TIBBETTS ROAD SITE
Barrington, New Hampshire

Remedial Investigation Report

Appendix A

Prepared For: U.S. Environmental Protection Agency
Region I
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June 1992

LIST OF APPENDICES

SECTION 3.0 TABLES

(Repeated herein for ease of reference.)

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TABLE 3-1
OVERBURDEN WELLS
INSTALLATION DETAILS

Well No.	Former No.	Property Owner	Category	Elevations (FT MSL) Outer Casing	Inner Casing	Ground Surface	Screened Interval (FT)	Diameter (INCHES)	Slot Size (INCHES)
10S	RF-10	CLAUSS	R-OV	313.36	†	311.19	†	†	†
11S	RF-11	MALONEY	R-OV	286.46	†	286.12	†	†	†
12S	RF-12	DOMINIQUE	R-OV	299.92	†	296.55	†	†	†
36D	T-3D	JOHNSON	EPA-OV	328.65	328.41	326.16	47.1 to 57.1	2	0.01
37D	T-4D	COUTURE	EPA-OV	327.87	327.68	324.3	15.4 to 25.4	2	0.01
38D	T-6D	TREADWELL	EPA-OV	329.10	328.73	327.00	25.9 to 50.9	2	0.01
39S	—	WHITEHOUSE	R-OV	†	†	†	†	†	†
40S	—	BOYLE	R-OV	†	†	†	†	†	†
41S	—	CARLE	R-OV	†	†	†	†	†	†
42S	—	DOMBROSKI	R-OV	†	†	†	†	†	†
43S	—	KELLEHER	R-OV	†	†	†	†	†	†
44S	—	ST. ONGE	R-OV	†	†	†	†	†	†
45S	—	ROBINETTE	R-OV	†	†	†	†	†	†
46S	—	PURVIS	R-OV	†	†	†	†	†	†

Well Categories

R-OV	Residential Overburden
EPA-OV	EPA-Installed Overburden Monitoring Well
NH-OV	NH-DEP-Installed Overburden Monitoring Well

Notes

† Residential well beyond 400 ft. from Site, not investigated

TABLE 3-1 (cont'd)
OVERBURDEN WELLS
INSTALLATION DETAILS

Well No.	Former No.	Property Owner	Category	Elevations (FT MSL) Outer Casing	Inner Casing	Ground Surface	Screened Interval (FT)	Diameter (INCHES)	Slot Size (INCHES)
47S	—	BRYSON	R-OV	†	†	†	†	†	†
48S	—	CRAFT	R-OV	†	†	†	†	†	†
49S	T-1S	COUTURE	EPA-OV	321.9	—	319.0	5.3 to 10.3	2	0.01
50S	T-2S	R. BOUCHER	EPA-OV	325.0	324.9	322.4	9.6 to 14.6	2	0.01
51S	T-3S	JOHNSON	EPA-OV	328.40	328.27	326.10	11.3 to 16.3	2	0.01
52S	T-4S	COUTURE	EPA-OV	327.8	—	324.8	6.5 to 11.5	2	0.01
53S	T-5	TREADWELL	EPA-OV	322.5	—	319.7	5.8 to 10.8	2	0.01
54S	T-6S	TREADWELL	EPA-OV	329.36	329.10	327.10	7.7 to 12.7	2	0.01
55S*	OW-1	JOHNSON	EPA-OV	330.31	330.35	328.67	6.8 to 16.8	2	0.01
56S	OW-2	JOHNSON	EPA-OV		—Boring Only—		(20.2 Boring Only)	—	—
57S	OW-3	JOHNSON	EPA-OV	330.5	—	328.5	9 to 19.0	2	0.01
58S	B-1S	TREADWELL	NH-OV	331.38	330.90	328.90	8 to 48	2	0.01
60S	B-2S	N. BOUCHER	NH-OV		—Abandoned—		3 to 52.5	2	0.01

*. Well 80S, installed April 1991, replaces abandoned well 55S.

Well Categories
- R-OV Residential Overburden
- EPA-OV EPA-Installed Overburden Monitoring Well
- NH-OV NH-DEP-Installed Overburden Monitoring Well

Notes
- † Residential well beyond 400 ft. from Site, not investigated

TABLE 3-1 (cont'd)
OVERBURDEN WELLS
INSTALLATION DETAILS

Well No.	Former No.	Property Owner	Category	Elevations (FT MSL) Outer Casing	Inner Casing	Ground Surface	Screened Interval (FT)	Diameter (INCHES)	Slot Size (INCHES)
62S	B-3S	JOHNSON	NH-OV	327.69	326.37	325.41	4 to 64	2	0.010
64S	B-4S	JOHNSON	NH-OV	329.71	329.27	327.70	13 to 73	2	0.010
66S	B-5S	JOHNSON	NH-OV	—	—	—	NO LOG	—	NO LOG
68S	B-6S	SHANKLIN	NH-OV	—Abandoned—			0 to 25	2	0.010
70S	—	JOHNSON	EPA-OV	329.66	329.29	327.5	8 to 13	2	0.010
71S	—	JOHNSON	EPA-OV	331.60	331.34	329.6	12 to 17	2	0.010
72S	—	JOHNSON	EPA-OV	330.75	330.55	328.5	7.5 to 12.5	2	0.010
73S	—	JOHNSON	EPA-OV	330.30	330.03	328.3	13.5 to 18.5	2	0.010
74S	—	SHANKLIN	EPA-OV	324.69	324.45	322.5	13 to 18	2	0.010
77S	—	SHANKLIN	EPA-OV	315.22	315.13	313.5	10 to 15	2	0.010
79S	—	JOHNSON	EPA-OV	329.97	329.86	328.1	17 to 22	2	0.010
80S	Replaces OW-1	JOHNSON	EPA-OV	330.86	330.73	328.7	11 to 16	2	0.010
82S*	—	LANE	EPA-OV	323.04	322.70	323.0	33 to 43	2	0.010
83S	—	SWIER	EPA-OV	313.62	313.30	312.8	4.9 to 9.9	2	0.010
84S	—	SHANKLIN	EPA-OV	Boring Only		309	Competent rock at less than 5-ft depth.		

Well Categories

R-OV	Residential Overburden
EPA-OV	EPA-Installed Overburden Monitoring Well
NH-OV	NH-DEP-Installed Overburden Monitoring Well

Notes

* Screened in heavily weathered rock; overburden depth 17 ft.

† Residential well beyond 400 ft. from Site, not investigated

TABLE 3-2

OVERBURDEN WELLS
WATER LEVEL MEASUREMENTS

	Elevation (FT MSL)			Depth to Water From Measuring Point (FT)				Water Elev. (FT)
Well No.	TOC	TOR	SFC	10/8/85	10/8/90	6/5/91	7/5/91	7/5/91
10S	313.36	—	311.19	6.73 (TOC)	—	—	†	
11S	286.46	—	286.12	1.88 (TOC)	—	—	†	
12S	299.92	—	296.55	10.32 (TOC)	—	—	†	
36D	328.65	328.41	326.16	14.30 (TOC)	14.0 (TOC)	—	—	
37D	327.97	327.68	324.3	10.69 (TOC)	11.7 (TOC)	7.8 (TOC)	10.72 (TOC)	317.25
38D	329.10	328.73	327.00	10.08 (TOC)	10.5 (TOC)	—	10.30 (TOC)	318.80
39S	†	†	†	†	†	†	†	
40S	†	†	†	†	†	†	†	
41S	†	†	†	†	†	†	†	
42S	†	†	†	†	†	†	†	
43S5	†	†	†	†	†	†	†	
44S	†	†	†	†	†	†	†	
45S	†	†	†	†	†	†	†	
46S	†	†	†	†	†	†	†	
47S	†	†	†	†	†	†	†	
48S	†	†	†	†	†	†	†	
49S	321.88	—	319.0	6.85 (TOC)	7.0 (TOC)	—		
50S	324.99	324.9	322.4	13.00 (TOC)	13.0 (TOC)	—	12.83 (TOC)	312.16
51S	328.40	328.27	326.10	12.61 (TOC)	13.1 (TOC)	—	11.78 (TOC)	316.62
52S	327.78	—	324.8	10.44 (TOC)	11.9 (TOC)	7.8 (TOC)	10.71 (TOR)	317.07
53S	322.46	—	319.7	6.67 (TOC)	8.9 (TOC)	5.6 (TOC)	8.40 (TOC)	314.06
54S	329.36	329.10	327.10	9.13 (TOC)	10.1 (TOC)	—	9.99 (TOC)	319.37
55S*	330.31	330.35	328.67	Abandoned				
56S	Boring Only							
57S	330.5	—	328.5	—	11.2 (TOC)	—	9.60 (TOC)	320.90
58S	331.38	330.90	328.90	13.19 (TOC)	13.5 (TOC)	—	12.87 (TOC)	318.51
60S	Abandoned							
62S	327.69	326.37	325.41	11.00 (TOC)	9.65 (TOC)	—	8.92 (TOC)	318.77
64S	329.71	329.27	327.70	11.55 (TOC)	9.9 (TOC)	—	10.45 (TOC)	319.26
66S	No Log							
68S	Abandoned							
70S	329.66	329.29	327.5	—	—	6.9 (TOC)	10.20 (TOC)	319.46
71S	331.60	331.34	329.6	—	—	8.3 (TOC)	11.09 (TOC)	320.51
72S	330.75	330.55	328.5	—	—	6.7 (TOC)	9.88 (TOC)	320.87
73S	330.30	330.03	328.3	—	—	8.2 (TOC)	11.12 (TOC)	319.18
74S	324.69	324.45	322.5	—	—	6.6 (TOC)	9.30 (TOC)	315.39
77S	315.22	315.13	313.5	—	—	6.6 (TOC)	9.20 (TOC)	306.02
79S	329.97	329.86	328.1	—	—	11.7 (TOC)	13.74 (TOC)	316.23
80S	330.86	330.73	328.7	—	—	6.8 (TOC)	9.79 (TOC)	321.07
82S	323.04	322.70	323.0	—	—	9.1 (TOC)	12.02 (TOC)	311.02
83S	313.62	313.30	312.8	—	—	3.0 (TOC)	—	—
84S	Boring Only							

* Well 80S, installed April 1990, replaces abandoned Well 55S.

D: Deep overburden (lower till); S: Shallow overburden (upper till); TOC: Top of protective casing; TOR: Top of PVC riser; SFC: Ground surface; —: Data point not available

†: Residential well beyond 400 ft. from the Site; not investigated

TABLE 3-3
BEDROCK WELLS
INSTALLATION DETAILS

Well No.	Former No.	Property Owner	Category	Elevation (FT MSL) Outer Casing	Inner Casing*	Ground Surface	Depth to Bottom (FT)	Thickness of Overburden (FT)	Thickness of Rock (FT)	Well Diameter (INCHES)
1R	RF-1	SWIER	RB	326.0	325.68	326.0	142.5	†	†	6
2R	RF-2	TREADWELL	RB	326.7	326.4	326.7	350	†	†	6
3R	RF-3	RUNDE	CUT OFF 3 FEET BELOW GROUND							
4R	RF-4	R. BOUCHER	RB	320.4	320.1	320.4	135	†	†	6
5R	RF-5	COUTURE	RB	329.05	328.75	328.35	140	†	†	6
6R	RF-6	BILODEAU	RB	322.87	—	322.87	240	†	†	6
7R	RF-7	HOLT	RB	318.76	—	317.73	†	†	†	6
8R	RF-8	VANCE	RB	302.72	—	302.72	162	†	†	6
9R	RF-9	FOSS	RB	318.09	—	317.65	†	†	†	6
13R	RF-13	DOLAN	RB	288.25	—	288.25	149	†	†	6
14R	RF-14	N. BOUCHER	RB	321.85	321.53	322.81	102	†	†	6
15R	RF-15	TERRY	RB	282.47	—	280.59	‡	†	†	6
16R	—	JANELLE	RB	‡	‡	‡	‡	‡	‡	‡
17R	—	MANGAR	RB	‡	‡	‡	‡	‡	‡	‡
18R	—	KAEMMERLEN	RB	‡	‡	‡	‡	‡	‡	‡
19R	—	HICKS	RB	‡	‡	‡	‡	‡	‡	‡

Well Categories

RB	Residential Bedrock
EPA-B	EPA-Installed Bedrock Monitoring Well
NH-MW	NH-DEP-Installed Bedrock Monitoring Well

Notes

* Inner casing is the true well casing elevation; the outer casing is the elevation of a protective cover which is flush with the ground.

† Data not available

‡ Residential well beyond 400 ft from Site, not investigated

TABLE 3-3 (cont'd)
BEDROCK WELLS
INSTALLATION DETAILS

Well No.	Former No.	Property Owner	Category	Elevation (FT MSL) Outer Casing	Inner Casing*	Ground Surface	Depth to Bottom (FT)	Thickness of Overburden (FT)	Thickness of Rock (FT)	Well Diameter (INCHES)
20R	—	LANE	RB	325.8	325.5	325.8	56	†	†	6
21R	—	TOWNSEND	RB	322.6	322.1	322.6	298	†	†	6
22R	—	SHANKLIN	RB	‡	‡	‡	‡	‡	‡	‡
23R	—	PHILLIPS	RB	‡	‡	‡	‡	‡	‡	‡
24R	—	TUTTLE	RB	‡	‡	‡	‡	‡	‡	‡
25R	—	LAVIGNE	RB	‡	‡	‡	‡	‡	‡	‡
26R	—	DAGENAIS	RB	‡	‡	‡	‡	‡	‡	‡
27R				——————Designation Not Utilized——————						
28R	—	FRANCESCHINI	RB	‡	‡	‡	‡	‡	‡	‡
29R	—	EPSTEIN	RB	‡	‡	‡	‡	‡	‡	‡
30R	—	CROSS	RB	‡	‡	‡	‡	‡	‡	‡
31R	—	FRENCH	RB	‡	‡	‡	‡	‡	‡	‡
32R	R-1	CHUBB	EPA-B	297.60	—	295.82	222.0	29.0	193	6
33R	R-2	SHANKLIN	EPA-B	310.12	—	307.43	220.8	11.0	210	6
34R	R-3	TREADWELL	EPA-B	330.02	—	326.76	222.0	60.0	162	6
35R	R-4	COUTURE	EPA-B	321.26	—	319.32	82.0	25.0	57	6
59R	B-1D	TREADWELL	NH-MW	330.54	—	329.40	203.5	50.0	154	6

Well Categories

RB	Residential Bedrock
EPA-B	EPA-Installed Bedrock Monitoring Well
NH-MW	NH-DEP-Installed Bedrock Monitoring Well

Notes

* Inner casing is the true well casing elevation; the outer casing is the elevation of a protective cover which is flush with the ground.

† Data not available

‡ Residential well beyond 400 ft from Site, not investigated

TABLE 3-3 (cont'd)
BEDROCK WELLS
INSTALLATION DETAILS

Well No.	Former No.	Property Owner	Category	Elevation (FT MSL) Outer Casing	Inner Casing*	Ground Surface	Depth to Bottom (FT)	Thickness of Overburden (FT)	Thickness of Rock (FT)	Well Diameter (INCHES)
61R	B-2D	JOHNSON	NH-MW	327.78	—	326.62	203.5	59	151	6
63R	B-3D	N. BOUCHER	NH-MW	326.66	—	325.17	202.3	60	137	6
65R	B-4D	COUTURE	NH-MW	328.89	—	328.20	203.5	70	129	6
67R	B-5D	JOHNSON	NH-MW	330.45	—	329.25	163.8	68.0	96	6
69R[1]	B-6D	COUTURE	NH-MW	326.88	326.63	324.01	57.0	32.5	25 (25WX)	1.5
75R[2]	—	JOHNSON	EPA-B	329.79	329.69	327.4	26.0	24.0	2 (2WX)	2
76R	—	SHANKLIN	EPA-B	314.96	—	313.2	252.0	12.0	240 (24WX)	6
78R[3]	—	SHANKLIN	EPA-B	316.93	316.69	317.0	200.0	15.0	185 (19WX)	6
81R	—	LANE	EPA-B	322.98	322.69	323.0	310.0	17.0	293 (43WX)	6

[1] In Well 69R, a 1.5-in. PVC well screen is used, no slot size is noted on well log.

[2] In Well 75R, a 2-in. screen is used, with a slot size of 0.020-in. from 21 to 26 ft. All other rock wells (except 69R) are assumed to be open hole completion without well screens.

[3] Well 78R was packed from 105 ft. to 110 ft. with gravel after a cavein to a depth of 110 ft.

Well Categories
- RB Residential Bedrock
- EPA-B EPA-Installed Bedrock Monitoring Well
- NH-MW NH-DEP-Installed Bedrock Monitoring Well

Rock Type
- WX Weathered

Notes
- * Inner casing is the true well casing elevation; the outer casing is the elevation of a protective cover which is flush with the ground.
- † Data not available
- ‡ Residential well beyond 400 ft from Site, not investigated

TABLE 3-4
BEDROCK WELL LOG SUMMARY
(from Drillers' Logs)

Well	Fracture Size	Fracture Depth (ft)	Yield (gpm unless noted)	Top of Bedrock (ft)	Bottom of Hole (ft)
32R	small	48	—	29	222
	2 ft	63	3		
	small	90	—		
	small	100	—		
	small	175	—		
33R	14 in	48	8	11	222
	small	56	2		
	6 in	158	4		
34R	none detectable	—	7 gph	60	222
35R	6 in	37	3	25	82
	2 ft	41	2		
	2 ft	48	5		
	5 ft	53	5		
	5 ft	64	5		
59R	none detectable	—	1 quart/min	50	204
61R	12 in	76	1	58	204
	12 in	76	2.5		
	6 in	195	30		
63R	14 in	115	16	60	203
	small	130	3		
	small	150	—		
	10 in	158	—		
	3 in	162	6		
	2 in	203	6		
65R		118	7.5	68	203.5
		188	10		
67R		124	2.5	68	164
	small	135	—		
		164	2		
69R	heavily fractured	32.5-58.5	—	32.5	58.5
75R	weathered	—	—	24.0	26.0
76R	dry to 247 ft (weathered 12-36 ft)	247-252	estimated 300	12.0	252
78R	—	117-122	1.5	15.0	200
	—	156-157	10		
	(78R: rotten rock — predominantly mica flake-filled hole to 110 ft depth; highly weathered and cased off 15 to 34 ft before cave-in)				
81R	none	none	—	17	310
	(81R: weathered rock 17 to 60 ft — saturated 31 to 43 ft — see well 82S)				
82S	weathered	17 to 43	not tested	17	43
	(2-in PVC 0.010-in diam. screen set at 33 to 43 ft)				

TABLE 3-5

BEDROCK WELLS
WATER LEVEL MEASUREMENTS

	Elevation (FT MSL)			Depth to Water From Measuring Point (FT)				Water Elev. (FT)
Well No.	TOC	TOR	SFC	10/8/85	10/8/90	6/5/91	7/5/91	7/5/91
1R	326.0	325.68	326.0	15.96 (TOC)	13.8 (TOC)	—	13.15 (TOC)	312.85
2R	326.7	326.4	326.7	34.40 (TOC)	29.6 (TOC)	—	27.18 (TOC)	299.52
3R	—Cut off 3' below ground—			28.95 (TOC)	—Not Reaccessed—			
4R	320.4	320.1	320.4	27.02 (TOC)	18.9 (TOC)	—	18.07 (TOC)	302.33
5R	329.05	328.75	328.35	34.63 (TOC)	23.0 (TOC)	20.2 (TOC)	22.32 (TOC)	306.73
6R	324.76	—	322.87	31.16 (TOC)	26.3 (TOC)	—	—	—
7R	318.76	—	317.73	20.35 (TOC)	22.5 (TOC)	—	—	—
8R	303.34	—	302.72	13.75 (TOC)	15.0 (TOC)	12.1 (TOC)	—	—
9R	318.09	—	317.65	23.54 (TOC)	—	—	—	—
10R	†	†	†	†	†	†	†	†
11R	†	†	†	†	†	†	†	†
12R	†	†	†	†	†	†	†	†
13R	—	—	288.25	12.04 (TOC)	11.5 (TOC)	—	—	—
14R	321.85	321.53	322.81	29.66 (TOC)	20.0 (TOC)	—	19.14 (TOC)	302.71
15R	282.47	—	280.59	—	20.5 (TOC)	—	—	—
16R	†	†	†	†	†	†	†	†
17R	†	†	†	†	†	†	†	†
18R	†	†	†	†	†	†	†	†
19R	†	†	†	†	†	†	†	†
20R*	325.8	—	325.8	—	11.4 (TOC)	—	11.18 (TOC)	314.62
21R	322.6	—	322.6	—	21.1 (TOC)	—	19.36 (TOC)	303.24
22R	†	†	†	†	†	†	†	†
23R	†	†	†	†	†	†	†	†
24R	†	†	†	†	†	†	†	†
25R	†	†	†	†	†	†	†	†
26R	†	†	†	†	†	†	†	†
27R	—Designation Not Utilized—							
28R	†	†	†	†	†	†	†	†
29R	†	†	†	†	†	†	†	†
30R	†	†	†	†	†	†	†	†
31R	†	†	†	†	†	†	†	†
32R	297.60	—	295.82	14.07 (TOC)	12.4 (TOC)	—	—	—
33R	310.12	—	307.43	20.28 (TOC)	20.8 (TOC)	—	—	—
34R	330.02	—	326.76	25.73 (TOC)	15.8 (TOC)	—	14.87 (TOC)	315.15
35R	321.26	—	319.32	10.56 (TOC)	10.2 (TOC)	6.6 (TOC)	9.62 (TOC)	311.64
59R	330.54	—	329.40	23.62 (TOC)	20.6 (TOC)	—	20.75 (TOC)	309.79
61R	327.78	—	326.62	32.85 (TOC)	28.5 (TOC)	—	26.88 (TOC)	300.90
63R	326.66	—	325.17	22.70 (TOC)	18.7 (TOC)	—	17.85 (TOC)	308.81
65R	328.89	—	328.20	22.35 (TOC)	20.0 (TOC)	—	19.50 (TOC)	309.39
67R	330.45	—	329.25	22.58 (TOC)	20.3 (TOC)	—	19.51 (TOC)	310.94
69R	326.88	326.63	324.01	15.97 (TOC)	15.1 (TOC)	11.2 (TOC)	14.41 (TOC)	312.47
75R	329.79	329.69	327.4	—	—	7.79 (TOC)	10.24 (TOC)	319.55
76R	314.96	—	313.2	—	—	11.3 (TOC)	15.90 (TOC)	299.06
78R	316.93	316.69	317.0	—	—	11.0 (TOC)	13.40 (TOC)	303.53
81R	322.98	322.69	323.0	—	—	16.0 (TOC)	20.70 (TOC)	302.28

R: Rock (Bedrock)
TOC: Top of protective casing
TOR: Top of PVC riser or inner steel casing — where no elevation is indicated, the bedrock well is an open hole without a riser
SFC: Ground surface
†: Residential well beyond 400 ft. from Site, not investigated
—: Data not collected or well installed after date shown
*: reported casing not sealed into bedrock

TABLE 3-6
SUMMARY OF AQUIFER TEST DATA
STRADDLE PACKER PUMP TESTS
(Copy of Table 2 from EPA, 1986)

PUMPING WELL	PACKER ZONE	MONITORING WELL	AZIMUTH	TRANSMISSIVITY (gpd/ft)	HYDRAULIC CONDUCTIVITY (gpd/ft^2)	HYDRAULIC CONDUCTIVITY (cm/sec)	STORAGE COEFFICIENT	METHOD OF SOLUTION
61R (B2D)	70-90 ft	63R (B3D)	16°	184	5.2	2.5×10^{-4}	3.8×10^{-4}	Hantush-Jacob[1]
61R	70-90 ft	2R Treadwell (RF-2)	120°	1,436	71.8	3.4×10^{-3}	7.3×10^{-5}	Theis
61R	70-90 ft	3R Runde (RF-3)	184°	287	14.4	6.8×10^{-4}	1.8×10^{-5}	Theis
61R	180-200 ft	2R Treadwell (RF-2)	120°	917	45.9	2.2×10^{-3}	6.7×10^{-5}	Theis
61R	180-200 ft	3R Runde (RF-3)	184°	187	9.4	4.4×10^{-4}	2.5×10^{-5}	Theis
65R (B4D)	110-130 ft	63R (B3D)	237°	98	4.9	2.3×10^{-4}	4.0×10^{-5}	Theis
65R	110-130 ft	67R (B5D[2])	165°	129	6.5	3.1×10^{-4}	9.1×10^{-5}	Theis
65R	110-130 ft	69R (B6D[2])	120°	166	8.3	3.9×10^{-4}	8.5×10^{-5}	Theis
65R	140-170 ft	63R (B3D[2])	237°	344	11.5	5.4×10^{-4}	1.7×10^{-4}	Theis
65R	140-170 ft	67R (B5D[2])	165°	174	5.8	2.8×10^{-4}	2.7×10^{-5}	Theis
	140-170 ft	69R (B6D[2])	120°	224	7.5	3.5×10^{-4}	4.0×10^{-5}	Theis

LEGEND:

1. *Aquitard (overburden) vertical hydraulic conductivity from Hantush-Jacob method = 0.4 gpd/ft^2 (1.9×10^{-5} cm/sec)*

2. *Analyses include delayed drawdown data*

Summary of Borehole Geophysics & Pump Test Results

EXPLANATION OF ABBREVIATIONS

s — single well pump or bail test
p — pumping well on a multi-well test
m — monitored well during multi-well test
t — static flow tested during heat-pulse flowmeter
c — cross-hole tested, pumped
x — cross-hole tested, monitored

Cal - Caliper log
Gam - Gamma log
SP - Spontaneous Potential log
PT[1] - Pump Test 1, conducted on Nov 30, 1984, pumping B2D from am to 4 pm at an initial rate of 30 gpm, and dropping to 20 gpm and finally 17.2 gpm. Superimposed on the test was noted a recovery phase, which is due to residential use prior to the test. This recovery was noted also in monitoring wells indicating that many of the wells are interconnected to some degree.

PT[2] - Multiple well pump tests were conducted on the following wells:
B2D pumping interval 70 to 90 feet at a rate of 8.83 gpm on 9/5/85.
B2D pumping interval 180 to 200 feet at a rate of 7.45 gpm on 9/10/85.
B4D pumping interval 110 to 130 feet at a rate of 7.45 gpm on 9/13/85.
B4D pumping interval 140 to 170 feet at a rate of 3.33 gpm on 9/17/85.
Single well pump tests conducted at this time on the entire intervals of the selected wells, and consisted of pump tests for wells R1, R2, and R4; while the rest were bail or slug tests.

FlR - Fluid resistivity

FoR - Focused resistivity

SPR - Single point resistivity

ATe - Acoustic televiewer

AVe - Acoustic velocity

DFM - Down-hole flow meter

PT - Pump test

RDR - Borehole ground penetrating radar

BOREHOLE GEOPHYSICS AND PUMP TEST RESULTS
OVERBURDEN WELLS

OVERBURDEN	*****Pre-1985***** Cal	Gam	SP	PT[1]	1985 PT[2]	Cal	Tmp	Gam	FlR	FoR	SP	SPR	ATe	AVe	DFM	PT	XHP	RDR
B1S - 58S	N	X	X	X_m	X_s													
B2S - 60S	___	X	X	X_m	X_m													
B3S - 62S	___	X	X	X_m	X_s													
B4S - 64S	___	X	X	X_m	X_m													
B6S - 68S	___	X	X	X_m	--													
OW1 - 55S	----------			X_m	X_m													
OW2 - 56S																		
OW3 - 57S	----------			X_m	X_m													
T3S - 51S	----------			--	X_s													
T3D - 36D	----------			--	X_s													
T4S - 52S	----------			--	X_s													
T4D - 37D	----------			--	X_s													
T6S - 54S	----------			--	X_s													
T6D - 38D	----------			--	X_s													

BOREHOLE GEOPHYSICS AND PUMP TEST RESULTS
BEDROCK WELLS

BEDROCK	*****Pre-1985***** Cal	Gam	SP	PT[1]	1985 PT[2]	Cal	Tmp	Gam	FlR	FoR	SP	SPR	ATe	AVe	DFM	PT	RDR
R1 - 32R	----------			--	X_s	X	X	X	X	X	X	X	X				
R2 - 33R	----------			--	X_s	X	X	X	X	X	X	X	X	X			
R3 - 34R	----------			--	--	X	X	X	X	X	X	X	X				
R4 - 35R	----------			--	X_s												
B1D - 59R	N	X	X	X_m	X_{sm}	X	X	X	X	--	X	X	X				
B2D - 61R	X	X	X	X_p	X_{spm}	X	X	X	X	X	X	X	X		X_{pcs}		
B3D - 63R	X	X	X	X_m	X_{sm}	X	X	X	X	X	X	X	X		X_{ms}		
B4D - 65R	X	X	X	X_m	X_{spm}	X	X	X	--	X	X	X	X		X_{ms}		
B5D - 67R	X	X	X	X_m	X_{sm}	X	X	X	X	--	X	X	X		X_{ms}		
B6D - 69R	X	X	X	X_m	X_{sm}												
SWIER - 1R	----------			X_m	X_m	X	X	X	X	X	X	X	X				
TREADWELL - 2R	----------			X_m	X_{sm}	X	X	X	X	X	X	X	X		X_{ms}		
R. BOUCHER - 4R	----------			X_m	X_m	X	X	X	X	X	X	X	X				
COUTURE - 5R	----------			X_m	X_m	X	X	X	X	X	X	X	X				
BILODEAU - 6R	----------			--	--	X	X	X	X	X	X	X	X		X_{ms}		
VANCE - 8R	----------			--	--	X	X	X	X	X	X	X	X				
DOLAN - 13R	----------			--	--	X	X	X	X	X	X	X	X				
N. BOUCHER - 14R	----------			X_m	X_{sm}	X	X	X	X	X	X	X	X				
LANE - 20R	----------			--	--	X	X	X	X	X	X	X	X				
TOWNSEND - 21R	----------			--	--	X	X	X	X	X	X	X	X		X_{ms}		
RUNDE - 3R	----------			X_m	X_{sm}												
FOSS - 9R	----------			X_m	X_m												

WELL LOGS -
OVERBURDEN WELLS
(Bedrock Wells included following Well 83S)

MONITORING WELL CHARACTERISTICS SUMMARY

Unit	GEOLOGY* 1	2	3	4	Comments
OVERBURDEN					
B1S - 58S	8	17.5	50	-	No refusal, K=2.5 E-4/5.3 (15-16 ft/gr sz), K= 6.5 E-7/0.014 (39-39.5/gr sz), K=3.6 E-5/0.8 (bail slug), fully screened, did not respond to pumping of B2D or B4D in '85. Hnu soil every 5' to 50' all were at background (2 ppm).
B2S - 60S	23	28	52.3r	-	K=8 E-7/0.017 (45-46'/gr sz), Hnu soil rdgs: 1'=50 ppm, 5=120, 10=400, 15=20, 20=<1, 25=15, 30=71, every 5 to 50 at background; very slight response to B2D pump after 100 min('84); very slight response to B2D(70-90) pump after 300 min, but may be affected by couture pump; fully screened,
B3S - 62S	11	12	65r	-	K=1.2 E-3/25.4 (5-7'/gr sz), K=1.4 E-4/3 (full/bail), fully screened, NR to B2D pump in '84, Unit 2 may consists of varving in this location, NR to B2,4D pump in '85, Hnu evry 5' to 55 and NR.
B4S - 64S	7.3	20.5	75r	-	Hnu showed NR until 30=22, 35=22, 40=2, 45=4.5, 50=NR, 55=20, 60=30, 65=NS, and 70=20; and showed NR to '84 or '85 pump tests. fully screened.
B6S - 68S	10	20	26	32.5	Hnu 0-10=NR, 15=8, 20=7, 25=4, 30=7, 31=19; NR to pump in '84 or '85.
OW1 - 55S	15	17r	?	?	Unit 2 may in fact be the weathered bedrock zone. NR to pump in '84 or '85
OW2 - 56S	(abandoned)				No log taken, augered to 17.5 then used ss to go to 20'2"(ref), unit appears to be weathered bedrock, all OW wells required 100+ blows below 15' w/ 140# hammer.
OW3 - 57S	15	-	19	?	15 to 19 feet appear to be the weathered bdrx zone, refusal at 19 feet with 140 ham. Water depth recorder was left over a period from 10/12/90 to 4/2/91 (not continuous). Matched with rainfall data from UNH, OW-3 showed an instant response (raise in water level) for all prec. events. Those in Oct did not have the same effect as those later. I need to find out how a 2 inch event can lead to a 2 foot change in depth. No response to pump in '84 and '85.
T1S - 49S	13	25	27	?	Screened 5.3 to 10.3, but sand pack went to 27. 0-1: ova nr; 5-7: hnu 5, ova 0; 10-12: ova 7, hnu 7; 15-17: ova 2.5, hnu 3; 20-22: ova .1, hnu 0; 25-27: ova 0, hnu 3.
T2S - 50S	11	17	20	?	Screened 9.57 to 14.57 but sand pack to 25.25. 0-2: ova 2; 5-7: o 25 - 30; 10-11: o 3; 15-16.25: o 3; 20-21.33: o 1, hnu 19; 25-25.25: o 0.
T3S - 51S	21	36	-	?	Screened 11.27 to 16.27
T3D - 36D	2	26	51		Screened 47.07 to 57.07; Bottom of boring is 57.07 ft; K = 0.3 gpd/ft^2 / 1.4 E-5 cm/sec
T4S - 52S	11	19			Screened 6.45 to 11.45, below 19'; Bottom of boring is 15 ft; K = 15 gpd/ft^2 / 7.1 E-4 cm/sec.
T4D - 37D	11	19			Screened 15.43 to 25.43, below 19' becomes a fine-grained sand with some silt; Bottom of boring is 25.43 ft; K = 1.1 gpd/ft^2 / 5.3 E-5 cm/sec.

***A footnote describing geological units appears on the following page.**

T5 - 53S	5	20			Bottom of boring at 20 ft where a gravel, boulder and sand zone were encountered. Screened 5.78 to 10.78, but filter packed throughout; 0-2: hnu 8 to 11, 5-7: hnu 13, 10-12: hnu 9.
T6S - 54S	11	18	45		Screened 7.71 to 12.71, but filter packed to 27'; the dense grey clay is interbedded with lenses of sand and gravel, some boulders were encountered. 0-2: hnu 7 to 13, 5-7: hnu 6 to 8, 10-12: hnu 4, 16-18: hnu 0, 20-21: hnu 0.2, 25-27: hnu 0. K = 18.6 gpd/ft^2 / 8.8 E-4 cm/sec.
T6D - 38D	11	18	45	55+	Screened 25.92 to 50.92, filter packed to bottom (60'). Pumped 1.5 gpm; K = 0.8 gpd/ft^2 / 3.7 E-5 cm/sec.
70S	13	-	25?		Hnu showed 5-7=NR, 10-12=40, 15-17=70, 20-22=180; screen 8-13 feet.
71S	20	-	20?		Refusal at 20' showed gray till at tip of spoon, NR on Hnu throughout hole; screen 12-17
72S	12.5*				*material was tan with gray sand lens at 7 ft; Hnu showed NR; screened 7.5 - 12.5.
73S	20				Hnu 2ppm at 5 to 7' then NR, refusal at 20, screen 13.5 to 18.5.
74S	18				No samples, screen at 13 to 18, refusal at rock.
77S	12				No samples, screen 10 - 15'.
79S	20	-	34		No samples, screen 17 - 22', gray till was nearly lithified and dry.
80S	16.5	-	-	19.5	No samples, cuttings 8 ppm, screen 11 - 16.
82S	17	-	-	43	No samples, screen 33 - 43'.
83S	9.5				Refusal, screen 4.5 - 9.5.

Unit 1 consists of 5 to 7 inches of organic topsoil overlying 5 to 10 feet of dry to wet, brown fine to medium sand with a little silt and some fine gravel.
Unit 2 consists of from 10 to 55 feet of a moist gray to brown silt and clay which contains some fine sand and a trace of coarse sand and gravel. Iron staining was noticed in all of the logs.
Unit 3 consists of from 30 to 50 feet of a dark gray very dense silt and clay with little fine sand and a trace of coarse sand.
Unit 4 consists of about 5 feet of weathered bedrock comingled with the gray sandy till.

36D

ENVIRESPONSE INC.

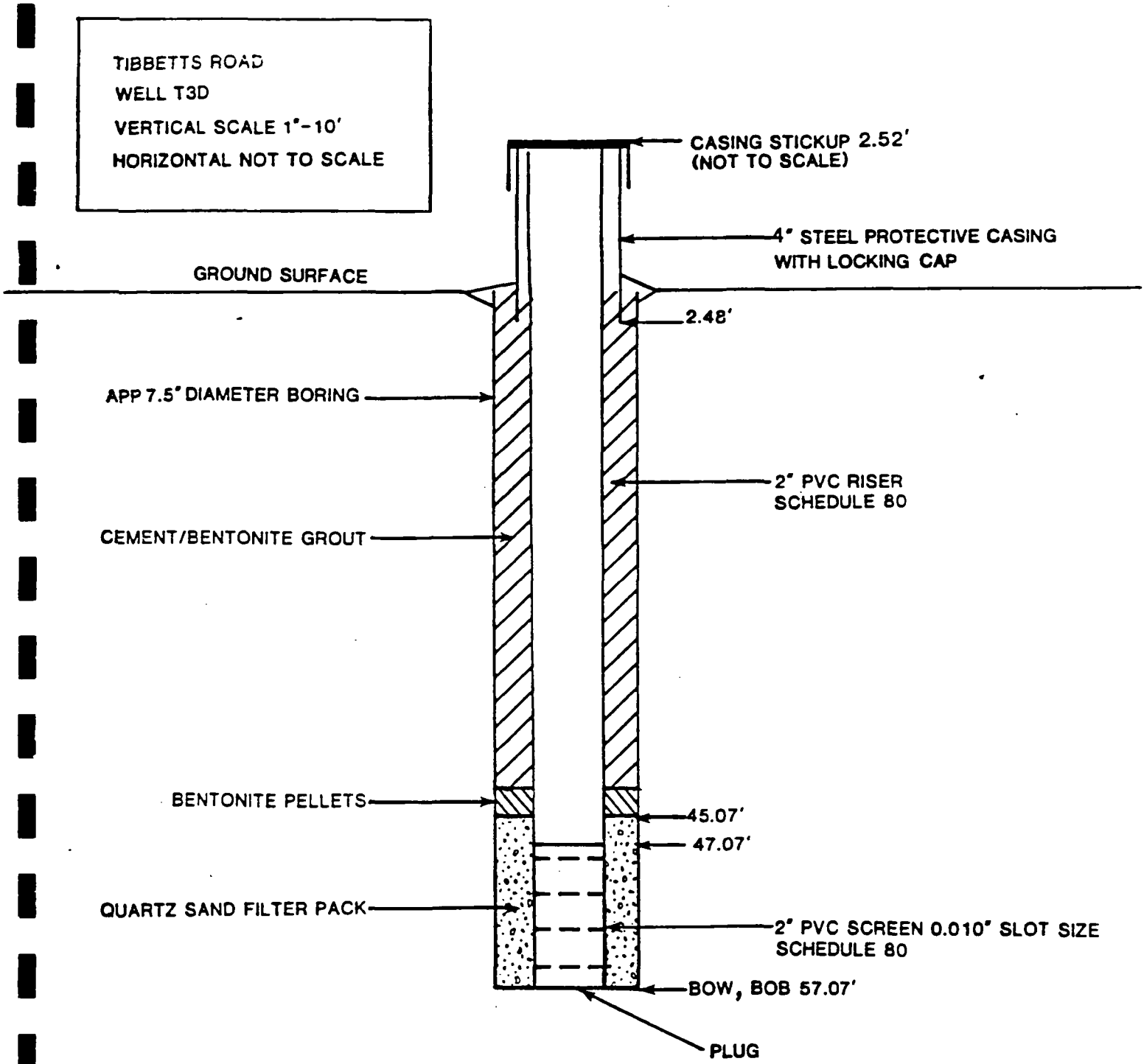
PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190102 / 36682190102 BORING: T-3D
T.O.C. ELEVATION: 329.57 msl[a] 327.10[a] DATE: 9/13/85
FIELD GEOLOGIST: PAUL KARWAZINSKI

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR RQD (%)	SAMPLE REC. / SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
0.0-2.0			dry		brown	sand, some gravel, trace silt. (SM)	
5.0-6.25			moist		gray	sand, some fine gravel and silt. (SM)	
10.0-11.0			moist		brown-gray	same as above.	
15.0-16.0			moist		brown-gray	same as above.	
20.0-21.0			moist		brown-gray	same as above.	
25.0-26.0			moist		gray	silt and fine sand, trace gravel and clay. (ML) some iron staining.	
30.0-30.75			moist		gray	silt and clay, some fine sand, trace gravel. (ML)	
35.0-36.0			moist		gray	same as above.	
40.0-41.0			moist		dk. gray	same as above.	
45.0-46.0			moist		dk. gray	same as above.	
50.0-51.0			moist		dk. gray	same as above.	

(K from slug (bail) test = 0.3 gpd/ft^2 // 1.4×10^{-5} cm/s)

REMARKS: Bottom of boring - 57.07ft. below ground surface.
Log is taken from N.H. state report - Hydrogeologic Investigation, Tibbetts Rd. Hazardous Waste Site, Barrington, N.H. - boring no. B2S.

BORING: T-3D
PAGE: 1 OF 1


TIBBETTS ROAD
WELL T3D
VERTICAL SCALE 1"-10'
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.52'
(NOT TO SCALE)
4" STEEL PROTECTIVE CASING
WITH LOCKING CAP
GROUND SURFACE
2.48'
APP 7.5" DIAMETER BORING
2" PVC RISER
SCHEDULE 80
CEMENT/BENTONITE GROUT
BENTONITE PELLETS
45.07'
47.07'
QUARTZ SAND FILTER PACK
2" PVC SCREEN 0.010" SLOT SIZE
SCHEDULE 80
BOW, BOB 57.07'
PLUG

(37D)

ENVIRESPONSE INC.

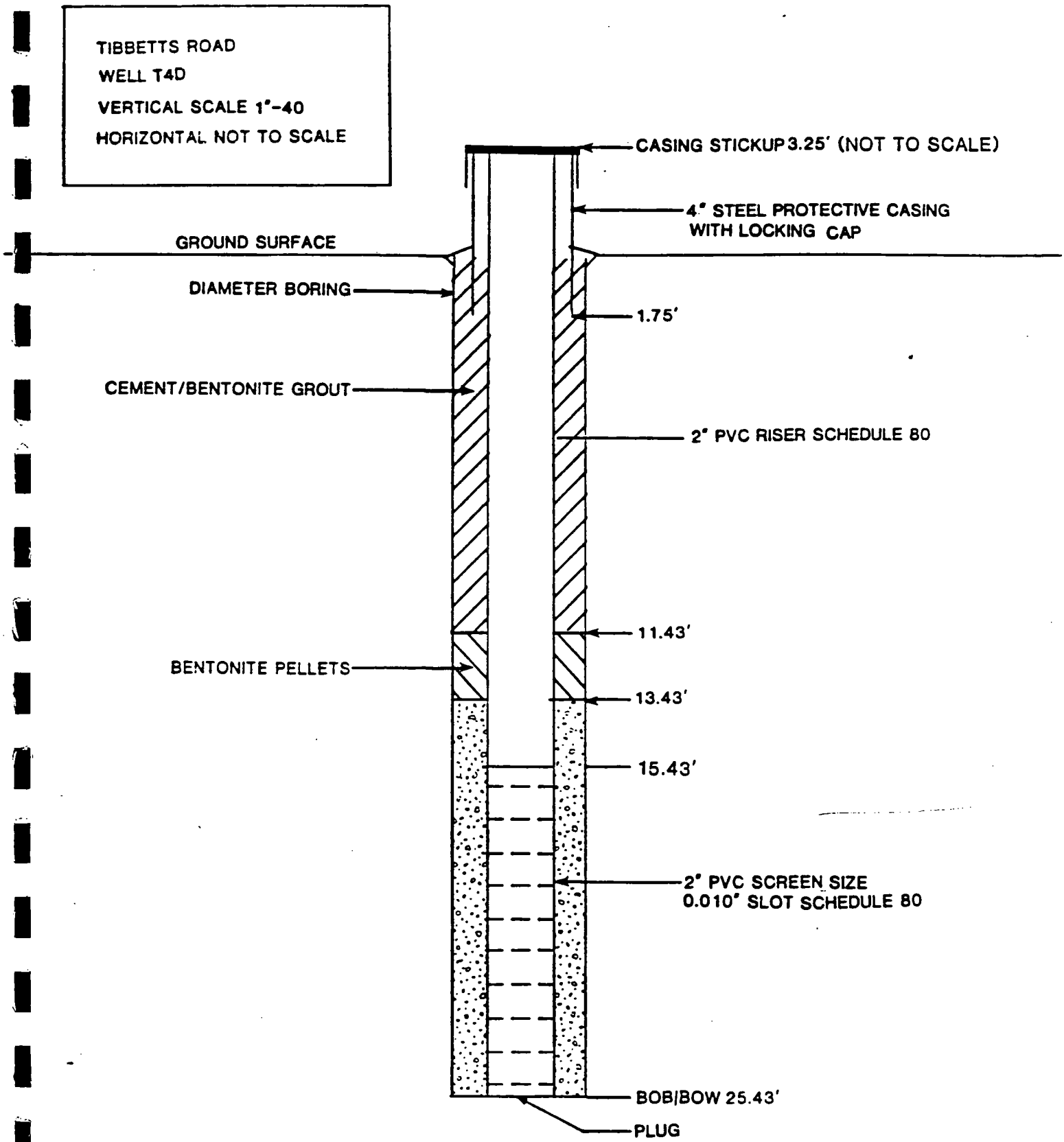
PROJECT: TIBBETTS RD.
PROJECT NO.: 3568219B102 / 3668219B102 BORING: T-4D
T.O.C. ELEVATION: 327.87 msl GRND 325.27 DATE: 9/18/85 - 9/19/85
FIELD GEOLOGIST: MIKE NICHOLAS

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR REC (%)	SAMPLE REC./ SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
0.0-2.0			dry		brown	0.0ft-.58ft organics and topsoil .58ft-2.0ft sand, trace silt and fine gravel. (SM)	
3.0-5.5			wet		brown	same as above.	
10.0-11.58			moist moist		brown gray	10.0ft-10.2ft sand, trace silt. (SM) 10.2ft-11.58ft silt and clay, some sand, trace gravel. (ML)	
15.0-16.5			moist		gray	silt, some clay and sand, trace gravel. (ML) mottled.	
19.0-19.33			moist		dk. gray	silt, some clay and sand. (ML)	
19.33-19.58			moist		dk. gray	fine grained sand. (SM)	
24.0-24.42			moist		gray	sand, some silt and fine gravel. (SP)	

$K(bail) = 1.1\ gpd/ft^2 // 5.3 \times 10^{-5}\ cm/sec$

REMARKS: Bottom of boring - 25.43ft. below ground surface.
Log is taken from N.H. state report - Hydrogeologic Investigation, Tibbetts RD. Hazardous Waste Site, Barrington, N.H. - boring no. B6D.

BORING: T-4D
PAGE: 1 OF 1


TIBBETTS ROAD
WELL T4D
VERTICAL SCALE 1"-40
HORIZONTAL NOT TO SCALE
CASING STICKUP 3.25' (NOT TO SCALE)
4" STEEL PROTECTIVE CASING
WITH LOCKING CAP
GROUND SURFACE
DIAMETER BORING
1.75'
CEMENT/BENTONITE GROUT
2" PVC RISER SCHEDULE 80
11.43'
BENTONITE PELLETS
13.43'
15.43'
2" PVC SCREEN SIZE
0.010" SLOT SCHEDULE 80
BOB/BOW 25.43'
PLUG

(535)

ENVIRESPONSE INC.

PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190182 / 36682190182 BORING: T-5
T.O.C. ELEVATION: 323.52 msl[a] GRND 320.57[a] DATE: 9/17/85
FIELD GEOLOGIST: PAUL KARWAZINSKI

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR ROD (%)	SAMPLE REC./ SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
S-1 0.0-2.0	1/3/7/9	1.2ft/2.0ft	moist	med. dense	lt. brown	0.0ft-0.4ft root zone. sand, some silt, trace gravel. (SM)	0-11 ppm HNu
S-2 5.0-7.0	8/18/19/20	1.5ft/2.0ft	W.L. @ 6.0ft	dense	lt. brown	sand and gravel, some silt. mottled, micaceous. (SP)	13.0 ppm HNu
S-3 10.0-12.0	25/36/42/51	1.9ft/2.0ft	moist	hard	gray	silt, sand and gravel, some clay. mottled, micaceous. (MH)	19.0 ppm HNu
no samp. 15.0-20.0						gravel, boulder and sand zone. no sample attempt	

REMARKS: Bottom of boring - 20.0ft. below ground surface.

BORING: T-5
PAGE: 1 OF 1

38D

ENVIRESPONSE INC.

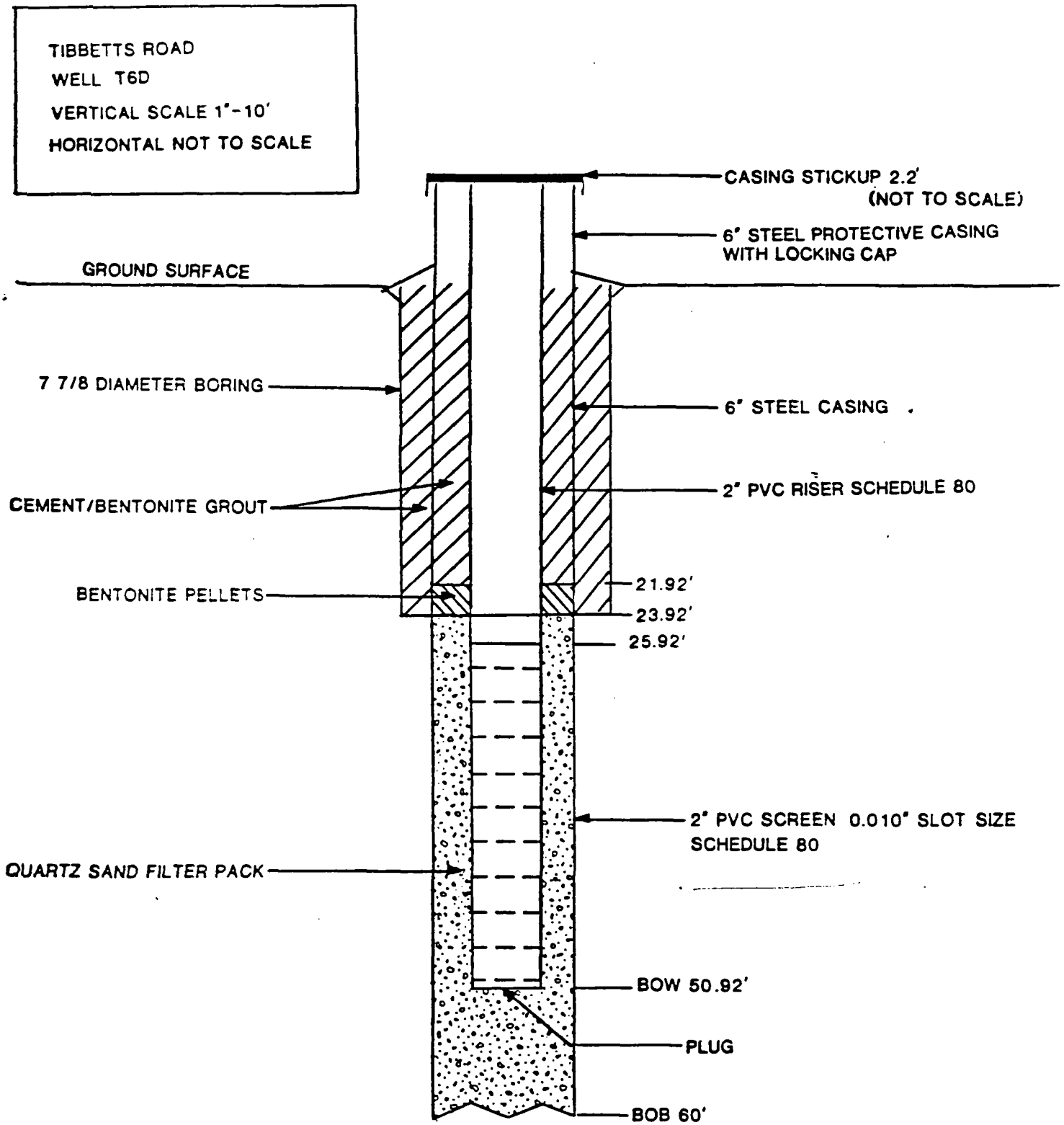
PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190102 / 35682190102 BORING: T-6D
T.O.C. ELEVATION: 338.86 msl GRND 327.90' DATE: 9/30/85 - 10/01/85
FIELD GEOLOGIST: PAUL KARMAZINSKI

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR RQD (%)	SAMPLE REC. / SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
8.0-27.0						(see boring T-6S)	
35.0					gray	coarse to med. grained sand and gravel, some silt. (GM)	
40.0					brown-gray	same as above	
45.0						quartz monzonite boulder.	
50.0						quartz monzonite boulder.	
55.0					gray	coarse to med. grained sand and gravel, some silt. (GM)	

$K(bail) = 0.8\ gpd/ft^2 // 3.7 \times 10^{-5}\ cm/sec$

REMARKS: Bottom of boring - 60.0ft. below ground surface.
Production rate - 1.5gpm.

BORING: T-6D
PAGE: 1 OF 1

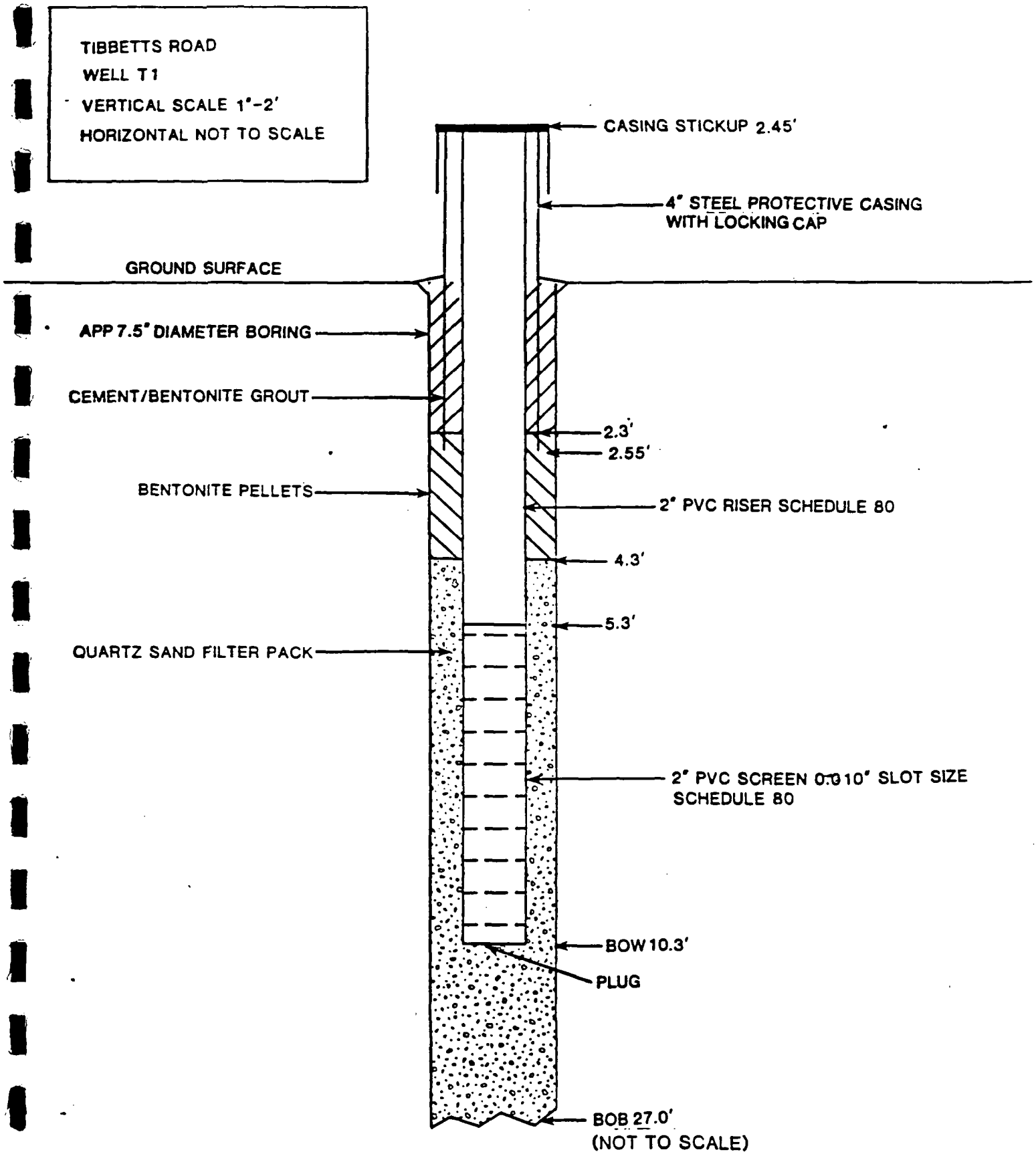

TIBBETTS ROAD
WELL T6D
VERTICAL SCALE 1"-10'
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.2'
(NOT TO SCALE)
6" STEEL PROTECTIVE CASING
WITH LOCKING CAP
GROUND SURFACE
7 7/8 DIAMETER BORING
6" STEEL CASING
2" PVC RISER SCHEDULE 80
CEMENT/BENTONITE GROUT
BENTONITE PELLETS
21.92'
23.92'
25.92'
2" PVC SCREEN 0.010" SLOT SIZE
SCHEDULE 80
QUARTZ SAND FILTER PACK
BOW 50.92'
PLUG
BOB 60'

ENVIRESPONSE INC.

PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190182 / 36682190182 BORING: T-1
T.O.C. ELEVATION: 322.36 msl GRD 320.03' DATE: 9/20/85
FIELD GEOLOGIST: MIKE NICHOLAS

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR RQD (%)	SAMPLE REC./ SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
S-1 0.0-1.0	1/2/4/8		moist	soft	lt. gray	0.0ft-0.4ft root zone. clay, some lt. brown sand and silt. (CL)	18.0 ppm OVA
S-2 5.0-7.0	29/27/29/28		W.T. @ 6.0ft	dense	lt. brown	sand, some silt, some gravel. (SM)	15.0 ppm HNu 18.0 ppm OVA
S-3 10.0-12.0	18/49/63/83	1.5ft/2.0ft	damp	very dense	lt. brown to gray	sand, some silt, trace gravel. mottled throughout. (SM)	16-7 ppm OVA 17.0 ppm HNu
S-4 15.0-17.0	18/29/32/47	1.9ft/2.0ft		very dense	gray to dk. gray	sand, some silt and some gravel mixed w/coarse sand, trace clay. (SM)	12.5 ppm OVA 12-3 ppm HNu
S-5 20.0-22.0	19/31/43/79	2.0ft/2.0ft		very dense	dk. gray	silt, some sand, some gravel, trace clay. (MH)	18.1 ppm OVA 18.0 ppm HNu
S-6 25.0-27.0	23/24/37/45	2.0ft/2.0ft		very dense	dk. gray	silt, some sand, some coarse sand and gravel, trace clay. (MH)	18.0 ppm OVA 12-3 ppm HNu

REMARKS: Bottom of boring - 27.0ft. below ground surface.


TIBBETTS ROAD
WELL T1
VERTICAL SCALE 1"-2'
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.45'
4" STEEL PROTECTIVE CASING WITH LOCKING CAP
GROUND SURFACE
APP 7.5" DIAMETER BORING
CEMENT/BENTONITE GROUT
2.3'
2.55'
BENTONITE PELLETS
2" PVC RISER SCHEDULE 80
4.3'
5.3'
QUARTZ SAND FILTER PACK
2" PVC SCREEN 0.010" SLOT SIZE SCHEDULE 80
BOW 10.3'
PLUG
BOB 27.0'
(NOT TO SCALE)

505

ENVIRESPONSE INC.

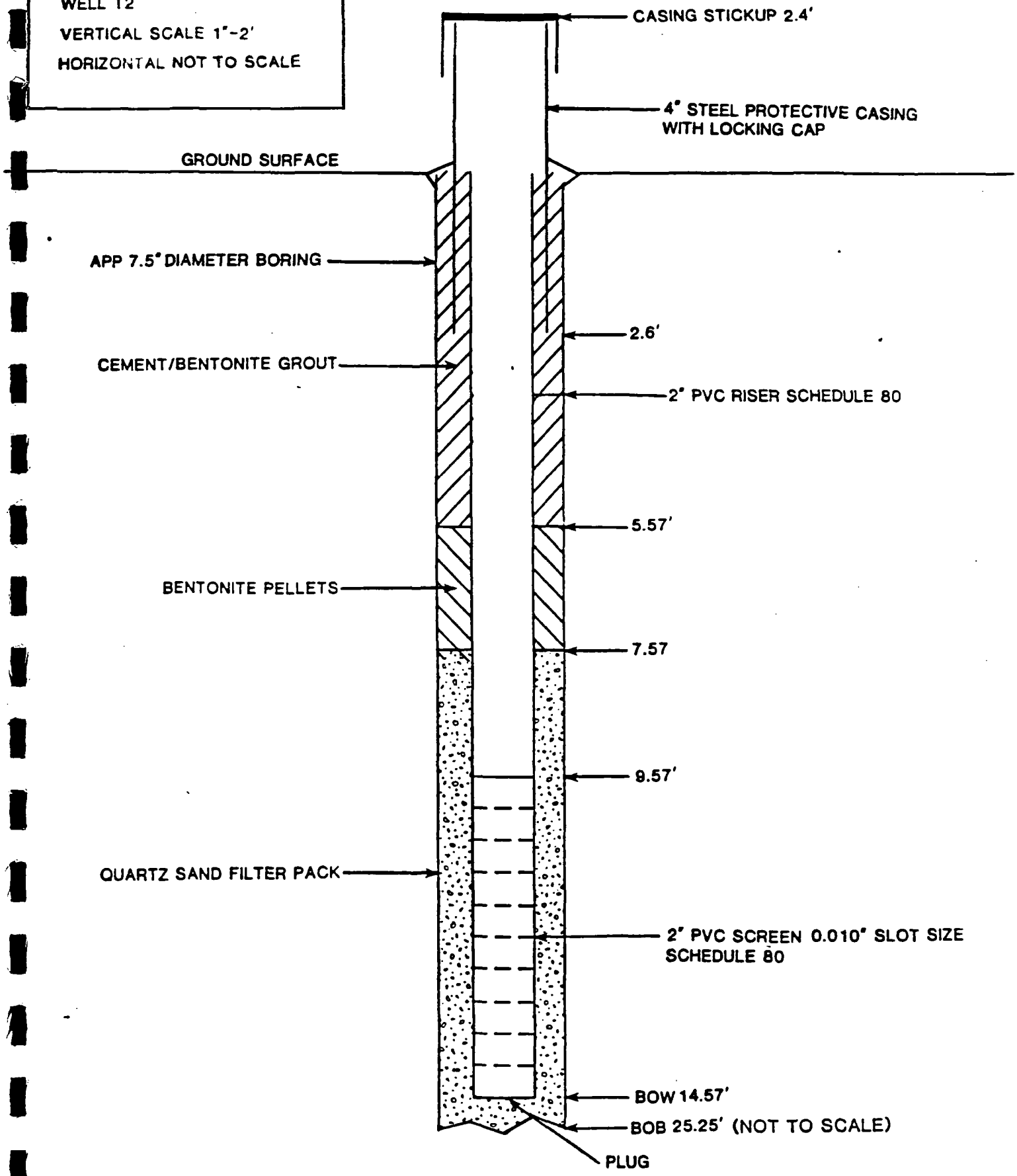
PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190102 / 36682190102 BORING: T-2
T.O.C. ELEVATION: 325.80 msl* GRND 323.40 DATE: 9/23/85
FIELD GEOLOGIST: PAUL KARWAZINSKI

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR REC (%)	SAMPLE REC./ SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
S-1 0.0-2.0	1/2/3/5	1.0ft/2.0ft	damp	loose	brown	sand, some silt, trace gravel and fill. (SM)	2.0 ppm OVA
S-2 5.0-7.0	32/62/62/66	2.0ft/2.0ft	damp	very dense	lt. brown	sand, some silt, trace gravel. (SM)	25-30 ppm OVA
S-3 10.0-10.83	19/88/.33ft	.83ft/.83ft	wet		lt. brown	sand, gravel and silt. mottled throughout. (SM)	3.0 ppm OVA
S-4 15.0-16.25	53/131/ 100/.25ft	1.25ft/1.25ft	wet	very dense	gray	sand, silt, trace gravel, mottled (first .66ft) (SM) silt, some sand, trace gravel, mottled (last .58ft) (ML)	2-3 ppm OVA
S-5 20.0-21.33	31/84/ 100/.33ft	1.0ft/1.33ft	wet	very dense	tan to gray	sand and silt, some gravel. (SM)	1.0 ppm OVA 119 ppm HNu
S-6 25.0-25.25	200/.25ft	.25ft/.25ft		hard	gray	silt, some sand, trace gravel. (ML)	10.0 ppm OVA

REMARKS: Bottom of boring - 25.25ft. below ground surface.

BORING: T-2
PAGE: 1 OF 1

TIBBETTS ROAD
WELL T2
VERTICAL SCALE 1"-2'
HORIZONTAL NOT TO SCALE



515

ENVIRESPONSE INC.

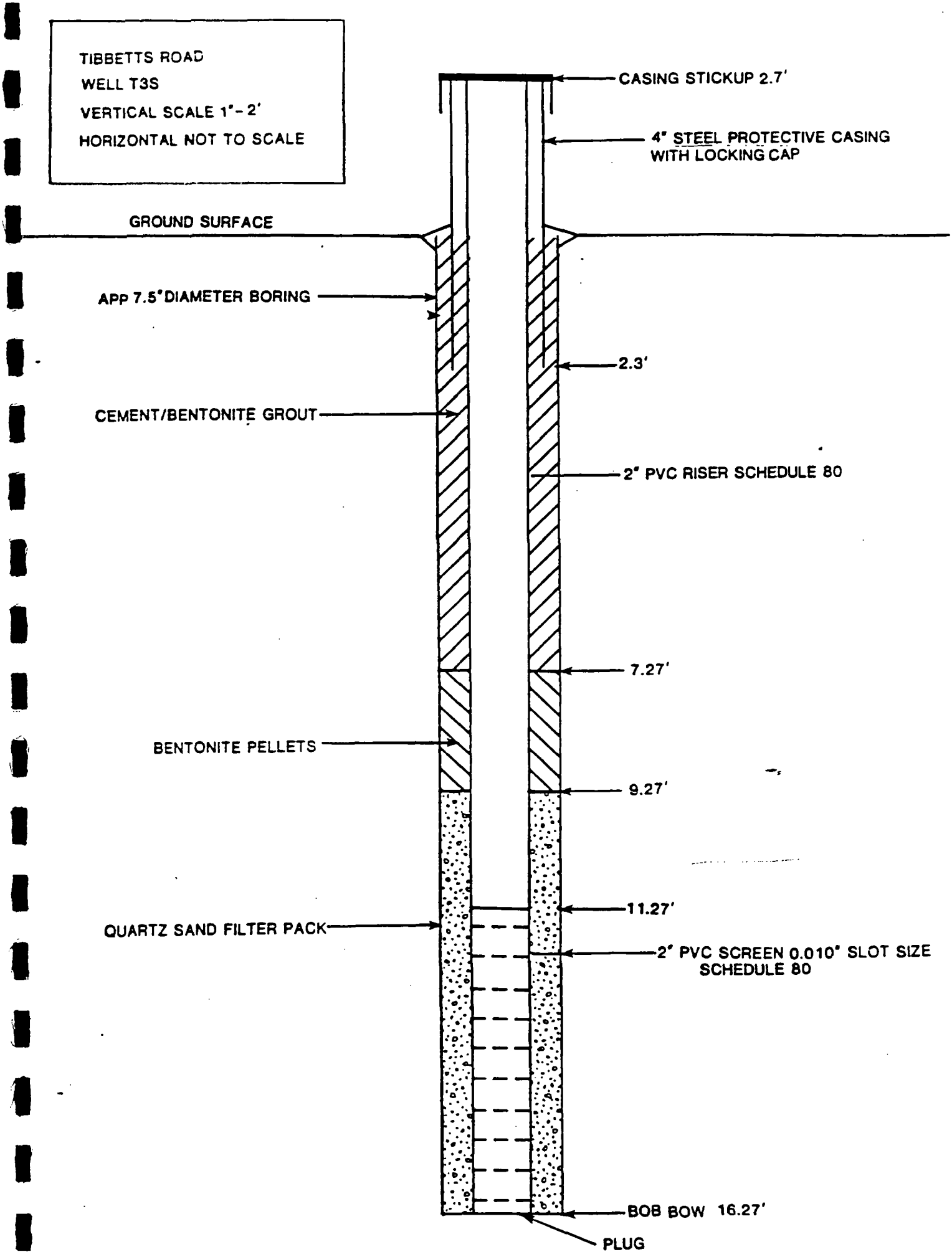
PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190102 / 36682190102 BORING: T-3S
T.O.C. ELEVATION: 329.24 msl" GRND 326.54" DATE: 9/13/85
FIELD GEOLOGIST: PAUL KARWAZINSKI

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR RQD (%)	SAMPLE REC. / SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
						(see boring T-3D)	

K from slug (bail) test = 14.8 gpd/ft²/6.9x10

REMARKS: Bottom of boring - 16.27ft. below ground surface.

