GROUND-WATER BASIC DATA

for

McINTOSH COUNTY, NORTH DAKOTA

by
Robert L. Klausing
U.S. Geological Survey

COUNTY GROUND-WATER STUDIES 30 — PART II
North Dakota State Water Commission
Vernon Fahy, *State Engineer*

BULLETIN 73 — PART II
North Dakota Geological Survey
Lee Gerhard, *State Geologist*

Prepared by the U.S. Geological Survey
in cooperation with the North Dakota Geological Survey,
North Dakota State Water Commission,
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GROUND-WATER DATA FOR McINTOSH COUNTY, NORTH DAKOTA

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INTRODUCTION

The ground-water investigation in McIntosh County (fig. 1) was made cooperatively by the U.S. Geological Survey, North Dakota State Water Commission, North Dakota Geological Survey, and the McIntosh County Water Management District. The results of the investigation will be published in three separate parts. Part I, which has been published, is an interpretive report describing the geology of the study area; part II is a compilation of the ground-water data; and part III is an interpretive report describing the ground-water resources. Part II (this report) makes available the geologic and hydrologic data collected during the county investigation and functions as a reference for the other reports.

The stratigraphic nomenclature used in this report is that of the North Dakota Geological Survey and does not necessarily follow the usage of the U.S. Geological Survey.

The following table may be used to convert inch-pound units to the SI (International System) of metric units.

Multiply inch-pound unit	By	To obtain SI unit
Acre	0.4047	hectare (ha)
Foot (ft)	.3048	meter (m)
Inch (in)	25.4	millimeter (mm)

Purpose

The purpose of the investigation was to determine the availability and quality of ground water for municipal, domestic, livestock, industrial, and irrigation uses. Specifically, the objectives were to: (1) determine the location, extent, and nature of the major aquifers and confining beds; (2) evaluate the occurrence and movement of ground water, including sources of recharge and discharge; (3) estimate the

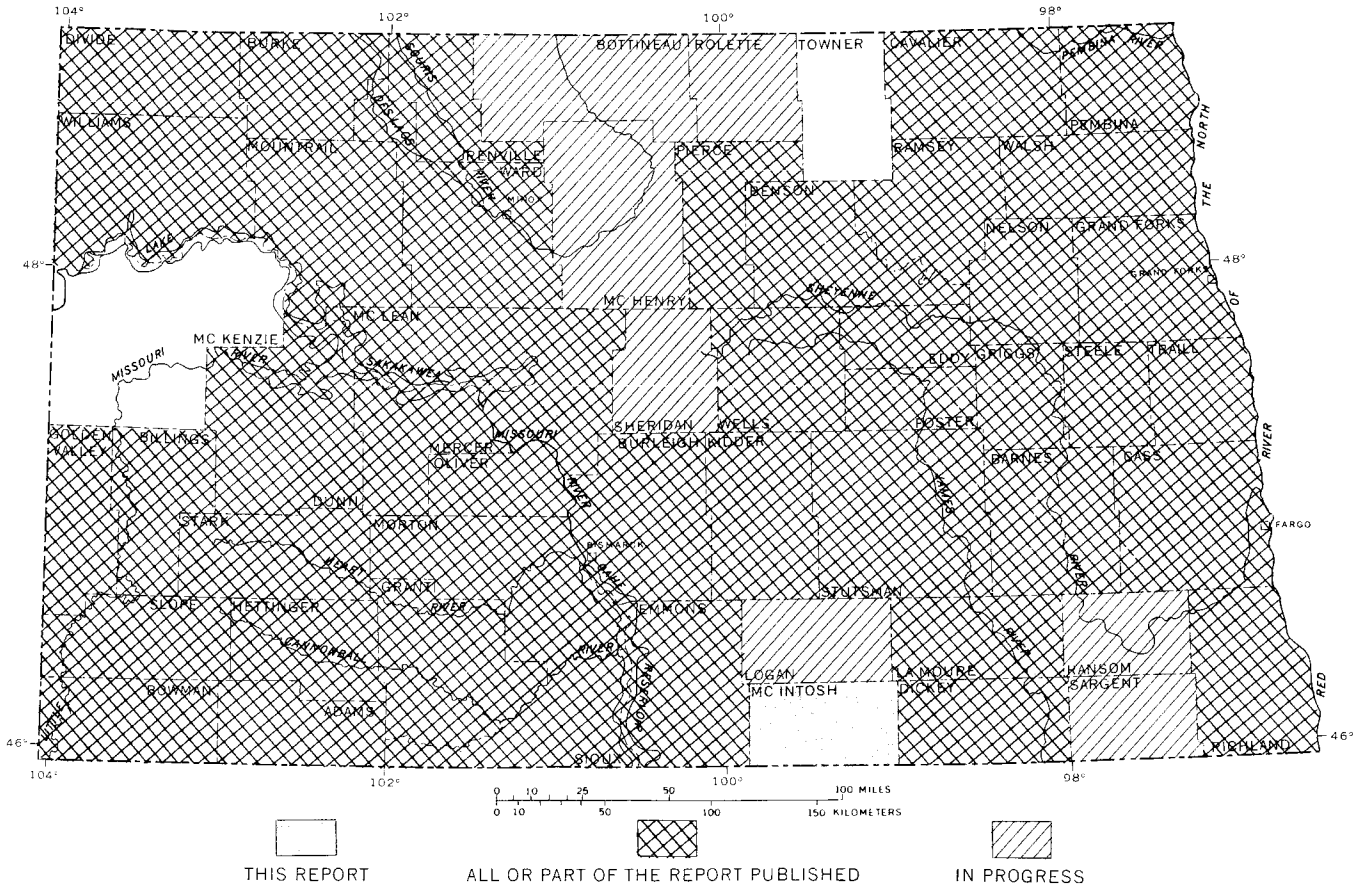

FIGURE 1.—County ground-water studies in North Dakota.

quantities of water stored in the aquifers; (4) estimate the potential yields of wells tapping the major aquifers; (5) evaluate the chemical quality of the water; and (6) estimate the water use.

Location-Numbering System

The location-numbering system used in this report is based on the public land classification system used by the U.S. Bureau of Land Management. The system is illustrated in figure 2. The first numeral denotes the township north of a base line, the second numeral denotes the range west of the fifth principal meridian, and the third numeral denotes the section in which the well is located. The letters A, B, C, and D designate, respectively, the northeast, northwest, southwest, and southeast quarter section, quarter-quarter section, and quarter-quarter-quarter section (10-acre or 4-ha tract). For example, well 130-073-15ADC is in the SW¼SE¼NE¼ sec. 15, T. 130 N., R. 73 W. Consecutive terminal numerals are added if more than one well or test hole is recorded within a 10-acre (4-ha) tract. The location of each well and test hole in the tables is shown on plate 1 (in pocket).

Acknowledgments

The collection of data for this report was made possible by the cooperation of residents and officials of McIntosh County, who furnished information on wells and permitted water-level measurements and the collection of water samples. Recognition is due to the following personnel of the North Dakota State Water Commission: G. L. Sunderland, R. L. Cline, and Gary Calheim for drilling and logging test holes, G. O. Muri for chemical analyses of water samples, R. B. Shaver for hydrologic testing, and M. O. Lindvig for scheduling of drilling. Thanks are due to the well drillers and drilling companies that furnished drillers' logs and other information in this report.

EXPLANATION OF TABLES AND METHODS OF DATA COLLECTION

The data in this report, collected chiefly between 1975 and 1977,

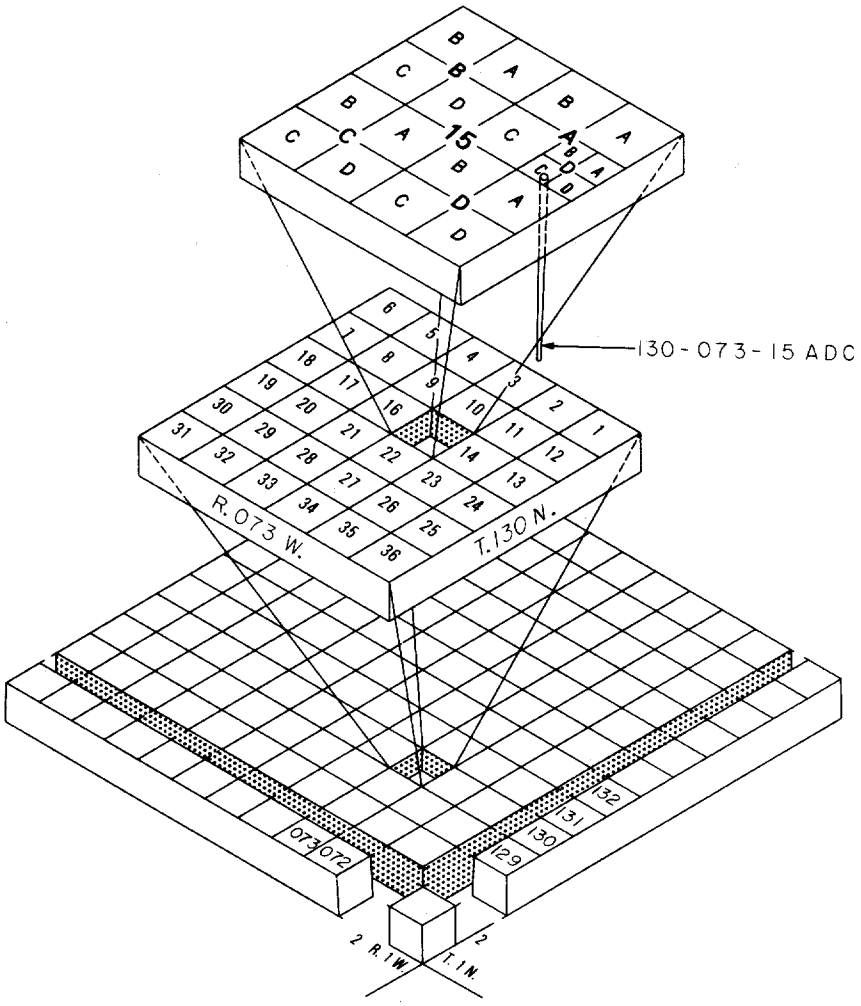

FIGURE 2.—Location-numbering system.

are listed in tables 1-6. The points of collection are shown on plate 1. The data consist of the following: (1) Geologic and hydrologic records for 747 wells, test holes, and surface-water sites; (2) water-level measurements in 105 observation wells; (3) lithologic and geophysical logs of 497 test holes and wells; (4) chemical analyses of 185 ground-water samples; (5) chemical analyses of water from 4 selected lakes; and (6) chemical analyses of minor elements of water from 3 municipal wells. The data are useful for evaluating geologic and ground-water conditions in McIntosh County. For example, a person considering the construction of a new well can locate the proposed site on plate 1. Depths, water quality, lithologies, and water levels of nearby wells and test holes tapping the different aquifers can be determined from the tables. However, use of the data as a guide to conditions at different sites should be made with caution because of the lenticular character of the water-bearing rocks and varying water quality in some aquifers.

Records of Wells, Test Holes, and Surface-Water Sites

Records of selected wells, test holes, and surface-water sites are listed in table 1. Well depth is the depth of casing for open-bottom wells or the base of the well screen. Most test holes were converted to observation wells for periodic water-level measurements and water-quality sampling. At some sites two or three observation wells were drilled in order to obtain water levels and water samples from superimposed aquifers. The observation wells were constructed of 1¼-inch (32-mm) plastic casing with 3- or 6-foot (1- or 2-m) screens. The observation wells were developed by backwashing and were pumped a minimum of 8 hours for development before collection of water samples for analysis.

Water Levels in Selected Wells

Table 2 lists the monthly and intermittent water levels, in feet below (or above) land surface, in selected wells that tap the major

aquifers in McIntosh County. Water-level measurements were made beginning in the spring of 1975 and extended through September 1977. Measurements will continue to be made in several wells as part of the statewide observation-well network to monitor changes in water levels as the ground-water resources of the area are developed.

Logs of Wells and Test Holes

Commercial well logs submitted to the North Dakota State Water Commission and logs of test holes drilled as part of this project are included in table 3. Minor changes in word order have been made on some of the drillers' logs. Most test holes drilled during this project and some municipal, industrial, and private wells have geophysical logs in addition to a description of the materials penetrated. The geophysical logs are extremely useful for geologic correlation purposes. Grain-size determinations refer to the Wentworth (1922) size scale. The color descriptions were determined by comparing fresh samples with the Geological Society of America's rock color chart (1963).

Water Quality

The mineral constituents and physical properties of water are reported in the tables of analyses (tables 4-6). Water for samples was secured from privately owned wells by using the existing pumps and from the North Dakota State Water Commission observation wells by airlift. Generally enough water was pumped to clear the well column and plumbing, then the sample was collected in a polyethylene bottle. For those metals considered unstable, a separate sample was filtered and acidified before transport to the laboratory. Most of the samples were analyzed by the North Dakota State Water Commission, Bismarck, N. Dak. The analyses of minor elements (table 6) were made by the U.S. Geological Survey, Lakewood, Colo. Methods of analyses were generally those described by Brown and others (1970). The results are expressed in milligrams per liter (mg/L) or micrograms per liter (µg/L). A microgram per liter is one-thousandth of a milligram per liter.

According to regulations established by the North Dakota State Department of Health (1977) the maximum contaminant levels for inorganic chemicals in public water supplies are as follows.

Contaminant	*Maximum limit in mg/L*
Arsenic (As)	*0.05*
Barium (Ba)	*1.0*
Cadmium (Cd)	*.01*
Chromium (Cr)	*.05*
Fluoride (F)	*2.4*
Lead (Pb)	*.05*
Mercury (Hg)	*.002*
Nitrate (As N)[1]	*10.0*
Selenium (Se)	*.01*
Silver (Ag)	*.05*

[1] *The maximum contaminant level for nitrate is applicable to both community and noncommunity water systems. The levels for other inorganic chemicals apply only to community water supply systems. (Noncommunity water systems primarily provide service to transients.)*

Mineral Constituents in Solution

Silica (SiO_2)

Weathering processes dissolve silica from practically all rocks. Silica affects the usefulness of water because it contributes to the formation of scale in pipes, water heaters, and boilers. Concentrations of silica in ground water usually range from 10 to 30 mg/L.

Iron (Fe)

Iron compounds are common in rocks and are easily leached by ground water. On exposure to air, water with iron concentrations greater than 100 µg/L soon becomes turbid with the insoluble reddish ferric oxide produced by oxidation. The recommended limit of iron in water is 300 µg/L. Concentrations greater than this will impart a metallic taste to drinking water and cause reddish-brown stains on porcelain, enamelware and fixtures, and fabrics washed in the water. Concentrations of iron in ground water are usually less than 10,000 µg/L.

Manganese (Mn)

Water containing more than 50 µg/L of manganese is objectionable because of its effect on taste, staining of plumbing fixtures, spotting

of laundered clothes, and accumulation of deposits in distribution systems. Ground water that contains high concentrations of iron may also have considerable amounts of manganese.

Calcium (Ca)

Calcium may be leached from most rocks. It is a major cause of hardness and forms scale on utensils, boilers, and pipes. Concentrations of calcium in ground water may be several hundred milligrams per liter.

Magnesium (Mg)

Magnesium is dissolved from many rocks, particularly from dolomitic rocks. Its effect in water is similar to that of calcium. Concentrations of magnesium in soft water range from 1 to about 5 mg/L, but in areas that contain large quantities of dolomite or other magnesium-bearing rocks the water may have magnesium concentrations exceeding 100 mg/L.

Sodium and Potassium (Na and K)

Sodium and potassium are dissolved from practically all rocks. Sodium dissolves readily and when brought into solution it tends to stay in solution. Potassium is dissolved with greater difficulty and exhibits a stronger tendency to be reincorporated into solid weathering products such as clay minerals. Moderate quantities of sodium and potassium have little effect on the usefulness of water, but water with concentrations of sodium and potassium exceeding 50 mg/L may cause foaming in steam boilers. More highly mineralized water that contains a large proportion of sodium salts may be unsatisfactory for irrigation. There is no recommended limit of intake of sodium for healthy persons; however, various restricted-sodium diets are recommended by physicians for persons suffering from hypertension, edema associated with congestive cardiac failure, and women with toxemias of pregnancy (National Academy of Sciences-National Academy of Engineering, 1972; p. 88).

Bicarbonate and Carbonate (HCO_3 and CO_3)

Bicarbonate and carbonate ions are the major cause of alkalinity

in most water. The significance of alkalinity to the domestic, agricultural, and industrial user is usually dependent upon the nature of the cations (Ca, Mg, Na, and K) in the water. However, moderate amounts of alkalinity (400 to 500 mg/L as $CaCO_3$) do not adversely affect most uses.

Alkalinity, expressed as milligrams per liter, can be calculated from the analyses by using the formula:

$$\text{Alkalinity (as } CaCO_3) = 0.82(HCO_3)+1.67(CO_3)$$

Sulfate (SO_4)

Metallic sulfide minerals in both sedimentary and igneous rocks are converted to sulfates upon weathering or oxidation. Sulfate may also be dissolved from deposits of gypsum and sodium sulfate. Water having sulfate concentrations in excess of 250 mg/L may be distasteful and also may have a laxative effect.

Chloride (Cl)

Chlorides are generally very soluble compounds and are present in most rocks, especially in sedimentary rocks deposited in a marine environment. Large quantities of chloride may affect the industrial use of water by increasing the corrosiveness of water that contains large quantities of calcium and magnesium. Water having a concentration of more than 250 mg/L generally will have a salty taste.

Fluoride (F)

Fluoride in ground water is derived by dissolution of the minerals fluorite, apatite, and hornblende.

Investigations have shown that certain fluoride concentrations have a beneficial effect on the structure and resistance to decay of children's teeth, whereas ingestion of excessive concentrations of fluoride may cause staining or mottling of the teeth.

Excessive fluoride concentrations for a specific water supply depend on climatic conditions because the amount of water and, consequently, the amount of fluoride ingested by children is primarily influenced by air temperature. The following table (National Academy

of Sciences-National Academy of Engineering, 1972; p. 66) relates air temperature to maximum intake of fluoride.

Annual average of daily air temperature[1]	*Fluoride maximum in mg/L*
80-91	*1.4*
72-79	*1.6*
65-71	*1.8*
59-64	*2.0*
55-58	*2.2*
50-54	*2.4*

[1]*Based on [Fahrenheit] temperature data obtained for a minimum of 5 years.*

Nitrate (NO_3)

High nitrate concentrations are found in many shallow wells on farms and in small rural communities. The origin of high nitrate concentrations in shallow ground water has been attributed to leaching from feedlots and barnyards, leakage from septic tanks, and seepage from irrigated fields fertilized with nitrogen compounds. Water containing nitrate concentrations in excess of 45 mg/L may cause methemoglobinemia in infants.

Boron (B)

Boron is a constituent of the mineral tourmaline and may be present in biotite and amphibole minerals. Boron is an essential element for the growth of plants; however, some plants are more tolerant of boron than others. The maximum boron concentration for sensitive plants is 750 µg/L, 1,000 and 2,000 µg/L, respectively, for semitolerant and tolerant plants. Additional information regarding sensitivity of plants can be found in "Water Quality Criteria, 1972," page 341, or in "U.S. Department of Agriculture Handbook 60, 1954."

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic material and water of crystallization. Water with less than 500 mg/L of dissolved solids is usually satisfactory for domestic and some industrial uses. Water containing more than about 2,000 mg/L is considered to be unsuitable for long-term

irrigation under average conditions. However, water with dissolved-solids concentrations greater than 2,000 mg/L is sometimes successfully used for irrigation where practices permit the removal of soluble salts through the application of large volumes of water on well-drained lands.

Properties and Characteristics of Water

Hardness

Calcium and magnesium are the principal cause of hardness. Hardness exhibits the characteristic of requiring greater quantities of soap to produce a lather as the hardness increases. Hard water also can contribute to the formation of scale in boilers, water heaters, radiators, and pipes, with a resultant decrease in the rate of water flow and(or) heat transfer.

The hardness that is equivalent to the alkalinity is called carbonate hardness, and any excess is called noncarbonate hardness. The carbonate hardness is the quantity that will contribute scale on heating and the noncarbonate hardness is the quantity of hardness that will remain after precipitation of the carbonate hardness. As a general reference, the U.S. Geological Survey has provided the following classification of water hardness.

Calcium and magnesium hardness, as $CaCO_3$ (milligrams per liter)	Hardness description
0-60	Soft
61-120	Moderately hard
121-180	Hard
More than 181	Very hard

Percent sodium and sodium-adsorption ratio (SAR)

The percent sodium is the percentage of sodium to all cations, with the cations in milliequivalents per liter. The displacement of calcium and magnesium by sodium in soils is slight unless the percent sodium is considerably greater than 50.

The term sodium-adsorption ratio (SAR) was introduced by the U.S. Salinity Laboratory Staff, U.S. Department of Agriculture (1954). Their experiments show that the SAR relates to the degree water enters

into cation-exchange reactions with soil. SAR is expressed by the equation:

$$SAR = \frac{Na^{+}}{\sqrt{\frac{Ca^{++}+Mg^{++}}{2}}}$$

where the concentrations of the ions are expressed in milliequivalents per liter. The U.S. Salinity Laboratory Staff (1954) divided water into 16 classes, depending upon the SAR and specific conductance. The classifications indicate the usefulness of water for irrigation of different crops on different types of soil.

Specific conductance (micromhos per centimeter at 25°C)

Specific conductance is a measure of the ability of water to conduct an electric current. Approximately 0.65 to 0.70 of the specific conductance (in micromhos) is an estimate of the amount of dissolved solids (in milligrams per liter) in water; however, this relation is not constant and will vary with the chemical composition of the water (Hem, 1970).

Hydrogen-ion concentration (pH)

Hydrogen-ion concentration (activity) is expressed in terms of pH units. The values of pH often are used as one measure of the solvent power of water.

The hydrogen-ion concentrations affect the corrosiveness of water. A pH of 7.0 indicates that the water is neutral, neither acidic nor basic. Readings progressively lower than 7.0 denote increasing acidity, and those progressively higher than 7.0 denote increasing alkalinity.

Temperature

Temperature is an important factor in evaluating the usefulness of water. This is evident for such a direct use as an industrial coolant. Temperature is also important, but perhaps not so evident, for its influence upon concentrations of dissolved gases and mineral matter in water. Water temperatures given in the tables are expressed in degrees Celsius (Centigrade). Degrees Celsius and the equivalent temperature in degrees Fahrenheit are given in the following table.

Degrees Celsius (°C)	Degrees Fahrenheit (°F)	Degrees Celsius (°C)	Degrees Fahrenheit (°F)	Degrees Celsius (°C)	Degrees Fahrenheit (°F)
3.5	38	12.5	54	21.5	71
4.0	39	13.0	55	22.0	72
4.5	40	13.5	56	22.5	72
5.0	41	14.0	57	23.0	73
5.5	42	14.5	58	23.5	74
6.0	43	15.0	59	24.0	75
6.5	44	15.5	60	24.5	76
7.0	45	16.0	61	25.0	77
7.5	45	16.5	62	25.5	78
8.0	46	17.0	63	26.0	79
8.5	47	17.5	63	26.5	80
9.0	48	18.0	64	27.0	81
9.5	49	18.5	65	27.5	81
10.0	50	19.0	66	28.0	82
10.5	51	19.5	67	28.5	83
11.0	52	20.0	68	29.0	84
11.5	53	20.5	69	29.5	85
12.0	54	21.0	70	30.0	86

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TABLE 1.--Records of wells, test holes, and surface-water sites

EXPLANATION

Owner

NDSWC 5206, North Dakota State Water Commission, test hole number 5206

USGS 1, United States Geological Survey, test hole number 1

Water level (feet)

Water level, in feet below or (+) above land surface

D, dry
F, flowing
P, pumping
R, recently pumped
S, nearby pumping
Z, other

Use of water

D, dewatering
H, domestic
P, public supply
S, stock supply
U, unused
Z, other

Principal aquifer

112, Pleistocene
211, Upper Cretaceous
217, Lower Cretaceous

BGFV, buried glaciofluvial deposits
DKOT, Dakota Formation
FXHL, Fox Hills Formation
OTSH, outwash deposits

Specific conductance

Value shown is the field specific conductance measured at the well at the time of inventory.

LOCAL NUMBER	OWNER	DEPTH DRILLED (FEET)	DEPTH OF WELL (FEET)	DEPTH TO FIRST OPENING (FEET)	CASING DIAM-ETER (INCHES)	DATE COMPLETED	WATER LEVEL (FEET)		DATE WATER LEVEL MEASURED	USE OF WATER	PRINCIPAL AQUIFER	SPECIFIC CONDUCTANCE (µMHO/CM @ 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
129-067-03AAA	NDSWC 5206	142	51	48	1.25	08/30/1977	40.69		10/05/1977	U	112BGFV	--	--	1992
129-067-03BBB1	NDSWC 5207	262	191	188	1.25	08/30/1977	51.85		10/05/1977	U	112BGFV	1100	--	1989
129-067-03BBB2	NDSWC 5207A	140	130	127	1.25	08/30/1977	51.10		10/05/1977	U	112BGFV	900	--	1989
129-067-03BCD	DASCHENDORF, GOTTHILF	--	29	--	24	1964	10.00		--	S,H	--	650	--	--
129-067-05ADD	NDSWC 5205	182	--	38	1.25	08/30/1977		D	--	--	--	--	--	2010
129-067-07DBB	ERLENBUSH, MARVIN	--	18	--	36	1948	5.86		07/17/1975	S,H	--	990	10.0	--
129-067-08DAA	NDSWC 9623	140	56	53	1.25	07/13/1976	14.65		02/20/1976	U	112BGFV	800	10.0	1971
129-067-12DDA	HOFFMAN, GOTTLIEB	--	50	--	24	1963	8.00		--	S,H	--	835	9.0	--
129-067-15CDB	HEINRICH, ALVIN	--	58	--	24	1967	19.42		07/17/1975	H	--	3100	7.0	1980
129-067-15CDC	HEINRICH, ALVIN	--	58	--	24	1969	19.58		07/17/1975	S	--	2750	6.5	1957
129-067-17ADD	NDSWC 9622	340	290	287	1.25	07/13/1976	31.45		07/20/1976	U	112BGFV	1195	8.5	1968
129-067-17DDD	NDSWC 9515	240	161	158	1.25	11/21/1975	23.98		07/20/1976	U	112BGFV	1020	9.0	1972
129-067-18ADB	ROHRBACH, EDWIN	--	135	--	24	1960	35.00		--	S,H	--	1590	9.5	1965
129-067-20BBB1	NDSWC 5203	162	--	--	--	08/29/1977	--		--	U	--	--	--	1970
129-067-20BBB2	NDSWC 5203A	42	33	30	1.25	08/29/1977		D	--	U	--	--	--	1970
129-067-21ADD	JERKE, ANNA	28	28	--	18	08/05/1975	12.00		08/05/1975	S	--	1060	8.5	--
129-067-22ABB	NDSWC 9621	160	--	--	--	07/13/1976	--		--	U	--	--	--	1965
129-067-24BCC1	ERLENBUSCH, LLOYD	--	29	--	24	--	21.00		--	H	--	3000	11.0	--
129-067-24BCC2	ERLENBUSCH, LLOYD	--	31	--	24	1925	21.00		--	S	--	1630	6.5	--
129-067-24DDA	NDSWC 9620	280	--	--	--	07/12/1976	--		--	U	--	--	--	2070
129-067-28BBB	NDSWC 5204	202	161	158	1.25	08/29/1977	37.25		09/07/1977	U	112BGFV	1050	8.0	1970
129-067-28BCB1	NDSWC 10124	180	155	152	1.25	06/29/1978	38.39	Z	07/20/1978	U	112BGFV	--	--	1965
129-067-28BCB2	NDSWC 10125	200	161	158	1.25	06/29/1978	42.12	Z	07/20/1978	U	112BGFV	--	--	1965
129-067-28BCB3	NDSWC 10125A	120	113	110	1.25	06/29/1978	19.43	Z	07/20/1978	U	112BGFV	--	--	1965
129-067-28DAA	NITSCHKE, ALLEN	--	55	--	24	1966	11.00		07/16/1975	S,H	--	2300	11.0	--
129-067-29DAD	NDSWC 10123	180	--	--	--	06/29/1978	--		--	U	--	--	--	1960
129-067-30BBB	NDSWC 9627	235	--	--	--	07/15/1976	--		--	U	--	--	--	1984
129-067-33DDC	NDSWC 9517	260	--	--	--	11/25/1975	--		--	U	--	--	--	2000
129-067-35CBB	PFEIFER, DONALD	27	27	--	24	05/01/1972	17.00		05/01/1972	S,H	112BGFV	2100	10.5	--
129-067-36DDD	NDSWC 9516	340	--	--	--	11/25/1975	--		--	U	--	--	--	2100
129-068-01DDA	NDSWC 9513	120	--	--	--	11/20/1975	--		--	U	--	--	--	1967
129-068-03AAA	NDSWC 9512	140	71	68	1.25	11/20/1975		F	--	U	112BGFV	--	--	1915
129-068-04CAB1	NIES, REUBEN	--	99	--	4	--	5.83		07/16/1975	S,H	--	1160	9.0	--
129-068-04CAB2	NIES, ROBERT	--	90	--	3	1966		F	--	S	--	1150	9.0	--
129-068-07BCA	WAHL, LAWRENCE	--	62	--	18	--	--		--	S,H	--	995	10.0	--
129-068-08CCC	NDSWC 9521	195	166	163	1.25	12/05/1975	32.95		07/20/1976	U	112BGFV	1340	9.0	1970
129-068-09CCB1	NDSWC 5199	262	230	227	1.25	08/25/1977	38.15		09/07/1977	U	112BGFV	1400	8.5	1970
129-068-09CCB2	NDSWC 5199A	70	65	62	1.25	08/25/1977	41.74		09/07/1977	U	112BGFV	800	8.0	1970
129-068-12BBB	NDSWC 10118	120	--	--	--	06/28/1978	--		--	U	--	--	--	--
129-068-12DBD	KLIPFEL, CHRIST	--	25	--	2.50	1946	11.06		07/16/1975	S,H	--	670	7.5	--

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129-068-14BAA	NDSWC 10119	180	--	--	--	06/28/1978	--		--	U	--	--	--	2005
129-068-14CCC	NDSWC 10122	180	--	--	--	06/29/1978	--		--	U	--	--	--	1970
129-068-15AAD	NDSWC 5200	182	141	138	1.25	08/25/1977	44.96		10/05/1977	U	112BGFV	1400	--	1970
129-068-15CBB	SCHAUER, MILTON	--	67	--	24	1945	--		--	S,H	--	560	10.0	--
129-068-18BBB	NDSWC 9661	140	--	--	--	07/28/1976	--		--	U	--	--	--	2002
129-068-18CCC	NDSWC 5197	262	225	222	1.25	08/24/1977	16.13		10/05/1977	U	112BGFV	1900	--	1940
129-068-19CBC1	KEMPF, ROBERT	--	124	--	36	1960	12.27		07/15/1975	S	--	1550	9.5	--
129-068-19CBC2	KEMPF, ROBERT	--	40	--	36	1960	5.05		07/15/1975	H	--	4000	--	--
129-068-20CCC	NDSWC 9519	160	--	--	--	12/04/1975	--		--	U	--	--	--	1937
129-068-22DCD	MEIDINGER, MARVIN	53	53	--	18	07/21/1975	8.82	P	07/06/1976	S	--	3050	9.0	1945
129-068-23CBB	NDSWC 9628	300	--	--	--	07/15/1976	--		--	U	--	--	--	1974
129-068-23CDB	WEISZ, OSCAR	--	100	--	--	--	--		--	S,H	--	990	9.0	--
129-068-23DCC	WEISZ, OSCAR	--	40	--	--	--	--		--	S	--	595	7.0	--
129-068-24BBB1	NDSWC 9514	100	--	--	--	11/20/1975	--		--	U	--	--	--	1977
129-068-24BBB2	NDSWC 9514A	180	166	163	1.25	11/21/1975	41.37		11/03/1976	U	112BGFV	1200	8.0	1977
129-068-25BAA1	BETSCH, THEODORE	--	25	--	36	--	6.44		07/16/1975	S,H	--	1000	9.0	--
129-068-25BAA2	BETSCH, THEODORE	--	30	--	24	--	12.53	S	07/16/1975	U	--	--	--	--
129-068-27BBC	NDSWC 9629	220	--	--	--	07/15/1976	--		--	U	--	--	--	1926
129-068-28ADD	NDSWC 9630	200	161	158	1.25	07/16/1976	.78		07/20/1976	U	112BGFV	1720	8.0	1936
129-068-28BAD	NDSWC 10121	180	--	--	--	06/29/1978	--		--	U	--	--	--	1920
129-068-29AAA	NDSWC 10120	140	106	103	1.25	06/28/1978	7.67	Z	07/20/1978	U	112BGFV	--	--	1926
129-068-31ADA	NDSWC 9520	260	218	215	1.25	12/04/1975	9.60+		09/16/1976	U	112BGFV	1890	8.0	1919
129-068-32DBC	GOEHRING, LEROY	--	168	--	6	1955		F	07/16/1975	S,H	--	1140	8.5	--
129-068-33DDC	NDSWC 9518	280	--	--	--	12/03/1975	--		--	U	--	--	--	1940
129-068-34ODD1	NDSWC 5202	342	281	278	1.25	08/26/1977	52.16		09/07/1977	U,S	112BGFV	2000	9.0	1982
129-068-34DDD2	NDSWC 5202A	102	101	98	1.25	08/26/1977	43.38		09/07/1977	U	112BGFV	800	8.0	1982
129-068-36DDD1	NDSWC 5201	262	171	168	1.25	08/25/1977	32.06		09/07/1977	U	112BGFV	1100	8.0	1962
129-068-36DDD2	NDSWC 5201A	75	70	67	1.25	08/25/1977	22.33		09/07/1977	U	112BGFV	700	7.0	1962
129-069-02ACD	KLIPFEL, ROGER	152	152	--	--	01/06/1975		D	--	U	--	--	--	--
129-069-03AAA1	NDSWC 5196	242	159	156	1.25	08/24/1977	53.33		10/05/1977	U	112BGFV	900	9.0	1982
129-069-03AAA2	NDSWC 5196A	62	51	48	1.25	08/24/1977	35.37		10/05/1977	U	112BGFV	650	10.0	1982
129-069-03BBB	NDSWC 9663	160	--	--	--	07/28/1976	--		--	U	--	--	--	1966
129-069-05BCC	NDSWC 5195	202	--	--	--	08/23/1977	--		--	U	--	--	--	2006
129-069-08DBA1	BUCK, ALVIN	--	70	--	--	--	20.20		07/15/1975	S	--	5300	7.5	--
129-069-08DBA2	BUCK, ALVIN	--	55	--	--	--	4.96	S	07/15/1975	U	--	--	--	--
129-069-10BBB	NDSWC 5194	142	--	--	--	08/23/1977	--		--	--	--	--	--	1980
129-069-11DCD	MARTZ, ROBERT	--	80	--	24	1890	16.15		07/15/1975	U	--	2990	9.5	--
129-069-11DDC	MARTZ, ROBERT	120	120	84	4	11/02/1973	60.00		11/02/1973	S,H	112BGFV	2400	8.5	--
129-069-12CCD1	NDSWC 9660	260	231	228	1.25	07/27/1976	34.95	Z	08/03/1976	U	112BGFV	1710	8.5	1957
129-069-12CCD2	NDSWC 9660A	180	166	163	1.25	07/28/1976	34.59	Z	08/03/1976	U	112BGFV	1650	9.0	1957

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129-069-15BBB	NDSWC 9659	120	--	--	--	07/27/1976	--		--	U	--	--	--	2075
129-069-18BBB	NDSWC 1571	115	--	--	--	--	--		--	U	--	--	--	2021
129-069-18CAA	JENNER, ALBERT	--	90	--	24	1955	67.19	R	07/15/1975	U	--	2570	8.5	--
129-069-19BBB	JENNER, ALBERT	--	60	--	24	1920	30.00		--	S,H	--	1690	8.0	--
129-069-19DDD	NDSWC 5192	162	--	--	--	08/23/1977	--		--	U	--	--	--	2084
129-069-21ADC	KLIPFEL, ROGER	--	23	--	24	1945	17.00		--	S,H	--	2190	11.5	--
129-069-24DDC	NDSWC 9662	140	--	--	--	07/28/1976	--		--	U	--	--	--	1920
129-069-24DDD	NDSWC 1572	115	--	--	--	--	--		--	U	--	--	--	--
129-069-27ABB	KLIPFEL, RAYMOND	--	14	--	36	1955	12.00		--	S,H	--	1000	--	--
129-069-27ABC	KLIPFEL, RAYMOND	--	24	--	24	1960	14.00		--	S,H	--	1100	10.5	--
129-069-27BCB	NDSWC 9658	180	--	--	--	07/27/1976	--		--	U	--	--	--	2028
129-069-28CDC	HOFFMAN, CAROLINA	--	90	--	24	1933	34.00		--	H,S	--	2490	11.0	--
129-069-32CCD	NDSWC 9525	100	--	--	--	12/10/1975	--		--	U	--	--	--	2120
129-069-34CCC	NDSWC 5193	142	97	94	1.25	08/23/1977	44.85		10/05/1977	U	112BGFV	1600	10.0	2065
129-069-36CCC	NDSWC 9523	180	--	--	--	12/10/1975	--		--	U	--	--	--	2005
129-070-06AAA	NDSWC 9682	100	--	--	--	08/04/1976	--		--	U	--	--	--	2026
129-070-09DDB	KAPPES, JUDD	--	115	--	24	1953	100.00		--	H,S	--	1810	9.0	--
129-070-10DDD	NDSWC 9657	120	--	--	--	07/27/1976	--		--	U	--	--	--	2086
129-070-12ABB	BENDER, CHRIST	103	103	99	24	10/17/1974	10.00		--	S	--	3400	8.5	--
129-070-12DDA	LIPPERT, JOHN	86	86	--	18	11/05/1974	65.00		11/05/1974	S	112BGFV	5300	8.0	--
129-070-14CDB	GROSS, LEONARD	68	68	--	24	11/07/1974	39.41		07/14/1975	H	112BGFV	2750	9.0	--
129-070-19DDD	NDSWC 9655	220	--	--	--	07/26/1976	--		--	U	--	--	--	2090
129-070-24DDD	NDSWC 9524	140	--	--	--	12/10/1975	--		--	U	--	--	--	2107
129-070-25BAA	JENNER, JOHN	--	65	--	36	1963	33.16		07/11/1975	H,S	--	2390	8.5	--
129-070-25BAB	JENNER, JOHN	--	62	--	24	1960	42.00		--	S,D	--	1850	8.0	--
129-070-27CCC	NDSWC 9656	200	--	--	--	07/27/1976	--		--	U	--	--	--	2085
129-070-28AAD	FISCHER, ORVIL	--	85	--	10	10/ /1974	49.00		--	S	--	2600	9.0	--
129-070-31CCC	NDSWC 9654	240	--	--	--	07/26/1976	--		--	U	--	--	--	2052
129-070-32DDD	NDSWC 9527	200	--	--	--	12/11/1975	--		--	U	--	--	--	2077
129-070-35DDD	NDSWC 9526	100	--	--	--	12/10/1975	--		--	U	--	--	--	2136
129-071-04BBB	NDSWC 9684	100	--	--	--	08/04/1976	--		--	U	--	--	--	2091
129-071-04BDB	DOCKTER, LEOPOLD	--	135	--	36	1965	117.00		--	H	--	1590	10.5	--
129-071-06BCC	HOFF, HENRY	--	160	--	24	1965	130.00		--	U	--	1470	8.5	--
129-071-12ADD	RAU, OSCAR	--	106	--	36	1960	94.47		07/10/1975	H	--	2450	9.0	--
129-071-12CCC	NDSWC 9652	140	126	123	1.25	07/23/1976	90.00		07/29/1976	U	112BGFV	1700	9.0	2039
129-071-12DDD	NDSWC 9653	100	--	--	--	07/26/1976	--		--	U	--	--	--	2069
129-071-15AAB	VENTURIA	--	2495	--	--	07/ /1967	20.00		--	P	217DKOT	2070	29.0	--
129-071-15BBB	NDSWC 5188	142	--	--	--	08/22/1977	--		--	--	--	--	--	2042
129-071-16BCC	NDSWC 5187	122	--	--	--	08/19/1977	--		--	--	--	--	--	2051
129-071-17CCC	NDSWC 5186	202	--	--	--	08/19/1977	--		--	--	--	--	--	2105

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129-071-17DCC	RITTER, LENHARDT	--	125	--	24	1972	115.00		--	S,H	--	1780	9.0	--
129-071-18BBA	BLUMHARDT, HENRY	144	144	--	26	1936	136.00		--	S,H	--	1300	8.2	--
129-071-22BAA	NDSWC 9648	160	141	138	1.25	07/22/1976	84.16		07/29/1976	U	112BGFV	1360	8.5	2029
129-071-24CCC	NDSWC 5191	182	--	--	--	08/23/1977	--		--	--	--	--	--	--
129-071-27DBB	NDSWC 5189	142	--	--	--	08/22/1977	--		--	--	--	--	--	2049
129-071-31ACC	DOHN, ADOLPH	80	80	--	--	--	47.15		07/10/1975	H,S	--	1340	9.0	--
129-071-32BBB	NDSWC 5185	102	47	44	1.25	08/19/1977		D	--	U	--	--	--	2000
129-071-32CCC	NDSWC 9650	80	56	53	1.25	07/22/1976		D	--	U	--	--	--	2013
129-071-34CDC	NDSWC 9649	160	--	--	--	07/22/1976	--		--	U	--	--	--	2057
129-071-35CDD	NDSWC 5190	202	--	--	--	08/22/1977	--		--	--	--	--	--	2041
129-072-10ACB	STROBEL, ARTHUR	118	118	--	30	1933	88.00		--	S,H	--	1070	8.0	--
129-072-12BBD	ENGELHARDT, GERTRUDE	90	90	--	--	--	6.54		07/09/1975	S,H	--	1100	9.0	--
129-072-14AAA	NDSWC 9647	120	--	--	--	07/22/1976	--		--	U	--	--	--	1961
129-072-15AAA	NDSWC 5182	142	--	--	--	08/18/1977	--		--	--	--	--	--	1955
129-072-16BBB	NDSWC 9646	160	151	148	1.25	07/21/1976	72.38		07/29/1976	U	112BGFV	1240	--	1925
129-072-18BDD	SCHUMACHER, ANTON	130	130	--	8	10/ /1971	85.00		--	S,H	--	810	9.0	--
129-072-19CDC	SALWEI, JOE	--	110	--	6	1969	8.00		1969	H,S	112BGFV	1410	10.0	--
129-072-21ABD	WALD, JAMES	130	130	--	6	02/ /1972	30.00		--	S,H	--	690	--	--
129-072-23DBB	LACHER, FRANK	149	149	--	24	1969	127.00		--	S,H	--	790	9.0	--
129-072-26BBB	NDSWC 5183	182	134	128	1.25	08/18/1977	124.60		10/14/1977	U	112BGFV	--	--	2055
129-072-27BDD	JANGULA, HENRY	120	120	--	6	10/ /1968	20.00		--	S,H	--	910	--	--
129-072-29DAA	NDSWC 5179	162	--	--	--	08/17/1977	--		--	--	--	--	--	2000
129-072-30BAA	NDSWC 9730	140	--	--	--	07/18/1976	--		--	U	--	--	--	1966
129-072-30BBA	NDSWC 9732	140	110	107	1.25	08/18/1976	2.92		08/20/1976	U	112BGFV	1660	7.5	1965
129-072-30BBB	NDSWC 9725	160	126	123	1.25	08/16/1976	5.41		08/20/1976	U	112BGFV	1120	8.5	1968
129-072-30CBB	MITZEL, SIMON	--	40	--	36	1930		F	--	H,S	112BGFV	1220	9.0	--
129-072-30CDD	NDSWC 5178	142	124	118	1.25	08/17/1977	.30		12/13/1977	U	112BGFV	1390	8.5	1920
129-072-31CBB	NDSWC 5177	162	65	62	1.25	08/17/1977	16.34		11/09/1977	U	112BGFV	1290	7.0	1922
129-072-32BBA	NDSWC 9733	120	--	--	--	08/18/1976	--		--	U	--	--	--	1970
129-072-32CCC	NDSWC 9639	140	111	108	1.25	07/20/1976	6.80+		09/15/1976	U	112BGFV	1220	8.5	1920
129-072-32DDD	NDSWC 9640	140	121	118	1.25	07/20/1976	5.21		07/29/1976	U	112BGFV	1000	--	1928
129-072-33CCC	NDSWC 9641	140	--	--	--	07/21/1976	--		--	U	--	--	--	--
129-072-34DAA	NDSWC 5184	122	88	85	1.25	08/18/1977	56.96		10/14/1977	U	112BGFV	900	--	1997
129-072-35BCA	MOOS, VERNON	40	40	--	18	1955	18.00		--	S,H	--	970	8.5	--
129-072-35DDD1	NDSWC 9642	40	--	--	--	07/21/1976	--		--	U	--	--	--	1976
129-072-35DDD2	NDSWC 9651	140	--	--	--	07/22/1976	--		--	U	--	--	--	1976
129-073-01CCC	NDSWC 9738	140	111	108	1.25	08/23/1976	58.17	Z	09/03/1976	U	112BGFV	1150	8.0	2043
129-073-01DCC	ZIEGLER, FRANK	100	100	--	24	1959	70.00		--	S,H	--	1600	--	--

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129-073-03AAA	NDSWC 5172	122	--	--	--	08/15/1977	--		--	U	--	--	--	1960
129-073-03DBC	FEIST, JAMES	2561	2561	--	2	07/24/1970		F	--	S,H	217DKOT	1990	24.5	--
129-073-05DDB	FEIST, ANTON	61	61	--	18	06/20/1974	14.00		06/20/1974	S	--	465	8.5	--
129-073-05DDD	FEIST, ANTON	27	27	--	--	1875	--		--	S	--	515	7.5	--
129-073-11ABB	HOLZER, ROY	90	70	--	4	1970	40.00		1970	S	112BGFV	1200	7.5	--
129-073-11BBB	NDSWC 9644	120	--	--	--	07/21/1976	--		--	U	--	--	--	2003
129-073-12AAA	NDSWC 9737	160	128	125	1.25	08/23/1976	83.67	Z	09/03/1976	U	112BGFV	900	7.5	2067
129-073-12AAB	SCHUMACHER, RICHARD	160	160	120	4	08/12/1976	80.00		06/12/1976	H	112BGFV	1000	--	--
129-073-12CDD	NDSWC 9746	120	107	104	1.25	08/24/1976	37.54	Z	09/03/1976	U	112BGFV	1200	7.5	2017
129-073-12DDD	NDSWC 9736	140	121	118	1.25	08/19/1976	70.02	Z	09/03/1976	U	112BGFV	1020	8.5	2052
129-073-13BBB	NDSWC 9735	120	--	--	--	08/19/1976	--		--	U	--	--	--	2018
129-073-13DDD	NDSWC 9643	160	141	138	1.25	07/21/1976	41.14	Z	07/29/1976	U	112BGFV	1270	--	1982
129-073-14DAD	WALD, ANTON	24	24	--	24	1951	12.00		--	H	--	2400	--	--
129-073-14DDA	WALD, ANTON	90	90	--	24	1947	70.00		--	S	--	1410	8.5	--
129-073-15ACB	FEIST, KATIE	60	60	--	22	1931	--		--	S,H	--	3900	7.5	--
129-073-16AAA	NDSWC 9739	40	--	--	--	08/23/1976	--		--	U	--	--	--	2041
129-073-18BDC	SCHUMACHER, SEBASTIAN	38	38	--	24	08/11/1975	20.00		08/11/1975	S	--	1100	8.5	--
129-073-18DAD	NDSWC 9721	100	--	--	--	08/16/1976	--		--	U	--	--	--	--
129-073-19ADD	NDSWC 9720	80	--	--	--	08/16/1976	--		--	U	--	--	--	--
129-073-19BBC1	SCHUMACHER, SEBASTIAN	24	24	--	24	1935	--		--	S,H	--	1020	8.5	--
129-073-19BBC2	NDSWC 9723	80	--	--	--	08/16/1976	--		--	U	--	--	--	1971
129-073-21AAA	NDSWC 9636	80	--	--	--	07/20/1976	--		--	U	--	--	--	2040
129-073-21CDB	ZEELAND 2	2516	2516	2348	2.50	04/23/1975	91.60+		08/15/1975	U	217DKOT	3500	30.0	2010
129-073-23AAA	NDSWC 9727	120	--	--	--	08/17/1976	--		--	U	--	--	--	2020
129-073-24ABB	NDSWC 9734	60	41	38	1.25	08/20/1976	11.99		09/03/1976	U	112OTSH	3100	8.2	2018
129-073-24BBB	NDSWC 9726	40	--	--	--	08/17/1976	--		--	U	--	--	--	2020
129-073-24DDA	NDSWC 9796	160	136	133	1.25	09/28/1976	21.78		10/08/1976	U	112BGFV	730	--	--
129-073-24DDC	NDSWC 9731	140	121	118	1.25	08/18/1976	8.90		08/20/1976	U	112BGFV	1490	7.5	1973
129-073-24DDD1	NDSWC 9792	160	128	125	1.25	09/27/1976	13.93		10/08/1976	U	112BGFV	730	--	1975
129-073-24DDD2	NDSWC 9793	160	128	125	1.25	09/27/1976	12.50		11/15/1976	U	112BGFV	860	--	--
129-073-24DDD3	NDSWC 9794	140	121	118	1.25	09/27/1976	8.65		11/15/1976	U	112BGFV	--	--	--
129-073-24DDD4	NDSWC 9795	160	130	127	1.25	09/28/1976	14.38		11/15/1976	U	112BGFV	780	--	--
129-073-24DDD5	NDSWC 5021	140	134	117	12	10/26/1976	14.65		11/15/1976	U	112BGFV	900	--	--
129-073-25ABB	NDSWC 9729	180	--	--	--	08/17/1976	--		--	U	--	--	--	1968
129-073-25BBB	NDSWC 9724	100	--	--	--	08/16/1976	--		--	U	--	--	--	1991
129-073-26BBB	NDSWC 9728	60	--	--	--	08/17/1976	--		--	U	--	--	--	1983
129-073-29B	USGS 1	11	--	--	--	--	8.00		1946	U	--	--	--	--
129-073-29BBB	NDSWC 9632	100	--	--	--	07/19/1976	--		--	U	--	--	--	2022
129-073-29D	USGS 14	26	--	--	--	1946	5.00		1946	U	--	--	--	--
129-073-30A1	USGS 10	36	--	--	--	1946	3.70		1946	U	--	--	--	--

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129-073-30A2	USGS 15	15	--	--	--	1946	--	--	U	--	--	--	--
129-073-30A3	USGS 16	31	31	24	18	1946	3.60	1946	U	--	--	--	--
129-073-30ADD	NDSWC 9740	40	--	--	--	08/23/1976	--	--	U	--	--	--	1967
129-073-30BAA	ZEELAND 1	40	40	27	--	1947	9.00	--	P	112BGFV	640	9.5	--
129-073-30BAC1	BOSCHEE, CHARLES	72	72	--	24	11/11/1975	30.00	11/11/1975	S	--	700	9.0	1905
129-073-30BAC2	NDSWC 9631	120	--	--	--	07/19/1976	--	--	U	--	--	--	1958
129-073-30BAC3	NDSWC 9633	100	--	--	--	07/19/1976	--	--	U	--	--	--	1958
129-073-30BCB	NDSWC 9722	60	--	--	--	08/16/1976	--	--	U	--	--	--	--
129-073-30BD1	USGS 2	15	--	--	--	--	2.40	1946	U	--	--	--	--
129-073-30BD2	USGS 3	16	--	--	--	1946	--	--	U	--	--	--	--
129-073-30BDA	NDSWC 9744	120	--	--	--	08/24/1976	--	--	U	--	--	--	1954
129-073-30D	USGS 11	54	--	--	--	1946	4.60	1946	U	--	--	--	--
129-073-30DA	USGS 8	11	--	--	--	1946	9.80	1946	U	--	--	--	--
129-073-30DAD1	NDSWC 9741	100	76	73	1.25	08/24/1976	16.44	09/03/1976	U	112BGFV	2800	7.5	1962
129-073-30DAD2	NDSWC 9742	120	71	68	1.25	08/24/1976	16.86	09/03/1976	U	112BGFV	3300	7.5	1963
129-073-30DDA	NDSWC 9743	40	--	--	--	08/24/1976	--	--	U	--	--	--	1982
129-073-32AAD	NDSWC 9634	80	--	--	--	07/19/1976	--	--	U	--	--	--	1970
129-073-32DDD	NDSWC 9637	60	--	--	--	07/20/1976	--	--	U	--	--	--	1972
129-073-33CCC	SCHERR, KASPER	59	59	55	--	12/09/1974	5.96	07/08/1975	S,H	--	1020	8.5	--
129-073-33DB1	USGS 12	30	--	--	--	1946	6.50	1946	U	--	--	--	--
129-073-33DB2	USGS 13	40	--	--	--	1946	--	--	U	--	--	--	--
129-073-34BBB	NDSWC 9635	80	--	--	--	07/19/1976	--	--	U	--	--	--	1994
129-073-35DDB	SCHATZ, LEO	65	65	--	22	1953	--	--	H	--	1630	9.0	--
129-073-36CCC	NDSWC 9638	80	--	--	--	07/20/1976	--	--	U	--	--	--	1935
129-073-36DDD	NDSWC 5176	142	--	--	--	08/16/1977	--	--	U	--	--	--	1931
130-067-01CCC	ISAAK, ERNEST	30	30	--	--	--	--	--	H	--	940	9.5	--
130-067-04CCB	NDSWC 9782	200	--	--	--	09/20/1976	--	--	U	--	--	--	2021
130-067-05DDD	NITSCHKE, HUGO	12	12	--	37	07/16/1975	5.00	07/16/1975	S	--	890	--	--
130-067-07BBB1	NDSWC 9783	120	--	--	--	09/20/1976	--	--	U	--	--	--	2004
130-067-07BBB2	NDSWC 9783A	40	29	26	1.25	08/21/1976	7.72	10/05/1976	U	112BGFV	820	7.0	2004
130-067-10AAA	NDSWC 9776	180	--	--	--	09/15/1976	--	--	U	--	--	--	1975
130-067-14ADA1	VAN DEN EYKEL, MARTIN	40	40	--	--	--	9.72	07/30/1975	S	--	2970	8.5	--
130-067-14ADA2	VAN DEN EYKEL, MARTIN	100	100	--	4	1966	--	--	H	--	680	--	--
130-067-20BBB	STROBEL, EDWIN	102	102	--	--	09/18/1974		D --	U	--	--	--	--
130-067-21AAD	NDSWC 5210	222	--	--	--	08/31/1977	--	--	U	--	--	--	--
130-067-21DBA	SCHNEIDER, MARVIN	14	14	10	24	09/21/1976	10.00	09/21/1976	U	112BGFV	--	--	--
130-067-21DDA	NDSWC 5211	182	120	117	1.25	08/31/1977	10.27	10/05/1977	U	112BGFV	1500	9.0	1942
130-067-24DDD	NDSWC 5209	162	--	--	--	08/31/1977	--	--	U	--	--	--	1998
130-067-25CCB	NDSWC 5208	122	--	--	--	08/30/1977	--	--	U	--	--	--	2012
130-067-27CC81	NDSWC 9625	140	--	--	--	07/14/1976	--	--	U	--	--	--	1961

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130-067-27CCB2	NDSWC 9625A	40	36	33	1.25	07/14/1976	17.45	07/20/1976	U	112OTSH	750	9.0	1961
130-067-29CBA1	PUHLMAN, ELLIS	200	200	--	--	07/06/1974	--	--	U	--	--	--	--
130-067-29CBA2	PUHLMAN, ELLIS	260	260	--	--	07/06/1974	--	--	U	--	--	--	--
130-067-29DDD	FREGIEN, MELVIN	102	17	--	--	09/18/1974	10.00	09/18/1974	U	--	--	--	--
130-067-30ABB	PUHLMAN, ELLIS	137	137	133	4	10/21/1976	69.20	06/14/1977	U	112BGFV	--	--	--
130-067-31BCA	NEU, EDWIN	20	20	16	24	12/20/1972	7.00	12/20/1972	S,H	112BGFV	950	--	--
130-067-31BDA	NEU, EDWIN	33	33	--	15	03/18/1976	14.00	03/18/1976	S	--	1500	--	--
130-067-33BAD	NEU, EDWIN	17	17	--	18	06/18/1975	6.96	07/29/1975	S	--	1100	--	--
130-067-35ADD1	QUASCHNICK, HEINRICH	16	16	--	8	1948	10.00	--	H	--	585	10.0	--
130-067-35ADD2	QUASCHNICK, HEINRICH	50	50	--	8	1954	10.00	--	S	--	575	8.0	--
130-067-35ADD3	NDSWC 9624	360	--	--	--	07/14/1976	--	--	U	--	--	--	1960
130-067-35ADD4	NDSWC 9624A	40	31	28	1.25	07/14/1976	3.09	07/20/1976	U	112BGFV	770	8.0	1960
130-068-04BBD1	NDSWC 5229	362	--	--	--	09/14/1977	--	--	U	--	--	--	2009
130-068-04BBD2	NDSWC 5229A	102	100	97	1.25	09/14/1977	4.65	10/05/1977	U	112BGFV	1000	9.0	2009
130-068-10ACC	HOFFMAN, MARVIN	37	37	--	18	08/26/1974	8.33	07/25/1975	S	112BGFV	485	8.5	--
130-068-11BCB1	NDSWC 9784	140	--	--	--	09/21/1976	--	--	U	--	--	--	1991
130-068-11BCB2	NDSWC 9784A	40	36	34	1.25	09/21/1976	4.35	10/05/1976	U	112OTSH	800	7.0	1991
130-068-19CAD1	NITSCHKE, RUDOLPH	135	135	--	24	1930	--	--	S,H	--	1130	8.5	--
130-068-19CAD2	NITSCHKE, RUDOLPH	180	180	--	4	05/ /1975	40.00	05/ /1975	S	--	1090	9.5	--
130-068-20CDD	NDSWC 9788	120	--	--	--	09/23/1976	--	--	U	--	--	--	1991
130-068-22DCD	NITSCHKE, ARTHUR	140	140	120	4	10/20/1974	100.00	10/20/1974	U	--	--	--	--
130-068-22DDC	NITSCHKE, ARTHUR	25	25	--	40	1940	17.00	--	S,H	--	1510	8.0	--
130-068-22DDD	NITSCHKE, ARTHUR	47	47	--	18	04/16/1974	8.00	04/16/1974	U	--	--	--	--
130-068-24AAA	NDSWC 5212	142	100	97	1.25	09/01/1977	19.05	10/05/1977	U	112BGFV	1600	--	1955
130-068-24AAC	SCHLABSZ, GARY	147	147	--	6	09/ /1974	2.00	09/ /1974	S,H	--	1370	10.0	--
130-068-26BBB	NDSWC 5213	122	--	--	--	09/06/1977	--	--	--	--	--	--	1912
130-068-26DCD	SCHAUER, EDWIN	28	28	--	24	1969	24.00	1969	S	--	1790	9.0	--
130-068-30BBA1	NITSCHKE, ROLAND	150	--	--	--	10/14/1976	--	--	U	--	--	--	--
130-068-30BBA2	NITSCHKE, ROLAND	200	200	--	4	10/19/1976	60.00	10/19/1976	S	--	1600	8.0	--
130-068-31CAD	REUTHER, CLARENCE	120	120	--	--	--	10.00	--	S,H	--	1400	11.0	--
130-068-32DDD	NDSWC 5118	122	--	--	--	08/25/1977	--	--	--	--	--	--	1957
130-068-33CCD1	MAIER, THEODORE	140	140	--	6	1965	--	--	S,H	--	1100	8.5	--
130-068-33CCD2	MAIER, THEODORE	25	25	--	24	1950	--	--	S	--	1430	8.5	--
130-068-35ABA	SCHAUER, EDWIN	26	26	--	10	1951	23.00	--	H	--	2010	11.0	--
130-068-36ADA	NDSWC 9626	280	--	--	--	07/14/1976	--	--	U	--	--	--	1959
130-069-06ABB	NDSWC 5226	182	80	77	1.25	09/13/1977	28.73	10/13/1977	U	112BGFV	1300	--	2033
130-069-06DAC	STROBEL, ENOCH	80	80	--	24	1967	26.12	07/24/1975	S	--	1210	8.0	--
130-069-07CDD	SCHOCK, DENNIS	94	94	--	24	06/11/1975	60.00	06/11/1975	S	--	--	--	--
130-069-07DDD	NDSWC 5227	162	130	127	1.25	09/13/1977	57.71	10/13/1977	U	112BGFV	800	9.0	2047
130-069-09BDA1	ESZLINGER, JACOB	20	20	--	12	1905	--	--	S	--	890	9.0	--

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130-069-09BDA2	ESZLINGER, JACOB	29	29	--	18	11/02/1973	18.00		11/02/1973	S,H	112BGFV	610	9.0	--
130-069-09DAD1	NDSWC 9790	260	203	200	1.25	09/23/1976	20.36		10/05/1976	U	112BGFV	1100	8.0	2012
130-069-09DAD2	NDSWC 9790A	80	--	--	--	09/23/1976	--		--	U	--	--	--	2012
130-069-10BBB1	NDSWC 5216	202	--	--	--	09/07/1977	--		--	--	--	--	--	2024
130-069-10BBB2	NDSWC 5216A .	80	76	73	1.25	09/07/1977	13.39		10/05/1977	U	112BGFV	850	--	2024
130-069-10BCD	TSCHETTER, DELANE	12	12	--	36	1963	--		--	S,H	--	1500	7.0	--
130-069-14ADD	HELFENSTEIN, RUBEN	56	56	56	15	10/27/1976	15.00		10/27/1976	S,H	--	2800	--	--
130-069-14CBB	NDSWC 9789	220	--	--	--	09/23/1976	--		--	U	--	--	--	2063
130-069-14DAD	HELFENSTEIN, RUBEN	135	135	--	24	1968	--		--	S	--	2250	--	--
130-069-16DDD	NDSWC 5215	182	--	--	--	09/07/1977	--		--	--	--	--	--	2016
130-069-19BCC	NDSWC 1563	116	--	--	--	--	--		--	U	--	--	--	1990
130-069-19CCC	NDSWC 9667	180	--	--	--	07/29/1976	--		--	U	--	--	--	2006
130-069-19DAA	HELFENSTEIN, RUBEN	109	109	--	36	1923	--		--	S,H	--	1400	--	--
130-069-19DAD	BENDER, JOHN	20	20	--	24	1925		F	--	S,H	112BGFV	710	8.5	--
130-069-19DDD	NDSWC 9666	160	--	--	--	07/29/1976	--		--	U	--	--	--	1950
130-069-21BBB1	NDSWC 5228	223	180	177	1.25	09/13/1977	54.02		10/13/1977	U	112BGFV	1200	--	2033
130-069-21BBB2	NDSWC 5228A	102	100	97	1.25	09/13/1977	53.35		10/13/1977	U	112BGFV	1300	--	2033
130-069-22DDD	NDSWC 5214	202	176	173	--	09/06/1977	42.17		10/05/1977	U	112BGFV	1500	9.0	2022
130-069-24CDD1	NITSCHKE, C.G.	130	130	--	24	1918	40.00		--	S,H	--	3300	9.0	--
130-069-24CDD2	NITSCHKE, C.G.	140	140	--	4	1967	40.00		--	S	--	1270	8.0	--
130-069-24CDD3	NITSCHKE, C.G.	130	130	--	4	06/ /1975	40.00		06/ /1975	S	--	2140	9.0	--
130-069-30CBB	NDSWC 9668	180	137	134	1.25	07/29/1976	82.60		08/03/1976	U	112BGFV	1730	9.5	1998
130-069-30CCC1	NDSWC 1565	264	--	--	--	--	--		--	U	--	--	--	2004
130-069-30CCC2	NDSWC 9747	300	--	--	--	08/25/1976	--		--	U	--	--	--	2004
130-069-30CDC	ASHLEY	218	--	--	--	08/25/1974	--		--	--	--	--	--	--
130-069-30DCC	ASHLEY 3	170	170	156	10	01/30/1975	82.61	S	07/02/1975	U	112BGFV	1220	8.0	--
130-069-30DCD	ASHLEY	192	--	--	--	08/30/1974	--		--	U	--	--	--	--
130-069-30DDC1	NDSWC 1566	178	--	--	--	--	--		--	U	--	--	--	--
130-069-30DDC2	ASHLEY	182	--	--	--	08/30/1974	--		--	--	--	--	--	--
130-069-30DDD	NDSWC 9665	220	191	188	1.25	07/28/1976	105.75		08/03/1976	U	112BGFV	1220	9.0	2014
130-069-31BAB	ASHLEY 2	182	182	--	--	1948	50.00		--	P	112BGFV	1080	9.0	--
130-069-31CCC	NDSWC 1570	189	--	--	--	--	--		--	U	--	--	--	1991
130-069-31DDC	NDSWC 1569	231	--	--	--	--	--		--	U	--	--	--	--
130-069-32BCB	DOCKTER, MILBERT	220	220	180	4	11/07/1973	100.00		--	H	--	910	--	2024
130-069-33AAA1	NDSWC 9664	220	--	--	--	07/28/1976	--		--	U	--	--	--	1973
130-069-33AAA2	NDSWC 9664A	60	46	43	1.25	07/28/1976	21.13		08/03/1976	U	112BGFV	1810	8.5	1973
130-069-33DAB	NDSWC 1568	158	--	--	--	--	--		--	U	--	--	--	1975
130-069-34CDC1	WALZ, ALVIN	36	36	--	24	1963	31.00		--	S,H	--	940	12.0	--
130-069-34CDC2	WALZ, ALVIN	30	30	--	24	1957	25.00		--	S,H	--	940	12.0	--
130-069-35AAA1	NITSCHKE, RICHARD	8	8	--	72	1957	2.00		--	S,H	--	1030	9.5	--

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130-069-35AAA2	NITSCHKE, RICHARD	50	50	--	24	1968	18.00		--	S	--	1200	8.5	--
130-069-36DDD	NDSWC 9522	180	--	--	--	12/09/1975		F	--	U	--	--	--	1919
130-070-01DDC	KOST, EDWIN	25	25	--	30	1963	17.00		--	S,H	--	770	8.5	--
130-070-02CCC	NDSWC 9671	180	118	115	1.25	07/29/1976	22.30+		09/14/1976	U	112BGFV	850	9.0	1968
130-070-06AAB	GROSZHANS, ROMAN	47	47	43	24	10/31/1974	38.00		10/31/1974	S,H	112BGFV	700	--	--
130-070-06AAC	GROSZHANS, ROMAN	20	--	--	--	10/09/1972	14.00		10/09/1972	U	--	--	--	--
130-070-07AAA	NDSWC 9678	120	--	--	--	08/04/1976	--		--	U	--	--	--	2077
130-070-09ACB	KASEMAN, WAYNE	23	22	--	--	09/30/1974	11.00		09/30/1974	S,H	--	950	10.0	--
130-070-12BBB	NDSWC 9670	60	--	--	--	07/29/1976		D	--	U	--	--	--	2104
130-070-13AAA	NDSWC 1562	115	--	--	--	--	--		--	U	--	--	--	2054
130-070-13CCB1	ISZLER, RAYMOND	36	36	--	24	1952	12.13		07/23/1975	U	--	570	9.0	--
130-070-13CCB2	ISZLER, RAYMOND	60	60	--	36	1956	6.00		--	H	--	560	8.5	--
130-070-16AAA	NDSWC 9680	40	--	--	--	08/04/1976	--		--	U	--	--	--	1983
130-070-17CDA	SCHNABEL, HARLEY	45	--	--	24	10/03/1973	15.00		10/03/1973	U	--	--	--	--
130-070-17CDC	SCHNABEL, HARLEY	26	26	--	24	1945	8.00		--	S,D	--	1900	--	--
130-070-17DDA	SCHNABEL, HARLEY	60	60	--	24	10/02/1972	20.00		10/02/1972	S,H	112BGFV	2010	9.0	--
130-070-23ADA	NDSWC 9669	140	--	--	--	07/29/1976	--		--	U	--	--	--	2074
130-070-23CDD	NDSWC 1574	148	--	--	--	--	--		--	U	--	--	--	--
130-070-25AAA	NDSWC 1564	189	--	--	--	--	--		--	U	--	--	--	--
130-070-26CCC	NDSWC 1575	158	--	--	--	--	--		--	U	--	--	--	1985
130-070-28ADD	NDSWC 9683	80	--	--	--	08/04/1976	--		--	U	--	--	--	1972
130-070-29BBB	NDSWC 1567	179	--	--	--	--	--		--	U	--	--	--	2023
130-070-30ADA	NDSWC 9681	140	--	--	--	08/04/1976	--		--	U	--	--	--	2015
130-070-33CAA	NDSWC 1573	115	--	--	--	--	--		--	U	--	--	--	1989
130-070-33CAC	KRAEMER, WALTER	100	100	--	24	1940	19.23		07/31/1975	S	--	2110	8.5	--
130-070-33DAA	KRAEMER, WALTER	50	50	--	24	1940	30.00		--	S,H	--	675	9.5	--
130-070-36BBB	NDSWC 1576	168	--	--	--	--	--		--	U	--	--	--	1999
130-071-02ACD1	PFEIFLE, OSCAR	20	20	--	10	1955	--		--	H	--	495	9.5	--
130-071-02ACD2	PFEIFLE, OSCAR	40	40	--	24	06/ /1945	20.00		--	S	--	610	8.0	--
130-071-03DDD	NDSWC 5246	182	61	58	1.25	09/29/1977	21.90		10/14/1977	U	112BGFV	580	8.0	2093
130-071-05BDC	KASEMAN, MELVIN	55	55	--	24	1940	40.00		--	S	--	720	8.0	--
130-071-05BDD	KASEMAN, MELVIN	53	53	--	24	1959	38.00		--	S,H	--	710	--	--
130-071-05CCC	NDSWC 5167	162	--	--	--	08/11/1977	--		--	--	--	--	--	2138
130-071-08CBB	NDSWC 5165	142	--	--	--	08/10/1977	--		--	--	--	--	--	2116
130-071-09AAA	NDSWC 5166	242	--	--	--	08/11/1977	--		--	--	112BGFV	--	--	2117
130-071-09BBB	NDSWC 9686	100	66	63	1.25	08/05/1976	8.39		08/10/1976	U	112BGFV	650	7.5	2114
130-071-12DDC1	PFEIFLE, HELMUTH	57	57	--	24	1918	37.00		--	S	--	1360	7.5	--
130-071-12DDC2	PFEIFLE, HELMUTH	57	57	--	10	1918	32.00		--	H	--	820	9.5	--
130-071-13BAA	NDSWC 9679	80	--	--	--	08/04/1976	--		--	U	--	--	--	2038
130-071-17CAC	ZIMMERMAN, ALVIN	77	77	--	18	1951	64.00		--	S,H	--	800	9.0	--

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130-071-19DCD	DOLLINGER, EDWIN	78	78	--	24	05/06/1972	--	--	U	--	--	--	--
130-071-20DDD	NDSWC 9685	180	93	87	1.25	08/05/1976	69.67	08/10/1976	U	211FXHL	1080	--	2175
130-071-23ACC	DOCKTER, MELVIN	84	84	--	24	1925	--	--	S	--	750	9.0	--
130-071-23CCC	DOCKTER, MELVIN	64	64	--	24	1956	48.00	--	S,H	--	760	10.0	--
130-071-25CDD	DOCKTER, EMIL	96	94	--	6	1946	5.00	--	S	--	1420	8.0	--
130-071-26BBA	NDSWC 5247	142	--	--	--	09/29/1977	--	--	--	--	--	--	--
130-071-33BBC	MILLER, DAVID	68	68	--	24	1970	28.00	--	H	--	2370	9.0	--
130-071-33BCA	MILLER, DAVID	76	76	72	24	06/04/1976	55.00	06/04/1976	S	--	--	--	--
130-071-33BCB	MILLER, DAVID	98	98	--	24	1966	30.40	07/11/1975	S	--	1070	8.0	--
130-071-33DAD	NORMAN, GLEN	160	160	--	5	10/ /1974	50.00	10/ /1974	S,H	--	660	13.0	--
130-072-02ACC	SCHILLING, DELMAR	170	170	130	4	07/13/1972	70.00	07/13/1972	S,H	211FXHL	640	--	--
130-072-02DDD	NDSWC 5162	182	--	--	--	08/10/1977	--	--	--	--	--	--	2152
130-072-03BBB	KASEMAN, HOWARD	45	45	--	24	10/13/1973	18.00	10/13/1973	S	211FXHL	760	8.0	--
130-072-04AAA	KASEMAN, HOWARD	60	60	--	24	1961	14.89	07/22/1975	S	--	1990	10.0	--
130-072-07DAC	MEIDINGER, PAUL	50	--	--	18	1971	45.00	--	U	--	1200	8.0	--
130-072-07DBA	MEIDINGER, PAUL	55	55	--	24	06/25/1974	34.00	06/25/1974	S,H	--	518	9.0	--
130-072-07DCA	MEIDINGER, PAUL	50	50	--	24	06/30/1973	30.00	06/30/1973	S	--	--	--	--
130-072-08AAA	NDSWC 9693	60	--	--	--	08/06/1976	--	--	U	--	--	--	2074
130-072-10ABD	WIEST, ALVIN	85	85	--	24	09/21/1972	65.00	09/21/1972	S,H	211FXHL	432	9.0	--
130-072-13ABC	WIEST, CLARENCE	200	200	--	8	1973	--	--	Z,S	--	670	9.0	--
130-072-13ABD	WIEST, CLARENCE	56	--	--	24	10/05/1973	21.00	10/05/1973	U	--	--	--	--
130-072-20AOC	SCHUMACHER, JOHN	100	100	--	6	1964	89.00	--	S,H	--	740	9.0	--
130-072-20DDD	NDSWC 5180	162	--	--	--	08/17/1977	--	--	--	--	--	--	2003
130-072-22CCC	NDSWC 9695	140	--	--	--	08/06/1976	--	--	U	--	--	--	2001
130-072-23AAB	NDSWC 9694	100	--	--	--	08/06/1976	--	--	U	--	--	--	1988
130-072-23CCD	KNOLL, GORDON	80	80	--	24	1971	--	--	S	--	780	10.5	--
130-072-28CCA	SCHUMACHER, JOHN	50	50	--	36	1925	--	--	S,H	--	1470	8.5	--
130-072-29CCC	NDSWC 5249	242	171	168	1.25	09/29/1977	147.45	10/14/1977	U	--	--	--	2142
130-072-30BCC	NDSWC 5248	18	--	--	--	09/29/1977	--	--	--	--	--	--	--
130-072-31BBB	NDSWC 5169	82	--	--	--	08/11/1977	--	--	--	--	--	--	--
130-072-33DDD	NDSWC 9645	140	--	--	--	07/21/1976	--	--	U	--	--	--	1956
130-072-34DDD1	NDSWC 5181	50	--	--	--	08/17/1977	--	--	--	--	--	--	1969
130-072-34DDD2	NDSWC 5181A	162	--	--	--	08/18/1977	--	--	--	--	--	--	1969
130-072-36CCC1	KNOLL, WILBUR	140	140	--	24	1935	--	--	S,H	--	1040	10.0	--
130-072-36CCC2	KNOLL, WILBUR	150	149	149	24	04/03/1976	120.00	04/03/1976	S	--	--	--	--
130-073-01AAA	NDSWC 5160	142	56	53	1.25	08/09/1977	13.03	09/06/1977	U	112DTSH	440	--	2037
130-073-01DDD	NDSWC 5161	142	--	--	--	08/10/1977	--	--	U	--	--	--	2068
130-073-02BBB	KETTERLING, GOTTLIEB	44	44	--	24	07/24/1972	34.00	07/24/1972	S	112BGFV	655	9.0	--
130-073-02CCC	NDSWC 9702	140	--	--	--	08/10/1976	--	--	U	--	--	--	2030
130-073-05AAA1	NDSWC 9699	80	--	--	--	08/09/1976	--	--	U	--	--	--	1998

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130-073-05AAA2	NDSWC 9699A	40	23	20	1.25	08/09/1976	7.38	08/18/1976	U	112BGFV	920	8.0	1998
130-073-06ACD	DOCKTER, HARRY	40	40	--	24	1920	25.00	07/ /1974	S,H	--	760	--	--
130-073-07ABB	NDSWC 9698	80	13	10	1.25	08/09/1976	--	09/15/1976	U	--	--	--	2022
130-073-07DAC1	SCHUMACHER, THOMAS	49	--	--	--	07/31/1975	30.00	07/31/1975	U	--	--	--	--
130-073-07DAC2	SCHUMACHER, THOMAS	80	80	--	24	06/ /1976	45.00	06/ /1976	S	--	655	10.5	--
130-073-09CAB1	BRANDNER, MILTON	64	64	--	24	1875	34.00	--	S	--	560	9.0	--
130-073-09CAB2	BRANDNER, MILTON	100	100	60	4	09/16/1974	50.00	09/16/1974	H	--	1280	8.5	--
130-073-09CCC	NDSWC 5174	182	--	--	--	08/16/1977	--	--	U	--	--	--	2015
130-073-10DDD	NDSWC 5173	142	--	--	--	08/16/1977	--	--	U	--	--	--	2032
130-073-11BCB	KETTERLING, HENRY	35	35	--	24	07/21/1972	--	--	U	112BGFV	--	--	--
130-073-11BDC	KETTERLING, HENRY	84	84	--	24	04/30/1974	60.00	04/30/1974	S	112BGFV	515	8.5	--
130-073-15ADC	KETTERLING, RAYMOND	110	110	--	4	1970	50.00	--	H,S	--	750	8.5	--
130-073-19BBB1	WERLINGER, FRANCES	160	160	--	8	1960	157.00	06/ /1974	H	--	960	--	--
130-073-19BBB2	WERLINGER, FRANCES	170	170	--	18	1964	165.00	06/ /1974	S	--	1810	8.0	--
130-073-23CAC1	WOLFF, HARRY	100	100	--	24	1955	23.02	07/18/1975	S	--	2690	9.0	--
130-073-23CAC2	WOLFF, HARRY	150	150	--	4	1970	--	--	H	--	605	8.5	--
130-073-24AAA	NDSWC 5168	202	--	--	--	08/11/1977	--	--	U	--	--	--	2098
130-073-26BCA	WOLFF, HARRY	180	180	--	4	1960	--	--	S	--	840	9.0	--
130-073-27AAA	NDSWC 9696	160	121	118	1.25	08/06/1976	86.99	08/10/1976	U	112BGFV	800	--	2007
130-073-27DCA	FEIST, BERNARD	180	180	--	8	1968	--	--	S,H	--	750	8.5	--
130-073-29AAA	NDSWC 9697	140	118	115	1.25	08/09/1976	1.37+	09/15/1976	U	112BGFV	770	--	1976
130-073-29BDB	ENGELHARDT, JOHN	50	50	--	24	1930	16.00	--	S,H	--	640	11.5	--
130-073-30BBB	NDSWC 5175	102	--	--	--	08/16/1977	--	--	U	--	--	--	2009
130-073-34DDD	NDSWC 5171	42	--	--	--	08/15/1977	--	--	U	--	--	--	1964
130-073-35DAA1	MEIER, ADAM	145	145	--	4	1962	--	--	S,D	--	1150	10.0	--
130-073-35DAA2	MEIER, ADAM	150	150	--	4	1969	--	--	H	--	920	9.5	--
130-073-36DDD1	NDSWC 5170	162	--	--	--	08/12/1977	--	--	U	--	--	--	2140
130-073-36DDD2	NDSWC 5170A	262	174	171	1.25	08/12/1977	142.09	09/06/1977	U	112BGFV	--	--	2140
131-067-01BBA	KUSLER, WALTER	45	45	--	6	1935	--	--	S,H	--	2600	9.0	--
131-067-05CDC1	ULRICH, CYRUS	110	110	80	4	07/06/1973	88.75	08/12/1975	U	--	--	--	--
131-067-05CDC2	ULRICH, CYRUS	81	81	--	4	05/26/1975	--	--	S,H	--	1790	--	--
131-067-13BBB1	NDSWC 9778	50	--	--	--	09/16/1976	--	--	U	--	--	--	1927
131-067-13BBB2	NDSWC 9778A	320	--	--	--	09/16/1976	--	--	U	--	--	--	1927
131-067-13BBB3	NDSWC 9778B	80	67	61	1.25	09/16/1976	2.30+	10/05/1976	U	112BGFV	2100	7.0	1927
131-067-15BBB	WOEHL, RAYMOND	550	550	--	--	07/24/1973	D	--	U	--	--	--	--
131-067-19ABC	LIESKE, BENJAMIN	118	118	--	4	1964	19.61	08/12/1975	S,H	--	2660	8.0	--
131-067-21CCC	NDSWC 9781	340	--	--	--	09/20/1976	--	--	U	--	--	--	1977
131-067-23CAD	REINKE, HERBERT	45	45	--	24	1969	--	--	S,H	--	550	8.0	--
131-067-26DAA	NDSWC 9777	280	--	--	--	09/15/1976	--	--	U	--	--	--	1934
131-067-28AAB	MEIDINGER, LEONARD	90	90	--	24	1930	60.00	1970	S,H	--	1800	9.0	--

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131-067-31CBB	FRANZ, ERIE	136	136	--	4	1940	--		--	S,H	--	855	8.0	--
131-067-35ACC	FRANZ, ARTHUR	6	6	--	48	1915		F	--	S,H	112OTSH	990	8.0	--
131-068-01DCA	ULRICH, CYRUS	280	280	--	6	1955	--		--	S	--	1110	10.0	--
131-068-02AAD1	HARR, ADAM	210	210	--	6	1947	--		--	S,H	--	990	9.0	--
131-068-02AAD2	HARR, ADAM	15	15	--	24	1967	2.00		--	S,H	--	1260	10.5	--
131-068-06DCC	NDSWC 9765	260	--	--	--	09/01/1976	--		--	U	--	--	--	2021
131-068-07BBA	OLSEN, ELMER	105	105	--	24	1957	52.50		--	S,H	--	1430	11.0	--
131-068-13DAD1	GOEHRING, EPHRAIM	20	20	--	24	1935	5.00		--	S	--	2190	10.0	--
131-068-13DAD2	GOEHRING, EPHRAIM	90	90	--	4	1965	--		--	S,H	--	1860	--	--
131-068-14BAB1	NDSWC 9786	340	--	--	--	09/02/1976	--		--	U	--	--	--	1932
131-068-14BAB2	NDSWC 9786A	90	84	81	1.25	09/22/1976	.76		04/12/1977	U	112BGFV	1600	7.5	1932
131-068-22DCC	MEIDINGER, NORMAN	21	21	--	--	--	7.50		08/11/1975	U	--	--	--	--
131-068-23AAD	NDSWC 9785	300	--	--	--	09/02/1976	--		--	U	--	--	--	1976
131-068-28DAA1	NITSCHKE, HERBERT	60	60	--	24	1963	--		--	S,H	--	1820	8.0	--
131-068-28DAA2	NITSCHKE, HERBERT	65	65	--	--	--	--		--	S	--	1410	8.0	--
131-068-31DCC	SCHOCK, MARVIN	81	80	--	24	1915	60.00		1974	S,H	--	1330	8.0	--
131-068-34CBB	NDSWC 9787	400	213	210	1.25	09/22/1976	31.51		10/05/1976	U	112BGFV	1550	--	2029
131-068-35BBB	MEIDINGER, NORMAN	63	63	--	24	1945	15.50		08/11/1975	S	--	1510	8.0	--
131-068-35BBD	MEIDINGER, NORMAN	27	27	23	24	09/20/1974	8.00		09/20/1974	S,H	112OTSH	1620	--	--
131-069-03CBB	LANG, LESTER	106	106	106	15	12/29/1972	35.00		12/29/1972	S	112BGFV	1730	9.0	--
131-069-07DDD	NDSWC 9760	180	--	--	--	08/30/1976	--		--	U	--	--	--	2147
131-069-08BAB	SPITZER, ARTHUR	28	28	--	10	1925	8.00		--	S,H	--	555	8.5	--
131-069-11BAA	WOLF, MARVIN	75	75	--	6	1930	59.25		08/08/1975	S,H	--	1150	--	--
131-069-11BAD	WOLF, MARVIN	97	97	97	18	08/30/1973	46.47		08/08/1975	S	112BGFV	820	8.5	--
131-069-13CDC	FREY, GIDEON	49	49	--	24	1925	40.12		08/08/1975	S,H	--	1090	9.0	--
131-069-13DDD	NDSWC 5220	142	--	--	--	09/09/1977	--		--	U	--	--	--	2055
131-069-19BAC	KOST, JACOB	35	35	--	24	1940	5.00		--	S,H	--	1090	10.0	--
131-069-21DDD	WETZEL, WALWIN	42	42	--	24	1962	17.50		08/08/1975	S,H	--	1700	12.0	--
131-069-22DCD1	NDSWC 9791	220	--	--	--	09/23/1976	--		--	U	--	--	--	2025
131-069-22DCD2	NDSWC 9791A	160	153	150	1.25	09/23/1976	11.83		10/05/1976	U	112BGFV	1650	8.0	2025
131-069-25CCC	HOFFMAN, GARY	40	40	--	24	1963	26.17		08/08/1975	S,H	--	1300	10.5	--
131-069-26ADD	NDSWC 5219	182	111	108	1.25	09/08/1977	38.62		10/05/1977	U	112BGFV	1300	--	2044
131-069-28CAA	WEBER, CLARENCE	28	28	--	24	1967	25.90		08/08/1975	S	--	910	8.0	--
131-069-31DDB	STROBEL, ENOCH	70	70	--	24	1963	30.00		--	S	--	1230	8.0	--
131-069-32CCC	NDSWC 5225	50	--	--	--	09/12/1977	--		--	U	--	--	--	2036
131-069-33BDA	WEBER, CLARENCE	85	85	--	36	1936	55.00		--	S,H	--	830	--	--
131-069-33BDB	WEBER, CLARENCE	14	14	--	24	1920	5.00		--	S	--	1200	6.5	--
131-069-34CBB1	NDSWC 5217	202	--	--	--	09/08/1977	--		--	--	--	--	--	2048
131-069-34CBB2	NDSWC 5217A	42	33	30	1.25	09/08/1977		D	10/05/1977	U	--	--	--	2048
131-069-35ADA	NDSWC 5218	162	76	73	--	09/08/1977	10.87		10/05/1977	U	112OTSH	--	--	1999

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131-070-02CCB	WALZ, EDWIN	--	9	--	36	--	0.59+		08/26/1976	S	112OTSH	600	7.0	--
131-070-04CCB	NDSWC 9749	120	--	--	--	08/25/1976	--		--	U	--	--	--	2000
131-070-05BBB	NDSWC 9752	80	33	30	1.25	08/26/1976	5.17		09/02/1976	U	112BGFV	700	--	2009
131-070-06ACC	ULMER, CLARENCE	90	90	--	8	1875	30.00		--	S,H	--	760	8.5	--
131-070-07DDD	NDSWC 9748	140	--	--	--	08/25/1976	--		--	U	--	--	--	2029
131-070-09BCC	THURN, ARTHUR	27	27	--	6	02/14/1944	27.00		02/14/1944	S,H	--	418	10.0	--
131-070-10AAB	NDSWC 9751	140	--	--	--	08/25/1976	--		--	U	--	--	--	2046
131-070-10BBB1	NDSWC 9750	140	--	--	--	08/25/1976	--		--	U	--	--	--	2035
131-070-10BBB2	NDSWC 9750A	40	31	28	1.25	08/25/1976	18.09	Z	08/26/1976	U	112DTSH	740	8.0	2035
131-070-14BDC	RETZER, JULIUS	55	55	--	6	1965	12.00		--	S,H	--	740	9.0	--
131-070-20DDC	NDSWC 9675	140	--	--	--	08/03/1976	--		--	U	--	--	--	2002
131-070-21BAA	MARTZ, THOMAS	100	100	--	4	1945	--		--	S,H	--	600	8.5	--
131-070-21DDD	NDSWC 9674	120	66	63	1.25	08/03/1976	26.00		08/10/1976	U	112BGFV	1250	9.0	2030
131-070-23DDD	ESZLINGER, JOHN	65	65	--	24	1948	50.00		--	S,H	--	1280	9.0	--
131-070-24BBB	NDSWC 9673	180	--	--	--	08/03/1976	--		--	U	--	--	--	2049
131-070-24CDD	NDSWC 5222	162	--	--	--	09/09/1977		F	--	U	112BGFV	--	--	1998
131-070-25AAB	NDSWC 5221	202	--	--	--	09/09/1977	--		--	U	--	--	--	2055
131-070-26BBB	NDSWC 5224	182	--	--	--	09/12/1977	--		--	U	--	--	--	2058
131-070-28BBC1	MERKEL, MILTON	12	12	--	6	1957	4.00		--	S	--	1200	--	--
131-070-28BBC2	MERKEL, MILTON	12	12	8	24	10/08/1974	4.00		10/08/1974	S,H	112OTSH	820	--	--
131-070-29BBA	NDSWC 9677	100	--	--	--	08/04/1976	--		--	U	--	--	--	2032
131-070-30BAA	NDSWC 9676	100	--	--	--	08/03/1976	--		--	U	--	--	--	1995
131-070-31DDD	MILLER, PAUL	12	12	--	24	10/07/1972	2.00		10/02/1972	S	112OTSH	1300	9.0	--
131-070-32CCB	MILLER, PAUL	35	35	--	24	1967	8.00		1967	S,H	--	850	--	--
131-070-32CCC	MILLER, PAUL	34	34	31	18	12/03/1974	5.00		12/03/1974	S	--	2010	7.5	--
131-070-34ABB	NDSWC 5223	142	--	--	--	09/12/1977	--		--	U	--	--	--	1999
131-070-35ADD	NDSWC 9672	80	--	--	--	07/03/1976	--		--	U	--	--	--	1989
131-071-02BBB	ULMER, EMIL	60	60	--	24	10/02/1973	25.00		10/02/1973	S	--	2790	8.0	--
131-071-02DCD	NDSWC 9719	50	--	--	--	08/13/1976	--		--	U	--	--	--	2066
131-071-04DBA	BADER, ARTHUR	70	70	--	24	1958	36.00		09/ /1974	H	--	755	10.0	--
131-071-05ADA	DITMAR, HENRY	80	63	63	4	06/ /1975	50.00		06/07/1975	H	--	880	9.0	--
131-071-06BBB1	HOCHHALTER, WALTER	60	60	--	24	1967	30.00		1962	S	--	1500	8.5	--
131-071-06BBB2	HOCHHALTER, WALTER	70	70	--	6	1965	30.00		1965	H	--	428	10.0	--
131-071-07BBB1	NDSWC 5151	182	--	--	--	08/04/1977	--		--	U	--	--	--	2166
131-071-07BBB2	NDSWC 5151A	122	121	115	1.25	08/04/1977	58.42		09/16/1977	U	211FXHL	610	--	2166
131-071-08AAA	NDSWC 5150	182	--	--	--	08/04/1977	--		--	U	--	--	--	2189
131-071-12BBB1	ULMER, BEN	80	80	--	6	1945	--		--	S	--	980	8.5	--
131-071-12BBB2	ULMER, BEN	200	200	--	4	1968	--		--	S,H	--	1180	8.5	--
131-071-18DDC	WALTH, JACOB	35	35	--	24	07/03/1973	8.00		07/03/1973	S	112OTSH	585	9.0	--
131-071-21AAC	BENDER, ARTHUR	15	15	--	24	1960	12.00		1960	H	--	855	--	--

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131-071-21ADB	BENDER, ARTHUR	15	15	--	6	1964	12.00	--	S	--	1200	--	--
131-071-21CCD	NDSWC 9688	100	--	--	--	08/05/1976	--	--	U	--	--	--	2088
131-071-27BBB	NDSWC 9687	80	--	--	--	08/05/1976	--	--	U	--	--	--	2084
131-071-27BDD	FETZER, MELVIN	25	25	--	24	1968	9.81	08/06/1975	H	--	1290	10.0	--
131-071-27CCC	NDSWC 5164	82	--	--	--	08/10/1977	--	--	U	--	--	--	--
131-071-29BAB	NDSWC 9689	20	--	--	--	08/05/1976	--	--	U	--	--	--	2100
131-071-30CDD	WETZEL, HARLIN	90	90	--	6	1965	--	--	H	--	1630	--	--
131-071-30DCC	WETZEL, HARLIN	60	60	--	4	1971	--	--	S	--	690	9.0	--
131-071-34BCC	NDSWC 5163	102	--	--	--	08/10/1977	--	--	U	--	--	--	2091
131-072-02CCC1	NDSWC 5152	142	--	--	--	08/05/1977	--	--	U	--	--	--	2108
131-072-02CCC2	NDSWC 5152A	50	48	42	1.25	08/05/1977	23.48	09/06/1977	U	211FXHL	400	9.5	2108
131-072-07BBB	NDSWC 5154	122	--	--	--	08/08/1977	--	--	U	--	--	--	2085
131-072-08ACD	MEHLHOFF, BARLOW	35	--	--	24	07/19/1974	--	--	U	--	--	--	--
131-072-09BBB1	NDSWC 5153	82	--	--	--	08/05/1977	--	--	U	--	--	--	2054
131-072-09BBB2	NDSWC 5153A	22	21	18	1.25	08/05/1977	6.06	09/06/1977	--	1120TSH	925	8.5	2054
131-072-11CCC	RUDOLF, FERDINAND	60	--	--	--	02/11/1964			D U	--	--	--	--
131-072-12BAA	NEIS, WILBERT	140	140	100	4	11/12/1972	100.00	11/12/1972	S	211FXHL	405	--	--
131-072-14BBB1	NDSWC 9703	120	--	--	--	08/10/1976	--	--	U	--	--	--	2112
131-072-14BBB2	NDSWC 9703A	40	34	28	1.25	08/10/1976	11.05	08/18/1976	U	211FXHL	420	9.5	2112
131-072-18CDC	WOEHL, JULIUS	68	68	68	24	07/02/1974	33.00	07/02/1974	S	--	1200	8.0	--
131-072-19CDD	NDSWC 9692	100	--	--	--	08/05/1976	--	--	U	--	--	--	2026
131-072-20CCC	NDSWC 9691	120	26	23	1.25	08/05/1976	3.35	08/10/1976	U	1128GFV	960	9.5	2028
131-072-22BDD1	WALTH, FRED	30	30	--	24	1958	15.00	--	S	--	2850	8.0	--
131-072-22BDD2	WALTH, FRED	85	85	--	24	1962	61.00	--	H	--	1400	13.0	--
131-072-25CBB	GRUEBELE, WILLIAM	170	120	--	6	1971	112.00	07/ /1974	S,H	--	435	8.0	--
131-072-27AAA	NDSWC 9690	160	--	--	--	08/05/1976	--	--	U	--	--	--	2182
131-072-30BCC1	BOSCHEE, RUBIN	31	31	--	24	12/20/1974	8.00	12/20/1974	S	1120TSH	2000	7.0	--
131-072-30BCC2	BOSCHEE, RUBIN	34	34	--	24	07/12/1972	12.00	07/12/1972	S	1120TSH	700	7.5	--
131-072-30CBB	BOSCHEE, RUBIN	15	15	--	48	1926	12.50	--	H	--	1430	10.5	--
131-072-34CBA1	KASEMAN, ELMER	30	30	--	--	--	--	--	H	--	950	--	--
131-072-34CBA2	KASEMAN, ELMER	50	50	--	24	1941	--	--	S	--	2090	8.0	--
131-073-01BAB1	HERR, DWIGHT	48	48	--	24	1957	8.00	--	H	--	755	10.0	--
131-073-01BAB2	HERR, DWIGHT	48	48	--	24	1970	8.00	--	S	--	1220	7.5	--
131-073-07CCC	NDSWC 5158	122	--	--	--	08/09/1977	--	--	U	--	--	--	2016
131-073-08BBB	NDSWC 5157	142	40	37	1.25	08/09/1977	13.05	09/06/1977	U	1120TSH	600	9.0	2047
131-073-09CBC1	MEIDINGER, VICTOR	82	82	--	24	1959	63.98	07/30/1975	S,H	--	825	10.0	--
131-073-09CBC2	MEIDINGER, VICTOR	67	67	--	24	07/12/1972	62.26	07/30/1975	S,D	211FXHL	3050	--	--
131-073-10BBB	NDSWC 5156	182	19	16	1.25	08/08/1977	15.73	09/06/1977	U	1120TSH	--	--	2130
131-073-12BBA1	NDSWC 5155	102	--	--	--	08/08/1977	--	--	U	--	--	--	2054
131-073-12BBA2	NDSWC 5155A	102	5	2	1.25	08/08/1977	4.53	11/07/1977	U	1120TSH	--	--	2054

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131-073-17AAA	NDSWC 5159	202	--	--	--	08/09/1977	--		--	U	--	--	--	--
131-073-18BAB	MEIDINGER, WILBERT	65	65	--	24	1940	32.00		--	S	--	3600	8.0	--
131-073-19DBB1	WOEHLHAFF, ELMER	39	39	--	9	1970	--		--	S	--	620	8.0	--
131-073-19DBB2	WOEHLHAFF, ELMER	55	55	--	24	1972	--		--	H	--	700	--	--
131-073-21DDD1	MEIDINGER, ELLON	28	28	--	15	1915	17.55		07/31/1975	U	--	--	--	--
131-073-21DDD2	MEIDINGER, ELLON	124	60	--	6	07/ /1974	--		--	S,H	--	1570	9.0	--
131-073-22CCC	NDSWC 9700	120	--	--	--	08/10/1976	--		--	U	--	--	--	2046
131-073-23D8B	KETTERLING, ARNDT	47	47	47	24	07/27/1974	25.00		07/27/1974	S	211FXHL	1110	8.0	--
131-073-26ABB	MEIDINGER, ISADORE	37	37	37	24	07/29/1974	12.00		07/29/1974	S	211FXHL	3100	8.5	--
131-073-31ADA	DOCKTER, MELVIN	80	80	--	4	1970	--		--	S	--	735	8.5	--
131-073-32B8C1	DOCKTER, MELVIN	65	65	--	36	1950	--		--	S,H	--	610	9.0	--
131-073-32B8C2	DOCKTER, MELVIN	100	100	--	4	07/ /1974	69.02		07/31/1975	U	--	--	--	--
131-073-33BCC1	MEIDINGER, ARTHUR	47	47	--	15	09/ /1955	35.00		--	H	--	560	15.0	--
131-073-33BCC2	MEIDINGER, ARTHUR	60	60	--	24	05/11/1974	30.00		05/11/1974	S	112OTSH	575	9.0	--
131-073-33C8C	MEIDINGER, CLINTON	40	40	--	24	04/25/1974	20.00		04/25/1974	S,H	112OTSH	950	9.0	--
131-073-33C8D	MEIDINGER, CLINTON	25	25	--	24	1929	8.77		07/31/1975	S	--	--	--	--
131-073-34ACA	MEIDINGER, AARON	44	44	32	24	05/01/1976	32.00	P	05/01/1976	H	--	700	11.0	--
131-073-35BCC	NDSWC 9701	100	36	33	1.25	08/10/1976	14.99		08/18/1976	U	211FXHL	1180	--	2010
132-067-05DD8	JONAS, CARL	15	15	--	36	1968	5.00		--	S,H	--	840	10.0	--
132-067-10AAD	VOGEL, LAWRENCE	90	90	--	24	1935	86.00		1974	S,H	--	3250	11.0	--
132-067-11DDD	NDSWC 5237	342	--	--	--	09/22/1977	--		--	U	--	--	--	--
132-067-13BBA	OBERLANDER, LEROY	65	65	--	24	1952	--		--	S,H	--	1420	8.0	--
132-067-13DDD	NDSWC 5238	422	--	--	--	09/23/1977	--		--	U	--	--	--	--
132-067-14D0A1	NDSWC 5239	402	--	--	--	09/26/1977	--		--	U	--	--	--	2004
132-067-14D0A2	NDSWC 5239A	50	40	37	1.25	09/26/1977	13.12		10/05/1977	U	112OTSH	750	9.0	2004
132-067-16B8B	NDSWC 9769	340	--	--	--	09/09/1976	--		--	U	--	--	--	2000
132-067-20DCC	KLEIN, JAKE	50	50	--	48	1947	10.00		1944	S,H	--	1920	7.5	--
132-067-22DDA	NDSWC 9771	420	--	--	--	09/10/1976	--		--	U	--	--	--	1992
132-067-23B0A	ROLOFF, MARVIN	55	55	--	24	12/28/1974	8.26		08/22/1975	U	--	1000	--	--
132-067-23B0D	ROLOFF, MARVIN	29	29	--	24	12/31/1974	10.00		12/31/1974	S	--	--	--	--
132-067-23CCC	NDSWC 9770	110	--	--	--	09/09/1976	--		--	U	--	--	--	--
132-067-24AAB	HOLLAN, LEE	98	98	78	20	06/10/1976	32.36	R	06/14/1977	S,H	112BGFV	1800	8.0	--
132-067-31DCA1	HOFFMAN, FRED	98	98	--	24	1944	59.99		08/22/1975	S	--	1920	8.0	--
132-067-31DCA2	HOFFMAN, FRED	278	278	--	2	1964	--		--	S,H	--	1395	9.0	--
132-067-33CCC	NDSWC 9780	420	--	--	--	09/17/1976	--		--	U	--	--	--	2036
132-067-34B0D	KUNGEL, RICHARD	32	32	--	12	09/ /1974	12.00		09/ /1974	S,H	--	580	10.0	--
132-067-36DCC	NDSWC 9779	400	--	--	--	09/16/1976	--		--	U	--	--	--	1965
132-068-01DDD	DITTUS, LEVEORN	200	200	--	6	1930	25.00		--	S,H	--	1120	8.0	--
132-068-02DD01	NDSWC 9768	240	--	--	--	09/08/1976	--		--	U	--	--	--	2102
132-068-02DDD2	NDSWC 9768A	40	30	24	1.25	09/08/1976	11.75	Z	09/16/1976	U	112BGFV	840	7.5	2102

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132-068-03AAA	NDSWC 5240	262	155	152	1.25	09/26/1977	46.08		10/05/1977	U	112BGFV	950	8.0	2087
132-068-04BBB	NDSWC 5232	242	--	--	--	09/20/1977	--		--	U	--	--	--	2000
132-068-07BAA	BITTNER, DARREL	100	100	--	--	--	--		--	S,H	--	595	8.0	--
132-068-09DDC1	ENTZI, GEDION	50	50	1	24	09/11/1975	35.00		09/11/1975	H	--	1600	--	--
132-068-09DDC2	ENTZI, GEDION	34	34	--	--	--	25.00		1974	H	--	1395	9.0	--
132-068-14CAA	KETTERLING, EDWIN	40	40	36	3	04/09/1973	10.00		04/09/1973	S	112BGFV	515	7.5	--
132-068-14DDD1	NDSWC 9767	100	76	73	1.25	09/02/1976	6.72	Z	09/16/1976	U	112BGFV	1100	7.0	2062
132-068-14DDD2	NDSWC 9767A	100	--	--	--	09/02/1976	--		--	U	--	--	--	2062
132-068-14DDD3	NDSWC 9767B	40	--	--	--	09/07/1976	--		--	U	--	--	--	2062
132-068-16AAB	ENTZI, GEDION	49	49	--	24	1973	25.00		1974	S	--	1270	9.0	--
132-068-16DDD	NDSWC 5231	322	--	--	--	09/20/1977	--		--	U	--	--	--	2056
132-068-17BAA1	NDSWC 5233	322	--	--	--	09/21/1977	--		--	--	--	--	--	2046
132-068-17BAA2	NDSWC 5233A	42	27	24	1.25	09/21/1977	18.74		10/05/1977	U	112OTSH	--	--	2046
132-068-18BBB	NDSWC 5234	202	--	--	--	09/21/1977	--		--	U	--	--	--	2030
132-068-19BBB	NDSWC 9763	410	--	--	--	08/31/1976	--		--	U	--	--	--	2119
132-068-19BCB	KAUK, TED	32	32	--	2	1958	12.00		--	S	--	610	10.0	--
132-068-20CAB1	KAUK, TED	32	32	--	--	--	12.00		--	S	--	1100	10.0	--
132-068-20CAB2	KAUK, TED	32	32	--	24	1971	12.00		1971	H	--	1190	--	--
132-068-22CDA	FLEMMER, JACOB	63	63	--	24	07/10/1973	28.42		08/21/1975	S	112BGFV	1590	7.5	--
132-068-24AAA	ENTZI, HAROLD	260	260	240	4	08/26/1973	18.00		08/26/1973	S	112BGFV	2290	9.5	--
132-068-24CCC	NDSWC 5230	402	--	--	--	09/20/1977	--		--	U	--	--	--	2058
132-068-26DAD	STROBEL, CLAUDINA	48	48	--	--	--	5.00		1974	S,H	--	1790	8.0	--
132-068-28BBB	NDSWC 9766	340	--	--	--	08/02/1976	--		--	U	--	--	--	2019
132-068-28BDB1	LEPP, MARVIN	44	44	--	--	1960	27.73		08/20/1975	H	--	560	8.0	--
132-068-28BDB2	LEPP, MARVIN	15	15	--	24	1969	7.70		08/20/1975	U	--	--	--	--
132-069-01BBB	NDSWC 5235	182	101	98	1.25	09/21/1977	28.60		10/05/1977	U	112BGFV	1470	3.5	2086
132-069-03BDA	NAGEL, CLAYTON	104	104	84	4	04/13/1976	--		04/13/1976	H	112BGFV	--	--	--
132-069-03CAD1	NAGEL, CLAYTON	20	20	--	24	1965	10.00		--	H	--	470	10.0	--
132-069-03CAD2	NAGEL, CLAYTON	22	22	--	24	1965	10.00		--	S	--	515	8.5	--
132-069-04CCA	KOEPPLIN, THEODORE	60	42	--	4	04/08/1976	12.00		04/08/1976	H	112BGFV	670	9.0	--
132-069-05BAD	NDSWC 1100	310	--	--	--	--	--		--	U	--	--	--	--
132-069-05BBA	NDSWC 1105	150	--	--	--	--	--		--	U	--	--	--	--
132-069-05BBC	NDSWC 1115	190	--	--	--	--	--		--	U	--	--	--	--
132-069-05BCD	LEHR 1	240	240	--	--	1947	--		--	P	112BGFV	1300	9.5	--
132-069-05CAA	SPERLING, ELMER	220	--	--	--	--	106.67		07/03/1975	U	--	--	--	--
132-069-06BCA	NDSWC	100	--	--	--	--	--		--	U	--	--	--	--
132-069-06BDD	NDSWC 1107	160	--	--	--	--	--		--	U	--	--	--	--
132-069-06DAA	NDSWC 1106	360	--	--	--	--	--		--	U	--	--	--	2057
132-069-06DDD	NDSWC 1111	100	--	--	--	--	--		--	U	--	--	--	2034
132-069-08DDB1	BITTNER, HERBERT	25	25	--	--	--	--		--	S,H	--	3900	11.0	--

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132-069-08DDB2	BITTNER, HERBERT	65	65	--	24	05/23/1973	25.00		05/23/1973	U	--	--	--	--
132-069-11DCC	NDSWC 5236	302	266	263	1.25	09/22/1977	4.00+		11/11/1977	U	112BGFV	1800	9.0	2022
132-069-11DDA	NAGEL, HARVEY	100	100	80	4	04/12/1976	16.00		04/12/1976	S	112BGFV	735	8.0	--
132-069-12CCB	NAGEL, HARVEY	40	40	--	--	1973	--		--	H	--	550	10.5	--
132-069-17BBC	GOEBEL, EDNA	37	37	0	24	08/23/1975	20.00	P	08/23/1975	U	112BGFV	--	--	--
132-069-19AAC	KRANZLER, JAMES	180	180	--	--	--	--		--	S,H	--	1320	11.0	--
132-069-22BBB	NDSWC 9762	220	--	--	--	08/31/1976	--		--	U	--	--	--	2027
132-069-22DCB	FLEMMER, LEO	28	28	--	--	--	8.12		08/20/1975	H	--	1750	--	--
132-069-30DDD	NDSWC 9759	160	86	83	1.25	08/30/1976	16.40		09/15/1976	U	112BGFV	1900	7.5	2012
132-069-32BAC	GEORGE, RUBEN	120	120	--	--	1973	105.00		1973	S,H	--	1020	10.0	--
132-069-34CAA1	ZIMMERMAN, RAYMOND	80	80	--	15	08/06/1973	23.00		06/06/1973	H	112QTSH	3050	10.0	--
132-069-34CAA2	ZIMMERMAN, RAYMOND	97	97	--	18	08/07/1973	30.00		08/07/1973	S	--	1580	10.0	--
132-069-34CCC	NDSWC 9761	160	--	--	--	08/31/1976	--		--	U	--	--	--	2001
132-069-36AAA1	NDSWC 9764	320	--	--	--	09/01/1976	--		--	U	--	--	--	2023
132-069-36AAA2	NDSWC 9764A	40	29	26	1.25	09/01/1976	11.57		09/16/1976	U	112QTSH	540	7.5	2023
132-070-01ADA	NDSWC 1108	150	--	--	--	--	--		--	U	--	--	--	--
132-070-01BBD	NDSWC 1109	100	--	--	--	--	--		--	U	--	--	--	1984
132-070-01DDA	LEHR 2	80	80	--	--	1956	--		--	P	--	1010	--	--
132-070-02BCC	FEICHTNER, MARVIN	90	90	--	4	06/04/1974	20.00		06/04/1974	S	112BGFV	1180	9.0	--
132-070-07AAA	WOLFF, HARVEY	70	70	--	24	1930	40.00		--	S,H	--	770	--	--
132-070-12AAA	LEHR 2	80	80	--	--	1956	--		--	P	--	1010	10.0	--
132-070-07CCC	WOLFF, RICHARD	52	52	--	24	07/08/1975	20.00		07/08/1975	H	--	--	--	--
132-070-08CCB	NDSWC 5243	142	29	26	1.25	09/27/1977	22.10		10/05/1977	U	112QTSH	750	8.0	2082
132-070-10BDC	ZIEGENHAGEL, WALTER	100	100	--	24	1925	--		--	S,H	--	820	--	--
132-070-16BBB	NDSWC 5241	42	27	24	1.25	09/27/1977		D	10/05/1977	U	--	--	--	2107
132-070-16BBC	NDSWC 5242	42	--	--	--	09/27/1977	--		--	U	--	--	--	2090
132-070-17CCC1	NDSWC 9754	160	111	108	1.25	08/26/1976	17.89		09/02/1976	U	112BGFV	750	--	2068
132-070-17CCC2	NDSWC 9754A	80	66	63	1.25	08/26/1976	13.50		09/02/1976	U	112BGFV	740	7.0	2068
132-070-19BBB	NDSWC 9715	100	--	--	--	08/12/1976	--		--	U	--	--	--	2041
132-070-20BBA1	STEVAHN, ELMER	50	50	--	24	1940	--		--	S	--	5500	10.0	--
132-070-20BBA2	STEVAHN, ELMER	100	100	--	6	1968	8.00		05/ /1975	H	--	595	8.0	--
132-070-22BBB1	NDSWC 9756	220	164	158	1.25	08/26/1976	28.58		09/15/1976	U	211FXHL	800	--	2066
132-070-22BBB2	NDSWC 9756A	60	--	--	--	08/27/1976	--		--	U	--	--	--	2066
132-070-24BBC	KAUK, CALVIN	111	111	--	24	1955	--		--	S,H	--	1420	9.5	--
132-070-26DAB1	WERTH, JOHN	58	58	--	4	06/14/1974	56.28		08/19/1975	U	--	--	--	--
132-070-26DAB2	WERTH, JOHN	58	58	--	24	06/20/1974	55.00	Z	08/19/1975	U	--	--	--	--
132-070-26DCD	NDSWC 9758	160	--	--	--	08/27/1976	--		--	U	--	--	--	2099
132-070-28DDA	MAIER, EDWIN	28	28	--	24	1950	19.71		08/19/1975	S,H	--	1690	9.0	--
132-070-28DDC	NDSWC 9757	160	--	--	--	08/27/1976	--		--	U	--	--	--	2032
132-070-31AAA	NDSWC 9716	160	131	128	1.25	08/12/1976	22.10		08/17/1976	U	112BGFV	745	7.5	2028
132-070-31BBB	NDSWC 9753	80	61	58	1.25	08/26/1976	46.60	Z	09/02/1976	U	112BGFV	1620	8.0	2057

LOCAL NUMBER	OWNER	DEPTH DRILLED (FEET)	DEPTH OF WELL (FEET)	DEPTH TO FIRST OPENING (FEET)	CASING DIAMETER (INCHES)	DATE COMPLETED	WATER LEVEL (FEET)		DATE WATER LEVEL MEASURED	USE OF WATER	PRINCIPAL AQUIFER	SPECIFIC CONDUCTANCE (µMHO/CM @ 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
132-070-32CDB	PARK SERVICE	60	50	30	4	10/26/1973	9.00		10/26/1973	P	112BGFV	690	9.5	--
132-071-01DDD1	FETZER, WILLIAM	50	50	--	24	06/04/1974	20.00		06/04/1974	S	211FXHL	500	8.0	--
132-071-01DDD2	NDSWC 9755	120	64	58	1.25	08/26/1976	15.96	Z	09/15/1976	U	211FXHL	950	8.0	2084
132-071-04BAA	NDSWC 9713	40	16	13	1.25	08/12/1976	4.14		08/16/1976	U	112OTSH	810	8.0	1995
132-071-07DCD	KASEMAN, EDGAR	62	62	--	24	10/17/1972	20.00		--	S	--	1400	12.0	--
132-071-08CDB	WIEST, JULIUS	46	46	--	24	07/03/1972	--		--	H	--	1750	10.5	--
132-071-10BAA	NDSWC 9712	60	--	--	--	08/11/1976	--		--	U	--	--	--	2035
132-071-10CAA1	NDSWC 9711	80	--	--	--	08/11/1976	--		--	U	--	--	--	2012
132-071-10CAA2	NDSWC 9711A	20	19	16	1.25	08/11/1976	3.97		08/17/1976	U	112OTSH	775	6.5	2012
132-071-10CBD	WISHEK	118	115	--	8	06/01/1975	20.86	P	07/03/1975	P	112BGFV	850	8.5	--
132-071-13ABC1	MOECKEL, STANLEY	50	50	--	36	1954	--		--	H	--	418	--	--
132-071-13ABC2	MOECKEL, STANLEY	180	180	--	6	1965	--		--	S	--	2250	9.5	--
132-071-14BBB	BOSCHEE, RICHARD	45	45	45	24	02/20/1976	31.00		02/20/1976	S	112BGFV	775	--	--
132-071-14BBC1	NDSWC 9714	120	106	103	1.25	08/12/1976	36.21		08/17/1976	U	112BGFV	900	7.5	2039
132-071-14BBC2	NDSWC 9714A	40	36	33	1.25	08/12/1976	24.76		08/17/1976	U	112OTSH	850	--	2039
132-071-14DDD1	NDSWC 5244	182	121	118	1.25	09/27/1977	18.47		10/05/1977	U	112BGFV	650	8.0	2028
132-071-14DDD2	NDSWC 5244A	50	41	38	1.25	09/27/1977	12.60		10/05/1977	U	112OTSH	650	7.0	2028
132-071-15AAC	WISHEK	116	116	94	18	09/29/1962	29.00		09/29/1962	P	112BGFV	570	9.0	--
132-071-15ACA	WISHEK	46	46	--	120	1933	5.00		1933	P	112OTSH	600	9.0	--
132-071-16ACA	MARTELL, MIKE	100	100	--	24	01/10/1975	6.00		01/10/1975	U	--	--	--	--
132-071-18AAA	NDSWC 5149	102	--	--	--	08/04/1977	--		--	U	--	--	--	2046
132-071-20CAA	DEILE, ALLEN	70	70	--	24	1960	--		--	S,H	--	665	9.5	--
132-071-20CAD	DEILE, ALLEN	40	40	--	24	1970	--		--	S	--	740	9.0	--
132-071-22BBB	NDSWC 9710	80	--	--	--	08/11/1976	--		--	U	--	--	--	2002
132-071-22DBB	ACKERMAN, EDWARD	70	70	--	24	1963	52.50		--	S,H	--	640	10.5	--
132-071-22DBD	ACKERMAN, EDWARD	10	10	--	24	1970	5.00		--	S	--	1030	--	--
132-071-23DDD	NDSWC 5245	42	--	--	--	09/27/1977	--		--	U	--	--	--	--
132-071-25BCB	AIPPERSPACH, BENJAMIN	75	75	--	24	1959	45.00		1959	S,H	--	1200	--	--
132-071-25BCD	AIPPERSPACH, BENJAMIN	28	28	--	24	1969	21.00		--	S	--	1600	7.0	--
132-071-28AAA	GRUEBELE, CLAYTON	19	19	19	24	11/12/1975	8.00	P	11/12/1975	S	--	800	9.0	--
132-071-34BBB	NDSWC 9718	20	--	--	--	08/13/1976	--		--	U	--	--	--	2058
132-071-35ABA	NDSWC 9717	40	--	--	--	08/12/1976	--		--	U	--	--	--	2012
132-072-03DCB	DIEGEL, WALDEMAR	90	90	--	6	1963	--		--	H	--	650	9.0	--
132-072-04DDD	NDSWC 5148	362	--	--	--	08/04/1977	--		--	U	--	--	--	2088
132-072-08ACC	OEYLE, EDWIN	260	240	220	4	07/24/1973	140.00		07/24/1973	U	211FXHL	--	--	--
132-072-12CCC	BROSY, ELMER	84	84	--	4	1959	54.00		1959	S,H	--	1000	8.5	--
132-072-18BAD	JUST, HERBERT	210	210	--	--	--	195.00		--	S,H	--	515	8.5	--
132-072-20AAA	RATH, EDWARD	75	75	--	36	1953	40.00		--	D,S	--	3300	8.5	--
132-072-21DDB	KAUK, HERMAN	28	28	--	24	09/22/1976	6.00		09/22/1976	S	112BGFV	--	--	--
132-072-22CCC1	NDSWC 9705	180	--	--	--	08/10/1976	--		--	U	--	--	--	2136

LOCAL NUMBER	OWNER	DEPTH DRILLED (FEET)	DEPTH OF WELL (FEET)	DEPTH TO FIRST OPENING (FEET)	CASING DIAM-ETER (INCHES)	DATE COMPLETED	WATER LEVEL (FEET)		DATE WATER LEVEL MEASURED	USE OF WATER	PRINCIPAL AQUIFER	SPECIFIC CONDUCTANCE (µMHO/CM @ 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
132-072-22CCC2	NDSWC 9705A	100	84	78	1.25	08/10/1976	33.71		08/18/1976	U	211FXHL	555	7.0	2136
132-072-23CBD	NDSWC 1332	84	84	--	--	10/29/1963		D	--	U	--	--	--	--
132-072-32BBA	KREIN, CLARENCE	75	75	--	6	1925	50.00		--	S,H	--	2790	--	--
132-072-33DAA	NDSWC 9704	80	--	--	--	08/10/1976	--		--	U	--	--	--	2084
132-072-33DDB	BETTENHAUSEN, CHRIST	52	52	--	24	1955	46.00		--	S,H	--	1260	--	--
132-072-36DDD	HOCHHALTER, WALTER	50	50	--	--	1975	28.00		--	S	--	418	8.5	--
132-073-01CCC	DOLL, ANTON	180	180	--	8	1964	--		--	S,H	--	505	11.0	--
132-073-02DDD1	NDSWC 5147	222	--	--	--	08/03/1977	--		--	U	--	--	--	2088
132-073-02DDD2	NDSWC 5147A	80	79	73	1.25	08/03/1977	52.97		09/06/1977	U	211FXHL	610	9.0	2088
132-073-04BBB1	NDSWC 9709	100	--	--	--	08/11/1976	--		--	U	--	--	--	2126
132-073-04BBB2	NDSWC 9709A	40	34	28	1.25	08/11/1976	7.96		08/16/1976	U	211FXHL	1690	10.0	2126
132-073-04CAB	WALD, PETER	57	57	--	24	08/30/1972	13.00		08/30/1972	S	211FXHL	4000	8.0	--
132-073-07BAA	WALD, KASMER	14	14	--	24	06/26/1974	9.27		08/12/1975	H	112OTSH	1460	10.5	--
132-073-07BCB	NDSWC 9708	100	--	--	--	08/11/1976	--		--	U	--	--	--	2084
132-073-08CBC	WALD, JOE	52	52	48	24	11/23/1974	24.03		08/13/1975	S	211FXHL	5000	8.5	--
132-073-15BCC1	WANNER, KARL	150	150	--	3	1905	65.00		--	H	--	770	12.0	--
132-073-15BCC2	WANNER, KARL	150	150	--	4	1965	65.00		--	S	--	600	8.5	--
132-073-20DCC	SAYLER, HERMAN	190	190	--	8	1969	--		--	S,H	--	1610	10.0	--
132-073-21DDD	NDSWC 9707	220	--	--	--	08/11/1976	--		--	U	--	--	--	2042
132-073-23BDD	AIPPERSPACH, ARTHUR	66	66	--	24	07/31/1974	50.00		07/31/1974	U	--	--	--	--
132-073-28BAB	MEIDINGER, MARVIN	160	160	120	4	11/04/1976	65.00		11/04/1976	S	211FXHL	1650	8.0	--
132-073-32ADD	MEIDINGER, MARVIN	90	90	--	4	1961	50.00		--	H	--	650	--	--
132-073-34DAD	AIPPERSPACH, ARTHUR	72	72	--	24	05/ /1975	42.88		08/13/1975	S,H	--	700	9.0	--
132-073-35DDD	NDSWC 9706	100	--	--	--	08/11/1976	--		--	U	--	--	--	2082
SURFACE-WATER SITES														
129-067-03BCC	--	--	--	--	--	--	--		--	--	--	--	--	--
130-070-27CBC	--	--	--	--	--	--	--		--	--	--	--	--	--
131-068-25DDB	--	--	--	--	--	--	--		--	--	--	--	--	--
131-070-05BBA	--	--	--	--	--	--	--		--	--	--	--	--	--

TABLE 2.—Water levels in selected wells

EXPLANATION

Water levels shown have been adjusted to feet below or (+) above land surface

MP, measuring point lsd, land surface datum msl, mean sea level

Depth to water, in feet below or (+) above land surface

129-067-03AAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1977.....	40.69	Nov. 10.....	40.68	Dec. 16.....	40.51

129-067-03BBB1 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Oct. 5, 1977.....	51.85	Nov. 10.....	51.65	Dec. 16.....	51.41

129-067-03BBB2 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Oct. 5, 1977.....	51.10	Nov. 10.....	50.94	Dec. 16.....	50.69

129-067-08DAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Feb. 20, 1976.....	14.65	Feb. 7.....	15.74	Aug. 2.....	16.05
Sept. 16.....	15.01	Mar. 15.....	16.05	Sept. 7.....	16.24
Oct. 5.....	15.16	Apr. 11.....	15.91	Oct. 5.....	16.40
Nov. 3.....	15.36	May 9.....	15.68	Nov. 10.....	16.45
Nov. 30.....	15.29	June 7.....	15.76	Dec. 16.....	16.28
Jan. 17, 1977.....	15.80	July 5.....	15.88		

129-067-17ADD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July 20, 1976.....	31.45	Feb. 7.....	31.73	Aug. 2.....	31.70
Sept. 16.....	31.81	Mar. 15.....	31.54	Sept. 7.....	31.63
Oct. 5.....	31.83	Apr. 11.....	31.50	Oct. 5.....	31.60
Nov. 3.....	31.84	May 9.....	31.54	Nov. 10.....	31.43
Nov. 30.....	31.80	June 7.....	31.67	Dec. 16.....	31.17
Jan. 17, 1977.....	31.78	July 5.....	31.57		

129-067-17DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July 20, 1976.....	23.98	Feb. 7.....	24.58	Aug. 2.....	24.87
Sept. 16.....	24.36	Mar. 15.....	24.50	Sept. 7.....	24.83
Oct. 5.....	24.41	Apr. 11.....	24.53	Oct. 5.....	24.93
Nov. 3.....	24.49	May 9.....	24.54	Nov. 10.....	24.89
Nov. 30.....	24.48	June 7.....	24.63	Dec. 16.....	24.77
Jan. 17, 1977.....	24.57	July 5.....	24.73		

Depth to water, in feet below or (+) above land surface

129-067-28BBB MP is top of 1¼-inch plastic pipe 2.20 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 7, 1977	37.25	Nov. 10	36.99	Dec. 16	36.82
Oct. 5	37.18				

129-068-08CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 20, 1976	32.95	Feb. 7	33.35	Aug. 1	33.84
Sept. 18	33.25	Mar. 15	33.18	Sept. 7	33.91
Oct. 5	33.32	Apr. 11	33.21	Oct. 5	33.94
Nov. 3	33.38	May 9	33.24	Nov. 10	33.93
Nov. 30	33.36	June 7	33.34	Dec. 16	33.62
Jan. 17, 1977	33.37	July 5	33.65		

129-068-15AAD MP is top of 1¼-inch plastic pipe 2.10 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1977	44.96	Nov. 10	45.45	Dec. 16	44.62

129-068-18CCC MP is top of 1¼-inch plastic pipe 2.70 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1977	16.13	Nov. 10	15.52	Dec. 16	15.10

129-068-24BBB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1976	41.37	Apr. 11	41.50	Aug. 2	41.54
Nov. 30	41.52	May 9	41.56	Sept. 7	41.51
Jan. 17, 1977	41.69	June 7	41.64	Oct. 5	41.46
Mar. 15	41.55	July 5	41.41	Nov. 10	41.47

129-068-28ADD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 20, 1976	0.78	Mar. 15, 1977	0.35	Sept. 7	0.70
Sept. 16	.85	Apr. 11	.35	Oct. 5	.66
Oct. 5	1.08	May 9	.39	Nov. 10	.55
Oct. 5	.42	June 7	.43	Dec. 16	.39
Nov. 3	.49	July 5	.59		
Nov. 30	.49	Aug. 1	.70		

129-068-31ADA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 16, 1976	+9.60	Nov. 30	+11.10	July 5	+9.50
Oct. 5	+9.60	May 9, 1977	+10.00	Aug. 1	+10.00
Nov. 3	+10.00	June 7	+9.50	Oct. 5	+8.80

Depth to water, in feet below or (+) above land surface

129-068-34DDD1 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 7, 1977.....	52.16	Nov. 10.....	51.97	Dec. 16.....	51.83
Oct. 5.....	52.14				

129-068-34DDD2 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Sept. 7, 1977.....	43.38	Nov. 10.....	43.70	Dec. 16.....	43.64
Oct. 5.....	43.81				

129-068-36DDD1 MP is top of 1¼-inch plastic pipe 2.60 ft above lsd.

Sept. 7, 1977.....	32.06	Nov. 10.....	32.95	Dec. 16.....	32.56
Oct. 5.....	32.89				

129-068-36DDD2 MP is top of 1¼-inch plastic pipe 2.60 ft above lsd.

Sept. 7, 1977.....	22.33	Nov. 10.....	22.88	Dec. 16.....	22.72
Oct. 5.....	22.50				

129-069-03AAA1 MP is top of 1¼-inch plastic pipe 2.30 ft above lsd.

Oct. 5, 1977.....	53.33	Nov. 10.....	52.43	Dec. 16.....	51.71

129-069-03AAA2 MP is top of 1¼-inch plastic pipe 2.20 ft above lsd.

Oct. 5, 1977.....	35.37	Nov. 9.....	35.27	Dec. 16.....	35.02

129-069-12CCD1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug. 3, 1976.....	34.95	Feb. 7.....	34.58	Aug. 1.....	37.28
Sept. 16.....	36.01	Mar. 15.....	34.10	Sept. 7.....	36.75
Oct. 5.....	35.96	Apr. 11.....	34.03	Oct. 5.....	36.16
Nov. 3.....	35.55	May 9.....	34.32	Nov. 10.....	35.44
Nov. 30.....	35.13	June 7.....	34.84	Dec. 16.....	34.87
Jan. 17, 1977.....	34.62	July 5.....	35.79		

129-069-12CCD2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug. 3, 1976.....	34.59	Feb. 7.....	34.67	Aug. 1.....	36.54
Sept. 16.....	35.75	Mar. 15.....	34.10	Sept. 7.....	36.65
Oct. 5.....	35.88	Apr. 11.....	34.08	Oct. 5.....	36.35
Nov. 3.....	35.69	May 9.....	34.04	Nov. 10.....	35.55
Nov. 30.....	35.31	June 7.....	34.53	Dec. 16.....	35.05
Jan. 17, 1977.....	34.75	July 5.....	35.32		

Depth to water, in feet below or (+) above land surface

129-069-34CCC MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1977.....	44.85	Nov. 10.....	44.60	Dec. 16.....	44.44

129-071-12CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July	29, 1976.....	90.00	Feb.	7.....	90.23	Aug.	1.....	90.06
Sept.	15.....	90.32	Mar.	15.....	90.06	Sept.	6.....	89.98
Oct.	4.....	90.27	Apr.	11.....	90.09	Oct.	14.....	89.76
Nov.	3.....	90.33	May	9.....	90.05	Nov.	9.....	89.73
Nov.	29.....	90.29	June	7.....	90.16	Nov.	29.....	89.61
Jan.	17, 1977.....	90.26	July	5.....	89.93			

129-071-22BAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July	29, 1976.....	84.16	Feb.	7.....	84.16	Sept.	6.....	84.12
Sept.	15.....	84.32	Mar.	15.....	83.99	Oct.	14.....	83.99
Oct.	4.....	84.29	Apr.	11.....	84.00	Nov.	9.....	83.87
Nov.	3.....	84.32	May	9.....	84.03	Nov.	29.....	83.73
Nov.	29.....	84.31	June	6.....	84.12			
Jan.	17, 1977.....	84.20	Aug.	1.....	84.27			

129-072-16BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July	29, 1976.....	72.38	Feb.	7.....	72.92	Aug.	1.....	72.37
Sept.	15.....	72.65	Mar.	14.....	72.49	Sept.	6.....	72.48
Oct.	4.....	72.59	Apr.	11.....	72.61	Oct.	14.....	72.43
Nov.	2.....	72.77	May	9.....	72.56	Nov.	8.....	72.20
Nov.	29.....	73.08	June	6.....	72.58	Nov.	28.....	72.31
Jan.	17, 1977.....	72.88	July	5.....	72.32			

129-072-26BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 14, 1977.....	124.60	Nov. 8.....	114.40	Nov. 28.....	116.42

129-072-30BBA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	20, 1976.....	2.92	Mar.	14.....	3.12	Sept.	6.....	3.35
Sept.	15.....	2.86	Apr.	11.....	3.08	Oct.	14.....	3.17
Oct.	4.....	2.86	May	9.....	3.05	Nov.	7.....	3.14
Nov.	2.....	2.87	June	6.....	3.08	Nov.	28.....	2.92
Jan.	17, 1977.....	3.70	July	5.....	2.95			
Feb.	7.....	3.55	Aug.	1.....	3.04			

Depth to water, in feet below or (+) above land surface

129-072-30BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 20, 1976	5.41	Mar. 14	5.91	Sept. 6	5.92
Sept. 16	5.66	Apr. 11	5.79	Oct. 14	5.73
Oct. 4	5.73	May 9	5.75	Nov. 7	5.73
Nov. 2	5.66	June 6	5.78	Nov. 28	5.53
Jan. 17, 1977	6.47	July 5	5.53		
Feb. 7	6.29	Aug. 1	5.61		

129-072-32CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept. 15, 1976	+6.80	Feb. 7, 1977	+4.10	June 6	+7.00
Nov. 2	+5.90	Apr. 11	+6.30	July 5	+7.00
Nov. 2	+6.90	May 9	+6.80		

129-072-32DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July 29, 1976	5.21	Feb. 7	5.99	Aug. 1	5.66
Sept. 15	5.52	Mar. 14	5.75	Sept. 6	5.65
Oct. 4	5.47	Apr. 11	5.68	Oct. 14	5.47
Nov. 2	5.63	May 9	5.65	Nov. 8	5.34
Nov. 29	6.00	June 6	5.72	Nov. 28	5.29
Jan. 17, 1977	5.88	July 5	5.44		

129-072-34DAA MP is top of 1¼-inch plastic pipe 2.30 ft above lsd.

Oct. 14, 1977	56.96	Nov. 9	56.65	Nov. 28	56.82

129-073-01CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept. 3, 1976	58.17	Feb. 7	58.42	Aug. 1	58.33
Sept. 15	58.36	Mar. 14	58.25	Sept. 6	58.34
Oct. 4	58.36	Apr. 11	58.42	Oct. 14	58.36
Nov. 2	58.46	May 9	58.27	Nov. 7	58.22
Nov. 29	58.38	June 6	58.44	Nov. 28	58.30
Jan. 17, 1977	58.41	July 5	58.21		

129-073-12AAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept. 3, 1976	83.67	Feb. 7	83.83	Sept. 6	83.90
Sept. 15	83.91	Apr. 11	84.02	Oct. 14	83.87
Oct. 4	83.74	May 9	83.78	Nov. 7	83.42
Nov. 5	83.94	June 6	84.11	Nov. 28	83.75
Nov. 29	83.85	July 5	83.68		
Jan. 17, 1977	84.01	Aug. 1	83.92		

Depth to water, in feet below or (+) above land surface

129-073-12CDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 3, 1976.....	37.54	Apr. 11, 1977.....	37.53	Sept. 6.....	37.54
Sept. 15.....	37.59	May 9.....	37.53	Oct. 14.....	37.52
Oct. 4.....	37.54	June 6.....	37.60	Nov. 7.....	37.98
Nov. 2.....	37.59	July 5.....	37.53		
Nov. 29.....	37.91	Aug. 1.....	37.63		

129-073-12DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	3, 1976.....	70.02	Feb.	7.....	70.29	Aug.	1.....	70.10
Sept.	15.....	70.20	Mar.	14.....	69.97	Sept.	6.....	70.07
Oct.	4.....	70.08	Apr.	11.....	70.14	Oct.	14.....	70.05
Nov.	2.....	70.20	May	9.....	70.10	Nov.	7.....	69.92
Nov.	29.....	70.25	June	6.....	70.29	Nov.	28.....	69.90
Jan.	17, 1977.....	70.28	July	5.....	69.97			

129-073-13DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July	29, 1976.....	41.14	Mar.	14.....	41.41	Sept.	6.....	40.88
Sept.	15.....	41.28	Apr.	11.....	41.35	Oct.	14.....	40.74
Oct.	4.....	41.28	May	9.....	41.27	Nov.	7.....	40.76
Nov.	2.....	41.27	June	6.....	41.34	Nov.	28.....	40.54
Jan.	17, 1977.....	41.95	July	5.....	40.74			
Feb.	7.....	41.78	Aug.	1.....	40.90			

129-073-24ABB MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Sept.	3, 1976.....	11.99	Feb.	7.....	12.52	Aug.	1.....	12.48
Sept.	15.....	12.09	Mar.	14.....	12.54	Sept.	6.....	12.65
Oct.	4.....	12.17	Apr.	11.....	12.31	Oct.	14.....	12.73
Nov.	2.....	12.29	May	9.....	12.20	Nov.	7.....	12.67
Nov.	29.....	12.36	June	6.....	12.26	Nov.	28.....	12.75
Jan.	17, 1977.....	12.51	July	5.....	12.33			

129-073-24DDC MP is top of 1¼-inch plastic pipe 2.60 ft above lsd.

Aug.	20, 1976.....	8.90	Mar.	14.....	9.63	Sept.	6.....	9.90
Sept.	15.....	9.24	Apr.	11.....	9.49	Oct.	14.....	8.70
Oct.	4.....	9.38	May	9.....	9.47	Nov.	7.....	9.07
Nov.	2.....	9.30	June	6.....	9.50	Nov.	28.....	8.85
Jan.	17, 1977.....	10.15	July	5.....	9.50			
Feb.	7.....	9.95	Aug.	1.....	9.60			

129-073-24DDD1 MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Oct.	8, 1976.....	13.93	July	5.....	7.93	Oct.	14.....	7.69
May	9, 1977.....	7.93	Aug.	1.....	7.54	Nov.	7.....	7.67
June	6.....	7.96	Sept.	6.....	7.85	Nov.	28.....	7.47

Depth to water, in feet below or (+) above land surface

129-073-30DAD1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 3, 1976	16.44	Feb. 7	17.12	Aug. 1	16.97
Sept. 15	16.52	Mar. 14	16.85	Sept. 6	17.00
Oct. 4	16.59	Apr. 11	16.88	Oct. 14	16.83
Nov. 2	17.72	May 9	16.88	Nov. 7	16.78
Nov. 29	18.15	June 6	17.00		
Jan. 17, 1977	17.24	July 5	16.81		

129-073-30DAD2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 3, 1976	16.86	Feb. 7	17.54	Aug. 1	17.47
Sept. 15	16.97	Mar. 14	17.29	Sept. 6	17.51
Oct. 4	17.03	Apr. 11	17.33	Oct. 14	17.40
Nov. 2	18.13	May 9	17.24	Nov. 7	17.36
Nov. 29	18.57	June 6	17.37		
Jan. 17, 1977	17.68	July 5	17.30		

130-067-07BBB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1976	7.72	Mar. 15	8.04	Aug. 2	7.84
Nov. 3	7.83	Apr. 12	6.95	Sept. 7	8.18
Nov. 30	7.90	May 10	6.11	Oct. 5	8.09
Jan. 18, 1977	8.10	June 7	6.75	Nov. 10	7.65
Feb. 8	8.19	July 6	7.34	Nov. 29	7.37

130-067-21DDA MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1977	10.27	Nov. 10	10.11	Dec. 16	9.91

130-067-27CCB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 20, 1976	17.45	Feb. 8	20.04	Aug. 2	18.79
Sept. 16	18.89	Mar. 15	19.82	Sept. 7	18.64
Oct. 5	19.25	Apr. 12	19.26	Oct. 5	18.44
Nov. 3	19.48	May 10	18.69	Nov. 10	18.12
Nov. 30	19.48	June 7	18.44	Dec. 16	17.87
Jan. 18, 1977	19.88	July 6	18.37		

130-067-35ADD4 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 20, 1976	3.09	Feb. 8	4.17	Aug. 2	4.23
Sept. 16	3.64	Mar. 15	4.11	Sept. 7	4.34
Oct. 5	3.72	Apr. 12	3.78	Oct. 5	4.44
Nov. 3	3.91	May 10	3.90	Nov. 10	4.40
Nov. 30	3.92	June 7	4.04	Dec. 16	4.24
Jan. 18, 1977	4.17	July 6	4.03		

Depth to water, in feet below or (+) above land surface

130-068-04BBD2 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1977.....	4.65	Nov. 10.....	4.55	Nov. 29.....	4.45

130-068-11BCB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Oct.	5, 1976.....	4.35	Mar.	15.....	4.25	Aug.	2.....	4.37
Nov.	3.....	4.23	Apr.	12.....	3.14	Sept.	7.....	4.20
Nov.	30.....	4.39	May	10.....	3.38	Oct.	5.....	3.82
Jan.	18, 1977.....	5.07	June	7.....	3.61	Nov.	10.....	3.18
Feb.	8.....	5.16	July	6.....	3.79	Nov.	29.....	3.14

130-068-24AAA MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Oct.	5, 1977.....	19.05	Nov.	10.....	18.92	Dec.	18.....	18.73

130-069-06ABB MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Oct.	13, 1977.....	28.73	Nov.	11.....	28.95	Nov.	29.....	28.65

130-069-07DDD MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Oct.	13, 1977.....	57.71	Nov.	10.....	57.65	Nov.	29.....	57.53

130-069-09DAD1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Oct.	5, 1976.....	20.36	Mar.	15.....	20.45	Aug.	1.....	20.55
Nov.	2.....	20.40	Apr.	12.....	20.38	Sept.	6.....	20.52
Nov.	29.....	20.45	May	10.....	20.05	Oct.	5.....	20.47
Jan.	18, 1977.....	20.56	June	6.....	20.57	Nov.	10.....	20.55
Feb.	8.....	20.63	July	5.....	20.47	Nov.	29.....	20.15

130-069-10BBB2 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Oct.	5, 1977.....	13.39	Nov.	11.....	13.12	Nov.	29.....	13.02

130-069-21BBB1 MP is top of 1¼-inch plastic pipe 2.20 ft above lsd.

Oct.	13, 1977.....	54.02	Nov.	10.....	54.03	Nov.	29.....	53.87

130-069-21BBB2 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Oct.	13, 1977.....	53.35	Nov.	10.....	53.30	Nov.	29.....	53.23

Depth to water, in feet below or (+) above land surface

130-069-30CBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 3, 1976	82.60	Jan. 17, 1977	81.10	Aug. 1	85.67
Sept. 14	83.71	Apr. 11	80.34	Sept. 6	84.51
Oct. 5	83.52	May 9	80.84	Oct. 13	83.13
Nov. 3	82.65	June 6	81.84	Nov. 10	82.42
Nov. 29	82.06	July 5	83.75	Nov. 29	81.89

130-069-30DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	3, 1976	105.75	Feb.	7	100.97	Aug.	1	109.70
Sept.	16	105.43	Mar.	15	98.73	Sept.	6	104.23
Oct.	5	102.37	Apr.	11	100.25	Oct.	13	99.91
Nov.	3	100.10	May	9	101.44	Nov.	9	101.80
Nov.	29	101.22	June	6	104.31	Nov.	29	99.19
Jan.	17, 1977	100.73	July	5	108.75			

130-069-33AAA2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	3, 1976	21.13	Feb.	7	21.41	Aug.	1	21.63
Sept.	16	21.24	Mar.	15	21.58	Sept.	6	21.70
Oct.	5	21.31	Apr.	11	21.60	Oct.	5	21.68
Nov.	3	21.35	May	9	21.50	Nov.	10	21.80
Nov.	29	21.36	June	6	21.68	Dec.	16	21.64
Jan.	17, 1977	21.50	July	5	21.71			

130-070-02CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	14, 1976	+22.30	Nov.	2	+23.30	June	6	+23.50
Oct.	4	+23.30	May	9, 1977	+23.50	Aug.	1	+23.00

130-071-03DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Oct.	14, 1977	21.90	Nov.	9	21.84	Nov.	29	21.87

130-071-09BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	10, 1976	8.39	Feb.	7	9.15	Aug.	1	9.23
Sept.	15	8.88	Mar.	15	8.88	Sept.	6	9.07
Oct.	4	8.94	Apr.	11	8.55	Oct.	14	9.67
Nov.	3	8.95	May	9	8.58	Nov.	9	9.07
Nov.	30	8.96	June	6	8.93	Nov.	29	8.94
Jan.	17, 1977	9.08	July	5	8.99			

Depth to water, in feet below or (+) above land surface

130-071-20DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 10, 1976	69.67	Feb. 7	69.78	Sept. 6	69.81
Sept. 15	70.03	Apr. 11	70.01	Oct. 14	69.84
Oct. 4	69.96	May 9	69.77	Nov. 9	69.66
Nov. 3	70.03	June 6	69.95	Nov. 29	69.45
Nov. 29	69.93	July 5	69.71		
Jan. 17, 1977	70.15	Aug. 1	69.68		

130-073-01AAA MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Sept.	6, 1977	13.03	Nov.	7	12.93	Nov.	28	12.88
Oct.	14	13.30						

130-073-05AAA2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	18, 1976	7.38	Feb.	7	6.70	Aug.	1	7.06
Sept.	15	7.54	Mar.	14	6.63	Sept.	6	6.99
Oct.	4	7.48	Apr.	11	6.79	Oct.	14	6.88
Nov.	2	7.36	May	9	6.97	Nov.	7	6.85
Nov.	29	7.30	June	6	7.02	Nov.	28	6.72
Jan.	17, 1977	6.93	July	5	6.91			

130-073-27AAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	10, 1976	86.99	Feb.	7	87.44	Aug.	1	87.34
Sept.	15	87.49	Mar.	14	87.22	Sept.	6	87.40
Oct.	4	87.38	Apr.	11	87.49	Oct.	14	87.46
Nov.	2	87.51	May	9	87.31	Nov.	7	87.14
Nov.	29	87.40	June	6	87.56	Nov.	28	87.33
Jan.	17, 1977	87.53	July	5	87.21			

130-073-29AAA MP is top of 1¼-inch plastic pipe 1.20 ft above lsd.

Aug.	18, 1976	+1.38	Nov.	2	+1.30	July	5	+1.20
Sept.	15	+1.37	Apr.	11, 1977	.27	Aug.	1	+1.20
Oct.	4	+1.32	May	9	+1.20	Nov.	7	+1.20
Oct.	4	+1.54	June	6	+1.20			

130-073-36DDD2 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Sept.	6, 1977	142.09	Nov.	7	142.75	Nov.	28	142.88
Oct.	14	143.01						

131-067-13BBB3 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1976.....	+2.30	Apr. 12, 1977.....	+2.00	Oct. 5.....	+5.00
Oct. 5.....	+3.30	May 10.....	+4.80		
Nov. 3.....	+3.50	Aug. 2.....	+4.00		

131-068-14BAB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Apr.	12, 1977.....	0.76	July	6.....	0.70	Oct.	5.....	0.79
May	10.....	.61	Aug.	2.....	.75	Nov.	11.....	.65
June	7.....	.50	Sept.	7.....	.81	Nov.	29.....	.49

131-068-34CBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Oct.	5, 1976.....	31.51	Mar.	15.....	30.48	Aug.	2.....	30.88
Nov.	3.....	30.50	Apr.	12.....	30.57	Sept.	7.....	30.88
Nov.	30.....	30.44	May	10.....	30.54	Oct.	5.....	31.01
Jan.	18, 1977.....	30.55	June	7.....	30.61	Nov.	10.....	31.15
Feb.	8.....	30.55	July	6.....	30.79	Nov.	29.....	30.72

131-069-22DCD2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Oct.	5, 1976.....	11.83	Apr.	12.....	10.46	Aug.	1.....	11.82
Nov.	2.....	11.79	May	10.....	11.48	Sept.	6.....	11.76
Nov.	29.....	12.74	June	6.....	10.62	Oct.	5.....	11.65
Mar.	15, 1977.....	10.43	July	5.....	11.71	Nov.	11.....	11.68

131-069-26ADD MP is top of 1¼-inch plastic pipe 2.60 ft above lsd.

Oct.	5, 1977.....	38.62	Nov.	11.....	38.52	Nov.	29.....	38.34

131-070-05BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	2, 1976.....	5.17	Feb.	8.....	6.07	Aug.	1.....	6.08
Sept.	15.....	5.39	Mar.	15.....	5.83	Sept.	6.....	6.24
Oct.	4.....	5.53	Apr.	12.....	5.43	Oct.	13.....	6.17
Nov.	2.....	5.67	May	10.....	5.44	Nov.	11.....	6.39
Nov.	30.....	5.74	June	6.....	5.69	Nov.	29.....	6.03
Jan.	18, 1977.....	6.01	July	5.....	5.84			

131-070-21DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	10, 1976.....	26.00	Feb.	8.....	26.19	Aug.	1.....	26.26
Sept.	14.....	26.17	Mar.	15.....	26.10	Sept.	6.....	26.26
Oct.	4.....	26.11	Apr.	12.....	26.22	Oct.	13.....	26.25
Nov.	2.....	26.19	May	9.....	26.17	Nov.	11.....	26.52
Nov.	29.....	26.22	June	6.....	26.31	Nov.	29.....	26.21
Jan.	18, 1977.....	26.27	July	5.....	26.19			

Depth to water, in feet below or (+) above land surface

131-071-07BBB2 MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 16, 1977	58.42	Nov. 7	58.07	Dec. 13	58.11
Oct. 14	58.83				

131-072-02CCC2 MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Sept.	6, 1977	23.48	Nov.	7	23.19	Nov.	28	23.38
Oct.	14	23.66						

131-072-09BBB2 MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Sept.	6, 1977	6.06	Nov.	7	5.12	Nov.	28	3.77
Oct.	14	5.13						

131-072-14BBB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	18, 1976	11.05	Feb.	7	12.12	Aug.	1	11.67
Sept.	15	11.97	Mar.	14	11.67	Sept.	6	12.01
Oct.	4	12.12	Apr.	11	10.79	Oct.	14	11.54
Nov.	2	12.15	May	9	10.73	Nov.	7	11.25
Nov.	29	12.11	June	6	11.05	Nov.	28	11.12
Jan.	17, 1977	12.05	July	5	11.34			

131-072-20CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	10, 1976	3.35	Feb.	7	4.16	Aug.	1	3.86
Sept.	15	3.87	Mar.	14	3.86	Sept.	6	3.96
Oct.	4	3.94	Apr.	11	3.58	Oct.	14	3.72
Nov.	2	3.97	May	9	3.41	Nov.	7	3.87
Nov.	29	3.99	June	6	3.59	Nov.	28	3.37
Jan.	17, 1977	4.09	July	5	3.71			

131-073-08BBB MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Sept.	6, 1977	13.05	Oct.	14	13.18	Nov.	7	12.85

131-073-10BBB MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Sept.	6, 1977	15.73	Nov.	7	16.81	Nov.	28	17.05
Oct.	14	16.82						

Depth to water, in feet below or (+) above land surface

131-073-35BCC MP is top of 1¼-inch plastic pipe 1.35 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 18, 1976	14.99	Nov. 29	15.79	Apr. 11	15.30
Sept. 15	15.33	Jan. 17, 1977	15.93	May 9	15.13
Oct. 4	15.45	Feb. 7	16.03	June 6	15.13
Nov. 2	15.62	Mar. 14	15.91		

132-067-14DDA2 MP is top of 1¼-inch plastic pipe 2.30 ft above lsd.

