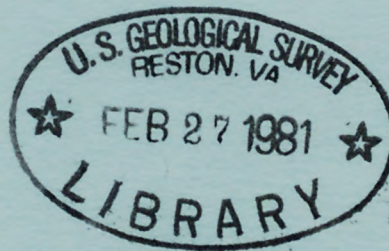


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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

**LITHOLOGIC LOGS AND GEOPHYSICAL LOGS
FROM TEST DRILLING IN PALM BEACH COUNTY,
FLORIDA, SINCE 1974**

OPEN-FILE REPORT 81-68



Prepared in cooperation with
PALM BEACH COUNTY
and the
SOUTH FLORIDA WATER MANAGEMENT DISTRICT.



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By Leo J. Swayze, Michael C. McGovern, and John N. Fischer

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Tallahassee, Florida

316007

1980

UNITED STATES DEPARTMENT OF THE INTERIOR

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LITHOLOGIC LOGS AND GEOPHYSICAL LOGS FROM TEST DRILLING IN
PALM BEACH COUNTY, FLORIDA, SINCE 1974

By Leo J. Swayze, Michael C. McGovern, and John N. Fischer

ABSTRACT

Test well data that may be used to determine the hydrogeology of the zone of high permeability in Palm Beach County, Florida are presented. Lithologic logs from 46 test wells and geophysical logs from 40 test wells are contained in this report.

INTRODUCTION

The U.S. Geological Survey, in cooperation with Palm Beach County and the South Florida Water Management District, began a study of the water resources of Palm Beach County in January 1970. This study provided a hydrogeologic data base necessary for water-management and land-use decisions (Land and others, 1973). A geologic data base (Schneider, 1976) for Palm Beach County has been increased by the addition of lithologic logs from 46 test wells and geophysical logs from 40 test wells from test drilling since 1974 in eastern and central Palm Beach County (fig. 1). These data, presented in this report, were used to determine the areal extent and thickness of the zone of high permeability in Palm Beach County.

Drilling of the test wells was accomplished by using a rotary drill rig. Lithologic logs were made from examinations of rock cuttings for every test well listed in this report. The reaction of the drill stem, loss of mud circulation, and rate of penetration of the formation by the drill stem are noted in the lithologic logs.

Borehole geophysical logs were run on most of the test wells. All the test wells, except for PB-940 through PB-944 and PB-1036, had some combination of gamma ray, electric, and neutron logs run before casings were set. The specific geophysical logs run on each test well are listed in table 1. In some test wells, the total depth shown by the geophysical log does not correspond to the depth of the lithologic log. This is primarily due to settling of cuttings in the borehole and the nonrecovery of some core material.

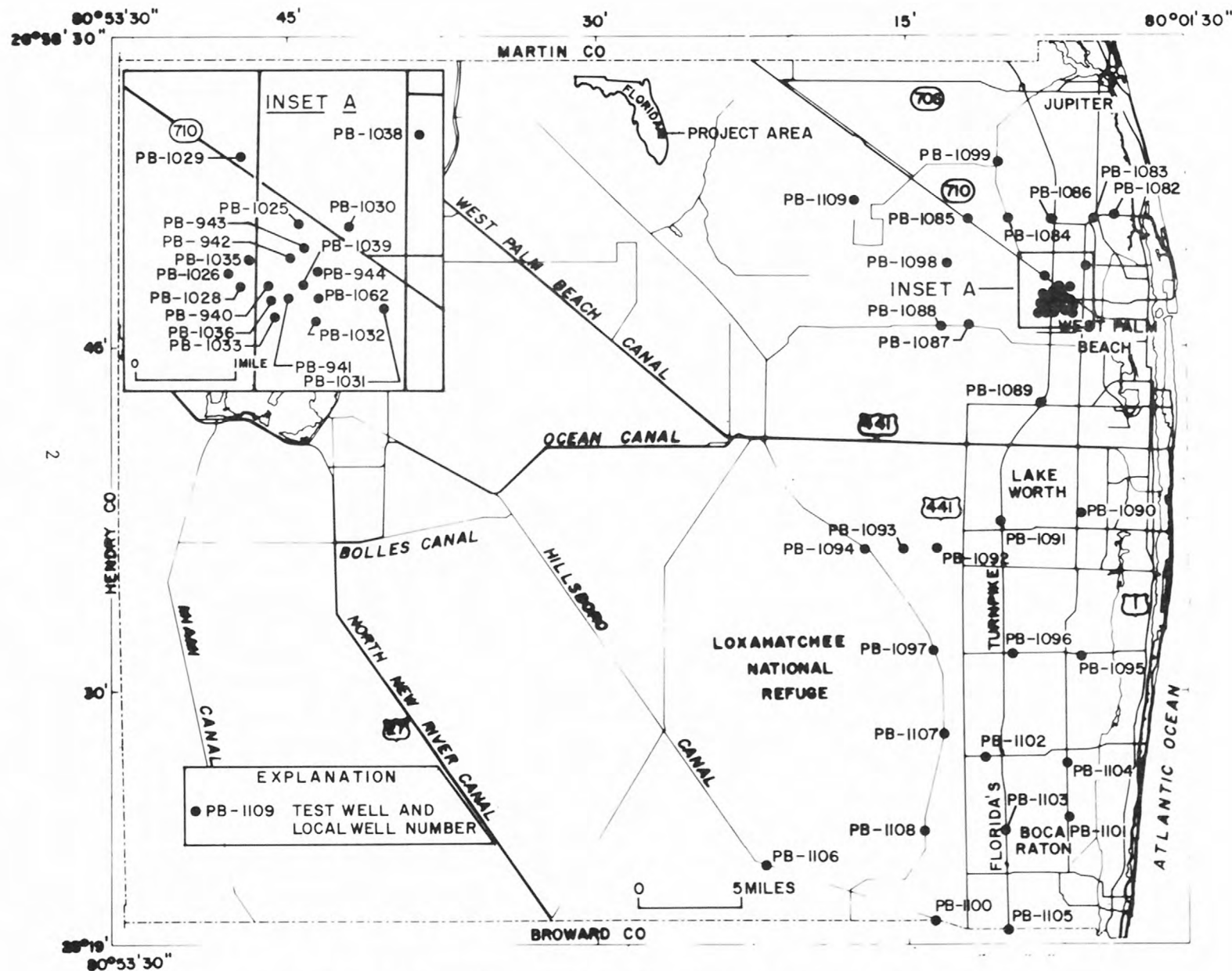


Figure 1.--Location of test wells and well numbers in Palm Beach County.

Table 1.--Logs of selected test wells in Palm Beach County

Local well No.	Page No.	USGS well No.	Depth of well below land surface (feet)	Altitude of land surface in feet (NGVD)	Lithologic	Spontaneous potential	Resistivity		Neutron	Gamma ray
							6 foot lateral	16 inch and 64 inch normal		
PB-940	7	264651080075701	156	18	X					
PB-941	8	264643080074001	141	18	X					
PB-942	9	264704080073901	141	18	X					
PB-943	10	264712080073801	136	18	X					
PB-944	11	264701080072801	126	18	X					
PB-1025	12	264729080073801	149	17	X		X	X		X
PB-1026	14	264715080082301	114	17	X	X	X	X		
PB-1028	16	264618080083001	129	18	X	X	X	X		X
PB-1029	18	264802080081301	129	18	X	X	X	X		X
PB-1030	20	264722080070801	129	17	X	X	X	X		X
PB-1031	22	264619080064301	129	16	X			X		X
PB-1032	24	264622080078601	137	15	X	X	X	X	X	X
PB-1033	26	264624080071801	129	17	X		X		X	X
PB-1035	28	264708080075801	131	18	X	X	X	X	X	X
PB-1036	30	264637080074801	49	16	X					
PB-1038	31	264817080062301	123	17	X	X	X	X	X	X
PB-1039	33	264647080072301	119	17	X	X	X	X	X	X
PB-1062	35	264643080070001	114	17	X	X	X	X	X	X
PB-1082	37	265034080050001	200	12	X	X	X	X	X	X
PB-1083	39	265027080060001	200	12	X	X	X	X	X	X
PB-1084	41	265027080100201	200	17	X	X	X	X	X	X
PB-1085	43	265027080115702	200	18	X	X		X	X	X
PB-1086	45	265018080075801	200	18	X	X		X	X	X

Table 1.--Logs of selected test wells in Palm Beach County--Continued

Local well No.	Page No.	USGS well No.	Depth of well below land surface (feet)	Altitude of land surface in feet (NGVD)	Lithologic	Spontaneous potential	Resistivity		Neutron	Gamma ray
							6 foot lateral	16 inch and 64 inch normal		
PB-1087	47	264555080115201	200	18	X	X		X	X	X
PB-1088	49	264555080134401	200	19	X	X		X	X	X
PB-1089	51	264225080084701	240	17	X	X		X	X	X
PB-1090	53	263745080064001	200	16	X	X		X	X	X
PB-1091	55	263728080102501	160	17	X				X	X
PB-1092	57	263622080132601	200	18	X	X		X	X	X
PB-1093	59	263626080151501	200	18	X	X		X	X	X
PB-1094	61	263629080171401	180	18	X				X	X
PB-1095	63	263138080064701	300	17	X	X		X	X	X
PB-1096	65	263138080095201	200	20	X	X		X	X	X
PB-1097	67	263144080134001	160	16	X	X		X	X	X
PB-1098	69	264835080130201	180	20	X	X		X	X	X
PB-1099	71	265250080103601	180	18	X	X		X	X	X
PB-1100	73	262007080134501	200	15	X	X		X	X	X
PB-1101	75	262405080071801	220	19	X	X		X	X	X
PB-1102	77	262711080111401	240	18	X	X		X		
PB-1103	79	262403080101601	240	21	X	X		X	X	X
PB-1104	81	262645080071801	340	20	X	X		X	X	X
PB-1105	83	261938080101001	220	16	X	X		X	X	X
PB-1106	85	262227080215001	220	22	X	X		X	X	X
PB-1107	87	262808080131701	200	15	X	X		X		X
PB-1108	89	262403080141301	200	14	X	X		X	X	X
PB-1109	91	265115080173101	170	23	X	X		X	X	X

LITHOLOGIC AND GEOPHYSICAL LOGS OF TEST WELLS

All substances emit some natural gamma radiation. Gamma ray logs are graphic representations of the number of gamma rays detected for a unit of time. The quantity of radiation emitted and detected is dependent on the type of geologic materials through which the probe passes and the method used for detection. There is no unique correlation between gamma rays emitted and a specific material. There is instead a range of values which can be expected for sand, limestone, or other geologic materials. Because ranges of values generally overlap, it is essential that other types of geologic and geophysical information be available to assist in the interpretation of gamma ray logs. In general, in the area of south Florida under investigation, increasing gamma ray activity is indicative of an increasing percentage of clay in the geologic formation being logged. Gamma rays do not give a direct indication of water quality.

Another type of radioactive log, the neutron log, can be helpful in interpreting formation characteristics in the borehole. A neutron source, americium-241/beryllium, and a detector are placed in a probe and lowered into the borehole. Variation in neutron adsorption is primarily a function of the hydrogen content within the geologic strata that the probe is passing. Consequently, neutron logs can be a useful tool in indicating moisture content above the water table and total porosity below the water table.

Electric logs measure two properties of geologic formations, spontaneous potential (SP) and resistivity. Spontaneous potential, as measured in wells in this report, is the potential difference between the drilling mud surrounding the probe. The SP curves show potential differences in the drilling mud, which have been created by ground water of varying quality mixing with the drilling mud in the borehole.

Resistivity is the resistance of the formation to the flow of an electric current and can be affected by the composition of the formation and the contained fluid. The resistivity logs in this report are multiple-electrode resistivity measurements and include the 6-foot lateral, 16-inch short normal and the 64-inch long normal curves. The distance, 6 foot, and 16 and 64 inch, indicate the electrode spacing on the probe. The larger the spacing the farther the probe "sees" into the formation. The apparent resistivity extends laterally into the surrounding formation with an increase in electrode spacing.

The logs in this report and the original logs can only be used in a qualitative sense. The equipment with which they were obtained does not make absolute value measurements. However, they are a valuable additional tool in making lithologic determinations, correlating geologic formations, and estimating changes in ground-water quality.

The following pages present geophysical data as listed in table 1.

LITHOLOGIC LOG OF WELL PB-940

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, dark brown, clear, fine to medium grained; mostly subangular to subrounded; some organic material.	0 - 7
Shell and shell fragments; with calcareous coquinoid quartz sandstone, light gray.	7 - 16
Shell (as above, but finer) and sandstone (as above).	16 - 21
Shell fragments; with sandstone, light gray and medium grained, locally coquinoid, calcite-cemented.	21 - 29
Sandstone, quartz, brownish-gray, fine grained; locally coquinoid, calcite-cemented.	29 - 36
Sandstone, coquinoid, brownish-gray, large fragments, hard, calcite-cemented.	36 - 46
Sandstone, gray, medium to coarse grained, hard porous, calcite-cemented; some interbedded broken shell, large fragments.	46 - 51
Sandstone, dark gray, marly in part; some marlstone, white and leached shell material; some limestone, tan, hard.	51 - 66
Coquina-microcoquina, gray, fine grained, pebble sized to large cuttings; quartzose in part; and sandstone; brownish-gray, silty; some marl, white.	66 - 71
Sandstone, grayish-tan, medium grained, hard, shelly, small to large pebble size, calcite-cemented.	71 - 81
Coquina, gray, and abundant shell fragments; some sandstone, brown; rock fragments smaller than overlying layers.	81 - 88
Limestone, sandy, dark tan, hard, large chunk size, with some broken shell fragments; some clay, dark tan, sandy, intermixed; coral present.	88 - 96
Coquinoid biosparite, gray, fine mixture of shell fragments; microcoquina, fine.	96 - 141
Shell fragments, gray, fine; mudstone.	141 - 156

LITHOLOGIC LOG OF WELL PB-941

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, tan to gray, medium grained.	0 - 12
Shell, tan, whole, large; some sand intermixed. (NOTE: tan to gray, sandy, clay; between 30-35 feet).	12 - 35
Sand and shell, tan to gray, hard, pebble size, cemented; some broken shell intermixed.	35 - 45
Sandstone, gray, fine grained, hard, porous, cemented; broken shell intermixed; some clay, grayish-green, sandy, at approximately 47 feet.	45 - 76
Sandstone, gray, coarse to pebble size, very hard, cemented; broken shell intermixed (porous between 80-96 feet).	76 - 96
Limestone, grayish tan, fairly hard; broken shell interbedded; with sandstone, gray.	96 - 101
Sandstone, gray, fine grained, very hard, large pebble size, porous, cemented; with limestone, grayish-tan; intermixed.	101 - 107
Sandstone, gray, crushed fragments; much broken shell intermixed.	107 - 111
Limestone, sandy, grayish tan, hard, porous, pebble size; with broken shell and sandstone fragments.	111 - 121
Sandstone, tan to gray, loosely cemented; with crushed shell fragments.	121 - 141

LITHOLOGIC LOG OF WELL PB-942

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, grayish white to dark brown, medium grained.	0 - 6
Shell, tan, whole, large and broken; with some sand, fine-grained, intermixed. (NOTE: Picked up some clay, greenish, sandy, between 15-21 feet).	6 - 28
Sandstone, gray, fine grained, small pebble size, hard, porous, cemented; with some broken shell intermixed.	28 - 31
Sandstone, clear to tan, coarse grained, hard, shelly, small pebble size, calcite-cemented.	31 - 61
Sandstone, gray, fine to medium grained, pebble size, hard, porous, calcite-cemented.	61 - 91
Sandstone, brownish gray, very large chunks, hard, porous, shelly, calcite-cemented; with clay, brown, intermixed.	91 - 96
Sandstone, gray, crushed; with broken shell.	96 - 111
Limestone, sandy, tan, hard; with some sandstone and broken shell intermixed.	111 - 126
Sandstone, gray, crushed; with broken shell fragments intermixed.	126 - 141

LITHOLOGIC LOG OF WELL PB-943

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white to dark brown, medium grained.	0 - 8
Shell, tan, large broken fragments; with sandstone, tan, hard, intermixed.	8 - 13
Shell, small whole and broken fragments; with intermixed sandy clay.	13 - 16
Clay, sandy, greenish gray; with shell, large whole; and intermixed sandstone fragments.	16 - 21
Shell; with sand, brown, and biomicrite, blue-gray.	21 - 28
Sandstone, light gray, fine grained, slightly calcareous; with some biomicrite and sandstone, light tan, calcite cemented.	28 - 31
Sandstone, light gray, coarse grained, hard, small to pebble size, cemented; some broken shell intermixed; calcite crystals abundant; microcoquina, gray.	31 - 66
Sandstone, gray, hard, shelly, pebble size, calcite-cemented; some broken shell fragments intermixed.	66 - 81
Sandstone, gray, fine grained, hard, large well-rounded pebble sized, porous; with some broken shell intermixed.	81 - 91
Limestone, sandy, brownish tan, hard, with large cuttings; some whole and broken shell fragments intermixed.	91 - 106
Sandstone, gray, coarse grained, crushed; many broken shell fragments intermixed.	106 - 111
Limestone, sandy, brownish tan, hard, porous, shelly; some broken shell intermixed; calcite crystals.	111 - 126
Sandstone, gray, coarse grained, hard, crushed; many broken shell fragments and marl intermixed.	126 - 141

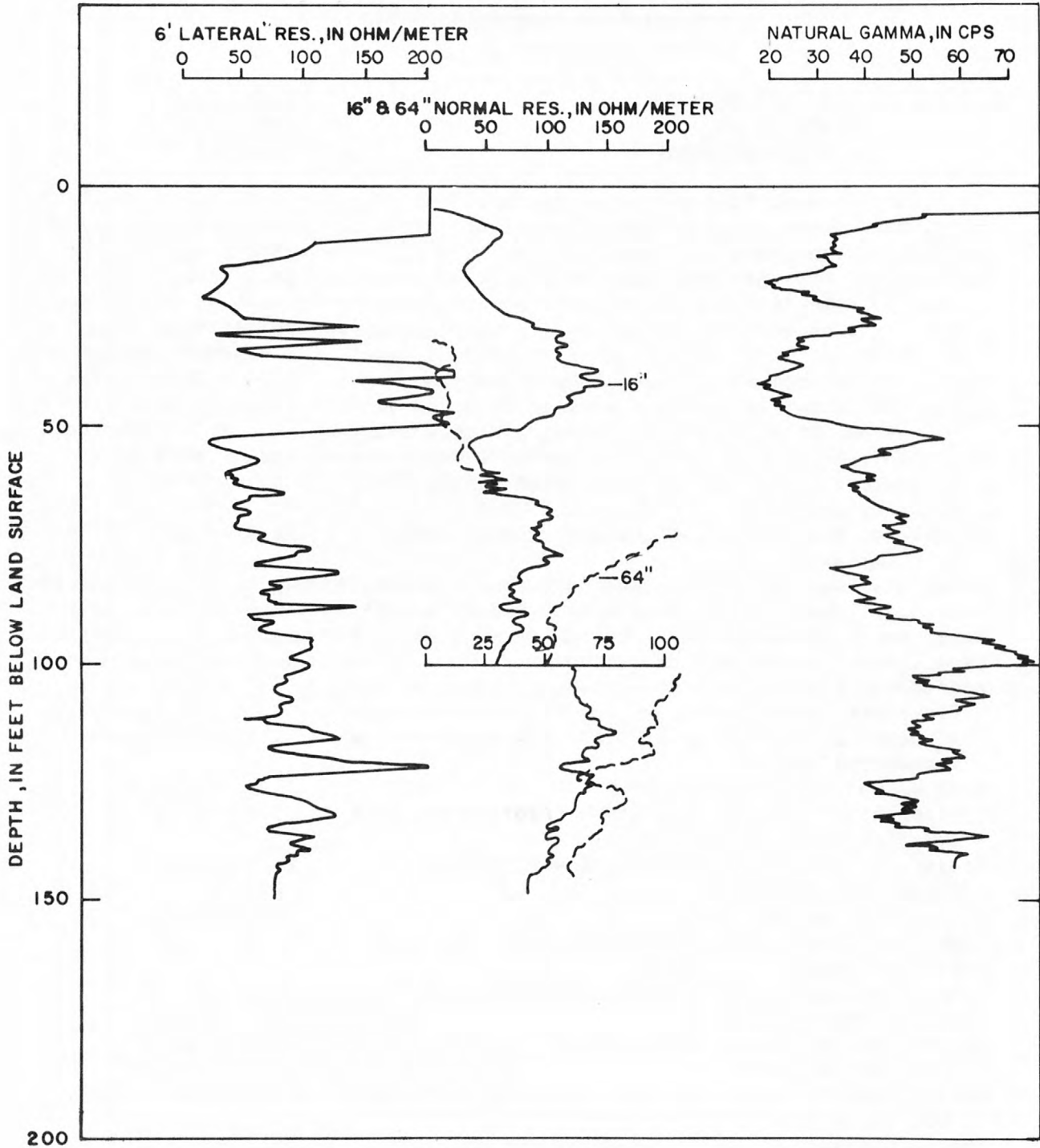
LITHOLOGIC LOG OF WELL PB-944

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white to dark brown, medium grained.	0 - 4
Shell, tan, large, whole; with some large bits of shelly sand rock intermixed.	4 - 14
Shell (as above); some intermixed sandy clay, gray.	14 - 24
Shell, tan, broken; with some shelly sandstone fragments intermixed.	24 - 30
Sandstone, gray, coarse grained, shelly, hard, small pebble size, calcite-cemented; much broken shell intermixed.	30 - 39
Sandstone, clear to light gray, small to large pebble size, hard, porous; cemented quartz crystals; some broken shells intermixed.	39 - 51
Sandstone, gray, fine to medium grained, hard, small to large pebble size, cemented (appears to be porous); broken shell intermixed.	51 - 81
Sandstone, light to dark gray, fine grained, some well rounded and pebble sized cuttings, shelly.	81 - 91
Sandstone, gray, crushed; broken, shell, tan, intermixed (much dark clay, brown between 96-111 feet).	91 - 111
Sandstone, gray, crushed; limestone fragments, tan; intermixed with broken, crushed shell.	111 - 126

LITHOLOGIC LOG OF WELL PB-1025

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, dark brown, fine to medium grained.	0.0 - 3.5
Sand, dark brown, fine to medium grained.	3.5 - 5.0
Sand, cream to gray, fine grained; broken shell.	5.0 - 13.5
Sand, gray, fine grained; with broken shell; and clay (sample is curdled).	13.5 - 22.0
Sand, light brown, fine to medium grained (change at 22 feet).	22.0 - 25.0
Sand, fine to coarse grained; broken shell.	25.0 - 29.0
Limestone, gray; white, fine grained sand; small amount of marly limestone, white; broken shell.	29.0 - 33.5
Sandstone, gray, fine to medium grained; small shell fragments; little bit of marl; sand (15%), fine-grained, loose.	33.5 - 38.5
Sandstone, fine to medium grained; little shells, hard streaks.	38.5 - 43.5
Sandstone (same as above); shells (same as above).	43.5 - 48.5
Sandstone (same as above); shells (same as above).	48.5 - 53.5
Sandstone (same as above); shells (same as above).	53.5 - 58.5
Sand, gray, fine to medium grained.	58.5 - 63.5
Sandstone, gray; with sand, fine-grained; some small fragmented shell.	63.5 - 68.5
Sandstone, gray; with sand, fine-grained; some small fragmented shell.	68.5 - 73.5
Same as above; little harder.	73.5 - 78.5
Sandstone; with sand, fine-grained and shell, dark gray, cemented; soft streaks.	78.5 - 92.0
Sandstone, dark gray; some small shells, tan, fragmented.	92.0 - 92.5
Sand, fine grained, soft.	92.5 - 94.0
Sandstone, dark gray; with shells tan; some sand, white, marly.	94.0 - 98.5
Sandstone, light gray to white, fine grained; some shells, gray, marly.	98.5 - 107.0
Shells, tan to brown, broken; hard streaks at 114, 116, and 120 feet.	107.0 - 123.5
Shells, tan to brown, broken; hard streaks every foot, 3 to 4 inches.	123.5 - 128.5
Shells (as above); hard streaks at 129 and 132 feet.	128.5 - 132.0
Sandstone, gray, fine grained; abundant sand, fine-grained and shell, tan; phosphatic; even drilling.	132.0 - 138.5
Same as above; clay streak, dark brown at 143 feet.	138.5 - 148.5

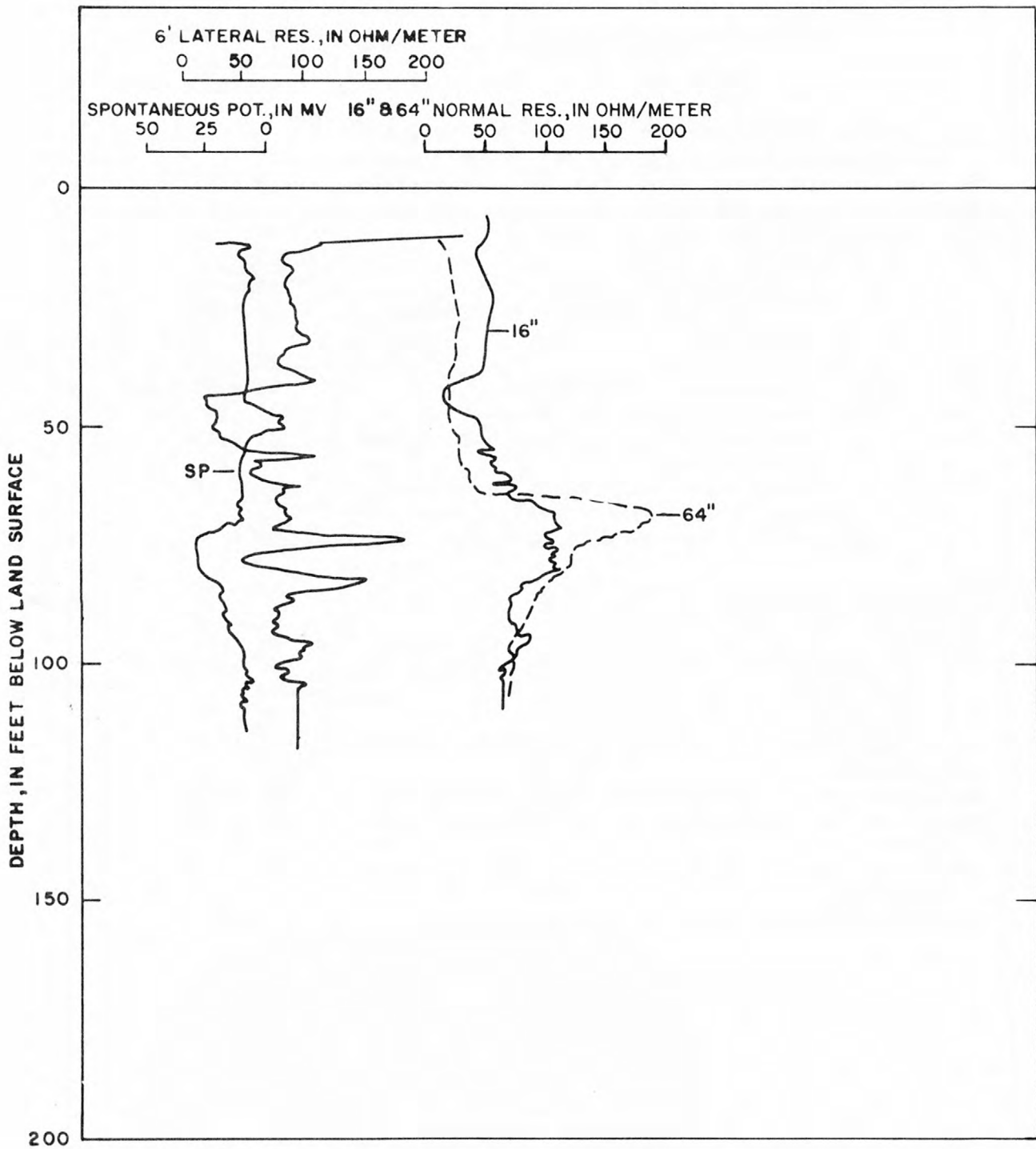
GEOPHYSICAL LOGS OF WELL PB-1025



LITHOLOGIC LOG OF WELL PB-1026

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white, fine to medium grained; mostly sub-angular; with shell fragments and organic material.	0 - 9
Shells, tan and cream; sand, fine to medium-grained.	9 - 13
Sandy clay, gray; with organic layer.	13 - 14
Sand and shell, light gray to buff.	14 - 15
Sand and clay; organic layer.	15 - 16
Sand (80%) and little shell, white to buff.	16 - 19
Sand (90%), white to light gray, fine to medium grained; little shell.	19 - 24
Same as above; 1% coarse.	24 - 32
Sand; and some clay, gray, and shell.	32 - 34
Sand (85%); some shell, gray and tan.	34 - 39
Sand (75%); some shell, gray and tan; hard streak 6 inches thick at 41 feet.	39 - 44
Sand, gray, fine grained; with shell, gray and buff and clay lense, blue-green at 46-47 feet.	44 - 49
Sand, fine grained; clay lense, blue-green shell (20%).	49 - 54
Sand and broken shell, gray and tan.	54 - 55
Limestone, buff; some sand, fine-grained.	55 - 59
Limestone, tan to gray; with fine-grained sand.	59 - 64
Sand, light to dark gray, fine grained; shell, buff to tan, broken, loose.	64 - 69
Sand (as above); with shells.	69 - 75
Limestone, cemented; with sand, gray, fine grained; (used mud).	75 - 82
Sandstone, gray, fine grained, hard; few shells.	82 - 94
Sandstone (as above); some shell; drilled little softer.	94 - 99
Sandstone, gray to light brown, fine grained; small fragments.	99 - 104
Sandstone, brown to gray, fine grained.	104 - 114

