

SEABROOK UPDATED FSAR

APPENDIX 2F

GEOTECHNICAL REPORT - REACTOR BORINGS. JULY 1974

The information contained in this appendix was not revised, but has been extracted from the original FSAR and is provided for historical information.

GEOTECHNICAL REPORT
REACTOR BORINGS
SEABROOK STATION, NEW HAMPSHIRE

Submitted to
YANKEE ATOMIC ELECTRIC CO.

GEOTECHNICAL ENGINEERS INC.
1017 Main Street
Winchester, Massachusetts 01890

July 31, 1974

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5. Contoured Equal Area Upper Hemisphere Polar Projection to joints in Reactor 2; Borings E2-15, 16, 17, and 18
6. Contoured Equal Area Upper Hemisphere Polar Projection to slickensided surfaces in Reactor 2; Borings E2-15, 16, 17, and 18

1.0 INTRODUCTION

1.1 Purpose

An excavation approximately 150 feet in diameter and 70 feet deep will be required for each of the two proposed reactors at **Seabrook** Station.

To design the side slopes of the excavation and to estimate the quantity of excavation, it is necessary to determine the frequency and orientation of fractures in the rock. For this purpose inclined borings were made around the perimeter of each of the two proposed excavations. The core was oriented and the orientation of joints, slickensided surfaces, and foliation was determined.

1.2 Scope

Four inclined borings were made around the perimeter of each proposed reactor excavation. The borings ranged in length from 165 to 169 feet, and in inclination from 39° to 41.5° , measured from vertical. (The bottom of a **165-foot-long** boring inclined at 40° is at a vertical difference in elevation of 126 feet below the ground surface.)

2.4 Orientation Data

Core was oriented from near the rock surface to the bottom of the hole, with three exceptions: Boring E2-11 in which orientation starts at 63 ft (inclined length) below the rock surface; Boring E2-17 in which orientation terminates at 65 ft (inclined length) in a borehole that was 165 ft long; and Boring E2-15 in which orientation terminates at 42 ft (inclined length) in a borehole that was 165 ft long.

Appendix II is a summary of all the orientation data, and Appendix III contains polar equal area stereo net projections for the features oriented in each borehole.

Fig. 1 is a plot of generalized dip and strike data for joints in each of the borings.

Fig. 2 is a plot of generalized dip and strike data for foliation. As shown on the individual boring logs in Appendix I, the rock at the two reactor sites does not exhibit much foliation.

Fig. 3 is a plot of generalized dip and strike data for slickensided surfaces.

Fig. 4 is a contoured plot of the projections of poles for 230 joints measured in the core from borings at Reactor 1; Fig. 5 is a contoured plot of the projections of poles for 93 joints in Reactor 2; and Fig. 6 is a contoured plot of the projections of poles for 114 slickensided surfaces in Reactor 2.

Fig. 4 shows that there are two dominant sets of fracture surfaces at Reactor No. 1 with strikes and dips roughly as follows (listed in order of decreasing frequency of occurrence):

N30E, 40NW
N40E, 60SE

Figs. 5 and 6 show that there are three dominant sets of fracture surfaces at Reactor No. 2, with strikes and dips roughly as follows (listed in order of decreasing frequency of occurrence):

N30E, 30 NW
N45E, 55SE
N15W, 60 SW

TABLES

TABLE 1

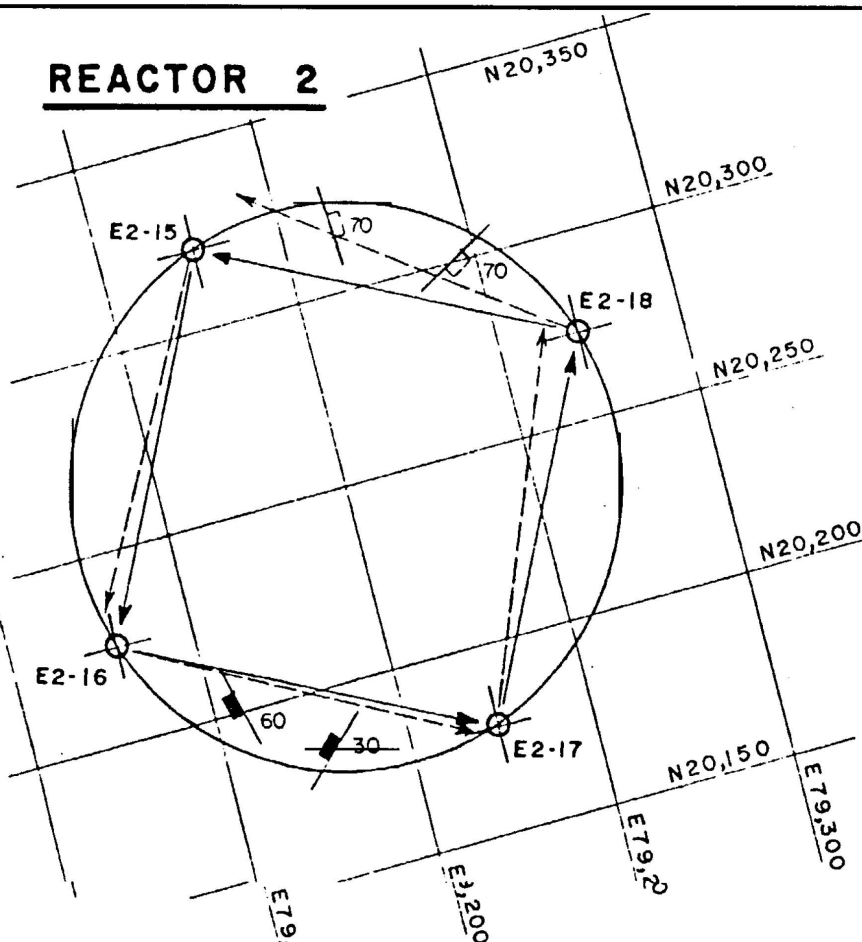
ZONES ORIENTED IN REACTOR BORINGS

<u>Reactor No.</u>	<u>Boring No.</u>	<u>Length of Boring*</u> (feet)	<u>Inclination of Boring Measured From Vertical</u>	<u>Length Oriented*</u> (feet)	<u>Vertical Depth to Top of Rock</u> (feet)
1	E2-11	168.0	40°	63-168	13.5
1	E2-12	165.7	41°	13.8-165.7	0.7
1	E2-13	169.0	41°	22-169	0.0
1	E2-14	166.0	41.5°	11-166	2.2
2	E2-15	165.0	41.5°	13.5-42	8.6
2	E2-16	165.1	41°	18-165	7.1
2	E2-17	165.0	41°	22-65	14.3
2	E2-18	168.0	39°	15.5-168	10.8

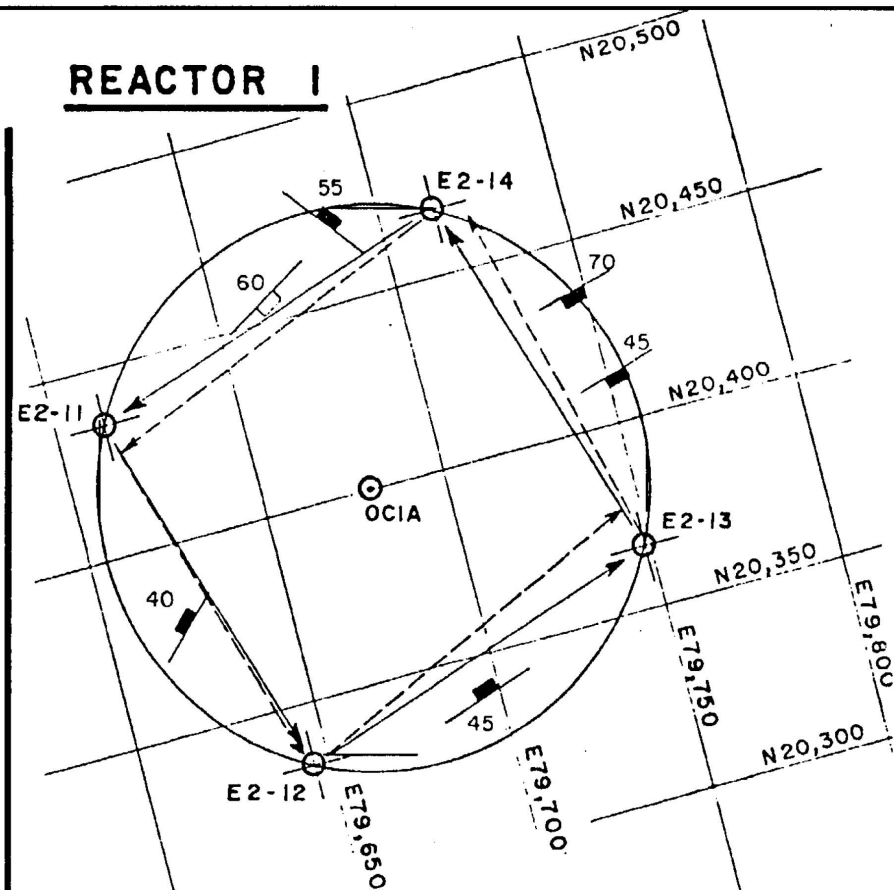
*Measured along inclined axis of borehole.

FIGURES

REACTOR 2



REACTOR 1



— PROPOSED DIRECTION OF ANGLE BORINGS
 - - - ACTUAL DIRECTION OF ANGLE BORINGS

NOTE: LENGTH OF ARROWS INDICATES PROJECTION OF HOLE TO HORIZONTAL

< 10 POINTS PER CLUSTER OF FEATURES

> 10 POINTS PER CLUSTER OF FEATURES

○ OVERCORE BORING

⊙ ANGLE BORING

N



YAN K EE ATOMIC

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PLAN OF REACTOR SITES

SHOWING GENERALIZED DIP & STRIKE OF JOINTS

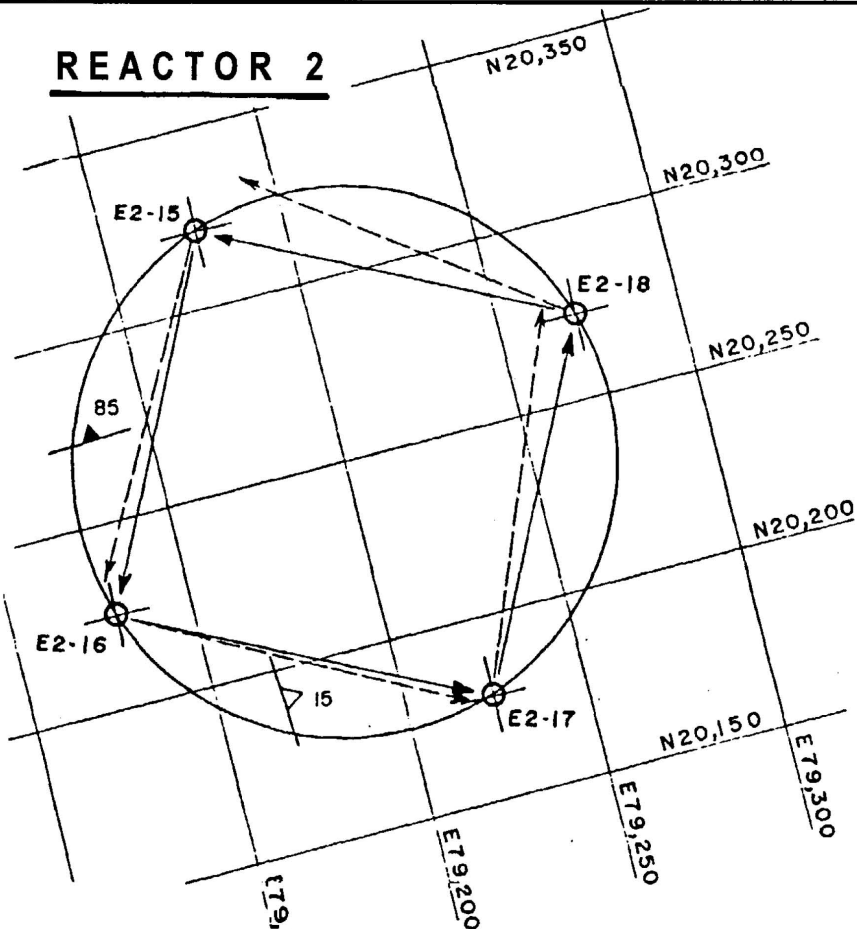
GEOTECHNICAL ENGINEERS, INC.
 WINCHESTER, MASSACHUSETTS