BORING: T-3S
PAGE: 1 OF 1


TIBBETTS ROAD
WELL T3S
VERTICAL SCALE 1"- 2'
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.7'
4" STEEL PROTECTIVE CASING WITH LOCKING CAP
GROUND SURFACE
APP 7.5"DIAMETER BORING
2.3'
CEMENT/BENTONITE GROUT
2" PVC RISER SCHEDULE 80
7.27'
BENTONITE PELLETS
9.27'
11.27'
QUARTZ SAND FILTER PACK
2" PVC SCREEN 0.010" SLOT SIZE SCHEDULE 80
BOB BOW 16.27'
PLUG

(525)

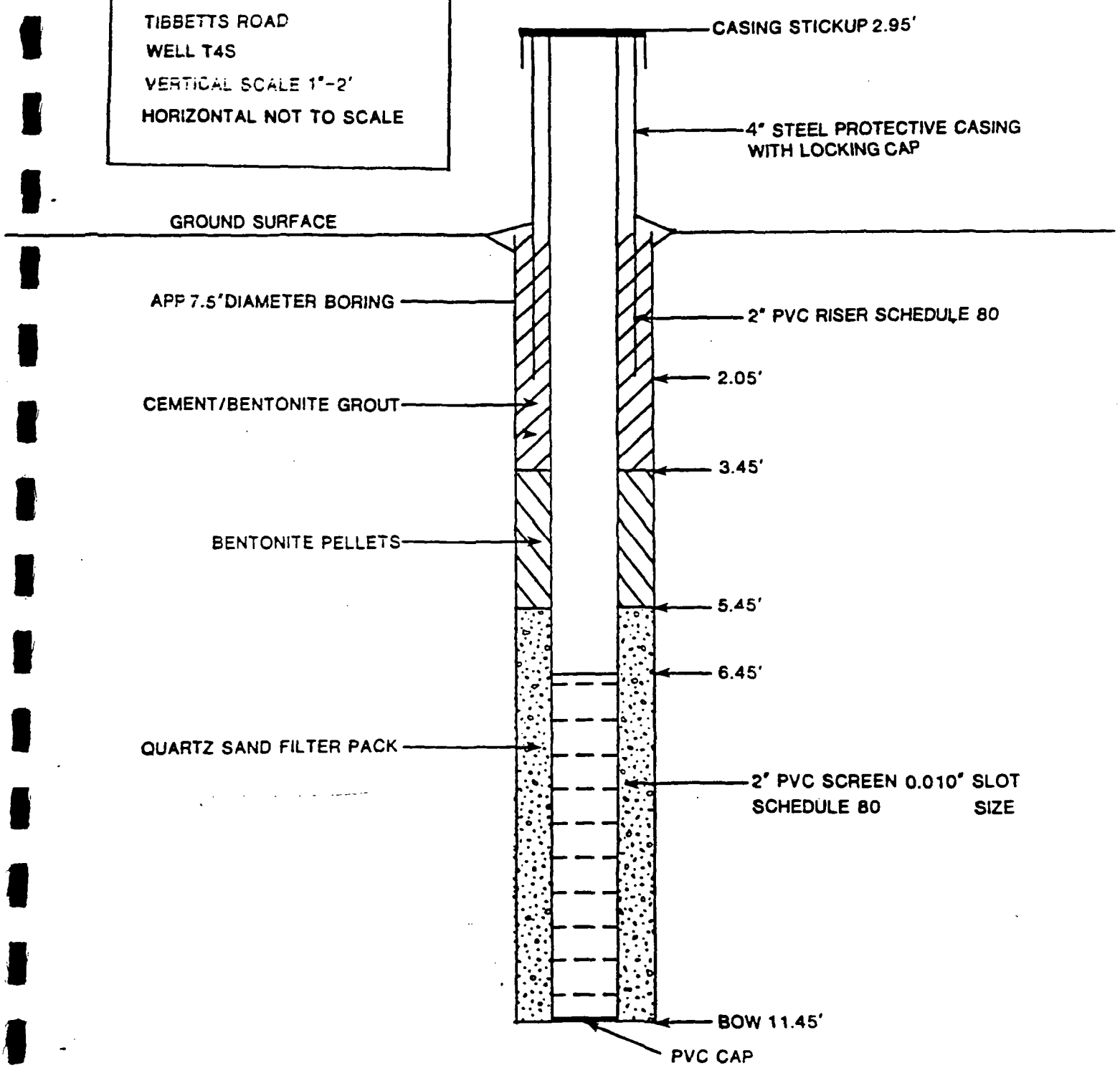
ENVIRESPONSE INC.

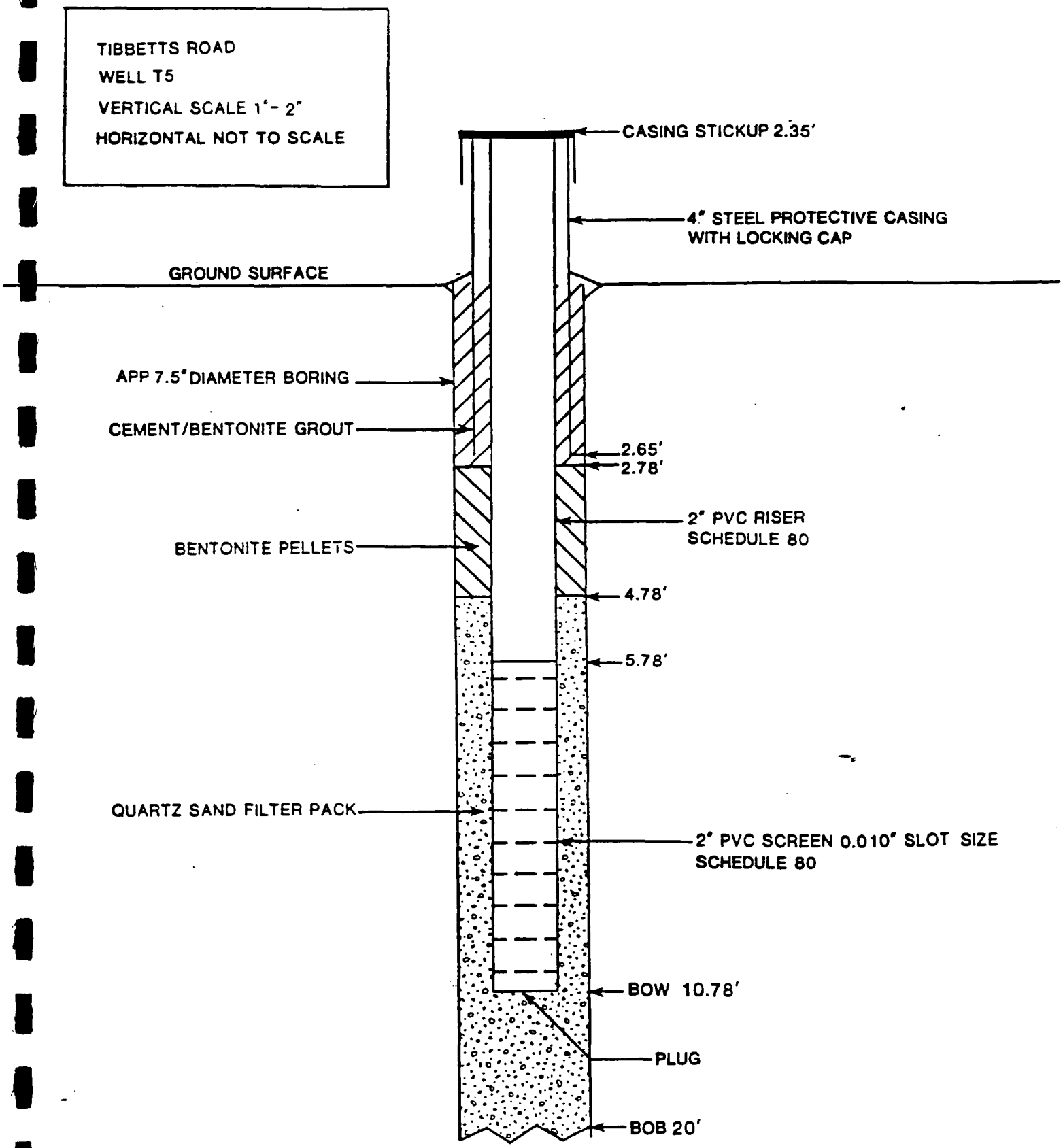
PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190102 / 36682190102 BORING: T-4S
T.O.C. ELEVATION: 327.71 msl GRND: 325.71 DATE: 9/18/85 - 9/19/85
FIELD GEOLOGIST: MIKE NICHOLAS

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR ROD (%)	SAMPLE REC./ SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
						(see boring T-4D)	

K (bail) = 15.0 gpd/ft² // 7.1 x 10⁻⁴ cm/sec c

REMARKS: Bottom of boring - 15ft. below ground surface.


TIBBETTS ROAD
WELL T4S
VERTICAL SCALE 1"-2'
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.95'
4" STEEL PROTECTIVE CASING WITH LOCKING CAP
GROUND SURFACE
APP 7.5'DIAMETER BORING
2" PVC RISER SCHEDULE 80
2.05'
CEMENT/BENTONITE GROUT
3.45'
BENTONITE PELLETS
5.45'
6.45'
QUARTZ SAND FILTER PACK
2" PVC SCREEN 0.010" SLOT SIZE SCHEDULE 80
BOW 11.45'
PVC CAP


TIBBETTS ROAD
WELL T5
VERTICAL SCALE 1"- 2'
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.35'
4" STEEL PROTECTIVE CASING WITH LOCKING CAP
GROUND SURFACE
APP 7.5" DIAMETER BORING
CEMENT/BENTONITE GROUT
2.65'
2.78'
2" PVC RISER SCHEDULE 80
BENTONITE PELLETS
4.78'
5.78'
QUARTZ SAND FILTER PACK
2" PVC SCREEN 0.010" SLOT SIZE SCHEDULE 80
BOW 10.78'
PLUG
BOB 20'

545

ENVIRESPONSE INC.

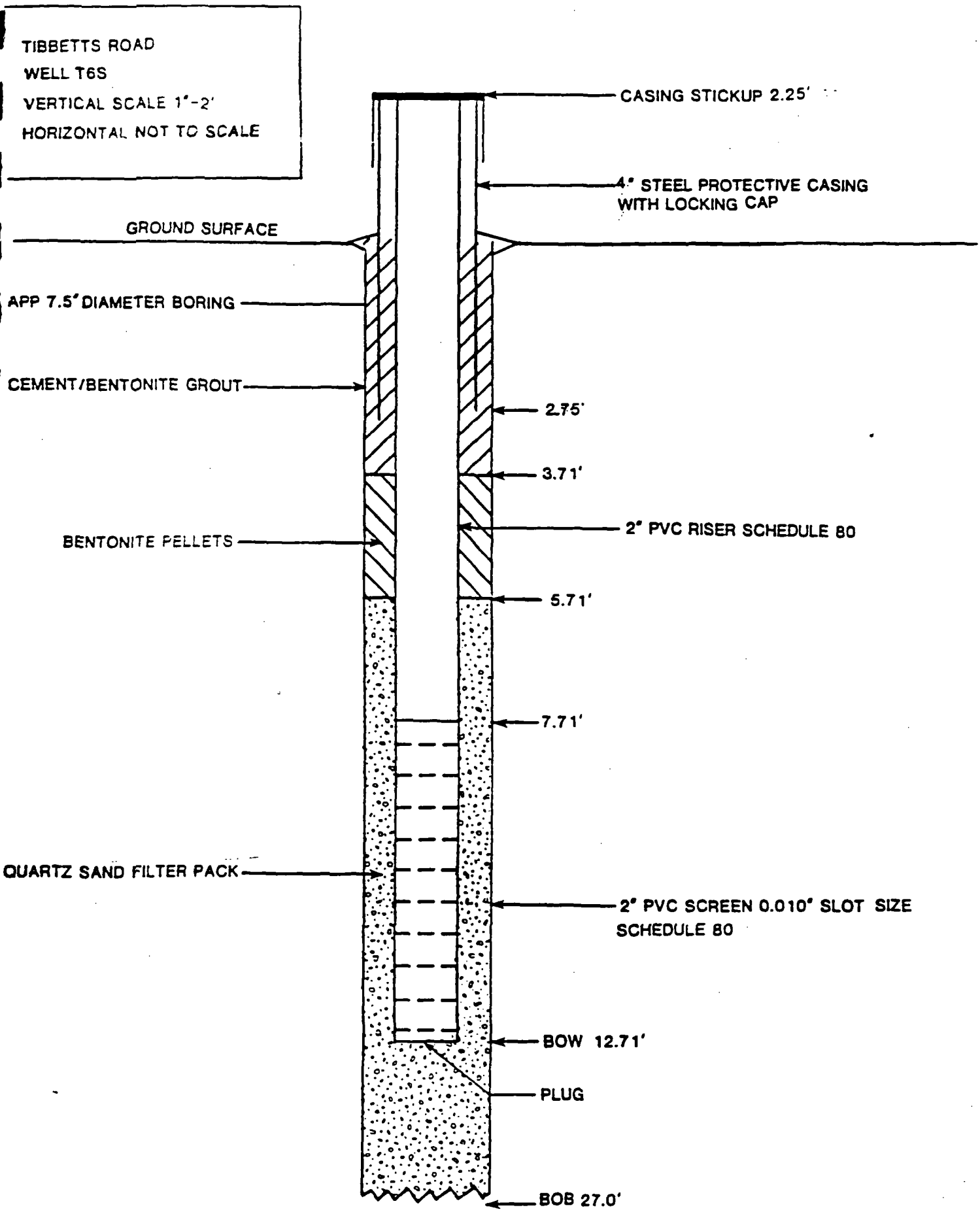
PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190102 / 36682190102 BORING: T-6S
T.O.C. ELEVATION: 330.29 msl GRND 328.19 DATE: 9/16/85
FIELD GEOLOGIST: PAUL KARMAZINSKI / MIKE NICHOLAS

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR ROD (%)	SAMPLE REC. / SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
S-1							
0.0-2.0	1/2/4/5	1.1ft/2.0ft	damp	loose	lt. brown	0.0ft-0.5ft root zone. sand, some silt, trace gravel and coarse sand. mottled and increasing silt content from 0.5ft-1.0ft. (SM)	7-13 ppm HNu
S-2							
5.0-7.0	14/22/20/23	1.7ft/2.0ft	damp	dense	lt. brown	fine grained sand, some silt and gravel, trace clay. mottled. (SM)	6-8 ppm HNu
S-3							
10.0-12.0	13/29/56/89	1.85ft/2.0ft	wet	very dense	brown to gray	sand and gravel, some silt and clay. color changes to gray in bottom 1.0ft of sample. (SM)	4.0 ppm HNu
						boulder @ 15.0ft - no sample attempt	
S-4							
15.0-18.0	18/56/68/85		moist	hard	gray	silt, fine grained sand, some clay and gravel. micaceous. (MH)	0.0 ppm HNu
S-5							
20.0-21.0	28/89/100/.0ft	1.0ft/1.0ft	moist	very dense	gray	sand, silt, increasing silt and clay content to the bottom of sample. micaceous. (SM)	0.2 ppm HNu
S-6							
25.0-27.0	42/62/76/89	2.0ft/2.0ft	damp	very dense	gray	sand and silt, trace gravel w/sand lenses throughout. (SM)	0.0 ppm HNu

$K(bail) = 18.6 gpd/ft^2 // 8.8 \times 10^{-4} cm/sec$

REMARKS: Bottom of boring - 27.0ft. below ground surface.

BORING: T-6S
PAGE: 1 OF 1


TIBBETTS ROAD
WELL T6S
VERTICAL SCALE 1"-2'
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.25'
4" STEEL PROTECTIVE CASING
WITH LOCKING CAP
GROUND SURFACE
APP 7.5" DIAMETER BORING
CEMENT/BENTONITE GROUT
2.75'
3.71'
BENTONITE PELLETS
2" PVC RISER SCHEDULE 80
5.71'
7.71'
QUARTZ SAND FILTER PACK
2" PVC SCREEN 0.010" SLOT SIZE
SCHEDULE 80
BOW 12.71'
PLUG
BOB 27.0'

425 TAYLOR ROAD
STOW, MASSACHUSETTS 01775
(617) 897-8737

55s

SOIL EXPLORATION CORPORATION

TEST BORINGS • GEOLOGICAL CONSULTING

OAK HILL PROFESSIONAL PARK
LONDONDERRY, N.H. 03053
(603) 627-3051

To O. H. Materials Co. Date 4/26/84 Job No. 84-101

Location Tibbets Rd., Barrington, N.H. Scale 1" = ft.

#DC D25 - E003 - 1780 - E9

Observation Well No. OW-1
Ground Surface

0'	* see below	0'	4
6"	Loose, moist, fine sand, trace inorganic silt, trace medium sand.	6"	3-3
		1'6"	
2'6"	Compact to very compact, moist to wet, fine sand, trace inorganic silt, trace medium sand.	2'6"	15-30-32
		4'	
		5'	23-33-36
		6'6"	
		7'6"	
		9'	12-21-29
10'	Very compact, wet, fine sand, trace coarse sand, trace inorganic silt.	10'	14-41-83
		11'6"	
		12'6"	40-69-62
		14'	
15'	Very compact, wet, fine to med. sand, some fine to med. gravel & inorganic silt, trace crushed rock.	15'	25-93-120/3"
		16'3"	120/0"
16'10"		16'10"	

Auger refusal at 16'10"
Water level 8'
upon completion.

Installed observation well point at 16'10"

*0"-6" Loose, moist, fine to med. sand, some organic silt, trace root matter.

Materials used:
10' - 2" threaded slotted PVC
20' - 2" threaded blank PVC
1 - Protective locking casing
1 - 2" threaded PVC end plug
1 - Bentonite, cement and sand seal

Standard Penetration Test - 140# hammer falling 30" - Blows are per 6" taken with 18" long x 2" O.D. x 1-3/8" I.D. Split Spoon Sampler unless otherwise noted.

Type of Boring - 2½" Casing ☐ 3½" Casing ☐ Hollow Stem Auger ☒ Solid Stem Auger ☐

Notes - Water levels indicated may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken. The following terms used in the soil descriptions are based on visual identification: Trace 0-10%, little or few 10-20%, Some 20-40%, and 40-50%.

425 TAYLOR ROAD
STOW, MASSACHUSETTS 01775
(617) 897-8737

565

SOIL EXPLORATION CORPORATION

TEST BORINGS • GEOLOGICAL CONSULTING

OAK HILL PROFESSIONAL PARK
LONDONDERRY, N.H. 03053
(603) 627-3051

To O. H. Materials Co. Date 4/26/84 Job No. 84-101

Location Tibbets Rd., Barrington, N.H. Scale 1" = _____ ft.

Observation Well No. OW-2
Ground Surface

0'

Augured to 17'6"
No samples required 0' - 17'6"

17'6" — 17'6"

Very compact, wet, fine to medium sand, some fine to med. gravel, little inorganic silt, trace crushed rock and clay.

40-86-120/3"

19'0"

20'0"

20'2" — 20'2" 120/2"

Auger refusal at 20'2"
120/0" 140# hammer.
Water level 4'6"
upon completion.

Standard Penetration Test - 140# hammer falling 30" - Blows are per 6" taken with 18" long x 2" O.D. x 1-3/8" I.D. Split Spoon Sampler unless otherwise noted.

Type of Boring - 2½" Casing ☐ 3½" Casing ☐ Hollow Stem Auger ☒ Solid Stem Auger ☐

Notes - Water levels indicated may very with seasonal fluctuation and the degree of soil saturation when the boring was taken. The following terms used in the soil descriptions are based on visual identification: Trace 0-10%, little or few 10-20%, Some 20-40%, and 40-50%.

425 TAYLOR ROAD
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SOIL EXPLORATION CORPORATION

TEST BORINGS • GEOLOGICAL CONSULTING

OAK HILL PROFESSIONAL PARK
LONDONDERRY, N.H. 03053
(603) 627-3051

To O. H. Materials Co. Date 4/27/84 Job No. 84-101

Location Tibbets Rd., Barrington, N.H. Scale 1" = _____ ft.

Observation Well No. OW-3
Ground Surface

0'	Very loose, moist, fine sand, little organic silt and root matter.	0'	1-1
1'		1'	
		1'6"	5
	Firm to hard, moist to wet, fine to medium sand, little fine to medium gravel, trace inorganic silt and cobbles.		
	(Additional samples taken from flight)		
15'	Very compact, wet, fine to medium sand, some inorganic silt, trace medium to coarse gravel, trace crushed rock and clay.		
	(additional samples taken from flight)	18'6"	72-120/0"
19'		19'	

Auger refusal at 19' 120/0"
140# hammer.
Water level 7'8"
upon completion.

Installed observation well point at 19'

Materials used:
10' - 2" threaded slotted PVC
10' - 2" threaded blank PVC
1 - Protective locking casing
1 - 2" threaded PVC end plug
1 - Bentonite, cement and sand seal

Standard Penetration Test - 140# hammer falling 30" - Blows are per 6" taken with 18" long x 2" O.D. x 1-3/8" I.D. Split Spoon Sampler unless otherwise noted.

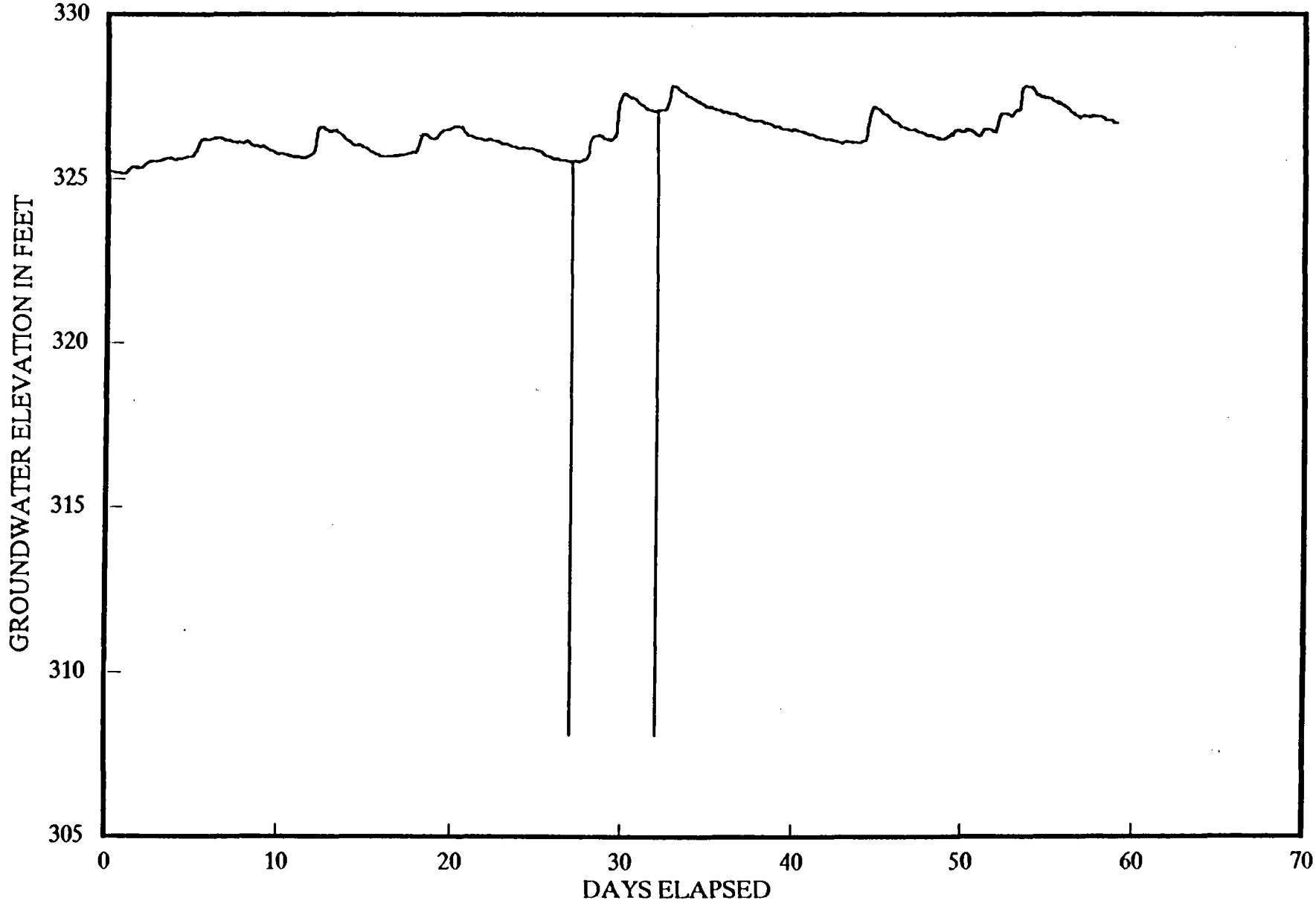
Type of Boring - 2½" Casing ☐ 3½" Casing ☐ Hollow Stem Auger ☒ Solid Stem Auger ☐

Notes - Water levels indicated may vary with seasonal fluctuation and the degree of soil saturation when the boring was taken. The following terms used in the soil descriptions are based on visual identification: Trace 0-10%, little or few 10-20%, Some 20-40%, and 40-50%.

Tibb. Rd.
HERMIT DATA

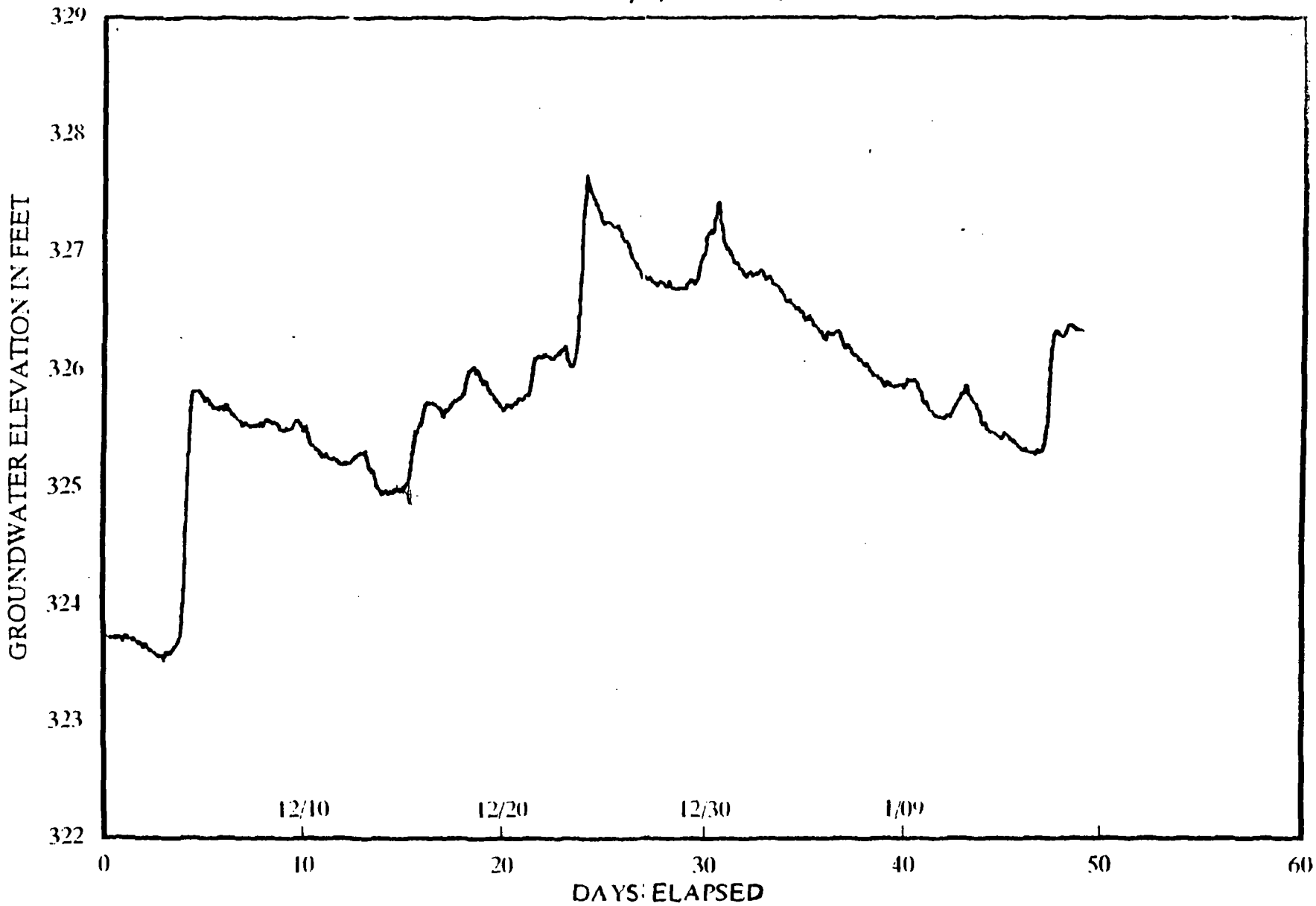
WELL 57S

2/02/91 TO 4/02/91



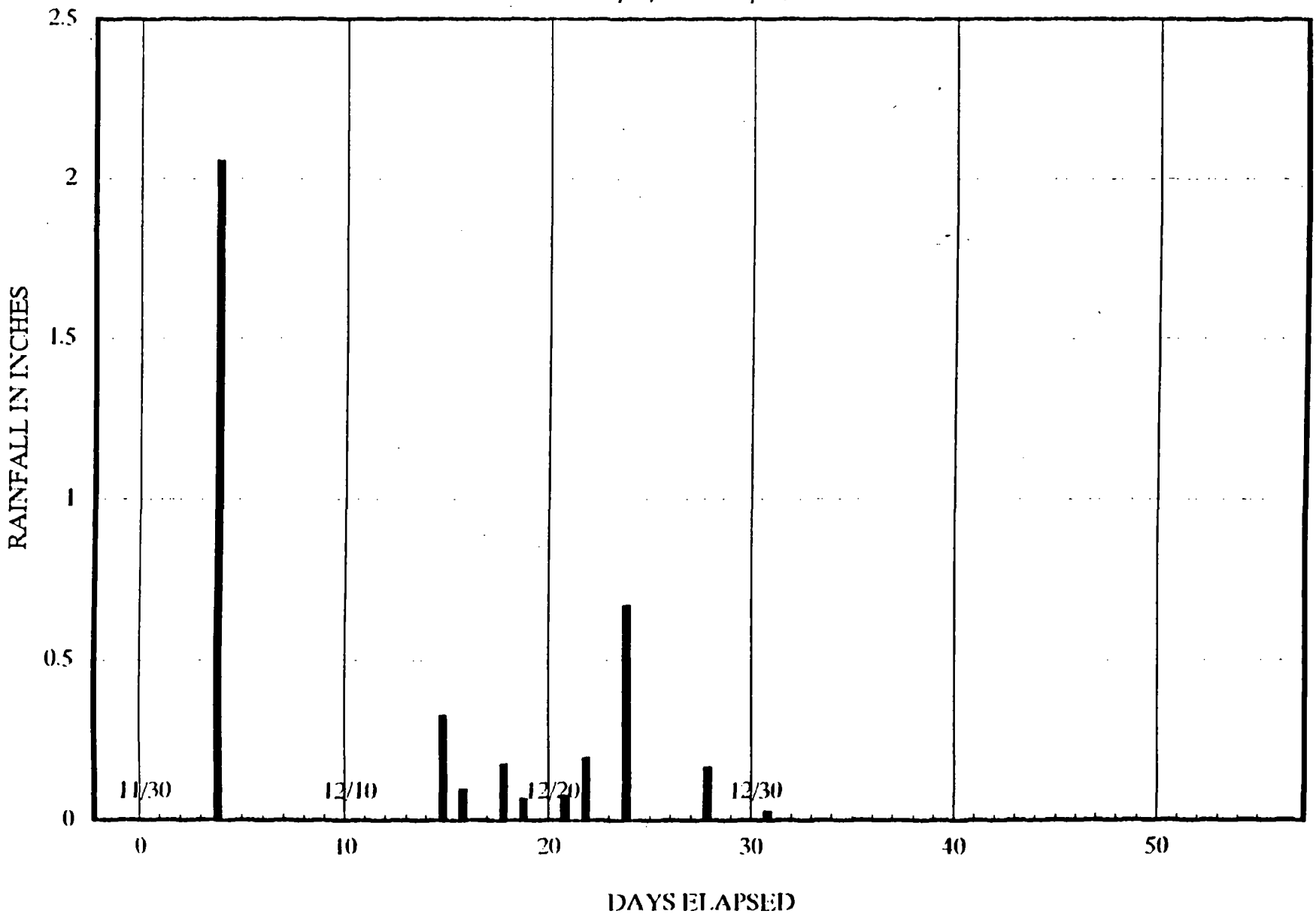
WELL 57S

11/30/90 TO 1/18/91



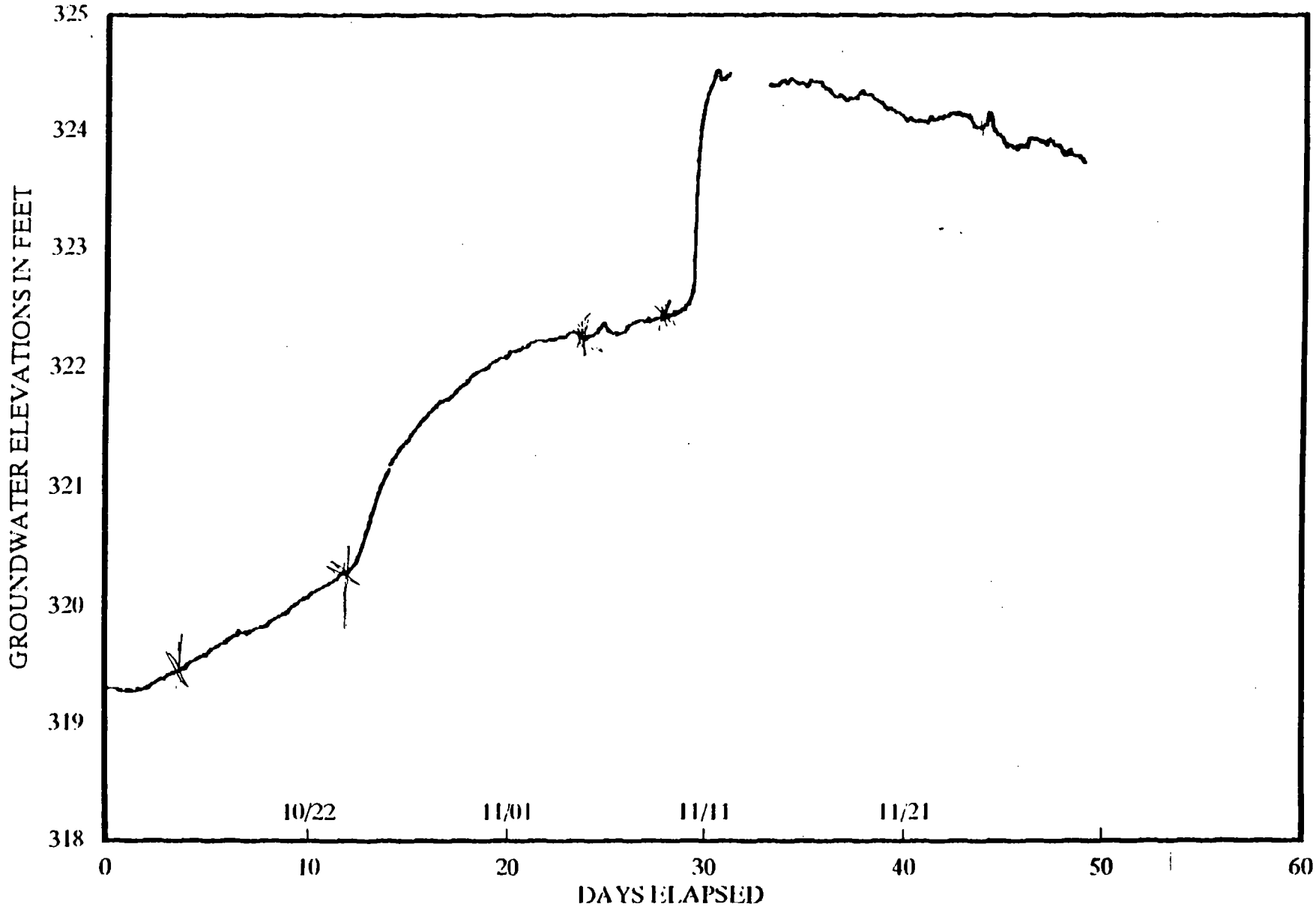
RAINFALL PER UNH (DURHAM, NH) STATION

11/30/90 TO 12/31/90



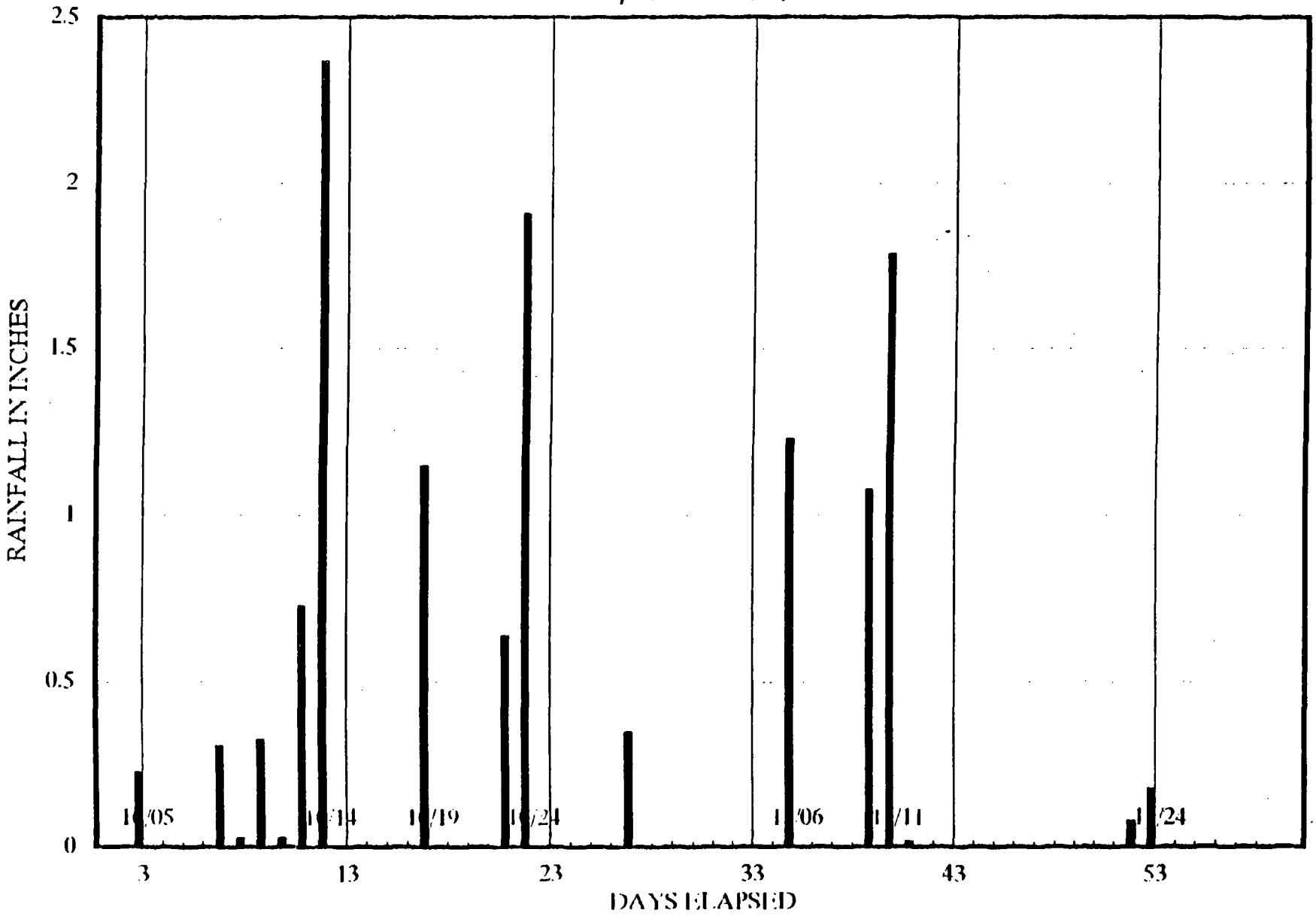
WELL 57S

10/12/90 TO 11/30/90



RAINFALL PER UNH (DURHAM, NH) STATION

10/03/90 TO 11/30/90



585

NHWS&PCC BORING LOG

SITE
Tibbetts Road Site
Barrington

Boring No: B - 15
Sheet: 1 of 2
Date: 7/10/84

Boring Company: Soils Engineering
Foreman: Myron Dominque
Geologist/Engineer: John Regan

Boring Location: Mr. Treadwell/Downing line along Tibbetts Rd.
Ground/Casing Elevation:
Starting Date: 7/10/84 Ending Date: 7/11/84

SAMPLER
Type Split Spoon 1 3/8 I.D.
Hammer Wt. 140 lbs
Fall 30 Inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/12/84	7.15'	T.O.C.	14:30

Hollow Stem Augur 3 3/8" I.D.

Depth	Casing Bl/ft	SAMPLE No	SAMPLE Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
		S-1	0-1'6"	18/11	4/3/8		5" topsoil dry brown f and m sand, some silt, trace gravel.	
5		S-2	5-6'6"	18/16	24/42/50		wet brown and grey f and m sand. some silt, trace gravel.	
10					15/79/50-3"			
		S-3	10-11'3"	15/11			moist brown and grey silt and f sand, some med sand, little gravel, iron staining present.	
15		S-4	15-15'9"	9/6"	98/81-3"		Same as above.	
20		S-5	19-19'7"	7"/5"	104/61-2"		moist dark gray very dense silt and clay w/ little fine sand, trace coarse sand. Hnu rding - background 2 ppn. @ hole 2 ppm	
25		S-6	24-24'10"	10"/9"	71/80-4"		Same as above.	
30		S-7	29'-30'	12"/2"	79/124		Same as above.	

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:
1. Started tricone roller bit inside augur with water @ 10', Hollow stem augur to 10'.
2. All samples after S-3 contained some wash sediment.

Hydr. Conduct from Grain Size b
Transitional till (15-16') 2.5×10^{-4} cm/sec 5.3 gal/day/ft²
basal tills (39-39.5') 6.5×10^{-7} cm/sec 0.014 gal/day/ft²

K from (bail) slug tests = 0.8 gpd/ft² / 3.6×10^{-5} cm/sec c

NHWS&PCC BORING LOG

SITE

Tibbetts Road Site

Barrington

Boring No: B - 1S

Sheet: 2 of: 2

Date: 7/10/84

Boring Company: Soils Engineering

Boring Location: Nr. Treadwell/Downing line along

Foreman: Myron Dominque

Ground/Casing Elevation: Tibbetts Rd.

Geologist/Engineer: John Regan

Starting Date: 7/10/84 Ending Date: 7/11/84

SAMPLER

Type Split Spoon 1 3/8 I.D.

Hammer Wt. 140 lbs.

Fall 30"

Groundwater Readings

Date	Depth to Water	Ref Pt.	Time/Stabilization

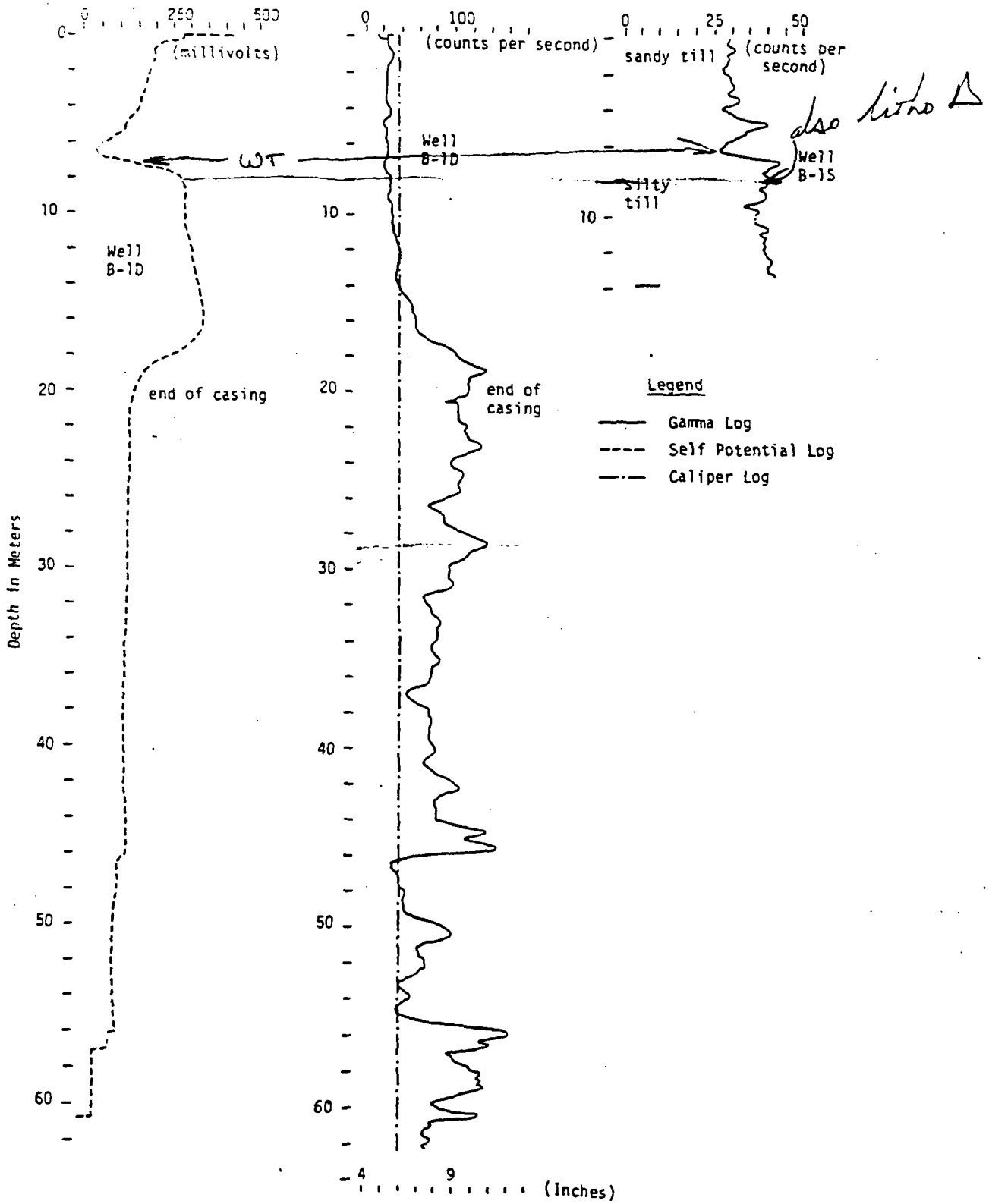
Depth	Casing Blows	SAMPLE No	SAMPLE Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
35		S-8	34-34'6"	6"/0	68/50-0"		No sample/wash	
40		S-9	39-39'5"	5"/5"	120-5"/50blows		Same as above.	
45		S-10	44-44'5"	5"/2"	20#/5"		Same as above.	
50		S-11	49-50	0/0			Sample all wash	
55								
60								

KEY:

Granular Bls/ft	Desc.	Cohesive Bls/ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	dense	8-15	stiff
>50	v. cense	15-30	v. stiff
		>30	hard

REMARKS:

1. 7/11/84 Advanced augur to 25'.
2. Hole collapsing @ 50'.
3. 40' of Sch 80 2" PVC screen, 0.010 slots. 9'6" of solid pipe threaded joints.
4. 3" Protective steel casing w locking cap set in cement.
5. 480 #lbs of sand, 40# of Cement.



BOREHOLE GEOPHYSICAL LOGS, WELLS 1S AND 1D,
TIBBETTS ROAD SITE, BARRINGTON

60S

NHWS&PCC BORING LOG

SITE

Barrington

Tibbetts Road Site

Boring No: B-2S

Sheet: 1 of: 2

Date: 7/5/84

Boring Company: Soils Engineering

Boring Location: #B-2S - S.W. corner @ Downing/Boucher boundary along Tibbetts Rd.

Foreman: Myron Dominque

Ground/Casing Elevation:

Geologist/Engineer: John Regan

Starting Date: 7/5/84 Ending Date: 7/9/84

SAMPLER

Type 2' Split Spoon - 1 3/8" I.D.

Hammer Wt. 140 lbs.

Fall 30 inches

Hollow Stem Augur 3 3/8" I.D.

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/9/84	4'9"	gr sfc	
7/10/84	6'1"	T.O.C.	

Depth	Casing Bl/ft	SAMPLE No	SAMPLE Depth	Pen/Recv	Blows/6"	LOG	Description	Construction
HNu rdings		S-1	0-2	24/15	1/9/19/33		Dry brown medium and fine sand, some gravel, little trace silt	
back-ground = 2 ppm								
5		S-2	5-6'3"	15/14	23/53/50-3"		moist gray, f & m sand some fine gravel, some silt, slight sweet odor	
10		S-3	10-11	12/12	79/204		moist brown and gray f - m sand, some gravel, some silt, slight sweet odor	
15		S-4	15-16	12/11	59/83"		same as above	
20		S-5	20-21	12/12	79/84		moist brown & gray f - m sand, some silt, some gravel	
25		S-6	25-26	12/12	83-106		moist gray silt and fine sand, little gravel, some iron staining, little clay	
30								

++ on Sp

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Began w/tricone roller bit @ 26' w/water recirculation, Hollow stem augur advanced to 25'.
2. HNU rdgs. of soil samples
   S-1 = 50 S-6 = 15 ppm
   S-2 = 120
   S-3 = 400
   S-4 = 20
   S-5 = less than 1 ppm

Hyd. Cond (K) from Grain size

basal Till (45-46') 8×10^{-7} cm/sec 0.017 gal/day/ft^2

b

NHWS&PCC BORING LOG

SITE

Tibbetts Road

Barrington

Boring No: B-25

Sheet: 2 of 2

Date: 7/6/84

Small excavated area near Downing/Boucher property line

Boring Company: Soil Engineering

Boring Location: B-25

Foreman: Myron Domingue

Ground/Casing Elevation:

Geologist/Engineer: John Regan

Starting Date: 7/5/84 Ending Date: 7/9/84

SAMPLER

Type SS 1 3/8" I.D.

Hammer Wt. 140 pounds

Fall 30 inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/9/84	4.9	T.O.C.	

SAMPLE

Depth	Casing Bl/ft	No.	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
		S-7	30-30'9"	9"/9"	96/104-3"		moist gray silt and clay, some f sand trace gravel	
35		S-8	35-36	12/7	69/101		same as above	
40		S-9	40-41	12/3*	78/240		moist dark gray silt and clay, some fine sand, little gravel	
45		S-10	45-46	12/6	49/104		same as above	
50		S-11	50-51	12/4	68/188		dark gray silt and clay, some fine sand, little fine gravel	
55							Refusal @ 52'4"	
60								

on R; splog, nothing - caliper log

on R, + on caliper

on caliper, + on R

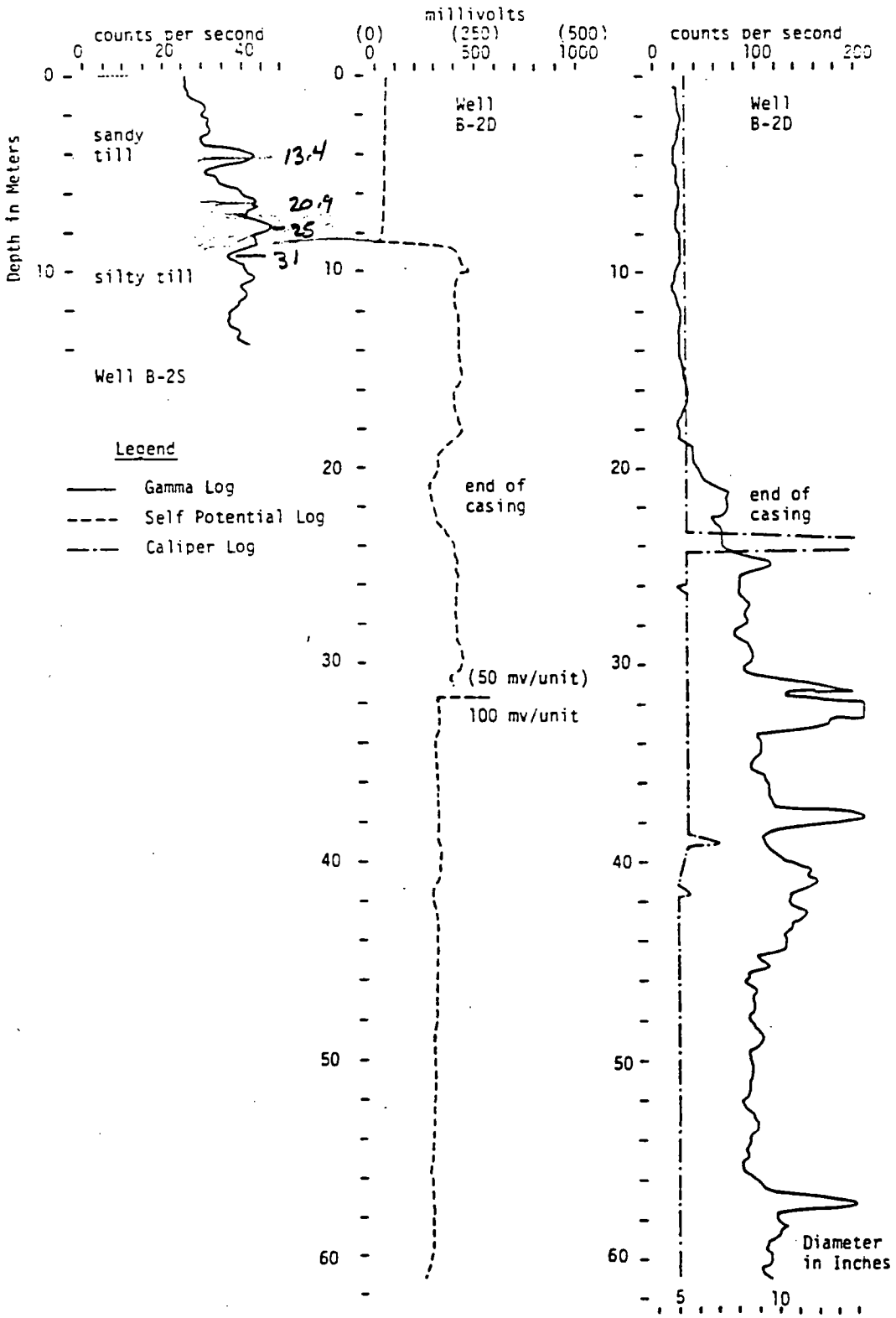
on R

KEY

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	cense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Hnu Rdings @ 30' soil 71 ppm background 3 ppm augur hole 110 ppm
2. Hnu Rdings 7/9/84 prior to start up -- background nr rig = 1ppm, in augur = 1ppm.
3. 50'-2" Sch. 80 PVC mfg. screen (0.01" slots, 4'3" riser pipe threaded joints)



BOREHOLE GEOPHYSICAL LOGS, WELLS 2S AND 2D,
TIBBETTS ROAD SITE, BARRINGTON

b

625

NHWS&PCC BORING LOG

SITE
Tibbetts Road
Barrington

Boring No: B-35
Sheet: 1 of: 3
Date: 7/12/84

Boring Company: Soils Engineering, Inc.
Foreman: Myron Dominque
Geologist/Engineer: John Regan
Boring Location: Field nr. Boucher/Downing property line.
Ground/Casing Elevation:
Starting Date: 7/12/84 Ending Date: 7/13/84

SAMPLER
Type Split Spoon 1 3/8" I.D.
Hammer Wt. 140 lbs.
Fall 30 Inches

4:30 Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/16/84	5' 11"	T.O.C.	10:30

Hollow Stem Augur 3 3/8 I.D.

Depth	Casing Bl./ft.	SAMPLE No	SAMPLE Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
		S-1	0-2'	2#/11	12/14/20		5" organic topsoil	
					12		Moist, brown f-m sand, little silt, trace coarse sand	
5								
++ on Sp →		S-2	5-7	24/19	26/46/34		Same as above.	
					40			
10		S-3	10-11'6"	18/12	11/54/99		Moist, brown m sand, some fine sand, trace coarse sand.(dark gray lense of fine sand @ 11')	
15		S-4	15-16	12/11	54/128		Moist, brown m sand, some f & c sand, little silt, silt & m-c sand bands (2mm).	
+ on SP								
20		S-5	20'6"-22	18"/9"	68/88/104		Moist dark gray silt and clay, some f-m sand, trace gravel cemented in matrix.	
25		S-6	24-25'6"	18/17	28/58/114		Same as above.	
30								

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v dense	15-30	v. stiff
		>30	hard

REMARKS:
1. Hollow stem augur to 20'.
2. Started w/tricone roller inside augur, with clear water @ 10'.
3. Soil samples S-4 and after all contained varying amounts of wash sediments.

Hydra. Cond (K) from Grain Size b
upper till (5-7') 1.2×10^{-3} cm/sec 25.4 gal/day/ft^2

K from slug (bail) test = 3.0 gpd/ft^2 = 1.4×10^{-4} cm/sec c

NHWS&PCC BORING LOG

SITE
Tibbetts Road
Barrington, NH

Boring No: B-3S
Sheet 2 of 3
Date: 7/12/84

Boring Company: Soils Engineering, Inc. Boring Location: Field near Boucher/Downing property line.
Foreman: Myron Dominoue Ground/Casing Elevation:
Geologist/Engineer: John Regan Starting Date: 7/12/84 Ending Date:

SAMPLER
Type Split Spoon 1 3/8" I.D.
Hammer Wt. 140 lbs.
Fall 30 Inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

Depth	Casing Bl/ft	SAMPLE No	SAMPLE Depth	SAMPLE Pen/Rcvy	SAMPLE Blows/6"	LOG	Description	Construction
35		S-7	34-35'	12/4"	60/139		Moist dark/gray silt and clay, some f sand, trace coarse sand and fine gravel (very compact matrix).	
40								
45		S-8	44-45'8"	15/7	51/104/101		Same as above.	
50								
55		S-9	54-55'6"	18"/0	48/199/114		Recovered wash (lost remainder of sample).	
		S-9	54-55'6"	18"/3"	88/104/128			
60								

KEY

Granular Bls/ft	Granular Desc.	Cohesive Bls./ft	Cohesive Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS

on cal.
on cal., #on r
on cal

NRWS&PCC BORING LOG

SITE
Tibbetts Road
Barrington

Boring No: B-3S
Sheet: 3 of 3
Date: 7/13/84

Boring Company: Soils Engineering, Inc.
Boring Location: Field Near Boucher/Downing Line
Foreman: Myron Dominque
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: 7/12/84 Ending Date: 7/13/84

SAMPLER
Type Split Spoon 1 3/8"
Hammer Wt. 140 lbs.
Fall 30 Inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

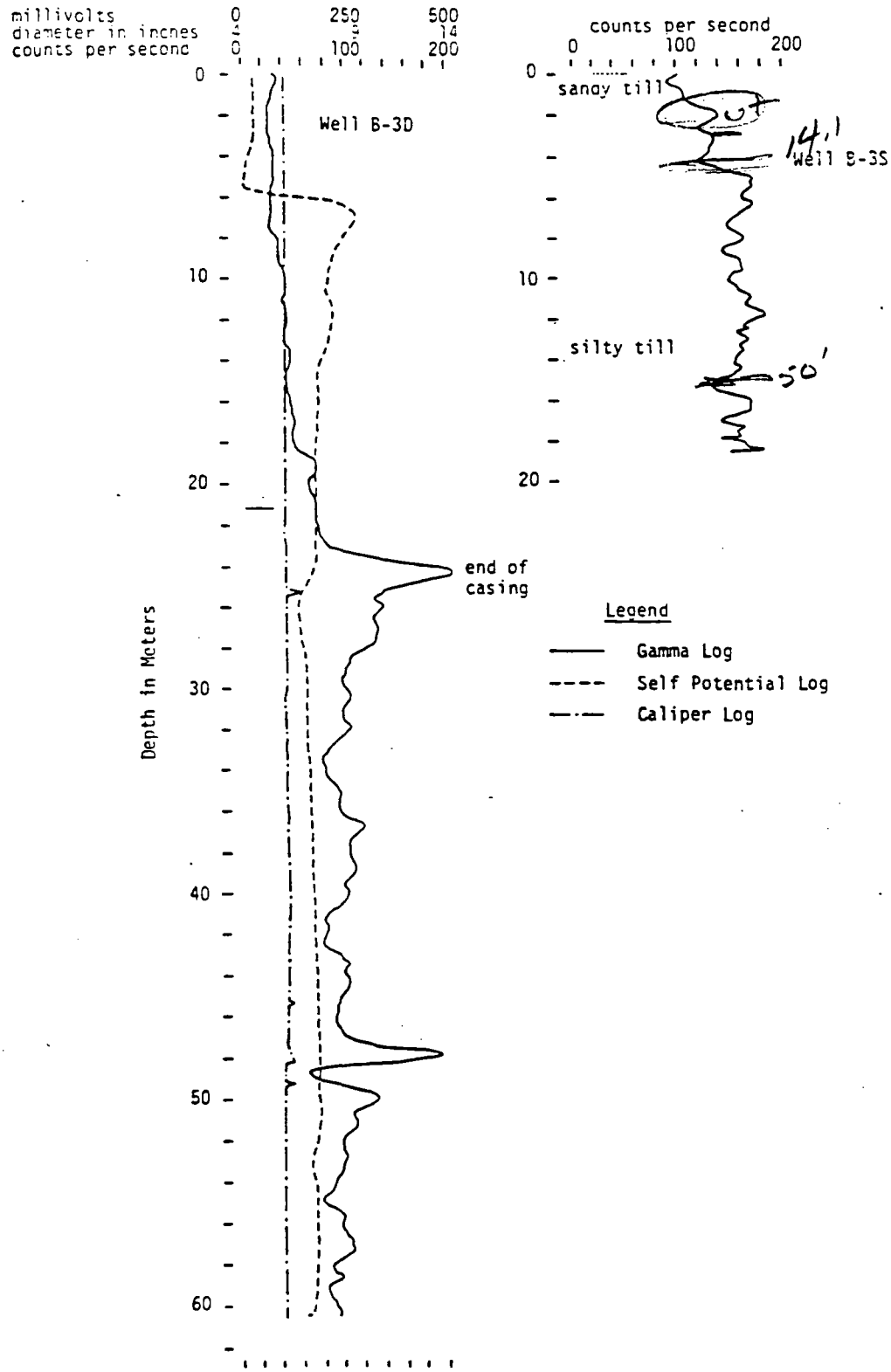
SAMPLE

Depth	Casing Bl/ft	No	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
65							Refusal @ 65'	
70								

KEY:

Granular		Cohesive	
Bls/ft	Desc.	Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v dense	15-30	v. stiff
		>30	hard

REMARKS:
1. Tricone roller bit ground for 10 min. @ 65' with no penetration.
2. 60' Sch 80 PVC slotbed screen (.010 slots).
3. 5' Sch 80 PVC riser.
4. 500 lbs. of silica sand, to 1' from gr sfc.
5. 40 lbs. of concrete.



BOREHOLE GEOPHYSICAL LOGS, WELLS 3D AND 3S,
TIBBETTS ROAD SITE, BARRINGTON

b

64S

NHWS&PCC BORING LOG

SITE

Tibbetts Road Site
Barrington

Boring No: B-4S
Sheet: 1 of: 3
Date: 7/31/84

B-4S

Boring Company: Soils Engineering, Inc. Boring Location: Corner of Downing/Couture Line
Foreman: Myron Domincue Ground/Casing Elevation:
Geologist/Engineer: John Regan Starting Date: 7/31/84 Ending Date:

SAMPLER
Type Split Spoon 1 3/8" I.D.
Hammer Wt. 140 lbs.
Fall 30 Inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
			9:00

SAMPLE Hollow Stem Augur 3 3/8" I.D.

Depth	Casing Bl./ft.	No	Depth	Pen/Recv	Blows/6"	LOG	Description	Construction
HNu Backgr. = 1 ppm		S-1	0-2'	24/12	5/6/9/22		6" loose organic topsoil, dry lt. brown f-m sand, some silt, trace f gravel	
5		S-2	5-6'6"	18/15	25/55/51		moist, lt. br. f-m sand, some silt, trace f gravel	
10		S-3	10-10'5"	5"/5"	75-5" stone encounter		Note: lost spoon, offset 4' and augured to 10' depth, wet lt. brown and gray silt and fine sand, little c sand, little f gravel	
15		S-4	15-15'9"	9"/9"	58/68-3"		wet firm sand, some silt, little f gravel	
20		S-5	20-20'9"	9"/7"	84/106-3"		moist brown gray f sand, some silt, little f gravel, moist dark gray silt, some f sand, little clay and m-c sand	
25		S-6	25-25'9"	9"/	91/142-3"		moist dark gray silt, some clay, little m-c sand, little f gravel	
30								

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:
1. Advanced 4" solid stem augur to 20'.
2. HNu rdg. in rock well spoils = 15-17 ppm from B-4D.
3. Advanced HSA 3 3/8" to 18' and began w/tricone roller bit w/recirc. water.
4. Soil Samples from S-5 and deeper contained varying amounts of wash sediment.

NHWS&PCC BORING LOG

SITE

Tibbetts Road Site

Barrington

Boring No: B-4S

Sheet 2 of 3

Date: 7/31/84

Boring Company: Soils Engineering, Inc. Boring Location: Corner of Downing/Couture Line

Foreman: Myron Dominque Ground/Casing Elevation:

Geologist/Engineer: John Regan Starting Date: 7/31/84 Ending Date:

SAMPLER

Type Split Spoon 1 3/8" I.D.

Hammer Wt. 140 lbs.