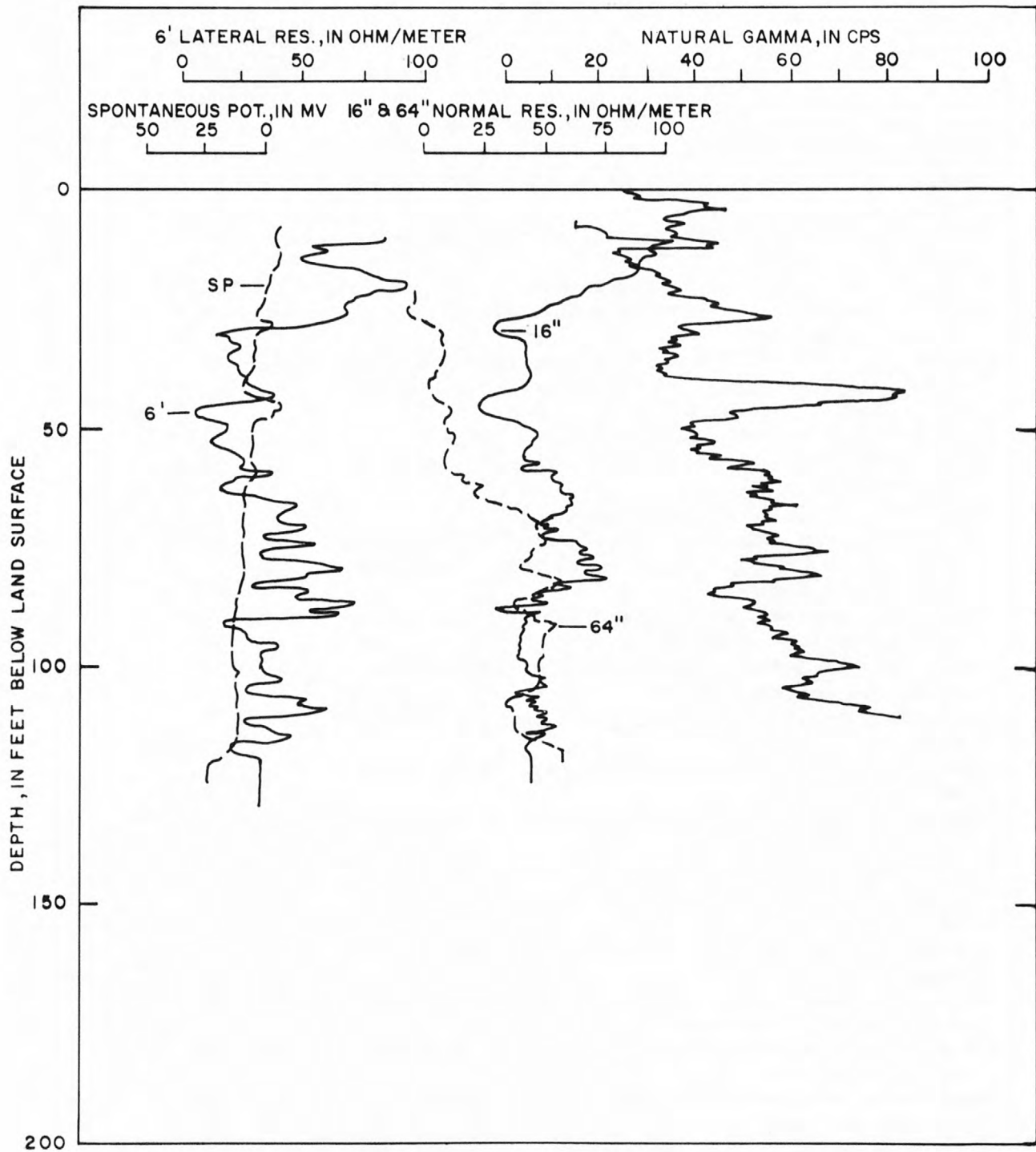
GEOPHYSICAL LOGS OF WELL PB-1026



LITHOLOGIC LOG OF WELL PB-1028

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand and shell; loose.	0 - 3
Wood fragments.	3 - 5
Shells, whole, small and large broken; with strings of sand, brown, clayey.	5 - 11
Sandstone, gray to white; sand, fine-grained, loose; streaks of shell.	11 - 17
Sand, brown, fine to medium grained.	17 - 19
Sand (as above), with sandstone strings, gray; little firmer last foot.	19 - 24
Sand, brown, fine to medium grained; some shell and sandstone bits; clay lenses, black; at 25 and 28 feet about 4 inches thick.	24 - 29
Sand (as above); many lenses, gray to black.	29 - 34
Sand, dark brown, fine to medium grained; few thin clay lenses, black.	34 - 39
Sand (95%), fine to coarse grained (2%).	39 - 44
Sand (95%), tan, fine to coarse grained (2%); sandy clay, gray; hard streaks at 47.5 feet; limestone with cemented shell.	44 - 49.5
Sand, fine grained; with broken shell (40%), some lenses, stringy, dark gray.	49.5 - 54
Sand, fine to medium grained; broken shell; with sandstone strings, black.	54 - 59
Sandstone, hard; sandy clay, gray, thin at 60 and 64 feet.	59 - 64
Limestone and sandstone, white, gray, brown, buff, silty, cemented.	64 - 67.5
Limestone, cemented; sand, fine grained, buff, and broken shell with loose layers.	67.5 - 73
Limestone, with sandstone, gray, small fragmented.	73 - 79
Same as above; some broken shells.	79 - 84
Sandstone and limestone, fine grained, with a few soft thin strings; much sand, gray, fine-grained; large angular cuttings.	84 - 89
Sandstone, gray, hard, assorted angular sizes and cuttings; with shell (20%).	89 - 99
Sand, fine to medium grained; soft layer from 100 to 102 feet.	99 - 102
Sandstone, gray to light brown, fine grained.	102 - 109
Sandstone and sand, gray to tan, loose; broken shell, looks phosphatic; hard streak at 117.5, 123, and 127-129 feet.	109 - 129

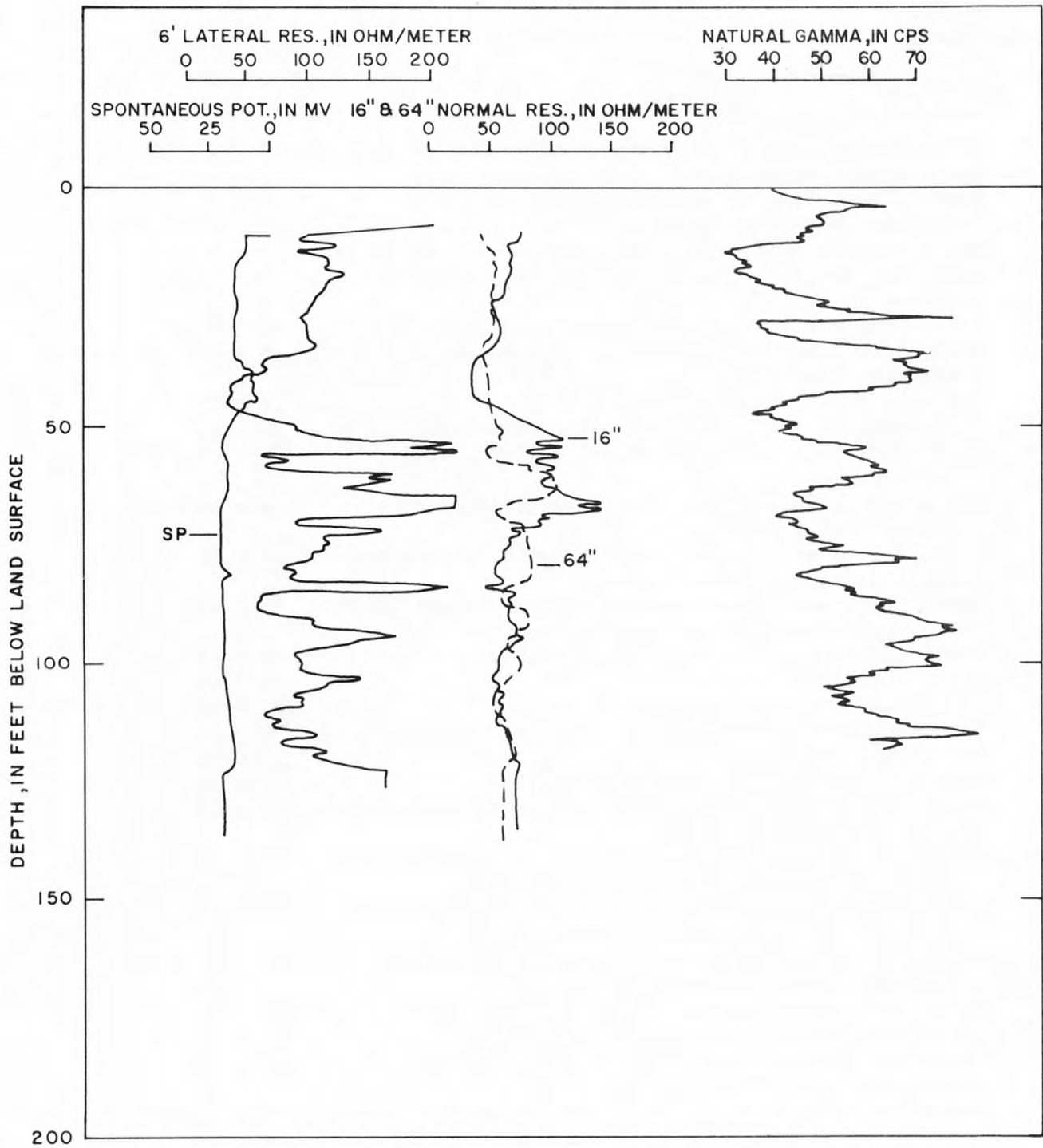
GEOPHYSICAL LOGS OF WELL PB-1028



LITHOLOGIC LOG OF WELL PB-1029

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white, clean.	0 - 2
Sand, white; with organic, dark brown color.	2 - 4
Sand, clear, fine to medium grained; with clay streak, sandy and roots.	4 - 7
Shell, tan to buff, medium grained; broken to whole.	7 - 9
Sand, tan to gray, fine to medium grained; with shell.	9 - 13.5
Sand, clay and shell, dark gray; consolidated.	13.5 - 15
Sand, dark brown organic color, fine to medium grained; some shell.	15 - 18
Sand and shell; loosely cemented.	18 - 20
Sand, fine to coarse grained (3%); with shell.	20 - 24
Sand, dark brown, fine to coarse grained; shell, buff, broken.	24 - 29
Sand, tan to brown, fine to medium grained; some shell, small, broken.	29 - 34
Sand, tan to gray brown, fine to medium grained; a small amount of shell, brown.	34 - 36
Sand, gray-tan, fine to medium grained; shell (30%), tan; some clay streaks, gray and sandy.	36 - 41
Shell and sand; with clay strings, gray.	41 - 44
Shell and sand.	44 - 45
Sandstone; cemented layer at 45 feet.	45 - 46
Sandstone and shell; trace of clay, green-gray.	46 - 51
Sandstone, light gray, fine grained.	51 - 59
Sandstone (as above); flat-angular.	59 - 64
Sandstone, fine grained, hard, cemented; some shell; sand, phosphatic, soft.	64 - 69
Sandstone, dark gray, fine grained, phosphatic; much shell; loose sand, few calcite crystals.	69 - 74
Sandstone, dark gray; cemented shell; some calcite crystals; and loose sand, fine-grained.	74 - 79
Sandstone, dark gray to olive; much sand, fine-grained; some calcite crystals.	79 - 87
Sand, dark gray, fine to medium grained; shell.	87 - 95
Sandstone, tan to buff, hard; some shell.	95 - 99
Sandstone and limestone, tan to gray, loosely cemented; some shell mixed.	99 - 109
Sandstone and limestone (as above); some shell mixed; hard thin streaks (30% of formation from 108 feet); sand (50%), fine-grained, loose.	109 - 114
Sandstone, fine grained; loose; some shell, hard, thin streaks.	114 - 119
Sandstone, fine grained; with shell, gray, fragmented.	119 - 124
Sandstone, fine grained; but more shell.	124 - 129

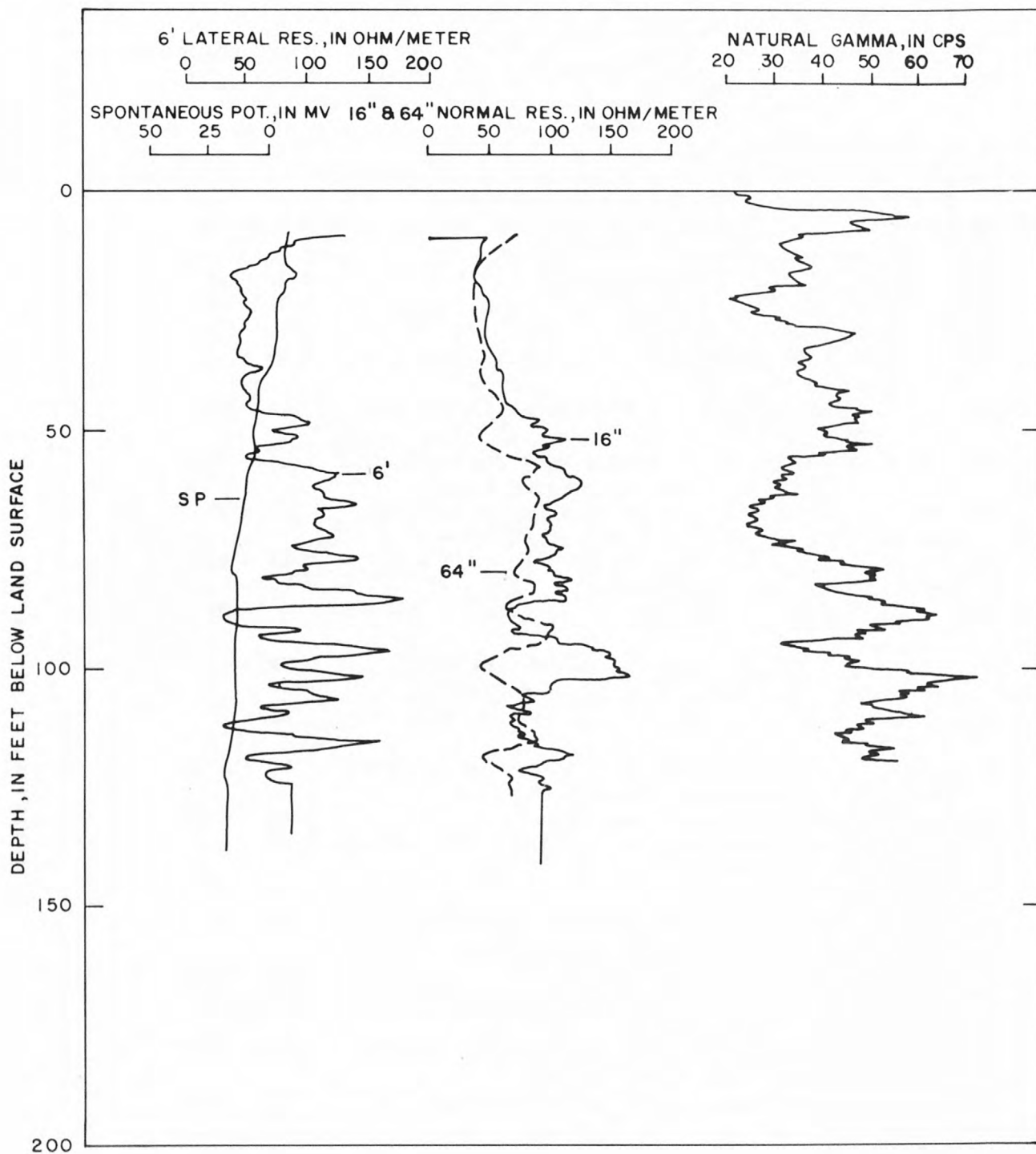
GEOPHYSICAL LOGS OF WELL PB-1029



LITHOLOGIC LOG OF WELL PB-1030

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white to buff, fine-grained.	0 - 4
Sand, white, fine to medium-grained.	4 - 9
Sand, fine to medium-grained; traces of shell.	9 - 24
Sand, dark brown, organic, fine to coarse-grained.	24 - 26
Sand, tan to white, fine to coarse-grained.	26 - 29
Sand, white, fine to coarse-grained.	29 - 34
Sand, (90%) very fine-grained; some shell, gray.	34 - 39
Sand, fine-grained; with shell, gray.	39 - 44
Sand, fine to medium-grained; with shell (15%), gray and tan.	44 - 49
Sandstone, gray, fine-grained; some shell and soft sand layers.	49 - 54
Sandstone as above; sand, loose, dark gray, fine to coarse-grained, small and fragmented layers.	54 - 59
Sandstone, light gray to dark gray, fine-grained; few shells, with sand grains, large, loose.	59 - 64
Sandstone, light gray to buff, fine to medium-grained; small and fragmented.	64 - 69
Sandstone as above; some quartz and calcite crystals loose in streaks.	69 - 78
Sandstone, light gray, fine to medium grained; with sand, fine to medium grained and shell.	78 - 83
Sand, light gray, fine-grained and loose, soft streaks.	83 - 84
Sandstone, light gray, fine to medium-grained; with few small and fragmented shells.	84 - 87.5
Sand, light gray, fine-grained; loose.	87.5 - 89
Sandstone, light gray, fine to medium-grained; loose 6-inch sand streaks at 91 and 94 feet.	89 - 94
Sandstone, light gray.	94 - 99
Sandstone, light gray, with few thin soft sand streaks; cuttings are small and angular.	99 - 104
Same as above; small broken shell.	104 - 114
Sandstone, tan to gray (traces of olive color), fine-grained; shell, crushed.	114 - 119
Sandstone as above; with some shell; cuttings are flat and angular with sharp edges.	119 - 122
Sandstone, dark gray to gray; small amount of shell.	122 - 125
Sandstone, dark gray, fine-grained; phosphatic; little shell.	125 - 129

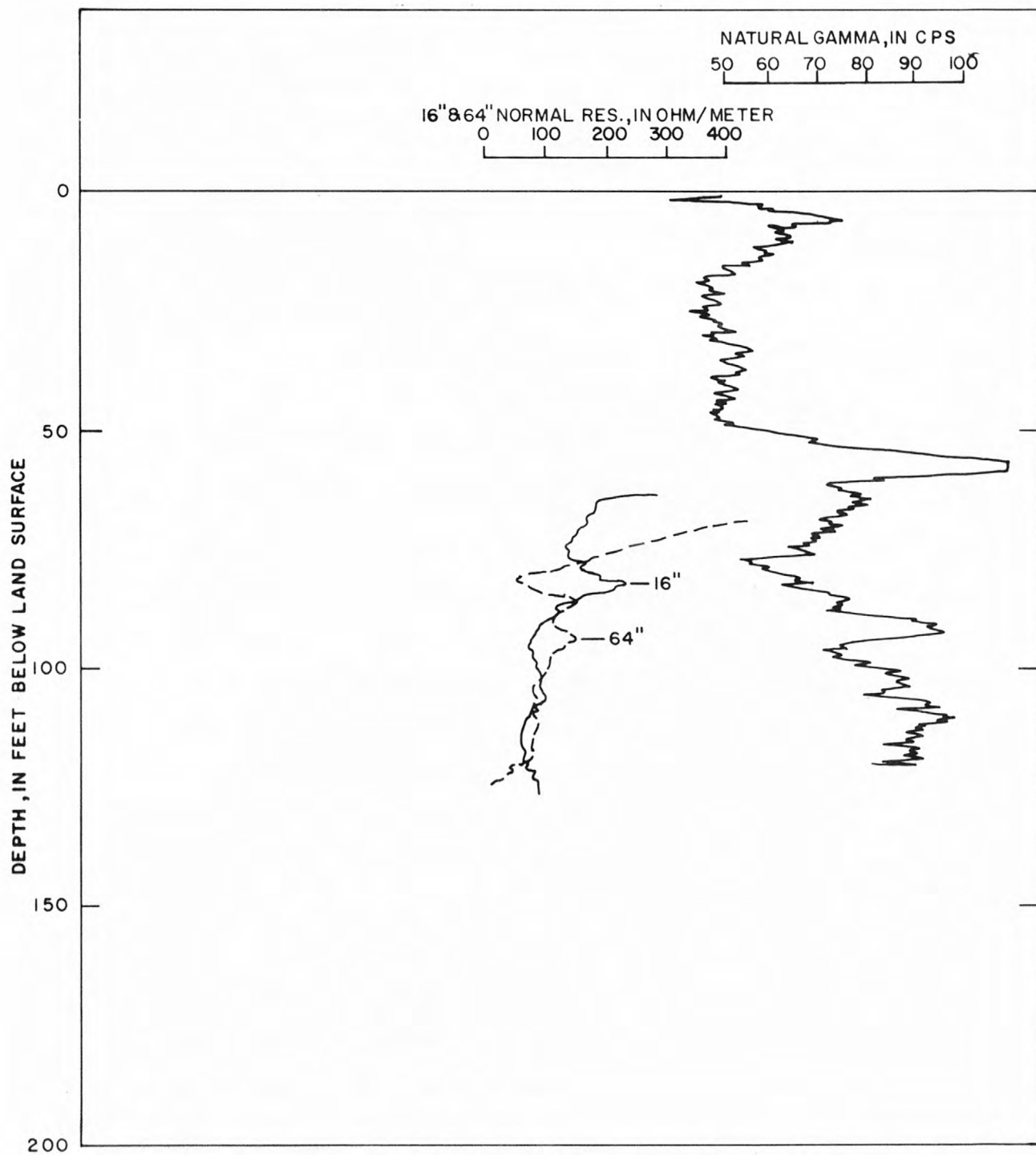
GEOPHYSICAL LOGS OF WELL PB-1030



LITHOLOGIC LOG OF WELL PB-1031

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, white, fine to medium-grained.	0 - 3
Sand, dark brown, fine to coarse-grained.	3 - 4
Sand, tan to clear, fine to coarse-grained.	4 - 7
Sandstone, light gray and brown, fine grained; small fragments.	7 - 10
Sand, white, fine.	10 - 14
Sandstone, gray and brown, fine grained; with sand, white to gray, fine-grained; alternating layers of each.	14 - 17
Sand, white to light gray, fine grained; with small amounts of shell.	17 - 24
Sand, white to light gray, fine to coarse.	24 - 29
Sand, light gray to tan, fine to coarse.	29 - 34
Sand, tan to brown, fine to coarse; dark brown layer at 37 feet.	34 - 39
Sand, brown, gray and clear, fine to coarse.	39 - 44
Sand, dark gray to brown, fine grained; with broken shell.	44 - 49
Sand, dark gray to brown, fine grained; with broken shell.	49 - 54
Sand, dark gray to buff, fine grained; with broken shell.	54 - 59
Sand, dark gray to buff, fine grained; with broken shell.	59 - 64
Sandstone, dark gray, fine to medium grained; with sand, fine grained; in layers with shell.	64 - 69
Sandstone, dark gray, fine to medium grained; with a few shells.	69 - 74
Sandstone, dark gray, fine to medium grained; with a few shells. (NOTE: Lost water).	74 - 79
Sandstone, dark gray, fine to medium grained, angular. (NOTE: Hard layer at 81.5 feet).	79 - 84
Sandstone, brownish to olive, drab, fine to medium grained, angular.	84 - 88
Sand, gray, fine to medium grained, loose.	88 - 90
Sandstone, dark gray to olive, fine to medium grained; with some shells. (NOTE: Sand lenses 3 inches thick.	90 - 94
Sand and sandstone, light gray to buff, layered, hard streaks.	94 - 99
Sand and sandstone, light gray to buff, layered, hard streaks. (NOTE: Lost circulation).	99 - 104
Sand and shell mix, packed (probably fell in from above); some sandstone, gray to brown.	104 - 109
Sand and sandstone, gray to brown, fine grained; phosphatic (resin material present).	109 - 114
Sandstone and sand, fine grained; and shell.	114 - 119
Sandstone, light gray, fine grained; cuttings flat and angular.	119 - 124
Sandstone, light gray, fine grained; cuttings flat with sharp edges.	124 - 129

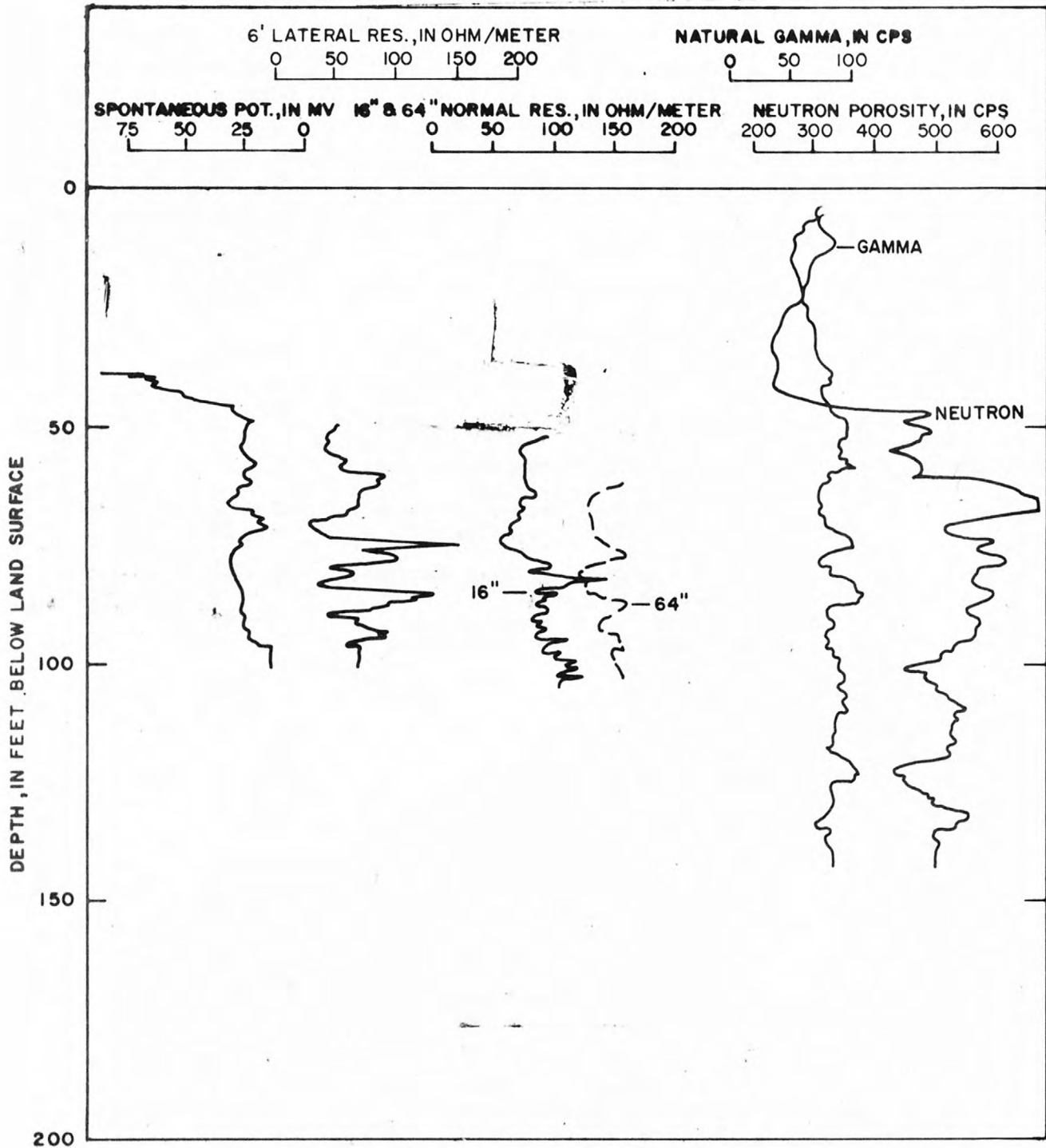
GEOPHYSICAL LOGS OF WELL PB-1031



LITHOLOGIC LOG OF WELL PB-1032

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white, fine grained.	0 - 4
Sand, fine to medium grained; with organics, black.	4 - 8
Sand, fine (60%) to coarse grained (2%). (NOTE: occasional thin streak of clay, gray, sandy).	8 - 22
Sand, fine (60%) to coarse grained (2%); with occasional rust colored grains.	22 - 28
Sand, white, fine (80%) to coarse grained (1%); with shell. (NOTE: Shell increases from 2% at 29 feet to 15% at 34 feet).	28 - 34
Sand, white, fine grained; with shell 15 to 20%.	34 - 39
Sand, white, fine grained; with shell 15 to 20%. (NOTE: Charcoal bed 1 foot thick at 41 feet).	39 - 41
Hit old log.	41 - 42
Limestone or sandstone, gray, cemented; some shell, (20%), loose.	42 - 45
Limestone or sandstone, cemented; some shell, gray to black; pebbles, beach worn, (20%).	45 - 48
Sandstone, gray, small fragments, with broken shell.	48 - 54
Sand and sandstone, gray to dark gray, fine to medium grained; with shell.	54 - 59
Sand, fine grained; with sandstone streaks and shell. (NOTE: Lost circulation at 62 feet).	59 - 64
Sand, fine to medium grained; with broken shell.	64 - 66
Sand, fine to medium grained; with broken shell; lost circulation.	66 - 67
Lost circulation (no returns). (NOTE: 68 - 69 stem dropped 1/2 foot).	67 - 69
Alternating hard and soft layers, no returns.	69 - 74
Sandstone, gray; inbedded shells.	74 - 79
Sandstone, light gray; and inbedded shell.	79 - 84
Sandstone, light gray; and traces of broken shell.	84 - 89
Sandstone, light gray; a few shells; cuttings angular.	89 - 94
Sandstone, light gray, fine grained.	94 - 97
Lost circulation.	97 - 99
Sandstone, light gray to white and tan, silty; a few shells; lost circulation at 100 feet.	99 - 104
Sandstone, white to tan and light gray; only slight return of circulation.	104 - 109
Sandstone, gray, fine grained; salt and pepper appearance. (NOTE: Only small return of circulation).	109 - 114
Sandstone, light gray, fine grained.	114 - 119
Sand, gray and tan, fine grained; and broken shell. (NOTE: Only small return of circulation).	119 - 124
Sand, gray and tan, fine grained; and broken shell.	124 - 129
Sand, tan and gray; with shell, loosely packed.	129 - 134
Sand, tan and gray; with shell, loosely packed.	134 - 139