Oct.	5, 1977	13.12	Nov.	11	12.75	Nov.	29	12.54

132-068-02DDD2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	16, 1976	11.75	Mar.	15	13.00	Aug.	2	11.21
Oct.	4	12.10	Apr.	12	9.42	Sept.	7	11.83
Nov.	2	12.45	May	10	9.45	Oct.	5	11.48
Nov.	30	12.62	June	7	9.98	Nov.	11	10.97
Jan.	18, 1977	13.04	July	6	10.76	Nov.	29	10.20

132-068-03AAA MP is top of 1¼-inch plastic pipe 2.70 ft above lsd.

Oct.	5, 1977	46.08	Nov.	11	45.89	Nov.	29	45.65

132-068-14DDD1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	16, 1976	6.72	Mar.	15	6.80	Sept.	7	6.84
Oct.	4	6.90	Apr.	12	5.92	Oct.	5	6.72
Nov.	2	7.09	May	10	5.78	Nov.	11	6.75
Nov.	30	7.21	June	7	5.95	Nov.	29	6.27
Jan.	18, 1977	7.43	July	6	6.12			
Feb.	8	7.49	Aug.	2	6.47			

132-068-17BAA2 MP is top of 1¼-inch plastic pipe 1.70 ft above lsd.

Oct.	5, 1977	18.74	Nov.	11	18.58	Nov.	29	18.41

132-069-01BBB MP is top of 1¼-inch plastic pipe 2.30 ft above lsd.

Oct.	5, 1977	28.60	Nov.	11	27.82	Nov.	29	27.40

Depth to water, in feet below or (+) above land surface

132-069-30DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 15, 1976	16.40	Mar. 15	16.26	Aug. 2	16.71
Oct. 4	16.40	Apr. 12	16.29	Sept. 7	16.58
Nov. 2	16.42	May 10	16.29	Oct. 5	16.44
Nov. 30	16.43	June 7	16.38	Nov. 11	16.25
Jan. 18, 1977	16.43	July 6	16.56	Nov. 29	16.12

132-069-36AAA2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	16, 1976	11.57	Feb.	8	12.14	July	6	11.88
Oct.	4	11.68	Mar.	15	11.71	Aug.	2	11.98
Nov.	2	11.75	Apr.	12	11.52	Sept.	7	12.02
Nov.	30	11.80	May	10	11.40	Oct.	5	11.90
Jan.	18, 1977	12.04	June	7	11.55	Nov.	11	11.74

132-070-08CCB MP is top of 1¼-inch plastic pipe 2.60 ft above lsd.

Oct.	5, 1977	22.10	Nov.	11	22.29	Nov.	29	22.11

132-070-17CCC1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	2, 1976	17.89	Feb.	8	18.26	Aug.	2	18.36
Sept.	15	18.09	Mar.	15	18.19	Sept.	7	18.45
Oct.	4	18.13	Apr.	12	17.88	Oct.	5	18.43
Nov.	2	18.14	May	10	17.78	Nov.	11	18.54
Nov.	30	18.14	June	7	18.01	Nov.	29	18.28
Jan.	18, 1977	18.27	July	5	18.10			

132-070-17CCC2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	2, 1976	13.50	Feb.	8	14.26	Aug.	2	14.35
Sept.	15	13.91	Mar.	15	14.48	Sept.	7	14.49
Oct.	4	14.09	Apr.	12	14.13	Oct.	5	14.53
Nov.	2	14.17	May	10	13.90	Nov.	11	14.78
Nov.	30	13.95	June	7	14.00	Nov.	29	14.26
Jan.	18, 1977	14.28	July	5	14.26			

132-070-22BBB1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	15, 1976	28.58	Mar.	15	28.66	Sept.	7	29.17
Oct.	4	28.39	Apr.	12	28.91	Oct.	5	29.31
Nov.	2	28.55	May	10	28.89	Nov.	11	29.30
Nov.	30	28.52	June	7	29.08	Nov.	29	29.26
Jan.	18, 1977	28.73	July	6	28.86			
Feb.	8	28.72	Aug.	2	29.10			

Depth to water, in feet below or (+) above land surface

132-070-31AAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 17, 1976.....	22.10	Feb. 8.....	21.59	Aug. 1.....	22.00
Sept. 15.....	21.73	Mar. 15.....	21.43	Sept. 6.....	21.93
Oct. 4.....	21.71	Apr. 12.....	21.25	Oct. 13.....	21.71
Nov. 2.....	21.65	May 10.....	21.36	Nov. 11.....	21.67
Nov. 30.....	21.53	June 6.....	21.65		
Jan. 18, 1977.....	21.57	July 5.....	21.74		

132-070-31BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	2, 1976.....	46.60	Feb.	8.....	47.04	Aug.	1.....	47.28
Sept.	15.....	47.28	Mar.	15.....	47.21	Sept.	6.....	47.51
Oct.	4.....	47.17	Apr.	12.....	47.36	Oct.	13.....	47.20
Nov.	2.....	47.34	May	10.....	47.04	Nov.	11.....	47.89
Nov.	30.....	46.83	June	6.....	47.42	Nov.	29.....	47.21
Jan.	18, 1977.....	47.43	July	5.....	47.20			

132-071-01DDD2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Sept.	15, 1976.....	15.96	Mar.	15.....	16.84	Sept.	7.....	16.04
Oct.	4.....	16.19	Apr.	12.....	15.99	Oct.	5.....	16.31
Nov.	2.....	16.42	May	10.....	16.00	Nov.	11.....	16.87
Nov.	30.....	16.36	June	7.....	16.21	Nov.	29.....	16.62
Jan.	18, 1977.....	16.74	July	5.....	16.10			
Feb.	8.....	16.72	Aug.	1.....	15.74			

132-071-04BAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	16, 1976.....	4.14	Jan.	18, 1977.....	4.36	July	5.....	2.49
Sept.	15.....	4.40	Mar.	15.....	3.83	Aug.	1.....	2.99
Oct.	4.....	4.40	Apr.	12.....	2.61	Sept.	6.....	3.22
Nov.	2.....	4.32	May	10.....	2.77	Oct.	13.....	1.95
Nov.	30.....	4.27	June	6.....	3.51	Nov.	11.....	1.93

132-071-10CAA2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug.	17, 1976.....	3.97	Feb.	8.....	4.21	Aug.	1.....	3.22
Sept.	15.....	4.34	Mar.	15.....	1.50	Sept.	7.....	2.95
Oct.	4.....	4.17	Apr.	12.....	1.30	Oct.	13.....	2.13
Nov.	2.....	3.82	May	10.....	2.86	Nov.	11.....	2.13
Nov.	30.....	3.88	June	6.....	3.48	Nov.	28.....	2.38
Jan.	18, 1977.....	4.24	July	5.....	.58			

Depth to water, in feet below or (+) above land surface

132-071-14BBC1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 17, 1976	36.21	Feb. 8	33.50	Aug. 1	36.69
Sept. 15	38.51	Mar. 15	33.22	Oct. 5	32.85
Oct. 7	36.11	Apr. 12	32.72	Nov. 11	33.71
Nov. 2	33.89	May 10	34.12	Nov. 29	32.78
Nov. 30	33.35	June 6	37.62		
Jan. 18, 1977	33.93	July 5	36.99		

132-071-14BBC2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 17, 1976	24.76	Feb. 8	27.05	Aug. 1	26.64
Sept. 15	26.61	Mar. 15	27.09	Sept. 7	26.61
Oct. 7	26.70	Apr. 12	26.94	Oct. 5	26.62
Nov. 2	26.80	May 10	26.86	Nov. 11	26.59
Nov. 30	26.90	June 6	26.85	Nov. 29	26.57
Jan. 18, 1977	27.00	July 5	26.83		

132-071-14DDD1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1977	18.47	Nov. 11	17.95	Nov. 29	17.55

132-071-14DDD2 MP is top of 1¼-inch plastic pipe 2.20 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1977	12.60	Nov. 11	12.01	Nov. 29	12.08

132-072-22CCC2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 18, 1976	33.71	Feb. 7	35.28	Aug. 1	34.19
Sept. 15	34.92	Mar. 14	34.87	Sept. 6	34.56
Oct. 4	34.92	Apr. 11	34.41	Sept. 7	33.72
Nov. 2	34.98	May 9	34.31	Oct. 14	34.45
Nov. 29	34.98	June 6	34.60	Nov. 7	34.33
Jan. 17, 1977	35.17	July 5	34.40	Nov. 28	34.25

132-073-02DDD2 MP is top of 1¼-inch plastic pipe 1.60 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 6, 1977	52.97	Oct. 14	53.12	Nov. 7	52.71

132-073-04BBB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 16, 1976	7.96	Feb. 7	7.60	Sept. 6	7.88
Sept. 15	8.78	Mar. 14	6.76	Oct. 14	7.38
Oct. 4	8.54	Apr. 11	6.89	Nov. 7	7.23
Nov. 2	8.20	May 9	7.12	Nov. 28	6.94
Nov. 29	8.01	June 6	7.70		
Jan. 17, 1977	7.69	Aug. 1	7.98		

TABLE 3.–Logs of wells and test holes

EXPLANATION

All natural-gamma and neutron logs have Time Constant 3.

Depths shown are in feet below land surface.

Electric logs are uncalibrated.

Potential given in millivolts (mV).

Resistance in ohms.

NDSWC 5206

LOCATION: 129-067-03AAA

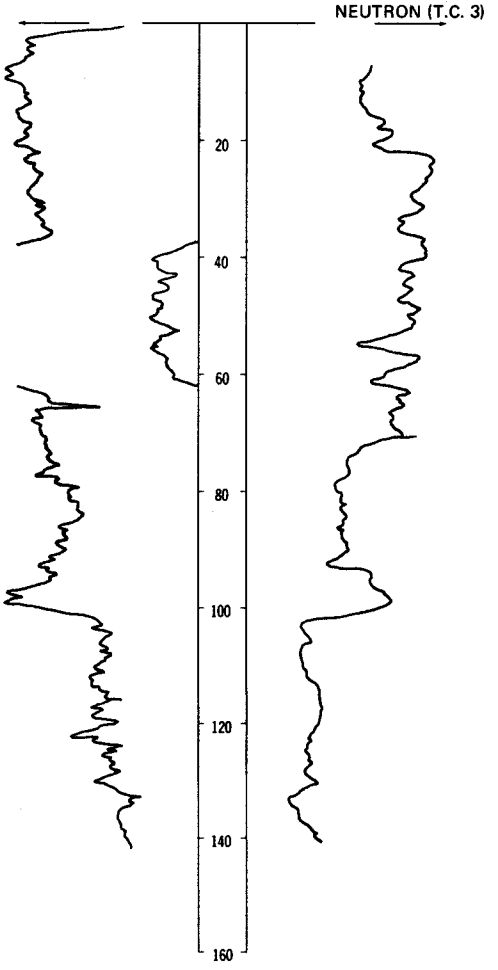
DATE DRILLED: 8/30/77

ALTITUDE: 1992
(FT, MSL)

DEPTH: 142
(FT)

NATURAL–GAMMA (T.C. 3)

NEUTRON (T.C. 3)



NOTE: Detailed log on following page.

129-067-03AAA, Continued
NDSWC 5206

Altitude:	1992 feet	Date drilled:	8/30/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown	12	12
	Clay (till), silty, sandy, gravelly, medium-dark-gray to olive-gray	26	38
	Gravel, fine to coarse, angular to subrounded; predominantly carbonate and shale fragments	24	62
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	39	101
	Clay (till), silty, sandy, shaly, grayish-black to black	31	132
Pierre Formation:			
	Shale, black, bentonitic	10	142

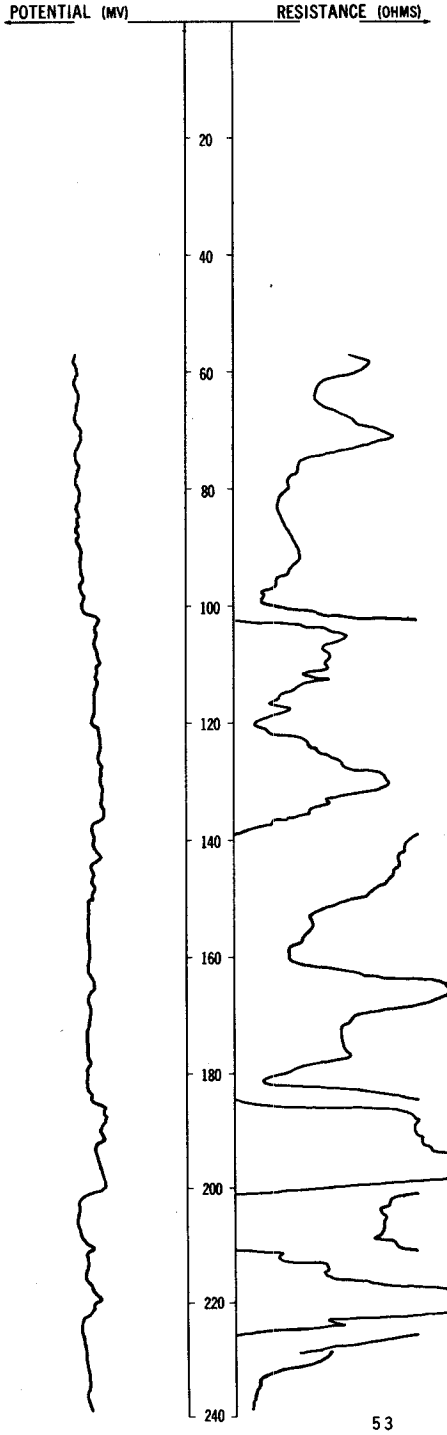
NDSWC 5207, 5207A

LOCATION: 129-067-03BBB1, 2

DATE DRILLED: 8/30/77

ALTITUDE: 1989
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-37 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

37-100 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; few thin gravel lenses.

100-136 Sand, fine to coarse, predominantly coarse to very coarse, gravelly; predominantly quartz and shale fragments.

136-162 Clay (till), sandy, silty, pebbly, medium-dark-gray to olive-gray.

162-168 Sand, very fine, silty, clayey, greenish-gray.

168-186 Clay (lacustrine), silty, sandy, medium-dark-gray.

186-226 Sand, fine to coarse, predominantly coarse to very coarse, gravelly; predominantly quartz, carbonate, and shale fragments; till lens from 201 to 210 feet.

PIERRE FORMATION

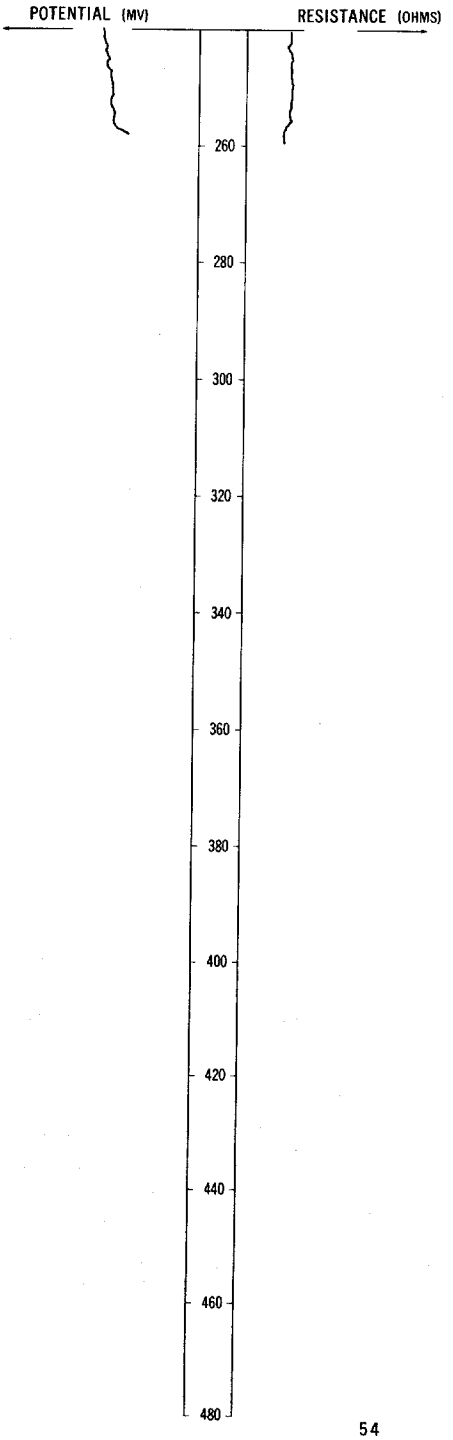
226-262 Shale, grayish-black to black, siliceous, noncalcareous, hard.

LOCATION: 129-067-03BBB1, 2

DATE DRILLED: 8/30/77

ALTITUDE: 1989
(FT, MSL)

DEPTH: 262
(FT)



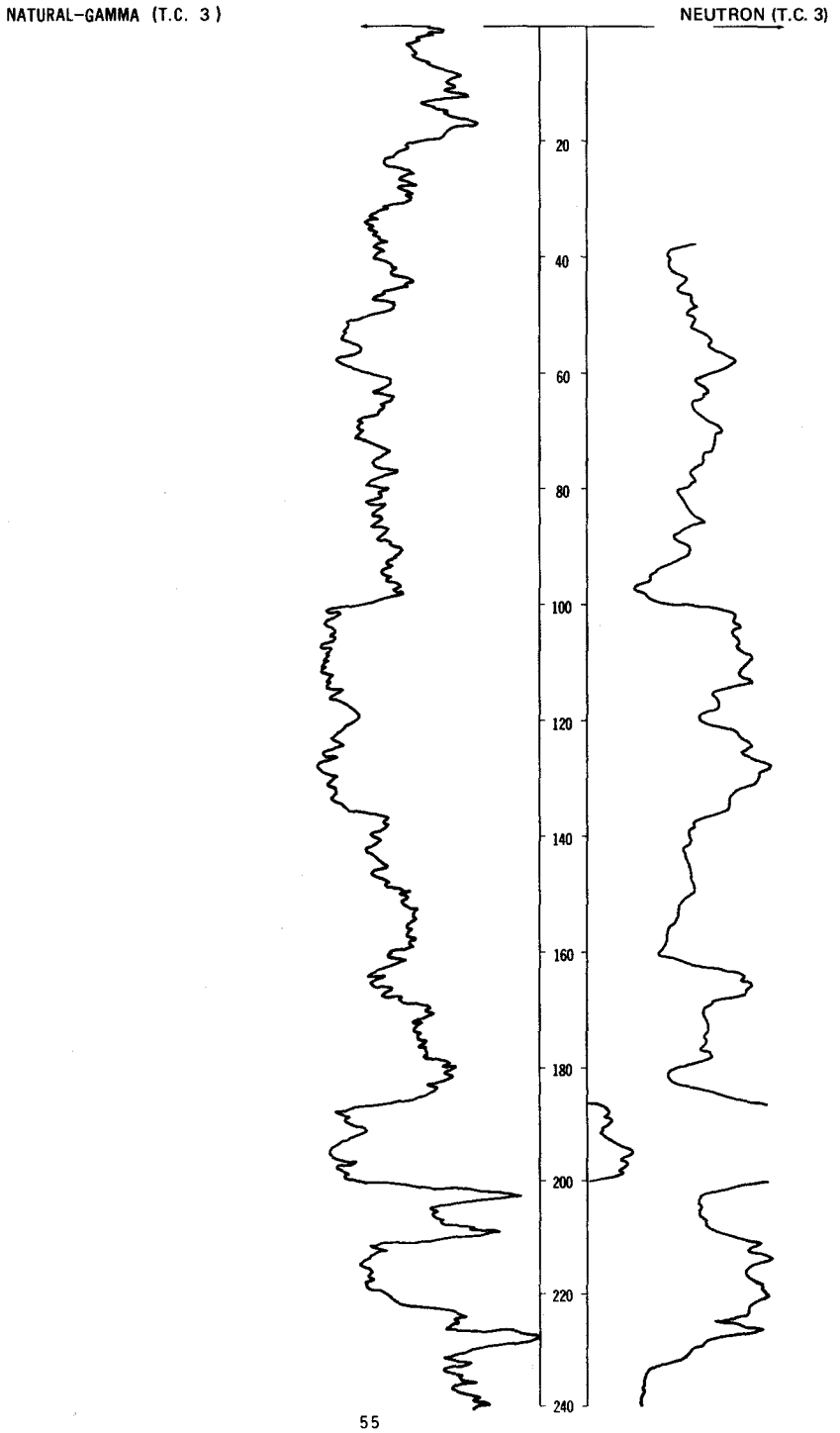
DESCRIPTION OF DEPOSITS

LOCATION: 129-067-03BBB1, 2

DATE DRILLED: 8/30/77

ALTITUDE: 1989
(FT, MSL)

DEPTH: 262
(FT)



LOCATION: 129-067-03BBB1, 2

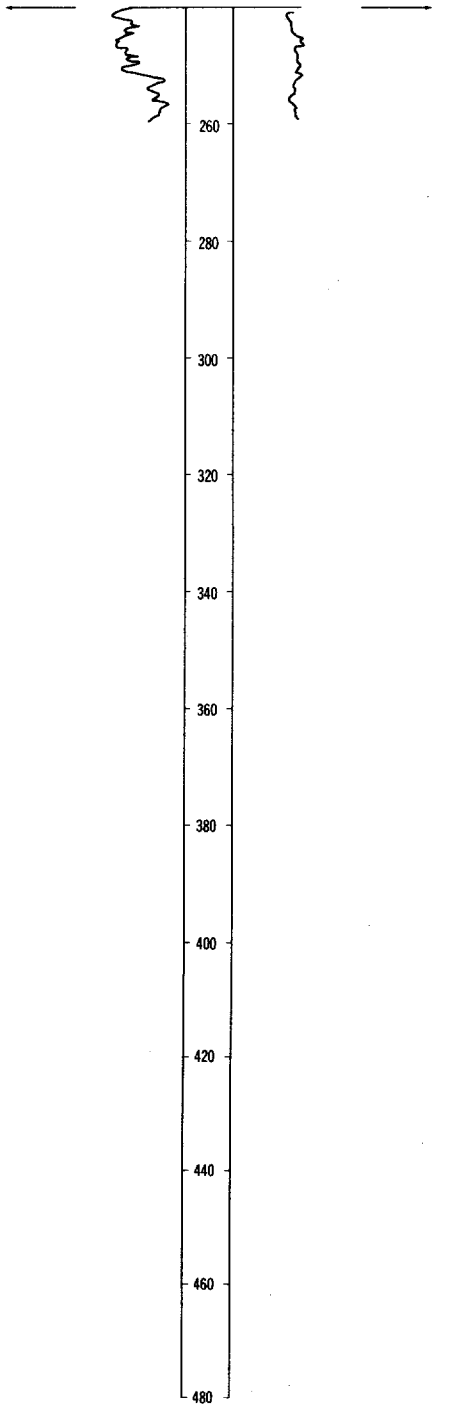
DATE DRILLED: 8/30/77

ALTITUDE: 1989
(FT, MSL)

DEPTH: 262
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



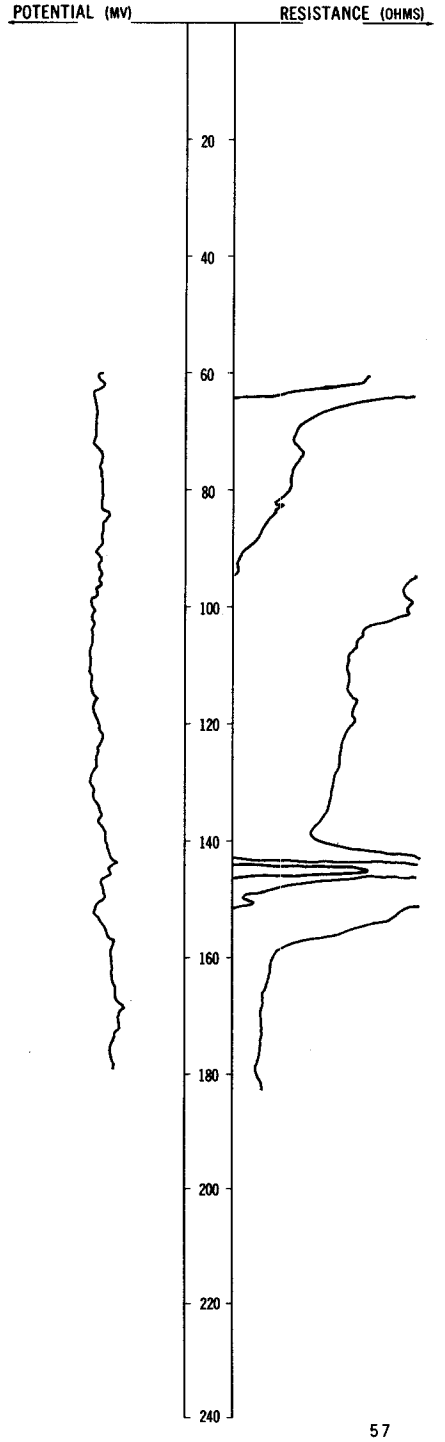
NDSWC 5205

LOCATION: 129-067-05ADD

DATE DRILLED: 8/30/77

ALTITUDE: 2010
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-25	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.
25-63	Sand, fine to very coarse, predominantly coarse, gravelly; composed of quartz, carbonate, shale, and some lignite fragments.
63-100	Clay, sandy, silty, medium-gray.
100-140	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.
140-156	Clay (till), sandy, silty, moderate-yellowish-brown to brownish-gray; scattered pebbles; gravel from 142 to 147 feet.

PIERRE FORMATION

156-182	Clay (shale), grayish-black to black, siliceous, hard.

LOCATION: 129-067-05ADD

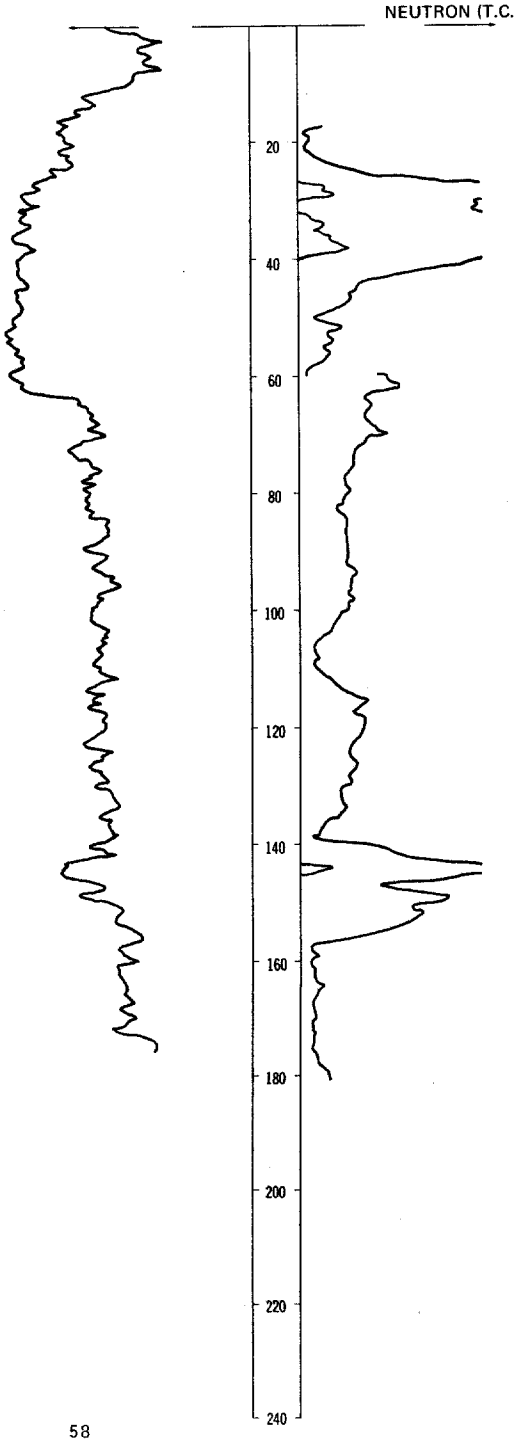
DATE DRILLED: 8/30/77

ALTITUDE: 2010
(FT, MSL)

DEPTH: 182
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



129-067-08DAA
NDSWC 9623

Altitude: 1971 feet — Date drilled: 7/13/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, gravelly, moderate-yellowish-brown	13	13
	Clay (till), silty, sandy, gravelly, olive-gray	35	48
	Gravel, medium, sandy	9	57
	Sand, very fine to very coarse, predominantly medium, gravelly; composed of 60 percent quartz, 20 percent shale, 10 percent carbonate, and 10 percent unidentified fragments	12	69
	Clay (till), silty, sandy, gravelly, olive-gray to dusky-yellowish-brown	71	140

129-067-17ADD
NDSWC 9622

Altitude: 1968 feet — Date drilled: 7/13/76

Glacial drift:			
	Clay (till), sandy, moderate-yellowish-brown; scattered pebbles	13	13
	Clay (till), silty, sandy, olive-gray; scattered pebbles	29	42
	Gravel, fine, sandy; predominantly shale and carbonate rock fragments	3	45
	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel lenses from 108 to 111 feet, 124 to 126 feet, and 134 to 135 feet	121	166
	Sand, fine, silty, gravelly	28	194
	Silt, clayey, brownish-gray	54	248
	Sand, very fine to very coarse, silty, gravelly; sand is predominantly quartz	12	260
	Sand, clayey, silty; sand lenses from 267 to 280 feet and 282 to 286 feet	18	278
	Sand, very fine to very coarse, gravelly, silty; sand is predominantly quartz	26	304
Pierre Formation:			
	Clay, silty, medium-gray to dark-gray, hard	36	340

129-067-17DDD
NDSWC 9515

Altitude: 1972 feet — Date drilled: 11/21/75

Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	27	27
	Clay (till), sandy, silty, gravelly, olive-gray	13	40
	Sand, very fine to coarse, predominantly fine to medium; 70 percent quartz, 20 percent carbonate, and 10 percent unidentified fragments	5	45
	Clay (till), sandy, silty, gravelly, olive-gray	27	72
	Gravel, fine to coarse; 50 percent carbonate, 30 percent shale, 15 percent quartz, and 5 percent unidentified fragments	6	78
	Clay (till), sandy, silty, gravelly, olive-gray	42	120
	Sand, fine to very coarse, predominantly coarse, gravelly; sand is composed of 70 percent quartz, 20 percent carbonate, and 10 percent shale fragments	54	174
	Clay (till), gravelly, sandy, silty, olive-gray	22	196
	Sand, fine to very coarse, predominantly coarse, gravelly	20	216
	Clay (till), sandy, black to grayish-black	9	225
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	15	240

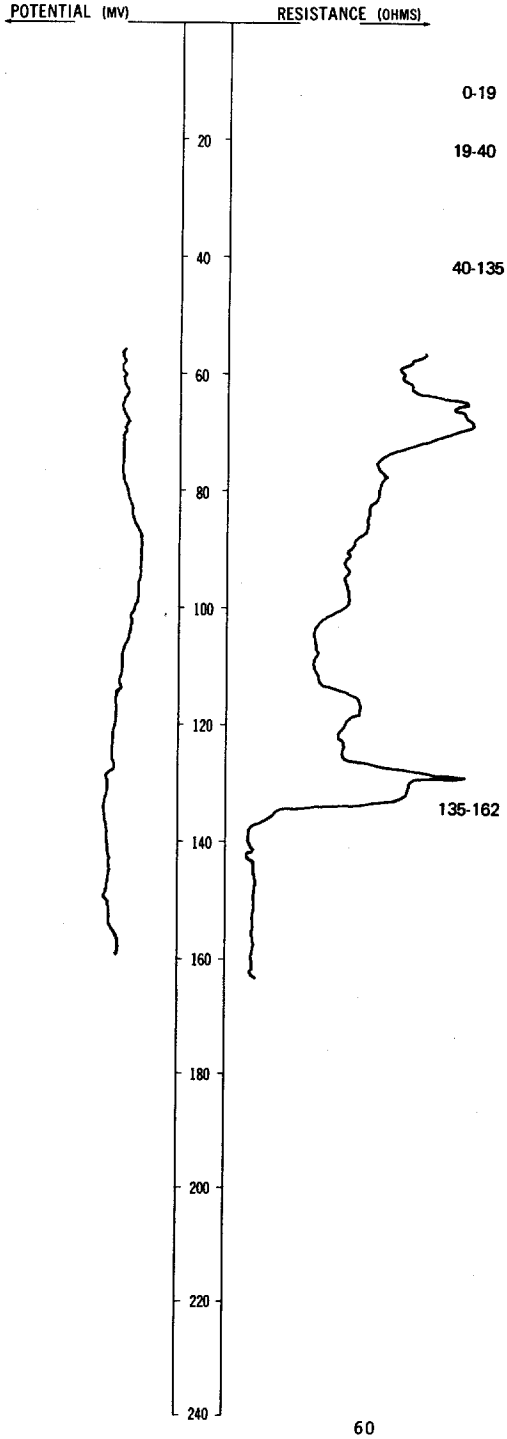
NDSWC 5203, 5203A

LOCATION: 129-067-20BBB1, 2

DATE DRILLED: 8/29/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-19 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

19-40 Gravel, fine to medium, sandy, angular to subrounded; composed predominantly of carbonate and shale fragments.

40-135 Clay (till), sandy, silty, medium-dark-gray to olive-gray; oxidized gravel lens at base of till; scattered pebbles.

PIERRE FORMATION

135-162 Shale, black, siliceous, noncalcareous, hard.

LOCATION: 129-067-20BBB1, 2

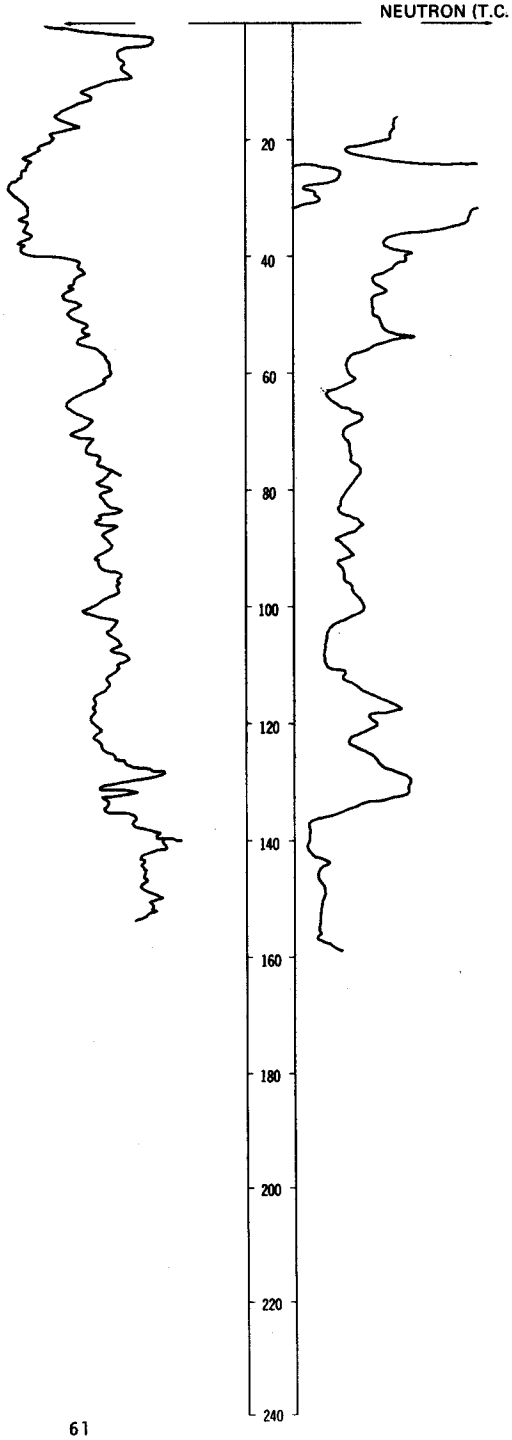
DATE DRILLED: 8/29/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 162
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



129-067-21ADD
(Log from Albrecht Well Work)

Date drilled: 8/05/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	No log	18	18
	Sand and gravel	10	28

129-067-22ABB
NDSWC 9621

Altitude: 1965 feet — Date drilled: 7/13/76

Glacial drift:			
	Clay (till), sandy, gravelly, moderate-yellowish-brown	14	14
	Gravel, very fine, sandy	1	15
	Clay, silty, sandy, olive-gray; scattered pebbles	113	128
Pierre Formation:			
	Clay, grayish-black, carbonaceous, hard	32	160

129-067-24DDA
NDSWC 9620

Altitude: 2070 feet — Date drilled: 7/12/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	12	12
	Clay (till), sandy, dusky-yellowish-brown	6	18
	Gravel, sandy	2	20
	Clay (till), silty, olive-gray; scattered pebbles	84	104
	Silt, clayey, olive-gray	23	127
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	18	145
	Silt, clayey; moderate yellowish brown to light olive gray near bottom	60	205
	Silt, brownish-gray	10	215
	Clay, dark-gray	3	218
	Silt, clayey, brownish-gray	49	267
Pierre Formation:			
	Shale, dark-gray, hard	13	280

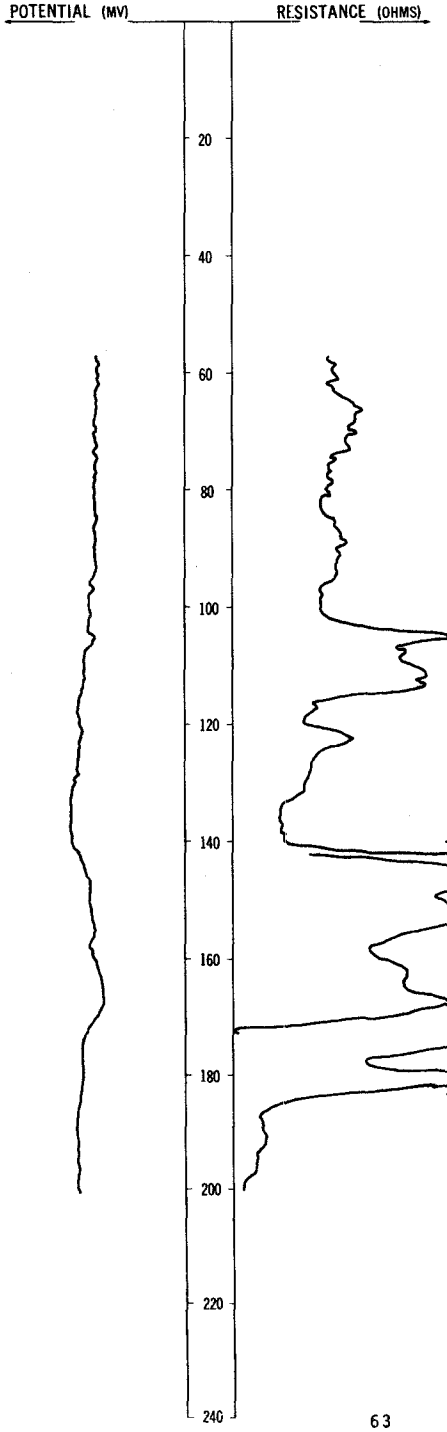
NDSWC 5204

LOCATION: 129-067-28BBB

DATE DRILLED: 8/29/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

15-21 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

21-27 Gravel, fine to medium, sandy, angular to subrounded; predominantly carbonate and shale fragments.

27-141 Clay (till), sandy, silty, gravelly, olive-gray.

141-183 Sand, medium to very coarse, predominantly coarse, gravelly, subangular to rounded; composed predominantly of quartz, carbonate, and shale fragments.

PIERRE FORMATION

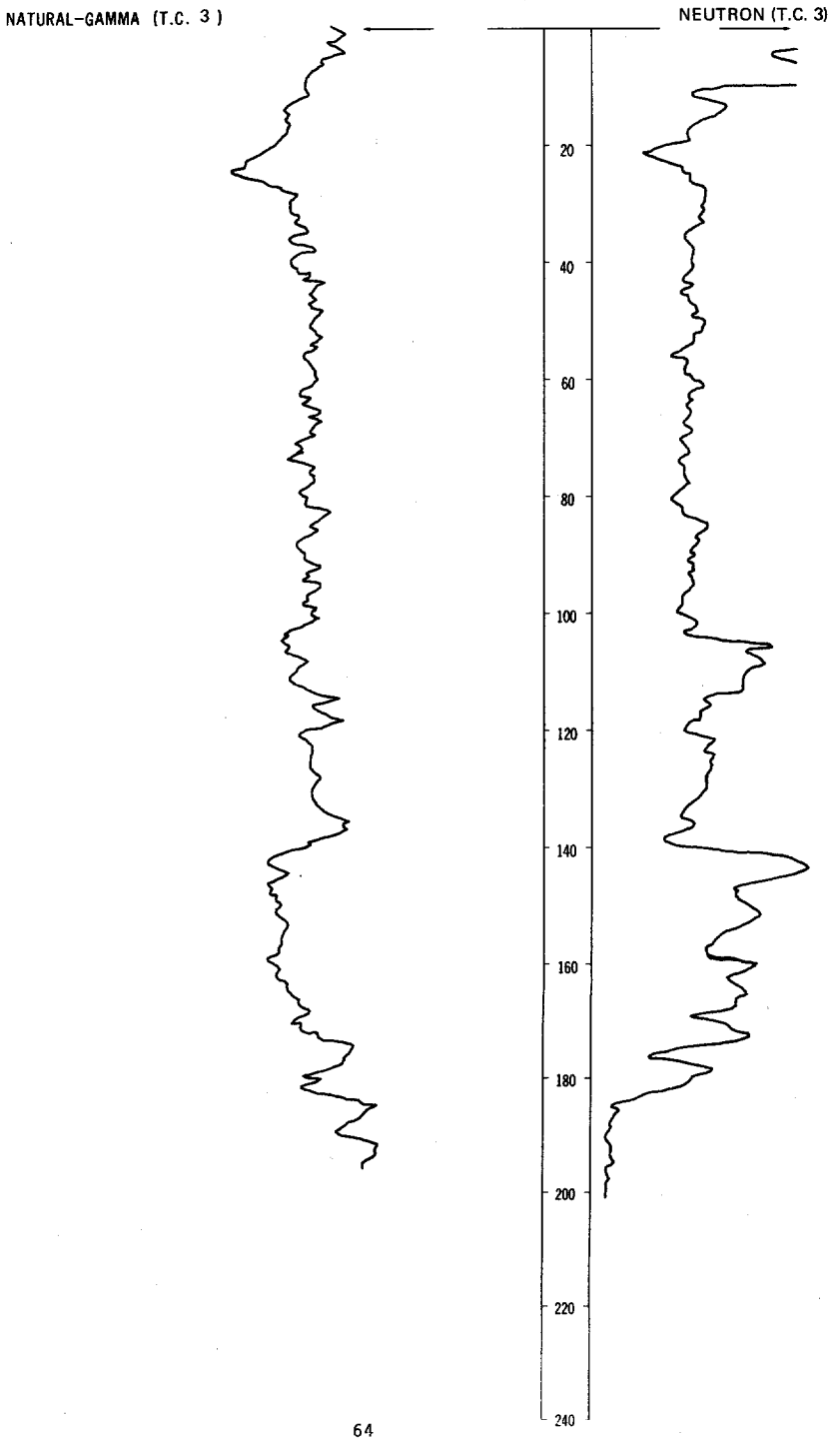
183-202 Shale, black to grayish-black, siliceous, hard.

LOCATION: 129-067-28BBB

DATE DRILLED: 8/29/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 202
(FT)



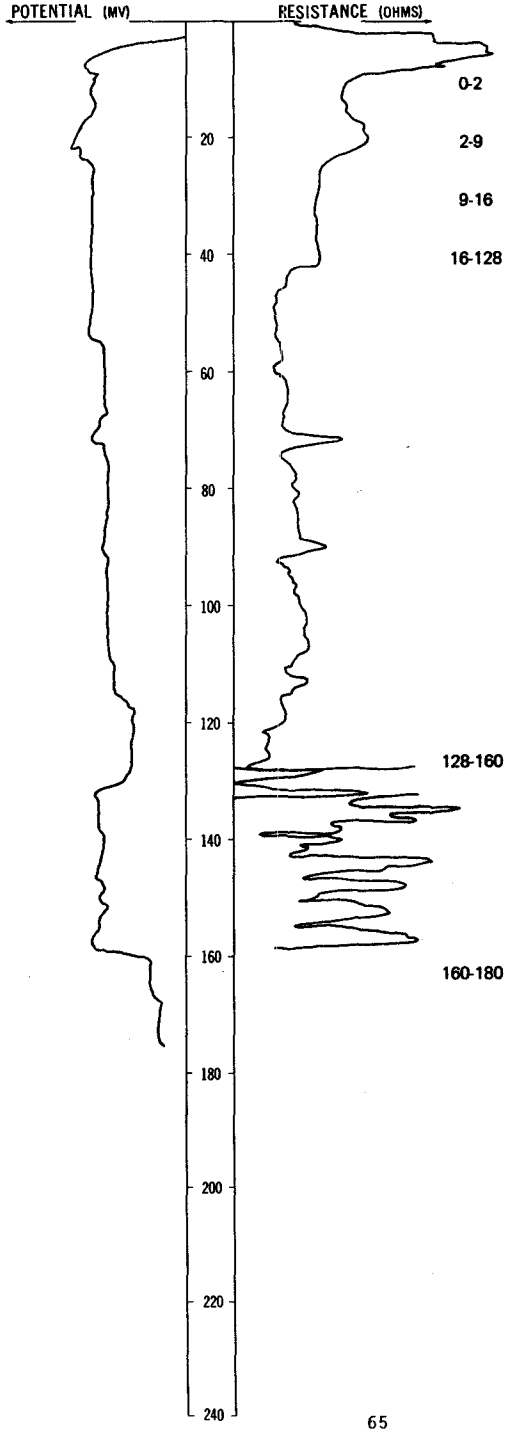
NDSWC 10124

LOCATION: 129-067-28BCB1

DATE DRILLED: 6/29/78

ALTITUDE: 1965
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-2	Clay (till), silty, sandy, pebbly, light-olive-gray.
2-9	Gravel, fine to medium, sandy, clayey.
9-16	Clay (till), silty, sandy, pebbly, light-olive-gray.
16-128	Clay (till), silty, sandy, pebbly, dark-gray; gravel lens from 117 to 118 feet.
128-160	Gravel, fine to coarse, sandy, clayey, silty, subrounded to rounded; composed of 40 percent carbonate, 30 percent shale, 20 percent igneous and metamorphic, and 10 percent unidentified fragments.

PIERRE FORMATION

160-180	Clay, dark-gray, hard.

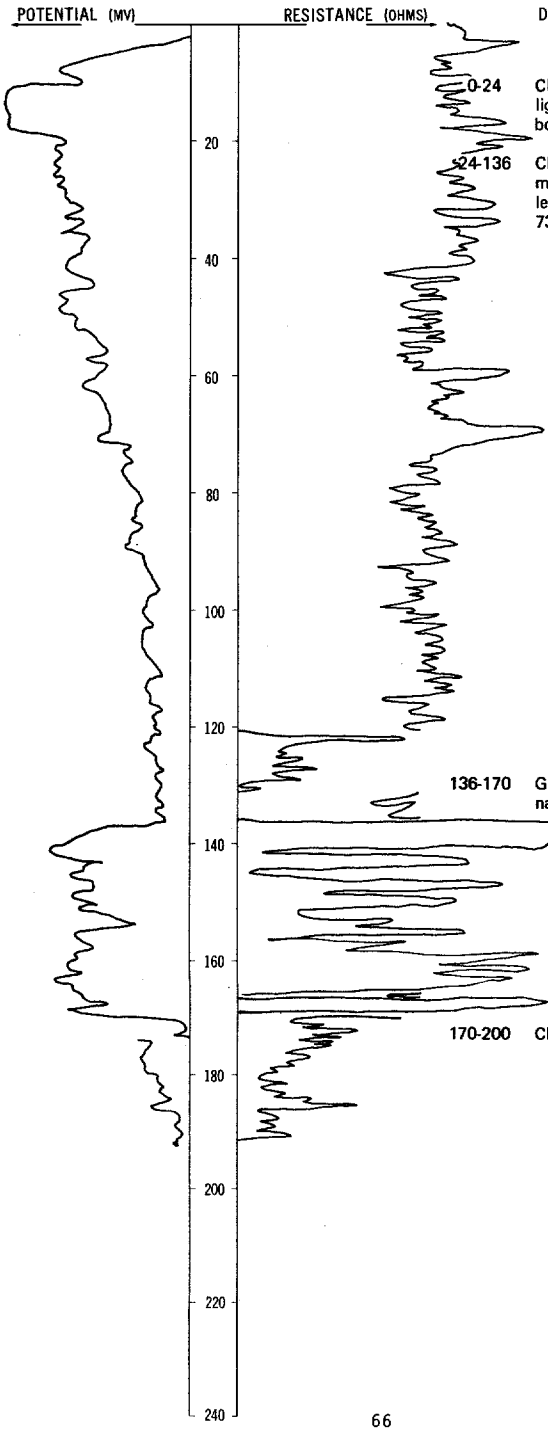
NDSWC 10125, 10125A

LOCATION: 129-067-28BCB2, 3

DATE DRILLED: 6/29/78

ALTITUDE: 1965
(FT, MSL)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-24 Clay (till), silty, sandy, pebbly, light-olive-gray to olive-gray; boulder at 21 feet.

24-136 Clay (till), silty, sandy, pebbly, medium-gray to dark-gray; gravel lenses from 62 to 63 feet and 72 to 73 feet.

136-170 Gravel, fine to coarse, predominantly fine, sandy, clayey, silty.

PIERRE FORMATION

170-200 Clay, dark-gray, hard.

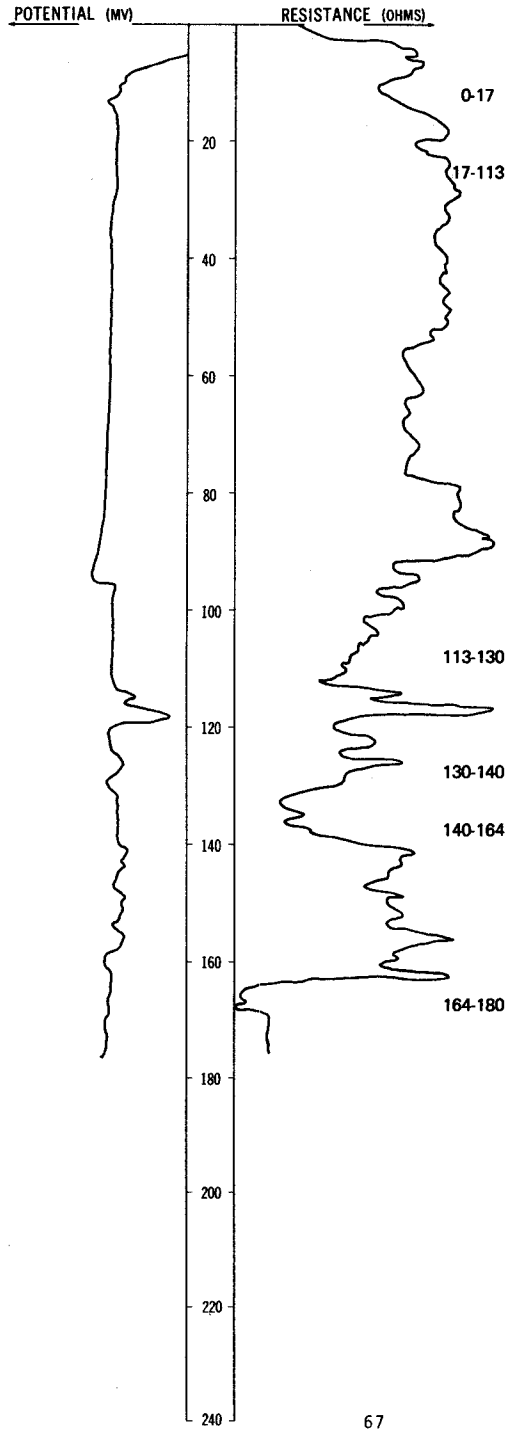
NDSWC 10123

LOCATION: 129-067-29DAD

DATE DRILLED: 6/29/78

ALTITUDE: 1960
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-17 Clay (till), silty, sandy, pebbly, light-olive-gray to pale-brown; few thin gravel lenses.

17-113 Clay (till), silty, sandy, pebbly, dark-gray; gravel lenses at 33 feet, 55 feet, and 69 feet.

113-130 Clay, sandy, pale-brown to light-brown.

130-140 Clay, medium-gray, hard.

140-164 Clay (till), sandy, pebbly, medium-gray; gravel lens from 162 to 163 feet.

PIERRE FORMATION

164-180 Clay, dark-gray, hard.

129-067-30BBB
NDSWC 9627

Altitude: 1984 feet — Date drilled: 7/15/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly medium, gravelly	4	4
	Clay (till), silty, sandy, moderate-yellowish-brown	11	15
	Clay (till), silty, sandy, olive-gray; scattered pebbles	98	113
	Gravel, very fine, sandy; composed predominantly of shale and carbonate fragments	11	124
	Clay (till), silty, sandy, brownish-gray to dark-yellowish-brown	101	225
Pierre Formation(?):			
	Clay, hard	10	235

129-067-33DDC
NDSWC 9517

Altitude: 2000 feet — Date drilled: 11/25/75

Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown	17	17
	Clay (till), sandy, silty, gravelly, olive-gray	196	213
	Clay, silty, olive-gray	7	220
	Clay (till), sandy, gravelly, silty, medium-dark-gray to olive-gray	24	244
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	16	260

129-067-35CBB
(Log from Jacob Thurn)

Date drilled: 5/01/72

	Black dirt	4	4
	Clay	16	20
	Sand	7	27

129-067-36DDD
NDSWC 9516

Altitude: 2100 feet — Date drilled: 11/25/75

Glacial drift:			
	Clay (till), silty, sandy, greenish-brown to yellowish-brown; scattered pebbles	16	16
	Clay (till), gravelly, medium-dark-gray to olive-gray	142	158
	Clay (till), gravelly, moderate-yellowish-brown; changes to olive gray at 215 feet	132	290
	Gravel, fine to medium, angular to subrounded; composed of 60 percent carbonate, 30 percent shale, and 10 percent quartz fragments	4	294
	Clay, sandy, silty, medium-gray to olive-gray	38	332
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	8	340

129-068-01DDA
NDSWC 9513

Altitude: 1967 feet — Date drilled: 11/20/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse; composed of 70 percent quartz, 20 percent carbonate, and 10 percent shale fragments	17	17
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	13	30
	Clay (till), sandy, silty, medium-dark-gray to olive-gray	57	87
	Clay (till), sandy, silty, moderate-yellowish-brown	6	93
Pierre Formation:			
	Shale, silty, sandy, grayish-black to black	27	120

129-068-03AAA
NDSWC 9512

Altitude: 1915 feet — Date drilled: 11/20/75

Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	5	5
	Sand, fine to very coarse, predominantly coarse; composed of 60 percent quartz, 25 percent carbonate, 10 percent shale, and 5 percent igneous fragments	5	10
	Clay (till), sandy, silty, medium-dark-gray to olive-gray	40	50
	Sand, fine to very coarse, and fine to coarse gravel; gravel is composed of 60 percent carbonate, 30 percent shale, and 10 percent quartz fragments	24	74
Pierre Formation:			
	Shale, silty, sandy, grayish-black to black, hard	66	140

129-068-08CCC
NDSWC 9521

Altitude: 1970 feet — Date drilled: 12/05/75

Glacial drift:			
	Sand, very fine to coarse, predominantly medium	9	9
	Silt, sandy, clayey, moderate-yellowish-brown	16	25
	Silt, sandy, clayey, medium-dark-gray to olive-gray	47	72
	Clay (till), sandy, silty, olive-gray; scattered pebbles	18	90
	Gravel, fine to coarse, angular to subrounded; composed of 50 percent carbonate, 30 percent shale, and 20 percent quartz fragments	13	103
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles	25	128
	Gravel, fine to coarse, angular to subrounded	4	132
	Clay (till), sandy, silty, medium-dark-gray to gray; scattered pebbles	19	151
	Sand, very fine to very coarse, predominantly medium to coarse; composed of 70 percent quartz, 20 percent carbonate, and 10 percent shale fragments	18	169
Pierre Formation:			
	Shale, silty, grayish-black to black	26	195

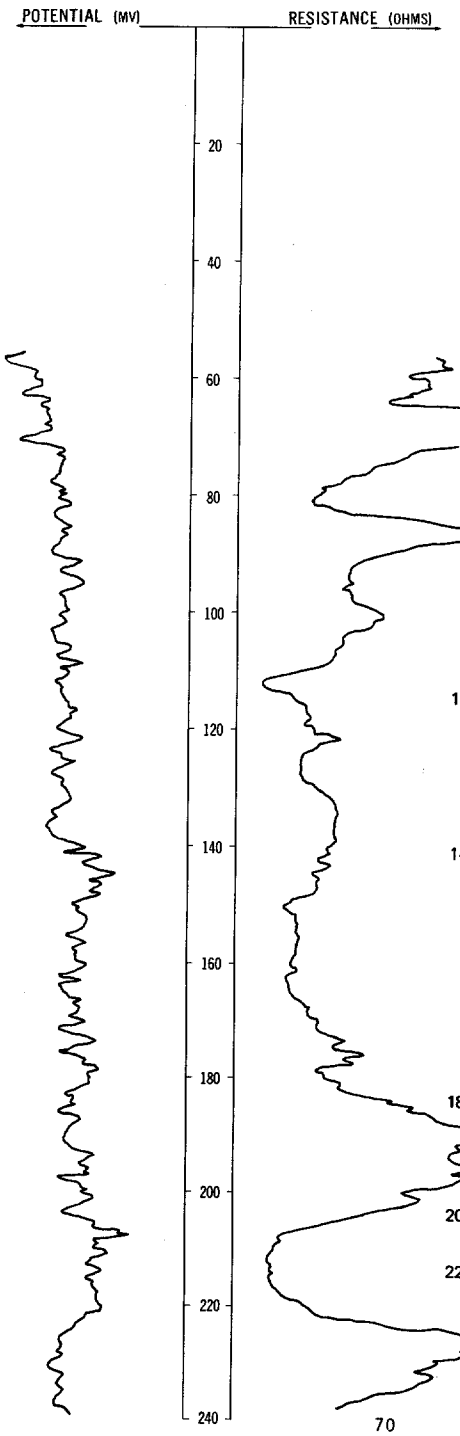
NDSWC 5199, 5199A

LOCATION: 129-068-09CCB1, 2

DATE DRILLED: 8/25/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

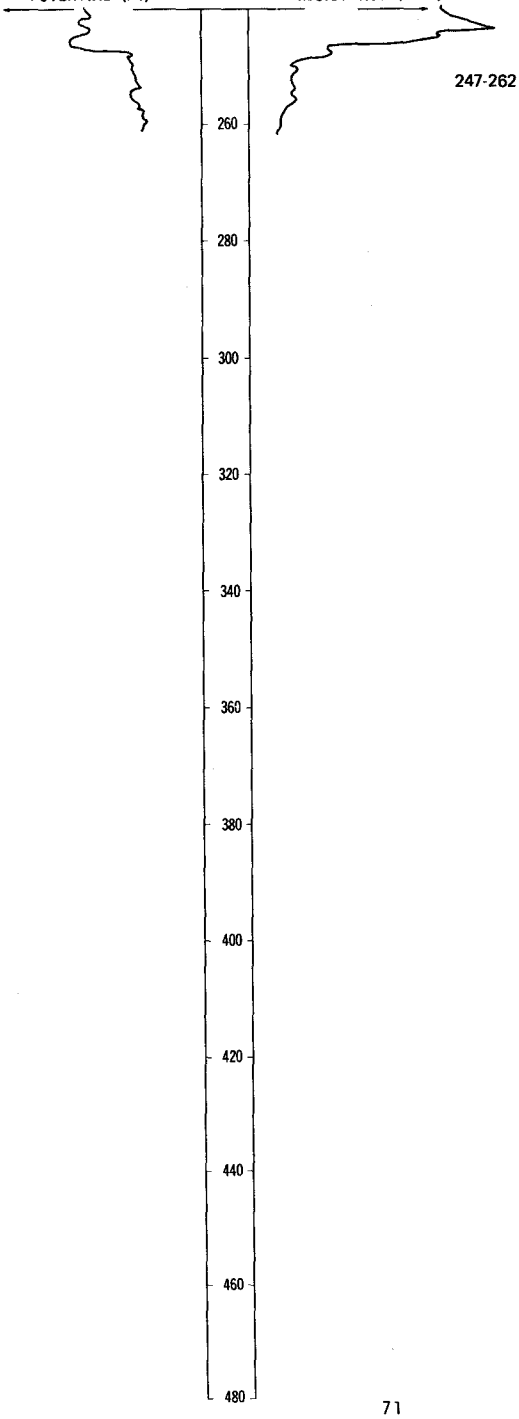
0-21	Clay (lacustrine), silty, sandy, moderate-yellowish-brown; thin veneer of gravel on top.
21-30	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.
30-43	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.
43-70	Sand, fine to very coarse, predominantly coarse, subangular to rounded; composed of quartz, carbonate, and shale fragments.
70-115	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.
115-140	Clay (lacustrine), silty, sandy, medium-dark-gray.
140-184	Clay (till), sandy, silty, gravelly, olive-gray.
184-205	Sand, very fine to medium, silty, well-rounded.
205-224	Clay (till), sandy, silty, dark-gray to olive-gray; scattered pebbles.
224-247	Sand, predominantly coarse, gravelly, subangular to rounded; predominantly quartz, carbonate, and shale fragments.

LOCATION: 129-068-09CCB1, 2

DATE DRILLED: 8/25/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

PIERRE FORMATION

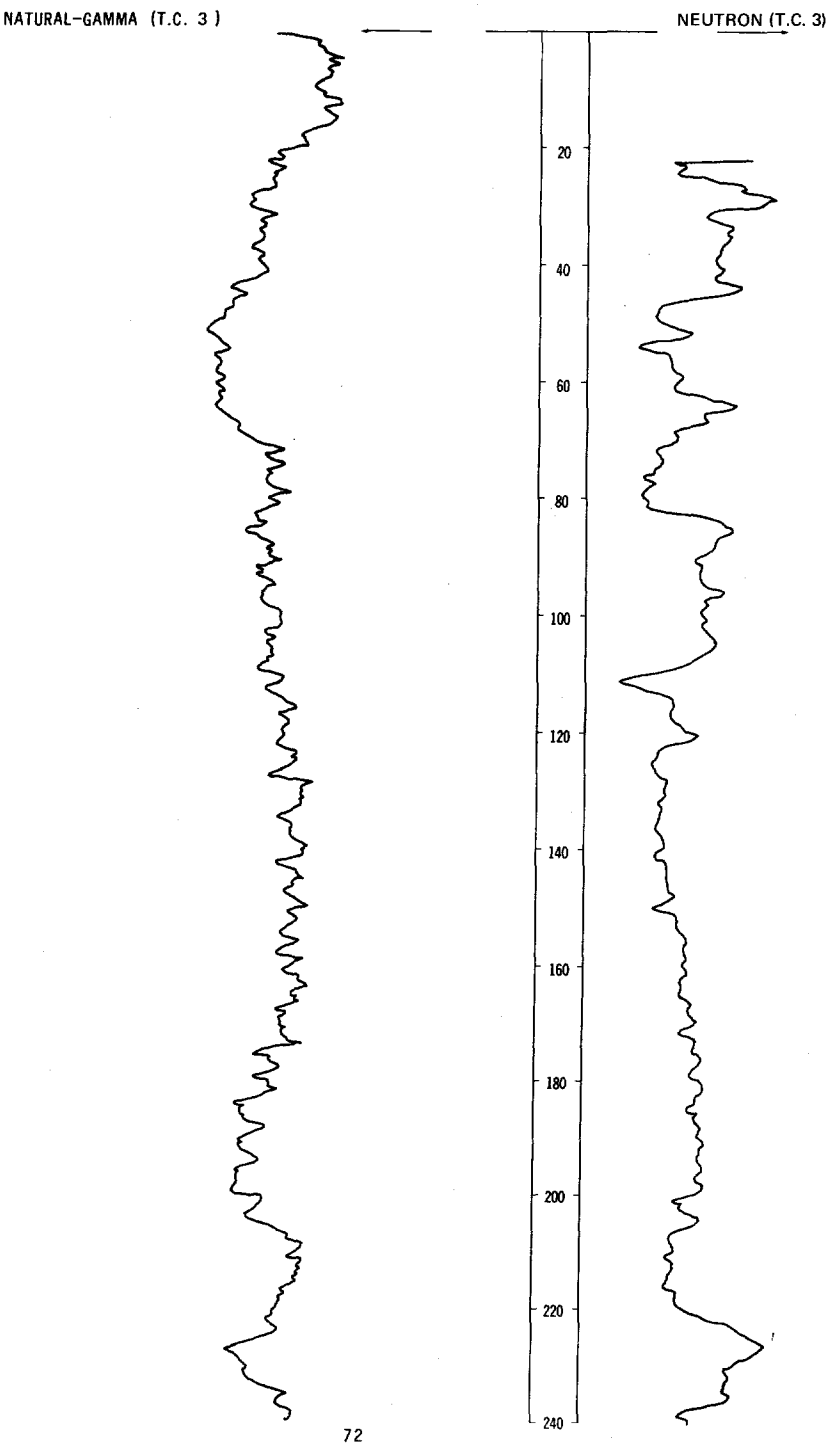
247-262 Shale, black to grayish-black, non-calcareous, hard.

LOCATION: 129-068-09CCB1, 2

DATE DRILLED: 8/25/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 262
(FT)

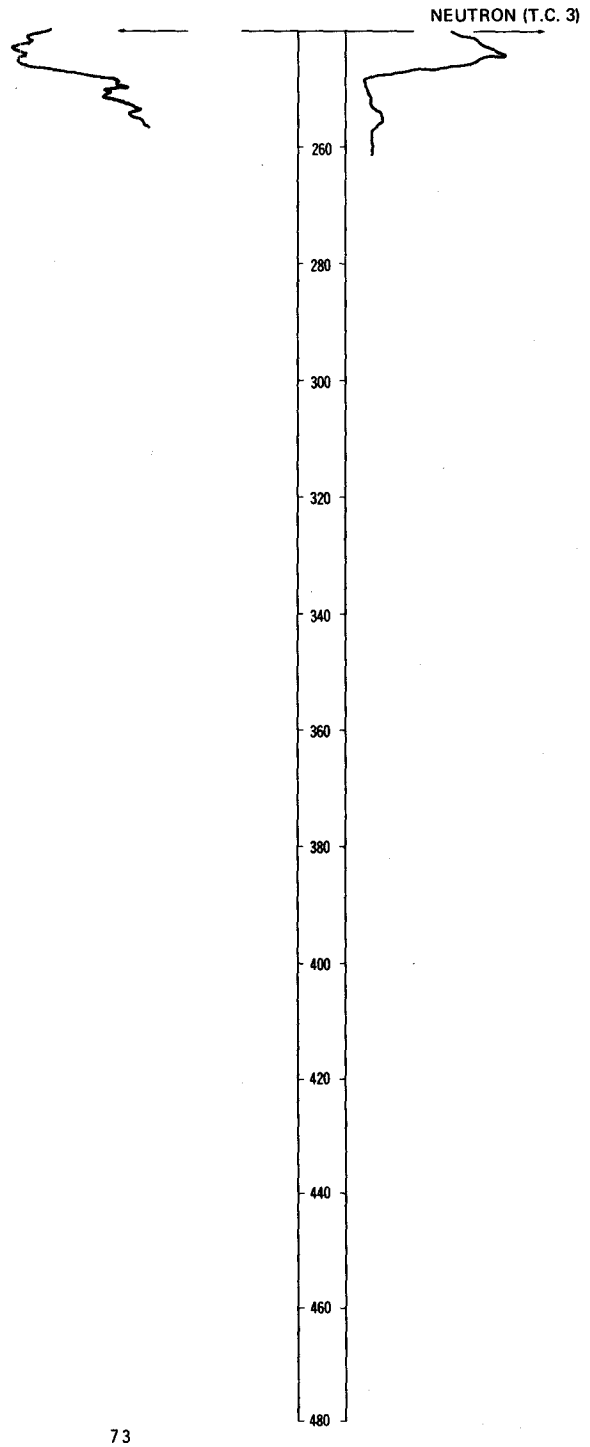


LOCATION: 129-068-09CCB1, 2

DATE DRILLED: 8/25/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 262
(FT)



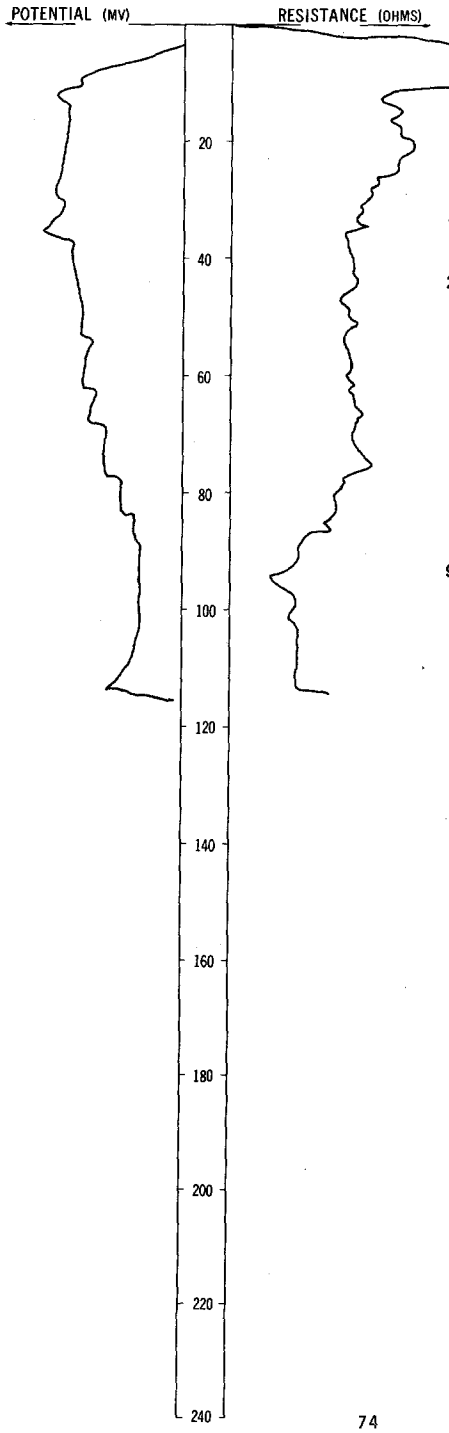
NDSWC 10118

LOCATION: 129-068-12BBB

DATE DRILLED: 6/28/78

ALTITUDE: (FT, MSL)

DEPTH: 120 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12 Sand, very fine to very coarse, gravelly, silty, rounded to sub-rounded; composed of 40 percent shale particles and 30 percent quartz, 20 percent carbonate, and 10 percent unidentified fragments.

12-27 Clay (till), silty, sandy, gravelly, light-olive-gray.

27-94 Clay (till), silty, sandy, gravelly, medium-gray; gravel lens from 87 to 88 feet.

PIERRE FORMATION

94-120 Clay, dark-gray, hard.

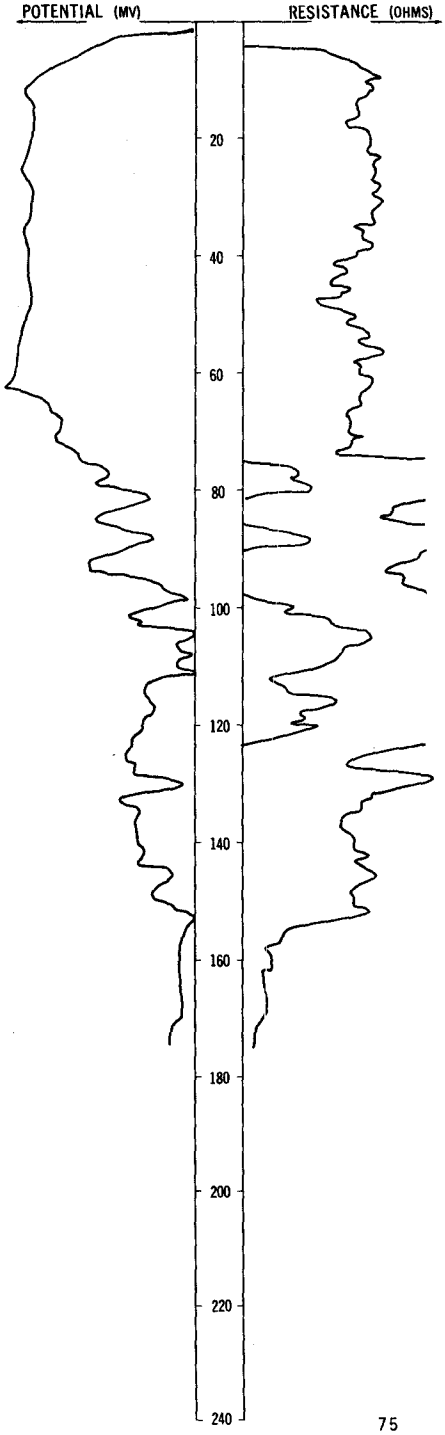
NDSWC 10119

LOCATION: 129-068-14BAA

DATE DRILLED: 6/28/78

ALTITUDE: 2005
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-31	Clay (till), silty, sandy, pebbly, light-olive-gray to light-gray.
31-41	Clay (till), silty, sandy, pebbly, medium-brown.
41-75	Clay (till), silty, sandy, pebbly, dark-gray; gravel lens from 47 to 48 feet.
75-82	Gravel, fine to medium, sandy, subangular to rounded; composed predominantly of carbonate and shale fragments.
82-86	Clay, sandy, pale-brown to light-brown.
86-90	Gravel, fine to medium, sandy; composed predominantly of carbonate and shale fragments.
90-131	Clay (till), sandy, pebbly, silty, pale-brown to moderate-brown; gravel lenses from 104 to 106 feet, 119 to 120 feet, and 129 to 131 feet.
131-154	Clay (till), silty, pebbly, sandy, pale-brown to light-brown.

PIERRE FORMATION

154-180	Clay, dark-gray, hard.

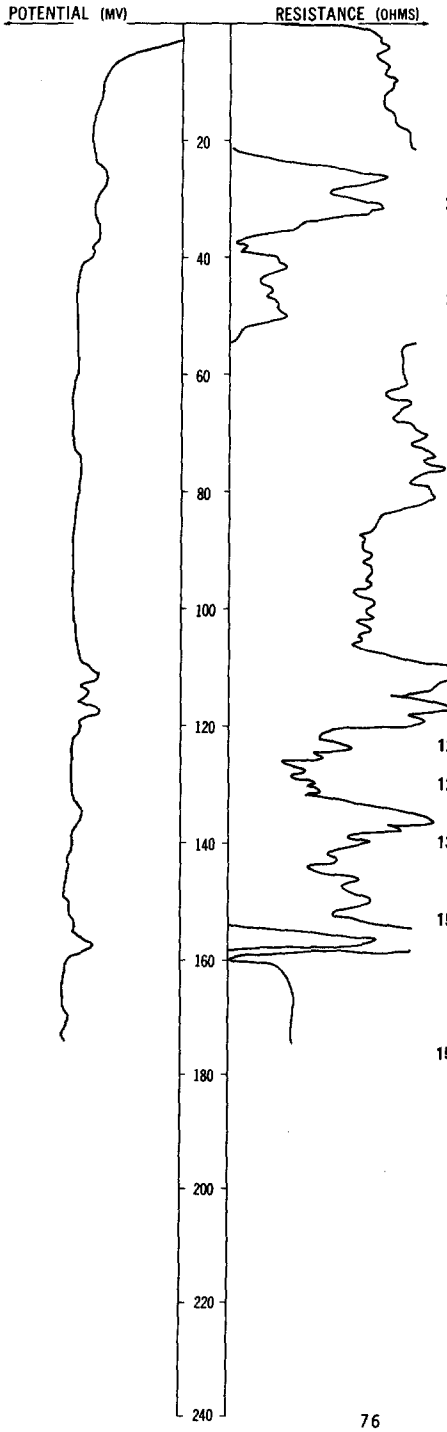
NDSWC 10122

LOCATION: 129-068-14CCC

DATE DRILLED: 6/29/78

ALTITUDE: 1970
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-13	Clay (till), silty, sandy, pebbly, light-olive-gray.
13-24	Clay (till), silty, sandy, pebbly, medium-dark-gray.
24-36	Gravel, fine to medium, sandy, subrounded to rounded; composed predominantly of carbonate and shale fragments.
36-121	Clay (till), sandy, silty, pebbly, dark-gray; boulder at 65 feet.
121-126	Clay, sandy, silty, light-brown.
126-134	Clay (till), silty, sandy, pebbly, dark-gray.
134-156	Clay, medium-gray, hard.
156-159	Gravel, fine to medium, sandy, clayey, subrounded to angular; composed predominantly of carbonate and shale fragments.

PIERRE FORMATION

159-180	Clay, dark-gray, hard.

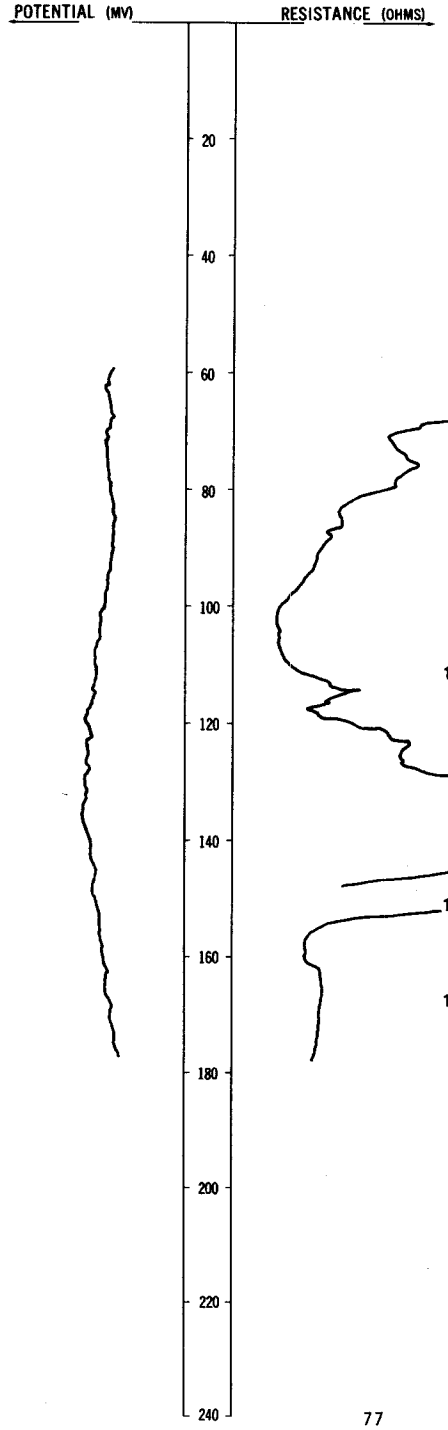
NDSWC 5200

LOCATION: 129-068-15AAD

DATE DRILLED: 8/25/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-17 Clay (till), sandy, gravelly, silty, moderate-yellowish-brown.

17-69 Sand, fine to very coarse, predominantly coarse to very coarse, gravelly; composed largely of quartz, carbonate, and shale fragments.

69-112 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

112-154 Sand, very fine to coarse, predominantly coarse, gravelly, 50 percent quartz, 30 percent carbonate, 15 percent shale, and 5 percent other fragments.

154-163 Clay (till), sandy, silty, olive-gray; scattered pebbles.

PIERRE FORMATION

163-182 Shale, silty, black to grayish-black, noncalcareous.

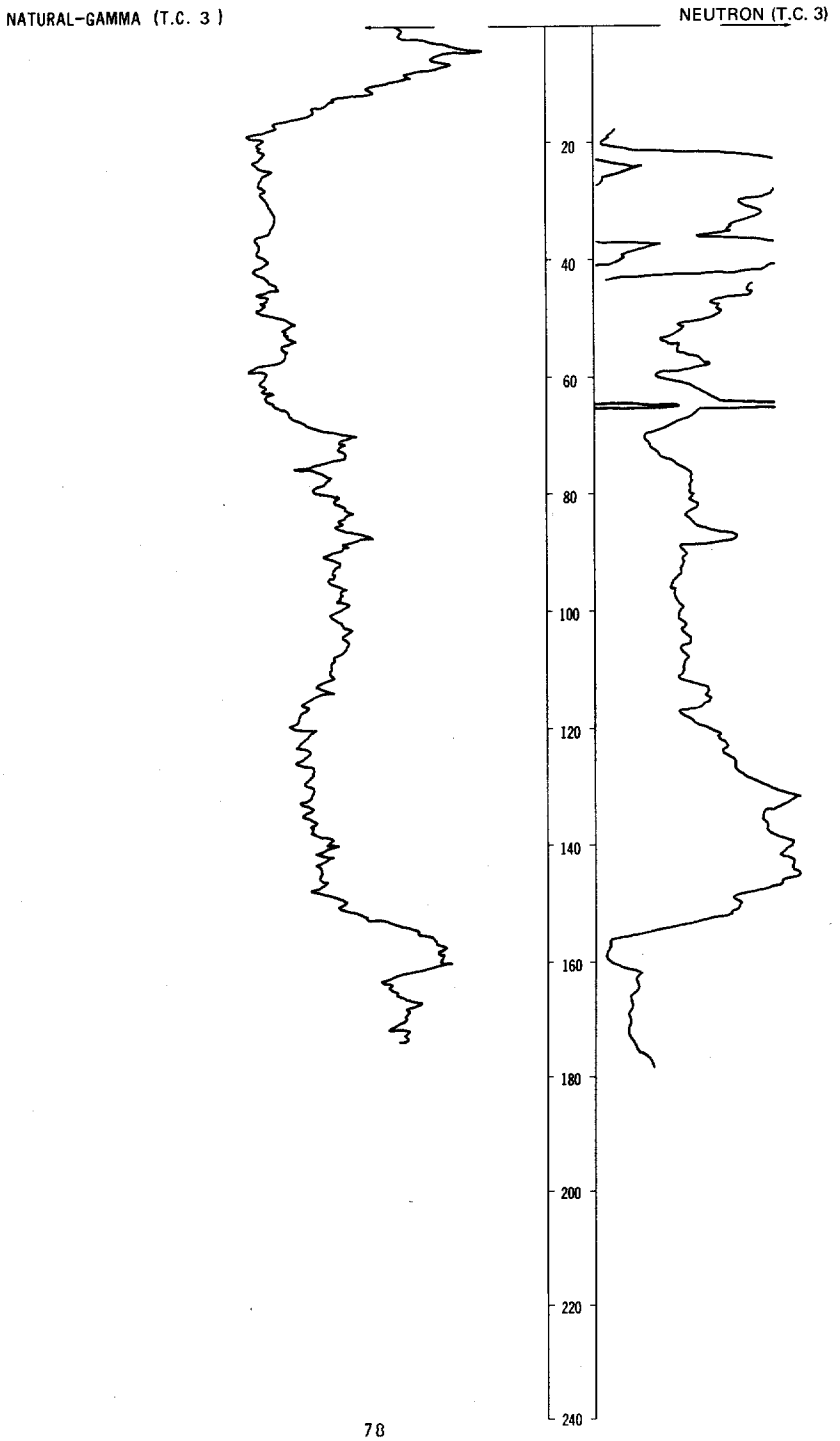
NDSWC 5200, Continued

LOCATION: 129-068-15AAD

DATE DRILLED: 8/25/77

ALTITUDE: 1970
(FT, MSL)

DEPTH: 182
(FT)



129-068-18BBB
NDSWC 9661

Altitude: 2002 feet | Date drilled: 7/28/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, moderate-yellowish-brown	8	8
	Clay, dark-yellowish-brown	8	16
	Clay, moderate-yellowish-brown	15	31
	Clay (till), olive-gray	3	34
	Sand and gravel	2	36
	Clay (till), silty, sandy, olive-gray; scattered pebbles	86	122
Pierre Formation:			
	Shale, grayish-black, hard	18	140

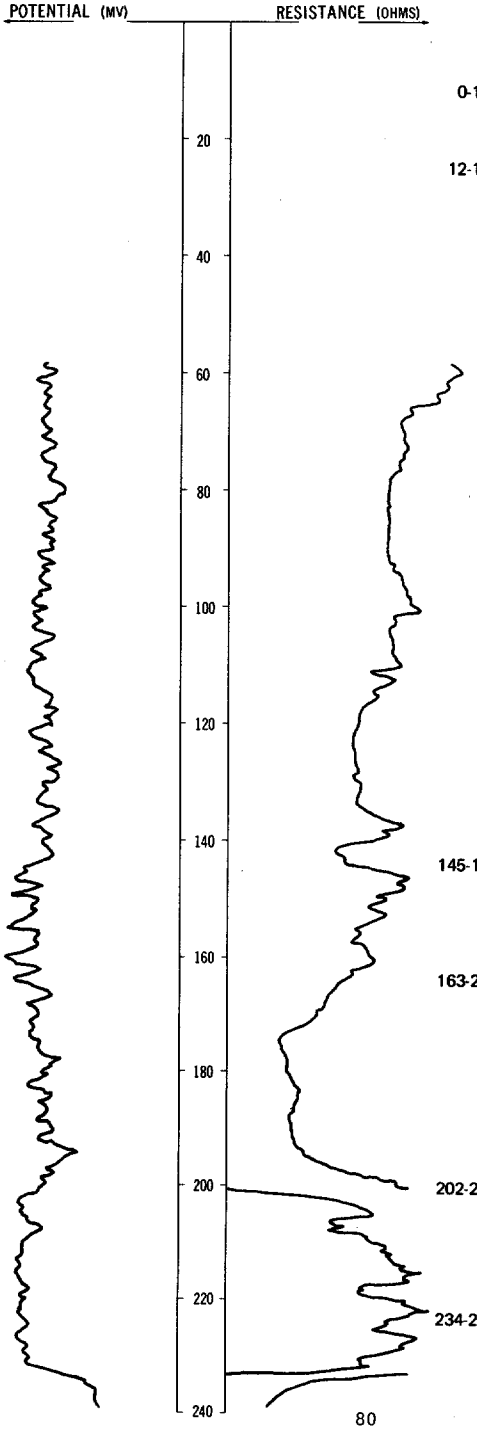
NDSWC 5197

LOCATION: 129-068-18CCC

DATE DRILLED: 8/24/77

ALTITUDE: 1940
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12 Clay (till), sandy, silty, moderate-yellowish-brown; gravelly from 5 to 10 feet.

12-145 Clay (till), sandy, silty, dark-gray to olive-gray; numerous thin gravel lenses and lacustrine clay lenses.

145-163 Sand, very fine to medium, well-rounded; composed largely of quartz, shale, and carbonate fragments.

163-202 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

202-234 Sand, fine to coarse, predominantly coarse, gravelly, subangular to rounded; predominantly quartz, carbonate, and shale fragments.

PIERRE FORMATION

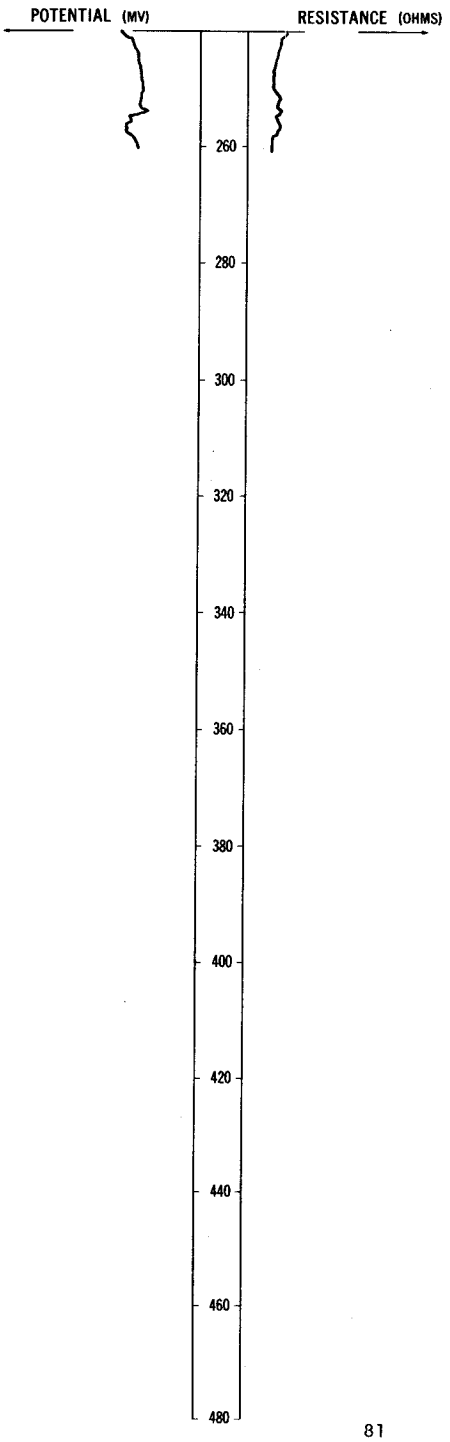
234-262 Shale, grayish-black to black, hard.

LOCATION: 129-068-18CCC

DATE DRILLED: 8/24/77

ALTITUDE: 1940
(FT, MSL)

DEPTH: 262
(FT)



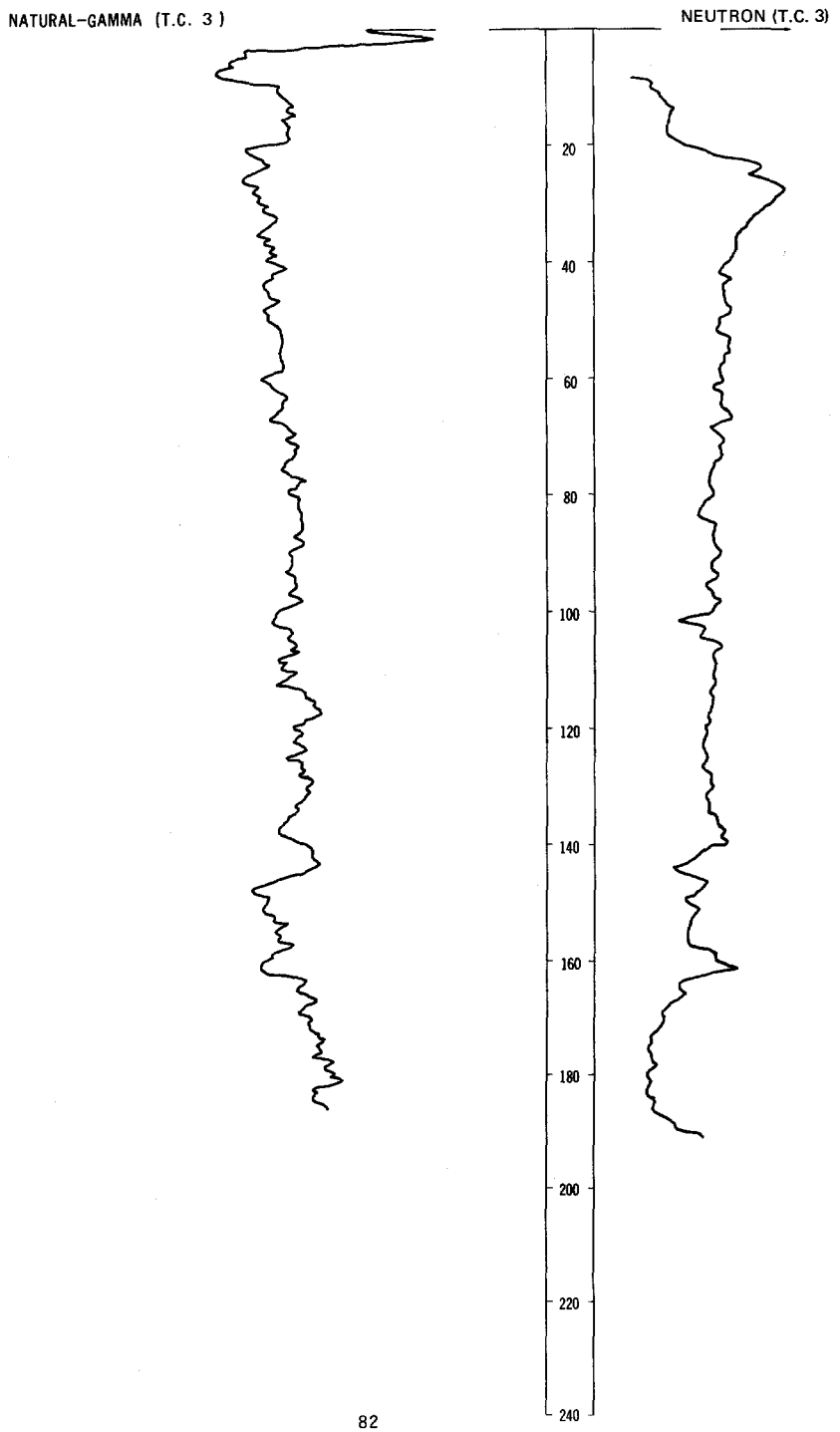
DESCRIPTION OF DEPOSITS

LOCATION: 129-068-18CCC

DATE DRILLED: 8/24/77

ALTITUDE: 1940
(FT, MSL)

DEPTH: 262
(FT)



129-068-20CCC
NDSWC 9519

Altitude: 1937 feet — Date drilled: 12/04/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	18	18
	Clay (till), sandy, silty, olive-gray; scattered pebbles	10	28
	Gravel, fine to coarse, sandy; composed of 60 percent carbonate, 30 percent shale, and 10 percent quartz fragments	4	32
	Clay (till), silty, sandy, medium-dark-gray to olive-gray	98	130
	Gravel	5	135
Pierre Formation:			
	Shale, silty, grayish-black to black, hard	25	160

129-068-22DCD
(Log from Albrecht Well Work)

Altitude: 1945 feet — Date drilled: 7/21/75

	Topsoil, black	3	3
	Clay, silty, yellow	11	14
	Clay, blue; stones (till)	16	30
	Sand and gravel; coarse	2	32
	Clay, blue; stones (till)	21	53

129-068-23CBB
NDSWC 9628

Altitude: 1974 feet — Date drilled: 7/15/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-olive-brown; scattered pebbles	28	28
	Clay (till), silty, sandy, olive-gray; scattered pebbles	130	158
	Sand and gravel	5	163
	Clay (till), silty, sandy, dark-brownish-gray	16	179
	Silt (till), clayey, sandy, brownish-gray, hard	35	214
	Boulders	1	215
	Silt (till), clayey, sandy, dusky-yellowish-brown	35	250
	Boulders and gravel	4	254
	Clay (till), silty, sandy, olive-gray; scattered pebbles	8	262
	Silt (till), clayey, sandy, brownish-gray	16	278
Pierre Formation:			
	Shale, dark-gray, hard	22	300

129-068-24BBB1
NDSWC 9514

Altitude: 1977 feet — Date drilled: 11/20/75

Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown; few sand lenses	17	17
	Clay (till), silty, sandy, gravelly, medium-dark-gray to olive-gray; numerous boulders; end of drill rod twisted off	83	100

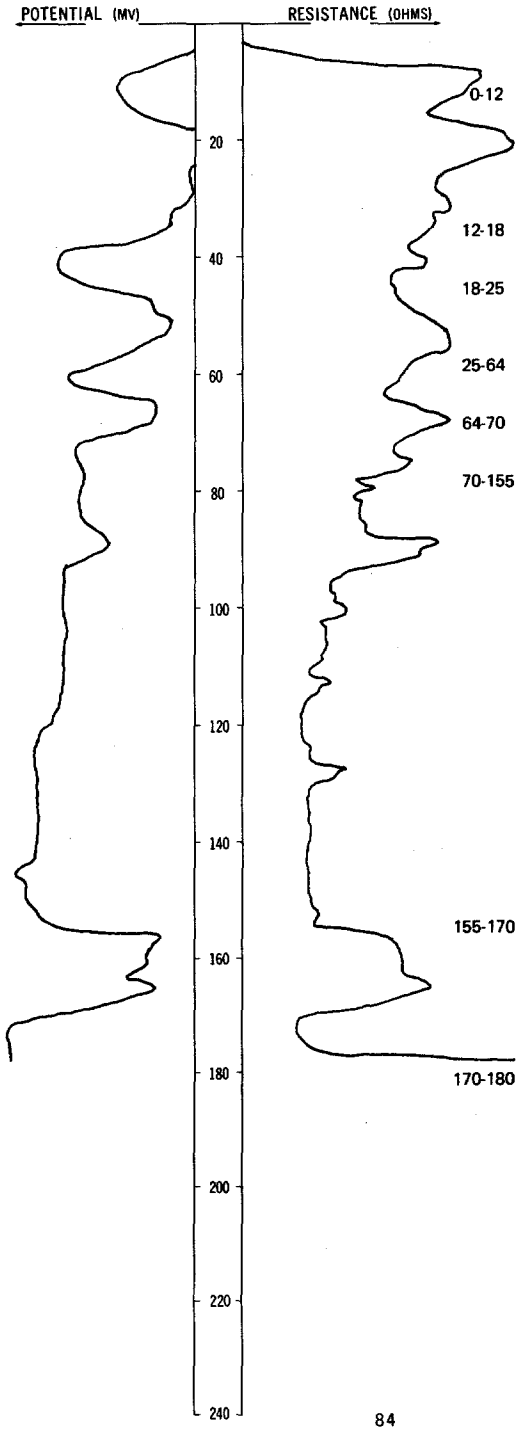
NDSWC 9514A

LOCATION: 129-068-24BBB2

DATE DRILLED: 11/21/75

ALTITUDE: 1977
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12	Sand, fine to very coarse, predominantly coarse, angular to subrounded; composed of 60 percent quartz, 20 percent shale, 15 percent carbonate, and 5 percent unidentified fragments.
12-18	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
18-25	Sand, fine to very coarse, predominantly coarse, angular to subrounded.
25-64	Clay (till), silty, sandy, olive-gray; scattered pebbles.
64-70	Sand, fine to coarse, gravelly, angular to subrounded.
70-155	Clay (till), sandy, silty, medium-gray to dark-olive-gray; scattered pebbles.
155-170	Sand, fine to very coarse, predominantly coarse, gravelly, angular to subrounded; 70 percent quartz, 20 percent carbonate, and 10 percent shale and unidentified fragments.

PIERRE FORMATION

170-180	Shale, silty, black to grayish-black, hard.

129-068-27BBC
NDSWC 9629

Altitude:	1926 feet	Date drilled:	7/15/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, moderate-yellowish-brown	13	13
	Sand, medium, gravelly; composed predominantly of shale and carbonate fragments	15	28
	Clay (till), silty, sandy, gravelly, dusky-yellowish-brown to dark-olive-gray	39	67
	Sand, medium to coarse, predominantly coarse, gravelly; composed predominantly of shale and carbonate fragments	10	77
	Clay (till), sandy, gravelly, olive-gray	53	130
	Sand, fine to very coarse, predominantly coarse, gravelly	19	149
	Clay (till), silty, sandy, olive-gray; scattered pebbles; thin gravel lenses near base	18	167
	Clay (till), silty, sandy, olive-gray	23	190
	Gravel, very fine to very coarse	4	194
	Clay (till), silty; scattered pebbles	3	197
Pierre Formation:			
	Shale, dark-gray, brittle	23	220

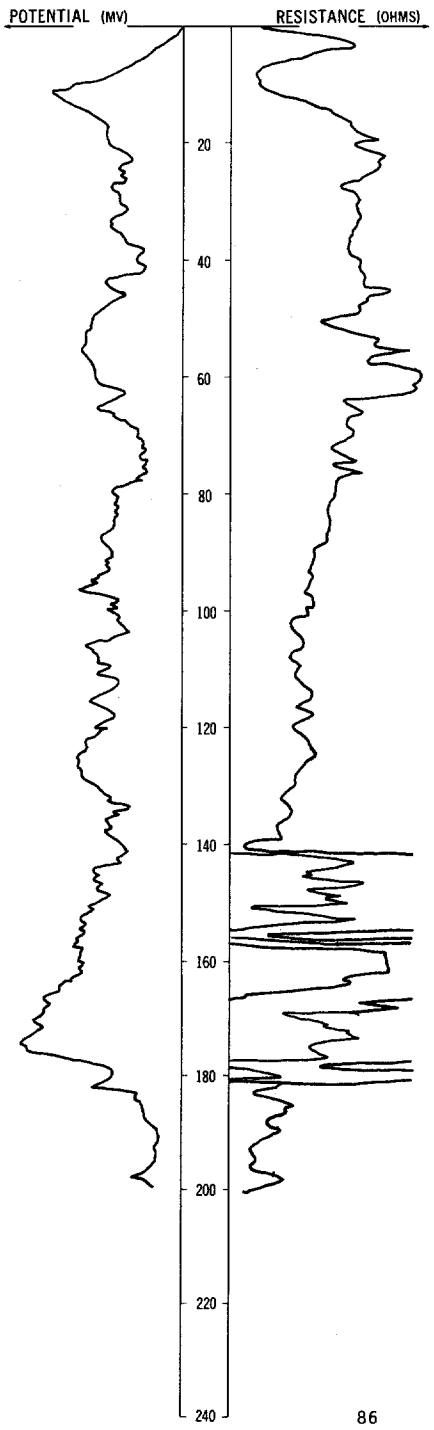
NDSWC 9630

LOCATION: 129-068-28ADD

DATE DRILLED: 7/16/76

ALTITUDE: 1936
(FT, MSL)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-16	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
16-142	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel lenses from 43 to 44 feet and 63 to 65 feet.
142-157	Silt, clayey, brownish-gray.
157-158	Clay, silty, olive-gray.
158-178	Sand, medium to very coarse, predominantly coarse, gravelly.
178-180	Silt, clayey.

PIERRE FORMATION

180-200	Shale, dark-gray, hard.

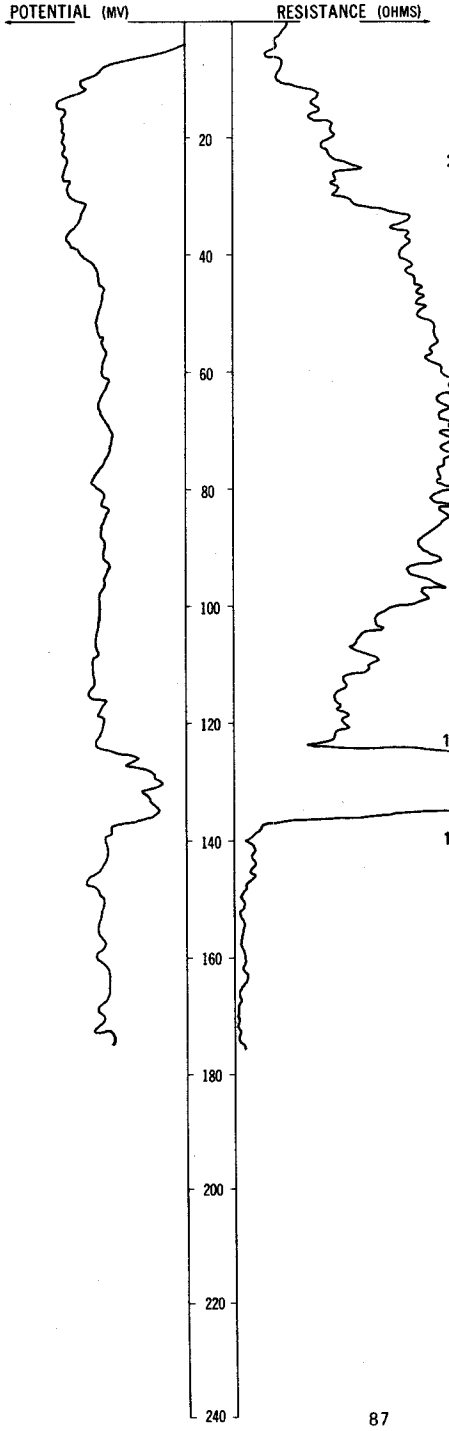
NDSWC 10121

LOCATION: 129-068-28BAD

DATE DRILLED: 6/29/78

ALTITUDE: 1920
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-21 Clay (till), silty, sandy, pebbly, medium-brown; gravel lenses at 2 and 14 feet.

21-123 Clay (till), silty, sandy, pebbly, dark-gray; gravel lens from 105 to 106 feet.

123-135 Sand, very fine to coarse, predominantly medium, clayey, silty.

PIERRE FORMATION

135-180 Clay, dark-gray, hard.

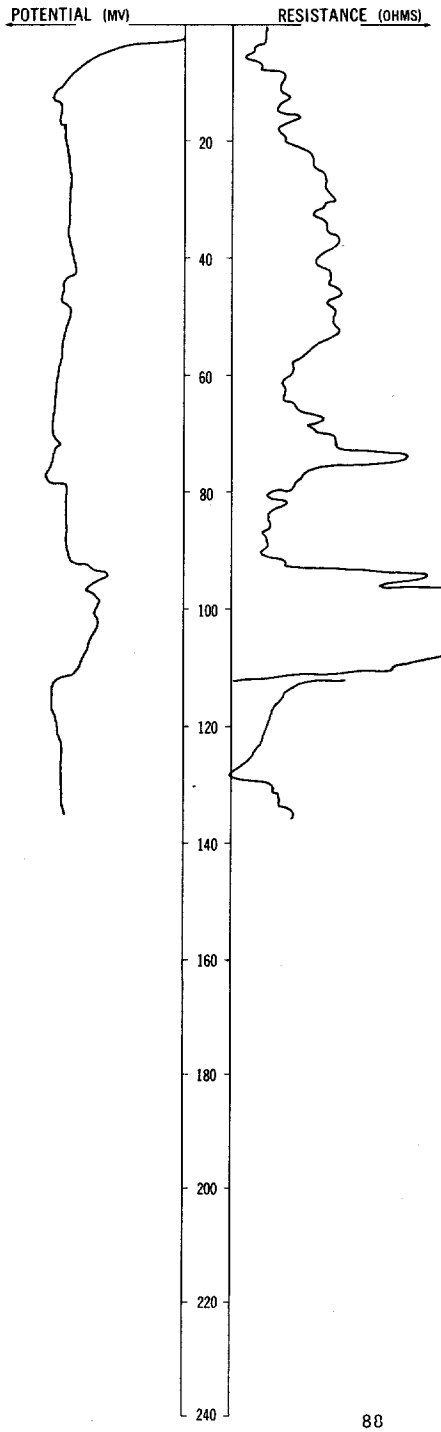
NDSWC 10120

LOCATION: 129-068-29AAA

DATE DRILLED: 6/28/78

ALTITUDE: 1926
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-16	Clay (till), silty, sandy, gravelly, light-olive-brown; gravel lens from 12 to 14 feet.
16-50	Clay (till), silty, sandy, gravelly, dark-gray.
50-67	Clay, silty, dark-gray.
67-94	Clay (till), silty, sandy, gravelly, dark-gray.
94-112	Gravel, fine to medium, sandy, silty, subrounded to rounded; composed of 30 percent carbonate, 40 percent quartz, 20 percent shale, and 10 percent unidentified fragments.

PIERRE FORMATION

112-140	Clay, dark-gray, hard.

129-068-31ADA
NDSWC 9520

Altitude:	1919 feet	Date drilled:	12/04/75
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 50 percent quartz, 30 percent shale, and 20 percent carbonate fragments	20	20
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; few gravel lenses	120	140
	Sand, fine to coarse, predominantly medium, angular to subrounded	11	151
	Clay (till), sandy, silty, gravelly, olive-gray	44	195
	Gravel, fine to medium, sandy; composed of 50 percent carbonate, 40 percent shale, and 10 percent quartz fragments	37	232
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	28	260

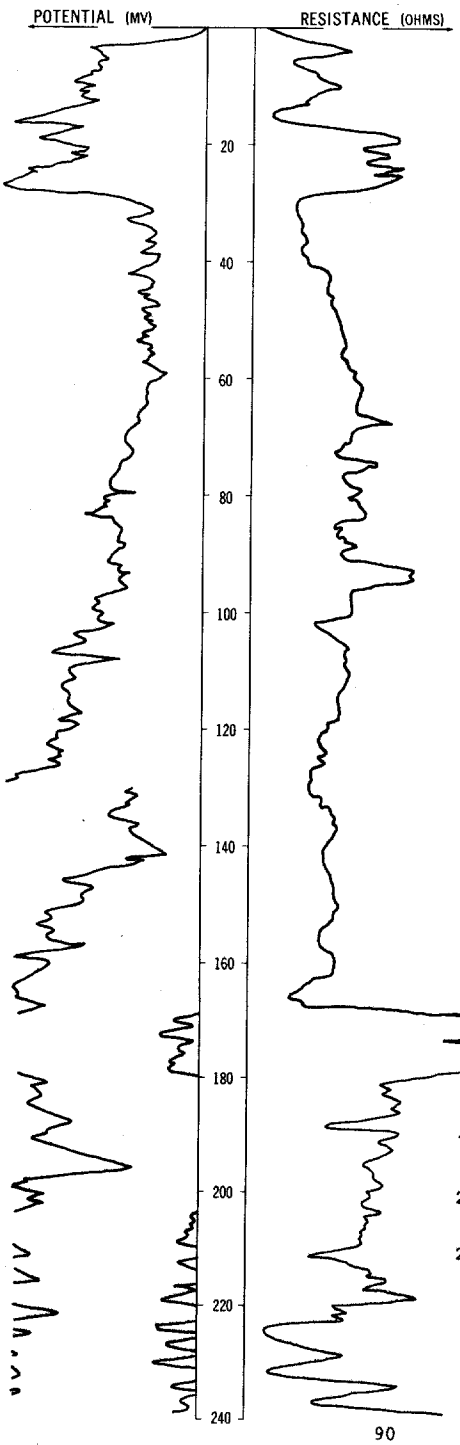
NDSWC 9518

LOCATION: 129-068-33DDC

DATE DRILLED: 12/03/75

ALTITUDE: 1940
(FT, MSL)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

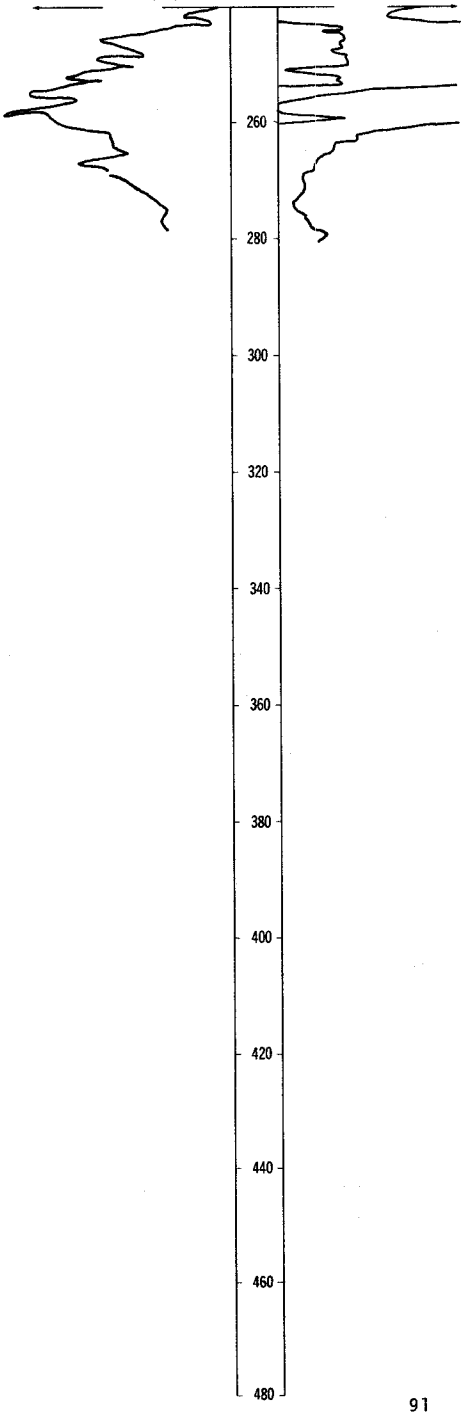
0-16	Clay (lacustrine), silty, sandy, moderate-yellowish-brown.
16-19	Clay (lacustrine), silty, sandy, medium-gray to olive-gray.
19-28	Gravel, fine to coarse, sandy, angular to subrounded; composed of 50 percent carbonate, 30 percent shale, and 20 percent quartz and unidentified fragments.
28-168	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.
168-179	Sand, fine to very coarse, predominantly coarse, angular to subrounded; composed of 60 percent quartz, 20 percent shale, 15 percent carbonate, and 5 percent unidentified fragments.
179-224	Silt, sandy, clayey, medium-dark-gray.
224-239	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.
239-255	Gravel, fine to coarse, angular to subrounded; few boulders.

LOCATION: 129-068-33DDC

DATE DRILLED:12/03/75

ALTITUDE: 1940
(FT, MSL)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

255-261 Silt, brownish-gray.

PIERRE FORMATION

261-280 Shale, silty, black to grayish-black, hard.

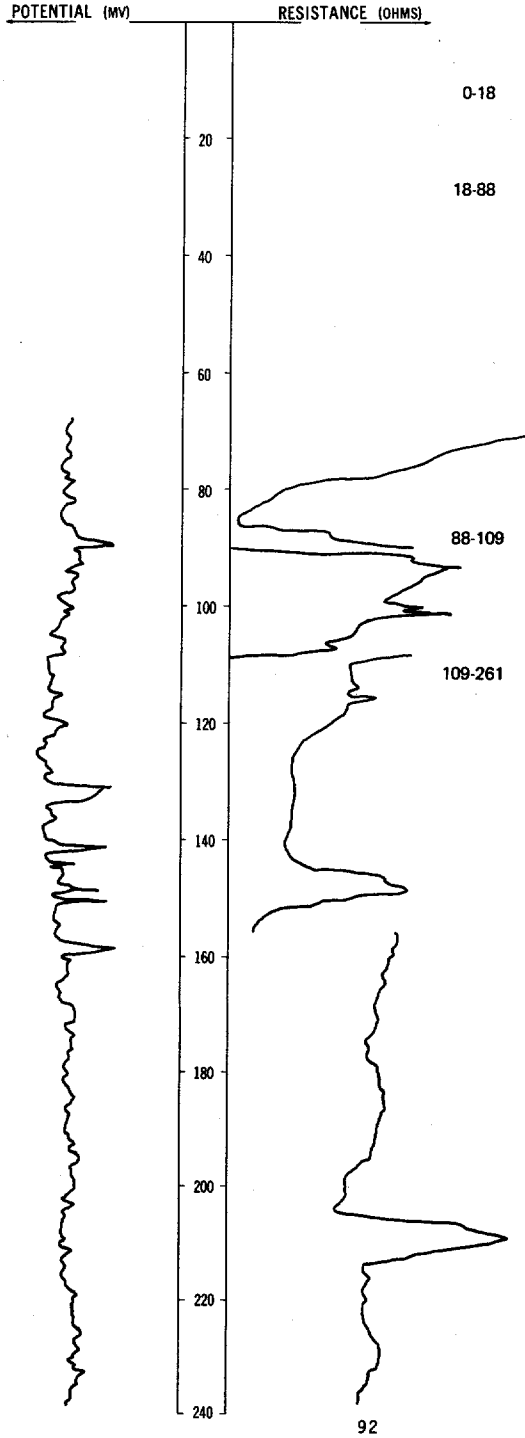
NDSWC 5202, 5202A

LOCATION: 129-068-34DDD1, 2

DATE DRILLED: 8/26/77

ALTITUDE: 1982
(FT, MSL)

DEPTH: 342
(FT)



92

DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18 Sand, coarse to very coarse, gravelly, angular to subrounded; predominantly quartz and carbonate fragments.

18-88 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

88-109 Sand, fine to coarse, predominantly coarse; composed largely of quartz, carbonate, and shale fragments.

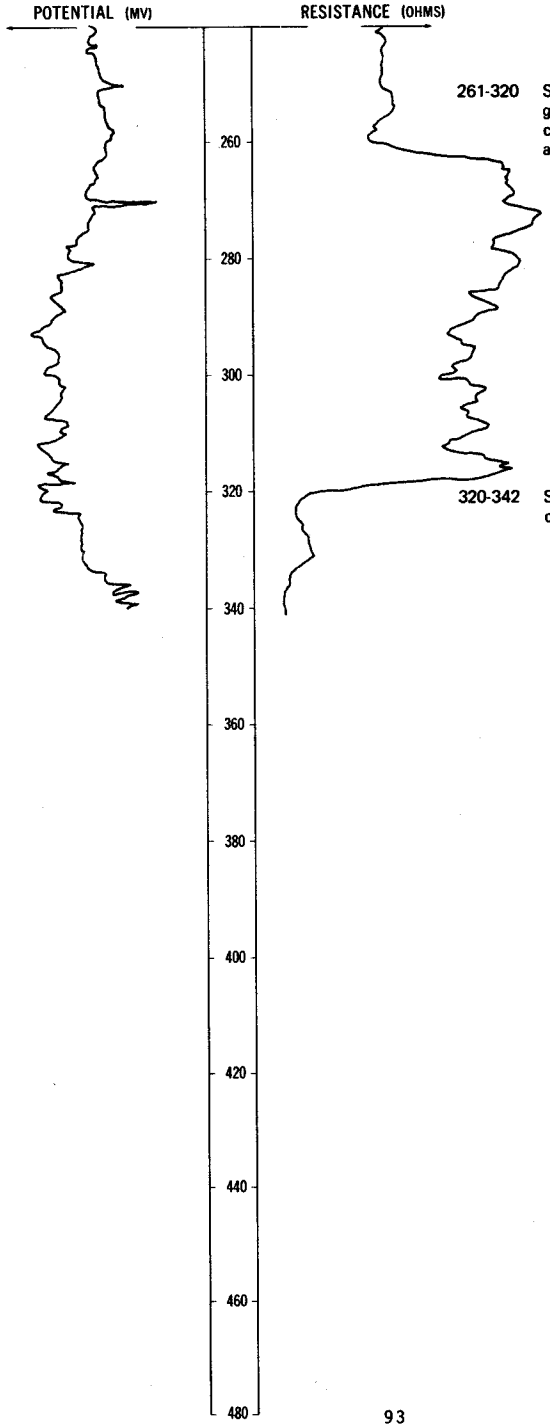
109-261 Clay (till), sandy, silty, medium-dark-gray to olive-gray; gravel lenses from 146 to 152 feet and 206 to 213 feet.

LOCATION: 129-068-34DDD1, 2

DATE DRILLED: 8/26/77

ALTITUDE: 1982
(FT, MSL)

DEPTH: 342
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

261-320 Sand, medium to very coarse, gravelly, subangular to subrounded; composed largely of quartz, carbonate, and shale fragments.

PIERRE FORMATION

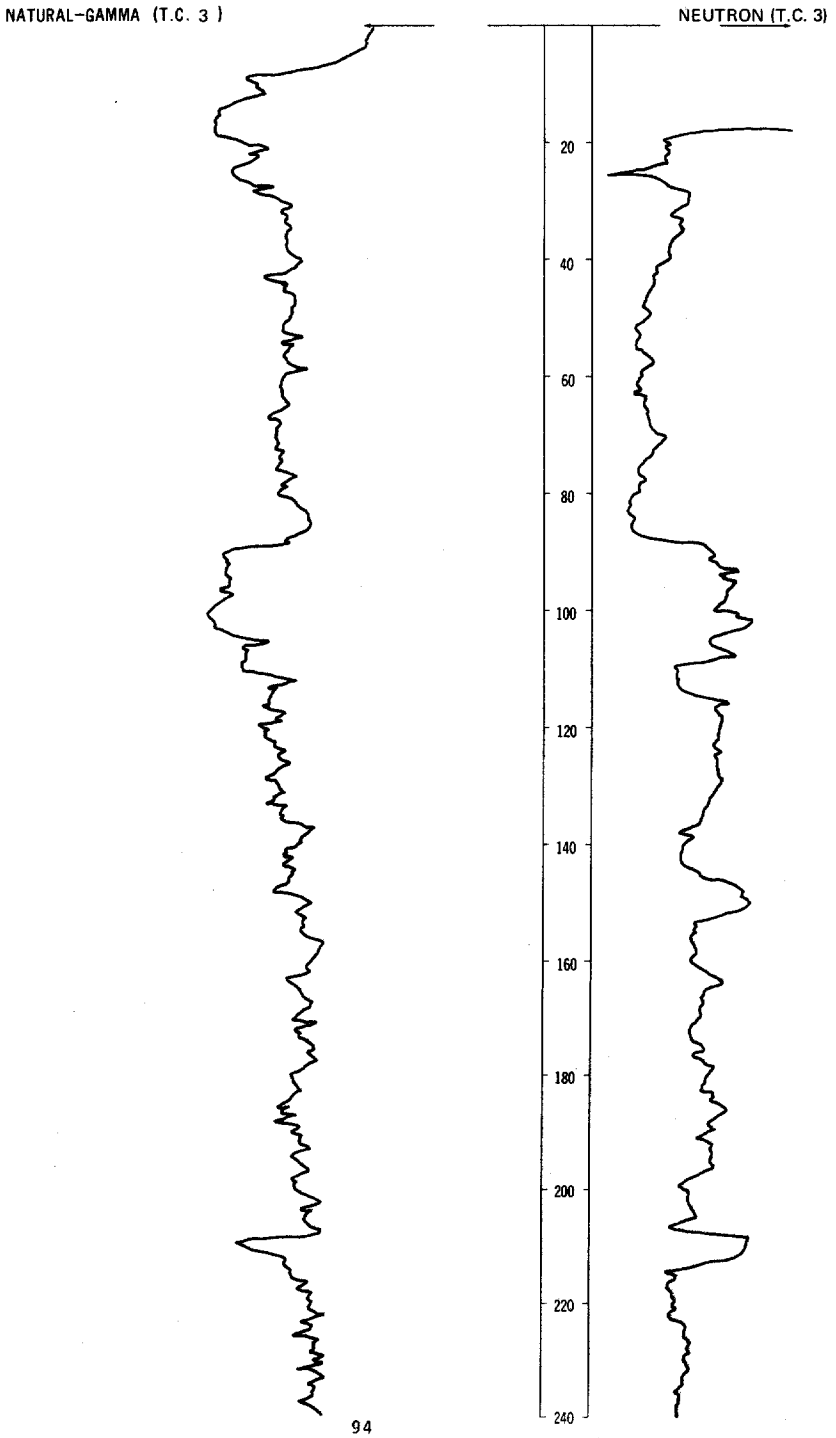
320-342 Shale, black to grayish-black, siliceous, hard.

LOCATION: 129-068-34DDD1, 2

DATE DRILLED: 8/26/77

ALTITUDE: 1982
(FT, MSL)

DEPTH: 342
(FT)

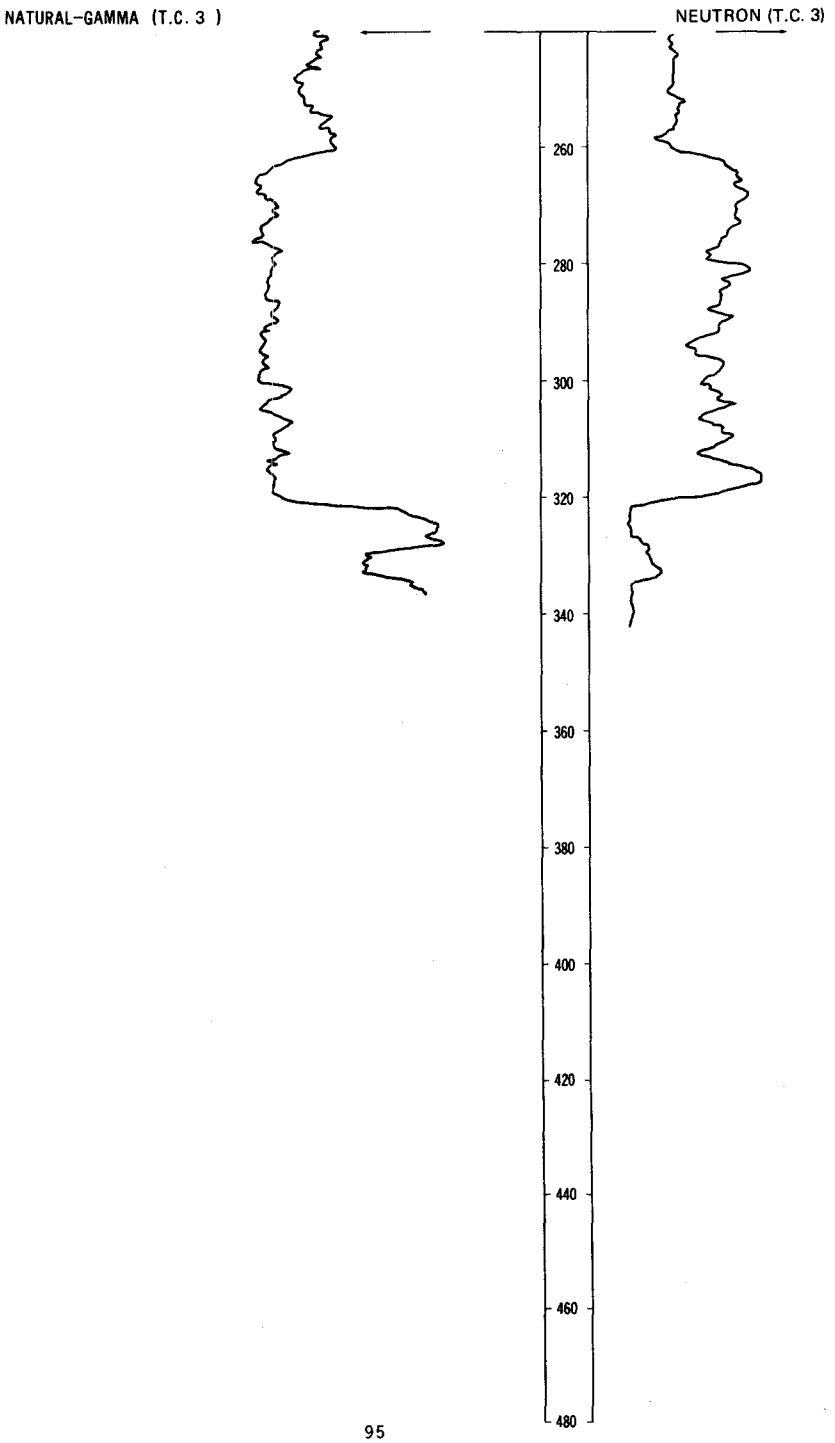


LOCATION: 129-068-34DDD1, 2

DATE DRILLED: 8/26/77

ALTITUDE: 1982
(FT, MSL)

DEPTH: 342
(FT)



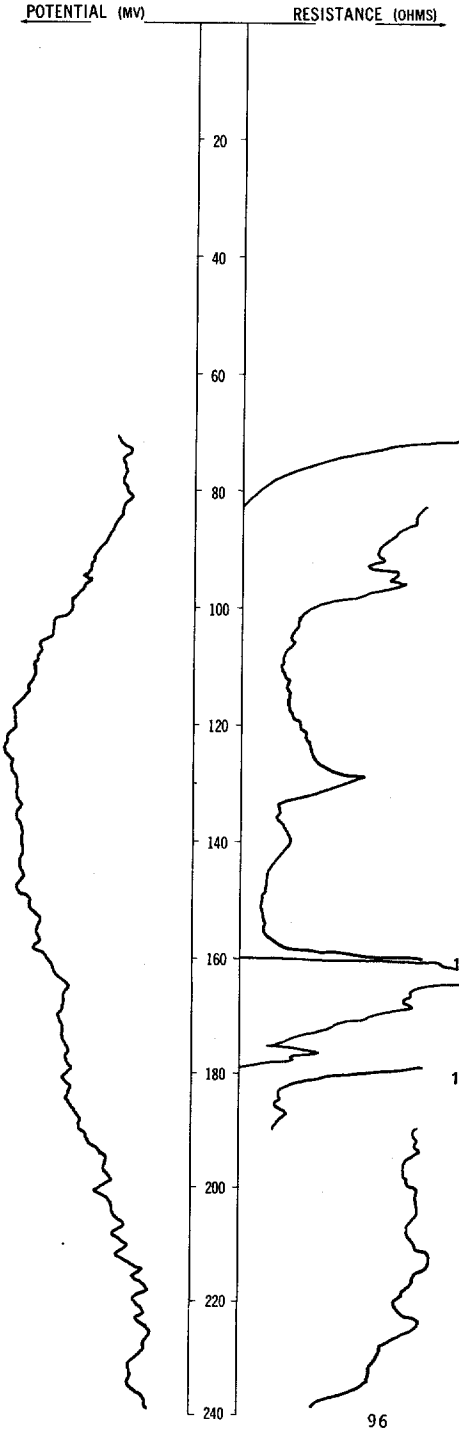
NDSWC 5201, 5201A

LOCATION: 129-068-36DDD1, 2

DATE DRILLED: 8/25/77

ALTITUDE: 1962
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

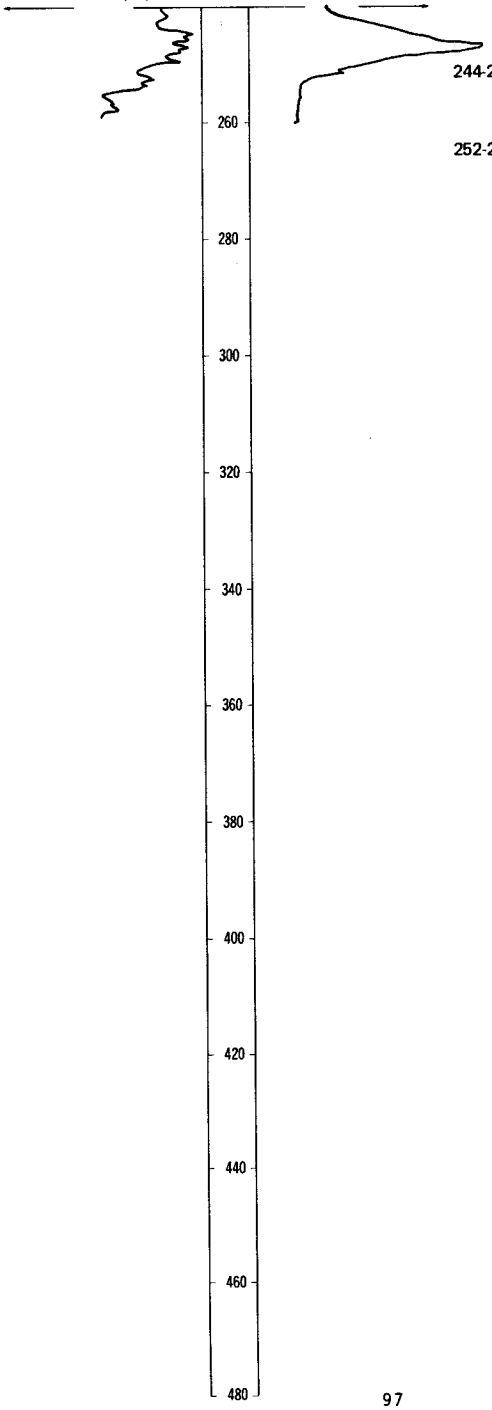
0-32	Sand, fine to very coarse, predominantly coarse to very coarse, gravelly, subangular to subrounded; composed largely of quartz, carbonate, and shale fragments.
32-41	Clay (lacustrine), silty, sandy, medium-dark-gray.
41-74	Sand, coarse to very coarse, gravelly.
74-160	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.
160-181	Sand, fine to very coarse, predominantly coarse.
181-244	Clay (till), sandy, silty, dark-gray; scattered pebbles.

LOCATION: 129-068-36DDD1, 2

DATE DRILLED: 8/25/77

ALTITUDE: 1962
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

244-252 Sand and gravel.

PIERRE FORMATION

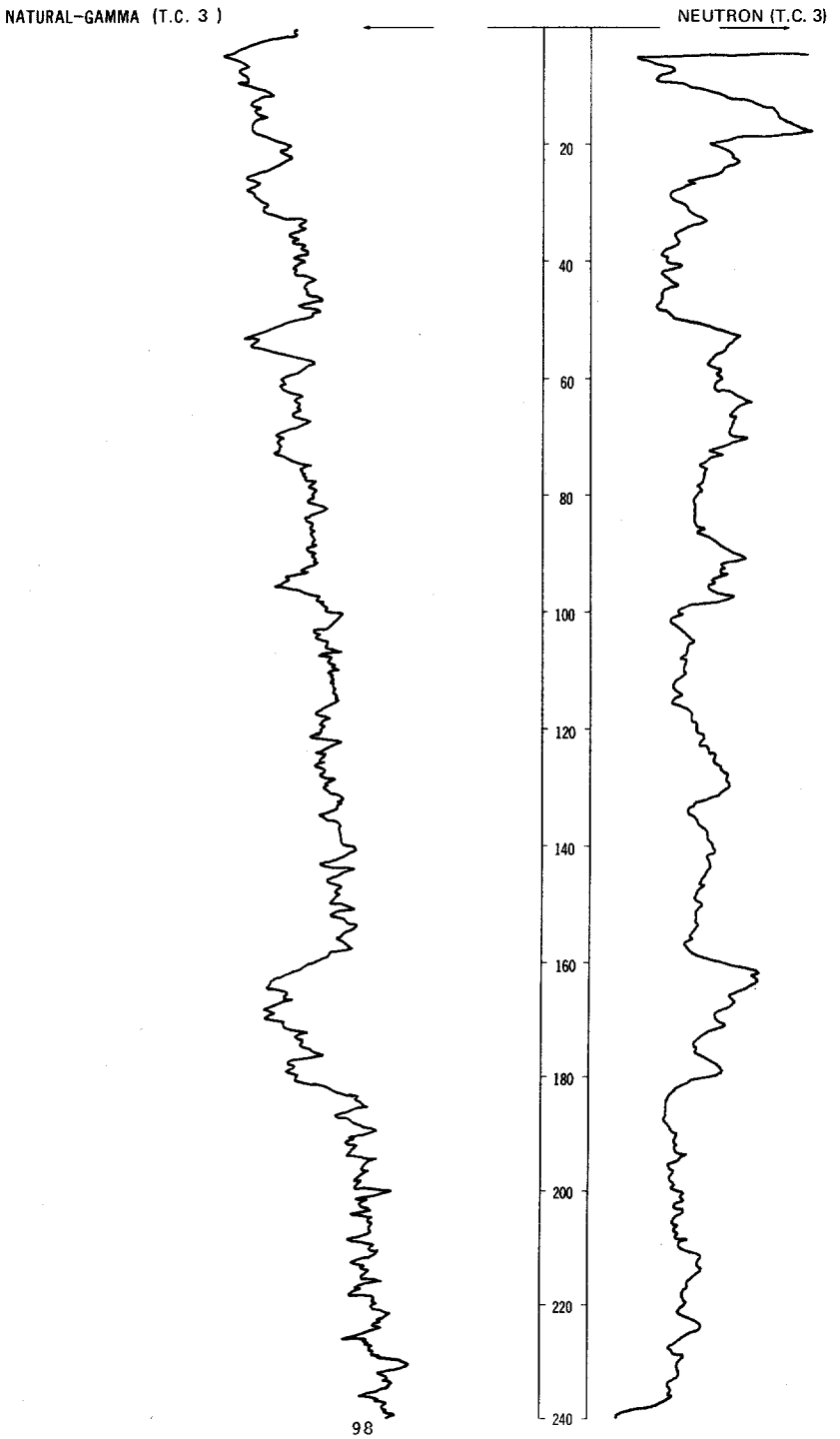
252-262 Shale, black to grayish-black, non-calcareous, hard.

LOCATION: 129-068-36DDD1, 2

DATE DRILLED: 8/25/77

ALTITUDE: 1962
(FT, MSL)

DEPTH: 262
(FT)



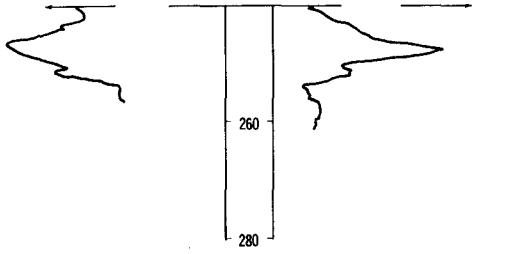
LOCATION: 129-068-36DDD1, 2

DATE DRILLED: 8/25/77

ALTITUDE: 1962
(FT, MSL)

DEPTH: 262
(FT)

NATURAL-GAMMA (T.C. 3)



129-069-02ACD
(Log from Venturia Well Drilling)

Date drilled: 1/06/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand and gravel	17	17
	Clay, blue	68	85
	Shale, gray	67	152

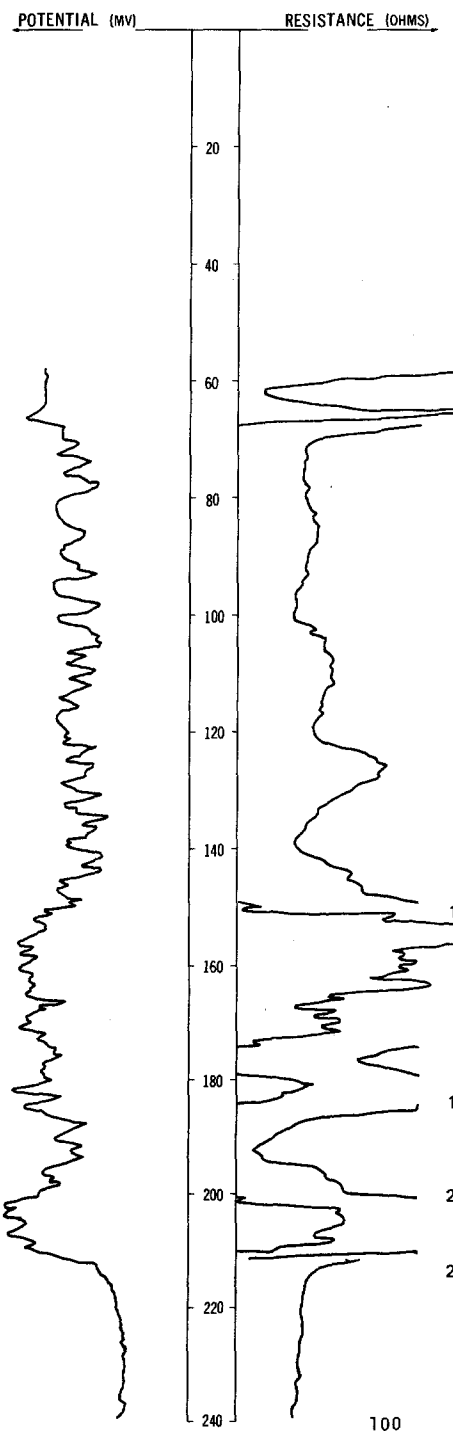
NDSWC 5196, 5196A

LOCATION: 129-069-03AAA1, 2

DATE DRILLED: 8/24/77

ALTITUDE: 1982 (FT, MSL)

DEPTH: 242 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-28 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

28-67 Sand, fine to coarse, predominantly coarse, gravelly, subangular to subrounded; composed largely of quartz, carbonate, and shale fragments.

67-149 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles; few gravel lenses.

149-186 Sand, medium.

186-201 Clay (till), sandy, silty, medium-dark-gray.

201-212 Sand, medium.

PIERRE FORMATION

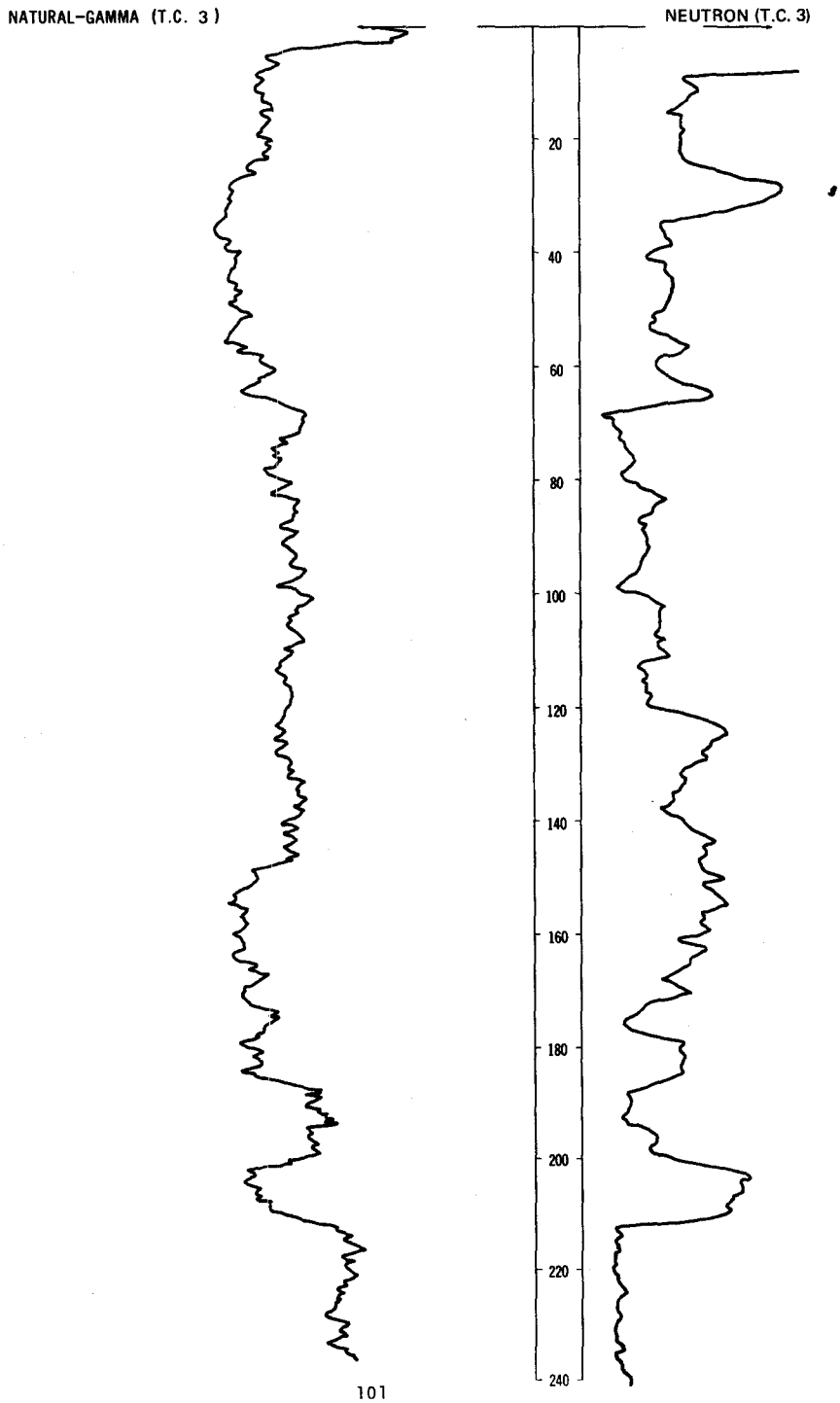
212-242 Shale and siltstone; black to grayish-black; hard.

LOCATION: 129-069-03AAA1, 2

DATE DRILLED: 8/24/77

ALTITUDE: 1982
(FT, MSL)

DEPTH: 242
(FT)



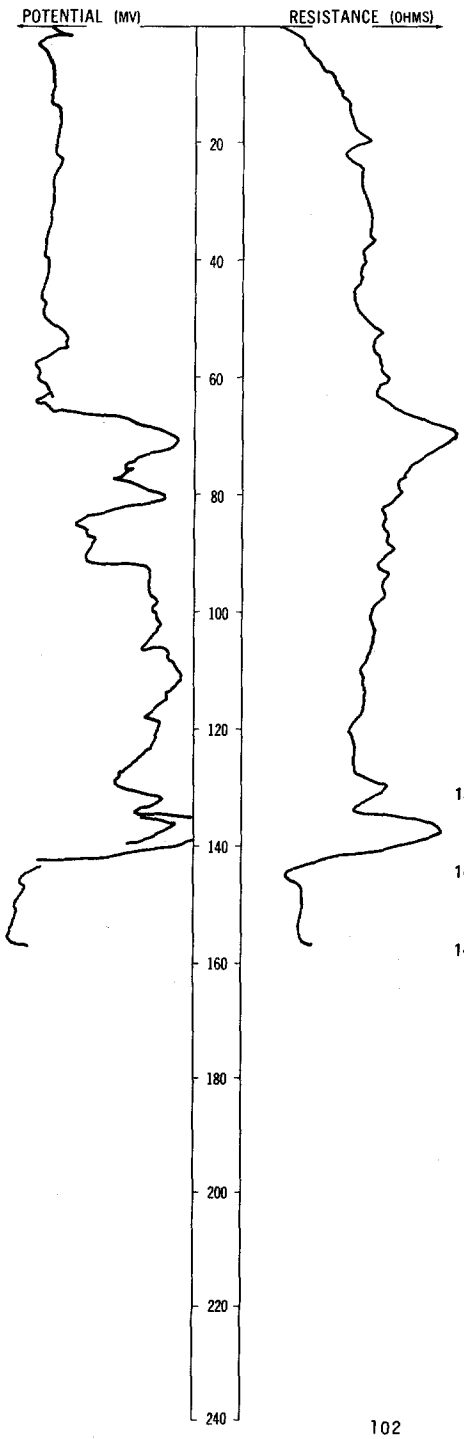
NDSWC 9663

LOCATION: 129-069-03BBB

DATE DRILLED: 7/28/76

ALTITUDE: 1966
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
10-26	Clay (till), silty, sandy, olive-gray; scattered pebbles.
26-27	Sand, silty, very fine to fine.
27-52	Clay (till), silty, sandy, olive-gray; scattered pebbles.
52-56	Gravel, sandy; gravel consists predominantly of shale pebbles.
56-66	Clay, silty, sandy, olive-gray; scattered pebbles.
66-74	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 50 percent quartz, 25 percent carbonate, 15 percent shale, and 10 percent unidentified fragments.
74-135	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel from 91 to 92 feet.
135-142	Sand, very fine to very coarse, predominantly medium, gravelly.
142-144	Clay, silty, brownish-gray.

PIERRE FORMATION

144-160	Shale, grayish-black, hard.