PROJECT 7206

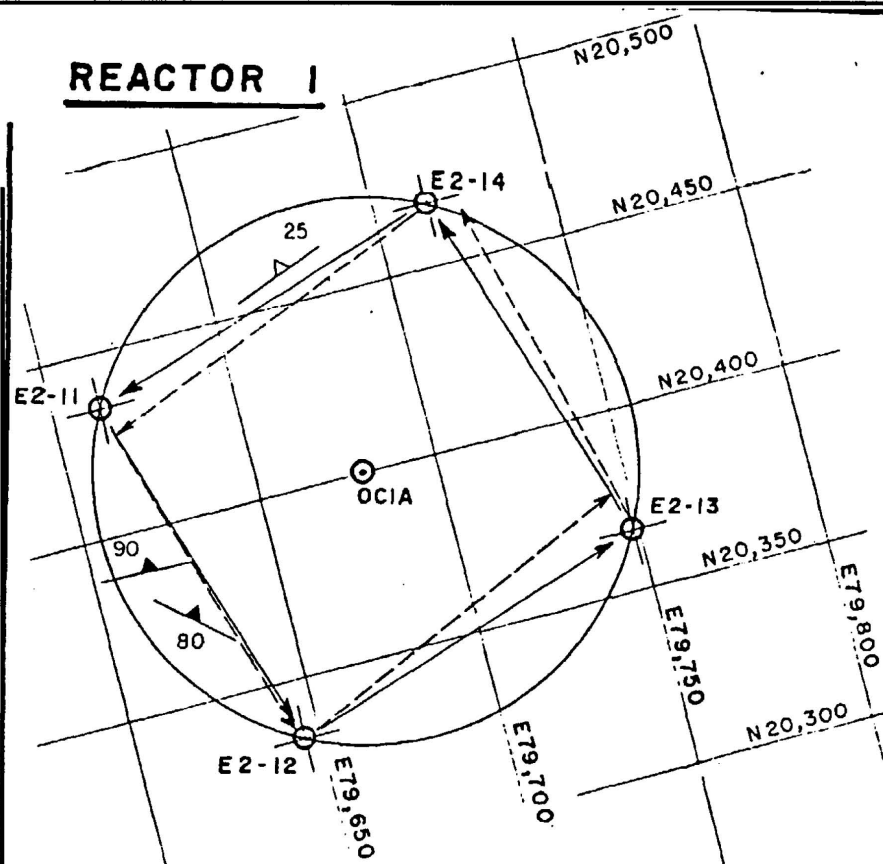
JULY 1974

FIG. 1

REACTOR 2



REACTOR 1



△ < 2 POINTS PER CLUSTER
OF FEATURES

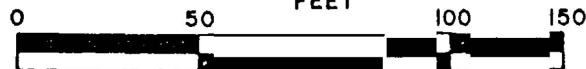
▲ > 2 POINTS PER CLUSTER
OF FEATURES

○ OVERCORE BORING

⊕ ANGLE BORING

N

SCALE
FEET



— PROPOSED DIRECTION OF ANGLE BORINGS
- - - ACTUAL DIRECTION OF ANGLE BORINGS

NOTE: LENGTH OF ARROWS INDICATES PRO-
JECTION OF HOLE TO HORIZONTAL.

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PLAN OF REACTOR SITES

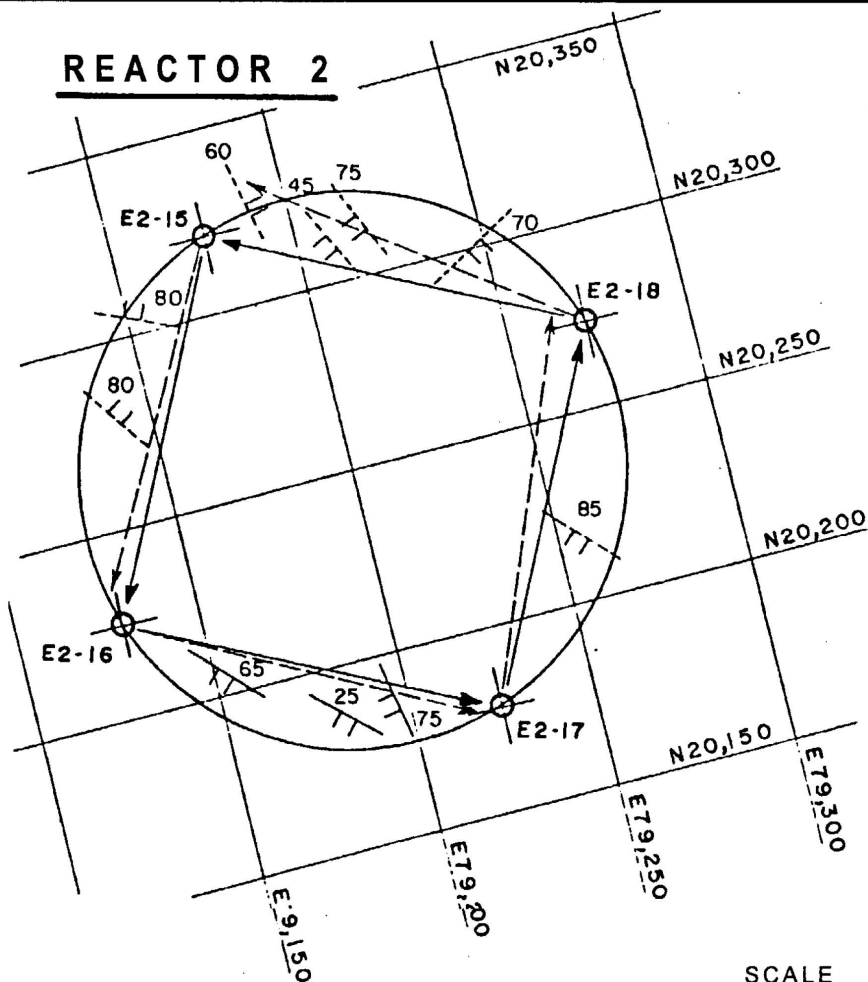
SHOWING GENERALIZED DIP & STRIKE
OF FOLIATIONS

GEOTECHNICAL ENGINEERS, INC.
WINCHESTER, MASSACHUSETTS

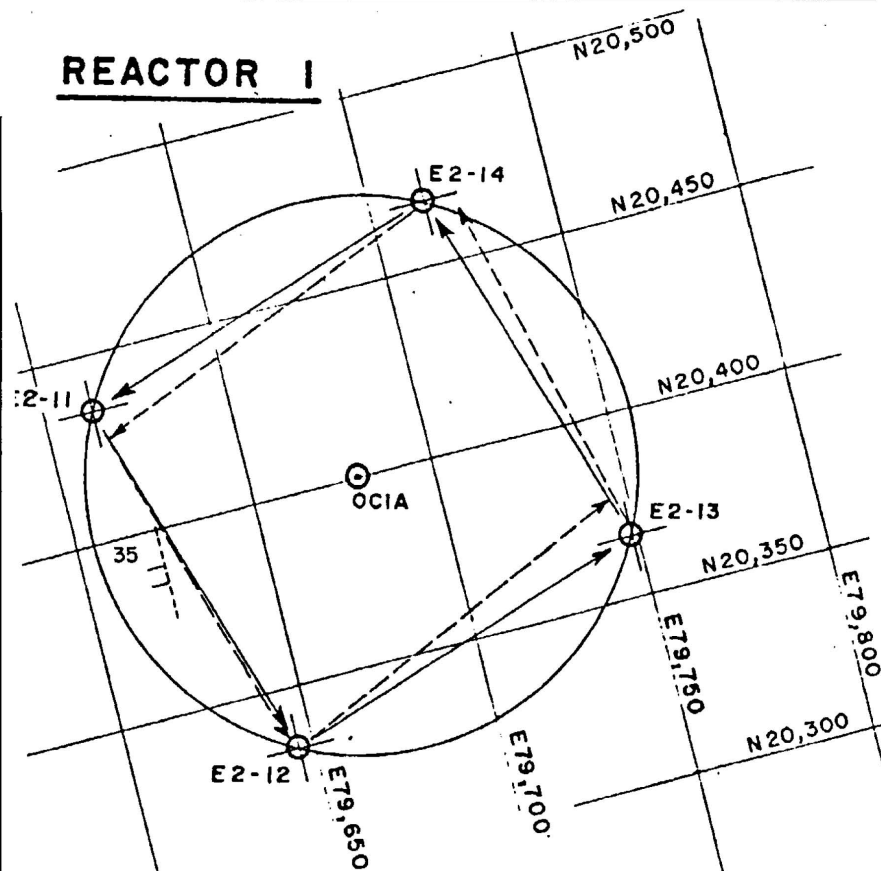
PROJECT 7286

JULY 1974 FIG. 2

REACTOR 2



REACTOR 1



— PROPOSED DIRECTION OF ANGLE BORINGS
 - - - ACTUAL DIRECTION OF ANGLE BORINGS

NOTE: LENGTH OF ARROWS INDICATES PROJECTION OF HOLE TO HORIZONTAL.

