Diameter: **4" X 4"**
Type: **Lockable Steel**
Interval: **Above Grade**

RISER CASING
Diameter: **2"**
Type: **Sch. 40 PVC**
Interval: **0 to 12 ft bls**

GROUT
Type: **Neat Cement**
Interval: **0 to 7 ft bls**

SEAL
Type: **Bentonite**
Interval: **7 to 9 ft bls**

FILTERPACK
Type: **#1 Filter Sand**
Interval: **9 to 27 ft bls**

SCREEN
Diameter: **2"**
Type: **0.010 Slotted Sch. 40 PVC**
Interval: **12 to 27 ft bls**

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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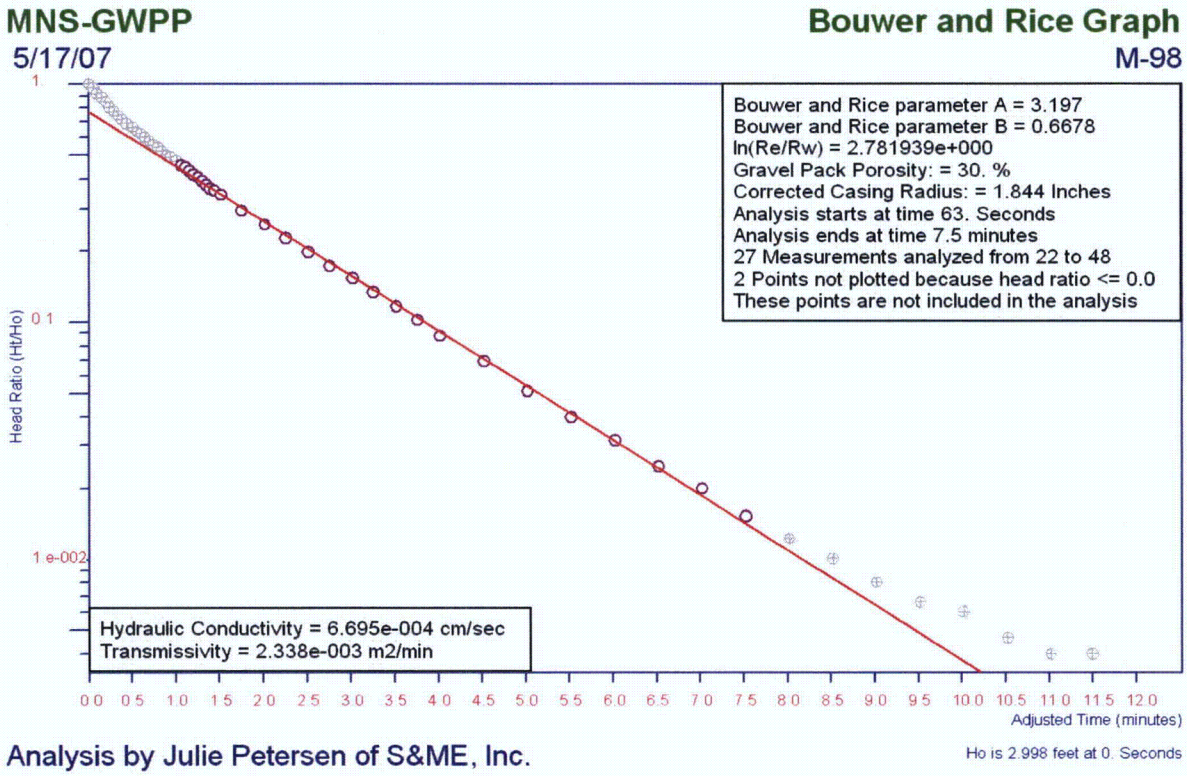
COMPLETION REPORT OF WELL No. M-98

Calculation of Permeability By The Rising Head Method (Slug Test)

Site Name:	MNS-GWPP
Test Date:	5/17/2007
Well Label:	M-98
Aquifer Thickness:	19.09 feet
Screen Length:	15. feet
Casing Radius:	1. Inches
Effective Radius:	3. Inches
Gravel Pack Porosity:	30.00%
Corrected Casing Radius:	1.844 Inches
Static Water Level:	12.91 feet
Water Table to Screen Bottom:	14.09 feet
Anisotropy Ratio:	1

Time Adjustment: 0. Seconds
Test starts with trial 0
There are 58 time and drawdown measurements
Maximum head is 2.998 feet
Minimum head is 0. feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

PERMEABILITY

6.70E-04 cm/sec

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Project: **MNS - Groundwater Protection Project**			**Boring No. M-98R**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 1 of 2
Boring Depth (ft): **49.7**	Elevation (ft): **722.7**	Driller: **Jay Little, NC Cert No. 2717**	Date Drilled: **4/25/07**
Logged By: **Julie Petersen**	Water Level: **Stabilized Water Level at 13.50 ft bls**		Drilling Method: **Mud Rotary**

Elev. (Feet)	Depth (Feet)	Lithology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
720			SOIL/SAPROLITE (M1): Red, Micaceous, Medium to Fine Sandy, **SILT**		
715	5		SOIL/SAPROLITE (M1): Yellowish-Red, Slightly Micaceous, Silty, Medium to Fine **SAND**		14
710	10		SOIL/SAPROLITE (M1): Red, Gray, and White Striated, Fine Sandy, **SILT** With Pyrite		8
705	15		SOIL/SAPROLITE (M1): Brown and White, Silty, Medium to Fine **SAND** With Manganese Banding and Pyrite (Granitic)		27
700	20		WEATHERED ROCK (M2): When Sampled Becomes Brown and White, Silty, Medium to Fine **SAND** With Pyrite		50/3 >>
			Roller Cone Refusal at 22.00 ft bls		
695	25		SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Moderately Fractured		
690	30		SOUND ROCK (D): Medium-Grained **GRANITE**,		
			SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Moderately to Intensely Fractured		

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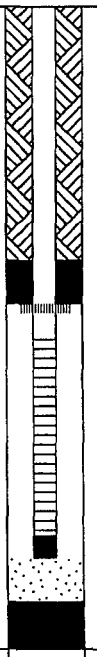
2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-98R**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 2 of 2
Boring Depth (ft): **49.7**	Elevation (ft): **722.7**	Driller: **Jay Little, NC Cert No. 2717**	Date Drilled: **4/25/07**
Logged By: **Julie Petersen**	Water Level: **Stabilized Water Level at 13.50 ft bls**		Drilling Method: **Mud Rotary**

Elev. (Feet)	Depth (Feet)	Lith-ology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
685					
	40				
680					
	45				
675			SOUND ROCK (D): Fine-Grained **DIORITE**, Moderately Fractured		
			SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Intensely Fractured		
			Boring Terminated at 49.70 ft bls		

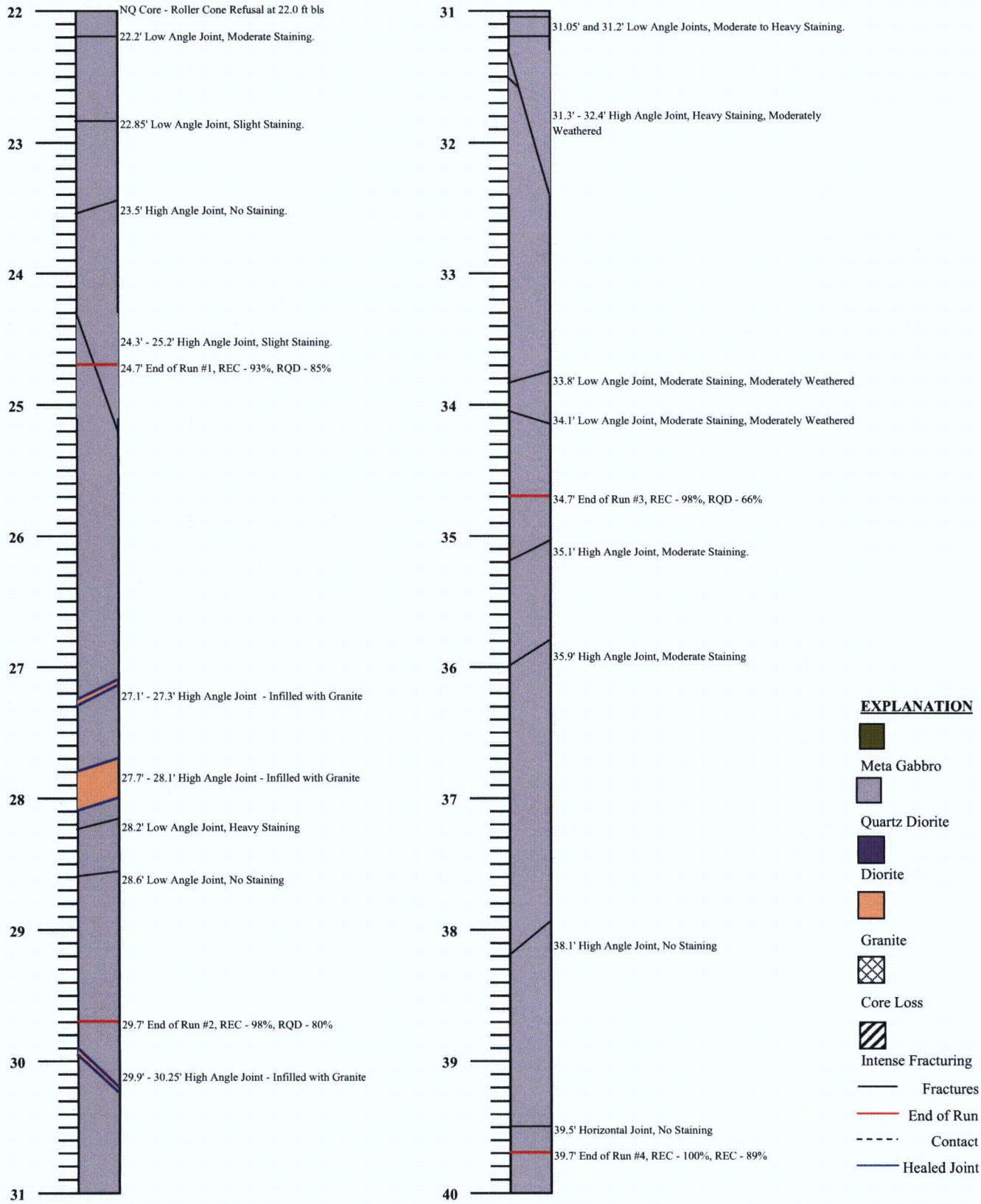


FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-98R

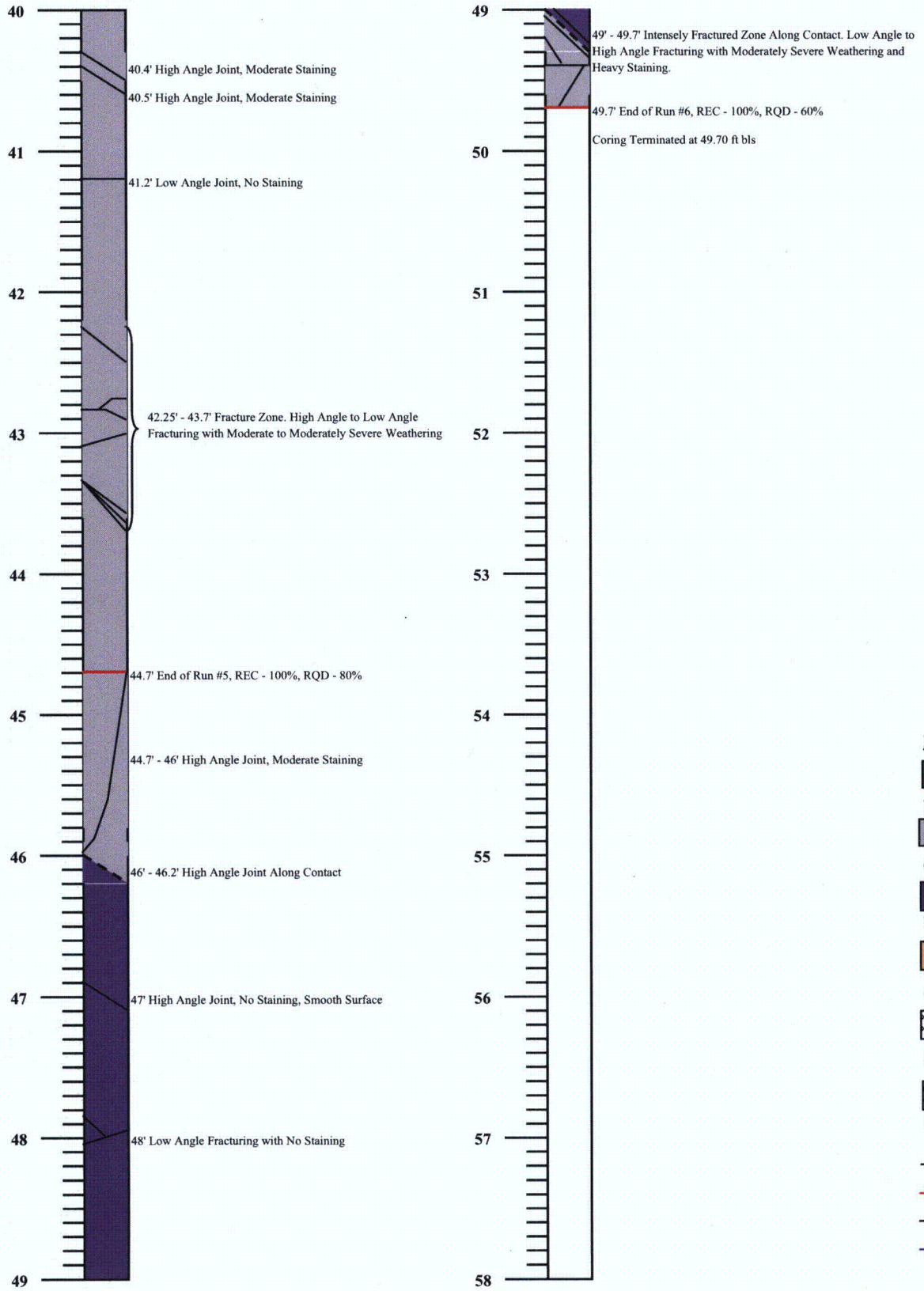


FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-98R



COMPLETION REPORT OF WELL No. M-98R

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

WATER LEVEL: **Stabilized Water Level at 13.50 ft bls**
LATITUDE: **35 25 48.61**
LONGITUDE: **80 56 57.37**
TOP OF CASING ELEVATION: **725.93**
DATUM: **MSL**
LOGGED BY: **Julie Petersen**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **Mud Rotary**
DATE DRILLED: **4/25/07**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)
				0.00		722.71
SOIL/SAPROLITE (M1): Red, Micaceous, Medium to Fine Sandy, **SILT**		0				
SOIL/SAPROLITE (M1): Yellowish-Red, Slightly Micaceous, Silty, Medium to Fine **SAND**		5				
SOIL/SAPROLITE (M1): Red, Gray, and White Striated, Fine Sandy, **SILT** With Pyrite		10				
SOIL/SAPROLITE (M1): Brown and White, Silty, Medium to Fine **SAND** With Manganese Banding and Pyrite (Granitic)		15				
WEATHERED ROCK (M2): When Sampled Becomes Brown and White, Silty, Medium to Fine **SAND** With Pyrite		20				
SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Moderately Fractured		25				
SOUND ROCK (D): Medium-Grained **GRANITE**,						
SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Moderately to Intensely Fractured		30				

WELL CONSTRUCTION DETAILS

PROTECTIVE CASING
Diameter: **4" X 4"**
Type: **Lockable Steel**
Interval: **Above Grade**

RISER CASING
Diameter: **2"**
Type: **Sch. 40 PVC**
Interval: **0 to 42.6 ft bls**

GROUT
Type: **Neat Cement**
Interval: **0 to 40.8 ft bls**

SEAL
Type: **K-Packer + Bentonite**
Interval: **40.8 to 42.0 ft bls**

FILTERPACK
Type: **N/A**
Interval: **N/A**

SCREEN
Diameter: **2"**
Type: **0.010 Slotted Sch. 40 PVC**
Interval: **42.6 to 47.6 ft bls**

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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COMPLETION REPORT OF WELL No. M-98R

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

GROUND SURFACE ELEVATION: **722.7**
LOGGED BY: **Julie Petersen**
CHECKED BY:

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
							(See Page 1)
SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Moderately to Intensely Fractured *(continued)*		35					
		40		40.80		681.91	
				41.80		680.91	
				42.00		680.71	
				42.60		680.11	
		45					
SOUND ROCK (D): Fine-Grained **DIORITE**, Moderately Fractured				47.10		675.61	
				47.60		675.11	
				48.60		674.11	
SOUND ROCK (D): Medium-Grained **QUARTZ DIORITE**, Intensely Fractured				49.70		673.01	

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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COMPLETION REPORT OF WELL No. M-98R

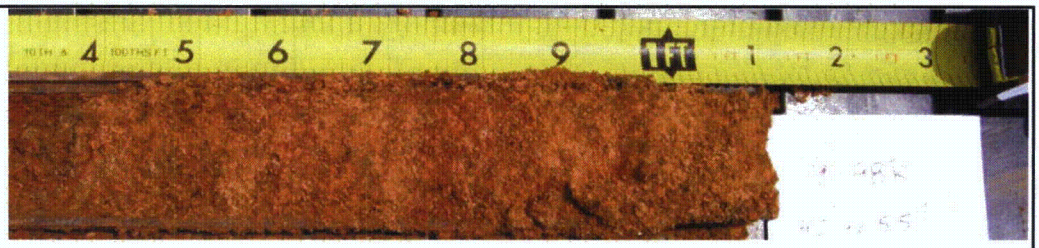
SPLIT SPOON SAMPLE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

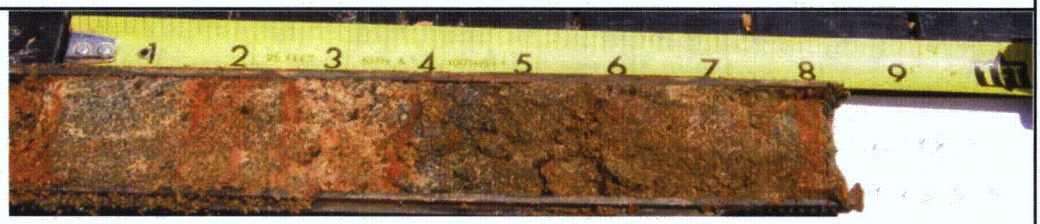
S&ME Project No: 1264-06-724

Boring Number: M-98R

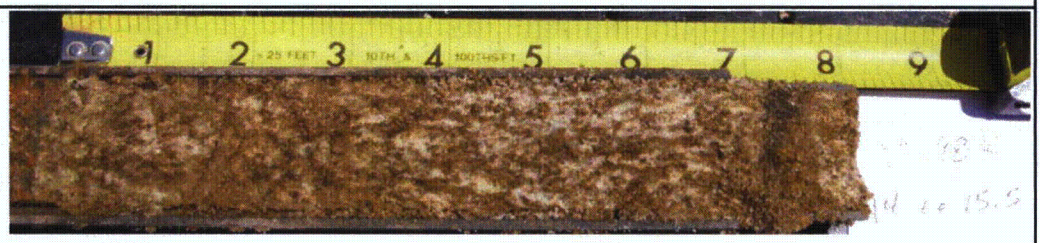
Sample No: 1
Depth (ft-bls): 4 - 5.5
Blow Count: 5 * 6 * 8



Sample No: 2
Depth (ft-bls): 9 - 10.5
Blow Count: 4 * 4 * 4



Sample No: 3
Depth (ft-bls): 14 - 15.5
Blow Count: 9 * 15 * 12



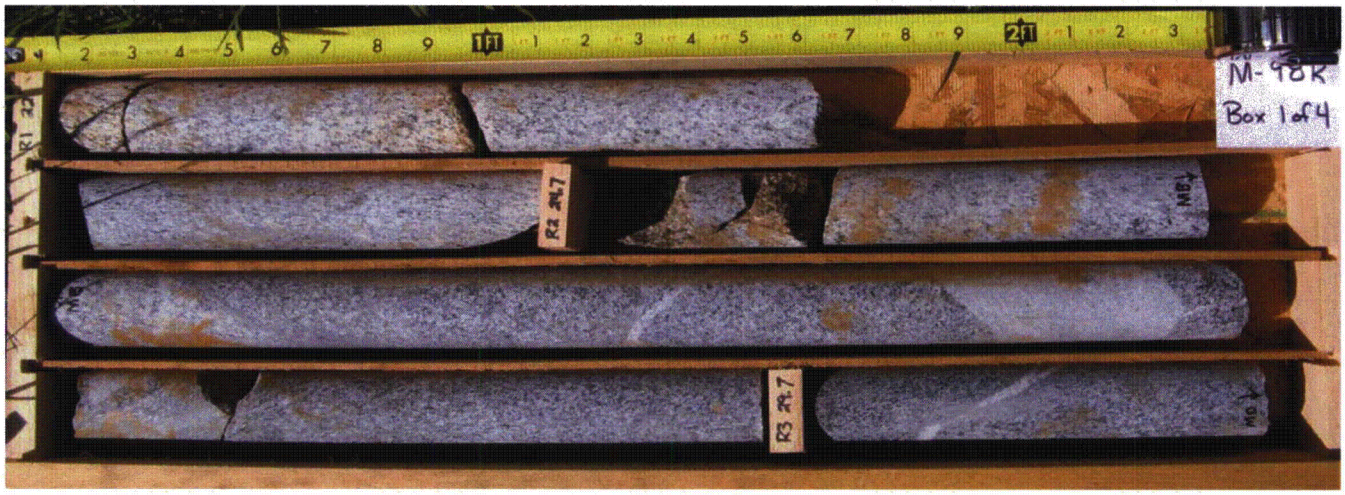
Sample No: 4
Depth (ft-bls): 19 - 20.5
Blow Count: 46 * 50/3

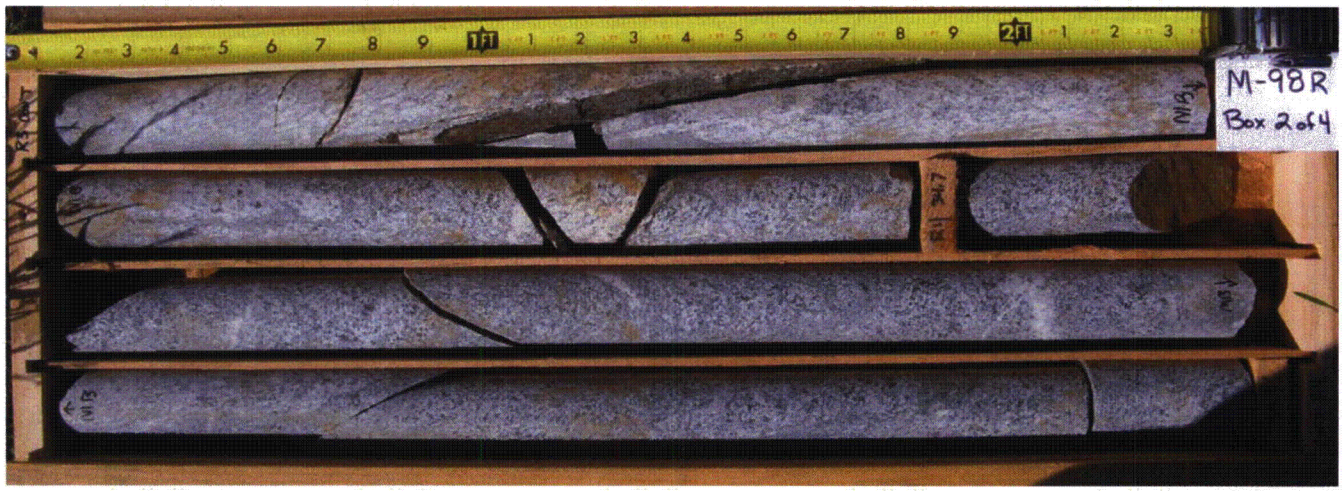
ROCK CORE PICTURES

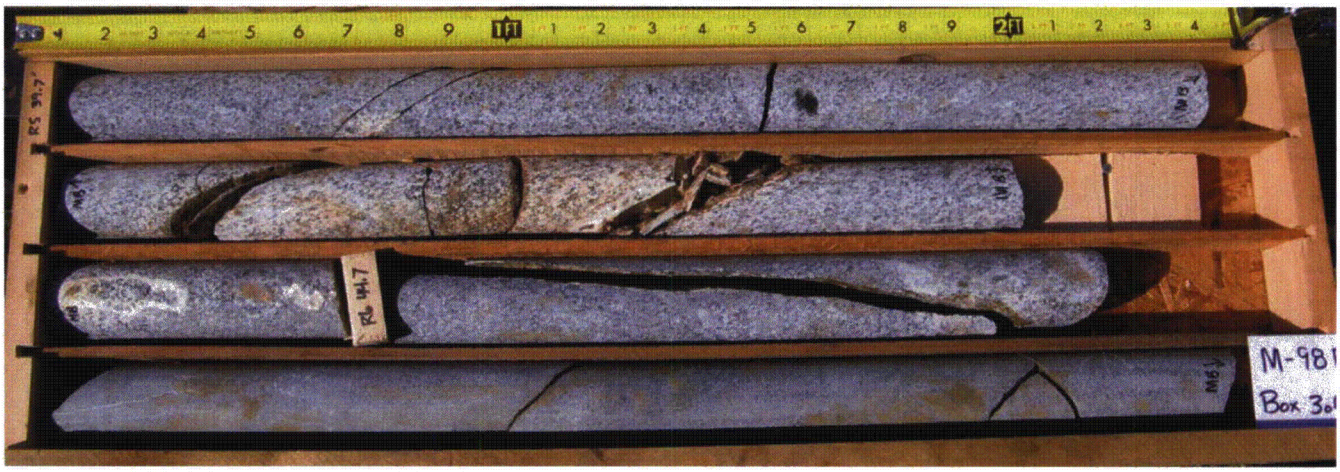
McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-98R





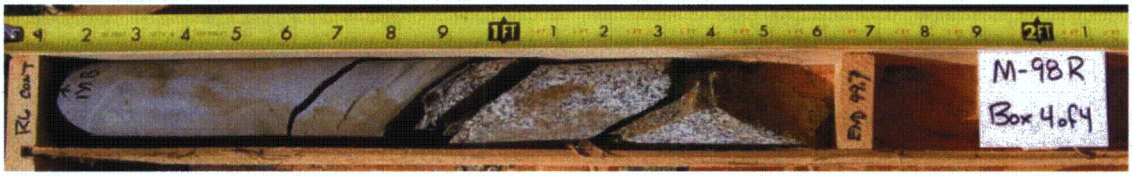


ROCK CORE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-98R



CLASSIFICATION:

22' to 27.7' Medium Grained Quartz Diorite

27.7' to 28.1' Medium Grained Grainite

28.1' to 46.1' Medium Grained Quartz Diorite

46.1' to 49.1' Fine Grained Diorite

49.1' to 49.7' Medium Grained Quartz Diorite

CALCULATION OF PERMEABILITY BY THE FALLING HEAD METHOD
(Open Hole in Uniform Material)

S&ME

Site Name:	MNS - GWPP		
Date:	4/25/2007		
Boring I.D.	M-98R		
Test Interval:	22' to 24.7'	(Sound Rock)	
Total Depth of Hole:	24.7 ft		753.05 cm
Length of Open Hole:	2.7 ft		82.32 cm
Transformation Ratio m=	1		
Performed by:	Julie Petersen		

Time (sec)	Head (cm)	Permeability (cm/sec)
0	695.27	
60	693.20	1.35E-05
120	690.34	1.87E-05
180	687.53	1.84E-05
240	684.82	1.79E-05
300	682.16	1.75E-05
360	679.48	1.78E-05
420	676.89	1.73E-05
480	674.27	1.75E-05
540	671.80	1.66E-05
600	669.36	1.64E-05
900	658.02	1.54E-05
1200	642.62	2.14E-05
1500	628.93	1.94E-05
1800	612.47	2.40E-05
2400	596.10	1.22E-05
3000	578.11	1.38E-05
3600	556.59	1.71E-05

Calculations

$$K_h = \frac{d^2 \cdot \ln\left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \cdot \ln\frac{H_1}{H_2}$$

$$\frac{mL}{D} > 4$$

Where:

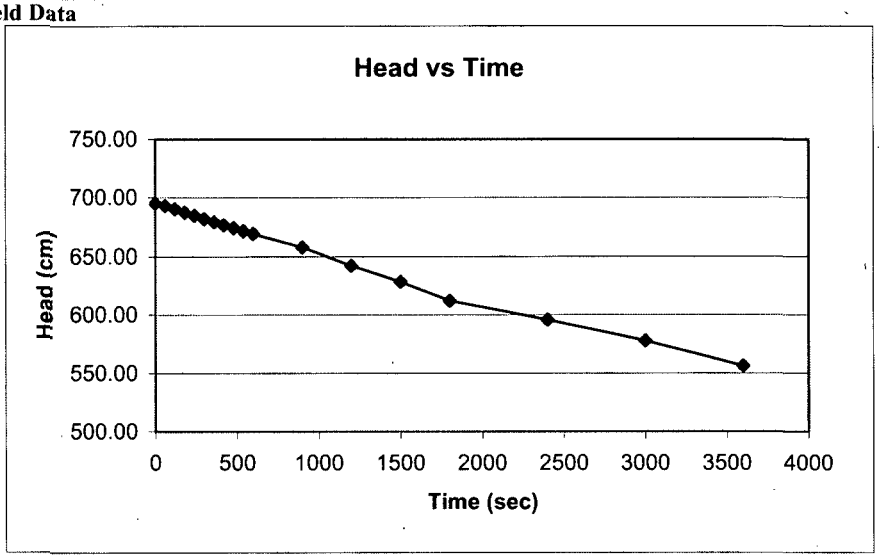
K_h	is the Horizontal Coefficient of Permeability (cm/sec)
H_1	is the Piezometric Head for time; $t = t_1$ (cm)
H_2	is the Piezometric Head for time; $t = t_2$ (cm)
D	is the Diameter of the Standpipe (cm)
d	is the diameter of the Open Length (cm),
m	is the Transformation Ratio, Where
	$m = \sqrt{K_h / K_v}$ — K_h is the Horizontal Permeability; K_v is the Vertical Permeability
L	is the Open Length of Hole (cm)

Spreadsheet assumes 3" ID Pipe; NQ Hole, OD = 3"

MEAN PERMEABILITY (cm/sec)

1.74E-05

Graph of Field Data

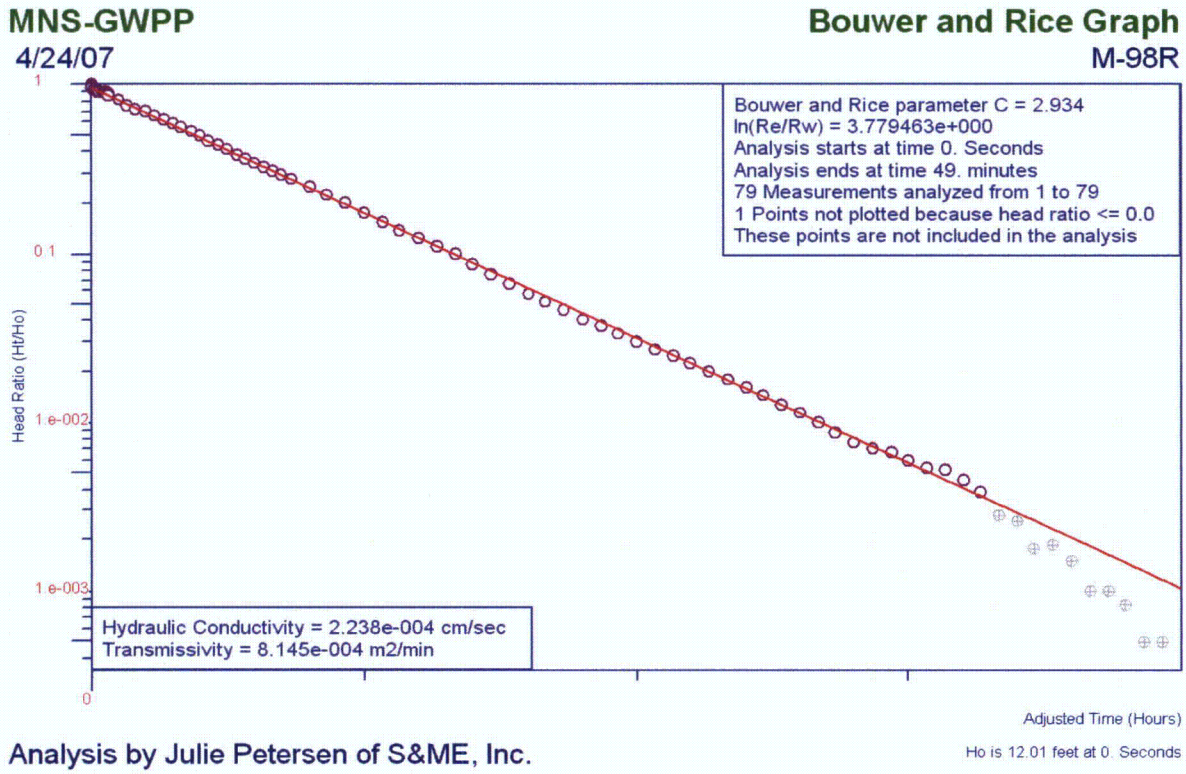


Calculation of Permeability By The Falling Head Method (Open Hole in Uniform Material)

Site Name:	MNS-GWPP	
Test Date:	4/24/2007	
Well Label:	M-98R	
Test Interval:	22 to 29.7 ft bls	(Sound Rock)
Length of Open Hole:	7.7 feet	
Borehole Radius:	1.5 Inches	
Effective Radius:	1.5 Inches	
Anisotropy Ratio:	1	

Test starts with trial 0
There are 90 time and drawdown measurements
Maximum head is 12.01 feet
Minimum head is 0. feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

PERMEABILITY

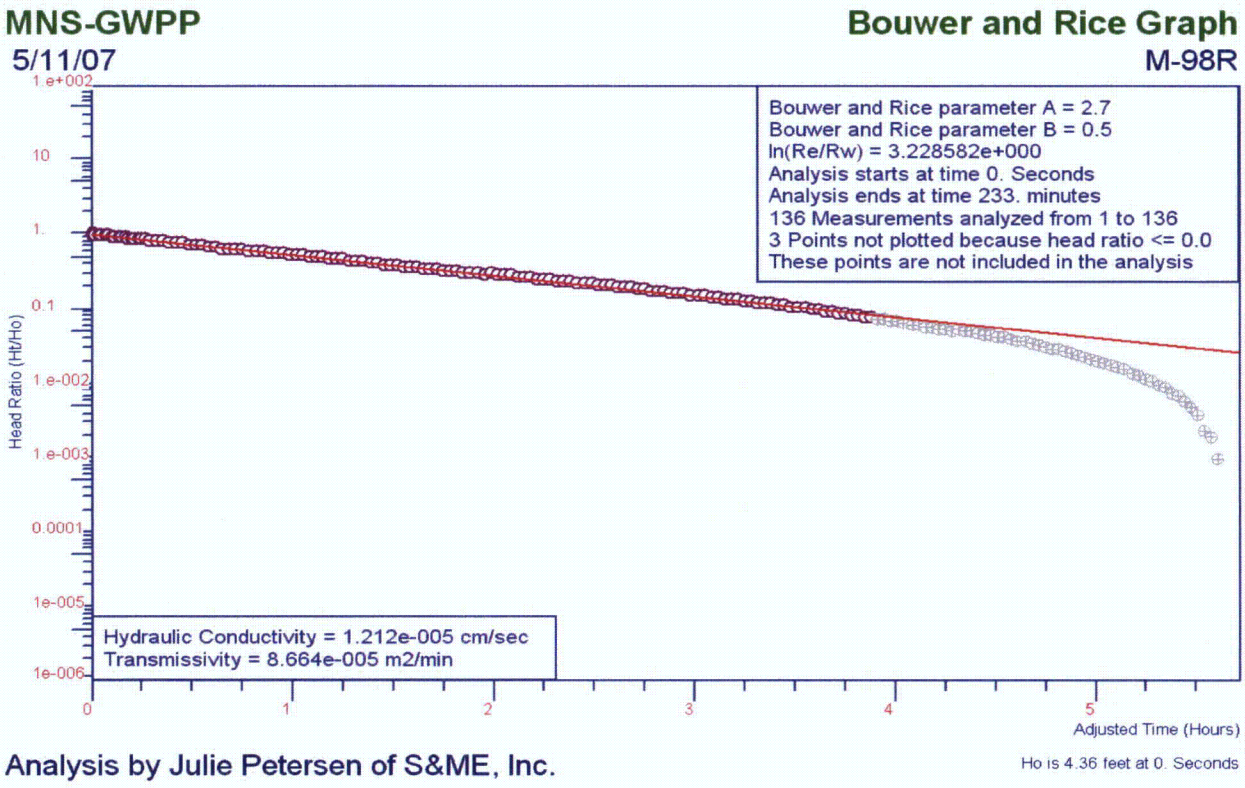
2.24E-04 cm/sec

Calculation of Permeability By The Rising Head Method (Slug Test)

Site Name:	MNS-GWPP
Test Date:	5/11/2007
Well Label:	M-98R
Aquifer Thickness:	39.1 feet
Screen Length:	5. feet
Casing Radius:	1. Inches
Effective Radius:	1.5 Inches
Static Water Level:	13.5 feet
Water Table to Screen Bottom:	34.1 feet
Anisotropy Ratio:	1

Time Adjustment: 0. Seconds
Test starts with trial 0
There are 192 time and drawdown measurements
Maximum head is 4.36 feet
Minimum head is -8.e-003 feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

PERMEABILITY

1.21E-05 cm/sec

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1. BORING AND SAMPLING IS IN ACCORDANCE WITH ASTM D-1586.
2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-100R**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 1 of 2
Boring Depth (ft): **60.0**	Elevation (ft): **732.1**	Driller: **Jay Little, NC Cert No. 2717**	Date Drilled: **4/19/07**
Logged By: **Julie Petersen**	Water Level: **Stabilized Water Level at 28.42 ft bls**		Drilling Method: **Mud Rotary**

Elev. (Feet)	Depth (Feet)	Lith-ology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
			GRAVEL		
			SOIL/SAPROLITE (M1): Red, Fine Sandy, Silty, **CLAY**		
730					
	5				6
725					
	10				7
720					
			SOIL/SAPROLITE (M1): Yellow and Grayish-Red Striated, Fine Sandy, Silty, **CLAY**		
	15				4
715					
			SOIL/SAPROLITE (M1): Grayish-Red Striated, Micaceous, Fine Sandy, Silty, **CLAY** With White, High Plasticity Clay Layers (Schistose)		
	20				5
710					
	25				11
705					
	30		WEATHERED ROCK (M2): Gray and White, Silty, Medium to Fine **SAND** (Granitic)		50/5 >>
700					
		+ + + + + +	PARTIALLY WEATHERED/FRACTURED ROCK		50/1 >>

BORING LOG WITH WELL MNSLOG.GPJ LAGWGN01.GDT 3/26/08

S&ME, Inc.
9751 Southern Pine Blvd.
Charlotte, North Carolina
Telephone: 704-523-4726
Fax: 704-525-3953

ENGINEERING • TESTING
ENVIRONMENTAL SERVICES

1. BORING AND SAMPLING IS IN ACCORDANCE WITH ASTM D-1586.
2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-100R**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 2 of 2
Boring Depth (ft): **60.0**	Elevation (ft): **732.1**	Driller: **Jay Little, NC Cert No. 2717**	Date Drilled: **4/19/07**
Logged By: **Julie Petersen**	Water Level: **Stabilized Water Level at 28.42 ft bls**		Drilling Method: **Mud Rotary**

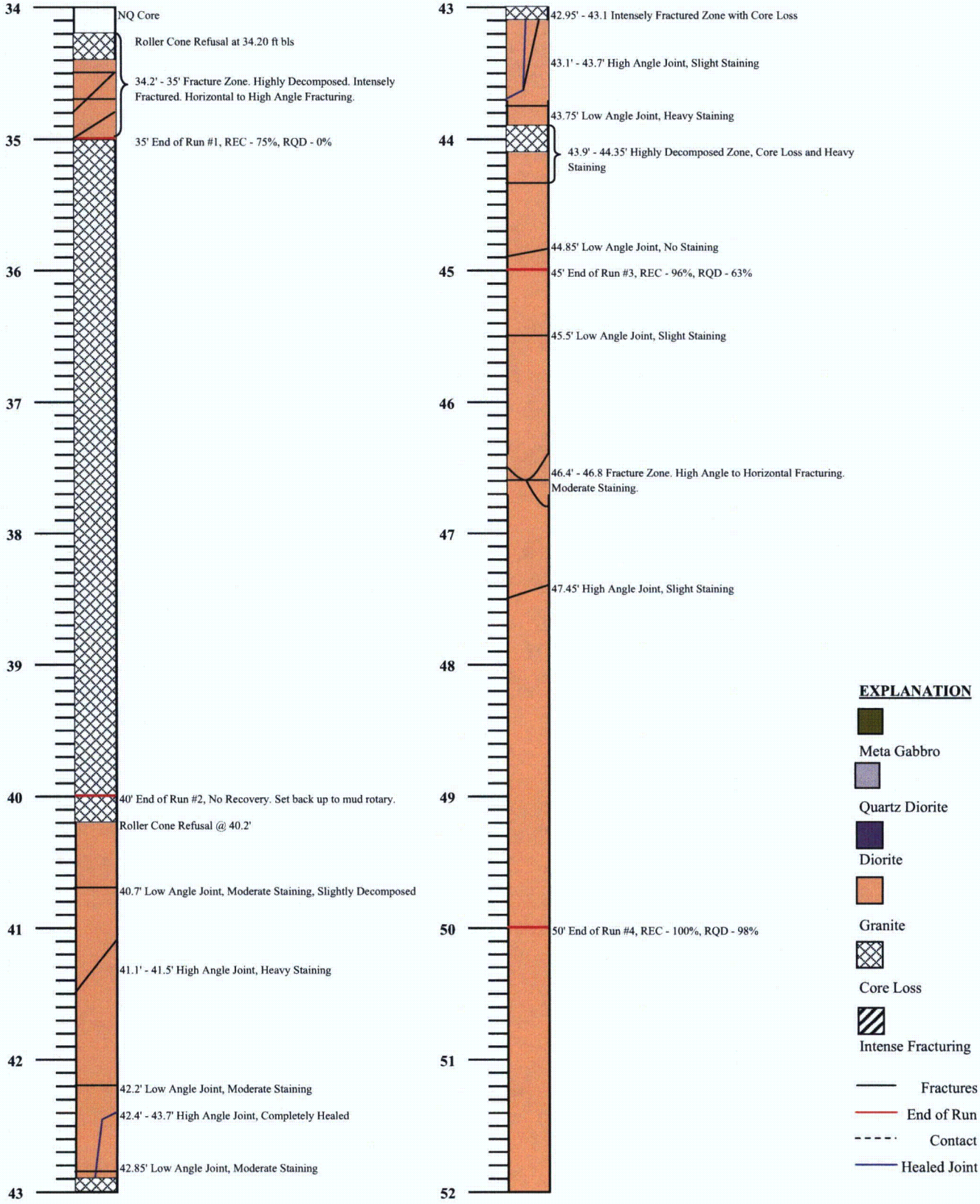
Elev. (Feet)	Depth (Feet)	Lithology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
695	40		(WF): Highly Weathered Fragments of Fine-Grained **GRANITE** **Roller Cone Refusal at 34.20 ft bls** WEATHERED ROCK (M2): When Sampled Becomes Gray and White, Silty, Medium to Fine **SAND** (Granitic)		
690	45		SOUND ROCK (D): Fine-Grained **GRANITE** With Orbicuals, Moderately to Intensely Fractured. Slight to Heavy Weathering		
685	50		SOUND ROCK (D): Fine-Grained **GRANITE**, Unfractured		
680	55				
675	60		**Boring Terminated at 60.00 ft bls**		

FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-100R

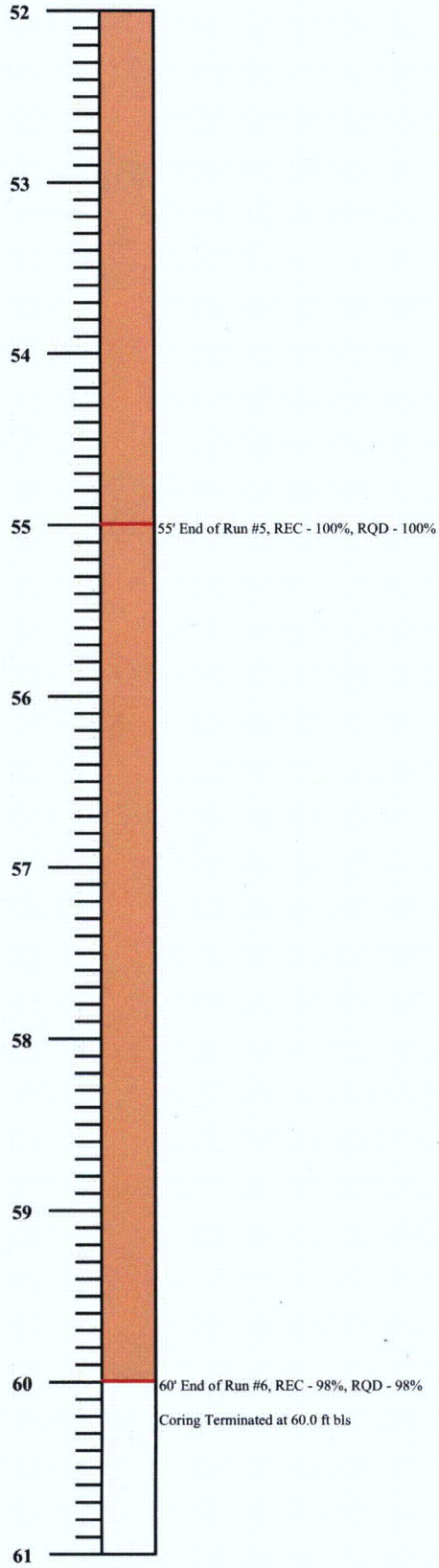


FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-100R



EXPLANATION

- Meta Gabbro
- Quartz Diorite
- Diorite
- Granite
- Core Loss
- Intense Fracturing
- Fractures
- End of Run
- Contact
- Healed Joint

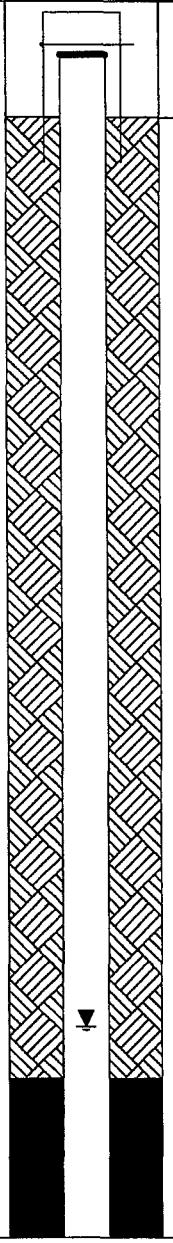
COMPLETION REPORT OF WELL No. M-100R

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **Mud Rotary**
DATE DRILLED: **4/19/07**

WATER LEVEL: **Stabilized Water Level at 28.42 ft bls**
LATITUDE: **35 25 47.87**
LONGITUDE: **80 57 06.80**
TOP OF CASING ELEVATION: **735.05**
DATUM: **MSL**
LOGGED BY: **Julie Petersen**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)
				0.00		732.09
GRAVEL		0				
SOIL/SAPROLITE (M1): Red, Fine Sandy, Silty, **CLAY**		5, 10				
SOIL/SAPROLITE (M1): Yellow and Grayish-Red Striated, Fine Sandy, Silty, **CLAY**		15				
SOIL/SAPROLITE (M1): Grayish-Red Striated, Micaceous, Fine Sandy, Silty, **CLAY** With White, High Plasticity Clay Layers (Schistose)		20, 25				
				30.00		702.09
WEATHERED ROCK (M2): Gray and White, Silty, Medium to Fine **SAND** (Granitic)		30				
PARTIALLY	+ +					



WELL CONSTRUCTION DETAILS

PROTECTIVE CASING
Diameter: **4" X 4"**
Type: **Lockable Steel**
Interval: **Above Grade**

RISER CASING
Diameter: **2"**
Type: **Sch. 40 PVC**
Interval: **0 to 41.4 ft bls**

GROUT
Type: **Neat Cement**
Interval: **0 to 30 ft bls**

SEAL
Type: **K-Packer + Bentonite**
Interval: **30 to 41.6 ft bls**

FILTERPACK
Type:
Interval:

SCREEN
Diameter: **2"**
Type: **0.010 Slotted Sch. 40 PVC**
Interval: **42 to 47 ft bls**

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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9751 Southern Pine Blvd.
Charlotte, North Carolina

COMPLETION REPORT OF WELL No. M-100R

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

GROUND SURFACE ELEVATION:
LOGGED BY: **732.1**
CHECKED BY: **Julie Petersen**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
							(See Page 1)
WEATHERED/FRACTURED ROCK (WF): Highly Weathered Fragments of Fine-Grained **GRANITE**		35					
WEATHERED ROCK (M2): When Sampled Becomes Gray and White, Silty, Medium to Fine **SAND** (Granitic)		40		41.40 41.60 42.00		690.69 690.49 690.09	
SOUND ROCK (D): Fine-Grained **GRANITE** With Orbicuals, Moderately to Intensely Fractured. Slight to Heavy Weathering		45		46.50 47.00		685.59 685.09	
SOUND ROCK (D): Fine-Grained **GRANITE**, Unfractured		50		50.00		682.09	
		55					
		60		60.00		672.09	

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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COMPLETION REPORT OF WELL No. M-100R

SPLIT SPOON SAMPLE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Boring Number: M-100R

Sample No: 1
Depth (ft-bls): 4.2 - 5.7
Blow Count: 3 * 3 * 3

No Recovery

Sample No: 2
Depth (ft-bls): 9.2 - 10.7
Blow Count: 3 * 3 * 4

Sample No: 3
Depth (ft-bls): 14.2 - 15.7
Blow Count: 2 * 2 * 2

Sample No: 4
Depth (ft-bls): 19.2 - 20.7
Blow Count: 2 * 2 * 3

Sample No: 5
Depth (ft-bls): 24.2 - 25.7
Blow Count: 3 * 5 * 6

No Recovery

Sample No: 6
Depth (ft-bls): 29.2 - 30.7
Blow Count: 3 * 10 * 50/5

SPLIT SPOON SAMPLE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Boring Number: **M-100R**

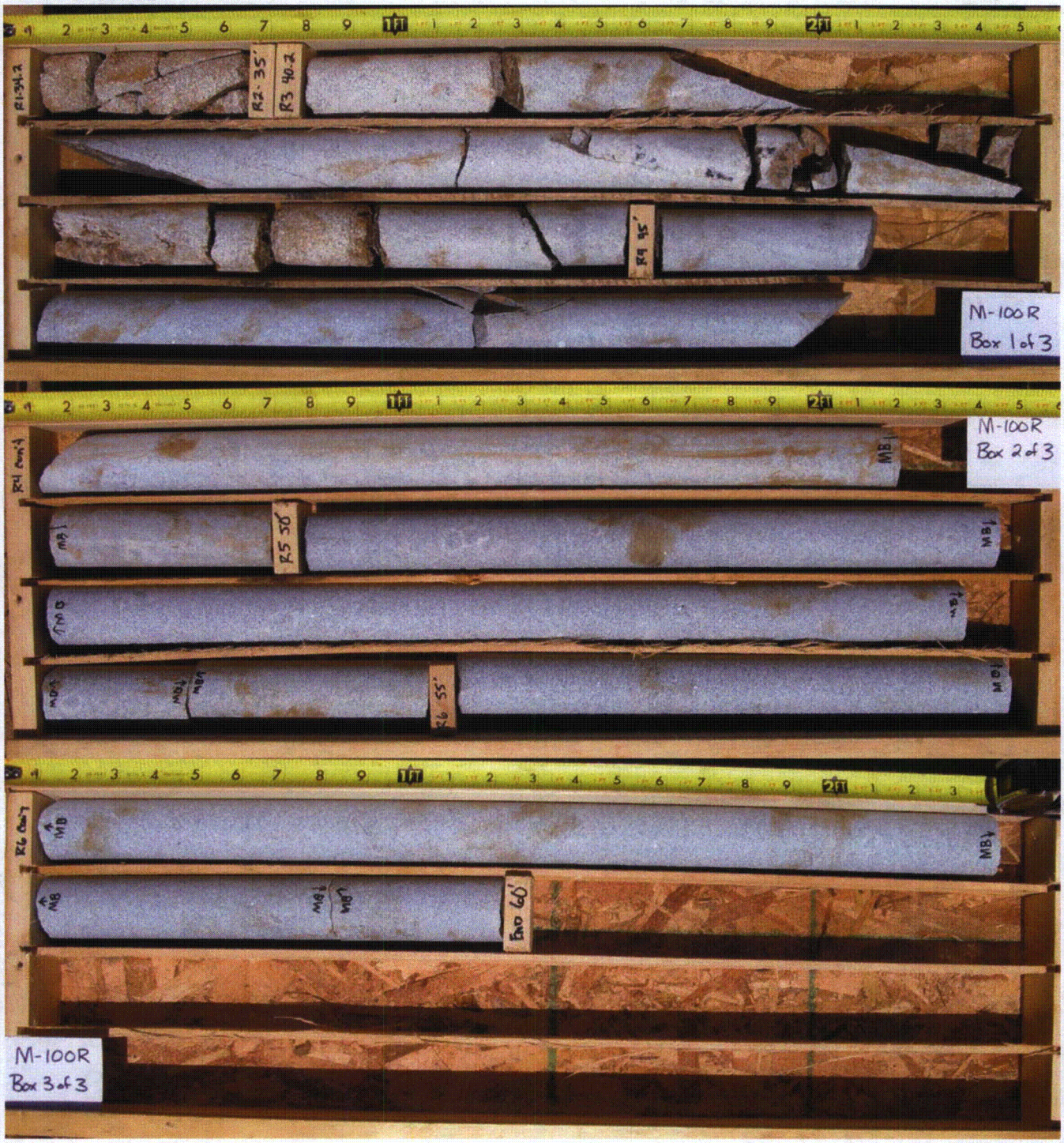
Sample No: 7
Depth (ft-bls): 34.2 - 35.7 **No Recovery**
Blow Count: 50/1

ROCK CORE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-100R



CLASSIFICATION:

34.2' - 60' Fine Grained Granite with Orbicuals

CALCULATION OF PERMEABILITY BY THE FALLING HEAD METHOD
(Open Hole in Uniform Material)

S&ME

Site Name:	MNS - GWPP	
Date:	4/19/2007	
Boring I.D.	M-100R	
Test Interval:	29.65 to 33.2	(Weathered Rock)
Total Depth of Hole:	33.2 ft	1012.2 cm
Length of Open Hole:	3.55 ft	108.23 cm
Transformation Ratio m=	1	
Performed by:	Julie Petersen	

Time (sec)	Head (cm)	Permeability (cm/sec)
0	1003.72	
60	999.82	1.46E-05
120	996.10	1.39E-05
180	991.86	1.59E-05
240	987.74	1.56E-05
300	983.78	1.50E-05
360	979.82	1.51E-05
420	975.91	1.49E-05
480	972.07	1.48E-05
540	968.32	1.45E-05
600	964.48	1.49E-05
900	946.04	1.44E-05
1200	928.78	1.38E-05
1500	911.83	1.38E-05
1800	895.49	1.35E-05
2400	864.09	1.34E-05
3000	834.39	1.31E-05
3600	806.19	1.29E-05

Calculations

$$K_h = \frac{d^2 \cdot \ln\left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \cdot \ln\frac{H_1}{H_2}$$

for $\frac{mL}{D} > 4$

Where:

K_h	is the Horizontal Coefficient of Permeability (cm/sec)
H_1	is the Piezometric Head for time; $t = t_1$ (cm)
H_2	is the Piezometric Head for time; $t = t_2$ (cm)
D	is the Diameter of the Standpipe (cm)
d	is the diameter of the Open Length (cm),
m	is the Transformation Ratio, Where

$m = \sqrt{K_h / K_v}$ — K_h is the Horizontal Permeability; K_v is the Vertical Permeability

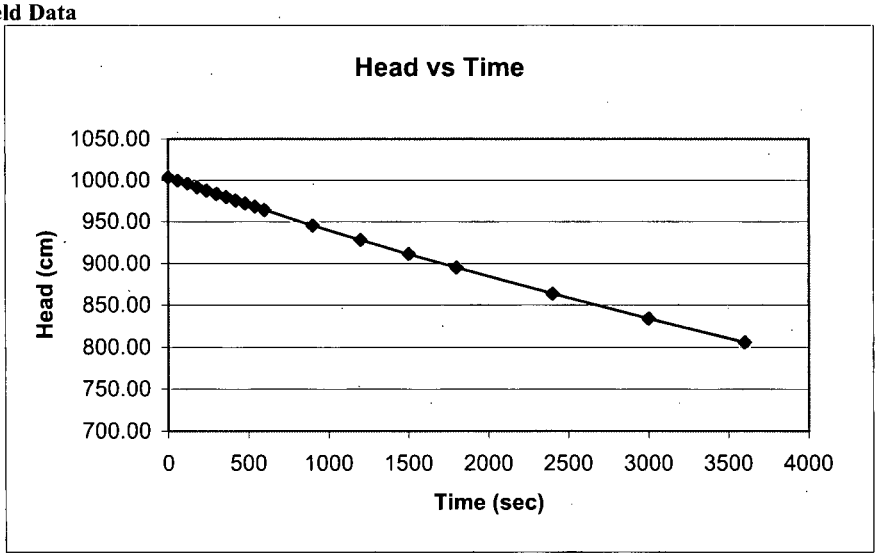
L	is the Open Length of Hole (cm)

Spreadsheet assumes 3" ID Pipe; NQ Hole, OD = 3"

MEAN PERMEABILITY (cm/sec)

1.44E-05

Graph of Field Data

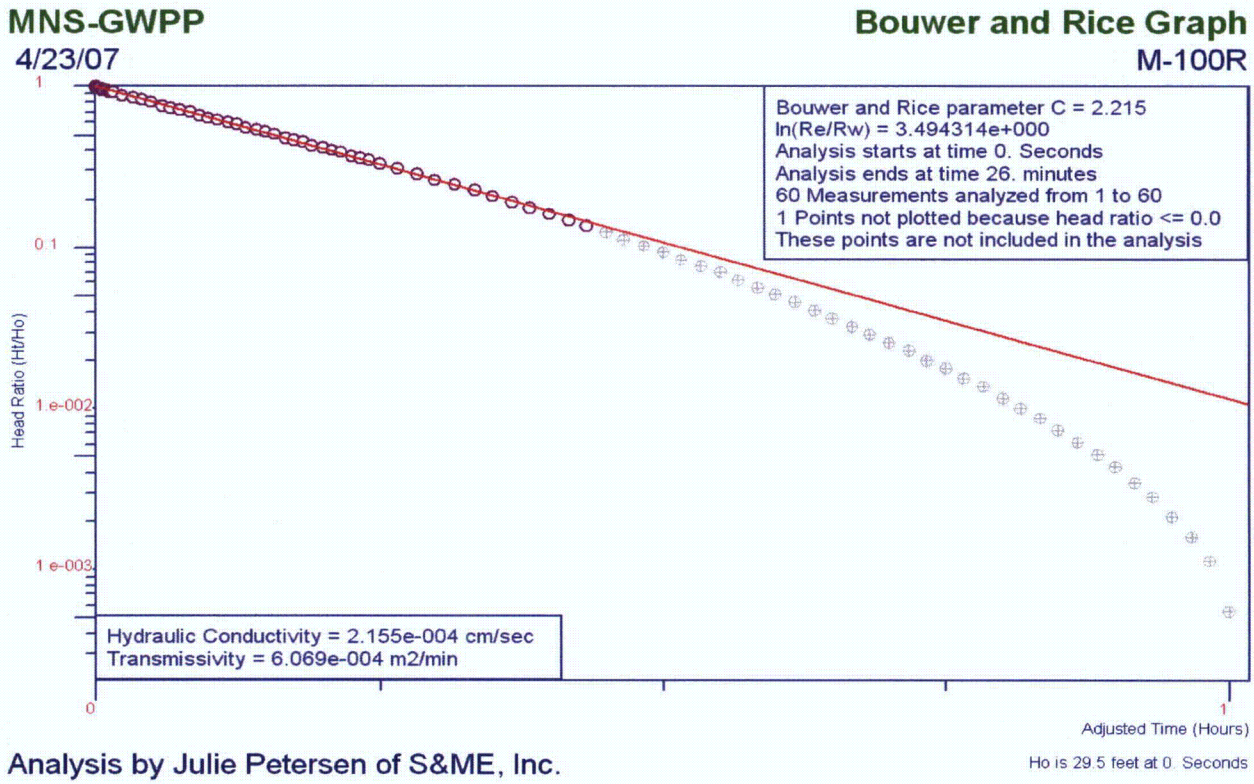


Calculation of Permeability By The Falling Head Method (Open Hole in Uniform Material)

Site Name:	MNS-GWPP	
Test Date:	4/23/2007	
Well Label:	M-100R	
Test Interval:	40.2 to 45 ft bls	(Sound Rock)
Length of Open Hole:	4.8 feet	
Borehole Radius:	1.5 Inches	
Effective Radius:	1.5 Inches	
Anisotropy Ratio:	1	

Test starts with trial 0
There are 95 time and drawdown measurements
Maximum head is 29.5 feet
Minimum head is 0. feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

PERMEABILITY
2.16E-04 cm/sec

CALCULATION OF PERMEABILITY BY THE FALLING HEAD METHOD
(Open Hole in Uniform Material)

S&ME

Site Name:	MNS - GWPP	
Date:	4/23/2007	
Boring I.D.	M-100R	
Test Interval:	40.2 to 50	(Sound Rock)
Total Depth of Hole:	50 ft	1524.39 cm
Length of Open Hole:	9.8 ft	298.78 cm
Transformation Ratio m=	1	
Performed by:	Julie Petersen	

Time (sec)	Head (cm)	Permeability (cm/sec)
0	1562.99	
60	1485.03	9.04E-05
120	1469.30	1.88E-05
180	1454.57	1.78E-05
240	1439.39	1.85E-05
300	1421.10	2.26E-05
360	1406.98	1.76E-05
420	1390.03	2.14E-05
480	1374.60	1.97E-05
540	1362.74	1.53E-05
600	1350.61	1.58E-05
900	1299.45	1.36E-05
1200	1230.98	1.91E-05
1500	1136.83	2.81E-05
1800	1073.51	2.02E-05
2400	942.71	2.29E-05
3000	842.87	1.98E-05
3600	766.89	1.67E-05

Calculations

$$K_h = \frac{d^2 \cdot \ln\left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \cdot \ln\frac{H_1}{H_2}$$

for $\frac{mL}{D} > 4$

Where:

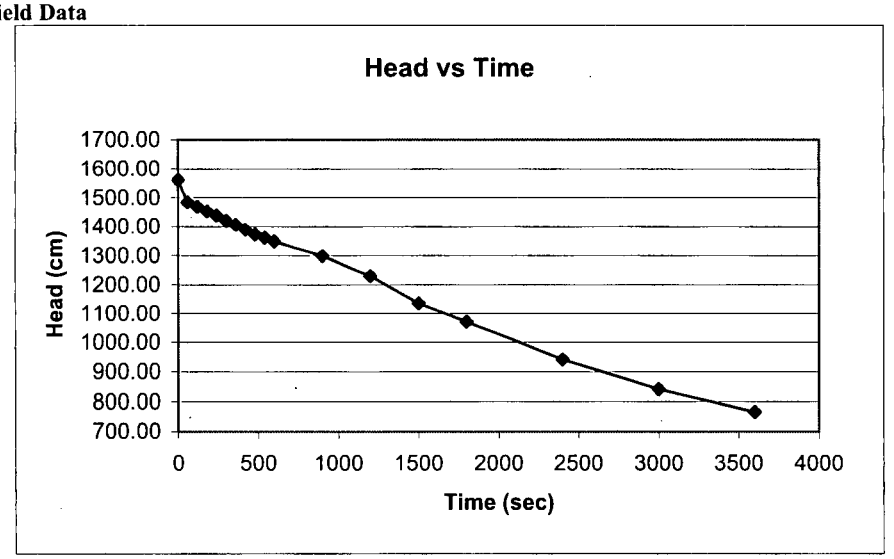
- K_h is the Horizontal Coefficient of Permeability (cm/sec)
- H_1 is the Piezometric Head for time; $t = t_1$ (cm)
- H_2 is the Piezometric Head for time; $t = t_2$ (cm)
- D is the Diameter of the Standpipe (cm)
- d is the diameter of the Open Length (cm),
- m is the Transformation Ratio, Where $m = \sqrt{K_h / K_v}$ — K_h is the Horizontal Permeability, K_v is the Vertical Permeability
- L is the Open Length of Hole (cm)

Spreadsheet assumes 3" ID Pipe; NQ Hole, OD = 3"

MEAN PERMEABILITY (cm/sec)

2.34E-05

Graph of Field Data



BOREHOLE PERMEABILITY TEST USING PACKERS
FIELD DATA SHEET

S&ME

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-100R				
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	42.0	to	47.0	bgs	
TEST DATE:	4/24/2007	**TEST INTERVAL:**	690.0	to	685.0	EL	
TESTED BY:	Jay Little and Julie Petersen						
GROUND ELEV (ft MSL):	732.0						

TEST METHOD: Double Packer Method using Multiple Pressure Tests
METHOD REFERENCE: Ground Water Manual, US Bureau of Reclamation, 1995, Chapter 10

TEST DATA (Enter data in underlined cells):

Rock Description of test interval:	Sound Rock - Fine Grained Granite, Moderately Fractured, with Slight Decomposition. Highly Decomposed Zone from 43.9 to 44.35 ft bls.			
Source of test water and clarity:	Catawba River - Slightly Turbid			
Method of cleaning hole prior to testing:	Flushed			
Drilling Fluid (water or type of drilling mud)	Water			
Packer Brand and Model:				
Packer Inflation Pressure	160	psi		
Packer Length:	2.00	feet		
Method: Single (1) or double (2) packer (Enter 1 or 2):	2			
Interval below base of packer for Method 1 (single packer test), A_1:	-	feet		
Interval between packers for Method 2 (double packer test), A_2:	5.0	feet		
Depth of hole at time of test:	60.0	feet below ground surface (bgs)		
Diameter of borehole, d:	3.0	inches	0.3	feet
Radius of the borehole, r	0.13	feet		
Depth to water table (thickness of unsaturated material above water table, U):	28.4	feet		
Height above ground surface of pressure gauge:	3.8	feet ags		
Top of test section (bottom of upper packer), h_t:	42.0	feet bgs		
Bottom of test section (top of lower packer if double packer used, bottom of hole for a single packer, D):	47.0	feet bgs		
Is test section above or below water table?	below			
For tests below the water table determine h_1, the distance between the gauge and the water table:	32.2	feet		
Length of pipe over which head loss occurs (distance from gauge to outlet of pipe in test section):	48.3	feet		
Diameter and type of pipe used:	1.25-inch I.D.			

BOREHOLE PERMEABILITY TEST USING PACKERS
FIELD DATA SHEET

S&ME

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-100R				
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	42	to	47	bgs	
TEST DATE:	4/24/07	**TEST INTERVAL:**	689.96	to	684.96	EL	

Gauge Pressure (h_2) in psi	Elapsed Time (minutes)	Water Level (feet bgs)	Flow Rate (total flow in gal)	Flow Rate (gpm)
Step 1				
15	0		1824.00	
15	1		1825.10	1.10
15	2		1826.20	1.10
15	5		1829.20	1.00
15	10		1834.20	1.00
15	15		1839.00	0.96
15	20		1843.90	0.98
		Average	1.00	1.02
		Selected stabilized flow rate to be used in calculations		1.00
Step 2				
25	0		1845.00	
25	1		1846.70	1.70
25	2		1848.30	1.60
25	5		1853.40	1.70
25	10		1861.70	1.66
25	15		1870.00	1.66
25	20		1878.40	1.68
		Average	1.67	1.67
		Selected stabilized flow rate to be used in calculations		1.67
Step 3				
35	0		1880.00	
35	1		1883.40	3.40
35	2		1886.70	3.30
35	5		1896.50	3.27
35	10		1913.50	3.40
35	15		1932.00	3.70
35	20		1952.30	4.06
		Average	3.62	3.52
		Selected stabilized flow rate to be used in calculations		3.52
Step 4				
25	0		1953.60	
25	1		1956.50	2.90
25	3		1962.40	2.95
25	5		1968.60	3.10
		Average	3.00	2.98
		Selected stabilized flow rate to be used in calculations		2.98
Step 5				
15	0		1969.10	
15	1		1970.70	1.60
15	3		1974.50	1.90
15	5		1978.80	2.15
		Average	1.94	1.88
		Selected stabilized flow rate to be used in calculations		1.88

NOTES:

BOREHOLE PERMEABILITY TEST USING PACKERS
CALCULATIONS

S&ME

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-100R				
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	42.0	to	47.0	bgs	
TEST DATE:	4/24/2007	**TEST INTERVAL:**	690.0	to	685.0	EL	
TESTED BY:	Jay Little and Julie Petersen						
GROUND ELEV (ft MSL):	732.0						

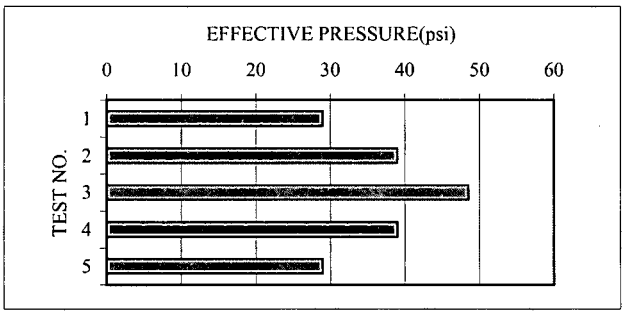
TEST METHOD: Double Packer Method using Multiple Pressure Tests
METHOD REFERENCE: Ground Water Manual, US Bureau of Reclamation, 1995, Chapter 10

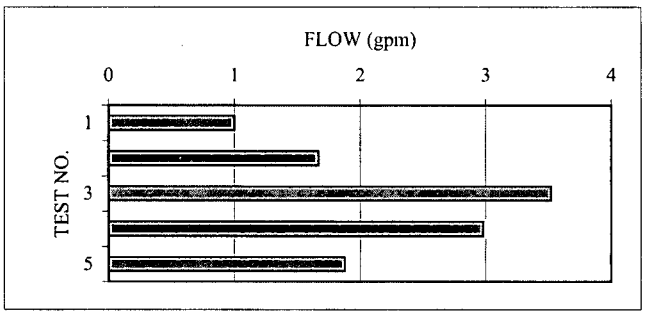
RESULTS OF PERMEABILITY CALCULATIONS
MULTIPLE STEP TEST

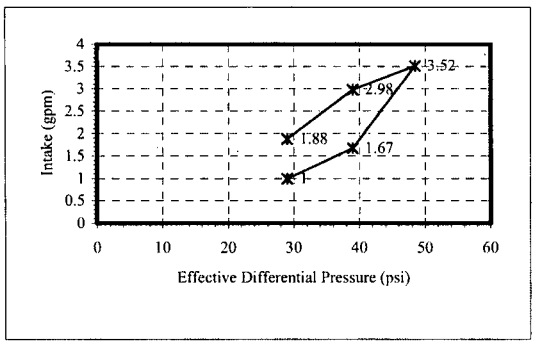
Step	Flow (Q) (gpm)	Pressure (psi) Gauge	Pressure (psi) Effective	Lugeons	Permeability (ft/sec)	Permeability (cm/sec)
1	1	15	29	12	4.17E-06	1.3E-04
2	1.67	25	39	15	5.2E-06	1.6E-04
3	3.52	35	48	26	8.8E-06	2.7E-04
4	2.98	25	39	28	9.2E-06	2.8E-04
5	1.88	15	29	23	7.8E-06	2.4E-04
			AVERAGE	21	7.0E-06	2.1E-04
			SELECTED VALUES			

Rock Description of Tested Interval:
Sound Rock - Fine Grained Granite, Moderately Fractured, with Slight Decomposition. Highly Decomposed Zone from 43.9 to 44.35 ft bls.

TEST INTERPRETATION
Text here
Text here







PERMEABILITY CALCULATIONS FOR EACH STEP OF TEST

S&ME

CALCULATED PERMEABILITY FOR STEP 1

Gauge Pressure, **h2**	15	psi	34.6	feet of water
Flow Rate, **Q**:	1	gpm	0.002	ft^3/sec
Head loss per TEN foot section of pipe:	0.0	psi		(per tables)
Head Loss, ***L*** :	0.0	psi	0.0	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	32.2	feet		
Value of $\mathbf{h_1}$:	32.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	66.9	feet	29.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	48.3	feet		
X = (H/Tu)*100	138.5	%		
Tu/A	9.7			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	4.17E-06	ft/sec	1.27E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 2

Gauge Pressure, **h2**	25	psi	57.7	feet of water
Flow Rate, **Q**:	1.67	gpm	0.004	ft^3/sec
Head loss per TEN foot section of pipe:	0.0	psi		(per tables)
Head Loss, ***L*** :	0.0	psi	0.0	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	32.2	feet		
Value of h_1:	32.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	90.0	feet	39.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	71.4	feet		
X = (H/Tu)*100	126.0	%		
Tu/A	14.3			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	5.17E-06	ft/sec	1.58E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 3				
Gauge Pressure, **h2**:	35	psi	80.8	feet of water
Flow Rate, **Q**:	3.52	gpm	0.008	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.5	psi	1.1	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	32.2	feet		
Value of h_1:	32.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	111.9	feet	48.5	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	93.4	feet		
X = (H/Tu)*100	119.9	%		
Tu/A	18.7			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	8.76E-06	ft/sec	2.67E-04	cm/sec
Is this step valid?				
If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow				
Calculate a, the total open area of the test section:			3.9	square feet
Is Q/a * (estimated porosity) > 10??			True, Test Valid	

CALCULATED PERMEABILITY FOR STEP 4				
Gauge Pressure, **h2**:	25	psi	57.7	feet of water
Flow Rate, **Q**:	2.98	gpm	0.007	ft^3/sec
Head loss per TEN foot section of pipe:	0.0	psi		(per tables)
Head Loss, ***L*** :	0.0	psi	0.0	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	32.2	feet		
Value of h_1:	32.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	90.0	feet	39.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	71.4	feet		
X = (H/Tu)*100	126.0	%		
Tu/A	14.3			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	9.23E-06	ft/sec	2.81E-04	cm/sec
Is this step valid?				
If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow				
Calculate a, the total open area of the test section:			3.9	square feet
Is Q/a * (estimated porosity) > 10??			True, Test Valid	

CALCULATED PERMEABILITY FOR STEP 5				
Gauge Pressure, **h2**:	15	psi	34.6	feet of water
Flow Rate, **Q**:	1.88	gpm	0.004	ft^3/sec
Head loss per TEN foot section of pipe:	0.0	psi		(per tables)
Head Loss, ***L*** :	0.0	psi	0.0	feet of water
Distance from pressure gauge to bottom of test section, h_1:	32.2	feet		
Value of h_1:	32.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	66.9	feet	29.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	48.3	feet		
X = (H/Tu)*100	138.5	%		
Tu/A	9.7			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	7.83E-06	ft/sec	2.39E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

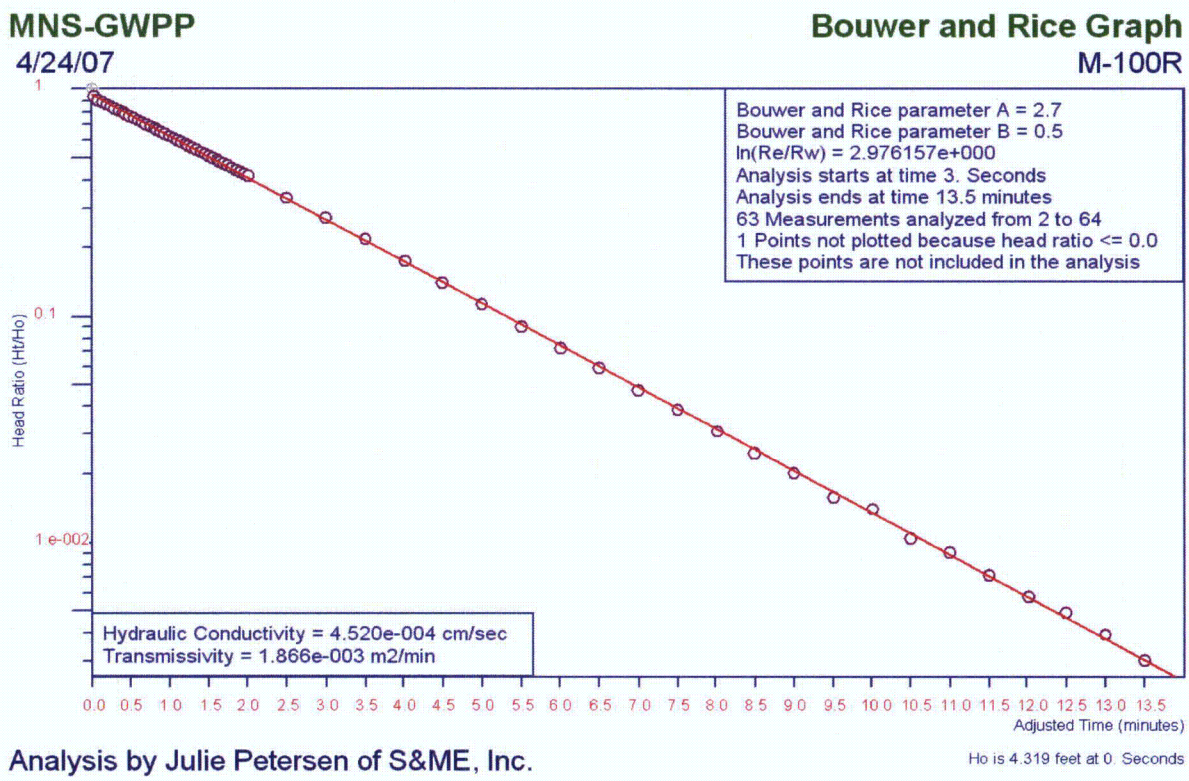
Is Q/a * (estimated porosity) > 10?? True, Test Valid

Calculation of Permeability By The Rising Head Method (Slug Test)

Site Name:	MNS-GWPP
Test Date:	4/24/2007
Well Label:	M-100R
Aquifer Thickness:	22.58 feet
Screen Length:	5. feet
Casing Radius:	1. Inches
Effective Radius:	1.5 Inches
Static Water Level:	29.42 feet
Water Table to Screen Bottom:	17.58 feet
Anisotropy Ratio:	1

Time Adjustment: 0. Seconds
Test starts with trial 0
There are 65 time and drawdown measurements
Maximum head is 4.319 feet
Minimum head is 0. feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

Ho is 4.319 feet at 0. Seconds

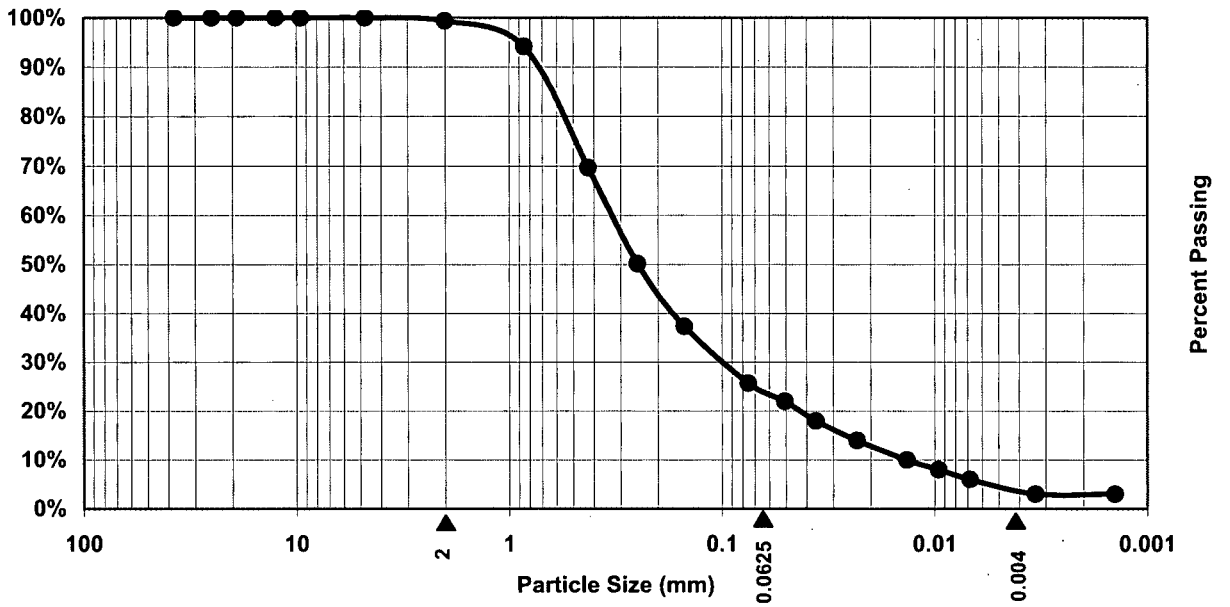
PERMEABILITY

4.52E-04 cm/sec

PARTICLE SIZE ANALYSIS OF SOILS
FOR USE IN FETTER AND BEAR DIAGRAMS

Boring No.:	**Sample No.:**	**Depth:**
M-100R	SS-6	29.2 to 30.7 ft bls

Sample Description:
Gray and White, Silty, Fine to Medium Sand



	> 2 mm	2 mm - 0.0625 mm	0.0625 mm - 0.004 mm	<0.004 mm
From Graph:	% Gravel 0.6%	% Sand 75.2%	% Silt 20.6%	% Clay 3.6%
Adjusted for Calculations	**0%**	**76%**	**21%**	**4%**

Notes:
Grain size distribution taken from grain size with hydrometer data located in Appendix II.
Gravel, sand, silt and clay sizes based on Wentworth Scale.

S&ME Project:
McGuire Nuclear Station - GWPP

S&ME Project No.:
1264-06-724

S&ME

FETTER AND BEAR DIAGRAMS

S&ME PROJECT: McGuire Nuclear Station - GWPP
S&ME PROJECT NO.: 1264-06-724

Boring No. M-100R

Boring Depth: 29.2 to 30.7 ft bls

% Sand: 76%

% Silt: 21%

% Clay: 4%

Estimated Specific Yield: 27.5%

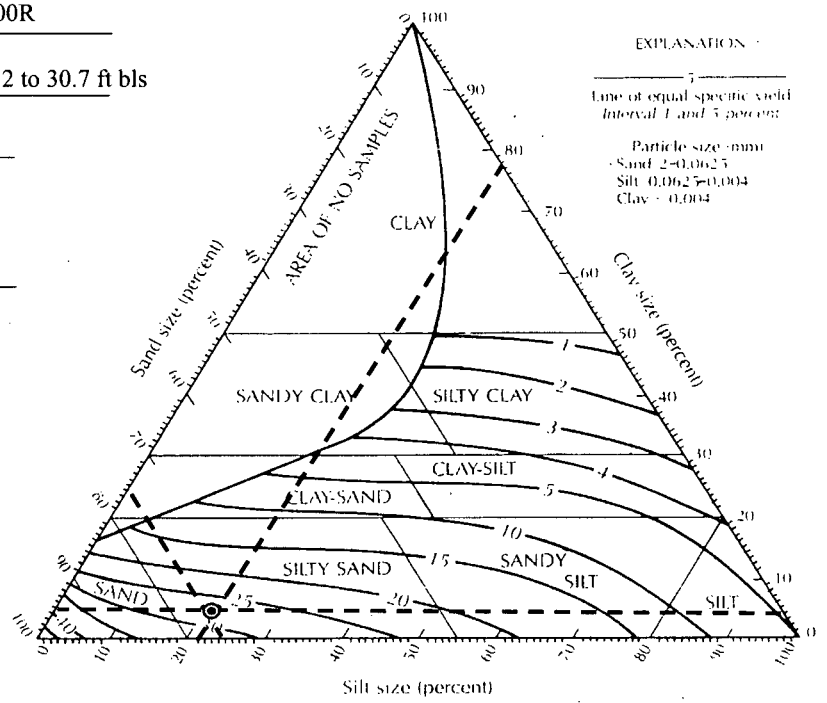
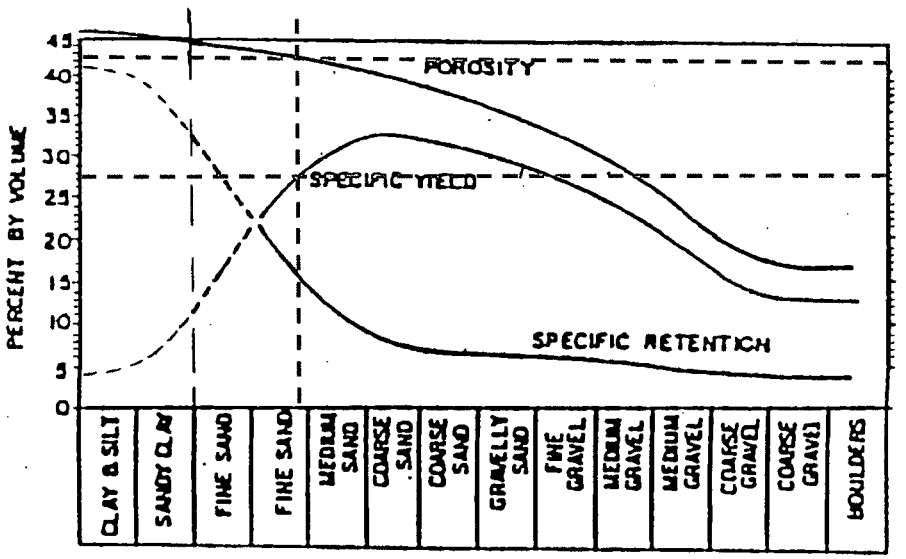


FIGURE 4.11 Textural classification triangle for unconsolidated materials showing the relation between particle size and specific yield. Source: A. I. Johnson, U.S. Geological Survey Water-Supply Paper 1662-D, 1967.



Estimated Porosity: 42.5%

Variation of Porosity, Specific Yield, and Specific Retention with Grain Size (after Bear, 1972)

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1. BORING AND SAMPLING IS IN ACCORDANCE WITH ASTM D-1586.
2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-103**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 1 of 1
Boring Depth (ft): **22.0**	Elevation (ft): **695.3**	Driller: **Jay Little, NC Cert No. 2717**	Date Drilled: **4/4/07**
Logged By: **Julie Petersen**	Water Level: **Stabilized Water Level at 11.90 ft bls**		Drilling Method: **4¼" H.S.A.**

Elev. (Feet)	Depth (Feet)	Lith-ology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
695			SOIL/SAPROLITE (M1): Brown, Fine Sandy, Clayey, **SILT**		
			SOIL/SAPROLITE (M1): Red, Medium to Fine Sandy, Silty, **CLAY**		
690	5				
			WEATHERED ROCK (M2): **QUARTZ DIORITE** Rock Lense		
			SOIL/SAPROLITE (M1): Yellowish-Red, Micaceous, Slightly Clayey, Silty, Medium to Fine **SAND**		
685	10				
			SOIL/SAPROLITE (M1): Tannish-Gray, Medium to Fine **SAND** With Mica (Granitic)		
680	15				
675	20		WEATHERED ROCK (M2): When Sampled Becomes Tannish-Gray and White, Silty, Medium to Fine **SAND** (Granitic)		
			Boring Terminated at 22.00 ft bls **Lithologic Descriptions Obtained from M-103R**		

COMPLETION REPORT OF WELL No. M-103

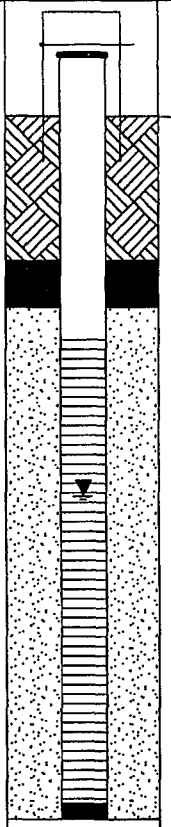
PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

WATER LEVEL: **Stabilized Water Level at 11.90 ft bls**

LATITUDE: **35 25 48.78**
LONGITUDE: **80 57 13.94**
TOP OF CASING ELEVATION: **698.62**
DATUM: **MSL**
LOGGED BY: **Julie Petersen**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **4¼" H.S.A.**
DATE DRILLED: **4/4/07**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)
SOIL/SAPROLITE (M1): Brown, Fine Sandy, Clayey, **SILT**		0		0.00		695.34
SOIL/SAPROLITE (M1): Red, Medium to Fine Sandy, Silty, **CLAY**		5		4.50		690.84
				6.00		689.34
WEATHERED ROCK (M2): **QUARTZ DIORITE** Rock Lense						
SOIL/SAPROLITE (M1): Yellowish-Red, Micaceous, Slightly Clayey, Silty, Medium to Fine **SAND**		10				
SOIL/SAPROLITE (M1): Tannish-Gray, Medium to Fine **SAND** With Mica (Granitic)		15				
WEATHERED ROCK (M2): When Sampled Becomes Tannish-Gray and White, Silty, Medium to Fine **SAND** (Granitic)		20		21.50		673.84
				22.00		673.34



WELL CONSTRUCTION DETAILS

PROTECTIVE CASING
Diameter: **4" X 4"**
Type: **Lockable Steel**
Interval: **Above Grade**

RISER CASING
Diameter: **2"**
Type: **Sch. 40 PVC**
Interval: **0 to 7 ft bls**

GROUT
Type: **Neat Cement**
Interval: **0 to 4.5 ft bls**

SEAL
Type: **Bentonite**
Interval: **4.5 to 6 ft bls**

FILTERPACK
Type: **#1 Filter Sand**
Interval: **6 to 22 ft bls**

SCREEN
Diameter: **2"**
Type: **0.010 Slotted Sch. 40 PVC**
Interval: **7 to 22 ft bls**

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

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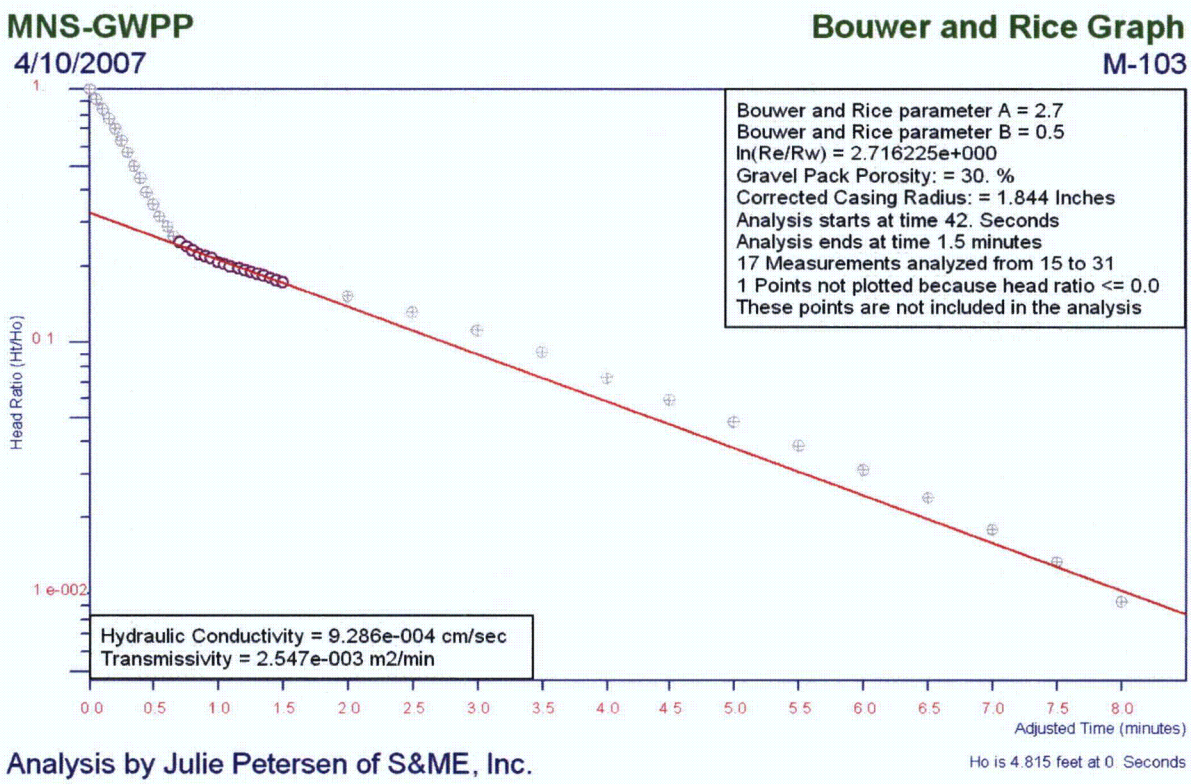
COMPLETION REPORT OF WELL No. M-103

Calculation of Permeability By The Rising Head Method (Slug Test)

Site Name:	MNS-GWPP
Test Date:	4/10/2007
Well Label:	M-103
Aquifer Thickness:	15. feet
Screen Length:	15. feet
Casing Radius:	1. Inches
Effective Radius:	3. Inches
Gravel Pack Porosity:	30.00%
Corrected Casing Radius:	1.844 Inches
Static Water Level:	12. feet
Water Table to Screen Bottom:	10. feet
Anisotropy Ratio:	1

Time Adjustment: 0. Seconds
Test starts with trial 0
There are 45 time and drawdown measurements
Maximum head is 4.815 feet
Minimum head is 0. feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

PERMEABILITY

9.29E-04 cm/sec

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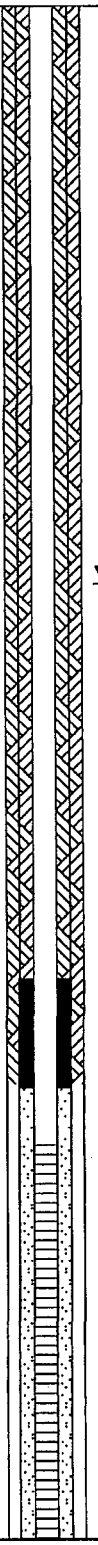
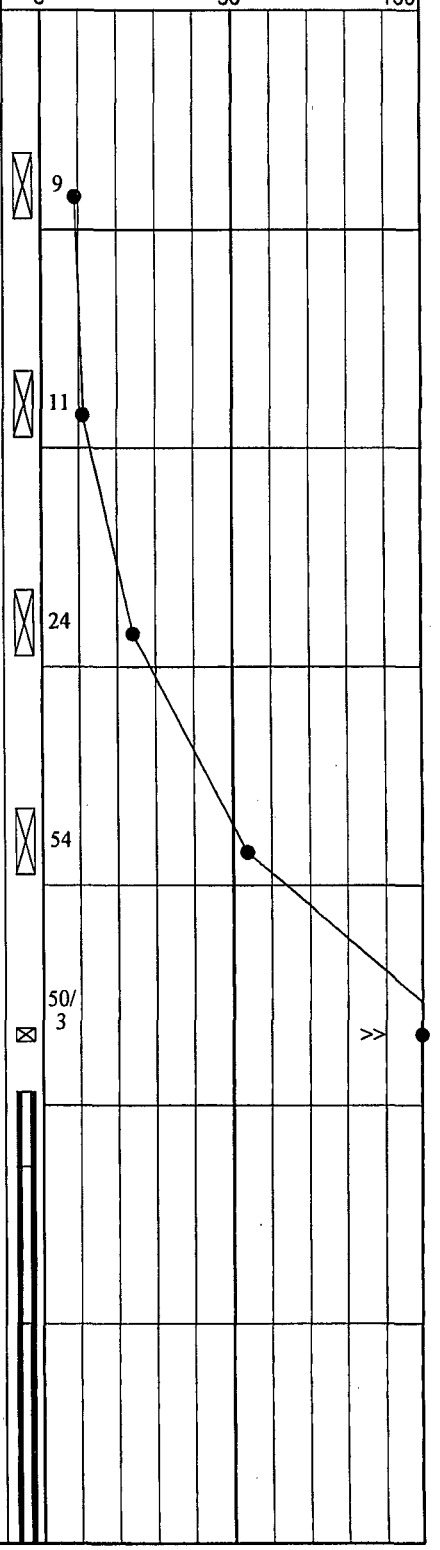
Project: **MNS - Groundwater Protection Project**			**Boring No. M-103R**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 1 of 2
Boring Depth (ft): **45.0**	Elevation (ft): **696.0**	Driller: **Jay Little, NC Cert No. 2717**	Date Drilled: **3/29/07**
Logged By: **Julie Petersen**	Water Level: **Stabilized Water Level at 13.20 ft bls**		Drilling Method: **4¼" H.S.A.**

Elev. (Feet)	Depth (Feet)	Lithology	Material Description
695			SOIL/SAPROLITE (M1): Brown, Fine Sandy, Clayey, **SILT**
			SOIL/SAPROLITE (M1): Red, Medium to Fine Sandy, Silty, **CLAY**
	5		
690			
			WEATHERED ROCK (M2): **QUARTZ DIORITE** Rock Lense
			SOIL/SAPROLITE (M1): Yellowish-Red, Micaceous, Slightly Clayey, Silty, Medium to Fine **SAND**
	10		
685			
			SOIL/SAPROLITE (M1): Tannish-Gray, Medium to Fine **SAND** With Mica (Granitic)
	15		
680			
	20		
675			WEATHERED ROCK (M2): When Sampled Becomes Tannish-Gray and White, Silty, Medium to Fine **SAND** (Granitic)
			Auger Refusal at 24.70 ft bls
	25		PARTIALLY WEATHERED/FRACTURED ROCK (WF): Medium-Grained **GRANITE**, Moderate to Intense Weathering
670			SOUND ROCK (D): Fine-Grained **QUARTZ DIORITE**, Unfractured
			SOUND ROCK (D): Fine-Grained **GRANITE**, Slightly Fractured
	30		SOUND ROCK (D): Fine-Grained **QUARTZ DIORITE**, Slightly Fractured
665			SOUND ROCK (D): Fine-Grained **GRANITE**, Slightly Fractured

Well Construction



Penetration Resistance (Blows/Foot)



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Project: **MNS - Groundwater Protection Project**			**Boring No. M-103R**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 2 of 2
Boring Depth (ft): **45.0**	Elevation (ft): **696.0**	Driller: **Jay Little, NC Cert No. 2717**	Date Drilled: **3/29/07**
Logged By: **Julie Petersen**	Water Level: **Stabilized Water Level at 13.20 ft bls**		Drilling Method: **4¼" H.S.A.**

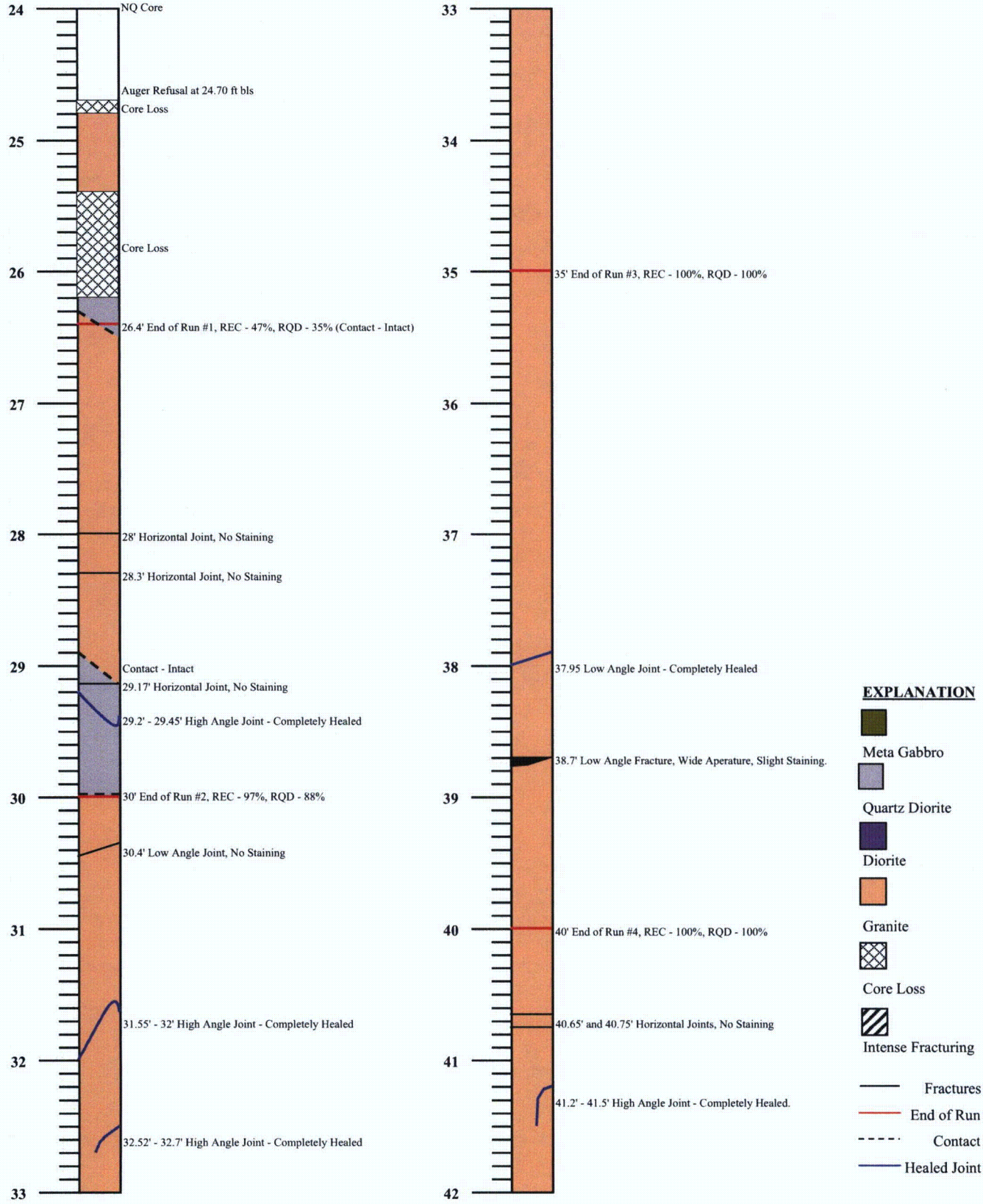
Elev. (Feet)	Depth (Feet)	Lith-ology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
660					
	40				
655					
	45		**Boring Terminated at 45 ft bls**		

FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-103R

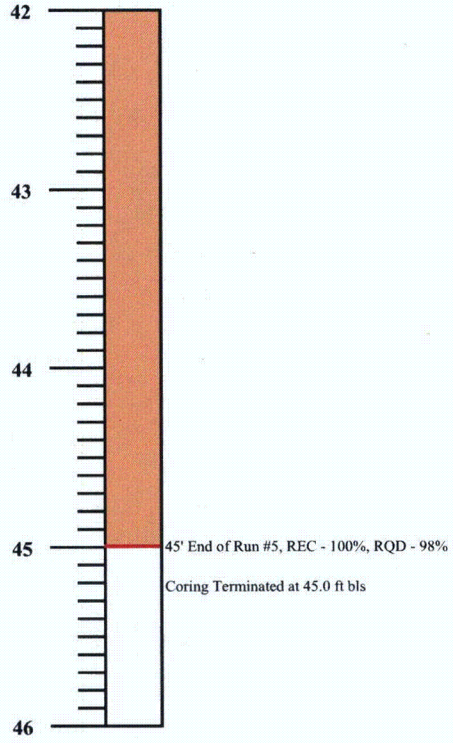


FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-103R



EXPLANATION

Meta Gabbro

Quartz Diorite

Diorite

Granite

Core Loss

Intense Fracturing

Fractures

End of Run

Contact

Healed Joint

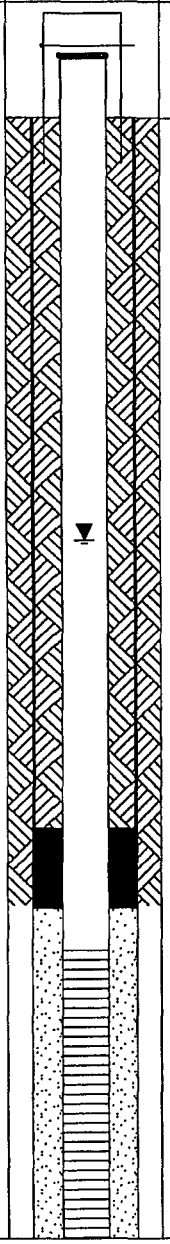
COMPLETION REPORT OF WELL No. M-103R

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

WATER LEVEL: **Stabilized Water Level at 13.20 ft bls**
LATITUDE: **35 25 48.82**
LONGITUDE: **80 57 13.66**
TOP OF CASING ELEVATION: **699.13**
DATUM: **MSL**
LOGGED BY: **Julie Petersen**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **4¼" H.S.A.**
DATE DRILLED: **3/29/07**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)
				0.00		696.00
SOIL/SAPROLITE (M1): Brown, Fine Sandy, Clayey, **SILT**		0				
SOIL/SAPROLITE (M1): Red, Medium to Fine Sandy, Silty, **CLAY**		5				
WEATHERED ROCK (M2): **QUARTZ DIORITE** Rock Lense						
SOIL/SAPROLITE (M1): Yellowish-Red, Micaceous, Slightly Clayey, Silty, Medium to Fine **SAND**		10				
SOIL/SAPROLITE (M1): Tannish-Gray, Medium to Fine **SAND** With Mica (Granitic)		15				
WEATHERED ROCK (M2): When Sampled Becomes Tannish-Gray and White, Silty, Medium to Fine **SAND** (Granitic)		20		24.60		671.40
PARTIALLY WEATHERED/FRACTURED ROCK (WF): Medium-Grained **GRANITE**, Moderate to Intense Weathering		25		24.70		671.30
SOUND ROCK (D): Fine-Grained **QUARTZ DIORITE**, Unfractured		30				
SOUND ROCK (D): Fine-Grained **GRANITE**, Slightly						



WELL CONSTRUCTION DETAILS

PROTECTIVE CASING
Diameter: **6" X 6"**
Type: **Lockable Steel**
Interval: **Above Grade**

RISER CASING
Diameter: **4" and 2"**
Type: **Sch. 40 PVC**
Interval: **4": 0 to 24.60 ft bls 2": 0 to 26 ft bls**

GROUT
Type: **Neat Cement**
Interval: **0 to 22.2 ft bls**

SEAL
Type: **Bentonite**
Interval: **22.2 to 24.7 ft bls**

FILTERPACK
Type: **#2 Filter Sand**
Interval: **24.7 to 37 ft bls**

SCREEN
Diameter: **2"**
Type: **0.010 Slotted Sch. 40 PVC**
Interval: **26 to 36 ft bls**

LEGEND

FILTER PACK	TOC	TOP OF CASING
BENTONITE	GS	GROUND SURFACE
CEMENT GROUT	BS	BENTONITE SEAL
CUTTINGS / BACKFILL	FP	FILTER PACK
STATIC WATER LEVEL	TSC	TOP OF SCREEN
	BSC	BOTTOM OF SCREEN
	TD	TOTAL DEPTH
	CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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COMPLETION REPORT OF WELL No. M-103R

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

GROUND SURFACE ELEVATION:
LOGGED BY: **696.0**
CHECKED BY: **Julie Petersen**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
							(See Page 1)
Fractured SOUND ROCK (D): Fine-Grained **QUARTZ DIORITE**, Slightly Fractured		35		35.50		660.50	
				36.00		660.00	
				37.00		659.00	
SOUND ROCK (D): Fine-Grained **GRANITE**, Slightly Fractured *(continued)*		40					
		45		45.00		651.00	

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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COMPLETION REPORT OF WELL No. M-103R

SPLIT SPOON SAMPLE PICTURES

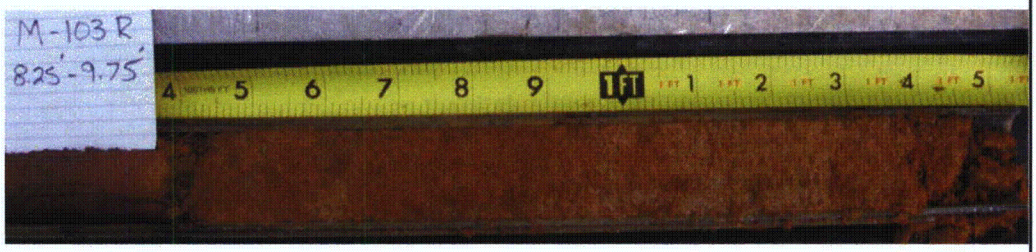
McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Boring Number: M-103R

Sample No: 1
Depth (ft-bls): 3.25 -4.75
Blow Count: 3 * 4 * 5

Sample No: 2
Depth (ft-bls): 8.25 - 9.75
Blow Count: 4 * 5 * 6



Sample No: 3
Depth (ft-bls): 13.25 - 14.75
Blow Count: 8 * 15 * 9

Sample No: 4
Depth (ft-bls): 18.25 - 19.75
Blow Count: 14 * 10 * 44

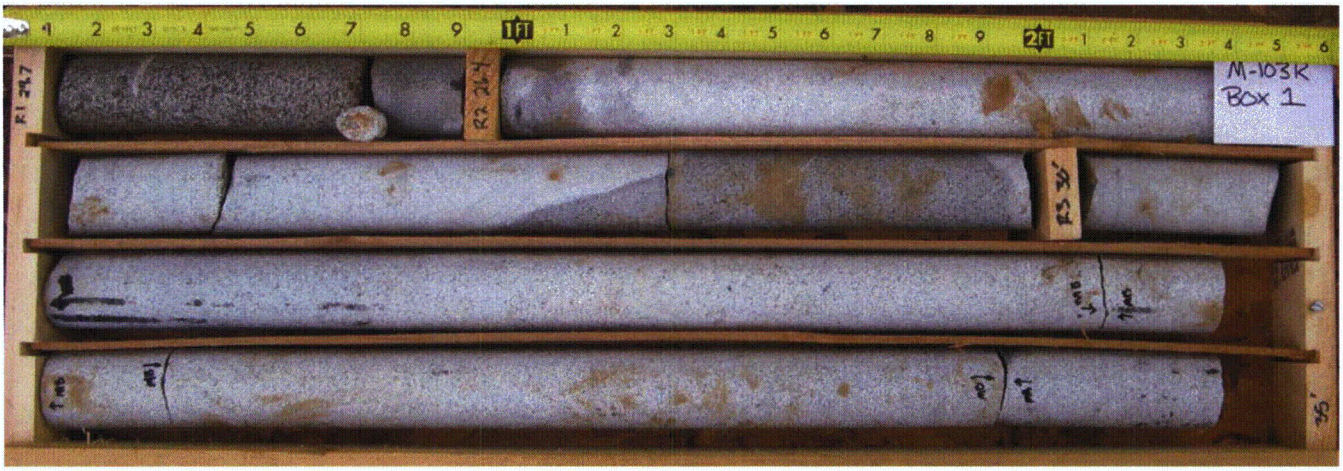
Sample No: 5
Depth (ft-bls): 23.25 - 24.75
Blow Count: 50/3

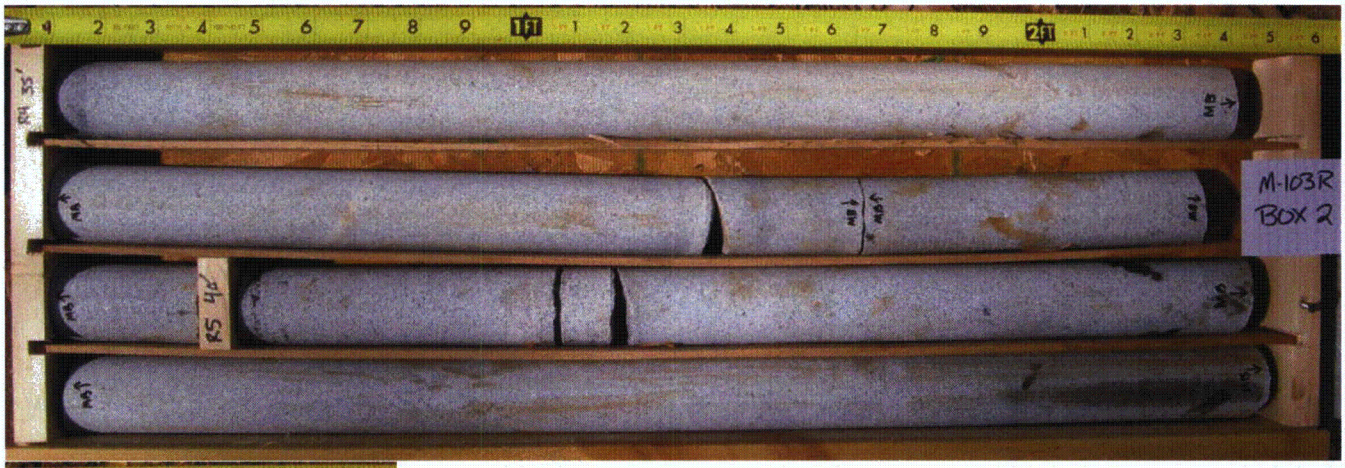
ROCK CORE PICTURES

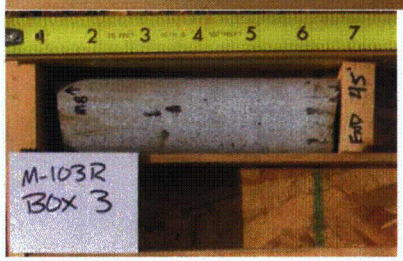
McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-103R







CLASSIFICATION:

24.7' - 26.2' Medium Grained Granite

26.2' - 26.4' Fine Grained Quartz Diorite

26.4' - 29' Fine Grained Granite

29' - 30' Fine Grained Quartz Diorite

30' - 45' Fine Grained Granite

CALCULATION OF PERMEABILITY BY THE FALLING HEAD METHOD
(Open Hole in Uniform Material)

S&ME

Site Name:	MNS - GWPP		
Date:	4/3/2007		
Boring I.D.	M-103R		
Test Interval:	24.7 to 30	(Sound Rock)	
Total Depth of Hole:	30 ft		914.63 cm
Length of Open Hole:	5.03 ft		153.35 cm
Transformation Ratio m=	1		
Performed by:	Julie Petersen		

Time (sec)	Head (cm)	Permeability (cm/sec)
0	934.79	
60	930.00	1.50E-05
120	925.37	1.46E-05
180	920.88	1.42E-05
240	916.59	1.36E-05
300	912.29	1.37E-05
360	907.29	1.60E-05
420	902.35	1.59E-05
480	897.50	1.57E-05
540	892.99	1.47E-05
600	888.69	1.41E-05
900	869.54	1.27E-05
1200	852.84	1.13E-05
1500	837.87	1.03E-05
1800	824.27	9.54E-06
2400	799.91	8.74E-06
3000	779.79	7.43E-06
3600	763.45	6.17E-06

Calculations

$$K_h = \frac{d^2 \cdot \ln\left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \cdot \ln\frac{H_1}{H_2}$$

for $\frac{mL}{D} > 4$

Where:

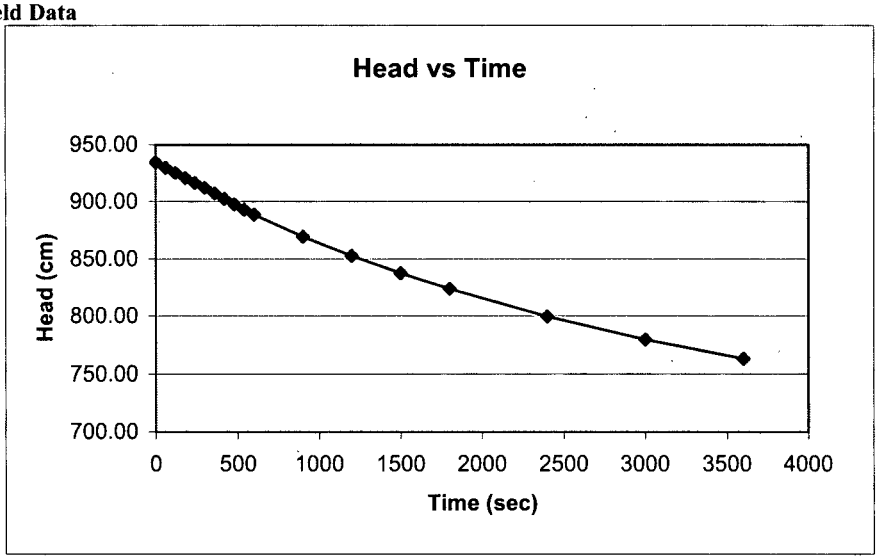
K_h	is the Horizontal Coefficient of Permeability (cm/sec)
H_1	is the Piezometric Head for time; $t = t_1$ (cm)
H_2	is the Piezometric Head for time; $t = t_2$ (cm)
D	is the Diameter of the Standpipe (cm)
d	is the diameter of the Open Length (cm),
m	is the Transformation Ratio, Where
	$m = \sqrt{K_h / K_v}$ — K_h is the Horizontal Permeability; K_v is the Vertical Permeability
L	is the Open Length of Hole (cm)

Spreadsheet assumes 3" ID Pipe; NQ Hole, OD = 3"

MEAN PERMEABILITY (cm/sec)

1.26E-05

Graph of Field Data



CALCULATION OF PERMEABILITY BY THE FALLING HEAD METHOD
(Open Hole in Uniform Material)

S&ME

Site Name:	MNS - GWPP		
Date:	4/3/2007		
Boring I.D.	M-103R		
Test Interval:	24.7 to 35	(Sound Rock)	
Total Depth of Hole:	35 ft bls		1067.07 cm
Length of Open Hole:	10.03 ft		305.79 cm
Transformation Ratio m=	1		
Performed by:	Julie Petersen		

Time (sec)	Head (cm)	Permeability (cm/sec)
0	1038.02	
60	1031.68	1.06E-05
120	1025.98	9.61E-06
180	1020.30	9.61E-06
240	1014.91	9.20E-06
300	1009.76	8.83E-06
360	1004.63	8.82E-06
420	999.79	8.39E-06
480	994.94	8.43E-06
540	990.18	8.31E-06
600	985.64	7.98E-06
900	964.54	7.51E-06
1200	945.95	6.76E-06
1500	929.24	6.18E-06
1800	914.09	5.70E-06
2400	888.51	4.92E-06
3000	866.95	4.26E-06
3600	847.80	3.87E-06

Calculations

$$K_h = \frac{d^2 \cdot \ln\left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \cdot \ln\frac{H_1}{H_2}$$

for $\frac{mL}{D} > 4$

Where:

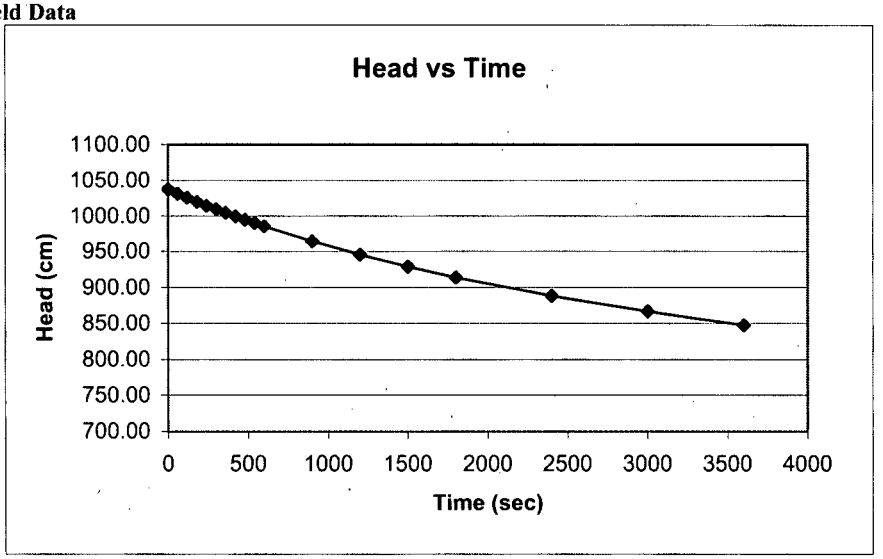
K_h	is the Horizontal Coefficient of Permeability (cm/sec)
H_1	is the Piezometric Head for time; $t = t_1$ (cm)
H_2	is the Piezometric Head for time; $t = t_2$ (cm)
D	is the Diameter of the Standpipe (cm)
d	is the diameter of the Open Length (cm),
m	is the Transformation Ratio, Where
	$m = \sqrt{K_h / K_v}$ — K_h is the Horizontal Permeability; K_v is the Vertical Permeability
L	is the Open Length of Hole (cm)

Spreadsheet assumes 3" ID Pipe; NQ Hole, OD = 3"

MEAN PERMEABILITY (cm/sec)

7.59E-06

Graph of Field Data

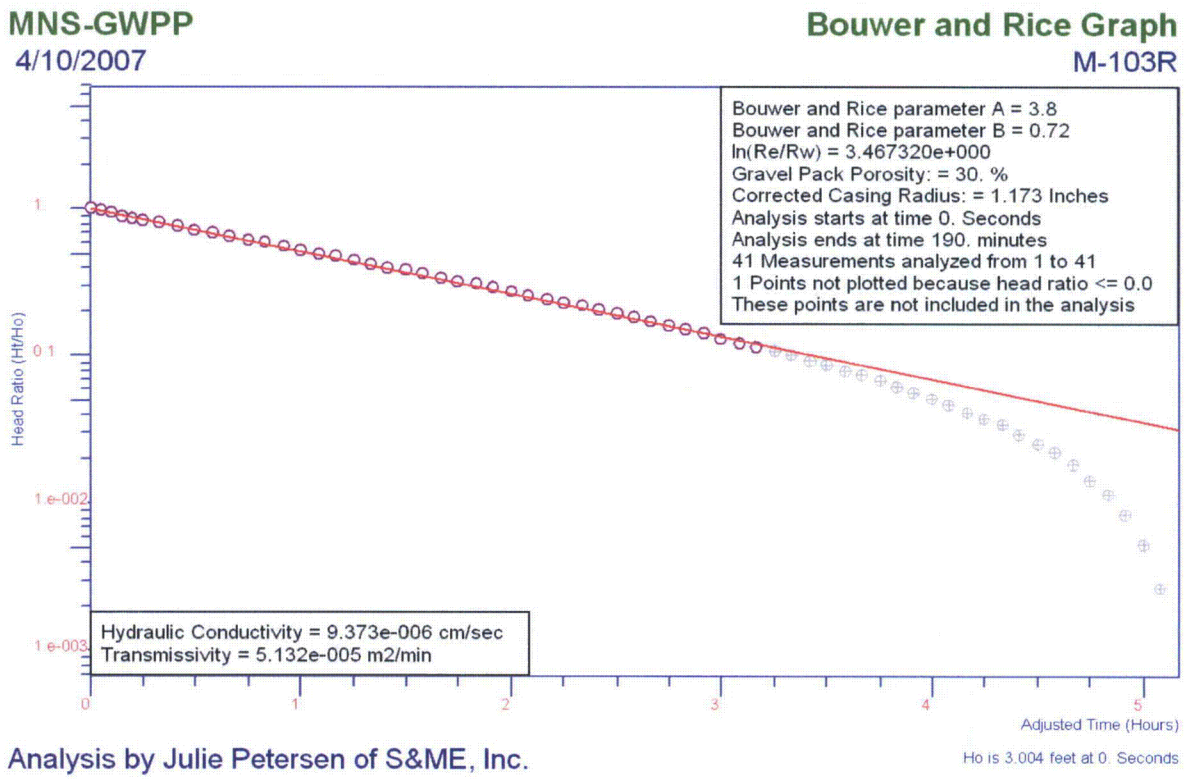


Calculation of Permeability By The Rising Head Method (Slug Test)

Site Name:	MNS-GWPP
Test Date:	4/10/2007
Well Label:	M-103R
Aquifer Thickness:	29.94 feet
Screen Length:	10. feet
Casing Radius:	1. Inches
Effective Radius:	3. Inches
Gravel Pack Porosity:	30.00%
Corrected Casing Radius:	1.844 Inches
Static Water Level:	11.06 feet
Water Table to Screen Bottom:	24.94 feet
Anisotropy Ratio:	1

Time Adjustment: 0. Seconds
Test starts with trial 0
There are 65 time and drawdown measurements
Maximum head is 3.004 feet
Minimum head is 0. feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

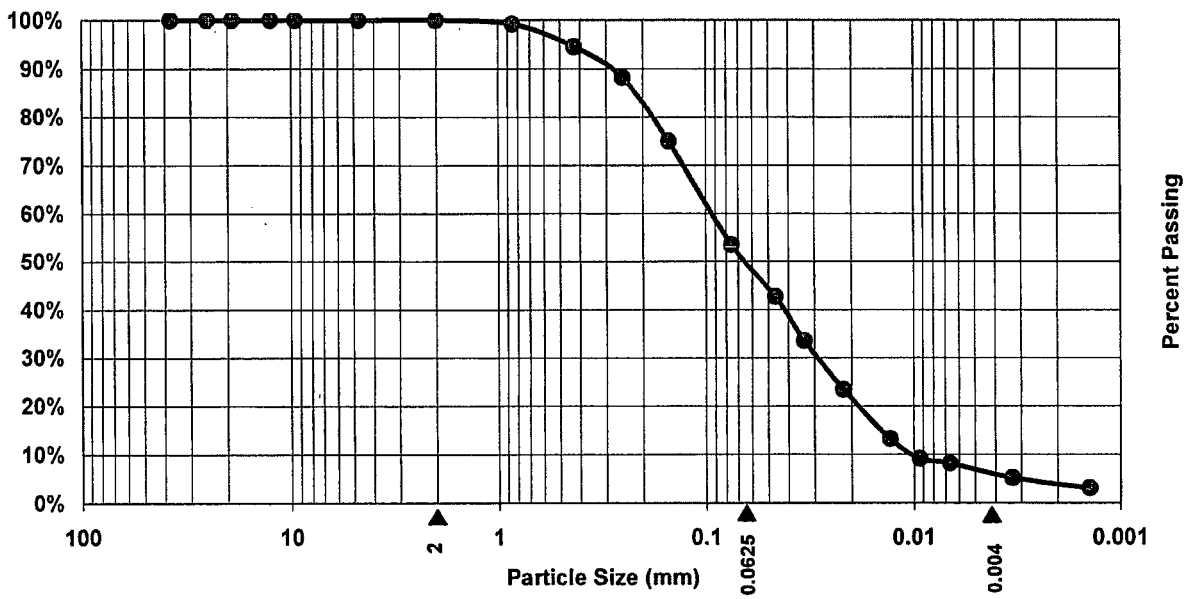
PERMEABILITY

9.37E-06 cm/sec

PARTICLE SIZE ANALYSIS OF SOILS
FOR USE IN FETTER AND BEAR DIAGRAMS

Boring No.:	Sample No.:	Depth:
M-103R	SS-4	18.25 to 19.75 ft bls

Sample Description:
Tannish-Gray, Fine to Medium Sand With Mica



	> 2 mm	2 mm - 0.0625 mm	0.0625 mm - 0.004 mm	<0.004 mm
From Graph:	% Gravel 0.0%	% Sand 50.2%	% Silt 44.0%	% Clay 5.7%
Adjusted for Calculations	**0%**	**50%**	**44%**	**6%**

Notes:
Grain size distribution taken from grain size with hydrometer data located in Appendix II.
Gravel, sand, silt and clay sizes based on Wentworth Scale.

S&ME Project:
McGuire Nuclear Station - GWPP

S&ME Project No.:
1264-06-724

S&ME

FETTER AND BEAR DIAGRAMS

S&ME PROJECT: McGuire Nuclear Station - GWPP
S&ME PROJECT NO.: 1264-06-724

Boring No. M-103R

Boring Depth: 18.25 to 19.75 ft bls

% Sand: 50%

% Silt: 44%

% Clay: 6%

Estimated Specific Yield: 20%

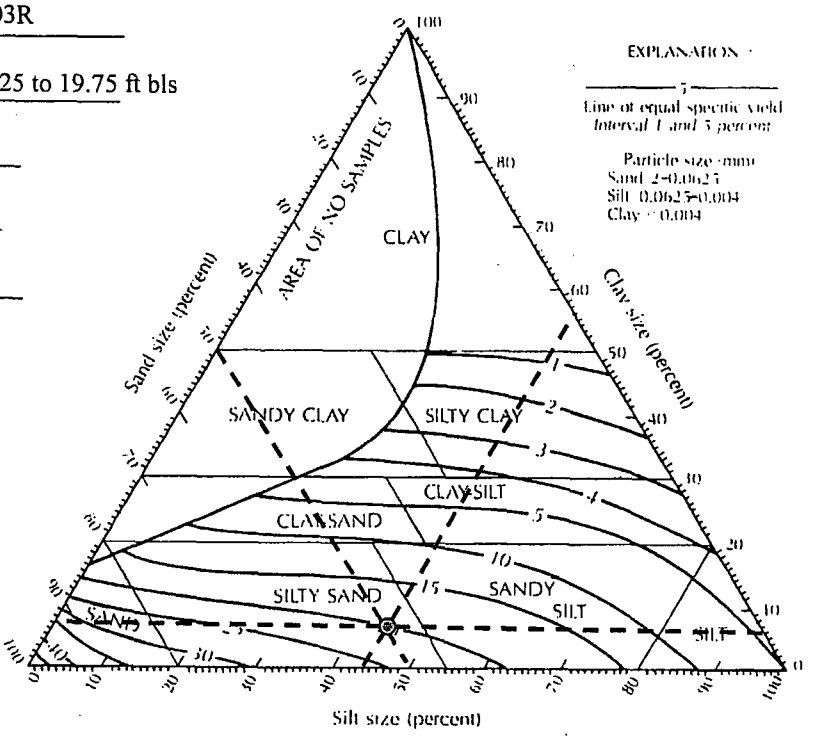
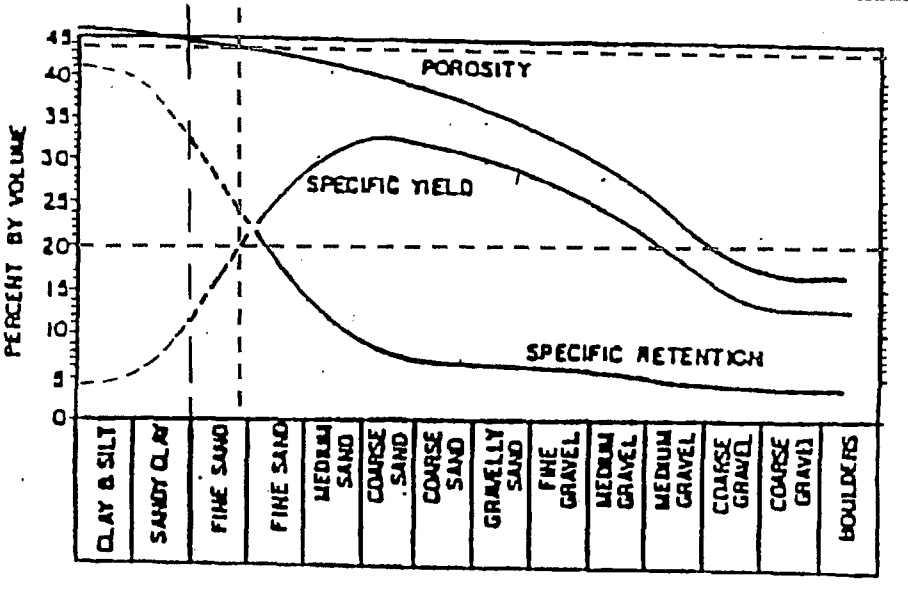


FIGURE 4.11 Textural classification triangle for unconsolidated materials showing the relation between particle size and specific yield. Source: A. I. Johnson, U.S. Geological Survey Water-Supply Paper 1662-D, 1967.



