GROUND-WATER DATA

for

BOTTINEAU AND ROLETTE COUNTIES, NORTH DAKOTA

By

Ronald L. Kuzniar
and
P. G. Randich

U.S. Geological Survey

COUNTY GROUND-WATER STUDIES 35 – PART II
North Dakota State Water Commission
Vernon Fahy, *State Engineer*

BULLETIN 78 – PART II
North Dakota Geological Survey
Don L. Halvorson, *State Geologist*

Prepared by the U.S. Geological Survey in cooperation
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Bismarck, North Dakota

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OF METRIC UNITS

A dual system of measurements--inch-pound units and the International System (SI) of metric units--is given in this report. SI is an organized system of units adopted by the 11th General Conference of Weights and Measures in 1960. Selected factors for converting inch-pound units to SI units are given below.

Multiply inch-pound unit	By	To obtain SI unit
Acre	0.4047	hectare (ha)
Foot (ft)	0.3048	meter (m)
Inch (in)	25.4	millimeter (mm)

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INTRODUCTION

The investigation of the geology and occurrence of ground water in Bottineau and Rolette Counties (fig. 1) was made cooperatively by the U.S. Geological Survey, North Dakota State Water Commission, North Dakota Geological Survey, Bottineau County Water Management District, and Rolette County Water Management District. The results of the investigation will be published in three separate parts. Part I 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 geologic and hydrologic data collected during the county investigation and functions as a reference for the other reports.

Purpose

The purpose of the investigation was to provide detailed geologic and hydrologic information needed for the orderly development of water supplies for municipal, domestic, livestock, irrigation, industrial, and similar uses. Specifically, the objectives were to (1) determine the location, extent, and nature of the major aquifers, including estimates of storage and potential yield; (2) evaluate the chemical quality of the ground water; (3) identify current and potential use of ground water; and (4) estimate and attempt to quantify the movement of ground water, including sources of recharge and discharge.

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

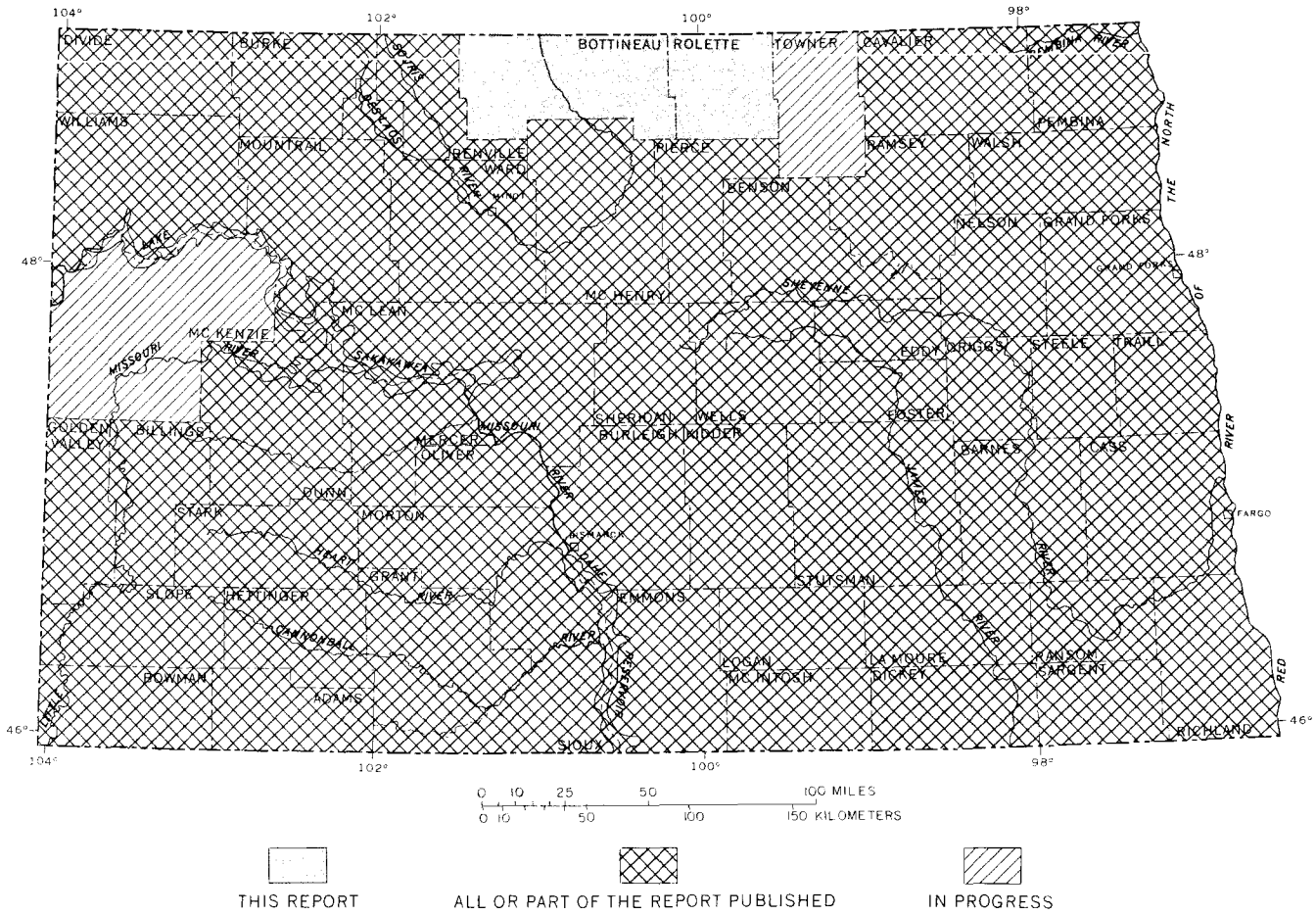

FIGURE 1.—County ground-water studies in North Dakota.

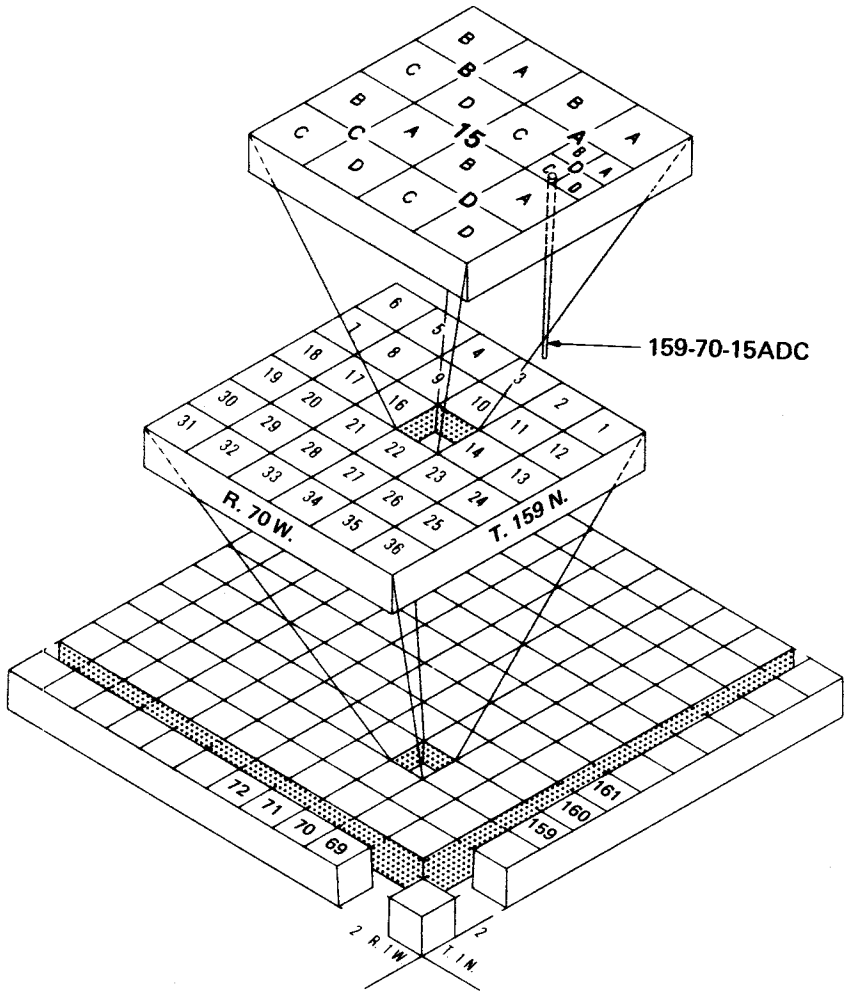

FIGURE 2.—Location-numbering system.

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 159-070-15ADC is in the SW1/4SE1/4NE1/4 sec. 15, T. 159 N., R. 070 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 for Bottineau County is shown on plate 1 (in pocket) and for Rolette County is shown on plate 2 (in pocket).

Acknowledgments

The collection of data for this report was made possible by the cooperation of residents and officials of Bottineau and Rolette Counties, who furnished essential information on wells and permitted water-level measurements and the collection of water samples. Particular recognition is due to the following personnel of the North Dakota State Water Commission: G. L. Sunderland, P. A. Burke, A. R. Wanek, A. E. Comeskey, R. L. Cline, G. J. Calheim, and K. K. Kunz for drilling and logging of test holes and contributing to the understanding of the stratigraphy; G. O. Muri for chemical analyses of water samples; and M. O. Lindvig for scheduling of drilling activities. Thanks are due to the private 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, which were collected chiefly between 1978 and 1981, are listed in tables 1-5. The points of collection are shown on plates 1 and 2. The data consist of the following: (1) Geologic and hydrologic records of wells and test holes; (2) water-level measurements in observation wells; (3) lithologic and geophysical logs of test holes and wells; and (4) chemical analyses of ground water. The data provided are useful for evaluating geologic and ground-water conditions in Bottineau and Rolette Counties. For example, a person considering the construction

of a new well can locate the proposed site on plate 1 or 2. 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 Miscellaneous Data-Collection Sites

Records of selected wells, test holes, and miscellaneous data-collection sites are given in table 1. Well depth is the depth of casing for open-bottom wells or the base of the deepest well screen for screened wells. Many 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 several aquifers. The observation wells were constructed of 1¼-inch (32-mm) plastic casing with 3-, 4-, or 6-foot (1-, 1-, or 2-m) screens or 2-inch (51-mm) steel casing with 3-, 6-, 9-, 10-, or 12-foot (1-, 2-, 3-, 3.3-, or 4-m) screens. The observation wells were developed by backwashing and, in some cases, jetting the screened interval and were pumped a minimum of 10 hours for development before water samples were collected for analysis.

Water Levels in Selected Wells

Table 2 lists the monthly and intermittent water levels in selected wells, in feet below or above (+) land surface, that tap major aquifers in Bottineau and Rolette Counties. Water-level measurements began in 1978 and extended through November 1981. 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

Logs collected from water-well drillers and other sources 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 and logs from test holes drilled during previous investigations. However, geologic interpretations shown on commercial and private well logs are those of the drillers. 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 chemical composition and physical properties of water are reported in the tables of analyses (tables 4 and 5). 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 linear 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. Methods of analyses were generally those described by Brown and others (1970), Skougstad and others (1979), and Fishman and Bradford (1982). The results are expressed in milligrams per liter (mg/L) or micrograms per liter (ug/L). A microgram per liter is one-thousandth of a milligram per liter.

Drinking-water standards have been recommended by the National Academy of Sciences-National Academy of Engineering (1972) at the request of the Environmental Protection Agency. Standards for public drinking-water supplies were established by the U.S. Environmental Protection Agency (1976). These standards include the following recommended limits: iron (Fe), 300 ug/L; manganese (Mn), 50 ug/L; sulfate (SO_4), 250 mg/L; and chloride (Cl), 250 mg/L.

The following summation for farmstead use is modified from the Federal Water Pollution Control Administration (1968) and the National Academy of Sciences-National Academy of Engineering (1972).

KEY WATER QUALITY CRITERIA FOR FARMSTEAD USES

Characteristic	Recommendations (at point of use) General farmstead uses	Additional special-use requirements
Taste and odor	Substantially free	
Odor	Substantially free	
pH	6.0 to 8.5	6.8 to 8.5 dairy sanitation
Total dissolved inorganic solids	<500 mg/L (under certain circumstances, higher levels are acceptable)	
Hazardous trace elements	Levels in excess of those shown are grounds for rejection of supply:	
	Substances	
	Arsenic (ug/L) [a/] 50	
	Barium (ug/L) [a/] 1000	
	Cadmium (ug/L) [a/] 10	
	Chromium (ug/L) [a/] 50	
	Cyanide (mg/L) 0.2	
	Lead (ug/L) [a/] 50	
	Selenium (ug/L) [a/] 10	
	Silver (ug/L) [a/] 50	
Other trace elements	Levels shown below should not be exceeded if alternate sources are available:	
	Substances	
	Manganese (ug/L) 50	In dairy sanitation, water should contain <20 mg/L potassium and <0.1 mg/L iron and copper.
	Iron (ug/L) 300	
	Copper (ug/L) 1000	
	Zinc (ug/L) 5000	
	Fluoride (mg/L) 0.7-1.2 ([a/] 2.4)	
	Nitrate (as N) (mg/L) [a/] 10	

[a/] *Maximum permitted levels of inorganic chemicals in public water systems of North Dakota; set by the North Dakota State Department of Health (1977).*

Chemical Constituents in Solution

Silica (SiO_2)

Weathering processes dissolve silica from practically all rocks. Silica affects the usefulness of water because it can contribute to the formation of scale in pipes, water heaters, and boilers in the presence of calcium and magnesium.

Iron (Fe)

Iron is a widespread constituent in rocks and is easily leached by ground water under reducing conditions or in acidic water. Water containing more than 300 ug/L of iron, after exposure to air, may become discolored. Reddish-brown stains on porcelain or enamelware and fixtures and on fabrics washed in the water result from the iron.

Manganese (Mn)

Manganese in concentrations as low as 200 ug/L may cause a dark-brown or black stain on fabrics and porcelain fixtures. Ground water that contains high concentrations of iron may also have considerable amounts of manganese.

Calcium and Magnesium (Ca and Mg)

Limestone and similar rocks are the principal source of calcium and magnesium in natural water. Calcium and magnesium cause water hardness and, with anions, can form scale on utensils and in water heaters, boilers, and pipes.

Sodium and Potassium (Na and K)

Sodium and potassium are present in many igneous and sedimentary rocks. Sodium dissolves readily and when brought into solution it tends to remain in solution. Potassium is dissolved with greater difficulty and exhibits a stronger tendency to be reincorporated into solid weathering products, especially clay minerals. In most natural water the concentration of potassium is much lower than the concentration of sodium. Water that contains a large proportion of sodium salts may be unsatisfactory for irrigation on certain types of poorly drained soils. The presence of several hundred milligrams per liter of sodium in water can make it unsuitable for use in sodium-restricted diets (North Dakota State Department of Health, 1962).

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) associated with it. However, moderate amounts of alkalinity do not adversely affect most uses.

Alkalinity 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 may be converted to sulfates upon weathering or with bacterial action. Sulfate may also be dissolved from beds of gypsum and deposits of sodium sulfate and other sulfosalts.

Chloride (Cl)

Chloride is present in all natural waters, but the concentrations usually are low. Important sources of chloride are sedimentary rocks that were deposited under marine conditions. Chloride concentrations of 400 mg/L impart a noticeable salty taste for most people.

Fluoride (F)

Fluoride in the ground water is probably derived from solution of fluorite, apatite, and hornblende minerals. High fluoride content (depending on annual average maximum daily air temperature) may cause mottling of tooth enamel in children's teeth during calcification.

Nitrate (NO_3)

The occurrence of high nitrate concentrations in shallow ground water has been attributed to leaching in feedlots or to fertilizer from irrigated fields where nitrogen compounds have been applied. High nitrate content is undesirable in drinking water because of its bitter taste and it has been reported to cause methemoglobinemia (blue babies) in infants (Comly, 1945).

Boron (B)

Boron is a constituent of the mineral tourmaline and may be present in biotite and amphiboles. In small quantities boron is essential for plant growth. Excessive concentrations in soil and in irrigation water are harmful for some plants.

Dissolved Solids

The concentration of dissolved solids is calculated from the weight of residue on evaporation at 180°C from a known volume of water.

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 removal of the carbonate hardness. As a general reference, the U.S. Geological Survey often uses the following classification of water hardness (Hem, 1970).

Calcium and magnesium hardness, as $CaCO_3$ (milligrams per liter)	Hardness description
0-60	Soft
61-120	Moderately hard
121-180	Hard
More than 180	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 higher than 50.

The term SAR (sodium-adsorption ratio) was introduced by the U.S. Salinity Laboratory Staff (1954). Their experiments show that the SAR relates to the degree water enters into cation-exchange reactions with soil. Sodium-adsorption ratio 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 65 to 70 percent 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 capacity 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. For example, high temperature precludes its use as an industrial coolant. Temperature is also important 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

miscellaneous data-collection sites

Owner

NDFS, North Dakota Forest Service

NDSWC 5882, North Dakota State Water Commission, test hole number 5882

PHS 34, Public Health Service, test hole number 34

USBIA, United States Bureau of Indian Affairs

USDI, United States Department of the Interior

USGS 13, United States Geological Survey, test hole number 13

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

C, commercial
D, dewatering
H, domestic
I, irrigation
N, industrial
P, public supply
S, stock
T, institutional
U, unused
Z, other

Principal aquifer

112, Pleistocene
125, Paleocene
211, Upper Cretaceous

BGFV, buried glaciofluvial deposits
CBLD, Cannonball-Ludlow members of Fort Union Formation
FXHL, Fox Hills Sandstone
GLNB, Glenburn aquifer
HLCK, Hell Creek Formation
LKSO, Lake Souris aquifer
OTSH, outwash deposits
PIRR, Pierre Shale
ROLL, Rolla aquifer
SLVL, Shell Valley aquifer

Specific conductance

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

Altitude of land surface (feet)

Altitude of land surface is reported with respect to the National Geodetic Vertical Datum of 1929 (NGVD). NGVD is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

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 AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
159-069-07CCC	NDSWC 5882	161	--	--	--	11/06/1980	--		--	--	--	--	--	1635
159-069-11ADA	KURTTI, T.	22	22	18	24	05/11/1977	9.00		05/11/1977	H	112BGFV	--	--	1650
159-069-15BBB	NDSWC 5793	121	--	--	--	09/29/1980	--		--	--	--	--	--	1625
159-069-23ADD	BUNN, A.	89	89	85	5	10/27/1976	45.00		10/27/1976	S	112BGFV	2400	8.0	1625
159-069-26CCC	NDSWC 5794	141	--	--	--	09/29/1980	--		--	--	--	--	--	1595
159-069-28BBB	NDSWC 5528	137	--	--	--	08/17/1979	--		--	U	--	--	--	1590
159-070-01AAA	NDSWC 174	100	--	--	--	1949	--		--	U	--	--	--	1640
159-070-02BBB	NDSWC 5531	122	--	--	--	08/21/1979	--		--	U	--	--	--	1625
159-070-04DDD	NDSWC 5801	61	--	--	--	10/01/1980	--		--	--	--	--	--	1605
159-070-10CCB	NDSWC 5800	101	--	--	--	10/01/1980	--		--	--	--	--	--	1600
159-070-13DCC	YODER, IVAN	120	--	--	--	06/18/1966		D	--	--	--	--	--	1630
159-070-13DDD	MENNONITE CH, SALEM, ND	60	60	--	--	06/17/1972	30.00		06/17/1972	H	--	--	--	1629
159-070-15ADC	JOHNSON, EVERETT	100	--	--	--	11/20/1965	--		--	--	--	--	--	1600
159-070-15CAC	JOHNSON, EVERETT	120	--	--	--	11/26/1965		D	--	U	--	--	--	1595
159-070-16BBA	NDSWC 5799	121	--	--	--	10/01/1980	--		--	--	--	--	--	1605
159-070-17DDD	NDSWC 5527	122	56	53	1.25	08/16/1979	30.15		10/03/1979	Z	112BGFV	800	8.0	1644
159-070-22BAD	HELMUTH, ERVIN	86	86	0	2	09/18/1965	40.00		09/18/1965	U	112BGFV	--	--	1620
159-070-25ADA	NDSWC 5883	201	--	--	--	11/06/1980	--		--	--	--	--	--	1630
159-070-29BBB	NDSWC 5798	81	61	58	1.25	09/30/1980	3.92	Z	12/15/1980	U	112BGFV	440	7.0	1613
159-070-33DDD	NDSWC 5796	121	83	80	1.25	09/30/1980	3.79		12/16/1980	U	112BGFV	--	--	1595
159-070-34BBB	NDSWC 5797	101	--	--	--	09/30/1980	--		--	--	--	--	--	1600
159-070-36CCC	NDSWC 5795	181	--	--	--	09/29/1980	--		--	--	--	--	--	1605
159-071-02BCD	HOCHSTETLER, VERNON	28	28	20	36	07/21/1974	8.00		07/21/1974	S	112OTSH	--	--	1620
159-071-04CAB1	MATTSON, GEORGE	68	68	63	4	01/03/1967	20.00		01/03/1967	H	112BGFV	--	--	1615
159-071-04CAB2	MATTSON, GEORGE	60	60	0	2	05/20/1967	8.00		05/20/1967	S	112BGFV	--	--	1610
159-071-04CAB3	MATTSON, GEORGE	55	55	34	2	03/22/1968	18.00		03/22/1968	S	112BGFV	--	--	1620
159-071-04CAB4	MATTSON, GEORGE	52	52	48	4	01/27/1969	9.00		01/27/1969	S	112BGFV	--	--	1610
159-071-04CAB5	MATTSON, GEORGE	70	65	45	4	07/01/1971	--		--	H	112BGFV	--	--	1620
159-071-04CBA	MATTSON, GEORGE	120	--	--	--	05/22/1973	--		--	U	--	--	--	1630
159-071-06AAA	NDSWC 5786	101	--	--	--	09/25/1980	--		--	--	--	--	--	1600
159-071-17BBB	NDSWC 5787	80	--	--	--	09/25/1980	--		--	--	--	--	--	1600
159-071-23DAC	NDSWC 5526	47	--	--	--	08/16/1979	--		--	--	--	--	--	1605
159-072-02DCD	LAW, RAY	217	217	175	4	11/13/1968	32.00		11/13/1968	S	211PIRR	--	--	1595
159-072-03BDA	MOORS, LEROY	75	75	70	4	06/15/1968	28.00		06/15/1968	--	112BGFV	--	--	1590
159-072-04AAB	NDSWC 5807	121	--	--	--	10/02/1980	--		--	--	--	--	--	1540
159-072-11BCC	KITTELSON, GARY	213	213	196	4	06/18/1968	35.00		06/18/1968	H	211PIRR	4000	--	1600
159-072-14AAB	BEAVER, ALVIS	200	200	160	5	05/02/1975	25.00		05/02/1975	H	211PIRR	--	--	1580
159-072-21CCC	NDSWC 5818	41	--	--	--	10/08/1980	--		--	--	--	--	--	1560
159-072-22AAA	NDSWC 5525	122	--	--	--	08/16/1979	--		--	--	--	--	--	1560
159-072-31BCC	NDSWC 5817	61	--	--	--	10/08/1980	--		--	--	--	--	--	1570

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159-073-01BBB	NDSWC 5520	92	--	--	--	08/15/1979	--		--	--	--	--	--	1550
159-073-06DDD	NDSWC 5824	121	--	--	--	10/08/1980	--		--	--	--	--	--	1510
159-073-08CCC	NDSWC 5821	61	--	--	--	10/08/1980	--		--	--	--	--	--	1515
159-073-08DDD	NDSWC 5820	101	--	--	--	10/08/1980	--		--	--	--	--	--	1500
159-073-12CDC	NDSWC 5819	61	--	--	--	10/08/1980	--		--	--	--	--	--	1565
159-073-18BCC	NDSWC 5523	92	--	--	--	08/15/1979	--		--	--	--	--	--	1494
159-073-19CBB	NDSWC 5822	261	200	197	1.25	10/08/1980	13.97		12/16/1980	--	112BGFV	2200	6.0	1490
159-073-22BBB	NDSWC 5522	107	50	47	1.25	08/15/1979	7.19		09/19/1979	U	112BGFV	2100	8.5	1500
159-073-23AAA	NDSWC 5521	242	--	--	--	08/15/1979	--		--	--	--	--	--	1542
159-073-23CDD	NDSWC 5815	161	--	--	--	10/07/1980	--		--	--	--	--	--	1507
159-073-27AAA	NDSWC 5814	241	113	110	1.25	10/07/1980	2.00+		12/16/1980	--	112BGFV	--	--	1512
159-073-30CCC	NDSWC 5823	141	--	--	--	10/08/1980	--		--	--	--	--	--	1495
159-073-35DDD	NDSWC 5524	287	--	--	--	08/16/1979	--		--	--	--	--	--	1639
159-073-36AAA	NDSWC 5816	81	--	--	--	10/08/1980	--		--	--	--	--	--	1575
159-074-05DDD	NDSWC 5830	121	78	75	1.25	10/09/1980	1.48		12/16/1980	--	112BGFV	--	--	1470
159-074-07DDD	NDSWC 1	100	--	--	--	07/11/1967	--		--	U	--	--	--	1470
159-074-16AUD	NDSWC 5540	152	--	--	--	08/22/1979	--		--	--	--	--	--	1470
159-074-17AAA	NDSWC 2	320	--	--	--	07/10/1967	--		--	U	--	--	--	1470
159-074-30AAA	NDSWC 3	80	--	--	--	07/12/1967	--		--	U	--	--	--	1488
159-074-32AAA	KUCKVOY, DENNIS	60	60	54	5	05/02/1975	8.00	P	05/02/1975	H	112BGFV	2600	11.0	1490
159-075-01CCC	NDSWC 4	200	--	--	--	07/13/1967	--		--	--	--	--	--	1458
159-075-02ACC	NDSWC 5	100	--	--	--	07/13/1967	--		--	--	--	--	--	1461
159-075-02BAA	HANSON, H.	80	80	--	--	1963	12.00		07/07/1963	H	112BGFV	2200	8.3	1465
159-075-10BBB	NDSWC 5541	107	--	--	--	08/22/1979	--		--	--	--	--	--	1460
159-075-11AUD	NDSWC 6	80	--	--	--	07/14/1967	--		--	--	--	--	--	1468
159-075-11CCD	NDSWC 7	120	--	--	--	07/12/1967	--		--	--	--	--	--	1460
159-075-11DAA	NDSWC 8	60	--	--	--	07/14/1967	--		--	--	--	--	--	1467
159-075-12A	WILLOW CITY, ND	34	33	21	36	06/14/1976	9.40	P	06/14/1977	P	112LKSU	1000	18.0	1471
159-075-12BBC	SCHUCHARD, VINCENT	25	25	--	--	1967	16.00		07/07/1967	H	112LKSU	979	8.9	1470
159-075-12CAA1	NDSWC 9	80	--	--	--	07/14/1967	--		--	--	--	--	--	1470
159-075-12CAA2	WILLOW CITY, ND	34	33	0	36	06/14/1976	15.30		06/18/1976	P	--	--	--	1470
159-075-12CAD	WITTMIER, DONALD	15	15	--	--	1966	12.00		07/07/1967	H	112LKSU	a/1470	7.2	1465
159-075-12CBB	NDSWC 10	100	--	--	--	07/12/1967	--		--	--	--	--	--	1460
159-075-12CBC	NDSWC 11	80	--	--	--	07/14/1967	--		--	--	--	--	--	1473
159-075-12CCB	NDSWC 12	340	--	--	--	07/11/1967	--		--	--	--	--	--	1462
159-075-12CCC	USGS 13	28	28	25	1.25	07/17/1967	7.40		07/17/1967	--	112LKSU	a/2530	7.2	1469
159-075-12CDD	NDSWC 14	32	32	29	1.25	07/17/1967	7.10		07/17/1967	U	112LKSU	a 1210	7.2	1465
159-075-12DCC	N CENTRAL ELEC	20	20	12	24	10/20/1975	5.00		10/20/1975	H	112LKSU	--	--	1465
159-075-12DDD	NDSWC 15	80	--	--	--	07/11/1967	--		--	--	--	--	--	1467
159-075-13BAA	NDSWC 16	34	31	25	1.25	07/17/1967	7.30		07/17/1967	U	112LKSU	a/913	6.7	1470

a/Value shown is the laboratory specific conductance.

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159-075-13BAC	NDSWC 17	60	--	--	--	07/17/1967	--	--	--	--	--	--	1470
159-075-16AAA	NDSWC 18	140	--	--	--	07/12/1967	--	--	--	--	--	--	1465
159-075-17AAA	NDSWC 5832	141	--	--	--	10/10/1980	--	--	--	--	--	--	1470
159-075-17BBA	BLOCK, CARRY	47	47	39	24	10/10/1975	19.00	10/10/1975	H,S	--	--	--	1470
159-075-20AAA	NDSWC 5831	101	--	--	--	10/10/1980	--	--	--	--	--	--	1465
159-075-24BBB	NDSWC 19	80	--	--	--	07/12/1967	--	--	--	--	--	--	1475
159-075-24CCC	NDSWC 20	80	--	--	--	07/12/1967	--	--	U	--	--	--	1480
159-075-26CCC	NDSWC 21	100	--	--	--	07/12/1967	--	--	U	--	--	--	1475
159-075-36BBB	NDSWC 22	100	--	--	--	07/12/1967	--	--	U	--	--	--	1475
159-081-01AAA	NDSWC 11066	180	--	--	--	09/12/1979	--	--	U	--	--	--	1485
159-081-02CCC	NDSWC 11023	220	--	--	--	08/16/1979	--	--	--	--	--	--	1500
159-081-03CDD	NDSWC 11025	200	--	--	--	08/16/1979	--	--	--	--	--	--	1497
159-081-06AAA	NDSWC 11069	220	--	--	--	09/13/1979	--	--	--	--	--	--	1510
159-081-07CCC	NDSWC 5202	180	--	--	--	08/09/1977	--	--	--	--	--	--	1525
159-081-08AAA	NDSWC 11056	180	--	--	--	09/06/1979	--	--	--	--	--	--	1505
159-081-08DDA	NDSWC 11058	300	181	178	1.25	09/06/1979	6.70+	09/10/1979	U	112GLNB	1600	8.5	1508
159-081-08DDD	NDSWC 5217	280	--	--	--	08/17/1977	--	--	--	--	--	--	1510
159-081-09AAA	NDSWC 11024	200	--	--	--	08/16/1979	--	--	--	--	--	--	1498
159-081-09ABB	NDSWC 11059	180	--	--	--	09/11/1979	--	--	--	--	--	--	1505
159-081-09BCC	NDSWC 11057	180	--	--	--	09/06/1979	--	--	--	--	--	--	1507
159-081-10ABA	NDSWC 11060	200	--	--	--	09/10/1979	--	--	--	--	--	--	1500
159-081-11ABB	NDSWC 11026	200	--	--	--	08/16/1979	--	--	--	--	--	--	1492
159-081-11DDD	NDSWC 11027	200	--	--	--	08/17/1979	--	--	--	--	--	--	1495
159-081-12ADD	NDSWC 11061	200	--	--	--	09/11/1979	--	--	--	--	--	--	1490
159-081-12BBB	NDSWC 11026	200	--	--	--	08/16/1979	--	--	--	--	--	--	1490
159-081-12BCC	NDSWC 11065	180	--	--	--	09/12/1979	--	--	--	--	--	--	1488
159-081-13BCC	NDSWC 11062	200	--	--	--	09/11/1979	--	--	--	--	--	--	1495
159-081-13CCC	NDSWC 11063	200	--	--	--	09/12/1979	--	--	--	--	--	--	1498
159-081-17AAA	NDSWC 5217A	240	206	203	1.25	08/18/1977	--	--	U	112GLNB	1500	8.0	1510
159-081-17ADD	NDSWC 5216	160	--	--	--	08/17/1977	--	--	--	--	--	--	1513
159-081-19AAA	USGS 65-47	245	245	--	--	07/29/1947	5.52	08/12/1947	U	112GLNB	--	--	1520
159-081-20AAB	NDSWC 5210	180	--	--	--	08/11/1977	--	--	--	--	--	--	1515
159-081-20BBB	NDSWC 5215	240	201	198	1.25	08/17/1977	.62+	11/11/1980	U	112GLNB	1500	7.0	1522
159-081-21AAA	NDSWC 5845	221	--	--	--	10/15/1980	--	--	--	--	--	--	1502
159-081-21ADD	NDSWC 5846	221	--	--	--	10/15/1980	--	--	--	--	--	--	1502
159-081-24CBB	NDSWC 11064	180	--	--	--	09/12/1979	--	--	--	--	--	--	1493
159-082-01BB	CARDINAL DRLG	6770	--	--	--	03/04/1956	--	--	--	--	--	--	1525
159-082-05AAA	NDSWC 11043	280	--	--	--	08/28/1979	--	--	--	--	--	--	1565
159-082-05AAB	ABERNATHEY, NORMAN	210	210	206	4	07/01/1974	30.00	07/01/1974	H	--	--	--	1550
159-082-05BBA	NDSWC 11034	320	228	225	1.25	08/22/1979	12.50	09/11/1979	U	112GLNB	1100	8.0	1555

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159-082-05CCD	NDSWC 11029	280	223	220	1.25	08/21/1979	17.02		09/11/1979	U	112GLN8	2400	8.0	1570
159-082-06ABA	NDSWC 8898	205	--	--	--	09/14/1973	--		--	--	--	--	--	1553
159-082-06CCC	NDSWC 11040	280	--	--	--	08/27/1979	--		--	--	--	--	--	1575
159-082-06DCD	NDSWC 11030	280	--	--	--	08/21/1979	--		--	--	--	--	--	1571
159-082-07BCC	NDSWC 11041	300	--	--	--	08/27/1979	--		--	--	--	--	--	1550
159-082-07DDD	NDSWC 11039	240	--	--	--	08/24/1979	--		--	--	--	--	--	1558
159-082-11DDD	NDSWC 5201	200	--	--	--	09/08/1977	--		--	--	--	--	--	1530
159-082-15AA	CARDINAL DRLG	5004	--	--	--	09/09/1955		D	--	--	--	--	--	1553
159-082-17AAA	NDSWC 11028	320	193	190	1.25	08/20/1979	6.00+		09/10/1979	U	112GLNB	--	--	1568
159-082-21AAA	NDSWC 5218	300	151	148	1.25	08/18/1977	4.30+		10/14/1980	U	112GLNB	1850	--	1545
159-082-21DAA	NDSWC 5208	220	--	--	--	08/11/1977	--		--	U	--	--	--	1535
159-082-22ADD1	NDSWC 5279	60	--	--	--	12/01/1977	--		--	--	--	--	--	1550
159-082-22ADD2	NDSWC 5279A	200	--	--	--	01/24/1978	--		--	U	--	--	--	1550
159-082-23ADA	NDSWC 5206	200	--	--	--	08/10/1977	--		--	--	--	--	--	1545
159-082-23BBB	NDSWC 5207	180	--	--	--	08/10/1977	--		--	U	--	--	--	1550
159-082-23DDD	NDSWC 5205	160	--	--	--	08/10/1977	--		--	U	--	--	--	1545
159-082-24ADA	NDSWC 5203	220	177	174	1.25	08/10/1977	--		--	U	112GLN8	2250	8.0	1535
159-082-25AAA	NDSWC 5204	200	--	--	--	08/10/1977	--		--	U	--	--	--	1545
159-082-27AAD	NDSWC 5200	200	162	159	1.25	08/09/1977	13.77		05/21/1980	U	112GLN8	1800	8.0	1557
159-082-27BAA	NDSWC 5277	208	--	--	--	11/29/1977	--		--	--	--	--	--	1561
159-082-27BBA	NDSWC 5278	220	--	--	--	11/30/1977	--		--	--	--	--	--	1550
159-082-28DDD	NDSWC 5209	240	--	--	--	08/11/1977	--		--	--	--	--	--	1570
159-082-34DDC	NDSWC 5276	400	241	238	1.25	11/29/1977	26.42		07/17/1980	U	112GLN8	1650	7.0	1563
159-082-34DDD	USGS 64-47	210	210	--	--	07/29/1947	7.50		08/12/1947	U	112GLN8	1650	7.0	1551
159-082-35BBA	NDSWC 5275	300	--	--	--	11/18/1977	--		--	--	--	--	--	1553
159-082-35BBB1	NDSWC 5274	380	262	259	1.25	11/17/1977	24.15		05/21/1980	U	112GLN8	2000	8.0	1560
159-082-35BBB2	NDSWC 5274A	270	181	178	1.25	11/17/1977	23.39		05/21/1980	U	112GLN8	1750	7.0	1560
159-082-35BBB3	NDSWC 10168	320	--	--	--	08/01/1978	--		--	--	--	--	--	1562
159-083-01AAA	NDSWC 11032	220	--	--	--	08/22/1979	--		--	--	--	--	--	1572
159-083-01BCC	NDSWC 2	294	--	--	--	07/07/1965	--		--	--	--	--	--	1555
159-083-02BCC	LECLAIR, PETER	12	12	--	--	1941	--		--	H	112QTSH	a/1890	6.6	--
159-083-03ABC	LANSFORD, ND	290	290	--	8	--	122.00		07/16/1965	P	211HLCK	4450	8.9	--
159-083-03ACB	NDSWC 1	315	--	--	--	07/06/1965	--		--	--	--	--	--	1610
159-083-03ACD	NDSWC 8902	100	--	--	--	09/18/1973	--		--	--	--	--	--	1607
159-083-03BAB	NDSWC 5560	226	--	--	--	09/11/1979	--		--	--	--	--	--	1601
159-083-03CDD	NDSWC 8903	1000	858	840	2	09/26/1973	--		--	U	211PIRR	--	--	1603
159-083-03DAA	LANSFORD, ND 1	266	266	0	6	1958	62.50	R	1958	P	211HLCK	4000	12.0	1604
159-083-03DDD	NDSWC 5559	257	--	--	--	09/11/1979	--		--	--	--	--	--	1602
159-083-04BCB	MARTINESON, SAM	10	10	--	--	1926	1.50		07/16/1965	H	112QTSH	a/1020	7.8	1590
159-083-04DBB	NDSWC 8	11	--	--	--	1966	--		--	--	--	--	--	1591

a/Value shown is the laboratory specific conductance.

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 AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
159-083-04QDC	NDSWC 5	21	--	--	--	1966	--		--	--	--	--	--	1620
159-083-05AAD	NDSWC 4	264	--	--	--	07/08/1965	--		--	--	--	--	--	1590
159-083-08BBB	NDSWC 8896	260	--	--	--	09/13/1973	--		--	--	--	--	--	1628
159-083-10CDA1	NDSWC 18	242	--	--	--	07/15/1965	--		--	--	--	--	--	1591
159-083-10CDA2	NDSWC 17	42	28	--	--	07/14/1965	21.00		07/15/1965	--	1128GFV	[a]/8720	8.0	1587
159-083-10DDA	SAVELKOUL, ROBERT	247	247	245	3.75	08/16/1972	20.00	P	08/16/1972	H	211HLCK	3750	14.0	1590
159-083-11AAA	NDSWC 11042	260	--	--	--	08/28/1979	--		--	--	--	--	--	1585
159-083-11ABA	HELMING, LYNN	408	408	--	6	--	--		--	U	211HLCK	[a]/4240	7.8	1585
159-083-11CCC1	NDSWC 19	42	--	--	--	07/15/1965	--		--	--	--	--	--	1585
159-083-11CCC2	HELMING, HERBERT	18	18	17	--	1923	--		--	P	112QTSH	[a]/791	8.9	1585
159-083-18AAA	NDSWC 5558	242	--	--	--	09/07/1979	--		--	--	--	--	--	1622
159-083-22BCC	NDSWC 8899	220	--	--	--	09/14/1973	--		--	--	--	--	--	1625
160-069-06DDD	NDSWC 5661	182	--	--	--	10/17/1979	--		--	--	--	--	--	1732
160-069-09BCC	NEAMEYER, DONALD	38	38	30	24	07/31/1975	9.69		06/07/1978	H	--	--	--	1740
160-069-15DDD	NDSWC 5659	197	--	--	--	10/17/1979	--		--	--	--	--	--	1715
160-069-16ABB	NDSWC 5660	332	--	--	--	10/17/1979	--		--	--	--	--	--	1730
160-069-27ACD	NDSWC 5530	242	141	138	1.25	08/20/1979	7.00		09/04/1979	U	112BGFV	2250	8.0	1695
160-069-29AAA	NDSWC 5658	203	--	--	--	10/16/1979	--		--	--	--	--	--	1695
160-069-31CAA	USGS 429	120	--	--	--	06/13/1951	--		--	--	--	--	--	1660
160-069-31CAB1	BAXSTROM, ARNOLD	--	40	--	24	1920	28.50		06/11/1951	S	--	--	--	1650
160-069-31CAB2	USGS 428	110	--	--	--	06/13/1951	--		--	--	112BGFV	1750	8.0	1650
160-069-31CAC1	MYLO	--	37	8	--	1946	--		--	P	--	--	--	1650
160-069-31CAC2	SCHELL, R.	--	40	--	9	1948	19.20		06/13/1951	S	--	--	--	1650
160-069-31CAC3	WELANDER, E.	--	36	--	--	1910	16.49		06/08/1951	H	--	--	--	1650
160-069-31CAC4	BAXSTROM, ARNOLD	--	43	--	24	1950	24.69		06/08/1951	H	--	--	--	1650
160-069-31CAC5	USGS 425	120	--	--	--	06/09/1951	--		--	--	--	--	--	1650
160-069-31CAC6	USGS 430	120	--	--	--	06/15/1951	--		--	--	--	--	--	1650
160-069-31CAD1	USGS 431	110	--	--	--	06/15/1951	--		--	--	--	--	--	1645
160-069-31CAD2	USGS 436	100	--	--	--	06/21/1951	--		--	--	--	--	--	1645
160-069-31CAD3	USGS 437	120	--	--	--	06/22/1951	--		--	--	--	--	--	1645
160-069-31CBA	USGS 434	110	--	--	--	06/19/1951	--		--	--	--	--	--	1650
160-069-31CBC	USGS 435	110	--	--	--	06/20/1951	--		--	--	--	--	--	1650
160-069-31CCA1	WELANDER, WALTER	--	85	--	24	1941	19.77		06/08/1951	--	--	--	--	1640
160-069-31CCA2	USGS 433	100	--	--	--	06/18/1951	--		--	--	--	--	--	1640
160-069-31CDA	USGS 438	100	--	--	--	06/25/1951	--		--	--	--	--	--	1650
160-069-31CDB1	JOHNSON, T.	--	76	--	24	1915	36.04		06/08/1951	H	--	--	--	1645
160-069-31CDB2	WELANDER, E.	--	26	--	--	1925	16.58		--	--	--	--	--	1645
160-069-31CDB3	USGS 426	110	--	--	--	06/11/1951	--		--	--	--	--	--	1645
160-069-31CDC	USGS 427	105	--	--	--	06/12/1951	--		--	--	--	--	--	1650
160-069-31DCB	USGS 432	100	--	--	--	06/18/1951	--		--	--	--	--	--	1645

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160-069-36DDD	NDSWC 5529	167	--	--	--	08/20/1979	--		--	--	--	--	--	1665
160-070-02CDD	GRABER, JOE	93	93	77	24	09/17/1976	17.60		09/17/1976	S	--	--	--	1720
160-070-02DCC1	GRABER, JACK	134	--	--	--	08/15/1973	--		--	U	--	--	--	1720
160-070-02DCC2	GRABER, JACK	125	--	--	--	08/17/1973	--		--	U	--	--	--	1720
160-070-12BCC1	GRABER, MONTE	26	--	--	--	08/23/1973	--		--	U	--	--	--	1695
160-070-12BCC2	GRABER, MONTE	47	47	35	4	08/23/1973	13.00		08/23/1973	S	--	--	--	1695
160-070-20CCC	NDSWC 5532	77	--	--	--	08/21/1979	--		--	--	--	--	--	1610
160-070-23CBC	EVANS PROD CORP	4949	--	--	--	06/09/1953	--		--	U	--	--	--	1680
160-070-23DDD	NDSWC 5657	107	75	72	1.25	10/16/1979	7.40		10/30/1979	U	1128GFV	2150	5.0	1660
160-070-27BBB	NDSWC 5656	107	--	--	--	10/16/1979	--		--	--	--	--	--	1650
160-070-30CDD	NDSWC 5802	81	--	--	--	10/01/1980	--		--	--	--	--	--	1610
160-071-02DDC	NDSWC 11429	20	--	--	--	10/16/1980	--		--	--	--	--	--	1660
160-071-03CCC	NDSWC 5792	80	--	--	--	09/26/1980	--		--	--	--	--	--	1685
160-071-05AAA	NDSWC 5599	242	--	--	--	10/11/1979	--		--	--	--	--	--	1655
160-071-05BAA	NDSWC 11408	47	35	32	1.25	10/14/1980	12.60		12/16/1980	--	1128LVL	760	7.0	1646
160-071-07AAA	NDSWC 11407	60	41	35	1.25	10/14/1980	6.60		12/16/1980	--	1128LVL	965	6.5	1628
160-071-07BBC	NDSWC 5889	141	111	108	1.25	11/11/1980	17.90		12/16/1980	--	1128LVL	1450	6.0	1620
160-071-07BCC	NDSWC 5931	100	51	48	1.25	06/03/1981	--		--	--	1128LVL	1500	7.0	1620
160-071-07DDD	NDSWC 5926	120	--	--	--	06/02/1981	--		--	--	--	--	--	1629
160-071-14BBB	NDSWC 11430	20	--	--	--	10/16/1980	--		--	--	--	--	--	1636
160-071-16AAA	NDSWC 5791	60	--	--	--	09/26/1980	--		--	--	--	--	--	1650
160-071-16BBB	NDSWC 11406	160	84	78	1.25	10/10/1980	5.33		12/16/1980	--	1128LVL	915	7.0	1627
160-071-16DDD	NDSWC 5790	161	29	26	1.25	09/26/1980	9.25		10/20/1980	--	1128LVL	--	--	1635
160-071-19DDD	NDSWC 5786	140	32	26	1.25	09/25/1980	5.44		12/15/1980	--	1128LVL	645	7.0	1615
160-071-20DAD	SAWCHUCK, DR. JOHN	20	20	12	36	07/19/1974	8.00		07/19/1974	S	1128LVL	--	--	1625
160-071-20DBC	FARMERS UNION, ROLETTE	51	40	34	4	09/23/1976	10.00		09/23/1976	N	1128LVL	--	--	1620
160-071-21BBB	NDSWC 5789	101	--	--	--	09/26/1980	--		--	--	--	--	--	1630
160-071-21CCB	ROLETTE, ND	49	49	35	8	03/25/1975	14.00		03/25/1975	P	1128LVL	625	6.0	1640
160-071-22DDD	NDSWC 5933	77	51	48	1.25	08/21/1979	3.70		09/17/1979	U	1128LVL	1000	8.0	1619
160-071-24DDD	NDSWC 5784	141	103	100	1.25	09/25/1980	14.34		12/15/1980	--	1128LVL	1290	5.0	1620
160-071-26AAA	NDSWC 5783	140	94	88	1.25	09/25/1980	26.66		12/15/1980	--	1128LVL	790	7.0	1640
160-071-28AAA	NDSWC 5803	81	44	37	1.25	10/01/1980	5.17		12/15/1980	--	1128LVL	420	7.0	1622
160-071-29ADD	NDSWC 5785	121	44	38	1.25	10/25/1980	6.19		12/16/1980	--	1128LVL	600	7.0	1620
160-071-29CCD	TAYLOR, HOWARD	42	42	34	5	06/29/1976	9.00		06/29/1976	H	1128LVL	--	--	1610
160-071-32AAD	ANKLAM, DONALD	32	32	28	24	12/01/1976	10.00	R	06/08/1978	H	1128LVL	--	--	1610
160-072-01ADD	NDSWC 5887	81	--	--	--	11/10/1980	--		--	--	--	--	--	1631
160-072-02AAA	NDSWC 5653	47	32	26	1.25	10/15/1979	8.20		11/06/1979	U	1128LVL	1350	5.5	1621
160-072-02CAB	NDSWC 5891	61	--	--	--	11/11/1980	--		--	--	--	--	--	1632
160-072-02CBC	NDSWC 11482	120	51	48	1.25	12/04/1980	7.82		04/06/1981	--	1128LVL	--	--	1613
160-072-03ADA	NDSWC 11480	80	--	--	--	12/04/1980	--		--	--	--	--	--	1635

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160-072-03BBB1	NDSWC 5893	121	81	78	1.25	11/11/1980	32.95	12/16/1980	--	112SLVL	1100	5.0	1642
160-072-03BBB2	NDSWC 5930	80	--	--	--	06/03/1981	--	--	--	--	--	--	1642
160-072-03BBC	NDSWC 5896	101	71	68	1.25	11/12/1980	34.00	12/16/1980	--	112SLVL	1400	5.5	1630
160-072-04ADD	NDSWC 5929	100	48	45	1.25	06/03/1981	--	--	--	--	--	--	1650
160-072-04BBC	NDSWC 5913	60	--	--	--	03/18/1981	--	--	--	--	--	--	1600
160-072-04BCB	NDSWC 5915	60	--	--	--	03/19/1981	--	--	--	--	--	--	1600
160-072-04DAA	NDSWC 5895	61	--	--	--	11/12/1980	--	--	--	--	--	--	1628
160-072-05ADD	NDSWC 11494	120	101	98	1.25	12/10/1980	33.79	04/06/1981	--	112SLVL	1100	6.0	1615
160-072-05DAD	NDSWC 5912	158	143	139	1.25	03/18/1981	--	--	--	112SLVL	--	--	1610
160-072-06BBB	NDSWC 5810	81	--	--	--	10/03/1980	--	--	--	--	--	--	1585
160-072-06BCC	NDSWC 11478	107	74	71	1.25	12/03/1980	.92+	04/06/1981	--	112BGFV	--	--	1574
160-072-07BBB	NDSWC 5809	101	--	--	--	10/02/1980	--	--	--	--	--	--	1590
160-072-08AAA	NDSWC 5914	100	--	--	--	03/19/1981	--	--	--	--	--	--	1590
160-072-10AAA	NDSWC 11432	60	--	--	--	10/18/1980	--	--	--	--	--	--	1623
160-072-10ADA	NDSWC 5892	61	--	--	--	11/11/1980	--	--	--	--	--	--	1620
160-072-10DAA	NDSWC 5890	61	--	--	--	11/11/1980	--	--	--	--	--	--	1608
160-072-11CBB	NDSWC 5901	112	--	--	--	11/12/1980	--	--	--	--	--	--	1620
160-072-11DDA	NDSWC 5885	61	--	--	--	11/10/1980	--	--	--	--	--	--	1610
160-072-12AAB	NDSWC 5655	77	45	42	1.25	10/15/1979	17.45	10/30/1979	U	112SLVL	1700	5.0	1632
160-072-12ADD	NDSWC 5886	121	39	36	1.25	11/10/1980	13.06	12/16/1980	--	112SLVL	--	--	1622
160-072-12DAD	NDSWC 5888	121	49	46	1.25	11/11/1980	10.60	12/16/1980	--	112SLVL	790	5.7	1615
160-072-12DDD	NDSWC 11431	80	41	38	1.25	10/16/1980	19.05	12/16/1980	--	112SLVL	1450	7.0	1630
160-072-13CCC	NDSWC 5536	55	24	21	1.25	08/22/1979	5.04	09/04/1979	U	112SLVL	900	8.0	1594
160-072-13DDD	NDSWC 5534	77	53	47	1.25	08/21/1979	5.04	09/04/1979	U	112SLVL	1000	10.0	1609
160-072-15AAA	NDSWC 5884	81	--	--	--	11/10/1980	--	--	--	--	--	--	1620
160-072-21AAA	NDSWC 5805	61	--	--	--	10/02/1980	--	--	--	--	--	--	1585
160-072-22DA	LION OIL	3155	--	--	--	07/22/1955	--	--	--	--	--	--	1591
160-072-23BBB	NDSWC 5537	107	--	--	--	08/22/1979	--	--	--	--	--	--	1621
160-072-24CCB	NDSWC 5535	77	25	22	1.25	08/21/1979	8.19	09/04/1979	U	112SLVL	620	8.0	1600
160-072-25AAA	NDSWC 5804	81	--	--	--	10/02/1980	--	--	--	--	--	--	1600
160-072-28DDD	NDSWC 5806	101	--	--	--	10/02/1980	--	--	--	--	--	--	1605
160-072-29CBB	BARBOT, AIME	18	18	10	24	06/29/1976	7.80	06/08/1978	H	112BGFV	900	6.0	1585
160-072-30ADC	BARBOT, AIME	265	--	--	--	07/01/1964	--	--	U	--	--	--	1595
160-072-32DCC	NDSWC 5808	101	--	--	--	10/02/1980	--	--	--	--	--	--	1590
160-073-01BCB1	ARSTEIN, ALVIN	58	58	0	6	11/19/1963	18.00	11/19/1963	H	112BGFV	--	--	1566
160-073-01BCB2	ARSTEIN, ALVIN	62	62	58	6	04/25/1964	15.00	04/25/1964	H	112BGFV	1220	5.0	1568
160-073-12DAA	NDSWC 11477	40	--	--	--	12/03/1980	--	--	--	--	--	--	1597
160-073-13AAA	NDSWC 11476	40	--	--	--	12/03/1980	--	--	--	--	--	--	1580
160-073-14DDD	NDSWC 5518	122	--	--	--	08/14/1979	--	--	--	--	--	--	1552
160-073-17CCC	NDSWC 5538	62	--	--	--	08/22/1979	--	--	--	--	--	--	1541

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160-073-27DDD	NDSWC 5519	92	--	--	--	08/14/1979	--		--	--	--	--	--	1551
160-073-30DDD	NDSWC 5826	121	--	--	--	10/09/1980	--		--	--	--	--	--	1520
160-073-31DDD	NDSWC 5825	141	--	--	--	10/09/1980	--		--	--	--	--	--	1515
160-074-12BAB	RUDE, RICHARD	188	188	70	4	10/24/1972	18.00	P	10/24/1972	H	211FXML	3750	15.0	1550
160-074-13ACD	OVERLY, ND	22	22	--	--	1935	--		--	P	112LKSD	1250	5.5	--
160-074-21BBA	NDSWC 5539	107	66	63	1.25	08/22/1979	3.02		12/11/1979	U	1128GFV	1900	7.0	1523
160-074-27DDD	NDSWC 5827	101	--	--	--	10/09/1980	--		--	--	--	--	--	1530
160-074-31DDD	NDSWC 23	220	--	--	--	07/14/1967	--		--	--	--	--	--	1472
160-074-32DDD	NDSWC 5829	101	--	--	--	10/09/1980	--		--	--	--	--	--	1480
160-074-33BBB	NDSWC 5828	101	--	--	--	10/09/1980	--		--	--	--	--	--	1490
160-075-03BCA	KIPPEN, CHARLES	20	20	12	24	05/25/1977	8.00		05/25/1977	S	--	--	--	1530
160-075-04CAA	BECKEDAHL, ED	34	34	0	8	1979	17.00	P	08/15/1979	H,S	1128GFV	6000	8.0	1520
160-075-08AAD	NDSWC 5543	77	--	--	--	08/23/1979	--		--	--	--	--	--	1499
160-075-14ADD	EGGE, GEORGE	80	80	40	5	06/18/1975	20.00		06/18/1975	H	--	--	--	1505
160-075-30BBD	BOETTCHER, MELVIN	28	28	20	24	10/23/1974	8.00		10/23/1974	H	--	--	--	1455
160-075-31DDD	NDSWC 5542	107	--	--	--	08/22/1979	--		--	--	--	--	--	1465
160-075-35DAD	NDSWC 24	120	--	--	--	07/13/1967	--		--	--	--	--	--	1463
160-075-36BBB	NDSWC 25	160	--	--	--	07/13/1967	--		--	U	--	--	--	1470
160-076-02AAA	NDSWC 5544	77	--	--	--	08/23/1979	--		--	--	--	--	--	1473
160-076-02BBB	NDSWC 5837	101	--	--	--	10/14/1980	--		--	--	--	--	--	1470
160-076-03BBB	NDSWC 5838	141	53	50	1.25	10/14/1980	17.10		12/17/1980	--	1128GFV	1080	6.0	1480
160-076-05DDD	NDSWC 5545	167	--	--	--	08/28/1979	--		--	--	--	--	--	1460
160-076-09BCC	MILBRATH, WILLIAM	72	72	64	24	07/25/1975	15.50		07/25/1975	H	--	--	--	1470
160-076-10CCC	NDSWC 5835	141	--	--	--	10/13/1980	--		--	--	--	--	--	1465
160-076-11CCC	NDSWC 5836	141	111	108	1.25	10/13/1980	8.90		12/17/1980	--	1128GFV	2390	6.5	1460
160-076-23CCC1	NDSWC 5546	197	--	--	--	08/23/1979	--		--	I	--	--	--	1460
160-076-23CCC2	NDSWC 5546A	97	92	89	1.25	08/23/1979	7.82		12/17/1980	U	1128GFV	1700	7.0	1460
160-076-23DDD	NDSWC 5833	141	80	77	1.25	10/10/1980	7.91		12/19/1980	--	1128GFV	--	--	1460
160-076-27BBB	NDSWC 5834	101	--	--	--	10/13/1980	--		--	--	--	--	--	1460
160-077-08ADD	NDSWC 5547	122	--	--	--	08/28/1979	--		--	--	--	--	--	1444
160-077-14ADD	NDSWC 5839	121	--	--	--	10/14/1980	--		--	--	--	--	--	1443
160-077-19BBB	NDSWC 5840	81	--	--	--	10/14/1980	--		--	--	--	--	--	1455
160-077-29BA	NORTHWEST OIL	3891	--	--	--	08/11/1953	--		--	U	--	--	--	1453
160-078-11CCC	NDSWC 5548	107	--	--	--	08/28/1979	--		--	--	--	--	--	1452
160-078-17DDD	NDSWC 5842	161	--	--	--	10/14/1980	--		--	--	--	--	--	1444
160-079-01BA	MCALESTER FUEL	3465	--	3333	5.50	04/09/1959	--		--	--	--	--	--	1452
160-079-06AAA	NDSWC 5550	152	--	--	--	08/28/1979	--		--	--	--	--	--	1460
160-079-06ACC	NEWBURG, ND	107	107	99	8	09/12/1974	40.00	P	09/12/1974	P	1128GFV	2200	12.0	1465
160-079-17AAB	TVEDT, BOB	200	102	97	5	09/20/1974	30.00		09/20/1974	H,S	--	--	--	1455
160-079-21BBB	NDSWC 5549	152	--	--	--	08/28/1979	--		--	--	--	--	--	1462

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 AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
160-080-02DDD	HUNSKOR, ERVIN	170	170	159	4	07/16/1972	18.00	P	07/16/1972	H	211FXHL	6000	15.0	1475
160-080-05AC	AMERADA PET. CO	4318	--	--	--	09/12/1955	--		--	--	--	--	--	1503
160-080-09DDA	MILLER, LLOYD	94	94	90	4	10/03/1975	20.00		10/03/1975	H	--	--	--	1480
160-080-14CDD	HALL, DAVID	140	92	87	4	--	30.00		--	H	--	--	--	1485
160-080-19CCC	NDSWC 5552	197	--	--	--	08/29/1979	--		--	--	--	--	--	1493
160-080-20AAA	NDSWC 5844	201	--	--	--	10/15/1980	--		--	--	--	--	--	1490
160-080-23BBB	NDSWC 5843	371	--	--	--	10/15/1980	--		--	--	--	--	--	1480
160-080-30DDD	ELLSWORTH, LARRY	128	128	0	4	08/31/1972	70.00		08/31/1972	H	--	--	--	1490
160-081-01ADD	NDSWC 11447	200	--	--	--	11/04/1980	--		--	--	--	--	--	1495
160-081-02BBB	MAXBASS, ND	15	15	0	1.25	1972	4.00	P	1978	P	112LKSD	1400	10.0	1500
160-081-04BBB	MAXBASS, ND	12	12	10	1.25	04/21/1973	6.50		04/21/1973	U	112LKSD	1500	10.0	1500
160-081-25AAA	NDSWC 11068	200	--	--	--	09/13/1979	--		--	--	--	--	--	1494
160-081-33BBB	NDSWC 5553	182	--	--	--	08/29/1979	--		--	--	--	--	--	1489
160-081-35DC	USGS	185	--	--	--	--	--		--	--	--	--	--	1480
160-081-35DCC	USGS 66-47	185	185	--	--	07/29/1947	3.97		07/29/1947	--	--	--	--	1490
160-081-36AAA	NDSWC 11067	200	--	--	--	09/13/1979	--		--	--	--	--	--	1493
160-082-01AAA	NDSWC 5848	241	--	--	--	10/16/1980	--		--	--	--	--	--	1513
160-082-02BBB	NDSWC 11433	220	--	--	--	10/20/1980	--		--	--	--	--	--	1522
160-082-02CCC	NDSWC 11457	240	--	--	--	11/11/1980	--		--	--	--	--	--	1517
160-082-02DCC	NDSWC 11450	200	--	--	--	11/05/1980	--		--	--	--	--	--	1515
160-082-02DDC	NDSWC 11458	340	--	--	--	11/11/1980	--		--	--	--	--	--	1513
160-082-03BBB	NDSWC 11434	240	--	--	--	10/21/1980	--		--	--	--	--	--	1520
160-082-05DAD	NDSWC 11448	260	--	--	--	11/05/1980	--		--	--	--	--	--	1530
160-082-06BBB	NDSWC 8904	100	--	--	--	09/27/1973	--		--	--	--	--	--	1522
160-082-06DDA	NDSWC 8906	100	--	--	--	09/27/1973	--		--	--	--	--	--	1520
160-082-10CCC	USGS 57-47	205	205	--	--	07/25/1947	20.80		08/12/1947	H	--	--	--	1519
160-082-11BCC	NDSWC 11451	400	--	--	--	11/06/1980	--		--	--	--	--	--	1520
160-082-12AAB	NDSWC 11446	220	--	--	--	11/04/1980	--		--	--	--	--	--	1517
160-082-12ABA	NDSWC 11445	220	--	--	--	11/03/1980	--		--	--	--	--	--	1515
160-082-12BBB	NDSWC 5849	241	--	--	--	10/16/1980	--		--	U	--	--	--	1520
160-082-14AAA1	NDSWC 5850	321	193	190	1.25	10/17/1980	5.30+		11/11/1980	--	112GLN8	2220	7.5	1513
160-082-14AAA2	NDSWC 5850-2	80	75	72	1.25	10/17/1980	6.40		12/17/1980	--	112GLN8	2420	7.0	1513
160-082-14AAD	NDSWC 11455	280	--	--	--	11/10/1980	--		--	--	--	--	--	1515
160-082-14ABA	NDSWC 11456	320	--	--	--	11/11/1980	--		--	--	--	--	--	1515
160-082-14ABB	NDSWC 11452	200	--	--	--	11/06/1980	--		--	--	--	--	--	1513
160-082-14CBB	NDSWC 11454	200	--	--	--	11/07/1980	--		--	--	--	--	--	1521
160-082-14CCC	NDSWC 11453	220	--	--	--	11/06/1980	--		--	--	--	--	--	1523
160-082-23AAA	NDSWC 5554	242	207	201	1.25	08/29/1979	6.29		10/02/1979	U	112GLN8	--	--	1506
160-082-26CCC	NDSWC 11436	220	--	--	--	10/21/1980	--		--	--	--	--	--	1530
160-082-28AAA	NDSWC 11437	220	--	--	--	10/28/1980	--		--	--	--	--	--	1535

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160-082-29BAA	NDSWC 11036	240	--	--	--	08/23/1979	--	--	--	--	--	--	1561
160-082-29DCD	MIDDAUGH, JERALD	208	208	2	4	09/18/1972	23.00	09/18/1972	H	112BGFV	1300	--	1560
160-082-30DCC	NDSWC 11037	240	--	--	--	08/23/1979	--	--	--	--	--	--	1565
160-082-30DDD	NDSWC 11035	280	--	--	--	08/23/1979	--	--	--	--	--	--	1560
160-082-31BBB	NDSWC 11031	240	--	--	--	08/21/1979	--	--	--	--	--	--	1566
160-082-31DCD	NDSWC 11033	240	--	--	--	08/22/1979	--	--	--	--	--	--	1550
160-082-32BBA	NDSWC 11038	240	--	--	--	08/23/1979	--	--	--	--	--	--	1565
160-082-35DDD	NDSWC 11435	200	--	--	--	10/21/1980	--	--	--	--	--	--	1521
160-082-36AAA	NDSWC 11070	200	151	148	1.25	09/14/1979	5.37+	11/11/1980	U	112GLNB	2200	8.0	1507
160-082-36DDD	NDSWC 5847	201	--	--	--	10/16/1980	--	--	--	--	--	--	1515
160-083-01AAA	NDSWC 11440	200	--	--	--	10/29/1980	--	--	--	--	--	--	1520
160-083-01AAB	NDSWC 8905	100	--	--	--	09/27/1973	--	--	--	--	--	--	1523
160-083-06DDA	NDSWC 11449	180	--	--	--	11/05/1980	--	--	--	--	--	--	1580
160-083-13CCC	NDSWC 11439	220	--	--	--	10/29/1980	--	--	--	--	--	--	1572
160-083-14ADD	UNDLIN, LLOYD	190	190	1	4	04/28/1973	19.00	04/28/1973	H,S	--	--	--	1575
160-083-16DDD	NDSWC 8901	250	--	--	--	09/18/1973	--	--	--	--	--	--	1605
160-083-20DDD	NDSWC 11051	240	--	--	--	09/04/1979	--	--	--	--	--	--	1592
160-083-21CDD	NDSWC 11052	220	--	--	--	09/05/1979	--	--	--	--	--	--	1560
160-083-21DDD	NDSWC 11048	260	--	--	--	08/30/1979	--	--	--	--	--	--	1594
160-083-22DCC	NDSWC 11054	260	--	--	--	09/05/1979	--	--	--	--	--	--	1590
160-083-23DCC	NDSWC 11055	260	--	--	--	09/05/1979	--	--	--	--	--	--	1582
160-083-26AAA	NDSWC 11438	220	--	--	--	10/28/1980	--	--	T	--	--	--	1573
160-083-26DDD	NDSWC 11049	240	--	--	--	08/31/1979	--	--	--	--	--	--	1580
160-083-27BCC	NDSWC 8900	220	--	--	--	09/17/1973	--	--	--	--	--	--	1565
160-083-27CU	HAMMER, HORTENSE	500	500	--	--	1918	1.00+	07/16/1965	H	211FXHL	a/4070	6.1	1570
160-083-27CUC	NDSWC 11050	223	--	--	--	09/04/1979	--	--	--	--	--	--	1575
160-083-27CUD	NDSWC 3	231	--	--	--	07/08/1965	--	--	--	--	--	--	1560
160-083-28CBB	NDSWC 11053	260	--	--	--	09/05/1979	--	--	--	--	--	--	1615
160-083-33AAB	NDSWC 11047	90	--	--	--	08/30/1979	--	--	--	--	--	--	1605
160-083-34CCC	NDSWC 5557	257	--	--	--	09/06/1979	--	--	--	--	--	--	1607
160-083-35BBB	NDSWC 11046	240	--	--	--	08/29/1979	--	--	--	--	--	--	1585
160-083-35CCC	NDSWC 11045	100	82	79	1.25	08/29/1979	8.56	12/10/1979	U	112BGFV	3500	7.0	1590
160-083-35DCC	NDSWC 8897	200	--	--	--	09/13/1973	--	--	--	--	--	--	1560
160-083-35DDA	NDSWC 11044	260	233	230	1.25	08/28/1979	31.16	05/12/1980	U	112GLNB	2200	7.5	1580
161-069-04AAU	TIMMERMAN, WESLEY	92	91	87	24	10/08/1976	21.00	10/08/1976	H	--	--	--	1780
161-069-04CCC	NDSWC 5665	212	--	--	--	10/23/1979	--	--	--	--	--	--	1787
161-069-05BAA	NDSWC 5873	261	--	--	--	10/31/1980	--	--	--	--	--	--	1815
161-069-16BDD	LANGE, ARNOLD	127	127	123	4	10/19/1976	39.00	10/19/1976	S	--	--	--	1800
161-069-19DDD	NDSWC 10353	200	--	--	--	10/20/1978	--	--	--	--	--	--	1740
161-069-20DDD	NDSWC 5881	201	--	--	--	11/05/1980	--	--	U	--	--	--	1772

a/Value shown is the laboratory specific conductance.