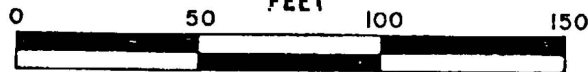
— > 8 POINTS PER CLUSTER OF FEATURES

○ OVERCORE BORING

⊕ ANGLE BORING

N

SCALE
 FEET



YANKEE ATOMIC

SEABROOK STATION

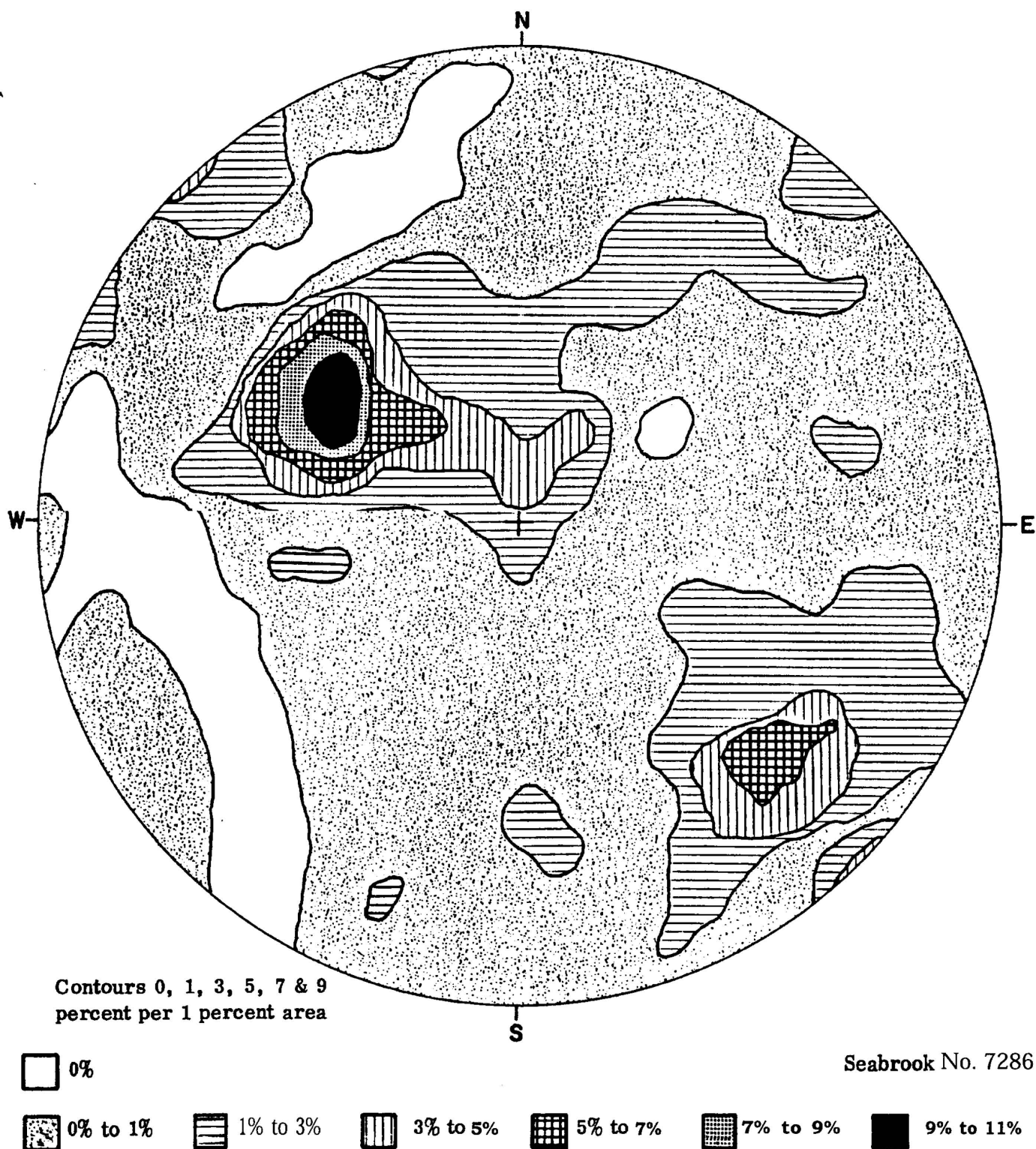
PLAN OF REACTOR SITES

SHOWING GENERALIZED DIP & STRIKE
 OF SLICKENSIDED SURFACES

GEOTECHNICAL ENGINEERS, INC
 WINCHESTER, MASSACHUSETTS

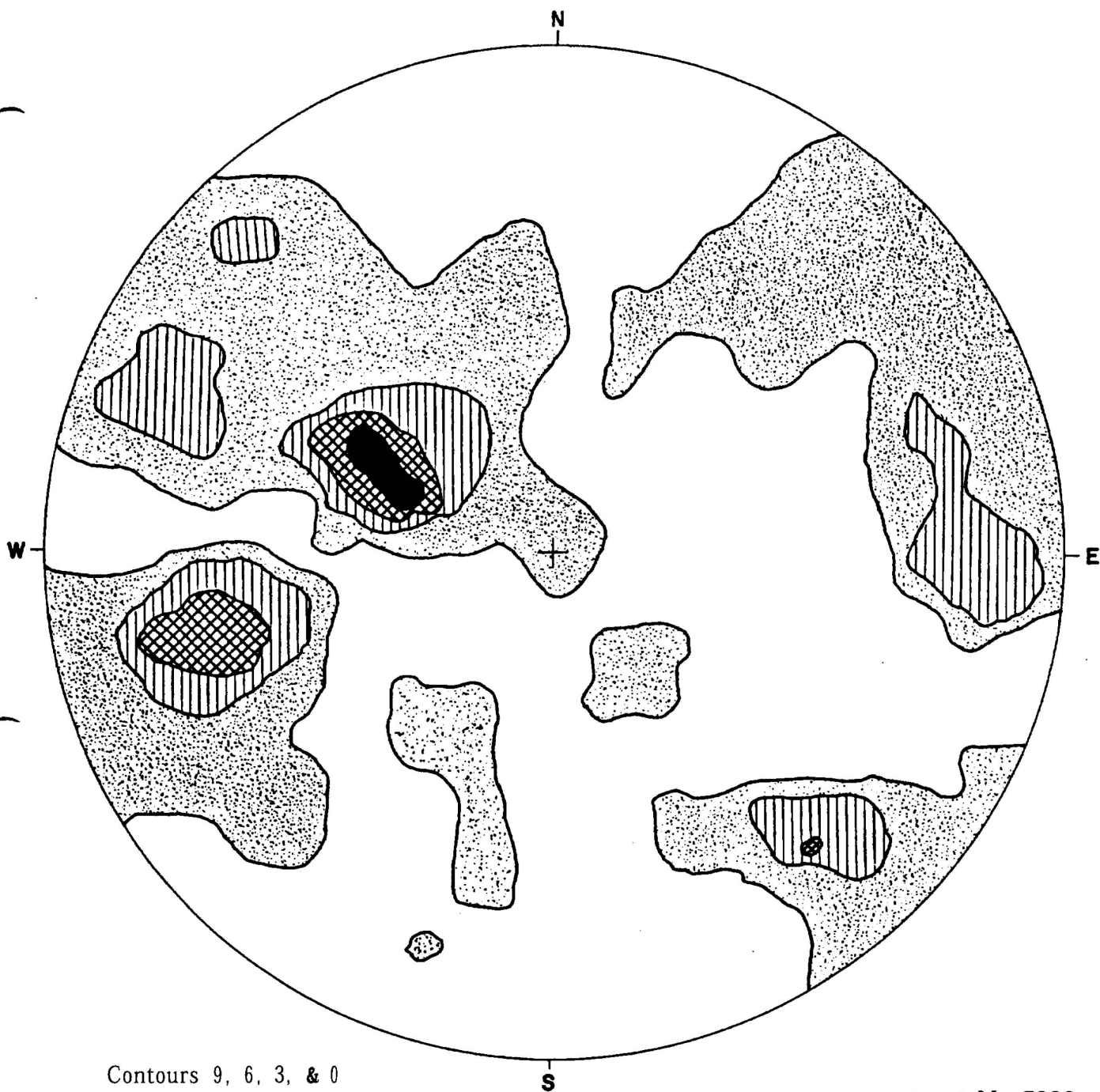
PROJECT 7266

JULY 1974 FIG. 3



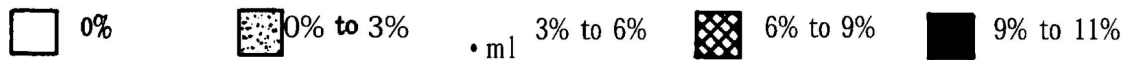
Contoured Equal Area Upper Hemisphere Polar Projection of Poles to 230 Joints In Reactor 1;
 Borings E2-11, 12, 13 & 14

Fig. 4



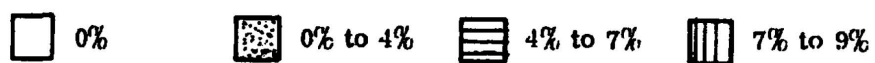
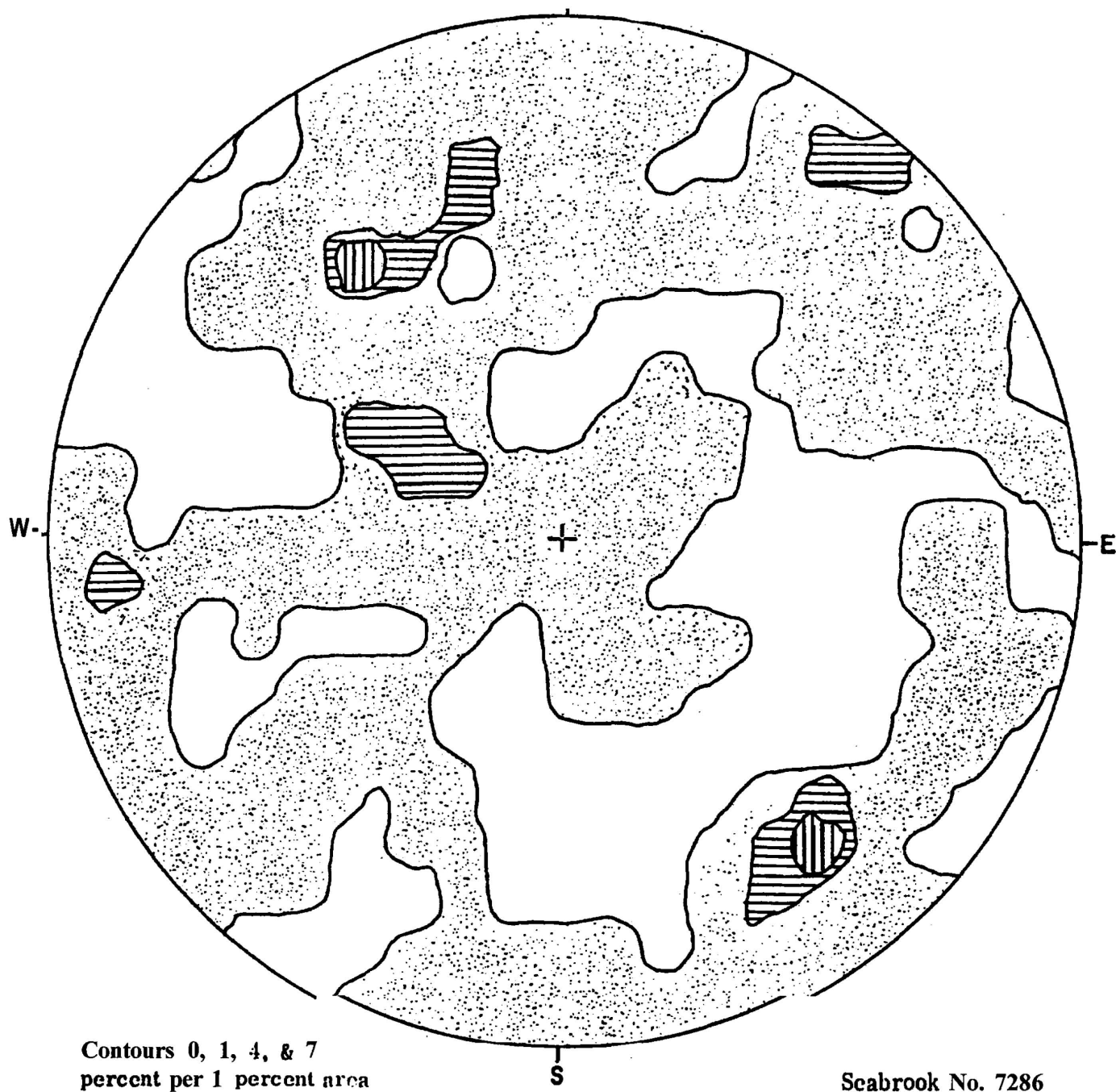
Contours 9, 6, 3, & 0
percent per 1 percent area