Fall 30 inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

Depth	Casing Bl/ft	SAMPLE No	SAMPLE Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
30		S-7	30-30'6"	6"/3"	183/6"		same as above	
HNu = 22 @ soil sample jar								
35								
HNu = 22 ppm soil sample jar		S-8	35-36	12"/12"	79/135		same as above several (3-4) layers of f sand between silt matrix	
40								
HNu = 2 ppm soil sample jar		S-9	40-41'3"	15"/14"	64/91/66		same as above 7/13/84 · 8/1/84	
45								
HNu = 4.5 ppm soil sample jar		S-10	45-46'6"	18/13	62/62/81		moist dark gray silt, some clay, little f sand, trace f gravel, trace c sand	
50		S-11	50-51'0"	12"/0"	74/226		no recovery, all wash	
HNu Bkgd. = 6.0 ppm soil jar = 20.0 ppm		S-11	55-56'1"	13"/9"	93/143/50		same as above	
60								

KEY:

Granular Bls/ft	Granular Desc.	Cohesive Bls./ft	Cohesive Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v dense	15-30	v. stiff
		>30	hard

REMARKS:

1. HNu @ 37' @ augur I.D. = 2 ppm
   wash water @ 39' in soil sample jar = 5 ppm.

NHWS&PCC BORING LOG

SITE

Tibbetts Road Site

Barrington

Boring No: B-4S

Sheet: 3 of 3

Date: 8/1/84

Boring Company: Soils Engineering

Boring Location: Couture Downing Line

Foreman: Myron Dominque

Ground/Casing Elevation:

Geologist/Engineer: John Regan

Starting Date: 7/31/84 Ending Date: 8/1/84

SAMPLER

Type Split Spoon

Hammer Wt. 140 lbs.

Fall 30 Inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

SAMPLE

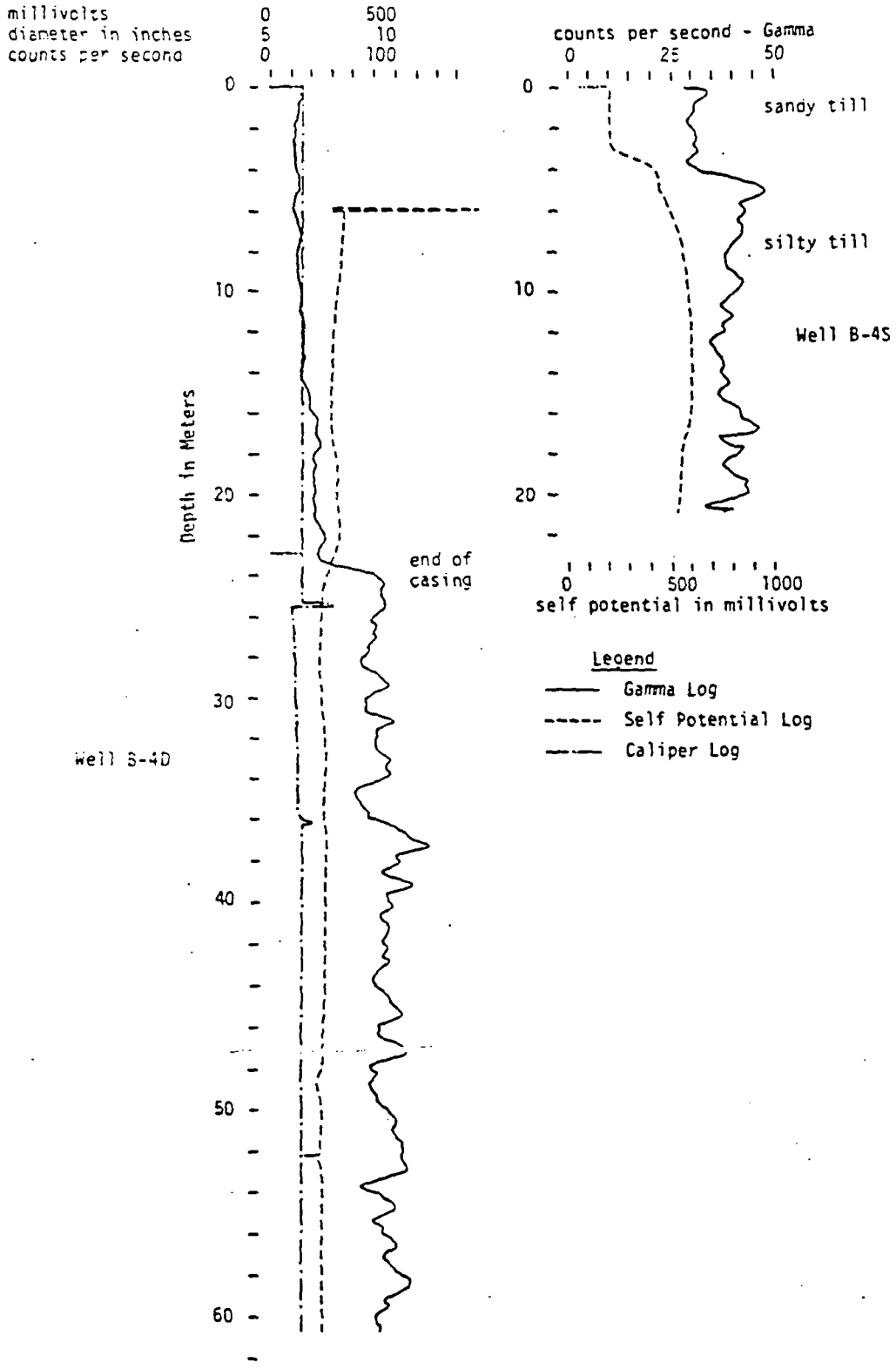
Depth	Casing Bl/ft.	No.	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
HNu Bckgrd Soil Sample Jar = 30 65 ppm		S-12	60-61'3"	15/2"	68/143/50-3"		moist dark gray silt, some clay, little f-m sand, trace c sand, trace f gravel	
HNu 70 Bckgrd = 6 Soil Sample= 20 ppm		S-13	70-70'3"	3/3	127/3"		same as above	
75							-----refusal @ 75'----------	
80								
85								
90								

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v.loose	<2	v.soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v.dense	15-30	v. stiff
		>30	hard

REMARKS

1. Noted dark gray film on wash water.
2. Muscovile and biotite flakes noted in wash water @ 75'.
3. 60' 2" Sch 80 PVC mfg. screen (0.010 slots), 16' 2" Sch 80 solid riser PVC threaded joints, 3" steel protective casing, cement seal.



BOREHOLE GEOPHYSICAL LOGS, WELLS 4D AND 4S,
TIBBETTS ROAD SITE, BARRINGTON

685

NHWS&PCC BORING LOG

SITE

Tibbetts Road Site
Barrington

Boring No: B-6S
Sheet: 1 of 2
Date: 7/30/84

Boring Company: Soils Engineering, Inc.
Boring Location: Couture Horse Pasture 20' from B-6D B-6S
Foreman: Myron Dominque
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: 7/30/84 Ending Date: 7/31/84 8:30

SAMPLER
Type No sampling
Hammer Wt. sec B-6D
Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

SAMPLE 3 3/8" I.D. Hollow Stem Augur

Depth	Casing Blows/ft.	No.	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
						See B-6D log	See B-6D for description	
5								
HNu=0.5								
10								
15								
HNu = 8 ppm								
20							- gray film on soil water noted	
7 ppm								
4 ppm 25							@ 25 = 4 ppm	
7 ppm							boulder - 25'-26'	
30								

KEY

Granular		Cohesive	
Bls/ft	Desc.	Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS

1. Augur Flite soil samples
   @ 17' @27'
   @ 24'
2. No samples taken, see B-6D for subsurface conditions.

NHWS&PCC BORING LOG

SITE

Tibbetts Road

Barrington

Boring No: B-6S

Sheet: 2 of: 2

Date: 7/30/84

Boring Company: Soils Engineering

Boring Location: Couture Horse Pasture

Foreman: Myron Dominque

Ground/Casing Elevation:

Geologist/Engineer: John Regan

Starting Date: 7/30/84 Ending Date: 7/31/84

SAMPLER

Type N/A

Hammer Wt.

Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

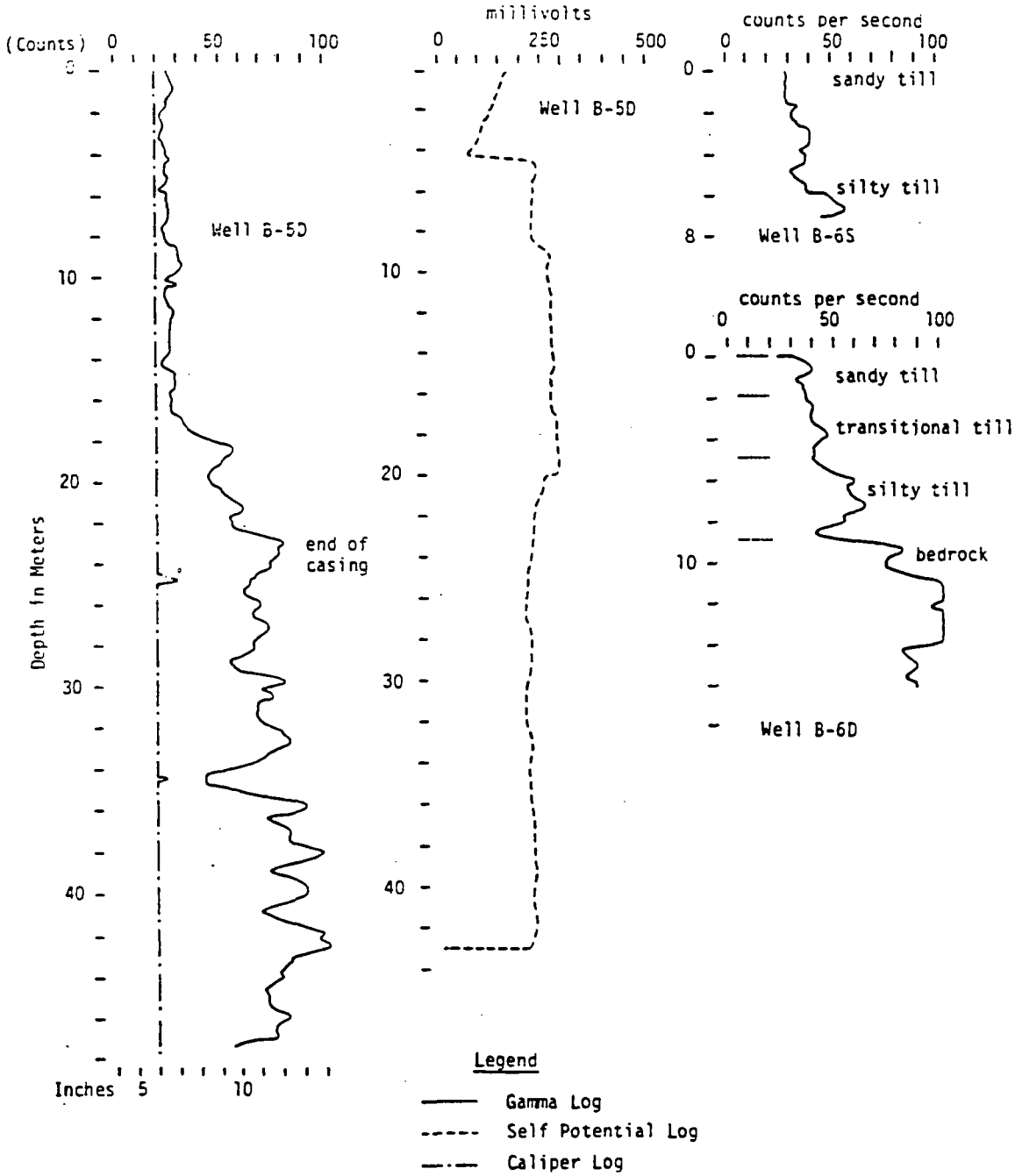
Depth	Casing Bl/ft	SAMPLE No	SAMPLE Depth	SAMPLE Pen/Rcvy	SAMPLE Blows/6"	LOG	Description	Construction
						refusal	HNu rdg @ 31' = 19 ppm refusal @ 31'	
35	5							
							30' screen 280 lbs. of silica sand 80 lbs. of cement 5 lbs. of bentonite 1-3" protective casing 1 - lock	

KEY:

Granular Bls/ft	Granular Desc.	Cohesive Bls./ft	Cohesive Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Advanced 4" solid - stem augur to 31'.
2. Advanced 3 3/8" I.D. H.S.A. to 15'.
3. Tricone roller bit w/water recirc. from 15' to 31'.
4. 30' of 2" PVC Sch. 80 mfg. screen, cement/bentonite sfc seal, 3" steel protective casing w/locking cap.



b

BOREHOLE GEOPHYSICAL LOGS, WELLS 5D, 6S, 6D,
TIBBETTS ROAD SITE, BARRINGTON

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 327.5

Date Drilled 4/1/91 Well No. 70S Boring Co. LaFramboise Top of Casing 329.66 Top of Riser 329.29 Screen Length 5 ft

Total Depth 25 ft Boring Method Used HSA/SS Piezometer Casing Size & Type 2" PVC, Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nμ Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
					HNμ	5" Top Soil		LPP, Cement Seal
5	S-1	9-18 20-21	5-7'	24" 18"	0 ppm	Dense		Bentonite 4' - 6'
7 10	S-2	109-96 48-56	10-12'	24" 15"	40 ppm	Brown Fine Sand and Silt with Gravel.		00 Sand 6'-14'
12 15	S-3	32-56 76-133	15-17'	24" 24"	70 ppm		13'	2" PVC Riser 2 ft A.G. to 8 ft
17 20	S-4	32-60 105 for 3"	20-21'3"	15" 15"	180 ppm	Very Dense Gray Silt with Diagonally Bedded <1/16" Fine Sand Lenses.		0.010 Slot Screen 8'-13'
22 25	S-5	>200/0"	0	0"	--			Sand/ Bentonite Layers 14'-26'
						-Refusal	26'	

Remarks: Developed 4/9/91. All elevations shown are ft. MSL.
Rising Head Test Conducted 4/4/91.
S-1 is from a location 3 ft distant from final location of 70S. Auger refusal at S-1 location was at 9 ft.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

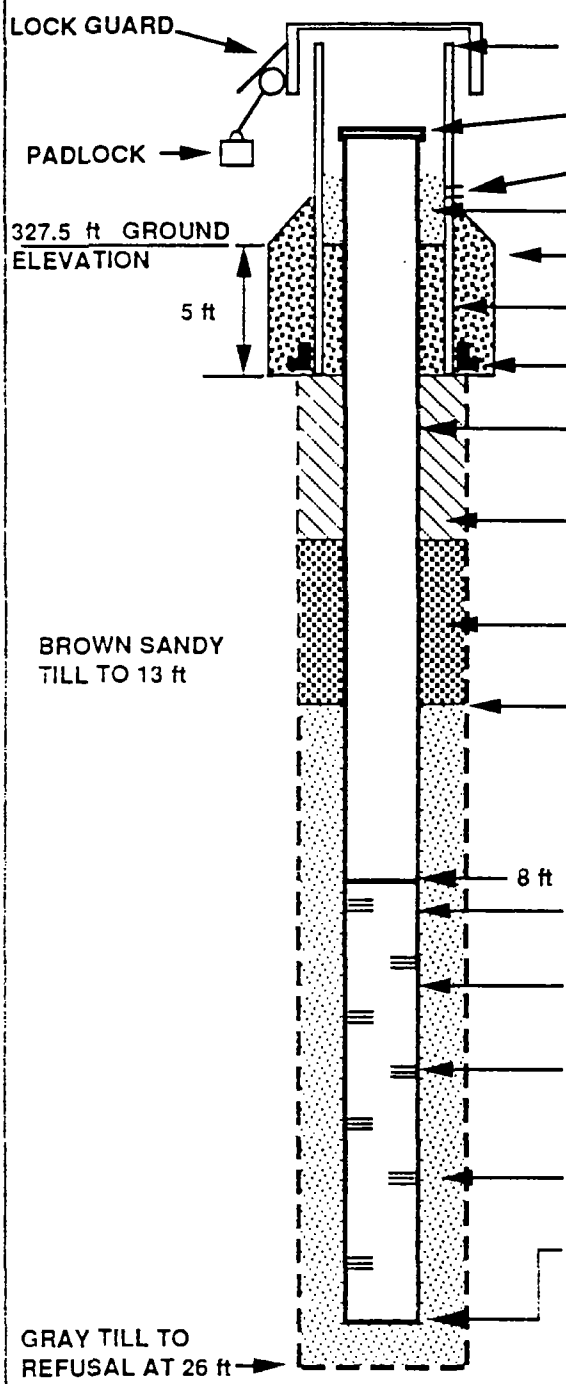
WELL: 70 S

LOCATION: Johnson Residence
Tibbetts Road

INSTALLED: 4/1/91

DEVELOPED: 4/9/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF MEASURING POINT OF PROTECTIVE CASING	329.66 ft
ELEVATION OF MEASURING POINT OF TOP OF RISER	329.29 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 in DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 in
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
8 ft (Elev. 319.5 ft)	PVC, SAW-CUT SLOTS 5 ft LENGTH
TYPE OF POINT OR SCREEN	
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 in
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 in PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
13 ft (Elev. 314.5 ft)	
BACKFILL BETWEEN BOTTOM OF SCREEN AND BOTTOM OF BOREHOLE	00 SAND 13 TO 26 ft

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 329.6

Date Drilled 4/2/91 Well No. 71S Boring Co. LaFramboise Top of Casing 331.60 Top of Riser 331.34 Screen Length 5 ft

Total Depth 20 ft Boring Method Used HSA/SS Piezometer Casing Size & Type 2" PVC Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
								LPP, in 4' Cement
5	S-1	17-30 37-21	5-7'	24" / 18"	NR			2' PVC Riser in 2' AG to 12'
7 10	S-2	17-38 55-134	10-12'	24" / 21"	NR	Dense Brown Fine-Medium Sand, Some Pebbles, Little Silt, Trace Gravel.		Bentonite 8'-10' 00 Sand 10'-20'
12 15	S-3	24-42 56-60	15-17'	24" / 21"	0 ppm	(Till)		.010 Slot Screen 12'-17'
17 20	S-4	100# for 1"	20-20'1"	1" / 0"	NA	Refusal	20'	
22						Gray till in tip of spoon at 20'		

Remarks: Developed 4/4/91. All elevations shown are ft. MSL.
Rising Head Test Conducted 4/5/91.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

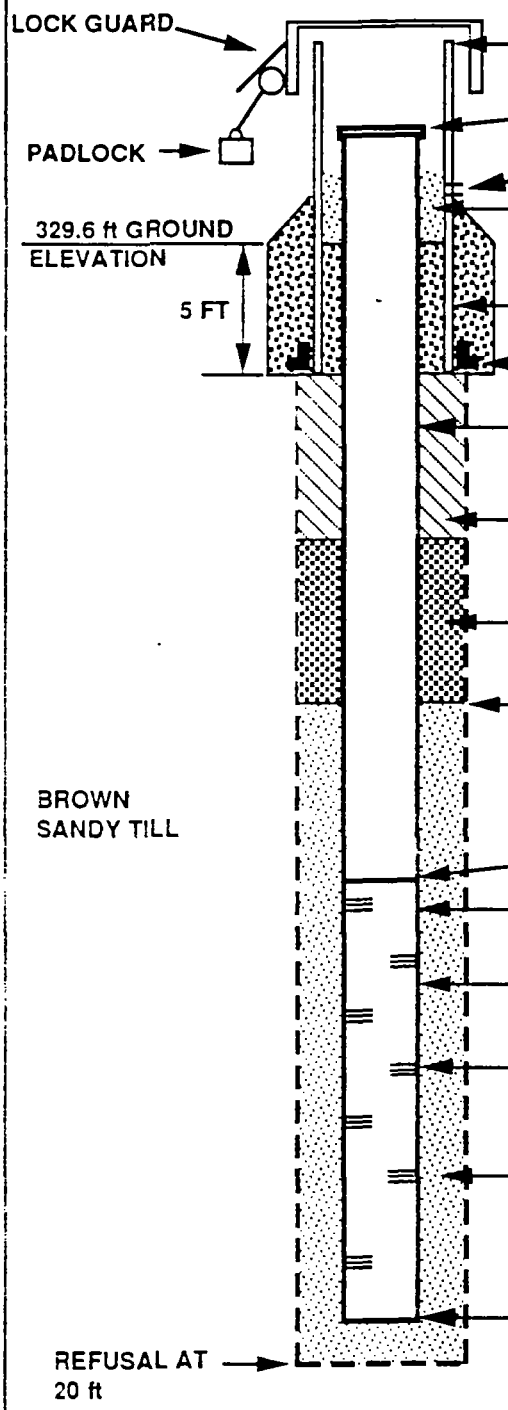
WELL: 71 S

LOCATION: Johnson Residence
Tibbetts Road

INSTALLED: 4/2/91

DEVELOPED: 4/4/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF MEASURING POINT OF PROTECTIVE CASING	331.60 ft
ELEVATION OF MEASURING POINT OF TOP OF RISER	331.34 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 in DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 in
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
12 ft (Elev. 317.6 ft)	
TYPE OF POINT OR SCREEN	PVC, SAW-CUT SLOTS 5 ft LENGTH
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 in
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 in PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
17 ft (Elev. 312.6 ft)	
DISTANCE BETWEEN BOTTOM OF SCREEN AND BOTTOM OF BOREHOLE	3 ft- backfilled with sand

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 328.5

Date Drilled 4/2/91 Well No. 72S Boring Co. LaFramboise Top of Casing 330.75 Top of Riser 330.55 Screen Length 5 ft

Total Depth 12-1/2 ft Boring Method Used HSA/SS Piezometer Casing Size & Type 2" PVC Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" (140 lbs.)	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
						1' Surficial Brown Sand Fill		LPP in 4' Cement
5	S-1	11-20 23-26	5-7'	24" / 14"	NR	Tan Fine-Medium Sand Trace/Little Silt, Trace Gravel, Gray Medium Sand Lens @ 7 ft		2" Riser in Grout to 4'
10	S-2	21-42 56-45	10-10'8"	24" / 8"	NR			
						-Refusal-	12½'	Bentonite 4' - 5'
								00 Sand 5-12½
								.010 Slot Screen 7½ - 12½

Remarks: Developed 4/4/91. All elevations shown are ft. MSL.
Rising Head Test Conducted 4/8/91.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

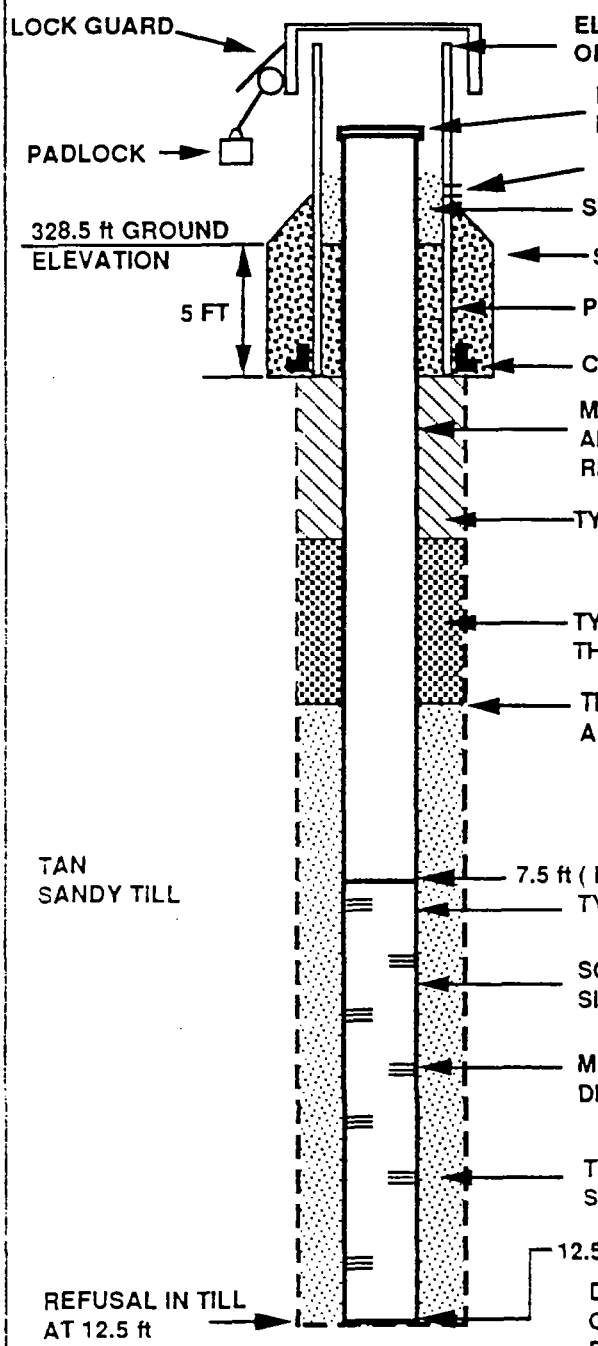
WELL: 72 S

LOCATION: Johnson Residence
Hall Road

INSTALLED: 4/2/91

DEVELOPED: 4/4/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF MEASURING POINT OF PROTECTIVE CASING	330.75 ft
ELEVATION OF MEASURING POINT OF TOP OF RISER	330.55 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 in DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 in
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 1 ft
THICKNESS OF BACKFILL ABOVE SCREEN	2.5 ft
7.5 ft (Elev. 321.0 ft) TYPE OF POINT OR SCREEN	PVC, SAW-CUT SLOTS 5 ft LENGTH
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 in
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 in PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
12.5 ft (Elev. 316.0 ft) DISTANCE BETWEEN BOTTOM OF SCREEN AND BOTTOM OF BOREHOLE	NONE

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 328

Date Drilled 4/2/91 Well No. 73S Boring Co. LaFramboise Top of Casing 330.30 Top of Riser 330.03 Screen Length 5 ft

Total Depth 20 ft Boring Method Used HSA/SS Piezometer Casing Size & Type 2" PVC, Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nμ Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
					HNμ			LPP, Cement Seal
5	S-1	47-100 68-49	5-7 ft	24" / 11"	2 ppm	Brown/Tan Fine Sand with Medium Sand, Some Pebbles, Little/Trace Silt		2' PVC Riser in Bentonite Grout
10	S-2	24-34 36-62	10-12 ft	24" / 24"	0 ppm			Bentonite 8'-10'
15	S-3	17-37 49-72	15-17 ft	24" / 24"	0 ppm			00 Sand Pack 10'-20'
20	S-4	>200/0"	0 ft	0" / 0"	0 ppm			.010 Slot Screen 13½'-18½'
						Refusal	20'	

Remarks: Developed 4/5/91. All elevations shown are ft. MSL.
Rising Head Test Conducted 4/5/91.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

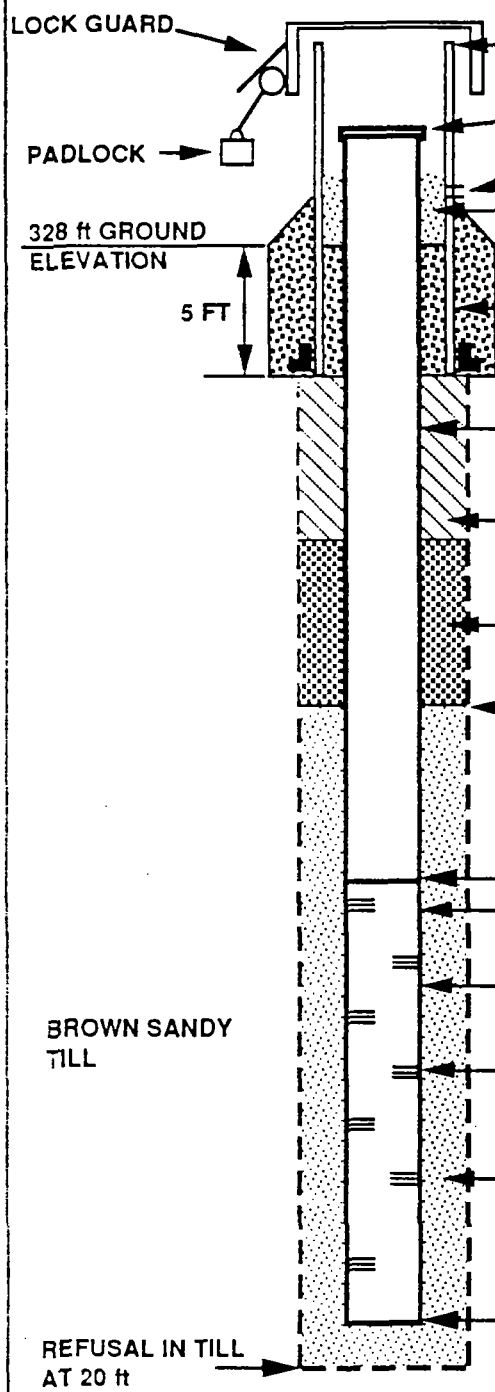
WELL: 73 S

LOCATION: Johnson Residence
Hall Road

INSTALLED: 4/2/91

DEVELOPED: 4/5/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF MEASURING POINT OF PROTECTIVE CASING	330.30 ft
ELEVATION OF MEASURING POINT OF TOP OF RISER	330.03 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 in DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 in
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
13.5 ft (Elev. 314.5 ft) TYPE OF POINT OR SCREEN	PVC, SAW-CUT SLOTS 5 ft LENGTH
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 in
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 in PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
18.5 ft (Elev. 309.5 ft) DISTANCE BETWEEN BOTTOM OF SCREEN AND BOTTOM OF BOREHOLE	1.5 ft. backfilled with sand

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 322.5

Date Drilled 4/3/91 Well No. 74S Boring Co. LaFramboise Top of Casing 324.69 PVC 324.45 Screen Length 5 ft

Total Depth 18 ft Boring Method Used HSA Piezometer Casing Size & Type 2" PVC Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
								LPD in 4' Cement
5			N O					2" Riser 2' AG to 13'
10			S A M			Brown Sandy Till (Observed from cuttings)		2" .010 Screen 13'-18'
15			P L E					00 Sand 10'-18'
18			S			-Refusal on Boulder	18'	Bentonite 8'-10'

Remarks: Developed 4/17/91. All elevations shown are ft. MSL.
Rising Head Test Conducted 4/8/91.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

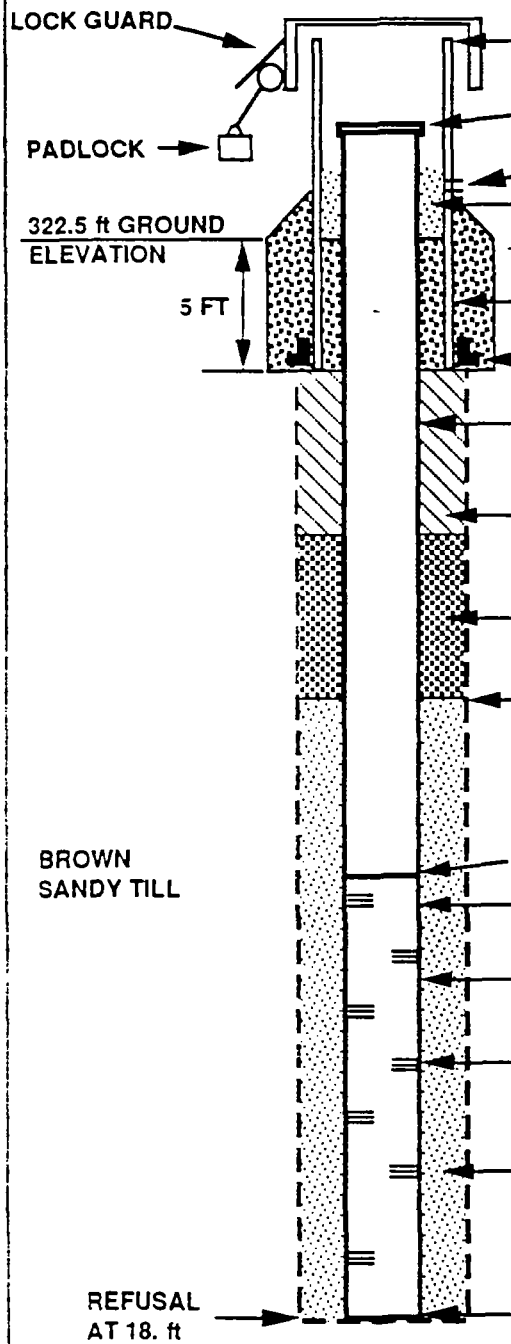
WELL: 74 S

LOCATION: Johnson Residence
Hall Road

INSTALLED: 4/3/91

DEVELOPED: 4/17/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF MEASURING POINT OF PROTECTIVE CASING	324.69 ft
ELEVATION OF MEASURING POINT OF TOP OF RISER	324.45 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 In DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1In x 1 In
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 In
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
THICKNESS OF BACKFILL ABOVE SCREEN	3 ft
13 ft (Elev. 309.5 ft)	
TYPE OF POINT OR SCREEN	PVC, SAW-CUT SLOTS 5 ft LENGTH
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 In
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 In PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
18 ft (Elev. 304.5 ft)	
DISTANCE BETWEEN BOTTOM OF SCREEN AND BOTTOM OF BOREHOLE	NONE

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 313.5

Date Drilled 4/9 - 4/10/91 Well No. 77S Boring Co. LaFramboise Top of Casing 315.13 PVC 315.22 Screen Length 5 ft

Total Depth 15 ft Boring Method Used HSA Piezometer Casing Size & Type 2" PVC Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth 3-1/2 ft

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
								LPP In 4' Cement
			N					2" Riser to 15'
			O					
5						Brown Sandy Till		
			S			(Observed from cuttings)		2" .020 Screen 10-15'
			A					
10			M					
			P				12'	02 Sand 8-15
			L			Weathered Rock		
15			E			BOH 15'		
			S					Bentonite 6-8'

Remarks: Developed 4/12/91. All elevations shown are ft. MSL.
Rising Head Test conducted 4/22/91.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

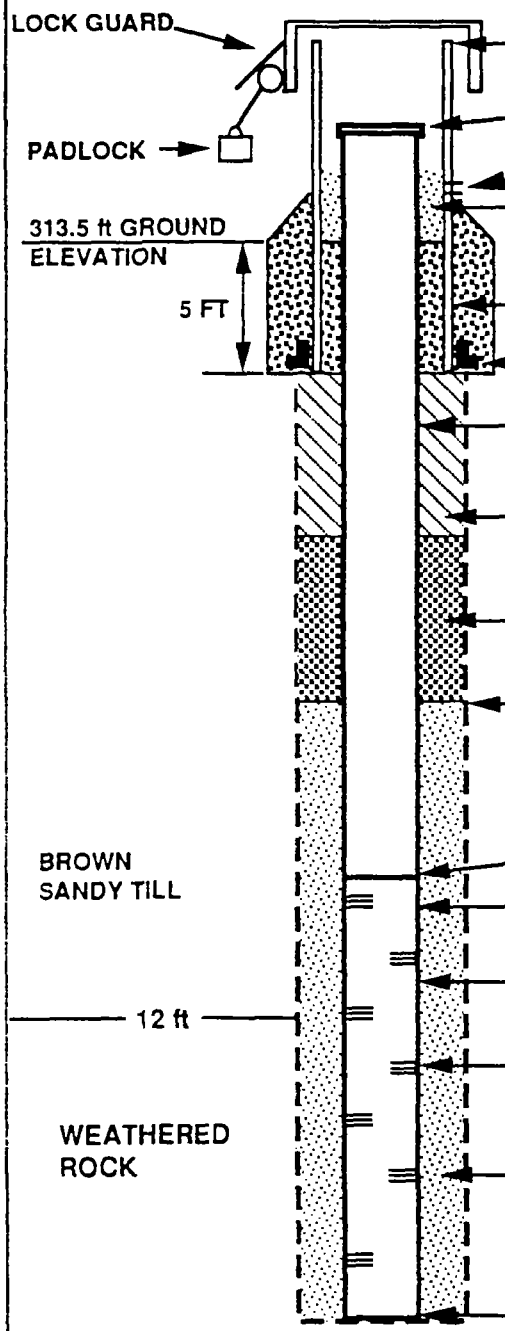
WELL: 77 S

LOCATION: Behind Johnson Residence

INSTALLED: 4/9/91-4/10/91

DEVELOPED: 4/12/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF MEASURING POINT OF PROTECTIVE CASING	315.22 ft
ELEVATION OF MEASURING POINT OF TOP OF RISER	315.13 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 in DIAMETER. 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 In
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	2 ft BENTONITE PELLETS
THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
10 ft (Elev. 303.5 ft)	
TYPE OF POINT OR SCREEN	PVC, SAW-CUT SLOTS 5 ft LENGTH
SCREEN GAGE OR SIZE OF OPENINGS	20 SLOT / 0.020 In
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 In PVC
TYPE OF BACKFILL AROUND SCREEN	.020 SAND
15 ft (Elev. 298.5 ft)	
DISTANCE BETWEEN BOTTOM OF SCREEN AND BOTTOM OF BOREHOLE	NONE

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 328

Date Drilled 4/12/91 Well No. 79S Boring Co. LaFramboise Top of Casing 329.97 Top of Riser 329.86 Screen Length 5 ft

Total Depth 34 ft Boring Method Used Air Rotary Piezometer Casing Size & Type 2"PVC Schd. 40 PVC Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
					Ambient 0			LPP - 2' AG
5			N O					Cement Sealed to -3 ft
10			S A M P L			Brown Sandy Till (Observed from cuttings)		2" Riser to 19'
15								Bentonite 13'-15'
20			E S					CO Sand 15-17'
							20'	2" 0.010 Slot Screen 17'-22'
25						Gray, Dense, Nearly Lithified Till - More Dense with Depth. Dry		
30								
35			T					
						BOH	34'	
						Did not Encounter Rock		*Back Filled from 23'-24' with sand: 24'-26' with Bentonite: 26'-34' with Sand.

Remarks: Developed 4/17/91. All elevations shown are ft. MSL.
K-Test Conducted 4/18/91.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

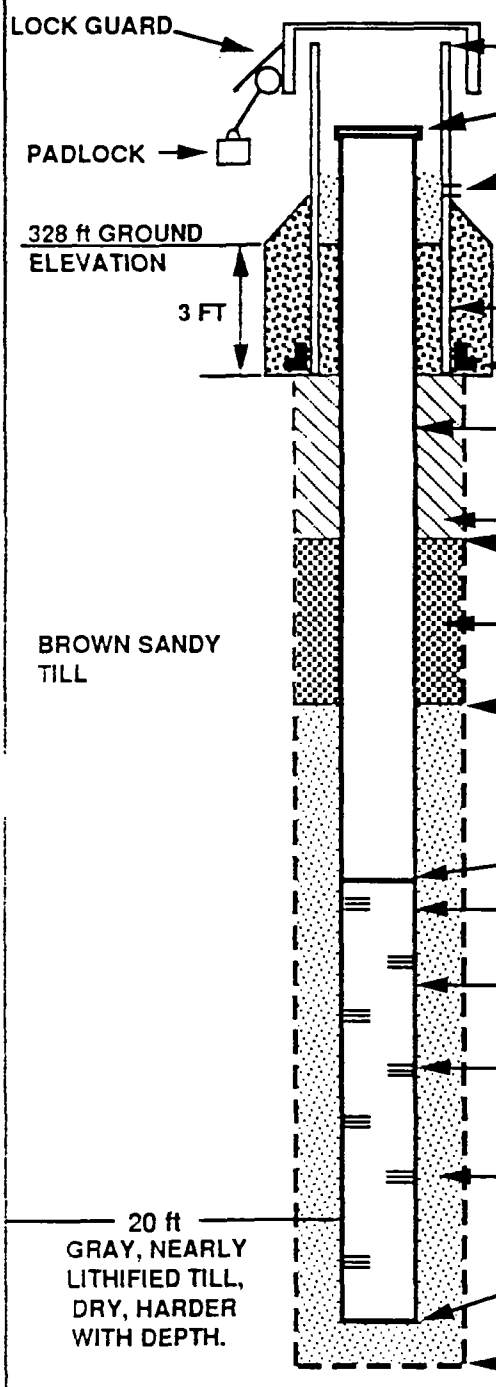
WELL: 79 S

LOCATION: Front Yard / Johnson Residence / Tibbetts Road

INSTALLED: 4/12/91

DEVELOPED 4/17/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF TOP OF CASING	329.97 ft
ELEVATION OF TOP OF RISER	329.86 ft
VENT HOLE	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 in DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 in
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
13 ft	
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
15 ft THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
17 ft (Elev. 311 ft)	PVC, SAW-CUT SLOTS 5 ft LENGTH
TYPE OF POINT OR SCREEN	
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 In
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 In PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
Bottom of well screen is 22 ft (Elev. 306 ft)	B.O.H. 34' in TILL. BACKFILLED 34 ft - 26 ft WITH SAND, 26 ft - 24 ft WITH BENTONITE, 22 ft - 24 ft WITH SAND
34 ft (Elev. 294 ft)	

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 328.7

Date Drilled 4/12/91 Well No. 80S Boring Co. LaFramboise Top of Casing 330.86 Top of Riser 330.73 Screen Length 5 ft

Total Depth 19½ ft Boring Method Used HSA Piezometer Casing Size & Type 2" PVC Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth 5 ft

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
					Ambient 0			LPP 2' A.G.
			N O		*			13-1/2 ft Riser
5						Till		Seal 7'-9'
			S A M		*			Sand 9'-11'
10								
			P L E		*			.010 Screen 11'-16'
15							—16-1/2'—	
			S			WX Rock		
20						—BOH—	—19-1/2'—	

*H-Nu 8 ppm in cuttings at ground surface

Remarks: Developed 4/17/91. All elevations shown are ft. MSL.
K-Test Conducted 4/18/91.
Installed to Replace OW-1.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

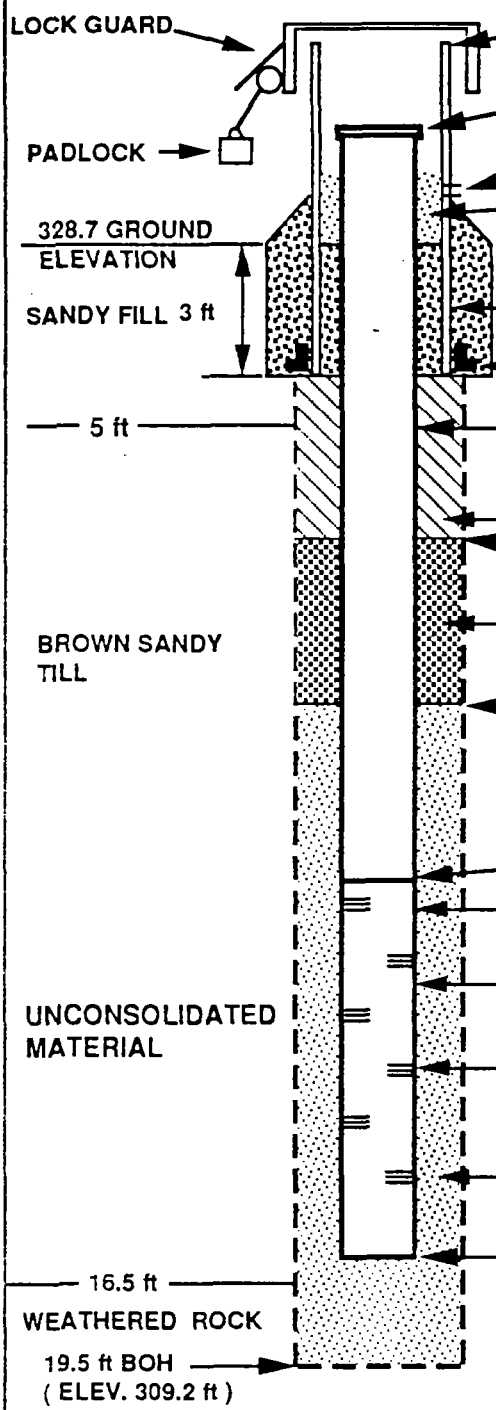
WELL: 80 S

LOCATION: Adjacent to OW - 1
Johnson Residence
Tibbetts Road

INSTALLED: 4/12/91

DEVELOPED: 4/17/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF TOP OF CASING	330.86 ft
ELEVATION OF TOP OF RISER	330.73 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 in DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 in
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
7.5 ft	
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
9.5 THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
11.0 ft (ELEV. 317.7 ft)	
TYPE OF POINT OR SCREEN	PVC, SAW-CUT SLOTS 5 ft LENGTH
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 in
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 in PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
16 ft (ELEV. 312.7 ft)	
DISTANCE BETWEEN BOTTOM OF SCEEN AND BOTTOM OF BOREHOLE	3.5 ft

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 323

Date Drilled 4/16/91 Well No. 82S Boring Co. LaFramboise Top of Casing 323.09 Top of Riser 322.7 Screen Length 10 ft

Total Depth 43 ft Boring Method Used Air Rotary Piezometer Casing Size & Type 2" PVC Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nμ Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
					Ambient 0			LPP - At SPC.
5			N O					
10			S A M			Sandy gravel (fill) Over Till (Observed from cuttings)		
15			P L					
20			E S				17'	
25						Weathered Rock		
30						Saturated 31'-43'		33'-2" PVC Riser
35								Bentonite 29'-31'
40								Sand 31'-43'
			to 43'				43'	.010 Slot Screen 33'-43'

Remarks: Developed.
No K-Test Conducted.
All elevations shown are ft. MSL.

GROUNDWATER MONITORING WELL SCHEMATIC

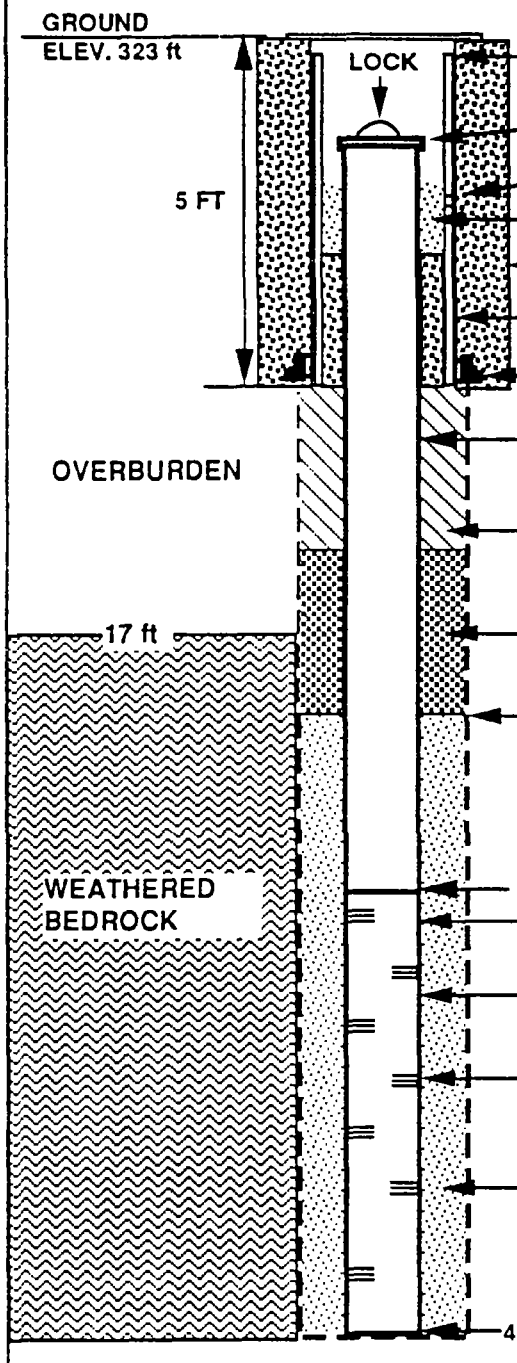
SITE: Tibbetts Road, Barrington, N.H.

WELL: 82 S

LOCATION: Lane Residence
Tibbetts Road

INSTALLED: 4/16/91

CONSTRUCTION DETAILS: CORED WELL COMPLETED IN WEATHERED BEDROCK



ELEVATION OF MEASURING POINT OF PROTECTIVE CASING	323.09 ft
ELEVATION OF MEASURING POINT OF TOP OF RISER	322.7 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE3
PROTECTIVE CASING	4 in DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 in
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
TYPE OF POINT OR SCREEN	PVC, SAW-CUT SLOTS 10 ft LENGTH
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 in
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 in PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
BOTTOM OF SCREEN	

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 313

Date Drilled 4/22/91 Well No. 83S Boring Co. LaFramboise Top of Casing 313.62 Top of Riser 313.30 Screen Length 5 ft

Total Depth 9-1/2ft Boring Method Used Air Rotary Piezometer Casing Size & Type 2" PVC Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nμ Water Table Depth Near SFC.

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
					Ambient 0			LPP 2' A.G.
			N O	/	0			Cement Seal to SFC.
5						Brown Sandy Till (Observed from cuttings)		Sand to 3' Screen 4-1/2-9-1/2
			S A	/	0			
10			M				9-1/2'	
			P L E			Refusal		
			S					

Remarks: Developed by Pumping 4/22/91.
Did not conduct K Test.
All elevations shown are ft. MSL.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

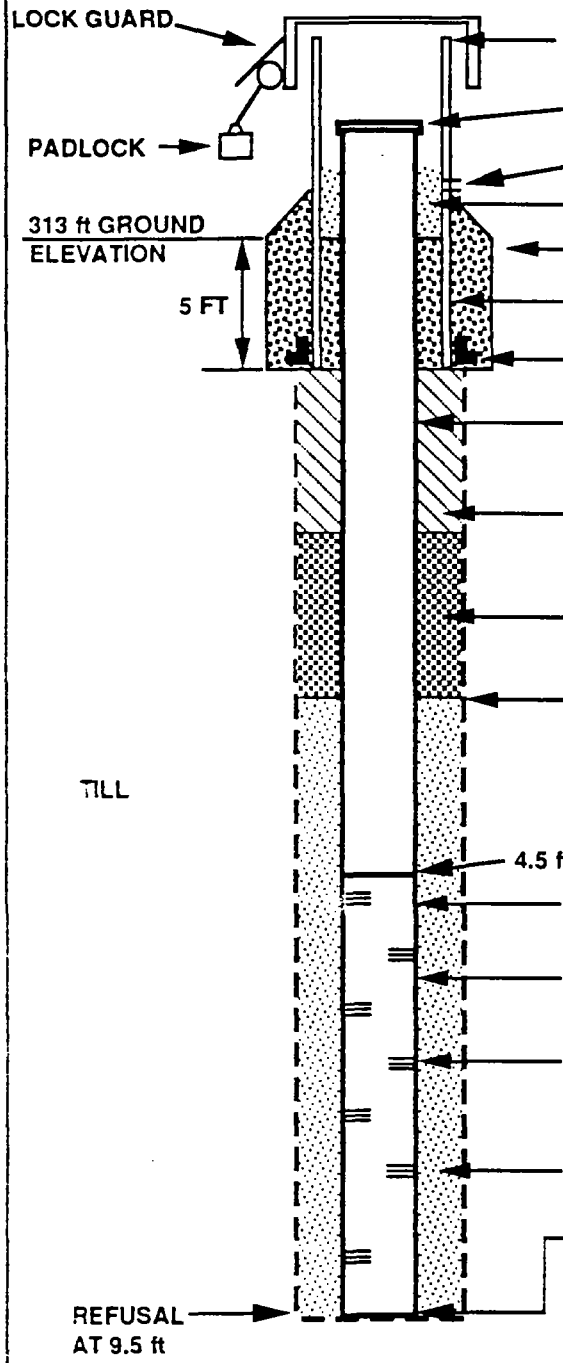
WELL: 83 S

LOCATION: Swier Residence
Tibbetts Road

INSTALLED: 4/22/91

DEVELOPED: 4/22/91

CONSTRUCTION DETAILS: WELL COMPLETED IN OVERBURDEN



ELEVATION OF TOP OF CASING	313.62 ft
ELEVATION OF TOP OF RISER	313.30 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	NON-SHRINK CONCRETE
PROTECTIVE CASING	4 In DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 In
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 In
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
4.5 ft (ELEV. 308.5 ft)	
TYPE OF POINT OR SCREEN	PVC, SAW-CUT SLOTS 5 ft LENGTH
SCREEN GAGE OR SIZE OF OPENINGS	10 SLOT / 0.010 In
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 In PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
9.5 ft (ELEV. 303.5 ft)	
DISTANCE BETWEEN BOTTOM OF SCREEN AND BOTTOM OF BOREHOLE	NONE

WELL LOGS -
BEDROCK RESIDENTIAL WELLS

RESIDENTIAL WELLS

SWIER - 1R 21/21/142.5 From 22 to 59 feet the borehole intersects either a very dense fracture zone, weathered bedrock or overburden. Examining the surficial seismic refraction results, the logs, and the water levels, it is apparent that a large part of the borehole (22 to 50' perhaps) is overburden or fractured and weathered rock. The primary transmissive fractures other than the obvious weathered zone are at 71.5 (N15W dip 25E) and 89 feet. While pumping B2D and B4D and the packed intervals, no response was noted in this well; however, this may be due to the connection to the near surface.

TREADWELL - 2R ?/35/350 Yield reported at +100 gal/min.; Pack tests: drwdn 4.6' during pump of B2D, .7' during B2D 70 to 90, 1.6' during B2D 180 to 200, .1' during B4D 110 to 130 and .1 during B4D 140 to 170; significant fracs at 59' (N35W, 83W), a zone at 80 to 84 (N85E, 25E), 185' (N5E, 31E), and 345' (N60W, 20W).

RUNDE - 3R (190) Yield 8 gpm (formerly named Carey)

R.BOUCHER - 4R ?/50/135 Pack tests: drwdn .7 ft when pump B2D open hole, no effect when pumping B2D at 70 to 90, drwdn .1' when pump B2D 180 to 200, no response to pumping B4D at either zone; significant fracs at zone 50 to 60, zone 63 to 66 (N15E, 24E), and another possible zone at 102 to 106 (N65E, 24W and N35W, 13E).

COUTURE - 5R ?/65/140 Pack tests on B2D and B4D showed NR; frac zones occur between the intervals of 70 and 100 ft and between 177 and 203 ft. Individual fracs appearred at 139, 148 (N55E, 68W), 191 (N40W, 88W), 200 (N45E, 35W), and 228 (N50W, 35E).

BILODEAU - 6R ?/22/240 No pump test, yield reported at 50 gpm; frac zone at 196.5 to 198 (N5E, 36E) and esp. below 207 with most orientations between N45W - N5E (31E - 51E) and N5E - N30E (36E - 57E) all fracs in this zone dipped easterly; individual frac is at 133.

WATERFIELD -7R Formerly Holt.

VANCE - 8R ?/15/162 No pump, signif fracs occur at 28 (N5E, 42W), 33 (N75W, 33W), 119 - 120 (N65W, 42E), 136 (N65W, 24E), and 149.5 - 151 (N35W - N25W, 24E).

FOSS - 9R
CLAUSS - 10S
MALONEY - 11S
DOMINIQUE-12S

DOLAN - 13R ?/18/149 No pump, frac zones appear at 54 - 63, 67 - 91, 98 - 100, 109 - 119, 124 (N55E, 84W), and 136 - 138 (N5E, 44W - 62W).

N.BOUCHER-14R **?/69/102** Yield of well reported to be 5 gpm; No response to pumping of intervals in B2D or B4D, but a drwdn of 1.2' when B2D was pumped open hole; fracs at 73 (N85W, 25E) and 93 (N85E, 30E), at 98 it appears that perhaps a litho change occurs.

TERRY - 15R Formerly Conrad and Cragin.

JANELLE - 16R
MANGAR - 17R
KHEMAIERIEN - 18R
HICKS - 19R

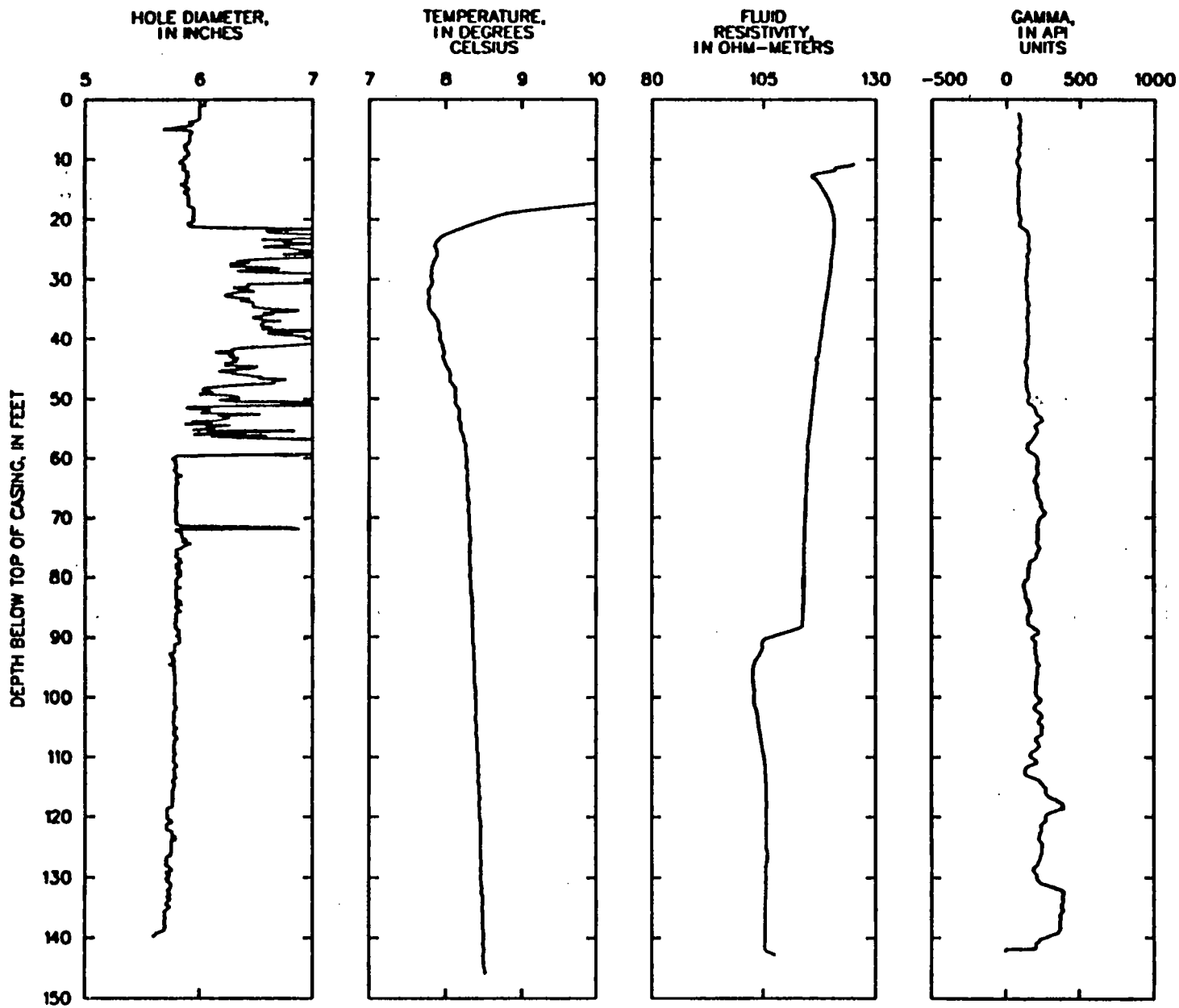
LANE - 20R **?/39/56** Major frac at 47.5 to 49 (N5W, 13W), other frac at 41, 44, and 49.5 (N15W, 31E).

TOWNSEND - 21R **?/40/298** Fracs at 50 (N60W, 13E), 122 (N35W, 31E), 148.5 (N55E, 57W), and 208.5 (N85W, 44W).
SHANKLIN - 22R
PHILLIPS - 23R Calef Island
TUTTLE - 24R
LAVIGNE - 25R
DAGENAIS - 26R
FRANCESCHINI - 28R
EPSTEIN - 29R
CROSS - 30R
FRENCH - 31R
WHITEHOUSE - 39S
BOYLE - 40S
CARLE - 41S
DOMBROSKI - 42S
KELLEHER - 43S
ST. ONGE - 44S
ROBINETTE - 45S
PURVIS - 46S
BRYSON - 47S
CRAFT - 48S
JOHNSON/DOWNING
IBER
CANDELARIA
CHEVALIAR Overburden well.
TRAINOR Bedrock well.
PARCELL Bedrock well.

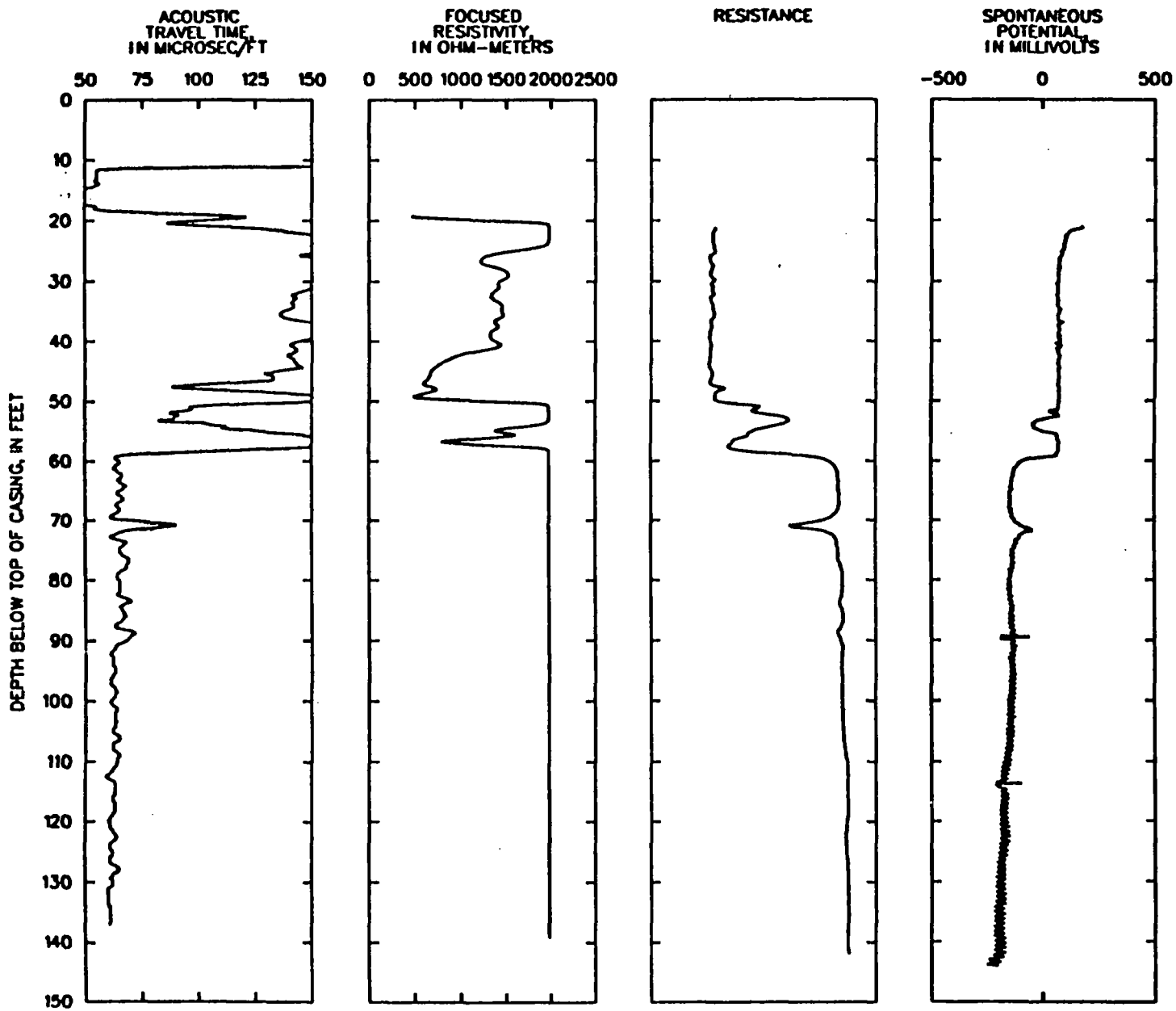
SAULNIER	Overburden well.
LEAHY	Overburden well.
KEN'S GENERAL STORE	Bedrock well.
PERRY	Overburden well.
FAGERBERG	Bedrock well.
GIFFORD	Bedrock well.
CASWELL	Bedrock well.
TREFETHEN	Bedrock well.
LEIGHTON	Overburden well.
LEN-KAY CAMP	Two bedrock wells.
PEABODY	Bedrock well.
SULLIVAN	Bedrock well.
BURKE	Overburden well.
MARCHAND	Overburden well.
HEDBURG	Bedrock well.
COTE	Bedrock well.