Estimated Porosity: 43.5%

Variation of Porosity, Specific Yield, and Specific Retention with Grain Size (after Bear, 1972)

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Charlotte, North Carolina
Telephone: 704-523-4726
Fax: 704-525-3953

1. BORING AND SAMPLING IS IN ACCORDANCE WITH ASTM D-1586.
2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-104R**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 1 of 2
Boring Depth (ft): **60.0**	Elevation (ft): **714.6**	Driller: **Justin Millwood, NC Cert. No. 3439**	Date Drilled: **3/26/07**
Logged By: **Courtney Withers**	Water Level: **Stabilized Water Level at 37.45 ft bls**		Drilling Method: **Mud Rotary**

Elev. (Feet)	Depth (Feet)	Lithology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
710	5		SOIL/SAPROLITE (M1): Red, Micaceous, Medium to Fine Sandy, Silty, **CLAY**		12
705	10		SOIL/SAPROLITE (M1): White and Green, Micaceous, Silty, Medium to Fine **SAND** With Iron Staining (Granitic)		15
700	15		SOIL/SAPROLITE (M1): White and Tan, Micaceous, Silty, Medium to Fine **SAND** With Manganese Staining (Granitic)		17
695	20				12
690	25				13
685	30				18
680					21

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2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-104R**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 2 of 2
Boring Depth (ft): **60.0**	Elevation (ft): **714.6**	Driller: **Justin Millwood, NC Cert. No. 3439**	Date Drilled: **3/26/07**
Logged By: **Courtney Withers**	Water Level: **Stabilized Water Level at 37.45 ft bls**		Drilling Method: **Mud Rotary**

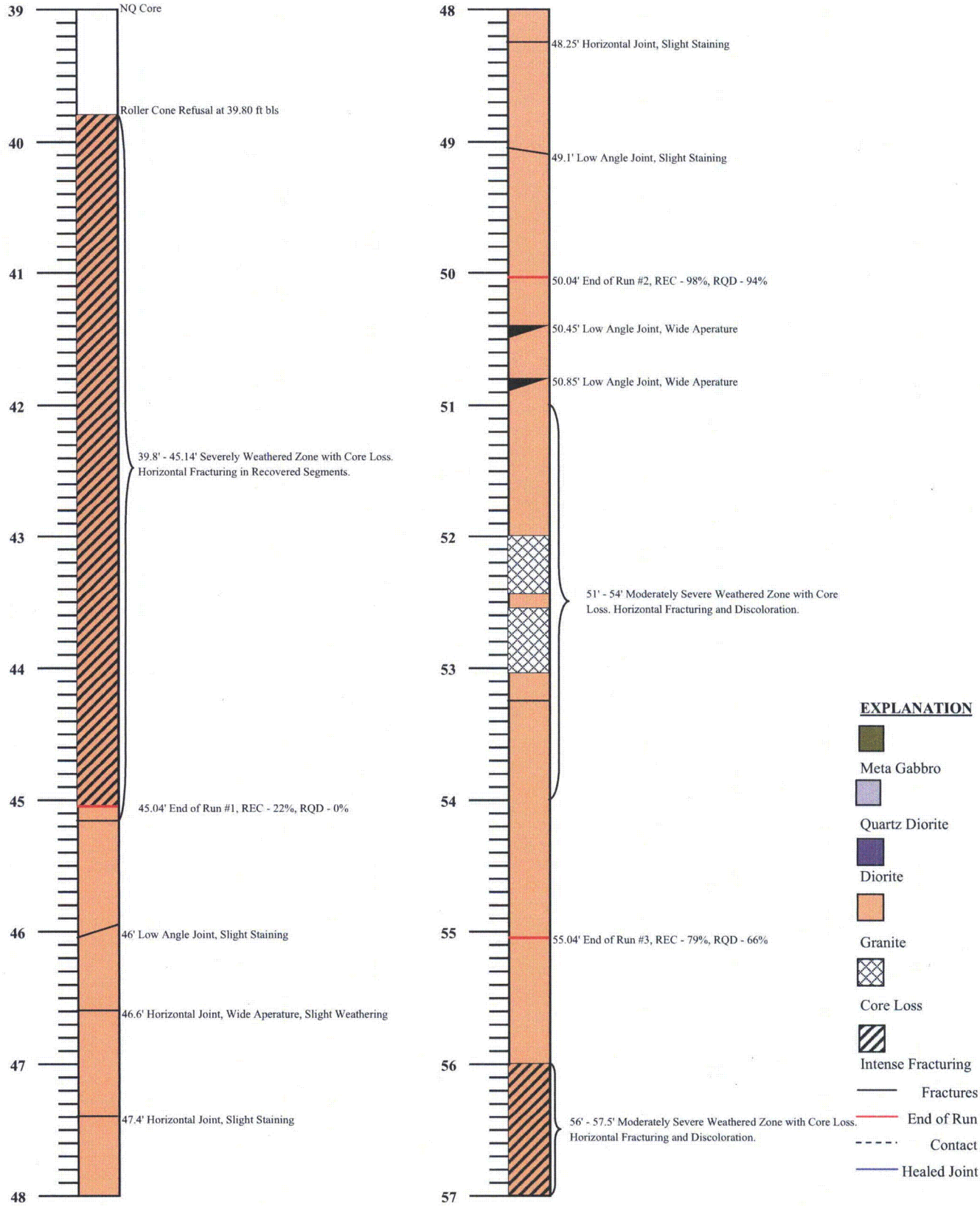
Elev. (Feet)	Depth (Feet)	Lithology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
					50/4
675	40		WEATHERED ROCK (M2): When Sampled Becomes White and Tan, Micaceous, Silty, Medium to Fine SAND With Manganese Staining (Granitic) **Roller Cone Refusal at 39.8 ft bls**		>>
670	45		PARTIALLY WEATHERED/FRACTURED ROCK (WF): Coarse-Grained **GRANITE**, Intensely Fractured and Severely Weathered		
665	50		SOUND ROCK (D): Coarse-Grained **GRANITE**, Moderately Fractured		
660	55		PARTIALLY WEATHERED/FRACTURED ROCK (WF): Coarse-Grained **GRANITE**, Intensely Fractured		
			SOUND ROCK (D): Coarse-Grained **GRANITE**, Slightly Fractured		
655	60		PARTIALLY WEATHERED/FRACTURED ROCK (WF): Coarse-Grained **GRANITE**, Intensely Fractured with Moderately Severe Weathering		
			SOUND ROCK (D): Coarse-Grained **GRANITE**, Slightly Fractured		
			Boring Terminated at 60.04 ft bls		

FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-104R

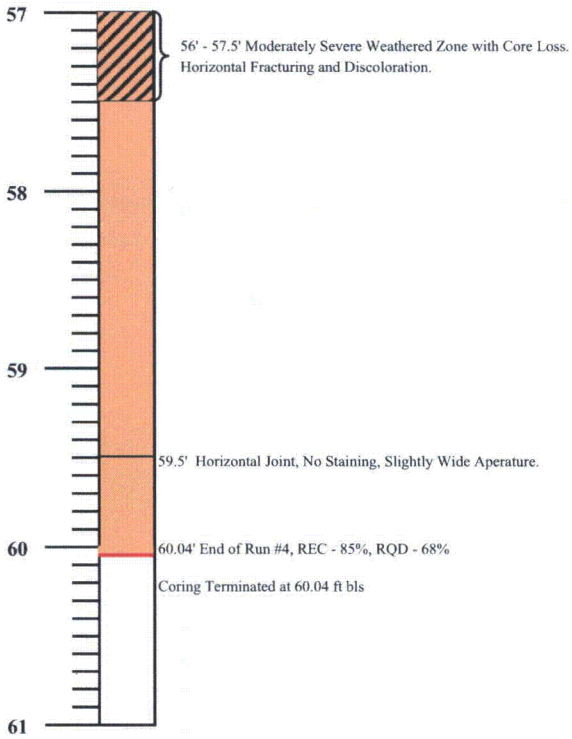


FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-104R



EXPLANATION

- Meta Gabbro
- Quartz Diorite
- Diorite
- Granite
- Core Loss
- Intense Fracturing
- Fractures
- End of Run
- Contact
- Healed Joint

COMPLETION REPORT OF WELL No. M-104R

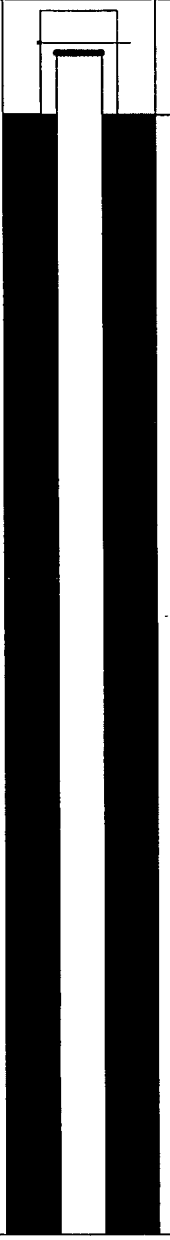
PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

WATER LEVEL: **Stabilized Water Level at 37.45 ft bls**

LATITUDE: **35 25 52.35**
LONGITUDE: **80 57 15.47**
TOP OF CASING ELEVATION: **717.58**
DATUM: **MSL**
LOGGED BY: **Courtney Withers**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **Mud Rotary**
DATE DRILLED: **3/26/07**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)
				0.00		714.56
SOIL/SAPROLITE (M1): Red, Micaceous, Medium to Fine Sandy, Silty, **CLAY**		0				
		5				
SOIL/SAPROLITE (M1): White and Green, Micaceous, Silty, Medium to Fine **SAND** With Iron Staining (Granitic)		10				
SOIL/SAPROLITE (M1): White and Tan, Micaceous, Silty, Medium to Fine **SAND** With Manganese Staining (Granitic)		15				
		20				
		25				
		30				



WELL CONSTRUCTION DETAILS

PROTECTIVE CASING
Diameter: **4" X 4"**
Type: **Lockable Steel**
Interval: **Above Grade**

RISER CASING
Diameter: **2"**
Type: **Sch. 40 PVC**
Interval: **0 to 42 ft bls**

GROUT
Type: **N/A**
Interval: **N/A**

SEAL
Type: **Bentonite**
Interval: **0 to 41 ft bls**

FILTERPACK
Type: **#2 Filter Sand**
Interval: **41 to 47 ft bls**

SCREEN
Diameter: **2"**
Type: **0.010 Slotted Sch. 40 PVC**
Interval: **42 to 47 ft bls**

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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COMPLETION REPORT OF WELL No. M-104R

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

GROUND SURFACE ELEVATION: **714.6**
LOGGED BY: **Courtney Wither**
CHECKED BY:

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
							(See Page 1)
		35					
WEATHERED ROCK (M2): When Sampled Becomes White and Tan, Micaceous, Silty, Medium to Fine **SAND** With Manganese Staining (Granitic)		40		41.00		673.56	
PARTIALLY WEATHERED/FRACTURED ROCK (WF): Coarse-Grained **GRANITE**, Intensely Fractured and Severely Weathered		45		46.50 47.00		668.06 667.56	
SOUND ROCK (D): Coarse-Grained **GRANITE**, Moderately Fractured		50					
PARTIALLY WEATHERED/FRACTURED ROCK (WF): Coarse-Grained **GRANITE**, Intensely Fractured		55					
SOUND ROCK (D): Coarse-Grained **GRANITE**, Slightly Fractured							
PARTIALLY WEATHERED/FRACTURED ROCK (WF): Coarse-Grained **GRANITE**, Intensely Fractured with Moderately Severe Weathering		60					
SOUND ROCK (D): Coarse-Grained **GRANITE**, Slightly Fractured							

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

S&ME
ENGINEERING • TESTING
ENVIRONMENTAL SERVICES

9751 Southern Pine Blvd.
Charlotte, North Carolina

COMPLETION REPORT OF WELL No. M-104R

SPLIT SPOON SAMPLE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

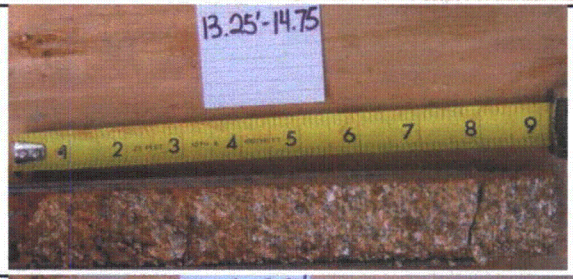
S&ME Project No: 1264-06-724

Boring Number: M-104R

Sample No: 1
Depth (ft-bls): 3.25 - 4.75
Blow Count: 3 * 5 * 7

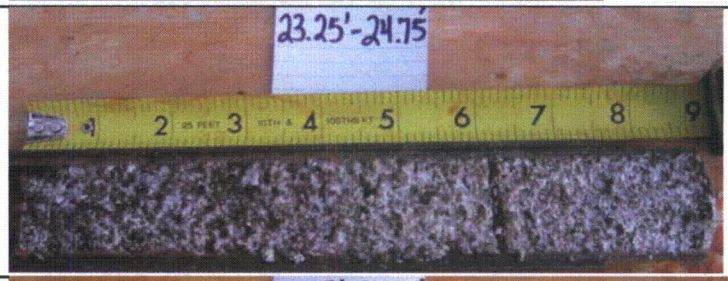
Sample No: 2
Depth (ft-bls): 8.25 - 9.75
Blow Count: 4 * 6 * 9

Sample No: 3
Depth (ft-bls): 13.25 - 14.75
Blow Count: 5 * 7 * 10

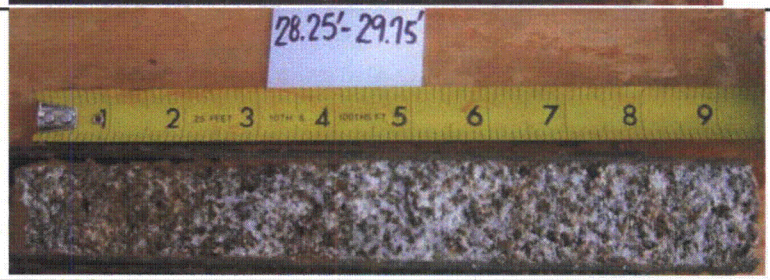


Sample No: 4
Depth (ft-bls): 18.25 - 19.75
Blow Count: 4 * 5 * 7

Sample No: 5
Depth (ft-bls): 23.25 - 24.75
Blow Count: 5 * 5 * 8



Sample No: 6
Depth (ft-bls): 28.25 - 29.75
Blow Count: 5 * 7 * 11

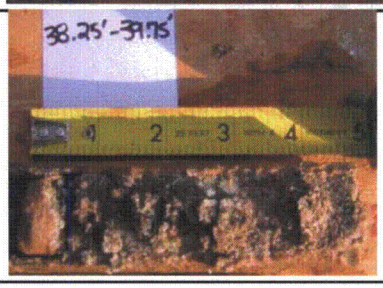


SPLIT SPOON SAMPLE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Boring Number: M-104R

Sample No: 7 **Depth (ft-bls):** 33.25 - 34.75 **Blow Count:** 8 * 9 * 12	
Sample No: 8 **Depth (ft-bls):** 38.25 - 39.75 **Blow Count:** 50/4	

ROCK CORE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-104R

CLASSIFICATION:

39.8' to 60.04' Coarse Grained Granite

CALCULATION OF PERMEABILITY BY THE FALLING HEAD METHOD
(Open Hole in Uniform Material)

S&ME

Site Name:	MNS - GWPP	
Date:	3/28/2007	
Boring I.D.	M-104R	(Partially Weathered/Fractured Rock)
Test Interval:	39.8 to 45.04	
Total Depth of Hole:	45.04 ft bls	1373.17 cm
Length of Open Hole:	5.24 ft	159.76 cm
Transformation Ratio m=	1	
Performed by:	Courtney Withers	

Time (sec)	Head (cm)	Permeability (cm/sec)
0	1376.92	
60	1359.85	3.53E-05
120	1344.05	3.31E-05
180	1328.63	3.26E-05
240	1313.63	3.21E-05
300	1299.05	3.16E-05
360	1284.76	3.13E-05
420	1270.76	3.10E-05
480	1257.01	3.08E-05
540	1243.54	3.05E-05
600	1230.27	3.03E-05
900	1167.38	2.97E-05
1200	1110.55	2.82E-05
1500	1059.18	2.68E-05
1800	1011.68	2.60E-05
2400	926.37	2.49E-05
3000	851.49	2.38E-05
3600	784.60	2.31E-05

Calculations

$$K_h = \frac{d^2 \cdot \ln\left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \cdot \ln\frac{H_1}{H_2}$$

for $\frac{mL}{D} > 4$

Where:

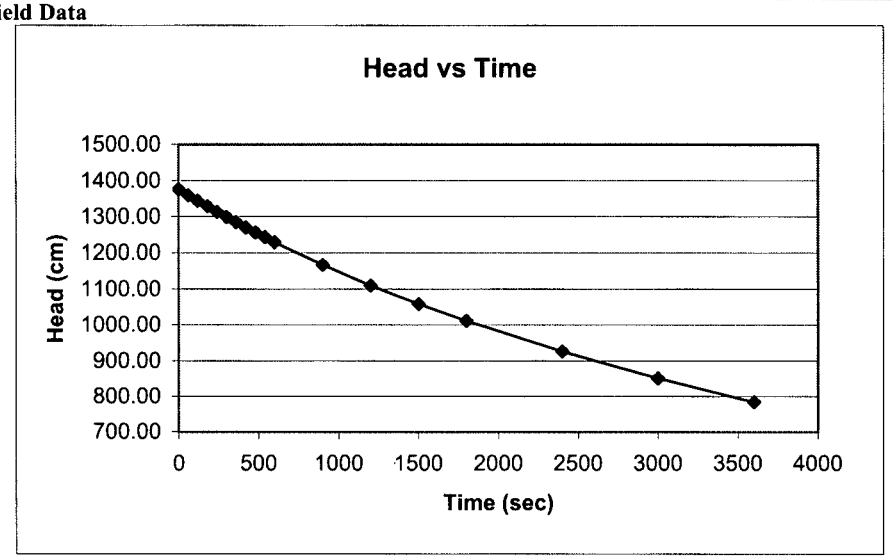
K_h	is the Horizontal Coefficient of Permeability (cm/sec)
H_1	is the Piezometric Head for time; $t = t_1$ (cm)
H_2	is the Piezometric Head for time; $t = t_2$ (cm)
D	is the Diameter of the Standpipe (cm)
d	is the diameter of the Open Length (cm),
m	is the Transformation Ratio, Where $m = \sqrt{K_h / K_v}$ — K_h is the Horizontal Permeability, K_v is the Vertical Permeability
L	is the Open Length of Hole (cm)

Spreadsheet assumes 3" ID Pipe; NQ Hole, OD = 3"

MEAN PERMEABILITY (cm/sec)

2.95E-05

Graph of Field Data



CALCULATION OF PERMEABILITY BY THE FALLING HEAD METHOD
(Open Hole in Uniform Material)

S&ME

Site Name:	MNS - GWPP	
Date:	3/28/2007	
Boring I.D.	M-104R	
Test Interval:	39.8 to 50.04	(Sound Rock)
Total Depth of Hole:	50.04 ft bls	1525.6 cm
Length of Open Hole:	10.24 ft	312.2 cm
Transformation Ratio m=	1	
Performed by:	Courtney Withers	

Time (sec)	Head (cm)	Permeability (cm/sec)
0	702.16	
60	691.28	2.67E-05
120	680.06	2.79E-05
180	668.93	2.82E-05
240	657.90	2.84E-05
300	647.04	2.84E-05
360	636.10	2.91E-05
420	625.67	2.82E-05
480	615.18	2.89E-05
540	604.73	2.92E-05
600	594.48	2.92E-05
900	545.00	2.97E-05
1200	498.38	3.05E-05
1500	454.15	3.17E-05
1800	412.35	3.30E-05
2400	334.63	3.57E-05
3000	264.30	4.03E-05
3600		

Calculations

$$K_h = \frac{d^2 \cdot \ln\left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \cdot \ln\frac{H_1}{H_2}$$

for $\frac{mL}{D} > 4$

Where:

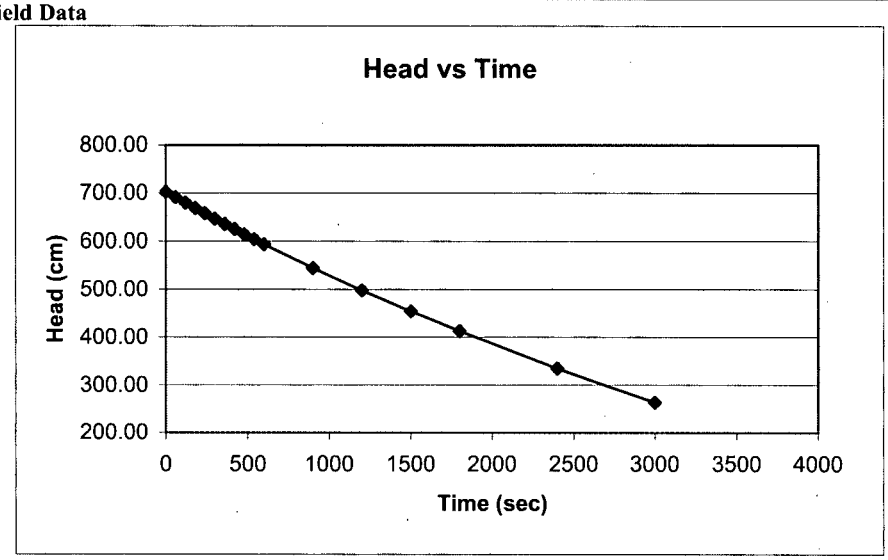
K_h	is the Horizontal Coefficient of Permeability (cm/sec)
H_1	is the Piezometric Head for time; $t = t_1$ (cm)
H_2	is the Piezometric Head for time; $t = t_2$ (cm)
D	is the Diameter of the Standpipe (cm)
d	is the diameter of the Open Length (cm),
m	is the Transformation Ratio, Where
	$m = \sqrt{K_h / K_v}$ — K_h is the Horizontal Permeability; K_v is the Vertical Permeability
L	is the Open Length of Hole (cm)

Spreadsheet assumes 3" ID Pipe; NQ Hole, OD = 3"

MEAN PERMEABILITY (cm/sec)

3.03E-05

Graph of Field Data



BOREHOLE PERMEABILITY TEST USING PACKERS
FIELD DATA SHEET

S&ME

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-104R
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	42.0 to 47.0 bgs
TEST DATE:	3/29/2007	**TEST INTERVAL:**	666.0 to 661.0 EL
TESTED BY:	Justin Milwood and Courtney Withers		
GROUND ELEV (ft MSL):	708.0 (Estimated)		

TEST METHOD: Double Packer Method using Multiple Pressure Tests
METHOD REFERENCE: Ground Water Manual, US Bureau of Reclamation, 1995, Chapter 10

TEST DATA (Enter data in underlined cells):

Rock Description of test interval:	Granite - Partially weathered and coarse grained. Intensely fractured with low angle to horizontal fractures.			
Source of test water and clarity:	Catawba River - Slightly Turbid			
Method of cleaning hole prior to testing:	Flushed			
Drilling Fluid (water or type of drilling mud)	Water			
Packer Brand and Model:				
Packer Inflation Pressure	160	psi		
Packer Length:	2.00	feet		
Method: Single (1) or double (2) packer (Enter 1 or 2):	2			
Interval below base of packer for Method 1 (single packer test), A_1:	-	feet		
Interval between packers for Method 2 (double packer test), A_2:	5.0	feet		
Depth of hole at time of test:	60.0	feet below ground surface (bgs)		
Diameter of borehole, d:	3.0	inches	0.3	feet
Radius of the borehole, r	0.13	feet		
Depth to water table (thickness of unsaturated material above water table, U):	37.4	feet		
Height above ground surface of pressure gauge:	4.0	feet ags		
Top of test section (bottom of upper packer), h_t:	42.0	feet bgs		
Bottom of test section (top of lower packer if double packer used, bottom of hole for a single packer, D):	47.0	feet bgs		
Is test section above or below water table?	below			
For tests below the water table determine h_1, the distance between the gauge and the water table:	41.4	feet		
Length of pipe over which head loss occurs (distance from gauge to outlet of pipe in test section):	48.5	feet		
Diameter and type of pipe used:	1.25-inch I.D.			

BOREHOLE PERMEABILITY TEST USING PACKERS
FIELD DATA SHEET

S&ME

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-104R				
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	42	to	47	bgs	
TEST DATE:	3/29/07	**TEST INTERVAL:**	666	to	661	EL	

Gauge Pressure (h_2) in psi	Elapsed Time (minutes)	Water Level (feet bgs)	Flow Rate (total flow in gal)	Flow Rate (gpm)
Step 1				
10	0		1291.00	
10	1		1297.20	6.20
10	2		1303.60	6.40
10	5		1320.40	5.60
10	10		1348.40	5.60
10	15		1374.80	5.28
10	20		1401.30	5.30
		Average	5.52	5.73
		Selected stabilized flow rate to be used in calculations		5.73
Step 2				
15	0		1407.50	
15	1		1415.20	7.70
15	2		1421.00	5.80
15	5		1441.50	6.83
15	10		1476.30	6.96
15	15		1510.60	6.86
15	20		1545.50	6.98
		Average	6.90	6.86
		Selected stabilized flow rate to be used in calculations		6.86
Step 3				
20	0		1552.00	
20	1		1560.40	8.40
20	2		1568.30	7.90
20	5		1594.20	8.63
20	10		1636.90	8.54
20	15		1678.70	8.36
20	20		1720.20	8.30
		Average	8.41	8.36
		Selected stabilized flow rate to be used in calculations		8.36
Step 4				
15	0		1724.00	
15	1		1731.50	7.50
15	3		1746.20	7.35
15	5		1760.70	7.25
		Average	7.34	7.37
		Selected stabilized flow rate to be used in calculations		7.37
Step 5				
10	0		1763.50	
10	1		1769.70	6.20
10	3		1782.50	6.40
10	5		1795.70	6.60
		Average	6.44	6.40
		Selected stabilized flow rate to be used in calculations		6.40

NOTES:

BOREHOLE PERMEABILITY TEST USING PACKERS CALCULATIONS

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-104R				
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	42.0	to	47.0	bgs	
TEST DATE:	3/29/2007	**TEST INTERVAL:**	666.0	to	661.0	EL	
TESTED BY:	Justin Milwood and Courtney Withers						
GROUND ELEV (ft MSL):	708.0						

TEST METHOD: Double Packer Method using Multiple Pressure Tests
METHOD REFERENCE: Ground Water Manual, US Bureau of Reclamation, 1995, Chapter 10

RESULTS OF PERMEABILITY CALCULATIONS
MULTIPLE STEP TEST

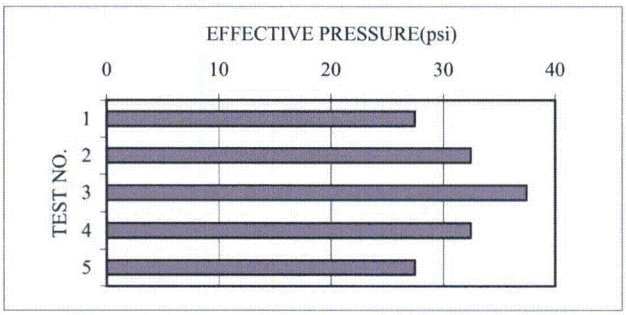
Step	Flow (Q) (gpm)	Pressure (psi) Gauge	Pressure (psi) Effective	Lugeons	Permeability (ft/sec)	Permeability (cm/sec)
1	5.73	10	27	75	2.52E-05	7.7E-04
2	6.86	15	32	76	2.5E-05	7.8E-04
3	8.36	20	37	80	2.7E-05	8.2E-04
4	7.37	15	32	82	2.7E-05	8.3E-04
5	6.4	10	27	84	2.8E-05	8.6E-04
			AVERAGE	79	2.7E-05	8.1E-04
			SELECTED VALUES			

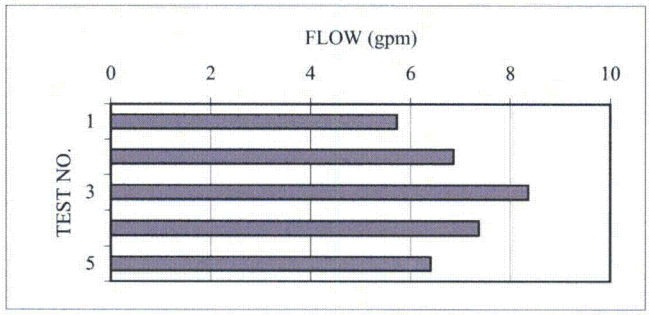
Rock Description of Tested Interval:

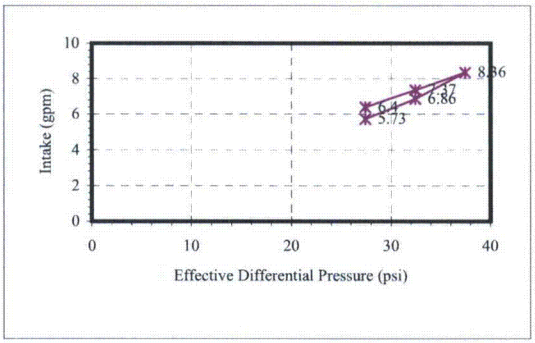
Granite - Partially weathered and coarse grained. Intensely fractured with low angle to horizontal fractures.

TEST INTERPRETATION

Text here
Text here







PERMEABILITY CALCULATIONS FOR EACH STEP OF TEST

S&ME

CALCULATED PERMEABILITY FOR STEP 1

Gauge Pressure, **h2**:	10	psi	23.1	feet of water
Flow Rate, **Q**:	5.73	gpm	0.013	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.5	psi	1.1	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.4	feet		
Value of $\mathbf{h_1}$:	41.4	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	63.4	feet	27.4	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	53.8	feet		
X = (H/Tu)*100	117.8	%		
Tu/A	10.8			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.52E-05	ft/sec	7.67E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 2

Gauge Pressure, **h2**:	15	psi	34.6	feet of water
Flow Rate, **Q**:	6.86	gpm	0.015	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.5	psi	1.1	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.4	feet		
Value of h_1:	41.4	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	74.9	feet	32.4	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	65.3	feet		
X = (H/Tu)*100	114.7	%		
Tu/A	13.1			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.55E-05	ft/sec	7.77E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 3				
Gauge Pressure, **h2**:	20	psi	46.2	feet of water
Flow Rate, **Q**:	8.36	gpm	0.019	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.5	psi	1.1	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.4	feet		
Value of h_1:	41.4	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	86.5	feet	37.4	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	76.9	feet		
X = (H/Tu)*100	112.5	%		
Tu/A	15.4			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.69E-05	ft/sec	8.21E-04	cm/sec
Is this step valid?				

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 4				
Gauge Pressure, **h2**:	15	psi	34.6	feet of water
Flow Rate, **Q**:	7.37	gpm	0.016	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.5	psi	1.1	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.4	feet		
Value of h_1:	41.4	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	74.9	feet	32.4	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	65.3	feet		
X = (H/Tu)*100	114.7	%		
Tu/A	13.1			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.74E-05	ft/sec	8.35E-04	cm/sec
Is this step valid?				

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 5				
Gauge Pressure, **h2**	10	psi	23.1	feet of water
Flow Rate, **Q**:	6.40	gpm	0.014	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.5	psi	1.1	feet of water
Distance from pressure gauge to bottom of test section, h_1:	41.4	feet		
Value of h_1:	41.4	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	63.4	feet	27.4	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	53.8	feet		
X = (H/Tu)*100	117.8	%		
Tu/A	10.8			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.81E-05	ft/sec	8.57E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

BOREHOLE PERMEABILITY TEST USING PACKERS
FIELD DATA SHEET

S&ME

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-104R
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	51.5 to 56.5 bgs
TEST DATE:	3/29/2007	**TEST INTERVAL:**	656.5 to 651.5 EL
TESTED BY:	Justin Milwood and Courtney Withers		
GROUND ELEV (ft MSL):	708.0 (Estimated)		

TEST METHOD: Double Packer Method using Multiple Pressure Tests
METHOD REFERENCE: Ground Water Manual, US Bureau of Reclamation, 1995, Chapter 10

TEST DATA (Enter data in underlined cells):

Rock Description of test interval:	Granite - Partially weathered to Sound Rock. Coarse grained. Intensely to moderately fractured with low angle to horizontal fractures.			
Source of test water and clarity:	Catawba River - Slightly Turbid			
Method of cleaning hole prior to testing:	Flushed			
Drilling Fluid (water or type of drilling mud)	Water			
Packer Brand and Model:				
Packer Inflation Pressure	160	psi		
Packer Length:	2.00	feet		
Method: Single (1) or double (2) packer (Enter 1 or 2):	2			
Interval below base of packer for Method 1 (single packer test), A_1:	-	feet		
Interval between packers for Method 2 (double packer test), A_2:	5.0	feet		
Depth of hole at time of test:	60.0	feet below ground surface (bgs)		
Diameter of borehole, d:	3.0	inches	0.3	feet
Radius of the borehole, r	0.13	feet		
Depth to water table (thickness of unsaturated material above water table, U):	37.4	feet		
Height above ground surface of pressure gauge:	4.5	feet ags		
Top of test section (bottom of upper packer), h_t:	51.5	feet bgs		
Bottom of test section (top of lower packer if double packer used, bottom of hole for a single packer, D):	56.5	feet bgs		
Is test section above or below water table?	below			
For tests below the water table determine h_1, the distance between the gauge and the water table:	41.9	feet		
Length of pipe over which head loss occurs (distance from gauge to outlet of pipe in test section):	58.5	feet		
Diameter and type of pipe used:	1.25-inch I.D.			

BOREHOLE PERMEABILITY TEST USING PACKERS
FIELD DATA SHEET

S&ME

PROJECT NAME AND NO.: MNS - GWPP
LOCATION: Huntersville, NC
TEST DATE: 3/29/07

BOREHOLE NO.: M-104R
TEST INTERVAL: 51.54 to 56.54 bgs
TEST INTERVAL: 656.46 to 651.46 EL

Gauge Pressure (h_2) in psi	Elapsed Time (minutes)	Water Level (feet bgs)	Flow Rate (total flow in gal)	Flow Rate (gpm)
Step 1				
15	0		620.00	
15	1		627.50	7.50
15	2		634.30	6.80
15	5		655.00	6.90
15	10		685.40	6.08
15	15		716.50	6.22
15	20		747.10	6.12
		Average	6.36	6.60
		Selected stabilized flow rate to be used in calculations		6.60
Step 2				
25	0		751.00	
25	1		763.00	12.00
25	2		772.80	9.80
25	5		799.30	8.83
25	10		843.40	8.82
25	15		887.30	8.78
25	20		929.10	8.36
		Average	8.91	9.43
		Selected stabilized flow rate to be used in calculations		9.43
Step 3				
35	0		953.00	
35	1		965.70	12.70
35	2		978.30	12.60
35	5		1015.70	12.47
35	10		1075.50	11.96
35	15		1133.90	11.68
35	20		1192.30	11.68
		Average	11.97	12.18
		Selected stabilized flow rate to be used in calculations		12.18
Step 4				
25	0		1197.50	
25	1		1206.80	9.30
25	3		1224.50	8.85
25	5		1242.40	8.95
		Average	8.98	9.03
		Selected stabilized flow rate to be used in calculations		9.03
Step 5				
15	0		1249.00	
15	1		1255.70	6.70
15	3		1268.20	6.25
15	5		1280.80	6.30
		Average	6.36	6.42
		Selected stabilized flow rate to be used in calculations		6.42

NOTES:

BOREHOLE PERMEABILITY TEST USING PACKERS CALCULATIONS

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-104R
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	51.5 to 56.5 bgs
TEST DATE:	3/29/2007	**TEST INTERVAL:**	656.5 to 651.5 EL
TESTED BY:	Justin Milwood and Courtney Withers		
GROUND ELEV (ft MSL):	708.0		

TEST METHOD: Double Packer Method using Multiple Pressure Tests
METHOD REFERENCE: Ground Water Manual, US Bureau of Reclamation, 1995, Chapter 10

RESULTS OF PERMEABILITY CALCULATIONS
MULTIPLE STEP TEST

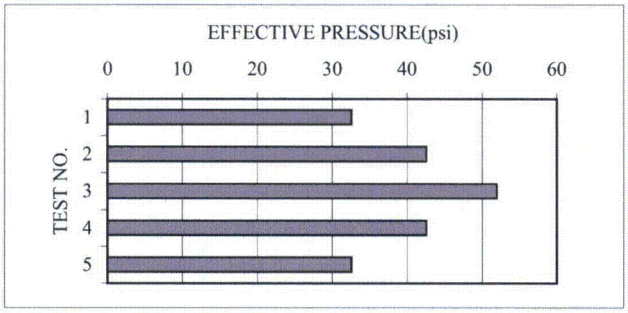
Step	Flow (Q) (gpm)	Pressure (psi) Gauge	Pressure (psi) Effective	Lugeons	Permeability (ft/sec)	Permeability (cm/sec)
1	6.6	15	33	73	2.44E-05	7.5E-04
2	9.43	25	43	80	2.7E-05	8.1E-04
3	12.18	35	52	84	2.8E-05	8.6E-04
4	9.03	25	43	76	2.6E-05	7.8E-04
5	6.42	15	33	71	2.4E-05	7.2E-04
			AVERAGE	77	2.6E-05	7.9E-04
			SELECTED VALUES			

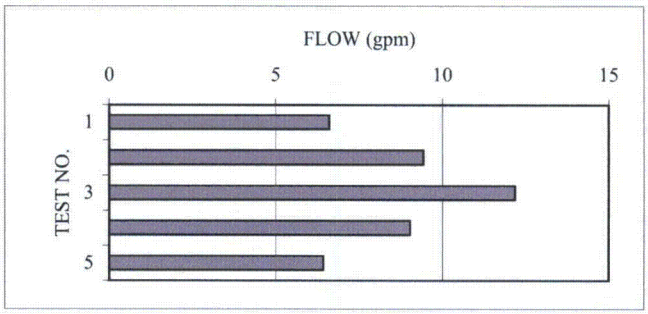
Rock Description of Tested Interval:

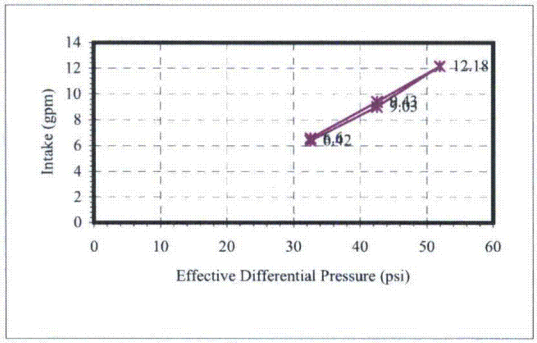
Granite - Partially weathered to Sound Rock. Coarse grained. Intensely to moderately fractured with low angle to horizontal fractures.

TEST INTERPRETATION

Text here
Text here







PERMEABILITY CALCULATIONS FOR EACH STEP OF TEST

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CALCULATED PERMEABILITY FOR STEP 1

Gauge Pressure, **h2**:	15	psi	34.6	feet of water
Flow Rate, **Q**:	6.6	gpm	0.015	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.6	psi	1.4	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.9	feet		
Value of $\mathbf{h_1}$:	41.9	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	75.2	feet	32.6	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	56.1	feet		
X = (H/Tu)*100	134.1	%		
Tu/A	11.2			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.44E-05	ft/sec	7.45E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 2

Gauge Pressure, **h2**:	25	psi	57.7	feet of water
Flow Rate, **Q**:	9.43	gpm	0.021	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.6	psi	1.4	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.9	feet		
Value of h_1:	41.9	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	98.3	feet	42.6	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	79.1	feet		
X = (H/Tu)*100	124.2	%		
Tu/A	15.8			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.67E-05	ft/sec	8.14E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 3

Gauge Pressure, **h2**:	35	psi	80.8	feet of water
Flow Rate, **Q**:	12.18	gpm	0.027	ft^3/sec
Head loss per TEN foot section of pipe:	0.2	psi		(per tables)
Head Loss, ***L*** :	1.2	psi	2.7	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.9	feet		
Value of h_1:	41.9	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	120.0	feet	52.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	100.9	feet		
X = (H/Tu)*100	119.0	%		
Tu/A	20.2			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.83E-05	ft/sec	8.61E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 4

Gauge Pressure, **h2**:	25	psi	57.7	feet of water
Flow Rate, **Q**:	9.03	gpm	0.020	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.6	psi	1.4	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.9	feet		
Value of h_1:	41.9	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	98.3	feet	42.6	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	79.1	feet		
X = (H/Tu)*100	124.2	%		
Tu/A	15.8			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.56E-05	ft/sec	7.80E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 5

Gauge Pressure, **h2**:	15	psi	34.6	feet of water
Flow Rate, **Q**:	6.42	gpm	0.014	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.6	psi	1.4	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	41.9	feet		
Value of h_1:	41.9	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	75.2	feet	32.6	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	56.1	feet		
X = (H/Tu)*100	134.1	%		
Tu/A	11.2			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.38E-05	ft/sec	7.25E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

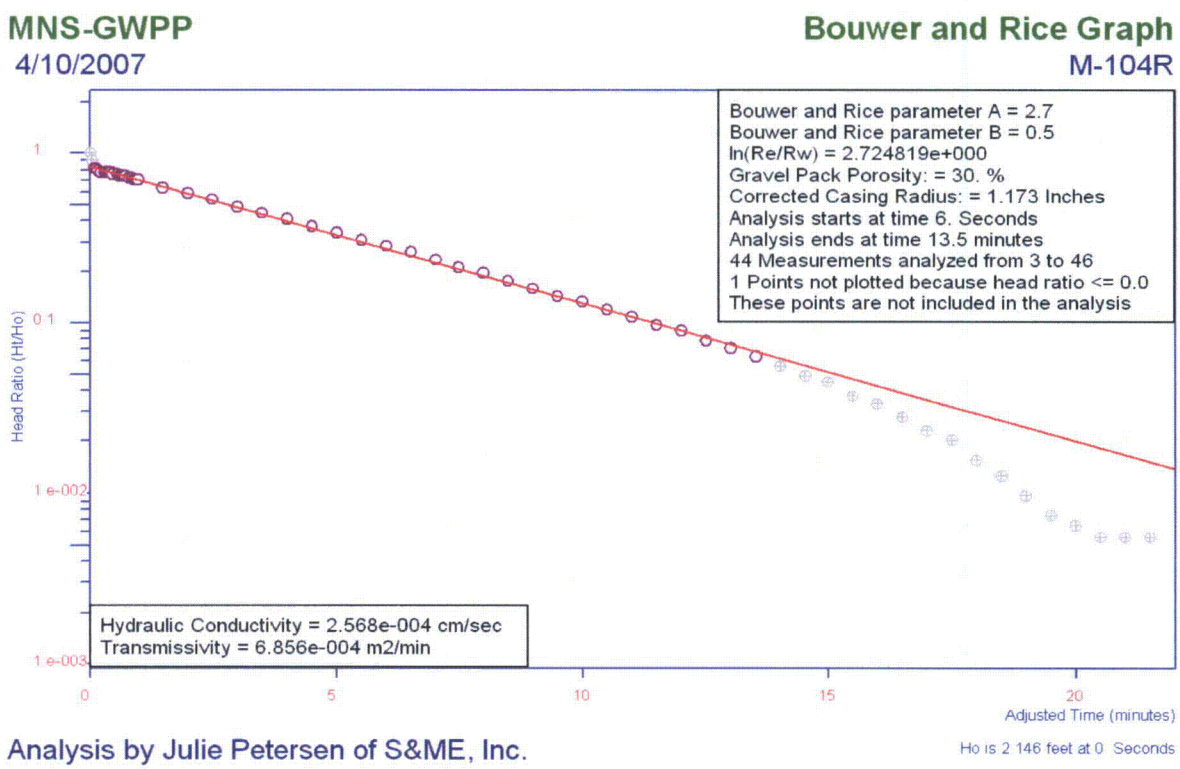
Is Q/a * (estimated porosity) > 10?? True, Test Valid

Calculation of Permeability By The Rising Head Method (Slug Test)

Site Name:	MNS-GWPP
Test Date:	4/10/2007
Well Label:	M-104R
Aquifer Thickness:	14.6 feet
Screen Length:	5. feet
Casing Radius:	1. Inches
Effective Radius:	1.5 Inches
Gravel Pack Porosity:	30.00%
Corrected Casing Radius:	1.173 Inches
Static Water Level:	37.4 feet
Water Table to Screen Bottom:	9.6 feet
Anisotropy Ratio:	1

Time Adjustment: 0. Seconds
Test starts with trial 0
There are 63 time and drawdown measurements
Maximum head is 2.146 feet
Minimum head is 0. feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

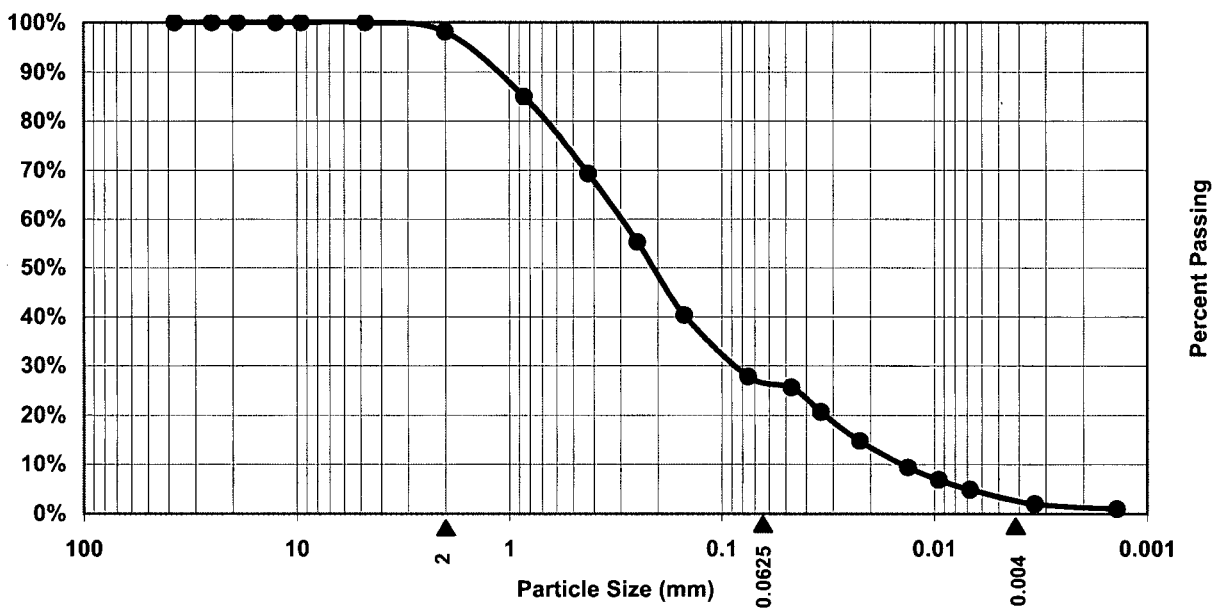
PERMEABILITY

2.57E-04 cm/sec

PARTICLE SIZE ANALYSIS OF SOILS
FOR USE IN FETTER AND BEAR DIAGRAMS

Boring No.:	**Sample No.:**	**Depth:**
M-104R	SS-7	33.25 to 34.75 ft bls

Sample Description:
White and Tan, Silty, Fine to Medium Sand With Mica



	> 2 mm	2 mm - 0.0625 mm	0.0625 mm - 0.004 mm	<0.004 mm
From Graph:	% Gravel 1.9%	% Sand 71.1%	% Silt 24.5%	% Clay 2.5%
Adjusted for Calculations	**0%**	**72%**	**25%**	**3%**

Notes:
Grain size distribution taken from grain size with hydrometer data located in Appendix II.
Gravel, sand, silt and clay sizes based on Wentworth Scale.

S&ME Project:
McGuire Nuclear Station - GWPP

S&ME Project No.:
1264-06-724

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FETTER AND BEAR DIAGRAMS

S&ME PROJECT: McGuire Nuclear Station - GWPP
S&ME PROJECT NO.: 1264-06-724

Boring No. M-104R

Boring Depth: 33.25 to 34.75 ft bls

% Sand: 72%

% Silt: 25%

% Clay: 3%

Estimated Specific Yield: 27.5%

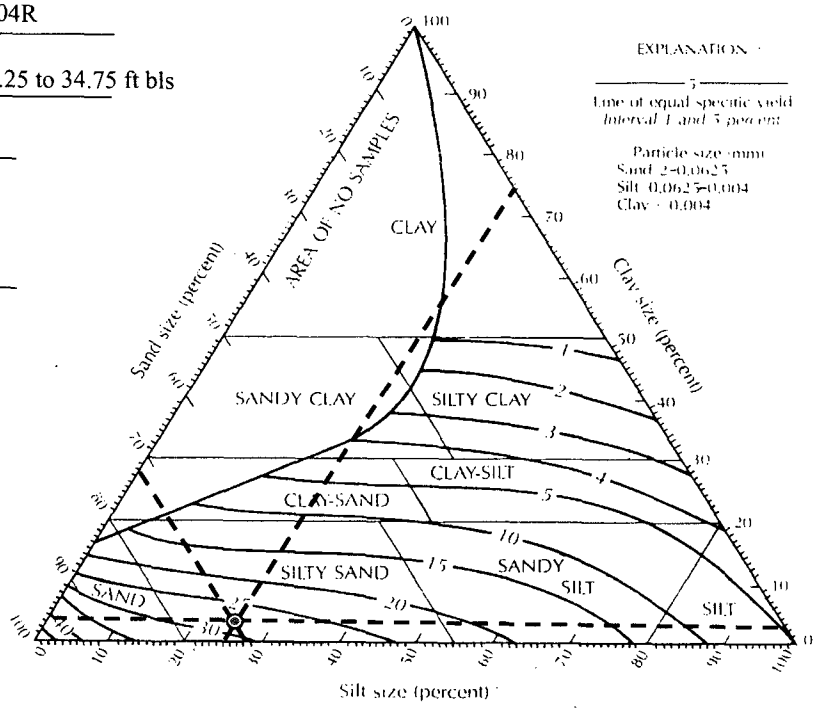
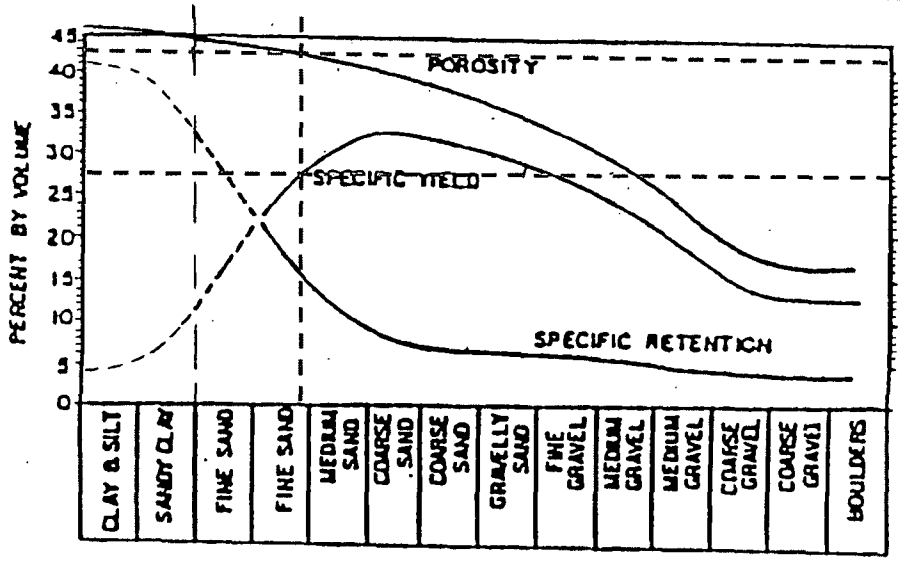


FIGURE 4.11 Textural classification triangle for unconsolidated materials showing the relation between particle size and specific yield. Source: A. I. Johnson, U.S. Geological Survey Water-Supply Paper 1662-D, 1967.



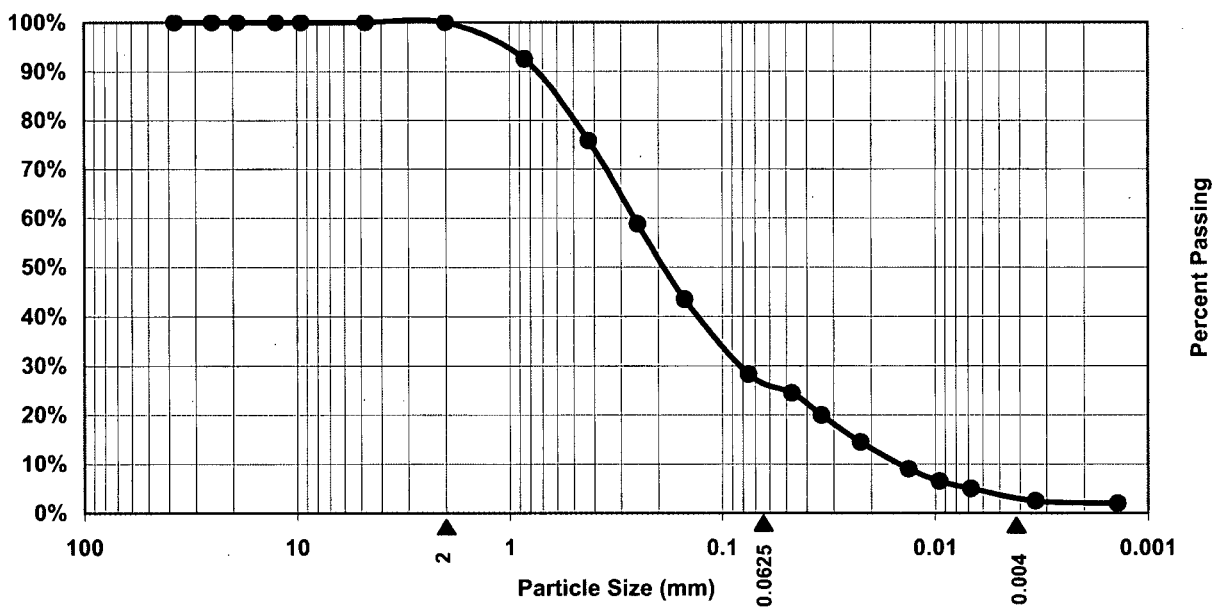
Estimated Porosity: 42.5%

Variation of Porosity, Specific Yield, and Specific Retention with Grain Size (after Bear, 1972)

PARTICLE SIZE ANALYSIS OF SOILS
FOR USE IN FETTER AND BEAR DIAGRAMS

Boring No.:	**Sample No.:**	**Depth:**
M-104R	SS-8	38.25 to 39.75 ft bls

Sample Description:
White and Tan, Silty, Fine to Medium Sand With Mica



	> 2 mm	2 mm - 0.0625 mm	0.0625 mm - 0.004 mm	<0.004 mm
From Graph:	% Gravel 0.0%	% Sand 73.1%	% Silt 24.0%	% Clay 3.0%
Adjusted for Calculations	**0%**	**73%**	**24%**	**3%**

Notes:
Grain size distribution taken from grain size with hydrometer data located in Appendix II.
Gravel, sand, silt and clay sizes based on Wentworth Scale.

S&ME Project:
McGuire Nuclear Station - GWPP

S&ME Project No.:
1264-06-724

S&ME

FETTER AND BEAR DIAGRAMS

S&ME PROJECT: McGuire Nuclear Station - GWPP
S&ME PROJECT NO.: 1264-06-724

Boring No. M-104R

Boring Depth: 38.25 to 39.75 ft bls

% Sand: 73%

% Silt: 24%

% Clay: 3%

Estimated Specific Yield: 27.5%

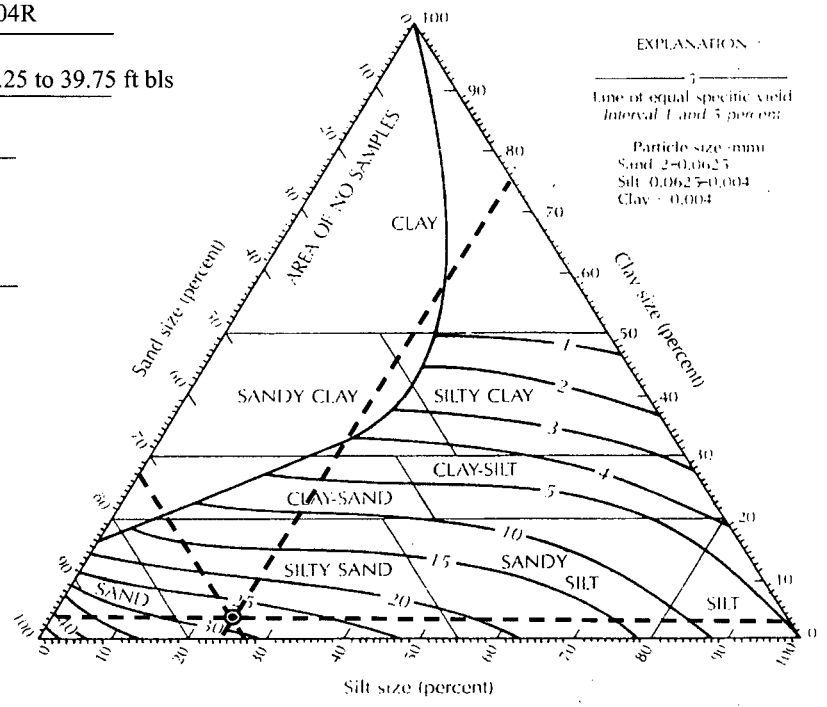
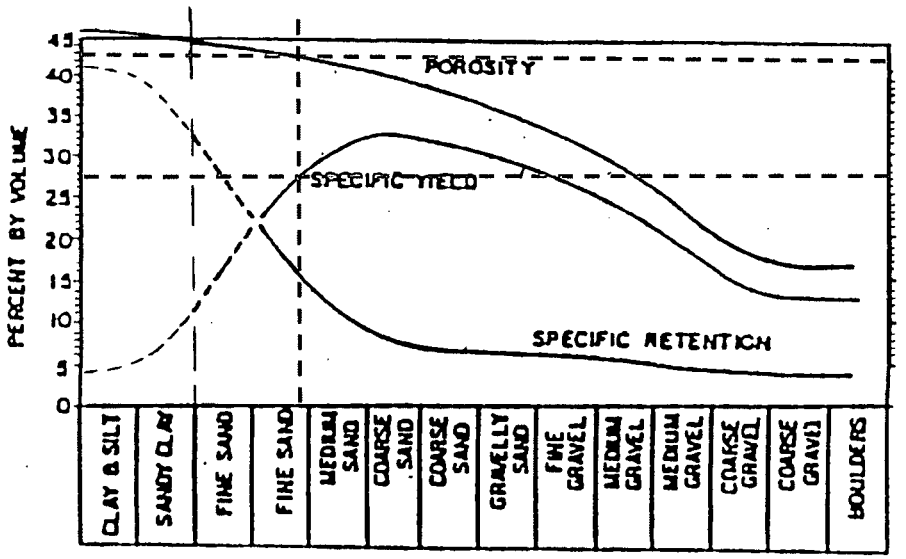


FIGURE 4.11 Textural classification triangle for unconsolidated materials showing the relation between particle size and specific yield. Source: A. I. Johnson, U.S. Geological Survey Water-Supply Paper 1662-D, 1967.



Estimated Porosity: 42.5%

Variation of Porosity, Specific Yield, and Specific Retention with Grain Size (after Bear, 1972)

S&ME
ENGINEERING • TESTING
ENVIRONMENTAL SERVICES

S&ME, Inc.
9751 Southern Pine Blvd.
Charlotte, North Carolina
Telephone: 704-523-4726
Fax: 704-525-3953

1. BORING AND SAMPLING IS IN ACCORDANCE WITH ASTM D-1586.
2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-104DR**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 1 of 3
Boring Depth (ft): **80.3**	Elevation (ft): **714.0**	Driller: **Justin Millwood, NC Cert. No. 3439**	Date Drilled: **6/28/07**
Logged By: **Courtney Withers**	Water Level: **Stabilized Water Level at 39.49 ft bls**		Drilling Method: **4¼" H.S.A.**

Elev. (Feet)	Depth (Feet)	Lith-ology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
710	5		SOIL/SAPROLITE (M1): Red, Micaceous, Medium to Fine Sandy, Silty, **CLAY**		
705	10		SOIL/SAPROLITE (M1): White and Green, Micaceous, Silty, Medium to Fine **SAND** With Iron Staining (Granitic)		
700	15		SOIL/SAPROLITE (M1): White and Tan, Micaceous, Silty, Medium to Fine **SAND** With Manganese Staining (Granitic)		
695	20				
690	25				
685	30				
680					

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Project: **MNS - Groundwater Protection Project**			**Boring No. M-104DR**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 2 of 3
Boring Depth (ft): **80.3**	Elevation (ft): **714.0**	Driller: **Justin Millwood, NC Cert. No. 3439**	Date Drilled: **6/28/07**
Logged By: **Courtney Withers**	Water Level: **Stabilized Water Level at 39.49 ft bls**		Drilling Method: **4¼" H.S.A.**

Elev. (Feet)	Depth (Feet)	Lithology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
			Roller Cone Refusal at 36.70 ft bls		
			SOUND ROCK (D): Coarse-Grained **GRANITE**, Moderately Fractured		
675	40				
			PARTIALLY WEATHERED/FRACTURED ROCK (WF): Coarse-Grained **GRANITE**, Intensely Fractured		
670			SOUND ROCK (D): Coarse-Grained **GRANITE**, Moderately Fractured		
	45				
665					
	50				
660					
	55				
655					
	60				
650					
	65				
645					

S&ME, Inc.
9751 Southern Pine Blvd.
Charlotte, North Carolina
Telephone: 704-523-4726
Fax: 704-525-3953

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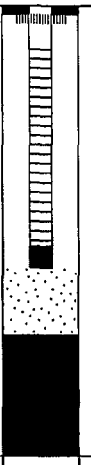
1. BORING AND SAMPLING IS IN ACCORDANCE WITH ASTM D-1586.
2. PENETRATION (N-VALUE) IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Project: **MNS - Groundwater Protection Project**			**Boring No. M-104DR**
Location: **Huntersville, North Carolina**		Number: **1264-06-724**	Sheet No. 3 of 3
Boring Depth (ft): **80.3**	Elevation (ft): **714.0**	Driller: **Justin Millwood, NC Cert. No. 3439**	Date Drilled: **6/28/07**
Logged By: **Courtney Withers**	Water Level: **Stabilized Water Level at 39.49 ft bls**		Drilling Method: **4¼" H.S.A.**

Elev. (Feet)	Depth (Feet)	Lith-ology	Material Description	Well Construction	Penetration Resistance (Blows/Foot) 0 50 100
640	75				
635	80				

Boring Terminated at 80.28 ft bls
Lithologic Descriptions Obtained From M-104R

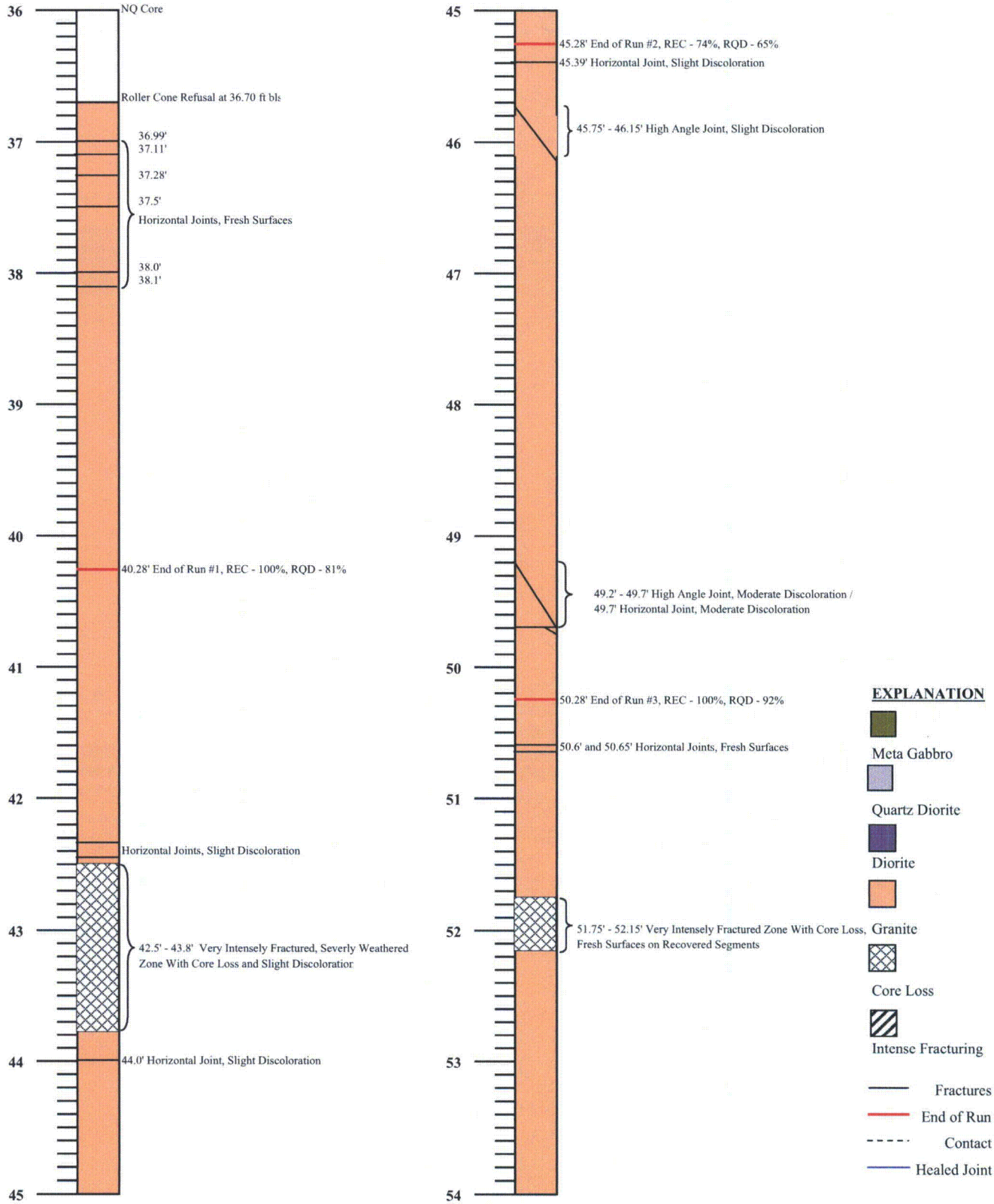


FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-104DR

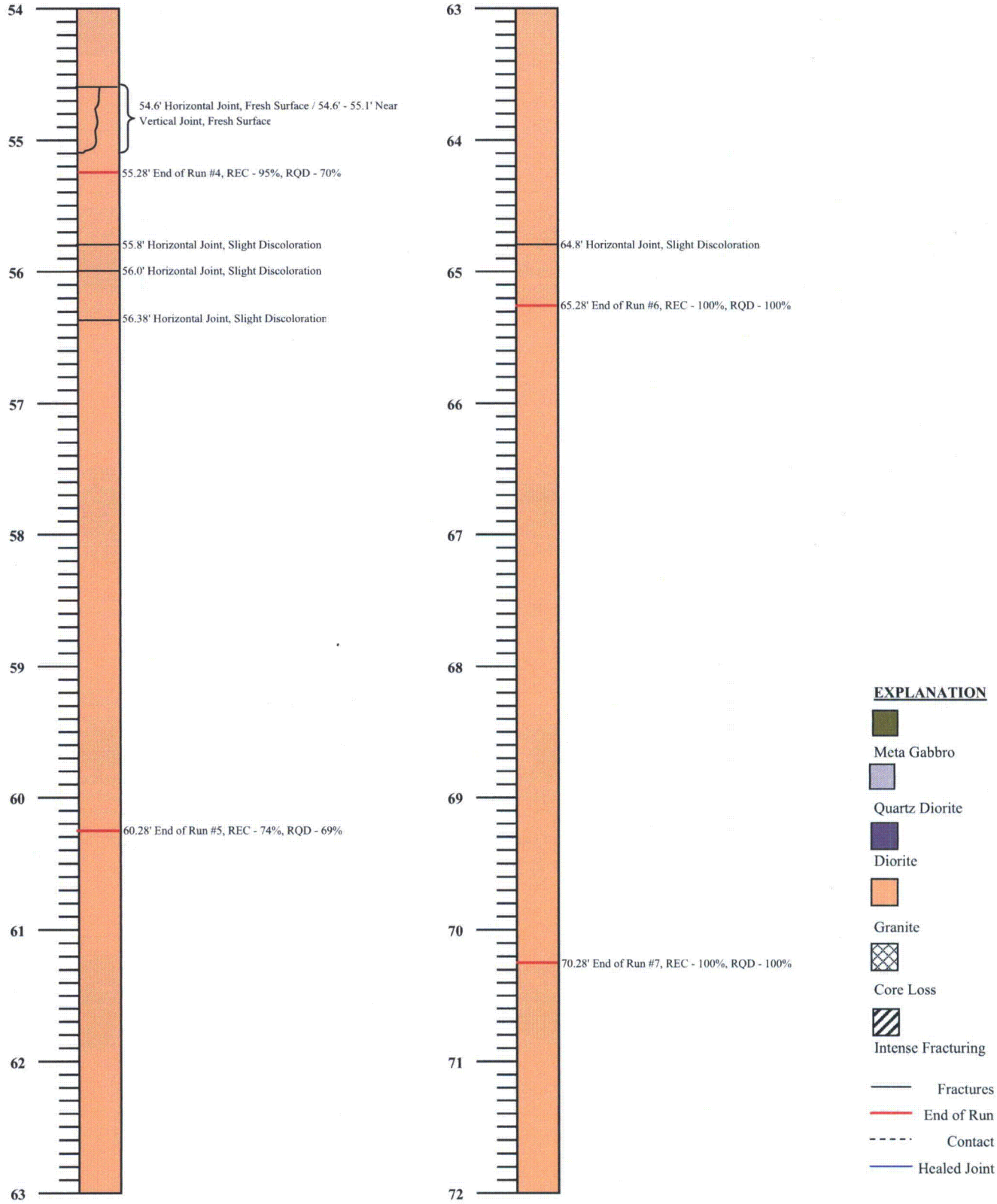


FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-104DR

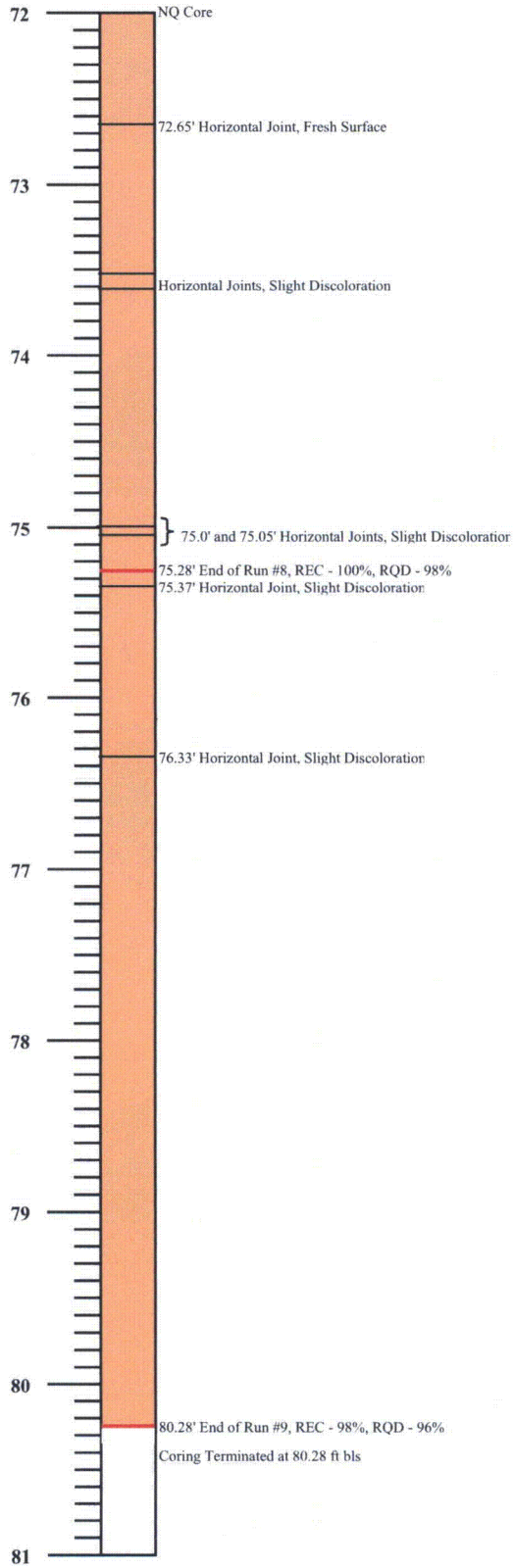


FIELD ROCK CORE LOG

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-104DR



EXPLANATION

- Meta Gabbro
- Quartz Diorite
- Diorite
- Granite
- Core Loss
- Intense Fracturing
- Fractures
- End of Run
- Contact
- Healed Joint

COMPLETION REPORT OF WELL No. M-104DR

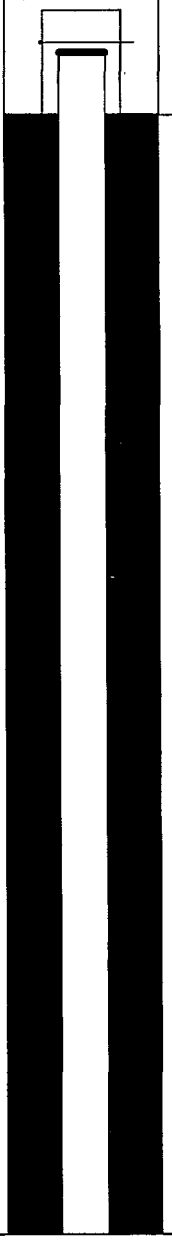
PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

WATER LEVEL: **Stabilized Water Level at 39.49 ft bls**

LATITUDE: **35 25 52.37**
LONGITUDE: **80 57 15.51**
TOP OF CASING ELEVATION: **717.06**
DATUM: **MSL**
LOGGED BY: **Courtney Withers**

DRILLING CONTRACTOR: **S&ME, Inc.**
DRILLING METHOD: **4¼" H.S.A.**
DATE DRILLED: **6/28/07**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)
				0.00		714.04
SOIL/SAPROLITE (M1): Red, Micaceous, Medium to Fine Sandy, Silty, **CLAY**		0, 5				
SOIL/SAPROLITE (M1): White and Green, Micaceous, Silty, Medium to Fine **SAND** With Iron Staining (Granitic)		10				
SOIL/SAPROLITE (M1): White and Tan, Micaceous, Silty, Medium to Fine **SAND** With Manganese Staining (Granitic)		15, 20, 25, 30				



WELL CONSTRUCTION DETAILS

PROTECTIVE CASING
Diameter: **6" X 6"**
Type: **Lockable Steel**
Interval: **Above Grade**

RISER CASING
Diameter: **2"**
Type: **Sch. 40 PVC**
Interval: **0 to 71 ft bls**

GROUT
Type: **N/A**
Interval: **N/A**

SEAL
Type: **K-Packer + Bentonite**
Interval: **0 to 70.4 ft bls**

FILTERPACK
Type: **N/A**
Interval: **N/A**

SCREEN
Diameter: **2"**
Type: **0.010 Slotted Sch. 40 PVC**
Interval: **71 to 76 ft bls**

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

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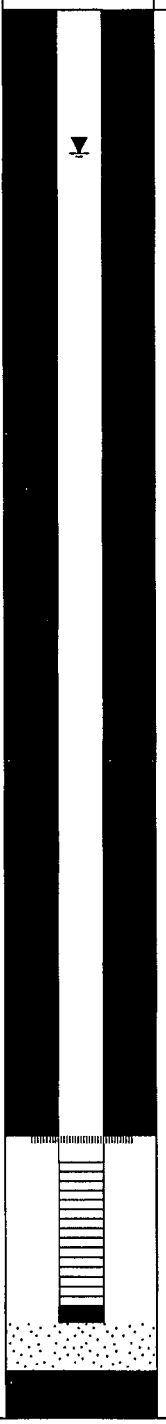
COMPLETION REPORT OF WELL No. M-104DR

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

GROUND SURFACE ELEVATION:
LOGGED BY: **714.0**
CHECKED BY: **Courtney Wither**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
							(See Page 1)
SOUND ROCK (D): Coarse-Grained **GRANITE**, Moderately Fractured		35, 40					
PARTIALLY WEATHERED/FRACTURED ROCK (WF): Coarse-Grained **GRANITE**, Intensely Fractured		45					
SOUND ROCK (D): Coarse-Grained **GRANITE**, Moderately Fractured		50, 55, 60, 65, 70, 75		70.20 70.40 71.00 75.50 76.00 77.50		643.84 643.64 643.04 638.54 638.04 636.54	



LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

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COMPLETION REPORT OF WELL No. M-104DR

PROJECT: **MNS - Groundwater Protection Project**
PROJECT NO: **1264-06-724**
PROJECT LOCATION: **Huntersville, North Carolina**

GROUND SURFACE ELEVATION:
LOGGED BY: **714.0**
CHECKED BY: **Courtney Wither**

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)	WELL DETAILS	DEPTH (ft.)	LEGEND	ELEVATION (ft.)	WELL CONSTRUCTION DETAILS
							(See Page 1)
	+ + + +	80		80.28		633.76	

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL

TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORING WELL MNSLOG.GPJ S&ME.GDT 3/26/08

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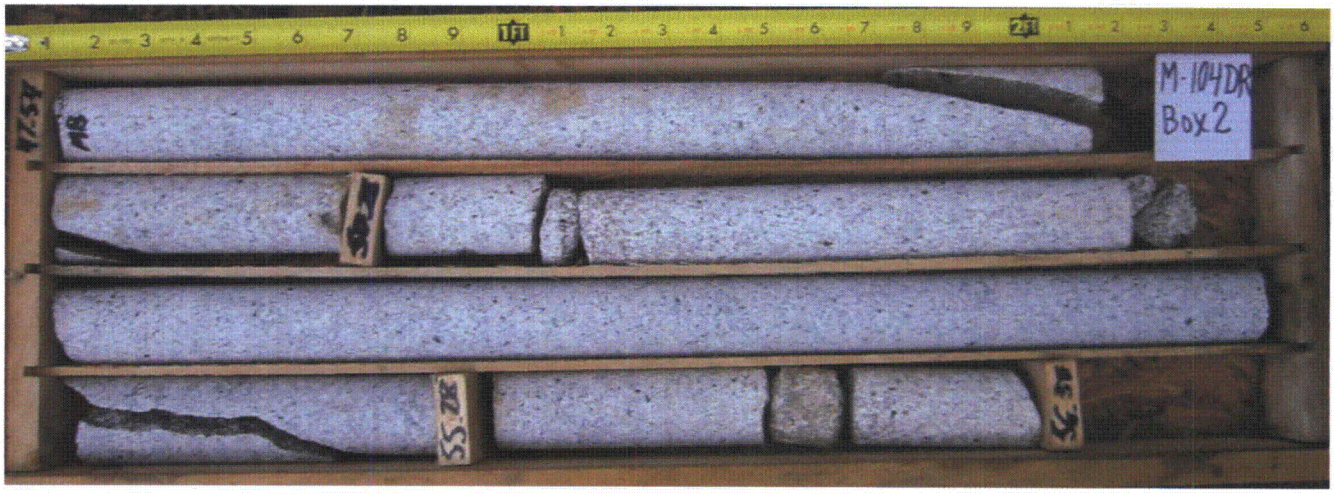
COMPLETION REPORT OF WELL No. M-104DR

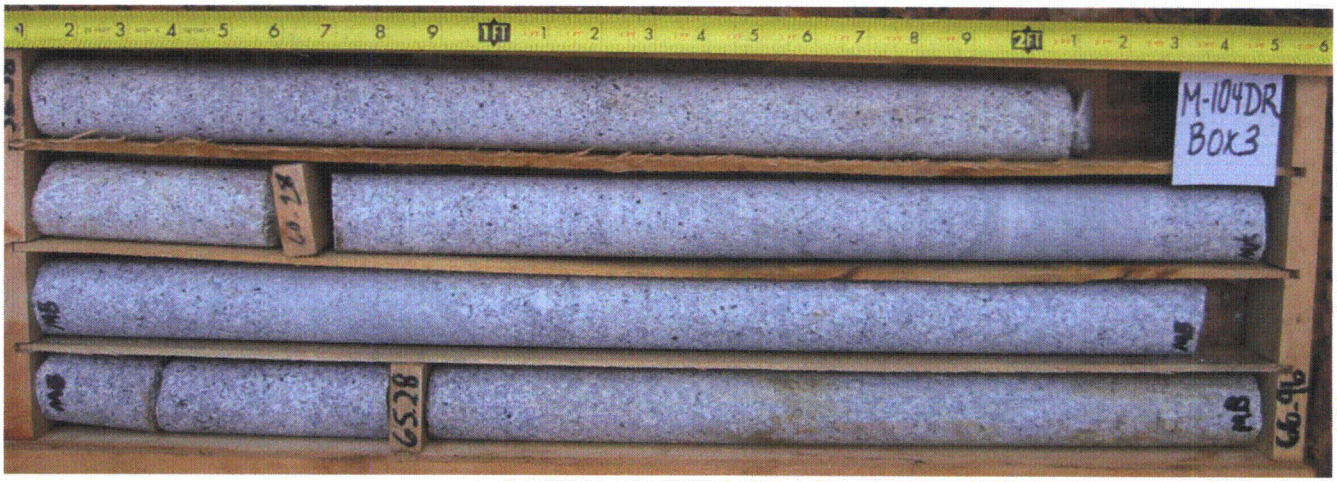
ROCK CORE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-104DR



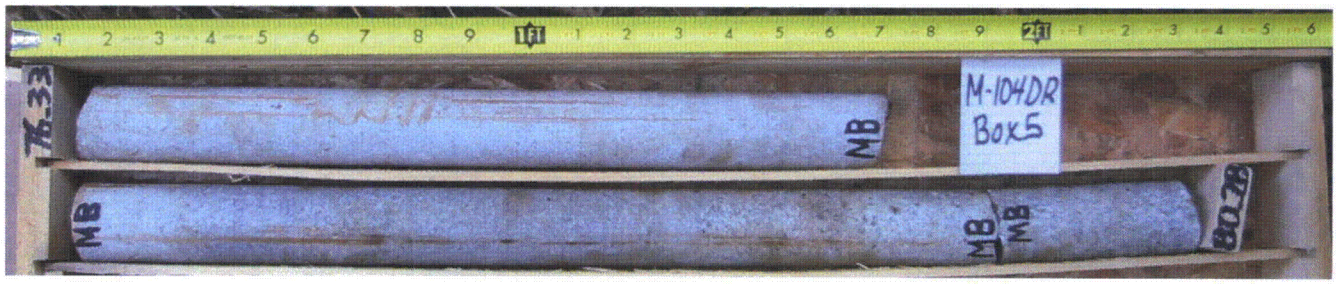


ROCK CORE PICTURES

McGuire Nuclear Station - Groundwater Protection Project

S&ME Project No: 1264-06-724

Core Location: M-104DR



CLASSIFICATION:

36.53' - 80.28' Coarse-Grained Granite

BOREHOLE PERMEABILITY TEST USING PACKERS
FIELD DATA SHEET

S&ME

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-104DR
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	71.8 to 76.8 bgs
TEST DATE:	7/10/2007	**TEST INTERVAL:**	641.7 to 636.7 EL
TESTED BY:	Justin Millwood and Courtney Withers		
GROUND ELEV (ft MSL):	713.5		

TEST METHOD: Double Packer Method using Multiple Pressure Tests
METHOD REFERENCE: Ground Water Manual, US Bureau of Reclamation, 1995, Chapter 10

TEST DATA (Enter data in underlined cells):
Rock Description of test interval:

	Moderately Fractured, Coarse-Grained Granite			
Source of test water and clarity:	Catawba River (slightly turbid)			
Method of cleaning hole prior to testing:	Flushed			
Drilling Fluid (water or type of drilling mud)	Mud			
Packer Brand and Model:				
Packer Inflation Pressure	160	psi		
Packer Length:	2.00	feet		
Method: Single (1) or double (2) packer (Enter 1 or 2):	2			
Interval below base of packer for Method 1 (single packer test), A_1:	-	feet		
Interval between packers for Method 2 (double packer test), A_2:	5.0	feet		
Depth of hole at time of test:	80.3	feet below ground surface (bgs)		
Diameter of borehole, d:	3.0	inches	0.3	feet
Radius of the borehole, r	0.13	feet		
Depth to water table (thickness of unsaturated material above water table, U):	37.8	feet		
Height above ground surface of pressure gauge:	4.4	feet ags		
Top of test section (bottom of upper packer), h_t:	71.8	feet bgs		
Bottom of test section (top of lower packer if double packer used, bottom of hole for a single packer, D):	76.8	feet bgs		
Is test section above or below water table?	below			
For tests below the water table determine h_1, the distance between the gauge and the water table:	42.2	feet		
Length of pipe over which head loss occurs (distance from gauge to outlet of pipe in test section):	78.6	feet		
Diameter and type of pipe used:	1.25-inch I.D.			

BOREHOLE PERMEABILITY TEST USING PACKERS
FIELD DATA SHEET

S&ME

PROJECT NAME AND NO.: MNS - GWPP
LOCATION: Huntersville, NC
TEST DATE: 7/10/07

BOREHOLE NO.: M-104DR
TEST INTERVAL: 71.78 to 76.78 bgs
TEST INTERVAL: 641.7 to 636.7 EL

Gauge Pressure (h_2) in psi	Elapsed Time (minutes)	Water Level (feet bgs)	Flow Rate (total flow in gal)	Flow Rate (gpm)
Step 1				
27.5	0		2578.00	
27.5	1		2586.30	8.30
27.5	2		2593.80	7.50
27.5	5		2616.50	7.57
27.5	10		2653.40	7.38
27.5	15		2689.20	7.16
27.5	20		2725.50	7.26
		Average	7.38	7.53
		Selected stabilized flow rate to be used in calculations		7.53
Step 2				
32.5	0		2729.00	
32.5	1		2737.20	8.20
32.5	2		2746.00	8.80
32.5	5		2770.60	8.20
32.5	10		2811.20	8.12
32.5	15		2851.10	7.98
32.5	20		2891.00	7.98
		Average	8.10	8.21
		Selected stabilized flow rate to be used in calculations		8.21
Step 3				
37.5	0		2896.00	
37.5	1		2905.00	9.00
37.5	2		2913.40	8.40
37.5	5		2940.30	8.97
37.5	10		2985.00	8.94
37.5	15		3029.20	8.84
37.5	20		3072.10	8.58
		Average	8.81	8.79
		Selected stabilized flow rate to be used in calculations		8.79
Step 4				
32.5	0		3075.50	
32.5	1		3083.80	8.30
32.5	3		3098.00	7.10
32.5	5		3113.20	7.60
		Average	7.54	7.67
		Selected stabilized flow rate to be used in calculations		7.67
Step 5				
27.5	0		3119.00	
27.5	1		3125.80	6.80
27.5	3		3139.00	6.60
27.5	5		3152.30	6.65
		Average	6.66	6.68
		Selected stabilized flow rate to be used in calculations		6.68

NOTES:

BOREHOLE PERMEABILITY TEST USING PACKERS CALCULATIONS

S&ME

PROJECT NAME AND NO.:	MNS - GWPP	**BOREHOLE NO.:**	M-104DR
LOCATION:	Huntersville, NC	**TEST INTERVAL:**	71.8 to 76.8 bgs
TEST DATE:	7/10/2007	**TEST INTERVAL:**	641.7 to 636.7 EL
TESTED BY:	Justin Millwood and Courtney Withers		
GROUND ELEV (ft MSL):	713.5		

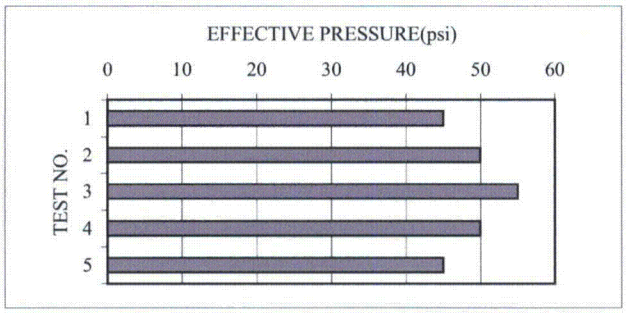
TEST METHOD: Double Packer Method using Multiple Pressure Tests
METHOD REFERENCE: Ground Water Manual, US Bureau of Reclamation, 1995, Chapter 10

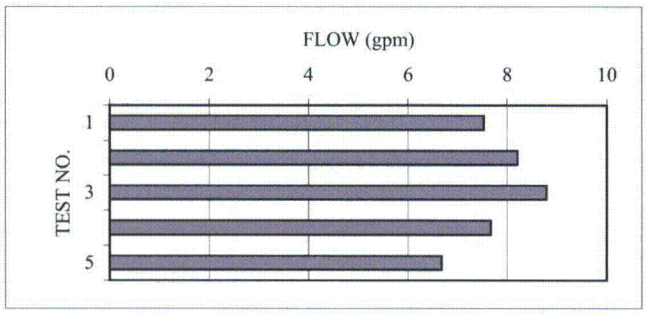
RESULTS OF PERMEABILITY CALCULATIONS
MULTIPLE STEP TEST

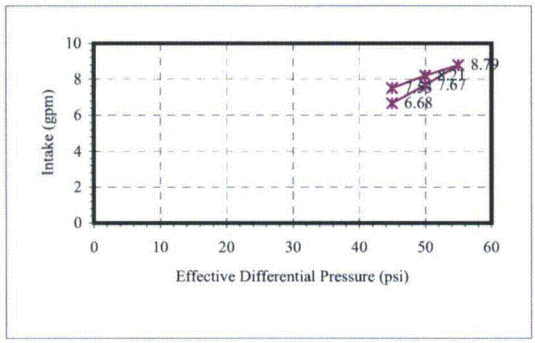
Step	Flow (Q) (gpm)	Pressure (psi) Gauge	Pressure (psi) Effective	Lugeons	Permeability (ft/sec)	Permeability (cm/sec)
1	7.53	27.5	45	60	2.02E-05	6.2E-04
2	8.21	32.5	50	59	2.0E-05	6.0E-04
3	8.79	37.5	55	58	1.9E-05	5.9E-04
4	7.67	32.5	50	55	1.9E-05	5.6E-04
5	6.68	27.5	45	53	1.8E-05	5.5E-04
			AVERAGE	57	1.9E-05	5.8E-04
			SELECTED VALUES			

Rock Description of Tested Interval:
Moderately Fractured, Coarse-Grained Granite

TEST INTERPRETATION
Text here
Text here







PERMEABILITY CALCULATIONS FOR EACH STEP OF TEST

S&ME

CALCULATED PERMEABILITY FOR STEP 1

Gauge Pressure, **h2**	27.5	psi	63.5	feet of water
Flow Rate, **Q**:	7.53	gpm	0.017	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.8	psi	1.8	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	42.2	feet		
Value of $\mathbf{h_1}$:	42.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	103.9	feet	45.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	64.9	feet		
X = (H/Tu)*100	160.0	%		
Tu/A	13.0			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	2.02E-05	ft/sec	6.15E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 2

Gauge Pressure, **h2**	32.5	psi	75.1	feet of water
Flow Rate, **Q**:	8.21	gpm	0.018	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.8	psi	1.8	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	42.2	feet		
Value of h_1:	42.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	115.4	feet	50.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	76.5	feet		
X = (H/Tu)*100	151.0	%		
Tu/A	15.3			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	1.98E-05	ft/sec	6.04E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 3				
Gauge Pressure, **h2**:	37.5	psi	86.6	feet of water
Flow Rate, **Q**:	8.79	gpm	0.020	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.8	psi	1.8	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	42.2	feet		
Value of h_1:	42.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	127.0	feet	55.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	88.0	feet		
X = (H/Tu)*100	144.3	%		
Tu/A	17.6			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	1.93E-05	ft/sec	5.88E-04	cm/sec
Is this step valid?				

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 4				
Gauge Pressure, **h2**:	32.5	psi	75.1	feet of water
Flow Rate, **Q**:	7.67	gpm	0.017	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.8	psi	1.8	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	42.2	feet		
Value of h_1:	42.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	115.4	feet	50.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	76.5	feet		
X = (H/Tu)*100	151.0	%		
Tu/A	15.3			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	1.85E-05	ft/sec	5.64E-04	cm/sec
Is this step valid?				

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

Is Q/a * (estimated porosity) > 10?? True, Test Valid

CALCULATED PERMEABILITY FOR STEP 5				
Gauge Pressure, **h2**:	27.5	psi	63.5	feet of water
Flow Rate, **Q**:	6.68	gpm	0.015	ft^3/sec
Head loss per TEN foot section of pipe:	0.1	psi		(per tables)
Head Loss, ***L*** :	0.8	psi	1.8	feet of water
Distance from pressure gauge to bottom of test section, $\mathbf{h_1}$:	42.2	feet		
Value of h_1:	42.2	feet		
Effective Head, ***H*** where ***H = h1+h2-L*** :	103.9	feet	45.0	psi
Determine Saturation Zone:		-		
Select Zone 1, 2, or 3	3		Zones 1 and 2 are unsaturated, 3 is saturated	
Tu = U-D+H	64.9	feet		
X = (H/Tu)*100	160.0	%		
Tu/A	13.0			
Determine Conductivity Coefficient				
H/r	-		Value for Zone 1 analysis	
A/H	-		Value for Zone 1 analysis	
A/r	40		Value for Zone 2 and 3 analysis	
Select Cu from Fig 10-7 for Zone 1 tests:			Cu for Zone 1	
Cs for Zone 2 and 3 tests:	64		Cs for Zones 2 and 3	
Calculate K if Zone 1 and using single or double packer	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 2 and using double packer (Method 2)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using single packer (Method 1)	-	ft/sec	-	cm/sec
Calculate K if Zone 3 and using double packer (Method 2)	1.79E-05	ft/sec	5.46E-04	cm/sec

Is this step valid?

If (Q/a)*(estimated porosity) > 10 the calculations may not be valid due to turbulent flow

Calculate a, the total open area of the test section: 3.9 square feet

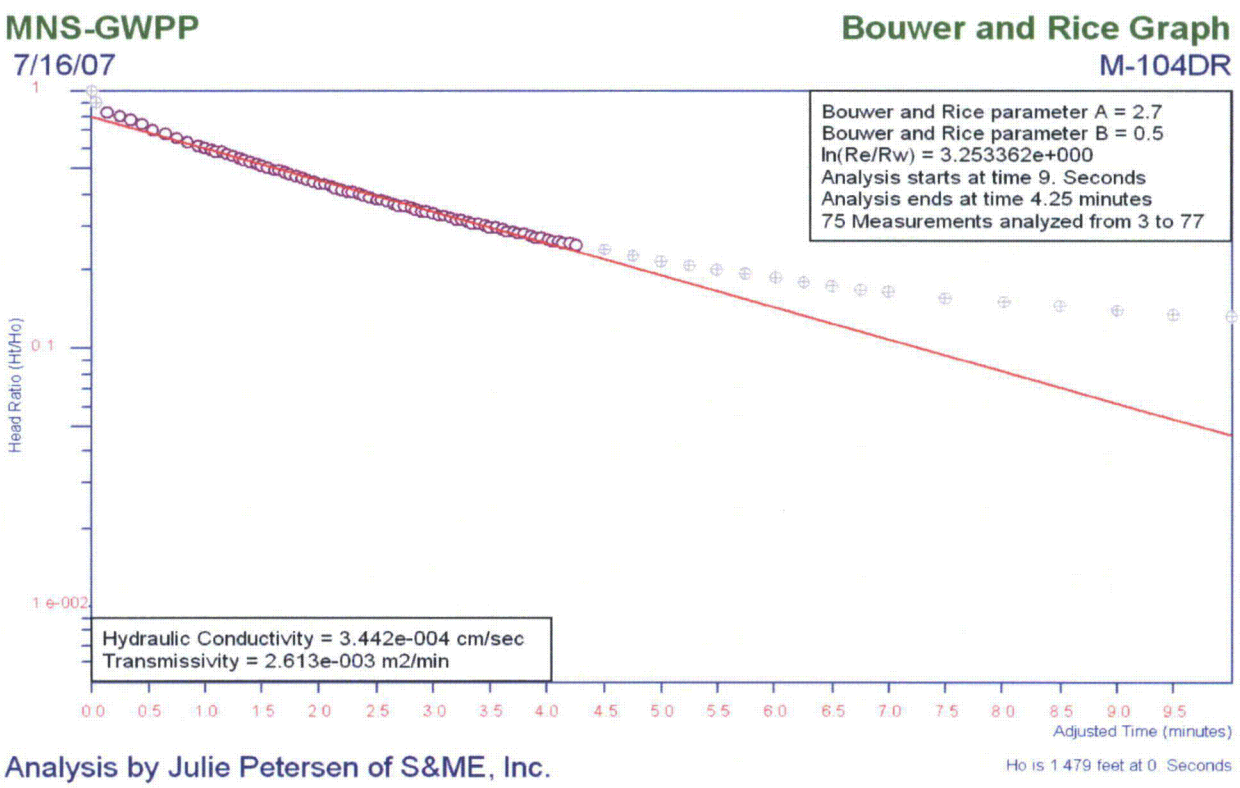
Is Q/a * (estimated porosity) > 10?? True, Test Valid

Calculation of Permeability By The Rising Head Method (Slug Test)

Site Name:	MNS-GWPP
Test Date:	7/16/2007
Well Label:	M-104DR
Aquifer Thickness:	41.51 feet
Screen Length:	5. feet
Casing Radius:	1. Inches
Effective Radius:	1.5 Inches
Static Water Level:	39.49 feet
Water Table to Screen Bottom:	36.51 feet
Anisotropy Ratio:	1

Time Adjustment: 0. Seconds
Test starts with trial 0
There are 94 time and drawdown measurements
Maximum head is 1.479 feet
Minimum head is 0. feet

Calculation by Bouwer and Rice Graphical Method



Analysis by Julie Petersen of S&ME, Inc.

PERMEABILITY

3.44E-04 cm/sec

Emails documenting the disposition of soil waste in the McGuire land fill, compiled by Keith Owensby.

Shook, Eric A, Thu 6/14/2007 9:52 AM
Keith,
I spoke with Mike Phillips regarding the spoil material (soil) from the groundwater project within the PA and this will need to be disposed of at the MNS landfill. I also instructed Joe Craver to do the same yesterday morning (he called regarding the same question). Please contact Mike Phillips to schedule the landfill shipment.

Please let me know if you have any additional questions or concerns and I will be glad to help if I can.

Thanks,

Eric

Sloan, Harry J, Tue 6/26/2007 12:32 PM
Keith, I have completed sampling the roll-back box and no radionuclides other than natural products were identified. A sample of water from the box drain did not identify any tritium activity (critical level at ~2E-6 uCi/ml).

The material can be released based on the radiological evaluation.

Harry Sloan
RP General Supervisor-McGuire

From: Owensby, Keith D
Sent: Monday, July 23, 2007 4:51 PM
To: Le Roy, Steven E
Subject: Dumpster

Steve,

Just a follow-up note on the Rain-for-Rent dumpster it was emptied and placed in the compactor yard last Wednesday. You may have already had it picked up if so disregard.

Thank you, Keith

Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000620**
Location: M-20 | **Collection Date: 2/21/2008 08:45:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-20**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.581E+00	0.000E+00	4.581	Less than	1000
CO58	< 3.966E+00	0.000E+00	3.966	Less than	1000
FE59	< 9.707E+00	0.000E+00	9.707	Less than	400.0
CO60	< 4.126E+00	0.000E+00	4.126	Less than	300.0
ZN65	< 8.936E+00	0.000E+00	8.936	Less than	300.0
NB95	< 5.174E+00	0.000E+00	5.174	Less than	400.0
ZR95	< 8.253E+00	0.000E+00	8.253	Less than	400.0
I131	< 4.478E+00	0.000E+00	4.478	Less than	2.000
CS134	< 4.007E+00	0.000E+00	4.007	Less than	30.00
CS137	< 3.486E+00	0.000E+00	3.486	Less than	50.00
BALA140	< 7.044E+00	0.000E+00	7.044	Less than	200.0
BE7	< 3.814E+01	0.000E+00	38.14	No limits specified	
K40	1.942E+02	3.216E+01	47.05	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	5.770E+02	6.534E+01	186	Less than	20000

Field Parameters

Elevation (ft (msl)) 667.99
pH (field) SU 6.16
Temp Celcius (degrees C) 13.23
Dissolved Oxygen (mg/L) 5.58
Spec. Cond. (field) micromhos/cm 97.7
Oxidation Reduction Potential (ORP)(mV) 403
Turbidity (field) NTU 14.4

Station: MCGUIRE | **Sample #: 28000621**
Location: M-20R | **Collection Date: 2/21/2008 09:30:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-20R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.953E+00	0.000E+00	5.953	Less than	1000
CO58	< 4.216E+00	0.000E+00	4.216	Less than	1000
FE59	< 1.088E+01	0.000E+00	10.88	Less than	400.0
CO60	< 6.178E+00	0.000E+00	6.178	Less than	300.0
ZN65	< 9.790E+00	0.000E+00	9.790	Less than	300.0
NB95	< 5.289E+00	0.000E+00	5.289	Less than	400.0
ZR95	< 9.765E+00	0.000E+00	9.765	Less than	400.0
I131	< 6.577E+00	0.000E+00	6.577	Less than	2.000
CS134	< 5.197E+00	0.000E+00	5.197	Less than	30.00
CS137	< 5.886E+00	0.000E+00	5.886	Less than	50.00
BALA140	< 7.502E+00	0.000E+00	7.502	Less than	200.0
BE7	< 4.400E+01	0.000E+00	44.00	No limits specified	
K40	2.077E+02	3.281E+01	46.05	No limits specified	

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000621**
Location: M-20R | **Collection Date: 2/21/2008 09:30:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-20R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	4.950E+02	6.396E+01	186	Less than	20000

Field Parameters

Elevation (ft (msl)) 670.49
pH (field) SU 6.32
Temp Celcius (degrees C) 13.2
Dissolved Oxygen (mg/L) 1.33
Spec. Cond. (field) micromhos/cm 116.4
Oxidation Reduction Potential (ORP)(mV) 293
Turbidity (field) NTU 4.35

Station: MCGUIRE | **Sample #: 28000622**
Location: M-21 | **Collection Date: 2/20/2008 14:50:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-21**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 3.575E+00	0.000E+00	3.575	Less than	1000
CO58	< 3.431E+00	0.000E+00	3.431	Less than	1000
FE59	< 6.095E+00	0.000E+00	6.095	Less than	400.0
CO60	< 3.592E+00	0.000E+00	3.592	Less than	300.0
ZN65	< 7.464E+00	0.000E+00	7.464	Less than	300.0
NB95	< 3.861E+00	0.000E+00	3.861	Less than	400.0
ZR95	< 5.621E+00	0.000E+00	5.621	Less than	400.0
I131	< 4.225E+00	0.000E+00	4.225	Less than	2.000
CS134	< 3.393E+00	0.000E+00	3.393	Less than	30.00
CS137	< 3.517E+00	0.000E+00	3.517	Less than	50.00
BALA140	< 5.130E+00	0.000E+00	5.130	Less than	200.0
BE7	< 2.874E+01	0.000E+00	28.74	No limits specified	
K40	< 5.340E+01	0.000E+00	53.40	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< 6.88E+01		187	Less than	20000

Field Parameters

Elevation (ft (msl)) 730.29
pH (field) SU 5.1
Temp Celcius (degrees C) 17.8
Dissolved Oxygen (mg/L) 6.05
Spec. Cond. (field) micromhos/cm 21.9
Oxidation Reduction Potential (ORP)(mV) 471
Turbidity (field) NTU 211

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000623**
Location: M-22 | **Collection Date: 2/20/2008 14:40:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-22**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.796E+00	0.000E+00	4.796	Less than 1000
CO58	< 5.066E+00	0.000E+00	5.066	Less than 1000
FE59	< 1.062E+01	0.000E+00	10.62	Less than 400.0
CO60	< 7.101E+00	0.000E+00	7.101	Less than 300.0
ZN65	< 9.858E+00	0.000E+00	9.858	Less than 300.0
NB95	< 4.762E+00	0.000E+00	4.762	Less than 400.0
ZR95	< 1.029E+01	0.000E+00	10.29	Less than 400.0
I131	< 6.094E+00	0.000E+00	6.094	Less than 2.000
CS134	< 4.033E+00	0.000E+00	4.033	Less than 30.00
CS137	< 4.171E+00	0.000E+00	4.171	Less than 50.00
BALA140	< 6.300E+00	0.000E+00	6.300	Less than 200.0
BE7	< 4.220E+01	0.000E+00	42.20	No limits specified
K40	1.187E+02	2.205E+01	58.83	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	< 9.10E+01		187	Less than 20000

Field Parameters

Elevation (ft (msl)) 736.85
pH (field) SU 6.09
Temp Celcius (degrees C) 15.66
Dissolved Oxygen (mg/L) 8.67
Spec. Cond. (field) micromhos/cm 54.1
Oxidation Reduction Potential (ORP)(mV) 399
Turbidity (field) NTU >1000

Station: MCGUIRE | **Sample #: 28000624**
Location: M-22R | **Collection Date: 2/20/2008 14:55:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-22R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.478E+00	0.000E+00	4.478	Less than 1000
CO58	< 4.478E+00	0.000E+00	4.478	Less than 1000
FE59	< 6.862E+00	0.000E+00	6.862	Less than 400.0
CO60	< 4.671E+00	0.000E+00	4.671	Less than 300.0
ZN65	< 8.150E+00	0.000E+00	8.150	Less than 300.0
NB95	< 5.227E+00	0.000E+00	5.227	Less than 400.0
ZR95	< 5.812E+00	0.000E+00	5.812	Less than 400.0
I131	< 4.803E+00	0.000E+00	4.803	Less than 2.000
CS134	< 3.392E+00	0.000E+00	3.392	Less than 30.00
CS137	< 3.614E+00	0.000E+00	3.614	Less than 50.00
BALA140	< 6.203E+00	0.000E+00	6.203	Less than 200.0
BE7	< 2.900E+01	0.000E+00	29.00	No limits specified
K40	4.287E+01	2.231E+01	39.71	No limits specified

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000624**
Location: M-22R | **Collection Date: 2/20/2008 14:55:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-22R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	4.420E+02	6.363E+01	187	Less than 20000

Field Parameters

Elevation (ft (msl)) 736.68
pH (field) SU 7.1
Temp Celcius (degrees C) 15.56
Dissolved Oxygen (mg/L) 12.59
Spec. Cond. (field) micromhos/cm 104.4
Oxidation Reduction Potential (ORP)(mV) 377
Turbidity (field) NTU 15.2

Station: MCGUIRE | **Sample #: 28000625**
Location: M-23 | **Collection Date: 2/21/2008 10:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-23**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 3.724E+00	0.000E+00	3.724	Less than 1000
CO58	< 4.123E+00	0.000E+00	4.123	Less than 1000
FE59	< 8.151E+00	0.000E+00	8.151	Less than 400.0
CO60	< 4.761E+00	0.000E+00	4.761	Less than 300.0
ZN65	< 9.399E+00	0.000E+00	9.399	Less than 300.0
NB95	< 4.754E+00	0.000E+00	4.754	Less than 400.0
ZR95	< 7.600E+00	0.000E+00	7.600	Less than 400.0
I131	< 4.950E+00	0.000E+00	4.950	Less than 2.000
CS134	< 4.641E+00	0.000E+00	4.641	Less than 30.00
CS137	< 3.507E+00	0.000E+00	3.507	Less than 50.00
BALA140	< 7.719E+00	0.000E+00	7.719	Less than 200.0
BE7	< 2.700E+01	0.000E+00	27.00	No limits specified
K40	1.019E+02	2.788E+01	38.49	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	< 3.06E+01		184	Less than 20000

Field Parameters

Elevation (ft (msl)) 737.39
pH (field) SU 5.46
Temp Celcius (degrees C) 14.69
Dissolved Oxygen (mg/L) 8.96
Spec. Cond. (field) micromhos/cm 41
Oxidation Reduction Potential (ORP)(mV) 457
Turbidity (field) NTU 5.21

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000626**
Location: M-30 | **Collection Date: 2/20/2008 13:30:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-30**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity - Error		Calculated MDA	Reporting Level	
MN54	< 3.475E+00	0.000E+00	3.475	Less than	1000
CO58	< 3.336E+00	0.000E+00	3.336	Less than	1000
FE59	< 6.748E+00	0.000E+00	6.748	Less than	400.0
CO60	< 3.343E+00	0.000E+00	3.343	Less than	300.0
ZN65	< 7.417E+00	0.000E+00	7.417	Less than	300.0
NB95	< 2.874E+00	0.000E+00	2.874	Less than	400.0
ZR95	< 6.537E+00	0.000E+00	6.537	Less than	400.0
I131	< 4.996E+00	0.000E+00	4.996	Less than	2.000
CS134	< 3.253E+00	0.000E+00	3.253	Less than	30.00
CS137	< 3.312E+00	0.000E+00	3.312	Less than	50.00
BALA140	< 4.370E+00	0.000E+00	4.370	Less than	200.0
BE7	< 2.568E+01	0.000E+00	25.68	No limits specified	
K40	3.762E+01	1.621E+01	35.71	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity - Error	Calculated MDA	Reporting Level	
H3	< -1.11E+01	187	Less than	20000

Field Parameters

Elevation (ft (msl)) 688.7
pH (field) SU 6.09
Temp Celcius (degrees C) 16.52
Dissolved Oxygen (mg/L) 4.06
Spec. Cond. (field) micromhos/cm 76.3
Oxidation Reduction Potential (ORP)(mV) 415
Turbidity (field) NTU 168

Station: MCGUIRE | **Sample #: 28000627**
Location: M-30R | **Collection Date: 2/20/2008 13:50:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-30R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity - Error		Calculated MDA	Reporting Level	
MN54	< 8.148E+00	0.000E+00	8.148	Less than	1000
CO58	< 6.787E+00	0.000E+00	6.787	Less than	1000
FE59	< 1.496E+01	0.000E+00	14.96	Less than	400.0
CO60	< 7.702E+00	0.000E+00	7.702	Less than	300.0
ZN65	< 9.986E+00	0.000E+00	9.986	Less than	300.0
NB95	< 7.190E+00	0.000E+00	7.190	Less than	400.0
ZR95	< 8.928E+00	0.000E+00	8.928	Less than	400.0
I131	< 7.705E+00	0.000E+00	7.705	Less than	2.000
CS134	< 7.514E+00	0.000E+00	7.514	Less than	30.00
CS137	< 5.277E+00	0.000E+00	5.277	Less than	50.00
BALA140	< 6.508E+00	0.000E+00	6.508	Less than	200.0
BE7	< 5.965E+01	0.000E+00	59.65	No limits specified	
K40	< 1.174E+02	0.000E+00	117.4	No limits specified	

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE — **Sample #: 28000627**
Location: M-30R — **Collection Date: 2/20/2008 13:50:00**
Type: GROUND WATER — **MNS GROUND WATER PROTECTION PROGRAM - M-30R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	2.080E+02	5.991E+01	186	Less than	20000

Field Parameters

Elevation (ft (msl)) 688.8
pH (field) SU 7.29
Temp Celcius (degrees C) 16.15
Dissolved Oxygen (mg/L) 11.71
Spec. Cond. (field) micromhos/cm 116.1
Oxidation Reduction Potential (ORP)(mV) 296
Turbidity (field) NTU 81.7

Station: MCGUIRE — **Sample #: 28000628**
Location: M-31 — **Collection Date: 2/20/2008 13:30:00**
Type: GROUND WATER — **MNS GROUND WATER PROTECTION PROGRAM - M-31**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.716E+00	0.000E+00	5.716	Less than	1000
CO58	< 5.309E+00	0.000E+00	5.309	Less than	1000
FE59	< 1.087E+01	0.000E+00	10.87	Less than	400.0
CO60	< 6.294E+00	0.000E+00	6.294	Less than	300.0
ZN65	< 9.426E+00	0.000E+00	9.426	Less than	300.0
NB95	< 4.474E+00	0.000E+00	4.474	Less than	400.0
ZR95	< 8.287E+00	0.000E+00	8.287	Less than	400.0
I131	< 6.477E+00	0.000E+00	6.477	Less than	2.000
CS134	< 4.866E+00	0.000E+00	4.866	Less than	30.00
CS137	< 5.296E+00	0.000E+00	5.296	Less than	50.00
BALA140	< 6.441E+00	0.000E+00	6.441	Less than	200.0
BE7	< 4.387E+01	0.000E+00	43.87	No limits specified	
K40	< 9.746E+01	0.000E+00	97.46	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< -1.06E+02		190	Less than	20000

Field Parameters

Elevation (ft (msl)) 743.13
pH (field) SU 6.16
Temp Celcius (degrees C) 16.71
Dissolved Oxygen (mg/L) 9.81
Spec. Cond. (field) micromhos/cm 69.7
Oxidation Reduction Potential (ORP)(mV) 427
Turbidity (field) NTU 363

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000629**
Location: M-32 | **Collection Date: 2/21/2008 10:35:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-32**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity - Error	Calculated MDA	Reporting Level
H3	< -4.40E+01	186	Less than 20000

Field Parameters

Elevation (ft (msl)) 737.84
pH (field) SU 5.96
Temp Celcius (degrees C) 12.86
Dissolved Oxygen (mg/L) 4.85
Spec. Cond. (field) micromhos/cm 66.6
Oxidation Reduction Potential (ORP)(mV) 294
Turbidity (field) NTU NA

Station: MCGUIRE | **Sample #: 28000630**
Location: M-33
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-33**

UNAVAIL — UNAVAILABLE SAMPLE (NO TESTS PERFORMED)

Units: pCi/liter

	Activity - Error	Calculated MDA	Reporting Level
	NO SAMPLE		

Field Parameters

Elevation (ft (msl)) 739.05
pH (field) SU NA
Temp Celcius (degrees C) NA
Dissolved Oxygen (mg/L) NA
Spec. Cond. (field) micromhos/cm NA
Oxidation Reduction Potential (ORP)(mV) NA
Turbidity (field) NTU NA

Station: MCGUIRE | **Sample #: 28000631**
Location: M-34R | **Collection Date: 2/20/2008 15:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-34R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.074E+00	0.000E+00	4.074	Less than 1000
CO58	< 3.848E+00	0.000E+00	3.848	Less than 1000
FE59	< 7.878E+00	0.000E+00	7.878	Less than 400.0
CO60	< 4.077E+00	0.000E+00	4.077	Less than 300.0
ZN65	< 9.319E+00	0.000E+00	9.319	Less than 300.0
NB95	< 4.629E+00	0.000E+00	4.629	Less than 400.0
ZR95	< 6.974E+00	0.000E+00	6.974	Less than 400.0
I131	< 5.846E+00	0.000E+00	5.846	Less than 2.000
CS134	< 4.095E+00	0.000E+00	4.095	Less than 30.00
CS137	< 4.441E+00	0.000E+00	4.441	Less than 50.00
BALA140	< 4.747E+00	0.000E+00	4.747	Less than 200.0
BE7	< 3.361E+01	0.000E+00	33.61	No limits specified
K40	8.848E+01	1.998E+01	37.49	No limits specified

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000631**
Location: M-34R | **Collection Date: 2/20/2008 15:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-34R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity - Error	Calculated MDA	Reporting Level
H3	< -3.77E+01	187	Less than 20000

Field Parameters

Elevation (ft (msl)) 755.42
pH (field) SU 6.3
Temp Celcius (degrees C) 17.11
Dissolved Oxygen (mg/L) 10.77
Spec. Cond. (field) micromhos/cm 88.3
Oxidation Reduction Potential (ORP)(mV) 415
Turbidity (field) NTU 8.09

Station: MCGUIRE | **Sample #: 28000632**
Location: M-34DR | **Collection Date: 2/20/2008 15:35:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-34DR**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 3.928E+00	0.000E+00	3.928	Less than 1000
CO58	< 4.203E+00	0.000E+00	4.203	Less than 1000
FE59	< 8.138E+00	0.000E+00	8.138	Less than 400.0
CO60	< 4.389E+00	0.000E+00	4.389	Less than 300.0
ZN65	< 9.280E+00	0.000E+00	9.280	Less than 300.0
NB95	< 5.080E+00	0.000E+00	5.080	Less than 400.0
ZR95	< 7.244E+00	0.000E+00	7.244	Less than 400.0
I131	< 5.248E+00	0.000E+00	5.248	Less than 2.000
CS134	< 4.145E+00	0.000E+00	4.145	Less than 30.00
CS137	< 3.830E+00	0.000E+00	3.830	Less than 50.00
BALA140	< 6.854E+00	0.000E+00	6.854	Less than 200.0
BE7	< 3.471E+01	0.000E+00	34.71	No limits specified
K40	1.025E+02	3.083E+01	42.29	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity - Error	Calculated MDA	Reporting Level
H3	< 6.21E+01	187	Less than 20000

Field Parameters

Elevation (ft (msl)) 755.52
pH (field) SU 6.2
Temp Celcius (degrees C) 16.78
Dissolved Oxygen (mg/L) 3.77
Spec. Cond. (field) micromhos/cm 131
Oxidation Reduction Potential (ORP)(mV) 412
Turbidity (field) NTU 3.85

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000633**
Location: M-35 | **Collection Date: 2/20/2008 13:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-35**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.386E+00	0.000E+00	4.386	Less than	1000
CO58	< 3.958E+00	0.000E+00	3.958	Less than	1000
FE59	< 7.952E+00	0.000E+00	7.952	Less than	400.0
CO60	< 4.992E+00	0.000E+00	4.992	Less than	300.0
ZN65	< 9.435E+00	0.000E+00	9.435	Less than	300.0
NB95	< 3.873E+00	0.000E+00	3.873	Less than	400.0
ZR95	< 6.039E+00	0.000E+00	6.039	Less than	400.0
I131	< 5.683E+00	0.000E+00	5.683	Less than	2.000
CS134	< 4.639E+00	0.000E+00	4.639	Less than	30.00
CS137	< 3.348E+00	0.000E+00	3.348	Less than	50.00
BALA140	< 7.939E+00	0.000E+00	7.939	Less than	200.0
BE7	< 3.970E+01	0.000E+00	39.70	No limits specified	
K40	1.340E+02	2.174E+01	45.96	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< -5.04E+01		185	Less than	20000

Field Parameters

Elevation (ft (msl)) 743.36
pH (field) SU 6.16
Temp Celcius (degrees C) 15.61
Dissolved Oxygen (mg/L) 9.4
Spec. Cond. (field) micromhos/cm 64
Oxidation Reduction Potential (ORP)(mV) 395
Turbidity (field) NTU 443

Station: MCGUIRE | **Sample #: 28000634**
Location: M-42 | **Collection Date: 2/18/2008 14:05:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-42**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.767E+00	0.000E+00	4.767	Less than	1000
CO58	< 5.249E+00	0.000E+00	5.249	Less than	1000
FE59	< 6.850E+00	0.000E+00	6.850	Less than	400.0
CO60	< 3.623E+00	0.000E+00	3.623	Less than	300.0
ZN65	< 9.952E+00	0.000E+00	9.952	Less than	300.0
NB95	< 4.556E+00	0.000E+00	4.556	Less than	400.0
ZR95	< 6.519E+00	0.000E+00	6.519	Less than	400.0
I131	< 5.544E+00	0.000E+00	5.544	Less than	2.000
CS134	< 4.017E+00	0.000E+00	4.017	Less than	30.00
CS137	< 5.727E+00	0.000E+00	5.727	Less than	50.00
BALA140	< 8.849E+00	0.000E+00	8.849	Less than	200.0
BE7	< 3.304E+01	0.000E+00	33.04	No limits specified	
K40	< 1.058E+02	0.000E+00	105.8	No limits specified	

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Station: MCGUIRE | **Sample #: 28000634**
Location: M-42 | **Collection Date: 2/18/2008 14:05:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-42**

H3GW | TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level
H3	9.700E+02	6.981E+01	182	Less than 20000

Field Parameters

Elevation (ft (msl)) 734.69
pH (field) SU 7.35
Temp Celcius (degrees C) 24.23
Dissolved Oxygen (mg/L) 7.87
Spec. Cond. (field) micromhos/cm 352.3
Oxidation Reduction Potential (ORP)(mV) 361
Turbidity (field) NTU 14.5

Station: MCGUIRE | **Sample #: 28000635**
Location: M-48
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-48**

UNAVAIL | UNAVAILABLE SAMPLE (NO TESTS PERFORMED)

Units: pCi/liter

	Activity - Error	Calculated MDA	Reporting Level
	NO SAMPLE		

Field Parameters

Elevation (ft (msl)) 740.72
pH (field) SU NS
Temp Celcius (degrees C) NS
Dissolved Oxygen (mg/L) NS
Spec. Cond. (field) micromhos/cm NS
Oxidation Reduction Potential (ORP)(mV) NS
Turbidity (field) NTU NS

Station: MCGUIRE | **Sample #: 28000636**
Location: M-48R | **Collection Date: 2/18/2008 08:25:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-48R**

GAMMAGW | GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level
MN54	< 5.552E+00	0.000E+00	5.552	Less than 1000
CO58	< 5.337E+00	0.000E+00	5.337	Less than 1000
FE59	< 1.145E+01	0.000E+00	11.45	Less than 400.0
CO60	< 6.058E+00	0.000E+00	6.058	Less than 300.0
ZN65	< 9.940E+00	0.000E+00	9.940	Less than 300.0
NB95	< 6.599E+00	0.000E+00	6.599	Less than 400.0
ZR95	< 1.099E+01	0.000E+00	10.99	Less than 400.0
I131	< 7.204E+00	0.000E+00	7.204	Less than 2.000
CS134	< 4.910E+00	0.000E+00	4.910	Less than 30.00
CS137	< 4.694E+00	0.000E+00	4.694	Less than 50.00
BALA140	< 7.230E+00	0.000E+00	7.230	Less than 200.0
BE7	< 4.425E+01	0.000E+00	44.25	No limits specified
K40	9.381E+01	3.446E+01	58.80	No limits specified

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000636**
Location: M-48R | **Collection Date: 2/18/2008 08:25:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-48R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	7.650E+02	6.701E+01	182	Less than	20000

SR89SR90 — RADIOSTRONTIUM (SR89 & SR90)

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
SR89	< 6.33E-01			No limits specified
SR90	< 1.26E+00			No limits specified

Field Parameters

Elevation (ft (msl)) 739.07
pH (field) SU 6.06
Temp Celcius (degrees C) 20.64
Dissolved Oxygen (mg/L) 3.73
Spec. Cond. (field) micromhos/cm 61.1
Oxidation Reduction Potential (ORP)(mV) 338
Turbidity (field) NTU 17.2

Station: MCGUIRE | **Sample #: 28000637**
Location: M-48DR | **Collection Date: 2/18/2008 08:45:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-48DR**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.137E+00	0.000E+00	4.137	Less than	1000
CO58	< 3.095E+00	0.000E+00	3.095	Less than	1000
FE59	< 1.012E+01	0.000E+00	10.12	Less than	400.0
CO60	< 4.526E+00	0.000E+00	4.526	Less than	300.0
ZN65	< 9.071E+00	0.000E+00	9.071	Less than	300.0
NB95	< 5.060E+00	0.000E+00	5.060	Less than	400.0
ZR95	< 6.127E+00	0.000E+00	6.127	Less than	400.0
I131	< 4.712E+00	0.000E+00	4.712	Less than	2.000
CS134	< 3.272E+00	0.000E+00	3.272	Less than	30.00
CS137	< 3.879E+00	0.000E+00	3.879	Less than	50.00
BALA140	< 5.636E+00	0.000E+00	5.636	Less than	200.0
BE7	< 3.200E+01	0.000E+00	32.00	No limits specified	
K40	8.451E+01	1.762E+01	46.53	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	7.530E+02	6.730E+01	184	Less than	20000

SR89SR90 — RADIOSTRONTIUM (SR89 & SR90)

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
SR89	< 3.97E-01			No limits specified

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000637**
Location: M-48DR | **Collection Date: 2/18/2008 08:45:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-48DR**

SR89SR90 — RADIOSTRONTIUM (SR89 & SR90)

Units: pCi/liter

	Activity - Error	Calculated MDA	Reporting Level
SR90	< 4.77E-01		No limits specified

Field Parameters

Elevation (ft (msl)) 716.07
pH (field) SU 6.87
Temp Celcius (degrees C) 20.35
Dissolved Oxygen (mg/L) 2.18
Spec. Cond. (field) micromhos/cm 116.8
Oxidation Reduction Potential (ORP)(mV) 272
Turbidity (field) NTU 13

Station: MCGUIRE | **Sample #: 28000638**
Location: M-53 | **Collection Date: 2/18/2008 14:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-53**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level
MN54	< 4.377E+00	0.000E+00	4.377	Less than 1000
CO58	< 3.622E+00	0.000E+00	3.622	Less than 1000
FE59	< 9.319E+00	0.000E+00	9.319	Less than 400.0
CO60	< 5.629E+00	0.000E+00	5.629	Less than 300.0
ZN65	< 9.062E+00	0.000E+00	9.062	Less than 300.0
NB95	< 4.097E+00	0.000E+00	4.097	Less than 400.0
ZR95	< 6.262E+00	0.000E+00	6.262	Less than 400.0
I131	< 5.257E+00	0.000E+00	5.257	Less than 2.000
CS134	< 4.028E+00	0.000E+00	4.028	Less than 30.00
CS137	< 4.519E+00	0.000E+00	4.519	Less than 50.00
BALA140	< 6.401E+00	0.000E+00	6.401	Less than 200.0
BE7	< 3.696E+01	0.000E+00	36.96	No limits specified
K40	6.795E+01	2.252E+01	43.53	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level
H3	1.040E+03	7.085E+01	184	Less than 20000

Field Parameters

Elevation (ft (msl)) 744.95
pH (field) SU 5.08
Temp Celcius (degrees C) 21.38
Dissolved Oxygen (mg/L) 6.33
Spec. Cond. (field) micromhos/cm 32
Oxidation Reduction Potential (ORP)(mV) 707
Turbidity (field) NTU 171

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000639**
Location: M-55 | **Collection Date: 2/18/2008 10:10:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-55**

GAMMAGW | GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.327E+00	0.000E+00	5.327	Less than	1000
CO58	< 4.654E+00	0.000E+00	4.654	Less than	1000
FE59	< 1.260E+01	0.000E+00	12.60	Less than	400.0
CO60	< 5.173E+00	0.000E+00	5.173	Less than	300.0
ZN65	< 9.677E+00	0.000E+00	9.677	Less than	300.0
NB95	< 6.721E+00	0.000E+00	6.721	Less than	400.0
ZR95	< 8.705E+00	0.000E+00	8.705	Less than	400.0
I131	< 6.578E+00	0.000E+00	6.578	Less than	2.000
CS134	< 4.949E+00	0.000E+00	4.949	Less than	30.00
CS137	< 5.899E+00	0.000E+00	5.899	Less than	50.00
BALA140	< 6.354E+00	0.000E+00	6.354	Less than	200.0
BE7	6.414E+01	3.524E+01	34.99	No limits specified	
K40	1.933E+02	3.818E+01	58.67	No limits specified	

H3GW | TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< 6.43E+01		181	Less than	20000

Field Parameters

Elevation (ft (msl)) 748.79
pH (field) SU 4.59
Temp Celcius (degrees C) 21.23
Dissolved Oxygen (mg/L) 7.16
Spec. Cond. (field) micromhos/cm 19
Oxidation Reduction Potential (ORP)(mV) 432
Turbidity (field) NTU 34.1

Station: MCGUIRE | **Sample #: 28000640**
Location: M-59 | **Collection Date: 2/18/2008 11:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-59**

GAMMAGW | GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.301E+00	0.000E+00	4.301	Less than	1000
CO58	< 5.252E+00	0.000E+00	5.252	Less than	1000
FE59	< 1.033E+01	0.000E+00	10.33	Less than	400.0
CO60	< 6.912E+00	0.000E+00	6.912	Less than	300.0
ZN65	< 9.603E+00	0.000E+00	9.603	Less than	300.0
NB95	< 6.009E+00	0.000E+00	6.009	Less than	400.0
ZR95	< 9.327E+00	0.000E+00	9.327	Less than	400.0
I131	< 5.184E+00	0.000E+00	5.184	Less than	2.000
CS134	< 3.969E+00	0.000E+00	3.969	Less than	30.00
CS137	< 4.840E+00	0.000E+00	4.840	Less than	50.00
BALA140	< 8.354E+00	0.000E+00	8.354	Less than	200.0
BE7	< 4.751E+01	0.000E+00	47.51	No limits specified	
K40	< 9.863E+01	0.000E+00	98.63	No limits specified	

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Station: MCGUIRE | **Sample #: 28000640**
Location: M-59 | **Collection Date: 2/18/2008 11:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-59**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	6.450E+02	6.467E+01	180	Less than	20000