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161-069-21DDD	NDSWC 10354	240	161	158	1.25	10/26/1978	16.19		10/31/1978	U	112BGFV	1550	5.5	1780
161-069-22BBB	KARNOPP, CLARENCE	185	170	158	4	09/28/1962	30.00		09/28/1962	H	--	--	--	1790
161-069-24CCC	NDSWC 5371	200	--	--	--	09/07/1978	--		--	--	--	--	--	1767
161-069-30ADD	ROY, TED & MIKE	95	93	85	24	09/06/1975	--		--	H	--	--	--	1760
161-069-35BBB	NDSWC 5662	197	--	--	--	10/18/1979	--		--	--	--	--	--	1773
161-070-08DDC	NDSWC 5663	137	--	--	--	10/18/1979	--		--	--	--	--	--	1817
161-070-25BAB	GEFROH, GORDON	54	53	45	36	06/08/1977	28.00		06/08/1977	S,H	--	--	--	1750
161-070-26AAA	NDSWC 5372	200	--	--	--	09/07/1978	--		--	--	--	--	--	1740
161-070-29AAA1	LEMIEUX, HOWARD	55	55	49	4	11/11/1965	20.00		11/11/1965	S,H	--	--	--	1765
161-070-29AAA2	NDSWC 10352	140	--	--	--	10/26/1978	--		--	--	--	--	--	1767
161-070-33BBB	LEMIEUX, PAUL	93	82	66	18	08/04/1974	37.00		08/04/1974	S	--	--	--	1745
161-071-02AAA	USGS BEL.16	280	--	--	--	12/10/1973	--		--	--	--	--	--	1805
161-071-02BBC	USGS BEL.18	240	--	--	--	12/11/1973	--		--	--	--	--	--	1785
161-071-02BCC	NDSWC 33	40	32	26	1.25	10/29/1974	--		--	--	112SLVL	--	--	1770
161-071-02BCD	NDSWC 27	40	32	26	1.25	10/29/1974	--		--	--	112SLVL	820	5.0	1768
161-071-02BDC	NDSWC 28	40	26	20	1.25	10/29/1974	--		--	--	112SLVL	750	5.0	1765
161-071-02CBB1	NDSWC 23	40	--	--	--	10/28/1974	--		--	--	--	--	--	1762
161-071-02CBB2	NDSWC 24	50	41	35	1.25	10/28/1974	--		--	--	112SLVL	880	5.0	1760
161-071-02CBB3	NDSWC 29	40	32	27	1.25	10/29/1974	--		--	--	112SLVL	--	--	1760
161-071-02CBB4	NDSWC 30	50	39	33	1.25	10/29/1974	--		--	--	112SLVL	--	--	1760
161-071-02CBB5	NDSWC 31	35	32	26	1.25	10/29/1974	--		--	--	112SLVL	--	--	1760
161-071-02CBB6	NDSWC 32	35	32	26	1.25	10/29/1974	--		--	--	112SLVL	--	--	1760
161-071-02CBB7	NDSWC 40	35	18	10	5	10/30/1974	4.34		12/16/1980	--	112SLVL	--	--	1760
161-071-02CBC1	NDSWC 25	25	20	12	1.25	10/28/1974	6.00		1974	--	112SLVL	800	5.0	1760
161-071-02CBC2	NDSWC 26	50	40	34	1.25	10/28/1974	--		--	--	112SLVL	--	--	1760
161-071-03BCC1	NDSWC 5595	167	--	--	--	10/10/1979	--		--	--	--	--	--	1752
161-071-03BCC2	NDSWC 5595A	40	38	35	1.25	10/10/1979	12.55		10/16/1979	U	112SLVL	1550	5.0	1752
161-071-03CCD	PHS 34	40	32	26	1.25	10/29/1974	16.48		06/21/1979	--	112SLVL	880	5.0	1749
161-071-03CDC1	PHS 38	40	32	26	1.25	10/30/1974	19.55		12/16/1980	--	112SLVL	880	5.0	1754
161-071-03CDC2	PHS 39	40	32	26	1.25	10/31/1974	19.18		12/16/1980	--	112SLVL	--	--	1750
161-071-03CDD1	PHS 35	60	39	33	1.25	10/29/1974	21.68		12/16/1980	--	112SLVL	700	5.0	1754
161-071-03CDD2	PHS 36	40	32	26	1.25	10/30/1974	20.58		12/16/1980	--	112SLVL	--	--	1751
161-071-03CDD3	PHS 37	40	32	26	1.25	10/30/1974	18.35		12/16/1980	--	112SLVL	--	--	1750
161-071-03CDD4	PHS 41	42	38	28	8	11/04/1974	19.97	S	12/16/1980	--	112SLVL	600	5.0	1752
161-071-03CDD5	PHS 42	40	32	26	1.25	11/05/1974	--		--	--	112SLVL	--	--	1751
161-071-04CCC	NDSWC 5902	161	41	38	1.25	11/13/1980	6.20		12/16/1980	--	112SLVL	850	4.9	1720
161-071-04DDC	NDSWC 20	40	30	24	1.25	1974	8.00		1974	--	112SLVL	--	--	1740
161-071-06DDC	NDSWC 11484	100	--	--	--	12/04/1980	--		--	--	--	--	--	1698
161-071-07AAA	INDIAN HEALTH, ABERDEEN	120	--	--	--	04/20/1981	--		--	--	--	--	--	1700
161-071-07DCC1	NDSWC 5905	121	--	--	--	11/14/1980	--		--	--	--	--	--	1710

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161-071-07DCC2	INDIAN HEALTH, ABERDEEN	100	--	--	--	05/11/1981	--	--	--	--	--	--	1705
161-071-07DCD	NDSWC 11493	80	--	--	--	12/09/1980	--	--	--	--	--	--	1696
161-071-07DDC	NDSWC 11492	100	--	--	--	12/09/1980	--	--	--	--	--	--	1708
161-071-07DDD1	NDSWC 5904	101	78	75	1.25	11/13/1980	34.49	12/16/1980	--	112SLVL	1250	5.5	1695
161-071-07DDD2	INDIAN HEALTH, ABERDEEN	160	151	148	1.25	04/27/1981	--	--	--	112SLVL	--	--	1695
161-071-08ABA	NDSWC 11485	120	--	--	--	12/04/1980	--	--	--	--	--	--	1716
161-071-08ADD	NDSWC A	140	--	--	--	10/07/1980	--	--	--	--	--	--	1711
161-071-08BCB	NDSWC 11425	160	38	35	1.25	10/15/1980	6.67	12/16/1980	--	112SLVL	1220	6.5	1695
161-071-08CBB	NDSWC 5589	182	156	150	1.25	10/09/1979	34.90	10/16/1979	U	112BGFV	1400	5.5	1695
161-071-08CCB	NDSWC 11426	180	141	138	1.25	10/15/1980	30.52	12/16/1980	--	112BGFV	1220	6.0	1691
161-071-08CCD	NDSWC 11491	80	--	--	--	12/09/1980	--	--	--	--	--	--	1695
161-071-08CDC	NDSWC 11490	80	--	--	--	12/09/1980	--	--	--	--	--	--	1693
161-071-08DCD	NDSWC 5588	77	40	37	1.25	10/09/1979	9.32	02/12/1980	U	112SLVL	880	6.0	1694
161-071-09AAD1	ALL SEASONS, WSI 15	60	38	28	1.25	06/06/1979	13.27	06/06/1979	--	112SLVL	--	--	1735
161-071-09AAD2	ALL SEASONS, WSI 16	60	27	22	1.25	06/06/1979	16.30	05/13/1980	--	112SLVL	--	--	1735
161-071-09ADD	ALL SEASONS, WSI 14	60	48	38	1.25	06/05/1979	15.70	12/12/1979	--	112SLVL	--	--	1730
161-071-09BAA	NDSWC 11486	140	--	--	--	12/05/1980	--	--	--	--	--	--	1730
161-071-09BBC	NDSWC 11487	120	49	46	1.25	12/05/1980	--	--	--	112SLVL	--	--	1715
161-071-09CBC1	NDSWC 11488	103	--	--	--	12/05/1980	--	--	--	--	--	--	1708
161-071-09CBC2	NDSWC 11489	100	--	--	--	12/08/1980	--	--	--	--	--	--	1708
161-071-09CCC	NDSWC B	120	39	35	1.25	10/07/1980	5.77	12/16/1980	--	112SLVL	890	7.0	1703
161-071-09CCD	MONGEON, ADRIEN	35	30	20	5	12/04/1979	8.00	12/04/1979	S	112SLVL	--	--	1705
161-071-09DDB	MONGEON, JIM	75	71	51	16	12/03/1979	17.00	12/03/1979	I	112SLVL	--	--	1720
161-071-10ABB	PHS 43	40	32	26	1.25	11/05/1974	20.02	12/16/1980	--	112SLVL	--	--	1753
161-071-10BBB	PHS BEL.19	240	30	24	1.25	12/11/1973	15.75	12/12/1979	U	112SLVL	895	5.0	1742
161-071-15BAA	NDSWC 11413	40	--	--	--	10/14/1980	--	--	--	--	--	--	1735
161-071-15BBA	NDSWC 11412	67	51	48	1.25	10/14/1980	4.78	12/16/1980	--	112SLVL	875	7.0	1715
161-071-15CDC	NDSWC 11415	20	--	--	--	10/14/1980	--	--	--	--	--	--	1698
161-071-15DCB	WHEELER, LOREN	38	38	26	24	01/04/1975	23.00	01/04/1975	S	112SLVL	--	--	1690
161-071-16AAB1	MONGEON, ADRIEN	60	54	34	4	10/15/1977	11.45	05/13/1980	--	112SLVL	--	--	1695
161-071-16AAB2	MONGEON, ADRIEN	60	60	40	12	10/12/1977	8.30	10/12/1977	I	112SLVL	620	12.0	1710
161-071-16ABA	MONGEON, ADRIEN	70	65	45	12	10/18/1977	8.00	10/18/1977	I	112SLVL	800	8.0	1710
161-071-16BCC	NDSWC C	60	40	36	1.25	10/08/1980	5.05	12/16/1980	--	112SLVL	760	6.0	1695
161-071-16BDD	MONGEON, ADRIEN	35	--	--	--	03/02/1977	--	--	U	--	--	--	1680
161-071-16CCD	NDSWC 11419	40	29	26	1.25	10/15/1980	4.99	12/16/1980	--	112SLVL	860	6.5	1688
161-071-16CDC	NDSWC 11420	60	--	--	--	10/15/1980	--	--	--	--	--	--	1692
161-071-16CDD	NDSWC D	60	30	18	1.25	10/08/1980	5.49	12/16/1980	--	112SLVL	690	7.5	1690
161-071-16DCD1	NDSWC 11414	60	28	25	1.25	10/14/1980	5.69	12/16/1980	--	112SLVL	840	7.5	1695
161-071-16DCD2	NDSWC 11421	60	--	--	--	10/15/1980	--	--	--	--	--	--	1693
161-071-16DDA	NDSWC 11418	40	--	--	--	10/14/1980	--	--	--	--	--	--	1697

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 AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
161-071-16DDC	NDSWC 11417	40	--	--	--	10/14/1980	--	--	--	--	--	--	1690
161-071-16DDD	NDSWC 11422	40	--	--	--	10/15/1980	--	--	--	--	--	--	1688
161-071-17CDC	NDSWC 11424	80	--	--	--	10/15/1980	--	--	--	--	--	--	1705
161-071-17DCC	NDSWC E	40	--	--	--	10/08/1980	--	--	--	--	--	--	1681
161-071-18DCC	NDSWC 5907	61	--	--	--	11/14/1980	--	--	--	--	--	--	1672
161-071-20AAB	NDSWC 11423	40	--	--	--	10/15/1980	--	--	--	--	--	--	1685
161-071-21BAD	WHEELER, LOREN	25	25	21	24	06/27/1977	16.00	06/27/1977	H	112SLVL	--	--	1690
161-071-21BBB	ALL SEASONS	40	--	--	--	05/23/1979	--	--	--	--	--	--	1685
161-071-21CBC	ALL SEASONS, WSI 10	40	31	26	1.25	05/23/1979	5.39	05/23/1979	--	112SLVL	--	--	1670
161-071-21CDD	ALL SEASONS, WSI 8	25	21	18	1.25	05/23/1979	5.18	05/23/1979	--	112SLVL	--	--	1670
161-071-22BBB	NDSWC 5596	47	23	20	1.25	10/11/1979	7.20	10/17/1979	U	112SLVL	1050	8.0	1690
161-071-22CCC	NDSWC 5597	62	34	31	1.25	10/11/1979	17.30	11/06/1979	U	112SLVL	--	--	1682
161-071-23CCC	NDSWC 5373	200	--	--	--	09/08/1978	--	--	--	--	--	--	1678
161-071-26CCC	NDSWC 11427	20	--	--	--	10/16/1980	--	--	--	--	--	--	1662
161-071-27BAA	NDSWC 11416	40	--	--	--	10/14/1980	--	--	--	--	--	--	1675
161-071-28BAB	NDSWC 10351	60	26	23	1.25	10/26/1978	11.65	10/31/1978	U	112SLVL	750	8.0	1665
161-071-29AAB	NDSWC 5598	62	32	29	1.25	10/11/1979	5.59	10/18/1979	U	112SLVL	800	7.0	1661
161-071-29DAD	NDSWC F	40	25	17	1.25	10/08/1980	11.29	12/16/1980	--	112SLVL	565	6.5	1660
161-071-30CDD	NDSWC 11428	20	--	--	--	10/16/1980	--	--	--	--	--	--	1640
161-071-32CCC	NDSWC 11410	40	--	--	--	10/14/1980	--	--	--	--	--	--	1620
161-071-32CDC	NDSWC 11411	40	--	--	--	10/14/1980	--	--	--	--	--	--	1625
161-071-32DCC	NDSWC 5652	32	25	22	1.25	10/11/1979	11.15	10/30/1979	U	112SLVL	1050	5.0	1635
161-071-33CCC	NDSWC 11409	60	--	--	--	10/14/1980	--	--	--	--	--	--	1640
161-071-33CDD	NDSWC 5651	47	35	32	1.25	10/11/1979	15.24	10/23/1979	U	112SLVL	1450	6.0	1650
161-071-34DDD	ALL SEASONS, WSI 12	40	30	25	1.25	05/24/1979	3.36	05/24/1979	--	112SLVL	--	--	1650
161-071-35CDA	MONGEON, ALFRED	300	--	--	4	08/10/1964	--	--	U	--	--	--	1665
161-072-01DDD	NDSWC 5590	107	36	33	1.25	10/09/1979	7.40	10/24/1979	U	112SLVL	1250	5.0	1694
161-072-02BBB	NDSWC 5591	122	53	50	1.25	10/09/1979	1.74	10/16/1979	U	112OTSH	1450	6.0	1725
161-072-03CCC	NDSWC 5587	77	--	--	--	10/05/1979	--	--	--	--	--	--	1681
161-072-04BAA	NDSWC 5898	40	--	--	--	11/12/1980	--	--	--	--	--	--	1682
161-072-12CDC	NDSWC 5903	61	--	--	--	11/13/1980	--	--	--	--	--	--	1675
161-072-13CDD	NDSWC 5813	61	--	--	--	10/03/1980	--	--	--	--	--	--	1660
161-072-13DAA	NDSWC 5906	61	--	--	--	11/14/1980	--	--	--	--	--	--	1665
161-072-18DDD	NDSWC 5933	60	--	--	--	06/03/1981	--	--	--	--	--	--	1695
161-072-19BBA	NDSWC 5932	60	--	--	--	06/03/1981	--	--	--	--	--	--	1660
161-072-20CCC	NDSWC 10349	40	--	--	--	10/25/1978	--	--	--	--	--	--	1615
161-072-23CCC	NDSWC 5374	240	92	60	1.25	09/08/1978	12.31	09/26/1978	U	211FXHL	2000	6.5	1633
161-072-24AAA	NDSWC 5894	61	--	--	--	11/11/1980	--	--	--	--	--	--	1655
161-072-25AAA	NDSWC 10350	180	--	--	--	10/26/1978	--	--	--	--	--	--	1645
161-072-26AAA	NDSWC 5812	61	--	--	--	10/03/1980	--	--	--	--	--	--	1635

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161-072-27DDC	NDSWC 5900	41	--	--	--	11/12/1980	--		--	--	--	--	--	1625
161-072-28AAD	PIGEON, DEAN	200	--	--	4	11/21/1965	--		--	U	--	--	--	1610
161-072-30DDD	NDSWC 5811	61	--	--	--	10/03/1980	--		--	--	--	--	--	1615
161-072-32ADD	PETRYSZYN, MIKE	24	24	18	36	09/29/1976	8.00		09/29/1976	S	--	--	--	1602
161-072-33ABB	COTE, ERNEST	36	35	27	24	07/18/1975	7.00		07/18/1975	H	--	--	--	1600
161-072-34ADB	BOUCHER, ALFRED	80	80	72	24	08/27/1975	18.50		08/27/1975	S	211FXHL	1000	7.0	1630
161-072-34DAA	NDSWC 5899	41	--	--	--	11/12/1980	--		--	--	--	--	--	1606
161-072-34DCD	NDSWC 5897	21	--	--	--	11/12/1980	--		--	--	--	--	--	1595
161-072-35CCD	NDSWC 5928	100	71	68	1.25	06/02/1981	--		--	--	112SLVL	1000	6.5	1620
161-072-35DDD	NDSWC 5927	120	91	88	1.25	06/02/1981	--		--	--	112SLVL	1400	6.8	1630
161-072-36BAA	NDSWC 11483	60	--	--	--	12/04/1980	--		--	--	--	--	--	1626
161-072-36BAD	NDSWC 5917	60	43	39	1.25	03/19/1981	--		--	--	112SLVL	--	--	1640
161-072-36BBB	NDSWC 5916	57	--	--	--	03/19/1981	--		--	--	--	--	--	1626
161-072-36BDD	NDSWC 11479	100	--	--	--	12/03/1980	--		--	--	--	--	--	1648
161-072-36DCC	NDSWC 5654	122	--	--	--	10/15/1979	--		--	--	--	--	--	1663
161-072-36DDD	NDSWC 11481	80	--	--	--	12/04/1980	--		--	--	--	--	--	1639
161-073-18D8C	VANDAL, MICHAEL	60	--	--	--	07/15/1968	--		--	U	--	--	--	1600
161-073-21CCC	NDSWC 10348	40	--	--	--	10/25/1978	--		--	--	--	--	--	1578
161-073-23BD	LION OIL CO.	5505	--	--	--	08/07/1952	--		--	--	--	--	--	1627
161-073-23CCC	NDSWC 5375	240	--	--	--	09/11/1978	--		--	--	--	--	--	1600
161-073-30BBB	NDSWC 10347	60	--	--	--	10/25/1978	--		--	--	--	--	--	1580
161-074-05DDD	NDSWC 5866	101	--	--	--	10/28/1980	--		--	--	--	--	--	1620
161-074-21CCC	NDSWC 10346	80	--	--	--	10/25/1978	--		--	--	--	--	--	1580
161-074-27AAA	NDSWC 5376	220	--	--	--	09/11/1978	--		--	--	--	--	--	1575
161-074-30BBB	NDSWC 10345	60	--	--	--	10/25/1978	--		--	--	--	--	--	1561
161-075-01AAA	NDSWC 5865	101	--	--	--	10/28/1980	--		--	--	--	--	--	1650
161-075-02CCC	OLSEN, PAUL	110	110	84	5	08/30/1963	18.00		08/30/1963	H	--	--	--	1600
161-075-05BBB	NDSWC 5577	107	--	--	--	09/25/1979	--		--	--	--	--	--	1598
161-075-13BBB	KYLE, DAVID	162	162	102	5	09/15/1976	--		--	H	211FXHL	1100	13.0	1590
161-075-15CB	BERGMAN, OTTO	185	--	--	--	06/ /1965	--		--	T	--	--	--	1560
161-075-20BBB	NDSWC 5578	62	--	--	--	09/25/1979	--		--	--	--	--	--	1531
161-075-21CCC	NDSWC 10344	60	--	--	--	10/25/1978	--		--	--	--	--	--	1537
161-075-22BC	BERGMAN, OTTO	190	--	--	--	1965		D	--	--	--	--	--	1540
161-075-26BAB	NDSWC 5377	60	--	--	--	09/12/1978	--		--	--	--	--	--	1550
161-075-30BBB	NDSWC 10343	60	--	--	--	10/25/1978	--		--	--	--	--	--	1505
161-076-02DCA	CAMPBELL, ANGUS	41	41	33	36	10/21/1974	20.00		1974	S	--	--	--	1560
161-076-10AAA	NDSWC 5863	101	--	--	--	10/27/1980	--		--	--	--	--	--	1550
161-076-19CCC	NDSWC 10341B	100	--	--	--	10/24/1978	--		--	--	--	--	--	1469
161-076-22BA	OWEN DRLG CO	3430	--	--	--	03/10/1954		D	--	--	--	--	--	1496
161-076-27AAA	NDSWC 5378	280	--	--	--	09/14/1978	--		--	--	--	--	--	1485

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161-076-28BBB	NDSWC 10342	80	--	--	--	10/25/1978	--		--	--	--	--	--	1475
161-076-28DDD	WATERS, WILLIAM	175	--	--	--	10/15/1966		D	--	--	--	--	--	1478
161-076-32DAA	MILLER, WILBUR	44	44	28	24	06/05/1975	12.00		06/05/1975	H	--	--	--	1465
161-077-11CBB	HOFFAS, EDWIN	95	--	--	--	10/22/1966	--		--	--	--	--	--	1470
161-077-11CCC	HOFFAS, EDWIN	225	--	--	--	10/20/1966		D	--	--	--	--	--	1470
161-077-20CCC	NDSWC 5841	121	--	--	--	10/14/1980	--		--	--	--	--	--	1467
161-077-21CCC	NDSWC 10340	140	--	--	--	10/24/1978	--		--	--	--	--	--	1470
161-077-23CCC	NDSWC 5379	280	71	68	1.25	09/14/1978	10.41		09/28/1978	U	112BGFV	--	7.0	1472
161-077-24CCC	GLINZ, NORMAN	71	71	--	4	11/05/1964	20.00		11/05/1964	--	--	--	--	1465
161-077-31BC	ALL SEASONS	100	--	--	--	04/08/1976		D	--	--	--	--	--	1465
161-078-17DDD	NDSWC 5842	161	--	--	--	10/14/1980	--		--	--	--	--	--	1444
161-078-12DDC	JOHNSON, HOWARD	56	56	1	24	10/26/1974	30.00		--	S	--	--	--	1475
161-078-20BBD	JOHNSON, VICTOR	77	77	67	18	10/29/1974	27.00		--	S	--	--	--	1460
161-078-25AAA1	KUSTER, LLOYD	120	120	108	4	09/27/1974		P	--	P,S	211FXHL	2400	7.0	1470
161-078-25AAA2	NDSWC 10339	140	--	--	--	10/24/1978	--		--	--	--	--	--	1467
161-078-26BBB	NDSWC 5380	240	--	--	--	09/14/1978	--		--	--	--	--	--	1480
161-078-30AAA	NDSWC 10338	100	--	--	--	10/24/1978	--		--	--	--	--	--	1440
161-078-32DAD	CHRISTENSON, IVAN	95	95	59	24	11/08/1972	80.00		11/08/1972	--	--	--	--	1440
161-078-34DA	CARDINAL DRLG	3276	3265	3251	5.50	05/14/1959	--		--	--	--	--	--	1463
161-079-03BBB	NDSWC 10355	140	--	--	--	10/27/1978	--		--	--	--	--	--	1470
161-079-16DDD	NDSWC 5551	167	--	--	--	08/28/1979	--		--	--	--	--	--	1471
161-079-21CAC	AMERADA PETR CO	4080	3771	3403	5.50	07/10/1955		F	--	--	--	--	--	1473
161-079-23CCC	NDSWC 5381	260	--	--	--	09/15/1978	--		--	--	--	--	--	1470
161-079-28CCC	KERSTEN, LARRY	172	164	129	4	10/04/1977	73.00	P	10/04/1977	H	211FXHL	5500	11.0	1465
161-079-28CDC	KERSTEN, LARRY	172	129	94	4	09/04/1974	73.00		09/04/1974	H	--	--	--	1465
161-079-29AAA	NDSWC 10337	160	--	--	--	10/24/1978	--		--	--	--	--	--	1470
161-079-30BBB	NDSWC 10336	180	--	--	--	10/24/1978	--		--	--	--	--	--	1490
161-079-31DDD	HENNING, GLENN	230	--	--	--	05/29/1964		D	--	--	--	--	--	1475
161-079-32CDC	HENNING, GLENN	163	--	--	--	03/09/1977		D	--	H	--	--	--	1480
161-079-34DDC	BLADA, BUD	200	200	--	--	11/02/1964		D	--	H	--	--	--	1465
161-080-12AAA	WYMAN, RON	180	120	0	4	1940	25.00		--	S	211FXHL	2200	7.5	1480
161-080-12DDD	WYMAN, VERL	180	180	0	4	1940	100.00		--	H	--	--	--	1490
161-080-22DDD	MORISON, ROSS	190	190	0	4	1912	20.00	R	1979	H	211FXHL	5700	8.0	1485
161-080-23CCC1	WYMAN, LARRY	180	180	--	4	1935	--		--	H,S	211FXHL	6000	9.5	1489
161-080-23CCC2	WYMAN, LARRY	176	176	0	4	10/28/1964	35.00	R	1964	H,S	--	--	--	1489
161-080-26BBB1	NDSWC 5382	320	--	--	--	09/18/1978	--		--	--	--	--	--	1490
161-080-26BBB2	NDSWC 5382A	80	73	70	1.25	09/18/1978	--		--	U	--	--	--	1490
161-080-36AAA	HENRY, KENNETH	195	195	162	4	05/07/1965	17.00		05/07/1965	S	--	--	--	1480
161-080-36AC8	HENRY, KENNETH	253	--	--	--	05/ /1965		D	--	--	--	--	--	1480
161-081-03DCD	SPAFFORD, G.	353	--	--	--	09/10/1963		D	--	--	--	--	--	1498
161-081-05CCC	NDSWC 11461	220	--	--	--	11/13/1980	--		--	--	--	--	--	1515

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161-081-05CDC	NDSWC 11457	220	--	--	--	11/13/1980	--		--	--	--	--	--	1512
161-081-05DDD	NDSWC 11459	220	--	--	--	11/13/1980	--		--	--	--	--	--	1514
161-081-08ABA	NDSWC 11464	220	--	--	--	11/18/1980	--		--	--	--	--	--	1510
161-081-08ABB	NDSWC 11460	220	75	72	1.25	11/13/1980	--		--	--	--	--	--	1513
161-081-09AAB	NDSWC 11467	240	--	--	--	11/18/1980	--		--	--	--	--	--	1505
161-081-09ABB	NDSWC 11465	220	--	--	--	11/18/1980	--		--	--	--	--	--	1505
161-081-10ABB	NDSWC 11468	240	--	--	--	11/19/1980	--		--	--	--	--	--	1497
161-081-10BAB	NDSWC 11469	220	--	--	--	11/19/1980	--		--	--	--	--	--	1500
161-081-10BBB	NDSWC 11466	240	--	--	--	11/18/1980	--		--	--	--	--	--	1500
161-081-13DAD	BERENTSON, T.	40	40	0	30	07/09/1976	37.00		07/09/1976	H	--	--	--	1520
161-081-14DDD	NDSWC 5851	201	--	--	--	10/21/1980	--		--	--	--	--	--	1500
161-081-19DB	DAKOTA DRILLING	6604	--	--	--	04/01/1954		D	--	--	--	--	--	1513
161-081-20CCC	NDSWC 11471	220	--	--	--	11/21/1980	--		--	--	--	--	--	1508
161-081-20DCD	NDSWC 11473	240	--	--	--	11/25/1980	--		--	--	--	--	--	1505
161-081-27BAA	NDSWC 5383	400	--	--	--	09/19/1978	--		--	--	--	--	--	1504
161-081-28BAB	NDSWC 11474	240	--	--	--	11/25/1980	--		--	--	--	--	--	1505
161-081-29AAA	NDSWC 10335	280	--	--	--	10/23/1978	--		--	--	--	--	--	1506
161-081-30AAB	NDSWC 11472	220	--	--	--	11/25/1980	--		--	--	--	--	--	1516
161-081-31DDC	NDSWC 11470	300	227	224	1.25	11/20/1980	3.00+		12/02/1980	--	112GLNB	2900	2.0	1517
161-081-35CAC	MAXBASS, ND	212	--	--	--	03/14/1973	132.00		03/14/1973	--	--	--	--	1500
161-082-19DDD	NDSWC 10334	240	--	--	--	10/20/1978	--		--	--	--	--	--	1560
161-082-24DC	CARDINAL DRLG	4343	4165	4112	4.50	04/14/1958	--		--	--	--	--	--	1535
161-082-26BBB	NDSWC 5384	500	84	78	1.25	09/19/1978	9.02		12/10/1979	--	112BGFV	a/3700	7.0	1535
161-082-31ABB	NDSWC 11462	220	--	--	--	11/13/1980	--		--	--	--	--	--	1542
161-082-31DCC	NDSWC 11463	220	--	--	--	11/14/1980	--		--	--	--	--	--	1577
161-082-33CCC	NDSWC 8904	100	--	--	--	09/27/1973	--		--	--	--	--	--	1522
161-083-06CCC	USGS 16	230	--	--	--	10/22/1948	--		--	--	--	--	--	1601
161-083-06CDC1	USGS 12	60	--	--	--	10/20/1948	--		--	--	--	--	--	1600
161-083-06CDC2	USGS 14	80	--	--	--	10/21/1948	--		--	--	--	--	--	1602
161-083-06CDD	USGS 15	60	--	--	--	10/22/1948	--		--	--	--	--	--	1605
161-083-07BBA	USGS 13	60	--	--	--	08/21/1948	--		--	--	--	--	--	1602
161-083-11DDD	USGS 2	50	--	--	--	09/ /1948	--		--	--	--	--	--	1535
161-083-12CCC	USGS 1	230	--	--	--	09/29/1948	--		--	--	--	--	--	1535
161-083-13CCC	NDSWC MOHALL 1	42	--	--	--	03/24/1961	--		--	--	--	--	--	1560
161-083-13CCD	NDSWC MOHALL 4	42	--	--	--	03/27/1961	--		--	--	--	--	--	1540
161-083-13CDC	NDSWC MOHALL 8	34	--	--	--	03/28/1961	--		--	--	--	--	--	1535
161-083-13CDD	NDSWC MOHALL 9	42	--	--	--	03/28/1961	--		--	--	--	--	--	1535
161-083-13DCC1	USGS 56-47	205	--	--	--	07/26/1947	3.93		08/09/1947	--	--	--	--	1535
161-083-13DCC2	NDSWC MOHALL 11	34	--	--	--	03/29/1961	--		--	--	--	--	--	1534
161-083-13DCD	NDSWC MOHALL 14	34	--	--	--	04/04/1961	--		--	--	--	--	--	1545

a/Value shown is the laboratory specific conductance.

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 AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
161-083-13DDC	NDSWC MOHALL 17	34	--	--	--	04/05/1961	--	--	--	--	--	--	1546
161-083-14AAB	USGS 3	40	--	--	--	10/02/1948	--	--	--	--	--	--	1540
161-083-14ABA	USGS 4	220	--	--	--	10/04/1948	--	--	--	--	--	--	1542
161-083-14ADD	NDSWC 11444	20	--	--	--	10/31/1980	--	--	--	--	--	--	1537
161-083-19DD	FISHER, J.	391	--	--	--	1929	--	--	--	--	--	--	1595
161-083-22CCC	NDSWC 10333	300	--	--	--	10/19/1978	--	--	--	--	--	--	1602
161-083-23DDD	NDSWC 5385	700	450	444	2	09/20/1978	29.70	12/10/1979	U	211FXML	a/11300	9.0	1585
161-083-29BBB	NDSWC 10332	260	--	--	--	10/19/1978	--	--	--	--	--	--	1587
161-083-33CCB	USGS 55-47	240	--	--	--	07/25/1947	5.24	08/14/1947	--	--	--	--	1587
161-084-24DDD	NDSWC 5556	662	488	470	2	08/30/1979	37.73	12/17/1980	U	211FXML	a/10700	8.0	1619
162-069-03CCA	MIKELSON, BEN	94	94	89	4	05/26/1970	25.00	05/26/1970	--	--	--	--	1820
162-069-05AAB	NDSWC 2-797	116	40	34	1.25	07/15/1963	7.67	07/22/1963	--	--	--	--	1820
162-069-05DAD	MARCHARD, WILLIAM	52	52	47	5	09/12/1969	10.00	09/12/1969	H	--	--	--	1810
162-069-05DCD	NDSWC 3-797	63	--	--	--	07/17/1963	--	--	U	--	--	--	1810
162-069-05DDD	NDSWC 1-797	168	--	--	--	07/15/1963	--	--	--	--	--	--	1808
162-069-06BAB	NDSWC 6-797	168	--	--	--	07/22/1963	--	--	--	--	--	--	1863
162-069-08CAB	DISRUD, MYRON	31	31	1	4	07/29/1966	8.00	07/29/1966	--	--	--	--	1855
162-069-08CAA	USGS 445	130	--	--	--	07/12/1951	--	--	--	--	--	--	1828
162-069-08DBC	USGS 447	30	--	--	--	07/16/1951	--	--	--	--	--	--	1820
162-069-08DCD1	USGS 446	60	--	--	--	07/13/1951	--	--	--	--	--	--	1816
162-069-08DCD2	USGS 450	40	--	--	--	07/21/1951	--	--	--	--	--	--	1816
162-069-08DCD3	USGS 453	30	--	--	--	07/28/1951	--	--	--	--	--	--	1816
162-069-08DDC1	USGS 439	30	--	--	--	07/02/1951	--	--	--	--	--	--	1810
162-069-08DDC2	USGS 443	170	--	--	--	07/06/1951	--	--	--	--	--	--	1815
162-069-09BCB	NDSWC 7-797	59	--	--	--	07/23/1963	--	--	--	--	--	--	1810
162-069-09CBA	USGS 442	40	--	--	--	07/05/1951	7.26	07/06/1951	--	--	--	--	1813
162-069-09CBD	USGS 441	40	--	--	--	07/04/1951	--	--	--	--	--	--	1819
162-069-09CCB	USGS 440	150	--	--	--	07/03/1951	--	--	--	--	--	--	1811
162-069-09CCD	NDSWC 167	135	--	--	--	1964	--	--	--	--	--	--	1802
162-069-09CDB	HART, JOHN	86	86	1	4	09/14/1964	20.00	09/14/1964	H	--	--	--	1810
162-069-09CDC	USGS 167	135	--	--	--	07/20/1949	--	--	--	--	--	--	1802
162-069-09CDD	ALBRECHT, IVAN	70	70	65	4	08/24/1968	14.00	08/24/1968	--	--	--	--	1810
162-069-09DCC1	NDSWC 10-797	168	--	--	--	07/25/1963	--	--	--	--	--	--	1810
162-069-09DCC2	GUILBERT, HECTOR	72	72	67	4	07/10/1969	12.00	07/10/1969	H	--	--	--	1810
162-069-09DCD	MUSOLF, LEROY	64	64	59	4	05/29/1970	10.00	05/29/1970	H	--	--	--	1805
162-069-09DDC1	ALLAND, ELDON	69	69	64	4	08/21/1970	11.00	08/21/1970	H	--	--	--	1807
162-069-09DDC2	BURKHART, GARY	52	52	48	4	06/30/1972	--	--	H	--	--	--	1805
162-069-09DDC3	STRAIT, E.	73	73	68	4	06/05/1971	14.00	06/05/1971	H	--	--	--	1808
162-069-10DCB	LINDBO, EDWIN	137	137	1	4	04/09/1964	28.00	04/09/1964	H	--	--	--	1818
162-069-11BBB	NDSWC 5875	141	118	115	1.25	11/03/1980	32.36	12/16/1980	--	112ROLL	2100	5.0	1812

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162-069-13AAA	USGS 170	210	--	--	--	07/27/1949	--		--	--	--	--	--	1756
162-069-15AAA	USGS 169	210	--	--	--	07/25/1949	--		--	--	--	--	--	1797
162-069-15CCC	USGS 168	200	--	--	--	07/21/1949	--		--	--	--	--	--	1807
162-069-16BAB	WAYNE IMPLEMENT	85	85	80	5	05/20/1969	12.00		05/20/1969	H,C	--	--	--	1805
162-069-16BBB	USGS 166	130	--	--	--	07/19/1949	--		--	--	--	--	--	1807
162-069-16BCC	USGS 468	100	--	--	--	09/18/1951	--		--	--	--	--	--	1807
162-069-16BCD	USGS 469	95	--	--	--	09/19/1951	--		--	--	--	--	--	1806
162-069-17AAB	USGS 165	130	--	--	--	07/16/1949	--		--	--	--	--	--	1809
162-069-17ABA1	USGS 451	40	--	--	--	07/23/1951	--		--	--	--	--	--	1813
162-069-17ABA2	USGS 452	40	--	--	--	07/25/1951	--		--	--	--	--	--	1811
162-069-17ABB	USGS 164	140	--	--	--	07/15/1949	--		--	--	--	--	--	1809
162-069-17ACD	USGS 444	140	--	--	--	07/10/1951	--		--	--	--	--	--	1807
162-069-17AOB	ROLLA, ND	--	30	--	--	--	--		--	P	112ROLL	1000	6.0	1810
162-069-17DCA	ROLLA, ND, NO. 5	52	52	0	10	09/ /1966	12.00	P	1978	P	112ROLL	2000	6.5	1805
162-069-17DCD	ROLLA, ND, NO. 4	27	27	0	10	06/14/1962	15.00	P	06/14/1962	P	112ROLL	--	--	1802
162-069-18AAA	USGS 160	150	--	--	--	07/06/1949	--		--	--	--	--	--	1825
162-069-18BBB	NDSWC 4-797	304	--	--	--	07/17/1963	--		--	--	--	--	--	1855
162-069-18DDD	USGS 171	210	--	--	--	07/29/1949	--		--	--	--	--	--	1836
162-069-20AAB1	NDSWC 9-797	94	80	2	1.25	07/23/1963	18.10		06/12/1978	--	--	--	--	1810
162-069-20AAB2	MUORI, WALTER	58	58	1	5	10/26/1965	18.00		10/26/1965	C	--	--	--	1810
162-069-20ABA1	USGS 448	140	--	--	--	07/17/1951	--		--	--	--	--	--	1804
162-069-20ABA2	ROLLA, ND, NO. 3	29	29	0	12	1951	--		--	P	112ROLL	925	6.0	1804
162-069-20ACD	USGS 449	40	--	--	--	07/20/1951	--		--	--	--	--	--	1803
162-069-20BDA	ROLLA, ND, NO. 6	75	75	0	12	06/25/1979	12.00	Z	1979	P	--	--	--	1800
162-069-20DDD1	NDSWC 5664	227	153	147	1.25	10/19/1979	2.00+		10/30/1979	U	112ROLL	2100	5.0	1797
162-069-20DDD2	NDSWC 5664A	104	99	93	1.25	10/19/1979	2.00+		10/30/1979	U	112ROLL	2000	5.0	1797
162-069-22CCB	OVERLAND, ARNOLD	191	191	187	4	11/26/1966	11.00		11/26/1966	H,S	--	--	--	1800
162-069-27CBC	FAGERLUND, GERALD	34	34	26	24	07/27/1976	19.00		07/27/1976	H	--	--	--	1805
162-069-34DDD	NDSWC 5874	161	--	--	--	10/03/1980	--		--	--	--	--	--	1785
162-070-01BDC	CLARK, L.	93	93	89	4	10/20/1966	24.00		10/20/1966	H,S	--	--	--	1930
162-070-05DBA	USDI	200	200	197	4	04/24/1964	--		--	P	--	--	--	2050
162-070-06DAA	USGS 5	283	--	--	--	08/15/1971	--		--	--	--	--	--	2020
162-070-07ACA	USDI	196	196	193	4	06/03/1964	69.00		06/03/1964	P	--	--	--	2040
162-070-08ADC	USDI	100	100	96	4	08/21/1964	37.00		--	P	--	--	--	2020
162-070-08DAA1	USGS 8	360	180	174	1.25	12/05/1973	71.46		09/29/1977	U	112BGFV	2550	6.0	2020
162-070-08DAA2	USGS 9	220	--	--	--	12/05/1973	--		--	--	--	--	--	2020
162-070-08DDD	CROUSE, FLORENCE	280	280	272	4	11/17/1969	82.00		11/17/1969	H	--	--	--	2000
162-070-09CBB	MARTEL, SHIRLEY	55	55	47	24	1973	32.00		1973	H	--	--	--	2020
162-070-11BAA1	NDSWC 8-797	63	--	--	--	07/23/1963	--		--	--	--	--	--	2000
162-070-11BAA2	WILKIE, LOUIS	40	40	32	24	1973	16.00		1973	H	--	--	--	2005

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162-070-12CCC	USGS 162	290	--	--	--	07/09/1949	--		--	--	--	--	--	1945
162-070-12DDD	USGS 161	320	--	--	--	07/07/1949	--		--	--	--	--	--	1855
162-070-14BBB	USGS 163	240	--	--	--	07/12/1949	--		--	--	--	--	--	1990
162-070-14CBC	AZURE, PATRICK	74	74	68	24	1973	46.00		1973	H	--	--	--	1990
162-070-15BAB1	NDSWC 10	360	--	--	--	12/06/1973	--		--	--	--	--	--	2000
162-070-15BAB2	NDSWC 10A	60	--	--	--	1974	--		--	--	--	--	--	2000
162-070-16ADA	GERMAINE, PAT	306	306	303	4	12/16/1967	116.00		12/16/1967	H	--	--	--	2010
162-070-17AAA	USGS 11	320	--	--	--	12/07/1973	--		--	--	--	--	--	2009
162-070-18ADD	USGS 6	380	--	--	--	08/15/1971	--		--	--	--	--	--	2040
162-070-19ABC	DAVIS, LYNN	84	--	--	--	11/11/1974		D	--	--	--	--	--	2020
162-070-19DBA	AZURE, DOMINIC	44	44	1	20	09/24/1974	--		--	H	--	--	--	1990
162-070-20AAB	USGS 12	320	75	--	--	12/07/1973	14.66		09/29/1977	--	112OTSH	598	6.0	1970
162-070-20AAC	USGS 21	102	--	--	--	12/12/1973	--		--	--	--	--	--	1960
162-070-20DBA	ST ANNE MISSION	285	285	1	5	07/25/1966	40.00		07/25/1966	H	211FXHL	1800	--	1990
162-070-25BAA	LAVERDURE, ROSE	130	130	120	4	10/ /1965	80.00		--	H	--	--	--	1900
162-070-26AAA	LAFONTAIN, STANLEY	300	--	--	--	04/16/1976		D	--	H	--	--	--	1905
162-070-26CDC	BELGRADE, DON	107	107	104	4	10/12/1968	7.00		10/12/1968	H	--	--	--	1880
162-070-26DAD	NELSON, MIKE	140	140	136	5	03/10/1973	65.00		03/10/1973	H	--	--	--	1890
162-070-27BAB	AZURE, LANCE	81	--	--	--	11/11/1974		D	--	T	--	--	--	1920
162-070-27CBC	LADUCER, CLIFFORD	76	76	72	5	02/27/1973	17.00		02/27/1973	H	--	--	--	1880
162-070-28CCD	LAVALLIE, LEONARD	174	174	170	4	02/23/1973	1.00+		02/23/1973	H	--	--	--	1890
162-070-29BDB	PETERSON, MARVIN	108	--	--	--	11/20/1970	1.00+		11/20/1970	--	--	--	--	1930
162-070-29CBC	USGS 13	500	--	--	--	12/08/1973	--		--	--	--	--	--	1884
162-070-30CCC	USGS 14	160	--	--	--	12/09/1973	--		--	--	--	--	--	1850
162-070-32BBA	LADUCER, MORRIS	62	62	54	30	12/18/1972	22.00		12/18/1972	H	--	--	--	1890
162-070-32CAA	LAROCQUE, BERNADINE	76	76	68	24	06/05/1973	40.00		06/05/1973	H	--	--	--	1870
162-071-02BBA	BELGRADE, FRANCIS	47	47	39	24	1973	14.00		1973	H	--	--	--	2130
162-071-03AAB	NDSWC 5872	301	--	--	--	10/30/1980	--		--	--	--	--	--	2160
162-071-03DDD	KEPLIN, LAWRENCE	294	294	290	4	11/27/1967	144.00		11/27/1967	H	--	--	--	2100
162-071-04ACC	USGS 4	320	--	--	--	08/14/1971	--		--	--	--	--	--	2160
162-071-09ABB	LAVALLIE, GREGORY	60	60	52	24	1973	8.00		1973	H	--	--	--	2165
162-071-13ADA	BERCLER, LOUIS	100	--	--	--	11/09/1972		D	--	H	--	--	--	2046
162-071-13DCC	MARCELLIES, PETER	289	289	285	4	09/20/1960	100.00		09/20/1960	--	--	--	--	2050
162-071-16BB	CITIES SER. OIL, CO.	3440	--	--	--	08/17/1957	--		--	--	--	--	--	2147
162-071-18CDB	MARCELLAIS, CLARENCE	55	55	47	24	1973	16.00		1973	H	--	--	--	2075
162-071-19DDD	AZURE, FRED	96	96	91	4	07/16/1965	15.00		07/16/1965	H,S	--	--	--	2020
162-071-25DDB	LIZOTTE, STEVE	35	35	24	24	1973	24.00		1973	H	--	--	--	1900
162-071-26BAA1	NDSWC 22	482	--	--	--	12/13/1973	--		--	--	--	--	--	1965
162-071-26BAA2	NDSWC 22A	46	--	--	--	1974	--		--	--	--	--	--	1965
162-071-26CCD	NDSWC 5593	32	--	--	--	10/10/1979	--		--	--	--	--	--	1870

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162-071-28DDB	LAFLOE, CHUCK	78	78	1	20	10/14/1976	52.00		10/14/1976	H	--	--	--	1900
162-071-29BCC	GOTTBRECHT, GEORGE	155	155	145	2	01/14/1967	22.00		01/14/1967	H	--	--	--	2000
162-071-30DCB	PARISIEN, PETER	97	97	89	24	1973	55.00		1973	H	--	--	--	1900
162-071-32CBB	ENNO, FRANK	46	46	38	24	1973	18.00		1973	H	--	--	--	1850
162-071-32DAD	NDSWC 5592	227	--	--	--	10/10/1979	--		--	--	--	--	--	1815
162-071-34DBB	KEPLIN, LOUIS	50	44	40	20	10/08/1976	23.00		--	H	--	--	--	1860
162-071-35CDA	MALATERRE, ELI	50	50	42	24	1973	20.00		1973	H	--	--	--	1810
162-071-35CDD	USGS 17	190	--	--	--	12/11/1973	--		--	--	--	--	--	1800
162-071-36BAA	TURTLE MNT.CORP	137	135	1	5	07/18/1964	18.00+		07/18/1964	N	--	--	--	1840
162-071-36CBC1	USGS 15	120	84	78	1.25	12/09/1973	11.62		09/29/1977	U	112SLVL	2220	5.5	1815
162-071-36CBC2	NDSWC 5594	57	55	52	1.25	10/10/1979	9.07		12/16/1980	U	112SLVL	2000	7.0	1814
162-072-05CDD	LACROIX, ERNEST	270	270	228	2	10/18/1963	125.00		10/18/1963	S	--	--	--	2130
162-072-07BCC1	HEADSTART SCH.	234	234	1	5	05/21/1969	30.00		05/21/1969	P	--	--	--	2070
162-072-07BCC2	USGS 2	300	--	--	--	08/13/1971	--		--	--	--	--	--	2070
162-072-13DDD	RAMANDY, DALE	76	76	1	20	09/24/1976	52.00		09/24/1976	--	--	--	--	2040
162-072-17DCD	BERGAN, CLAYTON	56	56	51	4	06/25/1972	20.00		06/25/1972	H,S	--	--	--	2000
162-072-18CBB	BRUCE, DAVID	320	--	--	--	07/23/1976		D	--	H	--	--	--	2030
162-072-19BBA	USGS 1	325	--	--	--	08/12/1971	--		--	--	--	--	--	2000
162-072-19BDC	GOLF COURSE, DUNSEITH, ND	51	51	47	4	05/25/1975	25.00		05/25/1975	I	--	--	--	1980
162-072-31CAC	USBIA	310	--	--	--	04/06/1971	--		--	--	--	--	--	1690
162-072-31CDB	USBIA	115	--	--	--	04/07/1971	--		--	--	--	--	--	1695
162-072-33ABB	PELTIER BROTHERS	118	118	113	4	10/12/1963	30.00		10/12/1963	H	--	--	--	1760
162-072-33DAD	BELGARDE, STEVE	90	90	1	4	06/ /1968	14.00		06/ /1968	H	--	--	--	1715
162-072-35BDC	WILKIE, FRANCIS	65	65	60	4	06/02/1966	14.00		06/02/1966	--	--	--	--	1745
162-073-06ABA	RIVARD, ROBERT	214	214	210	4	06/07/1975	2.00+		06/07/1975	H,S	211HLCK	2000	7.0	2050
162-073-21BBB	NDSWC 5868	161	--	--	--	10/29/1980	--		--	--	--	--	--	2000
162-073-21CCB	BEDARD, JOHN	171	171	166	4	06/19/1969	40.00		06/19/1969	H	--	--	--	1960
162-073-25AAD	DUNSEITH, ND	261	260	199	6	11/12/1963	121.00		11/12/1963	P	211HLCK	1600	10.0	1885
162-073-27CCC	EURICH, DAVE	72	72	66	4	12/14/1965	1.00+		12/14/1965	H,S	--	--	--	1720
162-073-28CBC	HILL, CHESTER	106	106	1	4	09/10/1968	2.00+		09/10/1968	H	--	--	--	1875
162-073-29CCD	WHEELER, JAMES	105	105	99	4	02/25/1965	11.00		02/25/1965	H	--	--	--	1745
162-073-30DBC	JOHNSON, JAMES	115	115	106	4	10/07/1963	1.00+		10/07/1963	H	--	--	--	1760
162-073-32CCD	SCHNEIDER, HENRY	112	112	1	4	11/01/1963	2.00+		11/01/1963	H	--	--	--	1665
162-073-34AAA	NDSWC 5869	61	--	--	--	10/29/1980	--		--	--	--	--	--	1705
162-074-02CDD1	BRUDWICK, MILEN	130	130	125	--	06/21/1971	60.00		06/21/1971	H	--	--	--	2190
162-074-02CDD2	BRUDWICK, MILEN	308	--	--	--	06/ /1971	--		--	--	--	--	--	2190
162-074-03CCC	NDSWC 5867	281	--	--	--	10/28/1980	--		--	--	--	--	--	2200
162-074-25CCA	BOGUSLAWSKI, PETER	143	143	--	4	06/10/1970	40.00		06/10/1970	H	--	--	--	1785
162-074-27CCC	NDSWC 5576	77	--	--	--	09/25/1979	--		--	U	--	--	--	1753
162-074-28BBB	CALVERT EXP.	3865	--	--	10.75	06/21/1953		D	--	--	--	--	--	1887

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162-074-29DAD	HIATT, LAUREL	140	127	107	4	08/21/1973	17.00	P	08/21/1973	H	211FXHL	2000	9.0	1785
162-074-30ACB	MOUM, DARYL	80	80	66	4	01/31/1964	--		--	S	--	--	--	1790
162-074-30DAA	BECKMAN, RONALD	168	168	133	4	11/08/1972	1.00		11/08/1972	S	--	--	--	1770
162-074-31DCC	HIATT, HOWARD	164	164	110	4	10/24/1967	27.00		10/24/1967	--	--	--	--	1660
162-074-36AAA	BOGUSLAWSKI, JOE	158	158	152	4	11/03/1966	8.00		11/03/1966	S	--	--	--	1720
162-074-36DAA	COTE, RENE	58	58	53	4	11/07/1966	8.00		11/07/1966	S	--	--	--	1690
162-075-03CCC	NDSWC 5860	321	--	--	--	10/23/1980	--		--	--	--	--	--	2150
162-075-04CDC	NDSWC 5580	347	--	--	--	09/25/1979	--		--	U	--	--	--	2120
162-075-05BAB	NDSWC 10-738	346	--	--	--	1962	--		--	--	--	--	--	2142
162-075-06ADD	MONSON, ALAN	187	187	0	4	10/02/1965	90.00		1965	H	--	--	--	2110
162-075-06CBC	NDSWC 35-738	126	--	--	--	06/27/1962	--		--	--	--	--	--	1960
162-075-06CD	NDSWC 27-738	52	--	--	--	06/19/1962	--		--	--	--	--	--	1960
162-075-06DDA	NDSWC 9-738	252	--	--	--	--	--		--	--	--	--	--	2062
162-075-07AAA	NDSWC 8-738	94	--	--	--	05/21/1962	--		--	--	--	--	--	2061
162-075-07ABA	BOTTINEAU, ND	76	76	--	10	1956	--		--	P	1128GFV	1290	7.0	2012
162-075-07ACA	BOTTINEAU, ND	70	70	--	--	1958	--		--	P	1128GFV	1480	7.0	1995
162-075-07ACC	BOTTINEAU 80-10	101	--	--	--	11/ /1980	--		--	--	--	--	--	1880
162-075-07ADB	BOTTINEAU 80-13	41	26	24	1.25	11/ /1980	--		--	--	--	--	--	1940
162-075-07ADC1	BOTTINEAU 80-6	85	79	74	1.25	11/ /1980	24.00		11/ /1980	--	--	--	--	1900
162-075-07ADC2	BOTTINEAU 80-12	85	--	--	--	11/ /1980	--		--	--	--	--	--	1900
162-075-07ADD	BOTTINEAU 80-7	80	65	60	1.25	05/06/1980	--		--	--	--	--	--	1950
162-075-07BAC	HALL, ELMER	81	81	0	4	09/29/1965	30.00		09/29/1965	H	--	--	--	1880
162-075-07BBB	NDSWC 26-738	126	--	--	--	06/19/1962	--		--	--	--	--	--	1890
162-075-07BCD	BOTTINEAU, ND	70	70	--	12	1968	32.00+		1973	P	1128GFV	1400	7.5	1875
162-075-07CBB	NDSWC 33-738	42	--	--	--	06/27/1962	--		--	--	--	--	--	1825
162-075-07DAA1	BOTTINEAU 80-4	140	--	--	--	11/ /1980	--		--	--	--	--	--	1930
162-075-07DAA2	BOTTINEAU 80-5A	100	--	--	--	11/ /1980	--		--	--	--	--	--	1930
162-075-07DAB	BOTTINEAU 80-1	100	55	51	1.25	11/ /1980	6.00		11/ /1980	--	--	--	--	1900
162-075-07DAC	BOTTINEAU 80-2	120	--	--	--	11/ /1980	--		--	--	--	--	--	1870
162-075-07DBA	BOTTINEAU 80-3	100	--	--	--	11/ /1980	--		--	--	--	--	--	1900
162-075-07DBB1	BOTTINEAU 80-8	100	--	--	--	11/ /1980	--		--	--	--	--	--	1875
162-075-07DBB2	BOTTINEAU 80-9A	61	56	53	1.25	11/ /1980	10.56		11/ /1980	--	--	--	--	1875
162-075-07DDA	BOTTINEAU 80-14	81	--	--	--	11/ /1980	--		--	--	--	--	--	1870
162-075-07DDC	BOTTINEAU 80-11	101	--	--	--	11/ /1980	--		--	--	--	--	--	1840
162-075-07DDD	NDSWC 7-738	63	--	--	--	05/21/1962	--		--	--	--	--	--	1854
162-075-08CAD	INDVIK, ROBERT	180	180	140	5	06/16/1975	--		--	H	--	--	--	1950
162-075-08CDC1	JENSON, HAROLD	161	161	147	4	06/30/1963	67.00		06/30/1963	H	--	--	--	1900
162-075-08CDC2	SHULINS, J.E.	244	144	124	2	04/26/1964	64.00		04/26/1964	H	--	--	--	1900
162-075-08CDD	NDSWC 15-738	63	--	--	--	06/07/1962	--		--	--	--	--	--	1930
162-075-08DCB	PETERSON, MERTON	178	178	166	2	04/25/1966	85.00		04/25/1966	H	--	--	--	2010

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162-075-08DCC	RAMSUS, STANLEY	222	222	214	2	08/02/1968	115.00		08/02/1968	--	--	--	--	1970
162-075-12CCA	KOFOID, ALLEN	86	86	74	4	10/07/1972	--		--	--	--	--	--	2200
162-075-16BCA	PETTIE, LEROY	82	82	76	5	06/13/1974	35.00		06/13/1974	S	--	--	--	2000
162-075-17ABB	COUNTRY CLUB, BOTTINEAU	110	110	97	4	03/22/1966	35.00		03/22/1966	P,I	--	--	--	1940
162-075-17CCC	NICKELSON, WAYNE	100	100	92	4	05/ /1966	10.00		05/ /1966	H	--	--	--	1735
162-075-18BA	NDSWC 17-738	52	--	--	--	06/11/1962	--		--	--	--	--	--	1780
162-075-18BCC	NDSWC 24-738	52	--	--	--	06/18/1962	--		--	--	--	--	--	1730
162-075-18DAA	NDSWC 3-738	63	--	--	--	05/15/1962	--		--	--	--	--	--	1785
162-075-19CCD	REING, OLIVER	76	76	--	4	05/15/1965	2.00+		05/15/1965	H	--	--	--	1660
162-075-20BAB	NDSWC 25-738	84	--	--	--	06/19/1980	--		--	--	--	--	--	1770
162-075-20BCB	AMSBAUGH, MARILYN	100	100	80	4	10/16/1972	32.00		10/16/1972	H	--	--	--	1715
162-075-20BCC	WAGNER, RUN	42	42	36	24	09/05/1975	25.50		09/05/1975	H	--	--	--	1710
162-075-21ABA	NDSWC 22-738	231	--	--	--	06/14/1962		F	--	--	--	--	--	1845
162-075-21DAA	WAGNER, LEWIS	70	70	50	4	09/12/1972	31.00		09/12/1972	S	112BGFV	1800	7.0	1792
162-075-22AAD	NDSWC 21-738	126	--	--	--	06/12/1962	--		--	--	--	--	--	1940
162-075-23BCC	HELGESON, HENRY	106	106	100	2	08/17/1966	20.00		08/17/1966	H	--	--	--	1860
162-075-24AAC	HAGEN, JOHN	160	--	--	--	10/03/1975		D	--	--	--	--	--	2040
162-075-27DCC	NDSWC 5-738	63	--	--	--	05/16/1972		F	--	--	--	--	--	1670
162-075-29ABB	KOFOID, TERRY	128	128	108	4.50	10/20/1972	10.00		10/20/1972	H	--	--	--	1680
162-075-30ADA	THOMPSON, CLIFFORD	135	135	105	3	12/10/1969	25.00		12/10/1969	H	--	--	--	1665
162-075-30CBB	HOTEL STONE	156	156	103	3	--	--		--	--	--	--	--	1630
162-075-30DCA	PAGE, ROBERT	65	48	28	3	05/05/1976	8.60+		05/05/1976	H	--	--	--	1640
162-075-30DDD	NDSWC 4-738	94	--	--	--	05/16/1962	--		--	--	--	--	--	1635
162-075-31BAB	KOFOID, CHARLES	110	--	--	--	12/03/1964		D	--	--	--	--	--	1615
162-075-31CCA	ANDERSON, LORENZO	118	118	112	6	05/13/1980	48.00		05/13/1980	S	--	--	--	1580
162-075-31CCC	NDSWC 6-738	74	--	--	--	05/16/1962	--		--	--	--	--	--	1586
162-075-31DBC	SVEEN, DR. G.O.	200	--	--	--	11/26/1965		D	--	--	--	--	--	1603
162-075-32CCC	JENSEN, MELFRED	200	--	--	--	05/21/1966	--		--	--	--	--	--	1602
162-075-34BDB	MCKAY, WILLIAM	70	--	--	--	06/20/1969	22.00		06/20/1969	H	--	--	--	1650
162-075-34DDC	KNUDSON, A. ALLAN	185	185	80	3	07/13/1965	20.00		07/13/1965	H	--	--	--	1629
162-075-35AAA	NDSWC 5864	101	--	--	--	10/28/1980	--		--	--	--	--	--	1695
162-076-01BCB	NDSWC 32-738	42	--	--	--	06/26/1962	--		--	--	--	--	--	1850
162-076-02ABA	NDSWC 18-738	73	--	--	--	06/12/1962	--		--	--	--	--	--	1860
162-076-02DAC	BRANDVOLD, OLAF	142	142	--	4	09/09/1965	20.00		09/09/1965	H	--	--	--	1800
162-076-02DAD	BRANDVOLD, OLAF	88	88	67	--	1967	11.50		07/11/1978	S	--	--	--	1810
162-076-05BAD	CARBURY, ND	215	--	--	--	06/05/1928	--		--	C	--	--	--	1654
162-076-05DAA	NDSWC 5575	107	84	78	1.25	09/25/1979	23.34		12/17/1980	U	211FXHL	1800	9.0	1661
162-076-09AAA	NDSWC 20-738	42	--	--	--	06/12/1962	4.85		06/12/1962	--	--	--	--	1660
162-076-11ABA	NDSWC 30-738	63	--	--	--	06/26/1962	--		--	--	--	--	--	1790
162-076-11DAD	NDSWC 23-738	210	--	--	--	06/14/1962	--		--	--	--	--	--	1755

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162-076-12BBB	NDSWC 31-738	42	--	--	--	06/26/1962	--		--	--	--	--	--	1800
162-076-13AAA	DUWALL, LEE	250	241	--	--	05/02/1971	55.00		05/02/1971	H	--	--	--	1784
162-076-14ABA	NDSWC 5862	161	--	--	--	10/27/1980	--		--	--	--	--	--	1710
162-076-14BBB	LION OIL, CO.	3917	--	--	--	07/09/1955	--		--	--	--	--	--	1668
162-076-17AAD	KORNKVEN, GLENN	81	81	68	2	08/25/1976	25.00		08/25/1976	H	--	--	--	1530
162-076-22CDC	SOLBURG, MARK	81	81	69	24	04/19/1976	17.00		04/19/1976	H	--	--	--	1478
162-076-23CDD	KLINK, MARK	60	54	43	15	09/01/1976	23.00		09/01/1976	H	--	--	--	1620
162-076-24AAA	NDSWC 5579	77	--	--	--	09/25/1976	--		--	--	--	--	--	1695
162-076-24ADD1	LARSON, ARDEEN	92	92	88	5	04/25/1974	3.00		04/25/1974	H	--	--	--	1680
162-076-24ADD2	NDSWC 2-738	191	--	--	--	05/15/1962	--		--	--	--	--	--	1682
162-076-25AAA	STOCKYARD, BOTTINEAU	110	110	90	5	05/28/1954	14.00		05/28/1954	S	--	--	--	1655
162-076-25AAD	NDSWC 33-738	68	--	--	--	06/26/1962	--		--	--	--	--	--	1646
162-076-26BAB	NDSWC 1-738	42	--	--	--	05/15/1962	--		--	--	--	--	--	1592
162-076-26DCD	GLINZ, NORMAN	90	90	75	2	11/14/1964	20.00		11/14/1964	H	--	--	--	1605
162-076-29BAA	BURNSTEIN, LEVERNE	98	98	58	21	08/07/1973	57.00		08/09/1973	H	--	--	--	1560
162-076-35AAB	M&J EQPT.	250	--	--	--	09/23/1974	--		--	--	--	--	--	1592
162-077-06DAD	KORNKVEN, NELS	115	--	--	--	05/24/1967	--		--	--	--	--	--	1498
162-077-07DAA	NDSWC 5574	107	--	--	--	09/24/1979	--		--	--	--	--	--	1495
162-078-01DAC1	BRANDVOLD, LARRY	100	--	--	--	09/20/1963	--		--	--	--	--	--	1511
162-078-01DAC2	BRANDVOLD, LARRY	70	70	50	2	10/06/1965	12.00		10/06/1965	H	--	--	--	1511
162-078-01DDB	BRANDVOLD, OLAF	59	59	51	24	09/18/1975	8.00		09/18/1975	H	--	--	--	1500
162-078-05ABB	GRAVSETH, REUBEN	500	--	--	--	06/ /1974	--		--	--	--	--	--	1495
162-078-12CD	PHILLIPS PETR.	5265	--	--	--	05/21/1960	--		--	--	--	--	--	1485
162-078-15CCC	NDSWC 5573	122	--	--	--	09/21/1979	--		--	--	--	--	--	1493
162-078-21BBB	SKARPHOL, ELMER	123	123	117	4	06/15/1964	27.00		06/15/1964	H	112BGFV	2200	11.0	1496
162-079-03BD	NAT.ASSOC.PET., CO.	3600	--	--	--	03/16/1953	--		--	--	--	--	--	1498
162-079-03CCC	NDSWC 5568	150	--	--	--	09/18/1979	--		--	--	--	--	--	1484
162-079-05ABA	NDSWC 5569	122	--	--	--	09/18/1979	--		--	--	--	--	--	1442
162-079-06CDC	NDSWC 5565	167	--	--	--	09/17/1979	--		--	--	--	--	--	1475
162-079-14BCC	VINJE, LUTHER	74	74	69	4	07/09/1969	18.00		07/09/1969	H	--	--	--	1484
162-079-14CCC	NDSWC 5570	122	--	--	--	09/18/1979	--		--	--	--	--	--	1479
162-079-17AAA	HUNTER, WILLIAM	117	117	0	4	06/03/1964	--		--	H	--	--	--	1472
162-079-23BBB	CARLSON, ERLING	150	--	--	--	06/16/1965	--		--	--	--	--	--	1484
162-079-29DDD	MOUM, LLOYD	130	130	--	4	06/29/1975	25.00		06/29/1975	H	--	--	--	1465
162-079-34BCB	OPDAHL, JERRY	64	64	--	4	10/02/1975	17.00		10/02/1975	H	--	--	--	1433
162-080-03AAA	MCKECKNIE, WALTER	160	160	0	4.50	06/14/1972	30.00		06/14/1972	H	--	--	--	1490
162-080-03ABB	NDSWC 958	175	--	--	--	08/24/1954	--		--	--	--	--	--	1491
162-080-03DCC	NDSWC 959	180	--	--	--	08/25/1954	--		--	--	--	--	--	1490
162-080-09BBC	ODEGAARD, CLIF	40	40	--	--	--	--		--	H	112BGFV	1250	7.0	1485
162-080-11ABA	LEE, ALMA	155	144	139	4	11/29/1976	35.00	P	11/29/1976	H,S	112BGFV	2900	8.0	1465

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162-080-11CAA	WESTHOPE 58-6	210	--	--	--	1958	--		--	--	--	--	--	1490
162-080-11CCC	NDSWC 5564	197	--	--	--	09/13/1979	--		--	--	--	--	--	1487
162-080-35ADD	STRATTON, DON	155	155	--	--	--	--		--	H	211FXHL	a/2340	9.0	1490
162-080-35BBB	HUBER, C.M.	200	166	0	4	1963	100.00	N	06/26/1979	P,D	211FXHL	a/2190	9.5	1491
162-081-08AAA1	KORMANN, W.	12	12	0	36	1942	5.00	P	--	S	112LKSD	2120	7.0	1507
162-081-08AAA2	KORMANN, WESLEY	8	8	0	36	1943	4.00	P	06/ /1979	H	112LKSD	525	6.5	1507
162-081-11BCC	CARPENTER, H.	12	12	--	--	--	--		--	H	112LKSD	2150	4.0	1497
162-081-13CCC	NDSWC 5854	201	--	--	--	10/21/1980	--		--	--	--	--	--	1495
162-081-15DAD	STEAD, ARTHUR	285	285	0	4	1954		F	--	S	112GLNB	1750	8.0	1507
162-081-16CCC	NDSWC 5853	221	56	53	1.25	10/21/1980	4.18		12/17/1980	--	112BGFV	2600	6.0	1510
162-081-22AAA	NDSWC 5563	512	--	--	--	09/13/1979	--		--	--	--	--	--	1489
162-081-34AAA	NDSWC 5652	241	--	--	--	10/21/1980	--		--	--	--	--	--	1495
162-082-11BBB	JORGENSEN, REED	40	--	--	--	06/16/1977	--		--	--	--	--	--	1525
162-082-13CCC	NDSWC 11441	230	--	--	--	10/30/1980	--		--	--	--	--	--	1527
162-082-16AAB	PETERSON, DON	300	300	0	4	1920	--		--	S	211FXHL	7900	6.5	1547
162-082-17ABB1	THORP, PERCY	200	200	0	4	1915		P	--	S	211FXHL	7000	7.0	1550
162-082-17ABB2	THORP, PERCY	12	12	0	36	1920	7.00	Z	--	S,H	--	--	--	1550
162-082-17BBB	NDSWC 11442	240	--	--	--	10/30/1980	--		--	--	--	--	--	1534
162-082-20ABB	NDSWC 5562	257	--	--	--	09/12/1979	--		--	--	--	--	--	1540
162-082-20DAD	ALL SEASONS	20	--	--	--	06/08/1977	--		--	--	--	--	--	1525
162-082-21DDA	STENSLAND, EMIL	11	11	0	48	1965	5.50	P	06/27/1979	H,S	112DTSH	2800	9.0	1533
162-082-28ABA	ALL SEASONS	50	--	--	--	06/08/1977	--		--	--	--	--	--	1530
162-083-01ADD	ALL SEASONS	60	--	--	--	04/08/1977	--		--	--	--	--	--	1545
162-083-02CB	--	344	--	--	--	1929	--		--	--	--	--	--	1595
162-083-15CCC	NDSWC 5561	278	238	235	1.25	09/12/1979	3.29+		10/15/1980	--	112BGFV	5000	9.0	1565
162-083-17BBA	NDSWC 11443	240	--	--	--	10/31/1980	--		--	--	--	--	--	1565
162-083-31CCD	NDSWC 10	60	--	--	--	10/19/1948	--		--	--	--	--	--	1596
162-083-31CDC	NDSWC MO 11	60	--	--	--	10/20/1948	--		--	--	--	--	--	1598
162-083-32CCB	NDSWC MO 8	60	--	--	--	10/09/1948	--		--	--	--	--	--	1591
162-083-32CCC	NDSWC MO 7	228	--	--	--	10/06/1948	--		--	--	--	--	--	1578
162-083-33DA	BOTTINEAU CO.	654	--	--	--	1929	--		--	--	--	--	--	1585
163-069-02BBB	NDSWC 5879	181	106	100	1.25	11/05/1980	18.51		12/16/1980	U	112ROLL	1600	5.5	1803
163-069-05BAB	NDSWC 5877	201	--	--	--	11/04/1980	--		--	--	--	--	--	1825
163-069-09DDD	LEGASSE, ZENON	125	--	--	--	09/28/1965	15.00		09/28/1965	H,S	--	--	--	1825
163-069-12BBB	NDSWC 5880	121	--	--	--	11/05/1980	--		--	--	--	--	--	1785
163-069-15AAA	NDSWC 5370	220	160	157	1.25	09/07/1978	8.57		12/16/1980	--	112ROLL	2250	7.0	1810
163-069-16BBC	NDSWC 5669	137	--	--	--	10/24/1979	--		--	--	--	--	--	1829
163-069-25AAA1	NDSWC 5668	62	--	--	--	10/24/1979	--		--	--	--	--	--	1775
163-069-25AAA2	NDSWC 5668A	227	--	--	--	10/24/1979	--		--	--	--	--	--	1773
163-069-25CCC	NDSWC 5667	227	121	118	1.25	10/23/1979	2.96		12/16/1980	--	112ROLL	1550	4.0	1792