LOG SUMMARY TABLE
TIBBETTS RD
SWIER

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
22-59		x	x			x	x	x	x	
22		x	x	x		x			x	(x)
25		x	x			x	x			
29-30		x	x			x				(15W,42W)
39		x	x			x				
41		x					x			(N85W,42E)
49.5						x	x	x		
51		x						(x)	x	N55E,19E
55.5		x				x	x		x	(N85W,64E)
57		x				x	x	x		(N30E,24E)
59		x	x	x					x	N60W,30E
71.5		x				x	(x)	x	x	N15W,25E
89.5				x	(x)	(x)		(x)	x	x
111				x				(x)	x	
118					x					
131					x					



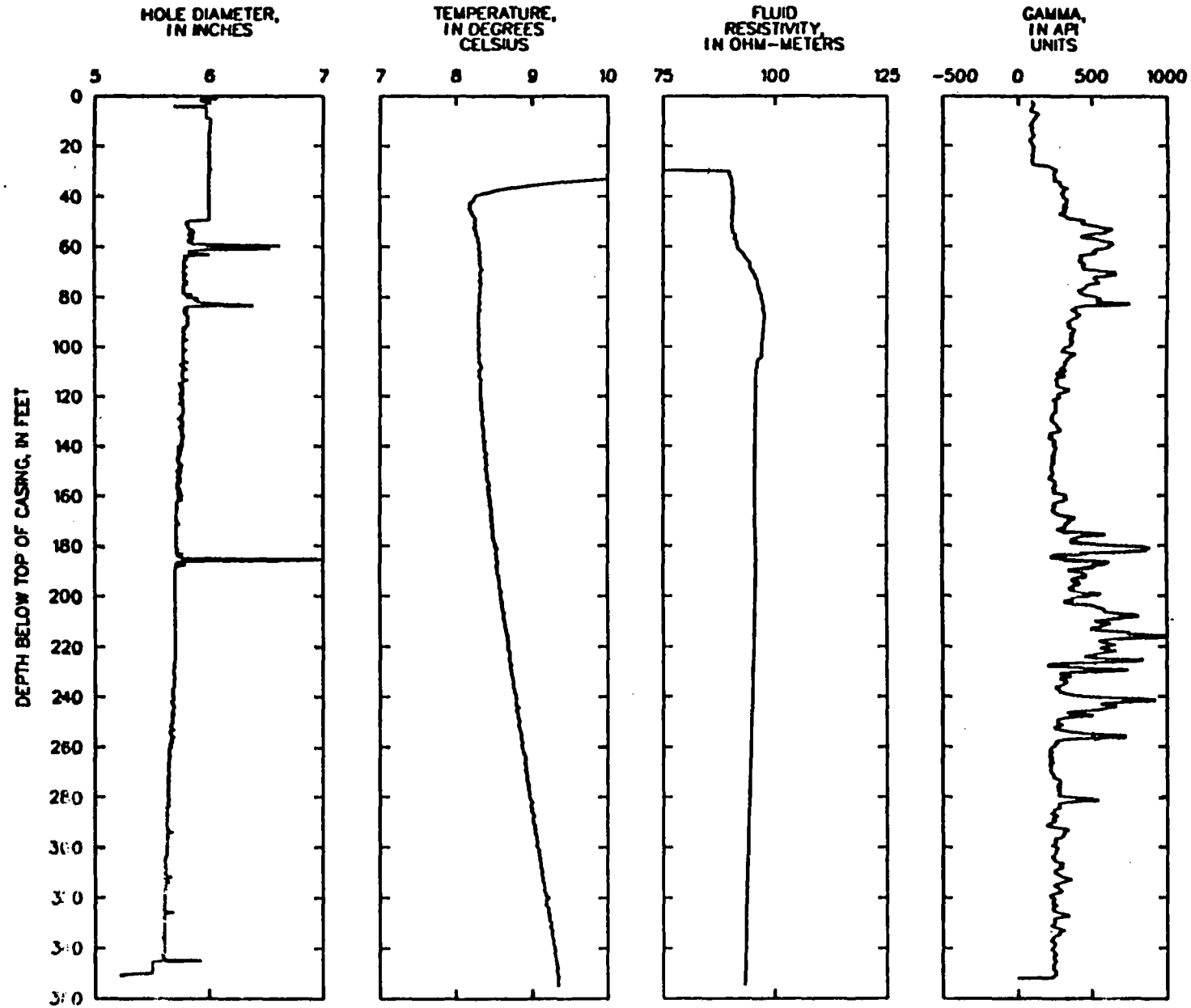
TIBBETTS RD, SWIER



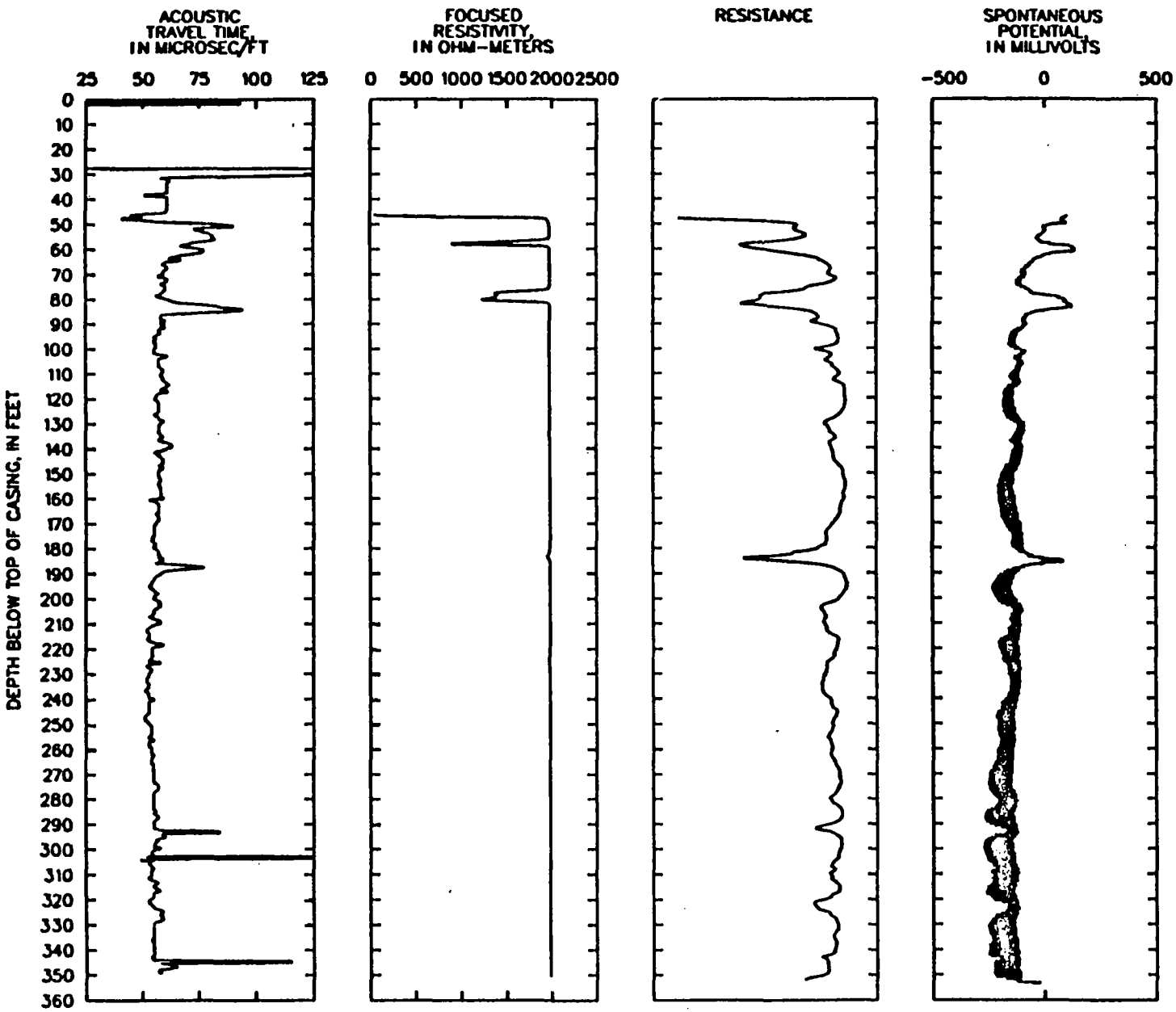
TIBBETTS RD, SWIER

LOG SUMMARY TABLE
TIBBETTS RD
TREADWELL

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
53.5-54			(x)	x	x	(x)				N25W,80W N35W,77W
59		x	x	x	x		x	x	x	N35W,83W
61		x				(x)				N25W,89W
70			x	x	x					
74										N35W,88W
77							x			
80							x	x		
83		x	x	x	x	x		x	x	N85E,25E
105			x	x						
135			x							
175-255					x					
183							(x)	x		(x)
185		x	x	x		x			x	(N05E,31E)
280					x			x	x	
292						x		x	x	
303						x				
322								x	x	
327.5			x							N55E,58E
344.5		x				x		(x)	(x)	N60W,20W



TIBBETTS RD, TREADWELL

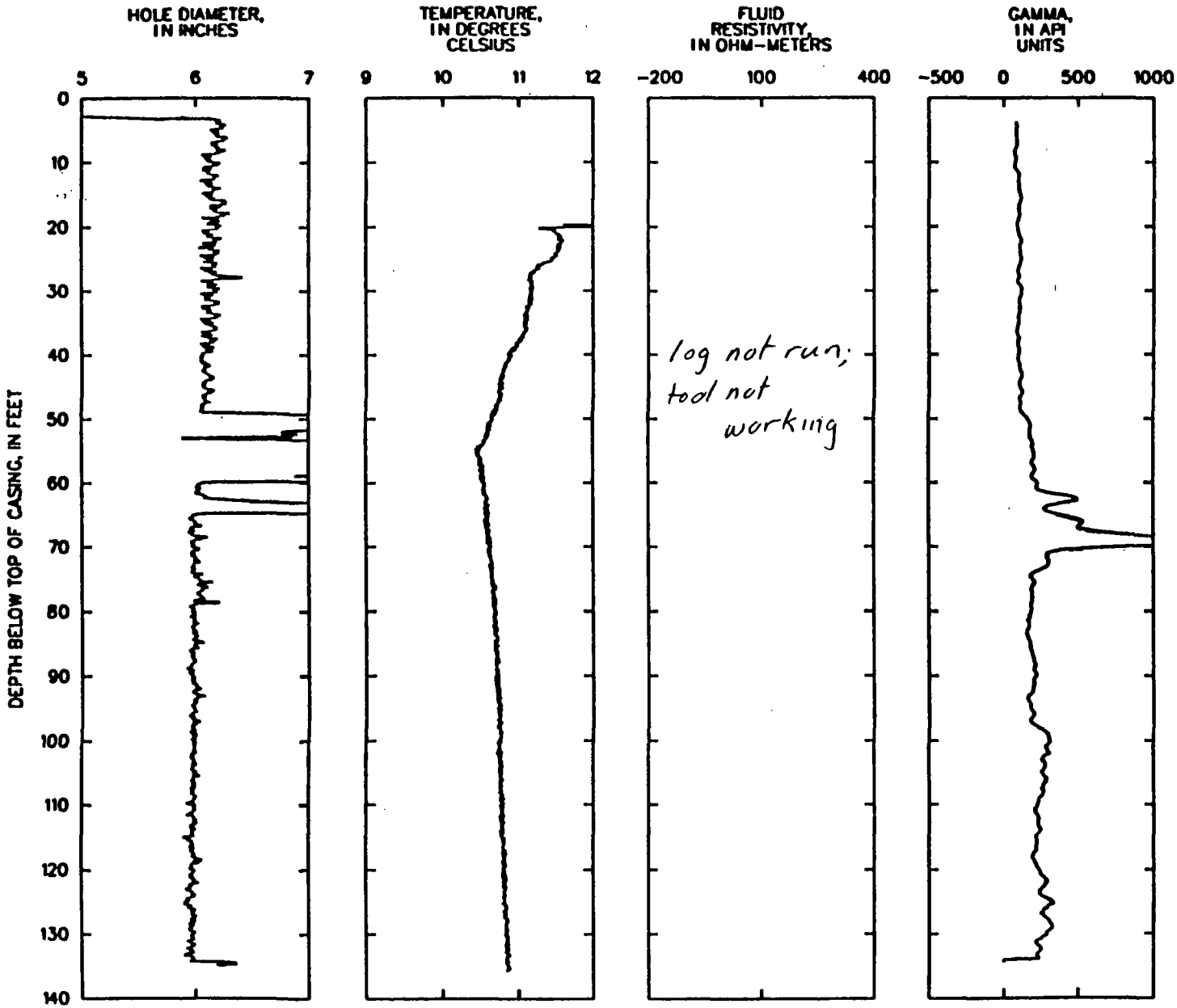


TIBBETTS RD, TREADWELL

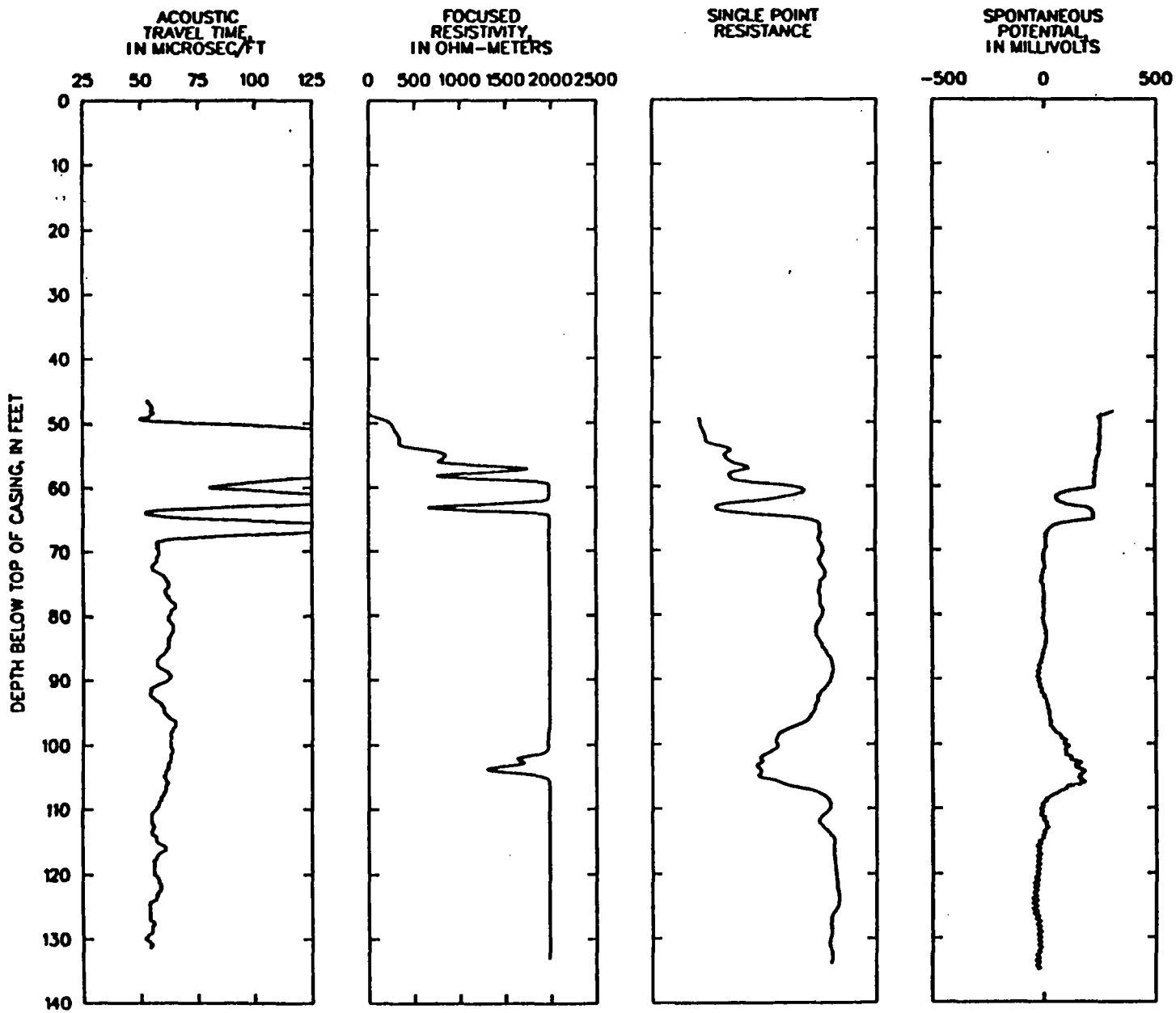
LOG SUMMARY TABLE
TIBBETTS RD
R. BOUCHER

DEPTH	ALTI-TUDE	CAL	TEM	FLR[1]	GAM	VEL	FOC	SPR	POT	ATV
51-60		x	x			x	x	x		x
51		x				x	(x)			
54		x				x	(x)			
55			x				x	x		
56						x				
57		x								
58						x	x	x		
59		x								
60									x	N55W,24E
61.5					x	x				
63						x	x	x		
64-65		x			x				x	(N15E,24E)
66						x				
68					x					
102							x	x	x	
103							x		x	(N65E,24W)
104.5								x	x	N65E,24W
106									x	N35W,13E
113								x	x	N85E,76W

[1]Fluid resistivity log not run on this well.



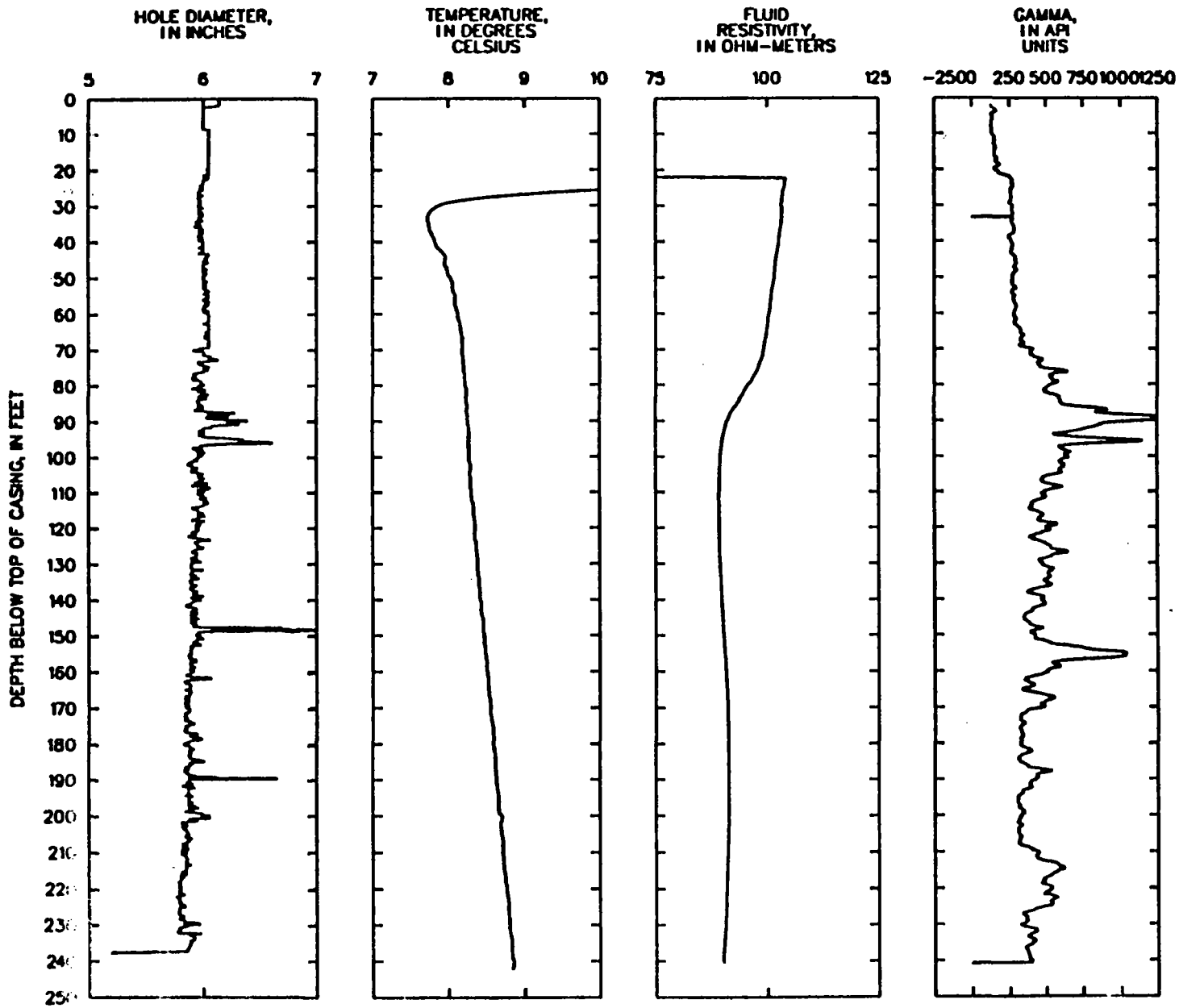
TIBBETTS RD, R-BOUCHER



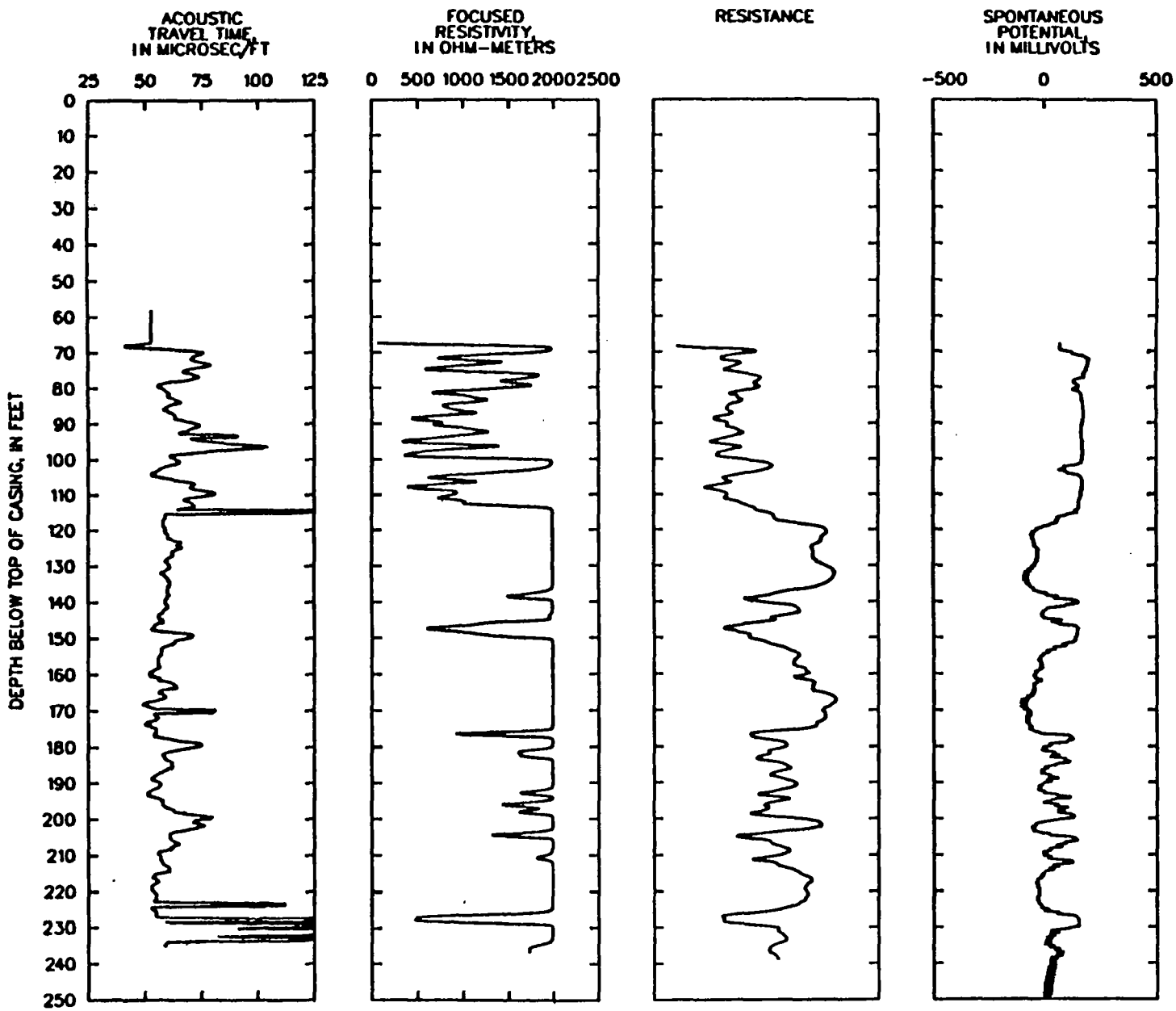
TIBBETTS RD, R-BOUCHER

LOG SUMMARY TABLE
TIBBETTS RD
COUTURE

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
70-112				x	x		x	x	x	x
72.5		x	x	x			x			N45W,30E
88.5		x					x			(N15E,81W)
90.5		x			x		x			x
91		x		x						(N45W,84W)
96		x	x	x	x	x	x			(N15E,30W)
109							x	x		
114						x				
139							x	x	x	
148		x					x	x	x	N55E,68W
156					x					
160		x								
171						x				N35W,35E
177-203							x	x	x	x
178						x	x	x	x	N15E,25W
189.5					x					N25W,79W
191		x		x			x			N40W,88W
200		(x)	x			x				N45E,35W
203							x	x	x	
209.5							x	x	x	N55E,59W
223						x				x
227-228						x	x	x	x	N50W,35E
229.5		(x)				x				N45W,38E
230										N65W,56E
231		(x)				x				N80W,73E
233						X				



TIBBETTS RD, COUTURE

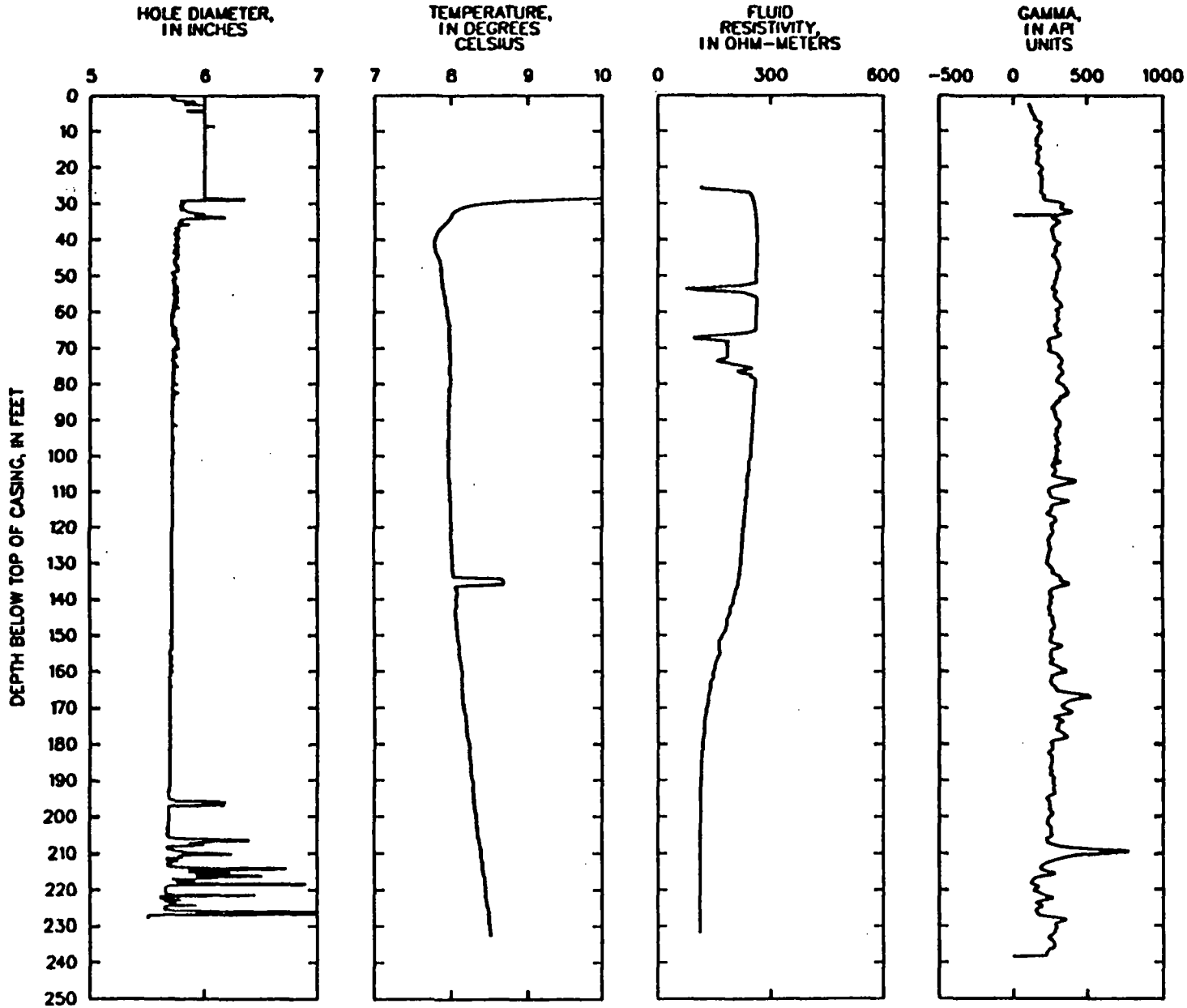


TIBBETTS RD, COUTURE

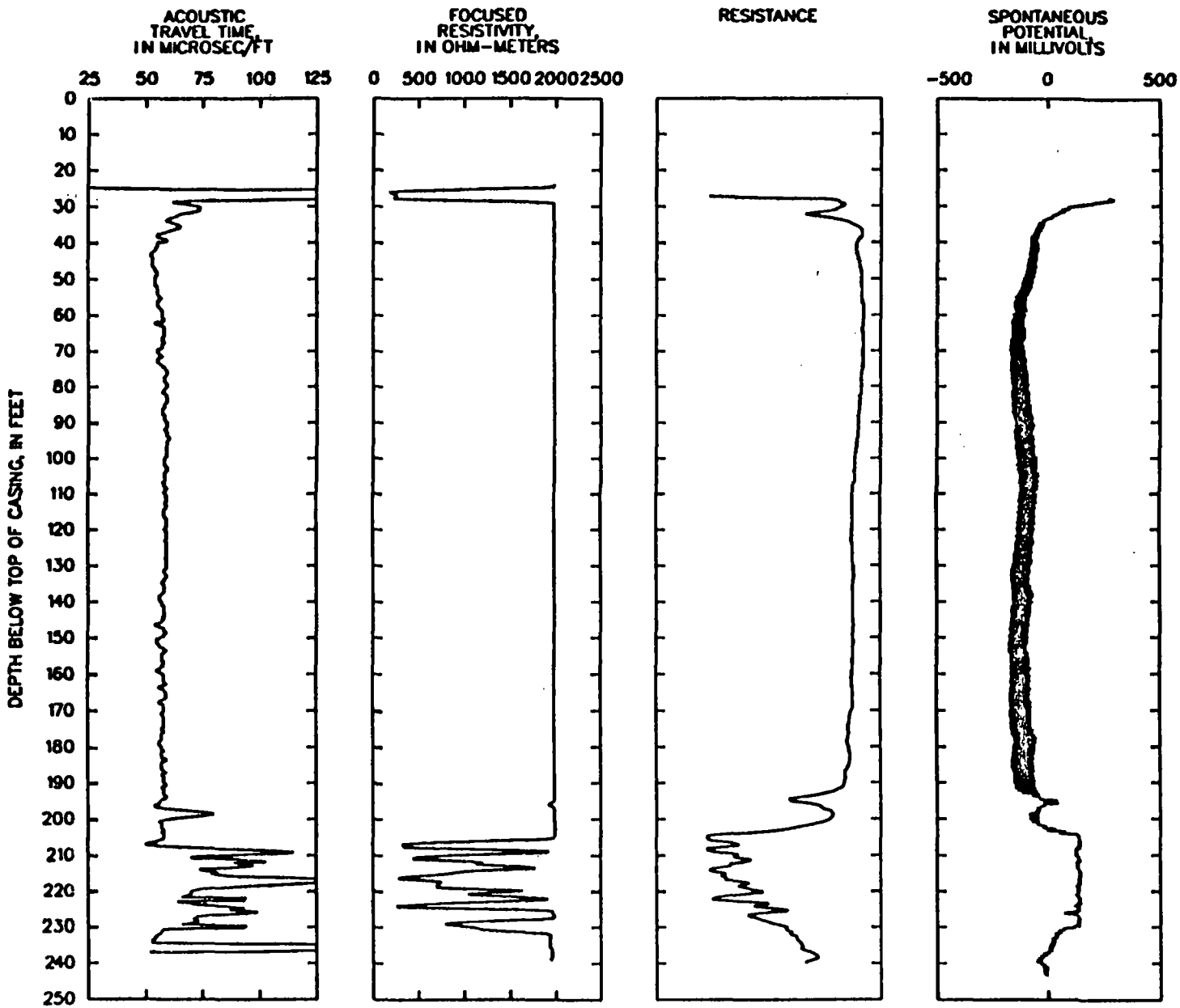
LOG SUMMARY TABLE
TIBBETTS RD
BILODEAU

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
26.5						x	x	x	x	
30		x				x		x	x	(N25W,03W)
32			x							
35		x				x			x	N65E,76W
53			(x)	x						
69			x	x						
74				x						
77				x						
133			x	x	(x)					(x)
180				x						
196.5-198		x				x	(x)	x	x	N05E,36E
203								x	x	
207		x					x	x		N05E,36E
211		x			x	x	x			N25E,36E
213		x				x		x		N25E,(62E)
215.5		x					x			N05W,51E
217						x				N30E,57E
219		x					x			N45W,31E
222		x				x		x		N05E,(57E)
223.5							x			[1]N35W,51E N15W,36E
227		x				x		x		N15E,44E
230						x	x		x	
235						x				

[1]Two fractures at this depth.



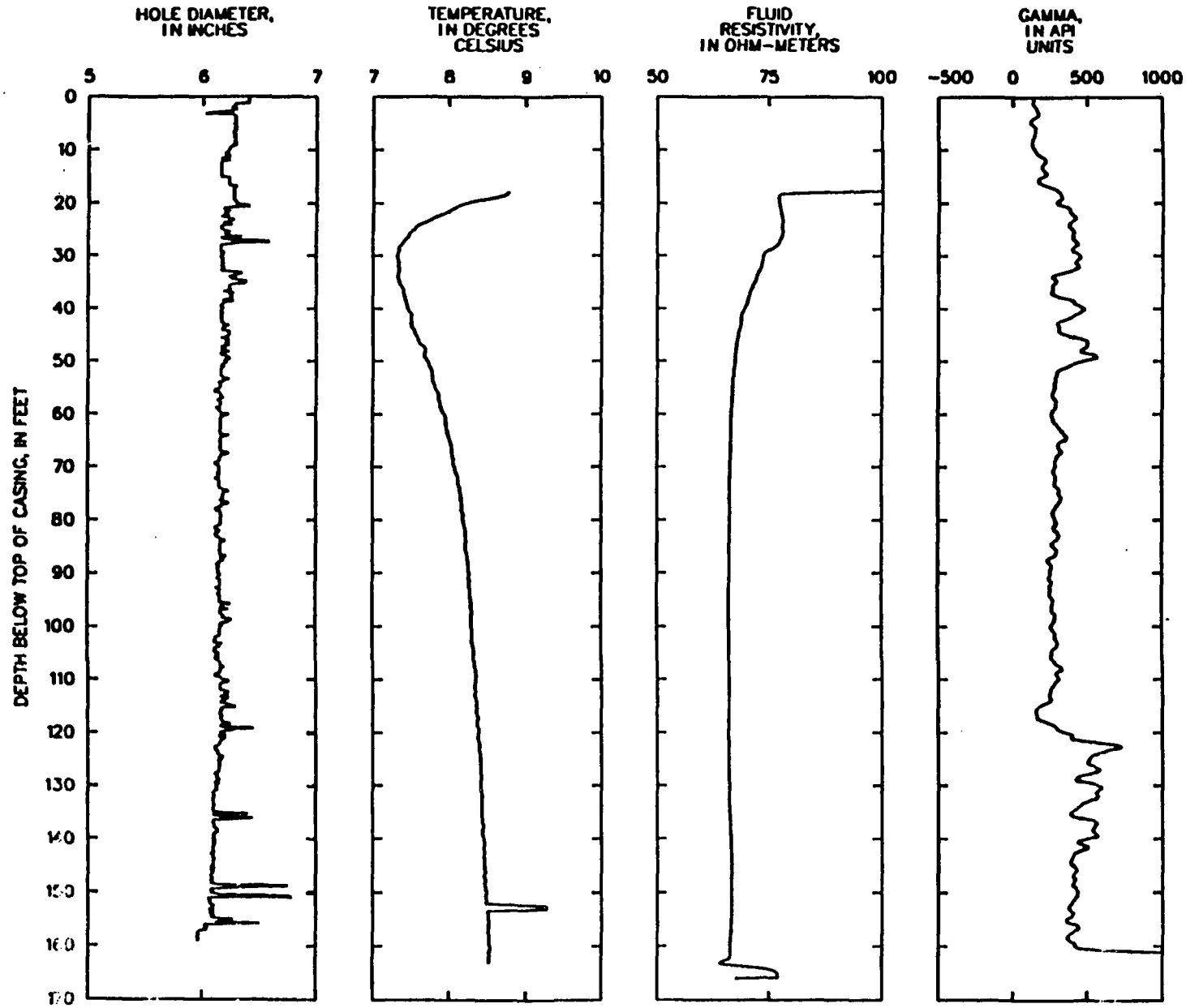
TIBBETTS RD, BILODEAU



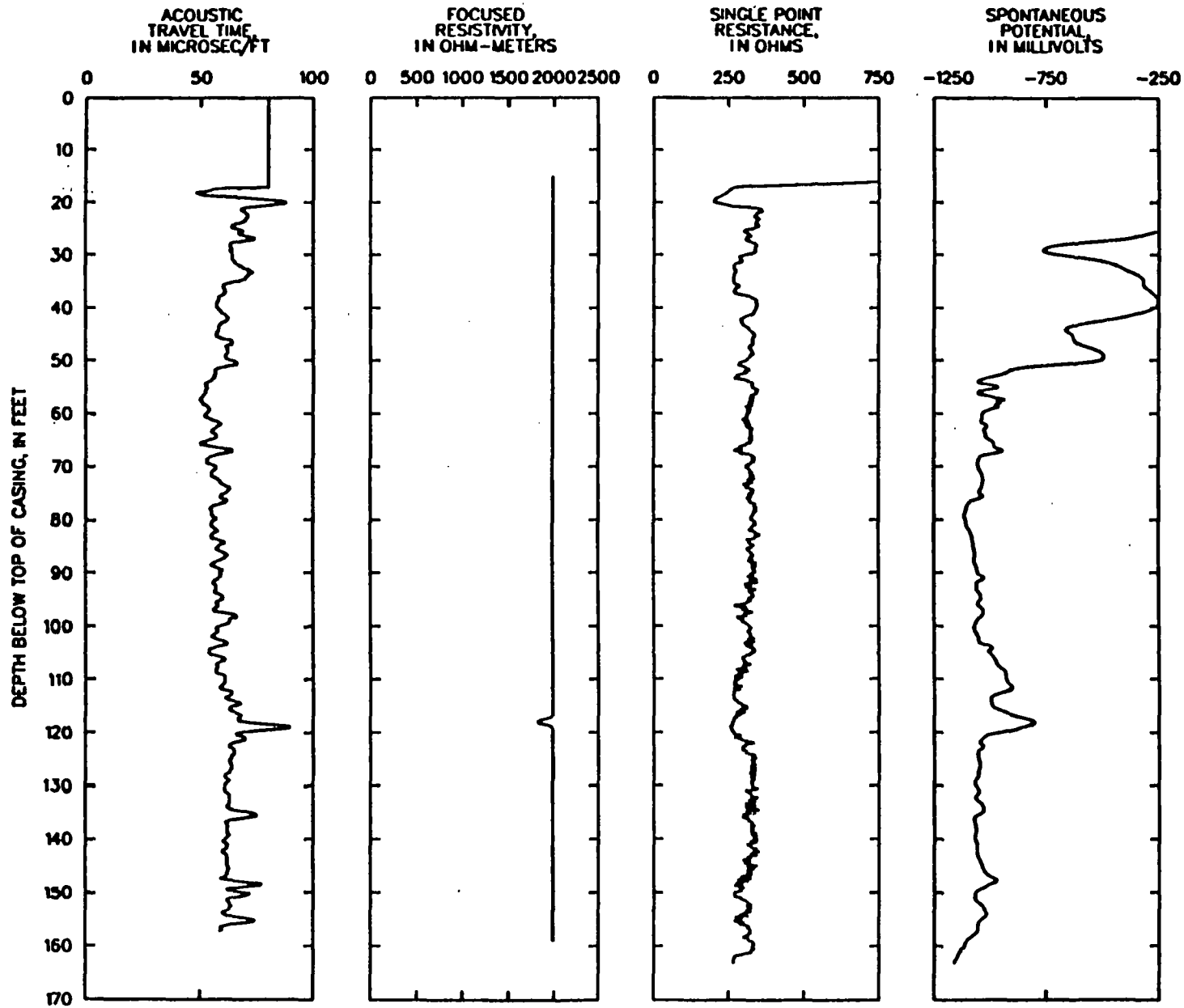
TIBBETTS RD, BILODEAU

LOG SUMMARY TABLE
TIBBETTS RD
VANCE

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
20						x		x	x	x
28		x		x		(x)			x	N05E,42W
30				x						
33		x	x	x	x	x			x	
35		x			x				x	N75W,(33W)
41-42			x	x	x					
48-49			x	x	x				x	
50					x				x	
60		(x)	x	x						(N05W,69W)
72			x							
84.5			x							N05E,23W
119		x			x	x	x	(x)	x	
120										N65W,42E
122				x	x					x
136		x				x				N65W,24E
137		x								N45W,29E
149.5		x				x				N35W,24E
151		x				x				N25W,24E
153			x							
155.5		x				x				N85E,18W
156.5		x								N45W,24E
159										N75W,12E
161				x	x					
166				x						



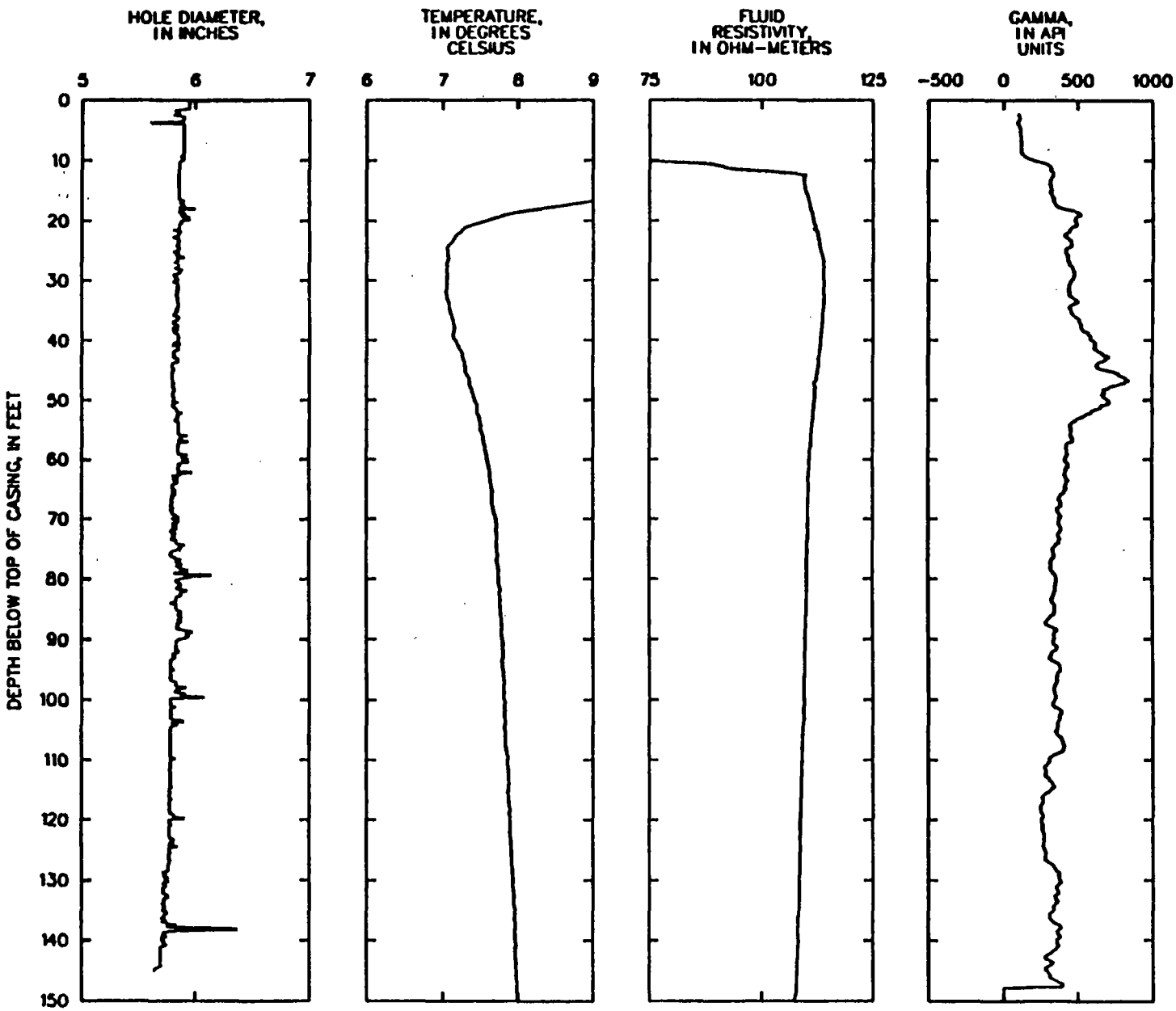
TIBBETTS RD, VANCE



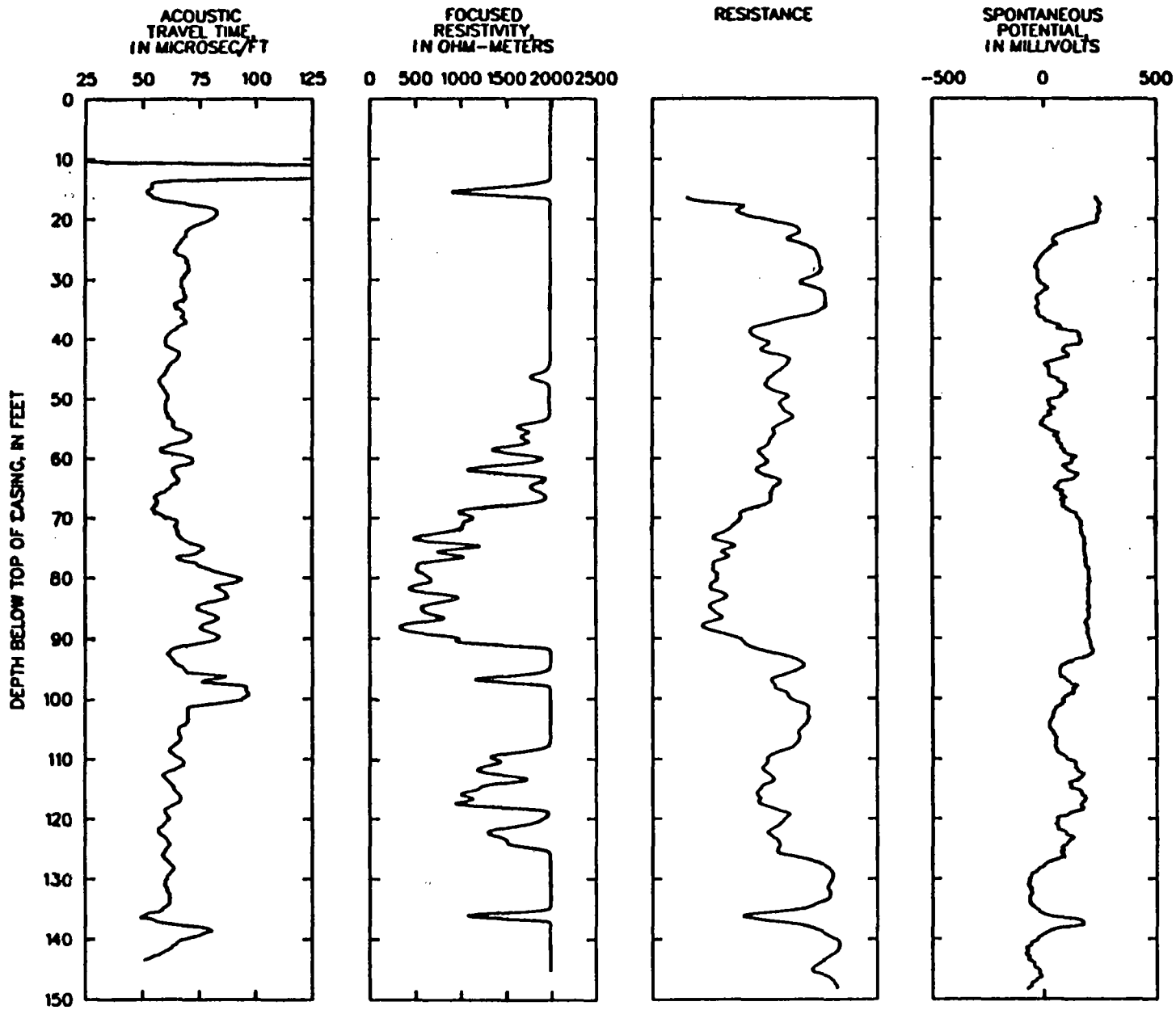
TIBBETTS RD, VANCE

LOG SUMMARY TABLE
TIBBETTS RD
DOLAN

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
15							x			
25			x							
28				x						
33			x	x						
39			x					x	x	
46			x	x	x		x			
54-63						(x)	x			x
56						x				x
60.5				x		x	x	(x)	(x)	N85W,61E
67-91			(x)	(x)		x	x	x	x	
76				x		x	x	(x)		
80		x				x		(x)		
89		x				x	x	x		(N60W,67E)
98-100		x				x	x	x	x	(N85W,66E)
103.5		x								(N75E,36W)
109-119							x	x		
109		(x)					x		x	N30E,07E
112								x	x	(N55E,84W)
116							x	x	x	N85E,(74W)
120		x								N25E,25E
123.5		(x)					x	x	x	N55E,84W
135.5							x	x	x	N05E,44W
138		x				x				N05E,62W



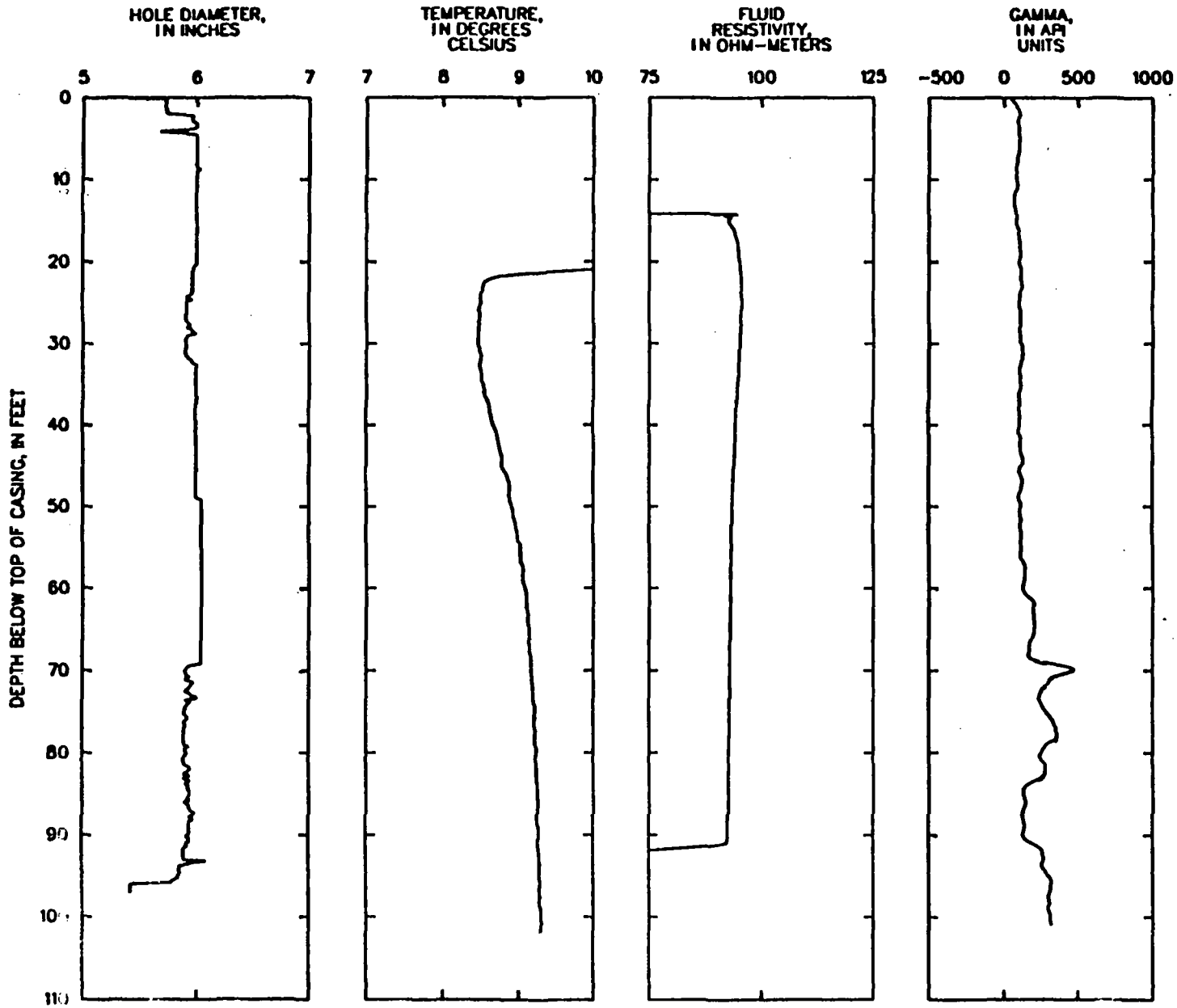
TIBBETTS RD, DOLAN



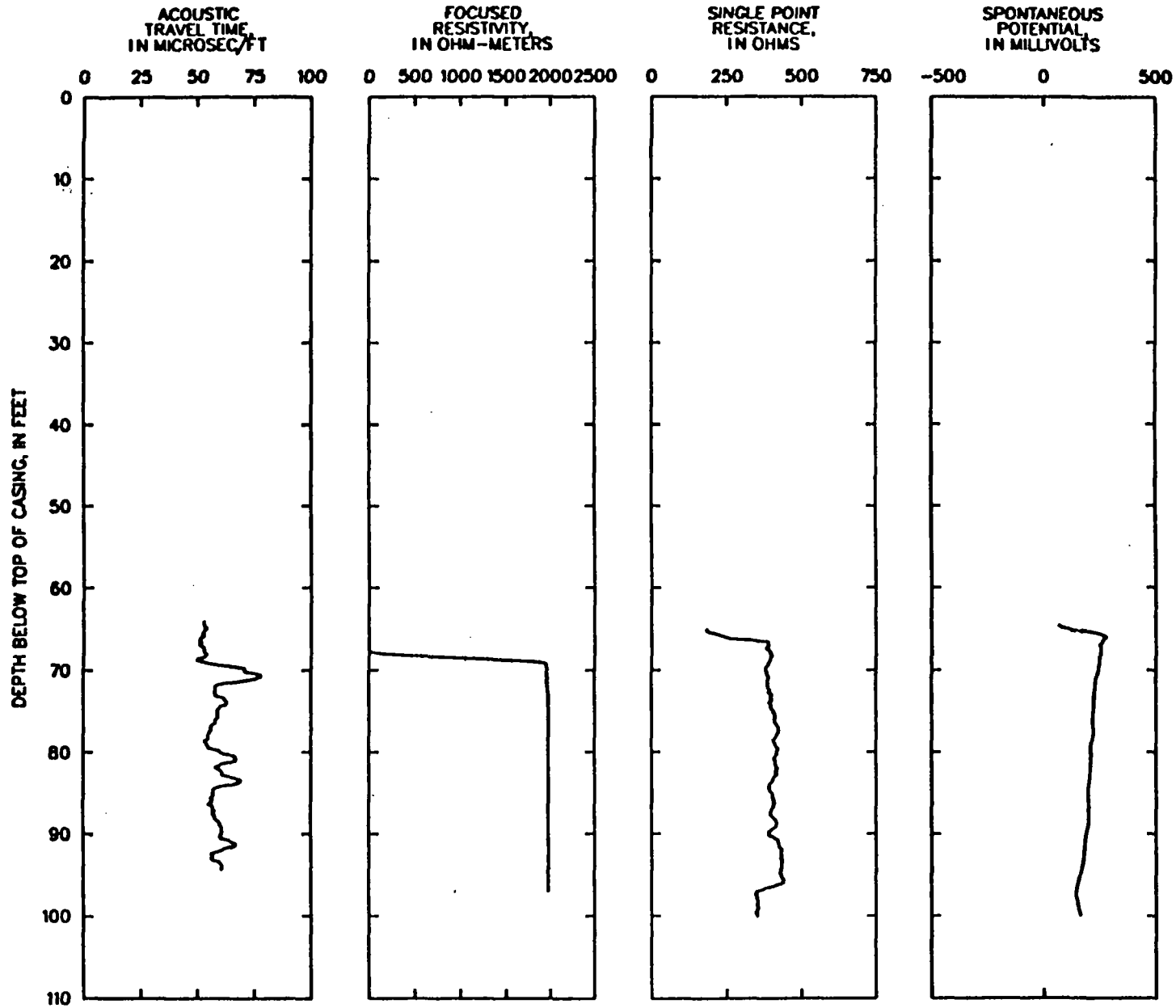
TIBBETTS RD, DOLAN

LOG SUMMARY TABLE
TIBBETTS RD
N. BOUCHER

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
73		(x)	(x)							N85W,25E
93		x								N85E,30E
98								x	x	



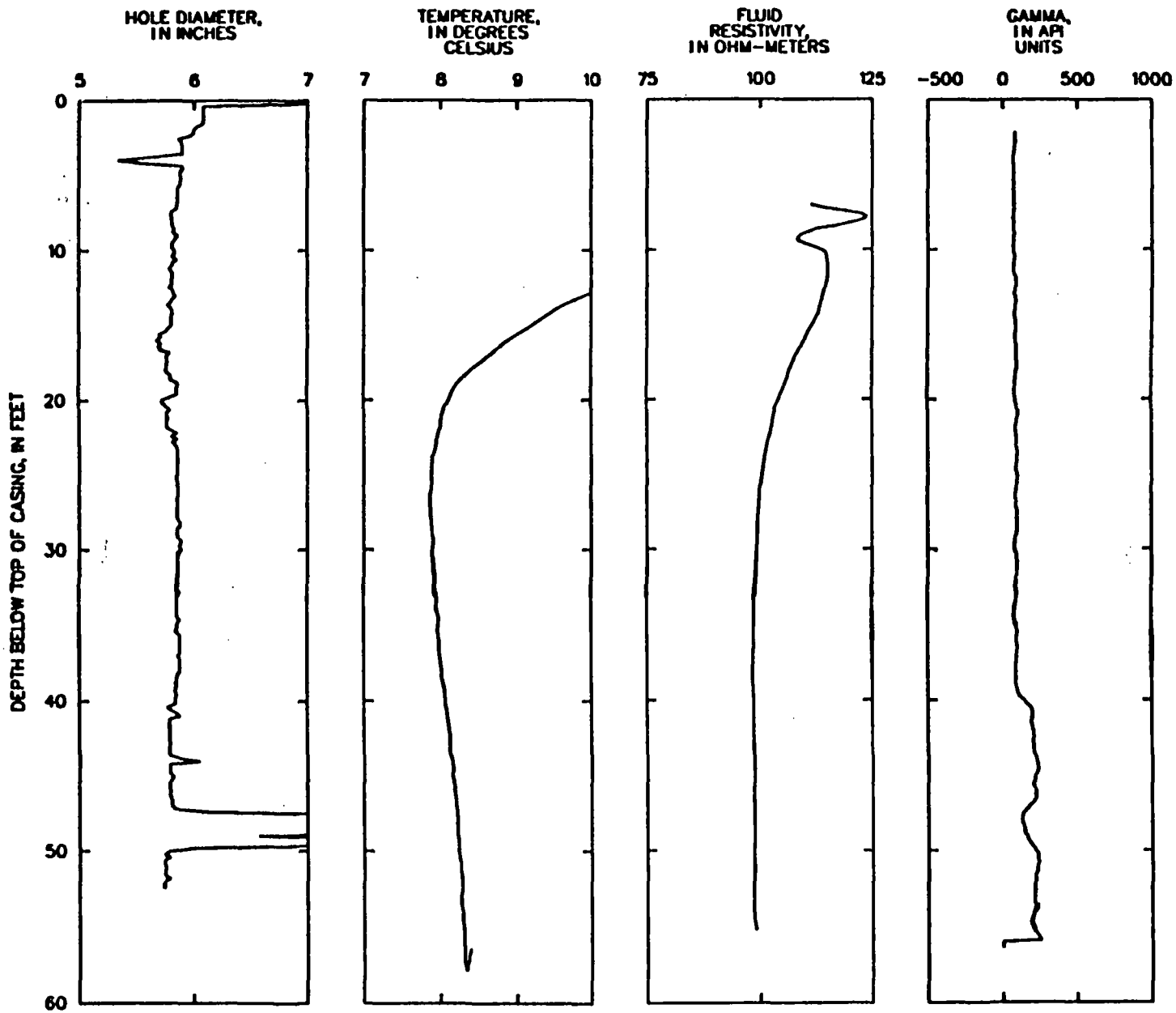
TIBBETTS RD, N-BOUCHER



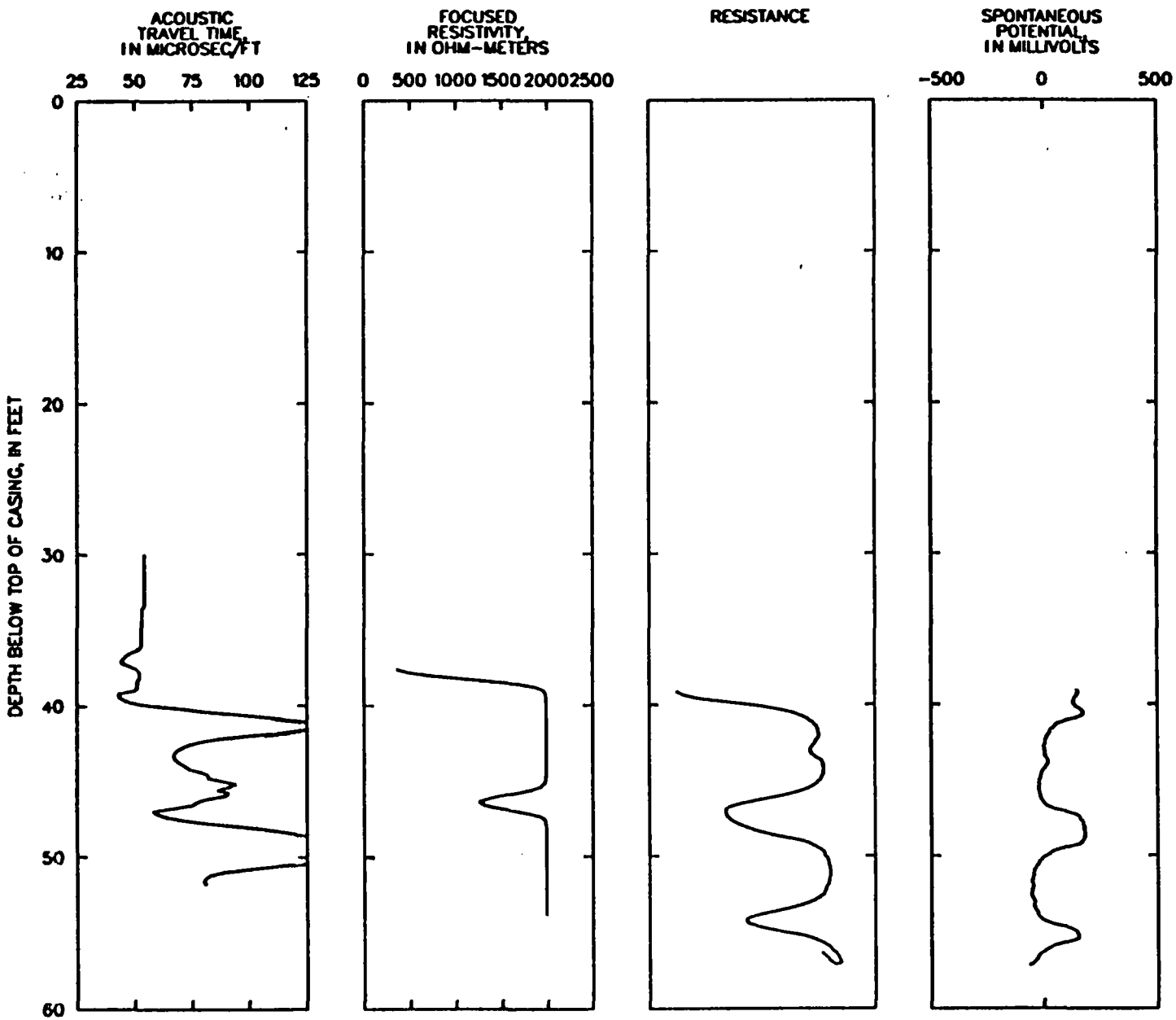
TIBBETTS RD, N-BOUCHER

LOG SUMMARY TABLE
TIBBETTS RD
LANE

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
41		(x)			(x)	x				
44		x	(x)			x				x
47.5-49		x			(x)	x	x	x	x	N05W,13W
49.5		x				x				N15W,31E
55								x	x	



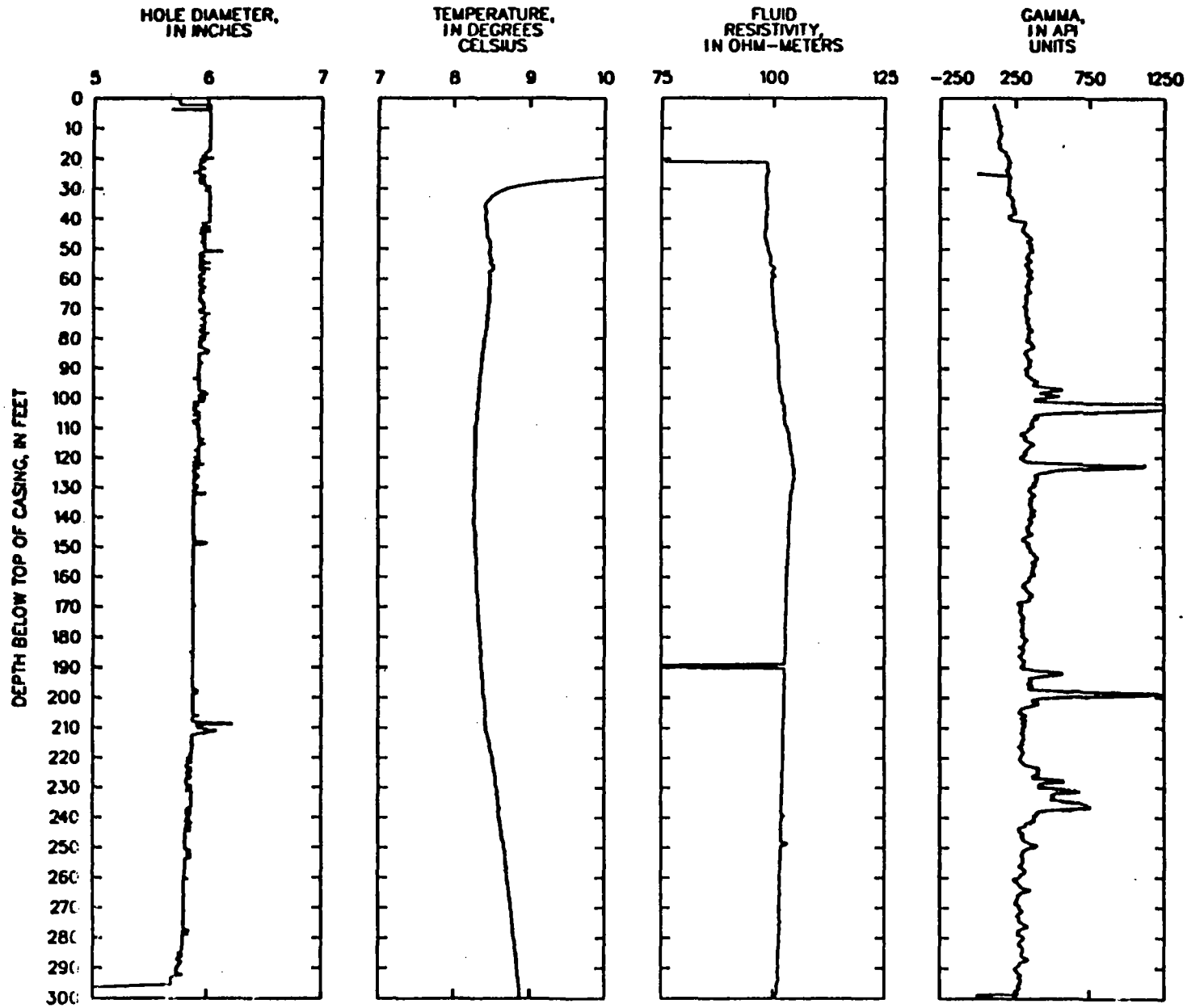
TIBBETTS RD. LANE



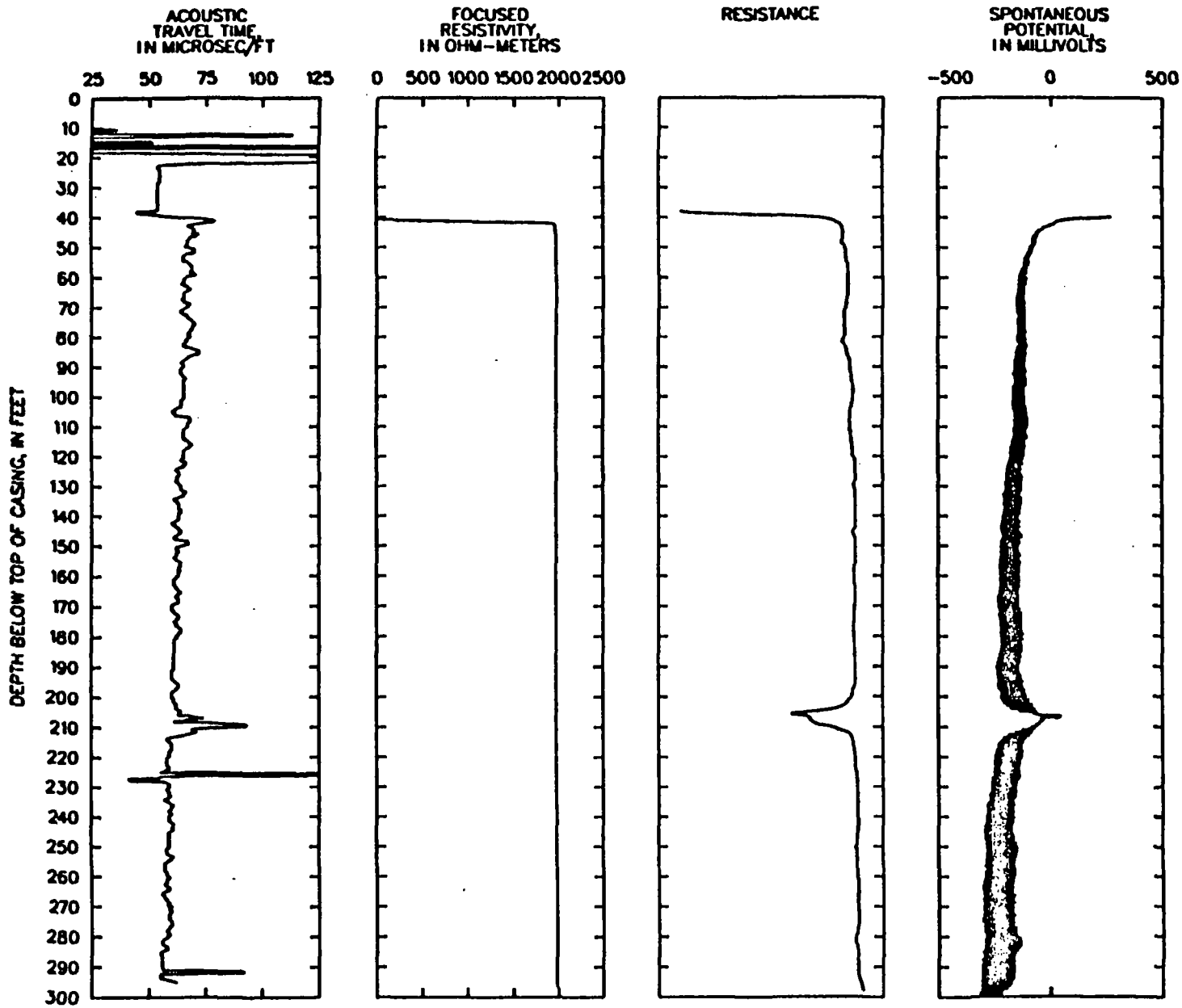
TIBBETTS RD, LANE

LOG SUMMARY TABLE
TIBBETTS RD
TOWNSEND

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
50		x	x	x				(x)		(N60W,13E)
55		(x)	x	x						
81				(x)				(x)		
84		x				(x)				N25E,81W
102				x	x					
122		(x)	x	x	x					(N35W,31E)
132		x								N05E,25W
148.5		x	x							N55E,57W
191				x	x					
199					x					
208.5		x	x			x	(x)	x	x	N85W,(44W)
210.5-211		x				x				N25E,77W N25E,62W
225-240					x	x				
250				(x)	(x)			(x)	(x)	



TIBBETTS RD, TOWNSEND



TIBBETTS RD, TOWNSEND

WELL LOGS -
BEDROCK MONITORING WELLS

BEDROCK	top bedrx/ case/bot hole	Comments

R1 - 32R **29/39/222** T = 12.9 gpd/ft, K = 0.07 gpd/ft^2 / 3.3 E-6 cm/sec; sand,silt,grav to 29 ft. changes to a grey-brown color at 20'; pumps 3gpm; frac at 48', 63' (2'wide, 3gpm, N55W 34E), 90'(N35E,67E), 100'(N5W 42W), 183'(N15E 13E), 217'(N15W 13E); qtz monzanite.