Field Parameters

Elevation (ft (msl)) 733.88
pH (field) SU 6.08
Temp Celcius (degrees C) 23
Dissolved Oxygen (mg/L) 4.48
Spec. Cond. (field) micromhos/cm 75.6
Oxidation Reduction Potential (ORP)(mV) 361
Turbidity (field) NTU 64.2

Station: MCGUIRE | **Sample #: 28000641**
Location: M-60 | **Collection Date: 2/21/2008 08:55:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-60**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 3.968E+00	0.000E+00	3.968	Less than	1000
CO58	< 3.758E+00	0.000E+00	3.758	Less than	1000
FE59	< 6.088E+00	0.000E+00	6.088	Less than	400.0
CO60	< 4.512E+00	0.000E+00	4.512	Less than	300.0
ZN65	< 8.608E+00	0.000E+00	8.608	Less than	300.0
NB95	< 4.764E+00	0.000E+00	4.764	Less than	400.0
ZR95	< 6.983E+00	0.000E+00	6.983	Less than	400.0
I131	< 4.991E+00	0.000E+00	4.991	Less than	2.000
CS134	< 3.889E+00	0.000E+00	3.889	Less than	30.00
CS137	< 3.888E+00	0.000E+00	3.888	Less than	50.00
BALA140	< 6.755E+00	0.000E+00	6.755	Less than	200.0
BE7	< 3.431E+01	0.000E+00	34.31	No limits specified	
K40	1.404E+02	2.517E+01	37.93	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< 6.06E+01		160	Less than	20000

Field Parameters

Elevation (ft (msl)) 750.15
pH (field) SU 5.84
Temp Celcius (degrees C) 13.42
Dissolved Oxygen (mg/L) 8
Spec. Cond. (field) micromhos/cm 167.5
Oxidation Reduction Potential (ORP)(mV) 424
Turbidity (field) NTU 423

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Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000642**
Location: M-62 | **Collection Date: 2/18/2008 10:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-62**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.083E+00	0.000E+00	4.083	Less than	1000
CO58	< 3.703E+00	0.000E+00	3.703	Less than	1000
FE59	< 8.019E+00	0.000E+00	8.019	Less than	400.0
CO60	< 5.940E+00	0.000E+00	5.940	Less than	300.0
ZN65	< 9.974E+00	0.000E+00	9.974	Less than	300.0
NB95	< 4.971E+00	0.000E+00	4.971	Less than	400.0
ZR95	< 9.294E+00	0.000E+00	9.294	Less than	400.0
I131	< 5.312E+00	0.000E+00	5.312	Less than	2.000
CS134	< 3.912E+00	0.000E+00	3.912	Less than	30.00
CS137	< 5.007E+00	0.000E+00	5.007	Less than	50.00
BALA140	< 5.343E+00	0.000E+00	5.343	Less than	200.0
BE7	< 3.585E+01	0.000E+00	35.85	No limits specified	
K40	1.342E+02	2.023E+01	34.81	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Calculated MDA	Reporting Level	
H3	< 6.68E+01	182	Less than	20000

Field Parameters

Elevation (ft (msl)) 733.14
pH (field) SU 5.36
Temp Celcius (degrees C) 17.77
Dissolved Oxygen (mg/L) 7.35
Spec. Cond. (field) micromhos/cm 69
Oxidation Reduction Potential (ORP)(mV) 449
Turbidity (field) NTU 207

Station: MCGUIRE | **Sample #: 28000643**
Location: M-64 | **Collection Date: 2/18/2008 09:10:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-64**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.765E+00	0.000E+00	5.765	Less than	1000
CO58	< 4.573E+00	0.000E+00	4.573	Less than	1000
FE59	< 8.304E+00	0.000E+00	8.304	Less than	400.0
CO60	< 5.562E+00	0.000E+00	5.562	Less than	300.0
ZN65	< 8.740E+00	0.000E+00	8.740	Less than	300.0
NB95	< 5.438E+00	0.000E+00	5.438	Less than	400.0
ZR95	< 9.782E+00	0.000E+00	9.782	Less than	400.0
I131	< 6.299E+00	0.000E+00	6.299	Less than	2.000
CS134	< 4.573E+00	0.000E+00	4.573	Less than	30.00
CS137	< 4.260E+00	0.000E+00	4.260	Less than	50.00
BALA140	< 9.632E+00	0.000E+00	9.632	Less than	200.0
BE7	< 3.849E+01	0.000E+00	38.49	No limits specified	
K40	6.534E+01	2.706E+01	67.02	No limits specified	

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Station: MCGUIRE | **Sample #: 28000643**
Location: M-64 | **Collection Date: 2/18/2008 09:10:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-64**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
H3	5.050E+02	6.352E+01	183	Less than	20000

Field Parameters

Elevation (ft (msl)) 743.72
pH (field) SU 5.2
Temp Celcius (degrees C) 18.51
Dissolved Oxygen (mg/L) 7.85
Spec. Cond. (field) micromhos/cm 40
Oxidation Reduction Potential (ORP)(mV) 449
Turbidity (field) NTU >1000

Station: MCGUIRE | **Sample #: 28000644**
Location: M-66 | **Collection Date: 2/18/2008 08:10:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-66**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
MN54	< 4.239E+00	0.000E+00	4.239	Less than	1000
CO58	< 4.250E+00	0.000E+00	4.250	Less than	1000
FE59	< 7.431E+00	0.000E+00	7.431	Less than	400.0
CO60	< 4.645E+00	0.000E+00	4.645	Less than	300.0
ZN65	< 7.875E+00	0.000E+00	7.875	Less than	300.0
NB95	< 4.147E+00	0.000E+00	4.147	Less than	400.0
ZR95	< 5.705E+00	0.000E+00	5.705	Less than	400.0
I131	< 4.737E+00	0.000E+00	4.737	Less than	2.000
CS134	< 3.957E+00	0.000E+00	3.957	Less than	30.00
CS137	< 4.590E+00	0.000E+00	4.590	Less than	50.00
BALA140	< 4.792E+00	0.000E+00	4.792	Less than	200.0
BE7	< 3.204E+01	0.000E+00	32.04	No limits specified	
K40	7.644E+01	2.226E+01	43.46	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
H3	5.630E+02	6.371E+01	181	Less than	20000

Field Parameters

Elevation (ft (msl)) 742.47
pH (field) SU 4.95
Temp Celcius (degrees C) 17.6
Dissolved Oxygen (mg/L) 8.16
Spec. Cond. (field) micromhos/cm 42
Oxidation Reduction Potential (ORP)(mV) 396
Turbidity (field) NTU 359

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Station: MCGUIRE | **Sample #: 28000645**
Location: M-66R | **Collection Date: 2/18/2008 08:55:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-66R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.766E+00	0.000E+00	4.766	Less than	1000
CO58	< 3.214E+00	0.000E+00	3.214	Less than	1000
FE59	< 9.341E+00	0.000E+00	9.341	Less than	400.0
CO60	< 4.787E+00	0.000E+00	4.787	Less than	300.0
ZN65	< 8.412E+00	0.000E+00	8.412	Less than	300.0
NB95	< 4.441E+00	0.000E+00	4.441	Less than	400.0
ZR95	< 7.360E+00	0.000E+00	7.360	Less than	400.0
I131	< 5.781E+00	0.000E+00	5.781	Less than	2.000
CS134	< 3.872E+00	0.000E+00	3.872	Less than	30.00
CS137	< 4.048E+00	0.000E+00	4.048	Less than	50.00
BALA140	< 6.109E+00	0.000E+00	6.109	Less than	200.0
BE7	< 3.746E+01	0.000E+00	37.46	No limits specified	
K40	6.361E+01	2.188E+01	50.79	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< -4.51E+00		184	Less than	20000

Field Parameters

Elevation (ft (msl)) 737.88
pH (field) SU 8.04
Temp Celcius (degrees C) 17.78
Dissolved Oxygen (mg/L) 1.61
Spec. Cond. (field) micromhos/cm 195.3
Oxidation Reduction Potential (ORP)(mV) 13
Turbidity (field) NTU 5.71

Station: MCGUIRE | **Sample #: 28000646**
Location: M-68 | **Collection Date: 2/18/2008 08:05:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-68**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.370E+00	0.000E+00	4.370	Less than	1000
CO58	< 3.581E+00	0.000E+00	3.581	Less than	1000
FE59	< 9.032E+00	0.000E+00	9.032	Less than	400.0
CO60	< 5.624E+00	0.000E+00	5.624	Less than	300.0
ZN65	< 9.911E+00	0.000E+00	9.911	Less than	300.0
NB95	< 4.632E+00	0.000E+00	4.632	Less than	400.0
ZR95	< 7.585E+00	0.000E+00	7.585	Less than	400.0
I131	< 5.742E+00	0.000E+00	5.742	Less than	2.000
CS134	< 4.205E+00	0.000E+00	4.205	Less than	30.00
CS137	< 4.285E+00	0.000E+00	4.285	Less than	50.00
BALA140	< 4.465E+00	0.000E+00	4.465	Less than	200.0
BE7	< 3.850E+01	0.000E+00	38.50	No limits specified	
K40	8.775E+01	1.602E+01	33.77	No limits specified	

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Station: MCGUIRE | **Sample #: 28000646**
Location: M-68 | **Collection Date: 2/18/2008 08:05:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-68**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
H3	1.020E+03	7.019E+01	182	Less than	20000

Field Parameters

Elevation (ft (msl)) 734.79
pH (field) SU 5.7
Temp Celcius (degrees C) 20.94
Dissolved Oxygen (mg/L) 7.6
Spec. Cond. (field) micromhos/cm 52.3
Oxidation Reduction Potential (ORP)(mV) 416
Turbidity (field) NTU 23.5

Station: MCGUIRE | **Sample #: 28000647**
Location: M-70 | **Collection Date: 2/18/2008 12:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-70**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
MN54	< 5.253E+00	0.000E+00	5.253	Less than	1000
CO58	< 5.143E+00	0.000E+00	5.143	Less than	1000
FE59	< 7.917E+00	0.000E+00	7.917	Less than	400.0
CO60	< 6.570E+00	0.000E+00	6.570	Less than	300.0
ZN65	< 9.548E+00	0.000E+00	9.548	Less than	300.0
NB95	< 5.455E+00	0.000E+00	5.455	Less than	400.0
ZR95	< 7.895E+00	0.000E+00	7.895	Less than	400.0
I131	< 5.384E+00	0.000E+00	5.384	Less than	2.000
CS134	< 4.040E+00	0.000E+00	4.040	Less than	30.00
CS137	< 4.052E+00	0.000E+00	4.052	Less than	50.00
BALA140	< 6.194E+00	0.000E+00	6.194	Less than	200.0
BE7	< 3.465E+01	0.000E+00	34.65	No limits specified	
K40	8.292E+01	2.645E+01	61.56	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
H3	3.450E+02	6.134E+01	184	Less than	20000

SR89SR90 — RADIOSTRONTIUM (SR89 & SR90)

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level
SR89	< 4.01E-01			No limits specified
SR90	< 5.49E-01			No limits specified

Field Parameters

Elevation (ft (msl)) 747.04
pH (field) SU 4.91
Temp Celcius (degrees C) 18.7
Dissolved Oxygen (mg/L) 6.08
Spec. Cond. (field) micromhos/cm 34.2
Oxidation Reduction Potential (ORP)(mV) 411
Turbidity (field) NTU 237

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Station: MCGUIRE | **Sample #: 28000648**
Location: M-70R | **Collection Date: 2/18/2008 10:55:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-70R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.453E+00	0.000E+00	4.453	Less than 1000
CO58	< 4.428E+00	0.000E+00	4.428	Less than 1000
FE59	< 8.443E+00	0.000E+00	8.443	Less than 400.0
CO60	< 3.691E+00	0.000E+00	3.691	Less than 300.0
ZN65	< 6.468E+00	0.000E+00	6.468	Less than 300.0
NB95	< 6.053E+00	0.000E+00	6.053	Less than 400.0
ZR95	< 7.725E+00	0.000E+00	7.725	Less than 400.0
I131	< 6.389E+00	0.000E+00	6.389	Less than 2.000
CS134	< 3.758E+00	0.000E+00	3.758	Less than 30.00
CS137	< 4.355E+00	0.000E+00	4.355	Less than 50.00
BALA140	< 7.105E+00	0.000E+00	7.105	Less than 200.0
BE7	< 3.566E+01	0.000E+00	35.66	No limits specified
K40	7.607E+01	2.393E+01	54.33	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	2.730E+02	5.330E+01	160	Less than 20000

SR89SR90 — RADIOSTRONTIUM (SR89 & SR90)

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
SR89	< 3.33E-01			No limits specified
SR90	< 4.85E-01			No limits specified

Field Parameters

Elevation (ft (msl)) 745.47
pH (field) SU 6.95
Temp Celcius (degrees C) 17.74
Dissolved Oxygen (mg/L) 15.33
Spec. Cond. (field) micromhos/cm 97.2
Oxidation Reduction Potential (ORP)(mV) 280
Turbidity (field) NTU 275

Station: MCGUIRE | **Sample #: 28000649**
Location: M-70DR | **Collection Date: 2/18/2008 11:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-70DR**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 3.874E+00	0.000E+00	3.874	Less than 1000
CO58	< 3.635E+00	0.000E+00	3.635	Less than 1000
FE59	< 8.565E+00	0.000E+00	8.565	Less than 400.0
CO60	< 5.011E+00	0.000E+00	5.011	Less than 300.0
ZN65	< 8.814E+00	0.000E+00	8.814	Less than 300.0
NB95	< 4.826E+00	0.000E+00	4.826	Less than 400.0
ZR95	< 7.489E+00	0.000E+00	7.489	Less than 400.0
I131	< 5.015E+00	0.000E+00	5.015	Less than 2.000

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Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000649**
Location: M-70DR | **Collection Date: 2/18/2008 11:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-70DR**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
CS134	< 4.050E+00	0.000E+00	4.050	Less than 30.00
CS137	< 4.388E+00	0.000E+00	4.388	Less than 50.00
BALA140	< 6.160E+00	0.000E+00	6.160	Less than 200.0
BE7	< 3.702E+01	0.000E+00	37.02	No limits specified
K40	< 6.379E+01	0.000E+00	63.79	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	< 9.25E+01		160	Less than 20000

SR89SR90 — RADIOSTRONTIUM (SR89 & SR90)

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
SR89	< 4.91E-01			No limits specified
SR90	< 8.25E-01			No limits specified

Field Parameters

Elevation (ft (msl)) 745.3
pH (field) SU 6.81
Temp Celcius (degrees C) 18.43
Dissolved Oxygen (mg/L) 1
Spec. Cond. (field) micromhos/cm 143.1
Oxidation Reduction Potential (ORP)(mV) 255
Turbidity (field) NTU 21.9

Station: MCGUIRE | **Sample #: 28000650**
Location: M-72 | **Collection Date: 2/18/2008 11:40:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-72**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.722E+00	0.000E+00	4.722	Less than 1000
CO58	< 3.886E+00	0.000E+00	3.886	Less than 1000
FE59	< 7.986E+00	0.000E+00	7.986	Less than 400.0
CO60	< 6.146E+00	0.000E+00	6.146	Less than 300.0
ZN65	< 9.921E+00	0.000E+00	9.921	Less than 300.0
NB95	< 4.845E+00	0.000E+00	4.845	Less than 400.0
ZR95	< 7.639E+00	0.000E+00	7.639	Less than 400.0
I131	< 5.724E+00	0.000E+00	5.724	Less than 2.000
CS134	< 4.035E+00	0.000E+00	4.035	Less than 30.00
CS137	< 4.258E+00	0.000E+00	4.258	Less than 50.00
BALA140	< 4.900E+00	0.000E+00	4.900	Less than 200.0
BE7	< 3.583E+01	0.000E+00	35.83	No limits specified
K40	1.702E+02	3.205E+01	58.30	No limits specified

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Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000650**
Location: M-72 | **Collection Date: 2/18/2008 11:40:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-72**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	7.990E+02	6.170E+01	161	Less than	20000

Field Parameters

Elevation (ft (msl)) 751
pH (field) SU 4.45
Temp Celcius (degrees C) 20.86
Dissolved Oxygen (mg/L) 2.02
Spec. Cond. (field) micromhos/cm 38.7
Oxidation Reduction Potential (ORP)(mV) 479
Turbidity (field) NTU 88.4

Station: MCGUIRE | **Sample #: 28000651**
Location: M-76 | **Collection Date: 2/18/2008 14:10:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-76**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.201E+00	0.000E+00	5.201	Less than	1000
CO58	< 7.659E+00	0.000E+00	7.659	Less than	1000
FE59	< 1.265E+01	0.000E+00	12.65	Less than	400.0
CO60	< 6.665E+00	0.000E+00	6.665	Less than	300.0
ZN65	< 9.255E+00	0.000E+00	9.255	Less than	300.0
NB95	< 7.329E+00	0.000E+00	7.329	Less than	400.0
ZR95	< 1.115E+01	0.000E+00	11.15	Less than	400.0
I131	< 7.155E+00	0.000E+00	7.155	Less than	2.000
CS134	< 6.679E+00	0.000E+00	6.679	Less than	30.00
CS137	< 6.608E+00	0.000E+00	6.608	Less than	50.00
BALA140	< 1.109E+01	0.000E+00	11.09	Less than	200.0
BE7	5.627E+01	2.265E+01	56.65	No limits specified	
K40	< 1.100E+02	0.000E+00	110.0	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	9.360E+02	6.270E+01	158	Less than	20000

Field Parameters

Elevation (ft (msl)) 713.34
pH (field) SU 6.33
Temp Celcius (degrees C) 22.37
Dissolved Oxygen (mg/L) .38
Spec. Cond. (field) micromhos/cm 162.2
Oxidation Reduction Potential (ORP)(mV) 321
Turbidity (field) NTU 84.3

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Station: MCGUIRE | **Sample #: 28000652**
Location: M-82 | **Collection Date: 2/20/2008 09:00:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-82**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.128E+00	0.000E+00	4.128	Less than	1000
CO58	< 4.125E+00	0.000E+00	4.125	Less than	1000
FE59	< 8.025E+00	0.000E+00	8.025	Less than	400.0
CO60	< 4.522E+00	0.000E+00	4.522	Less than	300.0
ZN65	< 9.133E+00	0.000E+00	9.133	Less than	300.0
NB95	< 4.767E+00	0.000E+00	4.767	Less than	400.0
ZR95	< 7.201E+00	0.000E+00	7.201	Less than	400.0
I131	< 5.201E+00	0.000E+00	5.201	Less than	2.000
CS134	< 4.379E+00	0.000E+00	4.379	Less than	30.00
CS137	< 3.766E+00	0.000E+00	3.766	Less than	50.00
BALA140	< 5.671E+00	0.000E+00	5.671	Less than	200.0
BE7	< 3.564E+01	0.000E+00	35.64	No limits specified	
K40	1.111E+02	2.290E+01	44.83	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	1.680E+03	7.210E+01	160	Less than	20000

Field Parameters

Elevation (ft (msl)) 648.93
pH (field) SU 6.01
Temp Celcius (degrees C) 13.33
Dissolved Oxygen (mg/L) 9.51
Spec. Cond. (field) micromhos/cm 126
Oxidation Reduction Potential (ORP)(mV) 408
Turbidity (field) NTU 911

Station: MCGUIRE | **Sample #: 28000653**
Location: M-84 | **Collection Date: 2/19/2008 14:05:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-84**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 3.145E+00	0.000E+00	3.145	Less than	1000
CO58	< 3.163E+00	0.000E+00	3.163	Less than	1000
FE59	< 7.027E+00	0.000E+00	7.027	Less than	400.0
CO60	< 3.091E+00	0.000E+00	3.091	Less than	300.0
ZN65	< 7.891E+00	0.000E+00	7.891	Less than	300.0
NB95	< 3.287E+00	0.000E+00	3.287	Less than	400.0
ZR95	< 6.318E+00	0.000E+00	6.318	Less than	400.0
I131	< 4.282E+00	0.000E+00	4.282	Less than	2.000
CS134	< 3.308E+00	0.000E+00	3.308	Less than	30.00
CS137	< 3.294E+00	0.000E+00	3.294	Less than	50.00
BALA140	< 5.377E+00	0.000E+00	5.377	Less than	200.0
BE7	< 2.813E+01	0.000E+00	28.13	No limits specified	
K40	5.632E+01	1.631E+01	35.13	No limits specified	

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000653**
Location: M-84 | **Collection Date: 2/19/2008 14:05:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-84**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	5.560E+03	1.100E+02	159	Less than	20000

Field Parameters

Elevation (ft (msl)) 648.37
pH (field) SU 5.17
Temp Celcius (degrees C) 13.99
Dissolved Oxygen (mg/L) 5.11
Spec. Cond. (field) micromhos/cm 207
Oxidation Reduction Potential (ORP)(mV) 499
Turbidity (field) NTU 90

Station: MCGUIRE | **Sample #: 28000654**
Location: M-84R | **Collection Date: 2/19/2008 14:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-84R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.895E+00	0.000E+00	4.895	Less than	1000
CO58	< 4.474E+00	0.000E+00	4.474	Less than	1000
FE59	< 9.215E+00	0.000E+00	9.215	Less than	400.0
CO60	< 4.554E+00	0.000E+00	4.554	Less than	300.0
ZN65	< 9.058E+00	0.000E+00	9.058	Less than	300.0
NB95	< 5.658E+00	0.000E+00	5.658	Less than	400.0
ZR95	< 7.376E+00	0.000E+00	7.376	Less than	400.0
I131	< 5.432E+00	0.000E+00	5.432	Less than	2.000
CS134	< 4.247E+00	0.000E+00	4.247	Less than	30.00
CS137	< 4.471E+00	0.000E+00	4.471	Less than	50.00
BALA140	< 6.832E+00	0.000E+00	6.832	Less than	200.0
BE7	< 3.888E+01	0.000E+00	38.88	No limits specified	
K40	1.697E+02	2.757E+01	48.75	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	6.930E+03	1.200E+02	159	Less than	20000

Field Parameters

Elevation (ft (msl)) 648.41
pH (field) SU 5.92
Temp Celcius (degrees C) 15.16
Dissolved Oxygen (mg/L) 5.2
Spec. Cond. (field) micromhos/cm 250
Oxidation Reduction Potential (ORP)(mV) 446
Turbidity (field) NTU 10.5

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000655**
Location: M-85 | **Collection Date: 2/19/2008 15:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-85**

GAMMAGW | GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.233E+00	0.000E+00	4.233	Less than	1000
CO58	< 4.486E+00	0.000E+00	4.486	Less than	1000
FE59	< 7.084E+00	0.000E+00	7.084	Less than	400.0
CO60	< 5.154E+00	0.000E+00	5.154	Less than	300.0
ZN65	< 9.740E+00	0.000E+00	9.740	Less than	300.0
NB95	< 4.923E+00	0.000E+00	4.923	Less than	400.0
ZR95	< 6.659E+00	0.000E+00	6.659	Less than	400.0
I131	< 5.112E+00	0.000E+00	5.112	Less than	2.000
CS134	< 3.944E+00	0.000E+00	3.944	Less than	30.00
CS137	< 4.049E+00	0.000E+00	4.049	Less than	50.00
BALA140	< 4.462E+00	0.000E+00	4.462	Less than	200.0
BE7	< 3.843E+01	0.000E+00	38.43	No limits specified	
K40	1.410E+02	2.872E+01	44.69	No limits specified	

H3GW | TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	1.390E+03	6.960E+01	161	Less than	20000

Field Parameters

Elevation (ft (msl)) 653.34
pH (field) SU 5.91
Temp Celcius (degrees C) 13.34
Dissolved Oxygen (mg/L) 4.64
Spec. Cond. (field) micromhos/cm 115
Oxidation Reduction Potential (ORP)(mV) 452
Turbidity (field) NTU 115

Station: MCGUIRE | **Sample #: 28000656**
Location: M-87 | **Collection Date: 2/19/2008 09:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-87**

GAMMAGW | GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.523E+00	0.000E+00	5.523	Less than	1000
CO58	< 5.089E+00	0.000E+00	5.089	Less than	1000
FE59	< 8.820E+00	0.000E+00	8.820	Less than	400.0
CO60	< 5.837E+00	0.000E+00	5.837	Less than	300.0
ZN65	< 9.908E+00	0.000E+00	9.908	Less than	300.0
NB95	< 6.290E+00	0.000E+00	6.290	Less than	400.0
ZR95	< 1.007E+01	0.000E+00	10.07	Less than	400.0
I131	< 4.858E+00	0.000E+00	4.858	Less than	2.000
CS134	< 4.467E+00	0.000E+00	4.467	Less than	30.00
CS137	< 5.691E+00	0.000E+00	5.691	Less than	50.00
BALA140	< 8.621E+00	0.000E+00	8.621	Less than	200.0
BE7	< 4.380E+01	0.000E+00	43.80	No limits specified	
K40	9.033E+01	2.535E+01	56.63	No limits specified	

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE — **Sample #: 28000656**
Location: M-87 — **Collection Date: 2/19/2008 09:20:00**
Type: GROUND WATER — **MNS GROUND WATER PROTECTION PROGRAM - M-87**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	2.580E+02	5.340E+01	161	Less than	20000

Field Parameters

Elevation (ft (msl)) 661.5
pH (field) SU 6.48
Temp Celcius (degrees C) 13.41
Dissolved Oxygen (mg/L) .22
Spec. Cond. (field) micromhos/cm 290
Oxidation Reduction Potential (ORP)(mV) 124
Turbidity (field) NTU 21

Station: MCGUIRE — **Sample #: 28000657**
Location: M-89 — **Collection Date: 2/19/2008 09:00:00**
Type: GROUND WATER — **MNS GROUND WATER PROTECTION PROGRAM - M-89**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.582E+00	0.000E+00	4.582	Less than	1000
CO58	< 4.435E+00	0.000E+00	4.435	Less than	1000
FE59	< 7.989E+00	0.000E+00	7.989	Less than	400.0
CO60	< 4.864E+00	0.000E+00	4.864	Less than	300.0
ZN65	< 7.656E+00	0.000E+00	7.656	Less than	300.0
NB95	< 5.191E+00	0.000E+00	5.191	Less than	400.0
ZR95	< 7.555E+00	0.000E+00	7.555	Less than	400.0
I131	< 5.198E+00	0.000E+00	5.198	Less than	2.000
CS134	< 4.223E+00	0.000E+00	4.223	Less than	30.00
CS137	< 3.840E+00	0.000E+00	3.840	Less than	50.00
BALA140	< 5.789E+00	0.000E+00	5.789	Less than	200.0
BE7	< 3.517E+01	0.000E+00	35.17	No limits specified	
K40	< 6.274E+01	0.000E+00	62.74	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	5.100E+02	5.760E+01	162	Less than	20000

Field Parameters

Elevation (ft (msl)) 714.74
pH (field) SU 4.98
Temp Celcius (degrees C) 14.54
Dissolved Oxygen (mg/L) 1.17
Spec. Cond. (field) micromhos/cm 27.2
Oxidation Reduction Potential (ORP)(mV) 464
Turbidity (field) NTU 8.04

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000658**
Location: M-91 | **Collection Date: 2/19/2008 10:25:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-91**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 8.434E+00	0.000E+00	8.434	Less than	1000
CO58	< 3.772E+00	0.000E+00	3.772	Less than	1000
FE59	< 1.055E+01	0.000E+00	10.55	Less than	400.0
CO60	< 6.840E+00	0.000E+00	6.840	Less than	300.0
ZN65	< 9.335E+00	0.000E+00	9.335	Less than	300.0
NB95	< 4.473E+00	0.000E+00	4.473	Less than	400.0
ZR95	< 1.051E+01	0.000E+00	10.51	Less than	400.0
I131	< 8.017E+00	0.000E+00	8.017	Less than	2.000
CS134	< 5.763E+00	0.000E+00	5.763	Less than	30.00
CS137	< 5.977E+00	0.000E+00	5.977	Less than	50.00
BALA140	< 9.193E+00	0.000E+00	9.193	Less than	200.0
BE7	3.842E+01	1.878E+01	55.59	No limits specified	
K40	< 1.283E+02	0.000E+00	128.3	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	3.420E+02	5.490E+01	162	Less than	20000

Field Parameters

Elevation (ft (msl)) 718.19
pH (field) SU 5.57
Temp Celcius (degrees C) 16.15
Dissolved Oxygen (mg/L) 6.39
Spec. Cond. (field) micromhos/cm 30
Oxidation Reduction Potential (ORP)(mV) 432
Turbidity (field) NTU >1000

Station: MCGUIRE | **Sample #: 28000659**
Location: M-91R | **Collection Date: 2/19/2008 10:45:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-91R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.722E+00	0.000E+00	5.722	Less than	1000
CO58	< 2.846E+00	0.000E+00	2.846	Less than	1000
FE59	< 9.455E+00	0.000E+00	9.455	Less than	400.0
CO60	< 4.094E+00	0.000E+00	4.094	Less than	300.0
ZN65	< 8.469E+00	0.000E+00	8.469	Less than	300.0
NB95	< 4.655E+00	0.000E+00	4.655	Less than	400.0
ZR95	< 8.451E+00	0.000E+00	8.451	Less than	400.0
I131	< 5.552E+00	0.000E+00	5.552	Less than	2.000
CS134	< 4.289E+00	0.000E+00	4.289	Less than	30.00
CS137	< 5.128E+00	0.000E+00	5.128	Less than	50.00
BALA140	< 6.593E+00	0.000E+00	6.593	Less than	200.0
BE7	< 4.091E+01	0.000E+00	40.91	No limits specified	
K40	2.516E+02	3.289E+01	50.40	No limits specified	

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE — **Sample #: 28000659**
Location: M-91R — **Collection Date: 2/19/2008 10:45:00**
Type: GROUND WATER — **MNS GROUND WATER PROTECTION PROGRAM - M-91R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	2.080E+02	5.220E+01	160	Less than	20000

Field Parameters

Elevation (ft (msl)) 717.02
pH (field) SU 7.39
Temp Celcius (degrees C) 14.81
Dissolved Oxygen (mg/L) 9.18
Spec. Cond. (field) micromhos/cm 103.2
Oxidation Reduction Potential (ORP)(mV) 360
Turbidity (field) NTU 20.4

Station: MCGUIRE — **Sample #: 28000660**
Location: M-92 — **Collection Date: 2/19/2008 08:25:00**
Type: GROUND WATER — **MNS GROUND WATER PROTECTION PROGRAM - M-92**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 3.847E+00	0.000E+00	3.847	Less than	1000
CO58	< 3.709E+00	0.000E+00	3.709	Less than	1000
FE59	< 7.782E+00	0.000E+00	7.782	Less than	400.0
CO60	< 3.563E+00	0.000E+00	3.563	Less than	300.0
ZN65	< 9.162E+00	0.000E+00	9.162	Less than	300.0
NB95	< 4.093E+00	0.000E+00	4.093	Less than	400.0
ZR95	< 6.887E+00	0.000E+00	6.887	Less than	400.0
I131	< 4.937E+00	0.000E+00	4.937	Less than	2.000
CS134	< 3.650E+00	0.000E+00	3.650	Less than	30.00
CS137	< 3.737E+00	0.000E+00	3.737	Less than	50.00
BALA140	< 5.426E+00	0.000E+00	5.426	Less than	200.0
BE7	< 3.608E+01	0.000E+00	36.08	No limits specified	
K40	1.939E+02	2.932E+01	43.53	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	2.190E+02	5.200E+01	159	Less than	20000

Field Parameters

Elevation (ft (msl)) 723.65
pH (field) SU 6.58
Temp Celcius (degrees C) 16.5
Dissolved Oxygen (mg/L) .15
Spec. Cond. (field) micromhos/cm 164.4
Oxidation Reduction Potential (ORP)(mV) 69
Turbidity (field) NTU 103

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000661**
Location: M-92R | **Collection Date: 2/19/2008 13:40:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-92R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 3.971E+00	0.000E+00	3.971	Less than 1000
CO58	< 4.984E+00	0.000E+00	4.984	Less than 1000
FE59	< 9.532E+00	0.000E+00	9.532	Less than 400.0
CO60	< 3.426E+00	0.000E+00	3.426	Less than 300.0
ZN65	< 9.564E+00	0.000E+00	9.564	Less than 300.0
NB95	< 4.014E+00	0.000E+00	4.014	Less than 400.0
ZR95	< 8.970E+00	0.000E+00	8.970	Less than 400.0
I131	< 6.869E+00	0.000E+00	6.869	Less than 2.000
CS134	< 4.250E+00	0.000E+00	4.250	Less than 30.00
CS137	< 4.429E+00	0.000E+00	4.429	Less than 50.00
BALA140	< 8.170E+00	0.000E+00	8.170	Less than 200.0
BE7	< 4.336E+01	0.000E+00	43.36	No limits specified
K40	< 9.837E+01	0.000E+00	98.37	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	< -2.68E+01		164	Less than 20000

Field Parameters

Elevation (ft (msl)) 722.08
pH (field) SU 8.13
Temp Celcius (degrees C) 13.58
Dissolved Oxygen (mg/L) 7.4
Spec. Cond. (field) micromhos/cm 257.8
Oxidation Reduction Potential (ORP)(mV) 283
Turbidity (field) NTU 65

Station: MCGUIRE | **Sample #: 28000662**
Location: M-93 | **Collection Date: 2/19/2008 08:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-93**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 6.846E+00	0.000E+00	6.846	Less than 1000
CO58	< 6.971E+00	0.000E+00	6.971	Less than 1000
FE59	< 1.635E+01	0.000E+00	16.35	Less than 400.0
CO60	< 5.399E+00	0.000E+00	5.399	Less than 300.0
ZN65	< 1.704E+01	0.000E+00	17.04	Less than 300.0
NB95	< 5.803E+00	0.000E+00	5.803	Less than 400.0
ZR95	< 7.870E+00	0.000E+00	7.870	Less than 400.0
I131	< 6.660E+00	0.000E+00	6.660	Less than 2.000
CS134	< 5.006E+00	0.000E+00	5.006	Less than 30.00
CS137	< 4.905E+00	0.000E+00	4.905	Less than 50.00
BALA140	< 8.269E+00	0.000E+00	8.269	Less than 200.0
BE7	< 3.710E+01	0.000E+00	37.10	No limits specified
K40	< 9.692E+01	0.000E+00	96.92	No limits specified

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000662**
Location: M-93 | **Collection Date: 2/19/2008 08:20:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-93**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	2.490E+02	5.520E+01	168	Less than 20000

Field Parameters

Elevation (ft (msl)) 722.82
pH (field) SU 5.6
Temp Celcius (degrees C) 16.27
Dissolved Oxygen (mg/L) 6.77
Spec. Cond. (field) micromhos/cm 35
Oxidation Reduction Potential (ORP)(mV) 469
Turbidity (field) NTU 112

Station: MCGUIRE | **Sample #: 28000663**
Location: M-93R | **Collection Date: 2/19/2008 08:50:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-93R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 3.991E+00	0.000E+00	3.991	Less than 1000
CO58	< 4.197E+00	0.000E+00	4.197	Less than 1000
FE59	< 8.129E+00	0.000E+00	8.129	Less than 400.0
CO60	< 4.604E+00	0.000E+00	4.604	Less than 300.0
ZN65	< 8.833E+00	0.000E+00	8.833	Less than 300.0
NB95	< 4.139E+00	0.000E+00	4.139	Less than 400.0
ZR95	< 6.923E+00	0.000E+00	6.923	Less than 400.0
I131	< 5.922E+00	0.000E+00	5.922	Less than 2.000
CS134	< 3.885E+00	0.000E+00	3.885	Less than 30.00
CS137	< 4.263E+00	0.000E+00	4.263	Less than 50.00
BALA140	< 6.678E+00	0.000E+00	6.678	Less than 200.0
BE7	< 3.559E+01	0.000E+00	35.59	No limits specified
K40	1.989E+02	2.693E+01	43.82	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	2.760E+02	5.430E+01	164	Less than 20000

Field Parameters

Elevation (ft (msl)) 725.42
pH (field) SU 7.01
Temp Celcius (degrees C) 13.05
Dissolved Oxygen (mg/L) 11.5
Spec. Cond. (field) micromhos/cm 158
Oxidation Reduction Potential (ORP)(mV) 300
Turbidity (field) NTU 58

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000664**
Location: M-94 | **Collection Date: 2/19/2008 11:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-94**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 5.747E+00	0.000E+00	5.747	Less than 1000
CO58	< 4.748E+00	0.000E+00	4.748	Less than 1000
FE59	< 7.166E+00	0.000E+00	7.166	Less than 400.0
CO60	< 6.301E+00	0.000E+00	6.301	Less than 300.0
ZN65	< 7.427E+00	0.000E+00	7.427	Less than 300.0
NB95	< 3.561E+00	0.000E+00	3.561	Less than 400.0
ZR95	< 8.783E+00	0.000E+00	8.783	Less than 400.0
I131	< 3.811E+00	0.000E+00	3.811	Less than 2.000
CS134	< 4.382E+00	0.000E+00	4.382	Less than 30.00
CS137	< 4.314E+00	0.000E+00	4.314	Less than 50.00
BALA140	< 3.760E+00	0.000E+00	3.760	Less than 200.0
BE7	< 3.913E+01	0.000E+00	39.13	No limits specified
K40	8.994E+01	2.395E+01	36.12	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	< 4.13E+00		164	Less than 20000

Field Parameters

Elevation (ft (msl)) 718.79
pH (field) SU 5.52
Temp Celcius (degrees C) 15.94
Dissolved Oxygen (mg/L) 5.89
Spec. Cond. (field) micromhos/cm 31
Oxidation Reduction Potential (ORP)(mV) 368
Turbidity (field) NTU 10.2

Station: MCGUIRE | **Sample #: 28000665**
Location: M-95 | **Collection Date: 2/21/2008 11:30:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-95**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.535E+00	0.000E+00	4.535	Less than 1000
CO58	< 4.783E+00	0.000E+00	4.783	Less than 1000
FE59	< 7.191E+00	0.000E+00	7.191	Less than 400.0
CO60	< 4.542E+00	0.000E+00	4.542	Less than 300.0
ZN65	< 8.935E+00	0.000E+00	8.935	Less than 300.0
NB95	< 4.218E+00	0.000E+00	4.218	Less than 400.0
ZR95	< 7.063E+00	0.000E+00	7.063	Less than 400.0
I131	< 4.630E+00	0.000E+00	4.630	Less than 2.000
CS134	< 4.636E+00	0.000E+00	4.636	Less than 30.00
CS137	< 4.203E+00	0.000E+00	4.203	Less than 50.00
BALA140	< 6.795E+00	0.000E+00	6.795	Less than 200.0
BE7	< 2.696E+01	0.000E+00	26.96	No limits specified
K40	5.654E+01	2.741E+01	51.92	No limits specified

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Station: MCGUIRE | **Sample #: 28000665**
Location: M-95 | **Collection Date: 2/21/2008 11:30:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-95**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	3.850E+02	5.440E+01	159	Less than	20000

Field Parameters

Elevation (ft (msl)) 715.19
pH (field) SU 6.21
Temp Celcius (degrees C) 18.23
Dissolved Oxygen (mg/L) 5
Spec. Cond. (field) micromhos/cm 219.1
Oxidation Reduction Potential (ORP)(mV) 162
Turbidity (field) NTU 32.8

Station: MCGUIRE | **Sample #: 28000666**
Location: M-95R | **Collection Date: 2/21/2008 11:55:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-95R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.035E+00	0.000E+00	4.035	Less than	1000
CO58	< 3.989E+00	0.000E+00	3.989	Less than	1000
FE59	< 8.008E+00	0.000E+00	8.008	Less than	400.0
CO60	< 4.486E+00	0.000E+00	4.486	Less than	300.0
ZN65	< 9.251E+00	0.000E+00	9.251	Less than	300.0
NB95	< 4.819E+00	0.000E+00	4.819	Less than	400.0
ZR95	< 6.476E+00	0.000E+00	6.476	Less than	400.0
I131	< 4.515E+00	0.000E+00	4.515	Less than	2.000
CS134	< 4.122E+00	0.000E+00	4.122	Less than	30.00
CS137	< 3.798E+00	0.000E+00	3.798	Less than	50.00
BALA140	< 5.823E+00	0.000E+00	5.823	Less than	200.0
BE7	< 3.305E+01	0.000E+00	33.05	No limits specified	
K40	< 4.984E+01	0.000E+00	49.84	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< 1.42E+01		161	Less than	20000

Field Parameters

Elevation (ft (msl)) 710.35
pH (field) SU 6.04
Temp Celcius (degrees C) 17.51
Dissolved Oxygen (mg/L) 2.55
Spec. Cond. (field) micromhos/cm 126.3
Oxidation Reduction Potential (ORP)(mV) 317
Turbidity (field) NTU 18.5

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Station: MCGUIRE | **Sample #: 28000667**
Location: M-96 | **Collection Date: 2/20/2008 09:30:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-96**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 2.541E+00	0.000E+00	2.541	Less than	1000
CO58	< 4.354E+00	0.000E+00	4.354	Less than	1000
FE59	< 1.121E+01	0.000E+00	11.21	Less than	400.0
CO60	< 6.212E+00	0.000E+00	6.212	Less than	300.0
ZN65	< 9.841E+00	0.000E+00	9.841	Less than	300.0
NB95	< 4.088E+00	0.000E+00	4.088	Less than	400.0
ZR95	< 5.453E+00	0.000E+00	5.453	Less than	400.0
I131	< 5.389E+00	0.000E+00	5.389	Less than	2.000
CS134	< 4.124E+00	0.000E+00	4.124	Less than	30.00
CS137	< 4.361E+00	0.000E+00	4.361	Less than	50.00
BALA140	< 6.981E+00	0.000E+00	6.981	Less than	200.0
BE7	< 3.405E+01	0.000E+00	34.05	No limits specified	
K40	< 7.010E+01	0.000E+00	70.10	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< -2.40E+01		158	Less than	20000

Field Parameters

Elevation (ft (msl)) 721.85
pH (field) SU 5.88
Temp Celcius (degrees C) 17.15
Dissolved Oxygen (mg/L) 3.19
Spec. Cond. (field) micromhos/cm 66.2
Oxidation Reduction Potential (ORP)(mV) 423
Turbidity (field) NTU 201

Station: MCGUIRE | **Sample #: 28000668**
Location: M-96R | **Collection Date: 2/20/2008 09:50:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-96R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.532E+00	0.000E+00	5.532	Less than	1000
CO58	< 5.654E+00	0.000E+00	5.654	Less than	1000
FE59	< 1.189E+01	0.000E+00	11.89	Less than	400.0
CO60	< 4.233E+00	0.000E+00	4.233	Less than	300.0
ZN65	< 8.963E+00	0.000E+00	8.963	Less than	300.0
NB95	< 6.240E+00	0.000E+00	6.240	Less than	400.0
ZR95	< 1.025E+01	0.000E+00	10.25	Less than	400.0
I131	< 6.622E+00	0.000E+00	6.622	Less than	2.000
CS134	< 4.447E+00	0.000E+00	4.447	Less than	30.00
CS137	< 6.434E+00	0.000E+00	6.434	Less than	50.00
BALA140	< 8.956E+00	0.000E+00	8.956	Less than	200.0
BE7	< 4.601E+01	0.000E+00	46.01	No limits specified	
K40	6.372E+01	1.839E+01	49.35	No limits specified	

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Station: MCGUIRE | **Sample #: 28000668**
Location: M-96R | **Collection Date: 2/20/2008 09:50:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-96R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
H3	< 5.07E+01		160	Less than	20000

Field Parameters

Elevation (ft (msl)) 722.94
pH (field) SU 7.25
Temp Celcius (degrees C) 16.19
Dissolved Oxygen (mg/L) 15.24
Spec. Cond. (field) micromhos/cm 122.5
Oxidation Reduction Potential (ORP)(mV) 341
Turbidity (field) NTU 79

Station: MCGUIRE | **Sample #: 28000669**
Location: M-97 | **Collection Date: 2/20/2008 11:05:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-97**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
MN54	< 4.194E+00	0.000E+00	4.194	Less than	1000
CO58	< 4.125E+00	0.000E+00	4.125	Less than	1000
FE59	< 9.484E+00	0.000E+00	9.484	Less than	400.0
CO60	< 5.243E+00	0.000E+00	5.243	Less than	300.0
ZN65	< 8.576E+00	0.000E+00	8.576	Less than	300.0
NB95	< 3.871E+00	0.000E+00	3.871	Less than	400.0
ZR95	< 7.589E+00	0.000E+00	7.589	Less than	400.0
I131	< 5.388E+00	0.000E+00	5.388	Less than	2.000
CS134	< 4.002E+00	0.000E+00	4.002	Less than	30.00
CS137	< 3.979E+00	0.000E+00	3.979	Less than	50.00
BALA140	< 6.070E+00	0.000E+00	6.070	Less than	200.0
BE7	< 3.816E+01	0.000E+00	38.16	No limits specified	
K40	1.476E+02	2.741E+01	40.06	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	- Error	Calculated MDA	Reporting Level	
H3	1.650E+02	5.160E+01	161	Less than	20000

Field Parameters

Elevation (ft (msl)) 733.72
pH (field) SU 6.73
Temp Celcius (degrees C) 18.83
Dissolved Oxygen (mg/L) 9.43
Spec. Cond. (field) micromhos/cm 90.5
Oxidation Reduction Potential (ORP)(mV) 387
Turbidity (field) NTU >1000

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Station: MCGUIRE | **Sample #: 28000670**
Location: M-98 | **Collection Date: 2/20/2008 09:10:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-98**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.543E+00	0.000E+00	5.543	Less than	1000
CO58	< 5.408E+00	0.000E+00	5.408	Less than	1000
FE59	< 1.007E+01	0.000E+00	10.07	Less than	400.0
CO60	< 6.148E+00	0.000E+00	6.148	Less than	300.0
ZN65	< 9.813E+00	0.000E+00	9.813	Less than	300.0
NB95	< 6.144E+00	0.000E+00	6.144	Less than	400.0
ZR95	< 8.583E+00	0.000E+00	8.583	Less than	400.0
I131	< 6.964E+00	0.000E+00	6.964	Less than	2.000
CS134	< 4.331E+00	0.000E+00	4.331	Less than	30.00
CS137	< 5.367E+00	0.000E+00	5.367	Less than	50.00
BALA140	< 9.000E+00	0.000E+00	9.000	Less than	200.0
BE7	< 4.789E+01	0.000E+00	47.89	No limits specified	
K40	8.934E+01	2.343E+01	43.14	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Calculated MDA	Reporting Level	
H3	< -1.01E+01	160	Less than	20000

Field Parameters

Elevation (ft (msl)) 707.92
pH (field) SU 7.28
Temp Celcius (degrees C) 16.74
Dissolved Oxygen (mg/L) 8.96
Spec. Cond. (field) micromhos/cm 119.3
Oxidation Reduction Potential (ORP)(mV) 267
Turbidity (field) NTU 872

Station: MCGUIRE | **Sample #: 28000671**
Location: M-98R | **Collection Date: 2/20/2008 09:25:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-98R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.098E+00	0.000E+00	4.098	Less than	1000
CO58	< 4.237E+00	0.000E+00	4.237	Less than	1000
FE59	< 9.528E+00	0.000E+00	9.528	Less than	400.0
CO60	< 5.487E+00	0.000E+00	5.487	Less than	300.0
ZN65	< 9.868E+00	0.000E+00	9.868	Less than	300.0
NB95	< 4.111E+00	0.000E+00	4.111	Less than	400.0
ZR95	< 7.579E+00	0.000E+00	7.579	Less than	400.0
I131	< 5.481E+00	0.000E+00	5.481	Less than	2.000
CS134	< 4.032E+00	0.000E+00	4.032	Less than	30.00
CS137	< 4.620E+00	0.000E+00	4.620	Less than	50.00
BALA140	< 6.441E+00	0.000E+00	6.441	Less than	200.0
BE7	< 3.326E+01	0.000E+00	33.26	No limits specified	
K40	< 7.140E+01	0.000E+00	71.40	No limits specified	

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Station: MCGUIRE | **Sample #: 28000671**
Location: M-98R | **Collection Date: 2/20/2008 09:25:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-98R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity - Error	Calculated MDA	Reporting Level
H3	< -5.82E+01	159	Less than 20000

Field Parameters

Elevation (ft (msl)) 708.62
pH (field) SU 9.27
Temp Celcius (degrees C) 15.77
Dissolved Oxygen (mg/L) .33
Spec. Cond. (field) micromhos/cm 153.8
Oxidation Reduction Potential (ORP)(mV) -26
Turbidity (field) NTU 6

Station: MCGUIRE | **Sample #: 28000672**
Location: M-100R | **Collection Date: 2/20/2008 10:40:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-100R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.093E+00	0.000E+00	4.093	Less than 1000
CO58	< 4.293E+00	0.000E+00	4.293	Less than 1000
FE59	< 9.089E+00	0.000E+00	9.089	Less than 400.0
CO60	< 4.432E+00	0.000E+00	4.432	Less than 300.0
ZN65	< 9.965E+00	0.000E+00	9.965	Less than 300.0
NB95	< 6.054E+00	0.000E+00	6.054	Less than 400.0
ZR95	< 7.519E+00	0.000E+00	7.519	Less than 400.0
I131	< 6.060E+00	0.000E+00	6.060	Less than 2.000
CS134	< 4.298E+00	0.000E+00	4.298	Less than 30.00
CS137	< 4.347E+00	0.000E+00	4.347	Less than 50.00
BALA140	< 6.053E+00	0.000E+00	6.053	Less than 200.0
BE7	9.138E+01	3.323E+01	36.33	No limits specified
K40	1.740E+02	2.627E+01	40.33	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	3.930E+02	5.470E+01	159	Less than 20000

Field Parameters

Elevation (ft (msl)) 702.78
pH (field) SU 7.98
Temp Celcius (degrees C) 16.51
Dissolved Oxygen (mg/L) 8.24
Spec. Cond. (field) micromhos/cm 196.1
Oxidation Reduction Potential (ORP)(mV) 72
Turbidity (field) NTU 11.8

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Station: MCGUIRE | **Sample #: 28000673**
Location: M-101 | **Collection Date: 2/20/2008 10:55:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-101**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.121E+00	0.000E+00	4.121	Less than 1000
CO58	< 3.996E+00	0.000E+00	3.996	Less than 1000
FE59	< 8.636E+00	0.000E+00	8.636	Less than 400.0
CO60	< 4.047E+00	0.000E+00	4.047	Less than 300.0
ZN65	< 9.975E+00	0.000E+00	9.975	Less than 300.0
NB95	< 5.906E+00	0.000E+00	5.906	Less than 400.0
ZR95	< 6.810E+00	0.000E+00	6.810	Less than 400.0
I131	< 6.361E+00	0.000E+00	6.361	Less than 2.000
CS134	< 3.806E+00	0.000E+00	3.806	Less than 30.00
CS137	< 4.466E+00	0.000E+00	4.466	Less than 50.00
BALA140	< 6.726E+00	0.000E+00	6.726	Less than 200.0
BE7	< 3.539E+01	0.000E+00	35.39	No limits specified
K40	1.418E+02	2.952E+01	41.22	No limits specified

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
H3	3.580E+02	5.370E+01	157	Less than 20000

Field Parameters

Elevation (ft (msl)) 703.26
pH (field) SU 7.65
Temp Celcius (degrees C) 16.6
Dissolved Oxygen (mg/L) 2.55
Spec. Cond. (field) micromhos/cm 351
Oxidation Reduction Potential (ORP)(mV) 108
Turbidity (field) NTU 77.8

Station: MCGUIRE | **Sample #: 28000674**
Location: M-102 | **Collection Date: 2/19/2008 15:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-102**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level
MN54	< 4.760E+00	0.000E+00	4.760	Less than 1000
CO58	< 4.394E+00	0.000E+00	4.394	Less than 1000
FE59	< 8.974E+00	0.000E+00	8.974	Less than 400.0
CO60	< 5.279E+00	0.000E+00	5.279	Less than 300.0
ZN65	< 9.970E+00	0.000E+00	9.970	Less than 300.0
NB95	< 4.600E+00	0.000E+00	4.600	Less than 400.0
ZR95	< 6.744E+00	0.000E+00	6.744	Less than 400.0
I131	< 5.684E+00	0.000E+00	5.684	Less than 2.000
CS134	< 3.590E+00	0.000E+00	3.590	Less than 30.00
CS137	< 4.303E+00	0.000E+00	4.303	Less than 50.00
BALA140	< 4.054E+00	0.000E+00	4.054	Less than 200.0
BE7	< 3.732E+01	0.000E+00	37.32	No limits specified
K40	2.457E+02	2.809E+01	39.05	No limits specified

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000674**
Location: M-102 | **Collection Date: 2/19/2008 15:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-102**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	7.740E+03	1.270E+02	168	Less than	20000

Field Parameters

Elevation (ft (msl)) 681.73
pH (field) SU 6.13
Temp Celcius (degrees C) 16.5
Dissolved Oxygen (mg/L) 0.2
Spec. Cond. (field) micromhos/cm 249.2
Oxidation Reduction Potential (ORP)(mV) 416
Turbidity (field) NTU 314

Station: MCGUIRE | **Sample #: 28000675**
Location: M-103 | **Collection Date: 2/19/2008 10:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-103**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.572E+00	0.000E+00	4.572	Less than	1000
CO58	< 4.660E+00	0.000E+00	4.660	Less than	1000
FE59	< 7.449E+00	0.000E+00	7.449	Less than	400.0
CO60	< 5.331E+00	0.000E+00	5.331	Less than	300.0
ZN65	< 9.475E+00	0.000E+00	9.475	Less than	300.0
NB95	< 4.792E+00	0.000E+00	4.792	Less than	400.0
ZR95	< 7.692E+00	0.000E+00	7.692	Less than	400.0
I131	< 5.390E+00	0.000E+00	5.390	Less than	2.000
CS134	< 3.349E+00	0.000E+00	3.349	Less than	30.00
CS137	< 4.092E+00	0.000E+00	4.092	Less than	50.00
BALA140	< 4.938E+00	0.000E+00	4.938	Less than	200.0
BE7	< 3.563E+01	0.000E+00	35.63	No limits specified	
K40	1.409E+02	3.065E+01	43.94	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	2.560E+03	8.390E+01	167	Less than	20000

Field Parameters

Elevation (ft (msl)) 683.46
pH (field) SU 5.9
Temp Celcius (degrees C) 14.36
Dissolved Oxygen (mg/L) 8.94
Spec. Cond. (field) micromhos/cm 137
Oxidation Reduction Potential (ORP)(mV) 456
Turbidity (field) NTU 885

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000676**
Location: M-103R | **Collection Date: 2/19/2008 10:45:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-103R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 3.724E+00	0.000E+00	3.724	Less than	1000
CO58	< 3.709E+00	0.000E+00	3.709	Less than	1000
FE59	< 7.092E+00	0.000E+00	7.092	Less than	400.0
CO60	< 4.103E+00	0.000E+00	4.103	Less than	300.0
ZN65	< 8.072E+00	0.000E+00	8.072	Less than	300.0
NB95	< 4.291E+00	0.000E+00	4.291	Less than	400.0
ZR95	< 6.376E+00	0.000E+00	6.376	Less than	400.0
I131	< 4.649E+00	0.000E+00	4.649	Less than	2.000
CS134	< 3.803E+00	0.000E+00	3.803	Less than	30.00
CS137	< 3.624E+00	0.000E+00	3.624	Less than	50.00
BALA140	< 4.845E+00	0.000E+00	4.845	Less than	200.0
BE7	< 3.275E+01	0.000E+00	32.75	No limits specified	
K40	4.375E+01	1.667E+01	42.07	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	1.740E+03	7.400E+01	164	Less than	20000

Field Parameters

Elevation (ft (msl)) 682.82
pH (field) SU 9.17
Temp Celcius (degrees C) 14.83
Dissolved Oxygen (mg/L) 2.57
Spec. Cond. (field) micromhos/cm 221
Oxidation Reduction Potential (ORP)(mV) 374
Turbidity (field) NTU 47.1

Station: MCGUIRE | **Sample #: 28000677**
Location: M-104R | **Collection Date: 2/19/2008 13:50:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-104R**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.149E+00	0.000E+00	4.149	Less than	1000
CO58	< 3.620E+00	0.000E+00	3.620	Less than	1000
FE59	< 8.446E+00	0.000E+00	8.446	Less than	400.0
CO60	< 5.126E+00	0.000E+00	5.126	Less than	300.0
ZN65	< 8.963E+00	0.000E+00	8.963	Less than	300.0
NB95	< 5.284E+00	0.000E+00	5.284	Less than	400.0
ZR95	< 6.737E+00	0.000E+00	6.737	Less than	400.0
I131	< 5.537E+00	0.000E+00	5.537	Less than	2.000
CS134	< 4.227E+00	0.000E+00	4.227	Less than	30.00
CS137	< 4.237E+00	0.000E+00	4.237	Less than	50.00
BALA140	< 6.619E+00	0.000E+00	6.619	Less than	200.0
BE7	< 3.508E+01	0.000E+00	35.08	No limits specified	
K40	1.595E+02	3.045E+01	41.15	No limits specified	

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000677**
Location: M-104R | **Collection Date: 2/19/2008 13:50:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-104R**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	1.070E+04	1.440E+02	164	Less than	20000

Field Parameters

Elevation (ft (msl)) 675.15
pH (field) SU 6.5
Temp Celcius (degrees C) 15.71
Dissolved Oxygen (mg/L) 5.33
Spec. Cond. (field) micromhos/cm 231.8
Oxidation Reduction Potential (ORP)(mV) 373
Turbidity (field) NTU 1.95

Station: MCGUIRE | **Sample #: 28000678**
Location: M-104DR | **Collection Date: 2/19/2008 14:10:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - M-104DR**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 3.779E+00	0.000E+00	3.779	Less than	1000
CO58	< 3.793E+00	0.000E+00	3.793	Less than	1000
FE59	< 7.449E+00	0.000E+00	7.449	Less than	400.0
CO60	< 4.081E+00	0.000E+00	4.081	Less than	300.0
ZN65	< 8.488E+00	0.000E+00	8.488	Less than	300.0
NB95	< 4.412E+00	0.000E+00	4.412	Less than	400.0
ZR95	< 6.207E+00	0.000E+00	6.207	Less than	400.0
I131	< 4.343E+00	0.000E+00	4.343	Less than	2.000
CS134	< 3.959E+00	0.000E+00	3.959	Less than	30.00
CS137	< 3.570E+00	0.000E+00	3.570	Less than	50.00
BALA140	< 5.449E+00	0.000E+00	5.449	Less than	200.0
BE7	< 3.050E+01	0.000E+00	30.50	No limits specified	
K40	1.560E+02	2.621E+01	40.07	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	6.030E+03	1.130E+02	164	Less than	20000

Field Parameters

Elevation (ft (msl)) 673.12
pH (field) SU 6.68
Temp Celcius (degrees C) 15.47
Dissolved Oxygen (mg/L) .36
Spec. Cond. (field) micromhos/cm 190.1
Oxidation Reduction Potential (ORP)(mV) 272
Turbidity (field) NTU 10.2

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000679**
Location: MS-1 | **Collection Date: 2/20/2008 09:40:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - MS-1**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.201E+00	0.000E+00	4.201	Less than	1000
CO58	< 4.366E+00	0.000E+00	4.366	Less than	1000
FE59	< 9.200E+00	0.000E+00	9.200	Less than	400.0
CO60	< 3.483E+00	0.000E+00	3.483	Less than	300.0
ZN65	< 9.220E+00	0.000E+00	9.220	Less than	300.0
NB95	< 5.864E+00	0.000E+00	5.864	Less than	400.0
ZR95	< 7.702E+00	0.000E+00	7.702	Less than	400.0
I131	< 6.779E+00	0.000E+00	6.779	Less than	2.000
CS134	< 4.420E+00	0.000E+00	4.420	Less than	30.00
CS137	< 4.600E+00	0.000E+00	4.600	Less than	50.00
BALA140	< 7.125E+00	0.000E+00	7.125	Less than	200.0
BE7	< 4.353E+01	0.000E+00	43.53	No limits specified	
K40	1.577E+02	4.182E+01	56.79	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	< 1.15E+01		151	Less than	20000

Field Parameters

Elevation (ft (msl)) NA
pH (field) SU 8.12
Temp Celcius (degrees C) 11.32
Dissolved Oxygen (mg/L) 9.67
Spec. Cond. (field) micromhos/cm 91.3
Oxidation Reduction Potential (ORP)(mV) 162
Turbidity (field) NTU 10.7

Station: MCGUIRE | **Sample #: 28000680**
Location: MS-2 | **Collection Date: 2/19/2008 15:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - MS-2**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.051E+00	0.000E+00	4.051	Less than	1000
CO58	< 5.171E+00	0.000E+00	5.171	Less than	1000
FE59	< 8.315E+00	0.000E+00	8.315	Less than	400.0
CO60	< 5.559E+00	0.000E+00	5.559	Less than	300.0
ZN65	< 9.501E+00	0.000E+00	9.501	Less than	300.0
NB95	< 3.866E+00	0.000E+00	3.866	Less than	400.0
ZR95	< 6.425E+00	0.000E+00	6.425	Less than	400.0
I131	< 5.171E+00	0.000E+00	5.171	Less than	2.000
CS134	< 4.144E+00	0.000E+00	4.144	Less than	30.00
CS137	< 5.444E+00	0.000E+00	5.444	Less than	50.00
BALA140	< 6.727E+00	0.000E+00	6.727	Less than	200.0
BE7	< 3.737E+01	0.000E+00	37.37	No limits specified	
K40	3.429E+01	2.147E+01	50.08	No limits specified	

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000680**
Location: MS-2 | **Collection Date: 2/19/2008 15:15:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - MS-2**

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	9.850E+02	6.450E+01	164	Less than	20000

Field Parameters

Elevation (ft (msl)) NA
pH (field) SU 7.63
Temp Celcius (degrees C) 13.92
Dissolved Oxygen (mg/L) 9.41
Spec. Cond. (field) micromhos/cm 105.9
Oxidation Reduction Potential (ORP)(mV) 302
Turbidity (field) NTU 15.2

Station: MCGUIRE | **Sample #: 28000681**
Location: MS-3 | **Collection Date: 2/19/2008 07:40:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - MS-3**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 5.029E+00	0.000E+00	5.029	Less than	1000
CO58	< 4.129E+00	0.000E+00	4.129	Less than	1000
FE59	< 8.946E+00	0.000E+00	8.946	Less than	400.0
CO60	< 2.747E+00	0.000E+00	2.747	Less than	300.0
ZN65	< 8.438E+00	0.000E+00	8.438	Less than	300.0
NB95	< 4.213E+00	0.000E+00	4.213	Less than	400.0
ZR95	< 7.102E+00	0.000E+00	7.102	Less than	400.0
I131	< 5.789E+00	0.000E+00	5.789	Less than	2.000
CS134	< 5.213E+00	0.000E+00	5.213	Less than	30.00
CS137	< 3.788E+00	0.000E+00	3.788	Less than	50.00
BALA140	< 5.904E+00	0.000E+00	5.904	Less than	200.0
BE7	< 4.058E+01	0.000E+00	40.58	No limits specified	
K40	1.867E+02	2.641E+01	43.00	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	8.000E+02	6.200E+01	164	Less than	20000

Field Parameters

Elevation (ft (msl)) NA
pH (field) SU 6.72
Temp Celcius (degrees C) 14.41
Dissolved Oxygen (mg/L) 10.21
Spec. Cond. (field) micromhos/cm 39
Oxidation Reduction Potential (ORP)(mV) 364
Turbidity (field) NTU 6.45

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Radiological Data for Job: 08-FEB-0002

Report Generated: 3/27/2008 06:20:03

Station: MCGUIRE | **Sample #: 28000682**
Location: MS-4 | **Collection Date: 2/19/2008 08:00:00**
Type: GROUND WATER | **MNS GROUND WATER PROTECTION PROGRAM - MS-4**

GAMMAGW — GAMMA GROUND WATER ANALYSIS

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
MN54	< 4.323E+00	0.000E+00	4.323	Less than	1000
CO58	< 5.467E+00	0.000E+00	5.467	Less than	1000
FE59	< 7.783E+00	0.000E+00	7.783	Less than	400.0
CO60	< 4.644E+00	0.000E+00	4.644	Less than	300.0
ZN65	< 9.659E+00	0.000E+00	9.659	Less than	300.0
NB95	< 5.318E+00	0.000E+00	5.318	Less than	400.0
ZR95	< 8.558E+00	0.000E+00	8.558	Less than	400.0
I131	< 4.728E+00	0.000E+00	4.728	Less than	2.000
CS134	< 3.882E+00	0.000E+00	3.882	Less than	30.00
CS137	< 5.576E+00	0.000E+00	5.576	Less than	50.00
BALA140	< 7.406E+00	0.000E+00	7.406	Less than	200.0
BE7	< 4.116E+01	0.000E+00	41.16	No limits specified	
K40	1.397E+02	2.130E+01	27.81	No limits specified	

H3GW — TRITIUM ANALYSIS OF GROUND WATER

Units: pCi/liter

	Activity	Error	Calculated MDA	Reporting Level	
H3	6.010E+02	6.000E+01	166	Less than	20000

Field Parameters

Elevation (ft (msl)) NA
pH (field) SU 6.54
Temp Celcius (degrees C) 8.4
Dissolved Oxygen (mg/L) 9.06
Spec. Cond. (field) micromhos/cm 42.2
Oxidation Reduction Potential (ORP)(mV) 256
Turbidity (field) NTU 30.7

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Huntersville, NC 28078-7929

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-20/M-20R

	M-20	M-20R
Ground Surface Elevation (ft-msl) =	705.99	706.17
Water Level Measurement (ft-bls) =	38.00	35.68
Top of Screen Elevation =	672.99	
Groundwater Elevation =	667.99	
Mid-Point of Saturated Screen Elevation =	662.99	
Bottom of Screen Elevation =	657.99	
Top of Screen Elevation =		643.25
Mid-Point of Saturated Screen Elevation =		640.75
Bottom of Screen Elevation =		638.25

21-Feb-08

670.49 = Groundwater Elevation

(Not to Scale)

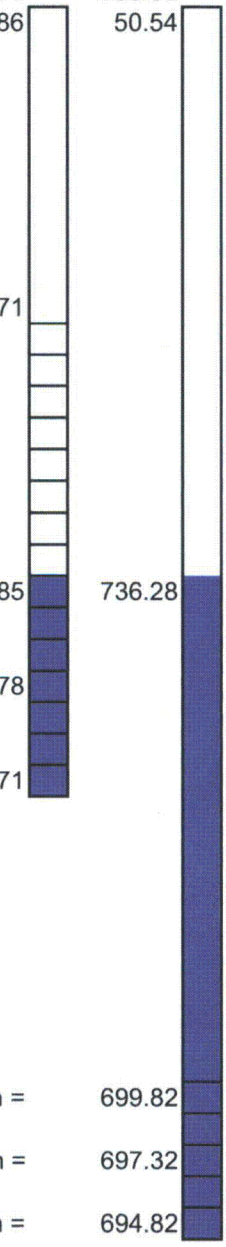
WATER LEVEL DELTA =	-2.50	FT.
SCREEN DELTA =	22.24	FT.
VERTICAL GRADIENT =	**-0.1124**	**FT/FT**

UPWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-22/M-22R

	M-22	M-22R
Ground Surface Elevation (ft-msl) =	786.71	786.82
Water Level Measurement (ft-bls) =	49.86	50.54
Top of Screen Elevation =	741.71	
Groundwater Elevation =	736.85	736.28
Mid-Point of Saturated Screen Elevation =	731.78	
Bottom of Screen Elevation =	726.71	
Top of Screen Elevation =		699.82
Mid-Point of Saturated Screen Elevation =		697.32
Bottom of Screen Elevation =		694.82

20-Feb-08



(Not to Scale)

WATER LEVEL DELTA =	0.57	FT.
SCREEN DELTA =	34.46	FT.
VERTICAL GRADIENT =	**0.0165**	**FT/FT**

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project

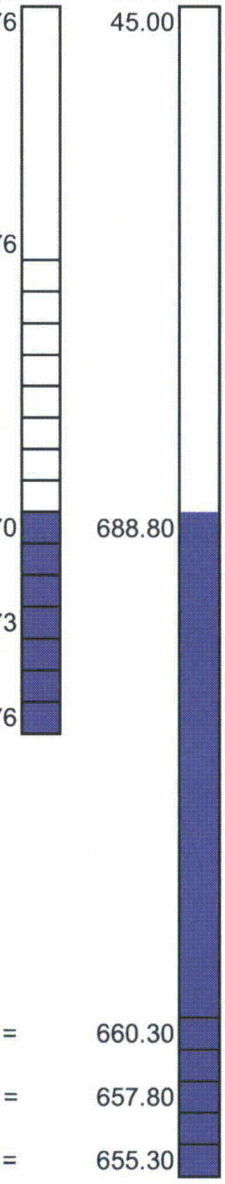
Huntersville, North Carolina

S&ME Job No: 1264-06-724

Vertical Gradient Calculation for M-30/M-30R

	M-30	M-30R
Ground Surface Elevation (ft-msl) =	733.46	733.80
Water Level Measurement (ft-bls) =	44.76	45.00
Top of Screen Elevation =	697.76	
Groundwater Elevation =	688.70	688.80
Mid-Point of Saturated Screen Elevation =	685.73	
Bottom of Screen Elevation =	682.76	
Top of Screen Elevation =		660.30
Mid-Point of Saturated Screen Elevation =		657.80
Bottom of Screen Elevation =		655.30

20-Feb-08



(Not to Scale)

WATER LEVEL DELTA = -0.10 FT.

SCREEN DELTA = 27.93 FT.

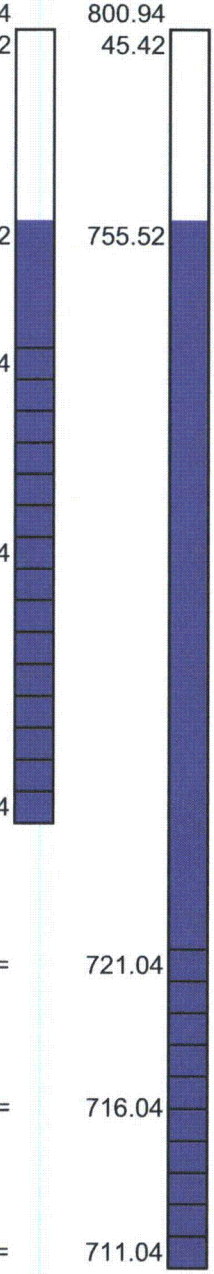
VERTICAL GRADIENT = -0.00358 FT/FT

UPWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-34R/M-34DR

	M-34R	M-34DR
Ground Surface Elevation (ft-msl) =	800.74	800.94
Water Level Measurement (ft-bls) =	45.32	45.42
Groundwater Elevation =	755.42	755.52
Top of Screen Elevation =	743.84	
Mid-Point of Saturated Screen Elevation =	741.34	
Bottom of Screen Elevation =	738.84	
Top of Screen Elevation =		721.04
Mid-Point of Saturated Screen Elevation =		716.04
Bottom of Screen Elevation =		711.04

20-Feb-08



(Not to Scale)

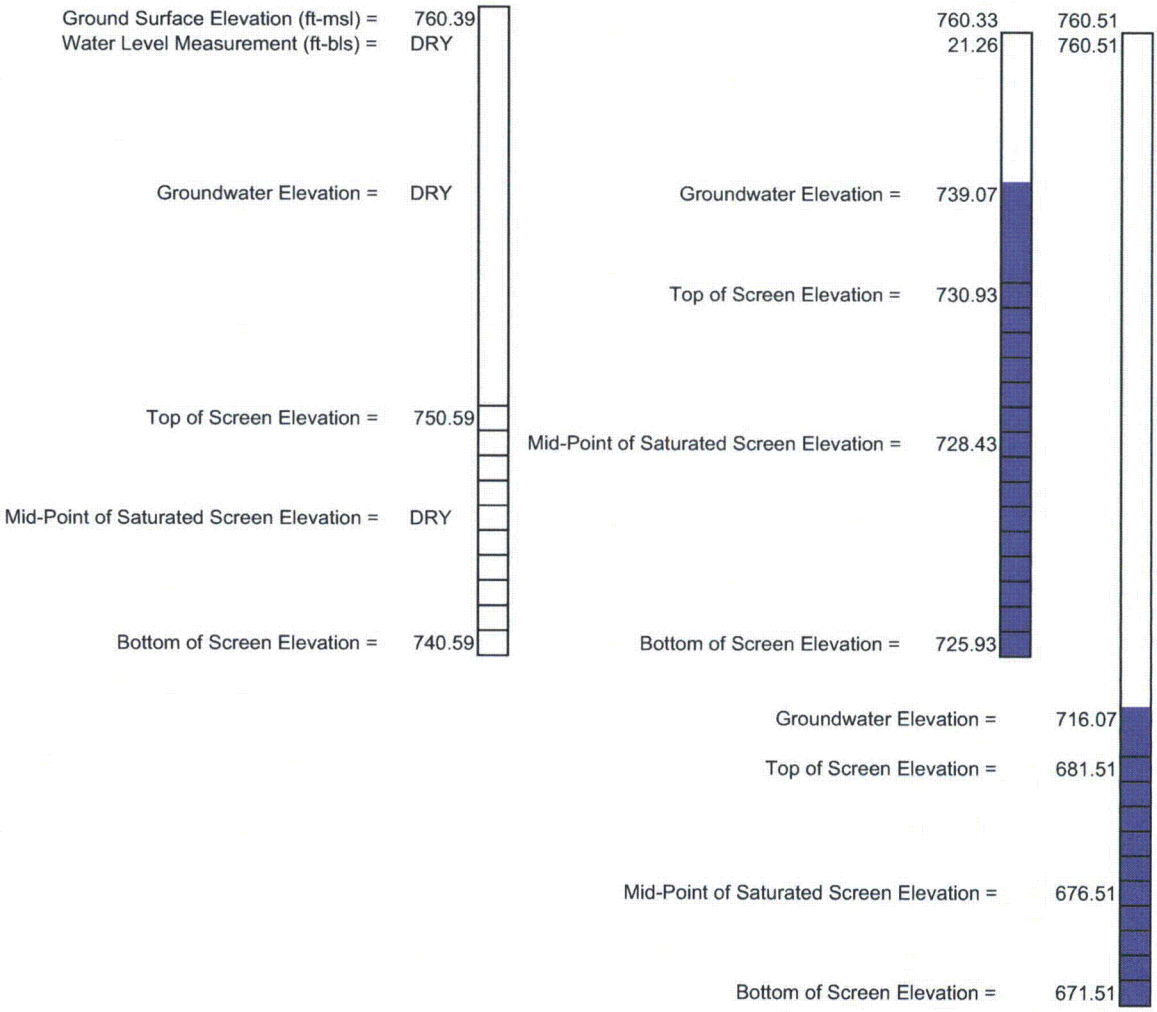
WATER LEVEL DELTA =	-0.10	FT.
SCREEN DELTA =	25.30	FT.
VERTICAL GRADIENT =	**-0.0040**	**FT/FT**

UPWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-48R/M-48DR

18-Feb-08

	M-48	M-48R	M-48DR
Ground Surface Elevation (ft-msl) =	760.39	760.33	760.51
Water Level Measurement (ft-bls) =	DRY	21.26	760.51
Groundwater Elevation =	DRY	739.07	716.07
Top of Screen Elevation =	750.59	730.93	681.51
Mid-Point of Saturated Screen Elevation =	DRY	728.43	676.51
Bottom of Screen Elevation =	740.59	725.93	671.51



(Not to Scale)

WATER LEVEL DELTA = 23.00 FT

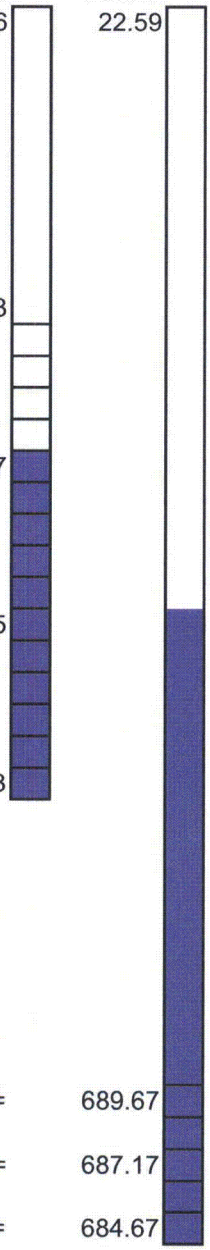
SCREEN DELTA = 51.92 FT

VERTICAL GRADIENT = 0.4430 FT/FT

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-66/M-66R

	M-66	M-66R	
Ground Surface Elevation (ft-msl) =	760.43	760.47	
Water Level Measurement (ft-bls) =	17.96	22.59	*18-Feb-08*
Top of Screen Elevation =	748.43		
Groundwater Elevation =	742.47		
Mid-Point of Saturated Screen Elevation =	737.95		737.88 = Groundwater Elevation
Bottom of Screen Elevation =	733.43		
			(Not to Scale)
Top of Screen Elevation =		689.67	
Mid-Point of Saturated Screen Elevation =		687.17	
Bottom of Screen Elevation =		684.67	



WATER LEVEL DELTA =	4.59	FT.
SCREEN DELTA =	50.78	FT.
VERTICAL GRADIENT =	**0.0904**	**FT/FT**

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-70/M-70R

	M-70	M-70R		M-70DR
Ground Surface Elevation (ft-msl) =	760.44	760.44		760.42
Water Level Measurement (ft-bls) =	13.40	14.97		15.12
Top of Screen Elevation =	754.44			
Groundwater Elevation =	747.04			
		745.47	----- Groundwater Elevation -----	745.30
Mid-Point of Saturated Screen Elevation =	743.24			
Bottom of Screen Elevation =	739.44			
Top of Screen Elevation =		704.99		
Mid-Point of Saturated Screen Elevation =		699.99		
Bottom of Screen Elevation =		694.99		
Top of Screen Elevation =				688.02
Mid-Point of Saturated Screen Elevation =				685.52
Bottom of Screen Elevation =				683.02

18-Feb-08

(Not to Scale)

WATER LEVEL DELTA = 1.74 FT
SCREEN DELTA = 57.72 FT

VERTICAL GRADIENT = 0.0301 FT/FT

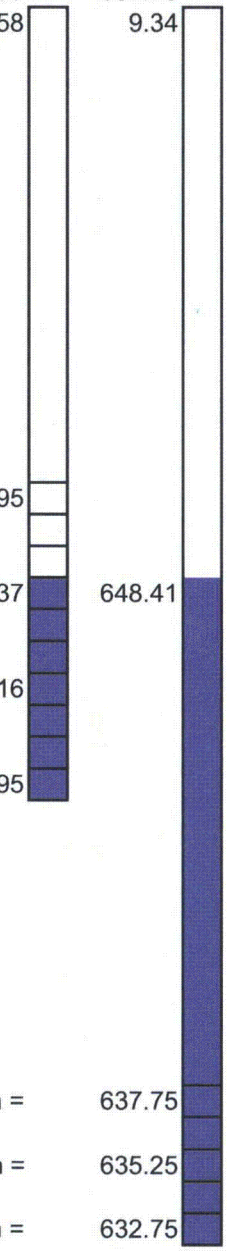
*** Calculated from M-70 to M-70DR**

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-84/M-84R

	M-84	M-84R
Ground Surface Elevation (ft-msl) =	656.95	657.75
Water Level Measurement (ft-bls) =	8.58	9.34
Top of Screen Elevation =	651.95	
Groundwater Elevation =	648.37	648.41
Mid-Point of Saturated Screen Elevation =	645.16	
Bottom of Screen Elevation =	641.95	
Top of Screen Elevation =		637.75
Mid-Point of Saturated Screen Elevation =		635.25
Bottom of Screen Elevation =		632.75

19-Feb-08



(Not to Scale)

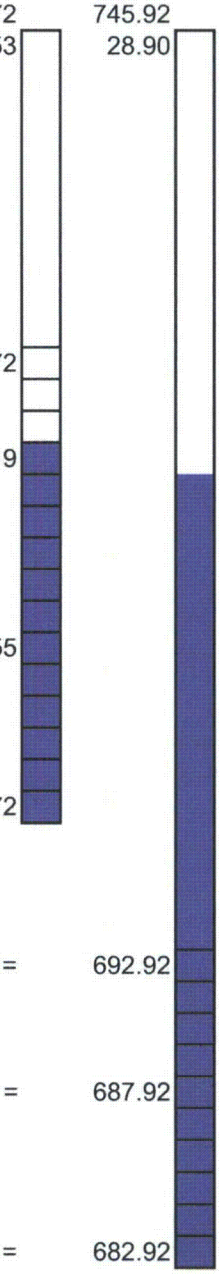
WATER LEVEL DELTA =	-0.04	FT.
SCREEN DELTA =	9.91	FT.
VERTICAL GRADIENT =	**-0.0040**	**FT/FT**

UPWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-91/M-91R

	M-91	M-91R
Ground Surface Elevation (ft-msl) =	745.72	745.92
Water Level Measurement (ft-bls) =	27.53	28.90
Top of Screen Elevation =	721.72	
Groundwater Elevation =	718.19	
Mid-Point of Saturated Screen Elevation =	712.455	
Bottom of Screen Elevation =	706.72	
Top of Screen Elevation =		692.92
Mid-Point of Saturated Screen Elevation =		687.92
Bottom of Screen Elevation =		682.92

19-Feb-08



717.02 = Groundwater Elevation

(Not to Scale)

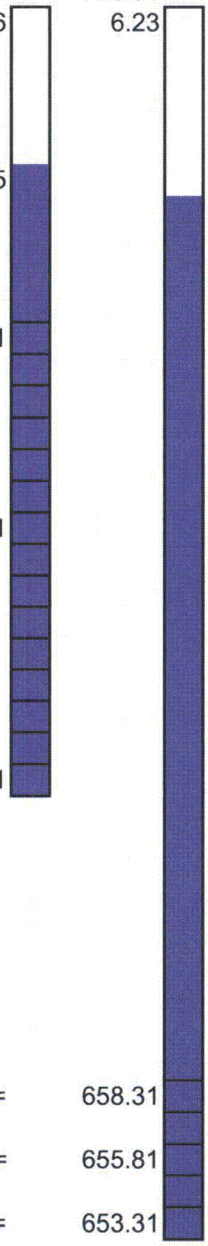
WATER LEVEL DELTA =	1.17	FT.
SCREEN DELTA =	24.54	FT.
VERTICAL GRADIENT =	**0.0477**	**FT/FT**

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-92/M-92R

	M-92	M-92R
Ground Surface Elevation (ft-msl) =	728.41	728.31
Water Level Measurement (ft-bls) =	4.76	6.23
Groundwater Elevation =	723.65	722.08 = Groundwater Elevation
Top of Screen Elevation =	708.91	
Mid-Point of Saturated Screen Elevation =	701.41	
Bottom of Screen Elevation =	693.91	
Top of Screen Elevation =		658.31
Mid-Point of Saturated Screen Elevation =		655.81
Bottom of Screen Elevation =		653.31

19-Feb-08



(Not to Scale)

WATER LEVEL DELTA =	1.57	FT.
SCREEN DELTA =	45.60	FT.
VERTICAL GRADIENT =	**0.0344**	**FT/FT**

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-93/M-93R

	M-93	M-93R
Ground Surface Elevation (ft-msl) =	756.60	756.55
Water Level Measurement (ft-bls) =	33.78	31.13
Top of Screen Elevation =	728.60	
Groundwater Elevation =	722.82	
Mid-Point of Saturated Screen Elevation =	718.21	
Bottom of Screen Elevation =	713.60	
Top of Screen Elevation =		668.55
Mid-Point of Saturated Screen Elevation =		666.05
Bottom of Screen Elevation =		663.55

19-Feb-08

725.42 = Groundwater Elevation

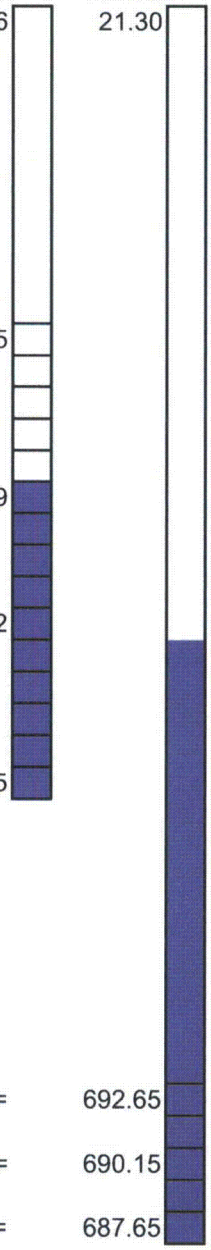
(Not to Scale)

WATER LEVEL DELTA =	-2.60	FT.
SCREEN DELTA =	52.16	FT.
VERTICAL GRADIENT =	**-0.0498**	**FT/FT**

UPWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-95/M-95R

	M-95	M-95R	
Ground Surface Elevation (ft-msl) =	731.65	731.65	
Water Level Measurement (ft-bls) =	16.46	21.30	*21-Feb-08*
Top of Screen Elevation =	722.65		
Groundwater Elevation =	715.19		
Mid-Point of Saturated Screen Elevation =	711.42		
			710.35 = Groundwater Elevation
Bottom of Screen Elevation =	707.65		
			(Not to Scale)
Top of Screen Elevation =		692.65	
Mid-Point of Saturated Screen Elevation =		690.15	
Bottom of Screen Elevation =		687.65	



WATER LEVEL DELTA =	4.84	FT.
SCREEN DELTA =	21.27	FT.
VERTICAL GRADIENT =	**0.2276**	**FT/FT**

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-96/M-96R

	M-96	M-96R
Ground Surface Elevation (ft-msl) =	747.29	747.40
Water Level Measurement (ft-bls) =	25.44	24.46
Top of Screen Elevation =	728.29	
Groundwater Elevation =	721.85	
Mid-Point of Saturated Screen Elevation =	717.57	
Bottom of Screen Elevation =	713.29	
Top of Screen Elevation =		665.40
Mid-Point of Saturated Screen Elevation =		662.90
Bottom of Screen Elevation =		660.40

20-Feb-08

722.94 = Groundwater Elevation

(Not to Scale)

WATER LEVEL DELTA =	-1.09	FT.
SCREEN DELTA =	54.67	FT.
VERTICAL GRADIENT =	**-0.0199**	**FT/FT**

UPWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-98/M-98R

	M-98	M-98R
Ground Surface Elevation (ft-msl) =	721.61	722.71
Water Level Measurement (ft-bls) =	13.69	14.09
Top of Screen Elevation =	709.61	
Groundwater Elevation =	707.92	
Mid-Point of Saturated Screen Elevation =	701.27	
Bottom of Screen Elevation =	694.61	
Top of Screen Elevation =		680.11
Mid-Point of Saturated Screen Elevation =		677.61
Bottom of Screen Elevation =		675.11

20-Feb-08

708.62 = Groundwater Elevation

(Not to Scale)

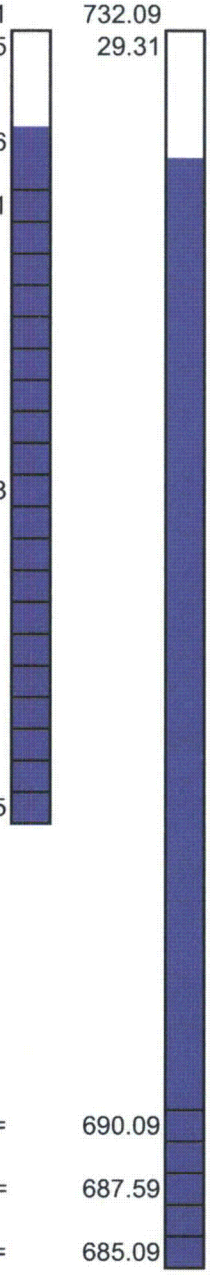
WATER LEVEL DELTA =	-0.70	FT.
SCREEN DELTA =	23.66	FT.
VERTICAL GRADIENT =	**-0.0296**	**FT/FT**

UPWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-101/M-100R

	M-101	M-100R
Ground Surface Elevation (ft-msl) =	732.61	732.09
Water Level Measurement (ft-bls) =	29.35	29.31
Groundwater Elevation =	703.26	702.78 = Groundwater Elevation
Top of Screen Elevation =	710.61	
Mid-Point of Saturated Screen Elevation =	700.68	
Bottom of Screen Elevation =	690.75	
Top of Screen Elevation =		690.09
Mid-Point of Saturated Screen Elevation =		687.59
Bottom of Screen Elevation =		685.09

20-Feb-08



(Not to Scale)

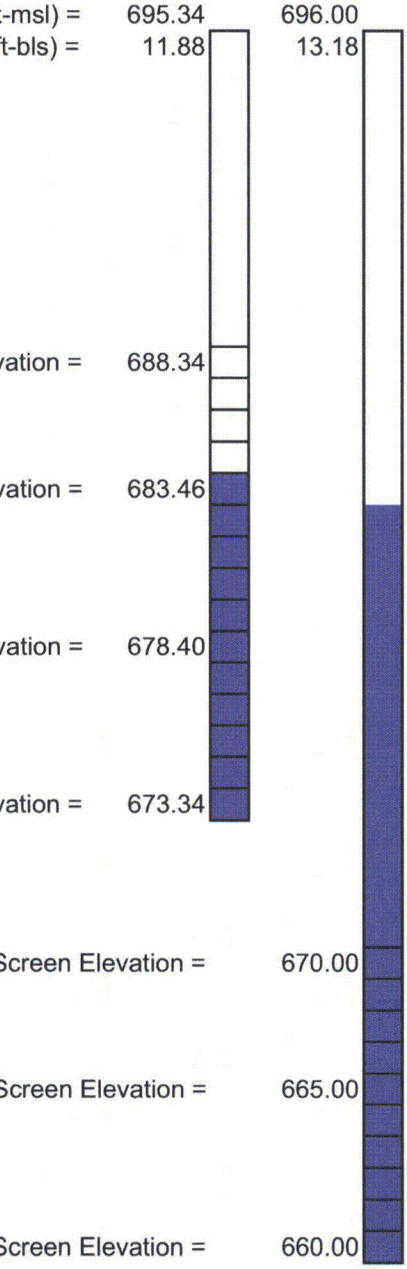
WATER LEVEL DELTA =	0.48	FT.
SCREEN DELTA =	13.09	FT.
VERTICAL GRADIENT =	**0.0367**	**FT/FT**

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-103/M-103R

	M-103	M-103R
Ground Surface Elevation (ft-msl) =	695.34	696.00
Water Level Measurement (ft-bls) =	11.88	13.18
Top of Screen Elevation =	688.34	
Groundwater Elevation =	683.46	
Mid-Point of Saturated Screen Elevation =	678.40	
Bottom of Screen Elevation =	673.34	
Top of Screen Elevation =		670.00
Mid-Point of Saturated Screen Elevation =		665.00
Bottom of Screen Elevation =		660.00

19-Feb-08



682.82 = Groundwater Elevation

(Not to Scale)

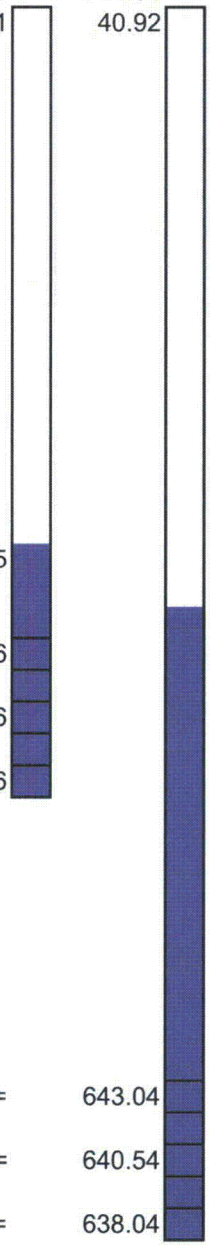
WATER LEVEL DELTA =	0.64	FT.
SCREEN DELTA =	13.40	FT.
VERTICAL GRADIENT =	**0.0478**	**FT/FT**

DOWNWARD

McGuire Nuclear Station - Groundwater Protection Project
Huntersville, North Carolina
S&ME Job No: 1264-06-724
Vertical Gradient Calculation for M-104R/M-104DR

	M-104R	M-104DR
Ground Surface Elevation (ft-msl) =	714.56	714.04
Water Level Measurement (ft-bls) =	39.41	40.92
Groundwater Elevation =	675.15	673.12 = Groundwater Elevation
Top of Screen Elevation =	672.56	643.04
Mid-Point of Saturated Screen Elevation =	670.06	640.54
Bottom of Screen Elevation =	667.56	638.04

19-Feb-08



(Not to Scale)

WATER LEVEL DELTA =	2.03	FT.
SCREEN DELTA =	29.52	FT.
VERTICAL GRADIENT =	**0.0688**	**FT/FT**

DOWNWARD

DEPTH FT.	DESCRIPTION	ELEV
0	Gray Red Silty Sand	690.30
		685.3
6.0	Firm to Dense Black Tan White Silty Fine to Medium Sand	
		680.3
		675.3
17.5	Partially Weathered Rock That Becomes Black Tan White Silty Fine to Medium Sand When Sampled	670.3
22.5	See Following Rock Log	

• PENETRATION-BLOWS PER FT.

10 20 30 40 60 80 100

50= 5"

50= 1/2"

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-1

DATE DRILLED 10-6-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				690.3		
				685.3		
				680.3		
				675.3		
				670.3		
22.5	Hard Boulder	37	NX	665.3		37%
26.5	No Recovery	0	NX	660.3		0%
30.5	Hard Black and White Coarse Grained Diorite	95	NX	655.3	Depth / Dip 31' 45° Joint Intrusion of Light Gray Fine to Medium Grained Granite at 33' 38.7' Vertical Joint	82%
40.0				650.3		

No Drilling Water Loss

CORE BORING RECORD

BORING NO. H-1
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				650.3		
	Hard Black and White Coarse Grained Diorite	90	NX	645.3	Depth 41.4' Dip 45° Joint Intrustion of Fine Grained Diorite at 41.6'	77%
46.5						
47.7	Hard Light Gray Fine to Medium*					
	Hard Black and White Coarse Grained Diorite					
49.0				640.3		
	Coring Terminated					

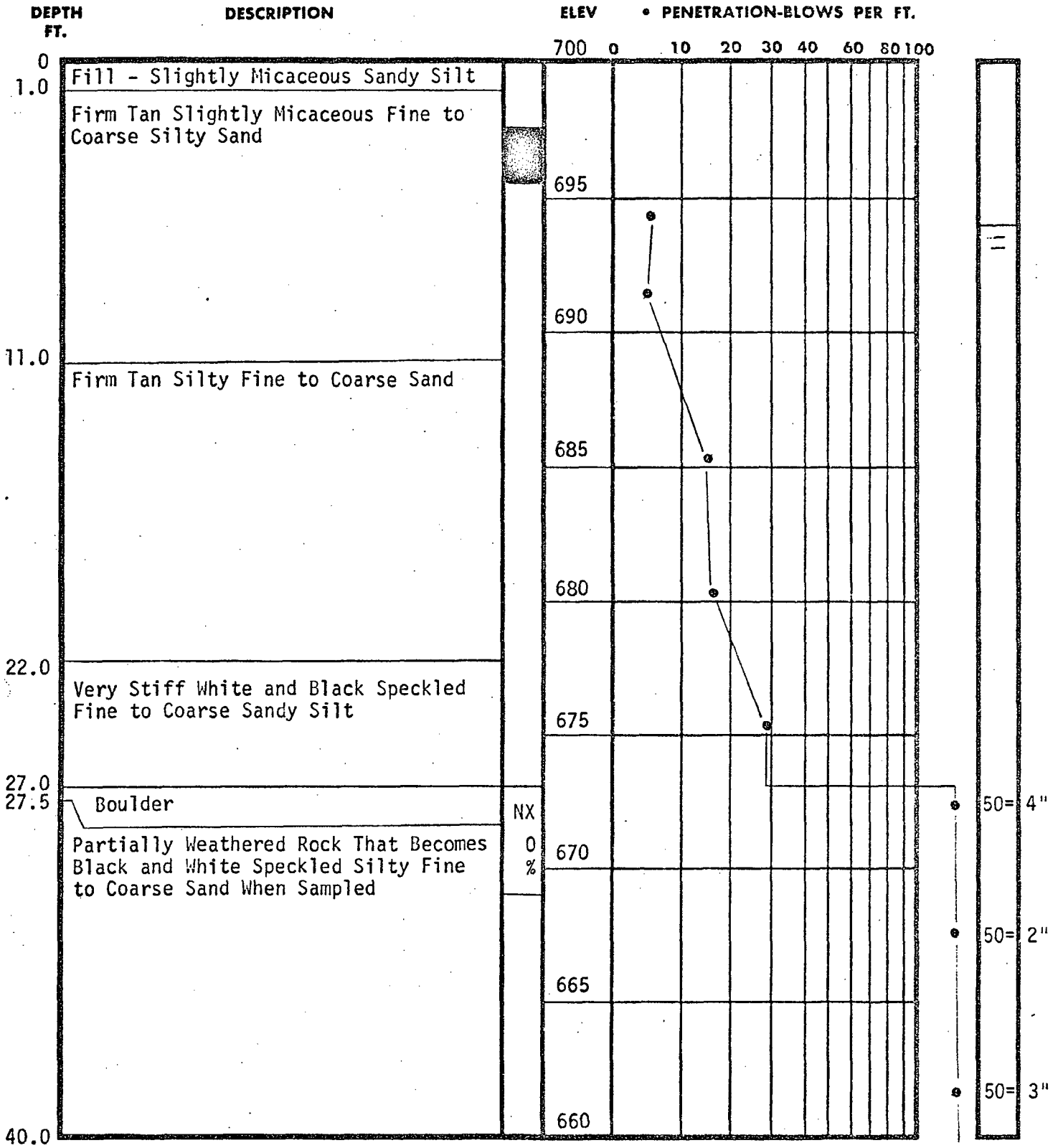
No Drilling Water Loss
*Grained Granite

CORE BORING RECORD

BORING NO. H-1
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-2

DATE DRILLED 10-11-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0	Partially Weathered Rock That Becomes Black and White Speckled Silty Fine to Coarse Sand When Sampled	660	•	50= 0"
12.2	See Following Rock Log	665		

TEST BORING RECORD

Page 2

BORING NO. H-2

DATE DRILLED 10-11-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 660	REMARKS	RQD
42.2	Hard Black and White Coarse Grained Diorite				Depth / Dip 44.4' 70° Joint Slightly Weathered 44.9' 70° Joint Slightly Weathered 47.2' 45° Joint	
		87	NX	655		87%
		82	NX	650		82%
53.5	Coring Terminated			645		

No Drilling Water Loss

CORE BORING RECORD

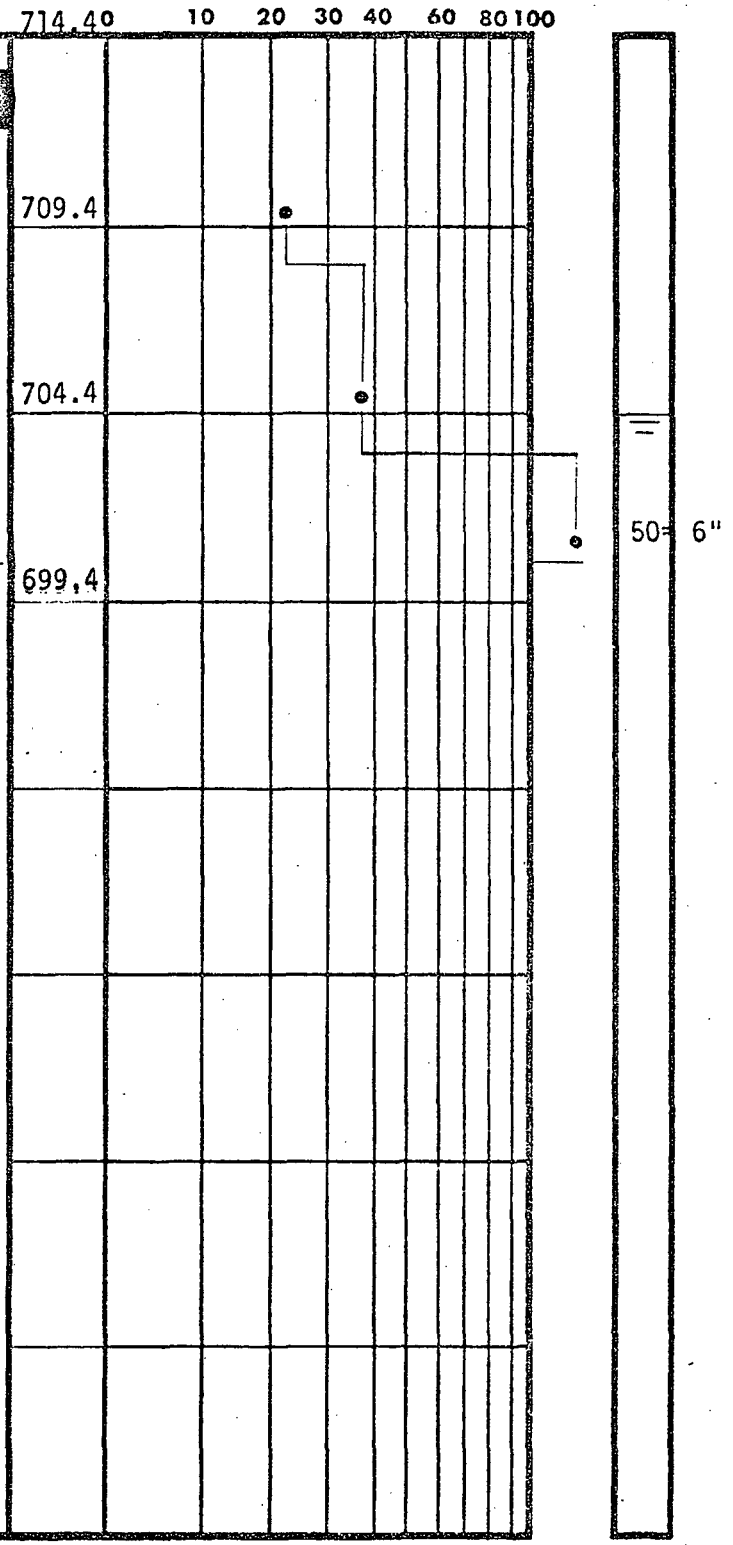
BORING NO. H-2
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Firm Black and Tan Very Silty Fine Sand	714.4
6.0	Dense Black Gray and Tan Silty Fine to Coarse Sand With Gravel Sized Fragments of Weathered Rock	709.4
11.0	Partially Weathered Rock That Becomes Gray and White Slightly Silty Fine to Coarse Sand When Sampled	704.4
14.0	See Following Rock Log	699.4

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-3

DATE DRILLED 10-7-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS		RQD
14.0							
14.8	Moderately Hard Black and*	60	NX	699.4			
	Hard Black and White Coarsed Grained Diorite				Depth	Dip	
					17.0'	45° Joint	0%
		60	NX	694.4			
					20.2'	30° Joint	
		100	NX		23.1'	60° Joint	
				689.4			89%
					27.7'	45° Joint	
		100	NX	684.4			
					32.8'	60° Joint	100%
35.0	Coring Terminated			679.4			

No Drilling Water Loss

*White Coarse Grained Diorite

CORE BORING RECORD

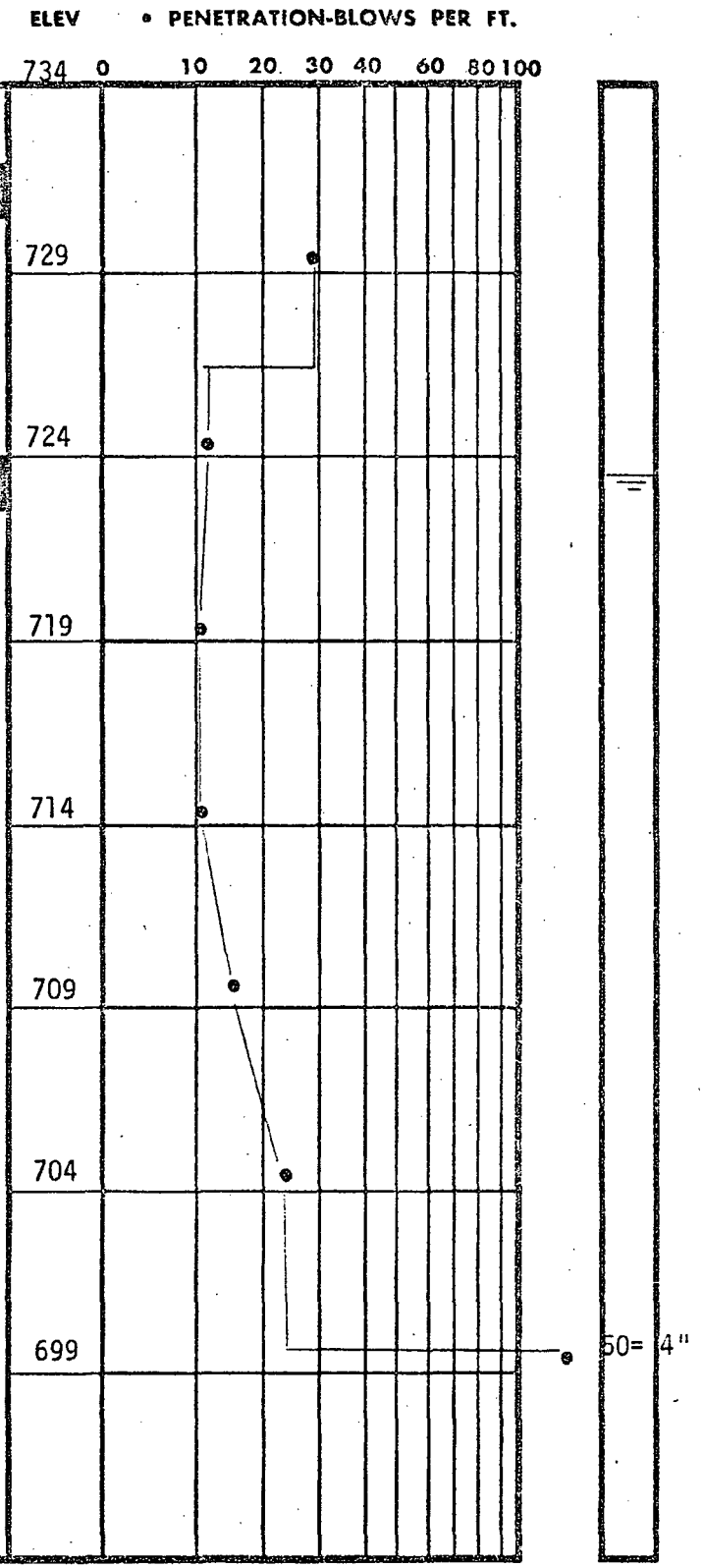
BORING NO. H-3

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Red Brown Fine Sandy Slightly Clayey Silt
7.5	Stiff Brown Tan Slightly Sandy Silt
12.0	Stiff Gray Green White Fine Sandy Silt
16.0	Firm Black and White Speckled Very Silty Fine to Medium Sand
34.5	Partially Weathered Rock That*
35.0	See Following Rock Log



*Becomes Black and White Silty Very Fine Sand When Sampled

No Drilling Water Loss

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-4

DATE DRILLED 10-29-69

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				699	Depth / Dip	
35.0					35.6' 60° Joint -Healed	
35.7	Moderately Hard Black and White Fine Grained Diorite	97	NX		36.0' 45° Joint 36.2' 45° Joint	78%
37.5	Hard Black and White Fine*					
	Hard Black and White Coarse Grained Diorite	100	NX	694	39.0' 45° Joint	
40.0						

No Drilling Water Loss
*Grained Diorite

CORE BORING RECORD

BORING NO. H-4
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0	Hard Black and White Coarse Grained Diorite			694	Depth 42.6' Dip 60° Joint	
44.7	Hard Black and White Fine Grained Diorite	100	NX	689	Small Intrusion of Light Gray Fine to Medium Grained Granite at 45.0' and 50.6'	100%
				684		
52.3	Coring Terminated			679		

No Drilling Water Loss

CORE BORING RECORD

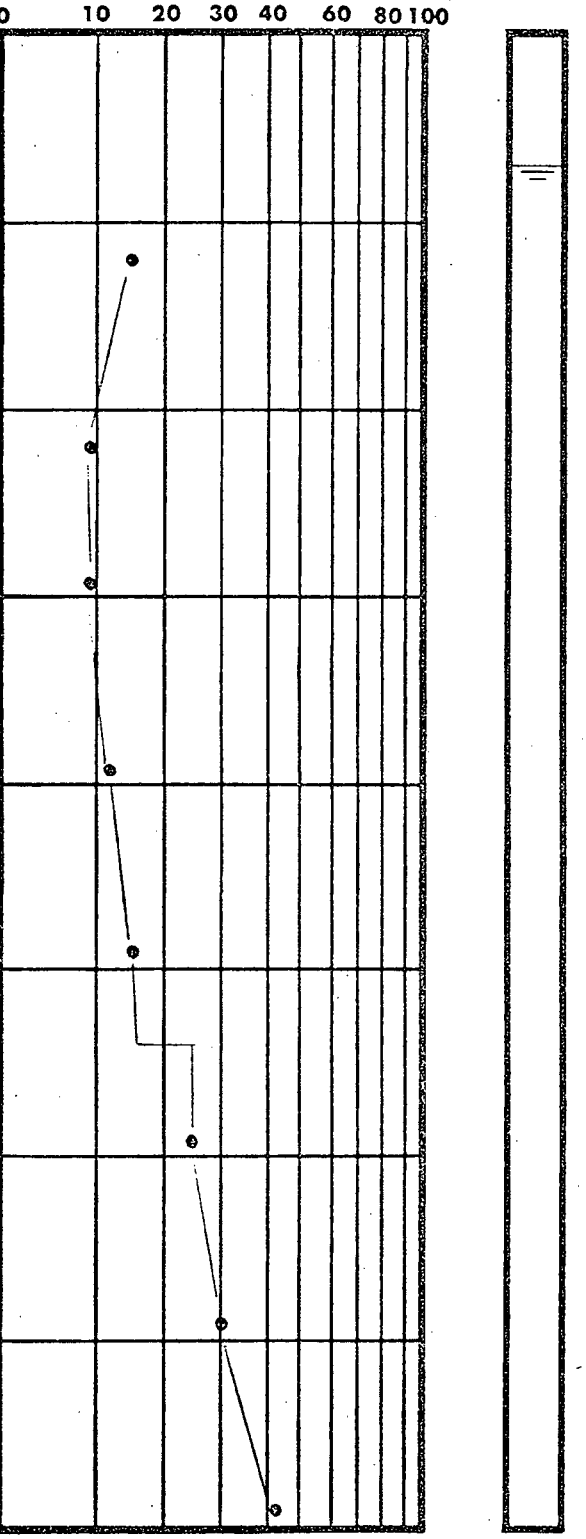
BORING NO. H-4
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Red Brown Fine Sandy Clayey Micaceous Silt	726.6
8.5	Stiff Tan Brown Fine to Medium Sandy Micaceous Silt	721.6
12.0	Loose Gray Silty Micaceous Fine to Medium Sand	716.6
14.5	Stiff Red Brown Black Tan Fine to Medium Sandy Silt	711.6
27.0	Firm to Dense Black and White Silty Fine to Medium Sand	706.6
40.0		701.6
		696.6
		691.6
		686.6

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-5

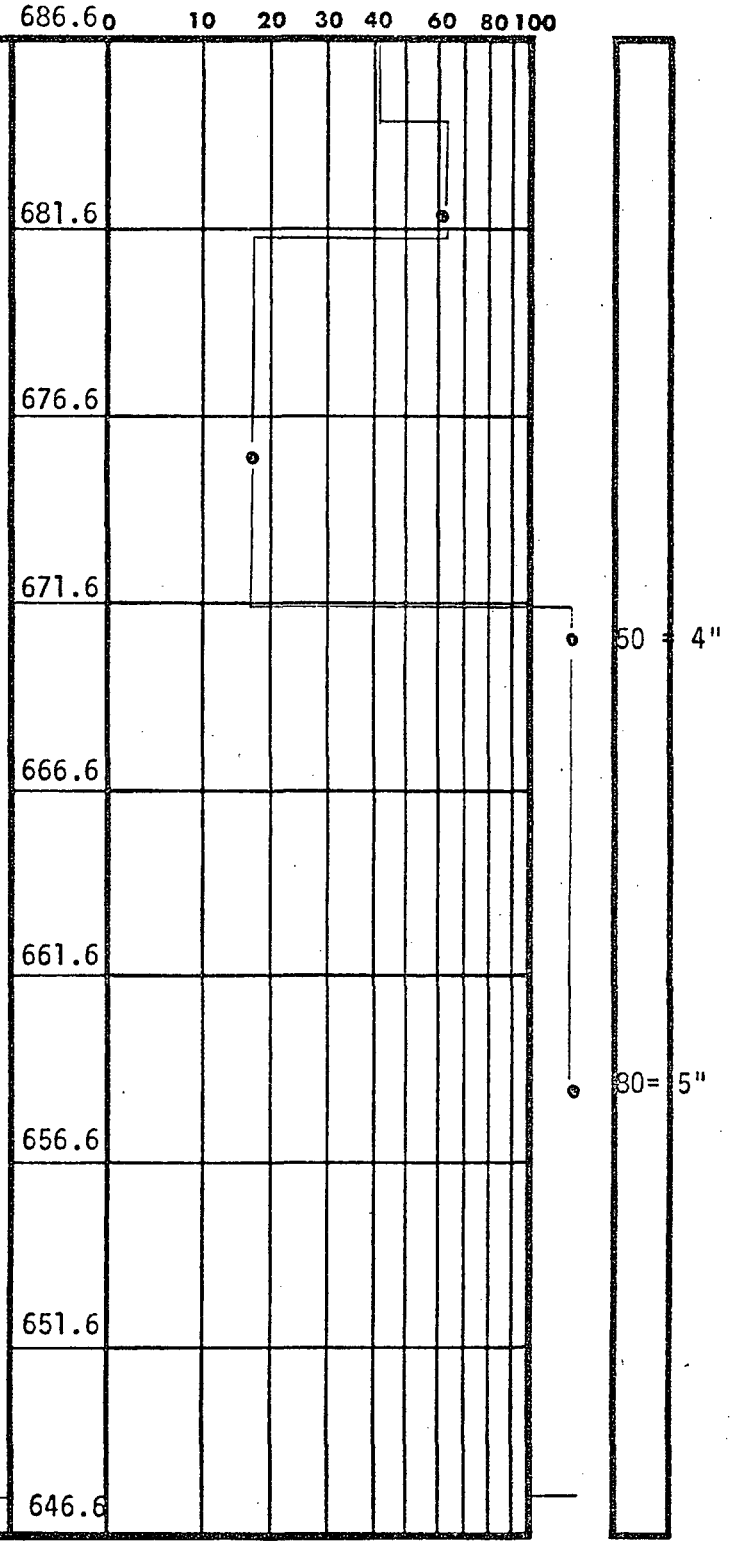
DATE DRILLED 10-2-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Firm to Dense Black and White Silty Fine to Medium Sand	686.6
42.0	Very Dense Gray Coarse Quartz Sand and Gravel	681.6
45.0	Firm Gray and Brown Medium to Coarse Quartz Sand	676.6
		671.6
55.0	Partially Weathered Rock That Becomes White Quartz Gravel When Sampled	666.6
		661.6
67.0	Partially Weathered Rock That Becomes Black and Tan Fine Sandy Micaceous Silt With Quartz Gravel	656.6
		651.6
79.0	See Following Rock Log	646.6

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

Page 2
BORING NO. H-5
DATE DRILLED 10-2-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS
				651.6	
79.0					
80.0	Hard Black and White Coarse*			646.6	

No Drilling Water Loss
*Grained Diorite

CORE BORING RECORD

BORING NO. H-5
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0	Hard Black and White Coarse Grained Diorite			646.6		
		100	NX	641.6		100%
					Depth 88.7' Dip 60° Joint - Healed	
				636.6		
		100	NX			100%
99.0	Coring Terminated			631.6		

Notes:

Injections of Hard Light Gray Fine to Medium Grained Granite at Depths of:

83'
84'
86'
90'
91'
92.8'

No Drilling Water Loss

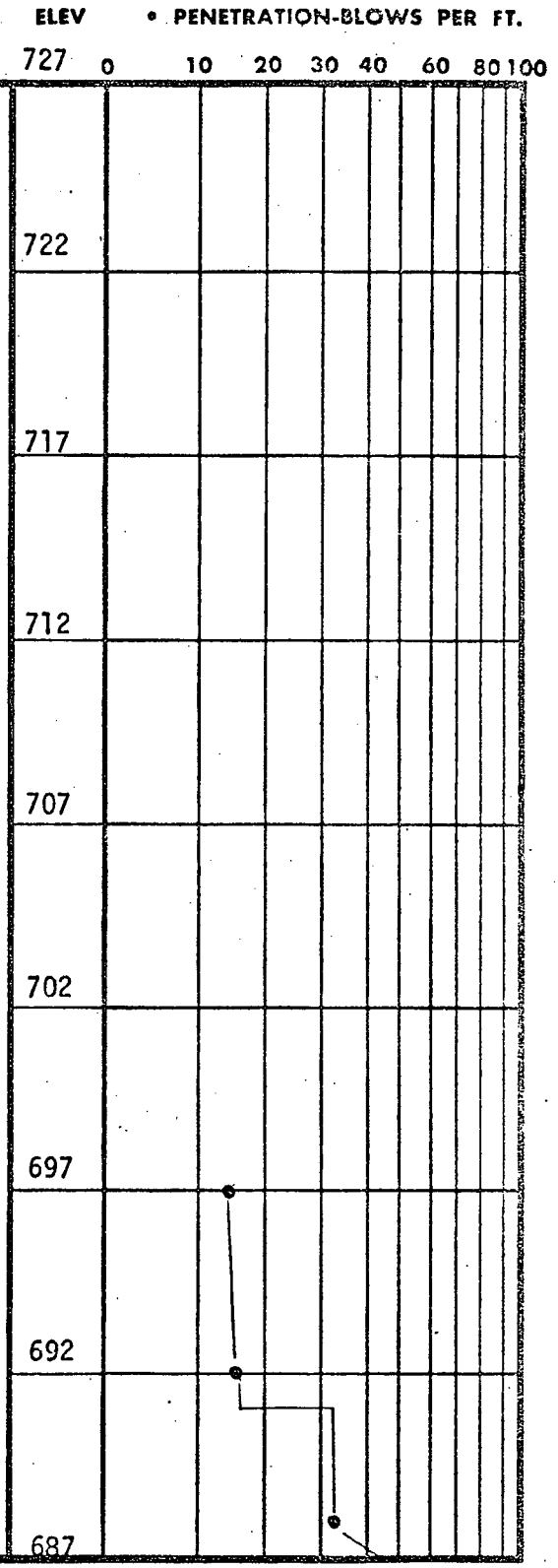
CORE BORING RECORD

BORING NO. H-5
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Note Log for H-5.	727
27.0	Firm Gray and White Very Silty Fine to Medium Sand.	697
36.0	Hard Gray Brown Very Micaceous Silt with Seams of Gravel Sized Quartz Fragments.	687
40.0		



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

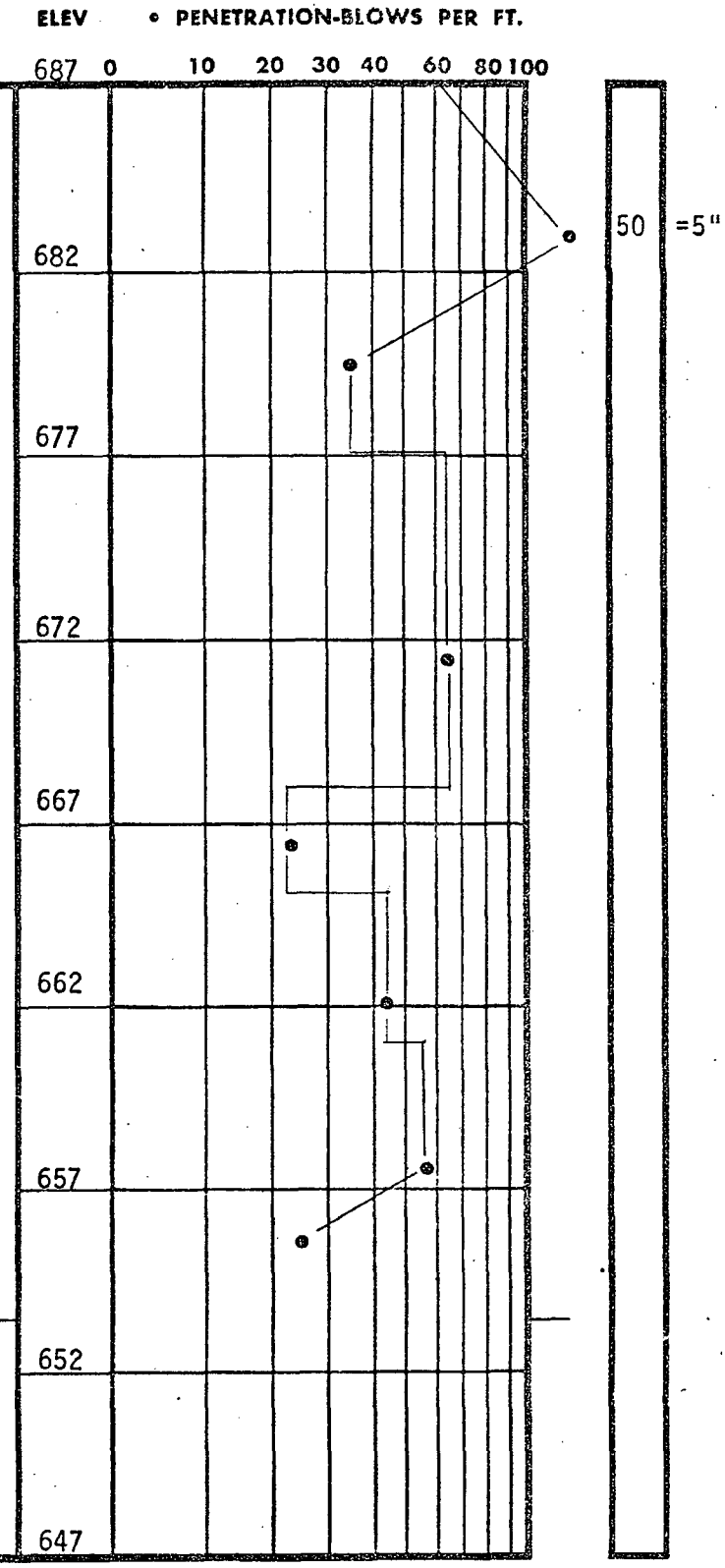
BORING NO. H-5A

DATE DRILLED 3-26-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
40.0	
	Hard Gray Brown Very Micaceous Silt with Seams of Gravel Sized Quartz Fragments.
50.0	
	Very Dense Gray and White Silty Fine to Medium Sand.
59.0	
	Very Stiff Tan and White Fine to Medium Very Sandy Silt.
62.0	
	Hard Gray Green Very Fine Sandy Silt.
66.0	
	Very Dense Gray and Black Slightly Silty Fine to Coarse Sand with Seams of Gravel Sized Quartz Fragments.
73.6	
	See Following Rock Log



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-5A

DATE DRILLED 3-26-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS
73.6	Coarse Grained Diorite	100	NX	652	RQD 100
75.8	Coring Terminated				

CORE BORING RECORD

BORING NO. H-5A
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. (10 20 30 40 60 80 100)
0	Stiff Red and Tan Fine Sandy Clayey Silt	705.40	
2.5	Dense Gray Fine to Medium Silty Sand	700.4	•
7.5	See Following Rock Log		

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-6

DATE DRILLED 10-9-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				705.4		
				700.4		
7.5	Hard Dark Green Meta Gabbro				Depth / Dip 8.0' 70° Joint	
				695.4		
					12.7' 45° Joint	
		100	NX			75%
				690.4	15.7' 45° Joint (Weathered on Surface)	
					16.5' 45° Joint (Weathered on Surface)	
				685.4		
		100	NX			100%
24.5	Soft Badly Weathered Seam			680.4		
		0	NX			0%
26.0	Hard Dark Green Meta Gabbro				27.0' Nearly Vertical (Weathered on Surface)	
		100	NX			83%
27.5	Coring Terminated					

No Drilling Water Loss

CORE BORING RECORD

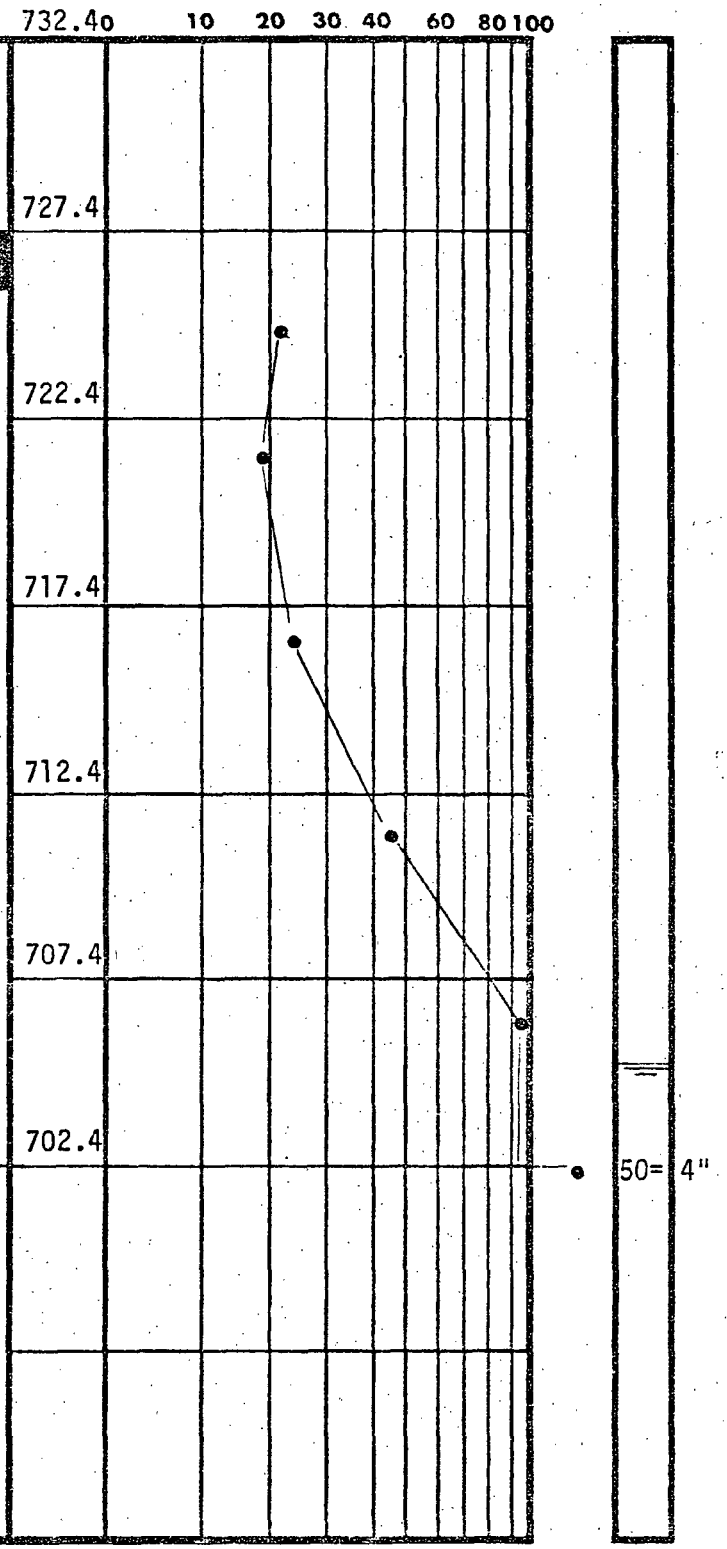
BORING NO. H-6
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Tan Brown Fine Sandy Micaceous Silt	732.4
9.0	Very Stiff Gray Green and Brown Fine Sandy Silt With Traces of Clay.	727.4
14.0	Dense and Very Dense Gray Fine to Medium Silty Sand	722.4
30.0	See Following Rock Log	717.4
		712.4
		707.4
		702.4

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-7

DATE DRILLED 10-3-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
30.0	Soft Brown Black and White Coarse Grained Diorite			702.4		
31.5	Very Soft Brown Black and White Coarse Grained Diorite (No Recovery)	26	NX	697.4	(No Recovery)	0%
37.9	Soft Brown Black and White Coarse Grained Diorite					
40.0				692.4		

No Drilling Water Loss

CORE BORING RECORD

BORING NO. H-7

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				692.4		
41.0	Soft Brown Black and White*					
	Very Soft Brown Black and White Coarse Grained Diorite (No Recovery)	24	NX	687.4		0%
48.0						
49.2	Soft Brown Black and White**			682.4		
	Very Soft Brown Black and White Coarse Grained Diorite (No Recovery)	10	NX	677.4		0%
58.0						
	Soft Brown Black and White Coarse Grained Diorite			672.4		
60.0	Moderately Hard Black and White Coarse Grained Diorite	60	NX			0%
61.2	Very Soft Brown Black and White Coarse Grained Diorite ***					
63.0						
	Hard Light Gray Fine to Medium Grained Granite	100	NX	667.4	Depth / Dip 66.6' 45° Joint 67.4' 70° Joint 69.1' 70° Joint 71.0' Nearly Vertical 71.4' 45° Joint 72.8' 45° Joint 73.4' 45° Joint 73.8' 45° Joint	35%
				662.4		
72.2	Hard Black and White Fine Grained Diorite	100	NX		74.5'-74.9' 70° Joint 75.6'-76.0' 70° Joint	72%
73.1						
74.6	Hard Black and White Coarse Grained Diorite			657.4		
	Hard Black and White Fine Grained Diorite				77.3'-77.6' 70° Joint 78.1' 45° Joint 79.3' 45° Joint	
79.4	****			652.4		50%

No Drilling Water Loss
*Coarse Grained Diorite
**Coarse Grained Diorite
***No Recovery
****Coring Terminated.