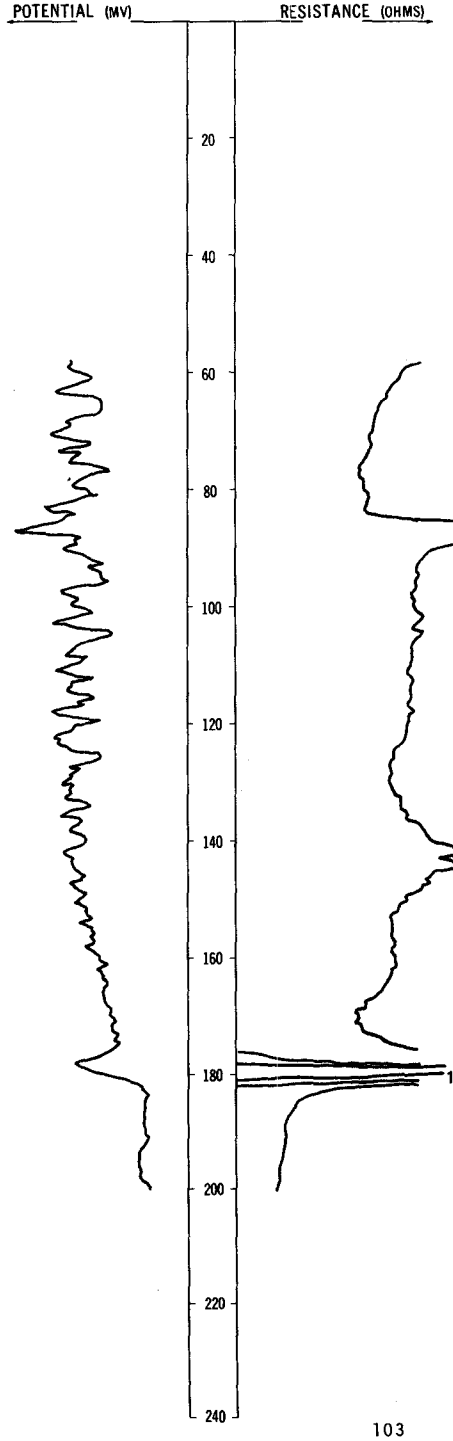
NDSWC 5195

LOCATION: 129-069-05BCC

DATE DRILLED: 8/23/77

ALTITUDE: 2006
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15 Clay (lacustrine), sandy, silty, moderate-yellowish-brown.

15-54 Clay (lacustrine), sandy, silty, medium-dark-gray.

54-181 Clay (till), sandy, silty, olive-gray; scattered pebbles; boulders from 84 to 88 feet and 178 to 181 feet.

PIERRE FORMATION

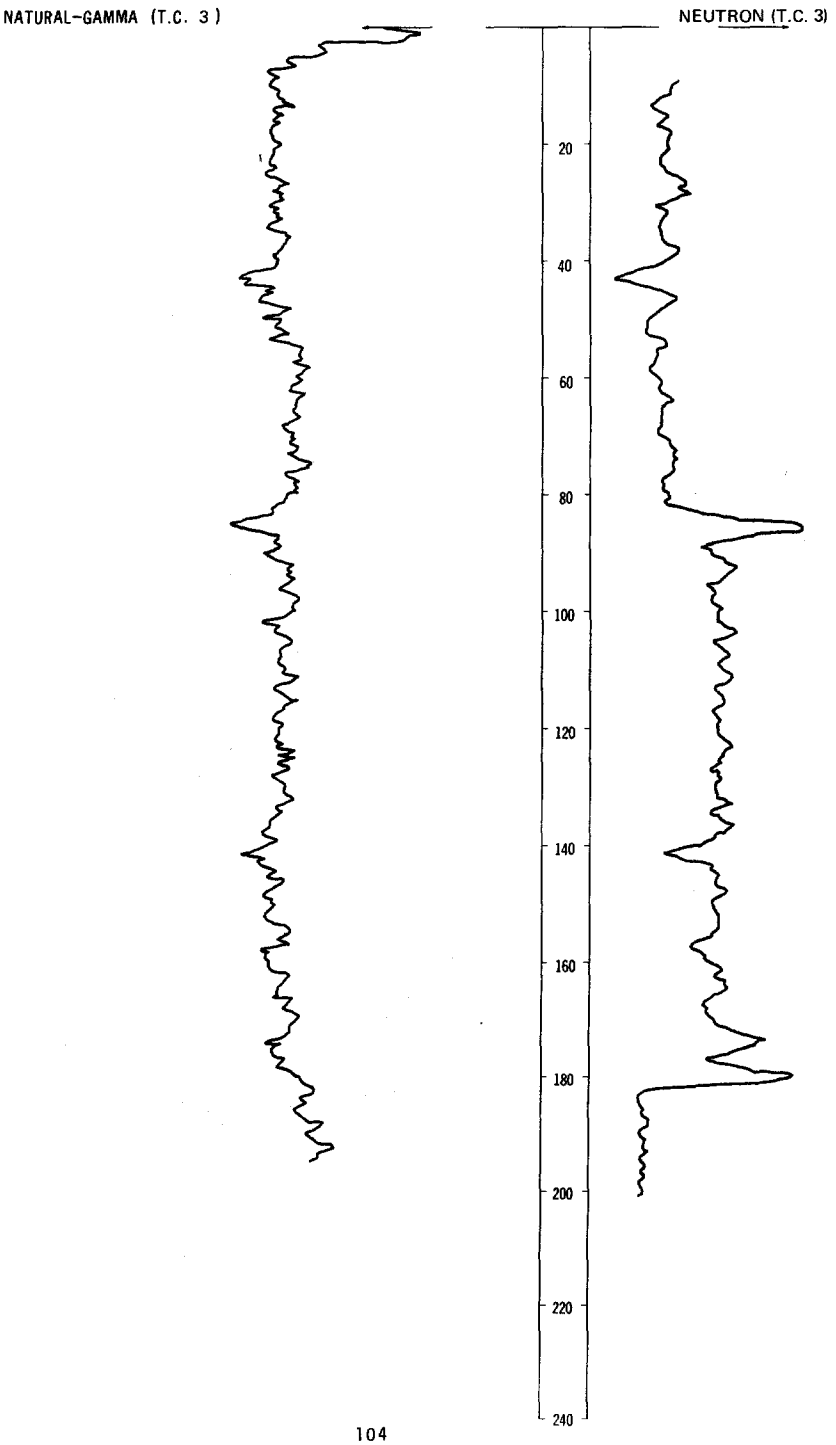
181-202 Shale, silty, sandy, medium-dark-gray to grayish-black, hard.

LOCATION: 129-069-05BCC

DATE DRILLED: 8/23/77

ALTITUDE: 2006
(FT, MSL)

DEPTH: 202
(FT)



NDSWC 5194

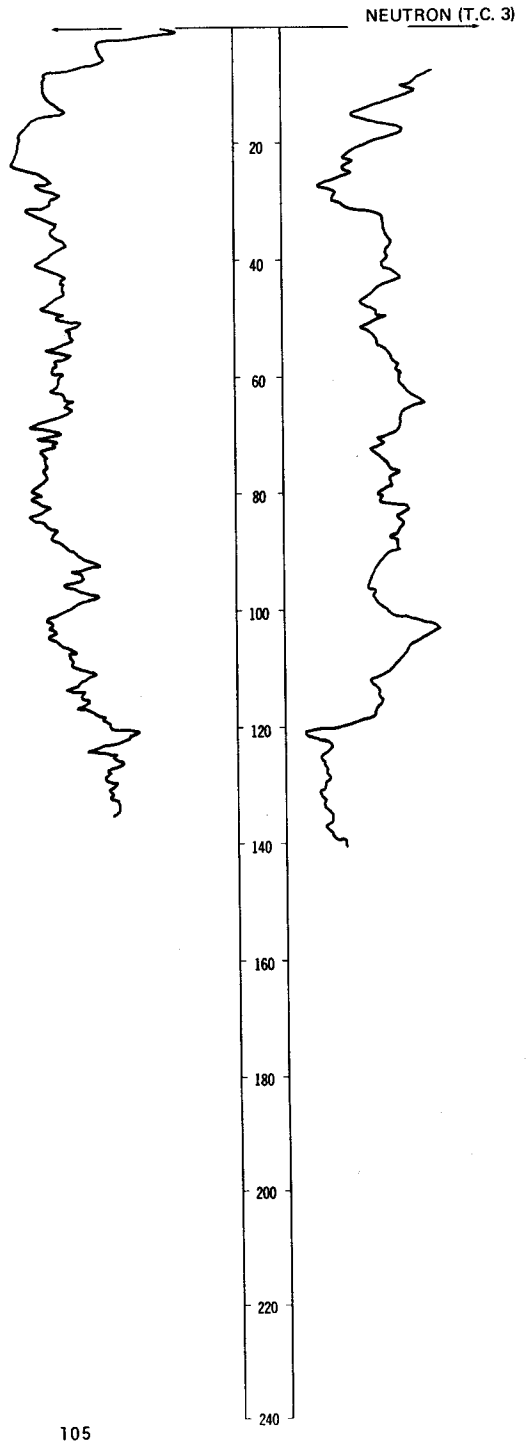
LOCATION: 129-069-10BBB

DATE DRILLED: 8/23/77

ALTITUDE: 1980
(FT, MSL)

DEPTH: 142
(FT)

NATURAL-GAMMA (T.C. 3)



NOTE: Detailed log on following page.

129-069-10BBB, Continued
NDSWC 5194

Altitude: 1980 feet — Date drilled: 8/23/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	25	25
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; few thin sand and gravel lenses	94	119
Pierre Formation:			
	Shale and siltstone; sandy; medium-dark-gray to grayish-black; micaceous; hard	23	142

129-069-11DDC
(Log from Baumgartner Drilling Co.)

Date drilled: 11/02/73

Clay, yellow	43	43
Clay, gray	41	84
Sand, coarse	16	100
Clay, gray	4	104
Sand	2	106
Clay, gray	14	120

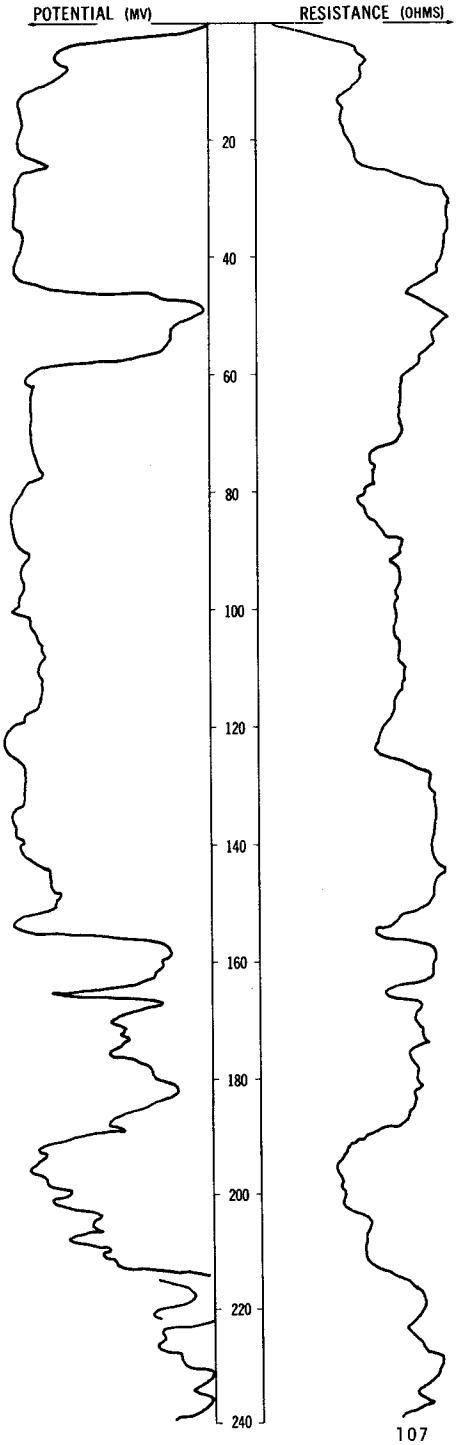
NDSWC 9660

LOCATION: 129-069-12CCD1

ALTITUDE: 1957
(FT, MSL)

DATE DRILLED: 7/27/76

DEPTH: 260
(FT)



107

DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-17	Silt, clayey, sandy, moderate-yellowish-brown.
17-28	Silt, clayey, sandy, olive-gray.
28-46	Clay (till), silty, sandy, olive-gray; scattered pebbles.
46-58	Sand, very fine to very coarse, predominantly medium.
58-76	Clay (till), silty, sandy, olive-gray; scattered pebbles.
76-126	Clay (till), silty, sandy, dusky-brown; scattered pebbles.
126-152	Gravel, very fine, sandy; composed predominantly of shale fragments.
152-157	Clay (till), silty, sandy; contains thin gravel lenses.
157-164	Sand, medium.
164-167	Clay (till), sandy, olive-gray.
167-189	Sand, fine to very coarse, predominantly medium, gravelly.
189-198	Clay (till), silty, sandy, olive-gray; scattered pebbles.
198-214	Clay, brownish-gray.
214-238	Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 40 percent quartz, 30 percent unidentified, 20 percent carbonate, and 10 percent shale fragments.

PIERRE FORMATION

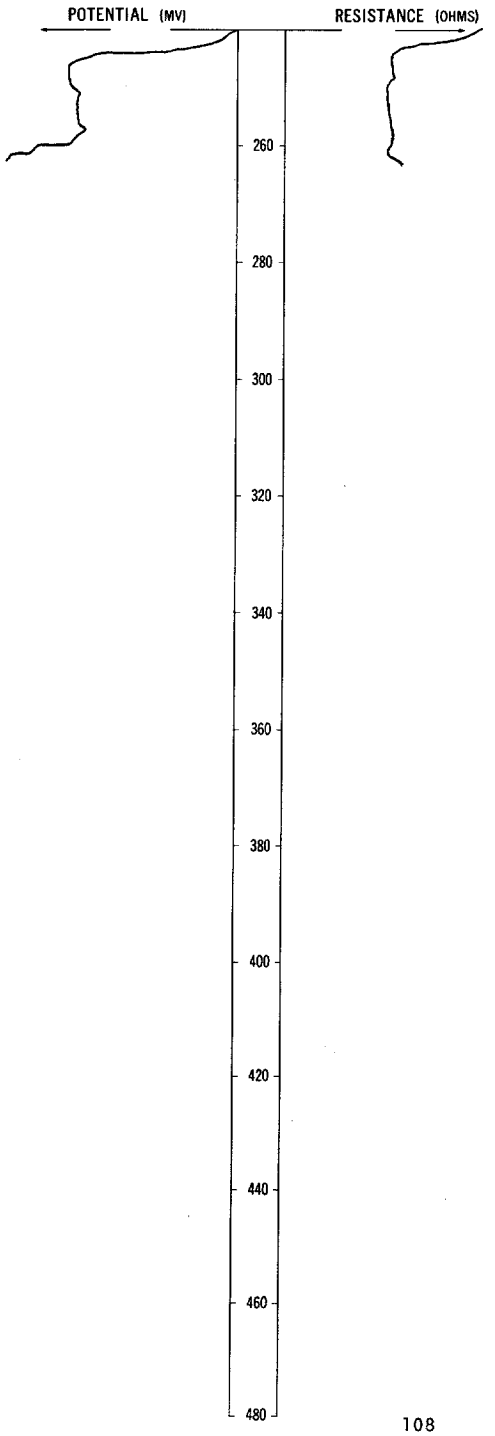
238-260	Shale, black, hard.

LOCATION: 129-069-12CCD1

DATE DRILLED: 7/27/76

ALTITUDE: 1957
(FT, MSL)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

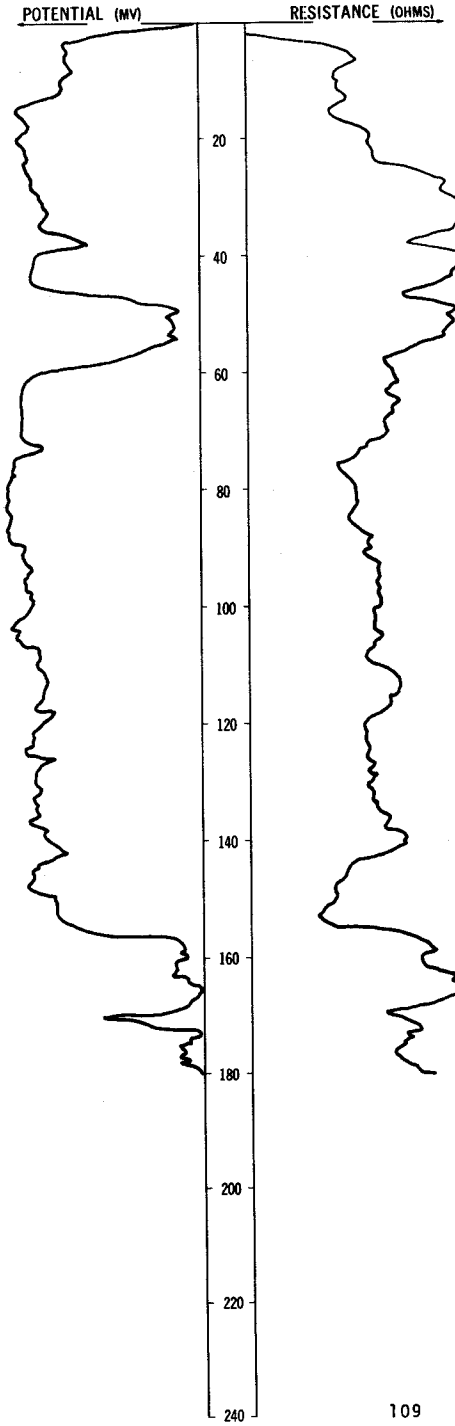
NDSWC 9660A

LOCATION: 129-069-12CCD2

DATE DRILLED: 7/28/76

ALTITUDE: 1957
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-16	Silt, clayey, sandy, moderate-yellowish-brown.
16-24	Silt, clayey, sandy, olive-gray.
24-48	Clay (till), silty, olive-gray.
48-57	Sand, very fine to very coarse, predominantly medium; composed of 90 percent quartz and 10 percent shale fragments.
57-110	Clay (till), silty, sandy, olive-gray; scattered pebbles.
110-120	Silt, clayey, sandy, dusky-brown.
120-135	Clay (till), silty, sandy, olive-gray; scattered pebbles.
135-143	Clay, olive-gray; contains thin sand and gravel lenses.
143-156	Clay (till), silty, sandy, olive-gray; scattered pebbles; contains thin gravel lenses.
156-180	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 60 percent quartz, 20 percent shale, 10 percent carbonate, and 10 percent unidentified fragments.

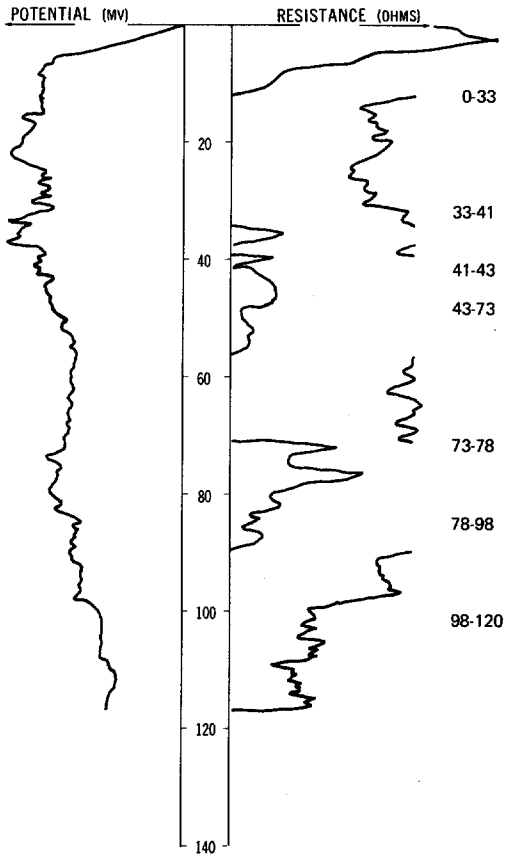
NDSWC 9659

LOCATION: 129-069-15BBB

DATE DRILLED: 7/27/76

ALTITUDE: 2075 (FT, MSL)

DEPTH: 120 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-33 Silt, clayey, sandy, moderate-yellowish-brown.

33-41 Silt, clayey, sandy, olive-gray.

41-43 Gravel, very fine, sandy.

43-73 Clay (till), silty, sandy, olive-gray; scattered pebbles.

73-78 Gravel, very fine, sandy; composed predominantly of carbonate and shale fragments.

78-98 Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

98-120 Shale, silty, dark-gray, hard.

129-069-18BBB
NDSWC 1571
(Log modified from Randich, 1961)

Altitude: 2021 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, brown	1	1
	Clay, silty, light-brown	4	5
	Till, clayey, light-brown; fine to medium gravel	10	15
	Till, clayey, sandy, gray; fine to medium gravel and shale pebbles	50	65
	Gravel, fine to coarse; coarse sand; and shale pebbles	4	69
	Till, clayey, gray; fine to medium gravel and shale pebbles	37	106
Pierre Formation:			
	Shale, gray	9	115

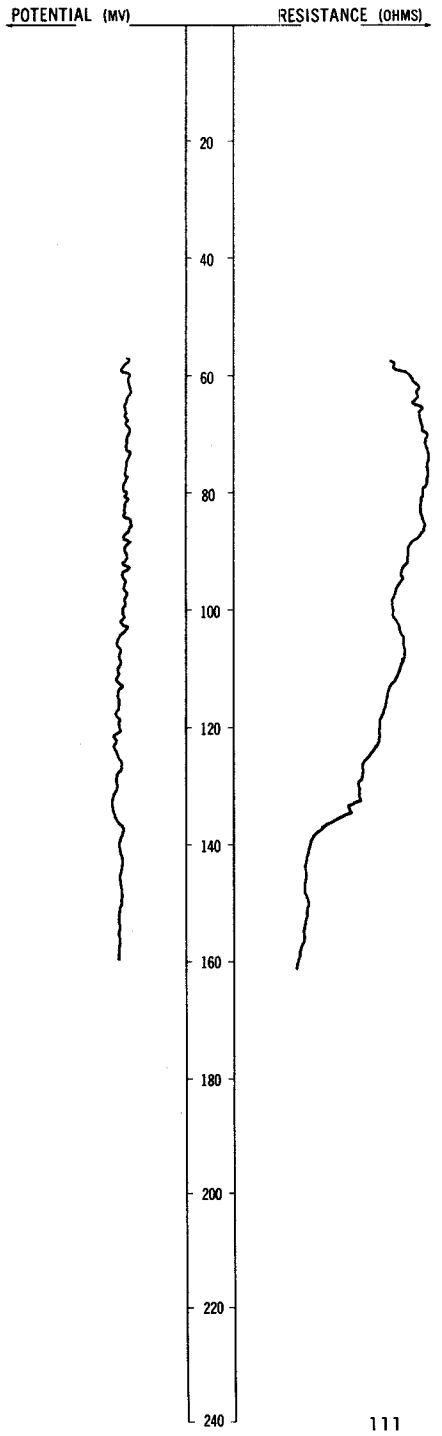
NDSWC 5192

LOCATION: 129-069-19DDD

DATE DRILLED: 8/23/77

ALTITUDE: 2084
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

18-136 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

PIERRE FORMATION

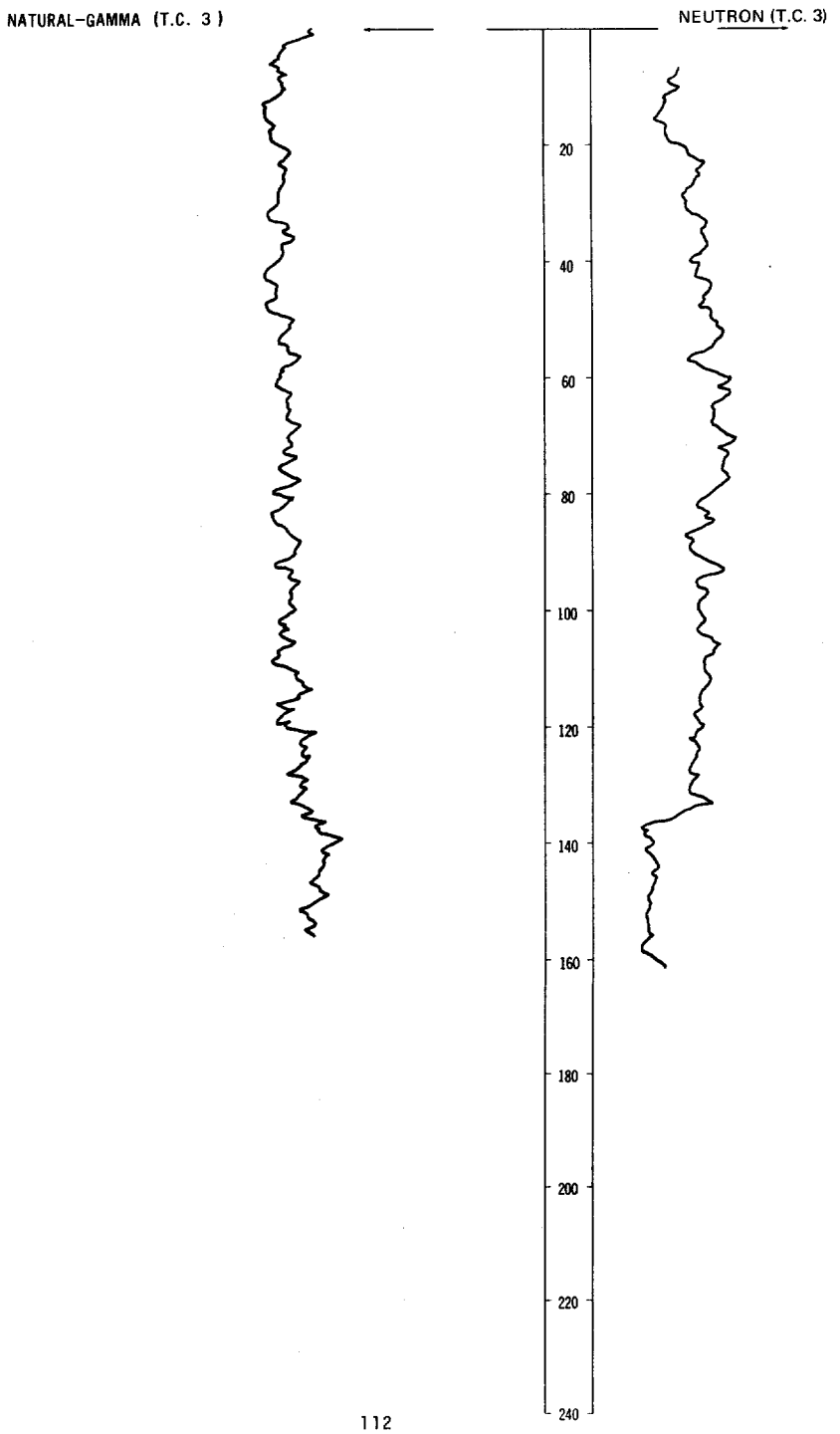
136-162 Clay, siltstone, and shale; sandy; medium-dark-gray to grayish-black; micaceous; hard.

LOCATION: 129-069-19DDD

DATE DRILLED: 8/23/77

ALTITUDE: 2084
(FT, MSL)

DEPTH: 162
(FT)



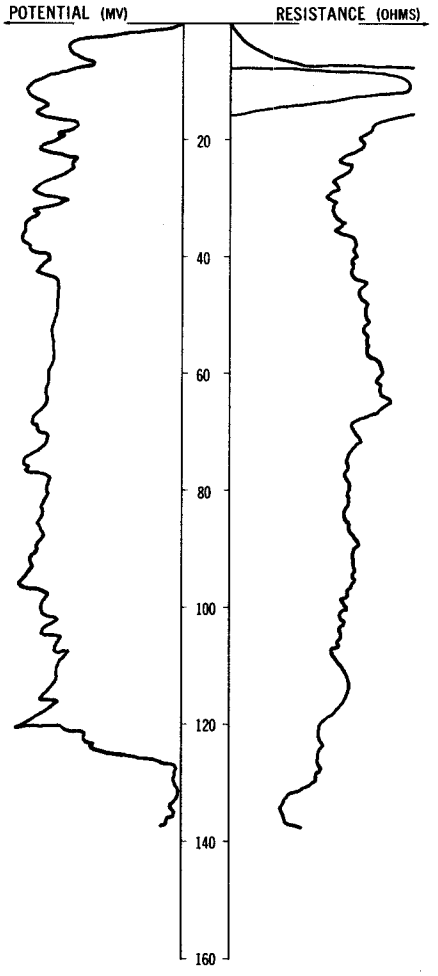
NDSWC 9662

LOCATION: 129-069-24DDC

DATE DRILLED: 7/28/76

ALTITUDE: 1920
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15	Sand, very fine to medium, predominantly medium, gravelly.
15-29	Clay, silty, moderate-yellowish-brown.
29-36	Clay, silty, olive-gray.
36-132	Clay, silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

132-140	Shale, grayish-black, hard, fissile.

129-069-24DDD
NDSWC 1572
(Log modified from Randich, 1961)

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, very silty, light-brown	24	26
	Till, clayey, light-gray; fine to medium gravel and shale pebbles	37	63
	Till, clayey, grayish-brown; fine gravel; coarse sand and selenite crystals	32	95
Pierre Formation:			
	Shale, sandy, gray	20	115

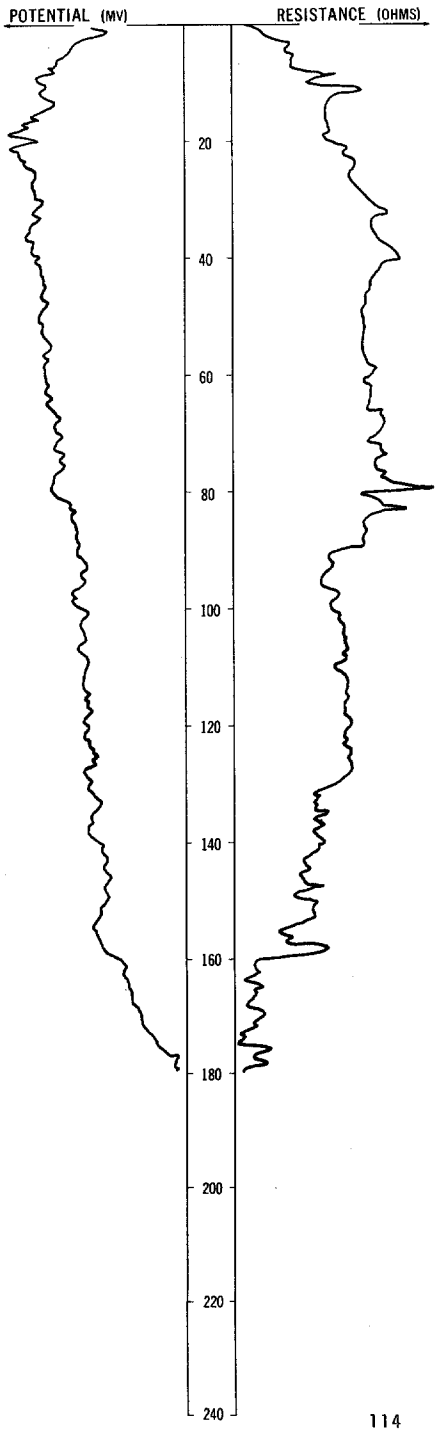
NDSWC 9658

LOCATION: 129-069-27BCB

DATE DRILLED: 7/27/76

ALTITUDE: 2028
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-11	Clay, silty, light-brown.
11-24	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
24-158	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel from 78 to 80 feet.

PIERRE FORMATION

158-180	Shale, dark-gray, hard.

129-069-32CCD
NDSWC 9525

Altitude: 2120 feet | Date drilled: 12/10/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	30	30
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	20	50
Fox Hills Formation(?):			
	Clay, sandy, silty, medium-dark-gray to greenish-black	28	78
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	22	100

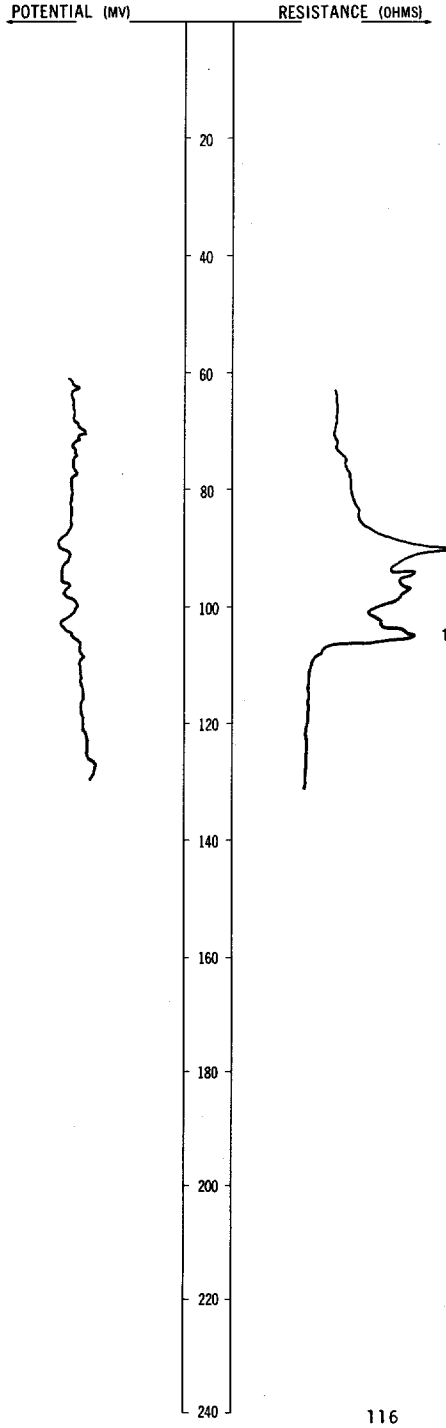
NDSWC 5193

LOCATION: 129-069-34CCC

DATE DRILLED: 8/23/77

ALTITUDE: 2065
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-25 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.

25-70 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

70-88 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

88-105 Sand, medium to very coarse, gravelly, subangular to subrounded.

PIERRE FORMATION

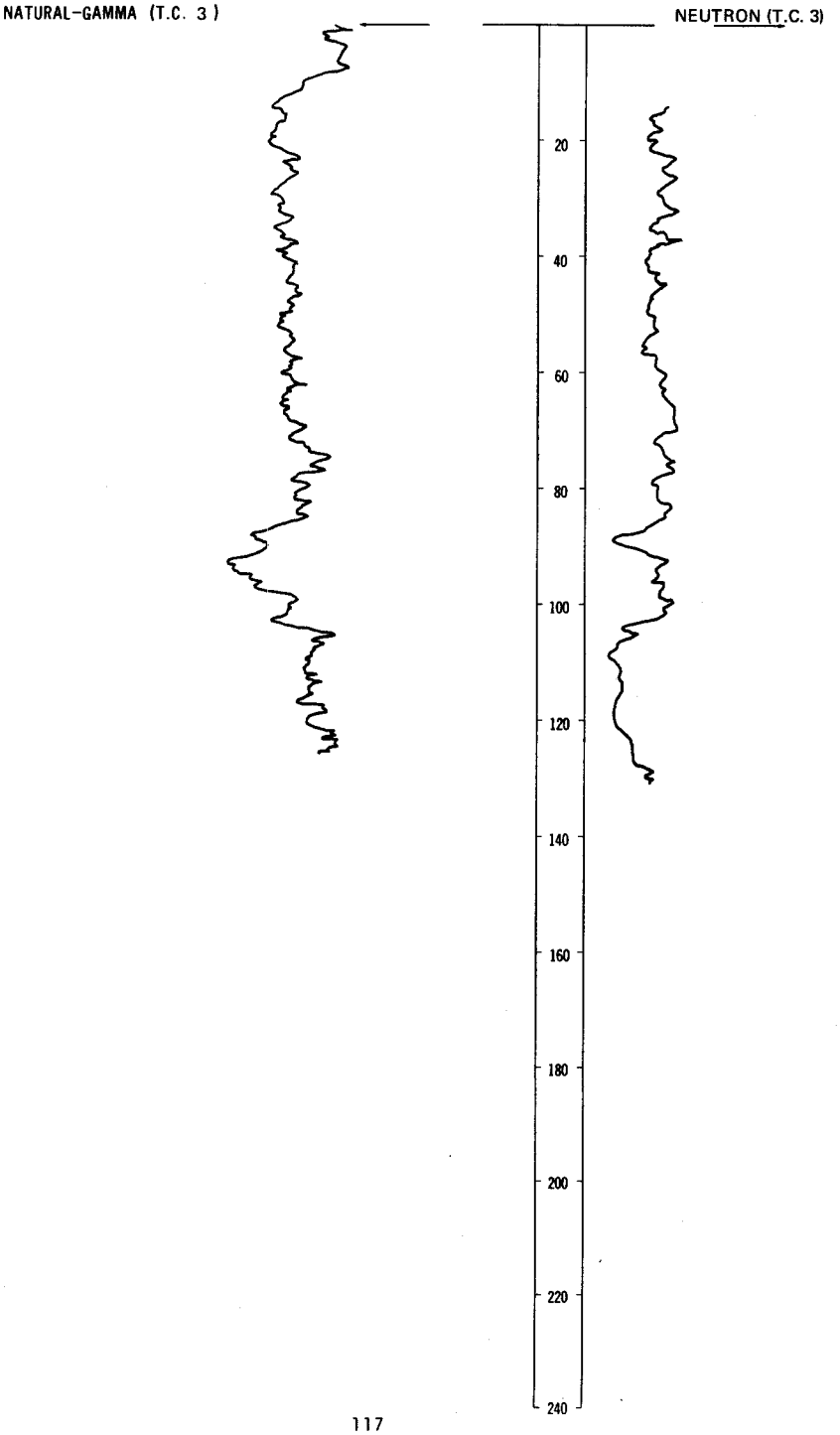
105-142 Siltstone and shale; sandy; medium-dark-gray to grayish-black; micaceous; hard.

LOCATION: 129-069-34CCC

DATE DRILLED: 8/23/77

ALTITUDE: 2065
(FT, MSL)

DEPTH: 142
(FT)



129-069-36CCC
NDSWC 9523

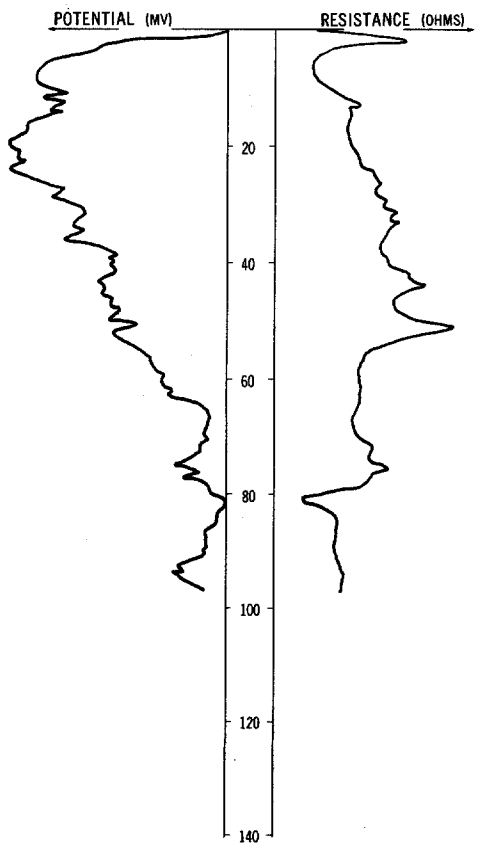
Altitude: 2005 feet — Date drilled: 12/10/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, sandy, clayey, light-brown to light-gray	29	29
	Silt, sandy, clayey, medium-gray	18	47
	Sand, fine to very coarse, predominantly coarse, gravelly, angular to subrounded; sand is composed of 60 percent quartz, 20 percent carbonate, 15 percent shale, and 5 percent unidentified fragments	8	55
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	99	154
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	26	180

NDSWC 9682

LOCATION: 129-070-06AAA — DATE DRILLED: 8/04/76

ALTITUDE: 2026 (FT, MSL) — DEPTH: 100 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-31 Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.

31-50 Clay (till), silty, sandy, olive-gray; scattered pebbles.

50-54 Gravel, very fine, sandy.

54-81 Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

81-100 Shale, grayish-black, hard.

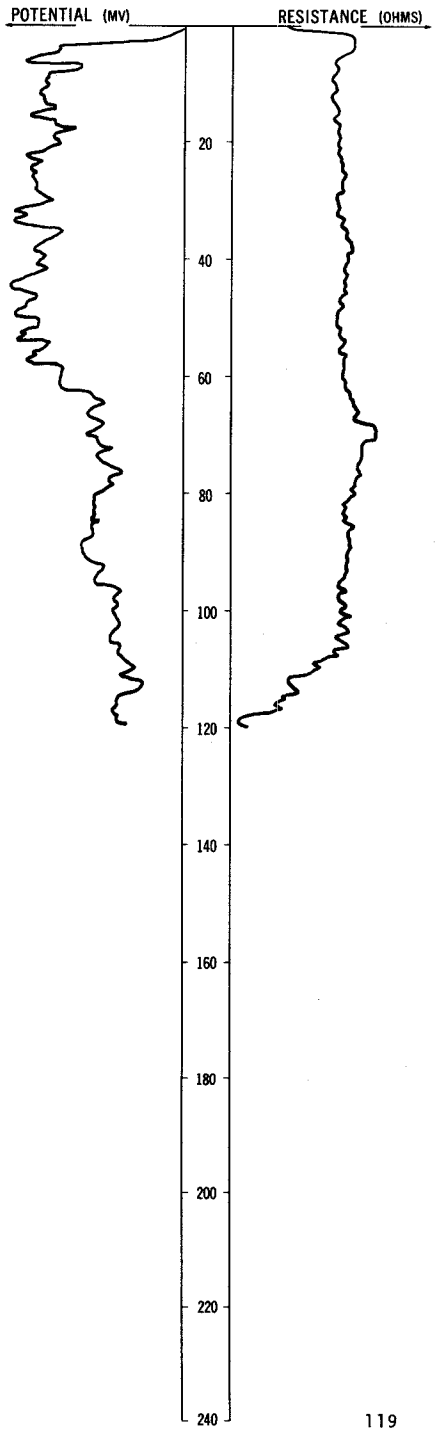
NDSWC 9657

LOCATION: 129-070-10DDD

DATE DRILLED: 7/27/76

ALTITUDE: 2086
(FT, MSL)

DEPTH: 120
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-2	Sand, gravelly.
2-37	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
37-54	Clay (till), silty, sandy, moderate-brown; scattered pebbles.
54-111	Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

111-120	Shale, silty, dark-gray, hard.

129-070-12ABB
(Log from Venturia Well Drilling)

Date drilled: 10/17/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	2	2
	Clay, brown	36	38
	Clay, blue	65	103

129-070-12DDA
(Log from Albrecht Well Work)

Date drilled: 11/05/74

	Topsoil, black	3	3
	Clay, silty, dark	22	25
	Clay, blue	55	80
	Sand and fine gravel	3	83
	Clay, blue	3	86

129-070-14CDB
(Log from Albrecht Well Work)

Date drilled: 11/07/74

	Topsoil, black	2	2
	Clay, silty, dark	18	20
	Clay, silty, yellow	10	30
	Clay, blue	17	47
	Clay and sand; mixed	8	55
	Sand	13	68

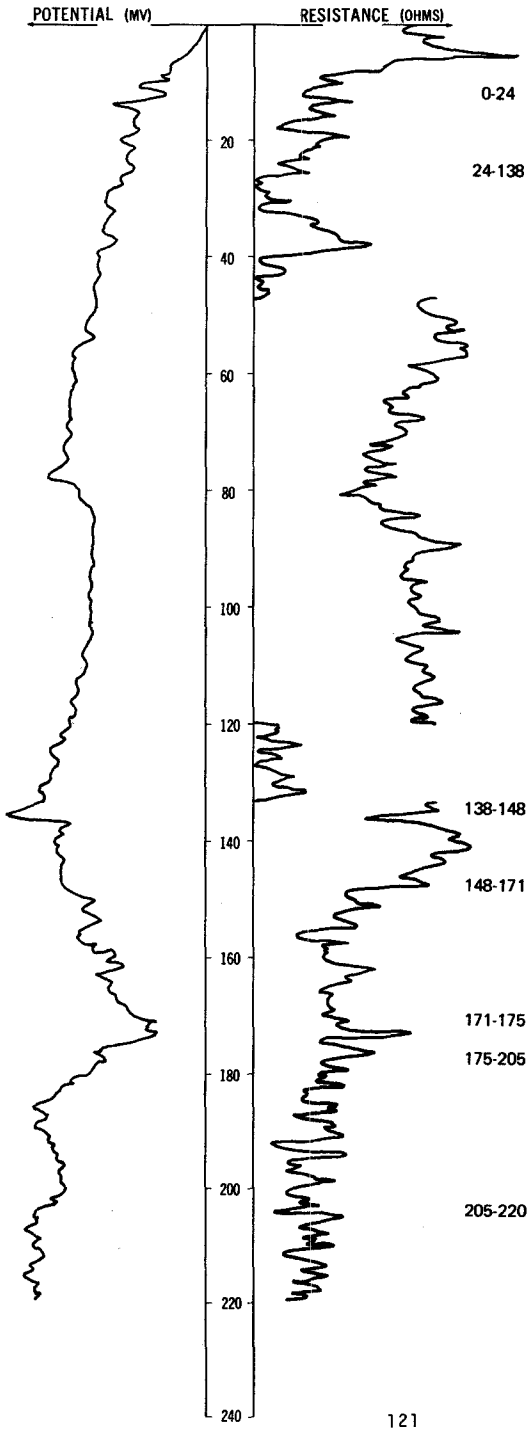
NDSWC 9655

LOCATION: 129-070-19DDD

DATE DRILLED: 7/26/76

ALTITUDE: 2090
(FT, MSL)

DEPTH: 220
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-24	Silt, clayey, sandy, moderate-yellowish-brown.
24-138	Clay (till), silty, sandy, olive-gray.
138-148	Clay (till), silty, sandy, olive-gray; scattered pebbles.
148-171	Clay (till), silty, sandy, dark-brownish-gray.
171-175	Gravel, clayey.
175-205	Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

205-220	Shale, silty, dark-gray, hard.

129-070-24DDD
NDSWC 9524

Altitude: 2107 feet — Date drilled: 12/10/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	28	28
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	8	36
	Silt, sandy, clayey, light-brown to olive-green	15	51
Fox Hills Formation:			
	Sandstone, very fine to fine	2	53
	Clay, sandy, silty, moderate-yellowish-brown	26	79
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	61	140

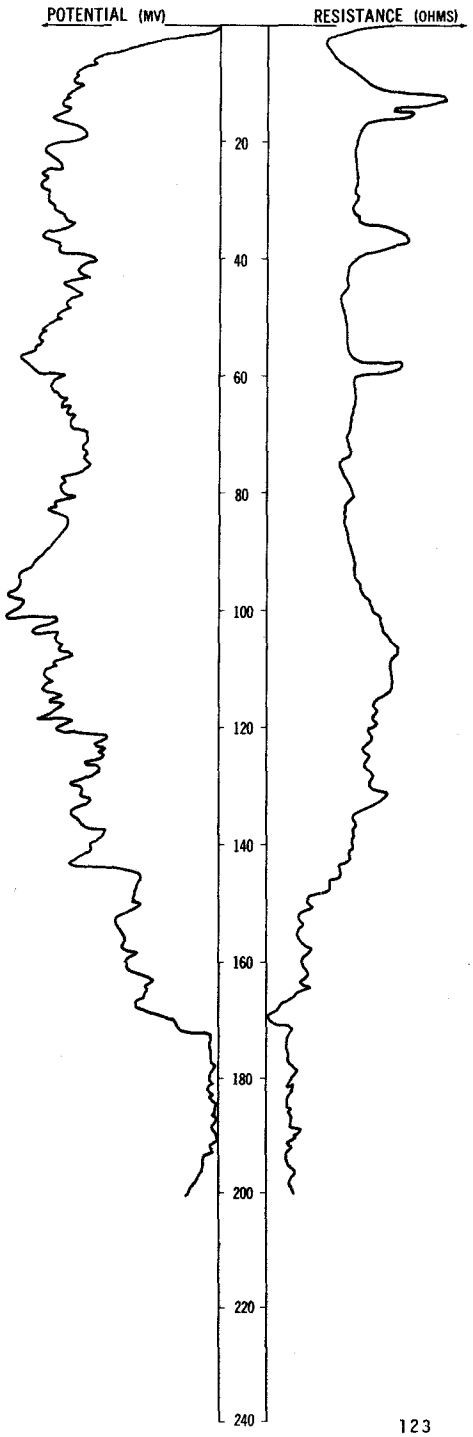
NDSWC 9656

LOCATION: 129-070-27CCC

DATE DRILLED: 7/27/76

ALTITUDE: 2085
(FT, MSL)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-14	Clay (till), silty, sandy, moderate-yellowish-brown.
14-21	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
21-32	Clay (till), silty, sandy, grayish-brown; scattered pebbles.
32-39	Sand, coarse, gravelly; composed of 40 percent carbonate, 40 percent shale, and 20 percent quartz fragments.
39-172	Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

172-200	Shale, silty, dark-gray, hard.

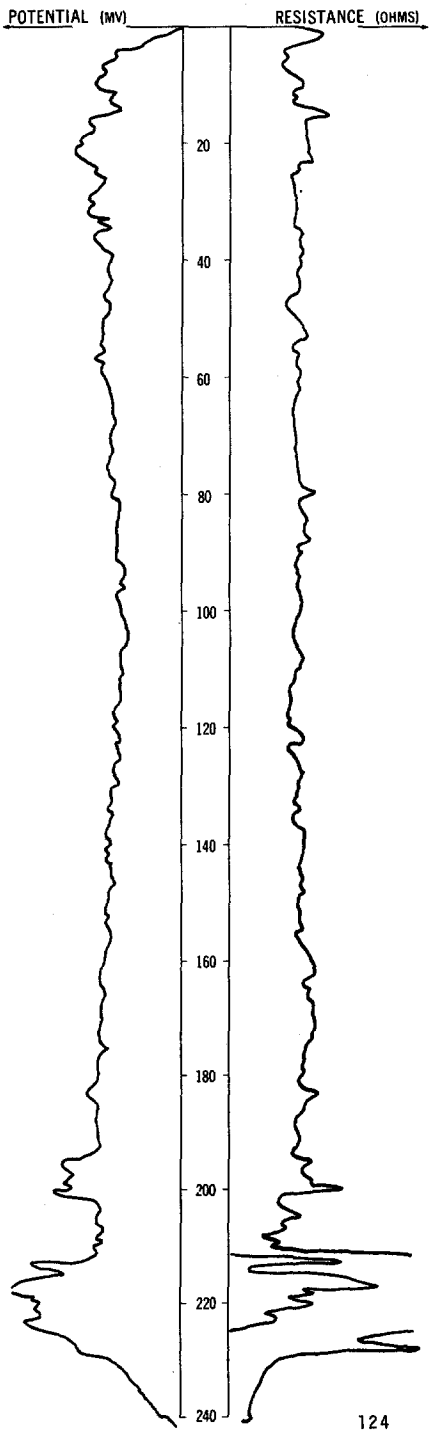
NDSWC 9654

LOCATION: 129-070-31CCC

DATE DRILLED: 7/26/76

ALTITUDE: 2052
(FT, MSL)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-44	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
44-194	Clay (till), silty, sandy, olive-gray; scattered pebbles.
194-201	Silt, clayey, sandy, dark-brownish-gray.
201-210	Clay (till), silty, sandy, olive-gray; scattered pebbles.
210-230	Gravel, clayey, sandy.

PIERRE FORMATION

230-240	Shale, silty, dark-gray, hard.

129-070-32DDD
NDSWC 9527

Altitude: 2077 feet — Date drilled: 12/11/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (lacustrine), sandy, silty, moderate-yellowish-brown	14	14
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	168	182
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	18	200

129-070-35DDD
NDSWC 9526

Altitude: 2136 feet — Date drilled: 12/10/75

Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown to reddish-brown	35	35
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	37	72
Fox Hills Formation(?):			
	Clay, sandy, silty, moderate-yellowish-brown to brownish-black	23	95
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	5	100

129-071-04BBB
NDSWC 9684

Altitude: 2091 feet — Date drilled: 8/04/76

Glacial drift:			
	Sand, fine to very coarse, gravelly	3	3
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown	13	16
	Clay (till), silty, sandy, gravelly, olive-gray	61	77
Pierre Formation:			
	Shale, grayish-black, brittle	23	100

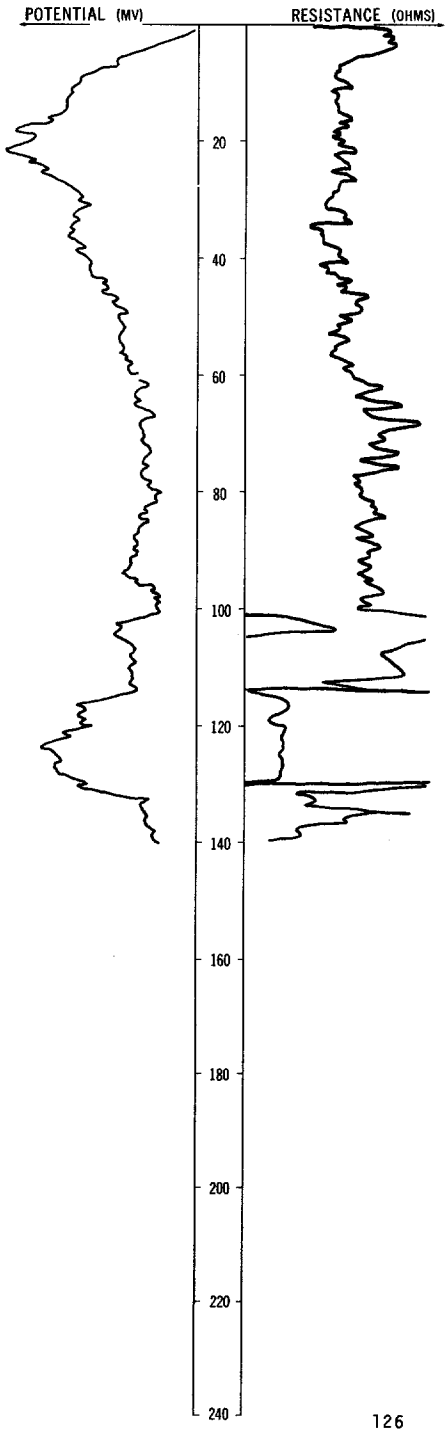
NDSWC 9652

LOCATION: 129-071-12CCC

DATE DRILLED: 7/23/76

ALTITUDE: 2039
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-13	Clay (till), silty, sandy, dark-yellowish-brown.
13-26	Clay (till), silty, moderate-brown.
26-101	Clay (till), silty, sandy, olive-gray; scattered pebbles.
101-106	Gravel, sandy; gravel consists predominantly of shale pebbles.
106-114	Clay (till), silty, sandy, olive-gray; scattered pebbles.
114-130	Gravel, very fine, sandy; composed of 50 percent carbonate, 30 percent sandstone, 10 percent shale, and 10 percent quartz fragments.

PIERRE FORMATION

130-140	Shale, silty, dark-gray, hard.

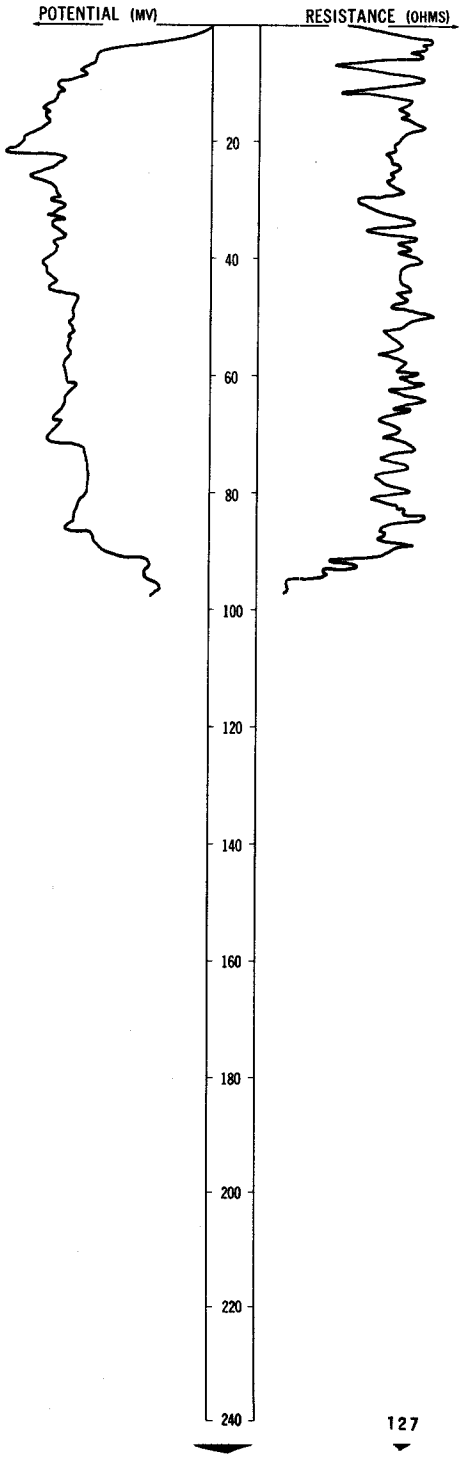
NDSWC 9653

LOCATION: 129-071-12DDD

DATE DRILLED: 7/26/76

ALTITUDE: 2069
(FT, MSL)

DEPTH: 100
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-30 Clay (till), silty, light-brown to dark-yellowish-brown.

30-92 Clay (till), silty, olive-gray.

PIERRE FORMATION

92-100 Shale, dark-gray, hard.

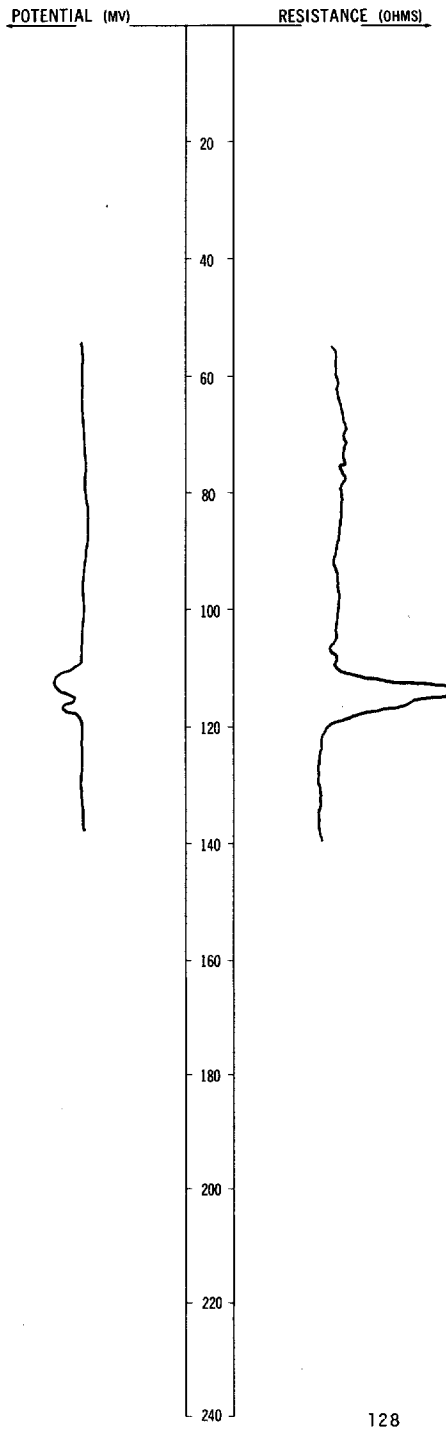
NDSWC 5188

LOCATION: 129-071-15BBB

DATE DRILLED: 8/22/77

ALTITUDE: 2042
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-35 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.

35-112 Clay (till), sandy, silty, gravelly, dark-gray to olive-gray.

112-118 Gravel, fine to medium, angular to subrounded.

PIERRE FORMATION

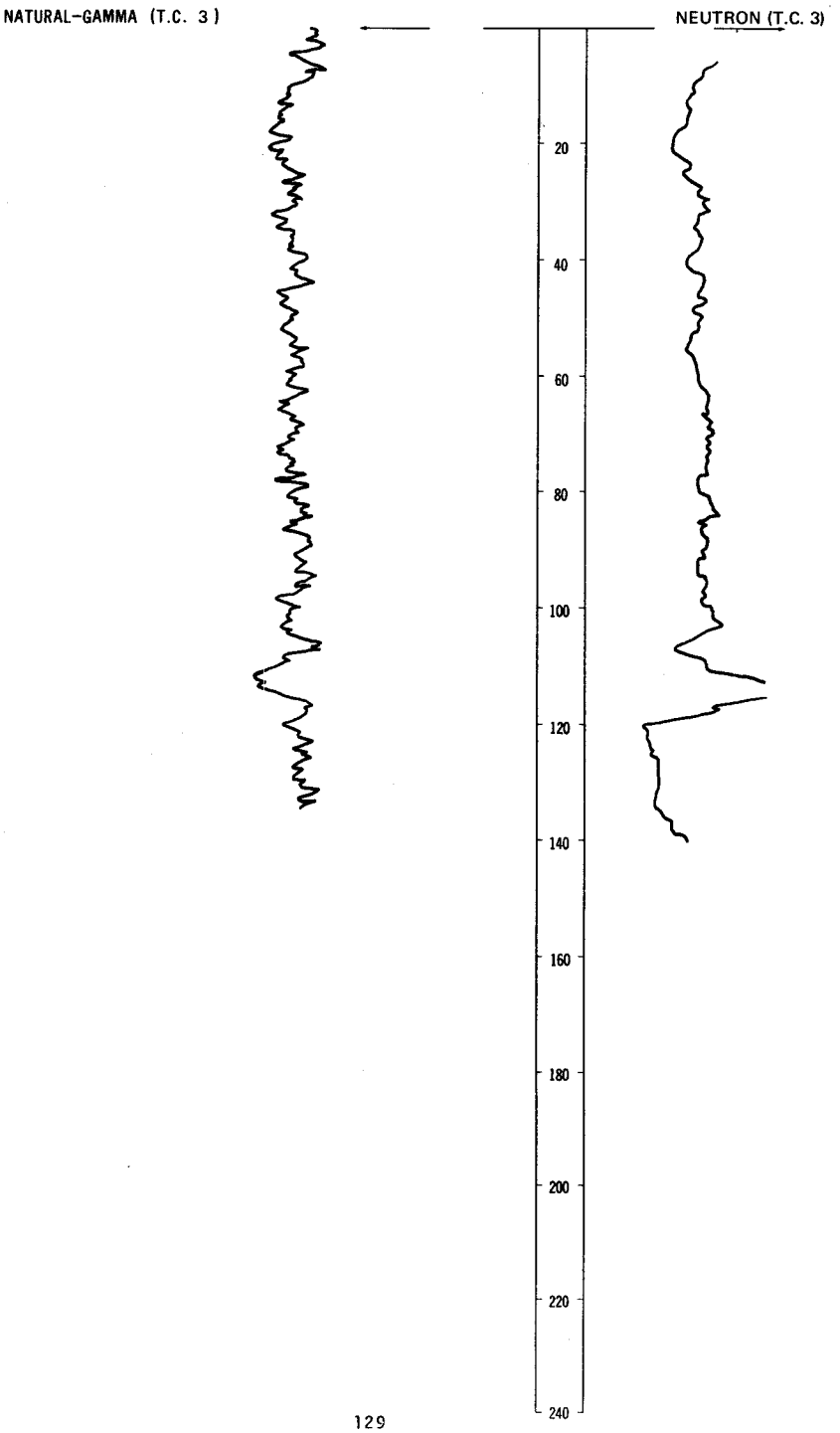
118-142 Shale, silty, sandy, dark-gray to grayish-black, hard.

LOCATION: 129-071-15BBB

DATE DRILLED: 8/22/77

ALTITUDE: 2042
(FT, MSL)

DEPTH: 142
(FT)



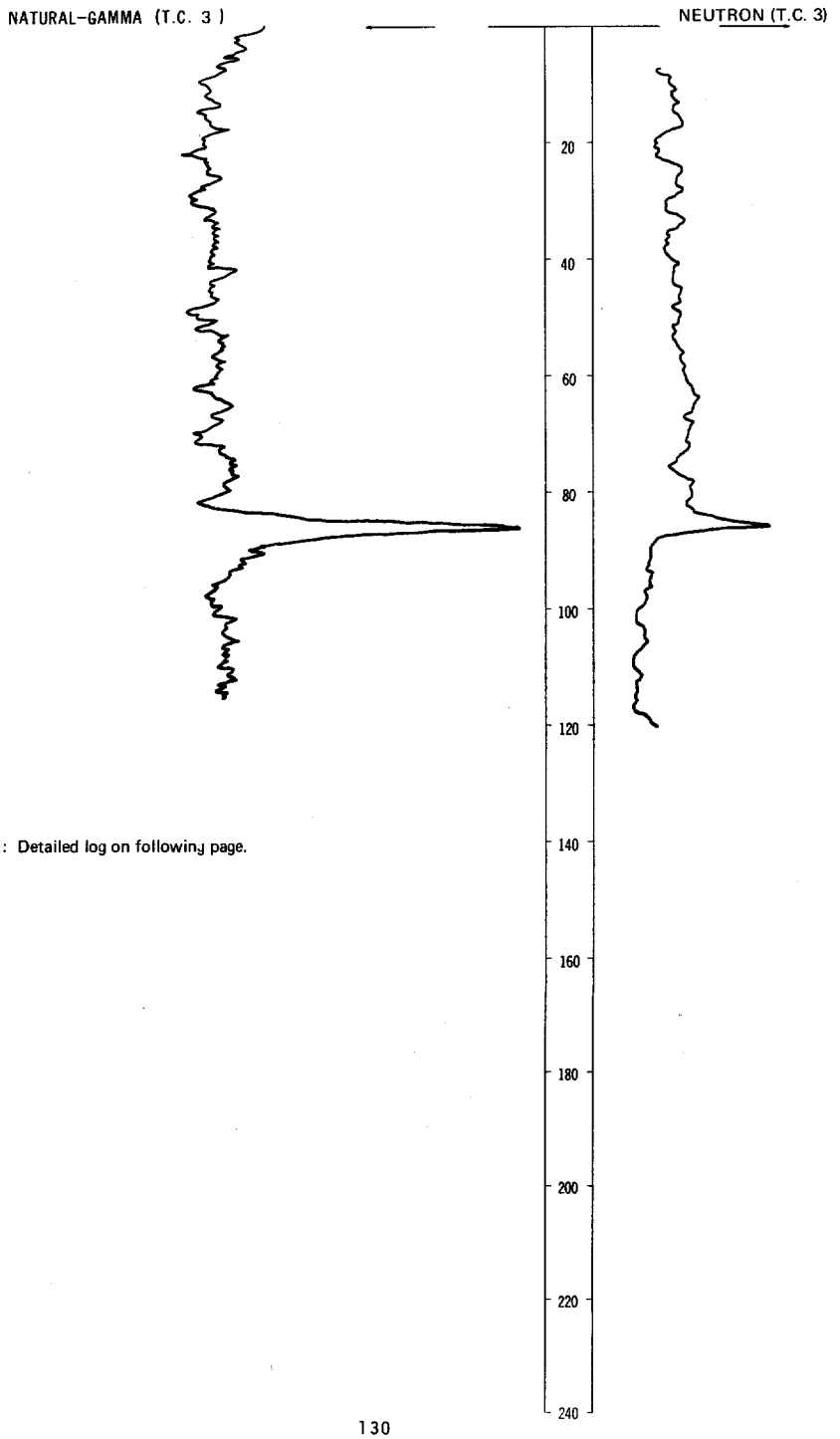
NDSWC 5187

LOCATION: 129-071-16BCC

DATE DRILLED: 8/19/77

ALTITUDE: 2051
(FT, MSL)

DEPTH: 122
(FT)



NOTE: Detailed log on following page.

Altitude: 2051 feet — Date drilled: 8/19/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift.			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown----------	45	45
	Clay (till), sandy, silty, gravelly, dark-gray to olive-gray----------	42	87
Pierre Formation:			
	Shale and siltstone; sandy; grayish-black to black----------	35	122

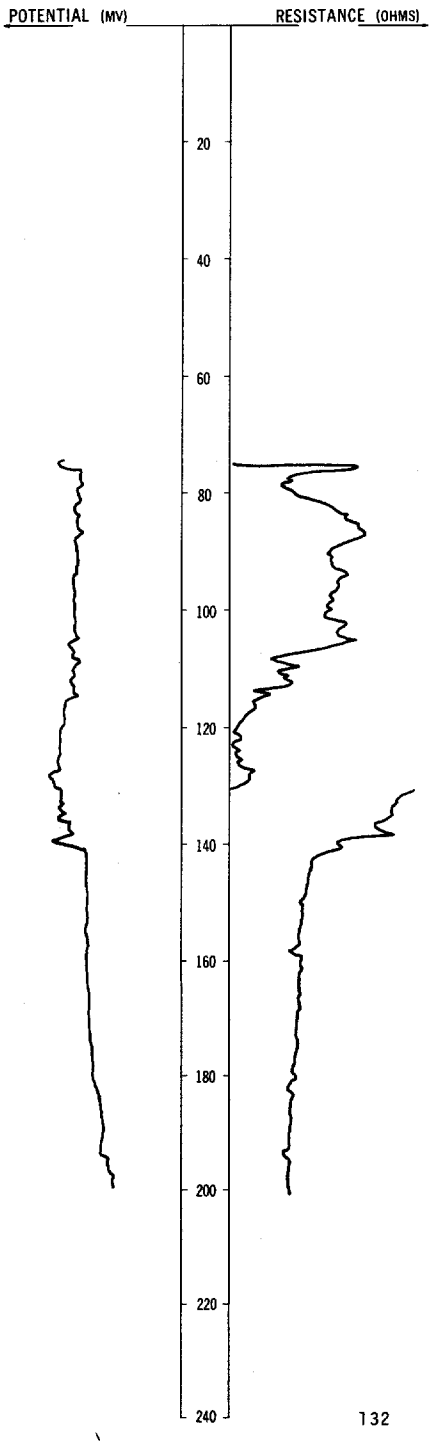
NDSWC 5186

LOCATION: 129-071-17CCC

DATE DRILLED: 8/19/77

ALTITUDE: 2105
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-75 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

FOX HILLS FORMATION

75-114 Siltstone, sandy, light-yellowish-brown, bentonitic.

114-140 Sand, very fine, silty, yellowish-brown.

PIERRE FORMATION(?)

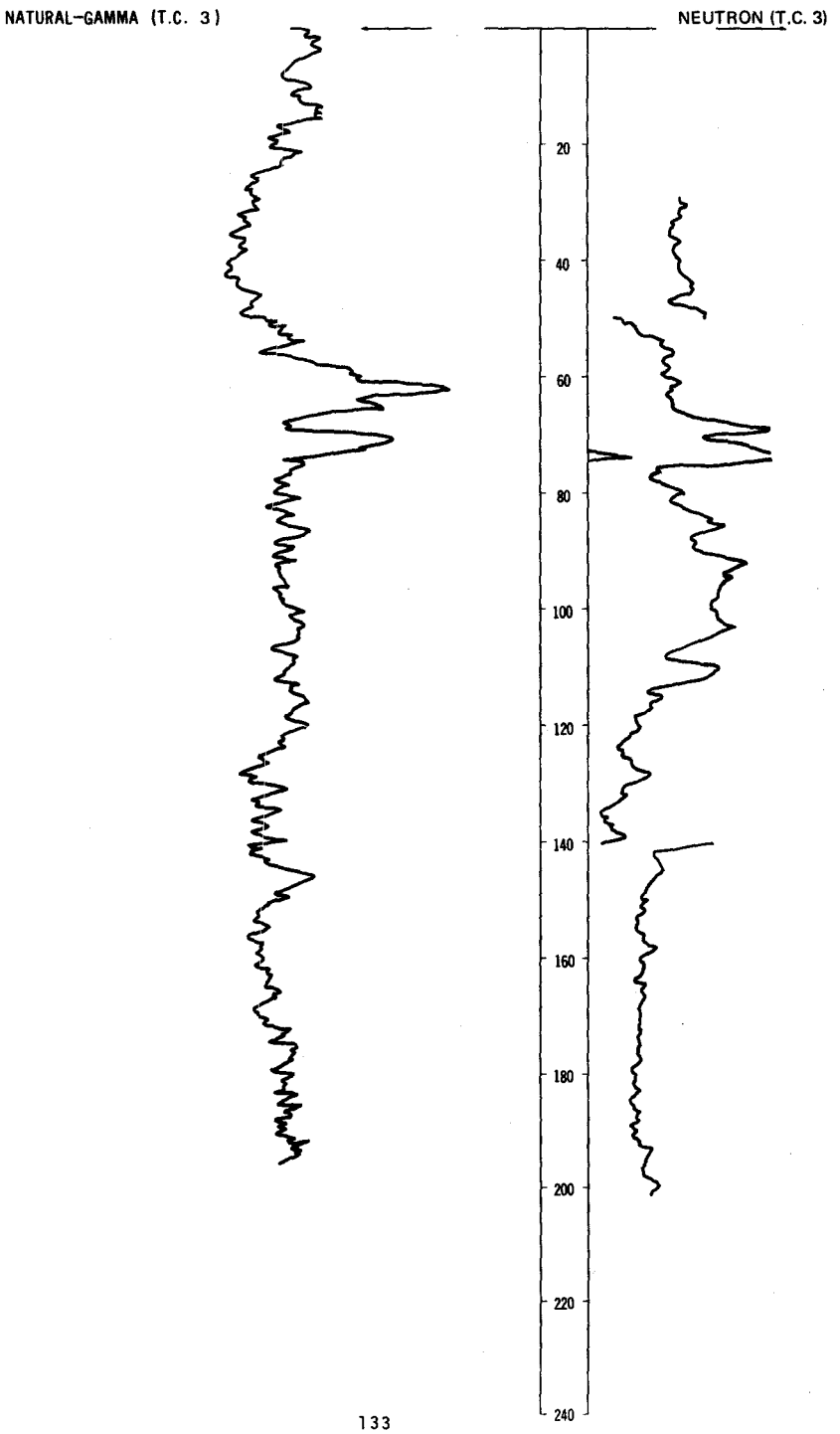
140-202 Siltstone, sandy, medium-dark-gray.

LOCATION: 129-071-17CCC

DATE DRILLED: 8/19/77

ALTITUDE: 2105
(FT, MSL)

DEPTH: 202
(FT)



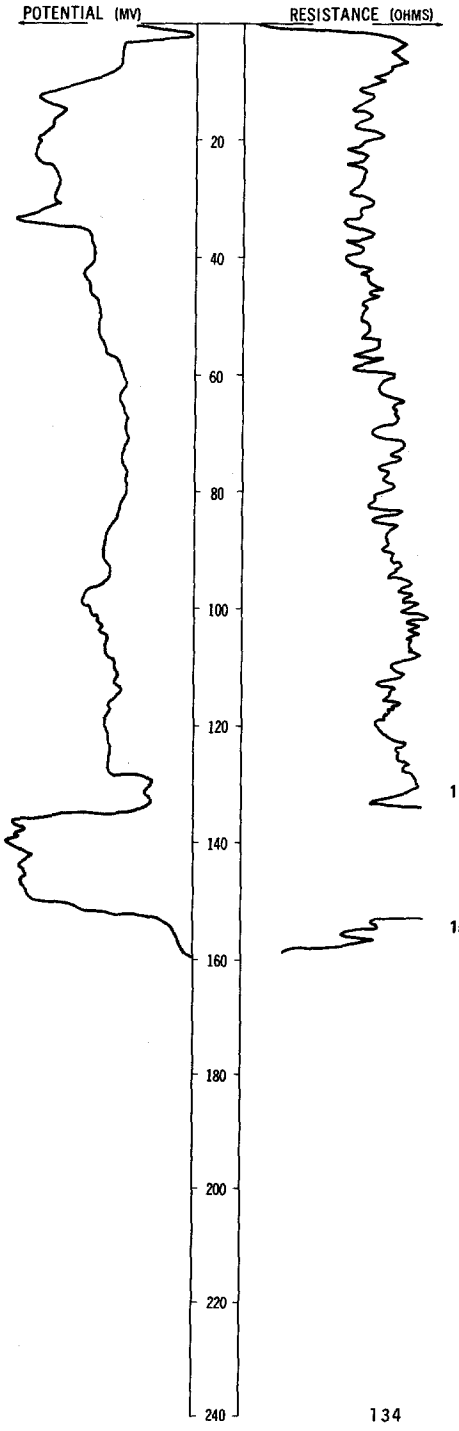
NDSWC 9648

LOCATION: 129-071-22BAA

DATE DRILLED: 7/22/76

ALTITUDE: 2029
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay, silty, grayish-green; mottled light gray.
8-22	Clay (till), silty, moderate-brown; scattered pebbles.
22-134	Clay (till), silty, olive-gray; scattered pebbles.
134-152	Gravel, very fine, sandy; composed of 40 percent carbonate, 30 percent quartz, 15 percent sandstone, and 15 percent unidentified fragments.

PIERRE FORMATION

152-160	Shale, silty, dark-gray, hard.

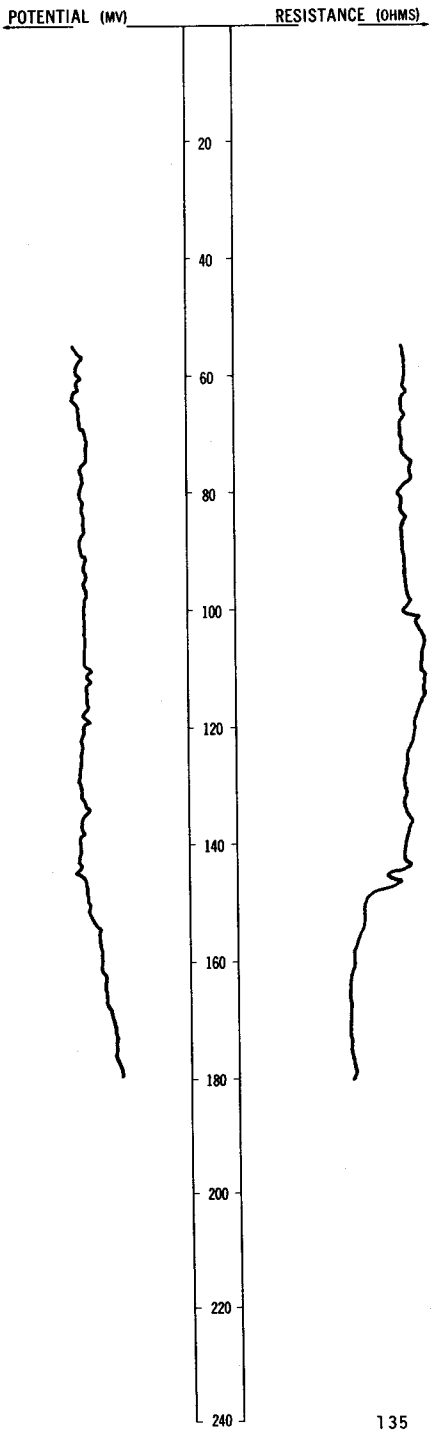
NDSWC 5191

LOCATION: 129-071-24CCC

DATE DRILLED: 8/23/77

ALTITUDE:
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.

20-146 Clay (till), sandy, silty, dark-gray to olive-gray; gravel lens from 144 to 146 feet.

PIERRE FORMATION

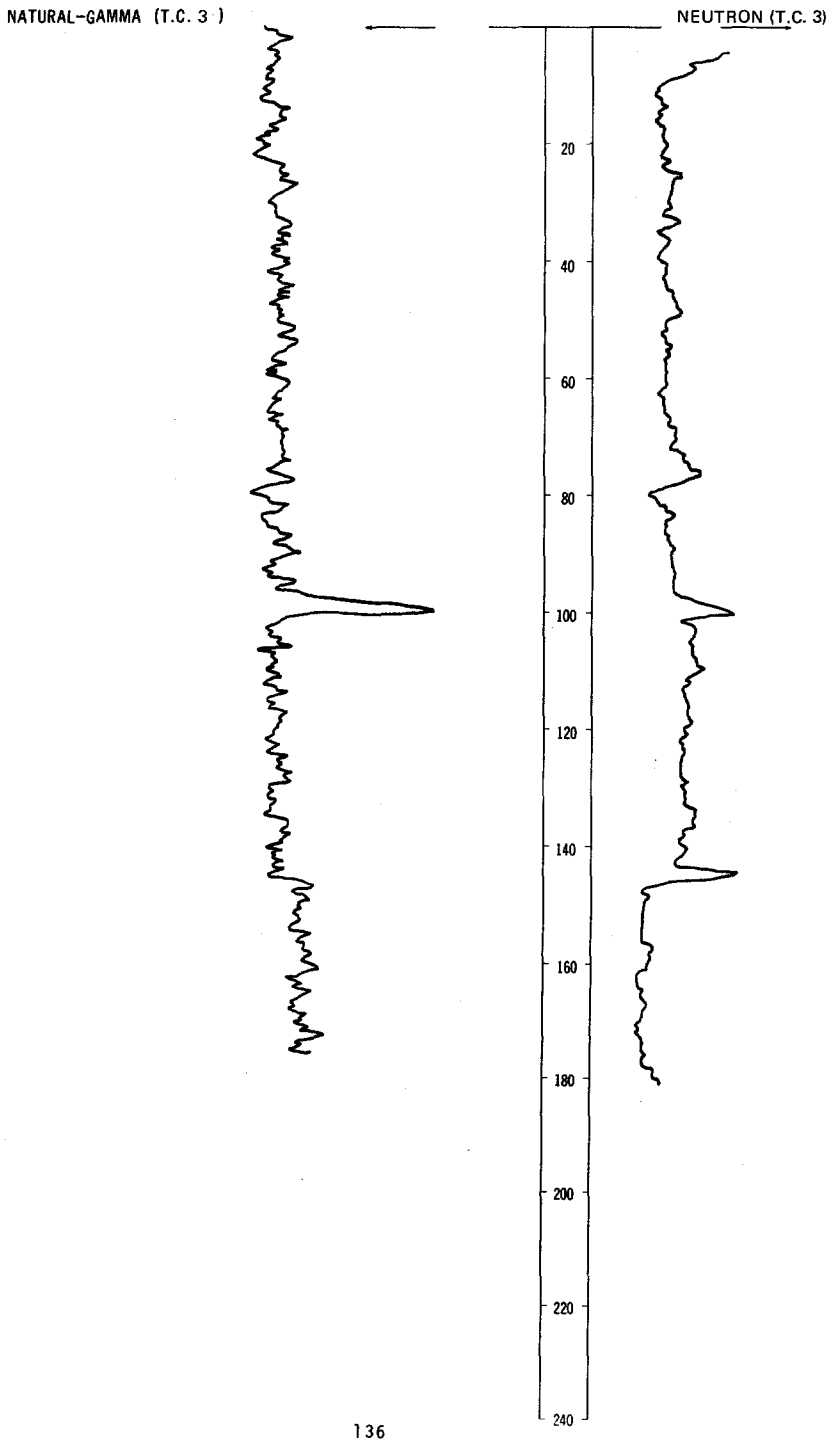
146-182 Siltstone and shale; sandy; medium-dark-gray to grayish-black; micaceous; hard.

LOCATION: 129-071-24CCC

DATE DRILLED: 8/23/77

ALTITUDE:
(FT, MSL)

DEPTH: 182
(FT)



NDSWC 5189

LOCATION: 129-071-27DBB

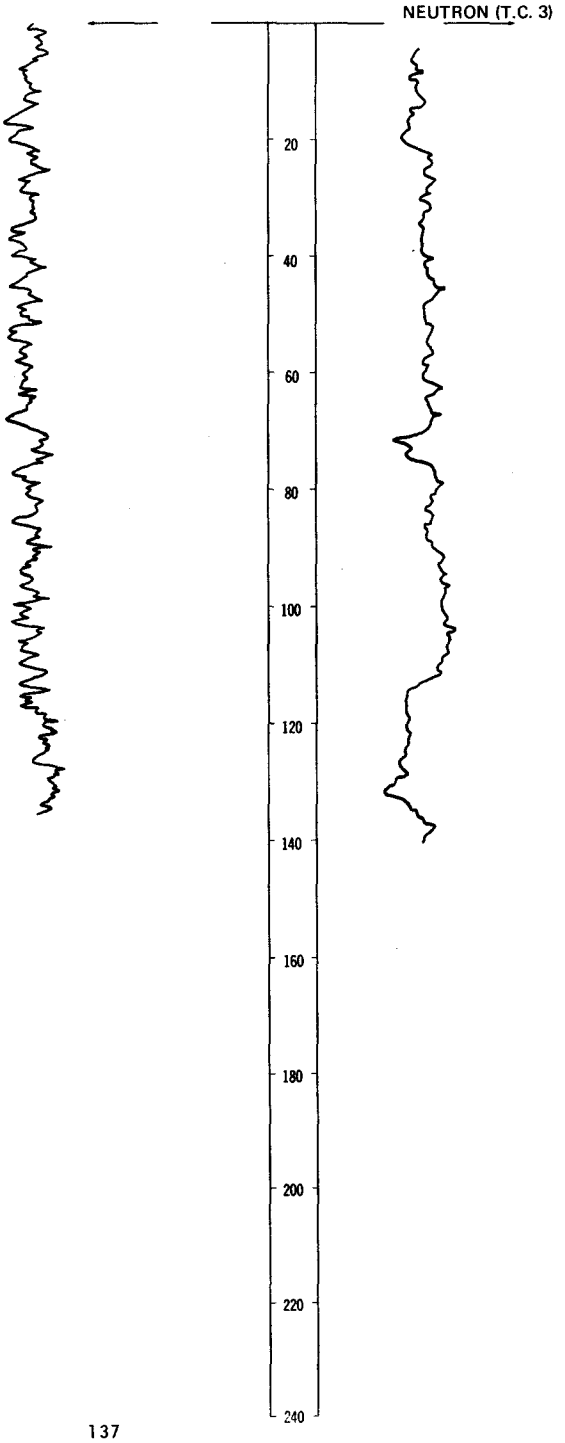
DATE DRILLED: 8/22/77

ALTITUDE: 2049
(FT, MSL)

DEPTH: 142
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



NOTE: Detailed log on following page.

129-071-27DBB, Continued
NDSWC 5189

Altitude: 2049 feet — Date drilled: 8/22/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown, scattered pebbles	28	28
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	85	113
Pierre Formation.			
	Siltstone, shaly, sandy, medium-dark-gray to grayish-black, bentonitic, hard	29	142

129-071-32BBB
NDSWC 5185

Altitude: 2000 feet — Date drilled: 8/19/77

Glacial drift:			
	Sand and gravel	4	4
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	16	20
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	15	35
	Gravel, fine to medium, angular to subrounded; composed largely of carbonate and shale fragments	20	55
Pierre Formation:			
	Siltstone, shaly, sandy, medium-dark-gray to grayish-black	47	102

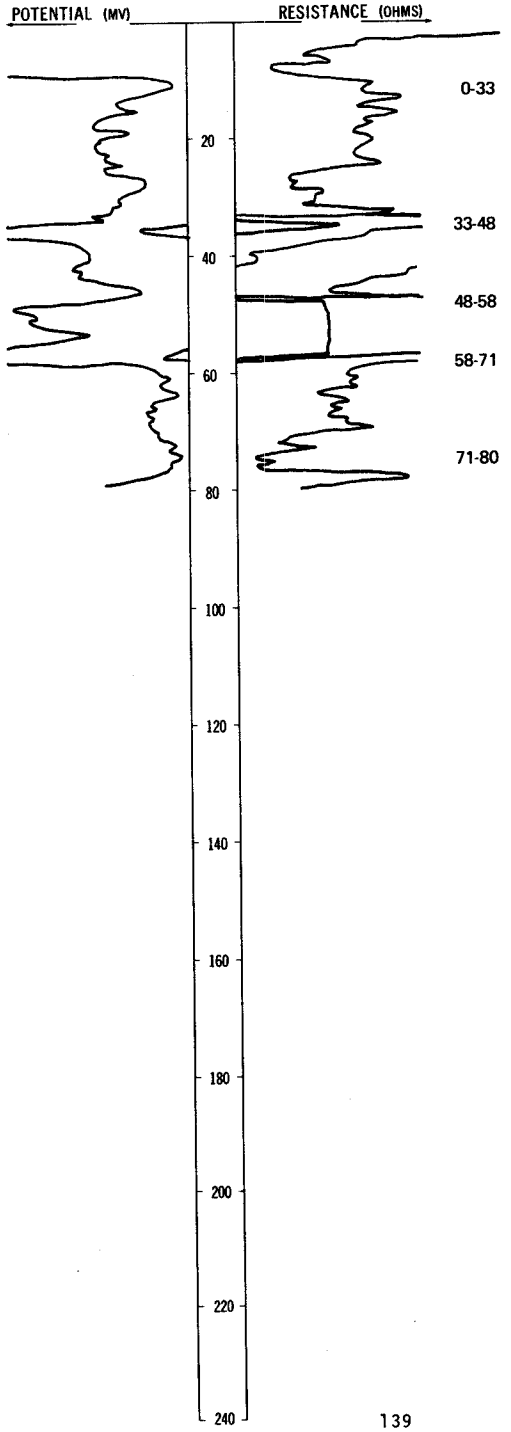
NDSWC 9650

LOCATION: 129-071-32CCC

DATE DRILLED: 7/22/76

ALTITUDE: 2013
(FT, MSL)

DEPTH: 80
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-33 Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.

FOX HILLS FORMATION(?)

33-48 Silt, clayey, sandy, light-brown.

48-58 Sand, very fine to coarse, predominantly fine, silty.

58-71 Clay (till), silty, sandy, light-olive-gray.

PIERRE FORMATION

71-80 Shale, silty, dark-gray, hard.

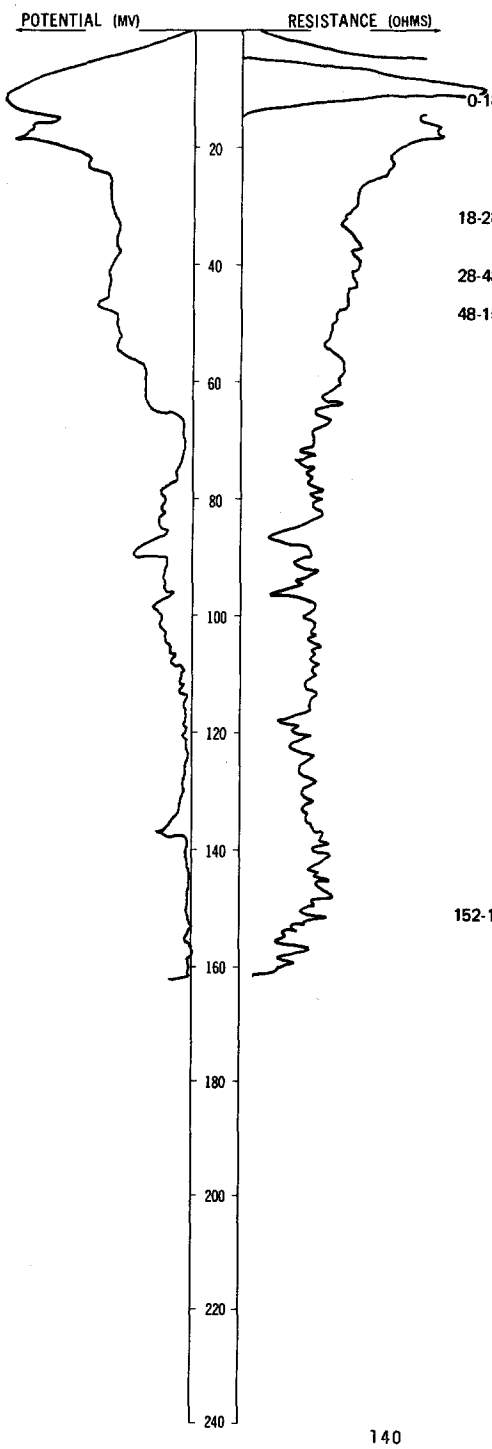
NDSWC 9649

LOCATION: 129-071-34CDC

DATE DRILLED: 7/22/76

ALTITUDE: 2057
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18 Sand, fine to very coarse, gravelly; composed of 40 percent quartz, 40 percent shale, 15 percent carbonate, and 5 percent unidentified fragments.

18-28 Silt, clayey, sandy, moderate-yellowish-brown.

28-48 Silt, clayey, sandy, brownish-gray.

48-152 Clay (till), silty, olive-gray; scattered pebbles.

PIERRE FORMATION

152-160 Shale, silty, dark-gray, hard.

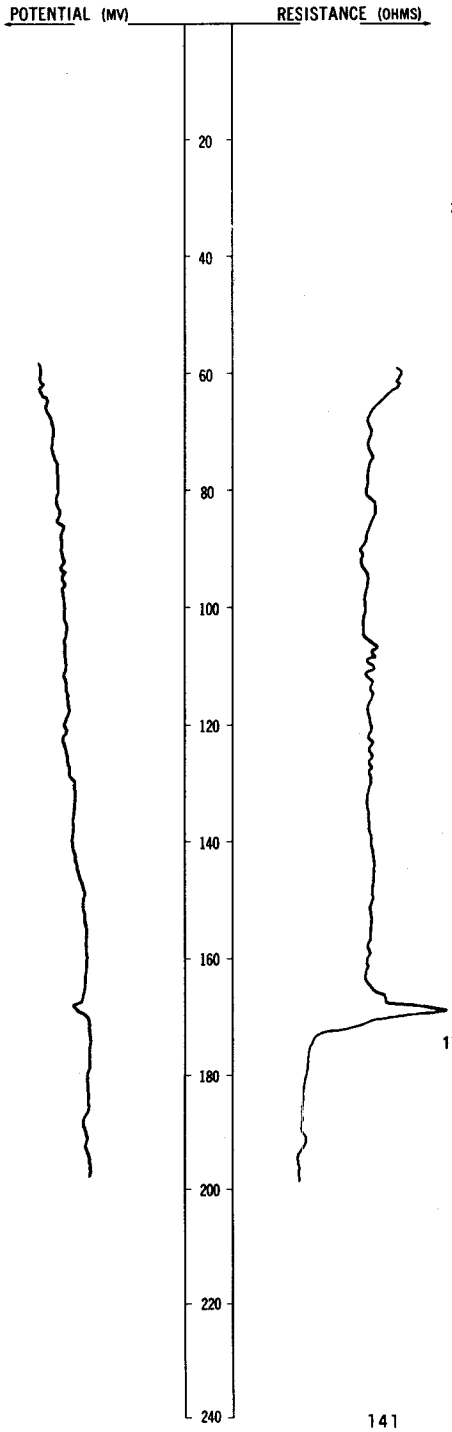
NDSWC 5190

LOCATION: 129-071-35CDD

DATE DRILLED: 8/22/77

ALTITUDE: 2041
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-35 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown; few boulders.

35-172 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; boulders from 169 to 172 feet.

PIERRE FORMATION

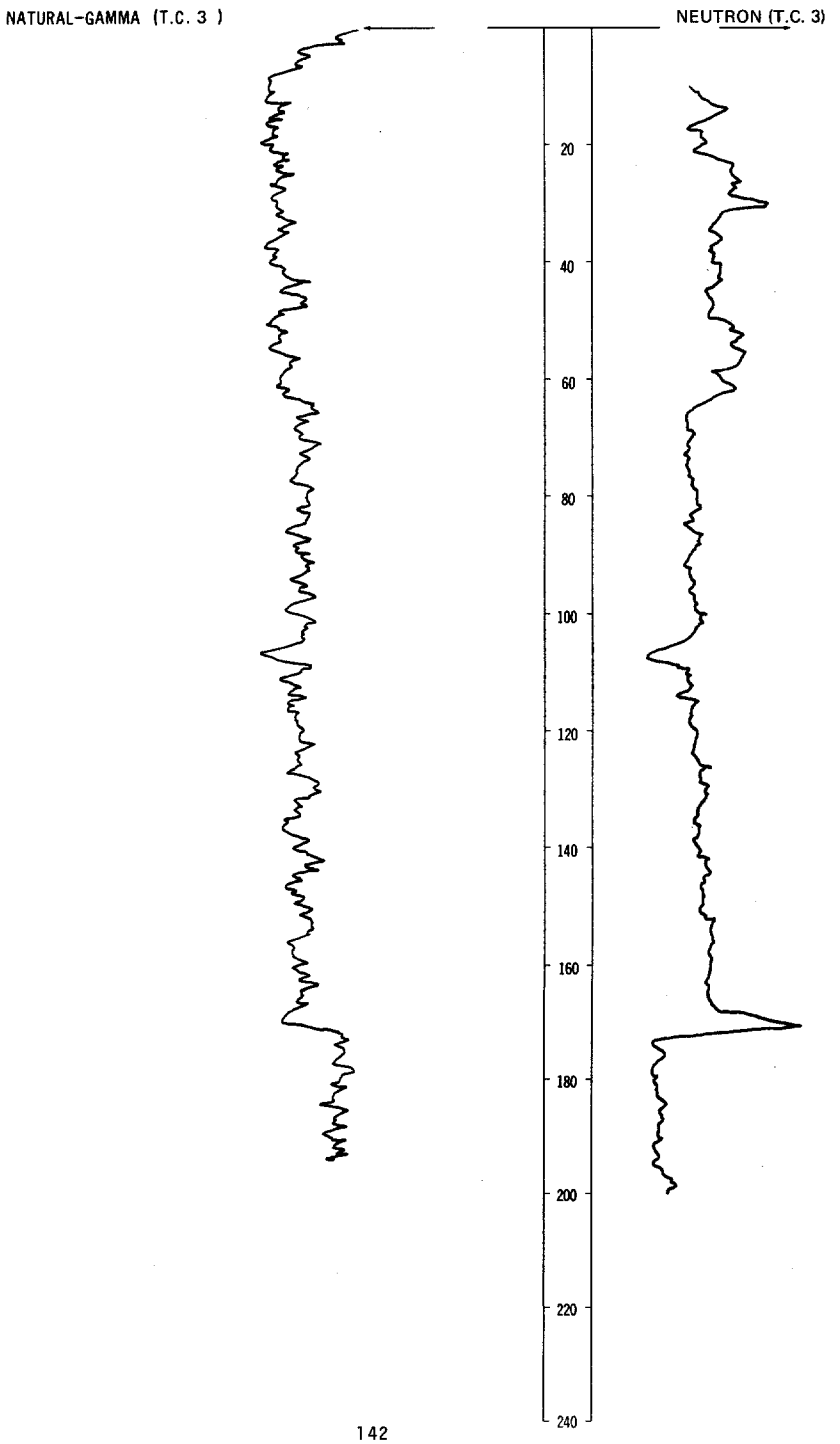
172-202 Shale, sandy, grayish-black to black.

LOCATION: 129-071-35CDD

DATE DRILLED: 8/22/77

ALTITUDE: 2041
(FT, MSL)

DEPTH: 202
(FT)



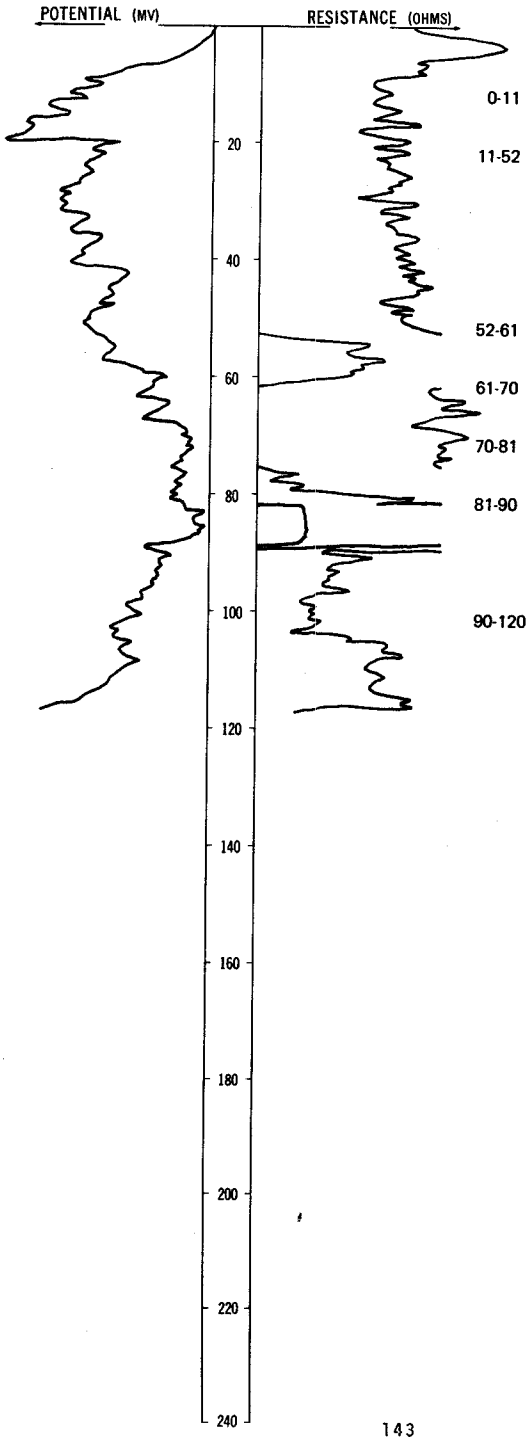
NDSWC 9647

LOCATION: 129-072-14AAA

DATE DRILLED: 7/22/76

ALTITUDE: 1961
(FT, MSL)

DEPTH: 120
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-11	Clay, silty, sandy, moderate-yellowish-brown; scattered pebbles.
11-52	Clay (till), silty, olive-gray; scattered pebbles.
52-61	Clay, sandy, moderate-brown.
61-70	Clay, silty, sandy, light-brown, carbonaceous; scattered pebbles.
70-81	Clay (till), silty, sandy, olive-gray; scattered pebbles.
81-90	Sand, very fine to very coarse, predominantly medium; contains few clay lenses.

PIERRE FORMATION

90-120	Shale, silty, dark-gray, hard.

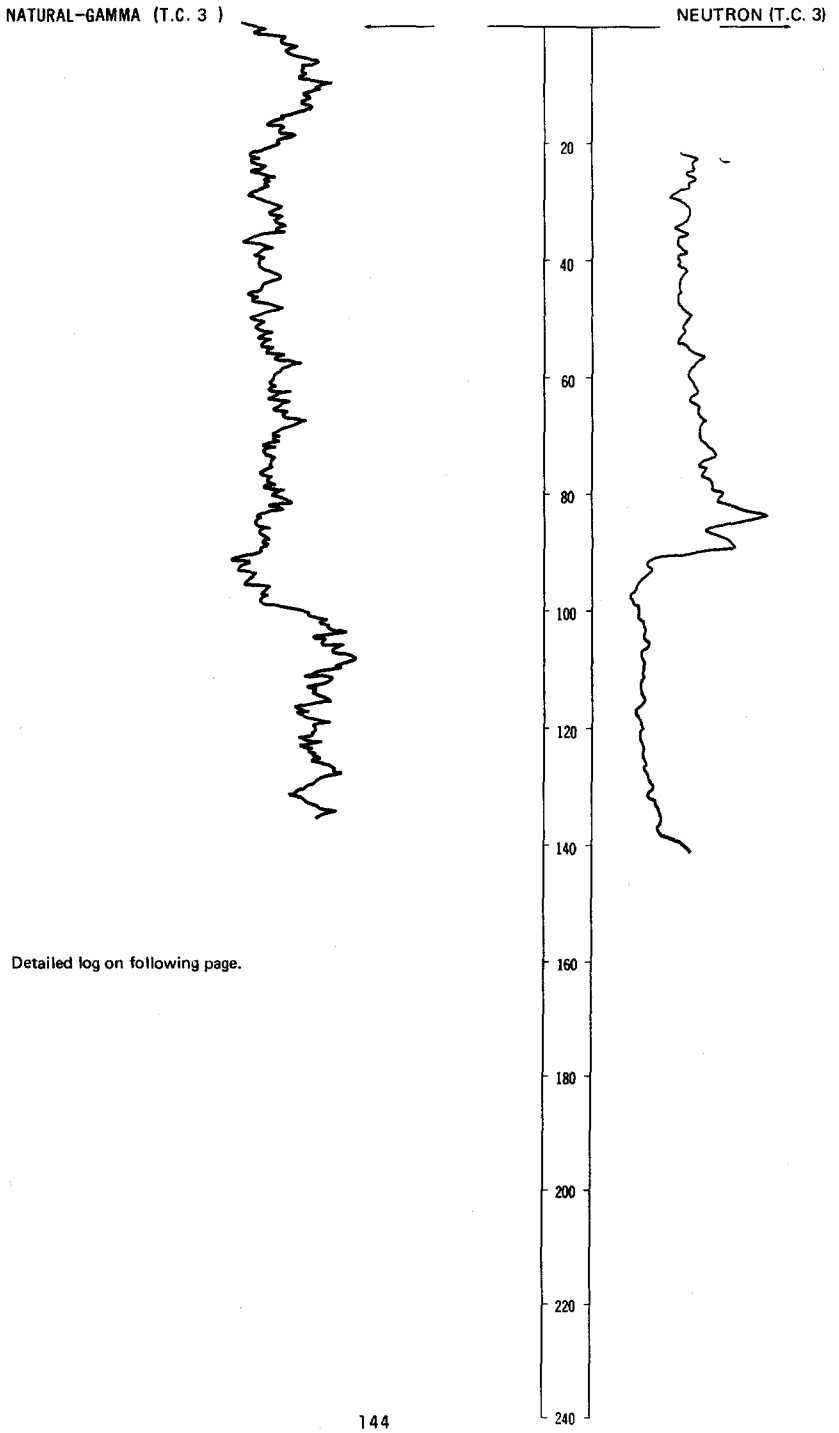
NDSWC 5182

LOCATION: 129-072-15AAA

DATE DRILLED: 8/18/77

ALTITUDE: 1955
(FT, MSL)

DEPTH: 142
(FT)



NOTE: Detailed log on following page.

129-072-15AAA, Continued
NDSWC 5182

Altitude: 1955 feet — Date drilled: 8/18/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	50	50
	Clay (till), sandy, silty, dark-gray to olive-gray; scattered pebbles	41	91
Fox Hills Formation(?):			
	Clay, sandy, silty, moderate-yellowish-brown	9	100
Pierre Formation:			
	Siltstone, clayey, sandy, medium-dark-gray to grayish-black	42	142

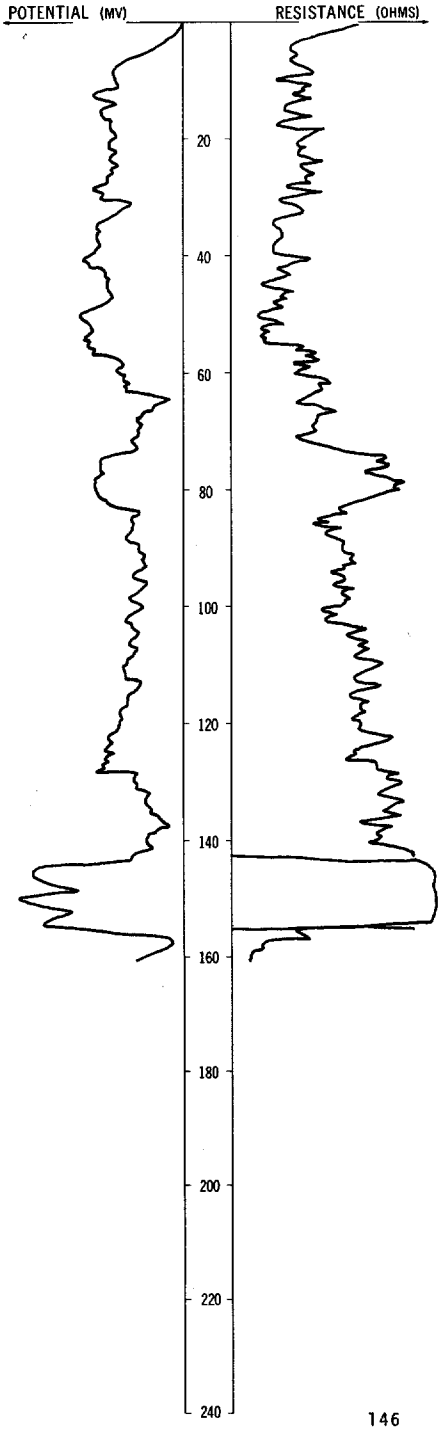
NDSWC 9646

LOCATION: 129-072-16BBB

DATE DRILLED: 7/21/76

ALTITUDE: 1925
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-45	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
45-74	Clay (till), silty, sandy, olive-gray; scattered pebbles.
74-83	Silt, clayey, brownish-gray.
83-104	Clay (till), silty, sandy, olive-gray; scattered pebbles.
104-143	Clay (till), sandy, olive-gray; scattered pebbles.
143-156	Gravel, very fine, sandy; composed of 50 percent carbonate, 30 percent quartz, 15 percent unidentified, and 5 percent shale fragments.

PIERRE FORMATION

156-160	Shale, silty, dark-gray, hard.

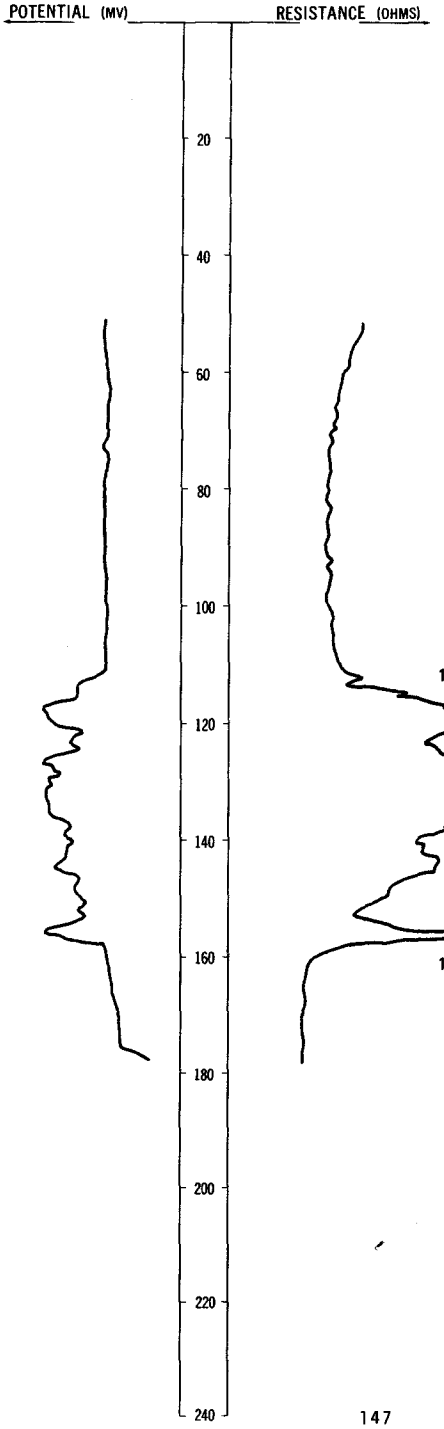
NDSWC 5183

LOCATION: 129-072-26BBB

DATE DRILLED: 8/18/77

ALTITUDE: 2055
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles and boulders.

20-114 Clay (till), sandy, silty, medium-dark-gray to olive-gray; gravel and boulders.

114-161 Sand, fine to very coarse, predominantly medium to coarse, subrounded; composed largely of quartz with some carbonate and shale fragments.

PIERRE FORMATION

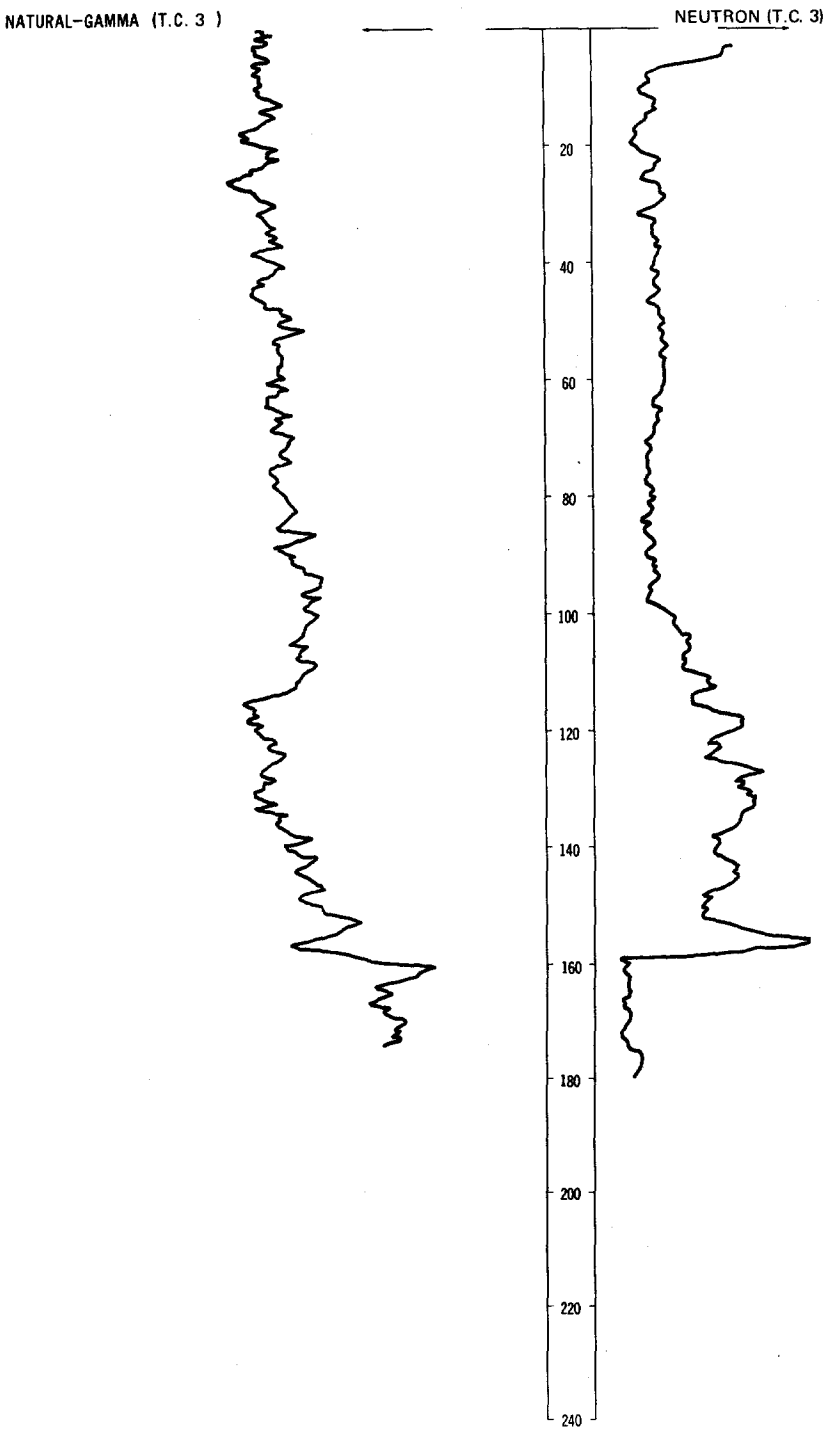
161-182 Shale, grayish-black to black, siliceous.

LOCATION: 129-072-26BBB

DATE DRILLED: 8/18/77

ALTITUDE: 2055
(FT, MSL)

DEPTH: 182
(FT)



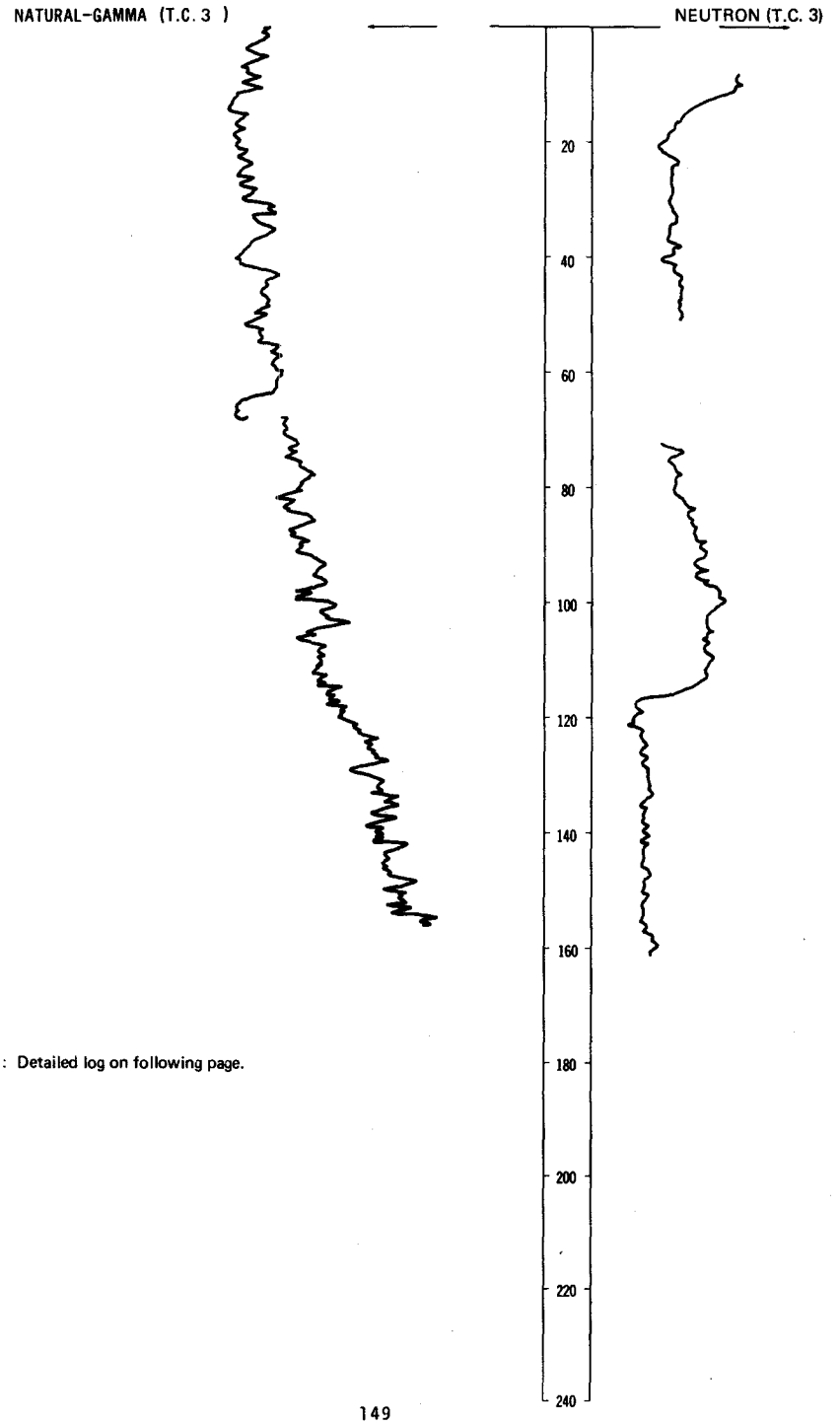
NDSWC 5179

LOCATION: 129-072-29DAA

DATE DRILLED: 8/17/77

ALTITUDE: 2000
(FT, MSL)

DEPTH: 162
(FT)



NOTE: Detailed log on following page.

129-072-29DAA, Continued
NDSWC 5179

Altitude:	2000 feet	Date drilled:	8/17/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown----------	18	18
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray----------	98	116
Pierre Formation(?):			
	Siltstone, sandy, medium-dark-gray to grayish-black----------	18	134
	Shale, sandy, grayish-black to black, hard----------	28	162

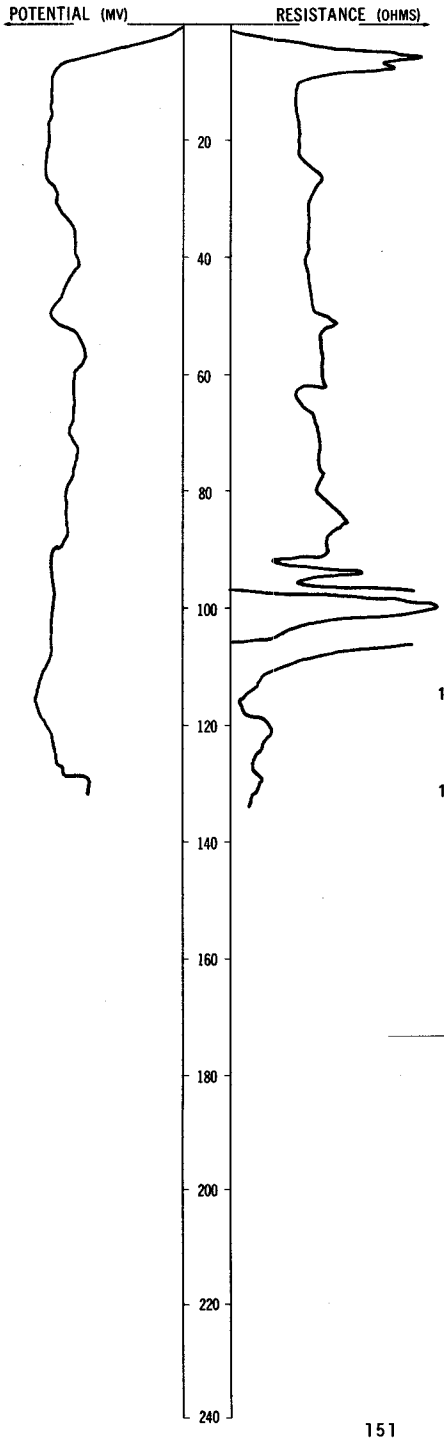
NDSWC 9730

LOCATION: 129-072-30BAA

DATE DRILLED: 7/18/76

ALTITUDE: 1966
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-4	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
4-7	Gravel, sandy, clayey.
7-19	Clay (till), silty, sandy, dark-yellowish-brown to dusky-yellowish-brown; scattered pebbles.
19-59	Clay (till), silty, sandy, olive-gray; scattered pebbles.
59-61	Gravel, sandy.
61-93	Clay (till), silty, sandy, olive-gray; scattered pebbles.
93-95	Gravel, sandy.
95-98	Clay (till), silty, sandy, olive-gray; scattered pebbles.
98-106	Gravel, very fine, sandy.
106-112	Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

112-140	Shale, grayish-black, hard.

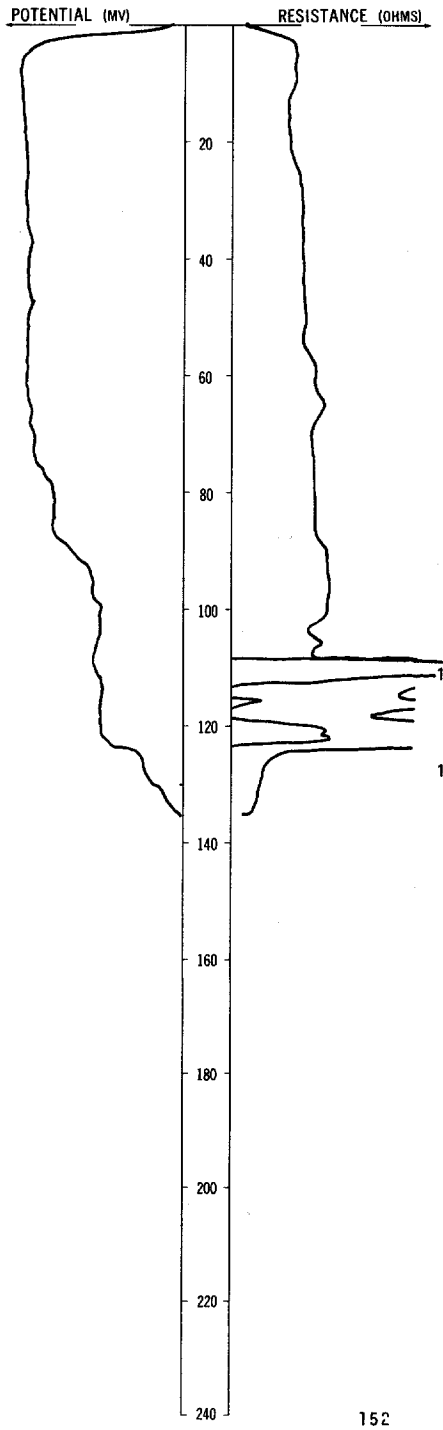
NDSWC 9732

LOCATION: 129-072-30BBA

DATE DRILLED: 8/18/76

ALTITUDE: 1965
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-3	Gravel, sandy, clayey.
3-13	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
13-22	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
22-64	Clay (till), silty, sandy, olive-gray; scattered pebbles.
64-66	Gravel, sandy.
66-87	Clay (till), silty, sandy, olive-gray; scattered pebbles.
87-88	Gravel, sandy.
88-108	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel from 105 to 107 feet.
108-122	Sand, fine to very coarse, gravelly; lensed with clay.

PIERRE FORMATION

122-140	Shale, grayish-black, hard.

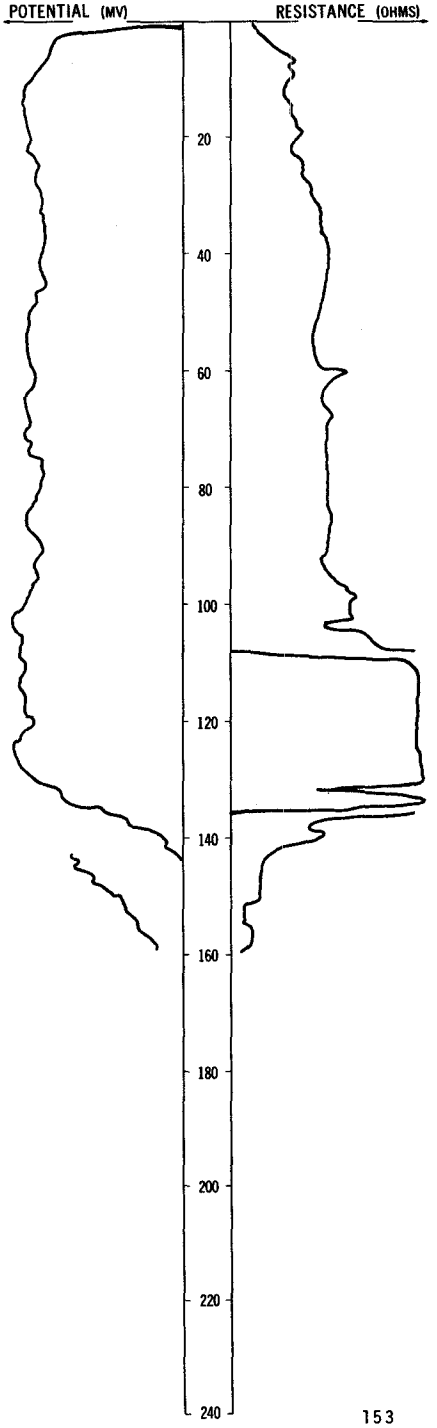
NDSWC 9725

LOCATION: 129-072-30BBB

DATE DRILLED: 8/16/76

ALTITUDE: 1968
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-29 Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.

29-102 Clay (till), silty, sandy, olive-gray; scattered pebbles.

102-109 Clay, sandy, grayish-brown.

109-136 Sand, medium to very coarse, predominantly very coarse, gravelly; composed of 30 percent quartz, 35 percent carbonate, 25 percent unidentified, and 10 percent shale fragments.

PIERRE FORMATION

136-160 Shale, grayish-black, hard.

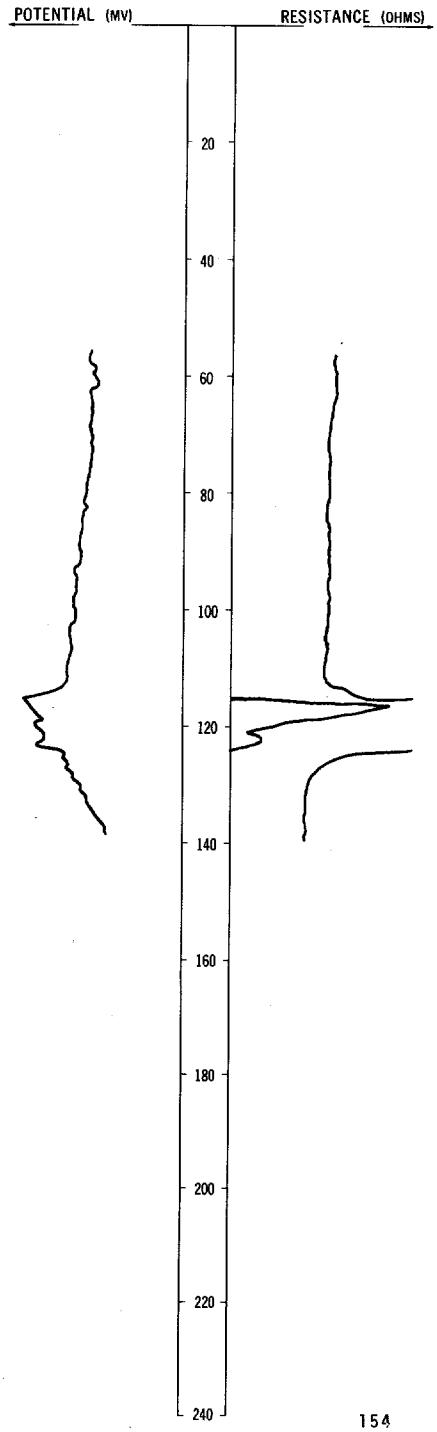
NDSWC 5178

LOCATION: 129-072-30CDD

DATE DRILLED: 8/17/77

ALTITUDE: 1920
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-32 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

32-115 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

115-125 Gravel, fine to coarse, sandy, subangular to subrounded; gravel composed largely of carbonate and shale fragments.

PIERRE FORMATION

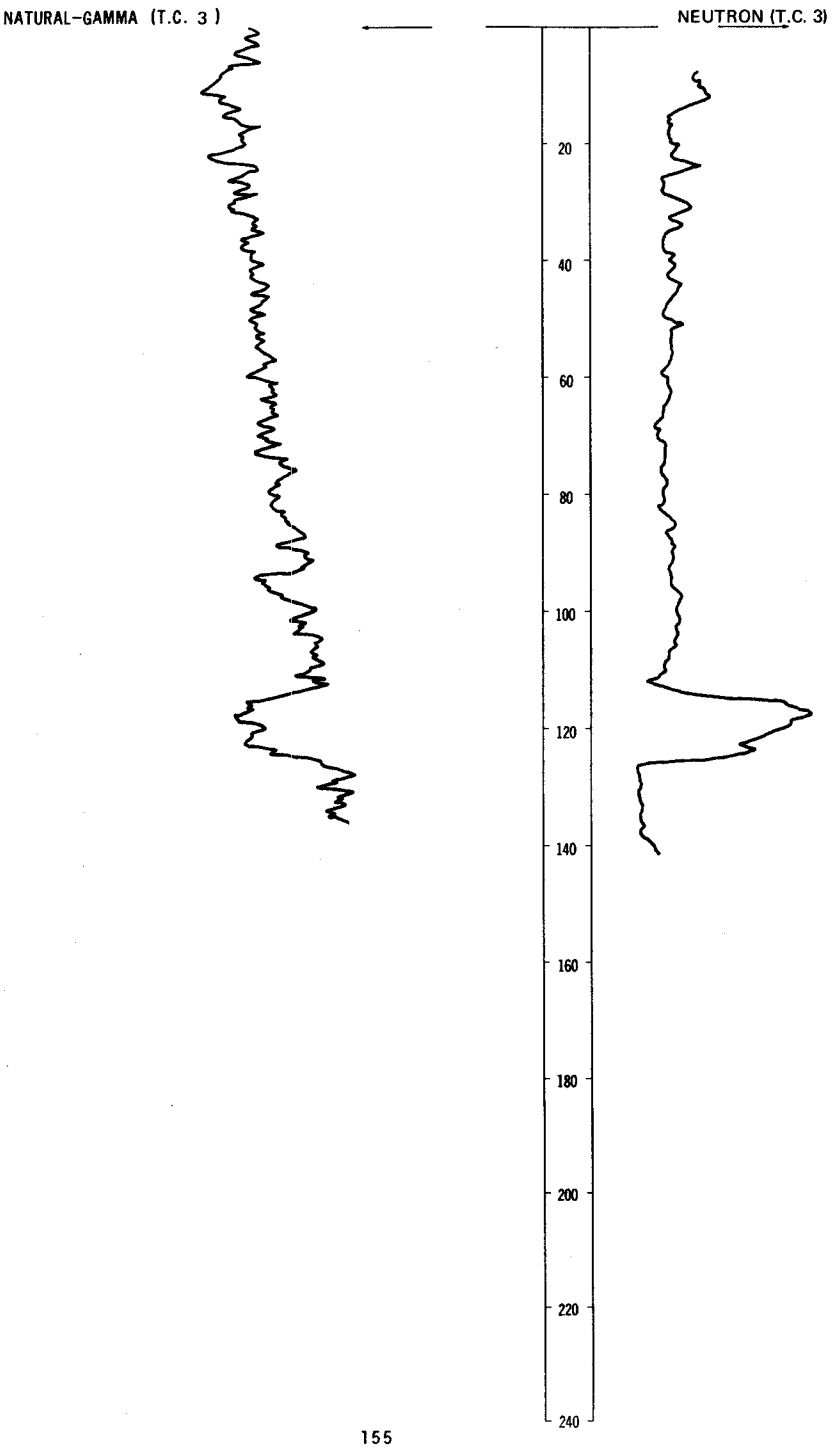
125-142 Siltstone and shale; grayish-black; hard.

LOCATION: 129-072-30CDD

DATE DRILLED: 8/17/77

ALTITUDE: 1920
(FT, MSL)

DEPTH: 142
(FT)



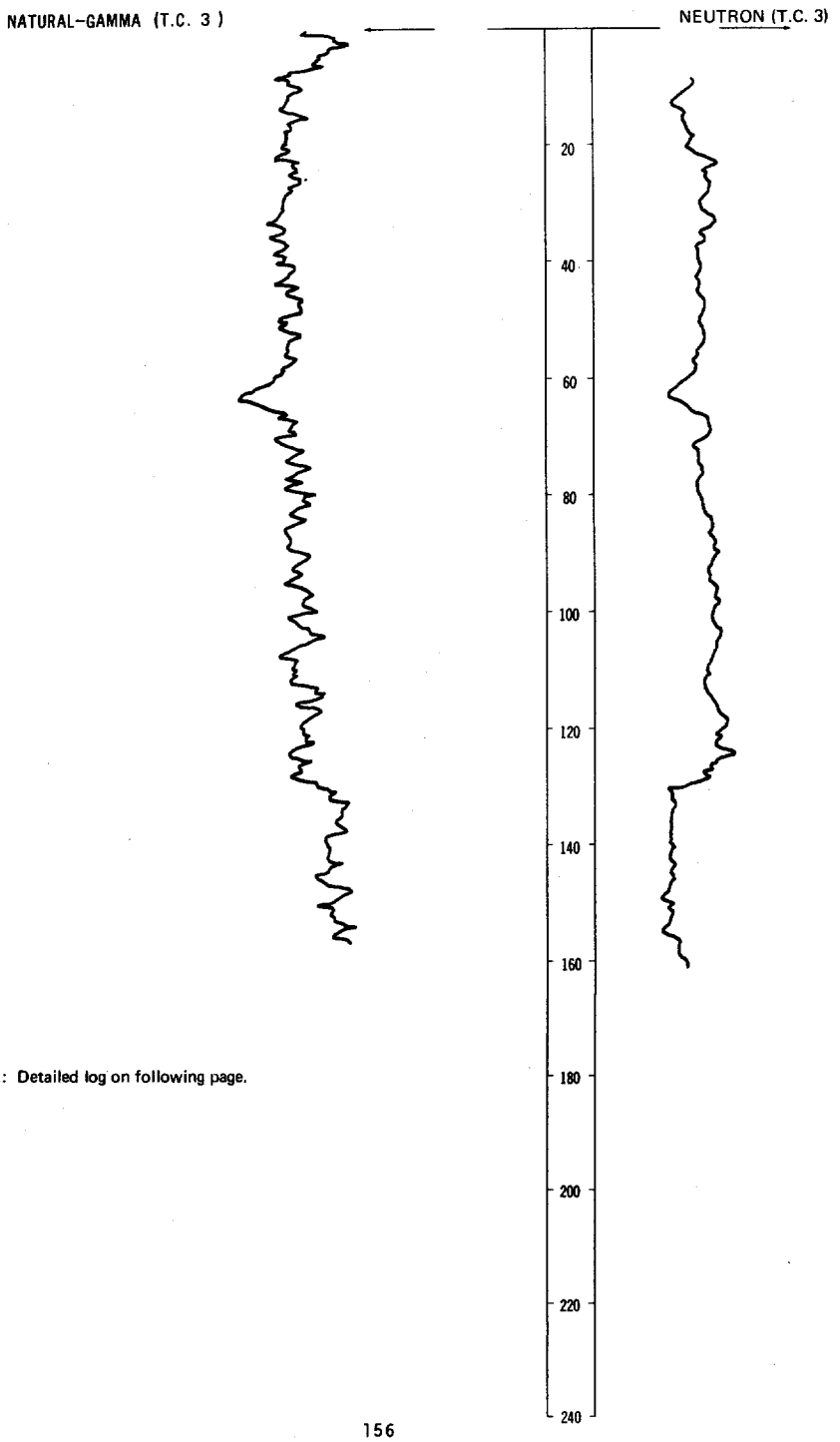
NDSWC 5177

LOCATION: 129-072-31CBB

DATE DRILLED: 8/17/77

ALTITUDE: 1922
(FT, MSL)

DEPTH: 162
(FT)



NOTE: Detailed log on following page.

Altitude: 1922 feet

Date drilled: 8/17/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	15	15
	Clay (till), sandy, silty, gravelly, dark-gray to olive-gray	45	60
	Sand and gravel; poor sample returns	5	65
	Clay (till), sandy, silty, gravelly, olive-gray	64	129
Pierre Formation:			
	Siltstone, clayey, sandy, grayish-black	33	162

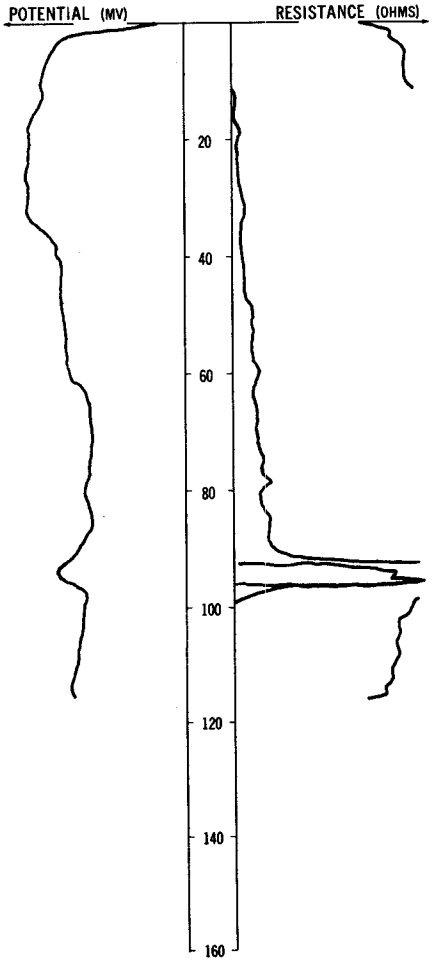
NDSWC 9733

LOCATION: 129-072-32BBA

DATE DRILLED: 8/18/76

ALTITUDE: 1970 (FT, MSL)

DEPTH: 120 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-31 Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.

31-91 Clay (till), silty, sandy, olive-gray; scattered pebbles.

91-96 Sand, fine to very coarse; gravelly.

96-102 Clay, silty, sandy, olive-gray.

PIERRE FORMATION

102-120 Shale, grayish-black, hard.

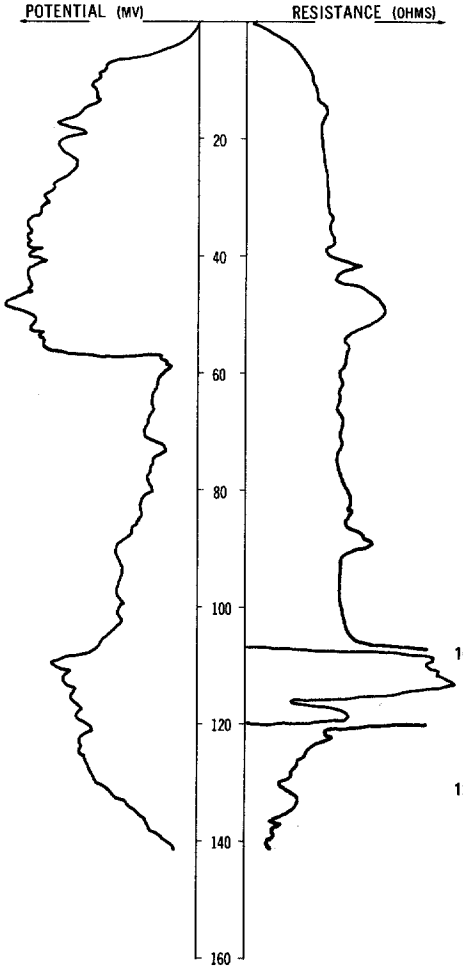
NDSWC 9639

LOCATION: 129-072-32CCC

DATE DRILLED: 7/20/76

ALTITUDE: 1920
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-29	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
29-42	Clay (till), silty, sandy, olive-gray; scattered pebbles.
42-52	Silt, sandy, medium-gray.
52-86	Clay (till), silty, olive-gray; scattered pebbles.
86-90	Silt, clayey, medium-gray.
90-106	Clay (till), silty, olive-gray; scattered pebbles.
106-120	Gravel, very fine, sandy; composed of 55 percent carbonate, 30 percent shale, and 15 percent quartz fragments.

PIERRE FORMATION

120-140	Shale, silty, dark-gray.

129-072-32DDD
NDSWC 9640

Altitude: 1928 feet

Date drilled: 7/20/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, sandy, gravelly, moderate-yellowish-brown	24	24
	Clay (till), silty, sandy, gravelly, olive-gray	89	113
	Clay (till), silty, gravelly, olive-gray; thin gravel lenses	3	116
	Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 60 percent quartz, 20 percent carbonate, and 20 percent shale fragments	17	133
	Clay (till), silty, gravelly, olive-gray	7	140

129-072-33CCC
NDSWC 9641

Date drilled: 7/21/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown to dark-yellowish-brown	28	28
	Clay (till), silty, sandy, gravelly, olive-gray	16	44
	Silt, sandy, brownish-gray	4	48
	Clay (till), silty, gravelly, olive-gray	62	110
	Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 50 percent quartz, 30 percent shale, and 20 percent carbonate fragments	10	120
	Clay (till), sandy, gravelly, olive-gray	6	126
Pierre Formation:			
	Shale, silty, dark-gray, hard	14	140

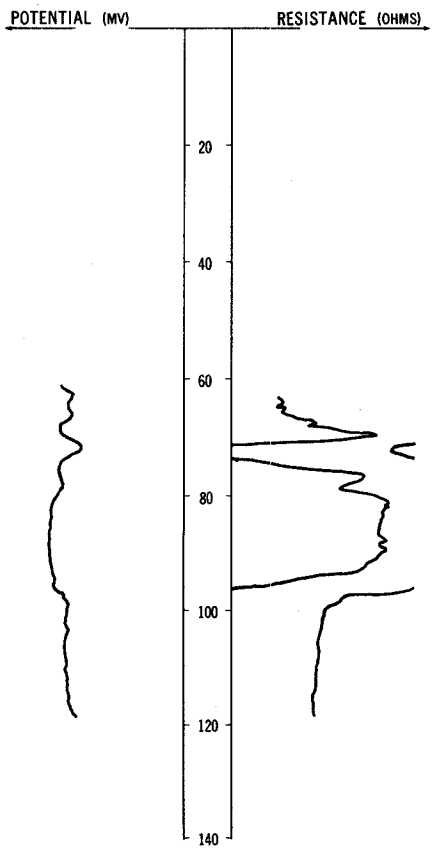
NDSWC 5184

LOCATION: 129-072-34DAA

DATE DRILLED: 8/18/77

ALTITUDE: 1997 (FT, MSL)

DEPTH: 122 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-42 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

42-51 Clay (till), sandy, silty, gravelly, olive-gray.

51-98 Sand, very fine to very coarse, predominantly medium, subrounded.

PIERRE FORMATION

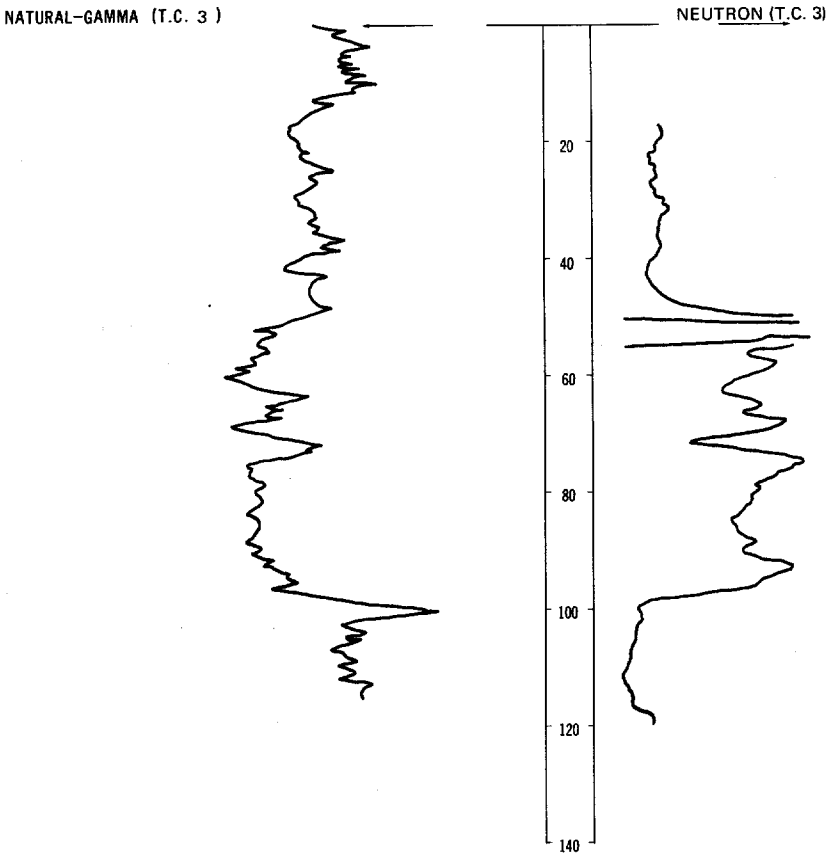
98-122 Siltstone and shale; dark-gray to grayish-black; hard.

LOCATION: 129-072-34DAA

DATE DRILLED: 8/18/77

ALTITUDE: 1997
(FT, MSL)

DEPTH: 122
(FT)



129-072-35DDD1
NDSWC 9642

Altitude: 1976 feet

Date drilled: 7/21/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown	40	40

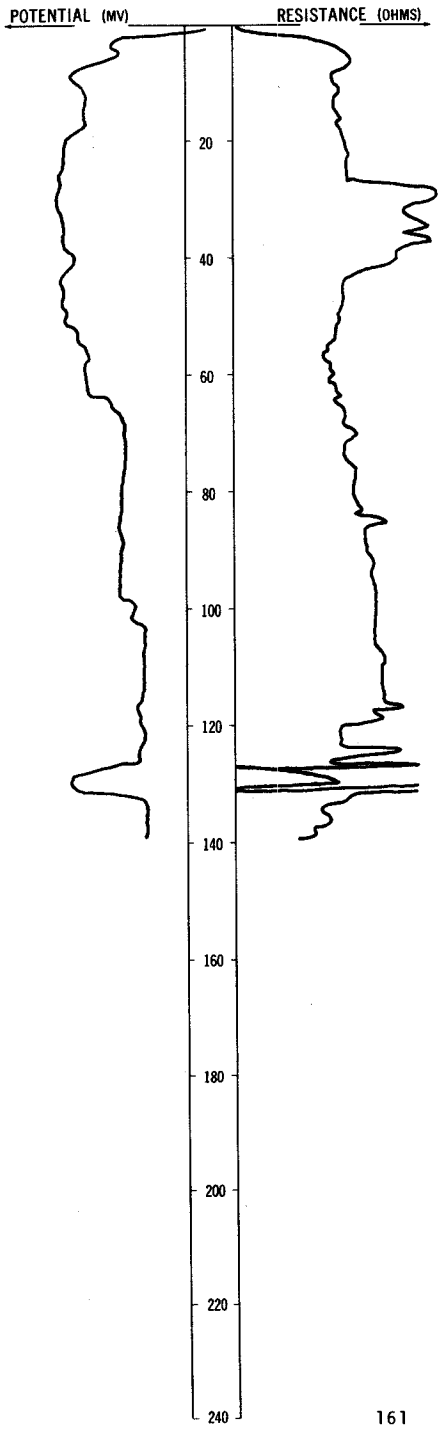
NDSWC 9651

LOCATION: 129-072-35DDD2

DATE DRILLED: 7/22/76

ALTITUDE: 1976
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-28 Clay (till), silty, moderate-yellowish-brown; scattered pebbles.