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163-069-34DDD	NDSWC 5666	67	--	--	--	10/23/1979	--	--	--	--	--	--	1802
163-070-02CCC	NDSWC 798-12	94	43	40	1.25	06/29/1966	--	--	--	--	--	--	1885
163-070-03BBA	NDSWC 798-9	84	--	--	--	06/28/1966	--	--	--	--	--	--	1888
163-070-03DD	TINGELSTAD, MELVIN	2825	--	--	--	05/03/1954	--	--	--	--	--	--	1895
163-070-04ACC	LASSONDE, WALTER	48	46	38	24	06/26/1975	7.00	06/26/1975	H	--	--	--	1915
163-070-04DAA	NDSWC 798-8	126	--	--	--	06/27/1966	--	--	--	--	--	--	1880
163-070-04DDA	GARRISON, HAROLD	45	44	36	24	09/29/1975	17.00	09/29/1975	H	--	--	--	1915
163-070-05BBD	BRYANT, DONALD	128	128	124	5	06/28/1974	40.00	06/28/1974	H	--	--	--	1985
163-070-07DBD	MILEMAN, JAMES	255	--	--	--	02/15/1972	--	--	--	--	--	--	2125
163-070-08AAA	WARD, LYLE	48	48	40	24	09/23/1975	37.00	09/23/1975	H	--	--	--	1970
163-070-09AAA	NDSWC 798-10	84	--	--	--	06/28/1966	--	--	--	--	--	--	1910
163-070-09BCA	YOKLAY, GARLAND	200	200	196	4	07/07/1970	35.00	07/07/1970	H	--	--	--	1960
163-070-10CBB	NDSWC 798-11	231	--	--	--	06/29/1966	--	--	--	--	--	--	1935
163-070-10CDD	NDSWC 462	232	--	--	--	08/28/1951	--	--	--	--	--	--	1910
163-070-10DCD	NDSWC 463	247	--	--	--	08/31/1951	--	--	--	--	--	--	1890
163-070-11DCC	NDSWC 467	162	--	--	--	09/15/1951	--	--	--	--	--	--	1881
163-070-12CDC	NDSWC 798-1	116	--	--	--	06/21/1966	--	--	--	--	--	--	1865
163-070-14CBB	NDSWC 798-3	105	--	--	--	06/22/1966	--	--	--	--	--	--	1905
163-070-14CCC	NDSWC 798-4	200	--	--	--	06/23/1966	--	--	--	--	--	--	1935
163-070-14CDC	NDSWC 798-5	94	--	--	--	06/23/1966	--	--	--	--	--	--	1910
163-070-14DDD	NDSWC 798-6	116	--	--	--	06/24/1966	--	--	--	--	--	--	1870
163-070-15AAA1	NDSWC 798-13	136	--	--	--	06/30/1966	--	--	--	--	--	--	1910
163-070-15AAA2	NDSWC 5369	360	--	--	--	09/06/1978	--	--	--	--	--	--	1900
163-070-15ABB	SAINT JOHN, ND	50	50	--	--	--	--	--	P	112BGFV	1400	8.0	1903
163-070-15ACA	NDSWC 460	280	--	--	--	08/17/1951	--	--	--	--	--	--	1935
163-070-15ADA1	NDSWC 798-2	242	--	--	--	06/21/1966	--	--	--	--	--	--	1900
163-070-15ADA2	NDSWC 461	203	--	--	--	08/22/1951	--	--	--	--	--	--	1900
163-070-15ADA3	NDSWC 465	140	--	--	--	09/11/1951	--	--	--	--	--	--	1900
163-070-15ADB	NDSWC 464	200	--	--	--	09/10/1951	--	--	--	--	--	--	1907
163-070-15BDD	NDSWC 172	300	--	--	--	08/01/1949	--	--	--	--	--	--	1955
163-070-15CAB	NDSWC 457	205	--	--	--	08/08/1951	--	--	--	--	--	--	1970
163-070-15CAD	NDSWC 459	180	--	--	--	08/16/1951	--	--	--	--	--	--	1960
163-070-15DBA	NDSWC 798-7	210	--	--	--	06/27/1966	--	--	--	--	--	--	1940
163-070-15DCD	NDSWC 466	230	--	--	--	09/12/1951	--	--	--	--	--	--	1955
163-070-16AAA	NDSWC 173	305	--	--	--	08/04/1947	--	--	--	--	--	--	1959
163-070-16DAA	NDSWC 458	280	--	--	--	08/13/1951	--	--	--	--	--	--	2005
163-070-16DAB	ALBERTSON, ALBERT	215	215	211	4	10/21/1972	56.00	10/21/1972	H	--	--	--	2030
163-070-17ABC	DAVIS, DON	238	238	233	5	08/14/1976	91.00	08/14/1976	H	112BGFV	2500	9.0	2060
163-070-24DDD	MARCELL, ROBERT	50	50	46	5	02/01/1973	20.00	02/01/1973	H	--	--	--	1860
163-070-29BCB	MANSON, LOUIS	70	--	--	--	05/07/1968		D --	--	--	--	--	2110

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163-070-29BCC	NDSWC 5876	478	--	--	--	11/04/1980	--		--	--	--	--	--	2110
163-070-30ABA1	USDI	359	--	--	--	04/29/1964		D	--	--	--	--	--	2100
163-070-30ABA2	USDI	215	215	212	4	05/20/1964	70.00		05/20/1964	P	--	--	--	2100
163-070-32DDD	NDSWC 7	460	--	--	--	12/04/1973	--		--	--	--	--	--	2062
163-070-35CDD	NDSWC 5-797	326	--	--	--	07/18/1966	--		--	--	--	--	--	2020
163-071-01BDB	SANDE, MARTIN	328	328	324	5	11/17/1966	215.00		11/17/1966	H	--	--	--	2185
163-071-02CCC	JAY, NORMAN	92	92	--	24	04/30/1976	9.00		04/30/1976	H	--	--	--	2140
163-071-07A0B	MAAS, JIM	316	316	311	4	03/15/1974	145.00		03/15/1974	H,S	--	--	--	2185
163-071-10DDD1	NDSWC 5368	700	485	479	2	08/31/1978	--		--	--	--	--	--	2165
163-071-10DDD2	NDSWC 5368-A	420	399	396	2	09/05/1978	163.22		11/18/1980	--	112BGFV	--	--	2165
163-071-16BDA	CROSS ROADS RANCH	124	91	0	4	12/17/1976	38.00		12/17/1976	S	--	--	--	2150
163-071-19CDD	PAGE, MIKE	40	40	32	30	11/18/1972	4.00		11/18/1972	H	--	--	--	2205
163-071-26AAD	ALLERY, RON	276	276	271	4	12/29/1967	123.00		12/29/1967	H	112BGFV	1800	7.0	2100
163-071-31CCA	NDSWC 3	220	--	--	--	08/14/1971	--		--	--	--	--	--	2180
163-071-32DDC	LAVALLIE, MIKE	54	54	46	30	1972	--		--	--	--	--	--	2165
163-071-35BBA	JEROME, FERDINAND	172	172	168	4	07/10/1974	35.00		07/10/1974	H	--	--	--	2125
163-071-35BBC	JEROME, BUCKY	25	25	5	24	07/08/1975	5.00		07/08/1975	S	--	--	--	2140
163-071-35BDD	JEROME, DAN	318	318	314	4	08/05/1974	140.00		08/05/1974	H	--	--	--	2140
163-071-36CDD	MURPHY, JOE	300	--	--	--	06/08/1965		D	--	--	--	--	--	2110
163-072-01BBC	RUPPELLUS, MERLIN	380	380	375	4	08/10/1970	200.00		08/10/1970	S	--	--	--	2240
163-072-05CB	SUN OIL CO.	3660	--	--	--	08/20/1954	--		--	--	--	--	--	2282
163-072-14ABB	NDSWC 5367	620	596	590	2	08/29/1978	251.48		12/16/1980	--	211FXHL	1600	8.0	2250
163-072-14BBA	PARISIEN, BRUNO	36	36	28	30	1972	--		--	H	--	--	--	2270
163-072-16ADD	LIGHTHOUSE CAMP	315	185	185	4	06/16/1969	27.00		06/16/1969	H	--	--	--	2220
163-072-18BBC	NDSWC 5585	452	367	358	1.25	10/02/1979	140.40		12/16/1980	--	112BGFV	1500	5.0	2200
163-072-24ADB	DEMERS, FRANK	351	351	347	5	12/11/1974	180.00		12/11/1974	S	--	--	--	2130
163-072-30BBB	NDSWC 5870	361	--	--	--	10/29/1980	--		--	--	--	--	--	2120
163-072-32CBD	WALTER, ED	238	238	237	4	10/30/1963	125.00		10/30/1963	H,S	--	--	--	2130
163-072-36CCC	NDSWC 5871	501	121	118	1.25	10/30/1980		D	--	--	--	--	--	2195
163-073-03CDA	SALMANSUN, HARLAN	39	39	35	24	10/02/1976	24.00		10/02/1976	S	--	--	--	2105
163-073-07DDD	NDSWC 5584	287	--	--	--	10/02/1979	--		--	--	--	--	--	2171
163-073-08ABB	HIATT, WILLIE	395	395	384	4	12/22/1964	140.00		12/22/1964	H	--	--	--	2120
163-073-10DCC	SALMONSUN, CLIFF	161	161	157	4	01/31/1968	45.00		01/31/1968	H,S	112BGFV	a/1460	6.0	2100
163-073-11CCC1	NDSWC 5366	715	412	406	2	08/22/1977	59.64		12/16/1980	U	211FXHL	1250	7.0	2123
163-073-11CCC2	NDSWC 5366A	295	275	269	2	08/23/1978	60.49		12/16/1980	--	211HLCK	1400	6.9	2123
163-073-11CCC3	NDSWC 5366B	240	220	217	2	08/28/1978	59.72		12/16/1980	--	112BGFV	1300	7.0	2123
163-073-18DDA	HIATT, ALBERT	168	168	163	4	01/22/1968	9.00		01/22/1968	H,S	--	--	--	2130
163-073-23DBD	METCALFE, WILLIAM	310	310	304	4	01/07/1964	130.00		01/07/1964	--	--	--	--	2175
163-073-26DAA	BERGAN, DAVID	280	280	275	4	06/22/1972	66.00		06/22/1972	H,S	--	--	--	2115
163-073-27DDD	NEEPAL, MIKE	41	41	--	--	06/17/1980	25.00		06/17/1980	H	112BGFV	710	8.0	2168

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163-073-30CCC	HALVORSON, LESTER	205	205	191	4	01/25/1964	45.00	01/25/1964	H,S	--	--	--	2120
163-073-30DDD	WENSTADT, OSCAR	255	255	250	4	05/26/1969	27.00	05/26/1969	H	--	--	--	2080
163-073-31CAD	FAUSKE, ELWOOD	69	69	61	24	09/02/1975	47.50	09/02/1975	H	--	--	--	2125
163-073-32CC	BRITISH-AMERICAN	5274	--	--	--	10/18/1954	--	--	--	--	--	--	2030
163-074-12DCC	LINDBERG, ELMER	154	154	148	4	08/18/1964	50.00	08/18/1964	H	--	--	--	2125
163-074-13BBA	HALVORSON, JAMES	172	172	168	5	07/29/1976	40.00	07/29/1976	H	--	--	--	2135
163-074-15ABA1	NDSWC 5365	795	516	510	2	08/21/1978	142.04	12/17/1980	--	211FXHL	2300	7.0	2190
163-074-15ABA2	NDSWC 5365A	375	363	357	2	08/22/1978	99.63	12/17/1980	--	211HLCK	[a]/2460	7.5	2190
163-074-16AA	NDFS	252	--	--	--	08/04/1970	--	--	--	--	--	--	2225
163-074-16BAB	NDFS	392	392	320	4	09/17/1970	125.00	09/17/1970	P	211HLCK	2300	8.0	2190
163-074-21BAC	HANSON, H.J.	110	--	--	--	06/03/1969	--	--	--	--	--	--	2175
163-074-34ABA	CHRISTENSON, MARVIN	42	42	34	24	09/06/1976	6.00	09/06/1976	S	--	--	--	2200
163-074-34CBA	KETTLESON, GORDON	110	110	105	5	1974	27.00	1974	H	--	--	--	2240
163-074-35DAB	CHRISTIANSON, CLARENCE	275	275	265	2	05/02/1973	115.00	05/02/1973	H,S	--	2300	8.0	2190
163-075-01BCC	OLSEN, HENRY	145	145	140	4	08/21/1970	--	--	--	--	--	--	2150
163-075-02AAA	SMITH, ISADORE	124	124	119	4	05/08/1969	62.00	05/08/1969	H	--	--	--	2150
163-075-02AAC	HAYHURST, GEORGE	152	152	146	4	02/08/1964	12.00	02/08/1964	H	--	--	--	2155
163-075-02CAA	WOLD, PETE	120	120	114	5	05/08/1971	21.00	05/08/1971	H	--	--	--	2145
163-075-02DDB	TWETEN, JOHN	203	203	202	5	08/15/1967	100.00	08/15/1967	--	--	--	--	2175
163-075-03DDD	LIGHT, BILL	189	188	183	4	11/21/1969	68.00	11/21/1969	H	--	--	--	2160
163-075-10CDB	LUND, ORVILLE	207	207	202	4	11/07/1964	108.00	11/07/1964	H	--	--	--	2140
163-075-11AAA	NDSWC 5861	321	--	--	--	10/24/1980	--	--	--	--	--	--	2220
163-075-11CDA	LAKESIDE, CENTER	184	182	172	6	04/17/1972	87.00	04/17/1972	P	--	--	--	2160
163-075-11CDD	LAKESIDE, CENTER	320	--	--	--	12/29/1971	--	--	--	--	--	--	2155
163-075-12DCA	HAHN, LOUIS	382	382	381	4	11/02/1967	161.00	11/06/1967	H	--	--	--	2215
163-075-13BAB	ROLAND, CARL	141	141	121	4	07/24/1973	30.00	07/24/1973	H	--	--	--	2180
163-075-14AAA	NDSWC 5583	227	181	178	1.25	10/02/1979	93.29	12/17/1980	--	112BGFV	--	--	2165
163-075-15AAB1	NDSWC 5364	735	515	509	2	08/15/1978	113.89	12/17/1980	--	211FXHL	1500	9.0	2150
163-075-15AAB2	NDSWC 5364A	175	158	155	1.25	08/18/1978	23.40	12/17/1980	--	112BGFV	1350	8.0	2150
163-075-15BBB	NDSWC 5582	242	--	--	--	09/27/1979	--	--	--	--	--	--	2142
163-075-17BAA	NDSWC 16-738	273	--	--	--	06/08/1962	--	--	--	--	--	--	2260
163-075-20DBC	PEDERSON, OLIVER	109	109	104	4	12/09/1965	45.00	12/09/1965	H	--	--	--	2165
163-075-22CDC	NDSWC 5859	310	--	--	--	10/22/1980	--	--	--	--	--	--	2140
163-075-23BB	LION OIL CO.	6422	--	--	--	08/09/1952	--	--	--	--	--	--	2190
163-075-25DAB	HELGESON, HANS	335	335	325	4	11/12/1964	180.00	11/12/1964	H	--	--	--	2228
163-075-28AAD	NDSWC 13-738	284	--	--	--	06/06/1962	--	--	--	--	--	--	2140
163-075-29ABB	NDSWC 11-738	126	--	--	--	06/04/1962	--	--	--	--	--	--	2150
163-075-29BDA	OLSON, CECIL	250	250	245	4	1972	150.00	1972	S	--	--	--	2175
163-075-30BBC	NDSWC 12-738	357	--	--	--	06/05/1962	--	--	--	--	--	--	2250
163-075-31AAA	VINJE, HAROLD	99	--	--	--	08/30/1974	--	--	--	--	--	--	2170

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163-075-31CB	NDSWC 28-738	262	--	--	--	06/20/1962	--		--	--	--	--	--	2130
163-075-31CBB	BECKMAN, HENRY	87	87	82	4	06/04/1966	50.00		06/04/1966	S	--	--	--	2135
163-075-34BCB	LARSON, LEODOLPH	245	245	240	4	08/15/1966	142.00		08/15/1966	H,S	--	--	--	2140
163-076-01CCA	PEDIE, OLEN	250	--	--	--	03/17/1966		D	--	--	--	--	--	2455
163-076-01CCB	PEDIE, OLEN	290	--	--	--	03/11/1966		D	--	--	--	--	--	2450
163-076-01CCD	PEDIE, OLEN	48	48	28	18	09/07/1972	22.00		09/07/1972	S	--	--	--	2460
163-076-05CCB	BERNSTEIN, LOREN	332	272	268	4	02/26/1977	195.00		02/26/1977	H	--	--	--	1830
163-076-10DDD1	NDSWC 5363	815	582	576	2	08/10/1978	168.47		09/10/1980	--	--	--	--	2260
163-076-10DDD2	NDSWC 5363A	355	323	320	2	08/15/1978	173.09		12/17/1980	--	112BGFV	1300	7.5	2260
163-076-15BCB	ND STATE PARK	82	82	81	4	06/20/1969	35.00		06/20/1969	P	--	--	--	2180
163-076-16BAD1	NDSWC 5572	497	490	470	2	09/20/1979	160.10		12/17/1980	--	211FXHL	--	--	2110
163-076-16BAD2	NDSWC 5572A	55	39	36	1.25	09/20/1979	9.30		12/17/1980	--	112BGFV	--	--	2110
163-076-16BAD3	NDSWC 5572B	162	153	150	1.25	09/20/1979	63.48		12/17/1980	--	125CBLD	2200	9.0	2110
163-076-16BBB	NDSWC 5571	62	--	--	--	09/19/1979	--		--	--	--	--	--	1965
163-076-16BCD	ND STATE REC.	202	--	--	--	07/30/1969		D	--	--	--	--	--	2250
163-076-18AAB	BERNSTEIN, LOREN	400	--	--	--	09/10/1974		D	--	--	--	--	--	1720
163-076-21DDB	LISTOE, OLGA	130	130	110	5	06/17/1975	--		--	H	--	--	--	1850
163-076-23ADD	NDSWC 18-738	280	--	--	--	06/11/1962	--		--	--	--	--	--	2240
163-076-24DAB	BRANDVOLD, MARVIN	458	458	448	4	08/08/1973	290.00		08/08/1973	H,S	--	--	--	2280
163-076-27CAA	BOWER, WALTER	200	200	188	4	10/02/1972	51.00	R	10/02/1972	S	211HLCK	2300	6.5	1890
163-076-33ACC	JOHNSON, MILFORD	133	133	123	4	08/10/1966	7.00		08/10/1966	H	--	--	--	1710
163-076-35CAB	LUNDY, JOE	62	62	58	24	08/19/1976	6.00		08/19/1976	H,S	--	--	--	1900
163-076-35DAB	SIVERSTON, NORMAN	57	57	49	24	05/26/1977	27.00		05/26/1977	H,S	112BGFV	1450	8.5	1910
163-076-36DAD	NDSWC 29-738	200	--	--	--	06/20/1962	--		--	--	--	--	--	2145
163-077-02BB	LION OIL CO.	5102	--	--	--	10/25/1952	--		--	--	--	--	--	1659
163-077-09ABB	NDSWC 5858	101	--	--	--	10/22/1980	--		--	--	--	--	--	1570
163-077-09DCD	TORHOL, OTTO	150	150	--	--	09/21/1963	30.00		09/21/1963	H	--	--	--	1780
163-077-12DBB	NYLOKKEN, MARVIN	124	124	82	4	05/14/1964	62.00		05/14/1964	H	--	--	--	1695
163-077-15AAA	NDSWC 5362	195	--	--	--	08/09/1978	--		--	--	--	--	--	1640
163-077-18BCA	HUNT OIL CO.	6422	--	--	--	04/28/1952	--		--	--	--	--	--	1510
163-077-27CBC	NDSWC 5857	101	--	--	--	10/22/1980	--		--	--	--	--	--	1540
163-077-33AAA	SOURIS, ND	26	26	18	8	1960	5.00	P	1975	P	112LKSD	1300	7.5	1525
163-078-09AD	FRAZIER-CONROY	3084	--	--	--	01/30/1953	--		--	--	--	--	--	1517
163-078-11CCC	NDSWC 5361	115	--	--	--	08/09/1978	--		--	--	--	--	--	1511
163-078-15AAB	KJELSHUS, SIGURD	84	84	78	7	07/12/1973	16.00	R	07/12/1977	S	211FXHL	5500	6.0	1515
163-078-19AUD	JUVE, HENRY	150	--	--	--	05/03/1971	--		--	--	--	--	--	1507
163-078-25DCD	COUNTS, LAWERENCE	59	59	51	4.50	05/14/1972	28.00		05/14/1972	H	--	--	--	1503
163-078-36BBB	NDSWC 5856	101	--	--	--	10/22/1980	--		--	--	--	--	--	1508
163-079-08CCC	SIVERTSON, GILBERT	140	--	--	--	04/11/1967	--		--	--	--	--	--	1488
163-079-09AAA	NDSWC 5566	122	--	--	--	09/18/1979	--		--	--	--	--	--	1495

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 AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
163-079-14BBB	NDSWC 5360	155	68	65	1.25	08/09/1978	8.60		12/17/1980	--	112BGFV	a/5010	9.0	1500
163-079-27BBB	NDSWC 5567	92	--	--	--	09/18/1979	--		--	--	--	--	--	1486
163-079-30CAB	NDSWC 971	70	--	--	--	--	--		--	--	--	--	--	1415
163-079-30CBC	NDSWC 950	110	--	--	--	08/09/1954	--		--	--	--	--	--	1415
163-079-30CBD	NDSWC 962	110	--	--	--	08/27/1954	--		--	--	--	--	--	1415
163-079-30CCB	NDSWC 975	110	--	--	--	09/09/1954	--		--	--	--	--	--	1416
163-079-30CCC	NDSWC 58-4	142	--	--	--	1958	--		--	--	--	--	--	1420
163-079-31ABA	NDSWC 948	90	--	--	--	08/07/1954	--		--	--	--	--	--	1420
163-079-31BAB	NDSWC 947	100	--	--	--	08/06/1954	--		--	--	--	--	--	1417
163-079-31BBB	NDSWC 946	110	--	--	--	08/06/1954	--		--	--	--	--	--	1425
163-079-32BBB	NDSWC 949	130	--	--	--	08/07/1954	--		--	--	--	--	--	1485
163-079-33DBD	NDSWC 970	110	--	--	--	1954	--		--	--	--	--	--	1482
163-079-33DCA	NDSWC 966	120	--	--	--	09/01/1954	--		--	--	--	--	--	1482
163-079-33DCD1	NDSWC 965	130	--	--	--	09/01/1954	--		--	--	--	--	--	1482
163-079-33DCD2	NDSWC 969	120	--	--	--	09/04/1954	--		--	--	--	--	--	1483
163-079-33DDB	NDSWC 963	110	--	--	--	08/28/1954	--		--	--	--	--	--	1482
163-079-33DDC1	NDSWC 964	100	--	--	--	08/30/1954	--		--	--	--	--	--	1482
163-079-33DDC2	NDSWC 967	110	--	--	--	09/02/1954	--		--	--	--	--	--	1482
163-079-34CBC	GRANN, IRVING	86	86	81	4	03/29/1967	10.00		03/29/1967	H	--	--	--	1481
163-080-02DCD	DESCHAMP, BUD	85	85	--	--	--	--		--	H	112HGFV	4500	7.5	1491
163-080-05DCC	ZAHN, MERVIN	150	--	--	--	10/10/1966		D	--	--	--	--	--	1495
163-080-11BA	HAUGEN, HERMAN	3755	--	--	--	09/10/1953	--		--	--	--	--	--	1492
163-080-11CCC	NDSWC 5359	195	--	--	--	08/08/1978	--		--	--	--	--	--	1490
163-080-14CDD	NDSWC 936	140	--	--	--	07/21/1954	--		--	--	--	--	--	1492
163-080-15BAA	NDSWC 935	150	--	--	--	07/20/1954	--		--	--	--	--	--	1485
163-080-15CAA	NDSWC 934	160	--	--	--	07/19/1954	--		--	--	--	--	--	1496
163-080-15DCC	NDSWC 933	158	--	--	--	07/17/1954	--		--	--	--	--	--	1490
163-080-21CD	BROOKS DRILLING	3633	3500	--	--	11/29/1952	--		--	--	--	--	--	1495
163-080-21DAD	NDSWC 937	180	--	--	--	07/24/1954	--		--	--	--	--	--	1492
163-080-21DDD	NDSWC 931	170	--	--	--	07/16/1954	--		--	--	--	--	--	1492
163-080-22ABB	BERENTSON, JEROME	150	150	--	--	--	--		--	H	112BGFV	5000	8.0	1490
163-080-22CAA	NDSWC 932	170	--	--	--	07/16/1954	--		--	--	--	--	--	1490
163-080-22CDD	NDSWC 930	170	--	--	--	07/15/1954	--		--	--	--	--	--	1496
163-080-22DDD	LODDEN, LEONARD	305	--	--	--	06/26/1973		D	--	--	--	--	--	1490
163-080-23DCC	NDSWC 953	160	--	--	--	08/12/1954	--		--	--	--	--	--	1485
163-080-24DAC	NDSWC 973	50	--	--	--	1954	--		--	--	--	--	--	1430
163-080-25BBB	NDSWC 952	150	--	--	--	08/11/1954	--		--	--	--	--	--	1481
163-080-25CCC1	WESTHOPE, ND	146	--	--	--	1953	--		--	--	--	--	--	1489
163-080-25CCC2	WESTHOPE, ND	148	127	118	8	12/ /1954	98.00		12/ /1954	P	--	--	--	1489
163-080-25CCD	WESTHOPE, ND	160	--	--	--	09/ /1953	--		--	--	--	--	--	1485

a/Value shown is the laboratory specific conductance.

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163-080-26ACC	NDSWC 955	150	--	--	--	1954	--	--	--	--	--	--	1489
163-080-26ACD	NDSWC 954	151	--	--	--	08/19/1954	--	--	--	--	--	--	1490
163-080-26BAB	NDSWC 956	150	--	--	--	08/20/1954	--	--	--	--	--	--	1492
163-080-26DAA	NDSWC 951	150	--	--	--	1954	--	--	--	--	--	--	1490
163-080-26DAC	NDSWC 976	150	--	--	--	09/10/1954	--	--	--	--	--	--	1490
163-080-26DDC	WESTHOPE, ND	160	160	159	8	1963	--	--	P	211FXML	2050	8.0	1490
163-080-26DDD	WESTHOPE, ND	149	--	--	--	--	--	--	--	--	--	--	1489
163-080-27AAA	LODUNE, LEONARD	153	--	--	--	07/ /1973	--	--	--	--	--	--	1488
163-080-27BDD	NDSWC 929	170	--	--	--	07/14/1954	--	--	--	--	--	--	1496
163-080-27CCC	NDSWC 941	180	--	--	--	07/29/1954	--	--	--	--	--	--	1495
163-080-27CDA	WESTHOPE, ND	240	--	--	--	09/ /1953	--	--	--	--	--	--	1493
163-080-27DBB	WESTHOPE, ND	174	--	--	--	1958	--	--	--	--	--	--	1495
163-080-28CCC	NDSWC 939	200	--	--	--	--	--	--	--	--	--	--	1497
163-080-28DCC	NDSWC 940	190	--	--	--	07/28/1954	--	--	--	--	--	--	1495
163-080-32BBB	NDSWC 938	190	--	--	--	07/26/1954	--	--	--	--	--	--	1500
163-080-32BCA	LODUNE, CLARENCE	190	190	187	4	11/06/1974	74.00	11/06/1974	H,S	--	--	--	1505
163-080-34BAA	NDSWC 928	180	--	--	--	07/13/1954	--	--	--	--	--	--	1498
163-080-34DBB	NDSWC 957	170	--	--	--	08/21/1954	--	--	--	--	--	--	1495
163-080-35AAB	NDSWC 961	150	--	--	--	08/26/1954	--	--	--	--	--	--	1490
163-080-35ABB1	NDSWC 943	160	--	--	--	07/31/1954	--	--	--	--	--	--	1490
163-080-35ABB2	WESTHOPE, ND	162	--	--	--	1958	--	--	--	--	--	--	1490
163-080-35BBB	NDSWC 942	170	--	--	--	07/30/1954	--	--	--	--	--	--	1496
163-080-36BAA	NDSWC 945	140	--	--	--	08/05/1954	--	--	--	--	--	--	1481
163-080-36BBA	NDSWC 960	150	--	--	--	08/26/1954	--	--	--	--	--	--	1485
163-080-36BBB	NDSWC 944	161	--	--	--	08/03/1954	--	--	--	--	--	--	1491
163-081-01CCA	CARDINAL OIL	3900	--	--	--	06/08/1955	--	--	--	--	--	--	1498
163-081-09AAB1	--	14	14	--	--	--	--	--	H	112LKSD	850	3.0	--
163-081-09AAB2	JESPERSON, BERT	113	113	101	4	08/28/1965	20.00	08/28/1965	H	--	--	--	1507
163-081-09BCD	ALL SEASONS	40	--	--	--	04/13/1977	--	--	--	--	--	--	1505
163-081-10ABD	HETH, LEROY	15	15	14	36	1977	12.00	06/20/1979	H	112LKSD	600	9.0	1503
163-081-11CCC	NDSWC 5358	235	--	--	--	08/08/1978	--	--	--	--	--	--	1505
163-081-22DDD	ALL SEASONS	200	--	--	--	04/07/1977	--	--	--	--	--	--	1498
163-081-34DDD	NDSWC 5855	221	--	--	--	10/21/1980	--	--	--	--	--	--	1505
163-082-01ACD	LEDOUX, ALBERT	12	12	11	36	1955	5.53	R 06/14/1979	H,S	112OTSH	800	5.5	1515
163-082-03ACD	ANTLER, ND	13	13	12	48	1945	10.00	R 06/14/1979	P	112OTSH	525	5.0	1528
163-082-10DDD	NDSWC 5357	335	60	57	1.25	08/08/1978	5.97	12/17/1980	--	112BGFV	--	--	1525
163-082-14CAA	SOHIO OIL	4123	--	--	--	08/07/1953	--	--	--	--	--	--	1521
163-082-26BCA	ALL SEASONS	40	--	--	--	04/15/1977	--	--	--	--	--	--	1525
163-082-27AAA	ALL SEASONS	40	25	19	1.25	06/08/1977	12.00	06/08/1977	P	--	--	--	1528
163-082-27CCC	THOMPSON, JUSTIN	10	10	9	48	1954	6.00	06/19/1979	H,S	--	780	10.0	1531

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163-082-28AAB	ARTZ, MICHAEL	15	15	14	36	1939	10.00		06/19/1979	H,S	112OTSH	600	6.0	1532
163-082-32ACC	ALL SEASONS	60	--	--	--	06/10/1977	--		--	--	--	--	--	1551
163-082-36000	ALL SEASONS	60	--	--	--	06/09/1977	--		--	--	--	--	--	1513
163-083-02CAA	FELAND, RALPH	12	12	11	36	1943	5.48	R	06/13/1979	H	112OTSH	1300	7.0	1575
163-083-05BCB	SOUTHAM, KEN	75	--	--	--	10/21/1976	--		--	--	--	--	--	1600
163-083-10ABA	ARTZ, J.	12	12	10	36	1948	3.00	P	06/13/1979	H	112OTSH	380	5.0	1585
163-083-11CCC	NDSWC 5356	415	--	--	--	08/07/1978	--		--	--	--	--	--	1578
163-083-21AAD	ALL SEASONS	60	--	--	--	04/08/1977	--		--	--	--	--	--	1560
163-083-22DCA	PEARSON, A.H.	18	18	--	48	1964	10.10		06/13/1979	H	112OTSH	640	4.0	1565
163-083-25AAB	FELAND, EDWIN	13	13	12	48	1950	4.00	R	--	H,S	--	2000	9.0	1563
163-083-36BBB	PEARSON, ARTHUR	4014	4014	--	--	11/17/1956	--		--	--	--	--	--	1564
164-069-28DDD	NDSWC 5878	171	141	138	1.25	11/04/1980	34.51		12/16/1980	--	112ROLL	1520	6.0	1811
164-070-31BDB	BRYANT, BILL	240	217	190	5	03/31/1973	35.00		03/31/1973	H	211PlRR	2400	7.5	1970
164-072-32CCB	METCALFE, GARY	325	325	320	4	09/02/1966	152.00		09/02/1966	H,S	--	--	--	2320
164-073-25DCB	NDSWC 5586	392	--	--	--	10/04/1979	--		--	--	--	--	--	2256
164-075-27ACD	NDSWC 738	174	--	--	--	06/06/1962	--		--	--	--	--	--	2160
164-075-33ABC	LOVADSEN BROS.	84	84	79	4	10/27/1970	30.00		10/27/1970	H	--	--	--	2255
164-075-34CDD	NDSWC 5581	407	--	--	--	09/26/1979	--		--	--	--	--	--	2152
164-075-34DBB	OLSEN, OSCAR	203	203	0	6	07/07/1975	93.00		07/07/1975	H	--	--	--	2150
164-075-35ADB	BOY SCOUTS, BUTTINEAU	80	80	77	4	07/05/1972	27.00		07/05/1972	P	--	--	--	2152
164-075-35BDA	TORGERSON, O.A.	107	107	104	4	05/10/1966	18.00		05/10/1966	H	--	--	--	2155
164-075-35CAD	GILLIES	82	82	77	4	05/07/1971	37.00		05/07/1971	H	--	--	--	2148
164-075-35CCB	DAHL, MAYNARD	98	98	92	4	01/09/1975	12.00		01/09/1975	--	--	--	--	2145
164-075-35DDB	KITTELSON, ARNOLD	87	87	82	4	09/16/1967	17.00		09/16/1967	H	--	--	--	2142
164-075-35DDC	NDSWC LM-6	158	146	143	1.25	10/18/1966	63.05		1966	--	112BGFV	1430	--	2146
164-075-36ADA	NDSWC LM-5	168	--	--	--	10/18/1966	--		--	--	--	--	--	2150
164-075-36BB	NDSWC LM-1	231	105	102	1.25	10/12/1966	64.60		1966	--	112BGFV	1250	--	2150
164-075-36CAB	ND STATE PARK, METIGOSHE	300	--	--	--	05/01/1973	--		--	--	--	--	--	2165
164-075-36CBB	NDSWC LM-2	126	110	107	1.25	10/17/1966	61.43		1966	--	112BGFV	1390	--	2168
164-075-36CBC	ND STATE PARK, METIGOSHE	120	108	--	--	05/12/1973	--		--	P	112BGFV	1400	7.2	2142
164-075-36CDA	NDSWC LM-4	262	--	--	--	10/18/1966	--		--	--	--	--	--	2160
164-075-36DDA	NDSWC LM-7	315	--	--	--	10/19/1966	--		--	--	--	--	--	2170
164-077-25CCD	BERGE, VERN	68	68	40	4	03/12/1966	15.00		03/12/1966	H	--	--	--	1718
164-077-33ADD	LION OIL CO.	3018	3018	--	--	07/18/1955	--		--	--	--	--	--	1580
164-078-31BDA	WALTZ-WESTBY	3115	--	--	--	04/19/1955		D	--	--	--	--	--	1517
164-079-36AB	WILLISTON DRLG, CO.	3080	3080	--	--	05/20/1953	--		--	--	--	--	--	1515
164-080-33DAD	ZAHN, FRED	165	--	--	--	10/12/1960	--		--	--	--	--	--	1495
164-080-35ADA	BALLANTYNE, GORDON	3225	3225	--	--	06/10/1954	--		--	--	--	--	--	1495
164-081-29CBB	ALL SEASONS	40	--	--	--	04/12/1977	--		--	--	--	--	--	1515
164-081-29CCA	ALL SEASONS	20	--	--	--	04/12/1977	--		--	--	--	--	--	1516

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164-081-29CCB	ALL SEASONS	40	--	--	--	04/12/1977	--	--	--	--	--	--	1515
164-081-31AAA	ALL SEASONS	20	--	--	--	04/12/1977	--	--	--	--	--	--	1517
164-081-31AAC	ALL SEASONS	40	--	--	--	04/12/1977	--	--	--	--	--	--	1515
164-082-26CDA	ALL SEASONS	40	25	19	1.25	06/14/1977	--	--	--	--	--	--	1520
164-082-26DAD	ALL SEASONS	40	27	21	1.25	06/15/1977	--	--	--	--	--	--	1520
164-082-27CDD	ALL SEASONS	40	26	20	1.25	06/23/1977	6.94	06/23/1977	--	--	--	--	1525
164-082-27DCC	ALL SEASONS	40	--	--	--	06/14/1977	--	--	--	--	--	--	1525
164-082-27DDA	ALL SEASONS	40	--	--	--	06/13/1977	--	--	--	--	--	--	1525
164-082-28CCC	ALL SEASONS	40	--	--	--	06/ /1977	--	--	--	--	--	--	1531
164-082-28DCA	ALL SEASONS	40	30	24	1.25	06/22/1977	11.46	06/22/1977	--	--	--	--	1530
164-082-28DDA	ALL SEASONS	40	27	21	1.25	06/22/1977	11.40	06/22/1977	--	--	--	--	1530
164-082-31BBD	ALL SEASONS	40	21	16	1.25	06/10/1977	11.70	06/10/1977	--	--	--	--	1550
164-082-31BDA	ALL SEASONS	40	--	--	--	06/10/1977	--	--	--	--	--	--	1540
164-082-33AAA	ALL SEASONS	40	--	--	--	06/22/1977	--	--	--	--	--	--	1530
164-082-33DCD	ALL SEASONS	60	--	--	--	06/10/1977	--	--	--	--	--	--	1530
164-082-33DDB	ALL SEASONS	60	--	--	--	04/08/1977	--	--	--	--	--	--	1535
164-082-33DDD	ALL SEASONS	60	--	--	--	04/08/1977	--	--	--	--	--	--	1530
164-082-34AAA	ALL SEASONS	60	--	--	--	04/11/1977	--	--	--	--	--	--	1520
164-082-34AAC	ALL SEASONS	40	28	20	1.25	04/15/1977	9.20	04/15/1977	--	--	--	--	1520
164-082-34AAD1	ALL SEASONS	40	27	17	4	04/13/1977	11.90	04/13/1977	--	--	--	--	1520
164-082-34AAD2	ALL SEASONS	40	25	19	1.25	04/11/1977	11.40	04/11/1977	--	--	--	--	1520
164-082-34ADA	ALL SEASONS	40	27	20	1.25	04/11/1977	11.60	04/11/1977	--	--	--	--	1530
164-082-34ADD	ALL SEASONS	40	--	--	--	04/12/1977	--	--	--	--	--	--	1530
164-082-34BAD	ALL SEASONS	60	--	--	--	06/22/1977	--	--	--	--	--	--	1525
164-082-34BBA	ALL SEASONS	40	28	22	1.25	06/23/1977	--	--	--	--	--	--	1530
164-082-35BBB1	ALL SEASONS	40	26	20	1.25	06/14/1977	--	--	--	--	--	--	1520
164-082-35BBB2	ALL SEASONS	40	26	20	1.25	06/14/1977	--	--	--	--	--	--	1520
MISCELLANEOUS SURFACE-WATER DATA-COLLECTION SITES													
161-071-10AAB	WOLF CREEK	--	--	--	--	--	--	--	--	--	650	0.5	--
161-071-28BAA	WOLF CREEK	--	--	--	--	--	--	--	--	--	580	1.0	--
162-070-08DAA	OX CREEK	--	--	--	--	--	--	--	--	--	800	16.0	--
162-070-20AAD	OX CREEK	--	--	--	--	--	--	--	--	--	1300	15.0	--

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

159-070-17DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 3, 1979...	30.15	Apr. 16.....	30.76	Sept. 10.....	31.05
Nov. 6.....	30.21	May 13.....	30.84	Oct. 7.....	30.98
Dec. 11.....	30.09	June 19.....	30.90	Nov. 18.....	30.09
Feb. 12, 1980...	30.01	July 17.....	30.94	Dec. 16.....	30.55
Mar. 17.....	29.83	Aug. 12.....	31.00	Feb. 18, 1981...	30.45

Highest water level--29.83 ft; Mar. 17, 1980
Lowest water level--31.05 ft; Sept. 10, 1980

159-070-29BBB MP is top of 1-1/4-inch plastic pipe 3.00 ft above lsd.

Oct. 7, 1980...	4.27	Dec. 15.....	3.92	Feb. 18, 1981...	4.38
Nov. 18.....	3.76				

Highest water level--3.76 ft; Nov. 18, 1980
Lowest water level--4.38 ft; Feb. 18, 1981

159-070-33DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 7, 1980...	1.46	Nov. 18.....	3.89	Dec. 16.....	3.79

Highest water level--1.46 ft; Oct. 7, 1980
Lowest water level--3.89 ft; Nov. 18, 1980

159-073-19CBB MP is top of 1-1/4-inch plastic pipe 3.50 ft above lsd.

Nov. 18, 1980...	14.10	Dec. 16.....	13.97	Feb. 18, 1981...	13.84

Highest water level--13.84 ft; Feb. 18, 1981
Lowest water level--14.10 ft; Nov. 18, 1980

159-073-22BBB MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Sept. 19, 1979...	7.19	Apr. 16.....	8.42	Oct. 8.....	5.20
Oct. 4.....	7.26	May 13.....	8.51	Nov. 18.....	4.34
Nov. 6.....	7.50	June 19.....	7.84	Dec. 16.....	4.37
Dec. 12.....	7.63	July 17.....	6.90	Feb. 18, 1981...	4.74
Feb. 12, 1980...	8.17	Aug. 12.....	7.97		
Mar. 17.....	8.47	Sept. 10.....	6.14		

Highest water level--4.34 ft; Nov. 18, 1980
Lowest water level--8.51 ft; May 13, 1980

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

159-074-05DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 19, 1980...	0.64	Dec. 16.....	1.08		

Highest water level--0.64 ft; Nov. 19, 1980
Lowest water level--1.08 ft; Dec. 16, 1980

159-081-20BBB MP is top of 1-1/4-inch plastic pipe 2.10 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 14, 1980...	+0.41	Nov. 11.....	+0.62		

Highest water level--+0.62 ft; Nov. 11, 1980
Lowest water level--+0.41 ft; Oct. 14, 1980

159-082-05BBA MP is top of 1-1/4-inch plastic pipe 2.20 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 11, 1979...	12.50	Apr. 17.....	12.60	Oct. 14.....	12.56
Oct. 3.....	12.61	May 12.....	12.54	Nov. 19.....	12.55
Nov. 7.....	12.65	June 20.....	12.61	Dec. 17.....	12.39
Dec. 10.....	12.32	July 17.....	12.49	Feb. 19, 1981...	12.35
Feb. 11, 1980...	12.59	Aug. 11.....	12.50	Mar. 10.....	12.28
Mar. 17.....	12.49	Sept. 9.....	12.72		

Highest water level--12.28 ft; Mar. 10, 1981
Lowest water level--12.72 ft; Sept. 9, 1980

159-082-05CCD MP is top of 1-1/4-inch plastic pipe 2.20 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 11, 1979...	17.02	June 20.....	18.10	Mar. 10.....	17.02
Oct. 3.....	21.70	July 17.....	17.69	Apr. 7.....	17.00
Nov. 7.....	19.81	Aug. 11.....	17.65	May 11, 1981...	16.81
Dec. 10.....	19.20	Sept. 9.....	17.58	June 1.....	16.85
Feb. 11, 1980...	18.35	Oct. 14.....	17.40	July 13.....	17.14
Mar. 17.....	18.03	Nov. 19.....	17.16	Nov. 30.....	16.95
Apr. 17.....	17.95	Dec. 17.....	17.10		
May 12.....	17.88	Feb. 19, 1981...	16.90		

Highest water level--16.81 ft; May 11, 1981
Lowest water level--21.70 ft; Oct. 3, 1979

159-082-27AAD MP is top of 1-1/4-inch plastic pipe 1.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
May 21, 1980...	13.77	Nov. 19.....	15.12	May 11.....	15.85
July 17.....	14.42	Dec. 17.....	15.27	June 1.....	15.40
Aug. 11.....	14.70	Feb. 19, 1981...	15.19	July 13.....	16.42
Sept. 9.....	14.90	Mar. 10.....	15.51	Nov. 30.....	17.53
Oct. 14.....	14.99	Apr. 7.....	15.55		

Highest water level--13.77 ft; May 21, 1980
Lowest water level--17.53 ft; Nov. 30, 1981

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

159-082-34DDC MP is top of 1-1/4-inch plastic pipe 2.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 17, 1980...	26.42	Dec. 17.....	28.34	June 1.....	28.73
Aug. 11.....	27.01	Feb. 19, 1981...	28.01	July 13.....	30.29
Sept. 9.....	27.40	Mar. 10.....	28.48	Nov. 30.....	32.84
Oct. 14.....	27.60	Apr. 7.....	28.19		
Nov. 19.....	28.02	May 11.....	29.18		

Highest water level--26.42 ft; July 17, 1980
Lowest water level--32.84 ft; Nov. 30, 1981

159-082-35BBB1 MP is top of 1-1/4-inch plastic pipe 1.00 ft above lsd.

May 21, 1980...	24.15	Nov. 19.....	29.26	May 11.....	29.85
July 17.....	24.58	Dec. 17.....	28.95	June 1.....	27.81
Aug. 11.....	29.28	Feb. 19, 1981...	26.45	July 13.....	29.37
Sept. 9.....	28.25	Mar. 10.....	25.64	Nov. 30.....	33.41
Oct. 14.....	28.42	Apr. 7.....	25.71		

Highest water level--24.15 ft; May 21, 1980
Lowest water level--33.41 ft; Nov. 30, 1981

159-082-35BBB2 MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

May 21, 1980...	23.39	Nov. 19.....	29.53	May 11.....	28.41
July 17.....	23.93	Dec. 17.....	26.12	June 1.....	28.43
Aug. 11.....	29.28	Feb. 19, 1981...	25.75	July 13.....	28.51
Sept. 9.....	29.44	Mar. 10.....	25.10	Nov. 30.....	33.38
Oct. 14.....	28.76	Apr. 7.....	25.16		

Highest water level--23.39 ft; May 21, 1980
Lowest water level--33.38 ft; Nov. 30, 1981

160-069-27ACD MP is top of 1-1/4-inch plastic pipe 3.00 ft above lsd.

Sept. 4, 1979...	7.00	Apr. 16.....	6.98	Oct. 7.....	6.70
Oct. 3.....	6.05	May 13.....	7.07	Nov. 18.....	6.60
Nov. 6.....	7.60	June 19.....	7.20	Dec. 15.....	6.57
Dec. 11.....	7.34	July 17.....	7.16	Feb. 18, 1981...	6.30
Feb. 12, 1980...	6.95	Aug. 12.....	7.05	Mar. 11.....	6.18
Mar. 18.....	6.86	Sept. 10.....	6.90		

Highest water level--6.05 ft; Oct. 3, 1979
Lowest water level--7.60 ft; Nov. 6, 1979

160-070-23DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 30, 1979...	7.40	May 13.....	7.98	Nov. 18.....	6.40
Nov. 6.....	9.48	June 19.....	7.90	Dec. 16.....	6.22
Dec. 11.....	7.54	July 18.....	7.89	Feb. 18, 1981...	5.85
Feb. 12, 1980...	7.29	Aug. 12.....	7.69	Mar. 11.....	5.85
Mar. 17.....	7.42	Sept. 10.....	7.45		
Apr. 16.....	7.91	Oct. 7.....	7.00		

Highest water level--5.85 ft; Feb. 18, 1981, and Mar. 11, 1981
Lowest water level--9.48 ft; Nov. 6, 1979

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

160-071-05BAA MP is top of 1-1/4-inch plastic pipe 1.30 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 18, 1980...	12.68	May 12.....	12.58	Oct. 18.....	13.24
Dec. 16.....	12.60	June 8.....	12.57	Nov. 29.....	13.30
Feb. 18, 1981...	12.79	July 11.....	12.77	Dec. 22.....	13.34
Mar. 11.....	12.80	Aug. 8.....	13.03		
Apr. 6.....	12.53	Sept. 14.....	13.22		

Highest water level--12.53 ft; Apr. 6, 1981
Lowest water level--13.34 ft; Dec. 22, 1981

160-071-07AAA MP is top of 1-1/4-inch plastic pipe 1.60 ft above lsd

Nov. 18, 1980...	6.10	May 12.....	6.13	Oct. 18.....	7.30
Dec. 16.....	6.60	June 8.....	6.12	Nov. 29.....	7.27
Feb. 18, 1981...	7.10	July 11.....	6.69	Dec. 22.....	7.38
Mar. 11.....	7.32	Aug. 8.....	7.32		
Apr. 6.....	6.44	Sept. 14.....	7.50		

Highest water level--6.10 ft; Nov. 18, 1980
Lowest water level--7.50 ft; Sept. 14, 1981

160-071-07BBC MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Feb. 18, 1980...	17.80	June 8.....	17.81	Oct. 18.....	18.52
Dec. 16.....	17.90	July 11.....	18.09	Nov. 29.....	18.50
Apr. 6, 1981...	17.66	Aug. 8.....	18.39	Dec. 22.....	18.52
May 12.....	17.79	Sept. 14.....	18.51		

Highest water level--17.66 ft; Apr. 6, 1981
Lowest water level--18.52 ft; Oct. 18, 1981, and Dec. 22, 1981

160-071-16BBB MP is top of 1-1/4-inch plastic pipe 0.80 ft above lsd.

Nov. 18, 1980...	5.18	May 12.....	5.02	Oct. 18.....	6.11
Dec. 16.....	5.33	June 8.....	4.99	Nov. 29.....	6.09
Feb. 18, 1981...	5.60	July 11.....	5.57	Dec. 22.....	6.24
Mar. 11.....	5.68	Aug. 8.....	6.07		
Apr. 6.....	5.09	Sept. 14.....	6.25		

Highest water level--4.99 ft; June 8, 1981
Lowest water level--6.25 ft; Sept. 14, 1981

160-071-19DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 6, 1980...	4.98	Apr. 6.....	4.90	Sept. 14.....	6.03
Nov. 18.....	4.26	May 12.....	4.39	Oct. 18.....	5.92
Dec. 15.....	5.44	June 8.....	3.48	Nov. 29.....	6.04
Feb. 18, 1981...	5.46	July 11.....	4.58	Dec. 22.....	6.29
Mar. 11.....	5.90	Aug. 8.....	5.82		

Highest water level--3.48 ft; June 8, 1981
Lowest water level--6.29 ft; Dec. 22, 1981

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

160-071-22DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 17, 1979...	3.70	July 18.....	4.00	May 12.....	1.72
Oct. 3.....	3.85	Aug. 12.....	3.53	June 8.....	1.60
Nov. 6.....	3.64	Sept. 10.....	2.99	July 11.....	2.59
Dec. 11.....	3.88	Oct. 7.....	2.08	Aug. 8.....	2.52
Feb. 12, 1980...	4.34	Nov. 18.....	1.70	Sept. 14.....	3.59
Mar. 17.....	4.39	Dec. 15.....	2.65	Oct. 18.....	3.20
Apr. 16.....	3.02	Feb. 18, 1981...	3.49	Nov. 29.....	3.12
May 13.....	2.50	Mar. 11.....	3.34	Dec. 22.....	3.14
June 19.....	3.26	Apr. 6.....	2.32		

Highest water level--1.60 ft; June 8, 1981
Lowest water level--4.39 ft; Mar. 17, 1980

160-071-24DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 7, 1980...	13.76	Apr. 6.....	14.09	Sept. 14.....	14.41
Nov. 18.....	14.41	May 12.....	14.13	Oct. 18.....	14.42
Dec. 15.....	14.34	June 8.....	14.15	Nov. 29.....	14.39
Feb. 18, 1981...	14.23	July 11.....	14.25	Dec. 22.....	14.38
Mar. 11.....	14.16	Aug. 8.....	14.35		

Highest water level--13.76 ft; Oct. 7, 1980
Lowest water level--14.42 ft; Oct. 18, 1981

160-071-26AAA MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 7, 1980...	26.89	Apr. 6.....	26.34	Sept. 14.....	26.76
Nov. 18.....	26.54	May 12.....	26.26	Oct. 18.....	26.85
Dec. 15.....	26.66	June 8.....	26.22	Nov. 29.....	26.90
Feb. 18, 1981...	26.68	July 11.....	26.30	Dec. 22.....	26.93
Mar. 11.....	26.84	Aug. 8.....	26.61		

Highest water level--26.22 ft; June 8, 1981
Lowest water level--26.93 ft; Dec. 22, 1981

160-071-28AAA MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 7, 1980...	4.85	Apr. 6.....	5.15	Sept. 14.....	5.52
Nov. 18.....	4.65	May 12.....	4.38	Oct. 18.....	5.86
Dec. 15.....	5.17	June 8.....	3.84	Nov. 29.....	5.94
Feb. 18, 1981...	5.95	July 11.....	4.29	Dec. 22.....	6.04
Mar. 11.....	5.80	Aug. 8.....	5.27		

Highest water level--3.84 ft; June 8, 1981
Lowest water level--6.04 ft; Dec. 22, 1981

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

160-071-29ADD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 6, 1980...	6.64	May 12.....	5.25	Oct. 18.....	7.50
Dec. 16.....	6.19	June 8.....	4.77	Nov. 29.....	7.26
Feb. 18, 1981...	7.07	July 11.....	5.68	Dec. 22.....	7.25
Mar. 11.....	7.30	Aug. 8.....	6.90		
Apr. 6.....	6.39	Sept. 14.....	7.40		

Highest water level--4.77 ft; June 8, 1981
Lowest water level--7.50 ft; Oct. 18, 1981

160-072-02AAA MP is top of 1-1/4-inch plastic pipe 2.60 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 30, 1979...	8.15	Aug. 12.....	8.60	June 8.....	7.32
Nov. 6.....	8.20	Sept. 10.....	8.26	July 11.....	7.69
Dec. 12.....	8.15	Oct. 6.....	7.89	Aug. 8.....	8.12
Feb. 12, 1980...	8.20	Nov. 18.....	7.60	Sept. 14.....	8.25
Mar. 18.....	8.13	Dec. 16.....	7.54	Oct. 18.....	8.26
Apr. 16.....	7.91	Feb. 18, 1981...	7.55	Nov. 29.....	8.22
May 13.....	8.12	Mar. 11.....	7.80	Dec. 22.....	8.23
June 19.....	8.45	Apr. 6.....	7.11		
July 18.....	10.90	May 12.....	7.30		

Highest water level--7.11 ft; Apr. 6, 1981
Lowest water level--10.90 ft; July 18, 1980

160-072-02CBC MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Apr. 6, 1981...	7.82	July 11.....	8.24	Oct. 18.....	8.63
May 12.....	7.97	Aug. 8.....	8.53	Nov. 29.....	8.55
June 8.....	7.96	Sept. 14.....	8.68	Dec. 22.....	8.51

Highest water level--7.82 ft; Apr. 6, 1981
Lowest water level--8.68 ft; Sept. 14, 1981

160-072-03BBB1 MP is top of 1-1/4-inch plastic pipe 2.40 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Dec. 16, 1980...	32.95	June 8.....	32.66	Oct. 18.....	33.02
Apr. 6, 1981...	32.77	July 11.....	30.75		
May 12.....	32.74	Sept. 14.....	32.03		

Highest water level--30.75 ft; July 11, 1981
Lowest water level--33.02 ft; Oct. 18, 1981

160-072-03BBC MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Dec. 16, 1980...	34.00	July 11.....	34.27	Nov. 29.....	34.59
Apr. 6, 1981...	34.25	Aug. 8.....	34.36	Dec. 22.....	34.61
May 12.....	35.44	Sept. 14.....	34.47		
June 8.....	34.22	Oct. 18.....	35.48		

Highest water level--34.00 ft; Dec. 16, 1980
Lowest water level--35.48 ft; Oct. 18, 1981

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

160-072-05ADD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Apr. 6, 1981...	33.79	July 11.....	32.56	Oct. 18.....	33.19
May 12.....	32.38	Aug. 8.....	33.93	Nov. 29.....	33.15
June 8.....	32.24	Sept. 14.....	33.10	Dec. 22.....	33.22

Highest water level--32.24 ft; June 8, 1981
Lowest water level--33.93 ft; Aug. 8, 1981

160-072-06BCC MP is top of 1-1/4-inch plastic pipe 3.00 ft above lsd.

Apr. 6, 1981...	+0.92	July 11.....	+2.46	Oct. 18.....	+2.31
May 12.....	+2.62	Aug. 8.....	+2.24		
June 8.....	+2.70	Sept. 14.....	+2.26		

Highest water level--+2.70 ft; June 8, 1981
Lowest water level--+0.92 ft; Apr. 6, 1981

160-072-12AAB MP is top of 1-1/4-inch plastic pipe 2.20 ft above lsd.

Oct. 30, 1979...	17.45	Aug. 12.....	18.07	June 8.....	16.94
Nov. 6.....	17.50	Sept. 10.....	18.74	July 11.....	17.13
Dec. 12.....	17.56	Oct. 6.....	17.46	Aug. 8.....	17.48
Feb. 2, 1980...	17.80	Nov. 18.....	17.13	Sept. 14.....	17.70
Mar. 18.....	17.91	Dec. 16.....	17.12	Oct. 18.....	17.75
Apr. 16.....	17.78	Feb. 18, 1981...	17.29	Nov. 29.....	17.78
May 13.....	17.57	Mar. 11.....	17.55	Dec. 22.....	17.80
June 19.....	17.75	Apr. 6.....	17.05		
July 18.....	18.03	May 12.....	16.98		

Highest water level--16.94 ft; June 8, 1981
Lowest water level--18.74 ft; Sept. 10, 1980

160-072-12ADD MP is top of 1-1/4-inch plastic pipe 2.50 ft above lsd.

Dec. 16, 1980...	13.06	June 8.....	12.06	Oct. 18.....	13.79
Feb. 18, 1981...	13.04	July 11.....	13.25	Nov. 29.....	13.77
Apr. 6.....	11.95	Aug. 8.....	13.57	Dec. 22.....	13.82
May 12.....	13.04	Sept. 14.....	13.72		

Highest water level--11.95 ft; Apr. 6, 1981
Lowest water level--13.82 ft; Dec. 22, 1981

160-072-12DAD MP is top of 1-1/4-inch plastic pipe 1.70 ft above lsd.

Dec. 16, 1980...	10.60	June 8.....	10.62	Oct. 18.....	11.27
Feb. 18, 1981...	10.60	July 11.....	10.07	Nov. 29.....	11.35
Apr. 6.....	10.52	Aug. 8.....	11.10	Dec. 22.....	11.32
May 12.....	10.56	Sept. 14.....	11.27		

Highest water level--10.07 ft; July 11, 1981
Lowest water level--11.35 ft; Nov. 29, 1981

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

160-072-12DDD MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 18, 1980...	18.90	May 12.....	19.18	Oct. 18.....	19.70
Dec. 16.....	19.05	June 8.....	19.03	Nov. 29.....	19.78
Feb. 18, 1981...	19.28	July 11.....	20.14	Dec. 22.....	19.88
Mar. 11.....	19.50	Aug. 8.....	15.45		
Apr. 6.....	19.17	Sept. 14.....	19.59		

Highest water level--15.45 ft; Aug. 8, 1981
Lowest water level--20.14 ft; July 11, 1981

160-072-13CCC MP is top of 1-1/4-inch plastic pipe 1.00 ft above lsd.

Sept. 4, 1979...	5.04	July 18.....	5.45	May 12.....	2.03
Oct. 4.....	5.86	Aug. 12.....	4.53	June 8.....	1.15
Nov. 6.....	5.63	Sept. 10.....	3.02	July 11.....	3.27
Dec. 12.....	5.66	Oct. 6.....	1.30	Aug. 8.....	4.84
Feb. 12, 1980...	6.34	Nov. 18.....	.99	Sept. 14.....	5.08
Mar. 18.....	6.47	Dec. 16.....	3.33	Oct. 18.....	4.47
Apr. 10.....	5.13	Feb. 18, 1981...	4.65	Nov. 29.....	3.84
May 13.....	3.66	Mar. 11.....	3.80	Dec. 22.....	3.97
June 19.....	4.83	Apr. 6.....	1.21		

Highest water level--0.99 ft; Nov. 18, 1980
Lowest water level--6.47 ft; Mar. 18, 1980

160-072-13DDD MP is top of 1-1/4-inch plastic pipe 2.30 ft above lsd.

Sept. 4, 1979...	5.04	July 18.....	5.40	May 12.....	4.49
Oct. 4.....	5.26	Aug. 12.....	5.40	June 8.....	4.29
Nov. 6.....	5.20	Sept. 10.....	5.18	July 11.....	4.14
Dec. 12.....	5.20	Oct. 6.....	4.85	Aug. 8.....	4.23
Feb. 12, 1980...	5.58	Nov. 18.....	4.58	Sept. 14.....	4.23
Mar. 18.....	5.59	Dec. 16.....	4.55	Oct. 18.....	4.50
Apr. 10.....	5.62	Feb. 18, 1981...	4.60	Nov. 29.....	4.68
May 13.....	5.40	Mar. 11.....	4.34	Dec. 22.....	4.59
June 19.....	5.30	Apr. 6.....	4.61		

Highest water level--4.14 ft; July 11, 1981
Lowest water level--5.62 ft; Apr. 10, 1980

160-072-24CCB MP is top of 1-1/4-inch plastic pipe 2.10 ft above lsd.

Sept. 4, 1979...	8.19	July 17.....	7.80	May 12.....	4.89
Oct. 4.....	7.64	Aug. 12.....	7.84	June 8.....	4.50
Nov. 6.....	7.72	Sept. 10.....	6.71	July 11.....	5.39
Dec. 12.....	7.82	Oct. 6.....	5.74	Aug. 8.....	6.40
Feb. 12, 1980...	8.34	Nov. 18.....	5.00	Sept. 14.....	6.87
Mar. 18.....	7.79	Dec. 15.....	5.64	Oct. 18.....	6.67
Apr. 16.....	7.45	Feb. 18, 1981...	6.50	Nov. 29.....	6.24
May 13.....	6.74	Mar. 11.....	6.01	Dec. 22.....	6.17
June 19.....	7.26	Apr. 6.....	4.99		

Highest water level--4.50 ft; June 8, 1981
Lowest water level--8.34 ft; Feb. 12, 1980

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

160-074-21BBA MP is top of 1-1/4-inch plastic pipe 2.30 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 25, 1979...	1.83	Mar. 17.....	5.01	Aug. 12.....	2.40
Oct. 3.....	2.24	Apr. 17.....	4.99	Sept. 9.....	1.05
Nov. 7.....	2.77	May 12.....	3.06	Oct. 15.....	+.52
Dec. 11.....	3.02	June 19.....	1.60	Mar. 11, 1981...	1.45
Feb. 12, 1980...	4.09	July 17.....	1.82		

Highest water level--+0.52 ft; Oct. 15, 1980
Lowest water level--5.01 ft; Mar. 17, 1980

160-076-03BBB MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Nov. 19, 1980...	17.28	Feb. 19, 1981...	17.15	Mar. 11.....	17.20
Dec. 17.....	17.10				

Highest water level--17.10 ft; Dec. 17, 1980
Lowest water level--17.28 ft; Nov. 19, 1980

160-076-11CCC MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Nov. 19, 1980...	10.30	Feb. 19, 1981...	7.97	Mar. 11.....	7.70
Dec. 17.....	8.90				

Highest water level--7.70 ft; Mar. 11, 1981
Lowest water level--10.30 ft; Nov. 19, 1980

160-076-23CCC2 MP is top of 1-1/4-inch plastic pipe 2.50 ft above lsd.

Oct. 3, 1979...	8.91	May 12.....	8.52	Nov. 19.....	7.99
Nov. 6.....	8.70	June 19.....	8.65	Dec. 17.....	7.82
Dec. 11.....	8.62	July 17.....	8.84	Feb. 19, 1981...	7.45
Feb. 12, 1980...	8.34	Aug. 12.....	8.72	Mar. 11.....	7.28
Mar. 17.....	8.28	Sept. 9.....	8.74		
Apr. 17.....	8.41	Oct. 15.....	8.45		

Highest water level--7.28 ft; Mar. 11, 1981
Lowest water level--8.91 ft; Oct. 3, 1979

160-076-23DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Nov. 19, 1980...	9.72	Feb. 19, 1981...	7.34	Mar. 11.....	7.18
Dec. 17.....	7.91				

Highest water level--7.18 ft; Mar. 11, 1981
Lowest water level--9.72 ft; Nov. 19, 1980

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

160-082-14AAA2 MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 19, 1980...	8.98	Feb. 19, 1981...	6.90	Mar. 11.....	6.75
Dec. 17.....	6.40				

Highest water level--6.40 ft; Dec. 17, 1980
Lowest water level--8.98 ft; Nov. 19, 1980

160-082-23AAA MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 2, 1979...	6.29	Aug. 11.....	5.63	Dec. 17.....	3.59
May 12, 1980...	9.40	Sept. 9.....	4.21	Feb. 19, 1981...	4.50
June 20.....	8.80	Oct. 14.....	3.85	Mar. 11.....	4.35
July 17.....	6.60	Nov. 19.....	3.35		

Highest water level--3.35 ft; Nov. 19, 1980
Lowest water level--9.40 ft; May 12, 1980

160-083-35CCC MP is top of 1-1/4-inch plastic pipe 3.00 ft above lsd.

Sept. 11, 1979...	7.80	Apr. 17.....	8.98	Oct. 14.....	8.86
Oct. 3.....	9.29	May 12.....	9.05	Nov. 19.....	8.20
Nov. 7.....	8.75	June 20.....	9.34	Dec. 17.....	7.80
Dec. 10.....	8.56	July 16.....	9.39	Feb. 19, 1981...	7.39
Feb. 11, 1980...	8.48	Aug. 11.....	9.38	Mar. 11.....	7.20
Mar. 17.....	8.57	Sept. 9.....	9.35		

Highest water level--7.20 ft; Mar. 11, 1981
Lowest water level--9.39 ft; July 16, 1980

160-083-35DDA MP is top of 1-1/4-inch plastic pipe 2.20 ft above lsd.

Sept. 11, 1979...	30.73	Apr. 17.....	31.14	Oct. 14.....	30.79
Oct. 3.....	30.85	May 12.....	31.16	Nov. 19.....	30.65
Nov. 7.....	30.85	June 20.....	31.12	Dec. 17.....	30.77
Dec. 10.....	30.78	July 17.....	30.92	Feb. 19, 1981...	31.00
Feb. 11, 1980...	31.10	Aug. 11.....	30.99	Mar. 11.....	31.10
Mar. 17.....	31.20	Sept. 9.....	31.00		

Highest water level--30.65 ft; Nov. 19, 1980
Lowest water level--31.20 ft; Mar. 17, 1980

161-069-21DDD MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Oct. 31, 1978...	16.19	Oct. 3.....	16.45	Aug. 12.....	16.74
Dec. 19.....	16.13	Nov. 6.....	16.57	Sept. 10.....	16.60
Mar. 6, 1979...	16.15	Dec. 11.....	16.48	Oct. 15.....	16.30
Apr. 27.....	16.05	Feb. 12, 1980...	16.56	Nov. 18.....	15.69
May 17.....	15.84	Mar. 17.....	16.60	Dec. 16.....	16.20
June 12.....	16.11	Apr. 17.....	16.60	Feb. 18, 1981...	16.05
July 9.....	16.17	May 13.....	16.60	Mar. 11.....	16.00
Aug. 2.....	16.38	June 19.....	16.67		
Sept. 5.....	16.42	July 17.....	17.00		

Highest water level--15.69 ft; Nov. 18, 1980
Lowest water level--17.00 ft; July 17, 1980

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

161-071-02CBB7 MP is top of 5-inch steel pipe 1.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 29, 1977...	4.54	May 13.....	4.55	Sept. 10.....	5.23
Oct. 25, 1979...	6.55	June 19.....	6.00	Oct. 15.....	4.77
Nov. 6.....	6.34	July 18.....	6.98	Nov. 18.....	4.45
Apr. 16, 1980...	4.00	Aug. 12.....	5.98	Dec. 16.....	4.34

Highest water level--4.00 ft; Apr. 16, 1980
Lowest water level--6.98 ft; July 18, 1980

161-071-03BCC2 MP is top of 1-1/4-inch plastic pipe 1.30 ft above lsd.

Oct. 16, 1979...	12.55	Aug. 12.....	14.14	June 8.....	12.29
Nov. 16.....	12.59	Sept. 10.....	13.38	July 11.....	12.50
Dec. 12.....	12.78	Oct. 8.....	12.17	Aug. 8.....	13.06
Feb. 12, 1980...	13.40	Nov. 18.....	11.07	Sept. 14.....	13.49
Mar. 19.....	13.65	Dec. 16.....	11.38	Oct. 18.....	13.62
Apr. 10.....	13.80	Feb. 18, 1981...	12.42	Nov. 29.....	13.74
May 13.....	13.89	Mar. 11.....	12.69	Dec. 22.....	13.92
June 19.....	13.98	Apr. 6.....	12.85		
July 18.....	14.14	May 12.....	12.63		

Highest water level--11.07 ft; Nov. 18, 1980
Lowest water level--14.14 ft; July 18, 1980, and Aug. 12, 1980

161-071-03CCD MP is top of 1-1/4-inch steel pipe 2.00 ft above lsd.

June 21, 1979...	16.48	Dec. 12.....	18.96	Aug. 12.....	20.80
July 24.....	16.86	Feb. 12, 1980...	19.69	Sept. 10.....	20.50
Aug. 2.....	16.89	Apr. 16.....	20.38	Oct. 8.....	20.30
Sept. 5.....	17.29	May 13.....	20.77	Nov. 18.....	19.75
Oct. 4.....	17.63	June 19.....	20.87	Dec. 16.....	19.59
Nov. 6.....	18.40	July 18.....	20.98	Feb. 18, 1981...	19.70

Highest water level--16.48 ft; June 21, 1979
Lowest water level--20.98 ft; July 18, 1980

161-071-03CDC1 MP is top of 1-1/4-inch steel pipe 2.00 ft above lsd.

June 21, 1979...	15.78	Feb. 12, 1980...	19.45	Oct. 8.....	20.08
July 10.....	16.16	Apr. 16.....	19.80	Nov. 18.....	19.65
Aug. 2.....	16.39	May 13.....	20.08	Dec. 16.....	19.55
Sept. 5.....	16.98	June 19.....	20.15	Feb. 18, 1981...	19.21
Oct. 4.....	17.41	July 18.....	20.35	Mar. 11.....	19.78
Nov. 6.....	18.00	Aug. 12.....	20.57		
Dec. 12.....	18.46	Sept. 10.....	20.08		

Highest water level--15.78 ft; June 21, 1979
Lowest water level--20.57 ft; Aug. 12, 1980

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

161-071-03CDC2 MP is top of 1-1/4-inch steel pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
June 21, 1979...	16.47	Feb. 12, 1980...	20.13	Oct. 8.....	20.73
July 10.....	16.68	Apr. 10.....	20.41	Nov. 18.....	20.20
Aug. 2.....	16.83	May 13.....	20.81	Dec. 16.....	19.18
Sept. 5.....	17.39	June 19.....	21.18	Feb. 18, 1981...	20.40
Oct. 4.....	17.81	July 18.....	21.30	Mar. 11.....	20.34
Nov. 6.....	18.55	Aug. 12.....	21.25		
Dec. 12.....	19.09	Sept. 10.....	20.74		

Highest water level--16.47 ft; June 21, 1979
Lowest water level--21.30 ft; July 18, 1980

161-071-03CDD1 MP is top of 1-1/4-inch steel pipe 2.00 ft above lsd.