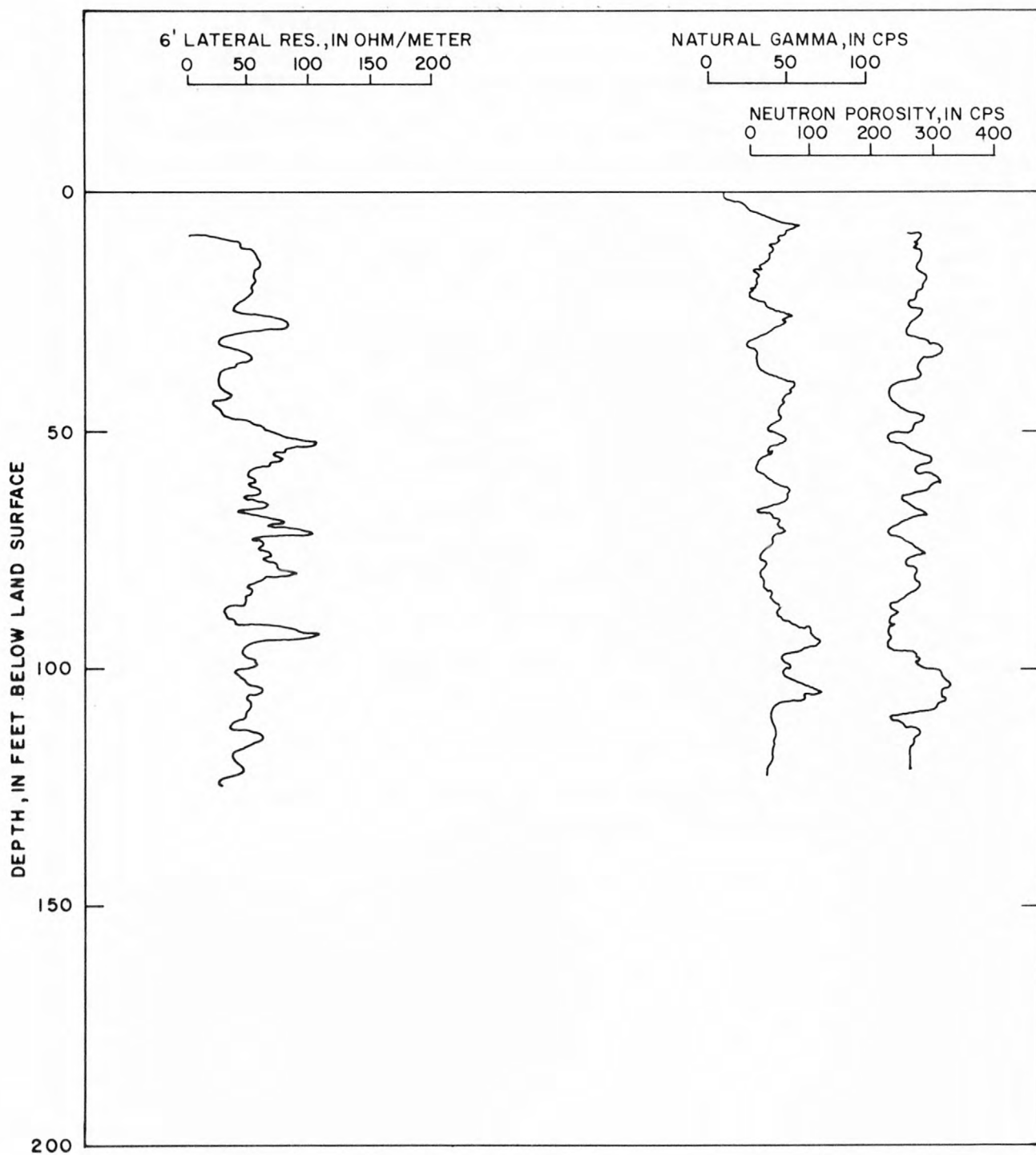
GEOPHYSICAL LOGS OF WELL PB-1032



LITHOLOGIC LOG OF WELL PB-1033

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, cream to white, fine grained.	0 - 12
Sandstone, gray; and sand, tan to buff; with broken shell.	12 - 19
Sand, light gray, fine to coarse grained; with some shell.	19 - 29
Sandstone, gray, fine to medium grained; with sand, fine grained and some shell; small angular fragments.	29 - 39
Sandstone, dark gray; with sand, fine to medium grained and interbedded shell and clay lenses 51 to 54 feet (NOTE: Hard layer 45-47 feet).	39 - 54
Sandstone with sand lenses, fine to coarse grained; interbedded limestone, dark gray to green gray.	54 - 57
Sandstone, gray, fine to coarse grained; small angular fragments.	57 - 64
Sandstone, light gray to tan and brown, fine to medium grained; with sand, fine to medium grained and interbedded calcite crystals; cuttings flat and angular.	64 - 74
Sandstone and limestone, gray; with sand lenses; broken shell and small fragments.	74 - 89
Limestone, gray sandy; with broken shell and sand, fine grained (NOTE: Hard layer at 95 feet; phosphatic appearance).	89 - 104
Shell (80%), tan, cemented and limestone (20%), dark gray.	104 - 124
Shell changing into clay, gray, fine to medium grained, sandy; phosphatic in appearance.	124 - 129

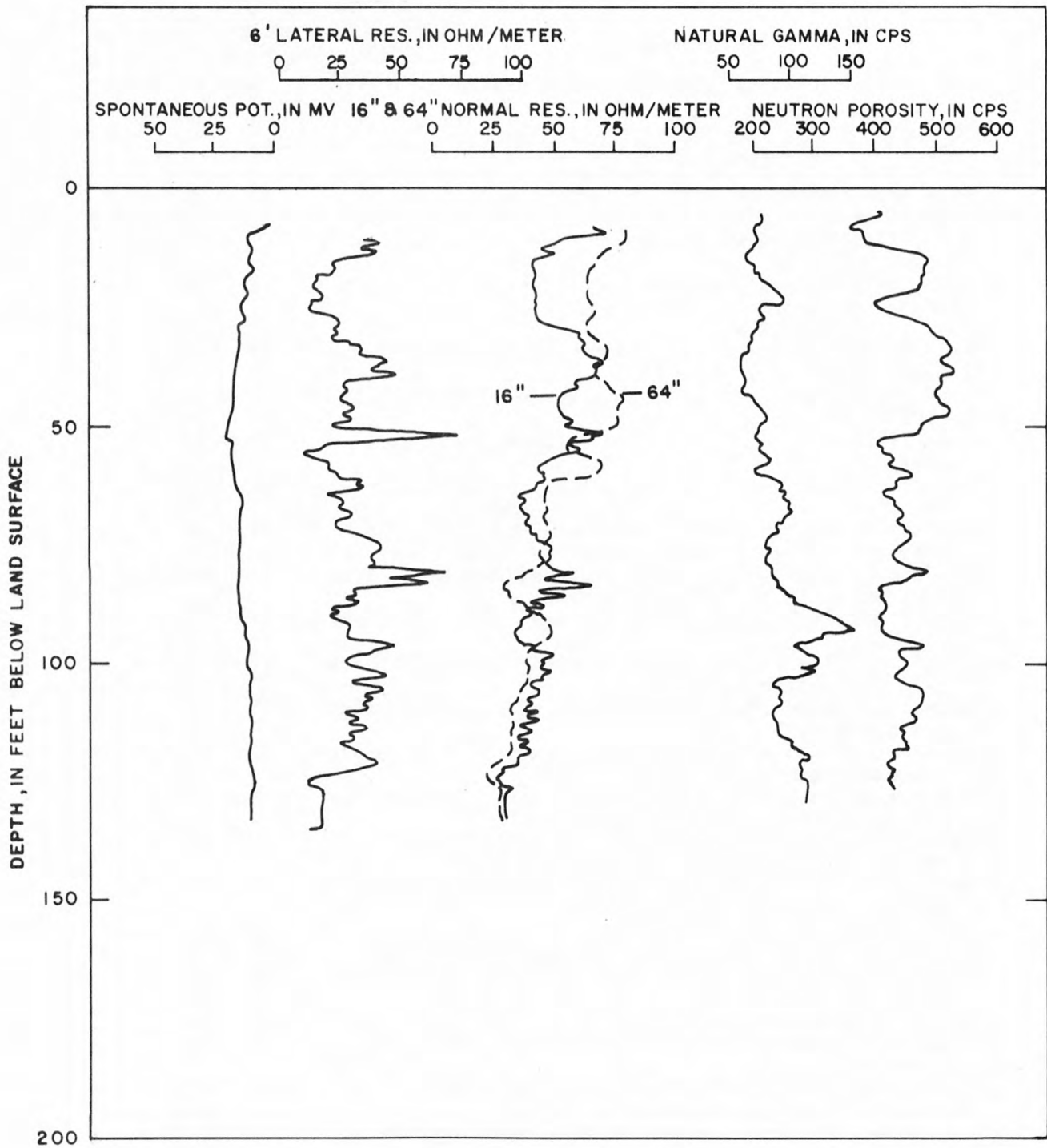
GEOPHYSICAL LOGS OF WELL PB-1033



LITHOLOGIC LOG OF WELL PB-1035

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white to tan, fine to medium grained.	0 - 3
Clay, tan, soft.	3 - 4
Sand (70%) tan; and broken shell, white (30%).	4 - 7
Sand (70%) white; and broken shell, white (30%) (NOTE: 12 to 14 feet, clay streaks present).	9 - 14
Sand (80%) white to gray; and broken shell (15%); some sandy clay.	14 - 19
Sand, fine to medium grained and shell: some sand- stone nodules.	19 - 24
Sand, fine to medium grained and shell: some sand- stone nodules.	24 - 25
Wood chips (old log).	25 - 27
Sand (90%); clear to translucent brown; with broken shell (10%).	27 - 29
Sand (70%), clear to tan, fine grained; with shell (30%).	29 - 34
Sand (70%) clear to tan, fine grained; with shell (30%)	34 - 36
Sandstone and sand, fine to medium grained; with some shell: sandstone is in small fragments.	36 - 39
Sandstone (70%) and sand, fine grained (25%); with some shell (5%); small fragments, light gray.	39 - 44
Sandstone, light gray, fine grained; and sand, fine grained; with small fragments.	44 - 49
Sandstone, light gray, fine grained; small fragments, rounded.	49 - 51
Sandstone, light gray, fine to medium grained; with sand (10%), fine grained.	51 - 55
Limestone, sandstone and shell mixed; cuttings flat and angular.	55 - 59
Sandstone (30%) and sand (45%), gray, fine to medium grained, with shell (25%).	59 - 64
Sand, fine to medium grained; and sandy limestone, with broken and cemented shells.	64 - 76
Sand, fine to medium grained; and broken shell. (NOTE: Used lost mud, circulation low).	76 - 79
Sand, fine and broken shell; some limestone cuttings. (NOTE: Continued losing mud).	79 - 84
Sand, fine grained; and shell.	84 - 86
Limestone, gray; with sand; and angular cuttings.	86 - 89
Limestone and sand, gray, fine grained; with loose shell.	89 - 95
Shell, broken and sand fine.	95 - 98
Limestone, gray; with broken shell and sand, cemented.	98 - 104
Limestone, gray; salt and pepper appearance.	104 - 107
Sandstone, gray to tanish gray; silty.	107 - 109
Limestone, tan to gray; with loose sand and shell.	109 - 114
Limestone, tan to gray; with loose sand, fine grained and shell; possible thin clay layers.	114 - 119
Limestone, tan to gray; with shells and loose sand, fine grained.	119 - 129

GEOPHYSICAL LOGS OF WELL PB-1035



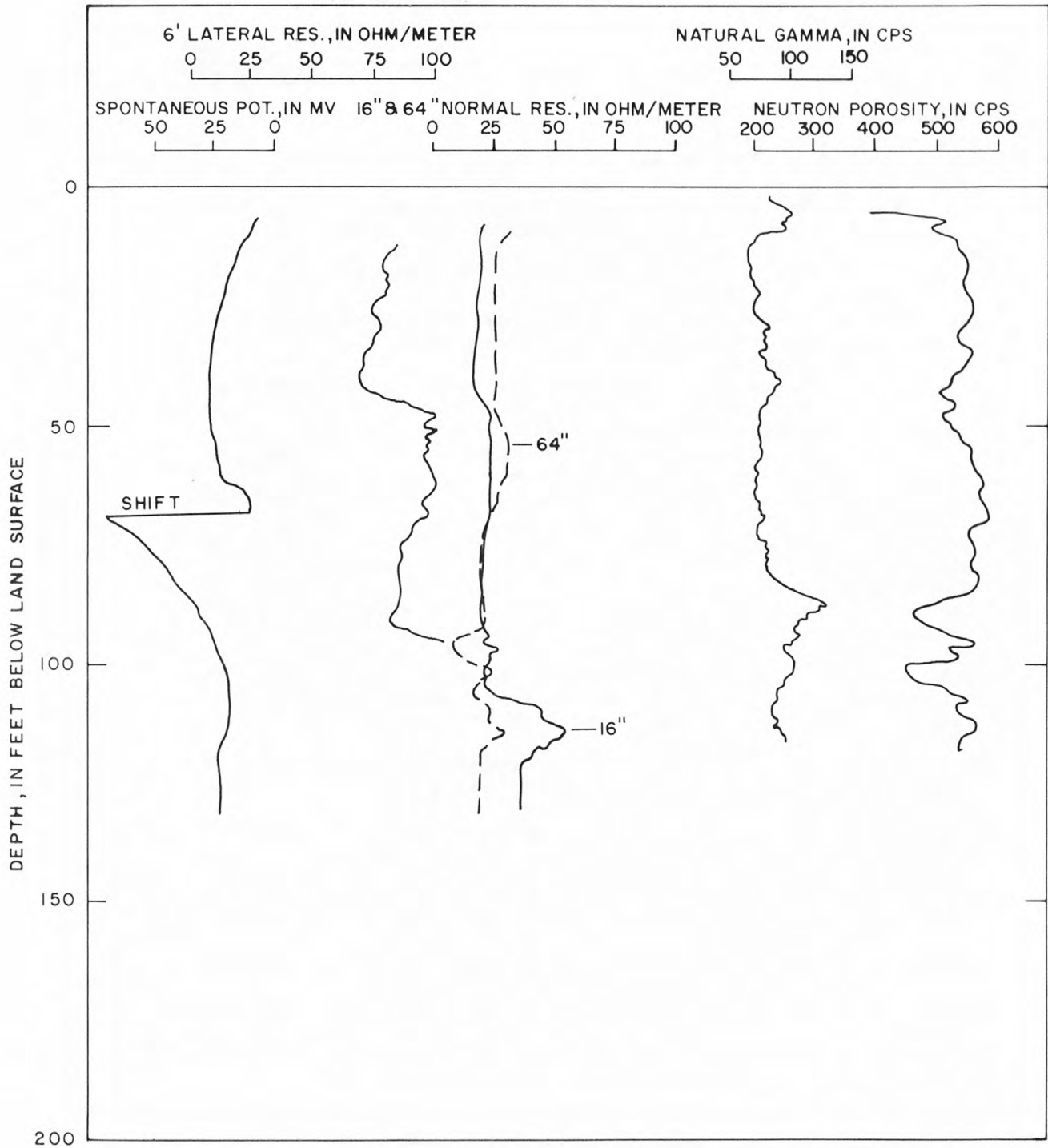
LITHOLOGIC LOG OF WELL PB-1036

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, white to tan, fine to medium grained.	0 - 4
Sand, fine to medium grained; with streak of clay, gray, sandy.	4 - 7
Sand and shell, tan to buff, fine to medium grained; shell, small and broken. (NOTE: Sandy clay layer at 13.5 feet).	7 - 14
Sand, light gray to clear, fine to coarse grained; with broken shell (30%).	14 - 19
Sand, light gray to clear, fine to coarse grained; with some broken shell.	19 - 23
Sandstone, white, fine to coarse grained; loosely cemented.	23 - 26
Sandstone, gray to white; cemented with calcite crystals; some shell.	26 - 29
Sand (50%), light gray; shell (50%), tan and dark gray to black. (NOTE: Used mud).	29 - 34
Sandstone, dark gray; small fragments; some shell.	34 - 36
Sand, light gray, fine to medium grained; with broken shell, tan, small.	36 - 37
Sandstone (80%), dark gray, fine to medium grained; small rounded fragments; broken shell, tan.	37 - 39
Sandstone, dark gray to light tan and light gray, fine to medium grained; large round cuttings; sand (20%), fine, loose.	39 - 44
Sandstone, gray, fine to medium grained; with streaks of sandy clay 46 to 49 feet.	44 - 49

LITHOLOGIC LOG OF WELL PB-1038

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, fine to medium grained; with organics, dark brown and some shells.	0 - 6
Sand, white to clear, fine to coarse grained.	6 - 11
Sandstone, gray; with sand, clear, fine to medium grained and shell, white.	11 - 14
Sand, fine to medium grained; with sandstone, gray, and shell.	14 - 24
Sand, white to light gray, fine to medium grained and some shell.	24 - 29
Sand, white, fine to medium grained.	29 - 39
Sand, light tan to gray, fine to coarse grained.	39 - 44
Sand, fine to coarse; some shell.	44 - 47.5
Sand, tan, fine to medium grained; broken shell, tan to gray.	47.5 - 49
Sand (60%), fine to medium grained; shell (40%), tan, broken. (NOTE: losing mud).	49 - 59
Sand (70%), fine to medium grained; shell, tan to gray.	59 - 64
Sand (90%), fine to medium grained; shell.	64 - 74
Sand (80%), gray, fine to medium grained; and shell.	74 - 84
Sand (90%) and shell, gray; salt and pepper appearance.	84 - 96
Sandstone and interbedded shell; cuttings flat and angular. (NOTE: Lost circulation momentarily at 97 feet).	96 - 99
Sandstone, light gray, fine grained; with shell; marly streaks present 101-102 and 102.5 feet.	99 - 104
Sandstone or limestone, gray, fine grained, cuttings flat and angular.	104 - 108
Sandstone, fine grained; with cemented shell.	108 - 114
Limestone and sand, buff to gray, fine grained; cemented; some shell.	114 - 119
Limestone, buff colored, marly; cuttings irregular and angular.	119 - 123

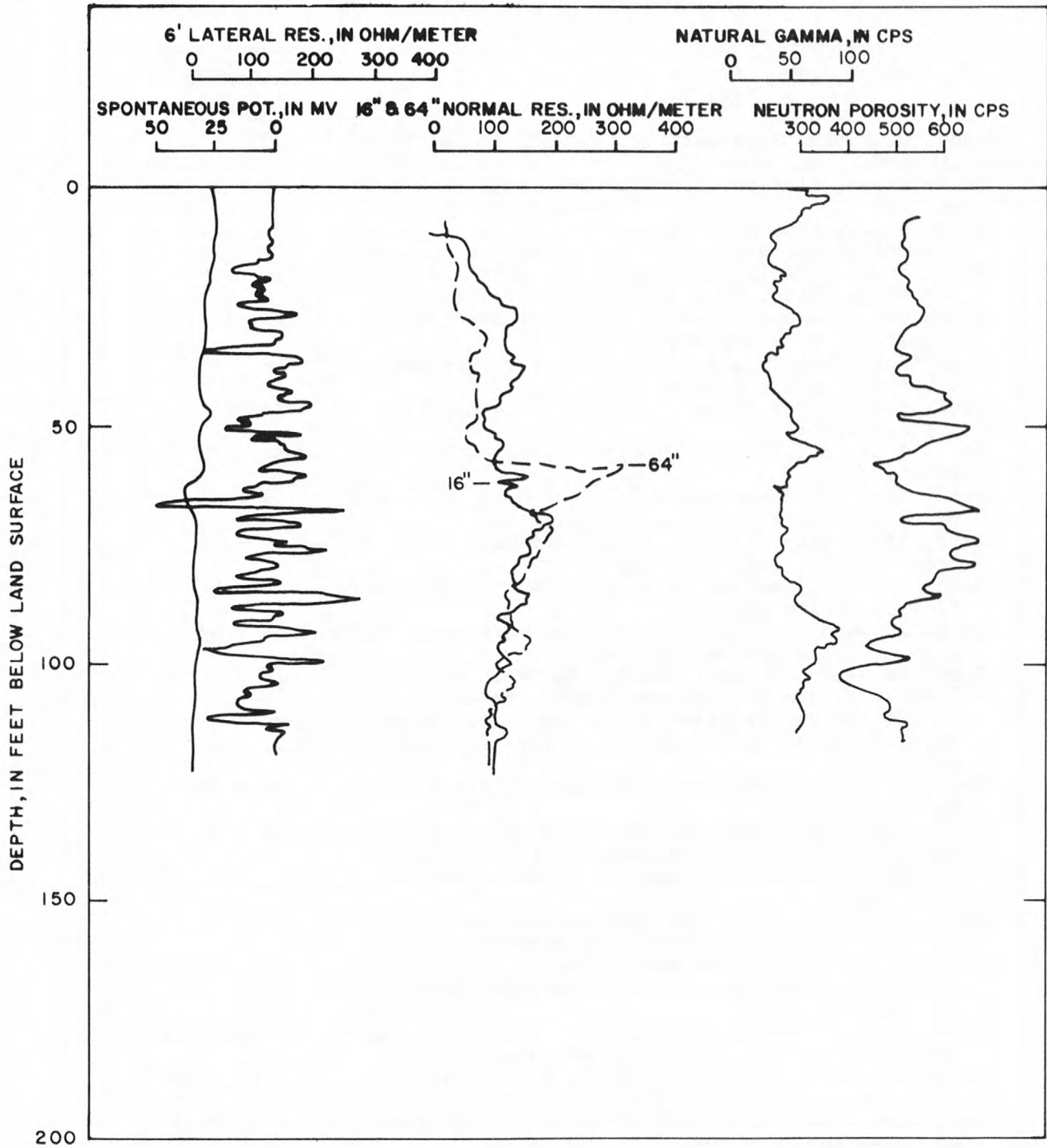
GEOPHYSICAL LOGS OF WELL PB-1038



LITHOLOGIC LOG OF WELL PB-1039

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, white, fine grained.	0 - 1.5
Sand, dark brown, fine to medium grained.	1.5 - 3
Sand, tan, fine to medium grained.	3 - 6
Sand, fine to coarse grained; with shell, tan and sandstone, cemented gray, fine grained; with silt.	6 - 14
Sand, fine to medium grained; with shell, tan and sandy clay streaks, gray. (NOTE: Shell content increases with depth.	14 - 19
Sand, fine to coarse grained; with sandy clay, gray, also whole and broken shell, tan. Some sandstones white, fine grained.	19 - 25
Sandstone, white to gray, fine grained; with shell.	25 - 34
Sandstone and sand, gray, fine to medium grained; with broken shell and calcite cemented crystals.	34 - 44
Sandstone, gray translucent; with some shell and interbedded calcite in small fragments.	44 - 49
Sandstone (80%) and limestone (20%), calcite cemented; calcite crystals; clay, gray at 50 feet.	49 - 54
Limestone and sandstone, fine grained, layered in hard streaks; with some clay, white, marly; small cuttings flat and angular.	54 - 59
Limestone or sandstone, sandy, gray, calcite cemented; with alternating hard and soft streaks. (NOTE: Bit dropped 6 inches; at 63 feet, lost circulation).	59 - 64
Limestone and/or sandstone, gray to dark gray, fine grained, calcite cemented; thin angular cuttings. (NOTE: Lost circulation momentarily throughout the 63 to 69 foot interval.	64 - 69
Sandstone or limestone, tan, calcite cemented; with a few calcite crystals and some shell; small and loose cuttings from 70 to 73.5 feet.	69 - 74
Sandstone or limestone, gray, fine grained; with shell (2%), tan; calcite cemented. (NOTE: Sample has salt and pepper appearance).	74 - 79
Sandstone or limestone, fine grained; with some shell and a few thin marly streaks; salt and pepper appearance.	79 - 84
Sandstone or limestone, gray, fine grained; with sand, fine grained; cuttings in assorted sizes.	84 - 89
Sandstone or limestone, fine grained; with cemented shell.	89 - 94
Sandstone or limestone, olive gray; with sand (20%), fine grained; angular cuttings. (NOTE: Hard and soft layers).	94 - 99.7
Sandstone or limestone, gray to brown gray, fine grained; with some cemented shell; various-sized angular cuttings.	99.7 - 109
Sandstone or limestone, brown to gray, fine grained; with cemented shells and some marl.	109 - 114
Limestone, olive, tan, cream brown, light gray to dark gray.	114 - 119