28-42 Sand, medium to very coarse, predominantly very coarse, gravelly; composed of 40 percent quartz, 40 percent shale, and 20 percent carbonate fragments.

42-48 Clay (till), silty, moderate-brown; scattered pebbles.

48-127 Clay (till), silty, olive-gray; scattered pebbles.

127-132 Gravel, very fine, sandy; gravel consists predominantly of limestone fragments.

PIERRE FORMATION

132-140 Shale, dark-gray, hard.

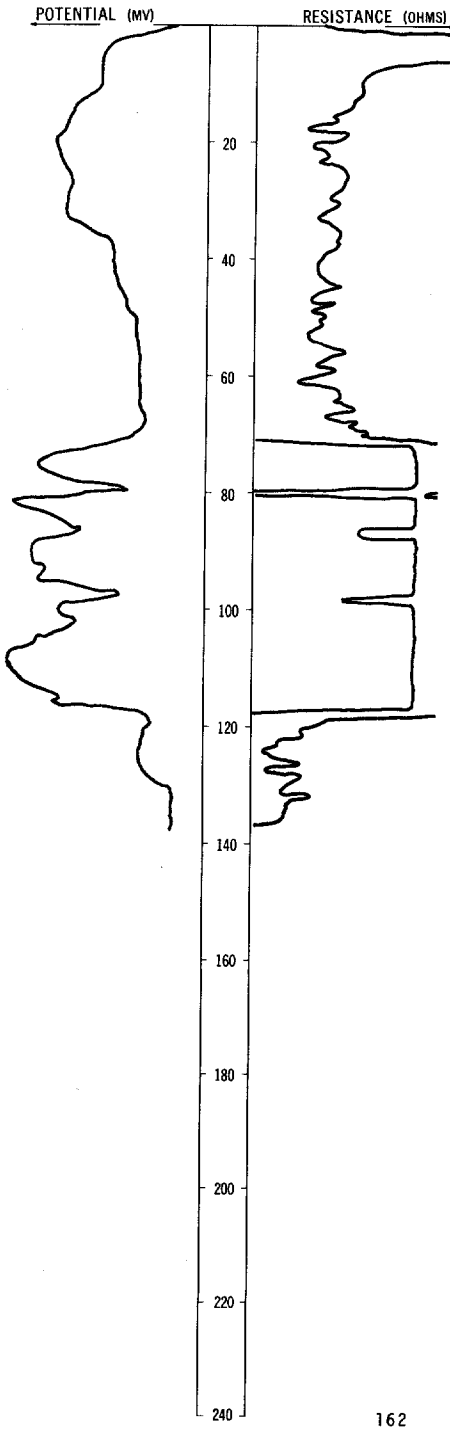
NDSWC 9738

LOCATION: 129-073-01CCC

DATE DRILLED: 8/23/76

ALTITUDE: 2043
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-6	Gravel, sandy; clay lens from 2 to 4 feet.
6-15	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
15-27	Clay (till), silty, sandy, dusky-yellowish-brown.
27-70	Clay (till), silty, sandy, olive-gray; scattered pebbles.
70-118	Sand, very fine to very coarse, predominantly coarse, gravelly, subrounded; clay lenses from 79 to 81 feet, 84 to 86 feet, and 96 to 98 feet; composed of 80 percent quartz, 10 percent carbonate, 5 percent shale, and 5 percent unidentified fragments.

PIERRE FORMATION

118-140	Shale, grayish-black, hard.

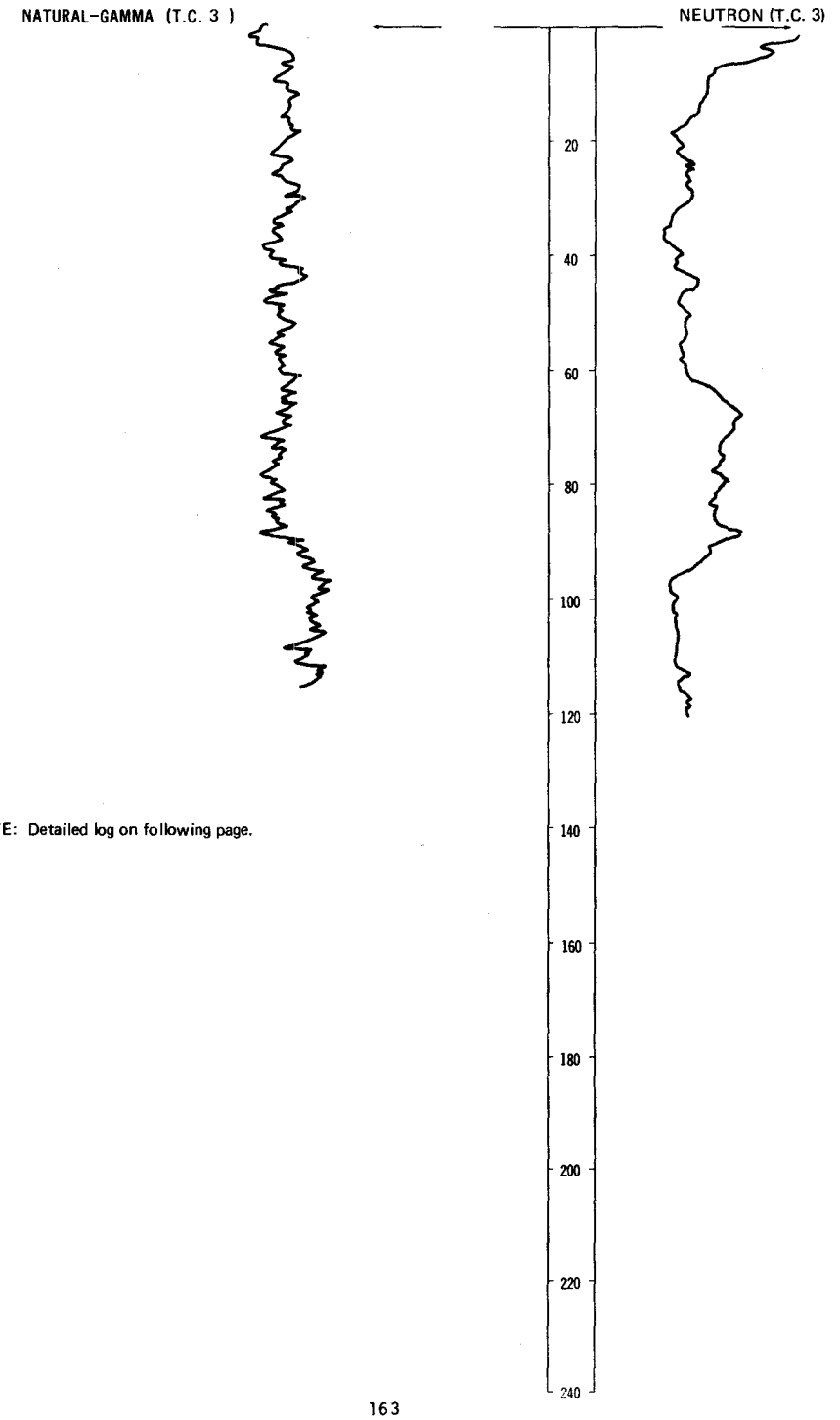
NDSWC 5172

LOCATION: 129-073-03AAA

DATE DRILLED: 8/15/77

ALTITUDE: 1960
(FT, MSL)

DEPTH: 122
(FT)



NOTE: Detailed log on following page.

129-073-03AAA, Continued
NDSWC 5172

Altitude:	1960 feet	Date drilled:	8/15/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	25	25
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	71	96
Pierre Formation:			
	Shale, black to grayish-black, siliceous, noncalcareous, hard	26	122

129-073-03DBC
(Log from Independent Drilling Co.)

	Date drilled:	7/24/70
Greenhorn Formation (top):		1,931
Dakota Formation (top):		2,418
Lakota Formation (top):		2,480
Total depth:		2,561

129-073-05DDB
(Log from Albrecht Well Work)

	Date drilled:	6/20/74
Topsoil, black	2	2
Clay, silty, sandy, yellow	13	15
Clay, blue	10	25
Shale, sandy	36	61

129-073-11BBB
NDSWC 9644

Altitude:	2003 feet	Date drilled:	7/21/76
Glacial drift:			
	Sand, very fine to very coarse, predominantly medium	3	3
	Clay (till), silty, pebbly, moderate-yellowish-brown; scattered pebbles	11	14
	Clay (till), silty, olive-gray; scattered pebbles	84	98
Pierre Formation:			
	Shale, dark-gray, hard	22	120

129-073-12AAA
NDSWC 9737

Altitude: 2067 feet — Date drilled: 8/23/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, sandy	3	3
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	8	11
	Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles	2	13
	Clay (till), silty, sandy, olive-gray; scattered pebbles	109	122
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 60 percent quartz, 20 percent carbonate, 10 percent shale, and 10 percent unidentified fragments	14	136
	Clay (till), silty, sandy, medium-gray	8	144
	Gravel, sandy	3	147
Pierre Formation:			
	Shale, grayish-black, hard	13	160

129-073-12AAB
(Log from Baumgartner Drilling Co.)

Date drilled: 8/12/76

Clay, brown	40	40
Clay, blue	47	87
Rock	2	89
Sand, coarse	3	92
Clay, brown	28	120
Clay and sand	25	145
Clay, brown	3	148
Sand, medium	12	160
Shale	----	160

129-073-12CDD
NDSWC 9746

Altitude: 2017 feet — Date drilled: 8/24/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	13	13
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	11	24
	Clay (till), silty, sandy, olive-gray; scattered pebbles	78	102
	Sand, fine to very coarse, predominantly coarse, gravelly	10	112
Pierre Formation:			
	Shale, grayish-black, hard	8	120

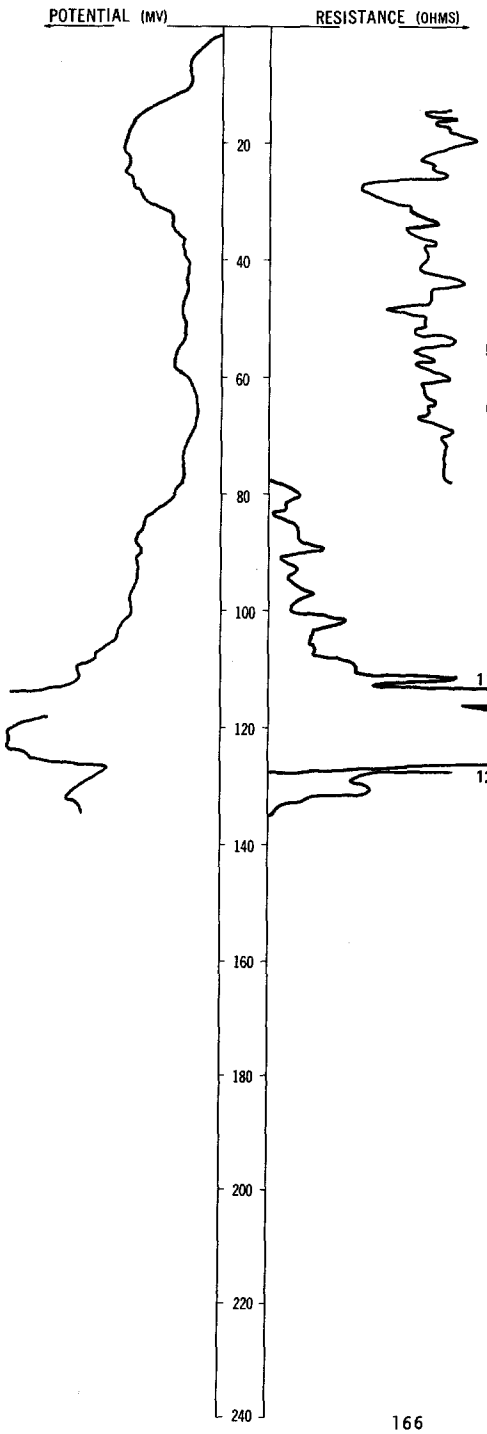
NDSWC 9736

LOCATION: 129-073-12DDD

DATE DRILLED: 8/19/76

ALTITUDE: 2052
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-55 Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles; gravel lenses from 8 to 10 feet and 12 to 13 feet.

55-63 Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles.

63-114 Clay (till), silty, sandy, olive-gray; scattered pebbles.

114-126 Sand, fine to very coarse, gravelly.

PIERRE FORMATION

126-140 Shale, grayish-black, hard.

129-073-13BBB
NDSWC 9735

Altitude:	2018 feet	Date drilled:	8/19/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, sandy; clay lenses from 0 to 2 feet and 3 to 5 feet	8	8
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	5	13
	Clay (lacustrine), silty, dark-yellowish-brown	9	22
	Clay (till), silty, sandy, olive-gray; scattered pebbles	54	76
	Clay (till), sandy, dusky-brown; gravel from 94 to 100 feet	24	100
	Clay (till), silty, sandy, dusky-brown; scattered pebbles	4	104
Pierre Formation:			
	Shale, grayish-black, hard	16	120

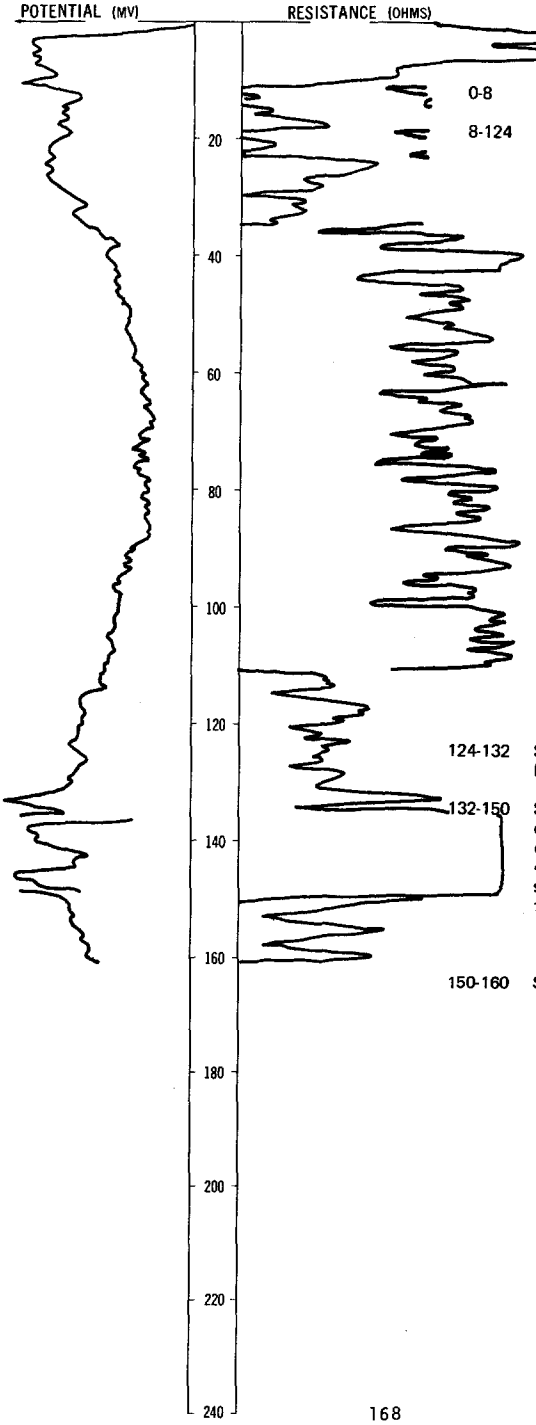
NDSWC 9643

LOCATION: 129-073-13DDD

DATE DRILLED: 7/21/76

ALTITUDE: 1982
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8 Sand, fine to very coarse, gravelly.

8-124 Clay (till), silty, sandy, olive-gray; scattered pebbles.

124-132 Silt, sandy, moderate-yellowish-brown.

132-150 Sand, medium to very coarse, predominantly very coarse, gravelly; composed of 30 percent quartz, 40 percent carbonate, 20 percent shale, and 10 percent unidentified fragments.

PIERRE FORMATION

150-160 Shale, dark-gray, fossiliferous, hard.

129-073-16AAA
NDSWC 9739

Altitude:	2041 feet	Date drilled:	8/23/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown; scattered pebbles	17	17
	Clay (till), silty, sandy, gravelly, dusky-yellowish-brown; scattered pebbles	3	20
	Clay (till), silty, sandy, gravelly, olive-gray; scattered pebbles	4	24
Fox Hills Formation(?):			
	Sand, very fine to fine, silty, clayey, greenish-black, hard	16	40

129-073-18BDC
(Log from Jacob Thurn)

		Date drilled:	8/11/75
	Topsoil	3	3
	Clay, yellow	17	20
	Sand and gravel	18	38

129-073-18DAD
NDSWC 9721

		Date drilled:	8/16/76
Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown; scattered pebbles	12	12
	Clay (till), silty, sandy, gravelly, dusky-yellowish-brown; scattered pebbles	11	23
	Clay (till), silty, sandy, gravelly, olive-gray; scattered pebbles; shale boulder from 44 to 49 feet	41	64
	Clay, silty, olive-gray	12	76
Pierre Formation:			
	Shale, grayish-black, hard	24	100

129-073-19ADD
NDSWC 9720

Date drilled: 8/16/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown; scattered pebbles	18	18
	Clay (till), silty, sandy, gravelly, dusky-yellowish-brown; scattered pebbles	10	28
	Clay (till), silty, sandy, olive-gray; scattered pebbles; few thin sand and gravel lenses	40	68
Pierre Formation:			
	Shale, grayish-black, hard	12	80

129-073-19BBC2
NDSWC 9723

Altitude: 1971 feet — Date drilled: 8/16/76

Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown; scattered pebbles	7	7
	Sand, medium, gravelly	4	11
	Clay, sandy, gravelly, moderate-yellowish-brown; scattered pebbles	7	18
	Sand and gravel	1	19
	Clay (till), silty, gravelly, olive-gray; scattered pebbles	41	60
	Clay (till), sandy, grayish-brown	5	65
Pierre Formation:			
	Shale, grayish-black, hard	15	80

129-073-21AAA
NDSWC 9636

Altitude: 2040 feet — Date drilled: 7/20/76

Glacial drift:			
	Clay (till), silty, sandy, gravelly, moderate-yellowish-brown; scattered pebbles	24	24
	Clay (till), silty, sandy, gravelly, olive-gray; scattered pebbles	15	39
Fox Hills Formation(?):			
	Sand, very fine to fine, clayey, dark-greenish-gray	17	56
Pierre Formation:			
	Silt, clayey, dark-gray, hard	24	80

129-073-21CDB
(Log from Independent Drilling Co.)

Altitude:	2010 feet	Date drilled:	4/23/75
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Greenhorn Formation (top):			1,490
Dakota Formation (top):			2,010
Lakota Formation (top):			2,360
Total depth:			2,516

129-073-23AAA
NDSWC 9727

Altitude:	2020 feet	Date drilled:	8/17/76
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	24	24
	Clay (till), silty, sandy, olive-gray; scattered pebbles	82	106
Pierre Formation:			
	Shale, grayish-black	14	120

129-073-24ABB
NDSWC 9734

Altitude:	2018 feet	Date drilled:	8/20/76
Glacial drift:			
	Sand, fine to coarse, predominantly coarse, gravelly; composed of 40 percent quartz, 20 percent carbonate, 20 percent sandstone, and 20 percent unidentified fragments	16	16
	Gravel, very fine, sandy; composed predominantly of shale fragments	44	60

129-073-24BBB
NDSWC 9726

Altitude:	2020 feet	Date drilled:	8/17/76
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	29	29
	Clay (till), silty, sandy, olive-gray; scattered pebbles	11	40

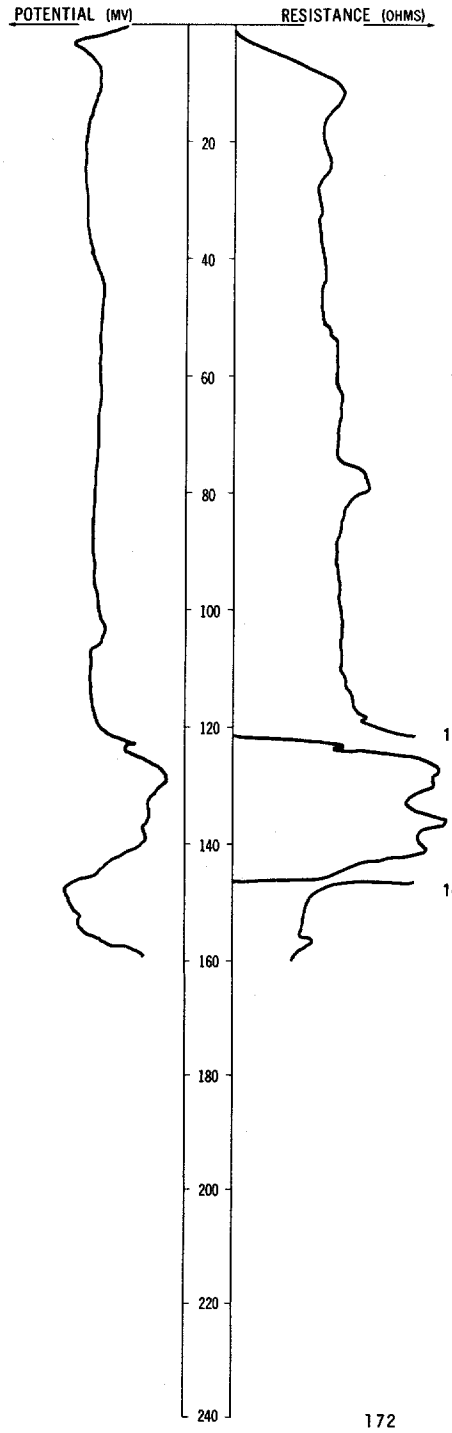
NDSWC 9796

LOCATION: 129-073-24DDA

DATE DRILLED: 9/28/76

ALTITUDE:
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-5	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
5-21	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
21-38	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
38-122	Clay (till), silty, sandy, olive-gray; scattered pebbles.
122-146	Sand, fine to very coarse, and very fine to medium gravel.

PIERRE FORMATION

146-160	Shale, grayish-black, hard.

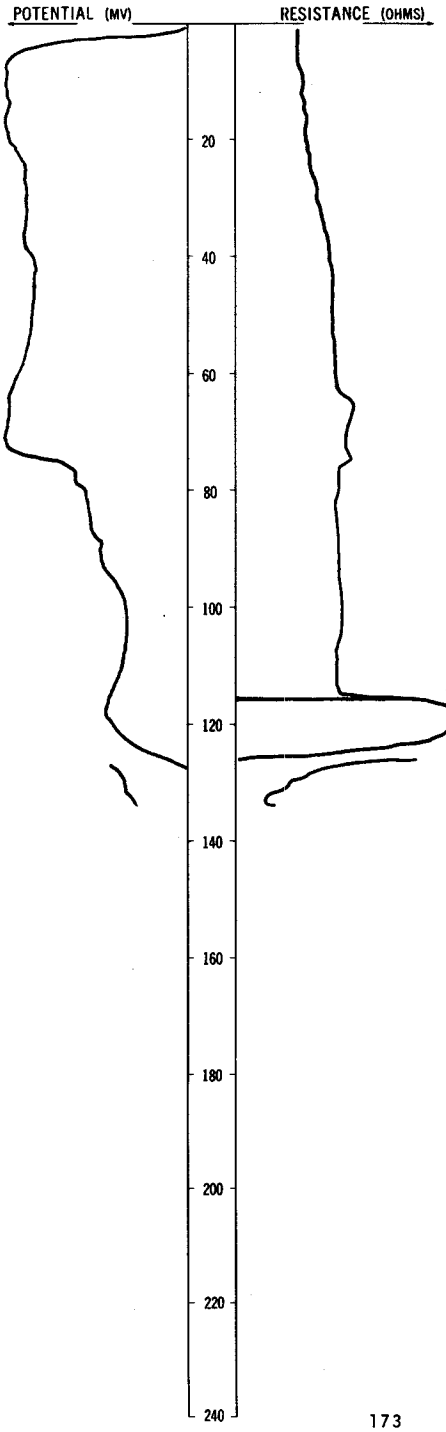
NDSWC 9731

LOCATION: 129-073-24DDC

DATE DRILLED: 8/18/76

ALTITUDE: 1973
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-14	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
14-28	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
28-116	Clay (till), silty, sandy, olive-gray; scattered pebbles.
116-127	Sand, fine to very coarse, gravelly; composed of 40 percent quartz, 30 percent carbonate, 20 percent unidentified, and 10 percent shale fragments.
127-130	Clay, sandy, dark-grayish-brown.

PIERRE FORMATION

130-140	Shale, grayish-black, hard.

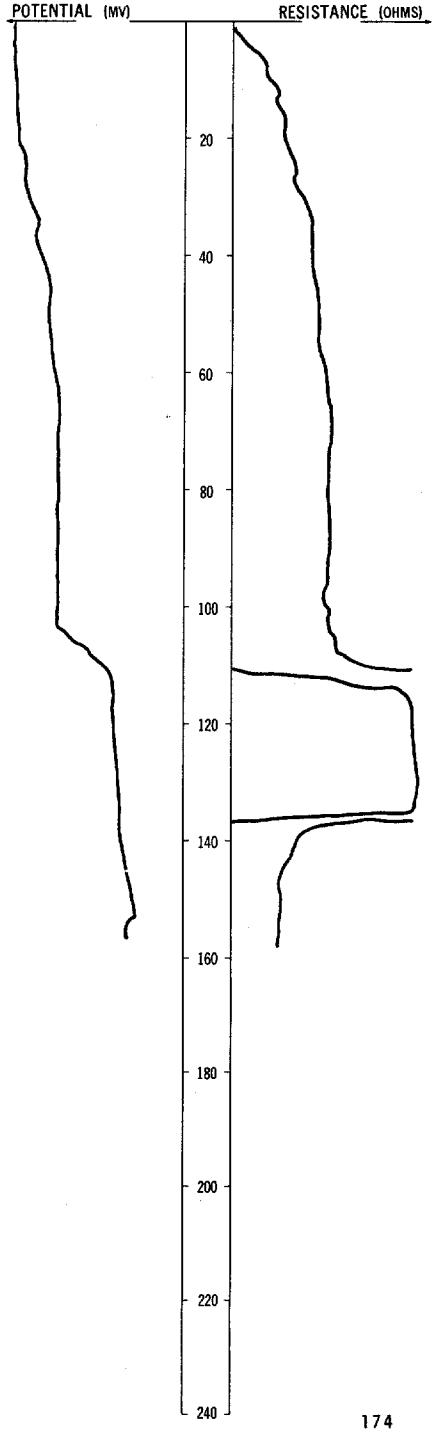
NDSWC 9792

LOCATION: 129-073-24DDD1

DATE DRILLED: 9/27/76

ALTITUDE: 1975
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-13	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
13-26	Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles.
26-56	Clay (till), silty, sandy, olive-gray; scattered pebbles.
56-58	Sand, gravelly.
58-87	Clay (till), silty, sandy, olive-gray; scattered pebbles.
87-88	Sand, coarse.
88-108	Clay (till), silty, sandy, olive-gray; scattered pebbles.
108-111	Sand, very fine to very coarse, predominantly coarse, gravelly.
111-134	Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 40 percent quartz, 25 percent carbonate, 15 percent sandstone, and 20 percent unidentified fragments.
134-137	Clay, silty, olive-gray.

PIERRE FORMATION

137-160	Shale, grayish-black, hard.

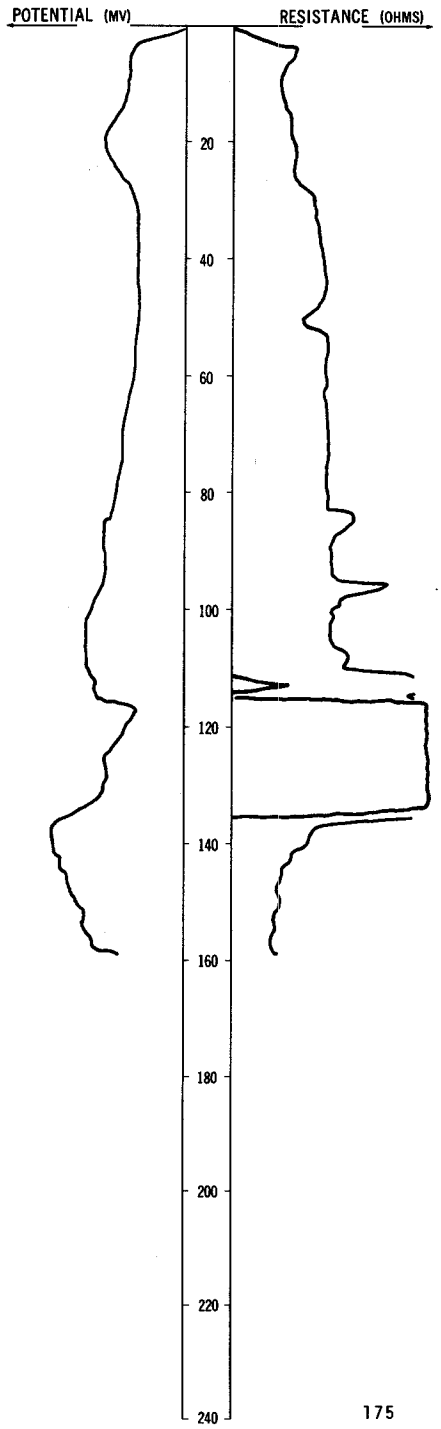
NDSWC 9793

LOCATION: 129-073-24DDD2

DATE DRILLED: 9/27/76

ALTITUDE: (FT, MSL)

DEPTH: 160 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
12-31	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
31-83	Clay (till), silty, sandy, olive-gray; scattered pebbles.
83-85	Gravel, sandy.
85-96	Clay (till), silty, sandy, olive-gray; scattered pebbles.
96-98	Sand, gravelly.
98-111	Clay (till), silty, sandy, olive-gray; scattered pebbles.
111-115	Sand, very fine to very coarse, predominantly coarse, gravelly.
115-136	Sand, fine to very coarse, and very fine to medium gravel; sand is composed of 35 percent quartz, 30 percent carbonate, 25 percent unidentified, and 10 percent shale fragments.

PIERRE FORMATION

136-160	Shale, grayish-black, hard.

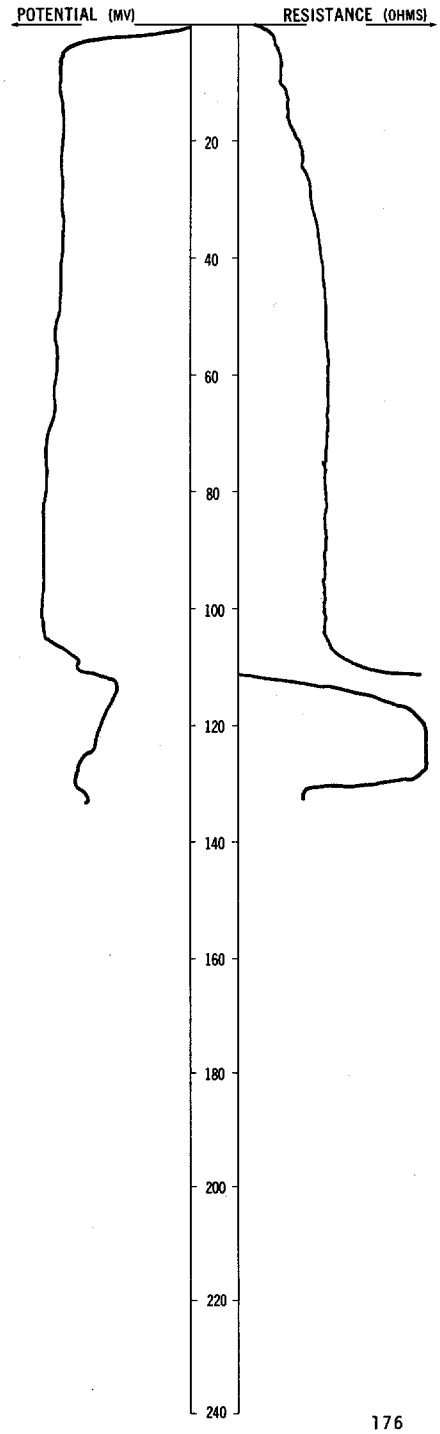
NDSWC 9794

LOCATION: 129-073-24DDD3

DATE DRILLED: 9/27/76

ALTITUDE:
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-7	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
7-26	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
26-108	Clay (till), silty, sandy, olive-gray; scattered pebbles.
108-111	Sand, coarse.
111-129	Sand, fine to very coarse, gravelly; composed of 50 percent quartz, 20 percent carbonate, 20 percent unidentified, and 10 percent shale fragments.

PIERRE FORMATION

129-140	Shale, grayish-black, hard.

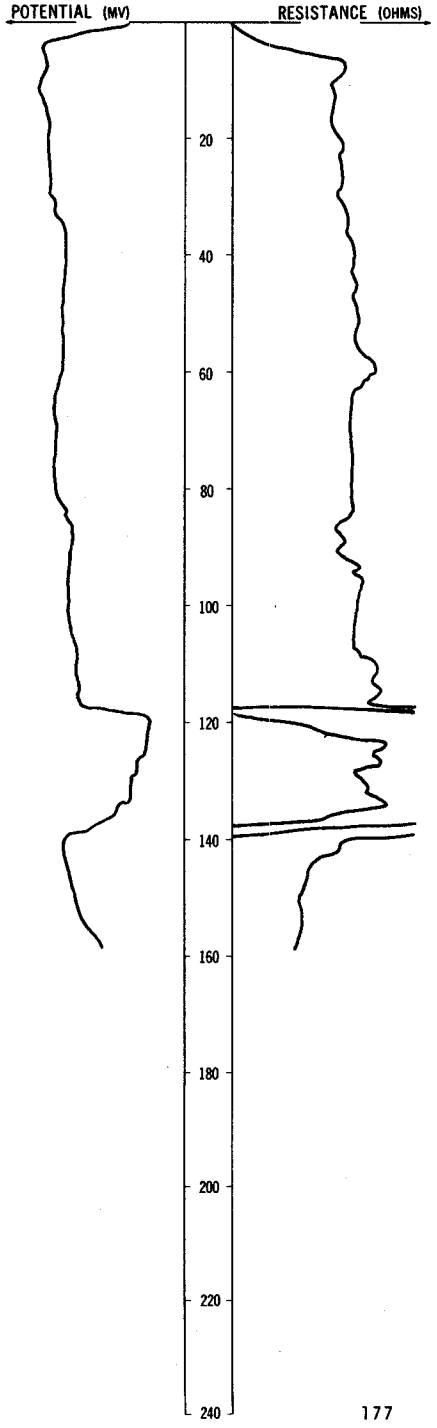
NDSWC 9795

LOCATION: 129-073-24DDD4

DATE DRILLED: 9/28/76

ALTITUDE:
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-9	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
9-32	Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles.
32-58	Clay (till), silty, sandy, olive-gray; scattered pebbles.
58-62	Sand, medium, gravelly.
62-118	Clay (till), silty, sandy, olive-gray; scattered pebbles.
118-140	Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 50 percent quartz, 20 percent carbonate, 20 percent unidentified, and 10 percent shale fragments.

PIERRE FORMATION

140-160	Shale, grayish-black, hard.

129-073-24DDD5
NDSWC 5021

Date drilled: 10/26/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), gravelly, sandy, silty, moderate-yellowish-brown	33	33
	Clay (till), silty, sandy, medium-dark-gray to greenish-olive-gray; scattered pebbles; few boulders	83	116
	Gravel, fine to coarse, and fine to very coarse sand	20	136
Pierre Formation:			
	Shale, black, hard	4	140

129-073-25ABB
NDSWC 9729

Altitude: 1968 feet — Date drilled: 8/17/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	32	32
	Clay (till), silty, sandy, olive-gray; scattered pebbles	54	86
	Sand; clay lens from 87 to 88 feet	3	89
	Clay (till), silty, sandy, olive-gray; scattered pebbles	49	138
	Gravel, sandy	2	140
	Clay (till), silty, sandy, olive-gray; scattered pebbles	14	154
Pierre Formation:			
	Shale, grayish-black	26	180

129-073-25BBB
NDSWC 9724

Altitude: 1991 feet — Date drilled: 8/16/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown	15	15
	Sand, very fine to medium, predominantly medium, clayey, moderate-yellowish-brown	11	26
	Gravel, sandy	4	30
	Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles	38	68
	Clay (till), silty, sandy, olive-gray	9	77
Pierre Formation:			
	Shale, grayish-black	23	100

129-073-26BBB
NDSWC 9728

Altitude: 1983 feet — Date drilled: 8/17/76

Glacial drift:			
	Gravel, sandy	2	2
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	21	23
	Clay (till), silty, sandy, olive-gray; scattered pebbles	23	46
Pierre Formation:			
	Shale, grayish-black, hard	14	60

129-073-29B
USGS 1
(Log modified from Laird and Akin, 1948)

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay (till), sandy, mottled, iron-stained	7	7
	Clay (till), gravelly	1.5	8.5
	Clay (till), sandy; few stones	1.3	9.8
	Clay (till), sandy, stony	1.2	11

129-073-29BBB
NDSWC 9632

Altitude:	2022 feet	Date drilled:	7/19/76
Glacial drift:			
	Sand, very fine to coarse	4	4
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	24	28
	Gravel, very fine, sandy	4	32
	Clay, sandy, moderate-yellowish-brown to dusky-yellowish-brown	21	53
Pierre Formation:			
	Shale, dark-gray, hard	47	100

129-073-29D
USGS 14
(Log modified from Laird and Akin, 1948)

		Date drilled:	1946
	Clay	3	3
	Clay, pebbly, yellowish-brown	3.5	6.5
	Sand and sandy clay; pebbly	2.5	9
	Sand, clayey, light-gray	1.5	10.5
	Clay (till), sandy, gravelly, dark-gray	3	13.5
	Gravel, medium, brown	2	15.5
	Gravel (till), clayey, brown	.5	16
	Clay (till), brown	2.5	18.5
	Clay (till), blue	2.5	21
	Clay (till), sandy	3.5	24.5
	Shale (Pierre), blue, fossiliferous	1.5	26

129-073-30A1
USGS 10
(Log modified from Laird and Akin, 1948)

		Date drilled:	1946
	Topsoil, clayey	1.5	1.5
	Sand, fine	3.2	4.7
	Clay (till), sandy, gravelly	2.3	7
	Rock	.5	7.5
	Clay (till), stony, gray to yellow, hard	7.5	15
	Clay (till), stony, blue; thin gravel lenses	9.5	24.5
	Clay (till), sandy, stony, blue	2.5	27
	Clay (till), stony, blue	2	29
	Gravel, medium	7	36

129-073-30A2
USGS 15
(Log modified from Laird and Akin, 1948)

Date drilled: 1946

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay and silt	1.5	1.5
	Sand, coarse, gravelly; water	12	13.5
	Clay (till), yellow	1.5	15

129-073-30A3
USGS 16
(Log modified from Laird and Akin, 1948)

Date drilled: 1946

	Clay and silt	3	3
	Sand, coarse; water	4	7
	Clay (till), sandy	1	8
	Sand, coarse, gravelly	2.5	10.5
	Clay (till), brown	3.5	14
	Clay (till), blue	8.5	22.5
	Gravel, very coarse; cobbles	8.5	31

129-073-30ADD
NDSWC 9740

Altitude: 1967 feet — Date drilled: 8/23/76

Glacial drift:			
	Clay, silty, moderate-yellowish-brown; scattered pebbles	13	13
	Gravel	1	14
	Clay (till), silty, sandy, olive-gray; scattered pebbles	20	34
Pierre Formation:			
	Shale, grayish-black, hard	6	40

129-073-30BAA
Zeeland City Well 1
(Log modified from Laird and Akin, 1948)

Date drilled: 1947

	Sand and clay	26	26
	Sand, coarse, rounded to subangular	3	29
	Sand, medium to coarse, subangular to subrounded	4	33
	Sand, fine to medium, subrounded to subangular	4	37
	Sand, fine to coarse, rounded to subangular; abundant shale fragments	3	40

129-073-30BAC1
(Log from Jacob Thurn)

Altitude: 1905 feet — Date drilled: 11/11/75

	Topsoil	3	3
	Clay, yellow	17	20
	Clay, blue	50	70
	Sand	2	72

129-073-30BAC2
NDSWC 9631

Altitude: 1958 feet — Date drilled: 7/19/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	4	4
	Sand, very fine to very coarse, predominantly medium, gravelly	6	10
	Clay (till), sandy, moderate-yellowish-brown	2	12
	Clay (till), silty, sandy, olive-gray; scattered pebbles	26	38
	Sand, very fine to very coarse, predominantly medium	4	42
	Clay (till), silty, sandy, olive-gray; scattered pebbles	29	71
	Sand, very fine to medium, predominantly medium, gravelly, clayey	7	78
	Clay (till), silty, olive-gray; scattered pebbles	17	95
	Clay, sandy, olive-gray	5	100
Pierre Formation:			
	Shale, dark-gray, hard	20	120

129-073-30BAC3
NDSWC 9633

Altitude: 1958 feet — Date drilled: 7/19/76

Glacial drift:			
	Sand, very fine to medium, predominantly medium, clayey, moderate-yellowish-brown	4	4
	Silt, sandy, moderate-yellowish-brown	10	14
	Clay (till), silty, olive-gray; scattered pebbles	15	29
	Gravel, very fine, sandy; composed of 50 percent shale, 30 percent carbonate, and 20 percent quartz fragments	7	36
	Clay (till), silty, olive-gray; scattered pebbles	28	64
	Silt, clayey, brownish-gray	7	71
	Gravel, clayey	4	75
	Silt (till), clayey, brownish-gray; scattered pebbles	13	88
Pierre Formation:			
	Shale, silty, dark-brownish-gray	12	100

129-073-30BCB
NDSWC 9722

Date drilled: 8/16/76

Glacial drift:			
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	40	40
	Clay (till), silty, sandy, olive-gray; scattered pebbles	11	51
Pierre Formation:			
	Shale, grayish-black, hard	9	60

129-073-30BD1
USGS 2
(Log modified from Laird and Akin, 1948)

Clay and silt; dark-gray; few pebbles	3.8	3.8
Clay, light-gray; mottled with light-brown iron stains	5	8.8
Sand, very fine; pebbles at 10.6 feet	4.2	13
Clay (till), sandy, stony, gray, mottled	.7	13.7
Gravel, fine; mixed with coarse sand	1.3	15

129-073-30BD2
USGS 3
(Log modified from Laird and Akin, 1948)

Date drilled: 1946

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay (till), sandy, stony, brown to gray	3.3	3.3
	Clay (till), gray; with reddish-brown mottling; abundant gypsum(?) crystals	5.1	8.4
	Clay (till), sandy, gray; with reddish-brown mottling; abundant gypsum(?) crystals	1.1	9.5
	Clay (till), dark-gray; few stones	6.5	16

129-073-30BDA
NDSWC 9744

Altitude: 1954 feet — Date drilled: 8/24/76

Glacial drift:

Clay (lacustrine), silty, grayish-black	7	7
Clay (lacustrine), yellowish-gray	1	8
Clay (till), silty, moderate-yellowish-brown	5	13
Clay (till), silty, sandy, olive-gray; scattered pebbles	4	17
Gravel, sandy	1	18
Clay (till), silty, sandy, olive-gray; scattered pebbles	13	31
Sand, medium	2	33
Clay, dark-brownish-gray	7	40
Clay (till), silty, sandy, olive-gray; scattered pebbles	15	55
Sand, very fine to very coarse, predominantly medium	6	61
Clay (till), silty, olive-gray	59	120

129-073-30D
USGS 11
(Log modified from Laird and Akin, 1948)

Date drilled: 1946

Clay and sand	2.5	2.5
Clay (till), sandy, gray	2.5	5
Clay (till), gravelly	2	7
Clay (till), sandy, brown	9	16
Clay (till), stony, blue; becomes sandy near base	31	47
Gravel, fine; contains clay lenses	2	49
Clay (till), stony, brown; numerous sand lenses	5	54

129-073-30DA
USGS 8
(Log modified from Laird and Akin, 1948)

Date drilled: 1946

Sand and clay	6.1	6.1
Clay (till), sandy, stony, gray	3.1	9.2
Sand, clayey; few stones	1	10.2
Gravel, fine, brown	.8	11

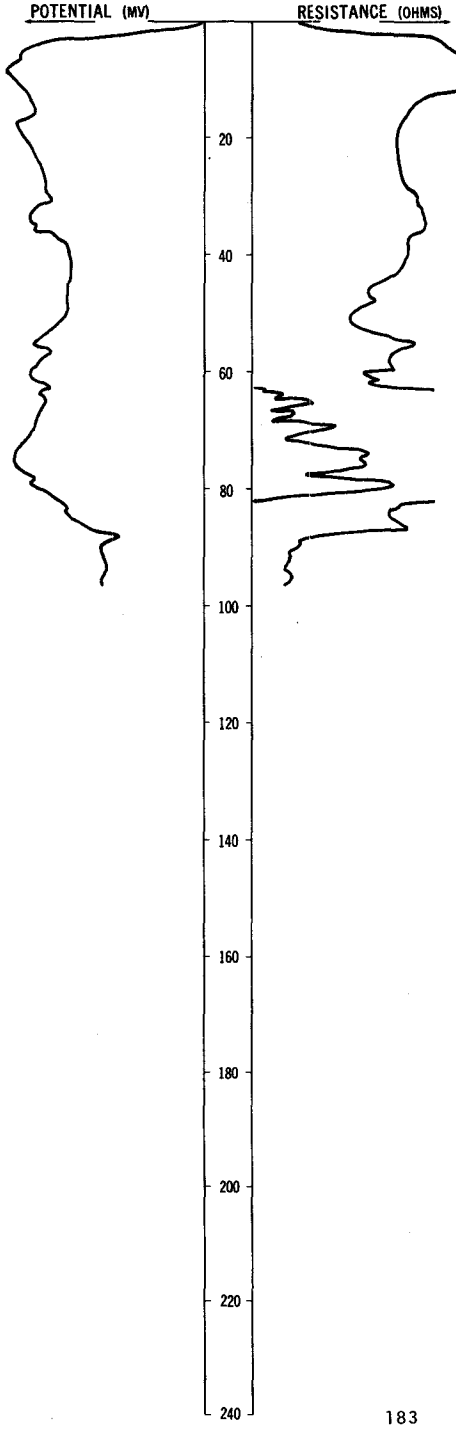
NDSWC 9741

LOCATION: 129-073-30DAD1

DATE DRILLED: 8/24/76

ALTITUDE: 1962
(FT, MSL)

DEPTH: 100
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-13 Silt, sandy, moderate-yellowish-brown.

13-18 Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.

18-22 Clay, olive-gray.

22-62 Clay (till), silty, sandy, olive-gray; scattered pebbles.

62-82 Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 40 percent shale, 30 percent quartz, 15 percent carbonate, and 15 percent unidentified fragments.

82-87 Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

87-100 Shale, grayish-black, hard.

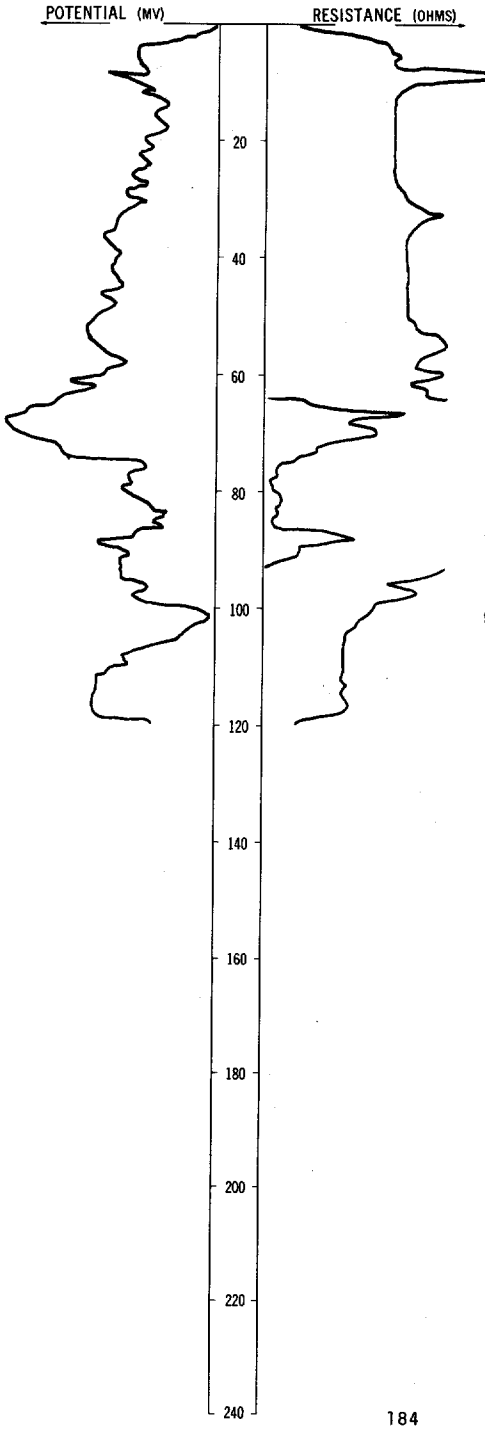
NDSWC 9742

LOCATION: 129-073-30DAD2

DATE DRILLED: 8/24/76

ALTITUDE: 1963
(FT, MSL)

DEPTH: 120
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-16	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles; gravel from 8 to 9 feet.
16-53	Clay (till), silty, sandy, olive-gray; scattered pebbles.
53-56	Gravel, sandy.
56-64	Clay (till), silty, sandy, olive-gray; scattered pebbles.
64-74	Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 30 percent carbonate, 30 percent unidentified, 20 percent shale, and 20 percent quartz fragments.
74-98	Clay, sandy, olive-gray.

PIERRE FORMATION

98-120	Shale, grayish-black, hard.

129-073-30DDA
NDSWC 9743

Altitude:	1982 feet	Date drilled:	8/24/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	18	18
	Gravel	1	19
	Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles	7	26
Pierre Formation:			
	Shale, grayish-black, hard	14	40

129-073-32AAD
NDSWC 9634

Altitude:	1970 feet	Date drilled:	7/19/76
Glacial drift:			
	Clay (till), silty, sandy, pebbly, moderate-yellowish-brown	14	14
	Clay (till), silty, sandy, olive-gray; scattered pebbles	18	32
Pierre Formation:			
	Shale, silty, dark-grayish-brown, hard	48	80

129-073-32DDD
NDSWC 9637

Altitude:	1972 feet	Date drilled:	7/20/76
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	16	16
Pierre Formation:			
	Clay, silty, dusky-yellowish-brown, hard	10	26
	Shale, silty, dark-gray, hard	34	60

129-073-33CCC
(Log from Venturia Well Drilling)

		Date drilled:	12/09/74
	Topsoil, black	2	2
	Clay, brown	16	18
	Shale, dark	41	59

129-073-33DB1
USGS 12
(Log modified from Laird and Akin, 1948)

Date drilled: 1946

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay and sand	2.5	2.5
	Clay (till), yellowish-gray; scattered pebbles	6.5	9
	Clay (till), sandy, bluish-gray; scattered pebbles	3.5	12.5
	Clay (till), sandy, pebbly; contains coarse sand lenses	6.5	19
	Quicksand and water	3.5	22.5
	Clay (till), blue; contains shale pebbles	6.5	29
	Shale (Pierre), dark	1	30

129-073-33DB2
USGS 13
(Log modified from Laird and Akin, 1948)

Date drilled: 1946

	Clay and silt	2.5	2.5
	Clay (till), sandy, stony, gray	1	3.5
	Clay (till), sandy, gravelly	3	6.5
	Gravel, medium	2	8.5
	Clay (till), sandy, yellow	4	12.5
	Clay (till), stony, sandy, blue	11.5	24
	Sand, coarse	1	25
	Clay (till), blue	9	34
	Clay (till), sandy, blue	6	40

129-073-34BBB
NDSWC 9635

Altitude: 1994 feet — Date drilled: 7/19/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown to dark-grayish-brown; scattered pebbles	50	50
Pierre Formation:			
	Clay, silty, dusky-yellowish-brown, hard	13	63
	Shale, silty, dark-gray, hard	17	80

129-073-36CCC
NDSWC 9638

Altitude: 1935 feet — Date drilled: 7/20/76

Glacial drift:			
	Clay (till), sandy, moderate-yellowish-brown; scattered pebbles; boulder at 12 feet	38	38
	Clay (till), sandy, olive-gray; scattered pebbles	26	64
	Clay, sandy, moderate-brown	7	71
Pierre Formation:			
	Shale, silty, dark-gray, hard	9	80

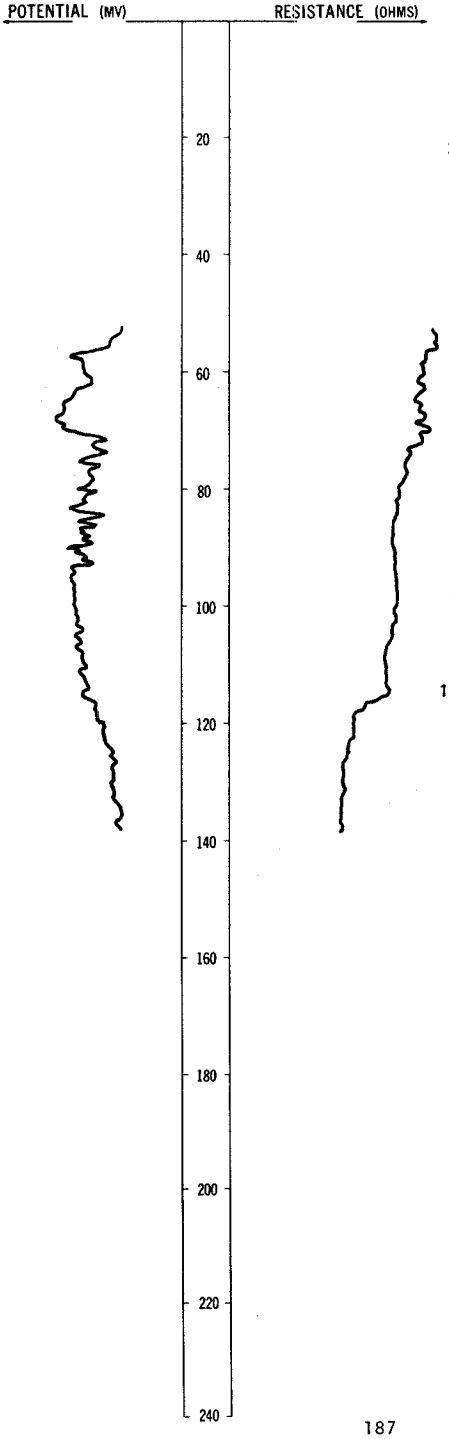
NDSWC 5176

LOCATION: 129-073-36DDD

DATE DRILLED: 8/16/77

ALTITUDE: 1931
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

20-117 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; gravelly from 58 to 71 feet.

PIERRE FORMATION

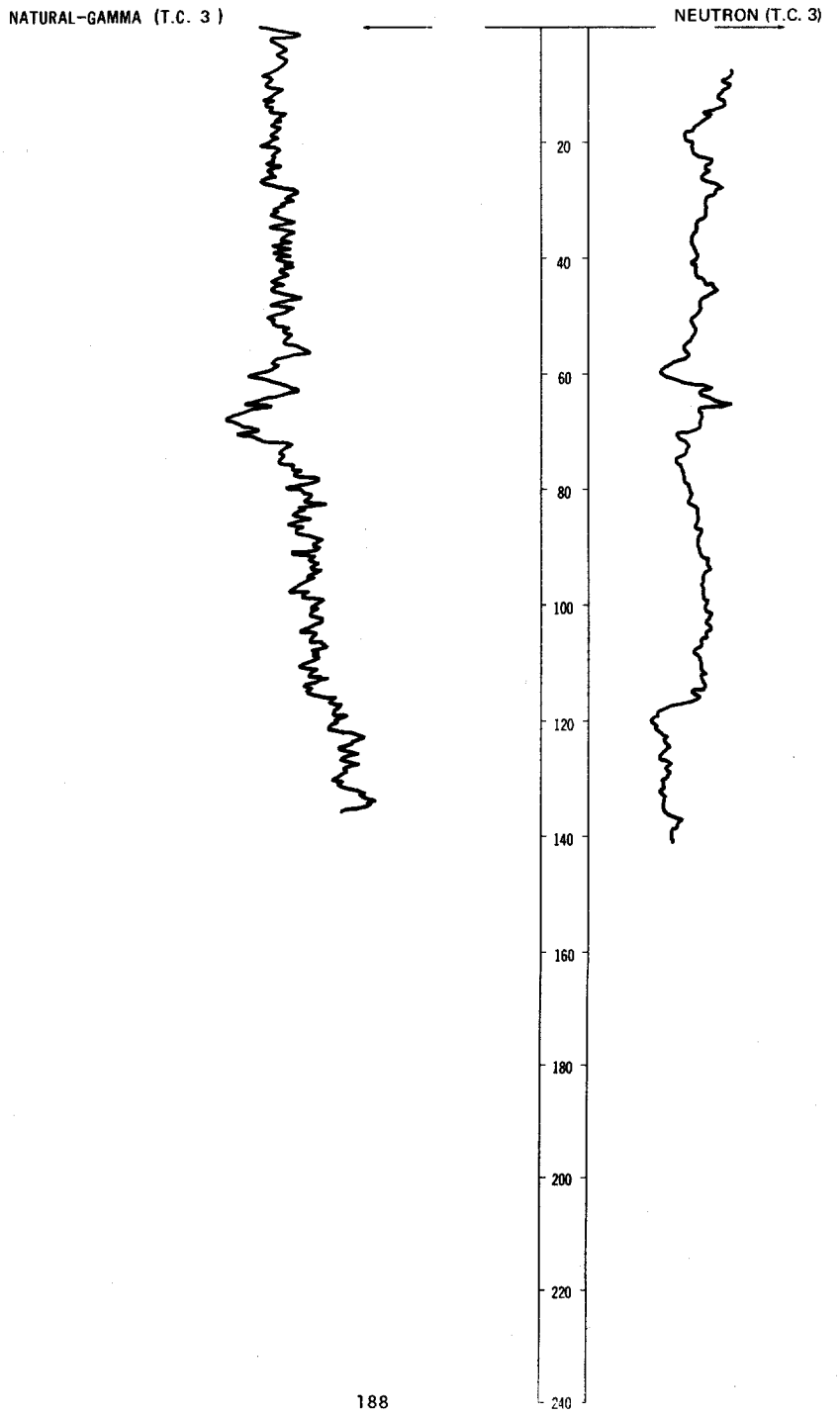
117-142 Siltstone, clayey, sandy, medium-dark-gray to grayish-black, hard.

LOCATION: 129-073-36DDD

DATE DRILLED: 8/16/77

ALTITUDE: 1931
(FT, MSL)

DEPTH: 142
(FT)



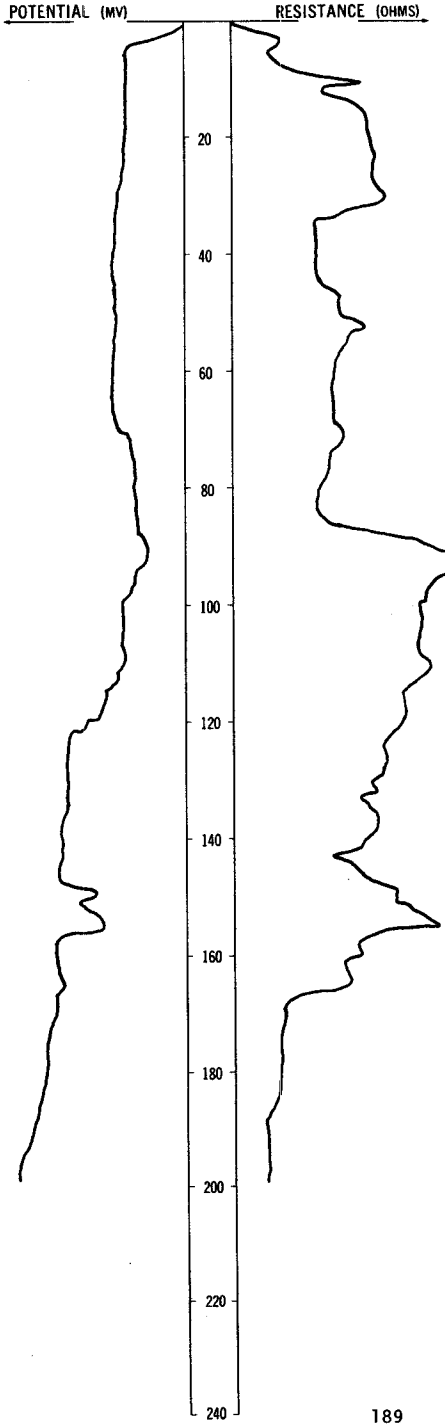
NDSWC 9782

LOCATION: 130-067-04CCB

DATE DRILLED: 9/20/76

ALTITUDE: 2021
(FT, MSL)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay, silty, moderate-yellowish-brown.
8-9	Clay, pale-yellowish-brown.
9-26	Clay, silty, moderate-yellowish-brown, fossiliferous.
26-34	Clay (till), silty, sandy, dark-yellowish-brown.
34-88	Clay (till), silty, sandy, olive-gray; scattered pebbles.
88-94	Sand, very fine to fine.
94-166	Clay, sandy, moderate-yellowish-brown.

PIERRE FORMATION

166-200	Shale, grayish-black, hard.

130-067-05DDD
(Log from Venturia Well Drilling)

Date drilled: 7/16/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black dirt	1	1
	Clay	3	4
	Clay and gravel	8	12

130-067-07BBB1
NDSWC 9783

Altitude: 2004 feet — Date drilled: 9/20/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	10	10
	Sand, fine to very coarse, predominantly coarse, gravelly	5	15
	Clay, silty, sandy, olive-gray	3	18
	Sand, very fine to very coarse, predominantly very coarse, gravelly; few clay lenses; composed of 35 percent quartz, 35 percent shale, 20 percent carbonate, and 10 percent unidentified fragments	14	32
	Clay, silty, sandy, olive-gray	6	38
	Gravel, sandy	4	42
	Clay (till), silty, sandy, olive-gray; scattered pebbles	10	52
	Gravel, sandy	6	58
	Clay (till), silty, sandy, olive-gray; scattered pebbles	16	74
	Silt, clayey, sandy, pale-yellowish-brown	22	96
Pierre Formation:			
	Shale, grayish-black	24	120

130-067-07BBB2
NDSWC 9783A

Altitude: 2004 feet — Date drilled: 8/21/76

Glacial drift:			
	Clay (till), silty, sandy, yellowish-brown; scattered pebbles	12	12
	Sand, fine to coarse, predominantly coarse, gravelly	3	15
	Clay (till), silty, sandy, olive-gray	4	19
	Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 35 percent quartz, 35 percent shale, 20 percent carbonate, and 10 percent unidentified fragments	10	29
	Clay (till), silty, sandy, olive-gray	11	40

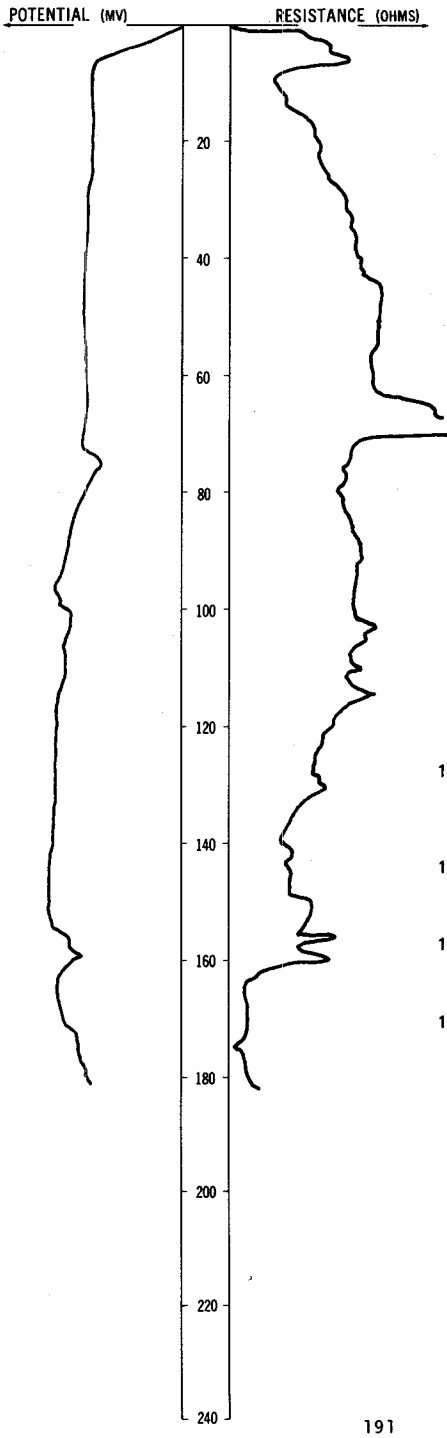
NDSWC 9776

LOCATION: 130-067-10AAA

DATE DRILLED: 9/15/76

ALTITUDE: 1975
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay, silty, sandy, pale-yellowish-brown; scattered pebbles.
8-12	Clay, silty, sandy, moderate-yellowish-brown; scattered pebbles.
12-24	Clay, silty, carbonaceous; contained small pieces of plant stems.
24-64	Clay (till), silty, sandy, olive-gray; scattered pebbles.
64-70	Gravel, very fine to medium, predominantly very fine, sandy.
70-126	Clay (till), silty, sandy, olive-gray; scattered pebbles.
126-142	Clay (till), silty, sandy, olive-gray, hard; scattered pebbles.
142-159	Clay (till), silty, sandy, moderate-yellowish-brown to reddish-brown.
159-164	Clay (till), silty, sandy, olive-gray.

PIERRE FORMATION

164-180	Shale, grayish-black, hard.

130-067-20BBB
(Log from Venturia Well Drilling)

Date drilled: 9/18/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	15	16
	Clay, gray	66	82
	Clay, brown	20	102

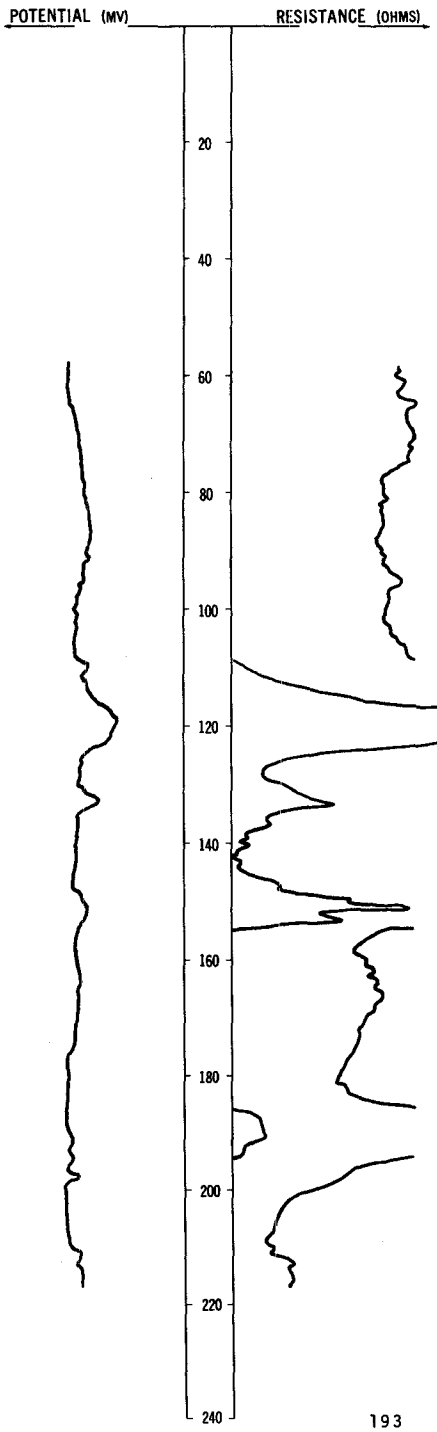
NDSWC 5210

LOCATION: 130-067-21AAD

DATE DRILLED: 8/31/77

ALTITUDE:
(FT, MSL)

DEPTH: 222
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-35 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown to reddish-brown.

35-100 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

100-116 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown to light-yellowish-brown.

116-126 Gravel.

126-150 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown to light-yellowish-brown; gravel lens from 133 to 136 feet.

150-156 Gravel, fine to medium, angular to subrounded.

FOX HILLS FORMATION(?)

156-186 Sand, very fine, silty, clayey, bentonitic; possibly reworked Fox Hills sand.

186-202 Sand, very fine to medium; possibly reworked Fox Hills sand.

PIERRE FORMATION

202-222 Shale, black to grayish-black, siliceous, hard.

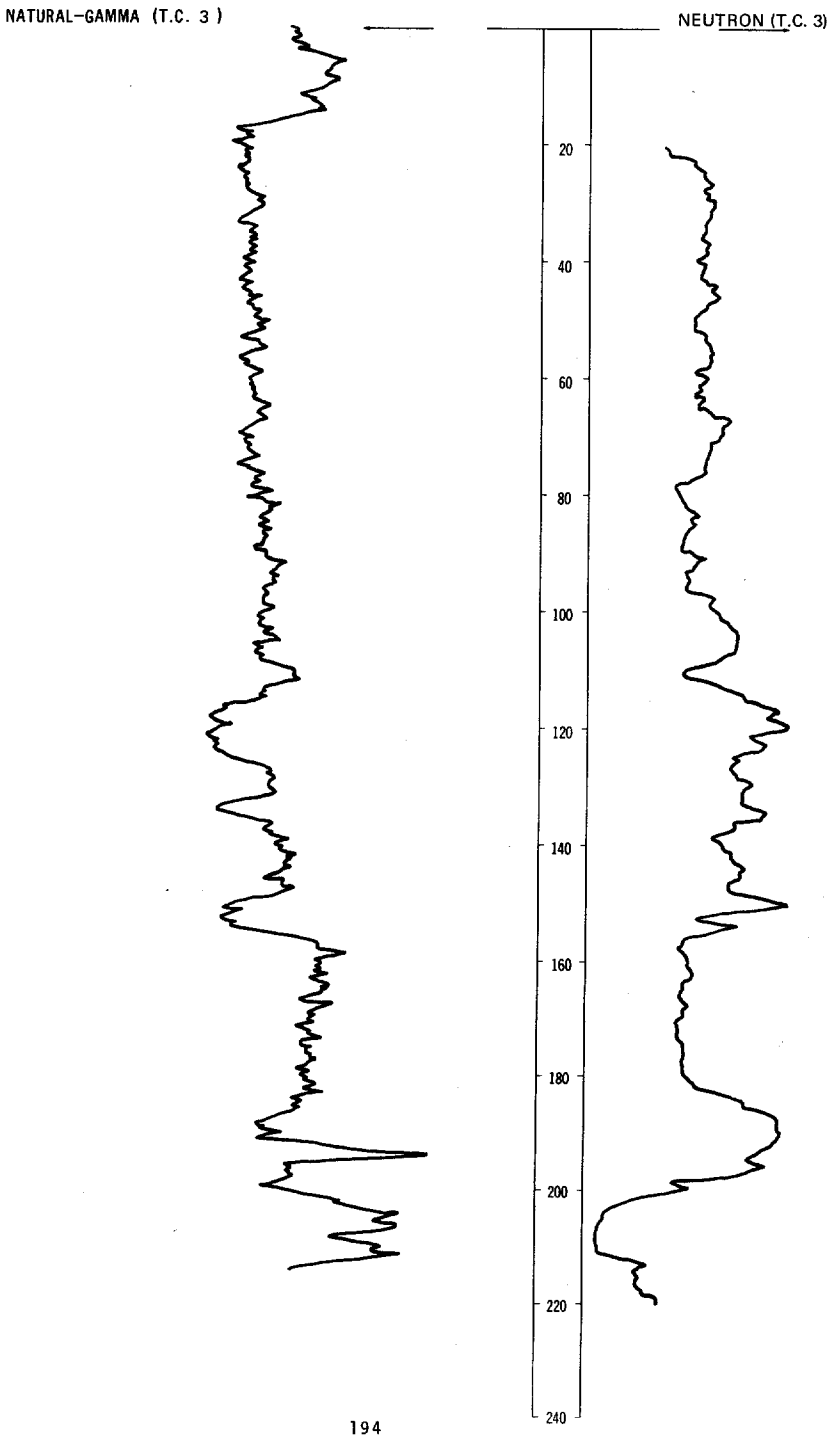
NDSWC 5210, Continued

LOCATION: 130-067-21AAD

DATE DRILLED: 8/31/77

ALTITUDE:
(FT, MSL)

DEPTH: 222
(FT)



130-067-21DBA
(Log from Venturia Well Drilling)

Date drilled: 9/21/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	2	2
	Gravel	10.5	12.5
	Clay, blue	1.5	14

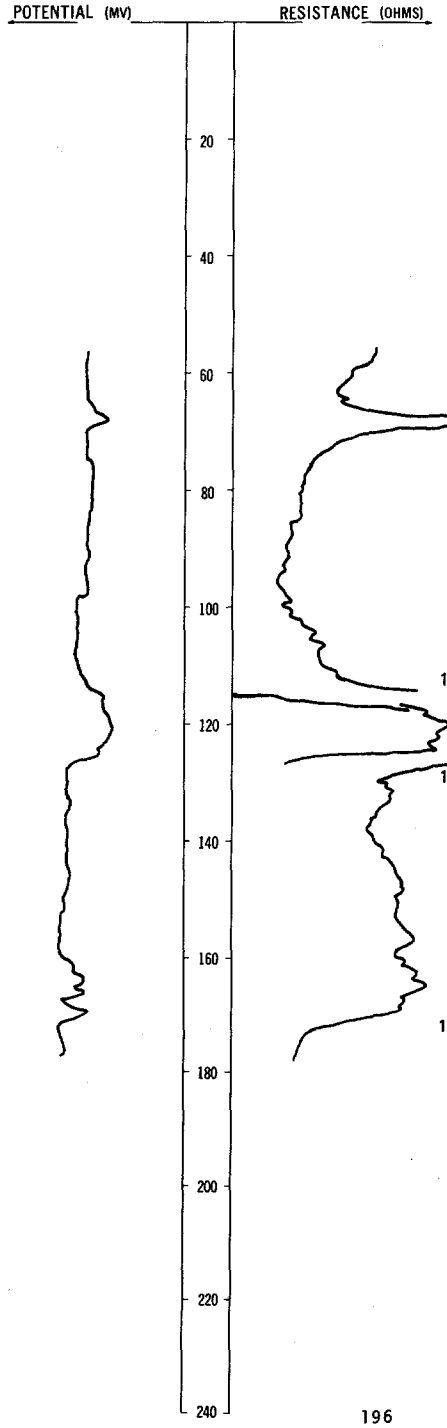
NDSWC 5211

LOCATION: 130-067-21DDA

DATE DRILLED: 8/31/77

ALTITUDE: 1942
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-17 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

17-115 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

115-127 Sand, coarse to very coarse, gravelly, subangular to subrounded.

FOX HILLS FORMATION(?)

127-172 Clay, sandy, silty, light-yellowish-brown to moderate-yellowish-brown, bentonitic.

PIERRE FORMATION

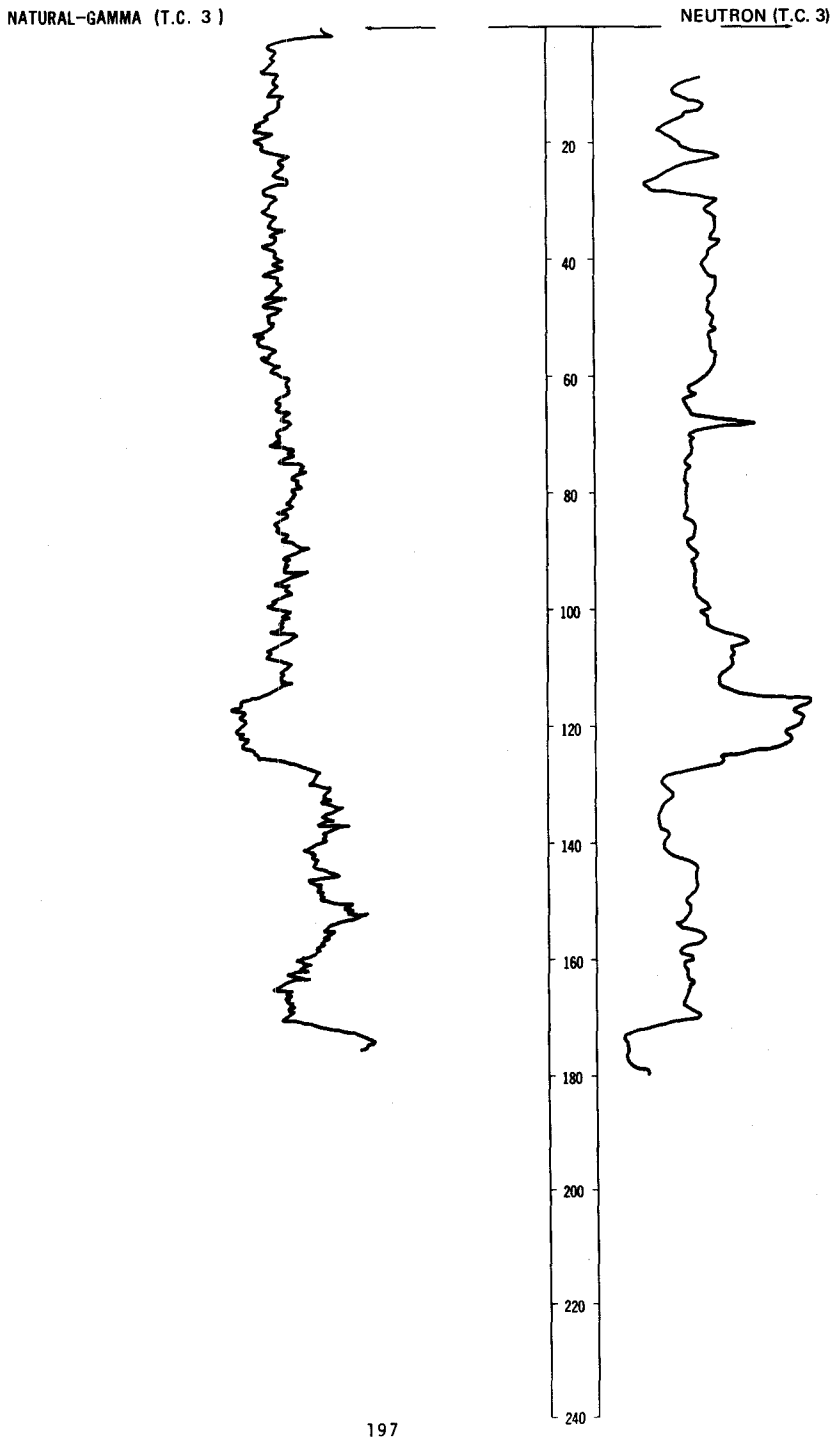
172-182 Shale, black to grayish-black, siliceous, hard.

LOCATION: 130-067-21DDA

DATE DRILLED: 8/31/77

ALTITUDE: 1942
(FT, MSL)

DEPTH: 182
(FT)



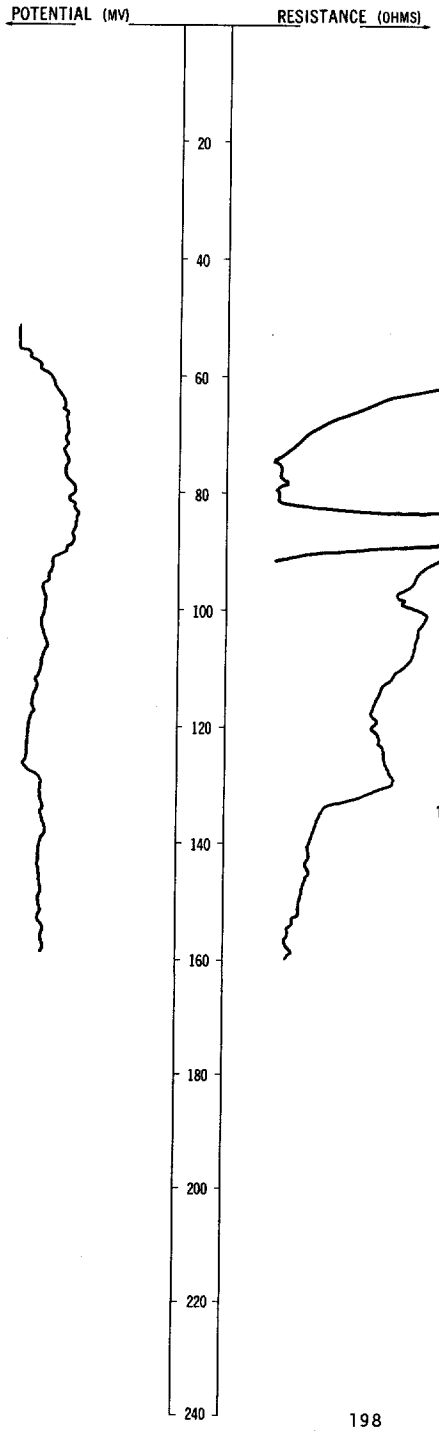
NDSWC 5209

LOCATION: 130-067-24DDD

DATE DRILLED: 8/31/77

ALTITUDE: 1998
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Sand, fine to coarse, predominantly coarse, gravelly; composed largely of quartz, carbonate, and shale fragments.

20-83 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

83-89 Sand, coarse, gravelly.

FOX HILLS FORMATION(?)

89-134 Sand, very fine, silty, clayey, light-yellowish-brown, bentonitic.

PIERRE FORMATION

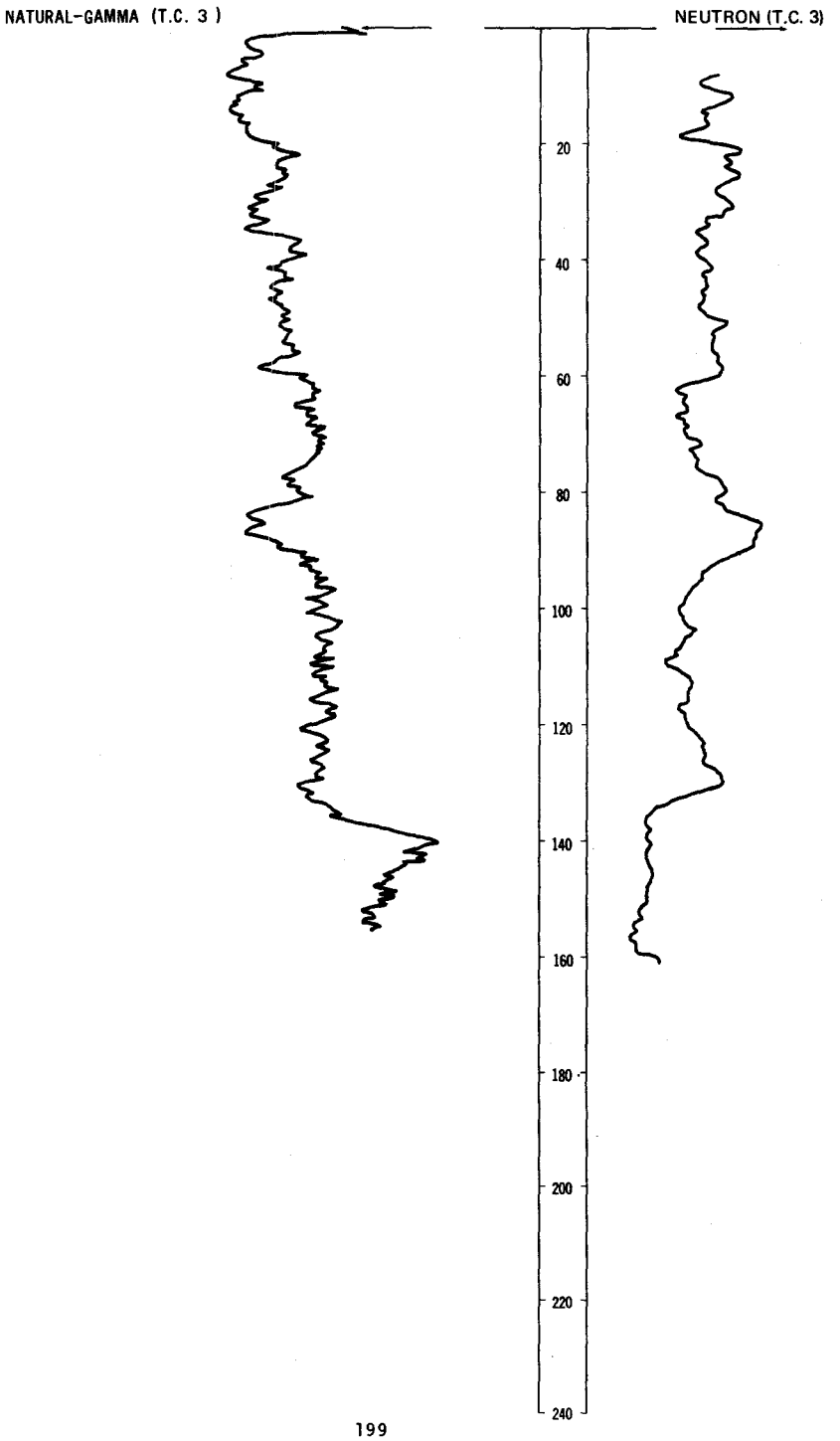
134-162 Shale, black to grayish-black, siliceous, hard; appears to be fractured.

LOCATION: 130-067-24DDD

DATE DRILLED: 8/31/77

ALTITUDE: 1998
(FT, MSL)

DEPTH: 162
(FT)



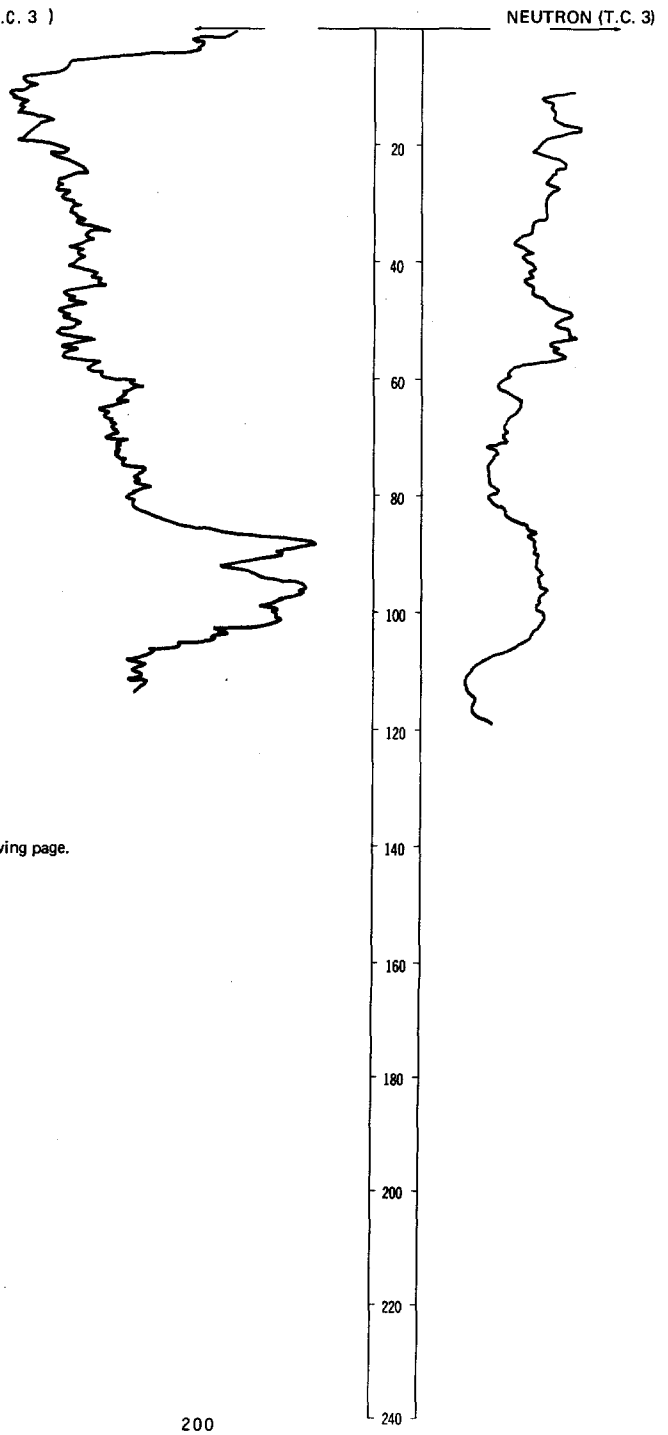
NDSWC 5208

LOCATION: 130-067-25CCB

DATE DRILLED: 8/30/77

ALTITUDE: 2012
(FT, MSL)

DEPTH: 122
(FT)



NOTE: Detailed log on following page.

130-067-25CCB, Continued
NDSWC 5208

Altitude:	2012 feet	Date drilled:	8/30/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, predominantly coarse, gravelly, subangular to rounded; composed largely of quartz, carbonate, and shale fragments	20	20
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	28	48
	Sand, fine to coarse, predominantly coarse, gravelly, subangular to rounded; composed largely of quartz, carbonate, and shale fragments	11	59
Fox Hills Formation:			
	Sand, very fine to fine, silty, light-yellowish-brown, bentonitic	26	85
	Sand, very fine to fine, silty, medium-gray to greenish-gray, glauconitic, bentonitic	22	107
Pierre Formation:			
	Shale, black to grayish-black, siliceous, hard; appears to be fractured	15	122

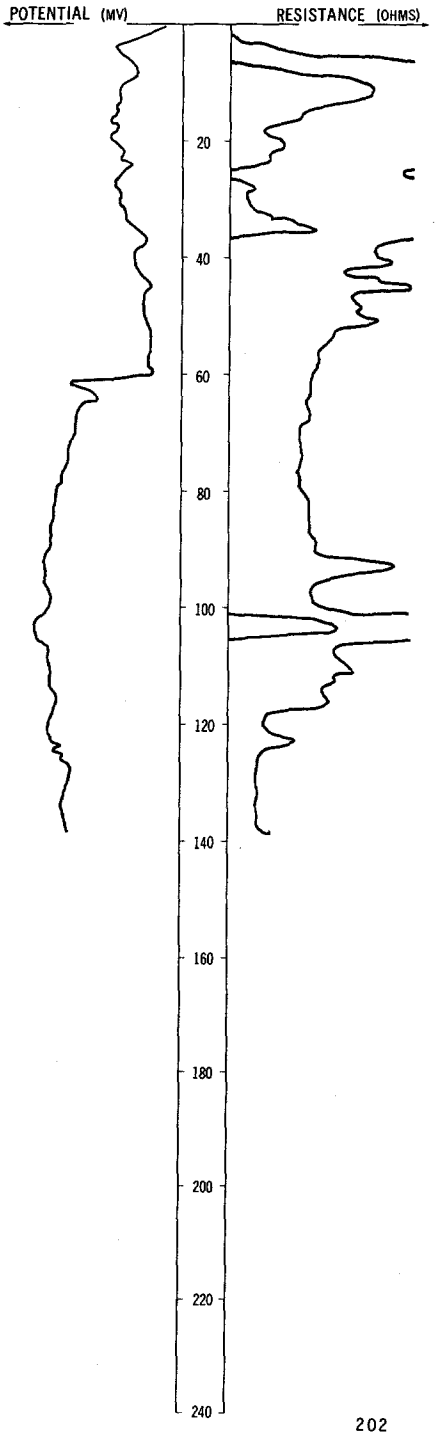
NDSWC 9625

LOCATION: 130-067-27CCB1

DATE DRILLED: 7/14/76

ALTITUDE: 1961
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-7	Gravel, fine to coarse, predominantly very fine, sandy.
7-9	Clay, sandy, moderate-yellowish-brown.
9-41	Sand, very fine to very coarse, gravelly.
41-92	Clay (till), silty, sandy, olive-gray.
92-95	Gravel, very fine, sandy.
95-102	Silt, clayey, sandy, brownish-gray.
102-106	Gravel, sandy.
106-114	Clay (till), silty, sandy, olive-gray.
114-118	Silt, clayey, moderate-yellowish-brown.

PIERRE FORMATION

118-140	Shale, brownish-black, hard.

130-067-27CCB2
NDSWC 9625A

Altitude:	1961 feet	Date drilled:	7/14/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, very fine, sandy, subangular to rounded	7	7
	Clay, sandy, moderate-yellowish-brown	2	9
	Sand, very fine to very coarse, predominantly medium, gravelly	31	40

130-067-29CBA1
(Log from Gross Drilling)

	Date drilled:	7/06/74
Clay, brown	40	40
Clay, blue	40	80
Clay and sand	20	100
Clay	100	200

130-067-29CBA2
(Log from Gross Drilling)

	Date drilled:	7/06/74
Clay, brown	50	50
Clay, blue	10	60
Clay and gravel; mixed	80	140
Clay	90	230
Shale	30	260

130-067-29DDD
(Log from Venturia Well Drilling)

	Date drilled:	9/18/74
Topsoil	1	1
Clay, yellow	15	16
Clay, gray	66	82
Clay, brown	20	102

130-067-30ABB
(Log from Baumann Well Drilling)

Date drilled: 10/21/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Gravel	9	10
	Clay	115	125
	Sand	12	137

130-067-31BCA
(Log from Albrecht Well Work)

Date drilled: 12/20/72

	Topsoil, black	2	2
	Clay, silty, gray	4	6
	Clay, silty, sandy, yellow	2	8
	Sand and gravel	12	20

130-067-31BDA
(Log from Albrecht Well Work)

Date drilled: 3/18/76

	Topsoil, black	2	2
	Sand	8	10
	Clay, light-colored	2	12
	Sand, dry	2	14
	Sand and water	8	22
	Clay, light-colored	1	23
	Clay, stony, dark	10	33

130-067-33BAD
(Log from Albrecht Well Work)

Date drilled: 6/18/75

	Topsoil, black	2	2
	Clay, silty, yellow	7	9
	Sand, dry	2	11
	Sand and water	6	17

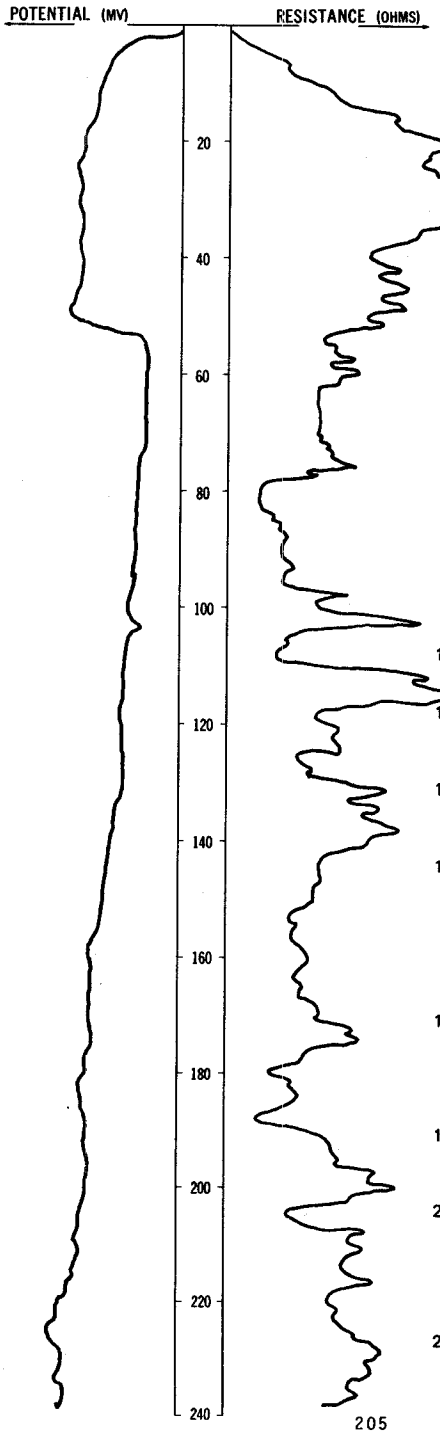
NDSWC 9624

LOCATION: 130-067-35ADD3

DATE DRILLED: 7/14/76

ALTITUDE: 1960
(FT, MSL)

DEPTH: 360
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

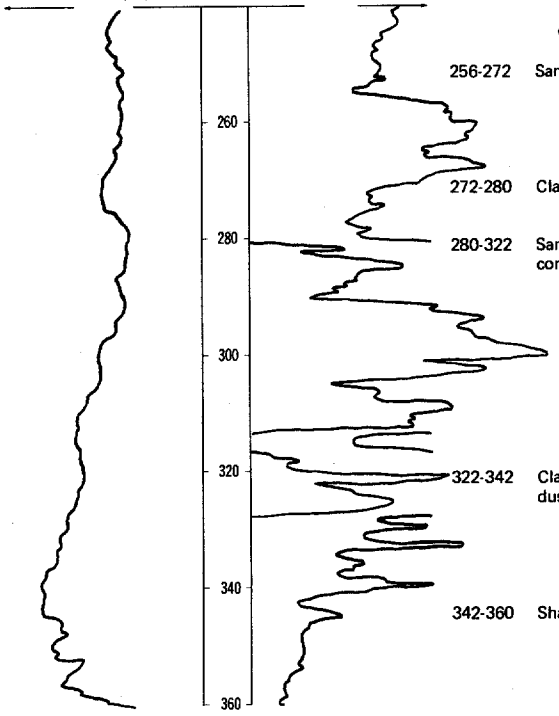
0-10	Clay, silty, sandy, moderate-yellowish-brown.
10-18	Clay, silty, sandy, dusky-brown.
18-34	Sand, fine to very coarse, predominantly coarse, gravelly; sand is composed of 40 percent quartz, 30 percent shale, 20 percent carbonate, and 10 percent unidentified rock fragments.
34-40	Clay (till), silty, olive-gray.
40-52	Sand, very fine to very coarse, predominantly coarse, gravelly; 50 percent quartz, 25 percent shale, 20 percent carbonate, and 5 percent unidentified fragments.
52-108	Clay (till), silty, sandy, olive-gray.
108-113	Clay (till), olive-gray; interbedded with sand and gravel.
113-128	Clay (till), silty, sandy, dusky-yellowish-brown.
128-142	Clay (till), olive-gray; interbedded with sand and gravel.
142-170	Clay (till), sandy, silty, olive-gray.
170-194	Clay, silty, brownish-gray.
194-203	Silt, clayey, brownish-gray.
203-238	Clay, silty, brownish-gray.
238-256	Clay (till), silty, sandy, brownish-gray.

LOCATION: 130-067-35ADD3

DATE DRILLED: 7/14/76

ALTITUDE: 1960
(FT, MSL)

DEPTH: 360
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

256-272 Sand, clayey, gravelly.

272-280 Clay (till), silty, sandy, olive-gray.

280-322 Sand, fine to medium, gravelly; contains numerous clay beds.

322-342 Clay (till), sandy, olive-gray to dusky-yellowish-brown.

PIERRE FORMATION

342-360 Shale, silty, olive-black, hard.

130-067-35ADD4
NDSWC 9624A

Altitude: 1960 feet

Date drilled: 7/14/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, moderate-yellowish-brown	10	10
	Clay (till), silty, dusky-brown	8	18
	Sand, fine to coarse, predominantly coarse, gravelly; composed of 40 percent quartz, 30 percent shale, 20 percent carbonate, and 10 percent unidentified fragments	15	33
	Clay (till), silty, olive-gray	7	40

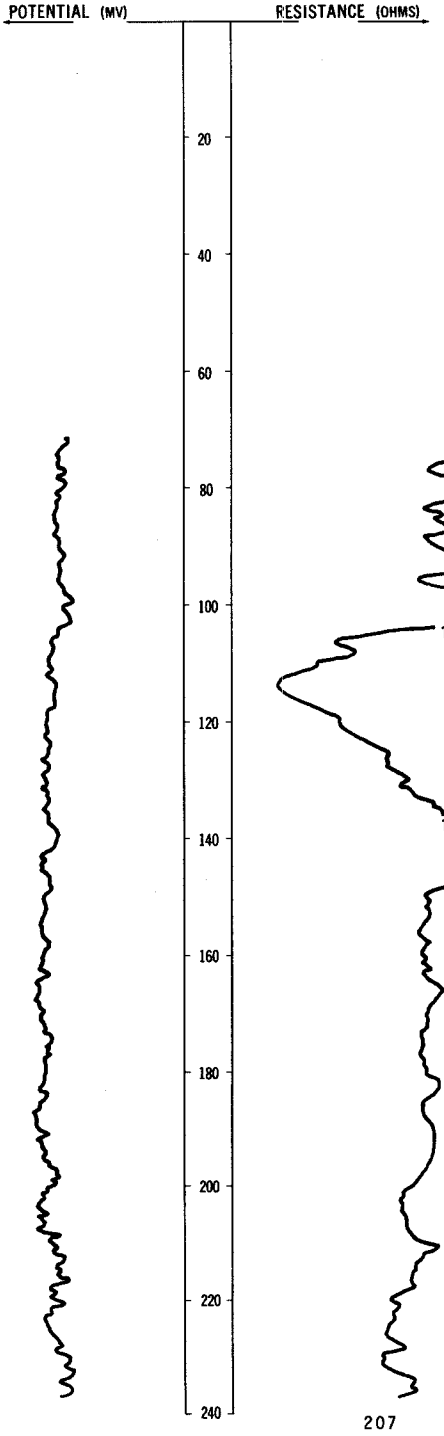
NDSWC 5229, 5229A

LOCATION: 130-068-04BBD1, 2

DATE DRILLED: 9/14/77

ALTITUDE: 2009
(FT, MSL)

DEPTH: 362
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

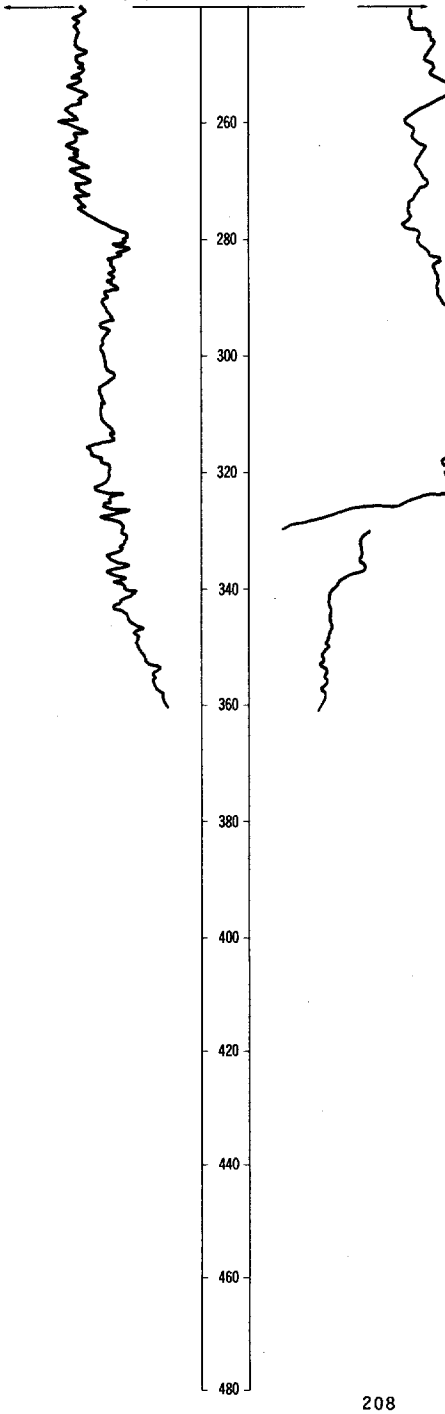
0-7	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.
7-25	Sand, medium to very coarse, predominantly coarse, gravelly, subangular to rounded; 70 percent quartz, 20 percent carbonate, and 10 percent shale and granitic fragments.
25-68	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles; few thin sand and gravel lenses.
68-104	Sand (lacustrine), very fine to medium, silty.
104-138	Clay (lacustrine), silty, sandy, dark-gray; few thin sand lenses.
138-272	Clay (glaciofluvial), silty, sandy, dark-gray; few thin sand lenses.

LOCATION: 130-068-04BBD1, 2

DATE DRILLED: 9/14/77

ALTITUDE: 2009
(FT, MSL)

DEPTH: 362
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

272-299 Clay, dark-gray.

299-326 Sand, fine to coarse; interbedded with silt and clay.

326-337 Clay (till), sandy, silty, dark-gray; scattered pebbles.

PIERRE FORMATION

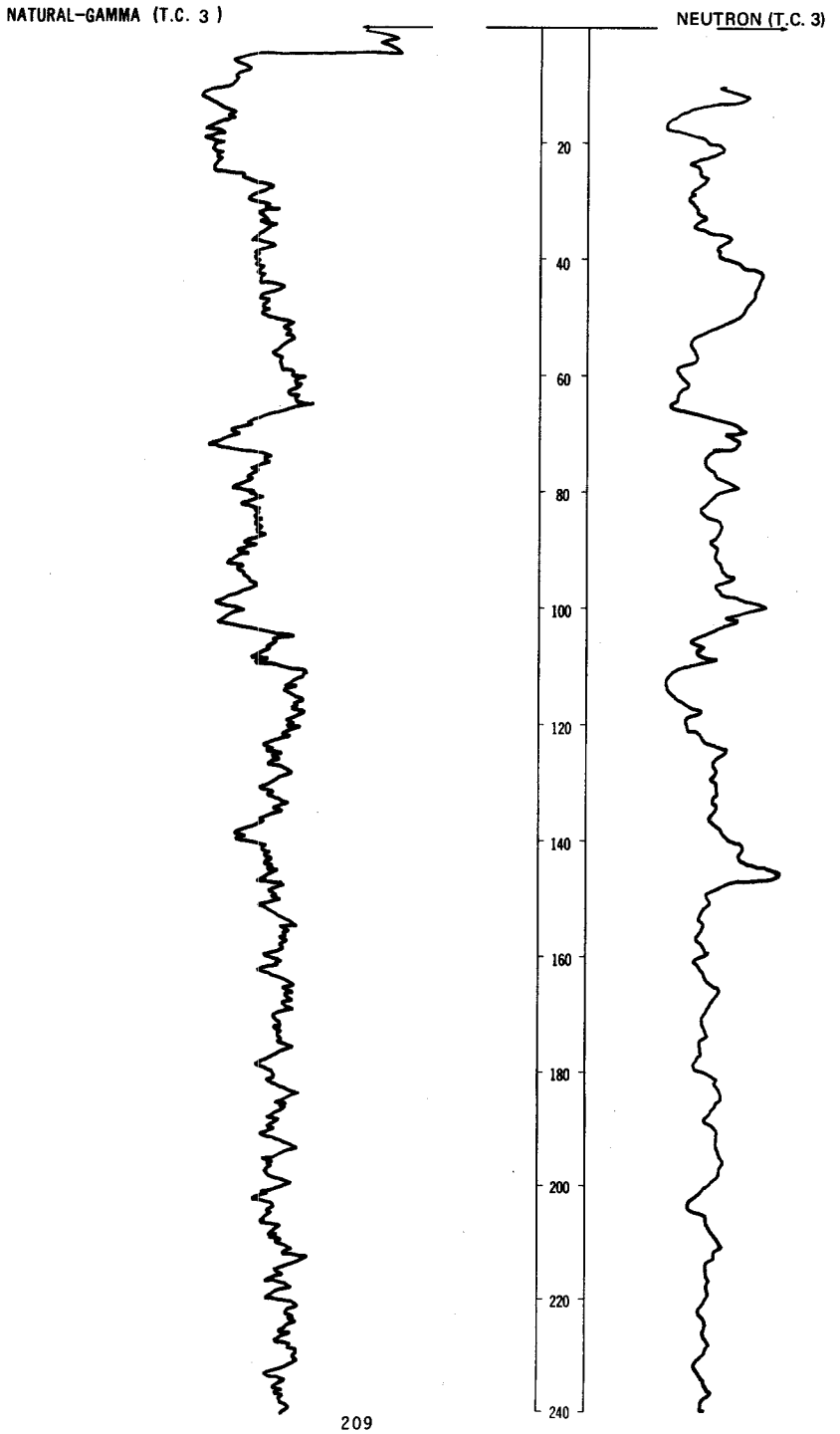
337-362 Shale, black to grayish-black, siliceous, hard.

LOCATION: 130-068-04BBD1, 2

DATE DRILLED: 9/14/77

ALTITUDE: 2009
(FT, MSL)

DEPTH: 362
(FT)

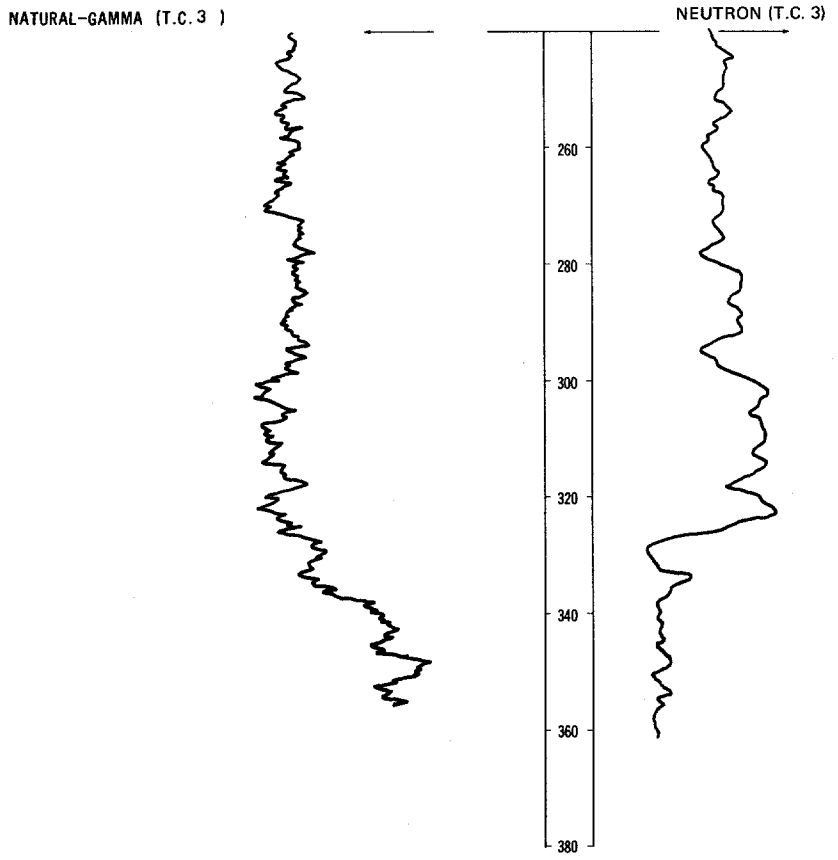


LOCATION: 130-068-04BBD1, 2

DATE DRILLED: 9/14/77

ALTITUDE: 2009
(FT, MSL)

DEPTH: 362
(FT)



130-068-10ACC
(Log from Albrecht Well Work)

Date drilled: 8/26/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	2	2
	Clay, silty, yellow	10	12
	Clay, sticky, blue	6	18
	Sand, gravel, and water	19	37

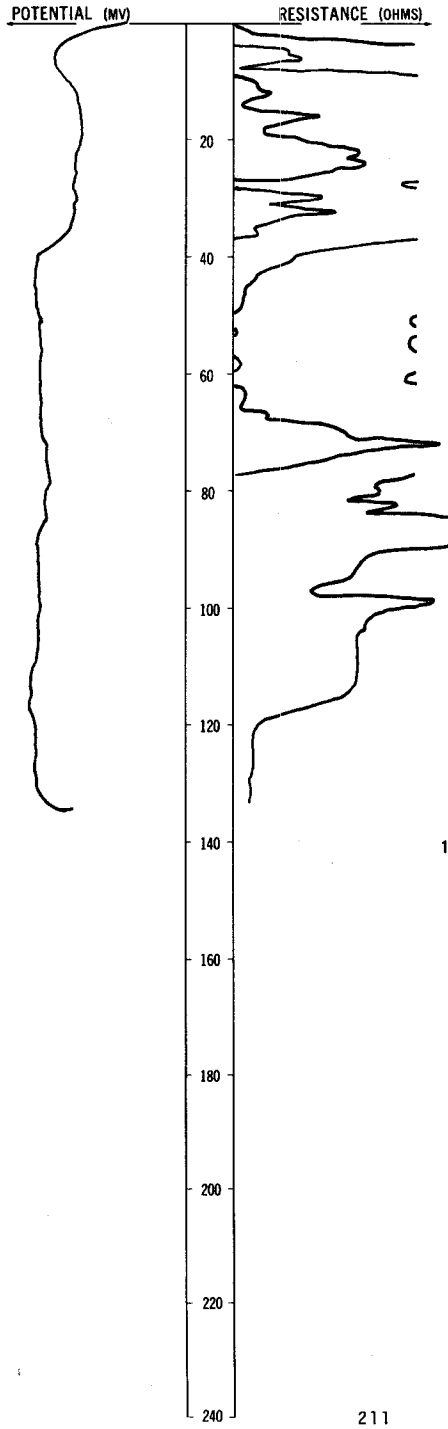
NDSWC 9784

LOCATION: 130-068-11BCB1

DATE DRILLED: 9/21/76

ALTITUDE: 1991
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-7	Clay, silty, sandy, moderate-yellowish-brown.
7-8	Gravel, sandy.
8-9	Clay, silty, sandy, moderate-yellowish-brown.
9-20	Sand, fine to very coarse, predominantly coarse, gravelly; sand is composed of 50 percent quartz, 20 percent carbonate, 10 percent sandstone, and 20 percent unidentified fragments.
20-38	Sand, very fine to very coarse, gravelly; sand is composed of 70 percent quartz, 20 percent carbonate, and 10 percent shale fragments.
38-69	Clay (till), silty, sandy, olive-gray; scattered pebbles.
69-75	Sand, medium, and fine gravel.
75-84	Clay (till), silty, sandy, olive-gray.
84-91	Sand, very fine to very coarse, predominantly medium; sand is composed of 80 percent quartz, 10 percent carbonate, and 10 percent shale fragments.
91-116	Clay (till), silty, sandy, olive-gray; becomes more silty near base.

PIERRE FORMATION

116-140	Shale, grayish-black, hard.

130-068-11BCB2
NDSWC 9784A

Altitude: 1991 feet — Date drilled: 9/21/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, moderate-yellowish-brown	7	7
	Gravel, sandy	1	8
	Clay, silty, sandy, moderate-yellowish-brown	1	9
	Sand, very fine to very coarse, predominantly coarse, gravelly; 60 percent quartz, 20 percent carbonate, 10 percent shale, and 10 percent unidentified fragments	29	38
	Clay (till), silty, sandy, olive-gray; scattered pebbles	2	40

130-068-20CDD
NDSWC 9788

Altitude: 1991 feet — Date drilled: 9/23/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	21	21
	Clay (till), silty, sandy, olive-gray; scattered pebbles	60	81
	Gravel	3	84
	Clay (till), silty, sandy, olive-gray; scattered pebbles	2	86
Pierre Formation:			
	Shale, grayish-black, hard	34	120

130-068-22DCD
(Log from Gross Drilling)

Date drilled: 10/20/74

Clay, brown	40	40
Clay, blue	80	120
Sand and clay; mixed	20	140

130-068-22DDD
(Log from Albrecht Well Work)

Date drilled: 4/16/74

Topsoil, black	2	2
Clay, silty, fine stones, yellow	8	10
Clay, soft, dark	33	43
Sand, gravel, and water	4	47

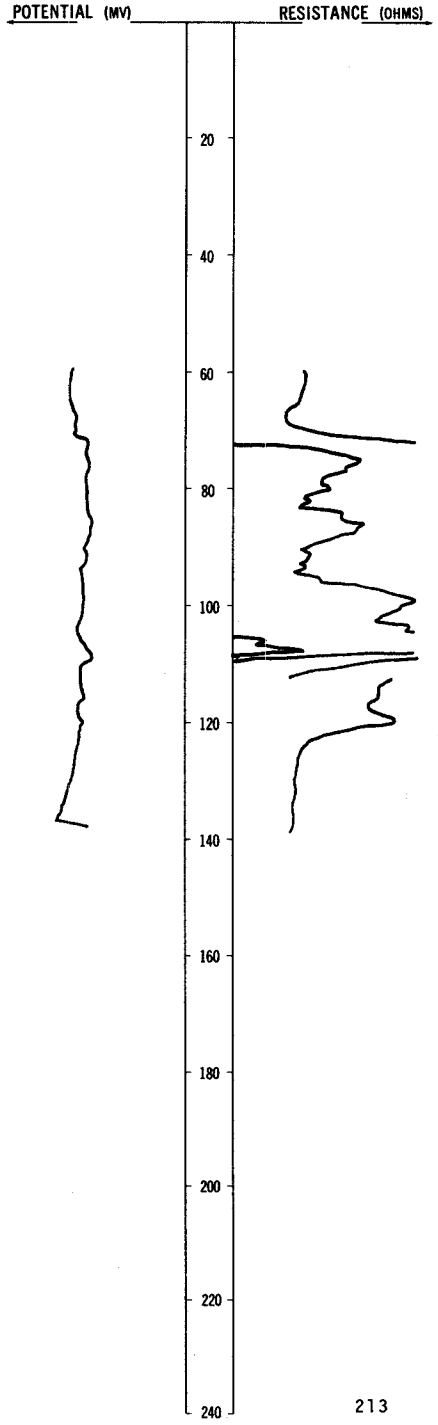
NDSWC 5212

LOCATION: 130-068-24AAA

DATE DRILLED: 9/01/77

ALTITUDE: 1955
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

12-71 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

71-110 Gravel, fine to coarse, sandy, angular to subrounded; composed largely of carbonate and shale fragments.

FOX HILLS FORMATION(?)

110-122 Clay, sandy, silty, light-yellowish-brown to light-gray, carbonaceous.

PIERRE FORMATION

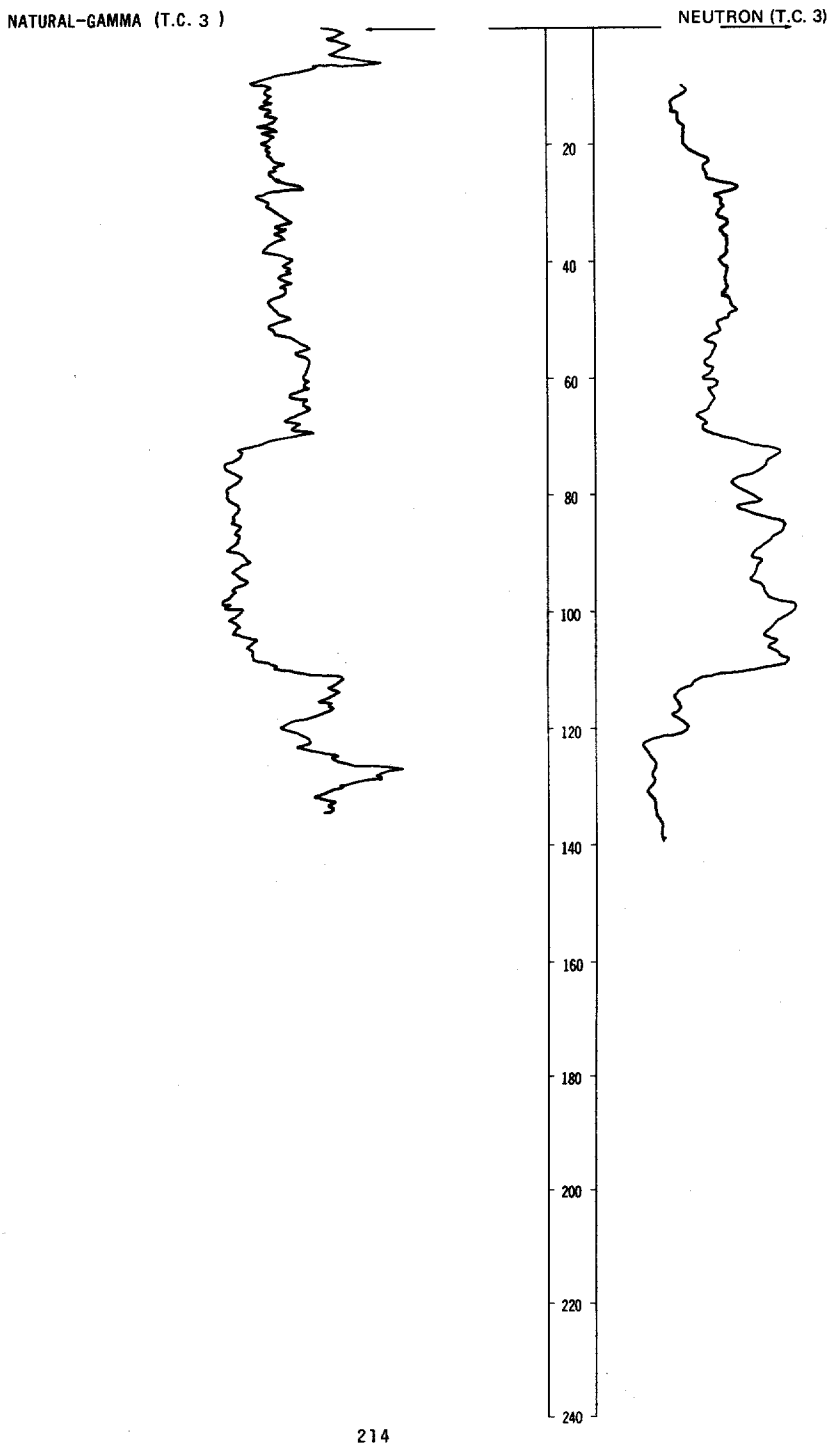
122-142 Shale, black to grayish-black, siliceous.

LOCATION: 130-068-24AAA

DATE DRILLED: 9/01/77

ALTITUDE: 1955
(FT, MSL)

DEPTH: 142
(FT)



NDSWC 5213

LOCATION: 130-068-26BBB

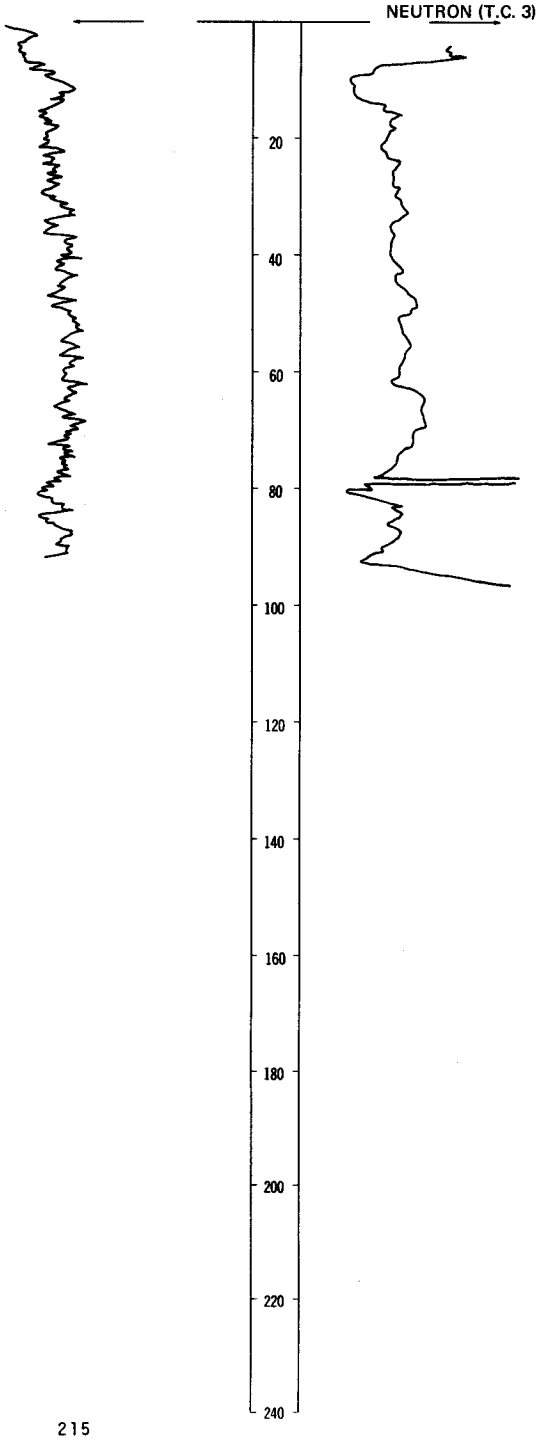
DATE DRILLED: 9/06/77

ALTITUDE: 1912
(FT, MSL)

DEPTH: 122
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



NOTE: Detailed log on following page.

130-068-26BBB, Continued
NDSWC 5213

Altitude: 1912 feet — Date drilled: 9/06/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	17	17
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; boulder at 96 feet; numerous gravel lenses below 80 feet	88	105
Pierre Formation:			
	Shale, black to grayish-black, hard	17	122

130-068-30BBA1
(Log from Baumann Well Drilling)

Date drilled: 10/14/76

Topsoil	1	1
Gravel	24	25
Clay, gray	125	150

130-068-30BBA2
(Log from Baumann Well Drilling)

Date drilled: 10/19/76

Topsoil	1	1
Gravel	14	15
Clay, yellow	10	25
Clay, gray	95	120
Clay, blue	80	200

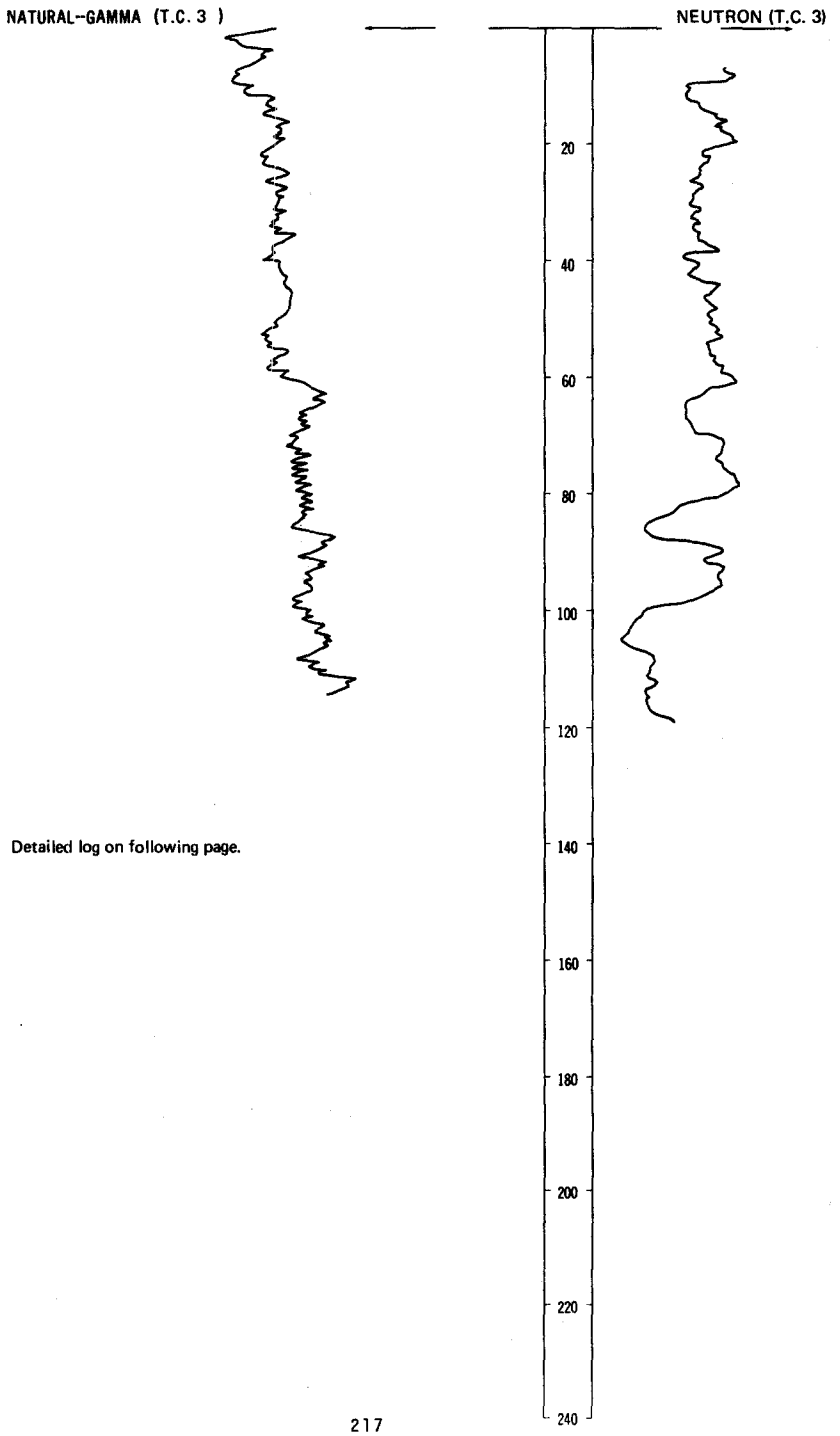
NDSWC 5118

LOCATION: 130-068-32DDD

DATE DRILLED: 8/25/77

ALTITUDE: 1957
(FT, MSL)

DEPTH: 122
(FT)



NOTE: Detailed log on following page.

130-068-32DDD, Continued
NDSWC 5118

Altitude:	1957 feet	Date drilled:	8/25/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	15	15
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles	73	88
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	12	100
Pierre Formation:			
	Shale, black to grayish-black, noncalcareous, hard	22	122

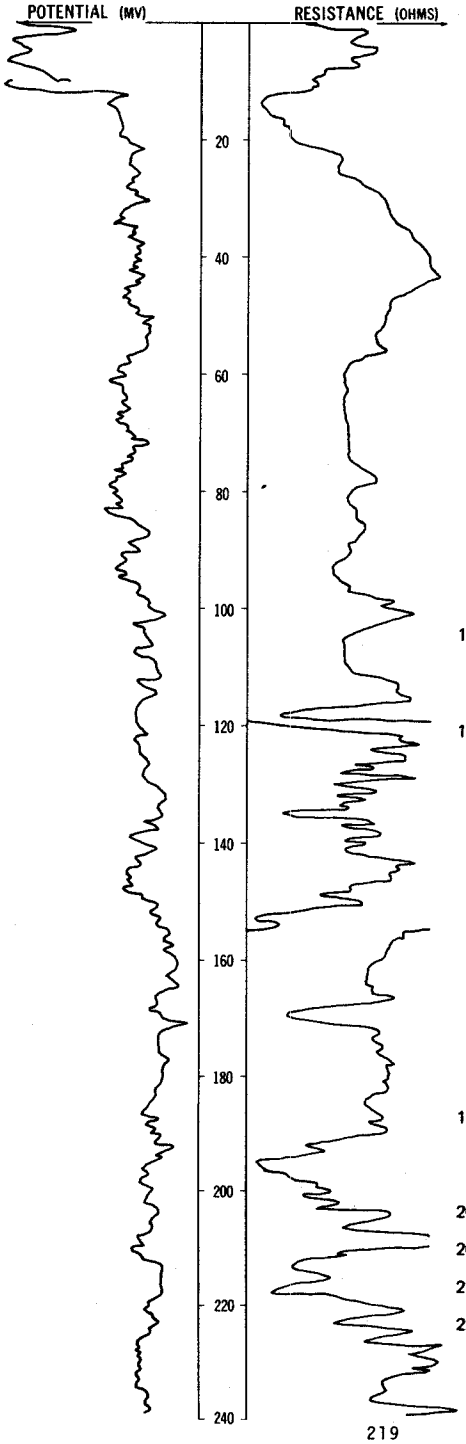
NDSWC 9626

LOCATION: 130-068-36ADA

DATE DRILLED: 7/14/76

ALTITUDE: 1959
(FT, MSL)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

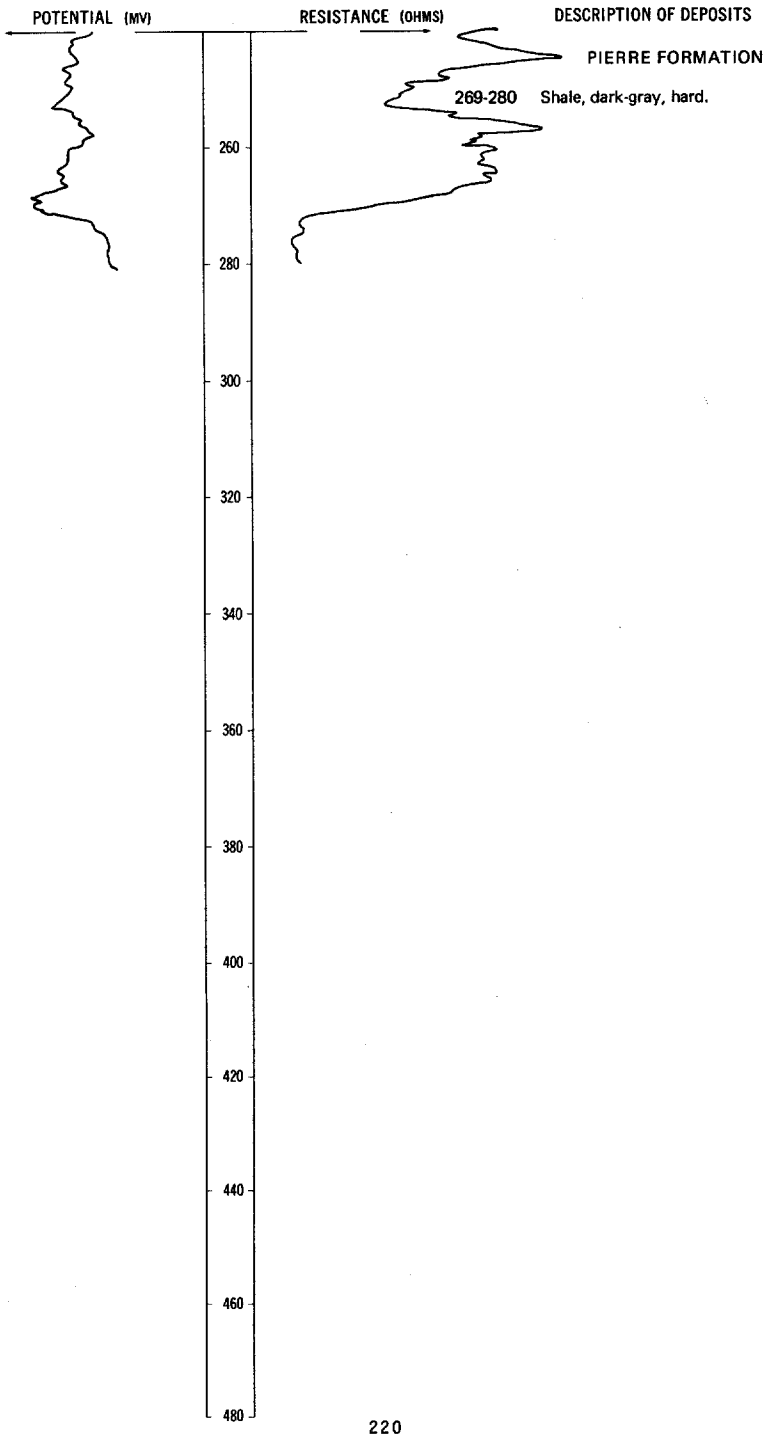
0-2	Clay, sandy, moderate-yellowish-brown.
2-12	Sand, medium to very coarse, predominantly very coarse, gravelly; sand is composed of 40 percent shale, 30 percent quartz, 20 percent carbonate, and 10 percent unidentified fragments.
12-98	Clay (till), silty, sandy, olive-gray; scattered pebbles.
98-102	Gravel, very fine.
102-121	Clay (till), silty, sandy, olive-gray.
121-192	Silt, clayey, brownish-gray.
192-206	Clay, sandy, olive-gray.
206-207	Gravel.
207-218	Clay (till), sandy, olive-gray.
218-224	Silt, clayey, brownish-gray.
224-269	Clay (till), silty, sandy, olive-gray; numerous gravel lenses.

LOCATION: 130-068-36ADA

DATE DRILLED: 7/14/76

ALTITUDE: 1959
(FT, MSL)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

PIERRE FORMATION

269-280 Shale, dark-gray, hard.

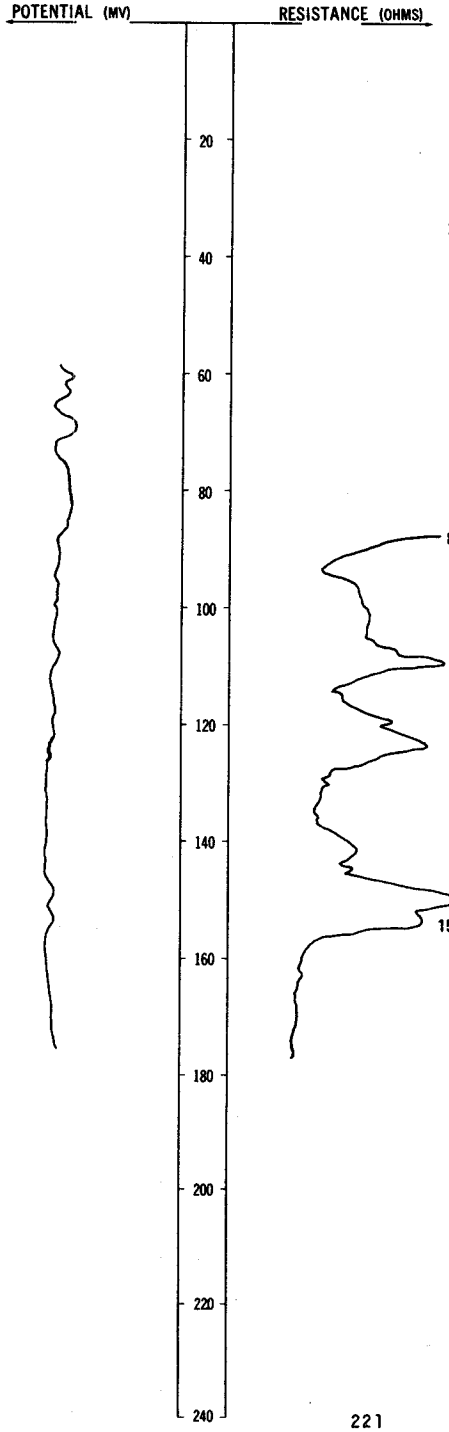
NDSWC 5226

LOCATION: 130-069-06ABB

DATE DRILLED: 9/13/77

ALTITUDE: 2033
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-13 Sand, coarse to very coarse, gravelly, subangular to rounded.

13-28 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

28-88 Sand, fine to very coarse, predominantly medium, subrounded to rounded.

88-157 Clay (glaciofluvial), silty, medium-light-gray; few sand lenses.

PIERRE FORMATION

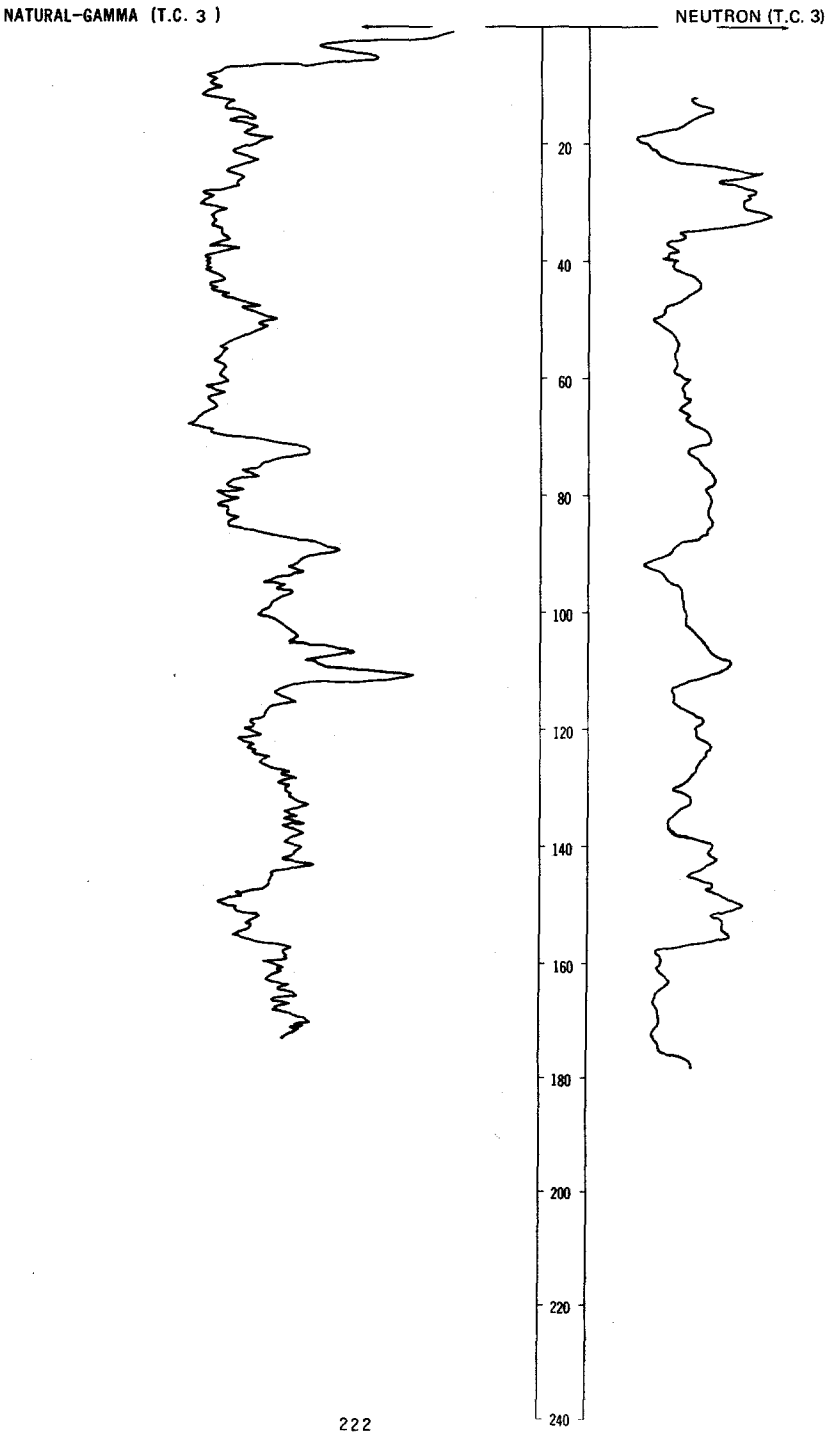
157-182 Shale, dark-gray to grayish-black, noncalcareous, hard.

LOCATION: 130-069-06ABB

DATE DRILLED: 9/13/77

ALTITUDE: 2033
(FT, MSL)

DEPTH: 182
(FT)



130-069-07CDD
(Log from Venturia Well Drilling)

Date drilled: 6/11/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	2	2
	Clay, brown	20	22
	Clay, blue	53	75
	Sand	19	94

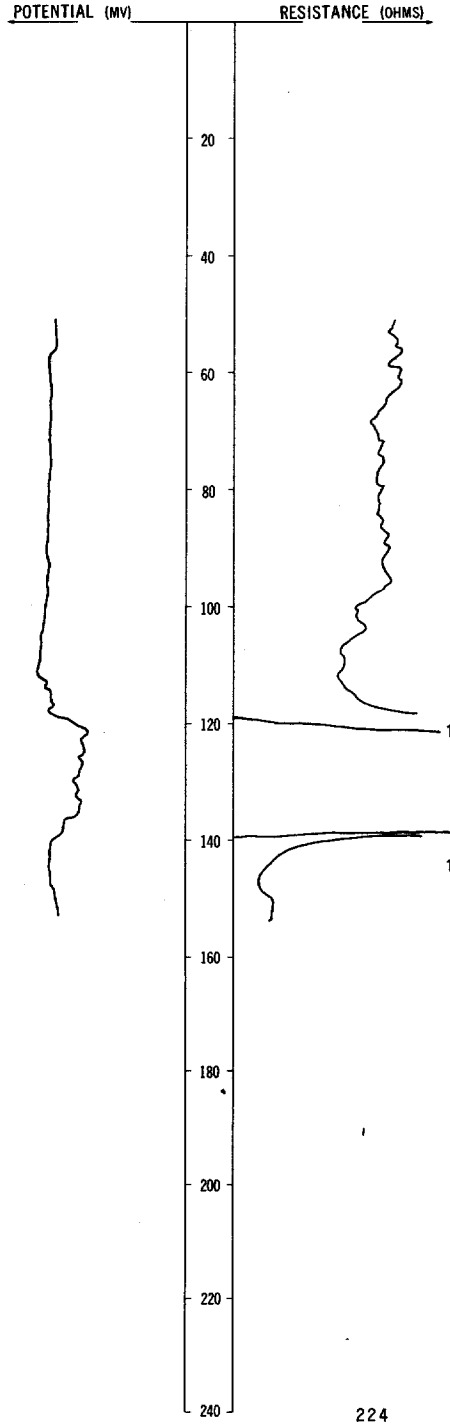
NDSWC 5227

LOCATION: 130-069-07DDD

DATE DRILLED: 9/13/77

ALTITUDE: 2047
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-25 Clay (lacustrine and water-washed till), silty, sandy, carbonaceous, laminated; scattered pebbles.

25-120 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles and boulders.

120-141 Gravel, fine to coarse, sandy, angular to subrounded; composed largely of carbonate and shale fragments.

PIERRE FORMATION

141-162 Shale, black to grayish-black, non-calcareous, hard.