Nov. 1, 1974...	12.30	Dec. 12.....	19.15	Oct. 8.....	22.10
Sept. 29, 1977...	16.61	Feb. 19, 1980...	19.71	Nov. 18.....	21.65
June 21, 1979...	16.63	Apr. 10.....	20.10	Dec. 16.....	21.68
July 10.....	17.90	May 13.....	20.26	Feb. 18, 1981...	21.83
Aug. 2.....	18.60	June 19.....	20.55	Mar. 11.....	22.33
Sept. 5.....	19.34	July 18.....	21.34	Apr. 6.....	22.33
Oct. 4.....	19.79	Aug. 12.....	22.15	May 12.....	22.42
Nov. 6.....	18.87	Sept. 10.....	22.28	June 8.....	22.69

Highest water level--12.30 ft; Nov. 1, 1974
Lowest water level--22.69 ft; June 8, 1981

161-071-03CDD2 MP is top of 1-1/4-inch steel pipe 1.90 ft above lsd.

Nov. 1, 1974...	10.70	Dec. 12.....	17.90	Sept. 10.....	21.20
June 21, 1979...	15.38	Feb. 12, 1980...	18.44	Oct. 8.....	21.10
July 10.....	16.80	Apr. 16.....	18.94	Nov. 18.....	20.64
Aug. 2.....	17.42	May 13.....	19.18	Dec. 16.....	20.58
Sept. 5.....	18.15	June 19.....	19.38	Feb. 18, 1981...	20.82
Oct. 4.....	18.60	July 18.....	20.58	Mar. 11.....	21.10
Nov. 6.....	17.60	Aug. 12.....	21.11		

Highest water level--10.70 ft; Nov. 1, 1974
Lowest water level--21.20 ft; Sept. 10, 1980

161-071-03CDD3 MP is top of 1-1/4-inch steel pipe 2.00 ft above lsd.

June 21, 1979...	15.94	Feb. 12, 1980...	17.17	Oct. 8.....	18.80
July 24.....	15.18	Apr. 16.....	17.66	Nov. 18.....	18.44
Aug. 2.....	15.31	May 13.....	17.88	Dec. 16.....	18.35
Sept. 5.....	15.88	June 19.....	18.08	Feb. 18, 1981...	18.70
Oct. 4.....	16.33	July 18.....	18.59	Mar. 11.....	18.89
Nov. 6.....	16.11	Aug 12.....	19.10		
Dec. 12.....	16.46	Sept. 10.....	19.10		

Highest water level--15.18 ft; July 24, 1979
Lowest water level--19.10 ft; Aug. 12, 1980, and Sept. 10, 1980

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

161-071-03CDD4 MP is top of 8-inch steel pipe 1.80 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 1, 1974...	10.37	Feb. 20.....	18.25	Aug. 15.....	20.57
June 21, 1979...	15.19	Feb. 25.....	18.32	Aug. 20.....	20.72
July 24.....	16.85	Mar. 10.....	18.49	Aug. 25.....	20.63
Aug. 1.....	16.99	Mar. 15.....	18.53	Aug. 31.....	20.73
Aug. 5.....	17.13	Mar. 19.....	18.60	Sept. 5.....	20.78
Aug. 10.....	17.25	Mar. 20.....	18.57	Sept. 10.....	20.61
Aug. 15.....	17.34	Mar. 25.....	18.63	Sept. 15.....	20.67
Aug. 20.....	17.48	Mar. 31.....	18.69	Sept. 20.....	20.59
Aug. 25.....	17.50	Apr. 5.....	18.73	Sept. 25.....	20.46
Aug. 31.....	17.56	Apr. 10.....	18.64	Sept. 30.....	20.46
Sept. 5.....	17.65	Apr. 15.....	18.52	Oct. 5.....	20.39
Sept. 10.....	17.76	Apr. 16.....	18.52	Oct. 8.....	20.29
Sept. 15.....	17.80	Apr. 20.....	18.57	Oct. 10.....	20.33
Sept. 20.....	17.89	Apr. 25.....	18.62	Oct. 15.....	20.12
Sept. 25.....	17.94	Apr. 30.....	18.68	Oct. 20.....	20.07
Sept. 30.....	18.01	May 10.....	18.75	Oct. 25.....	20.04
Oct. 4.....	18.14	May 13.....	18.78	Oct. 31.....	20.07
Oct. 5.....	18.10	May 15.....	18.78	Nov. 5.....	20.12
Oct. 10.....	18.17	May 20.....	18.82	Nov. 10.....	20.07
Oct. 15.....	17.57	June 5.....	18.94	Nov. 15.....	19.97
Oct. 20.....	17.40	June 10.....	18.97	Nov. 18.....	19.99
Oct. 25.....	17.35	June 15.....	19.00	Nov. 20.....	19.96
Oct. 31.....	17.32	June 19.....	19.06	Nov. 25.....	19.94
Nov. 5.....	17.34	June 20.....	19.05	Nov. 30.....	19.98
Nov. 6.....	17.38	June 25.....	19.19	Dec. 5.....	20.01
Nov. 10.....	17.35	June 30.....	19.23	Dec. 10.....	20.03
Nov. 15.....	17.39	July 5.....	19.21	Dec. 15.....	20.03
Nov. 20.....	17.43	July 10.....	19.46	Dec. 16.....	19.97
Nov. 25.....	17.55	July 15.....	19.49	Feb. 18, 1981...	20.50
Nov. 30.....	17.52	July 18.....	19.77	Mar. 11.....	20.60
Dec. 5.....	17.55	July 20.....	19.87	May 11.....	20.71
Dec. 10.....	17.59	July 25.....	20.09	July 14.....	21.25
Dec. 12.....	16.70	July 31.....	20.38	Aug. 13.....	21.28
Dec. 15.....	17.64	Aug. 5.....	20.48	Sept. 1.....	21.44
Feb. 12, 1980...	18.18	Aug. 10.....	20.64	Dec. 1.....	21.60
Feb. 15.....	18.18	Aug. 12.....	20.54		

Highest water level--10.37 ft; Nov. 1, 1974
Lowest water level--21.60 ft; Dec. 1, 1981

161-071-07DDD1 MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Dec. 16, 1980...	34.49	Feb. 18, 1981...	35.15

Highest water level--34.49 ft; Dec. 16, 1980
Lowest water level--35.15 ft; Feb. 18, 1981

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

161-071-08BCB MP is top of 1-1/4-inch plastic pipe 1.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 18, 1980...	4.44	May 12.....	5.28	Oct. 18.....	7.48
Dec. 16.....	6.67	June 8.....	4.26	Nov. 29.....	7.23
Feb. 18, 1981...	8.09	July 11.....	7.12	Dec. 22.....	7.46
Mar. 11.....	8.31	Aug. 8.....	8.27		
Apr. 6.....	6.66	Sept. 14.....	7.86		

Highest water level--4.26 ft; June 8, 1981
Lowest water level--8.31 ft; Mar. 11, 1981

161-071-08CBB MP is top of 1-1/4-inch plastic pipe 3.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 16, 1979...	34.90	Sept. 10.....	34.01	July 11.....	33.22
Nov. 6.....	34.18	Oct. 8.....	33.20	Aug. 8.....	32.58
Dec. 12.....	34.28	Nov. 18.....	32.26	Sept. 14.....	32.50
Apr. 16, 1980...	35.14	Dec. 16.....	32.30	Oct. 18.....	32.47
May 13.....	34.73	Feb. 18, 1981...	32.97	Nov. 29.....	32.39
June 19.....	34.51	Mar. 11.....	32.89	Dec. 22.....	32.44
July 17.....	34.58	Apr. 6.....	32.94		
Aug. 12.....	34.52	May 12.....	32.52		

Highest water level--32.26 ft; Nov. 18, 1980
Lowest water level--35.14 ft; Apr. 16, 1980

161-071-08CCB MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Dec. 16, 1980...	30.52	May 12.....	30.70	Oct. 18.....	31.46
Feb. 18, 1981...	31.38	July 11.....	31.91	Nov. 29.....	31.39
Mar. 11.....	31.49	Aug. 8.....	31.53	Dec. 22.....	31.43
Apr. 6.....	31.15	Sept. 14.....	32.43		

Highest water level--30.52 ft; Dec. 16, 1980
Lowest water level--32.43 ft; Sept. 14, 1981

161-071-08DCD MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Feb. 12, 1980...	9.32	Oct. 8.....	6.65	July 11.....	7.49
Mar. 19.....	9.40	Nov. 18.....	6.05	Aug. 8.....	8.24
Apr. 16.....	8.20	Dec. 16.....	7.15	Sept. 14.....	8.02
May 13.....	7.92	Feb. 18, 1981...	8.34	Oct. 18.....	7.69
June 19.....	8.43	Mar. 11.....	7.80	Nov. 29.....	7.59
July 18.....	8.90	Apr. 6.....	7.07	Dec. 22.....	7.88
Aug. 12.....	8.68	May 12.....	6.53		
Sept. 10.....	7.70	June 8.....	6.53		

Highest water level--6.05 ft; Nov. 18, 1980
Lowest water level--9.40 ft; Mar. 19, 1980

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

161-071-09AAD1 MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
June 6, 1979...	13.27	May 13.....	15.82	Apr. 6.....	15.52
July 9.....	13.47	June 19.....	16.16	May 12.....	15.59
Aug. 2.....	13.65	July 18.....	16.39	June 8.....	16.14
Sept. 5.....	13.94	Aug. 12.....	16.59	July 11.....	10.79
Oct. 4.....	15.36	Sept. 10.....	16.58	Aug. 8.....	15.90
Nov. 6.....	13.42	Oct. 8.....	16.30	Sept. 14.....	16.19
Dec. 12.....	14.82	Nov. 18.....	15.50	Oct. 18.....	16.49
Feb. 12, 1980...	15.89	Dec. 16.....	15.13	Nov. 29.....	16.77
Mar. 19.....	15.81	Feb. 18, 1981...	14.50	Dec. 22.....	16.84
Apr. 16.....	15.78	Mar. 11.....	14.39		

Highest water level--10.79 ft; July 11, 1981
Lowest water level--16.84 ft; Dec. 22, 1981

161-071-09AAD2 MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

June 6, 1979...	13.48	May 13.....	16.30	Apr. 6.....	15.86
July 24.....	13.66	June 19.....	16.45	May 12.....	16.08
Aug. 2.....	13.72	July 18.....	16.69	June 8.....	15.59
Sept. 5.....	13.98	Aug. 12.....	16.78	July 11.....	16.22
Oct. 4.....	14.26	Sept. 10.....	16.67	Aug. 8.....	16.37
Nov. 6.....	13.28	Oct. 8.....	16.35	Sept. 14.....	16.60
Dec. 12.....	14.88	Nov. 18.....	15.70	Oct. 18.....	15.86
Feb. 12, 1980...	15.85	Dec. 16.....	15.46	Nov. 29.....	17.11
Mar. 19.....	16.09	Feb. 18, 1981...	15.60	Dec. 22.....	17.22
Apr. 16.....	15.89	Mar. 11.....	15.58		

Highest water level--13.28 ft; Nov. 6, 1979
Lowest water level--17.22 ft; Dec. 22, 1981

161-071-09ADD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

June 20, 1979...	13.69	May 13.....	15.74	Apr. 6.....	15.38
July 10.....	13.76	June 19.....	16.50	May 12.....	14.89
Aug. 2.....	14.09	July 18.....	16.97	June 8.....	14.70
Sept. 5.....	14.64	Aug. 12.....	17.34	July 11.....	14.91
Oct. 4.....	15.07	Sept. 10.....	17.00	Aug. 8.....	12.97
Nov. 6.....	15.50	Oct. 8.....	16.34	Sept. 14.....	16.30
Dec. 12.....	15.70	Nov. 18.....	15.20	Oct. 18.....	15.73
Feb. 12, 1980...	16.45	Dec. 15.....	14.94	Nov. 29.....	16.81
Mar. 19.....	16.42	Feb. 18, 1981...	15.45	Dec. 22.....	16.89
Apr. 16.....	16.04	Mar. 11.....	15.50		

Highest water level--12.97 ft; Aug. 8, 1981
Lowest water level--17.34 ft; Aug. 12, 1980

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

161-071-09CCC MP is top of 1-1/4-inch plastic pipe 5.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 18, 1980...	5.20	May 12.....	5.75	Oct. 18.....	6.63
Dec. 16.....	5.77	June 8.....	5.70	Nov. 29.....	6.62
Feb. 18, 1981...	6.69	July 11.....	6.19	Dec. 22.....	6.73
Mar. 11.....	6.41	Aug. 8.....	6.70		
Apr. 6.....	6.05	Sept. 14.....	6.71		

Highest water level--5.20 ft; Nov. 18, 1980
Lowest water level--6.73 ft; Dec. 22, 1981

161-071-10ABB MP is top of 1-1/4-inch plastic pipe 1.80 ft above lsd.

Nov. 1, 1974...	11.24	Dec. 12.....	18.24	Sept. 10.....	20.60
June 21, 1979...	15.50	Feb. 12, 1980...	18.60	Oct. 8.....	20.25
July 10.....	16.44	Apr. 16.....	18.70	Nov. 18.....	19.95
Aug. 2.....	17.20	May 13.....	19.07	Dec. 16.....	20.02
Sept. 5.....	18.00	June 19.....	19.34	Feb. 18, 1981...	20.20
Oct. 4.....	17.33	July 18.....	19.87	Mar. 11.....	20.09
Nov. 6.....	18.00	Aug. 12.....	20.54		

Highest water level--11.24 ft; Nov. 1, 1974
Lowest water level--20.60 ft; Sept. 10, 1980

161-071-10BBB MP is top of 1-1/4-inch plastic pipe 1.70 ft above lsd.

June 20, 1979...	13.95	June 19.....	17.50	May 12.....	17.07
July 10.....	14.35	July 17.....	17.70	June 8.....	17.01
Aug. 2.....	14.35	Aug. 12.....	17.58	July 11.....	17.37
Sept. 5.....	14.59	Sept. 10.....	17.20	Aug. 8.....	17.49
Oct. 4.....	14.85	Oct. 8.....	16.78	Sept. 14.....	17.69
Nov. 6.....	15.29	Nov. 18.....	16.42	Oct. 18.....	17.83
Dec. 12.....	15.75	Dec. 16.....	16.16	Nov. 29.....	18.02
Feb. 12, 1980...	16.52	Feb. 18, 1981...	16.41	Dec. 22.....	18.16
Apr. 16.....	16.55	Mar. 11.....	16.66		
May 13.....	17.20	Apr. 6.....	16.81		

Highest water level--13.95 ft; June 20, 1979
Lowest water level--18.16 ft; Dec. 22, 1981

161-071-15BBA MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Nov. 18, 1980...	2.95	May 12.....	2.73	Oct. 18.....	6.82
Dec. 16.....	4.78	June 8.....	2.54	Nov. 29.....	6.88
Feb. 18, 1981...	5.86	July 11.....	4.52	Dec. 22.....	7.01
Mar. 11.....	5.69	Aug. 8.....	6.20		
Apr. 6.....	3.80	Sept. 14.....	6.82		

Highest water level--2.54 ft; June 8, 1981
Lowest water level--7.01 ft; Dec. 22, 1981

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

161-071-16AAB1 MP is top of 4-inch plastic pipe 2.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
June 20, 1979...	9.74	Mar. 31.....	10.50	Sept. 10.....	10.91
July 24.....	12.82	Apr. 5.....	10.43	Sept. 15.....	10.78
Aug. 2.....	11.40	Apr. 10.....	10.04	Sept. 20.....	10.58
Sept. 5.....	11.80	Apr. 15.....	9.83	Sept. 25.....	10.31
Sept. 10.....	12.03	Apr. 16.....	9.79	Sept. 30.....	9.93
Sept. 15.....	11.82	Apr. 20.....	9.65	Oct. 5.....	9.63
Sept. 20.....	13.06	Apr. 25.....	9.54	Oct. 8.....	9.45
Sept. 25.....	11.60	Apr. 30.....	9.44	Oct. 10.....	9.40
Sept. 30.....	12.01	May 10.....	12.20	Oct. 15.....	9.33
Oct. 4.....	11.59	May 13.....	11.45	Oct. 20.....	9.21
Oct. 5.....	11.47	May 15.....	11.75	Oct. 25.....	9.12
Oct. 10.....	10.97	May 20.....	12.04	Oct. 31.....	8.94
Oct. 15.....	10.74	May 25.....	12.04	Nov. 5.....	8.81
Oct. 20.....	10.55	May 31.....	13.86	Nov. 10.....	8.63
Oct. 25.....	10.47	June 5.....	12.02	Nov. 15.....	8.53
Oct. 31.....	10.35	June 10.....	11.42	Nov. 18.....	8.40
Nov. 5.....	10.30	June 15.....	13.53	Nov. 20.....	8.39
Nov. 6.....	10.31	June 19.....	12.95	Nov. 25.....	8.31
Nov. 10.....	10.25	June 20.....	13.20	Nov. 30.....	8.22
Nov. 15.....	10.22	June 30.....	13.35	Dec. 5.....	8.21
Nov. 20.....	10.18	July 5.....	14.01	Dec. 10.....	8.21
Nov. 25.....	10.16	July 10.....	13.45	Dec. 15.....	8.21
Nov. 30.....	10.16	July 15.....	13.62	Dec. 16.....	8.29
Dec. 5.....	10.11	July 18.....	13.17	Feb. 18, 1981...	8.96
Dec. 10.....	10.16	July 20.....	13.46	Mar. 11.....	8.83
Dec. 12.....	10.17	July 25.....	12.86	Mar. 13.....	10.67
Dec. 15.....	10.18	Aug. 12.....	12.80	May 11.....	8.81
Feb. 12, 1980...	10.39	Aug. 15.....	12.68	July 14.....	10.64
Feb. 15.....	10.38	Aug. 20.....	12.31	Aug. 18.....	8.96
Mar. 19.....	10.50	Aug. 25.....	11.97	Sept. 1.....	11.10
Mar. 20.....	10.49	Aug. 31.....	11.51	Oct. 8.....	10.39
Mar. 25.....	10.50	Sept. 5.....	11.21	Dec. 1.....	10.00

Highest water level--8.21 ft; Dec. 5, 1980, Dec. 10, 1980, and Dec. 15, 1980
Lowest water level--14.01 ft; July 5, 1980

161-071-16BCC MP is top of 1-1/4-inch plastic pipe 4.00 ft above lsd.

Nov. 18, 1980...	3.50	June 8.....	3.51	Oct. 18.....	4.46
Dec. 16.....	5.05	July 11.....	5.27	Nov. 29.....	4.53
Feb. 18, 1981...	5.89	Aug. 8.....	5.84	Dec. 22.....	5.02
Apr. 6.....	4.24	Sept. 14.....	5.14		

Highest water level--3.50 ft; Nov. 18, 1980
Lowest water level--5.89 ft; Feb. 18, 1981

161-071-16CCD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Nov. 18, 1980...	3.39	May 12.....	4.17	Sept. 14.....	5.47
Dec. 16.....	4.99	June 8.....	3.76	Oct. 18.....	5.32
Feb. 18, 1981...	6.00	July 11.....	4.92	Nov. 29.....	5.38
Apr. 6.....	5.09	Aug. 8.....	5.78	Dec. 22.....	5.63

Highest water level--3.39 ft; Nov. 18, 1980
Lowest water level--6.00 ft; Feb. 18, 1981

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

161-071-16CDD MP is top of 1-1/4-inch plastic pipe 2.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 18, 1980...	4.05	May 12.....	5.61	Sept. 14.....	5.46
Dec. 16.....	5.49	June 8.....	4.25	Oct. 18.....	5.28
Feb. 18, 1981...	6.19	July 11.....	5.60	Nov. 29.....	5.56
Apr. 6.....	5.49	Aug. 8.....	6.06	Dec. 22.....	5.87

Highest water level--4.05 ft; Nov. 18, 1980
Lowest water level--6.19 ft; Feb. 18, 1981

161-071-16DCD1 MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Nov. 18, 1980...	4.93	May 12.....	5.38	Sept. 14.....	5.77
Dec. 16.....	5.69	June 8.....	5.26	Nov. 29.....	6.14
Feb. 18, 1981...	6.60	July 11.....	5.80	Dec. 22.....	6.31
Apr. 6.....	5.84	Aug. 8.....	6.31		

Highest water level--4.93 ft; Nov. 18, 1980
Lowest water level--6.60 ft; Feb. 18, 1981

161-071-21CBC MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

May 23, 1979...	5.39	Nov. 6.....	6.80	Aug. 12.....	7.76
June 21.....	5.69	Dec. 12.....	6.83	Sept. 10.....	7.06
July 24.....	5.88	Apr. 16, 1980...	7.35	Oct. 8.....	6.54
Aug. 2.....	6.04	May 13.....	7.24	Nov. 18.....	5.95
Sept. 6.....	6.44	June 19.....	7.50	Dec. 16.....	5.88
Oct. 4.....	6.64	July 18.....	7.80		

Highest water level--5.39 ft; May 23, 1979
Lowest water level--7.80 ft; July 18, 1980

161-071-21CDD MP is top of 1-1/4-inch plastic pipe 1.80 ft above lsd.

May 23, 1979...	5.18	Dec. 12.....	6.80	Aug. 12.....	7.27
June 20.....	5.23	Feb. 12, 1980...	7.49	Sept. 10.....	6.97
July 10.....	5.40	Mar. 19.....	7.29	Oct. 8.....	6.00
Aug. 2.....	5.90	Apr. 16.....	6.39	Nov. 18.....	5.30
Sept. 6.....	5.34	May 13.....	6.80	Dec. 16.....	5.70
Oct. 4.....	6.52	June 19.....	6.30	Feb. 18, 1981...	5.90
Nov. 5.....	6.62	July 18.....	7.50	Mar. 11.....	5.78

Highest water level--5.18 ft; May 23, 1979
Lowest water level--7.50 ft; July 18, 1980

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

161-071-22BBB MP is top of 1-1/4-inch plastic pipe 1.90 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 17, 1979...	7.20	June 19.....	6.33	Feb. 18, 1981...	5.70
Nov. 6.....	6.30	July 18.....	6.79	Mar. 11.....	5.46
Dec. 12.....	6.39	Aug. 12.....	6.50	Apr. 6.....	4.70
Feb. 12, 1980...	6.94	Sept. 10.....	5.73	May 12.....	3.00
Mar. 19.....	7.52	Oct. 8.....	4.60	Oct. 18.....	5.95
Apr. 16.....	5.71	Nov. 18.....	3.78		
May 13.....	5.82	Dec. 16.....	4.76		

Highest water level--3.00 ft; May 12, 1981
Lowest water level--7.52 ft; Mar. 19, 1980

161-071-22CCC MP is top of 1-1/4-inch plastic pipe 3.00 ft above lsd.

Oct. 17, 1979...	15.39	May 13.....	17.39	Nov. 18.....	16.91
Nov. 6.....	17.30	June 19.....	17.58	Dec. 16.....	17.71
Dec. 12.....	17.37	July 18.....	17.90	Feb. 18, 1981...	16.50
Feb. 2, 1980...	17.78	Aug. 12.....	18.03	Mar. 11.....	16.42
Mar. 19.....	17.67	Sept. 10.....	17.67		
Apr. 16.....	17.62	Oct. 8.....	17.33		

Highest water level--15.39 ft; Oct. 17, 1979
Lowest water level--18.03 ft; Aug. 12, 1980

161-071-28BAB MP is top of 1-1/4-inch plastic pipe 1.30 ft above lsd.

Oct. 31, 1978...	11.65	Feb. 12, 1980...	11.58	Mar. 11.....	11.09
Dec. 19.....	11.97	Mar. 19.....	12.36	Apr. 6.....	10.60
Mar. 6, 1979...	12.10	Apr. 10.....	11.79	May 12.....	10.29
Apr. 27.....	10.58	May 13.....	11.66	June 8.....	10.12
May 17.....	9.89	June 19.....	12.10	July 11.....	10.96
June 12.....	9.77	July 18.....	12.37	Aug. 8.....	11.42
July 9.....	10.15	Aug. 12.....	12.27	Sept. 14.....	11.43
Aug. 2.....	10.76	Sept. 10.....	11.76	Oct. 18.....	11.51
Sept. 6.....	11.29	Oct. 8.....	11.17	Nov. 29.....	11.66
Oct. 4.....	11.56	Nov. 18.....	10.28	Dec. 22.....	11.70
Nov. 6.....	11.68	Dec. 16.....	10.85		
Dec. 12.....	11.84	Feb. 18, 1981...	11.29		

Highest water level--9.77 ft; June 12, 1979
Lowest water level--12.37 ft; July 18, 1980

161-071-29AAB MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 18, 1979...	5.59	Aug. 18.....	6.53	June 8.....	4.61
Nov. 7.....	5.99	Sept. 10.....	5.55	July 11.....	4.27
Dec. 12.....	5.99	Oct. 8.....	5.01	Aug. 8.....	5.72
Feb. 12, 1980...	6.27	Nov. 18.....	4.69	Sept. 14.....	5.58
Mar. 19.....	6.36	Dec. 16.....	4.98	Oct. 18.....	5.37
Apr. 10.....	5.70	Feb. 18, 1981...	5.44	Nov. 29.....	5.36
May 13.....	5.32	Mar. 11.....	5.07	Dec. 22.....	5.53
June 19.....	6.10	Apr. 6.....	4.72		
Aug. 12.....	6.09	May 12.....	4.62		

Highest water level--4.27 ft; July 11, 1981
Lowest water level--6.53 ft; Aug. 18, 1980

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

161-071-29DAD MP is top of 1-1/4-inch plastic pipe 3.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 18, 1980...	8.55	May 12.....	12.10	Oct. 18.....	12.64
Dec. 16.....	11.29	June 8.....	12.31	Nov. 29.....	12.64
Feb. 18, 1981...	11.50	July 11.....	12.56	Dec. 22.....	12.63
Mar. 11.....	11.24	Aug. 8.....	12.81		
Apr. 6.....	12.04	Sept. 14.....	12.82		

Highest water level--8.55 ft; Nov. 18, 1980
Lowest water level--12.82 ft; Sept. 14, 1981

161-071-32DCC MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Oct. 30, 1979...	11.15	Aug. 12.....	10.85	June 8.....	9.28
Nov. 6.....	11.11	Sept. 10.....	10.13	July 11.....	10.23
Dec. 12.....	11.15	Oct. 6.....	9.67	Aug. 8.....	11.10
Feb. 12, 1980...	11.50	Nov. 18.....	9.55	Sept. 14.....	11.13
Mar. 18.....	11.45	Dec. 16.....	10.17	Oct. 18.....	10.79
Apr. 16.....	10.72	Feb. 18, 1981...	10.50	Nov. 29.....	10.74
May 13.....	10.11	Mar. 11.....	10.10	Dec. 22.....	10.78
June 19.....	10.48	Apr. 6.....	9.76		
July 18.....	11.01	May 12.....	9.74		

Highest water level--9.28 ft; June 8, 1981
Lowest water level--11.50 ft; Feb. 12, 1980

161-071-33CDD MP is top of 1-1/4-inch plastic pipe 2.20 ft above lsd.

Oct. 23, 1979...	15.24	Aug. 12.....	15.93	June 8.....	15.07
Nov. 6.....	15.31	Sept. 18.....	15.75	July 11.....	15.09
Dec. 12.....	15.52	Oct. 8.....	15.48	Aug. 8.....	15.09
Feb. 12, 1980...	15.69	Nov. 18.....	15.17	Sept. 14.....	15.46
Mar. 18.....	15.65	Dec. 16.....	15.03	Oct. 18.....	15.55
Apr. 10.....	15.80	Feb. 18, 1981...	15.17	Nov. 29.....	15.62
May 13.....	15.67	Mar. 11.....	14.98	Dec. 22.....	15.66
June 19.....	15.71	Apr. 6.....	15.14		
July 18.....	15.84	May 12.....	15.13		

Highest water level--14.98 ft; Mar. 11, 1981
Lowest water level--15.93 ft; Aug. 12, 1980

161-071-34DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

May 24, 1979...	3.36	Apr. 16.....	6.27	Mar. 11.....	5.74
June 21.....	4.14	May 13.....	5.65	Apr. 6.....	4.77
July 24.....	5.21	June 19.....	6.10	May 12.....	3.95
Aug. 2.....	5.43	July 18.....	6.63	June 8.....	3.88
Sept. 6.....	6.04	Aug. 12.....	6.60	July 11.....	5.03
Oct. 4.....	6.28	Sept. 10.....	5.34	Aug. 8.....	5.94
Nov. 6.....	6.35	Oct. 7.....	4.40	Sept. 14.....	6.73
Dec. 12.....	6.50	Nov. 18.....	3.80	Oct. 18.....	6.18
Feb. 12, 1980...	6.99	Dec. 16.....	4.85	Nov. 29.....	6.33
Mar. 18.....	7.45	Feb. 18, 1981...	5.96	Dec. 22.....	6.46

Highest water level--3.36 ft; May 24, 1979
Lowest water level--7.45 ft; Mar. 18, 1980

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

161-072-01DDD MP is top of 1-1/4-inch plastic pipe 2.10 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 24, 1979...	7.40	Aug. 12.....	6.75	June 8.....	3.71
Nov. 6.....	7.22	Sept. 10.....	5.93	July 11.....	5.24
Dec. 12.....	7.34	Oct. 15.....	4.82	Aug. 8.....	6.50
Feb. 12, 1980...	8.05	Nov. 18.....	3.33	Sept. 14.....	6.76
Mar. 19.....	8.34	Dec. 16.....	4.91	Oct. 18.....	6.48
Apr. 16.....	7.36	Feb. 18, 1981...	6.54	Nov. 29.....	6.20
May 13.....	6.49	Mar. 11.....	5.24	Dec. 22.....	6.30
June 19.....	6.40	Apr. 6.....	5.33		
July 18.....	7.01	May 12.....	3.81		

Highest water level--3.33 ft; Nov. 18, 1980
Lowest water level--8.34 ft; Mar. 19, 1980

161-072-02BBB MP is top of 1-1/4-inch plastic pipe 2.20 ft above lsd.

Oct. 16, 1979...	1.74	Apr. 16.....	1.30	Sept. 10.....	0.10
Nov. 6.....	1.54	May 13.....	.77	Oct. 15.....	+.48
Dec. 12.....	1.86	June 19.....	.97	Nov. 18.....	+.90
Feb. 12, 1980...	2.64	July 18.....	1.60	Mar. 11, 1981...	.81
Mar. 19.....	2.88	Aug. 12.....	.36		

Highest water level--+0.90 ft; Nov. 18, 1980
Lowest water level--2.88 ft; Mar. 19, 1980

161-072-23CCC MP is top of 1-1/4-inch plastic pipe 2.50 ft above lsd.

Sept. 26, 1978...	12.31	Oct. 4.....	11.40	Aug. 12.....	11.51
Dec. 19.....	13.35	Nov. 6.....	11.76	Sept. 10.....	10.30
Mar. 6, 1979...	14.10	Dec. 12.....	11.51	Oct. 8.....	8.58
Apr. 27.....	13.67	Feb. 12, 1980...	12.61	Nov. 18.....	7.55
May 17.....	11.89	Mar. 19.....	13.02	Dec. 16.....	8.07
June 12.....	11.12	Apr. 16.....	12.95	Feb. 18, 1981...	9.98
July 9.....	10.79	May 13.....	12.28	Mar. 11.....	9.49
Aug. 2.....	10.77	June 19.....	11.69		
Sept. 6.....	11.10	July 18.....	11.63		

Highest water level--7.55 ft; Nov. 18, 1980
Lowest water level--14.10 ft; Mar. 6, 1979

161-077-23CCC MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Sept. 28, 1978...	10.41	Oct. 3.....	10.62	Aug. 11.....	11.10
Dec. 18.....	10.51	Nov. 7.....	10.39	Sept. 9.....	11.29
Mar. 5, 1979...	11.90	Dec. 11.....	10.85	Oct. 15.....	11.15
Apr. 2.....	12.19	Feb. 11, 1980...	10.94	Nov. 18.....	10.98
May 16.....	11.76	Mar. 17.....	11.00	Dec. 17.....	10.77
June 11.....	11.69	Apr. 17.....	11.27	Feb. 19, 1981...	10.75
July 9.....	10.38	May 12.....	11.02	Mar. 10.....	10.80
Aug. 2.....	10.38	June 19.....	10.10		
Sept. 6.....	10.71	July 17.....	10.98		

Highest water level--10.10 ft; June 19, 1980
Lowest water level--12.19 ft; Apr. 2, 1979

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

161-082-26BBB MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 5, 1978...	9.39	Oct. 11.....	8.52	Aug. 11.....	8.94
Dec. 18.....	9.87	Nov. 7.....	9.07	Sept. 9.....	9.32
Mar. 5, 1979...	10.79	Dec. 10.....	9.02	Oct. 15.....	9.04
Apr. 26.....	9.81	Feb. 11, 1980...	9.00	Nov. 19.....	8.44
May 16.....	9.09	Mar. 17.....	8.88	Dec. 17.....	8.03
June 11.....	8.27	Apr. 17.....	9.36	Feb. 19, 1981...	8.23
July 9.....	7.94	May 12.....	9.16	Mar. 10.....	7.83
Aug. 2.....	7.87	June 19.....	9.30		
Sept. 7.....	8.43	July 17.....	9.37		

Highest water level--7.83 ft; Mar. 10, 1981
Lowest water level--10.79 ft; Mar. 5, 1979

161-083-23DDD MP is top of 2-inch steel pipe 3.20 ft above lsd.

Oct. 24, 1978...	28.00	Nov. 7.....	30.05	Oct. 15.....	30.13
Dec. 18.....	31.65	Dec. 10.....	29.70	Nov. 19.....	30.00
Mar. 5, 1979...	31.75	Feb. 11, 1980...	30.10	Dec. 17.....	29.94
Apr. 26.....	29.76	Mar. 17.....	30.02	Feb. 19, 1981...	30.02
May 16.....	29.65	Apr. 17.....	30.17	Mar. 10.....	30.11
June 11.....	29.96	May 12.....	30.02	June 2.....	30.07
July 9.....	29.73	June 19.....	30.16	July 17.....	29.32
Aug. 2.....	28.07	July 17.....	29.98	Nov. 30.....	30.55
Sept. 7.....	30.14	Aug. 11.....	30.06		
Oct. 3.....	30.00	Sept. 9.....	30.41		

Highest water level--28.00 ft; Oct. 24, 1978
Lowest water level--31.75 ft; Mar. 5, 1979

161-084-24DDD MP is top of 2-inch steel pipe 3.00 ft above lsd.

Oct. 3, 1979...	38.35	May 12.....	37.64	Nov. 19.....	37.67
Nov. 7.....	35.19	June 19.....	36.10	Dec. 17.....	37.73
Dec. 10.....	36.75	July 17.....	34.95	Feb. 19, 1981...	37.43
Feb. 11, 1980...	36.66	Aug. 11.....	37.70	Mar. 10.....	37.25
Mar. 17.....	37.72	Sept. 9.....	38.08	Nov. 17.....	37.63
Apr. 17.....	37.39	Oct. 15.....	36.60		

Highest water level--34.95 ft; July 17, 1980
Lowest water level--38.35 ft; Oct. 3, 1979

162-069-11BBB MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Nov. 18, 1980...	33.80	Feb. 17, 1981...	32.63	Mar. 11.....	32.58
Dec. 16.....	32.36				

Highest water level--32.36 ft; Dec. 16, 1980
Lowest water level--33.80 ft; Nov. 18, 1980

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

162-071-36CBC2 MP is top of 1-1/4-inch plastic pipe 3.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 17, 1979...	10.80	Aug. 12.....	10.55	June 8.....	9.26
Nov. 6.....	10.80	Sept. 10.....	10.05	July 11.....	9.59
Dec. 12.....	10.68	Oct. 15.....	9.26	Aug. 8.....	10.00
Feb. 12, 1980...	10.87	Nov. 18.....	9.00	Sept. 14.....	10.02
Mar. 19.....	10.90	Dec. 16.....	9.07	Oct. 18.....	9.89
Apr. 16.....	10.60	Feb. 18, 1981...	9.58	Nov. 29.....	9.75
May 13.....	10.40	Mar. 11.....	9.34	Dec. 22.....	9.86
June 19.....	10.30	Apr. 6.....	9.37		
July 18.....	10.67	May 12.....	9.33		

Highest water level--9.00 ft; Nov. 18, 1980
Lowest water level--10.90 ft; Mar. 19, 1980

162-076-05DAA MP is top of 1-1/4-inch plastic pipe 1.40 ft above lsd.

Oct. 15, 1979...	23.41	May 13.....	23.55	Nov. 19.....	23.46
Nov. 7.....	23.38	June 19.....	23.70	Dec. 17.....	23.34
Dec. 11.....	23.38	July 17.....	23.75	Feb. 19, 1981...	23.27
Feb. 11, 1980...	23.37	Aug. 12.....	23.73	Mar. 10.....	23.29
Mar. 18.....	23.37	Sept. 10.....	23.70		
Apr. 17.....	23.45	Oct. 15.....	23.53		

Highest water level--23.27 ft; Feb. 19, 1981
Lowest water level--23.75 ft; July 17, 1980

162-081-16CCC MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Nov. 19, 1980...	7.70	Feb. 19, 1981...	3.74	Mar. 10.....	3.70
Dec. 17.....	4.18				

Highest water level--3.70 ft; Mar. 10, 1981
Lowest water level--7.70 ft; Nov. 19, 1980

162-083-15CCD MP is top of 1-1/4-inch plastic pipe 4.40 ft above lsd.

Oct. 15, 1979...	+2.91	June 19.....	+3.51	Sept. 9.....	+3.08
Apr. 17, 1980...	+2.80	July 17.....	+3.30	Oct. 15.....	+3.29
May 12.....	+3.41	Aug. 11.....	+3.29	Mar. 10, 1981...	+2.62

Highest water level--+3.51 ft; June 19, 1980
Lowest water level--+2.62 ft; Mar. 10, 1981

163-069-02BBB MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Nov. 18, 1980...	19.64	Feb. 17, 1981...	19.60	Mar. 11.....	19.25
Dec. 16.....	18.51				

Highest water level--18.51 ft; Dec. 16, 1980
Lowest water level--19.64 ft; Nov. 18, 1980

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

163-069-15AAA MP is top of 1-1/4-inch plastic pipe 2.20 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 4, 1978...	10.75	Oct. 3.....	11.19	Aug. 12.....	13.10
Dec. 19.....	11.20	Nov. 6.....	11.56	Sept. 10.....	12.37
Mar. 6, 1979...	12.32	Dec. 11.....	11.82	Oct. 15.....	10.64
Apr. 27.....	12.84	Feb. 13, 1980...	12.60	Nov. 18.....	9.03
May 17.....	11.94	Mar. 17.....	13.07	Dec. 16.....	8.57
June 12.....	11.16	Apr. 16.....	13.20	Feb. 17, 1981...	9.65
July 9.....	10.58	May 13.....	12.65	Mar. 11.....	9.73
Aug. 2.....	10.48	June 19.....	12.82		
Sept. 5.....	10.89	July 17.....	13.03		

Highest water level--8.57 ft; Dec. 16, 1980
Lowest water level--13.20 ft; Apr. 16, 1980

163-069-25CCC MP is top of 1-1/4-inch plastic pipe 1.40 ft above lsd.

Oct. 31, 1979...	4.02	June 19.....	4.79	Dec. 16.....	2.96
Nov. 6.....	4.08	July 17.....	4.76	Feb. 17, 1981...	2.70
Dec. 11.....	3.82	Aug. 12.....	4.77	Mar. 11.....	2.73
Feb. 13, 1980...	3.87	Sept. 10.....	4.58		
May 13.....	4.42	Nov. 18.....	3.34		

Highest water level--2.70 ft; Feb. 17, 1981
Lowest water level--4.79 ft; June 19, 1980

163-071-10DDD2 MP is top of 2-inch steel pipe 3.30 ft above lsd.

Oct. 2, 1978...	162.63	Oct. 3.....	163.05	Aug. 10.....	163.39
Dec. 14.....	162.47	Nov. 7.....	163.29	Sept. 12.....	163.27
Mar. 6, 1979...	163.80	Dec. 11.....	162.89	Oct. 15.....	163.12
Apr. 11.....	160.34	Feb. 13, 1980...	162.30	Nov. 18.....	163.22
May 17.....	160.32	Mar. 17.....	162.80	Dec. 16.....	163.19
June 12.....	160.40	Apr. 16.....	163.14	Feb. 18, 1981...	163.50
July 9.....	162.74	May 13.....	163.19	Mar. 11.....	163.30
Aug. 2.....	162.81	June 19.....	163.40		
Sept. 5.....	162.91	July 17.....	163.38		

Highest water level--160.32 ft; May 17, 1979
Lowest water level--163.80 ft; Mar. 6, 1979

163-072-14ABB MP is top of 2-inch steel pipe 3.30 ft above lsd.

Sept. 26, 1978...	253.40	Nov. 7.....	254.32	Sept. 10.....	251.65
Dec. 19.....	249.80	Dec. 11.....	251.40	Oct. 15.....	251.49
Mar. 6, 1979...	250.71	Feb. 13, 1980...	251.29	Nov. 18.....	251.50
Apr. 27.....	250.65	Mar. 17.....	250.49	Dec. 16.....	251.48
May 17.....	250.52	Apr. 16.....	251.33	Feb. 18, 1981...	251.38
June 12.....	250.05	May 13.....	251.53	Mar. 11.....	251.30
Aug. 2.....	251.00	June 19.....	251.65	Dec. 1.....	252.14
Sept. 5.....	251.19	July 17.....	251.77		
Oct. 3.....	251.30	Aug. 12.....	251.75		

Highest water level--249.80 ft; Dec. 19, 1978
Lowest water level--254.32 ft; Nov. 7, 1979

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

163-072-18BBC MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 23, 1979...	140.03	May 13.....	140.41	Oct. 15.....	140.85
Nov. 7.....	140.09	June 19.....	141.20	Nov. 18.....	140.14
Dec. 11.....	139.90	July 17.....	140.65	Dec. 16.....	140.40
Feb. 13, 1980...	140.20	Aug. 12.....	140.60	Feb. 18, 1981...	140.30
Apr. 16.....	140.32	Sept. 10.....	140.46	Mar. 11.....	140.25

Highest water level--139.90 ft; Dec. 11, 1979
Lowest water level--141.20 ft; June 19, 1980

163-073-11CCC1 MP is top of 2-inch steel pipe 3.30 ft above lsd.

Sept. 21, 1978...	58.75	Oct. 3.....	59.56	Aug. 12.....	59.84
Dec. 19.....	58.80	Nov. 7.....	59.58	Sept. 10.....	59.83
Mar. 6, 1979...	58.52	Dec. 11.....	59.62	Oct. 15.....	59.74
Apr. 26.....	58.89	Feb. 11, 1980...	59.51	Nov. 18.....	59.70
May 16.....	58.85	Mar. 17.....	59.48	Dec. 16.....	59.64
June 12.....	59.00	Apr. 16.....	59.58	Feb. 19, 1981...	59.69
July 9.....	59.21	May 13.....	59.75	Mar. 11.....	59.59
Aug. 2.....	59.35	June 19.....	59.92	Dec. 1.....	59.73
Sept. 5.....	59.55	July 17.....	60.09		

Highest water level--58.52 ft; Mar. 6, 1979
Lowest water level--60.09 ft; July 17, 1980

163-073-11CCC2 MP is top of 2-inch steel pipe 3.30 ft above lsd.

Sept. 20, 1978...	61.20	Oct. 3.....	60.13	Aug. 12.....	60.71
Dec. 18.....	59.65	Nov. 7.....	60.17	Sept. 10.....	60.71
Mar. 6, 1979...	59.68	Dec. 11.....	60.20	Oct. 15.....	60.57
Apr. 26.....	59.70	Feb. 11, 1980...	60.25	Nov. 18.....	60.53
May 16.....	59.63	Mar. 17.....	60.21	Dec. 16.....	60.49
June 12.....	59.66	Apr. 16.....	60.36	Feb. 19, 1981...	60.51
July 9.....	59.85	May 12.....	60.46	Mar. 11.....	60.55
Aug. 2.....	59.96	June 19.....	60.70	Dec. 1.....	60.68
Sept. 5.....	60.12	July 17.....	60.84		

Highest water level--59.63 ft; May 16, 1979
Lowest water level--61.20 ft; Sept. 20, 1978

163-073-11CCC3 MP is top of 2-inch plastic pipe 1.50 ft above lsd.

Aug. 29, 1978...	58.59	Sept. 5.....	59.17	Aug. 12.....	59.87
Sept. 21.....	59.70	Oct. 3.....	59.18	Sept. 10.....	59.86
Dec. 18.....	58.33	Nov. 7.....	59.22	Oct. 15.....	59.90
Mar. 6, 1979...	58.81	Dec. 11.....	59.28	Nov. 18.....	59.62
Apr. 26.....	58.72	Feb. 11, 1980...	59.33	Dec. 16.....	59.72
May 16.....	58.61	Mar. 17.....	59.39	Feb. 19, 1981...	59.60
June 12.....	58.66	Apr. 16.....	59.43	Mar. 11.....	59.39
July 9.....	58.85	May 13.....	59.55	Dec. 1.....	59.58
Aug. 2.....	58.96	July 17.....	59.90		

Highest water level--58.33 ft; Dec. 18, 1978
Lowest water level--59.90 ft; July 17, 1980, and Oct. 15, 1980

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

163-074-15ABA1 MP is top of 2-inch steel pipe 3.30 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 30, 1978...	143.05	Sept. 6.....	142.77	July 17.....	141.71
Sept. 21.....	142.20	Oct. 3.....	142.70	Aug. 12.....	142.60
Dec. 18.....	139.75	Nov. 7.....	142.69	Sept. 10.....	142.52
Mar. 6, 1979...	142.39	Dec. 11.....	142.74	Oct. 15.....	142.35
Apr. 26.....	142.14	Feb. 11, 1980...	142.33	Nov. 18.....	142.04
May 16.....	142.02	Mar. 17.....	142.40	Dec. 17.....	142.04
June 12.....	142.15	Apr. 16.....	142.44	Feb. 19, 1981...	141.90
July 9.....	142.28	May 13.....	142.54	Mar. 10.....	141.80
Aug. 2.....	142.37	June 19.....	142.70	Nov. 30.....	142.55

Highest water level--139.75 ft; Dec. 18, 1978
Lowest water level--143.05 ft; Aug. 30, 1978

163-074-15ABA2 MP is top of 2-inch steel pipe 3.30 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 30, 1978...	99.60	Sept. 6.....	100.08	July 17.....	100.41
Sept. 27.....	99.69	Oct. 3.....	100.35	Aug. 12.....	100.24
Dec. 18.....	100.20	Nov. 7.....	100.07	Sept. 10.....	100.24
Mar. 6, 1979...	99.90	Dec. 11.....	100.22	Oct. 15.....	97.31
Apr. 26.....	98.68	Feb. 11, 1980...	100.07	Nov. 18.....	99.88
May 16.....	98.58	Mar. 17.....	100.09	Dec. 17.....	99.63
June 12.....	98.67	Apr. 16.....	100.14	Feb. 19, 1981...	99.31
July 9.....	99.89	May 13.....	100.30	Mar. 10.....	99.14
Aug. 2.....	99.99	June 19.....	99.47	Nov. 30.....	100.33

Highest water level--97.31 ft; Oct. 15, 1980
Lowest water level--100.41 ft; July 17, 1980

163-075-14AAA MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Feb. 11, 1980...	90.39	July 17.....	93.12	Dec. 17.....	93.29
Mar. 17.....	92.70	Aug. 12.....	92.99	Feb. 19, 1981...	91.94
Apr. 16.....	92.78	Sept. 10.....	92.95	Mar. 10.....	91.78
May 13.....	92.80	Oct. 15.....	92.85		
June 19.....	93.10	Nov. 18.....	92.63		

Highest water level--90.39 ft; Feb. 11, 1980
Lowest water level--93.29 ft; Dec. 17, 1980

163-075-15AAB1 MP is top of 2-inch steel pipe 3.30 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 21, 1978...	111.97	Oct. 3.....	114.12	Aug. 12.....	113.98
Dec. 18.....	113.92	Nov. 7.....	114.22	Sept. 10.....	114.04
Mar. 6, 1979...	111.49	Dec. 11.....	113.89	Oct. 15.....	113.81
Apr. 26.....	113.84	Feb. 11, 1980...	116.49	Nov. 18.....	113.76
May 16.....	113.82	Mar. 17.....	114.40	Dec. 17.....	113.89
June 12.....	113.74	Apr. 16.....	114.02	Feb. 19, 1981...	113.53
July 9.....	113.85	May 13.....	114.06	Mar. 10.....	113.64
Aug. 2.....	113.90	June 19.....	114.20	Nov. 30.....	114.41
Sept. 6.....	114.05	July 17.....	114.19		

Highest water level--111.49 ft; Mar. 6, 1979
Lowest water level--116.49 ft; Feb. 11, 1980

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

163-075-15AAB2 MP is top of 1-1/4-inch plastic pipe 3.20 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 23, 1978...	24.10	Sept. 6.....	25.05	July 17.....	27.75
Sept. 21.....	24.78	Oct. 3.....	25.43	Aug. 12.....	27.84
Oct. 18.....	25.01	Nov. 7.....	25.50	Sept. 10.....	27.28
Mar. 6, 1979...	25.85	Dec. 11.....	26.44	Oct. 15.....	25.84
Apr. 26.....	26.04	Feb. 11, 1980...	27.07	Nov. 18.....	24.07
May 16.....	24.85	Mar. 18.....	27.45	Dec. 17.....	23.40
June 12.....	24.03	Apr. 16.....	27.55	Feb. 19, 1981...	24.01
July 9.....	24.00	May 13.....	27.29	Mar. 10.....	23.70
Aug. 2.....	24.28	June 19.....	27.59	Nov. 30.....	23.59

Highest water level--23.40 ft; Dec. 17, 1980
Lowest water level--27.84 ft; Aug. 12, 1980

163-076-10DDD2 MP is top of 2-inch steel pipe 3.30 ft above lsd.

Dec. 18, 1978...	176.39	Oct. 3.....	174.44	Aug. 11.....	173.29
Mar. 6, 1979...	176.42	Nov. 7.....	172.92	Sept. 10.....	173.18
Apr. 26.....	172.89	Dec. 11.....	173.10	Oct. 15.....	173.29
May 15.....	172.62	Feb. 11, 1980...	173.20	Nov. 18.....	172.98
June 12.....	172.90	Mar. 17.....	172.00	Dec. 17.....	173.09
July 9.....	172.90	Apr. 17.....	173.13	Feb. 19, 1981...	172.81
Aug. 2.....	174.57	June 19.....	173.18	Mar. 10.....	172.74
Sept. 19.....	175.02	July 17.....	172.96		

Highest water level--172.00 ft; Mar. 17, 1980
Lowest water level--176.42 ft; Mar. 6, 1979

163-076-16BAD1 MP is top of 2-inch plastic pipe 2.00 ft above lsd.

Nov. 7, 1979...	119.20	May 13.....	197.38	Oct. 15.....	169.20
Dec. 11.....	212.83	June 19.....	193.45	Nov. 18.....	159.80
Feb. 11, 1980...	201.02	July 17.....	197.22	Dec. 17.....	160.10
Mar. 17.....	190.08	Aug. 12.....	180.60	Feb. 19, 1981...	154.72
Apr. 17.....	163.50	Sept. 10.....	179.12	Mar. 10.....	156.90

Highest water level--119.20 ft; Nov. 7, 1979
Lowest water level--212.83 ft; Dec. 11, 1979

163-076-16BAD2 MP is top of 1-1/4-inch plastic pipe 1.50 ft above lsd.

Nov. 7, 1979...	11.20	May 13.....	10.40	Oct. 15.....	9.80
Dec. 11.....	11.50	June 19.....	10.85	Nov. 19.....	9.20
Feb. 11, 1980...	11.89	July 17.....	11.34	Dec. 17.....	9.30
Mar. 17.....	12.01	Aug. 12.....	10.74	Feb. 19, 1981...	10.70
Apr. 17.....	10.64	Sept. 10.....	11.20	Mar. 10.....	10.29

Highest water level--9.20 ft; Nov. 19, 1980
Lowest water level--12.01 ft; Mar. 17, 1980

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

163-076-16BAD3 MP is top of 1-1/4-inch plastic pipe 2.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 11, 1979...	62.92	May 13.....	63.29	Oct. 15.....	63.50
Dec. 11.....	63.00	June 19.....	63.49	Nov. 18.....	63.10
Feb. 11, 1980...	63.07	July 17.....	63.57	Dec. 17.....	63.48
Mar. 18.....	63.07	Aug. 11.....	63.77	Feb. 19, 1981...	63.49
Apr. 17.....	63.20	Sept. 10.....	63.72	Mar. 10.....	63.19

Highest water level--62.92 ft; July 11, 1979
Lowest water level--63.77 ft; Aug. 11, 1980

163-079-14BBB MP is top of 1-1/4-inch plastic pipe 1.90 ft above lsd.

Aug. 28, 1978...	8.80	Oct. 3.....	7.99	July 17.....	8.78
Dec. 18.....	8.41	Nov. 7.....	8.19	Aug. 11.....	8.84
Mar. 5, 1979...	7.68	Dec. 10.....	8.22	Sept. 9.....	8.84
May 15.....	7.63	Feb. 11, 1980...	8.22	Oct. 15.....	8.80
June 11.....	7.82	Mar. 17.....	8.11	Nov. 19.....	8.60
July 10.....	8.13	Apr. 17.....	8.12	Dec. 17.....	8.60
Aug. 2.....	8.22	May 12.....	8.39	Feb. 19, 1981...	7.90
Sept. 7.....	8.28	June 19.....	8.43	Mar. 10.....	7.79

Highest water level--7.63 ft; May 15, 1979
Lowest water level--8.84 ft; Aug. 11, 1980, and Sept. 9, 1980

163-082-10DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Dec. 18, 1978...	8.99	Oct. 3.....	6.32	July 17.....	6.30
Mar. 5, 1979...	8.41	Nov. 7.....	6.28	Aug. 11.....	6.20
Apr. 26.....	6.70	Dec. 10.....	6.27	Sept. 9.....	6.15
May 15.....	6.60	Feb. 11, 1980...	6.37	Oct. 15.....	6.05
June 11.....	6.58	Mar. 17.....	6.45	Nov. 19.....	6.00
July 10.....	6.51	Apr. 17.....	6.44	Dec. 17.....	5.97
Aug. 2.....	6.40	May 12.....	6.44	Feb. 19, 1981...	6.05
Sept. 7.....	6.36	June 19.....	6.40	Mar. 10.....	5.90

Highest water level--5.90 ft; Mar. 10, 1981
Lowest water level--8.99 ft; Dec. 18, 1978

164-069-28DDD MP is top of 1-1/4-inch plastic pipe 2.00 ft above lsd.

Nov. 18, 1980...	35.59	Dec. 16.....	34.51

Highest water level--34.51 ft; Dec. 16, 1980
Lowest water level--35.59 ft; Nov. 18, 1980

TABLE 3.--Logs of selected wells and test holes

Depths are shown in feet below land surface.

Gamma-ray logs are in API GR units (American Petroleum Institute *gamma-ray units*).

Neutron logs are in API N units (American Petroleum Institute neutron units).

Spontaneous potential (SP) logs are in mV (millivolts).

Resistivity are in ohm-m (ohm-meters); 16-inch short normal and 64-inch long normal.

Resistance logs (single point) are in ohms and are shown in the resistivity column.

159-069-07CCC
NDSWC 5882

Altitude: 1635 feet — Date drilled: 11/06/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, yellowish-brown, oxidized (till)	17	18
	Silt, clayey, yellowish-brown, oxidized	14	32
	Clay, silty, sandy, yellowish-brown, oxidized (till); interbedded with thin lenses of gravel	7	39
	Silt, olive-gray	8	47
	Clay, silty, olive-gray (till); interbedded with thin lenses of silt and gravel	13	60
	Silt, olive-gray	12	72
	Clay, very sandy to gravelly, olive-gray (till)	18	90
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, greenish-gray	40	130
Pierre Shale:			
	Shale, siliceous, well-indurated, fractured, dark-gray	31	161

159-069-11ADA
(Log from Church Well Boring)

Altitude: 1650 feet — Date drilled: 5/11/77

	Topsoil, black	1	1
	Clay, yellow	2	3
	Gravel	15	18
	Clay, blue; gravel, coarse	1	19
	Clay, blue	3	22

159-069-15BBB
NDSWC 5793

Altitude: 1625 feet — Date drilled: 9/29/80

Glacial drift:			
	Soil	1	1
	Clay, very silty to sandy, yellowish-brown, oxidized (till)	15	16
	Clay, very silty, sandy, gravelly, dark-gray (till); interbedded with lenses of sand and gravel from 59 to 69 feet	53	69
	Sand, fine; with medium to coarse poorly sorted angular to rounded gravel; predominately carbonate, quartz, and detrital shale grains	7	76
	Clay, very silty, pebbly, dark-olive-gray (till)	24	100
	Clay, very silty, sandy, olive-gray (till)	8	108
Fox Hills Sandstone:			
	Siltstone, very argillaceous, moderately indurated, greenish-gray	13	121

159-069-23ADD
(Log from Lee's Well Drilling)

Altitude: 1625 feet — Date drilled: 10/27/76

	Topsoil	1	1
	Clay, yellow	17	18
	Clay, blue	65	83
	Sand	6	89

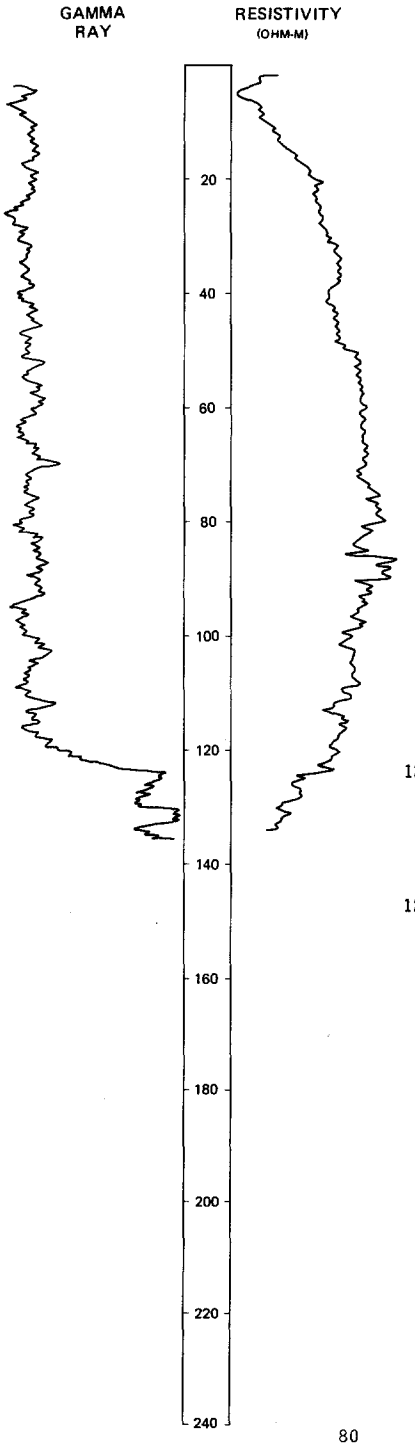
NDSWC 5794

LOCATION: 159-069-26CCC

DATE DRILLED: 9/29/80

ALTITUDE: 1595 (FT, NGVD)

DEPTH: 141 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Clay, very silty to sandy, pebbly, yellowish-brown, oxidized (till).
10-25	Clay, very silty to sandy, pebbly, brown, oxidized (till).
25-120	Clay, very silty to sandy, pebbly, olive-gray (till); interbedded with lenses of gravel from 80 to 120 feet.
120-124	Clay, very shaly, pebbly, dark-gray (till); interbedded with lenses of gravel from 120 to 124 feet.

PIERRE SHALE

124-141	Shale, calcareous, moderately indurated, fractured; gypsum.

159-069-28BBB
NDSWC 5528

Altitude: 1590 feet — Date drilled: 8/17/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, slightly pebbly, yellowish-brown, oxidized (till)	17	18
	Clay, silty, sandy, slightly pebbly, olive-gray (till)	34	52
	Sand, medium to fine, clayey, silty, gravelly	8	60
	Clay, silty, sandy, pebbly, olive-gray (till?); interbedded with 1- to 2-foot medium gravel lenses; gravel is mostly carbonate pebbles	17	77
	Clay, silty, sandy, pebbly, olive-gray (till?); interbedded with fine to medium gravel lenses; gravel is mostly shale pebbles	15	92
	Clay, silty, sandy, pebbly, compact, olive-gray	15	107
Pierre Shale:			
	Shale, brittle, black; contains a few sand grains	30	137

159-070-01AAA
NDSWC 174
(Log from Brookhart and Powell, 1961)

Altitude: 1640 feet — Date drilled: 1949

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Silt, sandy, pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	15	16
	Silt, sandy, pebbly, clayey, gray; probably till but may be in part lacustrine deposits	14	30
	Clay, sandy, gray; fine to medium gravel; and shale pebbles	52	82
Pierre Shale:			
	Shale, gray	18	100

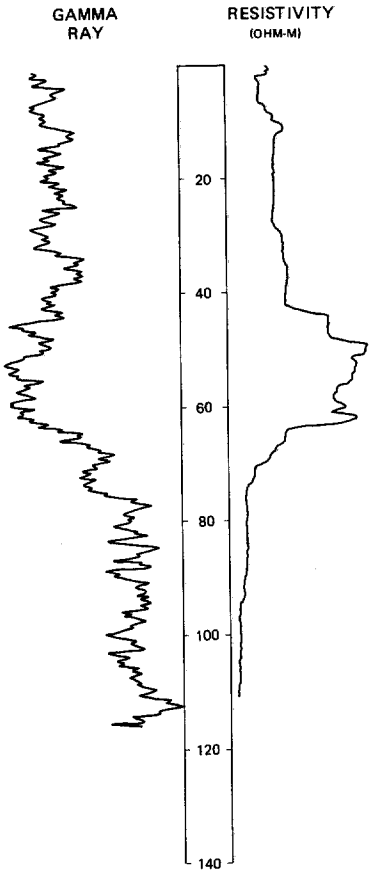
NDSWC 5531

LOCATION: 159-070-02BBB

DATE DRILLED: 8/21/79

ALTITUDE: 1625 (FT, NGVD)

DEPTH: 122 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, light-brown.
1-17	Clay, silty, sandy, pebbly, yellowish-brown (till).
17-47	Clay, silty, sandy, pebbly, olive-gray.
47-63	Clay, silty, sandy, pebbly, olive-gray; interbedded.

FOX HILLS SANDSTONE

63-74	Siltstone, sandy, clayey, moderately compacted to well-compacted, greenish-gray.
74-122	Siltstone, brittle, light-olive-gray; contains a few sand grains.

159-070-04DDD
NDSWC 5801

Altitude: 1605 feet

Date drilled: 10/01/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very silty to sandy, yellowish-brown, oxidized (till)	14	15
	Clay, very silty, pebbly, gravelly, greenish-gray (till)	9	24
	Clay, very sandy, pebbly, gravelly, greenish-gray (till)	6	30
	Gravel, fine to coarse, and coarse subrounded to rounded sand; predominately pebbles and grains with some igneous and detrital shale	7	37
Fox Hills Sandstone:			
	Siltstone, argillaceous, slightly calcareous, moderately indurated, greenish-gray	24	61

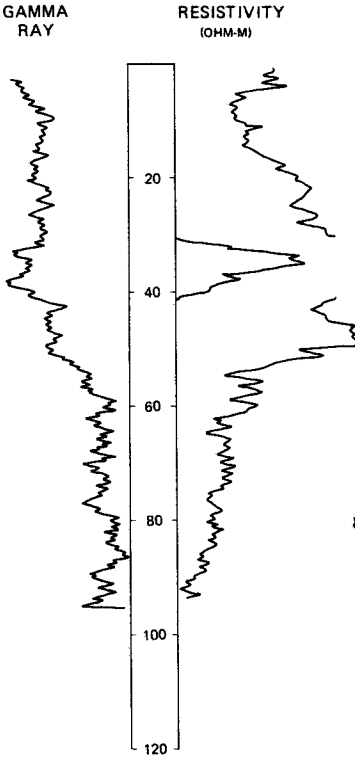
NDSWC 5800

LOCATION: 159-070-10CCB

DATE DRILLED: 10/01/80

ALTITUDE: 1600
(FT, NGVD)

DEPTH: 101
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-16	Clay, very silty to sandy, yellowish-brown, oxidized (till).
16-32	Clay, very silty to sandy, pebbly, olive-gray (till).
32-53	Clay, silty, greenish-gray (till); interbedded with lenses of sand and gravel.

FOX HILLS SANDSTONE

53-80	Siltstone, bentonitic, argillaceous, moderately indurated, greenish-gray.
80-101	Siltstone, very argillaceous, slightly carbonaceous, moderately indurated, medium-gray.

159-070-13DCC
(Log from C. A. Simpson & Son)

Altitude: 1630 feet

Date drilled: 6/18/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil----------	1	1
	Clay, yellow, sandy----------	17	18
	Clay, blue, sandy----------	74	92
	Clay, blue, gravelly----------	28	120

159-070-13DDD
(Log from M & R Drilling Co.)

Altitude: 1629 feet

Date drilled: 6/17/72

	Topsoil, black----------	1	1
	Clay, yellow----------	19	20
	Clay, blue----------	40	60

159-070-15ADC
(Log modified from C. A. Simpson & Son)

Altitude: 1600 feet — Date drilled: 11/20/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	21	22
	Clay, sandy, blue	23	45
	Clay, sandy, blue, hard	19	64
	Shale	36	100

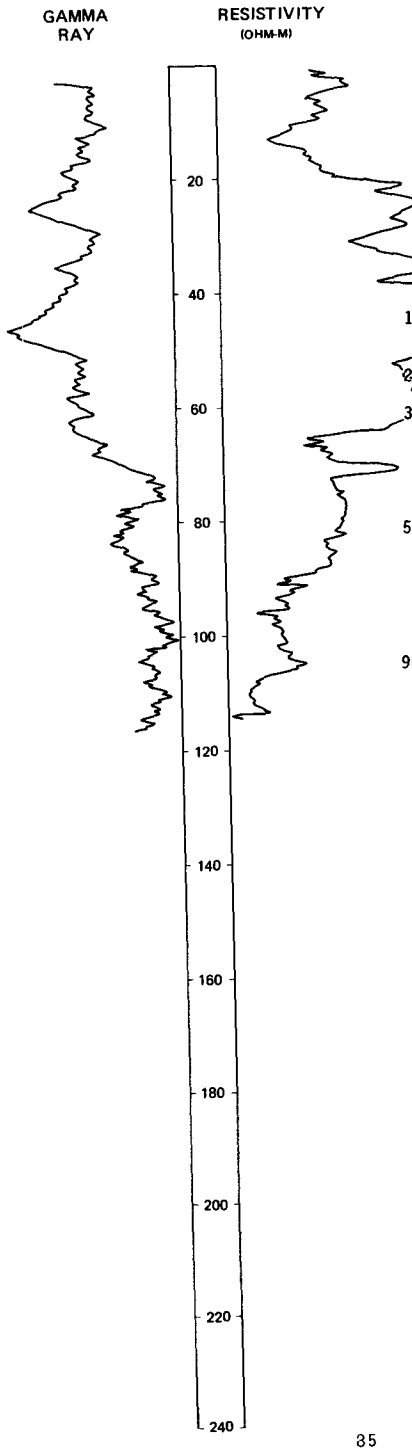
159-070-15CAC
(Log modified from C. A. Simpson & Son)

Altitude: 1595 feet — Date drilled: 11/26/65

	Topsoil	1	1
	Clay, sandy, yellow	26	27
	Clay, sandy, blue	19	46
	Clay, sandy, blue, hard	17	63
	Shale	57	120

LOCATION: 159-070-16BBA NDSWC 5799 DATE DRILLED: 10/01/80

ALTITUDE: 1605 (FT, NGVD) DEPTH: 121 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-3	Clay, very silty to sandy, yellowish-brown, oxidized (till).
3-14	Clay, very silty to sandy, pebbly, yellowish-brown oxidized (till).
14-20	Clay, very silty, pebbly, olive-gray (till).
20-39	Silt, clayey, greenish-gray.
39-52	Sand, fine to medium, subrounded to rounded; predominately quartz grains; 10 percent detrital lignite grains.
52-90	Clay, moderately cohesive, olive-gray (till); interbedded with lenses of sand and medium gravel.

FOX HILLS SANDSTONE

90-121	Siltstone, argillaceous, carbonaceous, moderately indurated, greenish-gray.