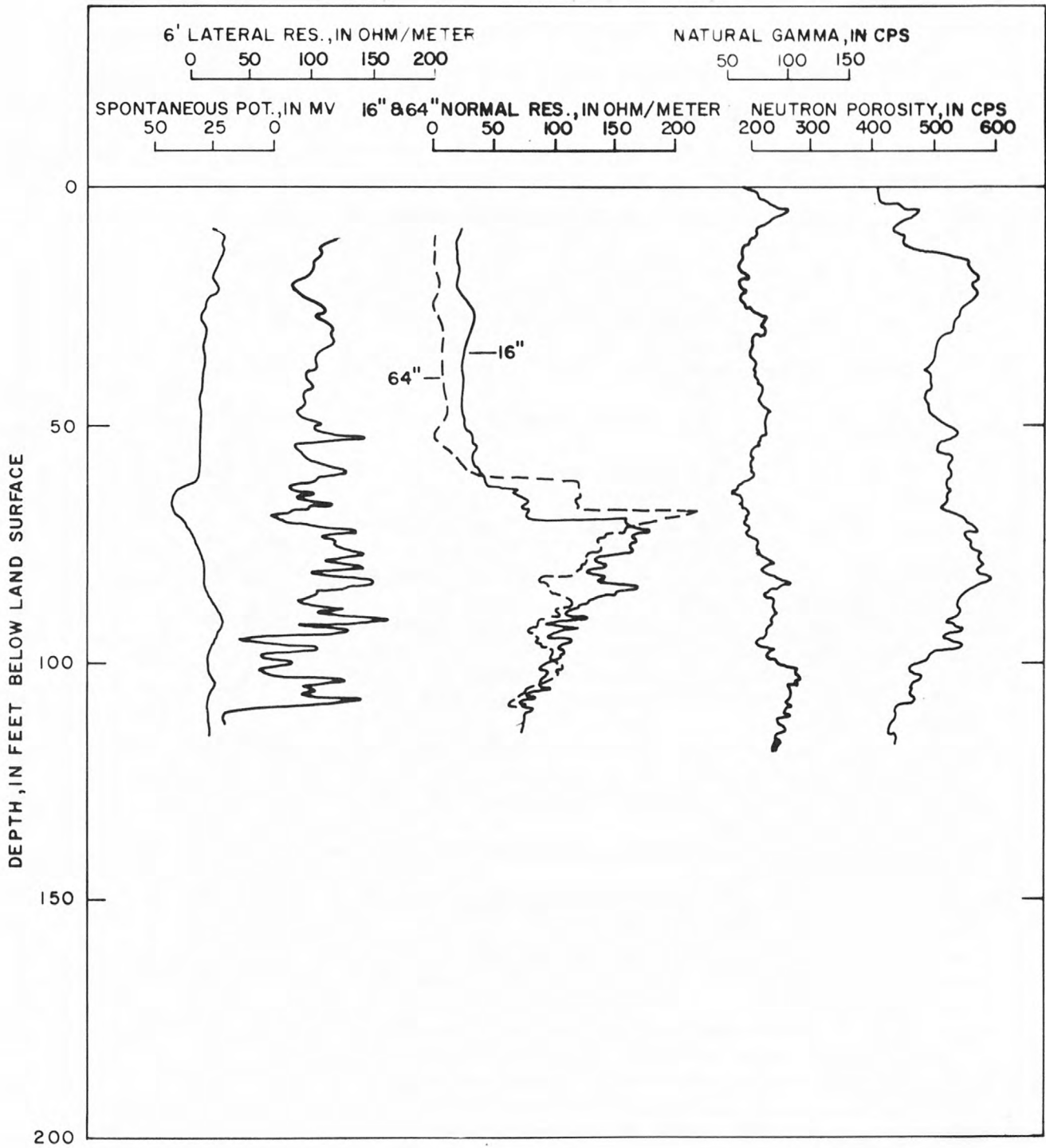
GEOPHYSICAL LOGS OF WELL PB-1039



LITHOLOGIC LOG OF WELL PB-1062

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, with organic material, black to brown, fine grained.	0 - 4
Sand, clear, fine to coarse grained with dark brown matrix.	4 - 9
Sand, brown, fine grained.	9 - 11
Sandstone, light gray, fine grained; with some shell.	11 - 16
Sand (50%); fine to medium grained; with shell (15%); sandstone (20%), gray and organic layers.	16 - 19
Sand, tan to brown, fine to medium grained; with sandstone, gray and shell, tan.	19 - 24
Sand (75%), tan to gray, fine to medium grained; with sandstone, gray, fine grained.	24 - 29
Sand, tan to gray, fine to coarse grained; with organic layers.	29 - 34
Sand, fine to coarse grained; with organic layers, brown.	34 - 39
Sand, fine to coarse grained; with shell, buff and gray; sandstone layer at 40 feet.	39 - 44
Sand, light gray, fine to medium grained; with broken shell, buff to gray.	44 - 51
Sandstone or limestone, dark gray; with sand, gray fine to medium grained.	51 - 54
Cemented sand and shell, dark gray; with sand, light gray, fine to medium grained.	54 - 59
Cemented sand and shell, dark gray; with sand, gray, fine to medium grained and beach worn shell. (NOTE: Harder drilling at 61 feet, stem dropped several times, cavity filled with sand, fine grained).	59 - 64
Sand and shell, cemented; with sand, gray, fine to medium grained.	64 - 69
Sand and shell, cemented; with sand, gray, fine to medium grained; also calcite crystals present. (NOTE: Circulation losses at 73.5 to 75 feet, lost mud).	69 - 74
Sand and shell, gray, calcite cemented and sand fine to medium grained; cuttings in assorted sizes.	74 - 79
Cemented sand, gray and shell, buff. (NOTE: circulation at 80 feet, soft sand streaks at 81.5, 82, 83-83.7 feet).	79 - 81.5
Sand, fine to medium grained; with some shell and sandstone, gray, salt and pepper appearance.	81.5 - 83.7
Sandstone (65%), gray; with shell (25%), calcite cemented and sand (10%), fine grained.	83.7 - 89
Sandstone, gray; with sand streaks, fine grained and some shell, loose.	89 - 94.5
Sandstone, gray, fine grained; small and angular cuttings; soft streaks at 97-97.5 feet and 98-98.5 feet.	94.5 - 99
Sandstone, gray, fine grained; interbedded with sand.	99 - 104
Sandstone, fine grained and sand, gray, fine grained; with shell, tan, 107-109 feet.	104 - 109
Sandstone, tan-brown, fine grained and sand, gray, fine grained; shell, tan.	109 - 112

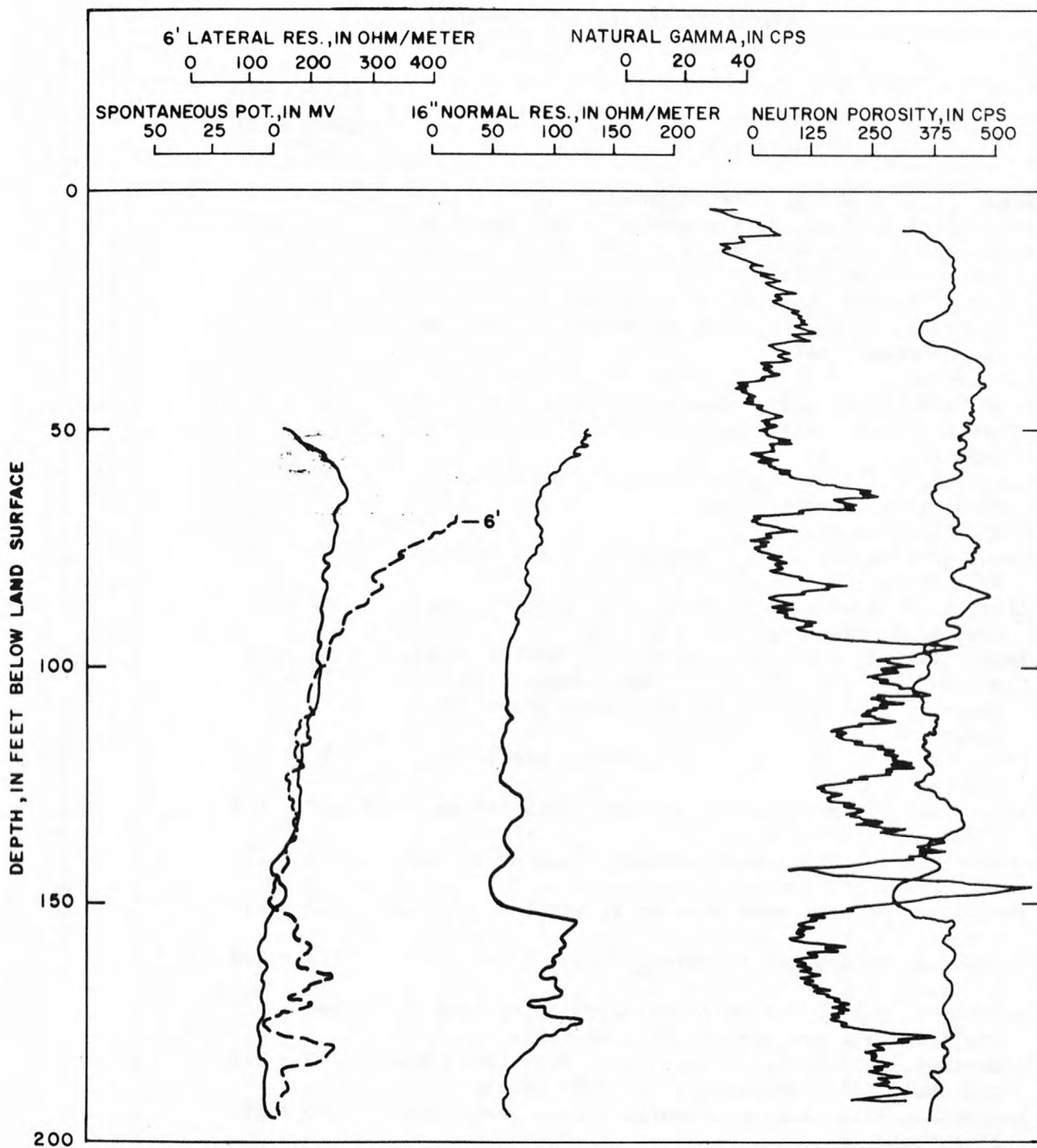
GEOPHYSICAL LOGS OF WELL PB-1062



LITHOLOGIC LOG OF WELL PB-1082

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, white to gray, fine grained.	0 - 5
Sand, brown, fine grained.	5 - 20
Sand, brown, fine grained; with quartz crystals, clear.	20 - 28
Sandstone, gray, with broken shell.	28 - 32
Sandstone, light gray; with clay, gray.	32 - 38
Sandstone, light gray; with decreasing amount of gray clay and trace of coquina.	38 - 40
Shell (80%), broken; sandstone (20%), gray to light gray.	40 - 42
Coquina, tan; with broken shell; some sandstone, gray.	42 - 50
Coquina (70%), tan; with broken shell (30%).	50 - 60
Coquina (20%), tan; with sandstone (30%), gray, broken shell (45%) and sand, gray, fine grained.	60 - 70
Shell (80%), broken; sandstone (20%), gray.	70 - 75
Shell (50%), broken; with sandstone (50%), gray and sand, gray, fine grained.	75 - 80
Shell (80%), broken; with sandstone, gray, coquina, tan and sand, gray, fine grained; fine cuttings.	80 - 90
Shell (70%), broken; with sandstone, gray (increasing with depth) and sand, tan, fine grained.	90 - 100
Shell (75%), broken; with sandstone (20%), gray and sand (5%), tan to gray, fine grained.	100 - 110
Shell (85%), broken; with sandstone (5%) and sand (10%), fine grained.	110 - 120
Shell (90%), broken; with sand, fine grained and some gravel.	120 - 130
Shell, broken; sand, gray, fine to medium grained. Sandstone, dark gray at 138 feet. (NOTE: Bit jumped, lost mud at 138 to 139 feet).	130 - 140
Limestone, tan; with broken shell (20%); some marl at 150 feet.	140 - 150
Limestone, tan; with some sandstone nodules and gravel; some white marl.	150 - 160
Limestone, tan; with some marl, white and broken shell.	160 - 170
Limestone, tan; with marl, white (hard layer at 174-177 feet).	170 - 180

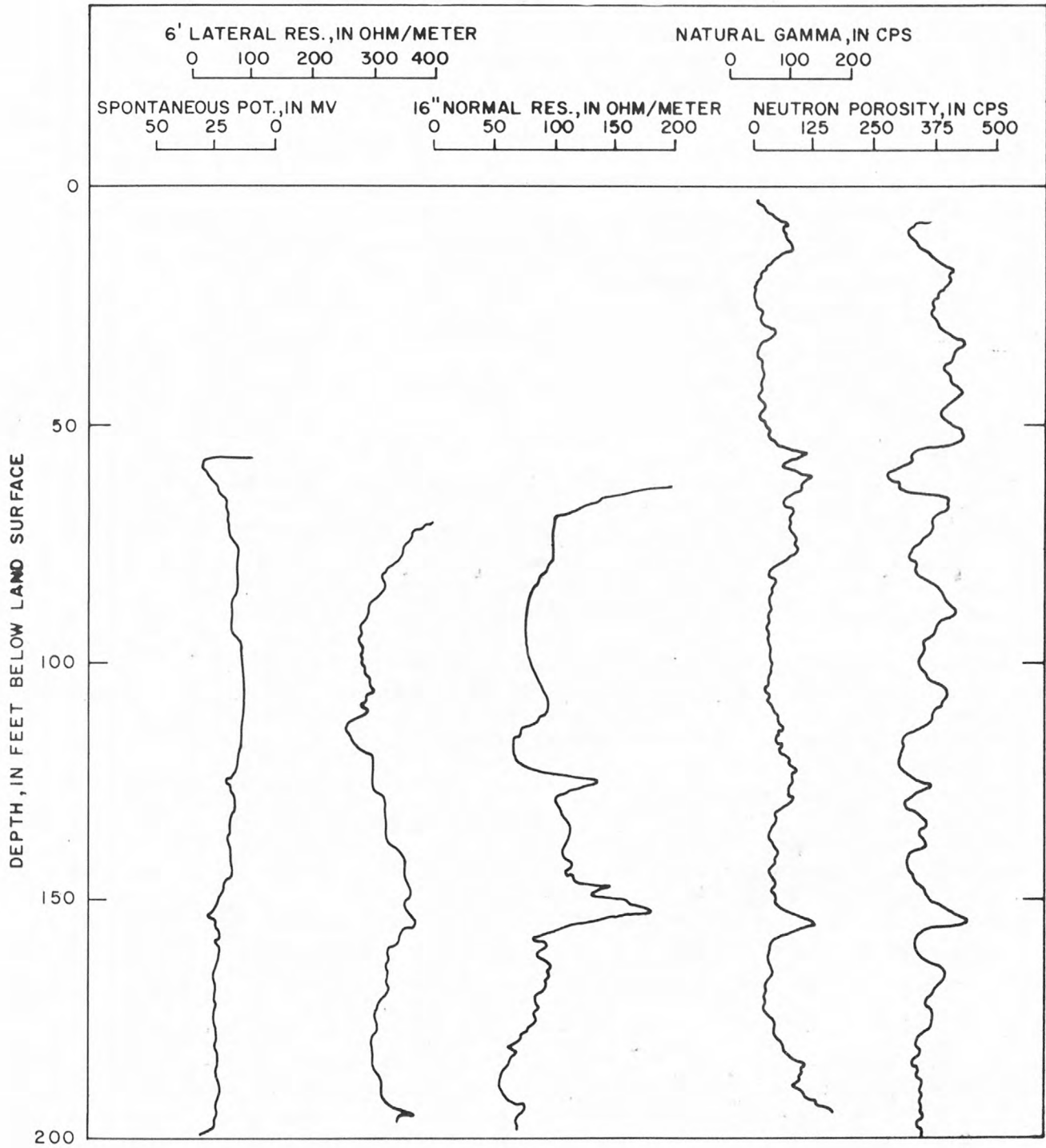
GEOPHYSICAL LOGS OF WELL PB-1082



LITHOLOGIC LOG OF WELL PB-1083

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, gray to white, fine grained.	0 - 3
Sand, fine grained; with organics, black (hard pan).	3 - 6
Sand (75%), gray; with shell (20%), yellow to tan and some clay (5%).	6 - 14
Sand, gray; with increasing shell (50%).	14 - 21
Sand (70%), dark gray, fine to medium grained; with large broken shell.	21 - 30
No sample.	30 - 40
Sand (50%), dark gray, fine to medium grained; with large broken shell; increasing shell content with depth.	40 - 50
Shell (80%), light tan to cream, large, broken; sand, gray, fine grained.	50 - 55
Clay, black, soft.	55 - 57
Clay, green gray, soft; changing to light gray at 59.5 feet.	57 - 60
Clay, light gray with black and tan streaks, soft; some sand, fine grained, and shell.	60 - 73
Sand, gray, fine grained; with small broken shell.	73 - 79
Clay (80%), light gray, soft; with sand, fine grained; some streaks of clay, dark brown (bit jumped at 82 and 85 feet).	79 - 97
Sand, fine grained; with small broken shell (bit chatter).	97 - 107
Sand (40%), fine to coarse grained; with broken shell (40%) and clay, gray.	107 - 113
Shell (90%), broken; with sand (10%), gray to dark gray, fine grained.	113 - 120
Shell, broken, and sand with marly streaks, gray to tan.	120 - 129
Limestone, yellow tan to white, marly; with shell and sand.	129 - 140
Limestone, yellow tan to cream; with thin, hard shell streaks and some calcite crystals.	140 - 160
Limestone, yellow tan to cream with clay (20%) gray, and shell (25%) increasing to (75%) by 180 feet.	160 - 180
Limestone; with calcite cemented broken shell and limey sand.	180 - 192
Sandstone (60%), limey; with shell, marl (20%) and clay, tan to gray (20%); flat and thin cuttings with sharp edges (Tamiami Formation).	192 - 200

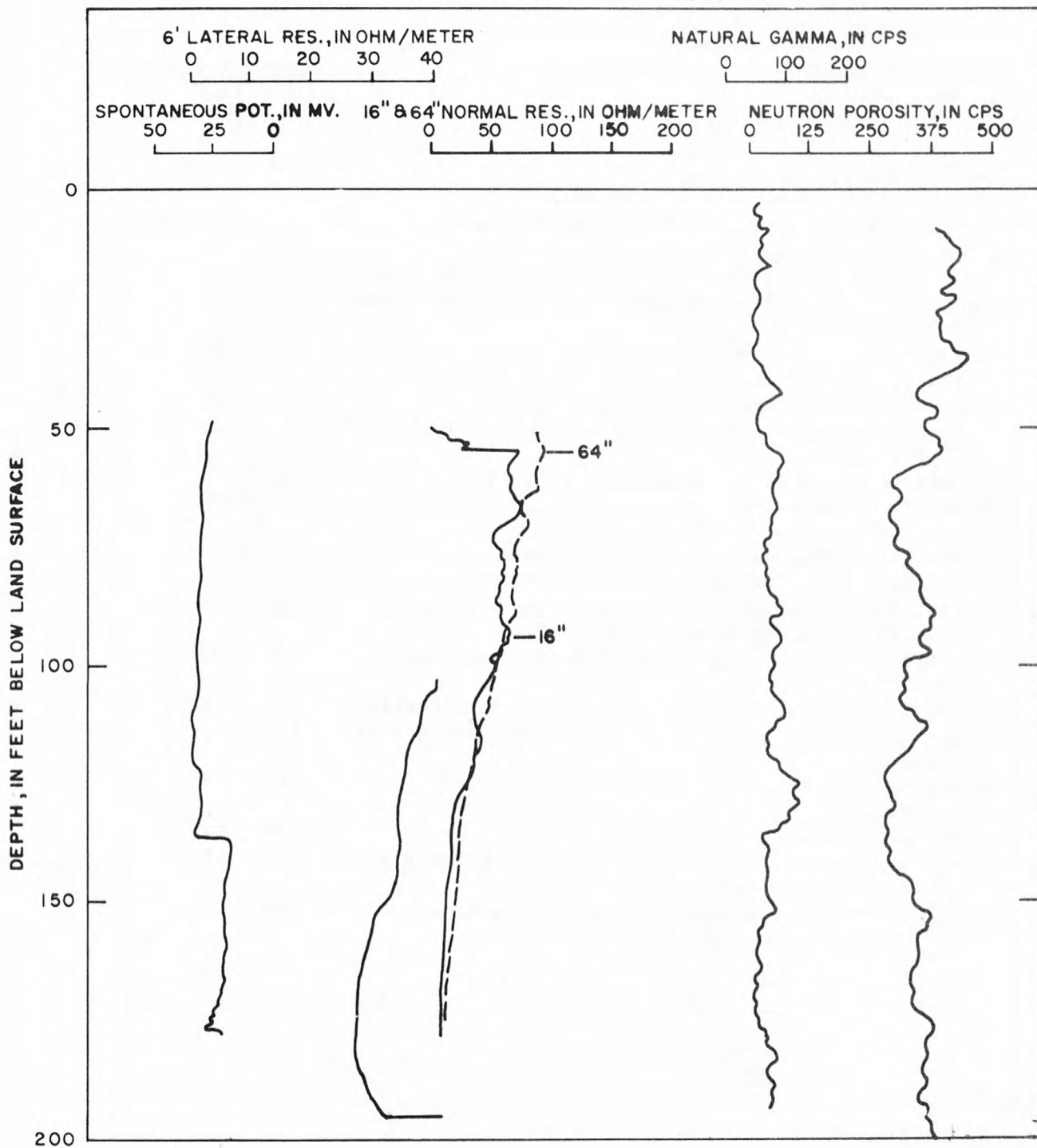
GEOPHYSICAL LOGS OF WELL PB-1083



LITHOLOGIC LOG OF WELL PB-1084

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Surface soil and sand.	0 - 4
Muck.	4 - 6
Shell (70%) and sand, fine grained; clay layer at 13-15 feet.	6 - 15
Sand, dark brown; with organic material.	15 - 17
Sand, white, fine to medium grained.	17 - 29
Sand, rust colored, fine grained.	29 - 37
Sand (60%), gray, clayey.	37 - 40
Clay, black; with sand, fine to coarse grained.	40 - 43
Clay, gray; with sand, fine grained.	43 - 45
Sandstone; small fragments with rounded edges; interbedded shell, limy.	45 - 50
Sandstone; with microscopic shell; calcite cemented, small fragments.	50 - 60
Sandstone or limestone, dark gray; calcite cemented, small fragments; hard layer at 66 feet.	60 - 66
Limestone, dark gray; calcite cemented; increasing nodules; cuttings small, angular (used mud).	66 - 76
Limestone with dark gray streaks and small shell; small angular cuttings (lost circulation at 83 feet).	76 - 83
Limestone, dark gray; gravel size, angular to sub-rounded cuttings, calcite cemented and crystals.	83 - 100
Limestone, tan to gray, calcite cemented; with increasing amounts of interbedded shell and numerous calcite crystals.	100 - 136
Coquina, tan; with limestone.	136 - 140
Limestone, tan to gray; with large shells.	140 - 150
Shell, crushed; with sand, fine grained.	150 - 155
Limestone, greenish gray to tan, fine grained; with few large shells (Tamiami Formation).	155 - 181
Clay, sandy, light green to gray and tan; with some shell (Tamiami Formation).	181 - 200

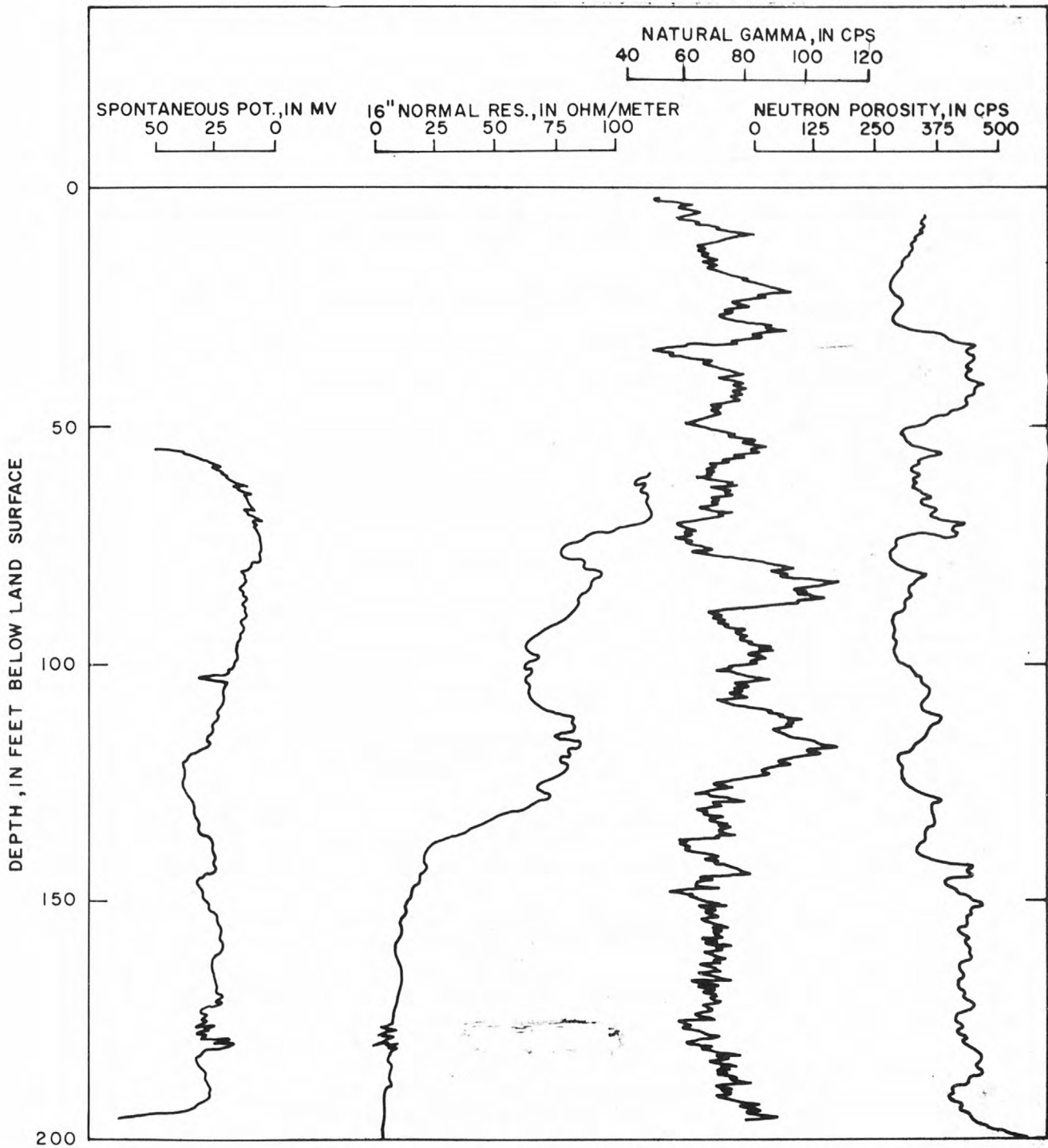
GEOPHYSICAL LOGS OF WELL PB-1084



LITHOLOGIC LOG OF WELL PB-1085

<u>Material</u>	<u>Depth, feet</u>
	<u>below land</u> <u>surface</u>
Sand, fine grained.	0 - 1
Clay, sandy, cemented sand nodules.	2 - 5
Sand and shell, gray, clayey, concretions.	5 - 10
Sand, light gray, fine grained.	10 - 21
Sand (60%), fine grained; with shells, light brown.	21 - 28
Sand (60%), fine grained; with shells, light brown and organic clay.	28 - 30
Limestone or sandstone, dark gray, coarse grained, dense, calcite cemented; with large shells.	30 - 40
Sandstone, gray; calcite cemented, gravel size cuttings, angular to subrounded (lost circulation, used water).	40 - 55
Sandstone and shell, cemented (used water).	55 - 61
Limestone, tan to gray; calcite present; cuttings rounded to subangular.	61 - 70
Limestone, gray-black; nodular, rounded to subrounded; with increasing shell (used water).	70 - 80
Limestone, tan to gray; nodular, rounded to subrounded; with shell and coral rock.	80 - 96
Limestone, yellow to gray; with broken and whole shell.	96 - 100
Limestone, yellow to gray; with increasing shell.	100 - 120
Limestone, yellow-gray; with broken and whole shell (40%).	120 - 140
Limestone, gray; with broken and whole shell, tan to gray.	140 - 165
Clay, green, sandy; with broken shell.	165 - 180
Clay, marly, soft; with sand, fine to medium grained (salt and pepper appearance).	180 - 193
Clay, dark green, sandy; with small sandstone stringers, green.	193 - 200

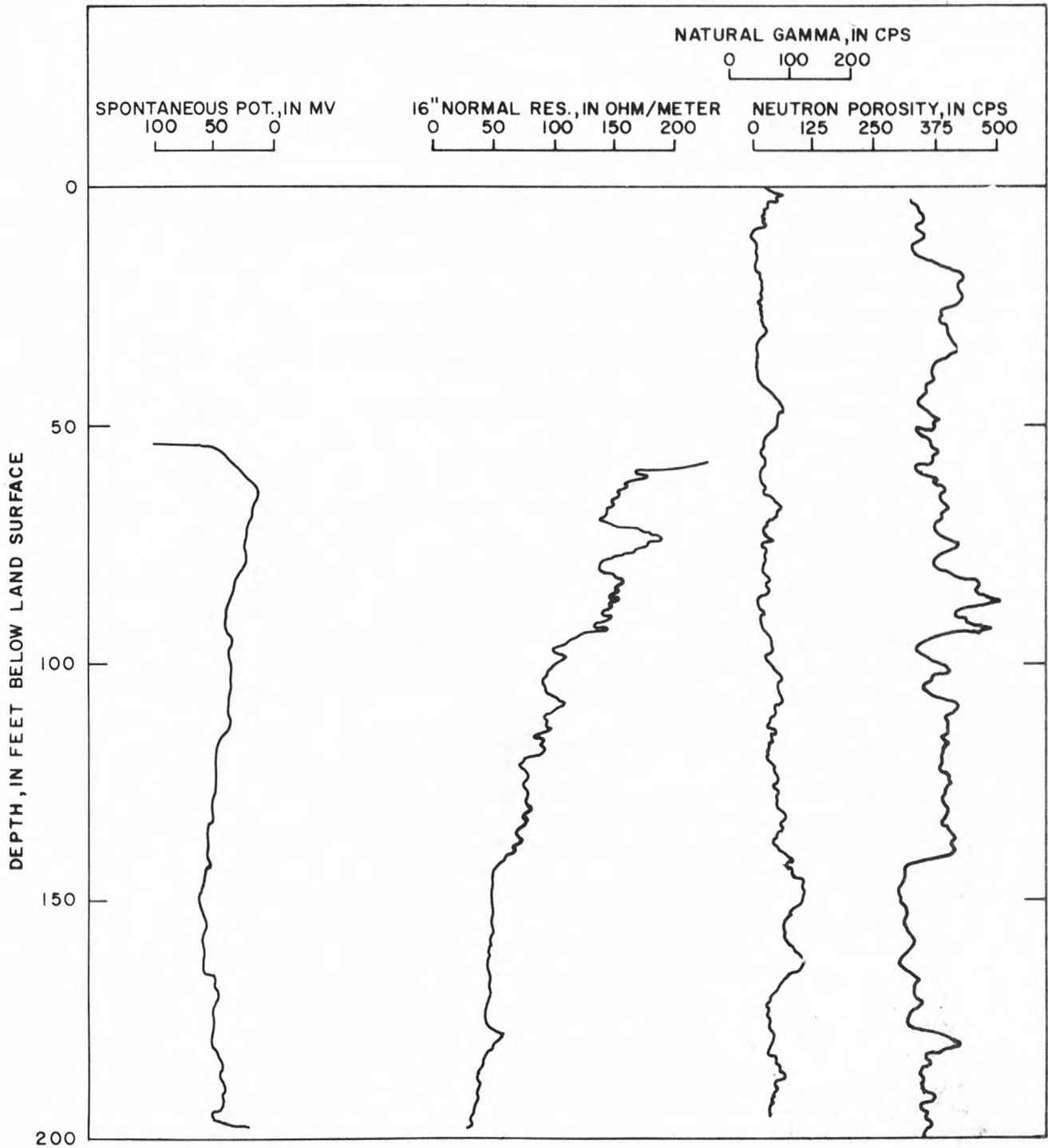
GEOPHYSICAL LOGS OF WELL PB-1085



LITHOLOGIC LOG OF WELL PB-1086

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, tan to gray.	0 - 4
Sand, black to dark brown, fine grained; clayey (30%).	4 - 5
Sand, gray, fine grained; clayey.	5 - 7
Sand, fine grained; with some shell and clay streaks.	7 - 10
Sand, light gray, fine grained.	10 - 13
Sand and broken shell.	13 - 17
Sand (10%), cream, fine grained; with clay (50%) and broken shell (40%).	17 - 33
Shell with sandy clay and sand, gray, fine to coarse grained.	33 - 36
Sandstone, gray, calcite cemented.	36 - 38
Clay, green, sandy; some shell.	38 - 40
Clay, greenish-gray, sandy.	40 - 47
Limestone or sandstone, dark gray to tan, calcite cemented.	47 - 54
Limestone, light gray; subrounded, small fragments.	54 - 60
Limestone, light gray, calcite cemented; with sand and small fragments.	60 - 65
Limestone, gray to tan; cuttings subrounded to angular and gravel size (used mud).	65 - 88
Limestone, gray to tan; gravel size cuttings, subrounded to angular, hard streaks; with interbedded shell and calcite crystals.	88 - 100
Limestone, mottled gray and tan; gravel size fragments; with loose and cemented shell. (NOTE: At 110 feet cuttings more varied in size and shape).	100 - 120
Limestone, dark gray mottled and tan to light gray; with broken and whole shell (small fragments present).	120 - 136
Limestone, yellowish tan; sandstone, cemented, hard.	136 - 140
Limestone, yellowish tan to gray; with streaks of calcite cemented sandstone, hard. (NOTE: Limestone is friable and contains microscopic shells).	140 - 154
Limestone, light gray to greenish cream, friable; with broken shell (Tamiami Formation).	154 - 180
Limestone, greenish cream to gray, friable.	180 - 200