LOCATION: 130-069-07DDD

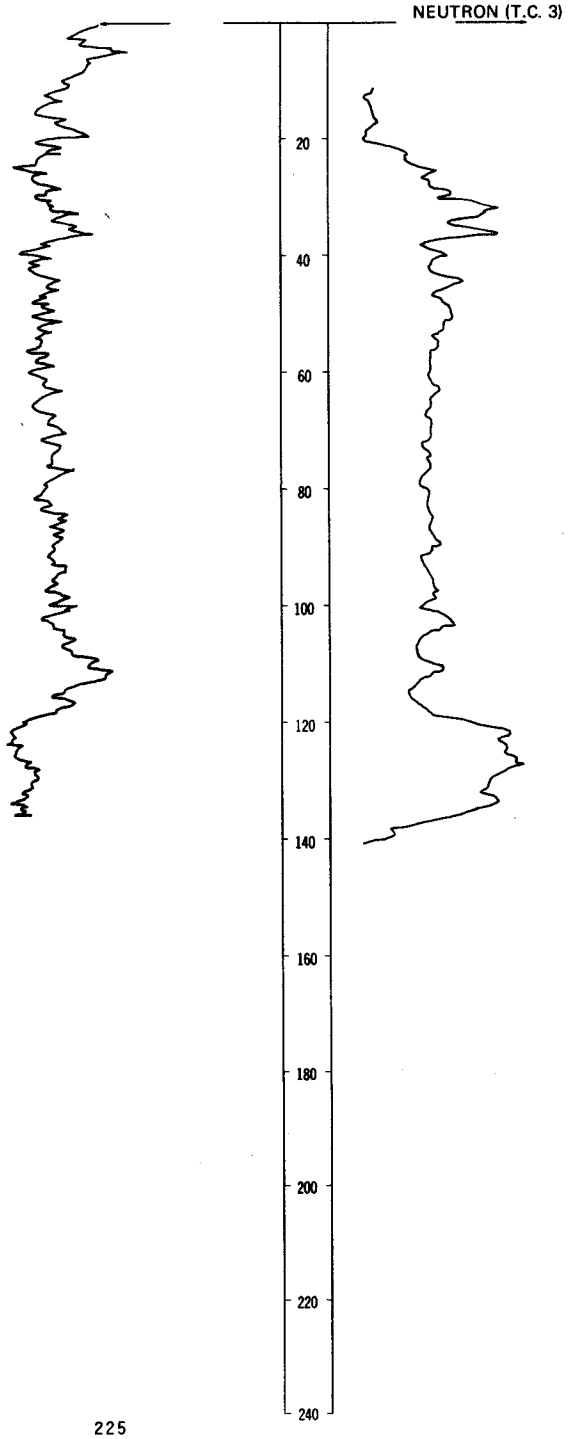
DATE DRILLED: 9/13/77

ALTITUDE: 2047
(FT, MSL)

DEPTH: 162
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



130-069-09BDA2
(Log from Albrecht Well Work)

Date drilled: 11/02/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	2	2
	Clay, silty, sandy, yellow	8	10
	Sand	10	20
	Sand, fine; water	4	24
	Clay, silty, sandy, yellow	1	25
	Sand, gravel, and water	4	29

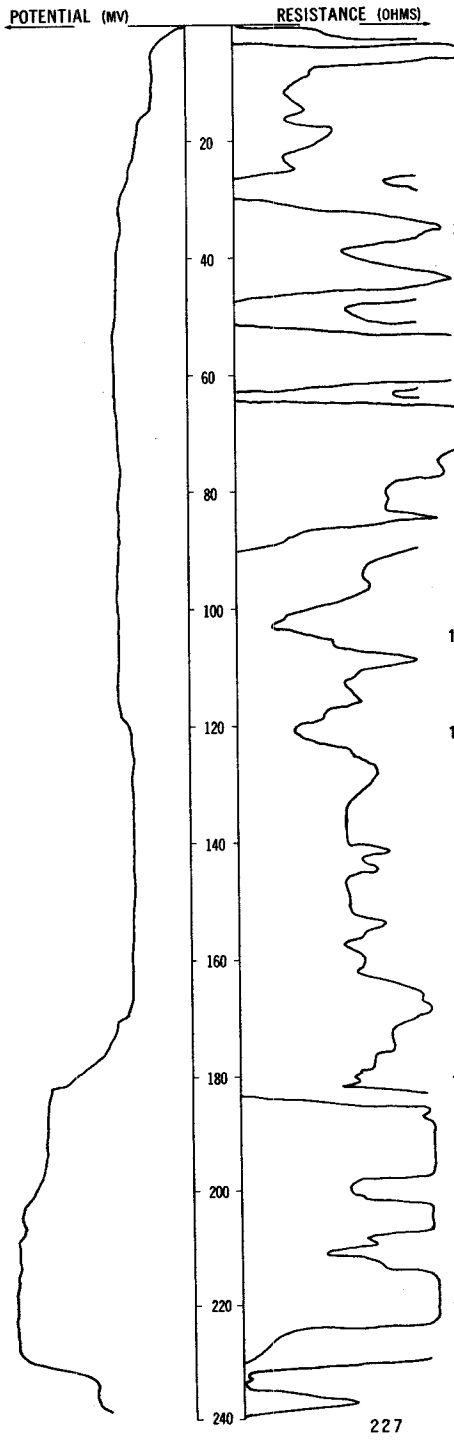
NDSWC 9790

LOCATION: 130-069-09DAD1

DATE DRILLED: 9/23/76

ALTITUDE: 2012
(FT, MSL)

DEPTH: 260
(FT)



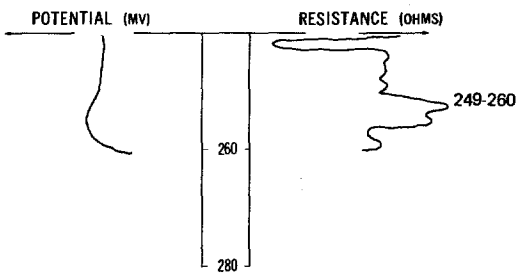
DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-7	Sand, very fine to very coarse, gravelly.
7-10	Clay, silty, yellowish-brown.
10-20	Clay, sandy, bluish-gray.
20-46	Clay (lacustrine), silty, medium-gray.
46-52	Clay, sandy, medium-gray.
52-60	Sand, fine.
60-65	Clay, silty, olive-gray.
65-86	Sand, very fine to very coarse, predominantly medium, gravelly.
86-104	Clay (till), silty, sandy, dusky-brown; scattered pebbles.
104-120	Clay, silty, olive-gray.
120-181	Clay (till), silty, sandy, olive-gray; scattered pebbles.
181-222	Gravel, very fine, sandy; gravel is composed of 35 percent carbonate, 30 percent unidentified, 20 percent quartz, and 15 percent shale fragments.
222-249	Clay (till), sandy, olive-gray.

LOCATION: 130-069-09DAD1 DATE DRILLED: 9/23/76

ALTITUDE: 2012 (FT, MSL) DEPTH: 260 (FT)



DESCRIPTION OF DEPOSITS

PIERRE FORMATION

249-260 Shale, grayish-black, hard.

130-069-09DAD2
NDSWC 9790A

Altitude: 2012 feet Date drilled: 9/23/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, gravelly; few thin clay lenses	5	5
	Sand, fine to coarse, gravelly	2	7
	Clay, silty, yellowish-brown to medium-gray	3	10
	Clay, sandy, bluish-gray	10	20
	Clay (lacustrine), silty, medium-gray	22	42
	Clay, sandy, medium-gray	22	64
	Clay (till), sandy, olive-gray; scattered pebbles	16	80

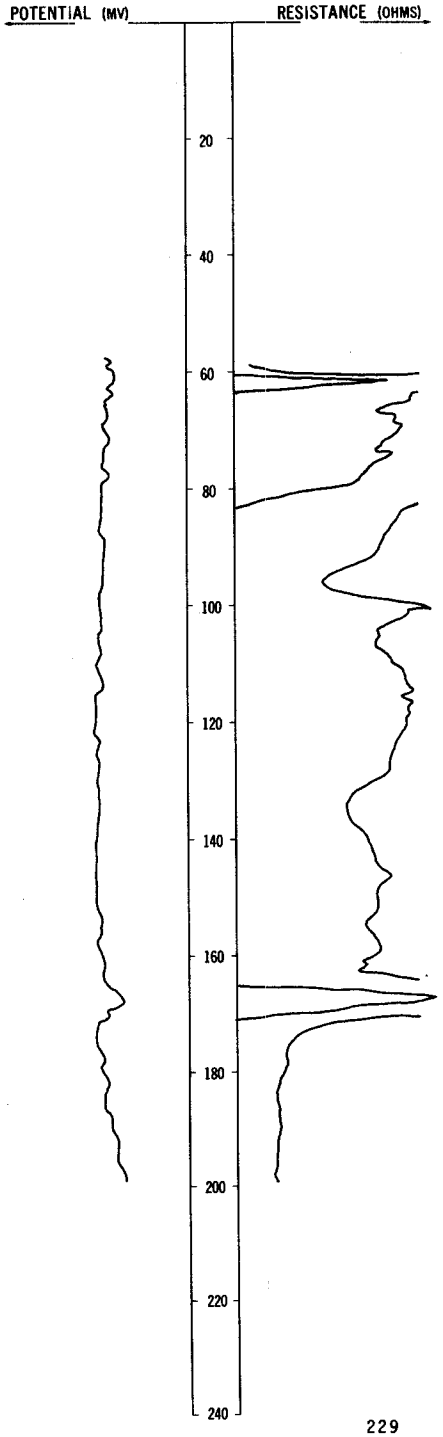
NDSWC 5216, 5216A

LOCATION: 130-069-10BBB1, 2

DATE DRILLED: 9/07/77

ALTITUDE: 2024
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-31 Sand, fine to very coarse, predominantly coarse, gravelly, subangular to subrounded.

31-58 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

58-80 Sand, fine to very coarse, subrounded to rounded.

80-173 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles; boulders from 166 to 173 feet.

PIERRE FORMATION

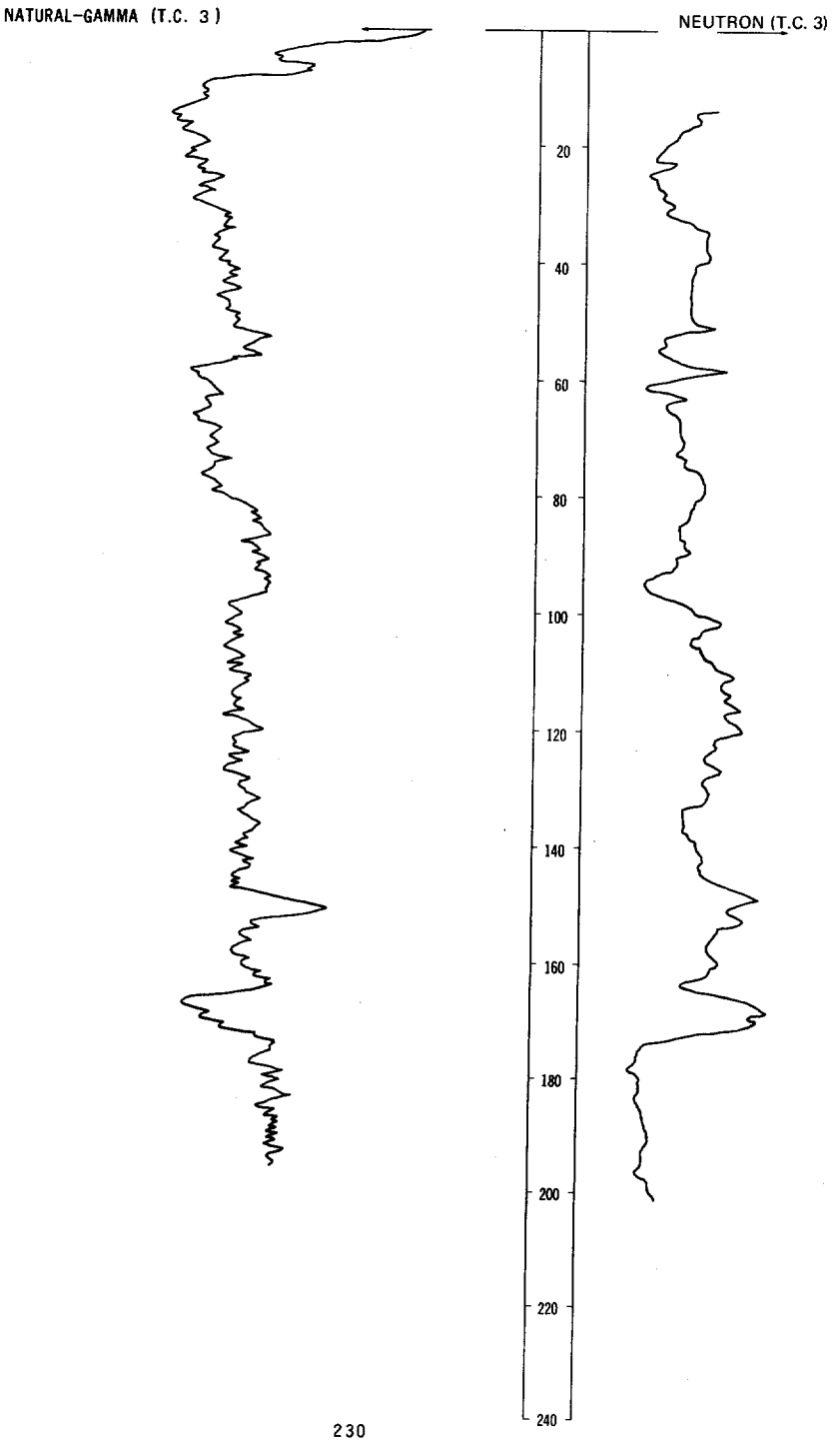
173-202 Shale, grayish-black to black, siliceous, hard.

LOCATION: 130-069-10BBB1, 2

DATE DRILLED: 9/07/77

ALTITUDE: 2024
(FT, MSL)

DEPTH: 202
(FT)



130-069-14ADD
(Log from Albrecht Well Work)

Date drilled: 10/27/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	2	2
	Clay, silty, gray	10	12
	Clay, soft, white	1	13
	Clay, silty, yellow	5	18
	Clay, yellow and black	6	24
	Clay, dark-gray	7	31
	Gravel	1	32
	Clay, dark	5	37
	Sand, gravel, and water	2	39
	Clay, stony, dark	17	56

130-069-14CBB
NDSWC 9789

Altitude: 2063 feet — Date drilled: 9/23/76

Glacial drift:			
	Clay, silty, sandy, moderate-yellowish-brown; scattered pebbles	5	5
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 55 percent quartz, 20 percent sandstone, 15 percent carbonate, and 10 percent unidentified fragments	16	21
	Silt, clayey, brownish-gray	10	31
	Sand, fine to very coarse, predominantly medium, gravelly	5	36
	Clay (till), silty, sandy, olive-gray; scattered pebbles	39	75
	Sand, very fine to very coarse, predominantly medium	6	81
	Silt, clayey, sandy, olive-gray	48	129
	Clay (till), sandy, olive-gray, hard; scattered pebbles	62	191
	Sand, fine to very coarse, predominantly coarse, gravelly	4	195
	Clay (till), silty, sandy, olive-gray, hard	6	201
Pierre Formation:			
	Shale, grayish-black, hard	19	220

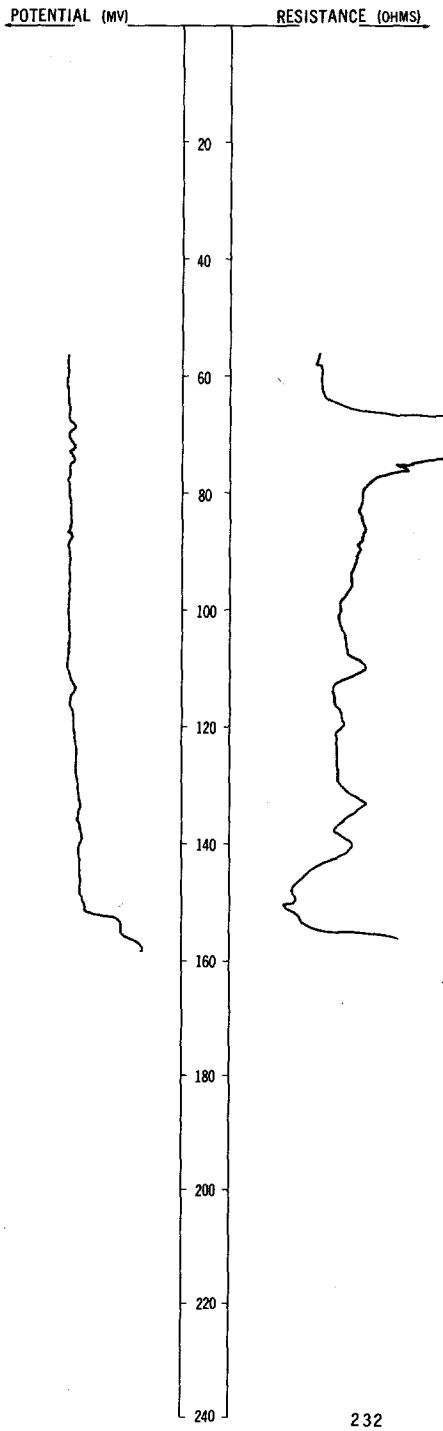
NDSWC 5215

LOCATION: 130-069-16DDD

DATE DRILLED: 9/07/77

ALTITUDE: 2016
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.

18-37 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

37-67 Clay (lacustrine), sandy, silty, medium-dark-gray.

67-77 Sand.

77-162 Clay (till), sandy, silty, olive-gray to yellowish-brown; scattered pebbles.

PIERRE FORMATION

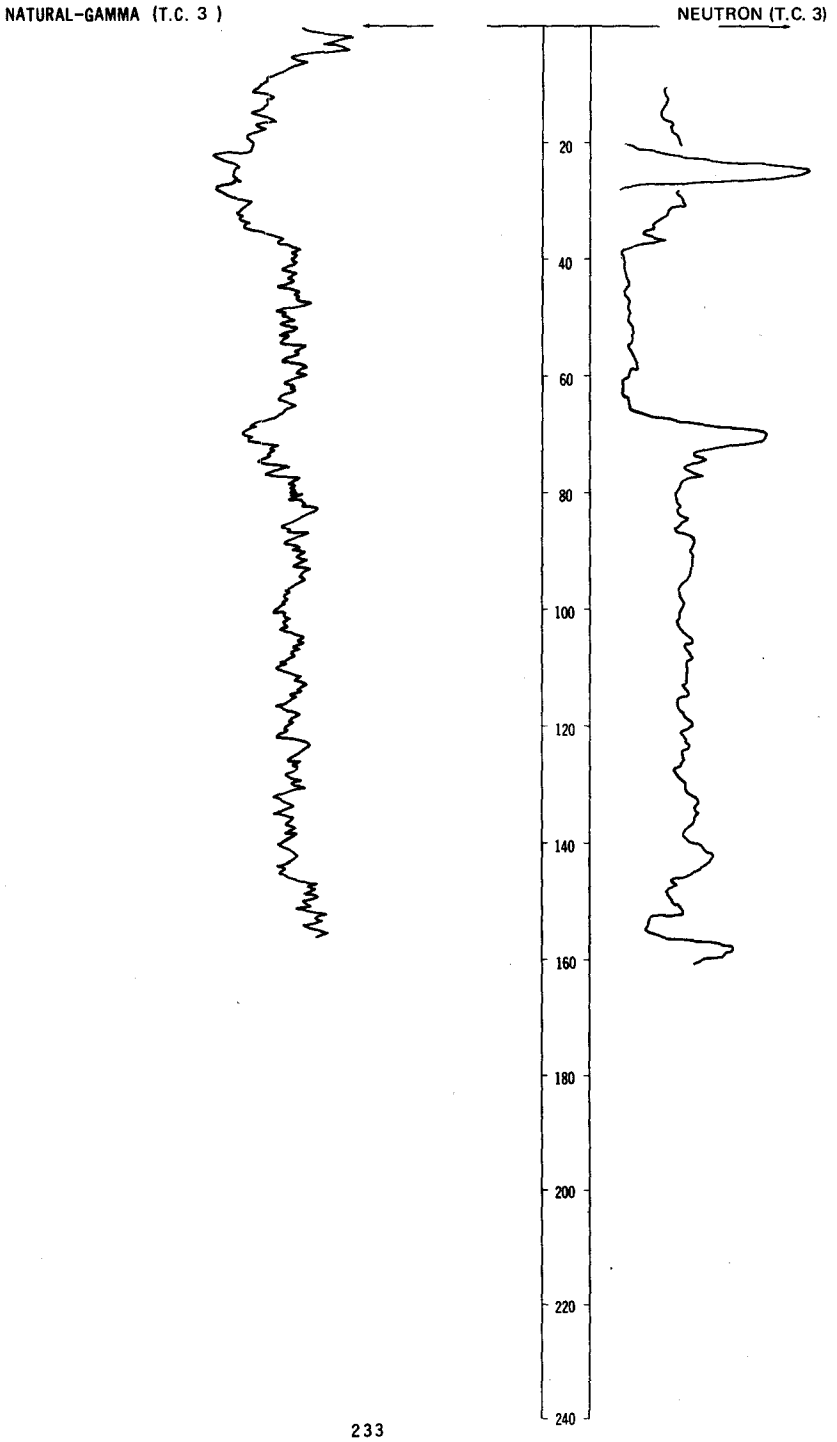
162-182 Shale, black to grayish-black, siliceous, hard.

LOCATION: 130-069-16DDD

DATE DRILLED: 9/07/77

ALTITUDE: 2016
(FT, MSL)

DEPTH: 182
(FT)



130-069-19BCC
NDSWC 1563
(Log modified from Randich, 1961)

Altitude: 1990 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	5	5
	Till, clayey, sandy, light-brown; fine gravel; coarse sand; and shale pebbles; calcareous	16	21
	Till, clayey, gray; fine gravel; shale pebbles; and lignite fragments; calcareous	84	105
	Gravel, fine to medium; coarse sand and shale pebbles; and lignite fragments	5	110
Pierre Formation:			
	Shale, gray, slightly calcareous	6	116

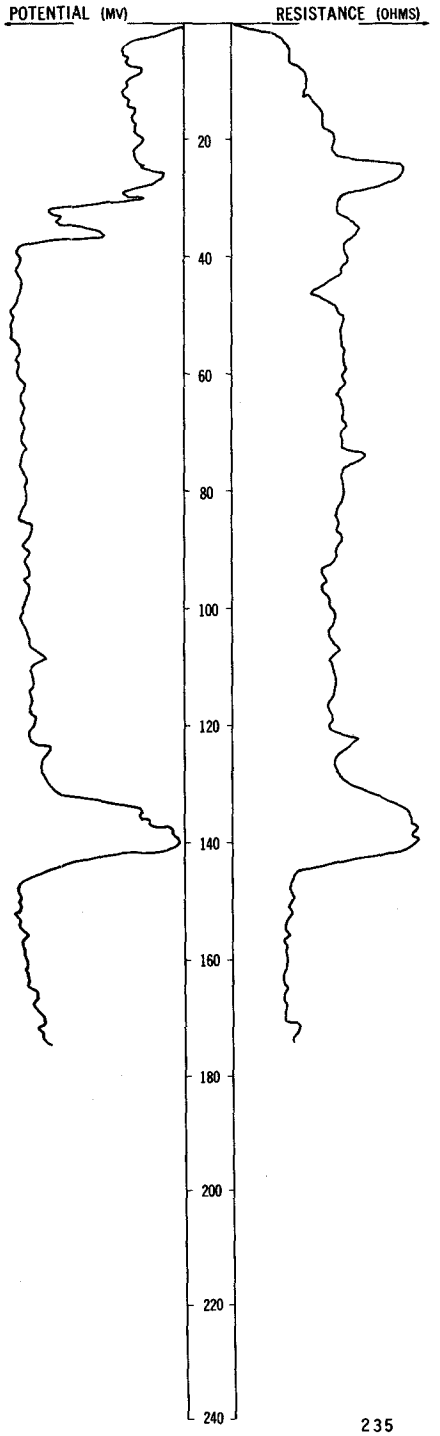
NDSWC 9667

LOCATION: 130-069-19CCC

DATE DRILLED: 7/29/76

ALTITUDE: 2006
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-14	Silt, clayey, sandy, light-brown.
14-24	Silt, clayey, sandy, olive-gray.
24-29	Sand, very fine to fine, silty.
29-34	Silt, clayey, sandy, olive-gray.
34-134	Clay (till), silty, sandy, olive-gray; scattered pebbles.
134-143	Gravel, sandy.

PIERRE FORMATION

143-180	Shale, grayish-black, hard.

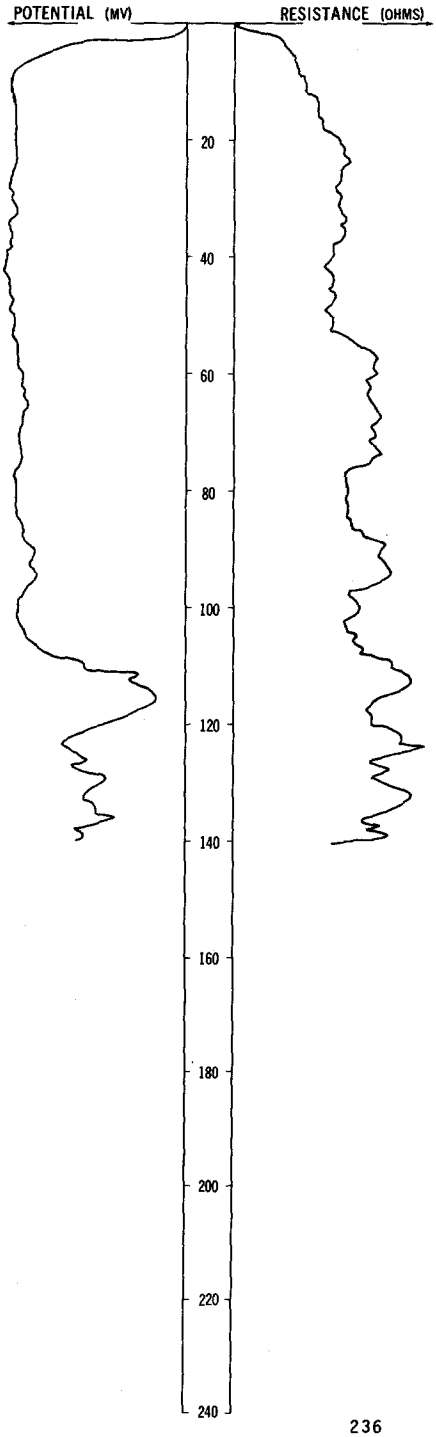
NDSWC 9666

LOCATION: 130-069-19DDD

DATE DRILLED: 7/29/76

ALTITUDE: 1950
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-2	Sand, very fine to fine, silty.
2-11	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
11-109	Clay (till), silty, sandy, olive-gray; scattered pebbles.
109-119	Sand, fine to very coarse, predominantly very coarse, gravelly; sand is composed of 40 percent carbonate, 30 percent quartz, 20 percent unidentified, and 10 percent shale fragments.
119-143	Sand, fine to very coarse, predominantly coarse, gravelly; numerous clay lenses.

PIERRE FORMATION

143-160	Shale, grayish-black, hard, fissile.

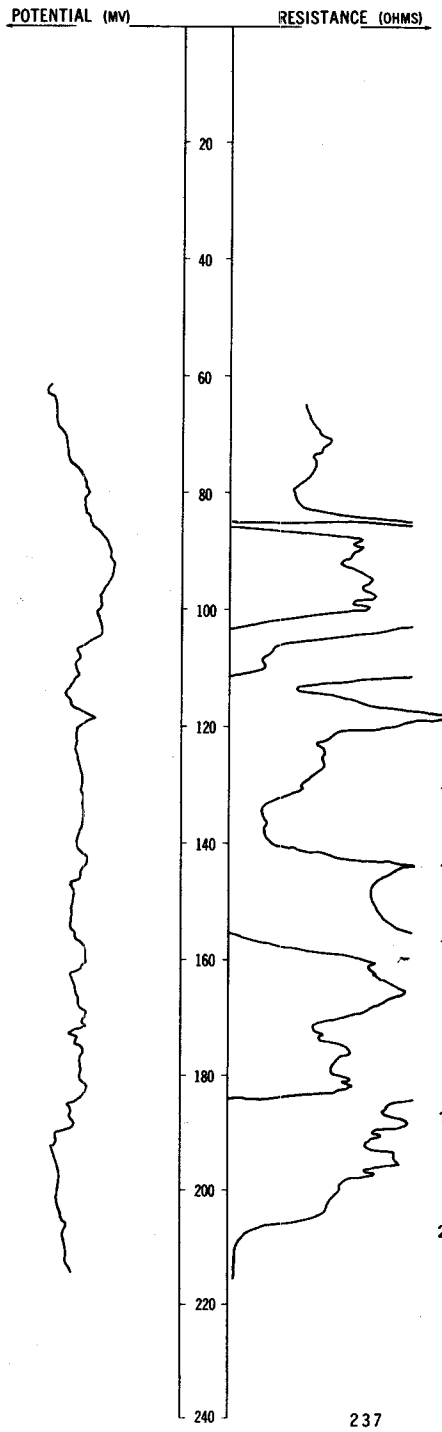
NDSWC 5228, 5228A

LOCATION: 130-069-21BBB1, 2

DATE DRILLED: 9/13/77

ALTITUDE: 2033
(FT, MSL)

DEPTH: 223
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-25	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.
25-84	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.
84-106	Sand, coarse to very coarse, sub-angular to subrounded; scattered pebbles.
106-131	Sand, very fine, clayey, yellowish-brown.
131-143	Clay (lacustrine), silty, dark-gray.
143-158	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.
158-186	Sand, coarse, gravelly, subrounded to rounded; gravel is composed largely of carbonate and shale fragments.
186-207	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

PIERRE FORMATION

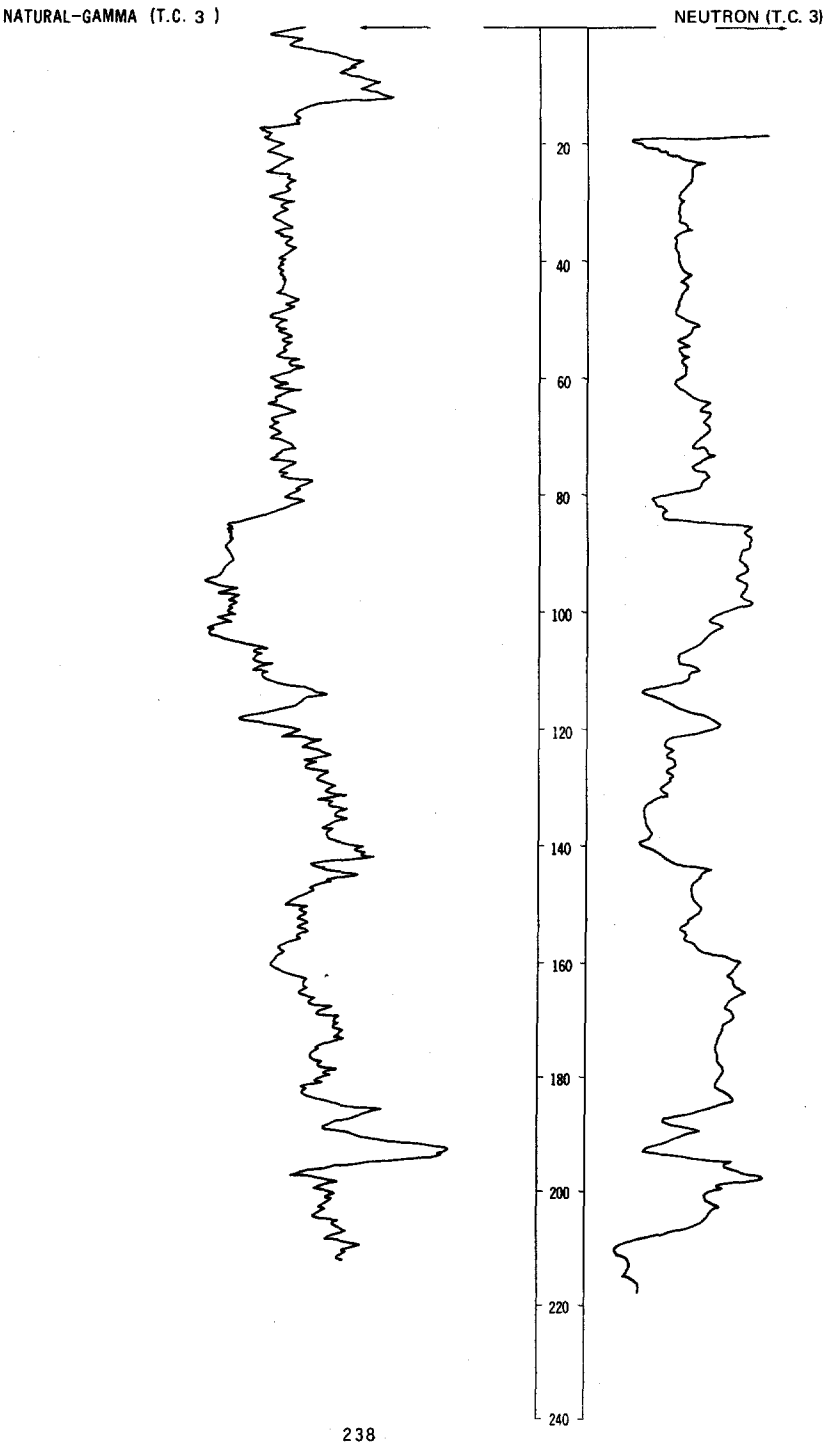
207-223	Shale, black to grayish-black, siliceous, hard.

LOCATION: 130-069-21BBB1, 2

DATE DRILLED: 9/13/77

ALTITUDE: 2033
(FT, MSL)

DEPTH: 223
(FT)



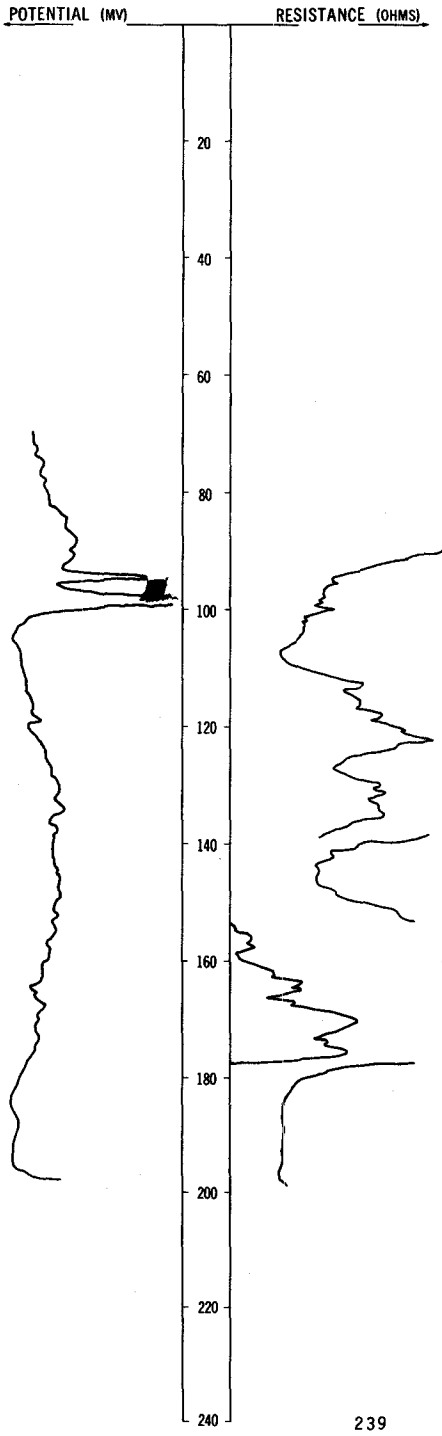
NDSWC 5214

LOCATION: 130-069-22DDD

DATE DRILLED: 9/06/77

ALTITUDE: 2022
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-33 Sand, coarse to very coarse, gravelly, subangular to subrounded.

33-99 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

99-140 Sand, very fine to fine, clayey, yellowish-brown.

140-161 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

161-179 Sand, fine to very coarse, predominantly coarse, gravelly, subangular to rounded; gravel is composed largely of carbonate and quartz fragments.

PIERRE FORMATION

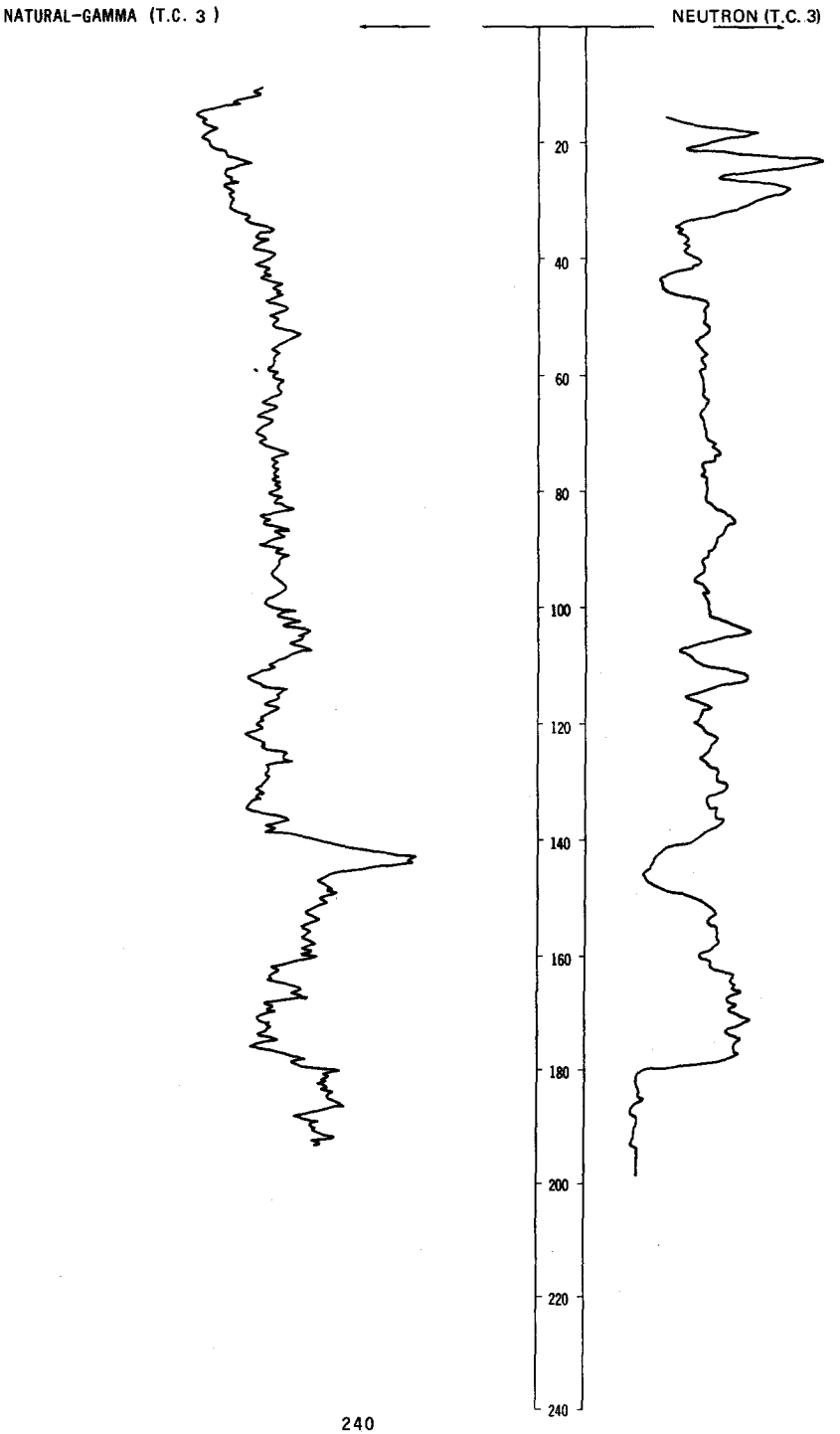
179-202 Shale, black to grayish-black, hard.

LOCATION: 130-069-22DDD

DATE DRILLED: 9/06/77

ALTITUDE: 2022
(FT, MSL)

DEPTH: 202
(FT)



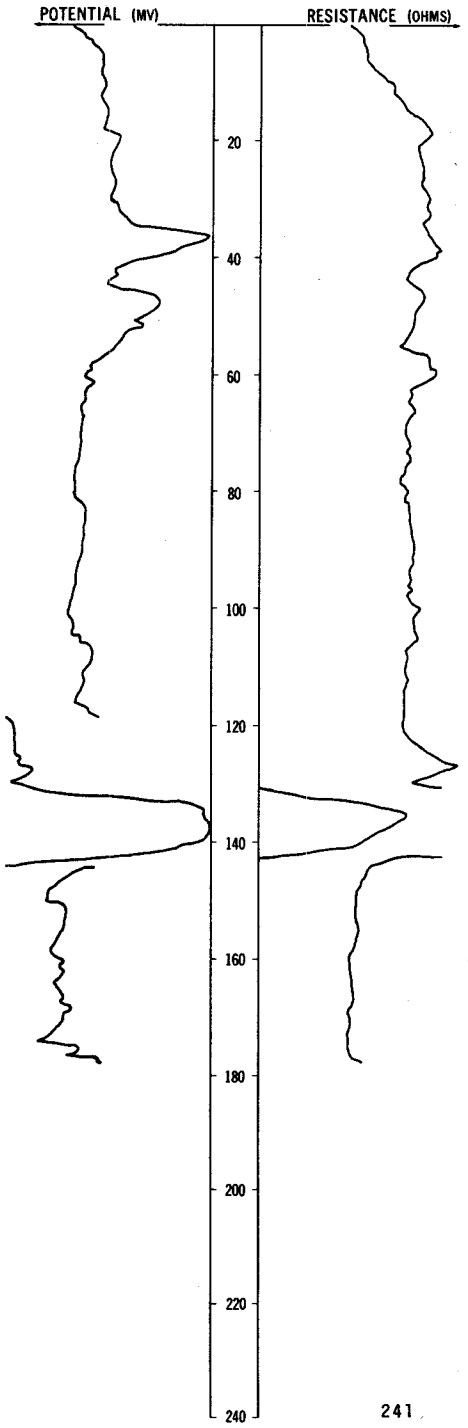
NDSWC 9668

LOCATION: 130-069-30CBB

DATE DRILLED: 7/29/76

ALTITUDE: 1998
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-23	Clay, silty, dark-yellowish-brown.
23-56	Clay, silty, olive-gray.
56-60	Gravel, coarse, sandy.
60-131	Clay (till), silty, sandy, olive-gray; scattered pebbles.
131-143	Sand, very fine to very coarse, predominantly very coarse, gravelly; sand is composed of 50 percent quartz, 25 percent carbonate, 15 percent unidentified, and 10 percent shale fragments.

PIERRE FORMATION

143-180	Shale, very dark gray, hard.

130-069-30CCC1
NDSWC 1565
(Log from Randich, 1961)

Altitude: 2004 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Till, clayey, sandy, light-brown; fine gravel	9	10
	Till, clayey, light-brown; fine gravel and shale pebbles	22	32
	Till, clayey, gray; fine gravel	41	73
	Till, clayey, gray; fine to medium gravel; abundant	11	84
	Till, clayey, gray; fine gravel; shale pebbles; and lignite fragments	64	148
	Gravel, fine to medium; shale pebbles; and lignite fragments	8	156
	Till, clayey, gray; fine gravel; shale pebbles; and lignite fragments	108	264

130-069-30CCC2
NDSWC 9747

Altitude: 2004 feet — Date drilled: 8/25/76

Glacial drift:			
	Silt, clayey, sandy, moderate-yellowish-brown	24	24
	Gravel	4	28
	Clay (till), silty, sandy, olive-gray	44	72
	Gravel, sandy	2	74
	Clay, dark-olive-gray	50	124
	Clay (till), sandy, olive-gray; scattered pebbles	40	164
	Clay (till), silty, sandy, grayish-brown; scattered pebbles; gravel lens from 220 to 222 feet	69	233
	Clay (till), silty, sandy, olive-gray; scattered pebbles	19	252
	Clay (till), silty, sandy, dusky-brown; scattered pebbles	16	268
	Clay (till), silty, sandy, dusky-brown	15	283
	Gravel	4	287
Pierre Formation:			
	Shale, grayish-black, hard	13	300

130-069-30CDC
(Log from Layne Minnesota Co.)

Date drilled: 8/25/74

Topsoil	2	2
Clay, yellow	18	20
Clay, blue	55	75
Till; with sand lenses	55	130
Gravel, fine	4	134
Till	39	173
Shale	45	218

130-069-30DCC
(Log from Layne Minnesota Co.)

Date drilled: 1/30/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Clay; with seams of sand	150	152
	Gravel, fine	12	164
	Clay, hard	.5	164.5
	Gravel, fine	5.5	170
	Rocks	----	170

130-069-30DCD
(Log from Layne Minnesota Co.)

Date drilled: 8/30/74

	Topsoil	1.5	1.5
	Clay, yellow	25.5	27
	Till; with few sand lenses	125	152
	Till, gravelly	5	157
	Sand; with clay streaks	10	167
	Sand, coarse	10	177
	Sand, dirty	5	182
	Rocks and dirty sand	5	187
	Shale	5	192

130-069-30DDC1
NDSWC 1566
(Log modified from Randich, 1961)

Glacial drift:			
	Topsoil, black	4	4
	Till, clayey, light-brown; fine to medium gravel	20	24
	Till, clayey, gray; fine to medium gravel; shale pebbles; and lignite fragments	125	149
	Gravel, fine to medium; coarse sand; shale pebbles; and lignite fragments	18	167
Pierre Formation:			
	Shale, gray	11	178

130-069-30DDC2
(Log from Layne Minnesota Co.)

Date drilled: 8/30/74

	Topsoil	1.5	1.5
	Clay, yellow	25.5	27
	Till; with lenses of sand	125	152
	Sand; with clay streaks	5	157
	Sand, medium-coarse	5	162
	Sand, coarse	5	167
	Sand; with clay streaks	5	172
	Rocks	1	173
	Shale	9	182

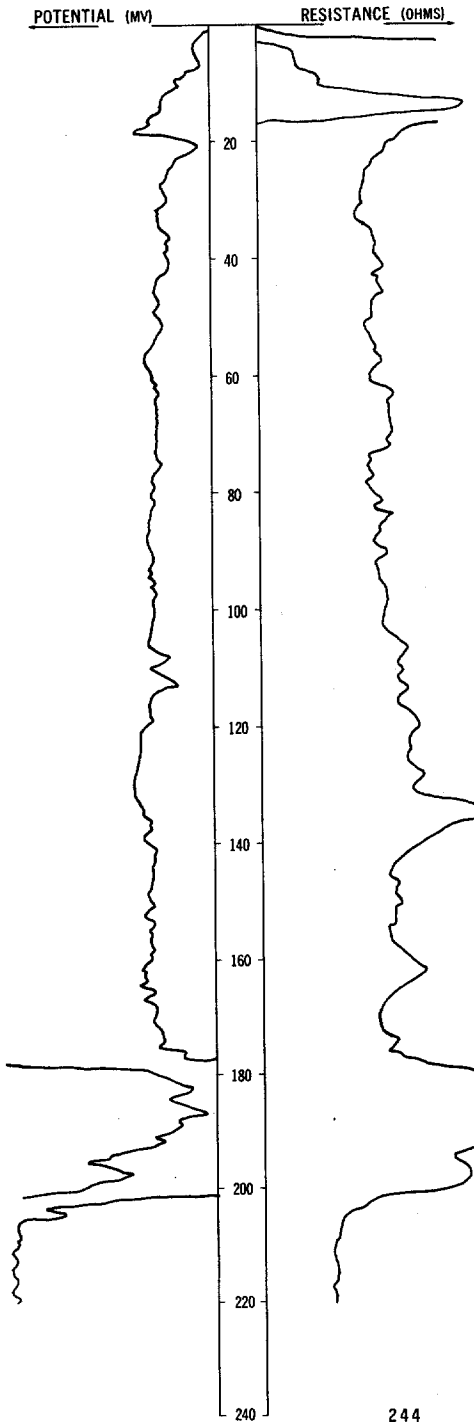
NDSWC 9665

LOCATION: 130-069-30DDD

DATE DRILLED: 7/28/76

ALTITUDE: 2014
(FT, MSL)

DEPTH: 220
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-11	Clay, silty, moderate-yellowish-brown.
11-16	Sand, very fine to coarse, predominantly fine.
16-32	Clay, silty, moderate-yellowish-brown.
32-35	Clay, silty, olive-gray.
35-46	Clay (till), silty, sandy, olive-gray.
46-50	Clay, silty, olive-gray.
50-133	Clay (till), silty, sandy, olive-gray; scattered pebbles.
133-137	Gravel, very fine, sandy.
137-177	Clay (till), silty, sandy, dusky-brown; scattered pebbles.
177-200	Gravel, very fine, and fine to very coarse sand; composed of 30 percent quartz, 30 percent carbonate, 20 percent shale, and 20 percent unidentified fragments.

PIERRE FORMATION

200-220	Shale, grayish-black, hard, fissile.

130-069-31CCC
NDSWC 1570
(Log modified from Randich, 1961)

Altitude: 1991 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, black	4	4
	Till, clayey, sandy, light-brown; fine gravel	7	11
	Clay, silty, light-gray	63	74
	Till, clayey, gray; fine gravel; shale pebbles; and lignite fragments	78	152
	Gravel, fine to medium	3	155
	Till, clayey, gray; fine to medium gravel; shale pebbles; and lignite fragments	26	181
Pierre Formation:			
	Shale, gray	8	189

130-069-31DDC
NDSWC 1569
(Log modified from Randich, 1961)

Glacial drift:			
	Topsoil, sandy, black	2	2
	Clay, sandy, light-brown	3	5
	Clay, sandy, silty, light-gray	55	60
	Till, clayey, gray; fine to medium gravel; shale pebbles and lignite fragments	99	159
	Gravel, fine to medium; shale pebbles; and lignite fragments	20	179
	Till, clayey, gray; fine gravel; shale pebbles; and lignite fragments	10	189
	Clay, sandy, gray	31	220
	Gravel, fine to medium	4	224
Pierre Formation:			
	Shale, gray	7	231

130-069-32BCB
(Log from Baumgartner Drilling Co.)

Altitude: 2024 feet Date drilled: 11/07/73

Clay, yellow	40	40
Clay, gray	140	180
Sand, coarse, and gravel	40	220

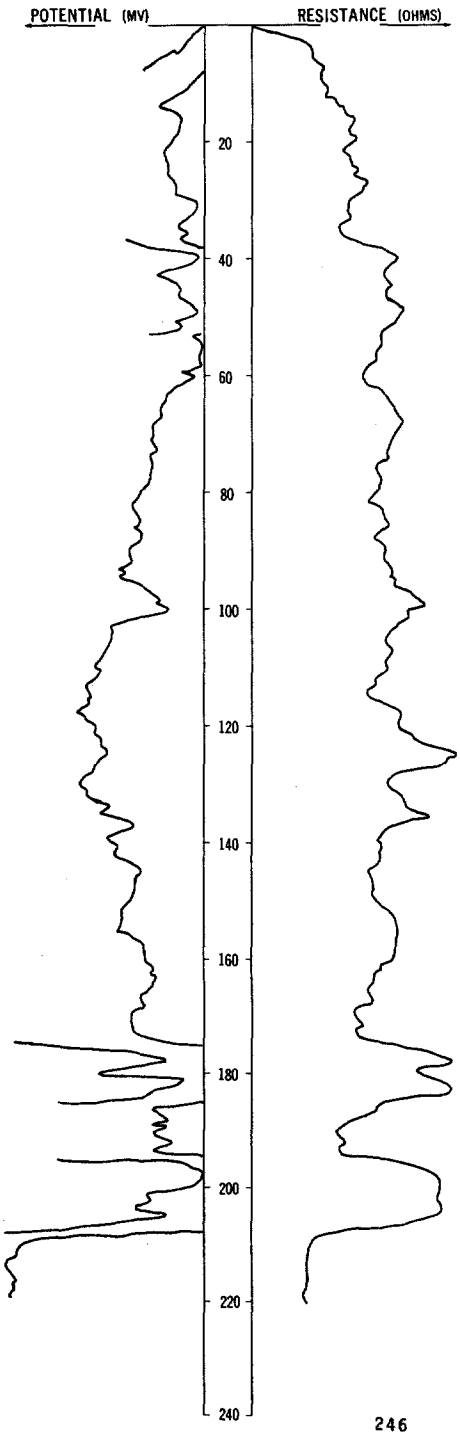
NDSWC 9664

LOCATION: 130-069-33AAA1

DATE DRILLED: 7/28/76

ALTITUDE: 1973
(FT, MSL)

DEPTH: 220
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-5	Sand, fine to very coarse, gravelly.
5-8	Silt, sandy, moderate-yellowish-brown.
8-16	Clay, light-brown.
16-32	Clay (till), silty, sandy, olive-gray; scattered pebbles.
32-33	Sand, gravelly.
33-38	Clay, silty, brownish-gray.
38-52	Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 40 percent quartz, 30 percent limestone, 20 percent shale, and 10 percent unidentified fragments.
52-70	Clay, silty, brownish-gray.
70-97	Clay (till), silty, sandy, olive-gray; scattered pebbles.
97-101	Sand, medium to very coarse, gravelly; composed largely of shale fragments.
101-122	Clay (till), silty, sandy, olive-gray; scattered pebbles.
122-128	Sand, fine to very coarse, predominantly medium, gravelly.
128-134	Clay (till), silty, sandy, olive-gray; scattered pebbles.
134-138	Gravel, sandy.
138-159	Clay (till), sandy, dusky-brown; scattered pebbles.
159-160	Gravel, sandy.
160-173	Clay (till), silty, sandy, olive-gray; scattered pebbles.
173-183	Gravel, very fine, sandy.
183-196	Clay, silty, grayish-brown.
196-208	Gravel, very fine, sandy.

PIERRE FORMATION

208-220	Shale, grayish-black, hard.

130-069-33AAA2
NDSWC 9664A

Altitude: 1973 feet — Date drilled: 7/28/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, gravelly	5	5
	Silt, sandy, moderate-yellowish-brown	3	8
	Clay, light-brown	8	16
	Clay (till), silty, sandy, olive-gray; scattered pebbles	15	31
	Sand and gravel	1	32
	Clay, silty, brownish-gray	8	40
	Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 40 percent quartz, 30 percent carbonate, 20 percent shale, and 10 percent unidentified fragments	20	60

130-069-33DAB
NDSWC 1568
(Log modified from Randich, 1961)

Altitude: 1975 feet

Glacial drift:			
	Topsoil, sandy, black	4	4
	Till, clayey, sandy, light-brown; fine to medium gravel	18	22
	Till, clayey, sandy, gray; fine to medium gravel; shale pebbles; and lignite fragments	115	137
	Gravel, fine to medium; coarse sand; shale pebbles; and lignite fragments	13	150
Pierre Formation:			
	Shale, gray	8	158

130-069-36DDD
NDSWC 9522

Altitude: 1919 feet — Date drilled: 12/09/75

Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	8	8
	Clay (till), sandy, silty, gravelly, olive-gray; boulders at 44 feet	117	125
	Sand, fine to very coarse, predominantly coarse, gravelly, angular to subrounded; composed of 60 percent quartz, 20 percent carbonate, 15 percent shale, and 5 percent unidentified fragments	23	148
	Clay (till), sandy, silty, olive-gray; scattered pebbles	12	160
Pierre Formation:			
	Shale, silty, black to grayish-black, hard	20	180

130-070-02CCC
NDSWC 9671

Altitude: 1968 feet — Date drilled: 7/29/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to coarse, clayey	3	3
	Clay, silty, brownish-gray	34	37
	Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 70 percent quartz, 20 percent shale, and 10 percent carbonate fragments	10	47
	Clay, sandy, brownish-gray	32	79
	Sand, fine to very coarse, and very fine gravel; composed of 60 percent quartz, 30 percent carbonate, and 10 percent shale fragments	5	84
	Clay (till), brownish-gray	15	99
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 65 percent quartz, 20 percent carbonate, and 15 percent shale fragments	23	122
	Clay, silty, sandy, brownish-gray	29	151
	Sand, very fine to very coarse, predominantly coarse, gravelly	16	167
Pierre Formation:			
	Shale, grayish-black, hard	13	180

130-070-06AAB
(Log from Venturia Well Drilling)

Date drilled: 10/31/74

Dirt, black	4	4
Clay	40	44
Gravel	3	47

130-070-06AAC
(Log from Jacob Thurn)

Date drilled: 10/09/72

Sand	14	14
Clay	6	20

130-070-07AAA
NDSWC 9678

Altitude: 2077 feet — Date drilled: 8/04/76

Glacial drift:			
	Clay (till), silty, sandy, dusky-brown; scattered pebbles	28	28
	Silt (till), clayey, sandy, moderate-yellowish-brown	16	44
Fox Hills Formation:			
	Sand, clayey, greenish-gray	34	78
	Sandstone, very fine to fine	2	80
	Clay, silty, sandy, brownish-gray	25	105
Pierre Formation:			
	Shale, grayish-black, hard	15	120

130-070-09ACB
(Log modified from Venturia Well Drilling)

Date drilled: 9/30/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	2	2
	Sand	21	23

130-070-12BBB
NDSWC 9670

Altitude: 2104 feet — Date drilled: 7/29/76

Glacial drift:			
	Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 80 percent quartz, 10 percent shale, and 10 percent unidentified fragments	15	15
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	2	17
	Clay (till), silty, sandy, olive-gray; scattered pebbles	27	44
Pierre Formation:			
	Shale, grayish-black, hard	16	60

130-070-13AAA
NDSWC 1562
(Log modified from Randich, 1961)

Altitude: 2054 feet

Glacial drift:			
	Topsoil, black	1	1
	Till, clayey, light-brown; fine to medium gravel	14	15
	Till, clayey, gray; fine to medium gravel; and shale pebbles	11	26
	Gravel, fine to medium	4	30
	Till, clayey, gray; fine to medium gravel; and shale pebbles	44	74
Pierre Formation:			
	Shale, light-gray, oxidized	21	95
	Shale, gray	20	115

130-070-16AAA
NDSWC 9680

Altitude: 1983 feet — Date drilled: 8/04/76

Glacial drift:			
	Sand, fine to very coarse, predominantly very coarse, gravelly	8	8
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	10	18
	Clay (till), silty, sandy, olive-gray; scattered pebbles	13	31
Pierre Formation:			
	Shale, grayish-black, hard	9	40

130-070-17CDA
(Log from Jacob Thurn)

Date drilled: 10/03/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	4	4
	Sand	11	15
	Clay, blue	30	45

130-070-17DDA
(Log from Jacob Thurn)

Date drilled: 10/02/72

	Dirt, black	4	4
	Clay, yellow	16	20
	Clay, blue	35	55
	Sand	5	60

130-070-23ADA
NDSWC 9669

Altitude: 2074 feet — Date drilled: 7/29/76

Glacial drift:			
	Clay, silty, dusky-brown	6	6
	Clay, moderate-yellowish-brown	8	14
	Clay, silty, dusky-brown	3	17
	Clay, light-brownish-gray	2	19
	Clay, moderate-yellowish-brown	7	26
	Clay, silty, sandy, olive-gray	2	28
	Clay, silty, sandy; gravel lenses from 28 to 30 feet, 31 to 33 feet, and 42 to 43 feet	35	63
	Clay (till), silty, sandy, olive-gray; scattered pebbles	57	120
Pierre Formation:			
	Shale, grayish-black, hard	20	140

130-070-23CDD
NDSWC 1574
(Log modified from Randich, 1961)

Glacial drift:			
	Topsoil, sandy, black	4	4
	Clay, light-gray; fine to coarse sand	7	11
	Clay, sandy, gray	9	20
	Sand, very fine to fine, silty	11	31
	Clay, sandy, gray	31	62
	Till, clayey, gray; fine to medium gravel; shale pebbles; and lignite fragments	13	75
	Gravel, fine to medium; shale pebbles; and lignite fragments	2	77
	Till, clayey, gray; fine to medium gravel, shale pebbles, and lignite fragments	67	144
Pierre Formation:			
	Shale, gray	4	148

130-070-25AAA
NDSWC 1564
(Log from Randich, 1961)

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	4	4
	Clay, sandy, light-brown	22	26
	Clay, sandy, gray	29	55
	Till, clayey, gray; fine to medium gravel; shale pebbles; and lignite fragments	102	157
	Gravel, fine to coarse; shale pebbles; and lignite fragments	20	177
	Till, clayey, gray; fine to medium gravel; and shale pebbles	12	189

130-070-26CCC
NDSWC 1575
(Log modified from Randich, 1961)

Altitude: 1985 feet

Glacial drift:			
	Topsoil, sandy, black	4	4
	Sand, fine to medium, silty	7	11
	Clay, sandy, light-brown	5	16
	Clay, sandy, gray	47	63
	Till, clayey, gray; fine to medium gravel; shale pebbles; and lignite fragments	85	148
Pierre Formation:			
	Shale, clayey, gray	10	158

130-070-28ADD
NDSWC 9683

Altitude: 1972 feet Date drilled: 8/04/76

Glacial drift:			
	Clay (till), silty, sandy, dusky-yellowish-brown	9	9
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	6	15
	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel lens from 51 to 52 feet	42	57
Pierre Formation:			
	Shale, grayish-black, hard	23	80

130-070-29BBB
NDSWC 1567
(Log modified from Randich, 1961)

Altitude: 2023 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, black	4	4
	Till, clayey, light-brown; fine gravel	8	12
	Till, clayey, gray; fine to medium gravel; and shale pebbles	156	168
Pierre Formation:			
	Shale, clayey, gray	11	179

130-070-30ADA
NDSWC 9681

Altitude: 2015 feet Date drilled: 8/04/76

Glacial drift:			
	Gravel, very fine, sandy	2	2
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	11	13
	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel lens from 62 to 63 feet	101	114
	Clay (till), silty, brownish-gray; contains thin gravel lenses	5	119
Pierre Formation:			
	Shale, grayish-black, hard	21	140

130-070-33CAA
NDSWC 1573
(Log modified from Randich, 1961)

Altitude: 1989 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, black	2	2
	Clay, sandy, light-gray	9	11
	Gravel, fine to medium; coarse sand	5	16
	Till, clayey, light-gray; fine to medium gravel; and shale pebbles	56	72
	Gravel, fine to coarse	6	78
	Till, clayey, gray; fine to medium gravel; and shale pebbles	27	105
Pierre Formation:			
	Shale, clayey, gray	10	115

130-070-36BBB
NDSWC 1576
(Log modified from Randich, 1961)

Altitude: 1999 feet

Glacial drift:			
	Topsoil, sandy, black	4	4
	Clay, light-brown	17	21
	Clay, light-gray	31	52
	Gravel, fine to medium; coarse sand; shale pebbles; and lignite fragments	11	63
	Clay, silty, olive-gray	44	107
	Till, clayey, gray; fine to medium gravel; and shale pebbles	55	162
Pierre Formation:			
	Shale, gray	6	168

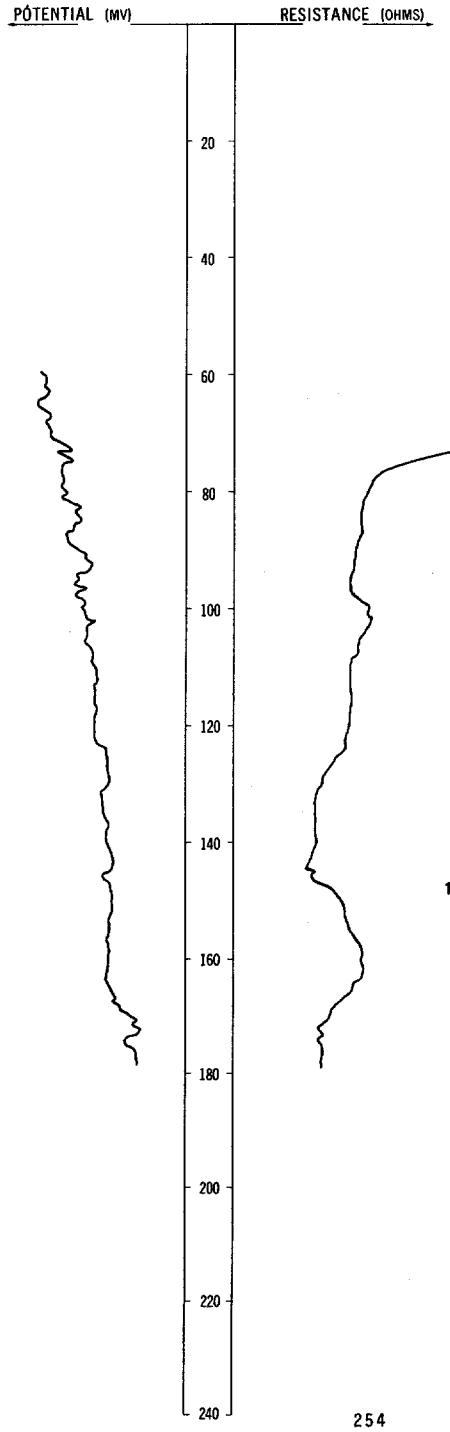
NDSWC 5246

LOCATION: 130-071-03DDD

DATE DRILLED: 9/29/77

ALTITUDE: 2093
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

15-47 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

47-73 Sand, fine to very coarse, predominantly coarse, subangular to rounded; gravel and cobbles are composed largely of carbonate and shale fragments.

FOX HILLS FORMATION

73-150 Clay, sandy, silty, greenish-gray, glauconitic.

PIERRE FORMATION(?)

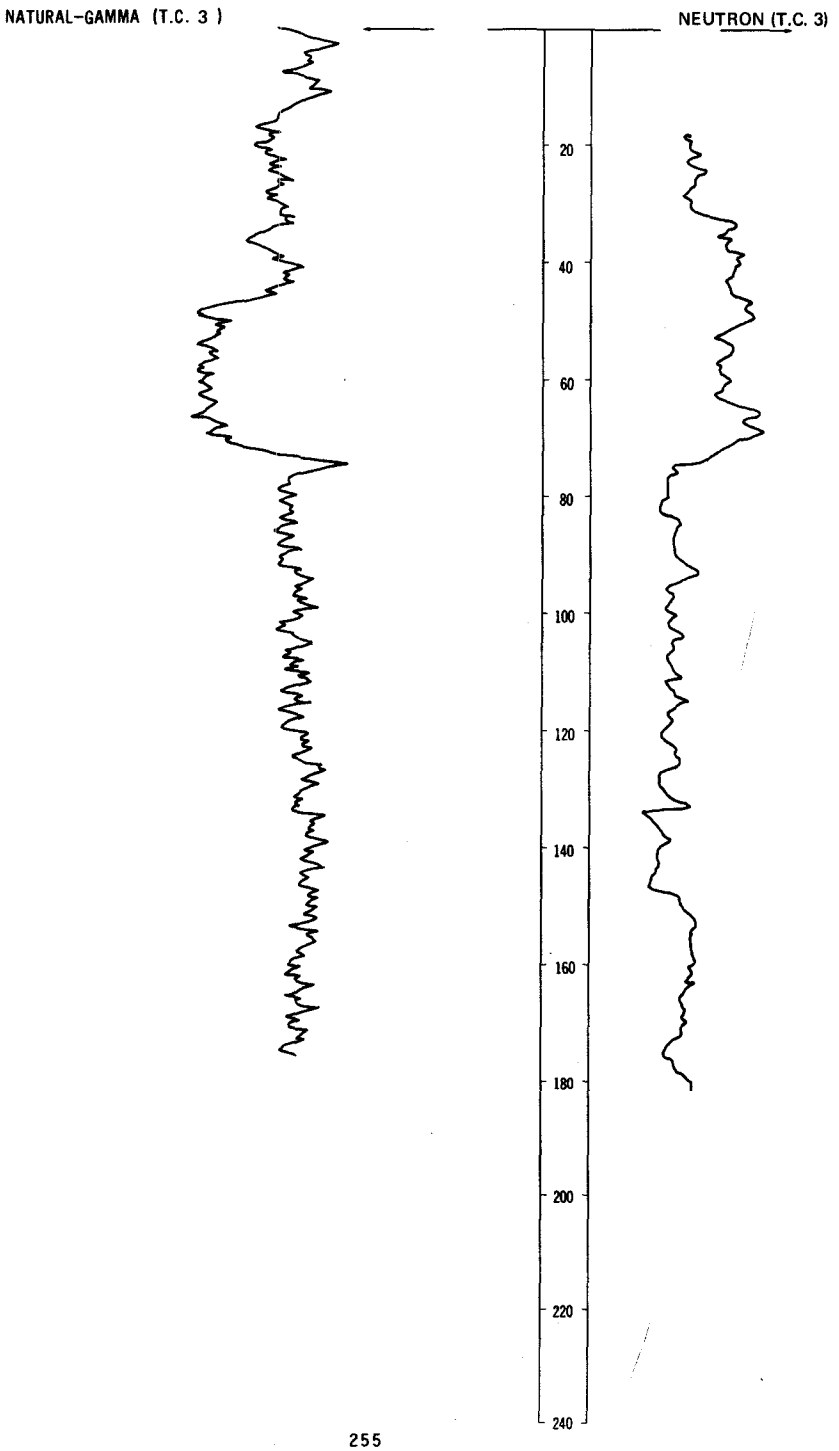
150-182 Clay, sandy, silty, medium-gray to medium-dark-gray, bentonitic.

LOCATION: 130-071-03DDD

DATE DRILLED: 9/29/77

ALTITUDE: 2093
(FT, MSL)

DEPTH: 182
(FT)



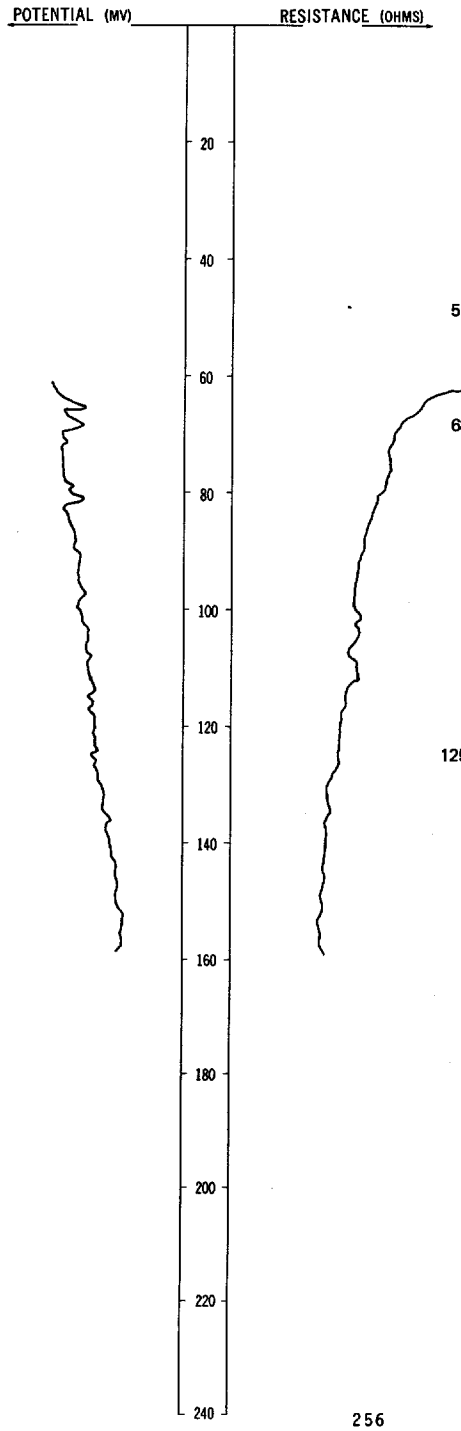
NDSWC 5167

LOCATION: 130-071-05CCC

DATE DRILLED: 8/11/77

ALTITUDE: 2138
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-50 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

50-68 Clay (till), sandy, silty, gravelly, medium-gray to olive-gray.

FOX HILLS FORMATION(?)

68-125 Clay, silty, sandy, medium-gray to dark-gray; carbonaceous streaks.

PIERRE FORMATION

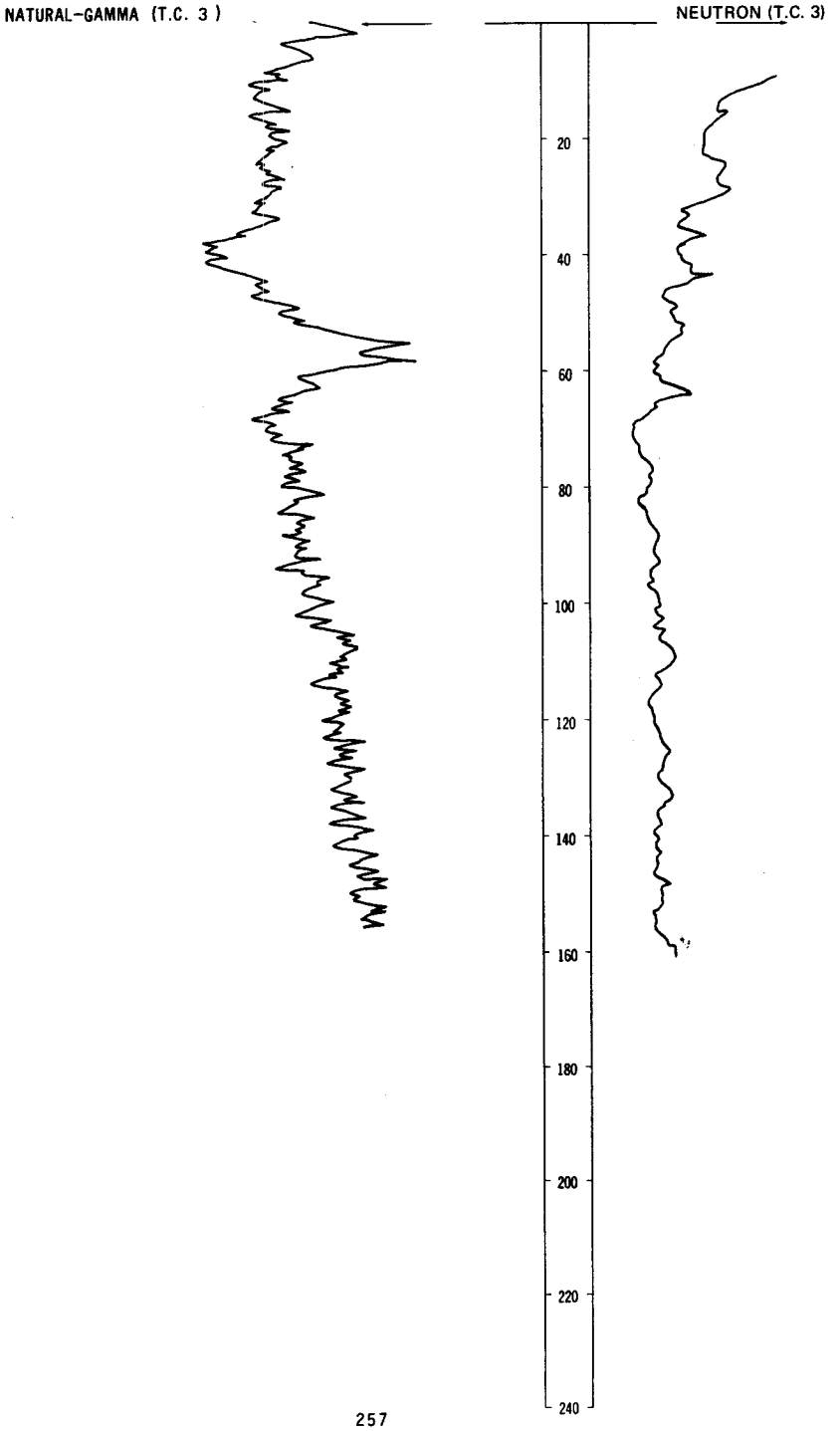
125-162 Shale, silty, sandy, medium-gray to dark-gray.

LOCATION: 130-071-05CCC

DATE DRILLED: 8/11/77

ALTITUDE: 2138
(FT, MSL)

DEPTH: 162
(FT)



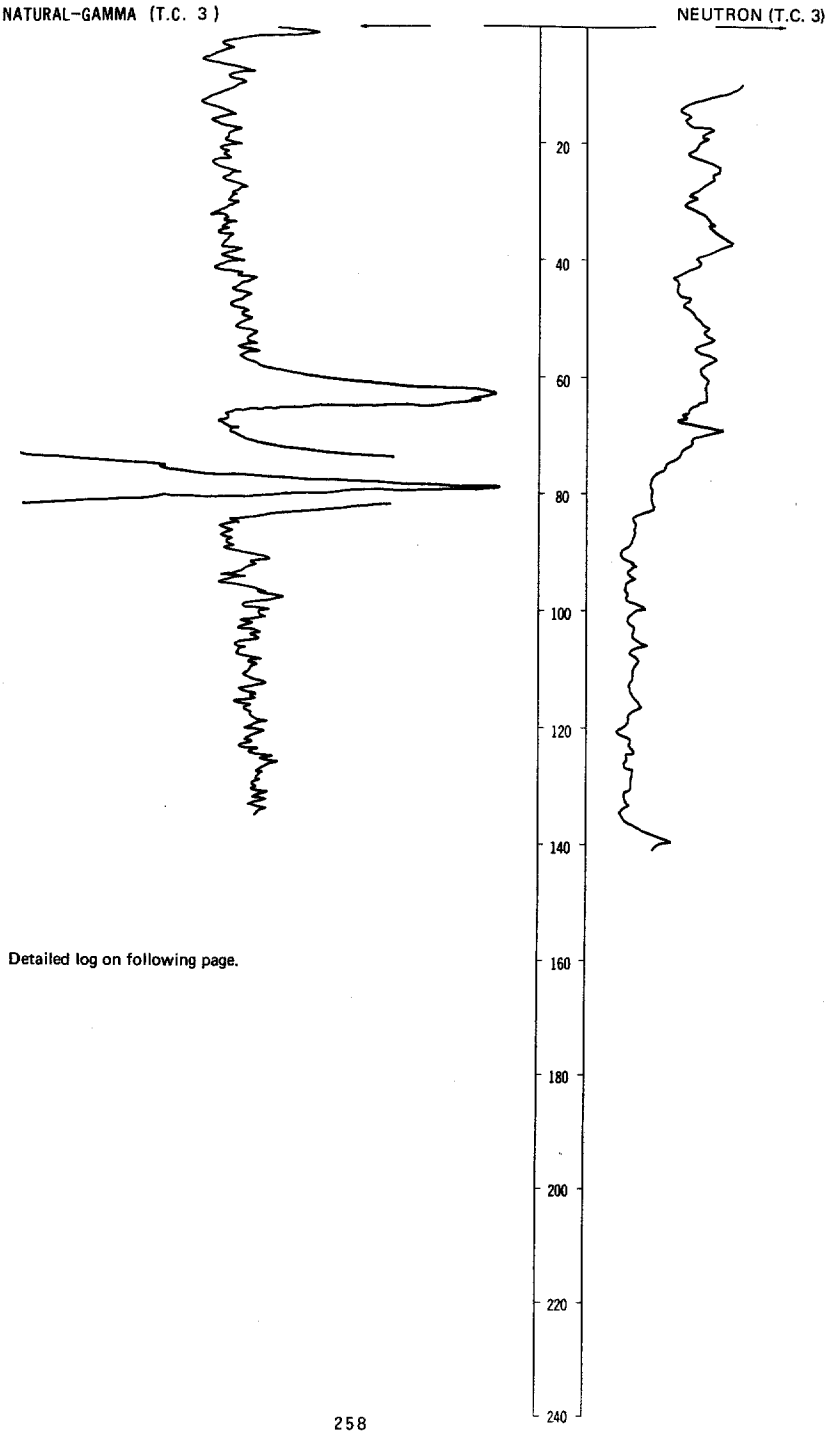
NDSWC 5165

LOCATION: 130-071-08CBB

DATE DRILLED: 8/10/77

ALTITUDE: 2116
(FT, MSL)

DEPTH: 142
(FT)



NOTE: Detailed log on following page.

Altitude: 2116 feet — Date drilled: 8/10/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, coarse to very coarse, gravelly, angular to subrounded; gravel is composed largely of carbonate and shale fragments	6	6
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	24	30
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles	66	96
Fox Hills Formation(?):			
	Clay, sandy, silty, medium-light-gray to medium-gray, micaceous	29	125
Pierre Formation(?):			
	Clay, silty, medium-gray to grayish-black, micaceous	17	142

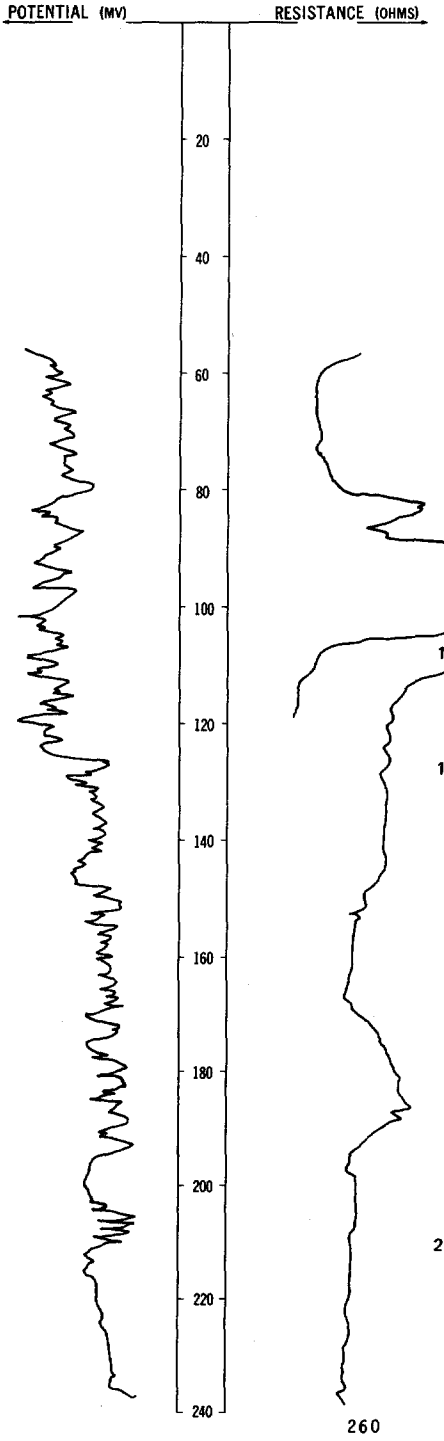
NDSWC 5166

LOCATION: 130-071-09AAA

DATE DRILLED: 8/11/77

ALTITUDE: 2117
(FT, MSL)

DEPTH: 242
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-6 Gravel, fine to medium, subangular to subrounded; composed largely of carbonate and shale fragments.

6-25 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

25-80 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

80-108 Gravel, fine to medium, sandy, subangular to subrounded; composed largely of carbonate fragments.

108-127 Clay (till), sandy, silty, medium-gray to greenish-gray; scattered pebbles.

FOX HILLS FORMATION

127-213 Clay, sandy, dark-green; interbedded with grayish-black siliceous shale.

PIERRE FORMATION

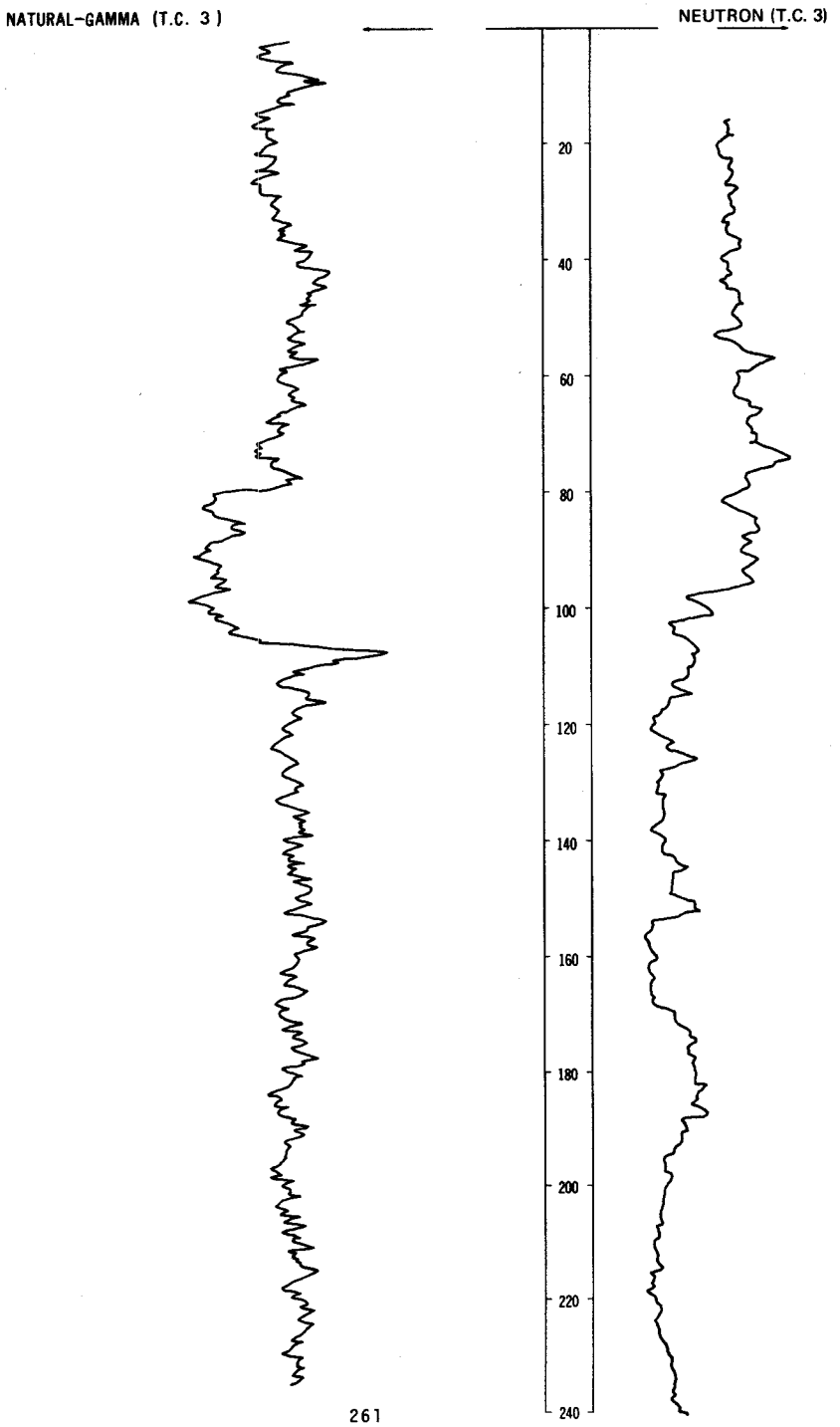
213-242 Shale, sandy, grayish-black to black, siliceous.

LOCATION: 130-071-09AAA

DATE DRILLED: 8/11/77

ALTITUDE: 2117
(FT, MSL)

DEPTH: 242
(FT)



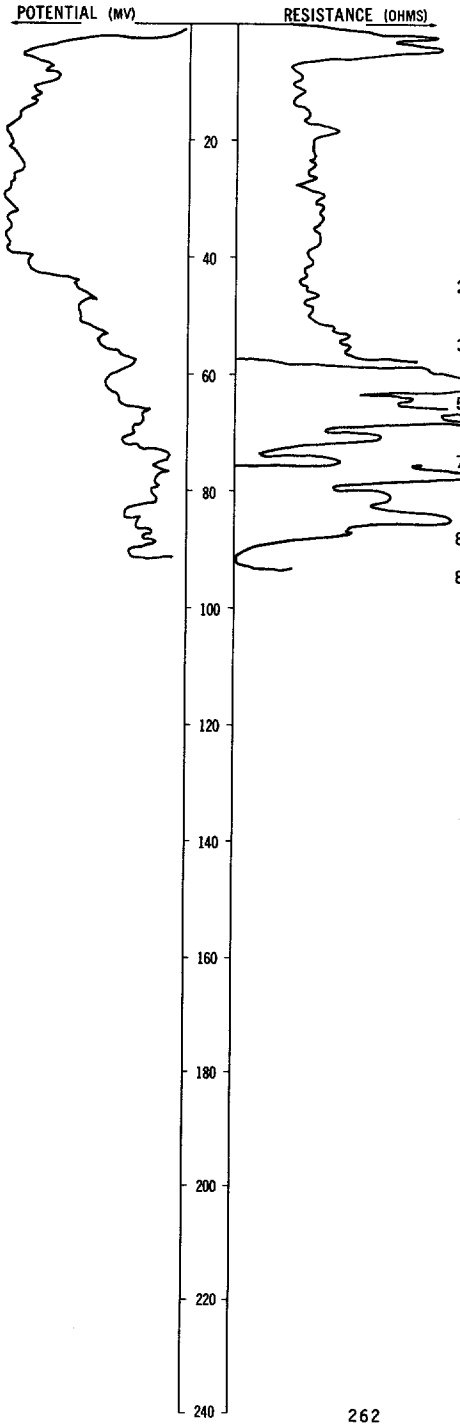
NDSWC 9686

LOCATION: 130-071-09BBB

DATE DRILLED: 8/05/76

ALTITUDE: 2114
(FT, MSL)

DEPTH: 100
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-6	Sand, very fine to very coarse, predominantly very coarse, gravelly; composed of 35 percent quartz, 30 percent shale, 25 percent carbonate, and 10 percent unidentified fragments.
6-28	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
28-36	Clay (till), silty, sandy, dusky-yellow; scattered pebbles.
36-58	Clay (till), silty, sandy, olive-gray; scattered pebbles.
58-71	Sand, very fine to very coarse, predominantly very coarse, gravelly.
71-82	Gravel, very fine, sandy.

FOX HILLS FORMATION(?)

82-89	Clay, sandy, greenish-brown.
89-100	Shale, grayish-black, hard.

130-071-13BAA
NDSWC 9679

Altitude: 2038 feet — Date drilled: 8/04/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown	16	16
	Clay (till), silty, sandy, olive-gray; scattered pebbles	18	34
Fox Hills Formation(?):			
	Sand, very fine to fine, clayey, dusky-yellowish-green	24	58
	Clay, silty, brownish-gray	4	62
	Clay, silty, sandy, greenish-black	9	71
	Siltstone, dark-brown	1	72
Pierre Formation:			
	Shale, grayish-black, hard	8	80

130-071-19DCD
(Log from Jacob Thurn)

Date drilled: 5/06/72

	Dirt, black	3	3
	Clay, yellow	65	68
	Clay, sandy	10	78

130-071-20DDD
NDSWC 9685

Altitude: 2175 feet — Date drilled: 8/05/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	31	31
	Clay (till), silty, sandy, olive-gray; scattered pebbles	22	53
Fox Hills Formation:			
	Clay, medium-yellowish-brown, bentonitic	4	57
	Sandstone, very fine to medium, moderate-yellowish-brown	52	109
	Sand, very fine to fine, clayey, greenish-black	22	131
	Clay, silty, grayish-brown	31	162
Pierre Formation:			
	Shale, grayish-black, hard	18	180

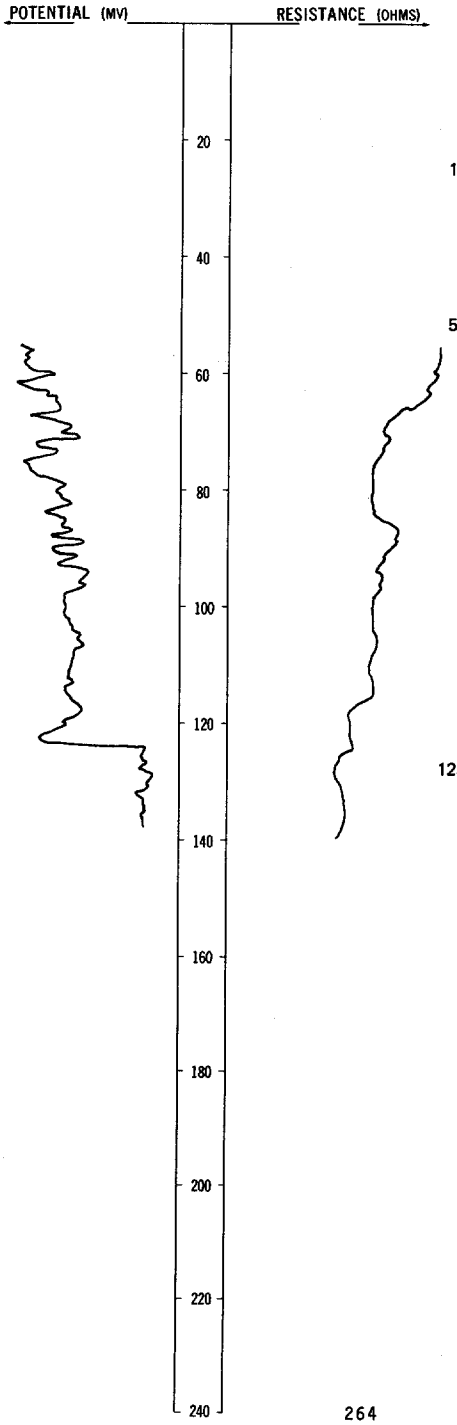
NDSWC 5247

LOCATION: 130-071-26BBA

DATE DRILLED: 9/29/77

ALTITUDE: (FT, MSL)

DEPTH: 142 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-17 Clay (till), sandy, silty, reddish-brown to brownish-gray; scattered pebbles.

17-50 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

FOX HILLS FORMATION

50-125 Sand, very fine to fine, clayey, dark-greenish-gray.

PIERRE FORMATION

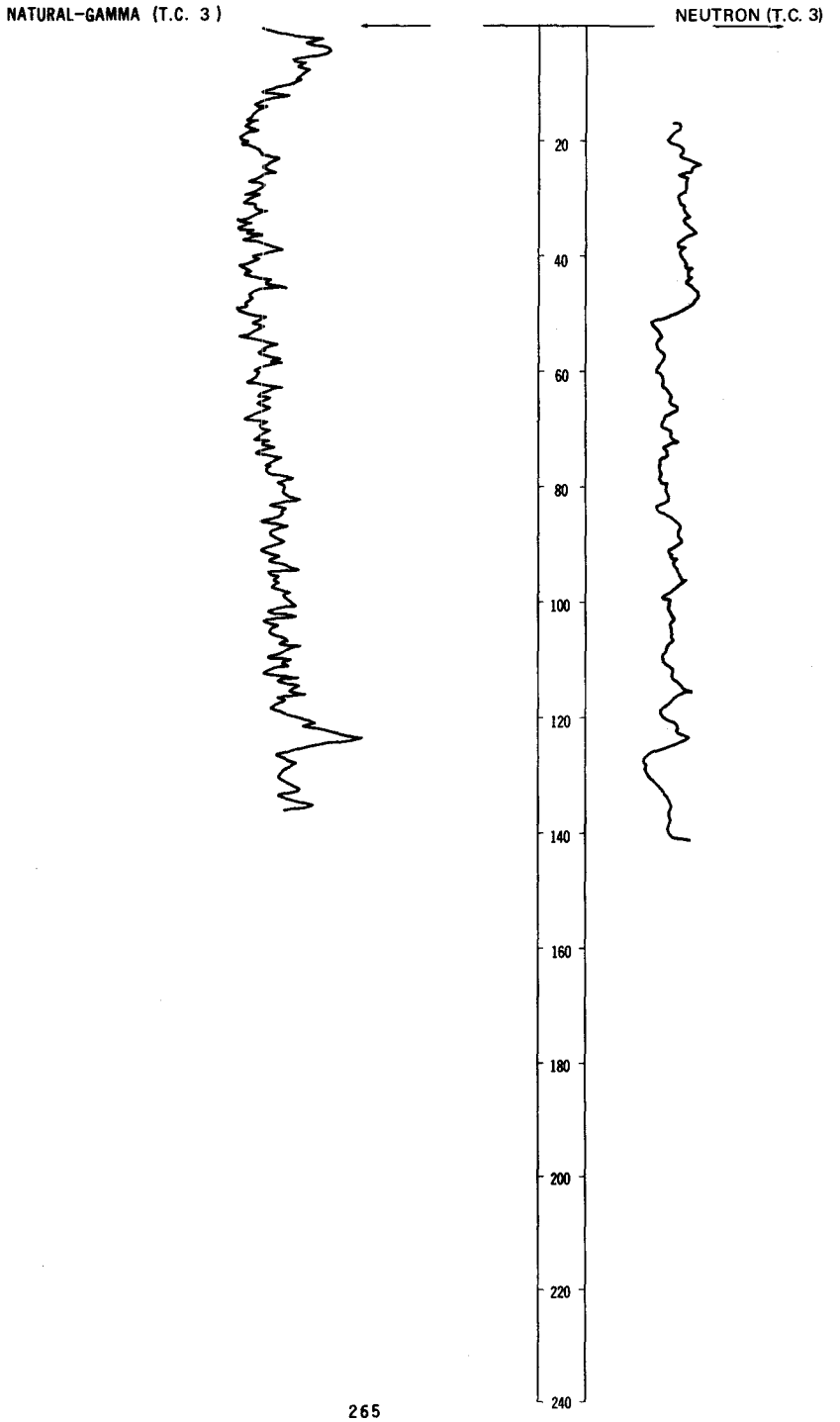
125-142 Shale, sandy, black to grayish-black, hard.

LOCATION: 130-071-26BBA

DATE DRILLED: 9/29/77

ALTITUDE:
(FT, MSL)

DEPTH: 142
(FT)



130-071-33BCA
(Log from Venturia Well Drilling)

Date drilled: 6/04/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	1	1
	Clay	15	16
	Sand	2	18
	Clay, blue	48	66
	Shale	10	76

130-072-02ACC
(Log from Baumgartner Drilling Co.)

Date drilled: 7/13/72

	Clay, brown	40	40
	Clay, bluish-gray	80	120
	Sand, gray	3	123
	Sand, blue	15	138
	Sand	6	144
	Clay, gray	4	148
	Sand, fine to coarse; mixed with clay	22	170

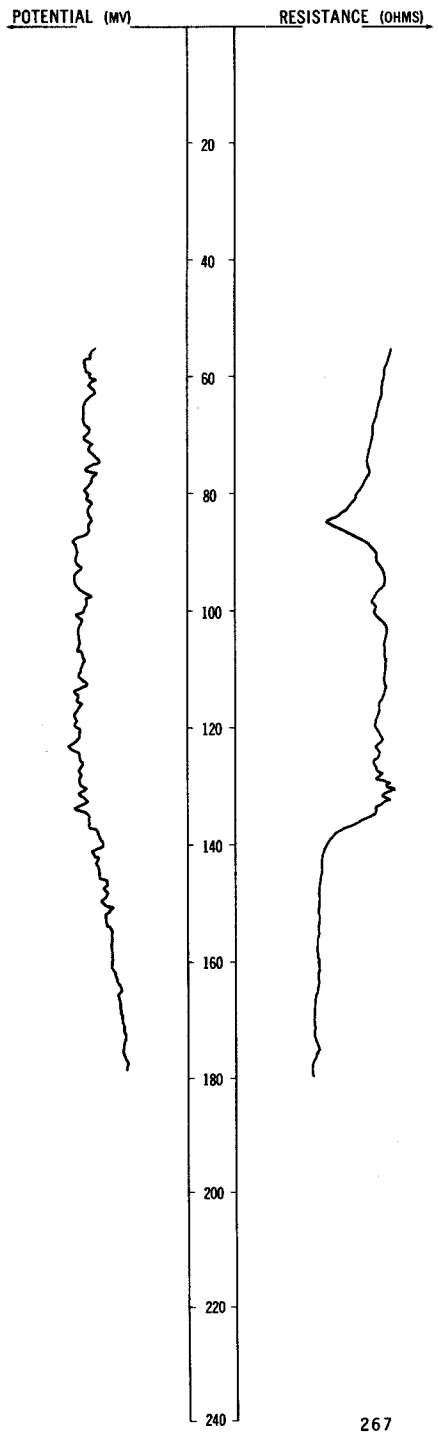
NDSWC 5162

LOCATION: 130-072-02DDD

DATE DRILLED: 8/10/77

ALTITUDE: 2152
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-6 Gravel, fine to coarse, angular to subangular; composed largely of carbonate fragments.

6-50 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

50-86 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

FOX HILLS FORMATION

86-138 Clay, sandy, silty, medium-light-gray; some dark-green streaks.

PIERRE FORMATION

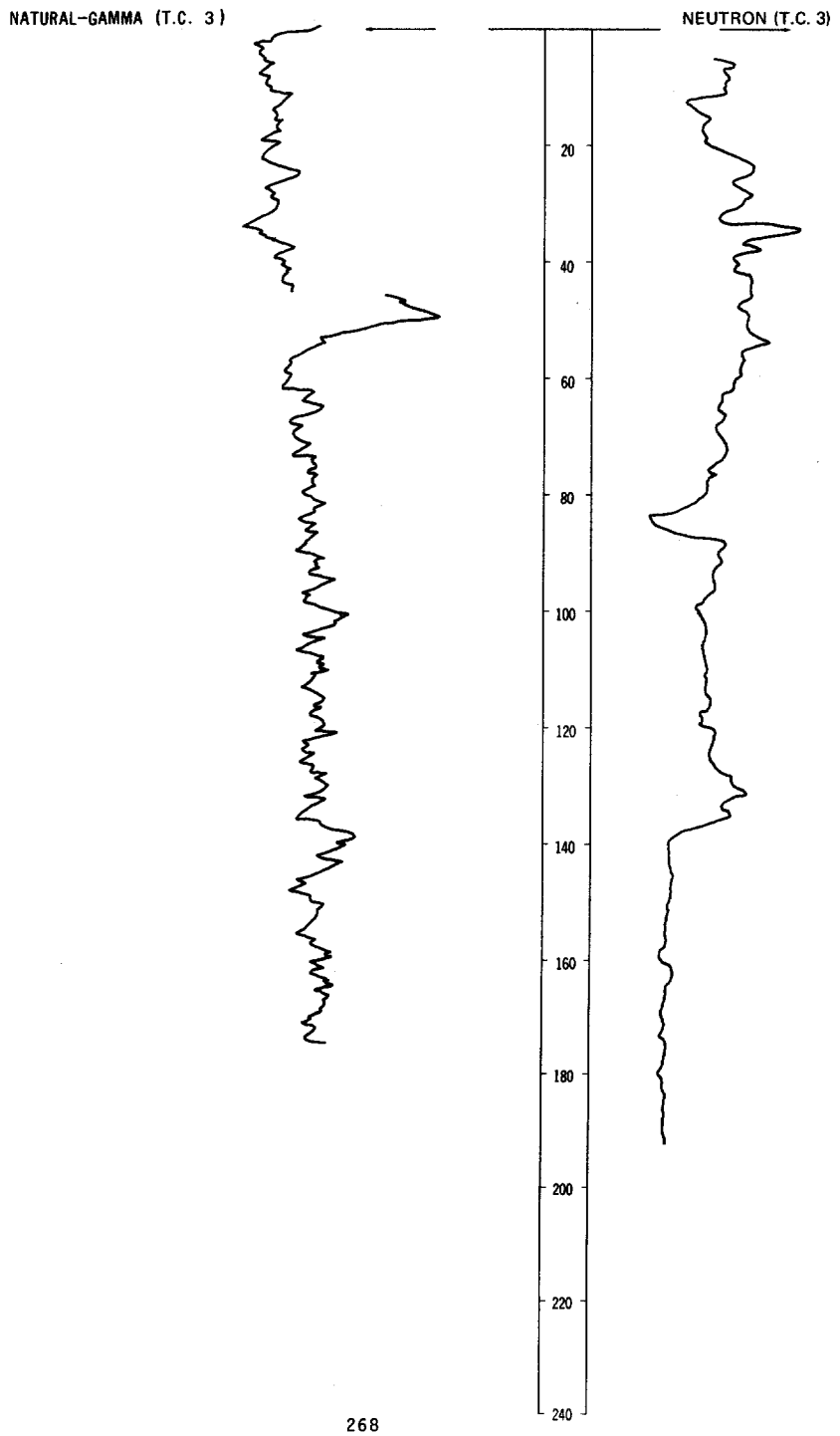
138-182 Clay, silty, sandy, medium-dark-gray.

LOCATION: 130-072-02DDD

DATE DRILLED: 8/10/77

ALTITUDE: 2152
(FT, MSL)

DEPTH: 182
(FT)



130-072-03BBB
(Log from Jacob Thurn)

Date drilled: 10/13/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	3	3
	Clay, yellow	21	24
	Shale, blue	21	45

130-072-07DBA
(Log from Jacob Thurn)

Date drilled: 6/25/74

	Topsoil	3	3
	Sand	17	20
	Clay, blue	30	50
	Sand	5	55

130-072-07DCA
(Log from Jacob Thurn)

Date drilled: 6/30/73

	Sand	5	5
	Clay, yellow	25	30
	Sand	9	39
	Clay, blue	11	50

130-072-08AAA
NDSWC 9693

Altitude: 2074 feet

Date drilled: 8/06/76

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 40 percent quartz, 30 percent carbonate, 20 percent shale, and 10 percent unidentified fragments	7	7
	Clay, silty, moderate-yellowish-brown	10	17
	Clay, silty, olive-gray	11	28
Pierre Formation:			
	Shale, medium-gray, hard	32	60

130-072-10ABD
(Log from Jacob Thurn)

Date drilled: 9/21/72

	Topsoil, black	5	5
	Clay	80	85

130-072-13ABD
(Log from Jacob Thurn)

Date drilled: 10/05/73

	Topsoil, black	4	4
	Clay, yellow	26	30
	Sand	1	31
	Clay, yellow	25	56

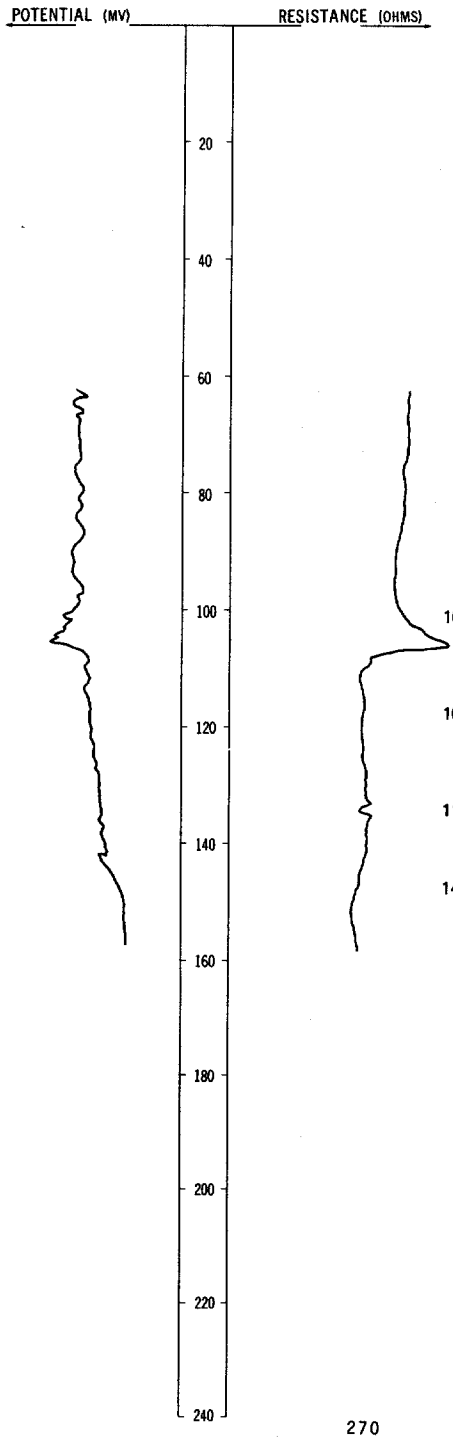
NDSWC 5180

LOCATION: 130-072-20DDD

DATE DRILLED: 8/17/77

ALTITUDE: 2003
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-22 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

22-50 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

50-102 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

102-107 Sand, coarse to very coarse, sub-angular to rounded, oxidized.

FOX HILLS FORMATION

107-115 Clay, silty, yellowish-green to light-green.

PIERRE FORMATION

115-147 Clay; medium-dark-gray to greenish-black; interbedded with siltstone.

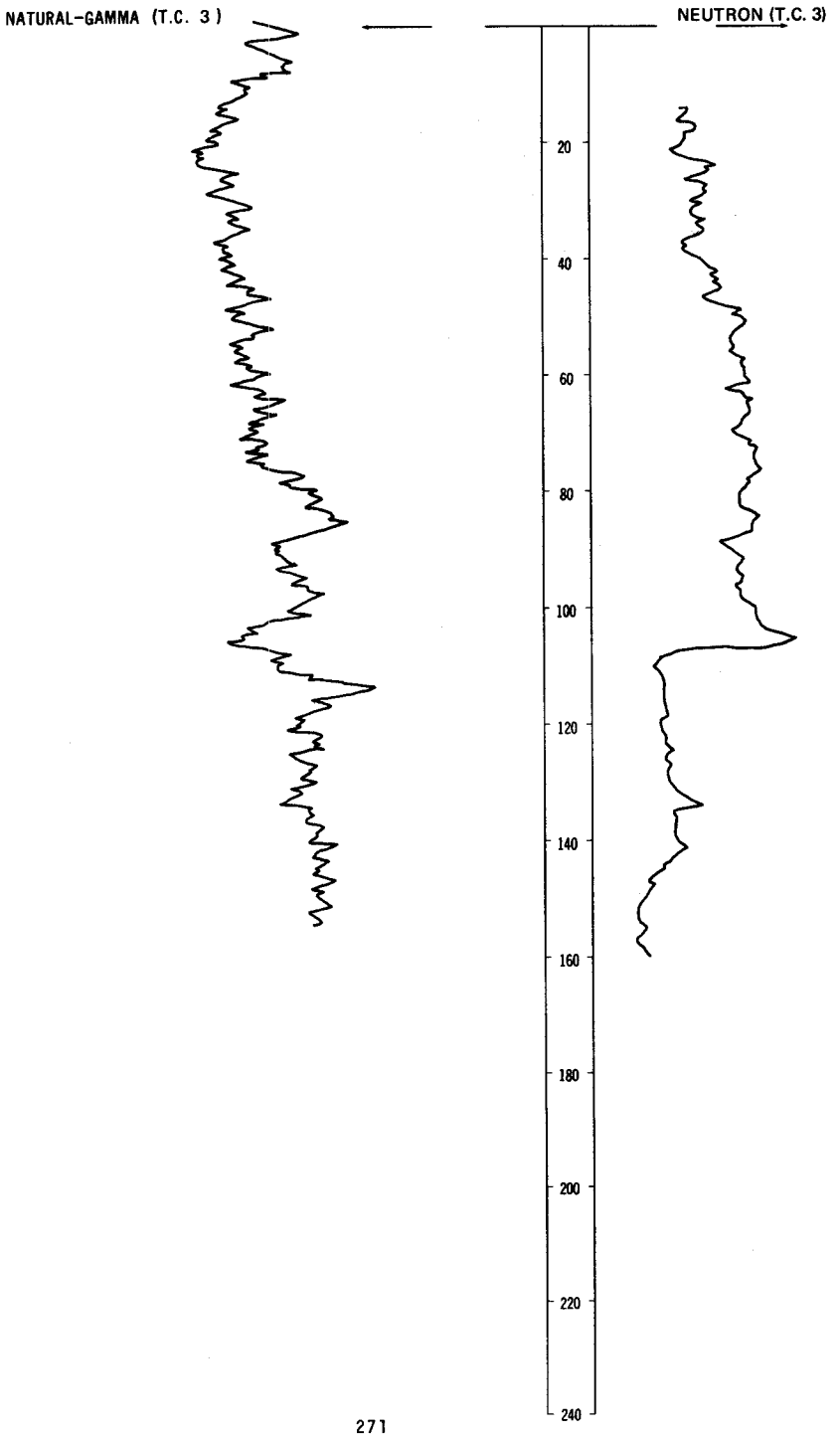
147-162 Shale, dark-gray to grayish-black, hard.

LOCATION: 130-072-20DDD

DATE DRILLED: 8/17/77

ALTITUDE: 2003
(FT, MSL)

DEPTH: 162
(FT)



130-072-22CCC
NDSWC 9695

Altitude:	2001 feet	Date drilled:	8/06/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	32	32
	Clay (till), silty, sandy, olive-gray; scattered pebbles	21	53
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	7	60
	Clay, olive-gray	2	62
	Clay (till), silty, sandy, moderate-yellowish-brown	35	97
	Clay (till), silty, sandy, olive-gray; scattered pebbles	17	114
	Gravel, sandy	3	117
Pierre Formation:			
	Shale, grayish-black, hard	23	140

130-072-23AAB
NDSWC 9694

Altitude:	1988 feet	Date drilled:	8/06/76
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	8	8
	Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles	16	24
	Clay (till), silty, sandy, olive-gray; scattered pebbles	51	75
	Gravel, fine to coarse, sandy	3	78
	Clay, olive-gray	5	83
Pierre Formation:			
	Shale, grayish-black	17	100

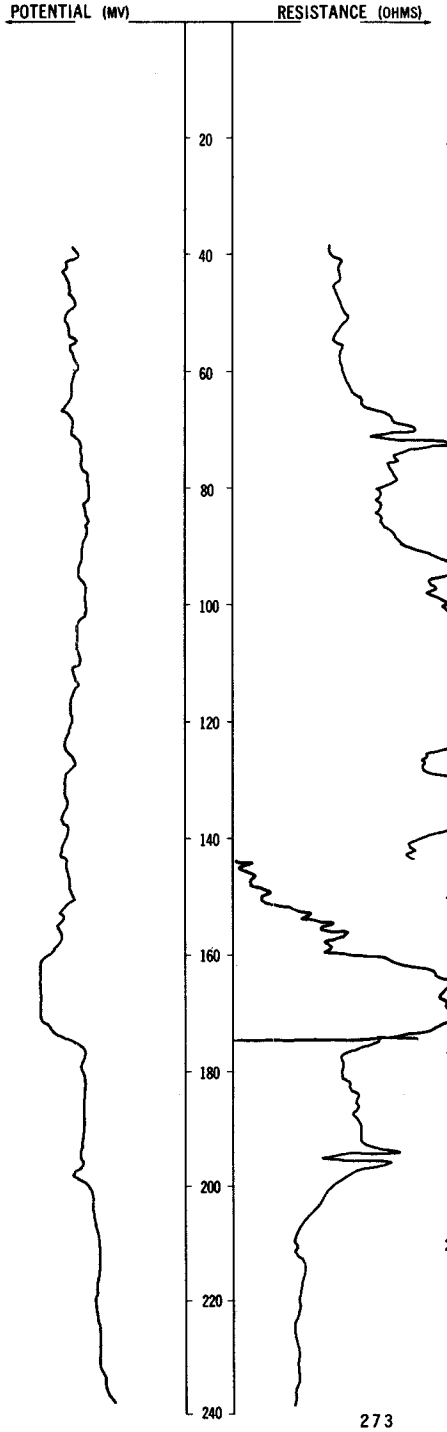
NDSWC 5249

LOCATION: 130-072-29CCC

DATE DRILLED: 9/29/77

ALTITUDE: 2142
(FT, MSL)

DEPTH: 242
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-50 Clay (till), sandy, silty, moderate-yellowish-brown, fractured; scattered pebbles.

50-70 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

70-152 Clay, sandy, silty, yellowish-brown.

152-176 Sand, fine to coarse, predominantly coarse, gravelly, subangular to rounded; gravel is composed of carbonate, shale, and granite fragments.

PIERRE FORMATION

176-214 Clay, sandy, silty, medium-dark-gray to grayish-black.

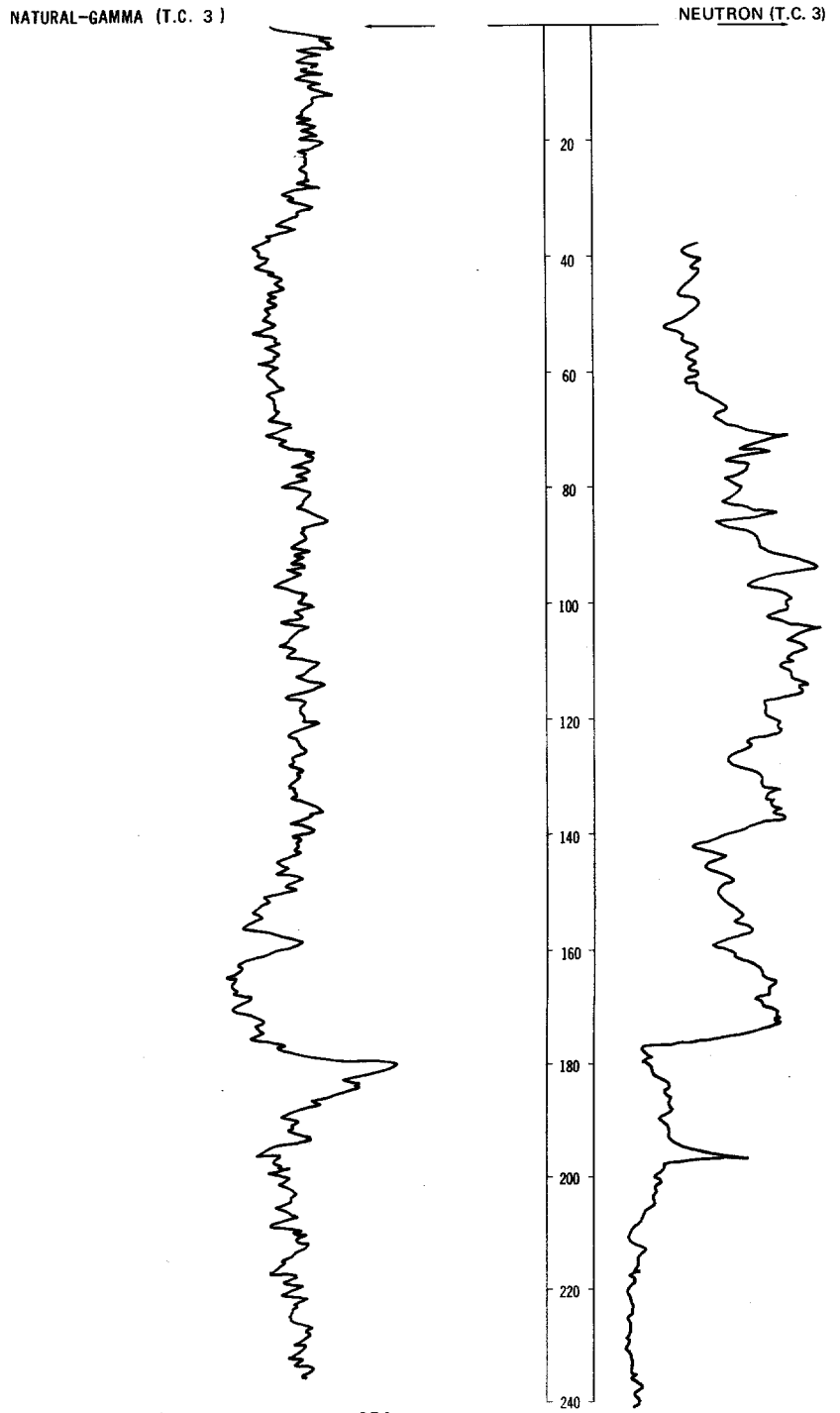
214-242 Shale, black to grayish-black, siliceous, hard.

LOCATION: 130-072-29CCC

ALTITUDE: 2142
(FT, MSL)

DATE DRILLED: 9/29/77

DEPTH: 242
(FT)



130-072-30BCC
NDSWC 5248

Date drilled: 9/29/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	18	18

130-072-31BBB
NDSWC 5169

Date drilled: 8/11/77

Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown; numerous boulders	82	82

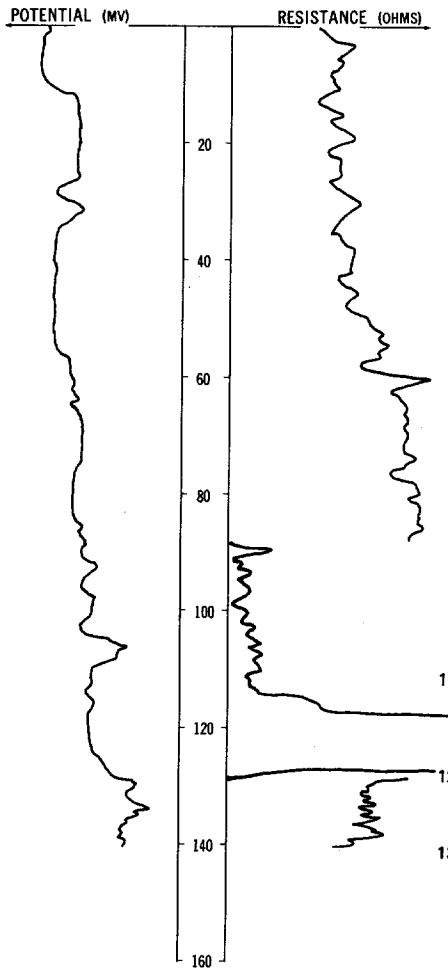
NDSWC 9645

LOCATION: 130-072-33DDD

DATE DRILLED: 7/21/76

ALTITUDE: 1956
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-32 Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.

32-115 Clay (till), silty, sandy, olive-gray; scattered pebbles.

115-128 Gravel, very fine, sandy; composed of 50 percent carbonate, 20 percent quartz, 20 percent unidentified, and 10 percent shale fragments.

128-134 Silt, clayey, grayish-brown.

PIERRE FORMATION

134-140 Shale, silty, very dark gray.

130-072-34DDD1
NDSWC 5181

Altitude: 1969 feet

Date drilled: 8/17/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	25	25
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	25	50

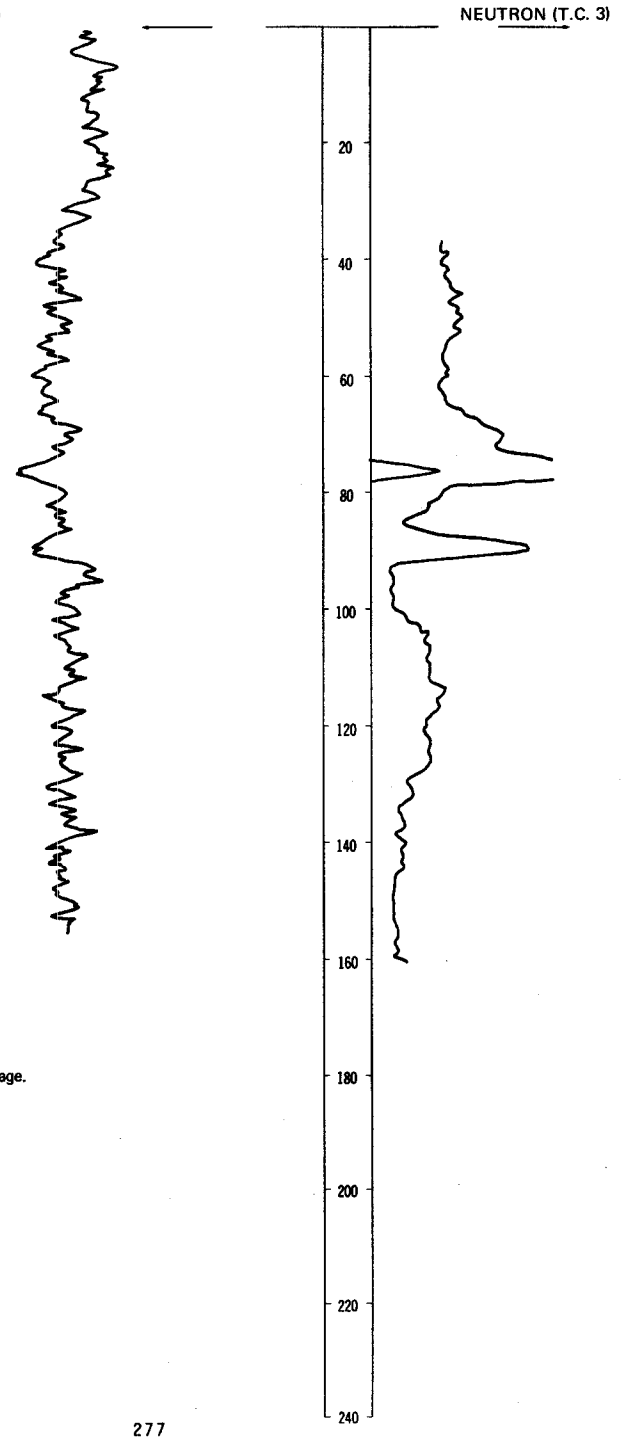
NDSWC 5181A

LOCATION: 130-072-34DDD2

DATE DRILLED: 8/18/77

ALTITUDE: 1969
(FT, MSL)

DEPTH: 162
(FT)



NOTE: Detailed log on following page.

130-072-34DDD2, Continued
NDSWC 5181A

Altitude: 1969 feet — Date drilled: 8/18/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	30	30
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; gravel lenses from 74 to 88 feet and 88 to 92 feet	62	92
Fox Hills Formation:			
	Sand, very fine to fine, silty, clayey, medium-gray to light-greenish-gray	36	128
Pierre Formation:			
	Siltstone, sandy, black to grayish-black	34	162

130-072-36CCC2
(Log from Venturia Well Drilling)

Date drilled: 4/03/76

Clay, brown	45	45
Clay, blue	35	80
Clay, yellow	35	115
Shale	35	150

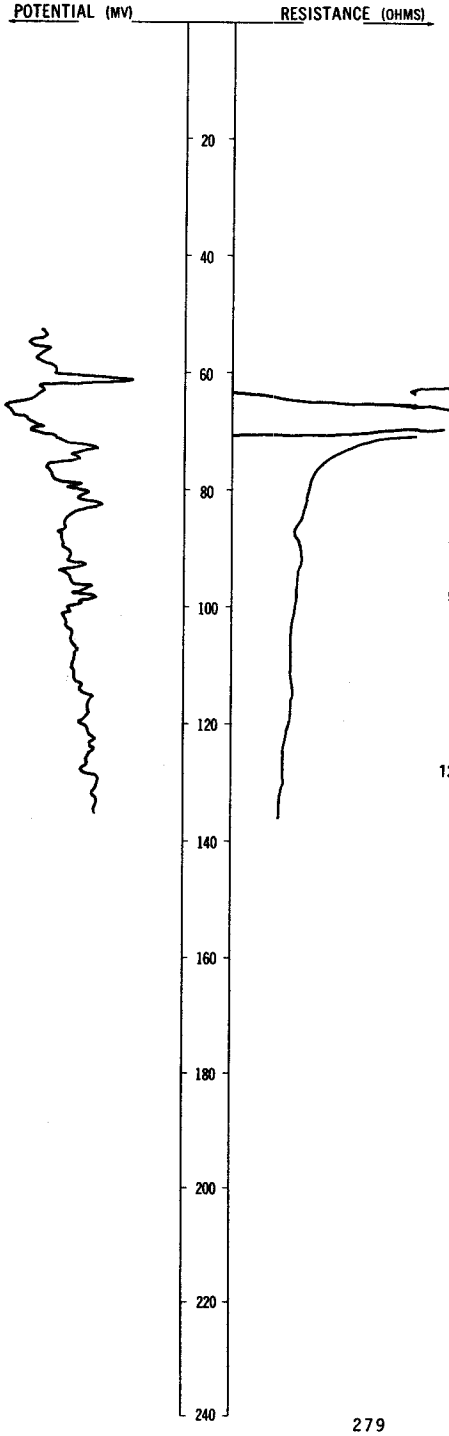
NDSWC 5160

LOCATION: 130-073-01AAA

DATE DRILLED: 8/09/77

ALTITUDE: 2037
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-71 Sand, medium to very coarse, subangular to subrounded; predominantly coarse sand below 20 feet; gravelly from 60 to 71 feet.

71-83 Clay—(till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

FOX HILLS FORMATION

83-98 Clay, sandy, medium-gray, greenish-gray, and dark-green.

98-124 Clay, silty, sandy, medium-dark-gray to dark-green.

PIERRE FORMATION

124-142 Shale, black to grayish-black, siliceous, hard.

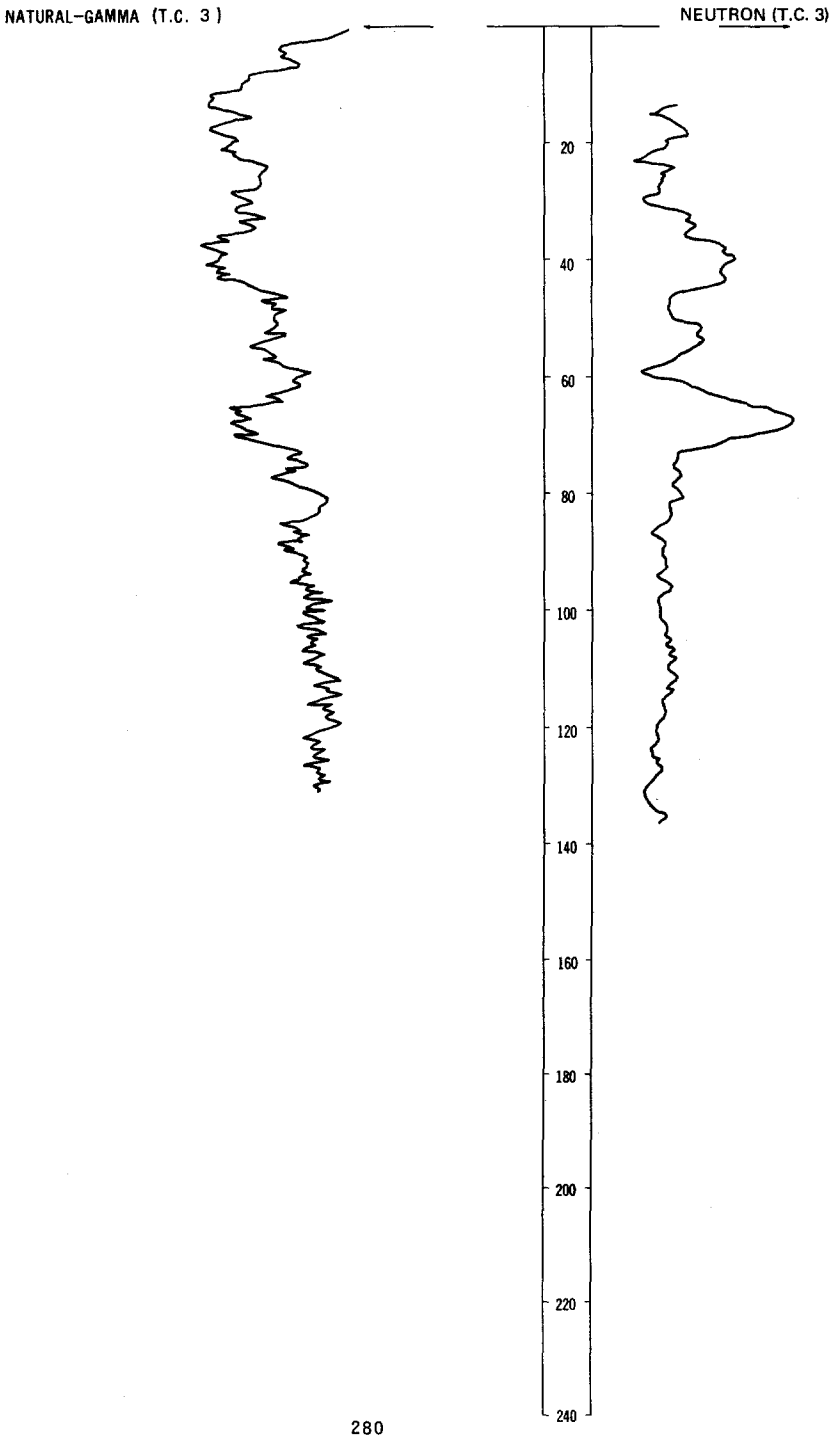
NDSWC 5160, Continued

LOCATION: 130-073-01AAA

DATE DRILLED: 8/09/77

ALTITUDE: 2037
(FT, MSL)

DEPTH: 142
(FT)



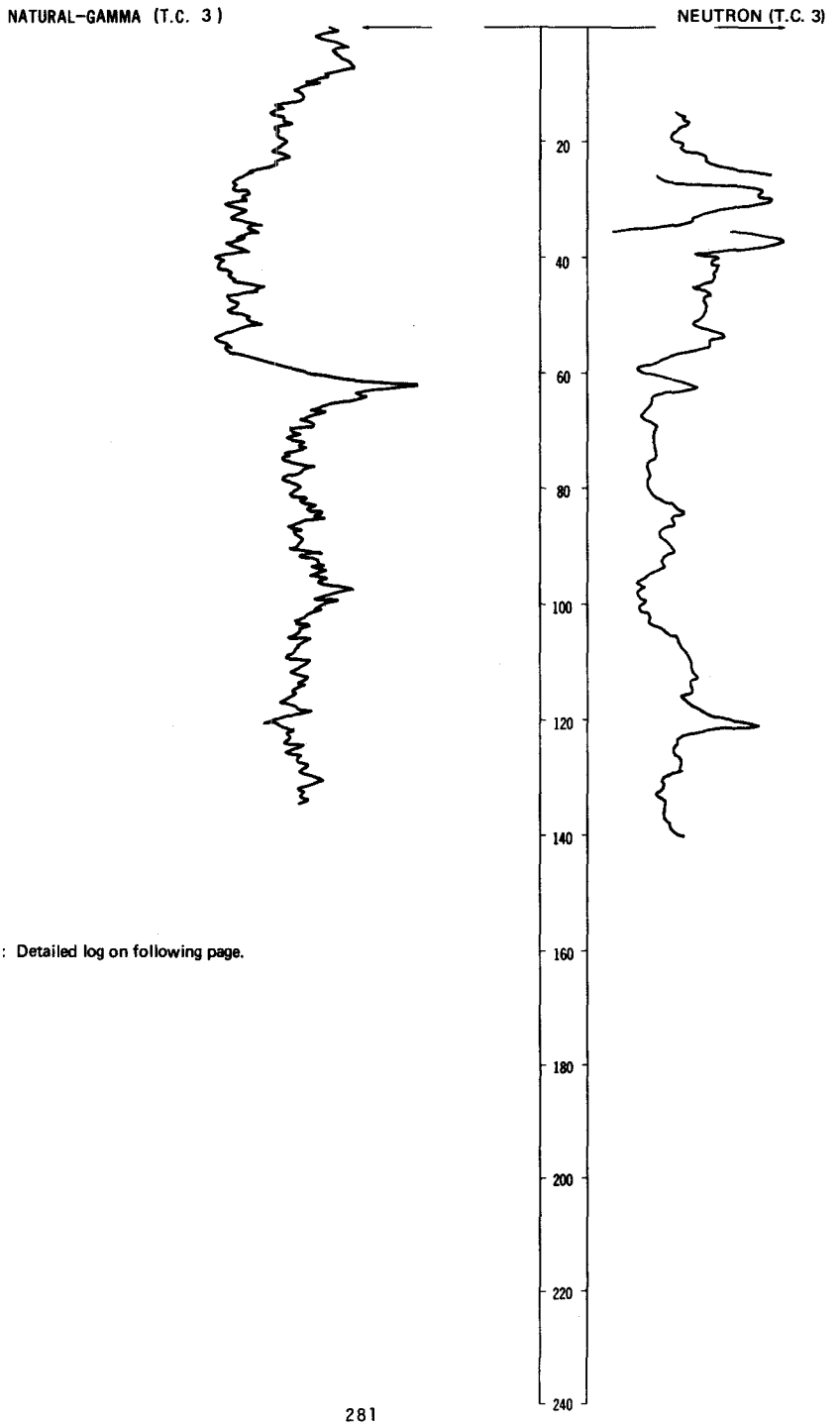
NDSWC 5161

LOCATION: 130-073-01DDD

DATE DRILLED: 8/10/77

ALTITUDE: 2068
(FT, MSL)

DEPTH: 142
(FT)



NOTE: Detailed log on following page.

130-073-01DDD, Continued
NDSWC 5161

Altitude:	2068 feet	Date drilled:	8/10/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	8	8
	Clay (till), sandy, silty, medium-dark-gray to olive-gray	17	25
	Clay (till), very sandy, moderate-yellowish-brown; scattered pebbles; very gravelly from 52 to 58 feet	34	59
Fox Hills Formation:			
	Clay, silty, sandy, medium-gray; numerous thin dark-gray glauconitic sand lenses	75	134
Pierre Formation:			
	Shale, grayish-black to black, siliceous, hard	8	142

130-073-02BBB
(Log from Jacob Thurn)

		Date drilled:	7/24/72
	Dirt, black	3	3
	Sand	41	44

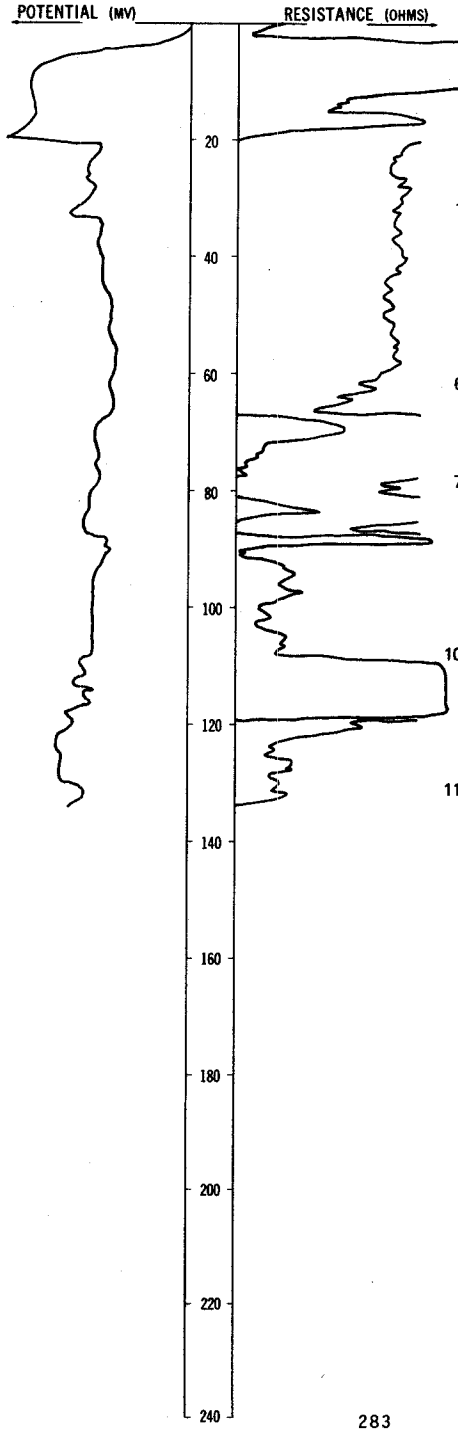
NDSWC 9702

LOCATION: 130-073-02CCC

DATE DRILLED: 8/10/76

ALTITUDE: 2030
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-19 Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 50 percent quartz, 40 percent carbonate, and 10 percent shale fragments.

19-64 Clay (till), silty, sandy, olive-gray; scattered pebbles.

64-78 Clay, brownish-gray.

78-109 Silt, clayey, sandy, brownish-gray; sand from 88 to 90 feet.

109-119 Gravel, very fine, sandy; composed of 50 percent carbonate, 40 percent quartz, and 10 percent shale fragments.

PIERRE FORMATION

119-140 Shale, grayish-black, hard.

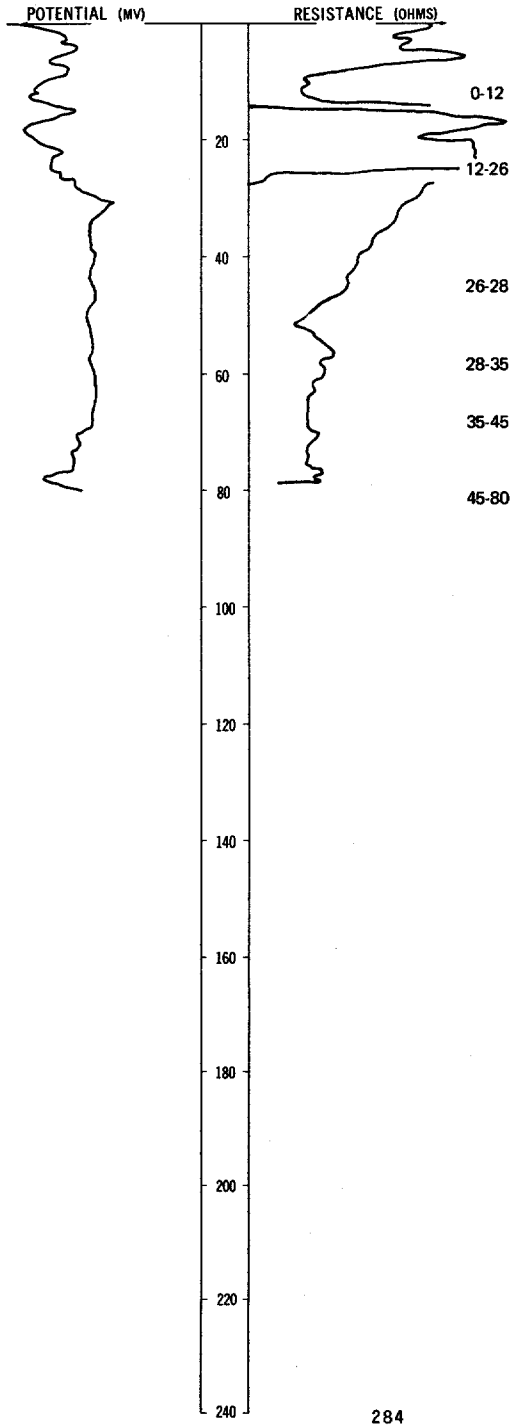
NDSWC 9699

LOCATION: 130-073-05AAA1

DATE DRILLED: 8/09/76

ALTITUDE: 1998
(FT, MSL)

DEPTH: 80
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12 Clay, silty, sandy, moderate-yellowish-brown; scattered pebbles and thin gravel lenses.

12-26 Gravel, very fine, and fine to very coarse sand; composed of 40 percent carbonate, 40 percent quartz, 15 percent unidentified, and 5 percent shale fragments.

26-28 Clay, brownish-gray.

FOX HILLS FORMATION

28-35 Sand, very fine to fine, clayey, greenish-gray.

35-45 Silt, clayey, sandy, greenish-gray.

PIERRE FORMATION

45-80 Shale, silty, dark-brownish-gray.

130-073-05AAA2
NDSWC 9699A

Altitude: 1998 feet — Date drilled: 8/09/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, moderate-yellowish-brown; interbedded with fine gravel	11	11
	Clay (till), silty, sandy, olive-gray	5	16
	Sand, fine to very coarse, and very fine gravel; composed of 40 percent quartz, 40 percent carbonate, 15 percent unidentified, and 5 percent shale fragments	10	26
	Clay, brownish-gray	2	28
Fox Hills Formation:			
	Sand, very fine to fine, clayey, greenish-gray	12	40

130-073-07ABB
NDSWC 9698

Altitude: 2022 feet — Date drilled: 8/09/76

Glacial drift:			
	Sand, fine to very coarse, gravelly; composed of 40 percent quartz, 40 percent carbonate, 10 percent shale, and 10 percent unidentified fragments	15	15
	Clay, moderate-yellowish-brown	2	17
	Clay (lacustrine), olive-gray	24	41
	Gravel, sandy	1	42
	Clay, gray	2	44
Fox Hills Formation:			
	Silt, clayey, sandy, greenish-gray	10	54
Pierre Formation:			
	Clay, silty, grayish-brown	16	70
	Shale, grayish-black, hard	10	80

130-073-07DAC1
(Log from Jacob Thurn)

Date drilled: 7/31/75

Topsoil	6	6
Gravel	9	15
Clay	15	30
Sand	19	49

130-073-09CAB2
(Log from Baumgartner Drilling Co.)

Date drilled: 9/16/74

Clay, brown	30	30
Clay, blue	31	61
Sand, fine	2	63
Clay, blue	7	70
Sand, fine to coarse	10	80
Clay, gray	5	85
Sand, coarse	4	89
Clay, blue	7	96
Shale	4	100

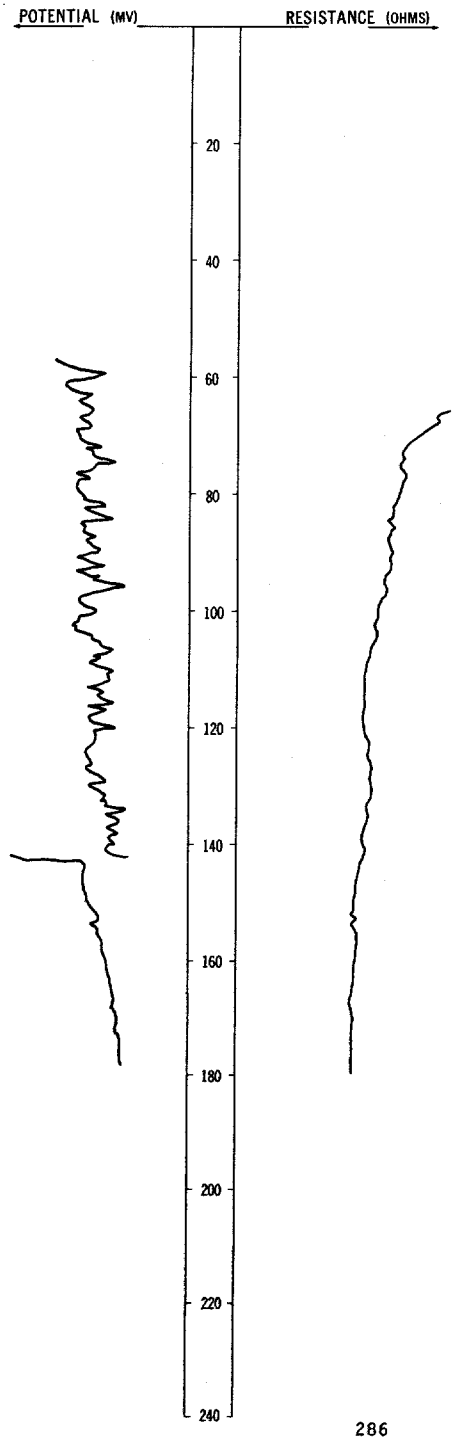
NDSWC 5174

LOCATION: 130-073-09CCC

DATE DRILLED: 8/16/77

ALTITUDE: 2015
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-5 Gravel, fine to medium, subangular to subrounded; composed largely of carbonate and shale fragments.

5-12 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

12-65 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

PIERRE FORMATION

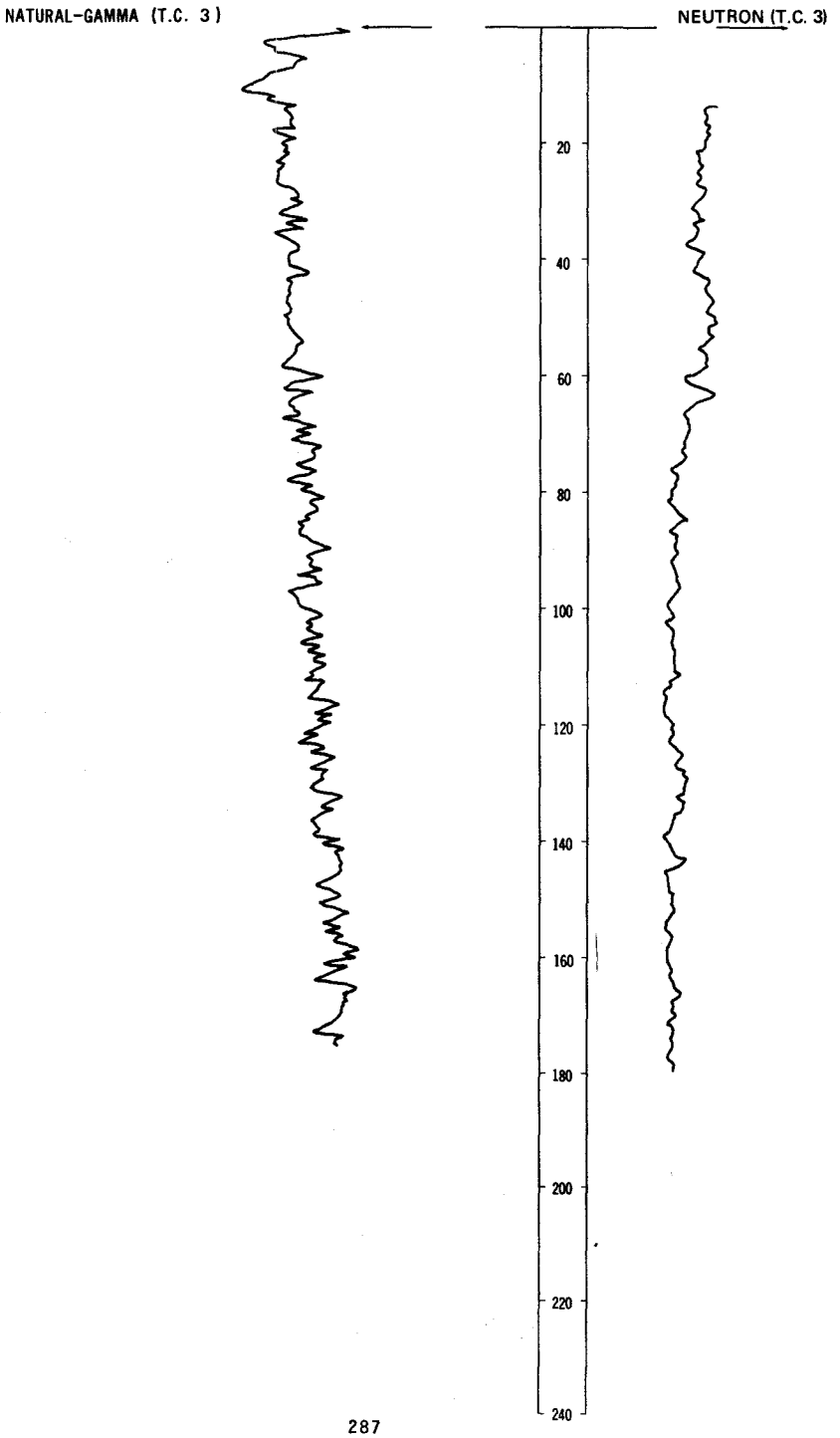
65-182 Siltstone, sandy, medium-gray to black.