159-070-17DDD
NDSWC 5527

Altitude: 1644 feet — Date drilled: 8/16/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, clayey	1	1
	Clay, silty, slightly sandy, yellowish-brown, oxidized	14	15
	Silt, clayey, sandy, yellowish-brown, oxidized (fluvial)	11	26
	Sand, predominately medium to coarse, gravelly; about 10 percent fine gravel	18	44
	Sand, predominately coarse, gravelly; about 10 percent fine to medium gravel	20	64
	Clay, silty, sandy, pebbly, olive-gray (till)	32	96
Fox Hills Sandstone:			
	Siltstone, moderately indurated, brittle, olive-green	26	122

159-070-22BAD
(Log from C. A. Simpson & Son)

Altitude: 1620 feet — Date drilled: 9/18/65

	Topsoil	1	1
	Clay, yellow	23	24
	Clay, blue	31	55
	Clay, blue, sandy	15	70
	Sand, fine	16	86
	Clay, blue	--	86

159-070-25ADA
NDSWC 5883

Altitude: 1630 feet — Date drilled: 11/06/80

Glacial drift:			
	Soil	1	1
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	11	12
	Silt, yellowish-brown, oxidized	10	22
	Clay, sandy, yellowish-brown, oxidized (till)	4	26
	Silt, yellowish-brown, oxidized	4	30
	Clay, sandy, gravelly, yellowish-brown, oxidized (till); interbedded with thin lenses of silt	18	48
	Clay, silty, gravelly, olive-gray (till)	22	70
	Sand, fine, well-sorted, subangular to rounded; interbedded with lenses of silt; predominately quartz grains	15	85
	Clay, sandy, pebbly, greenish-gray (till); cobbles and boulders	34	119
Fox Hills Sandstone:			
	Siltstone, very argillaceous, siliceous, moderately indurated, greenish-gray	41	160
	Siltstone, argillaceous, siliceous, well-indurated, medium-dark-gray	30	190
	Siltstone, argillaceous, calcareous, moderately indurated, brownish-gray	11	201

159-070-29BBB
NDSWC 5798

Altitude: 1613 feet — Date drilled: 9/30/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine, rounded, yellowish-brown, oxidized	3	4
	Clay, leached, pale-gray	2	6
	Sand, fine, well-sorted, rounded; predominately quartz grains	6	12
	Clay, very sandy, olive-gray (till)	20	32
	Gravel, fine to coarse; interbedded with coarse subangular to rounded sand; predominately carbonate and detrital lignite pebbles	8	40
	Clay, very sandy, pebbly, olive-gray (till); interbedded with lenses of medium gravel	4	44
	Gravel, fine to coarse, and medium to coarse subangular to rounded sand	22	66
	Clay, very sandy, pebbly, greenish-gray (till)	15	81

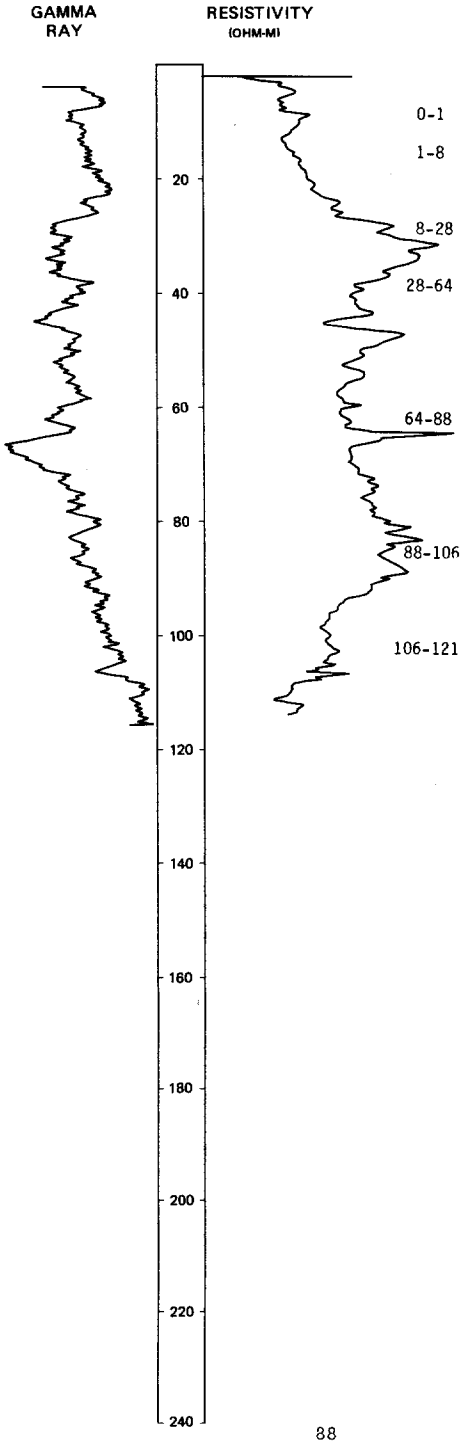
NDSWC 5796

LOCATION: 159-070-33DDD

DATE DRILLED: 9/30/80

ALTITUDE: 1595
(FT, NGVD)

DEPTH: 121
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-8	Clay, very silty to sandy, gravelly, yellowish-brown, oxidized (till).
8-28	Clay, very silty to sandy, pebbly, olive-gray (till).
28-64	Clay, silty to sandy, pebbly, olive-gray (till); some cobbles and boulders; interbedded with lenses of silt and sandy gravel.
64-88	Gravel, fine to coarse, sandy, poorly sorted, angular to rounded; interbedded with thin lenses of till; predominately detrital shale and igneous pebbles.
88-106	Clay, silty to sandy, gravelly, greenish-gray (till).

FOX HILLS SANDSTONE

106-121	Siltstone, argillaceous, moderately indurated, light-greenish-gray.

159-070-34BBB
NDSWC 5797

Altitude: 1600 feet | Date drilled: 9/30/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Clay, very silty, pebbly, yellowish-brown, oxidized (till)----------	16	17
	Clay, very silty to sandy, pebbly, olive-gray (till)----------	31	48
	Clay, very silty to very sandy, greenish-gray (till)----------	10	58
Fox Hills Sandstone:			
	Siltstone, very argillaceous, poorly indurated; carbonaceous streaks; interbedded with occasional thin lenses of fine sandstone----------	43	101

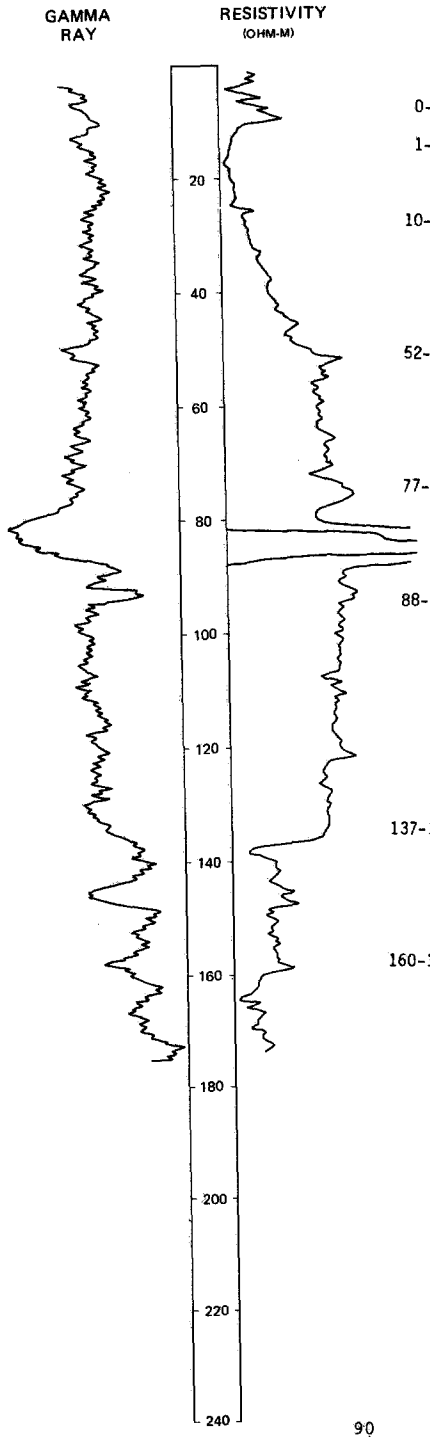
NDSWC 5795

LOCATION: 159-070-36CCC

DATE DRILLED: 9/29/80

ALTITUDE: 1605
(FT, NGVD)

DEPTH: 181
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Clay, very silty to sandy, pebbly, yellowish-brown, oxidized (till).
10-52	Clay, silty to very sandy, gravelly, olive-gray (till).
52-77	Clay, silty to very sandy, pebbly, greenish-gray (till).
77-88	Gravel, fine to coarse, clayey, poorly sorted, subrounded to rounded; predominately carbonate pebbles.
88-137	Clay, silty, sandy, gravelly, olive-gray (till).
137-160	Clay, very silty, greenish-gray (till); possibly reworked or localized bedrock.

FOX HILLS SANDSTONE

160-181	Siltstone, argillaceous, moderately indurated, greenish-gray.

159-071-02BCD
(Log from Virg's Well Drilling)

Altitude: 1620 feet — Date drilled: 7/21/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, sandy	1	1
	Sand	27	28

159-071-04CAB1
(Log from C. A. Simpson & Son)

Altitude: 1615 feet — Date drilled: 1/03/67

	Pit	12	12
	Sand, mushy	26	38
	Clay, blue, sandy	23	61
	Sand	7	68

159-071-04CAB2
(Log from C. A. Simpson & Son)

Altitude: 1610 feet — Date drilled: 5/20/67

	Topsoil	1	1
	Clay, mushy, yellow, sandy	17	18
	Clay, blue, sandy	32	50
	Sand, fine	10	60

159-071-04CAB3
(Log modified from C. A. Simpson & Son)

Altitude: 1620 feet — Date drilled: 3/22/68

	Topsoil	1	1
	Clay, yellow, sandy	21	22
	Clay, blue, sandy	14	36
	Sand, fine to coarse; some clay	19	55

159-071-04CAB4
(Log from C. A. Simpson & Son)

Altitude: 1610 feet — Date drilled: 1/27/69

	Topsoil	1	1
	Clay, yellow, sandy	17	18
	Clay, blue, sandy	32	50
	Sand	2	52

159-071-04CAB5
(Log from C. A. Simpson & Son)

Altitude: 1620 feet — Date drilled: 7/01/71

	Topsoil	1	1
	Clay, yellow	39	40
	Sand, gray, soupy	15	55
	Sand, gray, fine	10	65
	Gravel and fine sand	5	70

159-071-04CBA
(Log from C. A. Simpson & Son)

Altitude: 1630 feet — Date drilled: 5/22/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow, sandy	17	18
	Sand, yellow, clayey	12	30
	Sand, blue, clayey	20	50
	Clay, blue, sandy	10	60
	Sand, blue, clayey	6	66
	Clay, blue	54	120

159-071-06AAA
NDSWC 5786

Altitude: 1600 feet — Date drilled: 9/25/80

Glacial drift:			
	Soil	1	1
	Clay, very sandy, pebbly, yellowish-brown, oxidized (till)	4	5
	Sand, fine to coarse, subrounded to rounded; about 75 percent quartz and 25 percent carbonate, and shale grains	13	18
	Clay, silty to sandy, greenish-gray (till)	2	20
	Silt, clayey, dark-greenish-gray	25	45
Fox Hills Sandstone:			
	Sandstone, very fine, greenish-gray; interbedded with siltstone and bentonitic shale	39	84
	Siltstone, bentonitic, argillaceous, moderately indurated, light-greenish-gray	17	101

159-071-17BBB
NDSWC 5787

Altitude: 1600 feet — Date drilled: 9/25/80

Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	9	10
	Silt, clayey, yellowish-brown, oxidized	4	14
	Silt, clayey, dark-greenish-gray	20	34
	Clay, silty to sandy, greenish-gray (till); reworked localized bedrock or shove block	18	52
Fox Hills Sandstone:			
	Sandstone, very fine, clayey to silty, grayish-green	10	62
	Siltstone, argillaceous, moderately indurated, light-greenish-gray	18	80

159-071-23DAC
NDSWC 5526

Altitude: 1605 feet — Date drilled: 8/16/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, sandy, silty, pebbly, yellowish-brown, oxidized (till)	9	10
	Clay, slightly sandy, light-olive-gray (lacustrine?)	10	20
Fox Hills Sandstone:			
	Sandstone, very fine to fine, well-sorted, well-rounded; contains some glauconite, magnetite, and interstitial clay	12	32
	Siltstone, sandy, brittle, compact, light-olive-gray	15	47

159-072-02DCD
(Log from C. A. Simpson & Son)

Altitude: 1595 feet — Date drilled: 11/13/68

	Topsoil	1	1
	Clay, yellow, sandy	18	19
	Clay, blue, sandy	63	82
	Shale, gray	89	171
	Shale, brown	8	179
	Shale, crumbly	38	217

159-072-03BDA
(Log from C. A. Simpson & Son)

Altitude: 1590 feet — Date drilled: 6/15/68

	Topsoil	1	1
	Clay, yellow, sandy	21	22
	Clay, blue, sandy	47	69
	Sand, coarse, clayey	6	75
	Clay, blue	--	75

159-072-04AAB
NDSWC 5807

Altitude: 1540 — Date drilled: 10/02/80

Glacial drift:			
	Soil	1	1
	Silt, clayey, yellowish-brown, oxidized	7	8
	Silt, clayey, greenish-gray	16	24
	Clay, very silty to sandy, pebbly, olive-gray (till)	7	31
	Sand, fine to medium, and medium poorly sorted subangular to rounded gravel; predominately carbonate grains and pebbles	9	40
	Clay, very silty and sandy, pebbly, greenish-gray (till)	10	50
Fox Hills Sandstone:			
	Sandtone, fine, poorly indurated, greenish-gray to brownish-gray; bentonitic or carbonaceous in places	54	104
	Siltstone, argillaceous, moderately indurated, greenish-gray	17	121

159-072-11BCC
(Log modified from C. A. Simpson & Son)

Altitude: 1600 feet — Date drilled: 6/18/68

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	17	18
	Clay, sandy, blue	42	60
	Clay, gravelly; little water	12	72
	Shale, dry	124	196
	Shale, crumbly	17	213

159-072-14AAB
(Log from Lee's Well Drilling)

Altitude: 1580 feet — Date drilled: 5/02/75

	Soil	1	1
	Clay, sandy, yellow	18	19
	Sand, blue	116	135
	Shale	65	200

159-072-21CCC
NDSWC 5818

Altitude: 1560 feet — Date drilled: 10/08/80

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, gravelly, subrounded, oxidized	2	3
	Clay, very silty, pebbly, yellowish-brown, oxidized (till)	5	8
	Clay, very silty, pebbly, olive-gray (till)	6	14
Fox Hills Sandstone:			
	Sandstone, fine, bentonitic, siliceous, glauconitic, greenish-gray	27	41

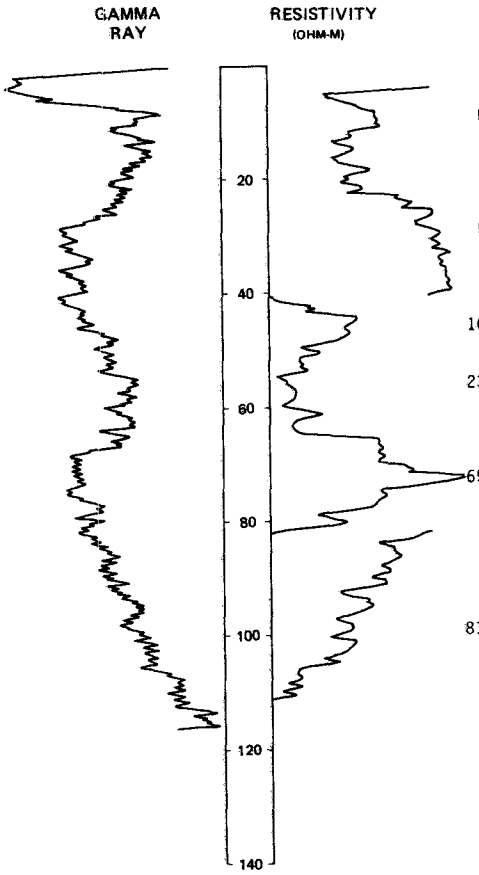
NDSWC 5525

LOCATION: 159-072-22AAA

DATE DRILLED: 8/16/79

ALTITUDE: 1560 (FT, NGVD)

DEPTH: 122 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-5	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
5-10	Sand, fine to coarse, predominately medium, moderately sorted to well-sorted.
10-23	Clay, olive-gray (lacustrine).
23-65	Clay, silty, sandy, slightly pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
65-81	Sandstone, very fine to fine, predominately very fine, well-sorted, well-rounded, greenish-gray; contains interstitial clay, glauconite, and some magnetite.
81-122	Siltstone, sandy, brittle, light-olive-gray.

159-072-31BCC
NDSWC 5817

Altitude: 1570 feet

Date drilled: 10/08/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very silty to sandy, pebbly, yellowish-brown, oxidized (till)	22	23
	Clay, very sandy to gravelly, olive-gray (till)	4	27
	Sand, fine to coarse, poorly sorted, rounded, oxidized	2	29
	Silt, yellowish-brown, oxidized	5	34
Fox Hills Sandstone:			
	Sandstone, fine, siliceous, glauconitic, poorly indurated, greenish-gray	27	61

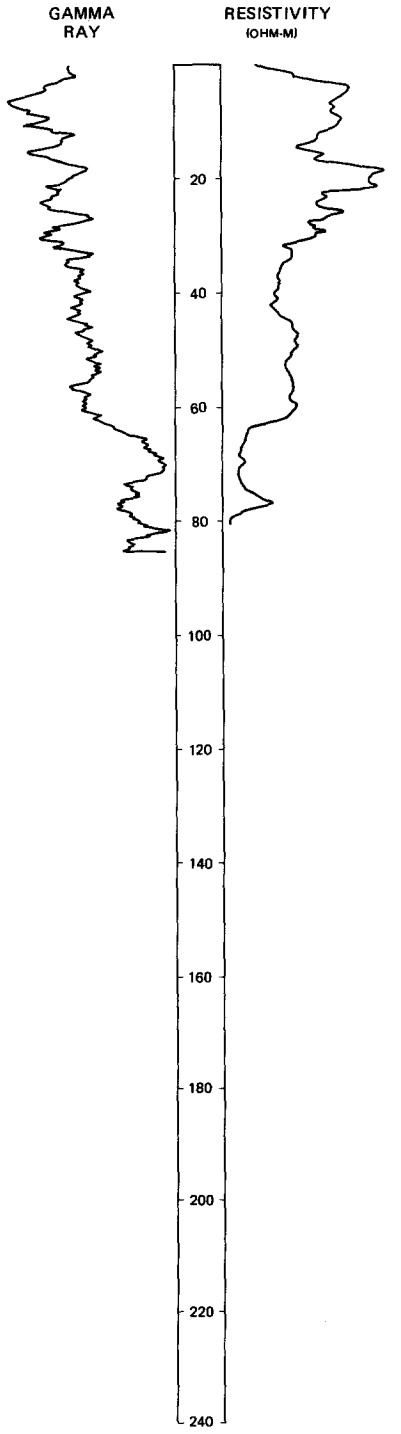
NDSWC 5520

LOCATION: 159-073-01BBB

DATE DRILLED: 8/15/79

ALTITUDE: 1550
(FT, NGVD)

DEPTH: 92
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-5	Clay, very sandy, pebbly, silty, yellowish-brown, oxidized.
5-18	Clay, very sandy, pebbly, silty, olive-gray; contains thin sand lenses.
18-24	Sand, predominately medium, gravelly, poorly sorted; contains thin clay lenses.
24-31	Clay, silty, sandy, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
31-63	Sandstone, very fine to fine, grayish-olive-green; contains some glauconite, mica, and magnetite.
63-92	Siltstone, sandy, brittle, dark-greenish-gray.

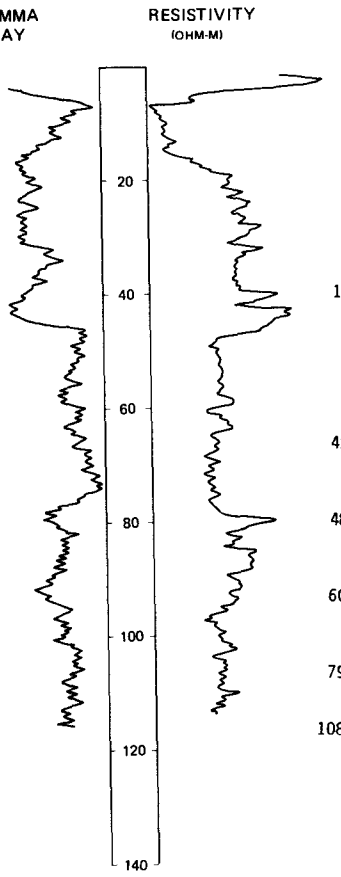
NDSWC 5824

LOCATION: 159-073-06DDD

DATE DRILLED: 10/08/80

ALTITUDE: 1510 (FT, NGVD)

DEPTH: 121 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, silty, brown.
1-7	Silt, yellowish-brown, oxidized.
7-16	Clay, cohesive, yellowish-brown, oxidized (lacustrine).
16-42	Clay, very silty, pebbly, yellowish-brown, oxidized (till); interbedded with lenses of gravel from 20 to 42 feet.

FOX HILLS SANDSTONE

42-48	Siltstone, argillaceous, yellowish-gray-brown, oxidized.
48-60	Sandstone, very fine, siliceous, glauconitic, green.
60-79	Siltstone, argillaceous, moderately indurated, brownish-gray.
79-108	Sandstone, fine, glauconitic, greenish-gray.
108-121	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray.

159-073-08CCC
NDSWC 5821

Altitude: 1515 feet

Date drilled: 10/08/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, cohesive, yellowish-brown, oxidized (lacustrine)	9	10
	Clay, very silty, sandy, yellowish-brown, oxidized (till); interbedded with thin lenses of gravel	26	36
	Clay, very silty, pebbly, olive-gray (till)	4	40
Fox Hills Sandstone:			
	Sandstone, fine, greenish-gray; interbedded with siltstone and shale	21	61

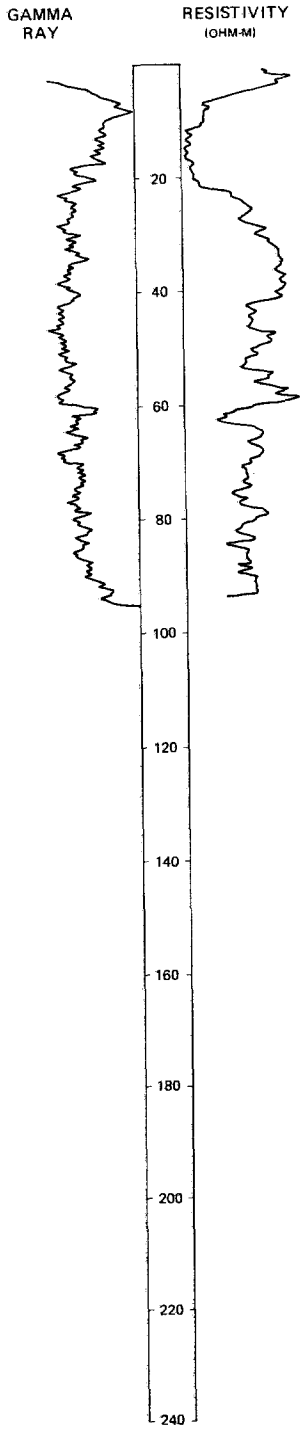
NDSWC 5820

LOCATION: 159-073-03DDD

DATE DRILLED: 10/08/80

ALTITUDE: 1500
(FT, NGVD)

DEPTH: 101
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-2	Soil.
2-17	Clay, cohesive, yellowish-brown, oxidized (lacustrine).
17-34	Clay, very silty, sandy, pebbly, yellowish-brown, oxidized (till); interbedded with thin lenses of gravel.
34-42	Clay, very silty, sandy, pebbly, olive-gray (till).
42-54	Clay, very silty, pebbly, brownish-gray; reworked localized bedrock.

FOX HILLS SANDSTONE

54-60	Sandstone, fine, argillaceous, poorly indurated, grayish-green.
60-101	Sandstone, very fine, siliceous, poorly indurated, greenish-gray; interbedded with lenses of siltstone.

159-073-12CDC
NDSWC 5819

Altitude: 1565 feet — Date drilled: 10/08/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very silty, sandy, yellowish-brown, oxidized (till)	9	10
	Sand, very fine to fine, well-sorted, subrounded; oxidized to 18 feet	17	27
	Silt, argillaceous, greenish-gray	2	29
	Clay, very silty, sandy, gravelly, olive-gray (till)	7	36
Fox Hills Sandstone:			
	Sandstone, fine, bentonitic, carbonaceous, greenish-gray; interbedded with moderately indurated siltstone	25	61

159-073-18BCC
NDSWC 5523

Altitude: 1494 feet — Date drilled: 8/15/79

Glacial drift:			
	Soil, dark-brown	1	1
	Clay, yellowish-brown, oxidized (lacustrine)	31	32
	Clay, silty, sandy, pebbly, olive-gray (till)	20	52
Fox Hills Sandstone:			
	Sandstone, fine to very fine, well-rounded, greenish-gray; contains abundant glauconite and some mica	24	76
	Siltstone, sandy, brittle, light-olive-gray	16	92

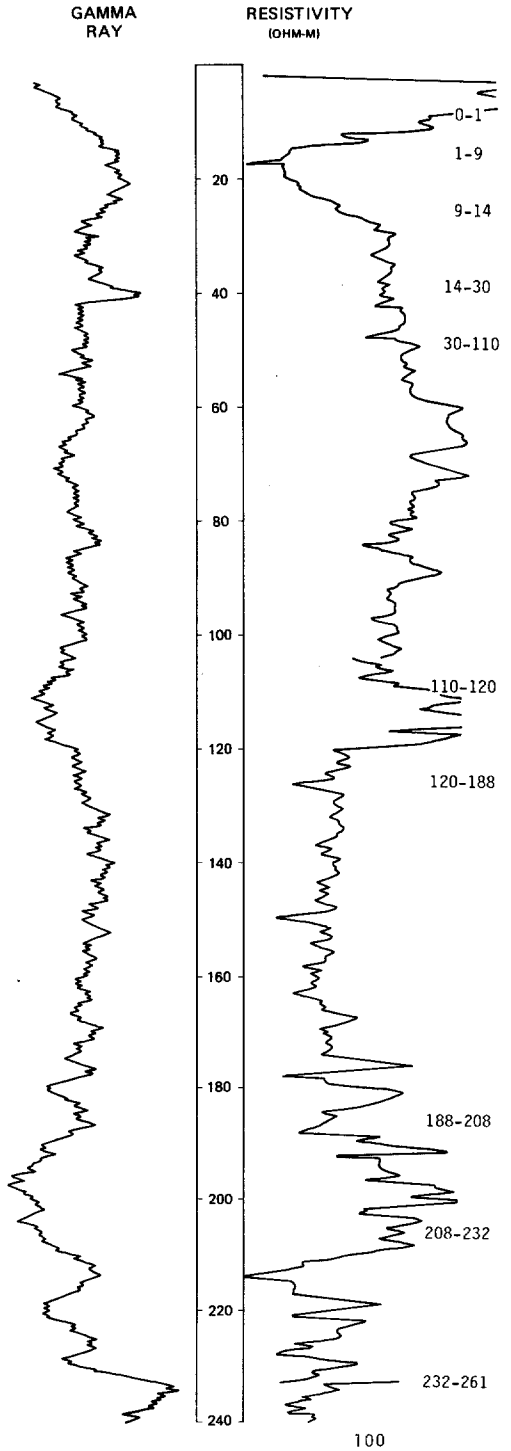
NDSWC 5822

LOCATION: 159-073-19CBB

DATE DRILLED: 10/08/80

ALTITUDE: 1490
(FT, NGVD)

DEPTH: 261
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-9	Sand, fine, silty, rounded, oxidized.
9-14	Clay, cohesive, yellowish-brown, oxidized (lacustrine).
14-30	Clay, cohesive, olive-gray (lacustrine).
30-110	Clay, very silty, pebbly, olive-gray (till).
110-120	Clay, silty to sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel.
120-188	Clay, very sandy, gravelly, olive-gray (till).
188-208	Sand, coarse; interbedded with fine to medium angular to rounded gravel; predominately carbonate grains.
208-232	Clay, silty to sandy, olive-gray (till); interbedded with lenses of sandy gravel.

FOX HILLS SANDSTONE

232-261	Shale, moderately indurated, dark-gray; interbedded with siltstone.

NDSWC 5822, continued

LOCATION: 159-073-19CBB

DATE DRILLED: 10/08/80

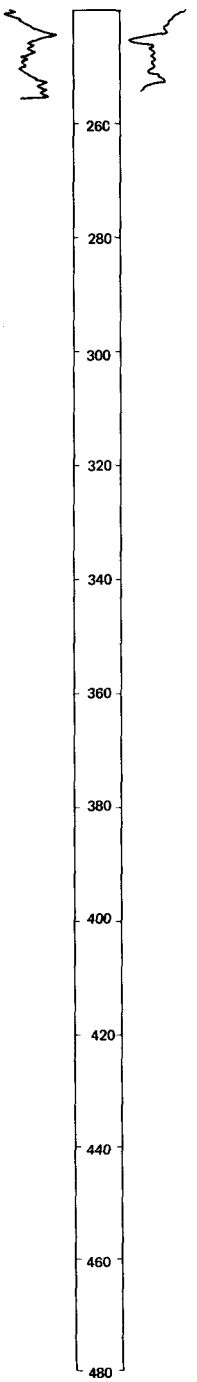
ALTITUDE: 1490
(FT, NGVD)

DEPTH: 261
(FT)

GAMMA RAY

RESISTIVITY
(OHM-M)

DESCRIPTION OF DEPOSITS



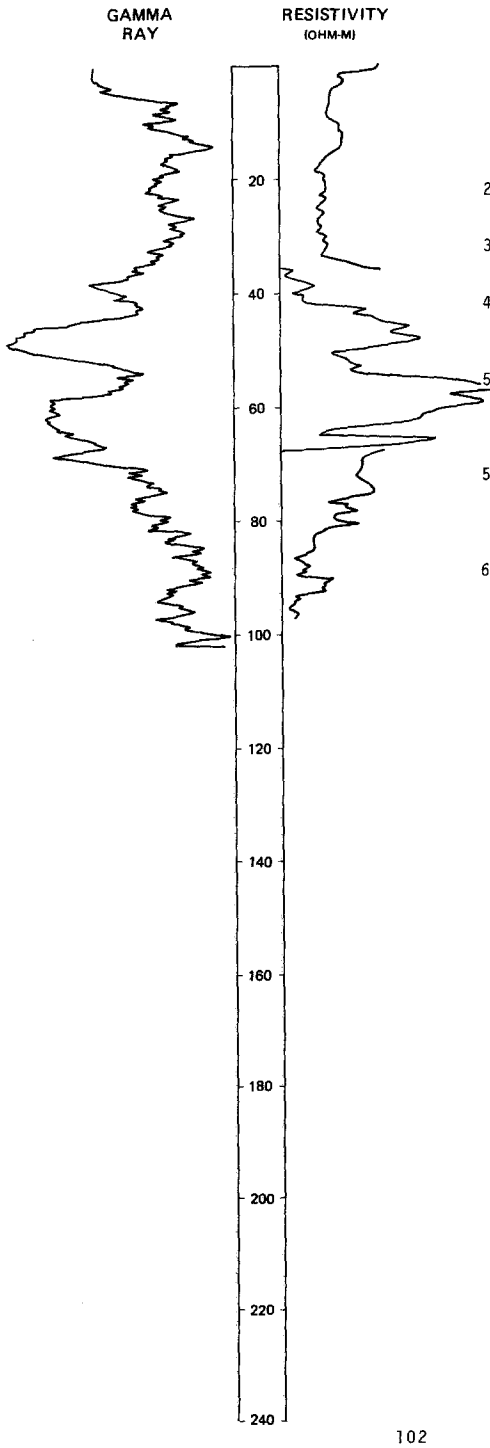
NDSWC 5522

LOCATION: 159-073-22BBB

DATE DRILLED: 8/15/79

ALTITUDE: 1500
(FT, NGVD)

DEPTH: 107
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-23	Clay, yellowish-brown, oxidized (lacustrine); locally carbonaceous.
23-35	Clay, olive-gray (lacustrine).
35-42	Clay, silty, sandy, pebbly, olive-gray (till).
42-50	Sand, predominately coarse, poorly sorted, rounded to angular, and fine gravel.
50-54	Clay, silty, sandy, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
54-68	Sandstone, very fine to fine, well-sorted, well-rounded, greenish-gray; contains interstitial clay.
68-107	Siltstone, sandy, brittle, olive-gray.

LOCATION: 159-073-22BBB

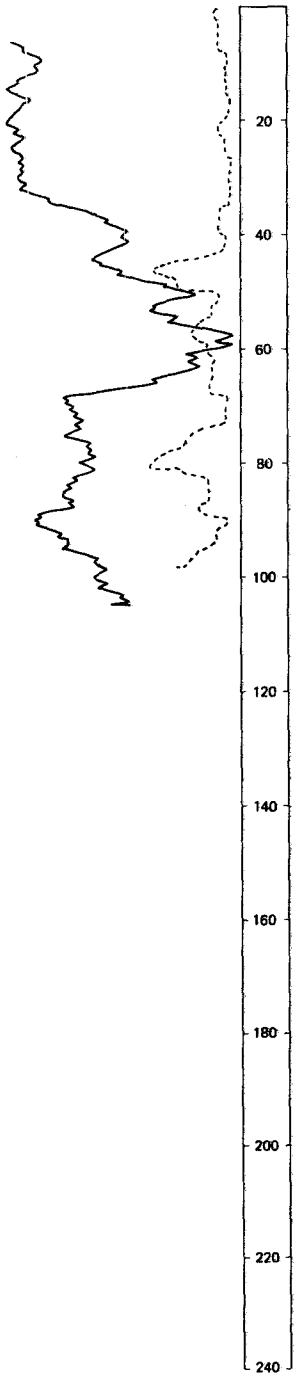
DATE DRILLED: 8/15/79

ALTITUDE: 1500
(FT, NGVD)

DEPTH: 107
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

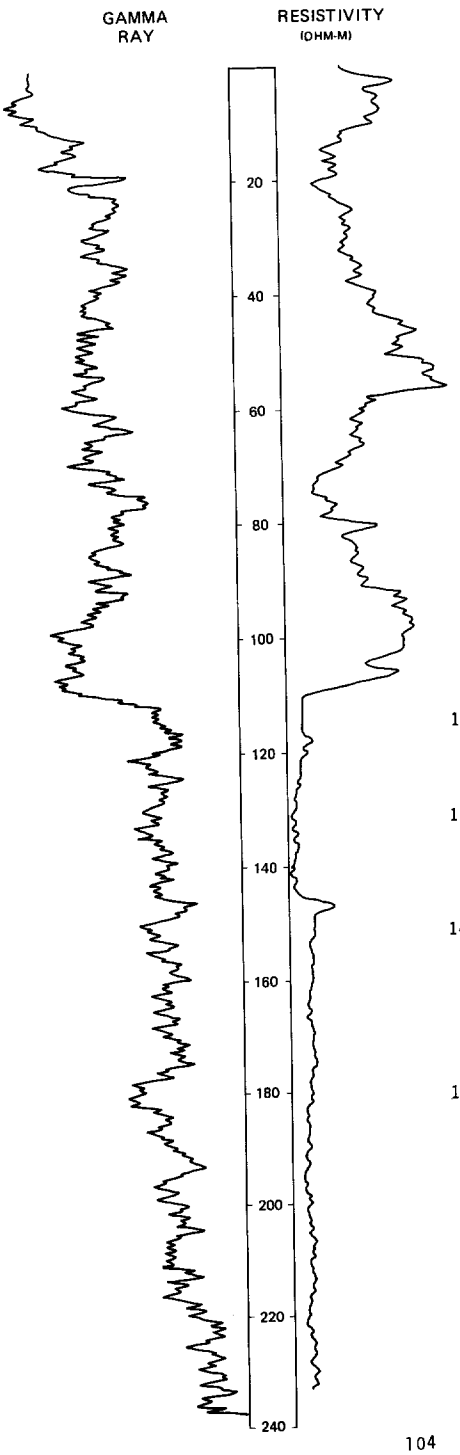
NDSWC 5521

LOCATION: 159-073-23AAA

DATE DRILLED: 8/15/79

ALTITUDE: 1542
(FT, NGVD)

DEPTH: 242
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, dark-brown; humus.
1-10	Sand, very fine to coarse, silty, yellowish-brown, oxidized.
10-24	Clay, silty, olive-gray (lacustrine).
24-50	Clay, silty, sandy, pebbly, olive-gray (till).
50-55	Sandstone, very fine to fine, well-sorted, well-rounded, brittle, greenish-gray; contains abundant glauconite; shove block(?).
55-70	Siltstone, slightly sandy and clayey, olive-gray; shove block(?).
70-90	Clay, silty, sandy, pebbly, olive-gray (till); contains some interbedded sand and gravel.
90-100	Siltstone, brittle, light-olive-gray; contains a few sand grains.
100-110	Siltstone, slightly sandy, brittle, light-olive-gray.

FOX HILLS SANDSTONE

110-148	Sandstone, very fine to fine, well-sorted, well-rounded, dusky-green; contains abundant glauconite and magnetite.
148-180	Siltstone, sandy, olive-gray.
180-242	Shale, silty, dark-olive-gray.

LOCATION: 159-073-23AAA

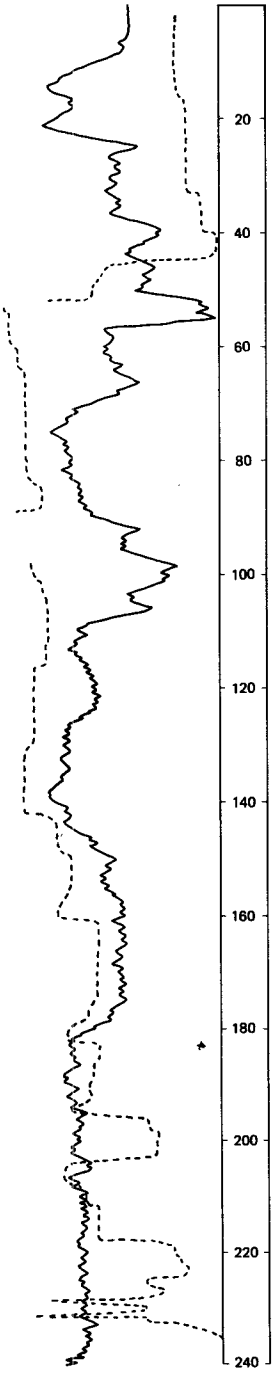
DATE DRILLED: 8/15/79

ALTITUDE: 1542
(FT, NGVD)

DEPTH: 242
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

159-073-23CDD
NDSWC 5815

Altitude: 1507 feet | Date drilled: 10/07/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine to very coarse; interbedded with fine angular to rounded oxidized gravel	2	3
	Silt, clayey, yellowish-brown, oxidized	7	10
	Sand, fine to coarse, rounded	5	15
	Clay, very silty, sandy, pebbly (till); interbedded with thin lenses of gravel	22	27
	Sand, fine to very coarse; interbedded with fine angular to rounded gravel; about 80 percent quartz and 20 percent carbonate grains	13	50
	Clay, very silty to sandy, brownish-gray (till)	20	70
	Sand, fine to coarse; predominately quartz, carbonate, and detrital shale grains	5	75
	Clay, very silty, brownish-gray (till); interbedded with lenses of sand and gravel	62	137
Fox Hills Sandstone:			
	Siltstone, argillaceous, olive-gray to brownish-gray	24	161

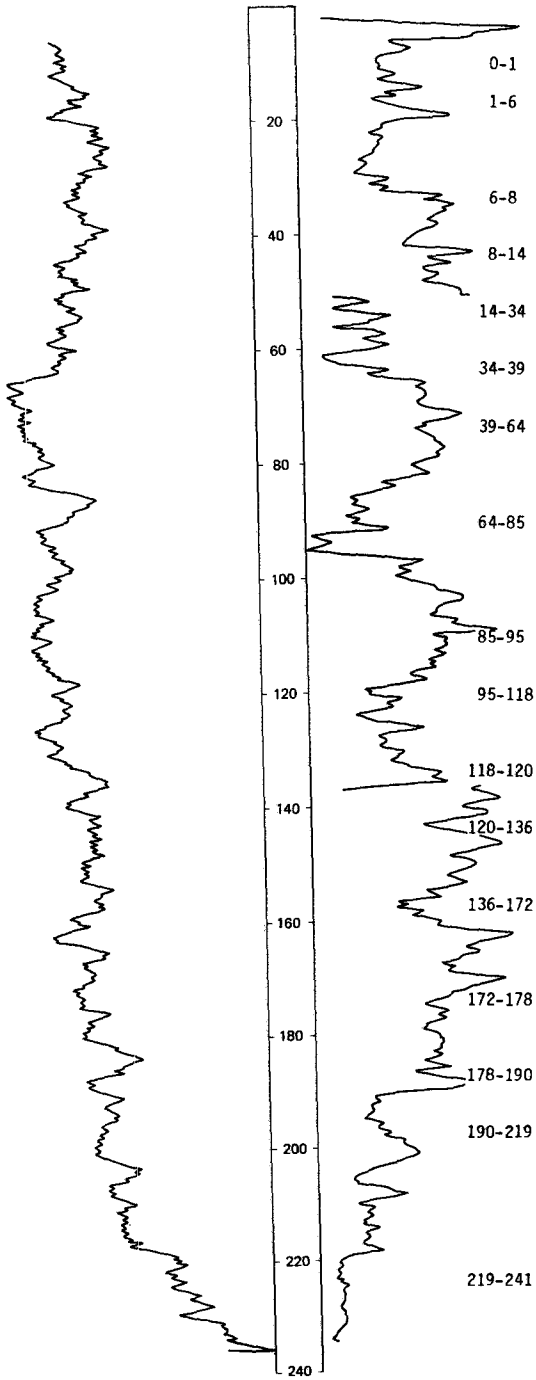
NDSWC 5814

LOCATION: 159-073-27AAA

DATE DRILLED: 10/07/80

ALTITUDE: 1512
(FT, NGVD)

DEPTH: 241
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-6	Sand, fine to coarse; interbedded with fine to coarse subrounded to rounded oxidized gravel.
6-8	Silt, yellowish-brown, oxidized (lacustrine).
8-14	Silt, clayey, sandy, greenish-gray (lacustrine).
14-34	Clay, very cohesive, olive-gray (lacustrine).
34-39	Silt, clayey, sandy, olive-gray (lacustrine).
39-64	Clay, very silty, pebbly, olive-gray (till); interbedded with thin lenses of gravel.
64-85	Sand, very coarse; interbedded with fine to medium subangular to rounded gravel; predominately quartz grains.
85-95	Clay, silty, sandy, pebbly, brownish-gray (till).
95-118	Sand, coarse; interbedded with fine to coarse angular to rounded gravel.
118-120	Clay, very silty, sandy, pebbly, brownish-gray (till).
120-136	Sand, coarse, gravelly, predominately angular; interbedded with till.
136-172	Clay, silty, sandy, gravelly, olive-gray (till).
172-178	Sand, medium to coarse, rounded; predominately quartz grains.
178-190	Clay, silty, sandy, gravelly, olive-gray (till).
190-219	Clay, very silty, pebbly, brownish-gray (till); reworked localized bedrock; interbedded with thin lenses of gravel.

FOX HILLS SANDSTONE

219-241	Siltstone, argillaceous, brownish-gray; streaks of carbonaceous and bentonitic clay.

159-073-30CCC
NDSWC 5823

Altitude: 1495 feet Date drilled: 10/08/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, silty, dark-brown	1	1
	Silt, yellowish-brown, oxidized (lacustrine)	7	8
	Clay, cohesive, yellowish-brown, oxidized (lacustrine)	8	16
	Clay, very silty to sandy, yellowish-brown, oxidized (till)	20	36
	Clay, very silty, pebbly, olive-gray (till)	19	55
	Sand, very fine, clayey	2	57
	Clay, silty, pebbly, olive-gray to brownish-gray (till)	6	63
Fox Hills Sandstone:			
	Siltstone, argillaceous, brownish-gray; interbedded with fissile moderately indurated to well-indurated shale	47	110
	Sandstone, fine, very glauconitic, poorly indurated, greenish-gray	12	122
	Siltstone, very argillaceous, carbonaceous, moderately indurated, brownish-gray	19	141

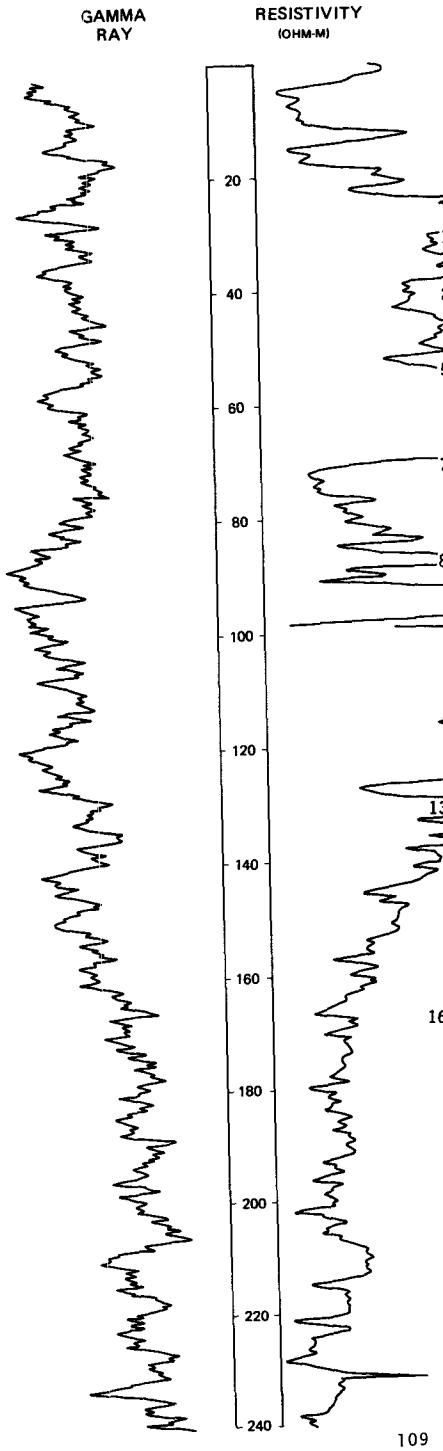
NDSWC 5524

LOCATION: 159-073-35DDD

DATE DRILLED: 8/16/79

ALTITUDE: 1639 (FT, NGVD)

DEPTH: 287 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-17 Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).

17-22 Silt, clayey, slightly sandy, yellowish-brown, oxidized.

22-54 Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).

54-70 Sand, fine to medium, silty, clayey, yellowish-brown, oxidized.

70-83 Silt, sandy, clayey, yellowish-brown, oxidized.

FOX HILLS SANDSTONE

83-130 Sandstone, very fine to fine, silty, clayey, greenish-gray; contains glauconite and magnetite.

130-166 Sandstone, fine to very fine, dark-greenish-gray; contains some glauconite, magnetite, and red grains.

166-268 Siltstone, very sandy, brittle, light-olive-gray.

NDSWC 5524, continued

LOCATION: 159-073-35DDD

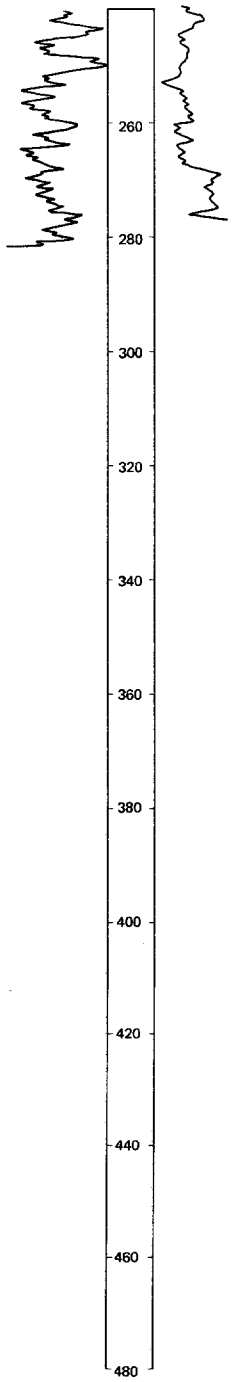
DATE DRILLED: 8/16/79

ALTITUDE: 1639
(FT, NGVD)

DEPTH: 287
(FT)

GAMMA RAY

RESISTIVITY
(OHM-M)



DESCRIPTION OF DEPOSITS

PIERRE SHALE

268-287 Shale, brittle, olive-gray to black.

LOCATION: 159-073-35DDD

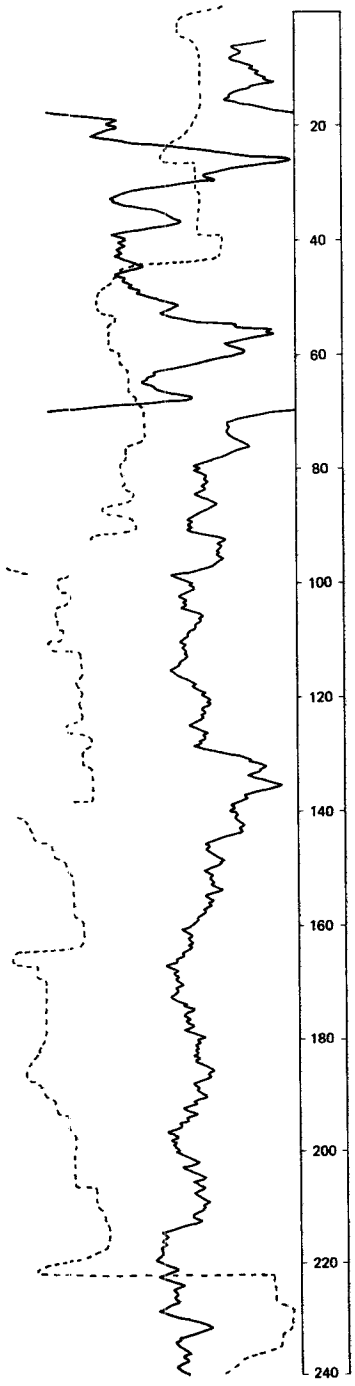
DATE DRILLED: 8/16/79

ALTITUDE: 1639
(FT, NGVD)

DEPTH: 287
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

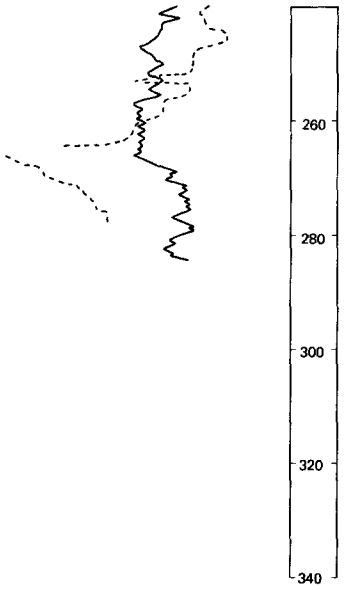
LOCATION: 159-073-35DDD

DATE DRILLED: 8/16/79

ALTITUDE: 1639
(FT, NGVD)

DEPTH: 287
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

159-073-36AAA
NDSWC 5816

Altitude: 1575 feet

Date drilled: 10/08/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Clay, very silty to sandy, yellowish-brown, oxidized (till)----------	9	10
	Gravel, fine to coarse; interbedded with coarse angular to rounded sand; interbedded with silt from 20 to 32 feet; about 50 percent carbonate, 40 percent igneous, and 10 percent detrital shale pebbles----------	22	32
	Clay, very silty, sandy, pebbly, olive-gray (till)----------	12	44
	Sand, coarse; interbedded with fine to medium angular to rounded gravel; predominately carbonate grains----------	6	50
Fox Hills Sandstone:			
	Sandstone, fine, siliceous, glauconitic, poorly indurated, greenish-gray; interbedded with bentonitic carbonaceous siltstone----------	31	81

LOCATION: 159-074-05DDD NDSWC 5830 DATE DRILLED: 10/09/80

ALTITUDE: 1470 (FT, NGVD) DEPTH: 121 (FT)

DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-11	Silt, yellowish-gray, oxidized (lacustrine).
11-26	Clay, very cohesive, yellowish-brown, oxidized (lacustrine).
26-43	Clay, very cohesive; interbedded with olive-gray silt (lacustrine).
43-59	Clay, very silty, pebbly, olive-gray (till).
59-62	Gravel, fine to medium, sandy, poorly sorted, subrounded to rounded; predominately quartz, carbonate, and detrital shale pebbles.
62-72	Clay, silty, olive-gray (till); interbedded with lenses of fine gravel.
72-83	Sand, fine to coarse; interbedded with fine to medium subrounded to rounded gravel.
83-98	Clay, very sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

98-121	Siltstone, fine, argillaceous; interbedded with well-indurated greenish-gray sandstone.

159-074-07DDD
NDSWC 1
(Log from Naplin, 1968)

Altitude 1470 feet — Date drilled: 7/11/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty loam; brownish-black	1	1
	Clay, silty, sandy, light-olive-brown to olive-brown, plastic, moderately cohesive, calcareous, oxidized	26	27
	Clay, sandy, olive-gray, cohesive, calcareous (till)	35	62
Fox Hills Sandstone:			
	Sandstone, silty to clayey, medium-bluish-gray to dark-greenish-gray, slightly indurated, noncalcareous	25	87
	Shale, silty, medium-gray to medium-dark-gray	13	100

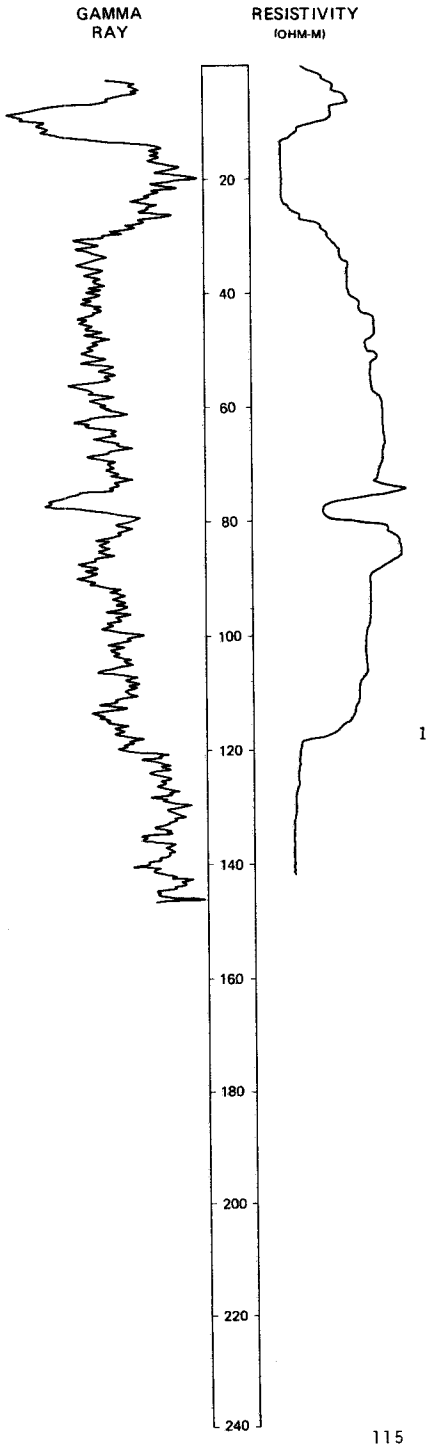
NDSWC 5540

LOCATION: 159-074-16ADD

DATE DRILLED: 8/22/79

ALTITUDE: 1470
(FT, NGVD)

DEPTH: 152
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil, black to dark-brown.
1-7	Clay, cohesive, olive-gray (lacustrine).
7-10	Clay, silty, sandy, pebbly (till?).
10-30	Clay, cohesive, olive-gray (lacustrine).
30-118	Clay, silty, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

118-152	Sandstone, clayey, silty, brittle, olive-gray.

159-074-17AAA
NDSWC 2
(Log from Naplin, 1968)

Altitude: 1470 feet — Date drilled: 7/10/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil; sandy loam; grayish-black	2	2
	Clay, very silty, yellowish-brown, moderately cohesive, plastic, oxidized	9	11
	Clay, sandy, olive-gray to medium-dark-gray, cohesive, calcareous	29	40
	Clay, silty; with sand grains and pebbles; olive gray; moderately cohesive; calcareous (till)	43	83
	Gravel, clayey, medium to coarse, angular to subangular, poorly sorted; mostly limestone and granitic constituents	2	85
	Clay, silty; with medium-size sand grains; olive gray; moderately cohesive; calcareous (till)	15	100
	Sand, fine- to medium-grained, angular to subrounded; fair sorting	3	103
	Clay, silty, sandy, olive-gray, cohesive, calcareous (till)	24	127
Fox Hills Sandstone:			
	Siltstone, clayey, medium-light-gray, calcareous, moderately indurated	53	180
	Claystone, silty, brownish-black to dark-grayish-black, moderately indurated, slightly calcareous	36	216
	Siltstone, silty to sandy, medium-light-gray to medium-dark-gray, indurated, noncalcareous	64	280
	Siltstone, sandy, medium-light-gray, moderately indurated, noncalcareous	32	312
Pierre Shale:			
	Shale, dark-gray to black, well-indurated, noncalcareous	8	320

159-074-30AAA
NDSWC 3
(Log from Naplin, 1968)

Altitude: 1488 feet — Date drilled: 7/12/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, brownish-black	1	1
	Sand, very fine to fine-grained, subangular to subrounded, well-sorted; greater than 75 percent quartz; remaining portion being shale, limestone, and granitics; oxidized to yellowish brown throughout	5	6
	Clay, silty, pebbly; moderate yellowish orange upper 10 feet; lower 21 feet olive gray to medium gray; moderately cohesive; calcareous (till)	31	37
	Mudstone and sandstone, yellowish-gray, interbedded, indurated, calcareous	3	40
	Sand, very fine to fine-grained, angular to subangular, well-sorted, dark-greenish-gray; greater than 30 percent quartz with remaining portion being shale, lignite, limestone, and granitics	21	61
Fox Hills	Sandstone:		
	Siltstone, clayey; light gray with some grayish-blue laminations; moderately well indurated; noncalcareous	19	80

159-074-32AAA
(Log modified from Marchus Drilling)

Altitude: 1490 feet — Date drilled: 5/02/75

	Topsoil, sandy, black	3	3
	Clay, sandy, yellow	12	15
	Clay, sandy, brown	19	34
	Clay, gray; pea gravel	11	45
	Sand, gray	15	60

159-075-01CCC
NDSWC 4
(Log from Naplin, 1968)

Altitude: 1458 feet — Date drilled: 7/13/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, sandy, brownish-black	1	1
	Clay, silty, medium-yellowish-orange, moderately cohesive, calcareous, oxidized	6	7
	Sand, very fine to fine, subangular to subrounded, well-sorted; greater than 70 percent quartz with remaining portion being shale, limestone, and lignite	17	24
	Clay, silty, pebbly, olive-gray to medium-dark-gray, cohesive, calcareous (till)	88	112
	Cobbles and boulders, gravelly; predominately granitic and limestone rocks	4	116
	Clay, silty, olive-gray, cohesive, calcareous (till)	9	125
	Cobbles and boulders, gravelly; limestone, dolostone, and granitic rocks	2	127
	Clay, silty, pebbly, medium-light-gray, cohesive, calcareous (till)	4	131
	Cobbles and boulders, gravelly; limestone, dolostone, and granitic rocks	3	134
	Clay, sandy, silty, pebbly, medium-light-gray to olive-gray, cohesive, calcareous (till)	2	136
	Cobbles and boulders, gravelly; limestone, dolostone, shale, and granitic rocks	4	140
	Clay, sandy, gravelly, olive-gray to medium-dark-gray, cohesive, calcareous (till)	34	174
Fox Hills Sandstone:			
	Shale, sandy, light-gray to greenish-gray, layered, well-indurated, calcareous to noncalcareous	26	200

159-075-02ACC
NDSWC 5
(Log from Naplin, 1968)

Altitude: 1461 feet — Date drilled: 7/13/67

Glacial drift:			
	Topsoil, silty, sandy, grayish-black	1	1
	Sand, very fine to fine, subangular to subrounded, well-sorted; oxidized to yellowish brown upper 3 feet; greater than 70 percent quartz with remaining portion being shale, limestone, and granitics	14	15
	Clay, sandy, pebbly, olive-gray to medium-light-gray, cohesive, calcareous (till)	45	60
	Clay, silty, medium-light-gray; very lignitic from 66 to 68 and 76 to 78 feet	18	78
	Gravel, medium to coarse, angular to sub-angular, poorly sorted; numerous cobbles and boulders	3	81
Fox Hills Sandstone:			
	Siltstone, sandy, light-gray, well-indurated, noncalcareous	19	100

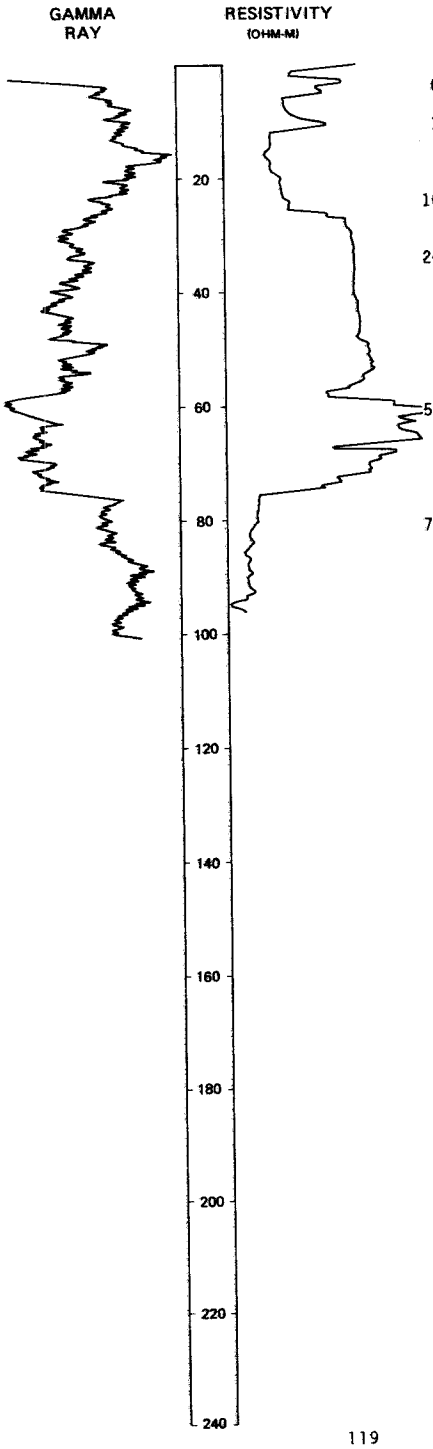
NDSWC 5541

LOCATION: 159-075-10BBB

DATE DRILLED: 8/22/79

ALTITUDE: (FT, NGVD) 1460

DEPTH: (FT) 107



DESCRIPTION OF DEPOSITS

0-1	Soil, dark-brown.
1-10	Clay, silty, slightly sandy, yellowish-brown, oxidized (lacustrine).
10-26	Clay, silty, slightly sandy, olive-gray (lacustrine).
26-59	Clay, silty, sandy, pebbly, olive-gray (till).
59-74	Sand, fine, and fine poorly sorted dirty gravel; about 5 percent gravel.
	FOX HILLS SANDSTONE
74-107	Siltstone, slightly sandy, brittle, compact, olive-gray to light-olive-gray.

NDSWC 5541, continued

LOCATION: 159-075-10BBB

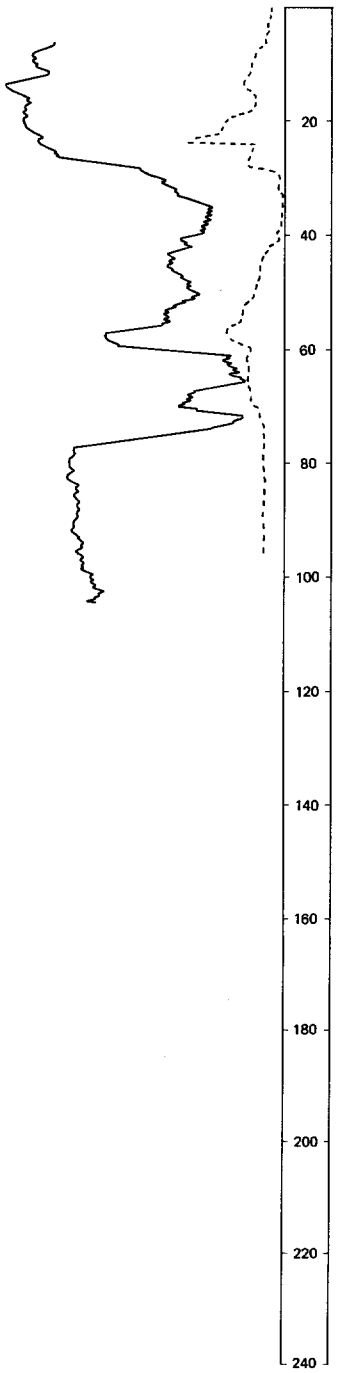
DATE DRILLED: 8/22/79

ALTITUDE: (FT, NGVD) 1460

DEPTH: (FT) 107

NEUTRON (API) S.P. (MV)

DESCRIPTION OF DEPOSITS



159-075-11ADD
NDSWC 6
(Log from Naplin, 1968)

Altitude: 1468 feet — Date drilled: 7/14/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, sandy, brownish-black	1	1
	Clay, silty, sandy, medium-yellowish-orange, moderately cohesive, plastic, very calcareous, oxidized	3	4
	Sand, very fine to fine, subangular to subrounded, moderately well sorted; greater than 50 percent quartz with remaining portion being shale, limestone, and granitics; oxidized	2	6
	Clay, silty, sandy, medium-yellowish-orange to olive-gray, cohesive, calcareous	25	31
	Clay, silty, lignitic, medium-light-gray to medium-dark-gray, moderately cohesive, calcareous (till)	28	59
Fox Hills Sandstone:			
	Shale and siltstone, interbedded, brownish-black to medium-light-gray, indurated, calcareous (siltstone) to noncalcareous (shale)	21	80

159-075-11CCD
NDSWC 7
(Log from Naplin, 1968)

Altitude: 1460 feet — Date drilled: 7/12/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty; sandy loam; brownish-black	1	1
	Sand, very fine to fine-grained, subangular to subrounded, moderately well sorted; greater than 70 percent quartz with remaining constituents being limestone and granite; oxidized	9	10
	Clay, silty, olive-gray, cohesive, calcareous	13	23
	Clay, sandy, silty, olive-gray, cohesive, calcareous	13	36
	Clay, silty, sandy, pebbly, olive-gray, cohesive, calcareous (till)	27	63
	Sand, gravelly, coarse to very coarse, subangular to subrounded, moderately well sorted; greater than 50 percent quartz; some lignite and limestone	5	68
	Clay, sandy, pebbly, olive-gray, cohesive (till)	3	71
	Sand, silty and clayey, medium to coarse, angular to subangular, poorly sorted	3	74
	Clay, silty, pebbly, medium-light-gray, moderately cohesive, calcareous (till)	18	92
Fox Hills Sandstone:			
	Shale, sandy to silty, brownish-gray, moderately indurated, noncalcareous	28	120

159-075-11DAA
NDSWC 8
(Log from Naplin, 1968)

Altitude: 1467 feet — Date drilled: 7/14/67

Glacial drift:			
	Topsoil, silty, sandy, brownish-black	1	1
	Clay, silty; medium yellowish orange upper 12 feet (oxidized) to olive gray bottom 2 feet; moderately cohesive; calcareous	14	15
	Sand, very fine to fine, subangular to subrounded, moderately well sorted; oxidized upper 10 feet; greater than 60 percent quartz	12	27
	Clay, silty, sandy, olive-gray to medium-dark-gray, cohesive, calcareous (till)	33	60

159-075-12CAA1
NDSWC 9
(Log from Naplin, 1968)

Altitude: 1470 feet — Date drilled: 7/14/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, sandy, grayish-black	1	1
	Clay, silty; moderate yellowish brown upper 8 feet (oxidized) to medium dark gray; cohesive; calcareous	17	18
	Sand, very fine to fine, angular to subangular, moderately well-sorted; greater than 60 percent quartz with remaining portion being limestone, shale, and granitics	10	28
	Clay, silty, sandy, pebbly, olive-gray; lignitic from 45 to 55 feet; cohesive; calcareous (till)	40	68
Fox Hills Sandstone:			
	Sandstone and siltstone, interbedded dusky-yellow (siltstone) to medium-bluish-gray (sandstone), well-indurated, noncalcareous	12	80

159-075-12CAA2
(Log modified from Church Well Boring)

Altitude: 1470 feet — Date drilled: 6/14/76

	Sand, light-gray	1	1
	Sand, yellow	4	5
	Clay, blue	1	6
	Sand, white	1	6
	Sand, light-yellow	4	11
	Sand, dark-gray; with intermittent thin layers of blue clay	23	34

159-075-12CBB
NDSWC 10
(Log from Naplin, 1968)

Altitude: 1460 feet — Date drilled: 7/12/67

Glacial drift:			
	Topsoil, silty, sandy, grayish-black	1	1
	Clay, silty, medium-yellowish-orange, moderately cohesive, calcareous, oxidized	2	3
	Sand, fine- to medium-grained, subangular to subrounded, moderately well sorted; greater than 60 percent quartz with remaining portion being shale, limestone, and granitics	21	24
	Clay, silty, sandy, pebbly, medium-gray to medium-light-gray, cohesive, calcareous	31	55
Fox Hills Sandstone:			
	Siltstone, clayey; light-gray to medium-light-gray with a few medium-bluish-gray layers; moderately well indurated; noncalcareous	45	100

159-075-12CBC
NDSWC 11
(Log from Naplin, 1968)

Altitude: 1473 feet — Date drilled: 7/14/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, sandy, grayish-black	1	1
	Clay, silty, moderate-yellowish-brown, slightly cohesive, oxidized, calcareous	6	7
	Sand, very fine to fine, angular to subangular, moderately well sorted, slightly oxidized; greater than 50 percent quartz	7	14
	Clay, silty, sandy, olive-gray, cohesive, plastic, calcareous	20	34
	Clay, silty, pebbly, olive-gray to medium-dark-gray, cohesive, moderately plastic, lignitic, calcareous (till)	31	65
Fox Hills Sandstone:			
	Sandstone and siltstone, interbedded, moderate-reddish-brown (oxidized) to light-gray, well-indurated, noncalcareous	15	80

159-075-12CCB
NDSWC 12
(Log from Naplin, 1968)

Altitude: 1462 feet — Date drilled: 7/11/67

Glacial drift:			
	Topsoil; sandy loam; brownish-black	½	½
	Sand, fine- to medium-grained, angular to subangular, well-sorted; greater than 80 percent quartz with remaining constituents being limestone and granite; oxidized upper 15 feet	24½	25
	Clay, sandy; with lignite grains; olive gray to medium dark gray; moderately cohesive	2	27
	Sand, fine- to medium-grained, angular to subangular, well-sorted	8	35
	Clay, sandy, olive-gray to medium-dark-gray, cohesive	2	37
	Sand, fine- to medium-grained, angular to subangular, moderately well sorted	3	40
Fox Hills Sandstone:			
	Claystone and siltstone, interbedded, sandy, light-gray to medium-dark-gray, soft to indurated, calcareous to noncalcareous	140	180
	Siltstone, clayey, medium-light-gray, slightly indurated, slightly calcareous to noncalcareous; siderite ($FeCo_3$) concretions from 197 to 216 feet	40	220
	Siltstone, clayey, sandy, medium-light-gray, slightly indurated, noncalcareous	96	316
Pierre Shale:			
	Shale, brownish-black to black, indurated, noncalcareous; thin bentonite layers throughout	24	340

159-075-12CCC
NDSWC 13
(Log from Naplin, 1968)

Altitude: 1469 feet — Date drilled: 7/17/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, grayish-black	1	1
	Clay, silty, sandy; dark yellowish orange upper 4 feet (oxidized) to medium light gray; cohesive; calcareous	8	9
	Sand, very fine to fine, subangular to subrounded, well-sorted; greater than 70 percent quartz with remaining portion being shale, limestone, and granitics	17	26
	Clay, silty, olive-gray to medium-light-gray, very cohesive, plastic, calcareous	2	28

159-075-12CDD
NDSWC 14
(Log from Naplin, 1968)

Altitude: 1465 feet — Date drilled: 7/17/67

Glacial drift:			
	Topsoil, silty, brownish-black	1	1
	Sand, very fine to fine, subangular to subrounded, well-sorted; greater than 60 percent quartz with remaining portion being shale, limestone, and granitics; oxidized	3	4
	Clay, silty, sandy; dark yellowish orange upper 4 feet (oxidized) to olive gray; moderately cohesive; calcareous	12	16
	Sand, very fine to fine, predominately subrounded, well-sorted, unoxidized; greater than 60 percent quartz	15	31
	Clay, silty, olive-gray, cohesive, calcareous	1	32

159-075-12DCC
(Log from Church Well Boring)

Altitude: 1465 feet — Date drilled: 10/20/75

Topsoil, black	1	1
Sand, fine, yellow	4	5
Sand, blue	14	19
Clay, blue	1	20

159-075-12DDD
NDSWC 15
(Log from Naplin, 1968)

Altitude: 1467 feet — Date drilled: 7/11/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil; silty loam; brownish black----------	1	1
	Clay, silty, sandy, light-olive-brown to moderate-olive-brown, cohesive, calcareous, oxidized----------	22	23
	Clay, silty; with sand and pebbles; olive gray; cohesive; moderately plastic; calcareous (till)----------	23	46
	Gravel, silty, clayey, fine to medium, angular to subangular, poorly sorted; predominately limestone and shale constituents----------	3	49
Fox Hills Sandstone:			
	Shale, sandy, silty, greenish-black, moderately indurated, noncalcareous; interbedded with thin layers of medium-bluish-gray sandstone----------	31	80

159-075-13BAA
NDSWC 16
(Log from Naplin, 1968)

Altitude: 1470 feet — Date drilled: 7/17/67

Glacial drift:			
	Topsoil, silty, sandy, brownish-black----------	1	1
	Clay, silty, dark-yellowish-orange, moderately cohesive, calcareous, oxidized----------	6	7
	Sand, very fine to fine, subangular to subrounded, well-sorted; greater than 60 percent quartz with remaining portion being shale, limestone, and granitics----------	26	33
	Clay, silty, olive-gray to medium-dark-gray, cohesive, calcareous----------	1	34

159-075-13BAC
NDSWC 17
(Log from Naplin, 1968)

Altitude: 1470 feet — Date drilled: 7/17/67

Glacial drift:			
	Topsoil, silty, grayish-black----------	1	1
	Clay, silty, dark-yellowish-orange, cohesive, calcareous, oxidized----------	8	9
	Clay, silty, pebbly, olive-gray to medium-dark-gray, moderately cohesive, calcareous (till)----------	48	57
Fox Hills Sandstone:			
	Shale, dark-greenish-gray to brownish-gray, well-indurated, noncalcareous, laminated----------	3	60

159-075-16AAA
NDSWC 18
(Log from Naplin, 1968)

Altitude: 1465 feet — Date drilled: 7/12/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, sandy, grayish-black	1	1
	Clay, silty, sandy, dark-yellowish-orange, slightly cohesive, calcareous, oxidized	10	11
	Clay, silty, olive-gray to light-olive-gray, cohesive, calcareous	24	35
	Clay, very sandy, olive-gray, moderately cohesive, calcareous	35	70
	Sandstone, clayey, medium-bluish-gray, slightly indurated, noncalcareous; not cemented (boulder or block dropped by melting glacial ice)	14	84
	Clay, sandy, pebbly, medium-light-gray, calcareous, cohesive (till)	13	97
	Gravel, medium to coarse, angular to subrounded, fairly well sorted	9	106
	Clay, silty, gravelly, olive-gray, cohesive, calcareous, lignitic (till)	16	122
	Clay, silty, gravelly; with a few cobbles and boulders; olive gray; moderately cohesive (till)	6	128
Fox Hills Sandstone:			
	Siltstone, light-gray to medium-light-gray; interbedded with a few brownish-gray shale layers; noncalcareous; poorly indurated	12	140

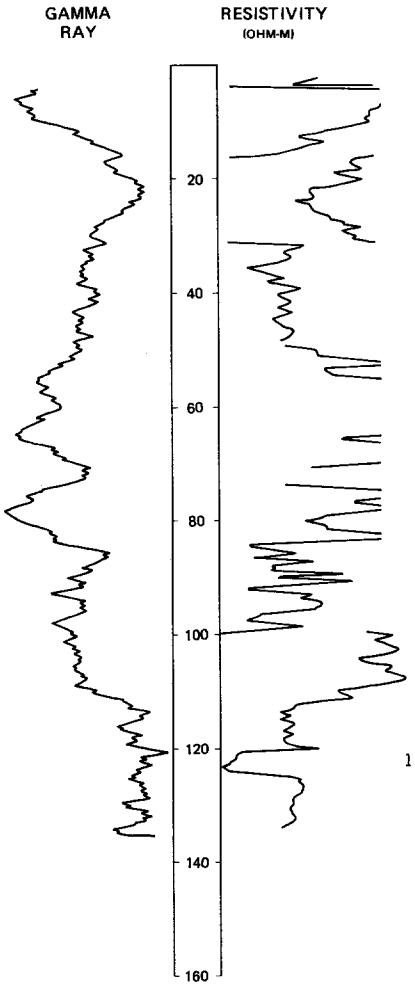
NDSWC 5832

LOCATION: 159-075-17AAA

DATE DRILLED: 10/10/80

ALTITUDE: 1470 (FT, NGVD)

DEPTH: 141 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Silt, yellowish-brown, oxidized (lacustrine).
10-15	Silt, olive-gray (lacustrine).
15-32	Clay, very cohesive, olive-gray (lacustrine).
32-54	Clay, very silty to sandy, olive-gray (till).
54-65	Sand, fine, gravelly, and fine to coarse poorly sorted angular to rounded gravel; interbedded with thin lenses of till.
65-77	Clay, very sandy, pebbly, olive-gray (till); interbedded with gravel.
77-80	Sand, fine to coarse, gravelly, angular to rounded.
80-112	Clay, sandy, pebbly, olive-gray (till); interbedded with thin lenses of gravel.