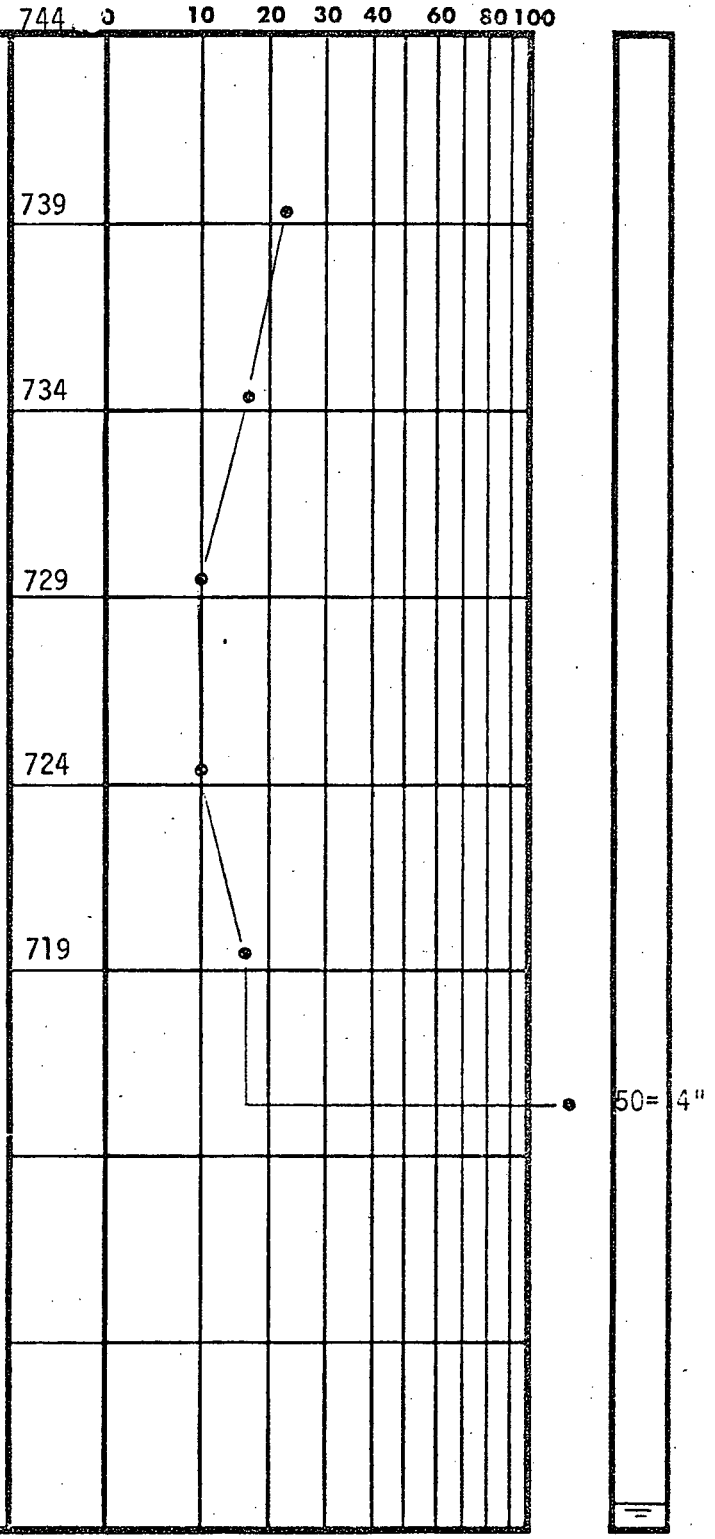
CORE BORING RECORD

BORING NO. H-7
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Reddish Brown Fine Sandy Micaceous Silt	744
7.0	Very Stiff Tan Brown Fine Sandy Micaceous Silt	739
10.0	Stiff to Very Stiff Tan Brown and Black Fine Sandy Silt	734
		729
		724
		719
28.5	See Following Rock Log	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-8
DATE DRILLED 10-9-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
				719		
28.5						
29.0	Partially Weathered Rock That Becomes Gray Tan White Silty*			714	Depth 30.5' Dip 45° Joint	RQD
	Moderately Hard Gray White Fine to Medium Grained Granite					
32.0	Very Soft Gray Brown Fine to Medium Grained Granite	46	NX	709		30%
37.8						
39.0	Moderately Hard Gray White**					
40.0	Very Soft Brown Gray Fine***			704		

*Fine Sand When Sampled
**Fine to Medium Grained Granite
***to Medium Grained Granite (No Recovery)

CORE BORING RECORD

BORING NO. H-8
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				704		
	Very Soft Brown Gray Fine to Medium Grained Granite (No Recovery)	18	NX	699	Loss of Drilling Water Pump Capacity 20 GPM.	11%
47.3	Moderately Hard Gray Brown White Fine to Medium Grained Granite	83	NX	694		40%
51.0	Very Soft Brown Gray Fine to Medium Grained Granite (No Recovery)	0	NX	689		0%
59.1	Very Soft Black and White Coarse Grained Diorite (No Recovery)	21	NX	684	Loss of Drilling Water 59.1 to 83.5 Pump Capacity 20 GPM	11%
				679		
66.5	Hard Black and White Coarse Grained Diorite					
70.2	Very Soft Black and White Coarse Grained Diorite	44	NX	674		0%
72.5	Moderately Hard Black and White Coarse Grained Diorite					
73.5	Very Soft Black and White Coarse Grained Diorite	33	NX	669		0%
77.3						
78.5	Hard Black and White Coarse*				Depth 79.5' Dip 45° Joint	
79.9	Hard Gray White Fine to **			664		

*Grained Diorite
**Medium Grained Granite

CORE BORING RECORD

BORING NO. H-8
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 664	REMARKS	RQD
80.0	Hard Black and White Coarse Grained Diorite	100	NX	659	Note: Rock is Fragmented and Weathered to a Depth of About 80'	95%
88.5	Coring Terminated					

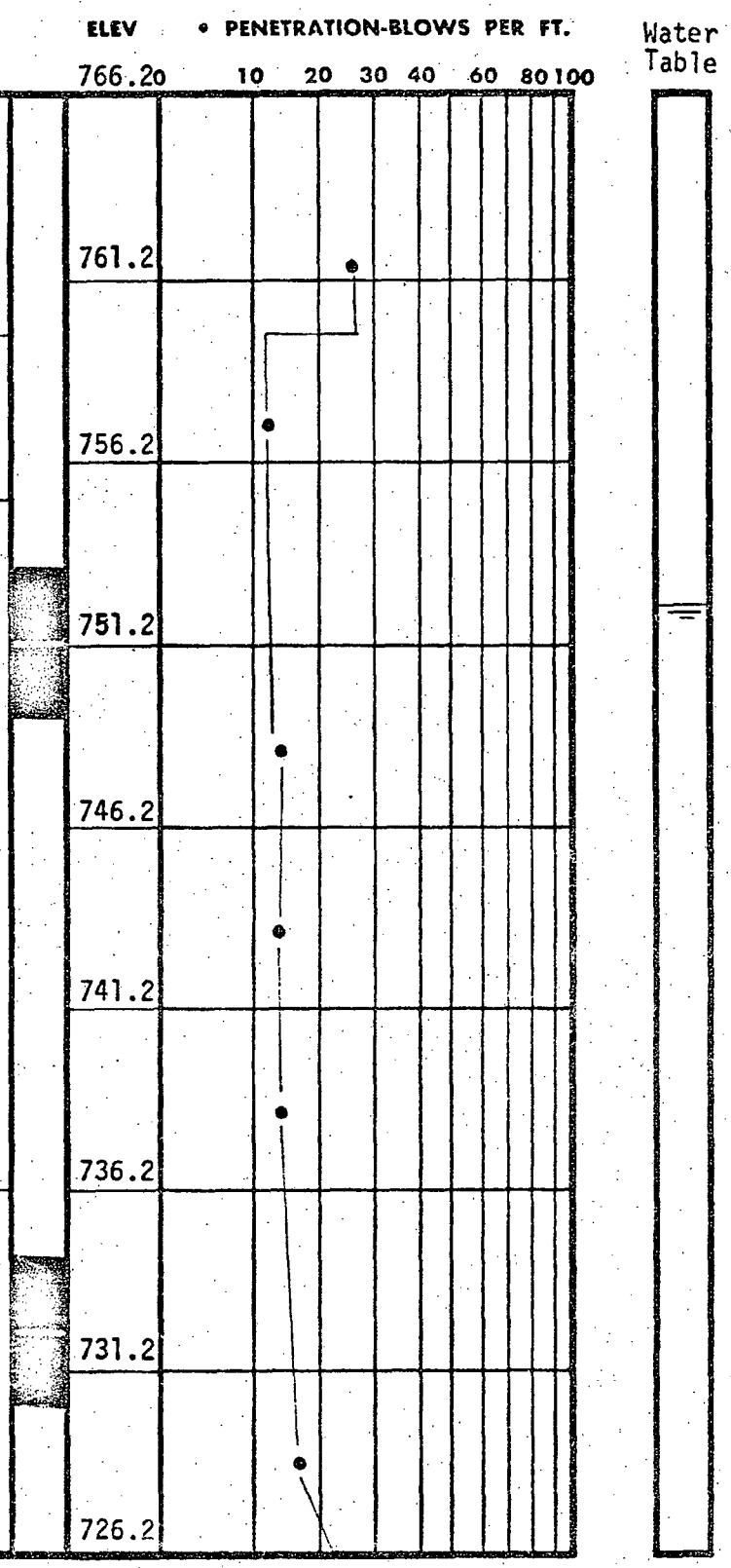
CORE BORING RECORD

BORING NO. H-8
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Red Brown Slightly Clayey Micaceous Silt With Traces of Fine Sand
6.5	Stiff Brown Sandy Micaceous Silt
11.0	Stiff Brown Tan Black Mottled Micaceous Silt With Traces of Fine Sand
30.0	Very Stiff Tan Black Sandy Very Micaceous Silt



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-9

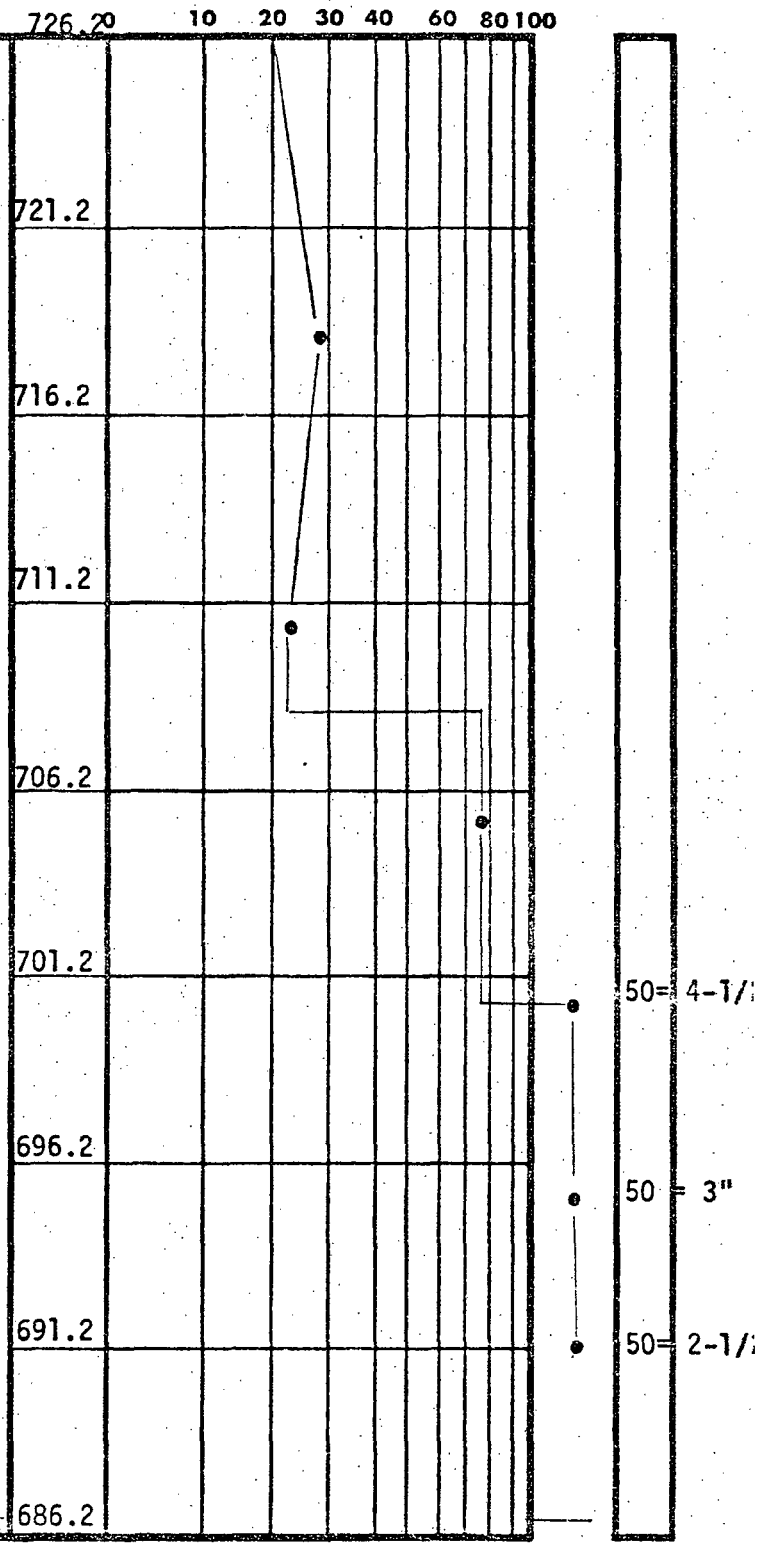
DATE DRILLED 12-19-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Very Stiff Tan Black Sandy Very Micaceous Silt	726.2
		721.2
		716.2
50.0	Gray Fine Sandy Very Micaceous Silt	
52.5	Firm Gray Very Silty Micaceous Sand	711.2
58.0	Hard Gray Brown Slightly Sandy Micaceous Silt	706.2
3.5	Very Dense Gray Micaceous Silty Sand.	701.2
65.5	Partially Weathered Rock That Becomes Green Brown Micaceous Silt When Sampled	696.2
73.0	Partially Weathered Rock That Becomes Green Fine to Medium Sandy Silt When Sampled	691.2
79.7	*	686.2

• PENETRATION-BLOWS PER FT.



*See Following Rock Log

TEST BORING RECORD

Page 2

BORING NO. H-9

DATE DRILLED 12-19-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT	DESCRIPTION	CORE %	BIT SIZE	ELEV	REMARKS	RQD
79.7				686.2		
	Hard Dark Green Meta-Gabbro	100	NX	681.2		96%
86.3						
	Hard Light Gray Fine to Medium Grained Granite				Depth / Dip	
88.7	Hard Light Gray Fine to Medium Grained Granite and Dark*			676.2	87.9' 45° Joint 88.2' 45° Joint	
90.0	Hard Dark Green Meta-Gabbro	100	BX	671.2		100%
96.6						
	Hard Light Gray Fine to Medium Grained Granite	100	BX	666.2		
101.2						
102.1	Hard Black and White Fine Grained Diorite					97%
	Hard Light Gray Fine to Medium Grained Granite			661.2		
				656.2		
111.2	Hard Black and White Coarse Grained Diorite	100	BX	651.2	111.4' 45° Joint	96%
115.8						
	Hard Light Gray Fine to Medium Grained Granite	100	BX	646.2		100%

*Green Meta-Gabbro

CORE BORING RECORD

BORING NO. H-9
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
120.0				646.2		
	Hard Light Gray Fine to Medium Grained Granite				Depth / Dip 120.7' / 45° Joint	100%
				641.2		
		100	BX			100%
129.3	Coring Terminated No Drilling Water Loss.					

CORE BORING RECORD

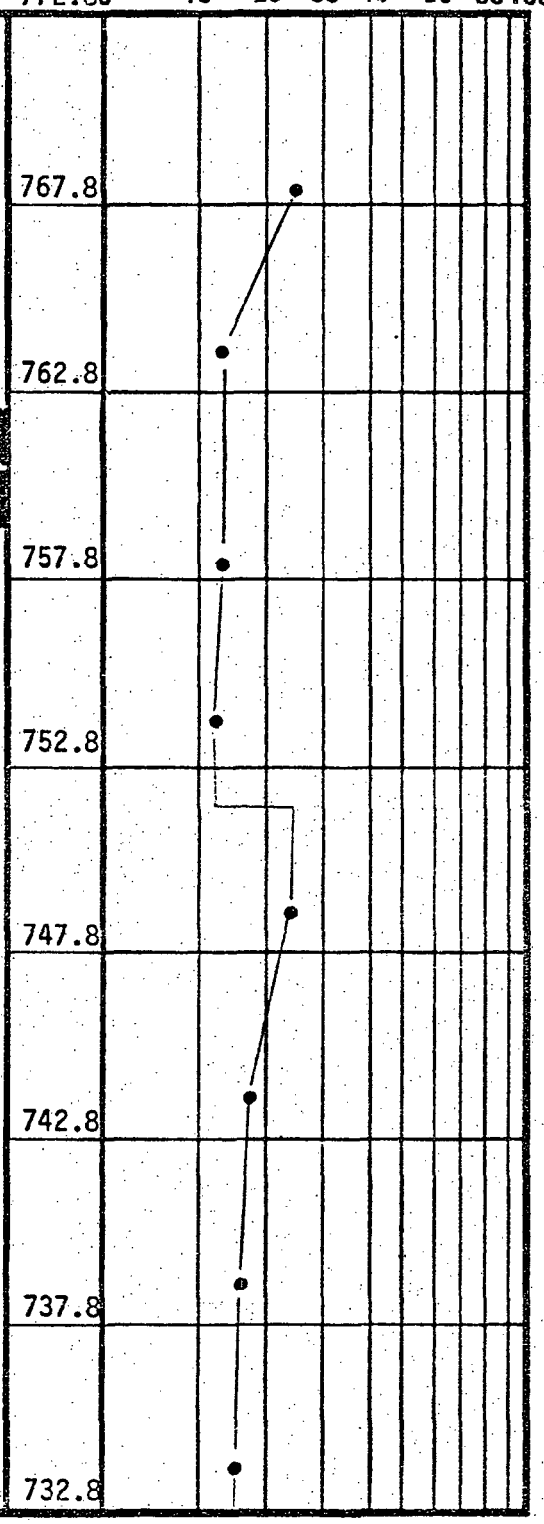
BORING NO. H-9
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt(with Semi-Rounded*/ Very Stiff Reddish Brown Slightly Sandy Clayey Micaceous Silt.	772.8
1.0		
6.0	Stiff Reddish Brown Slightly Sandy Micaceous Silt	767.8
10.0	Stiff Brown Tan Black White Sandy Micaceous Silt	762.8
		757.8
		752.8
21.0	Very Stiff Gray Tan Black Sandy Micaceous Silt	747.8
		742.8
34.0	Firm Light Gray Very Silty Fine to Medium Micaceous Sand	737.8
		732.8

• PENETRATION-BLOWS PER FT.



* Sand and Gravel). (High Level Terrace)

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-10

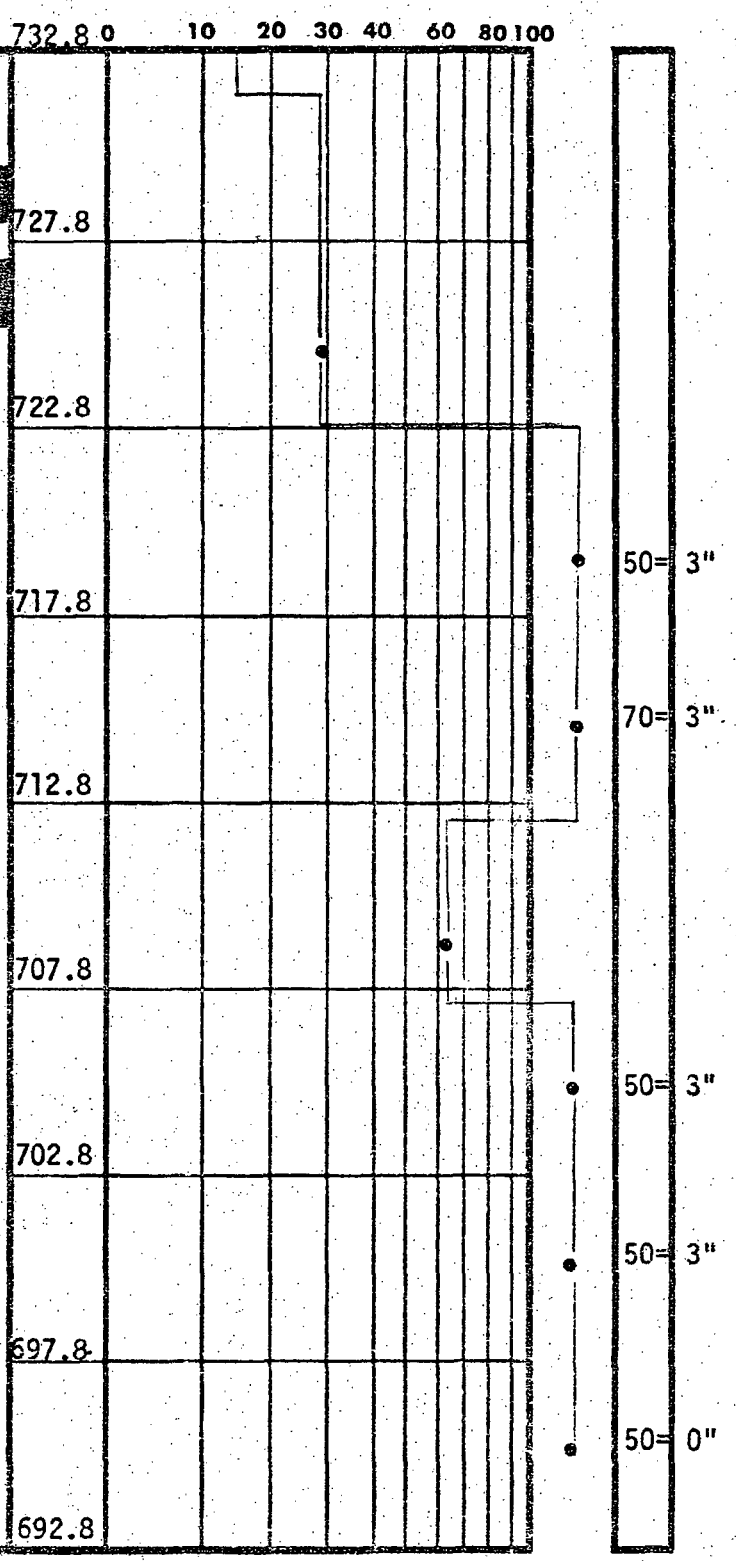
DATE DRILLED 12-1-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
41.0	Firm Light Gray Very Silty Fine to* Very Stiff Green Tan Black Fine Sandy Silt	732.8
50.0	Partially Weathered Rock That Becomes Green Micaceous Silt With Seams of Clay When Sampled	727.8
60.5	Hard Green Micaceous Silt.	722.8
65.5	Partially Weathered Rock That Becomes Green Micaceous Silt With Seams of Clay When Sampled.	717.8
		712.8
		707.8
		702.8
		697.8
		692.8

• PENETRATION-BLOWS PER FT.



*Medium Micaceous Sand

TEST BORING RECORD

Page 2

BORING NO. H-10

DATE DRILLED 12-1-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				692.8		
		0	NX			0%
				687.8		
		0	NX			0%
				682.8		
94.5				677.8	Fishtailed Without Sampling	
97.5						
98.0	Very Hard Light Gray Quartz				Depth / Dip 99.5' 70° Joint Slightly Weathered	
101.1	Moderately Hard Dark Green Meta-Gabbro	100	NX	672.8	103.0' 60° Joint 106.5' 60° Joint	68%
	Hard Dark Green Meta-Gabbro	100	NX	667.8		95%
				662.8	109.0' 80° Joint	
112.6	Hard Light Gray Fine to Medium Grained Granite	100	NX	657.8		100%
115.8	Hard Black and White Coarse Grained Diorite				117.6' 60° Joint	
120.0				652.8		

Page 3

CORE BORING RECORD

BORING NO. H-10

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
120.0				652.8		
	Hard Black and White Coarse Grained Diorite					
123.4						
	Hard Light Gray Fine to Medium Grained Granite	100	NX	647.8	Depth 125.1' Dip 60° Joint	88%
126.0						
	Hard Black and White Coarse Grained Diorite					
				642.8	130.5' 60° Joint	
		100	NX			92%
				637.8		
137.7						
	Hard Light Gray Fine to Medium Grained Granite			632.8		
140.2						
	Hard Black and White Coarse Grained Diorite	100	NX			100%
				627.8		
		100	NX			
				622.8	149.4' 60° Joint	96%
153.3						
	Coring Terminated No Drilling Water Loss.			617.8		
				612.8		

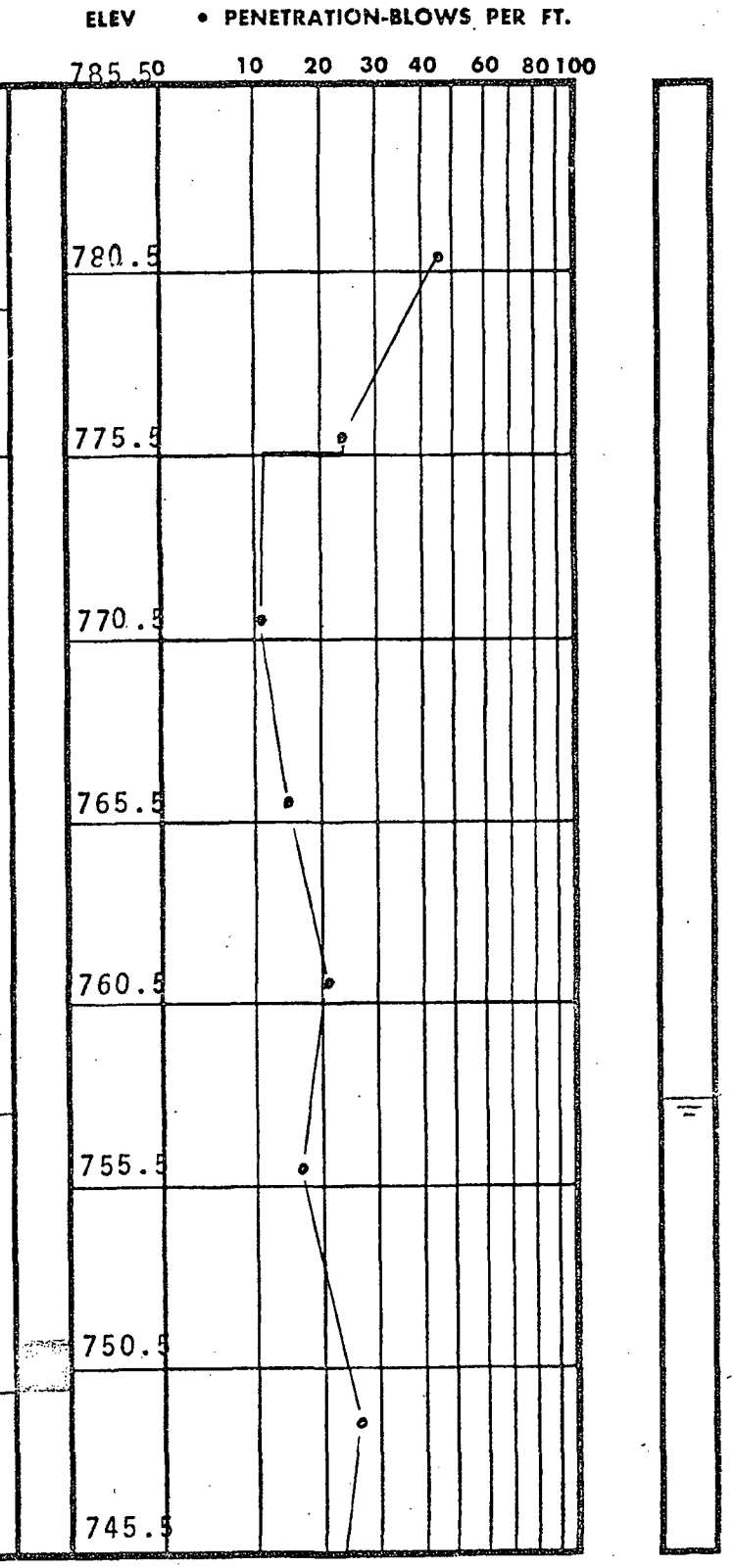
CORE BORING RECORD

BORING NO. H-10
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Hard Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)
6.0	Very Stiff to Hard Red Brown Fine to Medium Sandy Clayey Micaceous Silt.
10.0	Stiff to Very Stiff Red Brown And Tan Fine to Medium Sandy Micaceous Silt
28.0	Firm Maroon Silty Sand
35.5	Very Stiff Pink Tan And Black Fine Very Sandy Micaceous Silt



No Drilling Water Loss

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.
UNDISTURBED SAMPLE
WATER TABLE, 1 HR.
|50| % ROCK CORE RECOVERY
LOSS OF DRILLING WATER

BORING NO. H-11
DATE DRILLED 10-20,21,22-69
JOB NO. ~~CH-2055~~

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0	Very Stiff Pink Tan and Black Fine Very Sandy Micaceous Silt.	745.5	
		740.5	
45.5	Very Stiff Gray Green and White Very Fine Sandy Micaceous Silt		
		735.5	
		730.5	
		725.5	
64.3	See Following Rock Log	720.5	50= 3"

TEST BORING RECORD

Page 2

BORING NO. H-11

DATE DRILLED 10-20,21,22-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
64.3	Very Soft Brown, Black and White Fine Grained Diorite	16	NX	720.5		0%
67.5	Hard Black and White Fine Grained Diorite					
69.0	Soft Brown, Black and White Fine Grained Diorite	74	NX	715.5		49%
73.5						
74.0	Moderately Hard Black and White Fine Grained Diorite			710.5		58%
	Hard Black and White Fine Grained Diorite					
				705.5		94%
80.0						

CORE BORING RECORD

BORING NO. H-11
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				705.5		
80.0	Hard Black and White Fine Grained Diorite	100	NX		Inclusion of Light Green Fine to Medium Grained Granite at 80.3'	94%
				700.5	Inclusion of Light Gray Fine to Medium Grained Granite at 86.6'	100%
		100	NX			
89.8				695.5	Coarse Grained Diorite Intrusion Within Granite at 89.6'	
90.6	Hard Black and White Coarse Grained Diorite					
	Hard Black and White Fine Grained Diorite					100%
				690.5		
		100	NX	685.5		
100.5						100%
	Hard Light Gray Fine to Medium Grained Granite and Black and White Fine Grained Diorite					
103.6						
104.4	Hard Black and White Fine Grained Diorite			680.5		
		100	NX			86%
106.7	Hard Light Gray Fine to Medium Grained Granite					
	Hard Black and White Fine Grained Diorite			675.5		
						84%
		100	NX			
				670.5		78%
116.2	Hard Dark Green Meta-Gabbro				Depth / Dip: 117.0' 60° Joint; 119.3' 75° Joint	
120.0		100	NX	665.5		

Page 4

CORE BORING RECORD

BORING NO. H-11

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
120.0				665.5		
	Hard Dark Green Meta-Gabbro	100	NX	660.5	Depth / Dip 121.3' 70° Joint 122.2' 60° Joint 123.1' 60° Joint 122.2-123.1 - Nearly Vertical Joint	42% 100%
127.0	Coring Terminated					

Page 5

CORE BORING RECORD

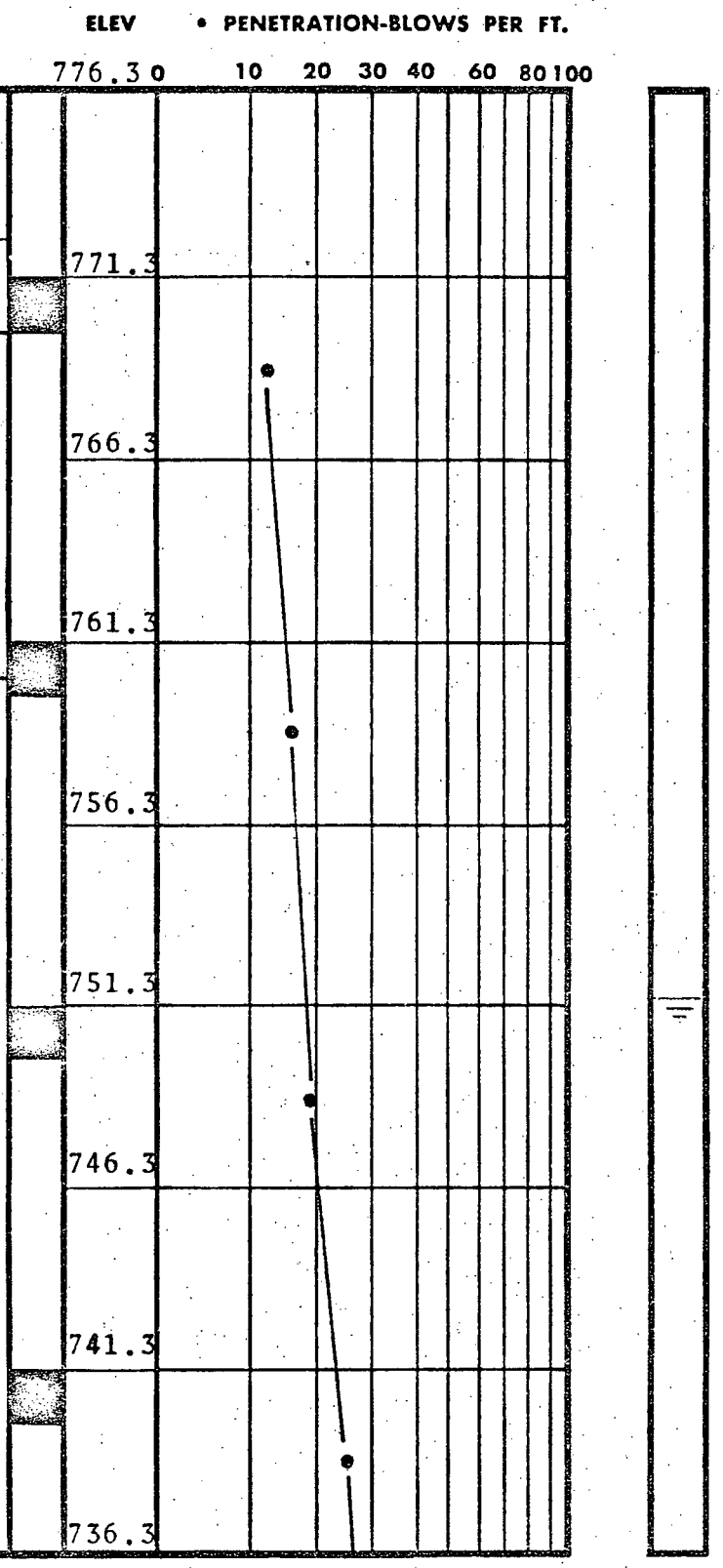
BORING NO. H-11

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Stiff Dark Red Brown Slightly Sandy Clayey Silt(with Semi-Rounded Sand and Gravel). (High Level Terrace)
4.0	Stiff Red Brown Fine to Medium Sandy Slightly Clayey Micaceous Silt.
6.5	Stiff Red Brown and Tan Fine Sandy Micaceous Silt
16.0	Very Stiff Purple Black Tan Slightly Sandy Micaceous Silt
40.0	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

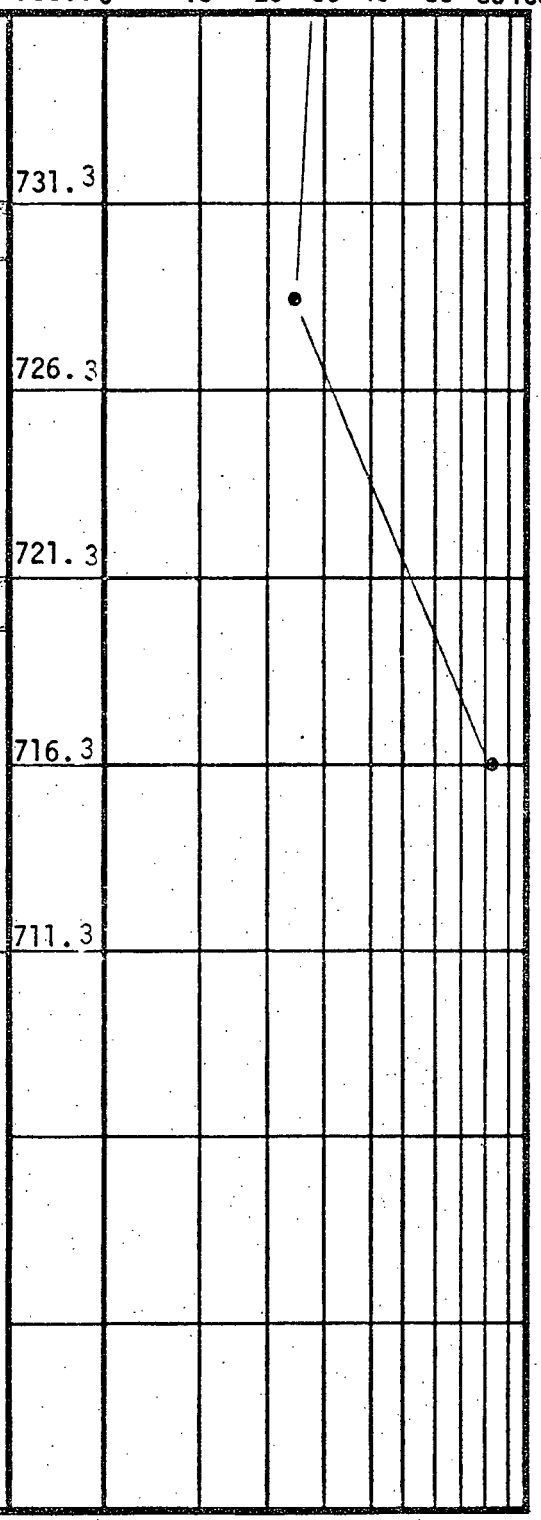
BORING NO. H-12

DATE DRILLED 10 22,23,24/69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0	Very Stiff Purple Black Tan Slightly Sandy Micaceous Silt	736.3	
45.0	Very Stiff Gray and White Slightly Sandy Micaceous Silt.	731.3	
50.0	Hard to Very Hard Gray and White Slightly Sandy Micaceous Silt.	726.3	
		721.3	
		716.3	
65.0	See Following Rock Log	711.3	



TEST BORING RECORD

Page 2

BORING NO. H-12

DATE DRILLED 10-22,23,24-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				711.3		
65.0	Soft Dark Green Meta-Gabbro					
67.6						
68.1	Very Soft Dark Green Meta-***	85	NX			
69.1	Hard Light Gray Fine to Medium Grained Granite			706.3	Slickensides on Surface Between Rock Types	56%
	Hard Dark Green Meta-Gabbro					
72.8	Hard Black and White Fine Grained Diorite.	100	NX	701.3		98%
77.5						
79.0	Hard Light Gray Fine to*					
80.0	Hard Black and White Fine**	100	NX	696.3		

*Medium Grained Granite
**Grained Diorite
***Gabbro (No Recovery)
No Drilling Water Loss

CORE BORING RECORD

BORING NO. H-12
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.3				696.3		
	Hard Light Gray Fine to Medium Grained Granite					100%
83.4						
	Hard Black and White Coarse Grained Diorite	100	NX	691.3		
				686.3		
91.7						
	Hard Light Gray Fine to Medium Grained Granite	100	BX			100%
93.8						
	Hard Black and White Coarse*			681.3		
95.1						
	Hard Light Gray Fine to Medium Grained Granite					
96.9						
	Hard Black and White Coarse Grained Diorite			676.3		
		100	BX			100%
104.0						
	Hard Light Gray Fine to Medium**			671.3		
105.0						
	Hard Black and White Coarse Grained Diorite					
106.4						
	Hard Light Gray Fine to Medium Grained Granite					100%
108.3		100	BX			
	Hard Black and White Coarse Grained Diorite			666.3		
111.7						
	Hard Light Gray Fine to Medium Grained Granite					
113.5						
	Hard Black and White Coarse Grained Diorite			661.3		
115.3		100	BX			100%
	Hard Light Gray Fine to Medium Grained Granite					
118.1						
119.3	Hard Black and White Coarse***					
	Coring Terminated			656.3		

*Grained Diorite
**Grained Granite
***Grained Diorite

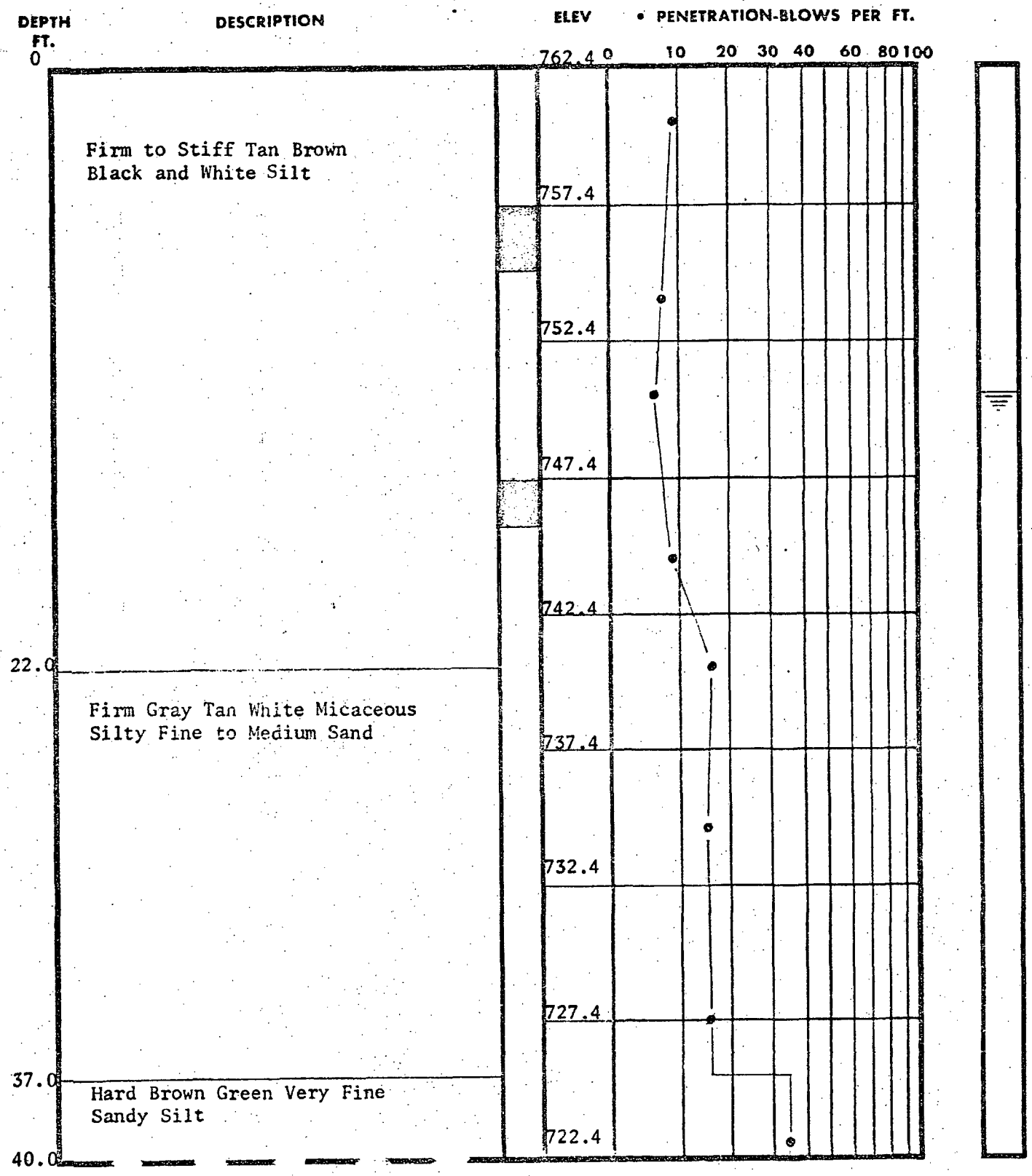
Page 4

CORE BORING RECORD

BORING NO. H-12
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

BORING NO. H-13

DATE DRILLED 1-1-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. (0 10 20 30 40 60 80 100)	
		722.4		
	Hard Green Brown Silt	717.4		
46.5	Very Stiff Green Brown Silt	712.4		
51.5	Hard Green Brown Silt	707.4		
		702.4		
		697.4		
68.5				50= 2-1/
69.0 *	See Following Rock Log	692.4		
		687.4		
		682.4		

* Partially Weathered Rock That Becomes Green Brown Silt When Sampled.

TEST BORING RECORD

Page 2

BORING NO. H-13

DATE DRILLED 1-1-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				697.4		
	Fishtail Refusal at 69.0'					
69.0	Soft Brown Gray Fine to Medium Grained Granite	67	NX	692.4		0%
69.3	Moderately Hard Black and White Fine Grained Diorite	95	NX		No Recovery	0%
74.4	Very Soft Brown, Black and White Fine Grained Diorite (No Recovery)	46	NX	687.4	Depth 71.5' Dip Nearly Vertical Joint With Ground-water Deposits on Surfaces; 73.2' Joint With Ground-water Deposits on ***	12%
78.5	Moderately Hard Black and *					
79.5	**	70	NX	682.4	74.2' Joint With Ground-****	

*White Fine Grained Diorite
**Very Soft Brown, Black and White Fine Grained Diorite

*** Surfaces
**** water Deposits on Surfaces

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-13
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 682.4	REMARKS	RQD
80.0	Very Soft Brown, Black and White Fine Grained Diorite				No Recovery	
82.1	Hard Black and White Fine Grained Diorite	70	NX	677.4	Depth / Dip 82.2' 45° Joint 82.5'- 84.2' Vertical Joint Slightly Weathered 85.1' Vertical Joint 86.4' 60° Joint 88.2'- 89.1' Nearly Vertical Joint	61%
89.5	Hard Dark Green Meta-Gabbro	100	NX	672.4 667.4		100%
		100	NX	662.4 657.4	104.7' 50° Joint	100%
		100	NX	652.4 647.4	116.6' 50° Joint 118.6' 45° Joint 118.7' 45° Joint	100%
120.0				642.4		

No Drilling Water Loss

CORE BORING RECORD

BORING NO. H-13
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
120.0				642.4		
	Hard Dark Green Meta-Gabbro					
		100	NX	637.4		100%
		100	NX	632.4		100%
133.2						
	Coring Terminated			627.4		

No Drilling Water Loss

CORE BORING RECORD

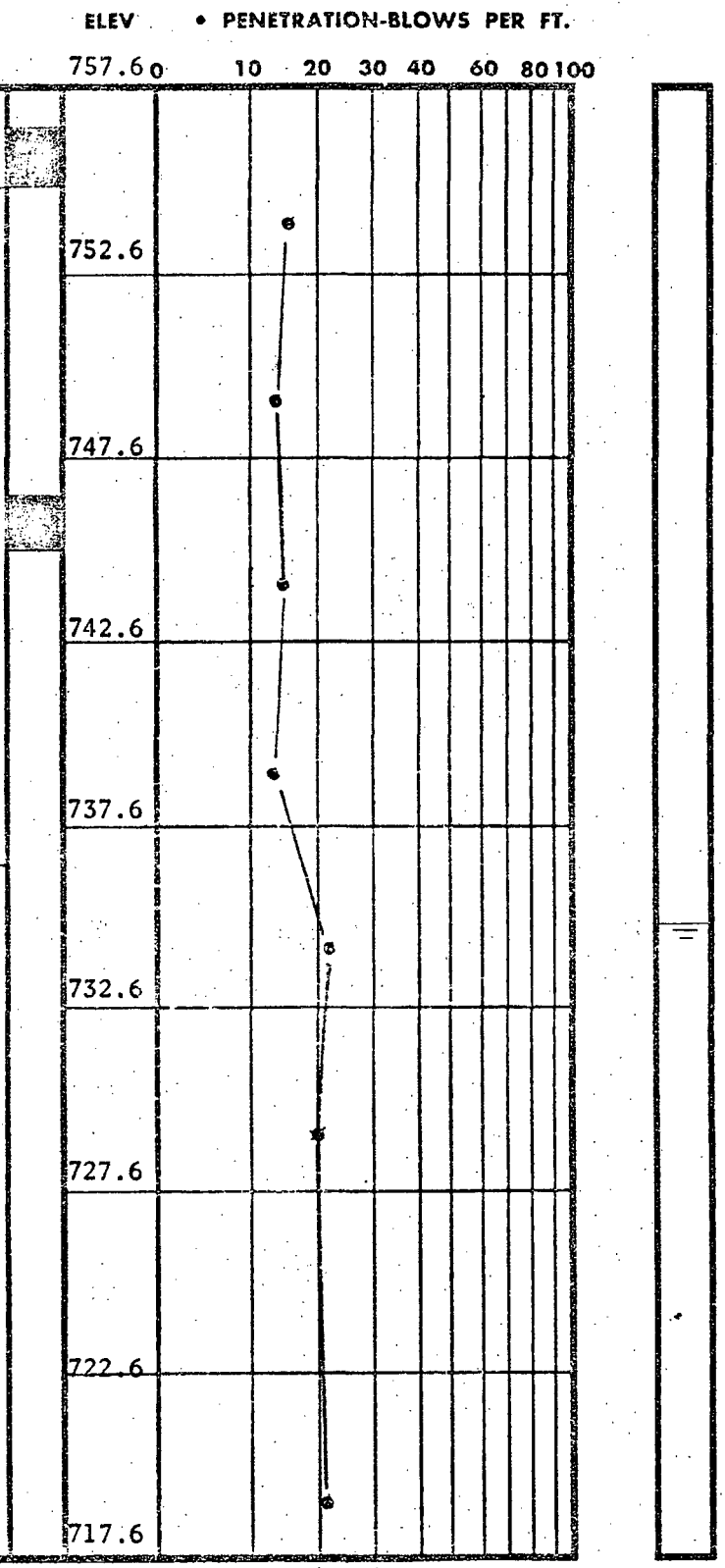
BORING NO. H-13

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION	ELEV
0	Red Brown Sandy Silt	757.6
5	Stiff Red Brown Tan and Black Slightly Sandy Micaceous Silt	752.6
		747.6
		742.6
		737.6
21.0	Very Stiff Brown and Black Very Fine Sandy Micaceous Silt	732.6
		727.6
		722.6
40.0		717.6



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-14

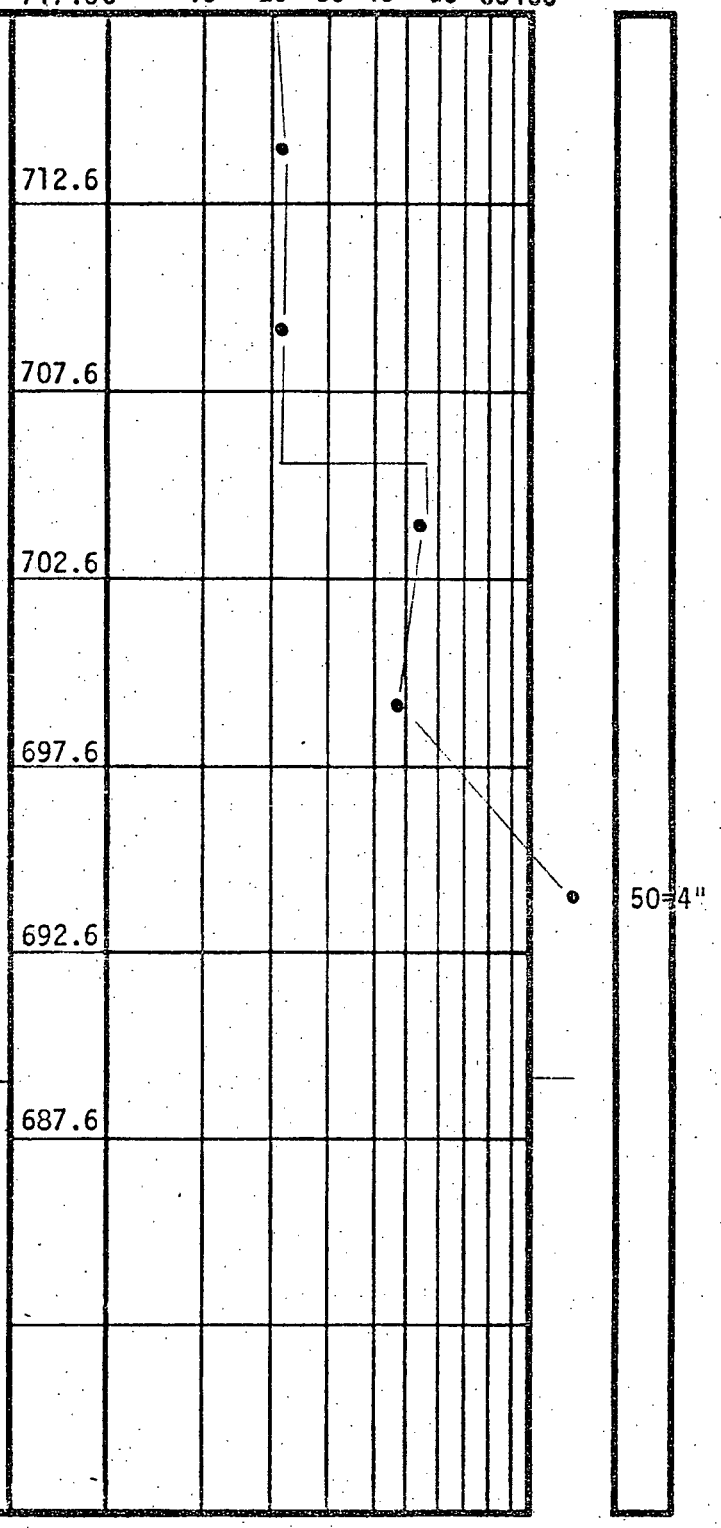
DATE DRILLED 10-16 & 18-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
		717.6
41.0	Very Stiff Brown and Black Very*	
	Firm Tan and Black Silty Fine Sand	712.6
		707.6
52.0	Hard Gray Fine Sandy Silt	702.6
		697.6
63.5	Partially Weathered Rock That Becomes Gray Fine Sandy Silt When Sampled.	692.6
68.5	See Following Rock Log	687.6

• PENETRATION-BLOWS PER FT.



*Fine Sandy Micaceous Silt

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

Page 2
BORING NO. H-14
DATE DRILLED 10-16 & 18-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				692.6		
68.5	Moderately Hard Light Gray and Brown Medium Grained Granite			687.6	Depth 70.0' 60° Dip Joint	
		45	NX	682.6		25%
		95	NX	677.6		80%

No Drilling Water Loss

Page 3

CORE BORING RECORD

BORING NO. H-14
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 677.6	REMARKS		RQD
	Moderately Hard Light Gray and Brown Medium Grained Granite	95	NX				
83.5	Hard Light Gray Medium Grained Grainite			672.6	Depth	Dip	80%
					86.7'	60° Joint	
					87.3'	45° Joint	
				667.6	90.0'	60° Joint	
		27	NX				20%
				662.6			
98.5	Hard Dark Green Meta-Gabbro			657.6	99.8'	80° Joint	
					101.7'	45° Joint	
		47	NX				34%
				652.6			
107.5							
108.0	Hard White Quartz Vein	38	NX				0%
	Hard Dark Green Meta-Gabbro			647.6			
		94	NX	642.6			86%
					116.0'	45° Joint	
					117.5'	45° Joint	
					118.6'	60° Joint	
				637.6			

No Drilling Water Loss

CORE BORING RECORD

BORING NO. H-14
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 637.6	REMARKS	RQD
	Hard Dark Green Meta-Gabbro				Depth / Dip 120.0' Vertical 121.0' Nearly Vertical 122.5' Vertical	61%
				632.6		
		100	NX	627.6		100%
				622.6		
138.1		100	BX			
139.7	Hard Black and White Fine Grained Diorite			617.6	141.8' 45° Joint	100%
	Hard Light Gray Fine to Medium Grained Granite				144.0 80° Joint	
				612.6		
		100	BX	607.6		100%
				602.6		
156.9						
157.8	Hard Fine Grained Diorite	100	BX			100%
	Hard Coarse Grained Diorite			597.6		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-14
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
160.0				597.6		
161.1	Hard Coarse Grained Diorite					
	Hard Fine to Medium Grained Light Gray Granite	100	BX			100%
				592.6		
165.4	Hard Coarse Grained Diorite With Light Gray Granite Intrusion					
169.4				587.6		
	Coring Terminated					

No Drilling Water Loss.

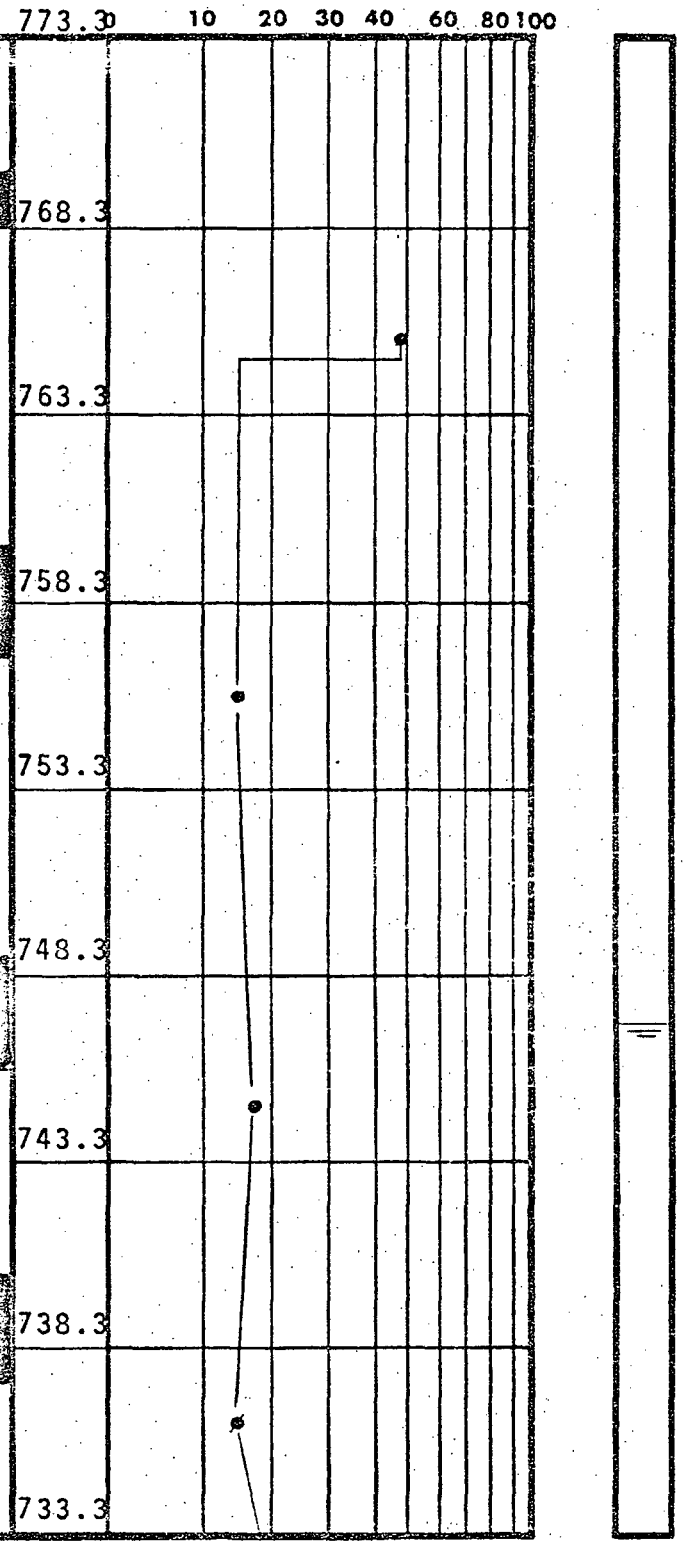
CORE BORING RECORD

BORING NO. H-14
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Hard Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel. (High Level Terrace)	773.3
6.0	Very Stiff Reddish Brown Slightly Sandy Clayey Silt.	768.3
8.5	Very Stiff Reddish Brown and Tan Fine Sandy Micaceous Silt	763.3
		758.3
		753.3
		748.3
26.0	Firm Brown Micaceous Silty Fine Sand.	743.3
		738.3
36.0	Stiff Brown Tan and Black Fine Very Sandy Micaceous Silt	733.3
40.0		



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER DRILLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-15

DATE DRILLED 11-6-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
		733.3	
40.0	Stiff Brown Tan and Black Fine Very Sandy Micaceous Silt		
44.0	Very Stiff Brown Tan and Black Fine Sandy Micaceous Silt	728.3	
		723.3	
53.5	See Following Rock Log		

TEST BORING RECORD

Page 2

BORING NO. H-15

DATE DRILLED 11-6-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				723.3		
53.5	Soft Brown, Black and White Fine Grained Diorite	62	NX	718.3	Depth 55.8'-57.0' Dip 90° Joint	0%
57.5	Hard Black and White Coarse Grained Diorite	100	NX	713.3		96%
				708.3	Small Intrusions of Fine Grained Diorite at 63.4' and 68.9'	
		100	NX	703.3		75%
				698.3		
		100	NX			100%
80.0				693.3		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-15
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				693.3		
	Hard Black and White Coarse Grained Diorite	100	NX			
83.3						
	Hard Black and White Fine Grained Diorite			688.3		
		100	NX			90%
				683.3		
				678.3	Depth 95.5' Dip 45° Joint	
		100	NX			69%
				673.3		
				668.3		
105.7		100	NX			94%
	Hard Light Gray Fine to Medium Grained Granite					
108.6						
	Coring Terminated			663.3		

No Drilling Water Loss.

CORE BORING RECORD

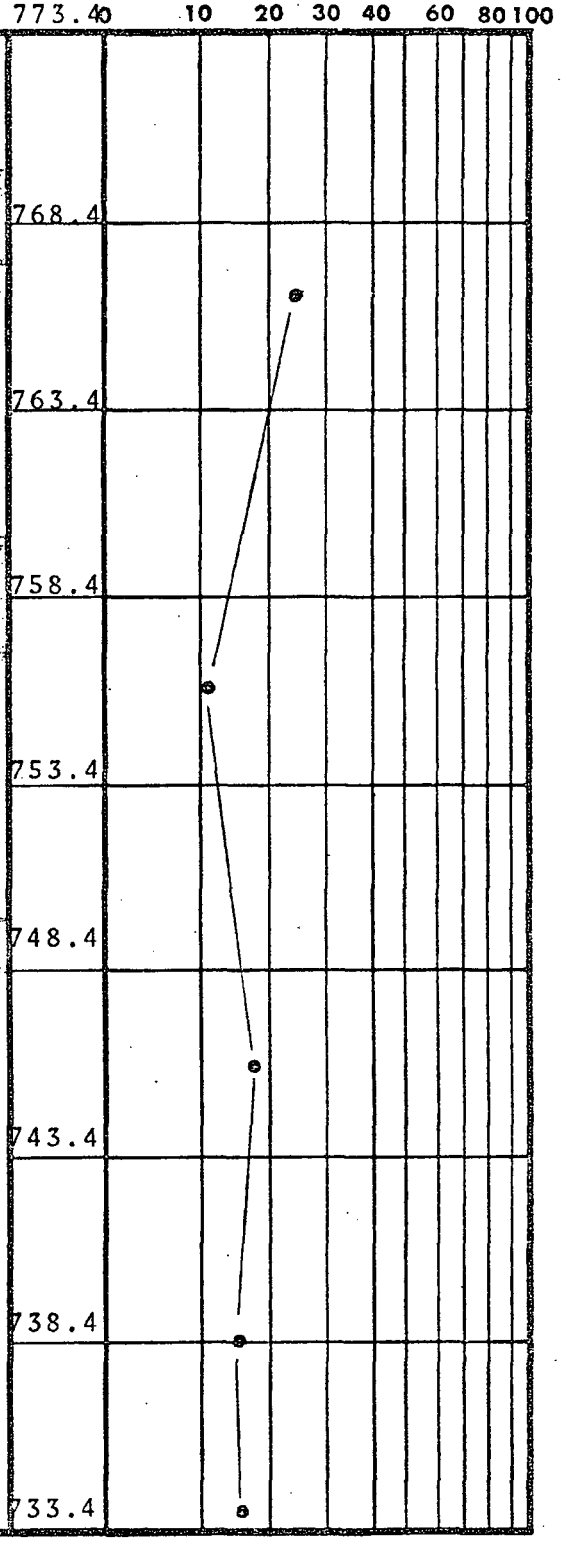
BORING NO. H-15
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)	773.40
5.0	Very Stiff Reddish Brown and Tan Fine Sandy Micaceous Silt.	768.4
		763.4
		758.4
15.0	Stiff to Very Stiff Gray Black Tan White Fine to Coarse Very Sandy Micaceous Silt	753.4
		748.4
		743.4
		738.4
		733.4

• PENETRATION-BLOWS PER FT.



No Drilling Water Loss

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-16

DATE DRILLED 11-8-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0	Stiff to Very Stiff Gray Black Tan White Fine to Coarse Very Sandy Micaceous Silt	733.4	
		728.4	
47.0	See Following Rock Log		

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

Page 2

BORING NO. H-16

DATE DRILLED 11-8-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 733.4	REMARKS	RQD
40.0				728.4		
47.0	Moderately Hard Light Gray Fine to Medium Grained Granite	64	NX	723.4	Depth 51.6' Dip 70° Joint	38%
54.5	Very Soft Light Gray Fine to Medium Grained Granite			718.4	No Recovery	
59.0				713.4		
59.6	Moderately Hard Light Gray Fine to Medium Grained Granite					
61.0	Moderately Hard Black and White Fine Grained Diorite	56	NX			17%
	Very Soft Black and White Fine Grained Diorite			708.4		
65.4	Hard Black and White Fine *					
66.9						
68.0	Hard Light Gray Fine to Medium Grained Granite			703.4		100%
	Hard Black and White Fine Grained Diorite	100	NX			
74.5	Hard Black and White Coarse Grained Diorite			698.4		
78.3	Hard Black and White Fine Grained Diorite	100	NX	693.4		100 %

*Grained Diorite

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-16

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				693.4		
	Hard Black and White Fine Grained Diorite	100	NX	688.4		100%
89.6				683.4		
	Hard Black and White Coarse Grained Diorite	100	NX	678.4		100%
95.7						
	Hard Black and White Fine Grained Diorite	100	NX	673.4	Depth 103.6' Dip 60° Joint	100%
				668.4		
		100	NX	663.4		
113.9						
	Hard Black and White Coarse Grained Diorite			658.4		100%
116.4						
	Coring Terminated					

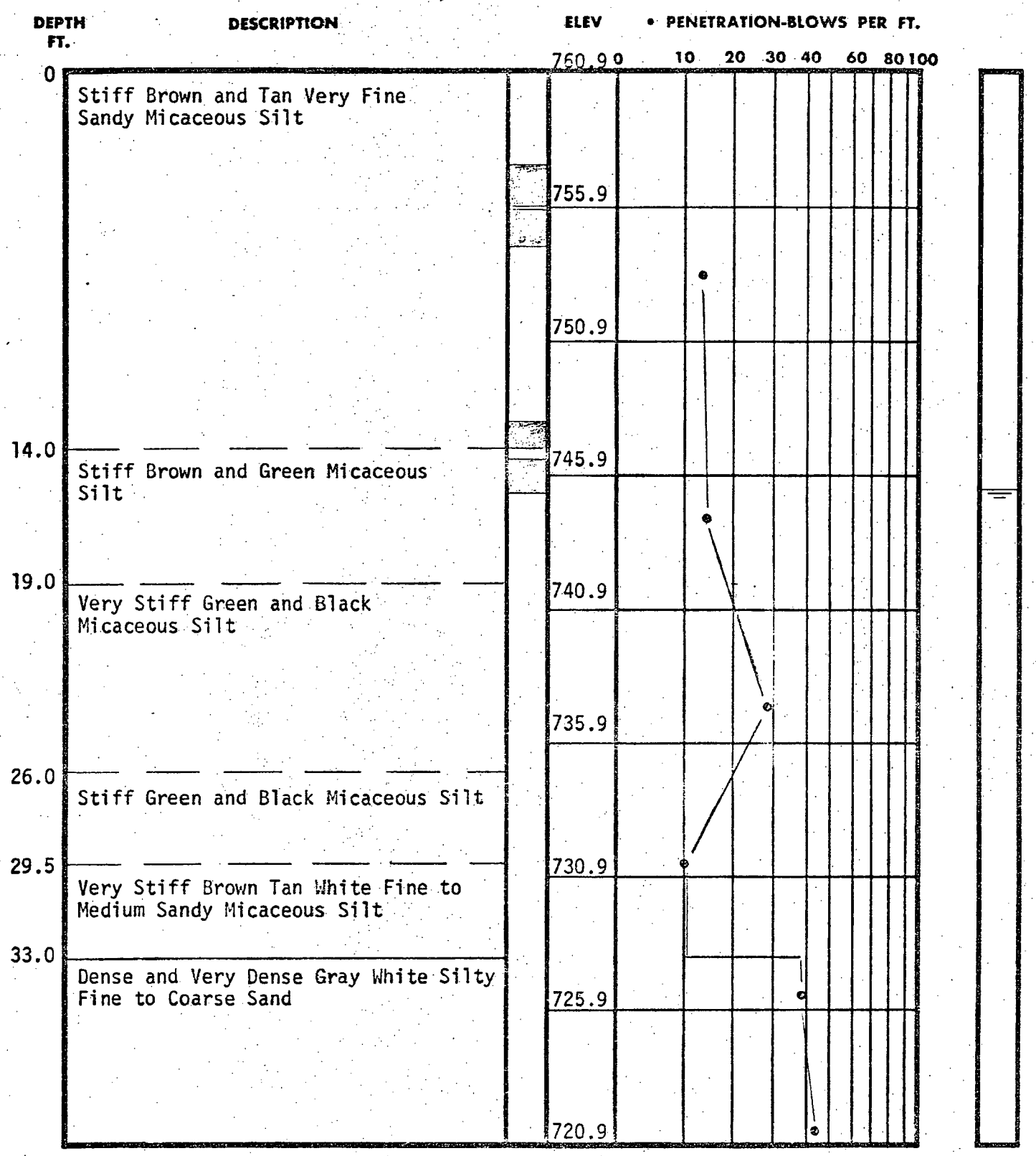
No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-16
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-17

DATE DRILLED 11-17-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
		720.9		
40.0	Dense and Very Dense Gray White Silty Fine to Coarse Sand			50= 4"
	Partially Weathered Rock That Becomes Gray White Silty Fine to Coarse Sand When Sampled.	715.9		
47.5	Partially Weathered Rock That Becomes Gray Green Silty Very Fine Sand When Sampled.	710.9		50= 2"
52.9	See Following Rock Log			

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

Page 2

BORING NO. H-17

DATE DRILLED 11-17-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				710.9		
52.9	Very Soft Black and White Fine Grained Diorite	100	NX			0%
		100	NX	705.9		0%
58.5	Hard Gray and White Fine to Medium Grained Granite	100	NX	700.9	Depth / Dip 58.5'- 64.0' Rock is Highly Fractured and Vertical Jointed	0%
		100	NX	695.9	64.0'- 70.0' Rock is Moderately Fractured and Jointed	45%
				690.9	69.0' 60° Joint	
71.6	Hard Black and White Fine Grained Diorite	100	NX			86%
		100	NX	685.9	75.5' 60° Joint 76.6' 45° Joint 76.8' 45° Joint	96%
				680.9		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-17
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				680.9		
	Hard Unweathered Diorite	100	NX		Depth 82.5' 45° Dip Joint	96%
				675.9		
		100	NX			100%
88.0						
89.8	Hard Black and White Coarse Grained Diorite.			670.9		
91.4	Hard Black and White Fine Grained Diorite.					
	Hard Black and White Coarse Grained Granite			665.9		
		100	NX			100%
99.8				660.9		
	Hard Gray White Fine to Medium Grained Granite					
				655.9		
		100	BX			100%
				650.9		
		100	BX			100%
				645.9		
		100	BX			
119.1				640.9		100%
	Hard Black and White Coarse Grained Diorite					
122.0						

Coring Terminated

No Drilling Water Loss.

CORE BORING RECORD

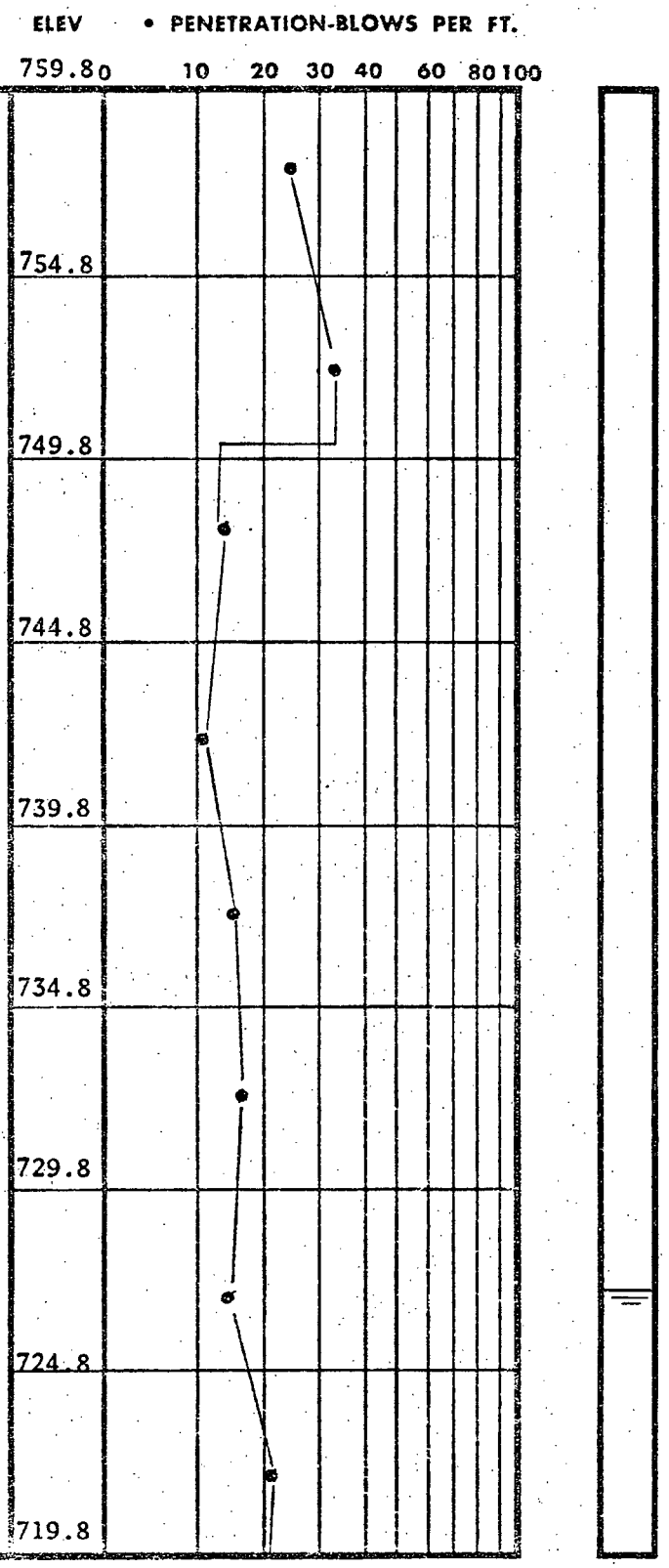
BORING NO. H-17

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Red Slightly Sandy Silty Clay
4.0	Hard Red Brown Slightly Sandy Very Clayey Silt
9.5	Stiff to Very Stiff Brown Tan Black White Micaceous Silt
40.0	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-18

DATE DRILLED 12-29-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
		719.8	
40.0	Stiff to Very Stiff Brown Tan Black White Micaceous Silt	714.8	
45.0	Dense to Very Dense Black Brown White Silty Fine to Coarse Sand	709.8	
		704.8	
57.0	See Following Rock Log		• 50=1-1/2"

TEST BORING RECORD

Page 2

BORING NO. H-18

DATE DRILLED 12-29-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0						
				704.8		
57.0	Fishtail Refusal at 57.0'					
	Moderately Hard Black and White Coarse Grained Diorite	100	NX			0%
				699.8	Depth / Dip	
60.0		83	NX			54%
	Hard Black and White Coarse Grained Diorite				62.0' 60° Joint	
					63.5' 70° Joint - Brown Stained	
		100	NX	694.8	64.1' 60° Joint - Brown Stained	
					64.4' 45° Joint - Brown Stained	91%
					66.8' 60° Joint Brown Stained	
	(Intrustion of Light Gray Fine to Medium Grained Granite at 69.0')				67.9' 60° Joint	
				689.8	68.2' 60° Joint	
					68.3' 45° Joint	
		100	NX		70.5' 45° Joint	
					71.0' 70° Joint Brown Stained	100%
					71.2' 60° Joint	
				684.8		
		100	NX			100%
77.8	Hard Light Gray Fine to Medium*					
78.6						
80.0	Hard Black and White Coarse**			679.8		

*Grained Granite
**Grained Diorite

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-18
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				679.8		
80.0	Hard Black and White Coarse Grained Diorite	100	NX			- 100%
82.8	Hard Black and White Fine Grained Diorite			674.8		
85.5						
86.5	Hard Light Gray Fine to Medium Grained Granite	100	NX			100%
	Hard Black and White Coarse Grained Diorite			669.8		
93.1					Depth / Dip 93.4' 60° Joint	
94.1	Hard Light Gray Fine to Medium Grained Granite			664.8		
	Hard Black and White Coarse Grained Diorite (Several Small Intrutions of Light Gray Fine to Medium*	100	NX		97.9' 60° Joint	100%
99.6	Hard Black and White Fine Grained Diorite			659.8		
				654.8		
		100	NX			100%
108.3	Hard Light Gray Fine to Medium Grained Granite			649.8		
110.2	Hard Black and White Fine Grained Diorite					
112.0	Coring Terminated					

*Grained Granite)

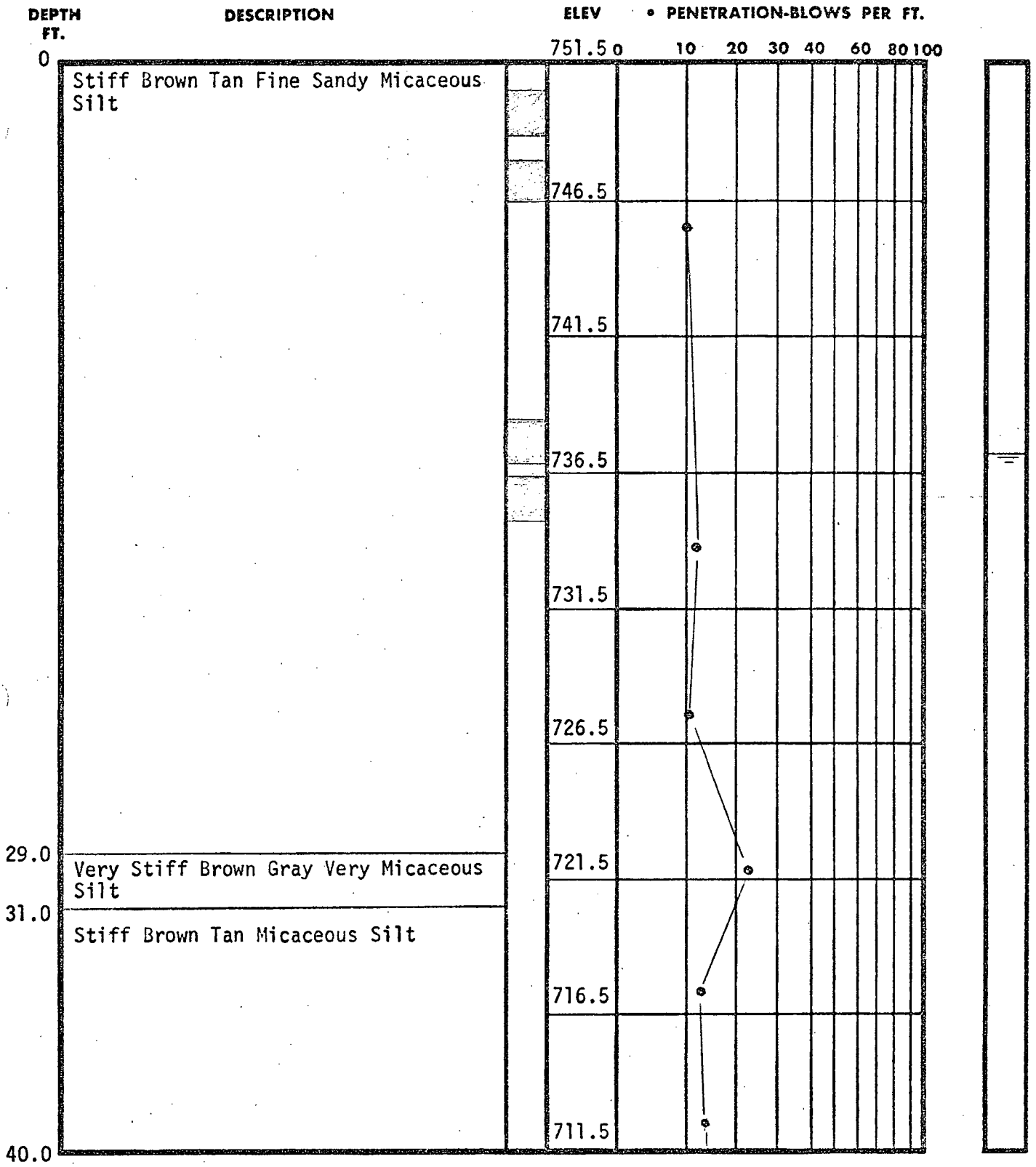
No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-18
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-19

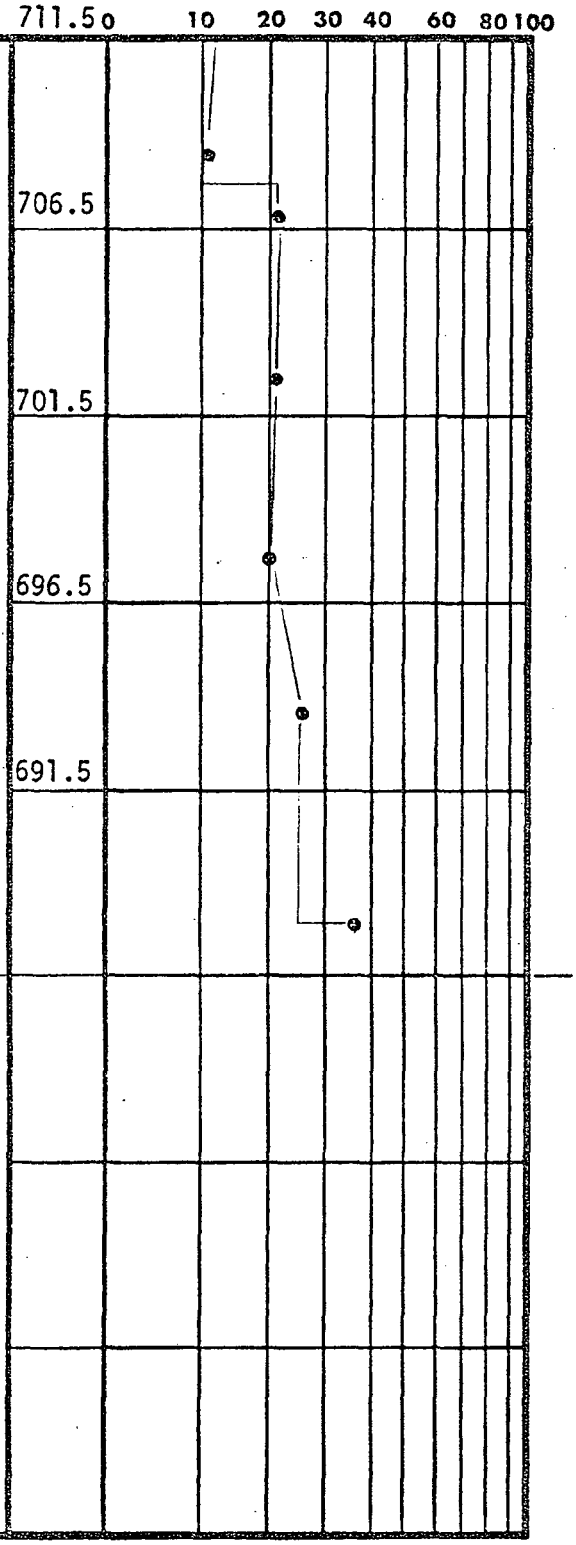
DATE DRILLED 11-11-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Stiff Brown Tan Micaceous Silt	711.5
44.0	Very Stiff Gray and White Fine to Medium Sandy Micaceous Silt	706.5
46.0	Very Stiff Brown Tan Very Fine Sandy Micaceous Silt	701.5
51.5	Very Stiff Gray White Very Fine Sandy Micaceous Silt	696.5
		691.5
63.6	Dense Tan White Silty Fine Sand	
64.8	See Following Rock Log	

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page 2

BORING NO. H-19

DATE DRILLED 11-11-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				691.5		
64.8	Hard Black and White Coarse Grained Diorite	100	NX	686.5	Rock is Hard, Sound and Continuous from 64.8' to 114.2'	100%
				681.5		
73.7	Hard Gray White Fine to Medium Grained Granite	100	NX	676.5		100%
75.6	Hard Black and White Coarse Grained Diorite	100	NX		Depth 77.3' Dip 45° Joint	100%
80.0				671.5		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-19
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 671.5	REMARKS	RQD
80.0	Hard Black and White Coarse Grained Diorite	100	NX		Depth 83.3' Dip 45° Joint	100%
		100	NX	666.5		100%
84.7	Hard Gray White Fine to Medium Grained Granite					
85.3	Hard Black and White Coarse Grained Diorite	100	BX	661.5		100%
94.9				656.5		
95.9	Hard Granite and Diorite Intrusions					
96.8						
97.4	Hard Black and White Coarse Grained Diorite	100	BX			100%
	Hard Gray White Fine Grained Granite			651.5		
	Hard Black and White Coarse Grained Diorite	100	BX	646.5		100%
107.5	Hard Gray White Fine to Medium Grained Granite			641.5		
		100	BX			100%
114.2	Coring Terminated			636.5		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-19
JOB NO. CH 2055

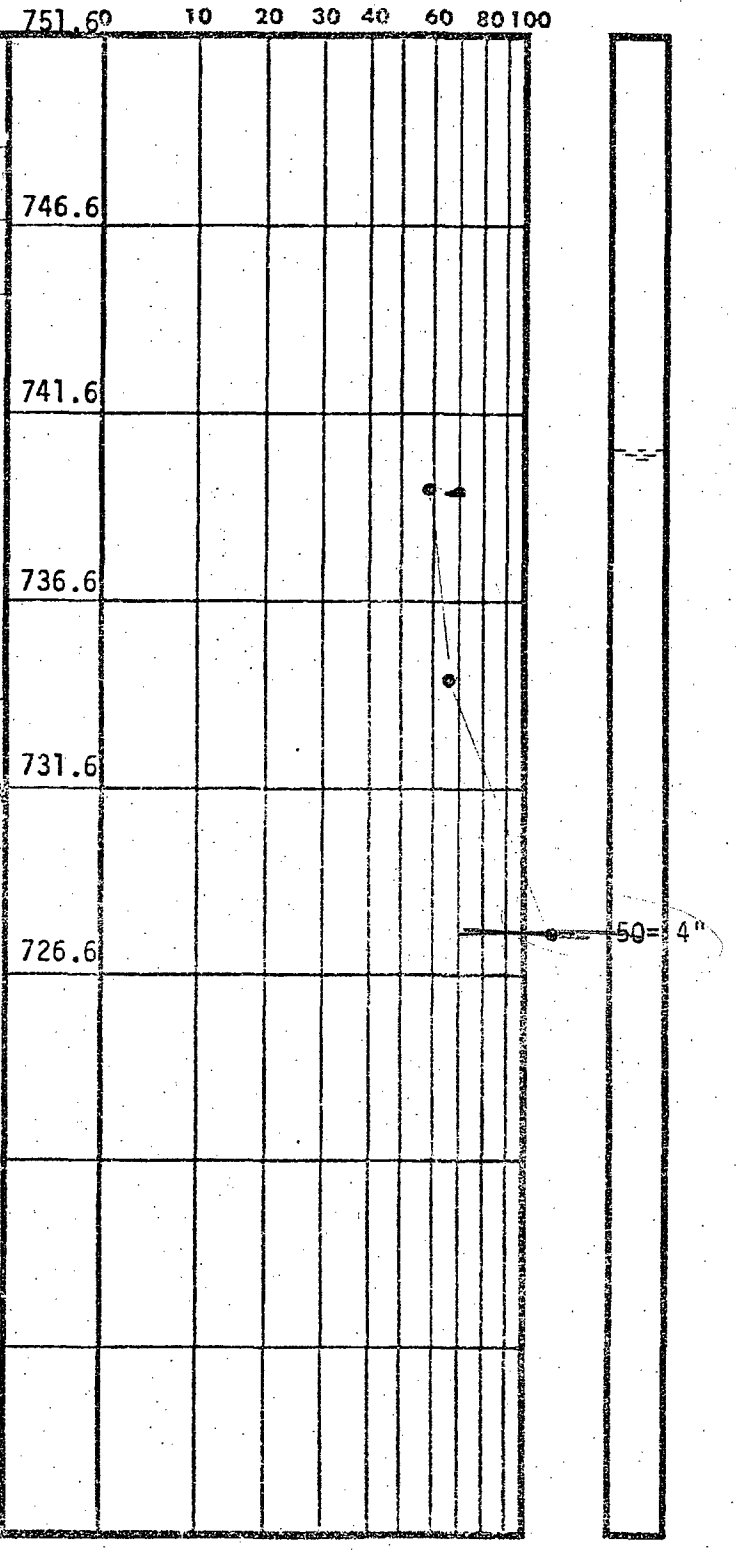
WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Brown Tan Fine Sandy Micaceous Silt	751.6
		746.6
		741.6
10.0	Very Dense Gray Silty Fine Sand	
14.5		736.6
	Boulder	
16.0	Very Dense Gray Silty Sand With Fragments of Weathered Rock	
17.5	Boulder	
		731.6
21.5	Very Dense Gray Tan Silty Sand and Gravel.	
23.8	See Following Rock Log	726.6

NX 10%

• PENETRATION-BLOWS PER FT.



Drilling Water Loss Between 17.5' and 23.5'

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-20

DATE DRILLED 11-25-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
23.8	Very Soft Brown Gray Fine to Medium Grained Granite			726.6	No Recovery	
25.2	Soft Brown Gray Fine to Medium Grained Granite	71	NX			18%
28.5	Very Soft Brown Gray Fine to Medium Grained Granite (No Recovery)			721.6	27.0'-28.5' Nearly Vertical Joint Slightly Weathered	
31.2		55	NX			23%
32.3	Soft Brown Gray Fine to Medium*					
	Very Soft Brown Gray Fine to Medium Grained Granite			716.6	No Recovery 33.5'-35.5'	
35.5	Soft Brown Gray Fine to Medium Grained Granite	67	NX			37%
40.0		13	NX	711.6		0%

*Grained Granite

Drilling Water Loss Between 28.5' and 33.5'

CORE BORING RECORD

BORING NO. H-20
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				711.6		
	Very Soft Brown Gray Fine to Medium Grained Granite	13	NX		No Recovery	0%
43.0						
43.5	Soft Brown Gray Fine to Medium Grained Granite					
44.1				706.6		
	Moderately Hard Black and White Fine Grained Diorite	100	NX			88%
48.0	Hard Black and White Fine Grained Diorite				Inclusion of Coarse Grained Diorite at 49.5'	
				701.6		
50.0	Hard Light Gray Fine to Medium Grained Granite					
	Hard Light Gray Fine to Medium Grained Granite and Black and White*	100	NX			100%
54.0				696.6		
	Hard Black and White Fine Grained Diorite					
58.0						
	Hard Light Gray Fine to Medium Grained Granite			691.6		
		100	NX			100%
				686.6		
67.0						
	Hard Black and White Fine Grained Diorite			681.6		
		100	NX			100%
				676.6		
				671.6		
80.0						

*White Fine Grained Diorite

CORE BORING RECORD

BORING NO. H-20
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				671.6		
80.0	Hard Black and White Fine Grained Diorite	100	NX			100%
				666.6		
		100	NX	661.6		100%
94.5				656.6		
	Coring Terminated					

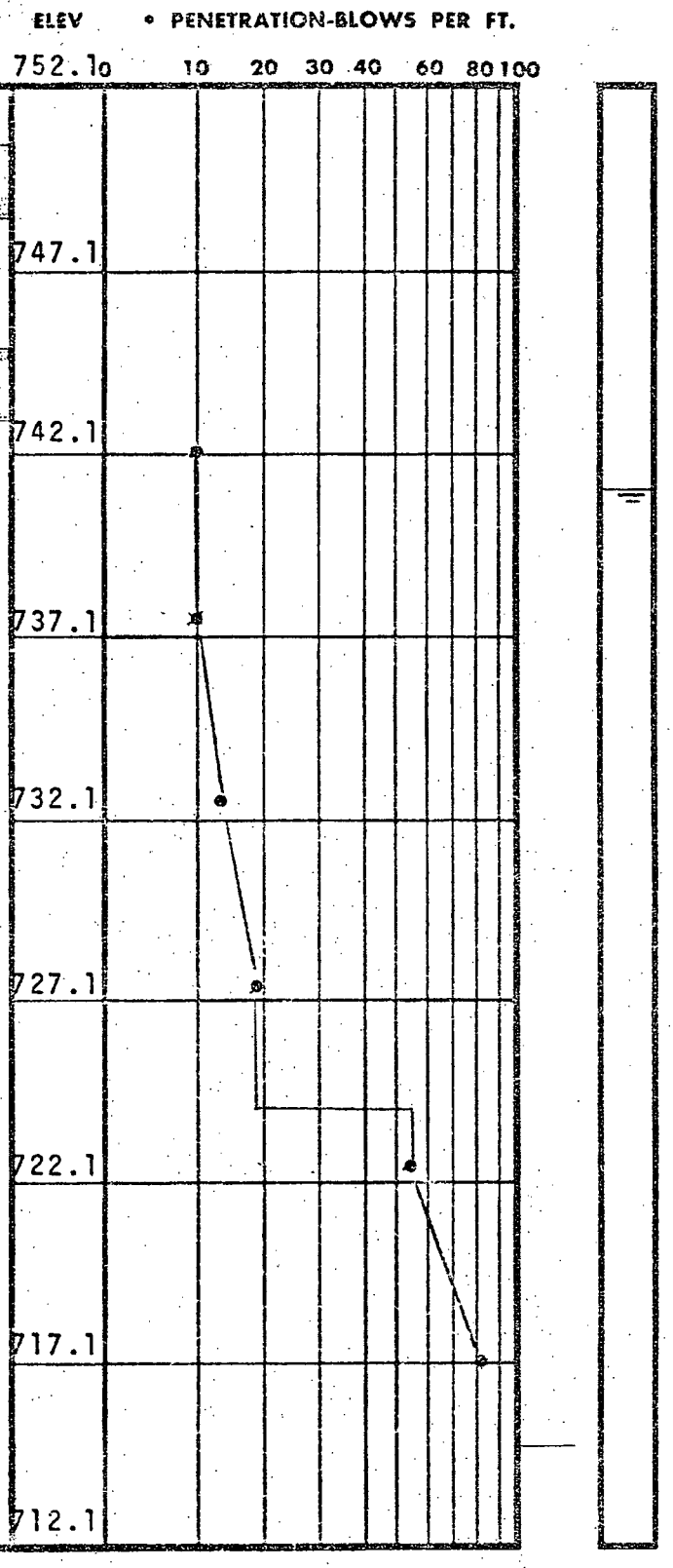
CORE BORING RECORD

BORING NO. H-20
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Stiff Tan Black Slightly Sandy Micaceous Silt
9.0	Stiff Black Gray Tan and White Fine Sandy Micaceous Silt
15.0	Firm Gray White and Tan Micaceous Silty Fine to Medium Sand
28.0	Very Dense Gray White and Tan Micaceous Silty Fine to Medium Sand
37.2	See Following Rock Log



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-21
DATE DRILLED 11-3-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				717.1	Rock is Hard, Sound and Continuous From 37.2' to 87.4'	
37.2	Hard Black and White Coarse Grained Diorite	100	NX		Depth 38.0' Dip 60° Joint	100%
40.0				712.1		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-21
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				712.1		
	Hard Black and White Coarse Grained Diorite	100	NX	707.1		100%
		100	NX	702.1	Depth / Dip 50.1' 60° Joint 53.2' 45° Joint	100%
				697.1		
		100	NX	792.1	58.7' 45° Joint	
59.2	Hard Gray White Fine to Medium Grained Granite				60.8' 60° Joint	87%
61.5	Hard Meta-Gabbro and Granite Intrusions				63.8' 45° Joint	
64.1	Hard Dark Green Meta-Gabbro			687.1		
		99	NX	682.1		93%
71.3	Hard Black and White Fine Grained Diorite				72.1' 45° Joint	
		100	NX	677.1		100%
		100	NX		Scattered Small Intrsions of Granite from 76.0' to 87.4'	100%
80.0				672.1		

No Drilling Water Loss.

Page 3

CORE BORING RECORD

BORING NO. H-21
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				672.1		
	Hard Black and White Fine Grained Diorite	100	NX			100
		100	NX			100
				667.1		
87.4						
	Coring Terminated			662.1		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-21
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. (0 10 20 30 40 60 80 100)
0	Very Stiff Red Brown Slightly Sandy Silty Clay.	766.2	
		761.2	
7.0	Dense to Very Dense Black Gray and White Silty Fine to Medium Sand.	756.2	
13.5			•50 4"
14.0	* See Following Rock Log	751.2	

TEST BORING RECORD

Partially Weathered Rock That Becomes Gray and White Silty Fine to Medium Sand When Sampled.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-22

DATE DRILLED 10-28-69

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
14.0	Moderately Hard Brown Gray Fine to Medium Grained Granite	73	NX	751.2	Depth / Dip 15.8' Nearly Vertical Joint	17%
17.6	Soft Brown Gray Fine to*				16.9' 45° Joint	
19.0	Moderately Hard Brown Gray Fine to Medium Grained Granite			746.2	21.0' 45° Joint Lost Circulation at 21.0'	
21.8						
22.5	Moderately Hard Black and White Coarse Grained Diorite	100	NX			84%
	Hard Black and White Coarse Grained Diorite			741.2		
				736.2		
		100	NX			100%
				731.2		
38.5	Coring Terminated					

*Medium Grained Granite

CORE BORING RECORD

BORING NO. H-22
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. (0 10 20 30 40 60 80 100)
0	Very Stiff Reddish Brown Fine Sandy Clayey Silt	768.8	
		763.8	
7.5	Loose to Very Dense Black Gray and White Silty Fine to Medium Sand	758.8	
13.5			50= 4"
14.0	* See Following Rock Log	753.8	

* Partially Weathered Rock That Becomes Gray and White Silty Fine to Medium Sand When Sampled.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-23

DATE DRILLED 10-29-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
					Lost Circulation at 13.9'	
14.0	Very Soft Black and White Fine Grained Diorite (No Recovery)			753.8	Depth / Dip 16.0' 30° Joint Slightly Weathered	35%
16.0	Moderately Hard Black and White Fine Grained Diorite	54	NX		17.0' 45° Joint Slightly Weathered	
18.0						
19.3	Moderately Hard Black and White Coarse Grained Diorite			748.8	17.5' Nearly Vertical Joint Slightly Weathered	86%
	Hard Black and White Coarse Grained Diorite	100	NX	743.8		
				738.8		
30.6	Hard Light Gray Fine to Medium Grained Granite	100	NX			100%
34.3	Hard Black and White Fine Grained Diorite			733.8		100%
36.8	Hard Light Gray Fine to Medium Grained Granite	100	NX			
40.0				728.8		

Page 2

CORE BORING RECORD

BORING NO. H-23
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 728.8	REMARKS	RQD
40.0	Hard Black and White Fine to Medium Grained Diorite					
44.0	Hard Light Gray Fine to Medium Grained Granite			723.8		
46.0	Hard Black and White Fine Grained Diorite	100	NX	718.8		100%
51.4	Coring Terminated					

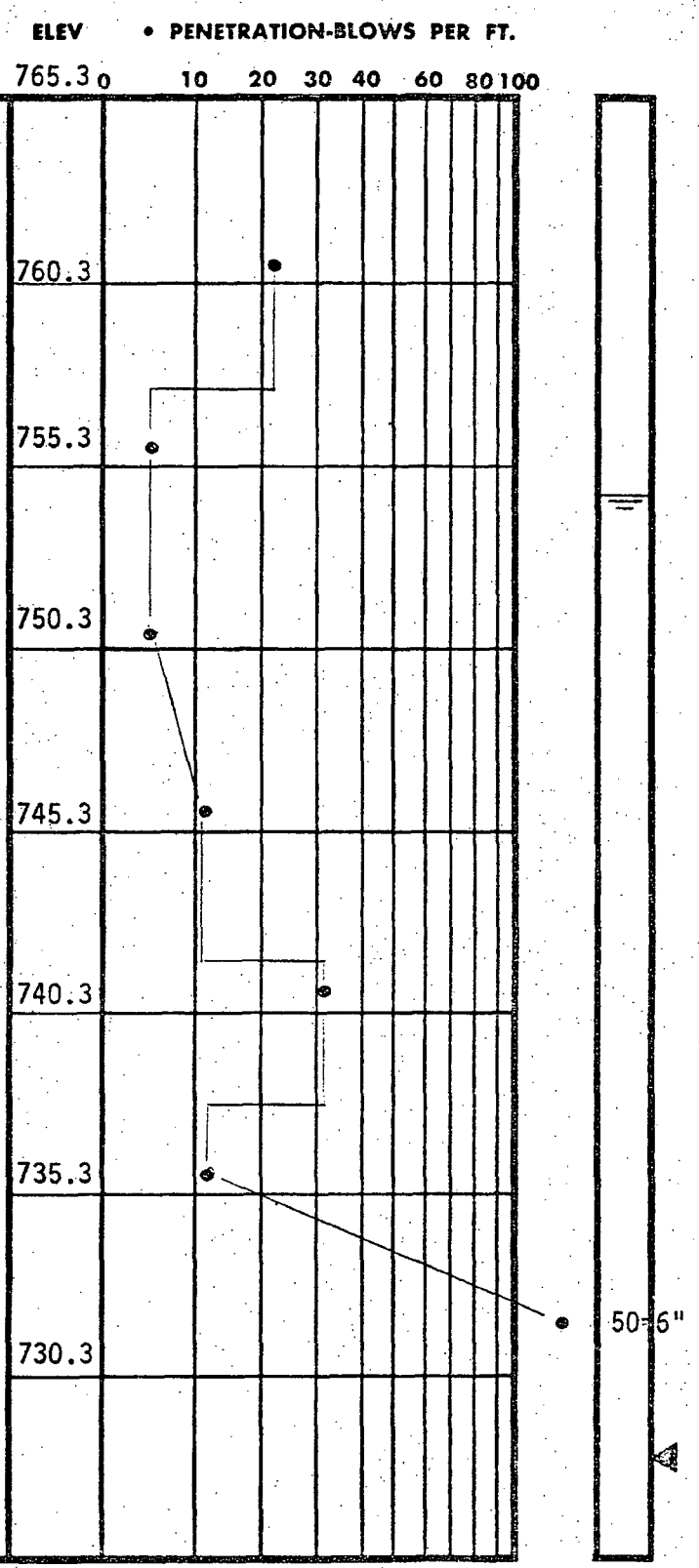
CORE BORING RECORD

BORING NO. H-23
JOB NO. CR 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Reddish Brown Slightly Sandy Clayey Micaceous Silt
8.0	Firm to Stiff Brown and Black Fine Sandy Micaceous Silt
3.5	Firm Gray and White Micaceous Silty Fine to Medium Sand
27.5	Very Dense Gray and White Micaceous Silty Fine Sand
33.5	See Following Rock Log



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-24
DATE DRILLED 10-30-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				735.3		
33.5						
	Moderately Hard Light Gray Fine to Medium Grained Granite	38	NX	730.3	Lost Circulation at 37.5'	29%
39.7	*			725.3		

*Hard Black and White Coarse Grained Diorite

Page 2

CORE BORING RECORD

BORING NO. H-24

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				725.3		
	Hard Black and White Coarse Grained Diorite	38	NX			29%
		100	NX	720.3		100%
		100	NX			100%
48.7				715.3		
	Coring Terminated					

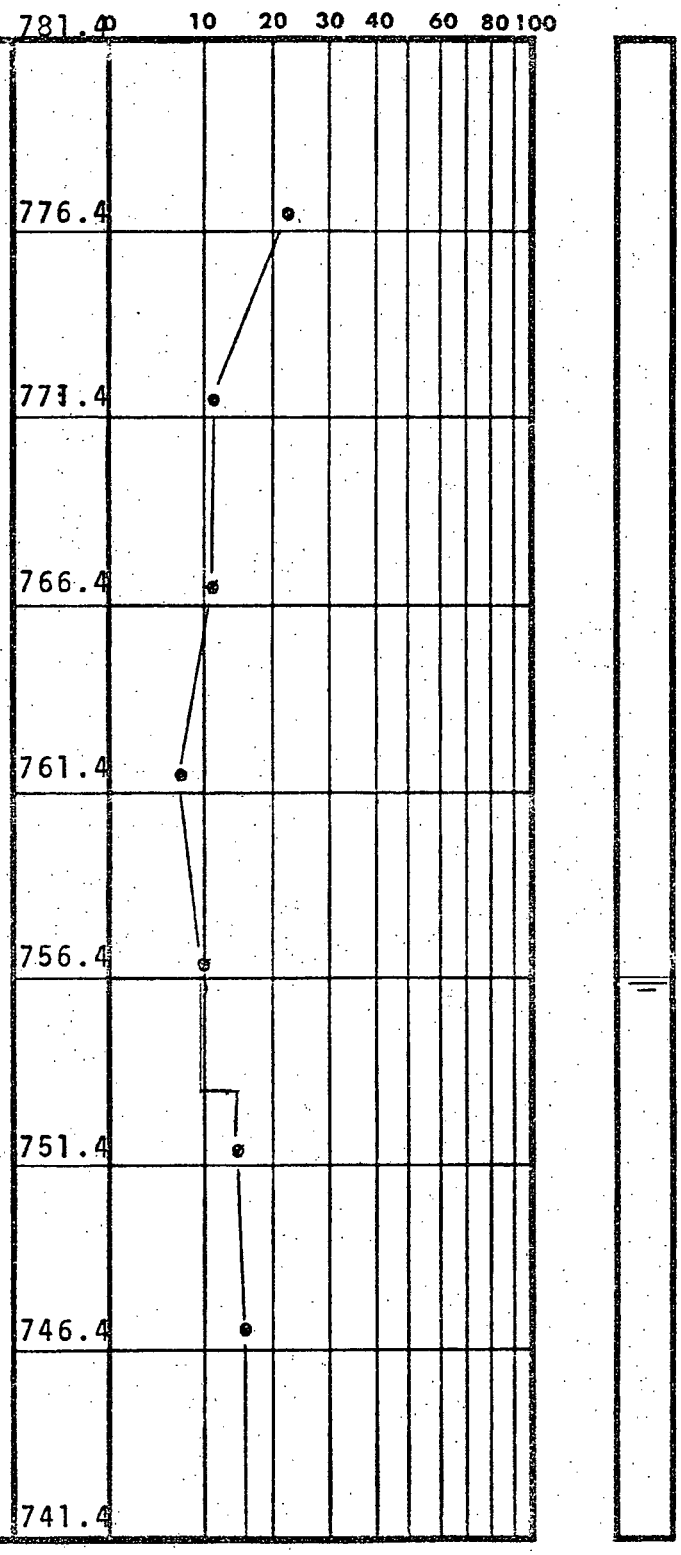
CORE BORING RECORD

BORING NO. H-24
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff to Stiff Reddish Brown Micaceous Silt
13.5	Stiff Reddish Brown, Brown and Black Micaceous Silt
19.0	Firm Brown and Black Micaceous Silt
2[illegible]	Stiff Brown and Black Fine Sandy Micaceous Silt
28.0	Firm Gray Tan and Brown Micaceous Silty Sand
40.0	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

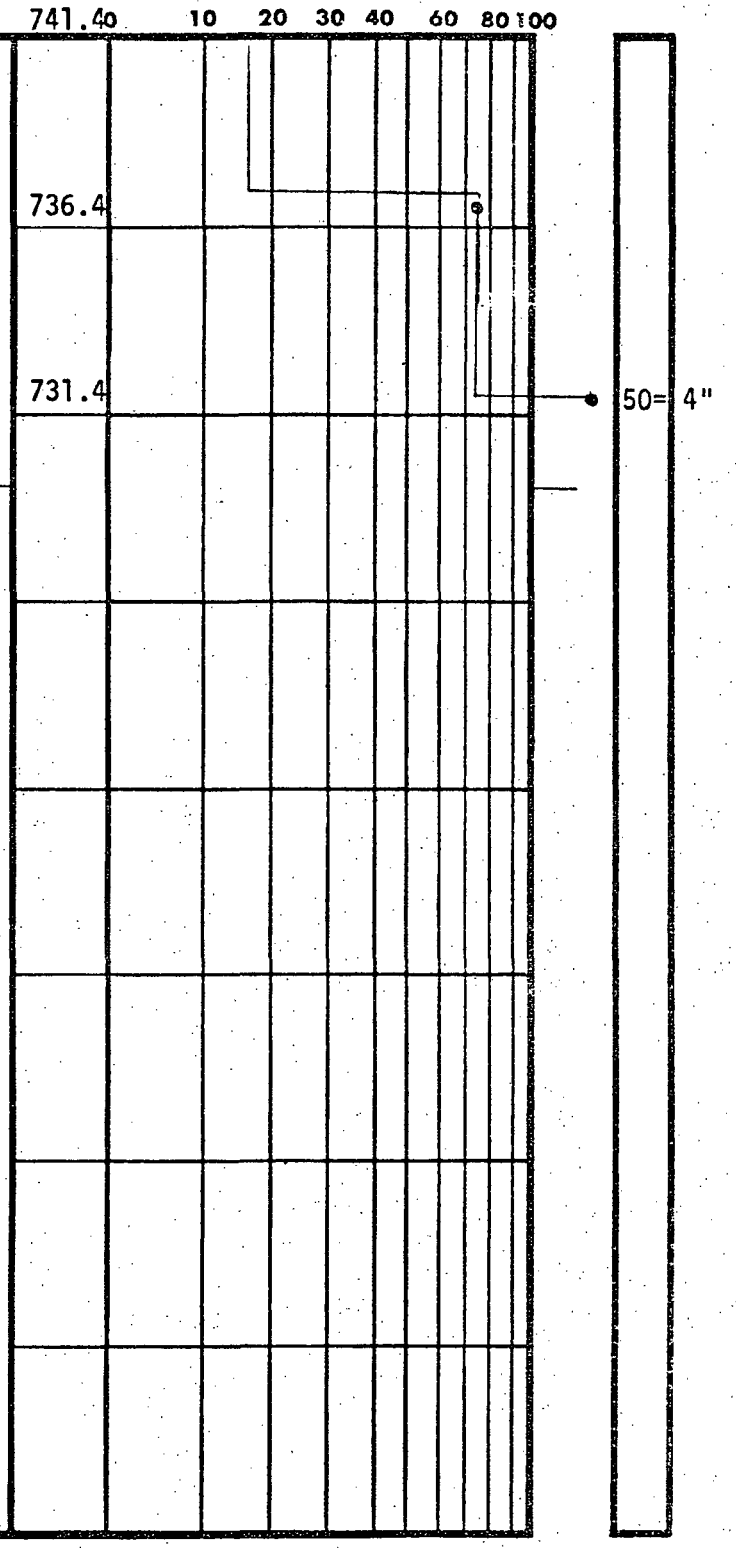
BORING NO. H-25

DATE DRILLED 10-29-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT.
40.0	Firm Gray Tan and Brown Micaceous Silty Sand	741.4	
44.0	Very Dense Gray and Brown Silty Sand	736.4	
49.5	Partially Weathered Rock That Becomes Gray and Brown Silty Sand When Sampled	731.4	50= 4"
52.0	See Following Rock Log		



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

Page 2

BORING NO. H-25

DATE DRILLED 10-29-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				731.4		
52.0	Soft Brown and Gray Fine Grained Diorite				Rock Has Closely Spaced Vertical Joints(1/4" Apart) From 52' to 71.9	
				726.4		
		45	NX			0%
				721.4		
				716.4		
		14	NX			0%
				711.4		
71.9	Hard Black and White Fine Grained Diorite				Joints Depth — Dip 74.1' 45° Weathered Joint 74.3' 45° Joint 74.5' 45° Joint 74.6' 45° Joint 76' 60° Joint 78.7' 45° Joint 79.6' 45° Weathered Joing 79.7' 45° Weathered Joint	
				706.4		79%
		100	NX			
80.0				701.4		

No Drilling Water Loss

CORE BORING RECORD

BORING NO. H-25
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 701.4	REMARKS	RQD
80.0	Hard Black and White Fine Grained*	100	NX			79%
81.4	Coring Terminated					
	No Drilling Water Loss.			696.4		

*Diorite.

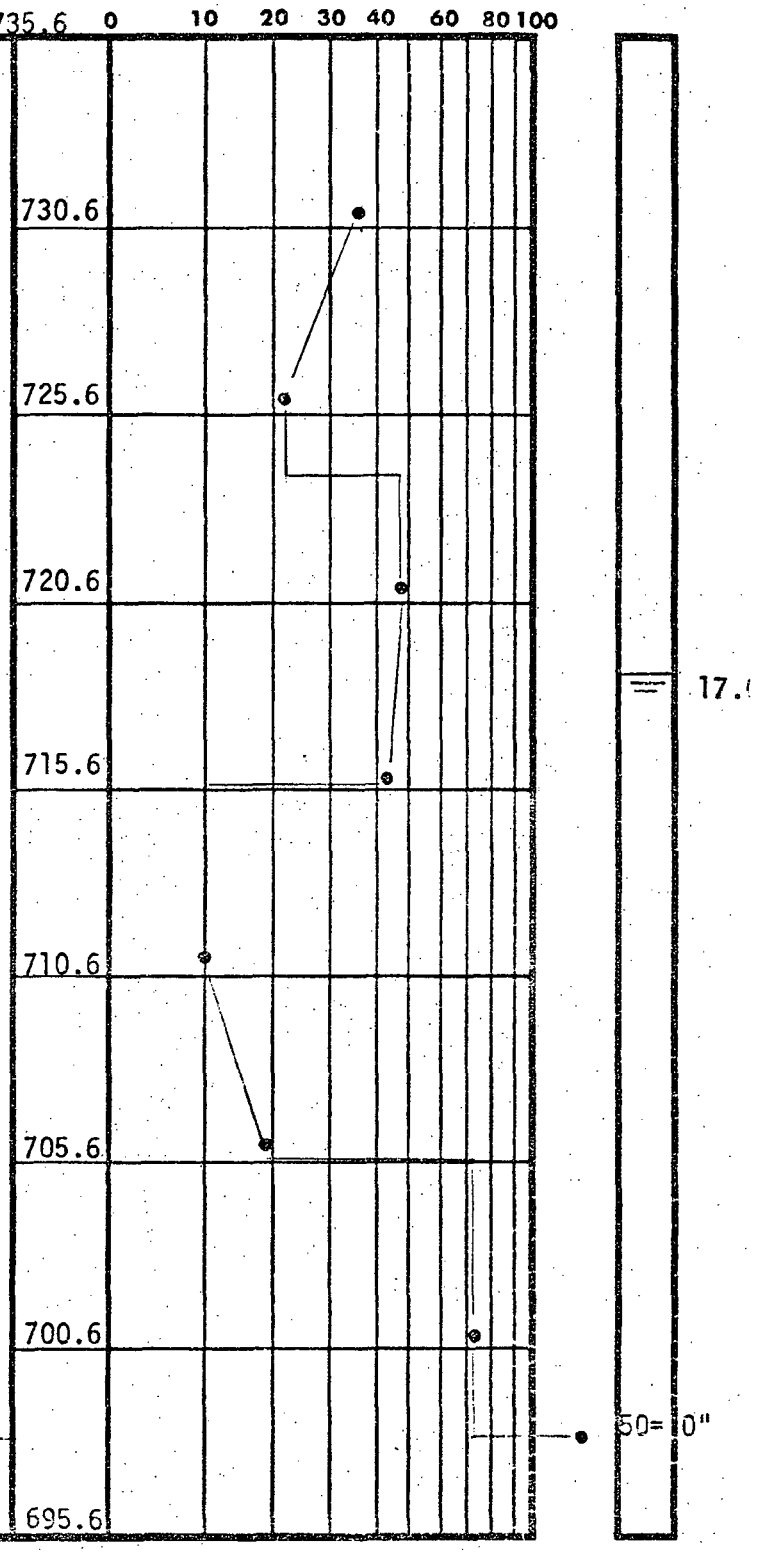
CORE BORING RECORD

BORING NO. H-25
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Hard and Very Stiff Reddish Brown Fine to Medium Sandy Clayey Silt.	735.6
12.0	Dense Gray and White Very Silty Fine Sand	
14.5	Dense Gray and White Fine to Medium Sand	
20.0	Loose Gray and Tan Very Silty Fine Sand	
25.0	Firm Gray and Tan Very Silty Fine Sand	
30.0	Dense Gray and Tan Very Silty Fine Sand	
37.5	See Following Rock Log.	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-26
DATE DRILLED B-14
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS
				700.6	RQD
37.5	Moderately Hard Black and White*				
38.5	Hard Black and White Fine **	33	NX	695.6	54%

40.0 No Drilling Water Loss

*Fine Grained Diorite

**Grained Diorite.

CORE BORING RECORD

BORING NO. H-26
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				695.6		
	Hard Black and White Fine Grained Diorite	83	NX			54%
		100	NX	690.6	JOINTS DEPTH DIP 45.9' - 45° Joint	96%
				685.6		
		100	NX			97%
				680.6		
56.3						
	Coring Terminated					

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-26
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
0	Hard Red Brown Clayey Fine to Medium Sandy Micaceous Silt	728.7	
		723.7	Cave
7.0	Firm Brown and Tan Micaceous Silty Fine to Medium Sand	718.7	
12.0	Stiff to Very Stiff Tan and Brown Very Micaceous Silt	713.7	
		708.7	
		703.7	
		698.7	
		693.7	
40.0		688.7	

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-27

DATE DRILLED 10-13-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0	Very Stiff Tan and Brown Very Micaceous Silt	688.7		
44.0	Hard Gray and White Sandy Micaceous Silt.	683.7		
48.5				
48.9	* See Following Rock Log	678.7		50= 5"

* Partially Weathered Rock That Becomes Gray and White Sandy Micaceous Silt When Sampled.

TEST BORING RECORD

Page 2

BORING NO. H-27

DATE DRILLED 10-13-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 688.7'	REMARKS
				683.7	
48.9	Hard Black and White Fine to Medium Grained Diorite	78	NX	678.7	JOINTS Depth / Dip 50.2' 60° Joint 51.9' 60° Joint 52.0' 45° Joint RQD 70%
52.0	Coring Terminated			673.7	

No Drilling Water Loss

CORE BORING RECORD

BORING NO. H-27
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
0	*	738.3		
0.5	Red Brown Slightly Clayey Fine to Medium Sandy Silt			
5.0		733.3	•	50 =6'
	See Following Rock Log			

* Topsoil

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-28

DATE DRILLED 10-13-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
				733.3		
5.0	Moderately Hard Gray and White*					
6.5	Very Soft Brown and Gray Fine to Medium Grained Granite	60	NX		No Recovery	RQD 43.3
8.5	Moderately Hard Gray and White Fine to Medium Grained Granite			728.3	JOINTS Depth: 10.8' Dip: 45° Weathered Joint	
13.7	Very Soft Brown and Gray Fine to Medium Grained Granite (No Recovery)	72	NX	723.3	No Recovery	RQD 61.5
16.5	Hard Gray White Fine to Medium Grained Granite					
18.0	Coring Terminated			718.3	18.0' 45° Joint	

*Fine to Medium Grained Granite

No Drilling Water Loss

Page 2

CORE BORING RECORD

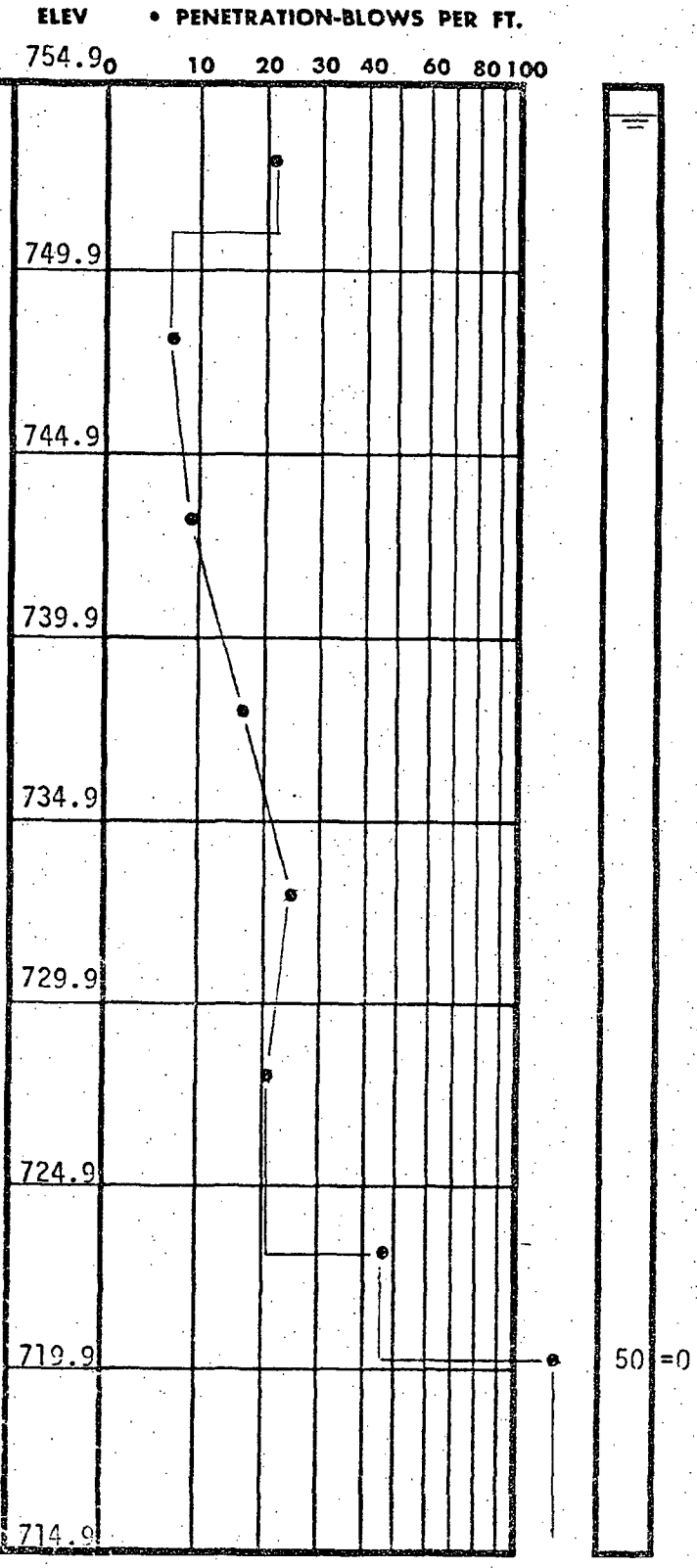
BORING NO. H-28

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Red Slightly Clayey Slightly Micaceous Silt.
4.0	Firm Brown Fine to Medium Sandy Micaceous Silt.
9.0	Stiff Gray and Black Fine Very Sandy Micaceous Silt.
14.0	Very Stiff Tan Pink and Black Fine Sandy Micaceous Silt.
19.0	Very Stiff Brown Micaceous Silt.
32.0	Hard Brown and Green Micaceous Silt.
34.8	Partially Weathered Rock That Becomes Green Micaceous Silt When Sampled.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. II-29

DATE DRILLED 3-23-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
		714.9		
	Partially Weathered Rock That Becomes Green Micaceous Silt When Sampled.			50= 5-1/
0				
	Partially Weathered Rock That Becomes Gray and White Silty Fine to Coarse Sand When Sampled.	709.9		50= 5
				50 =4
59.8				50 =0
	See Following Rock Log.			

TEST BORING RECORD

Page 2

BORING NO. H-29

DATE DRILLED 3-23-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				709.9		
48.8	Very Soft Brown and Green Meta-Gabbro	5	NX	704.9		0
				699.9		
58.0	Very Soft Brown and Gray Fine to Medium Grained Granite	40	NX	694.9		0
61.6	Moderately Hard Gray Fine to Medium Grained Granite	41	NX	689.9		9
65.4	Very Soft Brown and Gray Fine to Medium Grained Granite	71	NX	684.9		68
68.8	Hard Gray Fine to Medium Grained Granite				JOINTS	
70.2	Hard Black and White Fine Grained Diorite				DEPTH - DIP 73.2' - 45° Joint	
		100	NX	679.9		100
				674.9		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-20
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 674.9	REMARKS	RQD
80.1	Hard Black and White Fine Grained Diorite.	100	NX			100
82.9	Hard Gray Fine to Medium Grained Granite.			669.9		
	Hard Black and White Coarse Grained Diorite.	100	NX			100
87.6	Hard Gray Fine to Medium Grained Granite.					
89.3	Coring Terminated No Drilling Water Loss.					

No Drilling Water Loss.

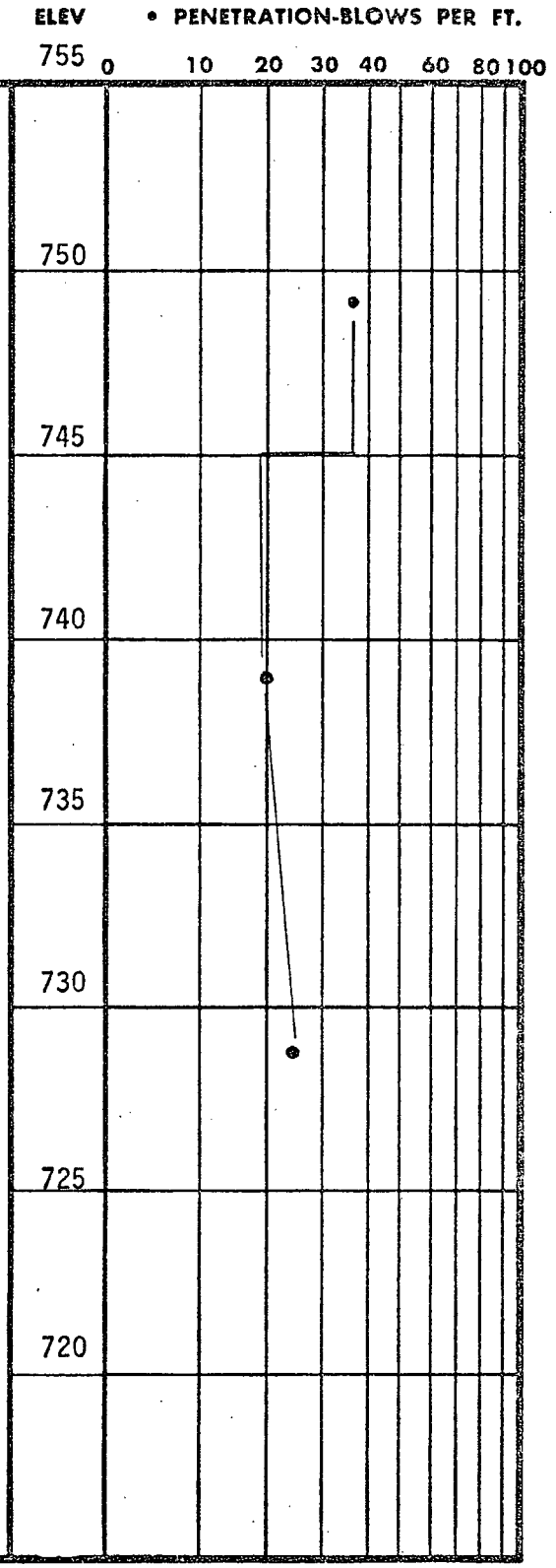
CORE BORING RECORD

BORING NO. H-29
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Reddish Brown Slightly Sandy Clayey Silt	755
10.0	Very Stiff Purple Tan and Black Fine Sandy Micaceous Silt	750
20.0	Very Stiff Tan Gray and White Fine to Coarse Very Sandy Micaceous Silt	745
35.0	Boring Terminated. No Rock Encountered. No Groundwater Encountered.	740



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

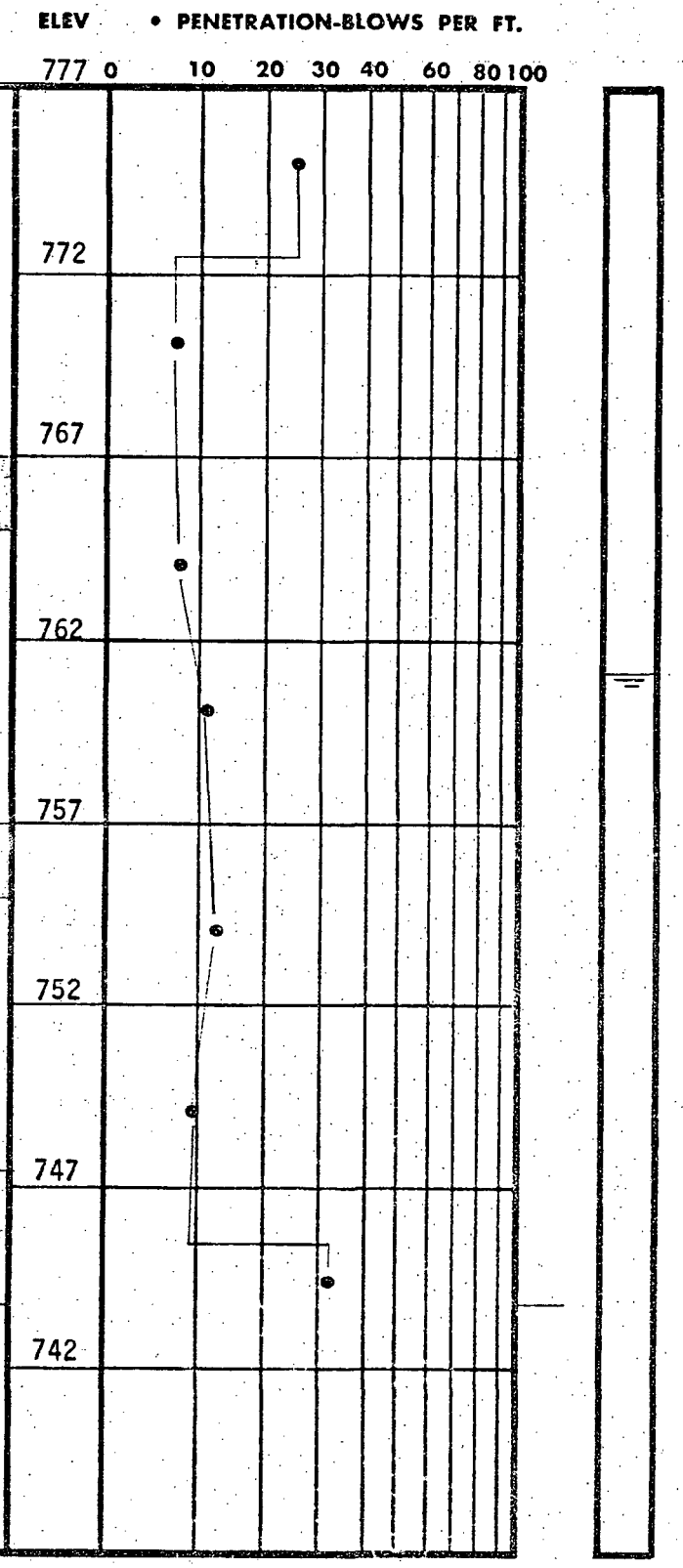
BORING NO. H-30

DATE DRILLED 11-7-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt(with Semi-Rounded Sand and Gravel.)(High Level Terrace)
4.0	Very Stiff Red Brown Slightly Clayey Silt.
4.5	Firm to Stiff Red Tan Black Micaceous Silt
22.0	Stiff Tan Black Micaceous Silt
25.5	Stiff Tan Black Fine to Medium Sandy Micaceous Silt
31.5	Firm Tan White Black Micaceous *
32.8	See Following Rock Log.