Seabrook No. 7286



Contoured Equal Area Upper Hemisphere Polar Projection of Poles to 93 Joints In
Reactor 2; Borings E2-15, 16, 17, 18.

Fig. 5



Contoured Equal Area Upper Hemisphere Polar Projection of Poles to 114 Slickensided Surfaces in Reactor 2; Borings E2-15, 16, 17, & 18.

Fig. 6

APPENDIX I

APPENDIX I

Boring Logs

Note: All holes are angle holes. Depths are measured along core axis. Inclinations of holes are measured from vertical.

BORING LOCATION <u>N20115, 129611, Plot No.</u>		INCLINATION <u>10°</u>		PLACING <u>STU</u>		DATE START/FINISH <u>June 20, 1971 / June 22, 1971</u>	
CASING ID <u>3 in.</u>		CORP SIZE <u>2 1/4 x 1 7/8 in.</u>		TOTAL DEPTH <u>168.6 ft</u>		DRILLED BY <u>American Drilling & Boring Co., Inc., Canine</u>	
GROUND ELEV. <u>25.0 ft</u>		DEPTH TO WATER DATE <u>7/1</u>		LOGGED BY <u>Soil & Rock, Inc., J. R. Bond</u>			

EL. MSL	Depth	Type and No.	N or Rec.	WATER CONTENT	or RQD	PRESSURE TEST	STRIKE, DIP	SOIL AND ROCK DESCRIPTIONS	
								(Weathering, defects, etc.)	(Type, texture, mineralogy, color, hardness, etc.)
25.0							S 7 Shickard		
							TOP OF TILL		
6.5	10	NN-1	100						
		NN-2	99						
		NQ-3	10						
		NQ-1	31						
17.7		NQ-3	57				TOP OF ROCK		
20		NQ-6	76	51				1.5' core lost Rusty stain Rusty stain Not chloritic.	Diorite. Medium fine grained, medium dark gray. Massive texture.
30		NQ-7	100	43				Minor rusty	
40		NQ-8	100	41				Minor rusty Fresh and hard. Drills well. Most joints and partings are clean. Not chloritic.	Pegmatite Diorite. Predominantly medium-fine grained, medium dark gray with occasional medium coarse quartz diorite.
50		NQ-9	100	41					
60		NQ-10	100	74				Solid core Fresh and hard. Drills very well. Joints and partings clean. Not chloritic. Most partings break across core.	Diorite. Fine to medium fine grained, medium dark gray. Massive texture.
70		NQ-11	100	98			N21E, 13NW J		
80		NQ-12	100	97			N15E, 60NW J		
90		NQ-13	100	70			N131, 53NW J	Minor chlorite Slight rusty	Fresh and hard. Joints and partings generally clean. Some minor chlorite on joints and partings in diabase.
100		NQ-14	100	00			N12W, 50NW S		74.8' Used intrusive contact Diabase. Fine to medium-grained, dark greenish gray. Locally calcitic.
110		NQ-15	100	00			N40E, 60NW J		
120		NQ-16	100	00			N15W, 62NW S		83.1' Used contact Diorite. Medium-fine grained, medium gray. Massive.
130		NQ-17	100	74			N11W, 40SW J		
140		NQ-18	100	44			N65W, 55NE J	Write Fresh and hard. Joints and partings generally clean. Diabase broken on calcite veining.	Diorite. Medium-fine, massive. Becoming gneissoid foliated toward base.
150		NQ-19	100	00					
160		NQ-20	100	85			N15E, 72NE J		Used Diabase, fine calcite - calcite veining
170		NQ-21	100	00			N55E, 76NW J		Used
180		NQ-22	100	42			N52E, 68NW J		
190		NQ-23	100	87			N34E, 44NW J	Fresh and hard. Joints and partings clean. Not chloritic.	Diorite. Mixed fine-grained dark gray and medium-coarse grained medium gray. Gneissoid. Predominantly fine-grained.
200		NQ-24	100	00			N27W, 72NE J		
210		NQ-25	100	00			N65W, 55SW J		
220		NQ-26	100	00			N25E, 90NW J	Fresh and hard. Drills well.	Diorite. Predominantly fine grained, medium dark gray. Gneissoid at top of section.
230		NQ-27	100	00			N75E, 82NW S		
240		NQ-28	100	00			N31E, 10NW J		
250		NQ-29	100	17			N33E, 36NW J		
260		NQ-30	100	00			N10E, 41NW J		
270		NQ-31	100	00			N71W, 61NE J		
280		NQ-32	100	00					
290		NQ-33	100	00					
300		NQ-34	100	00					
310		NQ-35	100	00					
320		NQ-36	100	00					
330		NQ-37	100	00					
340		NQ-38	100	00					
350		NQ-39	100	00					
360		NQ-40	100	00					
370		NQ-41	100	00					
380		NQ-42	100	00					
390		NQ-43	100	00					
400		NQ-44	100	00					
410		NQ-45	100	00					
420		NQ-46	100	00					
430		NQ-47	100	00					
440		NQ-48	100	00					
450		NQ-49	100	00					
460		NQ-50	100	00					
470		NQ-51	100	00					
480		NQ-52	100	00					
490		NQ-53	100	00					
500		NQ-54	100	00					
510		NQ-55	100	00					
520		NQ-56	100	00					
530		NQ-57	100	00					
540		NQ-58	100	00					
550		NQ-59	100	00					
560		NQ-60	100	00					
570		NQ-61	100	00					
580		NQ-62	100	00					
590		NQ-63	100	00					
600		NQ-64	100	00					
610		NQ-65	100	00					
620		NQ-66	100	00					
630		NQ-67	100	00					
640		NQ-68	100	00					
650		NQ-69	100	00					
660		NQ-70	100	00					
670		NQ-71	100	00					
680		NQ-72	100	00					
690		NQ-73	100	00					
700		NQ-74	100	00					
710		NQ-75	100	00					
720		NQ-76	100	00					
730		NQ-77	100	00					
740		NQ-78	100	00					
750		NQ-79	100	00					
760		NQ-80	100	00					
770		NQ-81	100	00					
780		NQ-82	100	00					
790		NQ-83	100	00					
800		NQ-84	100	00					
810		NQ-85	100	00					
820		NQ-86	100	00					
830		NQ-87	100	00					
840		NQ-88	100	00					
850		NQ-89	100	00					
860		NQ-90	100	00					
870		NQ-91	100	00					
880		NQ-92	100	00					
890		NQ-93	100	00					
900		NQ-94	100	00					
910		NQ-95	100	00					
920		NQ-96	100	00					
930		NQ-97	100	00					
940		NQ-98	100	00					
950		NQ-99	100	00					
960		NQ-100	100	00					

LEGEND

N - Standard penetration resistance, blows/ft
 Rec - Length recovered, length cored, ft
 RQD - Length of sound core 4 in. and longer/length cored, ft
 S - Split spoon sample
 U - Undisturbed samples

S - Shelly tube N - Denham
 F - Fixed plate P - Pilcher
 O - Osterberg G - GEI

D - Drilling break k - Coefficient of
 ws - Weathered, weathering permeability

NOTES

1) - Washed through soil # - 6.3 ft.
 No samples taken.

2) - No clay present; therefore no water contents determined.

x - Oriented core

SEABROOK STATION
 PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
 YANKEE ATOMIC ELECTRIC COMPANY

United Engineers
A DIVISION OF UNITED ENGINEERS & ARCHITECTS, INC.

Date: July 11, 1971 Project 7286

PAGE 1 of 2 LOG OF BORING 12-11

BORING LOCATION <u>N20135, E79611, Plant Site</u>				INCLINATION <u>16"</u>		BORING <u>SME</u>		DATE START/FINISH <u>June 26, 1971 / June 27, 1971</u>	
CASING ID <u>3 in.</u>				CORE SIZE <u>2-1/8" x 1-7/8 in.</u>		TOTAL DEPTH <u>164.0</u> ft		DRILLED BY <u>American Drilling & Boring Co.; T. Canning</u>	
GROUND EL (MSL) <u>72.0</u> ft				DEPTH TO WATER DATE <u>9.7</u> ft		LOGGED BY <u>Soil S. Coll. Rock - J. R. Reed</u>			

EL. MSL ft	Depth ft	SAMPLE Type and No.	N or Rec.	DATE OF ADV. min to	WATER CONTENT %	GRAVITY %	COMPOUND k	STRIKE, DIP F = Foliation J = Joint C = Contact B = Bedding	CORE BREAKS	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.) (Type, texture, mineralogy, color, hardness, etc.)		
										CONTINUED FROM PREVIOUS PAGE		
146		NQ-30	100		100			N27E, 32NW		Slight wx	Fresh and hard. Drills well. Partings are clean.	Diolite. Mixed fine and medium coarse grained textures. Locally gneissoid.
150		NQ-31	100		100			N26E, 28NW		Slight wx		
		NQ-32	100		100			N63W, 25NE		Solid core		
160		NQ-33	100		100			N18W, 71NE			Fresh and hard. Drills well. Joints and partings are clean.	Diolite. Predominantly fine, medium dark with patches of coarse quartz diolite.
164		NQ-31	97		81			N30E, 75NW				
								N70W, 13NE				
								BOTTOM OF BORING				