R2 - 33R **11/21/220.8** T = 84.1 gpd/ft, K = 0.42 gpd/ft^2 / 2 E-5 cm/sec; lt brn sand/silt/grav to bdrx; pumps 14 gpm; frac at 48' (14" wide, 8 gpm, N40E 42E), 56' (2 gpm, N50E 23W), 90'(N45E 59w), 158'(6" wide, 4 gpm), 192', 200'; may be a lithology change at 91 ft, driller logged qtz mon throughout.

R3 - 34R **60/60/222** K = 0.01 gpd/ft^2 / 5.7 E-7 cm/sec; pumped 7gpm; no fracs detected in drilling, fracs at 60-61' (N45E 37E), 108' (N75E 45W), 137' (N15W 73E).

R4 - 35R **25/29/82** T = 139.5 gpd/ft, K = 2.6 gpd/ft^2 / 1.2 E-4 cm/sec; yields 20 gpm, lt brn-gry sand with some silt and gravel to 23' then gravel boulder and sand to 25'; fracs at 37' (6", 3gpm), 41' (2', 2gpm), 48' (2', 5 gpm), 53' (5', 5gpm), 64' (5', 5 gpm).

B1D - 59R **50/61.5/203.5** Yield: @125 1qt/m (blow), @180-200 <1pt/m (pack); added polyfoamer to water to raise chips during drilling; Bedrock at 50 feet, 1985 responded very slightly to pumping B2D after 200 min.; Gamma & SP anom 150 to 183, cal & res NR, under half of log markedly differnt(poss contact?); GP logs in '90 indicate a relatively unfractured borehole that is very rough, numerous zones have been ided that may be zones of changing lithology (73-97, 125-130(may be a frac zone), and 155-185); A single frac was ided at 204'(N55W, 58SW).

B2D - 61R **59.5/71/203.5** Yield: @83 1gpm (blow), @143 2.5gpm, @74-93 6gpm(packer), @203.5 30gpm(blow). Hnu 40ppm @158; 12" frac @ 76, 6" frac @ 195; Pump test in 1984 wells 63R, 2R, 3R, 60S showed response. Slight response for 59R, 65R, 67R. NR for 5R, 1R, 69R, 14R, 4R and other overburden. Pump test in '85 showed connections to 3R, 2R and tenuous connection to B5D. Tests at the two pack zones (70-90 and 180-200) show that total contam falls with continued pumping, but that TCE and Ben remain constant and have values of 35 and 15 respectively after 6 hrs of pumping. The lower zone appears to be less contam than upper, but TCE and BEN are about equal with each depth. Multiwell tests were conducted pumping 61R at the following intervals: 70-90'/showed connect with 63R, T=104gpd/ft, K=2.5 E-4 cm/sec; 2R, T=1436, K=3.4E-3; 3R, T=287, K=6.8 E-4::180-200'/2R, T=917, K=2.2 E-3; 3R, T=187, K=4.4 E-4. Using USGS and GZA data it appears that fracs that transmit water are at about 76' (unknown orient), 110'(str.N60W dip 45W), and 202'(str.N80W dip33S) it may be further noted that GZA found that 78% of the borehole flow was at 202'. Minor fracs with possible flow were ided at 83'(N25W, 81W), 128'(N5E, 45W) and 136'(N10E, 51W). Cross hole flow metering indicated that 61R is connected with 63R but showed NR on 2R, but pumping was only 14 gpm. Poss change in litho occurs at 190 to 200'.

B3D - 63R **60/81/203** Yield: 105-123' 12gpm (pack), 123' 16gpm (bl), 143' 3gpm, 163' 6gpm, 202 6gpm; Used bentonite slurry to 81', drill rod dropped 4" at 115', driller found fracs at 130 (small), 150 (sm), 158 (10"), 162 (3"); Pump test in '84 found a connection with 61R. A connection was found with well 61R over the interval of 70 to 90 feet in 61R, but not 180 to 200 in the 1985 pump test. USGS showed stat flow at 120, 126.5, 149, 145. Under pumping of 61R flow occurred at 116(N30E,19W), 108(horiz?), 126.5(hor?), 130(litho change), and 139(N30E,23E). A change in litho occurred at 130', other fracs at depth that appeared significant did not respond to 61R test, notably the 157-162 (N15-20E, 53W) zone which the logs indicate to be significant. Below 162' fracs are rare.

B4D - 65R **70/81/203.5** Yield: 124' 6gpm(blow), 143 7.5gpm, 163 7.5gpm, 180-203.5 10gpm(pack). Driller noted frac at 118', very soft rock w Fe stain @ 124, and a frac at 188. In '84 pump test a slight connection with 61R was ided (1.12" drawdown after 362min). In '85 pump test other wells were monitored while zones 110-130 and 140-170 were pumped, 63R (@110 T=98, K=2.3 E-4, @140 T=344, K=5.4 E-4), 67R (@110 T=129, K=3.1 E-4, @140 T=174, K=2.8 E-4), 69R (@110 T=166, K=3.9 E-4, @140 T=224, K=3.5 E-4) and perhaps 5R were ided as being connected (except for 5R was not connected in 140-170 interval). It was est that 14R, 9R, 4R, 61R, 3R, 1R, 59R, and 2R are not substantially connected. Testing of effluent from the well at this time showed that Ben and TCE levels remained stabile (about 200 ppb) during the pump test. Heat flow tests showed no flow for both the static and pump tests at 95, 140, 160, and 190'. Fracs at 118 (N30E, 28W) 124 (N55W, 12W) were not tested(?) along with many between 80 to 90 feet.

B5D - 67R **70/81/164** Yield: 124 2.5gpm(blow), 164 2gpm(blow). Driller used bentonite to drill to 80', Hnu at 2ppm (background) at 10-30-70-90-120-140-164, small frac at 135, Poss. flow at 102 (logs) other investigated intervals (90, 110, 120, 124, 164 and 135) show no flow examining the logs (ATe, T, FLR, DFM). Perhaps a change in lithology occurs at 153'. In '84 pump test this well showed a slight connection to 61R (DD=2.22 aftr 362min of pumping). In '85 pump test this well showed no connection to either zone (70-90 and 180-200) in 61R, but did show a connection to both zones of 65R ((110-130/T=129/K=3.1 E-4) and (140-170/T=2.8 E-4).

B6D - 69R **32.5/32.5/58.3** Yield: No static tests were conducted in '84, and pumping 61R showed no response. In '85 this well showed a connection with well 65R {(110-130/T=166/K=3.9 E-4)(140-170/T=224/3.5 E-4)}. When the well was drilled it was cored to 58.3', the core showed heavily frac rx to bottom with Hnu readings of (40'-45ppm, 45'-1.5ppm, 50'-5ppm, 55'-1ppm). Core reveals that flow may have been occuring in the following fracs: 38.33' a vertical frac zone dip is about 80 deg., 42 <u>open</u> frac in pegm. dip 74, 45' 15-20 deg frac, 54' a 2" horiz frac, 55'10" weathered zone and horiz frac planes and sub horiz foliation, 58'4"-7or8" rough subhoriz open fracs weakly developed foliation.

75R **24/--/26** Well is screened in the weathered bedrock and lower till (21' to 26'). From 0 to 12' a brown sandy till was observed, from 12' to 15' a dense grey till, from 15' to 16' is a soft clay, from 16' to 24' is a dense grey till and from 24' to 26' is weathered bedrock.

76R **36/38/252** fractured 247 to 252, yields approx. 400 gpm, dry hole to 247, radar showed that the frac was dipping at an angle of approximately 30 to 40 degrees (no strike available at this time); had brown fine silty sand to 12, weathered bedrx is at 12′ to 36′;

78R **34/34/110** Well was drilled to 200′ but filled overnight with ochre to 110. during drilling fracs were found at 117 - 122′ @ 1.5 gpm and 156 - 157 @ 10 gpm; had 15′ of brn silty sand to 15′ and wx rock from 15 to 34′.

81R **17/60/310** Sandy gravel over brown sandy till to 17′ then weathered rock from 17′ to 60′. dry well.

32 R

ENVIRESPONSE INC.

PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190102 / 36682190102 BORING: R-1
T.O.C. ELEVATION: 298.70 msl GRND: 296.90 DATE: 9/18/85 - 9/24/85
FIELD GEOLOGIST: PAUL KARWAZINSKI

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR ROD (%)	SAMPLE REC./ SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
5.0			dry		lt. brown	sand and silt, some gravel. (SM)	
10.0			damp		brown	gravel, some sand. (GP)	
15.0			damp		brown	same as above.	
20.0			wet		brown-gray	med. to fine grained sand, some silt, trace gravel. (SM)	
25.0			wet		brown-gray	same as above.	
29.0						estimated bedrock surface @ 29ft. bedrock - quartz monzonite	
30.0						quartz monzonite	
35.0						"	
45.0						" small fracture @ 48ft.	
60.0						"	
63.0						" 2ft. fracture @ 63ft. [3gpm]	
80.0						" small fracture @ 90ft.	
100.0						" small fracture @ 100ft.	
120.0						"	
140.0						"	
160.0						"	
164.0						" small fracture @ 175ft.	
180.0						"	

REMARKS:

ENVIRESPONSE INC.

PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190102 / 35682190102
T.O.C. ELEVATION: 298.78 msl
FIELD GEOLOGIST: PAUL KARMAZINSKI

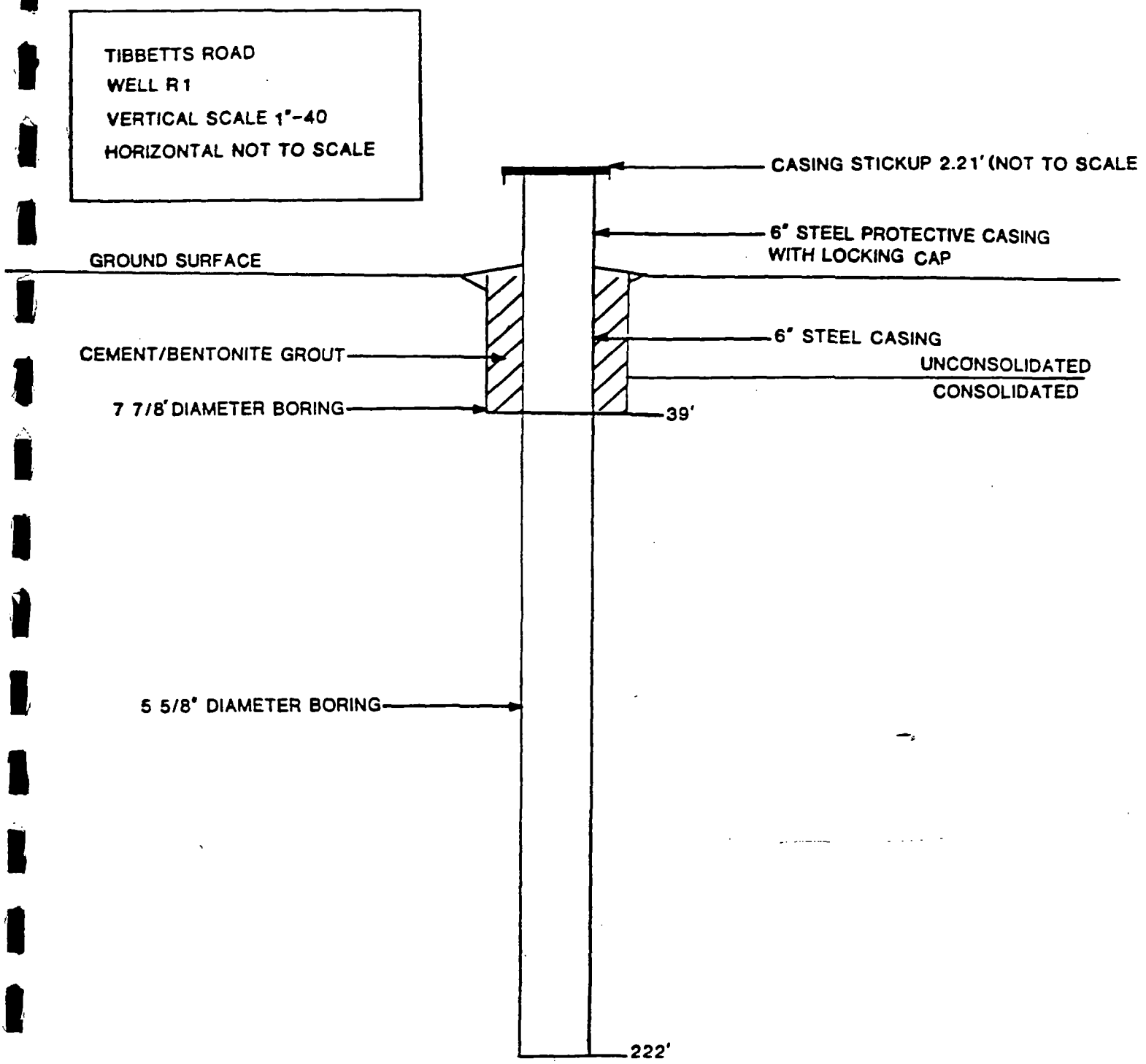
BORING: R-1
DATE: 9/18/85 - 9/24/85

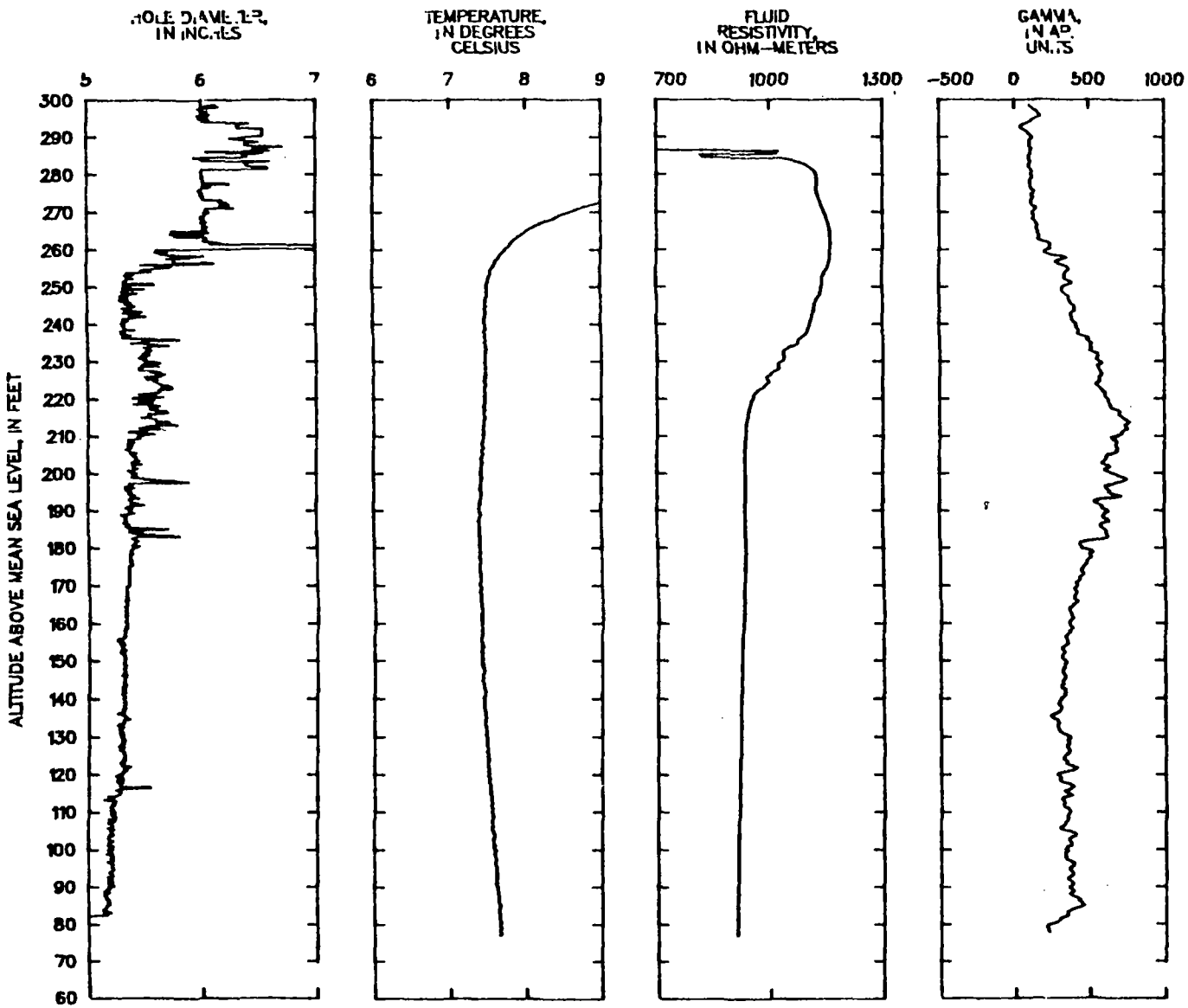
SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR RQD (%)	SAMPLE REC. / SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
182.0						quartz monzonite	
200.0						"	
203.0						"	
220.0						"	

C

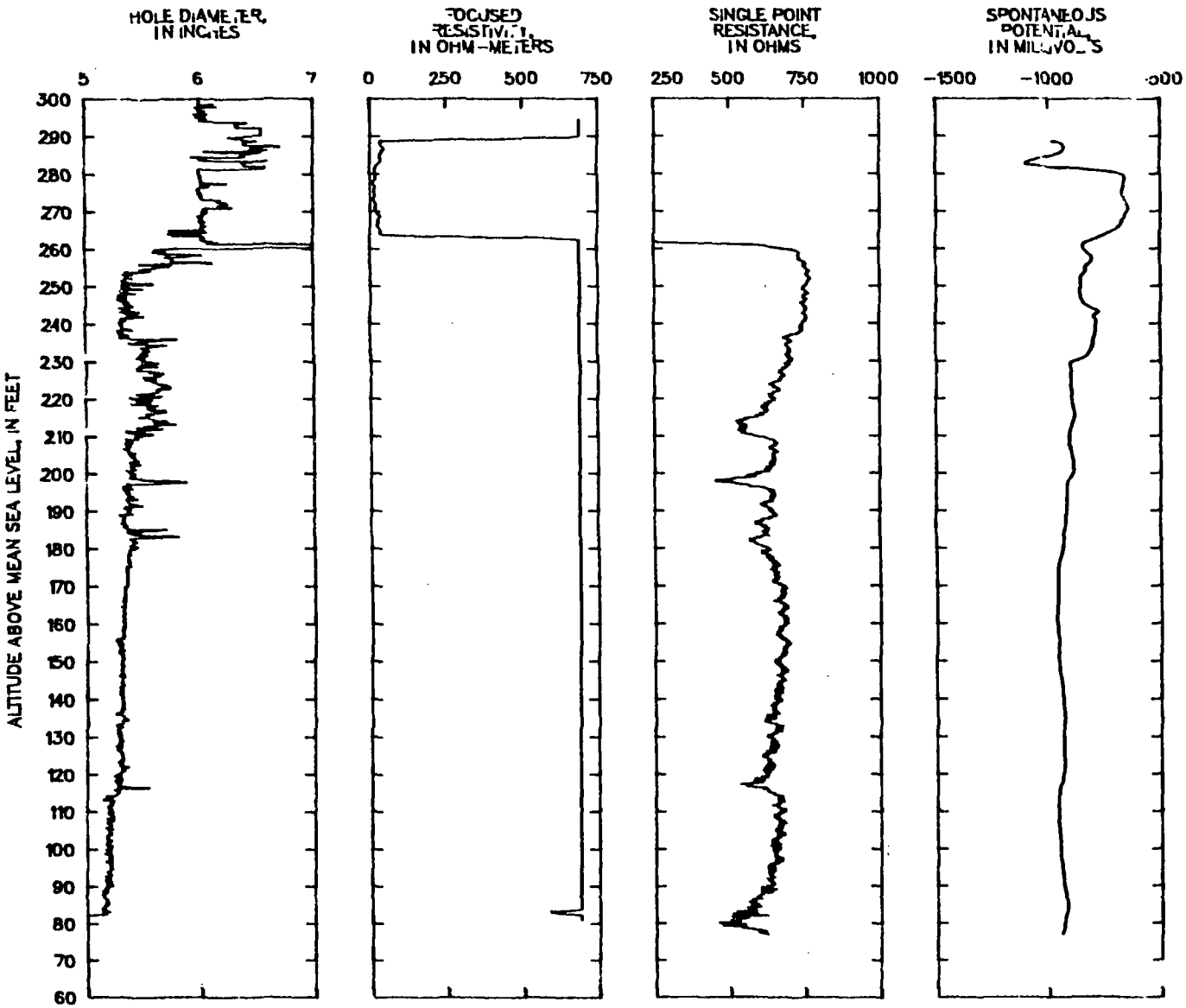
T (gpd/ft) = 12.9
Sat thick = 183'
K = 0.07 gpd/ft^2 / 3.3 x 10^{-6} cm/sec

REMARKS: Bottom of boring - 222ft. below ground surface.
Production rate - 3gpm.


TIBBETTS ROAD
WELL R1
VERTICAL SCALE 1"-40
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.21' (NOT TO SCALE
6" STEEL PROTECTIVE CASING
WITH LOCKING CAP
GROUND SURFACE
6" STEEL CASING
CEMENT/BENTONITE GROUT
UNCONSOLIDATED
CONSOLIDATED
7 7/8" DIAMETER BORING
39'
5 5/8" DIAMETER BORING
222'



ABBETTS RD, R1



ABBETTS RD, R1

LOG SUMMARY TABLE
TIBBETTS RD
R1

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL[1]	FOC	SPR	POT	ATV
39	260	x								
40	259	x								
41	258	x	x		(x)				x	
48	251	x		x	(x)					
54	245								x	
62	237	x	x	x	(x)			x		
64	235									[2]N55W,53E 34E
76	223	x	x	x						N40W,42E
80-117	219-182		x	x	x			(x)		
85	214	x						x	(x)	
85.5-91										N35E,67E
100-102	199-197	x	(x)		x		(x)	x	(x)	(N05W,42W)
105	294				x					x
113	186	x	(x)					(x)		(N30E,72E)
117	182	x	x		x			x		N75W,77W
120	179			x						
126	173									N35E,82W
164.5-166	134.5-	(x)	x					(x)		N05W,42E
183	116	x						x	(x)	N15E,13E
217.5	81.5						x	x	(x)	N15W,13E

[1]Acoustic velocity log not run on this well.
[2]Acoustic televiewer record showed fracture as "faulted". One dip angle (53^{o}) was determined using the entire vertical distance intercepted and the other (34^{o}) was determined by figuratively rejoining the two pieces of the record.

(33R)

ENVIRESPONSE INC.

PROJECT: TIBBETTS RD.
PROJECT NO.: 3568219018Z / 3668219018Z BORING: R-2
T.O.C. ELEVATION: 318.63 msl GRND: 308.38 DATE: 10/01/85 - 10/02/85
FIELD GEOLOGIST: PAUL KARWAZINSKI

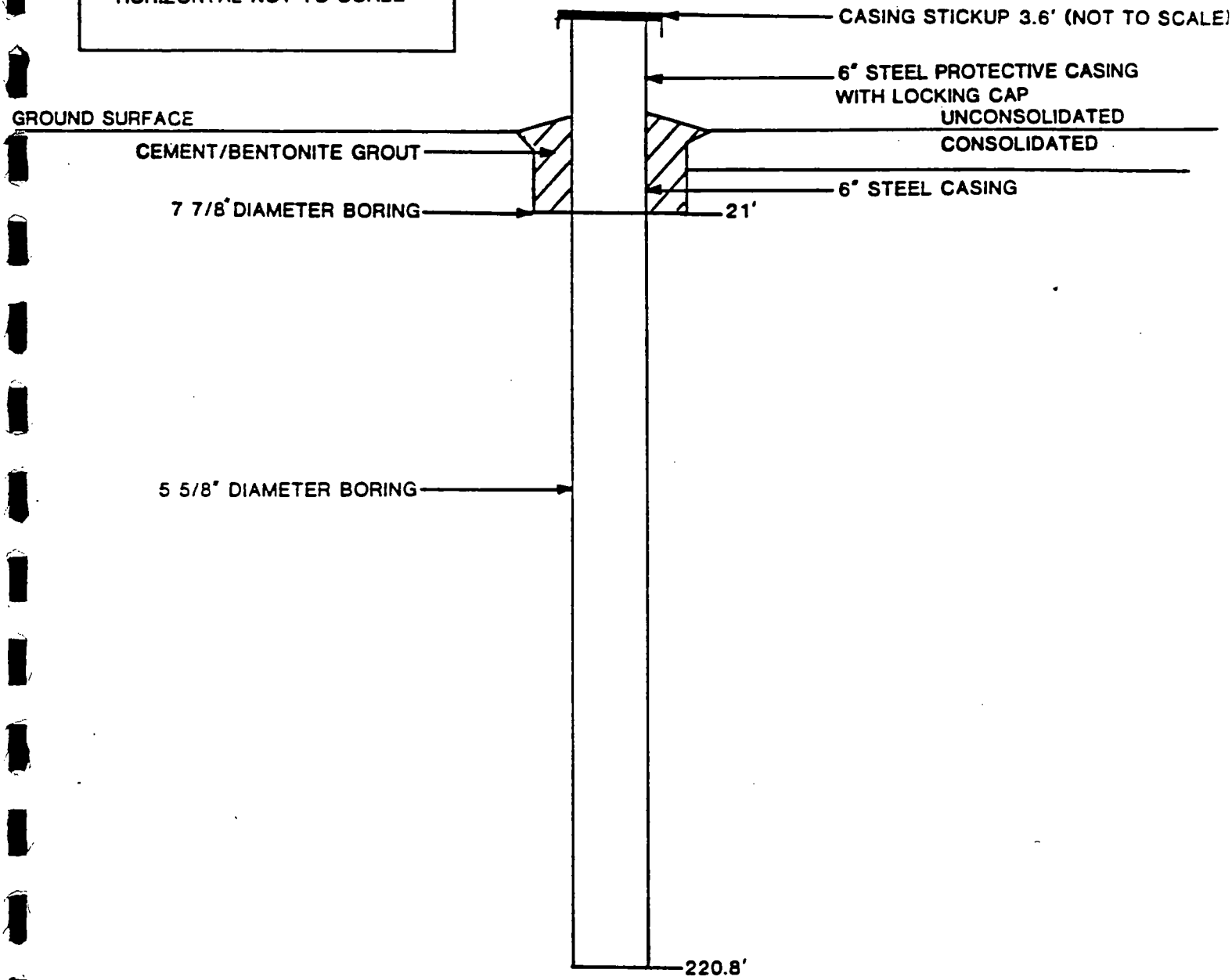
SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR REC (%)	SAMPLE REC./ SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
5.0			dry		lt. brown	sand and silt, some gravel. (SM)	
11.0						estimated bedrock surface @ 11.0ft bedrock - quartz monzonite	
15.0						quartz monzonite	
20.0						"	
40.0						"	
						14in. fracture @ 48ft. [8gpm]	
56.0						" small fracture @ 56ft. [2gpm]	
60.0						"	
80.0						"	
90.0						" small fracture @ 90ft.	
100.0						"	
120.0						"	
140.0						"	
						6in fracture @ 158ft. [4gpm]	
160.0						"	
180.0						"	
						small fracture @ 192ft.	
200.0						" small fracture @ 200ft	
206.0						"	
220.0						"	

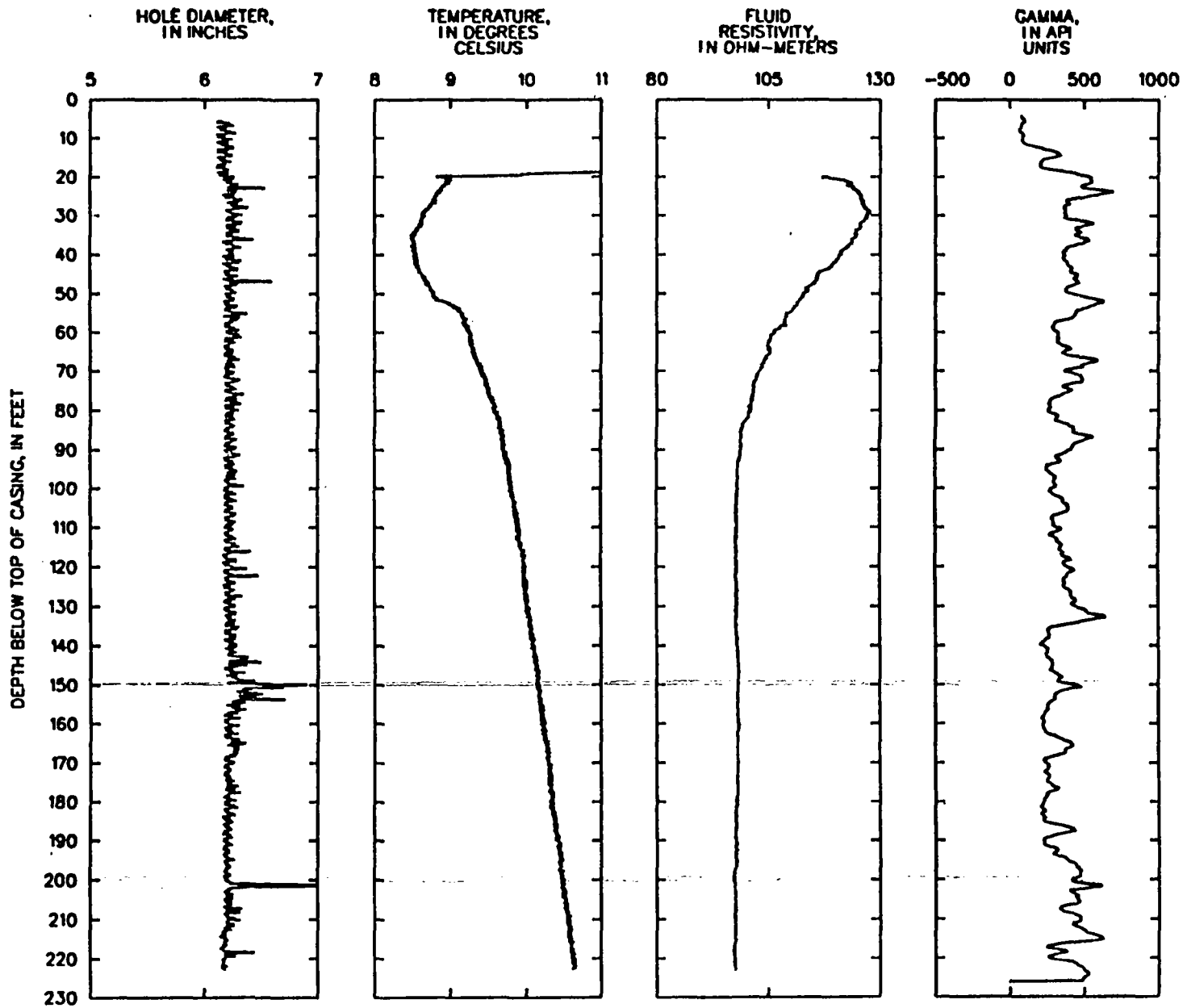
C

T = 84.1 gpd/ft²
Sat thick = 200'
K = 0.42 gpd/ft² / 2.0x10⁻⁵ cm/sec

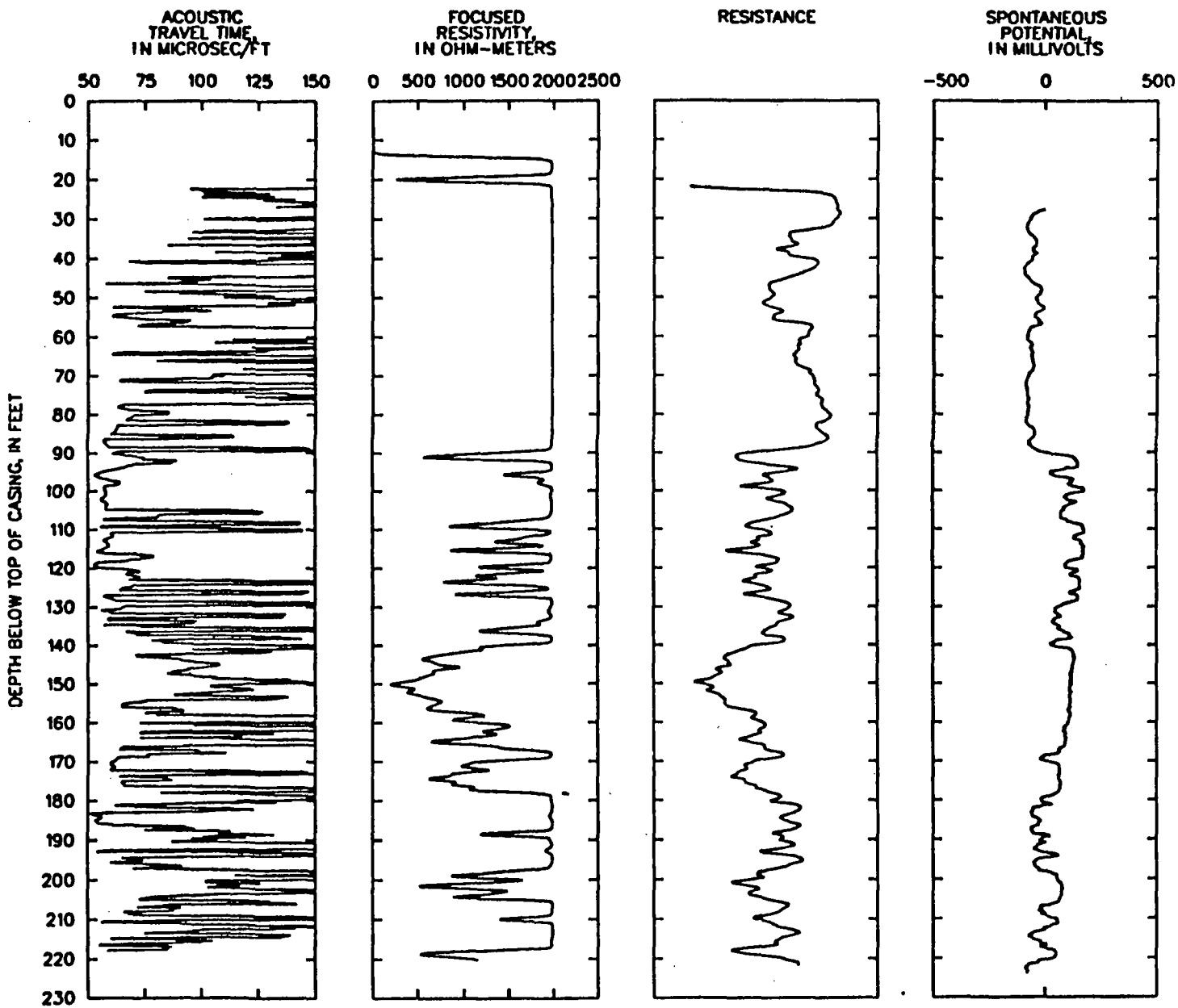
REMARKS: Bottom of boring - 222ft. below ground surface.
Production rate - 14gpm.

TIBBETTS ROAD
WELL R2
VERTICAL SCALE 1"-40
HORIZONTAL NOT TO SCALE





TIBBETTS RD, R2



TIBBETTS RD, R2

LOG SUMMARY TABLE
TIBBETTS RD
R2

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
23	288	x				x		x	x	x
28	283			x		x				N60W,29W
31	280					x				
36	275	x	x							(N40E, W)
38	273					x				
47	264	x	x	(x)						N40E,42E
51	260		x							
55	256	x	x	(x)			(x)			N50E,(23W)
59	252					x				(N85W, W)
67	244					x				
72	239					x				
83	228		x	x						
91-126	220-185			(x)			x	x	x	
91	220		(x)	(x)			x	x	x	(N45E,59W)
116	195	x	x				x	x	(x)	N05W,23E
120.5	190.5	x	x				x			N75E,42W
122.5	188.5	x	x				x			N55E,23W
135	176						x			(N45E,59E)
141	170						x	x	x	(N55E,55E)
144	167	x		x			x			N85W,18W
150.5	160.5	x					x	x	x	N15E,42W
153.5	157.5	x								N10E,79W
159	152					x				
164	147	(x)	x			x	x	x	x	
174	137						x	x		

LOG SUMMARY TABLE
TIBBETTS RD
R2 (continued)

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL	FOC	SPR	POT	ATV
189	122						x			(N15W,06W)
191	120					x				
199-203	112-108						x		x	
201.5	109.5	x		x			x	x		N10W,23W
209	102						x	x	x	
219	92	x					x	x	x	N05W,33W

34 R

330.57

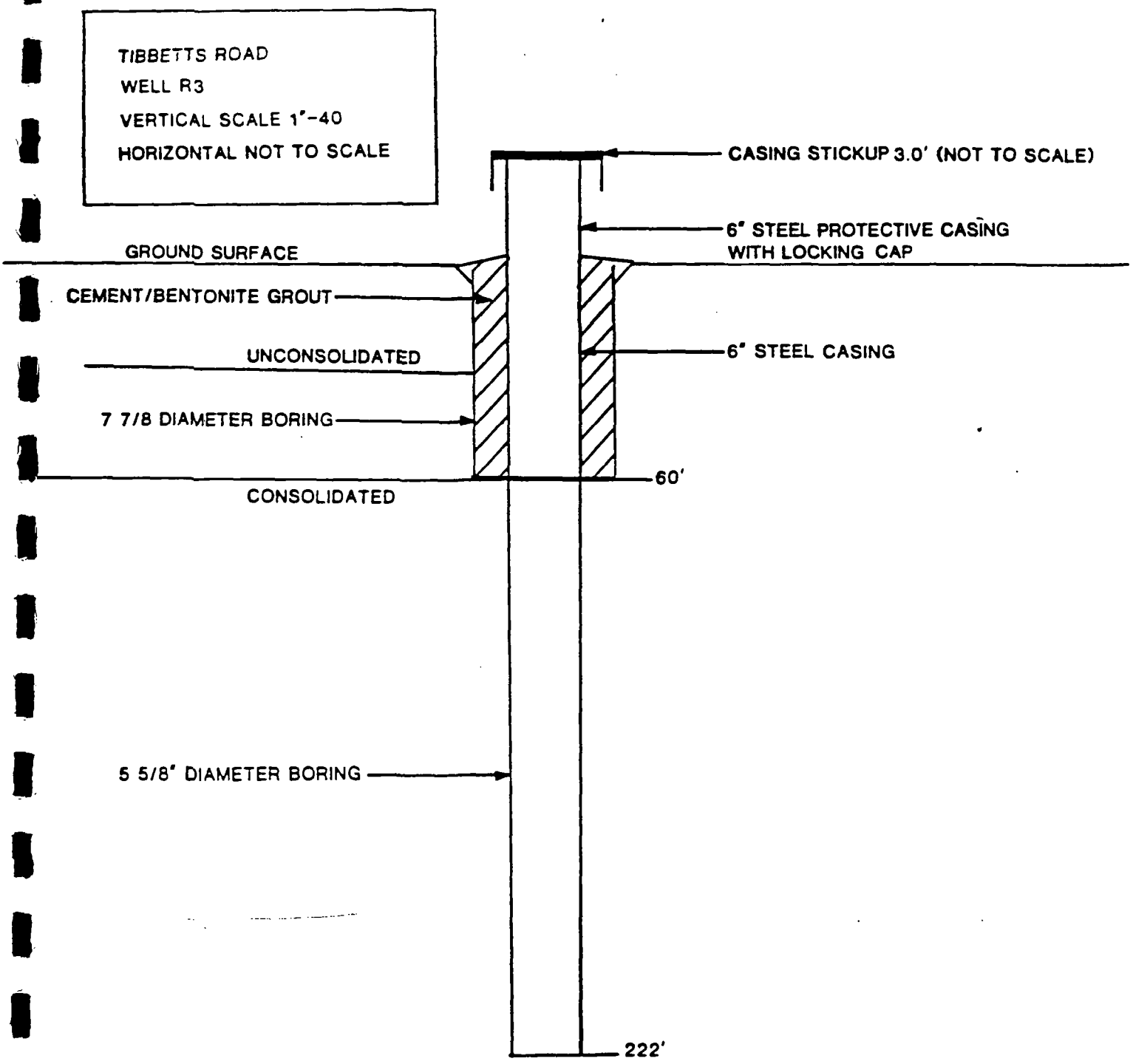
ENVIRESPONSE INC.

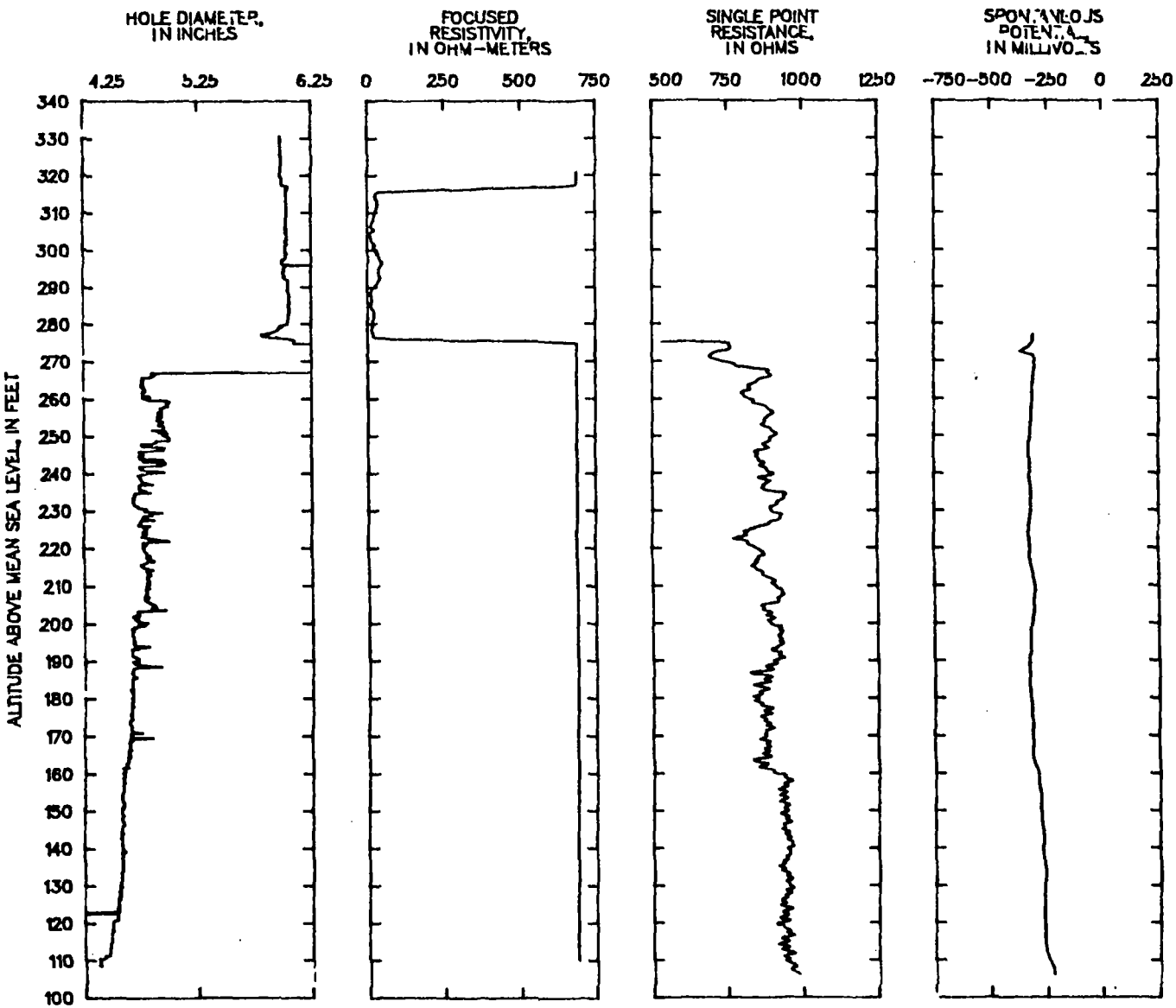
PROJECT: TIBBETTS RD.
PROJECT NO.: 356821901B2 / 366821901B2 BORING: R-3
T.O.C. ELEVATION: 330.95 msl GRND: 327.58 DATE: 9/17/85 - 9/26/85
FIELD GEOLOGIST: PAUL KARMAZINSKI

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR RQD (%)	SAMPLE REC. / SAMP. LENGTH	WAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
0-25.0						(see boring T-6D)	
						estimated bedrock surface @ 60ft.	
						bedrock - quartz monzonite	
65.0						quartz monzonite	
80.0						"	
100.0						"	
120.0						"	
140.0						"	
160.0						"	
180.0						"	
200.0						"	
220.0						"	

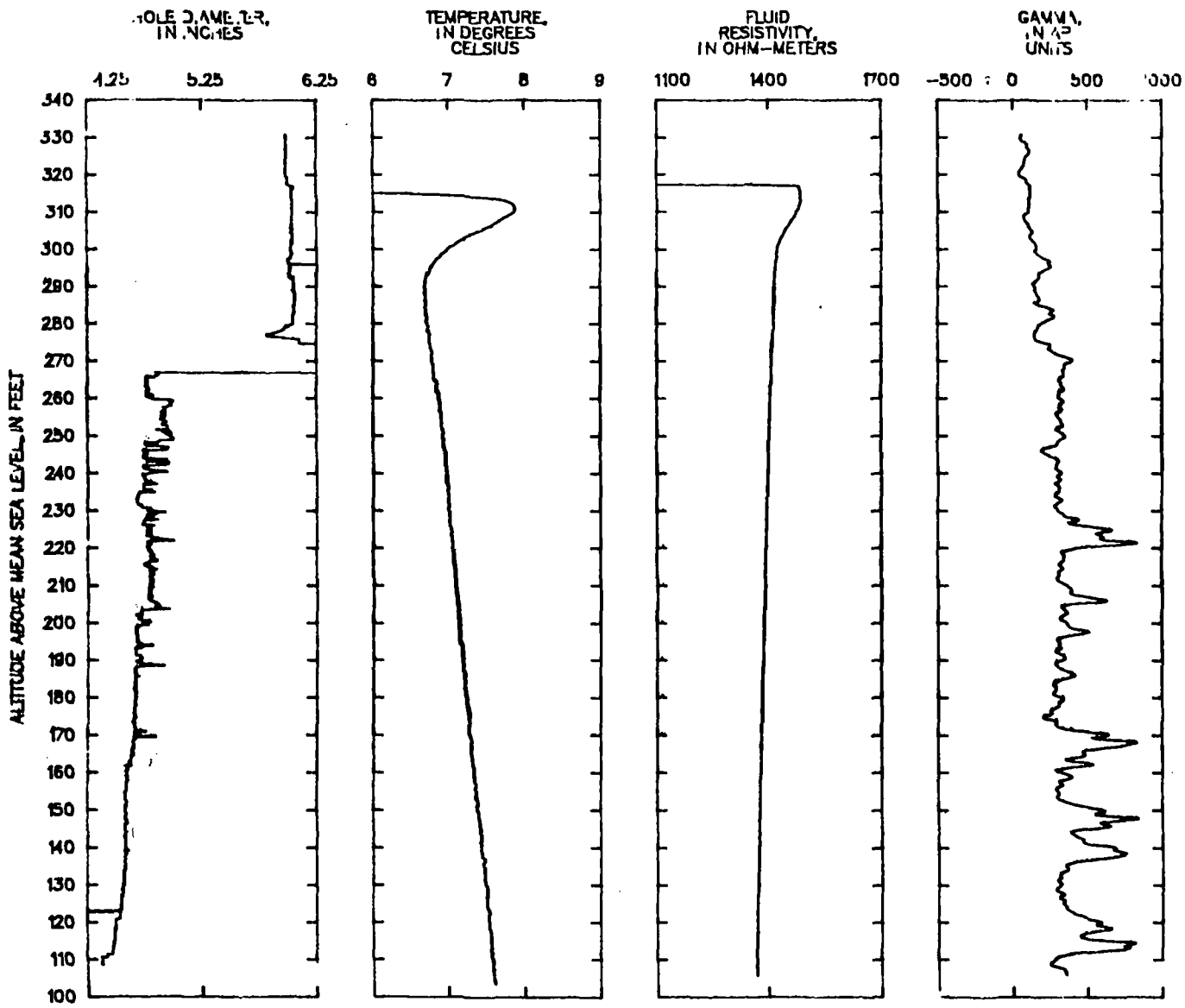
K(bail) = 0.01 gpd/ft² // 5.7×10⁻⁷ cm/sec

REMARKS: Bottom of boring - 222ft. below ground surface.
No detectable fractures.
Production rate - 7gph.


TIBBETTS ROAD
WELL R3
VERTICAL SCALE 1"-40
HORIZONTAL NOT TO SCALE
CASING STICKUP 3.0' (NOT TO SCALE)
6" STEEL PROTECTIVE CASING
WITH LOCKING CAP
GROUND SURFACE
CEMENT/BENTONITE GROUT
UNCONSOLIDATED
6" STEEL CASING
7 7/8 DIAMETER BORING
60'
CONSOLIDATED
5 5/8" DIAMETER BORING
222'



ABBETTS RD, R3


HOLE DIAMETER, IN INCHES
4.25
5.25
6.25
TEMPERATURE, IN DEGREES CELSIUS
6
7
8
9
FLUID RESISTIVITY, IN OHM-METERS
1100
1400
1700
GAMMA, IN API UNITS
-500
0
500
1000
ALTITUDE ABOVE MEAN SEA LEVEL, IN FEET
340
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100

:BBE.:S RD, R3

LOG SUMMARY TABLE
TIBBETTS RD
R3

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL[1]	FOC	SPR	POT	ATV
60-61	271-270	x			x			x		N45E,37E
71	260	x		(x)				x		N25E,51W
95.5	235.5							(x)		N30W,45E
101	230	x								[2]N70W,74E N35W,45E
105	226		(x)		x					(N45W),27W
108.5	222.5	x	(x)		x		(x)	x		(N75E,45W)
115	216									N25W,80E
125	206				x			x		
129	202	x	(x)							N30W,(84E)
133	198				x					
137.5	193.5	x	x							N15W,(73E)
142	189	x								N15W,74W
145	186				x			x		[2](N25W,27E) (N10W,72W)
161	170	x			x					
163	168				x					N30E,27E
168	163	(x)						x	x	
183	148				x					
192	139				x					
212.5	118.5				x					N75E,28W
218.5	112.5				x				x	N20W,28E

[1]Acoustic velocity log not run on this well.
[2]Two fractures at this depth.

(35 R)

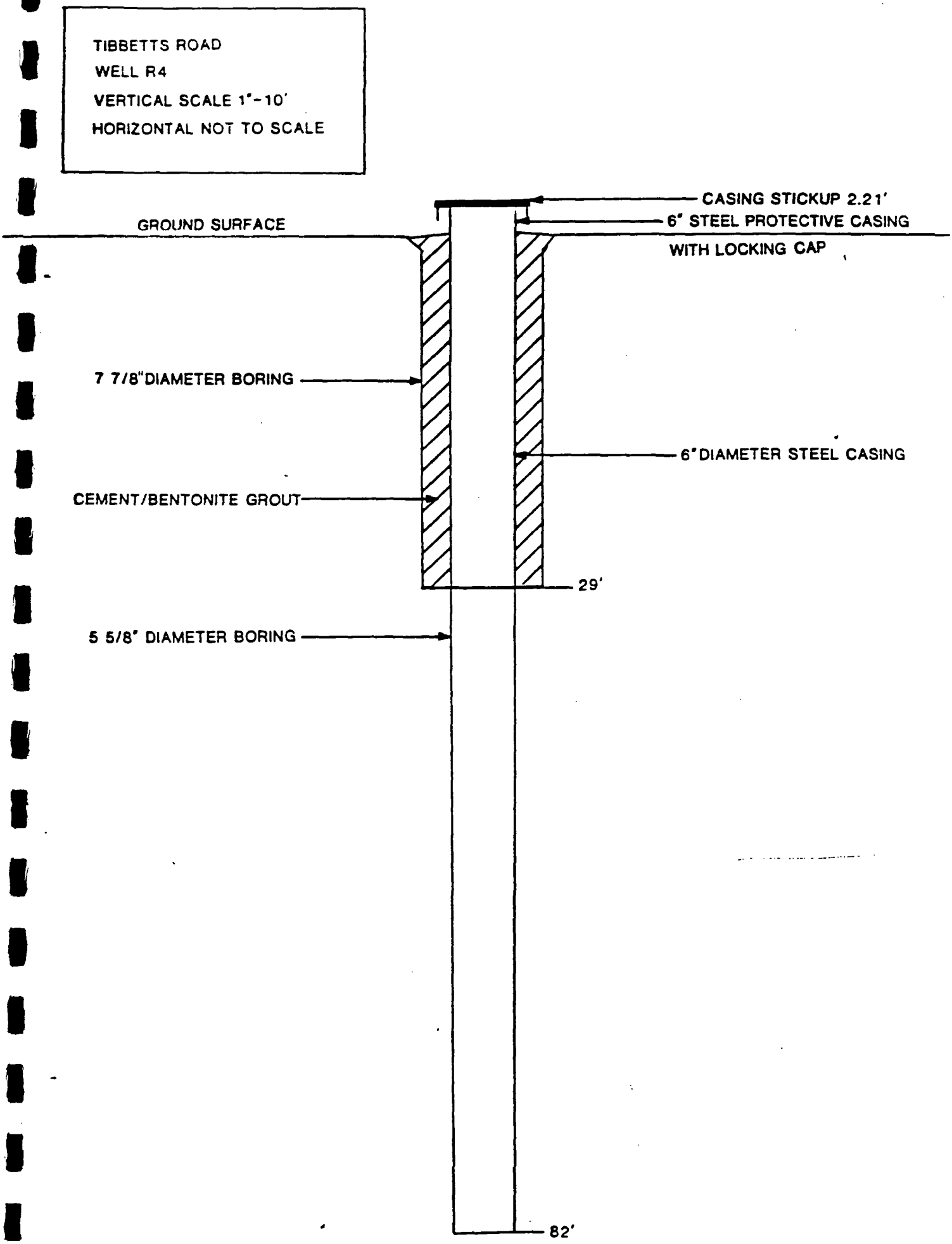
ENVIRESPONSE INC.

PROJECT: TIBBETTS RD.
PROJECT NO.: 35682190182 / 36682190182 BORING: R-4
T.O.C. ELEVATION: 322.12 msl GRND: 320.32 DATE: 9/17/85 - 9/23/85
FIELD GEOLOGIST: PAUL KARWAZINSKI

SAMP. NO. & DEPTH (FT)	BLOWS/SIX IN. OR ROD (%)	SAMPLE REC. / SAMP. LENGTH	MAT. MOIST. & W.T. (FT)	SOIL DEN/ ROCK HARD.	COLOR	MATERIAL CLASSIFICATION (USCS or rock brokenness)	REMARKS
8.0-28.0						(see boring T-5)	
23.0					brown-gray	gravel, boulder and sand zone.	
						estimated bedrock surface @ 25ft.	
						bedrock - quartz monzonite	
27.0						quartz monzonite	
29.0						"	
37.0						" 6in. fracture @ 37ft. [3gpm]	
40.0						"	
41.0						" 2ft. fracture @ 41ft. [2gpm]	
47.0						"	
						" 2ft. fracture @ 48ft. [5gpm]	
49.0						"	
53.0						" 5ft. fracture @ 53ft. [5gpm]	
58.0						"	
63.0						"	
						" 5ft. fracture @ 64ft. [5gpm]	

T = 139.5 gpd/ft.
Sat thick = 53'
K = 2.60 gpd/ft^2 / 1.2×10^{-4} cm/sec

REMARKS: Bottom of boring - 82ft. below ground surface.
Production rate - 20gpm.


TIBBETTS ROAD
WELL R4
VERTICAL SCALE 1"-10'
HORIZONTAL NOT TO SCALE
CASING STICKUP 2.21'
6" STEEL PROTECTIVE CASING
WITH LOCKING CAP
GROUND SURFACE
7 7/8"DIAMETER BORING
6"DIAMETER STEEL CASING
CEMENT/BENTONITE GROUT
29'
5 5/8" DIAMETER BORING
82'

59R

NHWS&PCC BORING LOG

SITE

Tibbetts Road
Barrington

Boring No: B-1D
Sheet: 1 of: 2
Date: 7/5/84

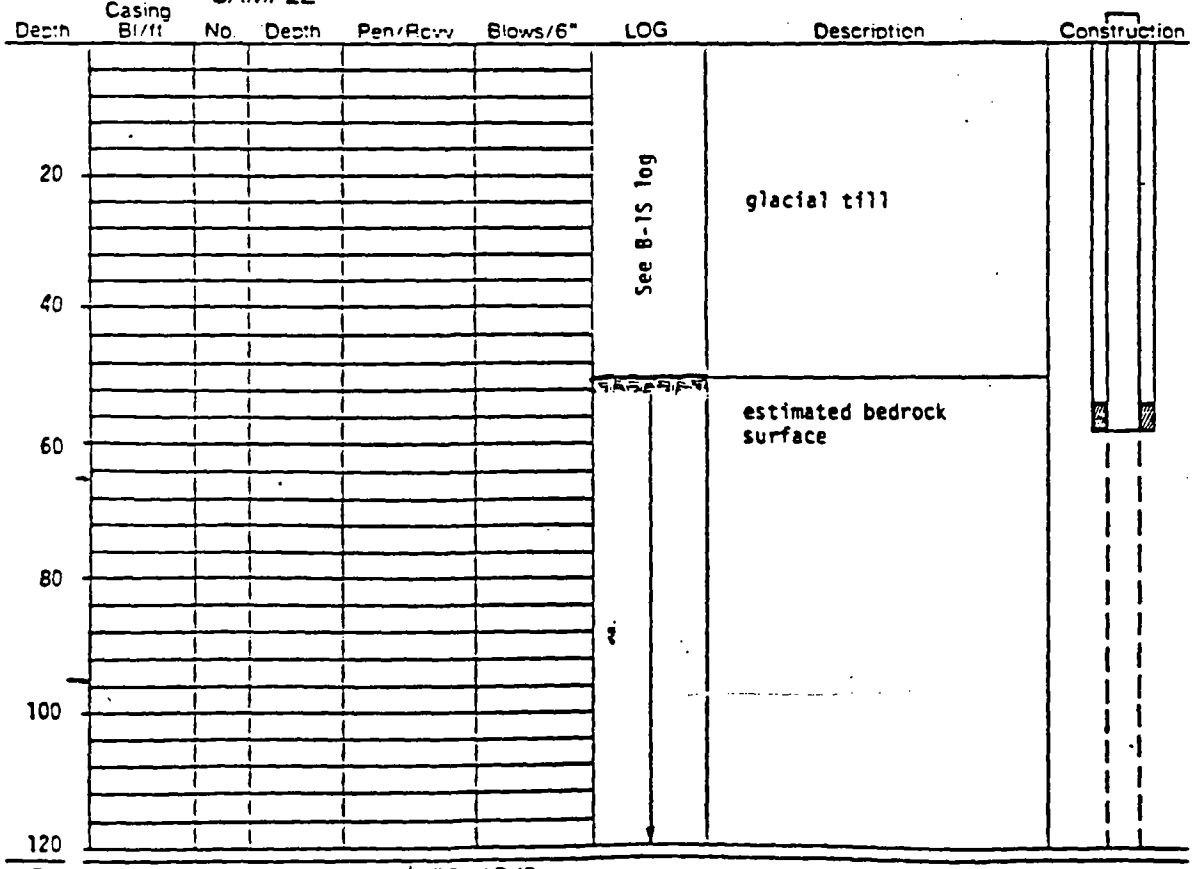
Boring Company: Tasker Well
Foreman: Danny Tasker
Geologist/Engineer: John Regan

Boring Location: B-1D - deep Mr. Treadwell/Downing Line along Tibbetts Road
Ground/Casing Elevation:
Starting Date: 7/5/84 Ending Date: 7/6/84

SAMPLER: Forta drill - air rotary
Type N/A
Hammer Wt.
Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/11/84	22'3"	T.O.C.	
7/12/84	21.05'	T.O.C.	14:30



KEY:

Granular Bls/ft	Desc.	Cohesive Bls/ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	cense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Ran dry to approx. 14', estimated water table, added poly-foamer to water to raise chips from 14'-60'.
2. Set 61'-6" I.D. steel, sealed above driving shoe w/two bags of cement. Drilled 8 3/4" hole to 61'.

Yield test 125' — 1 qt/min — blow test
180-200' — <1 pt/min — packer

NHWS&PCC BORING LOG

SITE

Tibbetts Road

Barrington

Boring No: B-1D

Sheet: 2 of: 2

Date: 7/5/84 and 7/6/84

Boring Company: Tasker Well

Boring Location: SE along Tibbetts Rd. Treadwell/Downing line

Foreman: Danny Tasker

Ground/Casing Elevation:

Geologist/Engineer: John Regan

Starting Date: 7/5/84 Ending Date: 7/6/84

SAMPLER

Type N/A

Hammer Wt.

Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

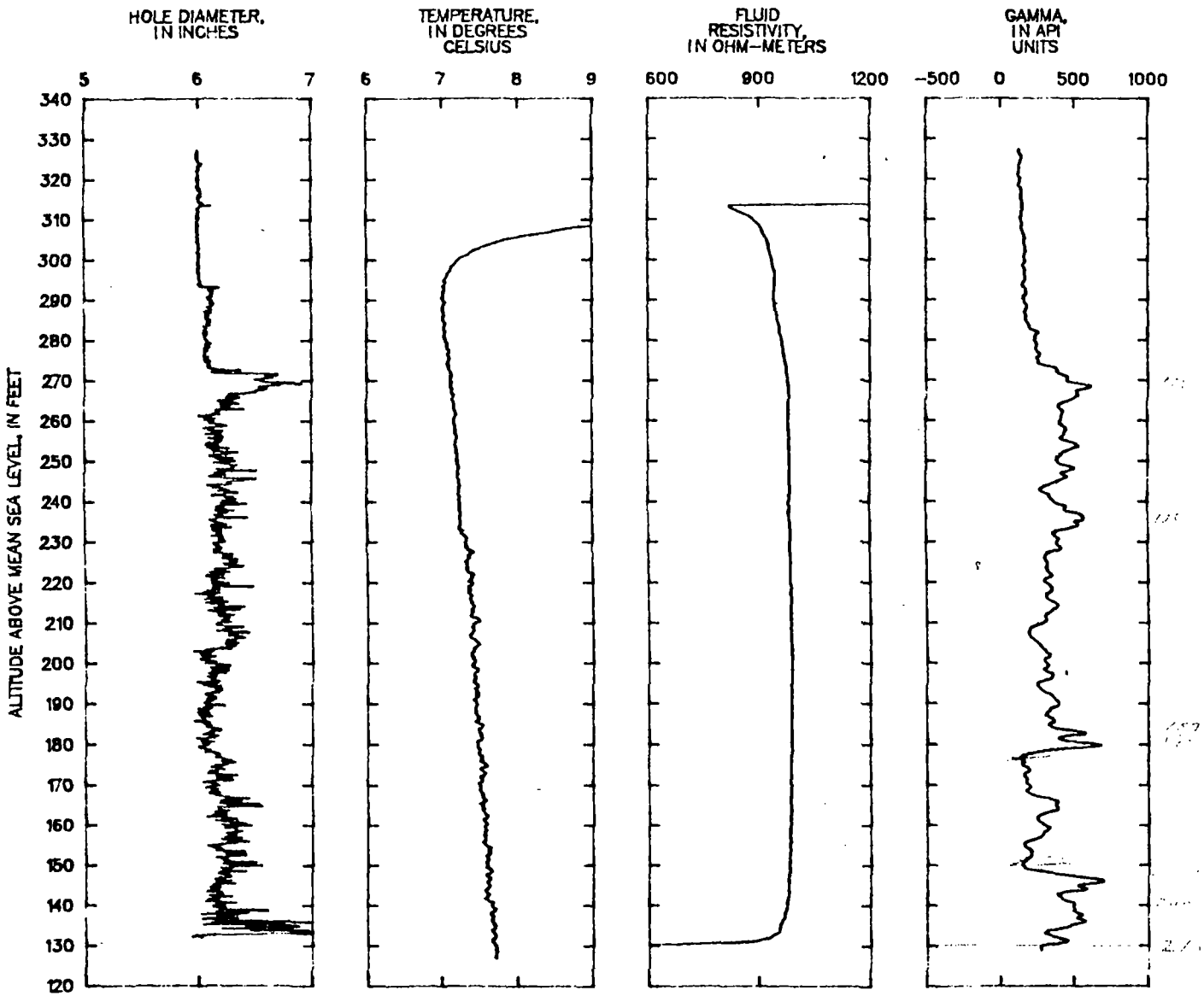
Depth	Casing Bl/ft	SAMPLE No.	SAMPLE Depth	SAMPLE Pen/Rcvy	SAMPLE Blows/6"	LOG	Description	Construction
							1 qt./min. @ 125' quartz monzonite	
140								
160								
180								
200							bot. of hole @ 203'6"	
220								
240								

KEY

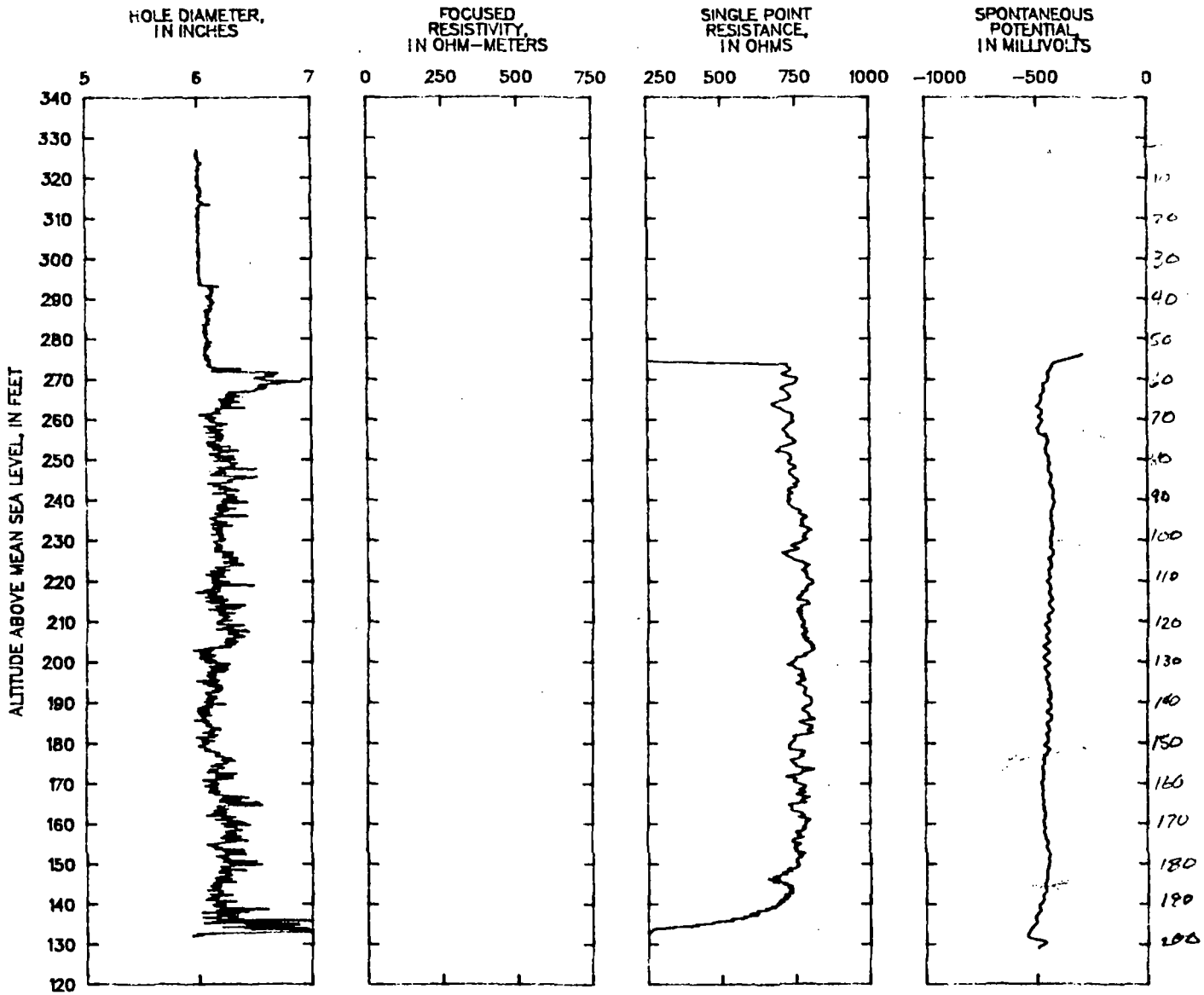
Granular Bls./ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m. dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Ran packer test @ 180-200', Down Time 2.0 hrs.
2. 6" steel casing 11 1/2" above ground, w/locking cap.
3. No fractures noted during drilling.