* Silty Fine to Medium Sand

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-31
DATE DRILLED 1-15-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
32.8	Moderately Hard Black and White*	73	NX	742	JOINTS Depth / Dip 36.2' 60° Joint 36.4' 60° Weathered Joint	0
34.0	Moderately Hard Black and White**					
34.6						
35.8	Very Soft Black and White Coarse Grained Diorite (No. Recovery)	51	NX			14
39.0	Soft Black and White Coarse***					
40.0	Very Soft Black and White ****			737		

* Fine Grained Diorite
** Coarse Grained Diorite
*** Grained Diorite
****Coarse Grained Diorite (No. Recovery)

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-31
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				737		
	Soft Black and White Coarse Grained Diorite (No. Recovery)	51	NX			
42.0						
42.6	Soft Black and White Coarse Grained Diorite					
	Very Soft Black and White Coarse Grained Diorite (No. Recovery)	11	NX	732		0
				727		
				722		50=1-1/2"
		29	NX			21%
56.5	Moderately Hard Light Gray Fine Medium Grained Granite					
58.0	Hard Black and White Fine Grained Diorite (Top of Hard Rock)			717		
60.8	Hard Black and White Coarse Grained Diorite	100	NX	712		94%
				707		
		100	NX	702		100%
76.6	Hard Light Gray Fine to Medium Grained Granite				77.6' - 60° Joint	
		100	NX	697		100
80.0						

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-31
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0	Hard Light Gray Fine to Medium Grained Granite			697		
		100	NX	692		100%
88.6	Hard Black and White Fine Grained Diorite			687	Intrusion of Light Gray Fine to Medium Grained Granite at 90.4'.	
		100	NX	682		
96.1	Hard Light Gray Fine to Medium Grained Granite			677		98%
100.2	Hard Black and White Fine Grained Diorite					
102.6	Hard Light Gray Fine to Medium Grained Granite	100	NX	672		100%
108.7	Hard Black and White Coarse Grained Diorite			667		
110.2	Coring Terminated					

No Drilling Water Loss.

Page 4

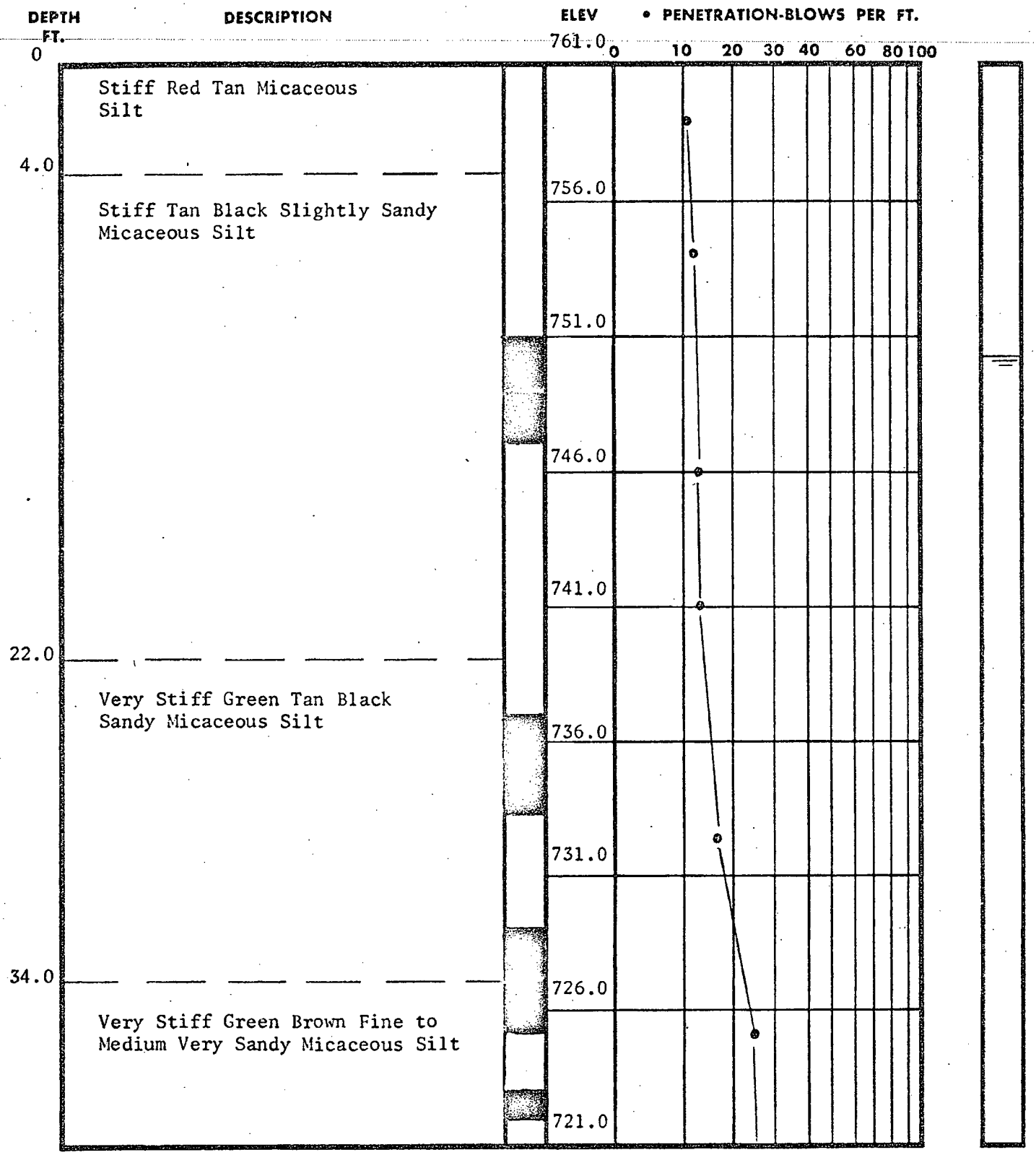
CORE BORING RECORD

BORING NO. H-31

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-32

DATE DRILLED 1-19-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. (10 20 30 40 60 80 100)	
		721.00		
41.0	Very Stiff Green Brown Fine to* Hard Green Tan Very Micaceous Silt		•	50-3"
43.7	See Following Rock Log	716.0		

*Medium Very Sandy Micaceous Silt

TEST BORING RECORD

Page 2

BORING NO. H-32

DATE DRILLED 1-19-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
					JOINTS DEPTH DIP	
43.7	Moderately Hard Dark Green Meta-Gabbro.	29	NX	716.0	45' - 60° Joint	13%
46.0	Soft Dark Green Meta-Gabbro. (No. Recovery)					
48.2	Moderately Hard Dark Green Meta-Gabbro.	58	NX	711.0		47%
51.9	Soft Dark Green Meta-Gabbro.					
				706.0	55.2' - 58.9' Rock Highly Fractured in Joints.	
55.2	Moderately Hard Dark Green Meta-Gabbro.	21	NX			0%
58.9	Soft Dark Green Meta-Gabbro (No. Recovery)			701.0		
61.8	Moderately Hard Light Gray Fine to Medium Grained Granite.	67	NX		61.7' - 60° Joint	48%
63.6	Hard Black and White Fine Grained Diorite.	86	NX	696.0	63.6' - 64.3' Rock Highly Fractured in Joints.	0%
		100	NX	691.0		96%
71.6	Hard Light Gray Fine to Medium Grained Granite.					
				686.0		
		100	NX			92%
				681.0		

CORE BORING RECORD

BORING NO. H-32
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 681.0	REMARKS	RQD
	Hard Light Gray Fine to Medium Grained Granite.					
81.9	Hard Black Diabase.					
84.0	Hard Black Diabase and Light Gray Granite.	100	NX	676.0		100%
89.0	Hard Light Gray Fine to Medium*			671.0		
90.1	Hard Black and White Coarse Grained Diorite.					
95.1				666.0		
96.1	Hard Black Diabase					
	Hard Black and White Coarse**					100%
97.6		100	NX			
98.0	Hard Black Diabase					
				661.0		
	Hard Black and White Coarse Grained Diorite.					
				656.0		
		100	NX			100%
				651.0		
		100	NX			100%
114.0				646.0		
	Hard Black and White Fine Grained Diorite.					
116.0						
	Coring Terminated.					
	Water Loss at 57.5'.					

* Grained Granite.
** Grained Diorite.

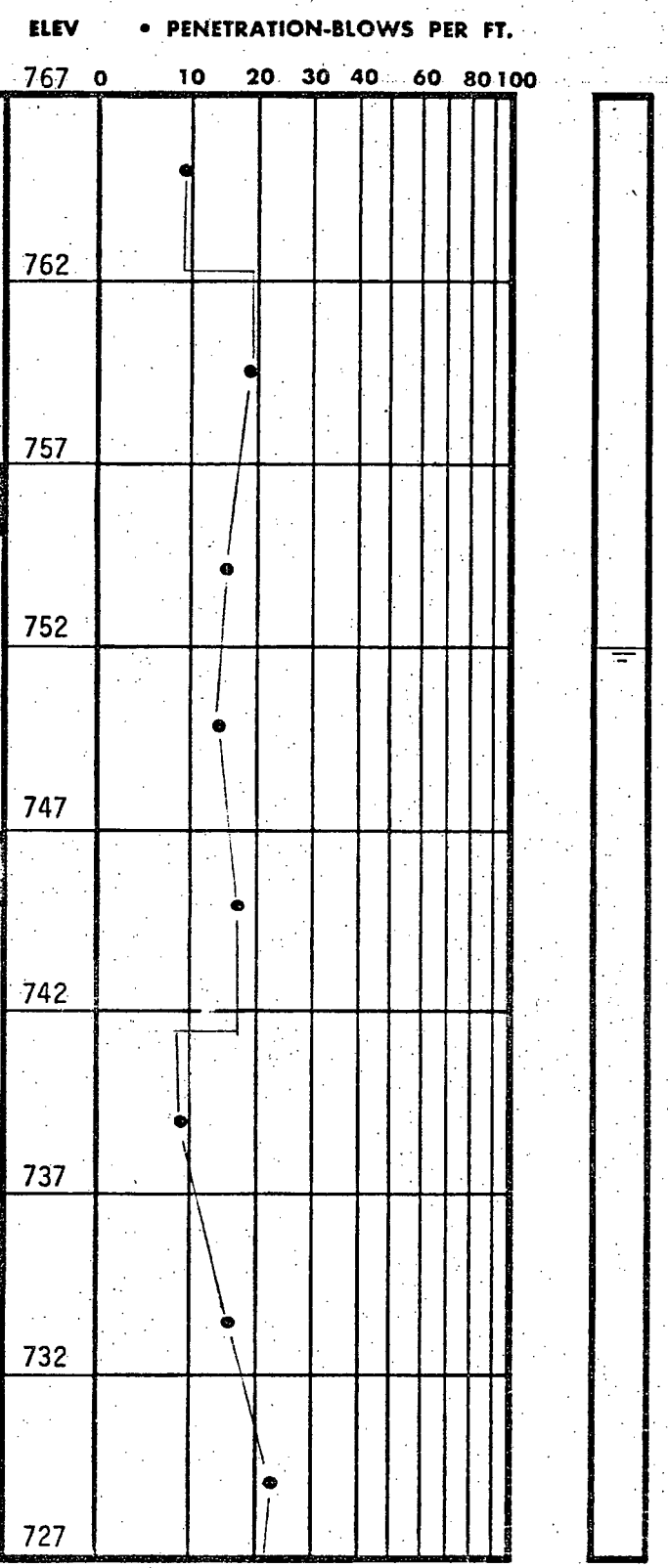
CORE BORING RECORD

BORING NO. H-32
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Stiff Red Slightly Clayey Slightly Sandy Silt
4.5	Very Stiff Pink Tan Black Slightly Sandy Micaceous Silt
15.0	Stiff Gray Tan Black Micaceous Silt
22.0	Very Stiff Gray Tan Black Very Fine Sandy Micaceous Silt
25.5	Loose Gray Tan Black Micaceous Silty Very Fine Sand
32.4	Firm Gray Tan Black Micaceous Silty Fine Sand
37.4	Very Stiff Tan Black Sandy Slightly Micaceous Silt
40.0	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-33

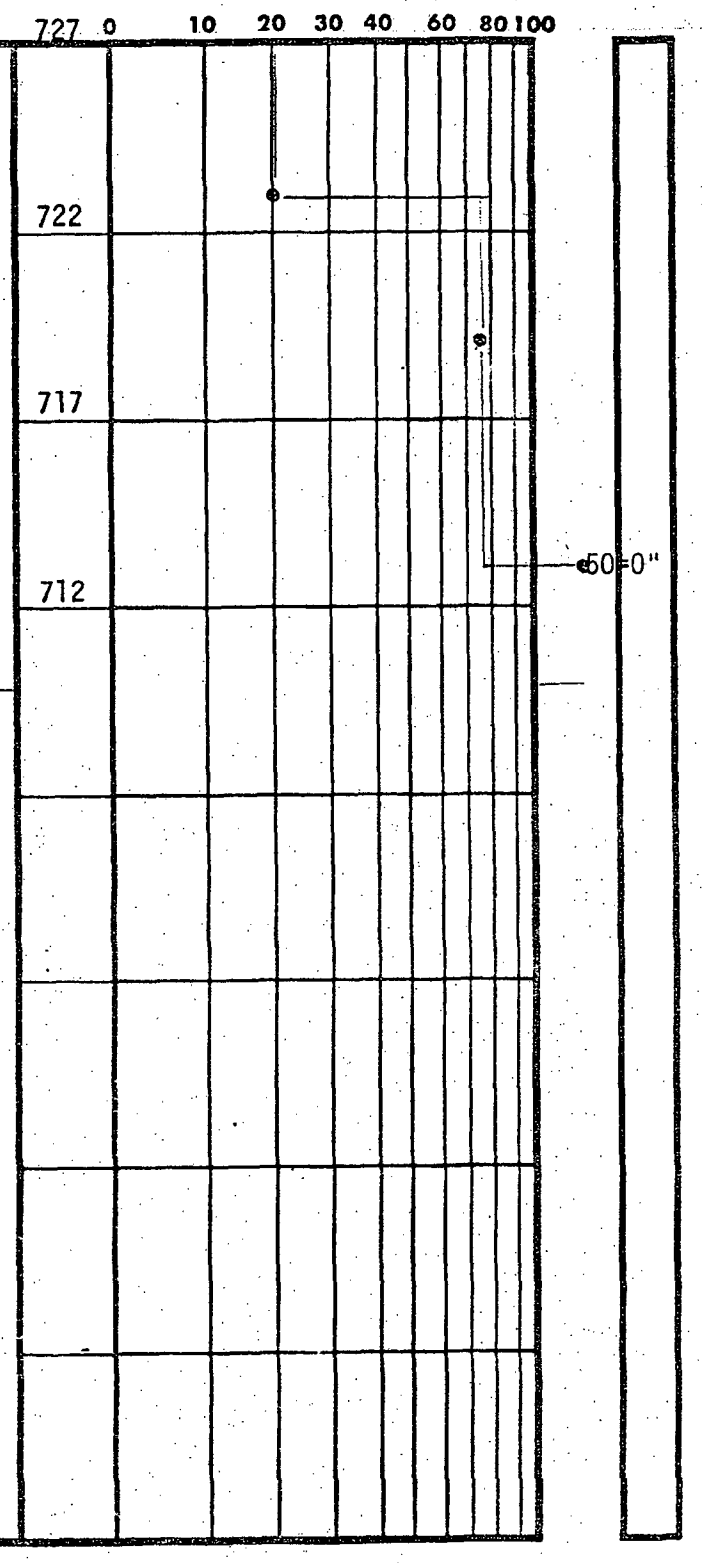
DATE DRILLED 1-7-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		727
41.0	Very Stiff Tan Black Sandy Slightly*	
	Firm Gray Micaceous Silty Very Fine Sand	
44.1	Very Stiff Tan Black White Silt	722
46.0	Very Dense Gray White Silty Fine to Coarse Sand	717
54.0		712
	Partially Weathered Rock-No Sample Recovery.	
57.1	See Following Rock Log	

• PENETRATION-BLOWS PER FT.



* Micaceous Silt.

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-33

DATE DRILLED 1-7-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				712		
57.1	Top of Hard Rock. Hard Black and White Fine Grained Diorite	100	NX			100%
	(Several Small Inclusions of Light Gray Fine to Medium Grained Granite.)			707		
		100	NX	702		100%
				697		
70.2	Hard Light Gray Fine to Medium Grained Granite	100	NX	692		100%
77.1	Hard Black and White Fine Grained Diorite				JOINT Depth Dip 77' 78' (Core Half Meta Gabbro)	
80.0		100	NX	687		100%

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-33
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 687	REMARKS	RQD
80.0	Hard Black and White Fine *					
81.5	Hard Dark Green Meta-Gabbro	100	NX	682		100%
		100	NX	677	Small Intrusion of Light Gray Fine to Medium Grained Granite at 91.0'	
				672		100%
		100	NX	667	JOINTS DEPTH DIP 103.4' - 45° Joint	
				662		100%
108.7 109.1	Hard Light Gray Fine to Medium Grained Granite			657		
	Coring Terminated					

* Grained Diorite
No Drilling Water Loss.

CORE BORING RECORD

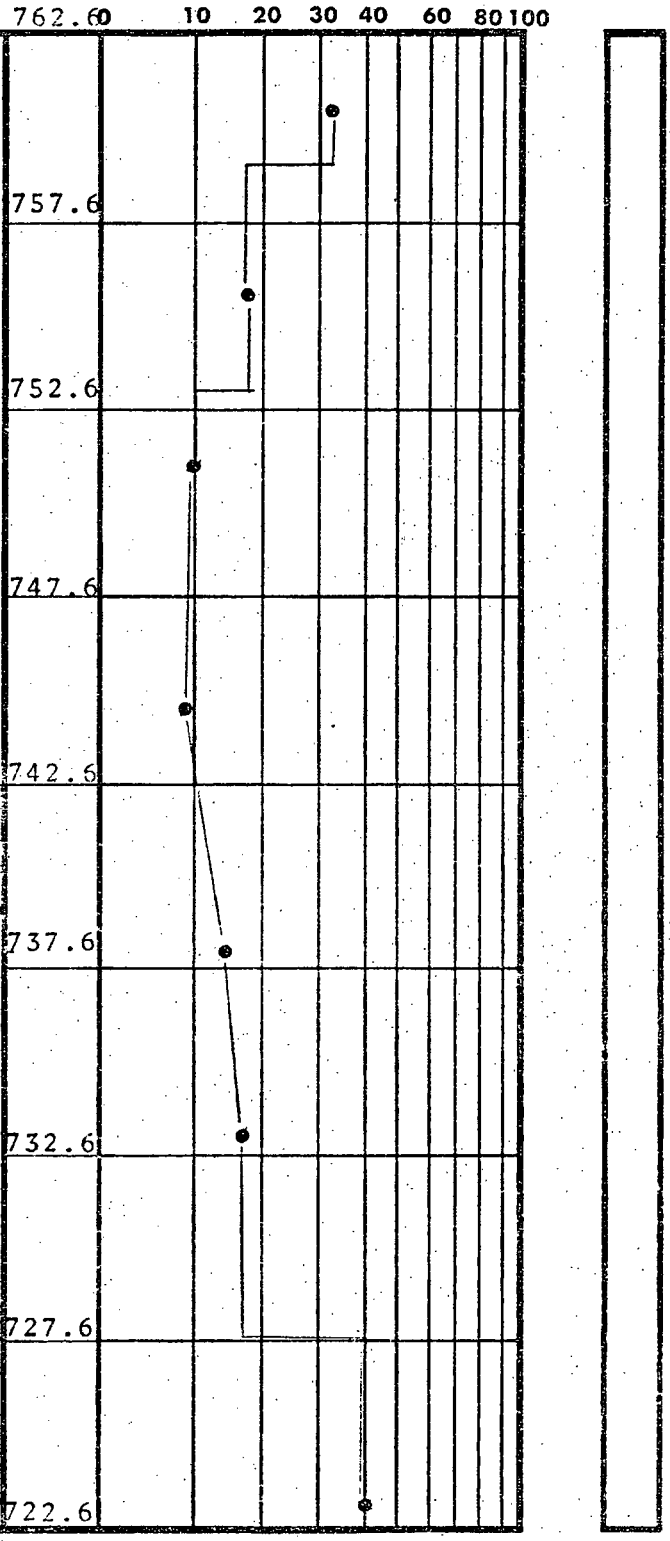
BORING NO. H-33
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		762.6
3.5	Hard Red Brown Slightly Clayey Silt (MH)	
	Very Stiff Red Brown Fine to Medium Slightly Sandy Clayey Silt	757.6
9.5		752.6
	Loose Pink Silty Fine to Medium Sand (SM-ML)	747.6
18.5		
	Firm Pink Gray Silty Fine to Medium Sand	742.6
		737.6
		732.6
35.0		727.6
	Dense to Very Dense Gray Black White Fine to Medium Silty Sand	722.6

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-34

DATE DRILLED 12-16-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0		722.6		
	Dense to Very Dense Gray Black White Fine to Medium Silty Sand			
44.0				50=4"
	Partially Weathered Rock That Becomes Gray Black and White Fine to Medium Silty Sand When Sampled.	717.6		50=0"
		712.6		
52.0				
	Fishtail Refusal at 52.0'			
	No Rock Cored			

Hole Dry and Caved at 45'

TEST BORING RECORD

Page Two

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

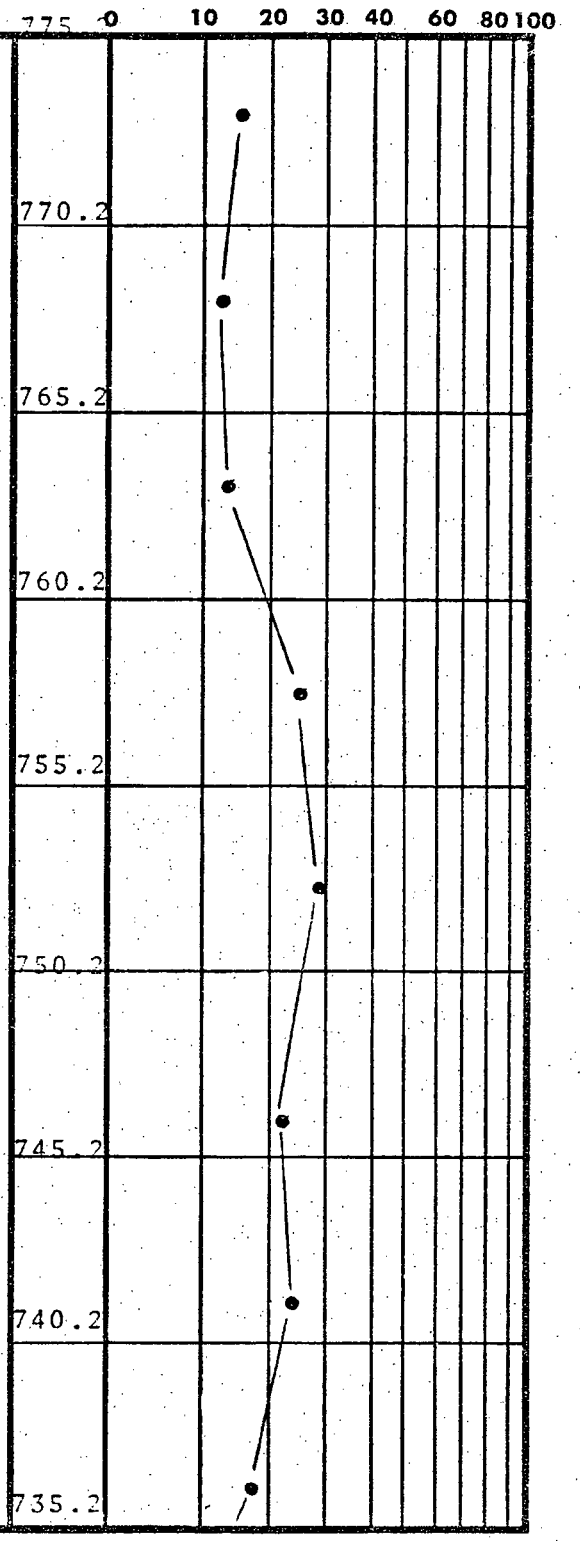
BORING NO. II-34

DATE DRILLED 12-16-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	
	Very Stiff Red Clayey Silt (MH)
3.5	
	Stiff Red Tan Sandy Micaceous Silt With Gravel
9.0	
	Firm Tan Gray Micaceous Silty Clayey Sand (SM)
14.5	
	Firm Gray White Micaceous Silty Fine to Coarse Sand



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-35

DATE DRILLED 12-23-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
		735.0	
41.0	Firm Gray White Micaceous*		
	Stiff Pink Tan Black Clayey Silt (MH)	730.2	
46.0	Stiff Yellow Silt	725.2	
53.0	Partially Weathered Rock That Becomes Gray and White Micaceous Fine to Coarse Sand When Sampled.	720.2	55-6"
57.0	Fishtail Refusal at 57.0'		

*Silty Fine to Coarse Sand

Hole Dry and Caved at 46'

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

TEST BORING RECORD

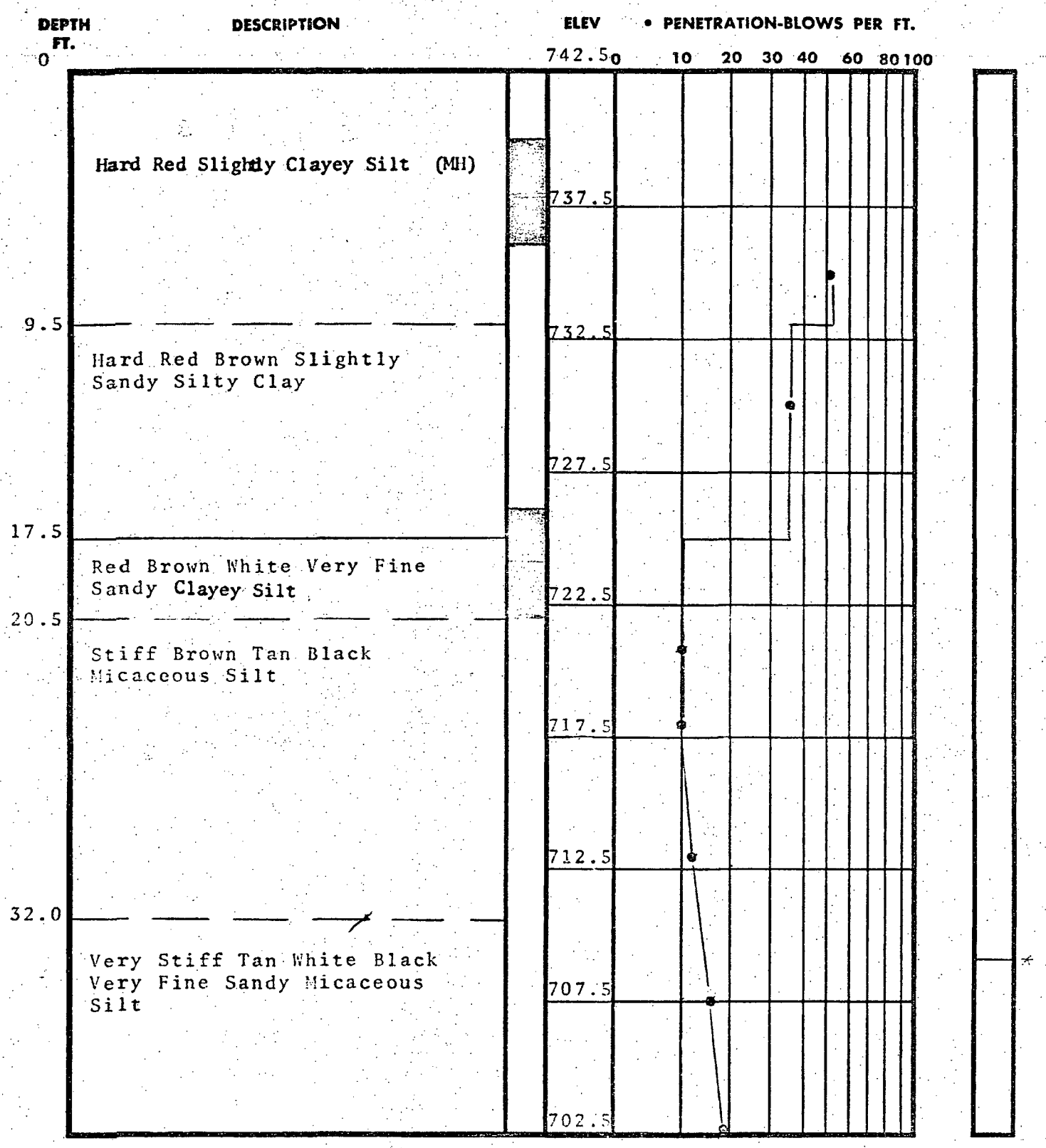
Page Two

BORING NO. H-35

DATE DRILLED 12-23-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.



* Caved at 33.5'

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

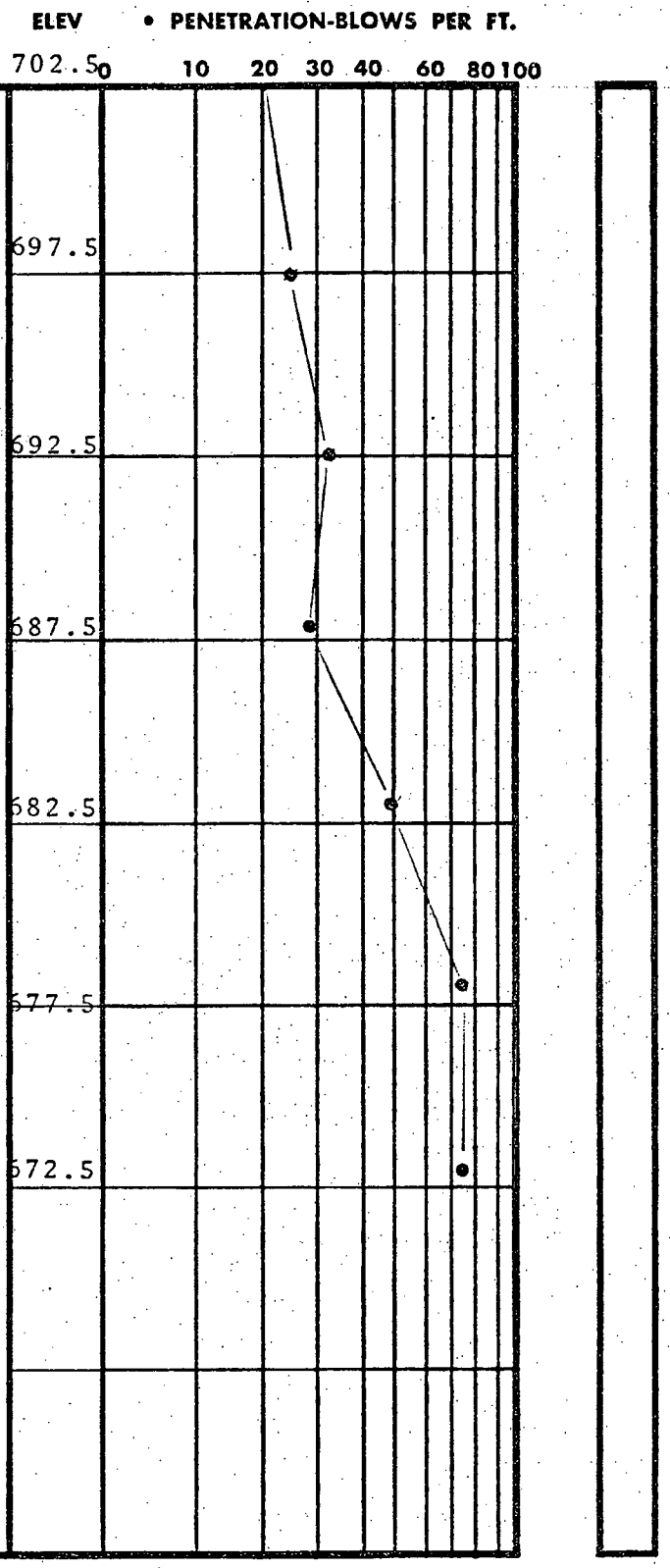
BORING NO. II-36

DATE DRILLED 12-20-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
	Very Stiff Tan White Black *
41.5	Dense to Very Dense Green White Micaceous Silty Fine to Medium Sand
71.5	Fishtail Refusal at 71.5'



*Very Fine Sandy Micaceous Silt

Hole Dry and Caved at 33.5'

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

TEST BORING RECORD

Page Two

BORING NO. H-36

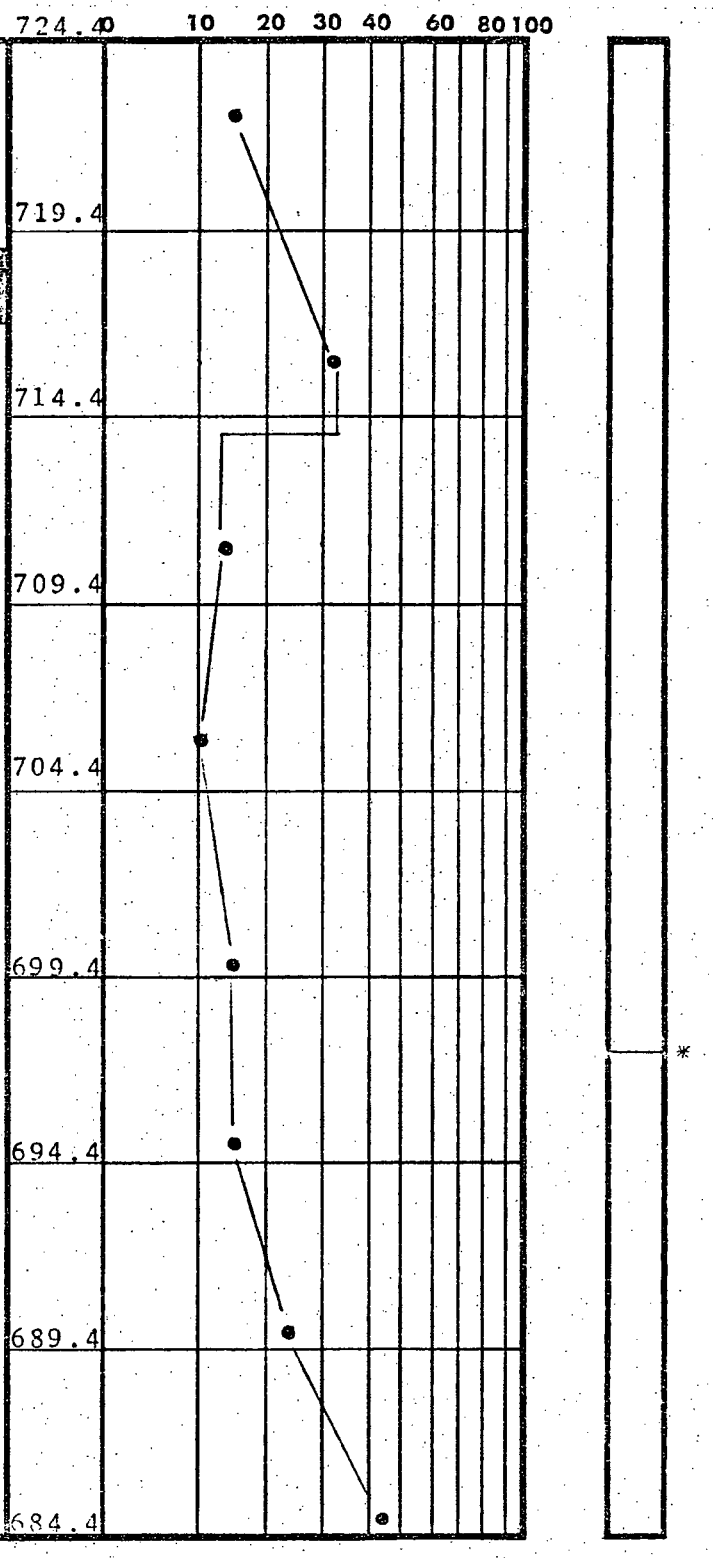
DATE DRILLED 12-20-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		724.4
	Very Stiff Red Clayey Silt (MH)	719.4
7.5		
	Hard Red Micaceous Silt With Traces of Fine Sand (ML)	714.4
10.5		
	Stiff Tan Black White Sandy Micaceous Silt	709.4
		704.4
		699.4
27.0		
	Very Stiff Green Tan White Mottled Very Fine Sandy Micaceous Silt	694.4
31.5		
	Firm to Dense Green Gray Black White Mottled Micaceous Silty Fine Sand	689.4
		684.4

• PENETRATION-BLOWS PER FT.



*Hole Dry and Caved at 27.0'.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.
UNDISTURBED SAMPLE
WATER TABLE, 1 HR.
% ROCK CORE RECOVERY
LOSS OF DRILLING WATER

BORING NO. H-37
DATE DRILLED 12-19-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
		684.4	
	Firm to Dense Green Gray Black White Mottled Micaceous Silty Fine Sand		
		679.4	
48.5			50-3"
49.5	Partially Weathered Rock That *	674.4	
	Fishtail Refusal at 49.5'		

TEST BORING RECORD

Page Two

BORING NO. H-37

DATE DRILLED 12-19-69

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

* Becomes Green Gray and Black Silty Fine Sand When Sampled.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

[50] % ROCK CORE RECOVERY

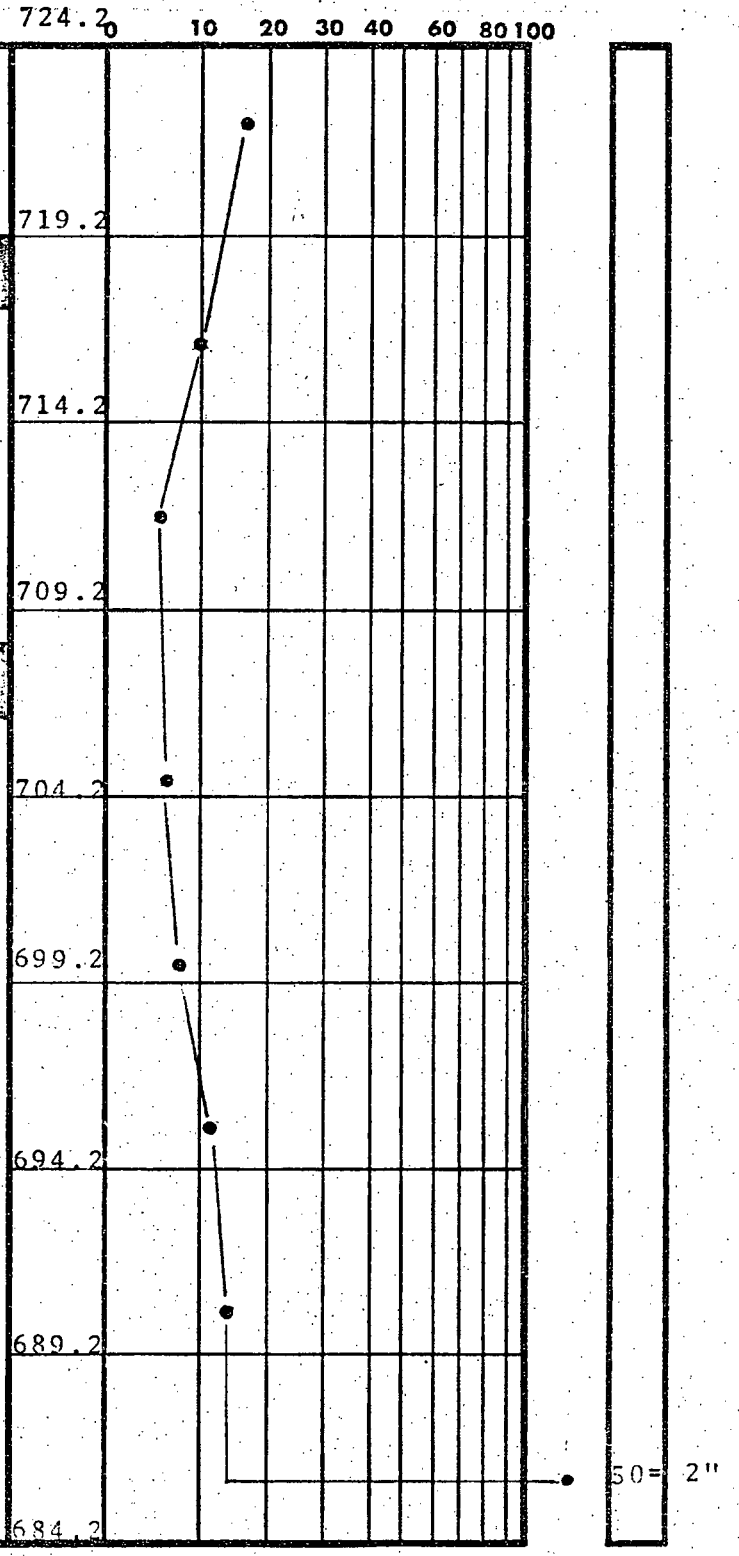
WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff to Very Stiff Tan Black Fine to Medium Sandy Micaceous Silt	724.2
10.0	Firm Tan Black White Sandy Micaceous Silt	714.2
26.5	Stiff Gray Tan Micaceous Fine Sandy Silt.	694.2
38.6	Fishtail Refusal at 38.6'	684.2

Hole Dry and Caved at 18.3'



TEST BORING RECORD

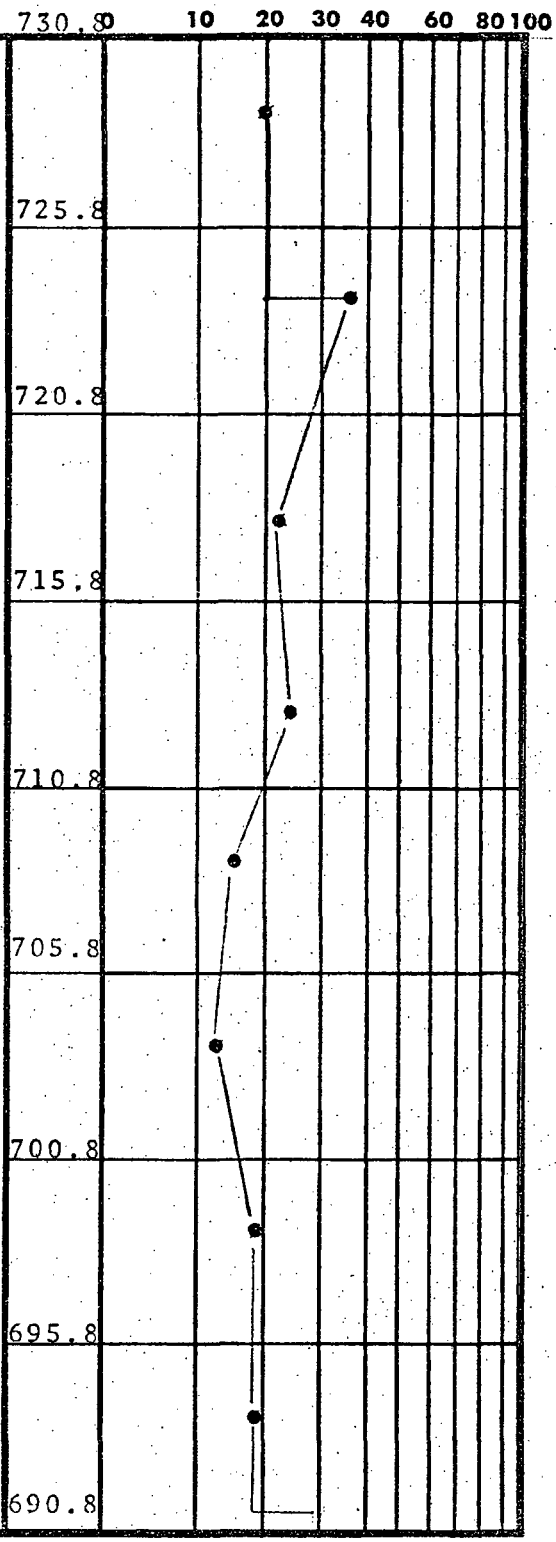
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
% ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-38
DATE DRILLED 12-18-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Red Slightly Sandy Clayey Silt (CH-MH)	730.8
		725.8
7.0	Very Stiff Red Brown Sandy*	
8.0	Very Stiff Red Brown Slightly Micaceous Sandy Silt	720.8
		715.8
15.5	Very Stiff Red White Slightly Clayey Silt	
20.0		710.8
	Very Stiff Tan Green Black Very Micaceous Silt	
2 0		705.8
	Firm Green Black Very Micaceous Silty Fine Sand	
		700.8
		695.8
39.5	Dense Green Tan White **	690.8



*Silt With Gravel
**Micaceous Silty Fine to Medium Sand

TEST BORING RECORD

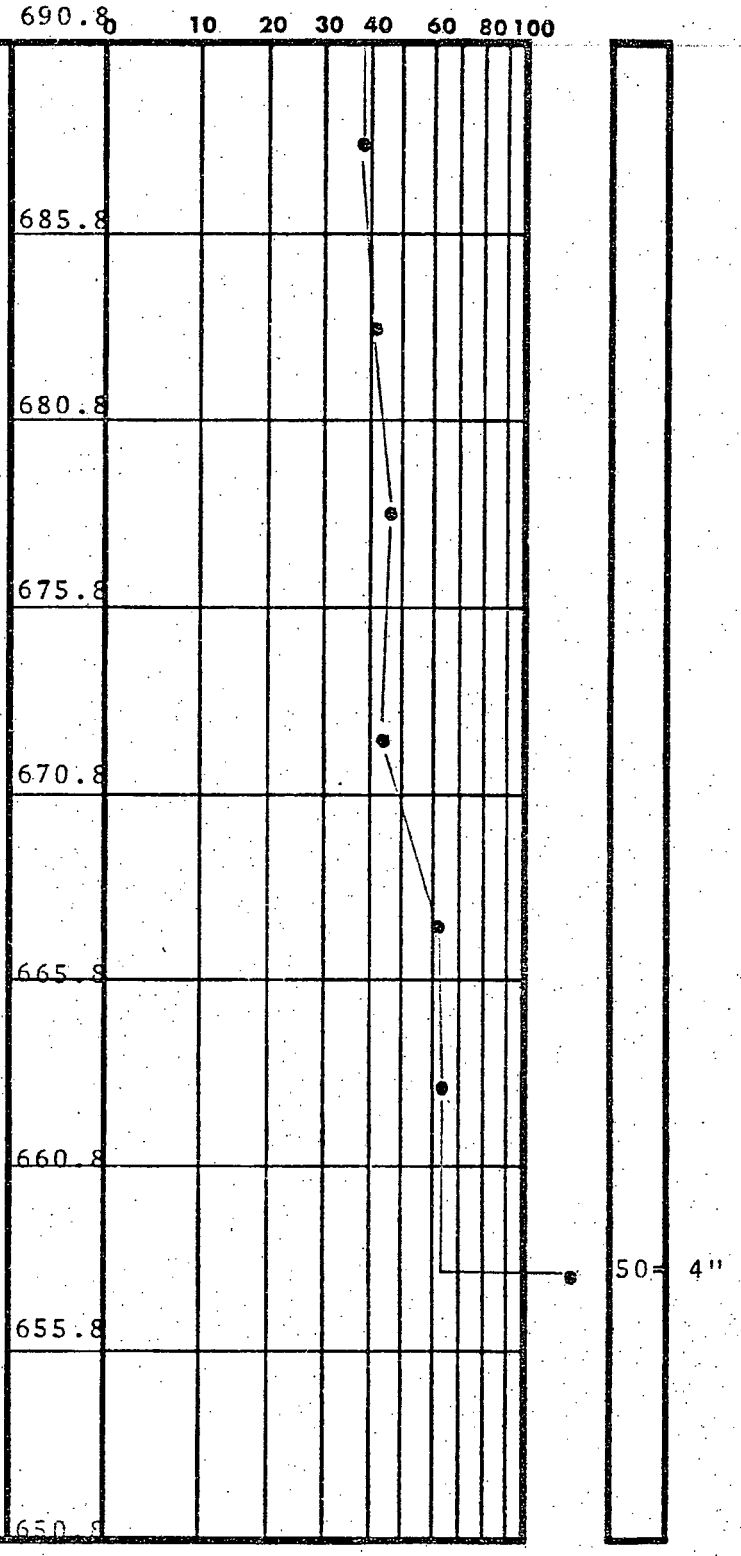
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-39
DATE DRILLED 12-20-69
JOB NO. CH 2055

WATER TABLE, 24 HR.
UNDISTURBED SAMPLE
WATER TABLE, 1 HR.
|50| % ROCK CORE RECOVERY
LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
	Dense Green Tan White Micaceous Silty Fine to Medium Sand (SM-ML)
50.0	Dense Brown Gray White Micaceous Silty Fine Sand
60.5	Very Dense Gray White Micaceous Silty Fine to Coarse Sand
73.0	Partially Weathered Rock That Becomes Gray and White Micaceous Silty Fine to Coarse Sand When Sampled.
80.9	



Fishtail Refusal at 80.9'
Hole Dry and Caved at 26.5'

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

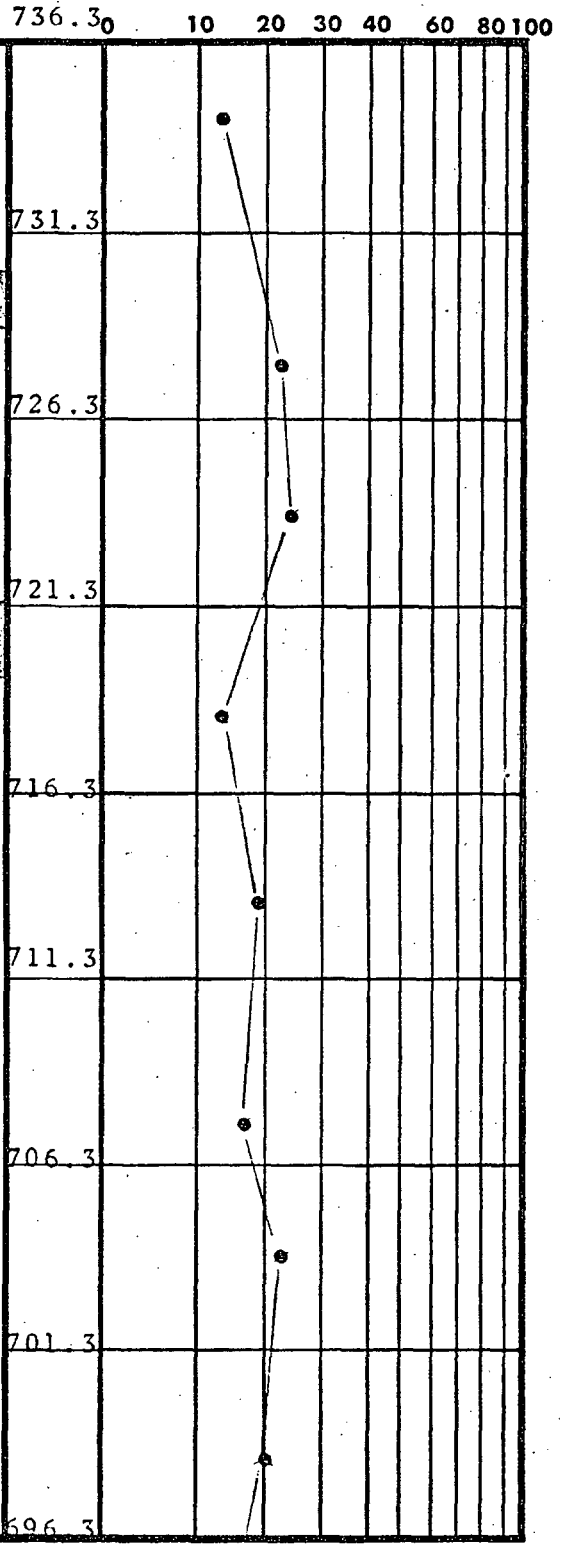
TEST BORING RECORD

Page Two

BORING NO. H-39
DATE DRILLED 12-30-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH 0 FT.	DESCRIPTION	ELEV 736.3
	Stiff Red Brown Silty Clay	731.3
7.0	Very Stiff Tan Black Slightly Sandy Very Micaceous Silt	726.3
		721.3
15.0	Firm Light Gray Very Silty Fine Sand	716.3
20.0	Very Stiff Light Brown and Black Silt	711.3
25.0	Firm Tan Very Silty Very Fine Sand	706.3
30.0	Stiff to Very Stiff Tan Black and White Micaceous Silt	701.3
		696.3



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

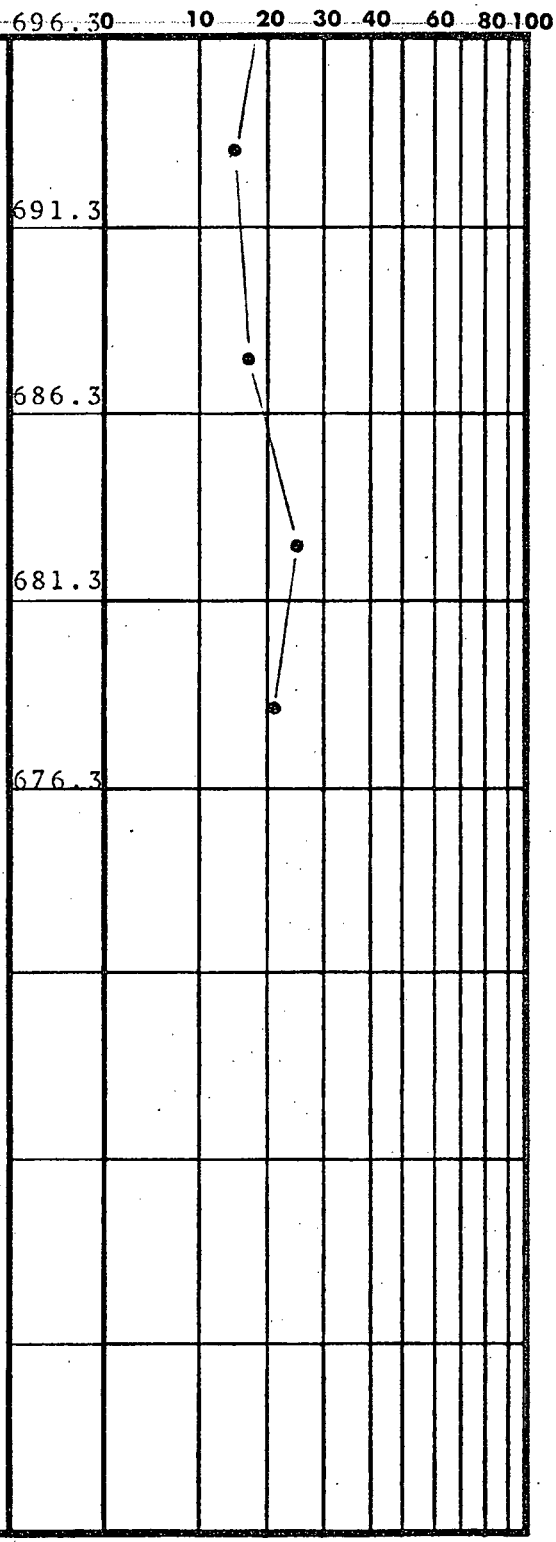
UNDISTURBED SAMPLE
% ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-40
DATE DRILLED 12-22-69
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
		696.30
	Stiff to Very Stiff Tan Black and White Micaceous Silt	
		691.3
45.5		
	Very Stiff Tan Black and White Slightly Sandy Micaceous Silt	
		686.3
		681.3
		676.3
61.0		
	Fishtail Refusal at 61.0'	

• PENETRATION-BLOWS PER FT.



Hole Dry and Caved at 40.5'

TEST BORING RECORD

Page Two

BORING NO. H-40

DATE DRILLED 12-22-69

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

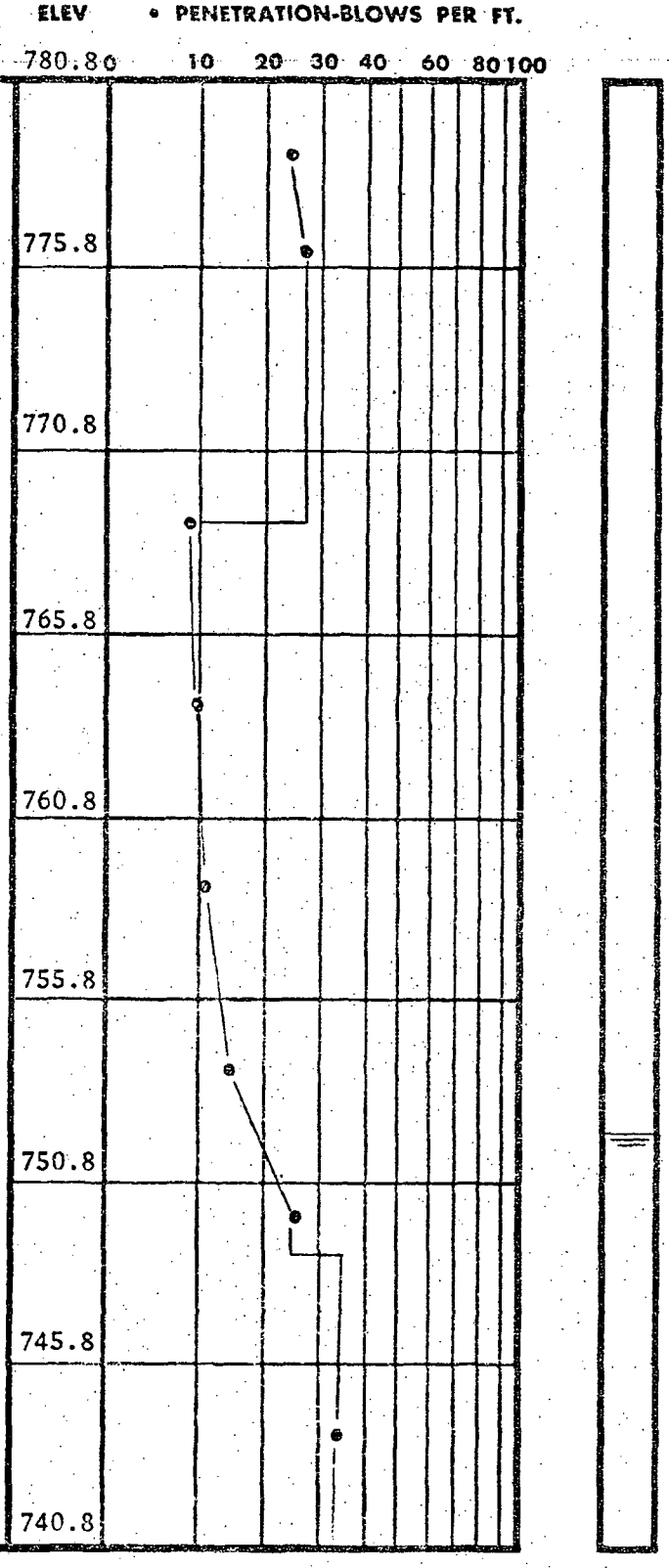
WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded*
2.5	Very Stiff Red Clayey Silt.
12.0	Stiff Red Tan and Black Micaceous Silt
32.0	Firm to Dense Gray Green and Tan Silty Fine to Medium Sand



*Sand and Gravel). (High Level Terrace)

TEST BORING RECORD

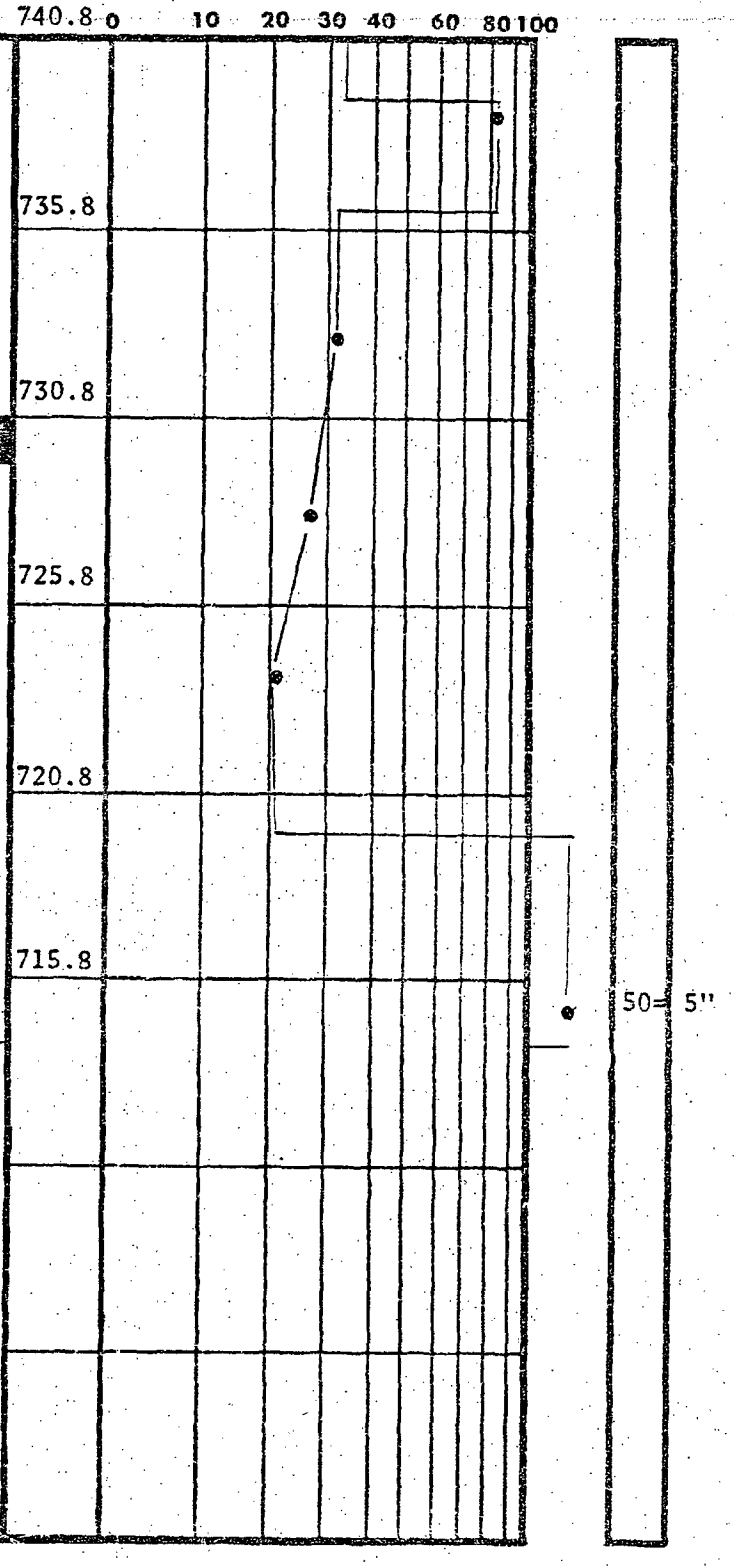
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-41
DATE DRILLED 1-30-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Firm to Dense Gray Green and Tan Silty Fine to Medium Sand	740.8
41.5	Very Dense Green Tan Silty Fine to Medium Sand	
44.5	Firm to Dense Tan Black and White Silty Micaceous Very Fine Sand	735.8
		730.8
		725.8
		720.8
61.0	Partially Weathered Rock That Becomes Gray Brown Silty Fine Sand When Sampled	715.8
66.8	See Following Core Boring Record	



TEST BORING RECORD

Page Two

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-41

DATE DRILLED CH 2055

JOB NO.

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				715.8	JOINTS DEPTH DIP 66.8' -78.0'-Highly Fractured Rock with Numerous Nearly Vertical Weathered Joints	
66.8 67.1 68.3	Moderatly Hard Gray White Fine to Medium Grained Granite	40	NX			
	Moderatly Hard Black and White Coarse Grained Diorite			710.8	79'-Nearly Vertical Weathered Joint	0%
71.0	Very Soft Black and White *					
	Very Soft and Moderatly Hard Granite and Diorite	86	NX	705.8		31%
		23	NX			0%
78.0	Hard Black and White Coarse Grained Diorite	67	NX	700.8		21%

* Coarse Grained Diorite
No Drilling Water Loss.

Page Three

CORE BORING RECORD

BORING NO. H-41
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 700.8	REMARKS	RQD
	Hard Black and White Coarse Grained Diorite	100	NX	695.8	JOINTS DEPTH DIP 80.5-Nearly Vertical Closed Joint 82.2' - 70° Joint	93
87.8	Hard Gray White Fine to Medium Grained Granite with Dark Green Meta-Gabbro Inclusion	100	NX	690.8	84' - 60° Joint 85' - 60° Joint	86
91.2	Hard Dark Green Meta-Gabbro	100	NX	685.8	87.5' - 70° Joint 88.1' - 70° Joint 98.6' - 45° Joint 99.5' - 45° Joint	95
				680.8	100' - Nearly Vertical Joint	
100.9	Coring Terminated					

No Drilling Water Loss.

CORE BORING RECORD

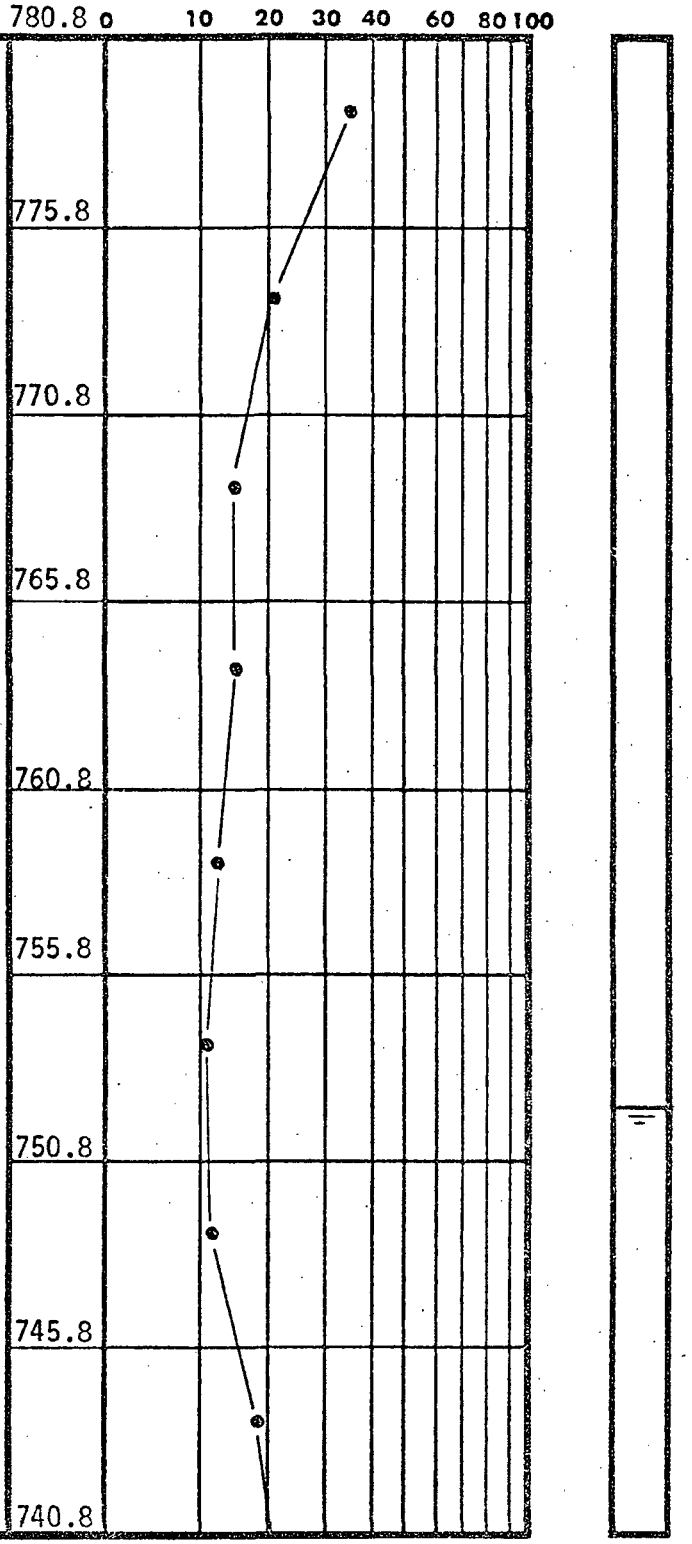
BORING NO. H-41

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)
5.5	Very Stiff Red Slightly Fine Sandy Clayey Slightly Micaceous Silt.
8.0	Stiff Red Fine to Medium Sandy Micaceous Silt
15.0	Stiff and Very Stiff Red Tan Fine Sandy Slightly Micaceous Silt
39.0	Very Stiff Tan and Black Fine*



*to Coarse Sandy Micaceous Silt

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

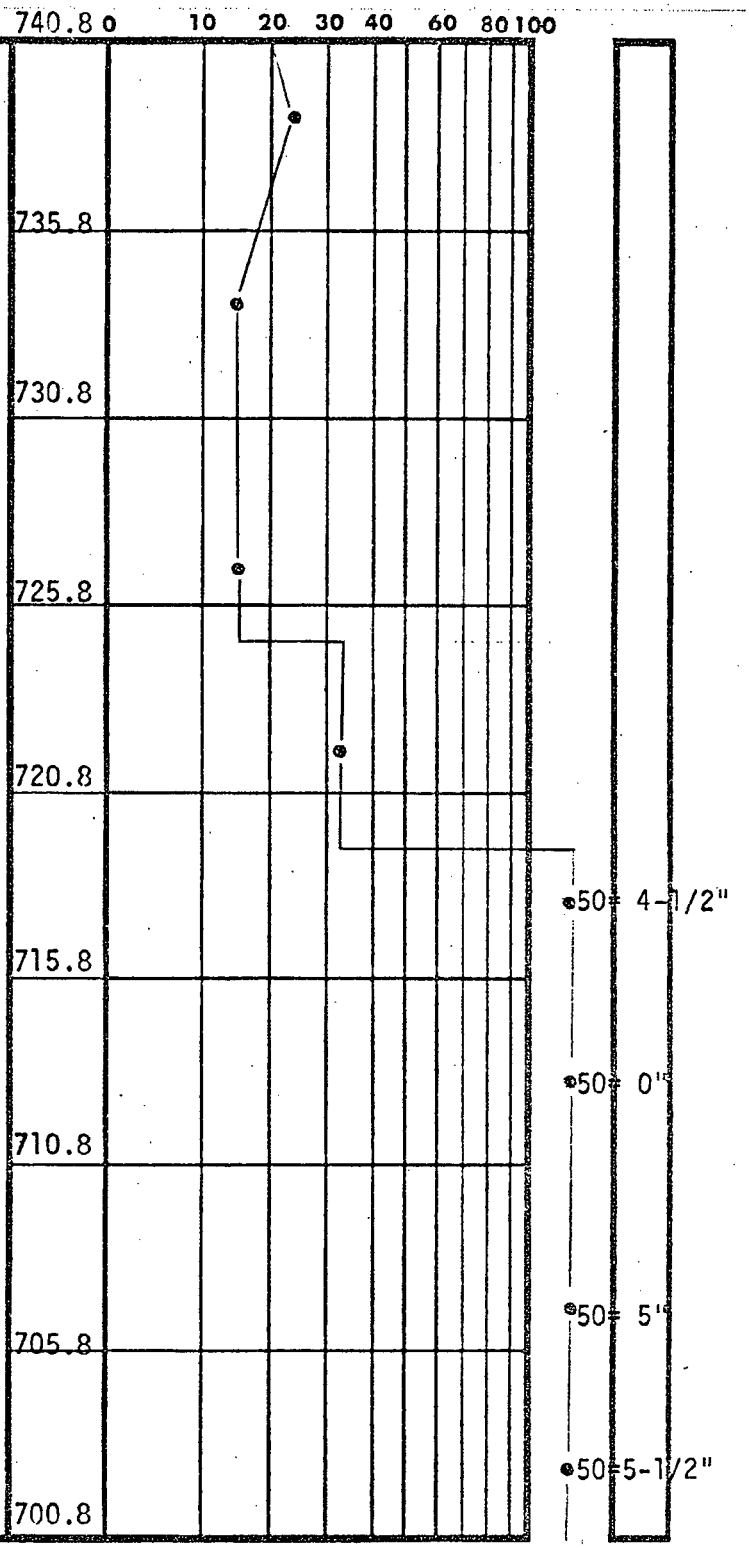
BORING NO. H-42

DATE DRILLED 2-18-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Very Stiff Tan and Black Fine to Coarse Sandy Micaceous Silt	740.8
56.0	Hard Gray Brown Black White Slightly Sandy Micaceous Silt	720.8
61.5	Partially Weathered Rock That Becomes Gray Brown Black White Slightly Sandy Micaceous Silt When Sampled.	715.8
76.0	Partially Weathered Rock That Becomes Black Green Fine to Coarse Sandy Silt When Sampled	700.8



TEST BORING RECORD

Page Two

BORING NO. H-42

DATE DRILLED 2-18-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
		700.8	
	Partially Weathered Rock That Becomes Black Green Fine to Coarse Sandy Silt When Sampled.	695.8	50= 0 "
88.6	See Following Rock Log.	690.8	50=4 1/2"

TEST BORING RECORD

Page Three

BORING NO. H-42

DATE DRILLED 2-18-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
		0	NX			0
						50=4 1/2'
88.6	Soft Brown Gray Coarse Grained Diorite.	5	NX	690.8		0%
				685.8		
98.6					JOINTS	
99.8	Soft Brown Gray Coarse Grained Diorite. (No. Recovery)	61	NX	680.8	99.8'- 100.4' Rock Highly Fractured in Joints	0%
100.4						50=0"
	Moderately Hard Light Gray Fine to Medium Grained Granite.	69	NX		100.3' - 60° Joint	31%
	Hard Light Gray Fine to Medium Grained Granite.	98	NX	675.8	101.5 - 102.0 Rock Fractured and Jointed	89%
107.2					101.6 - 2 Nearly Vertical Jointed at 90° to Each Other.	
	Hard Black and White Fine Grained Diorite.	100	NX	670.8	105.1 - 75° Joint	95%
		100	NX	665.8	116.2' - 75° Joint with Ground Water Deposits on Surfaces	97%
				660.8		

No Drilling Water Loss.

Page Four

CORE BORING RECORD

BORING NO. H-42
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 660.8	REMARKS
		100	NX		97%
123.0					
123.7	Hard Light Gray Fine to Medium Grained Granite.			655.8	
	Coring Terminated				

No Drilling Water Loss.

Page Five

CORE BORING RECORD

BORING NO. H-42

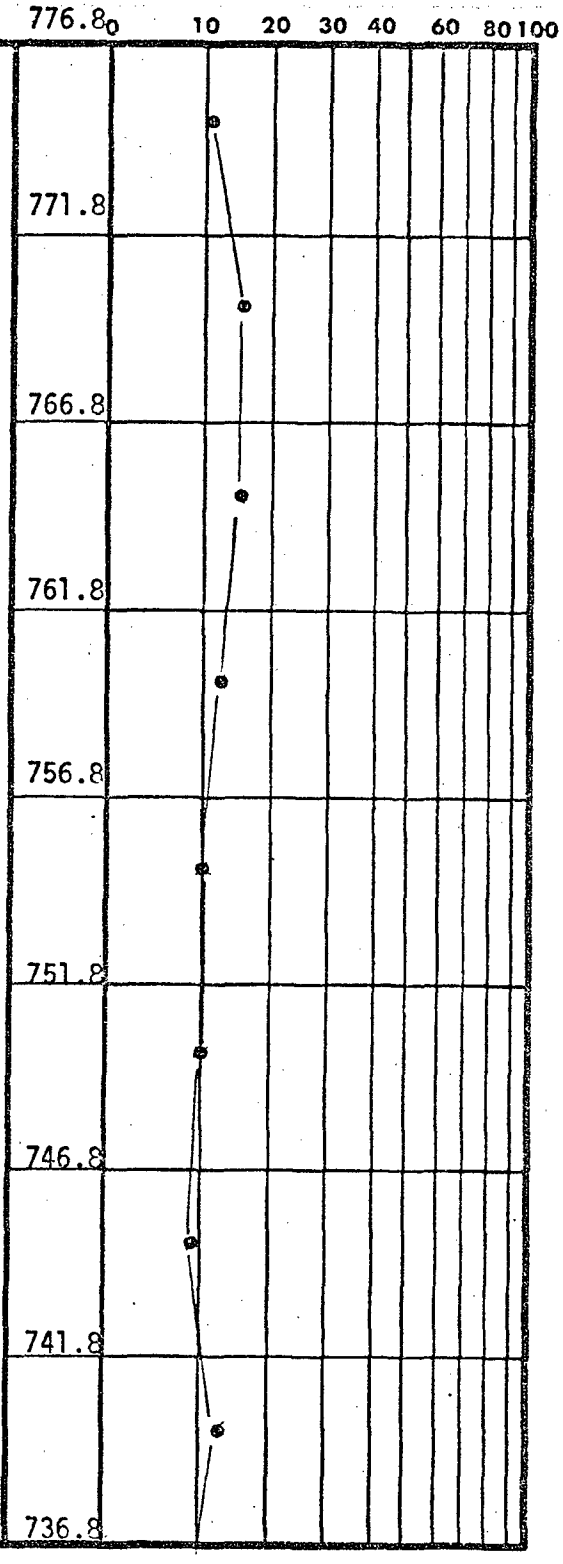
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level **	776.8
2.5	Stiff Red Slightly Sandy Slightly*	
4.0	Very Stiff Red Tan Micaceous Silt	771.8
		766.8
14.0	Stiff Red Tan Black Silt	761.8
19.5	Stiff Brown Tan Black Slightly Sandy Micaceous Silt	756.8
		751.8
		746.8
34.5	Stiff Gray Tan Black Micaceous Silt	741.8
		736.8

• PENETRATION-BLOWS PER FT.



* Clayey Silt.

** Terrace)

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-43

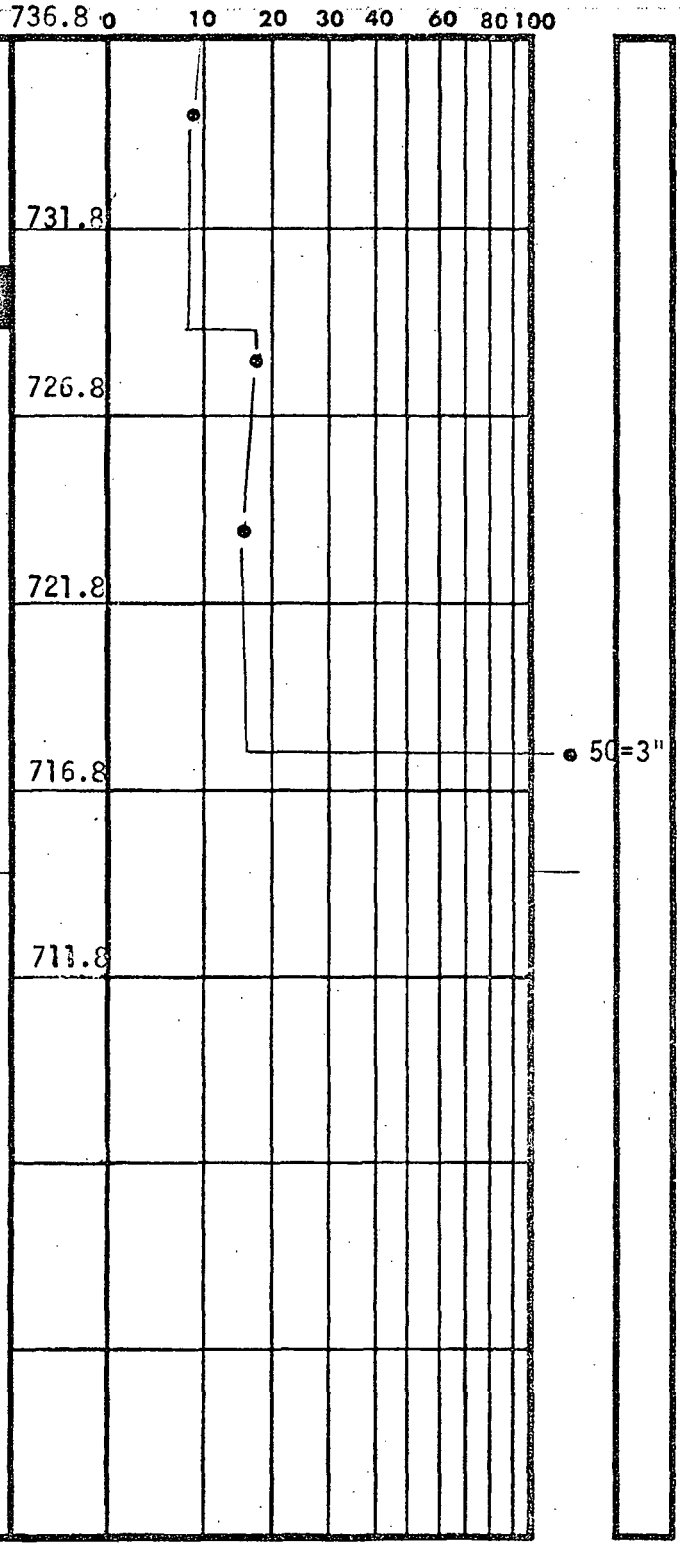
DATE DRILLED 2-20-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Stiff Gray Tan Black Micaceous Silt	736.8
47.8		731.8
48.4	Firm Gray White Silty Micaceous Sand	726.8
	Very Stiff Tan Slightly Sandy Slightly Micaceous Silt	721.8
59.0	Partially Weathered Rock That Becomes Gray and White Silty Micaceous Sand When Sampled	716.8
62.2	See Following Rock Log.	711.8

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page Two

BORING NO. H-43

DATE DRILLED 2-20-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
62.2	Hard Black and White Coarse Grained Diorite.(Top of Hard*			711.8		RQD
64.7		100	NX			100%
65.1	Hard Light Gray Fine to Medium Grained Granite.					
67.2	Hard Black and White Coarse Grained Diorite.					
68.3				706.8		
	Hard Light Gray Fine to Medium Grained Granite.	100	NX			100%
	Hard Black and White Coarse Grained Diorite.			701.8		
79.8	**	100	NX	696.8		100%

* Rock)
** Hard Light Gray Fine to Medium Grained Granite.

No Drilling Water Loss.

Page Three

CORE BORING RECORD

BORING NO. H-43
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 696.8	REMARKS
	Hard Light Gray Fine to Medium Grained Granite.	100	NX		100%
82.3	Coring Terminated			691.8	

No Drilling Water Loss.

Page Four

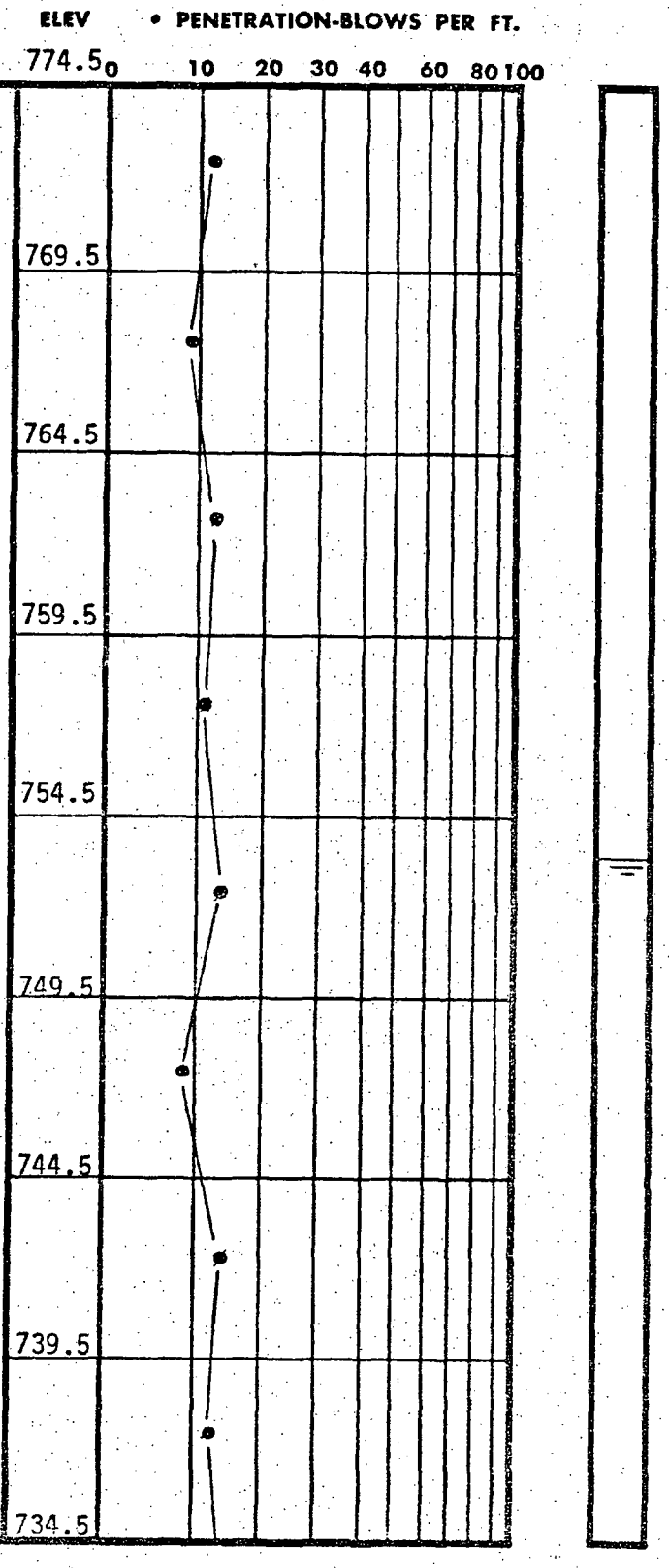
CORE BORING RECORD

BORING NO. H-43
JOB NO. ~~CH 2055~~

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level **
2.0	Stiff Red Slightly Clayey Silt.
4.0	Stiff Red Brown Slightly Micaceous Silt
9.5	Stiff Red Tan Black Slightly Sandy Micaceous Silt
24.5	Stiff Yellow Black Slightly Sandy Slightly Micaceous Silt
37.5	Firm Tan Black Silty Micaceous Fine Sand
39.0	Very Stiff Yellow Black Slightly*



*Sandy Slightly Micaceous Silt
** Terrace)

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

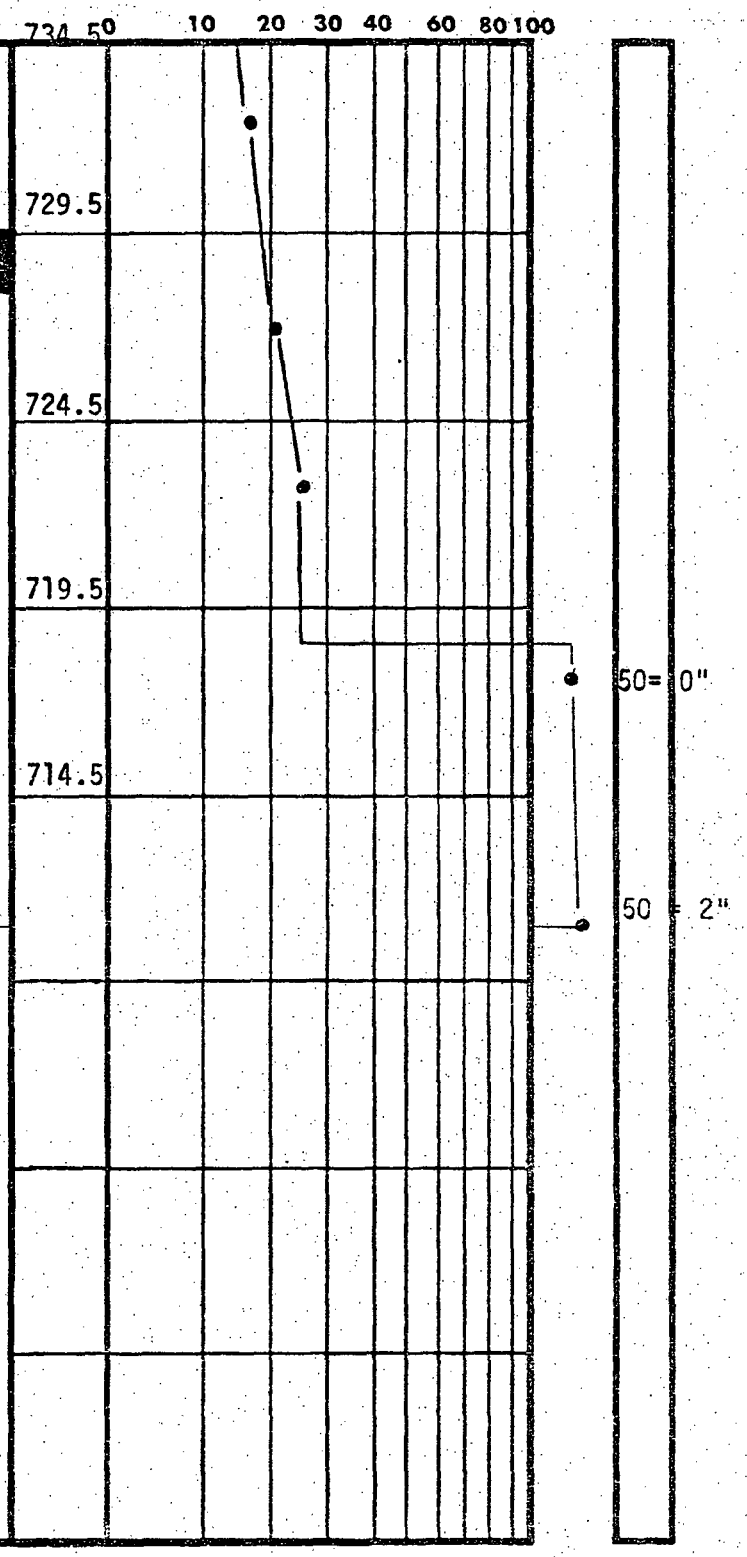
BORING NO. H-44

DATE DRILLED 2-23-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Very Stiff Yellow Black Slightly Sandy Slightly Micaceous Silt	729.5
46.7	Very Stiff Tan Black Green Slightly Sandy Micaceous Silt	724.5
50.0	Firm Gray Brown and White Silty Micaceous Fine Sand	719.5
56.2	See Following Rock Log.	714.5



TEST BORING RECORD

Page Two

BORING NO. H-44

DATE DRILLED 2-23-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
56.2	Soft Light Gray Fine to Medium Grained Granite	3	NX	714.5		0%
63.7	Hard Black and White Coarse Grained Diorite.			709.5		
67.0		100	NX			
67.3	Hard Light Gray Fine to Medium Grained Granite.					100%
69.5	Hard Black and White Coarse Grained Diorite.			704.5		
	Hard Black and White Fine Grained Diorite with Occassional Light Gray Granite Inclusions	100	NX	699.5		100%
81.8				692.7		

* Coring Terminated

No Drilling Water Loss.

Page Three

CORE BORING RECORD

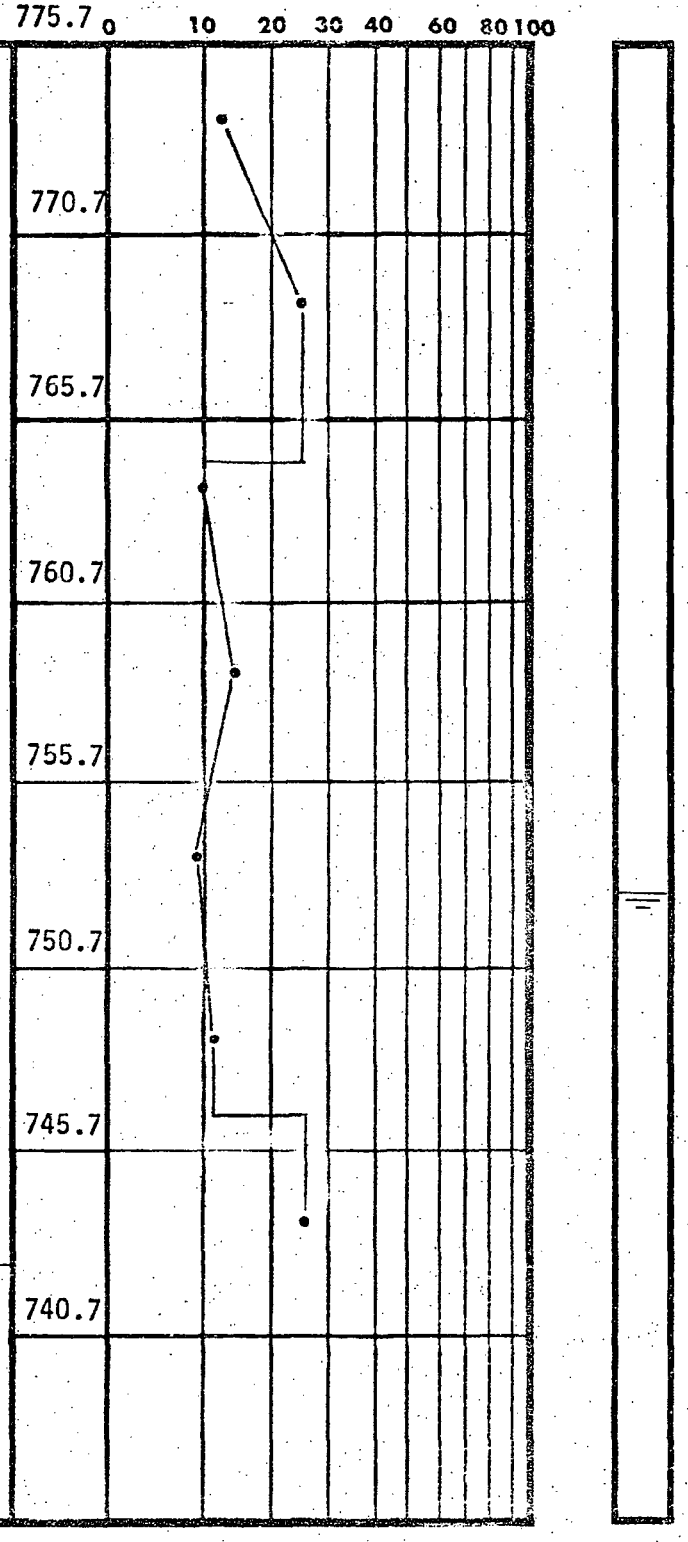
BORING NO. H-44

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION	ELEV
0		775.7
	Fill-Stiff Red Sandy Micaceous Silt.	
.5		
	Very Stiff Red Sandy Micaceous Silt.	770.7
		765.7
11.0		
	Stiff Purple Yellow Slightly Micaceous Silt.	760.7
		755.7
22.3		
	Stiff Purple Yellow Black Slightly Micaceous Silt.	750.7
29.0		
	Very Stiff Black White Tan Sandy Micaceous Silt.	745.7
32.5		
	See Following Rock Log.	740.7



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

BORING NO. H-45

DATE DRILLED 2-24-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
32.5	Moderately Hard Black and White Coarse Grained Diorite.	83	NX	740.7	JOINTS 32.5' - 32.9' Rock Highly Fractured and Jointed 33.6' - 60° Slightly Weathered Joint.	59%
37.0	Hard Black and White Coarse Grained Diorite.	100	NX		33.8' - 45° Slightly Weathered Joint. 33.9' - Nearly Vertical Joint.	69%
40.0				735.7	35.6'-37.8' Half Core *	

No Drilling Water Loss.

*Fine Grained Diorite Inclusion

CORE BORING RECORD

BORING NO. H45
JOB NO. CR 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				735.7		
	Hard Black and White Coarse Grained Diorite.	100	NX	730.7	JOINTS 39.1 - 45° Slightly Weathered Joint	100%
49.7				725.7		
	Moderately Hard Black and White Coarse Grained Diorite.					
51.3	Soft Light Gray Fine to Medium Grained Granite (No Recovery)	61	NX	720.7	51.6' Nearly Vertical Joint-Slightly Weathered.	53%
55.4						
55.8	Hard Light Gray Fine to Medium*					
57.6	Hard Dark Green Meta-Gabbro					
59.1				715.7		
	Hard Black and White Fine **				61.1' Nearly Vertical Joint-Slightly Weathered.	
	Hard Dark Green Meta-Gabbro	100	NX	710.7		98%
68.2						
69.4	Hard Light Gray Fine to Medium Grained Granite.			705.7		
70.1	Hard Dark Green Meta-Gabbro	100	NX			100%
	Hard Black and White Coarse Grained Diorite.			700.7		
78.0	Coring Terminated					

* Grained Granite.

** Grained Diorite.

No Drilling Water Loss.

CORE BORING RECORD

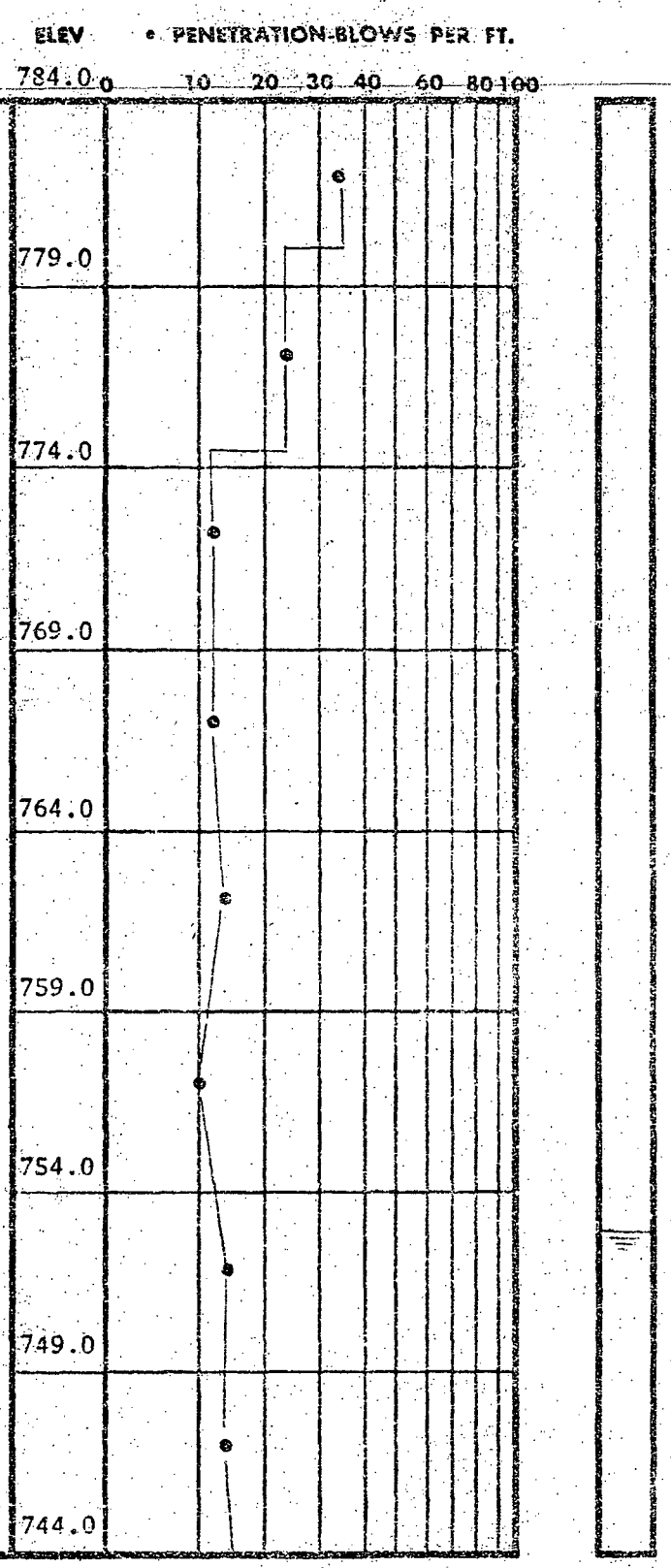
BORING NO. H-45

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Hard Dark Red-Brown Slightly Sandy Clayey Silt(with Semi-Rounded Sand and Gravel). (High Level Terrace)
6.0	Very Stiff Red Slightly Sandy Clayey Silt.
9.5	Stiff Red Tan Slightly Sandy Micaceous Silt
24.5	Stiff Gray Tan Pink Fine to Medium Sandy Micaceous Silt
29.5	Stfff and Very Stiff Pink Tan Black White Slightly Sandy Micaceous Silt



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

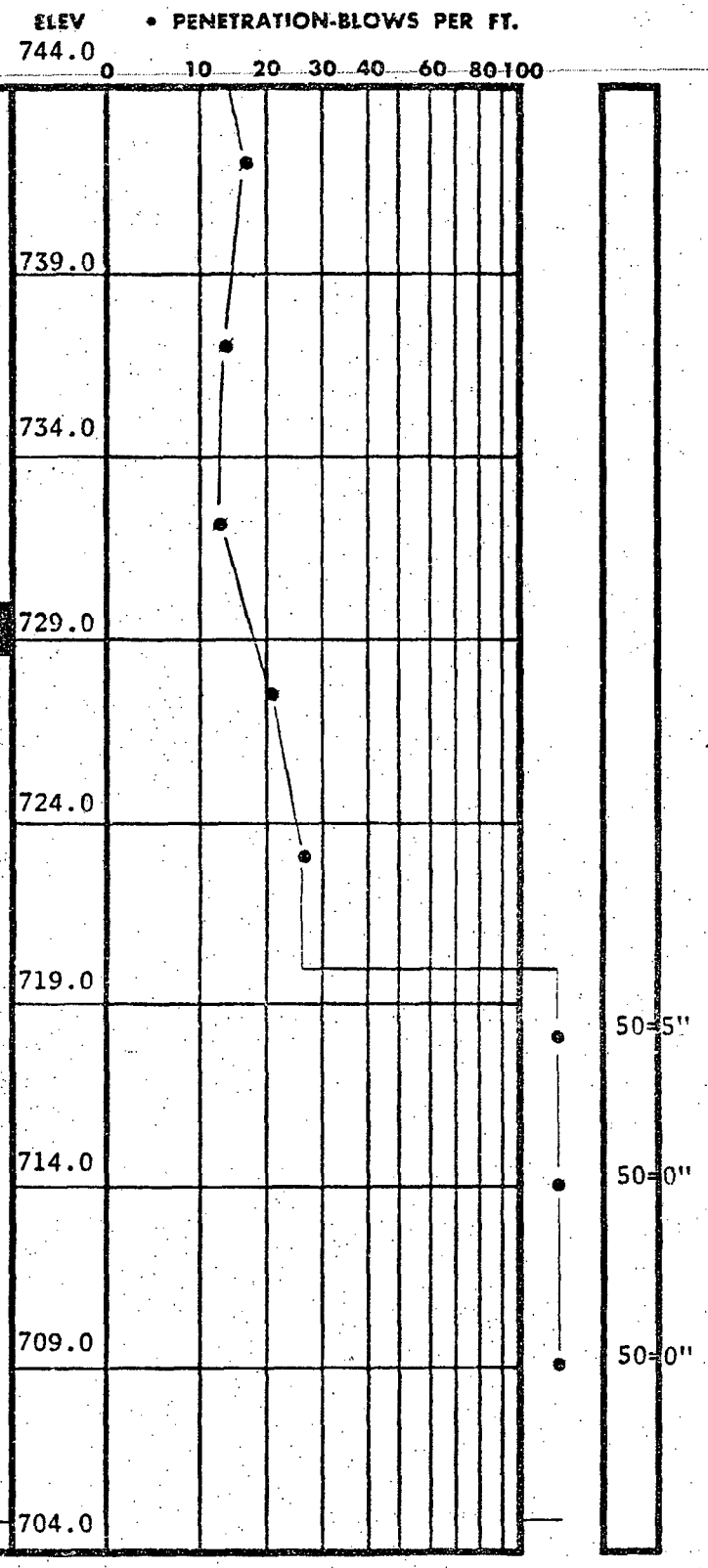
BORING NO. H-46

DATE DRILLED 2-5-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		744.0
	Stiff and Very Stiff Pink Tan Black White Slightly Sandy Micaceous Silt	739.0
		734.0
		729.0
56.5	Very Stiff Tan Black White Slightly Sandy Micaceous Silt	724.0
64.0	Partially Weathered Rock That Becomes Tan Black Very Silty Fine to Coarse Sand When Sampled	719.0
		714.0
		709.0
79.2	See Following Rock Log.	704.0



TEST BORING RECORD

Page Two

BORING NO. H-46

DATE DRILLED 2-5-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				709.0		
79.2					JOINTS DEPTH DIP	
80.0	Moderately Hard Brown Gray*	60	NX	704.0	79.4' - 60° Joint 79.6' - 60° Joint	6

*Fine Grained Diorite.

CORE BORING RECORD

BORING NO. H-46
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				704.0		
	Moderately Hard Brown Gray Fine Grained Diorite.	60	NX		JOINTS DEPTH - DIP 80.1' - 60° Joint	
83.4				699.0	81.1' - 45° Joint	6%
	Soft Brown and Gray Fine Grained Diorite.				83.0' - Nearly Vertical Joint.	
		34	NX	694.0	87.2' - 60° Joint	7%
93.0						
94.0	Moderately Hard Brown and White Fine Grained Diorite.			689.0		56%
	Hard Black and White Fine Grained Diorite.	72	NX			
		51	NX	684.0	100.0'-101.8'-Numerous Nearly Vertical Joints & Rock Fractures. Slickensides.	45%
100.0						
101.8	Hard Dark Green Meta-Gabbro*					
	Hard Brown and White Fine Grained Diorite.				103.7' - 45° Joint	68%
		92	NX	679.0	105.5'-106.8'-Numerous Joints and Rock Fractures Slickensides.	
107.0					107.2' - 60° Joint	
	Hard Dark Green Meta-Gabbro Diorite.					
		97	NX	674.0	111.0' - Numerous Nearly Vertical Joints.	92%
					112.0' - 80° Joints Slickensides.	
114.0				669.0		
	Hard Black and White Coarse Grained Diorite.				116.5' - 45° Joints	
					116.5' - 118.0' - Slickensides.	
120.0		100	NX	664.0	117.0' - 45° Joint	100%

*Diorite.

CORE BORING RECORD

BORING NO. H-46
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
120.0				664.0		
121.9	Hard Black and White Coarse Grained Diorite.					
	Lost Sample.	100	NX	659.0		100%
		100	NX	654.0		100%
				649.0		
135.5	Coring Terminated.					

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-46

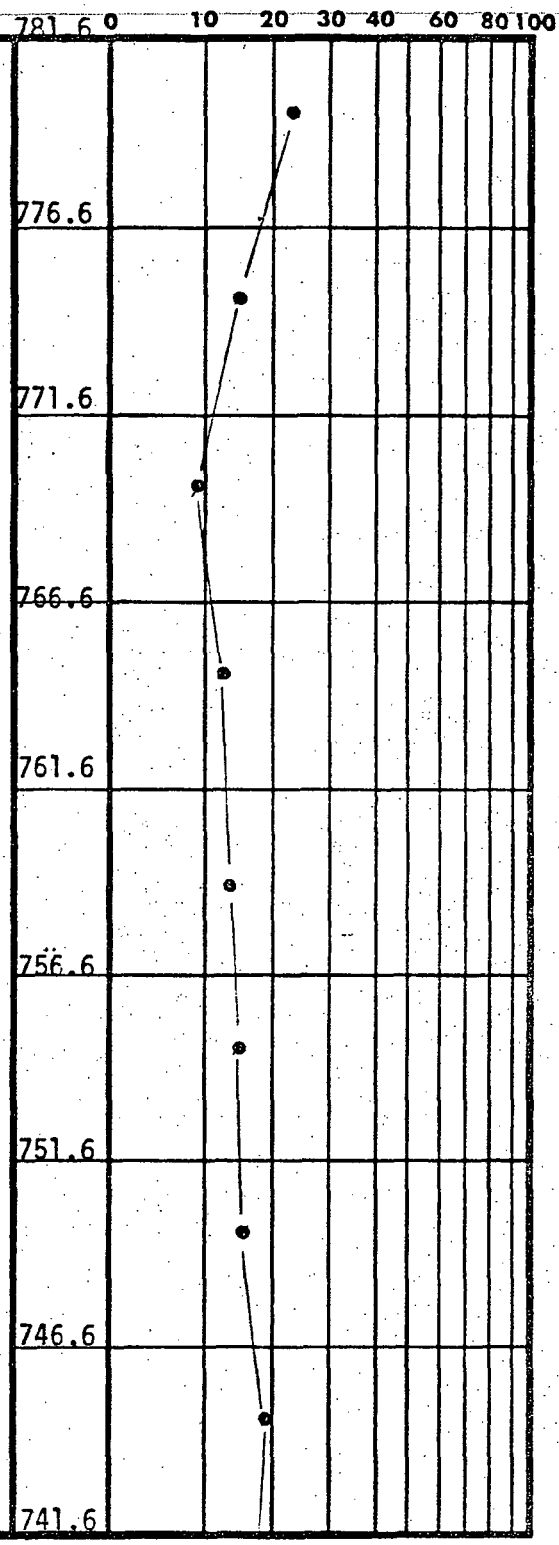
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt(with Semi-Rounded Sand and Gravel). (High Level Terrace)
6.0	Stiff Red Clayey Slightly Micaceous Silt.
9.0	Stiff Red Micaceous Silt
14.0	Stiff Purple and Tan Fine Sandy Micaceous Silt
29.0	Very Stiff Tan and Black Micaceous Silt
34.0	Very Stiff Red Brown and Black Micaceous Silt
39.0	Firm Gray Tan and Black Micaceous*

*Silty Fine to Medium Sand



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-47

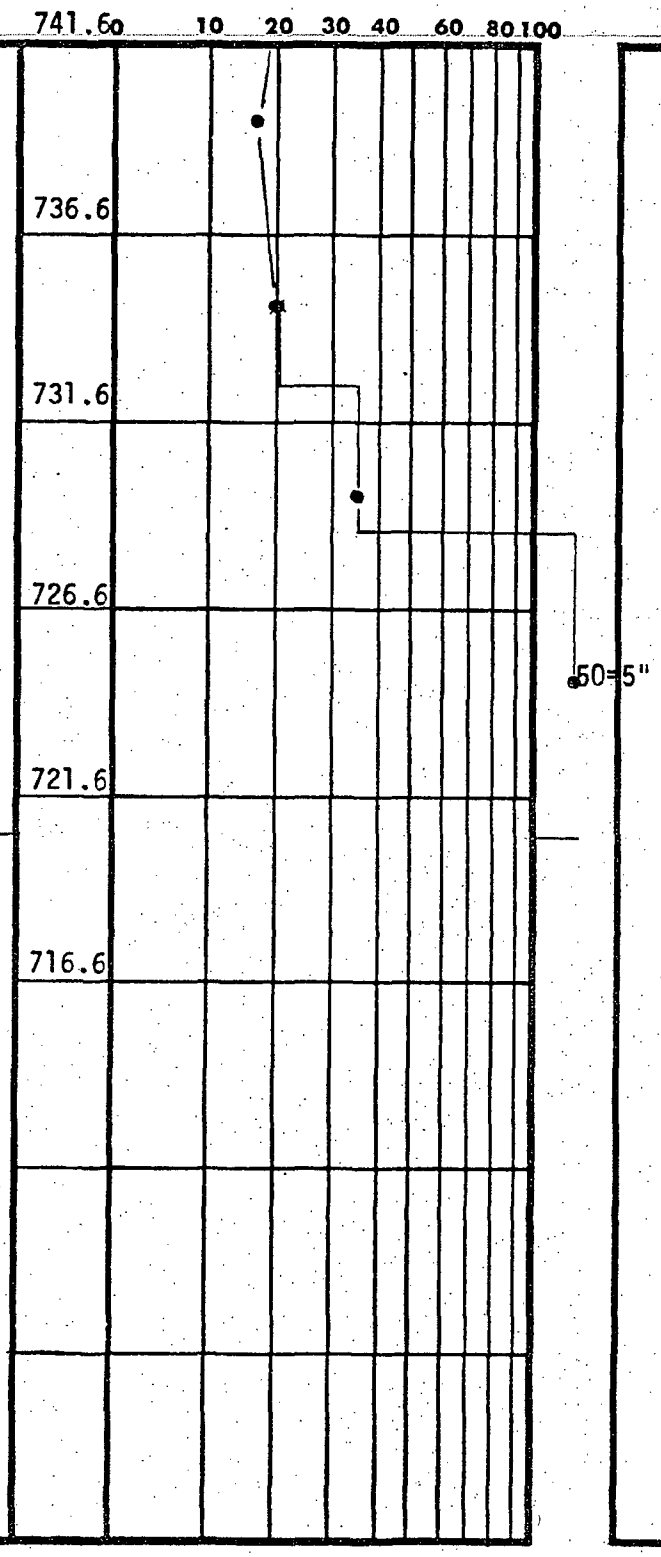
DATE DRILLED 3-11-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Firm Gray Tan and Black Micaceous Silty Fine to Medium Sand	741.6
44.0	Very Stiff Tan and Black Micaceous Silt	736.6
49.0	Dense Gray and White Micaceous Silty Fine Sand	731.6
53.0	Partially Weathered Rock That Becomes Gray and White Micaceous Silty Fine Sand When Sampled	726.6
		721.6
61.1	See Following Rock Log	716.6

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page Two

BORING NO. H-47

DATE DRILLED 3-11-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS
61.1					RQD
	Hard Black and White Fine Grained Diorite-Occassional Thin Layer or Inclusion of Hard Light Gray Granite.	100	NX	716.6	100%
				711.6	
		100	NX	706.6	100%
80.4				701.2	

Coring Terminated.
No Drilling Water Loss.

Groundwater Dry and Caved at 29.2 Feet.

Page Three

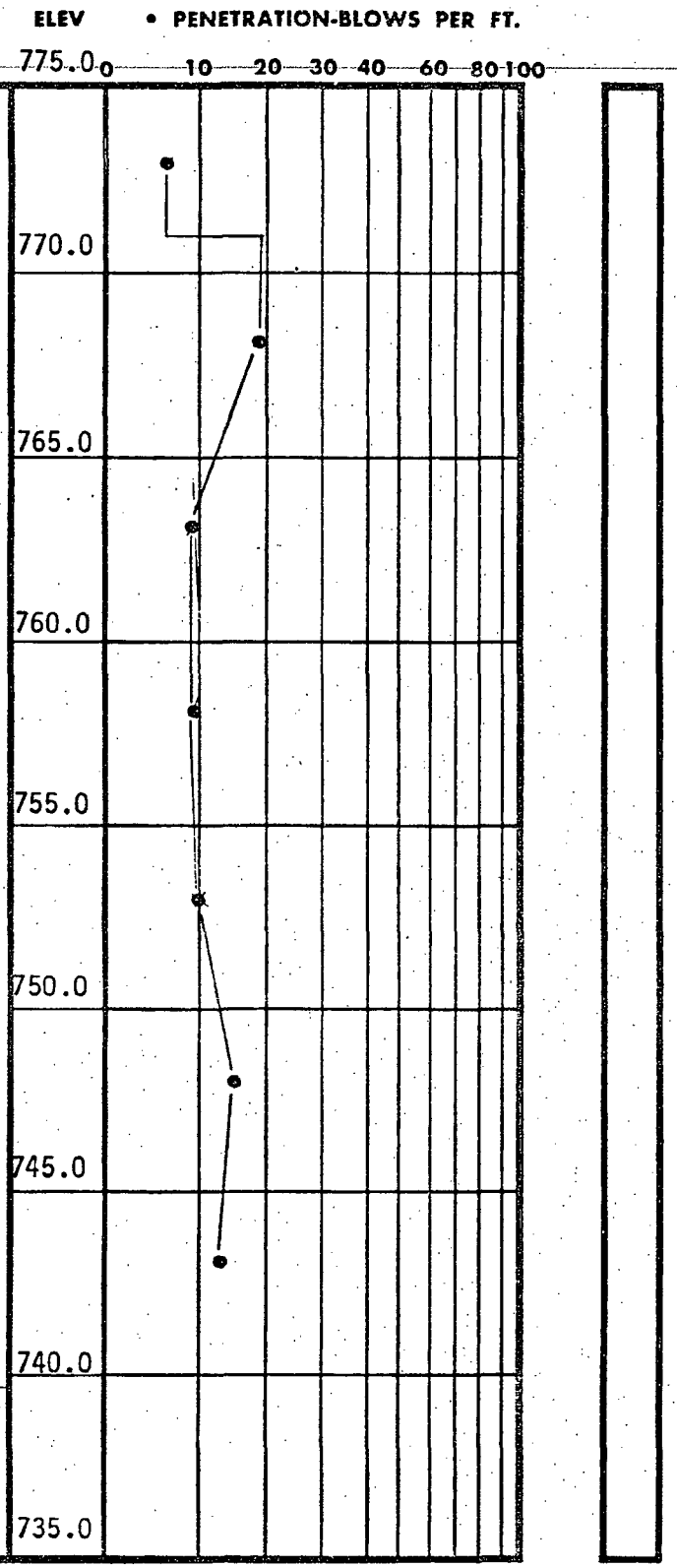
CORE BORING RECORD

BORING NO. H-47
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Firm Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded *
~ 0	
	Firm Red Fine to Medium Sandy Silt.
4.0	Stiff and Very Stiff Red Slightly Micaceous Silt
14.0	Loose Purple and White Very Silty Micaceous Fine to Coarse Sand
[illegible]	Firm Gray and White Very Silty Micaceous Fine to Coarse Sand
35.3	See Following Rock Log Refusal at 35.3'.



* Sand and Gravel). (High Level Terrace)

Hole Dry and Caved at 22'3" at 24 Hour.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-48

DATE DRILLED 3-16-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS
				740.0	
35.3	Soft Black and White Fine to Medium Grained Granite.	56	NX		RQD 29%
37.3	Moderately Hard Black and White Fine to Medium Grained*				
39.1	Very Soft Black and White Fine**			735.0	

* Granite.
** to Medium Grained Granite(No Recovery)

Page Two

CORE BORING RECORD

BORING NO. H-48
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 735.0	REMARKS	
	Very Soft Black and White Fine to Medium Grained Granite (No Recovery)	56	NX			29%
43.2	Soft Brown Black and White Fine Grained Diorite.	54	NX	730.0		9%
46.4	Very Soft Brown Black and White Fine Grained Diorite(No Recovery)					
48.9	Moderately Hard Brown Black and White Fine Grained Diorite *	91	NX	725.0		81%
50.3	Very Soft Brown Black and White Fine Grained Diorite (No Recovery)					
51.1	Hard Black and White Fine Grained Diorite.			720.0		
55.3	Hard Gray Fine to Medium Grained Granite.					
55.9	Hard Black and White Coarse Grained Diorite.	100	NX	715.0		98%
63.6	Hard Gray Fine to Medium Grained Granite.			710.0		
65.7	Hard Dark Green Meta-Gabbro.					
67.8	Hard Black and White Fine Grained Diorite.	100	NX	705.0	JOINTS DEPTH - DIP 68' - 45° 73.1' - 60° 73.4' - 60°	100%
73.7	Coring Terminated			700.0		

*(No Recovery)

No Drilling Water Loss.

Page Three

CORE BORING RECORD

BORING NO. H-48

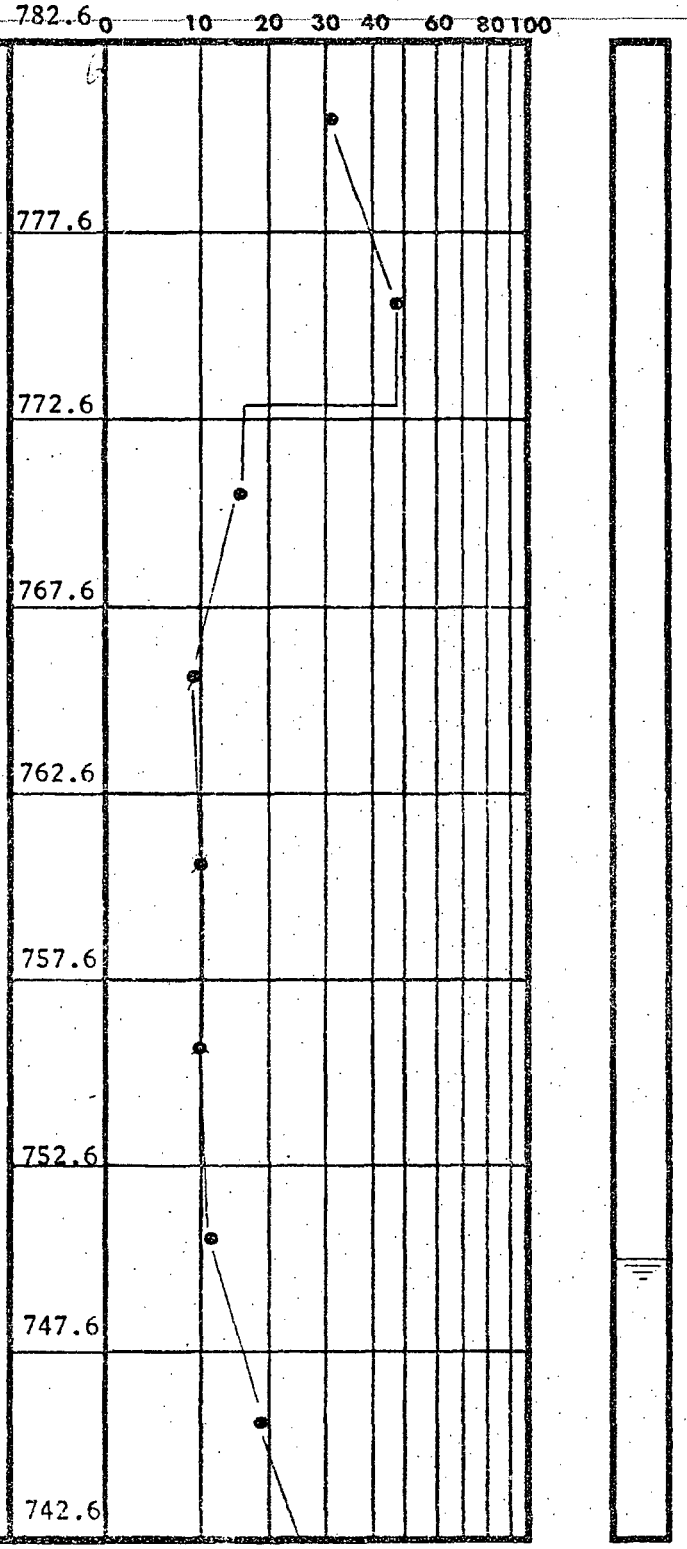
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Hard Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand*	782.6
2.5	Hard Red Fine to Coarse Sandy Silty Clay with Some Weathered Rock.	
4.5	Hard Red Tan Medium Sandy Clayey Silt	777.6
9.5	Stiff Red Fine Slightly Sandy Silt	772.6
		767.6
		762.6
24.5	Stiff Red Purple White Slightly Sandy Micaceous Silt	757.6
		752.6
34.5	Very Stiff Red Tan Slightly Sandy Micaceous Silt	747.6
39.5	**	742.6

• PENETRATION-BLOWS PER FT.



* and Gravel) (High Level Terrace).

** Very Stiff Tan and White Slightly Sandy Micaceous Silt with Black High Angle Slickensides.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-49

DATE DRILLED 2-10-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

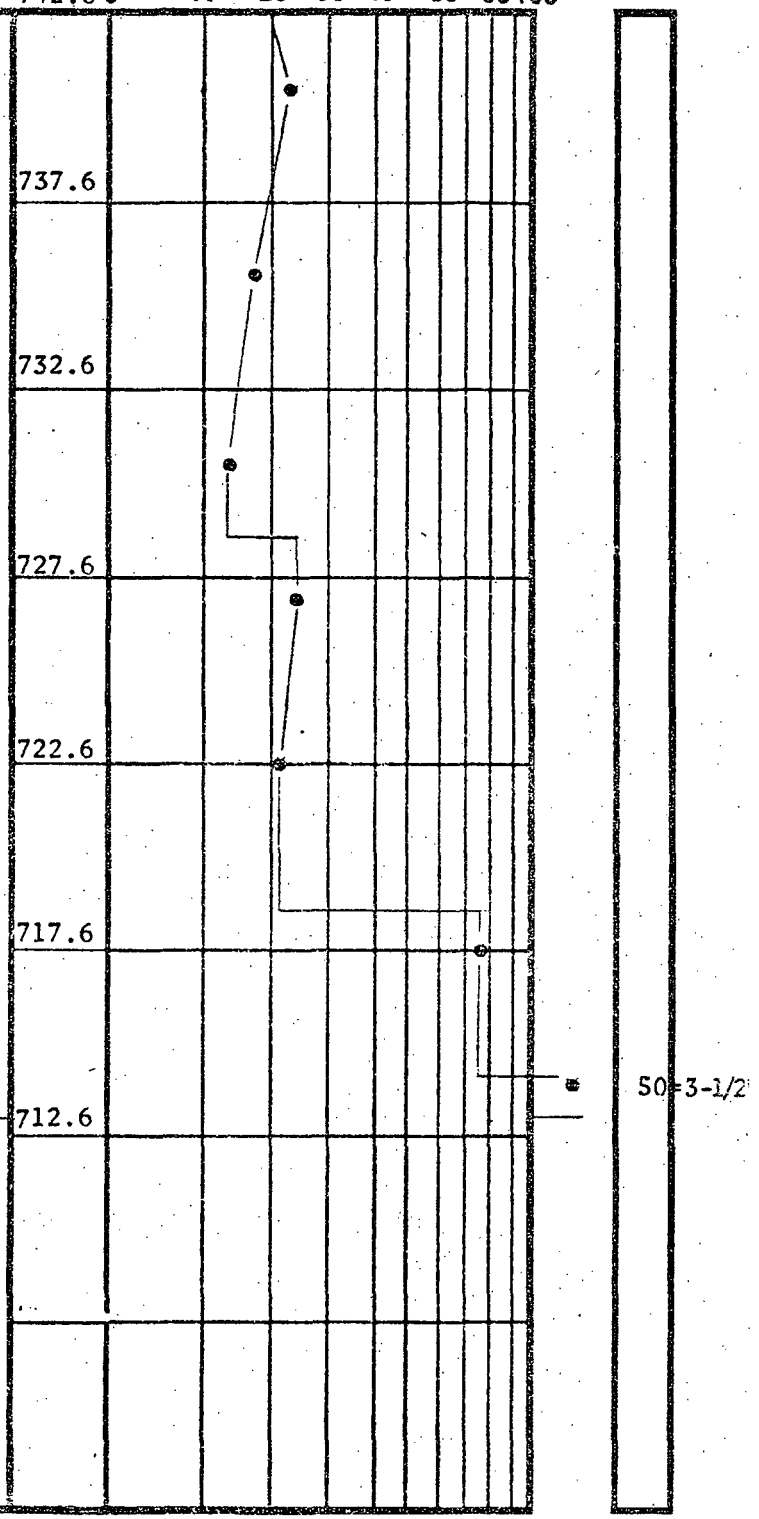
WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
		742.6
41.0	Very Stiff Tan and White Slightly*	
	Stiff and Very Stiff Light Brown, Black and White Slightly Sandy Micaceous Silt	737.6
		732.6
54.0		
	Very Stiff White and Light Tan Slightly Sandy Micaceous Silt	727.6
		722.6
64.0		
	Very Dense White and Light Gray Silty Fine to Coarse Sand	717.6
68.6		
69.4	Partially Weathered Rock	712.6
	See Following Rock Log	



*Sandy Micaceous Silt With Black High Angle Slickensides

TEST BORING RECORD

Page Two

BORING NO. H-49

DATE DRILLED 2-10-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
69.4	Hard Black and White Coarse Grained Diorite	87%	NX	712.6	JOINTS DEPTH - DIP 71.0' - Slicken-side 72.1' - 45° Joint 73.3' - 45° Joint	RQD 80%
		100%	NX	707.6		100%
				702.6		

Page Three

CORE BORING RECORD

BORING NO. H-49
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 702.6	REMARKS
	Hard Black and White Coarse Grained Diorite	100	NX	697.6	100
		100%	NX	692.6	100%
93.9	Coring Terminated No Drilling Water Loss.				