FOX HILLS SANDSTONE

112-141	Siltstone, argillaceous, moderately indurated, olive-gray to brownish-gray; carbonaceous and bentonitic streaks.

159-075-17BBA
(Log modified from Church Well Boring)

Altitude: 1470 feet

Date drilled: 10/10/75

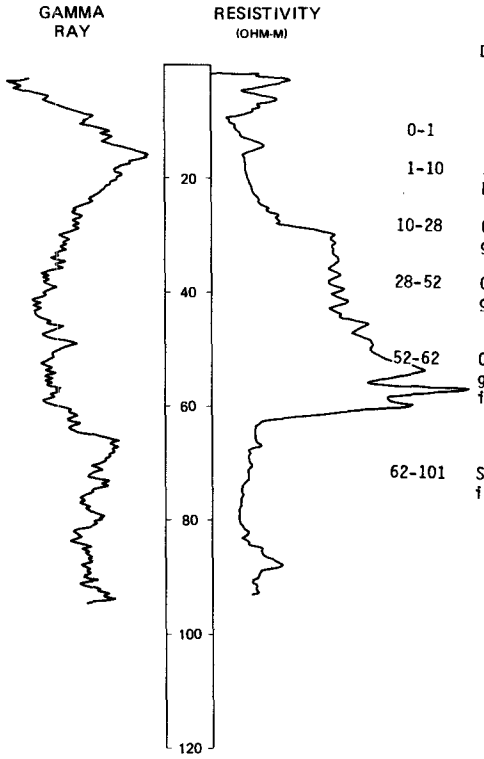
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	1	1
	Clay, sandy, yellow	12	13
	Clay, yellow	7	20
	Clay, blue	16	36
	Pea gravel	2	38
	Clay, blue	3	41
	Sand, blue	6	47

LOCATION: 159-075-20AAA NDSWC 5831

DATE DRILLED: 10/10/80

ALTITUDE: 1465 (FT, NGVD)

DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Silt, clayey, yellowish-brown, oxidized (lacustrine).
10-28	Clay, very cohesive, olive-gray (lacustrine).
28-52	Clay, silty, gravelly, olive-gray (till); some boulders.
52-62	Clay, very sandy, pebbly, greenish-gray (till); interbedded with gravel.

FOX HILLS SANDSTONE

62-101	Siltstone, argillaceous, indurated, greenish-gray.

159-075-24BBB
NDSWC 19
(Log from Naplin, 1968)

Altitude: 1475 feet

Date drilled: 7/12/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty and sandy, brownish-gray----------	1	1
	Sand, very fine to fine, subangular to subrounded, well-sorted; greater than 80 percent quartz; oxidized to yellowish brown upper 8 feet----------	10	11
	Clay, silty, olive-gray, cohesive, plastic----------	21	32
	Clay, silty, sandy, pebbly, medium-light-gray to medium-gray, cohesive, moderately plastic, calcareous (till)----------	11	43
	Sand, coarse to very coarse grained, angular to subrounded; fair sorting; unoxidized----------	6	49
	Clay, silty, sandy, medium-light-gray, slightly calcareous, cohesive (till)----------	2	51
Fox Hills Sandstone:			
	Siltstone, sandy, light-gray, moderately indurated, noncalcareous----------	29	80

159-075-24CCC
NDSWC 20
(Log from Naplin, 1968)

Altitude: 1480 feet — Date drilled: 7/12/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, silty, brownish-black	1	1
	Sand, very fine to fine-grained, subangular to subrounded, well-sorted; greater than 70 percent quartz; oxidized to yellowish brown upper 8 feet of section	15	16
	Clay, silty, lignitic, light-gray to medium-light-gray, very cohesive, calcareous	33	49
	Sand, gravelly, coarse to very coarse, subangular to subrounded; fair to good sorting	7	56
	Gravel, very clayey, fine to medium, angular, poorly sorted	4	60
Fox Hills Sandstone:			
	Sandstone, light-gray, unconsolidated; not cemented; noncalcareous	20	80

159-075-26CCC
NDSWC 21
(Log from Naplin, 1968)

Altitude: 1475 feet — Date drilled: 7/12/67

Glacial drift:			
	Topsoil, silty, sandy, brownish-black	1	1
	Clay, silty, sandy, dark-yellowish-orange, slightly cohesive, calcareous; sand occurs in thin layers	6	7
	Clay, silty, pebbly, medium-light-gray to medium-gray, cohesive, calcareous (till)	58	65
	Gravel, medium to coarse, angular to subangular, poorly sorted; mostly limestone and shale	3	68
	Clay, silty, sandy, pebbly, olive-gray, cohesive, moderately plastic, calcareous (till)	17	85
Fox Hills Sandstone:			
	Sandstone, clayey; medium-bluish-gray with bluish-white calcareous layers; generally noncalcareous; unconsolidated; not cemented	15	100

159-075-36BBB
NDSWC 22
(Log from Naplin, 1968)

Altitude: 1475 feet — Date drilled: 7/12/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, brownish-black----------	1	1
	Clay, very sandy, silty, yellowish-brown to yellowish-orange, cohesive, moderately plastic, oxidized----------	7	8
	Clay, sandy, pebbly, lignitic, olive-gray to medium-dark-gray, cohesive, calcareous (till)----------	60	68
	Gravel, sandy, medium, angular to subangular, poorly sorted----------	10	78
	Clay, silty, pebbly, medium-light-gray to light-gray, cohesive, calcareous (till)----------	3	81
Fox Hills Sandstone:			
	Sandstone, clayey; medium bluish gray with a few light-gray layers; slightly consolidated; noncalcareous----------	19	100

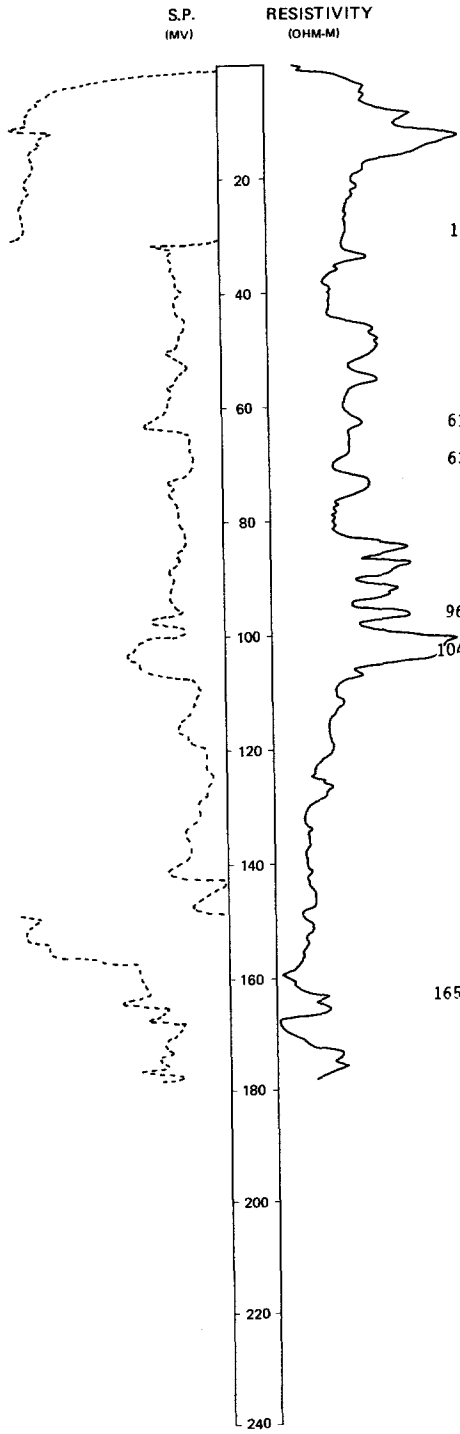
NDSWC 11066

LOCATION: 159-081-01AAA

DATE DRILLED: 9/12/79

ALTITUDE: 1485 (FT, NGVD)

DEPTH: 180 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-16	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
16-61	Clay, silty, sandy, pebbly, dark-olive-gray (till).
61-63	Sand.
63-96	Clay, silty, sandy, pebbly, dark-olive-gray (till).
96-104	Sand.
104-165	Clay, silty, sandy, pebbly, dark-olive-gray; contains some interbedded sand.

FOX HILLS SANDSTONE

165-180	Sandstone, fine, well-sorted, subrounded, glauconitic, greenish-gray.

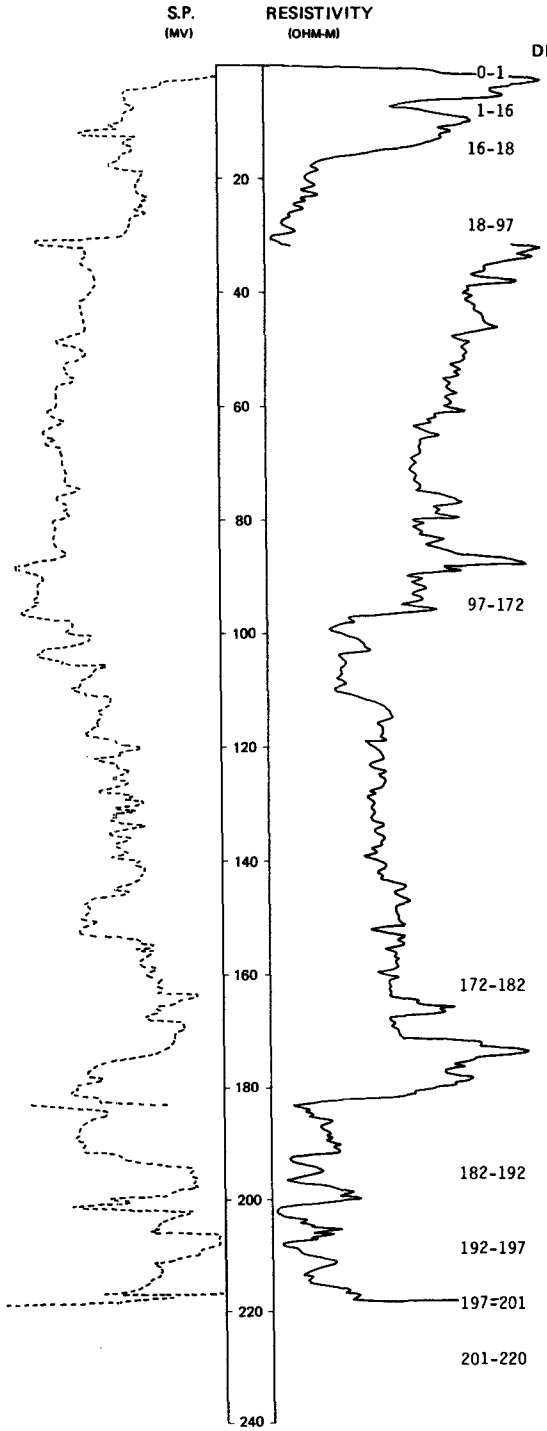
NDSWC 11023

LOCATION: 159-081-02CCC

DATE DRILLED: 8/16/79

ALTITUDE: 1500
(FT, NGVD)

DEPTH: 220
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil, sandy, brownish-black.
1-16	Sand, fine to coarse, silty.
16-18	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
18-97	Clay, silty, pebbly; medium-gray (till); with lenses of sand generally less than 1 foot thick.
97-172	Clay, silty, sandy, pebbly, dark-gray.
172-182	Gravel, fine to medium, subangular to rounded; contains about 30 percent medium to coarse sand; pebbles are composed predominately of carbonate, shale, and igneous rocks.
	FOX HILLS SANDSTONE
182-192	Sandstone, very fine to fine, clayey, moderately indurated, light-gray.
192-197	Shale, carbonaceous, fissile, dusky-brown.
197-201	Sandstone, very fine to fine, clayey, medium-gray.
201-220	Shale, grayish-brown to greenish-gray; interbedded with greenish-gray siltstone.

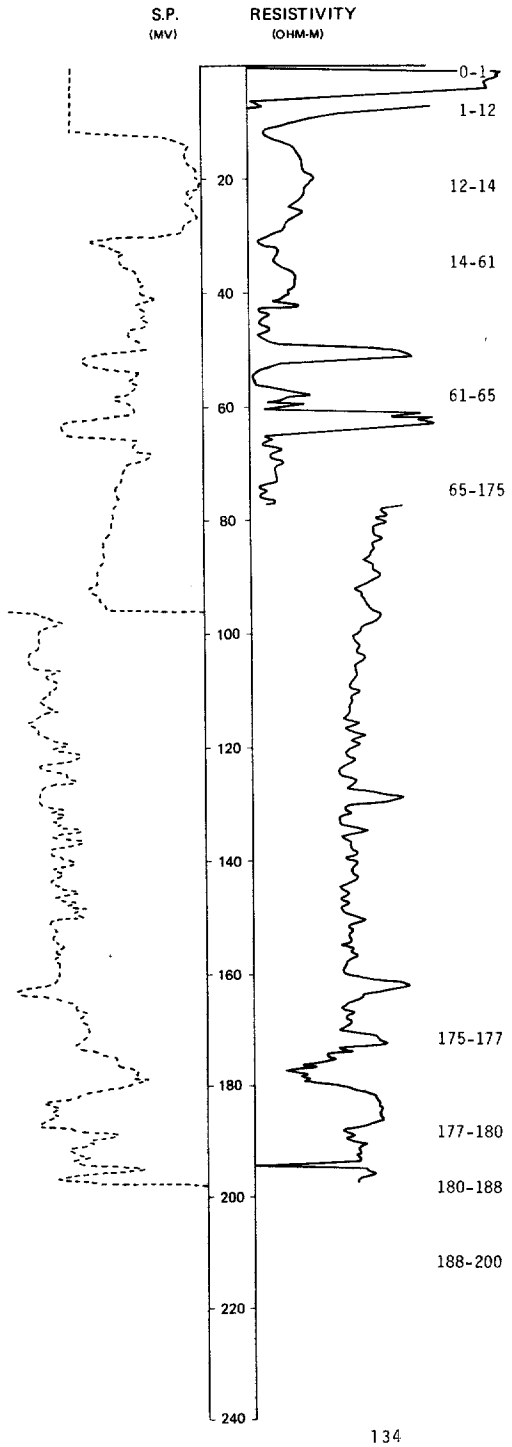
NDSWC 11025

LOCATION: 159-081-03CDD

DATE DRILLED: 8/16/79

ALTITUDE: 1497
(FT, NGVD)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil, sandy, brownish-black.
1-12	Sand, fine to medium, subrounded to rounded, oxidized.
12-14	Clay, silty, sandy, pebbly, medium-light-brown, oxidized (till).
14-61	Clay, silty, sandy, pebbly, medium-gray; with a few thin lenses of gravel.
61-65	Sand, fine to coarse, subangular to subrounded; about 10 percent fine granitic gravel.
65-175	Clay, silty, sandy, pebbly, olive-gray; contains a few thin sand and gravel lenses.

FOX HILLS SANDSTONE

175-177	Sandstone, fine to medium, well-indurated, medium-gray to light-gray, moderately indurated.
177-180	Shale, sandy, carbonaceous, dusky-brown.
180-188	Sandstone, very fine to medium, clayey, light-greenish-gray.
188-200	Siltstone, moderately indurated, brownish-gray.

159-081-06AAA
NDSWC 11069

Altitude: 1510 feet — Date drilled: 9/13/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine, oxidized	2	3
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	17	20
	Clay, silty, sandy, pebbly, dark-olive-gray (till)	8	28
	Sand, coarse, gravelly	1	29
	Clay, silty, sandy, pebbly, dark-olive-gray (till)	16	45
	Sand, fine to coarse, gravelly; about 50 percent quartz, 20 percent carbonate, and and 10 percent each feldspar, shale, and lignite grains	5	50
	Clay, silty, sandy, pebbly, dark-olive-gray (till)	123	173
	Sand, fine to coarse, subrounded to subangular; about 80 percent quartz grains	34	207
Fox Hills Sandstone:			
	Clay, sandy, bentonitic, and very fine clayey sandstone	13	220

159-081-07CCC
NDSWC 5202

Altitude: 1525 feet — Date drilled: 8/09/77

	Soil	1	1
	Clay, silty, sandy, pebbly, reddish-yellow, oxidized (till)	19	20
	Clay, silty, sandy, pebbly, olive-gray (till)	144	164
Fox Hills Sandstone:			
	Sandstone, very fine to fine, glauconitic (?), greenish-gray	16	180

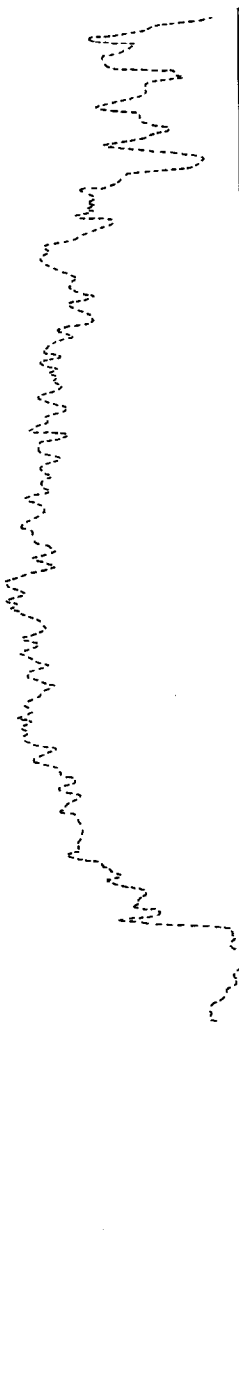
NDSWC 11056

LOCATION: 159-081-08AAA

DATE DRILLED: 9/06/79

ALTITUDE: 1505 (FT, NGVD)

DEPTH: 180 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil, brownish-black.
1-16	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
16-26	Clay, silty, sandy, pebbly, brownish-gray, partially oxidized (till).
26-41	Clay, silty, sandy, gravelly, medium-dark-gray (till).
41-45	Sand, medium to very coarse, gravelly, subangular to rounded.
45-164	Clay, silty, sandy, pebbly, medium-dark-gray; contains thin sand and gravel lenses.

FOX HILLS SANDSTONE

164-173	Shale, sandy, fissile, dusky-brown.
173-180	Siltstone, moderately indurated, light-gray to medium-gray.

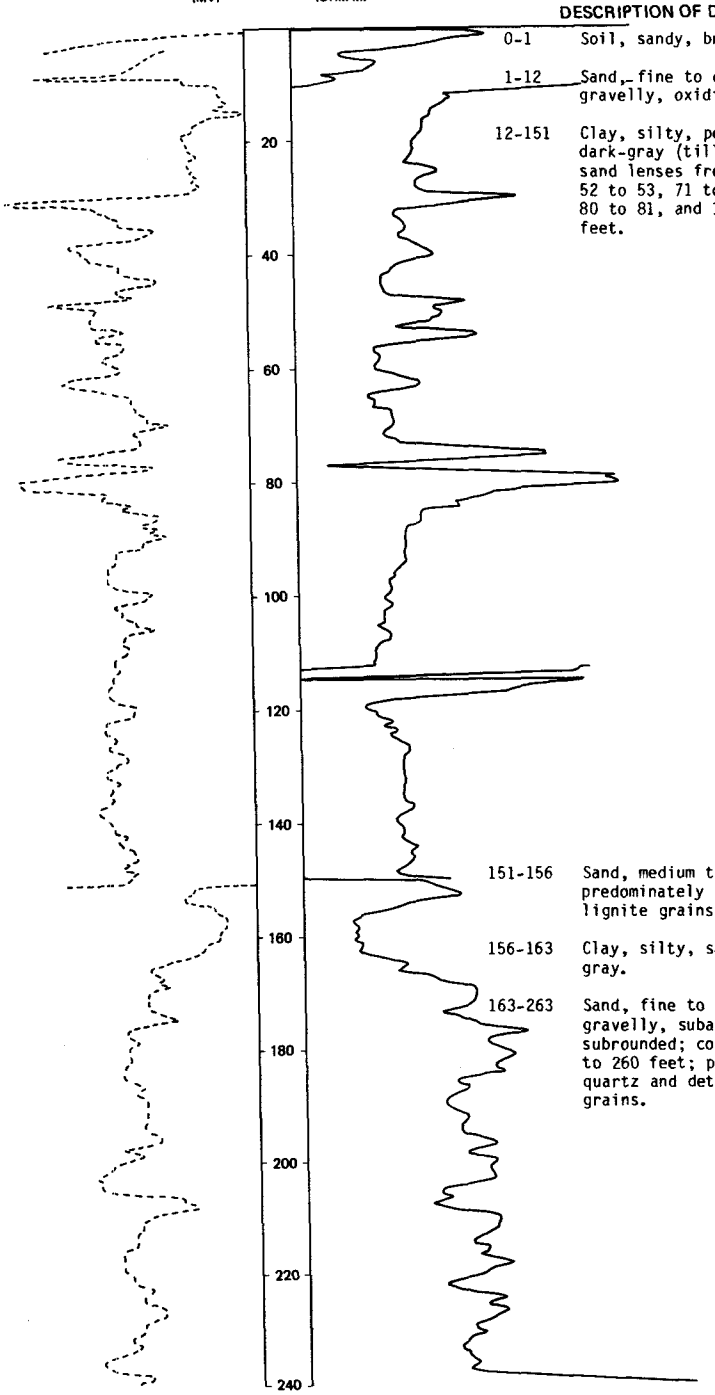
NDSWC 11058

LOCATION: 159-081-08DDA

DATE DRILLED: 9/06/79

ALTITUDE: 1508 (FT, NGVD)

DEPTH: 300 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil, sandy, brownish-black.
1-12	Sand, fine to coarse, gravelly, oxidized.
12-151	Clay, silty, pebbly, medium-dark-gray (till); contains sand lenses from 46 to 48, 52 to 53, 71 to 73, 75 to 76, 80 to 81, and 127 to 128 feet.
151-156	Sand, medium to coarse; predominately detrital lignite grains.
156-163	Clay, silty, sandy, dark-gray.
163-263	Sand, fine to very coarse, gravelly, subangular to subrounded; coarser from 238 to 260 feet; predominately quartz and detrital lignite grains.

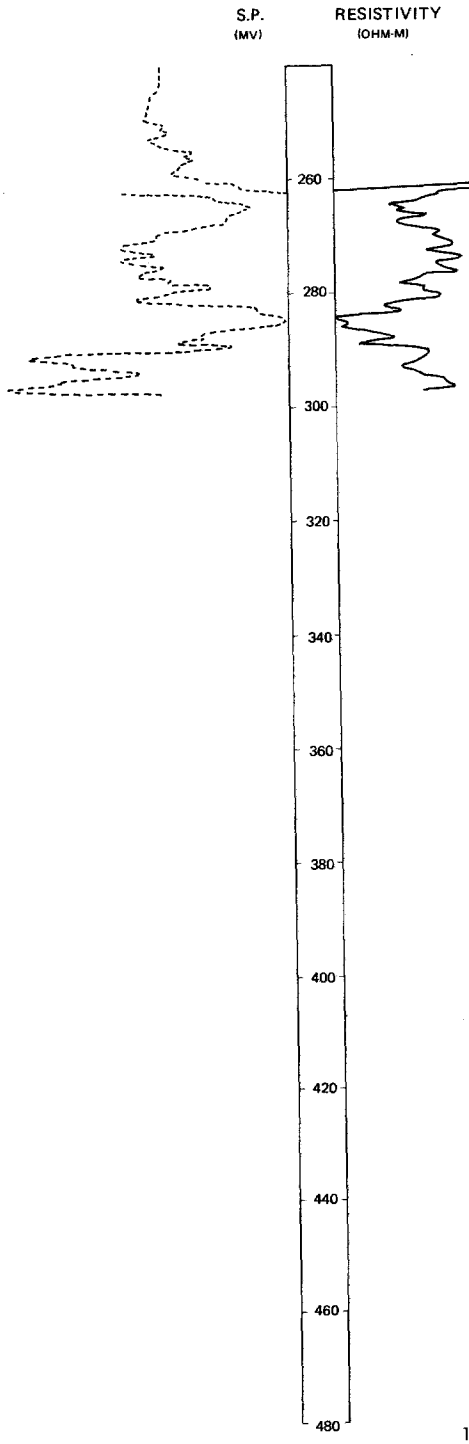
NDSWC 11058, continued

LOCATION: 159-081-08DDA

DATE DRILLED: 9/06/79

ALTITUDE: 1508
(FT. NGVD)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

263-282	Sandstone, fine to medium, clayey, greenish-gray.
282-290	Shale, carbonaceous, dusky-brown (peat).
290-300	Siltstone, indurated, medium-gray.

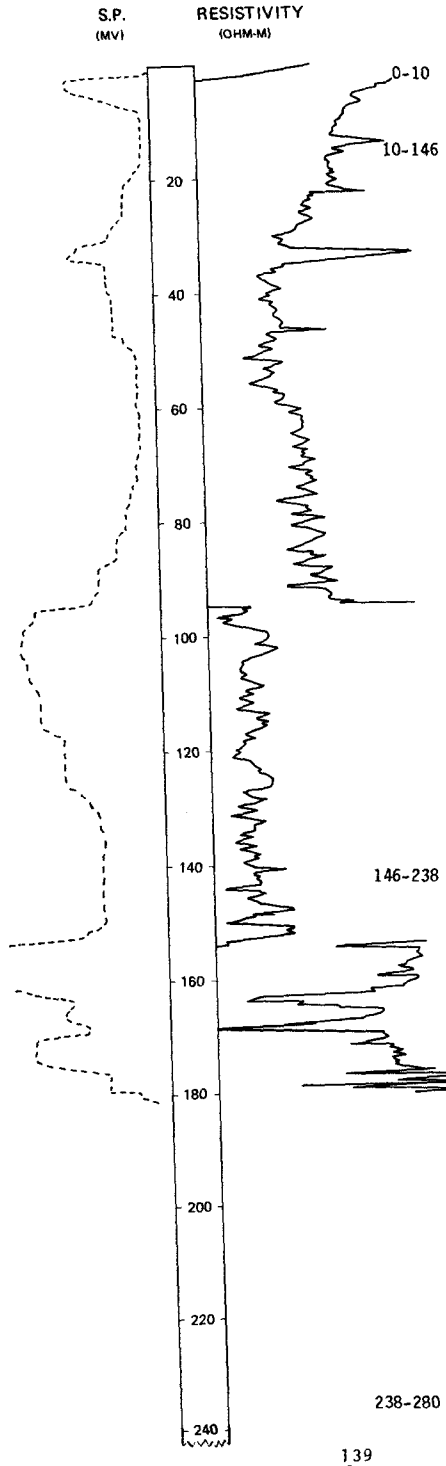
NDSWC 5217

LOCATION: 159-081-08DDD

DATE DRILLED: 8/17/77

ALTITUDE: 1510
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

0-10 Sand, very fine to coarse, predominately medium, oxidized.

10-146 Clay, silty, sandy, pebbly, olive-gray (till).

146-238 Sand, very fine to very coarse, slightly gravelly, subangular to subrounded; fairly sorted to well sorted in lenses.

FOX HILLS SANDSTONE

238-280 Sand, very fine to fine, silty, clayey, greenish-gray.

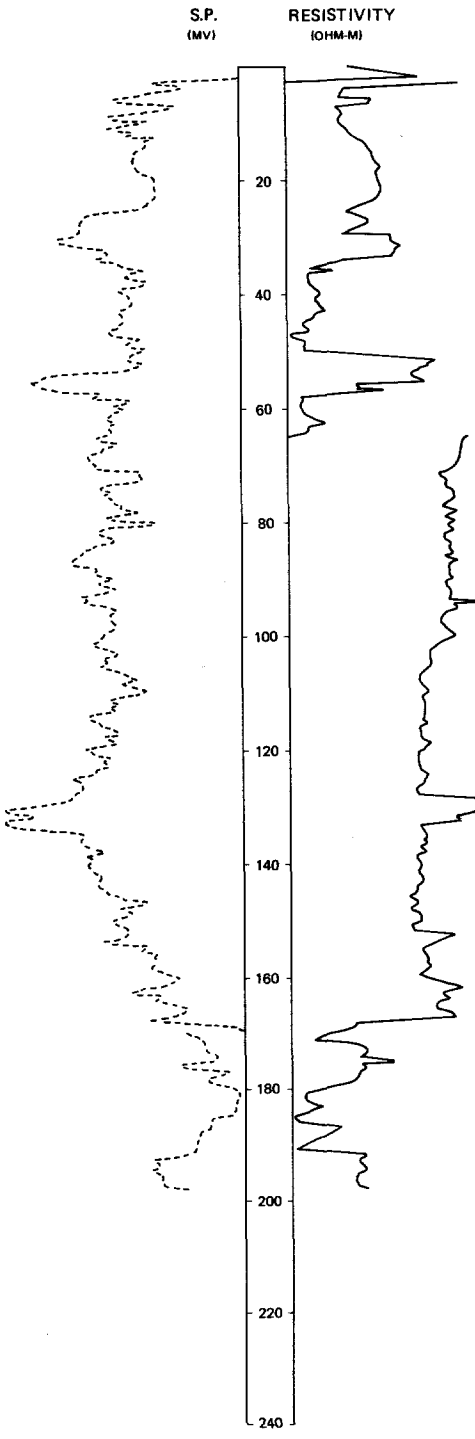
NDSWC 11024

LOCATION: 159-081-09AAA

DATE DRILLED: 8/16/79

ALTITUDE: 1498 (FT, NGVD)

DEPTH: 200 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil, sandy, brownish-black.
1-4	Clay, silty, yellowish-brown, oxidized.
4-9	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
9-25	Clay, silty, sandy, pebbly, olive-gray (till).
25-28	Gravel, fine to coarse; about 30 percent fine to very coarse sand.
28-52	Clay, sandy, silty, olive-gray (till); few pebbles.
52-58	Sand, fine to very coarse, subrounded to rounded; contains about 20 percent fine to medium gravel.
58-129	Clay, silty, sandy, pebbly, olive-gray (till).
129-132	Sand, medium to coarse, gravelly.
132-168	Clay, silty, sandy, pebbly, olive-gray (till); contains thin lenses of sand and gravel.
	FOX HILLS SANDSTONE
168-174	Shale, carbonaceous, fissile, dusky-brown.
174-180	Sandstone, fine to medium, light-gray.
180-200	Shale, carbonaceous, dusky-brown; interbedded with dark-gray siltstone.

159-081-09ABB
NDSWC 11059

Altitude: 1505 feet — Date drilled: 9/11/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Sand----------	3	4
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	7	11
	Clay, silty, sandy, pebbly, olive-gray (till)----------	45	56
	Sand, fine, well-sorted, subrounded to rounded----------	4	60
	Clay, silty, sandy, pebbly, olive-gray (till)----------	108	168
Fox Hills Sandstone:			
	Shale, brownish-black; interbedded with fine greenish-gray sandstone----------	12	180

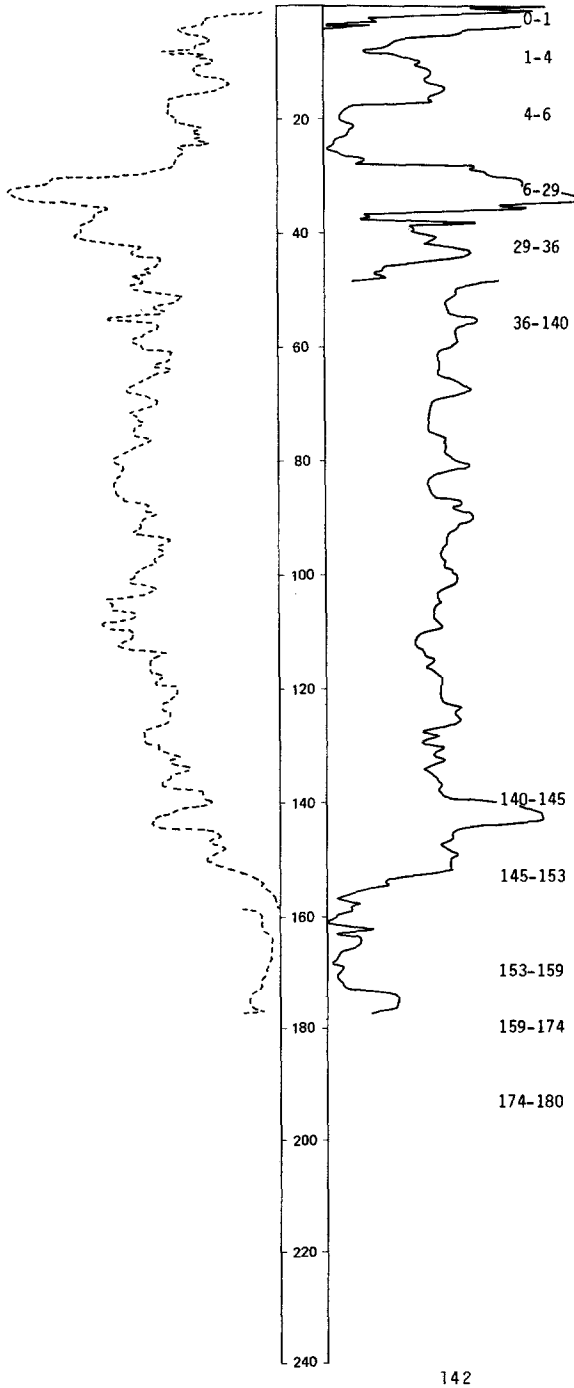
NDSWC 11057

LOCATION: 159-081-09BCC

DATE DRILLED: 9/06/79

ALTITUDE: 1507
(FT, NGVD)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil, sandy, brownish-black.
1-4	Sand, fine to very coarse, gravelly, oxidized.
4-6	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
6-29	Clay, silty, sandy, pebbly, medium-dark-gray (till).
29-36	Sand, fine to coarse, gravelly, subangular to rounded.
36-140	Clay, silty, sandy, pebbly, medium-dark-gray (till); very sandy from 36 to 48 feet.
140-145	Sand, fine to coarse, gravelly, subangular to subrounded.
145-153	Clay, silty, sandy, pebbly, medium-dark-gray (till).
	FOX HILLS SANDSTONE
153-159	Shale, carbonaceous, dusky-brown.
159-174	Siltstone, bentonitic, moderately indurated, medium-gray.
174-180	Sandstone, very fine to fine, clayey, light-greenish-gray.

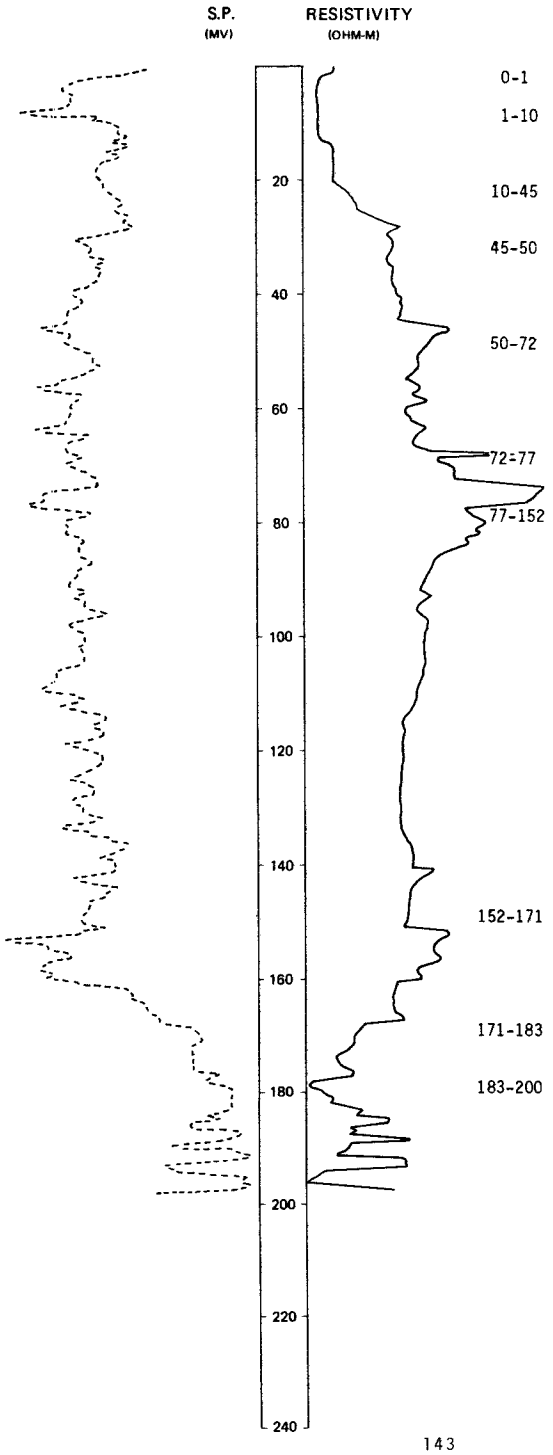
NDSWC 11060

LOCATION: 159-081-10ABA

DATE DRILLED: 9/10/79

ALTITUDE: 1500
(FT, NGVD)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-10	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
10-45	Clay, silty, sandy, pebbly, dark-olive-gray (till).
45-50	Sand, fine to very coarse, gravelly, poorly sorted, subrounded.
50-72	Clay, silty, sandy, pebbly, dark-olive-gray (till).
72-77	Sand, fine, well-sorted, subrounded to rounded.
77-152	Clay, silty, sandy, pebbly, dark-olive-gray (till); becomes sandier with depth.

FOX HILLS SANDSTONE

152-171	Clay, glauconitic, light-greenish-gray.
171-183	Shale, carbonaceous, brownish-black.
183-200	Sandstone, fine, argillaceous, greenish-gray.

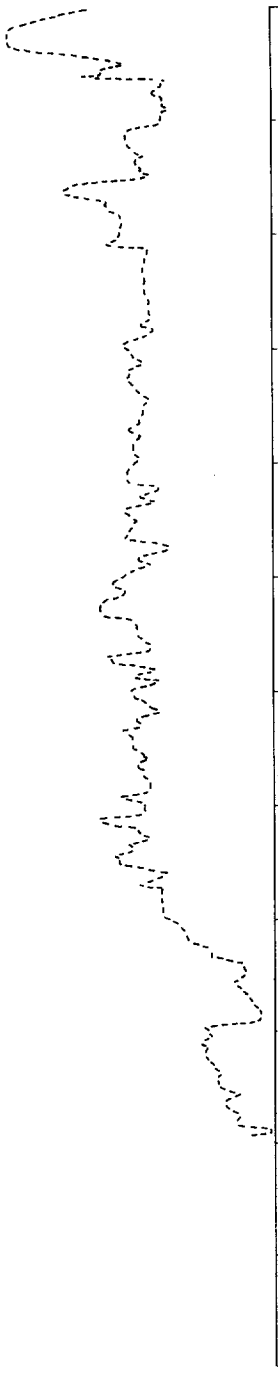
NDSWC 11026

LOCATION: 159-081-11ABB

DATE DRILLED: 8/16/79

ALTITUDE: 1492 (FT, NGVD)

DEPTH: 200 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, sandy, brownish-black.
1-4	Silt, sandy, yellowish-brown, oxidized.
4-9	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
9-29	Clay, silty, sandy, pebbly, medium-dark-gray (till).
29-33	Sand, medium to very coarse, gravelly.
33-166	Clay, silty, sandy, pebbly, medium-dark-gray (till); contains thin sand and gravel lenses.

FOX HILLS SANDSTONE

166-178	Shale, fissile, dark-brownish-gray.
178-200	Sandstone, very fine to fine, clayey, light-gray; interbedded with dark-gray siltstone.

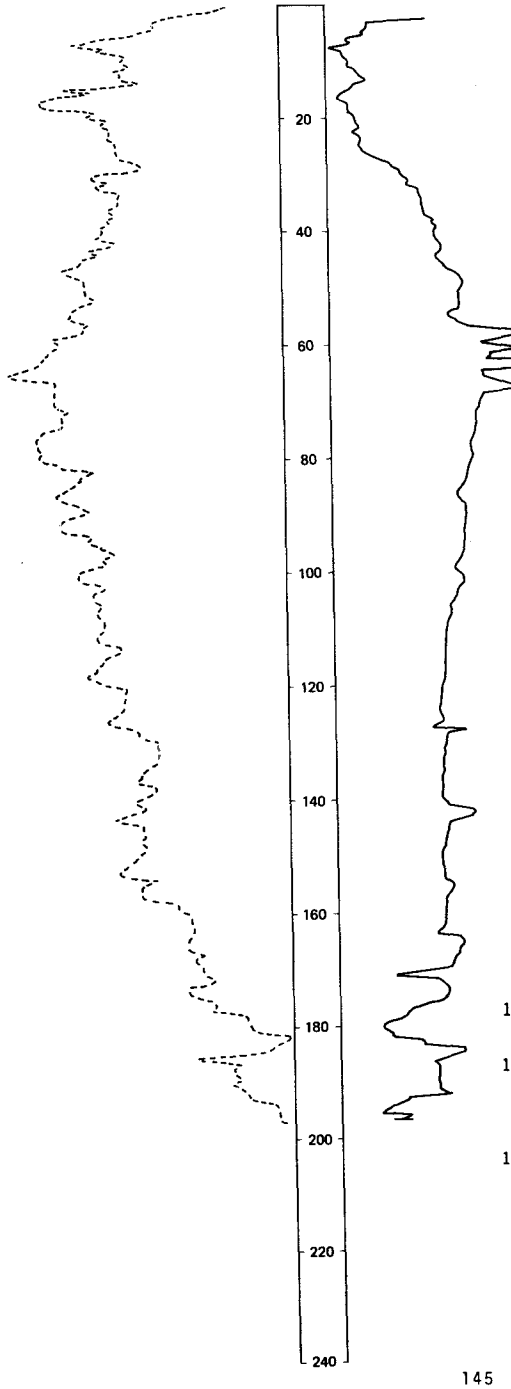
NDSWC 11027

LOCATION: 159-081-11DDD

DATE DRILLED: 8/17/79

ALTITUDE: 1495 (FT, NGVD)

DEPTH: 200 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, sandy, brownish-black.
1-14	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
14-58	Clay, silty, sandy, pebbly, medium-gray (till).
58-68	Sand, medium to very coarse; about 20 percent fine to medium gravel.
68-178	Clay, silty, sandy, pebbly, medium-dark-gray (till); contains thin sand and gravel lenses.

FOX HILLS SANDSTONE

178-185	Shale, carbonaceous, fissile, dusky-brown.
185-194	Sandstone, very fine to medium, clayey, micaceous, poorly indurated, light-greenish-gray.
194-200	Shale, silty, dark-gray.

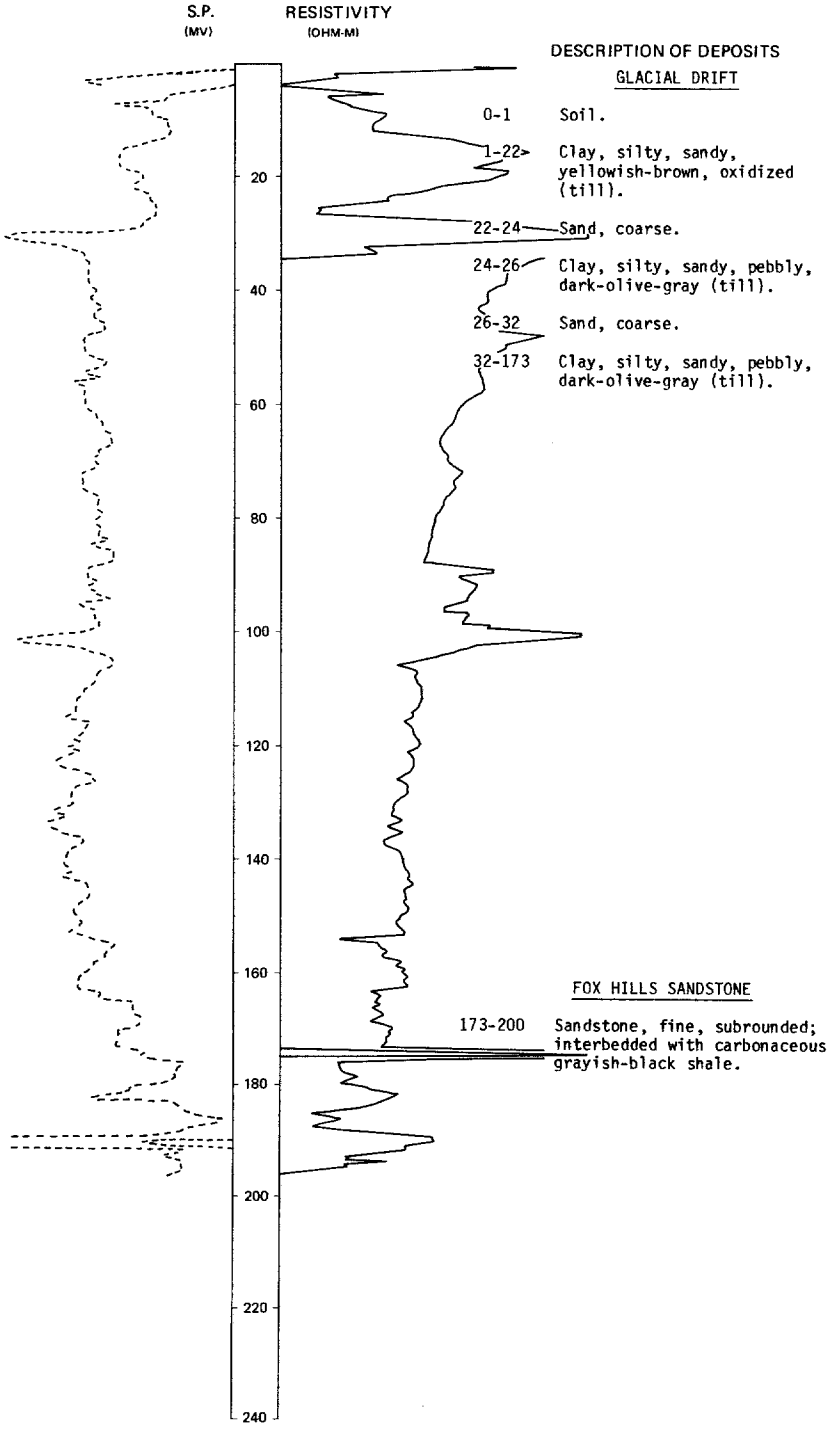
NDSWC 11061

LOCATION: 159-081-12ADD

DATE DRILLED: 9/11/79

ALTITUDE: 1490
(FT, NGVD)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-22 Clay, silty, sandy, yellowish-brown, oxidized (till).

22-24 Sand, coarse.

24-26 Clay, silty, sandy, pebbly, dark-olive-gray (till).

26-32 Sand, coarse.

32-173 Clay, silty, sandy, pebbly, dark-olive-gray (till).

FOX HILLS SANDSTONE

173-200 Sandstone, fine, subrounded; interbedded with carbonaceous grayish-black shale.

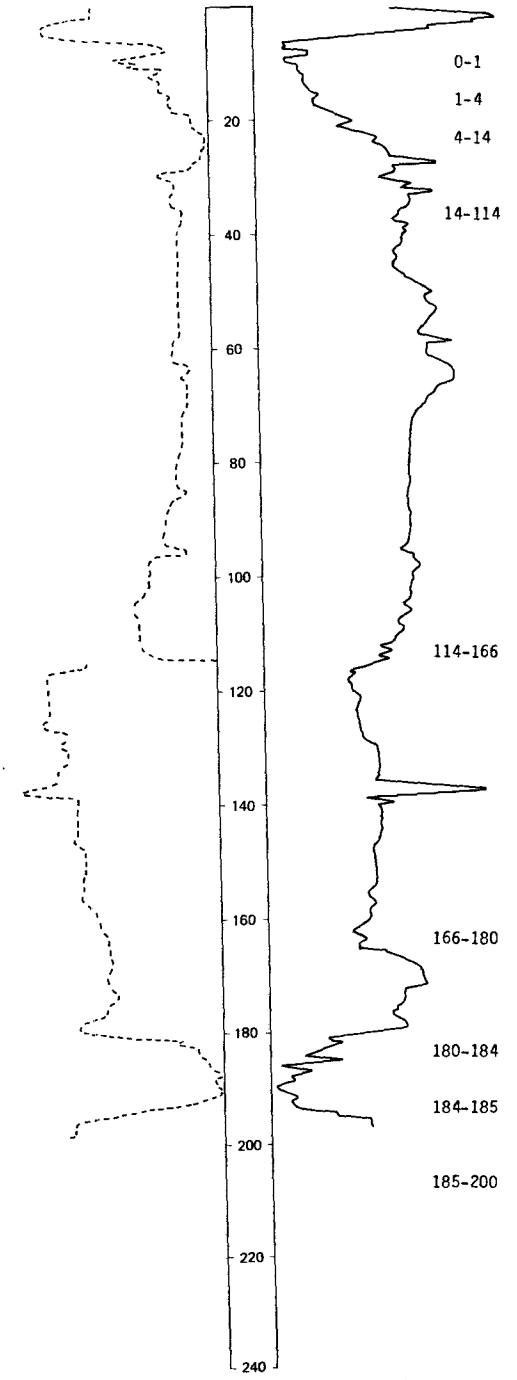
NDSWC 11026

LOCATION: 159-081-12BBB

DATE DRILLED: 8/16/79

ALTITUDE: 1490 (FT, NGVD)

DEPTH: 200 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, sandy, brownish-black.
1-4	Clay, silty, light-gray.
4-14	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
14-114	Clay, silty, pebbly, medium-gray (till); contains sand lenses less than 1 foot thick.
114-166	Clay, silty, pebbly, dark-gray (till).

FOX HILLS SANDSTONE

166-180	Sandstone, very fine to fine, light-gray.
180-184	Shale, carbonaceous, fissile, dusky-brown.
184-185	Sandstone, very fine to fine, moderately indurated, light-gray.
185-200	Shale, dark-gray.

159-081-12BCC
NDSWC 11065

Altitude: 1488 feet | Date drilled: 9/12/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine to medium, oxidized	6	7
	Clay, silty, sandy, yellowish-brown, oxidized	1	8
	Sand, fine	3	11
	Clay, silty, sandy, pebbly, dark-olive-gray (till)	62	73
	Sand, coarse	1	74
	Clay, silty, sandy, pebbly, dark-olive-gray (till)	90	164
Fox Hills Sandstone:			
	Shale, carbonaceous, dark-brown	16	180

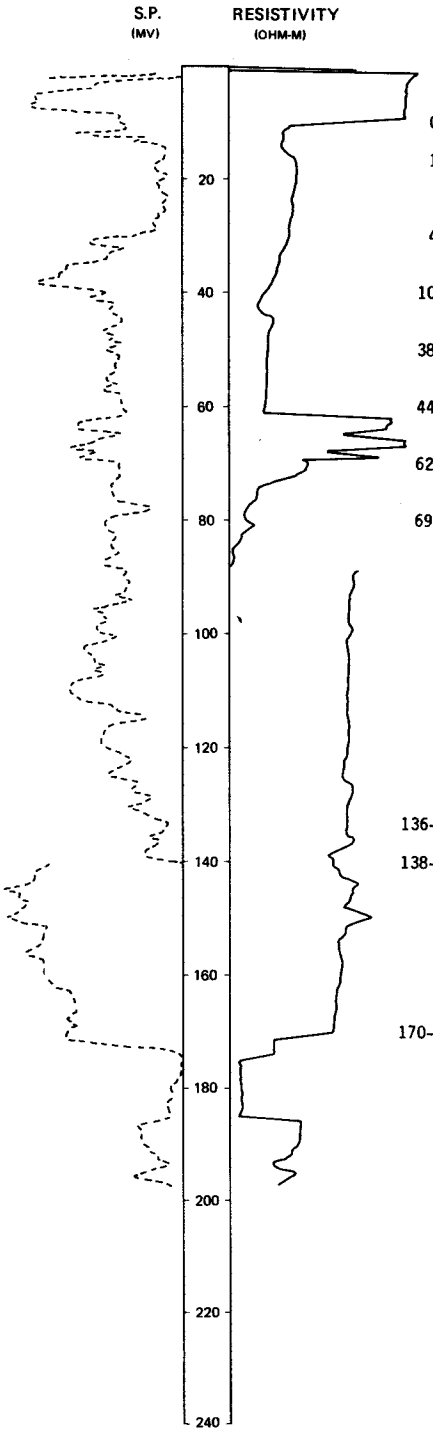
NDSWC 11062

LOCATION: 159-081-13BCC

DATE DRILLED: 9/11/79

ALTITUDE: 1495
(FT, NGVD)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-4	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
4-10	Sand, fine, rounded to subrounded, oxidized.
10-38	Clay, silty, sandy, pebbly, dark-brownish-gray (till).
38-44	Sand, fine to coarse, subrounded to rounded.
44-62	Clay, silty, sandy, pebbly, dark-brownish-gray (till).
62-69	Sand, fine to coarse, poorly sorted, subrounded.
69-136	Clay, silty, sandy, pebbly, dark-gray (till?).
136-138	Sand.
138-170	Clay, silty, sandy, pebbly, dark-gray (till).

FOX HILLS SANDSTONE

170-200	Shale, silty, medium-gray.

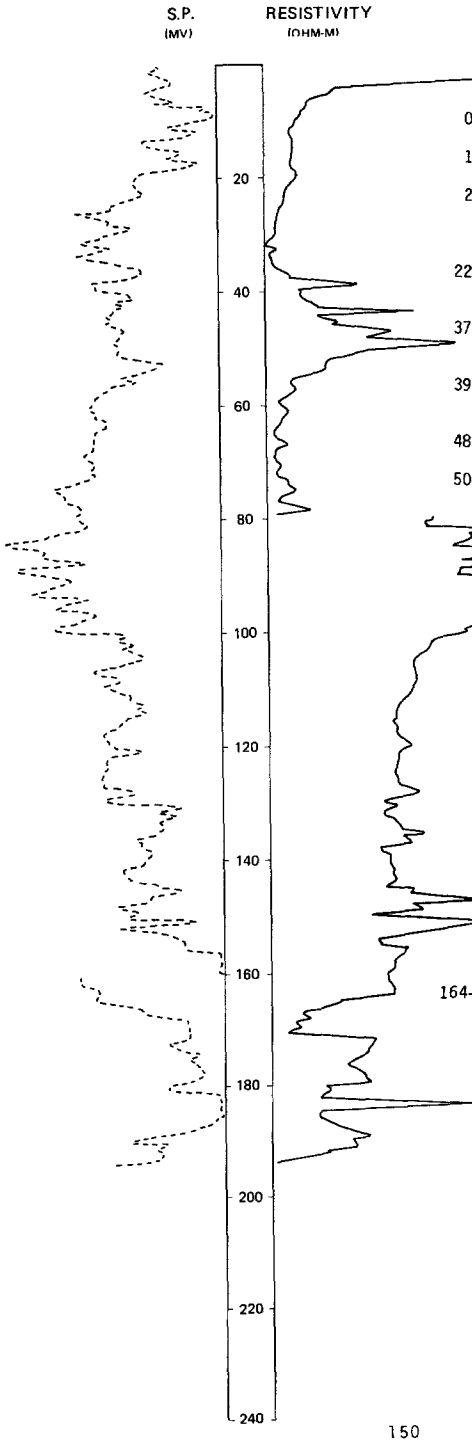
NDSWC 11063

LOCATION: 159-081-13CCC

DATE DRILLED: 9/12/79

ALTITUDE: 1498 (FT, NGVD)

DEPTH: 200 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-2	Sand.
2-22	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
22-37	Clay, silty, sandy, pebbly, dark-gray (till).
37-39	Sand, fine to coarse, rounded to subangular.
39-48	Clay, silty, sandy, pebbly, dark-gray (till).
48-50	Sand, fine to coarse.
50-164	Clay, silty, sandy, pebbly, dark-gray (till).

FOX HILLS SANDSTONE

164-200	Siltstone, greenish-gray; interbedded with fine greenish-gray sandstone.

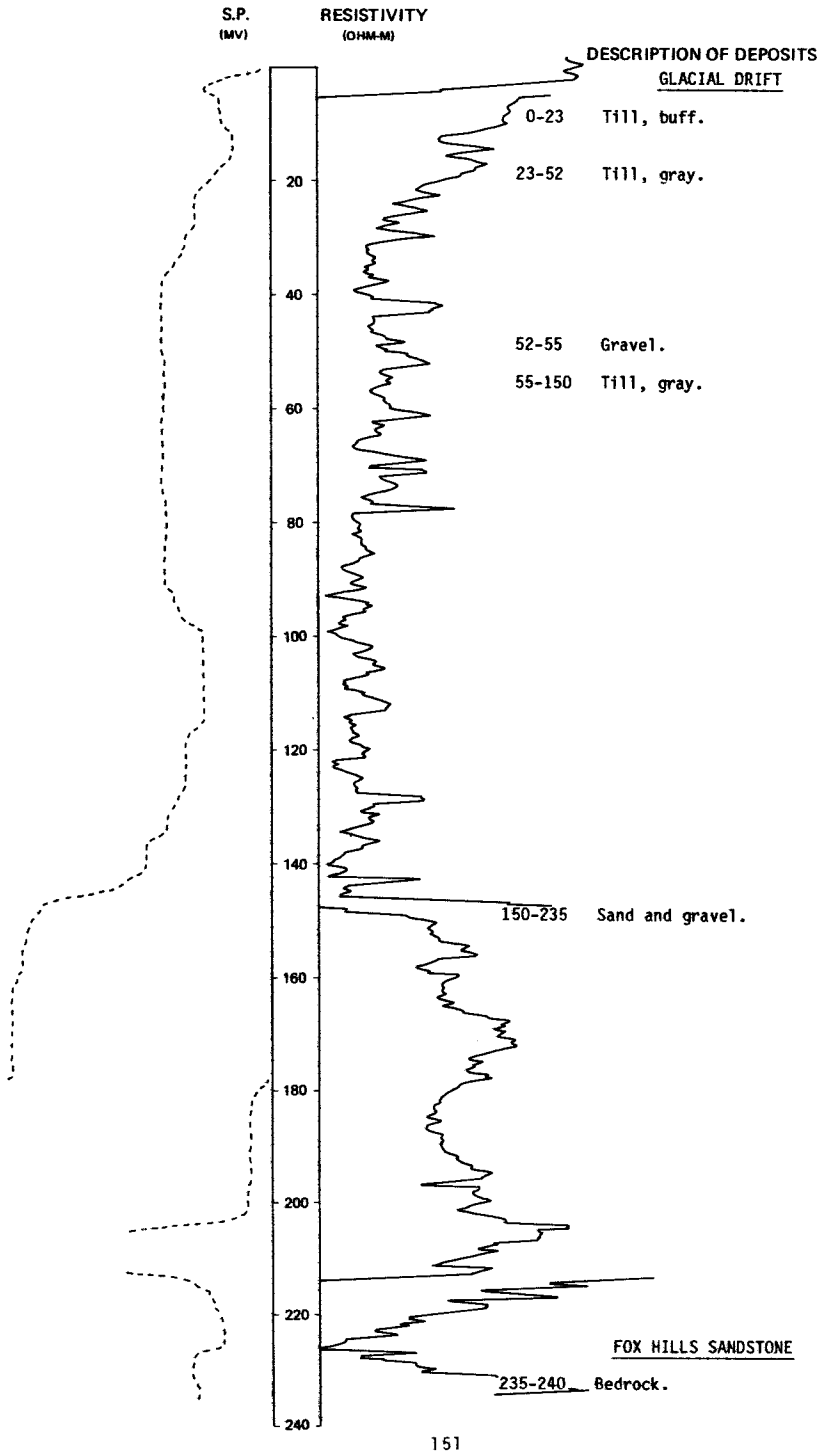
NDSWC 5217A

LOCATION: 159-081-17AAA

DATE DRILLED: 8/18/77

ALTITUDE: 1510
(FT, NGVD)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-23 Till, buff.

23-52 Till, gray.

52-55 Gravel.

55-150 Till, gray.

150-235 Sand and gravel.

FOX HILLS SANDSTONE

235-240 Bedrock.

159-081-17ADD
NDSWC 5216

Altitude: 1513 feet — Date drilled: 8/17/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, pebbly, dusky-yellow, oxidized (till)	25	25
	Clay, silty, sandy, pebbly, olive-gray (till)	125	150
Fox Hills Sandstone:			
	Sandstone, very fine to fine, silty, clayey, greenish-gray	8	158
	Limestone, argillaceous, brownish-gray	1	159
	Siltstone, clayey, pale-greenish-gray	1	160

159-081-19AAA
USGS 65-47
(Log from modified LaRocque and others, 1963b)

Altitude: 1520 feet — Date drilled: 7/29/47

Glacial drift:			
	Soil	1	1
	Clay, yellow; with some gravel	15	16
	Clay, brown; with some gravel	5	21
	Clay, sandy, gray; with some gravel	25	46
	Clay, sandy, gray; with some lignite fragments	9	55
	Clay, sandy, gray; with some gravel	30	85
	Clay, sandy, gray; with some lignite fragments	51	136
	Gravel and sand	4	140
	Lignite, black	5	145
	Gravel and sand	10	155
	Lignite, black; with some gravel	11	166
	Gravel, clean (coarse); with some lignite fragments	34	200
	Sand, fine, and gravel; lignite fragments	16	216
	Gravel, coarse, clean, and fine sand	11	227
Bedrock (undifferentiated):			
	Clay, brown	6	233
	Lignite, black	3	236
	Clay, brown	9	245

159-081-20AAB
NDSWC 5210

Altitude: 1515 feet — Date drilled: 8/11/77

Glacial drift:			
	Clay, silty, sandy, pebbly, reddish-yellow, oxidized (till)	22	22
	Clay, silty, sandy, pebbly, olive-gray (till)	14	36
	Sand, gravelly	15	51
	Clay, silty, sandy, pebbly, olive-gray (till)	11	62
	Sand and gravel; poor recovery due to caving	5	67
	Clay, silty, sandy, pebbly, olive-gray (till); poor recovery	91	158
Fox Hills Sandstone:			
	Sandstone, very fine to fine, silty, greenish-gray; interbedded with silty greenish-gray clay and clayey medium-brown silt and silt beds	22	180

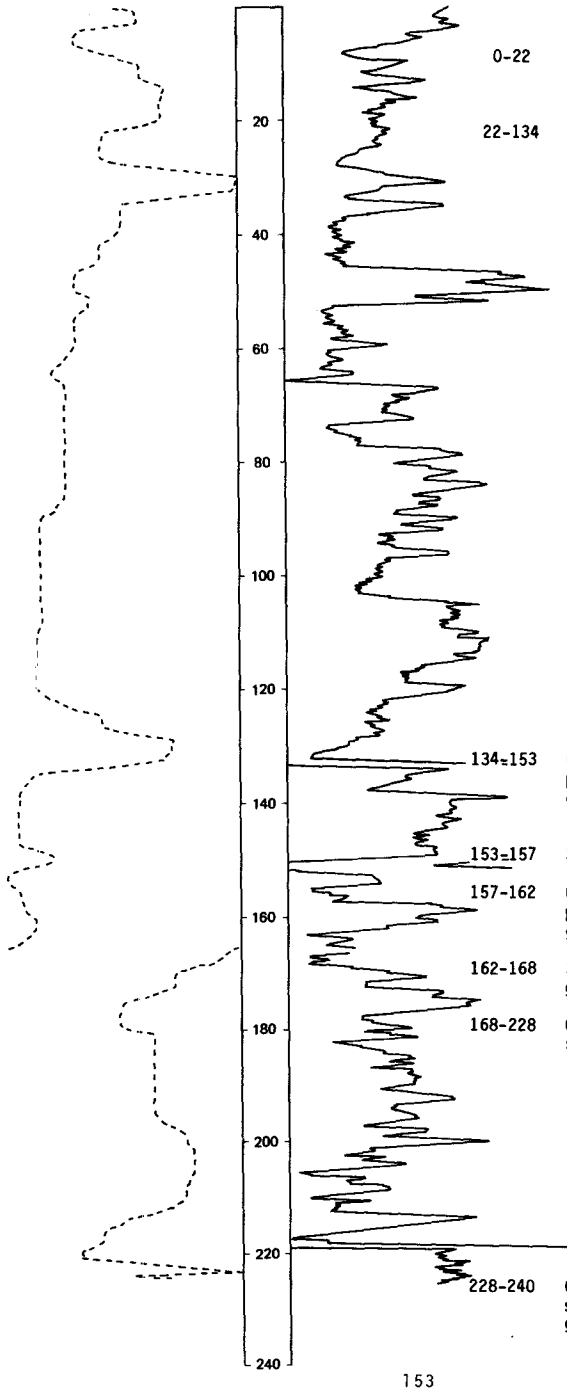
NDSWC 5215

LOCATION: 159-081-20BBB

DATE DRILLED: 8/17/77

ALTITUDE: 1522
(FT, NGVD)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-22 Clay, silty, sandy, pebbly, dusky-yellow, oxidized (till).