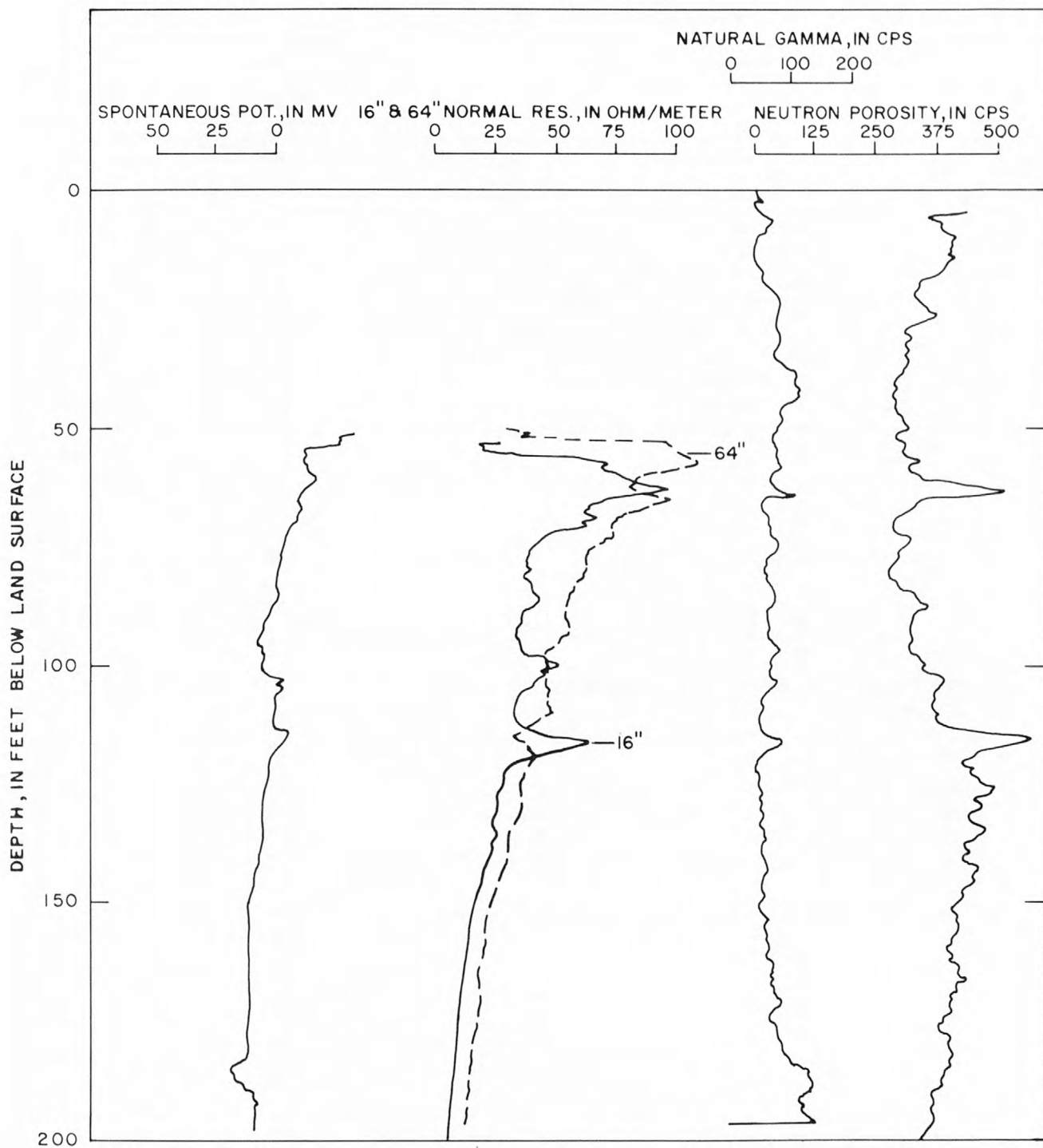
GEOPHYSICAL LOGS OF WELL PB-1086



LITHOLOGIC LOG OF WELL PB-1087

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, tan and gray, fine to medium grained.	0 - 5
Sandstone and sandy clay, brown.	5 - 10
Sandstone, gray; with sandy clay, brown and broken shell (75%).	10 - 20
Sandstone (80%), dark gray; with broken shell (10%) and sand, gray, fine grained.	20 - 30
Sandstone (90%), dark gray; with small amounts of broken shell.	30 - 40
Sandstone (75%), dark gray; with broken shell and clay, gray to green at 47 feet.	40 - 48
Sandstone, dark gray, hard, cavity riddled.	48 - 50
Coquina, dark gray, broken; with cavities.	50 - 60
Coquina, dark gray; increasing shell at 68-70 feet.	60 - 70
Shell (80%) and coquina (20%), dark gray.	70 - 80
Shell (60%), broken; with coquina, dark gray.	80 - 100
Coquina, dark gray, and broken shell in layers.	100 - 110
Shell, broken; with coquina, dark gray. (NOTE: Coquina becomes firmly cemented, changes to light gray, and sand grains become larger at 112 feet).	110 - 120
Limestone, light gray to dark gray, sandy; with loose shell.	120 - 130
Limestone, sandy; with shell hash and sand, gray, fine grained.	130 - 140
Limestone, tan to gray; with broken shell and clay, tan to gray at 145 feet.	140 - 150
Limestone, dark gray; with broken shell and clay stringers, tan to gray.	150 - 160
Coquina, dark gray; with clay, dark tan to green at 168 feet and small amounts of broken shell.	160 - 170
Clay, gray to green; with coquina, dark gray and small amounts of broken shell.	170 - 180

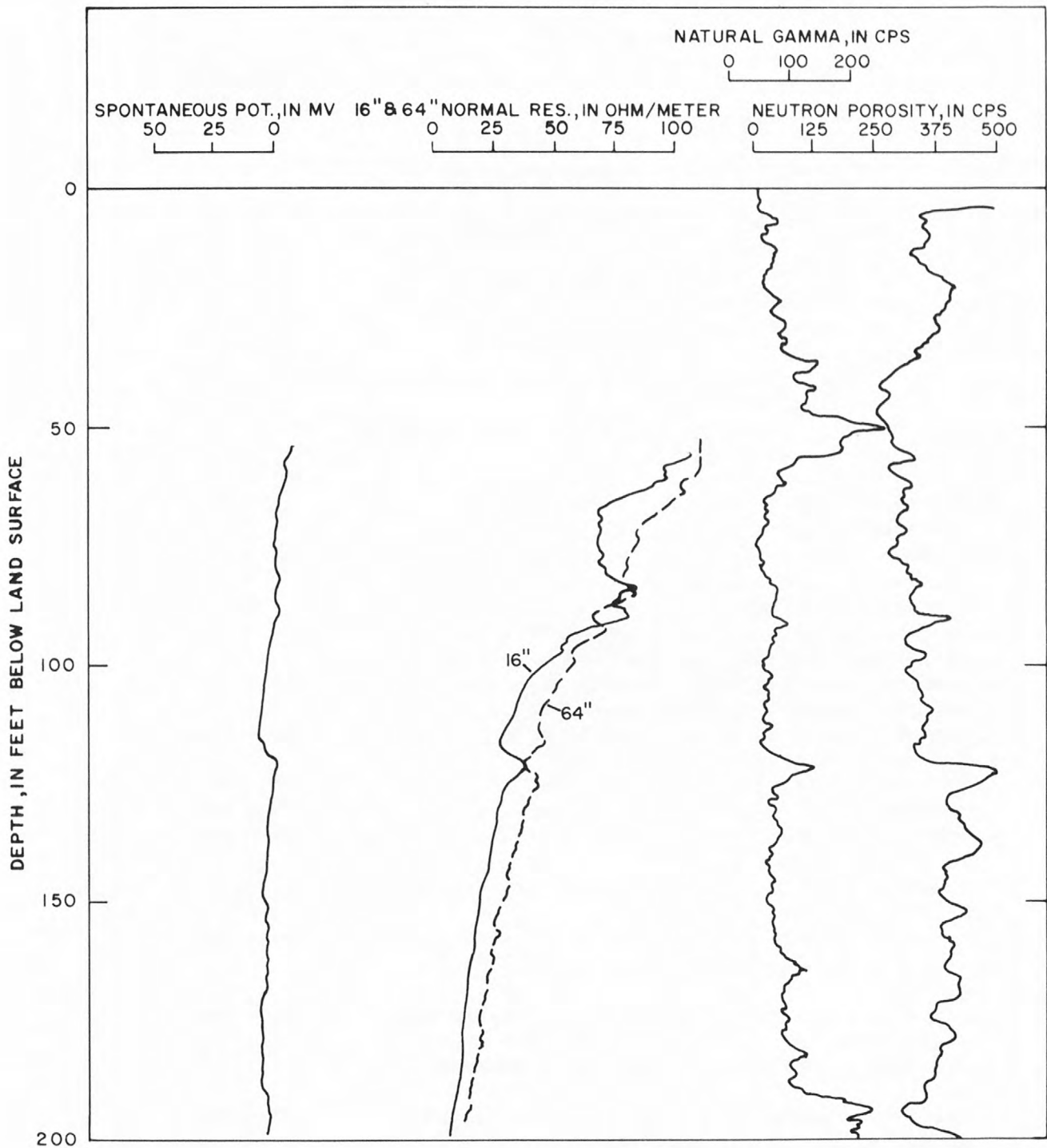
GEOPHYSICAL LOGS OF WELL PB-1087



LITHOLOGIC LOG OF WELL PB-1088

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, surface and fill.	0 - 3
Sand, slightly cemented.	3 - 6
Shell, broken, loose.	6 - 8
Clay, dark gray to light gray, sandy.	8 - 17
Sand, slightly cemented; and shell mixed.	17 - 19
Sand (quartz), light gray, fine to coarse grained.	19 - 21
Sand, gray, fine to medium grained; clayey.	21 - 40
Sand, tan, fine grained, loose.	40 - 51
Clay, gray-blue, sandy.	51 - 54
Shell, tan to gray, broken, loose; limestone, tan at 58 feet.	54 - 58
Limestone, tan; with shell, gray and sand (30%); (salt and pepper appearance).	58 - 80
Limestone, tan to gray.	80 - 88
Limestone, tan and gray; with shell, whole and small.	88 - 98
Limestone, tan to gray.	98 - 100
Limestone, dark gray to cream and tan; with broken shell.	100 - 122
Sandstone or limestone, greenish gray; small fragments.	122 - 131
Sandstone, green-gray (olive); with sandy clay and thin shell layers.	131 - 140
Limestone and sandy clay, greenish.	140 - 160
Limestone and sandy clay, green; with shell.	160 - 173
Clay, green, sandy.	173 - 188
Clay, gray to olive green; with interbedded broken shell.	188 - 193
Clay, dark green-black, fine grained, sandy.	193 - 200

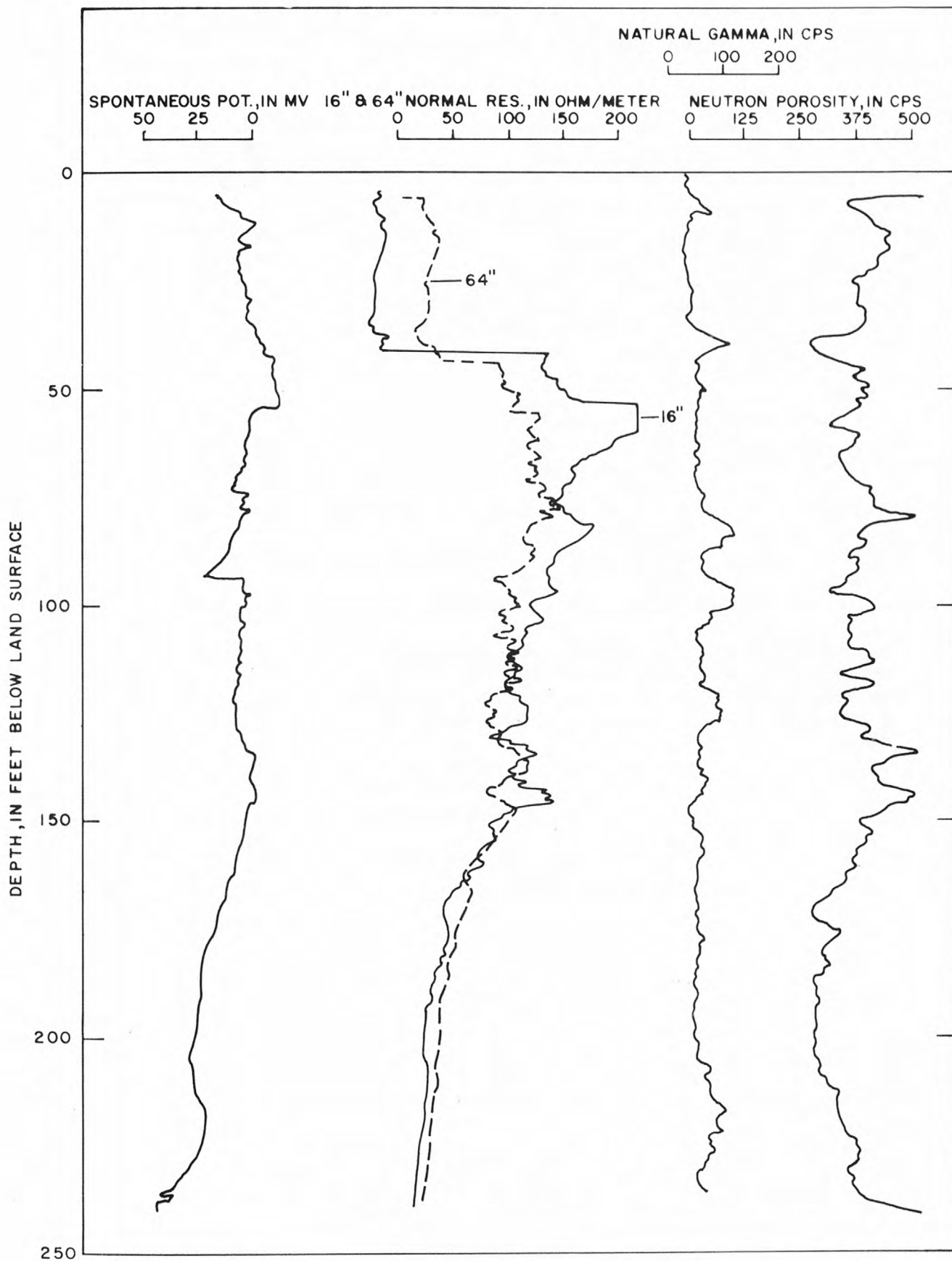
GEOPHYSICAL LOGS OF WELL PB-1088



LITHOLOGIC LOG OF WELL PB-1089

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white to tan, fine to medium grained.	0 - 4
Clay, gray, sandy.	4 - 7
Shell, large, broken, loose; with some sand.	7 - 12
Clay, dark gray, sandy.	12 - 16
Sand, fine grained; with some broken shell.	16 - 20
Sand, clay and broken shell.	20 - 27
Sand, fine grained; with broken shell.	27 - 38
Clay, gray, sandy.	38 - 44
Sandstone, dark gray; calcite cemented, angular cuttings (used water).	44 - 52
Limestone, light gray to tan cream, sandy, friable.	52 - 57
Shell, broken, cemented.	57 - 60
Shell, broken, cemented; small fragments.	60 - 67
Sandstone, light gray to dark gray; calcite cemented, small fragments angular and flat.	67 - 94
Sandstone, calcite cemented; with limestone, some fine-grained sand streaks and large angular cuttings (lost water).	94 - 100
Limestone, sandy, calcite cemented; with microscopic shells and calcite crystals (lost circulation).	100 - 120
Limestone, cemented; with calcite crystals and numerous rounded nodules (used water).	120 - 140
Limestone, gray, cemented; with interbedded shell and sand, fine-grained.	140 - 145
Clay, white, marly.	145 - 146
Limestone, gray.	146 - 149
Clay, white, marly; with broken shell and limestone in layers, gray.	149 - 154
Limestone, gray to tan cream; with nodules and rounded cuttings (used water).	154 - 160
Limestone, gray to cream, calcite cemented; with numerous nodules and calcite crystals (used water).	160 - 184
Limestone, cream tan to light gray, friable with smaller cuttings and a greenish olive cast to cuttings. (NOTE: Salt and pepper appearance to mud).	184 - 200
Limestone, greenish gray (greener with depth), sandy, silty, clayey and friable.	200 - 220
Limestone, greenish gray, sandy; with sandy clay streaks.	220 - 230
Limestone, greenish gray; with increasing clay.	230 - 240

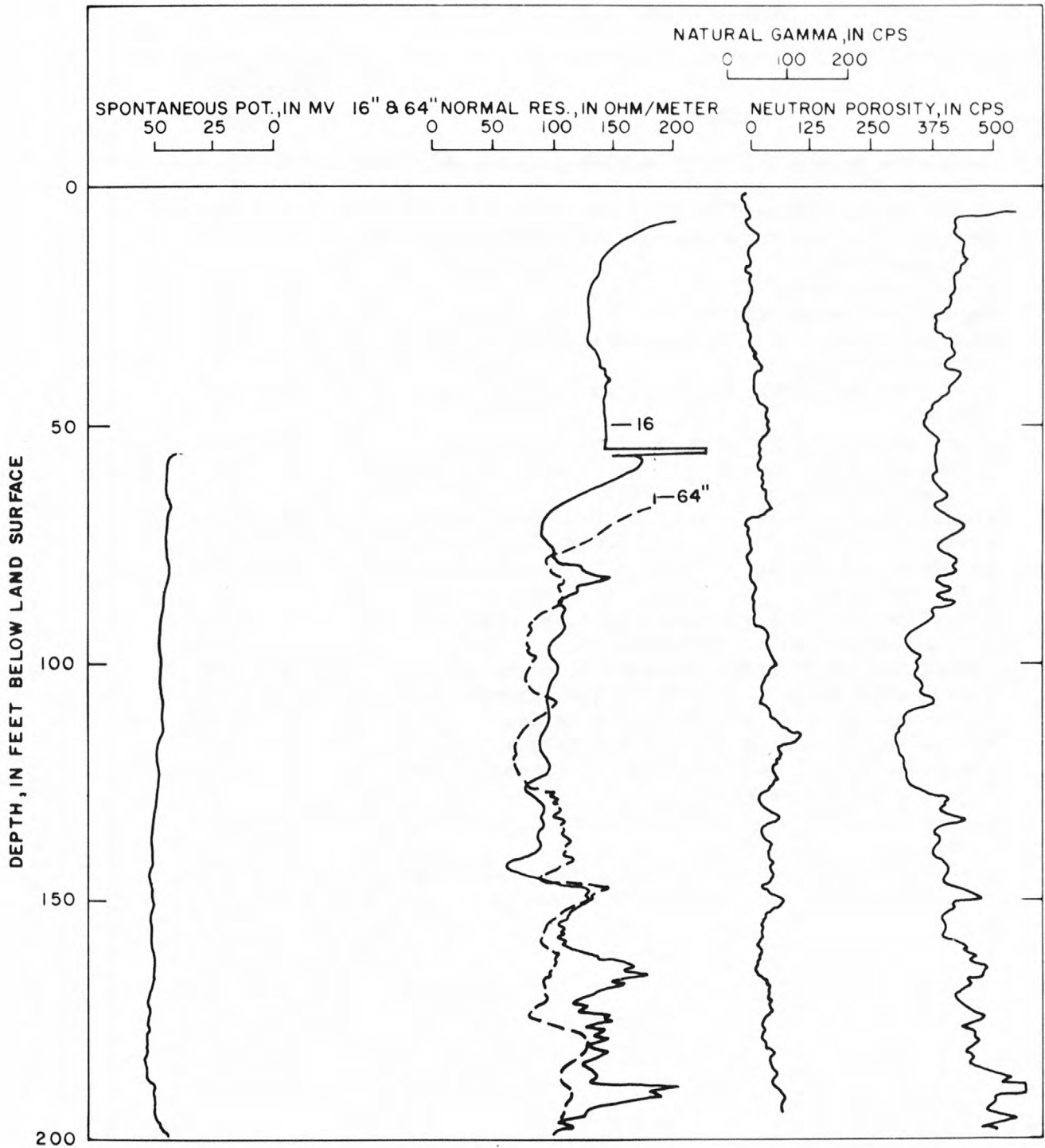
GEOPHYSICAL LOGS OF WELL PB-1089



LITHOLOGIC LOG OF WELL PB-1090

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, gray to tan and brown, fine to medium grained.	0 - 10
Sand, dark brown, fine grained.	10 - 20
Sand, dark brown, fine grained.	20 - 30
Sand, dark brown, fine grained; with clay.	30 - 40
Sand, dark brown; with gray streaks and some clay.	40 - 50
Sand, dark brown, fine to medium grained; with some clay. (NOTE: Consolidated area at 58 feet).	50 - 60
Sand, dark brown, fine grained; with shell hash at 65 feet.	60 - 70
Shell hash; with limestone, gray at 78-80 feet.	70 - 80
Shell hash; with some coquina and marl, white.	80 - 90
Shell hash; with increasing coquina and calcite crystals, small fragments.	90 - 100
Limestone, light gray; with some calcite and broken shell, angular cuttings.	100 - 110
Limestone, light gray; with increasing broken shell and coquina.	110 - 120
Coquina with broken shell; angular cuttings and calcite crystals.	120 - 140
Limestone, light gray; angular cuttings; small amount of broken shell (hard layer at 148 feet).	140 - 150
Limestone, tan, white and gray; with broken shell (25%) and some marl, white (hard layer at 159 feet).	150 - 160
Limestone, light gray; with broken shell and large amounts of white marl (hard layer at 176 feet).	160 - 180
Limestone, light gray; with shell hash and large angular cuttings.	180 - 190
Limestone, light gray; with small broken shell, marl, white and angular cuttings.	190 - 200

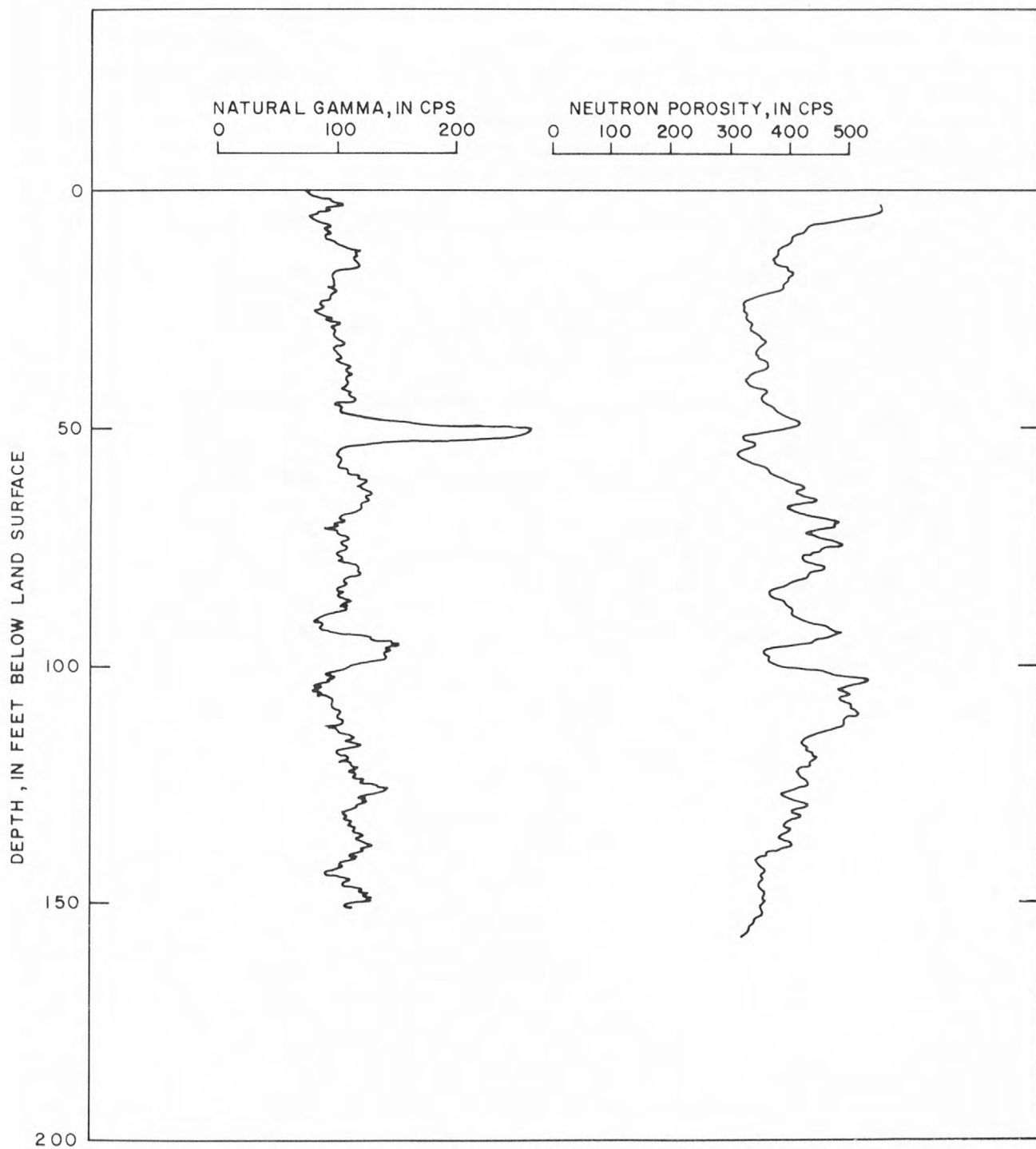
GEOPHYSICAL LOGS OF WELL PB-1090



LITHOLOGIC LOG OF WELL PB-1091

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, tan to gray, fine to medium grained; with some broken shell.	0 - 5
Spoil, shell and sand.	5 - 10
Sand, gray, fine to medium grained; with large amount of clay, white.	10 - 15
Sand, brown; with clay.	15 - 20
Sand, dark brown, clayey.	20 - 40
Sand, clear to white to gray and tan, large grained; crystalline.	40 - 50
Sand, tan and clear, large grained; with trace of clay.	50 - 55
Limestone, light gray, soft, small fragments.	55 - 62
Limestone, light gray; with hard layer at 62 feet (lost circulation at 64 feet).	62 - 64
Limestone, light gray; with broken shell (10%).	64 - 70
Limestone, light gray; lost circulation at 74 feet.	70 - 75
No return, circulation lost; bit dropped from 79 to 80 feet.	75 - 80
Limestone, light gray; cuttings fine, angular; circulation losses frequent.	80 - 90
Limestone, light gray; cuttings fine and angular with some marl; lost circulation throughout.	90 - 100
No return, extensive circulation losses.	100 - 110
No return, extensive circulation losses.	110 - 120
Limestone, gray; small angular cuttings; circulation losses continuing.	120 - 130
Limestone, gray with increasing shell; circulation losses.	130 - 140
Limestone, gray and tan; small angular cuttings.	140 - 150
Limestone, gray to tan; angular cuttings	150 - 160