Page Four

CORE BORING RECORD

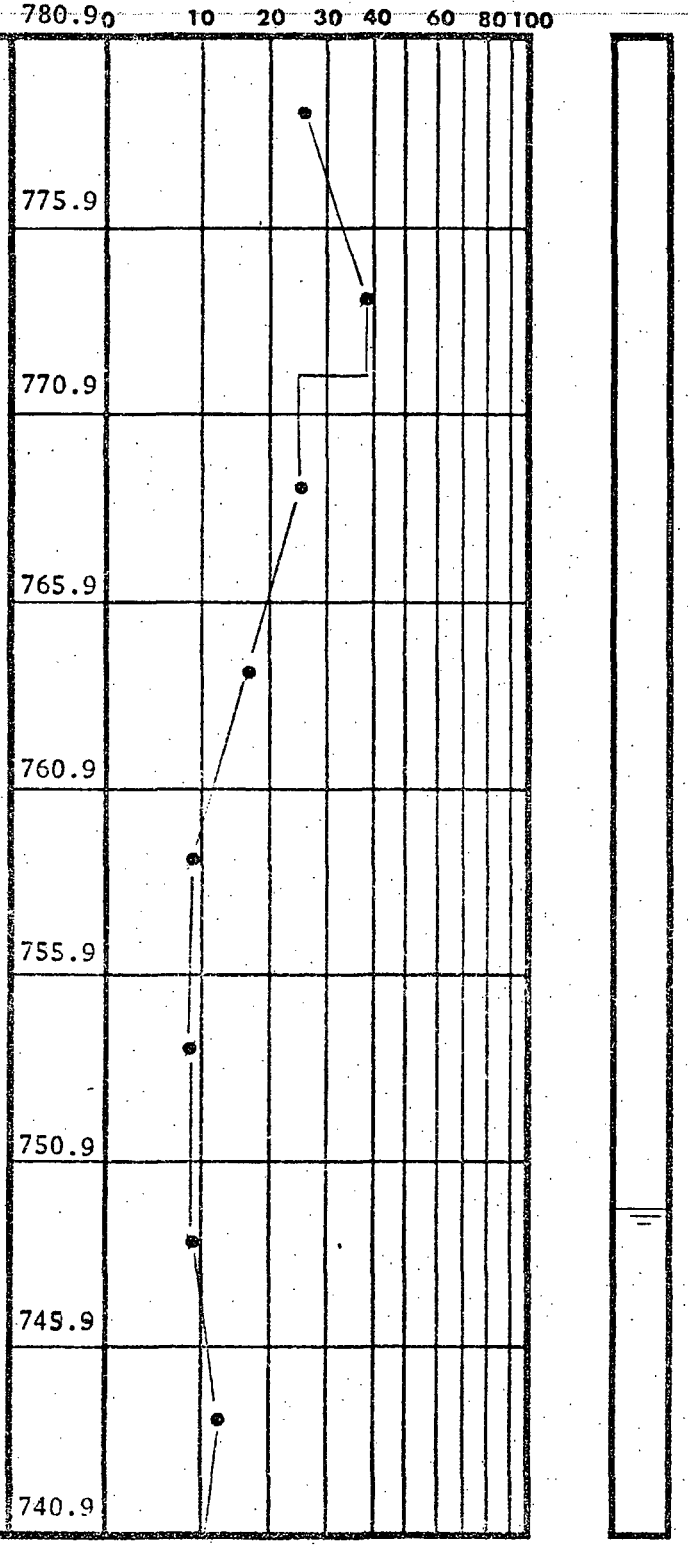
BORING NO. H-49
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)	780.9
5.0	Hard Red Slightly Sandy Clayey Silt.	775.9
9.0	Very Stiff Red Clayey Silt	770.9
14.0	Very Stiff Red Yellow Slightly Sandy Silt	765.9
19.0	Stiff Red Tan White Silt	760.9
		755.9
		750.9
		745.9
39.0	Stiff Yellow Tan Slightly Micaceous*	740.9
40.0		

*Silt



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-50

DATE DRILLED 2-12 & 2-13-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0		740.9	
	Stiff Yellow Tan Slightly Micaceous Silt		
44.0		735.9	
	Stiff Gray Tan Micaceous Silt		
		730.9	
51.0			50= 5"
	Partially Weathered Rock That Becomes Black White Tan Sandy Silt When*		
53.0		725.9	
	See Following Rock Log		

*Sampled

TEST BORING RECORD

Page Two

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-50

DATE DRILLED 2-12 & 2-13-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
53.0						RQD
54.0	Moderately Hard Black and White Coarse Grained Diorite.	100	NX	725.9	JOINTS	78%
	Hard Black and White Coarse Grained Diorite	83%	NX	720.9	DEPTH / DIP 54.5' 55° Joint 58.9' 45°	78%
62.0						
62.4 62.7 63.7	Soft Black and White Coarse Grained Granite (No Recovery) Moderately Hard Light Gray Fine to Medium Grained Granite			715.9		
	Soft Black and White Coarse Grained Diorite	100%	NX			100%
	Hard Black and White Coarse Grained Diorite			710.9		
74.7				705.9		
	Hard Black and White Fine Grained Diorite	98%	NX		78.7' 45° Joint 78.9' 45° Joint 79.1' 45° Joint	92%
80.0				700.9		

No Drilling Water Loss.

Page Three

CORE BORING RECORD

BORING NO. H-50

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				700.9		
	Hard Black and White Fine Grained Diorite	98	NX			92%
		100 %	NX	695.9		96%
				690.9		
93.4	Coring Terminated					

No Drilling Water Loss.

Page Four

CORE BORING RECORD

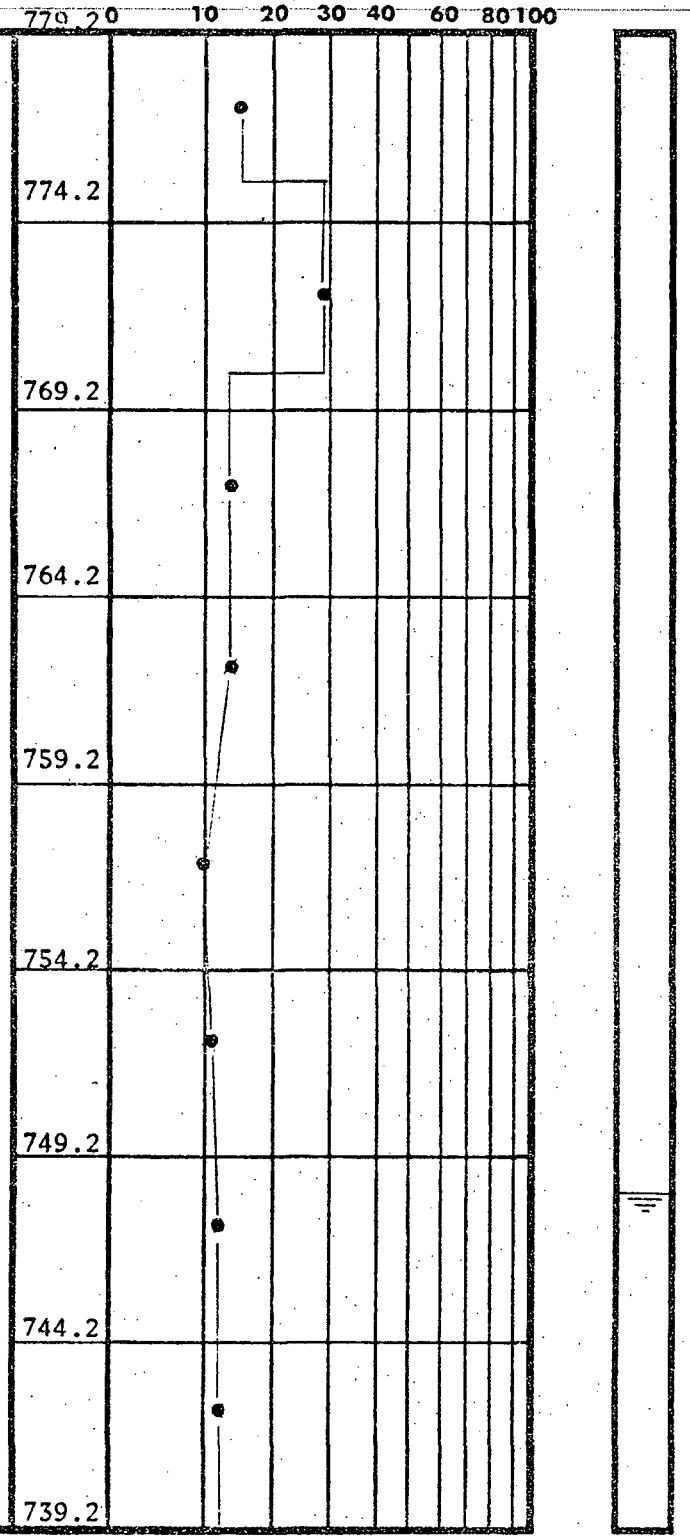
BORING NO. II-50

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)	779.2
2.5	Stiff Red Slightly Coarse Sandy*	
4.0	Very Stiff Red Slightly Micaceous Clayey Silt	774.2
9.0	Stiff Red Slightly Micaceous Silt	769.2
12.0	Stiff Yellow Red Slightly Fine Sandy Micaceous Silt	764.2
19.0	Stiff Yellow Red Slightly Micaceous Silt	759.2
24.0	Stiff Red Brown Black Slightly Micaceous Silt	754.2
		749.2
34.0	Stiff Tan Black Micaceous Silt	744.2
		739.2



*Silty Clay.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-51

DATE DRILLED 2-17-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0		739.2		
	Stiff Tan Black Micaceous Silt.			
45.1		734.2		50= 0"
	See Following Rock Log Refusal at 45.1'			

TEST BORING RECORD

Page Two

BORING NO. II-51

DATE DRILLED 2-17-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 739.2	REMARKS	
					JOINTS DEPTH DIP	
45.1				734.2		RQD
	Moderately Hard Light Gray Fine to Medium Grained Granite.	60%	NX		46.1' - Nearly Vertical Joint. 46.5' - Nearly Vertical Joint.	23%
48.1						
	Hard Light Gray Fine to Medium Grained Granite.			729.2	47.2' - Nearly Vertical Joint. 49.1' - 45° Joint 49.3' - 45° Joint 49.8' - 45° Joint 51.2' - 80° Joint 52.3' - 75° Joint	81%
		100 %	NX			
				724.2		
		100 %	NX			80%
58.0						
58.9	Hard Black and White Fine Grained Diorite.			719.2		
60.7	Soft Black and White Fine Grained Diorite. (No Recovery)	88%	NX		60.7' -88.8' - Occassional Layers or Inclusions of Hard Light Gray Granite.	87%
				714.2		
	Hard Black and White Fine Grained Diorite.					
				709.2		96%
		100 %	NX			
				704.2		
80.0		100 %	NX	699.2		100%

Lost Water at 54.2'.

Page Three

CORE BORING RECORD

BORING NO. H-51
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				699.2		
	Hard Black and White Fine Grained Diorite.	100%	NX			100%
				694.2		
88.8				689.2		
	Coring Terminated					

No Drilling Water Loss.

Page Four

CORE BORING RECORD

BORING NO. H-51

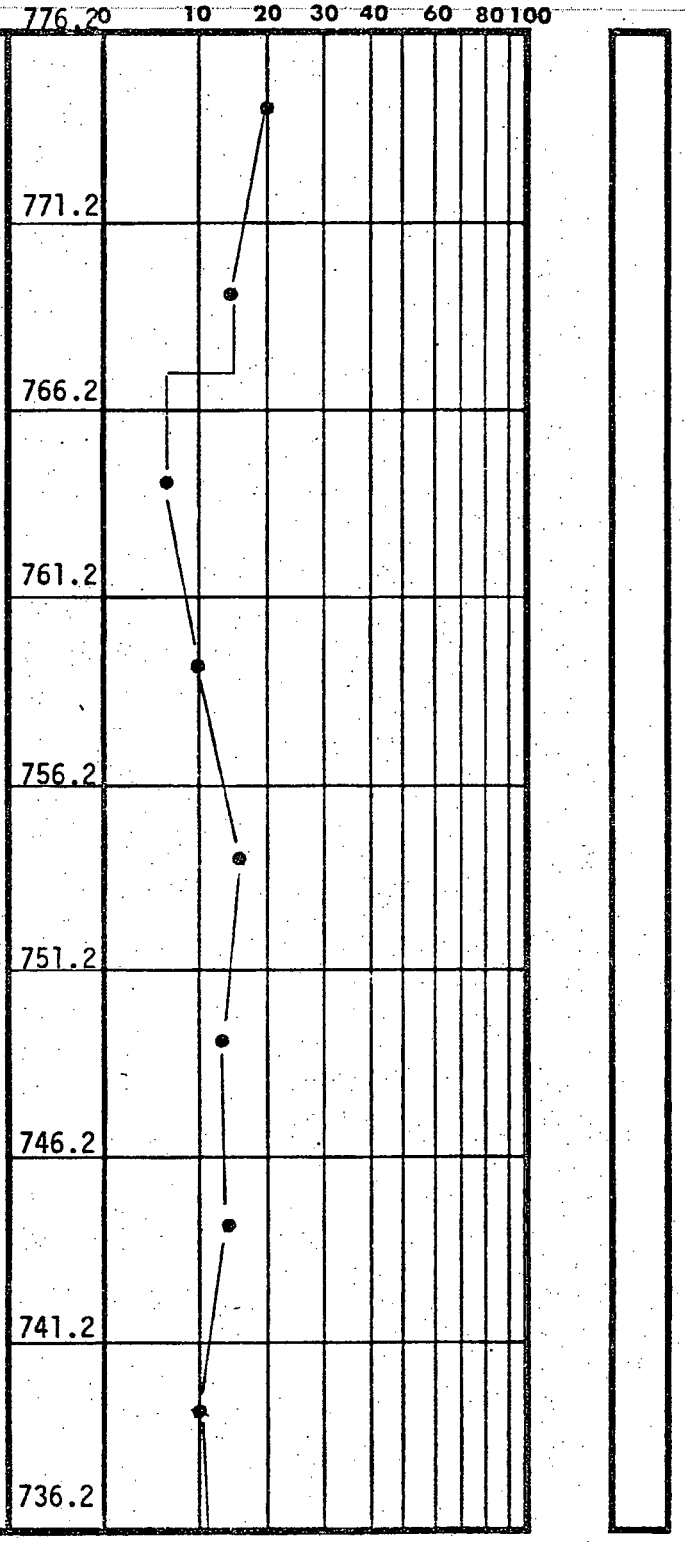
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)	776.2
4.0	Stiff Red Brown Fine Sandy Slightly Micaceous Silt.	771.2
9.0	Firm Brown and Tan Fine Sandy Micaceous Silt	766.2
14.0	Stiff to Very Stiff Purple Tan and Black Fine Sandy Micaceous Silt	761.2
24.0	Stiff Tan and Black Very Micaceous Silt	756.2
34.0	Firm Gray and Black Very Silty Micaceous Fine Sand	751.2
		746.2
		741.2
		736.2

• PENETRATION-BLOWS PER FT.



Hole Wet and Caved at 26'8" at 24 Hour.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

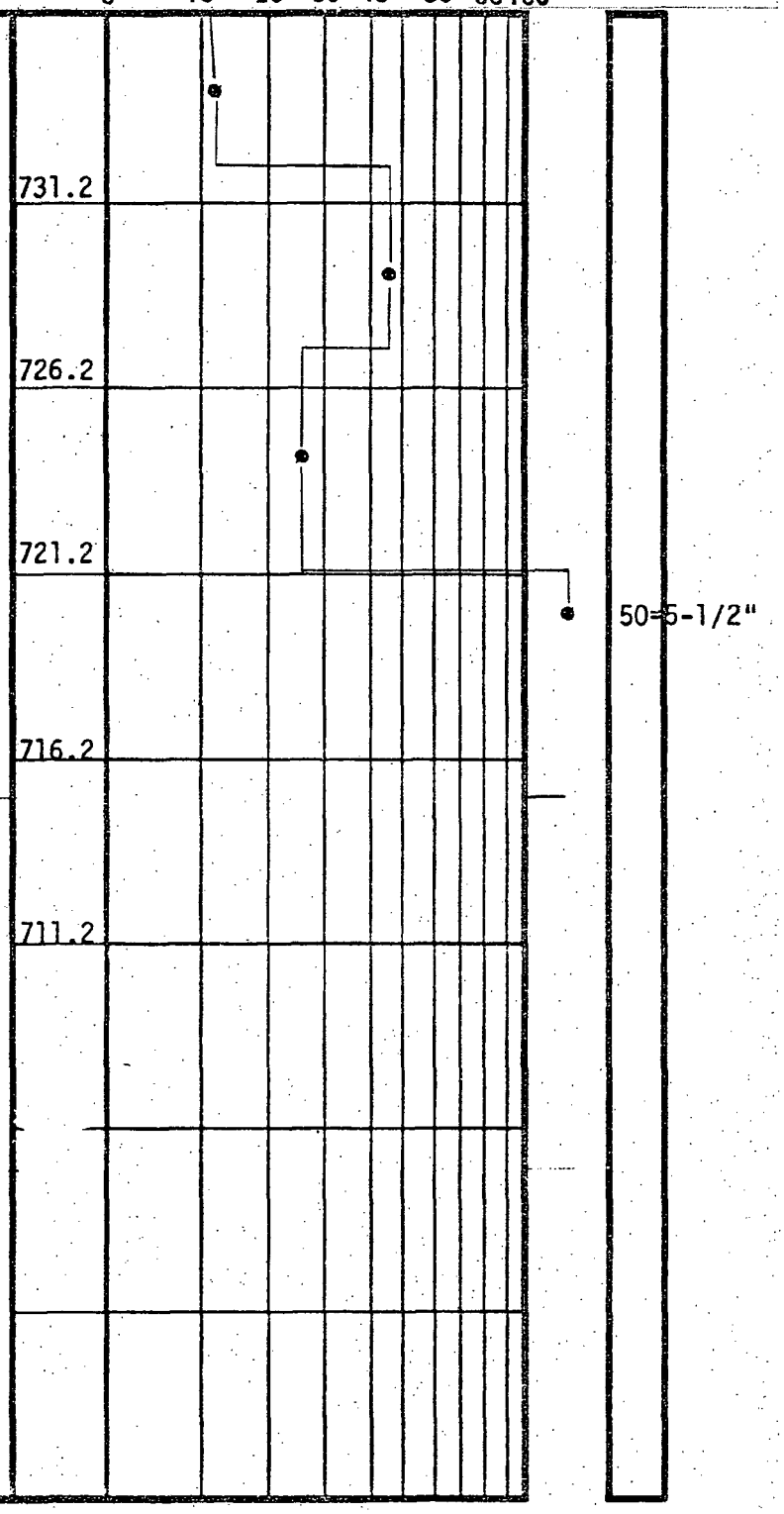
BORING NO. H-52

DATE DRILLED 3-13-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Firm Gray and Black Very Silty Micaceous Fine Sand	736.2
44.0		731.2
	Dense Gray and White Silty Micaceous Fine Sand	
49.0		726.2
	Firm Gray Black and White Very Silty Slightly Micaceous Very Fine Sand	
55.0		721.2
	Partially Weathered Rock That Becomes Brown and Black Micaceous Silt When Sampled	
61.0		716.2
	See Following Rock Log	711.2



TEST BORING RECORD

Page Two

BORING NO. H-52

DATE DRILLED 3-13-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 736.2	REMARKS
				731.2	
				726.2	
				721.2	
				716.2	
61.0	Hard Dark Green Meta-Gabbro.	100	NX		RQD 100%
64.5	Hard Black and White Fine Grained Diorite.			711.2	JOINTS: DEPTH 63.2' DIP 45° Joint
				706.2	
71.0	Coring Terminated				
				701.2	

No Drilling Water Loss.

Page Three

CORE BORING RECORD

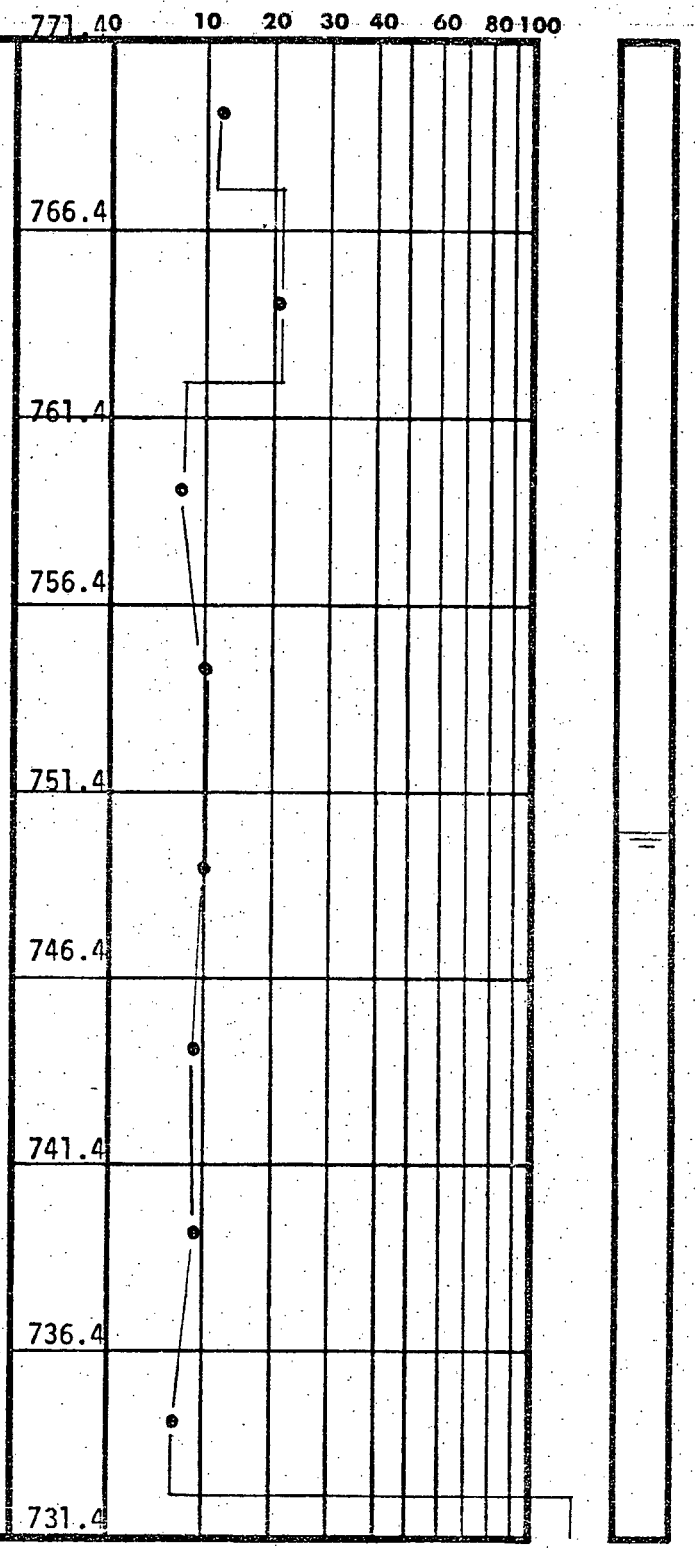
BORING NO. H-52

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Stiff Dark Red Brown slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)
2.5	Stiff Red Fine to Medium Sandy *
4.0	Very Stiff Red Slightly Micaceous Silt
9.0	Firm Purple and Tan Slightly Sand Micaceous Silt
14.0	Stiff Red and Gray Fine to Medium Sandy Micaceous Silt
19.0	Stiff Pink,Tan, Black and White Fine Sandy Micaceous Silt
34.0	Loose Gray and Brown Silty Micaceous Fine Sand
39.0	Partially Weathered Rock That **



** Becomes Gray and White Micaceous Very Silty Fine to Medium Sand When Sampled

* Very Clayey Silt.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-53

DATE DRILLED 3-10-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
		731.4	
41.2	Partially Weathered Rock That*		ø50=2"
	See Following Rock Log		
		726.4	

*Becomes Gray and White Micaceous Very Silty Fine to Medium Sand When Sampled

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

TEST BORING RECORD

Page Two

BORING NO. H-53

DATE DRILLED 3-10-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 731.4	REMARKS	RQD
40.0						
41.2	Hard Black and White Fine Grained Diorite.	100	NX	726.4	JOINTS DEPTH DIP 42.7' - Nearly Vertical Joint 41.2' - 58.4' - Several Small Layers or Inclusions of Hard Light Gray Granite.	96%
50.5	Hard Dark Green Meta-Gabbro.	100	NX	721.4		100%
55.6	Hard Black and White Fine Grained Diorite.			716.4		
58.4	Coring Terminated			711.4		

No Drilling Water Loss.

Page Three

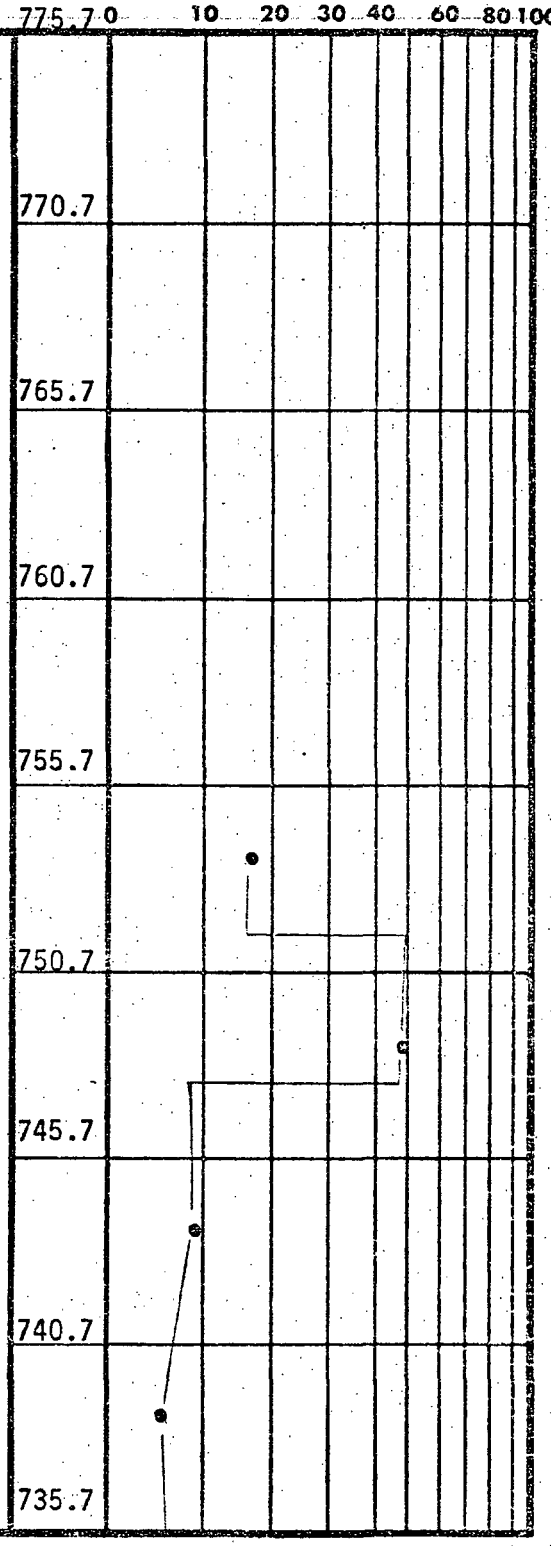
CORE BORING RECORD

BORING NO. H-53
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Fill-Red Fine to Medium Sandy Silt.	775.7
24.0	Dense Gray and Black Silty Very Fine Sand.	750.7
28.0	Stiff Reddish Brown Fine Sandy Micaceous Silt.	745.7
33.5	Loose Brownish Gray Very Silty Micaceous Fine Sand.	740.7
40.0		735.7



Dry and Caved at 8.0'.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-54

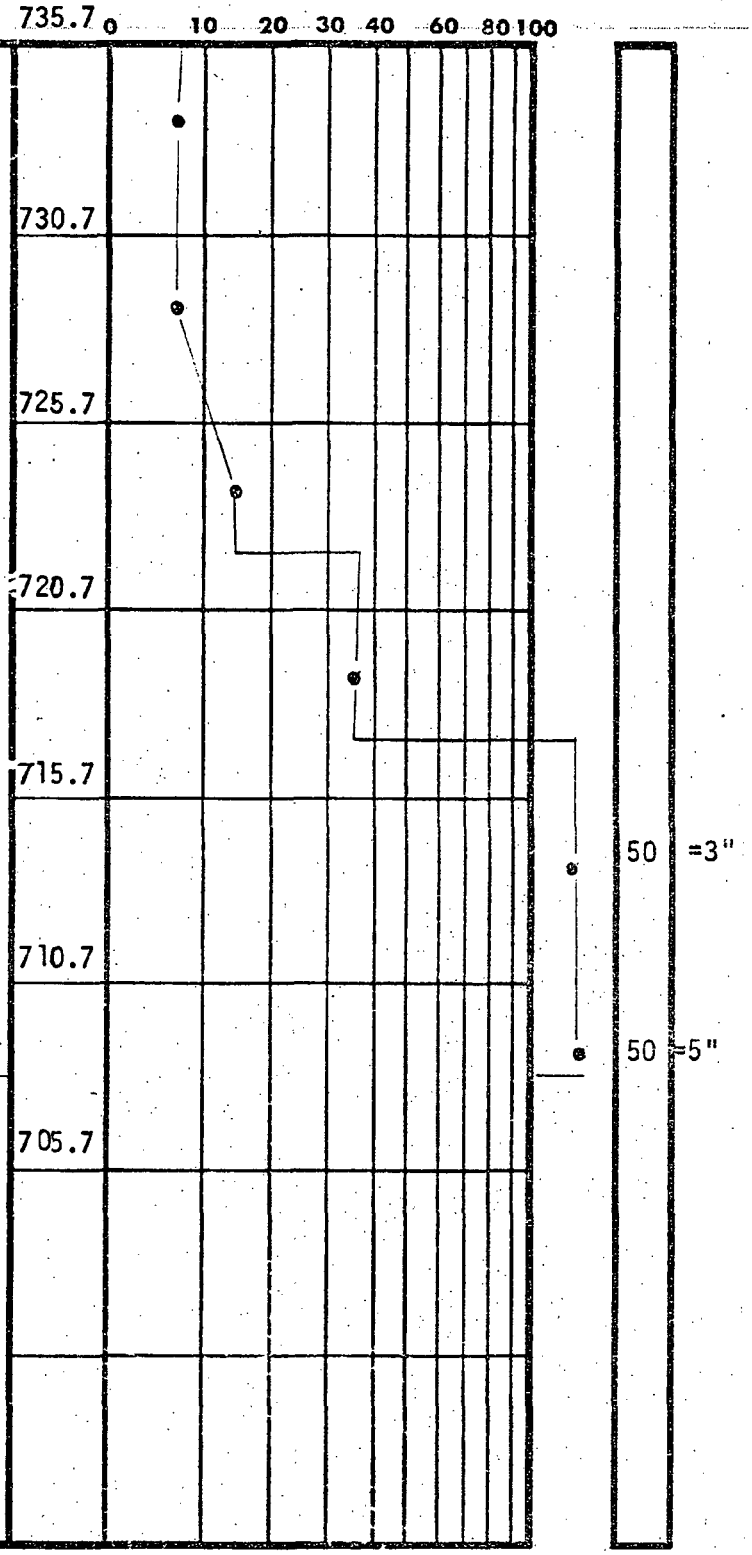
DATE DRILLED 3-2-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		735.7
	Loose Brownish Gray Very Silty Micaceous Fine Sand.	730.7
48.5		725.7
	Stiff Tan and Black Very Micaceous Silt.	
53.5		720.7
	Dense Gray and Black Micaceous Very Silty Very Fine Sand.	
58.5		715.7
	Partially Weathered Rock That Becomes Gray Black and White Micaceous Very Silty Fine to Medium Sand When Sampled.	710.7
67.5		705.7
	See Following Rock Log	

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page 2

BORING NO. H-54

DATE DRILLED 3-2-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 735.7	REMARKS	RQD
				730.7		
				725.7		
				720.7		
				715.7		
				710.7		
67.5	Moderately Hard Black and White Fine Grained Diorite.	100	NX	705.7	JOINTS DEPTH — DIP 68.0' - Nearly Vertical Joint-Slightly Weathered. 68.5-70.0' - Rock Highly Fractured and Jointed. 71.3' - 45° Joint 71.7' - Nearly Vertical Joint - Weathered. 72.5' - Nearly Vertical Joint - Weathered.	40%
70.0	Hard Black and White Fine Grained Diorite.					
71.4	Moderately Hard Black and White Fine Grained Diorite.	100	NX	700.7		71%
73.8	Hard Black and White Fine Grained Diorite.					
80.0		100	NX	695.7		98%

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H54
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 695.7	REMARKS	RQD
80.0	Hard Black and White Fine Grained Diorite.	100	NX	690.7	JOINTS DEPTH DIP 80.4' - 30° Joint 80.8' - 60° Joint	98%
		100	NX	685.7	92.2' - Nearly Vertical Joint	100%
93.4	Coring Terminated			680.7		

No Drilling Water Loss.

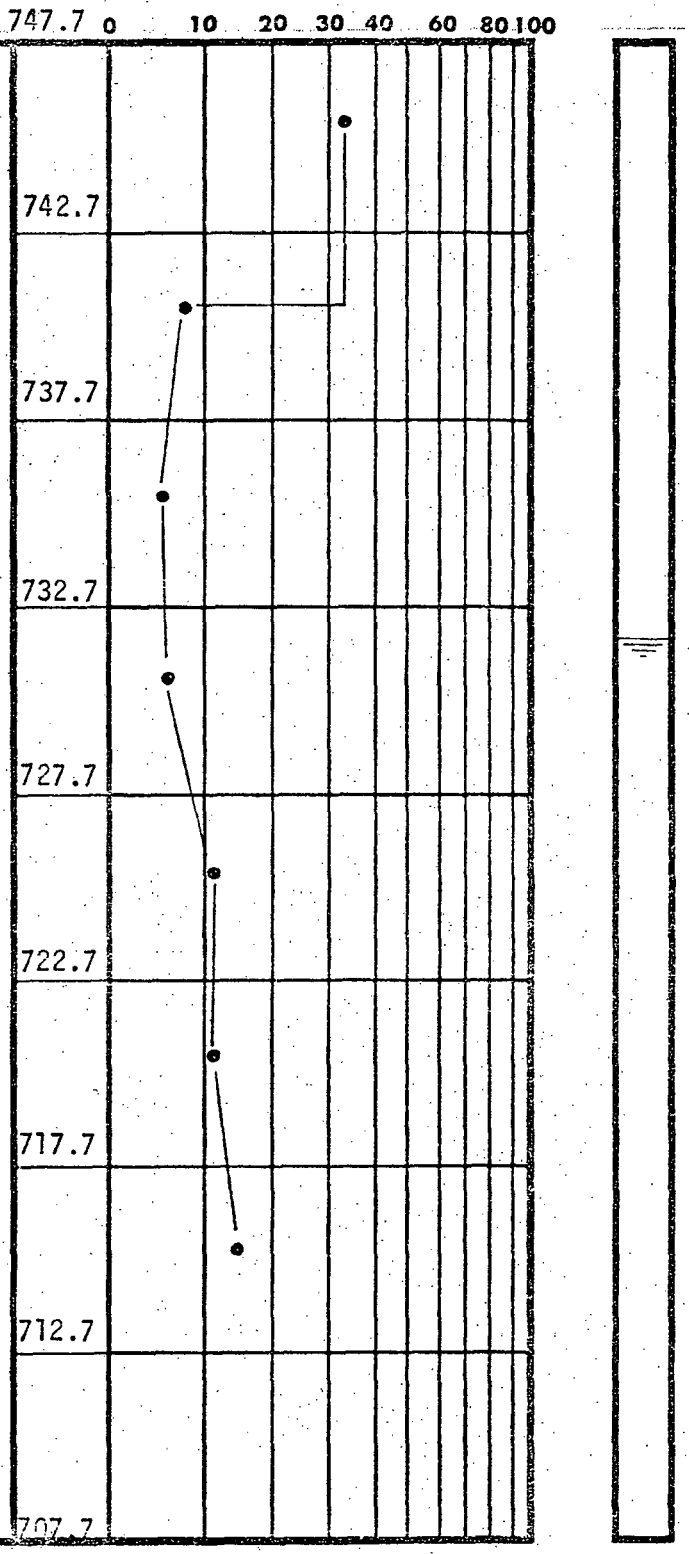
CORE BORING RECORD

BORING NO. H-54
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		747.7
	Hard Red Clayey Silt	
		742.7
7.0		
	Firm Pink Tan Very Silty Micaceous Sand.	737.7
12.0		
	Firm Brown Very Micaceous Silt.	732.7
16.5		
	Firm Red Brown Black Micaceous Silt.	
19.5		727.7
	Stiff Gray Brown Black Micaceous Silt.	
		722.7
29.0		717.7
	Firm Gray Brown Black Very Silty Micaceous Fine Sand.	
		712.7
40.0		707.7



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-55A

DATE DRILLED 3-2-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. (0 10 20 30 40 60 80 100)
40.0	Firm Gray Brown Black Very Silty Micaceous Fine Sand.	707.7	
	Dense and Very Dense Gray Brown Silty Micaceous Fine Sand.	702.7	
		697.7	50 = 4"
53.0	Partially Weathered Rock.	692.7	
56.0	See Following Rock Log.		50 = 3"
			50 = 0"

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-55A

DATE DRILLED 3-2-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				692.7		
56.2	Soft Brown and Gray Fine Grained Diorite				JOINTS DEPTH DIP	
59.4				687.7	60.1' - Nearly Vertical Joint-Weathered.	
60.4	Moderately Hard Light Gray Fine to Medium Grained Granite					
	Soft Brown and Gray Fine Grained Diorite	27	NX			8%
63.7						
64.7	Moderately Hard Brown and Gray*			682.7		
65.0	Moderately Hard Light Gray Fine to Medium Granined Granite				66.0' - 45° Joint	
66.0	Soft Light Gray Fine to Med-**					
68.5	Moderately Hard Light Gray Fine to Medium Grained Granite			677.7	71.9' - 60° Joint	
	Soft Brown and Gray Fine Grained Diorite	69	NX			35%
				672.7		
		42	NX		77.2' - Nearly Vertical Joint.	5%
		48	NX	667.7		0%
80.0						

*Fine Grained Diorite
**ium Grained Granite

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-55A
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 667.7	REMARKS	RQD
80.0	Soft Brown and Gray Fine Grained Diorite				JOINTS DEPTH DIP	
83.0	Moderately Hard Black and White Fine Grained Diorite	48	NX	662.7	82.4'-86.2'-Numerous Closely Spaced Vertical Joints and 60° Joints.	0%
86.2	Hard Black and White Fine Grained Diorite					
90.2				657.7	90.1' - 45° Joint	
91.3	Soft Black and White Fine Grained Diorite	89	NX		91.9' - 45° Joint	77%
	Hard Black and White Fine Grained Diorite			652.7	94.8' - Nearly Vertical Joint.	
					96.4' - 45° Joint	
					97.0' - 45° Joint	
				647.7	97.4' - 45° Joint-Weathered.	
		100	NX		97.5' - 2-45° Joints-Slightly Weathered.	72%
				642.7	98.7' - 45° Joint-Weathered.	
		56	NX		99.7'-101.7'-Vertical Joint. 101.2' - 45° Joint	0%
109.8				637.7		
110.3	Very Soft Dark Green Meta-Gabbro	82	NX		102.4' - 45° Joint 103.2'-104.2'-Nearly Vertical Joint.	0%
	Hard Black and White Fine Grained Diorite	19	NX		106.7'-107.8'-Fractured and Jointed Rock.	0%
114.0				632.7	107.8'-109.8'-Numerous Nearly Vertical Joints.	
	Coring Terminated				110.3'-113.8'-Numerous Nearly Vertical Joints.	

No Drilling Water Loss.

Page 4

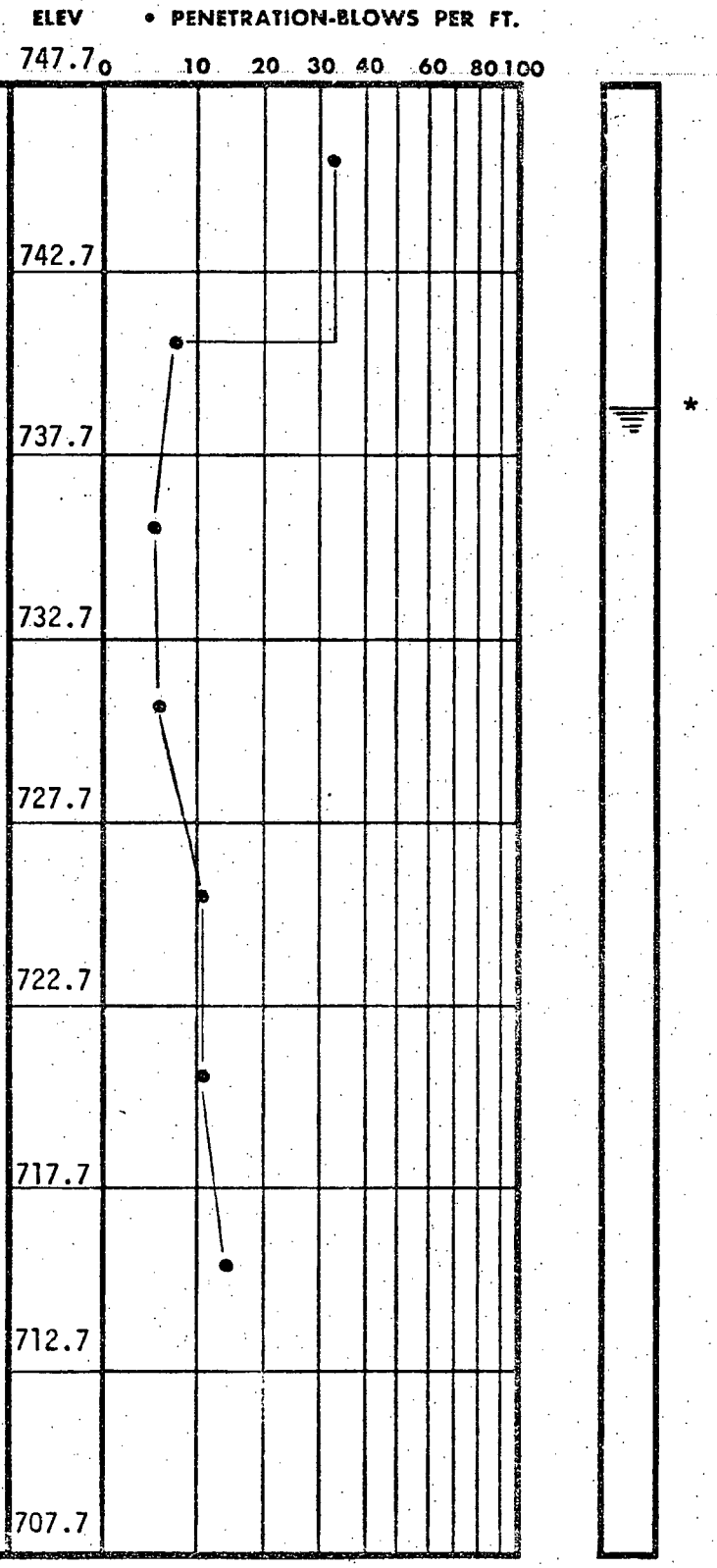
CORE BORING RECORD

BORING NO. H-55A
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Hard Red Clayey Silt
7.0	Firm Pink Tan Very Silty Micaceous Sand
12.0	Firm Brown Very Micaceous Silt
16.5	Firm Red Brown Black Micaceous Silt
19.5	Stiff Gray Brown Black Micaceous Silt
29.0	Firm Gray Brown Black Very Silty Micaceous Fine Sand



* Piezometer Sealed Into Hard Rock at 89.0'.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-55

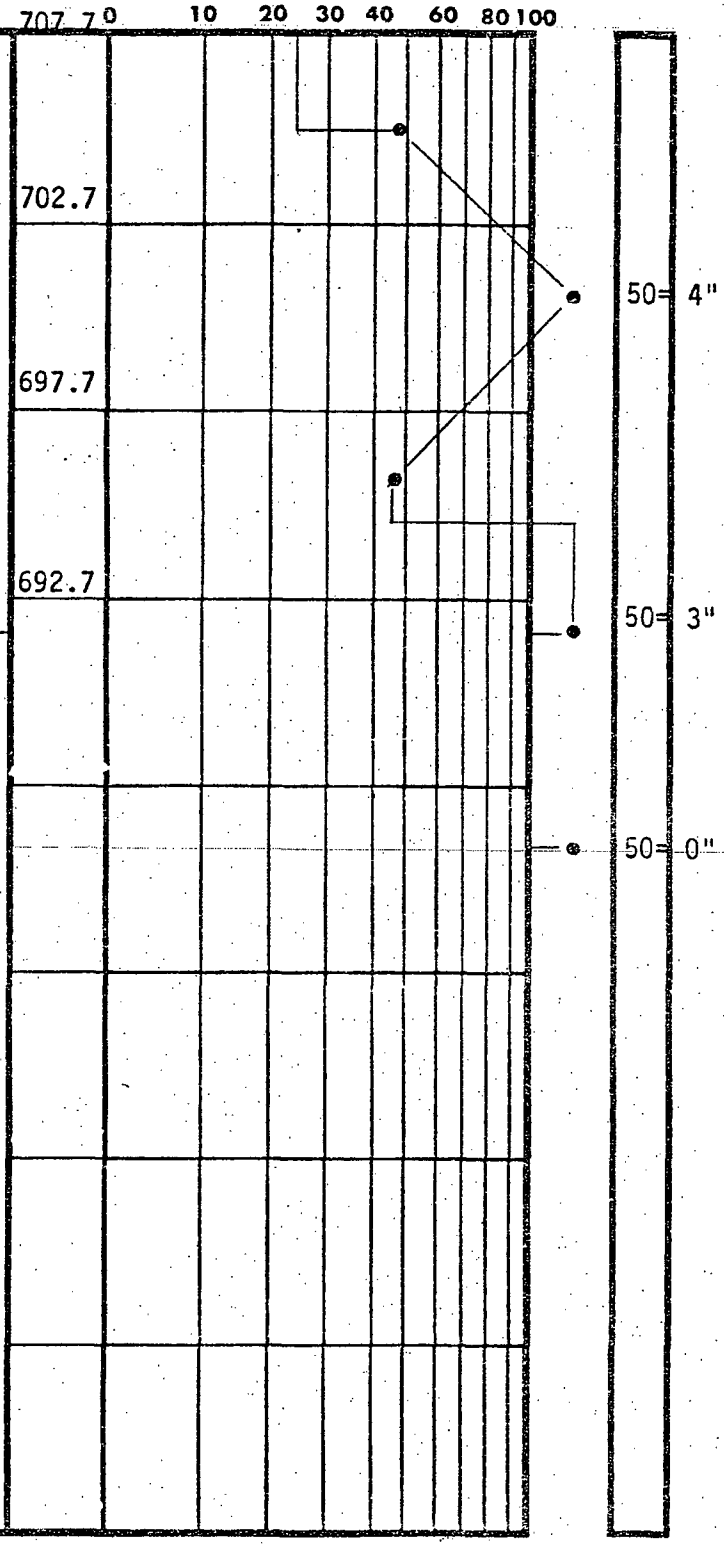
DATE DRILLED 3-2-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Firm Gray Brown Black Very Silty Micaceous Fine Sand	707.7
.5	Dense and Very Dense Gray Brown Silty Micaceous Fine Sand	702.7
		697.7
53.0	Partially Weathered Rock	692.7
56.0	See Following Rock Log.	

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page Two

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-55

DATE DRILLED 3-2-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
				692.7		
56.0	Very Soft Brown and Gray Fine to Medium Grained Granite	11	NX	687.7	JOINTS DEPTH DIP 63' - 80° Joint Weathered.	RQD 0%
61.5	Soft Brown and Gray Fine to Medium Grained Granite	62	NX	682.7		30%
66.0	Moderately Hard Brown and Gray Fine to Medium Grained Granite					
68.0	Soft Black Brown and White Fine Grained Diorite	68	NX	677.7		44%
71.0	Moderately Hard Brown Black and White Fine Grained Diorite				72.3'-74.2'-Closely Spaced Jointed-Nearly Vertical to 45°.	
74.5	Very Soft Brown Black and White Fine Grained Diorite	40	NX	672.7		12%
78.0	Moderately Hard Brown Black and White Fine Grained Diorite	80	NX	667.7	78'-90'- Numerous Vertical Joints-Closely Spaced.	20%
80.0						

No Drilling Water Loss.

Page Three

CORE BORING RECORD

BORING NO. H-55
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				667.7		
	Moderately Hard Brown Black and White Fine Grained Diorite	80	NX			20%
		90	NX	662.7		31%
89.0					JOINTS Depth Dip	
	Hard Black and White Fine Grained Diorite	100	NX	657.7	90.5' - 80° Joint 94.0' - Several Vertical Joints.	49%
				652.7	95.2' - 70° Joint.	
		100	NX	647.7	96.6' - Vertical Joint 97.4' - 60° Joint. 98.2' - Nearly Vertical Joint (Stained). 99.4' - 60° Joint.	88%
		100	NX	642.7 637.7	99.4'-100.5'-Rock Brecciated But Completely Recemented. 103.4' - 60° Joint (2) 103.6' - 60° Joint. 107.1' - 60° and 45° Joints.	70%
		80	NX	632.7	108.2' - 60° Joint 109.0' - 60° Joints(2) 110.8' - 45° Joints (3) 111.0'-115.0'-Rock Highly Fractured and Jointed. 116'-117'-Vertical Joint-Water Deposited.	10%
		100	NX			91%
120.0				627.7		

Page Four

CORE BORING RECORD

BORING NO. H-55

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
120.0				627.7		
122.5	Hard Black and White Fine Grained Diorite	100	NX	622.7	JOINTS DEPTH DIP 121' - 60° Joint-Water Deposited. 122.5-123.5'-Slickenside Surfaces.	91%
	Hard Gray Fine to Medium Grained Granite	100	NX	617.7	125.6' - 45° Joint 125.7' - 45° Joint 126.2' - 60° Joint 127.1' - 60° Joint 129.8' - 60° Joint 131'-136.3'-Rock Highly Fractured-Water Deposited on Surfaces.	75%
		100	NX	612.7	136.6' - 60° Joint	0%
		100	NX	607.7	138.5'-142.0'-Rock Highly Fractured and Jointed.	37%
		100	NX	602.7	144.0' - 60° Joint 146.0' - 60° Joint 146.5'-147.5'-Several Nearly Vertical Joints.	
		100	NX	597.7	148.0' - Vertical Joint	50%
		72	NX	592.7	150.5'-152.5'-Several Vertical Joints-Stained. 157.5' - 60° Joint 157.8' - 60° Joint 158.4' - 60° Joint	53%
152.5	Soft Gray Brown Fine to Medium Grained Granite					
155.0	Hard Gray Brown Fine to Medium Grained Granite	100	NX	587.7	159.1' - 60° Joint	94%
160.0						

Page Five

CORE BORING RECORD

BORING NO. H-55

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 587.7	REMARKS	RQD
160.0	Hard Gray Brown Fine to Medium Grained Granite	100	NX		JOINTS DEPTH DIP 160.0' - 60° Joint	94%
		100	NX	582.7	161.2' - 60° Joint (Recemented) 166.0' - 45° and 60° Joints.	96%
		100	NX	577.7	169.0' - Nearly Vertical Joint. 172.0' - 70° Joint.	80%
172.5	Coring Terminated			572.7	Note: Rock is Generally Fractured and Jointed From 56.0'-172.5'.	

No Drilling Water Loss.

Page Six

CORE BORING RECORD

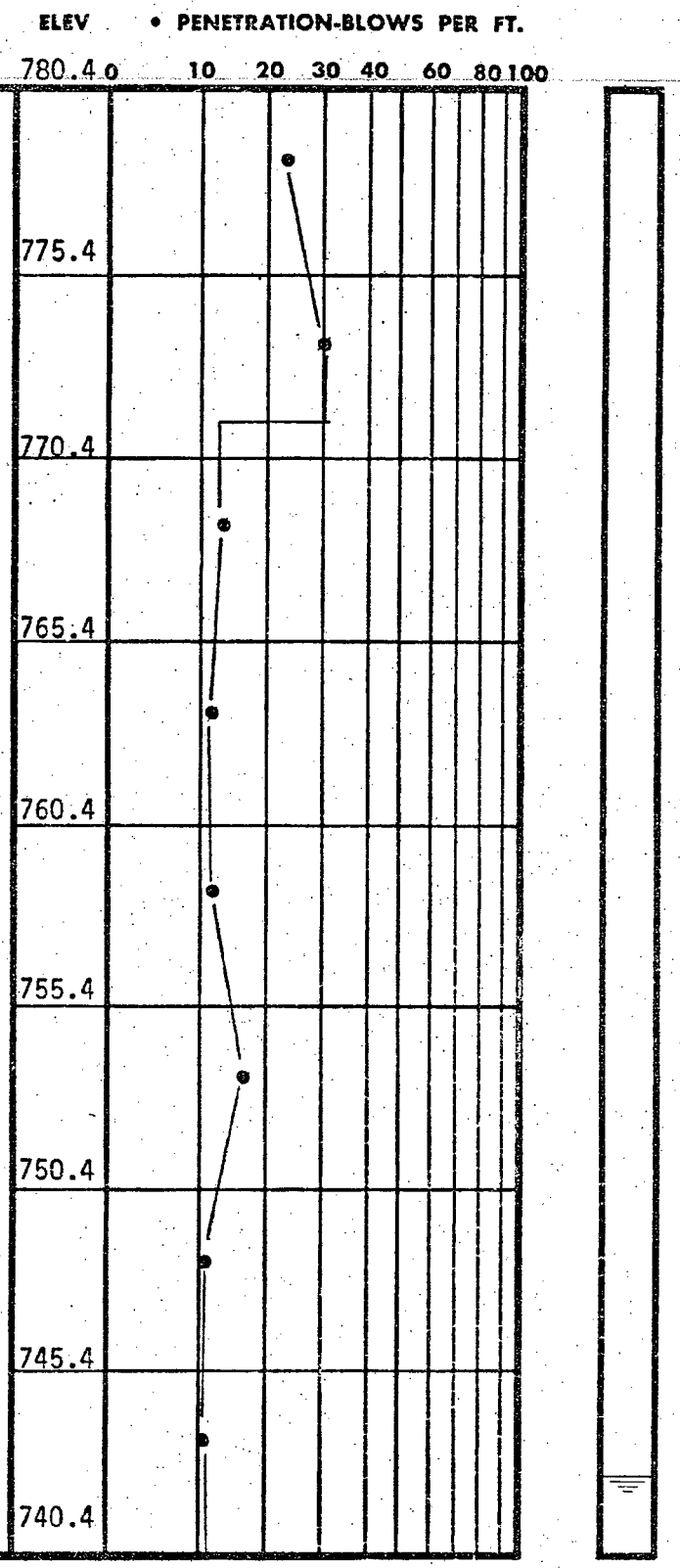
BORING NO. H-55

JOB NO. ~~CH 2055~~

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). *
2.5	Very Stiff Red Brown Very Clayey Silt.
9.0	Stiff Red Brown Slightly Sandy Silt
14.0	Stiff Purple and Tan Micaceous Silt
29.0	Stiff Purple Tan Black and White Fine to Medium Sandy Micaceous Silt



* High Level Terrace.

TEST BORING RECORD

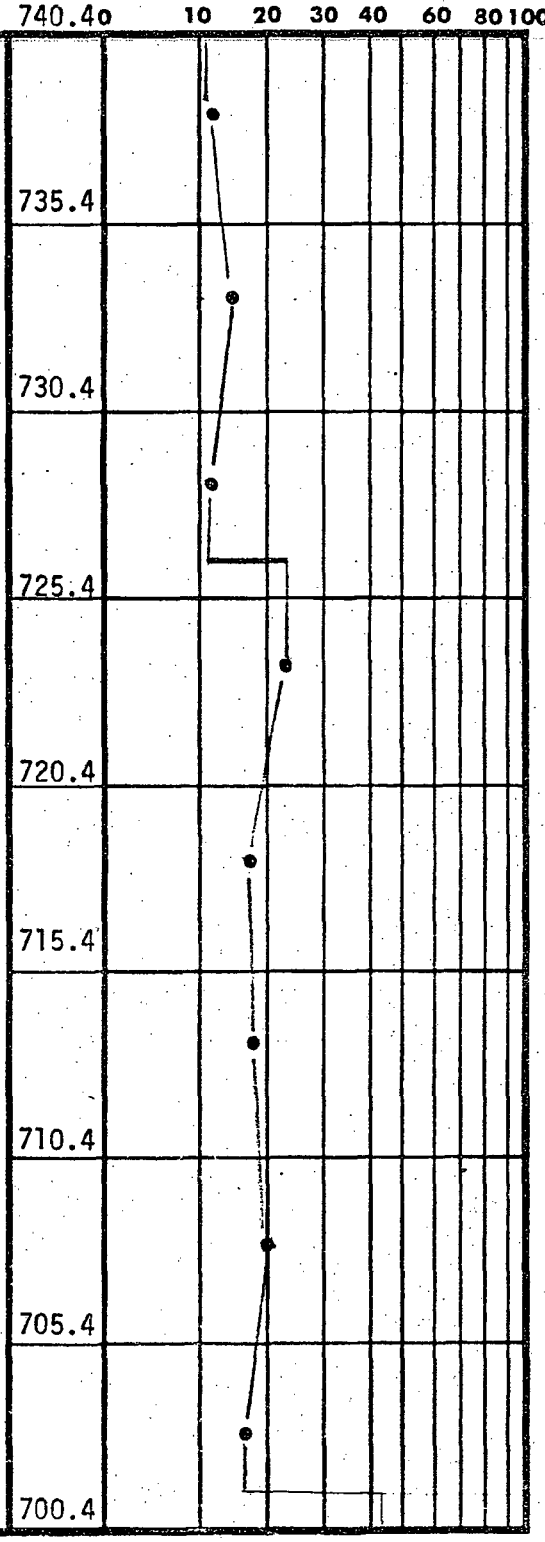
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.
UNDISTURBED SAMPLE
WATER TABLE, 1 HR.
|50| % ROCK CORE RECOVERY
LOSS OF DRILLING WATER

BORING NO. H-56
DATE DRILLED 3-9-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
40.0	Stiff Purple Tan, Black and White Fine to Medium Sandy Micaceous Silt
49.0	Stiff Tan Black and White Slightly Sandy Micaceous Silt
54.0	Very Stiff Tan Black and White Micaceous Silt
59.0	Very Stiff Gray Very Micaceous Silt
69.0	Very Stiff Gray and White Fine to Coarse Sandy Very Micaceous Silt
79.0	Hard Brown Gray Slightly Sandy Very*



*Micaceous Silt

TEST BORING RECORD

Page Two

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

50 % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

BORING NO. H-56

DATE DRILLED 3-9-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
80.0		700.4	
	Hard Brown Gray Slightly Sandy Very Micaceous Silt		
85.0		695.4	
	Partially Weathered Rock That Becomes Gray Micaceous Silty Fine to Medium Sand When Sampled		50=4"
89.7		690.4	
	See Following Rock Log		

TEST BORING RECORD

Page Three

BORING NO. H-56

DATE DRILLED 3-9-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				700.4		
				695.4		
89.7				690.4	JOINTS DEPTH DIP 89.7' - 97.3' -Numerous High Angle Joints.	
	Soft Brown and Gray Fine Grained Diorite.	15	NX			5%
				685.4		
97.3					97.3' - 60° Joint - Slightly Weathered.	
	Hard Black and White Fine Grained Diorite.			680.4		
		100	NX		103.6' - 45° Joint	96%
				675.4		
					107.9' - 65° Joint	
				670.4		
		100	NX		111.6' - 60° Joint 113.8' - 60° Joint	100%
				665.4		
116.9	Coring Terminated			660.4		

No Drilling Water Loss.

Page Four

CORE BORING RECORD

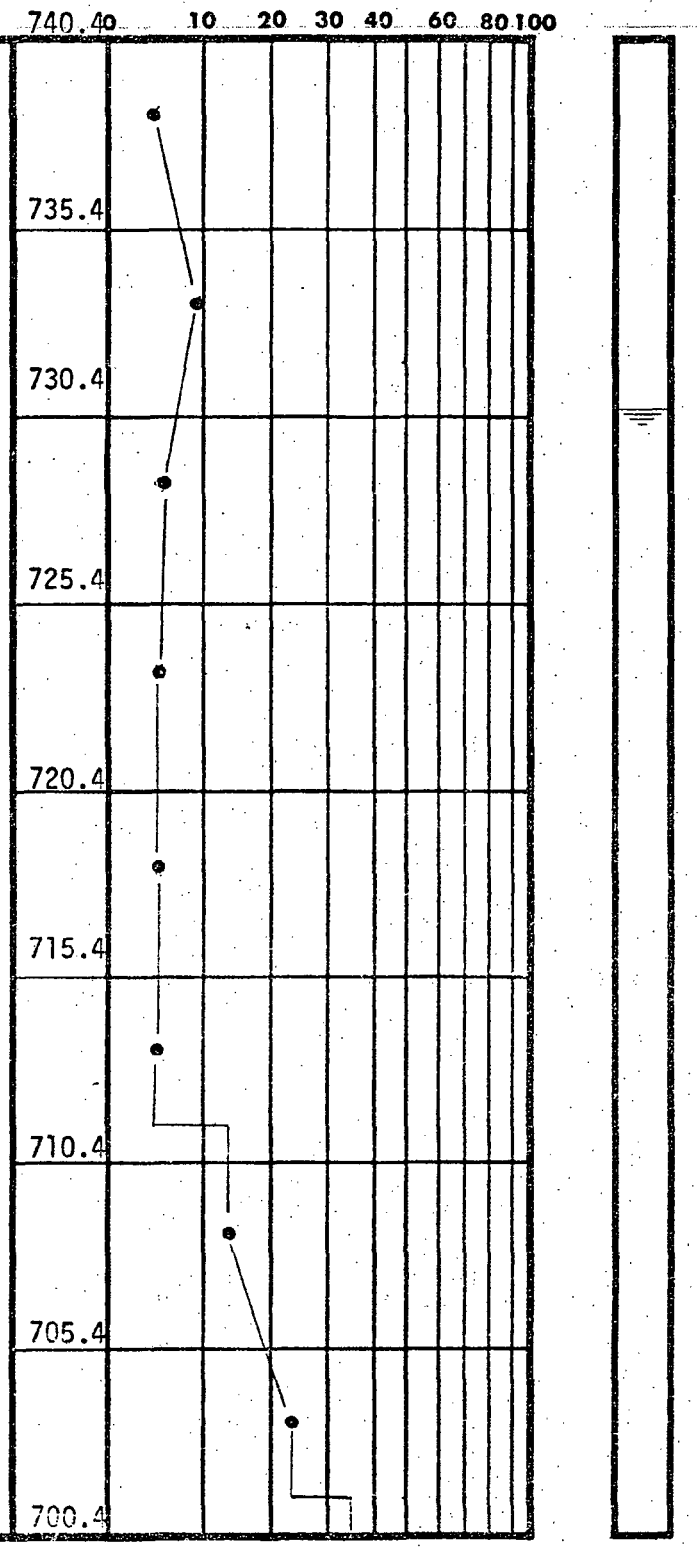
BORING NO. H-56

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Firm Tan Black and White Silt
4.0	Firm to Stiff Tan Black and White Slightly Sandy Micaceous Silt
19.0	Firm Gray Tan Black Very Micaceous Slightly Sandy Silt
29.0	Firm Gray and White Black Very Micaceous Very Silty Fine Sand.
39.0	Firm Gray Black and White Micaceous*



* Silty Fine to Medium Sand.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

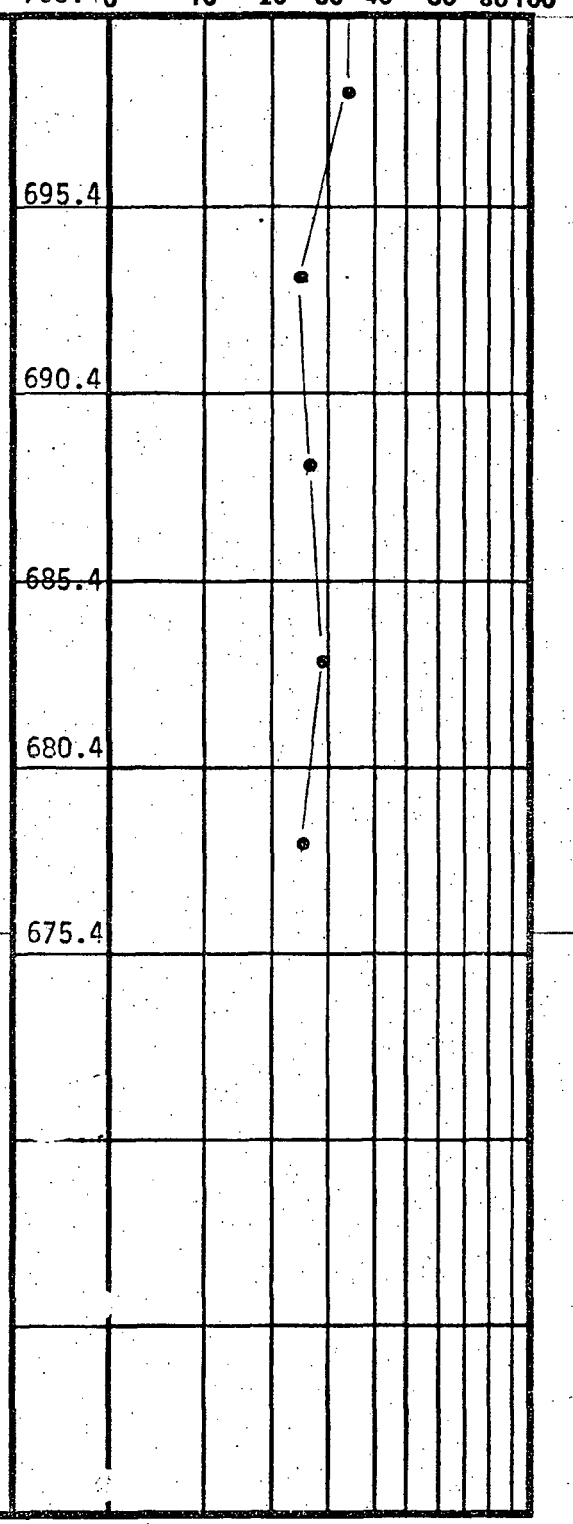
BORING NO. H-57

DATE DRILLED 3-5-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0		700.4	
	Firm Gray Black and White Micaceous Silty Fine to Medium Sand.	695.4	
49.0	Firm Gray White and Black Micaceous Very Silty Fine to Medium Sand.	690.4	
		685.4	
		680.4	
64.5	See Following Rock Log	675.4	



TEST BORING RECORD

Page Two

BORING NO. H-57

DATE DRILLED 3-5-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 700.4	REMARKS
				695.4	
				690.4	
				685.4	
				680.4	
64.5				675.4	
	Soft Gray Brown White Fine to Medium Grained Granite.	75	NX		RQD 18%
70.3				670.4	
71.6	Moderately Hard Gray Brown*	86	NX		
	Soft Gray Brown White Fine to Medium Grained Granite.			665.4	13%
		43	NX		12%
79.3	**			660.4	
80.0					

JOINTS

DEPTH		DIP
64.7	-	60° Joint
65.5	-	80° Joint
69.0	-	Vertical Joint
72.0	-	60° Joint
73.0	-	Vertical Joint
76.5	-	45° Joint
76.7	-	45° Joint
77.2	-	80° Joint

*White Fine to Medium Granined Granite.
**Very Soft Gray Brown White Fine to Medium Grained Granite.

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-57
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				660.4		
	Very Soft Gray Brown White Fine to Medium Grained Granite.				(No Recovery)	
83.3						
	Very Soft Gray Black and White Coarse Grained Diorite.	22	NX	655.4		0%
				650.4		
		0	NX			0%
				645.4		
96.0						9%
	Moderately Hard Black and White Coarse Grained Diorite.	54	NX			
99.0						
	Very Soft Brown and White Coarse Grained Diorite.			640.4		
102.0		50	NX			12%
	Moderately Hard Black and White Coarse Grained Diorite.				(No Recovery)	
104.0						
	Very Soft Brown Black and White Coarse Grained Diorite.			635.4	(No Recovery)	
		11	NX			0%
				630.4	JOINTS	
					DEPTH DIP	
					113.0-113.5 - Slickenside Surface.	
				625.4		
		36	NX			16%
117.3						
	Hard Black and White Fine Grained Diorite.				119.5 - Nearly Vertical Joint	
		100	NX	620.4		86%

Page Four

CORE BORING RECORD

BORING NO. H-57

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
120.0				620.4		
	Hard Black and White Fine Grained Diorite.	100	NX	615.4	JOINTS DEPTH - DIP 129.1 - 45° Joint 129.3 - 45° Joint 129.5 - 70° Joint 130.9 - 45° Joint	86%
		100	NX	610.4		100%
				605.4		
138.9				600.4		
	Coring Terminated					

No Drilling Water Loss.

Page Five

CORE BORING RECORD

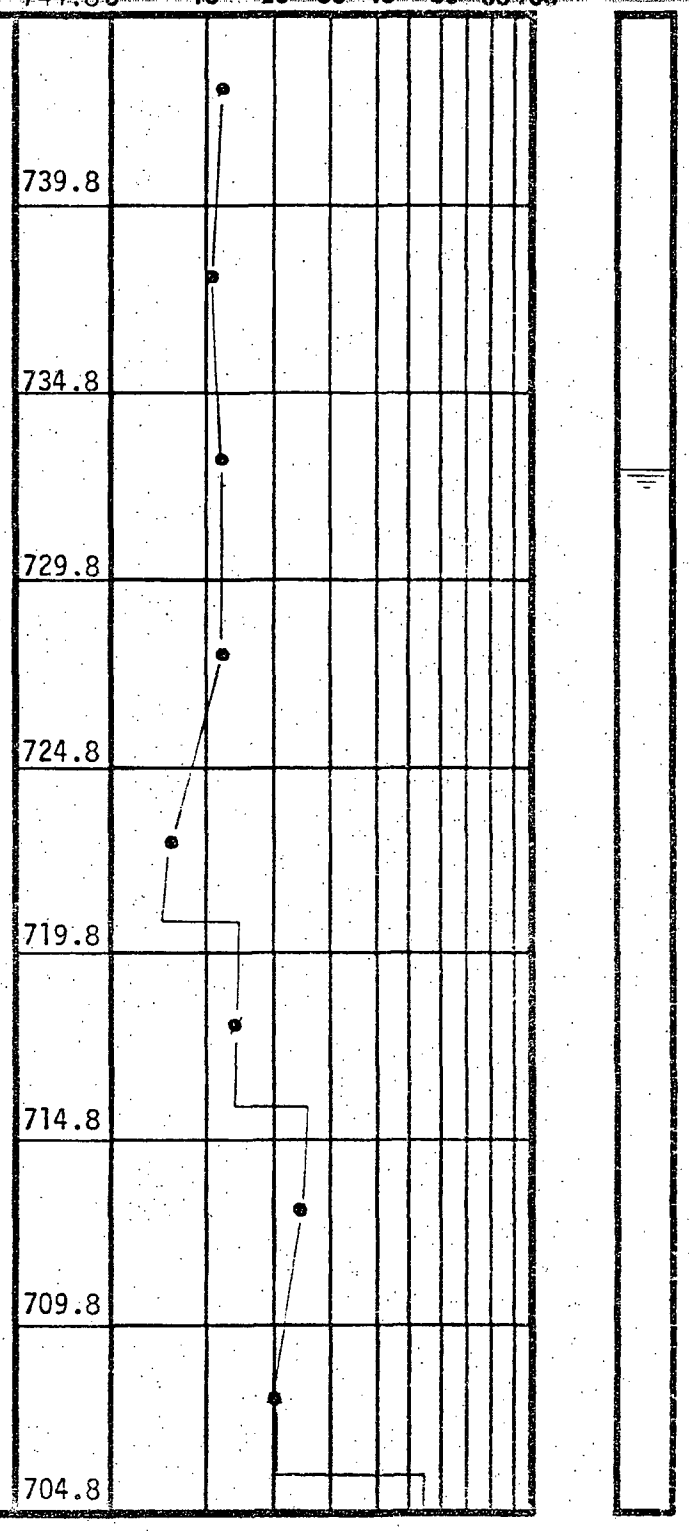
BORING NO. H-57

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Tan and Black Slightly Sandy Slightly Micaceous Silt	744.8
14.0	Firm and Stiff Tan and White Slightly Micaceous Silt	739.8
24.0	Firm Tan and White Silty Fine to Medium Sand	734.8
29.0	Firm Gray and White Silty Fine to Medium Sand	729.8
39.0	Very Dense Gray and White Silty*	724.8
		719.8
		714.8
		709.8
		704.8



*Fine to Medium Sand

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-58

DATE DRILLED 3-6-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Very Dense Gray and White Silty Fine to Medium Sand	704.80
46.5	Partially Weathered Rock That Becomes Brown Very Micaceous Silt When Sampled	699.8
51.7		694.8
52.7	Quartz Seam.	
55.5	Quartz and Partially Weathered Rock Seam.	689.8
	Hard Brown and White Very Micaceous Sandy Silt.	684.8
64.0	Partially Weathered Rock That Becomes Brown White Very Micaceous Sandy Silt When Sampled.	679.8
66.5		
	See Following Rock Log.	674.8
		669.8
		664.8

• PENETRATION-BLOWS PER FT.

10 20 30 40 60 80 100

25= 2"

50= 5 1/2"

TEST BORING RECORD

Page Two

BORING NO. H-58

DATE DRILLED 3-6-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				704.8		
				699.8		
				694.8		
51.7						
	Hard Fragments of Quartz (1" to 2" Segments)	42	NX			0%
		24	NX	689.8	(About 12" Rec.)	
55.5						0%
	See Soil Log.			684.8		
				679.8		
66.0						
	Very Soft Brown Gray Fine to Medium Grained Granite	17	NX	674.8	(12" Rec.)	0%
				669.8		
		0	NX			0%
80.0				664.8		

No Drilling Water Loss.

Page Three

CORE BORING RECORD

BORING NO. H-58
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 664.8	REMARKS	RQD
80.0	*					
80.7	Hard Gray Fine to Medium Grained Granite.	47	NX		JOINTS DEPTH DIP	26%
		100	NX	659.8	81.0' - Vertical Joint 83.4' - 45° Joint	100%
		100	NX	654.8		100%
94.8	Hard Black and White Coarse Grained Diorite.			649.8	94.4' - 70° - Water Deposits on Surface	
		100	NX	644.8	98.0' - 45° Joint	100%
104.5	Coring Terminated			639.8		

* Very Soft Brown Gray Fine to Medium Grained Ganite.
No Drilling Water Loss.

Page Four

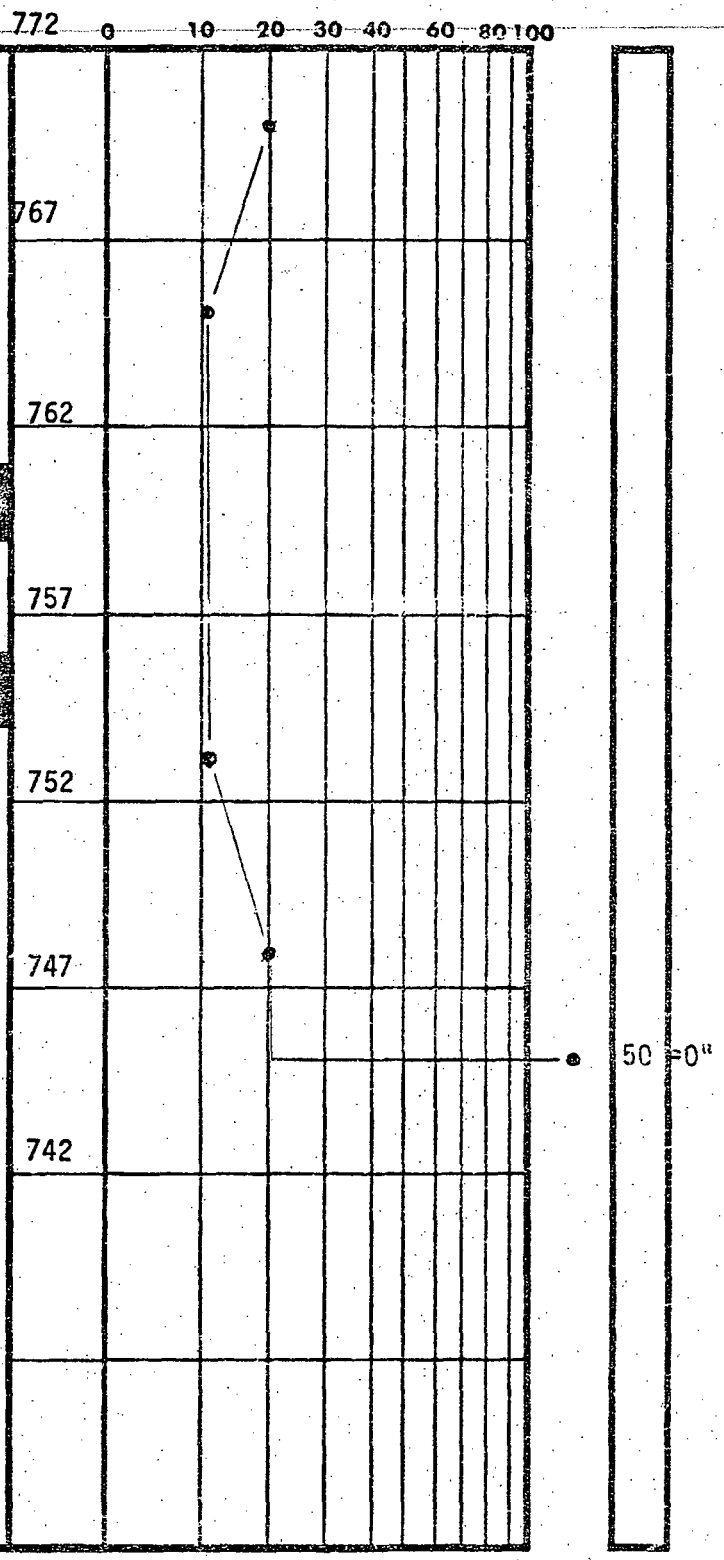
CORE BORING RECORD

BORING NO. H-58
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Dark Red Slightly Micaceous Clayey Fine Sandy Silt.	772
4.0	Stiff Brown Tan Slightly Micaceous Slightly Clayey Fine Sandy Silt.	767
		762
15.0	Stiff Tan Slightly Micaceous Fine Sandy Silt.	757
		752
21.5	Very Stiff Tan and White Slightly Micaceous Fine Sandy Silt.	747
27.0	Hawthorne Refusal. Boring Terminated.	742



No Water Data Due to Boring Location Being Destroyed by Motorgrader.

TEST BORING RECORD

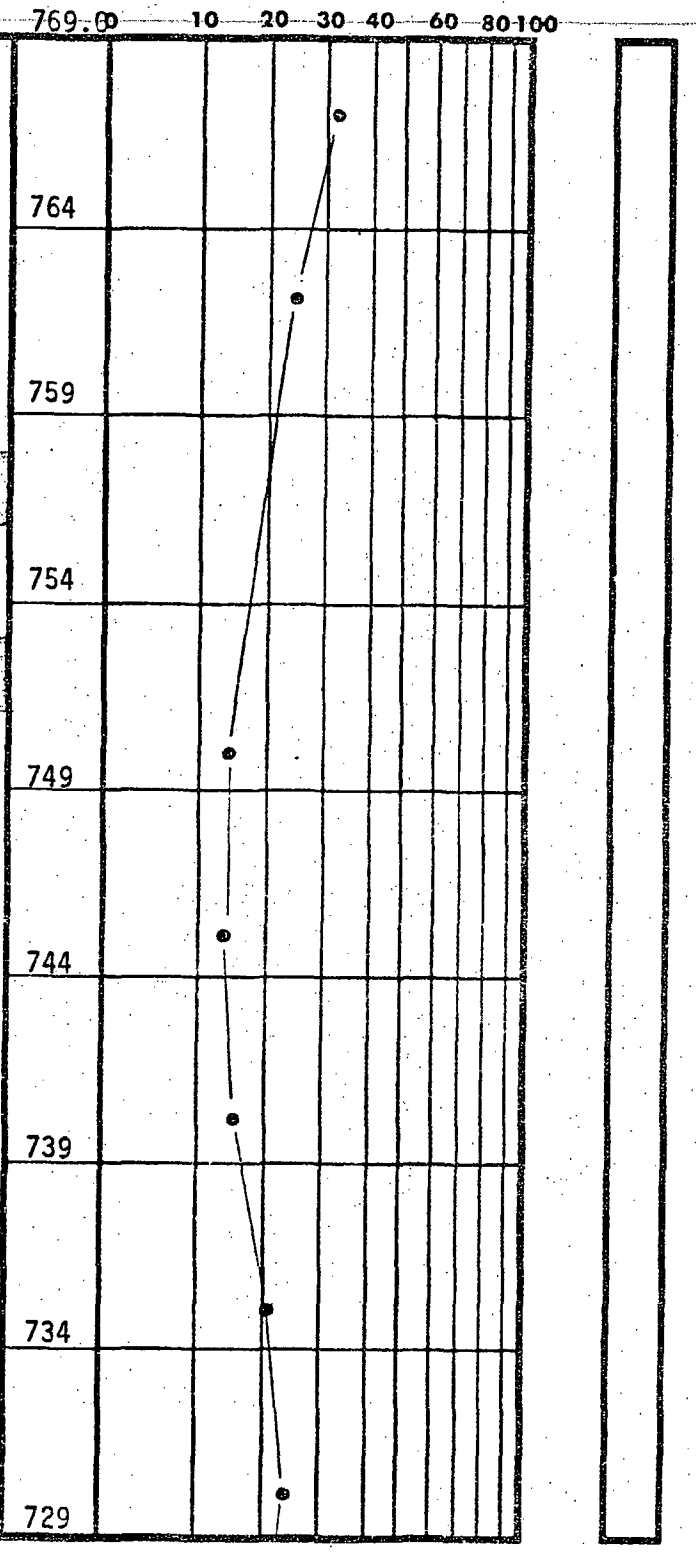
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-59
DATE DRILLED 3-16-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Hard Dark Red Brown Clayey Silt.
4.0	Very Stiff Red Slightly Micaceous Silt.
18.0	Stiff and Very Stiff Tan and Black Micaceous Fine Sandy Silt.
31.5	Very Stiff Tan and White Very Micaceous Fine Sandy Silt.
36.0	Very Stiff Gray Brown and Black Very Micaceous Fine to Medium Sandy Silt.
40.0	



No Water Data Due to Boring Location Being Destroyed by Motorgrader.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-60

DATE DRILLED 3-16-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0		729		
41.5	Very Stiff Gray Brown and Black* Firm Gray Micaceous Silty Sand.	724		
49.0	Partially Weathered Rock.	719	50	=5.5
52.5	Hawthorne Refusal. Boring Terminated	714		

*Very Micaceous Fine to Medium Sandy Silt.

TEST BORING RECORD

Page 2

BORING NO. H-60

DATE DRILLED 3-16-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

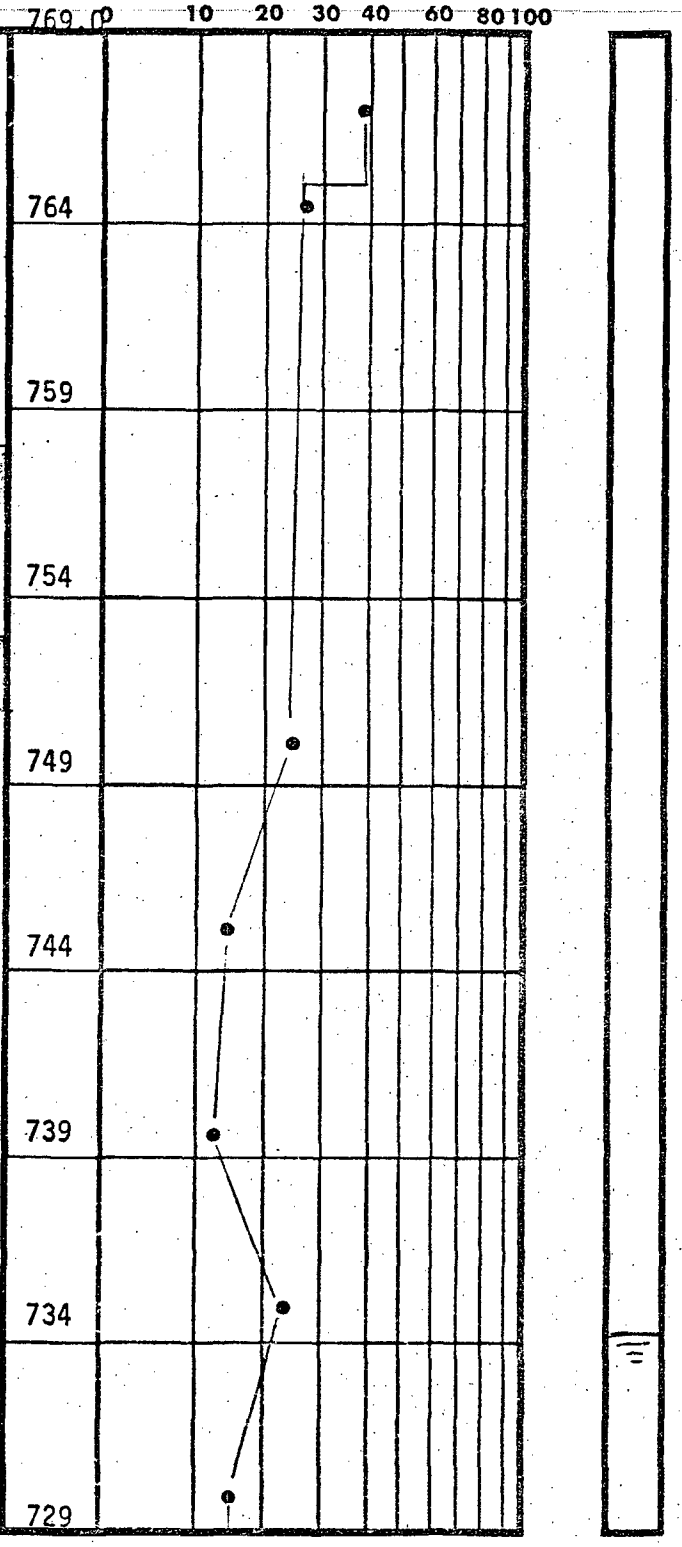
WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Hard Red Very Clayey Silt.
4.0	Very Stiff Red Clayey Silt.
16.5	Very Stiff Tan and Black Micaceous Silt.
21.5	Stiff Tan and Black Fine to Medium Sandy Micaceous Silt.
31.5	Stiff and Very Stiff Tan and Black Micaceous Silt.
40.0	



No Water Data Due to Boring Location Being Destroyed by Motorgrader.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-61

DATE DRILLED 3-14-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0		729.0		
[illegible].0	Stiff and Very Stiff Tan and Black Micaceous Silt			
	Partially Weathered Rock That Becomes Black and White Silty Fine to Medium Sand When Sampled	724.0	•	50= 3"
45.5				
	Hawthorne Refusal Boring Terminated.			

TEST BORING RECORD

Page Two

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

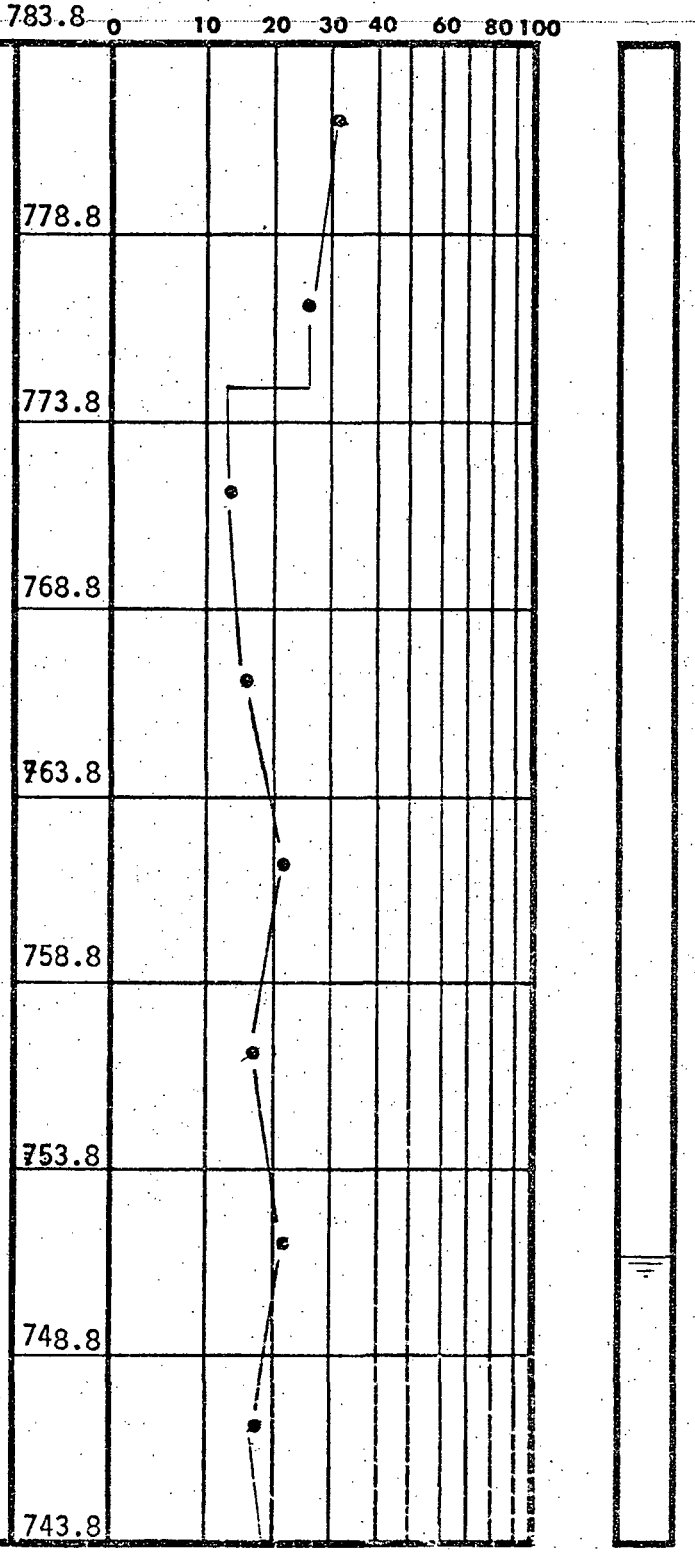
BORING NO. H-61

DATE DRILLED 3-14-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)
6.0	Very Stiff Red Slightly Sandy Silt.
9.0	Stiff Red and Tan Fine Sandy Micaceous Silt.
14.0	Very Stiff Tan Purple White Black Fine to Medium Sandy Micaceous Silt.
29.5	Very Stiff Pink Tan and Black Fine Sandy Micaceous Silt.
34.0	Very Stiff Gray Brown and Black Fine Sandy Micaceous Silt.
40.0	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

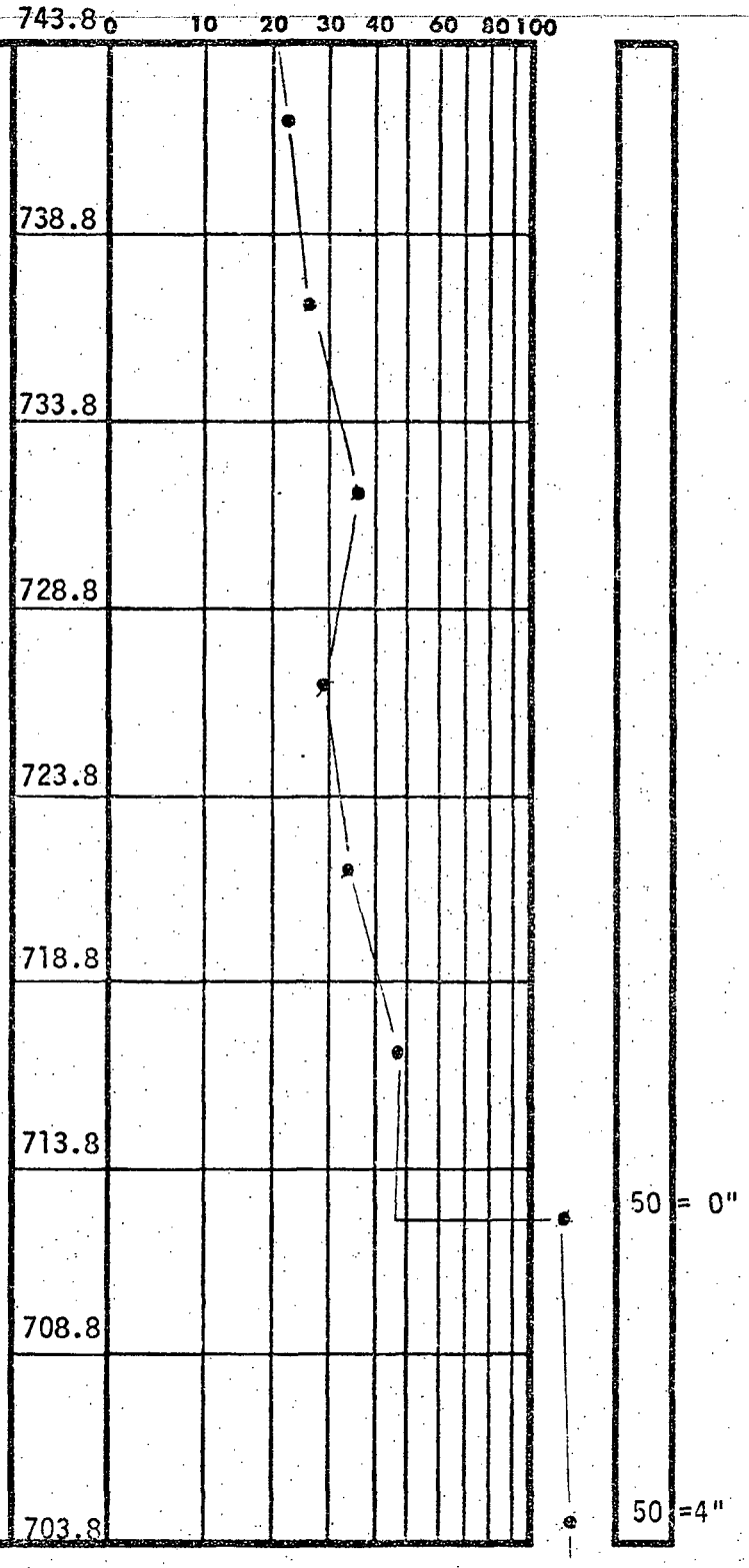
BORING NO. H-62

DATE DRILLED 3-18-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		743.8
	Very Stiff Gray Brown and Black Fine Sandy Micaceous Silt.	738.8
49.0		733.8
	Dense Gray and White Micaceous Silty Fine to Medium Sand.	
54.0		728.8
	Very Stiff Gray Very Fine Sandy Micaceous Silt.	
59.0		723.8
	Dense Gray Micaceous Very Silty Fine Sand.	718.8
		713.8
71.4		
	Partially Weathered Rock That Becomes Black and Gray Very Silty Fine Sand When Sampled.	708.8
80.0		703.8



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

Page 2

BORING NO. H-62

DATE DRILLED 3-18-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
80.0		703.8		
	Partially Weathered Rock That Becomes Black and Gray Very Silty Fine Sand When Sampled.			
84.2		698.8	•	50 =0"
	See Following Rock Log.			

TEST BORING RECORD

BORING NO. H-62

DATE DRILLED 3-13-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				703.8		
84.2				698.8		
	Hard Black and White Fine Grained Diorite.	100	NX	693.8		100
93.0						
	Hard Black and White Coarse Grained Diorite.			688.8		
95.0						
96.2	Hard Dark Green Meta-Gabbro.	100	NX			
	Hard Black and White Coarse Grained Diorite.			683.8		100
102.2						
103.5	Hard Gray Fine to Medium*			678.8		
	Coring Terminated NOTE: Several Layers or Inclusions of Granite From 84.2 to 93.0.					

* Grained Diorite.

No Drilling Water Loss.

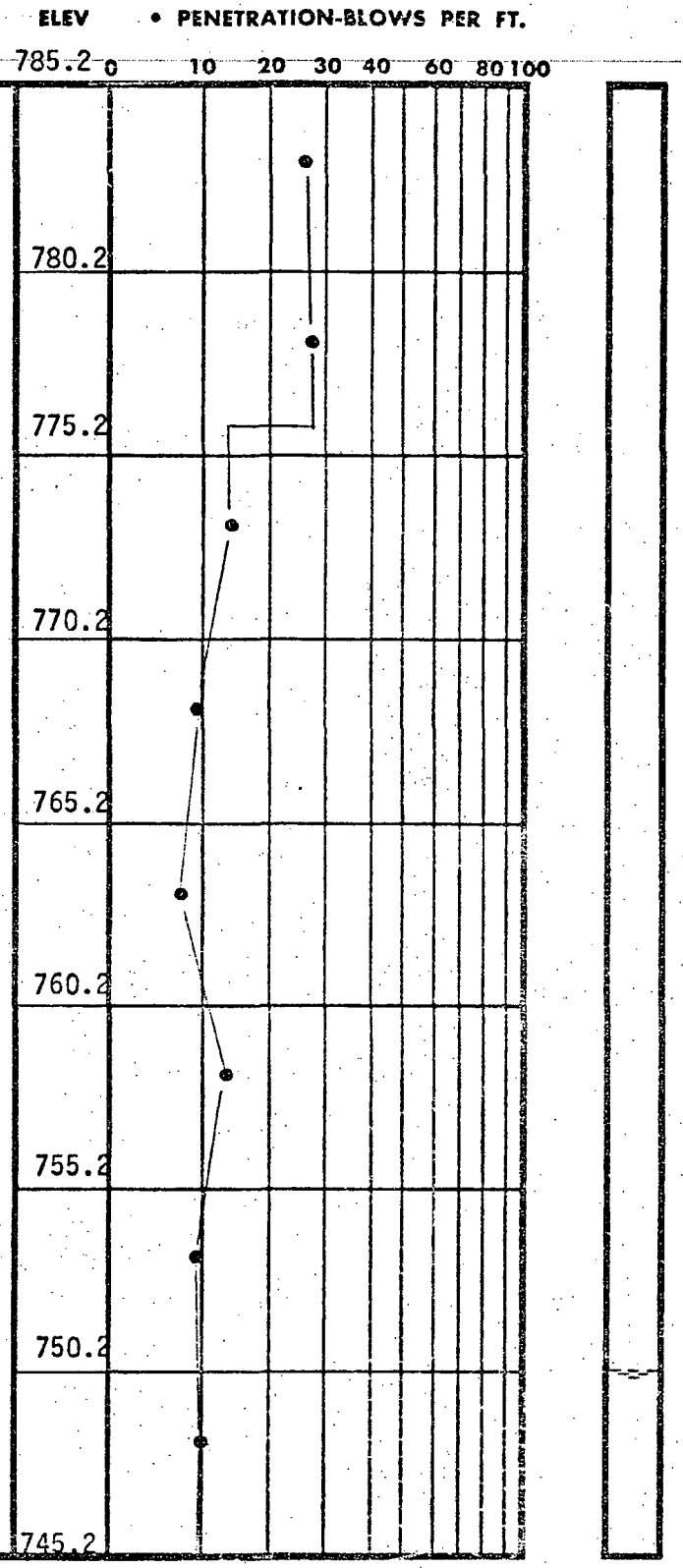
CORE BORING RECORD

BORING NO. H-62
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Dark Red Brown Slightly Sandy Clayey Silt (with Semi-Rounded Sand and Gravel). (High Level Terrace)
7.0	Very Stiff Red Brown and Tan Slightly Sandy Clayey Silt.
9.0	Firm to Stiff Reddish Brown and Tan Fine Sandy Micaceous Silt.
29.0	Stiff Brown Tan Gray Fine to Medium Sandy Micaceous Silt.
39.0	
40.0	Stiff Gray Pink and Black Fine*



*Sandy Micaceous Silt.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

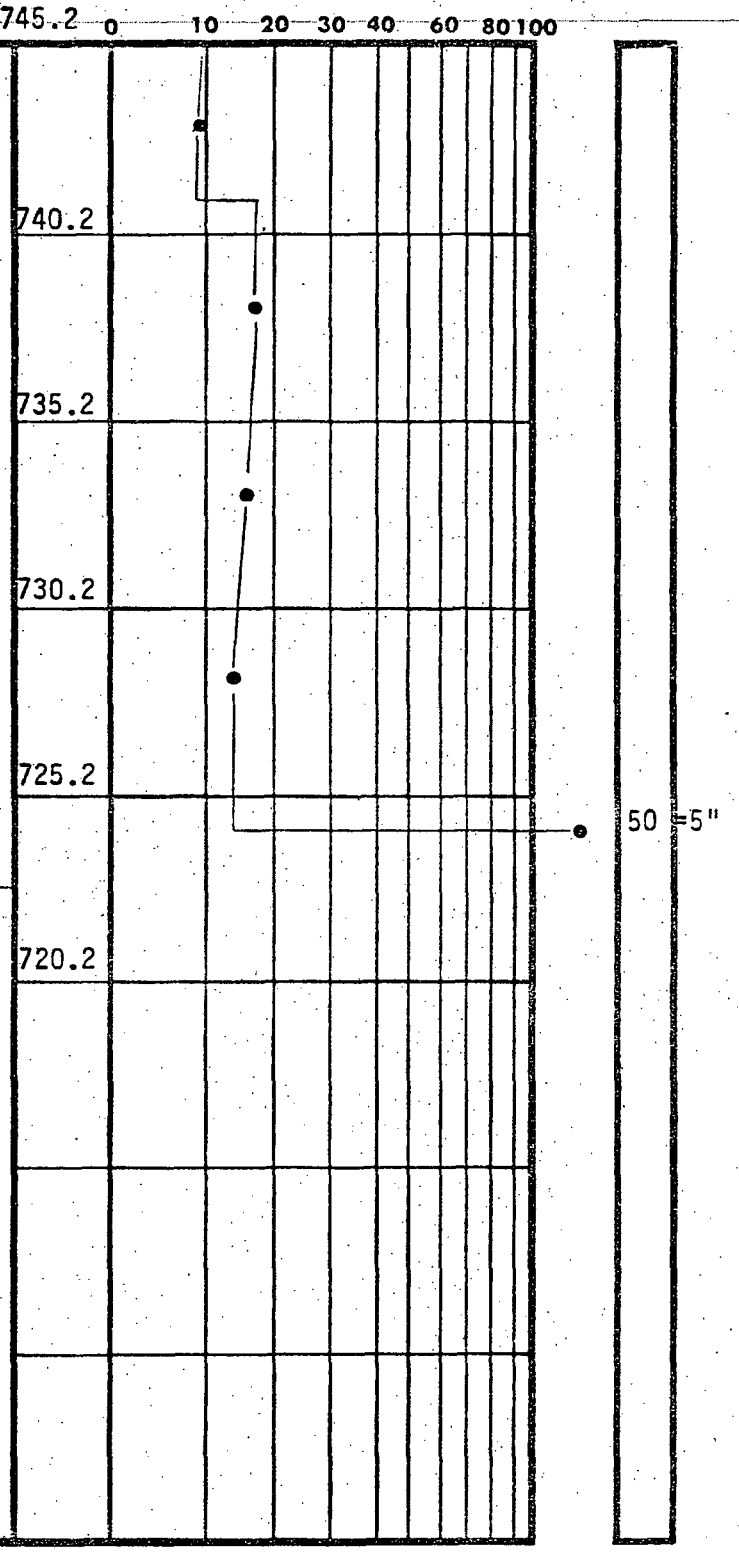
BORING NO. H-63

DATE DRILLED 3-18-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Stiff Gray Pink and Black Fine Sandy Micaceous Silt.	745.2
44.0	Very Stiff Gray Tan Purple and Black Fine Sand Very Micaceous Silt.	740.2
		735.2
54.0	Stiff Tan Black Fine Sandy Very Micaceous Silt.	730.2
		725.2
61.0	Partially Weathered Rock That*	
62.4	See Following Rock Log	720.2



*Becomes Gray and Black Micaceous Silty Fine to Coarse Sand When Sampled.

TEST BORING RECORD

Page 2

BORING NO. H-63

DATE DRILLED 3-18-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				745.2		
				740.2		
				735.2		
				730.2		
				725.2		
62.4	Moderately Hard Brown Black and White Coarse Grained Diorite.	78	NX	720.2	JOINTS DEPTH DIP 64.6' - 60° Joint 65.1' - 60° Joint	67
67.6	Very Soft Gray Brown and White Fine to Medium Grained Granite			715.2	(No Recovery)	
70.4						
70.9	Soft to Moderately Hard Gray Brown Fine to Medium Grained*	90	NX			72
73.7	Hard Gray Fine to Medium Grained Granite.			710.2		
	Hard Black and White Fine Grained Diorite.				76.0 - Several Closely Spaced Joints about 60° to 80° 73.7'-98' - Several Layers and Inclusions of**	
80.0		81	NX	705.2		74

* Granite.

No Drilling Water Loss.

** Granite.

CORE BORING RECORD

BORING NO. H-63
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 705.2	REMARKS	RQD
80.0	Hard Black and White Fine Grained Diorite.	81	NX	700.2		74
		100	NX	695.2		89
				690.2		
98.0	Hard Dark Green Meta-Gabbro.	100	NX	685.2	JOINTS DEPTH DIP 100.3 - Slickenside Surface. 103.5' - 104.3' - Slickenside Surface	100
				680.2		
106.5	Coring Terminated.					

No Drilling Water Loss.

CORE BORING RECORD

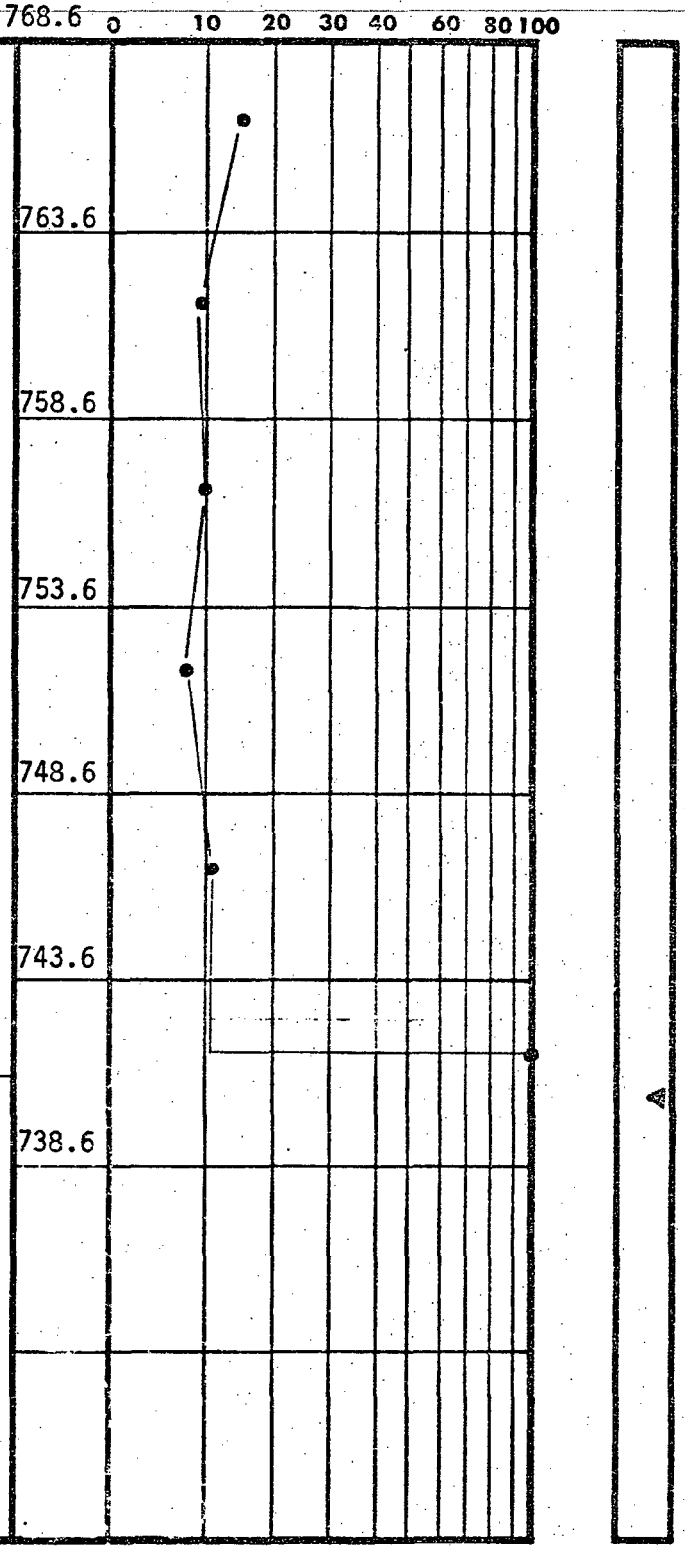
BORING NO. H-63

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Red Brown Micaceous Silt.	768.6
4.0	Loose Gray and White Micaceous Silty Fine to Medium Sand.	763.6
		758.6
		753.6
		748.6
		743.6
27.0	Partially Weathered Rock That*	
27.5	See Following Rock Log.	738.6



*Becomes Gray Tan Black Micaceous Silt When Sampled.
Hole Dry and Caved at 17'.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-64

DATE DRILLED 3-23-70

JOB NO. H-2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 768.6	REMARKS	RQD
				763.6		
				758.6		
				753.6		
				748.6		
				743.6		
27.5						
29.0	Moderately Hard Black and White Coarse Grained Diorite.	93	NX			0
	Hard Black and White Coarse Grained Diorite.			738.6		56
34.0		60	NX			
	Very Soft Brown Black and White Coarse Grained Diorite.			733.6	(9" Recovery)	
40.0		54	NX	728.6		40

CORE BORING RECORD

BORING NO. H-64
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
40.0				728.6		
	Very Soft Brown Black and White Coarse Grained Diorite.	54	NX		JOINTS DEPTH DIP 40.5' - 42' Vertical Joint	40
43.0						
	Very Soft Brown Black and White Coarse Grained Diorite.	26	NX	723.6	(12" Recovery)	8
		26	NX	718.6		26
				713.6		
57.0						
	Hard Black and White Fine Grained Diorite.	100	NX	708.6		100
				703.6	JOINTS DEPTH DIP 61.9' Nearly Vertical Joint.	
67.9						
69.2	Hard Gray White Fine to Medium*	100	NX	698.6		100
	Hard Black and White Coarse Grained Diorite.					
73.5						
	Coring Terminated. Loss of Drilling Water at 28.0'.					

*Grained Granite.

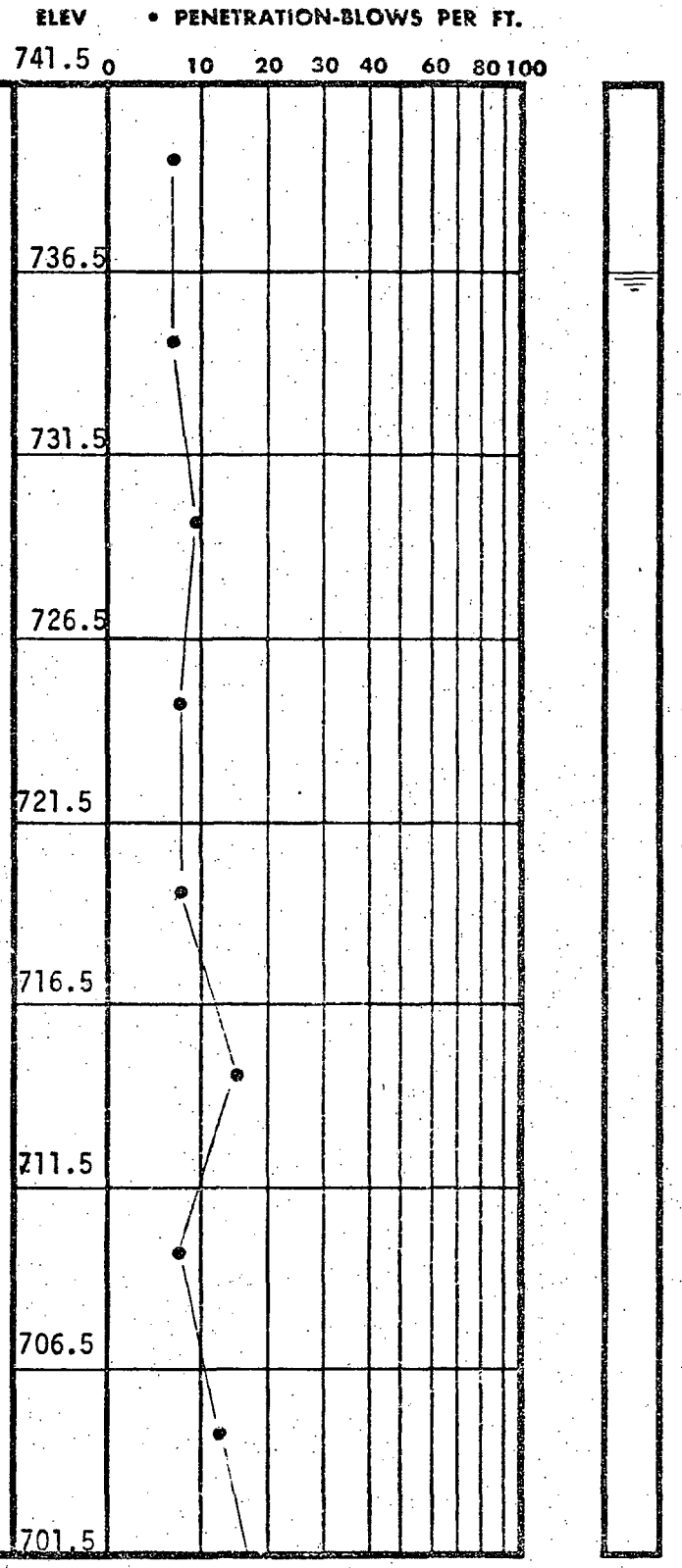
CORE BORING RECORD

BORING NO. H-64
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Firm Brown and Black Micaceous Silt.
14.0	Firm Tan Black and White Slightly Sandy Micaceous Silt.
24.0	Stiff Tan Black and White Slightly Sandy Micaceous Silt.
29.0	Stiff and Very Stiff Gray Brown and Black Very Micaceous Silt.
40.0	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

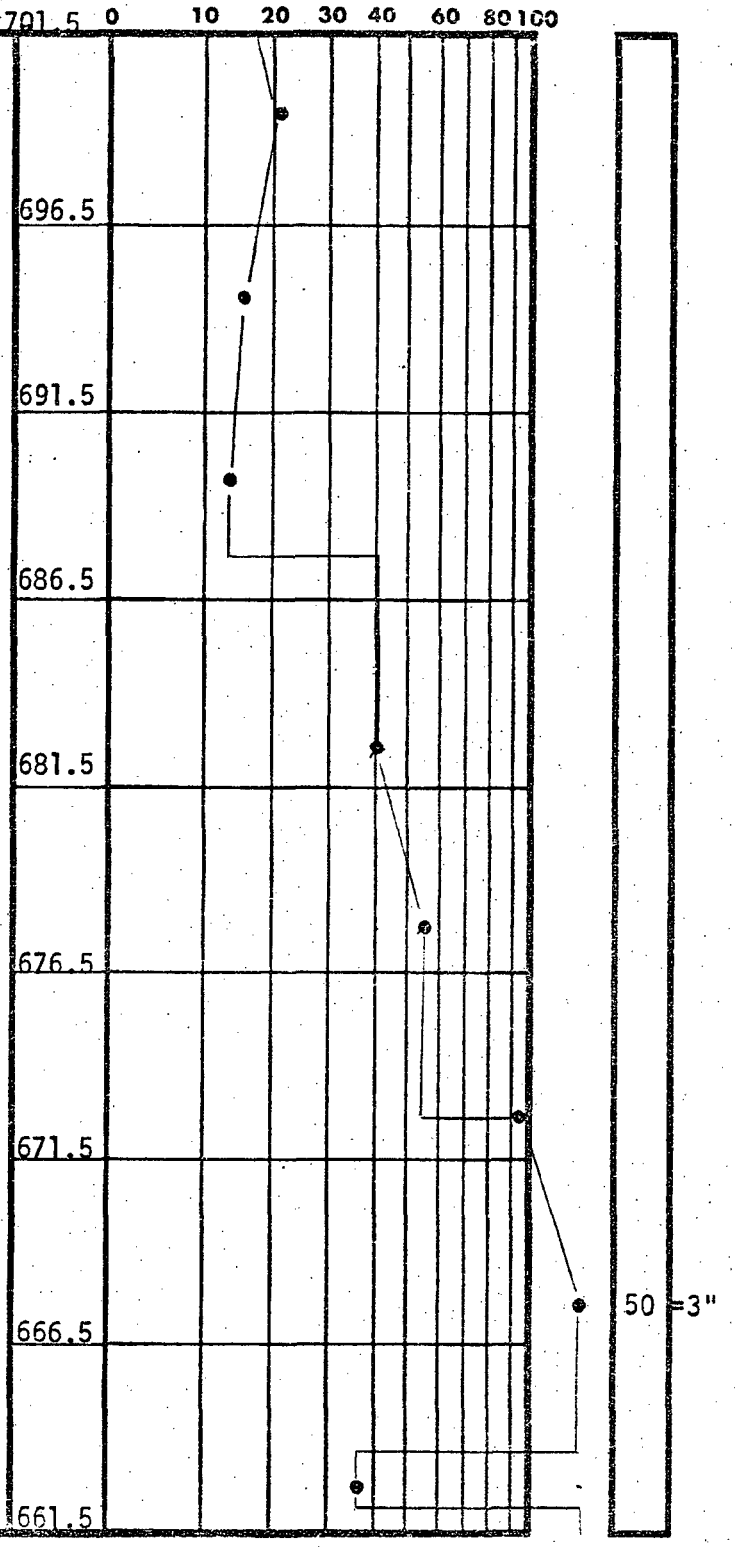
BORING NO. H-65

DATE DRILLED 3-30-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Stiff and Very Stiff Gray Brown and Black Very Micaceous Silt.	701.5
44.0	Firm Gray Brown and Black Very Micaceous Very Silty Fine Sand.	696.5
		691.5
54.0	Dense to Very Dense Gray Brown and Black Micaceous Silty Fine Sand.	686.5
		681.5
		676.5
69.0	Partially Weathered Rock That Becomes Gray Brown Micaceous Silt with Quartz Fragments When Sampled.	671.5
		666.5
78.0	Dense Dark Gray and Black Micaceous Silty Fine to Medium Sand.	
79.5		
80.0	*	661.5



*Partially Weathered Rock That Becomes Brown and White Very Micaceous Silt With Quartz Fragments When Sampled.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

Page 2

BORING NO. H-65

DATE DRILLED 3-30-70

JOB NO. CH 2055

WATER TABLE, 26 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
80.0		661.5		
	Partially Weathered Rock That Becomes Brown and White Very Micaceous Silt with Quartz Fragments When *		•	50 =4"
3.1				
83.3	Partially Weathered Rock That Becomes Brown Tan and White Micaceous*	656.5		
	See Following Rock Log.			
		651.5		

* Sampled.

TEST BORING RECORD

Page 3

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

BORING NO. H-65

DATE DRILLED 3-30-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 661.5	REMARKS	RQD
						0
83.3	Very Soft Brown and White Fine to Medium Grained *			656.5		
86.1	Hard Black and White Coarse Grained Diorite.	67	NX	651.5	JOINTS DEPTH DIP 92.4' - 45° Joint	67
		100	NX	646.5		100
		100	NX	641.5	98.4' - 60° Joint 100.2' - 45° Joint	100
101.9	Hard Gray Fine to Medium Grained Granite.					
103.6	Coring Terminated.			636.5		

* Granite and Hard Fragments of Quartz.
No Drilling Water Loss.

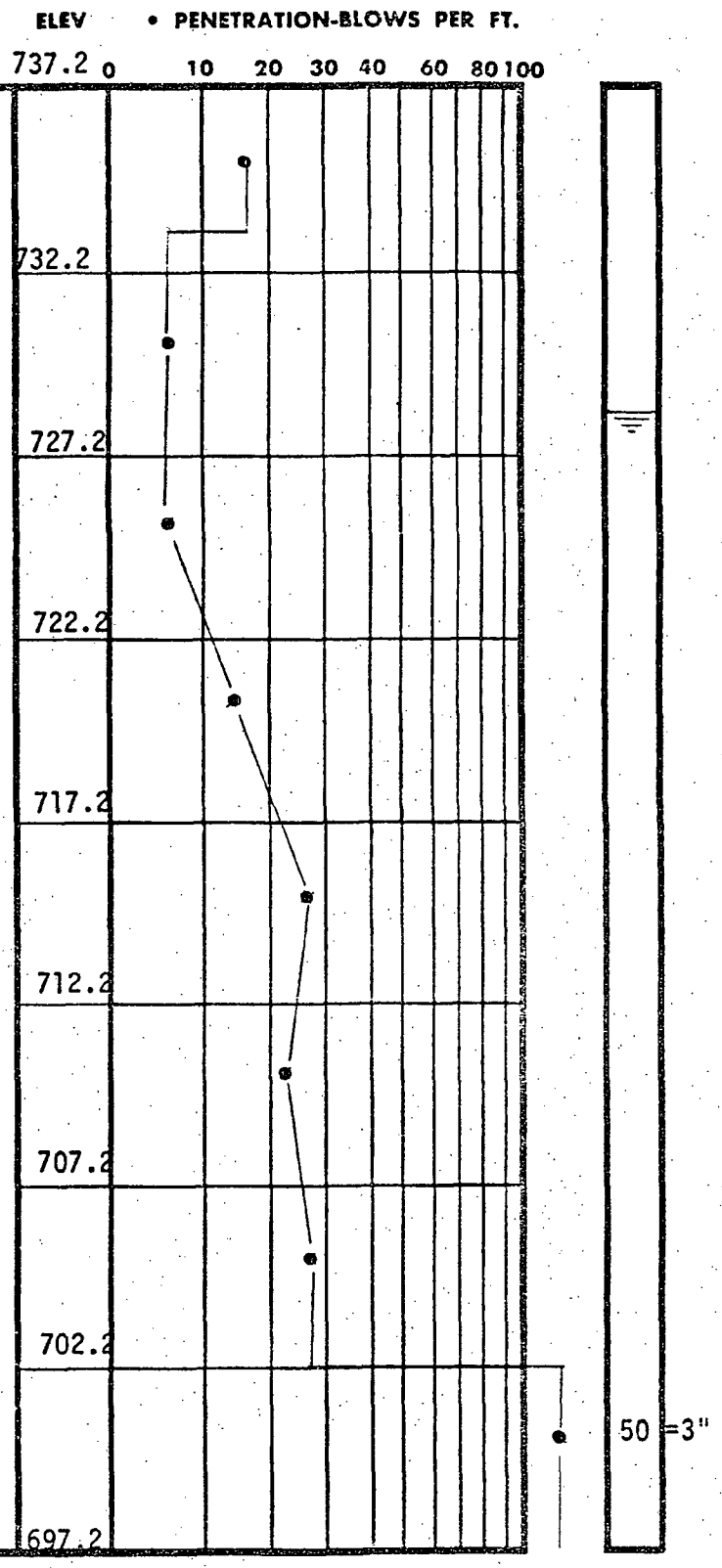
CORE BORING RECORD

BORING NO. H-65
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Brown Tan and Black Slightly Micaceous Silt.
4.0	Firm Brown and Black Micaceous Silt.
14.0	Firm Gray and Black Micaceous Very Silty Fine to Medium Sand.
35.0	Partially Weathered Rock That Becomes Gray and Black Micaceous Slightly Silty Fine to Coarse Sand When Sampled.
40.0	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-66
DATE DRILLED 3-25-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0		697.2		
41.2	Partially Weathered Rock That *			50 =4"
	See Following Rock Log.	692.2		

* Becomes Gray and Black Micaceous Slightly Silty Fine to Coarse Sand When Sampled.

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.6 IN. I.D. SAMPLER 1 FT.

BORING NO. H-66

DATE DRILLED 3-25-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 697.2	REMARKS	RQD
40.0						
41.2	Very Soft Black and White Coarse Grained Diorite.					
44.0		57	NX	692.2		52
	Hard Black and White Coarse Grained Diorite.				JOINTS DEPTH — DIP 45' - 70° Joint	
		100	NX	687.2	45.1' - Slickenside Surface.	100
					46.3' - Slickenside Surface.	
				682.2	50.0' - Slickenside Surface.	
		100	NX		51.4' - Slickenside Surface.	
					52.6' - Slickenside Surface.	100
				677.2	60.5' - Slickenside Surface.	
					62.8' - Slickenside Surface.	
73.7				672.2		
	Coring Terminated					

No Drilling Water Loss.