TIBBETTS RD, B1D

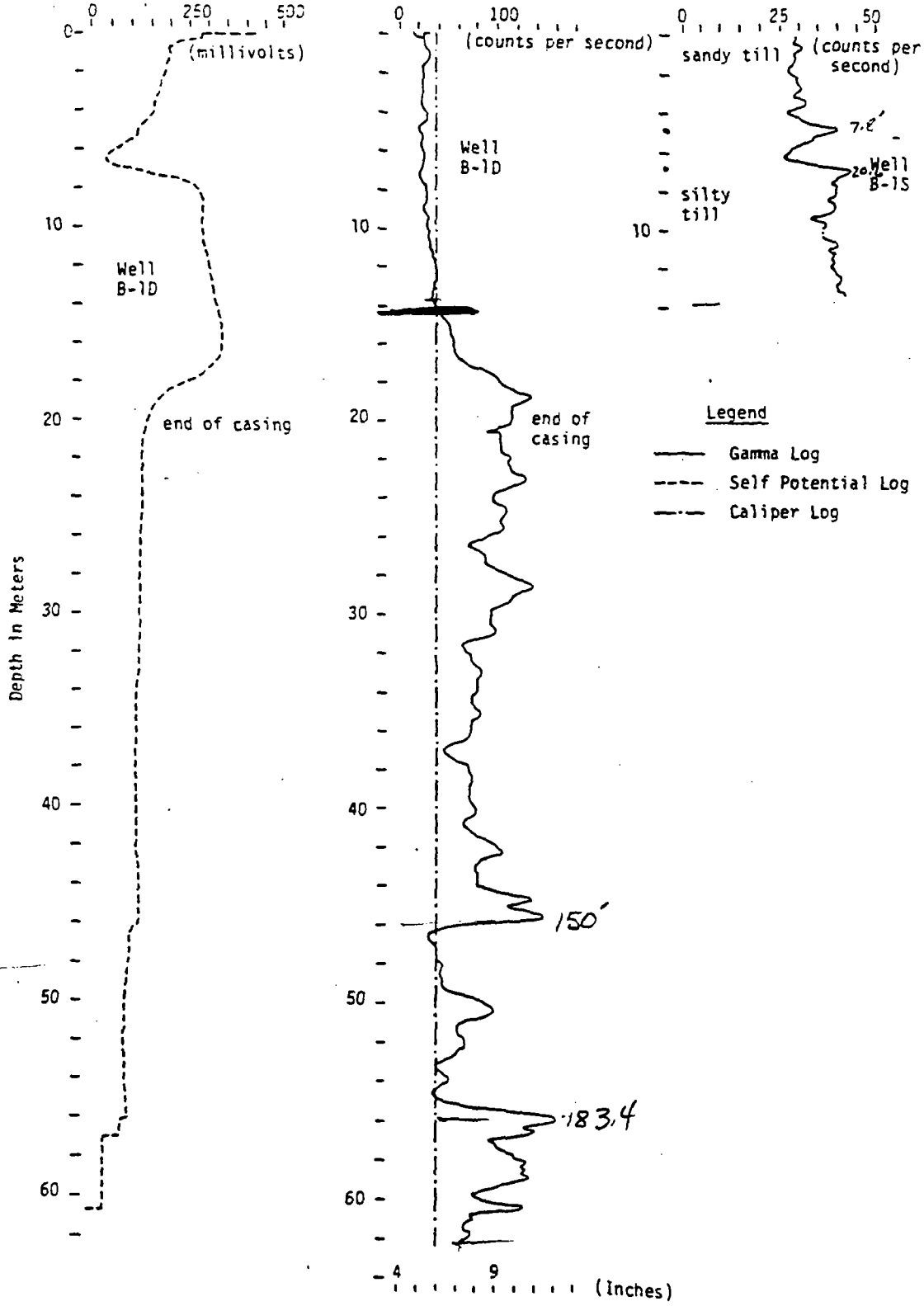


TIBBETTS RD, B1D

LOG SUMMARY TABLE
TIBBETTS RD
B1D

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL[1]	FOC[1]	SPR	POT	ATV
64	270				x					
74	260	x	x							N20W,77W
98	236				x					
103	231		x					(x)		
106.5	227.5									N05W,39W
109	225									N10E,22E
110	224									N05W,17E
114.5	219.5	x								N35W,11E
120	214				(x)					N10W,58W
150	184				x					
153	181				x					
157	177	(x)			x				x	N65W,61W
178	156				x					
204	130	x						x	x	N55W,58W

[1]Acoustic velocity and focused resistivity logs not run on this well.



b

BOREHOLE GEOPHYSICAL LOGS, WELLS 1S AND 1D,
TIBBETTS ROAD SITE, BARRINGTON

61R

Resurveyd
TOC 327.78
Grd. 326.62

NH ± elev.

TOC: 328.66ª GRND: 327.11ª

NHWS&PCC BORING LOG

SITE
Tibbetts Road Site
Barrington

Boring No: B-2D
Sheet: 1 of: 2
Date: 7/10/84

Boring Company: Tasker Well Co.
Boring Location: B-2D, 15' from B-2S, Downing/Boucher line along Tibbetts Road
Foreman: Danny Tasker
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: 7/10/84
Ending Date: 7/10/84
Portadrill Air Rotary

SAMPLER

Type: N/A
Hammer Wt.: — — —
Fall:

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/11/84	32'0"	T.O.C.	

Depth	Casing Bl/ft.	Sample No.	Sample Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
20								
40						See B-2S log	glacial till	
60							estimated bedrock surface	
							quartz monzonite	
80							12" fracture @ 76'	
							1 gpm @83'	
100								
120								

See 2S

Horiz. Splays →

110 N60W dip 45W

76
83
143
195
203.5

7' frac 1 deg

Frac N25W dip 81W

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v dense	15-30	v. stiff
		>30	hard

REMARKS:
1. 71' of 6" steel casing, drilled 8 3/4" hole to 69' using bentonite slurry.
2. Packer test @ 74'-93'.
3. Well adjacent to disposal area containing bottles and cans.

Yield test 83'	1gpm	blow
74-93	6gpm	packer
203.5	30gpm	blow

62A Id'd flow at 79, 110 and 202

NHWS&PCC BORING LOG

SITE
Tibbetts Road Site
Barrington

Boring No: B-2D
Sheet: 2 of: 2
Date: 7/10/84

Boring Company: Tasker Well Co.
Foreman: Danny Tasker
Geologist/Engineer: John Regan

Boring Location: Along Tibbetts Rd. - Near Treadwell/Boucher Line
Ground/Casing Elevation:
Starting Date: 7/10/84 Ending Date: 7/10/84

SAMPLER
Type
Hammer Wt.
Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

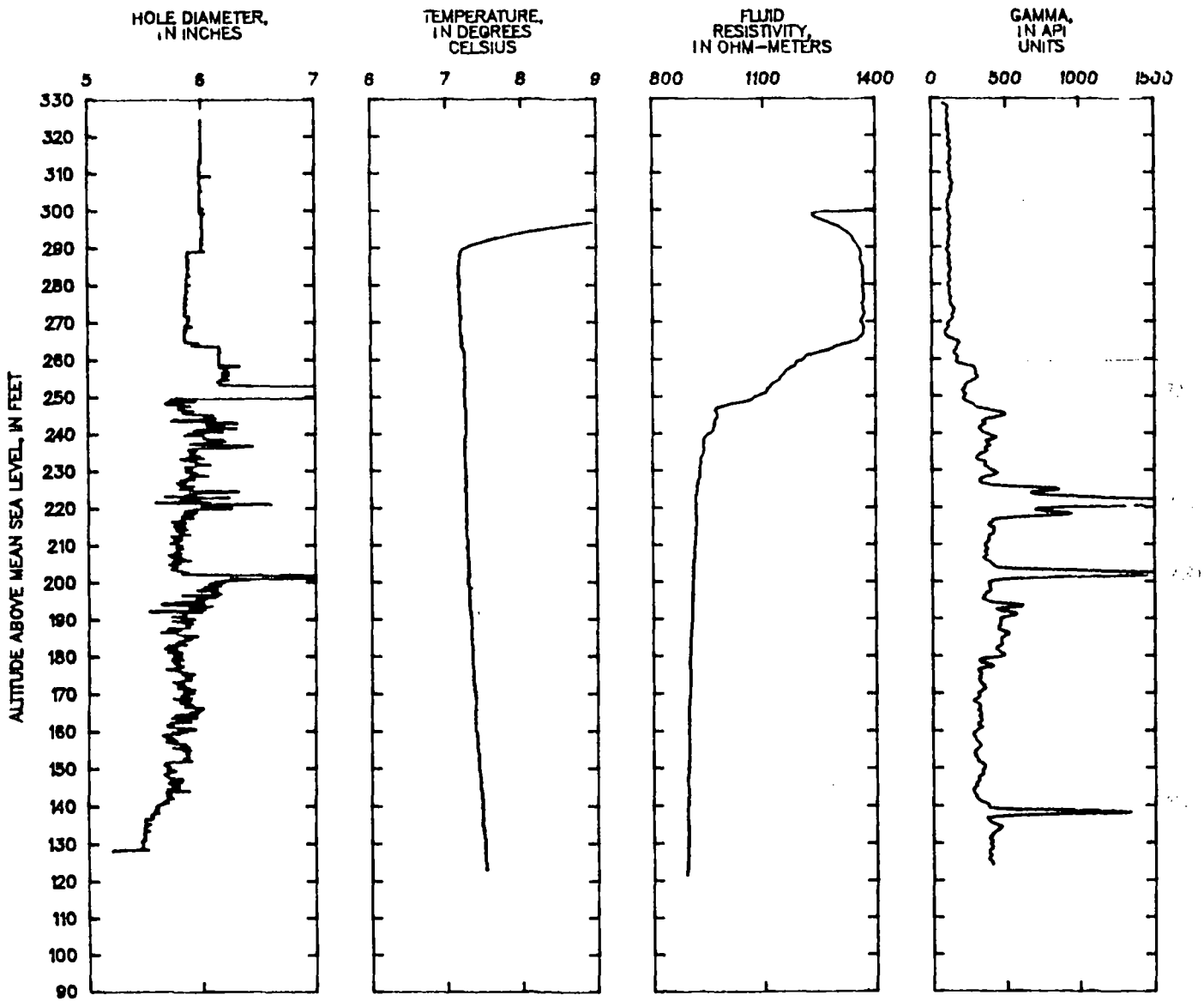
Depth	Casing Bl/ft	Sample No	Sample Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
HNU back = 3 ppm							quartz monzonite	
140							2½ gpm @ 143'	
@ 158 = 40 ppm								
160								
180								
							6" Fracture @ 195'	
200							30 gpm @ 203.5'	203'.5"

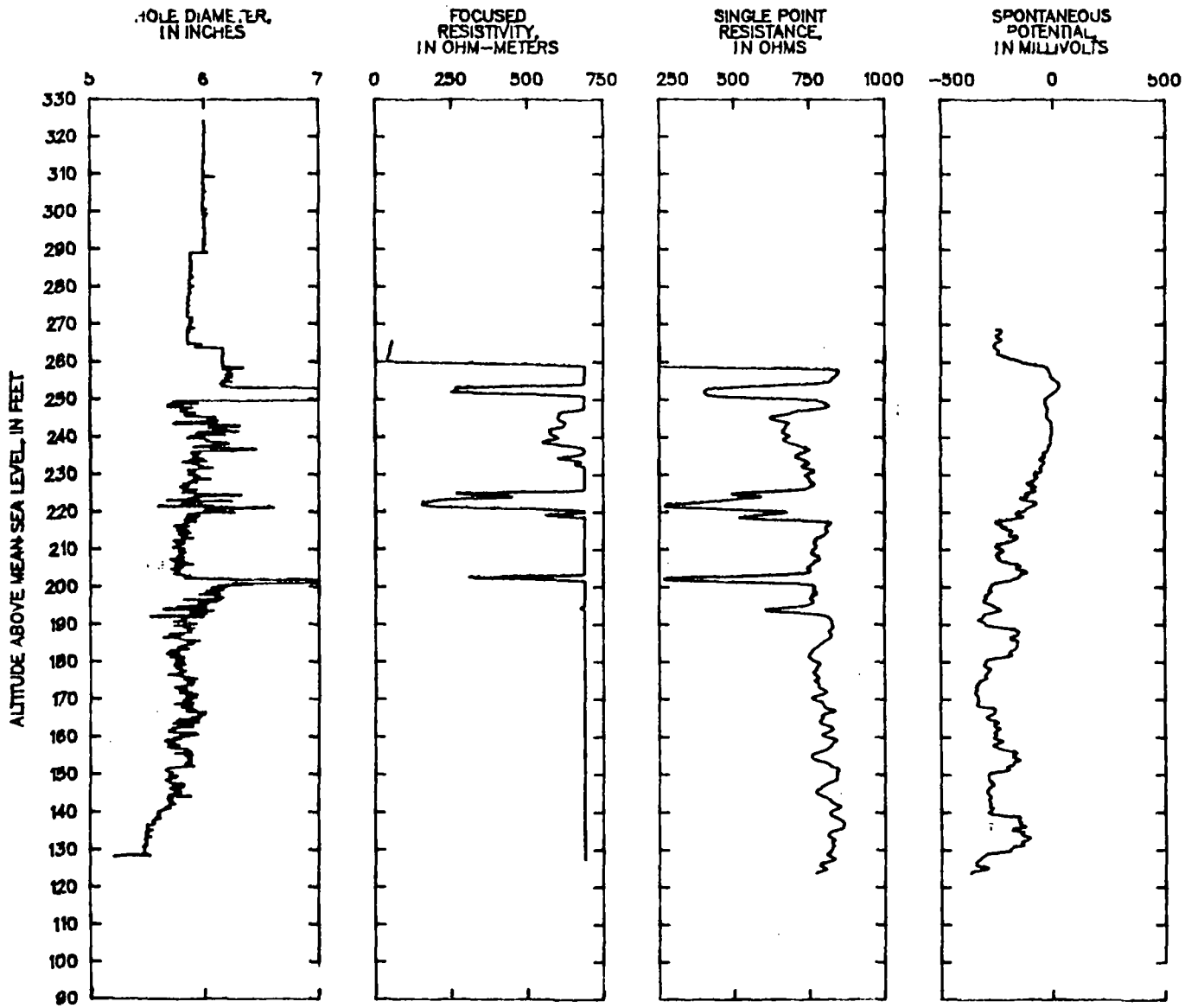
KEY

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Packer test @ 174' - 204'.


HOLE DIAMETER, IN INCHES
5
6
7
TEMPERATURE, IN DEGREES CELSIUS
6
7
8
9
FLUID RESISTIVITY, IN OHM-METERS
800
1100
1400
GAMMA, IN API UNITS
0
500
1000
1500
ALTITUDE ABOVE MEAN SEA LEVEL, IN FEET
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
ABBETTS RD, B2D


HOLE DIAMETER, IN INCHES
5
6
7
FOCUSED RESISTIVITY, IN OHM-METERS
0
250
500
750
SINGLE POINT RESISTANCE, IN OHMS
250
500
750
1000
SPONTANEOUS POTENTIAL, IN MILLIVOLTS
-500
0
500
ALTITUDE ABOVE MEAN SEA LEVEL, IN FEET
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
ABBETTS RD, B2D

LOG SUMMARY TABLE
TIBBETTS RD
B2D

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL[1]	FOC	SPR	POT	ATV
76.5-79.5	252.5-	x	x	x			x	x		x
~~83~~ 84-87	246	x		x	x		x	x	(x)	N33W, 81W
91	238	x		x	(x)					
94	235		(x)	(x)			x			
105	224				x		x	x		N30E,50W
108-109	221-220	x		x	x		x	x		N60W,74E
111	218			x	x		x	x	x	N65E,58W
123	206		x							
127-129	202-200	x	x		x		x	x		N10W,45W
136	193				x		x	x	x	N05W,51W
143	186	(x)							x	
190-200	139-129	x							x	
190	139				x					
195	134				(x)					
201.5	127.5									N80W,33W

[1]Acoustic velocity log not run on this well.

RADINTER MODEL FILE Version 2.1 Dipole Data
Date and Time: Tue Jun 25 22:12:24 1991

PARAMETERS:
Sampling Frequency MHz: 764.986
Direct Pulse Time (us): 0.111
Depth Increment (m): 0.250
Depth of Trace 1 (m): 27.100
Nominal Velocity(m/us): 123.000
T - R Separation (m): 8.800

INFORMATION FILE:
Site and borehole:Tibbets Road Bh 2D 60 MHz antennas.
Date:1991-06-25
T-R Distance:6 m rods
Equipment name:ABEM
Operator's name:BN CG

STATUS INFORMATION:
764.9860 ,Sampling frequency
-4.746000 ,Signal position
512 ,Number of samples

DATA FILE: DATA.RD3

REFLECTORS:

TYPE	NAME	DEPTH	DISTANCE	ANGLE	AZIMUTH
PLANE	Plane d	19.2	62.99	41.0	
PLANE	Plane c	32.7	107.3	49.6	
PLANE	Plane a	37.2	122.05	40.2	
PLANE	Plane b	41.7	136.8	47.5	
PLANE	Plane e	88.3	289.7	24.6	
PLANE	Plane f	92.5	303.5	41.5	

ABEM RAMAC Borehole radar system

Licensee 1989: ABEM Borehole Geophysics, Mala, Sweden.

Site and borehole:Tibbets Road Bh 2D 60 MHz antennas.

Date:1991-06-25

T-R Distance:6 m rods

Equipment name:ABEM

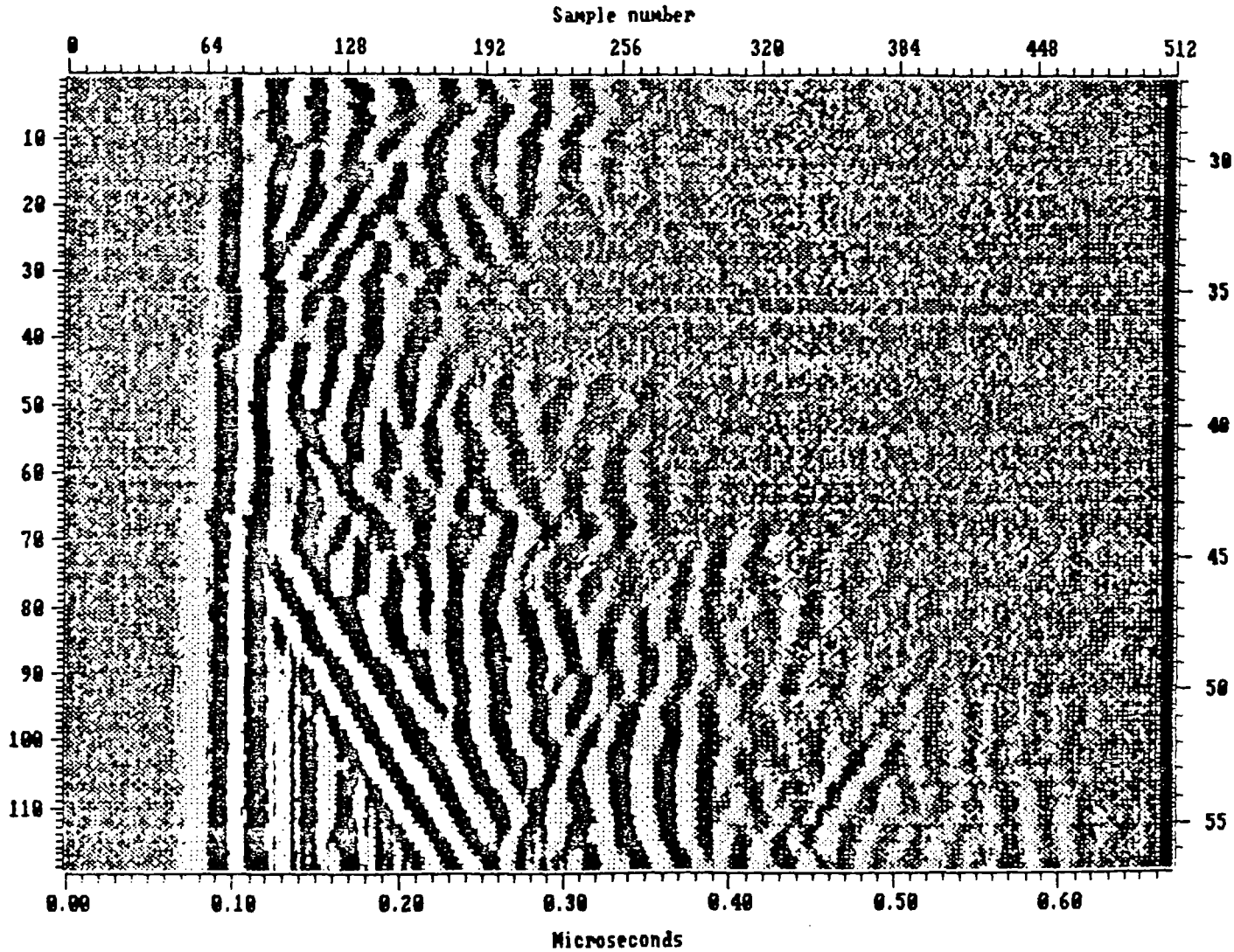
Operator's name:BN CG

Date of plot: Tue Jun 25 15:38:22 1991

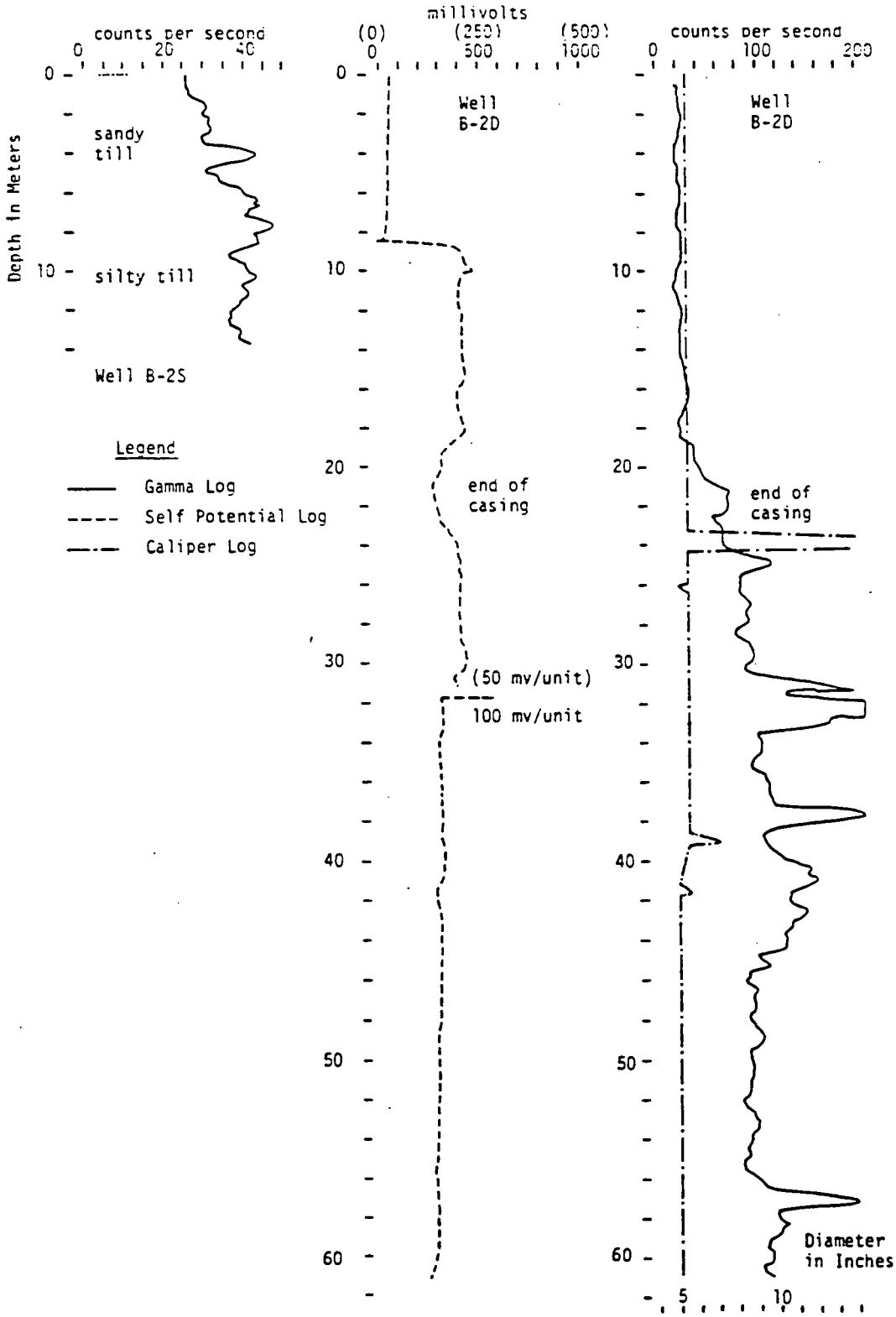
RAMAC MEASUREMENT PROGRAM 88287 VERSION 6.21

Maximum Time Gain	2.00
Lin. coefficient	1.000
Exp. coefficient	0.500
Start time of gain	0.100
DC level subracted.	
Dipole antenna.	

250 100 50 25 10 5 2 0 -2 -5 -10 -25 -50 -100 -250

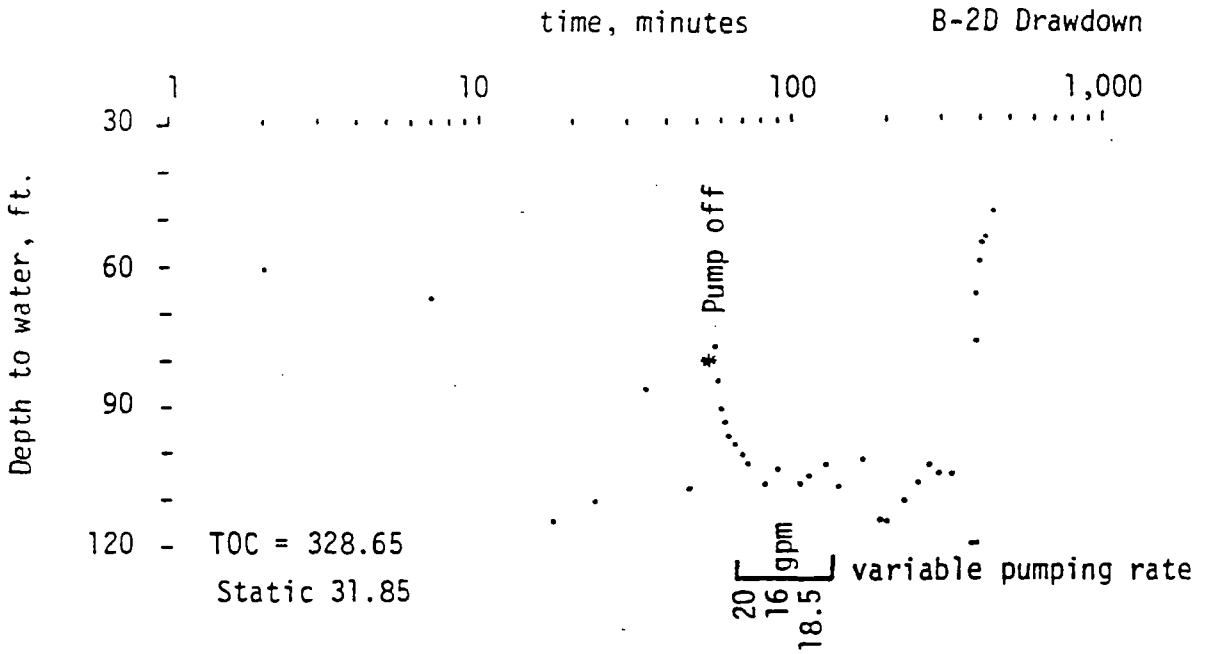


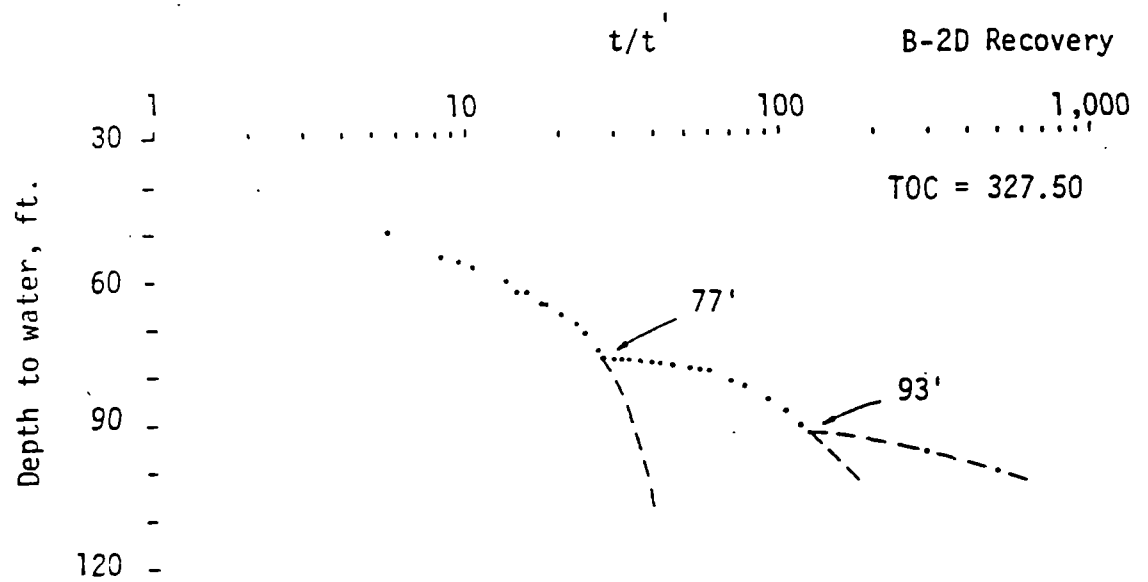
Depth in meters



BOREHOLE GEOPHYSICAL LOGS, WELLS 2S AND 2D,
TIBBETTS ROAD SITE, BARRINGTON

b





B-2D PUMPING WELL DRAWDOWN AND RECOVERY
TIBBETTS ROAD SITE, BARRINGTON

TABLE 6
RESULTS OF FIELD GC (Photovac) AND LABORATORY GC/MS ANALYSES
TIME SERIES ANALYSIS OF PUMP TEST DISCHARGE

Well: B2D Packer Zone: 70-90 ft
Date: 09/05/85

Sample Time	Benzene		Toluene		Ethylbenzene		Xylenes		TCE*		Methylene Chloride		Acetone		MEK*		* TOTAL V.O.C *	
(minutes)	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS
15	22.4	--	95.8	--	8.2	--	35.3	--	29.7	--	ND	--	ND	--	ND	--	191.4	--
45	19.6	ND	75.0	ND	5.2	ND	20.7	ND	24.9	38.0	ND	5(b)	ND	100.0	ND	3(b)	145.4	146.0
75	18.6	--	72.8	--	6.1	--	22.4	--	25.4	--	ND	--	ND	--	ND	--	145.3	--
105	16.1	--	60.8	--	10.1	--	54.3	--	25.8	--	ND	--	ND	--	ND	--	167.1	--
135	13.2	ND	44.3	ND	7.7	ND	39.8	ND	19.3	42.0	ND	5(b)	ND	47.0	ND	4(b)	124.3	98.0
165	13.4	--	33.8	--	ND	--	45.5	--	21.2	--	ND	--	ND	--	ND	--	115.9	--
195	14.0	2(b)	36.1	ND	7.9	ND	66.9	ND	22.8	41.0	ND	6(b)	ND	36.0	ND	4(b)	147.7	89.0
225	12.1	--	22.0	--	ND	--	(a)	--	18.2	--	ND	--	ND	--	ND	--	54.0	--
240	16.5	--	27.3	--	2.1	--	(a)	--	26.9	--	ND	--	ND	--	ND	--	75.0	--

All data expressed as parts per billion (ug/l).

--: Not analysed.
ND: Compound was analysed for but not detected.
(a): Area not recorded; above detection limit of 2 ppb.
(b): Estimate; less than detection limit (10 ug/l), but greater than zero.

* Abbreviations
TCE = Trichloroethene
MEK = 2-Butanone (Methyl ethyl ketone)

TABLE 7
RESULTS OF FIELD GC (Photovac) AND LABORATORY GC/MS ANALYSES
TIME SERIES ANALYSIS OF PUMP TEST DISCHARGE

Well: B2D Packer Zone: 180-200 ft
Date: 09/10/85

Sample Time	Benzene		Toluene		Ethylbenzene		Xylenes		TCE*		Methylene Chloride		Acetone	
(minutes)	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS
15	18.1	ND	58.0	ND	8.4	ND	29.6	ND	23.7	55.0	ND	5(a)	ND	92.0
45	12.8	--	19.0	--	3.2	--	ND	--	17.2	--	ND	--	ND	--
75	14.2	--	23.4	--	1.2	--	ND	--	21.4	--	ND	--	ND	--
105	13.5	--	6.3	--	ND	--	ND	--	19.9	--	ND	--	ND	--
135	12.9	3(a)	2.5	ND	ND	ND	ND	2(a)	19.9	56.0	ND	4(a)	ND	3(a)
165	11.4	--	3.4	--	0.6	--	ND	--	18.0	--	ND	--	ND	--
195	10.8	--	2.4	--	0.2	--	ND	--	17.2	--	ND	--	ND	--
225	8.7	9(a)	1.9	ND	ND	ND	ND	ND	13.9	43.0	ND	13.0	ND	8(a)
240	8.6	--	0.6	--	ND	--	ND	--	13.9	--	ND	--	ND	--

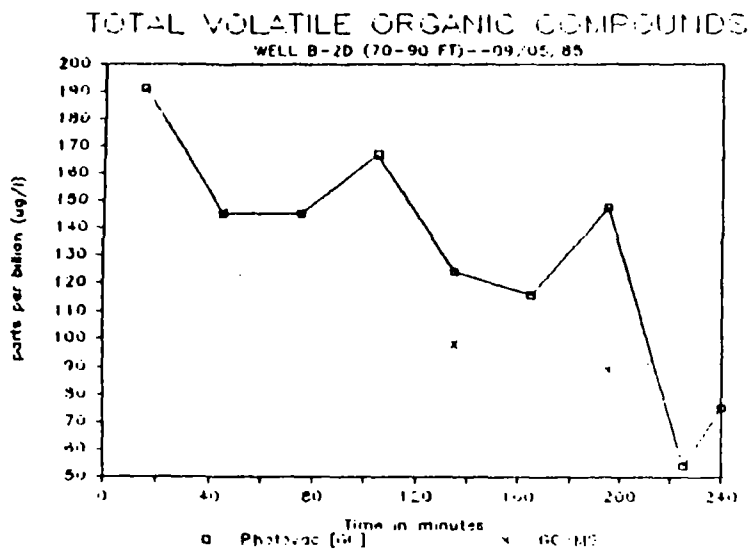
Sample Time	MEK*		Chloroform		MIBK*		1,1DCE*		T-1,2DCE*		PCE*		* TOTAL V.O.C *	
(minutes)	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS
15	ND	4(a)	ND	ND	ND	ND	0.7	ND	0.6	ND	ND	ND	138.4	156.0
45	ND	--	ND	--	ND	--	0.4	--	0.8	--	ND	--	52.4	--
75	ND	--	ND	--	ND	--	0.6	--	0.5	--	ND	--	60.9	--
105	ND	--	ND	--	ND	--	0.4	--	0.7	--	ND	--	40.1	--
135	ND	2(a)	ND	ND	ND	ND	0.4	ND	0.8	ND	ND	ND	35.7	70.0
165	ND	--	ND	--	ND	--	0.4	--	1.2	--	0.2	--	33.9	--
195	ND	--	ND	--	ND	--	0.5	--	0.9	--	0.2	--	31.3	--
225	ND	10.0	ND	3(a)	ND	1(a)	0.4	ND	0.9	ND	ND	ND	24.8	87.0
240	ND	--	ND	--	ND	--	0.4	--	1.2	--	ND	--	23.4	--

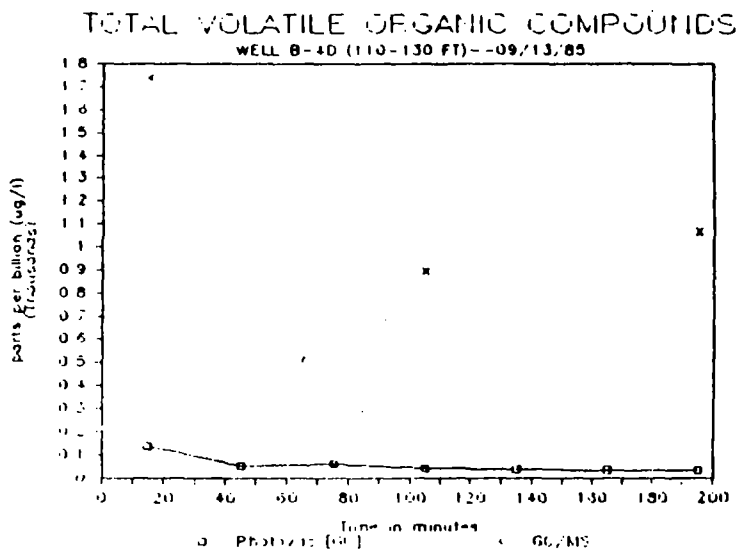
All data expressed as parts per billion (ug/l).

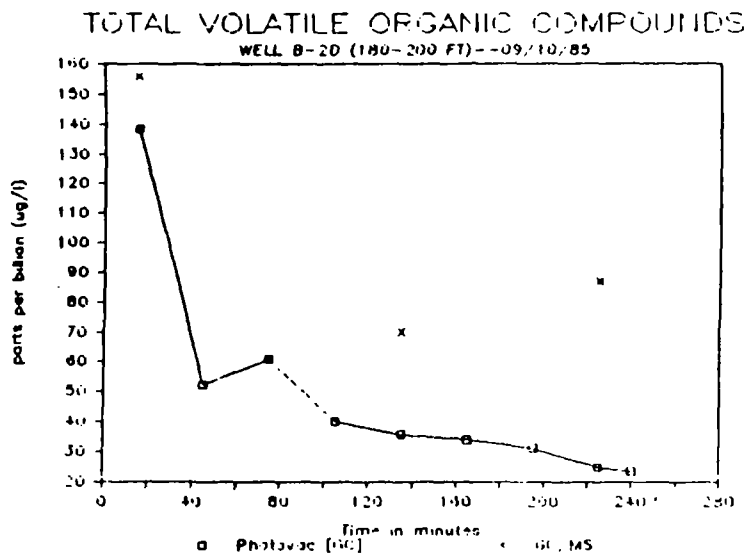
--: Not analysed.
ND: Compound was analysed for but not detected.
(a): Estimate; less than detection limit (10 ug/l), but greater than zero.

* Abbreviations

TCE = Trichloroethene
MEK = 2-Butanone [methyl ethyl ketone]
PCE = Tetrachloroethene [perchloroethene]
MIBK = 4-Methyl-2-pentanone [methyl isobutyl ketone]
1,1DCE = 1,1-Dichloroethene
T-1,2DCE = trans-1,2-Dichloroethene







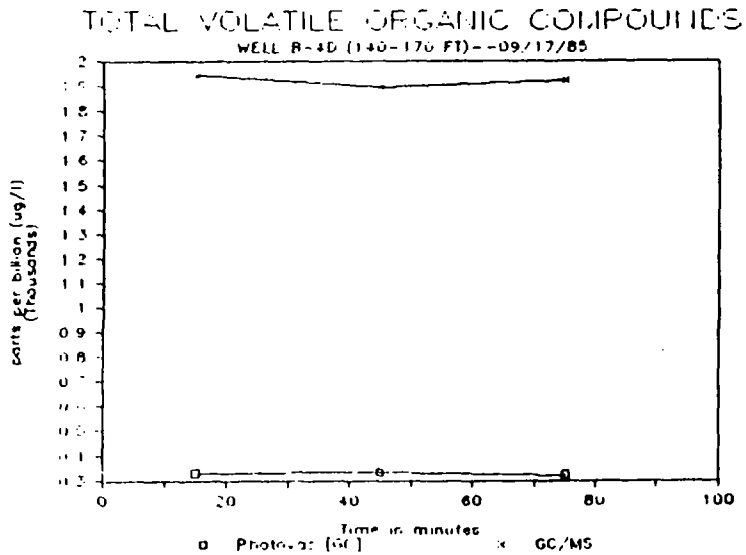


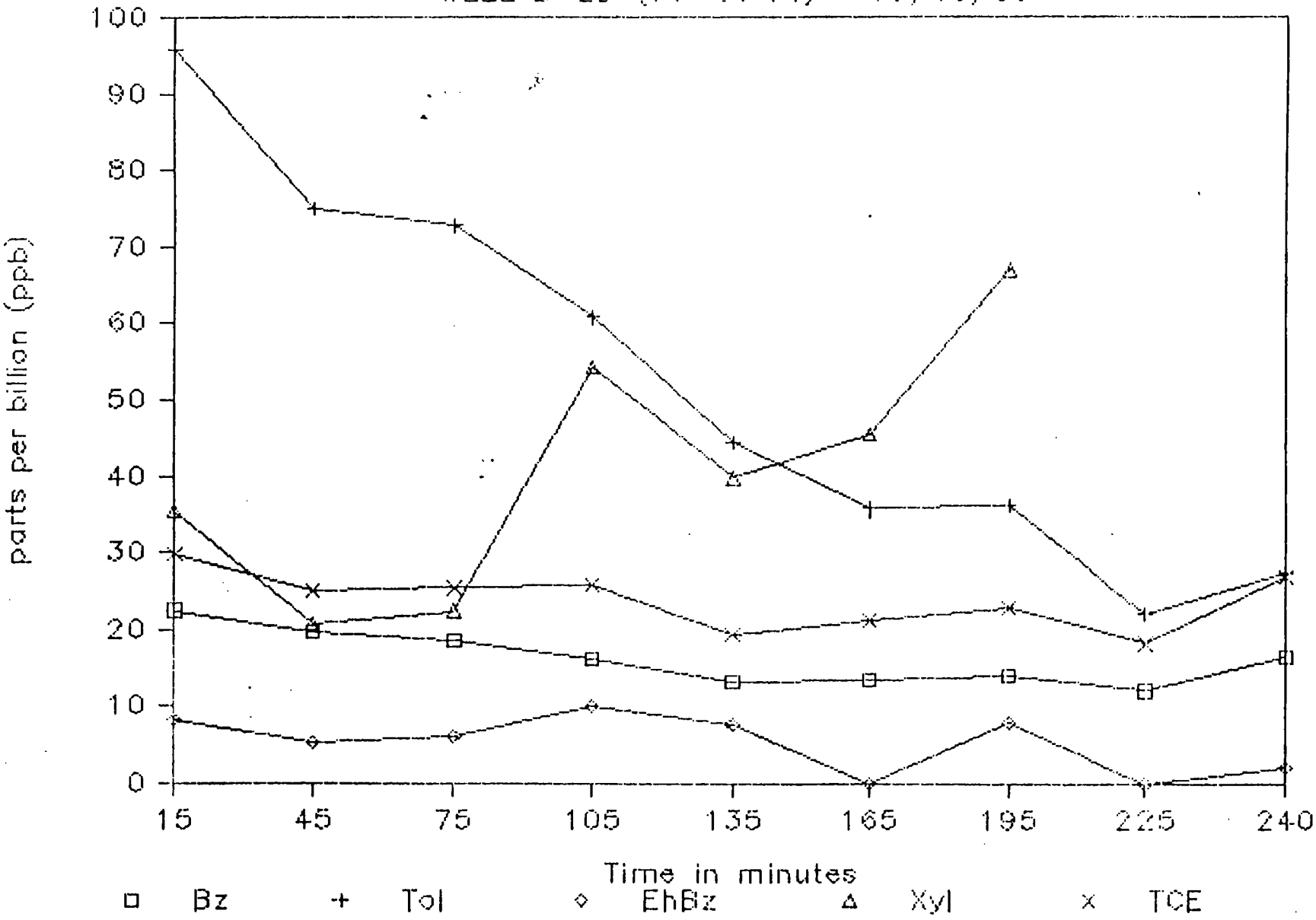
FIGURE 9

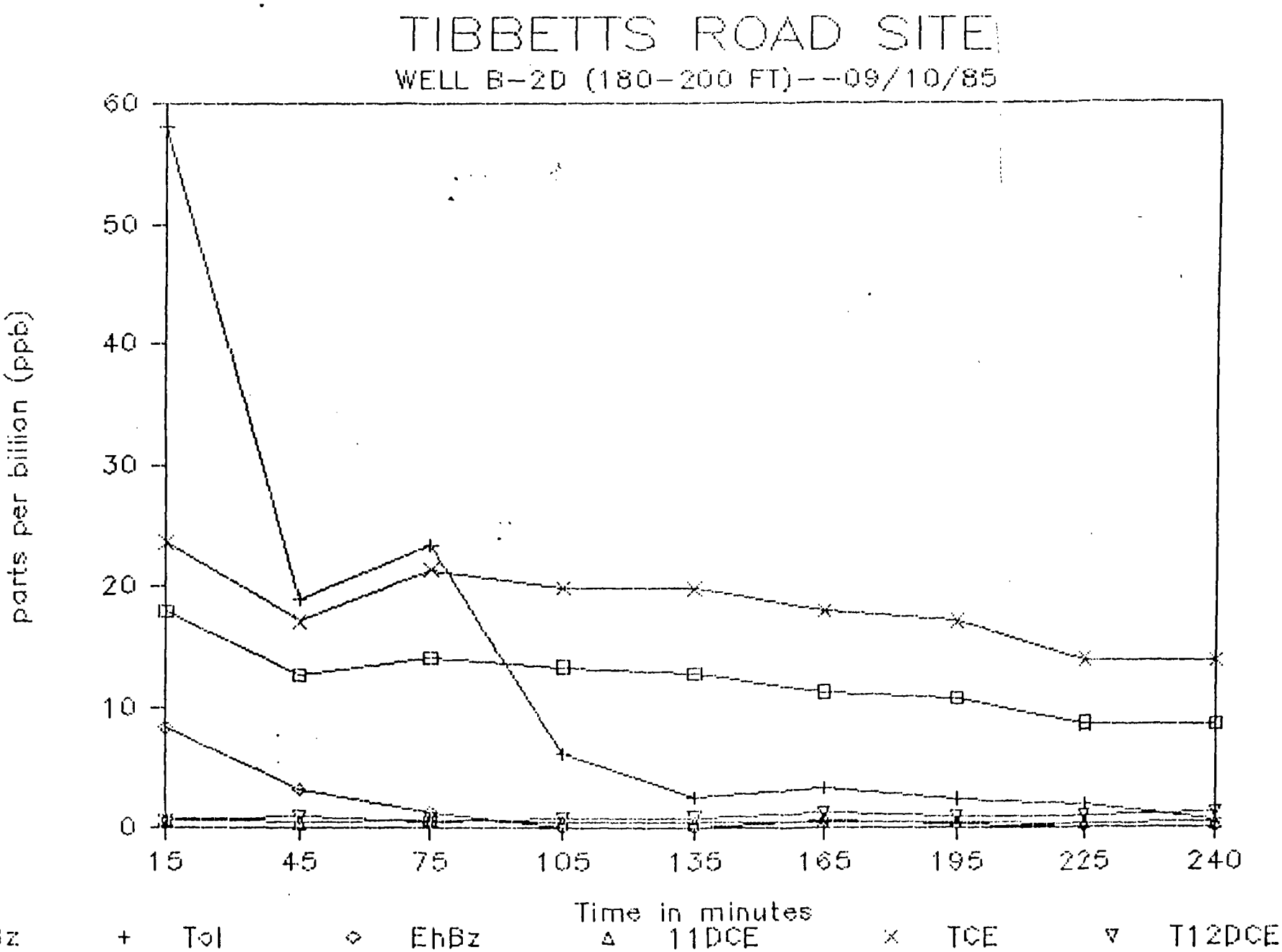
TIME SERIES ANALYSIS OF STRADDLE PACKER PUMP TEST DISCHARGE

RESULTS OF FIELD GC (PHOTOVAC) & LABORATORY GC/MS ANALYSES

TIBBETTS ROAD SITE

WELL B-2D (70--90 FT)--09/05/85




TIBBETTS ROAD SITE
WELL B-2D (180-200 FT)--09/10/85
parts per billion (ppb)
60
50
40
30
20
10
0
15
45
75
105
135
165
195
225
240
Time in minutes
Bz
Tol
EhBz
11DCE
TCE
T12DCE

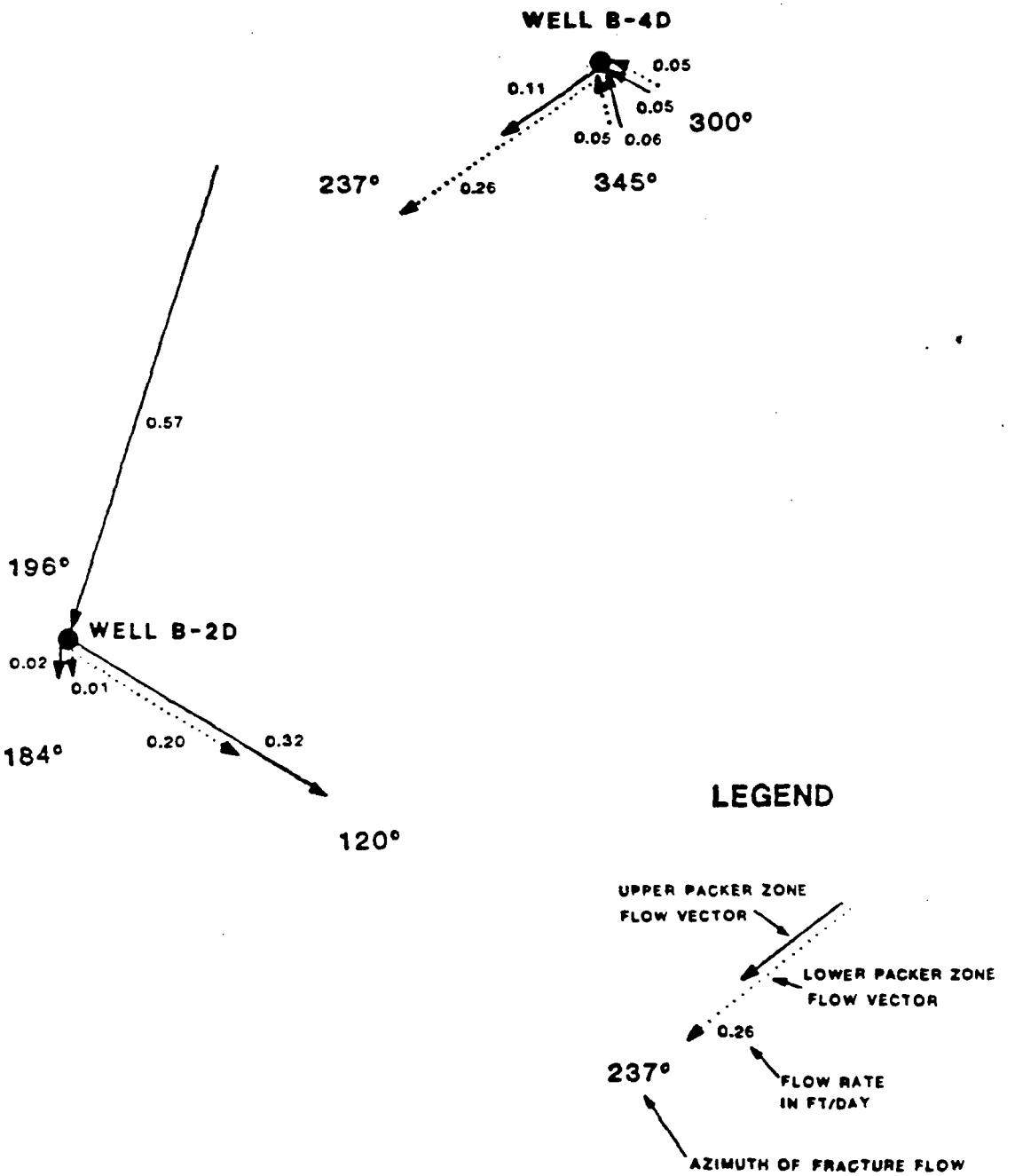


FIGURE 14

FRACTURE ZONE VELOCITY VECTORS

C

TABLE 2
SUMMARY OF AQUIFER TEST DATA
STRADDLE PACKER PUMP TESTS

PUMPING WELL	PACKER ZONE	MONITOR WELL	AZIMUTH (degrees)	TRANSMISSIVITY (gpd/ft)	HYDRAULIC CONDUCTIVITY (gpd/ft2)	(cm/sec)	STORAGE COEFFICIENT	METHOD OF SOLUTION
B3D	70-90 ft	B3D	16	104	5.2	2.5x10-4	3.8x10-4	Hantush-Jacob*
B2D	70-90 ft	TREADWELL	120	1436	71.8	3.4x10-3	7.3x10-5	Theis
B3D	70-90 ft	RUNDE	184	287	14.4	6.8x10-4	1.8x10-5	Theis
B2D	180-200 ft	TREADWELL	120	917	45.9	2.2x10-3	6.7x10-5	Theis
B2D	180-200 ft	RUNDE	184	187	9.4	4.4x10-4	2.5x10-5	Theis
B4D	110-130 ft	B3D	237	98	4.9	2.3x10-4	4.0x10-5	Theis
B4D	110-130 ft	B5D**	165	123	6.5	3.1x10-4	9.1x10-5	Theis
B4D	110-130 ft	B6D**	120	166	8.3	3.9x10-4	8.5x10-5	Theis
B4D	140-170 ft	B3D**	237	344	11.5	5.4x10-4	1.7x10-4	Theis
B4D	140-170 ft	B5D**	165	174	5.8	2.8x10-4	2.7x10-5	Theis
B4D	140-170 ft	B6D**	120	224	7.5	3.5x10-4	4.0x10-5	Theis

* Aquitard (overburden) vertical hydraulic conductivity from Hantush-Jacob method = 0.4 gpd/ft2 (1.9x10-5 cm/sec)

** These analyses include delayed drawdown data.

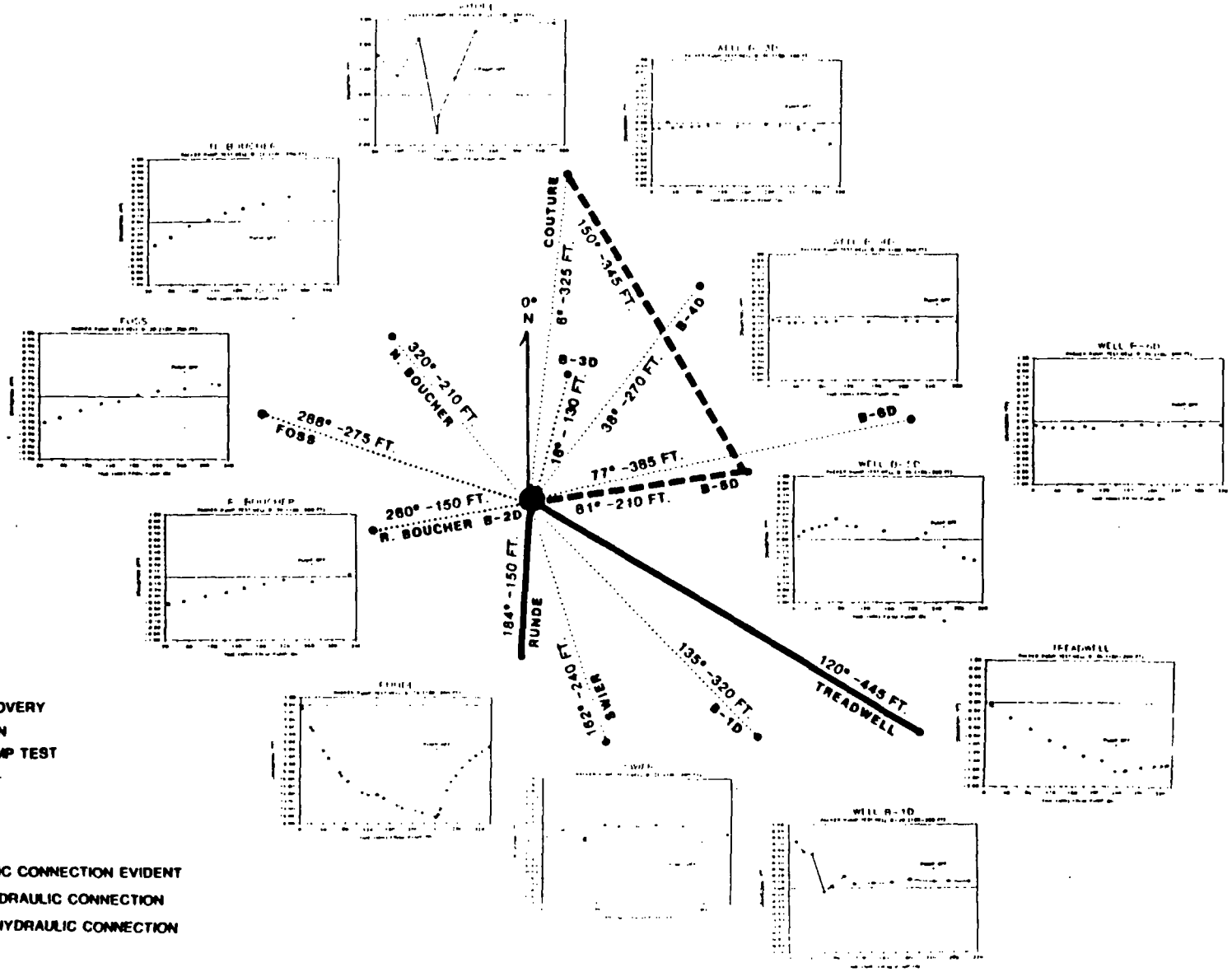


FIGURE 4
TIME-DRAWDOWN-RECOVERY
AND WELL ORIENTATION
STRADDLE PACKER PUMP TEST
WELL B2D: 180-200 FT.

LEGEND:

..... NO HYDRAULIC CONNECTION EVIDENT

▬ ▬ ▬ POSSIBLE HYDRAULIC CONNECTION

▬▬▬ CONFIRMED HYDRAULIC CONNECTION

b

after 6 hrs of pumping @ B2D @ a rate of 20 → 17.2 gpm

SAMPLE NUMBER = 34920
RECORD No. M = 13339
RECORD No. D = 19598
NO. OF RECORDS = 3
TYPE OF SAMPLE -- = IN-HOUSE
YOUR NAME -- = J REGAN
DATE/TIME SAMPLED = 11-30-84,15:15
DATE/TIME SUBMITTED = 12-03-84,09:14
DATE COMPLETED = 12-13-84
PERSON TAKING SAMPLE = JOHN REGAN
OWNERS NAME = TIBBETTS ROAD SITE
STREET ADDRESS = TIBBETTS ROAD
CITY OR TOWN = BARRINGTON
DIVISION = HWSCPD
PHONE No. = 3744

PUMP TEST SAMPLE
WELL B-2D
S-1

ID #	TEST NAME			RESULT	ANALYST	DATE
95	Methane, dichloro-	ug/L	ND		CZIBIK	12-11-84
96	Methane, dichlorobromo-	ug/L	ND		CZIBIK	12-11-84
97	Methane, tribromo-	ug/L	ND		CZIBIK	12-11-84
98	Methane, trichloro-	ug/L	ND		CZIBIK	12-11-84
99	Methane, tetrachloro-	ug/L	ND		CZIBIK	12-11-84
90	Methane, chlorodibromo-	ug/L	ND		CZIBIK	12-11-84
92	Ethane, 1,1 dichloro	ug/L	ND		CZIBIK	12-11-84
93	Ethane, 1,2 dichloro	ug/L	ND		CZIBIK	12-11-84
94	Ethane, 1,1,1trichloro	ug/L	ND		CZIBIK	12-11-84
95	Ethane, 1,1,2trichloro	ug/L	ND		CZIBIK	12-11-84
96	Tetrachloroethane	ug/L	ND		CZIBIK	12-11-84
97	Ethylene, 1,1 dichloro	ug/L	ND		CZIBIK	12-11-84
99	Ethylene, trichloro	ug/L		34.8000	CZIBIK	12-11-84
100	Ethylene, tetrachloro	ug/L	ND		CZIBIK	12-11-84
101	Propane, 1,2 dichloro	ug/L	ND		CZIBIK	12-11-84
102	1,3dichloropropane c+t	ug/L	ND		CZIBIK	12-11-84
103	Benzene	ug/L		15.2000	CZIBIK	12-11-84
104	Benzene, chloro	ug/L	ND		CZIBIK	12-11-84
105	Benzenes, dichloro	ug/L	ND		CZIBIK	12-11-84
106	Benzene, ethyl	ug/L	<	5.0000	CZIBIK	12-11-84
107	Toluene	ug/L		6.7000	CZIBIK	12-11-84
108	Xylene meta isomer	ug/L	ND		CZIBIK	12-11-84
115	Methane,trichlorofluoro	ug/L	ND		CZIBIK	12-11-84
224	Acetone	ug/L	ND		CZIBIK	12-11-84
225	Tetranydrofuran	ug/L	ND		CZIBIK	12-11-84
226	Diethyl ether	ug/L	ND		CZIBIK	12-11-84
227	Methyl ethyl ketone	ug/L	ND		CZIBIK	12-11-84
228	Methyl isobutyl ketone	ug/L	ND		CZIBIK	12-11-84
229	Propene 1,3 dimethyl	ug/L	ND		CZIBIK	12-11-84
230	Xylenes (ortho & para)	ug/L		7.7000	CZIBIK	12-11-84
281	Trichlorotrifluoroeth.	ug/L	ND		CZIBIK	12-11-84
282	1,2Dichloroethylene c+t	ug/L	ND		CZIBIK	12-11-84

SAMPLE NUMBER = 34921

63R

NHWS&PCC BORING LOG

SITE

Tibbetts Road Site

Barrington

Boring No: B-3D

Sheet 1 of 2

Date: 7/5/84

Boring Company: Tasker Well Co.

Boring Location: Boucher Field @ Boucher w/Downing property.

Foreman: Danny Tasker

Ground/Casing Elevation:

Geologist/Engineer: John Regan

Starting Date: 7/5/84 Ending Date: 7/9/84

Portadrill Air Rotary 12:30

SAMPLER

Type N / A

Hammer Wt.

Fall

Groundwater Readings 10:00

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/11/84	19'3"	T.O.C.	

6" steel casing w/locking cap 14" stick-up

Depth	Casing Bl/ft	SAMPLE No	SAMPLE Depth	SAMPLE Pen/Rcvy	SAMPLE Blows/6"	LOG	Description	Construction
20						See B-3S log	glacial till	
40								
60							estimated bedrock surface	
80							quartz monzonite	
100							95'	
120							Drill rod dropped approx. 4 inches @ 115'.	

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	cense	8-15	stiff
>50	v dense	15-30	v. stiff
		>30	hard

REMARKS:

1. Used bentonite slurry to 81', set 81' of steel casing, Drilled 8 3/4" hole to 81'.
2. Packer test @ 100'-123'.

Yield Test 105-123 ——— 12 gpm ——— pack

123 ——— 16 gpm ——— blow

143 ——— 3 gpm ——— blow

163 ——— 6 gpm ——— "

202 ——— 6 gpm ——— "

NHWS&PCC BORING LOG

SITE

Tibbetts Road Site
Barrington

Boring No: B-3D
Sheet: 2 of: 2
Date: 7/6/84

Boring Company: Tasker Well Co.
Boring Location: Field along Boucher/Johnson property line.
Foreman: Danny Tasker
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: 7/6/84
Ending Date: 7/9/84

SAMPLER

Type N / A

Hammer Wt.

Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/1/84	19'3"	T.O.C.	