LEGEND

N - Standard penetration resistance, blows ft
Rec - Length recovered length cored, %
RQD - Length of sound core 4 in. and longer length cored, %
S - Split spoon sample
U - Undisturbed samples

S - Shelby tube N - Denison
F - Fixed piston P - Pitcher
O - Osterberg G - GEI

D - Drilling break k - Coefficient of permeability
wx - Weathered, weathering

NOTES

SEABROOK STATION
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
YANKEE ATOMIC ELECTRIC COMPANY

A Subsidiary of American Company

Date: July 11, 1971 Project: 7266

PAGE: 2 of 2 LOG OF BORING: 12-11

BORING LOCATION N2034, F79612, Plant Site INCLINATION 11 DEARING N66E DATE START/FINISH June 10, 1971 / June 18, 1971
 CASING ID 3 in. CORE SIZE 2-1/8 - 1-7/8 in. TOTAL DEPTH 165.5 ft DRILLED BY American Drilling & Boring Co. A. Whitaker
 GROUND EL. (MSL) +71.5 ft DEPTH TO WATER DATE June 12, 1971 LOGGED BY Sgt. J. P. Bell, Rev. J. B. Hand

EL. MSU	SAMPLE	RAT. OF ADV. min/ft	WATER CONTENT or (Rq)	PRESSURE TEST	STRIKE, DIP	CORE BREAKS	SOIL AND ROCK DESCRIPTIONS	
							(Weathering, defects, etc.)	(Type, texture, mineralogy, color, hardness, etc.)
71.5	NX-1	100	2	16			Rusty	Fresh to slightly w. internally. Joints and partings have rusty coatings. Not chloritic.
	NX-2	95	3	6			Rusty	
	NX-3	100	3	16			Rusty	
	NX-4	100	3	25			Rusty	
	NQ-5	81	3	11			Rusty	
	NQ-6	100	4	82			Rusty	
	NQ-7	98	4	44			Rusty	
	NQ-8	100	5	68			Rusty	
	NQ-9	100	4	97			Rusty	
	NQ-10	100	4	98			Rusty	
	NQ-11	100	5	89			Rusty	
	NQ-12	100	5	92			Rusty	
	NQ-13	100	6	90			Rusty	
	NQ-14	98	15	89			Rusty	
	NQ-15	100	20	100			Rusty	
	NQ-16	100	15	92			Rusty	
	NQ-17	100	6	85			Rusty	
	NQ-18	100	8	92			Rusty	
	NQ-19	100	4	83			Rusty	
	NQ-20	100	6	61			Rusty	
	NQ-21	100	5	89			Rusty	
	NQ-22	100	6	25			Rusty	
	NQ-23	100	6	90			Rusty	
	NQ-24	100	8	100			Rusty	
	NQ-25	97	5	94			Rusty	
	NQ-26	100	4	90			Rusty	
	NQ-27	97	5	75			Rusty	
	NQ-28	100	6	95			Rusty	
	NQ-29	100	6	100			Rusty	
	NQ-30	94	6	94			Rusty	
	NQ-31	95	6	75			Rusty	

1 - Washed through #20-30 U.S. Sieves. No samples taken.
 2 - This is only a partial list of dip and strike data.

SEABROOK STATION
 PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
 YANKEE ATOMIC ELECTRIC COMPANY
 United engineers
 Date: July 11, 1971 Project 7288
 PAGE 1 of 2 LOG OF BORING

BORING LOCATION <u>N2034, 175632, Plant Site</u>				INCLINATION <u>10°</u>		BEARING <u>N62E</u>		DATE START/FINISH <u>June 18, 1974</u> / <u>June 18, 1974</u>	
CASING ID <u>3 in.</u>		CORE SIZE <u>2 1/8 - 1 7/8 in.</u>		TOTAL DEPTH <u>165.5</u> ft		DRILLED BY <u>American Drilling & Boring Co., Inc.</u>			
GROUND EL. (MSL) <u>172.5</u> ft		DEPTH TO WATER DATE <u>7.1</u>		W <u>June 17, 1974</u>		LOGGED BY <u>Salvatore, Frank; Hook - L. R. Hook</u>			

EL. MSL ft	SAMPLE		RAT. OF ADV. min/ft	WATER CONTENT or RQD		PRESSURE TEST		STRIKE, 100' F - Foliation J - Joint C - Contact R - Bedding	CORE BREAKS	SOIL AND ROCK DESCRIPTIONS	
	Depth ft	Type and No.		N or Rec.	%	Graphic	Min (psi)			Computed 10' k cm/sec	(Weathering, defects, etc.)
172.5										CONTINUED FROM PREVIOUS PAGE	
150		NQ-32	100	6	52					Driller mismatched	Fresh and hard. Drills very well. Joints and partings are clean. Not chloritic. Diorite. Fine grained, medium dark gray. Massive texture.
100		NQ-33	100	6	100						
160		NQ-34	50	6	50					Solid core	
165.5		NQ-35	100	1	100					Solid core	
BOTTOM OF BORING											

LEGEND

N - Standard penetration resistance, blows/ft
 Rec - Length recovered/length cored, %
 RQD - Length of sound core 4 in. and longer/length cored, %
 - Split spoon sample
 - Undisturbed samples

S - Shelby tube N - Deaton
 F - Fixed piston P - Pitcher
 O - Osterberg G - GFI

D - Drilling break k - Coefficient of permeability
 W - Weathered, weathering

NOTES

SEABROOK STATION

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

YANKEE ATOMIC ELECTRIC COMPANY

United Engineers

A Full Service Engineering Corporation

Date: July 11, 1974 Project: 7288

PAGE 2 of 2 LOG OF BORING: 165.5

BORING LOCATION <u>N2017, 12015, 12016</u> INCLINATION <u>41°</u> PLUMBING <u>N30W</u> DATE START/FINISH <u>June 20, 1971 / July 1, 1971</u>									
CASING ID <u>3 in.</u>			CORE SIZE <u>1-7/8 x 2-1/8 in.</u>			TOTAL DEPTH <u>160.0</u> ft		DRILLED BY <u>American Drilling & Boring Co. A. Whittaker</u>	
GROUND ELEVATION <u>30.5</u> ft			DEPTH TO WATER DATE <u>June 21, 1971</u>			LOGGED BY <u>SOB - R. Fink, ROE - J. R. Rind</u>			

FL. MSL	DEPTH	SAMPLE No.	N or Rec.	WATER CONTENT	WATER OF ADS.	TEMPERATURE	PRESSURE	STRIKE, DIP	SOIL AND ROCK DESCRIPTIONS		
									(Weathering, defects, etc.)	(Type, texture, mineralogy, color, hardness, etc.)	
10.5		NX-1	88	3.0	12			21	Slurry staining	Slightly wx to about 8" and fresh and hard below. Not chloritic.	Diorite. Mixed fine-grained, medium dark gray diorite with patches of medium to medium-coarse quartz diorite.
		NX-2	72	1.0	0				Slight wx		
		NX-3	100	5.0	13				Slurry staining		
									Moderate wx		
10		NX-4	100	5.0	96				Rusty	Fresh and hard. Slight rusty staining on joints. Not chloritic or slickensided.	Diorite. Mixed fine-grained dark gray diorite in medium coarse, medium gray quartz diorite.
		NX-5	100	4.0	85				Slight rusty		
									Slight rusty		
20		NX-6	100	4.0	100				Slight rusty		
		NX-7	75	5.0	96				Slight rusty		
		NX-8	93	7.0	13				Moderate wx		
									1" core lost	1" zone of moderate wx. Core lost.	
30		NQ-9	100	0.0	82				Slight wx		
									Slight wx		
		NQ-10	100	12.0	80				Slight wx	Fresh and hard. Some joints and partings show minor powdery surface wx effects. Not chloritic.	Diorite. Mixed fine-grained, dark gray diorite in medium to medium-coarse, medium gray quartz diorite.
40		NQ-11	100	14.0	100				Slight wx		
		NQ-12	100	15.0	83				Slight wx		
									Slight wx		
		NQ-13	100	16.0	100				Slight wx		
50									Slight wx		
		NQ-14	97	18.0	83				Slight wx	Fresh and hard. Some joints and partings show very minor powdery surface wx effects. Not chloritic.	Diorite. Mixed fine-grained, dark gray diorite in medium coarse to coarse, medium gray quartz diorite. Predominantly fine-grained.
		NQ-15	100	4.0	83				Slight wx		
60									Slight wx		
		NQ-16	100	5.0	88				Slight wx		
									Slight wx		
		NQ-17	100	6.0	92				Slight wx		
70									Slight wx		
		NQ-18	97	9.0	88				Moderate wx	Fresh and hard. Local thin zones of moderate to severe wx on closely spaced joints. Not chloritic.	Diorite. Mixed fine-grained, dark gray diorite in medium coarse, medium gray quartz diorite. Medium coarse textures predominate.
		NQ-19	94	2.0	87				Minor vuggy		
80									Severe wx		
		NQ-20	97	5.0	83				Moderate wx		
									Moderate wx		
		NQ-21	100	20.0	97				Moderate wx		
90									Moderate wx		
		NQ-22	100	4.0	80				Moderate wx	Fresh and hard. Drills well. Some thin wx zones on joints or partings as shown. Not chloritic.	Quartz diorite. Medium-coarse grained, medium gray with occasional patches of included fine-grained diorite.
									Moderate wx		
		NQ-23	98	6.0	98				Moderate wx		
100									Moderate wx		
		NQ-24	90	8.0	93				Moderate wx		
									Moderate wx		
		NQ-25	90	9.0	88				Moderate wx		
110									Moderate wx		
		NQ-26	90	0.0	80				Rusty stain	Fresh and hard. Some minor local rusty staining on some joints. Not chloritic.	Diorite. Mixed fine-grained, dark gray in medium coarse, medium gray quartz diorite. Quartz diorite.
									Rusty stain		
		NQ-27	90	5.0	87				Minor rusty		
									Slight wx		
		NQ-28	90	10.0	75				Slight wx	Fresh and hard. Some minor wx and rusty staining.	Diorite. Medium-grained medium gray.
120									Slight wx		
		NQ-29	97	4.0	83				Minor rusty		
									Minor rusty		
		NQ-30	90	5.0	83				Minor rusty		
130									Minor rusty		
		NQ-31	100	6.0	84				Minor rusty		
									Minor rusty		
		NQ-32	98	6.0	85				Minor rusty	Fresh and hard. Local thin zones of moderate to severe wx on joints or partings as shown. Not chloritic.	Diorite. Medium-coarse grained, medium gray. Somewhat porphyritic.
140									Minor rusty		
		NQ-33	98	6.0	80				Moderate wx		

LEGEND

N - Standard penetration resistance, blows/ft
Rec - Length recovered/length cored, %
RQD - Length of sound core 4 in. and longer/length cored, %
S - Split spore sample
U - Undisturbed samples

S - Shelby tube N - Denham
F - Fixed piston P - Fischer
O - Osterberg G - GEI

D - Drilling break k - Coefficient of permeability

Wx - Weathered, weathering

NOTES

1) No clay samples present; therefore no water contents were determined.