CORE BORING RECORD

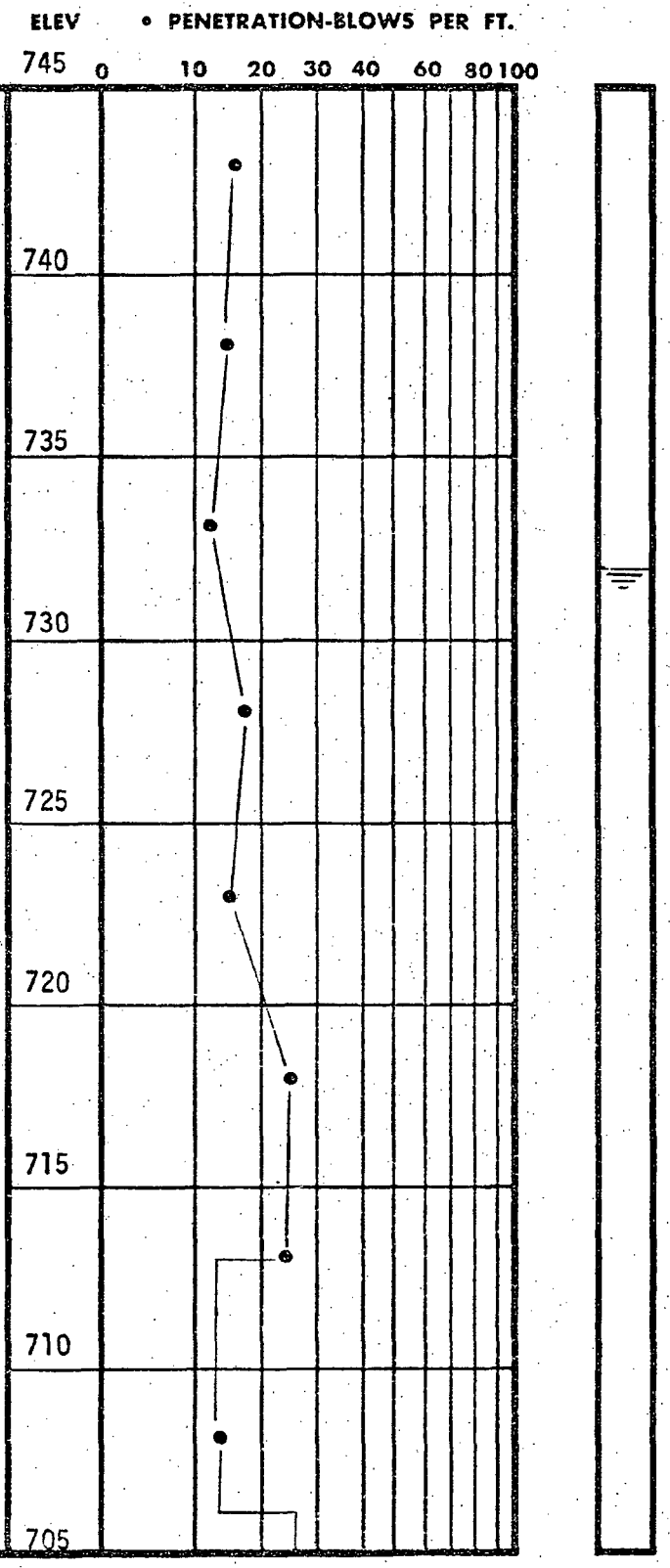
BORING NO. H-66

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Brown and Tan Silt.
4.0	Stiff Red Brown and Tan Slightly Micaceous Silt.
14.0	Very Stiff Red Brown and Black Slightly Sandy Slightly Micaceous Silt.
19.5	Firm Gray Black and White Micaceous Very Silty Fine to Medium Sand.
32.0	Very Stiff Brown and Black Slightly Micaceous Silt.
34.0	Stiff Brown and Black Slightly Micaceous Silt.
39.0	
40.0	Very Stiff Brown and Black Slightly*



* Micaceous Silt.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

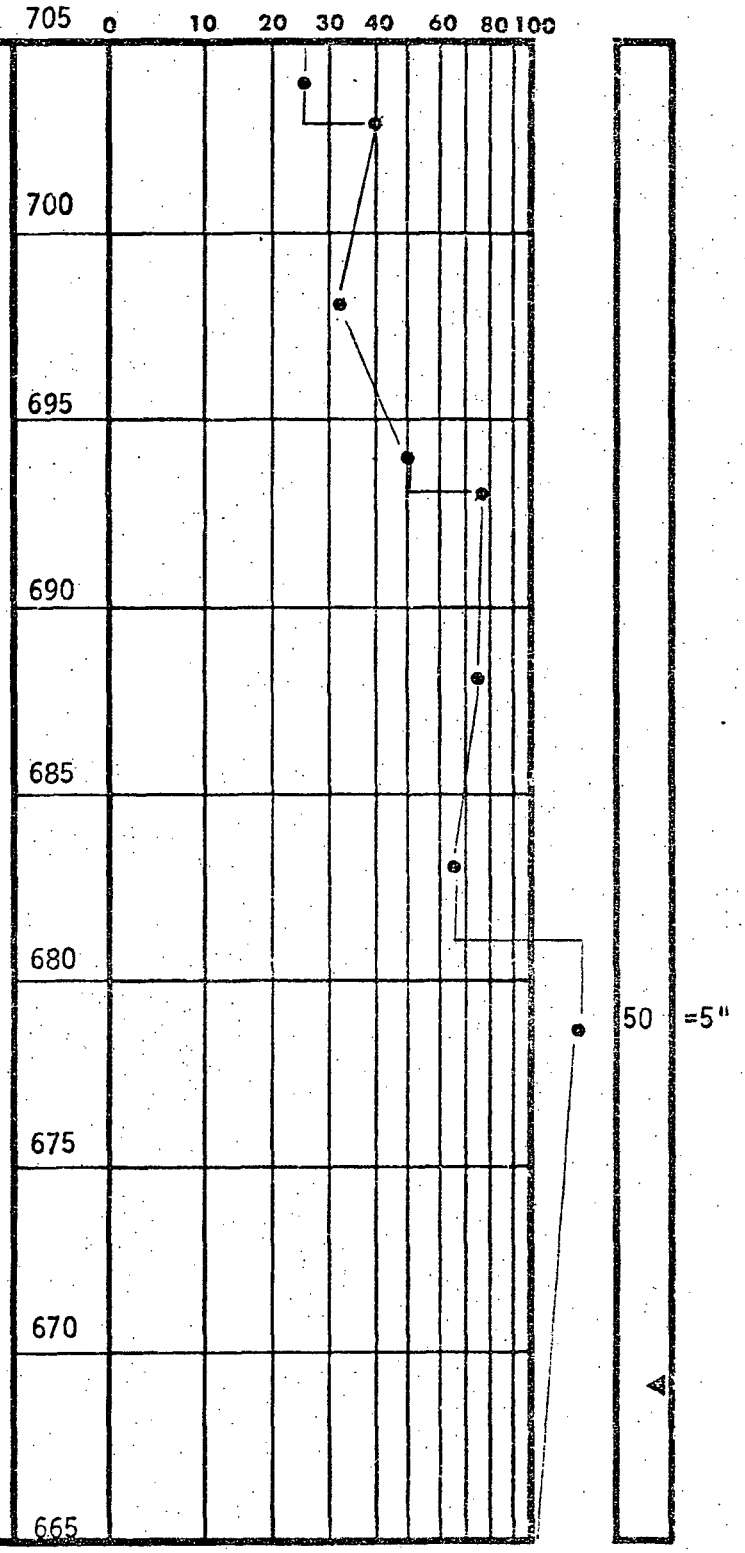
BORING NO. H-67

DATE DRILLED 3-25-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
40.0	Very Stiff Brown and Black Slightly Micaceous Silt.
42.0	Hard Brown Very Micaceous Silt.
52.0	Hard Brown Micaceous Slightly Sandy Silt.
54.0	Very Dense Gray and White Micaceous Silty Fine to Medium Sand.
64.0	Partially Weathered Rock That Becomes Gray Black and White Micaceous Silty Fine to Medium Sand When Sampled.
80.0	



TEST BORING RECORD

Page 2

BORING NO. H-67

DATE DRILLED 3-25-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
80.0	Partially Weathered Rock That Becomes Gray Black and White Micaceous Silty Fine to Medium Sand When Sampled.	665		
85.0	Partially Weathered Rock That Becomes Brown Black and White Slightly Sandy Very Micaceous Silt When Sampled.	660		50 =3-1/
90.0	Hard Brown Very Micaceous Silt.	655		
96.0	Spoon Refusal See Following Rock Log.	650 645		

TEST BORING RECORD

Page 3

BORING NO. H-67

DATE DRILLED 3-25-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
80.0				665		
				660		
				655		
				650		
96.0	Hard Black and White Coarse Grained Diorite.					
99.5				645	JOINTS DEPTH DIP 100' - 60° Joint	97
	Hard Black and White Fine Grained Diorite.	100	NX			
105.6				640		
	Hard Black and White Coarse Grained Diorite.				107.8' - Slickenside Surface	
108.8						
	Hard Black and White Fine Grained Diorite.	100	NX	635		100
115.8				630		
	Coring terminated. Loss of Drilling Water at 76.0'.			625		

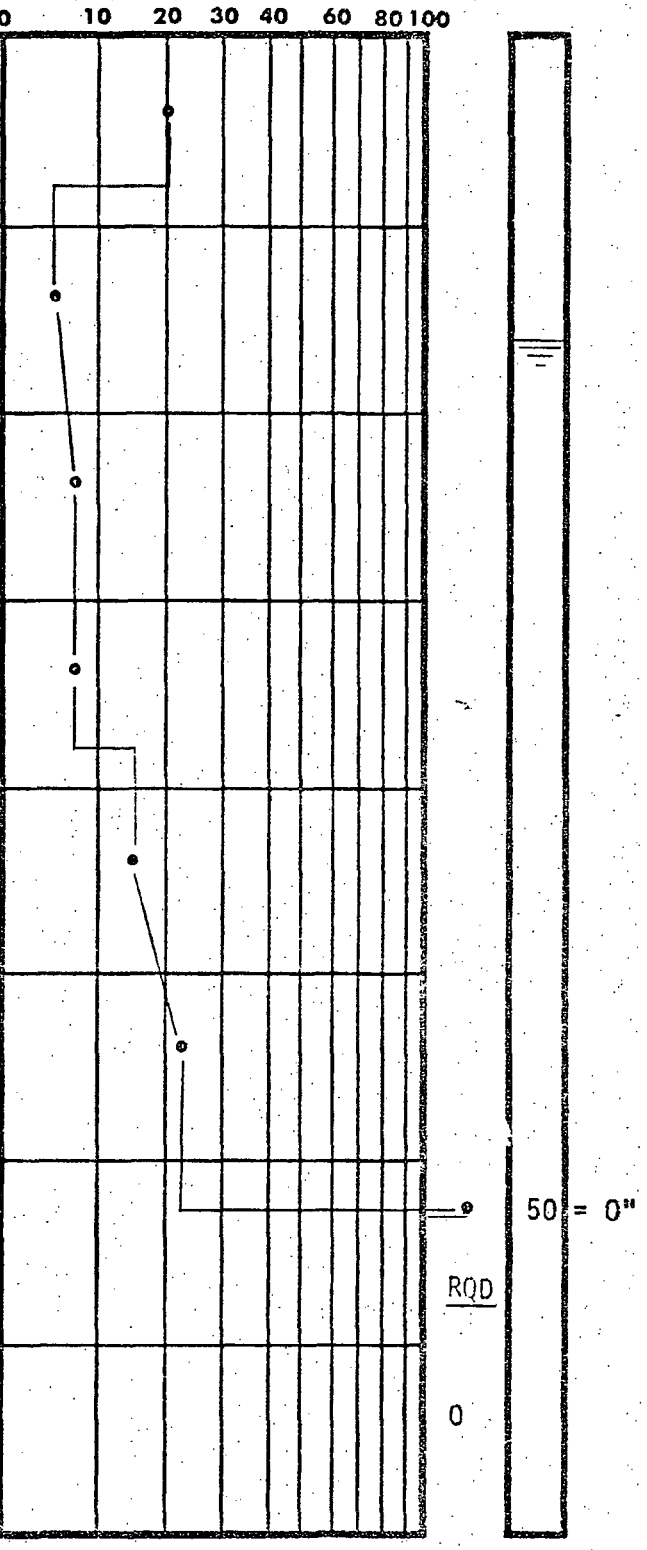
CORE BORING RECORD

BORING NO. H-67
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION		ELEV
0	Very Stiff Reddish Brown Fine to Coarse Sandy Silt with Rounded Quartz Gravel (Fill).		671.1
4.0	Firm Dark Gray and Brown Fine to Medium Sandy Micaceous Silt (Alluvium).		666.1
10.0			661.1
11.0	Boulder		
	Firm Dark Gray and Brown Fine to Medium Sandy Slightly Clayey Silt (Alluvium).		656.1
19.0	Stiff and Very Stiff Bluish Gray and Tan Fine Sandy Clay (Alluvium).		651.1
			646.1
			641.1
31.4	Weathered and Hard Meta-Gabbro and Rounded Quartz Gravel.	NX 10 %	636.1
40.0			631.1



TEST BORING RECORD

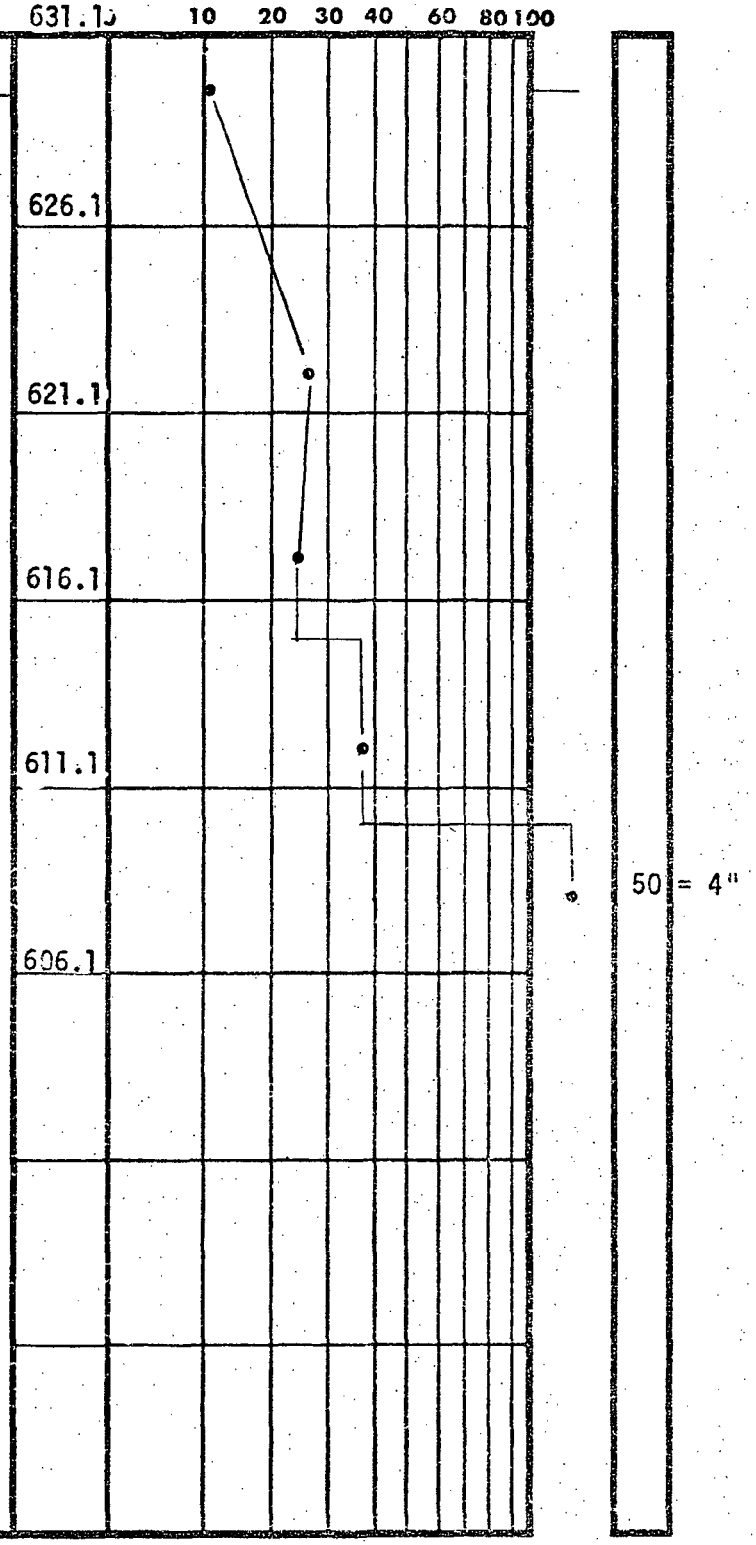
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.
UNDISTURBED SAMPLE
WATER TABLE, 1 HR.
|50| % ROCK CORE RECOVERY
LOSS OF DRILLING WATER

BORING NO. H-68
DATE DRILLED 4-20-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		631.1
	Weathered and Hard Metagabbro and *	
41.4		
	Stiff to Very Stiff Gray Tan and White Speckled Fine to Medium Sandy Silt.	626.1
		621.1
		616.1
56.0		
	Hard Gray Tan and White Speckled Fine Sandy Silt.	611.1
61.0		
	Partially Weathered Rock That Becomes Gray Tan and White Speckled**	
2.4		
	See Following Rock Log.	606.1



* Rounded Quartz Gravel.

** Fine to Coarse Very Sandy Silt When Sampled.

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-68

DATE DRILLED 4-20-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				611.1	JOINTS DEPTH DIP 61.9' - 45° Joint 69.0'-71.4' Rock Highly Fractured.	
63.4	Very Soft Brown and Gray Fine Grained Diorite (No Recovery).	12	NX	606.1		12
69.0	Soft Brown and Gray Fine Grained Diorite.	100	NX	601.1	72.8' - 60° Joint 74.1' - 45° Joint with Groundwater Deposits on Surface.	0
71.4	Moderately Hard Black and White Fine Grained Diorite.					
73.0	Hard Black and White Fine Grained Diorite.	100	NX	596.1	75.0' - 45° Joint with Groundwater Deposits on Surface. 75.3' - 60° Joint with Groundwater Deposits on Surface. 76.0' - 45° Joint with Groundwater Deposits on Surface.*	89
78.5	Coring Terminated.			591.1		

No Drilling Water Loss.

* 77.2'-78.0' - 45" Joint with Groundwater Deposits on Surface.

CORE BORING RECORD

BORING NO. H-68
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
	Note: Casing Bit Came Off in H-68 Core Hole Before Coring Was Completed; Therefore, H-68A was Located 15' Away. H-68A Drilled From Surface to Refusal Without Sampling.				JOINTS DEPTH - DIP 59.6' - 45° Joint 60.8' - 60° Joint 67.6' - 45° Joint with Groundwater Deposits on Surface. 70.0' - 60° Joint with Groundwater Deposits on Surface.	
59.4 59.6	Moderately Hard Black Brown and White Fine Grained *				71.2' - 60° Joint with Groundwater Deposits on Surface.	
	Hard Black and White Fine Grained Diorite.	97	NX		71.9' - 60° Joint with Groundwater Deposits on Surface. 72.1' - 60° Joint with Groundwater Deposits on Surface. 72.5' - 60° Joint with Groundwater Deposits on Surface.	88
		100	NX		72.6'-74.5' Vertical Joint with Groundwater Deposits on Surface.	95
		100	NX		75' - 60° Joint with Groundwater Deposits on Surface. 76' - 60° Joint with Groundwater Deposits on Surface. 77' - 60° Joint with Groundwater Deposits on Surface.	100
79.0	Coring Terminated.					

* Diorite.

No Drilling Water Loss.

CORE BORING RECORD

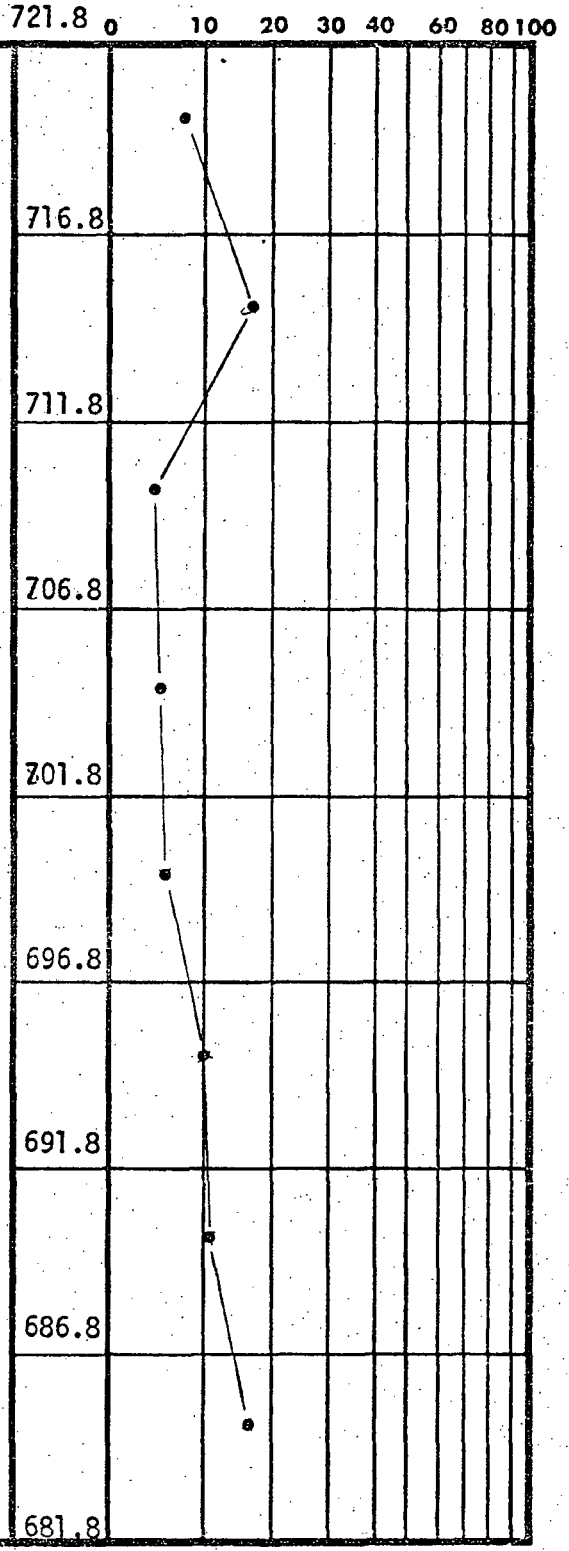
BORING NO. H-68A

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		721.8
	Firm Brown Fine Sandy Clayey Silt (Topsoil).	
3.0		
	Very Stiff Reddish Brown Clayey Silt.	716.8
9.0		
	Firm Brown Tan and Black Slightly Sandy Silt.	711.8
14.0		
	Firm Tan and Black Micaceous Silt.	706.8
		701.8
22.0		
	Firm Gray Very Micaceous Silt.	
1.0		
	Firm Very Micaceous Silty Fine Sand.	696.8
		691.8
		686.8
38.9		
40.0	Soft Weathered Rock.	681.8



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

BORING NO. H-69

DATE DRILLED 4-16-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0		681.8	
	Soft Weathered Rock. See Following Rock Log.	676.8	
49.4	Dense Gray Very Micaceous Silty Fine to Coarse Sand.	671.3	
54.9	See Following Rock Log.	666.8	50 = 1"

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-69

DATE DRILLED 4-16-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
				686.8		
38.9	Very Soft Light Gray Fine to *	33	NX	681.8		RQD 15

* Medium Grained Granite (No Recovery).

CORE BORING RECORD

BORING NO. H-69
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 681.8	REMARKS	RQD
	Very Soft Light Gray Fine to Medium Grained Granite (No Recovery).	33	NX		JOINTS DEPTH DIP	15
44.4				676.8	45.2' - 45° Joint	
	Moderately Hard Light Gray Fine to Medium Grained Granite.					0
46.3	Very Soft Brown and Gray Fine Grained Diorite. (No Recovery)	18	NX		56.8'-58.2' Rock Highly Fractured.	
				671.8		
				666.8		
55.3	Moderately Hard Brown and Gray Fine Grained Diorite.	68	NX			10
58.2				661.8		
59.9	Very Soft Brown and Gray Fine Grained Diorite (No Recovery).					
	Hard Black and White Fine Grained Diorite.	100	NX	656.8	63.2' - 45° Joint 6" Inclusion of Hard Light Gray Fine to Medium Grained Granite at 77.0' to 77.5'.	100
				651.8		
		100	NX	646.8		100
79.0	Coring Terminated.			641.8		

Approximately 15 GPM Water Loss Between 39' and 62'.

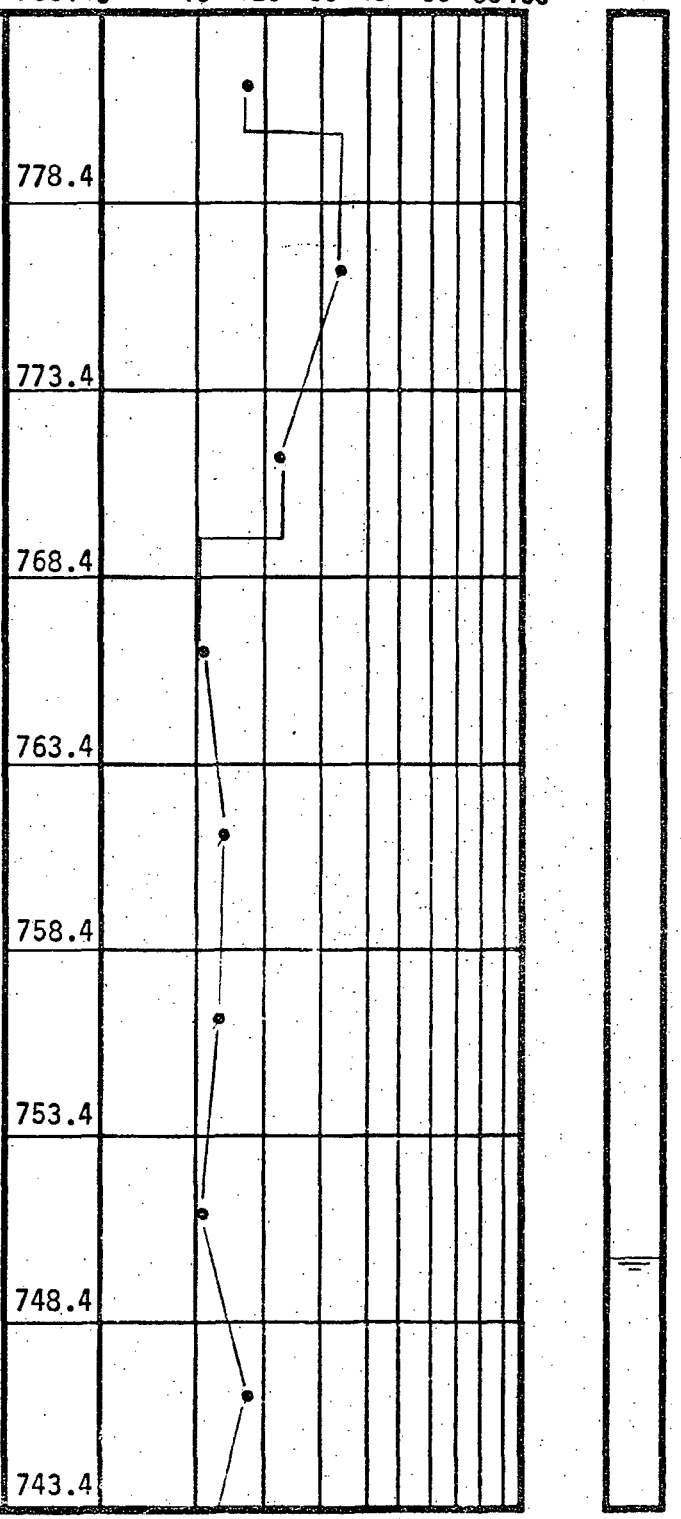
CORE BORING RECORD

BORING NO. H- 69
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		783.4
	Very Stiff Red Brown and Tan Slightly Sandy Clayey Silt with Traces of Gravel (High Level Terrace).	
3.0		
	Hard Red Brown, Tan, and White Clayey Silt.	778.4
9.0		773.4
	Very Stiff Red Brown, Tan and White Silt.	
14.0		768.4
	Stiff Pink and White Fine to Medium Sandy Micaceous Silt.	763.4
		758.4
29.0		753.4
	Stiff and Very Stiff Tan Pink and Black Fine Sandy Micaceous Silt.	748.4
39.0		
40.0	Firm and Stiff Tan Slightly Micaceous*	743.4



* Silt.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-70

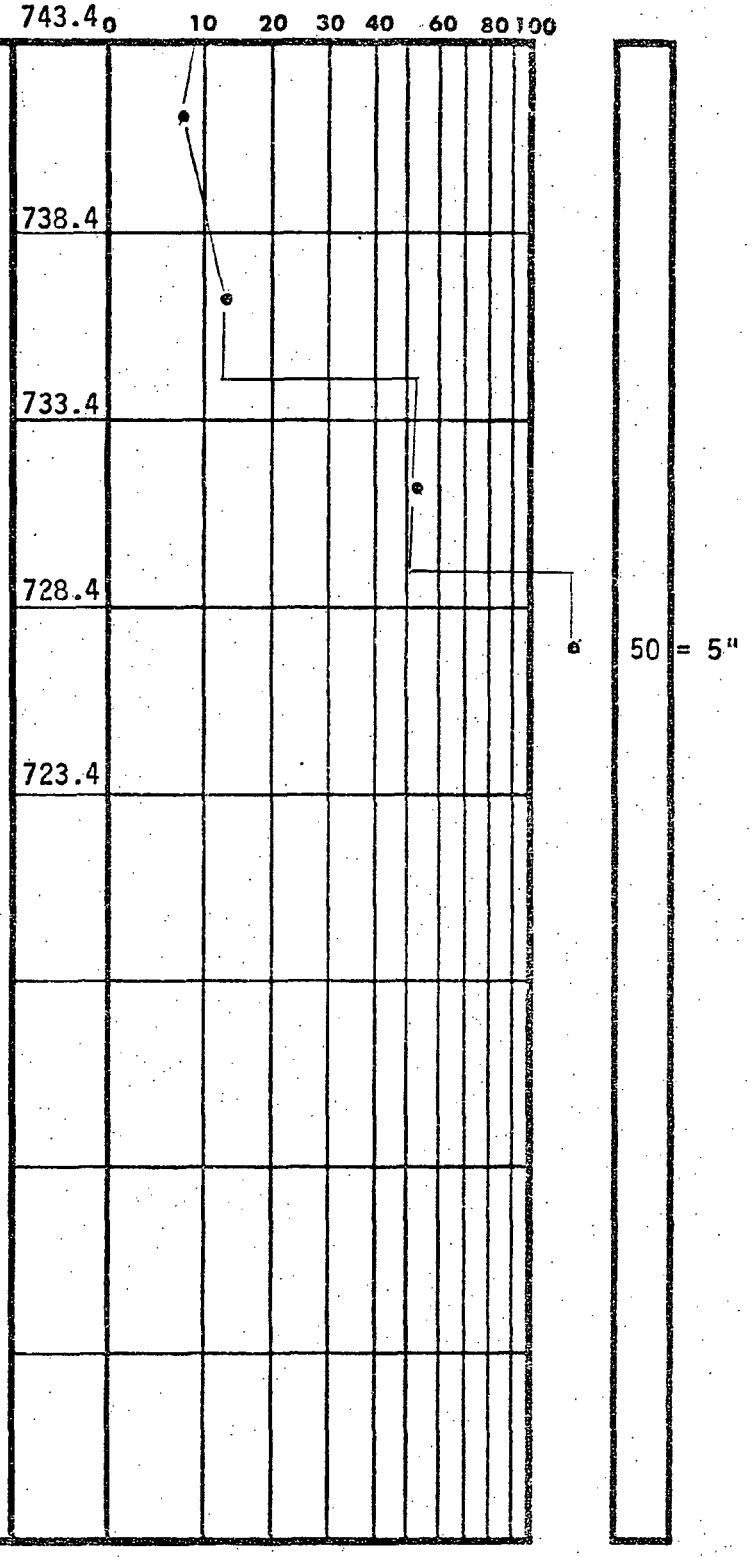
DATE DRILLED 5-28-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		743.4
	Firm and Stiff Tan Slightly Micaceous Silt.	738.4
49.0	Very Dense Gray and Black Silty Very Fine Sand.	733.4
54.0	Partially Weathered Rock That Becomes Gray and Black Silty Very Fine Sand When Sampled.	728.4
57.5	See Following Rock Log.	723.4

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-70

DATE DRILLED 5-28-70

JOB NO. CH 2055

UNDISTURBED SAMPLE

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				728.4		
57.5					JOINTS DEPTH DIP	
59.2	Very Soft Light Gray Fine to Medium Grained Granite (No *			723.4	59.2'-67.6' Fractured Rock.	
62.6	Moderately Hard Light Gray Fine to Medium Grained Granite (No Recovery).	66 %	NX			15%
63.0	Moderately Hard Dark Gray Mafic Dike.			718.4		
65.3	Hard Black and White Fine **					
66.1	Very Soft Black and White Fine Grained Diorite.					
67.2	Moderately Hard Black Brown and White Fine Grained Diorite			713.4		
	Hard Brown and White Fine Grained Diorite.	87 %	NX		71.2' - 60° Joint	80%
				708.4	75.7' - 60° Joint with Groundwater Deposits on Surface.	
77.5	Coring Terminated.	100	NX	703.4		100%

* Recovery).
** Grained Diorite. (No Recovery).
No Drilling Water Loss.

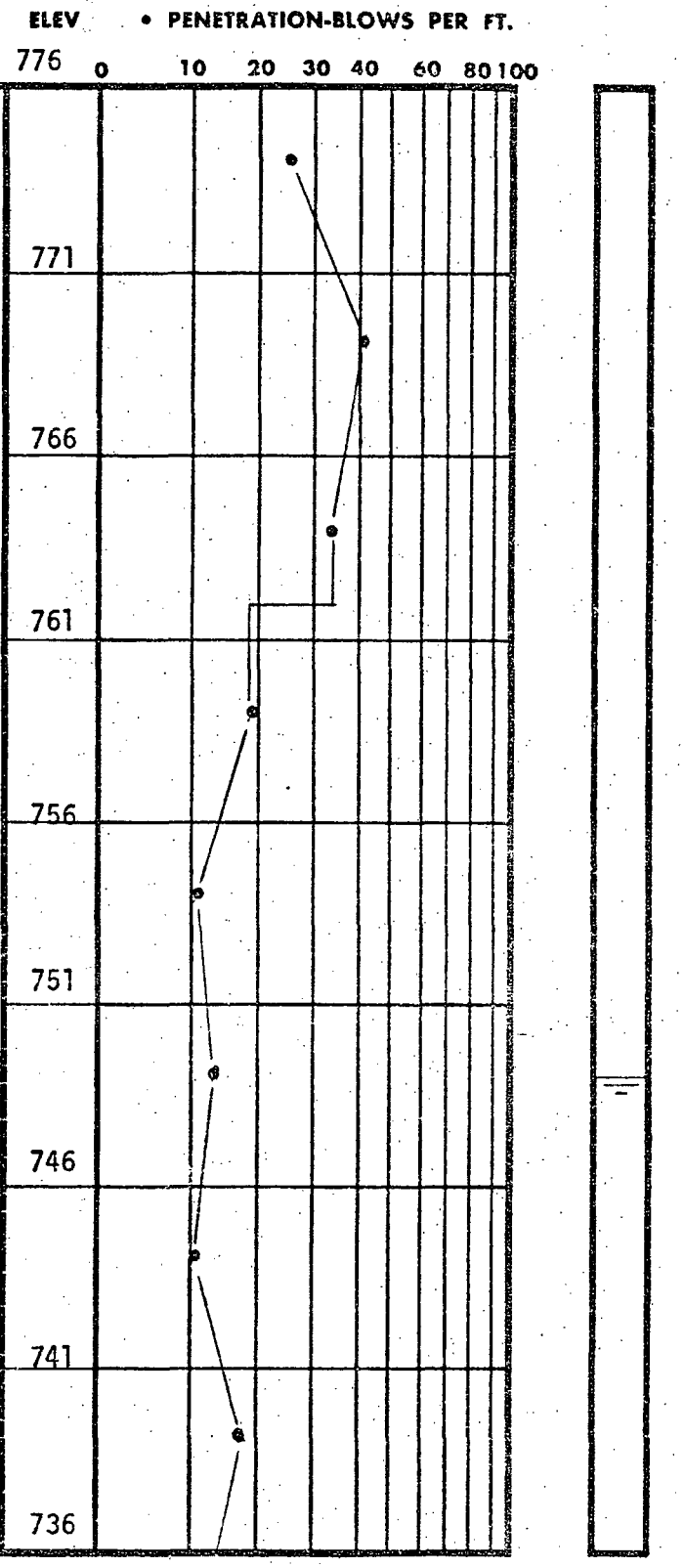
CORE BORING RECORD

BORING NO. H-70
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff to Hard Red Brown Slightly Sandy Clayey Silt (High Level Terrace)
8.0	Hard Red Brown Slightly Sandy Slightly Micaceous Silt.
14.0	Very Stiff to Stiff Red and Tan Slightly Sandy Micaceous Silt.
29.0	Stiff Tan Black and White Silt.
34.0	Very Stiff Tan Gray and Black Fine to Medium Very Sandy Silt.
39.0	
40.0	Stiff Tan Silt.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-71

DATE DRILLED 6-2-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

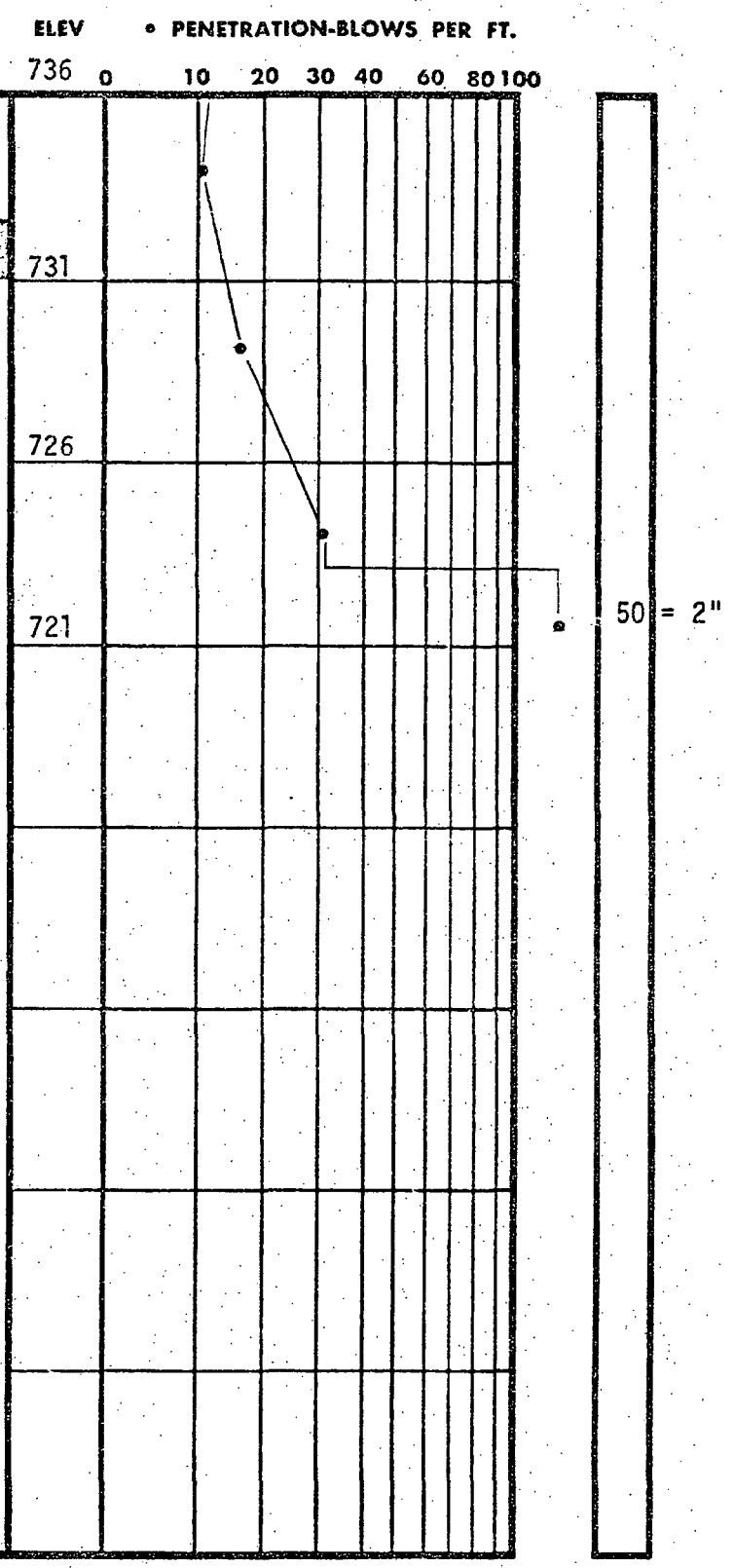
WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Stiff Tan Silt.	736
45.0	Very Stiff to Hard Brown Black and White Slightly Sandy Very Micaceous Silt.	731
		726
53.0	Partially Weathered Rock That Becomes Black and White Fine to *	
54.4	See Following Rock Log.	721



*Coarse Sand When Sampled.

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-71

DATE DRILLED 6-2-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				726		
54.4	Very Soft Black and White Coarse Grained Diorite (No Recovery).	25	NX	721		0
57.4	Hard Black and White Coarse Grained Diorite.	100	NX	716	JOINTS DEPTH DIP 63.6' - 45° Joint	100
		100	NX	711		100
68.0	Coring Terminated.			706		

No Drilling Water Loss.

Page 3

CORE BORING RECORD

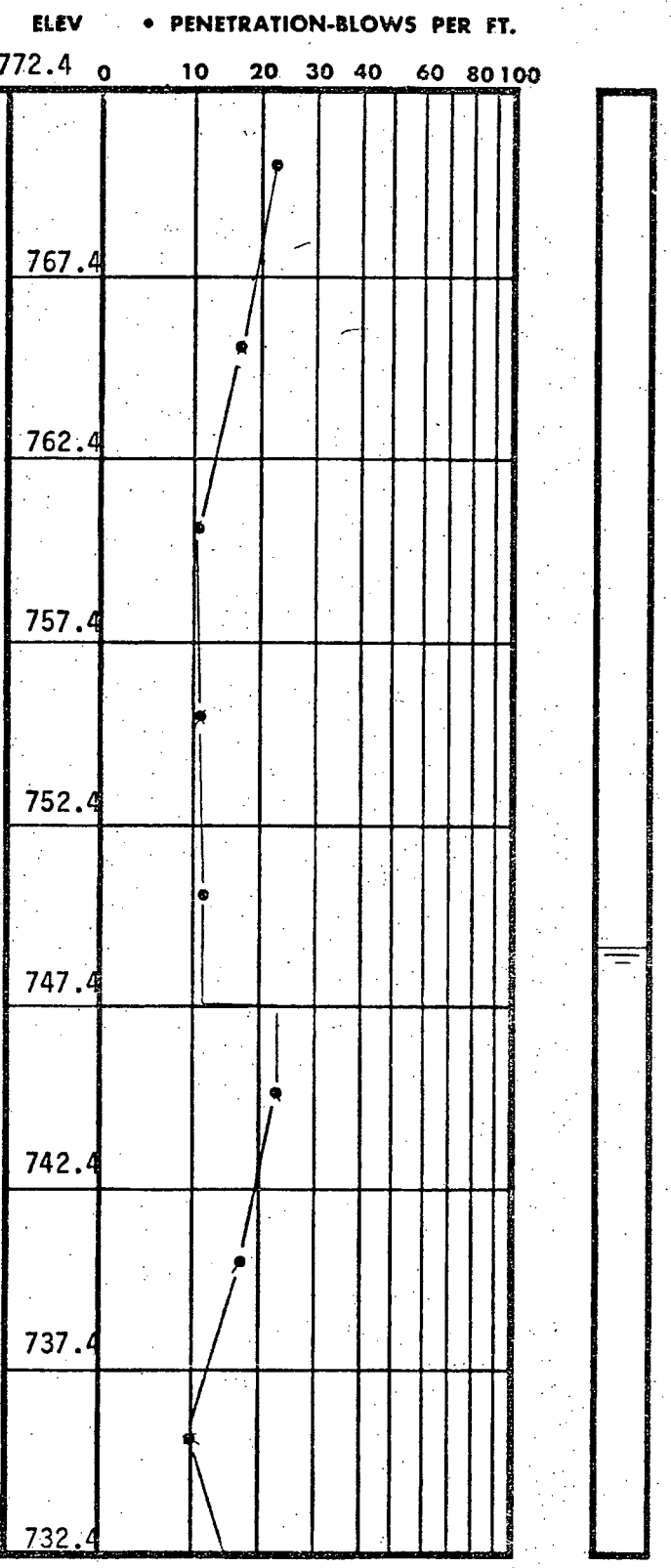
BORING NO. H-71

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Red Brown Slightly Sandy Clayey Silt.	772.4
4.0	Very Stiff Red Brown Slightly Clayey Silt.	767.4
9.0	Stiff Brown Pink and White Silt.	762.4
		757.4
		752.4
		747.4
25.0	Very Stiff Brown Pink and Black Slightly Sandy Micaceous Silt.	
29.0	Very Stiff Tan Black and White Silt.	742.4
		737.4
34.0	Stiff Tan Black and White Silt.	
39.0		
40.0	Very Stiff Tan Very Fine Sandy Silt.	732.4



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-72

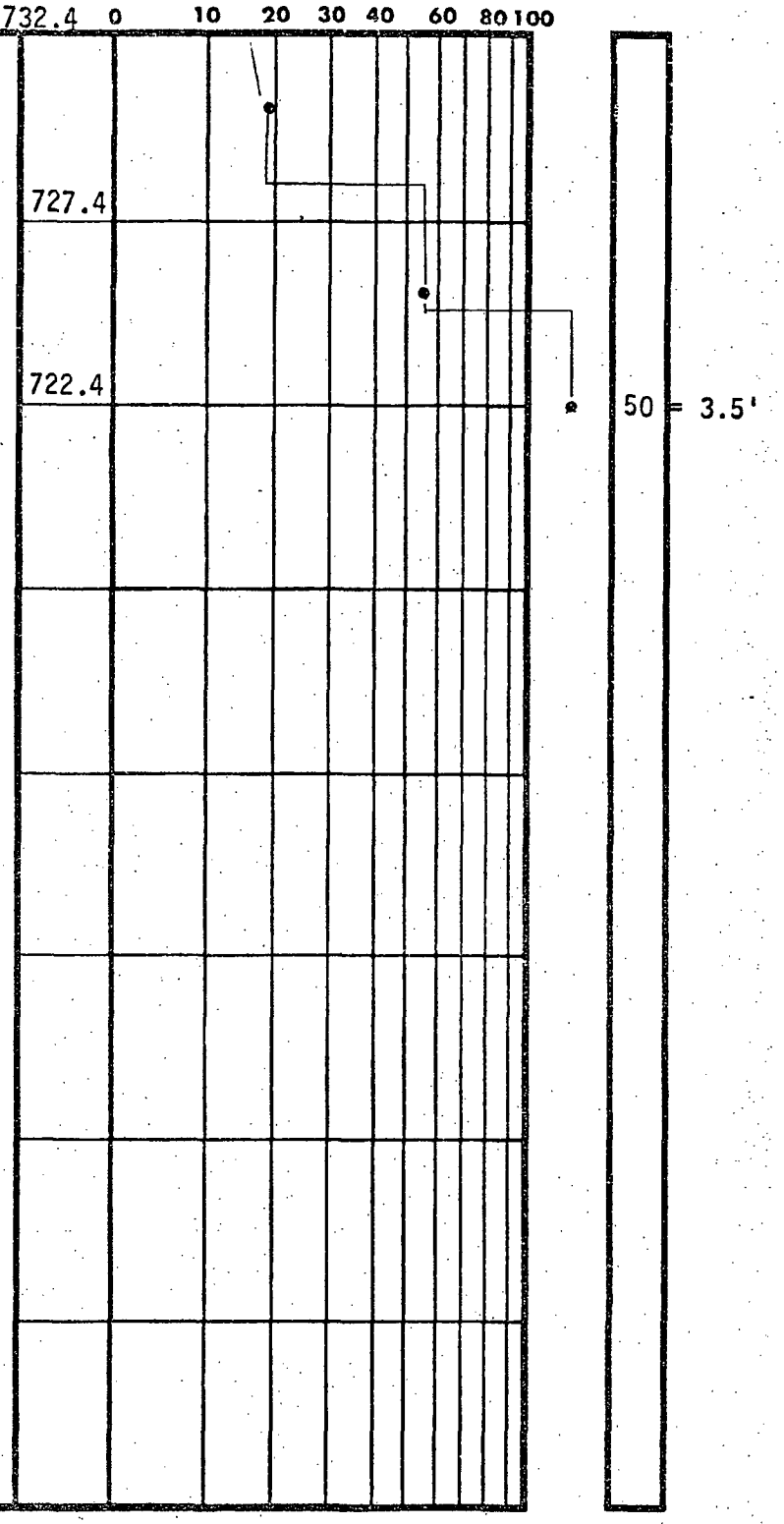
DATE DRILLED 5-28-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		732.4
	Very Stiff Tan Very Fine Sandy Silt.	
44.0		727.4
	Very Dense Gray Micaceous Fine Sand.	
47.5		722.4
	Partially Weathered Rock.	
50.2		
	See Following Rock Log.	

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-72

DATE DRILLED 5-28-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				722.4	JOINTS DEPTH DIP	
50.2 51.2	Very Soft Dark Green Meta-*	42	NX		52.5'-55.5' Vertical Seam of Hard Light Gray Granite.	0
	Hard Dark Green Meta-Gabbro (No Recovery).	100	NX	717.4		100
58.3	Hard Black and White Fine Grained Diorite.	100	NX	712.4	57.5' - 45° Joint 57.8' - Inclusion or Hard Light Gray Fine to Medium Grained Granite. 58.7' - 45° Joint 61.8' - Slickenside Surface.	100
61.8	Coring Terminated.			707.4		

* Gabbro (No Recovery).

No Drilling Water Loss.

CORE BORING RECORD

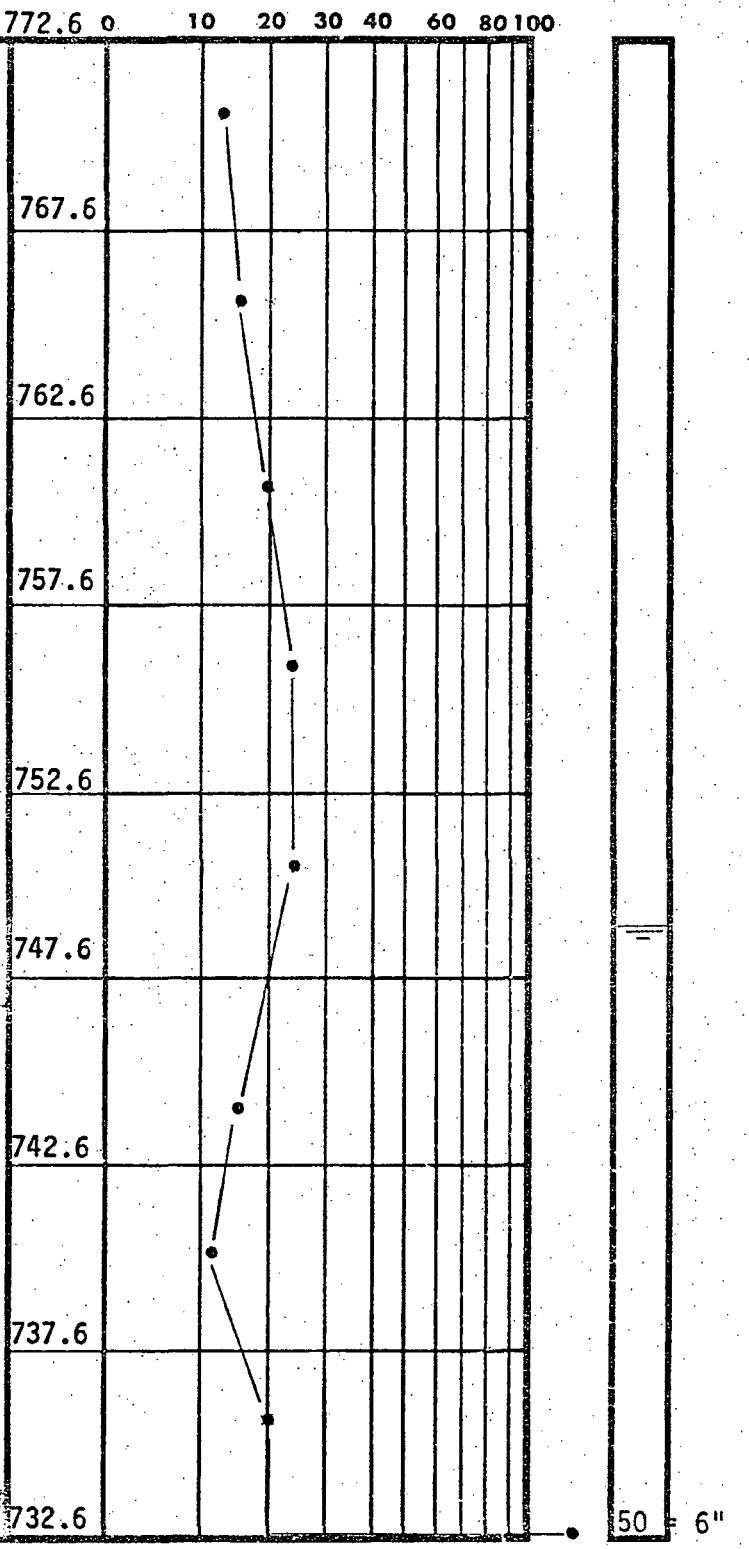
BORING NO. H-72

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Red Brown Slightly Sandy Clayey Silt.	772.6
4.0	Very Stiff Brown Tan and Black Slightly Sandy Micaceous Silt.	767.6
		762.6
		757.6
19.0	Very Stiff Pink Tan and Black Slightly Sandy Micaceous Silt.	752.6
		747.6
29.0	Stiff Tan and Black Slightly Sandy Micaceous Silt.	742.6
34.0	Very Stiff Brown and Gray Fine Sandy Very Micaceous Silt.	737.6
40.0		732.6



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-73

DATE DRILLED 5-27-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0		732.6	
40.5	* See Following Rock Log.	727.6	

* Partially Weathered Rock That Becomes Gray Micaceous Fine to Medium Sand When Sampled.

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-73

DATE DRILLED 5-27-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 732.6	REMARKS	RQD
40.5	Very Soft Light Brown and Gray Fine to Medium Grained Granite*					
43.0	Moderately Hard Light Gray Fine to Medium Grained Granite **	51	NX	727.6		42
45.5	Hard Black and White Fine Grained Diorite.					
49.0	Hard Dark Green Meta-Gabbro.	100	NX	722.6		97
50.4	Hard Brown and White Fine Grained Diorite.					
51.2	Hard Dark Green Meta-Gabbro.	100	NX			
53.6	Hard Light Gray Fine to Medium Grained Granite.			717.6		100
55.6	Coring Terminated.			712.6		

* (No Recovery).
** (No Recovery).

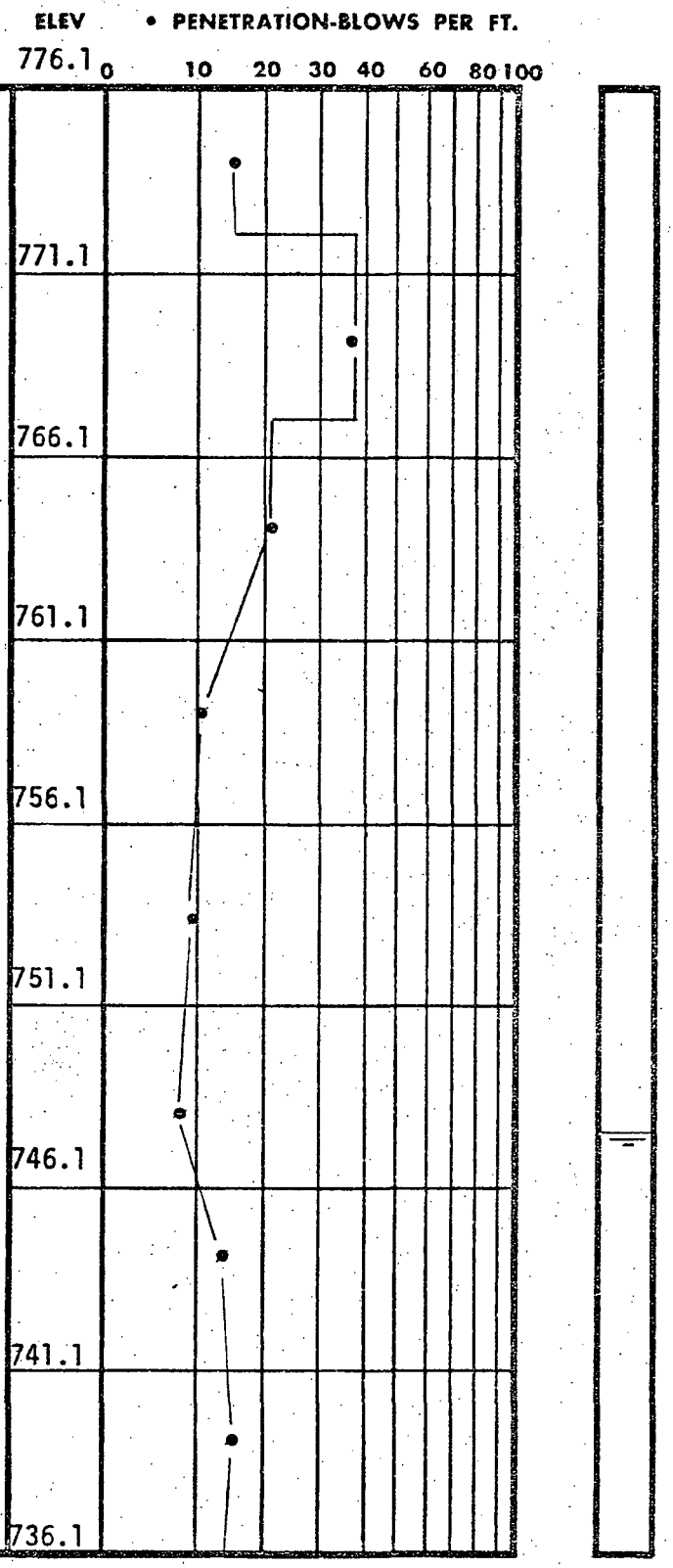
CORE BORING RECORD

BORING NO. H-73
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		776.1
	Stiff Red Brown Slightly Sandy Clayey Silt (High Level Terrace).	
4.0		771.1
	Hard Red Brown Slightly Clayey Slightly Micaceous Silt.	
9.0		766.1
	Very Stiff and Stiff Brown and Tan Micaceous Silt.	
		761.1
		756.1
		751.1
25.0		
	Firm to Very Stiff Brown Tan and Black Fine Sandy Micaceous Silt.	
		746.1
		741.1
40.0		736.1



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

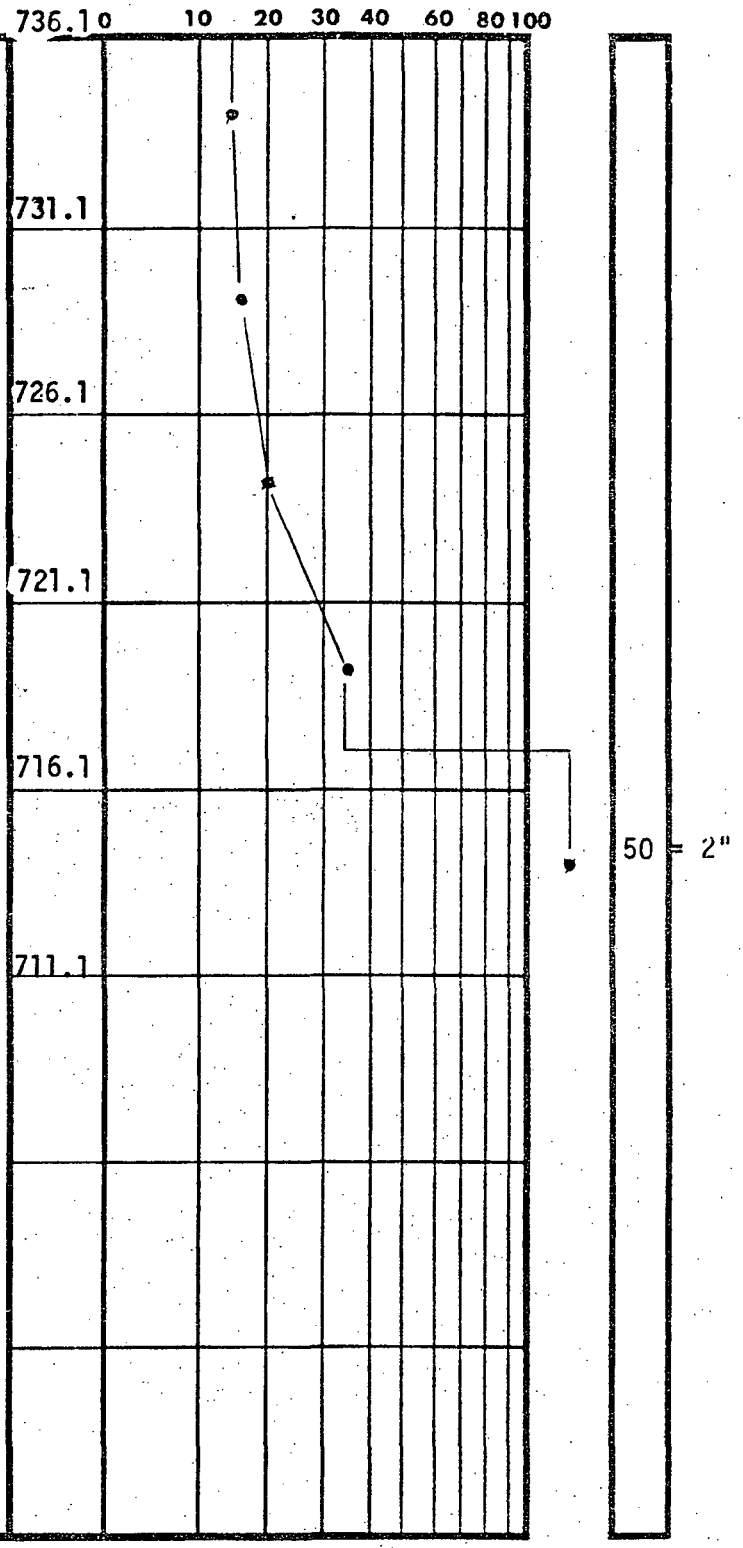
BORING NO. H-74

DATE DRILLED 5-21-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		736.1
	Firm to Very Stiff Brown Tan and Black Fine Sandy Micaceous Silt.	731.1
49.0		726.1
	Very Stiff and Hard Tan Black and White Fine Sandy Very Micaceous Silt.	721.1
59.0		716.1
	Partially Weathered Rock That Becomes Tan Black and White Micaceous Silty Fine Sand When Sampled.	
	See Following Rock Log.	711.1



TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-74

DATE DRILLED 5-21-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				716.1		
63.3		*			JOINTS	100
	Hard Black and White Coarse Grained Diorite.	100	NX	711.1	DEPTH DIP 66.6' - Slickenside Surface.	100
		100	NX	706.1	67.4' - Slickenside Surface Healed Together.	100
72.5						
	Coring Terminated.			701.1		

No Drilling Water Loss. *100 NX

Page 3

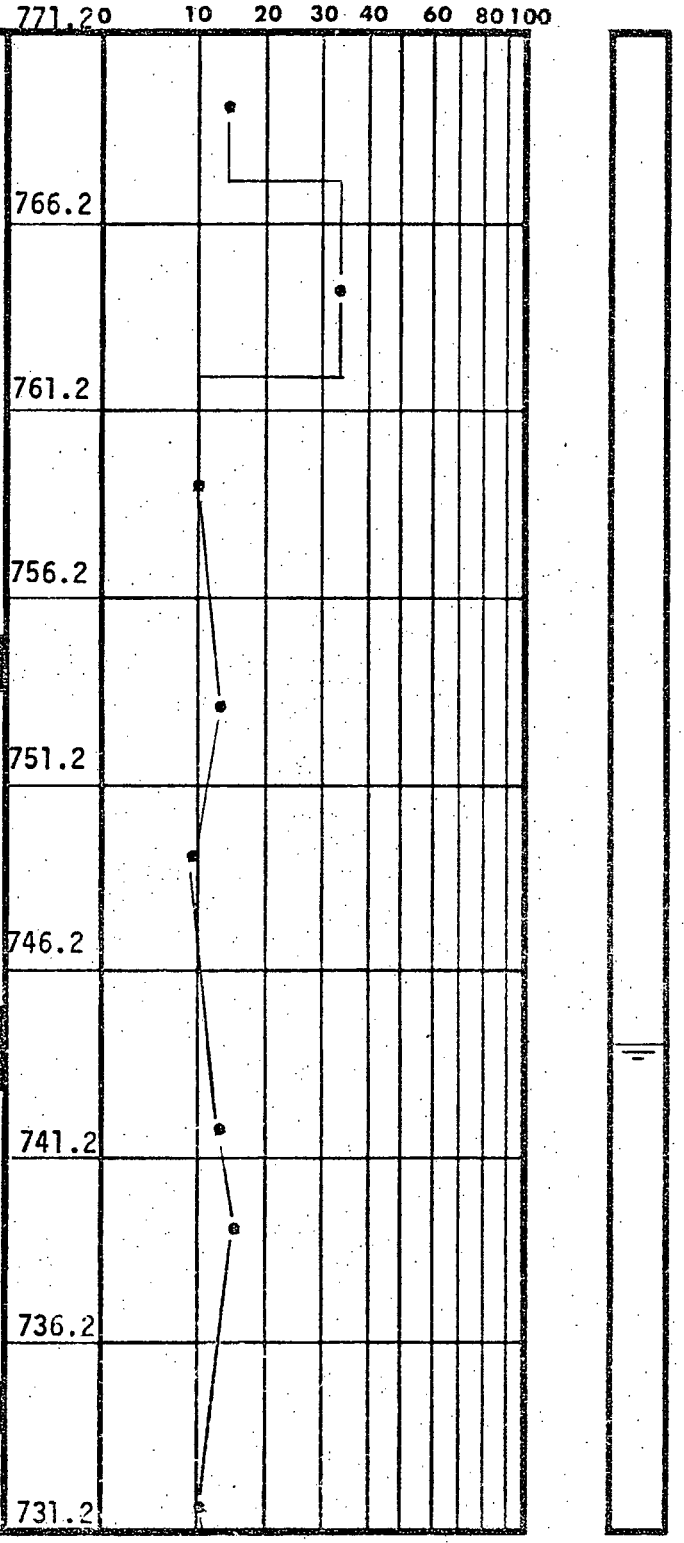
CORE BORING RECORD

BORING NO. H-74
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		771.2
	Stiff Red Brown Slightly Sandy Clayey Silt (High Level Terrace).	
4.0		766.2
	Hard Red Brown and Tan Clayey Silt.	
9.0		761.2
	Stiff Brown Tan and Black Micaceous Silt.	
		756.2
		751.2
		746.2
		741.2
31.0		
	Very Stiff Brown Very Micaceous Silt with Gravel Size Quartz Fragments.	
		736.2
38.5		
	Stiff Pink Gray and Black Fine *	
40.0		731.2



* Sandy Micaceous Silt.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

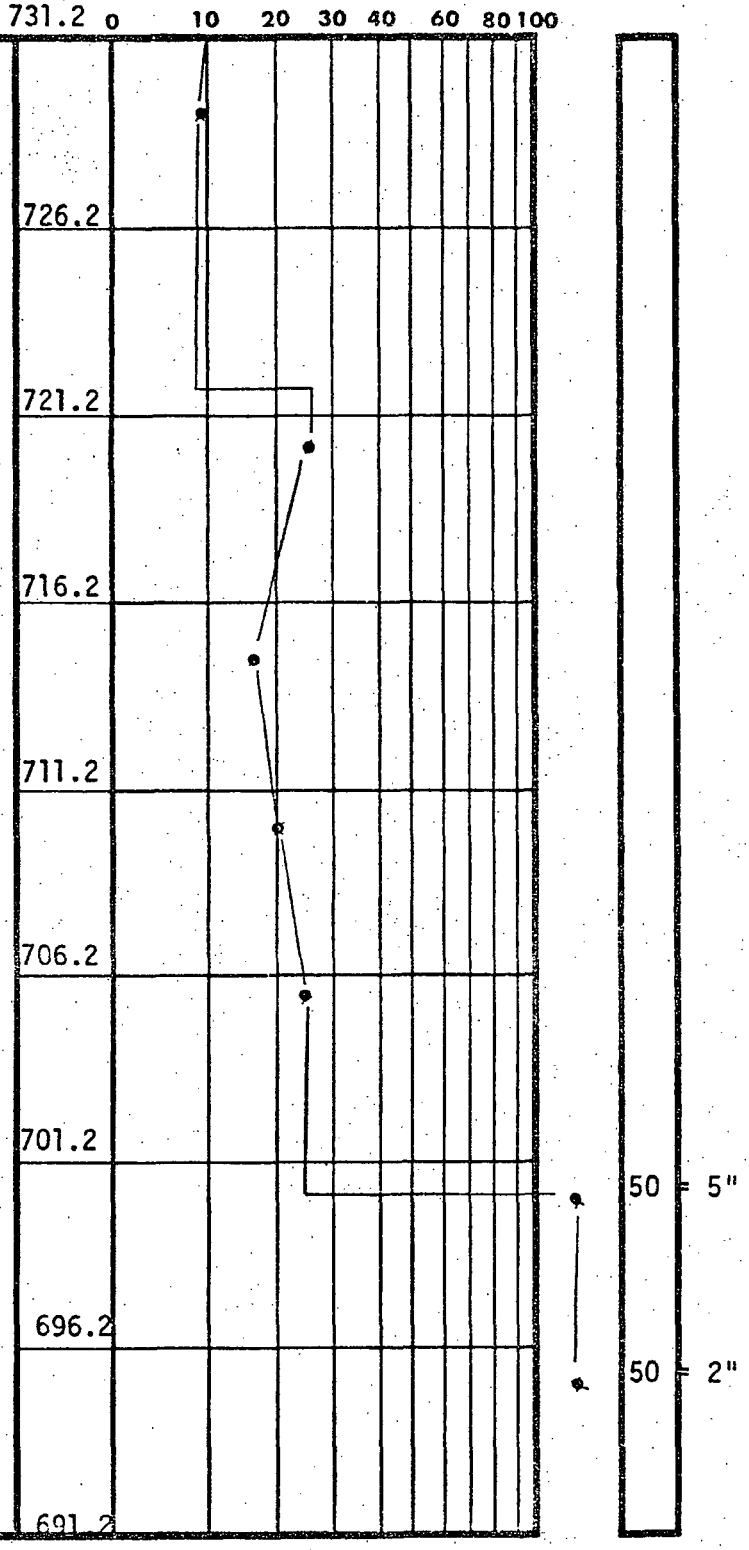
BORING NO. H-75

DATE DRILLED 5-11-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT.
40.0	Stiff Pink Gray and Black Fine Sandy Micaceous Silt.	731.2	
		726.2	
49.5		721.2	
	Very Stiff Tan Gray and Black Fine Sandy Micaceous Silt with Gravel Size Fragments of Weathered Rock.		
53.0	Very Stiff Tan Gray and Black Fine Sandy Micaceous Silt.	716.2	
		711.2	
62	Very Stiff Tan Gray and Black Fine to Coarse Very Sandy Micaceous Silt.	706.2	
		701.2	
71.0	Partially Weathered Rock That Becomes Tan Gray and Black Fine to Coarse Very Sandy Micaceous Silt When Sampled.	696.2	
75.6	See Following Rock Log.	691.2	



TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-75

DATE DRILLED 5-11-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS
75.6				696.2	RQD
77.0	Hard Black and White Coarse *	100	NX		100
78.0	Hard Black and White Fine **				
79.2	Hard Black and White Coarse ***				
	Hard Black and White Fine****			691.2	

* Grained Diorite.
** Grained Diorite.
*** Grained Diorite.
**** Grained Diorite.

CORE BORING RECORD

BORING NO. H-75
JOB NO. Ch 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 691.2	REMARKS	RQD
80.1	Hard Black and White Fine Grained Diorite.	100	NX		JOINTS DEPTH / DIP	100
	Hard Black and White Coarse Grained Diorite.	100	NX	686.2	82.7' - 45° Joint	100
85.7	Coring Terminated.			681.2		

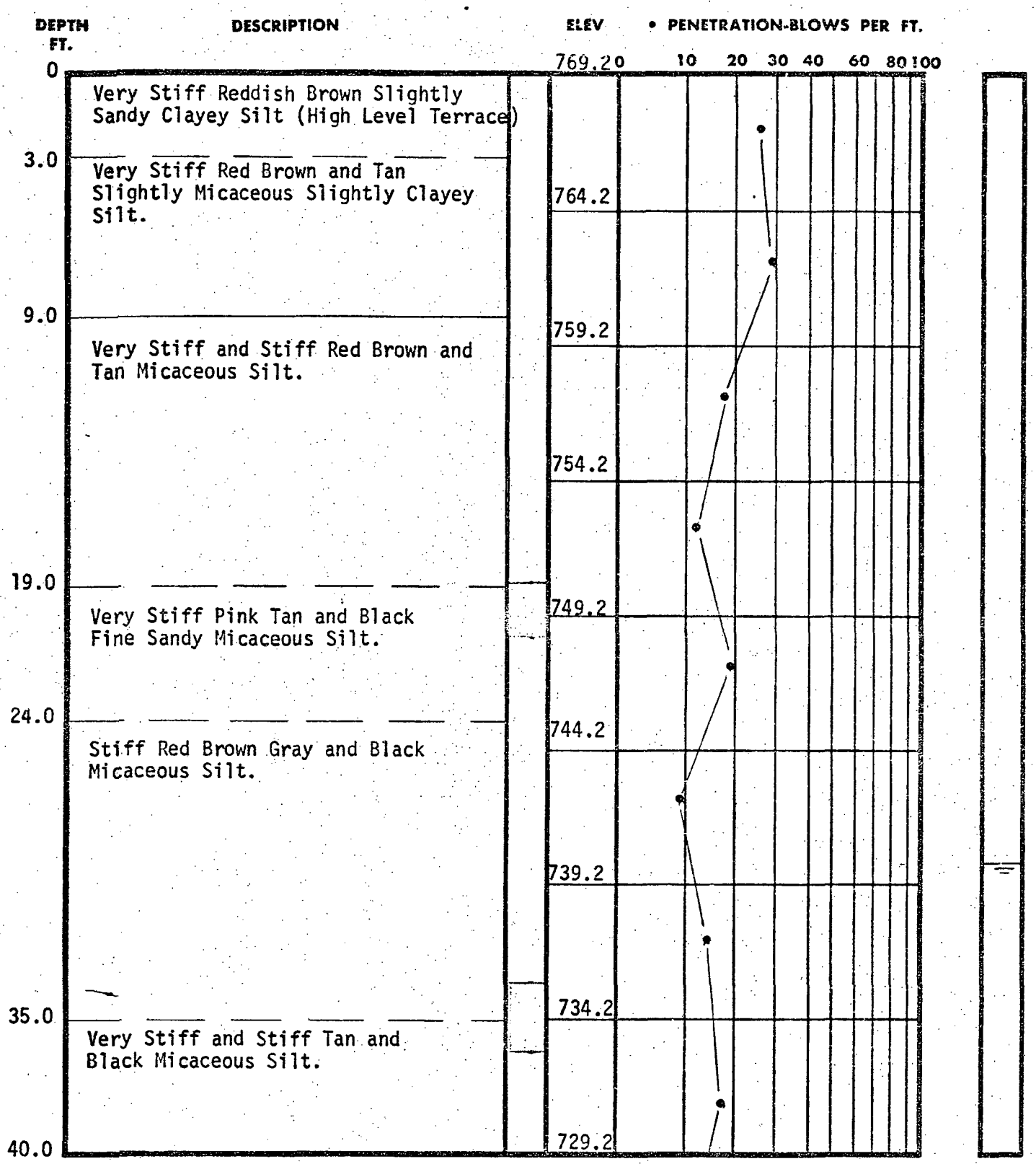
No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-75
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

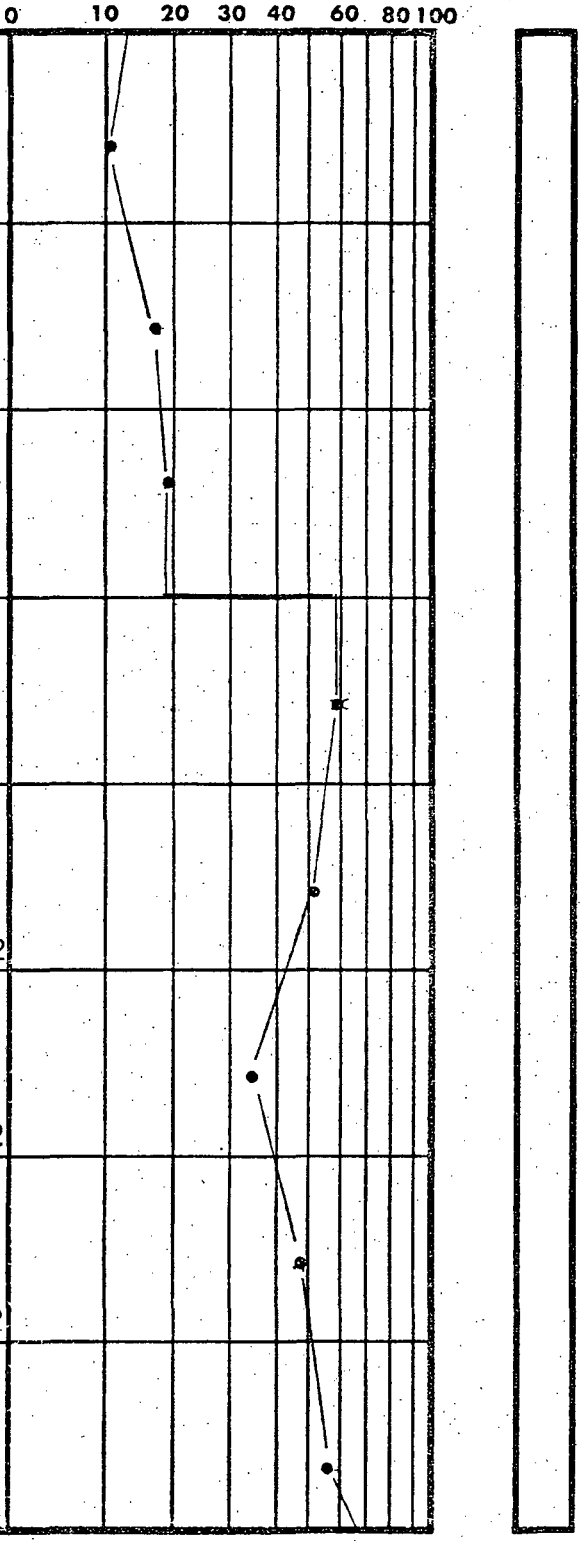
BORING NO. H-76

DATE DRILLED 5-23,24,25-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		729.2
	Very Stiff and Stiff Tan and Black Micaceous Silt.	
45.0		724.2
	Very Stiff Gray Tan and Black Very Micaceous Silt.	
		719.2
		714.2
55.0		
	Hard Dark Green Very Micaceous Silt.	
		709.2
		704.2
65.0		
	Hard Tan Gray and White Fine to Medium Sandy Micaceous Silt.	
		699.2
		694.2
		689.2
80.0		



TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-76

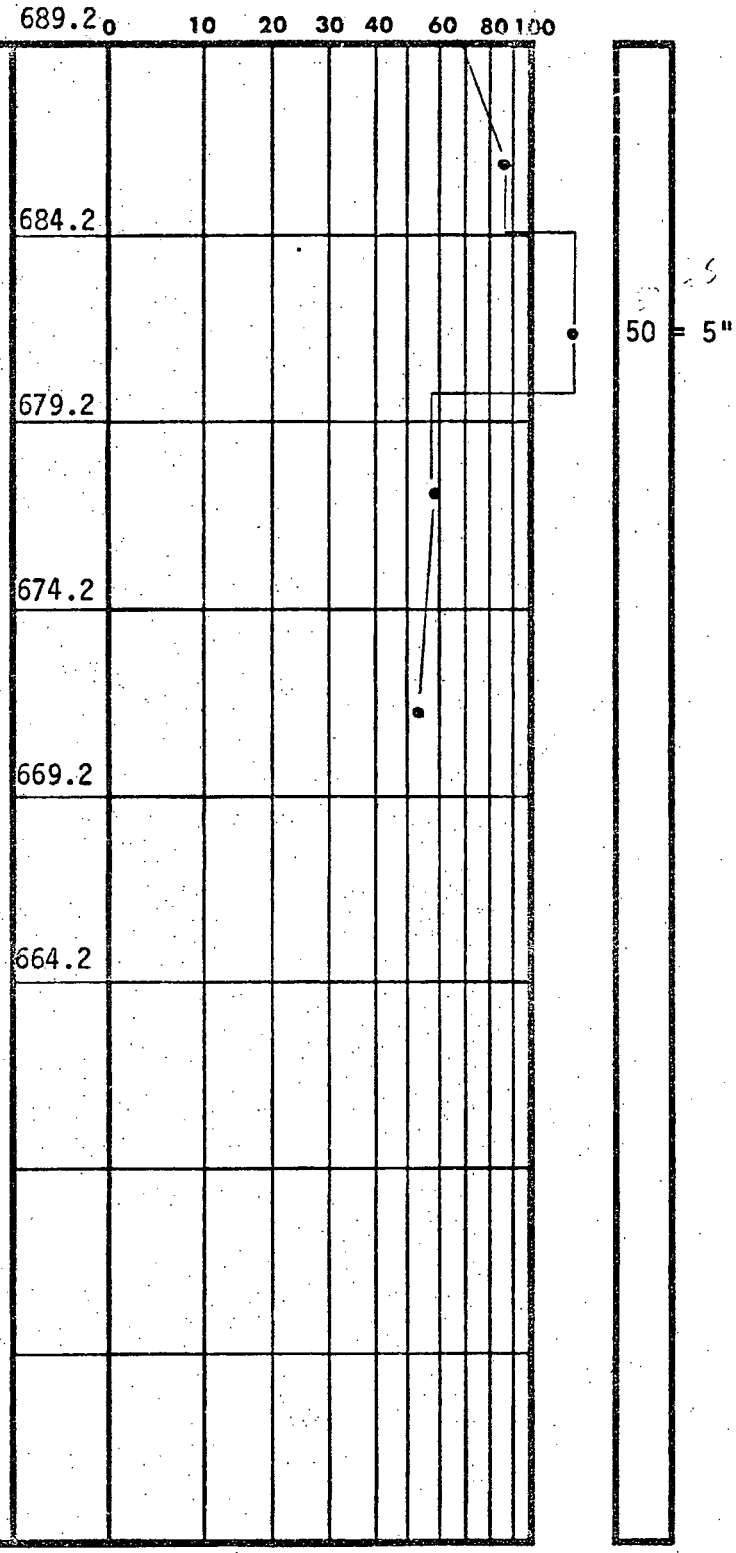
DATE DRILLED 5-23,24,25-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
80.0		689.2
	Hard Tan Gray and White Fine to Medium Sandy Micaceous Silt.	
85.0		684.2
	Partially Weathered Rock That Becomes Gray and White Very Silty Fine to Coarse Sand When Sampled.	
89.5		679.2
	Very Dense Tan Black and White Micaceous Very Silty Fine to Medium Sand.	
94.5		674.2
	Hard Tan Black and White Fine to Medium Sandy Micaceous Silt.	
100.5		669.2
	See Following Rock Log.	
		664.2

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page 3

BORING NO. H-76

DATE DRILLED 5-23,24,25-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
					JOINTS DEPTH DIP	
				669.2	100.5'-102' Rock Fractured.	
100.5	Moderately Hard Black Brown and Gray Coarse Grained Diorite.					
102.0	Hard Black and White Coarse Grained Diorite.	100	NX		102.9' - Slickenside Surface on 45°.	84
104.4	Hard Light Gray Fine Grained*			664.2	107.9' - 60° Joint	
105.5	Hard Black and White Coarse Grained Diorite.	100	NX		108.7' - 45° Joint	100
110.2		100	NX	659.2		100
111.2	Hard Light Gray Fine Grained *					
112.0	Hard Black and White Fine **					
	Coring Terminated.			654.2		

* Granite.
** Grained Diorite.
No Drilling Water Loss.

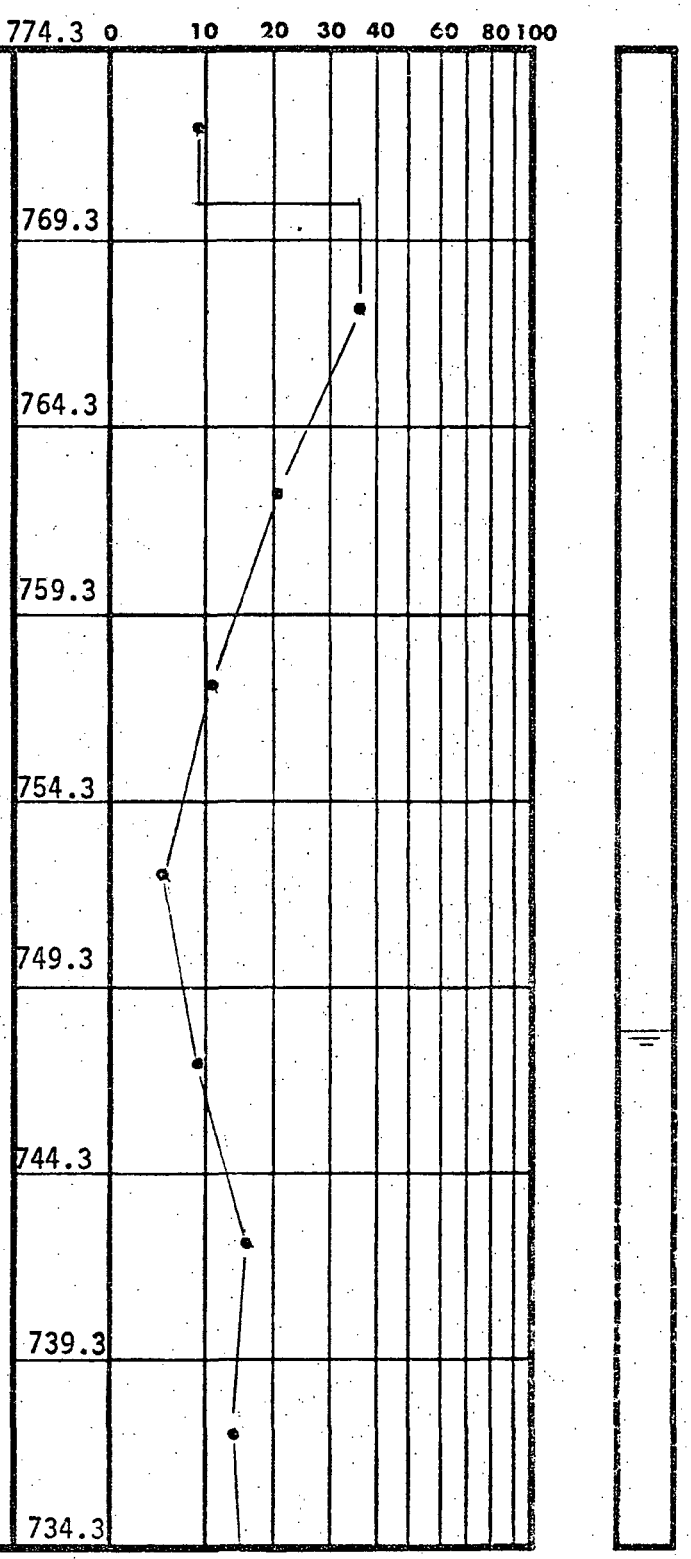
CORE BORING RECORD

BORING NO. H-76
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Red Brown Slightly Sandy Clayey Silt (High Level Terrace).	774.3
4.0	Hard Red Brown and Tan Clayey Silt.	769.3
9.0	Very Stiff to Stiff Brown Tan and Black Micaceous Silt.	764.3
		759.3
		754.3
		749.3
29.0	Very Stiff to Stiff Brown Gray and Black Fine Sandy Micaceous Silt.	744.3
		739.3
40.0		734.3



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-77

DATE DRILLED 5-12-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0		734.3	
	Very Stiff to Stiff Brown Gray and Black Fine Sandy Micaceous Silt.	729.3	
		724.3	
51.8	See Following Rock Log.	719.3	

TEST BORING RECORD

Page 2

BORING NO. H-77

DATE DRILLED 5-12-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				724.3		
51.8						
52.0	Hard Black and White Coarse Grained Diorite.					
53.6	Hard Light Gray Fine Grained Granite.	100	NX	719.3		100
	Hard Black and White Coarse Grained Diorite.	100	NX	714.3		100
63.0				709.3		
	Coring Terminated.					

No Drilling Water Loss.

Page 3

CORE BORING RECORD

BORING NO. H-77

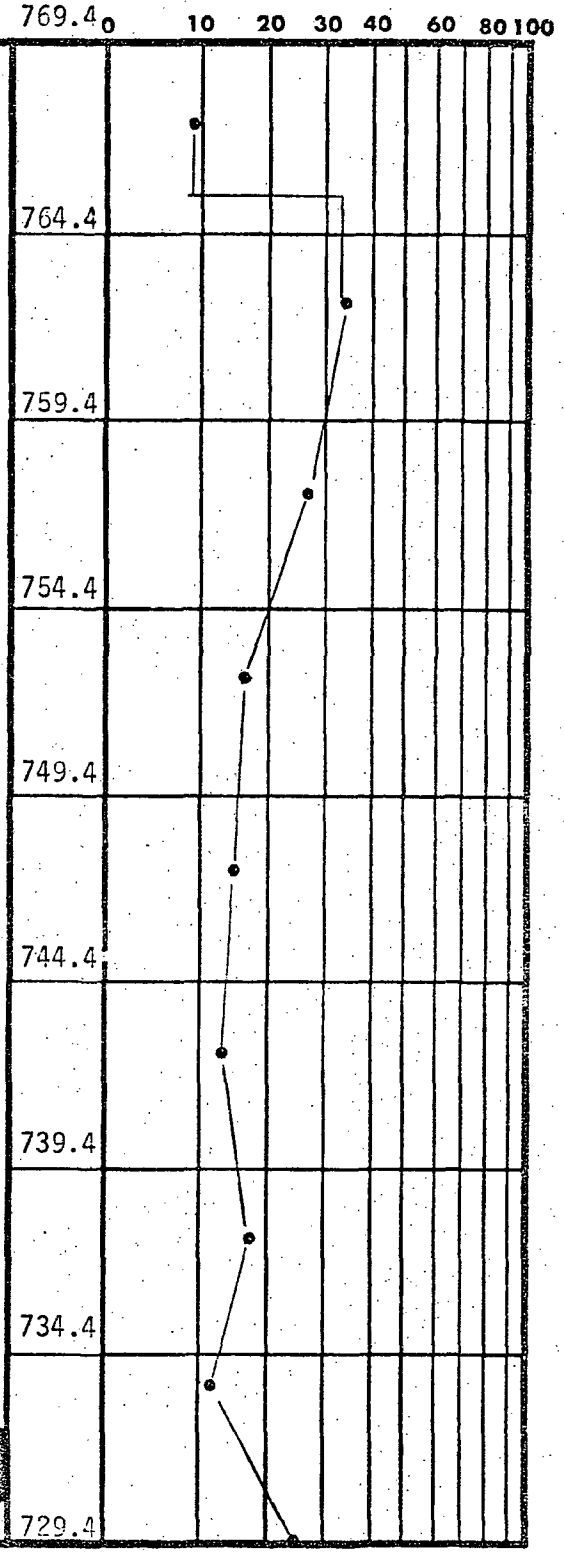
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Red Brown Slightly Sandy Slightly Clayey Silt (High Level Terrace).	769.4
4.0	Hard Brown and Tan Clayey Silt.	764.4
9.0	Very Stiff Red Brown and Tan Micaceous Silt.	759.4
14.0	Stiff to Very Stiff Brown and Tan Fine Sandy Micaceous Silt.	754.4
		749.4
		744.4
		739.4
		734.4
40.0		729.4

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-73

DATE DRILLED 5-20-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		729.4
42.0	Micaceous Silt.	
	Very Stiff and Hard Brown Gray and Black Very Micaceous Silt.	724.4
		719.4
52.0		
	Dense Brown Gray and Black Micaceous Silty Fine Sand.	714.4
58.2		
	See Following Rock Logs.	709.4

• PENETRATION-BLOWS PER FT.

0 10 20 30 40 60 80 100

50 = 3"

TEST BORING RECORD

Page 2

BORING NO. H-78

DATE DRILLED 5-20-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				714.4		
58.2						
60.4	Very Soft Light Gray Fine to Medium Grained Granite (No*			709.4	JOINTS DEPTH - DIP	56
60.6	Hard Light Gray Fine to Med-**	63	NX		61.8' - 45° Joint	
63.5	Hard Black and White Coarse Grained Diorite.				62.0' - 45° Joint	
64.9	Very Soft Black and White ***			704.4		
	Hard Black and White Coarse Grained Diorite.	68	NX			64
		100	NX	699.4		100
73.0						
	Coring Terminated.			694.4		

* Rocovery).
**ium Grained Granite.
*** Coarse Grained Diorite.

No Drilling Water Loss.

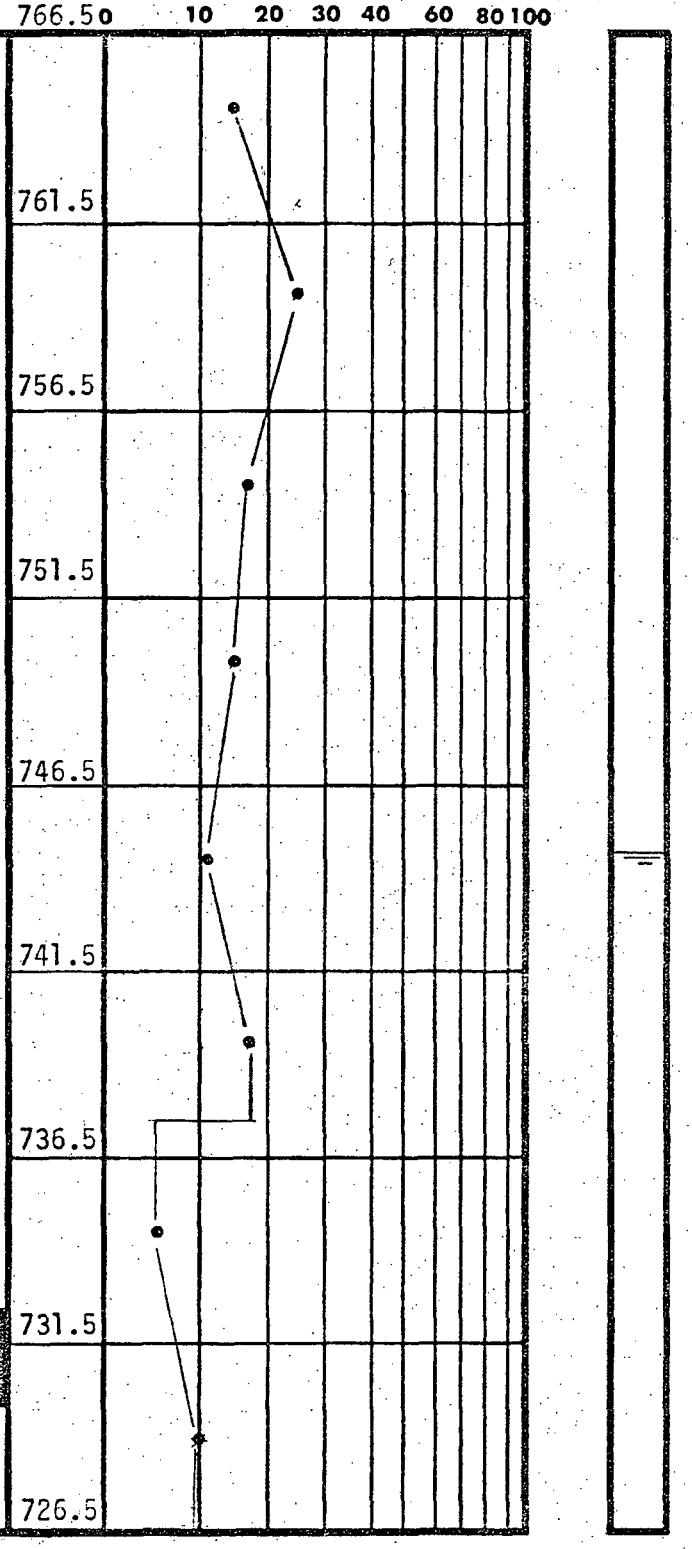
CORE BORING RECORD

BORING NO. H-78
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Red Brown Clayey Silt with Rounded Coarse Sand and Gravel. (High Level Terrace)	766.5
4.0	Very Stiff Red Brown and Tan Slightly Clayey Slightly Micaceous Silt.	761.5
9.0	Very Stiff and Stiff Brown Tan and Gray Slightly Sandy Micaceous Silt.	756.5
19.0	Stiff and Very Stiff Brown and Black Micaceous Silt.	746.5
29.0	Firm Tan Pink and Black Slightly Sandy Micaceous Silt.	736.5
36.0	Stiff Tan Gray and Black Slightly Sandy Micaceous Silt.	731.5
40.0		726.5



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

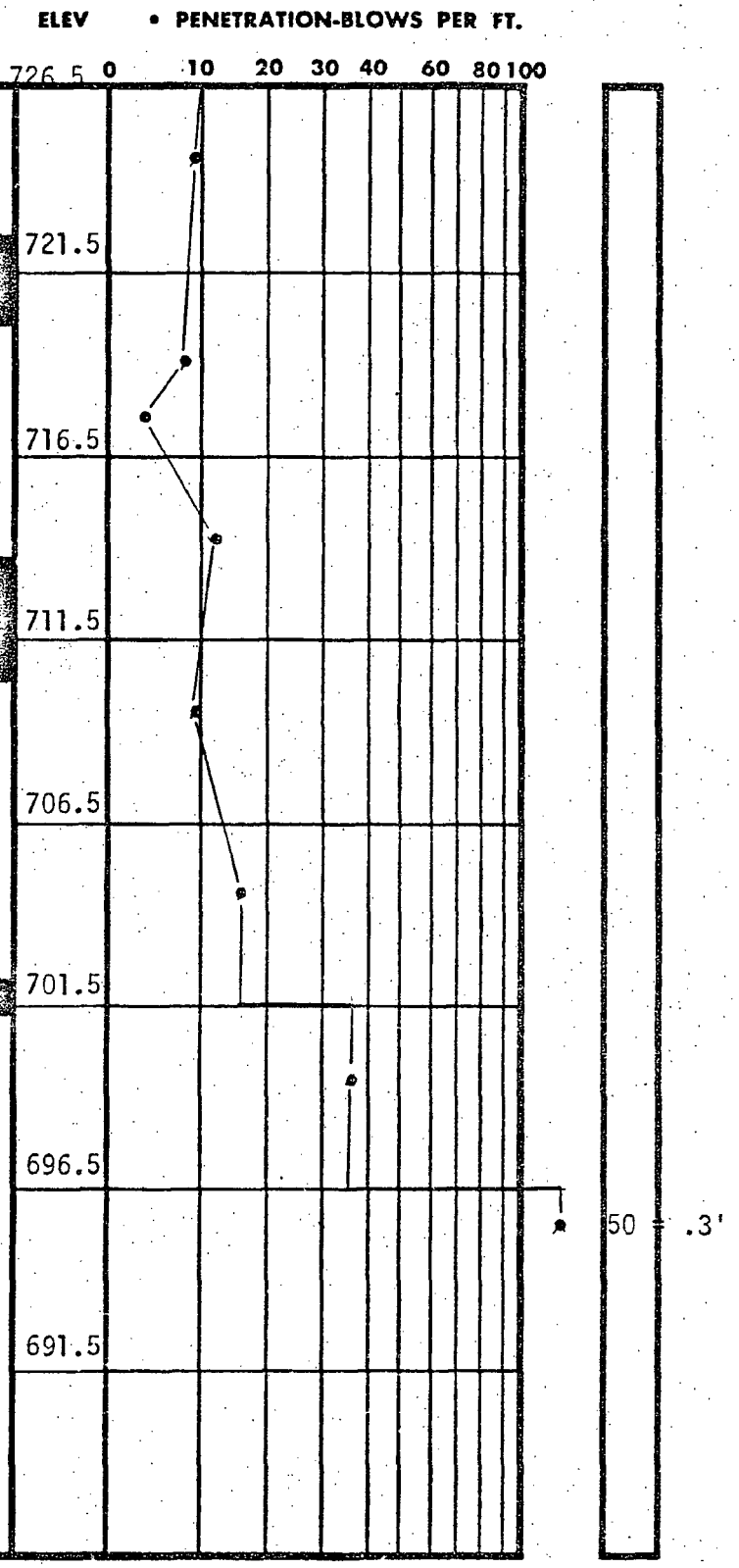
BORING NO. H-79

DATE DRILLED 5-13-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0		726.5
	Stiff Tan Gray and Black Slightly Sandy Micaceous Silt.	721.5
46.5	No Sample Recovery	
49.5		716.5
	Stiff Tan Gray and Black Slightly Sandy Micaceous Silt.	711.5
58.0	Very Stiff Brown Tan and White Slightly Sandy Micaceous Silt.	706.5
		701.5
65.0	Hard Brown Tan Black and White Fine to Medium Sandy Micaceous Silt.	696.5
70.0	Partially Weathered Rock That Becomes Gray and Black Micaceous Slightly Silty Fine to Coarse *	
72.9	See Following Rock Logs.	691.5
80.0		



*Sand When Sampled.

TEST BORING RECORD

Page 2

BORING NO. H-79

DATE DRILLED 5-13-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS			RQD
				696.5				
72.9								
73.0	Moderately Hard Black and White Coarse Grained Diorite.	100	NX	691.5	JOINTS DEPTH		DIP	77
76.9	Hard Black and White Coarse Grained Diorite.							
77.9	Hard Light Gray Fine to Medium Grained Granite.	100	NX		78.8'	-	45° Joint	97
	Hard Black and White Coarse*			686.5	78.5'	-	30° Joint	

* Grained Diorite.

CORE BORING RECORD

BORING NO. H-79

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 686.5	REMARKS	RQD
82.7	Hard Black and White Coarse Grained Diorite.	100	NX			97
	Coring Terminated.			681.5		

No Drilling Water Loss.

CORE BORING RECORD

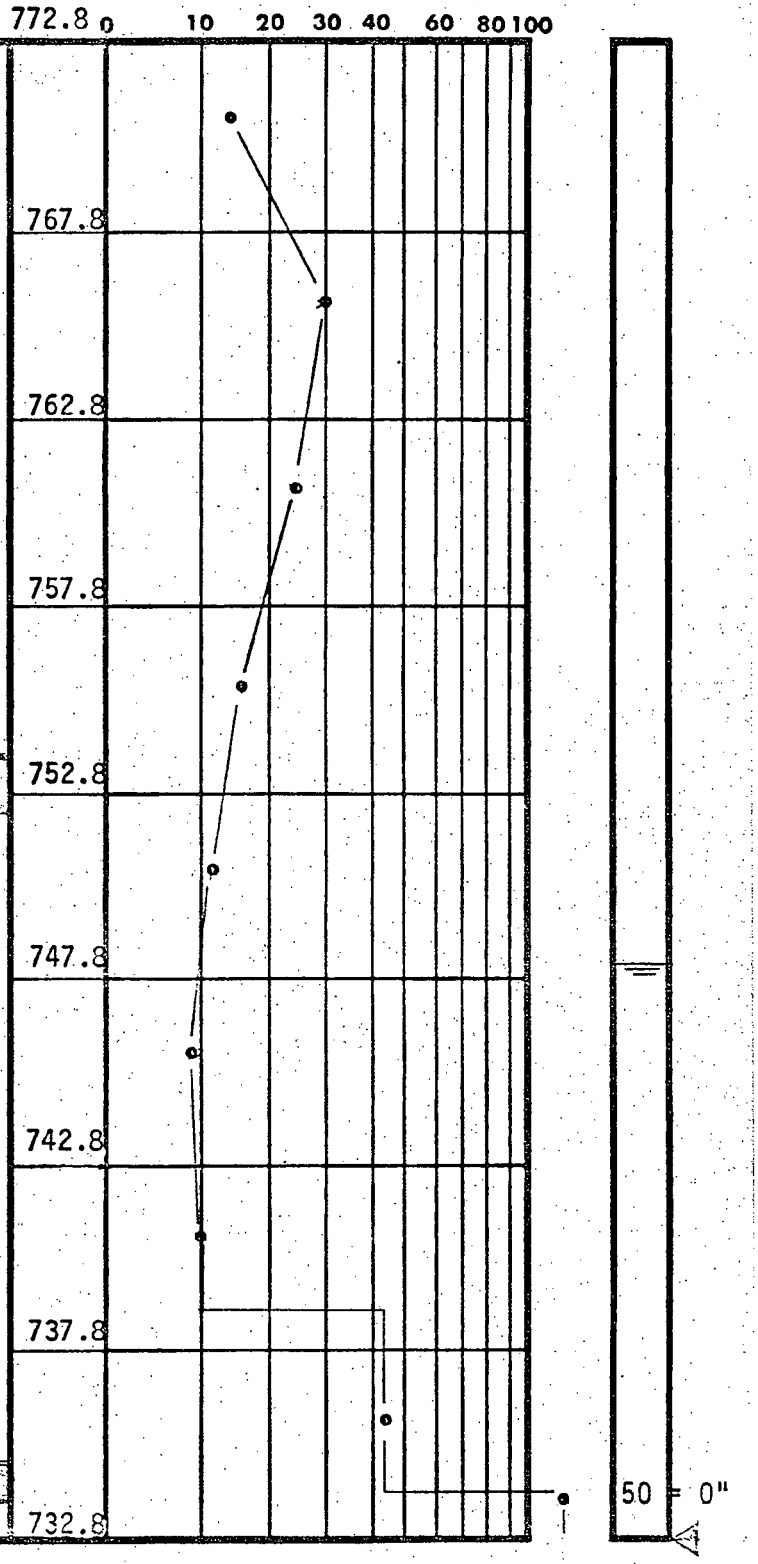
BORING NO. H-79

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Red Clayey Silt.	772.8
4.0	Very Stiff Red Slightly Sandy Clayey Silt.	767.8
		762.8
14.0	Stiff Brown Tan and Gray Fine Sandy Micaceous Silt.	757.8
		752.8
		747.8
29.0	Loose Gray Slightly Micaceous Silty Fine Sand.	742.8
34.0	Dense Gray Slightly Micaceous Silty Fine to Medium Sand.	737.8
39.0		
40.0	Highly Weathered Rock.	732.8



Partial Loss of Drilling Water at 40.0'.
Total Loss of Drilling Water at 51.0'.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

*PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. H-80
DATE DRILLED 5-14-70
JOB NO. CH 2055

WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				737.8		
39.0						
39.8	Moderately Hard Light Gray* **	44	NX	732.8		16

* Fine to Medium Grained Granite.

** Very Soft Light Gray Fine to Medium Grained Granite. (No Recovery)

Partial. Loss of Drilling Water at 40.0' to 54'.

CORE BORING RECORD

BORING NO. H-80
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 732.8	REMARKS	RQD
	Very Soft Light Gray Fine to Medium Grained Granite.	44	NX		JOINTS DEPTH DIP 43.8' - Nearly Vertical Joint.	16
43.6 44.0	Moderately Hard Light Gray **			727.8	32 Blows/Ft.	
47.0	Loss Spoon Sample.					• 50=4"
	Partially Weathered Rock That Becomes Gray Micaceous *			722.8		
49.4	Moderately Hard Black and White Fine Grained Diorite.				49.8' - Nearly Vertical Joint.	
51.3 52.4	Moderately Hard Light Gray **	60	NX		52.5' - Nearly Vertical Joint.	22
53.7	Very Soft Light Gray Fine ***			717.8		
53.9	Moderately Hard Light Gray Fine to Medium Grained ****					
55.7 56.5	Very Soft Light Gray Fine to Medium Grained Granite.	26	NX			0
57.3						
58.5	Moderately Hard Light Gray Fine to Medium Grained *****			712.8		
60.1	Very Soft Black and White Fine Grained Diorite.	56	NX		60.9' - 70° Joint	42
62.0 63.0	Moderately Hard Black and White Fine Grained Diorite.					
63.7	Very Soft Black and White Fine Grained Diorite.	100	NX	707.8		100
	Hard Black and White Fine Grained Diorite. (No Recovery)	100	NX			100
	Very Soft Black and White Fine Grained Diorite. (No Recovery)			702.8		
73.8	Moderately Hard Black and White Fine Grained Diorite.			697.8		
	Hard Black and White Fine Grained Diorite.					
	Coring Terminated.			692.8		

* Silty Fine to Medium Sand When Sampled.
** Fine to Medium Grained Granite.
***to Medium Grained Granite. (No Recovery)
**** Granite. (No Recovery)
*****Granite.

Partial Loss of Drilling Water 40' to 54'.
Lost All Drilling Water at 51.0'.

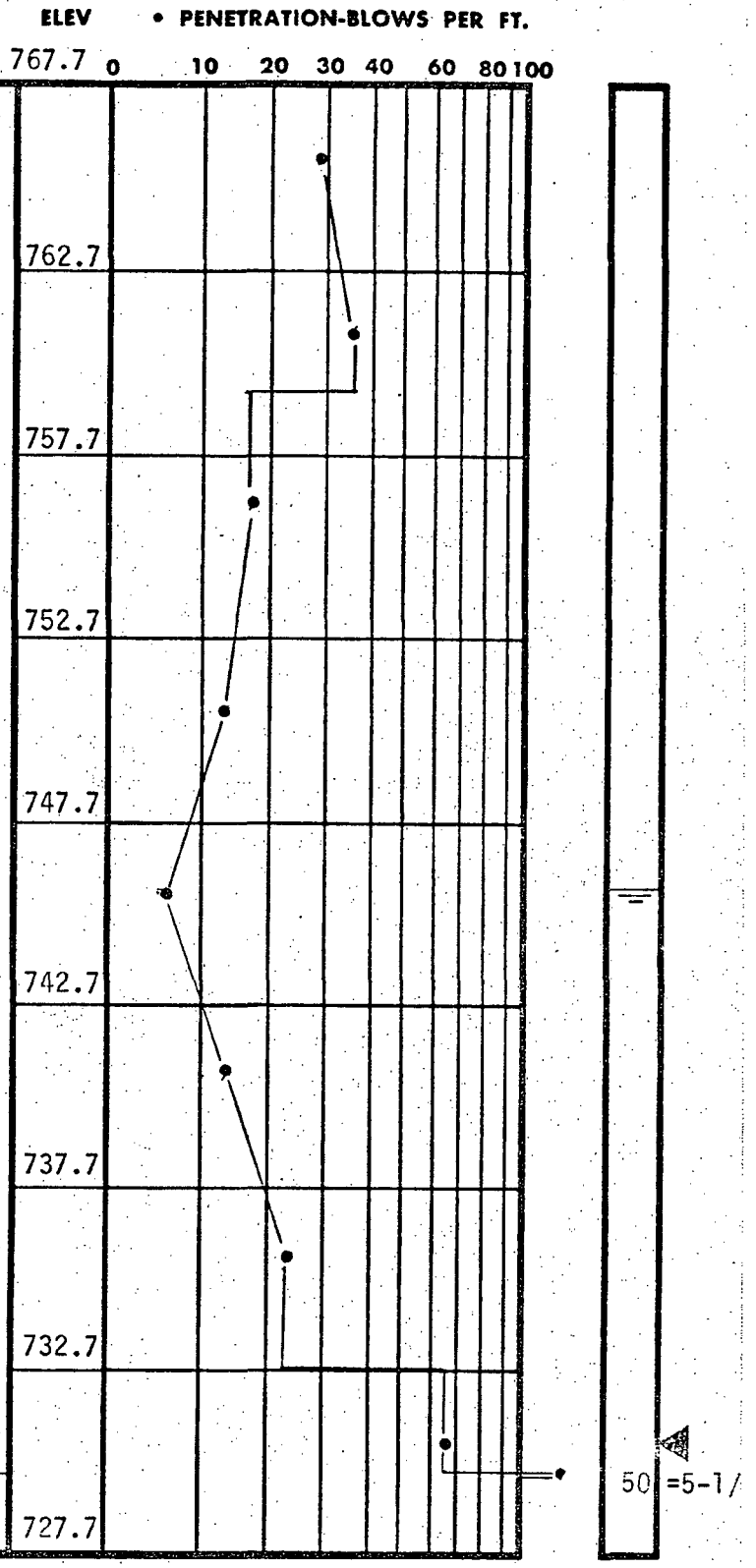
WATER TABLE

CORE BORING RECORD

BORING NO. H-80
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Red Brown Slightly Sandy Clayey Silt with Boulders and Gravel at 4.3 Feet.	767.7
4.5	Hard Tan Clayey Silt.	762.7
8.5	Very Stiff Tan Silt.	757.7
14.0	Firm Yellow Very Silty Fine to Medium Sand.	752.7
19.0	Firm Tan Very Fine Sandy Silt.	747.7
[illegible].0	Stiff Tan Silt.	742.7
29.0	Firm Black and White Fine to Coarse Sand.	737.7
35.0	Weathered Rock Fragments.	732.7
38.0		
40.0	See Following Rock Logs.	727.7



Loss of Drilling Water at 37.0 Feet.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-81
DATE DRILLED 5-18-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				732.7	JOINTS DEPTH DIP 38.0'-40.4' Rock Highly Fractured.	
38.0	Moderately Hard Black and White Fine Grained Diorite.	58	NX	727.7		0

CORE BORING RECORD

BORING NO. H-81
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 727.7	REMARKS	RQD
40.4	Moderately Hard Black and White Fine Grained Diorite.	58	NX		JOINTS DEPTH DIP 40.4'-42.1' - Rock Fractured.	0
		100	NX			0
		100	NX	722.7	45.5' - Nearly Vertical Joint.	85
	Hard Black and White Fine Grained Diorite.				46.4' - 45° Joint	
		100	NX	717.7	46.6' - 45° Joint	88
					46.7' - 45° Joint	
52.5					49' - 65° Joint	
	Coring Terminated.			712.7	51.1' - 45° Joint	
					51.3' - 45° Joint	
					52.0' - 60° Joint	

Loss of Drilling Water at 37.0 Feet.

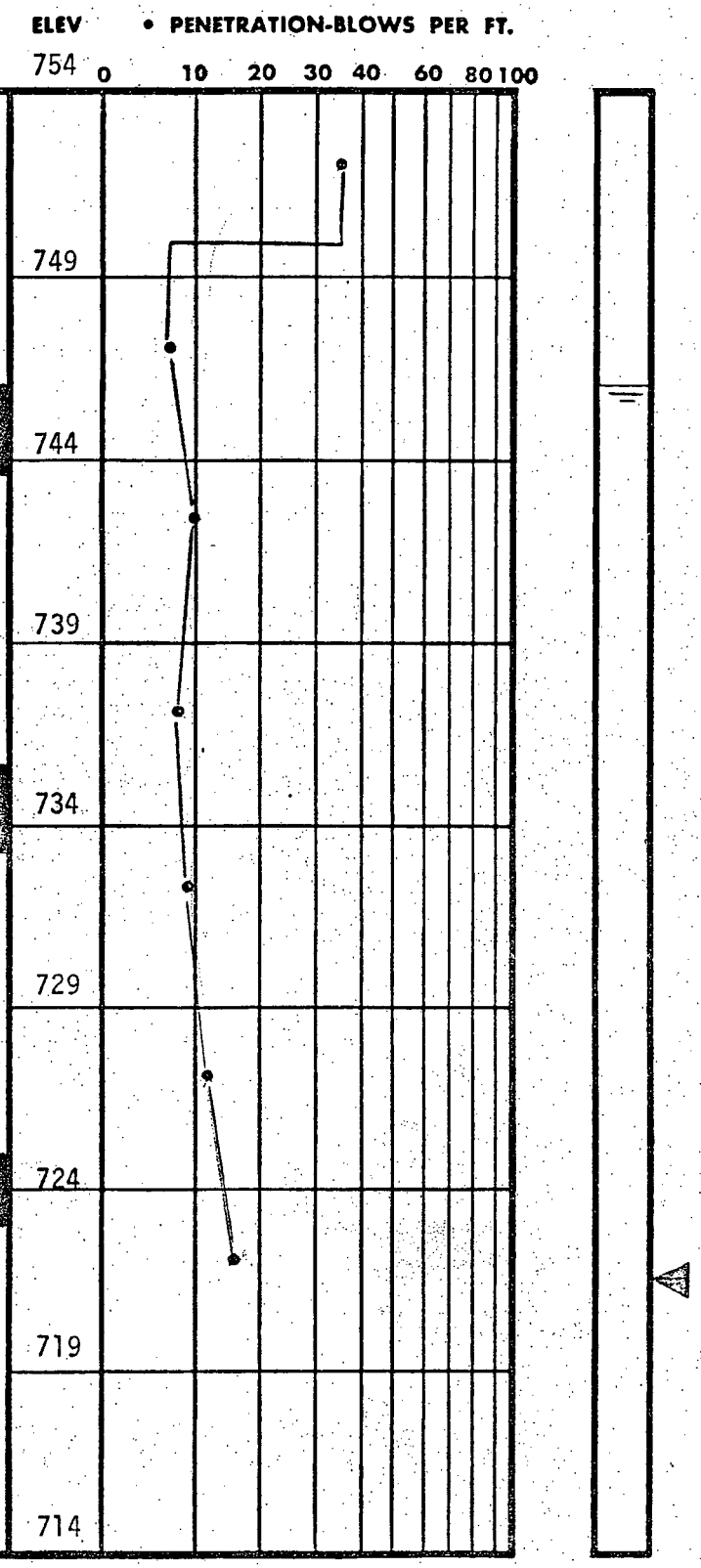
CORE BORING RECORD

BORING NO. H-81
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Hard Reddish Brown and Tan Fine to Medium Sandy Silt.
4.0	Firm and Stiff Tan Fine to Medium Sandy Micaceous Silt.
28.0	Stiff Tan Fine to Coarse Sandy Micaceous Silt.
31.0	Firm Brown and Gray Silty Very Fine*
32.6	See Following Rock Logs.
40.0	



* Sand.

Loss of Drilling Water at 32.6 Feet

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

BORING NO. H-82

DATE DRILLED 5-15-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				729	JOINTS DEPTH DIP	
32.6	Moderately Hard Black Brown and Gray Fine Grained Diorite.	100	NX		32.6'-34.5' Rock Slightly Fractured.	
34.5				724		53
	Hard Black and White Fine Grained Diorite.	100	NX			91
				719		

Loss of Drilling Water at 32.6 Feet.

CORE BORING RECORD

BORING NO. H-82
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 719	REMARKS	RQD
	Hard Black and White Fine Grained Diorite.	100	NX			91
42.2	Coring Terminated.			714		

Loss of Drilling Water at 32.6 Feet.

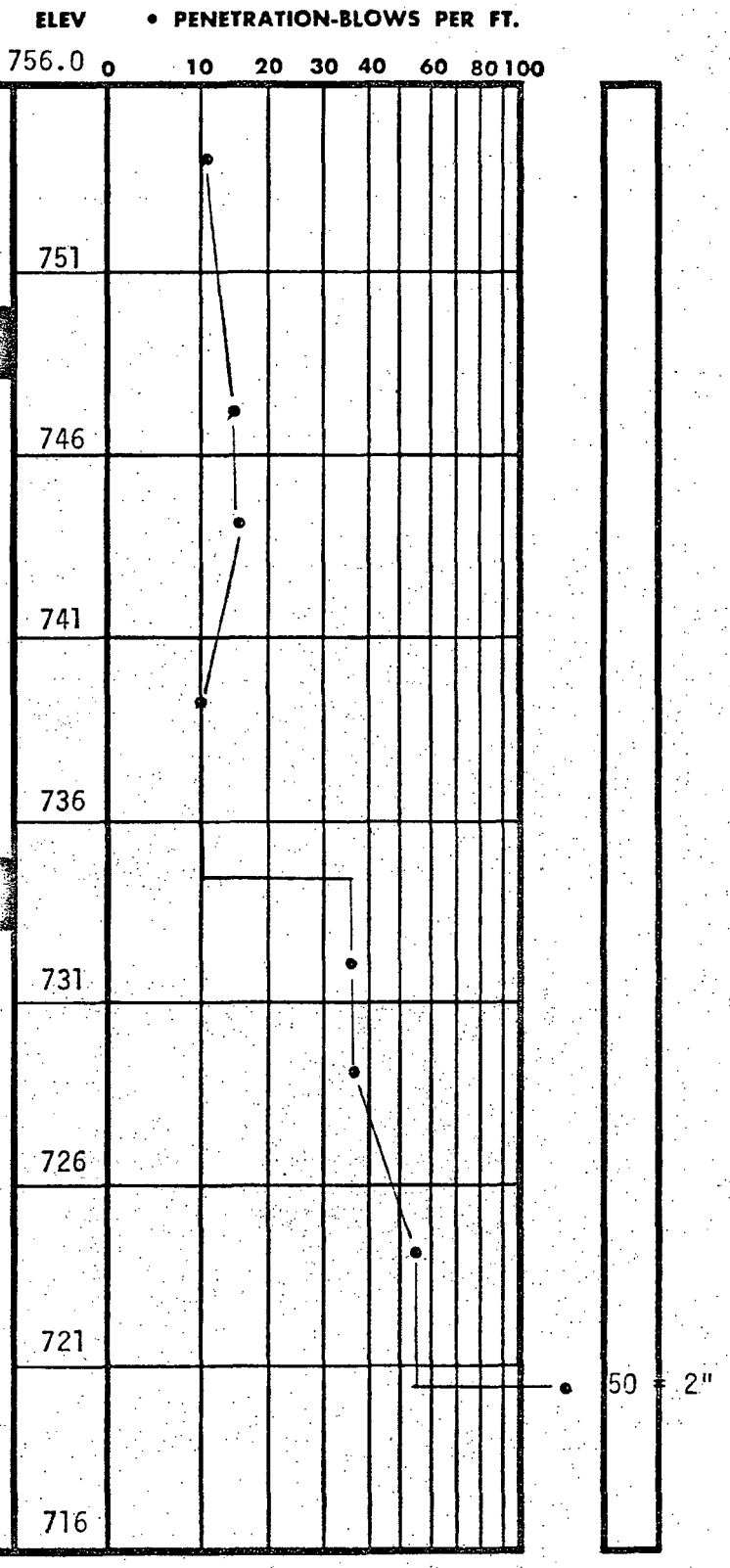
CORE BORING RECORD

BORING NO. H-82
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Stiff Tan Fine to Medium Sandy Silt.
7.5	Firm Gray Tan and Black Silty Fine *
9.0	Stiff and Very Stiff Brown and Black Fine Sandy Micaceous Silt.
21.5	Dense to Very Dense Brown Gray and White Fine to Coarse Sand.
35.5	See Following Rock Logs.



* to Coarse Sand.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-83
DATE DRILLED 5-4-70
JOB NO. CH-2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
					JOINTS	
				721	DEPTH / DIP 36'-38.5' - Vertical Joint.	
35.5	Moderately Hard Light Gray *					
37.0	Soft and Very Soft Light Gray and Brown Fine to Medium Grained Granite.	89	NX			23
		85	NX	716		74

* and Brown Fine to Medium Grained Granite.

CORE BORING RECORD

BORING NO. H-83

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 716	REMARKS	RQD
40.5	Soft and Very Soft Light Gray and Brown Fine to Medium*	85	NX		JOINTS DEPTH DIP 42.4' and 43.4' - 1" to 2" Moderately Hard Light Gray Granite Seams.	74
	Hard Light Gray Fine to Medium Grained Granite.			711		
		100	NX			
49.5				706		100
50.5	Hard Black and White Fine ** Hard Black and White Coarse Grained Diorite.					
53.5				701		
	Coring Terminated.					

* Grained Granite.

** Grained Diorite.

No Drilling Water Loss.

CORE BORING RECORD

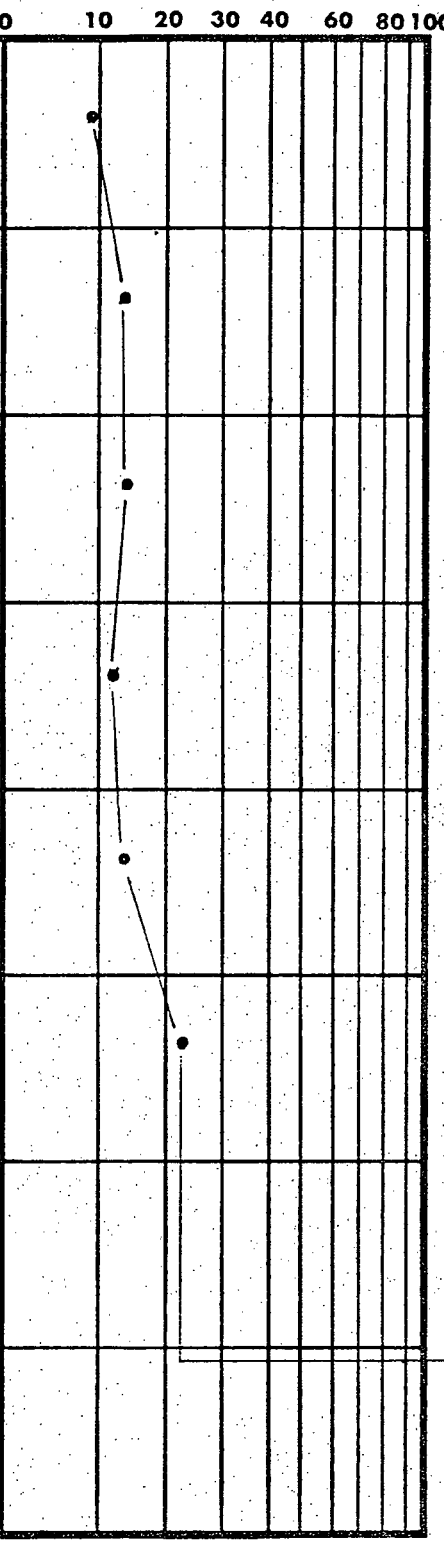
BORING NO. H-83
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Pink and Tan Slightly Sandy Silt.	757.5
9.0	Stiff Gray Tan and Black Fine Sandy Micaceous Silt.	752.5
19.0	Firm Gray and White Micaceous Silty Fine to Coarse Sand.	747.5
35.6	See Following Rock Logs.	742.5
		737.5
		732.5
		727.5
		722.5

• PENETRATION-BLOWS PER FT.



25'-0"

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-84

DATE DRILLED 6-5-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				722.5	JOINTS DEPTH — DIP 37.1' Surface. - Slickenside	
35.6 36.7	Hard Light Gray Fine to Medium Grained Granite.	100	NX			100
	Hard Black and White Fine*	100	NX	717.5		100

* Grained Diorite.

CORE BORING RECORD

BORING NO. H-84
JOB NO. CH2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				717.5		
40.9	*					
42.4	Hard Dark Green Meta Gabbro.				JOINTS	
44.0	Hard Black and White Fine Grained Diorite.	100	NX		DEPTH 44.5' - DIP 45° Joint	100
45.0	Hard Dark Green Meta Gabbro.			712.5		
47.8	Hard Black and White Fine Grained Diorite.					
	Coring Terminated.			707.5		

* Hard Black and White Fine Grained Diorite.

No Drilling Water Loss.

CORE BORING RECORD

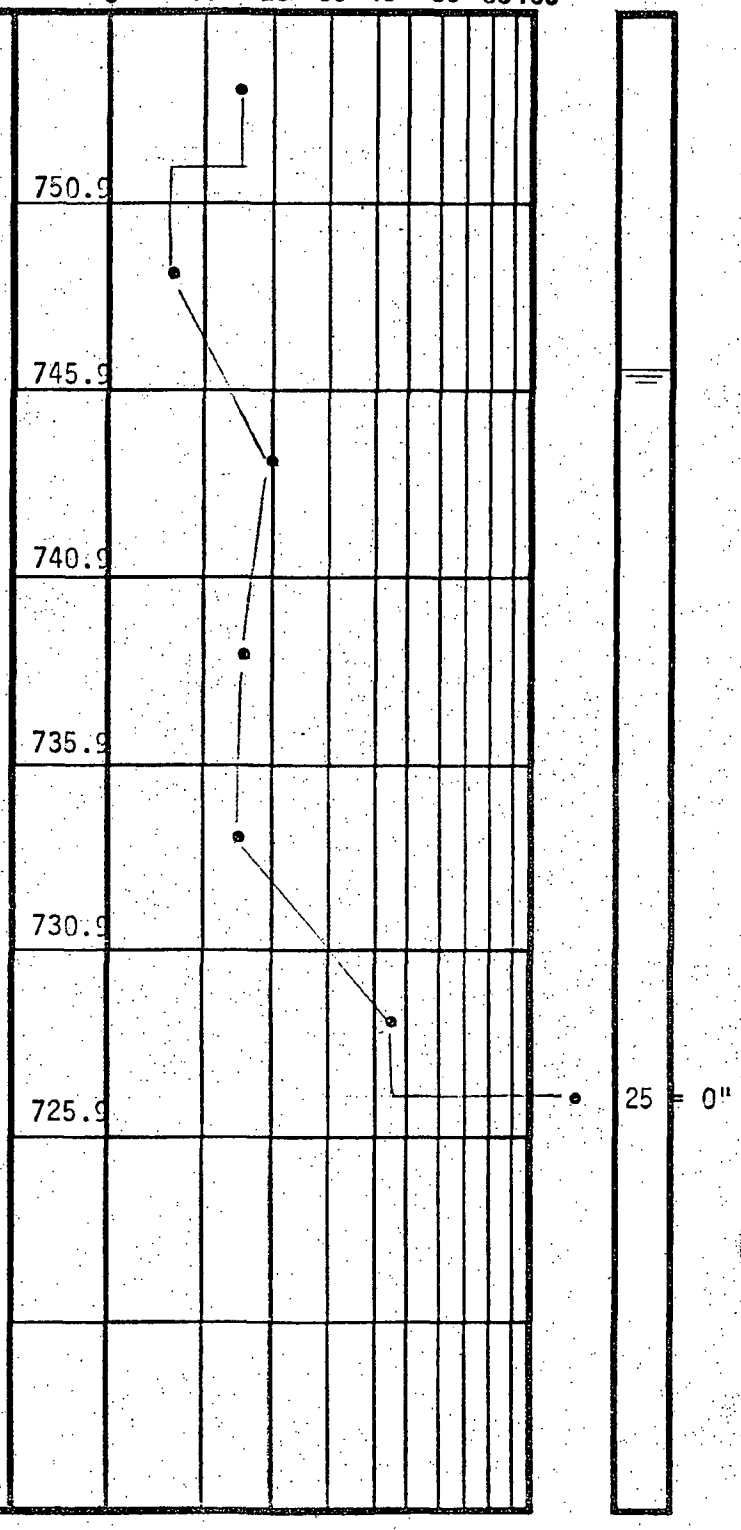
BORING NO. H-84

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Tan and Black Silt.	755.9
4.0	Loose Black and White Very Fine Sand with Gravel Size Fragments of Weathered Rock.	750.9
9.0	Very Stiff Brown and Black Micaceous Silt.	745.9
14.0	Firm to Dense Black Brown and White Fine to Coarse Sand with Gravel Size Fragments of Weathered Rock.	740.9
		735.9
		730.9
29.0	See Following Rock Log.	725.9
40.0		



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-85

DATE DRILLED 6-5-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				730.9		
29.0	Hard Black and White Coarse Grained Diorite.	100	NX	725.9	JOINTS DEPTH - DIP 29' - 45° Joint 29.2' - Slickenside Surface. 29.8' - Slickenside Surface. 32.0' - Slickenside Surface. 32.9' - 30° Joint.	50
		100	NX			100
				720.9		
		100	NX			100
38.3	Coring Terminated.			715.9		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-85

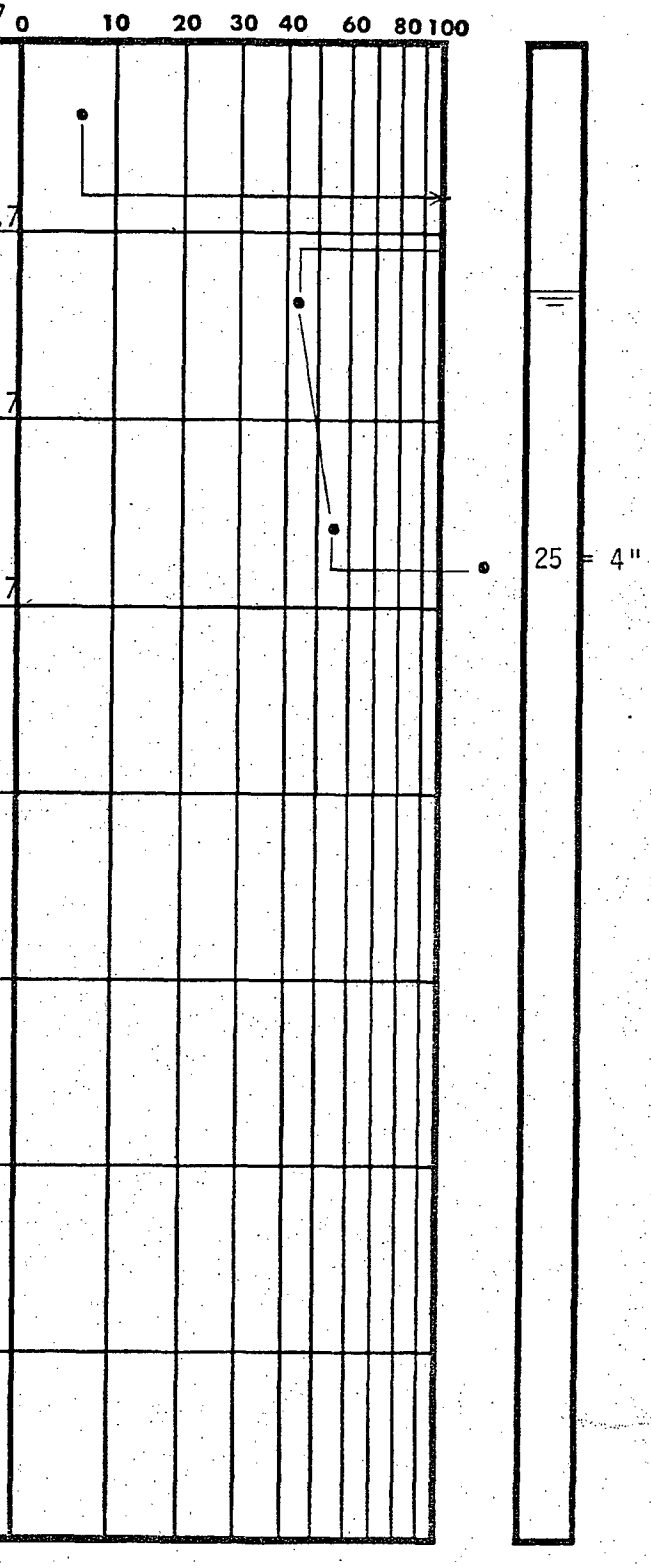
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Firm Tan and Black Silt	751.7
4.0	Partially Weathered Rock.	746.7
5.5	Dense to Very Dense Black and White Fine to Coarse Sand.	741.7
14.0	Partially Weathered Rock That Becomes Black and Gray Fine Sand *	736.7
16.6	See Following Rock Log.	731.7

• PENETRATION-BLOWS PER FT.



* When Sampled.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-36

DATE DRILLED 6-10-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				736.7	JOINTS DEPTH DIP	
16.6 17.7	Hard Black and White Fine Grained Diorite.	98	NX		16.6'-17.7' Rock Slightly Fractured. 16.6' - 45° Joint	60
		100	NX	731.7	17.2' - 30° Joint	100
	Hard Black and White Coarse Grained Diorite.				20.7' - Slickenside Surface.	
		100	NX	726.7	23.5'-25.0 Inclusion and Layers of Hard Black and White Fine Grained Diorite.	100
27.6					25.0'-25.3' 1/2" Quartz Fragments.	
	Coring Terminated.			721.7		

No Drilling Water Loss.