LOCATION: 130-073-09CCC

DATE DRILLED: 8/16/77

ALTITUDE: 2015
(FT, MSL)

DEPTH: 182
(FT)



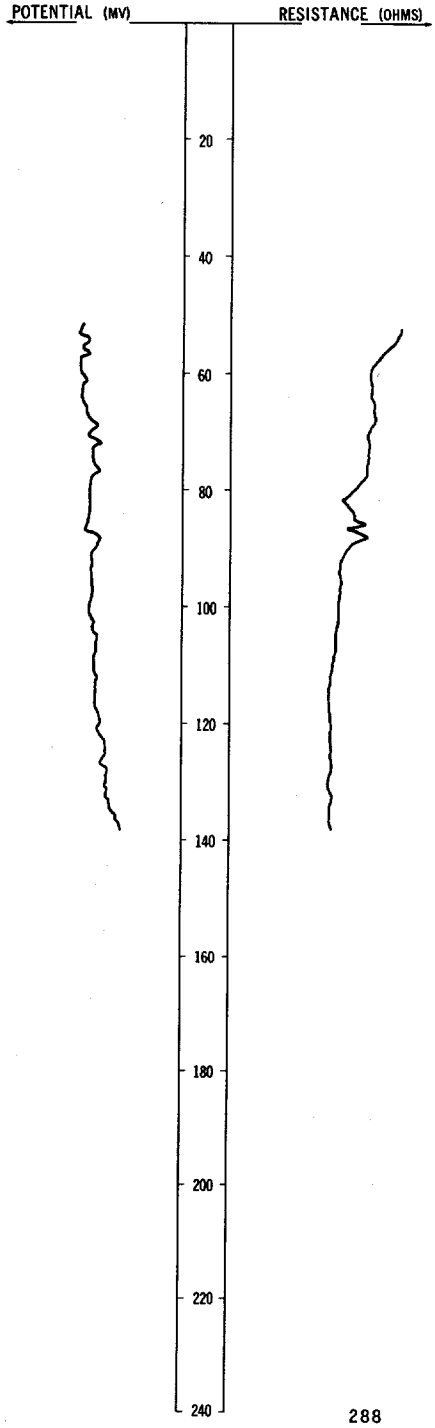
NDSWC 5173

LOCATION: 130-073-10DDD

DATE DRILLED: 8/16/77

ALTITUDE: 2032
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

20-88 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

FOX HILLS FORMATION(?)

88-123 Siltstone, sandy, medium-gray to dark-gray, calcareous.

PIERRE FORMATION

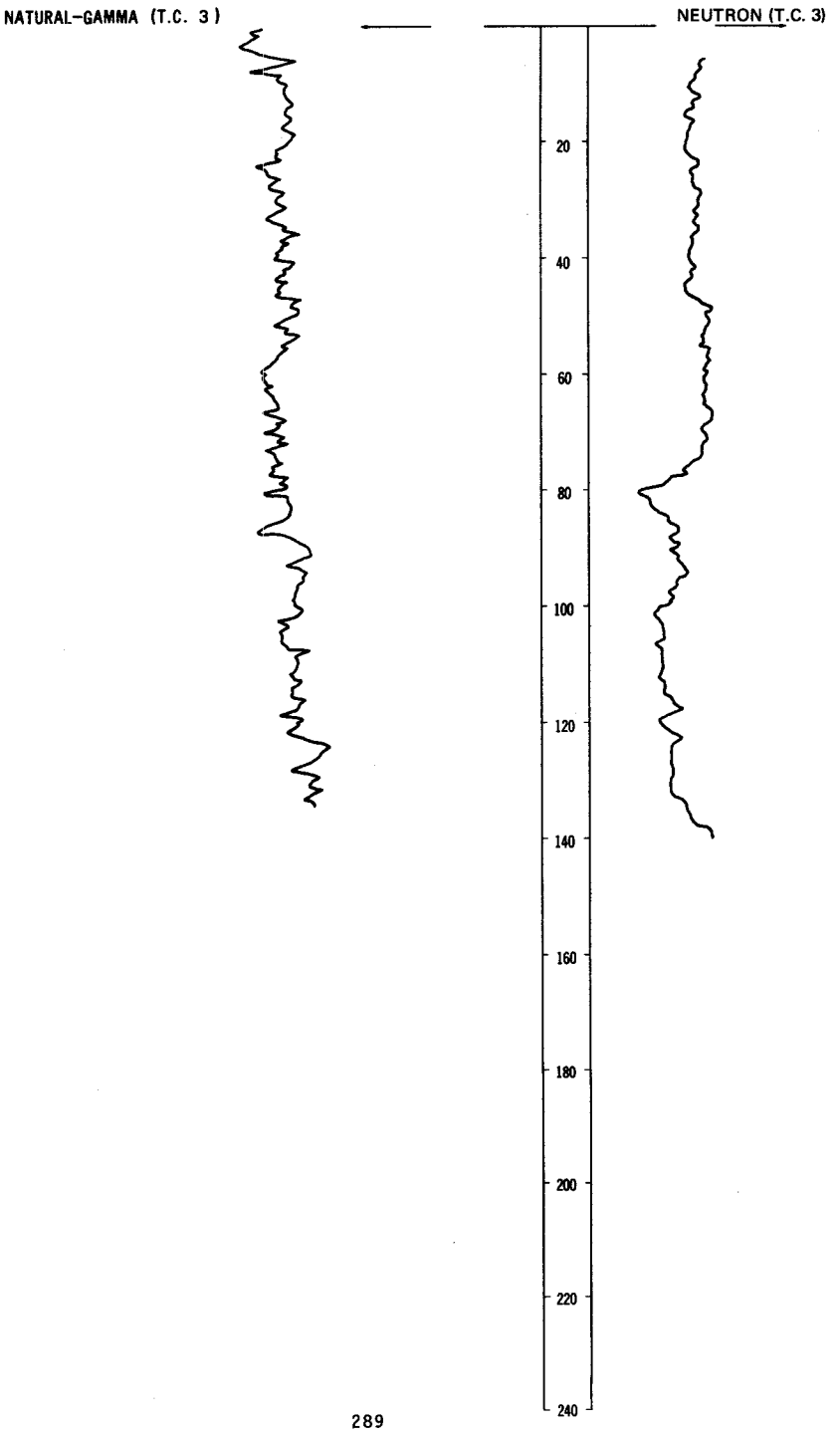
123-142 Siltstone, medium-dark-gray to grayish-black, hard; interbedded with shale.

LOCATION: 130-073-10DDD

DATE DRILLED: 8/16/77

ALTITUDE: 2032
(FT, MSL)

DEPTH: 142
(FT)



130-073-11BCB
(Log from Jacob Thurn)

Date drilled: 7/21/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	5	5
	Sand, gray	25	30
	Gravel	5	35

130-073-11BDC
(Log from Jacob Thurn)

Date drilled: 4/30/74

	Topsoil	3	3
	Sand and clay	17	20
	Clay, blue	60	80
	Sand	4	84

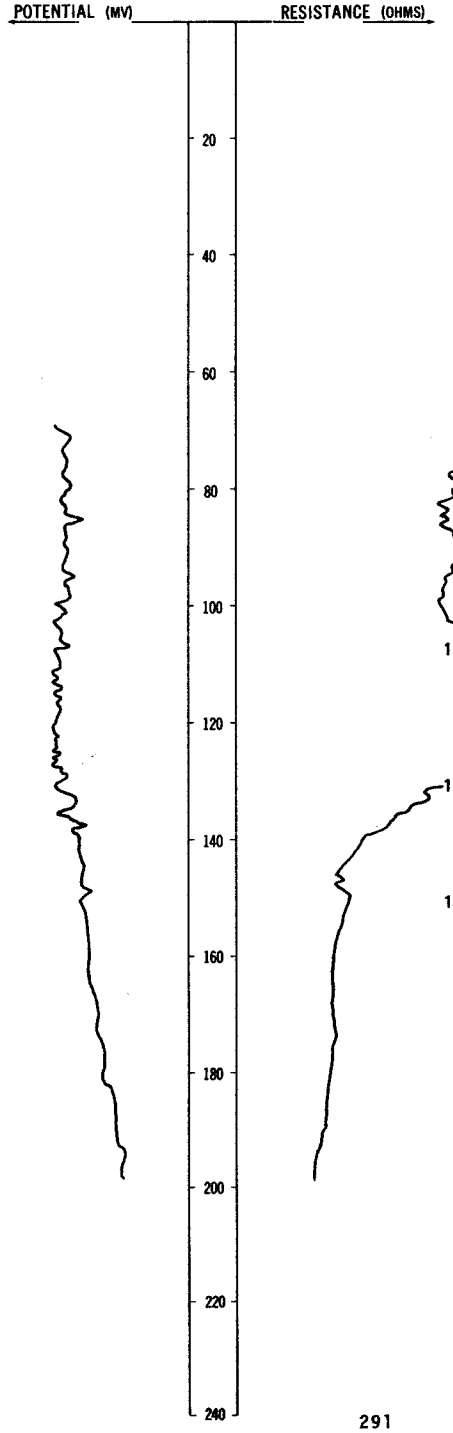
NDSWC 5168

LOCATION: 130-073-24AAA

DATE DRILLED: 8/11/77

ALTITUDE: 2098
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-110 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.

FOX HILLS FORMATION

110-132 Sand, very fine, silty, dark-gray to dark-green, glauconitic.

132-150 Clay, sandy, silty, medium-gray to dark-green.

PIERRE FORMATION

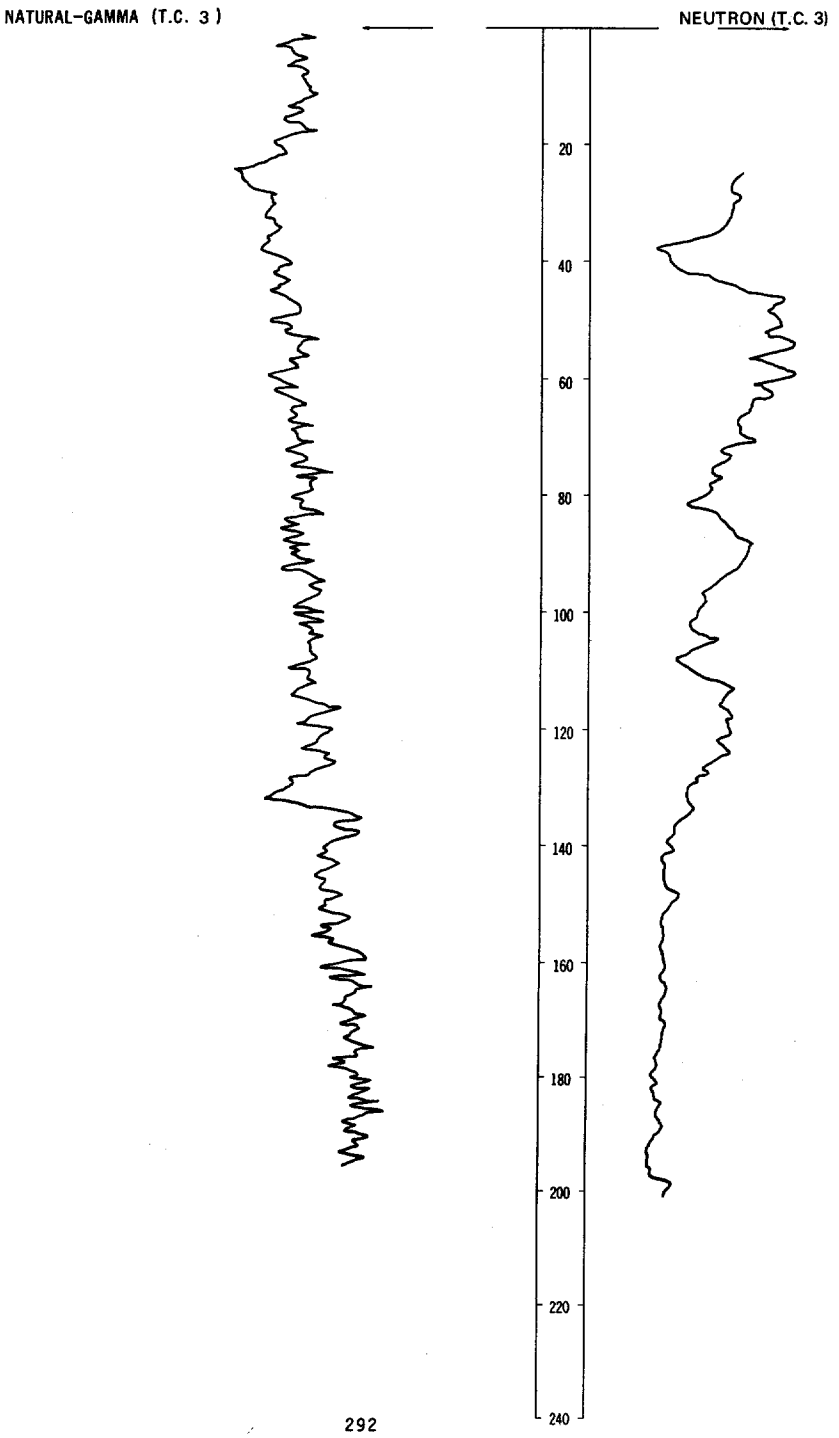
150-202 Clay, silty, sandy, dark-gray to grayish-black.

LOCATION: 130-073-24AAA

DATE DRILLED: 8/11/77

ALTITUDE: 2098
(FT, MSL)

DEPTH: 202
(FT)



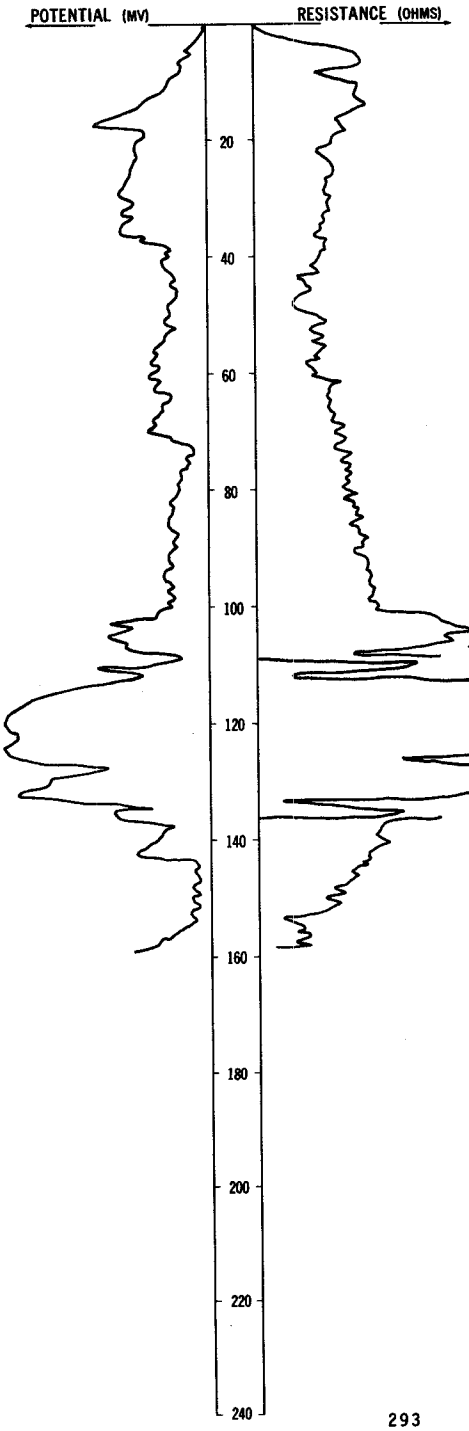
NDSWC 9696

LOCATION: 130-073-27AAA

DATE DRILLED: 8/06/76

ALTITUDE: 2007
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-45 Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.

45-53 Clay (till), silty, sandy, grayish-brown; scattered pebbles.

53-99 Clay (till), silty, sandy, olive-gray; scattered pebbles.

99-109 Clay, sandy.

109-136 Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 80 percent quartz, 15 percent carbonate, and 5 percent shale fragments.

FOX HILLS FORMATION(?)

136-142 Clay, sandy, greenish-gray.

PIERRE FORMATION

142-160 Shale, silty, grayish-black.

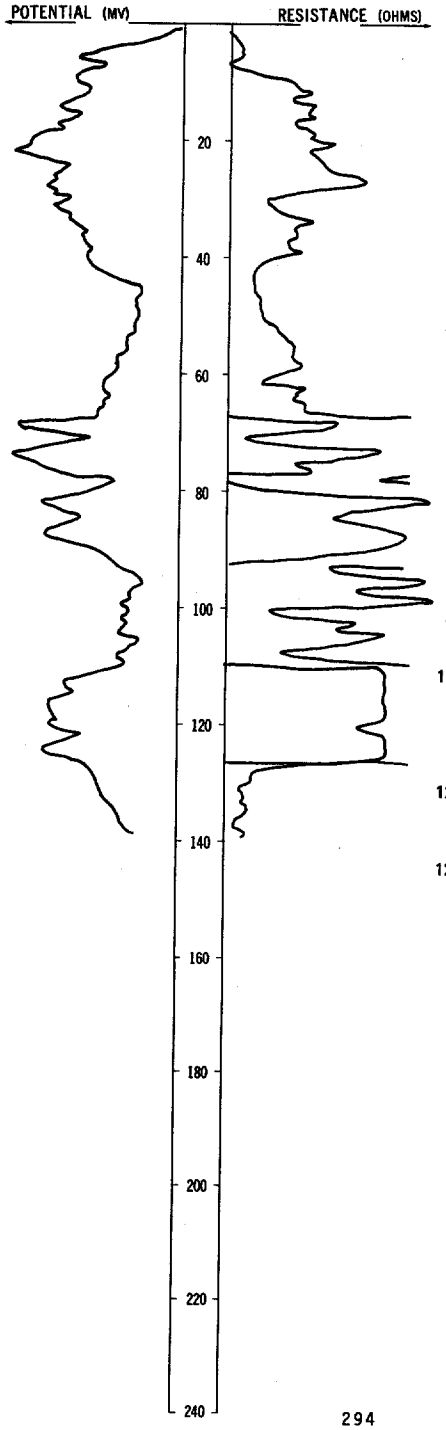
NDSWC 9697

LOCATION: 130-073-29AAA

DATE DRILLED: 8/09/76

ALTITUDE: 1976
(FT, MSL)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay, brownish-gray.
8-28	Sand, fine to very coarse, predominantly very coarse, gravelly.
28-67	Clay (till), silty, sandy, olive-gray; scattered pebbles.
67-77	Sand, fine to very coarse, predominantly coarse, gravelly; clay lens from 70 to 72 feet.
77-79	Clay.
79-89	Sand, very fine to very coarse, predominantly medium, gravelly; few clay lenses.
89-110	Clay (till), silty, sandy, olive-gray; scattered pebbles.
110-127	Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 60 percent quartz, 25 percent carbonate, and 15 percent shale fragments.
127-128	Clay (till), silty, sandy, olive-gray.

PIERRE FORMATION

128-140	Shale, grayish-black, hard.

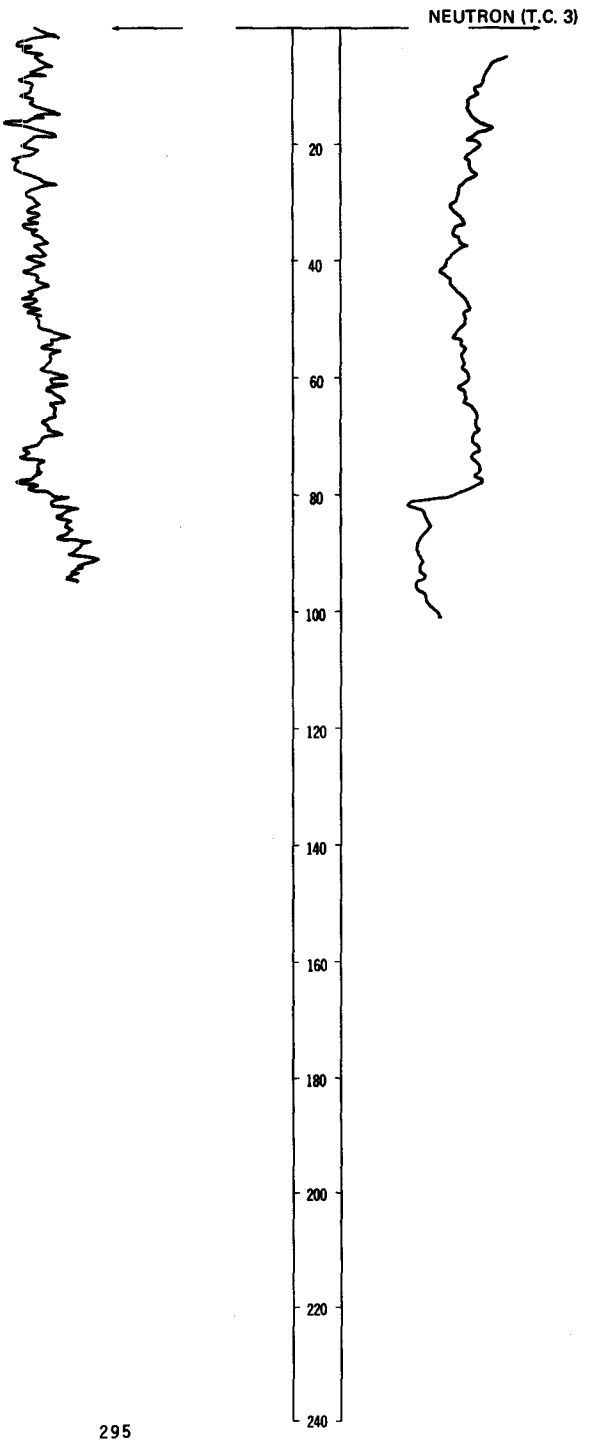
NDSWC 5175

LOCATION: 130-073-30BBB

DATE DRILLED: 8/16/77

ALTITUDE: 2009
(FT, MSL)

DEPTH: 102
(FT)



NOTE: Detailed log on following page.

130-073-30BBB, Continued
NDSWC 5175

Altitude:	2009 feet	Date drilled:	8/16/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	15	15
	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray	65	80
Pierre Formation:			
	Siltstone, clayey, sandy, medium-dark-gray to grayish-black	22	102

130-073-34DDD
NDSWC 5171

Altitude:	1964 feet	Date drilled:	8/15/77
Glacial drift:			
	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown	42	42

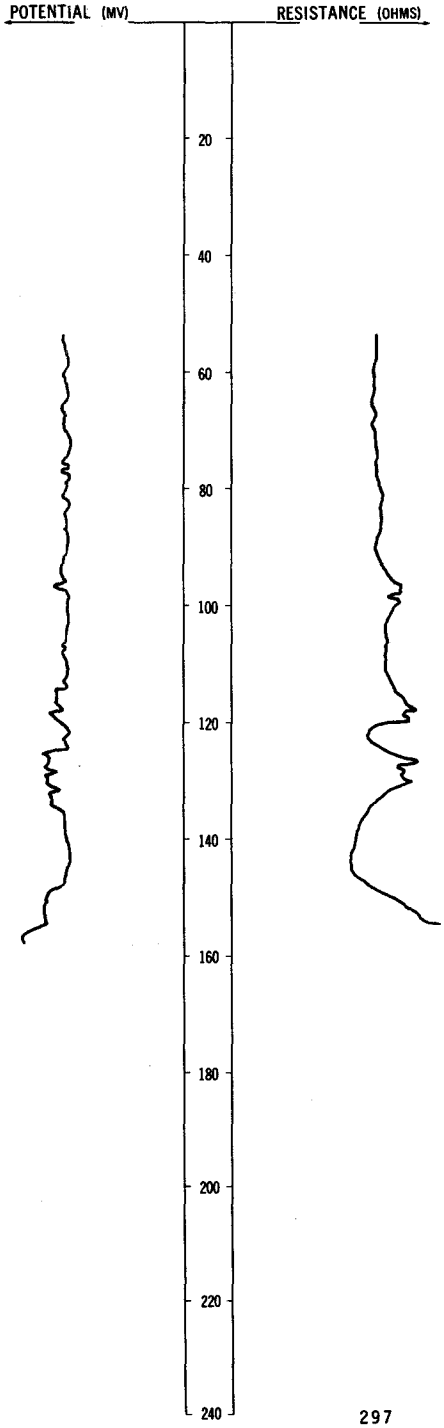
NDSWC 5170

LOCATION: 130-073-36DDD1

DATE DRILLED: 8/12/77

ALTITUDE: 2140
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

20-132 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; gravel lenses from 117 to 121 feet and 127 to 132 feet.

132-156 Clay (lacustrine), silty, sandy, calcareous.

156-162 Sand; no sample return; lost circulation.

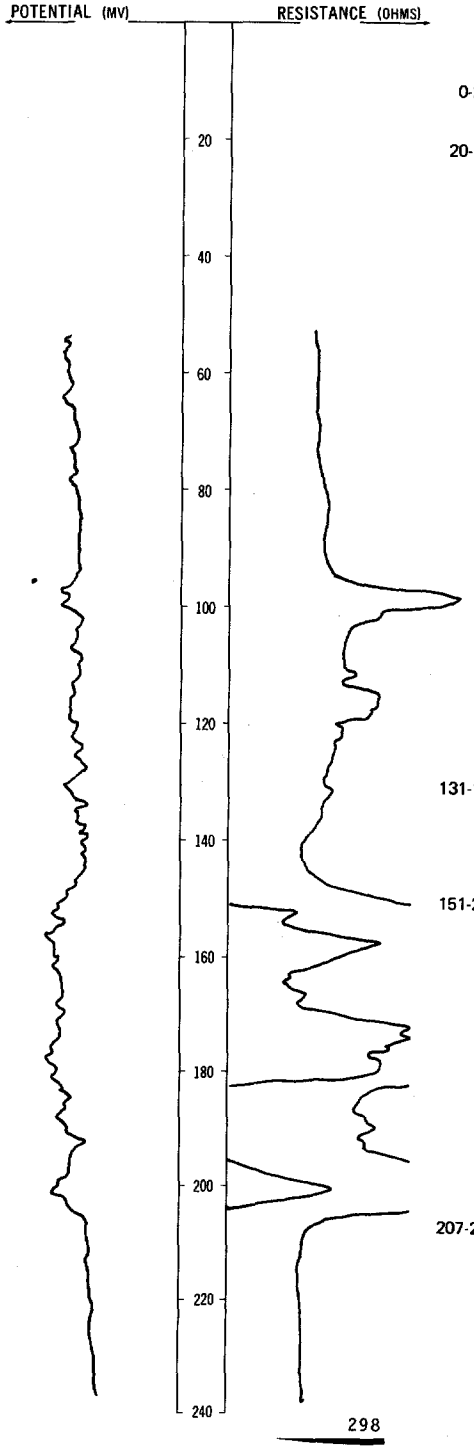
NDSWC 5170A

LOCATION: 130-073-36DDD2

DATE DRILLED: 8/12/77

ALTITUDE: 2140
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

20-131 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; oxidized gravel from 96 to 100 feet.

131-151 Clay (lacustrine), silty, sandy, medium-dark-gray to dark-gray, calcareous.

151-207 Sand, fine to very coarse, predominantly medium, gravelly, subrounded to rounded; sandy clay from 184 to 196 feet.

PIERRE FORMATION

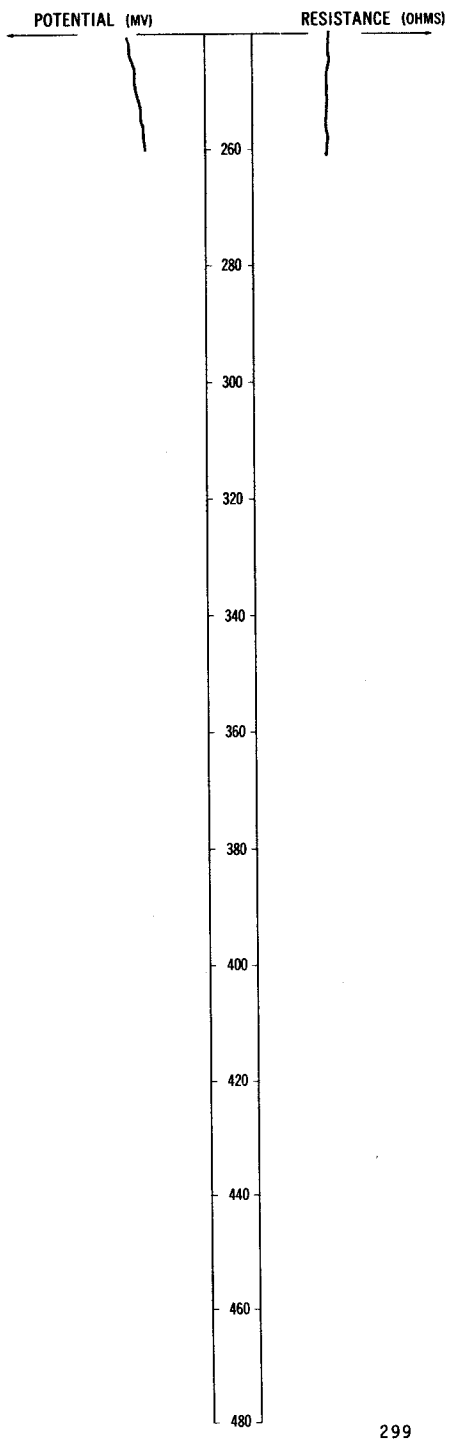
207-262 Shale, black to grayish-black, siliceous, hard.

LOCATION: 130-073-36DDD2

DATE DRILLED: 8/12/77

ALTITUDE: 2140
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

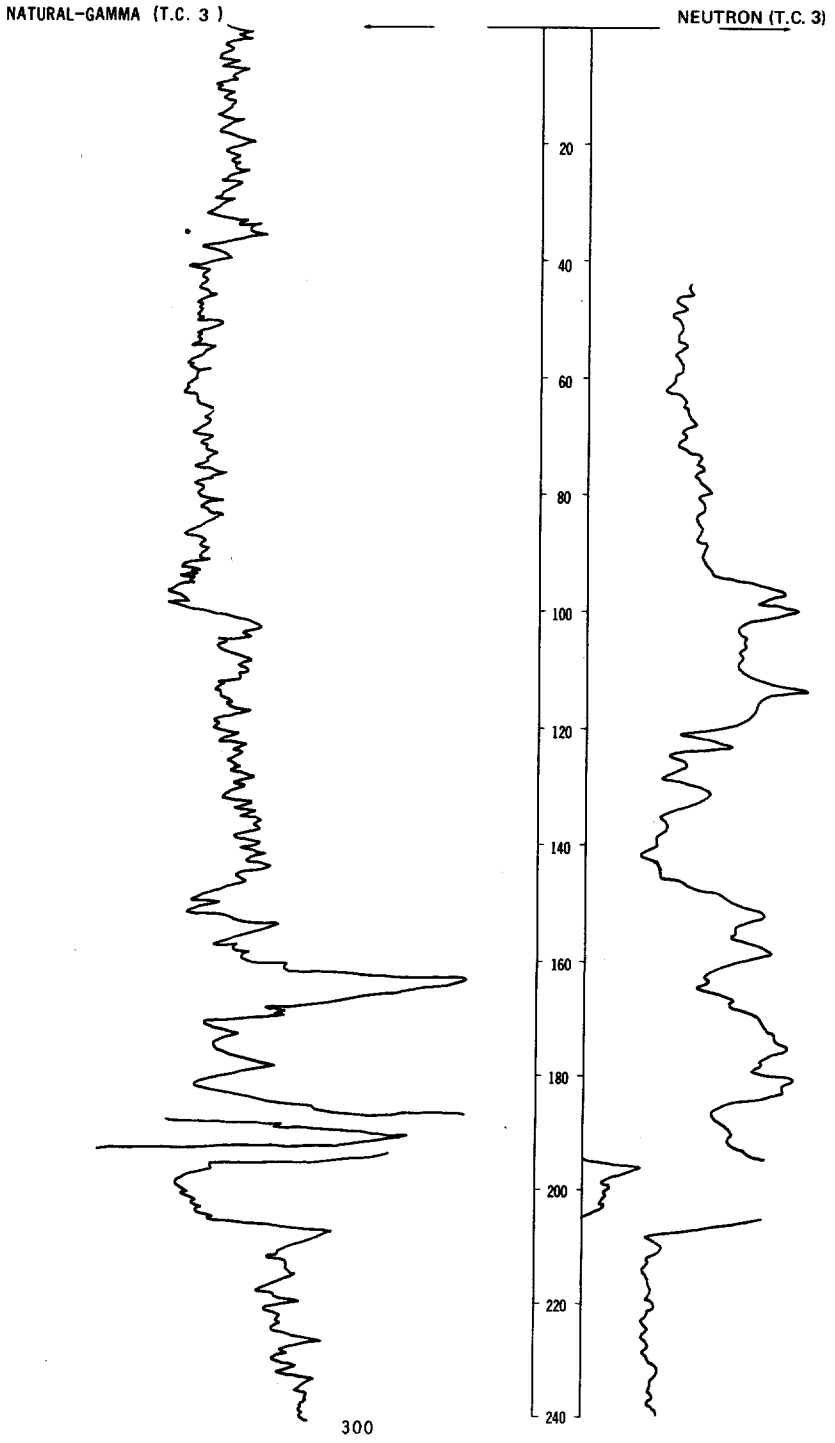
NDSWC 5170A, Continued

LOCATION: 130-073-36DDD2

DATE DRILLED: 8/12/77

ALTITUDE: 2140
(FT, MSL)

DEPTH: 262
(FT)



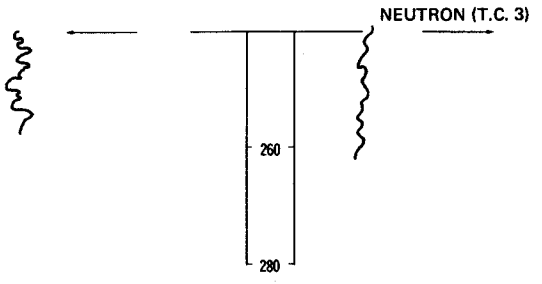
LOCATION: 130-073-36DDD2

DATE DRILLED: 8/12/77

ALTITUDE: 2140
(FT, MSL)

DEPTH: 262
(FT)

NATURAL-GAMMA (T.C. 3)



131-067-05CDC1
(Log from Gross Drilling)

Date drilled: 7/06/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, brown	20	20
	Clay, blue	60	80
	Sand, fine	10	90
	Gravel	20	110

131-067-13BBB1
NDSWC 9778

Altitude: 1927 feet

Date drilled: 9/16/76

Glacial drift:			
	Clay, silty, dark-yellowish-brown	7	7
	Clay, olive-gray	10	17
	Sand, very fine to very coarse, predominantly coarse, gravelly	3	20
	Clay, olive-gray	6	26
	Clay (till), silty, sandy, grayish-brown; scattered pebbles	24	50

131-067-13BBB2
NDSWC 9778A

Altitude: 1927 feet — Date drilled: 9/16/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	6	6
	Clay, pale-yellowish-brown	3	9
	Clay, olive-gray	4	13
	Sand, very fine to very coarse, predominantly medium; scattered lignite fragments	11	24
	Clay, brownish-gray	8	32
	Clay (till), silty, sandy, brownish-gray; scattered pebbles	25	57
	Sand, very fine to very coarse, predominantly medium; composed of 70 percent quartz, 15 percent shale, 10 percent carbonate, and 5 percent unidentified fragments	19	76
	Clay (till), silty, sandy, olive-gray; scattered pebbles	28	104
	Sand, gravelly	2	106
	Clay (till), silty, sandy, olive-gray; scattered pebbles	145	251
	Clay (till), silty, sandy, grayish-brown, hard; scattered pebbles	55	306
Pierre Formation:			
	Shale, grayish-black, hard	14	320

131-067-13BBB3
NDSWC 9778B

Altitude: 1927 feet — Date drilled: 9/16/76

Glacial drift:			
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	6	6
	Clay, pale-yellowish-brown	3	9
	Clay, olive-gray	27	36
	Clay (till), silty, sandy, brownish-gray; scattered pebbles	24	60
	Sand, very fine to very coarse, predominantly medium; composed of 70 percent quartz, 15 percent shale, 10 percent carbonate, and 5 percent unidentified fragments	8	68
	Clay (till), silty, sandy, olive-gray; scattered pebbles	12	80

131-067-15BBB
(Log from Olson Water Wells)

Date drilled: 7/24/73

Topsoil	1	1
Clay, yellow	29	30
Clay, blue	203	233
Clay, blue, sandy, pebbly	1.5	234.5
Clay, blue	5.5	240
Clay, blue, sandy, pebbly	1	241
Clay, blue	3.5	244.5
Clay, blue, sandy	2	246.5
Clay, blue; many small stones	83.5	330
Slate, soft, gray	160	490
Slate, hard, gray	60	550

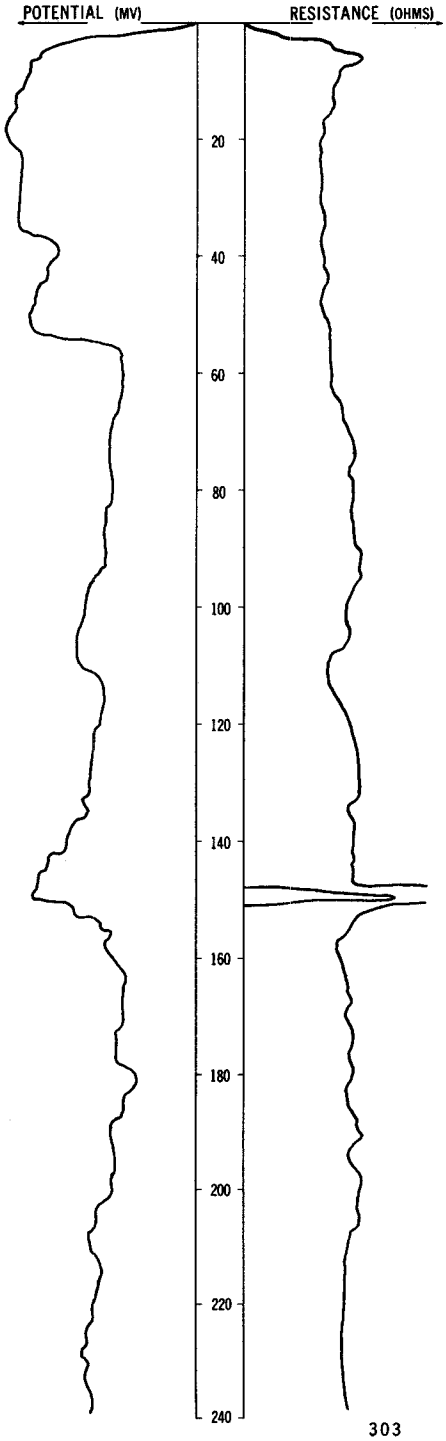
NDSWC 9781

LOCATION: 131-067-21CCC

DATE DRILLED: 9/20/76

ALTITUDE: 1977
(FT, MSL)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

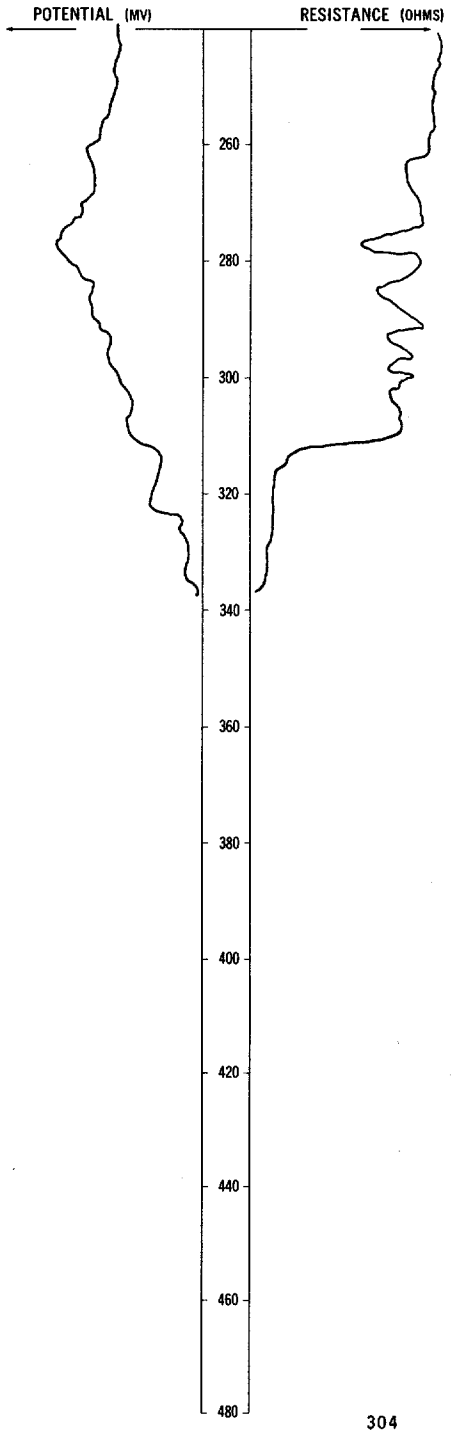
0-8	Clay (till), silty, sandy, pale-yellowish-brown.
8-19	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
19-148	Clay (till), silty, sandy, olive-gray; scattered pebbles.
148-152	Gravel, very fine, sandy; composed predominantly of carbonate fragments.
152-314	Clay, silty, sandy, olive-gray; scattered pebbles.

LOCATION: 131-067-21CCC

DATE DRILLED: 9/20/76

ALTITUDE: 1977
(FT, MSL)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

PIERRE FORMATION

314-340 Shale, grayish-black, hard.

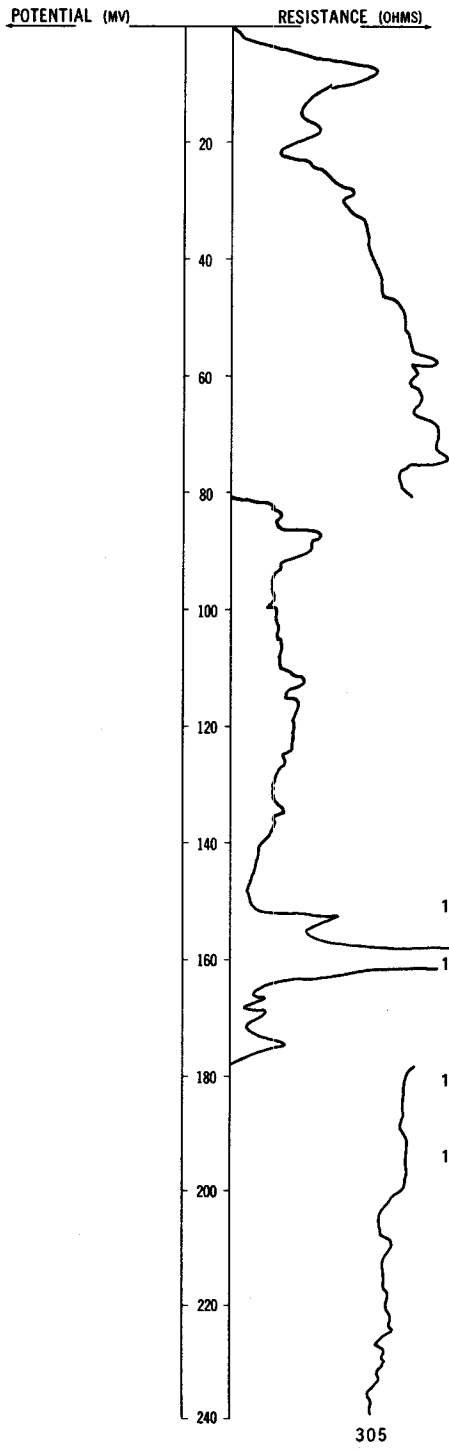
NDSWC 9777

LOCATION: 131-067-26DAA

DATE DRILLED: 9/15/76

ALTITUDE: 1934
(FT, MSL)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

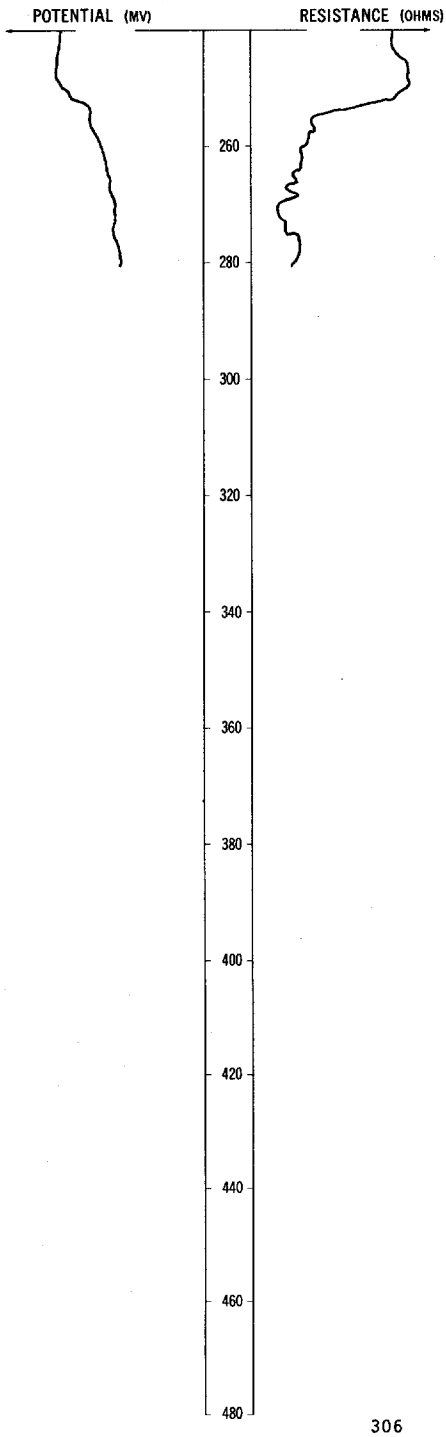
0-10	Clay (till), silty, sandy, moderate-yellowish-brown.
10-14	Clay (till), silty, sandy, olive-gray; scattered pebbles.
14-31	Clay, dusky-brown.
31-154	Clay (till), silty, sandy, olive-gray; scattered pebbles.
154-160	Sand, very fine to coarse, predominantly fine.
160-164	Sand, very fine to coarse, gravelly; composed of 45 percent quartz, 20 percent carbonate, 20 percent shale, and 15 percent unidentified fragments.
164-177	Clay (till), silty, sandy, olive-gray; scattered pebbles and few gravel lenses.
177-252	Clay (till), silty, sandy, dusky-brown; scattered pebbles.

LOCATION: 131-067-26DAA

DATE DRILLED: 9/15/76

ALTITUDE: 1934
(FT, MSL)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

PIERRE FORMATION

252-280 Shale, grayish-black, hard.

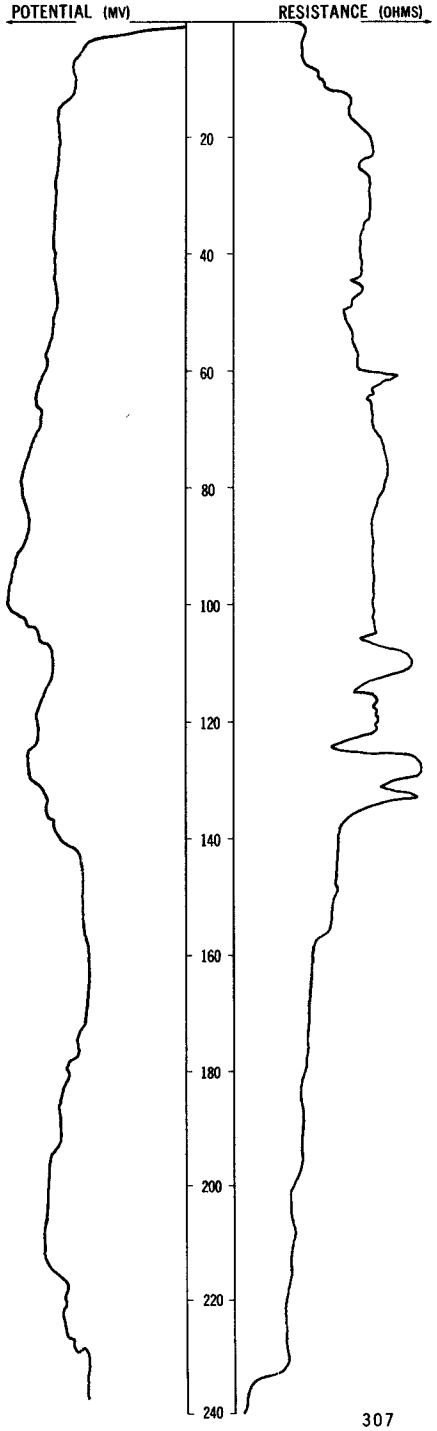
NDSWC 9765

LOCATION: 131-068-06DCC

DATE DRILLED: 9/01/76

ALTITUDE: 2021
(FT, MSL)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-2	Sand, very fine to medium.
2-7	Clay, silty, moderate-yellowish-brown.
7-13	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
13-108	Clay (till), silty, sandy, olive-gray; scattered pebbles.
108-112	Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 30 percent quartz, 30 percent carbonate, 30 percent shale, and 10 percent unidentified fragments.
112-115	Clay, silty, grayish-brown.
115-123	Sand, fine to very coarse, predominantly very coarse, gravelly; composed largely of shale particles.
123-126	Clay.
126-136	Silt, clayey, grayish-brown; gravel from 132 to 134 feet.
136-173	Clay (till), silty, sandy, olive-gray; scattered pebbles.
173-234	Clay (till), silty, sandy, olive-gray, hard; scattered pebbles.

PIERRE FORMATION

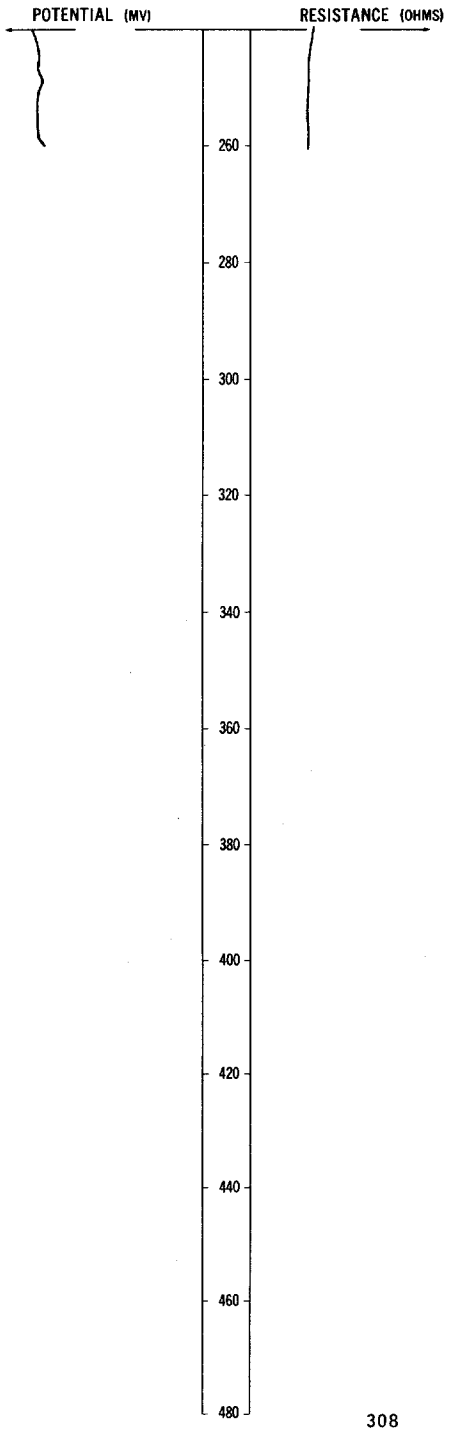
234-260	Shale, grayish-black, hard.

LOCATION: 131-068-06DCC

DATE DRILLED: 9/01/76

ALTITUDE: 2021
(FT, MSL)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

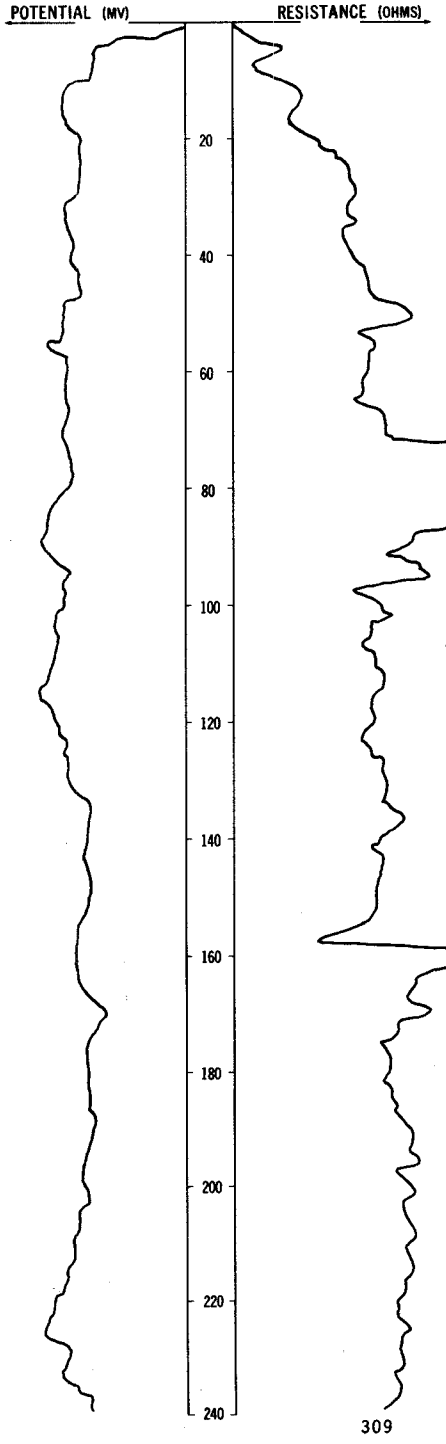
NDSWC 9786

LOCATION: 131-068-14BAB1

DATE DRILLED: 9/02/76

ALTITUDE: 1932
(FT, MSL)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

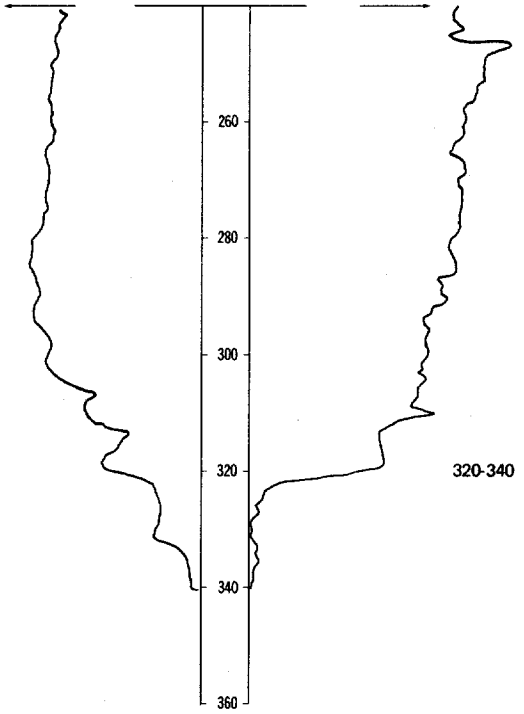
0-8	Clay, silty, dark-yellowish-brown.
8-13	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
13-72	Clay (till), silty, sandy, olive-gray; scattered pebbles.
72-87	Sand, very fine to very coarse, predominantly medium; composed predominantly of quartz fragments.
87-106	Clay (till), silty, sandy, olive-gray.
106-320	Clay (till), silty, sandy, dark-olive-gray; scattered pebbles; boulder from 152 to 153 feet; gravel lenses from 156 to 158 feet, 241 to 243 feet, and 246 to 247 feet.

LOCATION: 131-068-14BAB1

DATE DRILLED: 9/02/76

ALTITUDE: 1932
(FT, MSL)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

PIERRE FORMATION

320-340 Shale, grayish-black, hard.

131-068-14BAB2
NDSWC 9786A

Altitude: 1932 feet

Date drilled: 9/22/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, dark-yellowish-brown	8	8
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	5	13
	Clay (till), silty, sandy, olive-gray; scattered pebbles	58	71
	Sand, very fine to very coarse, predominantly medium	16	87
	Clay (till), silty, sandy, olive-gray	3	90

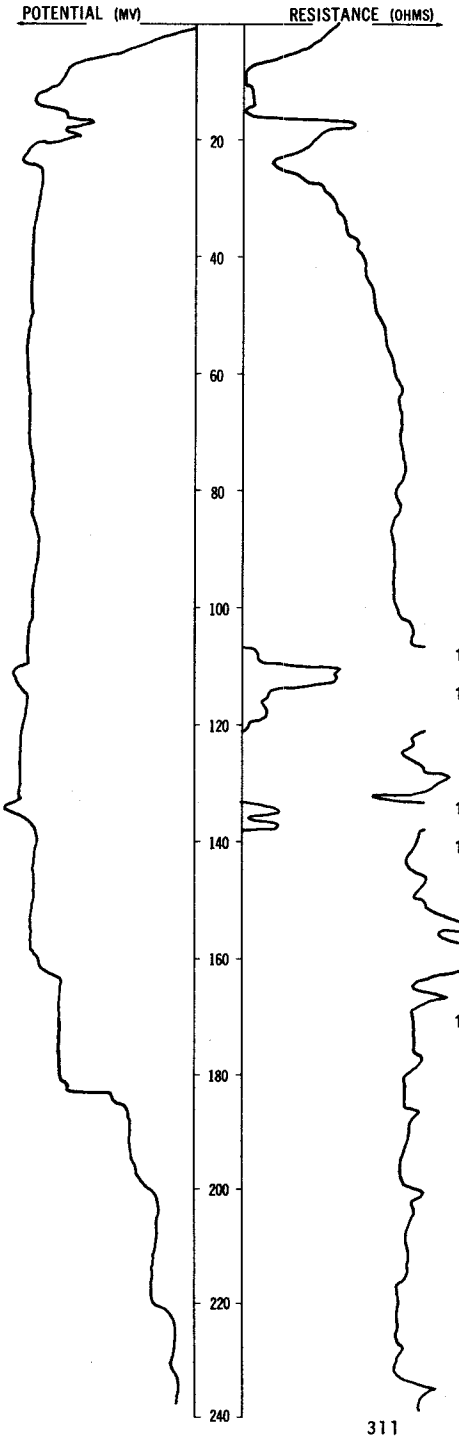
NDSWC 9785

LOCATION: 131-068-23AAD

DATE DRILLED: 9/02/76

ALTITUDE: 1976
(FT, MSL)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18	Clay, moderate-yellowish-brown.
18-27	Clay, dusky-yellowish-brown.
27-109	Clay (till), silty, olive-gray.
109-112	Gravel, sandy.
112-135	Clay (till), silty, sandy, olive-gray.
135-138	Gravel.
138-171	Clay (till), silty, sandy, olive-gray.
171-256	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel lenses from 184 to 185 feet, 236 to 237 feet, 243 to 245 feet, and 254 to 256 feet.

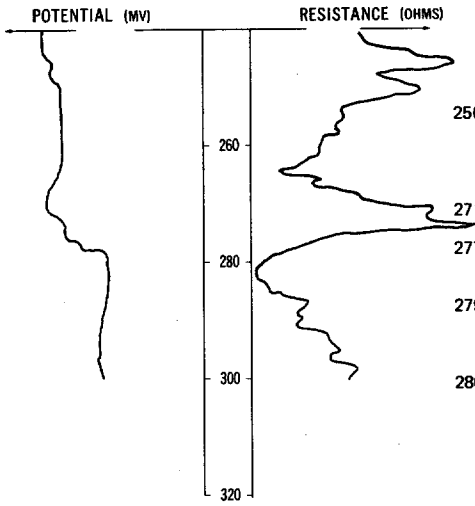
NDSWC 9785, Continued

LOCATION: 131-068-23AAD

DATE DRILLED: 9/02/76

ALTITUDE: 1976
(FT, MSL)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

256-271 Clay.

271-277 Gravel, sandy.

277-279 Clay (till), silty, sandy, olive-gray; abundant shale pebbles.

279-280 Boulder.

PIERRE FORMATION

280-300 Shale, grayish-black, hard.

131-068-31DCC
(Log from Albrecht Well Work)

Date drilled: 1915

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	2	2
	Clay, silty, yellow	28	30
	Sand	5	35
	Clay, yellow	23	58
	Gravel and sand; wet	2	60
	Clay, stony, blue	18	78
	Sand, gravel, and rocks	3	81

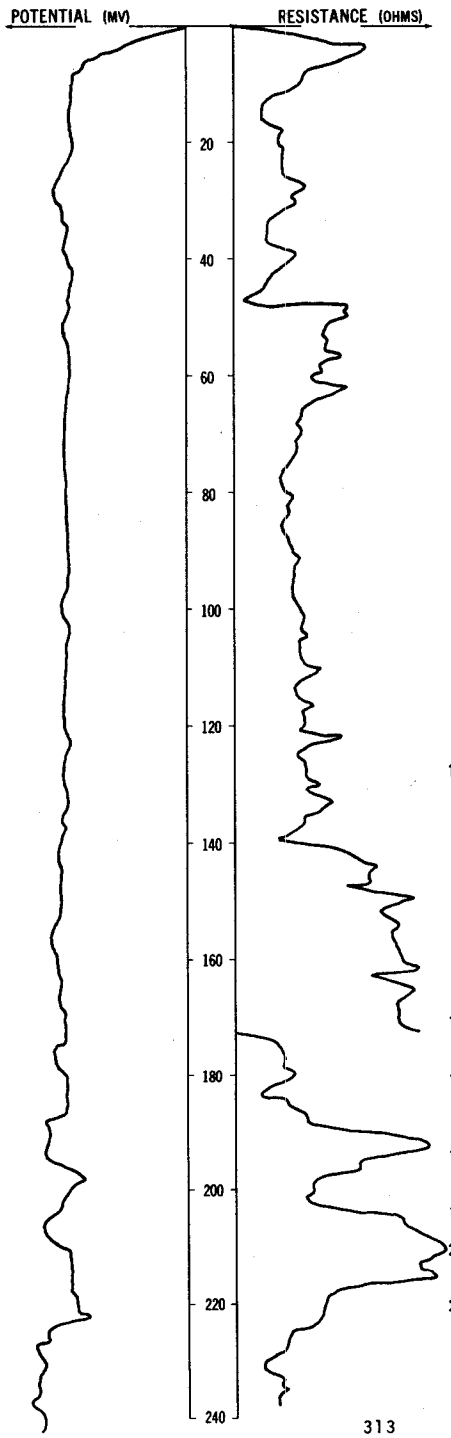
NDSWC 9787

LOCATION: 131-068-34CBB

DATE DRILLED: 9/22/76

ALTITUDE: 2029
(FT, MSL)

DEPTH: 400
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

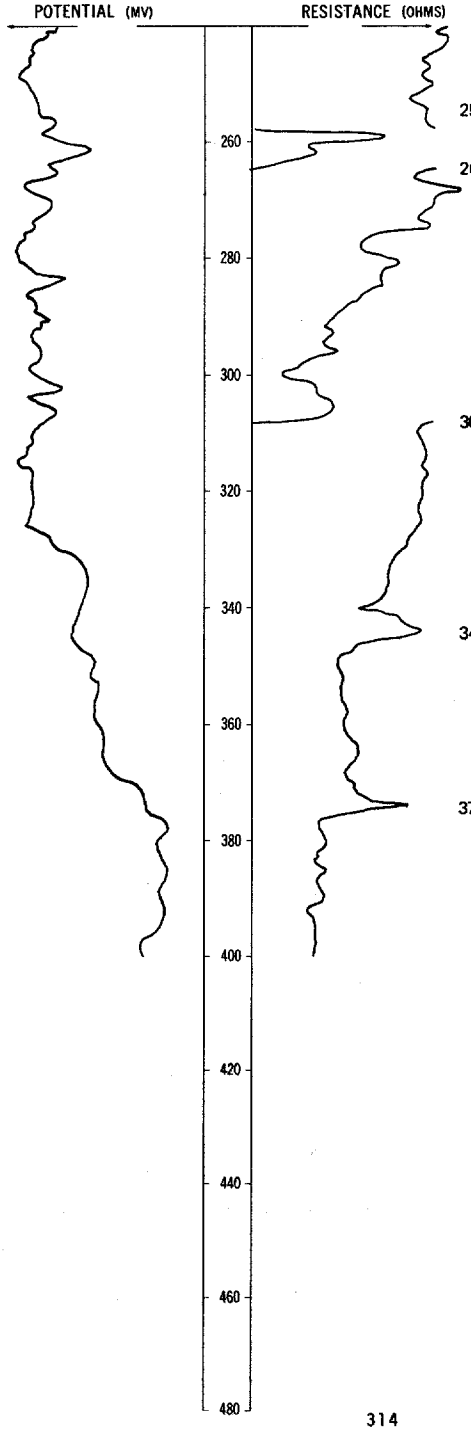
0-16	Clay (till), silty, sandy, moderate-yellowish-brown.
16-18	Clay, silty, black.
18-48	Clay, silty, olive-gray.
48-52	Sand, gravelly.
52-129	Clay, olive-gray.
129-174	Clay (till), silty, sandy, olive-gray; scattered pebbles.
174-181	Sand.
181-192	Clay (till), silty, sandy, olive-gray.
192-198	Sand, medium to very coarse, predominantly coarse, gravelly.
198-203	Clay (till), silty, sandy, olive-gray.
203-216	Sand, medium to very coarse, predominantly very coarse, gravelly.
216-257	Clay (till), silty, sandy, olive-gray; scattered pebbles.

LOCATION: 131-068-34CBB

DATE DRILLED: 9/22/76

ALTITUDE: 2029
(FT, MSL)

DEPTH: 400
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

257-263 Sand, medium to very coarse, predominantly very coarse, gravelly.

263-308 Clay (till), silty, sandy, olive-gray; scattered pebbles.

308-344 Clay (till), silty, sandy, olive-gray, hard; scattered pebbles.

344-374 Clay, sandy, dark-gray.

PIERRE FORMATION

374-400 Shale, grayish-black, hard.

131-068-35BBD
(Log from Venturia Well Drilling)

Date drilled: 9/20/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black; and gravel	0.5	0.5
	Clay	2.5	3
	Sand and gravel	24	27

131-069-03CBB
(Log from Albrecht Well Work)

Date drilled: 12/29/72

	Topsoil, black	3	3
	Clay, silty, yellow	19	22
	Clay, brown to blue	13	35
	Clay, blue; small stones	71	106
	Gravel and coarse sand	----	106

131-069-07DDD
NDSWC 9760

Altitude: 2147 feet — Date drilled: 8/30/76

Glacial drift:			
	Sand, very fine to very coarse, gravelly	7	7
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	58	65
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	30	95
	Clay (till), silty, sandy, olive-gray; scattered pebbles	27	122
	Clay, silty, brownish-gray	3	125
	Clay (till), silty, sandy, olive-gray; scattered pebbles	6	131
Fox Hills Formation:			
	Clay, sandy, greenish-black	11	142
	Clay, silty, greenish-black; contains thin sandstone lenses	26	168
Pierre Formation:			
	Shale, grayish-black, hard	12	180

131-069-11BAD
(Log from Albrecht Well Work)

Date drilled: 8/30/73

	Topsoil	2	2
	Clay, silty, yellow	28	30
	Clay, blue	64	94
	Gravel and sand	3	97

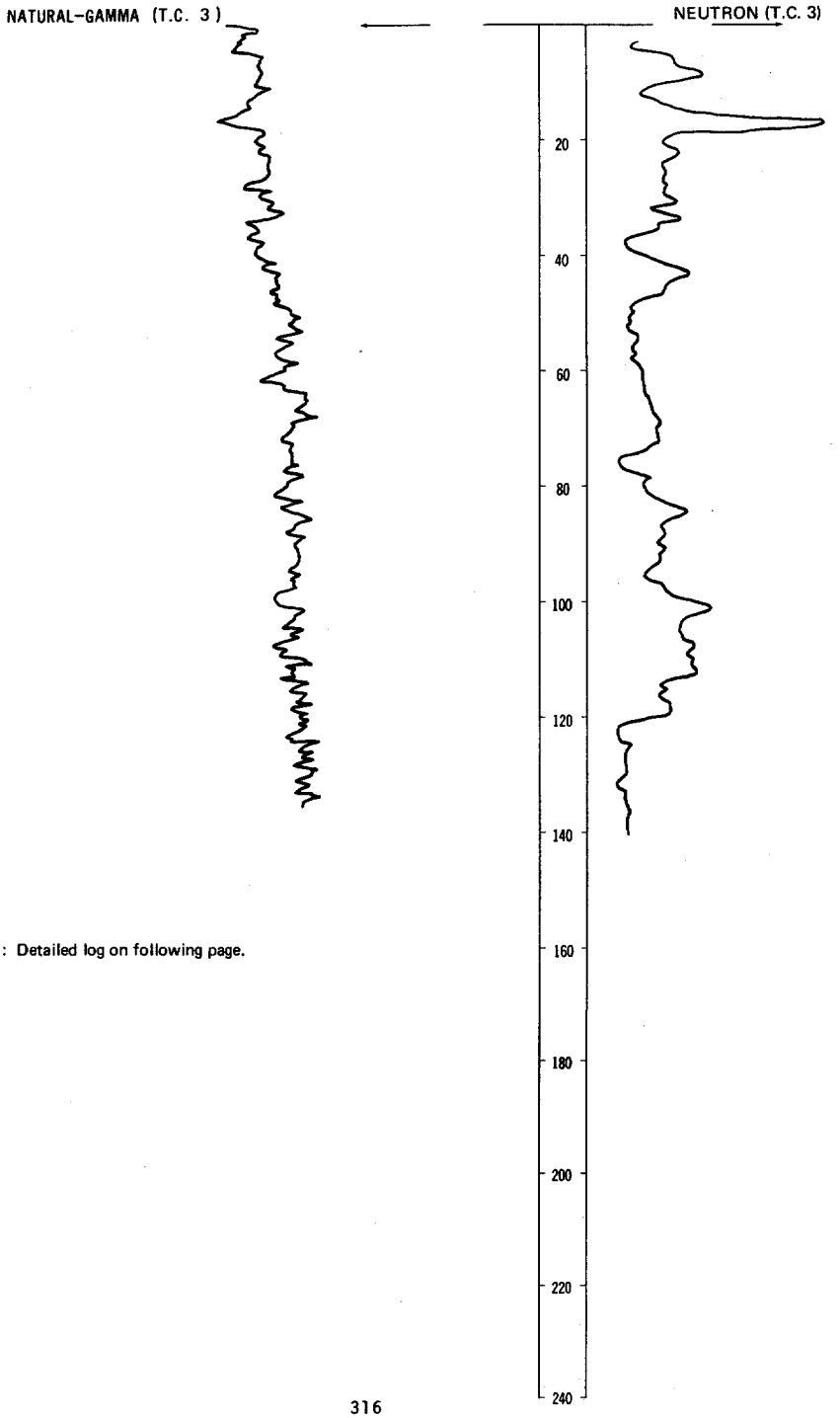
NDSWC 5220

LOCATION: 131-069-13DDD

DATE DRILLED: 9/09/77

ALTITUDE: 2055
(FT, MSL)

DEPTH: 142
(FT)



NOTE: Detailed log on following page.

131-069-13DDD, Continued
NDSWC 5220

Altitude: 2055 feet — Date drilled: 9/09/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty; scattered pebbles and boulders	30	30
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles; numerous boulders to 40 feet	91	121
Pierre Formation:			
	Shale, grayish-black to black, siliceous, hard	21	142

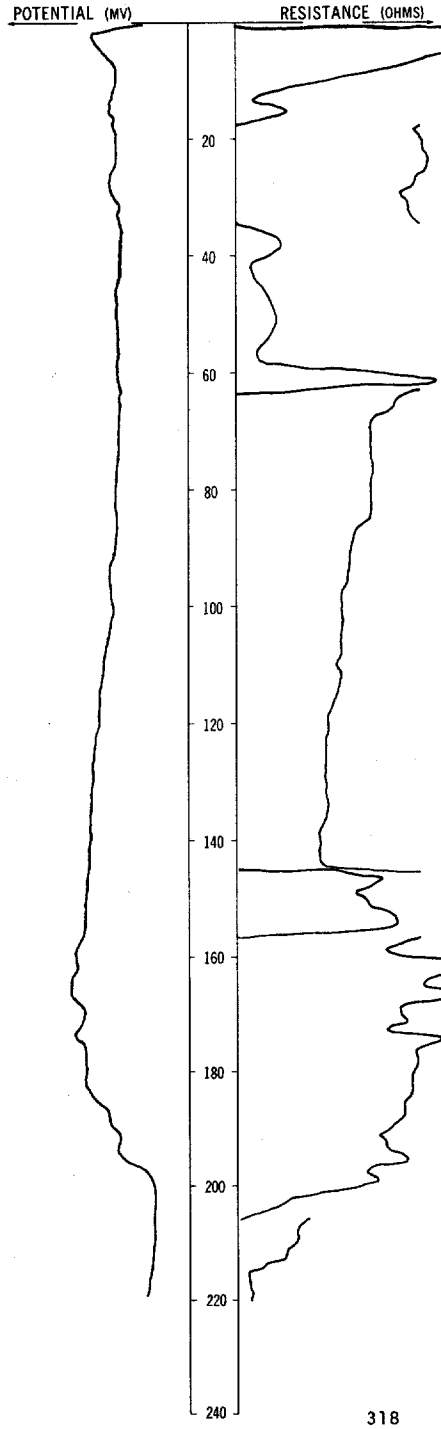
NDSWC 9791

LOCATION: 131-069-22DCD1

DATE DRILLED: 9/23/76

ALTITUDE: 2025
(FT, MSL)

DEPTH: 220
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 80 percent quartz, 15 percent carbonate, and 5 percent unidentified fragments.
8-22	Clay, sandy, dark-yellowish-brown.
22-26	Clay (till), silty, sandy, dusky-brown; scattered pebbles.
26-59	Clay (till), silty, sandy, olive-gray; scattered pebbles.
59-63	Gravel, sandy.
63-86	Clay (till), silty, sandy, olive-gray; abundant pebbles.
86-146	Clay (till), silty, sandy, olive-gray; scattered pebbles.
146-157	Gravel, fine, and medium to very coarse sand.
157-161	Clay (till), silty, sandy, olive-gray.
161-168	Sand, fine to medium, predominantly very coarse, gravelly; clay lens from 164 to 166 feet.
168-174	Clay.
174-197	Sand, fine to very coarse, predominantly coarse, silty, clayey.

PIERRE FORMATION

197-220	Shale, grayish-black, hard.

131-069-22DCD2
NDSWC 9791A

Altitude:	2025 feet	Date drilled:	9/23/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, gravelly	7	7
	Clay, sandy, dark-yellowish-brown	15	22
	Clay (till), silty, sandy, dusky-brown; scattered pebbles	4	26
	Clay (till), silty, sandy, olive-gray; scattered pebbles	33	59
	Gravel, sandy	4	63
	Clay (till), silty, sandy, olive-gray; scattered pebbles	23	86
	Clay (till), silty, sandy, hard, olive-gray; scattered pebbles	58	144
	Sand, medium to very coarse, and fine gravel	10	154
	Clay (till), silty, sandy, olive-gray	3	157
	Gravel, sandy; contains thin clay lenses	3	160

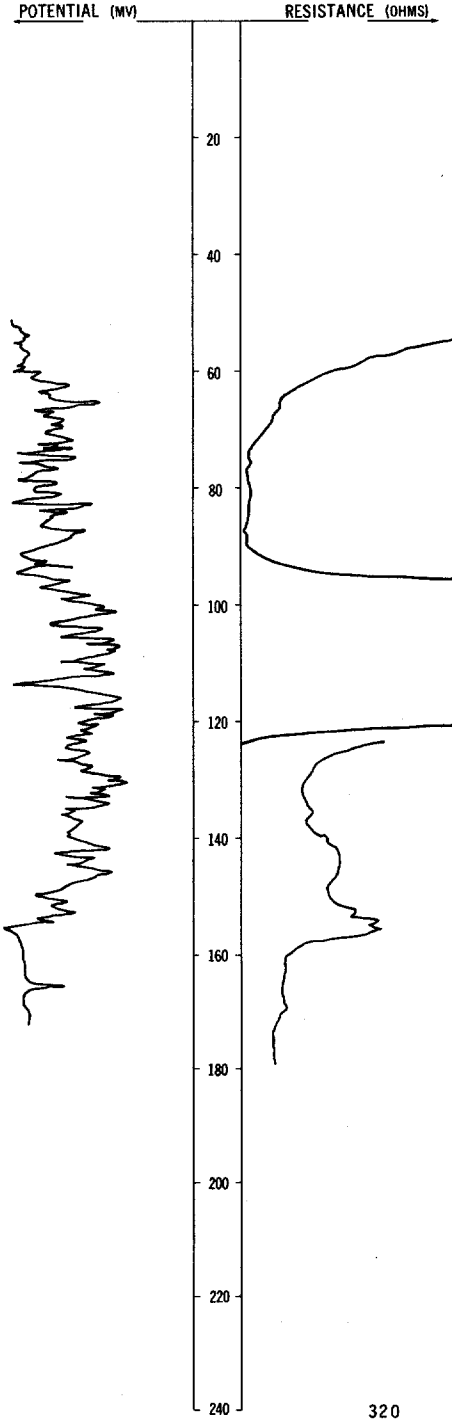
NDSWC 5219

LOCATION: 131-069-26ADD

DATE DRILLED: 9/08/77

ALTITUDE: 2044
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-11 Sand, fine to very coarse, gravelly, subangular to subrounded; gravel is composed largely of carbonate and shale fragments.

11-38 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

38-97 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

97-124 Gravel, fine to medium, sandy, subangular to subrounded; composed largely of carbonate and shale fragments.

FOX HILLS FORMATION

124-160 Clay, sandy, silty, light-greenish-gray.

PIERRE FORMATION

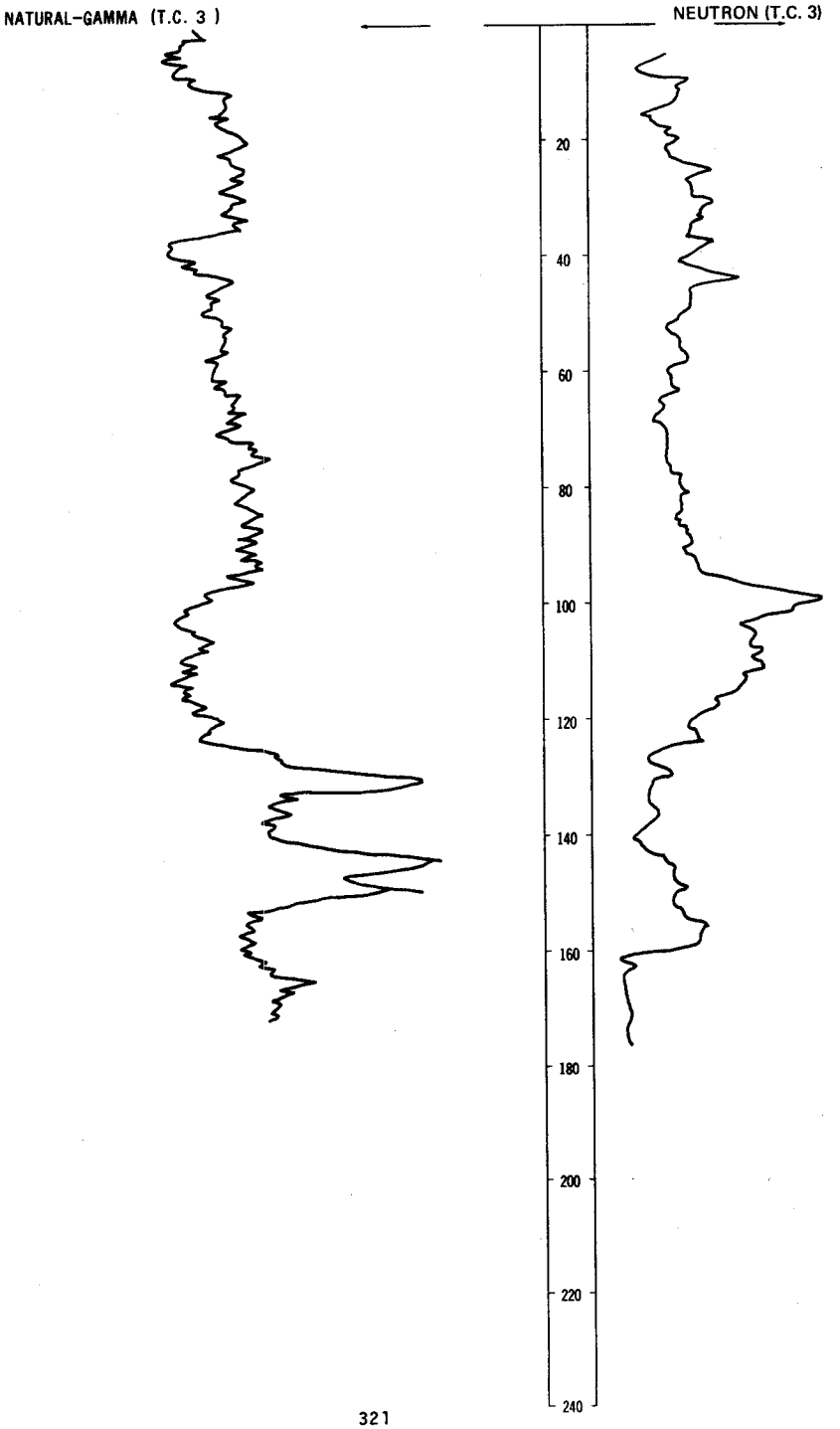
160-182 Shale, black to grayish-black, siliceous, hard.

LOCATION: 131-069-26ADD

DATE DRILLED: 9/08/77

ALTITUDE: 2044
(FT, MSL)

DEPTH: 182
(FT)



131-069-32CCC
NDSWC 5225

Altitude:	2036 feet	Date drilled:	9/12/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, predominantly coarse to very coarse, gravelly, subangular to subrounded; composed predominantly of quartz and carbonate fragments	12	12
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles	38	50

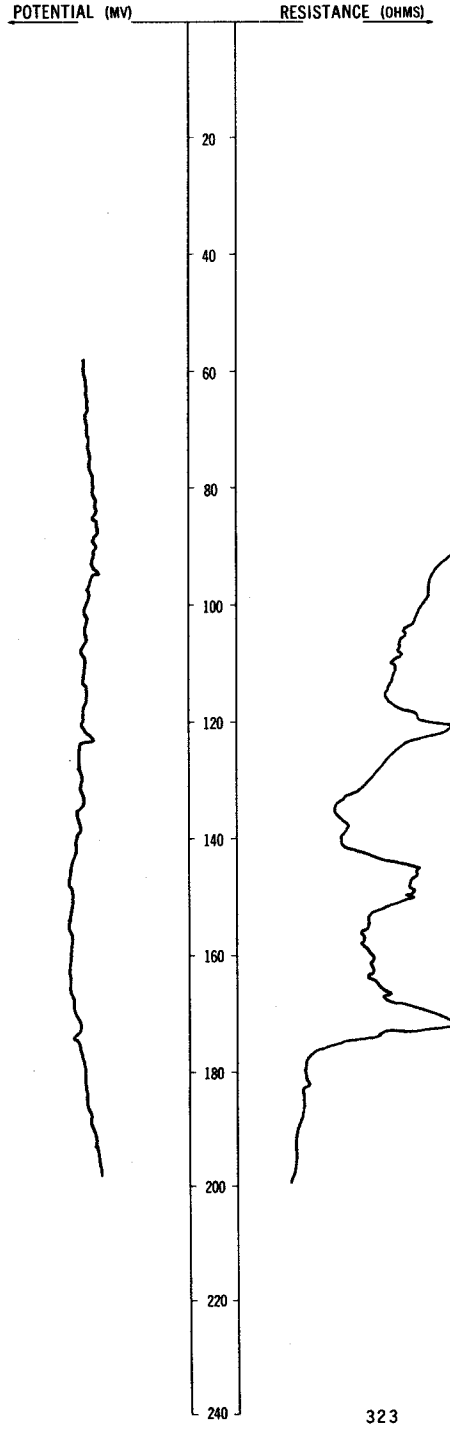
NDSWC 5217, 5217A

LOCATION: 131-069-34CBB1, 2

DATE DRILLED: 9/08/77

ALTITUDE: 2048
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-40 Sand and gravel; sand is predominantly coarse, subangular to rounded, and composed largely of quartz and carbonate fragments; gravel is predominantly medium, angular to subrounded, and composed largely of carbonate and shale fragments.

40-177 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles and boulders; color changed to light gray to greenish gray below 120 feet.

PIERRE FORMATION

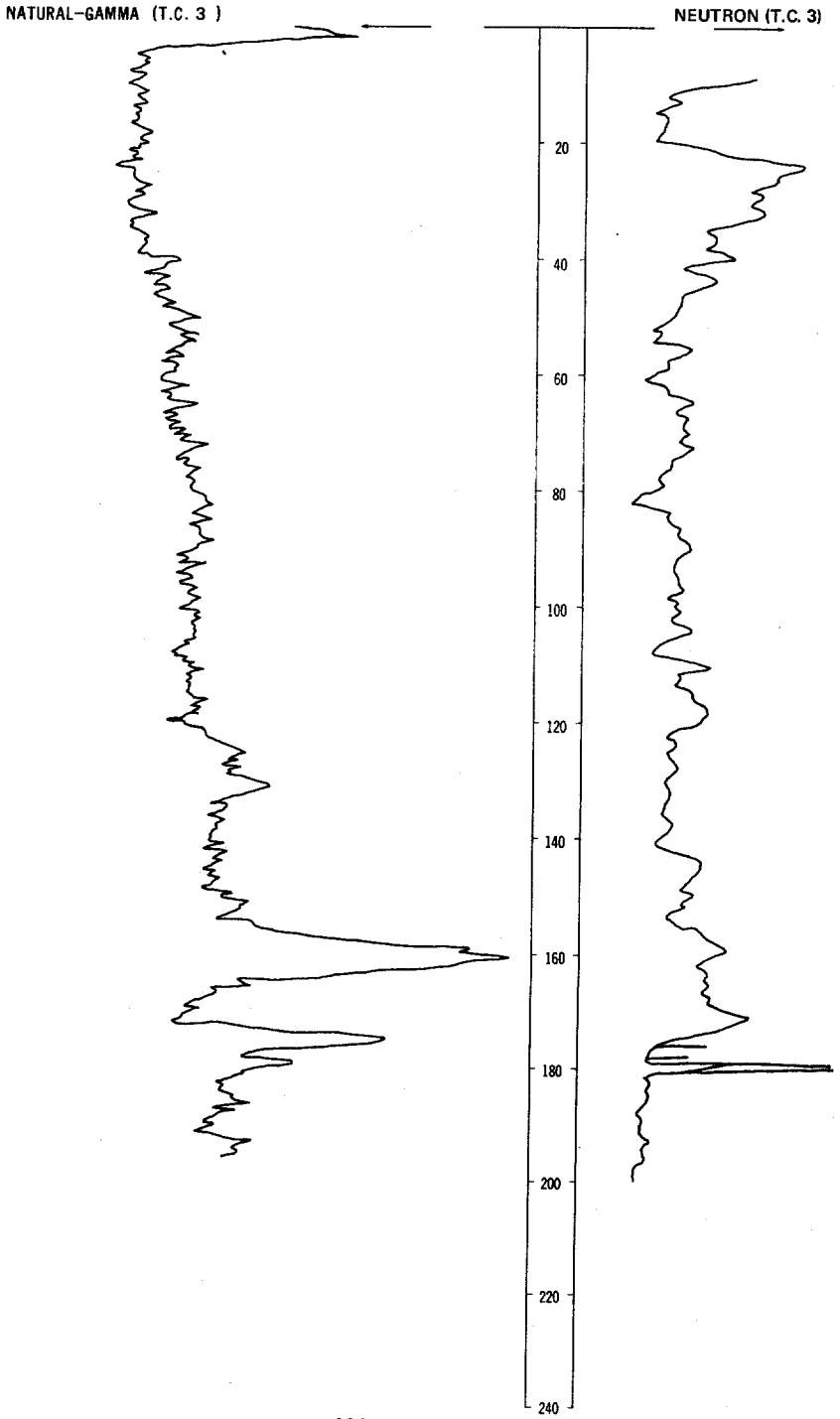
177-202 Shale, black to grayish-black, siliceous, hard.

LOCATION: 131-069-34CBB1, 2

DATE DRILLED: 9/08/77

ALTITUDE: 2048
(FT, MSL)

DEPTH: 202
(FT)



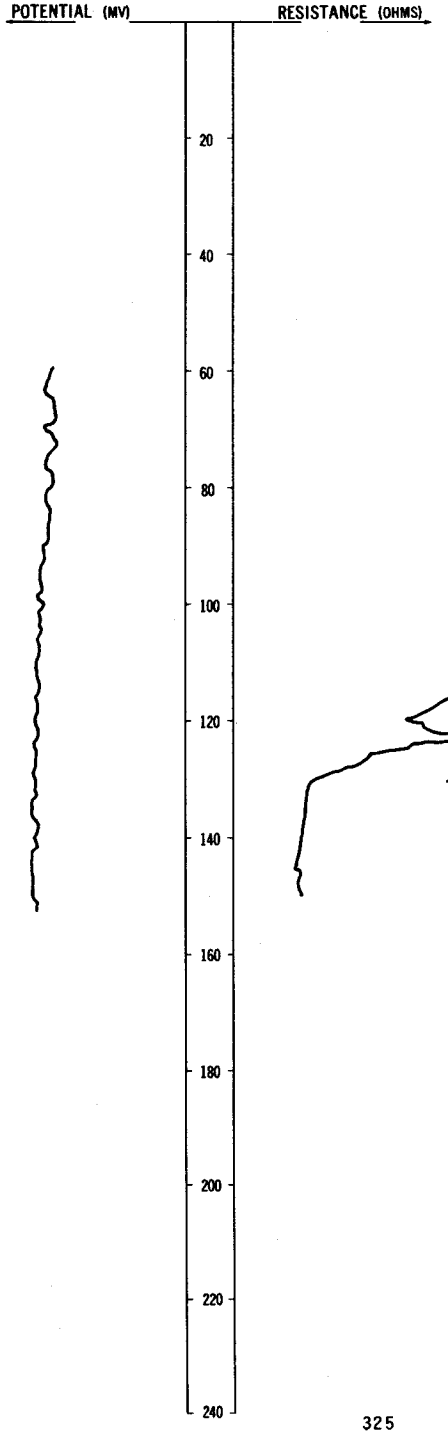
NDSWC 5218

LOCATION: 131-069-35ADA

DATE DRILLED: 9/08/77

ALTITUDE: 1999
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-80 Sand, fine to coarse, predominantly coarse, gravelly, subangular to rounded; material composed largely of quartz, carbonate, and shale fragments.

80-129 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

PIERRE FORMATION

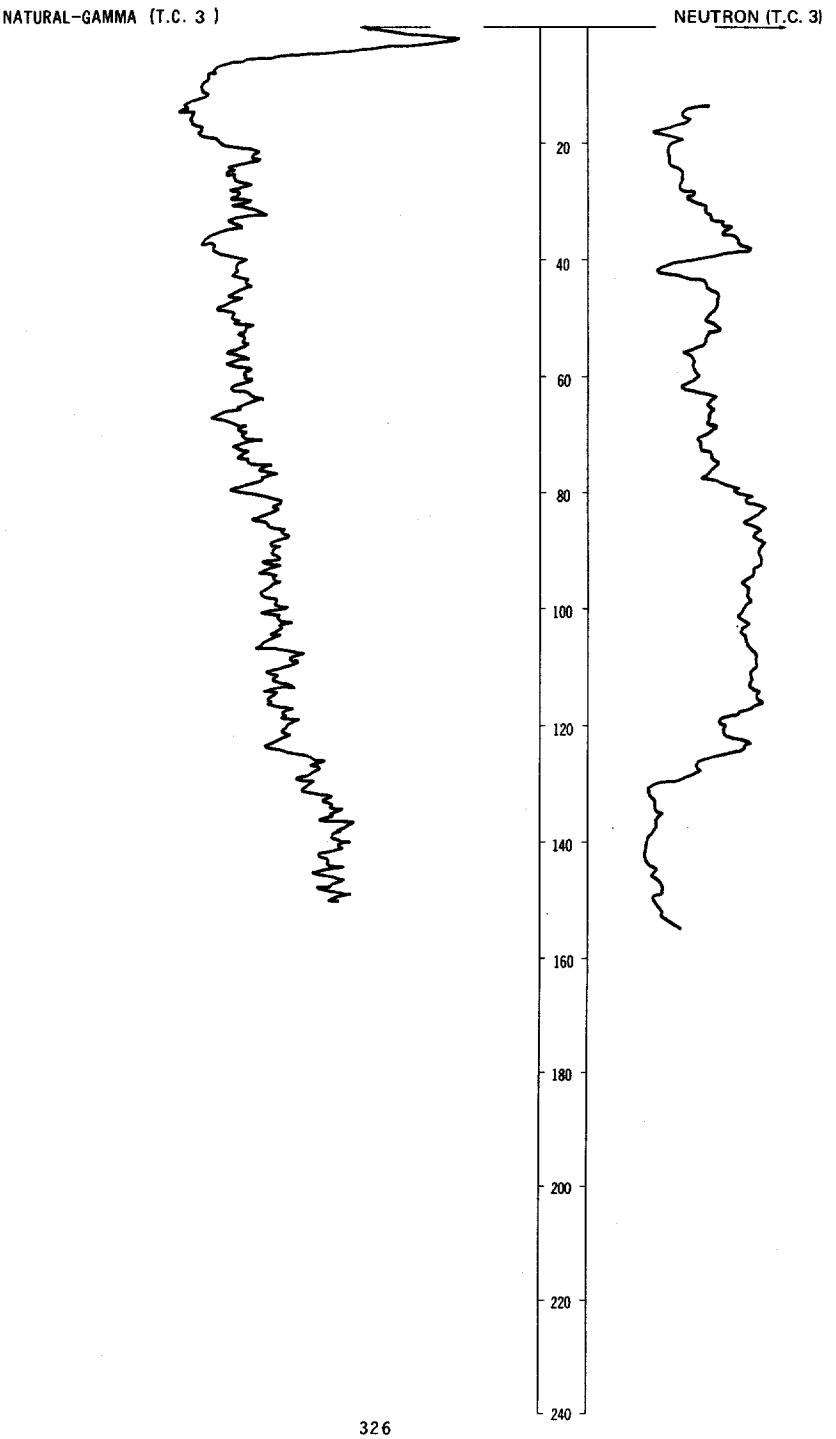
129-162 Shale, black to grayish-black, siliceous, hard.

LOCATION: 131-069-35ADA

DATE DRILLED: 9/08/77

ALTITUDE: 1999
(FT, MSL)

DEPTH: 162
(FT)



131-070-04CCB
NDSWC 9749

Altitude:	2000 feet	Date drilled:	8/25/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	7	7
	Clay (till), silty, sandy, olive-gray; scattered pebbles	20	27
Fox Hills Formation(?):			
	Clay, silty, dark-yellowish-brown	12	39
	Clay, yellowish-gray, bentonitic	1	40
	Sand, very fine to fine, dark-greenish-gray	22	62
	Clay, silty, sandy, brownish-gray	20	82
Pierre Formation:			
	Shale, grayish-black	38	120

131-070-05BBB
NDSWC 9752

Altitude:	2009 feet	Date drilled:	8/26/76
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 40 percent quartz, 25 percent carbonate, 25 percent unidentified, and 10 percent shale fragments	7	7
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	3	10
	Clay (till), silty, sandy, olive-gray	14	24
	Sand, very fine to very coarse, predominantly medium; composed of 60 percent quartz, 20 percent shale, and 10 percent carbonate fragments	16	40
	Clay (till), silty, sandy, olive-gray	2	42
Fox Hills Formation(?):			
	Clay, sandy, greenish-black	14	56
	Sandstone, very fine to fine, silty, clayey	7	63
Pierre Formation:			
	Shale, grayish-black, hard	17	80

131-070-07DDD
NDSWC 9748

Altitude: 2029 feet — Date drilled: 8/25/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	13	13
	Gravel, sandy	2	15
	Clay, dark-grayish-brown	2	17
Fox Hills Formation:			
	Clay, sandy, dark-greenish-gray	24	41
	Clay, silty, sandy, brownish-gray, hard	23	64
	Shale, grayish-black, hard	18	82
	Sandstone, very fine to fine, grayish-black, hard; upper part is clayey	9.5	91.5
	Clay, sandy, greenish-gray	26.5	118
	Clay, silty, sandy, dark-brownish-gray	13	131
Pierre Formation:			
	Shale, grayish-black, hard	9	140

131-070-10AAB
NDSWC 9751

Altitude: 2046 feet — Date drilled: 8/25/76

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, gravelly	9	9
	Clay, silty, moderate-yellowish-brown	17	26
	Clay, silty, sandy, olive-gray	18	44
	Sand, very fine to fine	4	48
	Clay, silty, sandy, olive-gray	24	72
	Clay (till), silty, sandy, dark-olive-gray; scattered pebbles	19	91
	Boulder, granite	1	92
	Clay (till), silty, sandy, dark-olive-gray; scattered pebbles	4	96
	Gravel and boulders	2	98
Fox Hills Formation(?):			
	Clay, silty, sandy	21	119
Pierre Formation:			
	Clay, grayish-black	21	140

131-070-10BBB1
NDSWC 9750

Altitude: 2035 feet — Date drilled: 8/25/76

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, gravelly	23	23
	Sand, very fine to coarse, predominantly medium	12	35
	Clay, silty, brownish-gray	56	91
	Clay (till), silty, sandy, brownish-gray; scattered pebbles	31	122
Pierre Formation:			
	Clay, grayish-black, hard	18	140

131-070-10BBB2
NDSWC 9750A

Altitude:	2035 feet	Date drilled:	8/25/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, predominantly coarse, gravelly; composed of 50 percent quartz, 20 percent carbonate, and 30 percent unidentified fragments	23	23
	Sand, very fine to coarse, predominantly medium; composed of 80 percent quartz and 20 percent shale fragments	17	40

131-070-20DDC
NDSWC 9675

Altitude:	2002 feet	Date drilled:	8/03/76
Glacial drift:			
	Sand, very fine to very coarse, predominantly medium, gravelly; composed predominantly of quartz fragments	13	13
	Clay, silty, light-brownish-gray	10	23
	Clay (till), silty, sandy, olive-gray; scattered pebbles	61	84
	Clay, silty, brownish-gray	23	107
	Clay; lensed with sand and gravel	12	119
	Clay (till), silty, sandy, olive-gray; scattered pebbles	7	126
Pierre Formation:			
	Shale, grayish-black, hard	14	140

131-070-21DDD
NDSWC 9674

Altitude:	2030 feet	Date drilled:	8/03/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly medium, gravelly	31	31
	Clay, olive-gray	5	36
	Clay (till), silty, sandy, olive-gray; scattered pebbles	21	57
	Gravel, very fine, sandy; composed predominantly of quartz and carbonate fragments	16	73
	Clay (till), silty, sandy, olive-gray; scattered pebbles	13	86
	Clay, silty, sandy	11	97
Pierre Formation:			
	Shale, grayish-black, hard	23	120

131-070-24BBB
NDSWC 9673

Altitude:	2049 feet	Date drilled:	8/03/76
Glacial drift:			
	Sand, fine to very coarse, gravelly	3	3
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	15	18
	Clay (till), silty, sandy, moderate-brown; scattered pebbles; gravel lens from 26 to 27 feet	17	35
	Clay, moderate-yellowish-brown	3	38
	Clay, olive-gray	7	45
	Sand, very fine to coarse	8	53
	Clay, silty, pale-yellowish-brown; gravel and rocks from 82 to 83 feet	30	83
	Clay (till), silty, sandy, brownish-gray; scattered pebbles	69	152
Pierre Formation:			
	Shale, black, hard	28	180

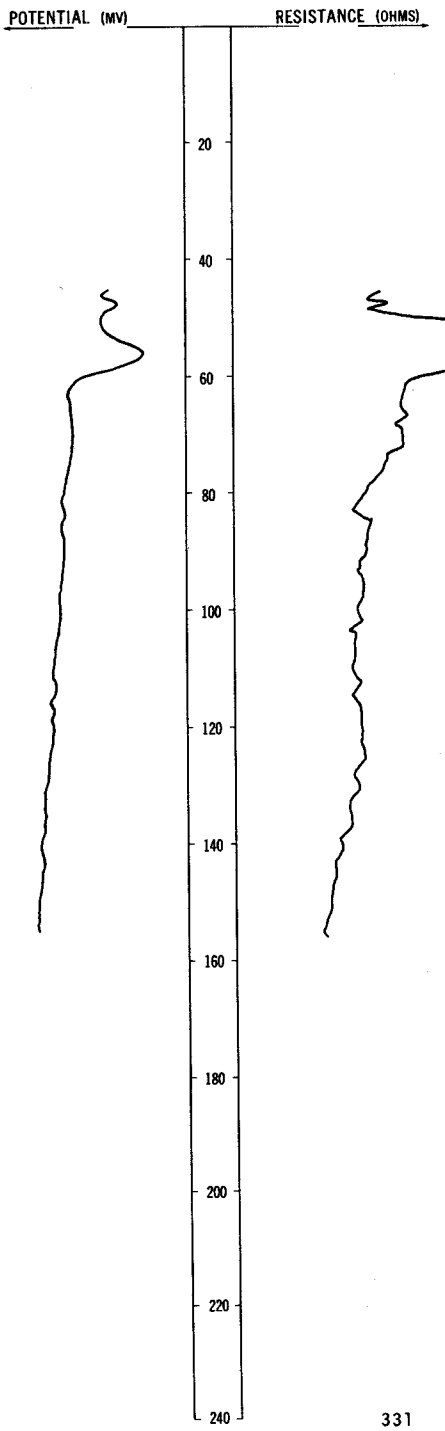
NDSWC 5222

LOCATION: 131-070-24CDD

DATE DRILLED: 9/09/77

ALTITUDE: 1998
(FT, MSL)

DEPTH: 162
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-5 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

5-25 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

25-58 Sand, fine to very coarse, predominantly medium to coarse, subrounded; composed largely of quartz, carbonate, and granitic fragments with detrital lignite.

58-128 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

PIERRE FORMATION

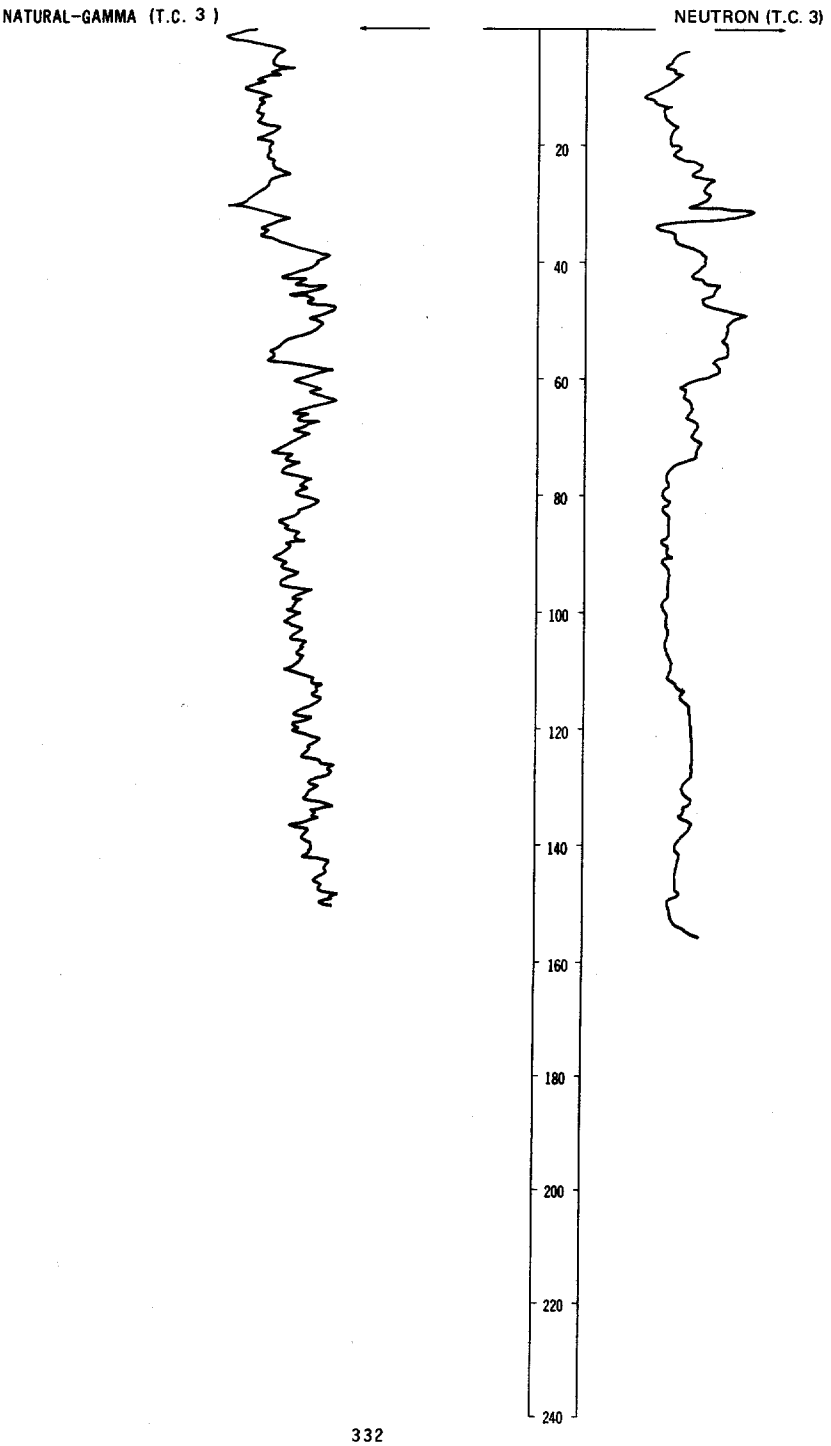
128-162 Shale, sandy, black to grayish-black, hard.

LOCATION: 131-070-24CDD

DATE DRILLED: 9/09/77

ALTITUDE: 1998
(FT, MSL)

DEPTH: 162
(FT)



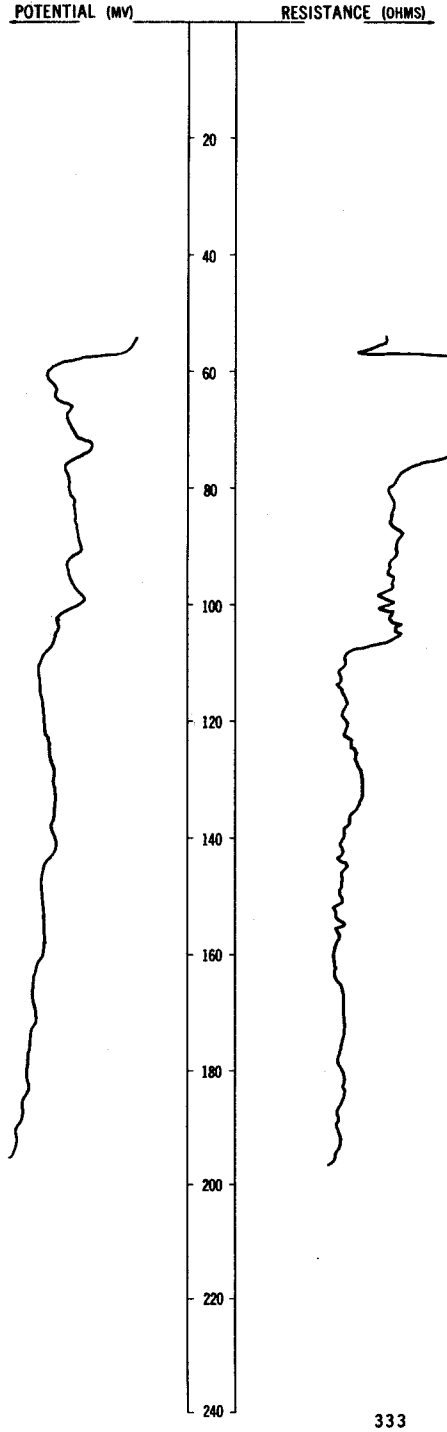
NDSWC 5221

LOCATION: 131-070-25AAB

DATE DRILLED: 9/09/77

ALTITUDE: 2055
(FT, MSL)

DEPTH: 202
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-11	Sand and gravel; sand is fine to very coarse, subangular to rounded, and composed largely of quartz and carbonate fragments; gravel is fine to medium and composed largely of carbonate and shale fragments.
11-15	Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.
15-35	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.
35-57	Sand and gravel; sand is fine to very coarse; gravel is fine to medium; few clay lenses.
57-78	Sand, fine to medium, silty, clayey, yellowish-brown, rounded.
78-108	Clay (till), sandy, silty, olive-gray to grayish-black; scattered pebbles; sand lens from 86 to 92 feet.

PIERRE FORMATION

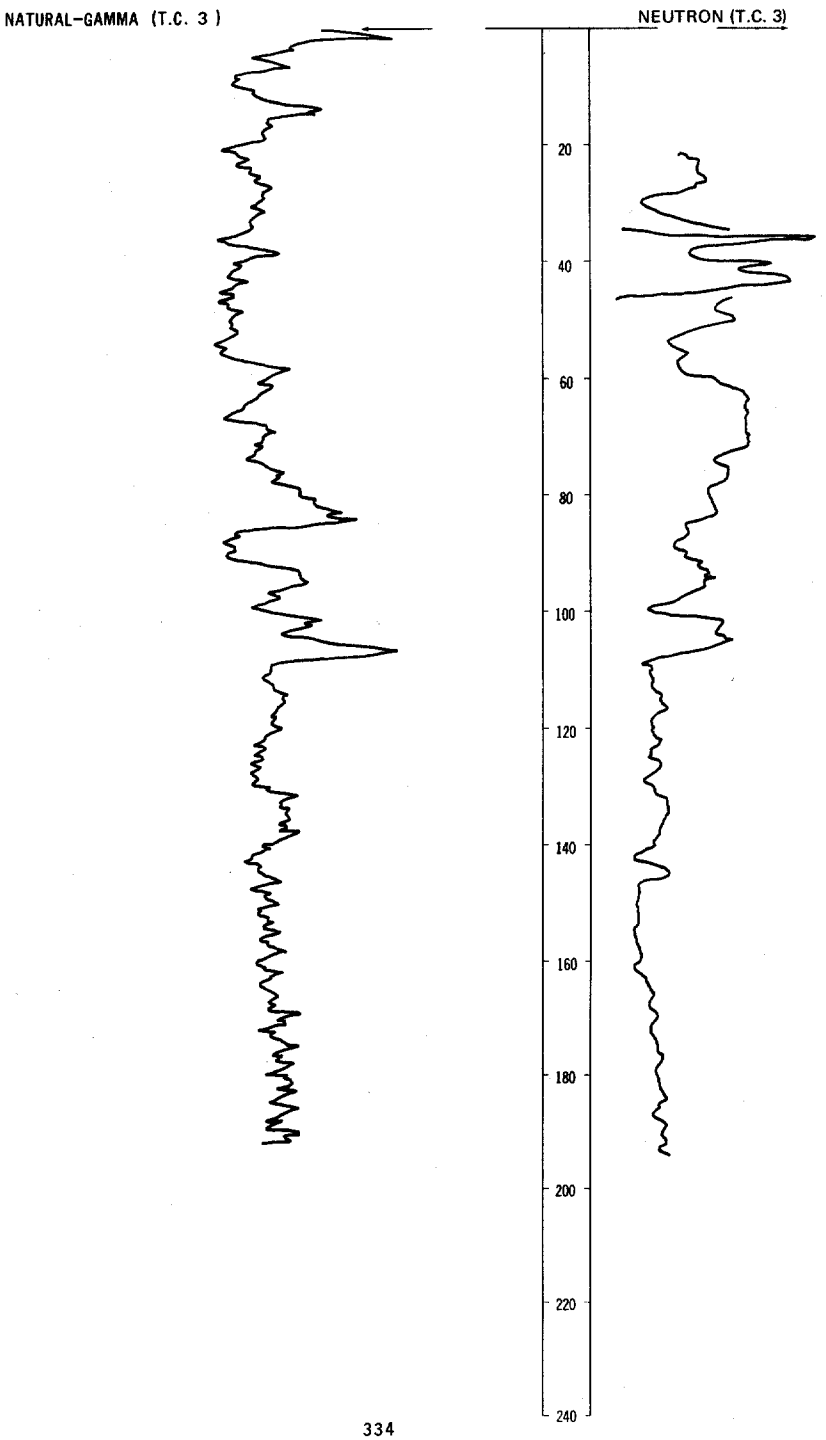
108-145	Clay, sandy, silty, black to grayish-black.
145-202	Shale, black to grayish-black.

LOCATION: 131-070-25AAB

DATE DRILLED: 9/09/77

ALTITUDE: 2055
(FT, MSL)

DEPTH: 202
(FT)



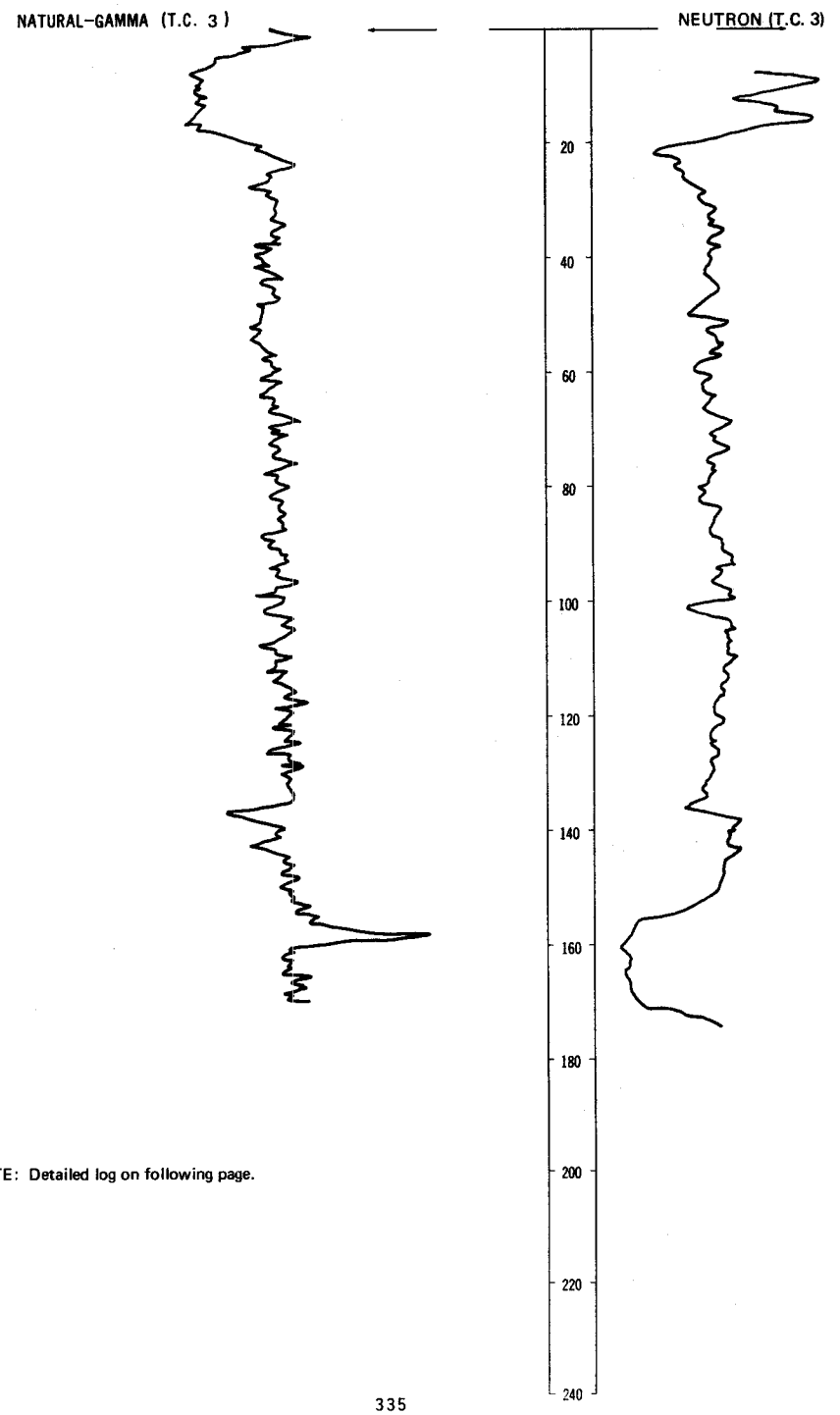
NDSWC 5224

LOCATION: 131-070-26BBB

ALTITUDE: 2058
(FT, MSL)

DATE DRILLED: 9/12/77

DEPTH: 182
(FT)



NOTE: Detailed log on following page.

131-070-26BBB, Continued
NDSWC 5224

Altitude:	2058 feet	Date drilled:	9/12/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, gravelly, subangular to subrounded	19	19
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles	6	25
	Clay (till), sandy, silty, moderate-yellowish-brown; composed largely of reworked Fox Hills	30	55
	Clay (till), sandy, silty, olive-gray; scattered pebbles; sand lenses from 135 to 138 feet and 141 to 143 feet	100	155
Pierre Formation:			
	Shale, black to grayish-black, siliceous, hard	27	182

131-070-28BBC2
(Log from Venturia Well Drilling)

		Date drilled:	10/08/74
	Dirt, black	3	3
	Gravel	9	12

131-070-29BBA
NDSWC 9677

Altitude:	2032 feet	Date drilled:	8/04/76
Glacial drift:			
	Sand, very fine to very coarse, gravelly	3	3
Fox Hills Formation:			
	Clay, silty, sandy, moderate-yellowish-brown	31	34
	Clay, silty, sandy, dusky-brown	5	39
	Silt, sandy, greenish-black	5	44
	Clay, silty, sandy	18	62
	Clay, silty, grayish-black	22	84
Pierre Formation:			
	Shale, grayish-black, hard	16	100

131-070-30BAA
NDSWC 9676

Altitude: 1995 feet — Date drilled: 8/03/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, dark-yellowish-brown	10	10
	Clay, grayish-black, fossiliferous	13	23
	Gravel, sandy	2	25
	Clay (till), silty, sandy, olive-gray; scattered pebbles	65	90
	Sand, very fine to very coarse, gravelly	2	92
	Clay (till), sandy, olive-gray; scattered pebbles	2	94
Pierre Formation:			
	Shale, grayish-black, hard	6	100

131-070-31DDD
(Log from Jacob Thurn)

Date drilled: 10/07/72

Dirt, black	1	1
Sand	11	12

131-070-32CCC
(Log from Venturia Well Drilling)

Date drilled: 12/03/74

Dirt, black	1	1
Shale	33	34

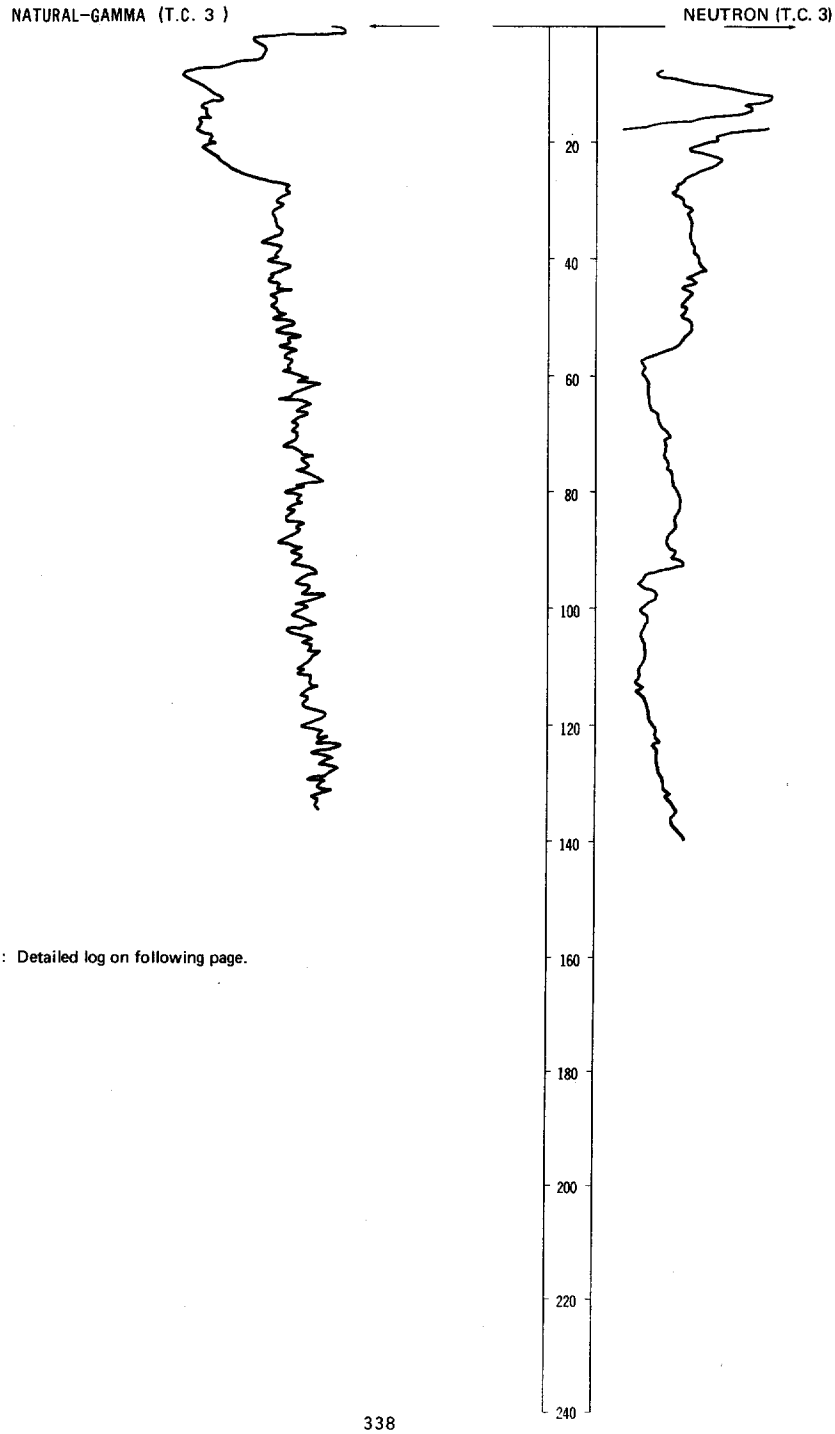
NDSWC 5223

LOCATION: 131-070-34ABB

DATE DRILLED: 9/12/77

ALTITUDE: 1999
(FT, MSL)

DEPTH: 142
(FT)



NOTE: Detailed log on following page.

131-070-34ABB, Continued
NDSWC 5223

Altitude:	1999 feet	Date drilled:	9/12/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, coarse to very coarse, gravelly, subangular to subrounded	26	26
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles; till is composed largely of reworked Fox Hills and Pierre below 50 feet	68	94
Pierre Formation:			
	Shale, black to grayish-black, noncalcareous, hard	48	142

131-070-35ADD
NDSWC 9672

Altitude:	1989 feet	Date drilled:	7/03/76
Glacial drift:			
	Clay, dusky-brown	6	6
	Gravel, very fine to medium, predominantly very fine, sandy	6	12
	Clay	2	14
	Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 50 percent quartz, 30 percent shale, 15 percent carbonate, and 5 percent unidentified fragments	13	27
	Clay (till), silty, sandy, olive-gray; scattered pebbles	41	68
Pierre Formation:			
	Shale, grayish-black, hard	12	80

131-071-02BBB
(Log from Jacob Thurn)

Date drilled: 10/02/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	4	4
	Clay, yellow	26	30
	Clay, blue, sandy	30	60

131-071-02DCD
NDSWC 9719

Altitude: 2066 feet

Date drilled: 8/13/76

Glacial drift:			
	Sand, very fine to very coarse, predominantly coarse, gravelly; composed of 60 percent quartz, 25 percent carbonate, 15 percent shale, and 5 percent unidentified fragments	11	11
Fox Hills Formation(?):			
	Clay, moderate-yellowish-brown, hard	6	17
	Clay, brownish-gray; contains sand lenses and carbonaceous material	24	41
Pierre Formation:			
	Shale, dark-brownish-gray, hard	9	50

131-071-05ADA
(Log from Gross Drilling)

Date drilled: 6/ /75

	Clay, brown	30	30
	Clay, blue	33	63
	Sand, blue	17	80

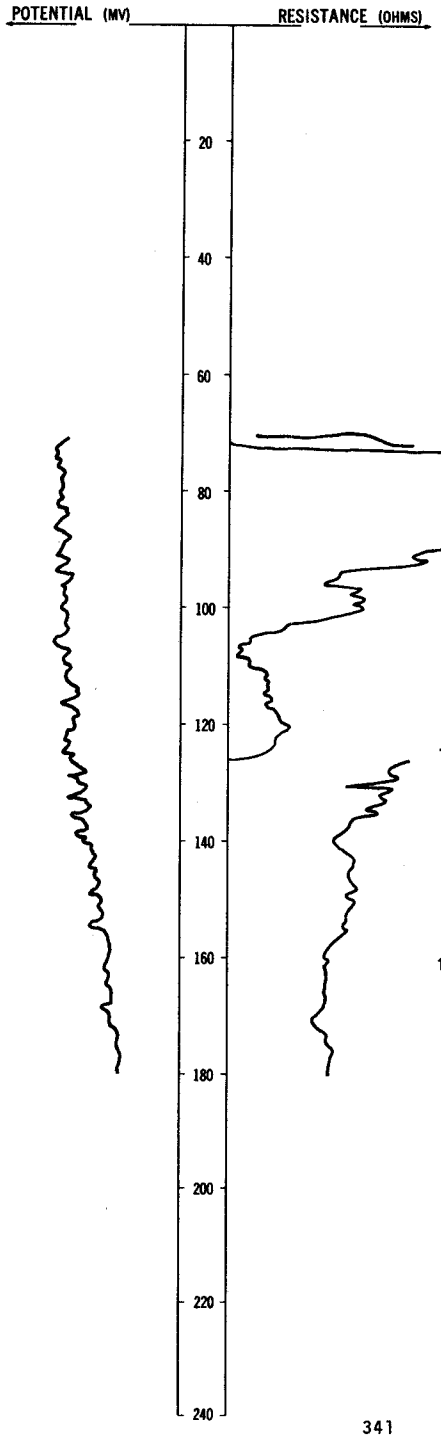
NDSWC 5151, 5151A

LOCATION: 131-071-07BBB1, 2

DATE DRILLED: 8/04/77

ALTITUDE: 2166
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-13 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.

FOX HILLS FORMATION

13-56 Sand, fine, clayey, light-brown.

56-66 Sand, fine, clayey; interbedded with carbonaceous shale and medium-bluish-gray to moderate-brown clay.

66-72 Clay, silty, black to moderate-brown, carbonaceous, hard.

72-126 Sand, fine, clayey, greenish-gray to medium-bluish-gray, rounded, glauconitic.

126-160 Siltstone, clayey, silty, sandy, light-gray to dark-gray.

PIERRE FORMATION

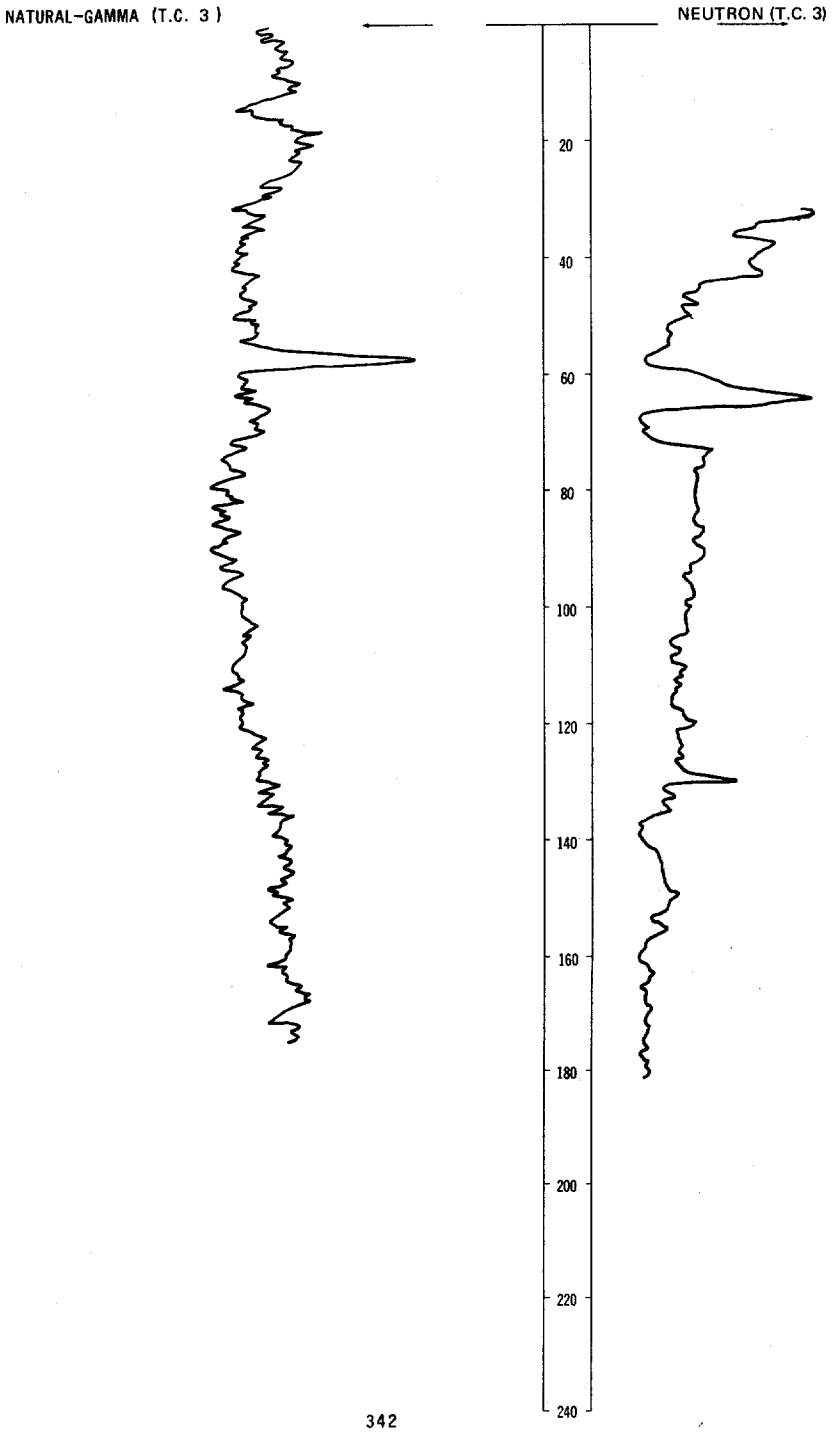
160-182 Shale, silty, medium-dark-gray to grayish-black, hard.

LOCATION: 131-071-07BBB1, 2

DATE DRILLED: 8/04/77

ALTITUDE: 2166
(FT, MSL)

DEPTH: 182
(FT)



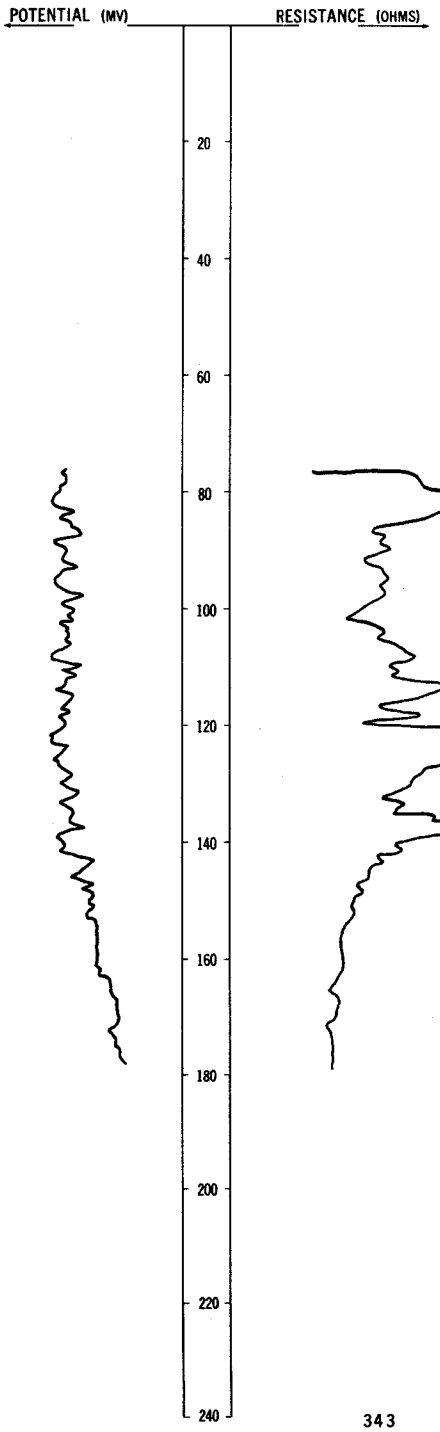
NDSWC 5150

LOCATION: 131-071-08AAA

DATE DRILLED: 8/04/77

ALTITUDE: 2189
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-29 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

29-42 Sand, fine, light-brown to moderate-reddish-brown; scattered pebbles; composed of reworked Fox Hills sand.

FOX HILLS FORMATION

42-84 Sand, fine, light-brown to moderate-reddish-brown; numerous thin clay lenses.

84-140 Sand, fine, clayey, medium-gray to medium-bluish-gray, glauconitic; numerous thin shale beds and few indurated zones below 100 feet.

140-153 Claystone, sandy, silty, medium-gray to medium-dark-gray.

PIERRE FORMATION

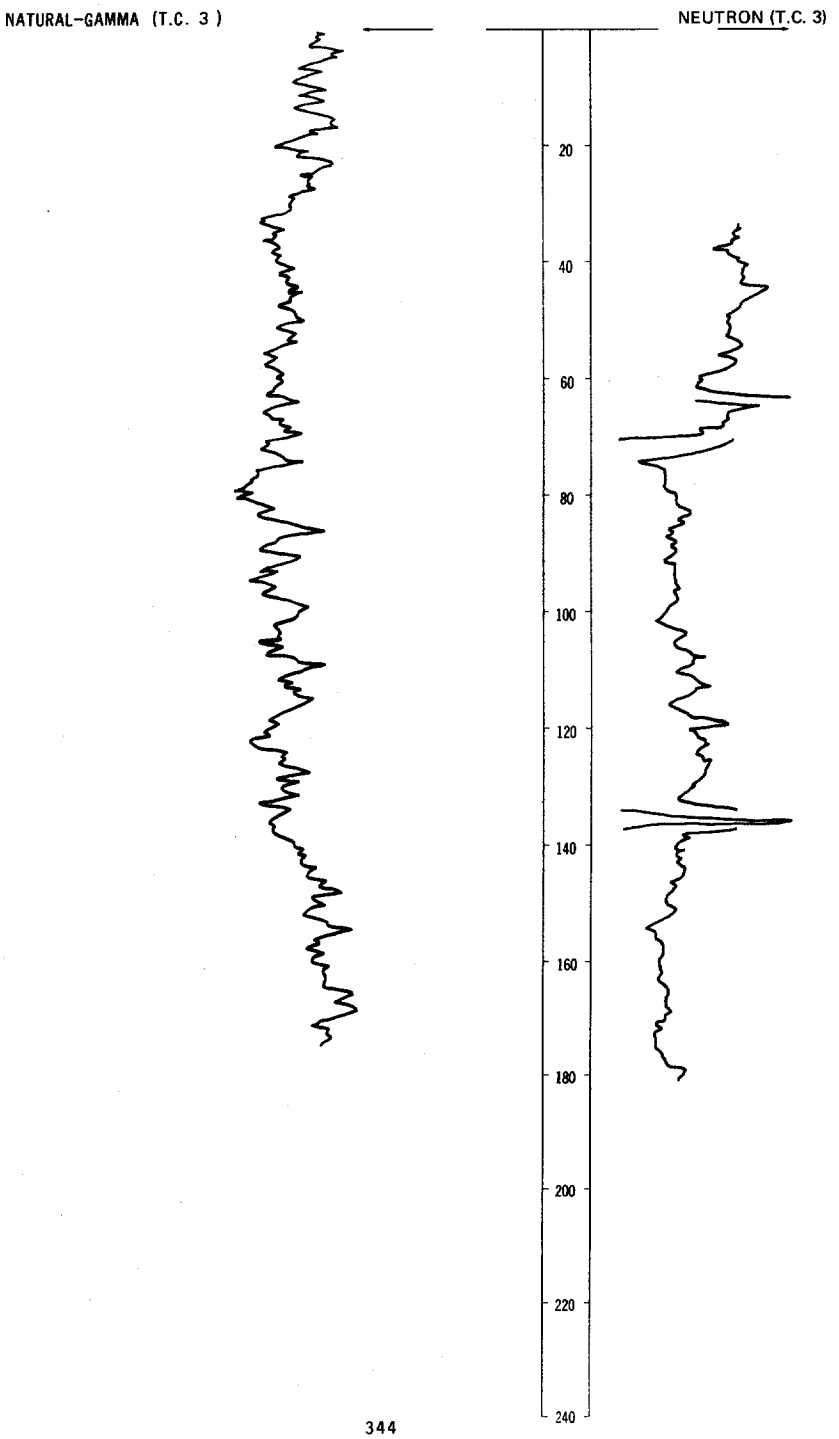
153-182 Shale, black to grayish-black, siliceous, hard.

LOCATION: 131-071-08AAA

DATE DRILLED: 8/04/77

ALTITUDE: 2189
(FT, MSL)

DEPTH: 182
(FT)



131-071-18DDC
(Log from Jacob Thurn)

Date drilled: 7/03/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	4	4
	Gravel	2	6
	Sand, yellow	11	17
	Sand, blue	18	35

131-071-21CCD
NDSWC 9688

Altitude: 2088 feet — Date drilled: 8/05/76

Glacial drift:			
	Gravel, sandy	3	3
	Clay (till), silty, sandy, light-brown; scattered pebbles	4	7
	Clay, silty, dark-yellowish-brown	4	11
	Clay, silty, sandy, brownish-gray	9	20
Fox Hills Formation:			
	Sand, very fine to fine, clayey	1	21
	Clay, silty, sandy, brownish-gray	52	73
Pierre Formation:			
	Shale, grayish-black, hard	27	100

131-071-27BBB
NDSWC 9687

Altitude: 2084 feet — Date drilled: 8/05/76

Glacial drift:			
	Sand, very fine to medium, gravelly	6	6
	Clay, moderate-yellowish-brown	5	11
Fox Hills Formation(?):			
	Clay, silty, brownish-gray, hard	11	22
	Sand, clayey, grayish-green	10	32
	Clay, silty, brownish-gray	4	36
Pierre Formation:			
	Shale, grayish-black, hard	44	80

NDSWC 5164

LOCATION: 131-071-27CCC

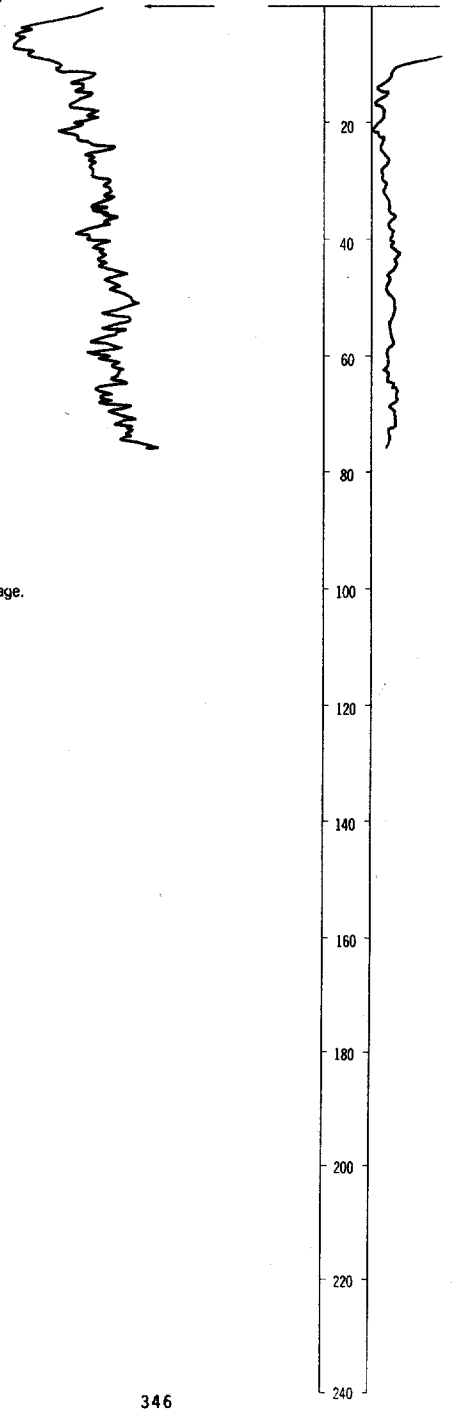
DATE DRILLED: 8/10/77

ALTITUDE:
(FT, MSL)

DEPTH: 82
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



NOTE: Detailed log on following page.

131-071-27CCC, Continued
NDSWC 5164

Date drilled: 8/10/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, coarse to very coarse, gravelly, angular to subrounded	11	11
Fox Hills Formation:			
	Clay, sandy, silty, medium-gray to medium-dark-gray; with dark-greenish-gray streaks	34	45
Pierre Formation:			
	Clay, silty, sandy, medium-gray to grayish-black	37	82

131-071-29BAB
NDSWC 9689

Altitude: 2100 feet

Date drilled: 8/05/76

Fox Hills Formation(?):			
	Sand, clayey, light-brown	3	3
	Clay, light-brown	4	7
	Clay, silty, brownish-gray, hard	13	20

NDSWC 5163

LOCATION: 131-071-34BCC

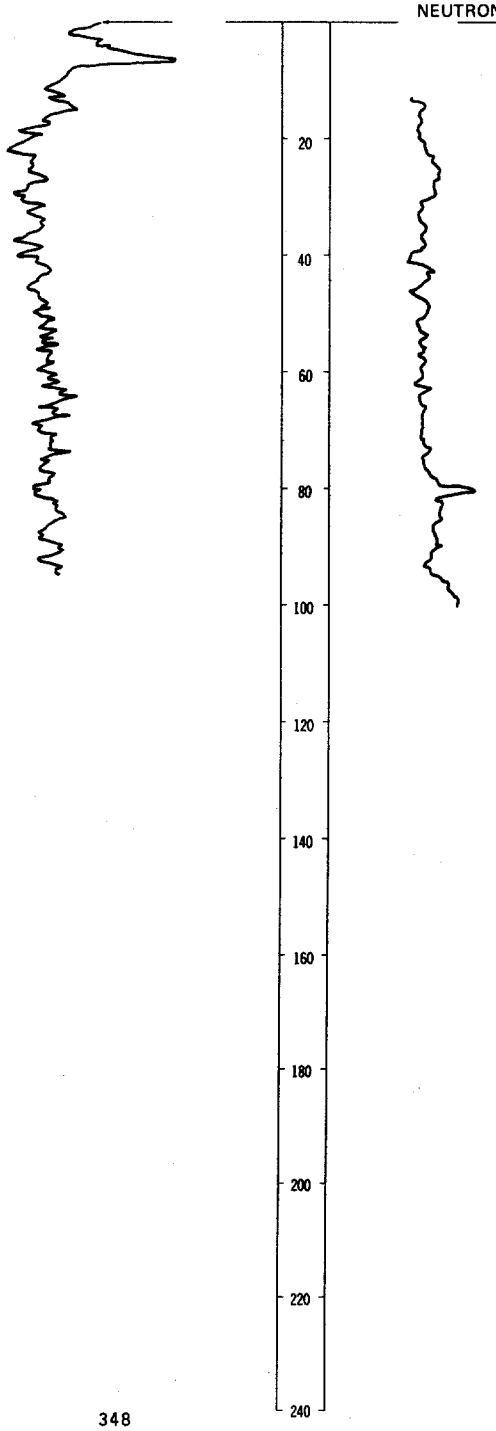
DATE DRILLED: 8/10/77

ALTITUDE: 2091
(FT, MSL)

DEPTH: 102
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



NOTE: Detailed log on following page.

131-071-34BCC, Continued
NDSWC 5163

Altitude:	2091 feet	Date drilled:	8/10/77
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	8	8
Fox Hills Formation:			
	Sand, very fine, silty, moderate-yellowish-brown	8	16
	Sand, very fine, silty, clayey, medium-gray to medium-dark-gray	35	51
Pierre Formation(?):			
	Clay, silty, sandy, medium-gray to grayish-black	51	102

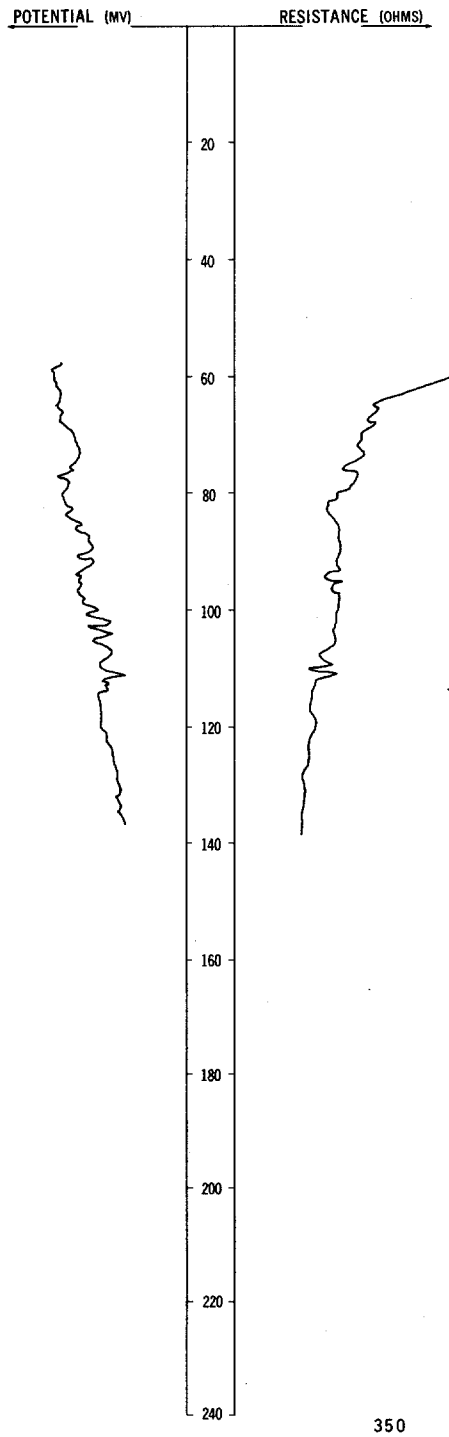
NDSWC 5152, 5152A

LOCATION: 131-072-02CCC1, 2

DATE DRILLED: 8/05/77

ALTITUDE: 2108
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-5 Gravel, fine to coarse, sandy, subangular to subrounded.

5-16 Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.

FOX HILLS FORMATION

16-22 Sand, fine, light-brown to moderate-brown; few detrital lignite fragments.

22-56 Sand, fine, light-brown to moderate-brown.

56-112 Clay, silty, sandy, medium-gray to medium-dark-gray, micaceous.

PIERRE FORMATION

112-142 Shale, grayish-black to black, siliceous, hard.