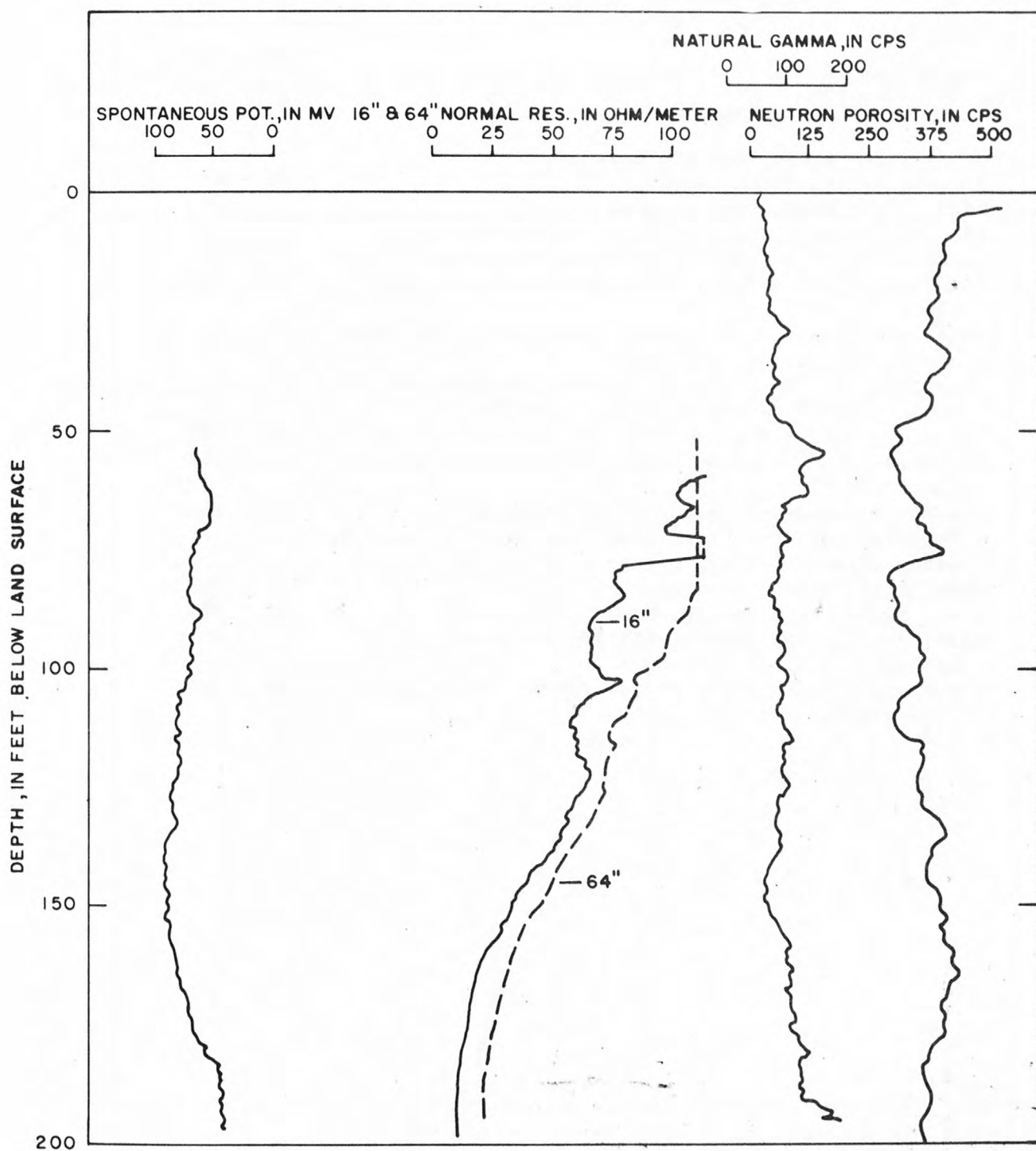
GEOPHYSICAL LOGS OF WELL PB-1091



LITHOLOGIC LOG OF WELL PB-1092

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white to rust, fine to medium grained.	0 - 9
Sand, white, fine to medium grained; with cemented sandstone pebbles, dark gray; organic layers at 10-11 feet.	9 - 20
Sand, clayey; with some shell and sandstone nodules, gray-tan.	20 - 40
Sand, tan, fine to medium grained.	40 - 55
Sandstone, limey; small fragments.	55 - 63
Limestone, gray; cuttings subrounded to angular; with calcite, gray to dark gray and organic layer at 63 feet.	63 - 80
Shell (50%), tan, whole and broken; with limestone, dark gray and angular.	80 - 100
Limestone; with shell, gray to tan.	100 - 108
Limestone; with shell, tan to gray, cemented; calcite crystals present.	108 - 128
Limestone, greenish-tan, sandy.	128 - 140
Limestone, greenish to cream, sandy; with shell, broken and whole and sandstone, gray.	140 - 160
Sand and limestone, tan, loose.	160 - 168
Clay, dark green, sandy.	168 - 200

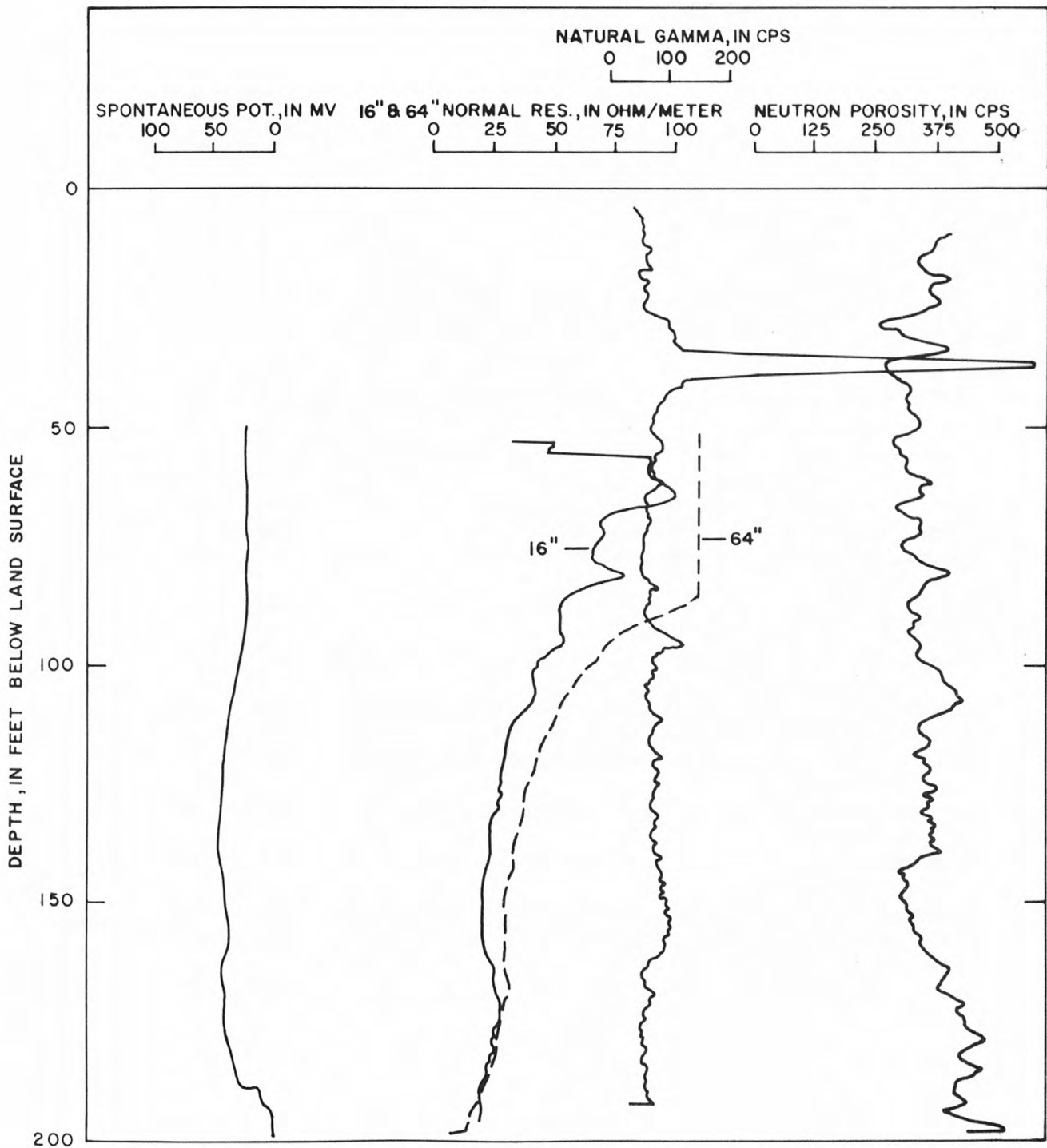
GEOPHYSICAL LOGS OF WELL PB-1092



LITHOLOGIC LOG OF WELL PB-1093

<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, light gray, fine grained.	0 - 2
Organic layer, black, sandy.	2 - 4
Sand, light gray, fine grained.	4 - 18
Sand, light gray, fine grained; with some shell.	18 - 20
Sand, white, fine grained; with clay stringers.	20 - 41
Sandstone, gray nodules; with shell, tan and some clay.	41 - 49
Shell and sand, tan to cream, loose; with some limestone, tan, sandy, friable.	49 - 61
Limestone, tan to brown, friable; with broken and whole shell (used water from 49-100 feet).	61 - 80
Limestone matrix coquina, tan to gray; some sand.	80 - 100
Sandstone (50%), tan to gray, friable; with shell (used water).	100 - 120
Limestone, sandstone and shell, tan to gray, friable; with traces of limestone, light greenish, sandy (trace of clay, green, sandy at 150 feet).	120 - 150
Clay, light green, sandy.	150 - 160
Clay, light green, sandy, mushy.	160 - 170
Clay, dark green, sandy; with limestone and shell layers.	170 - 180
Limestone, tan to light green, sandy; with clay, dark green, sandy.	180 - 200

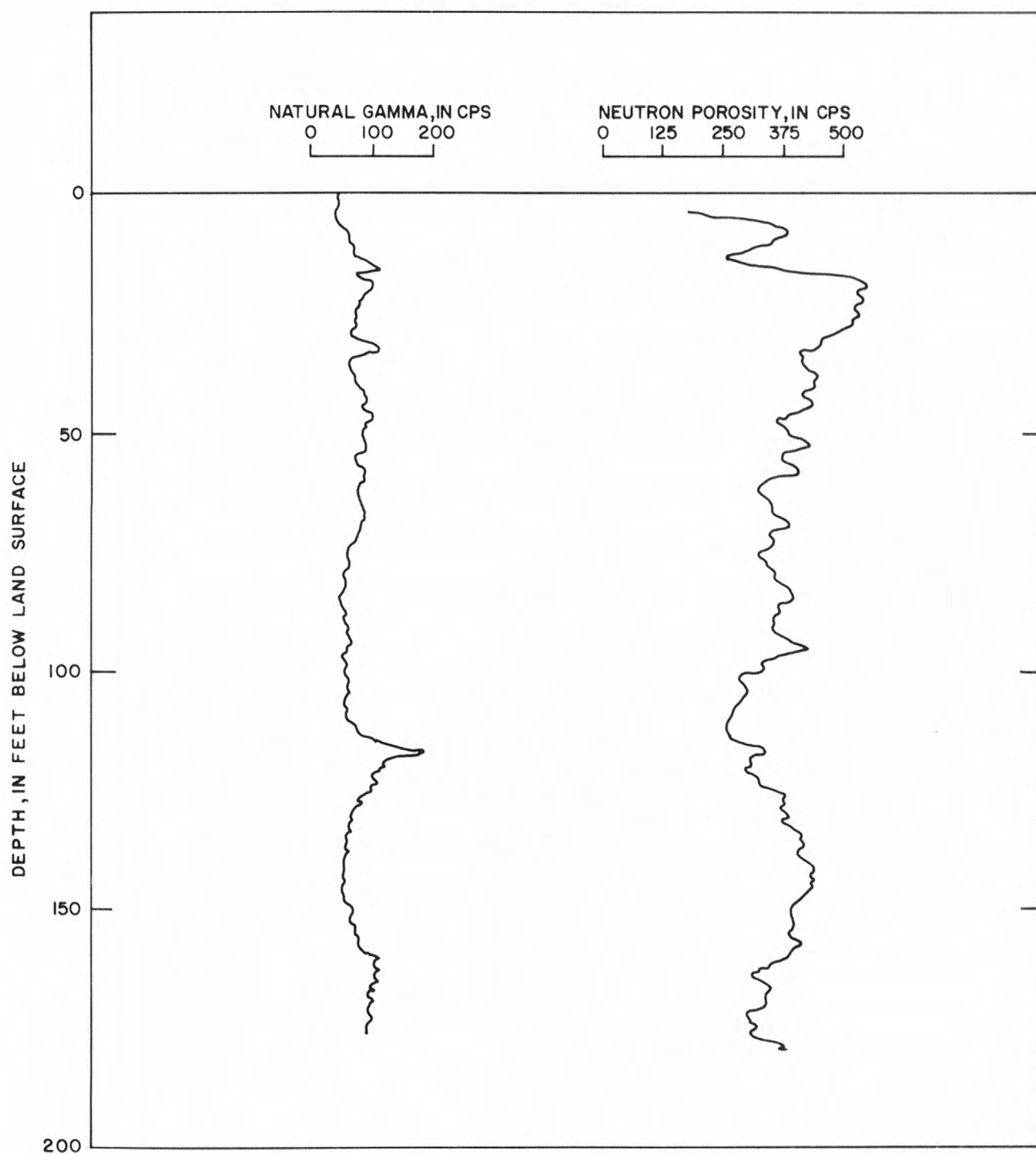
GEOPHYSICAL LOGS OF WELL PB-1093



LITHOLOGIC LOG OF WELL PB-1094

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, gray, fine to medium grained.	0 - 3
Organics, dark brown.	3 - 5
Sand, gray, clayey.	5 - 8
Shell, broken.	8 - 14
Shell, broken; with trace of coquina, gray.	14 - 18
Limestone, dark gray; with broken shell and sand, tan, fine grained.	18 - 20
Limestone, dark gray.	20 - 28
Limestone, dark gray; with increasing large shell and calcite crystals.	28 - 35
Limestone, dark gray; increasing shell and calcite crystals decreasing.	35 - 40
Shell, broken; with limestone, dark gray.	40 - 50
Shell, broken; with decreasing limestone.	50 - 57
Coquina, tan; with large shell pieces and limestone, dark gray.	57 - 60
Shell, broken; with limestone, dark gray and sand (20%), tan, fine grained.	60 - 67
Limestone, dark gray; with sand, gray, fine grained and broken shells.	67 - 70
Shell, broken; with limestone, dark gray and sand (30%), gray to tan, fine grained.	70 - 110
Coquina, tan; with broken shells (lost circulation at 115 feet).	110 - 115
Limestone, light gray to tan; with shell (20%), fine, broken.	115 - 120
Limestone, tan; with shell (15%), fine, broken, (used mud).	120 - 140
Limestone, tan; with shell (10%), fine, broken.	140 - 155
Clay, dark green; with limestone (10%) and shell, tan, fine, broken.	155 - 160
Clay, dark green.	160 - 180

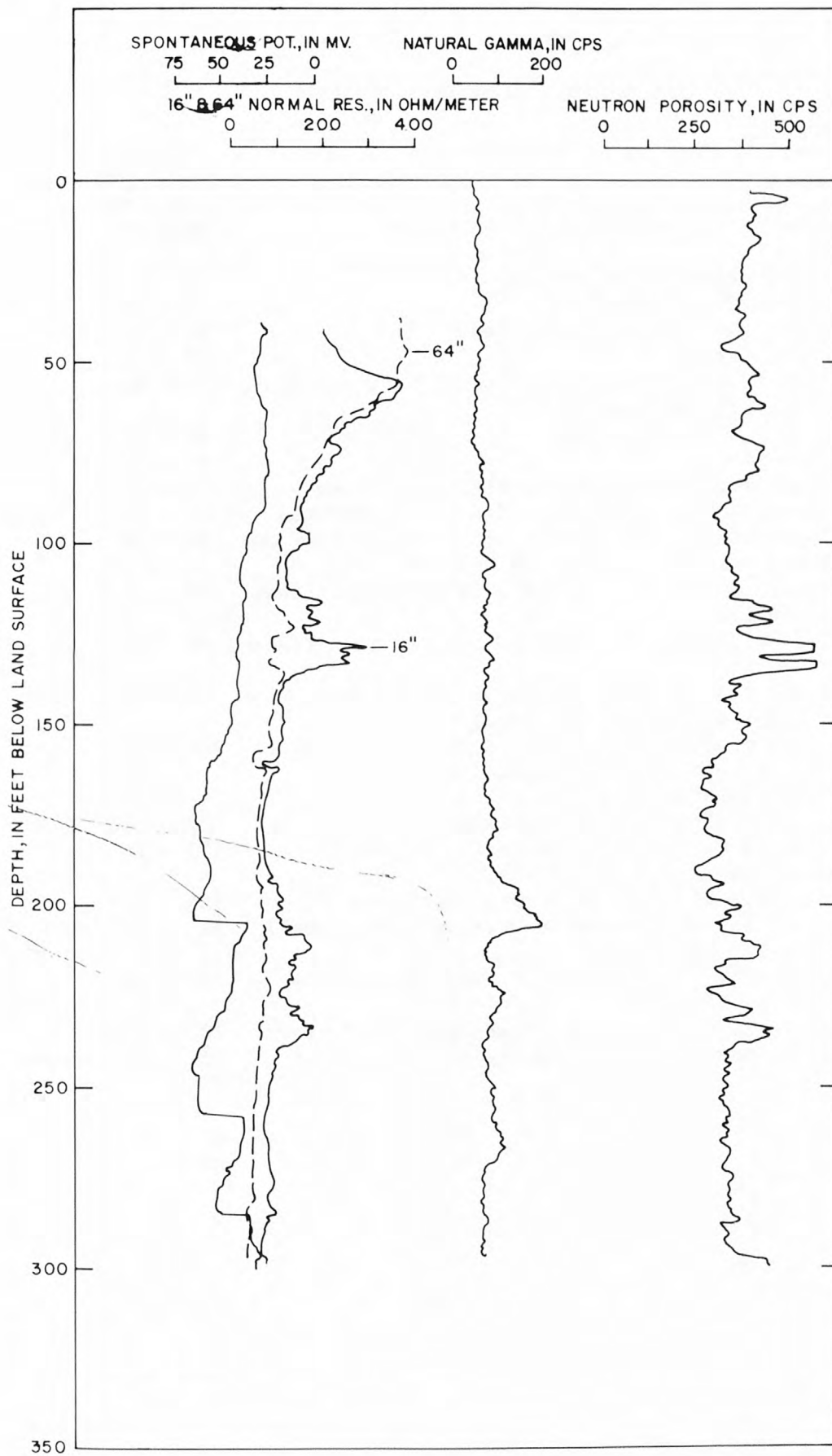
GEOPHYSICAL LOGS OF WELL PB-1094



LITHOLOGIC LOG OF WELL PB-1095

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, light gray to white, fine grained.	0 - 2
Muck, black, organic.	2 - 4.5
Sand, light gray, fine grained.	4.5 - 6
Sand, fine grained; with muck, dark, organic.	6 - 9
Sand, brown to rust, fine to medium grained.	9 - 20
Sand, brown to rust, fine to coarse grained.	20 - 36
Clay, tan to light gray, sandy.	36 - 40
Sandstone, gray, fine to medium grained.	40 - 45
Clay, tan, marly; with some shell.	45 - 46
Sandstone, fine to medium grained, limey, friable; with angular small fragments and broken shell.	46 - 54
Coquina, gray to tan.	56 - 64
Sandstone and shell cemented; with coquina; several hard layers.	64 - 68
Sandstone, fine grained; calcite cemented, rounded to angular nodules; large cuttings.	68 - 73
Limestone, tan to gray; calcite cemented, large cuttings; hard nodule.	73 - 102
Shell, tan, broken, loosely cemented.	102 - 106
Limestone, composed of broken shell and sand, tan to gray; nodules decreasing; lost circulation at 114 feet.	106 - 120
Limestone, gray to greenish-gray, sandy; calcite crystals present (used water).	120 - 138
Limestone or sandstone with sandy clay stringers, blue-green; calcite crystals.	138 - 160
Sandstone, gray to tan to cream, fine grained; limey, calcite cemented.	160 - 180
Sandstone, fine to medium grained; loose cuttings, small fragments.	180 - 197
Sandstone, gray to greenish tan, fine to medium grained; calcite cemented (salt and pepper appearance).	197 - 220
Sandstone, light gray to white; marly, friable (salt and pepper appearance).	220 - 240
Sandstone, white to dark gray, fine grained; friable, limey, calcite cemented.	240 - 300

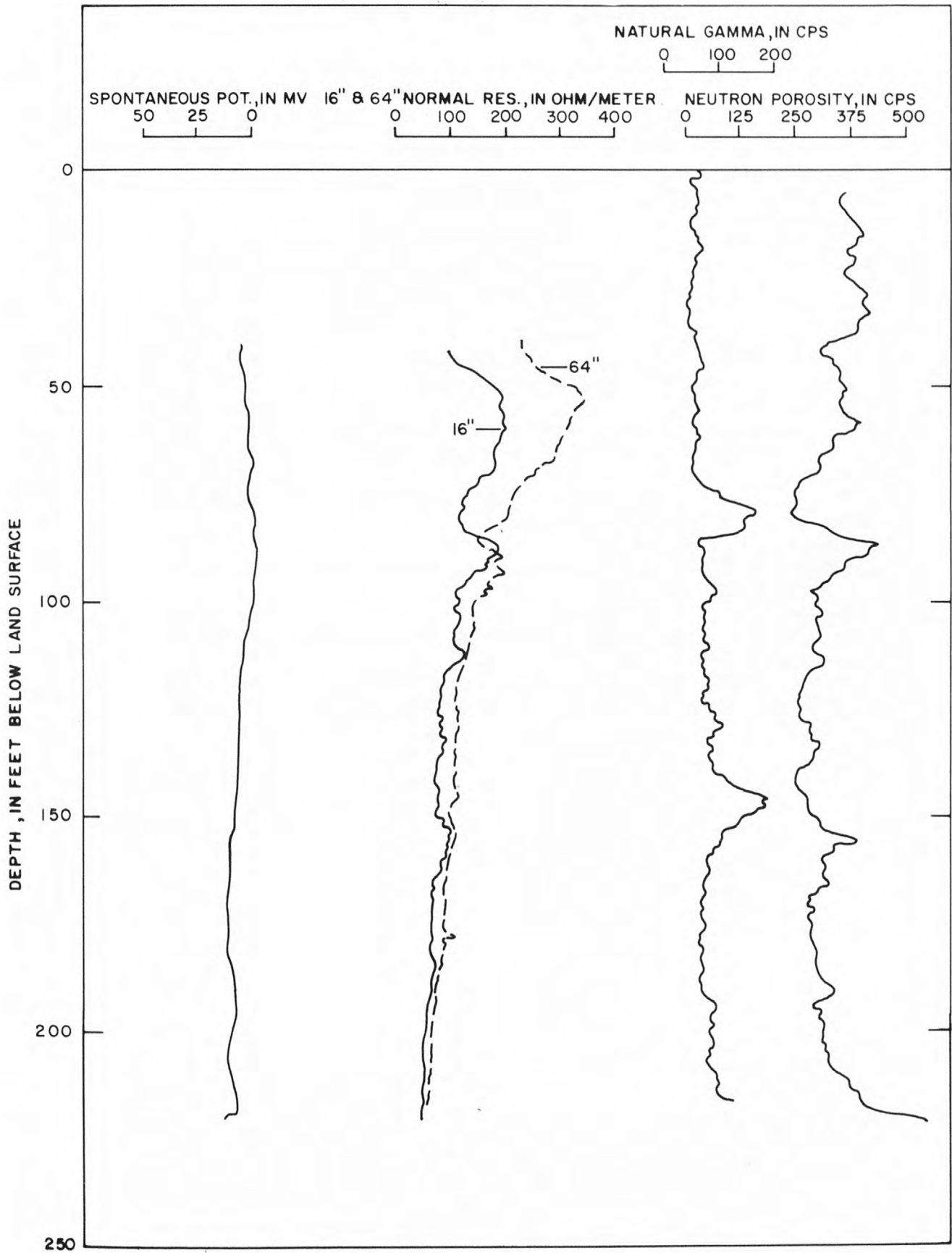
GEOPHYSICAL LOGS OF WELL PB-1095



LITHOLOGIC LOG OF WELL PB-1096

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, gray to black, fine grained.	0 - 5
Shell, broken; large pieces.	5 - 10
Sand, brown, fine to medium grained.	10 - 17
Organics and shell.	17 - 20
Sand, brown to dark brown, fine to medium grained; increasing clay with depth.	20 - 40
Sand, brown; increasing clay.	40 - 44
Clay, gray, sandy.	44 - 50
Clay, gray, sandy; with quartz sand, translucent.	50 - 77
Clay, black, sandy; with quartz sand, translucent.	77 - 80
Clay, black, sandy; with quartz sand, translucent and limestone; consolidation at 85 feet.	80 - 85
Coquina, dark gray; with calcite crystals and traces of marl, white.	85 - 90
Coquina, light gray; with calcite crystals and traces of marl, white.	90 - 100
Coquina, light gray; with calcite crystals and traces of marl, white; rounded and angular cuttings.	100 - 110
Coquina, light gray; with calcite crystals and traces of marl, white; rounded and angular cuttings; increasing amounts of shell.	110 - 120
Coquina, gray; with calcite crystals.	120 - 130
Coquina, gray; with calcite crystals, rounded cuttings (used mud at 155 feet).	130 - 155
Coquina, tan; with loose and broken shell.	155 - 160
Coquina, tan and gray; with increasing broken shell (used mud 177-180 feet).	160 - 192
Sand and shell with some coquina, tan; clay, gray- green at 200 feet.	192 - 200
Sand and shell, broken; with increasing clay, green.	200 - 217
Clay, light green; with sand and shell.	217 - 220

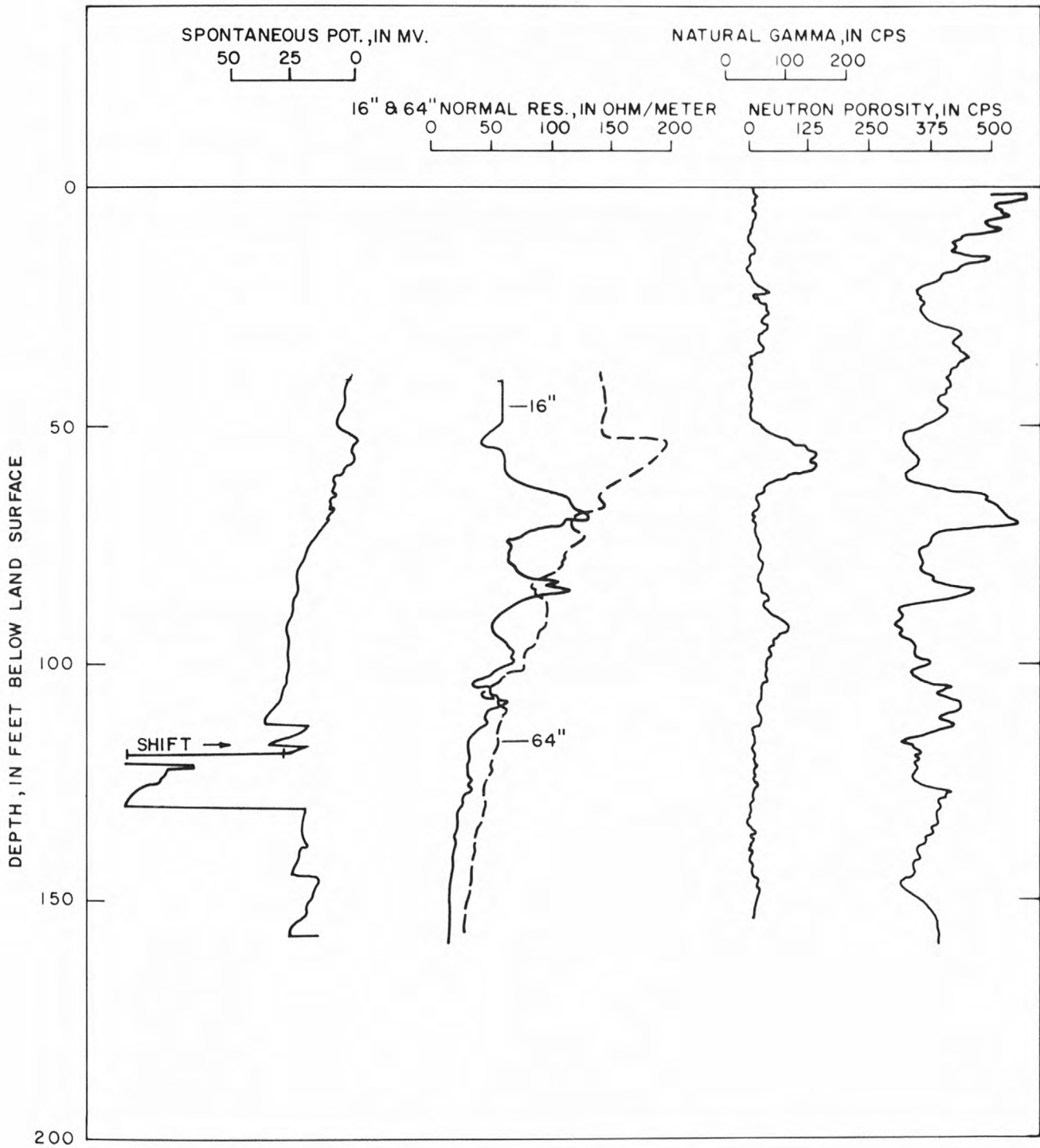
GEOPHYSICAL LOGS OF WELL PB-1096



LITHOLOGIC LOG OF WELL PB-1097

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand and shell, tan.	0 - 12
Organic muck, dark, sandy.	12 - 13
Limestone, dark.	13 - 15
Sand and shell, tan.	15 - 20
Shell, broken and whole; with sand, tan to dark gray.	20 - 29
Sandstone, gray, fine grained; limey with clayey streaks.	29 - 38
Shell (80%), large; in sandpack.	38 - 40
Sand, tan, fine to medium grained; packed.	40 - 54
Sand, tan to gray, fine grained; clayey.	54 - 60
Sand, fine grained.	60 - 65
Sand, tan to gray, fine grained; calcite cemented with marly streaks; and flat, angular, sharp cuttings.	65 - 80
Limestone or sandstone, gray; calcite cemented; angular, lost circulation at 84 feet.	80 - 87
Limestone, tan-gray, sandy.	87 - 100
Limestone, shells and sand, gray to tan; with small amounts of clay.	100 - 111
Limestone, sandy; with shells.	111 - 120
Limestone, tan-gray, sandy; with shell layers (salt and pepper appearance).	120 - 140
Limestone, light greenish to tan, sandy, friable.	140 - 153
Clay; sand; and limestone, light tan-green, sandy.	153 - 160