2) This is only a partial list of dip and strike data.

SEABROOK STATION
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
YANKEE ATOMIC ELECTRIC COMPANY

a subsidiary of American Electric

Date: July 10, 1971 Project: 7286

PAGE 1 of 2 LOG OF BORING 12015

BORING LOCATION <u>N20365, 179715</u>		INCLINATION <u>10°</u>		WEARING <u>N30W</u>		DATE START/FINISH <u>June 20, 1971 / July 3, 1971</u>	
CASING ID <u>3 in.</u>		CORE SIZE <u>1-7/8 - 2-1/8 in.</u>		TOTAL DEPTH <u>169.0</u> ft		DRILLED BY <u>American Drilling & Boring Co., A. Whitaker</u>	
GROUND FL. (MSL) <u>10.5</u> ft		DEPTH TO WATER DATE <u>13.5</u> ft		LOGGED BY <u>Soil & Rock, Inc., Rock & L. R. Reed</u>			

E.L. MSL ft	Depth ft	SAMPLE		R.A.T. OF ADV. min ft	WATER CONTENT or RQD		PRESSURE TEST		STRIKE, DIP F - Fullston J - Joint C - Contact B - Boring	CORE BREAKS	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.) (Type, texture, mineralogy, color, hardness, etc.)	
		Type and No.	N or Rec.		T	Graphic	Computed psi 10 ⁻¹ cm/sec	Soil & Rock			Soil & Rock	
											CONTINUED FROM PREVIOUS PAGE	
	144	NQ-31	95	3.0	25				N22E, 45SE J		Slight wx	Fresh and hard. Some minor wx effects and rusty staining on joints. Veining Dioritic. Medium-grained medium gray. Somewhat porphyritic.
	150	NQ-35	100	1.0	33				N16E, 69SE J		Rusty	
		NQ-36	100	6.0	85				N56E, 79NW J		Severe wx	
		NQ-37	100	7.0	83				N30E, 81SE J		Rusty stain	
		NQ-38	100	8.0	87				N38E, 46SE J		Rusty stain	
		NQ-39	100	8.0	87				N80E, 86SE J		Minor rusty	
	160								N49E, 66SE J		Slight wx	
	169								N55E, 63SE J		Slight wx	
									N67E, 76SE J		Slight wx	
		BOTTOM OF BORING										

LEGEND

N - Standard penetration resistance, blown/ft
 Rec - Length recovered/length cored, T
 RQD - Length of sound core 4 in. and longer/length cored, T
 S - Split spoon sample
 U - Undisturbed samples

S - Shelby tube N - Denison
 F - Fixed piston P - Pitcher
 O - Osterberg G - GEI

D - Drilling break k - Coefficient of permeability
 wx - Weathered, weathering

NOTES

SEABROOK STATION
 PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
 YANKEE ATOMIC ELECTRIC COMPANY

 **united engineers**
A Subsidiary of Parsons Corporation

Date: July 11, 1971 Project 7286

PAGE 2 of 2 LOG OF BORING 12-13

BORING LOCATION <u>N2062, 172713</u> Plant Site ISCLINATION <u>11.5</u> BEARING <u>85W</u> DATE START/FINISH <u>June 6, 1971</u> / <u>June 19, 1971</u>									
CASING ID <u>2 in.</u>		CORE SIZE <u>2-1/8 x 1-1/8</u>		TOTAL DEPTH <u>166.0</u> ft		DRILLED BY <u>American Drilling & Boring Co., T. Canning</u>			
GROUNDED FL. (MSL) <u>29.9</u> ft		DEPTH TO WATER DATE <u>June 11, 1971</u>		LOGGED BY <u>Soil: K. L. Poll; Rock: J. R. Ryan</u>					
E.L. MSL ft	SAMPLE Depth ft	Type No.	S or Rec.	RAT OF ADV. min/ft	WATER CONTENT or RQD %	PRESSURE TEST Computed k 10 ³ lb./sq. in.	STRIKE, DIP F = Isolation J = Joint C = Contact R = Bedding S = Slackensided	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.) (Type, texture, mineralogy, color, hardness, etc.)	
								Graphic	
29.9	3.0	NX-1	100	3.8	21				Diabase. Mixed fine-grained, dark gray diabase and medium to coarse quartz diorite.
	10	NX-2	100	4.1	33				
	10	NQ-3	90	2.1	23				
	10	NQ-4	93	1.8	27				
	20	NQ-5	90	2.4	30				
	20	NQ-6	73	2.6	17				
	20	NQ-7	68	2.7	11				
	30	NQ-8	100	4.5	11				
	30	NQ-9	83	4.1	0				
	30	NQ-10	39	2.5	0				
	40	NQ-11	97	1.1	60				
	40	NQ-12	100	4.4	80				
	50	NQ-13	100	5.2	92				
	50	NQ-14	100	6.2	87				
	60	NQ-15	98	5.5	92				
	60	NQ-16	100	5.6	77				
	70	NQ-17	100	6.4	83				
	70	NQ-18	100	6.3	65				
	80	NQ-19	100	3.6	32				
	80	NQ-20	100	1.8	71				
	80	NQ-21	166	5.5	80				
	90	NQ-22	97	1.8	62				
	90	NQ-23	49	2.7	0				
	90	NQ-24	100	5.0	14				
	90	NQ-25	55	5.3	81				
	100	NQ-26	100	4.8	67				
	100	NQ-27	84	5.0	75				
	110	NQ-28	100	5.4	82				
	120	NQ-29	94	5.7	85				
	120	NQ-30	100	6.0	81				
	130	NQ-31	100	5.4	100				
	130	NQ-32	94	6.7	94				
	140	NQ-33	100	4.6	53				
	150	NQ-34	74	5.7	94				

LEGEND	
N	- Standard penetration resistance, blows/ft
Rec	- Length recovered/length cored, %
RQD	- Length of sound core 4 in. and longer/length cored, %
S	- Split spoon sample
U	- Undisturbed samples
S	- Shelby tube
F	- Fixed piston
O	- Osterberg
D	- Drilling break
xs	- Weathered, weathering
N	- Denison
P	- Pitcher
G	- GCI
k	- Coefficient of permeability

NOTES	
1	- This is only a partial list of dip and strike data.
2	- No clay present, therefore no water contents were determined.
3	- Washed through soil 8-3 R. No samples taken.
x	- Oriented core

SEABROOK STATION	
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE	
YANKEE ATOMIC ELECTRIC COMPANY	
United Engineers	
Date: <u>July 2, 1971</u>	Project: <u>7286</u>
PAGE: <u>1</u> of <u>2</u>	LOG OF BORING: <u>1-1</u>

BORING LOCATION <u>S200-7, 179711, Plant Site</u>				INCLINATION <u>11.5</u>		LEADING <u>S55W</u>		DATE START/FINISH <u>June 6, 1971</u> / <u>June 15, 1971</u>	
CASING ID <u>3 in.</u>				CORE SIZE <u>2 1/2 to 3 1/2 in.</u>		TOTAL DEPTH <u>166.0</u> ft		DRILLED BY <u>American Drilling & Boring Co., J. Canning</u>	
GROUND EL. (MSL) <u>109.9</u>				DEPTH TO WATER DATE <u>June 11, 1971</u>		LOGGED BY <u>Soil Eng. L. Dill, Inc. L. R. Brand</u>			

ELEV. MSL ft	SAMPLE Depth ft	Type and No.	N or Rec.	RATIO OF ADV. min/ft	WATER CONTENT		PRESSURE TEST		STRIKE, DIP F = Foliation J = Joint G = Contact H = Bedding	CORE BREAKS	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.)		(Type, texture, mineralogy, color, hardness, etc.)
					%	Gravimetric	Emp.	Computed					
											CONTINUED FROM PREVIOUS PAGE		
	135	NQ-35	100	10.5	82				N71W, 25NE J	D			
	140	NQ-36	98	2.0	98				N63W, 60NE J	D			
	150	NQ-37	100	2.0	93				N19E, 62SE J	Slight wx			
		NQ-38	98	3.1	98				N31E, 70SE J				
		NQ-39	100	3.3	93				N61W, 54NE J				
	160	NQ-40	98	3.2	98				N65E, 18NW S				
									N55E, 29NE J				
	166								N25W, 20SW J				
BOTTOM OF BORING													

LEGEND

N - Standard penetration resistance, blows/ft
Rec - Length recovered length cored, %
RQD - Length of sound core 4 in. and longer/length cored, %
S - Split spoon sample
U - Undisturbed samples

S - Shelby tube N - Denison
F - Fixed piston P - Pitcher
O - Osterberg G - GEI

D - Drilling break k - Coefficient of permeability
wx - Weathered, weathering

NOTES

SEABROOK STATION

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

YANKEE ATOMIC ELECTRIC COMPANY

united engineers & architects inc.

100 State St., Boston, Mass. 02109

Date: July 2, 1971 Report: 7286

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BORING LOCATION N26321, F75170, Plant Site				INCLINATION 41.5°		HEADING S10W		DATE START/FINISH June 3, 1971 / June 5, 1971	
CASING ID 3 in.		CORE SIZE 2-1/8 - 1-7/8 in.		TOTAL DEPTH 165.0 ft		DRILLED BY American Drilling & Boring, A. Whitaker			
GROUND ELEV. (MSL) 13.9 ft		DEPTH TO WATER DATE June 3, 1971		LOGGED BY Soil: K. G. B., Rock: J. R. B. and					
E.L. MSL ft	SAMPLE Type and No.	RATIO OF ADV. min/ft	WATER CONTENT %	OR RQD %	PRESSURE TEST		STRIKE, DIP F = Foliation J = Joint C = Contact B = Bedding	CORE BREAKS	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.) (Type, texture, mineralogy, color, hardness, etc.)
					Gravimetric	Computed			
13.9	1)								
10									
11.5									
0	NQ-2	41	5.0	0			N85W, S0NE S		Generally fresh and hard internally. Some minor chlorite on joints and partings.
10	NQ-3	100	6.0	37			N71W, S0NE S		
20	NQ-4	100	6.0	8			N58E, 18NW S		
30	NQ-5	100	6.0	42			N75E, 42NW S		
40	NQ-6	100	3.0	18			N63E, 43NW S		
50	NQ-7	100	3.0	98			N88E, 42NW S		
60	NQ-8	100	3.0	57			N80E, 35E S		
70	NQ-9	100	3.0	57			N83E, 39NW S		
80	NQ-10	100	3.0	73			N50W, 45NE S		
90	NQ-11	100	4.0	67					
100	NQ-12	98	4.0	73					
110	NQ-13	100	1.0	73					
120	NQ-14	100	5.0	49					
130	NQ-15	100	3.0	72					
140	NQ-16	91	5.0	65					
150	NQ-17	100	4.0	40					
160	NQ-18	100	5.0	40					

NOTES

1) - Washed through soil # - 11.5 ft. No soil samples taken.