22-134 Clay, silty, sandy, pebbly, olive-gray (till); sand and gravel lenses from 47 to 52 feet; no recovery.

134±153 Gravel, sandy; about 80 percent shale pebbles and grains.

153±157 Silt(?); no recovery.

157-162 Gravel, sandy; about 80 percent shale pebbles and grains.

162-168 Sand, silty, clayey; greenish-gray; yellow stains.

168-228 Gravel, sandy; predominately shale pebbles.

FOX HILLS SANDSTONE

228-240 Clay, grayish-brown, and silty clayey sand, greenish-gray.

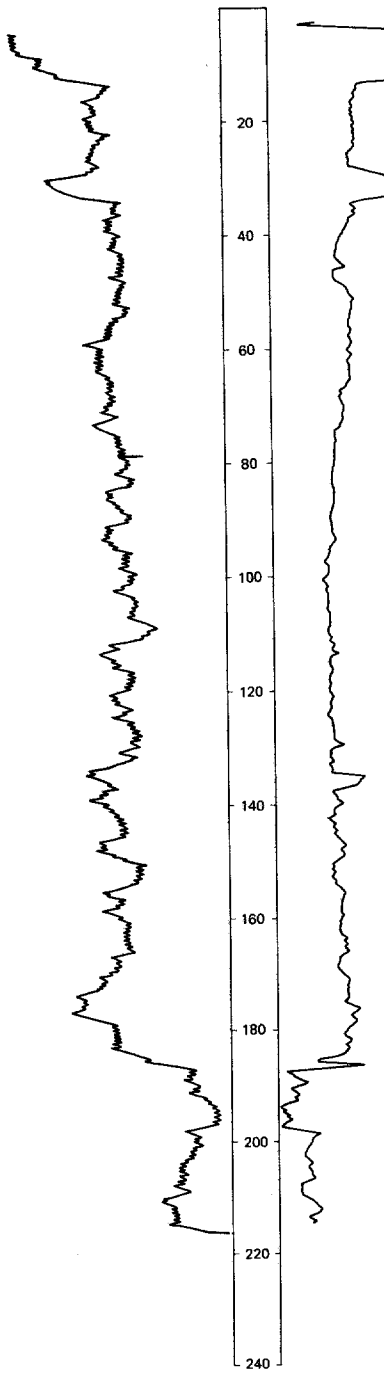
NDSWC 5845

LOCATION: 159-081-21AAA

DATE DRILLED: 10/15/80

ALTITUDE: 1502 (FT, NGVD)

DEPTH: 221 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-14	Sand, fine to coarse; interbedded with medium angular to rounded oxidized gravel.
14-20	Clay, very silty, olive-gray (till).
20-29	Clay, very sandy, pebbly, olive-gray (till).
29-34	Gravel, fine to coarse, sandy.
34-173	Clay, sandy, pebbly, olive-gray (till).
173-177	Sand, fine to coarse, and fine to medium angular to rounded gravel, predominately carbonate grains and pebbles.
177-186	Clay, sandy, pebbly, medium-gray (till).

FOX HILLS SANDSTONE

186-221	Siltstone, bentonitic, argillaceous, carbonaceous, brownish—gray; carbonaceous streaks; interbedded with fine clayey greenish-gray sandstone.

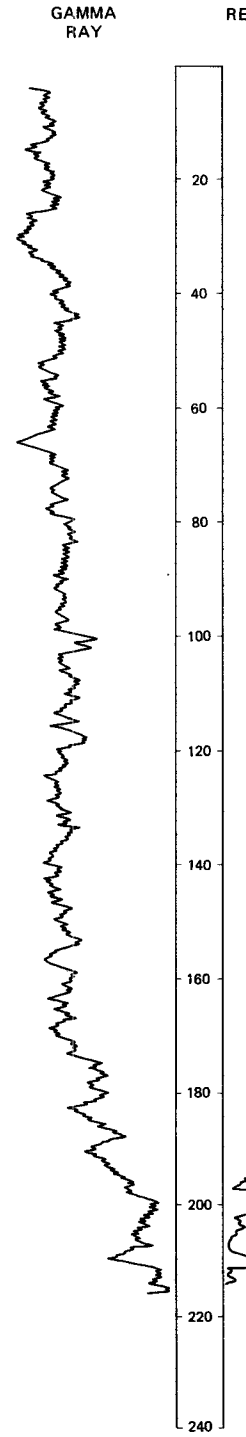
NDSWC 5846

LOCATION: 159-081-21ADD

DATE DRILLED: 10/15/80

ALTITUDE: 1502
(FT, NGVD)

DEPTH: 221
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-16	Clay, silty, sandy, yellowish-brown, oxidized (till).
16-26	Clay, silty, sandy, olive-gray (till).
26-62	Clay, silty, pebbly, olive-gray (till); interbedded with thin lenses of sand and gravel.
62-66	Sand, fine to coarse; interbedded with medium angular to rounded gravel; predominately quartz and carbonate grains.
66-70	Sand, fine to coarse, rounded; abundant detrital lignite grains.
70-154	Silt, slightly clayey, olive-gray.
154-190	Clay, silty, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

190-221	Siltstone, bentonitic, argillaceous, carbonaceous, brownish-gray; interbedded with fine clayey poorly indurated greenish-gray sandstone.

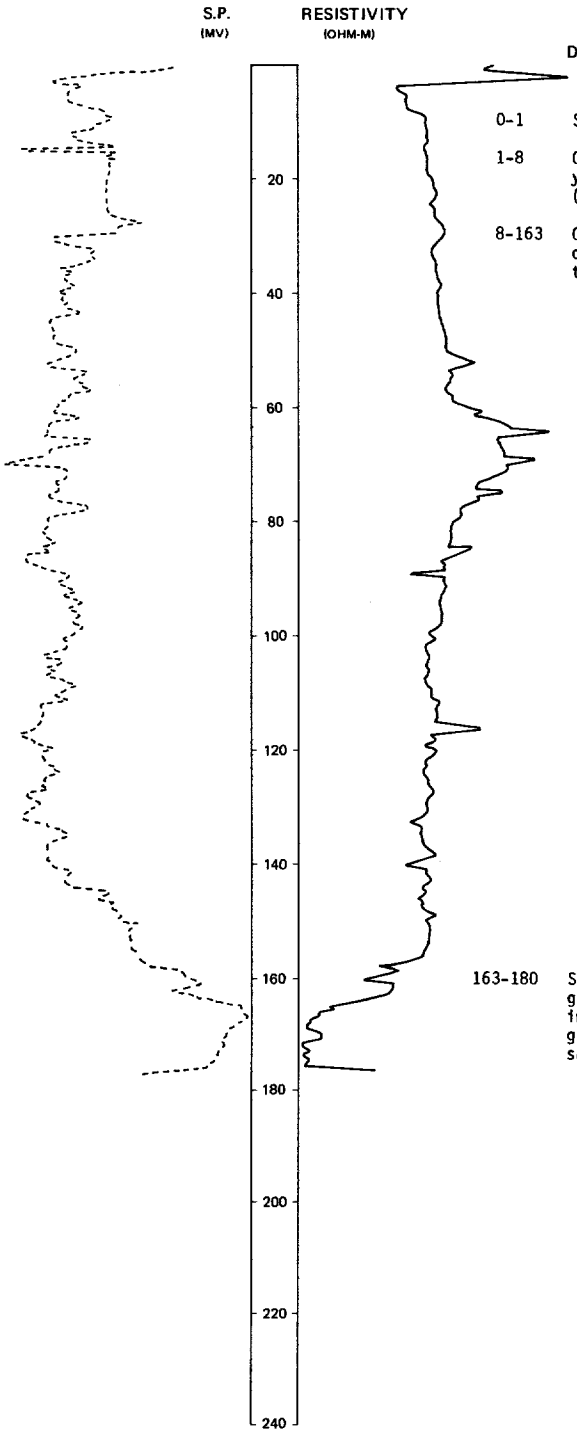
NDSWC 11064

LOCATION: 159-081-24CBB

DATE DRILLED: 9/12/79

ALTITUDE: 1493
(FT, NGVD)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, silty, dark-brown.
1-8	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
8-163	Clay, silty, sandy, pebbly, olive-gray; contains several thin sand beds.

FOX HILLS SANDSTONE

163-180	Shale, carbonaceous, medium-gray to brownish-gray; interbedded with very fine glauconitic greenish-gray sandstone.

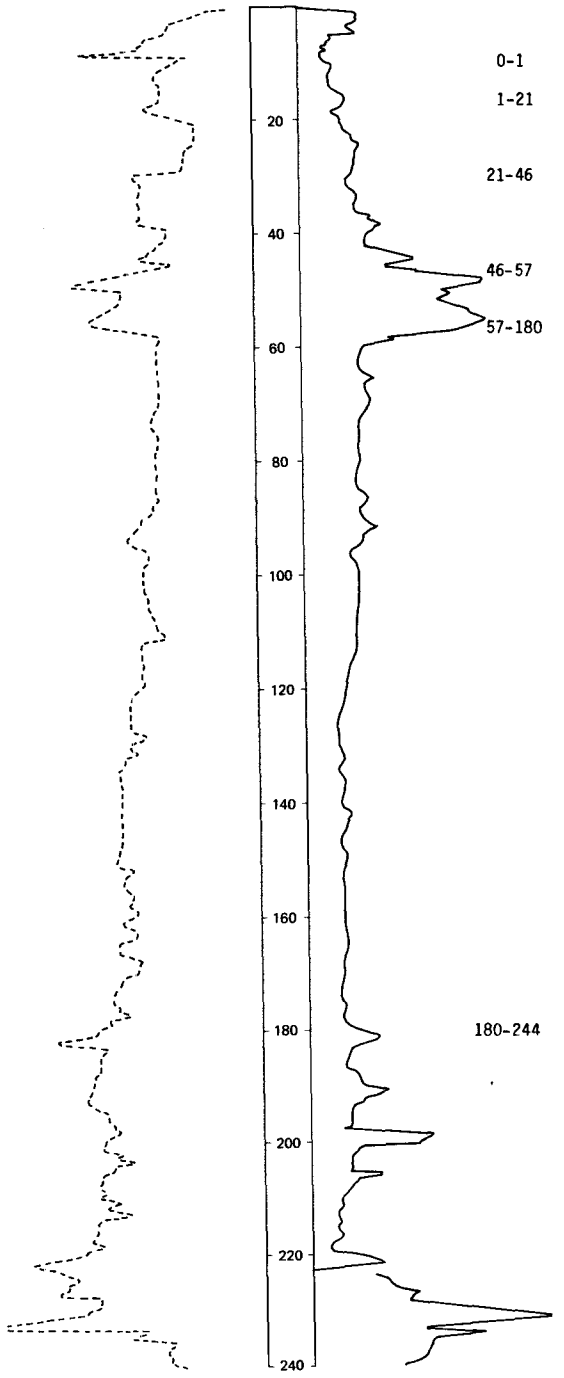
NDSWC 11043

LOCATION: 159-082-05AAA

DATE DRILLED: 8/28/79

ALTITUDE: 1565 (FT, NGVD)

DEPTH: 280 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-21	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
21-46	Clay, silty, sandy, brownish-gray to dark-gray (till); contains thin sand and gravel lenses.
46-57	Sand, fine to coarse; some limonite stains.
57-180	Clay, silty, sandy, pebbly, olive-gray (till).
180-244	Clay, silty, sandy, pebbly, dark-gray (till); contains sand and gravel lenses as much as 2 feet thick.

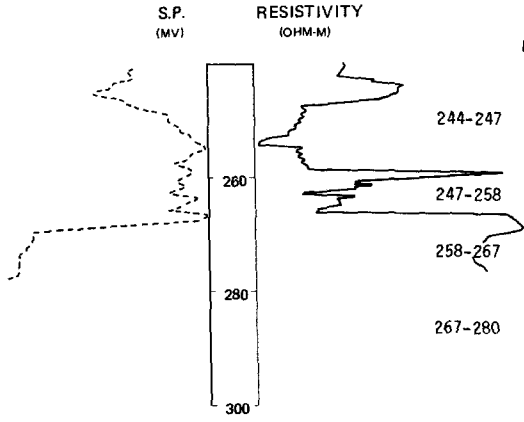
NDSWC 11043, continued

LOCATION: 159-082-05AAA

DATE DRILLED: 8/28/79

ALTITUDE: 1565 (FT, NGVD)

DEPTH: 280 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

244-247	Sandstone, medium, poorly indurated to well-indurated, light-gray.
247-258	Shale, silty, dark-gray; interbedded with sandstone.
258-267	Sandstone, fine, glauconitic, greenish-gray; interbedded with shale.
267-280	Sandstone, very fine to fine, glauconitic, dark-green to greenish-gray.

159-082-05AAB
(Log modified from Mariner Drilling Service)

Altitude: 1550 feet

Date drilled: 7/01/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Surface	1	1
	Clay, yellow	3	4
	Gravel; sand; clay and rocks	11	15
	Clay, yellow	12	27
	Clay, blue	13	40
	Gravel and rocks, coarse	3	43
	Clay, blue	149	192
	Gravel and shale	5	197
	Sand	3	200
	Coal	1	201
	Sand and water, fine	9	210

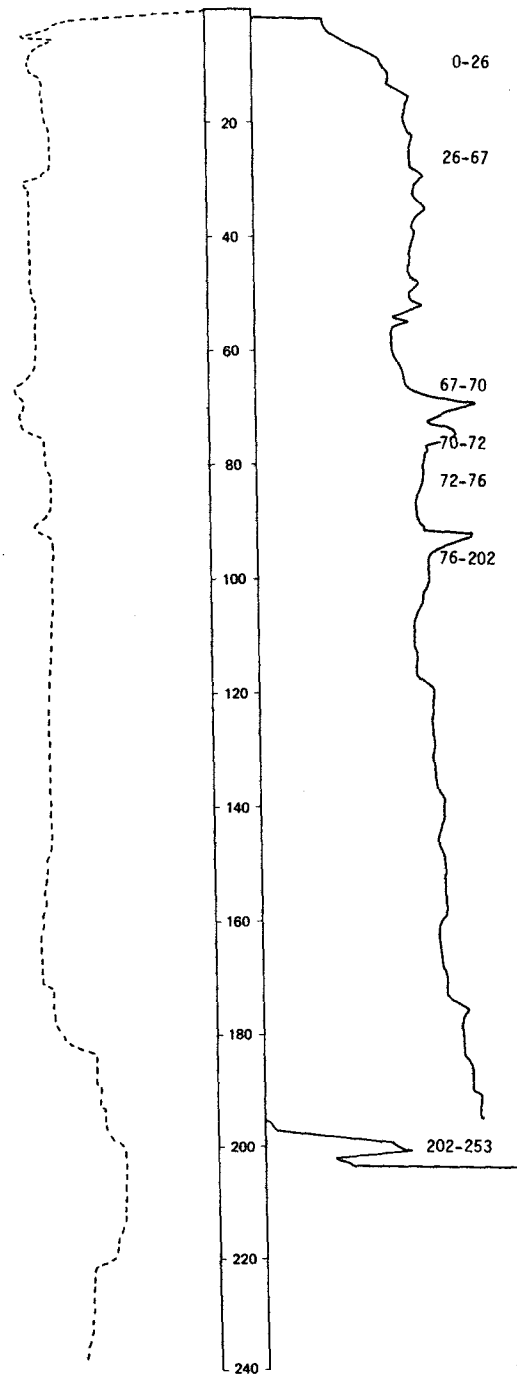
NDSWC 11034

LOCATION: 159-082-05BBA

DATE DRILLED: 8/22/79

ALTITUDE: 1555 (FT, NGVD)

DEPTH: 320 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-26	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
26-67	Clay, silty, sandy, pebbly, medium-dark-gray (till).
67-70	Gravel, fine to medium, sandy.
70-72	Clay, silty, sandy, pebbly.
72-76	Gravel, fine to medium; about 30 percent fine to coarse sand.
76-202	Clay, silty, sandy, pebbly, medium-dark-gray (till); contains a few lenses of sand and gravel.
202-253	Gravel, fine to medium, and medium to coarse sand; contains about 20 percent lignite fragments.

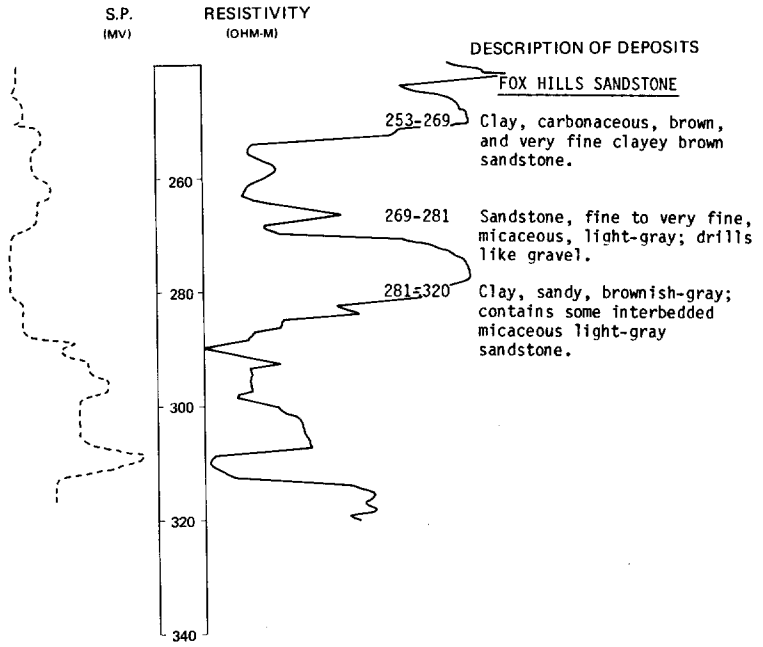
NDSWC 11034, continued

LOCATION: 159-082-05BBA

DATE DRILLED: 8/22/79

ALTITUDE: 1555 (FT, NGVD)

DEPTH: 320 (FT)



159-082-05CCD
NDSWC 11029

Altitude: 1570 feet

Date drilled: 8/21/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, sandy, brownish-black	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	13	14
	Clay, silty, pebbly, yellowish-gray to brownish-gray, partially oxidized (till)	6	20
	Clay, silty, sandy, pebbly, medium-dark-gray to brownish-gray, partially oxidized (till)	6	26
	Sand, fine to coarse, predominately medium, subangular to subrounded, partially oxidized	8	34
	Clay, silty, sandy, pebbly, medium-dark-gray to dark-gray (till); contains sand lenses from 52 to 53, 61 to 62, 70 to 72, 90 to 91, and 130 to 131 feet	178	212
	Gravel, fine to medium; contains about 30 percent fine to very coarse sand; contains silt lenses between 226 and 240 feet	28	240
Hell Creek Formation:			
	Clay, silty to sandy, dark-grayish-brown	15	255
	Shale, sandy, carbonaceous, dusky-brown	2	257
	Shale, fissile, light-gray; interbedded with very fine light-gray sandstone	7	264
	Sandstone, very fine to medium, micaceous, biotitic, slightly indurated, light-greenish-gray	16	280

159-082-06ABA
NDSWC 8898

Altitude: 1553 feet — Date drilled: 9/14/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, pebbly, moderate-yellowish-brown to dark-yellowish-brown, oxidized (till)	26	26
	Clay, silty, sandy, pebbly, olive-gray (till); contains thin sand stringers	19	45
	Sand, very fine to very coarse, clayey, subangular to subrounded; moderately well-sorted in lenses	5	50
	Clay, silty, sandy, pebbly, olive-gray (till); poor samples	127	177
	Sand, fine to coarse, silty	4	181
	Clay, silty, sandy, pebbly, olive-gray (till); contains thin sand and gravel lenses	15	196
	Sand, medium to coarse, gravelly	4	200
Hell Creek Formation:			
	Sandstone, calcareous, well-cemented, light-gray	5	205

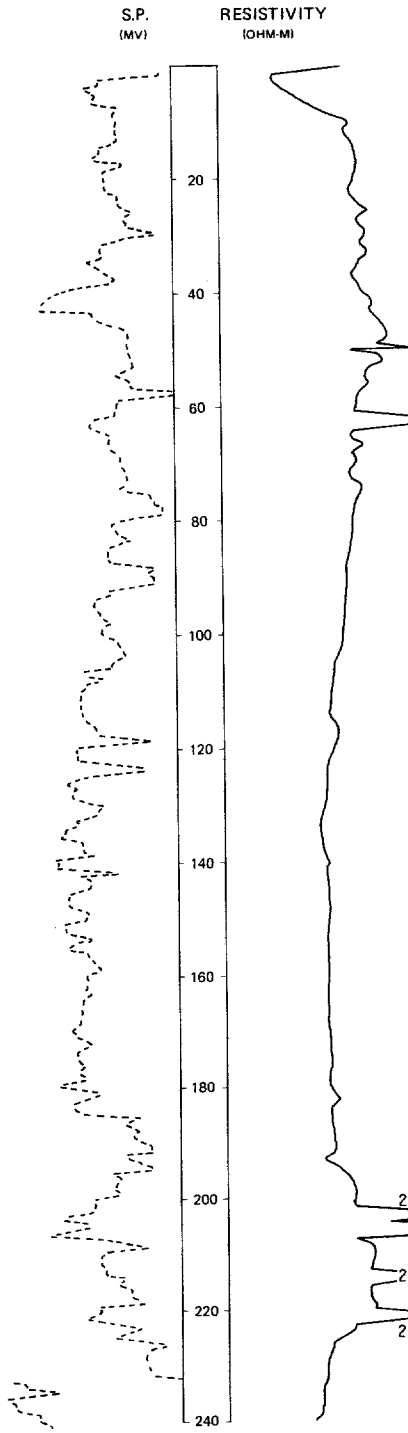
NDSWC 11040

LOCATION: 159-082-06CCC

DATE DRILLED: 8/27/79

ALTITUDE: 1575
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

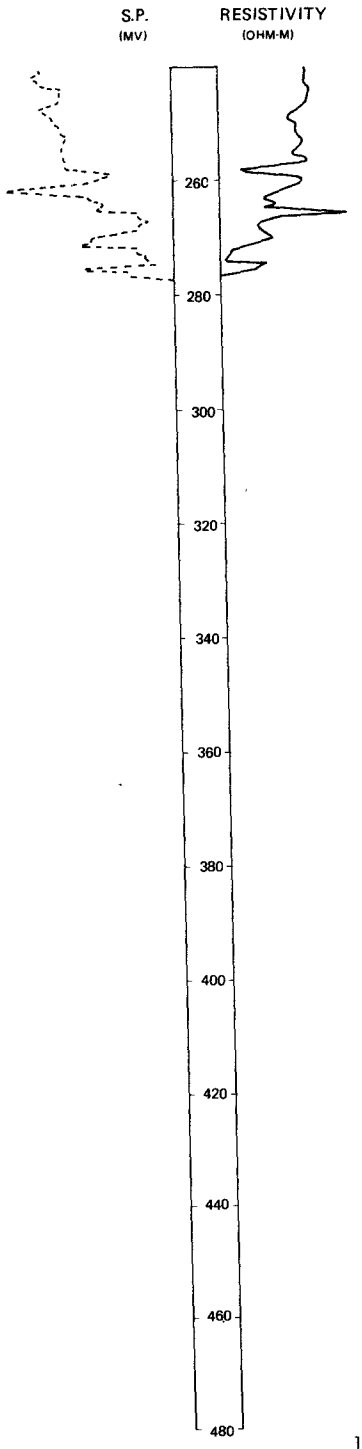
0-1	Soil, sandy, brownish-black.
1-7	Clay, silty, pebbly, yellowish—brown, oxidized (till).
7-23	Clay, silty, sandy, pebbly, brownish-gray, partially oxidized (till).
23-39	Clay, silty, sandy, pebbly, medium-dark-gray (till).
39-45	Sand, medium to coarse, subrounded to rounded; about 10 percent detrital lignite and shale grains.
45-59	Clay, silty, sandy, gravelly, medium-dark-gray (till).
59-202	Clay, silty, sandy, pebbly, medium-dark-gray; contains thin sand and gravel lenses.
202-207	Sand, fine to coarse; about 50 percent fine to medium gravel.
207-224	Clay, silty, sandy, gravelly, brownish-gray (till).
224-258	Clay, silty, sandy, pebbly, brownish-gray (till).

LOCATION: 159-082-06CCC

DATE DRILLED: 8/27/79

ALTITUDE: 1575
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION

258-266 Sandstone, very fine to medium, clayey, carbonaceous to lignitic, brownish-gray.

FOX HILLS SANDSTONE

266-280 Shale, brownish-gray to greenish-gray; interbedded with thin beds of greenish-gray siltstone and very fine light-gray sandstone.

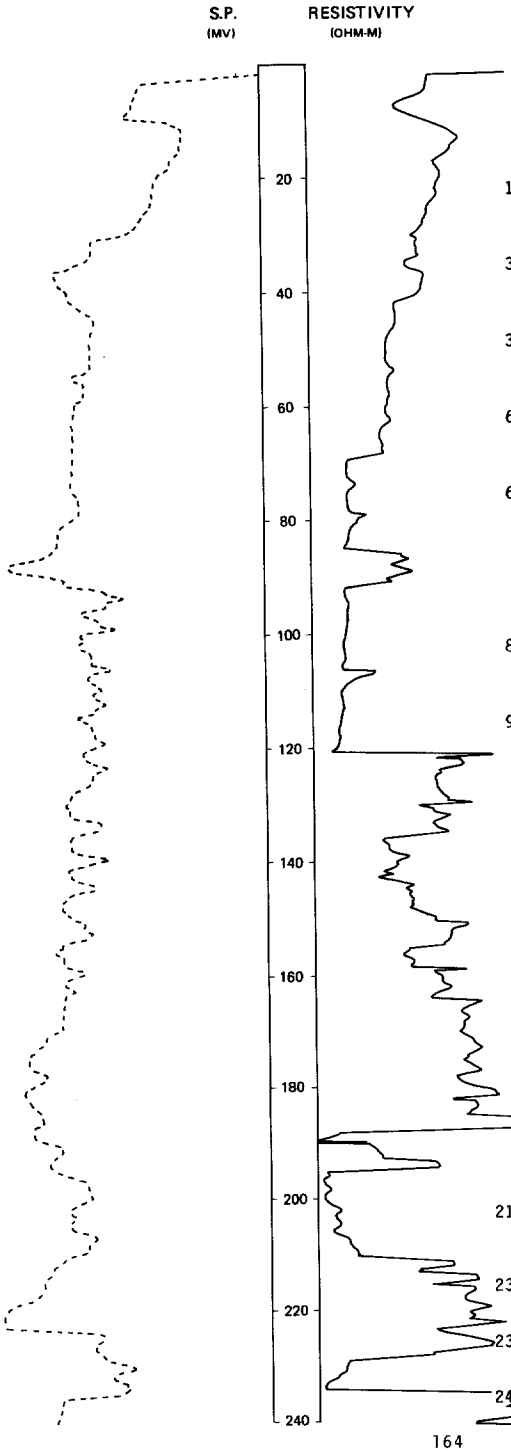
NDSWC 11030

LOCATION: 159-082-06DCD

DATE DRILLED: 8/21/79

ALTITUDE: 1571
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil, brownish-black.
1-12	Clay, sandy, silty, pebbly, yellowish-brown, oxidized (till).
12-36	Clay, silty, slightly sandy, pebbly, medium-dark-gray (till).
36-38	Sand, fine to medium, predominately fine, greenish-gray.
38-66	Clay, silty, sandy, pebbly, medium-dark-gray (till); poor returns.
66-68	Sand, very fine to medium, predominately fine, greenish-gray.
68-87	Clay, silty, sandy, pebbly, medium-dark-gray (till?); returns predominately caving sand.
87-92	Sand, very fine to medium, predominately fine, greenish-gray.
92-214	Clay, silty, sandy, pebbly, medium-dark-gray; contains several sand lenses above 170 feet.
214-230	Sand, clayey; silt; and clay; interbedded.
230-235	Clay, silty, sandy, medium-dark-gray (till?).
235-240	Clay, medium-dark-gray, and fine sand; interbedded.
240-244	Gravel and coarse sand.

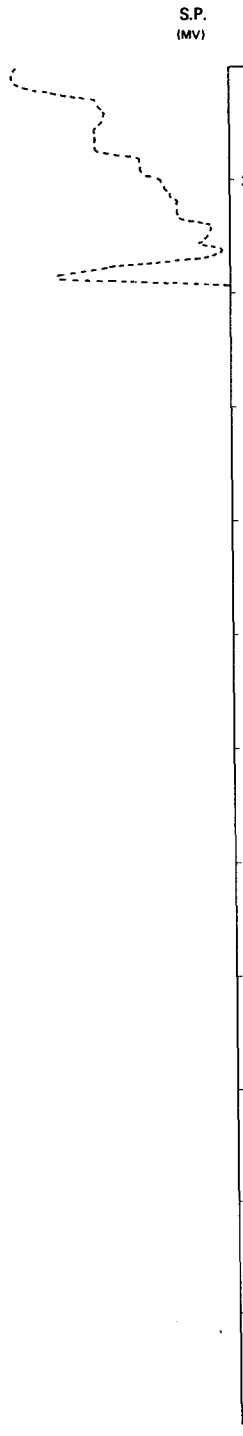
NDSWC 11030, continued

LOCATION: 159-082-06DCD

DATE DRILLED: 8/21/79

ALTITUDE: 1571
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION

244-257 Clay, carbonaceous, brown.

257-262 Lignite, black, and carbonaceous brownish-black shale.

262-275 Clay, brownish-gray; lignitic brownish-black clay; and lignite; interbedded.

FOX HILLS SANDSTONE

275-280 Sandstone, clayey, light-greenish-gray.

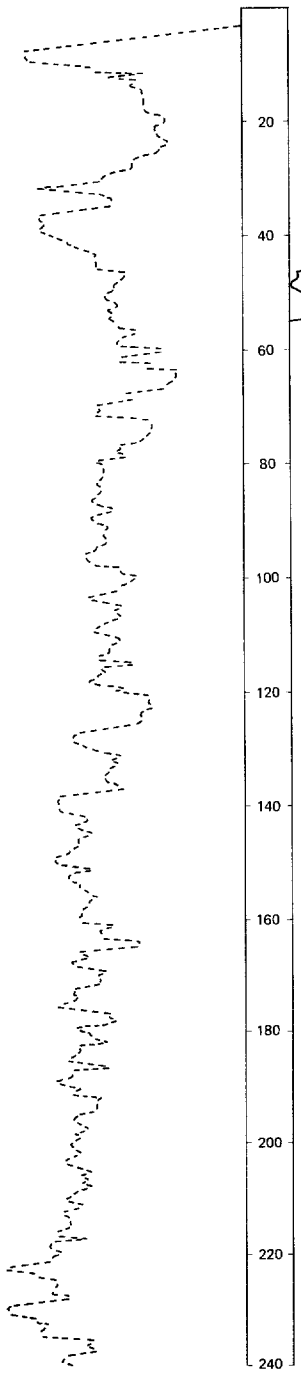
NDSWC 11041

LOCATION: 159-082-07BCC

DATE DRILLED: 8/27/79

ALTITUDE: 1550 (FT, NGVD)

DEPTH: 300 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-5	Sand, fine to very coarse, angular to subrounded, oxidized.
5-10	Gravel, fine to medium, reddish-brown, oxidized; contains about 40 percent medium to very coarse sand.
10-27	Clay, sandy, silty, pebbly, medium-dark-gray (till).
27-31	Sand, fine to very coarse.
31-55	Clay, sandy, silty, pebbly, medium-dark-gray (till); contains sand lenses.
55-220	Clay, silty, sandy, pebbly, medium-dark-gray (till).
220-274	Sandstone, fine; reworked bedrock; interbedded with shale and silt.

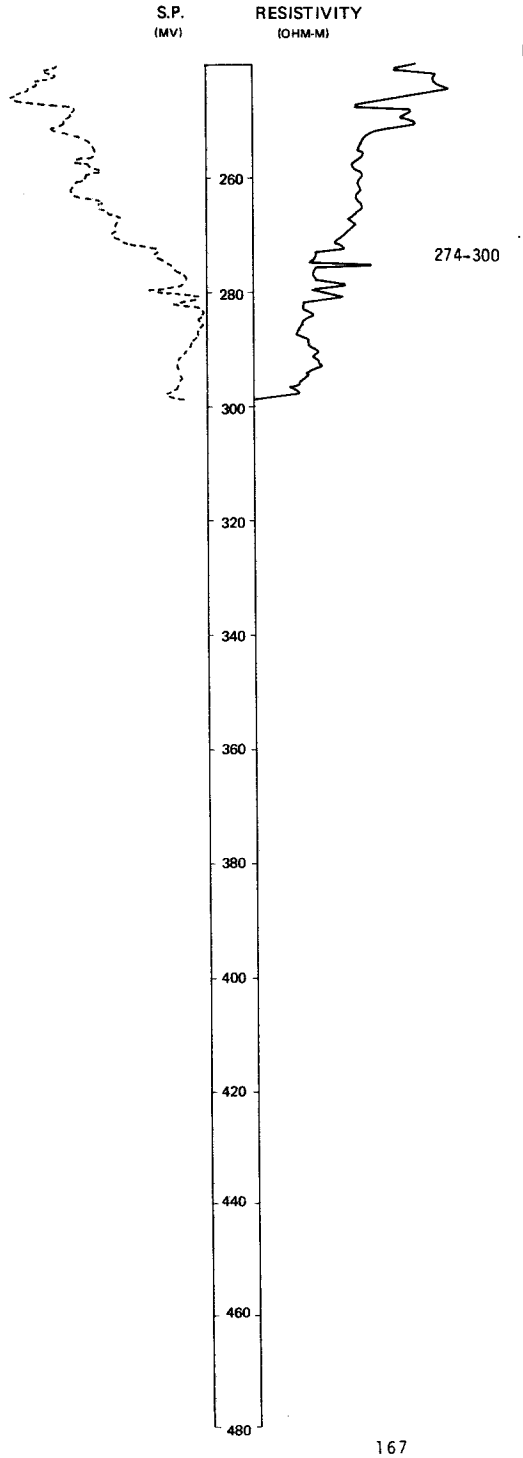
NDSWC 11041, continued

LOCATION: 159-082-07BCC

DATE DRILLED: 8/27/79

ALTITUDE: 1550
(FT, NGVD)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION

274-300 Shale, carbonaceous, brownish-gray to green; interbedded sandstone.

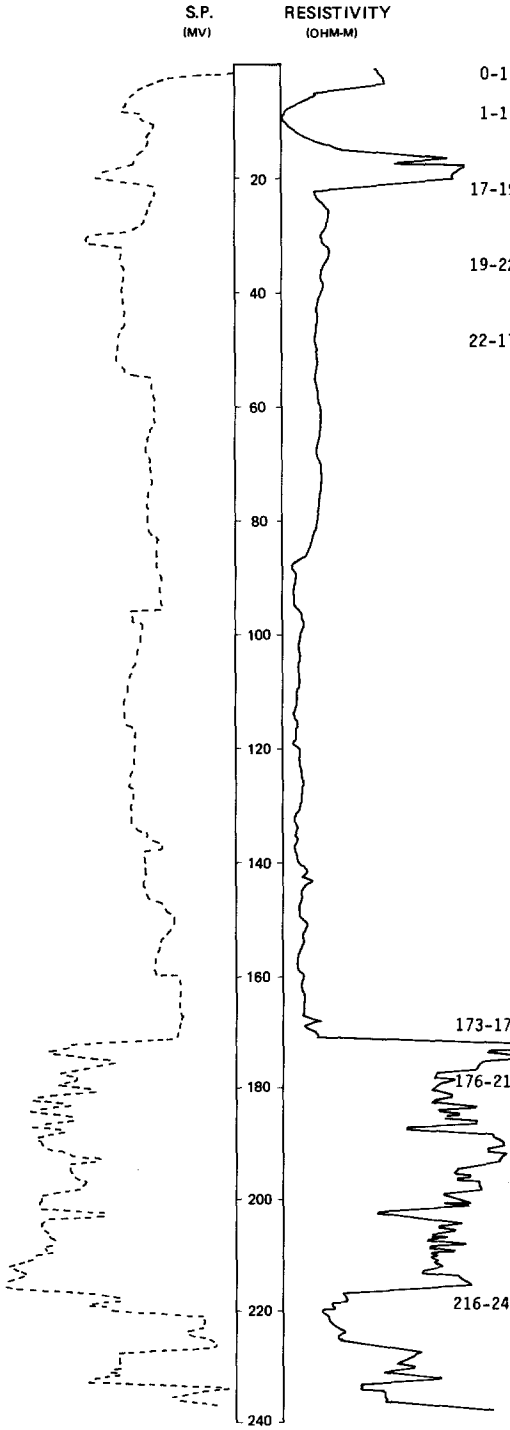
NDSWC 11039

LOCATION: 159-082-07DDD

DATE DRILLED: 8/24/79

ALTITUDE: 1558
(FT, NGVD)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-17	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
17-19	Gravel, fine to medium, angular, reddish-brown, and fine to coarse oxidized sand.
19-22	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
22-173	Clay, silty, sandy, pebbly, olive-gray (till).
173-176	Gravel, fine to medium, angular.
176-216	Gravel(?); drills like gravel; may be reworked semi-consolidated siltstone; returns are meager and consist of lignite, carbonaceous brown clay, and some fine to medium angular gravel that may be caving from overlying interval.

HELL CREEK FORMATION

216-240	Sandstone, fine to very fine, clayey, gray.

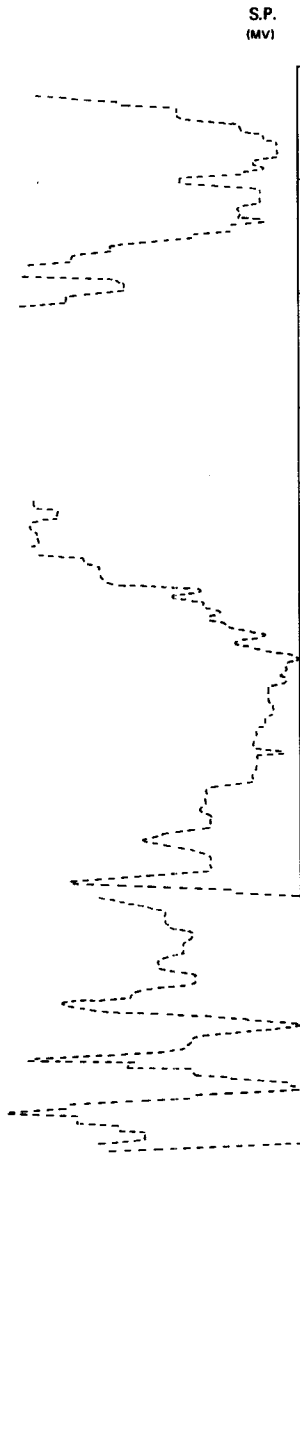
NDSWC 5201

LOCATION: 159-082-11DDD

DATE DRILLED: 9/08/77

ALTITUDE: 1530
(FT, NGVD)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

0-20	Clay, silty, sandy, pebbly, reddish-yellow, oxidized (till).
20-50	Clay, silty, sandy, pebbly, olive-gray (till).
50-58	Sand and gravel, poorly sorted; predominately sand.
58-75	Clay, silty, sandy (till?); poor recovery.
75-80	Sand and gravel, fairly sorted; predominately coarse sand.
80-164	Clay, silty, sandy, pebbly, olive-gray (till).

HELL CREEK FORMATION

164-200	Shale, greasy brownish-gray.

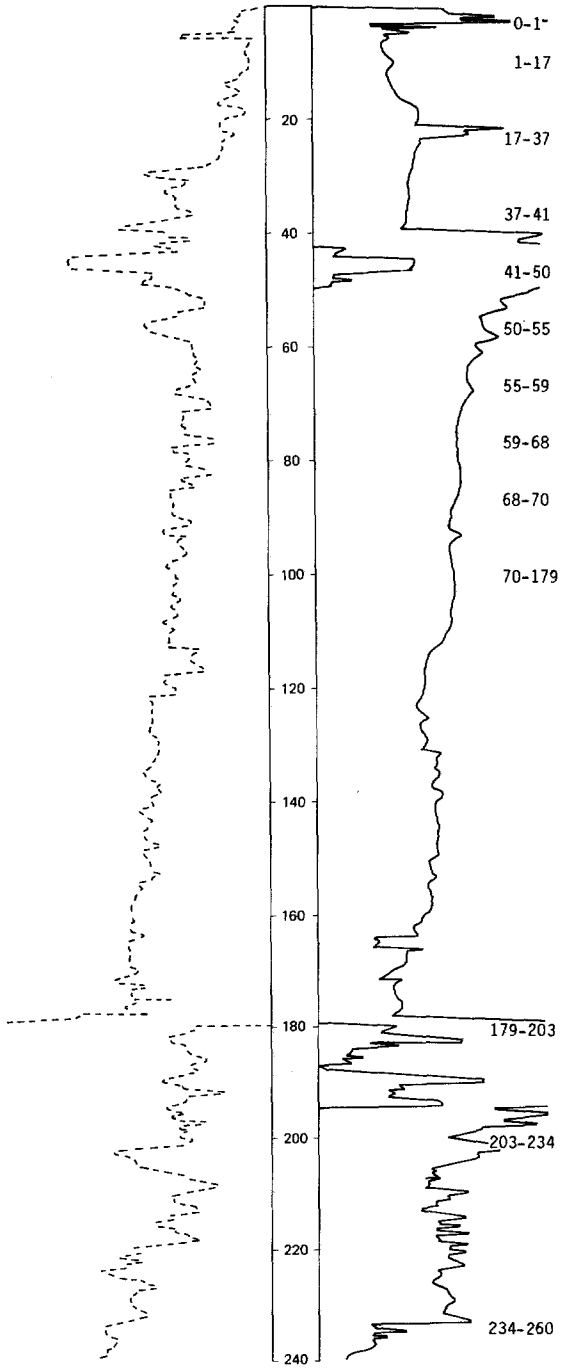
NDSWC 11028

LOCATION: 159-082-17AAA

DATE DRILLED: 8/20/79

ALTITUDE: 1568 (FT, NGVD)

DEPTH: 320 (FT)



DESCRIPTION OF DEPOSITS

0-1"	Soil, brownish-black.
1-17	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
17-37	Clay, silty, sandy, pebbly, brownish-gray, partially oxidized (till).
37-41	Clay, silty, pebbly, medium-dark-gray (till).
41-50	Sand, fine to medium, silty, subangular.
50-55	Clay, silty, pebbly, medium-dark-gray (till).
55-59	Sand, fine to very coarse, gravelly, subangular.
59-68	Clay, silty, sandy, pebbly, dark-gray (till).
68-70	Sand, medium to very coarse, gravelly, subangular to rounded.
70-179	Clay, silty, sandy, pebbly, dark-gray (till).
179-203	Gravel, fine to medium; contains about 30 percent medium to very coarse sand.
203-234	Clay, silty, sandy, dark-gray (till).

HELL CREEK FORMATION

234-260	Clay, silty to sandy, carbonaceous, brownish-gray.

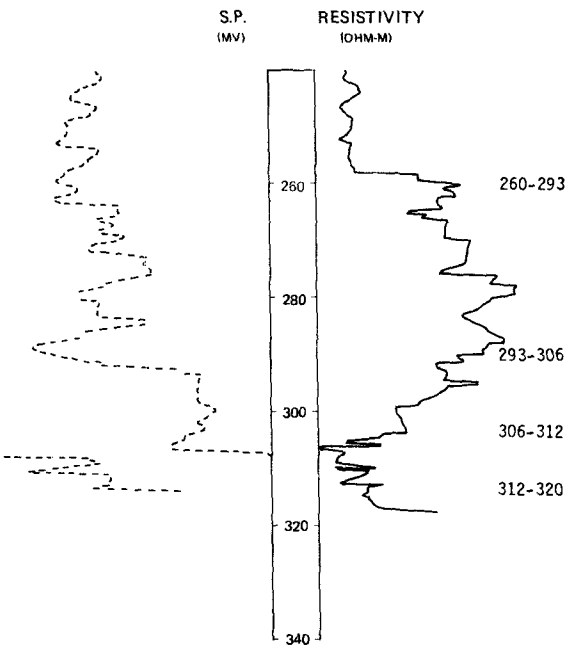
NDSWC 11028, continued

LOCATION: 159-082-17AAA

DATE DRILLED: 8/20/79

ALTITUDE: 1568 (FT, NGVD)

DEPTH: 320 (FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

260-293	Clay, very carbonaceous to lignitic, brownish-gray to dusky-brown; contains about 25 percent very fine to fine sand.
293-306	Clay, silty, tight, grayish-brown to dark-gray.
306-312	Shale, carbonaceous, dusky-brown.
312-320	Sandstone, fine to medium, clayey, micaceous, slightly indurated, light-greenish-gray; abundant biotite.

159-082-21AAA
NDSWC 5218

Altitude: 1545 feet

Date drilled: 8/18/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, pebbly, oxidized (till); dusky-yellow with reddish-yellow stringers	15	15
	Clay, silty, sandy, pebbly, olive-gray (till)	117	132
	Sand, very fine to coarse, predominately medium, subangular to rounded; well sorted in lenses; predominately quartz grains	30	162
	Sand, very fine to fine, well-sorted, subangular to rounded	58	220
	Sand and silt; poor recovery	56	276
	Boulders; chips include microcrystalline limestone and granite	8	284
Hell Creek Formation:			
	Limestone, sandy, silty, finely crystalline, and very fine to fine silty clayey pale-greenish-gray sandstone; contains some fine black sand grains; very slow drilling	16	300

159-082-21DAA
NDSWC 5208

Altitude: 1535 feet — Date drilled: 8/11/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, silty, sandy, pebbly, reddish-yellow, oxidized (till)	10	10
	Sand and gravel	1	11
	Clay, silty, sandy, pebbly, olive-gray (till)	161	172
	Sand, very fine to fine, silty; poor recovery	10	182
	Clay, silty, sandy, pebbly, olive-gray (till)	26	208
Hell Creek Formation:			
	Sandstone, very fine to fine, silty, greenish-gray	4	212
	Shale, carbonaceous, greasy, dark-brown; with some silty light-grayish-brown shale	8	220

159-082-22ADD1
NDSWC 5279

Altitude: 1550 feet — Date drilled: 12/01/77

	Clay, sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till)	18	18
	Clay, sandy, silty, pebbly, medium-dark-gray to olive-gray (till)	27	45
	Sand, fine to very coarse, predominately medium to coarse, subrounded to rounded; well sorted in lenses; contains about 40 percent fine to medium gravel	12	57
	Clay, sandy, silty, pebbly, medium-dark-gray (till)	3	60

159-082-22ADD2
NDSWC 5279A

Altitude: 1550 feet — Date drilled: 1/24/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, very sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till)	17	17
	Clay, sandy, silty, pebbly, medium-dark-gray to olive-gray (till)	132	149
Hell Creek Formation:			
	Claystone, sandy, silty, bentonitic, carbonaceous, tan to dark-brown to greenish-gray	6	155
	Sandstone, moderately cemented, indurated	3	158
	Claystone, sandy, silty, tan to dark-brown; a thin lignite bed at about 190 feet	42	200

159-082-23ADA
NDSWC 5206

Altitude: 1545 feet — Date drilled: 8/10/77

	Clay, silty, sandy, pebbly (till); reddish-yellow stringers	20	20
	Clay, silty, sandy, pebbly, olive-gray (till)	35	55
	Sand, medium, well-sorted, subangular to rounded	10	65
	Clay, silty, sandy, pebbly (till), or clayey silt; very poor samples due to caving sand	95	160
Hell Creek Formation:			
	Sandstone, very fine to fine, silty, slightly clayey, greenish-gray	40	200

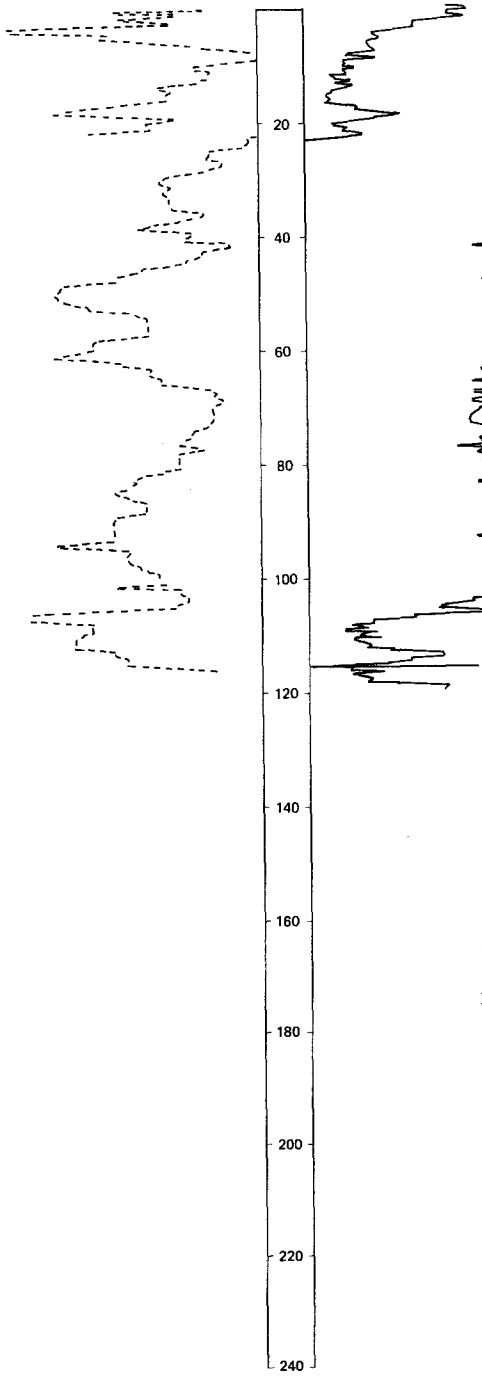
NDSWC 5207

LOCATION: 159-082-23BBB

DATE DRILLED: 8/10/77

ALTITUDE: 1550 (FT, NGVD)

DEPTH: 180 (FT)



DESCRIPTION OF DEPOSITS

0-20	Clay, silty, sandy, pebbly, oxidized (till); reddish-yellow stringers.
20-164	Clay, silty, sandy, pebbly, olive-gray (till); with sand and gravel lenses from 33 to 35, 38 to 40, 50 to 52, and 95 to 96 feet.

HELL CREEK FORMATION

164-170	Sandstone, very fine to fine, silty, clayey, greenish-gray.
170-180	Clay, silty; light brown with greenish-gray lenses.

159-082-23DDD
NDSWC 5205

Altitude: 1545 feet — Date drilled: 8/10/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, silty, sandy, pebbly, oxidized (till); reddish-yellow stringers	25	25
	Clay, silty, sandy, pebbly, olive-gray (till)	9	34
	Sand and gravel	6	40
	Clay, silty, sandy, pebbly, olive-gray (till)	100	140
Hell Creek Formation:			
	Silt, clayey, carbonaceous, laminated, brown	20	160

159-082-24ADA
NDSWC 5203

Altitude: 1535 feet — Date drilled: 8/10/77

Glacial drift:			
	Clay, silty, sandy, pebbly, oxidized (till); reddish-yellow stringers	18	18
	Clay, silty, sandy, pebbly, olive-gray (till)	22	40
	Sand and gravel; predominately medium subangular to rounded sand	5	45
	Clay, silty, sandy, pebbly; silty sand; or silt; very poor sample recovery; interval drilled as though material is softer than till; one small sample of silty greenish-gray sand was recovered	93	138
	Sand and gravel, poorly sorted, angular to rounded	52	190
Hell Creek Formation:			
	Sandstone, very fine to fine, silty, clayey, slightly calcareous; first few feet was light-grayish-green and appeared weathered; became greenish gray and unweathered with depth	30	220

159-082-25AAA
NDSWC 5204

Altitude: 1545 feet — Date drilled: 8/10/77

	Clay, silty, sandy, pebbly, oxidized (till); reddish-yellow stringers	20	20
	Clay, silty, sandy, pebbly, olive-gray (till); contains 1- to 2-foot sand and gravel lenses about 62, 68, 72, and 130 feet	118	138
	Till, sandy; silty clayey sand; clayey silt; and silty clay; all predominately greenish gray; probably a sequence of reworked bedrock; poor sample recovery	27	165
Hell Creek Formation:			
	Sandstone, very fine to fine, clayey, silty, light-greenish-gray	35	200

159-082-27AAD
NDSWC 5200

Altitude: 1557 feet — Date drilled: 8/09/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, silty, sandy, pebbly, oxidized (till); reddish-yellow stringers	12	12
	Clay, silty, sandy, pebbly, olive-gray (till)	20	32
	Sand, fine to medium, predominately medium, well-sorted, subangular to subrounded	6	38
	Clay, silty, sandy, pebbly, olive-gray (till)	110	148
	Sand and gravel; predominately fine angular to rounded gravel; fairly sorted in lenses; composed predominately of carbonate, shale, and siltstone fragments with some detrital lignite grains and pebbles	30	178
	No sample; probably reworked bedrock	8	186
Hell Creek Formation:			
	Shale, carbonaceous, greasy, moderate-brown	14	200

159-082-27BAA
NDSWC 5277

Altitude: 1561 feet — Date drilled: 11/29/77

	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till)	31	31
	Clay, silty, sandy, pebbly, medium-dark-gray to olive-gray (till); contains a sand lens from 62 to 64 feet	144	175
	Cobbles, boulders, and sand	13	188
Hell Creek Formation:			
	Claystone, silty, medium-gray to brownish-gray; contains fine thin indurated sandstone beds	20	208

159-082-27BBA
NDSWC 5278

Altitude: 1550 feet — Date drilled: 11/30/77

	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till)	20	20
	Clay, silty, sandy, pebbly, medium-dark-gray to olive-gray (till); contains thin sand lenses; contains intermixed bedrock below 183 feet	187	207
Hell Creek Formation:			
	Claystone, sandy, silty, medium-light-gray to greenish-gray; contains sandy carbonaceous chocolate-brown streaks	13	220

159-082-28DDD
NDSWC 5209

Altitude: 1570 feet — Date drilled: 8/11/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, silty, sandy, pebbly, oxidized (till); reddish-yellow stringers; with a sand and gravel lens from 53 to 55 feet----------	60	60
	Clay, silty, sandy, pebbly, olive-gray (till)----------	10	70
	Sand, fine to coarse, fairly sorted to well-sorted, subangular to rounded; contains about 10 to 15 percent gravel----------	22	92
	Clay, silty, sandy, pebbly, olive-gray (till)----------	108	200
	Silt(?); no samples; probably reworked bedrock materials----------	22	222
Hell Creek Formation:			
	Sandstone, very fine to fine, silty, greenish-gray; interbedded with carbonaceous greasy brown clay----------	18	240

159-082-34DDC
NDSWC 5276

Altitude: 1563 feet — Date drilled: 11/29/77

	Clay, sandy, silty, pebbly, locally cobbly, moderate-yellowish-brown, oxidized (till); contains a few thin sand stringers----------	34	34
	Clay, silty, sandy, pebbly, olive-gray (till); contains a few thin sand lenses----------	119	153
	Sand, very fine to coarse, subangular to rounded; contains numerous interbedded clay lenses; also abundant lignite fragments----------	57	210
	Clay, silty, sandy, pebbly, medium-dark-gray to olive-gray (till)----------	17	227
	Sand, fine to very coarse, predominately medium to coarse, subangular to rounded; contains abundant lignite fragments----------	42	269
	Clay, sandy, silty, pebbly, medium-dark-gray to olive-gray (till)----------	17	286
	Sand, fine to very coarse, predominately medium, subangular to rounded; contains lignite fragments----------	26	312
Fox Hills Sandstone:			
	Claystone, very sandy, silty, moderate-light-gray to brownish-gray; drills harder below 382 feet----------	88	400

159-082-34DDD
USGS 64-47
(Log modified from LaRocque and others, 1963)

Altitude: 1551 feet — Date drilled: 7/29/47

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	3	3
	Clay, sandy, yellow	3	6
	Gravel; with thin strips of yellow sandy clay	4	10
	Clay, sandy, yellow; with thin strips of sand	3	13
	Clay, sandy, gray; with some gravel	5	18
	Gravel; with thin strips of gray sandy clay	3	21
	Clay, sandy, gray; with some gravel	31	52
	Gravel	1	53
	Clay, sandy, gray; with some gravel	12	65
	Clay, sandy, gray; with some gravel and thin strips of lignite fragments	19	84
	Clay, sandy, gray; with thin strips of gravel, sand, and lignite fragments	23	107
	Clay, sandy, gray; with some gravel	13	120
	Clay, sandy, gray; with thin strips of gravel	4	124
	Clay, sandy, gray; with some gravel and boulders	12	136
	Clay, sandy, gray; with thin strips of gravel and lignite fragments	4	140
	Lignite fragments; with thin strips of gravel	18	158
	Clay, sandy, gray	2	160
	Gravel and fine sand; with strips of lignite and gray sandy clay	26	186
	Lignite; with strips of gravel and small strips of gray sandy clay	10	196
Hell Creek Formation:			
	Strips of gray compact and massive sand	5	201
	Sand, gray, compact	9	210

159-082-35BBA
NDSWC 5275

Altitude: 1553 feet — Date drilled: 11/18/77

	Clay, sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till)	23	23
	Clay, sandy, silty, pebbly, locally gravelly, medium-dark-gray to olive-gray (till); contains thin lenses of loose gravel	254	277
	Clay, gravel, and cobbles; drill action	5	282
Hell Creek Formation:			
	Claystone, silty, slightly sandy, brittle, medium-dark-gray to chocolate-brown	18	300

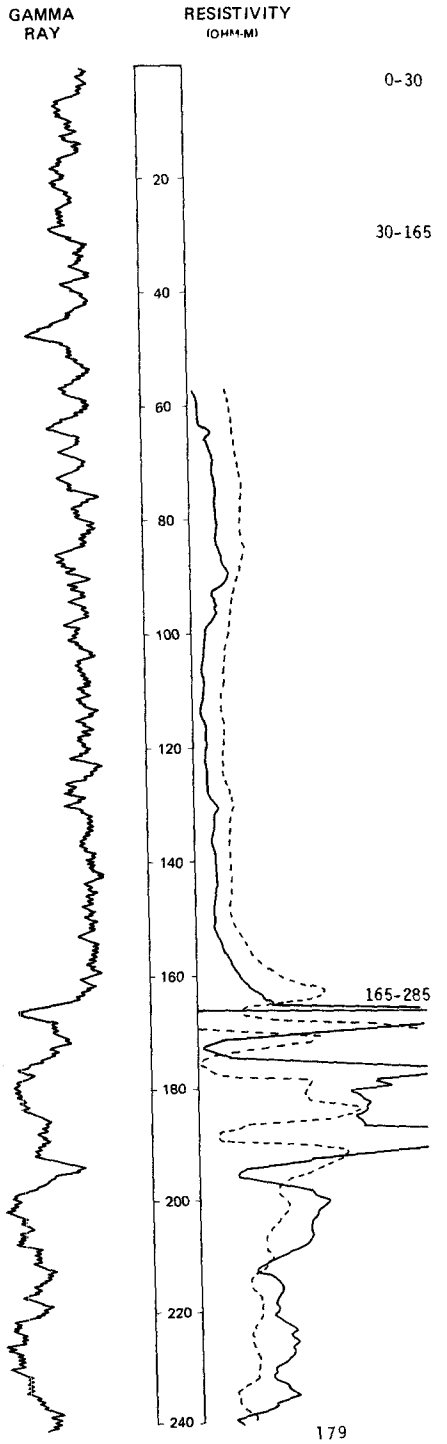
NDSWC 5274, 5274A

LOCATION: 159-082-35BBB1,2

DATE DRILLED: 11/17/77

ALTITUDE: 1560
(FT, NGVD)

DEPTH: 380
(FT)



DESCRIPTION OF DEPOSITS

0-30	Clay, very sandy, silty, pebbly, oxidized (till).
30-165	Clay, sandy, silty, pebbly, medium-dark-gray to olive-gray (till); contains a gravel lens from 47 to 49 feet.
165-285	Sand, fine to coarse, predominately medium, subrounded to rounded; well sorted in lenses; contains some very coarse gravel and abundant lignite.

NOTE:

------Long normal

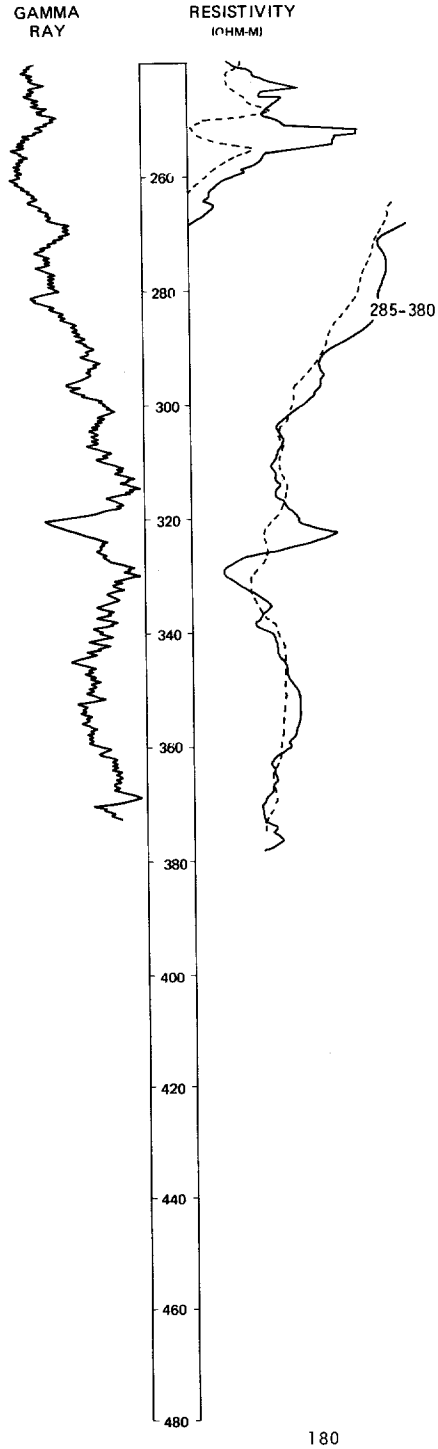
———Short normal

LOCATION: 159-082-35BBB1,2

DATE DRILLED: 11/17/77

ALTITUDE: 1560
(FT, NGVD)

DEPTH: 380
(FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION

285-380 Shale, carbonaceous, brownish-gray; interbedded with lenses of siltstone and occasional greenish-gray sandstone.

NOTE:

-----Long normal

———Short normal

LOCATION: 159-082-35BBB1,2

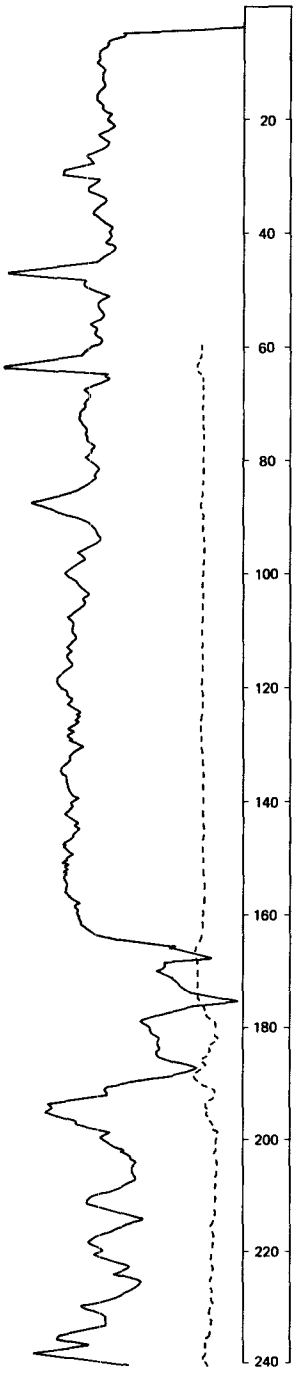
DATE DRILLED: 11/17/77

ALTITUDE: 1560
(FT, NGVD)

DEPTH: 380
(FT)

NEUTRON (API) S.P. (MV)

DESCRIPTION OF DEPOSITS



LOCATION: 159-082-35BBB1,2

DATE DRILLED: 11/17/77

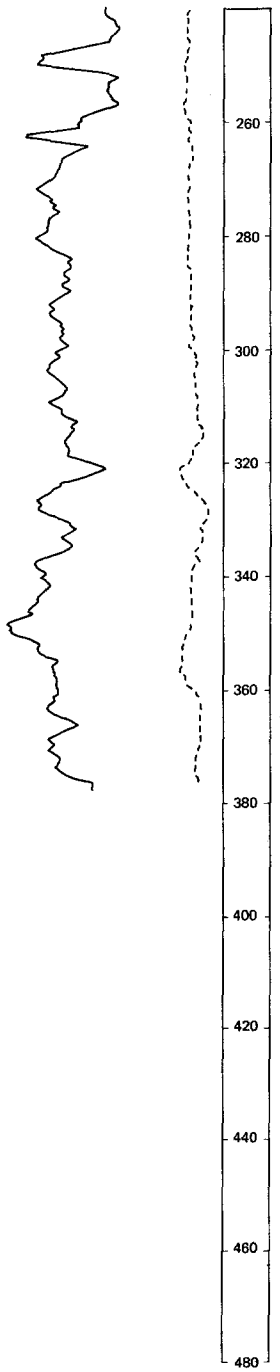
ALTITUDE: 1560
(FT, NGVD)

DEPTH: 330
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



159-082-35BBB3
NDSWC 10168

Altitude: 1562 feet — Date drilled: 8/01/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Sand, fine	1	2
	Clay, silty, sandy, pebbly, light-olive-brown, oxidized (till)	32	34
	Clay, silty, sandy, pebbly, medium-brown, partially oxidized (till)	8	42
	Sand, fine to very coarse, subangular to rounded; moderately well sorted in lenses; contains about 40 percent fine gravel and 10 percent medium gravel	9	51
	Clay, silty, sandy, pebbly, dark-gray (till); contains thin sand lenses at 80 and 96 feet	125	176
	Gravel and sand; silty dark-gray clay from 184 to 186 feet; composed of about 35 percent medium gravel, 35 percent fine gravel, and 30 percent medium to very coarse sand	22	198
	Clay, silty, sandy, pebbly (till)	39	237
	Sand, medium to very coarse, subrounded to rounded; contains about 35 percent fine gravel and 10 percent medium gravel	57	294
Fox Hills Sandstone:			
	Siltstone, carbonaceous, medium-brown; interbedded with silty medium-brown claystone	26	320

159-083-01AAA
NDSWC 11032

Altitude: 1572 feet — Date drilled: 8/22/79

	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	32	32
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	4	36
	Gravel, fine, and coarse sand	4	40
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	4	44
	Sand, medium to very coarse; contains about 15 percent fine gravel	11	55
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	13	68
	Sand, fine to very coarse, predominately medium to coarse, subangular to subrounded; contains about 10 percent fine gravel	12	80
	Clay, silty, sandy, medium-dark-gray (till); contains some sand lenses less than 1 foot thick; also contains scattered lignite chips	128	208
Hell Creek Formation:			
	Sandstone, very fine, clayey, light-gray to greenish-gray; contains a few thin indurated beds	12	220

159-083-01BCC
NDSWC 2
(Log modified from Froelich, 1966)

Altitude: 1555 feet — Date drilled: 7/07/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil; silty loam; black	2	2
	Gravel, fine and medium, sandy, subrounded, rusty	3	5
	Clay, silty and sandy; with pebbles; dusky yellow; soft; oxidized (till)	4	9
	Clay, silty; with sand grains and pebbles; olive gray; soft; cohesive (till)	24	33
	Sand, medium, light-gray, well-sorted, subrounded, quartzose	4	37
	Clay, silty to sandy; with pebbles; olive gray; moderately soft; cohesive (till)	25	62
	Clay (till); silty to sandy; with lenses of loose light-gray rounded medium-grained sand	11	73
	Clay, silty to sandy; with pebbles; olive gray; moderately soft; very cohesive (till); contains occasional thin lenses of sand and(or) gravel	93	166
	Sand and gravel; lensed with clay, silt, and till; poorly sorted; highly lignitic; dirty; rough drilling in spots	58	224
	Clay, sandy, olive-gray, soft, moderately cohesive; drills easy	23	247
	Gravel, fine and medium, sandy; with some coarse gravel; sorted; rough drilling	6	253
	Boulder, granite	2	255
	Clay, sandy; with lenses of silt and loose sand; olive gray; soft; drills easy	26	281
Hell Creek Formation:			
	Sand, fine to medium, dark-greenish-gray; with brown and black carbonaceous streaks; friable; micaceous; noncalcareous	13	294

159-083-03ACB
NDSWC 1
(Log modified from Froelich, 1966)

Altitude: 1610 feet — Date drilled: 7/06/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil; silty loam; black	1	1
	Silt, clayey to sandy, yellowish-gray, soft, loose	4	5
	Clay, silty, black, cohesive	2	7
	Clay, silty, yellowish-gray, soft, cohesive	3	10
	Clay, very silty and sandy; with pebbles; dusky yellow; soft; moderately cohesive; oxidized (till)	10	20
	Clay, very silty and sandy; with pebbles; olive gray; soft; cohesive; unoxidized (till); contains lenses of loose sand and fine gravel	13	33
	Clay, silty; with sand grains and pebbles; olive gray; soft to moderately soft; cohesive (till)	23	56
	Sand, fine and medium; some fine gravel; light olive gray; well sorted; subrounded; lensed with thin silt stringers	9	65
	Clay, silty; with lenses of fine to medium sand; olive gray; soft	9	74
	Clay, silty; with sand grains and pebbles; olive gray; moderately soft; cohesive (till)	32	106
	Clay, silty, olive-gray, soft, smooth, cohesive, plastic	4	110
	Clay, silty and sandy; with pebbles and occasional lenses of sandy clay and silt; olive gray; soft to moderately soft (till)	36	146
	Clay, very sandy; with numerous pebbles but very few rocks; olive gray; moderately soft; moderately cohesive; tightly compacted (till)	76	222
	Gravel, fine and medium, moderately well sorted, subangular and subrounded; mostly limestone and granitic particles	8	230
	Clay, sandy; with pebbles and loose gravelly lenses; olive gray; moderately soft and cohesive (till); moderately rough drilling	10	240
Hell Creek Formation:			
	Shale, light-olive-gray, soft, plastic, cohesive, tight	6	246
	Sand, light-greenish-gray, soft, friable, slightly calcareous, micaceous, lignitic	18	264
	Shale, olive-gray to purplish-gray, soft, smooth, cohesive	4	268
	Sand, light-gray; with black mica and lignite flakes; fine grained; subangular; slightly frosted appearance	8	276
	Shale, sandy to silty, dark-reddish-gray, moderately soft, moderately cohesive, tight	17	293
	Sand, dark-greenish-gray, fine-grained, soft, friable	11	304
	Sandstone, light-greenish-gray, indurated, highly calcareous	3	307
	Sand, dark-greenish-gray; with brownish-gray carbonaceous streaks; fine grained; soft; friable	8	315

159-083-03ACD
NDSWC 8902

Altitude: 1607 feet | Date drilled: 9/18/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, very silty, sandy, pebbly, yellowish-brown, oxidized (till)	30	30
	Clay, silty, sandy, pebbly, olive-gray (till)	23	53
	Sand, fine to coarse, subangular to subrounded	2	55
	Clay, sandy, pebbly, olive-gray (till)	6	61
	Sand, medium to very coarse, gravelly, subangular to subrounded	1	62
	Clay, sandy, pebbly, olive-gray (till)	8	70
	Sand, medium to very coarse, subangular to rounded	2	72
	Clay, sandy, pebbly, olive-gray (till)	24	96
	Sand, fine to medium; about 30 percent fine to medium subangular to subrounded gravel	4	100

NDSWC 5560

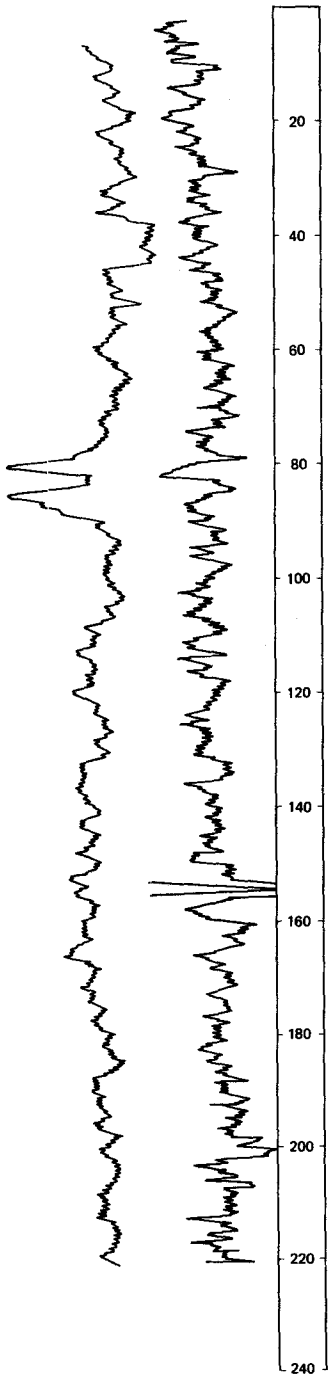
LOCATION: 159-083-03BAB

DATE DRILLED: 9/11/79

ALTITUDE: 1601
(FT, NGVD)

DEPTH: 226
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-30	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
30-89	Clay, silty, sandy, pebbly, olive-gray (till).
89-95	Sand, very fine to very coarse, predominately medium to coarse, predominately subrounded; contains about 10 percent fine gravel.
95-222	Clay, silty, sandy, pebbly, olive-gray (till); contains some interbedded sand and gravel lenses less than 1 foot thick.