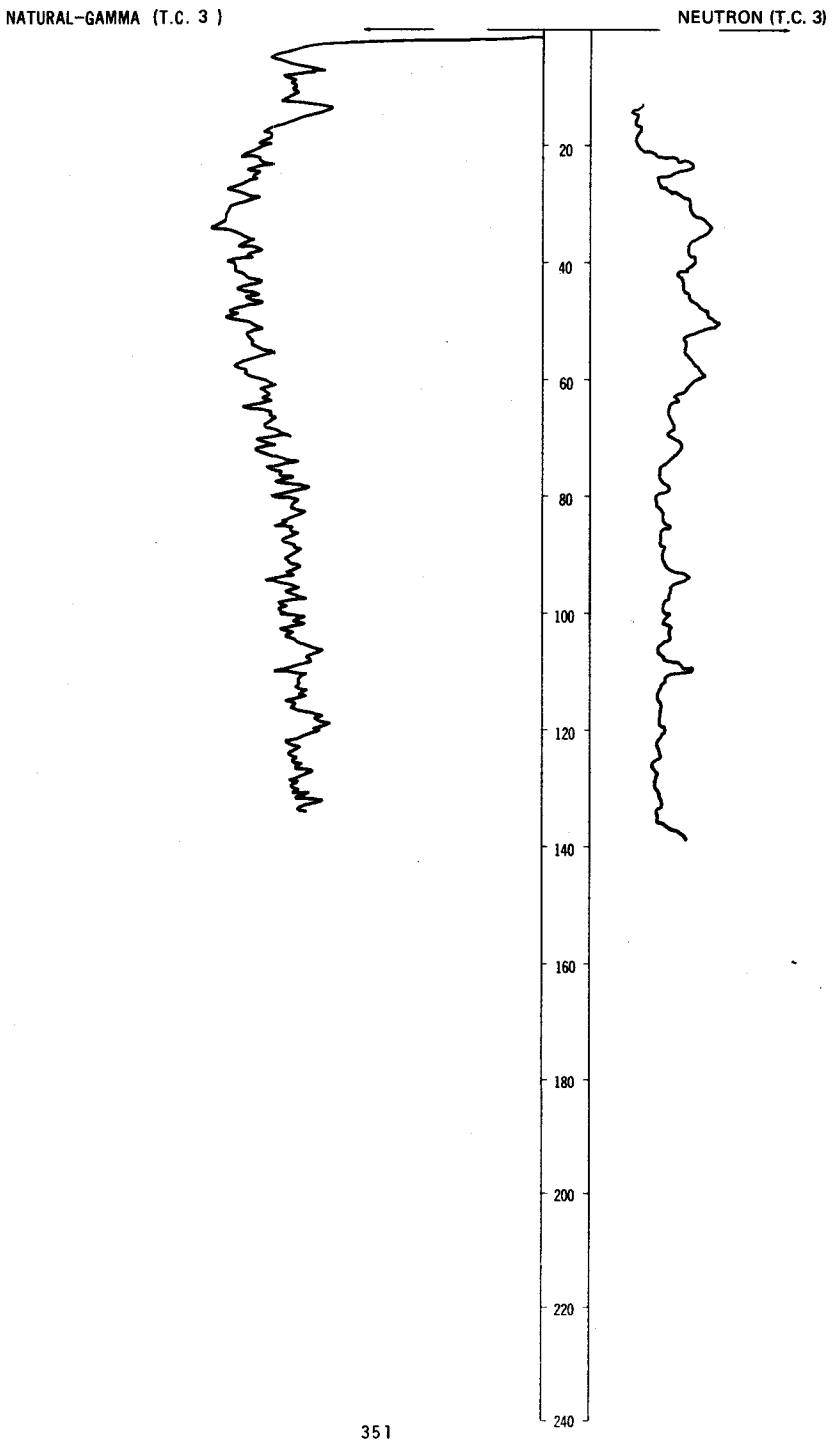
NDSWC 5152, 5152A, Continued

LOCATION: 131-072-02CCC1, 2

DATE DRILLED: 8/05/77

ALTITUDE: 2108
(FT, MSL)

DEPTH: 142
(FT)



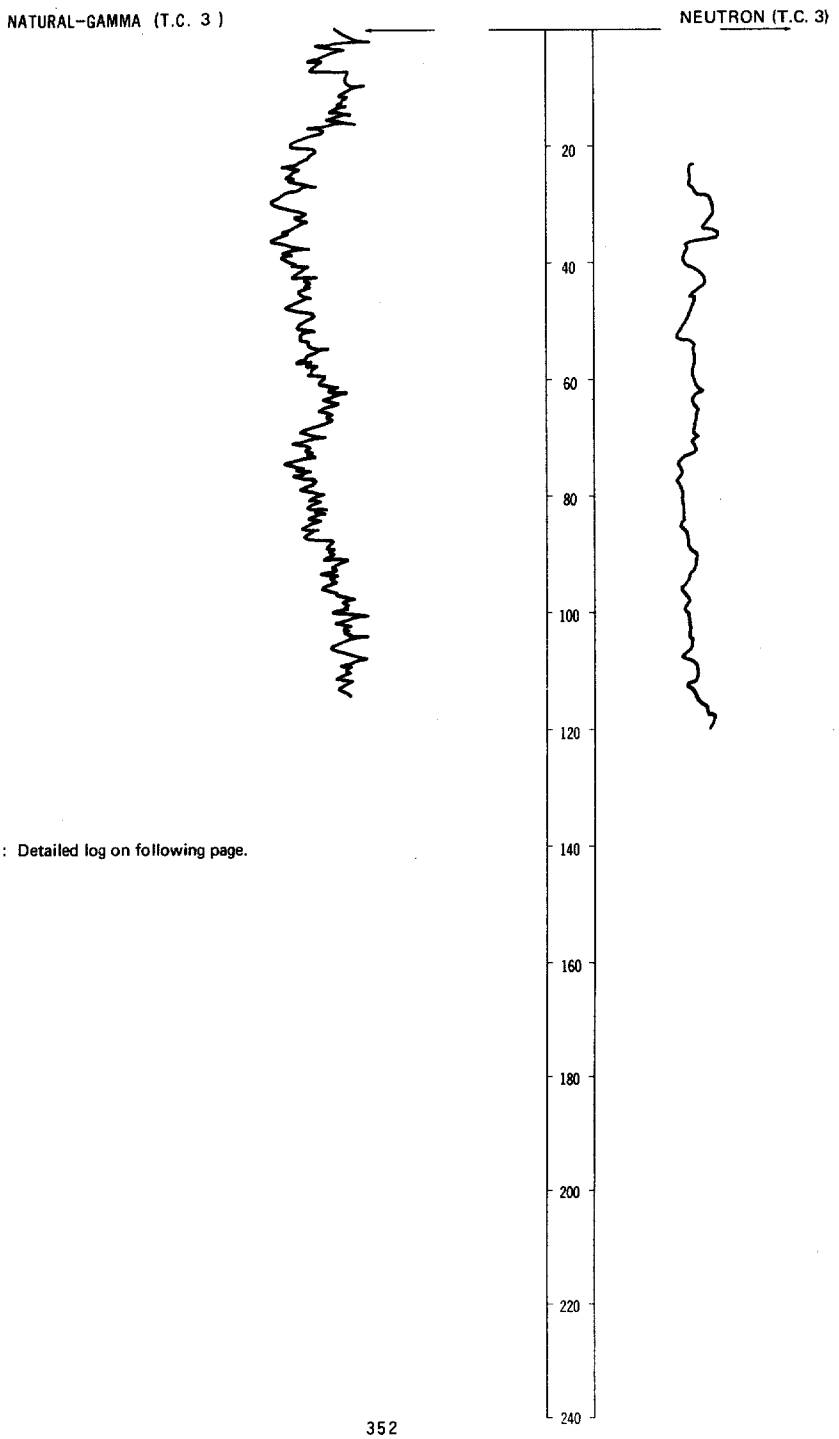
NDSWC 5154

LOCATION: 131-072-07BBB

DATE DRILLED: 8/08/77

ALTITUDE: 2085
(FT, MSL)

DEPTH: 122
(FT)



NOTE: Detailed log on following page.

131-072-07BBB, Continued
NDSWC 5154

Altitude: 2085 feet — Date drilled: 8/08/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Fox Hills Formation:			
	Clay, silty, sandy, moderate-yellowish-brown, bentonitic	35	35
	Clay, sandy, silty, medium-gray to medium-bluish-gray	53	88
Pierre Formation:			
	Shale, black to grayish-black, siliceous, hard	34	122

131-072-08ACD
(Log from Jacob Thurn)

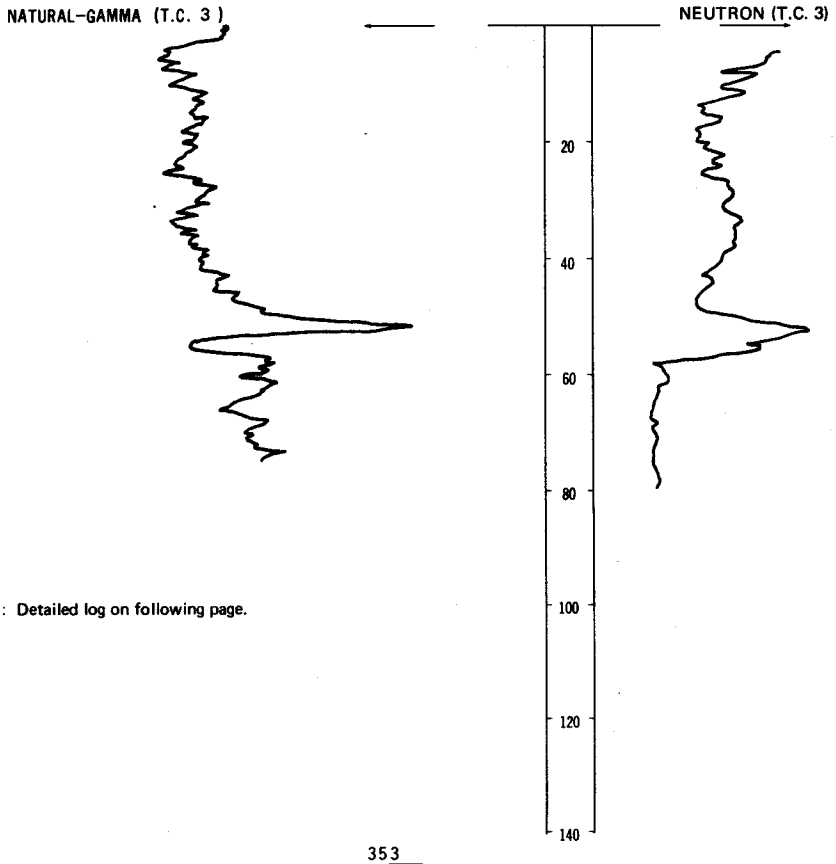
Date drilled: 7/19/74

Sand	35	35

NDSWC 5153, 5153A

LOCATION: 131-072-09BBB1, 2 — DATE DRILLED: 8/05/77

ALTITUDE: 2054 (FT, MSL) — DEPTH: 82 (FT)



NOTE: Detailed log on following page.

131-072-09BBB1, 2, Continued
NDSWC 5153, 5153A

Altitude: 2054 feet — Date drilled: 8/05/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, fine to coarse, sandy, subangular to subrounded; composed largely of carbonate and granitic material	35	35
	Clay (till), sandy, silty, olive-gray; scattered pebbles; boulders from 51 to 57 feet	22	57
Pierre Formation:			
	Shale, black to grayish-black, siliceous, hard	25	82

131-072-11CCC
(Log from Schnell, Inc.)

Date drilled: 2/11/64

Topsoil	2	2
Gravel, dry	3	5
Clay, sandy	53	58
Clay, hard, blue	2	60

131-072-12BAA
(Log from Gross Drilling)

Date drilled: 11/12/72

Clay, yellow	30	30
Clay	70	100
Sand, blue; water	40	140

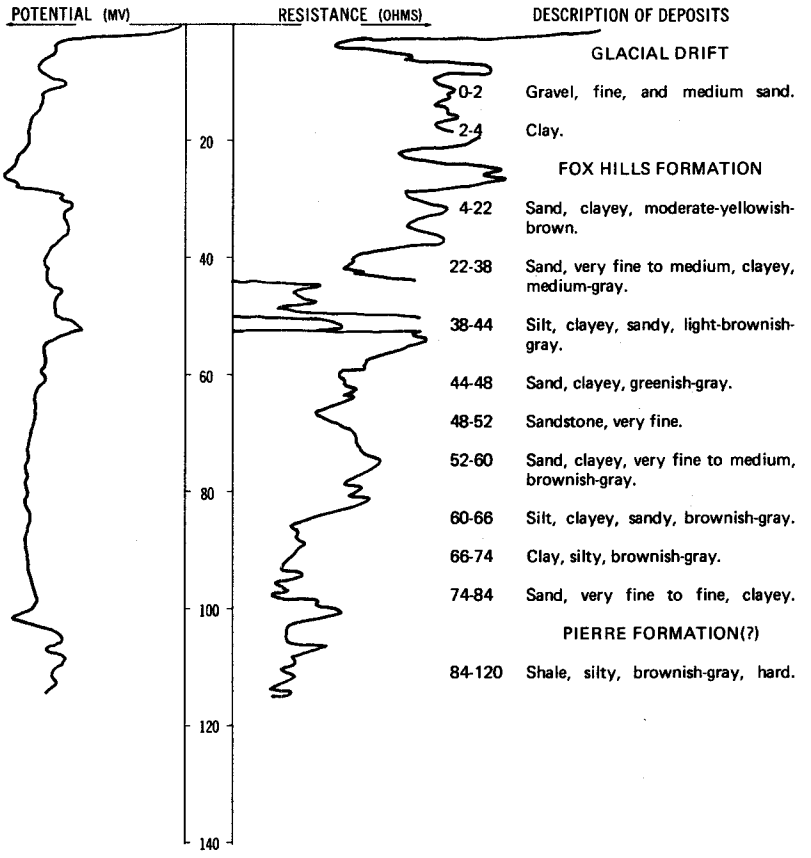
NDSWC 9703

LOCATION: 131-072-14BBB1

DATE DRILLED: 8/10/76

ALTITUDE: 2112
(FT, MSL)

DEPTH: 120
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-2 Gravel, fine, and medium sand.

2-4 Clay.

FOX HILLS FORMATION

4-22 Sand, clayey, moderate-yellowish-brown.

22-38 Sand, very fine to medium, clayey, medium-gray.

38-44 Silt, clayey, sandy, light-brownish-gray.

44-48 Sand, clayey, greenish-gray.

48-52 Sandstone, very fine.

52-60 Sand, clayey, very fine to medium, brownish-gray.

60-66 Silt, clayey, sandy, brownish-gray.

66-74 Clay, silty, brownish-gray.

74-84 Sand, very fine to fine, clayey.

PIERRE FORMATION(?)

84-120 Shale, silty, brownish-gray, hard.

131-072-14BBB2
NDSWC 9703A

Altitude: 2112 feet

Date drilled: 8/10/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, sandy	4	4
Fox Hills Formation:			
	Sand, medium, clayey, moderate-yellowish-brown	18	22
	Sand, very fine to medium, predominantly fine, clayey, medium-gray	17	39
	Silt, clayey, sandy, light-brownish-gray	1	40

131-072-18CDC
(Log from Jacob Thurn)

Date drilled: 7/02/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Clay, yellow	17	20
	Shale, blue	48	68

131-072-19CDD
NDSWC 9692

Altitude: 2026 feet — Date drilled: 8/05/76

Glacial drift:			
	Clay, silty, dusky-yellowish-brown	5	5
	Clay, pale-yellowish-brown; contains gastropod shells	2	7
	Clay, silty, sandy	6	13
	Clay, dusky-yellowish-brown	15	28
	Sand, fine to very coarse, predominantly very coarse, gravelly	10	38
	Clay (till), silty, sandy, brownish-gray	7	45
Fox Hills Formation(?):			
	Clay, grayish-brown; interbedded with thin greenish-gray very fine to fine sand	21	66
	Clay, silty, brownish-gray	12	78
Pierre Formation:			
	Shale, grayish-black, hard	22	100

131-072-20CCC
NDSWC 9691

Altitude: 2028 feet — Date drilled: 8/05/76

Glacial drift:			
	Clay, grayish-brown	6	6
	Clay, light-yellowish-brown	6	12
	Clay, olive-gray	9	21
	Sand, fine to very coarse, predominantly coarse, gravelly	7	28
	Sand, fine to coarse, clayey	4	32
	Sand, fine to very coarse, predominantly coarse, gravelly	4	36
	Clay (till), silty, brownish-gray	16	52
Fox Hills Formation:			
	Sand, very fine to fine, clayey, dark-greenish-gray	21	73
	Sandstone	1	74
	Clay, silty, sandy, dark-greenish-gray	12	86
Pierre Formation:			
	Shale, grayish-black, hard	34	120

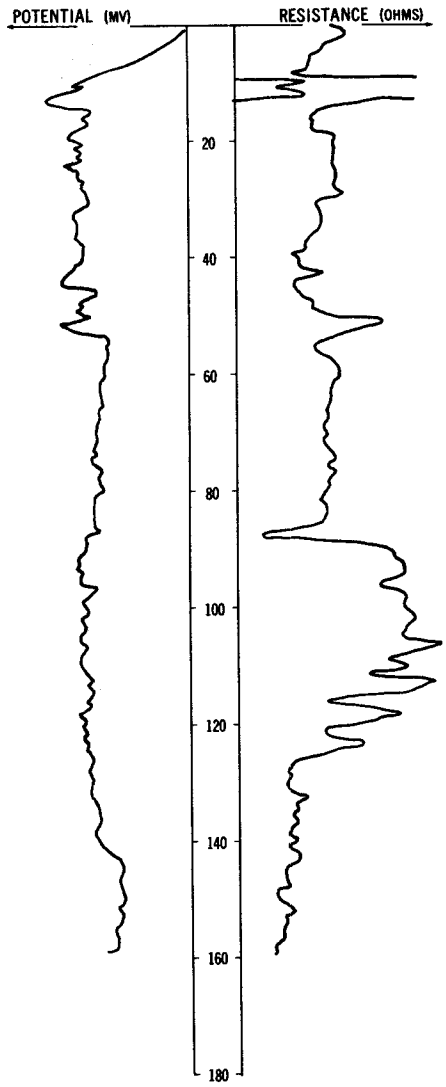
NDSWC 9690

LOCATION: 131-072-27AAA

DATE DRILLED: 8/05/76

ALTITUDE: 2182
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
8-13	Sand, fine to medium, gravelly.
13-19	Clay (till), silty, sandy, pale-yellowish-brown; scattered pebbles.
19-50	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
50-53	Gravel, sandy.
53-86	Clay (till), medium-gray; scattered pebbles.
86-88	Clay (till), sandy, grayish-brown; scattered pebbles.

FOX HILLS FORMATION(?)

88-125	Sand, fine, clayey, dark-yellowish-brown to greenish-gray; contains carbonaceous clay lenses near base.

PIERRE FORMATION

125-160	Shale, dark-brownish-gray, hard.

131-072-30BCC1
(Log from Jacob Thurn)

Date drilled: 12/20/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Clay, yellow	9	12
	Sand	3	15
	Shale	16	31

131-072-30BCC2
(Log from Jacob Thurn)

Date drilled: 7/12/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, black	3	3
	Sand	9	12
	Clay, dark	22	34

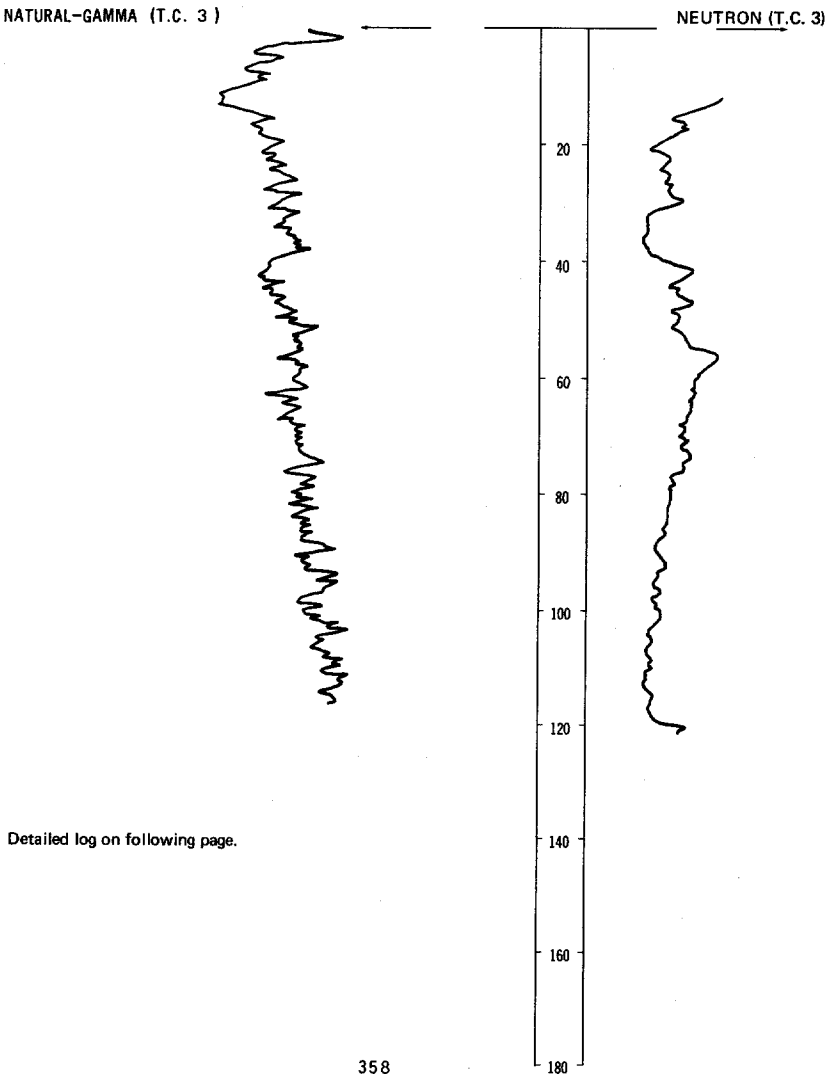
NDSWC 5158

LOCATION: 131-073-07CCC

DATE DRILLED: 8/09/77

ALTITUDE: 2016
(FT, MSL)

DEPTH: 122
(FT)



NOTE: Detailed log on following page.

Altitude: 2016 feet — Date drilled: 8/09/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	3	3
	Gravel, fine to coarse, clayey, angular to subrounded; composed largely of carbonate material	11	14
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles	25	39
Fox Hills Formation:			
	Clay, sandy, silty, medium-dark-gray to dusky-bluish-green; numerous thin glauconitic sand lenses	64	103
Pierre Formation:			
	Shale, black to grayish-black, siliceous, hard	19	122

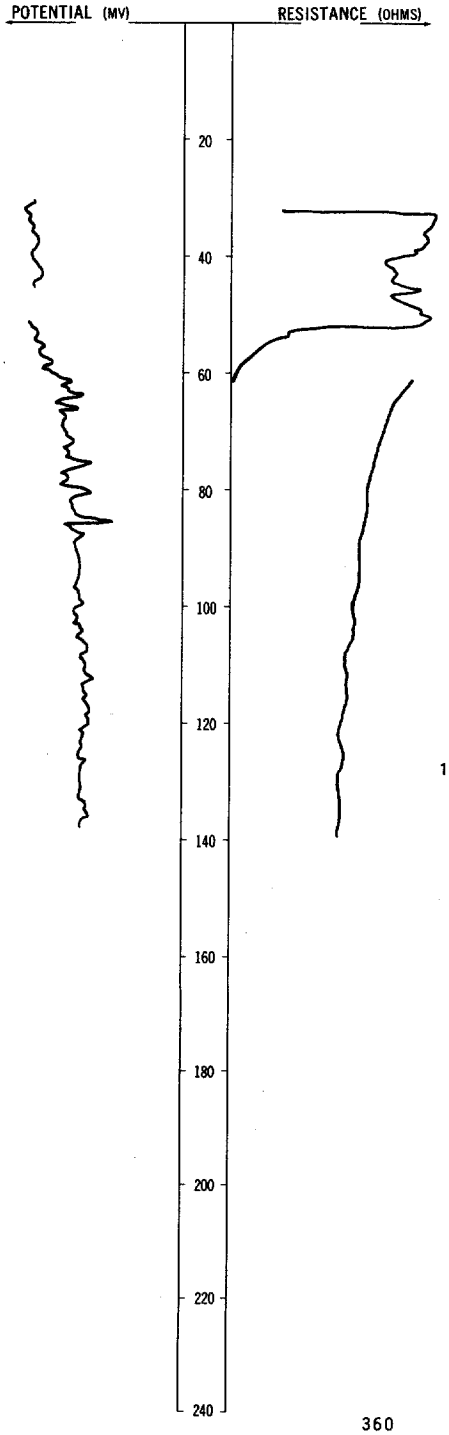
NDSWC 5157

LOCATION: 131-073-08BBB

DATE DRILLED: 8/09/77

ALTITUDE: 2047
(FT, MSL)

DEPTH: 142
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-53 Sand, coarse to very coarse, subangular to subrounded, and medium to coarse gravel; sand is predominantly quartz with some carbonate material; gravel is predominantly carbonate and some granitic material.

53-89 Clay (till), sandy, silty, medium-dark-gray to dusky-bluish-green; scattered pebbles.

FOX HILLS FORMATION

89-128 Clay, sandy, dusky-bluish-green to dark-greenish-gray, glauconitic.

PIERRE FORMATION

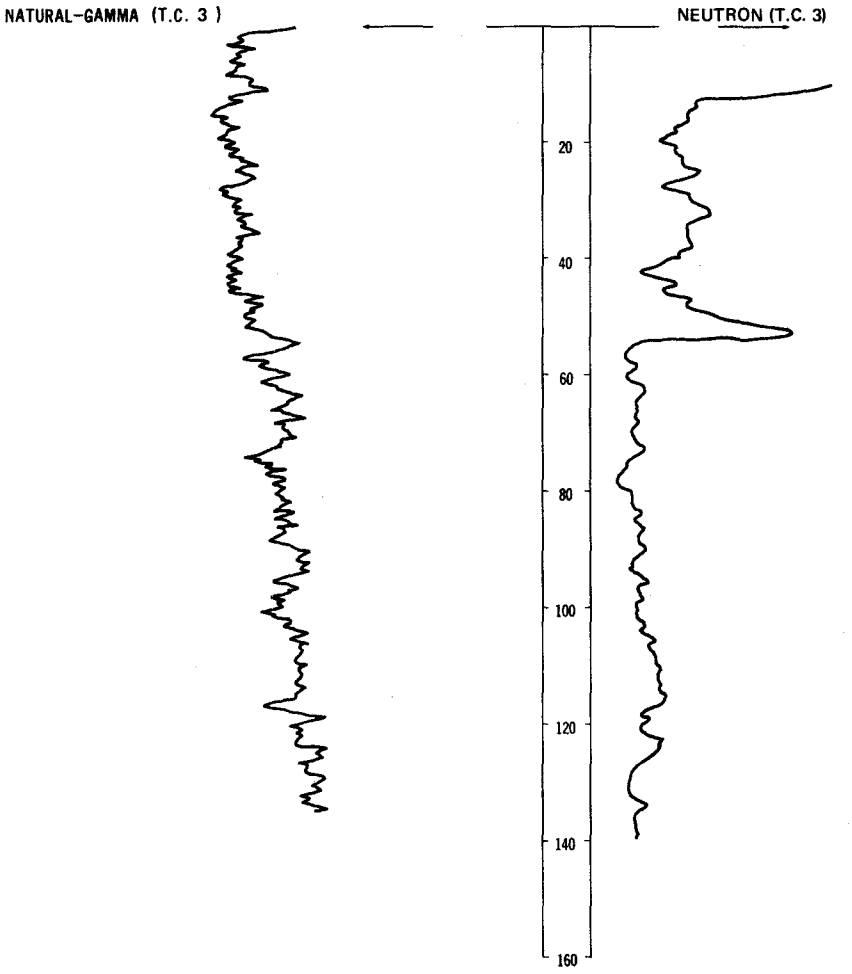
128-142 Shale, black to grayish-black, siliceous, hard.

LOCATION: 131-073-08BBB

DATE DRILLED: 8/09/77

ALTITUDE: 2047
(FT, MSL)

DEPTH: 142
(FT)



131-073-09CBC2
(Log from Jacob Thurn)

Date drilled: 7/12/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	3	3
	Clay, yellow	64	67

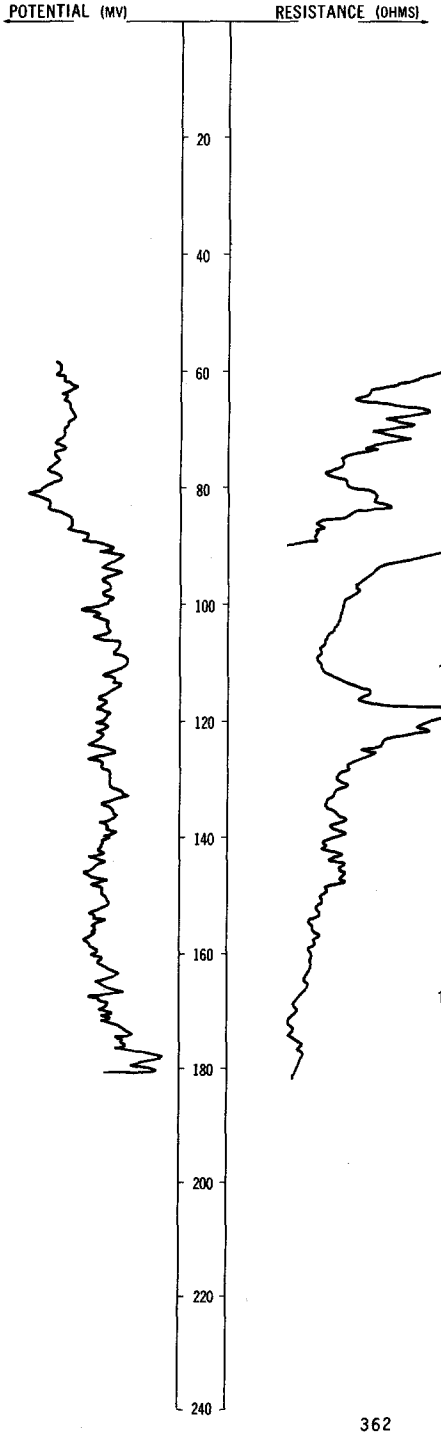
NDSWC 5156

LOCATION: 131-073-10BBB

DATE DRILLED: 8/08/77

ALTITUDE: 2130
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-19 Sand, coarse to very coarse, subrounded to rounded, and coarse angular to subrounded gravel; sand is predominantly quartz; gravel is predominantly carbonate material.

19-90 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.

FOX HILLS FORMATION

90-111 Clay, sandy.

111-166 Sand, fine, clayey, medium-dark-gray to dark-greenish-gray, glauconitic.

PIERRE FORMATION

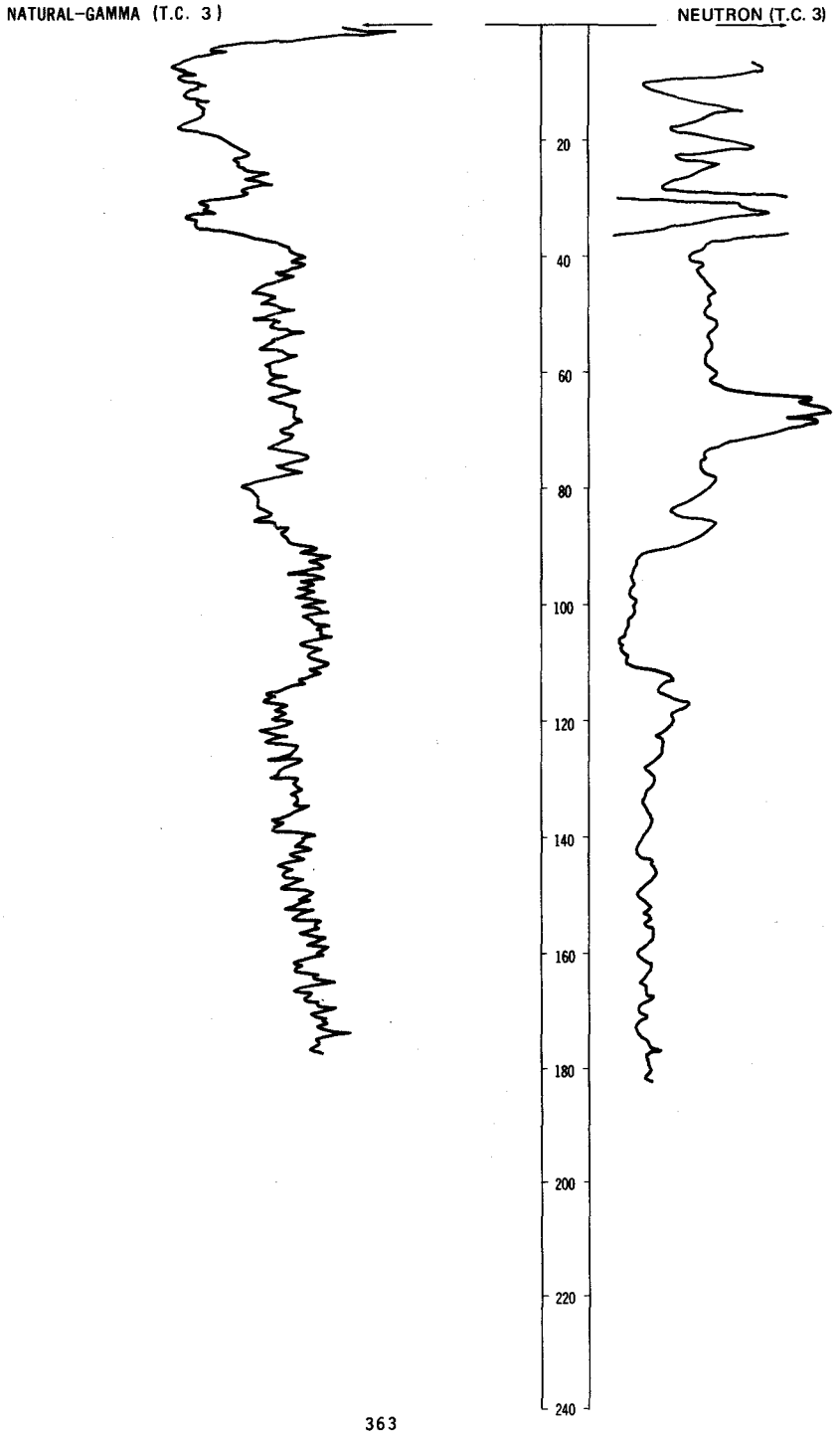
166-182 Shale, black to grayish-black, siliceous, hard.

LOCATION: 131-073-10BBB

DATE DRILLED: 8/08/77

ALTITUDE: 2130
(FT, MSL)

DEPTH: 182
(FT)



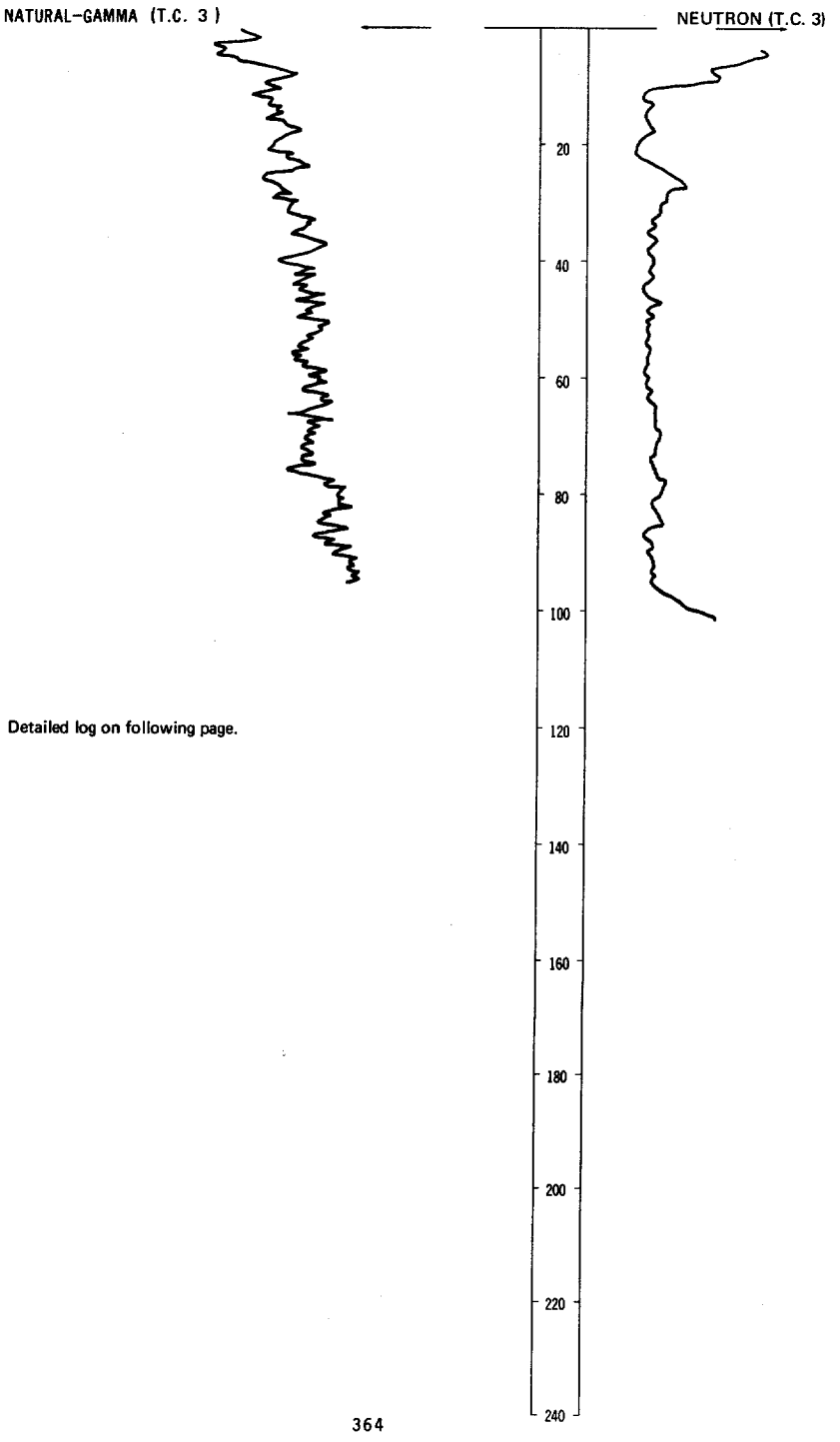
NDSWC 5155, 5155A

LOCATION: 131-073-12BBA1, 2

DATE DRILLED: 8/08/77

ALTITUDE: 2054
(FT, MSL)

DEPTH: 102
(FT)



NOTE: Detailed log on following page.

131-073-12BBA1, 2, Continued
NDSWC 5155, 5155A

Altitude: 2054 feet — Date drilled: 8/08/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, coarse, subangular to subrounded; composed largely of carbonate material	9	9
	Clay (till), sandy, silty, medium-dark-gray; scattered pebbles	28	37
Fox Hills Formation:			
	Clay, silty, sandy, medium-gray to medium-light-gray; few thin micaceous and glauconitic sandstone beds	40	77
Pierre Formation:			
	Shale, black to grayish-black, siliceous	25	102

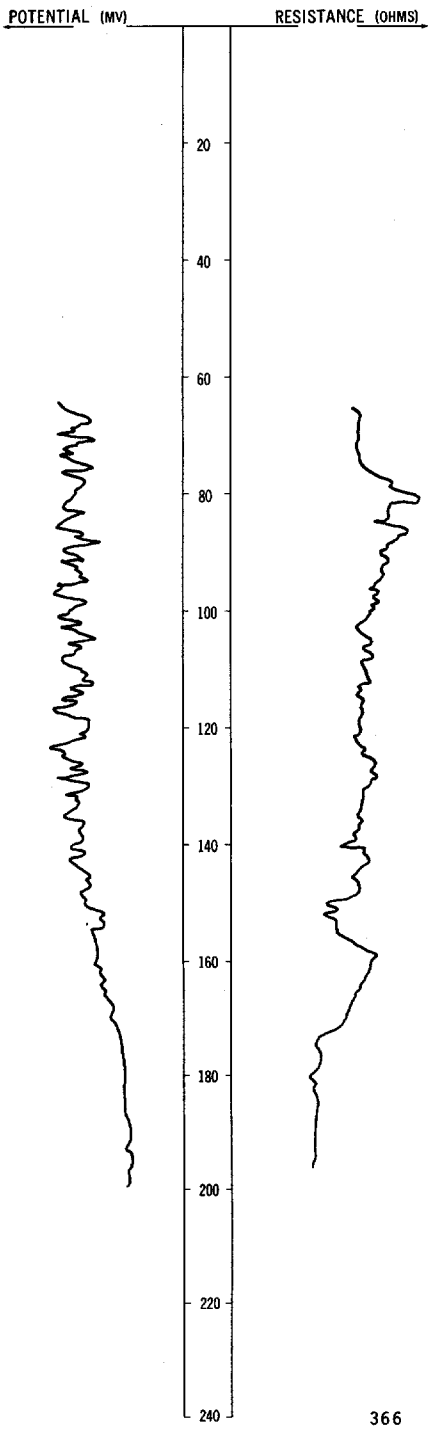
NDSWC 5159

LOCATION: 131-073-17AAA

DATE DRILLED: 8/09/77

ALTITUDE: (FT, MSL)

DEPTH: 202 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-24 Clay (lacustrine), silty, sandy, moderate-yellowish-brown.

FOX HILLS FORMATION

24-52 Sand, very fine, clayey, moderate-yellowish-brown; becomes very silty below 40 feet.

52-177 Clay, silty, sandy, medium-dark-gray; numerous sandy streaks.

PIERRE FORMATION

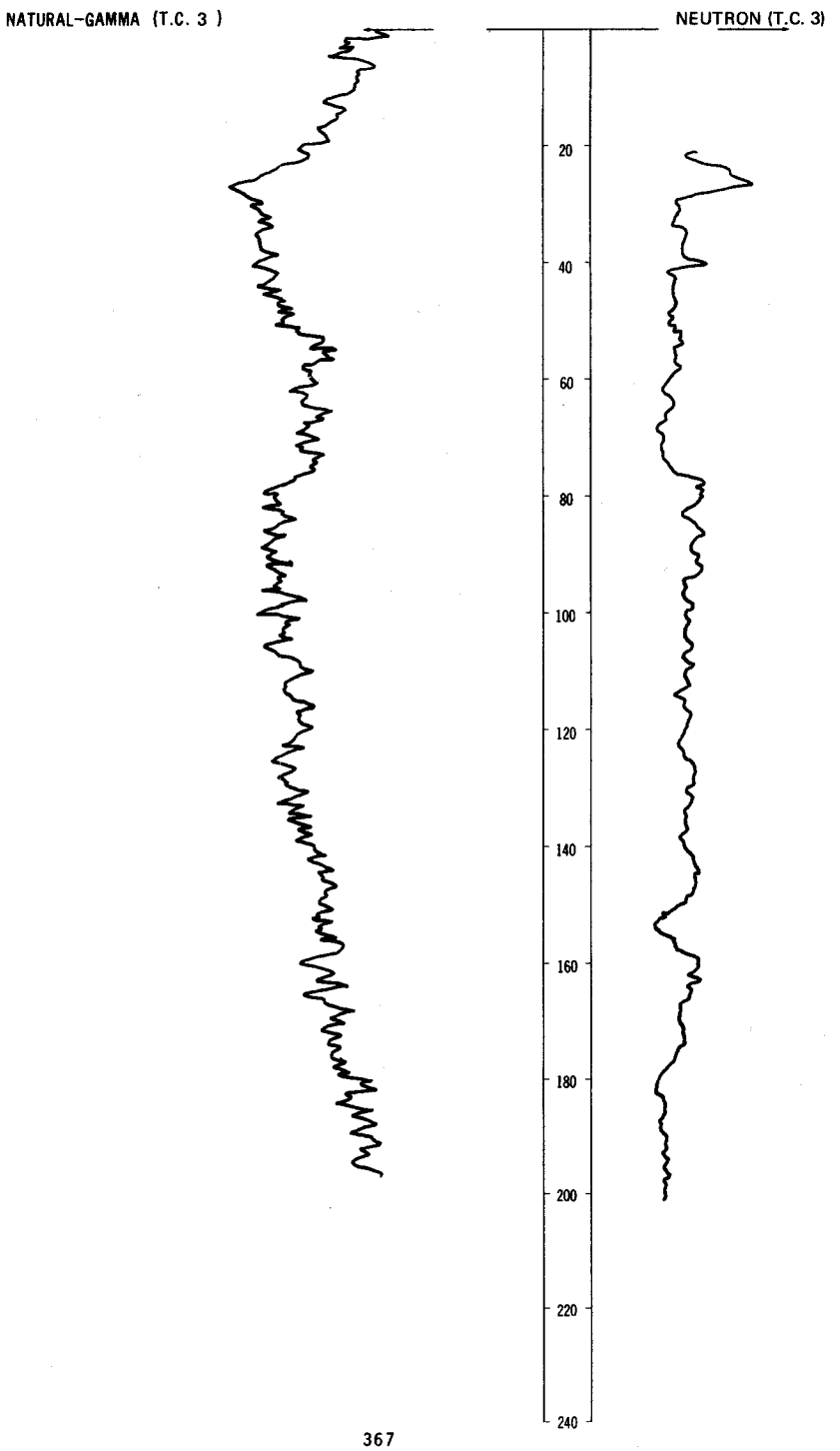
177-202 Shale, black to grayish-black, siliceous, hard.

LOCATION: 131-073-17AAA

DATE DRILLED: 8/09/77

ALTITUDE:
(FT, MSL)

DEPTH: 202
(FT)



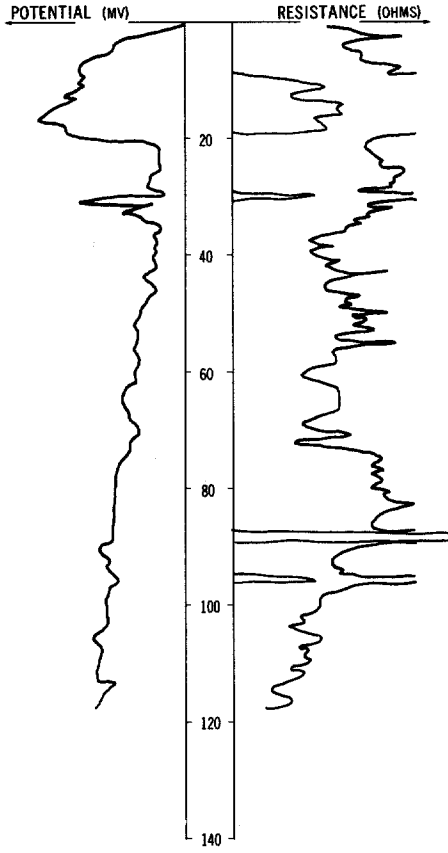
NDSWC 9700

LOCATION: 131-073-22CCC

DATE DRILLED: 8/10/76

ALTITUDE: 2046
(FT, MSL)

DEPTH: 120
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-9	Clay (till), silty, sandy, moderate-yellowish-brown.
9-19	Sand, very fine to coarse, predominantly medium.
19-34	Clay (till), sandy, pale-yellowish-brown.

FOX HILLS FORMATION(?)

34-41	Clay, brownish-gray.
41-42	Clay, grayish-black.
42-55	Clay, sandy, greenish-gray; contains thin very fine to fine sand lenses.
55-61	Clay, silty, grayish-black.
61-72	Clay, black.
72-81	Clay, sandy, greenish-black.
81-83	Sandstone, very fine.
83-87	Silt, clayey, sandy, dark-greenish-gray.
87-89	Sandstone.
89-95	Clay, silty, brownish-gray.
95-96	Sandstone.

PIERRE FORMATION

96-120	Shale, grayish-black, hard.

131-073-23DBB
(Log from Jacob Thurn)

Date drilled: 7/27/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	4	4
	Clay, yellow	16	20
	Shale, blue	12	32
	Sand	15	47

131-073-26ABB
(Log from Jacob Thurn)

Date drilled: 7/29/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Clay, yellow	17	20
	Sand, blue	17	37

131-073-33BCC2
(Log from Jacob Thurn)

Date drilled: 5/11/74

	Topsoil	2	2
	Sand	38	40
	Shale	20	60

131-073-33CBC
(Log from Jacob Thurn)

Date drilled: 4/25/74

	Topsoil	3	3
	Sand, yellow	17	20
	Shale, blue	20	40

131-073-34ACA
(Log from Jacob Thurn)

Date drilled: 5/01/76

	Topsoil	2	2
	Loam, sandy	30	32
	Sand	3	35
	Shale, blue	9	44
	Rock	----	44

131-073-35BCC
NDSWC 9701

Altitude: 2010 feet — Date drilled: 8/10/76

Glacial drift:			
	Sand, very fine to very coarse, predominantly coarse, gravelly	7	7
Fox Hills Formation:			
	Clay, yellowish-brown	7	14
	Shale, hard, grayish-black	14	28
	Sand, very fine to fine, clayey, greenish-black; sandstone from 49 to 50 feet	24	52
	Silt, clayey, sandy, dark-brownish-gray	9	61
	Clay, silty, dark-brownish-gray	25	86
Pierre Formation:			
	Shale, silty, grayish-black, hard	14	100

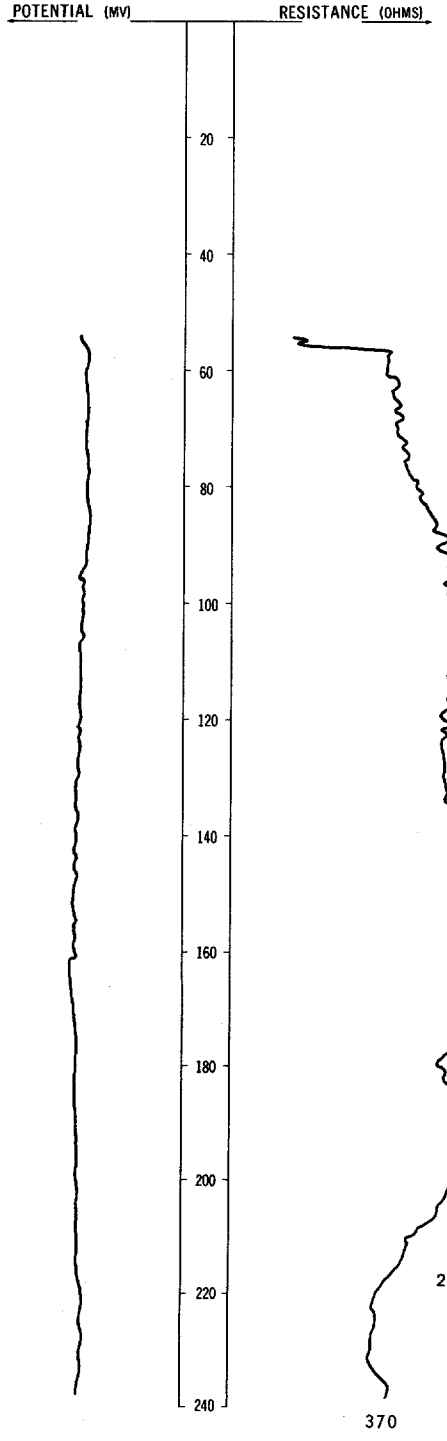
NDSWC 5237

LOCATION: 132-067-11DDD

DATE DRILLED: 9/22/77

ALTITUDE:
(FT, MSL)

DEPTH: 342
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-9 Clay (till), sandy, silty, gravelly, pale-yellowish-brown.

9-218 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles; gravelly from 158 to 165 feet and 187 to 199 feet.

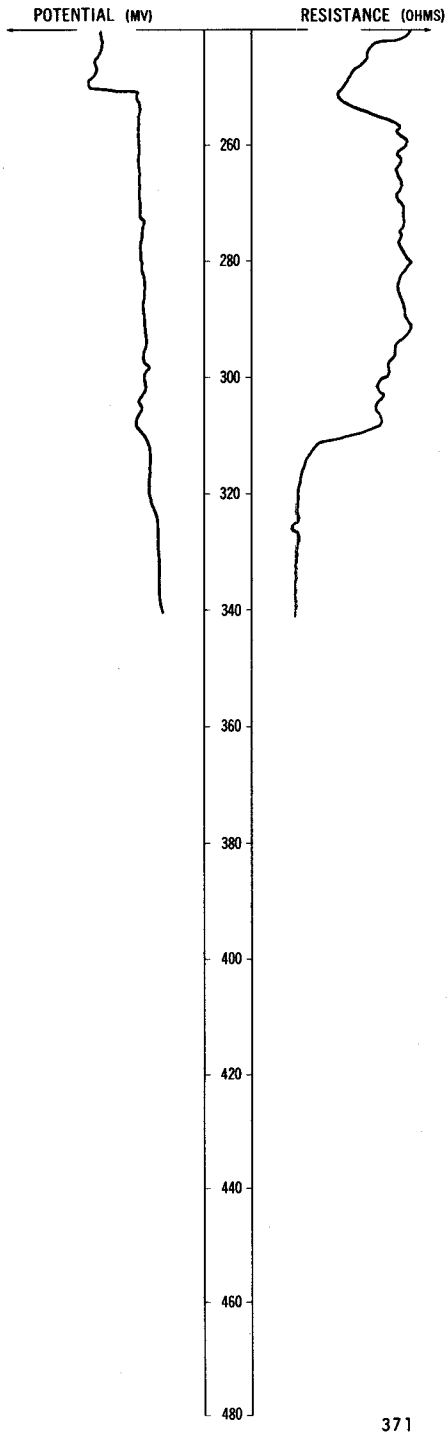
218-254 Clay (lacustrine), silty, sandy, medium-dark-gray; silty from 242 to 254 feet.

LOCATION: 132-067-11DDD

DATE DRILLED: 9/22/77

ALTITUDE:
(FT, MSL)

DEPTH: 342
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

254-310 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

PIERRE FORMATION

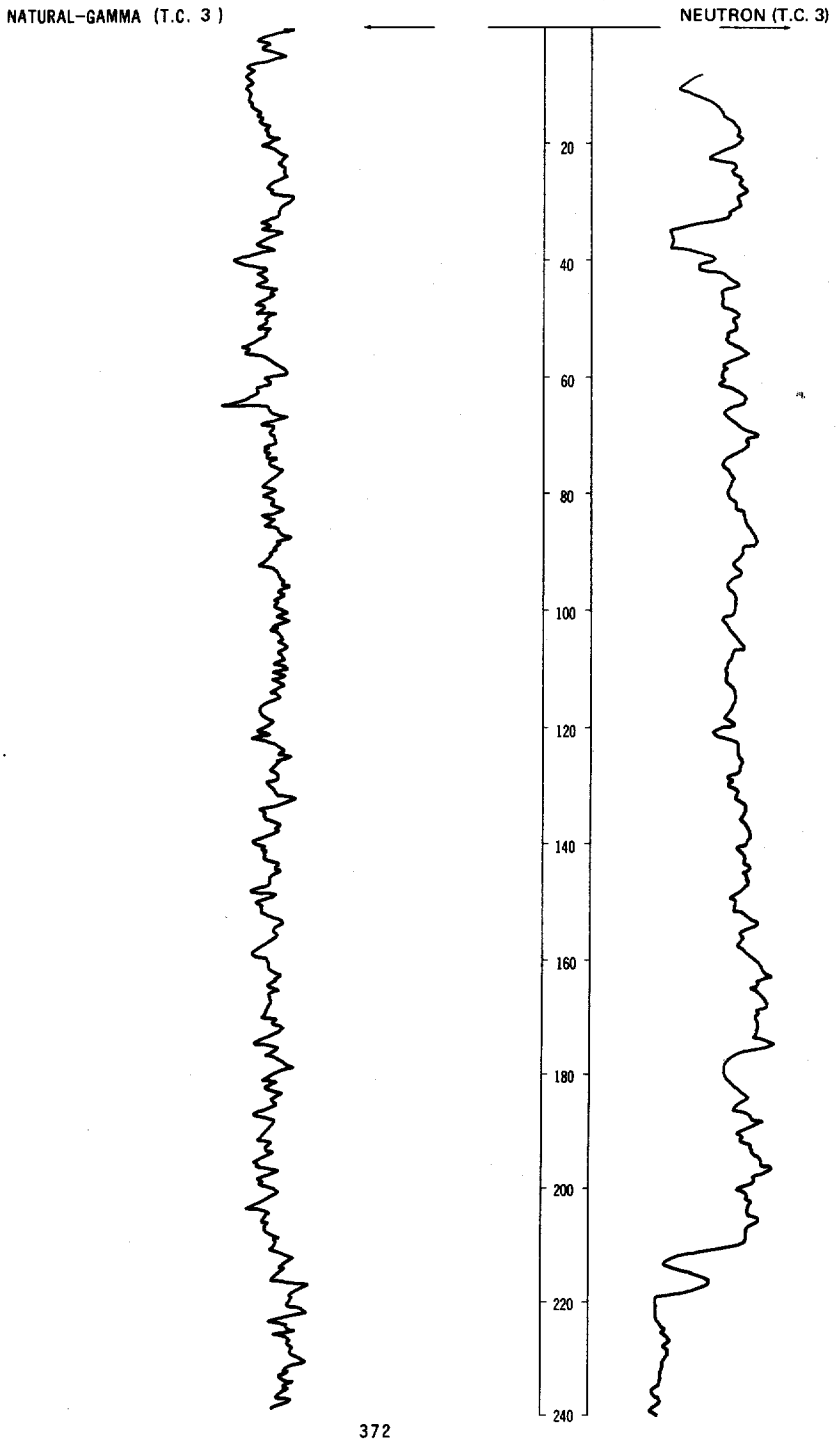
310-342 Shale, black to grayish-black, siliceous, hard.

LOCATION: 132-067-11DDD

DATE DRILLED: 9/22/77

ALTITUDE:
(FT, MSL)

DEPTH: 342
(FT)

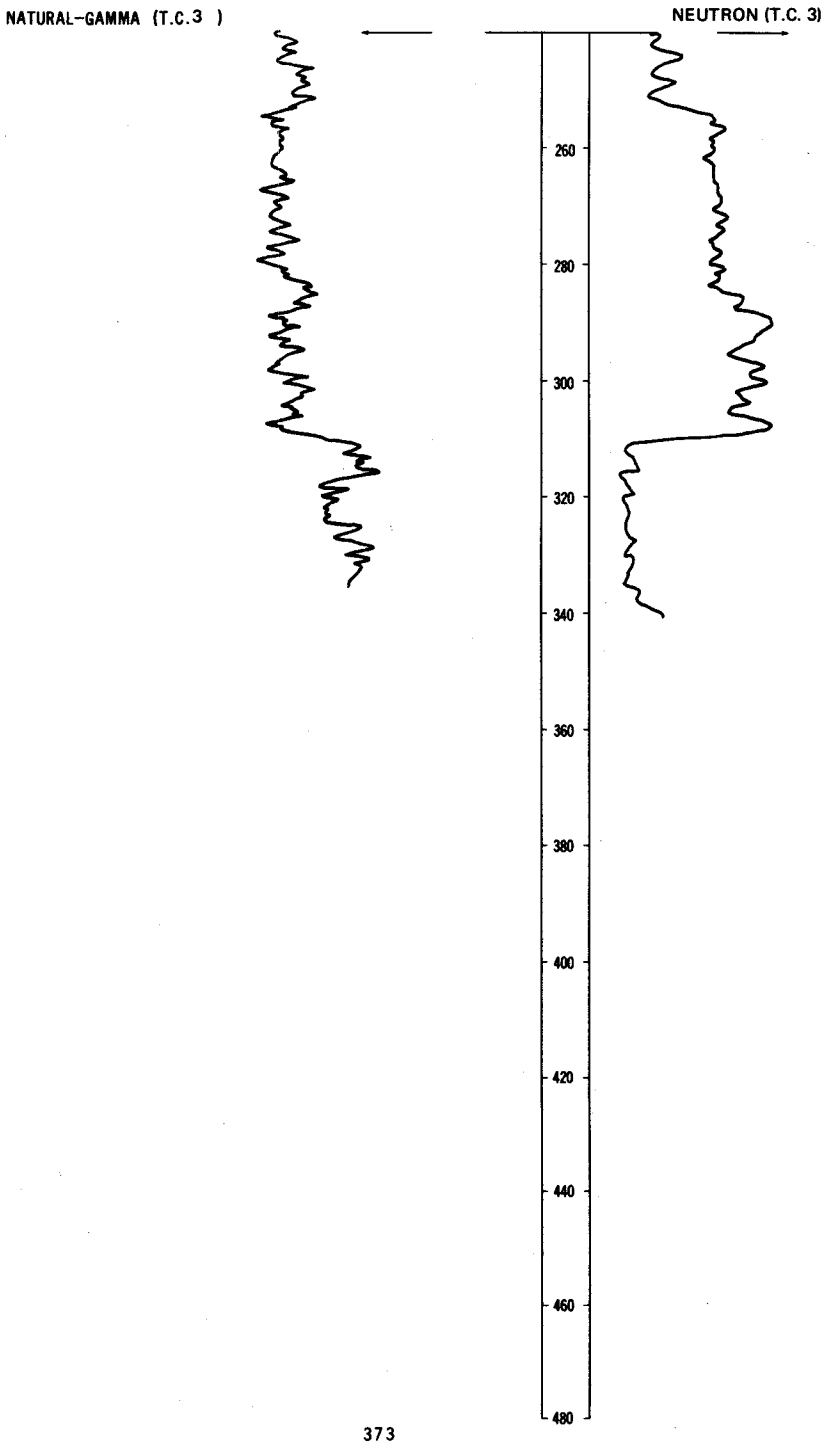


LOCATION: 132-067-11DDD

DATE DRILLED: 9/22/77

ALTITUDE:
(FT, MSL)

DEPTH: 342
(FT)



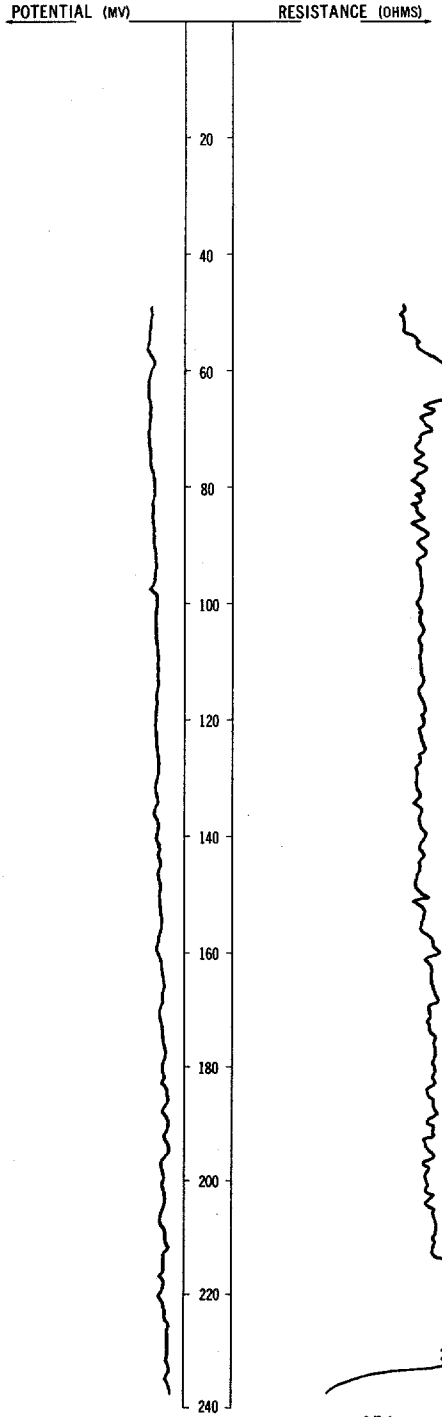
NDSWC 5238

LOCATION: 132-067-13DDD

DATE DRILLED: 9/23/77

ALTITUDE:
(FT, MSL)

DEPTH: 422
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-25 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

25-236 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; gravel lenses from 60 to 64 feet and 221 to 225 feet.

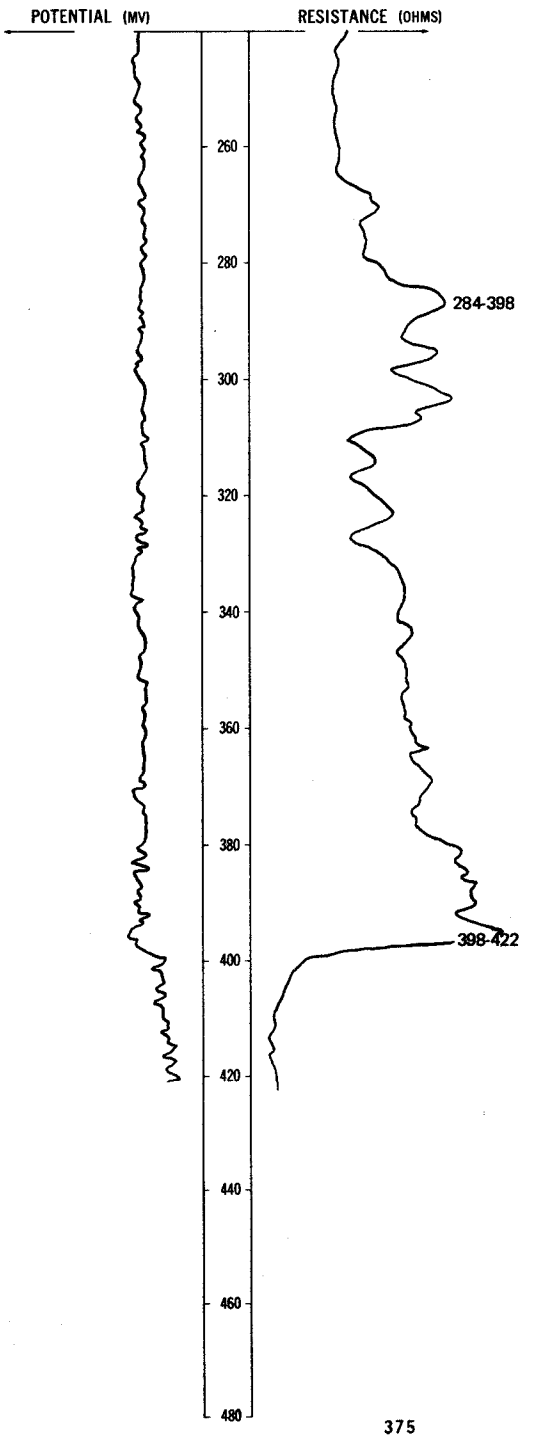
236-284 Clay (lacustrine), silty, sandy, medium-dark-gray.

LOCATION: 132-067-13DDD

DATE DRILLED: 9/23/77

ALTITUDE:
(FT, MSL)

DEPTH: 422
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

284-398 Clay (till), sandy, silty, medium-dark-gray; scattered pebbles; gravel lenses from 378 to 398 feet.

PIERRE FORMATION

398-422 Shale, black to grayish-black, hard.

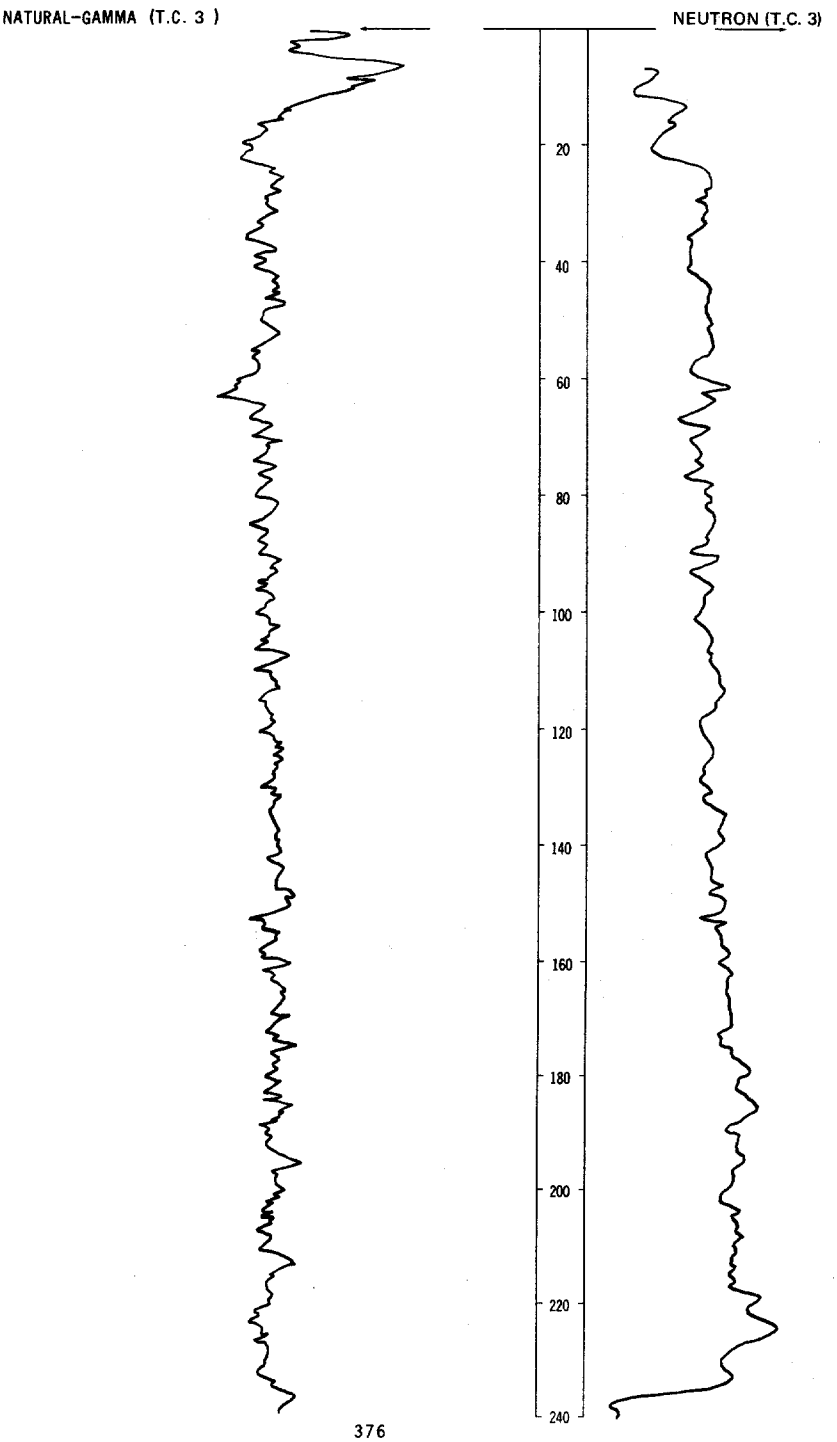
NDSWC 5238, Continued

LOCATION: 132-067-13DDD

DATE DRILLED: 9/23/77

ALTITUDE:
(FT, MSL)

DEPTH: 422
(FT)

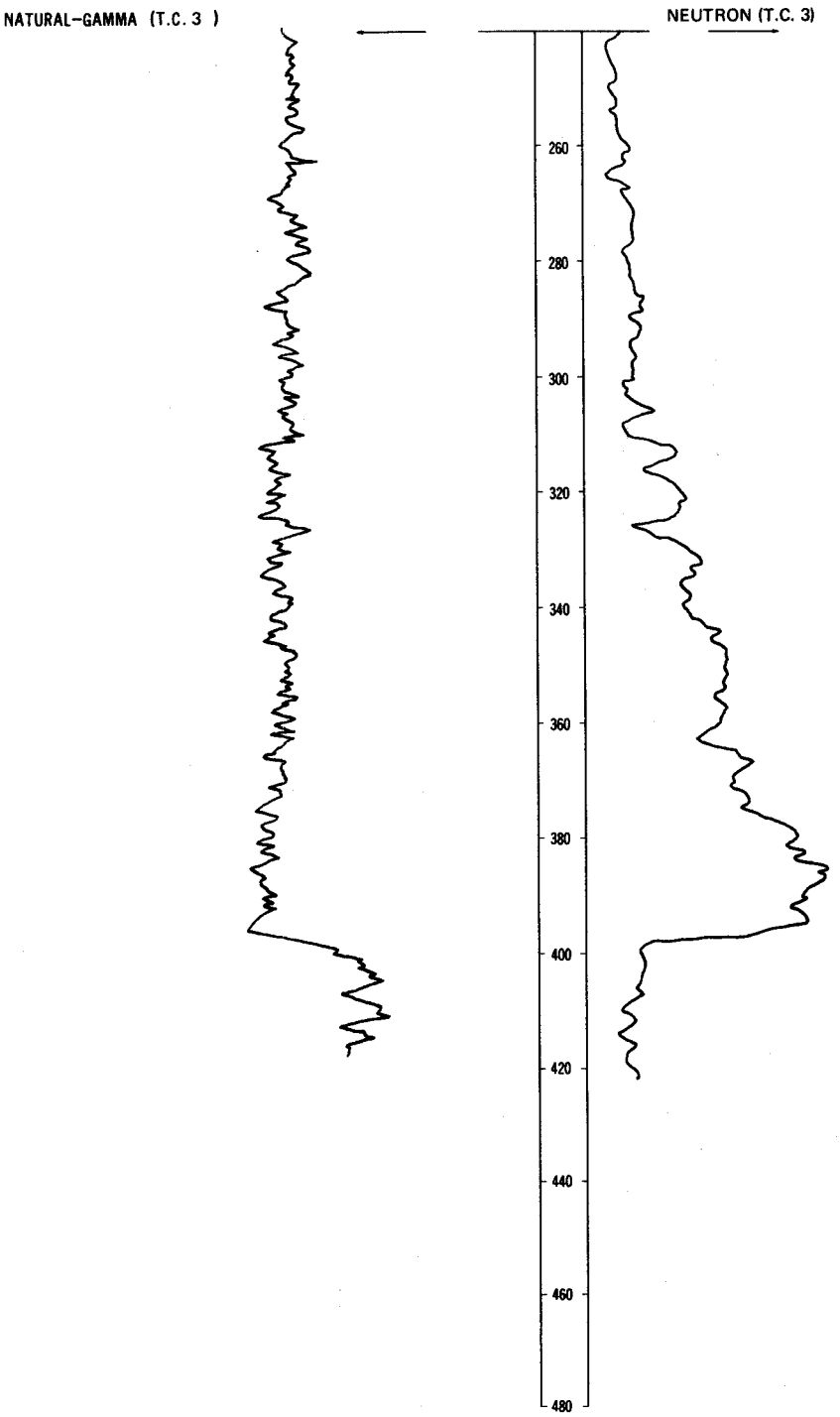


LOCATION: 132-067-13DDD

DATE DRILLED: 9/23/77

ALTITUDE:
(FT, MSL)

DEPTH: 422
(FT)



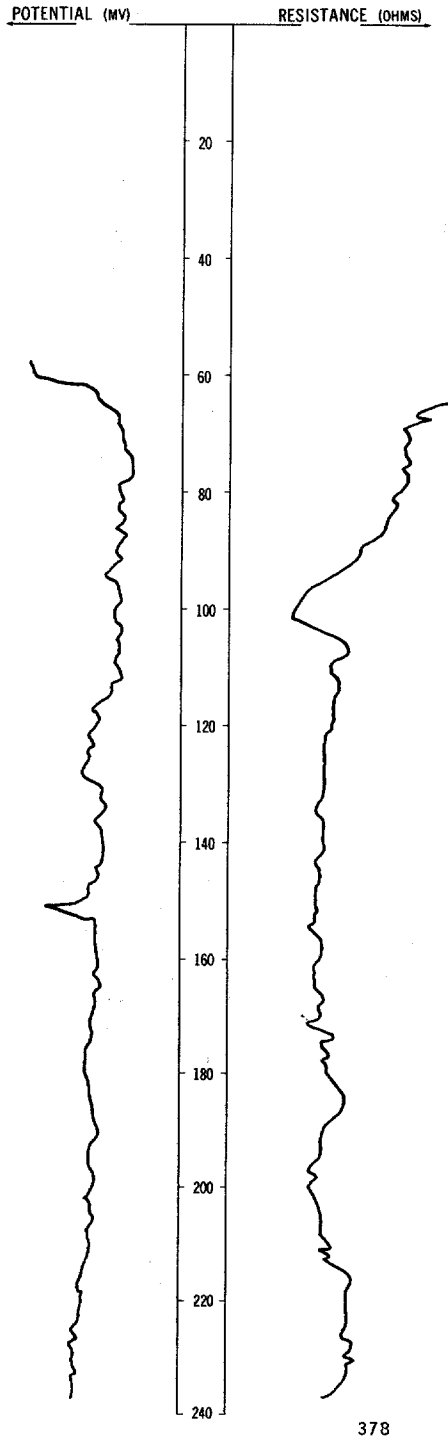
NDSWC 5239, 5239A

LOCATION: 132-067-14DDA1, 2

DATE DRILLED: 9/26/77

ALTITUDE: 2004
(FT, MSL)

DEPTH: 402
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-45 Sand, fine to very coarse, predominantly coarse, subangular to subrounded; 50 percent quartz, 30 percent carbonate, and 20 percent shale fragments.

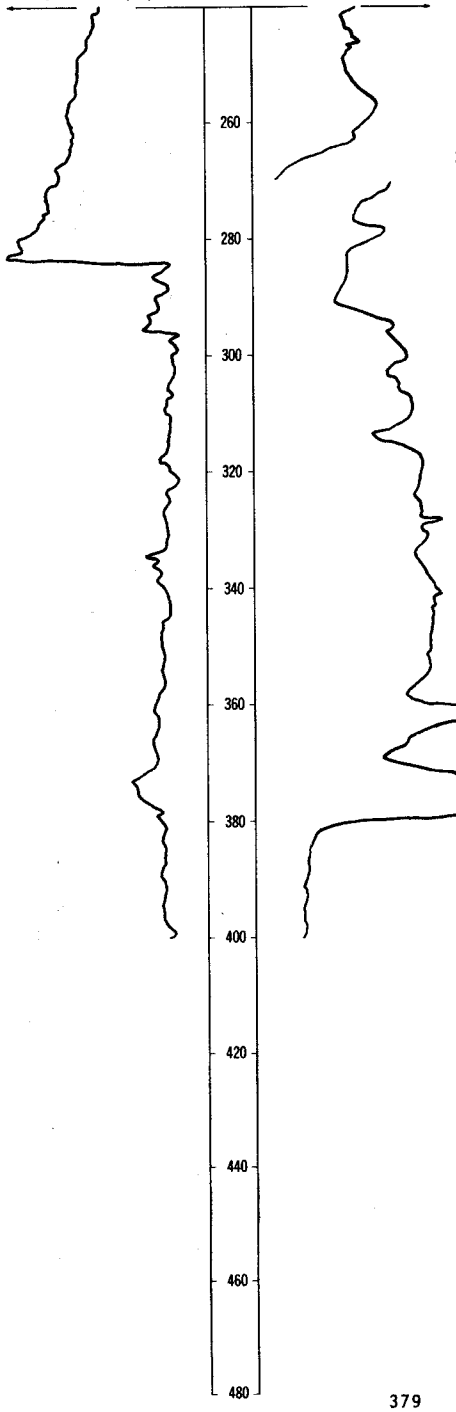
45-266 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

LOCATION: 132-067-14DDA1, 2

DATE DRILLED: 9/26/77

ALTITUDE: 2004
(FT, MSL)

DEPTH: 402
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

266-293 Clay (lacustrine), silty, sandy, medium-dark-gray.

293-380 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles; boulder from 359 to 362 feet; gravel lens from 370 to 380 feet.

PIERRE FORMATION

380-402 Shale, black to grayish-black, non-calcareous, hard.

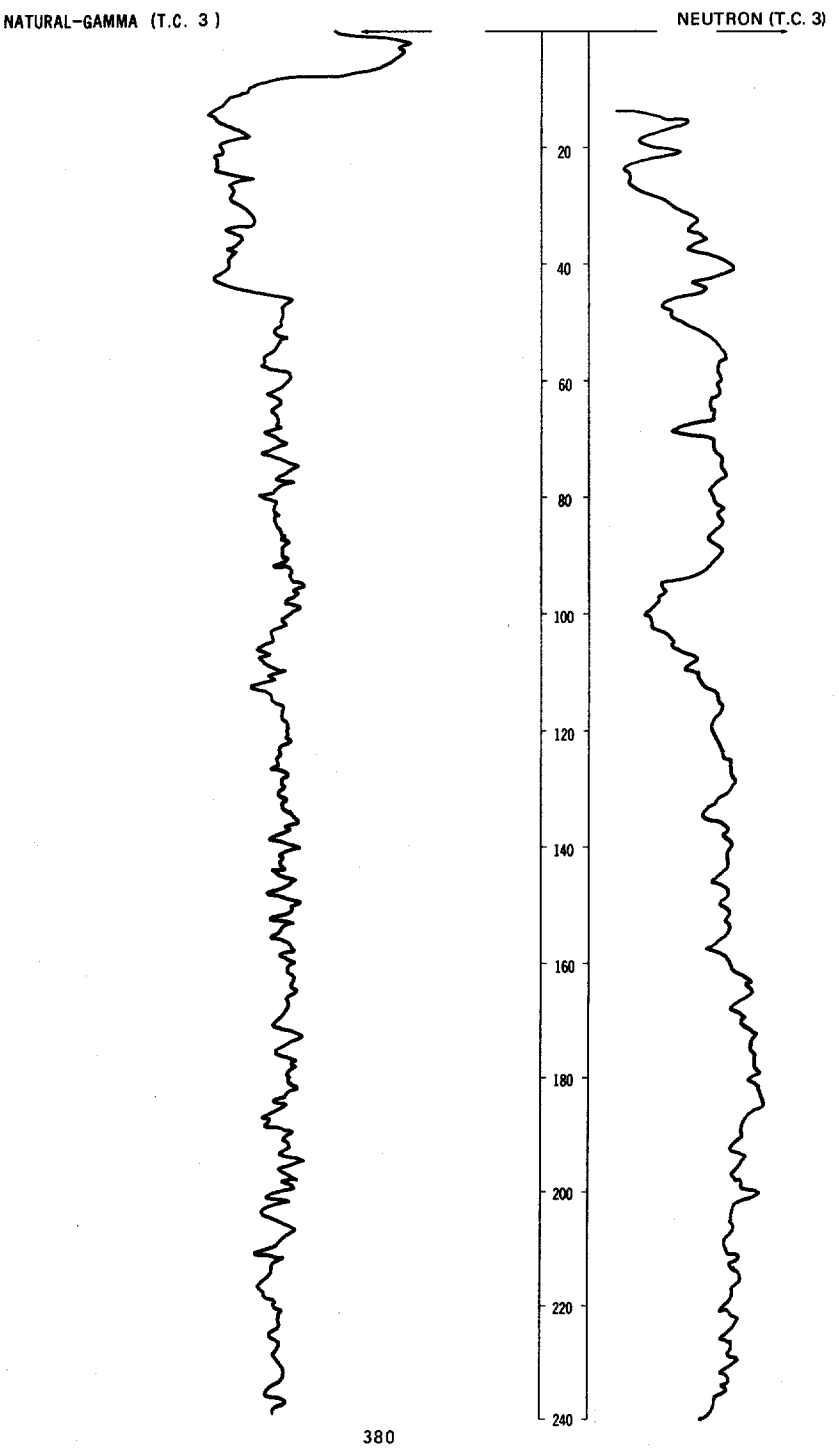
NDSWC 5239, 5239A, Continued

LOCATION: 132-067-14DDA1, 2

DATE DRILLED: 9/26/77

ALTITUDE: 2004
(FT, MSL)

DEPTH: 402
(FT)

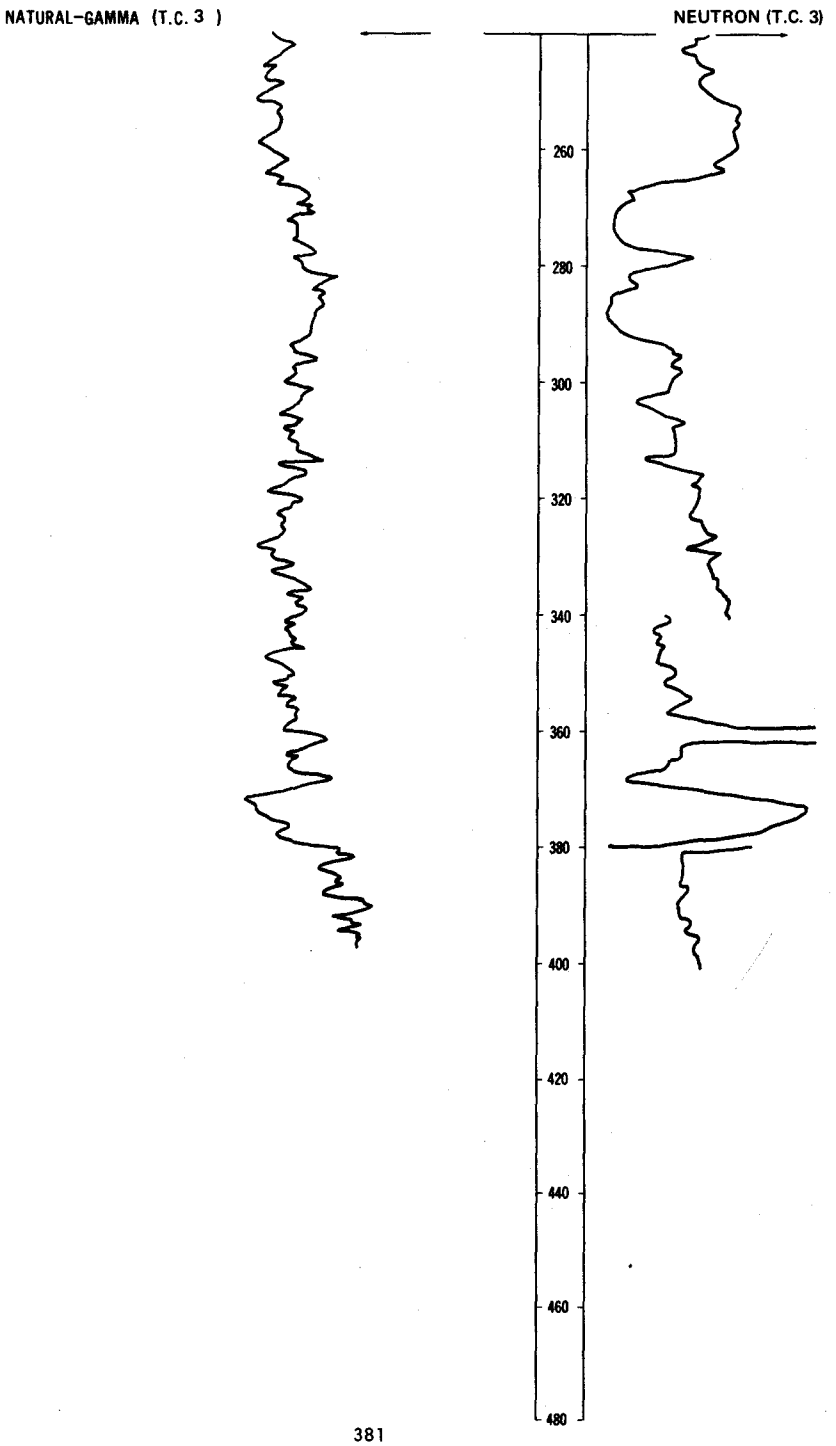


LOCATION: 132-067-14DDA1, 2

DATE DRILLED: 9/26/77

ALTITUDE: 2004
(FT, MSL)

DEPTH: 402
(FT)



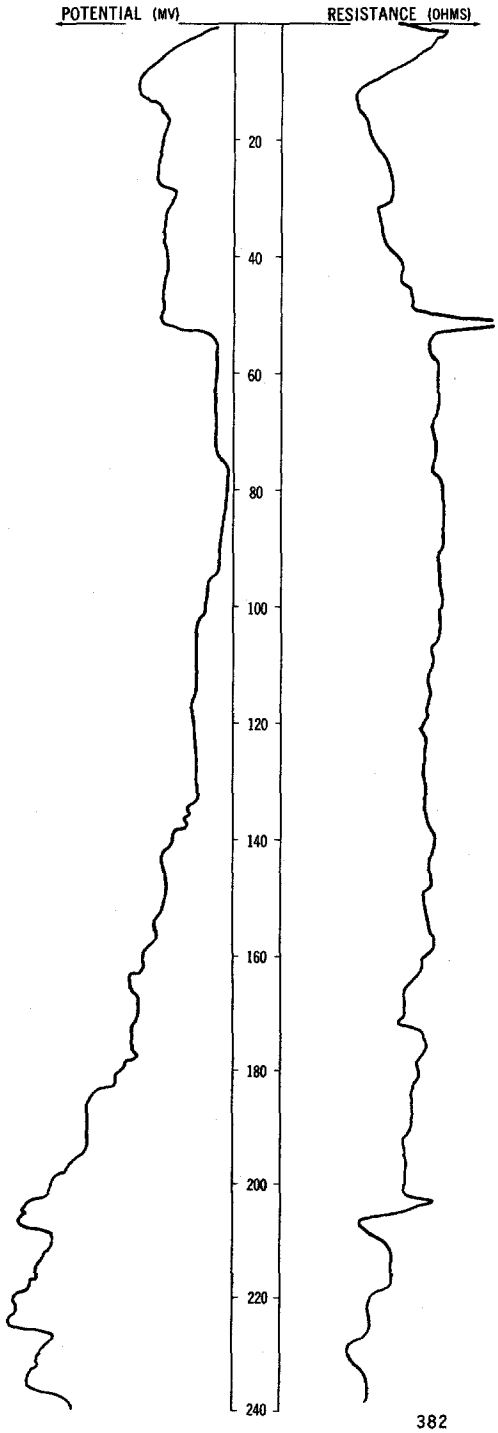
NDSWC 9769

LOCATION: 132-067-16BBB

DATE DRILLED: 9/09/76

ALTITUDE: 2000
(FT, MSL)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

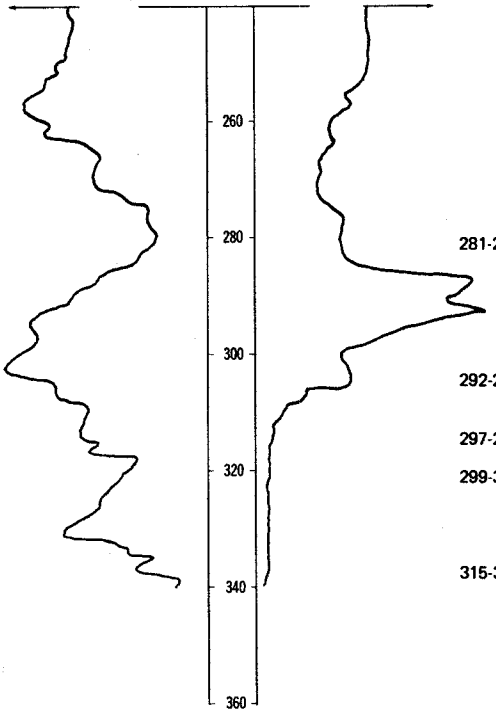
0-9	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
9-12	Clay (till), silty, sandy, dark-yellowish-brown.
12-23	Clay (till), silty, sandy, moderate-yellowish-brown; numerous pebbles.
23-50	Clay (till), silty, sandy, olive-gray; numerous pebbles.
50-52	Gravel, sandy.
52-281	Clay, silty, sandy, olive-gray; numerous pebbles; gravel lenses from 150 to 151 feet and 204 to 205 feet.

LOCATION: 132-067-16BBB

DATE DRILLED: 9/09/76

ALTITUDE: 2000
(FT, MSL)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

281-292 Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 40 percent quartz, 30 percent carbonate, 20 percent unidentified, and 10 percent shale fragments.

292-297 Clay (till), sandy, dusky-yellowish-brown.

297-299 Gravel, sandy.

299-315 Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

315-340 Shale, grayish-black, hard.

132-067-22DDA
NDSWC 9771

Altitude: 1992 feet

Date drilled: 9/10/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, sandy	3	3
	Clay, silty, pale-yellowish-brown	3	6
	Clay, silty, moderate-yellowish-brown	8	14
	Clay, silty, olive-gray	10	24
	Clay (till), silty, sandy, olive-gray; contains scattered pebbles and gravel lenses from 154 to 155 feet, 164 to 165 feet, 232 to 233 feet, 291 to 293 feet, and 365 to 366 feet	342	366
	Clay (till), silty, sandy, dark-grayish-brown	20	386
Pierre Formation:			
	Shale, grayish-black, hard	34	420

132-067-23BDA
(Log from Jacob Thurn)

Date drilled: 12/28/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Sand and clay; mixed	17	20
	Sand, gray	10	30
	Sand and clay; mixed	25	55

132-067-23BDD
(Log from Jacob Thurn)

Date drilled: 12/31/74

	Topsoil	1	1
	Sand	28	29

132-067-23CCC
NDSWC 9770

Date drilled: 9/09/76

Glacial drift:			
	Topsoil, silty, black	4	4
	Clay, silty, dusky-yellowish-brown	2	6
	Clay, silty, moderate-yellowish-brown	5	11
	Clay, silty, sandy, olive-gray	65	76
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 25 percent quartz, 30 percent carbonate, 20 percent unidentified, 15 percent shale, and 10 percent lignite fragments; contains thin clay lenses	26	102
	Clay (till), sandy, grayish-brown	8	110

132-067-24AAB
(Log from Kamoni Well Boring)

Date drilled: 6/10/76

	Topsoil, black	2	2
	Clay, yellow	20	22
	Clay, soft, blue	43	65
	Quicksand	25	90
	Rock	3	93
	Quicksand	5	98

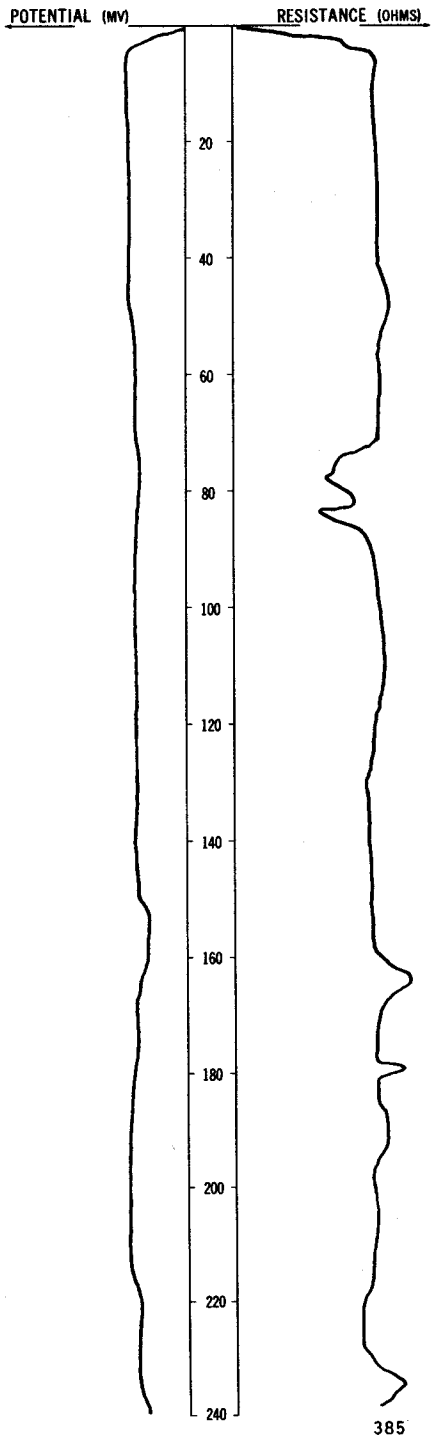
NDSWC 9780

LOCATION: 132-067-33CCC

DATE DRILLED: 9/17/76

ALTITUDE: 2036
(FT, MSL)

DEPTH: 420
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

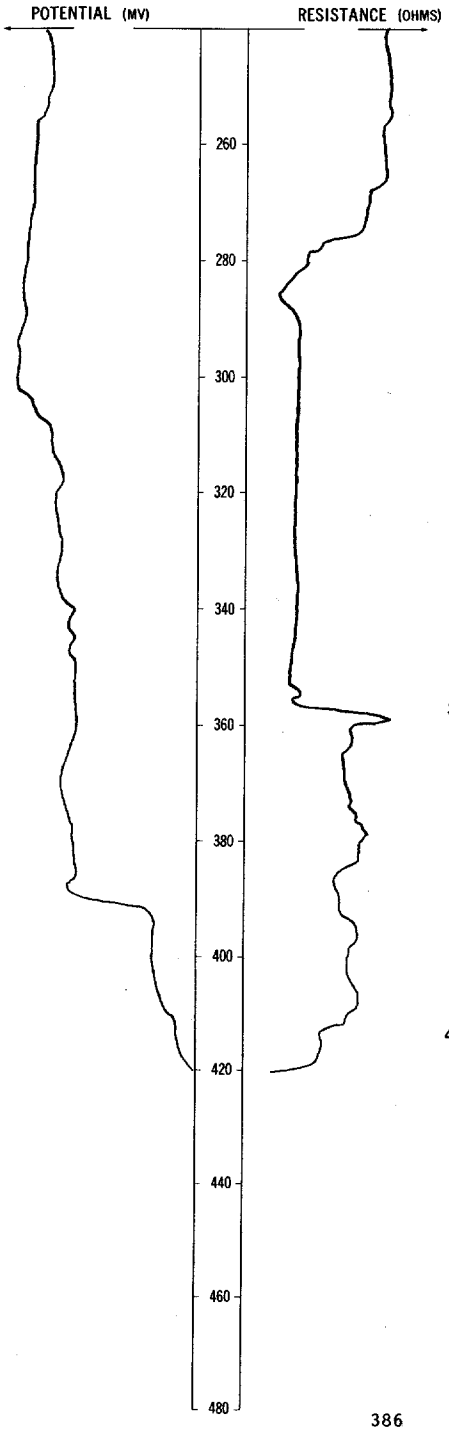
0-8	Clay (till), silty, sandy, dark-yellowish-brown.
8-11	Clay (till), silty, sandy, dusky-yellowish-brown.
11-161	Clay (till), silty, sandy, olive-gray; scattered pebbles.
161-167	Gravel, sandy.
167-179	Clay (till), silty, sandy, olive-gray; scattered pebbles.
179-181	Cobbles and boulders.
181-233	Clay (till), silty, sandy, olive-gray; scattered pebbles.
233-237	Gravel, sandy.
237-276	Clay (till), silty, sandy, olive-gray; scattered pebbles.

LOCATION: 132-067-33CCC

DATE DRILLED: 9/17/76

ALTITUDE: 2036
(FT, MSL)

DEPTH: 420
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

276-358 Clay (till), silty, sandy, brownish-gray; boulder from 353 to 354 feet.

358-413 Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel lenses from 393 to 397 feet and 405 to 408 feet.

PIERRE FORMATION

413-420 Shale, grayish-black, hard.

132-067-36DCC
NDSWC 9779

Altitude: 1965 feet — Date drilled: 9/16/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	13	13
	Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles	9	22
	Clay (till), silty, sandy, olive-gray; scattered pebbles	6	28
	Clay (till), silty, sandy, dark-reddish-brown; scattered pebbles	14	42
	Clay (till), silty, sandy, olive-gray; scattered pebbles	55	97
	Sand	1	98
	Clay (till), silty, sandy, olive-gray; scattered pebbles	4	102
	Gravel, fine, sandy	2	104
	Clay (till), silty, sandy, dusky-brown	168	272
	Clay (till), silty, sandy, dusky-brown, hard; scattered pebbles	117	389
Pierre Formation:			
	Shale, grayish-black, hard	11	400

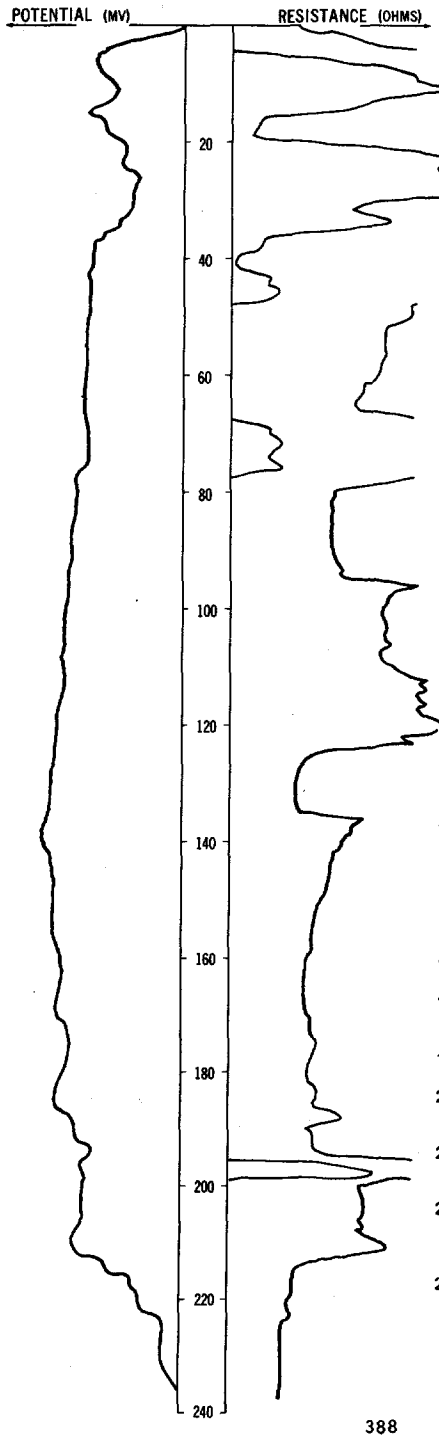
NDSWC 9768

LOCATION: 132-068-02DDD1

DATE DRILLED: 9/08/76

ALTITUDE: 2102
(FT, MSL)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
8-14	Sand, coarse.
14-20	Clay, silty, olive-gray.
20-36	Sand, very fine to very coarse, predominantly medium, gravelly; composed of 70 percent quartz, 15 percent carbonate, 10 percent shale, and 5 percent unidentified fragments.
36-68	Clay (till), sandy, olive-gray.
68-77	Sand, very fine to very coarse, predominantly medium, gravelly; composed predominantly of quartz fragments.
77-83	Clay (till), sandy, olive-gray; scattered pebbles.
83-107	Clay (till), sandy, medium-dark-gray.
107-120	Clay (till), sandy, dusky-brown; scattered pebbles.
120-123	Sand, medium.
123-138	Clay, medium-dark-gray.
138-188	Clay (till), sandy, dark-brownish-gray, hard.
188-190	Gravel.
190-197	Clay (till), sandy, dark-brownish-gray, hard.
197-200	Gravel.
200-211	Clay (till), sandy, moderate-yellowish-brown.
211-218	Clay, grayish-black, hard; shale boulder.
218-222	Clay (till), silty, sandy, olive-gray.

PIERRE FORMATION

222-240	Shale, grayish-black, hard.

132-068-02DDD2
NDSWC 9768A

Altitude:	2102 feet	Date drilled:	9/08/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	13	13
	Clay, silty, sandy, moderate-yellowish-brown	3	16
	Clay, silty, olive-gray	3	19
	Sand, very fine to very coarse, predominantly medium, gravelly; composed of 70 percent quartz, 15 percent carbonate, 10 percent shale, and 5 percent unidentified fragments	16	35
	Clay, sandy, olive-gray	5	40

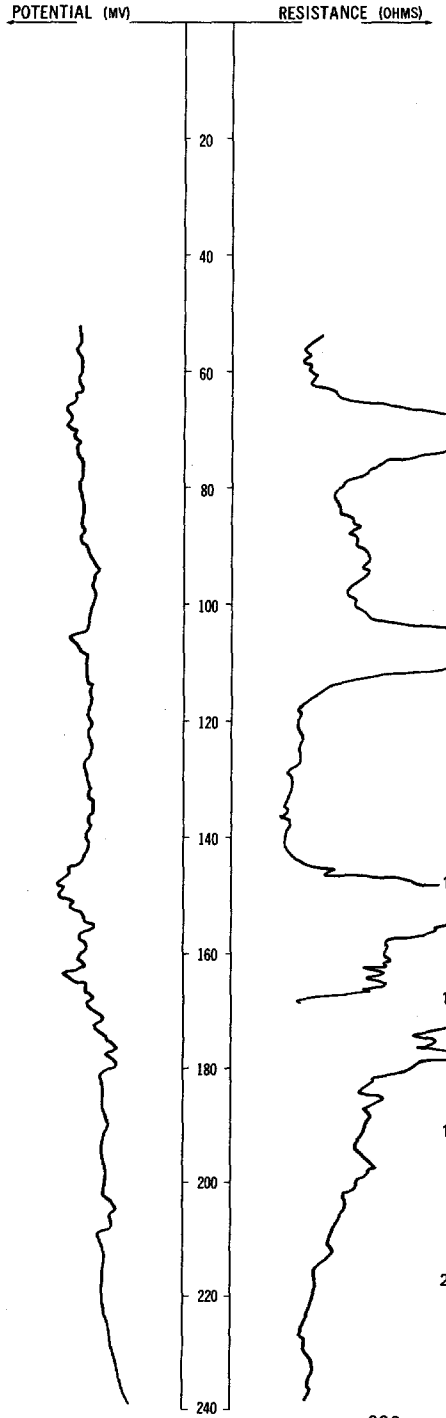
NDSWC 5240

LOCATION: 132-068-03AAA

DATE DRILLED: 9/26/77

ALTITUDE: 2087
(FT, MSL)

DEPTH: 262
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-26 Clay (till), sandy, silty; scattered pebbles and boulders.

26-33 Boulders.

33-146 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray; sand and gravel lenses from 34 to 42 feet, 66 to 72 feet, and 106 to 111 feet.

146-168 Sand, coarse, and fine to medium gravel; composed largely of carbonate, quartz, and shale fragments.

168-190 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.

190-215 Clay (till), sandy, silty, moderate-yellowish-brown.

PIERRE FORMATION

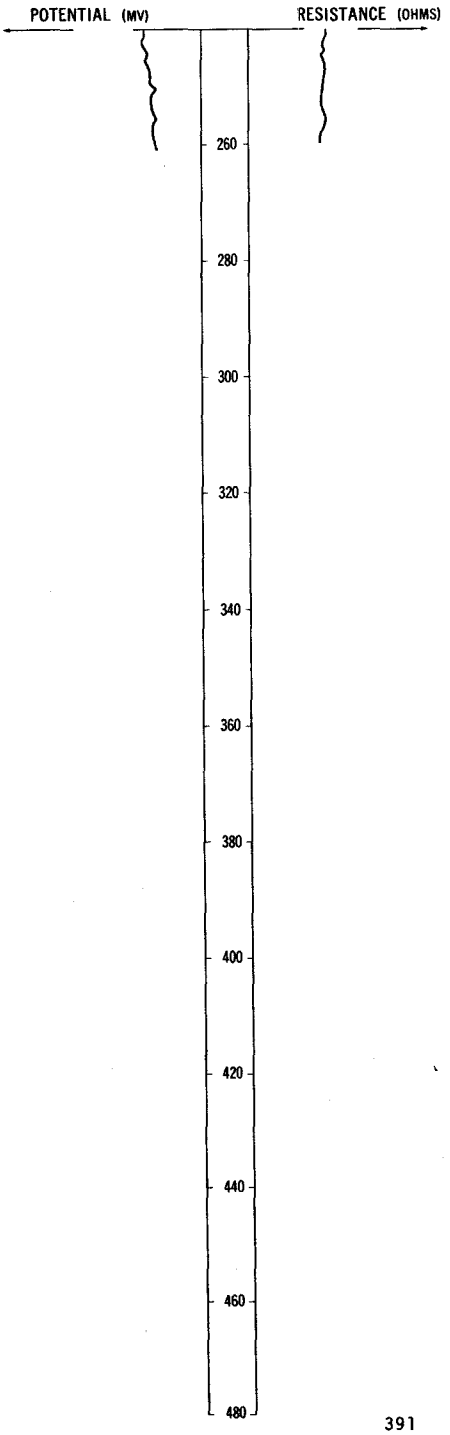
215-262 Shale, black to grayish-black, siliceous, hard.

LOCATION: 132-068-03AAA

DATE DRILLED: 9/26/77

ALTITUDE: 2087
(FT, MSL)

DEPTH: 262
(FT)



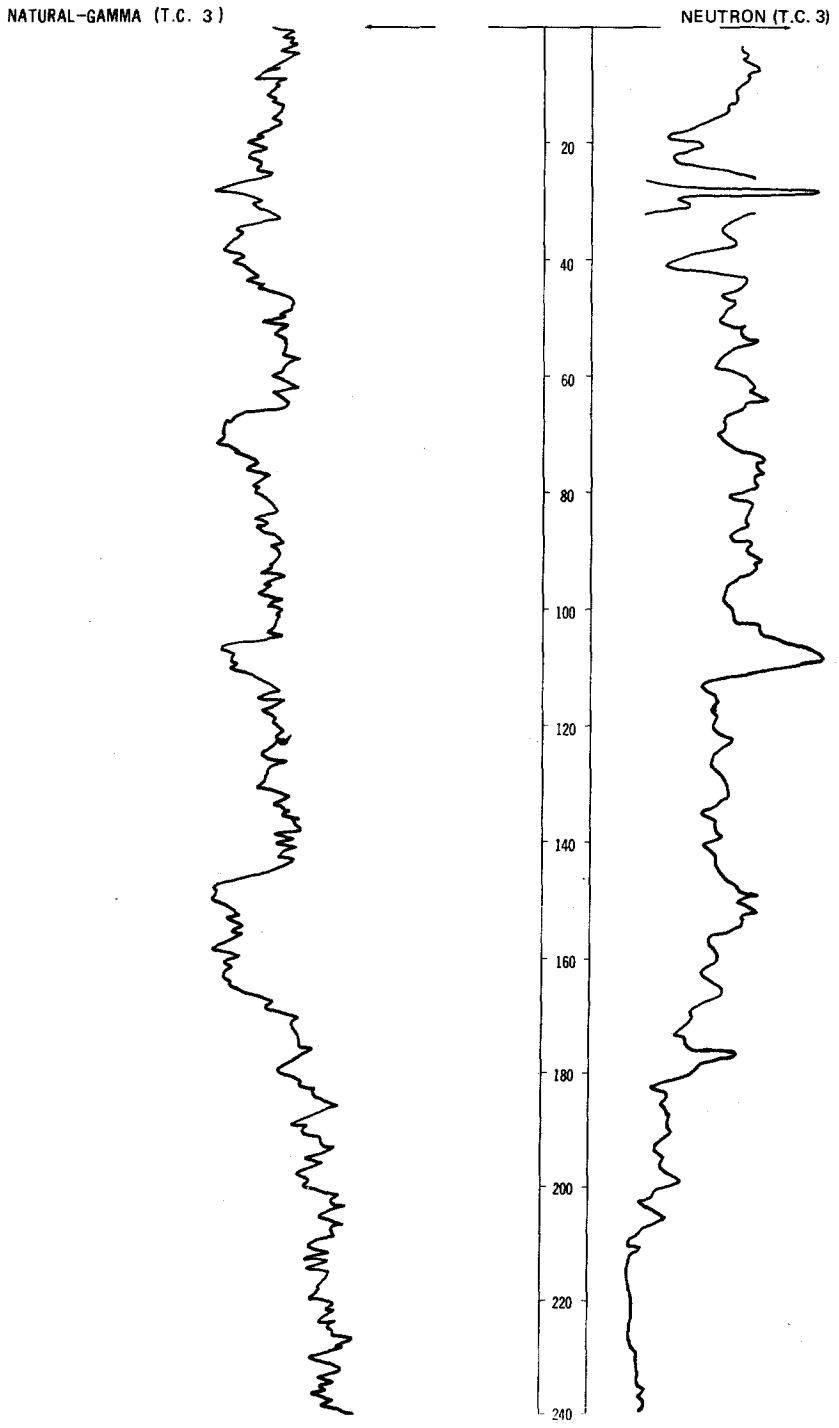
DESCRIPTION OF DEPOSITS

LOCATION: 132-068-03AAA

DATE DRILLED: 9/26/77

ALTITUDE: 2087
(FT, MSL)

DEPTH: 262
(FT)



LOCATION: 132-068-03AAA

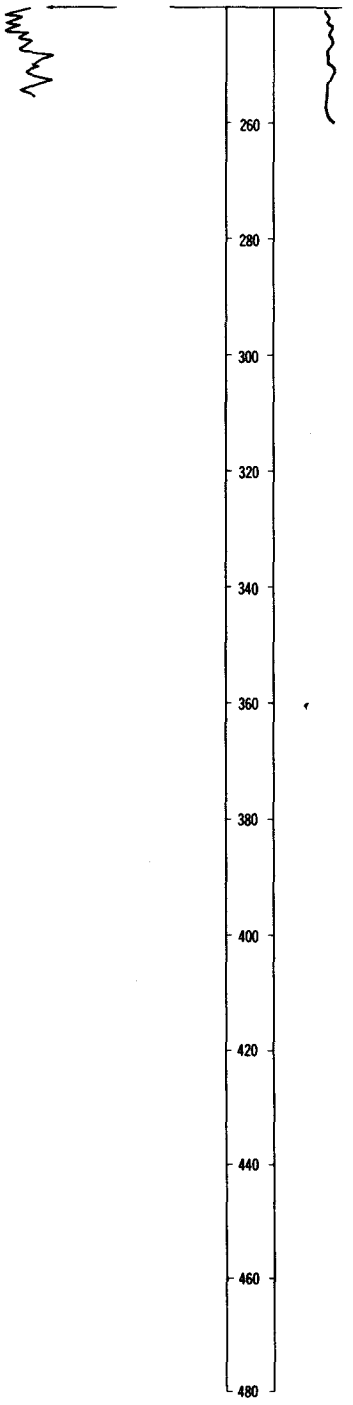
DATE DRILLED: 9/26/77

ALTITUDE: 2087
(FT, MSL)

DEPTH: 262
(FT)

NATURAL-GAMMA (T.C. 3)

NEUTRON (T.C. 3)



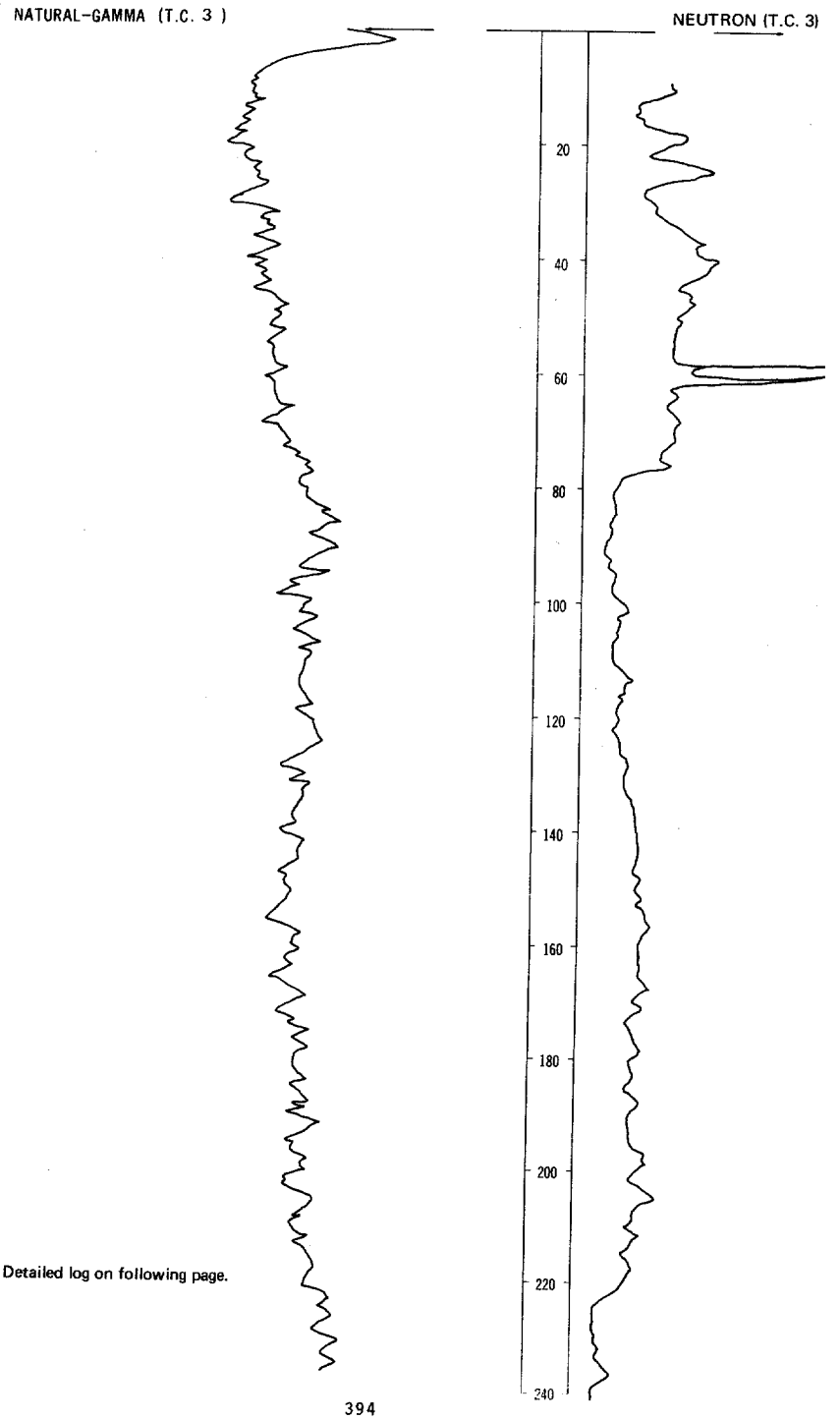
NDSWC 5232

LOCATION: 132-068-04BBB

DATE DRILLED: 9/20/77

ALTITUDE: 2000
(FT, MSL)

DEPTH: 242
(FT)



NOTE: Detailed log on following page.

132-068-04BBB, Continued
NDSWC 5232

Altitude: 2000 feet — Date drilled: 9/20/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	8	8
	Sand, fine to coarse, predominantly coarse, gravelly, subangular to rounded; composed largely of quartz, carbonate, and shale fragments	25	33
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles and cobbles	189	222
Pierre Formation:			
	Shale, black to grayish-black, noncalcareous, hard	20	242

132-068-09DDC1
(Log from Jacob Thurn)

Date drilled: 9/11/75

Topsoil	2	2
Clay and sand	18	20
Clay, blue	22	42
Sand	8	50

132-068-14CAA
(Log from Lucas Schweigert)

Date drilled: 4/09/73

Topsoil, black	2	2
Clay, gray	13	15
Gravel, red	5	20
Sand, fine	16	36
Gravel, coarse	4	40

132-068-14DDD1
NDSWC 9767

Altitude:	2062 feet	Date drilled:	9/02/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, dark-yellowish-brown	8	8
	Clay, silty, sandy, moderate-yellowish-brown	8	16
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	15	31
	Clay (till), silty, sandy, olive-gray; scattered pebbles	10	41
	Sand, fine to very coarse, predominantly very coarse, and very fine to medium gravel; composed of 35 percent carbonate, 30 percent quartz, 25 percent unidentified, and 10 percent shale fragments	13	54
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 35 percent shale, 30 percent quartz, 20 percent carbonate, and 15 percent unidentified fragments	8	62
	Sand, fine to very coarse, predominantly very coarse, and fine to medium gravel; composed of 35 percent carbonate, 25 percent unidentified, 20 percent shale, and 20 percent quartz fragments	32	94
	Clay (till), sandy, dusky-brown	6	100

132-068-14DDD2
NDSWC 9767A

Altitude:	2062 feet	Date drilled:	9/02/76
Glacial drift:			
	Clay, silty, sandy, dark-yellowish-brown	8	8
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	8	16
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	15	31
	Clay (till), silty, sandy, olive-gray; scattered pebbles	12	43
	Gravel, fine to medium, predominantly fine, sandy; composed of 40 percent carbonate, 30 percent unidentified, 20 percent quartz, and 10 percent shale fragments	33	76
	Clay (till), sandy, grayish-brown	15	91
	Gravel, sandy	3	94
	Clay, sandy, grayish-brown; contains numerous gravel lenses	6	100

132-068-14DDD3
NDSWC 9767B

Altitude:	2062 feet	Date drilled:	9/07/76
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	16	16
	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles	3	19
	Sand, fine to very coarse, predominantly very coarse, gravelly	21	40

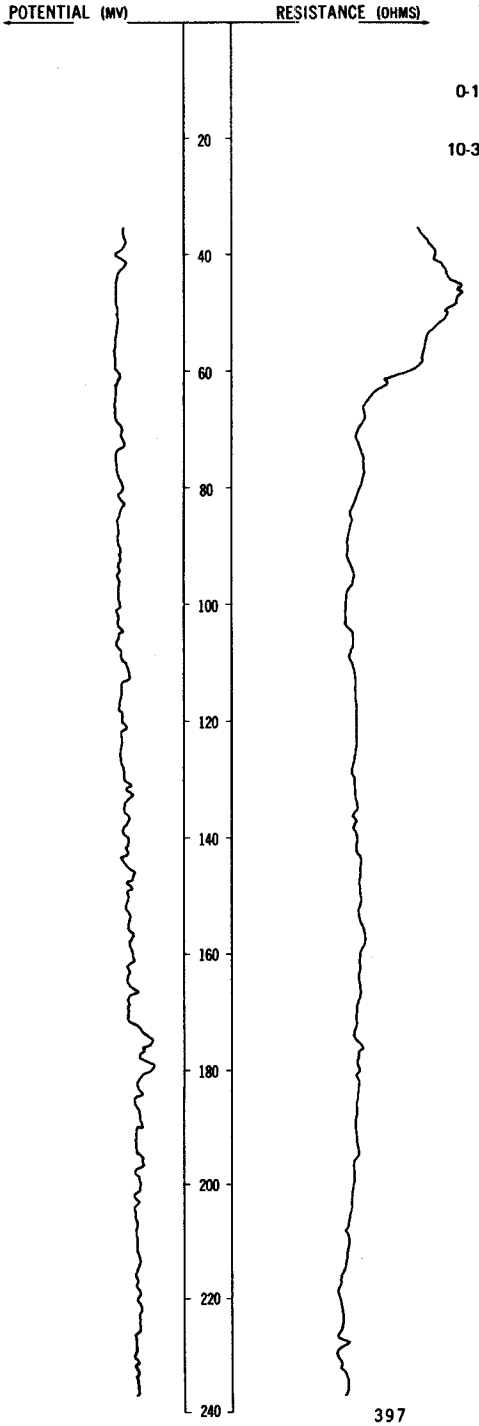
NDSWC 5231

LOCATION: 132-068-16DDD

DATE DRILLED: 9/20/77

ALTITUDE: 2056
(FT, MSL)

DEPTH: 322
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10 Clay (till), sandy, silty, gravelly, moderate-yellowish-brown.

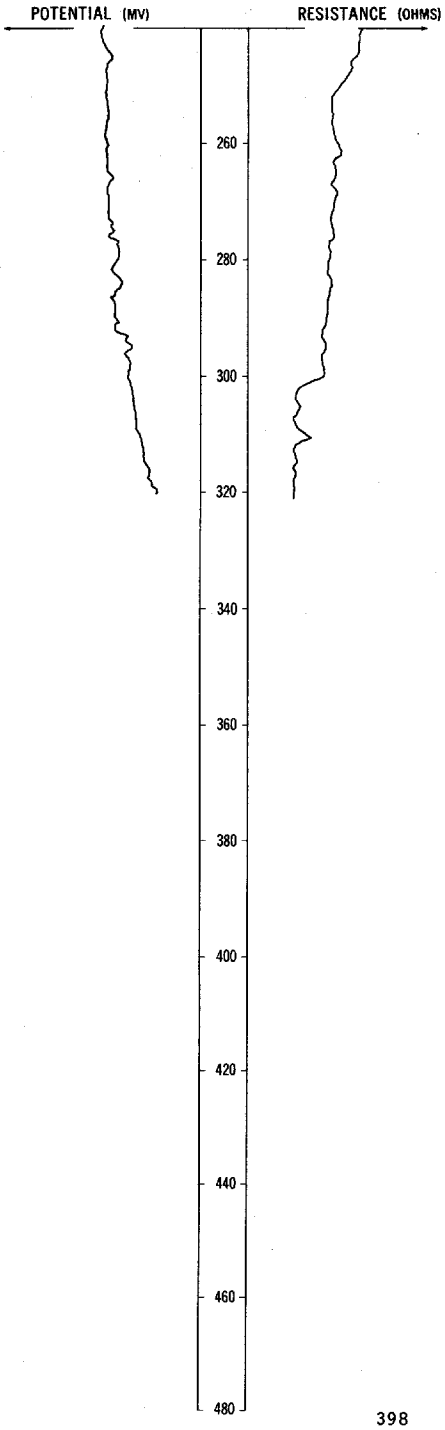
10-300 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

LOCATION: 132-068-16DDD

DATE DRILLED: 9/20/77

ALTITUDE: 2056
(FT, MSL)

DEPTH: 322
(FT)



DESCRIPTION OF DEPOSITS

PIERRE FORMATION

300-322 Shale, black to grayish-black, non-calcareous, hard; few selenite crystals.

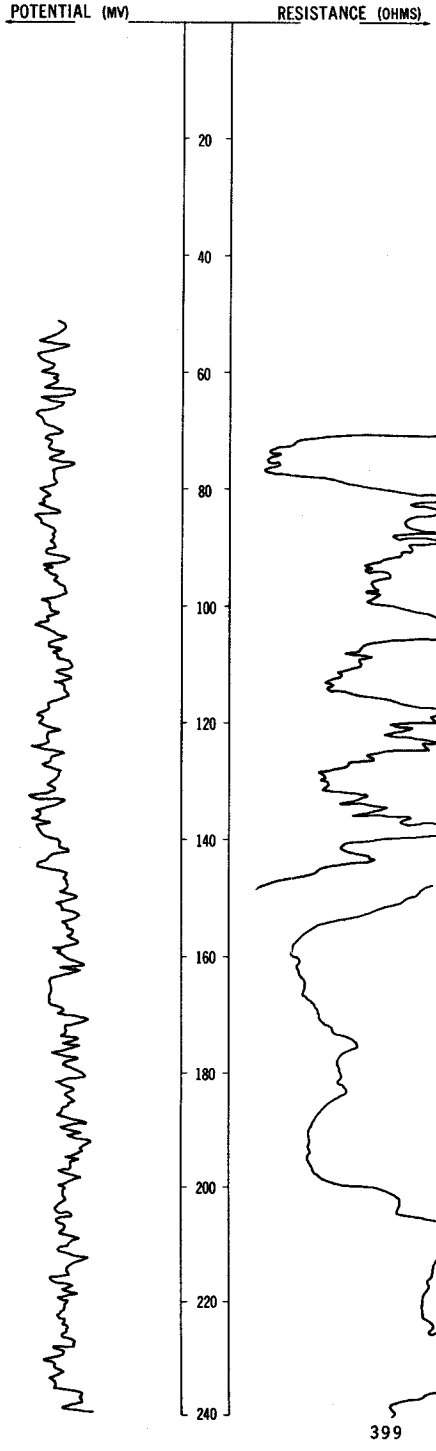
NDSWC 5233, 5233A

LOCATION: 132-068-17BAA1, 2

DATE DRILLED: 9/21/77

ALTITUDE: 2046
(FT, MSL)

DEPTH: 322
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

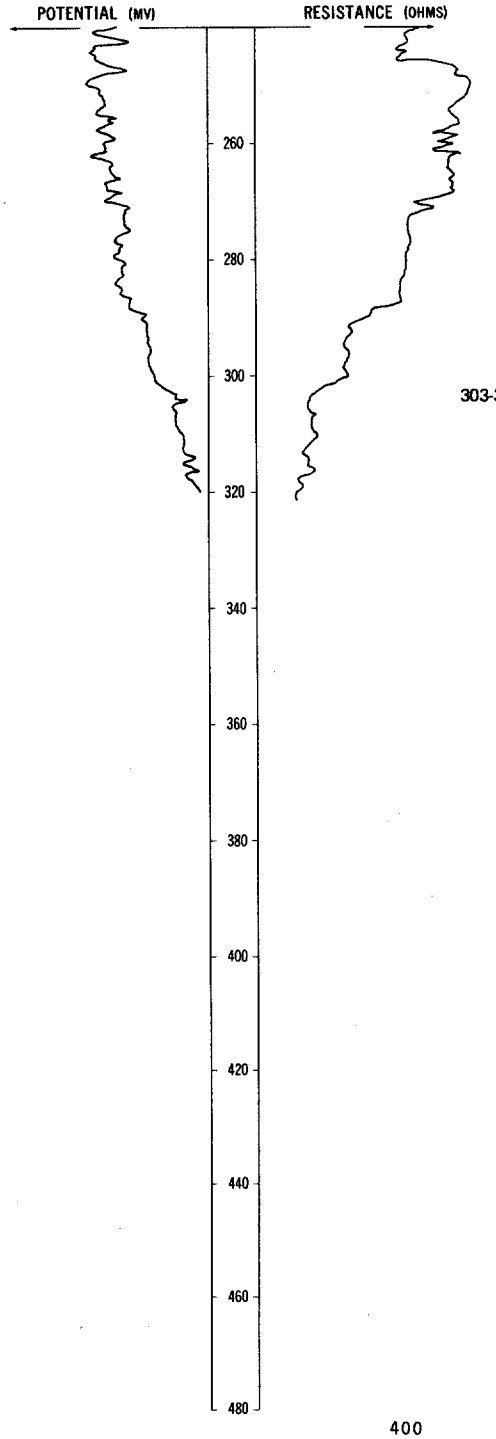
0-28	Sand, fine to very coarse, predominantly medium to coarse, subrounded to rounded; composed largely of quartz and carbonate fragments.
28-75	Clay (lacustrine), silty, sandy, medium-gray.
75-144	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.
144-204	Clay (lacustrine), silty, sandy, medium-dark-gray.
204-303	Clay (till), sandy, silty, gravelly, cobbly, medium-dark-gray to olive-gray; gravel lens from 227 to 235 feet.

LOCATION: 132-068-17BAA1, 2

DATE DRILLED: 9/21/77

ALTITUDE: 2046
(FT, MSL)

DEPTH: 322
(FT)



DESCRIPTION OF DEPOSITS

PIERRE FORMATION

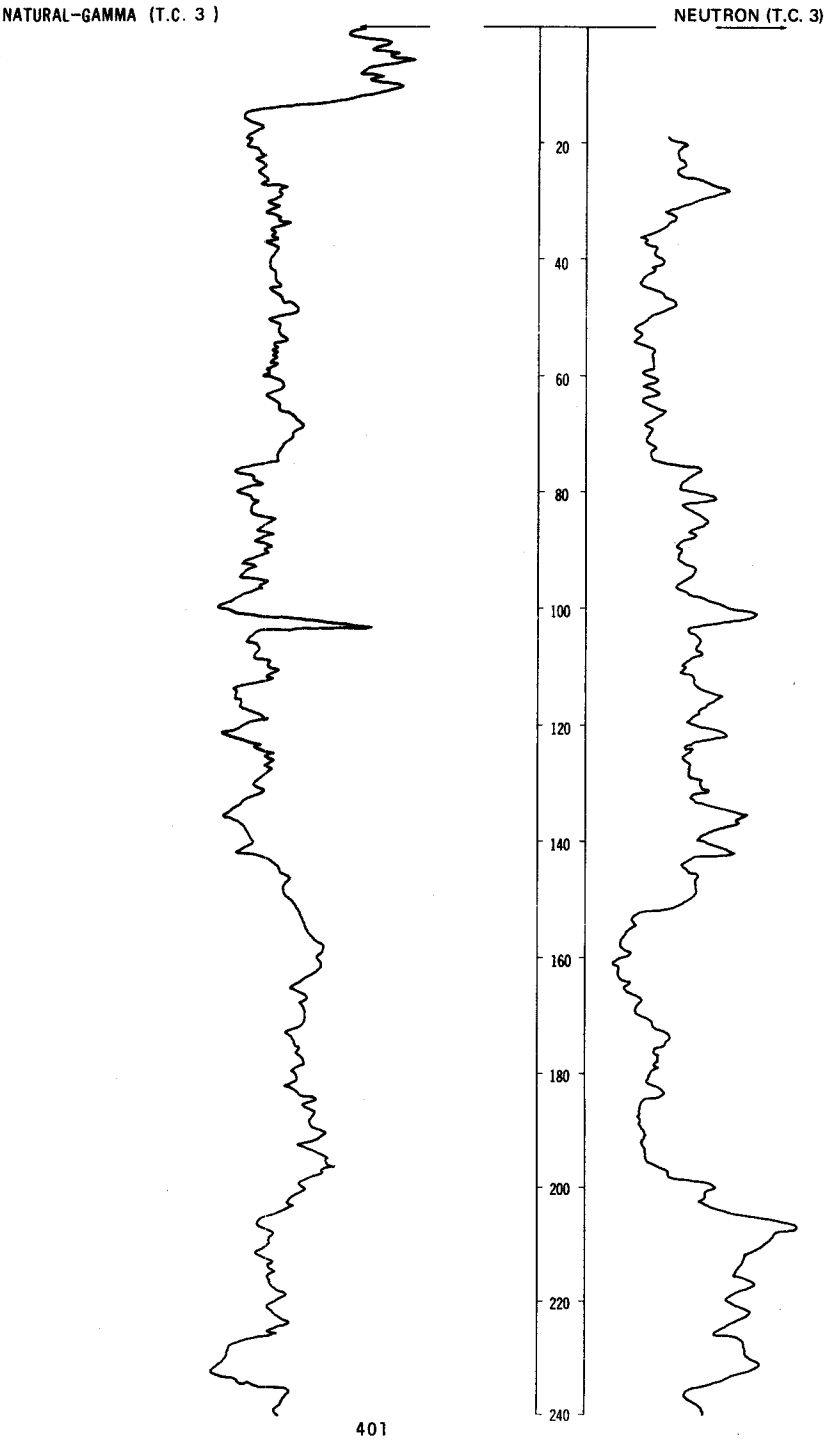
303-322 Shale, black to grayish-black, siliceous, hard.

LOCATION: 132-068-17BAA1, 2

DATE DRILLED: 9/21/77

ALTITUDE: 2046
(FT, MSL)

DEPTH: 322
(FT)

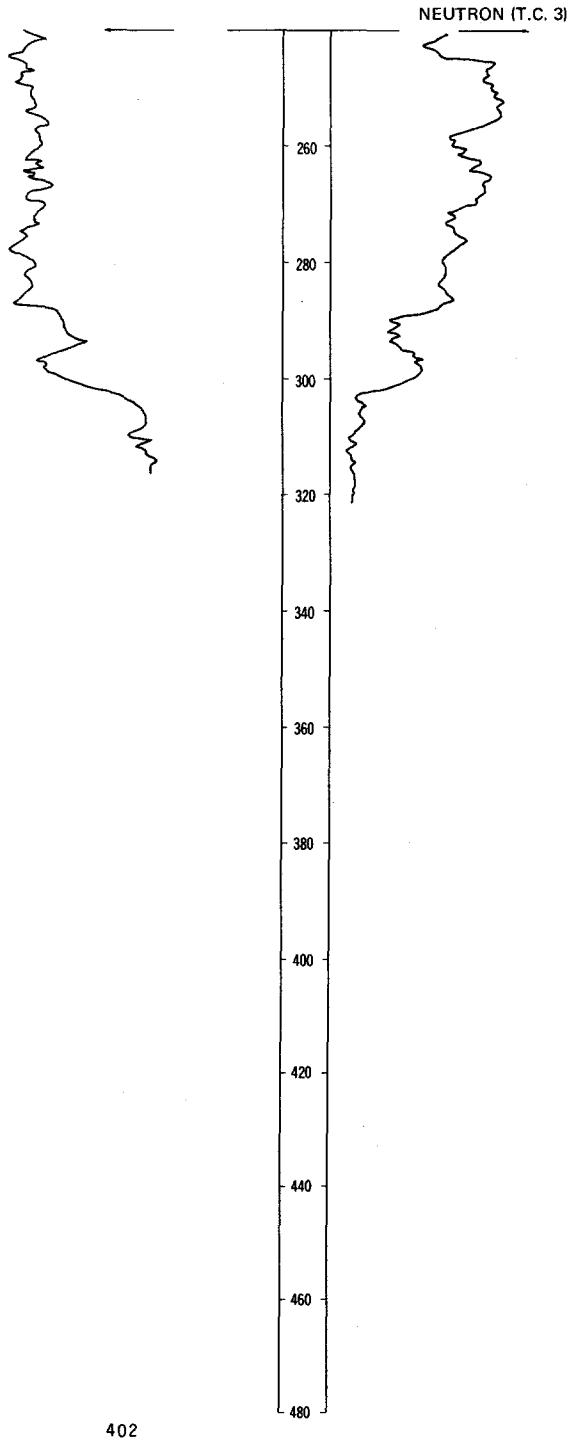


LOCATION: 132-068-17BAA1, 2

DATE DRILLED: 9/21/77

ALTITUDE: 2046
(FT, MSL)

DEPTH: 322
(FT)



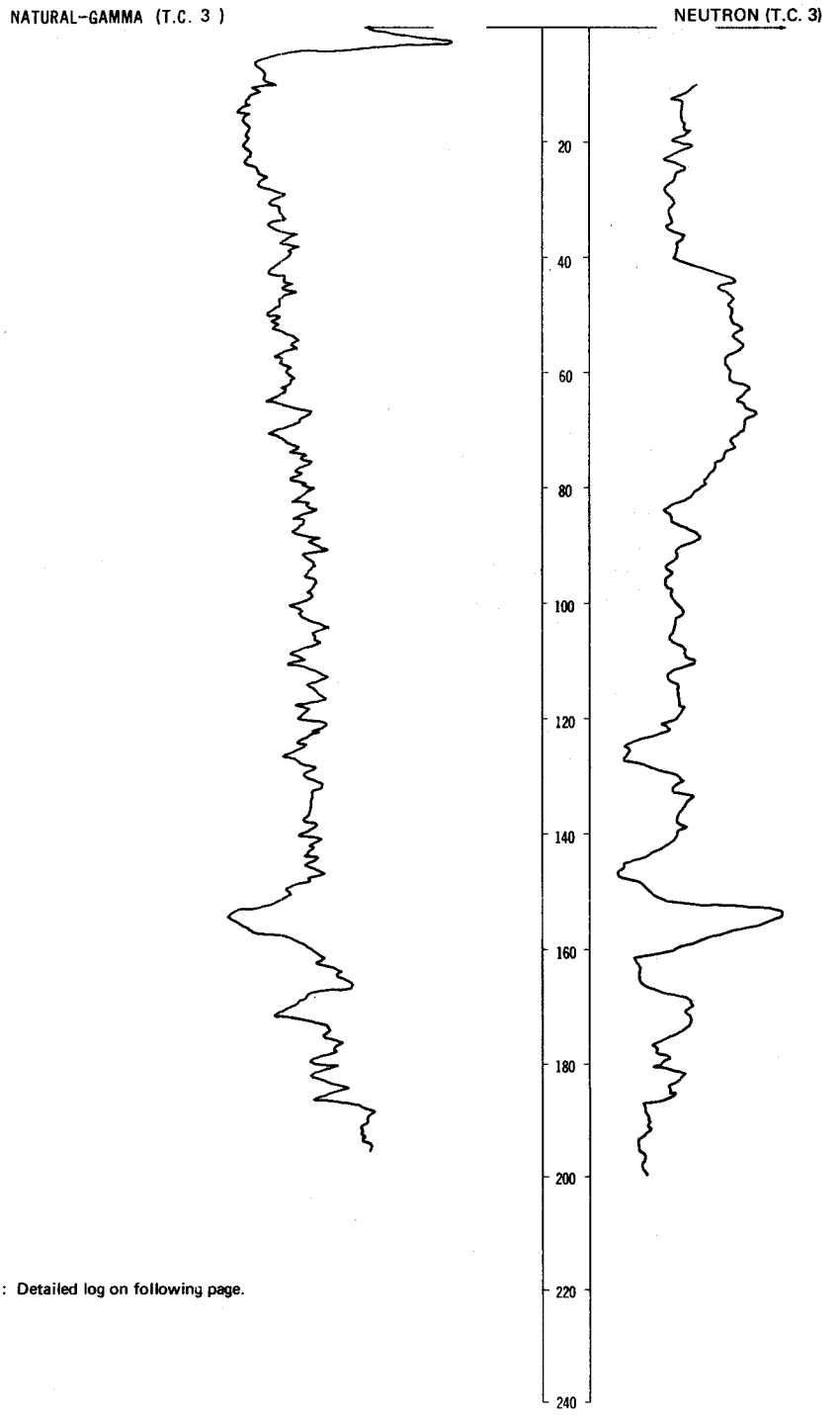
NDSWC 5234

LOCATION: 132-068-18BBB

DATE DRILLED: 9/21/77

ALTITUDE: 2030
(FT, MSL)

DEPTH: 202
(FT)



NOTE: Detailed log on following page.

132-068-18BBB, Continued
NDSWC 5234

Altitude: 2030 feet — Date drilled: 9/21/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	12	12
	Sand, fine to very coarse, predominantly medium to coarse, subrounded to rounded; composed largely of quartz and carbonate fragments	13	25
	Clay (till), sandy, silty, medium-dark-gray to dark-gray; scattered pebbles; oxidized till and gravel from 146 to 158 feet	161	186
Pierre Formation:			
	Shale, black, siliceous, hard	16	202

132-068-19BBB
NDSWC 9763

Altitude: 2119 feet — Date drilled: 8/31/76

Glacial drift:			
	Silt, clayey, moderate-yellowish-brown	3	3
	Clay, silty, moderate-yellowish-brown	23	26
	Clay, silty, olive-gray	7	33
	Clay (till), silty, sandy, olive-gray; scattered pebbles	73	106
	Gravel, sandy	2	108
	Clay (till), silty, sandy, olive-gray; scattered pebbles	59	167
	Clay (till), silty, sandy, olive-gray, hard; scattered pebbles	63	230
	Clay (till), silty, sandy, dusky-brown; scattered shale pebbles; boulder and cobbles from 251 to 252 feet, 289 to 289.5 feet, and 303 to 303.5 feet	89	319
	Gravel, fine, sandy	5	324
	Clay (till), silty, sandy, dusky-brown; boulders from 328 to 329 feet and 407 to 408 feet	86	410

132-068-22CDA
(Log modified from Jacob Thurn)

Date drilled: 7/10/73

Dirt, black	3	3
Clay, yellow	17	20
Clay, blue	25	45
Sand	18	63

132-068-24AAA
(Log from Baumgartner Drilling Co.)

Date drilled: 8/26/73

Clay, brown	10	10
Clay, sandy, brown	10	20
Clay, gray	222	242
Sand and gravel; fine to coarse	18	260
Shale	----	260

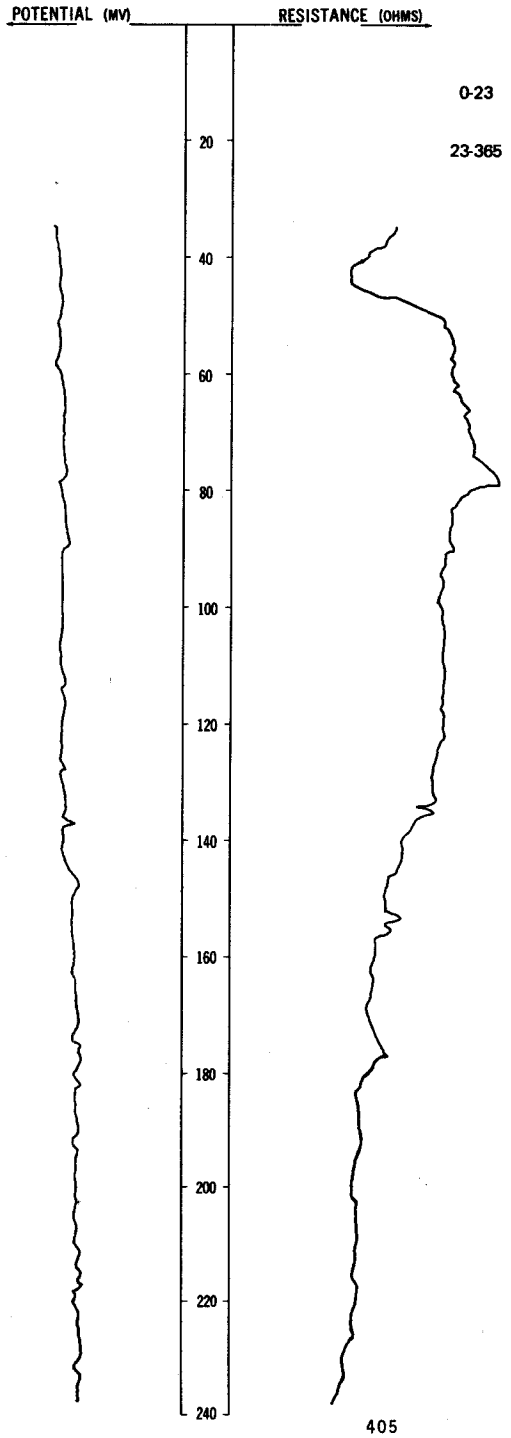
NDSWC 5230

LOCATION: 132-068-24CCC

DATE DRILLED: 9/20/77

ALTITUDE: 2058
(FT, MSL)

DEPTH: 402
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-23 Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.

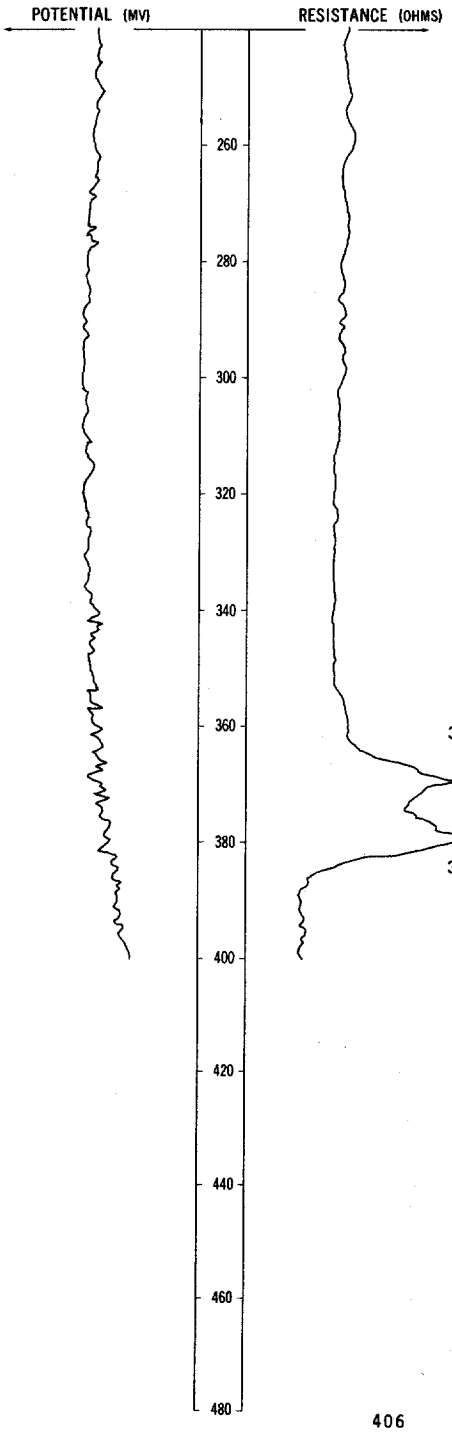
23-365 Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles and boulders.

LOCATION: 132-068-24CCC

DATE DRILLED: 9/20/77

ALTITUDE: 2058
(FT, MSL)

DEPTH: 402
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

365-383 Gravel, fine to medium, sandy, subangular to subrounded.