2) - This is only a partial list of dip and strike data. Orientation discontinued at 42 ft.

SEABROOK STATION

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

YANKEE ATOMIC ELECTRIC COMPANY

United engineers

Date: July 2, 1971 Project: 7286

PAGE 1 of 2 LOG OF BORING 17-15

BORING LOCATION N20321, E79179, 1st and 2nd Sts.				INCLINATION 11.5°		BEARING S16°W		DATE START/FINISH June 3, 1974 / June 5, 1974	
CASING ID 3 in.				CORE SIZE 2-1/4 - 1-7/8 in.		TOTAL DEPTH 165.0 ft		DRIILLED BY American Drilling & Boring, A. Whitaker	
GROUND ELEVATION 127.0 ft				DEPTH TO WATER 117.0 ft		DATE June 1, 1974		LOGGED BY Seal - R. T. B. B. - J. R. Rand	

EL. MSL ft	SAMPLE			RATE OF ADV. min./ft	WATER CONTENT %	ORIG. GRAIN	PRESSURE TEST		STRIKE, DIP F - Friction J - Joint C - Contact B - Bedding S - Stickenside	CORE DRESS	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.) (Type, texture, mineralogy, color, hardness, etc.)		
	Depth ft	Type and No.	N or Rec.				Grain	psi			Computed k	Soil and Rock Descriptions	
140											CONTINUED FROM PREVIOUS PAGE		
130	128	Q-1	95	5.0	81						Minor chlorite	Fresh and hard. Drill well. Some minor smooth chlorite development on some joints or partings.	Metaquartzite (?) Fine-grained medium dark gray locally feldspathized. Local vague banding or foliation.
150	148	Q-2	104	5.0	76						Minor chlorite		
160	158	Q-2	101	3.0	75						Chlorite	Fresh and hard. Some thin chlorite on joints as shown.	Metaquartzite (?) Fine-grained, medium dark gray vaguely foliated.
165											Chlorite		
BOTTOM OF BORING													

LEGEND

N - Standard penetration resistance, blows/ft
Rec - Length recovered/length cored, %
RQD - Length of sound core 4 in. and longer/length cored, %
S - Split spoon sample
U - Undisturbed samples

S - Shelby tube N - Denison
F - Fixed piston P - Pitcher
O - Osterberg G - GEI

D - Drilling break k - Coefficient of permeability
W - Weathered, weathering

NOTES

SEABROOK STATION
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
YANKEE ATOMIC ELECTRIC COMPANY

united engineers
a subsidiary of The Seabrook Company

Date: July 2, 1974 Project 7286

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[illegible]

BORING LOCATION <u>N20127, E70100, Plant Site</u>		INCLINATION <u>41</u>		BEARING <u>S78° E</u>		DATE START/FINISH <u>May 20, 1971</u> / <u>May 29, 1971</u>	
CASING ID <u>3 in.</u>		CORE SIZE <u>2-1/4" - 1-7/8 in.</u>		TOTAL DEPTH <u>165.2</u> ft		DRILLED BY <u>American Drilling & Boring Co. - A. Whistler</u>	
GROUND EL. (MSL) <u>165.2</u> ft		DEPTH TO WATER DATE <u>May 29, 1971</u>		LOGGED BY <u>Soil. & L. Poll. Dept. - E. B. Hunt</u>			

EL. MSL. ft	DEPTH ft	SAMPLE Type and No.	N or Rec.	RAIL OF ADV. min ft	WATER CONTENT or RQD	PRESSURE TEST	STRIKE, DIP	SOIL AND ROCK DESCRIPTIONS	
								(Weathering, defects, etc.)	(Type, texture, mineralogy, color, hardness, etc.)
-115.2		NQ-30	100	1.0	32		N101, 68NW S N82E, 77KW S	Minor chlorite	Unaltered
-150		NQ-31	100	1.0	82		N77W, 90SW S N81W, 56NE S	Pyrrhotite	Fresh and hard. Excellent drilling.
-120		NQ-32	100	4.0	92		N59W, 53NE S	Bleached	Discrete. Medium-fine grained, medium dark gray. Massive. Magnetic.
-165.2		NQ-33	100	1.0	100		N10W, 72SW S		
BOTTOM OF BORING									

LEGEND

N - Standard penetration resistance, blow-ft
Rec - Length recovered length cored, %
RQD - Length of sound core 4 in. and longer/length cored, %
S - Split spoon sample Groundwater
U - Undisturbed samples

S - Shelby tube N - Denison
F - Fixed piston P - Pitcher
O - Osterberg G - GCI

D - Drilling break k - Coefficient of permeability
W - Weathered, weathering

NOTES

SEABROOK STATION
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
YANKEE ATOMIC ELECTRIC COMPANY

united engineers
INCORPORATED IN NEW HAMPSHIRE

Date: June 28, 1971 Project: 7286

PAGE 2 of 2 LOG OF BORING E2-16

BORING LOCATION <u>NS0117, F79221, Plant Site</u>				INCLINATION <u>41°</u>		BEARING <u>N6.5E</u>		DATE START/FINISH <u>May 30, 1971 / June 5, 1971</u>	
CASING ID <u>3 in.</u>				CORE SIZE <u>1.75 in.</u>		TOTAL DEPTH <u>165.0 ft</u>		DRILLED BY <u>American Drilling & Boring, T. Canning</u>	
GROUND ELEVATION <u>1.0 ft</u>				DEPTH TO WATER DATE <u>June 5, 1971</u>		LOGGED BY <u>Ed. L. Doherty, Jr., J. R. Reed</u>			

EL. MSL. ft	SAMPLE		WATER CONSIST.	PRESSURE TEST	STRIKE, DIP	CORE BREAKS	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.) (Type, texture, mineralogy, color, hardness, etc.)
	Depth ft	Type and No.					
135							
140							
145							
150							
155							
160							
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170							
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975							
980							
985							
990							
995							
1000							

LEGEND

N - Standard penetration resistance, blows/ft
Rec - Length recovered/length cored, %
RQD - Length of sound core 4 in. and longer/length cored, %
S - Split spoon sample
U - Undisturbed samples

S - Shelby tube N - Denison
F - Fixed piston P - Pitcher
O - Osterberg G - GEI

D - Drilling break k - Coefficient of permeability

*x - Weathered, weathering

NOTES

SEABROOK STATION
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
YANKEE ATOMIC ELECTRIC COMPANY

United Engineers
A DIVISION OF THE UNITED ENGINEERS GROUP

Date: July 3, 1971 Project: 7286

PAGE: 2 of 2 LOG OF BORING: F7-17

BORING LOCATION N20270, F79272 **Plant Site** **INCLINATION** 30° **BEARING** N65.5W **DATE START/FINISH** May 22, 1971 / May 24, 1971

CASING ID 3 in. **CORE SIZE** 1.75 in. **TOTAL DEPTH** 168.0 ft **DRILLED BY** American Drilling & Boring Co., T. Canine

GROUND EL. (MSL) 11.5 ft **DEPTH TO WATER DATE** 20 in. 0 May 24, 1971 **LOGGED BY** Soil - A. J. P. R. - B. - J. R. R. - D.

EL. MSL ft	SAMPLE Type and No.	N or Rec.	HALL OF ADV. mm./ft.	WATER CONTENT or RQD		PRESSURE TEST		SPLIT DIP F = Foliation J = Joint C = Contact B = Bedding	CORE BREAKS	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.)		(Type, texture, mineralogy, color, hardness, etc.)
				%	Graphic	g/cm ³	psi			10 ⁻³ cm/sec		
11.5												
10												
14.0												
20	NQ-1	100	1.7	23						Slight wx	Fresh. Some slight wx on closely spaced joints.	Diorite (?) Fine-grained medium dark gray. Looks somewhat like quartzite. Magnetic.
	NQ-2	100	2.0	0						Slight wx	Rock broken on close chlorite coated joints.	
	NQ-3	100	1.5	14						Minor to moderate chlorite on joints	Fresh, intermittent slight to moderate wx on joint zones. Some minor bleaching. Minor chips - moderate wx rust. Magnetic.	Mixed fine quartzose diorite. Medium dark gray. May be meta-quartzite (?) Rock is magnetic. Apparently disseminated pyrrhotite.
	NQ-4	100	2.1	10						Powdery wx		
	NQ-5	100	2.2	0						Slight to moderate wx - stained		
	NQ-6	100	1.5	0								
	NQ-7	100	3.8	17								
	NQ-8	100	3.9	53								
	NQ-9	100	1.3	0								
	NQ-10	95	1.5	36								
	NQ-11	100	1.1	30								
	NQ-12	100	2.7	67								
	NQ-13	100	2.3	67								
	NQ-14	98	2.6	67								
	NQ-15	100	3.5	53								
	NQ-16	100	2.9	62								
	NQ-17	100	3.4	65								
	NQ-18	100	3.5	68								
	NQ-19	92	3.5	71								
	NQ-20	50	3.1	0								
	NQ-21	46	3.0	5								
	NQ-22	78	3.4	0								
	NQ-23	100	3.3	0								
	NQ-24	100	3.3	12								
	NQ-25	100	3.2	20								
	NQ-26	100	3.8	31								
	NQ-27	100	3.5	12								
	NQ-28	92	3.0	31								
	NQ-29	100	3.0	72								
	NQ-30	100	3.2	80								
	NQ-31	100	3.7	64								
	NQ-32	100	4.0	67								
	NQ-33	100	3.6	85								
	NQ-34	100	5.9	90								
	NQ-35	87	1.9	12								
	NQ-36	100	6.0	50								
	NQ-37	100	1.4	67		</						

BORING LOCATION		INCLINATION		BEARING		DATE START/FINISH		
S20270, 4 79277 Plant No.		39		N69.5W		May 22, 1971 / May 24, 1971		
CASING ID		CORE SIZE		TOTAL DEPTH		DRILLED BY		
3 in.		1-7/8 in.		168.0 ft		American Drilling & Boring Co., T. Canning		
GROUND ELEVATION		DEPTH TO WATER DATE				LOGGED BY		
114.0 ft		May 24, 1971				S. J. DeFuria, R. L. H. Reed		
EL. MSL ft	SAMPLE Depth Type No.	RATIO OF ADV. min./ft	WATER CONTENT or RQD		PRESSURE TEST		STRIKE, DIP F = Fracture J = Joint C = Contact B = Bedding	SOIL AND ROCK DESCRIPTIONS (Weathering, defects, etc.) (Type, texture, mineralogy, color, hardness, etc.)
			%	Graphic	g/cm ³ pcf	Computed k cm/sec		
-100								
114	NQ-3	100	5	87			300°, 28NW 3	Minor chlorite
150	NQ-3	100	.0	25			113W, 66SE 3	Minor chlorite
	NQ-3	100					1° W, 46NE 5	Pyrite
	NQ-4	97	1	80			152E, 66NE 5	Chloride
160	NQ-4	97	1	80			354°, 72NE 5	Pyrite
	NQ-4	97	1	80			336W, 53SW 5	Fresh and hard. Some chloride and pyrite on oints.
	NQ-11	99	0	100			350°, 67NE 1	Pyrite
168	NQ-11	99	0	100			477W, 52NW 1	Pyrite
							BOTTOM OF BORING	