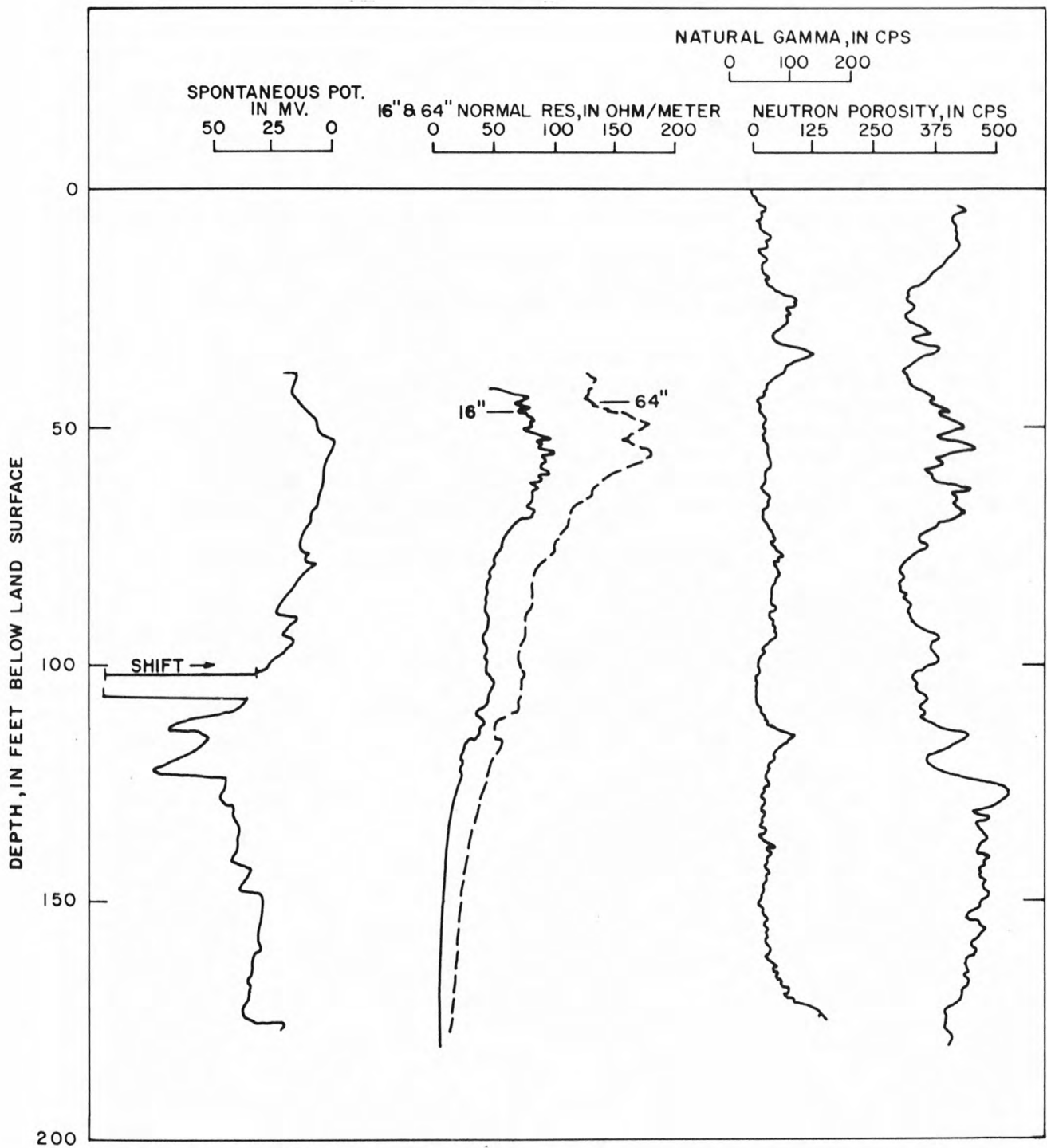
GEOPHYSICAL LOGS OF WELL PB-1097



LITHOLOGIC LOG OF WELL PB-1098

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, gray to white, fine to medium grained.	0 - 2
Clay, yellow, sandy.	2 - 4
Clay, sand; and limestone, sandy, layered light gray to brown-yellow.	4 - 22
Clay, gray; with some shell, sandstone and limestone.	22 - 28
Sandstone and limestone, gray; gravel size cuttings.	28 - 32
Shell, brown, small, broken.	32 - 35
Limestone and sandstone; with clay, tan to brown, thin layers.	35 - 40
Limestone, with calcite cemented sand and broken shell; angular to rounded.	40 - 45
Limestone, with calcite cemented sand and broken shell; small cuttings, angular.	45 - 60
Limestone, gray, sandy; with small broken shell and calcite crystals.	60 - 80
Limestone, gray; rounded; gravel size cuttings.	80 - 100
Sand and shell, loose, concretionous.	100 - 120
Sand, fine grained; with small broken shell and gray limestone concretion; clay streak, green at 135 feet.	120 - 140
Sandy limestone, gray; with clay, light green, sandy; in streaks with broken shell.	140 - 160
Shell, gray, broken; layered with sandy clay, light green.	160 - 173
Clay, gray to dark green, sandy.	173 - 180

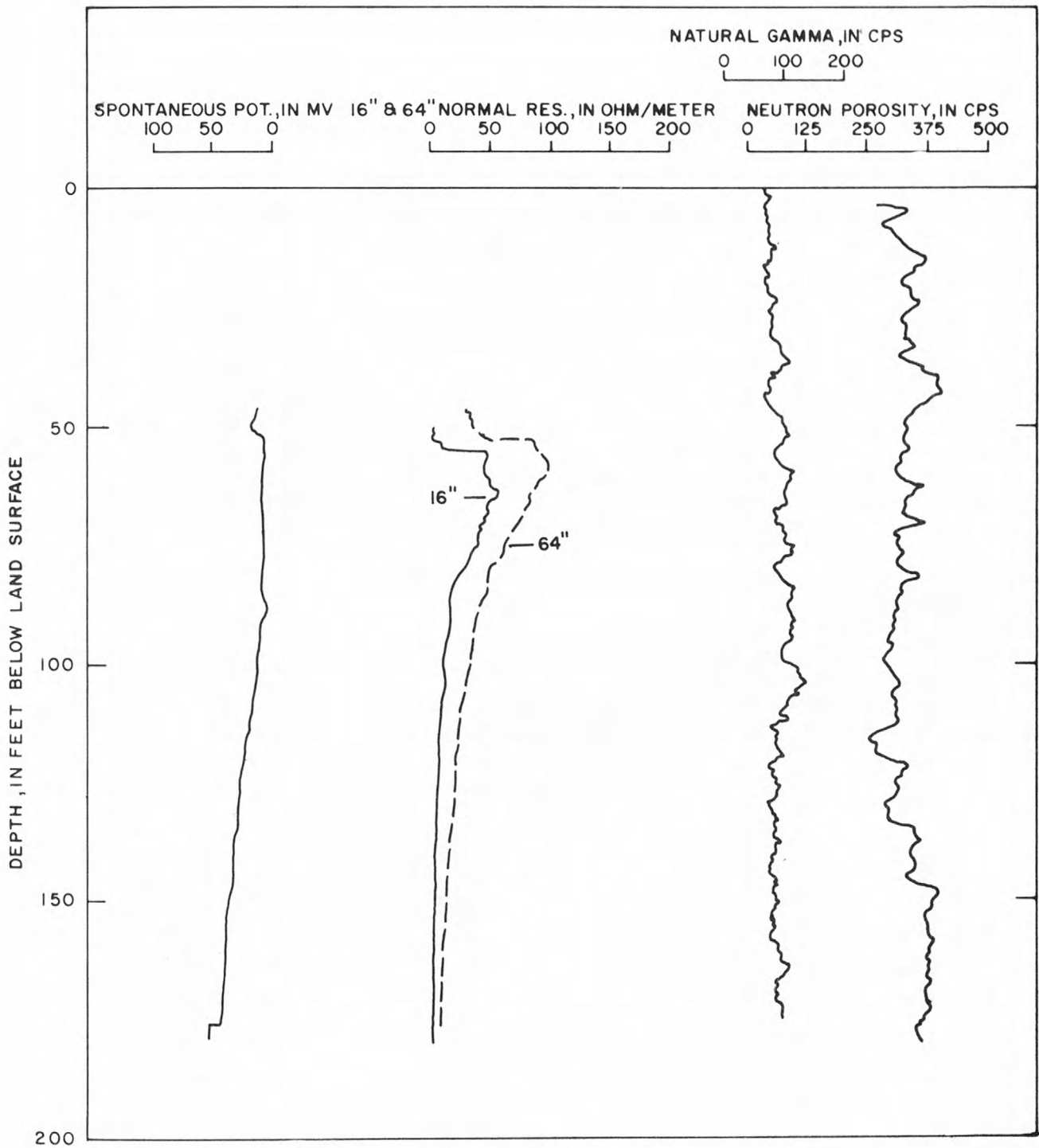
GEOPHYSICAL LOGS OF WELL PB-1098



LITHOLOGIC LOG OF WELL PB-1099

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, gray, fine grained.	0 - 2
Organic muck and sand.	2 - 3
Clay, gray, sandy.	3 - 7
Shell, white, large, some broken; with sand.	7 - 10
Sand and shell; with clay lenses, gray.	10 - 20
Sand, brown and shell, white; with organic layer at 27 feet.	20 - 35
Limestone, gray, sandy (used mud).	35 - 40
Limestone, gray, sandy; small fragments, calcareous.	40 - 54
Limestone, gray, sandy, calcite cemented.	54 - 60
Limestone and sandstone, calcite cemented, layered; with some shell and calcite crystals.	60 - 80
Limestone, gray, sandy; angular cuttings.	80 - 89
Limestone, shells and sand, loose; small fragments rounded to angular.	89 - 100
Sand, fine to medium grained and broken shell, gray to creamy.	100 - 120
Sand and shell, gray to cream.	120 - 134
Sandstone, light gray, friable.	134 - 160
Sandstone, light gray, friable; with thin clay lenses.	160 - 169
Clay, light greenish gray, sandy; with some shell.	169 - 180

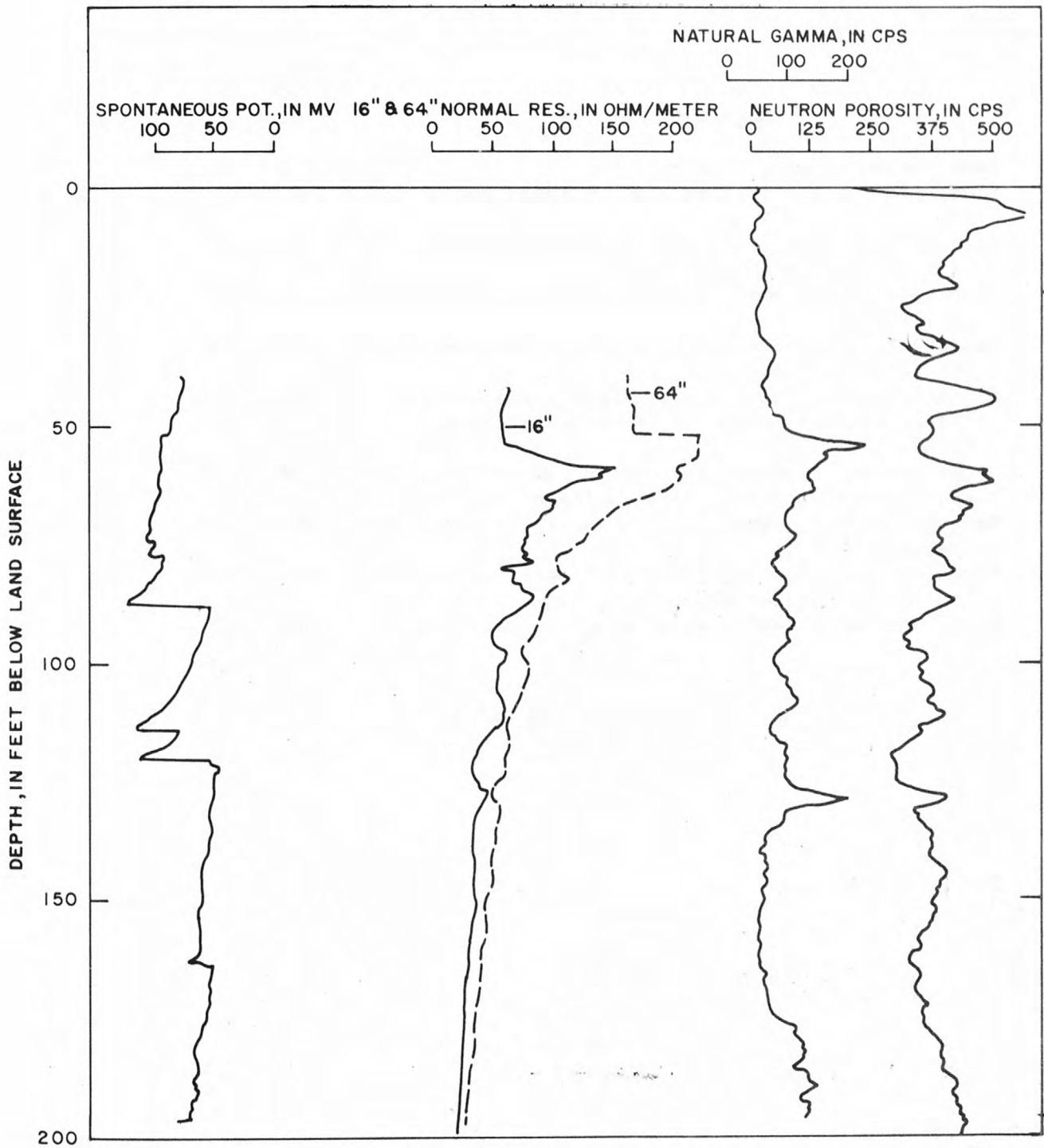
GEOPHYSICAL LOGS OF WELL PB-1099



LITHOLOGIC LOG OF WELL PB-1100

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand and sandstone, white to tan; with some broken shell.	0 - 3
Sand, clayey, gray; with sandstone, tan.	3 - 5
Sandstone, tan; cavity-riddled; with broken shell.	5 - 10
Sandstone, tan; with broken shell.	10 - 15
Sandstone, tan; with shell hash.	15 - 20
Sandstone, tan to gray; with broken shell; rounded cuttings.	20 - 30
Sandstone, tan; with broken shell.	30 - 35
Clay, brown, sandy.	35 - 38
Sandstone, tan to gray.	38 - 40
Sand, brown; with shell hash	40 - 57
Sandstone, gray, angular cuttings.	57 - 60
Coquina, gray, angular cuttings.	60 - 80
Coquina, gray, angular cuttings; with broken shell, fine.	80 - 90
Coquina, gray, angular cuttings; with broken shell, fine (used mud).	90 - 100
Coquina; with a fine shell hash.	100 - 140
Coquina, light gray to tan; with increasing sand, fine and broken shell.	140 - 175
Coquina, fine grained; with clay, light green.	175 - 180
Clay, green; with sand, fine grained and shell.	180 - 200

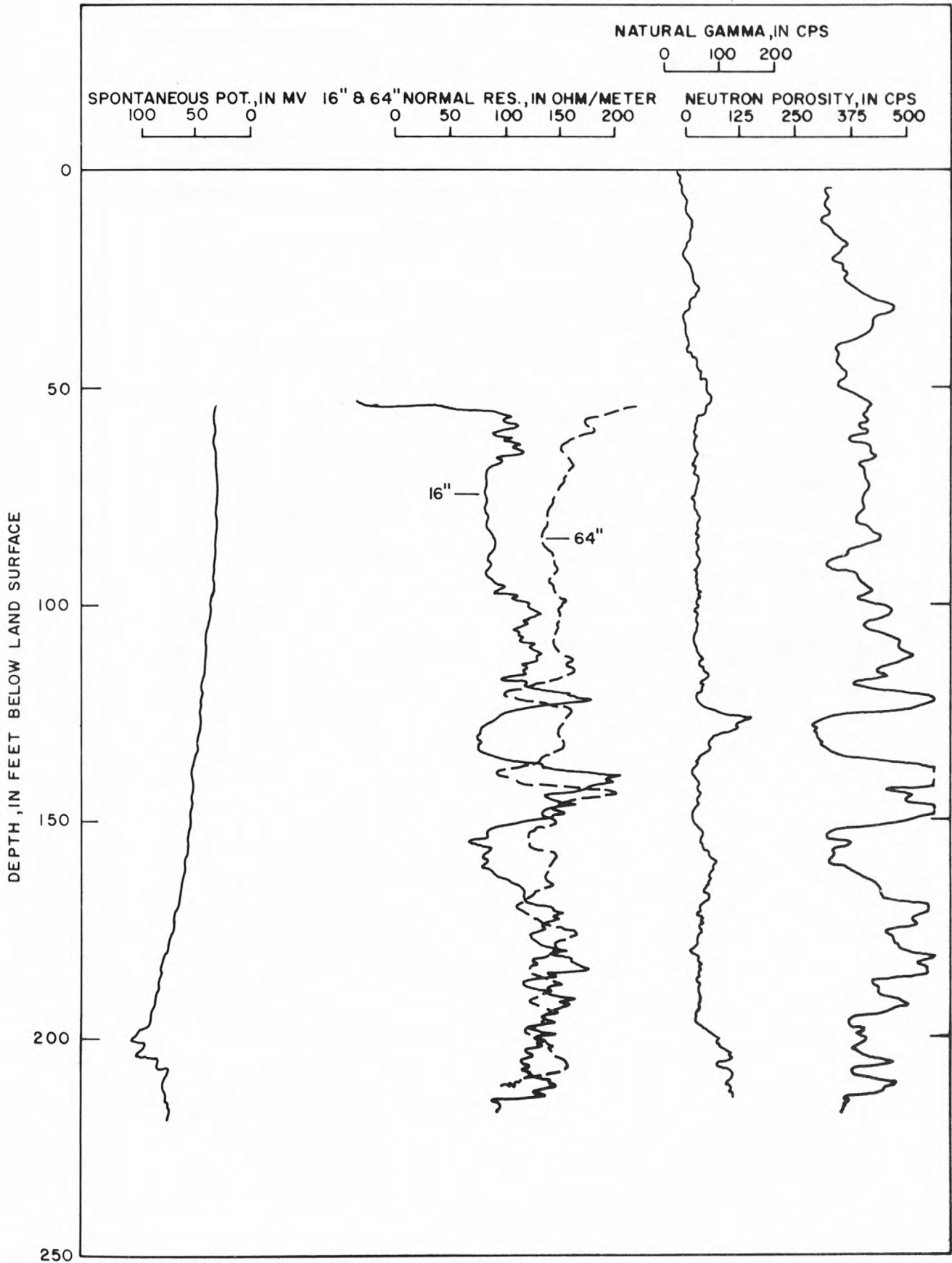
GEOPHYSICAL LOGS OF WELL PB-1100



LITHOLOGIC LOG OF WELL PB-1101

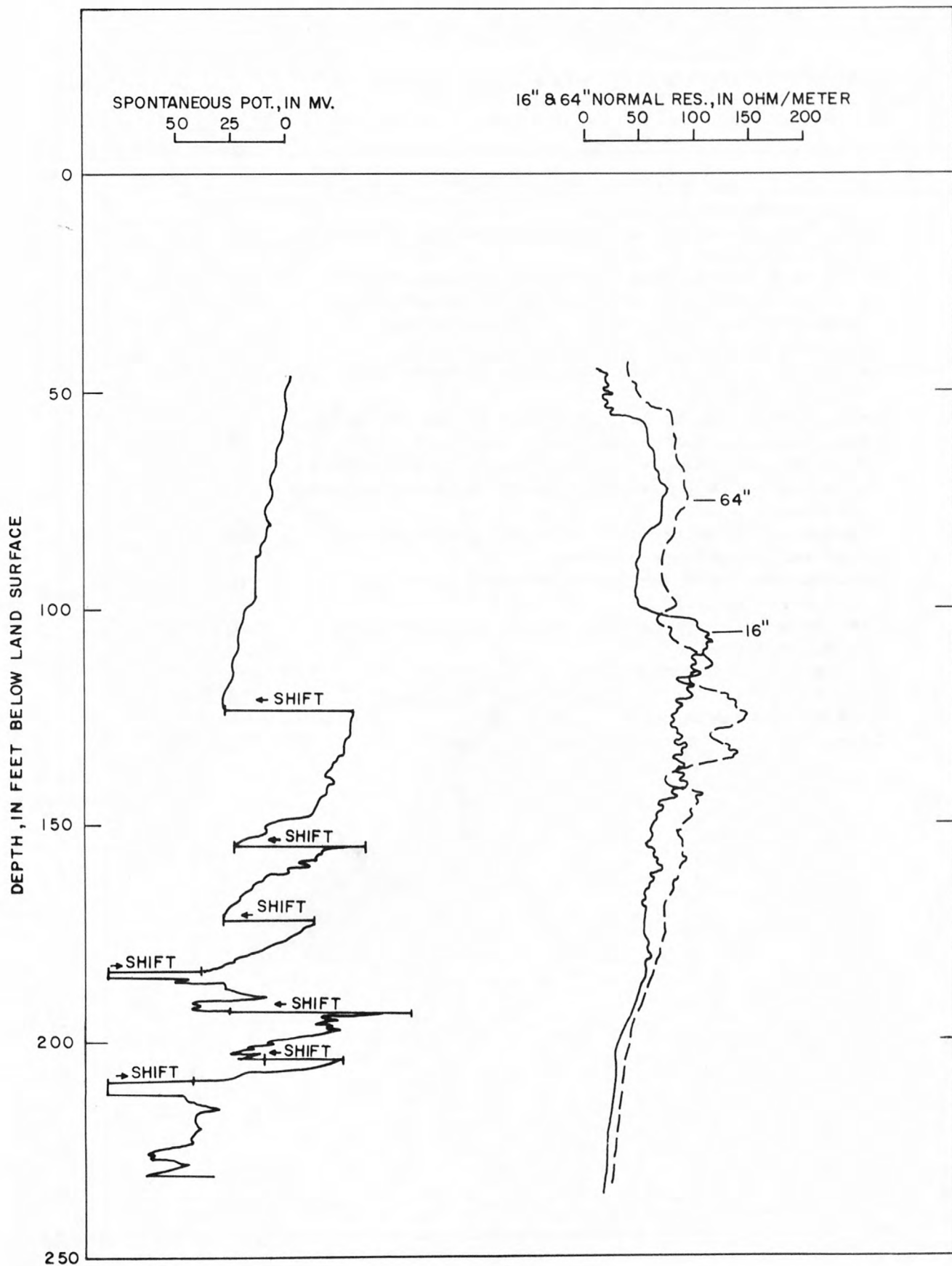
<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, brown to tan, fine grained.	0 - 20
Sand, gray to white, fine grained (used mud at 30 feet).	20 - 55
Sandstone, dark gray to tan; angular cuttings; friable; used mud 60-80 feet.	55 - 80
Sandstone, gray; small angular cuttings with broken shell (10%).	80 - 95
Sandstone, gray; rounded fragments with some calcite crystals (used mud).	95 - 100
Sandstone, gray; with increasing coquina, broken shell; rounded fragments and calcite crystals (10%).	100 - 120
Sandstone and coquina, gray; with calcite crystals and decreasing shell; marl, white at 121 feet.	120 - 140
Sandstone and coquina, gray, angular, less calcite crystals.	140 - 180
Sandstone and coquina, gray; with marl traces and increasing coquina with depth, light gray.	180 - 200
Sandstone and coquina, gray; angular; no calcite.	200 - 220

GEOPHYSICAL LOGS OF WELL PB-1101



LITHOLOGIC LOG OF WELL PB-1102

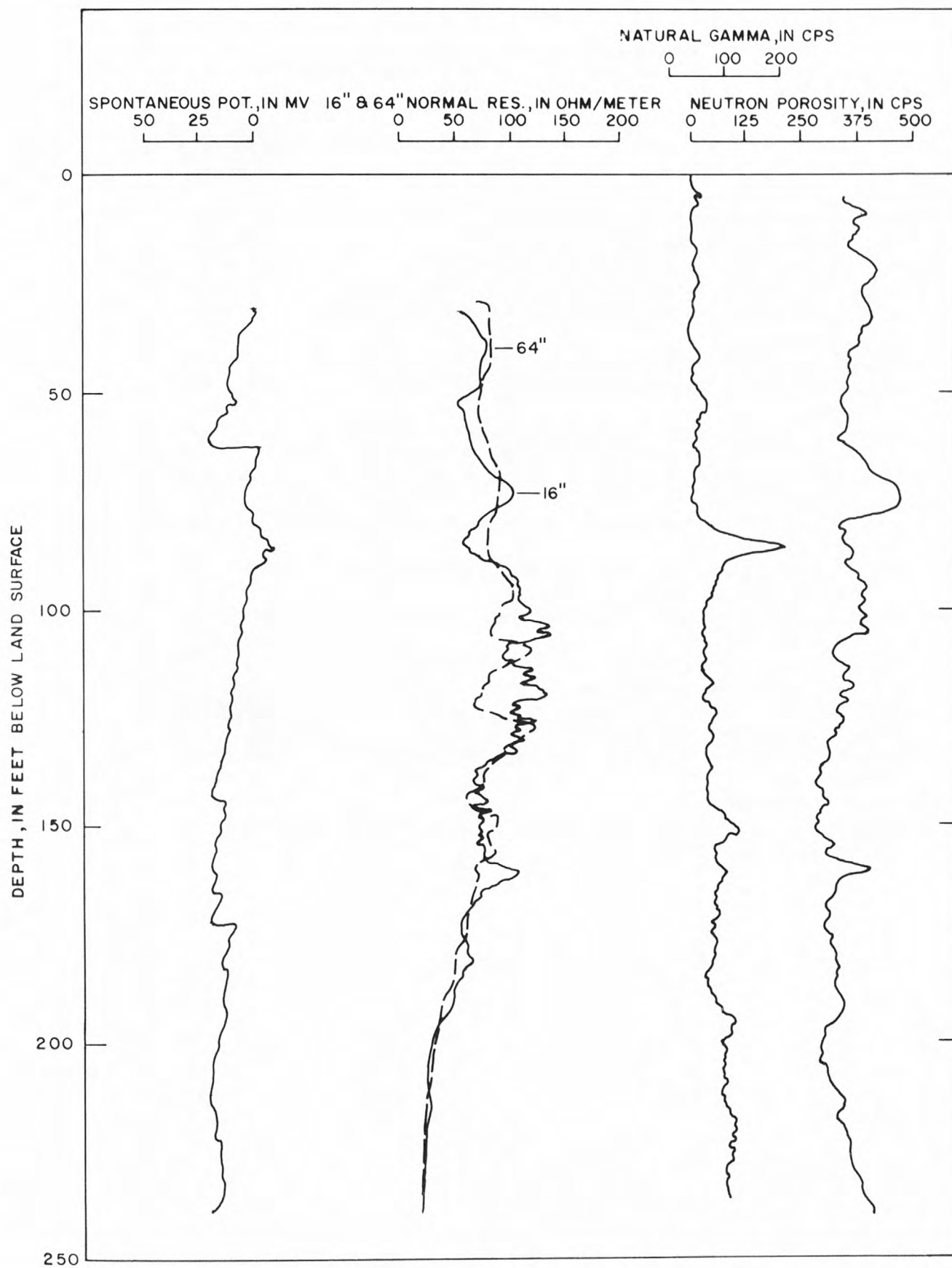
<u>Material</u>	<u>Depth, feet below land surface</u>
Sand, brown, fine grained; with broken shell.	0 - 10
Sand, tan to gray, fine grained.	10 - 30
Sand, brown, fine grained.	30 - 60
Sand, brown, fine to medium grained; with quartz (10%), clear and trace of clay, brown.	60 - 92
Sandstone, tan, friable; with sand, tan, fine grained and clay, dark gray to tan.	92 - 100
Sandstone and coquina, gray; angular cuttings.	100 - 115
Sandstone and coquina, gray; rounded and angular cuttings (lost circulation at 115 feet).	115 - 120
Sandstone, gray; angular and rounded cuttings; turning to coquina at 130 feet; calcite crystals present; lost circulation at 137 feet; cavity riddled.	120 - 140
Sandstone and coquina, gray; rounded cuttings; circulation loss at 147 feet.	140 - 160
Sandstone, gray; small cuttings, angular and rounded.	160 - 179
Shell hash; with sandstone nodules, rounded.	179 - 200
Shell hash.	200 - 215
Clay, green-gray.	215 - 240