PIERRE FORMATION

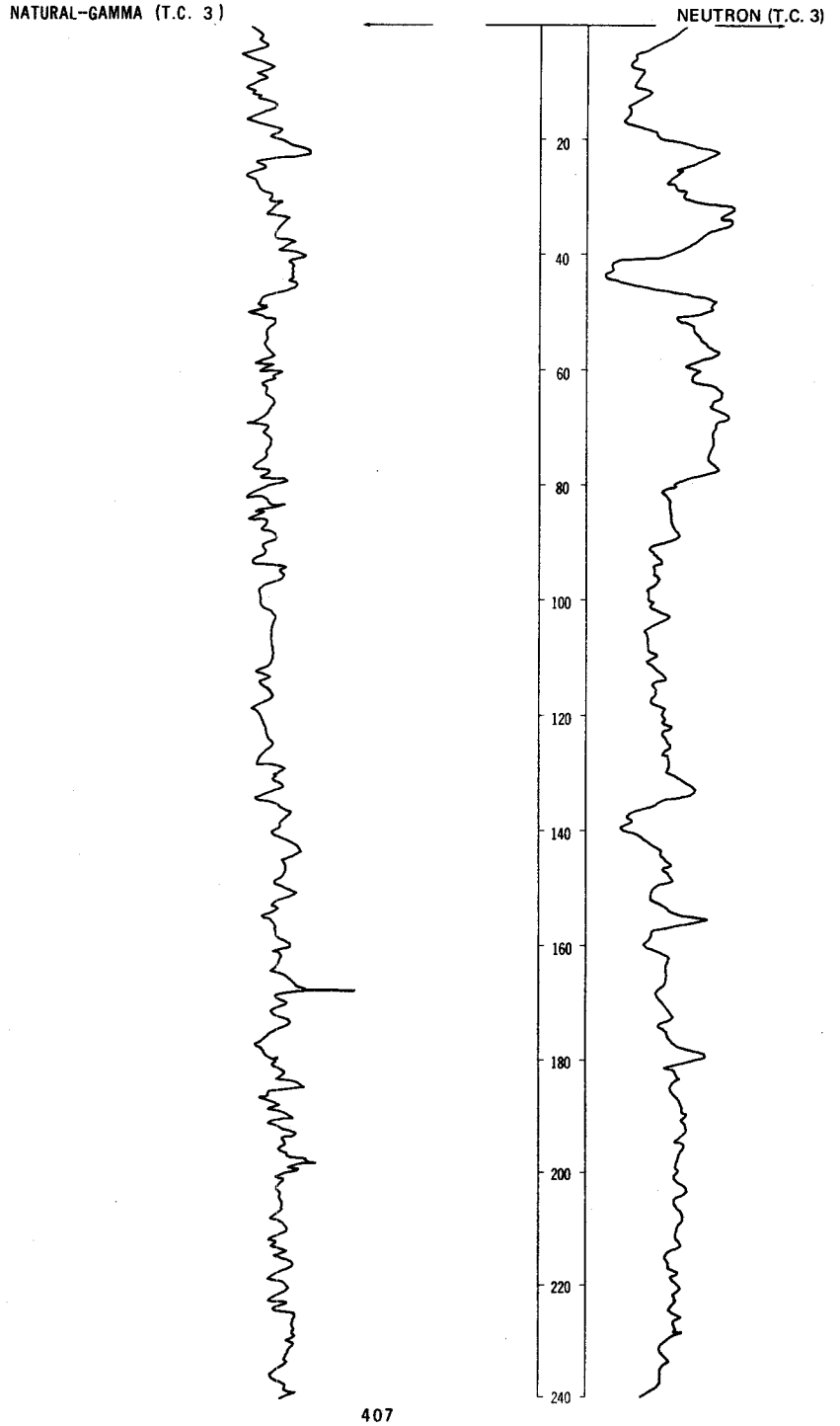
383-402 Shale, black to grayish-black, non-calcareous, hard.

LOCATION: 132-068-24CCC

DATE DRILLED: 9/20/77

ALTITUDE: 2058
(FT, MSL)

DEPTH: 402
(FT)

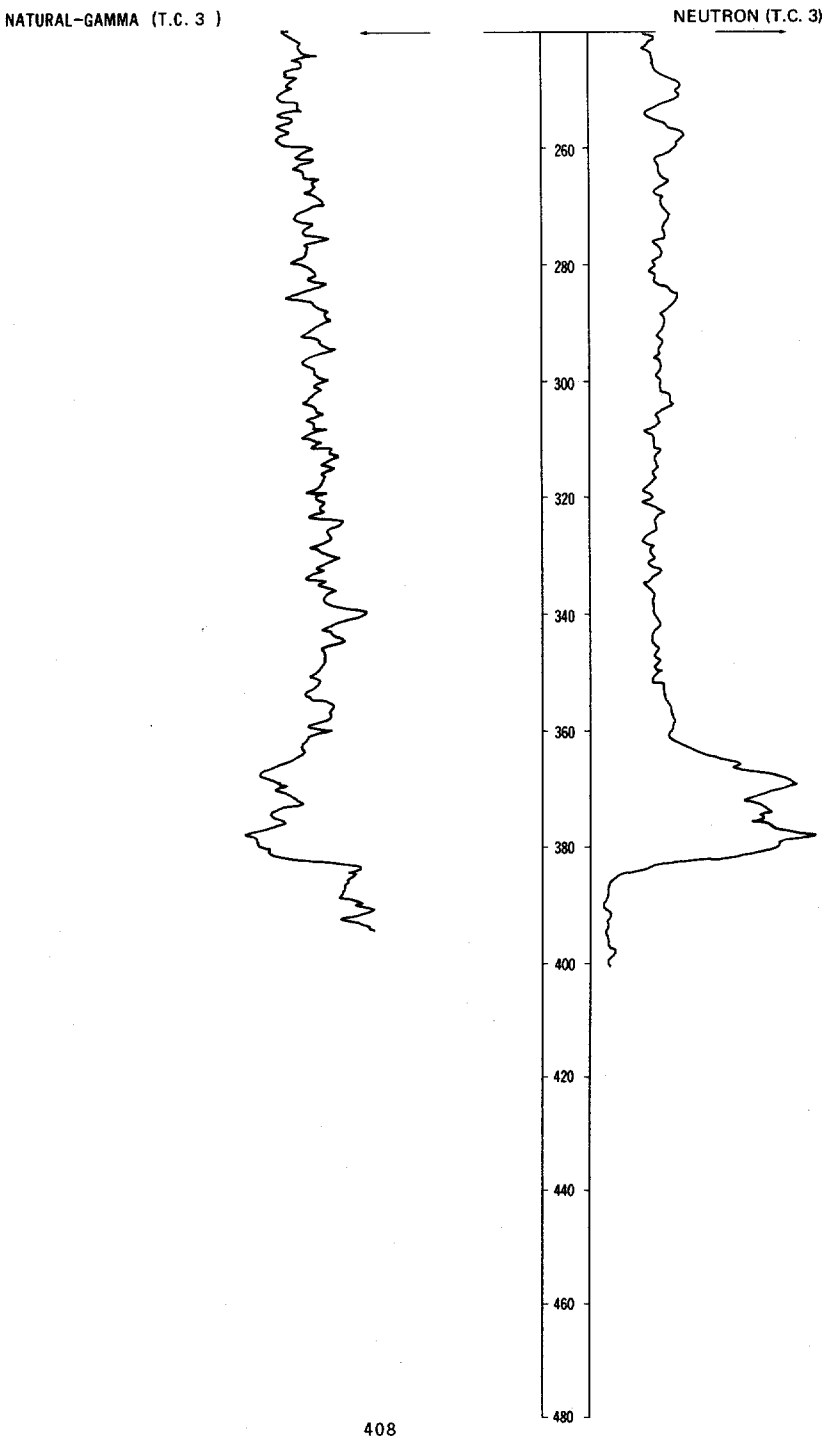


LOCATION: 132-068-24CCC

DATE DRILLED: 9/20/77

ALTITUDE: 2058
(FT, MSL)

DEPTH: 402
(FT)



132-068-28BBB
NDSWC 9766

Altitude: 2019 feet | Date drilled: 8/02/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, gravelly	6	6
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	4	10
	Clay (till), silty, sandy, pebbly, olive-gray	20	30
	Sand, very fine to very coarse, predominantly medium, gravelly; predominantly quartz fragments	13	43
	Clay, silty, brownish-gray	11	54
	Clay, gray	12	66
	Silt, clayey	8	74
	Clay, olive-gray	9	83
	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel lenses from 225 to 226 feet, 228 to 229 feet, and 252 to 253 feet	174	257
	Clay (till), sandy, dusky-brown; with reddish-brown mottling	4	261
	Clay (till), sandy, dark-gray, hard	68	329
Pierre Formation:			
	Shale, grayish-black, hard	11	340

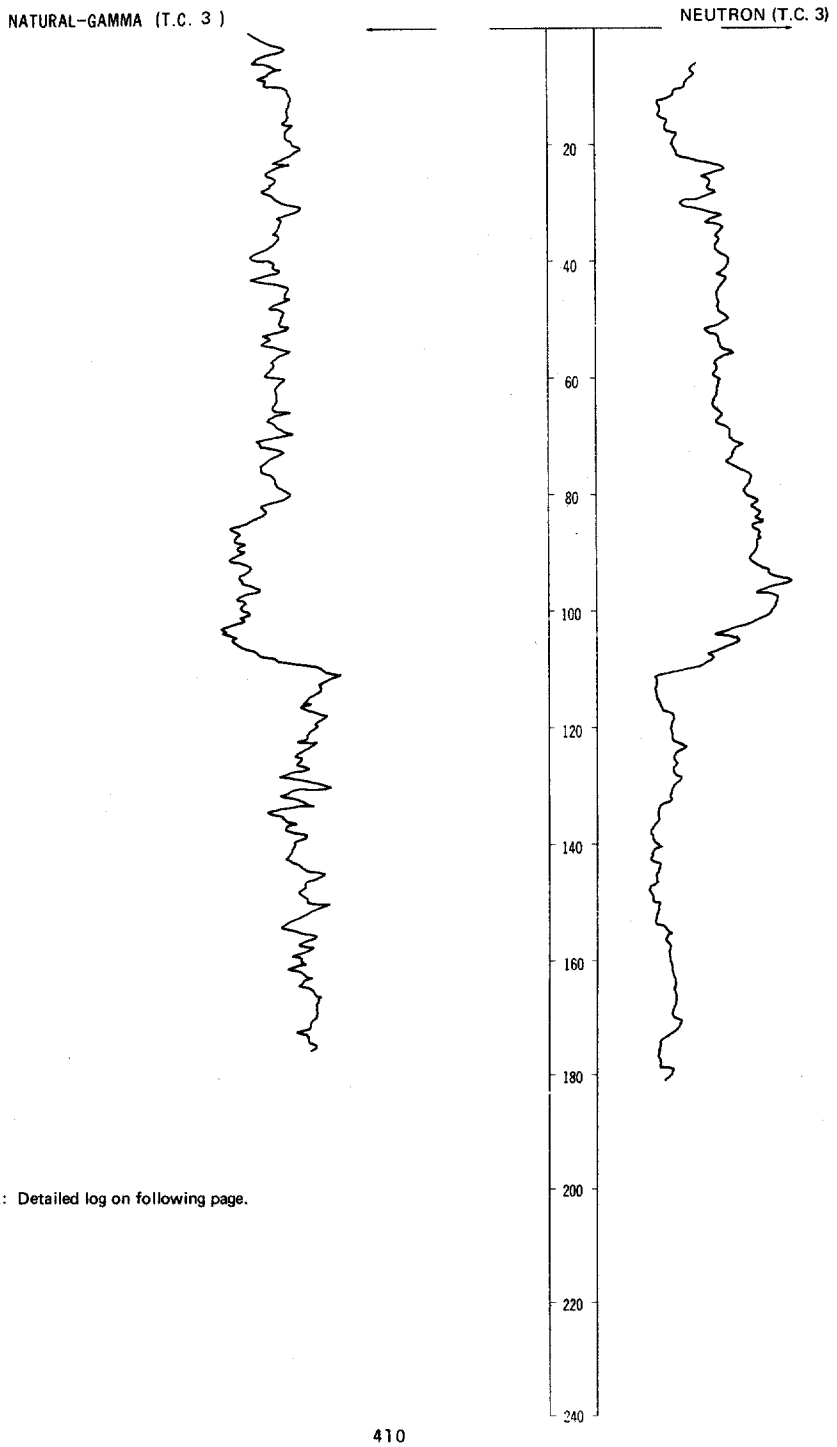
NDSWC 5235

LOCATION: 132-069-01BBB

ALTITUDE: 2086
(FT, MSL)

DATE DRILLED: 9/21/77

DEPTH: 182
(FT)



NOTE: Detailed log on following page.

132-069-01BBB, Continued
NDSWC 5235

Altitude: 2086 feet — Date drilled: 9/21/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), sandy, silty, moderate-yellowish-brown; gravelly near top	30	30
	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles	55	85
	Sand, fine to very coarse, predominantly coarse, gravelly, subangular to rounded; composed largely of quartz, carbonate, and shale fragments	24	109
	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles	45	154
Pierre Formation:			
	Shale, black to grayish-black, noncalcareous, hard	28	182

132-069-03BDA
(Log from Baumgartner Drilling Co.)

Date drilled: 4/13/76

Clay, brown	18	18
Sand, fine	4	22
Clay, black	56	78
Sand, coarse, and gravel	26	104
Clay, black	----	104

132-069-04CCA
(Log from Baumgartner Drilling Co.)

Date drilled: 4/08/76

Clay, brown	20	20
Clay, black	14	34
Sand, coarse	5	39
Clay, black	21	60

132-069-05BAD
NDSWC 1100
(Log modified from Adolphson, 1962)

Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, yellow	2	3
	Clay, sandy; fine to medium gravel; and shale pebbles	11	14
	Clay, smooth, gray	5	19
	Clay, smooth, yellow	41	60
	Clay, smooth, gray	16	76
	Till, clayey, gray; fine to medium gravel; lignite fragments; and shale pebbles	104	180
	Clay, sandy, yellow	15	195
	Till, clayey, gray; fine to medium gravel; and shale pebbles	60	255
	Clay, smooth, bluish-gray	10	265
Pierre Formation(?):			
	Clay, sandy, bluish-gray	45	310

132-069-05BBA
NDSWC 1105
(Log modified from Adolphson, 1962)

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, brown	3	5
	Clay, yellow; fine to medium gravel; and shale pebbles	18	23
	Till, clayey, gray; fine to medium gravel; and shale pebbles	109	132
Pierre Formation:			
	Shale, gray	18	150

132-069-05BBC
NDSWC 1115
(Log modified from Adolphson, 1962)

Glacial drift:			
	Topsoil, black	1	1
	Clay, gray	1	2
	Clay, yellow; fine to medium gravel; and shale pebbles	1	3
	Gravel, fine to medium; and yellow clay	1	4
	Clay, smooth, yellow	10	14
	Clay, smooth, brown	10	24
	Sand, fine to coarse; fine to medium gravel; and shale pebbles	9	33
	Clay, yellow; fine to medium gravel; and shale pebbles	21	54
	Till, clayey, gray; fine to medium gravel; and shale pebbles	8	62
	Sand, fine to coarse; fine to medium gravel; and shale pebbles	9	71
	Clay, sandy, gray	69	140
	Till, clayey, gray; fine to medium gravel; and shale pebbles	36	176
Pierre Formation(?):			
	Clay, sandy, gray	14	190

132-069-06BCA
(Log modified from Adolphson, 1962)

Glacial drift:			
	Clay, yellow; fine to coarse gravel; and shale pebbles	7	7
	Till, clayey, gray; fine to coarse gravel; and shale pebbles	26	33
	Sand, medium to coarse; fine to medium gravel; and shale pebbles	12	45
	Till, clayey, gray; fine to medium gravel; and shale pebbles	10	55
Pierre Formation(?):			
	Clay, sandy, gray	45	100

132-069-06BDD
NDSWC 1107
(Log modified from Adolphson, 1962)

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	2	2
	Clay, gray	1	3
	Clay, yellow, and fine to medium gravel	4	7
	Sand, fine to coarse; fine to medium gravel; and shale pebbles	4	11
	Clay, yellow; fine to medium gravel; and shale pebbles	5	16
	Till, clayey, gray; fine to medium gravel; lignite fragments; and shale pebbles	30	46
	Clay, sandy, gray	13	59
	Till, clayey, gray; fine to medium gravel; and shale pebbles	10	69
	Clay, gray, sandy	54	123
	Till, clayey, gray; fine to medium gravel; and shale pebbles	6	129
Pierre Formation(?):			
	Clay, sandy, gray	31	160

132-069-06DAA
NDSWC 1106
(Log modified from Adolphson, 1962)

Altitude: 2057 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, yellow	3	4
	Clay, yellow; fine to medium gravel; and shale pebbles	27	31
	Sand, fine to coarse; medium gravel; and shale pebbles	13	44
	Clay, smooth, yellow	9	53
	Clay, smooth, gray	6	59
	Till, clayey, gray; fine to medium gravel; and shale pebbles	38	97
	Clay, sandy, gray	5	102
	Till, clayey, gray; fine to medium gravel; and shale pebbles	20	122
	Clay, sandy, gray	35	157
	Sand, fine to coarse; fine gravel; and shale pebbles	11	168
	Till, clayey, gray; fine to medium gravel; lignite fragments; and shale pebbles	153	321
	Sand, medium to coarse; fine gravel; and shale pebbles	12	333
	Till, clayey, gray; fine to medium gravel; and shale pebbles	13	346
Pierre Formation(?):			
	Shale, gray	14	360

132-069-06DDD
NDSWC 1111
(Log modified from Adolphson, 1962)

Altitude: 2034 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, gray	2	4
	Clay, smooth, yellow	14	18
	Clay, sandy, bluish-gray	52	70
Pierre Formation(?):			
	Clay, sandy, gray	30	100

132-069-08DDB2
(Log from Jacob Thurn)

Date drilled: 5/23/73

Dirt, black	3	3
Sand	17	20
Clay, blue	45	65

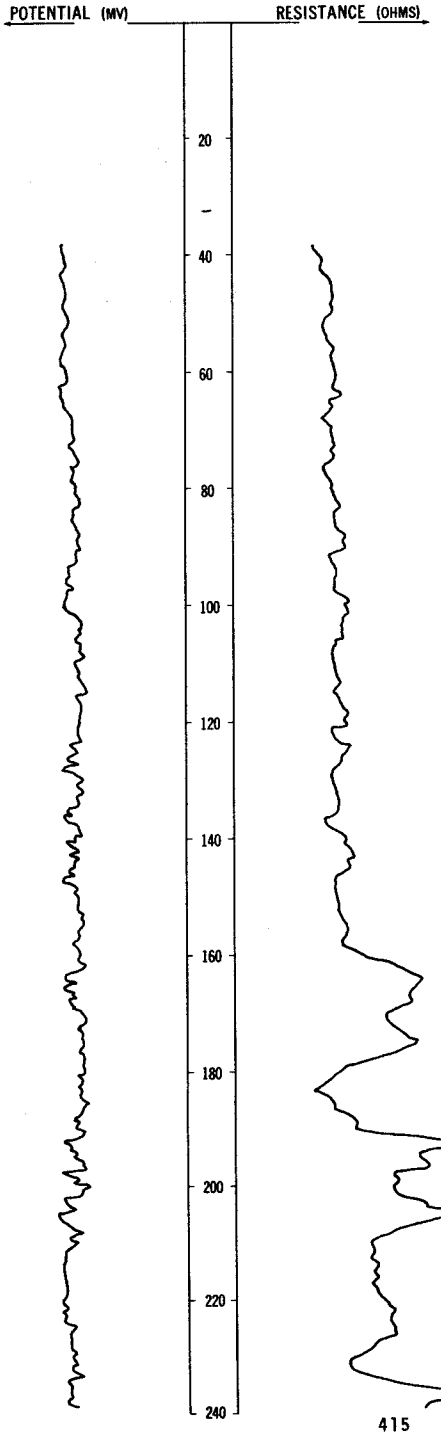
NDSWC 5236

LOCATION: 132-069-11DCC

DATE DRILLED: 9/22/77

ALTITUDE: 2022
(FT, MSL)

DEPTH: 302
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

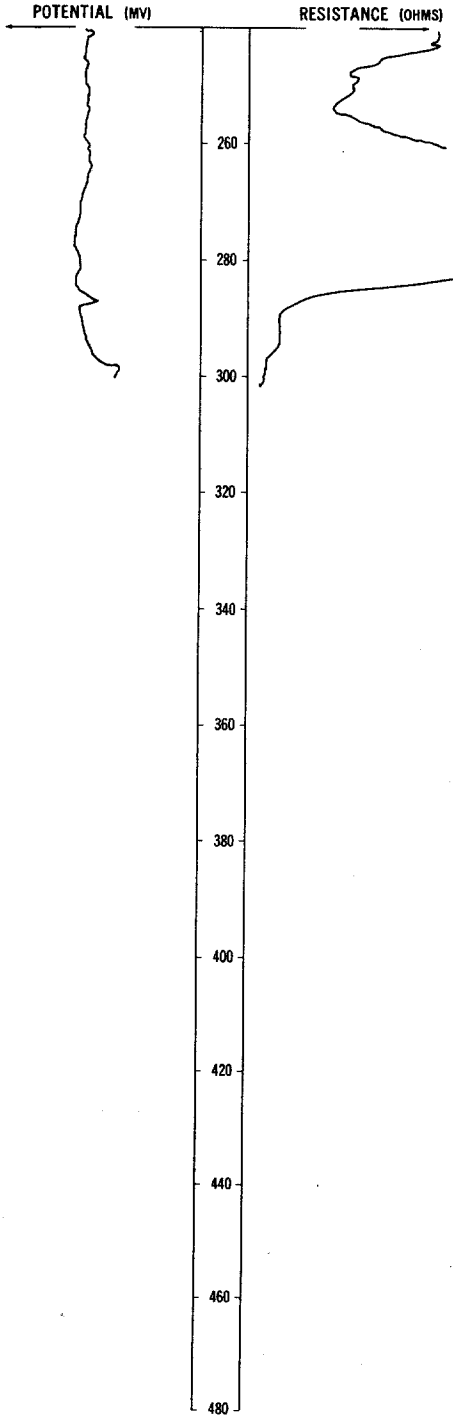
0-22	Clay (till), sandy, silty, moderate-yellowish-brown; scattered pebbles.
22-161	Clay (till), sandy, silty, medium-dark-gray to olive-gray; scattered pebbles.
161-178	Gravel, clayey.
178-192	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.
192-208	Gravel; clay lens from 198 to 206 feet.
208-235	Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.
235-243	Gravel.

LOCATION: 132-069-11DCC

DATE DRILLED: 9/22/77

ALTITUDE: 2022
(FT, MSL)

DEPTH: 302
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

243-258 Clay (till), sandy, silty, gravelly, medium-dark-gray to olive-gray.

258-284 Gravel, fine to medium, angular to subrounded; composed largely of carbonate and shale fragments.

PIERRE FORMATION

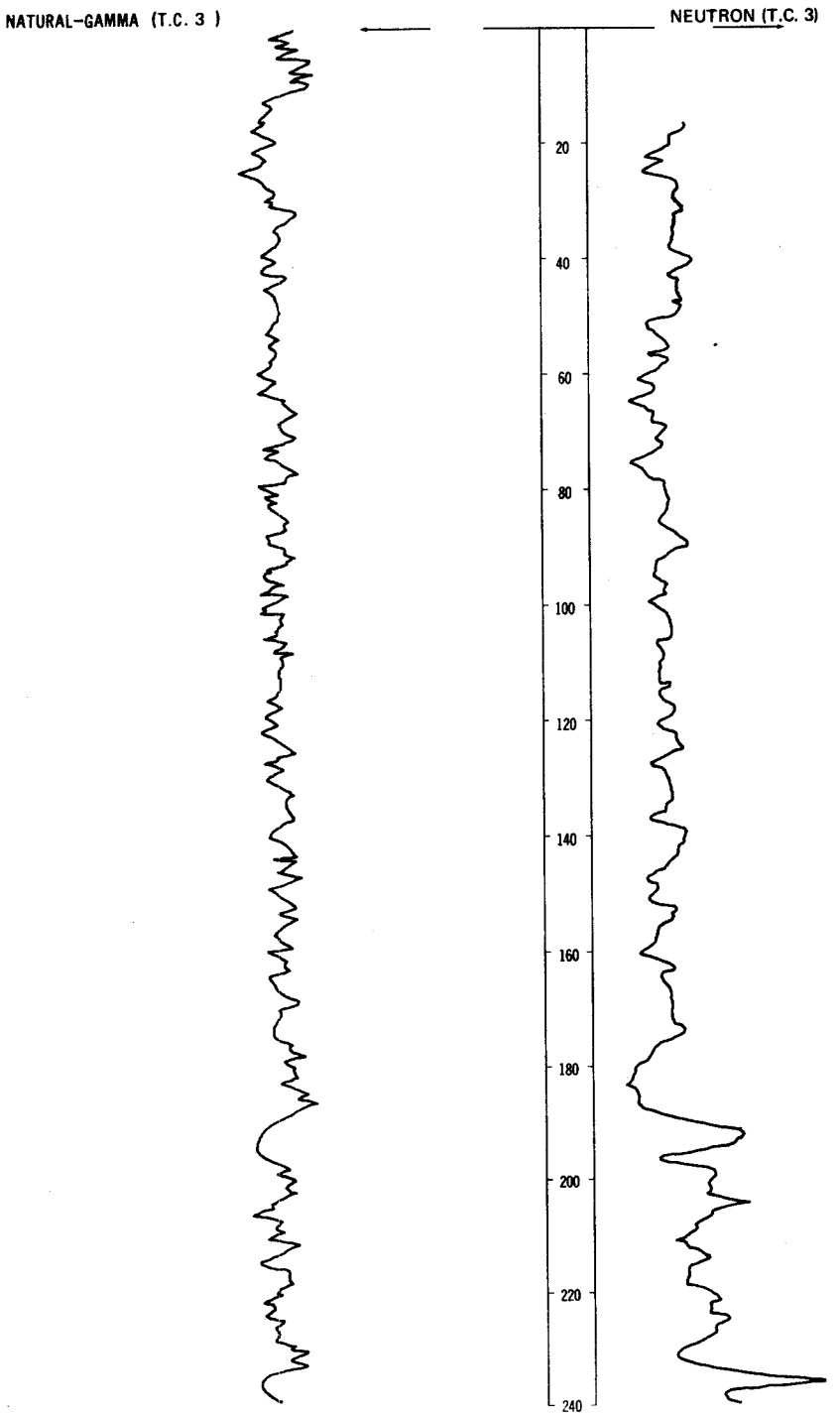
284-302 Shale, black, siliceous, hard.

LOCATION: 132-069-11DCC

DATE DRILLED: 9/22/77

ALTITUDE: 2022
(FT, MSL)

DEPTH: 302
(FT)

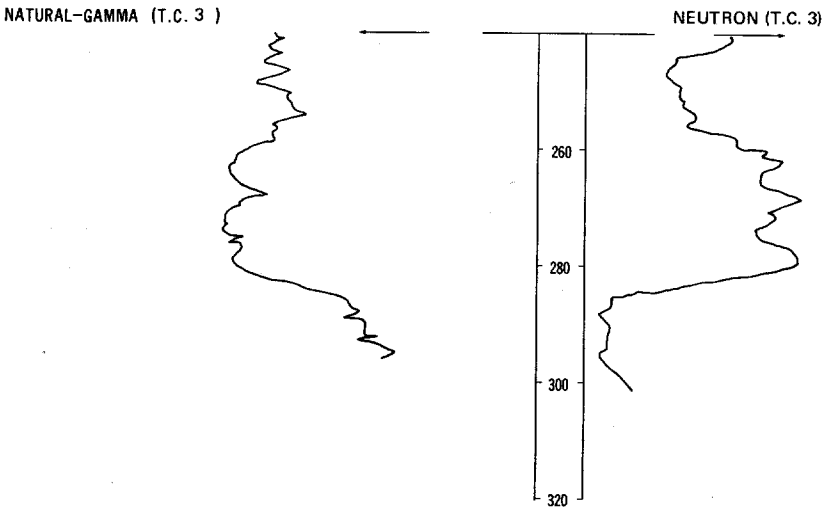


LOCATION: 132-069-11DCC

DATE DRILLED: 9/22/77

ALTITUDE: 2022
(FT, MSL)

DEPTH: 302
(FT)



132-069-11DDA
(Log from Baumgartner Drilling Co.)

Date drilled: 4/12/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, brown	8	8
	Sand, fine	12	20
	Clay, black	62	82
	Sand, coarse	18	100
	Clay, black	----	100

132-069-17BBC
(Log from Jacob Thurn)

Date drilled: 8/23/75

	Topsoil	3	3
	Clay, yellow	12	15
	Clay, blue	19	34
	Sand and gravel	3	37

132-069-22BBB
NDSWC 9762

Altitude: 2027 feet

Date drilled: 8/31/76

Glacial drift:			
	Clay, silty, moderate-yellowish-brown	17	17
	Clay, brownish-gray; becomes silty in lower half	85	102
	Clay (till), silty, sandy, olive-gray; scattered pebbles; gravel from 113 to 115 feet	91	193
Pierre Formation:			
	Shale, grayish-black, hard	27	220

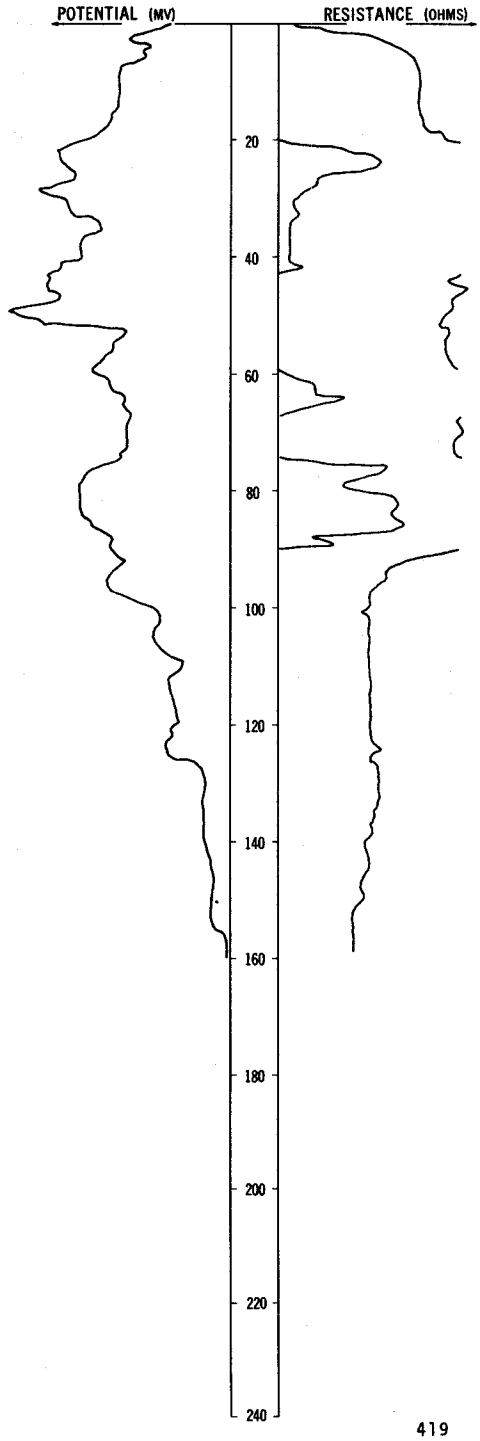
NDSWC 9759

LOCATION: 132-069-30DDD

DATE DRILLED: 8/30/76

ALTITUDE: 2012
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
12-16	Clay (till), silty, sandy, dark-yellowish-brown; scattered pebbles.
16-21	Clay (till), silty, sandy, dusky-yellowish-brown; scattered pebbles.
21-28	Sand, fine to very coarse, predominantly very coarse, gravelly; composed of 45 percent quartz, 40 percent carbonate, 10 percent shale, and 5 percent unidentified fragments.
28-42	Clay, sandy, olive-gray; scattered pebbles.
42-48	Clay, sandy, olive-gray; scattered pebbles; few thin gravel lenses.
48-75	Clay (till), silty, sandy, brownish-gray to olive-gray; scattered pebbles.
75-90	Sand, very fine to very coarse, gravelly; composed of 50 percent quartz, 20 percent carbonate, 15 percent shale, and 5 percent unidentified fragments.

FOX HILLS FORMATION

90-102	Clay, silty, sandy, greenish-black.
102-117	Clay, grayish-black.
117-122	Clay, silty, sandy, grayish-black.
122-142	Clay, silty, grayish-black.

PIERRE FORMATION

142-160	Shale, grayish-black, hard.

132-069-34CAA1
(Log from Albrecht Well Work)

Date drilled: 8/06/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	2	2
	Sand and gravel, dirty	21	23
	Sand, gravel, and water	2	25
	Clay, blue	55	80

132-069-34CAA2
(Log from Albrecht Well Work)

Date drilled: 8/07/73

	Topsoil, black	3	3
	Clay and sand; mixed	17	20
	Clay, blue	75	95
	Gravel and sand	2	97

132-069-34CCC
NDSWC 9761

Altitude: 2001 feet

Date drilled: 8/31/76

Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	11	11
	Clay (till), silty, sandy, olive-gray; scattered pebbles	7	18
	Gravel, sandy	1	19
	Clay (till), silty, sandy, olive-gray; scattered pebbles	12	31
	Gravel, sandy	1	32
	Clay (till), silty, sandy, olive-gray; scattered pebbles	74	106
	Clay, silty, grayish-black	45	151
Pierre Formation:			
	Shale, black, hard	9	160

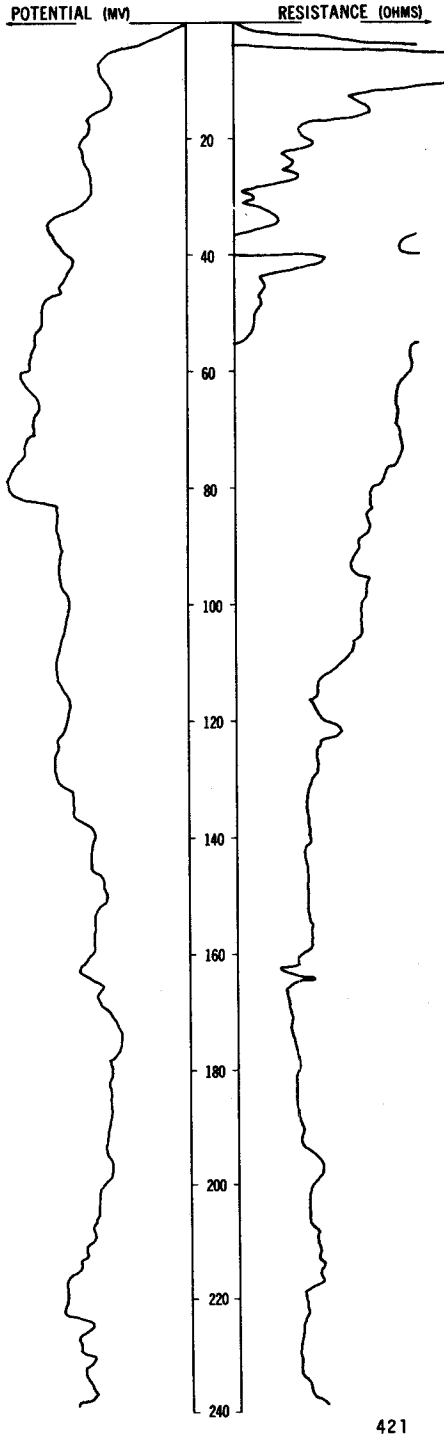
NDSWC 9764

LOCATION: 132-069-36AAA1

DATE DRILLED: 9/01/76

ALTITUDE: 2023
(FT, MSL)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

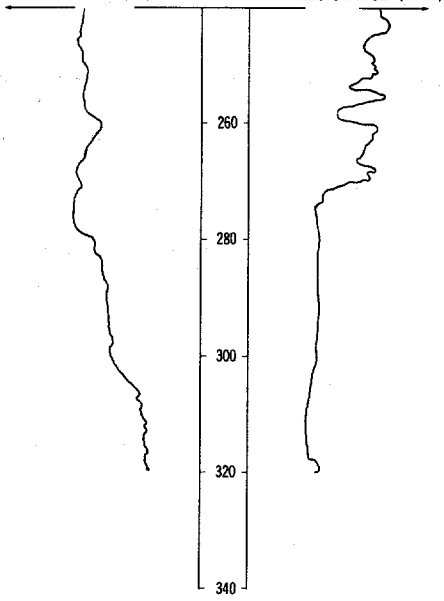
0-12	Sand, very fine to very coarse, predominantly very coarse, gravelly; composed of 40 percent carbonate, 25 percent unidentified, 20 percent shale, and 15 percent quartz fragments.
12-34	Sand, very fine to very coarse, predominantly medium, gravelly; composed of 60 percent quartz, 20 percent shale, 10 percent carbonate, and 10 percent unidentified fragments.
34-40	Silt, clayey, brownish-gray.
40-43	Sand, very fine to very coarse, predominantly medium, gravelly; composed of 70 percent quartz, 20 percent carbonate, and 10 percent unidentified fragments.
43-62	Clay, silty, brownish-gray.
62-164	Clay (till), silty, sandy, olive-gray; scattered pebbles.
164-166	Sand, coarse.
166-198	Clay (till), silty, sandy, olive-gray; scattered pebbles.
198-200	Sand, gravel, and boulders.
200-239	Clay (till), silty, sandy, olive-gray; scattered pebbles.
239-242	Sand, clayey.

LOCATION: 132-069-36AAA1

DATE DRILLED: 9/01/76

ALTITUDE: 2023
(FT, MSL)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

242-248	Clay.
248-253	Gravel, sandy.
253-254	Clay.
254-256	Gravel, sandy.
256-260	Clay.
260-270	Gravel, fine, sandy; composed predominantly of shale and limestone fragments.
270-296	Clay (till), silty, sandy, olive-gray; scattered pebbles.

PIERRE FORMATION

296-320	Shale, grayish-black, hard.

132-069-36AAA2
NDSWC 9764A

Altitude: 2023 feet

Date drilled: 9/01/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to very coarse, gravelly; composed of 40 percent carbonate, 25 percent unidentified, 20 percent shale, and 15 percent quartz fragments	31	31
	Silt, clayey, brownish-gray	9	40

132-070-01ADA
NDSWC 1108
(Log modified from Adolphson, 1962)

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, sandy, gray	2	2
	Sand, fine to coarse; medium to coarse gravel; and shale pebbles	3	5
	Clay, yellow; fine to medium gravel; and shale pebbles	5	10
	Till, clayey, gray; fine to medium gravel; and shale pebbles	11	21
	Sand, medium to coarse; fine gravel; and shale pebbles	3	24
	Till, clayey, gray; fine to medium gravel; and shale pebbles	4	28
	Sand, medium to coarse; fine to medium gravel; and shale pebbles	18	46
	Clay, sandy, gray	10	56
	Till; fine to medium gravel; gray clay; and shale pebbles	18	74
	Gravel, fine to medium, and shale pebbles	9	83
Pierre Formation(?):			
	Clay, sandy, gray	67	150

132-070-01DBD
NDSWC 1109
(Log modified from Adolphson, 1962)

Altitude: 1984 feet

Glacial drift:			
	Topsoil, black	1	1
	Clay, gray; fine to medium gravel; and shale pebbles	2	3
	Clay, yellow; fine to medium gravel; and shale pebbles	3	6
	Sand, fine to coarse; fine to medium gravel; and shale pebbles	9	15
	Till, clayey, gray; fine to medium gravel; and shale pebbles	30	45
	Sand, medium to coarse; fine to medium gravel; and shale pebbles	3	48
	Till, clayey, gray; fine to medium gravel; and shale pebbles	37	85
Pierre Formation(?):			
	Clay, sandy, gray	15	100

132-070-02BCC
(Log from Gross Drilling)

Date drilled: 6/04/74

Clay, brown	30	30
Clay, blue	50	80
Gravel	10	90

132-070-07CCC
(Log from Jacob Thurn)

Date drilled: 7/08/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Clay and sand; yellow	32	35
	Sand, blue	3	38
	Shale, gray	14	52

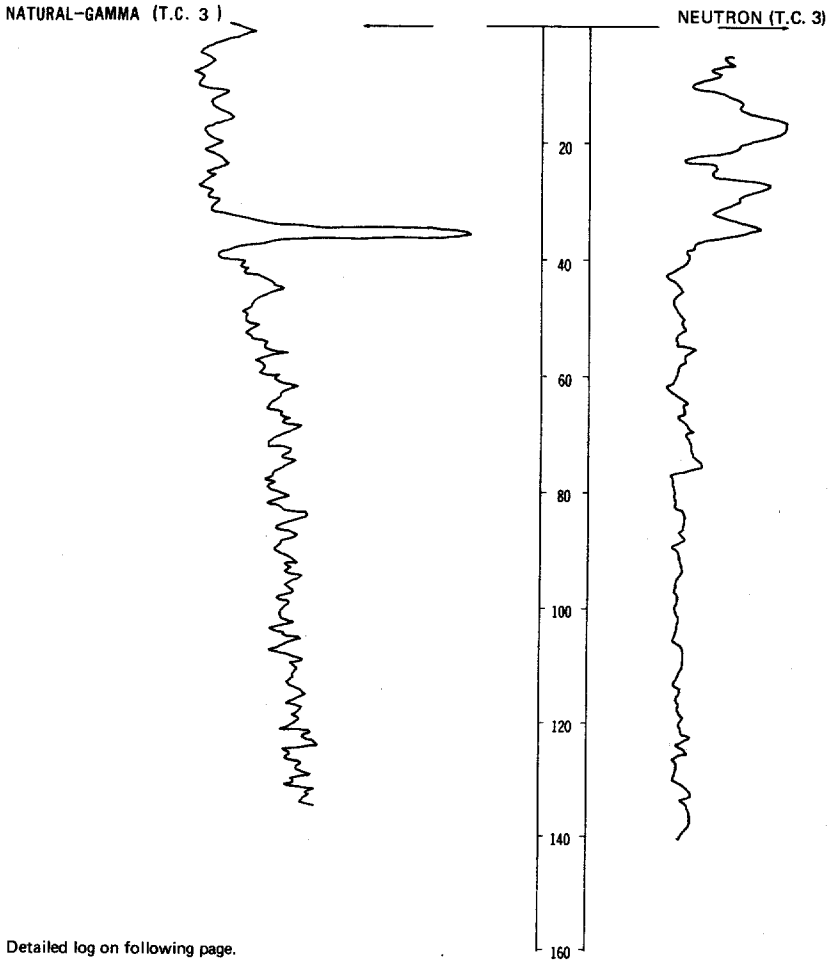
NDSWC 5243

LOCATION: 132-070-08CCB

DATE DRILLED: 9/27/77

ALTITUDE: 2082
(FT, MSL)

DEPTH: 142
(FT)



NOTE: Detailed log on following page.

132-070-08CCB, Continued
NDSWC 5243

Altitude: 2082 feet — Date drilled: 9/27/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse to very coarse, gravelly, subangular to rounded; composed largely of carbonate and shale fragments	36	36
Fox Hills Formation:			
	Sand, very fine, clayey, light-gray to greenish-gray, glauconitic	40	76
	Clay, silty, sandy, medium-gray to medium-dark-gray	49	125
Pierre Formation:			
	Shale, black to grayish-black, noncalcareous, hard	17	142

132-070-16BBB
NDSWC 5241

Altitude: 2107 feet — Date drilled: 9/27/77

Glacial drift:			
	Sand, fine to very coarse, gravelly, subangular to rounded; composed largely of carbonate and shale fragments	30	30
Fox Hills Formation:			
	Sand, very fine to fine, clayey, grayish-yellow-green to grayish-green, glauconitic	12	42

132-070-16BBC
NDSWC 5242

Altitude: 2090 feet — Date drilled: 9/27/77

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse to very coarse, gravelly, subangular to rounded; composed largely of quartz, carbonate, and shale fragments	34	34
Fox Hills Formation:			
	Sand, very fine to fine, clayey, grayish-yellow-green to grayish-green, glauconitic	8	42

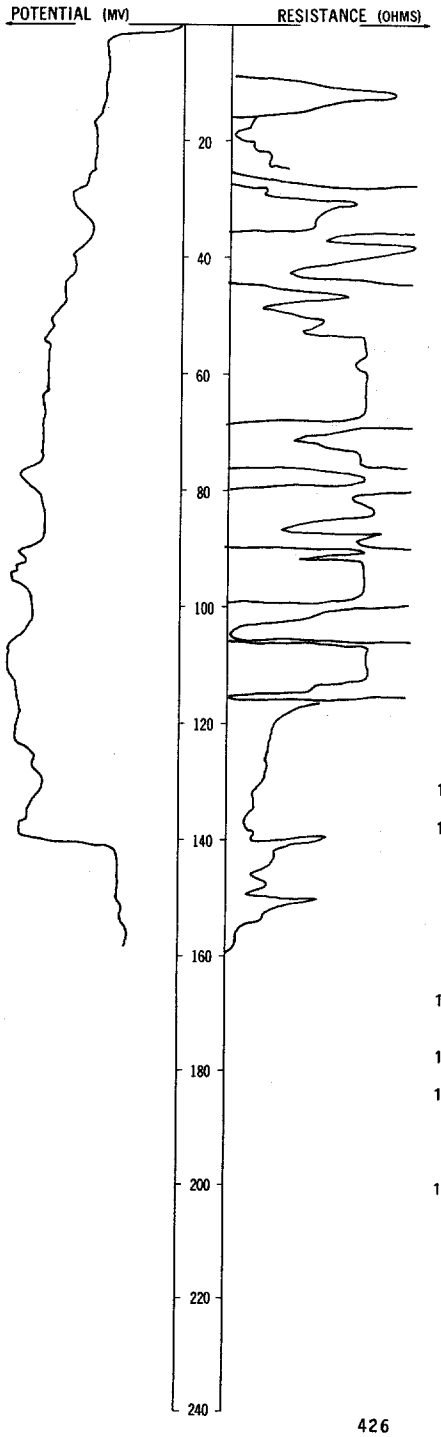
NDSWC 9754

LOCATION: 132-070-17CCC1

DATE DRILLED: 8/26/76

ALTITUDE: 2068
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
8-16	Sand, gravel, and boulders.
16-26	Clay (till), silty, sandy, gravelly, olive-gray.
26-36	Sand, very fine to very coarse, predominantly very coarse, gravelly; composed of 40 percent quartz, 25 percent carbonate, 25 percent shale, and 10 percent unidentified fragments.
36-44	Clay, sandy; sand lens from 38 to 39 feet.
44-69	Sand, very fine to very coarse, predominantly very coarse, gravelly; composed of 40 percent quartz, 25 percent carbonate, 25 percent shale, and 10 percent unidentified fragments.
69-76	Clay, silty, brownish-gray.
76-80	Gravel, sandy.
80-90	Clay, silty, brownish-gray.
90-100	Sand, fine to very coarse, predominantly coarse, gravelly; 40 percent quartz, 30 percent shale, and 30 percent carbonate fragments.
100-106	Clay, silty, brownish-gray.
106-116	Sand, very fine to very coarse, predominantly very coarse, and fine gravel; 40 percent quartz, 30 percent carbonate, 20 percent shale, and 10 percent unidentified fragments.

FOX HILLS FORMATION(?)

116-140	Clay, silty, sandy, grayish-black to greenish-black.
140-141	Sandstone, very fine to fine.
141-156	Clay, silty, sandy, greenish-black; sandstone from 151 to 152 feet.

PIERRE FORMATION

156-160	Shale, grayish-black, hard.

132-070-17CCC2
NDSWC 9754A

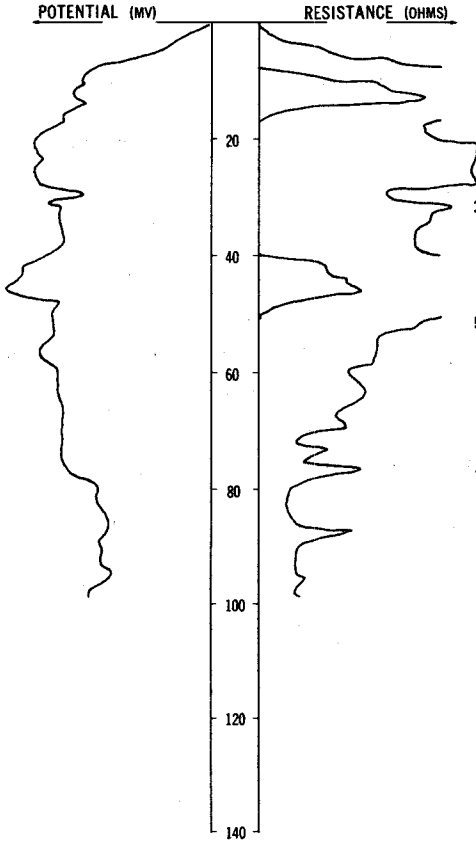
Altitude: 2068 feet — Date drilled: 8/26/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	12	12
	Clay (till), silty, sandy, olive-gray; scattered pebbles	13	25
	Sand, very fine to very coarse, predominantly very coarse, gravelly; composed of 40 percent quartz, 25 percent carbonate, 25 percent shale, and 10 percent quartz fragments; clay lenses from 36 to 37 feet and 40 to 44 feet	44	69
	Clay, silty, brownish-gray	6	75
	Gravel, sandy	3	78
	Clay, silty, brownish-gray	2	80

NDSWC 9715

LOCATION: 132-070-19BBB — DATE DRILLED: 8/12/76

ALTITUDE: 2041 (FT, MSL) — DEPTH: 100 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-26	Sand, very fine to very coarse, predominantly very coarse, gravelly; 30 percent quartz, 30 percent carbonate, 25 percent shale, and 15 percent unidentified fragments.
26-40	Sand, very fine to coarse, clayey.
40-50	Gravel, sandy.
50-79	Clay, brownish-gray.

PIERRE FORMATION

79-100	Shale, dark-brownish-gray, hard.

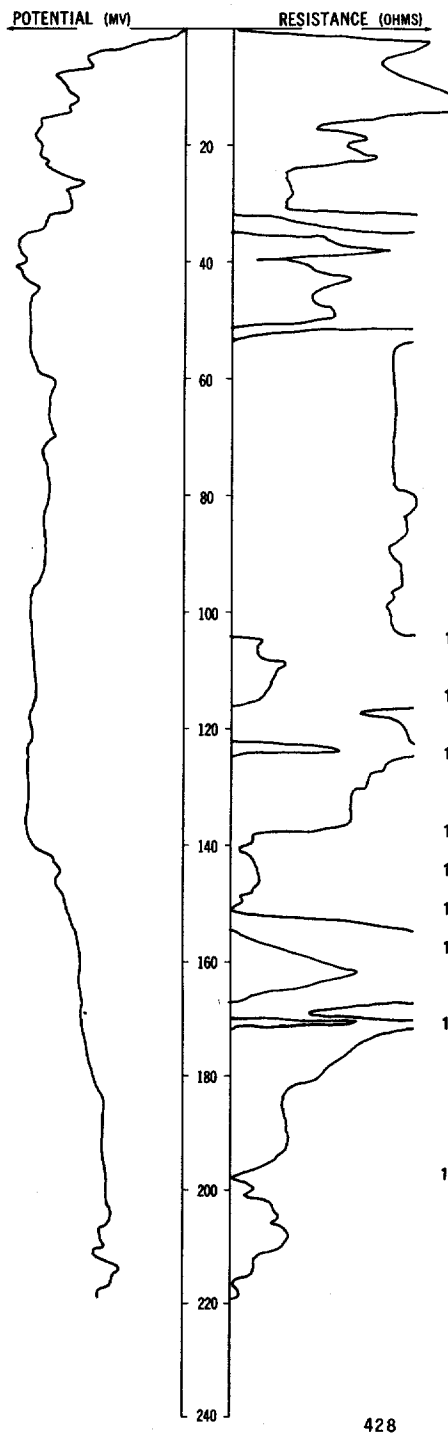
NDSWC 9756

LOCATION: 132-070-22BBB1

DATE DRILLED: 8/26/76

ALTITUDE: 2066
(FT, MSL)

DEPTH: 220
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-13	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
13-22	Clay (till), silty, sandy, moderate-yellowish-brown.
22-31	Clay, olive-gray.
31-52	Sand, very fine to very coarse, gravelly; composed of 60 percent quartz, 20 percent sandstone, and 20 percent carbonate fragments.

FOX HILLS FORMATION(?)

52-104	Clay, silty, brownish-gray; sandy in places.
104-116	Sand, very fine to fine, clayey, greenish-gray.
116-123	Clay, silty, grayish-brown.
123-128	Silt, clayey, sandy, greenish-gray; limestone concretion from 123 to 124 feet.
128-138	Clay, silty, grayish-brown.
138-142	Clay, silty, grayish-black.
142-154	Clay, silty, sandy, grayish-brown.
154-174	Sand, fine, clayey, greenish-black; sandstone from 170 to 172 feet.
174-198	Clay, silty, sandy, grayish-black.

PIERRE FORMATION

198-220	Shale, grayish-black, hard.

132-070-22BBB2
NDSWC 9756A

Altitude: 2066 feet — Date drilled: 8/27/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles	13	13
	Clay, silty, sandy, moderate-yellowish-brown	8	21
	Clay, olive-gray	11	32
	Sand, very fine to very coarse, gravelly	18	50
Fox Hills Formation(?):			
	Clay, silty, brownish-gray	10	60

132-070-26DAB1
(Log from Jacob Thurn)

Date drilled: 6/14/74

	Sand	58	58

132-070-26DAB2
(Log from Jacob Thurn)

Date drilled: 6/20/74

	Topsoil	3	3
	Clay, yellow	17	20
	Clay, gray	30	50
	Sand and gravel	8	58

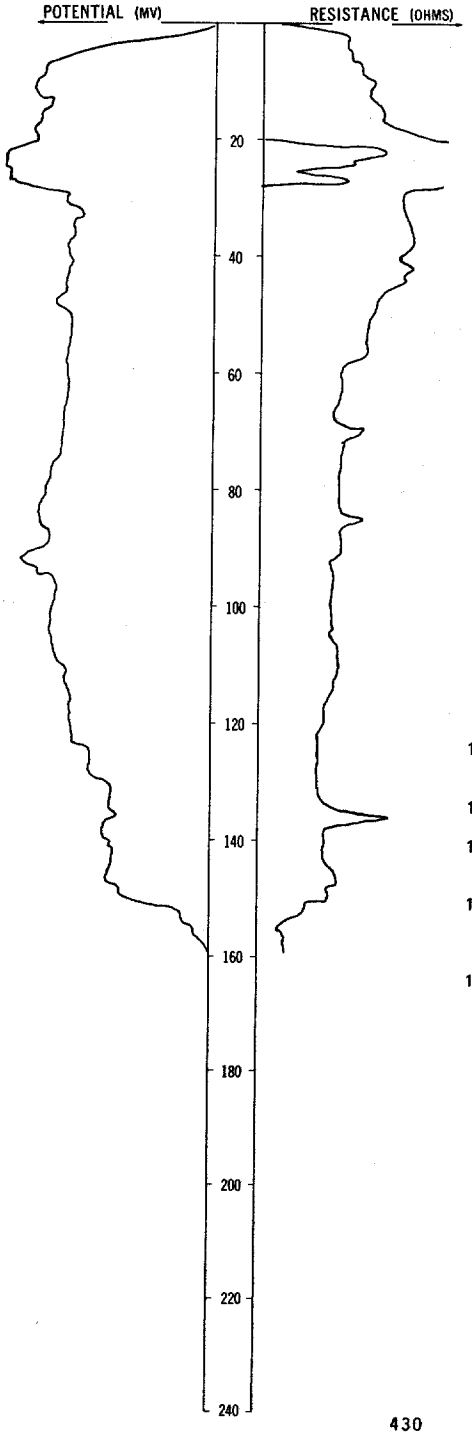
NDSWC 9758

LOCATION: 132-070-26DCD

DATE DRILLED: 8/27/76

ALTITUDE: 2099
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-21	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
21-28	Sand, fine to very coarse, gravelly.
28-35	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
35-58	Clay (till), silty, sandy, olive-gray; scattered pebbles.
58-122	Clay, silty, sandy, brownish-gray.

FOX HILLS FORMATION(?)

122-136	Sand, clayey, greenish-gray.
136-137	Sandstone, fine.
137-144	Sand, very fine, clayey, greenish-gray.
144-153	Clay, silty, grayish-black.

PIERRE FORMATION

153-160	Shale, black, hard.

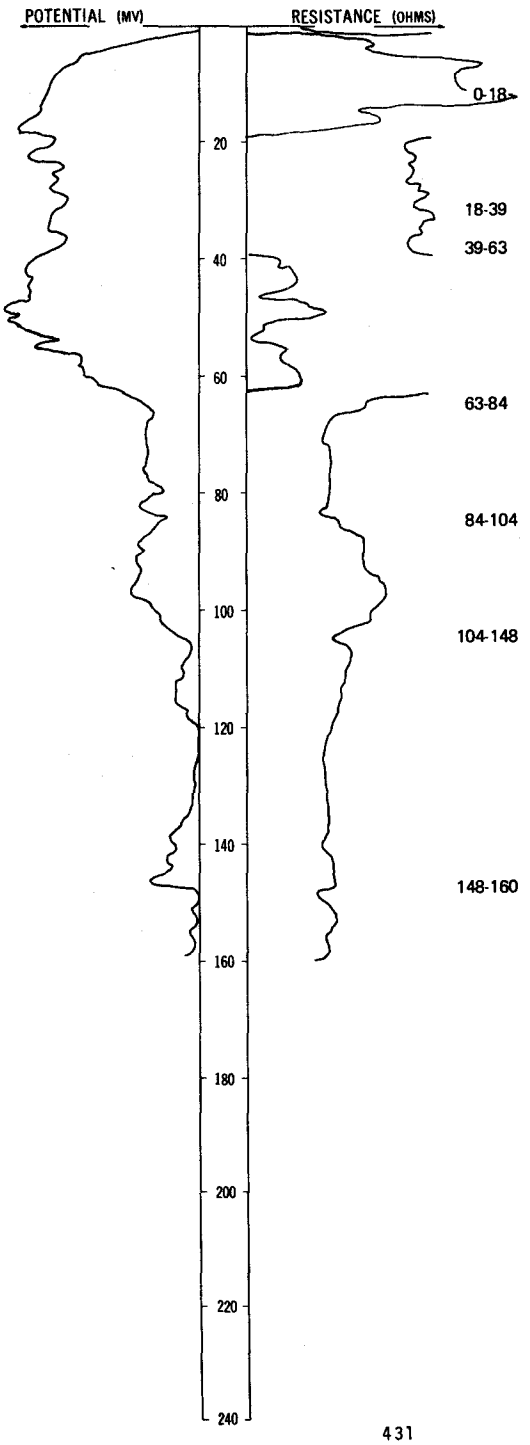
NDSWC 9757

LOCATION: 132-070-28DDC

DATE DRILLED: 8/27/76

ALTITUDE: 2032
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18 Sand, fine to very coarse, predominantly very coarse, gravelly; 45 percent quartz, 25 percent carbonate, 20 percent shale, and 10 percent unidentified fragments.

18-39 Clay (till), silty, sandy, olive-gray.

39-63 Silt, sandy, clayey, brownish-gray.

FOX HILLS FORMATION(?)

63-84 Clay, silty, sandy, grayish-black.

84-104 Sand, very fine to fine, clayey, greenish-black.

104-148 Clay, silty, sandy.

PIERRE FORMATION

148-160 Shale, grayish-black, hard.

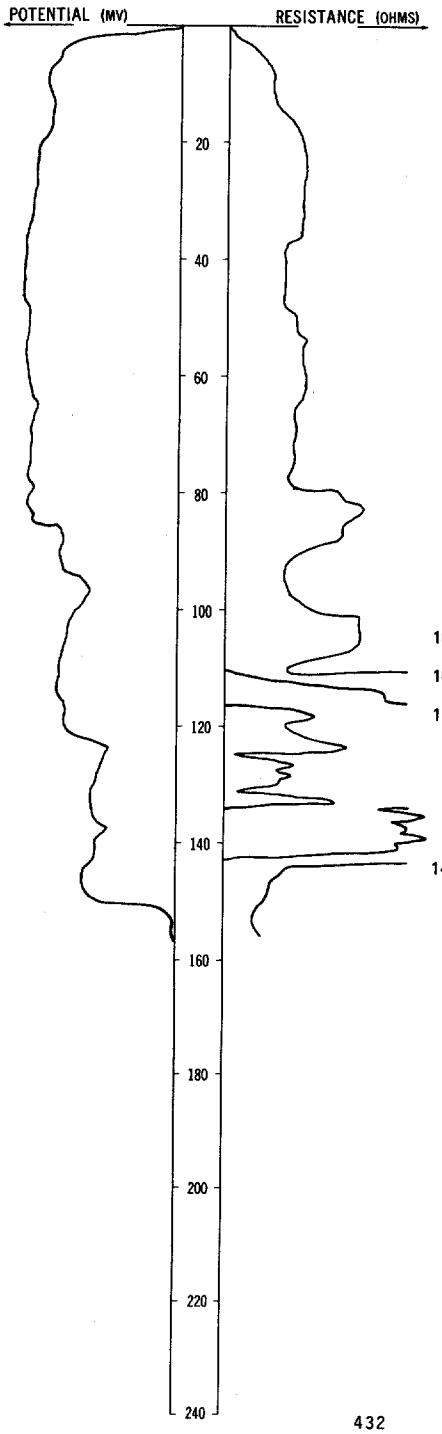
NDSWC 9716

LOCATION: 132-070-31AAA

DATE DRILLED: 8/12/76

ALTITUDE: 2028
(FT, MSL)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18	Clay, silty, sandy, grayish-black to moderate-yellowish-brown; scattered pebbles.
18-80	Clay (till), silty, sandy, olive-gray; scattered pebbles.
80-89	Silt, clayey.
89-102	Clay (till), silty, sandy, olive-gray; scattered pebbles.
102-108	Silt, clayey.
108-111	Clay, brownish-gray.
111-144	Sand, fine to very coarse, predominantly coarse, gravelly; 50 percent quartz, 25 percent shale, 15 percent carbonate, and 10 percent unidentified fragments.

PIERRE FORMATION

144-160	Shale, silty, grayish-black, hard.

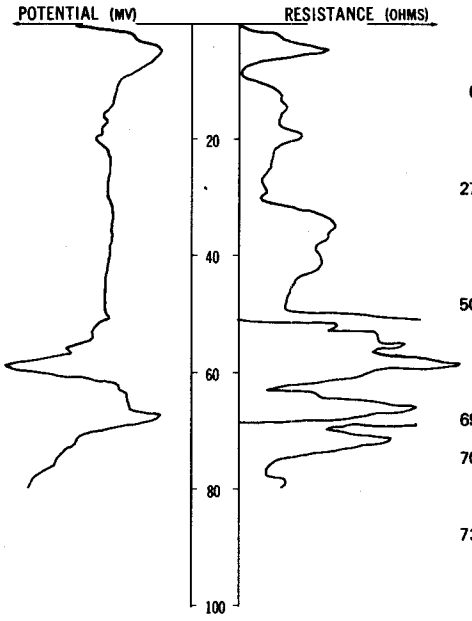
NDSWC 9753

LOCATION: 132-070-31BBB

DATE DRILLED: 8/26/76

ALTITUDE: 2057
(FT, MSL)

DEPTH: 80
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-27	Clay (till), silty, sandy, moderate-yellowish-brown; scattered pebbles.
27-50	Clay (till), silty, sandy, olive-gray; scattered pebbles.
50-69	Sand, fine to very coarse, predominantly coarse, gravelly; 35 percent carbonate, 30 percent quartz, 25 percent shale, and 10 percent unidentified fragments.
69-70	Clay.
70-73	Sand, clayey.

PIERRE FORMATION

73-80	Shale, grayish-black, hard.

132-070-32CDB
(Log from Dickson Well Drilling)

Date drilled: 10/26/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, gray	2	3
	Clay, black, gravelly	5	8
	Gravel	10	18
	Clay, gray, and gravel	2	20
	Clay, blue, and gravel	10	30
	Gravel	22	52
	Sand, fine to coarse	4	56
	Coal (detrital)	1	57
	Clay, gray, and gravel	3	60

132-071-01DDD1
(Log from Jacob Thurn)

Date drilled: 6/04/74

	Topsoil	3	3
	Sand	47	50

132-071-01DDD2
NDSWC 9755

Altitude: 2084 feet — Date drilled: 8/26/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, silty, moderate-yellowish-brown; scattered pebbles	2	2
Fox Hills Formation:			
	Sand, very fine to fine, silty, light-olive-brown	31	33
	Clay, silty, brownish-gray	3	36
	Sandstone, very fine to fine, medium-gray	1	37
	Clay, light-brownish-gray	11	48
	Clay, silty, light-brownish-gray	4	52
	Sandstone, very fine to fine, clayey, brownish-gray	16	68
	Clay, silty, light-brownish-gray	18	86
	Clay, silty, grayish-brown	4	90
	Silt, clayey, sandy, brownish-gray	8	98
Pierre Formation:			
	Clay, grayish-black, hard	22	120

132-071-04BAA
NDSWC 9713

Altitude: 1995 feet — Date drilled: 8/12/76

Glacial drift:			
	Clay, silty, sandy, olive-gray	6	6
	Sand, very fine to very coarse, predominantly medium; scattered pebbles	4	10
	Sand, very fine to very coarse, predominantly very coarse, gravelly; composed of 50 percent quartz, 20 percent unidentified, 20 percent carbonate, and 10 percent shale fragments	12	22
Pierre Formation:			
	Shale, brownish-gray, hard	18	40

132-071-07DCD
(Log from Jacob Thurn)

Date drilled: 10/17/72

Topsoil, black	2	2
Shale, blue	60	62

132-071-08CDB
(Log from Jacob Thurn)

Date drilled: 7/03/72

Topsoil, black	3	3
Clay, yellow	12	15
Shale, blue	31	46

132-071-10BAA
NDSWC 9712

Altitude: 2035 feet

Date drilled: 8/11/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, black; scattered pebbles	4	4
	Clay, silty, moderate-yellowish-brown	5	9
	Gravel, sandy	5	14
Fox Hills Formation:			
	Clay, brownish-gray, hard	15	29
	Silt, clayey, sandy, greenish-black to brownish-gray	13	42
Pierre Formation:			
	Shale, brownish-gray, hard	18	60

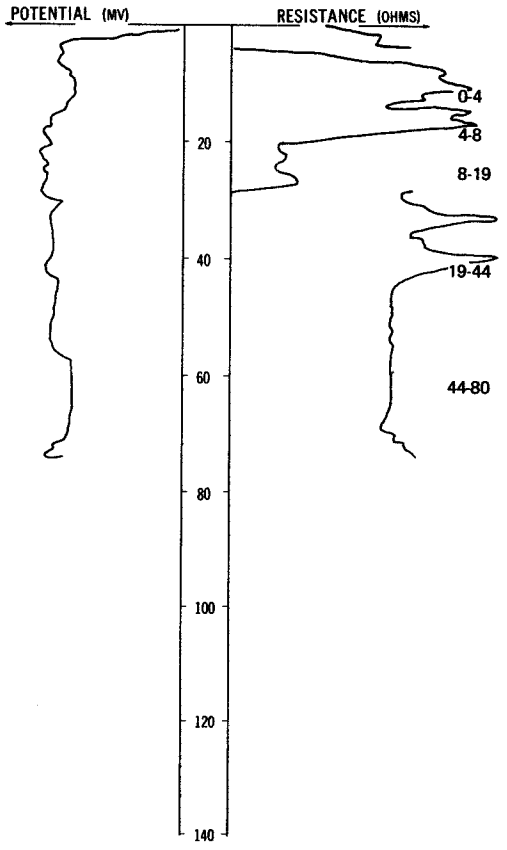
NDSWC 9711

LOCATION: 132-071-10CAA1

DATE DRILLED: 8/11/76

ALTITUDE: 2012 (FT, MSL)

DEPTH: 80 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-4 Clay, silty, dark-brown.

4-8 Gravel, sandy.

8-19 Sand, fine to very coarse, predominantly coarse, gravelly; 60 percent quartz, 20 percent shale, and 20 percent carbonate fragments.

19-44 Clay, silty, brownish-gray; silt lenses from 32 to 34 feet and 39 to 41 feet.

PIERRE FORMATION

44-80 Shale, grayish-black, hard.

132-071-10CAA2
NDSWC 9711A

Altitude: 2012 feet — Date drilled: 8/11/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, dark-brown	7	7
	Gravel, sandy	1	8
	Sand, fine to very coarse, predominantly coarse, gravelly; composed of 60 percent quartz, 20 percent shale, and 20 percent carbonate fragments	11	19
	Clay, silty, brownish-gray	1	20

132-071-10CBD
(Log from Gross Drilling)

Date drilled: 6/01/75

	Sand, fine	44	44
	Clay, bluish-gray	19	63
	Sand, fine	22	85
	Sand, coarse	33	118
	Clay, blue	----	118

132-071-14BBB
(Log from Venturia Well Drilling)

Date drilled: 2/20/76

	Topsoil, black	3	3
	Sand	42	45

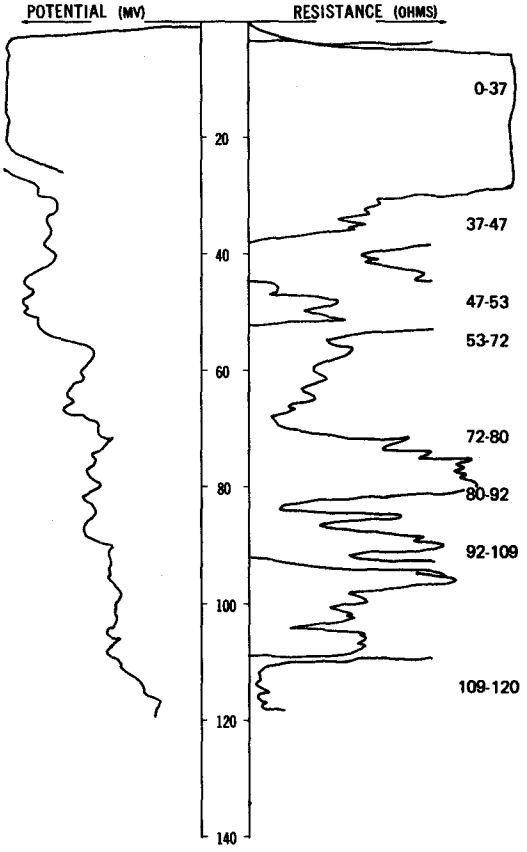
NDSWC 9714

LOCATION: 132-071-14BBC1

DATE DRILLED: 8/12/76

ALTITUDE: 2039
(FT, MSL)

DEPTH: 120
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-37	Gravel, very fine, sandy; 40 percent quartz, 30 percent limestone, 20 percent shale, and 10 percent unidentified fragments.
37-47	Clay, brownish-gray.
47-53	Clay, sandy, grayish-brown.
53-72	Clay, brownish-gray.
72-80	Silt, clayey.
80-92	Clay, sandy, grayish-brown.
92-109	Gravel, very fine, and very coarse sand; 30 percent shale, 30 percent limestone, 20 percent quartz, and 20 percent unidentified fragments.

PIERRE FORMATION

109-120	Shale, dark-brownish-gray, hard.

132-071-14BBC2
NDSWC 9714A

Altitude: 2039 feet

Date drilled: 8/12/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, very fine to medium, predominantly very fine, and fine to very coarse sand; composed of 40 percent quartz, 30 percent carbonate, 20 percent shale, and 10 percent unidentified fragments	37	37
	Clay, brownish-gray	3	40

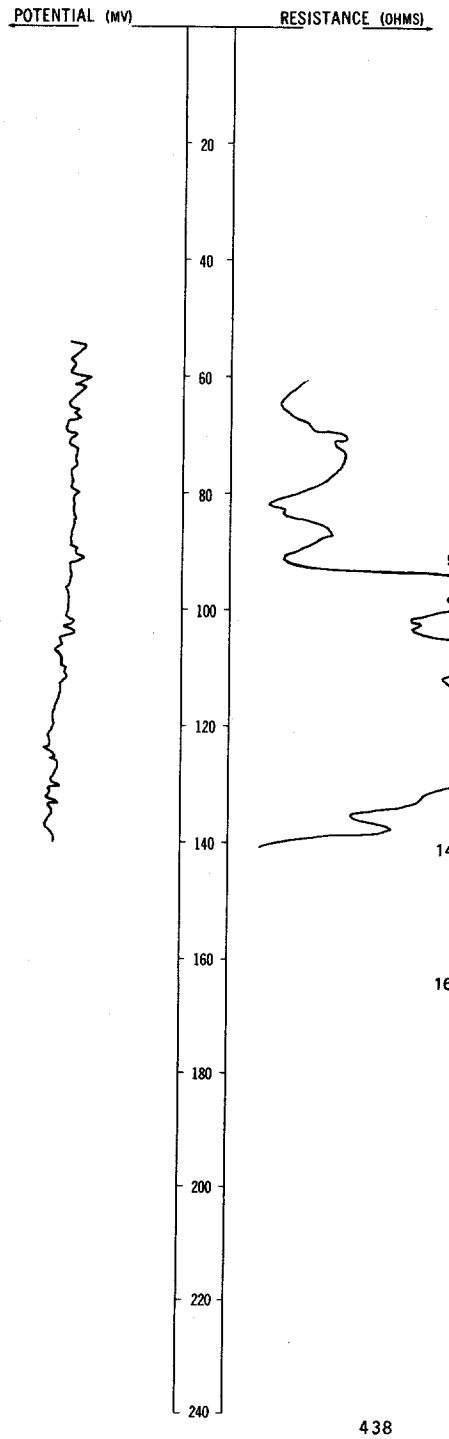
NDSWC 5244, 5244A

LOCATION: 132-071-14DDD1, 2

DATE DRILLED: 9/27/77

ALTITUDE: 2028
(FT, MSL)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-44 Sand, fine to very coarse, predominantly coarse to very coarse, gravelly, subangular to rounded; composed largely of quartz, carbonate, and shale fragments.

44-92 Clay (glaciofluvial), silty, sandy, medium-gray.

92-140 Sand, fine to very coarse, predominantly coarse to very coarse, gravelly; composed largely of carbonate and shale fragments.

PIERRE FORMATION

140-164 Clay, sandy, silty, medium-dark-gray.

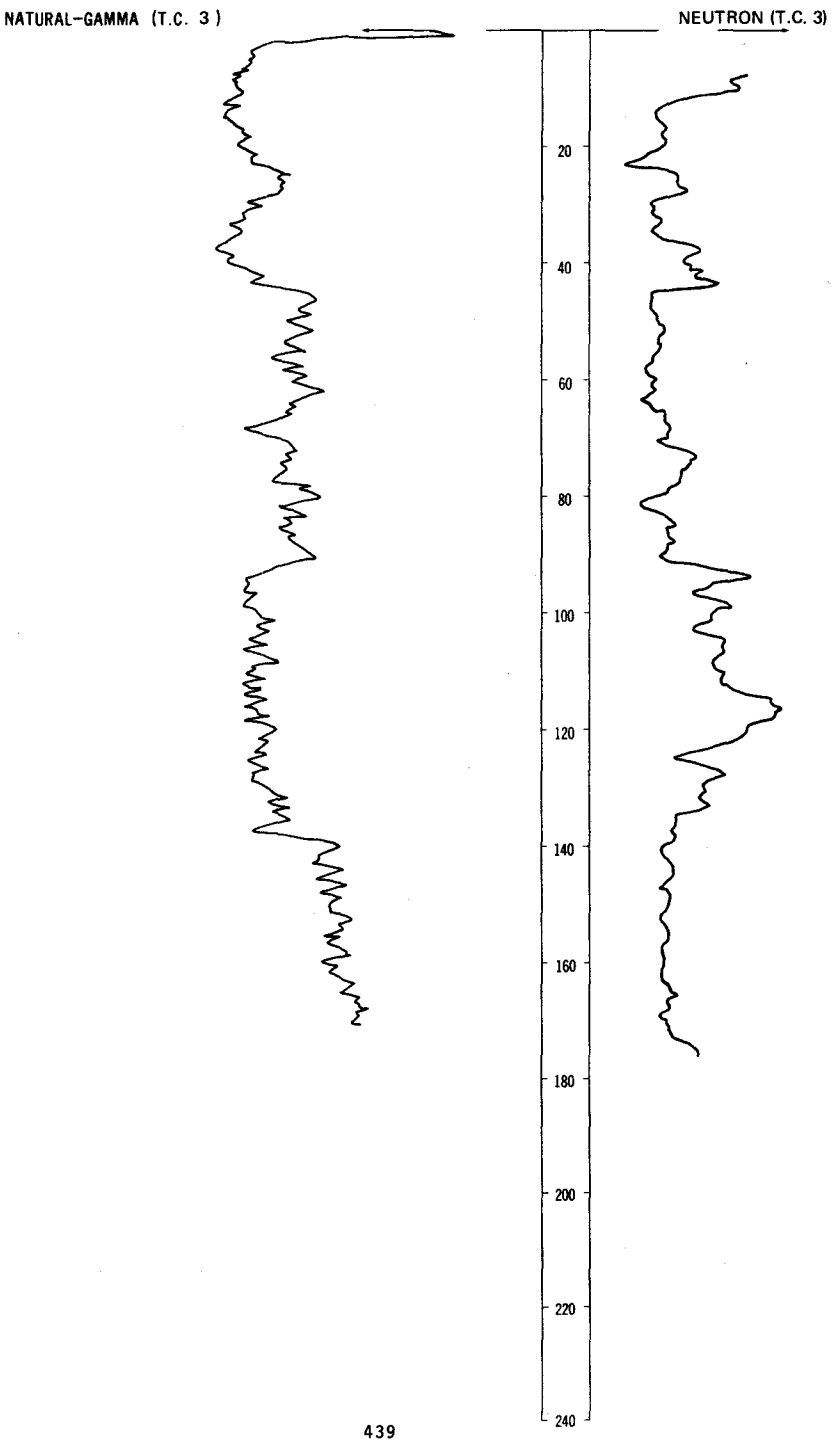
164-182 Shale, black to grayish-black, non-calcareous, hard.

LOCATION: 132-071-14DDD1, 2

DATE DRILLED: 9/27/77

ALTITUDE: 2028
(FT, MSL)

DEPTH: 182
(FT)



132-071-15AAC
(Log from Schnell, Inc.)

Date drilled: 9/29/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Sand, medium, and gravel	10	12
	Clay, sandy, yellow	2	14
	Sand, fine, and gravel	12	26
	Sand, fine; with slate chips	19	45
	Sand, fine, blue	5	50
	Clay, gray	32	82
	Clay, caving	2	84
	Sand, fine; clay streaks	6	90
	Sand, medium; gravel; and boulders	15	105
	Sand, medium; gravel; and large boulders	11	116
	Clay, sandy, gray	----	116

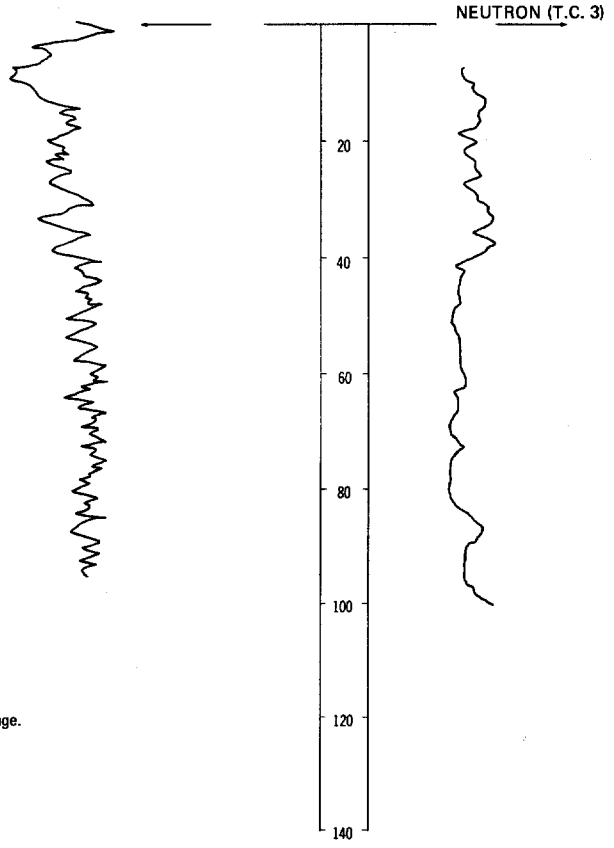
NDSWC 5149

LOCATION: 132-071-18AAA

DATE DRILLED: 8/04/77

ALTITUDE: 2046
(FT, MSL)

DEPTH: 102
(FT)



NOTE: Detailed log on following page.

132-071-18AAA, Continued
NDSWC 5149

Altitude: 2046 feet — Date drilled: 8/04/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Fox Hills Formation:			
	Sand, very fine to fine, clayey, moderate-yellowish-brown to moderate-reddish-brown	10	10
	Sand, very fine to fine, clayey, medium-gray to medium-bluish-gray	31	41
Pierre Formation:			
	Shale, black to grayish-black, noncalcareous, hard	61	102

132-071-22BBB
NDSWC 9710

Altitude: 2002 feet — Date drilled: 8/11/76

Glacial drift:			
	Clay, silty, brownish-gray	11	11
	Gravel, sandy	2	13
Pierre Formation:			
	Clay, grayish-brown	19	32
	Shale, grayish-brown, hard	48	80

132-071-23DDD
NDSWC 5245

Date drilled: 9/27/77

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse to very coarse, gravelly; predominantly quartz, carbonate, and shale fragments	42	42

132-071-28AAA
(Log from Jacob Thurn)

Date drilled: 11/12/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Clay, yellow	5	8
	Sand	7	15
	Shale	4	19

132-071-34BBB
NDSWC 9718

Altitude: 2058 feet — Date drilled: 8/13/76

Glacial drift:			
	Clay, sandy, moderate-yellowish-brown	9	9
Pierre Formation:			
	Shale, brownish-gray, hard	11	20

132-071-35ABA
NDSWC 9717

Altitude: 2012 feet — Date drilled: 8/12/76

Glacial drift:			
	Clay, dark-yellowish-brown	7	7
	Sand, very fine to very coarse, predominantly coarse, gravelly	5	12
Pierre Formation:			
	Clay, grayish-brown, hard	28	40

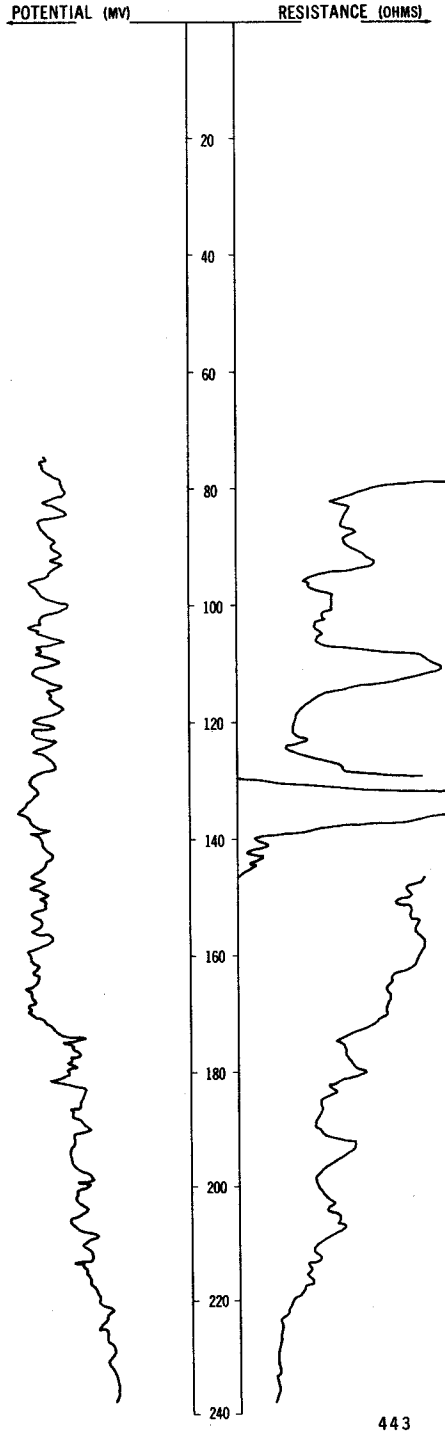
NDSWC 5148

LOCATION: 132-072-04DDD

DATE DRILLED: 8/04/77

ALTITUDE: 2088
(FT, MSL)

DEPTH: 362
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18 Clay (till), sandy, silty, moderate-yellowish-brown; few gravel lenses.

FOX HILLS FORMATION

18-43 Clay, silty, shaly, medium-gray to moderate-brown, carbonaceous.

43-50 Sand, very fine to fine, medium-gray to medium-bluish-gray.

50-71 Clay, silty, shaly, medium-gray to moderate-brown, carbonaceous.

71-80 Sand, very fine to fine, clayey, medium-gray to medium-bluish-gray, glauconitic.

80-90 Claystone, silty, sandy, medium-light-gray to medium-dark-gray, micaceous.

90-120 Sand, very fine to fine, clayey, medium-bluish-gray, glauconitic; contains thin interbeds of clay or shale.

120-130 Claystone, silty, sandy, medium-dark-gray, micaceous.

130-174 Sand, fine, clayey, moderate-bluish-green, rounded, glauconitic.

174-223 Claystone, sandy, medium-light-gray to medium-bluish-gray, bentonitic; interbedded with siltstone.

PIERRE FORMATION

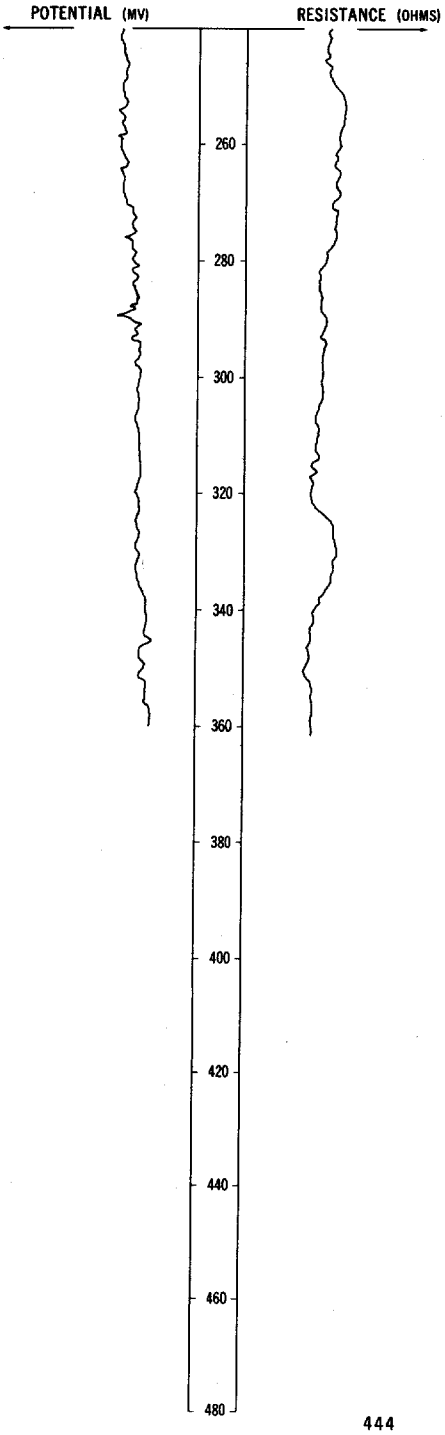
223-362 Shale, black to grayish-black, siliceous, hard.

LOCATION: 132-072-04DDD

DATE DRILLED: 8/04/77

ALTITUDE: 2088
(FT, MSL)

DEPTH: 362
(FT)



DESCRIPTION OF DEPOSITS

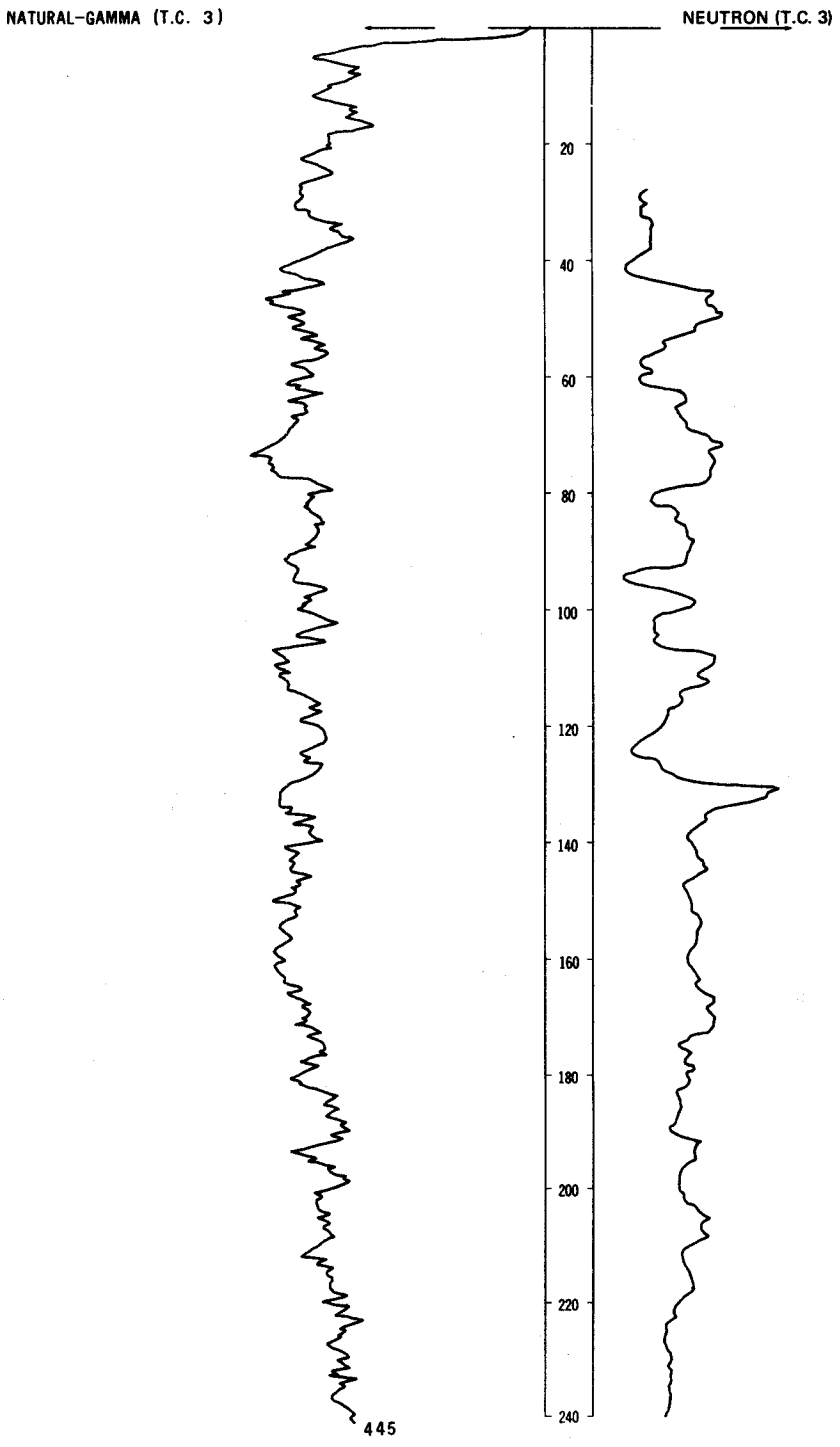
NDSWC 5148, Continued

LOCATION: 132-072-04DDD

DATE DRILLED: 8/04/77

ALTITUDE: 2088
(FT, MSL)

DEPTH: 362
(FT)

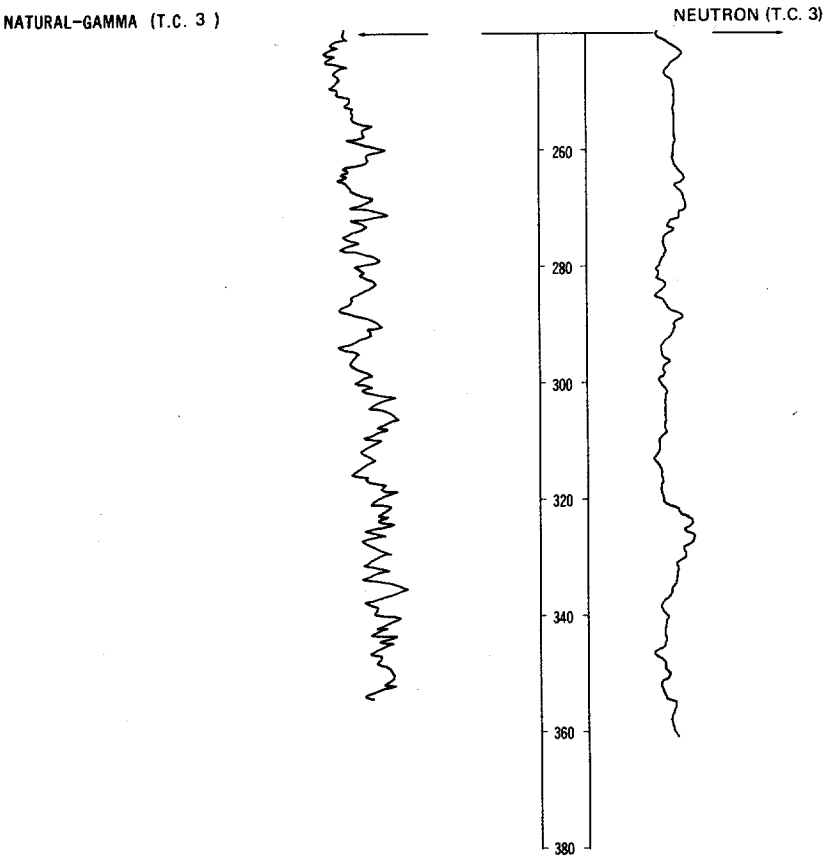


LOCATION: 132-072-04DDD

DATE DRILLED: 8/04/77

ALTITUDE: 2088
(FT, MSL)

DEPTH: 362
(FT)



132-072-08ACC
(Log from Baumgartner Drilling Co.)

Date drilled: 7/24/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, brown	140	140
	Clay, gray	60	200
	Fox Hills (sandstone?)	40	240
	Shale	20	260

132-072-21DDB
(Log from Jacob Thurn)

Date drilled: 9/22/76

	Topsoil	4	4
	Sand and gravel	24	28

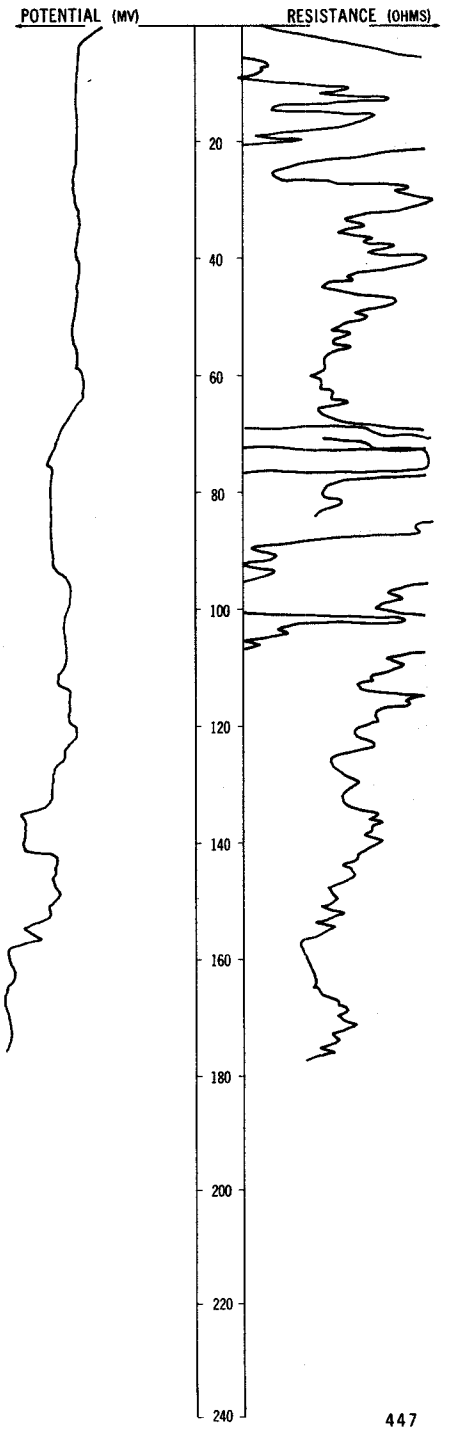
NDSWC 9705

LOCATION: 132-072-22CCC1

DATE DRILLED: 8/10/76

ALTITUDE: 2136
(FT, MSL)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS FORMATION

0-21	Sand, very fine to medium, predominantly fine, clayey, moderate-yellowish-brown; sandstone from 12 to 13 feet.
21-27	Clay, yellowish-orange.
27-31	Clay, silty, dark-grayish-brown.
31-38	Clay, brownish-black, carbonaceous.
38-42	Sand, very fine to fine, clayey, grayish-green.
42-46	Clay, silty, dark-brown.
46-50	Clay, sandy, greenish-gray.
50-55	Silt, clayey, sandy, medium-gray.
55-63	Clay, sandy, greenish-gray.
63-64	Clay, grayish-black.
64-67	Clay, sandy, greenish-gray.
67-69	Clay, silty, dark-brown.
69-77	Sandstone, fine, medium-gray.
77-89	Sand, very fine to medium, predominantly fine, greenish-gray.
89-96	Sand, fine, clayey, greenish-gray.
96-101	Clay, silty, brownish-gray.
101-103	Sandstone, very fine to medium, medium-gray.
103-107	Sand, very fine to medium, greenish-gray.
107-114	Clay, sandy, greenish-gray.
114-116	Sand, clayey.
116-134	Clay, silty, brownish-gray.
134-142	Sandstone.
142-156	Clay, silty, brownish-gray.

PIERRE FORMATION(?)

156-180	Clay, brownish-black, hard.

132-072-22CCC2
NDSWC 9705A

Altitude: 2136 feet — Date drilled: 8/10/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Fox Hills Formation:			
	Sand, very fine to medium, predominantly fine, clayey, moderate-yellowish-brown; sandstone from 13 to 14 feet	24	24
	Clay, silty, yellowish-orange	2	26
	Shale, dark-grayish-brown	5	31
	Clay, brownish-black, carbonaceous	7	38
	Sand, very fine to fine, clayey, grayish-green	5	43
	Clay, silty, dark-brown	3	46
	Clay, sandy, greenish-gray	4	50
	Silt, clayey, sandy, medium-gray	5	55
	Clay, sandy, greenish-gray	8	63
	Shale, grayish-black	1	64
	Clay, sandy, greenish-gray	3	67
	Clay, silty, dark-brown	5	72
	Sandstone, fine, medium-gray	3	75
	Sand, very fine to medium, predominantly fine, greenish-gray	21	96
	Clay, silty, brownish-gray	4	100

132-072-23CBD
NDSWC 1332

Date drilled: 10/29/63

	Topsoil, silty, black	1	1
	Gravel, fine to medium, sandy	12	13
	Gravel, fine to coarse, sandy; clay lenses	16	29
	Clay, silty, olive-black to yellowish-gray	19	48
	Clay, silty, olive-gray	4	52
	Gravel, fine to coarse, sandy, lignitic	17	69
	Clay (till), silty, olive-gray; thin gravel lenses	15	84

132-072-33DAA
NDSWC 9704

Altitude: 2084 feet — Date drilled: 8/10/76

Glacial drift:			
	Gravel, fine to medium, sandy	4	4
Fox Hills Formation:			
	Sand, very fine to medium, predominantly fine, clayey, moderate-brown	4	8
	Silt, clayey, sandy, dark-brownish-gray	8	16
	Shale, silty, grayish-brown	2	18
	Sand, very fine to fine, clayey, greenish-gray	9	27
	Sandstone, very fine to fine, hard	2	29
	Clay, silty, brownish-gray	32	61
Pierre Formation:			
	Shale, grayish-black, hard	19	80

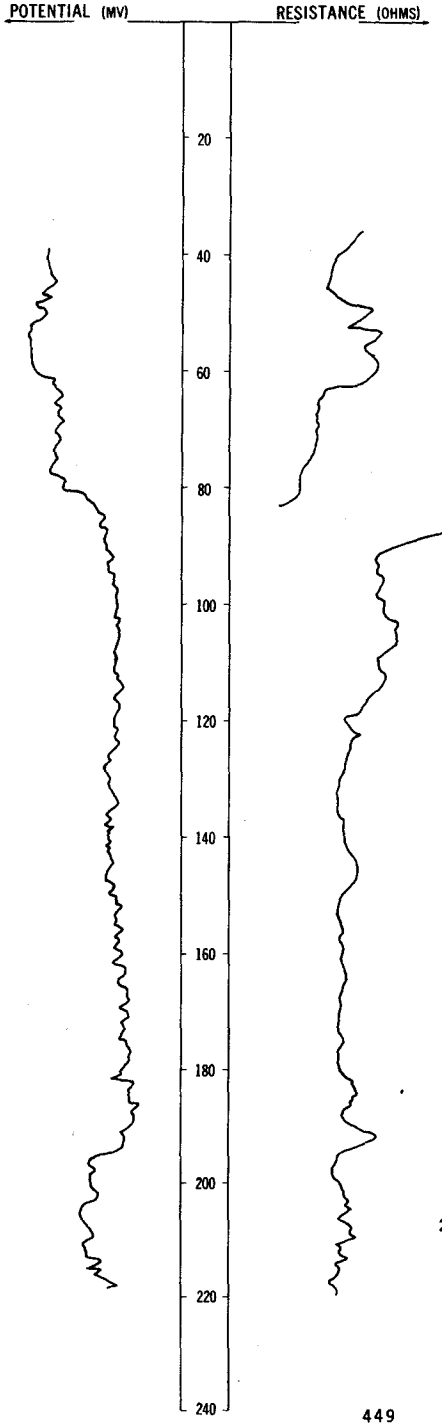
NDSWC 5147, 5147A

LOCATION: 132-073-02DDD1, 2

DATE DRILLED: 8/03/77

ALTITUDE: 2088
(FT, MSL)

DEPTH: 222
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS FORMATION

0-19 Sand, fine, dusky-yellow to moderate-reddish-brown, rounded, glauconitic.

19-31 Claystone, sandy, silty, moderate-reddish-brown to dusky-yellow.

31-51 Sand, fine, moderate-reddish-brown, rounded; contains thin indurated beds.

51-89 Sand, fine to medium, moderate-bluish-green, rounded, glauconitic.

89-212 Claystone, silty, sandy, medium-gray to medium-bluish-gray, bentonitic.

PIERRE FORMATION

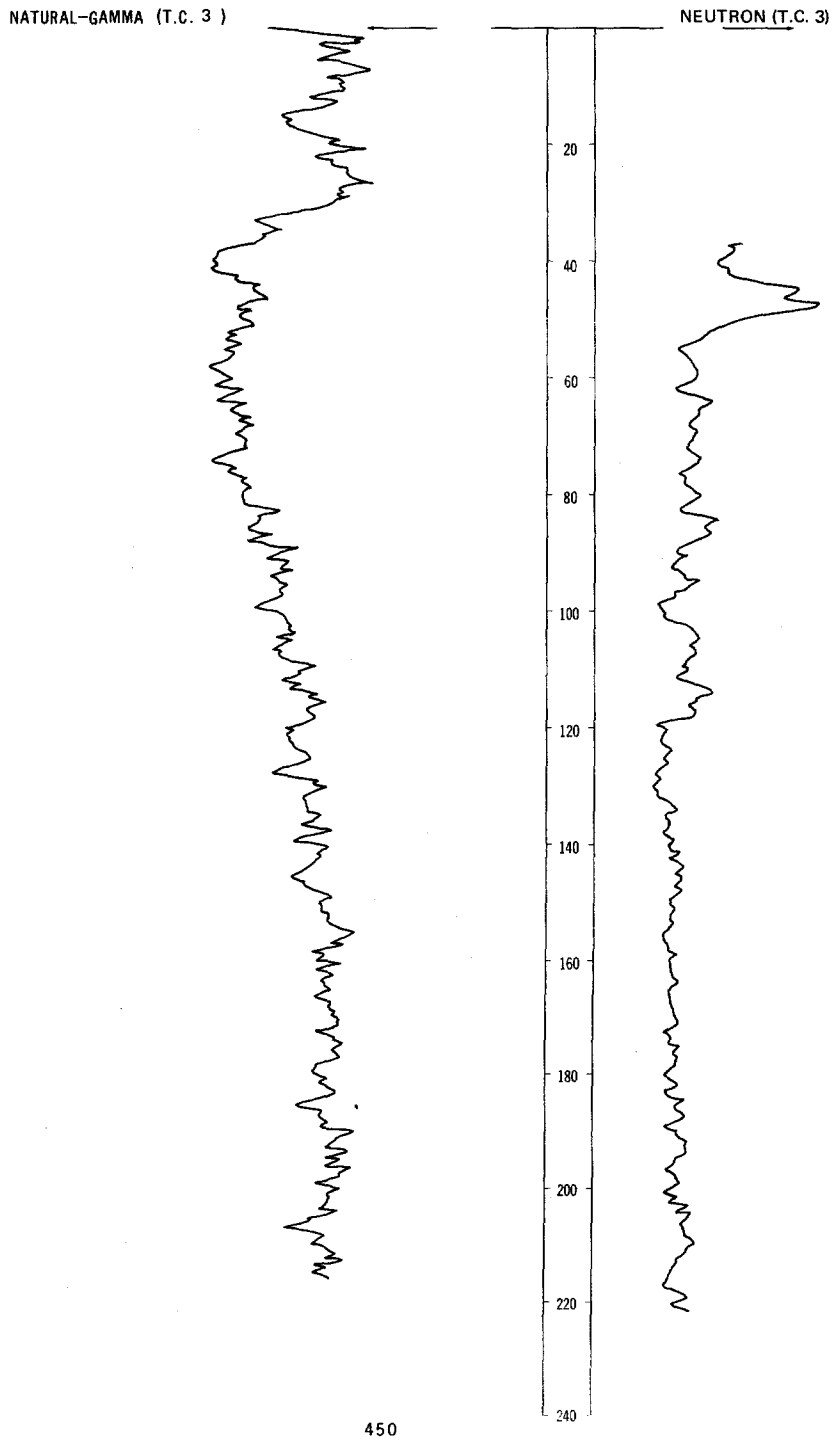
212-222 Shale, black to grayish-black, siliceous, hard.

LOCATION: 132-073-02DDD1, 2

DATE DRILLED: 8/03/77

ALTITUDE: 2088
(FT, MSL)

DEPTH: 222
(FT)



132-073-04BBB1
NDSWC 9709

Altitude: 2126 feet — Date drilled: 8/11/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, sandy, moderate-yellowish-brown	8	8
Fox Hills Formation:			
	Sand, very fine to fine, clayey, dark-greenish-gray	4	12
	Clay, silty, sandy, dark-greenish-gray	2	14
	Clay, silty, brownish-gray	6	20
	Sand, very fine to fine, clayey, greenish-gray	36	56
	Clay, sandy, greenish-gray	6	62
	Clay, silty, brownish-gray	14	76
Pierre Formation:			
	Shale, grayish-black, hard	24	100

132-073-04BBB2
NDSWC 9709A

Altitude: 2126 feet — Date drilled: 8/11/76

Glacial drift:			
	Clay, sandy, moderate-yellowish-brown	8	8
Fox Hills Formation:			
	Sand, very fine to fine, clayey, dark-greenish-gray	4	12
	Clay, silty, sandy, dark-greenish-gray	2	14
	Clay, silty, brownish-gray	6	20
	Sand, very fine to fine, clayey, greenish-gray	20	40

132-073-04CAB
(Log from Jacob Thurn)

Date drilled: 8/30/72

Clay, yellow	15	15
Sand, blue	42	57

132-073-07BAA
(Log from Jacob Thurn)

Date drilled: 6/26/74

Topsoil	2	2
Gravel	4	6
Sand	8	14

132-073-07BCB
NDSWC 9708

Altitude: 2084 feet — Date drilled: 8/11/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to medium, clayey, moderate-yellowish-brown	18	18
	Sand, very fine to fine, greenish-black	6	24
	Gravel, fine, sandy	2	26
	Clay	3	29
	Gravel, sandy	2	31
	Clay, sandy, grayish-brown	30	61
	Clay, brownish-gray	3	64
	Clay, sandy, greenish-gray	25	89
Pierre Formation:			
	Shale, grayish-black, hard	11	100

132-073-08CBC
(Log from Venturia Well Drilling)

Date drilled: 11/23/74

	Dirt, black	1.5	1.5
	Clay, brown	26.5	28
	Sandstone	2.5	30.5
	Shale, sandy	21.5	52

132-073-21DDD
NDSWC 9707

Altitude: 2042 feet — Date drilled: 8/11/76

Fox Hills Formation:			
	Silt, clayey, moderate-yellowish-brown	4	4
	Silt, clayey, sandy, moderate-yellowish-brown	5	9
	Silt, clayey, sandy, dark-yellowish-brown	8	17
	Silt, clayey, sandy, dark-brownish-gray	8	25
	Silt, clayey, medium-gray	17	42
	Clay, silty, medium-gray	6	48
	Clay, dark-brownish-gray	22	70
	Sand, very fine to fine, clayey, greenish-gray	12	82
	Clay, brownish-gray	11	93
	Clay, silty, brownish-gray	51	144
	Clay, sandy, greenish-gray	11	155
	Sand, clayey, dark-greenish-gray	9	164
	Clay, silty, dark-grayish-brown	18	182
Pierre Formation:			
	Shale, grayish-black, hard	38	220

132-073-23BDD
(Log from Jacob Thurn)

Date drilled: 7/31/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Sand	63	66

132-073-28BAB
(Log from Baumgartner Drilling Co.)

Date drilled: 11/04/76

	Topsoil	2	2
	Clay, yellow	26	28
	Clay, black	92	120
	Fox Hills sand	40	160

132-073-35DDD
NDSWC 9706

Altitude: 2082 feet

Date drilled: 8/11/76

Glacial drift:			
	Sand, very fine to very coarse, gravelly	4	4
Fox Hills Formation(?):			
	Clay, silty, moderate-yellowish-brown	6	10
	Clay, silty, olive-gray	3	13
	Sand, very fine to fine, clayey, greenish-gray	1	14
	Silt, sandy, medium-gray	7	21
	Sand, very fine to fine, clayey, medium-gray	22	43
	Clay, silty, dark-grayish-brown	33	76
Pierre Formation:			
	Clay, silty, dark-brownish-gray, hard	24	100

TABLE 4.--Chemical analyses of ground water from wells.

LOCAL IDENTIFIER	GEOLOGIC UNIT[1]	TOTAL DEPTH OF WELL (FT)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (µMHO/CM @ 25°C)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180°C) (MG/L)	DISSOLVED NITRATE (NO3) (MG/L)	DISSOLVED BORON (B) (UG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
129-067-03BBB1	112B6FV	191	77-09-07	1100	8.0	--	410	26	100	39	91	32	2.0	8.8	468	0	210	19	0.2	25	737	1.0	830	1200	960
129-067-03BBB2	112B6FV	130	77-09-07	980	10.0	--	440	66	110	48	88	28	1.7	9.1	453	0	240	17	.2	27	782	1.0	380	3400	2800
129-067-08DAA	112B6GFV	56	76-07-14	800	8.2	10.0	400	56	100	36	35	16	.8	6.5	417	0	130	9.3	.4	32	614	1.0	150	0	840
129-067-17ADD	112B6GFV	290	76-07-14	1195	7.8	8.5	330	0	89	26	140	47	3.4	11	458	0	240	1.1	.2	32	853	1.0	420	20	1500
129-067-17DDD	112B6GFV	161	76-07-12	1020	8.0	9.0	460	210	130	38	52	19	1.0	8.8	337	0	310	.5	.1	30	791	1.0	420	80	2800
129-067-28BBB	112B6GFV	161	77-06-31	1050	7.8	8.0	360	35	99	27	110	39	2.5	11	394	0	260	22	.1	27	730	1.0	380	0	1800
129-067-35CBB	112B6GFV	27	75-07-16	2100	6.9	10.5	1800	1500	420	180	52	6	.5	7.0	311	0	1200	110	.4	18	2700	390	0	0	20
129-068-08CCC	112B6FV	166	76-07-13	1340	7.5	9.0	300	120	82	23	180	56	4.5	9.4	218	0	410	79	.4	31	923	1.0	600	0	2500
129-068-09CCB1	112B6FV	230	77-09-01	1400	8.2	8.5	170	0	47	13	270	76	9.4	11	420	13	290	65	.1	25	939	1.0	910	200	1000
129-068-09CCB2	112B6FV	65	77-09-01	800	8.0	8.0	430	51	120	32	20	9	.4	7.7	421	21	89	7.8	.1	26	503	1.0	100	450	1300
129-068-15AAD	112B6FV	141	77-09-07	1400	7.5	--	410	150	110	33	190	48	4.1	23	309	7	170	310	.1	26	1030	1.0	760	420	1700
129-068-18CCC	112B6FV	225	77-09-14	1900	7.6	--	210	0	60	15	350	77	10	12	498	0	420	140	.1	26	1250	1.0	1300	60	1300
129-068-24BBB2	112B6FV	166	77-04-05	1200	7.8	8.0	270	0	73	21	150	54	4.0	8.9	353	0	220	75	.3	27	740	1.0	670	60	1500
129-068-28ADD	112B6FV	161	76-07-19	1720	7.7	8.0	230	0	1.4	55	310	73	8.9	11	560	0	330	92	.4	31	--	.40	910	0	1300
129-068-31ADA	112B6FV	218	76-07-13	1890	7.5	8.0	170	0	48	12	390	82	13	9.9	543	0	410	130	.3	32	1280	1.0	1000	20	900
129-068-34DDD1	112B6FV	281	77-08-31	2900	8.2	9.0	150	0	44	9.7	410	84	15	11	589	16	390	150	.0	24	1330	1.0	1100	200	960
129-068-34DDD2	112B6FV	101	77-08-31	800	7.8	8.0	330	0	100	19	56	27	1.3	7.7	407	5	110	5.9	.1	26	503	1.0	480	80	1500
129-068-36DDD1	112B6FV	171	77-08-31	1100	7.8	8.0	320	64	90	23	120	44	2.9	12	303	4	260	56	.1	24	746	1.0	430	0	1900
129-068-36DDD2	112B6FV	70	77-11-10	700	8.3	7.0	320	38	82	28	32	18	.8	6.2	344	0	100	4.5	.2	22	467	1.0	240	40	160
129-069-03AAA1	112B6FV	159	77-09-12	900	7.2	9.0	330	220	110	13	110	41	2.6	9.1	135	0	400	48	.1	28	834	1.0	380	0	3700
129-069-03AAA2	112B6FV	51	77-09-12	650	7.4	10.0	390	110	100	36	27	13	.6	5.8	327	9	150	16	.1	22	551	1.0	100	0	1600
129-069-11DDC	112B6FV	120	75-07-15	2400	7.3	8.5	1300	940	310	130	240	28	2.9	19	455	0	1400	36	.4	19	2480	2.5	390	40	3600
129-069-12CCD1	112B6FV	231	76-07-29	1710	7.9	8.5	160	0	47	10	340	81	12	9.8	459	0	420	79	.5	31	1130	.00	1100	290	740
129-069-12CCD2	112B6FV	166	76-07-29	1650	7.9	9.0	490	170	140	34	190	45	3.7	12	359	13	510	26	.1	31	1100	.00	380	20	3000
129-069-34CCC	112B6FV	97	77-09-14	1600	7.4	10.0	700	390	190	55	130	28	2.1	15	385	0	650	17	.3	26	1370	2.0	480	0	650
129-070-12ABB	--	103	75-07-14	3400	7.2	8.5	1600	1200	370	160	420	36	4.6	25	459	0	1900	160	.3	18	3450	70	510	60	2700
129-070-12DDA	112B6FV	86	75-07-15	5300	7.7	8.0	3200	2800	420	520	720	33	5.5	17	469	0	4200	190	.5	17	6450	96	160	170	140
129-070-14CDB	112B6FV	68	75-07-14	2750	6.8	9.0	1900	1400	470	180	170	16	1.7	24	575	0	1400	210	.7	22	3150	120	40	40	1300
129-071-12CCC	112B6FV	126	76-07-27	1700	7.9	9.0	590	190	150	52	150	35	2.7	16	467	7	534	18	.3	31	1170	.20	420	670	3000
129-071-15AAB	217DKOT	2495	75-07-02	2070	7.7	29.0	360	210	93	31	460	73	11	11	188	0	1100	71	1.4	9.1	1930	1.0	1400	1400	60
129-071-22BAA	112B6FV	141	76-07-27	1360	8.0	8.5	290	0	70	28	190	57	4.9	14	475	12	300	14	.2	35	895	.10	760	1500	1200
129-072-16BBB	112B6FV	151	76-07-23	1240	8.3	--	440	42	100	46	120	37	2.5	12	447	18	290	11	.5	36	853	1.0	340	0	1300
129-072-19CDC	112B6FV	110	76-08-19	1410	7.1	10.0	410	0	110	33	140	42	3.0	11	538	0	260	17	.2	25	880	2.7	680	60	1900
129-072-30BBA	112B6FV	110	76-08-19	1660	7.6	7.5	570	73	150	47	130	33	2.4	11	603	0	340	17	.2	31	1020	.20	380	120	2600
129-072-30BB	112B6FV	126	76-08-19	1120	8.2	8.5	250	0	62	23	94	44	2.6	8.9	417	16	84	8.1	.2	29	528	.20	150	0	1200
129-072-30CBB	112B6FV	126	76-09-16	820	7.9	8.0	250	0	61	24	95	44	2.6	8.4	424	15	72	3.0	.2	28	491	1.0	300	40	1400
129-072-30CDD	112B6FV	124	77-08-18	1390	8.5	8.5	510	0	120	51	150	38	2.9	13	631	0	310	12	.1	27	967	1.0	380	40	2500
129-072-31CBB	112B6FV	65	77-11-10	1290	8.6	7.0	290	0	78	23	220	61	5.6	14	399	0	440	7.9	.1	20	1020	.30	1200	140	1200
129-072-32CCC	112B6FV	111	76-07-20	1220	7.2	8.5	350	0	50	55	160	49	3.7	6.8	540	0	260	8.9	.4	31	816	1.0	450	0	1900
129-072-32DDD	112B6FV	121	76-07-21	1000	8.1	--	300	0	41	48	120	46	3.0	10	433	10	190	11	.4	31	677	.10	530	0	1400
129-072-34DAA	112B6FV	88	77-09-16	900	7.3	--	310	0	82	26	95	38	2.3	11	401	10	160	11	.2	29	628	1.0	390	40	800
129-073-01CCC	112B6FV	111	76-08-29	1150	7.8	8.0	470	24	110	47	76	26	3.5	9.3	511	15	190	5.9	.1	32	707	1.0	80	0	920
129-073-03BBC	217DKOT	2561	75-07-08	1990	7.4	24.5	1000	850	270	79	260	36	3.6	17	185	0	1300	85	2.5	6.9	2180	1.0	470	6200	180
129-073-05DDB	--	61	75-07-09	465	7.9	8.5	130	0	32	12	84	57	3.2	6.9	318	0	53	8.2	.4	15	367	1.0	470	130	180
129-073-11ABB	112B6FV	70	76-08-25	1200	7.3	7.5	480	0	97	38	190	50	4.1	8.8	542	0	330	17	.4	29	946	.60	300	0	420
129-073-12AAA	112B6FV	128	76-08-25	900	7.9	7.5	310	0	74	30	70	32	1.7	8.8	411	10	120	6.2	.2	34	535	1.0	80	0	1200
129-073-12CDD	112B6FV	107	76-08-26	1200	7.6	7.5	440	0	110	40	96	32	2.0	8.9	523	8	210	6.9	.1	30	716	1.0	40	0	1100
129-073-12DDD	112J6FV	121	76-08-24	1020	7.9	8.5	340	0	83	32	95	37	2.2	9.5	427	18	170	6.6	.2	32	635	1.0	190	0	920
129-073-13DDD	112B6FV	141	76-07-22	1270	8.1	--	420	0	110	35	110	36	2.3	12	544	0	230	8.3	.4	31	765	1.0	260	0	1900
129-073-21CDB	217DKOT	2516	75-07-01	3500	7.5	30.0	990	840	270	77	320	41	4.4	18	186	0	1300	180	3.0	8.5	2360	1.0	120	2900	100
	217DKOT	2516	77-04-28	2800	7.2	29.0	1000	900	290	76	330	40	4.5	20	180	0	1200	180	3.0	13	2380	--	360	3600	160
129-073-24ABB	112QTSH	41	76-08-23	3100	7.3	8.2	1800	1600	490	140	290	26	3.0	20	234	6	2100	23	.1	31	3350	2.5	260	0	4300
129-073-24DDA	112B6FV	136	76-10-08	730	--	--	240	0	61	21	100	47	2.8	8.3	425	15	76	9.5	.3	29	490	1.0	260	0	1300
129-073-24DDC	112B6FV	121	76-08-19	1490	7.5	7.5	350	0	87	32	170	51	4.0	9.8	537	0	260	20	.1	29	822	2.5	110	0	2000
129-073-24DDD1	112B6FV	128	76-10-05	730	--	--	240	0	62	21	110	49	3.1	8.1	425	15	99	9.0	.3	28	537	1.0	450	100	1300
129-073-24DDD2	112B6FV	128	76-10-05	860	--	--	300	0	74	28	120	46	3.0	9.0	450	6	150	15	.3	28	619	1.0	380	250	1500
129-073-24DDD3	112B6FV	121	76-10-05	--	--	--	320	0	85	26	120	44	2.9	10	495	0	180	12	.3	28	685	1.0	640	170	1500
129-073-24DDD4	112B6FV	130	76-10-08	780	--	--	260	0	66	22	110	47	3.0	8.2	436	11	110	12	.4	28	562	1.0	1300	100	1300
129-073-24DDD5	112B6FV	134	76-11-16	900	--	--	280	0	60	22	100	46	2.8	8.2	404	19	98	10	.1	27	518	1.0	320	150	1300

LOCAL IDENTIFIER	GEOLOGIC UNIT[1]	TOTAL DEPTH OF WELL (FT)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (UMHO/CM @ 25°C)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180°C) (MG/L)	DISSOLVED NITRATE (NO3) (MG/L)	DISSOLVED BORON (B) (UG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
129-073-24DDD5	112BGFV	134	76-11-17	690	--	--	230	0	57	21	100	48	2.9	8.2	434	0	100	9.8	0.2	26	527	1.0	280	40	1200
	112BGFV	134	76-11-18	685	--	--	260	0	66	23	100	45	2.7	8.3	403	26	100	9.9	.2	22	504	1.0	0	0	1200
	112BGFV	134	76-11-19	900	--	8.0	260	0	66	23	100	45	2.7	8.3	429	15	100	10	.2	26	539	1.0	320	0	1200
129-073-30WAA	112BGFV	40	75-07-02	640	7.4	9.5	430	140	120	32	12	6	.3	9.9	355	0	180	3.9	.1	20	576	2.5	0	130	1900
129-073-30DAD1	112BGFV	76	76-08-26	2800	7.8	7.5	380	0	100	32	510	74	11	12	582	14	950	27	.2	30	1950	1.0	1300	0	1800
129-073-30DAD2	112BGFV	71	76-08-25	3300	7.7	7.5	1000	560	260	85	390	45	5.4	15	528	5	1400	17	.1	30	2550	1.0	790	0	3000
129-073-33CCC	--	59	75-07-08	1020	7.4	8.5	560	200	140	51	79	23	1.5	9.0	444	0	340	17	.1	19	956	18	200	150	460
130-067-07BBB2	112BGFV	29	77-04-05	820	7.9	7.0	410	68	98	40	18	9	.4	3.7	404	6	84	21	.2	27	496	1.0	70	80	1300
130-067-21DDA	112BGFV	120	77-09-09	1500	7.5	9.0	390	67	100	34	180	49	4.0	14	367	13	380	65	.1	25	1020	2.0	860	750	640
130-067-27CCB2	112DTSH	36	76-07-15	750	7.8	9.0	400	110	100	36	19	9	.4	5.2	349	0	140	9.1	.3	31	535	1.0	0	100	1100
130-067-31BCA	112BGFV	20	75-07-29	950	7.6	--	570	300	94	81	54	17	1.0	3.2	523	0	400	20	.2	23	841	2.2	390	20	20
130-067-35ADD4	112BGFV	31	76-07-15	770	7.5	8.0	400	93	94	40	28	13	.6	5.8	373	0	150	6.5	.2	31	556	1.0	190	0	1300
130-068-06BB02	112BGFV	100	77-09-22	1000	8.0	9.0	360	0	100	27	91	35	2.1	8.0	448	0	160	30	.4	28	636	1.0	330	610	1500
130-068-10ACC	112BGFV	37	75-07-25	485	7.7	8.5	350	79	83	35	4.5	3	.1	3.6	332	0	68	3.6	.3	14	373	1.0	0	3700	620
130-068-11BCB2	112DTSH	36	77-04-05	800	7.6	7.0	410	140	110	33	6.7	3	.1	2.8	332	0	140	12	.1	25	502	1.0	0	230	820
130-068-24AAA	112BGFV	100	77-09-09	1600	7.9	--	560	200	120	63	120	31	2.2	15	438	0	440	27	.1	27	1080	.30	720	120	2340
130-069-06ABB	112BGFV	80	77-09-21	1300	7.5	--	590	240	140	58	69	20	1.2	9.9	425	0	380	18	.3	23	851	1.0	380	1100	320
130-069-07DDD	112BGFV	130	77-09-21	800	7.4	9.0	360	73	85	36	39	19	.9	7.1	336	7	160	11	.6	26	517	1.0	0	690	1600
130-069-09BDA2	112BGFV	29	75-07-24	610	7.7	9.0	390	140	100	34	8.6	4	.2	7.2	307	0	71	20	.2	14	517	85	0	0	20
130-069-09DAD1	112BGFV	203	76-09-29	1100	7.7	8.0	410	10	100	39	83	30	1.8	11	464	12	190	11	.1	30	701	1.0	380	270	1900
130-069-10BBB2	112BGFV	76	77-09-13	850	7.6	--	370	32	97	31	33	16	.7	8.4	386	13	110	6.4	.1	22	537	1.0	240	5100	2500
130-069-14ADD	--	56	77-06-14	2800	7.6	--	1600	1300	240	290	120	13	1.2	12	658	0	1300	86	.2	12	2660	58	350	160	500
130-069-19DA0	112BGFV	20	75-07-24	710	7.5	8.5	390	85	99	35	59	24	1.5	9.0	376	0	200	7.7	.4	13	641	2.0	80	40	2400
130-069-21BBB1	112BGFV	180	77-09-20	1280	7.3	--	430	40	100	44	150	42	3.1	11	468	4	280	48	.5	25	898	1.0	330	630	1100
130-069-21BBB2	112BGFV	100	77-09-20	1300	7.2	--	460	74	110	45	120	36	2.4	5.5	470	0	310	20	.6	28	872	.10	0	40	360
130-069-22DDD	112BGFV	176	77-09-12	1500	7.2	9.0	370	0	95	32	210	55	4.8	7.3	485	9	370	31	.1	26	1050	1.0	950	340	440
130-069-30CBB	112BGFV	137	76-08-03	1730	8.2	9.5	270	0	68	24	250	66	6.6	12	387	22	550	97	.2	29	995	1.0	1000	100	2000
130-069-30DCC	112BGFV	170	77-04-28	1220	7.5	8.0	180	0	54	12	190	68	6.1	10	360	0	270	22	.4	28	755	--	750	30	1200
130-069-30DDD	112BGFV	191	76-07-30	1220	8.3	9.0	130	0	36	9.7	220	77	6.4	8.3	438	6	200	34	.4	32	753	.00	1100	20	800
130-069-31BAB	112BGFV	182	75-07-02	1080	7.6	9.0	200	0	55	15	170	64	5.2	7.6	312	0	280	26	.3	20	732	.10	670	60	1300
130-069-33AAA2	112BGFV	46	76-07-30	1810	7.7	8.5	940	670	280	58	44	9	.6	11	301	11	660	69	.1	31	1410	.10	640	500	7400
130-070-02CCC	112BGFV	118	76-07-29	850	7.3	9.0	220	0	54	21	120	53	3.5	8.8	425	0	120	13	.2	33	568	.10	260	250	1200
130-070-06AAB	112BGFV	47	75-07-23	700	7.7	--	360	29	90	33	63	27	1.4	12	404	0	150	6.9	.2	24	570	5.3	160	630	180
130-070-09ACB	--	22	75-07-24	950	7.7	10.0	590	340	150	52	49	15	.9	3.6	298	0	300	33	.2	22	132	11	0	20	10
130-070-17DDA	112BGFV	60	75-07-23	2010	7.5	9.0	920	520	220	90	300	41	4.3	21	493	0	1100	39	.3	22	2100	8.8	960	40	2100
130-071-03DDD	112BGFV	61	77-10-05	580	7.4	8.0	280	14	69	26	19	13	.5	6.5	324	0	49	8.1	.2	30	356	1.0	0	40	20
130-071-09BBB	112BGFV	66	76-08-09	650	7.9	7.5	240	0	57	24	37	24	1.0	6.1	341	3	29	5.0	.3	35	329	.00	1100	0	680
130-071-20DDD	211FXHL	93	76-08-09	1080	8.2	--	350	41	68	44	74	31	1.7	12	378	0	170	13	.3	43	647	2.4	230	80	140
130-072-02ACC	211FXHL	170	75-07-22	640	8.1	--	260	0	58	30	87	41	2.4	11	481	0	46	5.2	.4	39	512	2.5	120	130	260
130-072-03BBB	211FXHL	45	75-07-22	760	7.8	8.0	240	0	52	27	92	44	2.6	10	419	0	60	11	.4	16	519	28	120	150	20
130-072-07DBA	--	55	75-07-21	518	7.9	9.0	360	120	93	31	3.7	2	.1	5.7	295	0	61	19	.2	17	429	42	0	60	10
130-072-10ABD	211FXHL	85	75-07-22	432	7.9	9.0	260	0	67	35	30	19	.6	7.3	367	0	14	8.4	1.1	24	327	1.6	40	80	20
130-073-01AAA	112DTSH	56	77-08-11	440	8.7	--	190	0	51	15	24	21	.8	3.5	253	16	13	1.3	.2	20	232	1.0	100	0	980
130-073-02BBB	112BGFV	44	75-07-18	655	8.0	9.0	360	73	90	33	42	20	1.0	7.3	351	0	150	10	.4	23	555	10	240	270	940
130-073-05AAA2	112BGFV	23	76-08-11	920	7.8	8.0	290	0	72	27	79	36	2.0	8.6	376	6	140	6.9	.2	29	578	.10	150	0	1300
130-073-09CAB2	--	100	75-07-18	1280	8.1	8.5	700	440	170	67	66	17	1.1	11	313	0	470	38	.2	21	1190	110	200	20	40
130-073-11BDC	112BGFV	84	75-07-21	515	7.8	8.5	270	0	68	24	45	26	1.2	10	358	0	71	5.5	.5	17	497	.80	40	150	900
130-073-27AAA	112BGFV	121	76-08-10	800	8.7	--	350	0	93	29	27	14	.6	10	448	10	41	5.2	.2	29	473	.60	110	730	520
130-073-29AAA	112BGFV	118	76-08-11	770	8.3	--	230	0	57	21	67	38	1.9	8.5	366	10	59	4.9	.1	46	413	2.5	190	20	1000
131-067-13BBB3	112BGFV	67	76-09-29	2100	7.5	7.0	800	310	230	55	180	32	2.8	12	577	12	630	46	.1	27	1530	1.0	600	120	1200
131-067-35ACC	112DTSH	6	75-08-12	990	7.4	8.0	580	210	140	56	36	12	.7	7.9	456	0	260	8.9	.3	20	783	.40	80	1100	1500
131-068-14AAB2	112BGFV	84	77-06-21	1600	7.6	7.5	680	190	190	50	120	27	2.0	9.6	573	13	450	20	.1	16	1170	1.0	210	2200	1600
131-068-34CBB	112BGFV	213	76-09-30	1550	8.1	--	320	0	85	26	210	58	5.1	9.8	462	19	260	88	.2	27	937	1.0	760	460	480
131-068-35BBD	112DTSH	27	75-08-11	1620	7.3	--	840	570	200	83	90	19	1.4	7.1	330	0	670	34	.1	13	1310	2.5	440	80	1600
131-069-03CBB	112BGFV	106	75-08-20	1730	7.9	9.0	470	15	110	47	290	57	5.8	13	552	0	510	93	.2	28	1390	35	1200	80	760
131-069-11BAD	112BGFV	97	75-08-08	820	7.6	8.5	300	110	82	23	91	39	2.3	7.7	235	0	270	17	.1	15	659	2.5	750	120	1500
131-069-22DCD2	112BGFV	153	76-09-28	1650	7.5	8.0	340	0	87	30	250	61	5.9	11	520	17	380	20	.1	31	1070	1.0	1200	130	1400
131-069-26ADD	112BGFV	111	77-09-13	1300	7.5	--	550	190	110	67	76	23	1.4	15	437	0	320	11	.1	23	834	1.0	190	100	2400
131-070-02CCB	112DTSH	9	76-08-26	600	7.4	7.0	260	0	66	23	25	17	.7	6.1	330	0	47	4.4	.2	34	362	.20	80	60	480

LOCAL IDENTIFIER	GEOLOGIC UNIT[1]	TOTAL DEPTH OF WELL (FT)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (UMHO/CM @ 25°C)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180°C) (MG/L)	DISSOLVED NITRATE (NO3) (MG/L)	DISSOLVED BORON (B) (UG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
131-070-05BBB	1128GFV	33	76-08-31	700	8.3	--	360	59	96	29	24	12	.6	6.4	336	15	97	6.4	0.1	27	461	1.0	230	120	1100
131-070-10BBB2	112QTSH	31	76-08-26	740	7.9	8.0	380	140	100	32	12	6	.3	5.1	274	9	140	16	.1	30	480	1.0	300	60	1300
131-070-21DDD	112NGFV	66	76-08-04	1250	7.8	9.0	540	190	130	52	65	20	1.2	11	391	17	310	19	.4	32	851	1.0	380	1500	1600
131-070-24BBC2	112UTBM	12	75-08-07	820	7.6	--	480	280	120	44	19	8	.4	5.5	266	0	190	35	.0	16	636	74	0	150	60
131-070-31DDD	1120TSH	12	75-08-07	1300	7.7	9.0	730	450	190	62	34	9	.5	5.8	342	0	310	41	.2	21	1040	150	0	150	90
131-070-32CCC	--	34	75-08-07	2010	7.3	7.5	750	280	180	73	220	18	3.5	1100	573	0	530	120	.1	20	1790	180	120	330	1600
131-071-02ABB	--	60	75-08-06	2790	7.7	8.0	930	520	190	110	360	45	5.1	17	500	0	660	410	.1	11	2190	44	160	60	100
131-071-07BBB2	211FXHL	121	77-08-08	610	8.3	--	190	0	44	19	61	40	1.9	6.1	313	9	50	5.4	.3	20	388	1.0	70	0	100
131-071-18DDC	1120TSH	35	75-08-06	585	7.4	9.0	320	58	98	18	4.5	3	.1	11	318	0	29	13	.0	15	426	31	120	500	20
131-072-02CCC2	211FXHL	46	77-08-09	480	8.4	9.5	150	0	40	12	28	26	1.0	5.8	237	3	21	2.8	.4	15	238	1.0	70	240	240
131-072-09BBB2	1120TSH	21	77-08-09	925	7.3	8.5	490	180	120	46	110	32	2.2	11	425	3	390	4.9	.2	21	913	1.0	140	220	490
131-072-12BAA	211FXHL	140	75-08-01	405	7.8	--	280	100	63	30	10	7	.5	4.7	217	0	100	11	.6	18	352	1.0	120	250	780
131-072-16BBB2	211FXHL	34	76-08-12	420	8.1	9.5	160	0	35	18	19	20	.7	5.7	224	0	7.0	2.8	.3	19	227	1.0	380	0	100
131-072-18CDC	--	68	75-08-05	1280	7.6	8.0	680	270	160	68	95	23	1.6	13	495	0	410	30	.0	11	1100	37	590	380	120
131-072-20CCC	1128GFV	26	76-08-10	960	8.1	9.5	210	0	47	22	140	58	4.2	6.6	432	0	120	20	.2	26	597	2.7	230	80	840
131-072-30BCC1	112UTSH	31	75-08-01	2000	8.3	7.0	620	170	120	78	400	58	7.0	7.6	533	7	590	140	.5	22	1870	290	590	40	30
131-072-30BCC2	112UTSH	34	75-08-01	700	8.6	7.5	300	0	65	33	100	42	2.5	5.1	329	20	100	24	.5	18	610	76	160	80	0
131-073-06BBB	112UTSH	40	77-08-10	600	8.5	9.0	320	93	80	29	14	9	.3	5.9	263	6	85	18	.2	20	399	31	70	0	0
131-073-09CBC2	211FXHL	67	75-07-30	3050	7.3	--	2300	1800	570	210	49	4	.4	26	628	0	1500	54	.4	26	3340	340	0	100	60
131-073-23DBB	211FXHL	47	75-07-31	1110	7.9	8.0	410	0	85	48	170	47	3.7	12	510	0	330	17	.2	14	923	.00	390	60	60
131-073-26ABB	211FXHL	37	75-07-31	3100	7.9	8.5	1000	530	140	160	620	57	8.5	20	579	0	1700	79	.2	15	3200	120	40	100	160
131-073-33BCC2	112UTSH	60	75-07-31	575	8.2	9.0	320	85	73	33	40	21	1.0	9.0	333	0	99	10	.3	19	452	22	590	<20	140
131-073-35CCC	112UTSH	40	75-07-31	950	7.6	9.0	510	130	110	57	79	25	1.5	11	467	0	280	8.4	.4	16	805	2.5	120	630	560
131-073-35BCC	211FXHL	36	76-08-12	1180	8.2	--	180	0	39	20	170	66	5.5	11	514	3	120	11	.2	19	650	2.4	450	480	120
132-067-14ODA2	112UTSH	40	77-09-29	750	7.0	9.0	400	58	100	36	26	13	.6	5.1	414	0	110	6.9	.1	29	525	1.0	190	590	540
132-067-24AAB	112NGFV	98	77-06-14	1800	7.3	8.0	620	170	180	41	200	41	5.5	9.4	550	0	570	16	.1	17	1350	2.9	490	630	1200
132-068-02DDD2	1128GFV	30	76-09-13	840	7.8	7.5	440	94	92	51	17	8	.4	5.8	397	12	120	6.4	.1	26	565	1.0	0	80	200
132-068-03AAA	1128GFV	155	77-09-29	950	7.6	8.0	430	24	130	26	58	22	1.2	8.9	497	0	160	4.3	.1	29	688	1.0	430	0	2000
132-068-14CAA	1128GFV	40	75-08-21	515	7.8	7.5	330	49	83	30	5.5	3	.1	4.8	343	0	56	4.1	.1	17	361	1.0	0	1500	720
132-068-14DDD1	1128GFV	76	76-09-14	1100	7.5	7.0	560	170	150	45	35	12	.6	8.4	472	0	240	6.2	.1	28	766	1.0	450	150	1300
132-068-22CDA	1128GFV	63	75-08-21	1590	7.8	7.5	900	510	160	110	120	22	1.7	12	479	0	590	40	.2	16	1420	87	320	190	560
132-068-24AAA	1128GFV	260	75-08-21	2290	7.8	9.5	680	290	160	68	360	53	6.0	9.8	474	0	910	99	.3	17	1930	4.2	560	4700	280
132-069-01BBB	1128GFV	101	78-01-04	1470	8.2	3.5	720	500	190	60	100	23	1.6	14	245	13	690	16	.1	20	1320	1.0	520	20	6400
132-069-05BCD	1128GFV	240	75-07-03	1300	7.6	9.5	550	0	97	26	250	60	5.8	11	485	0	370	95	.2	19	1120	.20	1200	420	1400
132-069-11UCC	1128GFV	266	77-09-26	1800	8.1	9.0	220	100	70	11	330	75	9.7	12	147	0	160	430	.1	29	1280	1.0	760	100	2400
132-069-30DDD	1128GFV	86	76-09-03	1900	7.9	7.5	510	95	110	57	250	51	4.8	11	505	0	620	9.5	.1	30	1350	.20	1100	20	1500
132-069-34CAA1	112OTSH	80	75-08-29	3050	7.8	10.0	1800	1400	320	240	93	10	1.0	11	467	0	610	270	.1	16	2580	740	200	130	580
132-069-36AAA2	112OTSH	29	76-09-03	540	8.0	7.5	240	10	65	19	12	10	.3	4.6	267	7	38	2.6	.2	29	316	2.5	110	1900	1700
132-070-01DDA	--	80	75-07-03	1010	7.5	--	450	67	130	30	120	36	2.5	11	465	0	320	26	.2	20	916	1.0	470	100	100
132-070-02BCC	1128GFV	96	75-08-19	1180	7.5	9.0	610	180	160	51	60	17	1.1	10	523	0	300	6.5	.2	19	989	1.0	320	210	1400
132-070-08CCB	112OTSH	29	77-09-30	750	7.1	8.0	320	38	84	27	27	15	.7	5.9	333	8	96	2.7	.1	27	420	4.8	290	360	20
132-070-12AAA	--	80	75-07-03	1010	7.5	10.0	450	67	130	30	120	36	2.5	11	465	0	320	26	.2	20	916	1.0	470	100	100
132-070-17CCC1	112NGFV	111	76-08-02	750	6.4	--	320	0	75	32	55	27	1.3	7.5	372	20	77	11	.1	27	487	1.0	300	40	1300
132-070-17CCC2	112NGFV	80	76-09-01	740	7.8	7.0	340	30	85	31	30	16	.7	5.5	363	7	92	3.9	.2	28	474	1.0	110	80	1500
132-070-22BBB1	211FXHL	164	76-09-29	800	8.0	--	110	0	26	11	140	72	5.6	6.8	373	15	86	4.4	.1	22	497	2.0	790	210	220
132-070-31AAA	112NGFV	131	76-08-17	725	7.4	7.5	280	0	76	22	38	22	1.0	6.7	364	0	61	5.1	.1	30	392	.10	230	0	1700
132-070-31BBB	112NGFV	61	76-08-31	1620	8.3	8.0	580	240	140	56	140	34	2.5	11	415	0	530	16	.2	27	1160	1.0	530	100	2100
132-070-32CDB	1128GFV	50	75-08-18	690	7.8	9.5	350	72	92	29	40	19	.9	8.6	338	0	140	7.0	.2	19	508	2.9	200	710	1600
132-071-01ODD1	211FXHL	50	75-08-18	500	8.0	8.0	290	85	68	29	9.6	6	.2	11	249	0	47	33	.2	23	373	17	0	0	0
132-071-01ODD2	211FXHL	64	76-09-02	950	6.4	8.0	170	0	39	18	150	64	5.0	8.6	416	15	98	18	.1	18	542	2.5	600	40	20
132-071-04BAA	112OTSH	16	76-08-16	810	7.6	8.0	300	21	74	28	53	27	1.3	6.1	332	4	120	11	.1	30	461	1.0	110	0	160
132-071-10CAA2	112OTSH	19	76-08-17	775	7.7	6.5	300	28	84	22	26	16	.7	5.1	322	5	76	14	.1	28	409	1.0	150	20	880
132-071-10CBD	1128GFV	115	76-07-07	850	7.2	8.5	360	15	93	31	52	24	1.2	6.7	421	0	120	5.6	.1	29	537	1.0	260	100	1600
	1128GFV	115	77-04-28	920	6.7	8.5	360	20	93	30	52	24	1.2	8.0	410	0	130	7.4	.2	28	544	--	240	80	1600
132-071-14BBC1	1128GFV	106	76-08-17	900	7.8	7.5	340	2	92	27	39	20	.9	6.4	391	11	98	4.9	.0	29	516	1.0	110	0	1500
132-071-14BBC2	112OTSH	36	76-08-17	850	8.1	--	310	19	82	26	29	17	.7	5.8	341	8	85	5.5	.1	28	444	.10	190	20	560
132-071-14DDD1	112NGFV	121	77-10-04	650	7.7	9.0	250	0	64	22	58	33	1.6	7.0	371	11	44	9.3	.2	25	394	1.0	140	40	1400
132-071-14DDD2	112OTSH	41	77-10-04	650	6.9	7.0	350	56	96	27	6.3	4	.1	5.0	359	0	51	10	.1	24	498	1.0	0	80	1700
132-071-15ACA	112OTSH	46	75-08-14	600	7.8	9.0	370	79	95	32	17	9	.4	5.6	353	0	89	15	.2	20	482	15	160	120	1000
132-072-22CCC2	211FXHL	84	76-08-13	555	7.7	7.0	240	0	61	21	17	13	.5	5.7	292	3	37	1.8	.2	25	325	2.0	80	0	460
132-073-02DDD2	211FXHL	79	77-08-05	610	8.0	9.0	270	0	68	24	37	22	1.0	7.3	322	6	91	2.6	.2	45	418	1.0	50	0	300
132-073-04BBB2	211FXHL	34	76-08-16	1690	8.3	10.0	50	0	14	3.7	340	93	21	6.5	667	0	210	7.6	.1	22	960	6.7	1200	350	720
132-073-04CAB	211FXHL	57	75-08-13	4800	7.6	8.0	1500	810	190	250	470	40	5.5	15	852	0	1100	190	.5	11	3240	570	630	60	180
132-073-07BAA	112UTSH	18	75-08-12	1460	7.6	10.5	440	94	93	50	200	49	4.2	8.0	419	0	400	75	.2	18	1070	52	320	130	190
132-073-08CBC	211FXHL	52	75-08-13	5080	7.1	8.5	1800	1400	320	240	580	41	6.0	23	499	0	2500	64	.1	21	4220	33	480	170	50
132-073-28BAB	211FXHL	160	77-06-13	1650	6.9	8.0	860	300	200	88	78	16	1.2	12	683	0	460	5.7	.1	15	1290	.30	310	690	400

[1]See page 15 for explanation.

TABLE 5.--Chemical analyses of water from selected lakes

Location	129-067-03BCC (Coldwater Lake)	130-070-27CBC (East side of Lake Hoskins)	131-068-25DDB (Trout Pond)	131-070-05BBA (Southwest side of Green Lake)
Date of collection	6-21-77	8-14-75	6-21-77	8-14-75
Specific conductance (µmho/cm @ 25°C)[1]	2,500	900	520	960
Hardness (Ca, Mg) (mg/L)	1,200	320	240	320
Noncarbonate hardness (mg/L)	600	5	22	0
Dissolved calcium (Ca) (mg/L)	45	55	31	39
Dissolved magnesium (Mg) (mg/L)	260	44	40	54
Dissolved sodium (Na) (mg/L)	190	130	24	140
Percent sodium	24	44	17	46
Sodium adsorption ratio (SAR)	2.4	3.2	.7	3.4
Dissolved potassium (K) (mg/L)	100	35	12	29
Bicarbonate (HCO_3) (mg/L)	585	384	222	441
Carbonate (CO_3) (mg/L)	72	0	22	9
Dissolved sulfate (SO_4) (mg/L)	1,000	270	78	270
Dissolved chloride (Cl) (mg/L)	54	34	10	14
Dissolved fluoride (F) (mg/L)	.0	.1	.1	.1
Dissolved silica (SiO_2) (mg/L)	8.1	15	4.1	13
Dissolved solids (residue at 180°C) (mg/L)	2,110	786	341	837
Dissolved nitrate (NO_3) (mg/L)	.5	9.4	2.5	2.8
Dissolved boron (B) (mg/L)	.73	.16	.0	.28
Dissolved iron (Fe) (µg/L)	--	1.3	.14	.10
Dissolved manganese (Mn) (µg/L)	--	.20	.32	.08

[1]Value shown is the field specific conductance measured at the well at the time of inventory.

TABLE 6.--Chemical analyses of ground water from selected municipal wells for minor elements[1/]

(Analyses reported in µg/L)

Location	129-073-21CDB	130-069-30DCC	132-071-10CBD
City	Zeeland	Ashley	Wishek
Well depth (feet)	2,516	170	115
Date of collection	4-28-77	4-28-77	4-28-77
Aluminum (Al)	10	40	0
Arsenic (As)	0	1	0
Beryllium (Be)	10	0	0
Cadmium (Cd)	1	0	0
Chromium (Cr)	0	0	0
Cobalt (Co)	1	1	1
Copper (Cu)	0	0	0
Lead (Pb)	8	1	0
Lithium (Li)	180	170	80
Mercury (Hg)	.0	.0	.0
Molybdenum (Mo)	2	12	3
Nickel (Ni)	0	2	2
Selenium (Se)	0	0	0
Strontium (Sr)	6,800	360	560
Vanadium (V)	1.1	.5	.2
Zinc (Zn)	0	0	0

[1/] Analyses by the U.S. Geological Survey Hydrologic Laboratory, Lakewood, Colo.