SAMPLE

Depth	Casing Bl/ft	No	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
							16 gpm @ 123'	
							Small Fracture @ 130'	
140							3 gpm @ 143'	
on cal., Hont · on cal							Small Fracture @ 150'	
160 · on cal							10" Fracture @ 158'	
							3" Fracture @ 162'	
							6 gpm @ 163'	
180								
200							6 gpm @ 202'2"	

KEY

Granular

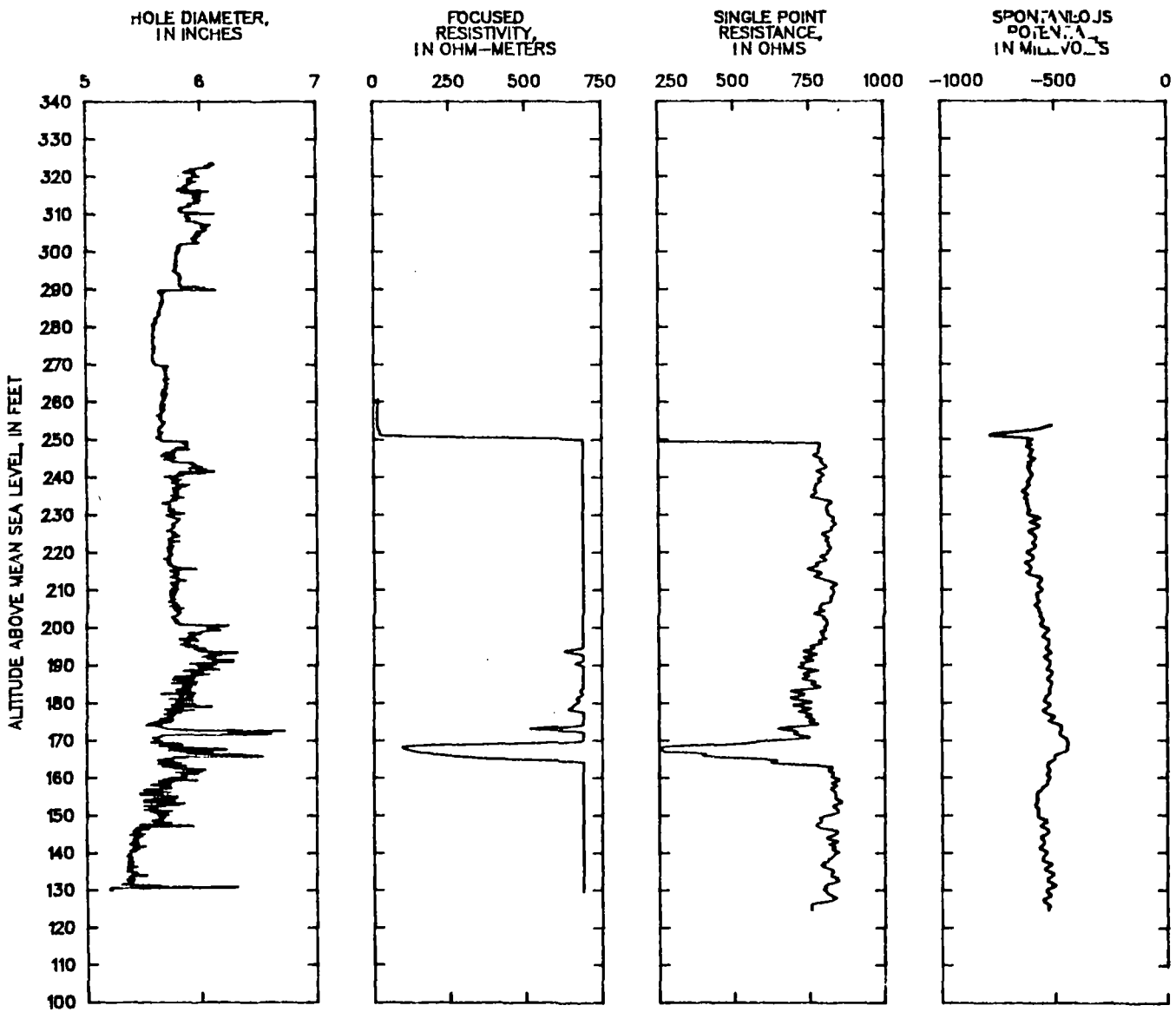
Bls/ft	Desc.
0-4	v. loose
4-10	loose
10-30	m dense
30-50	dense
>50	v. dense

Cohesive

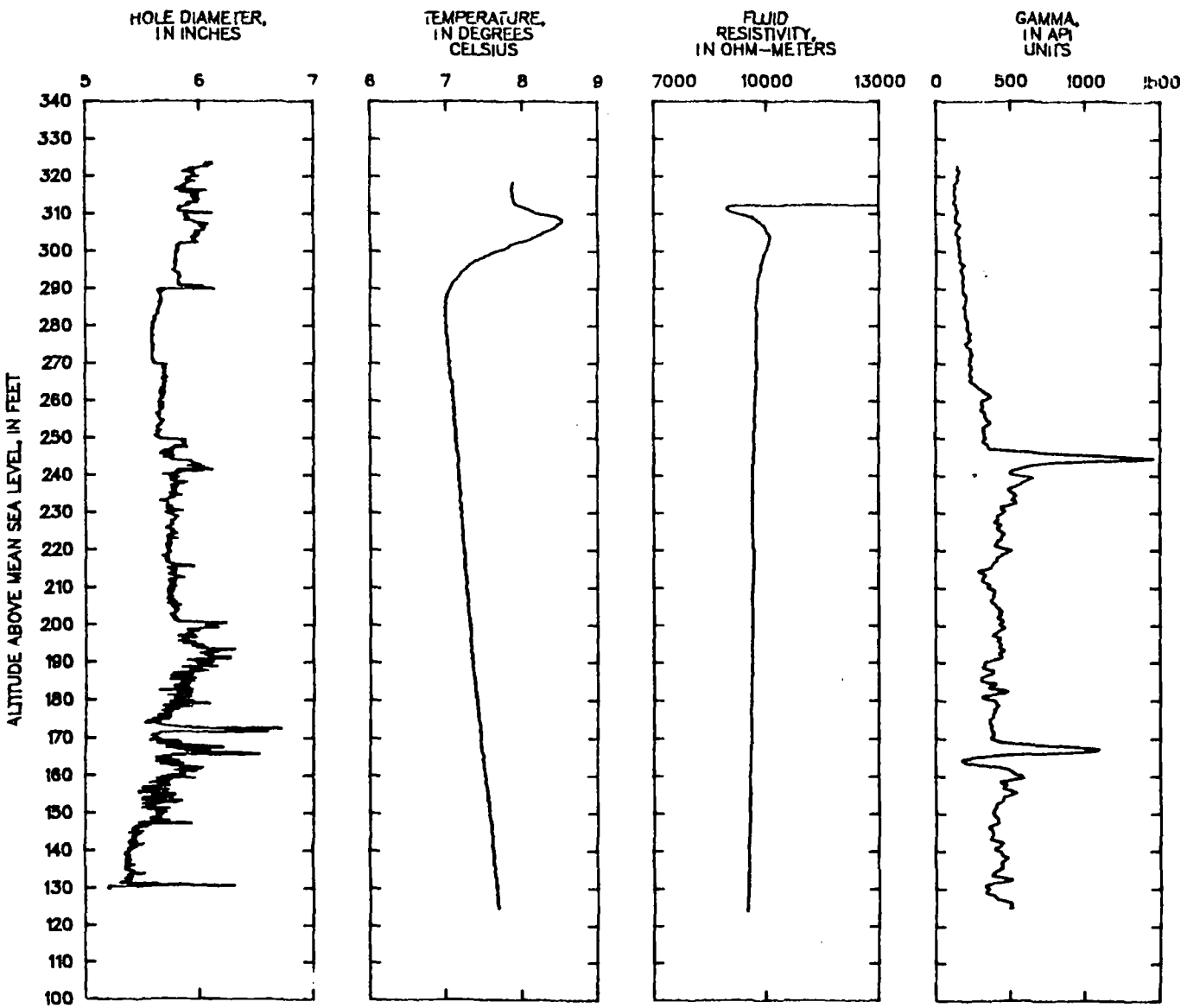
Bls/ft	Desc.
<2	v soft
2-4	soft
4-8	medium
8-15	stiff
15-30	v. stiff

REMARKS

1. Packer Test 100 - 123'.
2. Completed hole @ 203'.
3. 19½" stick-up above ground.



ABBETTS RD, 830

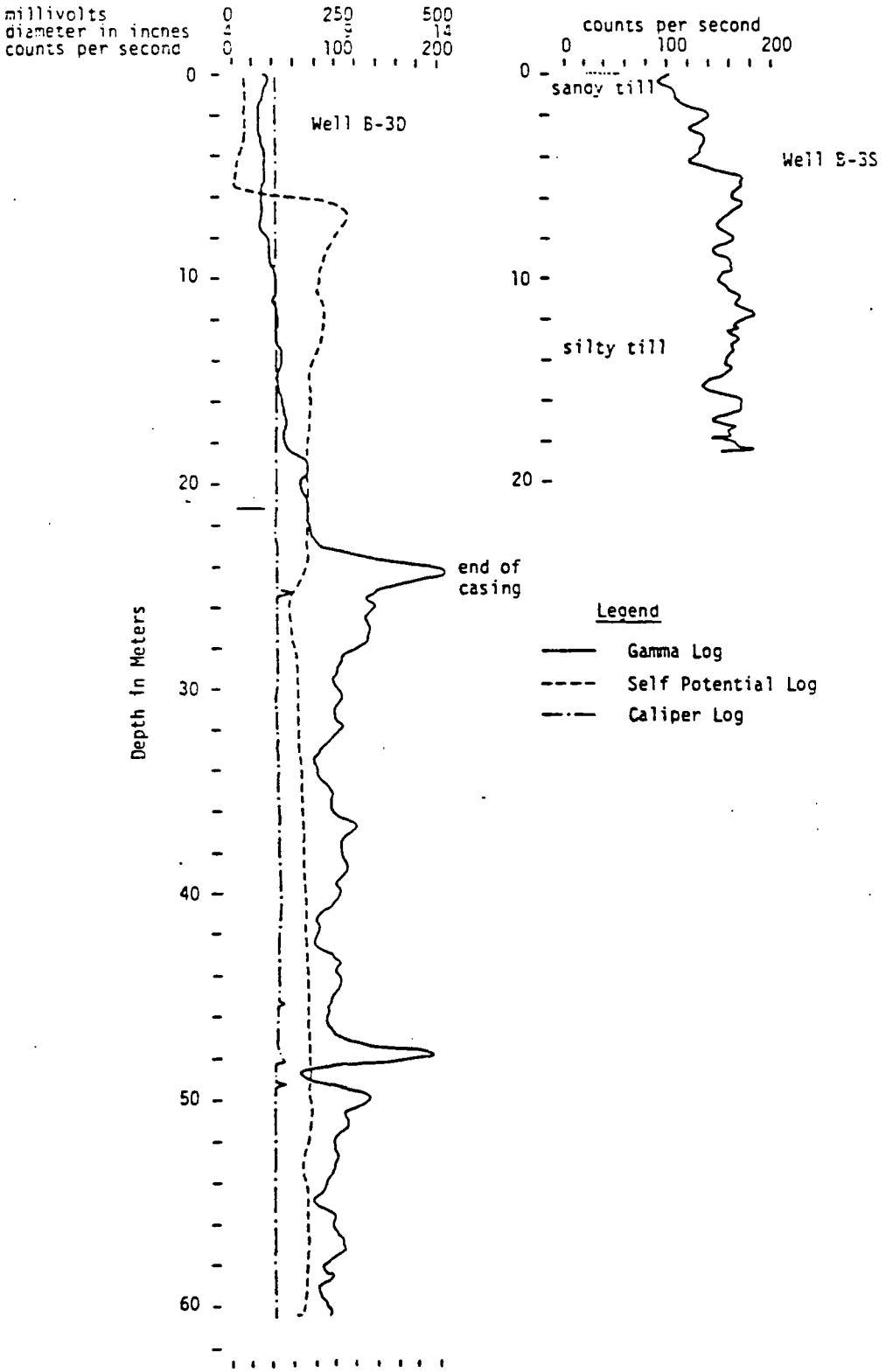


ABBETTS RD, B3D

LOG SUMMARY TABLE
TIBBETTS RD
B3D

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL[1]	FOC	SPR	POT	ATV
86	244	(x)			x					(N15W,15E)
89	241	x								N60W,69W
94.5	235.5	(x)						x	x	N30W,18W
96.5	233.5									N45W,67W
115	215	x		x				x	x	(N30E,19W)
130	200	x								
137	193	x					x	(x)		(N30E,23E)
140	190	x			(x)		x			
143	187		(x)							
148	182						x	(x)		N15W,13E
150	180	(x)								N45E,51E
151	179	x					x			
157-159	173-171	x	x				x	x		N15E,53W
162.5	167.5	x			x		x	x	x	N25E,53W
165	165	x					x	x		N30E,53W
182.5	147.5	x	x					(x)	(x)	(N65E,12E)
200	130	x								

[1]Acoustic velocity log not run on this well.



BOREHOLE GEOPHYSICAL LOGS, WELLS 3D AND 3S,
TIBBETTS ROAD SITE, BARRINGTON

65R

NHWS&PCC BORING LOG

SITE

Tibbetts Road
Barrington

Boring No: B-4D
Sheet: 1 of: 2
Date: 7/9/84

Boring Company: Tasker Well Co.
Boring Location: Near Couture Residence
Foreman: Danny Tasker
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: 7/9/84 Ending Date: 7/9/84
Portadrill Air Rotary 11:00

SAMPLER
Type N / A
Hammer Wt.
Fall

Groundwater Readings

Date	Depth to Water	Ref Pt.	Time/Stabilization
7/11/84	19'8"	T.O.C.	

8" stick-up

Depth	Casing Bl/ft	SAMPLE No.	SAMPLE Depth	SAMPLE Pen/Rcvy	SAMPLE Blows/6"	LOG	Description	Construction
20						See B-4S log	glacial till	
40								
60								
							estimated rock surface	
80								
100								
120							Fracture @ 118'	

- on cal, + on Y

KEY

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	cense	8-15	stiff
>50	v. cense	15-30	v. stiff

REMARKS

1. Set 81' of 6" steel casing w/drive shoe - drill 8 3/4" hole to 81'.

Yield test 124 — 6gpm — blow
143'-163' — 7½gpm — blow
180-203'6" - 10gpm — packer

b

NHWS&PCC BORING LOG

SITE
Tibbetts Road
Barrington

Boring No: B-40
Sheet: 2 of: 2
Date: 7/9/84

Boring Company: Tasker Well Co.
Boring Location: Near Couture Residence
Foreman: Danny Tasker
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: 7/9/84 Ending Date: 7/9/84

SAMPLER
Type N / A
Hammer Wt.
Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

Depth	Casing Bit/ft	SAMPLE No	SAMPLE Depth	SAMPLE Pen/Recv	SAMPLE Blows/6"	LOG	Description	Construction
140							6 gpm @ 124' very soft, iron staining noted.	
160							7½ gpm @ 143'	
180							7½ gpm @ 163'	
200							Fracture @ 188'	
							10 gpm @ 203'6"	

KEY

Granular Bls/ft	Granular Desc.	Cohesive Bls./ft	Cohesive Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	cense	8-15	stiff
>50	v cense	15-30	v. stiff
		>30	hard

REMARKS

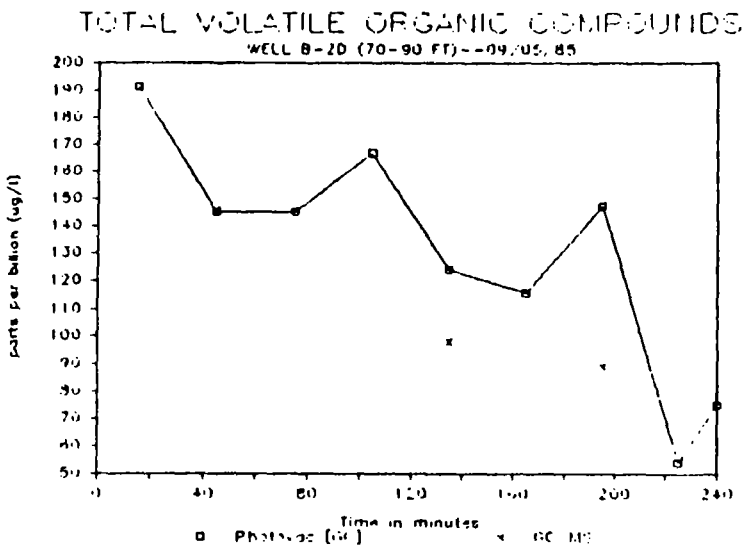
1. Packer Test from 180 - 203'6"

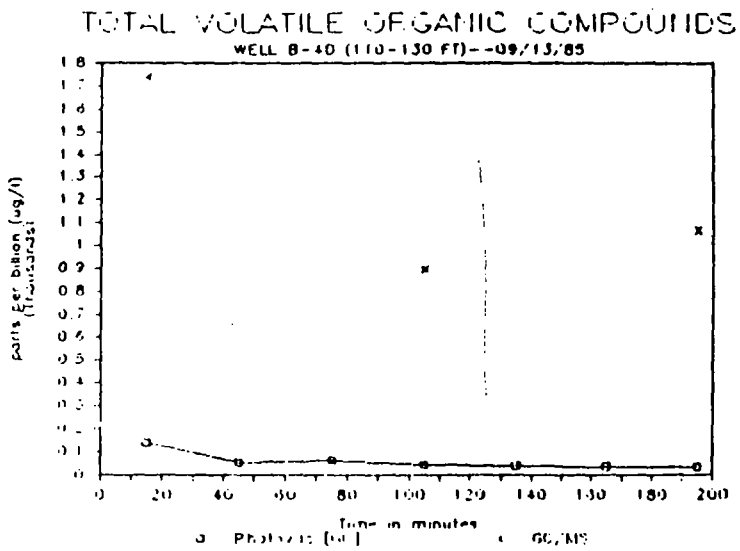
TABLE 2
SUMMARY OF AQUIFER TEST DATA
STRADDLE PACKER PUMP TESTS

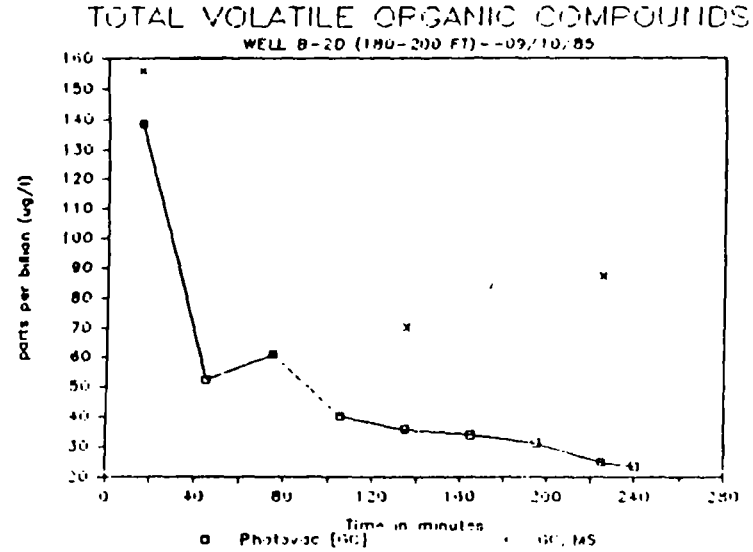
PUMPING WELL	PACKER ZONE	MONITOR WELL	AZIMUTH (degrees)	TRANSMISSIVITY (gpd/ft)	HYDRAULIC CONDUCTIVITY (gpd/ft2)	HYDRAULIC CONDUCTIVITY (cm/sec)	STORAGE COEFFICIENT	METHOD OF SOLUTION
B3D	70-90 ft	B3D	16	104	5.2	2.5x10-4	3.8x10-4	Hantush-Jacob*
B2D	70-90 ft	TREADWELL	120	1436	71.8	3.4x10-3	7.3x10-5	Theis
B3D	70-90 ft	RUNDE	184	287	14.4	6.8x10-4	1.8x10-5	Theis
B2D	180-200 ft	TREADWELL	120	917	45.9	2.2x10-3	6.7x10-5	Theis
B3D	180-200 ft	RUNDE	184	187	9.4	4.4x10-4	2.5x10-5	Theis
B4D	110-130 ft	B3D	237	98	4.9	2.3x10-4	4.0x10-5	Theis
B4D	110-130 ft	B5D**	165	123	6.5	3.1x10-4	9.1x10-5	Theis
B4D	110-130 ft	B6D**	120	166	8.3	3.9x10-4	6.5x10-5	Theis
B4D	140-170 ft	B3D**	237	344	11.5	5.4x10-4	1.7x10-4	Theis
B4D	140-170 ft	B5D**	165	174	5.8	2.8x10-4	2.7x10-5	Theis
B4D	140-170 ft	B6D**	120	224	7.5	3.5x10-4	4.0x10-5	Theis

* Aquitard (overburden) vertical hydraulic conductivity from Hantush-Jacob method = 0.4 gpd/ft2 (1.9x10-5 cm/sec)

** These analyses include delayed drawdown data.







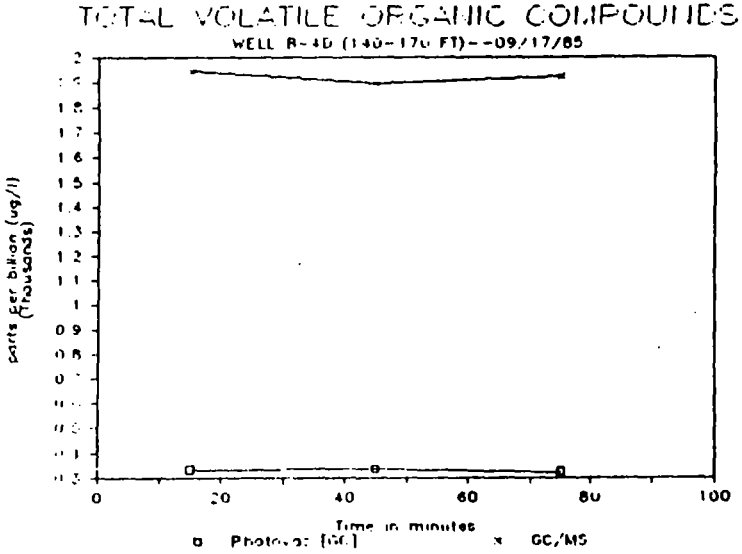
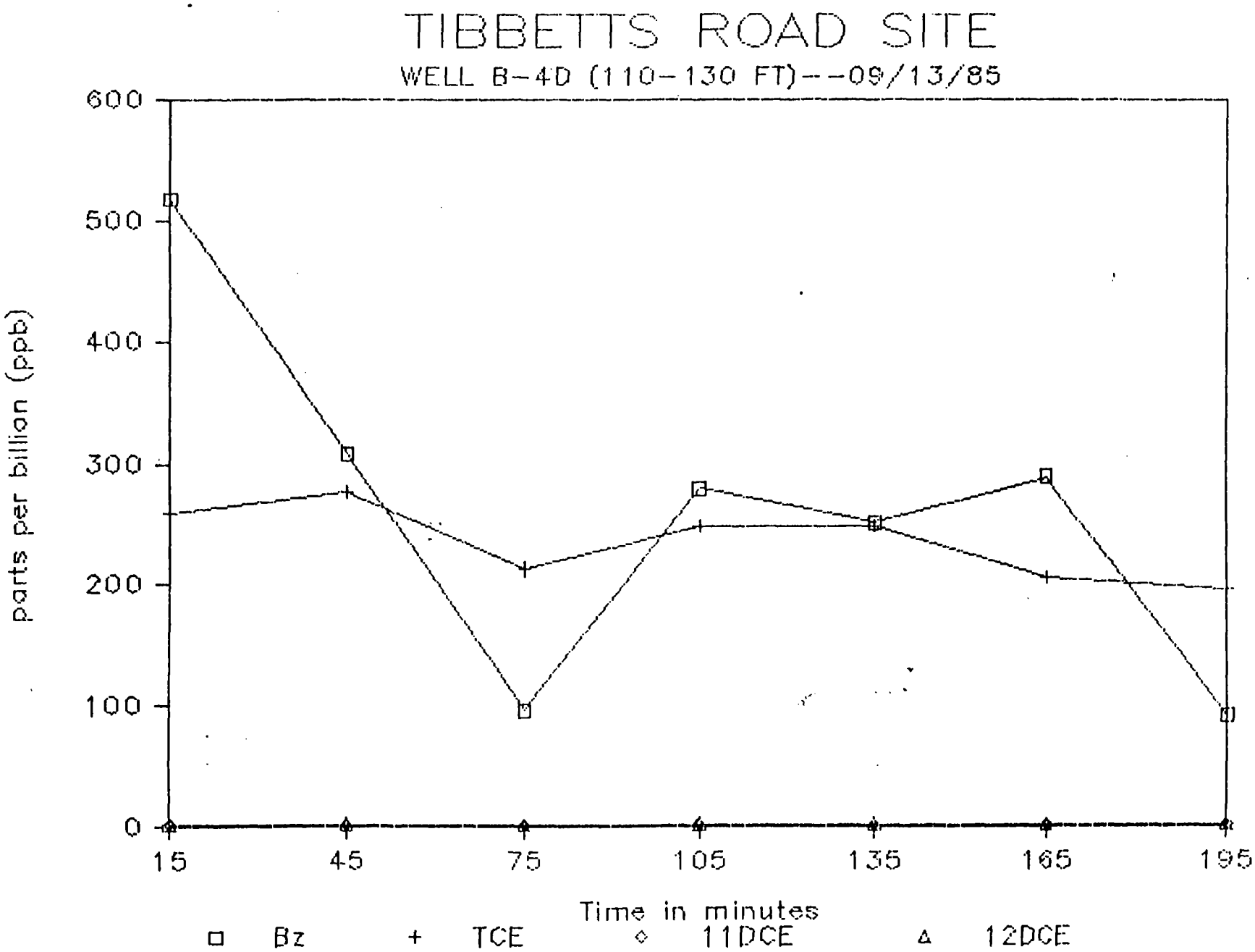
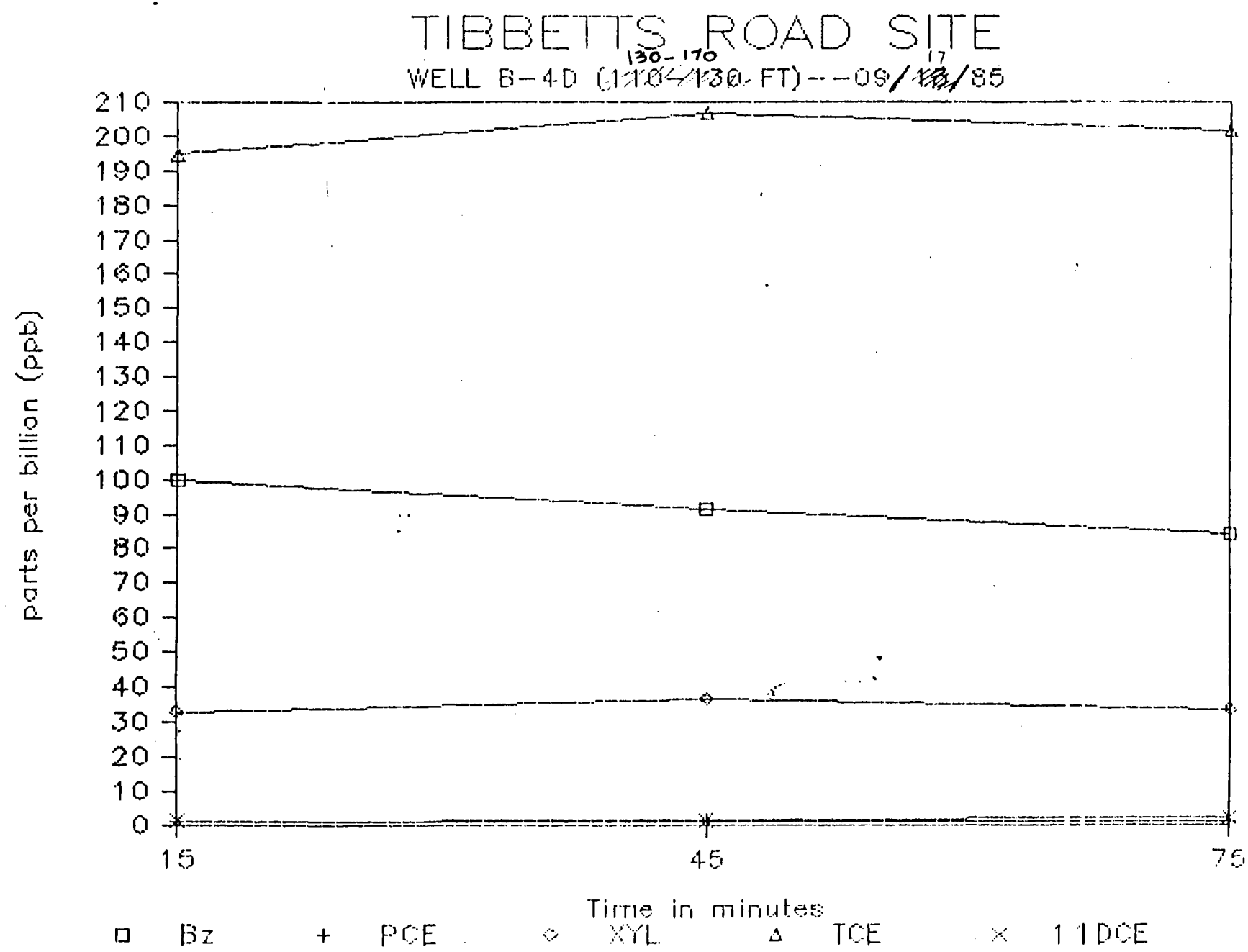


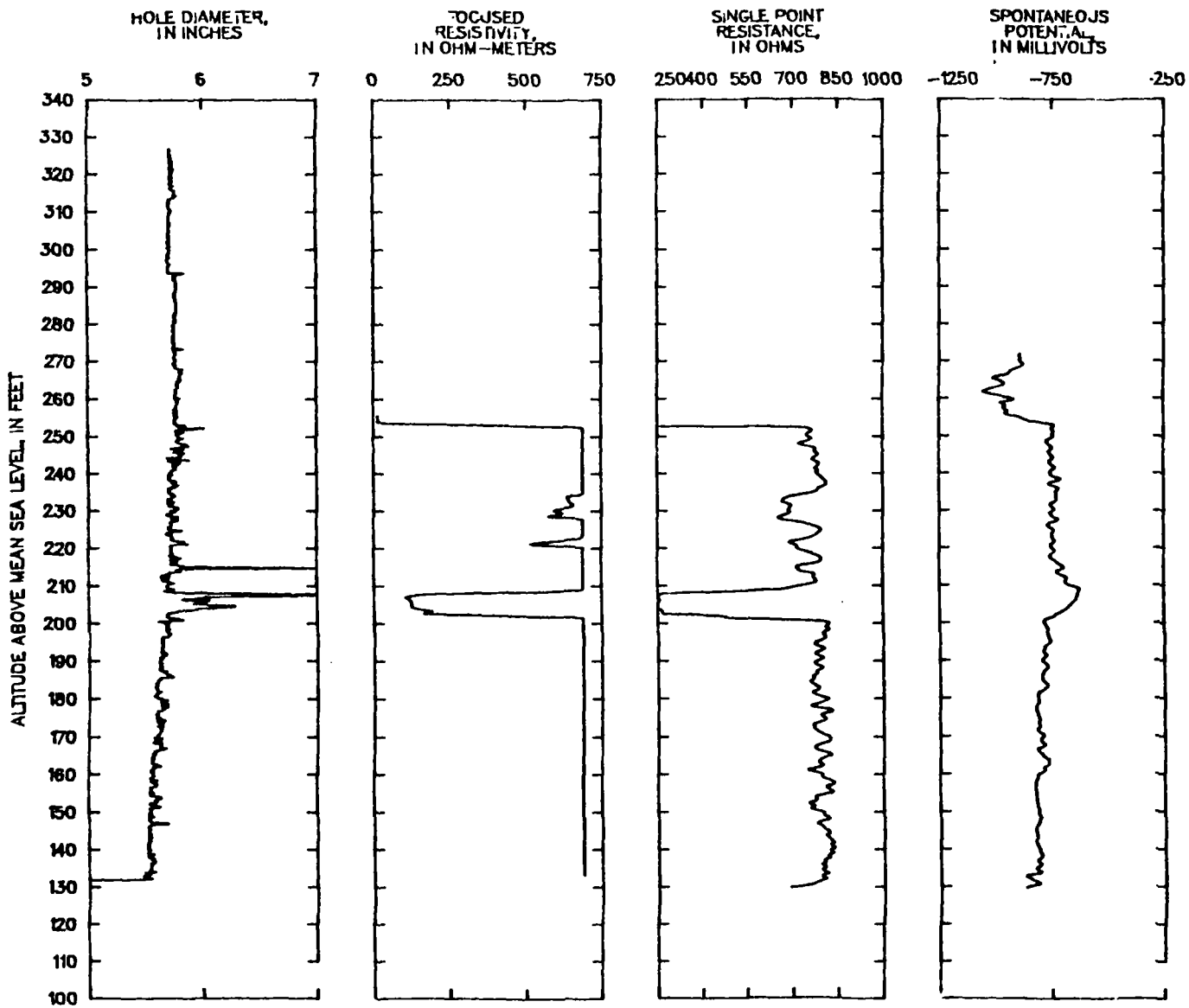
FIGURE 9

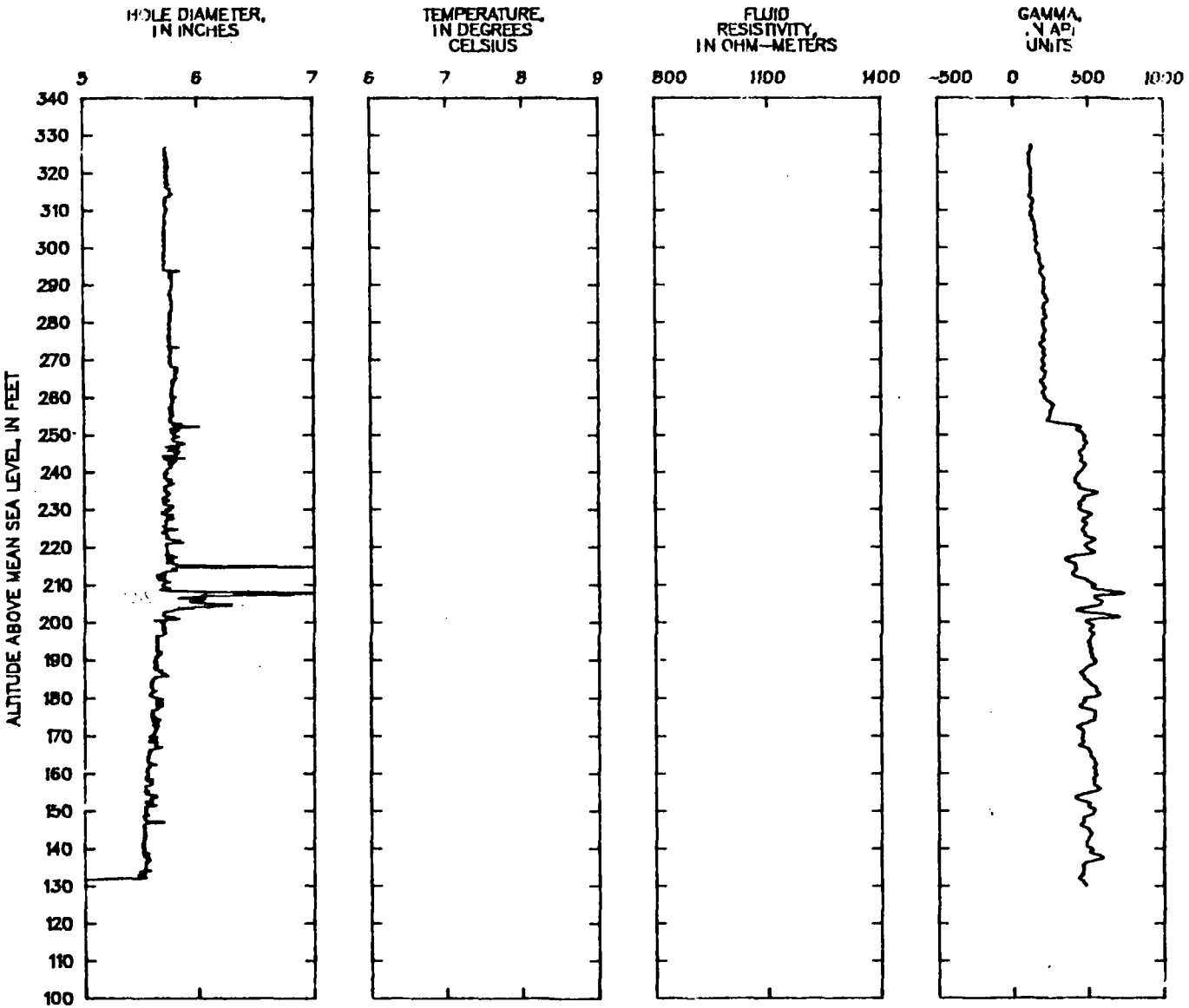
TIME SERIES ANALYSIS OF STRADDLE PACKER PUMP TEST DISCHARGE

RESULTS OF FIELD GC (PHOTOVAC) & LABORATORY GC/MS ANALYSES


TIBBETTS ROAD SITE
WELL B-4D (110-130 FT)--09/13/85
600
500
400
300
200
100
0
parts per billion (ppb)
15
45
75
105
135
165
195
Time in minutes
Bz
TCE
11DCE
12DCE


TIBBETTS ROAD SITE
WELL B-4D (130-170 FT)--09/17/85
parts per billion (ppb)
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
15
45
75
Time in minutes
Bz
PCE
XYL
TCE
1 1 DCE


HOLE DIAMETER, IN INCHES
5
6
7
FOCUSED RESISTIVITY, IN OHM-METERS
0
250
500
750
SINGLE POINT RESISTANCE, IN OHMS
250400
550
700
850
1000
SPONTANEOUS POTENTIAL, IN MILLIVOLTS
-1250
-750
-250
ALTITUDE ABOVE MEAN SEA LEVEL, IN FEET
340
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
TIBBETTS RD, B4D


HOLE DIAMETER, IN INCHES
5
6
7
TEMPERATURE, IN DEGREES CELSIUS
6
7
8
9
FLUID RESISTIVITY, IN OHM-METERS
800
1100
1400
GAMMA, IN API UNITS
-500
0
500
1000
ALTITUDE ABOVE MEAN SEA LEVEL, IN FEET
340
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100

:BBE.TS RD, B4D

LOG SUMMARY TABLE
TIBBETTS RD
B4D

DEPTH	ALTI-TUDE	CAL	TEM	FLR[1]	GAM	VEL[1]	FOC	SPR	POT	ATV
70	263		x							
99	234				(x)		x	x		
102	231						x	x		
104	229						x	x		N60W,(36E)
110	223				(x)					N75E,44W
111	222	x					x	x		
113	220									N15E,59W
119	214	x	x					(x)	x	N30E,28W
125	208	x			x		x	x	x	N55W,12W
127	206	x	(x)				x	x	x	N30E,66W
129	204	x					x	x		x
131	202	x			x					
133	200									N30E,59W
148.5	184.5	x							x	N75E,65W
187	146	x								N45E,41W
201	132							x	x	

[1]Fluid resistivity and acoustic velocity logs not run on this well.

RADINTER MODEL FILE Version 2.1 Dipole Data
Date and Time: Tue Jun 25 22:01:47 1991

PARAMETERS:

Sampling Frequency MHz:	764.986
Direct Pulse Time (us):	0.127
Depth Increment (m):	0.250
Depth of Trace 1 (m):	29.600
Nominal Velocity(m/us):	123.000
T - R Separation (m):	8.800

INFORMATION FILE:
Site and borehole:Tibbets Road Bh B4D 60 MHz dipole
Date:1991-06-25
T-R Distance:6 m rods
Equipment name:ABEM
Operator's name:BN CG

STATUS INFORMATION:
764.9860 ,Sampling frequency
-4.746000 ,Signal position
512 ,Number of samples

DATA FILE: DATA.RD3

REFLECTORS:

TYPE	NAME	DEPTH	DISTANCE	ANGLE	AZIMUTH
PLANE	Plane c	35.5	116.5	90.0	
PLANE	Plane a	39.7	130.3	41.7	
PLANE	Plane f	40.2	131.9	90.0	
PLANE	Plane e	55.6	182.4	68.9	
PLANE	Plane b	62.0	203.4	39.8	
PLANE	Plane d	77.5	254.2	31.1	

ABEM RAMAC Borehole radar system

Site and borehole:Tibbets Road Bh B4D 60 MHz dipole

Date:1991-06-25

T-R Distance:6 m rods

Equipment name:ABEM

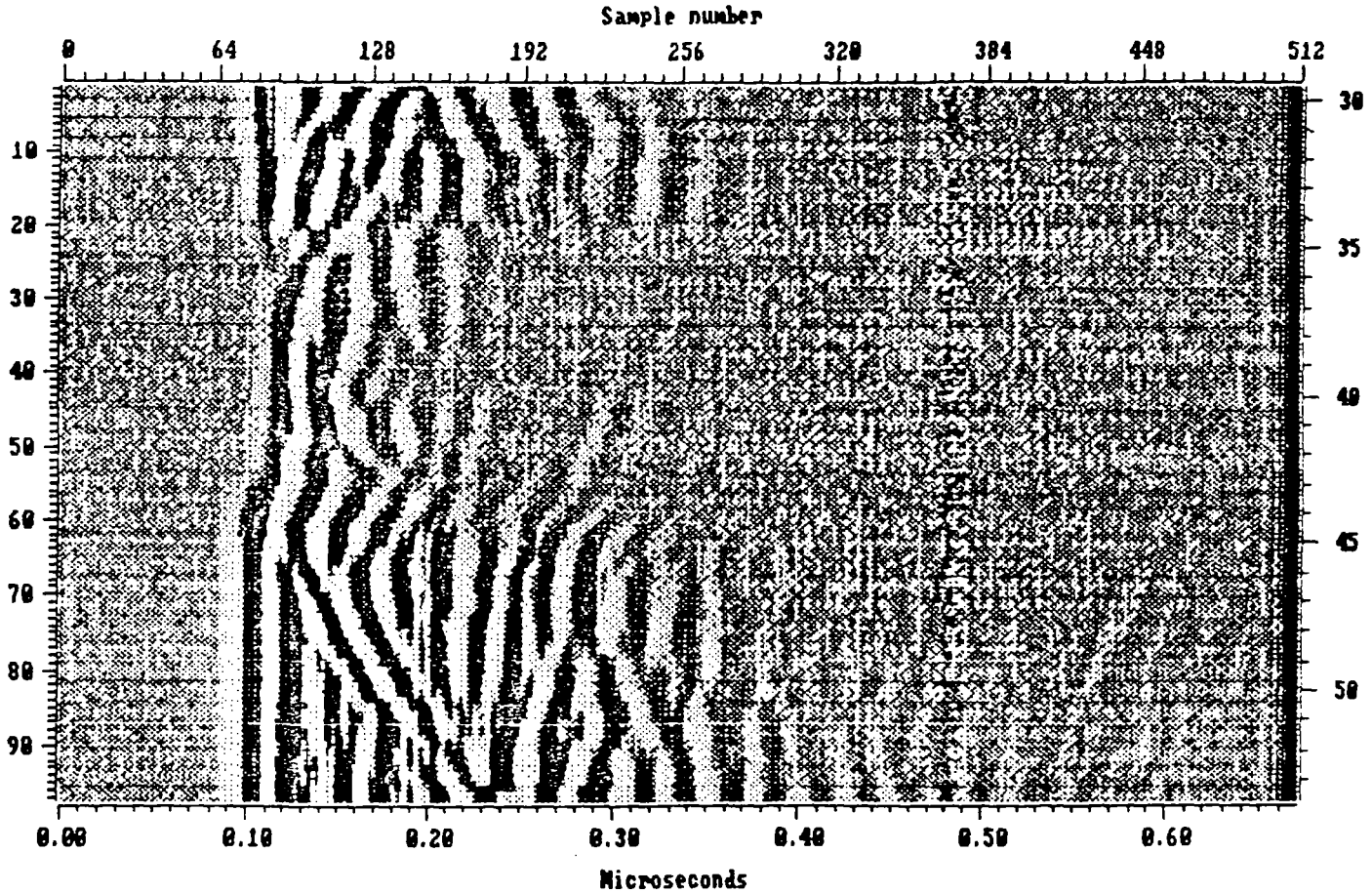
Operator's name:BN CG

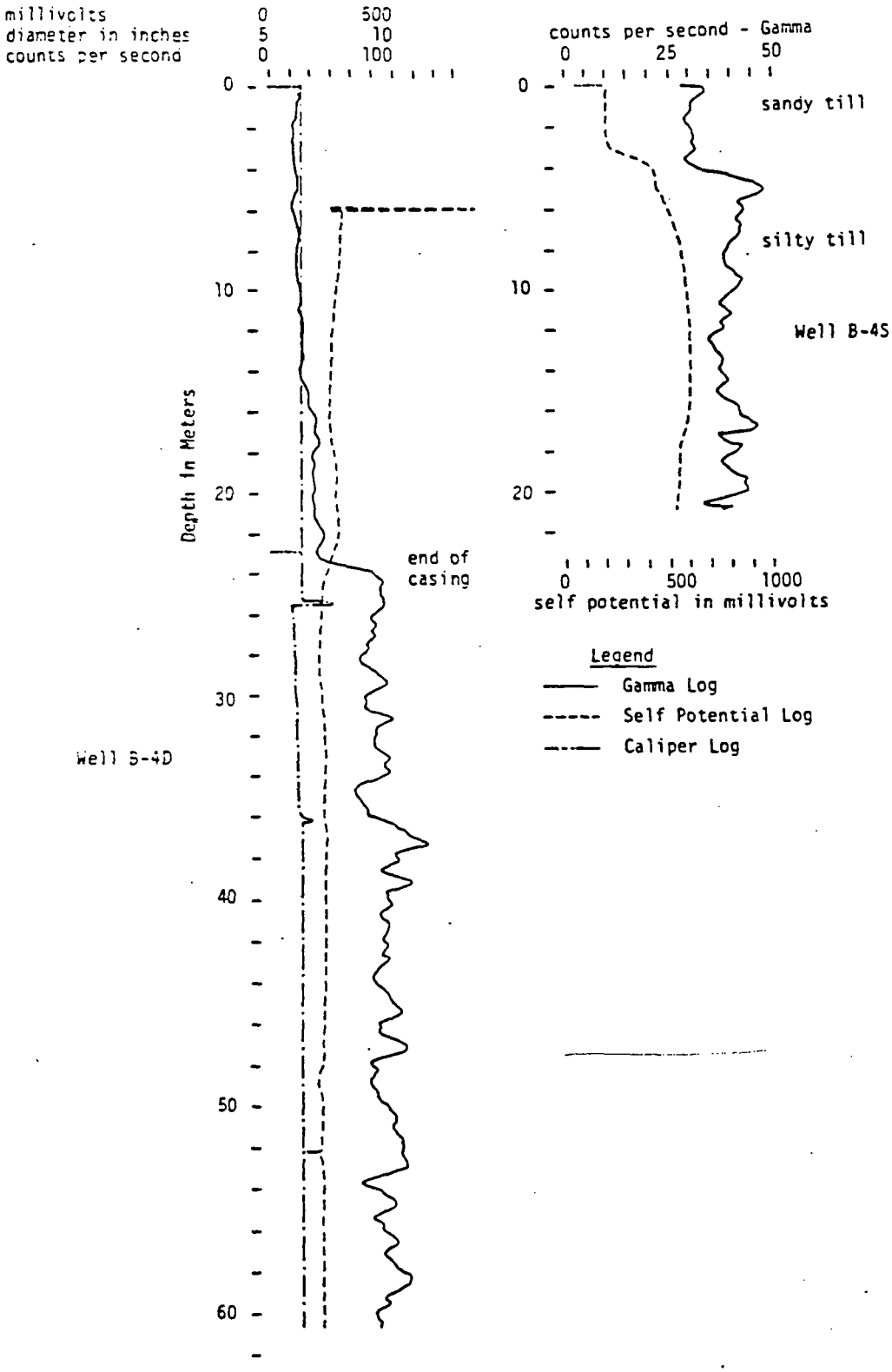
Date of plot: Tue Jun 25 21:43:24 1991

RAMAC MEASUREMENT PROGRAM 80287 VERSION 6.21

Maximum Time Gain	1.24
Lin. coefficient	0.300
Exp. coefficient	0.100
Start time of gain	0.100
DC level subracted.	
Dipole antenna.	

500 200 100 50 20 10 4 0 -4 -10 -20 -50 -100 -200 -500





BOREHOLE GEOPHYSICAL LOGS, WELLS 4D AND 4S,
TIBBETTS ROAD SITE, BARRINGTON

b

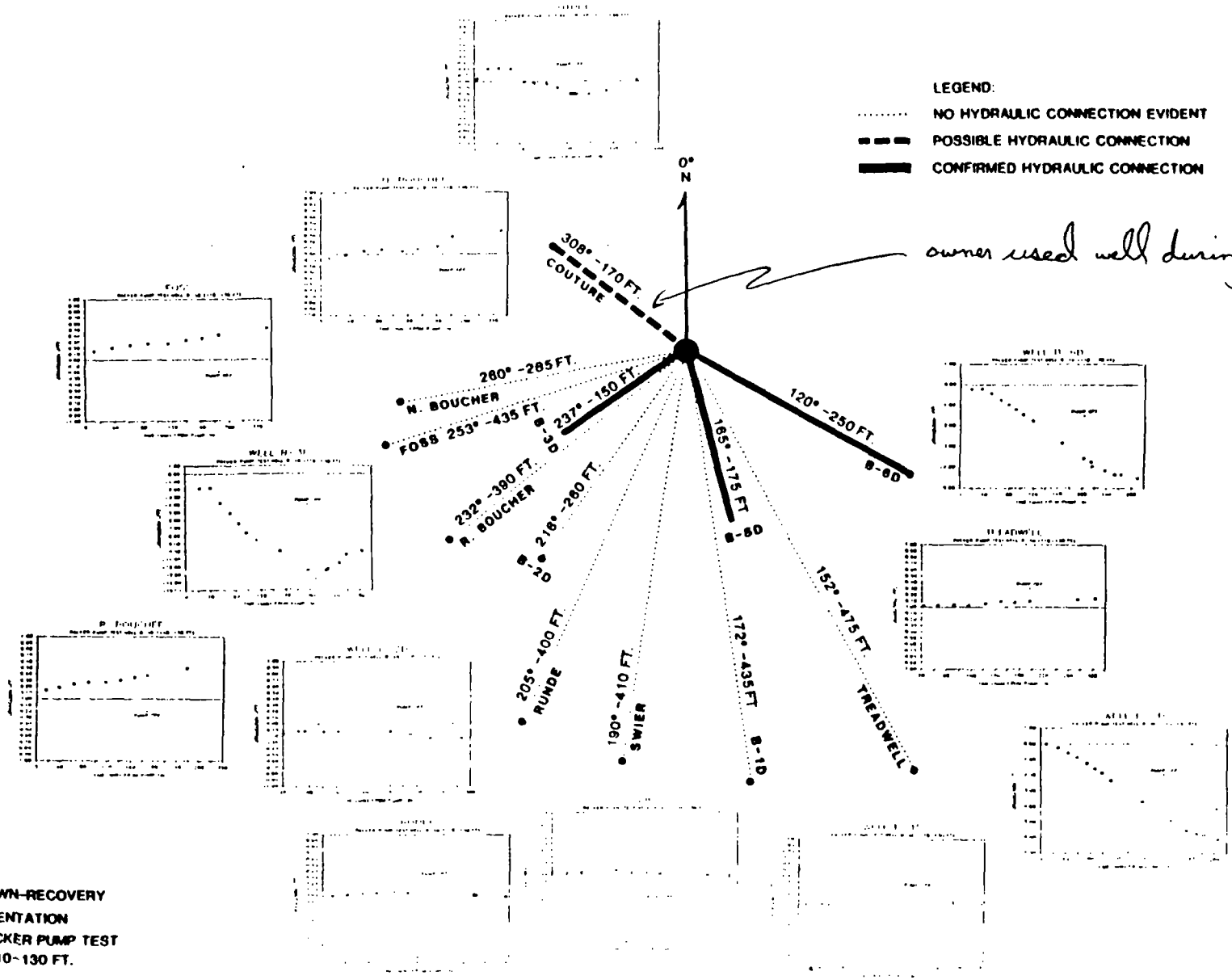


FIGURE 5
TIME-DRAWDOWN-RECOVERY
AND WELL ORIENTATION
STRADDLE PACKER PUMP TEST
WELL B4D : 110-130 FT.

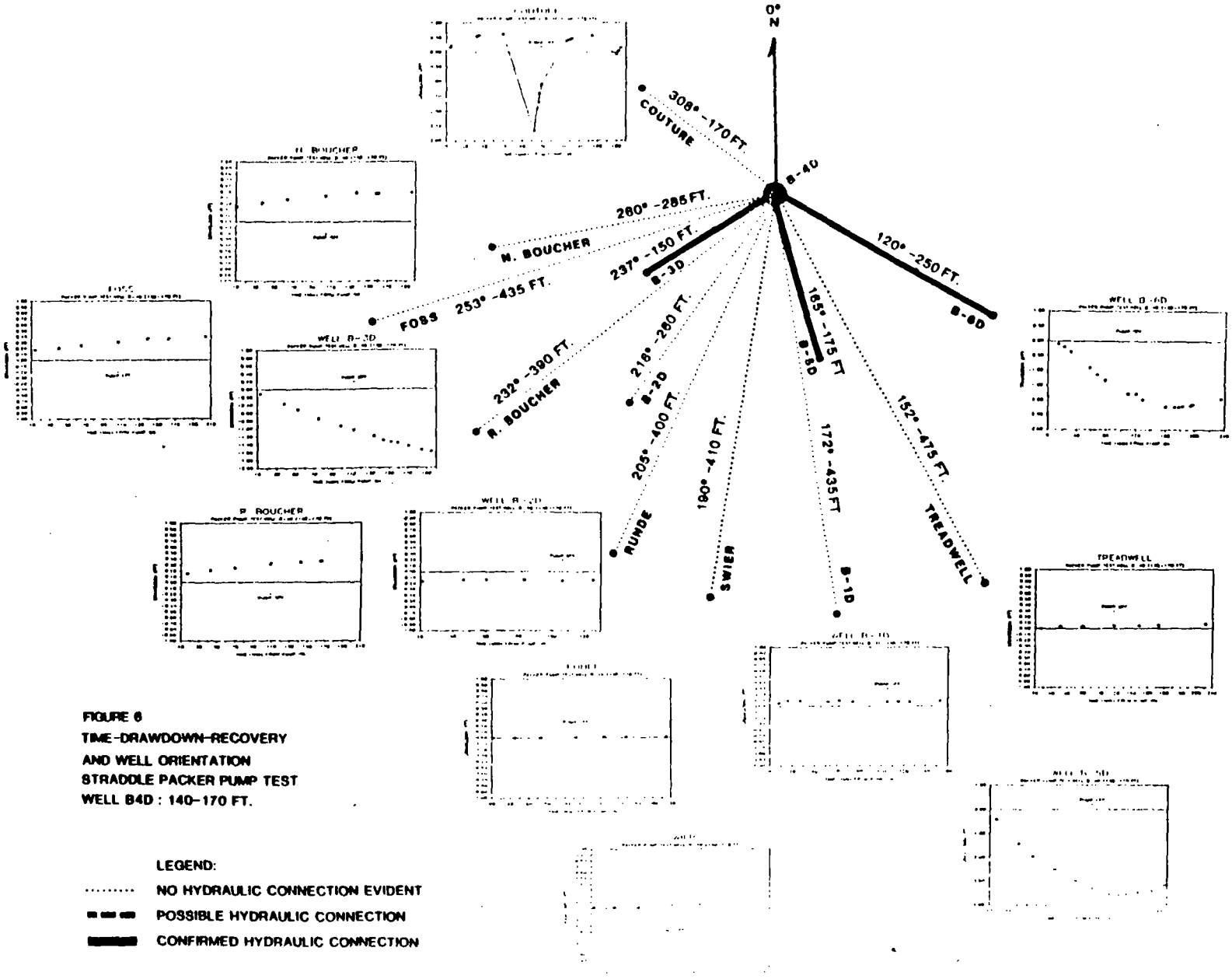


FIGURE 6
TIME-DRAWDOWN-RECOVERY
AND WELL ORIENTATION
STRADDLE PACKER PUMP TEST
WELL B4D : 140-170 FT.

LEGEND:

..... NO HYDRAULIC CONNECTION EVIDENT

- - - POSSIBLE HYDRAULIC CONNECTION

——— CONFIRMED HYDRAULIC CONNECTION

TABLE 8
RESULTS OF FIELD GC (Photovac) AND LABORATORY GC/MS ANALYSES
TIME SERIES ANALYSIS OF PUMP TEST DISCHARGE

Well: B4D Packer Zone: 110-130 ft
Date: 09/13/85

Sample Time	Benzene		Toluene		Xylenes		TCE*		Methylene Chloride		Acetone		MEK*	
(minutes)	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS
15	517.3	360(b)	1.7	1(a)	ND	22.0	259.7	780(b)	ND	4(a)	ND	320(b)	ND	11.0
45	308.7	--	ND	--	ND	--	278.2	--	ND	--	ND	--	ND	--
75	96.3	--	ND	--	14.4	--	214.3	--	ND	--	ND	--	ND	--
105	280.2	230(b)	ND	ND	10.3	4(a)	248.4	520(b)	ND	2(a)	ND	74.0	ND	5(a)
135	251.6	--	ND	--	ND	--	249.2	--	ND	--	ND	--	ND	--
165	289.5	--	ND	--	6.0	--	205.2	--	ND	--	ND	--	ND	--
195	91.4	260.0	ND	ND	10.0	6(a)	196.3	650.0	ND	1(a)	ND	86.0	ND	4(a)

Sample Time	MIBK*		1,1DCE*		T-1,2DCE*		PCE*		1,2DCE*		* TOTAL V.O.C *	
(minutes)	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS
15	ND	220.0	1.2	1(a)	ND	16.0	ND	4(a)	1.7	ND	781.6	1739.0
45	ND	--	1.1	--	ND	--	ND	--	1.8	ND	589.8	--
75	ND	--	0.8	--	ND	--	ND	--	1.3	ND	327.1	--
105	ND	48.0	1.0	ND	ND	10.0	ND	2(a)	1.7	ND	541.6	895.0
135	ND	--	0.9	--	ND	--	2.6	--	1.7	ND	506.1	--
165	ND	--	1.0	--	ND	--	0.3	--	1.1	ND	503.1	--
195	ND	46.0	0.8	ND	ND	11.0	0.2	2(a)	1.2	ND	299.8	1066.0

All data expressed as parts per billion (ug/l).

--: Not analysed.
ND: Compound was analysed for but not detected.
(a): Estimate; less than detection limit (10 ug/l), but greater than zero.
(b): Out of calibration range, but not saturated.

* Abbreviations

TCE = Trichloroethene
MEK = 2-Butanone (methyl ethyl ketone)
PCE = Tetrachloroethene (perchloroethene)
MIBK = 4-Methyl-2-pentanone (methyl isobutyl ketone)
1,1DCE = 1,1-Dichloroethene
1,2DCE = 1,2-Dichloroethene
T-1,2DCE = trans-1,2-Dichloroethene

TABLE 9
RESULTS OF FIELD GC (Photovac) AND LABORATORY GC/MS ANALYSES
TIME SERIES ANALYSIS OF PUMP TEST DISCHARGE

Well: B4D Packer Zone: 140-170 ft
Date: 09/17/85

Sample Time	Benzene		Toluene		Xylenes		TCE*		Methylene Chloride		Acetone	
(Minutes)	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS
15	100.0	250.0	ND	ND	33.0	ND	194.8	830.0	ND	3(b)	ND	570
45	91.5	290.0	ND	2(a)	34.0	20.0	206.8	830.0	ND	3(a)	ND	420
75	84.5	310.0	ND	2(a)	33.6	24.0	201.8	910.0	ND	3(a)	ND	340

Sample Time	MEK*		MIBK*		1,1DCE*		T-1,2DCE*		PCE*		* TOTAL V.O.C *	
(Minutes)	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS	GC	GC/MS
15	ND	32(b)	ND	260.0	1.2	ND	2.4	ND	1.0	ND	332.4	1945
45	ND	15.0	ND	300.0	1.3	ND	ND	15.0	1.2	3(a)	334.8	1898
75	ND	16.0	ND	300.0	2.1	1(a)	ND	14.0	1.1	3(a)	323.0	1923

All data expressed as parts per billion (ug/l).

--: Not analysed.
ND: Compound was analysed for but not detected.
(a): Estimate; less than detection limit (10 ug/l), but greater than zero.
(b): Estimate; less than detection limit (100 ug/l), but greater than zero.

* Abbreviations

TCE = Trichloroethene
MEK = 2-Butanone (methyl ethyl ketone)
PCE = Tetrachloroethene (perchloroethene)
MIBK = 4-Methyl-2-pentanone (methyl isobutyl ketone)
1,1DCE = 1,1-Dichloroethene
T-1,2DCE = trans-1,2-Dichloroethene

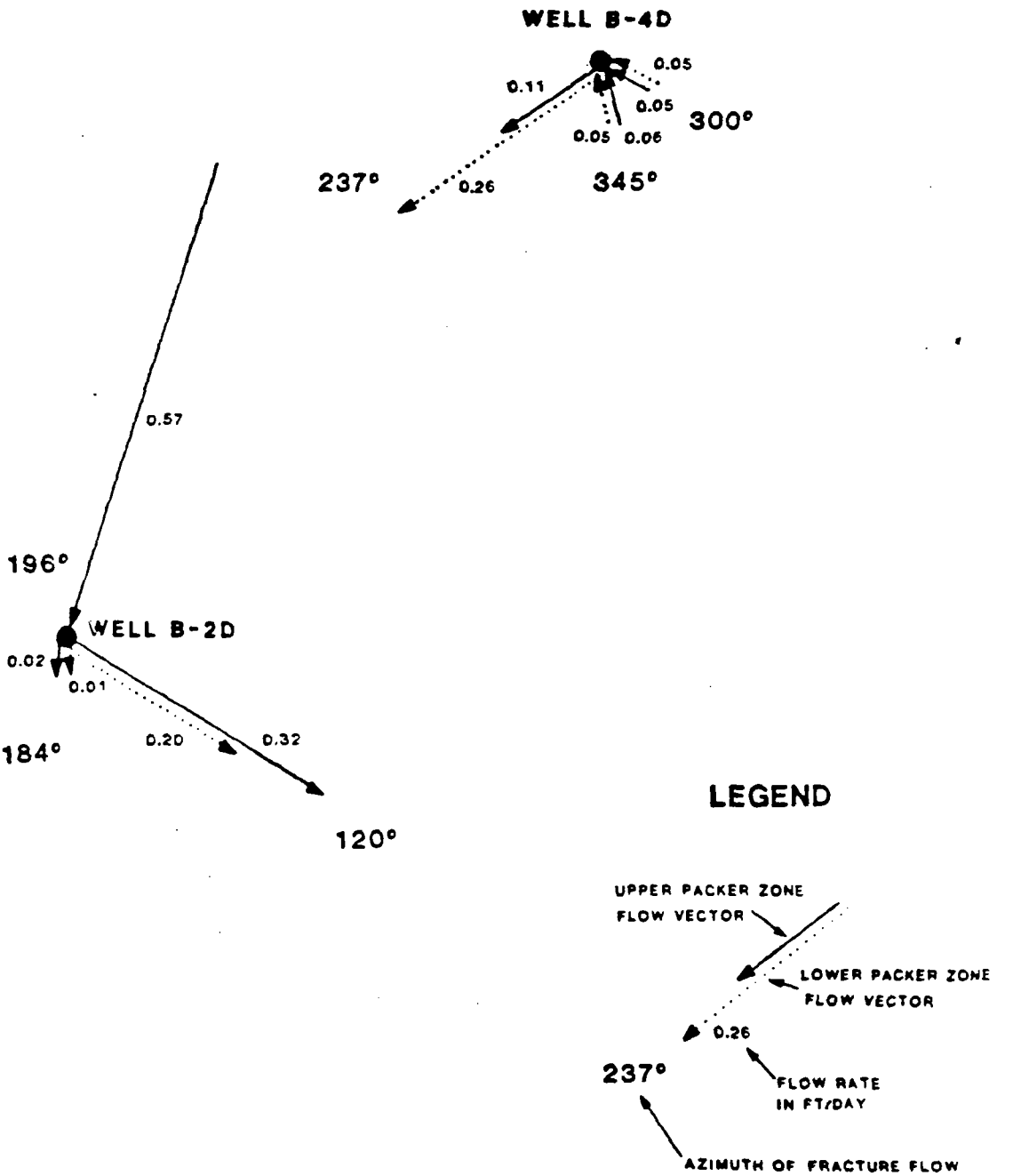


FIGURE 14

FRACTURE ZONE VELOCITY VECTORS

C

67R

NHWS&PCC BORING LOG

SITE

Tibbetts Road
Barrington

Boring No: B-5D
Sheet 1 of 2
Date: 7/10/84

Boring Company: Tasker Well Co.
Boring Location: Near Area B and OW-3
Foreman: Danny Tasker
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: 7/10/84 Ending Date: 7/10/84

SAMPLER
Type N / A
Hammer Wt.
Fall

Portadrill Air Rotary 3:00

Groundwater Readings 7:30

Date	Depth to Water	Ref. Pt.	Time/Stabilization
7/11/84	12'6"	T.O.C.	

SAMPLE

Depth	Casing Bl/ft	No	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
							glacial till	
							estimated bedrock surface	

KEY

Granular		Cohesive	
Bls/ft	Desc.	Bls/ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v. dense	15-30	v. stiff
		>30	hard

REMARKS

1. Used bentonite slurry to drill to 80'.
2. Hnu rdgs background = 2ppm, @ 70'=2 ppm, @ 90' = 2 ppm. @ 10' = 2 ppm, @ 30' = 2ppm,
3. Set 81' of 6" I.D. steel casing w/driving shoe.
4. Drilled 80' w/ 8 3/4" tricone roller bit w/bentonite slurry.