LITHOLOGIC LOG OF WELL PB-1103

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand (60%), tan to white, fine to medium grained; with broken shell (40%).	0 - 15
Sand, dark brown to black; with organics and broken shell (15%).	15 - 20
Sand, dark brown, fine grained; with organics.	20 - 30
Sand and shell, tan to white, friable; with sand (50%), tan to gray, fine to medium grained.	30 - 40
Sand, tan to gray, fine to medium grained.	40 - 50
Sand, tan to gray, fine to medium grained; with clay, green, 55-63 feet.	50 - 70
Sand, clear, medium grained; with quartz crystals.	70 - 80
Sand and clay, black from 84-86 feet.	80 - 86
Limestone and coquina, gray; with calcite crystals and sand (25%), gray, fine grained (small cavities present).	86 - 100
Coquina, gray; with sand (20%), gray and calcite crystals; cavities evident.	100 - 120
Coquina and limestone, gray, rounded cuttings; calcite present.	120 - 140
Limestone and coquina with layers of shell hash; nodules present.	140 - 160
Coquina, gray to gray-green, friable.	160 - 180
Coquina and limestone, gray-green, friable; with trace of clay, green.	180 - 220
Clay, light green; with limestone, gray.	220 - 240

GEOPHYSICAL LOGS OF WELL PB-1103



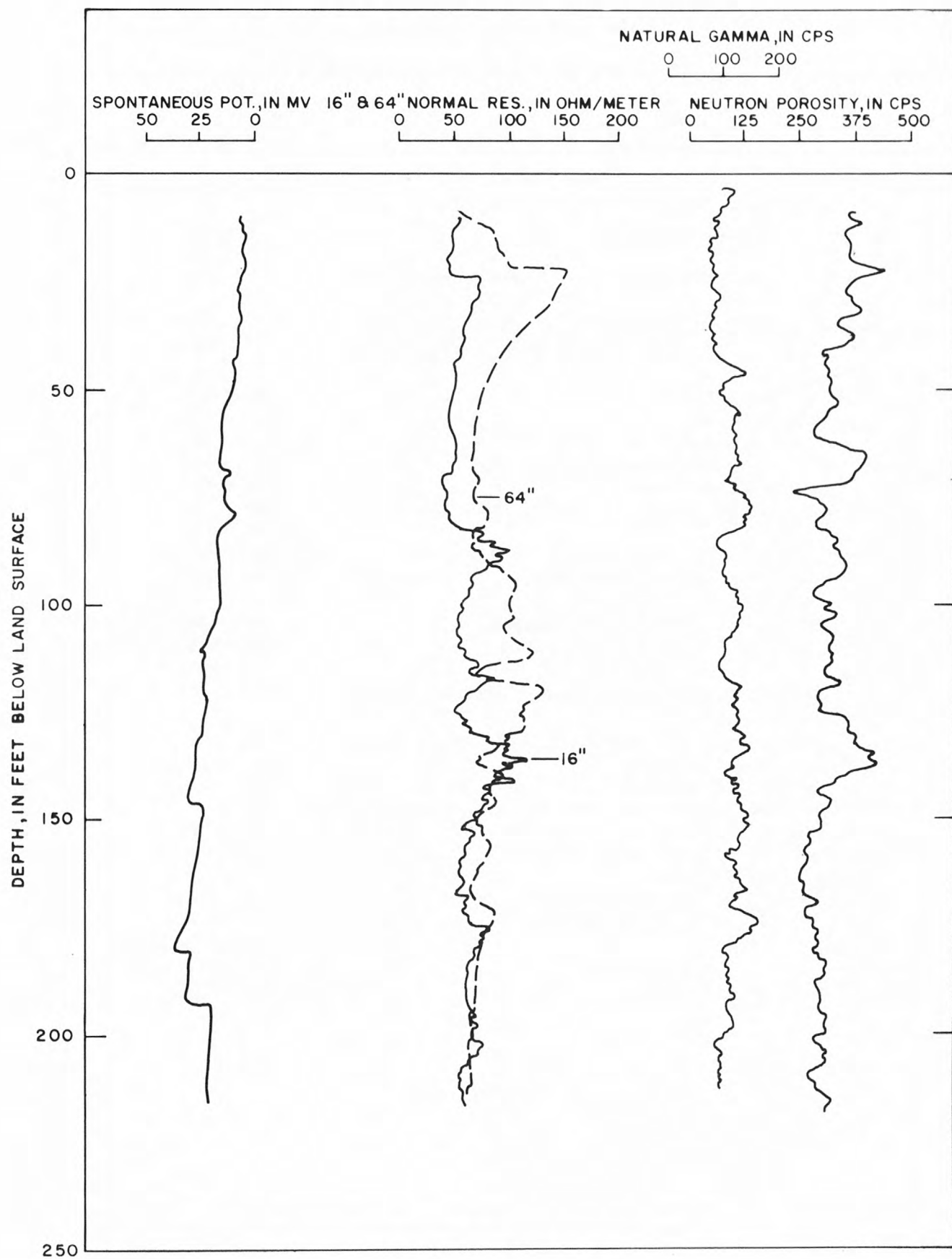
LITHOLOGIC LOG OF WELL PB-1104

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, gray to tan, fine grained.	0 - 20
Sand, tan, fine to medium grained.	20 - 35
Sand, gray, fine to medium grained.	35 - 40
Sand, tan, fine grained; with quartz (20%), clear.	40 - 55
Sandstone, white to tan, friable; circulation loss at 69 feet.	55 - 69
Limestone, gray, friable, porous, cavities present.	69 - 80
Limestone, gray, cemented, subrounded cuttings (25%).	80 - 100
Limestone, gray; with increasing coquina. (NOTE: Hole collapsed when changing rod).	100 - 120
Limestone, gray; with coquina, tan and subrounded cuttings (10%).	120 - 140
Limestone, gray; with coquina and streaks of clay, dark brown to tan.	140 - 160
Coquina, white to tan; with limestone, gray, subrounded; calcite present.	160 - 180
Coquina, tan to gray; with occasional calcite crystals.	180 - 200
Coquina, tan to gray; with calcite crystals and limestone, gray; subrounded to rounded fragments.	200 - 220
Coquina, gray; with limestone (40%), tan to white.	220 - 240
Limestone, white, friable.	240 - 280
Limestone, white, friable; with several calcite crystals.	280 - 300
Limestone, gray.	300 - 320
Limestone, gray-green; with trace of clay, light green, at 340 feet.	320 - 340

LITHOLOGIC LOG OF WELL PB-1105

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, white to yellow, fine to medium grained.	0 - 1
Limestone, white to tan, friable, sandy.	1 - 9
Sand (60%), fine to medium grained; with shell (40%), white.	9 - 21
Sand, white to light brown, fine grained; with shell.	21 - 47
Sand, fine to medium grained; with shell (10%) and some limestone, soft, friable.	47 - 61
Limestone, light tan; with clay at 72 feet.	61 - 73
Clay, dark muck, organic.	73 - 81
Limestone, gray, sandy.	81 - 83
Limestone, gray, sandy; angular and rounded cuttings with calcite.	83 - 104
Limestone, gray, fine grained, sandy; fragments sub-rounded to angular (lost circulation).	104 - 121
Limestone, gray (used mud).	121 - 127
Limestone, gray, fine grained, sandy, small angular cuttings.	127 - 138
Limestone, gray to tan, marly.	138 - 141
Limestone, gray, angular and rounded cuttings.	141 - 161
Sand and shell; with limestone streaks.	161 - 174
Limestone, dirty gray; with shells and some sand (mud losses).	174 - 181
Limestone, cream colored, sandy.	181 - 201
Limestone, greenish cream; with small clayey dry cuttings.	201 - 221

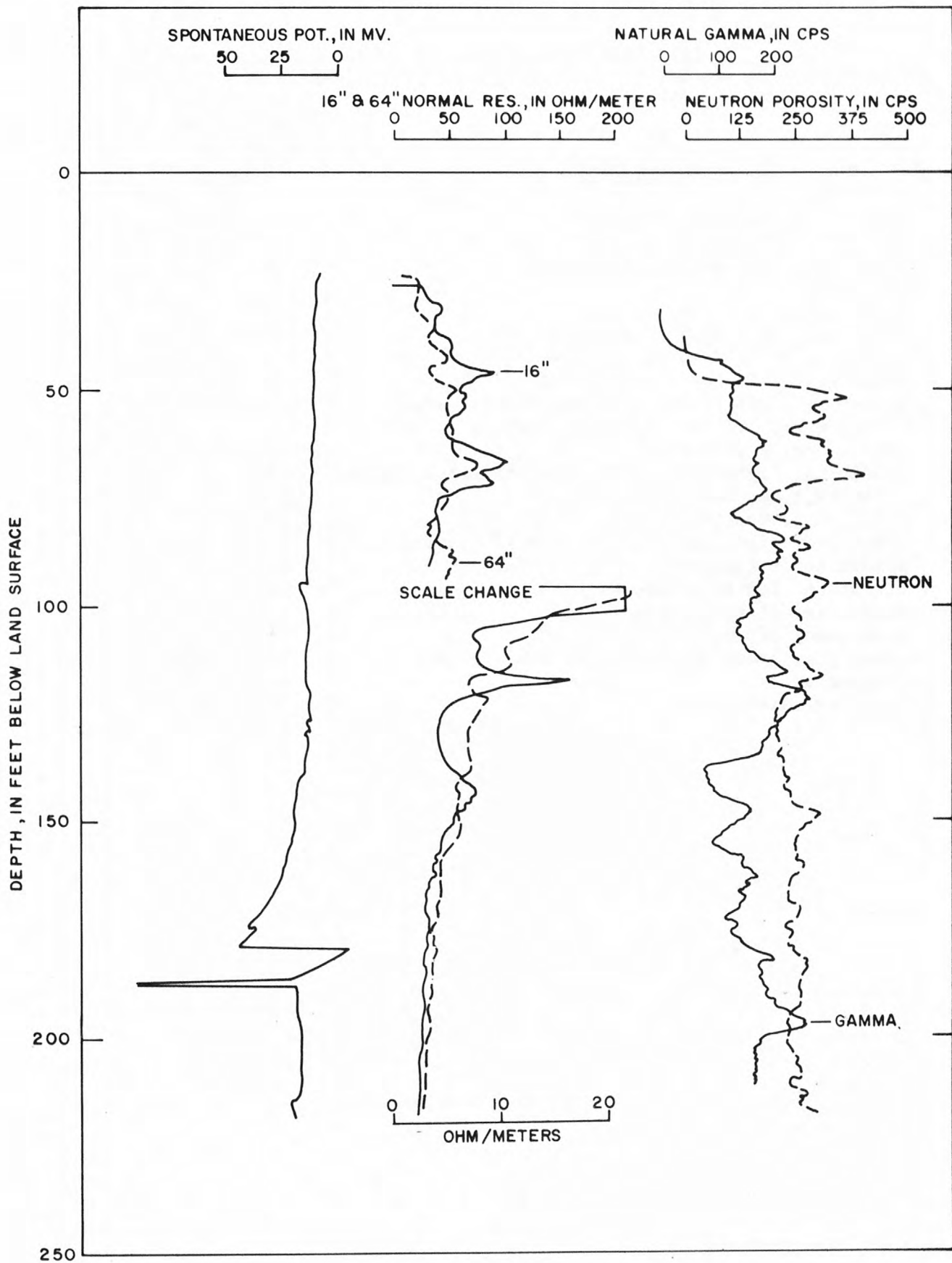
GEOPHYSICAL LOGS OF WELL PB-1105



LITHOLOGIC LOG OF WELL PB-1106

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Fill.	0 - 6
Muck; with fill.	6 - 8
Fill; with limestone, gray.	8 - 12
Muck.	12 - 15
Limestone, white to light gray, soft, marly; with some shell.	15 - 31
Limestone, dark gray to white, angular cuttings.	31 - 35
Limestone, dirty white, sandy, silty; with large shell.	35 - 41
Shell and sand, loose.	41 - 45
Silt, brown, sandy.	45 - 48
Sand and shell, white to cream, loose.	48 - 50
Limestone, gray to brown, hard streaks.	50 - 55
Sandstone, white, limey.	55 - 60
Limestone, white to gray, sandy, large shell present.	64 - 70
Sand, fine grained; with shell, small, whole.	70 - 77
Sandstone, dirty gray, fine grained, silty with bivalves present.	77 - 81
Sand and shell with sandstone streak.	81 - 88
Sandstone, gray to brown; with shell.	88 - 93
Muck.	93 - 95
Sandstone and limestone with marly streak, dirty appearance.	95 - 101
Shell, light tan, large, broken and small, whole.	101 - 116
Limestone, tan to gray.	116 - 119
Sand, silty, dry, friable.	119 - 121
Clay; with sand, fine grained, light green to green.	121 - 139
Limestone, dark gray, small cutting.	139 - 141
Limestone, dark gray; with sandstone, light gray to cream, silty, marly.	141 - 161
Sandstone, light greenish, silty; with layers of clayey sandstone, light gray (salt and pepper appearance).	161 - 201
Clay, green, sandy, mushy.	201 - 217
Clay, dark green, sandy.	217 - 221

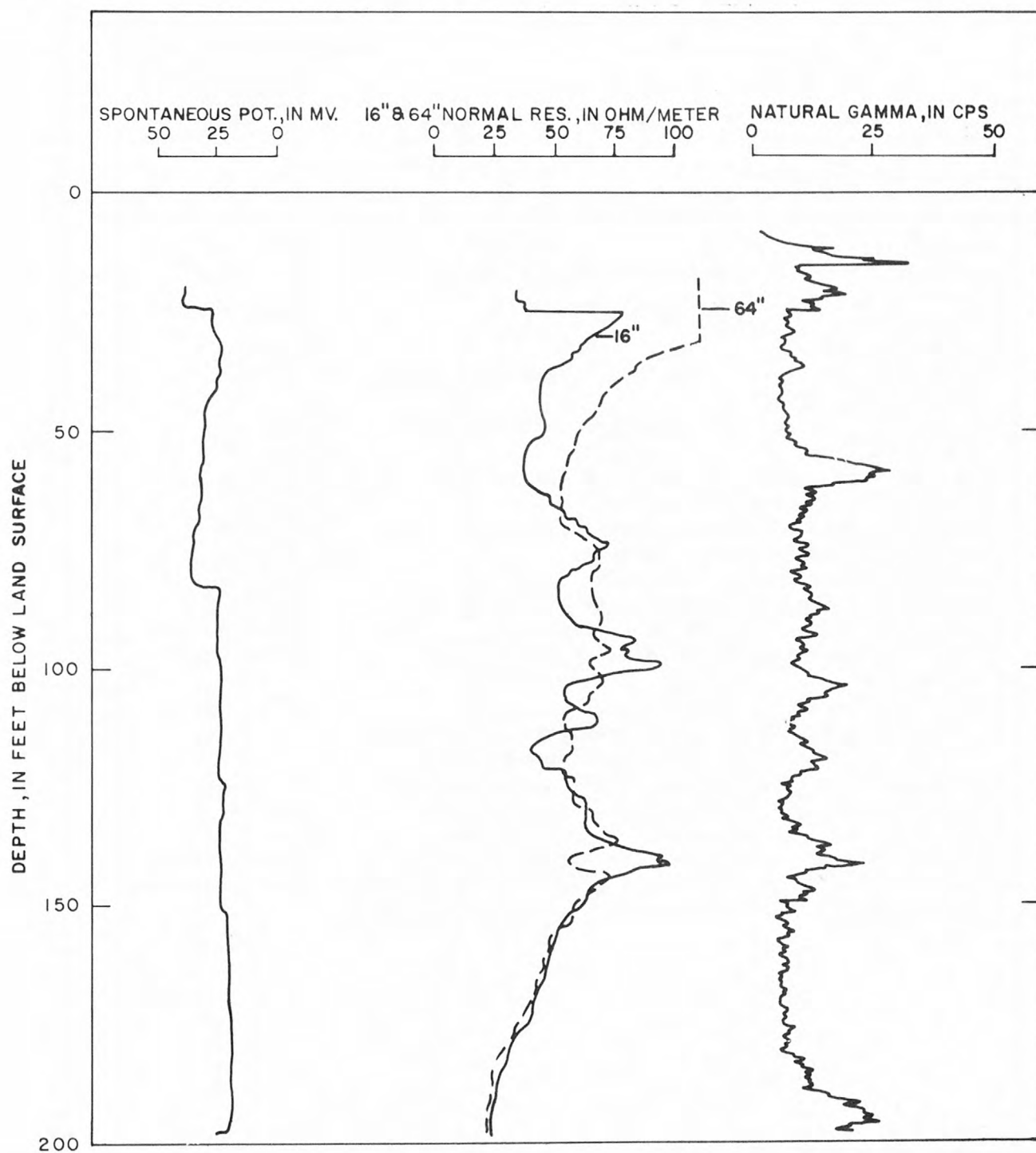
GEOPHYSICAL LOGS OF WELL PB-1106



LITHOLOGIC LOG OF WELL PB-1107

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, shell and soil (fill).	0 - 12
Muck, black, organic.	12 - 16
Limestone; with shells, tan-white.	16 - 23
Shell and sand.	23 - 28
Shell, loose.	28 - 35
Limestone; with shell and oolite.	35 - 36
Shell, broken and whole; with sand.	36 - 41
Sand and shell, light brown to tan.	41 - 69
Sandstone, gray to brown, fine grained; small fragments, angular, calcite cemented.	69 - 88
Shell, broken and whole.	88 - 95
Sandstone, light gray, fine grained; large angular cuttings and some nodules.	95 - 104
Shell, tan, broken, loose.	104 - 117
Limestone, light tan to cream, small fragments.	117 - 128
Sandstone or limestone, gray to tan.	128 - 129
Limestone, tan to cream; with shell.	129 - 141
Sandstone, white-greenish, fine grained, dense.	141 - 143
Limestone, cream, sandy; with shell.	143 - 161
Limestone, greenish, sandy (salt and pepper appearance).	161 - 181
Clay, greenish, sandy.	181 - 201

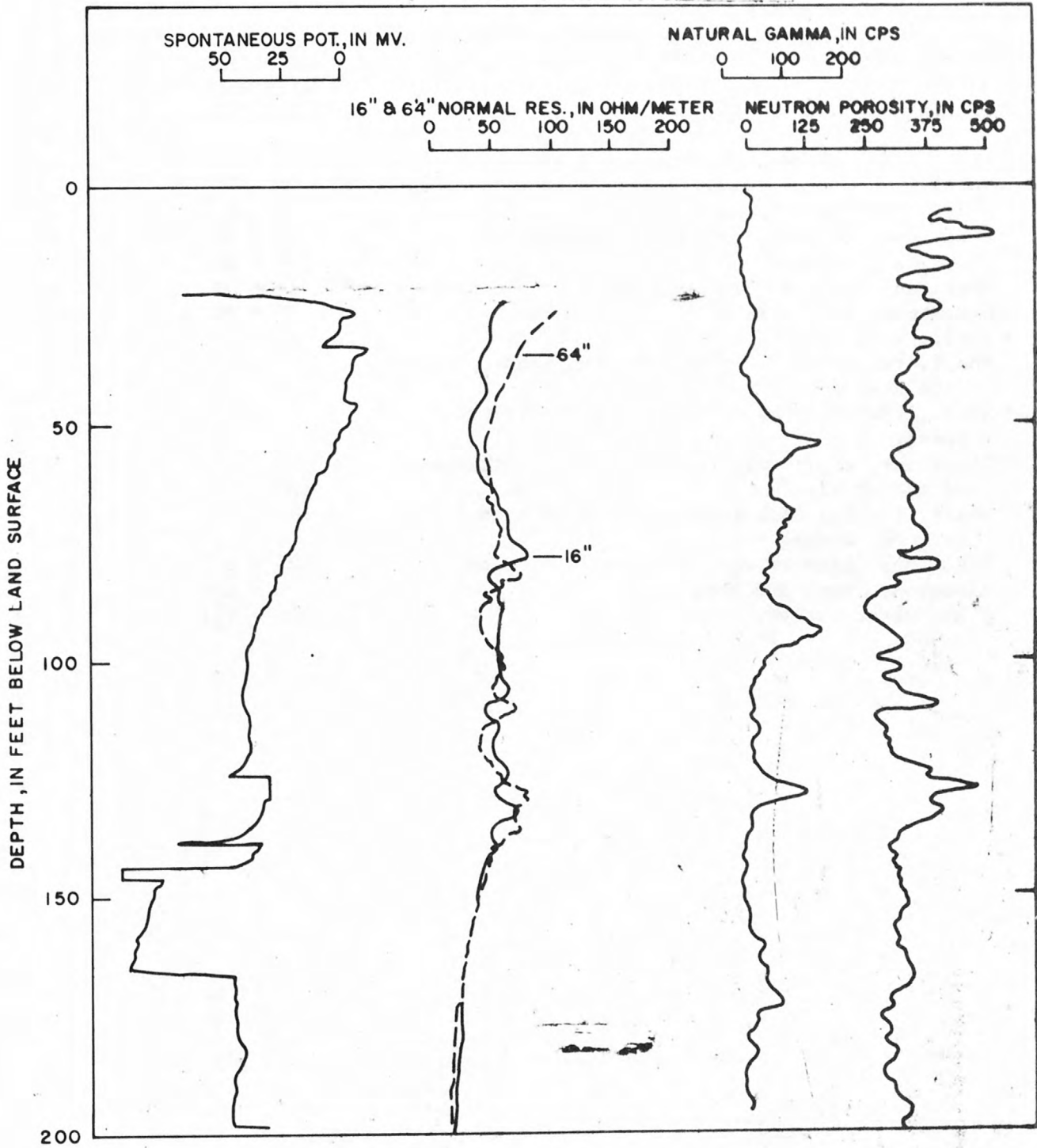
GEOPHYSICAL LOGS OF WELL PB-1107



LITHOLOGIC LOG OF WELL PB-1108

<u>Material</u>	<u>Depth, feet</u>
	<u>below land</u> <u>surface</u>
Fill, sand and shell.	0 - 10
Muck, dark brown to black.	10 - 12
Limestone, tan, shelly.	12 - 13
Muck, brown.	13 - 14
Limestone, tan, oolitic; some sand and shell.	14 - 21
Limestone and shell.	21 - 24
Clay, gray, sandy; with shell.	24 - 43
Sand, fine, broken.	43 - 55
Sandstone, dark gray; limestone, light gray to tan; with shell, broken.	55 - 61
Limestone, oolitic; with sandstone, limey, gray speckled.	61 - 81
Limestone and sandstone, tan to gray, small cuttings; lost circulation at 85 feet.	81 - 92
Sand, gray, fine to medium grained, loose.	92 - 98
Shell, broken and whole, cemented.	98 - 101
Limestone, tan, sandy.	101 - 103
Sand, fine to medium grained, and broken shell.	103 - 109
Limestone; with shell and sand (used mud).	109 - 111
Sand, fine to medium grained; with shell, whole and broken.	111 - 122
Sand, tan, hard (bit chattered).	122 - 130
Sandstone, gray, firm, small fragments; with broken shell. (NOTE: Salt and pepper appearance).	130 - 141
Sandstone, light gray-green, silty, small cuttings.	141 - 161
Sand and clay, light gray-green, friable, dry.	161 - 174
Limestone, dark gray to greenish gray, sandy.	174 - 181
Limestone, fine grained; with clay, silty, dry.	181 - 189
Limestone with sand and shell, gray (salt and pepper appearance); thin layers of clay, mustard colored, last 3 feet.	189 - 201

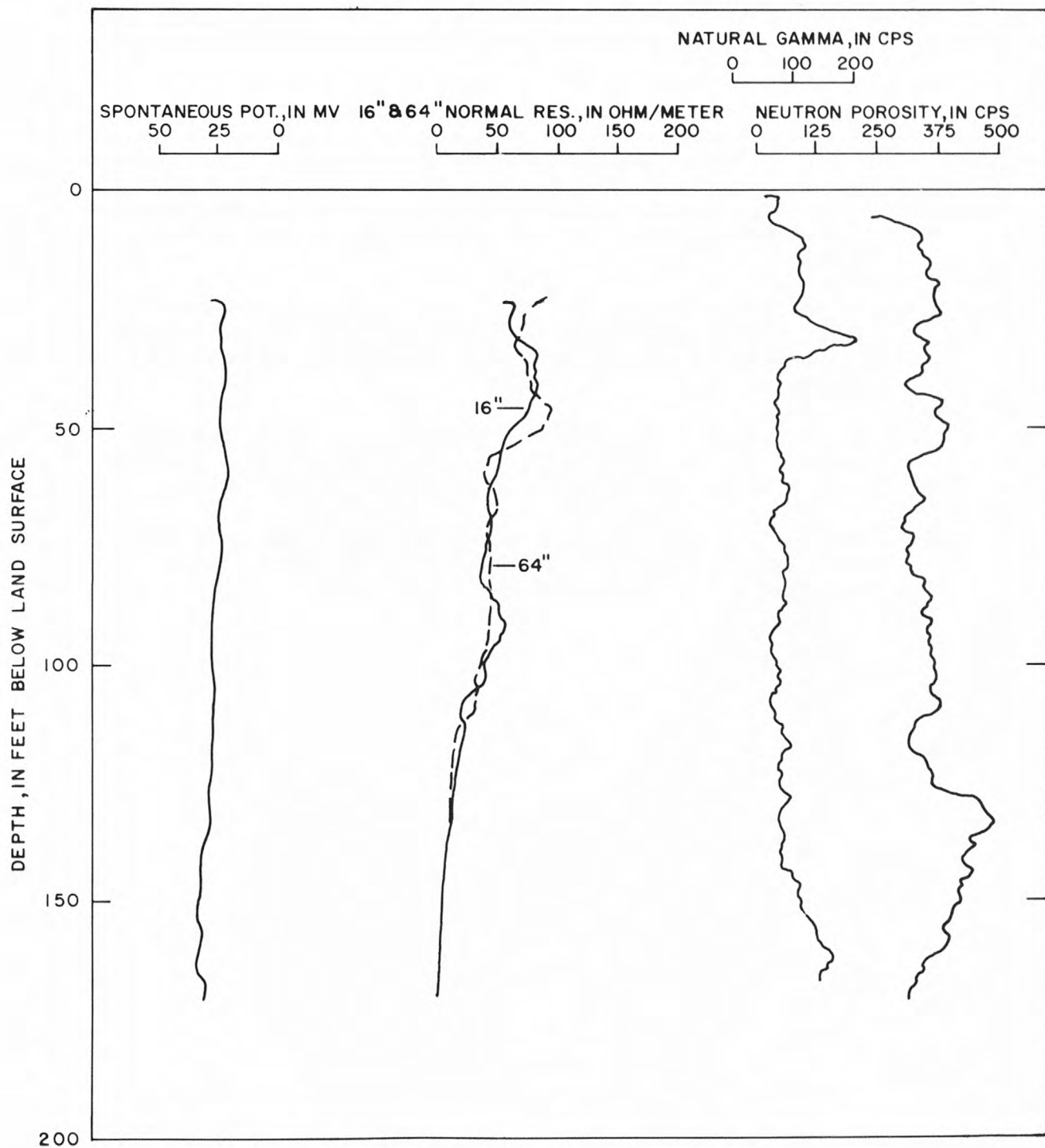
GEOPHYSICAL LOGS OF WELL PB-1108



LITHOLOGIC LOG OF WELL PB-1109

<u>Material</u>	<u>Depth, feet</u> <u>below land</u> <u>surface</u>
Sand, gray, clayey.	0 - 5
Muck.	5 - 7
Clay, blue-green, sandy.	7 - 9
Shell, tan to buff, broken and whole.	9 - 28
Clay, dark, sandy.	28 - 29
Shell and sand, tan to dark gray.	29 - 33
Limestone, dark gray.	33 - 36
Shell, tan, loose, broken.	36 - 41
Shell, tan to gray, small, broken; sand, gray, fine grained.	41 - 61
Shell, broken; sand, fine to medium grained, loose.	61 - 97
Limestone, gray; with shell, angular cuttings.	97 - 100
Sand and shell.	100 - 101
Shell, broken; with sand, gray, fine to medium grained, loose.	101 - 127
Limestone, gray to tan, fine grained, sandy.	127 - 141
Limestone, sand and shell.	141 - 154
Clay, green, sandy.	154 - 171

GEOPHYSICAL LOGS OF WELL PB-1109



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