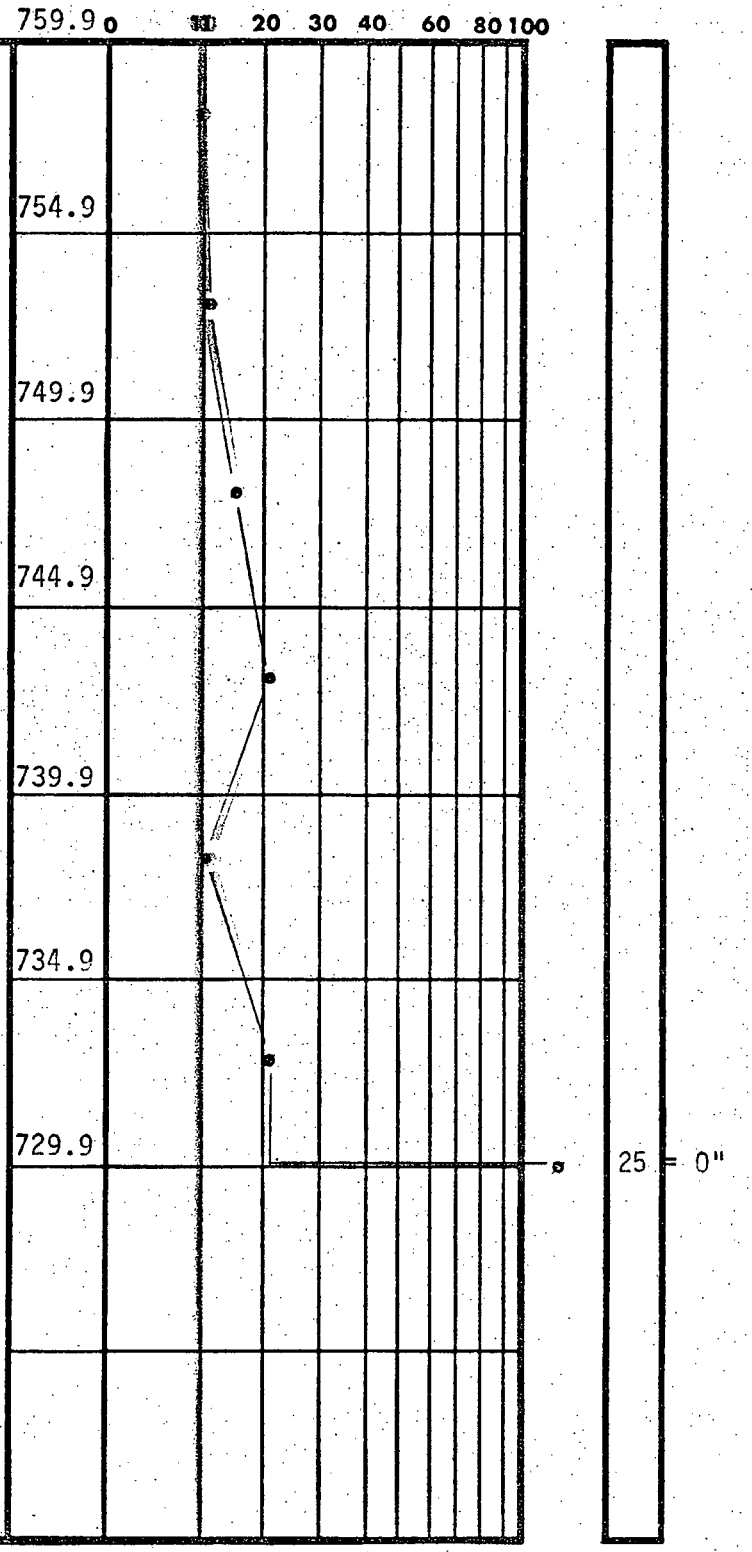
CORE BORING RECORD

BORING NO. H-86
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Loose and Firm Pink and White Micaceous Silty Fine to Coarse Sand.	759.9
		754.9
9.0	Firm Gray and White Micaceous Silty Fine to Medium Sand.	749.9
		744.9
19.0	Firm Pink Gray and Black Silty Very Fine Sand.	739.9
		734.9
30.0	See Following Rock Log.	729.9
40.0		



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-87

DATE DRILLED 6-3-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
					JOINTS DEPTH DIP	
				729.9	33.4' - Slickenside Surface.	
30.0	Hard Black and White Fine Grained Diorite.				33.9' - Slickenside Surface.	
					34.7' - Slickenside Surface.	100
34.0		100	NX	724.9	34'-35.4' Moderately Hard Dark Green Meta-Gabbro.	
35.4	Moderately Hard Dark Green *				36'and 38.2' 1" Hard Light Gray Grained Layers.	
	Hard Black and White Fine Grained Diorite.				37' - Slickenside Surface on 45°.	
		100	NX	719.9		100

* Meta Gabbro.

Page 2

CORE BORING RECORD

BORING NO. H-87
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 719.9	REMARKS	RQD
	Hard Black and White Fine Grained Diorite.	100	NX		JOINTS DEPTH DIP 40' - Slickenside Surface on 30°	100
43.3				714.9	40.3' - Slickenside Surface on 45°	
	Coring Terminated.					

No Drilling Water Loss.

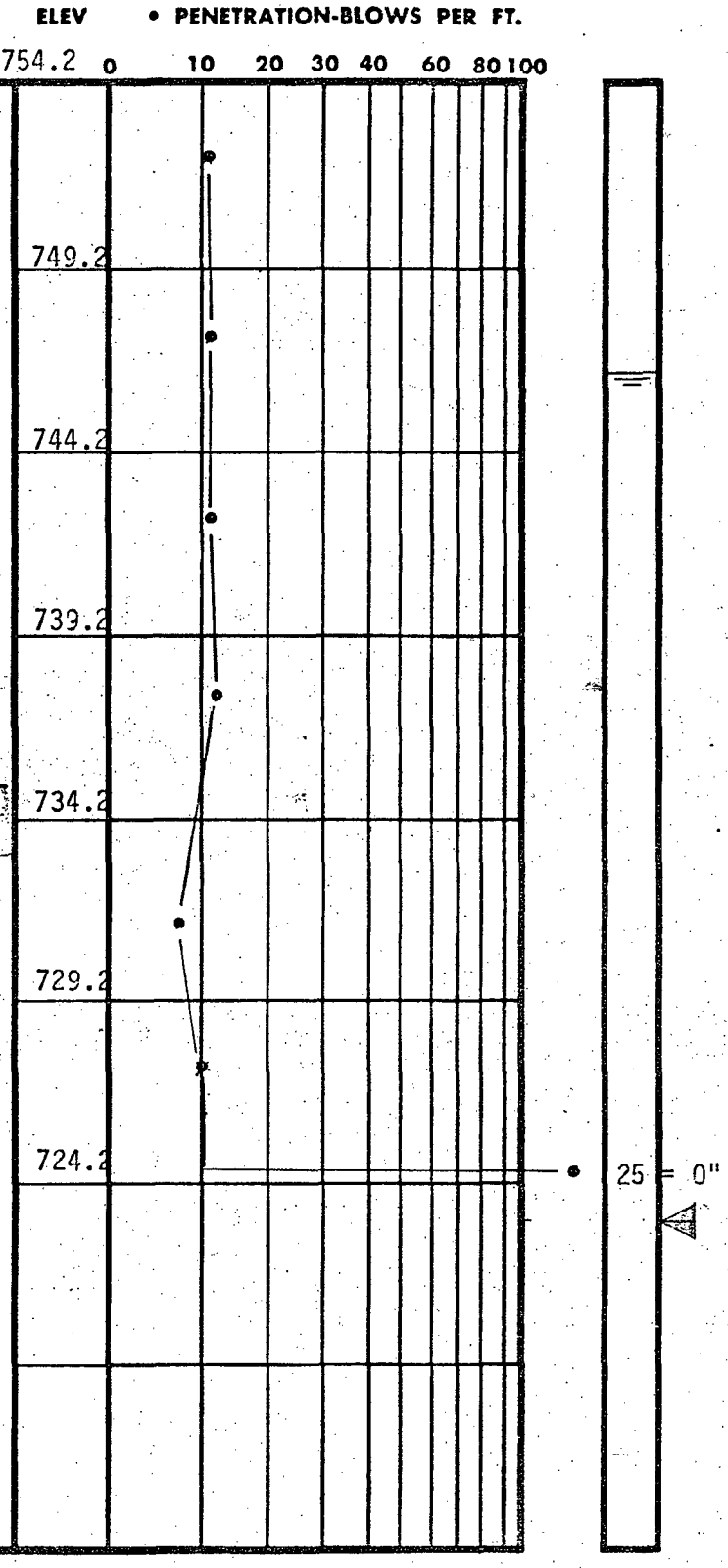
CORE BORING RECORD

BORING NO. H-87
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Brown and Tan Slightly Sandy Silt.	754.2
14.0	Stiff Brown Tan Black and White Fine to Coarse Sandy Micaceous Silt.	
21.0	Firm to Stiff Brown and Black Very Fine Sandy Micaceous Silt.	
29.8	See Following Rock Log.	



Partial Drilling Water Loss at 31.0'.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
|50| % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-33
DATE DRILLED 6-3-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
29.8				724.2	DEPTH / JOINTS DIP	
	Moderately Hard Light Gray Fine to Medium Grained Granite.	100	NX		29.8'-32.0' Rock Slightly Fractured.	67
		100	NX			0
32.0	Hard Light Gray Fine to Medium Grained Granite.	100	NX			33
35.0				719.2		100
	Hard Black and White Fine Grained Diorite.	100	NX			
39.0		100	NX			93
	Hard Light Gray Fine to Medium*			714.2		

* Grained Granite.
Partial Drilling Water Loss at 31.0'.

CORE BORING RECORD

BORING NO. H-88
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 714.2	REMARKS	RQD
41.3	Hard Light Gray Fine to Medium*	100	NX			93
	Coring Terminated.			709.2		

* Grained Granite.

Partial Drilling Water Loss at 31.0'.

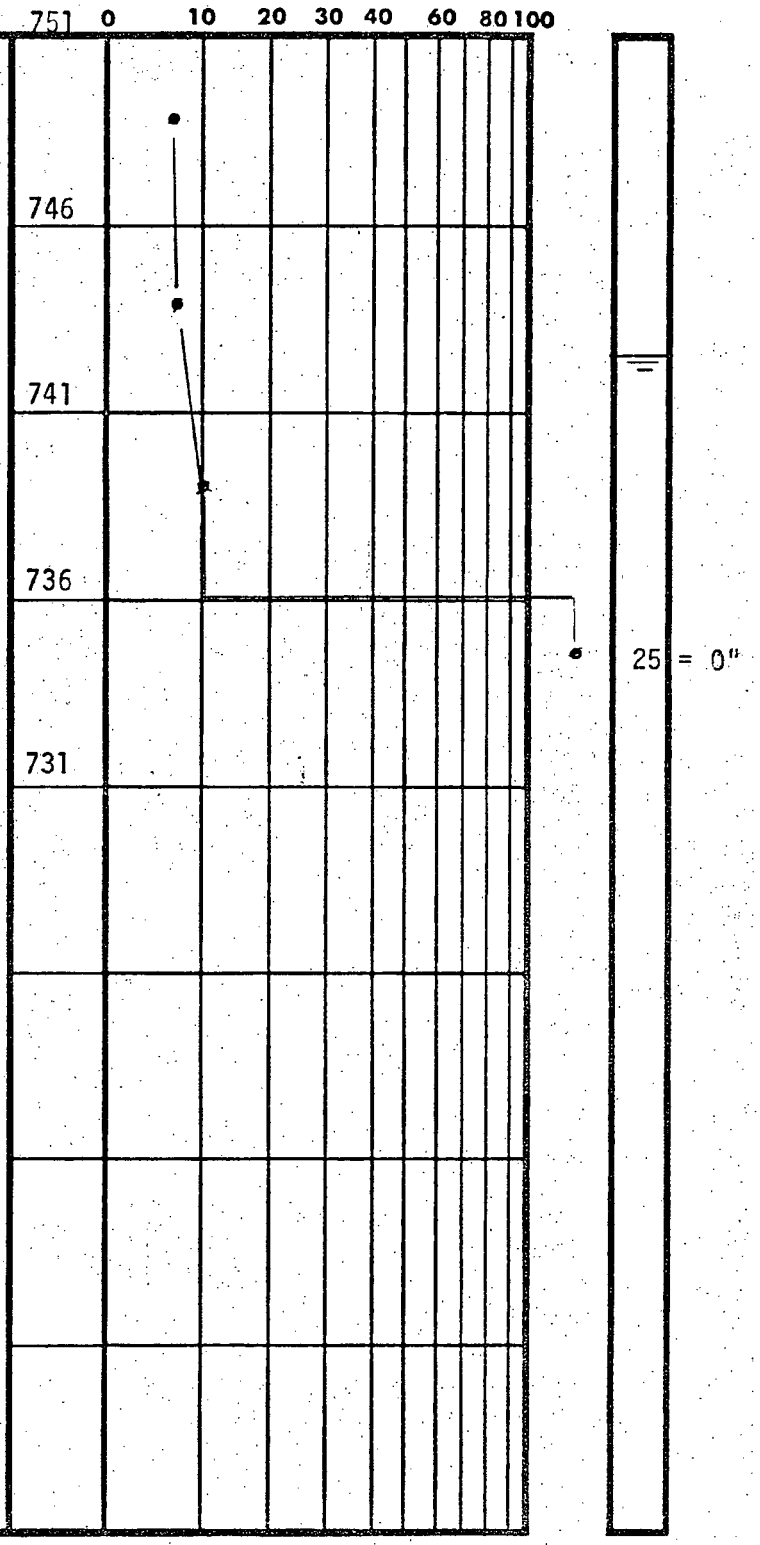
CORE BORING RECORD

BORING NO. H-88
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Firm Tan and Black Silt.	751
		746
9.0	Stiff Tan and Green Very Fine Sandy Silt.	741
		736
15.0	Partially Weathered Rock That Be-*	
16.8	See Following Rock Log.	731



*comes Green and Black Very Fine Sand When Sampled.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-89
DATE DRILLED 6-10-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
				736		RQD
16.8						
18.3	Hard Black and White Fine Grained Diorite.			731	JOINTS DEPTH DIP 20.4' - Slickenside Surface-Curved Surface.	97
	Hard Black and White Coarse Grained Diorite.	100	NX	726	25.7' - Slickenside Surface-Curved Surface.	
26.4						
	Coring Terminated.			721		

No Drilling Water Loss.

CORE BORING RECORD

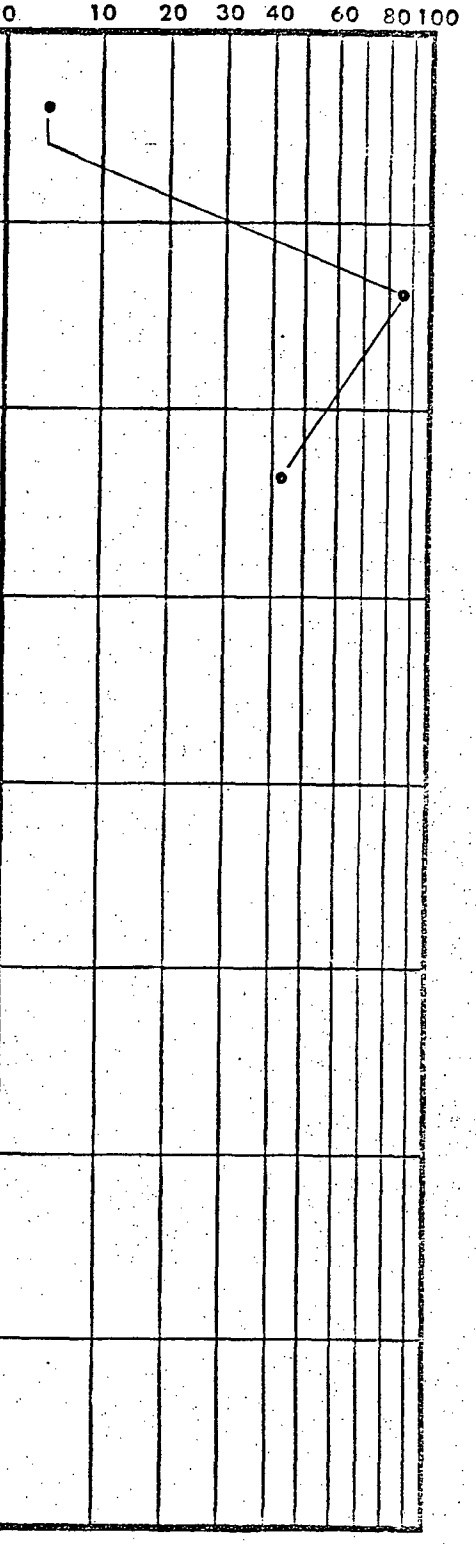
BORING NO. H-89
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Soft Brown Fine to Medium Sandy Organic Silt.	692.2
3.0	Loose to Very Dense Brown and Black Fine to Coarse Sand.	687.2
		682.2
13.5	Fishtail Refusal at 13.5'. See Following Rock Log.	677.2

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-90

DATE DRILLED 6-19,20-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				682.2		
13.5	Very Soft Black Brown and Gray Coarse Grained Diorite (No *	50	NX	677.2		0
15.5	Soft Black Brown and Gray Coarse Grained Diorite.	50	NX			0
18.6	Moderately Hard Black and White Coarse Grained Diorite.			672.2		
20.7	Very Soft Black Brown and Gray Coarse Grained Diorite (No*	40	NX			10
23.5	Moderately Hard Black and White Coarse Grained Diorite.			667.2		
24.7	Very Soft Black Brown and Gray Coarse Grained Diorite (No Recovery).			662.2		0
33.0		32	NX			
33.5	Moderately Hard Black and White Coarse Grained Diorite.			657.2		
	Hard Black and White Coarse Grained Diorite.	69	NX			44
40.2				652.2		

* Recovery).

CORE BORING RECORD

BORING NO. H-90
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 652.2	REMARKS	RQD
	Hard Black and White Coarse Grained Diorite.	75	NX	647.2	JOINTS DEPTH - DIP 45.5' - 45° and 60° Joints.	0
46.0	Moderately Hard Black and White Coarse Grained Diorite.	84	NX			18
49.1 49.7	Hard Light Gray Fine to Medium Grained Granite.			642.2	50.1' - 45° Joint 51.0' - 45° Joint	
51.3 51.9	Hard Black and White Coarse Grained Diorite.	100	NX		52.5'-53.5 Vertical Joint	83
53.8	Hard Light Gray Fine to Medium Grained Granite.			637.2	54'-55.5' Vertical Joint with Grounwater Deposits on Surfaces.	
56.1	Hard Black and White Coarse*					
	Hard Light Gray Fine to Medium Grained Granite.			632.2		
	Coring Terminated. Note: Rock is Generally Fractured From 13.5' to 56.1'.					

*Grained Diorite.

No Drilling Water Loss.

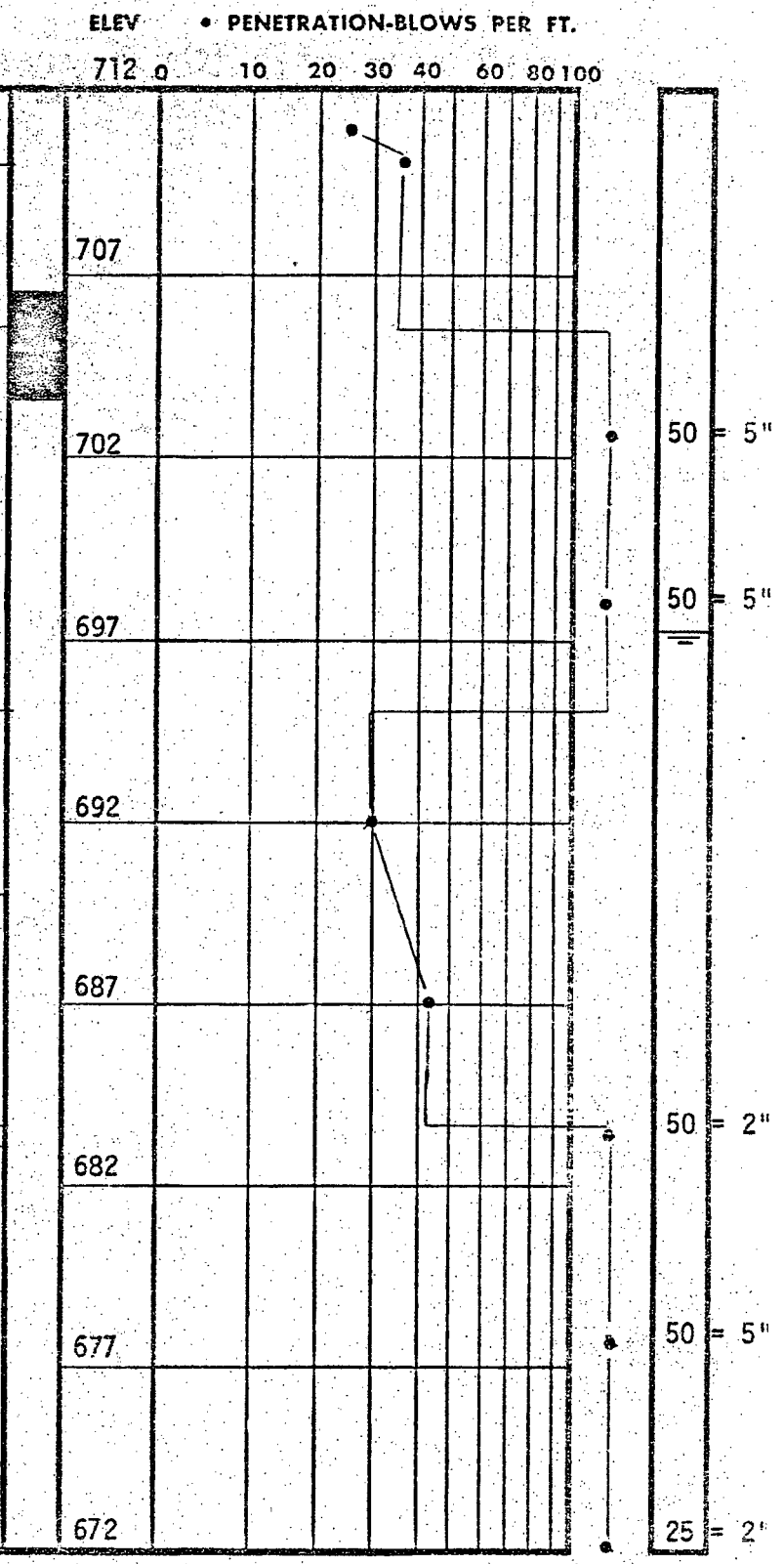
CORE BORING RECORD

BORING NO. H-90
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	
	Very Stiff Tan Fine Sandy Slightly Clayey Silt.
2.0	
	Dense Gray Slightly Clayey Fine to Medium Sand with Gravel.
6.5	
	Partially Weathered Rock That Becomes Brown and Gray Micaceous Fine to Coarse Sand When Sampled.
17.0	
	Firm Gray Silty Fine Sand.
22.0	
	Dense Gray Tan and Black Fine to Medium Sand.
28.3	
29.0	*
	Partially Weathered Rock That Becomes Brown Black and Gray Fine to Medium Sand When Sampled.
40.0	



* Hard Weathered Granite.

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-91

DATE DRILLED 6-23-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0	Partially Weathered Rock That Becomes Brown Black and Gray Fine to Medium Sand When Sampled.	672		
		667	•	50 = 5"
			•	50 = 4"
50.0	See Following Rock Log.	662		

TEST BORING RECORD

Page 2

BORING NO. H-91

DATE DRILLED 6-23-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 627	REMARKS	RQD
81.4	Moderately Hard Black and White Coarse Grained Diorite	100	NX			
82.1						
82.4	Quartz Seam			622		72
85.4	Hard Black and White *					
	Coring Terminated					

* Coarse Grained Diorite

No Drilling Water Loss

CORE BORING RECORD

BORING NO. H-91

JOB NO. ~~CH 2055~~

LAW ENGINEERING TESTING CO.

WATER TABLE

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS		RQD
				667	Joints	Dip	
					54.7	45°	
					55.2	Vertical	
				662			
50.0					56.6	Vertical	
	Soft Black and White Coarse *						
51.2	Very Soft Black and White Coarse Grained Diorite (No Recovery).	34	NX		56.0	45°	0
53.7					57.9	45°	
	Soft Black and White Coarse**			657			
55.0					58.6	10°	
	Moderately Hard Black and White Coarse Grained Diorite.	100	NX		62.0	45° Brown Stained	58
		50	NX				0
59.7				652	62.5	45° Brown Stained	
	Very Soft Black and White Coarse Grained Diorite ***						
61.6							
	Moderately Hard Black and White Coarse Grained Diorite (No Recovery)	73	NX		63.5	30°	
				647	64.5	45°	17
					64.7	30°	
66.8					66.0	45°	
	Very Soft Black and White Coarse Grained Diorite ****				66.2	45°	
68.2							
	Moderately Hard Black and White Coarse Grained Diorite	73	NX	642	68.6-69.5	Nearly Vertical Joint	0
71.0					69.5	45° Brown Stained	
	Soft Black and White Coarse*****						
72.0							
	Hard Black and White Coarse Grained Diorite	64	NX		70.7	30° Brown Stained	
				637	72.0	45° Brown Stained	45
75.3							
	Very Soft Black and White Coarse Grained Diorite				74.2	20°	
77.6							
	Hard Black and White Coarse Grained Diorite	100	NX		75.0	Nearly Vertical	72
				632	79.0	10° With 1/4" Calcite Deposit	

* Grained Diorite.
**Grained Diorite.
*** (No Recovery)
**** (No Recovery)
***** Grained Diorite (No

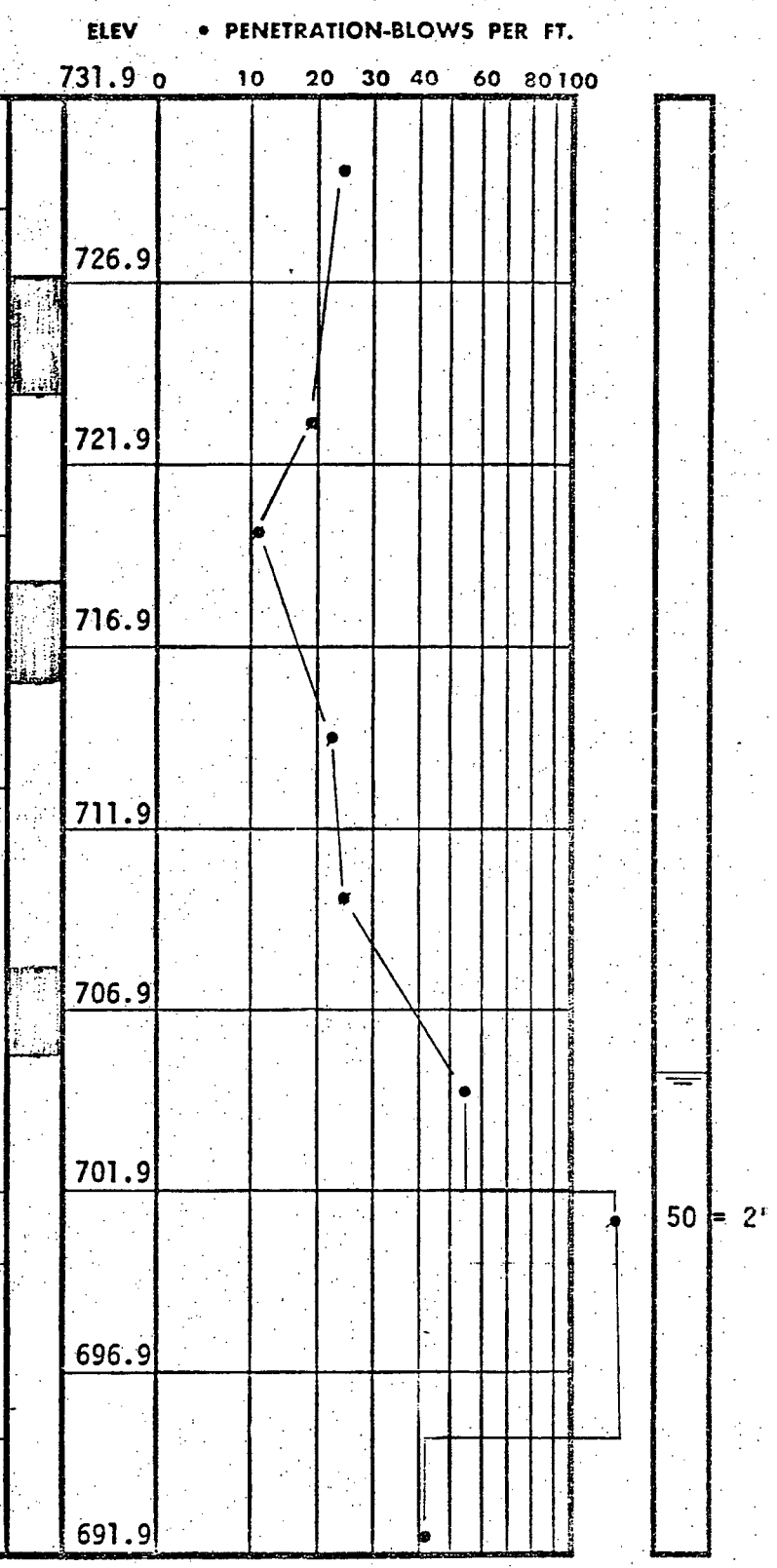
CORE BORING RECORD

BORING NO. H-91
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Very Stiff Red Brown Slightly Sandy Slightly Clayey Silt.
3.0	Loose to Firm Yellow and Gray Very Silty Slightly Micaceous Fine Sand.
12.0	Firm Tan and White Slightly Micaceous Silty Fine to Medium Sand.
19.0	Firm to Very Dense Black and White Silty Fine to Coarse Sand.
30.0	Partially Weathered Rock That Becomes Tan and White Silty Fine to Coarse Sand When Sampled.
37.0	No Sample Recovered.
40.0	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-92

DATE DRILLED 6-16-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. (0 10 20 30 40 60 80 100)	
40.0	No Sample Recovered.	691.9		
		686.9		
46.0	Partially Weathered Rock That Becomes Tan and Gray Slightly Silty Micaceous Fine to Coarse Sand When Sampled.	681.9		50 = 4'
51.0	Very Dense Black Brown and White Micaceous Fine to Medium Sand.	676.9		
55.0	Hard Dark Gray Very Fine Sandy Silt.	671.9		
60.0	Partially Weathered Rock That Becomes Dark Gray Very Fine Sandy Silty When Sampled.	666.9		50 = 4'
65.0	Partially Weathered Rock That Becomes Gray Brown and Black Slightly Micaceous Fine to Coarse Sand When Sampled.	661.9		50 = 4'
		656.9		50 = 4'
		651.9		50 = 2'
80.0				

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-92

DATE DRILLED 6-16-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
80.0		651.9		
	Partially Weathered Rock That Becomes Gray Brown and Black Slightly Micaceous Fine to Coarse Sand When Sampled.	646.9	•	50 = 3 1/2
		641.9	•	50 = 3'
		636.9	•	50 = 5'
97.0			•	50 = 6'
	See Following Rock Log.	631.9	◀	

TEST BORING RECORD

Page 3

BORING NO. H-92

DATE DRILLED 6-16-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

◀ LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
				636.9	JOINTS DEPTH DIP	
97.0					97.2' - 45° Joint	
	Moderately Hard Light Gray and Brown Fine to Medium Grained Granite.	19	NX	631.9		0
				626.9		
106.0	Soft Light Gray and Brown Fine to Medium Grained Granite with 2" to 4" Layers of Moderately Hard Granite.	54	NX	621.9		24
111.9						
	Moderately Hard Light Gray and Brown Fine to Medium Grained Granite.	72	NX	616.9	113' - 45° Joint 114' - 60° Joint 115' - 45° Joint 116' - 60° Joint	45
115.4	Soft and Very Soft Light Gray and Black Fine to Medium*					
117.5	Moderately Hard Light Gray Fine to Medium Grained Granite	85	NX	611.9	119.1 - 45° Joint 119.6 - 45° Joint	50

* Grained Granite.
Complete Loss of Drill Water at 101.0'.

CORE BORING RECORD

BORING NO. H-92
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 611.9	REMARKS
121.8	Moderately Hard Light Gray Fine to Medium Grained Granite.	85	NX		JOINTS DEPTH DIP 120.5' - 45° Joint
	Coring Terminated.			606.9	121.5' - Vertical Joint.

Complete Loss of Drilling Water at 101.0 Feet.

CORE BORING RECORD

BORING NO. H-92
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 10 20 30 40 60 80 100
0		740.7	
	Fishtailed to Refusal Without Sampling - Boulders Encountered Between 31.0' and 66.0'.	735.7	
		730.7	
		725.7	
		720.7	
		715.7	
		710.7	
		705.7	
40.0		700.7	

Lost Drilling Water at 32 Feet.

No Water Table Data

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

50 % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

BORING NO. H-93

DATE DRILLED 6/12/70

JOB NO. CH 2205

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0		700.7	
	Fishtailed to Refusal Without Sampling - Boulders Encountered Between 31.0' and 66.0'.	695.7	
		690.7	
		685.7	
		680.7	
		675.7	
68.9	Fishtail Refusal See Following Rock Log.	670.7	

No Drilling Water Loss.

TEST BORING RECORD

Page 2

BORING NO. H-93

DATE DRILLED 6-12-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
				675.7		RQD
68.9	Very Soft Black and White Coarse Grained Diorite.			670.7		
		40	NX	665.7		11
79.0	Moderately Hard Black and *	37	NX	660.7		22

* White Coarse Grained Diorite.

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-93
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 660.7	REMARKS	RQD
81.7	Moderately Hard Black and * Hard Black and White Coarse Grained Diorite.	58	NX	655.7	JOINTS DEPTH - DIP: 80' - 75° Joint	58
87.7	Coring Terminated.			650.7		

* White Coarse Grained Diorite.

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-93
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
0		733	
	Fishtailed From Surface to Refusal Without Sampling.		
		728	
		723	
		718	
		713	
		708	
		703	
34.0	Refusal at 34.0'. See Following Rock Log.	698	• 25 = 0"
40.0		693	

No Water Table Data

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-94

DATE DRILLED 6/16/70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	
				703		RQD
34.0	Hard Dark Green Meta Gabbro.			698		
		100	NX			100
38.9	Coring Terminated.			693		

No Drilling Water Loss.

CORE BORING RECORD

BORING NO. H-94
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
0		725	
	Fishtailed From Surface to Refusal Without Sampling.	720	
		715	
		710	
		705	
		700	
		695	
		690	
40.0		685	

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. HS-95

DATE DRILLED 6-25-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100
40.0		685	
	Fishtailed From Surface to Refusal Without Sampling.		
.0			
	Refusal at 42.0'.	680	
	See Following Rock Log.		

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. HS-95

DATE DRILLED 6-25-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 685	REMARKS	RQD
42.0					JOINTS DEPTH DIP	
	Very Soft Light Gray and Brown Fine to Medium Grained Granite.	37	NX	680	45.1'-48.3' Rock Fractured.	0
45.1 45.9	Moderately Hard Light Gray*					
	Moderately Hard Black and White Coarse Grained Diorite.				48.3'-49.8' Rock Slightly Fractured.	
49.8		84	NX	675		
	Hard Black and White Coarse Grained Diorite.				49' Nearly Vertical Joint.	61
52.3					50' 45° Joint	
	Coring Terminated.			670	52.3' 70° Joint.	

* and Brown Fine to Medium Grained Granite.

No Drilling Water Loss.

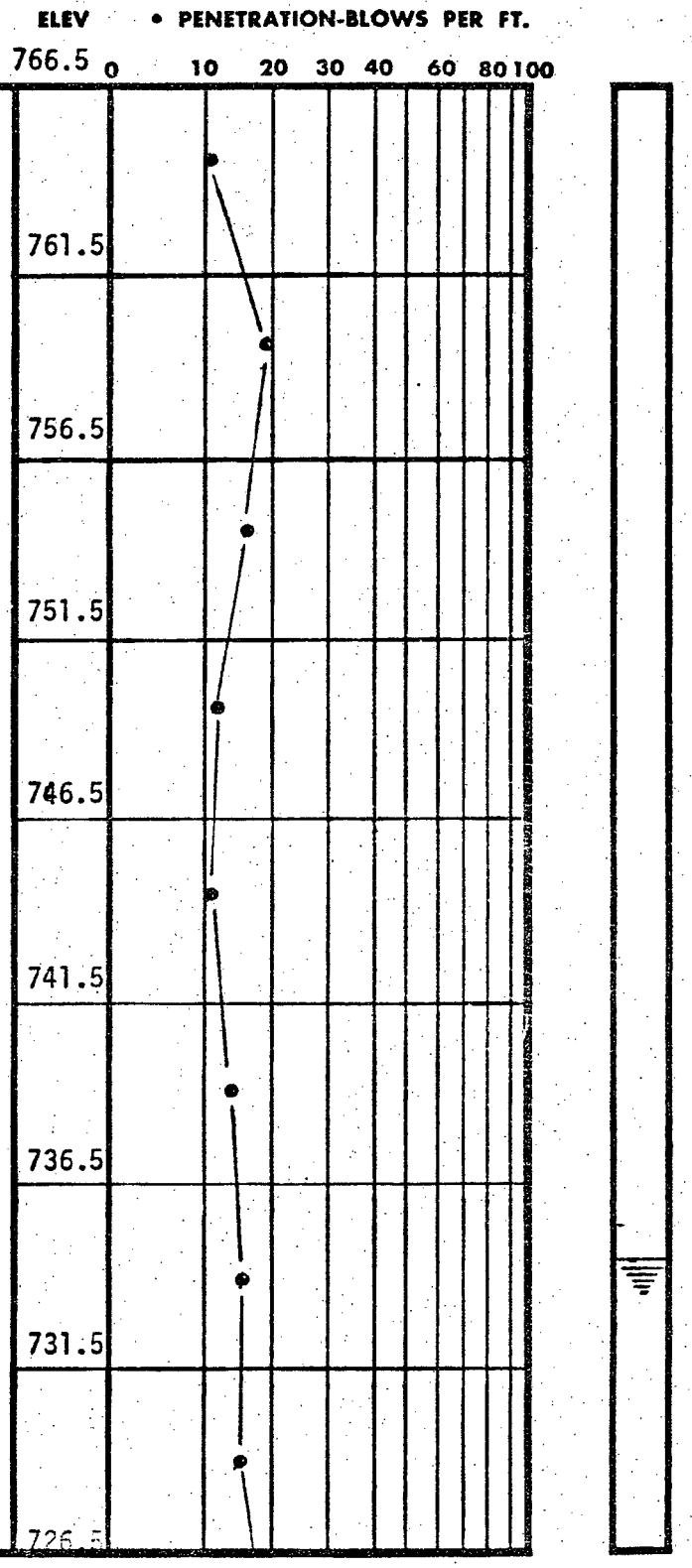
CORE BORING RECORD

BORING NO. HS-95
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Stiff Red Slightly Sandy Slightly Clayey Silt.
4.0	Very Stiff Red Micaceous Silt.
9.0	Very Stiff Red Tan and Black Slightly Sandy Micaceous Silt.
14.0	Stiff and Very Stiff Tan Brown and Black Slightly Sandy Micaceous Silt.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

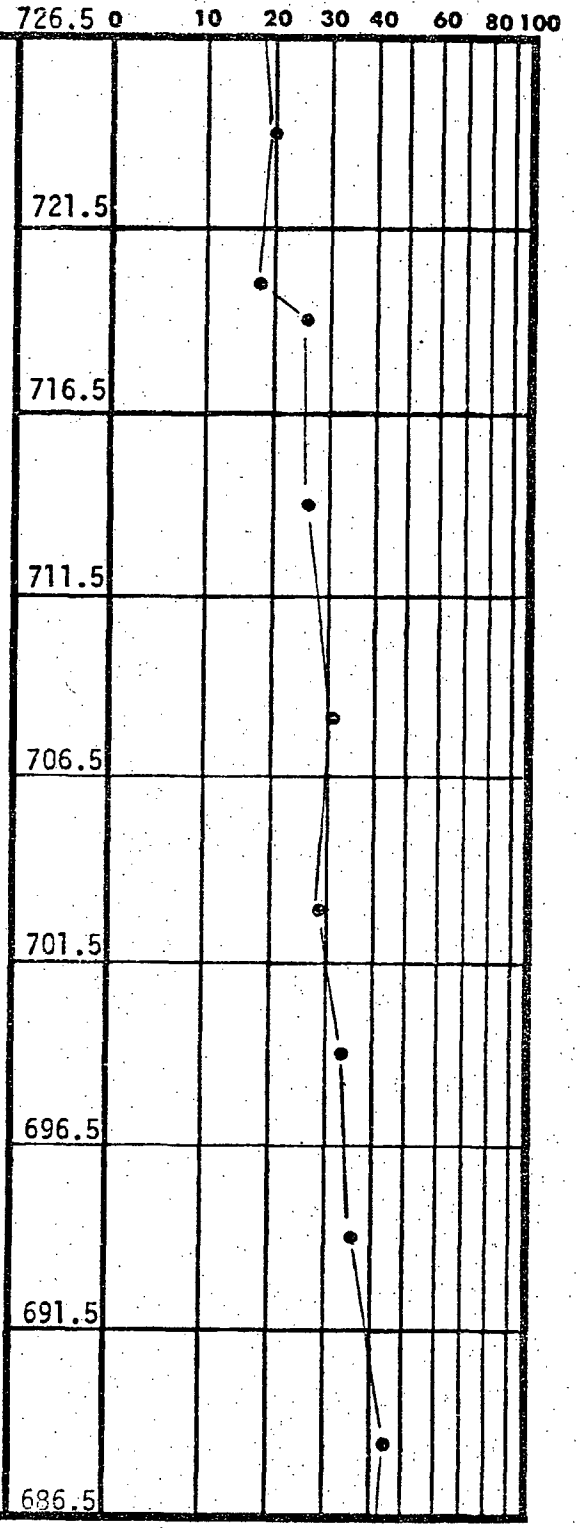
BORING NO. H-95

DATE DRILLED 7-13-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
	Stiff and Very Stiff Tan Brown and Black Slightly Sandy Micaceous Silt.
44.5	Firm Gray Black and White Micaceous Silty Fine to Medium Sand.
47.5	Very Stiff to Hard Tan White Black and Green Very Fine Sandy Micaceous Silt.
80.0	Dense Tan White and Gray Micaceous Very Silty Fine Sand.



TEST BORING RECORD

Page 2

BORING NO. H-95

DATE DRILLED 7-13-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
80.0	Dense Tan White and Gray Micaceous Very Silty Fine Sand.	686.5		
		681.5		
		676.5		
92.5	Partially Weathered Rock That Becomes Gray and White Silty Fine Sand When Sampled.	671.5		50 = 5-1/
		666.5		50 = 5"
		661.5		50 = 4-1/
105.0	Partially Weathered Rock That Becomes Green and Black Very Micaceous Silt When Sampled.	656.5		50 = 5-1/
111.2	Fishtail Refusal See Following Rock Log.	651.5		50 = 0"

TEST BORING RECORD

Page 3

BORING NO. H-95

DATE DRILLED 7-13-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 686.5	REMARKS	RQD
				681.5		
				676.5		
				671.5		
				666.5		
				661.5		
				656.5		
111.2						
112.2	Hard Fractured Black and White*					
112.8	Moderately Hard Black and White Coarse Grained Diorite					
113.8	Very Soft Black and White**	42	NX	651.5		0
114.9	Moderately Hard Black and White Coarse Grained Diorite					
118.2	Very Soft Black and White Coarse Grained Diorite ***					
118.7	Very Hard Quartz Seam	100	NX	646.5		84

* Fine Grained Granite
** Coarse Grained Diorite (No Recovery)
*** No Recovery

CORE BORING RECORD

BORING NO. H-95
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 646.5	REMARKS		RQD
	Hard Black and White Fine Grained Diorite	100	NX	641.5			84
		100	NX		Joint	Dip	
					111.5	10°	32
					112.4	Vertical	
				636.5	114.0	Vertical	
130.9 / 131.3	Hard Black and White Fine Grained Granite	100	NX		119.9	90°- Calcite Stained	100
	Hard Black and White Fine Grained Diorite			631.5	120.3	45°	
137.0					121.5	45°	
	Coring Terminated				122.4	45° Weathered	
					122.5	45° Weathered	
					124.4	45° Slightly Weathered	
					124.7	45° Brown Stained	
					125.9	45° Brown Stained	
					126.3	10° Calcite Stained	
					126.6	80° Calcite Stained	
					126.9	80° Calcite Stained	
					127.0	40° Calcite Stained	
					127.2	900	
					128.1	Slickenside Surface	
					129.7	Slickenside Surface	
					132.5	90° Weathered	
					132.9	90° Weathered	
					136.3	45°- Calcite Deposit	

No Drilling Water Loss

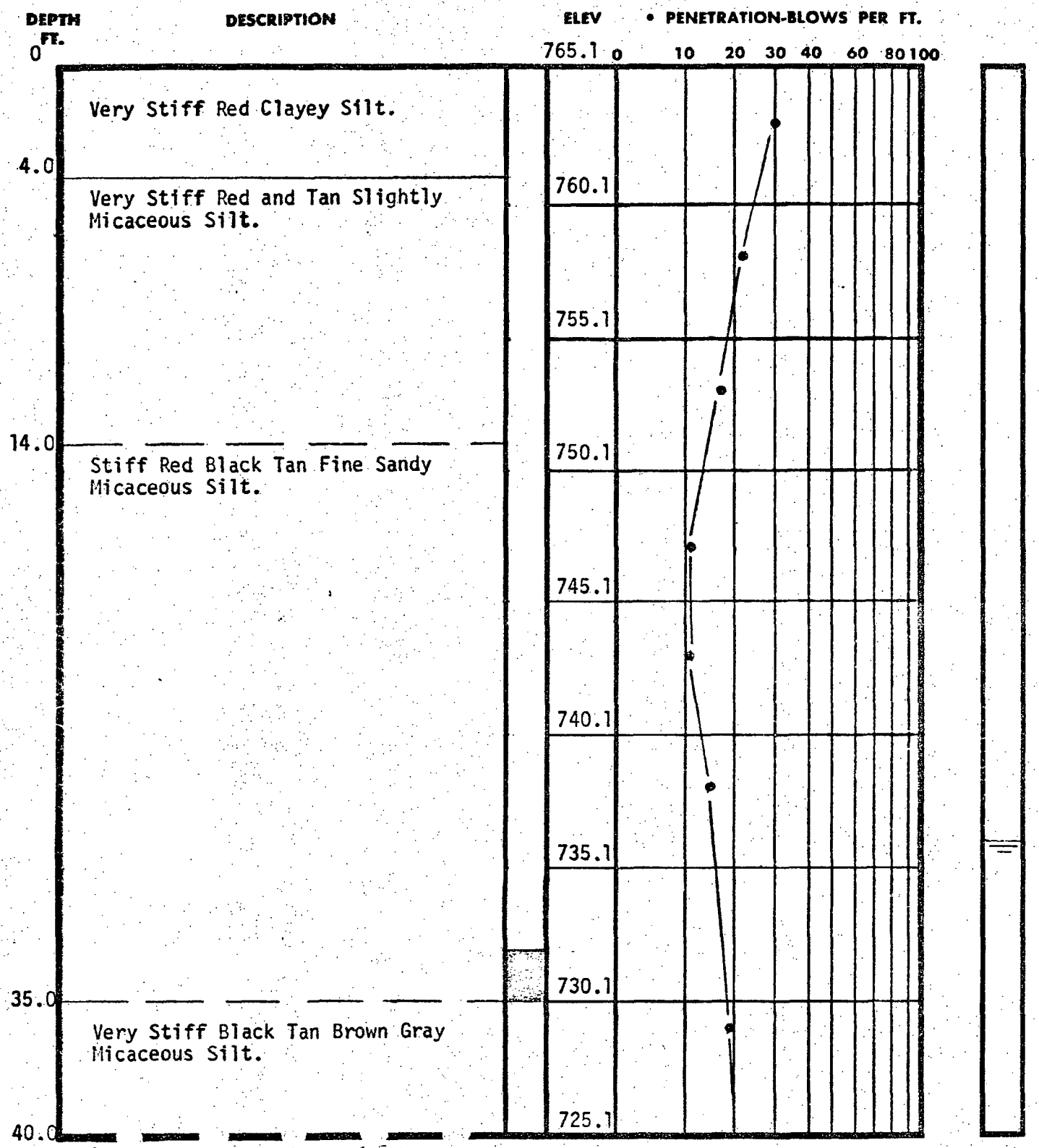
CORE BORING RECORD

BORING NO. H-95

JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.



TEST BORING RECORD

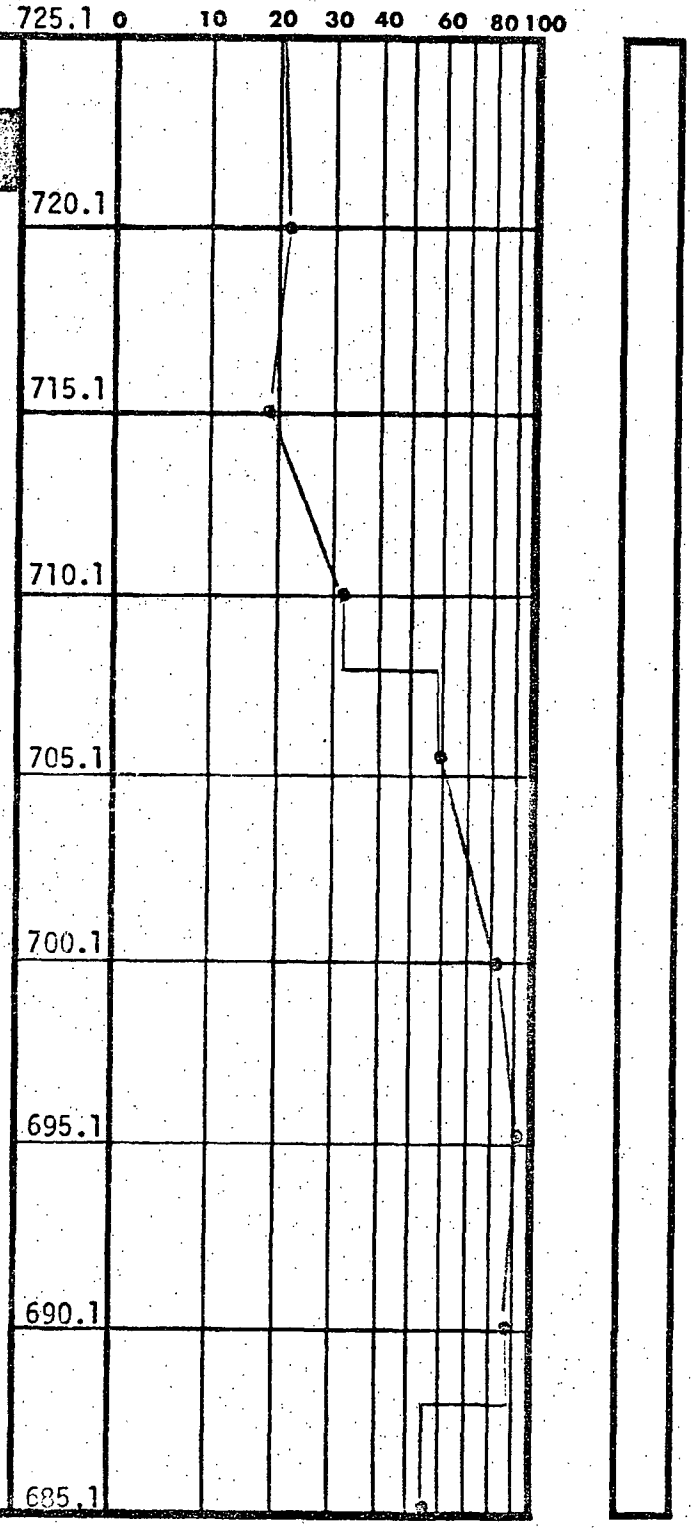
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-96
DATE DRILLED 7-16-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
40.0	
	Very Stiff Black Tan and Gray Fine to Medium Sandy Micaceous Silt.
52.0	
	Hard Black Tan and Gray Fine Sandy Micaceous Silt.
57.0	
	Very Dense Tan and White Very Silty Fine to Medium Sand.
59.8	
	Hard Green and Brown Very Micaceous Silt.
62.0	
	Hard Brown Green and Gray Fine to Coarse Sandy Silt with Gravel.
72.0	
	Hard Green and Brown Very Micaceous Silt.
77.0	
	Hard Gray and Black Fine to Medium Sandy Slightly Micaceous Silt.



TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-96

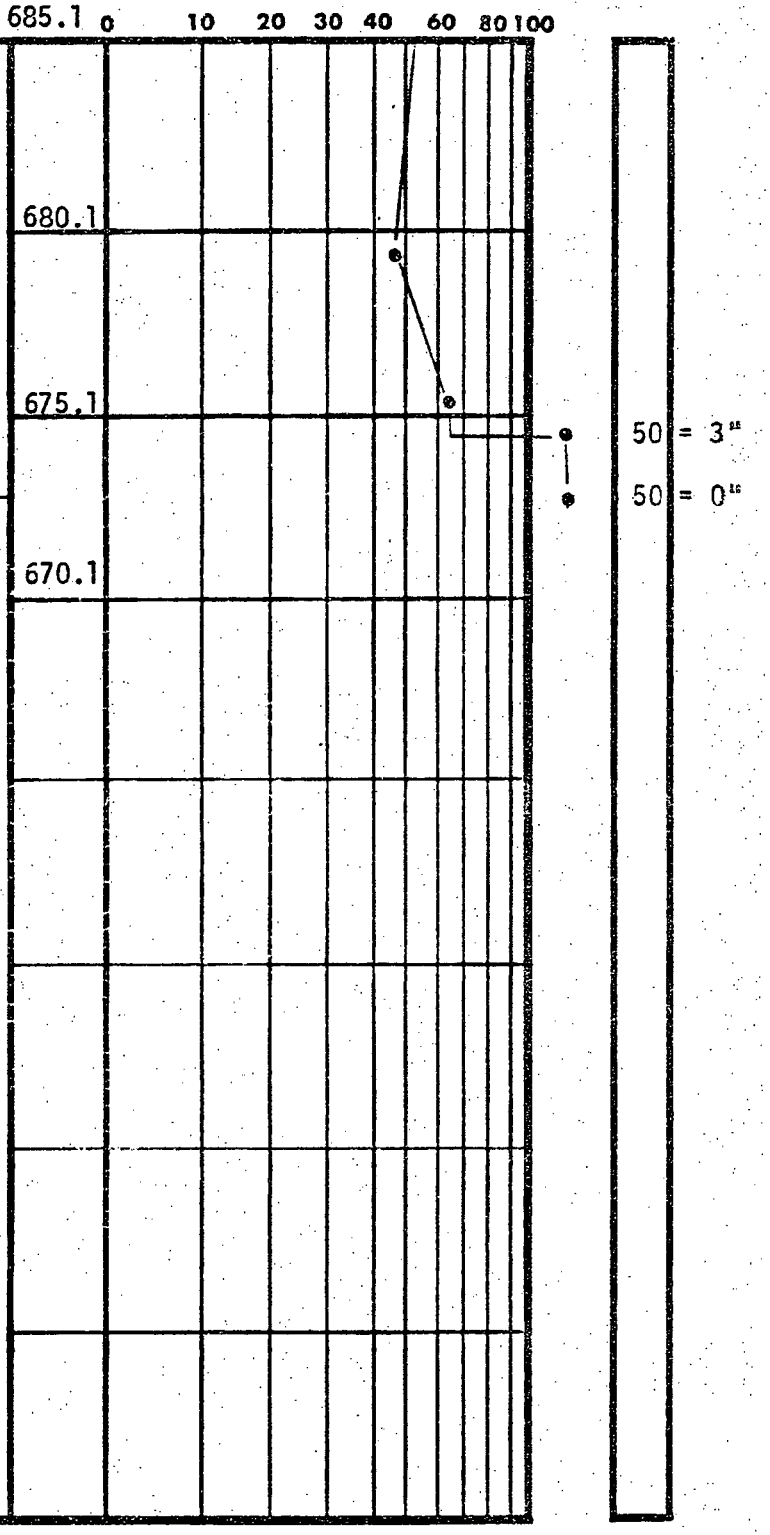
DATE DRILLED 7-16-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
		685.1
8[illegible]	Hard Gray and Black Fine to Medium Sandy Slightly Micaceous Silt.	
	Dense to Very Dense Brown Black and White Micaceous Very Silty Fine to Medium Sand.	680.1
		675.1
90.5		
92.1	Partially Weathered Rock.	
	See Following Rock Log.	670.1

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page 3

BORING NO. H-96

DATE DRILLED 7-16-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV. 685.1	REMARKS	RQD
				680.1		
				675.1		
92.1	Hard Light Gray Fine Grained Granite					
94.4	Hard Black and White Coarse Grained Diorite	100	NX	670.1		100
				665.1		
101.8	Coring Terminated			660.1		

No Drilling Water Loss

CORE BORING RECORD

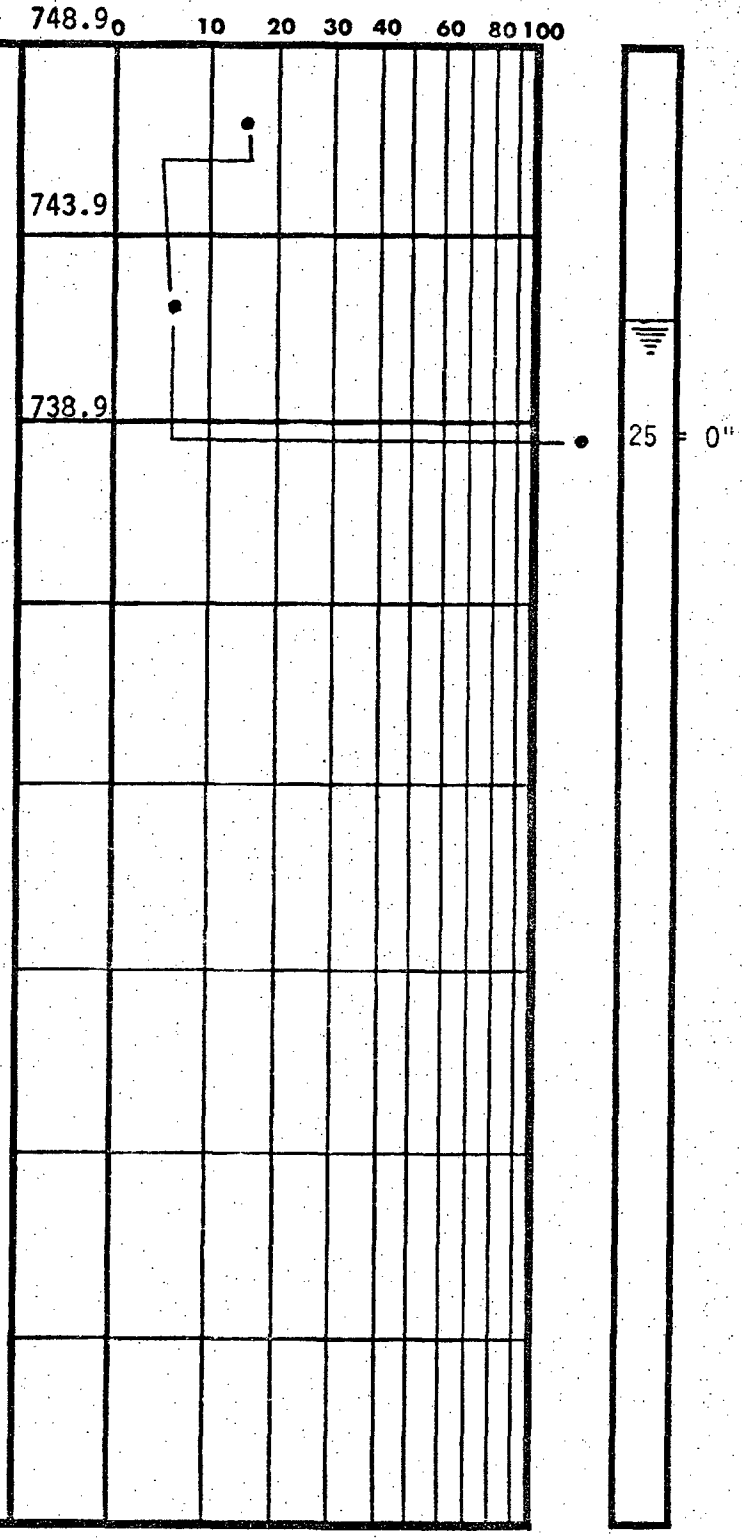
BORING NO. H-96
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Red Tan Brown Black Yellow Micaceous Silt.	748.9
3.0	Firm Black Tan Yellow Slightly Micaceous Silt.	743.9
10.5	Auger Refusal.	738.9
	See Following Rock Log.	

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-97

DATE DRILLED 7-20-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS			RQD
				738.9	JOINTS DEPTH		DIP	
10.5	Hard Dark Green Meta Gabbro.	100	NX	733.9	11.1'	-	45°	100%
					12.5'	-	Slickenside Surfaces	
16.2					13.5'	-	Slickenside Surface	
	Hard Black and White Coarse Grained Diorite.	100	NX	728.9	14.4'	-	Slickenside Surface	100
					19.6'	-	Slickenside Surface	
22.9	Coring Terminated.			723.9				

No Drilling Water Loss.

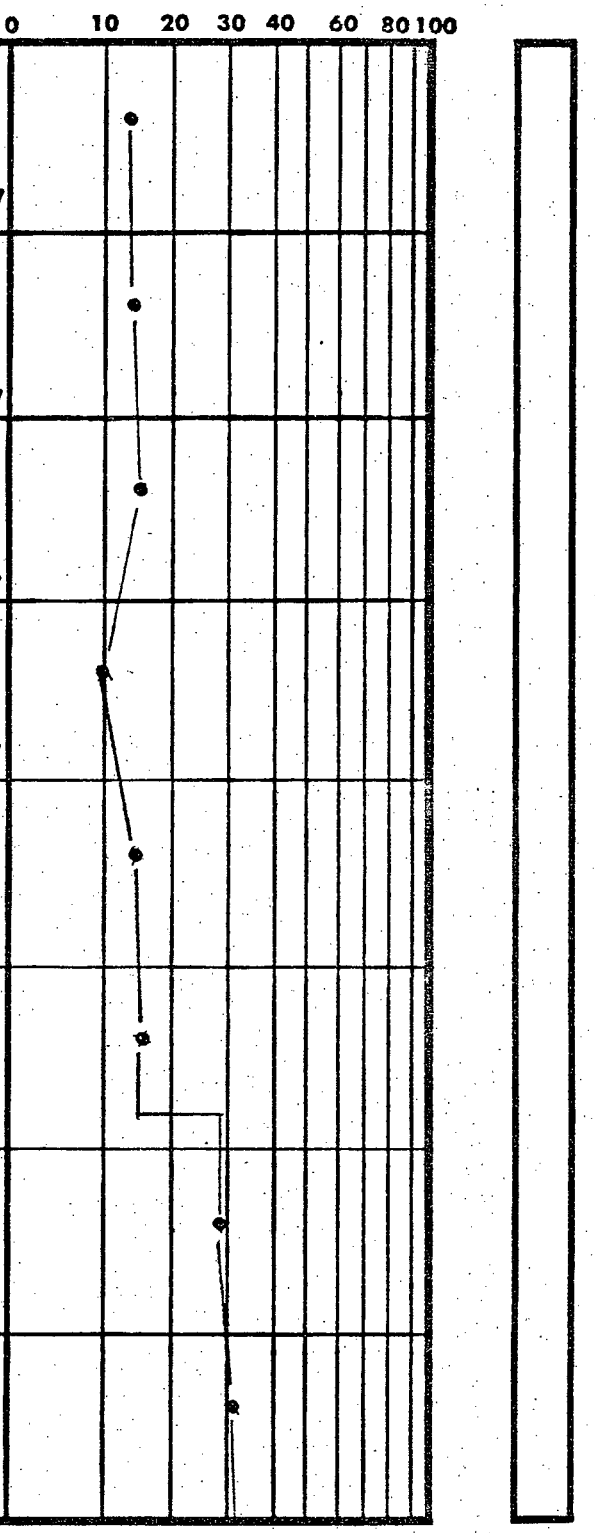
CORE BORING RECORD

BORING NO. H-97
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Brown Tan Slightly Micaceous Silt.	748.7
3.0	Stiff Red Brown Tan Black Slightly Micaceous Silt.	743.7
10.0	Very Stiff Brown Black Very Micaceous Silt.	738.7
15.0	Stiff Gray Brown Micaceous Silt.	733.7
.0	Stiff White Tan Fine to Medium Sandy Silt.	728.7
29.0	Very Stiff White Tan Fine to Medium Sandy Silt.	723.7
34.0	Hard Brown Gray Very Micaceous Silt.	718.7
40.0		713.7
		708.7



Dry and Caved At 10'

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. H-98

DATE DRILLED 7-22-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. (0 10 20 30 40 60 80 100)
40.0	Dense White Tan Micaceous Very Silty Fine to Medium Sand.	708.7	
		703.7	
		698.7	
		693.7	
		688.7	
60.5	Auger Refusal. See Following Rock Log.		25 = 0"
		683.7	

TEST BORING RECORD

Page 2

BORING NO. H-98

DATE DRILLED 7-22-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	CORE %	BIT SIZE	ELEV.	REMARKS	RQD
60.5						
61.4	Very Hard Black and White Fine Grained Granite					
	Very Hard Black and White Coarse Grained Diorite			683.7		
65.3		99	NX			98
	Very Hard Black and White Fine Grained Granite- Small Inclusions of Fine Grained Granite @ 63.0 and 64.1			678.7		
69.						
	Coring Terminated.					

No Drilling Water Loss

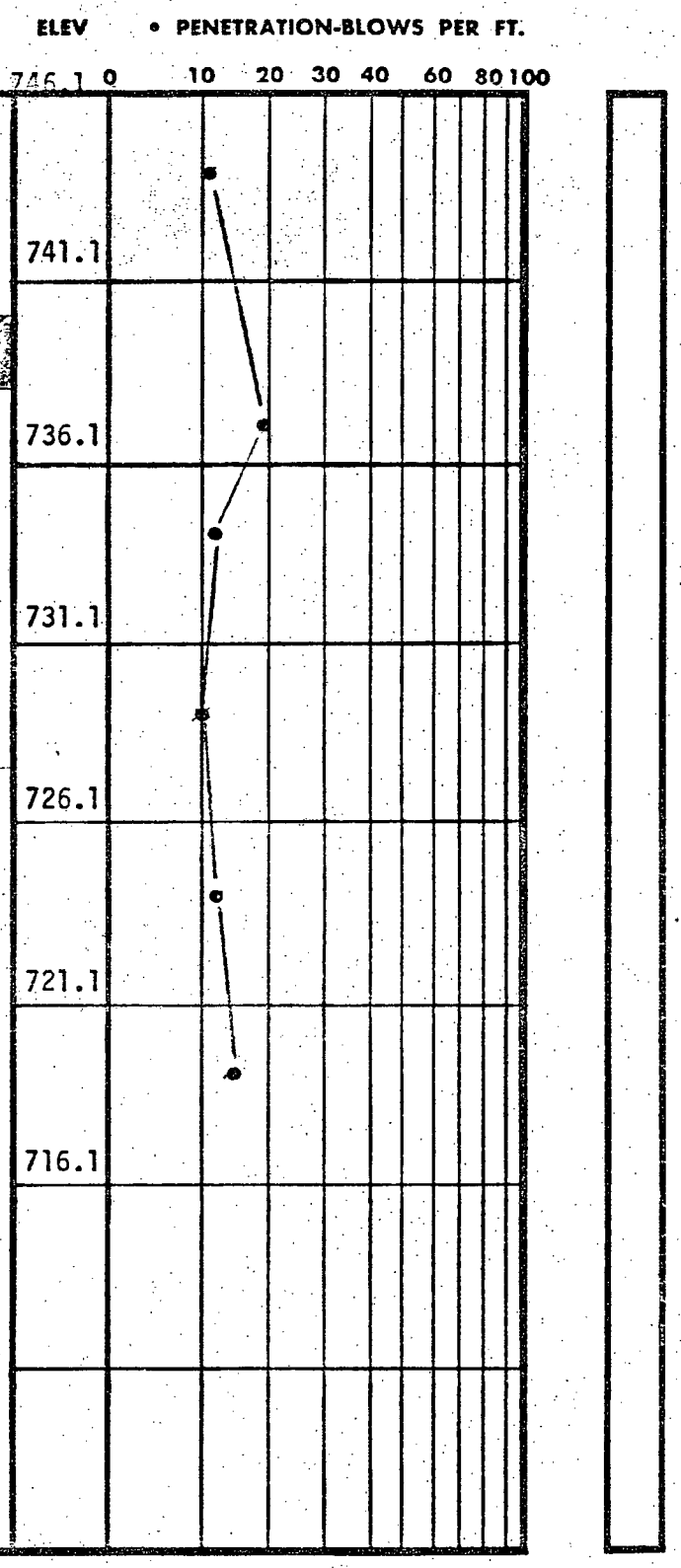
CORE BORING RECORD

BORING NO. H-98
JOB NO. CH 2055

WATER TABLE

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		746.1
	Stiff Brown and Tan Micaceous Silt.	
3.0		
	Stiff Tan Black Micaceous Silt.	741.1
		736.1
		731.1
15.0		
	Stiff Tan Black and White Micaceous Silt.	726.1
24.0		721.1
	Stiff Brown and Tan Micaceous Silt.	
30.0		716.1
	Boring Terminated.	



No Water Table Data

TEST BORING RECORD

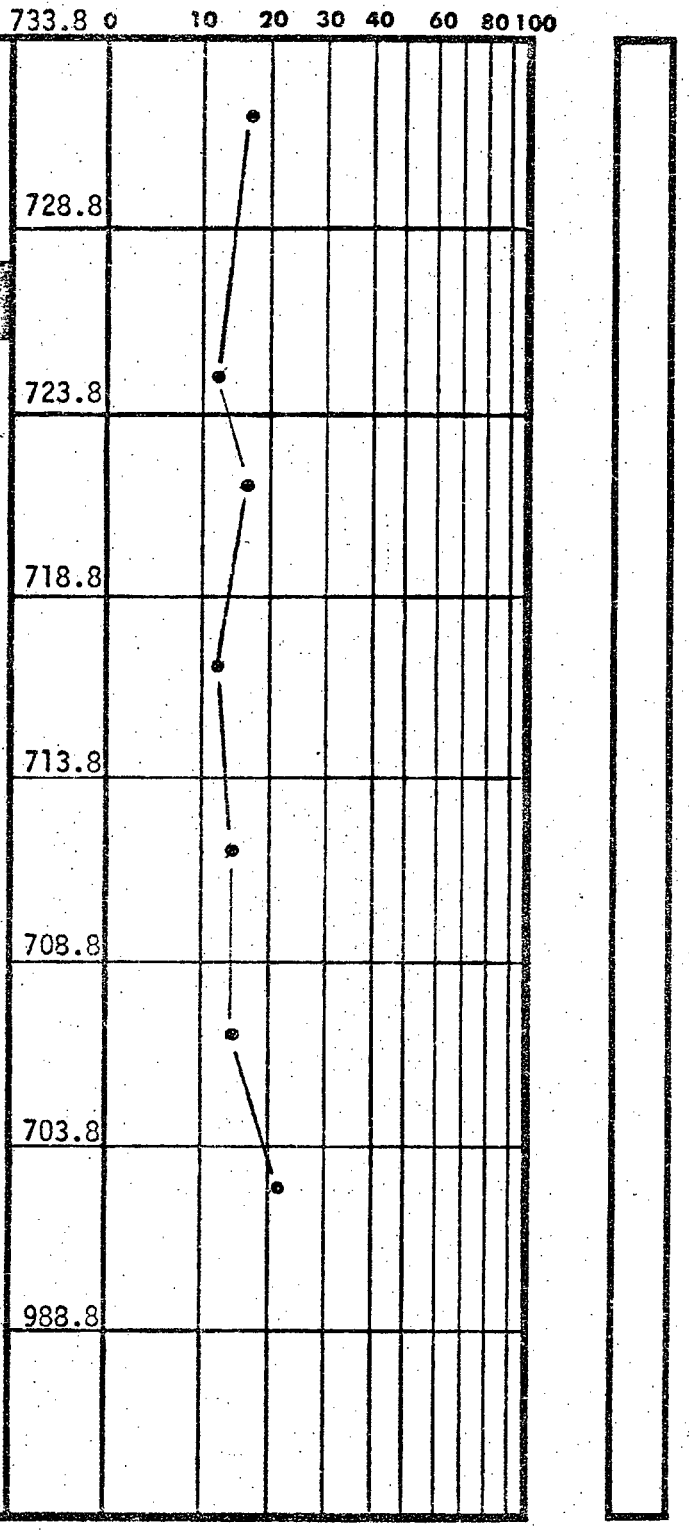
BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE
50 % ROCK CORE RECOVERY
WATER TABLE, 24 HR.
WATER TABLE, 1 HR.
LOSS OF DRILLING WATER

BORING NO. H-99
DATE DRILLED 7-20-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		733.8
	Very Stiff Red Tan Silt.	
5.0		728.8
	Stiff Tan Black Micaceous Silt.	
8.0		
	Stiff Gray Black Very Fine Sandy Silt.	
10.0		723.8
	Very Stiff Gray Black Very Fine Sandy Silt.	
15.0		718.8
	Stiff Tan Black White Micaceous Silt.	
		713.8
		708.8
		703.8
31.1		
31.2	Brown Black Micaceous Silty Fine Sand.	
31.5		
	Very Stiff Brown Tan Micaceous Silt.	988.8
	Boring Terminated.	



Dry and Caved At 9.1'

TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

% ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

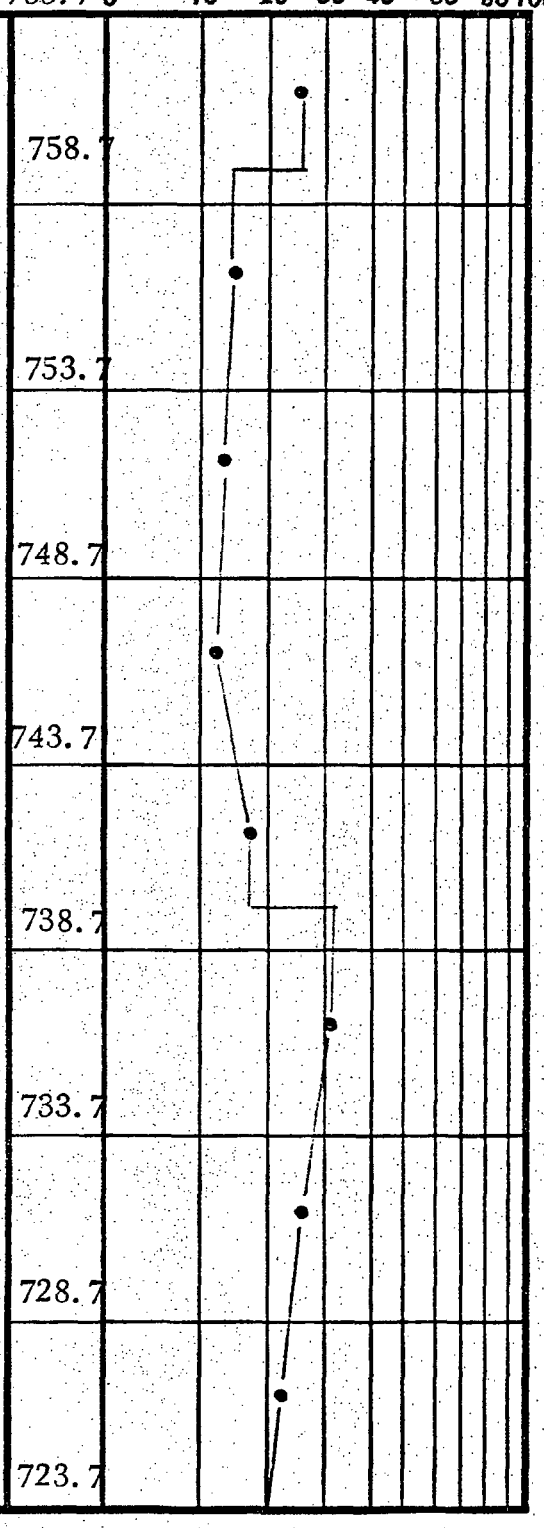
BORING NO. H-100

DATE DRILLED 7-20-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		763.7
	Very Stiff Dark Red Slightly Micaceous Fine Sandy Clayey Silt.	
4.0		758.7
	Stiff Yellow Red Slightly Micaceous Fine Sandy Silt.	
9.5		753.7
	Stiff and Very Stiff Yellow Red Brown Micaceous Fine Sandy Silt.	
		748.7
		743.7
0		738.7
	Hard Yellow Brown Micaceous Fine Sandy Silt.	
29.0		733.7
	Very Stiff Yellow Dark Brown Micaceous Fine Sandy Clayey Silt.	
34.0		728.7
	Very Stiff Yellow Red Brown Micaceous Fine Sandy Silt.	
		723.7



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. W-1

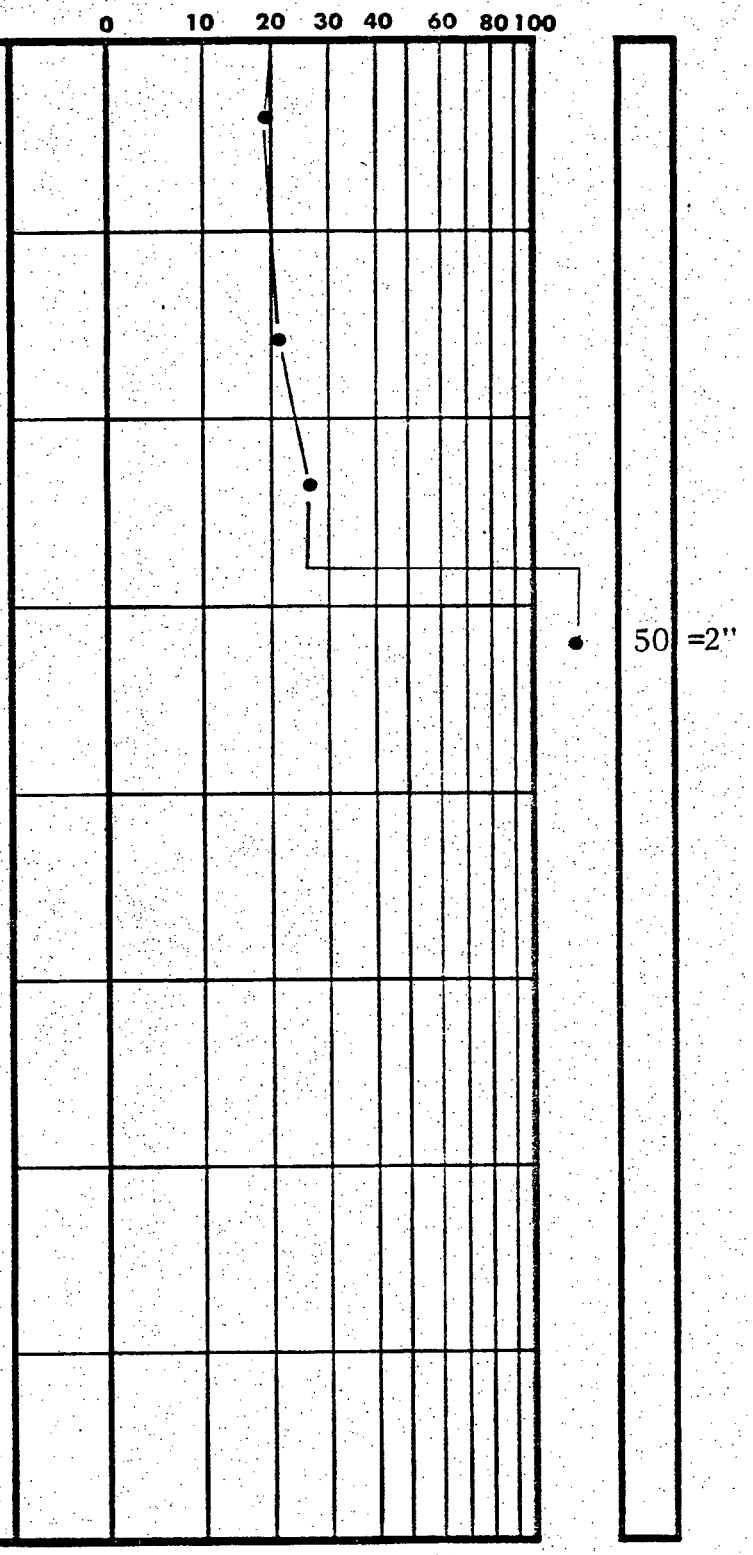
DATE DRILLED 3-17-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Very Stiff Yellow Red Brown Micaceous Fine Sandy Silt.	
54.0	Partially Weathered Rock That Becomes Gray Very Micaceous Silty Fine Sand When Sampled	
62.5	Boring Terminated No Groundwater Encountered	

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. W-1

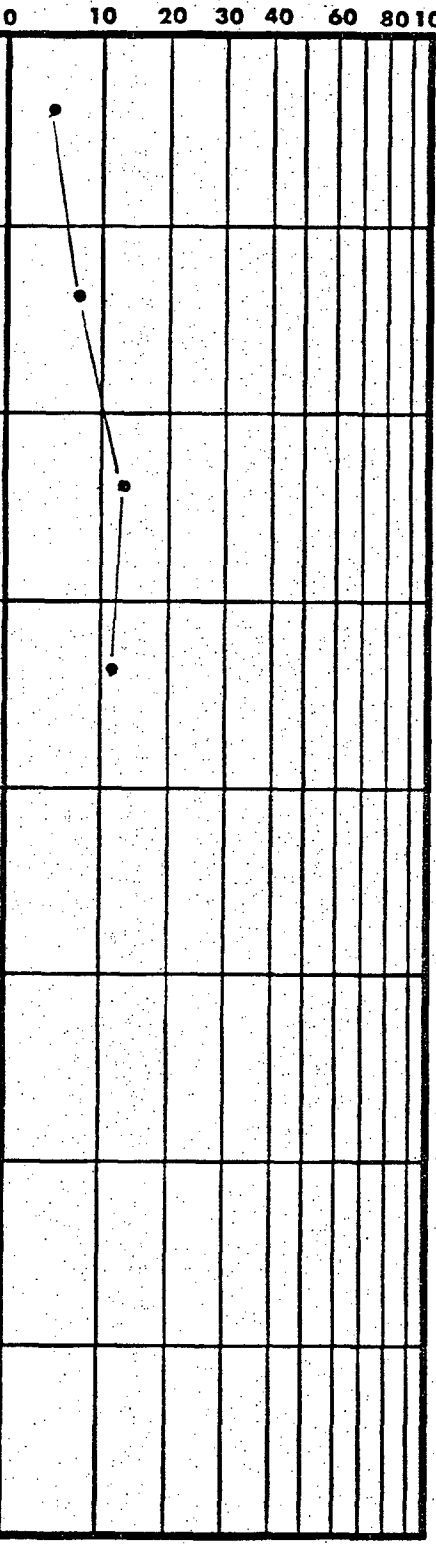
DATE DRILLED 3-17-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Firm Brown and Tan Fine to Medium Sandy Silt.	713
4.0	Firm to Stiff Tan and Gray Fine to Medium Sandy Silt.	708
		703
		698
		693
20.0	Boring Terminated.	

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

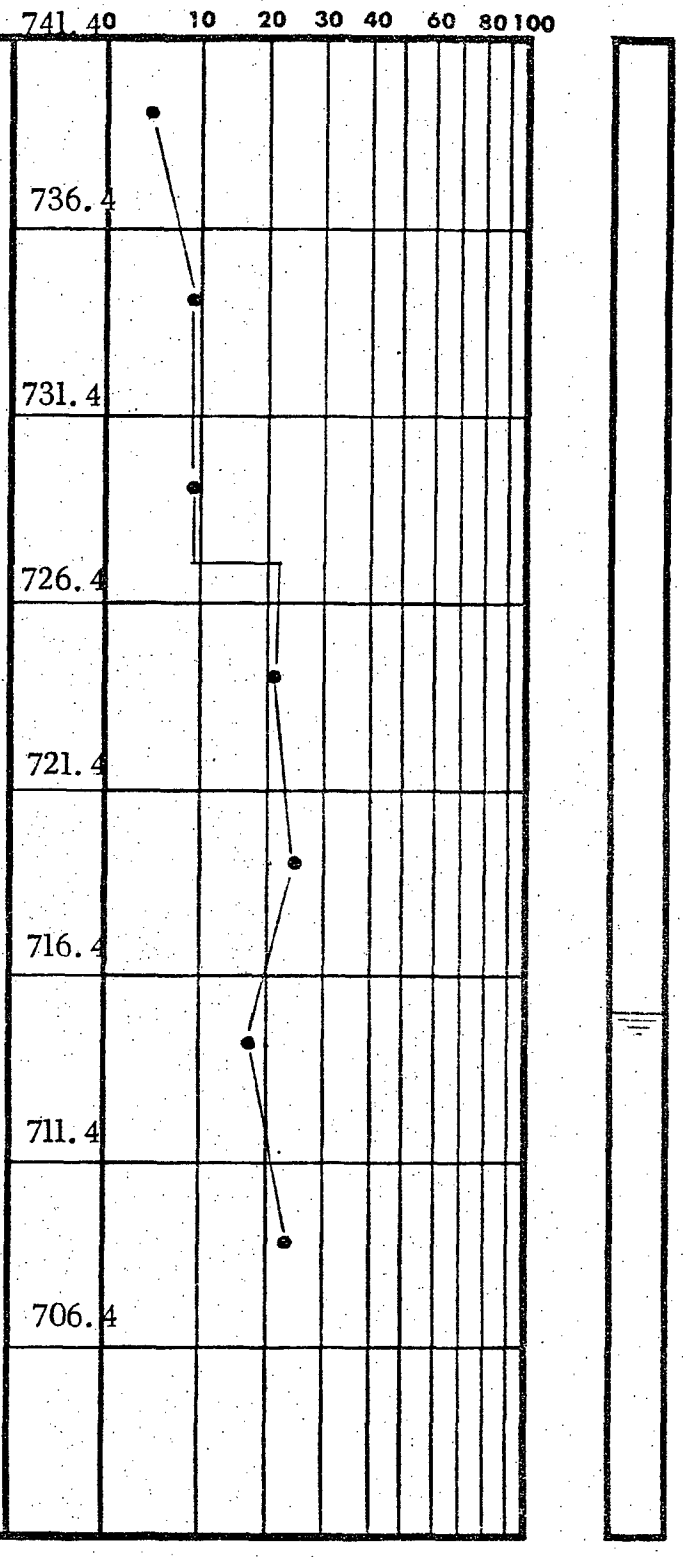
BORING NO. W-2

DATE DRILLED 4-4-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Firm Tan Silt.	741.4
4.0	Stiff Tan and Black Silt.	736.4
		731.4
14.0	Very Stiff Brown Fine Sandy Silt.	726.4
		721.4
		716.4
29.0	Firm Black and White Silty Fine to Medium Sand.	711.4
		706.4
36.0	Boring Terminated	



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

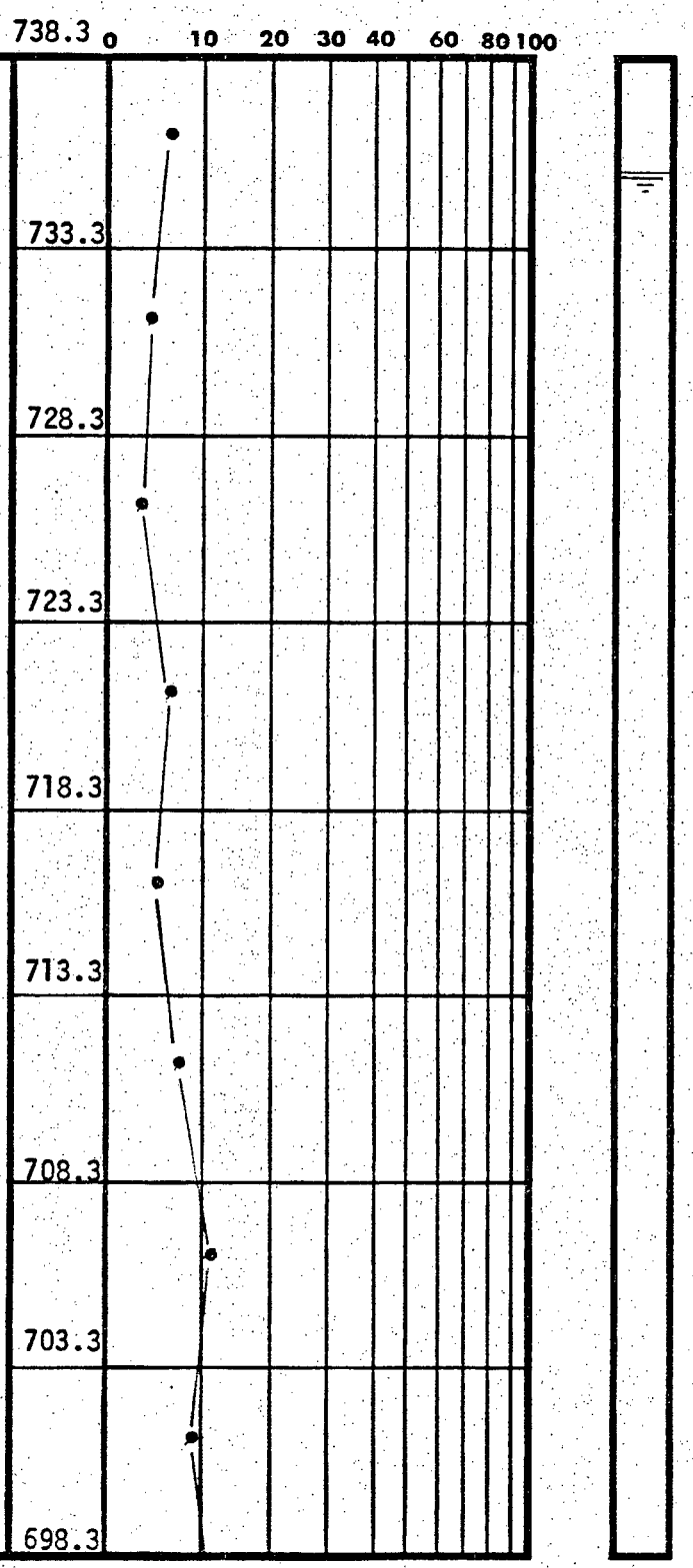
BORING NO. W-3

DATE DRILLED 4-1-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Firm Light Tan Fine to Medium Sandy Silty Clay.	738.3
4.0	Soft Light Tan and White Silty Clay.	733.3
		728.3
14.0	Firm Tan White and Pink Slightly Sandy Very Clayey Silt.	723.3
19.0	Firm Brown Tan and White Micaceous Silt with Seams of Clay.	718.3
		713.3
29.0	Stiff Brown Tan and White Fine to Coarse Sandy Micaceous Silt.	708.3
		703.3
40.0		698.3



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

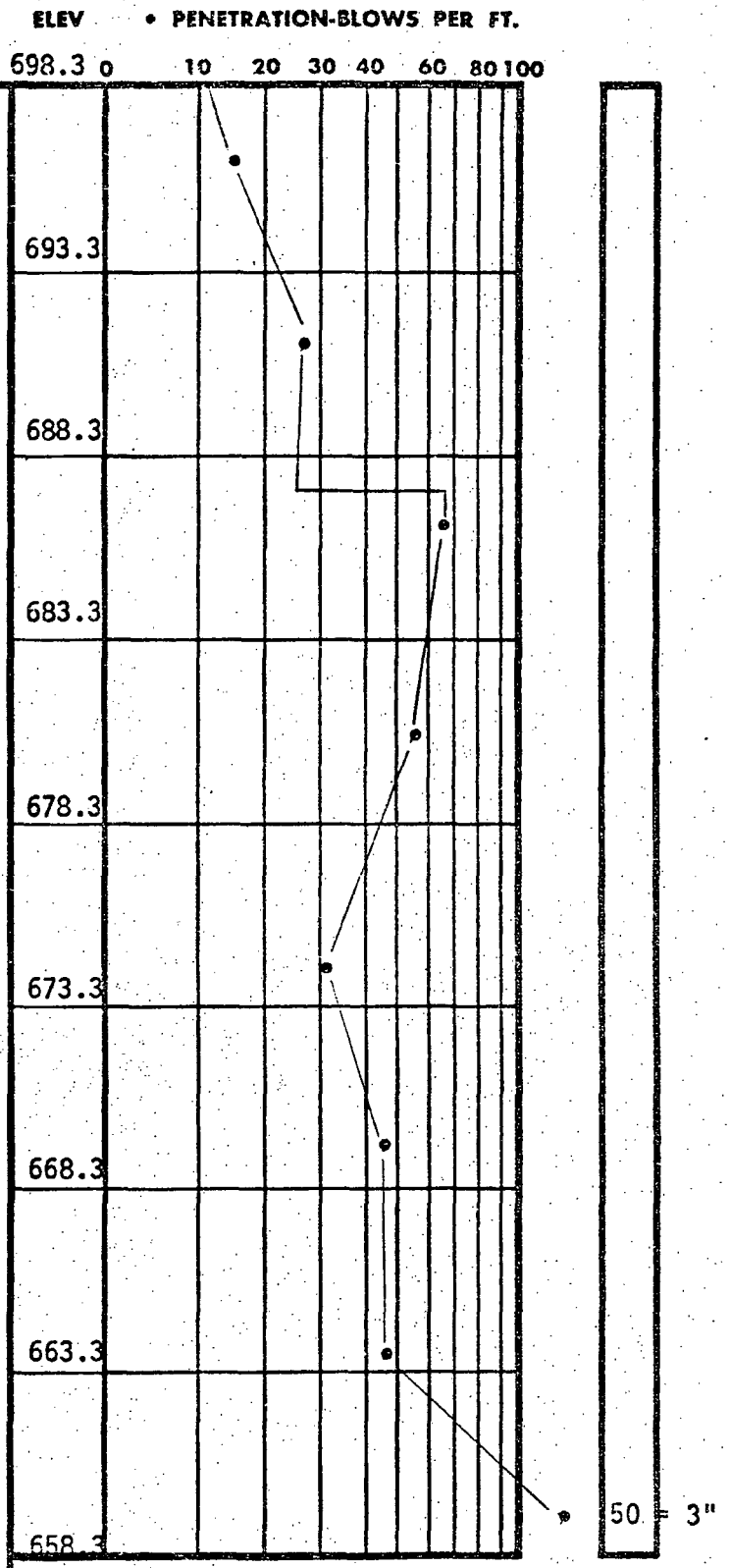
BORING NO. W-4

DATE DRILLED 4-3-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
40.0	Stiff Brown Tan and White Fine to Coarse Sandy Micaceous Silt.
44.0	Firm Gray and White Micaceous Fine to Medium Sand.
51.0	Very Dense Gray and White Micaceous Fine to Medium Sand.
4.0	Hard Gray Brown and White Slightly Coarse Sandy Micaceous Silt.
81.0	Partially Weathered Rock That Becomes Gray Brown and White Slightly Coarse*



Boring Terminated.
* Sandy Micaceous Silt When Sampled.

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.
UNDISTURBED SAMPLE
WATER TABLE, 1 HR.
[50] % ROCK CORE RECOVERY
LOSS OF DRILLING WATER

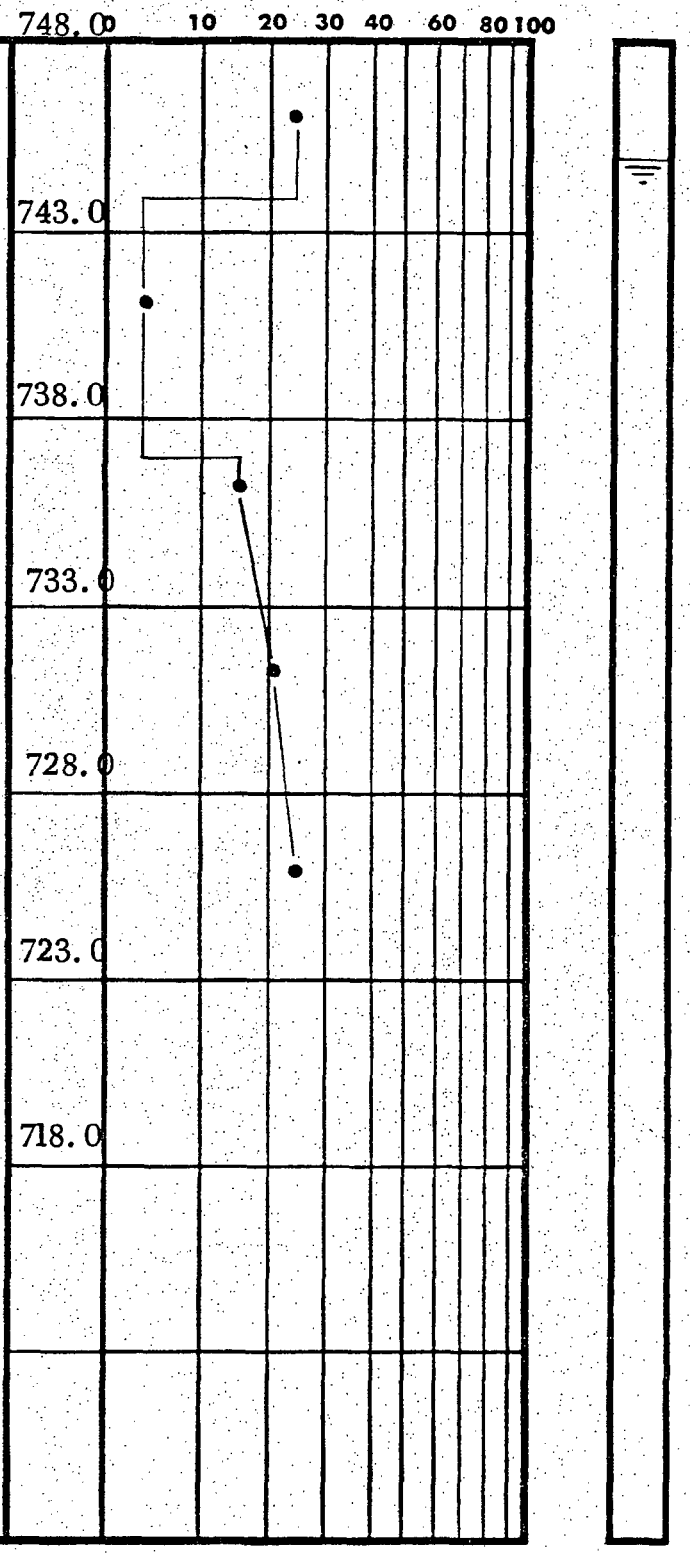
TEST BORING RECORD

Page 2

BORING NO. W-4
DATE DRILLED 4-3-70
JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		748.0
4.0	Very Stiff White and Tan Fine to Medium Sandy Clayey Silt.	743.0
11.0	Very Loose Gray and White Silty Fine to Medium Sand.	738.0
14.0	Firm Gray and White Silty Fine to Medium Sand.	733.0
19.0	Very Stiff Brown and Black Slightly Micaceous Silt.	728.0
32.0	Very Stiff Brown and Black Very Fine Sandy Silt with Coarse Sand Sized Fragments of Weathered Rock.	723.0
	Boring Terminated	718.0



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

50 % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. W-5

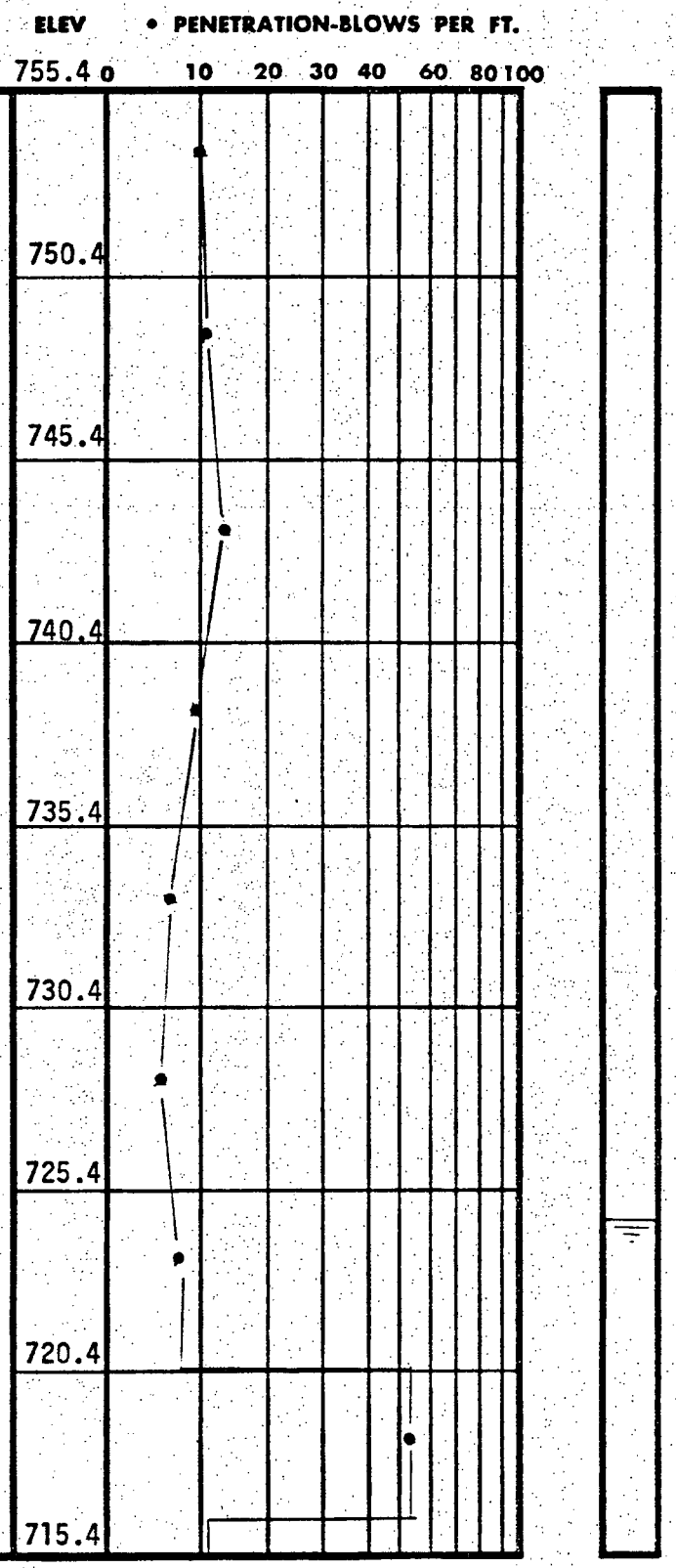
DATE DRILLED 3-18-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION
0	Stiff Brown Tan and Black Slightly Sandy Silt.
9.0	Stiff Tan and Black Fine Sandy Micaceous Silt.
19.0	Firm Tan White and Black Fine to Medium Sandy Micaceous Silt.
35.0	Very Dense White Fine to Medium Sand.
39.0	
40.0	Stiff Gray White and Black Fine *

*Sandy Silt.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. W-6

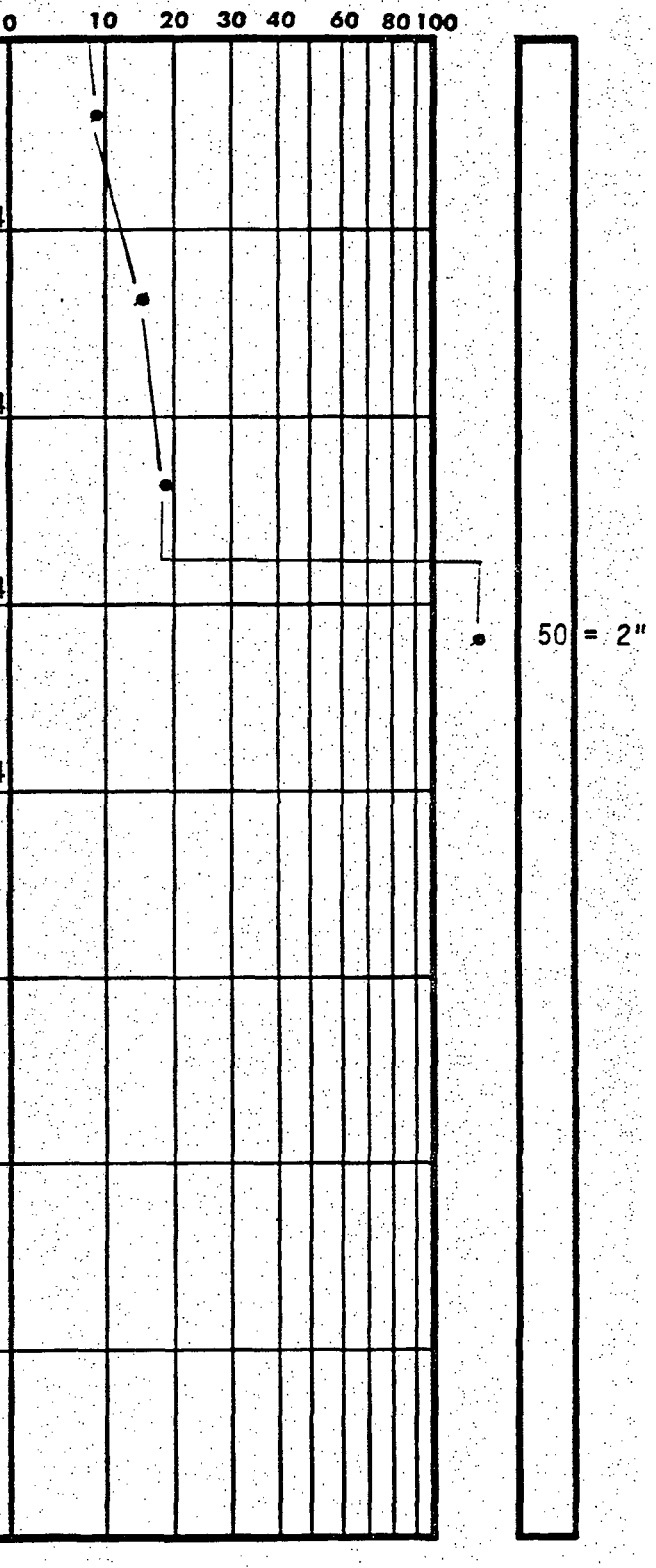
DATE DRILLED 4-7-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Stiff Gray White and Black Fine Sandy Silt.	715.4
		710.4
49.0	Very Stiff Gray Brown and Black Very Silty Fine Sand.	705.4
54.0	Partially Weathered Rock.	700.4
56.1	Boring Terminated.	695.4

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

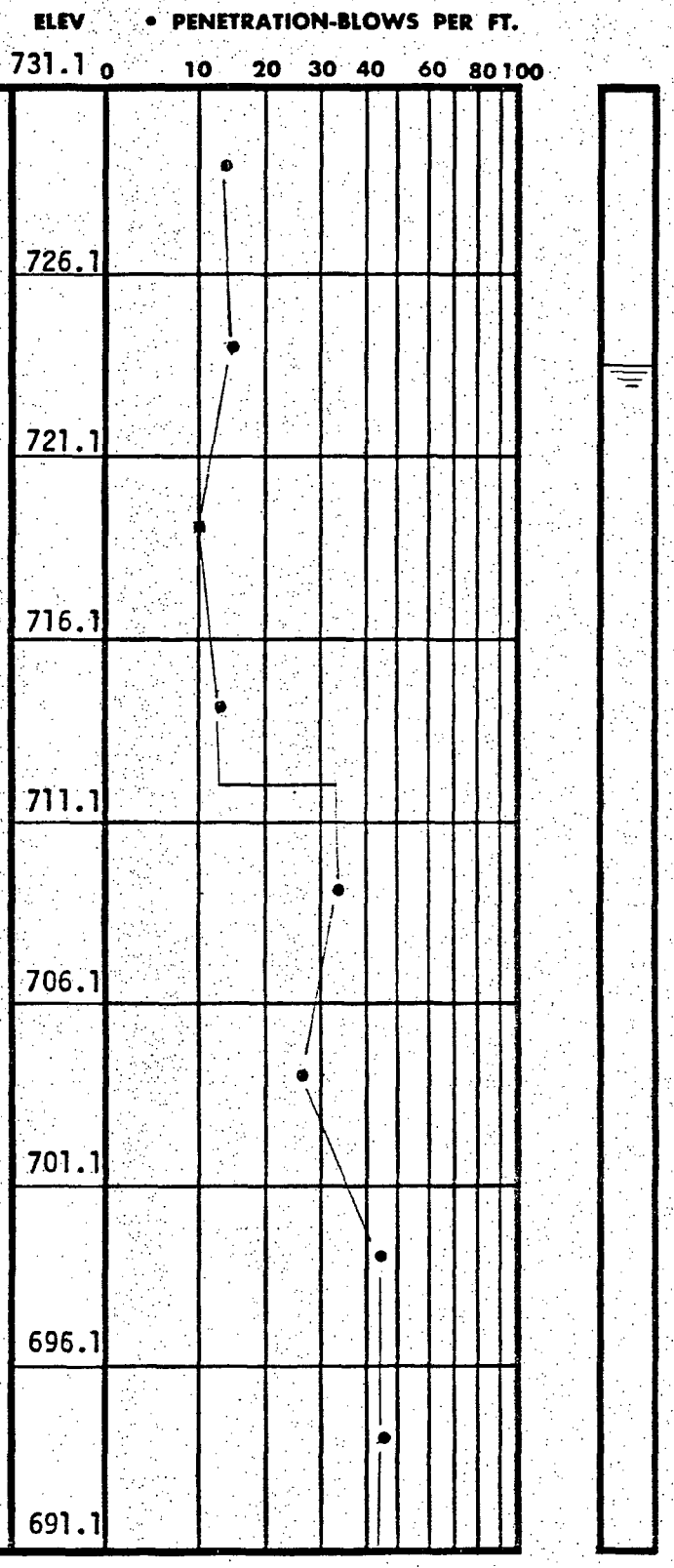
BORING NO. W-6

DATE DRILLED 4-7-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0		731.1
	Stiff Gray Fine Sandy Clay.	
4.0		726.1
	Firm Gray Green and Black Very Silty Fine to Coarse Sand.	
9.0		721.1
	Stiff Tan and White Slightly Sandy Silt.	
14.0		716.1
	Stiff Tan Green and White Fine to Coarse Very Sandy Silt with Gravel Size Fragments of Weathered Rock.	
19.0		711.1
	Hard Tan and White Fine to Medium Sandy Silt.	
24.0		706.1
	Very Stiff Tan Green and White Fine to Medium Sandy Silt with Gravel Size Fragments of Weathered Rock.	
28.0		701.1
	Hard Tan and White Fine to Coarse Sandy Silt.	
		696.1
		691.1
40.0		



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. W-7

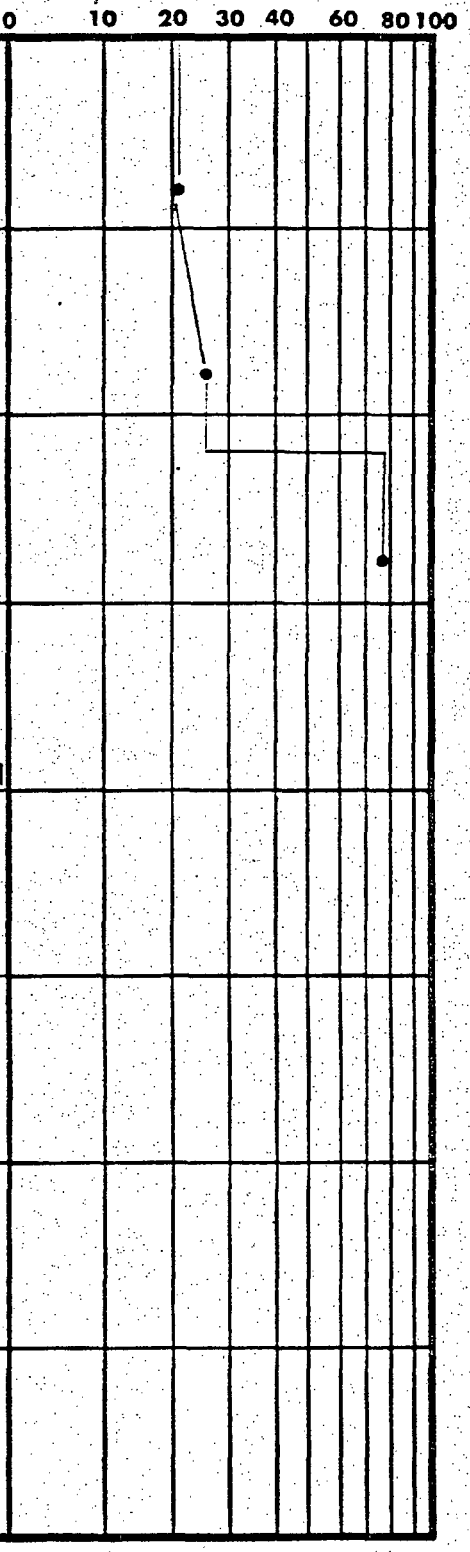
DATE DRILLED 4-6-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
40.0	Hard Tan and White Fine to Coarse Sandy Silt.	691.1
42.0	Very Stiff Green and White Speckled Fine Sandy Silt.	686.1
		681.1
51.0	Hard Green Brown and White Fine to Coarse Sandy Silt Becoming Partially Weathered Rock at 57.8 Feet.	676.1
57.8	Boring Terminated.	671.1

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. W-7

DATE DRILLED 4-6-70

JOB NO. CH 2055

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

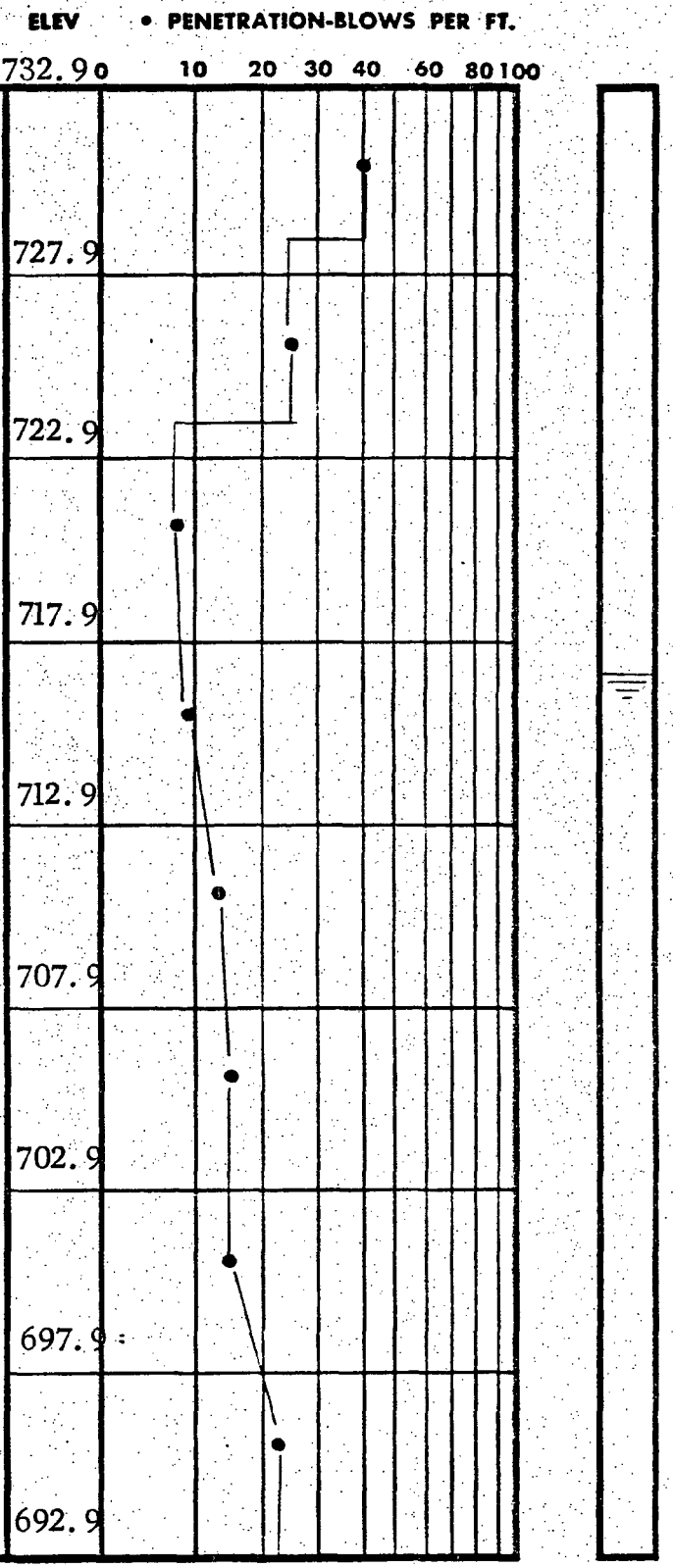
WATER TABLE, 1 HR.

|50| % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Very Stiff Red Clayey Silt	732.9
4.0	Very Stiff Reddish Brown Slightly Clayey Slightly Micaceous Silt.	727.9
9.0	Firm to Stiff Brown Tan and Black Micaceous Silt	722.9
		717.9
		712.9
19.0	Stiff Pink Brown and Black Micaceous Silt.	
24.0	Firm Gray Micaceous Silty Fine Sand.	707.9
		702.9
29.0	Stiff Tan and Black Micaceous Silt.	
		697.9
34.0	Very Stiff Gray Brown and Black Micaceous Silt.	
		692.9
40.0		



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. W-9

DATE DRILLED 3-12-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 0 10 20 30 40 60 80 100	
40.0	Partially Weathered Rock	692.0		50 =0
42.0	Boring Terminated			50 =0

TEST BORING RECORD

Page 2

BORING NO. W-9

DATE DRILLED 3-12-70

JOB NO. CH 2055

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

WATER TABLE, 24 HR.

UNDISTURBED SAMPLE

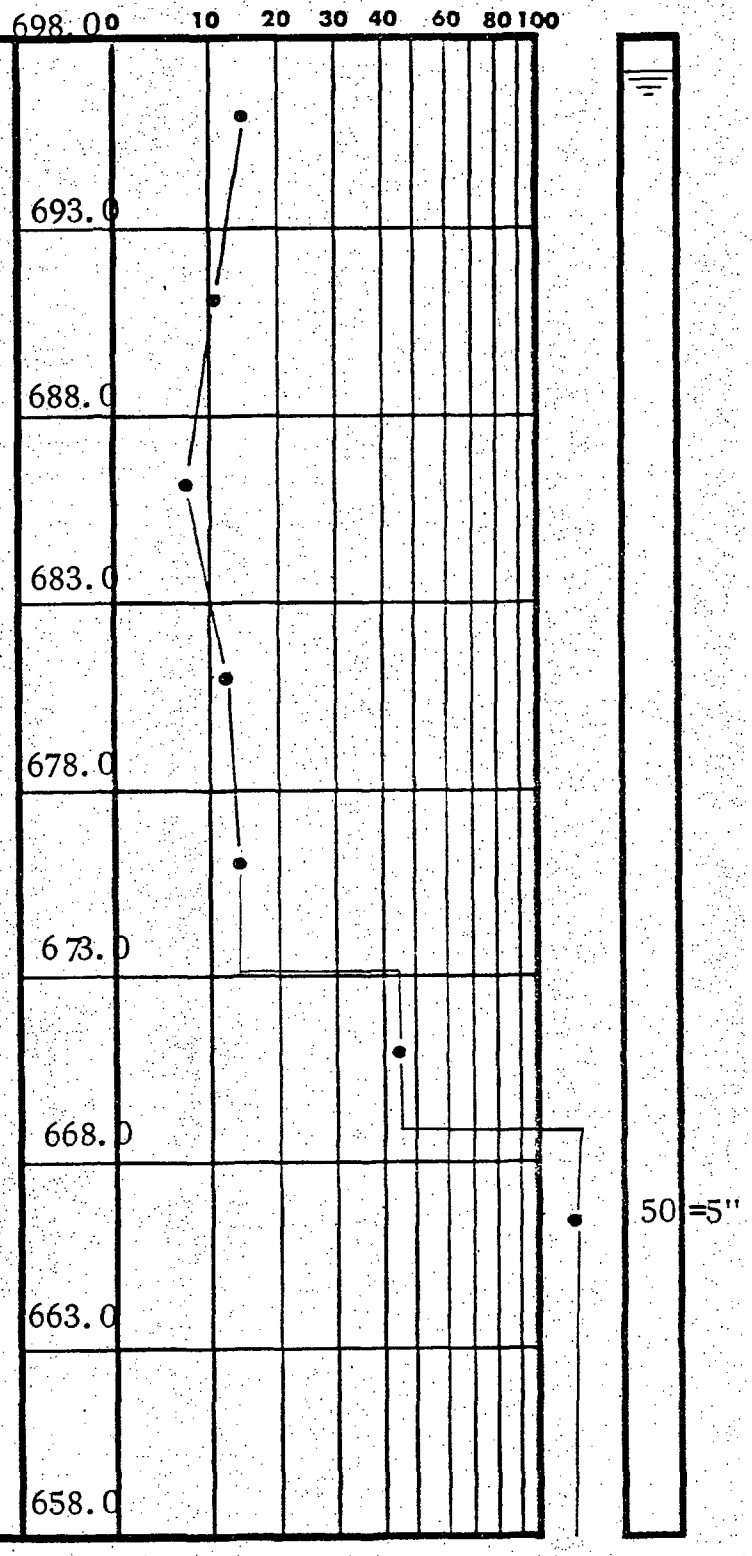
WATER TABLE, 1 HR.

50 % ROCK CORE RECOVERY

LOSS OF DRILLING WATER

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Brown Clayey Fine Sandy Silt.	698.0
4.0	Stiff Reddish Brown Fine Sandy Micaceous Silt.	693.0
9.0	Firm Gray and Brown Fine Sandy Very Micaceous Silt.	688.0
14.0	Firm Gray Micaceous Silty Fine to Medium Sand.	683.0
		678.0
		673.0
25.0	Dense Gray Micaceous Silty Fine to Medium Sand.	
29.0	Partially Weathered Rock That Becomes Black and Gray Silty Fine to Medium Sand When Sampled.	668.0
		663.0
		658.0



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. W-10

DATE DRILLED 3-18-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV	• PENETRATION-BLOWS PER FT. 10 20 30 40 60 80 100	
		658.0		
	Partially Weathered Rock That Becomes Black and Gray Silty Fine to Medium Sand When Sampled		•	50 =4"
45.0	Boring Terminated	653.0		

TEST BORING RECORD

Page 2

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

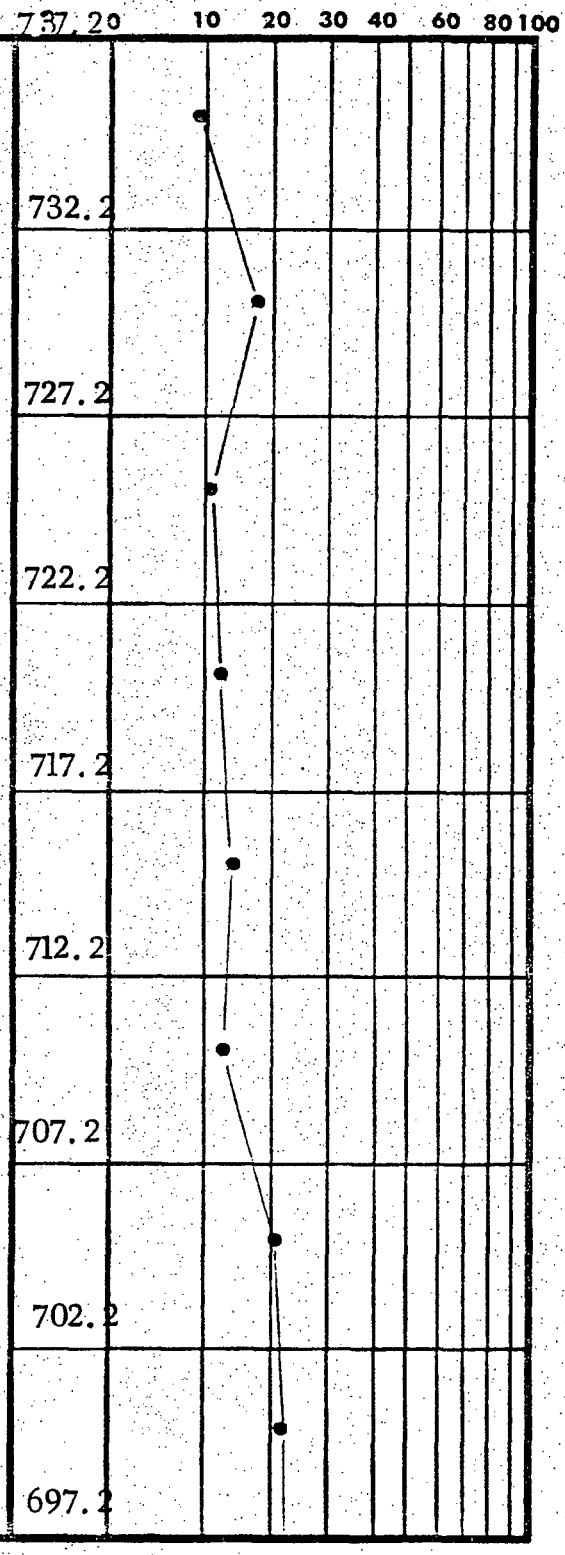
BORING NO. W-10

DATE DRILLED 3-18-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
0	Stiff Red Brown Slightly Clayey Fine to Medium Sandy Micaceous Silt.	737.2
4.0	Stiff and Very Stiff Pink Fine to Coarse Very Sandy Micaceous Silt.	732.2
		727.2
		722.2
16.5	Stiff Tan and Black Fine Sandy Micaceous Silt.	
19.0	Stiff Purple Tan and Black Fine to Coarse Slightly Sandy Micaceous Silt.	717.2
		712.2
27.5	Firm Gray and White Micaceous Silty Fine to Coarse Sand.	707.2
34.0	Very Stiff Brown Tan and Black Fine Sandy Micaceous Silt.	702.2
		697.2



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

BORING NO. W-11

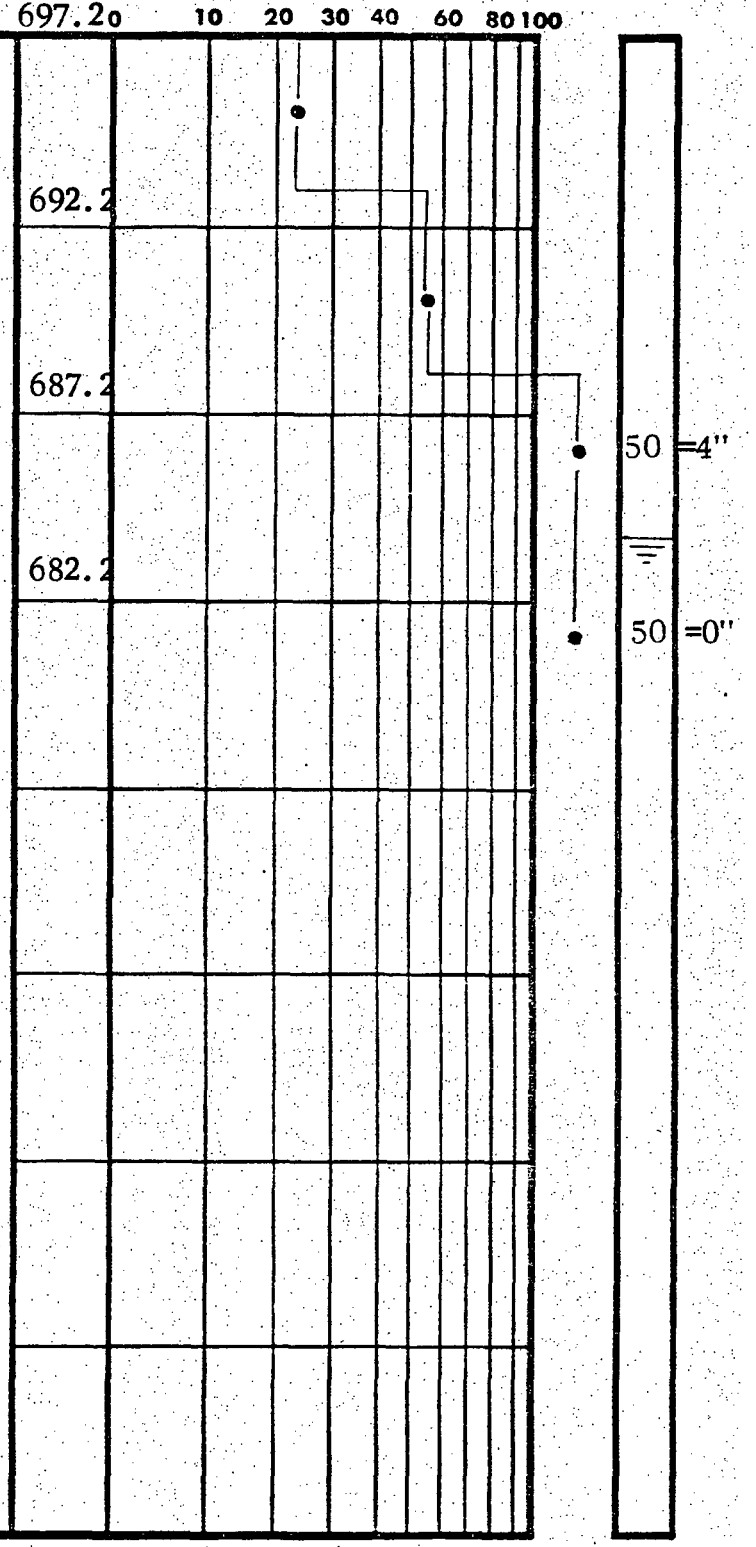
DATE DRILLED 3-17-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.

DEPTH FT.	DESCRIPTION	ELEV
	Very Stiff Brown Tan and Black Fine Sandy Micaceous Silt	697.2
44.0	Very Dense Gray and White Micaceous Silty Fine to Coarse Sand.	692.2
48.0	Partially Weathered Rock.	687.2
		682.2
56.0	Boring Terminated	

• PENETRATION-BLOWS PER FT.



TEST BORING RECORD

BORING AND SAMPLING MEETS ASTM D-1586
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE

|50| % ROCK CORE RECOVERY

WATER TABLE, 24 HR.

WATER TABLE, 1 HR.

LOSS OF DRILLING WATER

Page 2

BORING NO. W-11

DATE DRILLED 3-17-70

JOB NO. CH 2055

LAW ENGINEERING TESTING CO.