Yield Test 124 — 2.5 — blow
164 — 2 — blow

NHWS&PCC BORING LOG

SITE
Tibbetts Road
Barrington

Boring No: B-5D
Sheet: 2 of: 2
Date: 7/10/84

Boring Company: Tasker Well Co.
Boring Location: Near Area B and OW-3
Foreman: Danny Tasker
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: Ending Date:

SAMPLER
Type N / A
Hammer Wt.
Fall

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

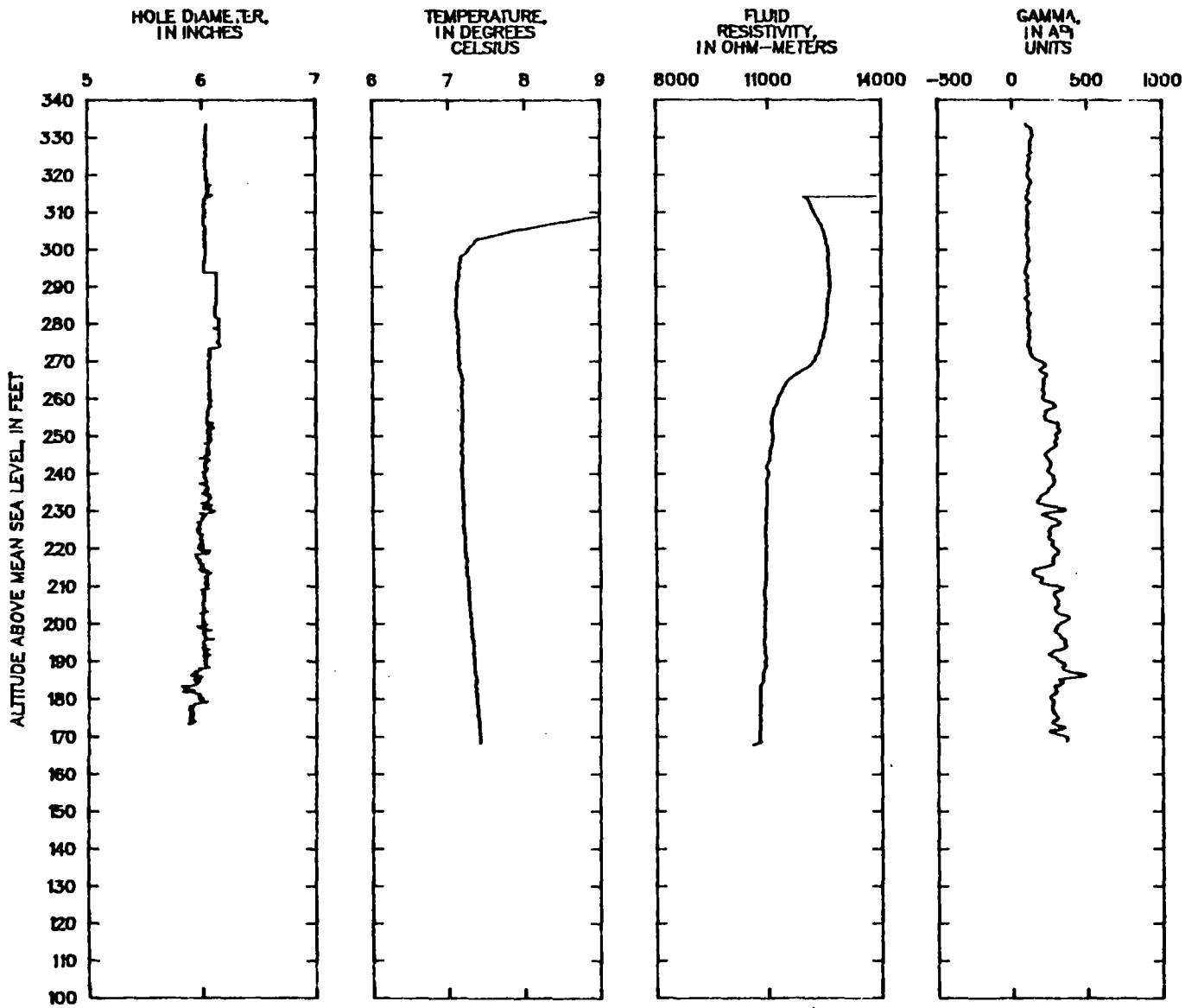
high K

Depth	Casing Bls/ft	Sample No.	Sample Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
140							2½ gpm @ 124'	
							Small Fracture @ 135'	
150								
160							2 gpm @ 164'	
							Bottom of hole @ 164'	163'10"
180								
200								

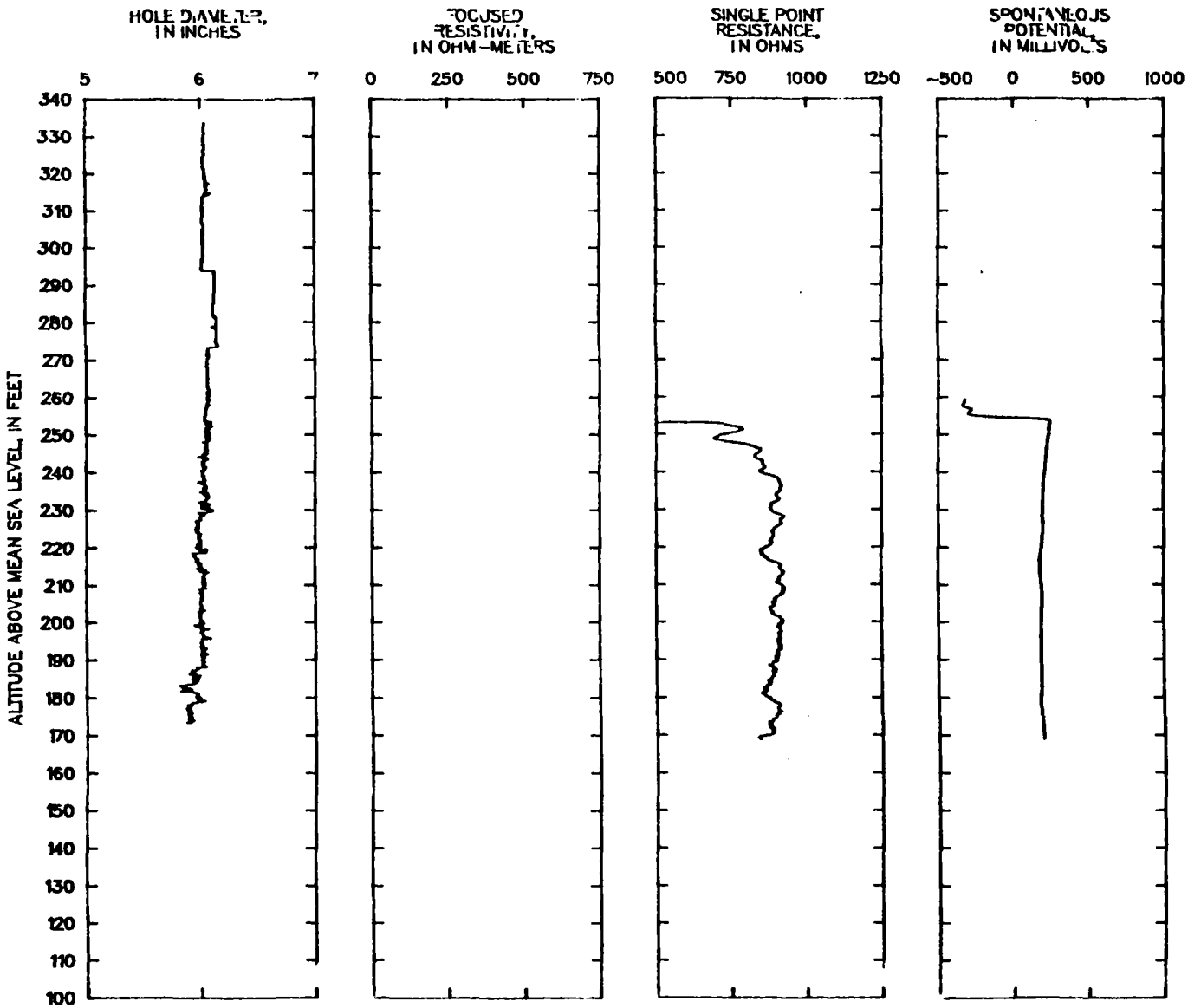
KEY

Granular		Cohesive	
Bls/ft	Desc.	Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	cense	8-15	stiff
>50	v cense	15-30	v. stiff
		>30	hard

REMARKS
1. HNu rdgs. @ 120' = 2ppm.
@ 140' = 2 ppm.
@ 164' = 2 ppm.



ABBETTS RD, B5D

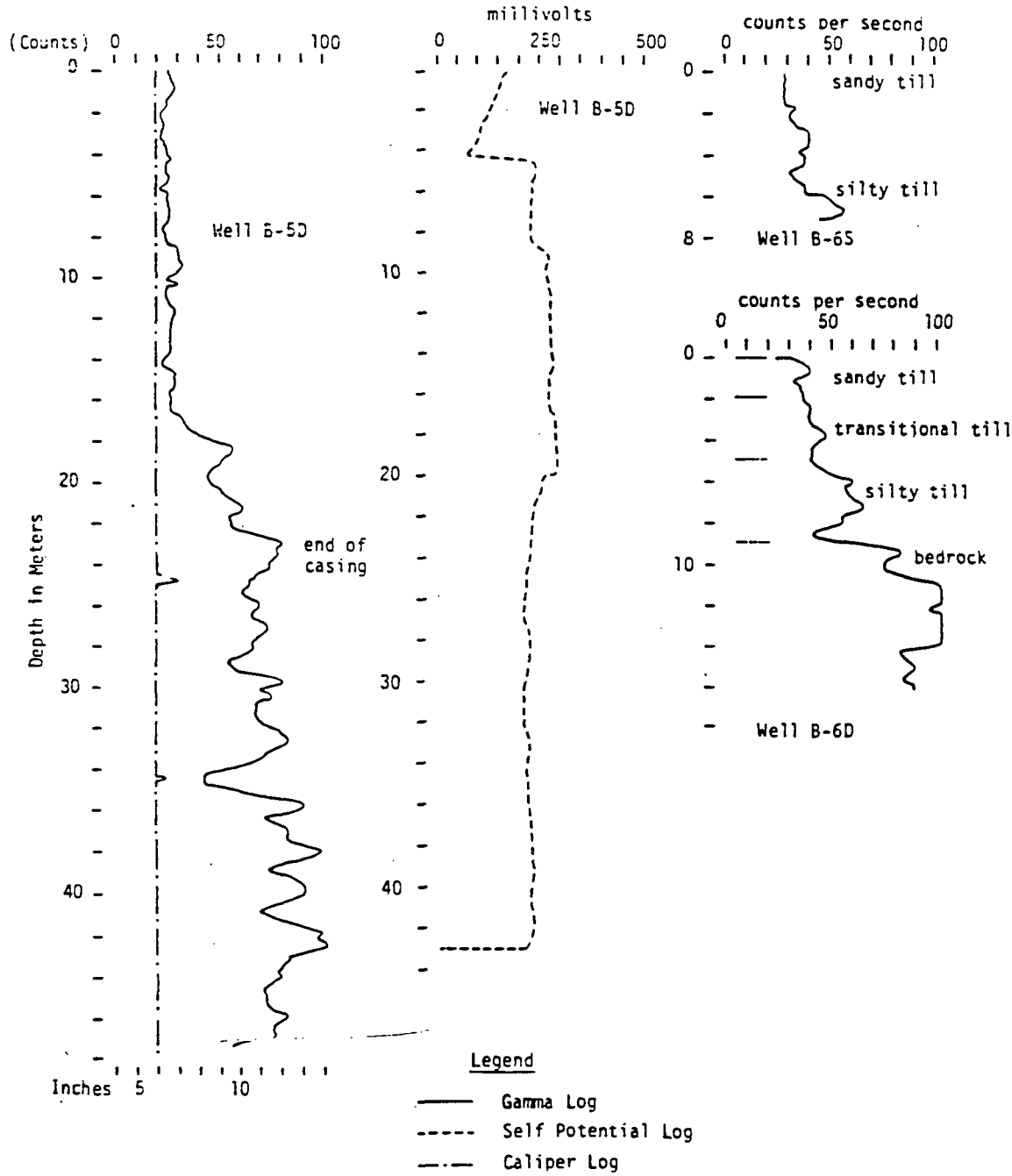


TIBBETTS RD, B5D

LOG SUMMARY TABLE
TIBBETTS RD
B5D

DEPTH	ALTI-TUDE	CAL	TEM	FLR	GAM	VEL[1]	FOC[1]	SPR	POT	ATV
83	251			x						
85	249							x		N25E,66W
93	241		x	x						N45E,70E
103	231	x			x					N45E,83E
116	218	x	x					x		N40E,63W
125	209				(x)					N75E,67E
130	204							x	x	
149	185		x	x	x					
154	180	x						x	(x)	(N85W,24E)
164	170							(x)	(x)	

[1]Acoustic velocity log not run on this well.

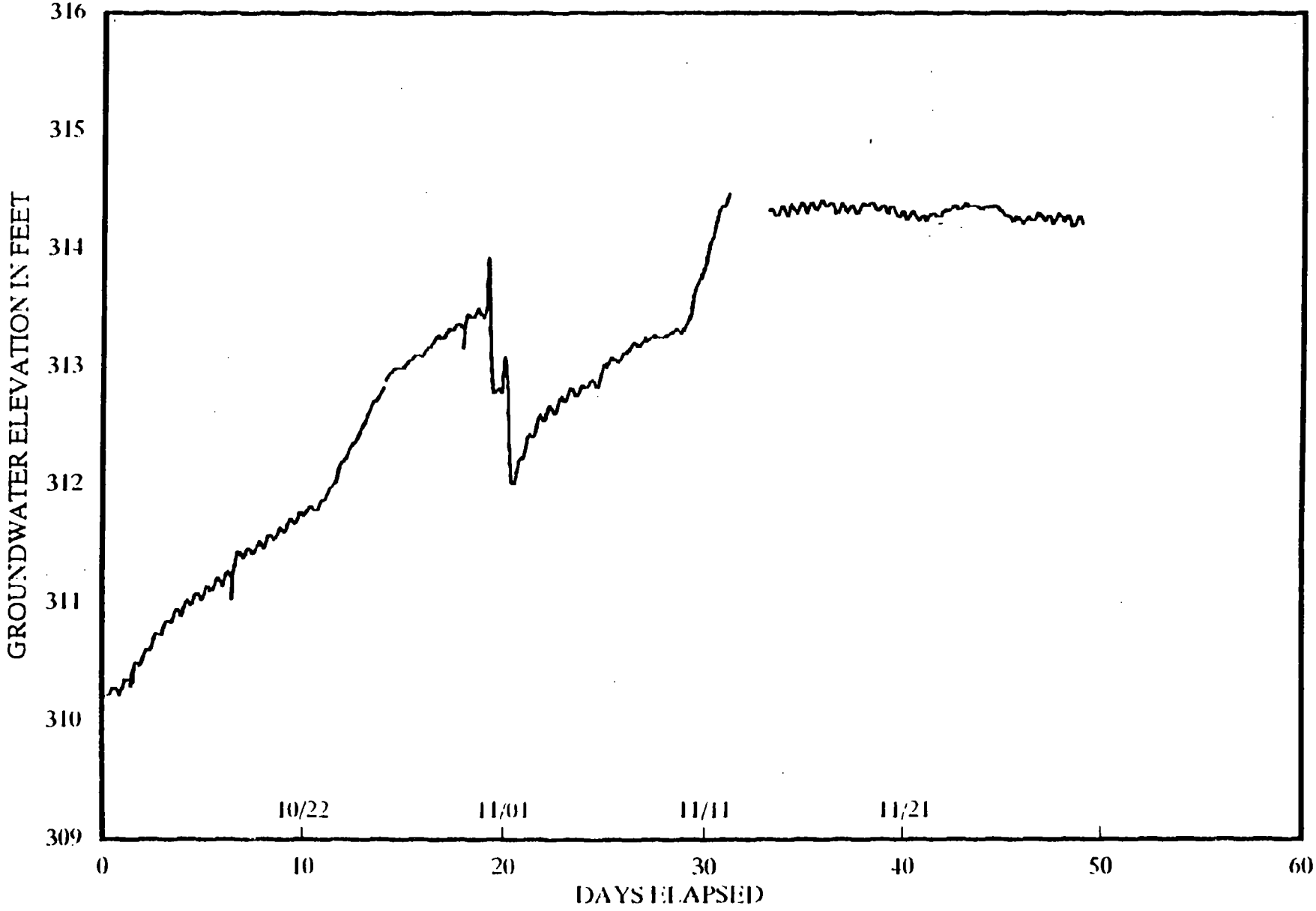


b

BOREHOLE GEOPHYSICAL LOGS, WELLS 5D, 6S, 6D,
TIBBETTS ROAD SITE, BARRINGTON

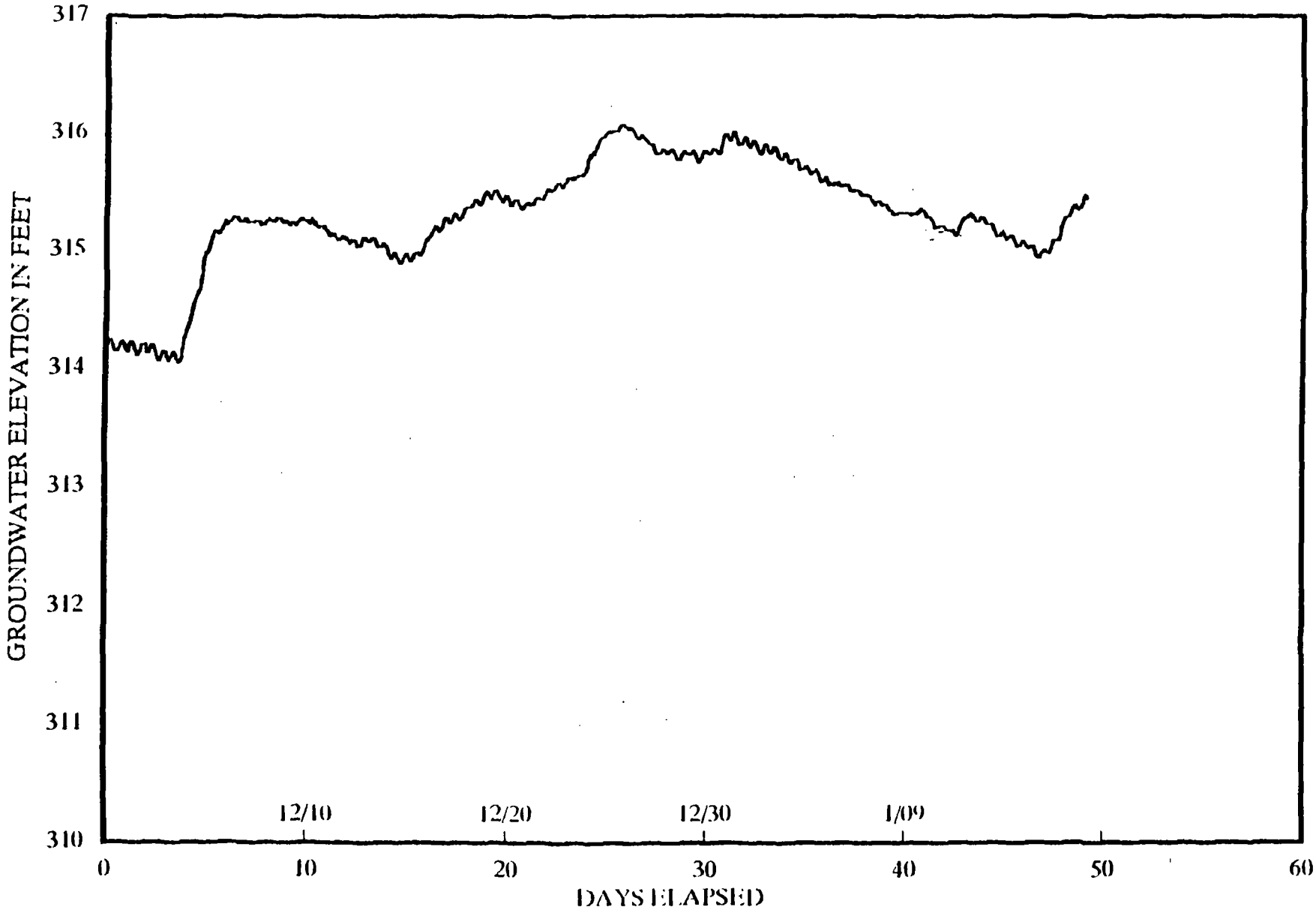
WELL 67R

10/12/90 TO 11/30/90



WELL 67R

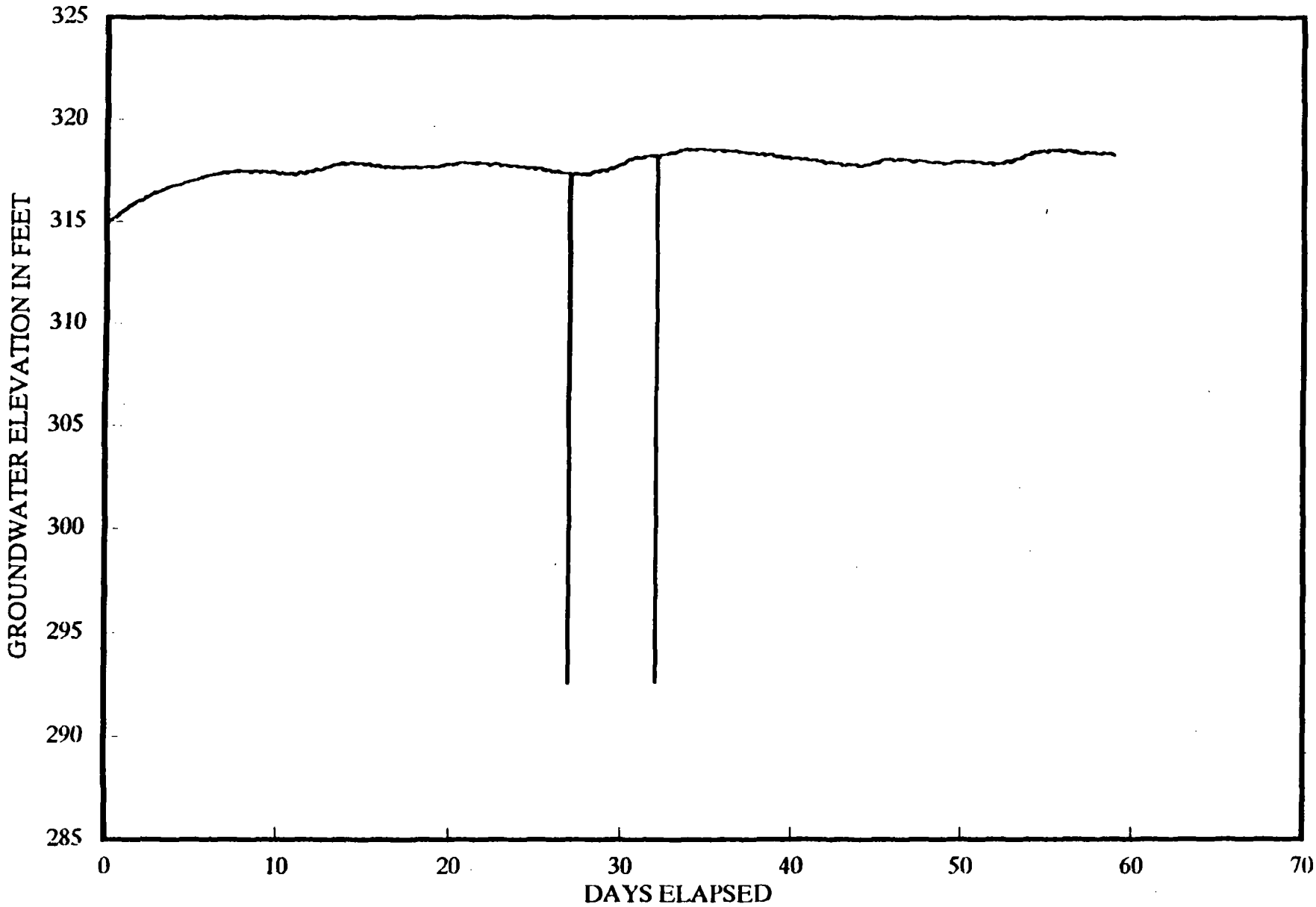
11/30/90 TO 1/18/91



Tibb. Rd.
HERMIT DATA

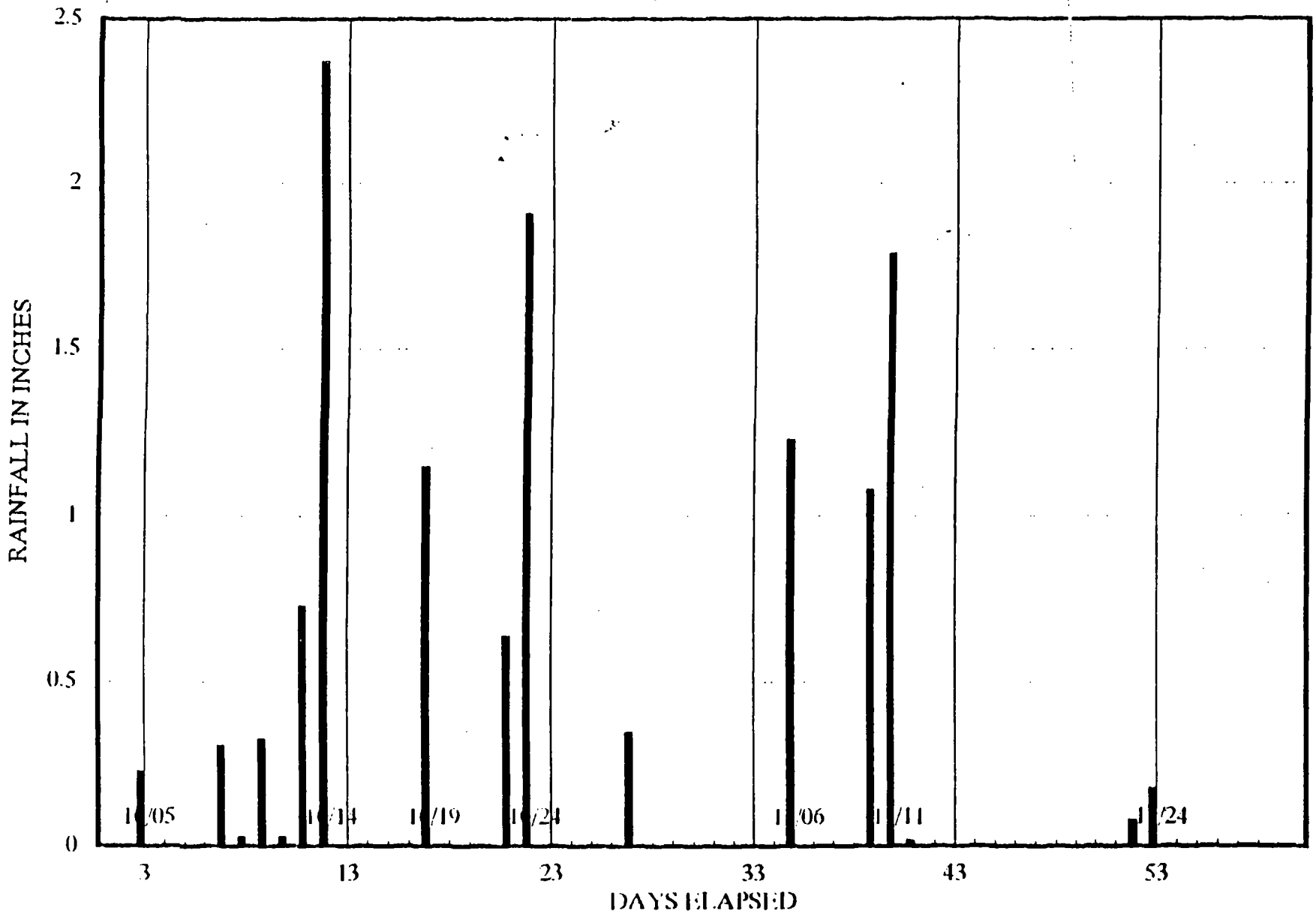
WELL 67R

2/02/91 TO 4/02/91



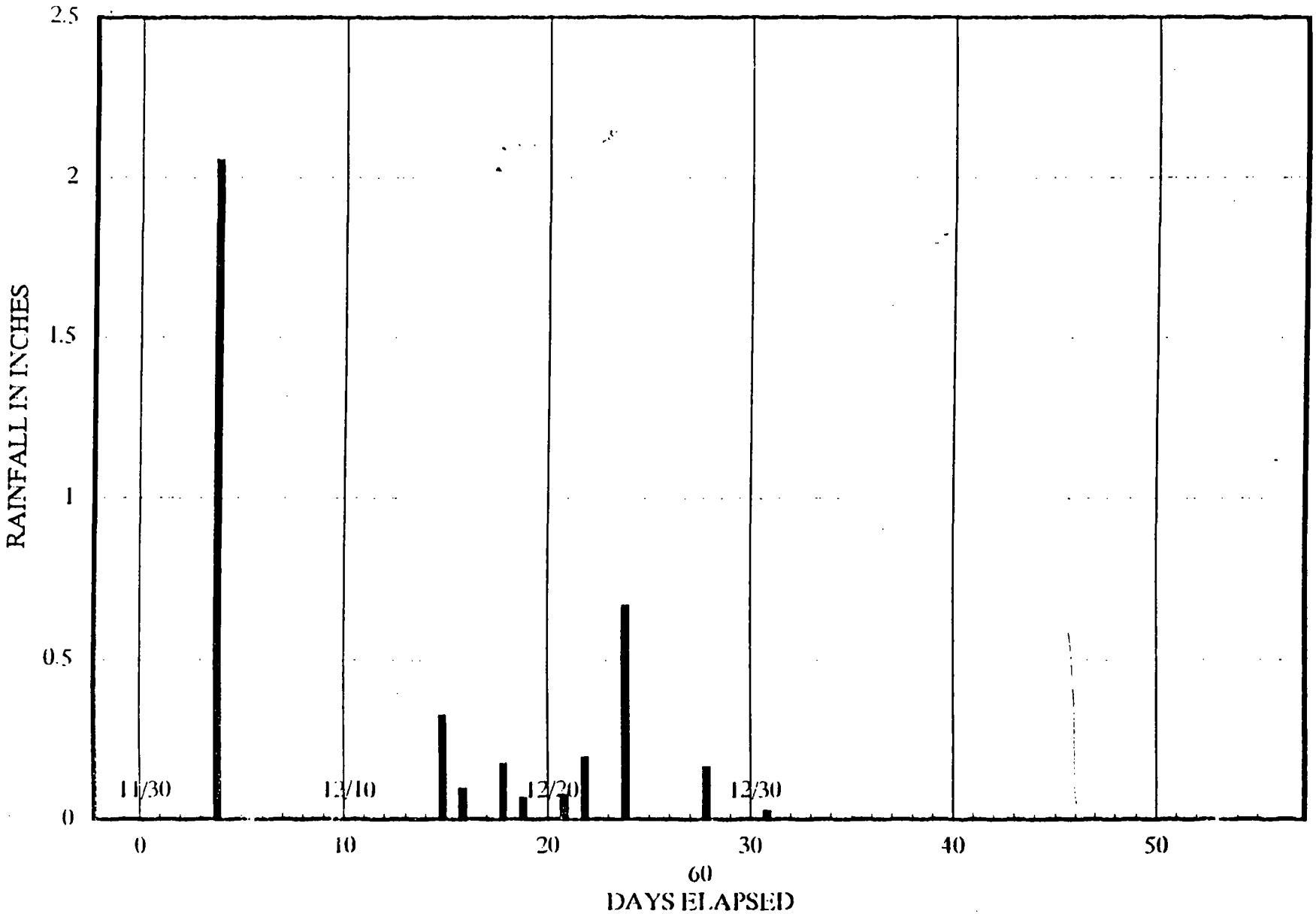
RAINFALL PER UNH (DURHAM, NH) STATION

10/03/90 TO 11/30/90



RAINFALL PER UNH (DURHAM, NH) STATION

11/30/90 TO 12/31/90



69R

NHWS&PCC BORING LOG

SITE
Tibbetts Road
Barrington

Boring No: B-6D
Sheet: 1 of: 3
Date: 7/16/84

Boring Company: Soils Engineering, Inc. Boring Location: Couture Field B-6D
Foreman: Myron Dominque Ground/Casing Elevation: TOC: 327.57' GRND: 324.97'
Geologist/Engineer: John Regan Starting Date: 7/16/84 Ending Date: 7/20/84

SAMPLER
Type Split Spoon 1 3/8"
Hammer Wt. 140 lbs.
Fall 30 Inches

11:30 Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

Hilu back = 2ppm SAMPLE Hollow Stem Augur 3 3/8" I.D.

Depth	Casing Bl/ft	No.	Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
Hilu Rdng Background 2 ppm		S-1	0-2'	24/5"	3/4/3/12		7" organic topsoil (forest liter) dry, brown f-m sand, little silt and fine gravel.	
5		S-2	5-6'6"	18/17	32/38/24		wet, brown f-m sand, little silt, little fine gravel.	
Hilu=10 2ppm		S-3	10-11'7"	19/12"	9/9/109/50.1"		moist, brown f-m sand, little silt.	
							moist gray and brown silt & clay, some f sand, trace C sand & gravel.	
2ppm 15		S-4	15-16'6"	18"	30/36/79		moist gray and brown silt, some clay, some f-m sand, little gravel, iron staining noticed.	
20		S-5A	19-19'4"	7"/7"	77/54-1"		S-5A moist, dark gray silt, some clay, some fine sand (well graded)	
		S-5B	19'4"-19'7"				S-5B moist dark gray fine sand (poorly graded).	
See next sheet.								

KEY:

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v. loose	<2	v. soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	cense	8-15	stiff
>50	v cense	15-30	v. stiff
		>30	hard

REMARKS
1. Many large sfc boulders in field (larger than 36" diameter.)
2. HSA to 15', began use of tricone roller bit w/ clean water @ 10'.
3. Bentonite added to recirc liquid @ 15'.

NHWS&PCC BORING LOG

SITE
Tibbetts Road
Barrington

Boring No: B-6D
Sheet: 2 of: 3
Date: 7/16/84

Boring Company: Soils Engineering, Inc.
Boring Location: Couture Field B-6D (deep)
Foreman: Myron Dominque
Ground/Casing Elevation:
Geologist/Engineer: John Regan
Starting Date: 7/16/84 Ending Date: 7/20/84

SAMPLER
Type Split Spoon 1 3/8"
Hammer Wt. 140 lbs.
Fall 30 Inches

Groundwater Readings

Date	Depth to Water	Ref. Pt.	Time/Stabilization

Hollow Stem Augur 3 3/8" I.D.

Depth	Casing Bl/ft	SAMPLE No	SAMPLE Depth	Pen/Rcvy	Blows/6"	LOG	Description	Construction
HNu Rdng								
25		S-6	24-24'5"	5"	200-5"		moist gray f & m sand, some silt, some fine gravel.	
3 ppm		R-1	26-29	36/18			26'0" white gray quartz monzonite w/iron staining.	
		R-2	29-31	24/0"			26'10" Dark gray silty till-18"	
30		S-7	31-31'4"		200-4"		28'4" white gray quartz monzonite w/iron staining.	
							29'3" No recovery.	
See Next Sheet.							No recovery, all wash sediment & pieces of rock.	1½" PUC Sch 80 Solid riser.

KEY

Granular Bls/ft	Desc.	Cohesive Bls/ft	Desc.
0-4	v loose	<2	v soft
4-10	loose	2-4	soft
10-30	m dense	4-8	medium
30-50	dense	8-15	stiff
>50	v dense	15-30	v. stiff
		>30	hard

REMARKS 1. Augur advanced to refusal (25'). HNu reading of augur flite soil placed in a jar. Rdng= 3 ppm. Back gr.=2ppm.
2. 7/17/84 Water level @ top of augur casing.
3. Began NX Casing @ 26', two runs to 31, Began w/ tricone roller bit again @ 31' to 33'4". Advanced hollow stem augur to 28', would not advance past a boulder.

NHWS&FCC BORING LOG

SITE
Tibbetts Road
Barrington

Boring No: B-6D
Sheet: 3 of: 3
Date: 7/19/84

Boring Company: Soils Engineering, Inc. Boring Location: Couture Horse Pasture B-6D
Foreman: Myron Dominque Ground/Casing Elevation:
Geologist/Engineer: John Regan Starting Date: 7/16/84 Ending Date: 7/20/84

SAMPLER
Type
Hammer Wt.
Fall

Groundwater Readings

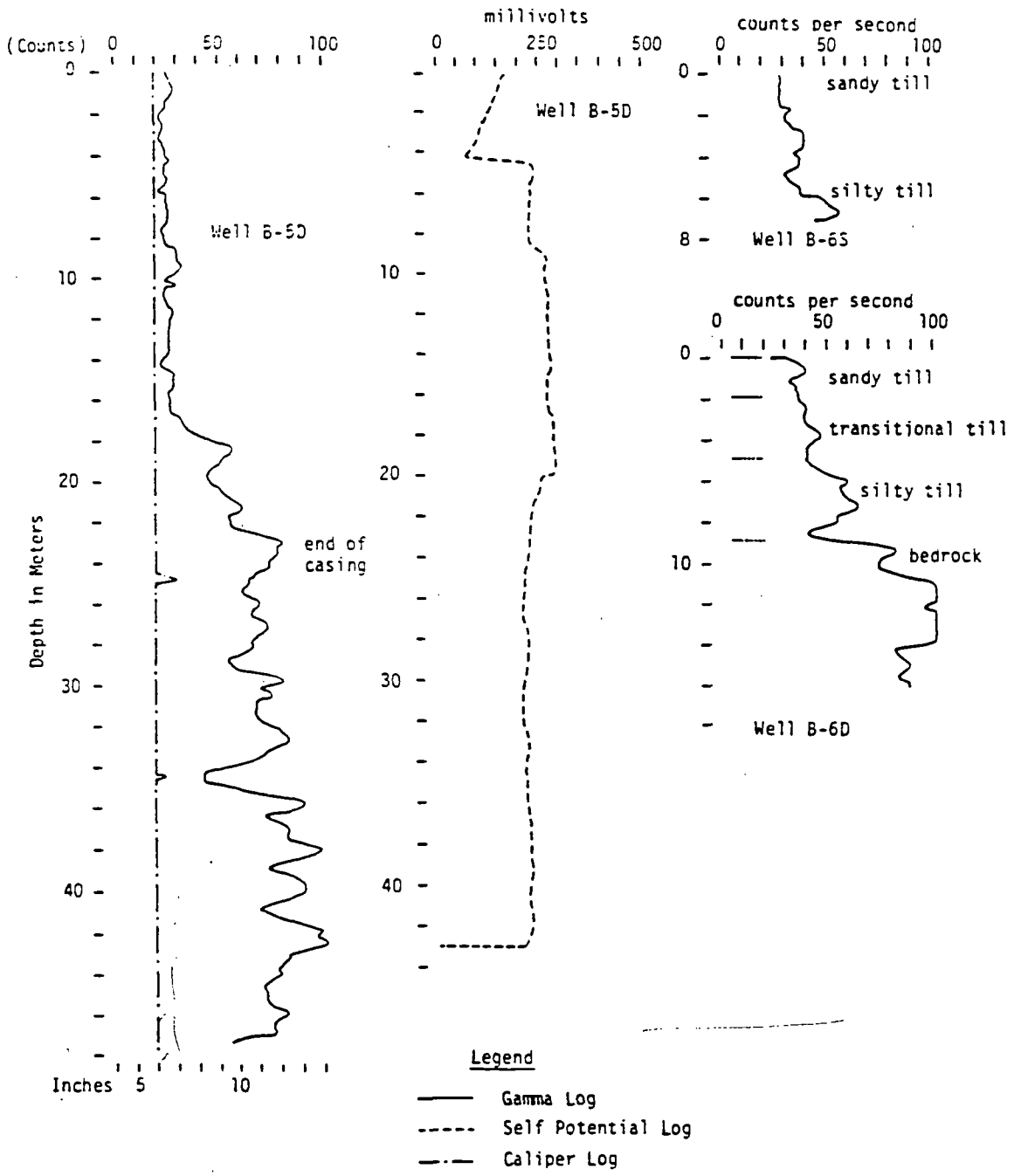
Date	Depth to Water	Ref. Pt.	Time/Stabilization

Depth	Casing Bl/ft	SAMPLE No	SAMPLE Depth	Pen/Recv	Blows/6"	LOG	Description	Construction
							32'6"	
		R-1	33'4"- 38'4"	60/60			Began Bx coring 33'4"	
35							Heavily Fractured	
40		R-2	38'4"- 43'4"	60/60			Heavily Fractured HNu=45ppm	
45		R-3	43'4"- 48'4"	60/60			Heavily Fractured HNu=1.5ppm	
50		R-4	48'4"- 53'4"	60/60			Heavily Fractured HNu=5ppm	
55		R-5	53'4" 58'4"	60/60			Iron stain Fractures 1 ppm	
60								

KEY

Granular Bls/ft	Desc.	Cohesive Bls./ft	Desc.
0-4	v.loose	<2	v soft
4-10	loose	2-4	soft
10-30	m cense	4-8	medium
30-50	cense	8-15	stiff
>50	v.dense	15-30	v. stiff
		>30	hard

REMARKS:
1. Set 4" steel casing to 28'. Set 3" casing to 32'6".
2. Began coring w/Bx corebarrel @ 33'4" and continued to 58'4".
3. 1½",20' of PVC mfg. screen, 45'1½" PVC solid riser, 40 lbs. bentonite grout, 10 lbs. silica sand, 3" steel prot. casing.
4. Bentonite grout from 37'1" to ground surface.



BOREHOLE GEOPHYSICAL LOGS, WELLS 5D, 6S, 6D,
TIBBETTS ROAD SITE, BARRINGTON

b

B-6D ROCK CORE DESCRIPTIONS
Tibbetts Road Site, Barrington

General Discussion

- Granite, NH Plutonic series, upper Devonian
- competent mass
- horizontal and vertical fractures present along with small pegmatite zones and advanced weathering zones.
- well indurated, some intrinsic permeability (see iron staining in fresh break surfaces from leaching and weathering.
- most breakage is a function of drilling and sampling procedures, not existing fractures
- you could go to a NX or MX core to obtain larger diameter cores which wouldn't be as subject to breakage.

Short Lc

38'4" a vertical fracture zone - 80° dip, incipient and oxidized, an indication that bigger high angle fractures may be present nearby.

41'2" - 42' open oxidized fract - 74° dip, rough fracture, no slickensides, transecting pegmatitic zone, leaching and weathering of feldspars observable.

44'10" 15° - 20° incipient fracture, slight weathering. Breakdown of feldspars.

54'2" - 54'4" zone of increase feldspar weathering, horizontal (release joint?), no iron oxidation to indicate groundwater movement.

55'10" zone of increased weathering - feldspar weathering out, horizontal fracture planes (rough)

> feldspars are more weathered at depth hint of sub-horizontal foliation which may be controlling sub-horizontal fracture planes and weathering.

58'4" - 7" and 8" rough subhorizontal open fractures, parallel to weakly developed foliation (function of plastic deformation, iron weathering and increased feldspar breakdown).

The fractures present in the cores indicate groundwater flow in both vertical and horizontal directions. The horizontal fractures are probably of most concern as they would extend for greater distances than the high angle vertical ones and could be intersected by domestic wells in the area. Packer test on the horizontal fractures (between 2 holes) would give you a better idea as to the horizontal transmissivity and hydraulic connection on and off the site.

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 327

Date Drilled 4/4/91 Well No. 75R Boring Co. LaFramboise Top of Casing 329.79 Top of Riser 329.69 Screen Length 5 ft

Total Depth 26 ft Boring Method Used Air Rotary Piezometer Casing Size & Type 2" PVC Schd. 40 Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
			N					LPP in 4' Cement
			O					2" Riser 2' AG to 21' in Grout
5						Brown Sandy Till (Observed from cuttings)		
			S					5 ft .020 Slot Screen 21'-26'
			A					
10			M					
			P				12'	
			L			Dense Gray Till		Bentonite 17'-19'
15			E				15'	
			S			Soft Clay	16'	
20						Dense Gray Till		
								02 Sand 19'-26'
25			V				24'	
26						Weathered Rock BOH	26'	

Remarks: Developed 4/6/91. All elevations shown are ft. MSL.
Rising head test conducted 4/18/91.

GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

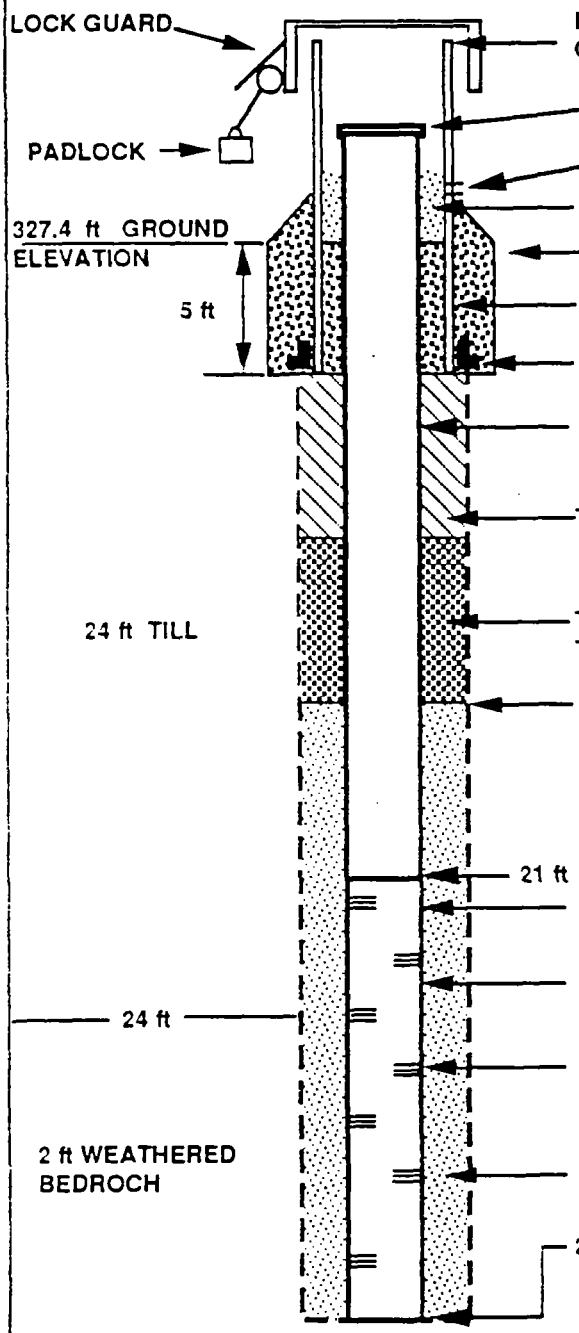
WELL: 75 R

LOCATION: Johnson Residence
Tibbetts Road

INSTALLED: 4/4/91

DEVELOPED: 4/6/91

CONSTRUCTION DETAILS: CORED WELL COMPLETED IN WEATHERED BEDROCK (5D - Wx)



ELEVATION OF MEASURING POINT OF PROTECTIVE CASING	329.79 ft
ELEVATION OF MEASURING POINT OF TOP OF RISER	329.69 ft
VENT HOLE	
SAND FILL	
SURFACE SEAL	3 ft BELOW GRADE
PROTECTIVE CASING	4 in DIAMETER, 5 ft LONG
CEMENT ANCHOR	3-STEEL ANGLE 1in x 1 in
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	SCH 40 PVC / 2 in
TYPE OF BACKFILL AROUND RISER	BENTONITE GROUT
TYPE OF SUBSURFACE SEAL/ THICKNESS	BENTONITE PELLETS / 2 ft
THICKNESS OF BACKFILL ABOVE SCREEN	2 ft
21 ft (Elev. 306.4 ft)	PVC, SAW-CUT SLOTS 5 ft LENGTH
TYPE OF POINT OR SCREEN	
SCREEN GAGE OR SIZE OF OPENINGS	20 SLOT / 0.020 in
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT SCREEN	2 in PVC
TYPE OF BACKFILL AROUND SCREEN	00 SAND
26 ft (Elev. 301.4 ft)	
BACKFILL BETWEEN BOTTOM OF SCREEN AND BOTTOM OF BOREHOLE	NONE

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 313

Date Drilled 4/2/91 Well No. 76R Boring Co. LaFramboise Top of Casing 314.96 (1) See Remarks Open Hole 38-250 ft

Total Depth 252 ft Boring Method Used Air Rotary Piezometer Casing Size & Type 6" Steel Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth 3.5 ft

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
			N					
5			O			Brown Sandy Till (Observed from cuttings)		
10			S A M P L E S					
							12'	
15								
20								
25						Weathered Rock		
30								
35								
							36'	Bottom of Casing
40								38'
						Open Hole		
250								Fractured 247-252
						BOH	252'	

Remarks: Dry Hole to 247': Well made >300 GPM when fractured zone penetrated.
Self-developed.
Well yield test conducted 4/26/91. Tested at 53 GPM, the limit of the Pump.
(1) Elev. of point above lock flange.
All elevations shown are ft. MSL.

BEDROCK GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

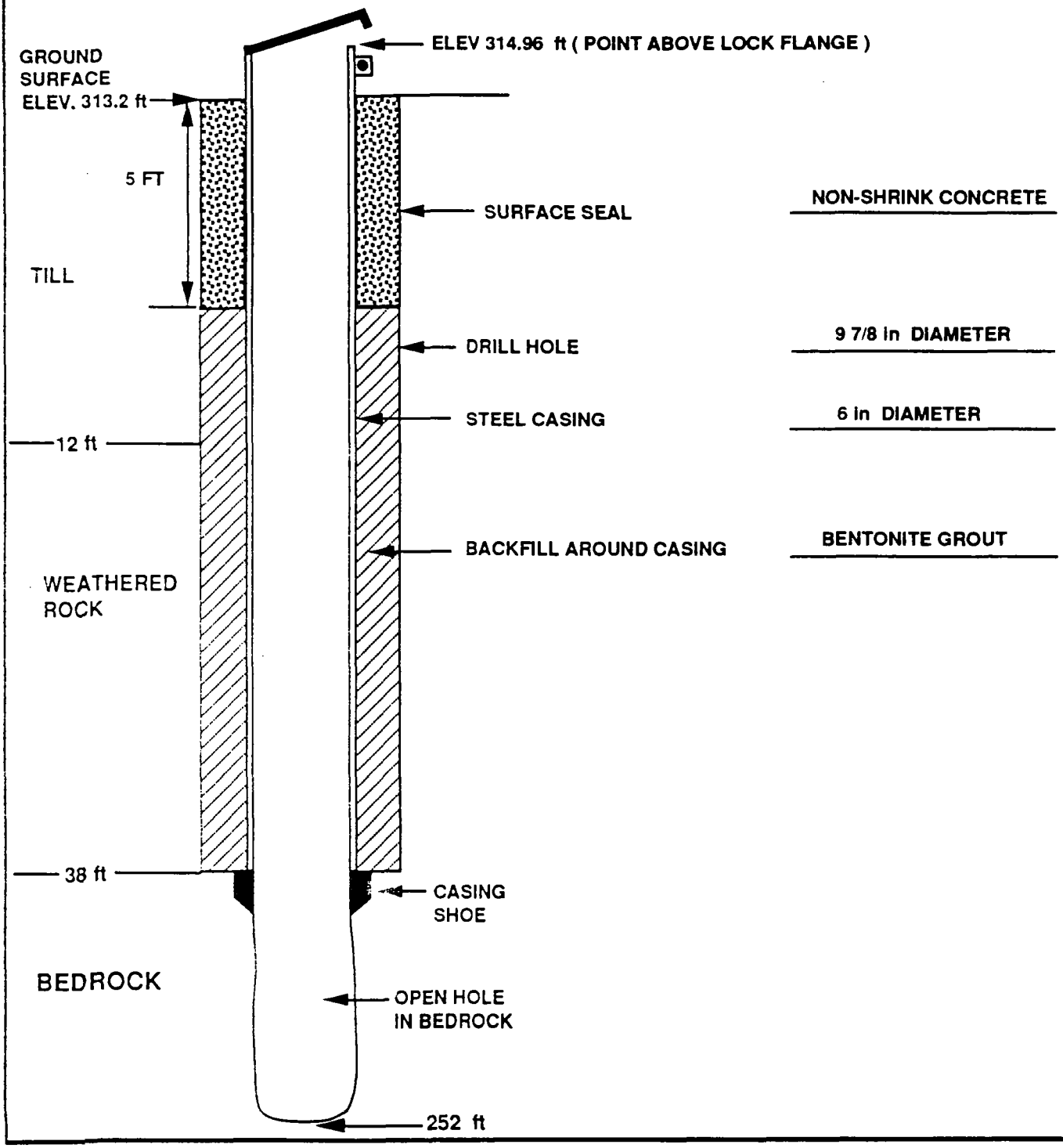
WELL: 76 R

LOCATION: Behind Johnson Residence

INSTALLED: 4/2/91

DEVELOPED: Self-developed

Construction Details: 6 inch Bedrock Well



RADINTER MODEL FILE Version 2.1 Dipole Data
Date and Time: Tue Jun 25 20:09:35 1991

PARAMETERS:

Sampling Frequency MHz:	764.986
Direct Pulse Time (us):	0.115
Depth Increment (m):	0.250
Depth of Trace 1 (m):	17.100
Nominal Velocity(m/us):	123.000
T - R Separation (m):	8.800

INFORMATION FILE:
Site and borehole:Tibbets Road Bh 76R
Date:1991-06-24
T-R Distance:6 m rods
Equipment name:ABEM
Operator's name:BN CG

STATUS INFORMATION:
764.9860 ,Sampling frequency
-4.746000 ,Signal position
512 ,Number of samples

DATA FILE: C_DAT.RD4

REFLECTORS:

TYPE	NAME	DEPTH	DISTANCE	ANGLE	AZIMUTH
PLANE	Plane c	7.7	25.3	16.4	
PLANE	Plane l	11.2	36.7	57.5	
PLANE	plane h	29.8	97.7	34.6	
POINT	Point a	43.3	142.1 36.7		
PLANE	Plane f	49.9	163.7	37.8	
PLANE	Plane g	63.3	207.7	27.2	
PLANE	Plane d	69.4	227.7	37.9	
PLANE	Plane b	73.5	241.2	32.0	
PLANE	Plane i	79.1	259.5	37.8	
PLANE	Plane a	79.3	260.1	65.9	
PLANE	Plane j	86.2	282 8	35.7	
PLANE	Plane e	88.1	289	44.2	

ABEM RAMAC Borehole radar system

Site and borehole:Tibbets Road Bh 76r 22 MHz

Date:1991-06-24

T-R Distance:10 m rods

Equipment name:ABEM

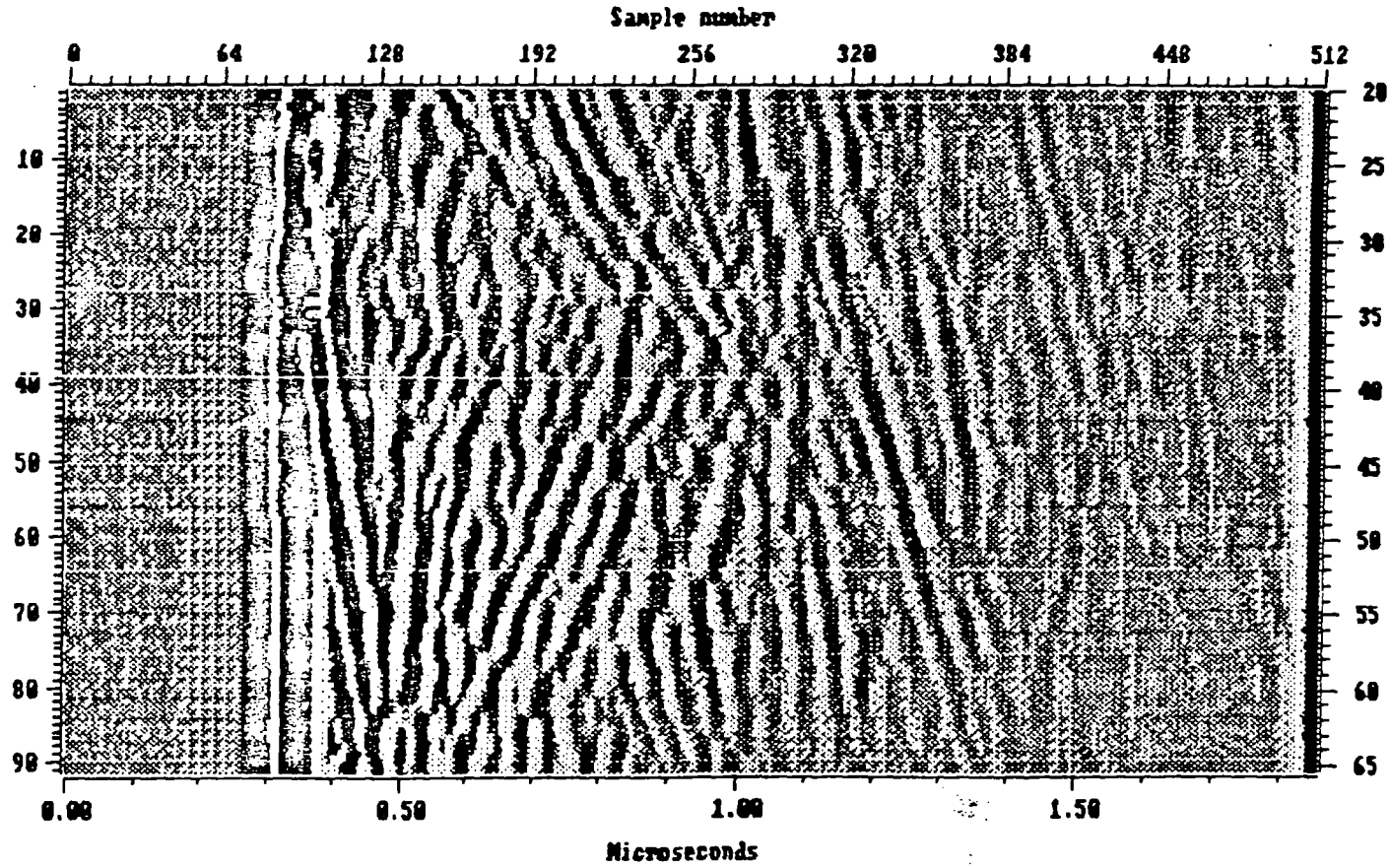
Operator's name:BM CG

Date of plot: Tue Jun 25 19:43:06 1991

RAMAC MEASUREMENT PROGRAM 80287 VERSION 6.21

Maximum Time Gain	4.07
Lin. coefficient	1.000
Exp. coefficient	0.300
Start time of gain	0.300
DC level subracted.	
Dipole antenna.	

25000
10000
5000
2500
1000
500
250
0
-250
-500
-1000
-2500
-5000
-10000
-25000



ABEM RAMAC Borehole radar system

Site and borehole:Tibbets Road Bh 76r 22 MHz

Date:1991-06-24

T-R Distance:10 m rods

Equipment name:ABEM

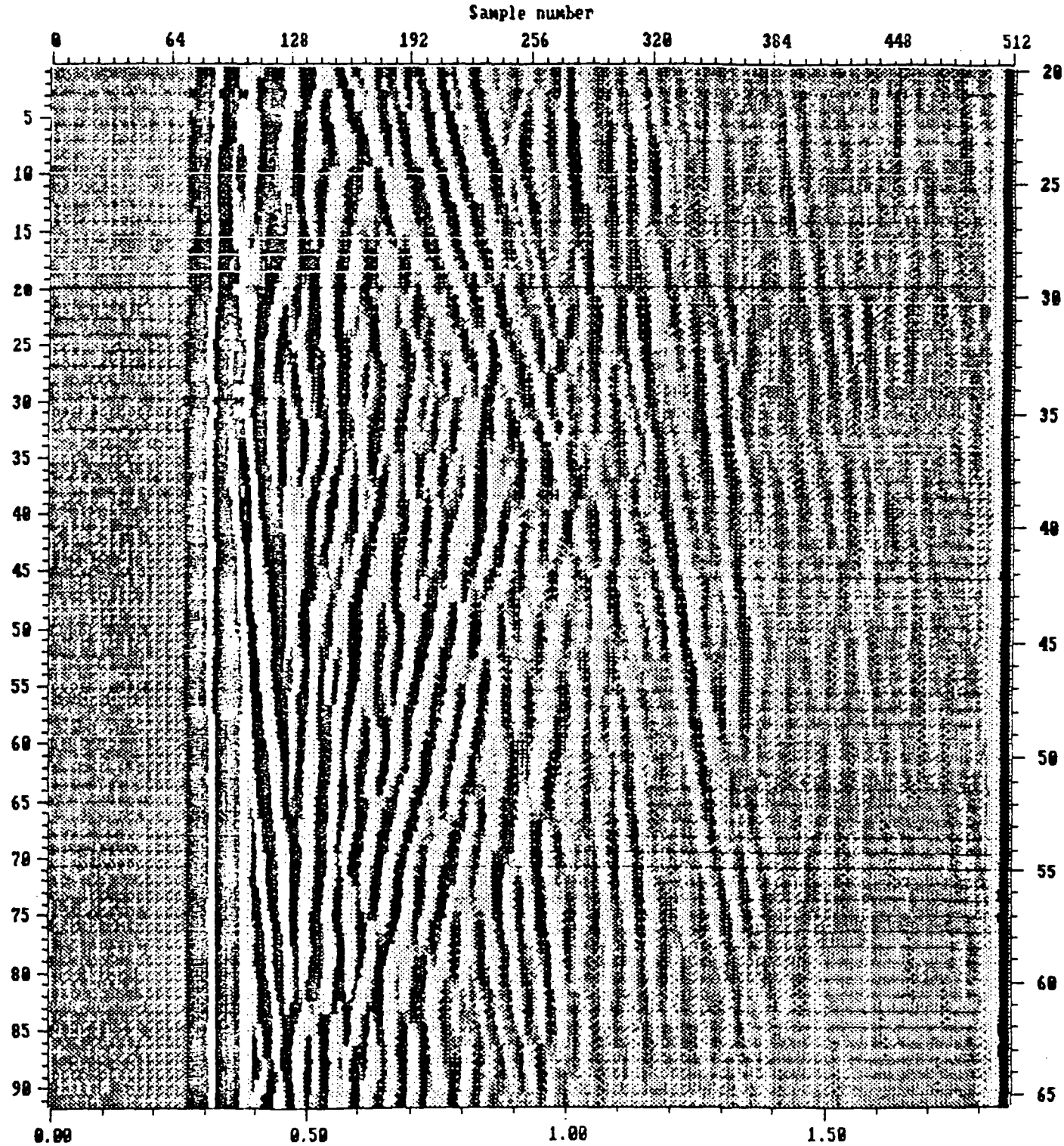
Operator's name:BN CG

Date of plot: Tue Jun 25 19:47:29 1991

RAMAC MEASUREMENT PROGRAM 80287 VERSION 6.21

Maximum Time Gain	4.07
Lin. coefficient	1.000
Exp. coefficient	0.300
Start time of gain	0.300
DC level subracted.	
Dipole antenna.	

25000
10000
5000
2500
1000
500
250
0
-250
-500
-1000
-2500
-5000
-10000
-25000



ABEM RAMAC Borehole radar system

Site and borehole:Tibbets Road Bh 76R

Date:1991-06-24

T-R Distance:6 m rods

Equipment name:ABEM

Operator's name:BM CG

Date of plot: Tue Jun 25 15:11:25 1991

RAMAC MEASUREMENT PROGRAM 80287 VERSION 6.21

Maximum Time Gain	2.00
Lin. coefficient	1.000
Exp. coefficient	0.500
Start time of gain	0.100
DC level subracted.	
Dipole antenna.	

400 200 100 40 20 10 0 -10 -20 -40 -100 -200 -400 -1000

Sample number

0 64 128 192 256 320 384 448 512

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200

20 25 30 35 40 45 50 55 60 65

Depth in metres

CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 317

Date Drilled 4/11/91 Well No. 78R Boring Co. LaFramboise Top of Casing 316.93(1) and 316.69(2) Open Hole 76 ft

Total Depth 200 ft Boring Method Used Air Rotary Piezometer Casing Size & Type 6" Steel Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth 9 ft

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
					Ambient 0			
5			N O S A M P L E S			Brown Sandy Till (Observed from cuttings)		6" Steel Casing to 34'
10							15'	
15						Weathered Rock	34'	
▽						Drilled well to 200'. Fractures yield 1-1/2 gpm from 117-122 ft and 10 gpm from 156-157 ft. Overnight, rotten rock (primarily Mica Flake) ochre caved in to fill well to 110 ft. See note, below.	105' Gravel 110'	
110								
▽ 200			7					

Remarks: Developed 4/25/91 by Cable Tool Rig. Unable to remove Ochre. Packed 110-105 with Gravel: Pump Test Conducted May 3 1991 - Pump Set @ 105 ft.

(1) Elev. is north bolt hole.

(2) Elev. is inner casing - not PVC.

All elevations shown are ft. MSL.

BEDROCK GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

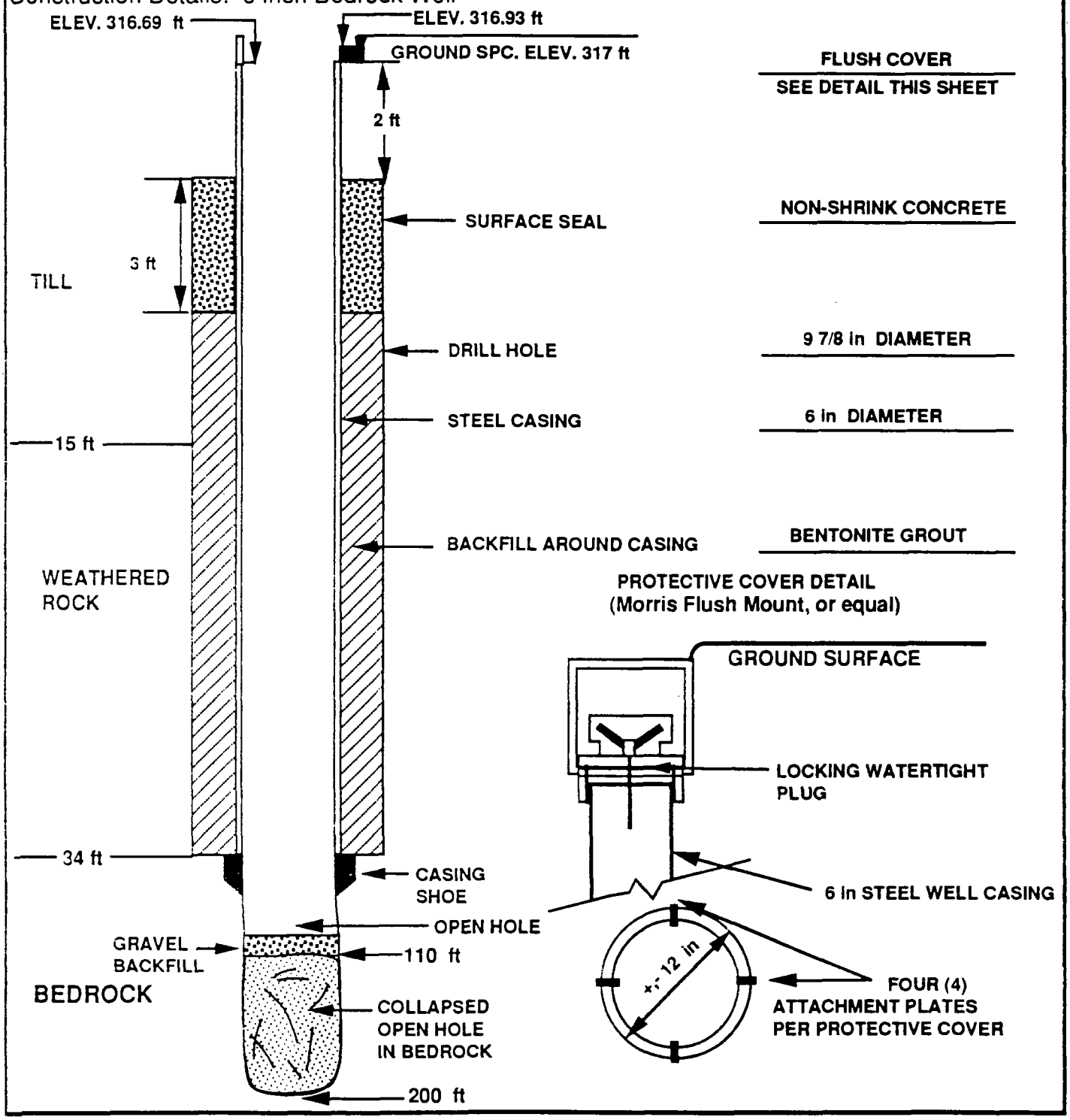
WELL: 78 R

LOCATION: Shanklin Residence
Hall Road

INSTALLED: 4/10 - 4/11/91

DEVELOPED: 4/25/91

Construction Details: 6 inch Bedrock Well



CAMP, DRESSER & McKEE, INC.
Soil Boring Log

TEN CAMBRIDGE CENTER, CAMBRIDGE, MA 02142
Well Installation and Completion Data

Client Environmental Protection Agency Site Tibbetts Road Job No. 4710-004-FI1 Surveyed Elevation: Ground ± 323

Date Drilled 4/15/91 Well No. 81R Boring Co. LaFramboise Top of Casing 322.98(1) and 322.69(2) Open Hole 60 ft-310 ft

Total Depth 310 ft Boring Method Used Air Rotary Piezometer Casing Size & Type 6" Steel Casing Field Geologist Jan Drake

Organic Vapor Instruments H-Nu Water Table Depth ____

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. PPM	Sample Description	Strata. Change	Equipment Installed
					Ambient 0			
5			NO					
10			SAMPLES			Sandy gravel (fill) Over Brown Sandy Till (Observed from cuttings)		
15								6" Steel Casing to 60'
17							17'	
▽ 60						Weathered Rock Saturated 31'-43'	60'	
						Competent Rock No Rock Cores Obtained		Open Hole to 310'
▽ 310						BOH	310'	

Remarks: Developed 4/16/91. All elevations shown are ft. MSL.

Pump Test Conducted 5/6/91 - Did not achieve stable pumping rate.

(1) Outer casing

(2) Inner casing

BEDROCK GROUNDWATER MONITORING WELL SCHEMATIC

SITE: Tibbetts Road, Barrington, N.H.

WELL: 81 R

LOCATION: Lane Residence
Tibbetts Rd.

INSTALLED: 4/15/91

DEVELOPED: 4/16/91

Construction Details: 6 inch Bedrock Well