APPENDIX I I

Project Seabrook
Project No. 7286

Boring No. E2-11

Ground Elevation (MSL) = + 25.0

Type of Feature

Feature Depth	Strike	Dip	Joint	Foliation	Slickensided Surface	Contact	Remarks
66.1	N21E	43MW	X				
70.2	N15E	64NW	X				
74.0	N13E	53NW	X				
75.9	N67W	45NE	X				
76.0	N12W	50SW			X		
76.1	N80W	70NE			X		
77.0	N30W	69SW			X		
78.5	N86E	67NW	X				
81.1	N15W	62NW			X		
82.9	N39E	15NW			X		
83.0	N45E	84NW			X		
84.0	N17W	49sw			X		
85.1	N50E	7SE	X			X	Diabase over Diorite
87.0	N14W	40sw	X				
87.4	N65E	80NW	X				
88.5	N65W	55NE	X				
99.3	N45E	72SE				X	Diorite over Diabase
99.9	N30E	75NW			X		
100.6	N55E	76NW				X	Diabase over Diorite
103.1	N50W	25SW	X				
105.5	N52E	68NW	X				
108.1	N35E	45NW	X				
108.9	N85E	86NW		X			
110.9	N38E	48NW	X				
110.9	N10E	85SE	X				
111.0	N50E	81NW	X				
111.1	N50E	81NW	X				
111.2	N50E	81NW	X				
112.0	N27W	72NE	X				
113.1	N65E	90NW	X				
113.4	N50E	53NW	X				
113.5	N15W	55NE	X				
114.0	N65W	55SW		X			
121.5	N75E	90NW		X			
123.5	N75E	39NW		X			
124.8	N75E	82NW					
129.3	N34E	19NW	X				
129.8	N29E	40NW	X				
129.9	N82E	37NW	X				
131.1	N33E	36NW	X				
133.1	N15E	50NW	X				
133.1	N15E	50NW					
133.2	N30W	75NE					
133.5	N25E	37NW	X				
134.5	N40E	41NW	X				
135.2	N43E	80NW	X				

Project Seabrook
Project No. 7286

Boring No. E2-11

Ground Elevation (MSL) = + 25.0

Type of Feature

Feature Depth	Strike	Dip	Joint	Foliation	Slickensided Surface	Contact	Remarks
137.5	N74W	61NE			X		
142.8	N44E	40NW	X				
143.3	N25E	40NW	X				
143.6	N47E	46NW	X				
143.8	N30E	45NW	X				
144.2	N25E	36NW	X				
144.8	N30E	45NW	X				
144.9	N20E	45NW	X				
145.4	N70W	80NE		X			
146.0	N31E	22NW	X				
147.4	N27E	32NW	X				
148.5	N70E	90NW		X			
149.6	N70W	71NE		X			
152.0	N26E	28NW	X				
154.4	N85E	70NW		X			
155.3	N63W	25NE		X			
158.2	N35E	41NW	X				
159.0	N18W	70NE	X				
161.0	N85W	16NE	X				
162.0	N30E	75NW	X				
163.1	N25E	45NW	X				
163.9	N70W	15NE	X				
164.8	N50W	43NE					

Boring No. E2-12Project Seabrook
Project No. 7286Ground Elevation (MSL) = t 21.5Type of Feature

Feature Depth	Strike	Dip	Joint'	Foliation	Slickensided Surface	Contact	Remarks
19.2	N18E	43NW	x				
19.8	N17E	46NW	X				
20.2	Horizontal		X				
21.2	North	21w	X				
21.9	N35E	25SE		X			
23.0	N23W	39SW	X				
24.0	N17E	47NW	X				
24.4	N50E	61SE	X				
25.1	Horizontal		X				
25.8	N38W	73NE	X				
27.1	N73W	15NE	X				
29.0	N41W	67NE	X				
35.1	N23E	47NW	X				
40.0	N73W	82SW		X			
44.3	N63W	37SW	X				
48.9	N12E	67NW	X				
50.4	N63E	45NW	X				
53.3	N40E	46NW	X				
57.3	N38E	52NW	X				
59.4	N34E	43NW	X				
60.0	N8W	79NE	X				
61.5	N51E	37NW	X				
75.0	N26W	86NE	X				
77.0	N75W	55SW	X				
77.5	N9E	48NW	X				
77.6	N9E	48NW	X				
82.0	N19W	81 SW	X				
82.4	N41E	40NW	X				
83.0	N81E	55SE	X				
85.7	N26E	65NW	X				
89.0	N35E	45NW				X	Diabase Dikelet
89.1	N35E	45NW	X			X	Diabase Dikelet
103.9	N28W	43sw	X				
108.0	N26E	37NW	X				
111.9	N65W	67SW	X				
114.3	N36E	45NW	x				
119.5	N35E	44NW	X				
119.6	N35E	44NW	X				
119.7	N60E	22NW	X				
132.1	N15E	12NW	X				
133.0	N40E	43NW	X				
136.0	N45E	12NE	X				
143.1	N35E	42NW	X				
143.9	N55E	50SE		X			
144.9	N75E	73SE		X			
153.7	N25E	37NW	X				
156.8	N25E	26NW	X				

Project Seabrook
Project No. 7286

Boring No. E2-13

Ground Elevation (MSL) □ + 30.5

Type of Feature

Feature Depth	Strike	Dip	Joint	Foliation	Slickensided Surface	Contact	Remarks
23.6	N83E	28NW	X				
25.3	N40E	58SE	X				
28.7	N15E	75SE	X				
34.0	Horizontal		X				
34.5	N25E	12SE	X				
35.1	N30E	83SE	X				
35.7	N35E	22sw	X				
38.3	N32E	67SE	X				
39.2	N5W	31NE	X				
44.2	N65E	27NW	X				
49.5	N25E	67SE	X				
50.8	N34E	30SE	X				
50.9	N29E	51SE	X				
51.8	N55E	85SE					
52.5	N55E	11SE	X				
55.9	N28E	25NW	X				
62.8	N28E	64SE	X				
63.0	N32E	60SE	X				
64.3	N35E	66SE	X				
67.0	N79W	39sw	X				
70.5	N35W	63NE	X				
70.8	N40W	54NE	X				
76.8	N55E	7NW	X				
77.0	N50E	4NW	x				
77.3	N52E	22NW	X				
78.7	N53E	84SE	X				
81.2	N46E	86NW	X				
82.0	N67E	75SE	X				
83.8	N80E	30SE	X				
89.5	N83E	52SE	X				
90.3	East	58S	X				
98.8	N45E	21NW	X				
99.3	N51E	65SE	X				
100.6	N46E	58SE	X				
101.7	N23E	39sw	x				
102.8	N45E	87NW	X				
105.0	N15W	57NE	X				
108.4	N21E	88SE	x				
110.4	N35E	88SE	X				
112.5	North	36W	X				
115.3	N19E	86SE				X	Diabase over Diorite
117.3	N67W	83SW	X				
117.8	Horizontal		X				
118.2	N40E	N40E				X	Diorite over Diabase
118.3	N45W	N40E				X	Diabase over Diorite
120.1	N30E	N45W	X				

Project Seabrook
Project No. 7286

Boring No. E2-13

Ground Elevation (MSL) = + 30.5

Type of Feature

Feature Depth	Strike	Dip	Joint	Foliation	Slickensided Surface	Contact	Remarks
121.8	N30E	38SE	X				
123.0	N70E	23NW		X			
123.7	N80W	37NE	X				
125.0	N50W	30NE	X				
125.4	N44E	57SE	X				
128.0	N16W	44NE	X				
129.3	N68W	54NE	X				
131.3	N56E	83NW				X	Diorite over Diabase
131.6	N15W	19%	X				
131.7	N45E	76SE	X			X	Diabase over Diorite
132.8	N60E	44SE	x				
134.1	N45E	35SE	X				
135.0	N42E	37SE	X				
136.3	East	8NE	X				
136.8	N38E	73SE	X				
138.0	N50E	18NW	X				
139.3	N35E	43SE	X				
140.5	N31E	42SE	X				
142.4	N28E	30SE	X				
142.5	N40E	46NW	X				
145.0	N22E	45SE	X				
145.2	N22E	45SE	X				
149.7	N46E	63SE	X				
150.0	N34E	34SE	X				
150.5	N21E	73SE	X				
151.3	N56E	79NW	X				
151.7	N26E	48SE	X				
153.0	N30E	81SE	X				
154.7	N26E	78SE	X				
154.9	N38E	46SE	X				
157.4	N89E	86SE	X				
158.0	N75W	72SW	X				
159.9	N49E	66SE	X				
162.3	N55E	63SE	X				
163.7	N60E	70SE	X				
165.5	N67E	76SE	X				

Project Seabrook
Project NO. 7286

Boring No. E2-14

Ground Elevation (MSL) = + 29.9

Type of Feature

Feature Depth	Strike	Dip	Joint	Foliation	Slickensided Surface	Contact	Remarks
11.8	N65E	43NW	X				
12.0	N65W	77SW	X				
13.6	N83W	88NE	X				
13.8	N70W	42NE	X				
13.9	N70W	42NE	X				
14.5	N44E	69SE	X				
15.8	N37E	67SE	X				
16.5	N73W	72NE	X				
28.9	N28E	67SE	X				
29.0	N85E	26NW	X				
42.2	N22E	53SE	X				
43.2	N87E	37NW	X				
44.0	N60W	69NE	X				
46.0	N43E	40NW	X				
50.8	N3W	67NE	X				
51.8	N57W	71NE	X				
53.2	N57W	41NE	X				
58.9	N30E	35NW	X				
62.5	N65W	14NE	X				
63.8	N71W	52NE	X				
65.3	N50E	42SE	X				
65.4	N75E	38SE	X				
66.7	N42W	50NE	X				
67.0	N30E	30NW	X				
70.0	N45E	85NW				X	Diorite over Diabase
70.8	N30W	21NE	X				
72.9	N5E	49SE	X				
73.5	N43W	63NE	X				
74.6	N60E	55SE	X				
78.2	East	77s	X				
80.0	N15W	42SW	X				
80.2	N70E	12NW	X				
80.4	N49E	33NW	X				
81.2	N46W	87NE	X				
85.0	N34W	22SW	X				
87.5	N6E	64SE	X				
87.8	N48W	14NE	X				
88.2	N3W	39NE	X				
89.3	N11E	77SE	X				
89.6	N65E	86SE	X				
94.3	N10E	68SE					
94.6	N59E	59SE					
99.3	N78E	40SE	X				