HELL CREEK FORMATION

222-226	Sandstone, very fine to fine, well-rounded, indurated, light-green.

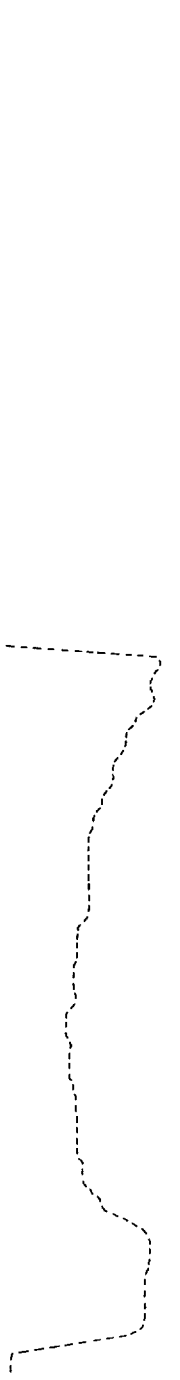
NDSWC 8903

LOCATION: 159-083-03CDD

DATE DRILLED: 9/26/73

ALTITUDE: 1603 (FT, NGVD)

DEPTH: 1000 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-30	Clay, very silty, pebbly, yellowish-brown, oxidized (till).
30-74	Clay, silty, pebbly, olive-gray (till).
74-78	Sand, medium to coarse; about 30 percent medium to very coarse subangular to rounded gravel.
78-96	Clay, sandy, pebbly, olive-gray (till).
96-99	Sand, fine to very coarse, gravelly, subangular to rounded.
99=114	Clay, silty, pebbly, olive-gray (till).
114-116	Sand, medium to very coarse, gravelly, subangular to rounded.
116-130	Clay, silty, pebbly, olive-gray (till).
130-236	Clay, sandy, gravelly, olive-gray (till).
236-256	Sand, fine to very coarse, gravelly, silty to sandy, poorly sorted, angular to subrounded.

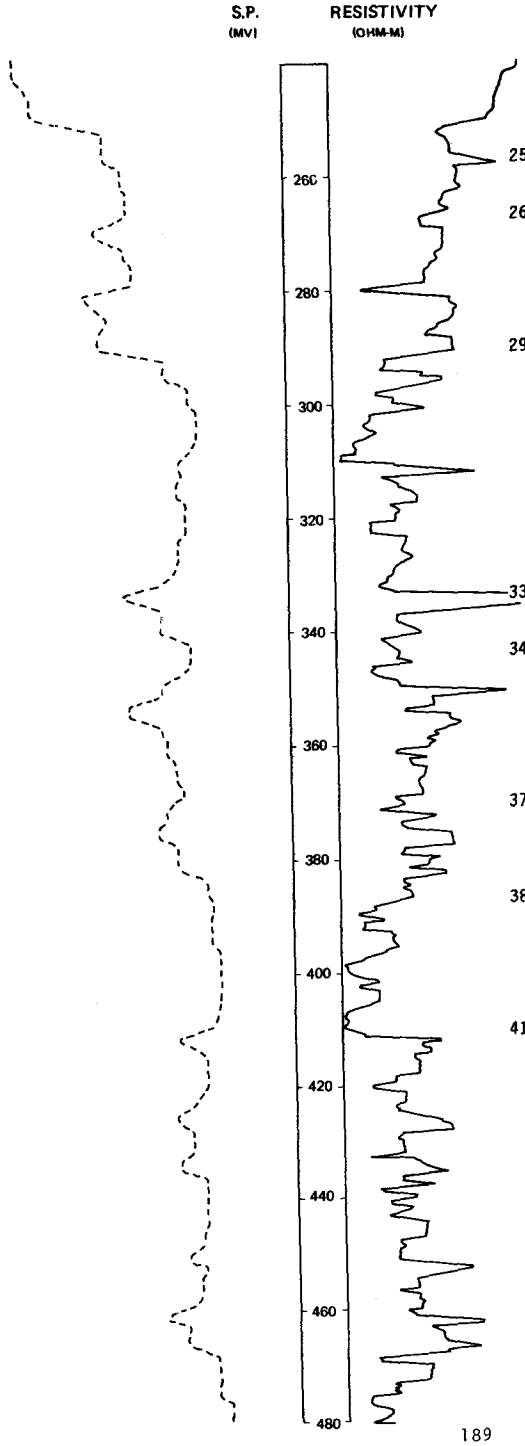
NDSWC 8903, continued

LOCATION: 159-083-03CDD

DATE DRILLED: 9/26/73

ALTITUDE: 1603 (FT, NGVD)

DEPTH: 1000 (FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION

256-261	Shale, silty, carbonaceous, limonitic, grayish-brown.
261-290	Siltstone, clayey; carbonaceous brownish-gray streaks; interbedded with fine greenish-gray sandstone and carbonaceous grayish-brown shale.
290-335	Shale, carbonaceous, grayish-brown; interbedded with fine sandstone; with carbonaceous greenish-gray streaks.
335-340	Sandstone, very fine to fine, micaceous, greenish-gray.
340-370	Shale, carbonaceous, brown.
370-385	Sandstone, fine, clayey; carbonaceous micaceous indurated greenish-gray streaks.
385-410	Siltstone, clayey, moderately indurated, brownish-gray; with very thin lenses of lignite.
410-482	Siltstone, sandy, brownish-gray; interbedded with carbonaceous moderately indurated brown shale.

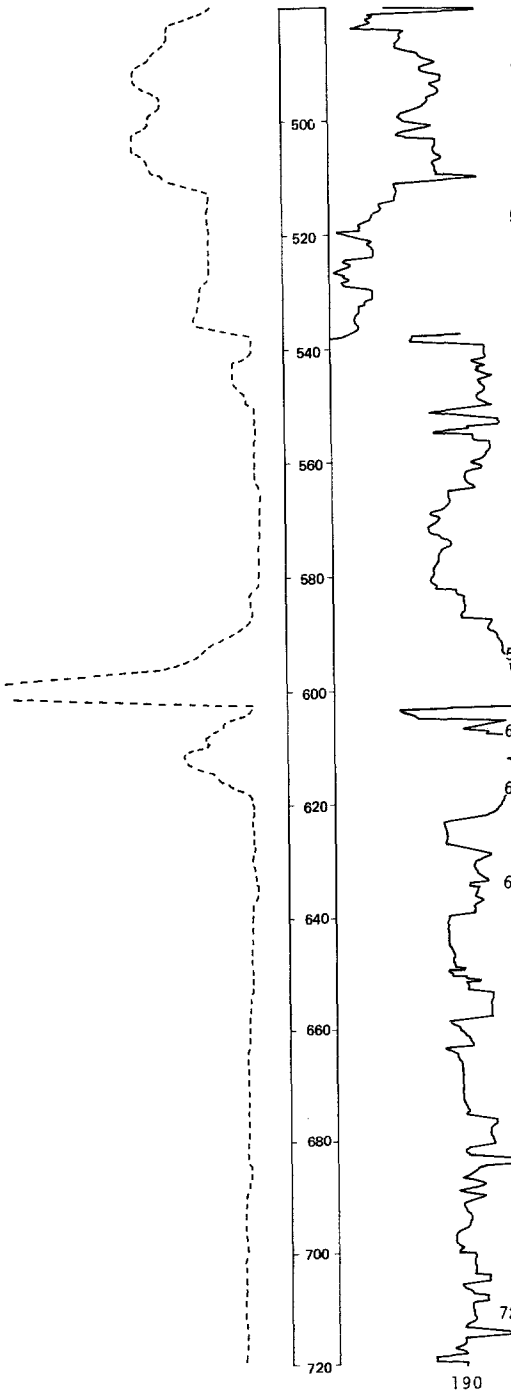
NDSWC 8903, continued

LOCATION: 159-083-03CDD

DATE DRILLED: 9/26/73

ALTITUDE: 1603 (FT, NGVD)

DEPTH: 1000 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

482-518 Sandstone, very fine to fine, glauconitic, light-greenish-gray.

518-596 Siltstone, sandy, brownish-gray; interbedded with lenses of carbonaceous poorly indurated brown shale.

596-602 Limestone, siliceous, indurated, grayish-yellow-green.

602-606 Siltstone, clayey, moderately indurated, dark-gray.

606-616 Siltstone, sandy, clayey, carbonaceous, grayish-brown; interbedded with light-greenish-gray limestone.

616-720 Siltstone, very sandy, carbonaceous, brownish-gray; interbedded with very carbonaceous brown shale.

720-770 Shale, sandy, bentonitic, indurated, dark-gray.

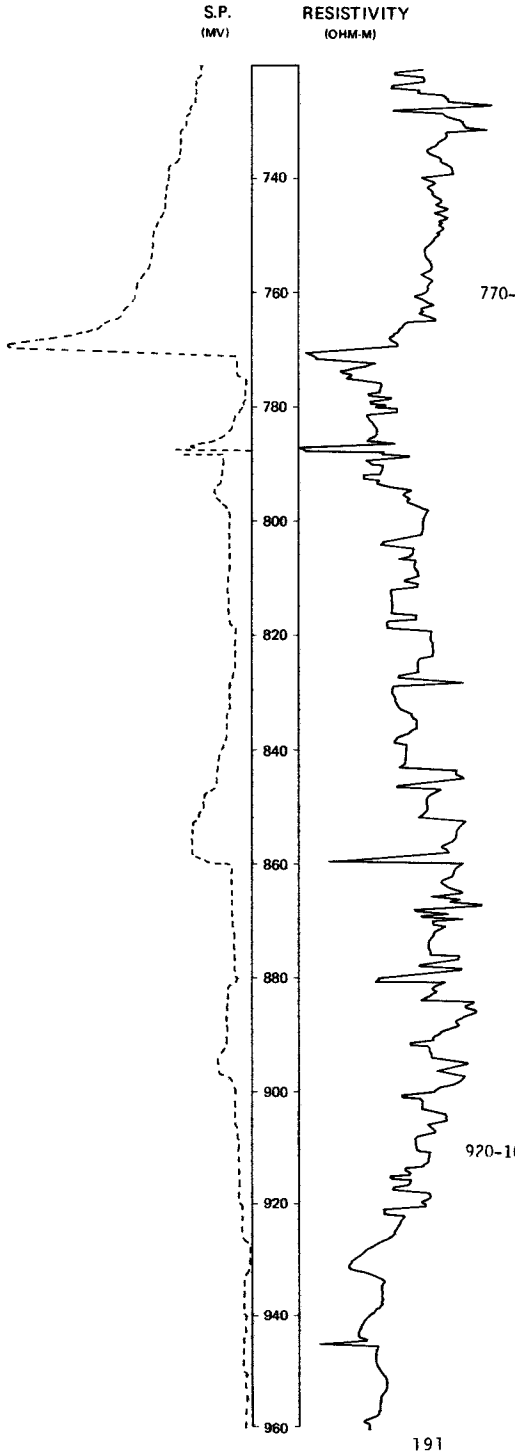
NDSWC 8903, continued

LOCATION: 159-083-03CDD

DATE DRILLED: 9/26/73

ALTITUDE: 1603
(FT, NGVD)

DEPTH: 1000
(FT)



DESCRIPTION OF DEPOSITS

PIERRE SHALE

770-920 Shale, grayish-black; interbedded with very thin lenses of bentonite.

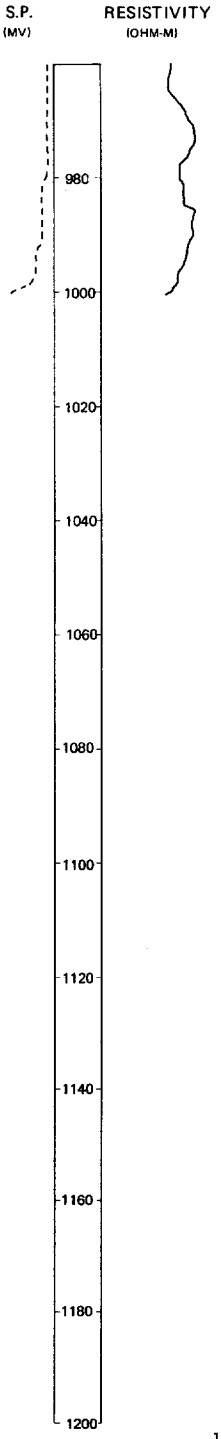
920-1000 Shale, siliceous, indurated, brittle; occasional seams of grayish-black bentonite.

LOCATION: 159-083-03CDD

DATE DRILLED: 9/26/73

ALTITUDE: 1603
(FT, NGVD)

DEPTH: 1000
(FT)



DESCRIPTION OF DEPOSITS

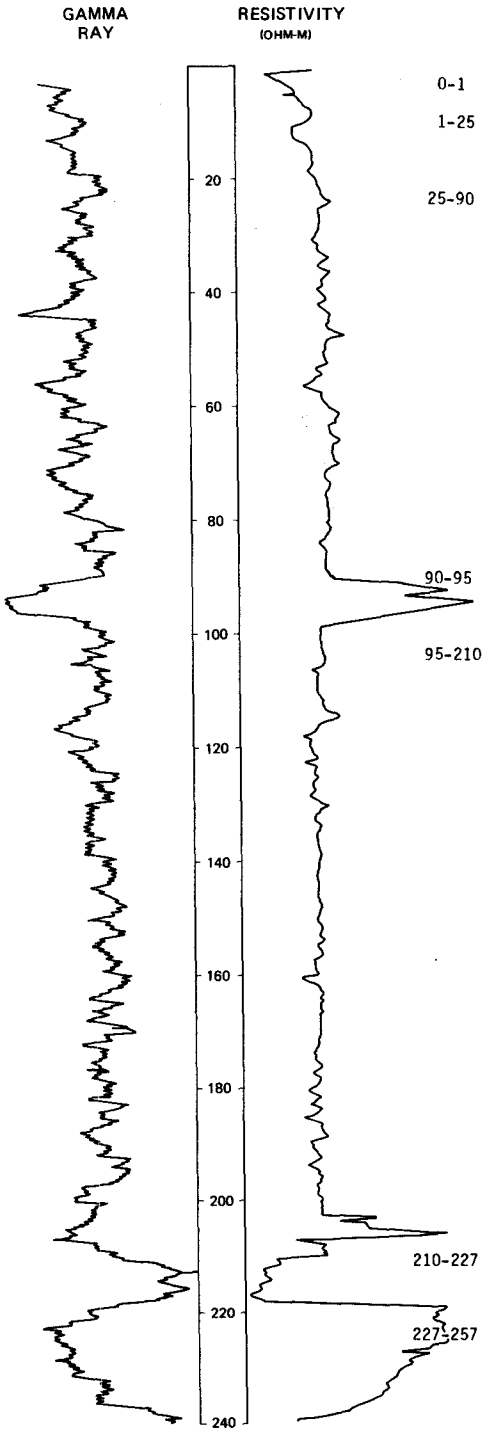
NDSWC 5559

LOCATION: 159-083-03DDD

DATE DRILLED: 9/11/79

ALTITUDE: 1602
(FT, NGVD)

DEPTH: 257
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-25	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
25-90	Clay, silty, sandy, pebbly, olive-gray.
90-95	Sand, very fine to very coarse, predominately medium, subangular to rounded.
95-210	Clay, silty, sandy, pebbly, olive-gray (till).

HELL CREEK FORMATION

210-227	Sandstone, very fine, well-rounded, olive-gray to greenish-gray.
227-257	Siltstone, sandy, olive-gray.

NDSWC 5559, continued

LOCATION: 159-083-03DDD

DATE DRILLED: 9/11/79

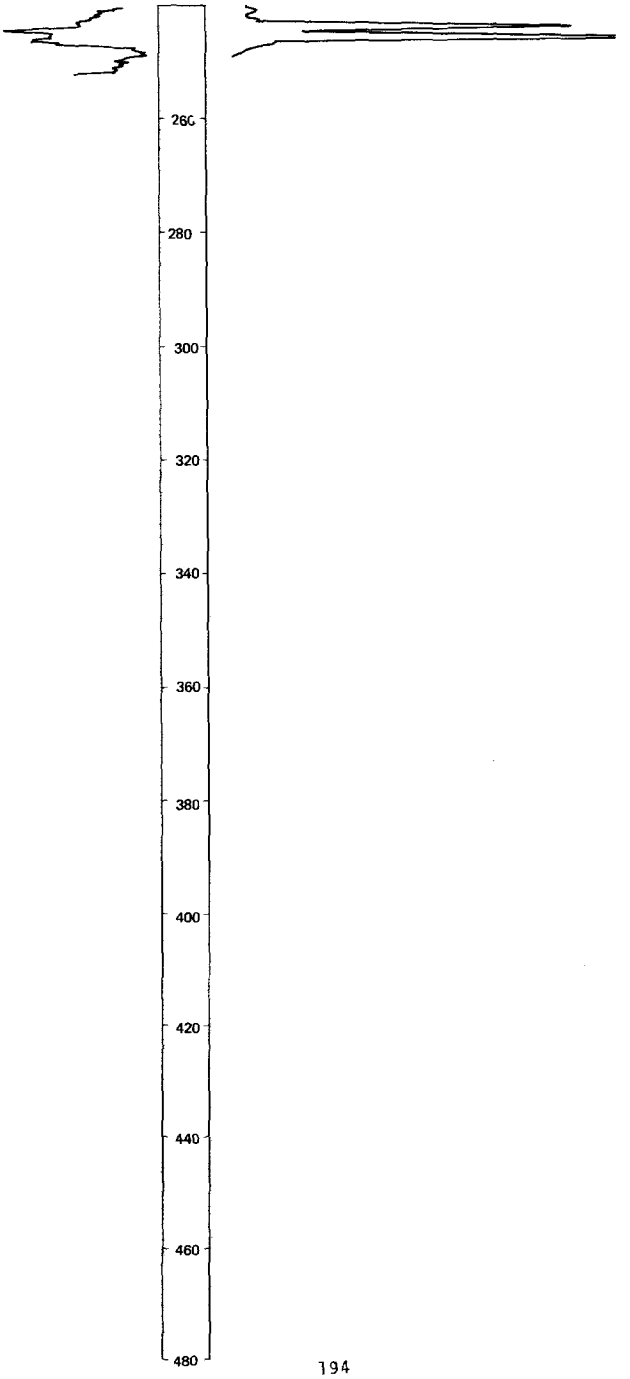
ALTITUDE: 1602
(FT, NGVD)

DEPTH: 257
(FT)

GAMMA RAY

RESISTIVITY
(OHM-M)

DESCRIPTION OF DEPOSITS



LOCATION: 159-083-03DDD

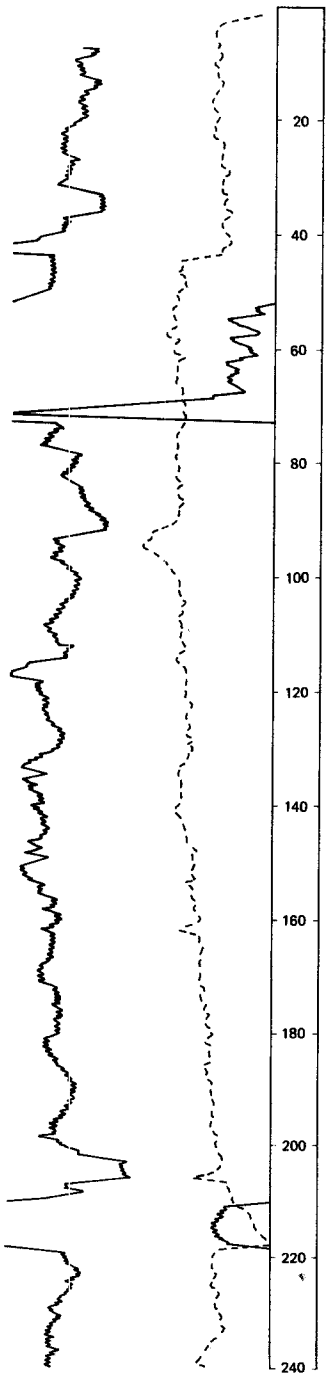
DATE DRILLED: 9/11/79

ALTITUDE: 1602
(FT, NGVD)

DEPTH: 257
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

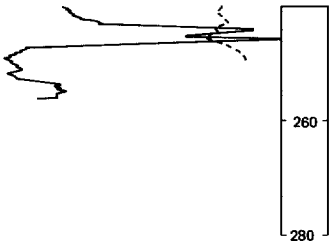
LOCATION: 159-083-03DDD

DATE DRILLED: 9/11/79

ALTITUDE: 1602
(FT, NGVD)

DEPTH: 257
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

159-083-04DBB
NDSWC 8
(Log from Froelich, 1966)

Altitude: 1591 feet

Date drilled: 1966

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil; sandy loam; black----------	1	1
	Gravel, fine and medium, sandy; with coarse gravel; moderately sorted; subangular and subrounded; moderately rusty; mostly granitic particles with limestone and shale----------	7	8
	Clay, silty and sandy; with pebbles; yellowish gray; soft; moderately soft and cohesive; oxidized (till)----------	3	11

159-083-04DDC
NDSWC 5
(Log from Froelich, 1966)

Altitude: 1620 feet

Date drilled: 1966

Glacial drift:			
	Gravel, fine to medium, very sandy, rusty-brown, moderately sorted, subangular and subrounded----------	4	4
	Clay, silty and sandy; with pebbles; yellowish gray; soft; slightly to moderately cohesive; oxidized (till)----------	8	12
	Clay, silty to sandy; with pebbles; olive gray; moderately soft; cohesive; unoxidized (till)----------	9	21

159-083-05AAD
NDSWC 4
(Log modified from Froelich, 1966)

Altitude: 1590 feet — Date drilled: 7/08/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil; sandy loam; black	2	2
	Gravel, fine and medium, sandy, moderately well sorted, subangular and subrounded, rusty	4	6
	Sand, fine and medium; interbedded with clay and silt; soft; lignitic; drills easy	7	13
	Clay, silty, olive-gray, soft, smooth	4	17
	Clay, sandy; with pebbles and occasional sand and gravel lenses; olive gray; soft; moderately cohesive; cuttings are quite small (till)	49	66
	Gravel, fine to medium, sandy, well-sorted, subangular and subrounded, clean	4	70
	Till, clay, sandy; with pebbles and occasional sand and gravel lenses; olive gray; soft; moderately cohesive; cuttings are quite small	11	81
	Clay, very sandy; with numerous pebbles and frequent cobbles or boulders; also thin lenses of silty clay; sandy clay; loose fine- to medium-grained sand and gravel; olive gray; moderately soft; cohesive (till); drills tight and slow	62	143
	Silt, clayey to sandy, tight, olive-gray, soft, moderately cohesive; interbedded	8	151
	Clay, silty to very sandy; with pebbles; some gravel and occasional rocks; olive gray; moderately soft; cohesive; tightly compacted (till)	52	203
	Sand, fine to medium, slightly clayey; with coarse sand grains and pebbles; light olive gray to olive gray; slightly cohesive; friable and brittle (till); drills tight; cuttings are large and square or rectangular in shape	22	225
	Till, sand, fine to medium, slightly clayey; with coarse sand grains and pebbles; light olive gray to olive gray; slightly cohesive; friable and brittle; with much bedrock included; mainly olive black; oily; plastic clay and greenish-gray sandy clay; occasional rock	24	249
Hell Creek Formation:			
	Sand, fine-grained, light-greenish-gray to greenish-gray, well-sorted, subangular, soft, friable, frosted	15	264

159-083-08BBB
NDSWC 8896

Altitude: 1628 feet — Date drilled: 9/13/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	26	26
	Clay, sandy, pebbly, olive-gray (till)	11	37
	Gravel, fine to coarse, poorly sorted, angular to subrounded	2	39
	Clay, silty, sandy, pebbly, olive-gray (till)	6	45
	Sand, fine to very coarse; interbedded with thin lenses of silty clay; about 20 percent fine subangular to subrounded gravel	13	58
	Clay, sandy, pebbly, olive-gray (till)	16	74
	Gravel, fine; occasional thin lenses of clay; predominately granitic, carbonate, and detrital shale pebbles; about 30 percent fine to medium angular to subrounded sand	6	80
	Clay, sandy, pebbly, olive-gray (till)	170	250
Hell Creek Formation:			
	Sandstone, fine, clayey, friable, dark-greenish-gray	10	260

159-083-10CDA1
NDSWC 18
(Log modified from Froelich, 1966)

Altitude: 1591 feet — Date drilled: 7/15/65

Glacial drift:			
	Topsoil; sandy loam; black	1	1
	Gravel, fine and medium, sandy, moderately sorted, subrounded, rusty	2	3
	Clay, silty and very sandy, soft, slightly cohesive, oxidized (till)	7	10
	Clay, silty and sandy; with pebbles; dusky yellow to light olive gray; soft; moderately cohesive; partially oxidized (till)	11	21
	Clay, silty and sandy; with pebbles; olive gray; soft; cohesive (till)	13	34
	Sand, coarse, well-sorted, subangular to subrounded; caves rapidly; takes water	3	37
	Clay, silty to sandy; with pebbles; olive gray; moderately soft; cohesive; tight drilling	82	119
	Clay, sandy; with pebbles and occasional thin sand or gravel lenses; olive gray; moderately soft; cohesive; drills tight and uniform	92	211
Hell Creek Formation:			
	Shale, olive-black, moderately soft to slightly hard, massive, cohesive, smooth, very tight, noncalcareous	21	232
	Sand, fine, greenish-gray, soft, friable, frosted	10	242

159-083-10CDA2
NDSWC 17
(Log from Froelich, 1966)

Altitude: 1587 feet — Date drilled: 7/14/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil; sandy loam; black	1	1
	Gravel, fine and medium, sandy, moderately sorted, subangluar and subrounded, very rusty	3	4
	Clay, silty and sandy; with pebbles; yellowish gray to dusky yellow; soft; cohesive; moderately plastic; oxidized (till)	13	17
	Sand, light-olive-gray, medium to very coarse; some gravel; well sorted; generally subrounded; mainly granitic particles with limestone, shale, and lignite; takes water	11	28
	Clay, silty and sandy; with pebbles; olive gray; moderately soft; cohesive, unoxidized (till)	14	42

159-083-10DDA
(Log modified from Mariner Drilling Service)

Altitude: 1590 feet — Date drilled: 8/16/72

	Surface	1	1
	Clay, yellow	27	28
	Clay, blue	116	144
	Sand; little water	2	146
	Clay, blue	76	222
	Hardpan	1	223
	Clay and sand, hard, black	22	245
	Sand, fine, black; water	2	247

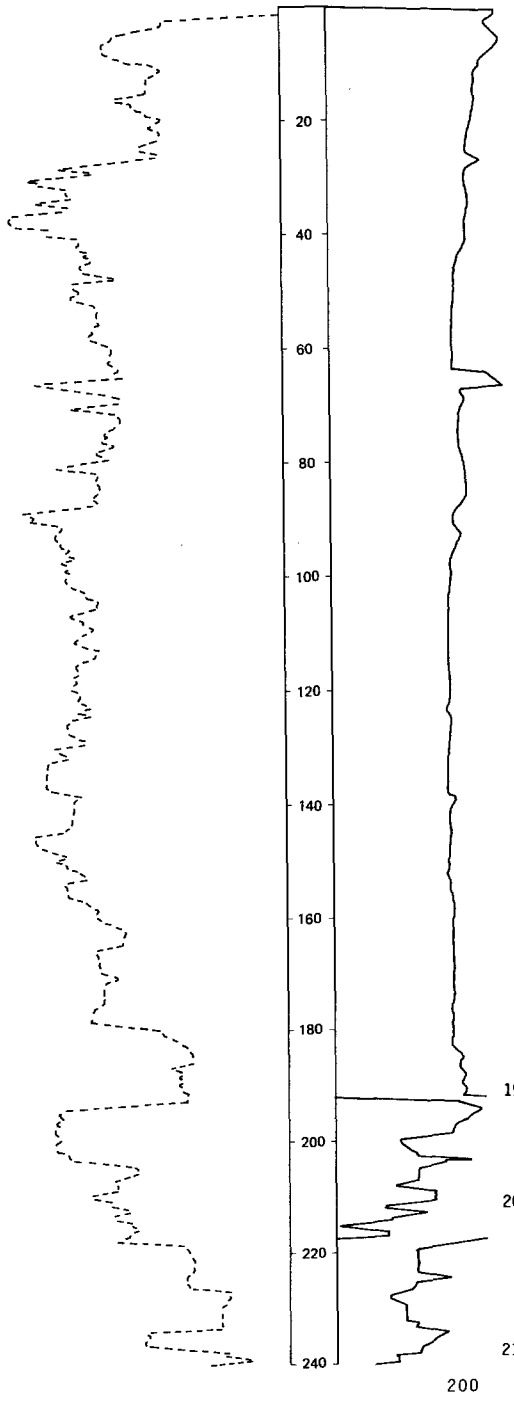
NDSWC 11042

LOCATION: 159-083-11AAA

DATE DRILLED: 8/28/79

ALTITUDE: 1585 (FT, NGVD)

DEPTH: 260 (FT)



200

DESCRIPTION OF DEPOSITS

0-1	Soil.
1-15	Clay, silty, sandy, yellowish-brown (till).
15-27	Clay, silty, sandy, olive-gray (till).
27-30	Sand, fine to coarse, oxidized.
30-46	Clay, silty, sandy, brownish-gray to medium-dark-gray (till).
46-80	Clay, silty, sandy, pebbly, dark-gray (till).
80-192	Clay, silty, sandy, pebbly, dark-gray (till); contains thin beds of sand and gravel; lignite scattered throughout.
192-204	Sand, fine to coarse; composed of 50 percent quartz, 20 percent carbonate, 20 percent shale, and 10 percent lignite grains.
204-218	Clay, yellowish-brown to grayish-brown; interbedded with sand pebbles and small boulders; detrital lignite scattered throughout.

HELL CREEK FORMATION

218-246	Shale, silty, sandy, carbonaceous, dark-gray.

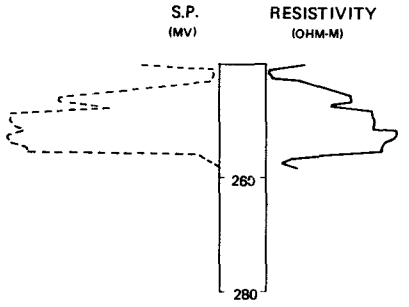
NDSWC 11042, continued

LOCATION: 159-083-11AAA

DATE DRILLED: 8/28/79

ALTITUDE: 1585
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

246-260 Sandstone, very fine, carbonaceous, friable, medium-gray to brownish-gray.

159-083-11CCC1
NDSWC 19
(Log from Froelich, 1966)

Altitude: 1585 feet

Date drilled: 7/15/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil; gravelly loam; dark brown----------	1	1
	Sand, clayey, dusky-yellow, limey----------	1	2
	Gravel, fine and medium, very sandy, tan, well-sorted, subrounded, clean; takes water----------	7	9
	Clay, silty; with sand grains and pebbles; olive gray; moderately soft; cohesive, tight (till)----------	33	42

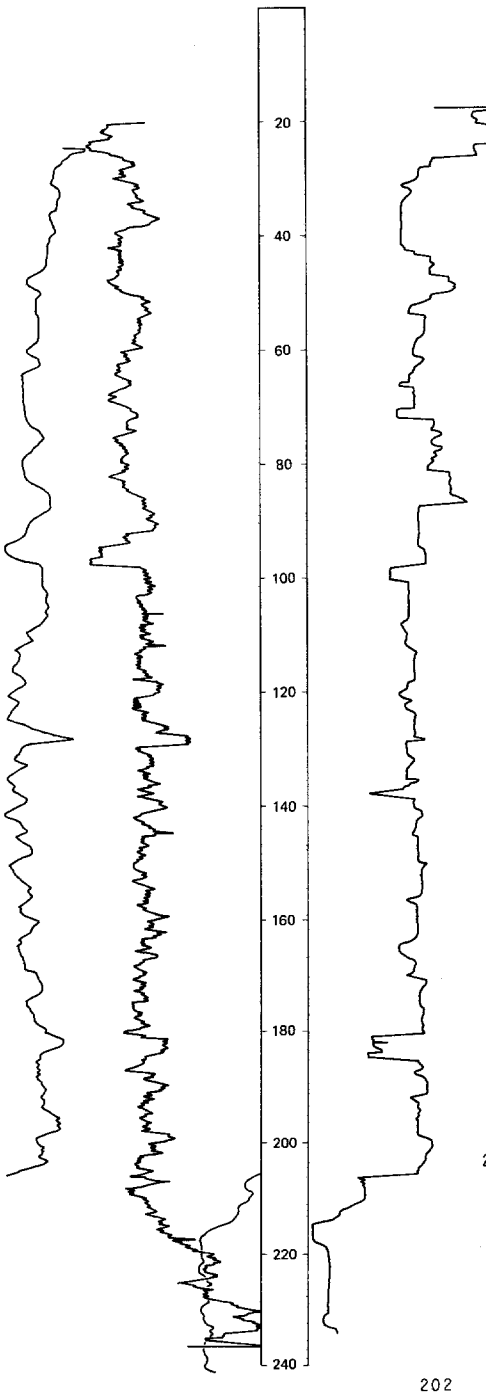
NDSWC 5558

LOCATION: 159-083-18AAA

DATE DRILLED: 9/07/79

ALTITUDE: 1622
(FT, NGVD)

DEPTH: 242
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-5	Sand and gravel.
5-15	Clay, sandy, silty, pebbly, yellowish-brown (till).
15-144	Clay, sandy, silty, pebbly, olive-gray (till).
144-206	Clay, sandy, silty, pebbly, olive-gray (till); contains a few sand lenses about 6 inches thick.

HELL CREEK FORMATION

206-242	Sandstone, predominately very fine, rounded to subrounded, carbonaceous, olive-gray to greenish-gray; becomes silty with depth.

159-083-22BCC
NDSWC 8899

Altitude: 1625 feet — Date drilled: 9/14/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	25	25
	Clay, silty, sandy, pebbly, olive-gray (till)----------	75	100
	Clay, silty, pebbly, olive-gray (till); interbedded with thin lenses of sand----------	100	200
Hell Creek Formation:			
	Shale, dark-gray to brownish-gray; interbedded with thin lenses of moderately indurated light-brownish-gray siltstone----------	20	220

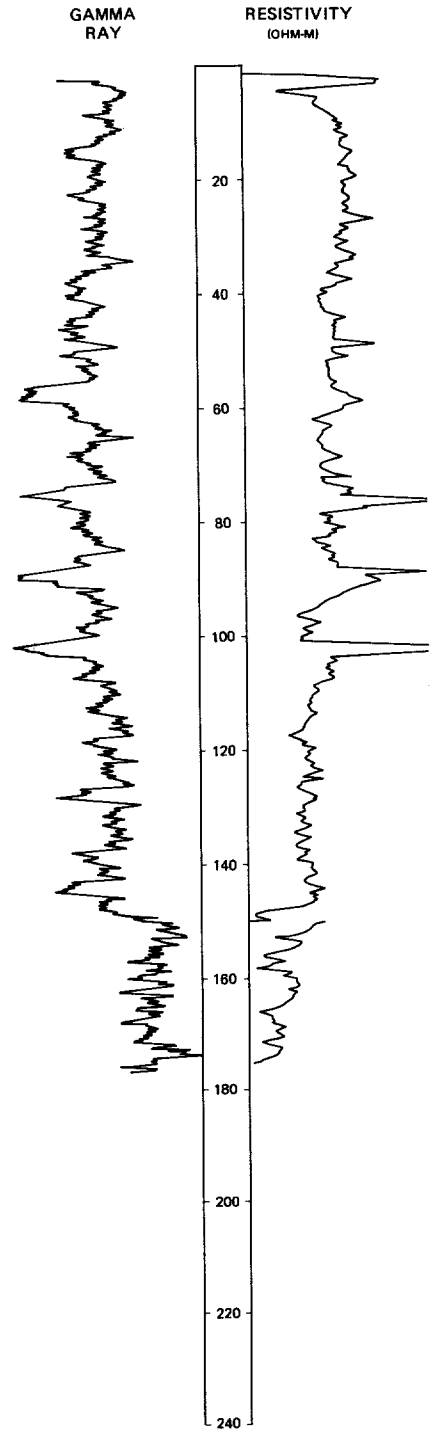
NDSWC 5661

LOCATION: 160-069-06DDD

DATE DRILLED: 10/17/79

ALTITUDE: 1732
(FT, NGVD)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

0-3	Soil.
3-10	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
10-20	Clay, silty, sandy, pebbly, brown, partially oxidized (till).
20-74	Clay, silty, sandy, pebbly, olive-gray (till).
74-78	Sand, fine to very coarse, predominately medium to coarse; contains about 10 percent fine gravel.
78-150	Clay, silty, sandy, pebbly, olive-gray (till).

PIERRE SHALE

150-182	Shale, brittle, black.

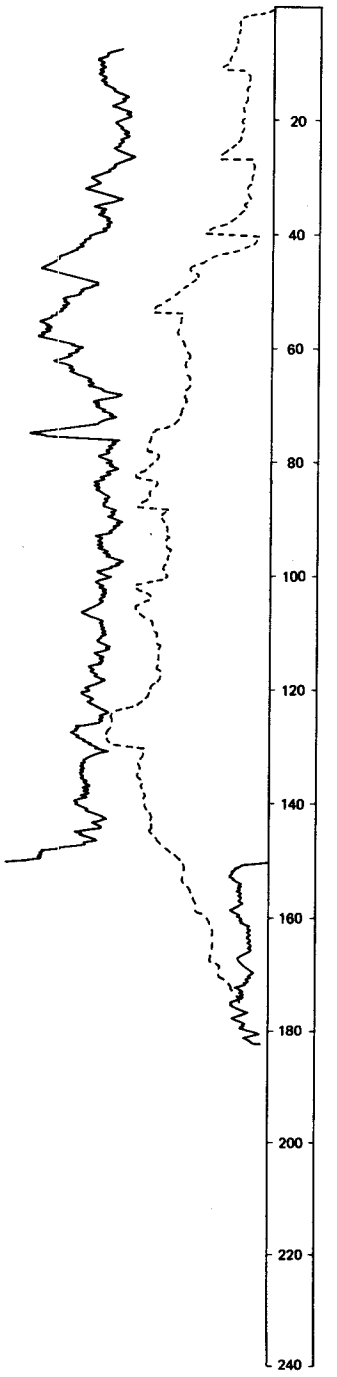
LOCATION: 160-069-06DDD

DATE DRILLED: 10/17/79

ALTITUDE: 1732
(FT, NGVD)

DEPTH: 182
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

160-069-09BCC
(Log from Church Well Boring)

Altitude: 1740 feet — Date drilled: 7/31/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, black	1	1
	Clay, yellow	6	7
	Clay, sandy, yellow	6	13
	Sand, coarse	6	19
	Clay, sandy, yellow	8	27
	Clay, dark-yellow	3	30
	Clay, blue	8	38

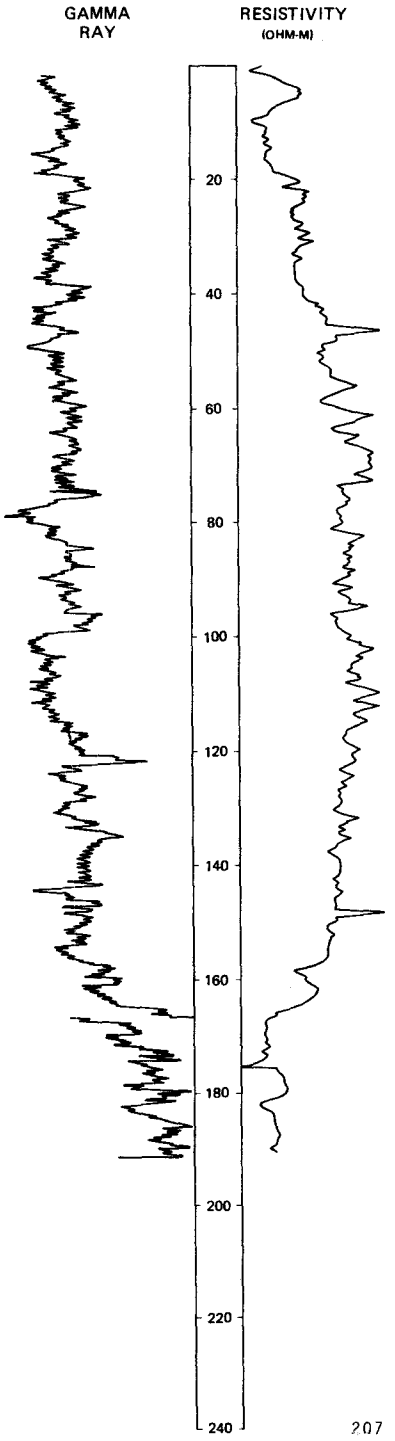
NDSWC 5659

LOCATION: 160-069-15DDD

DATE DRILLED: 10/17/79

ALTITUDE: 1715
(FT, NGVD)

DEPTH: 197
(FT)



DESCRIPTION OF DEPOSITS

0-20	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
20-122	Clay, silty, sandy, pebbly, light-olive-gray to grayish-olive (till).
122-167	Clay, silty, slightly sandy, dark-olive-gray to blackish-gray (till); drilled harder than overlying till.

PIERRE SHALE

167-197	Shale, siliceous, brittle, black.

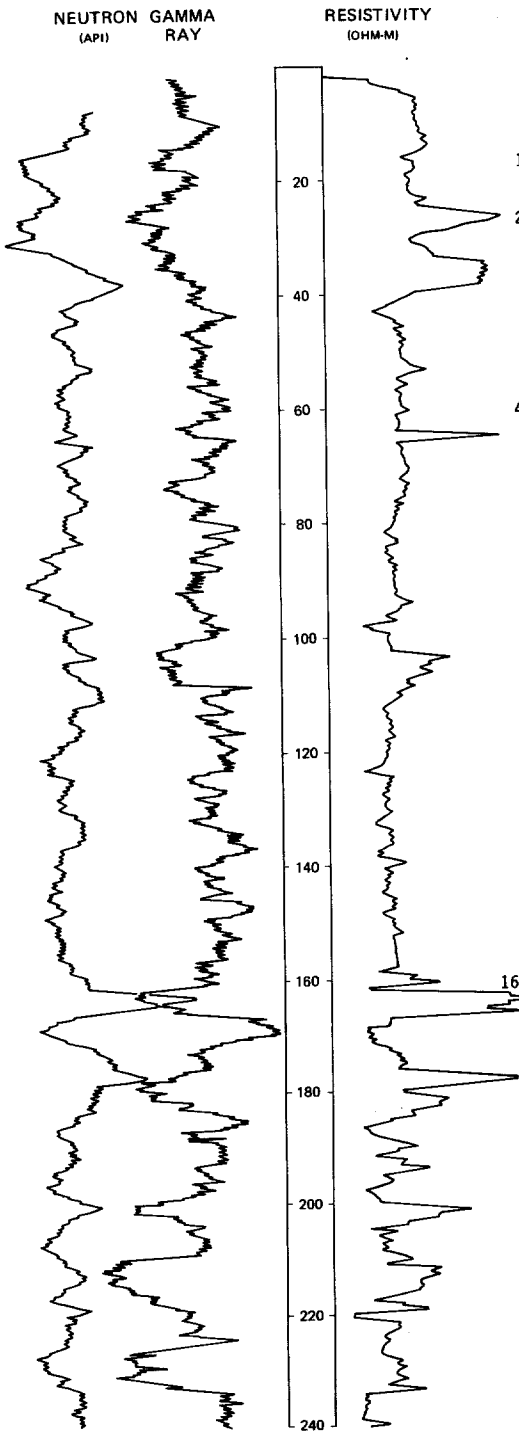
NDSWC 5660

LOCATION: 160-069-16ABB

DATE DRILLED: 10/17/79

ALTITUDE: 1730
(FT, NGVD)

DEPTH: 332
(FT)



DESCRIPTION OF DEPOSITS

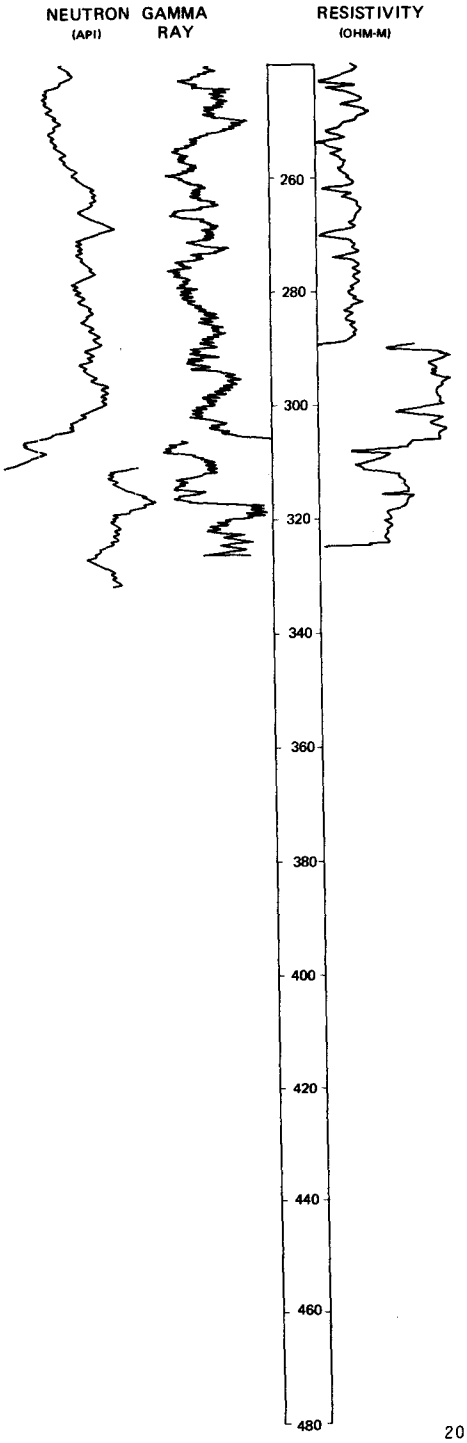
0-15	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
15-25	Clay, silty, sandy, pebbly, olive-gray (till).
25-40	Sand, very fine to very coarse, predominately medium, generally subrounded; contains about 10 percent fine gravel; composed of about 50 percent quartz, 30 percent carbonate and igneous, and 10 percent shale grains.
40-160	Clay, silty, sandy, pebbly, olive-gray (till).
160-307	Clay, silty, sandy, pebbly, dark-gray (till); contains a few sand and gravel lenses; drills harder than overlying till interval.

LOCATION: 160-069-16ABB

DATE DRILLED: 10/17/79

ALTITUDE: 1730
(FT, NGVD)

DEPTH: 332
(FT)



DESCRIPTION OF DEPOSITS

PIERRE SHALE

307-332 Shale, brittle, black; contains slight amount of sand.

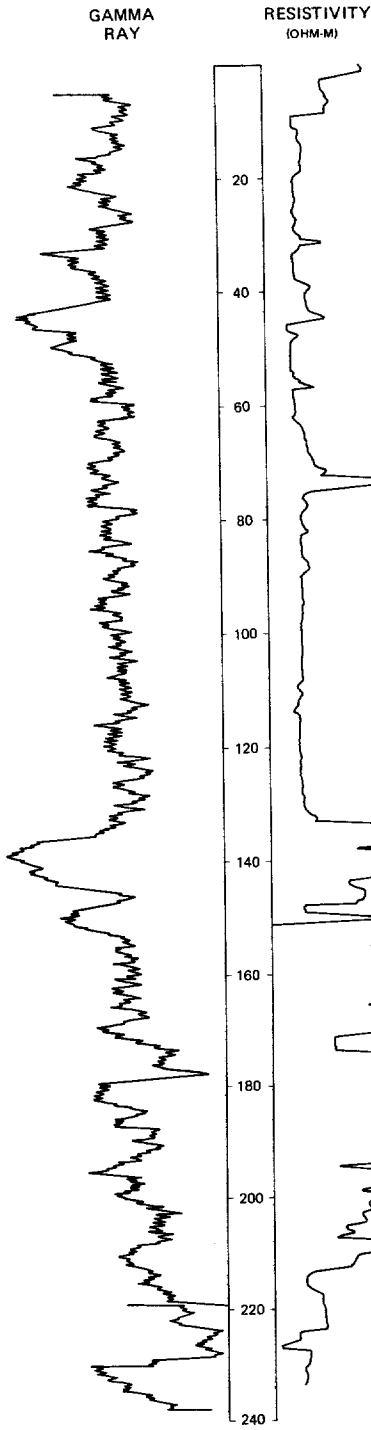
NDSWC 5530

LOCATION: 160-069-27ACD

DATE DRILLED: 8/20/79

ALTITUDE: (FT, NGVD) 1695

DEPTH: (FT) 242



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-15	Clay, very silty, sandy, pebbly, yellowish-brown, oxidized (till).
15-41	Clay, very silty, sandy, pebbly, olive-gray (till).
41-47	Sand, very fine to very coarse, predominately very coarse, rounded to angular; contains about 20 percent fine to medium gravel; composed of about 35 percent shale, 30 percent carbonate, and 30 percent silicate grains.
47-134	Clay, sandy, pebbly, olive-gray (till).
134-152	Sand and gravel; from geophysical logs.
152-213	Clay, very sandy, pebbly, olive-gray (till); contains a few thin sand and gravel lenses.

PIERRE SHALE

213-242	Shale, slightly sandy, brittle, black.

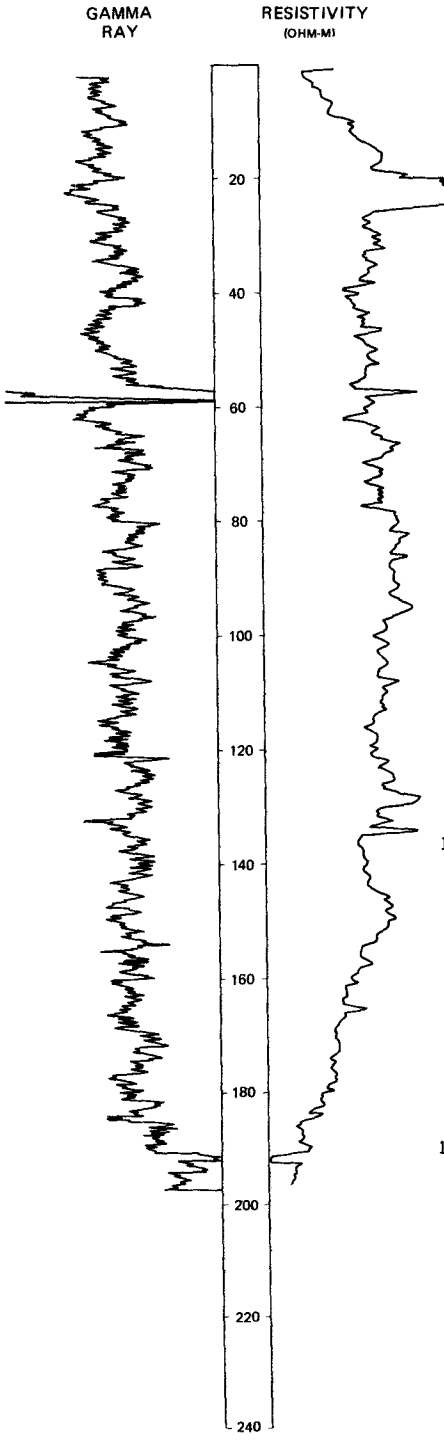
NDSWC 5658

LOCATION: 160-069-29AAA

DATE DRILLED: 10/16/79

ALTITUDE: 1695
(FT, NGVD)

DEPTH: 203
(FT)



DESCRIPTION OF DEPOSITS

0-2	Soil.
2-15	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
15-137	Clay, silty, sandy, pebbly, olive-gray (till); contains thin sand and gravel lenses.
137-191	Clay, silty, sandy, pebbly, dark-olive-gray (till); hard drilling.

PIERRE SHALE

191-203	Shale, fractured, brittle, blocky, black; lost circulation.

160-069-31CAA
USGS 429
(Log from Brookhart and Powell, 1961)

Altitude: 1660 feet — Date drilled: 6/13/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	18	19
	Silt, sandy and pebbly, clayey, gray; probably till but may be in part lacustrine deposits	15	34
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	79	113
Pierre Shale:			
	Shale, gray	7	120

160-069-31CAB2
USGS 428
(Log modified from Brookhart and Powell, 1961)

Altitude: 1650 feet — Date drilled: 6/13/51

Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Clay, sandy, light-brown, and fine gravel	1	3
	Sand, very coarse, light-brown, and fine clayey gravel	1	4
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	20	24
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	79	103
Pierre Shale:			
	Shale, gray	7	110

160-069-31CAC5
USGS 425
(Log modified from Brookhart and Powell, 1961)

Altitude: 1650 feet — Date drilled: 6/09/51

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	11	12
	Clay, very sandy and silty, light-brown, and fine to medium gravel	4	16
	Sand, very fine to very coarse, and fine clayey gravel and shale fragments	26	42
	Gravel, fine to medium, and medium to very coarse sand	8	50
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	56	106
Pierre Shale:			
	Shale, gray	14	120

160-069-31CAC6
USGS 430
(Log from Brookhart and Powell, 1961)

Altitude: 1650 feet — Date drilled: 6/15/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	26	26
	Silt, sandy and pebbly, clayey, gray; probably till but may be in part lacustrine deposits	19	45
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	67	112
Pierre Shale:			
	Shale, gray	8	120

160-069-31CAD1
USGS 431
(Log from Brookhart and Powell, 1961)

Altitude: 1645 feet — Date drilled: 6/15/51

Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	17	19
	Clay, sandy and silty, gray, and fine to medium gravel and shale pebbles	87	106
Pierre Shale:			
	Shale, gray	4	110

160-069-31CAD2
USGS 436
(Log from Brookhart and Powell, 1961)

Altitude: 1645 feet — Date drilled: 6/21/51

Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	20	22
	Silt, sandy and pebbly, clayey, gray; probably till but may be in part lacustrine deposits	16	38
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	56	94
Pierre Shale:			
	Shale, gray	6	100

160-069-31CAD3
USGS 437
(Log from Brookhart and Powell, 1961)

Altitude: 1645 feet — Date drilled: 6/22/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	27	27
	Silt, sandy and pebbly, clayey, gray; probably till but may be in part lacustrine deposits	15	42
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	70	112
Pierre Shale:			
	Shale, gray	8	120

160-069-31CBA
USGS 434
(Log from Brookhart and Powell, 1961)

Altitude: 1650 feet — Date drilled: 6/19/51

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	22	23
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	77	100
Pierre Shale:			
	Shale, gray	10	110

160-069-31CBC
USGS 435
(Log from Brookhart and Powell, 1961)

Altitude: 1650 feet — Date drilled: 6/20/51

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, very sandy, light-brown, and fine gravel	3	4
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	13	17
	Silt, sandy and pebbly, clayey, gray; probably till but may be in part lacustrine deposits	48	65
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	37	102
Pierre Shale:			
	Shale, gray	8	110

160-069-31CCA2
USGS 433
(Log from Brookhart and Powell, 1961)

Altitude: 1640 feet — Date drilled: 6/18/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, very sandy, light-brown, and fine gravel and shale pebbles	17	18
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	76	94
Pierre Shale:			
	Shale, gray	6	100

160-069-31CDA
USGS 438
(Log from Brookhart and Powell, 1961)

Altitude: 1650 feet — Date drilled: 6/25/51

Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Clay, silty, light-brown, and very fine sand	3	5
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	9	14
	Silt, sandy and pebbly, clayey, gray; probably till but may be in part lacustrine deposits	14	28
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	66	94
Pierre Shale:			
	Shale, gray	6	100

160-069-31CDB3
USGS 426
(Log from Brookhart and Powell, 1961)

Altitude: 1645 feet — Date drilled: 6/11/51

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	16	17
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	87	104
Pierre Shale:			
	Shale, gray	6	110

160-069-31CDC
USGS 427
(Log from Brookhart and Powell, 1961)

Altitude: 1650 feet — Date drilled: 6/12/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	11	12
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	83	95
Pierre Shale:			
	Shale, gray	10	105

160-069-31DCB
USGS 432
(Log from Brookhart and Powell, 1961)

Altitude: 1645 feet — Date drilled: 6/18/51

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, very sandy, light-brown, and coarse gravel	3	4
	Silt, sandy and pebbly, clayey, light-brown; probably till but may be in part lacustrine deposits	12	16
	Silt, sandy and pebbly, clayey, gray; probably till but may be in part lacustrine deposits	15	31
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	62	93
Pierre Shale:			
	Shale, gray	7	100

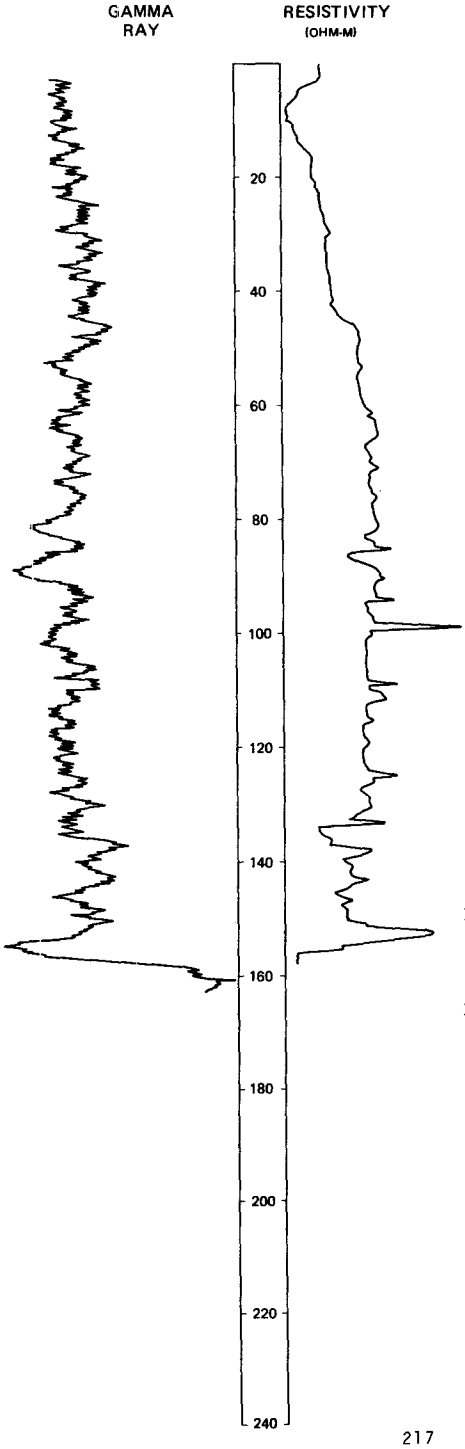
NDSWC 5529

LOCATION: 160-069-36DDD

DATE DRILLED: 8/20/79

ALTITUDE: 1665
(FT, NGVD)

DEPTH: 167
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-23	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
23-88	Clay, silty, sandy, pebbly, olive-gray (till).
88-90	Sand, predominately coarse.
90-152	Clay, silty, sandy, pebbly, olive-gray (till).
152-155	Sand, gravelly, predominately rounded.
	PIERRE SHALE
155-167	Shale, black; contains a few sand grains.

160-070-02CDD
(Log from Church Well Boring)

Altitude: 1720 feet — Date drilled: 9/17/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, black	1	1
	Clay, yellow	11	12
	Clay, yellow and blue	11	23
	Clay, blue	7	30
	Clay, sandy, blue, and streaks of sand; water from 38 to 40 feet	11	41
	Clay, blue	2	43
	Clay, sandy, blue	8	51
	Clay, blue	41	92
	Sand, blue	1	93

160-070-02DCC1
(Log from C. A. Simpson & Son)

Altitude: 1720 feet — Date drilled: 8/15/73

	Soil	1	1
	Clay, yellow	29	30
	Clay, blue	63	93
	Gravel	1	94
	Clay, blue	7	101
	Clay, sandy, blue, and rocks; about 1/3 gallon per minute	9	110
	Clay, blue	24	134

160-070-02DCC2
(Log from C. A. Simpson & Son)

Altitude: 1720 feet — Date drilled: 8/17/73

	Soil	1	1
	Clay, yellow	29	30
	Clay, blue	32	62
	Clay, sandy, mushy, blue; trace of water	7	69
	Clay, blue	18	87
	Gravel	6	93
	Gravel, very coarse; 2 gallons per minute	2	95
	Clay, very gravelly, blue	7	102
	Sand; 1/2 gallon per minute	2	104
	Clay, gravelly, blue	21	125

160-070-12BCC1
(Log from C. A. Simpson & Son)

Altitude: 1695 feet — Date drilled: 8/23/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Gravel	16	17
	Clay, gravelly, blue	3	20
	Clay, blue	6	26

160-070-12BCC2
(Log from C. A. Simpson & Son)

Altitude: 1695 feet — Date drilled: 8/23/73

	Soil	1	1
	Gravel	12	13
	Clay, gravelly, blue	12	25
	Gravel	8	33
	Clay, blue	2	35
	Gravel, shaly; 4 gallons per minute	5	40
	Gravel, coarse	7	47

160-070-20CCC
NDSWC 5532

Altitude: 1610 feet — Date drilled: 8/21/79

	Soil	1	1
	Clay, very silty, slightly sandy, yellowish-brown, oxidized	16	17
	Clay, sandy, silty, pebbly, olive-gray (till)	28	45
	Sand, predominately coarse, rounded; contains about 10 percent gravel	6	51
Fox Hills Sandstone:			
	Siltstone, slightly sandy, brittle, light-olive-gray	26	77

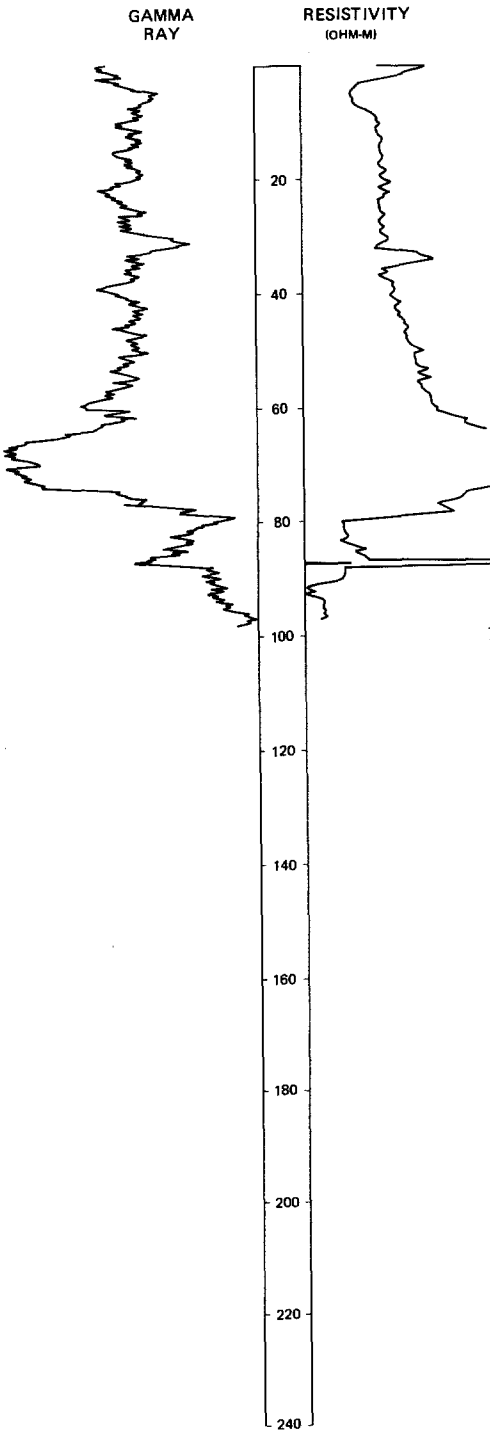
NDSWC 5657

LOCATION: 160-070-23DDD

DATE DRILLED: 10/16/79

ALTITUDE: 1660 (FT, NGVD)

DEPTH: 107 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-12	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
12-66	Clay, silty, sandy, pebbly, olive-gray (till).
66-77	Sand, predominately medium to coarse; contains about 30 percent fine to medium gravel and thin olive-gray clay lenses; composed of about 45 percent silicate, 30 percent carbonate, and 25 percent shale grains.

FOX HILLS SANDSTONE

77-107	Siltstone, sandy, carbonaceous, greenish-gray to olive-gray to brown.

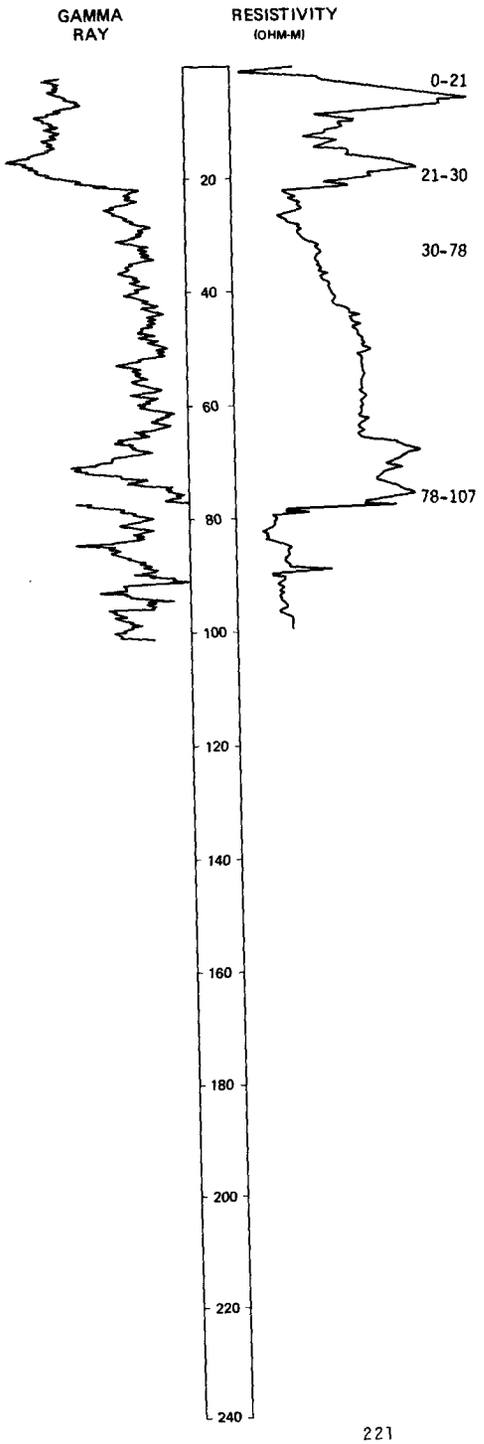
NDSWC 5656

LOCATION: 160-070-27BBB

DATE DRILLED: 10/16/79

ALTITUDE: 1650
(FT, NGVD)

DEPTH: 107
(FT)



DESCRIPTION OF DEPOSITS

0-21	Sand, predominately coarse, rounded; contains about 10 percent fine yellowish-brown oxidized gravel.
21-30	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
30-78	Clay, silty, sandy, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
78-107	Siltstone, slightly sandy, brittle, light-olive-gray.

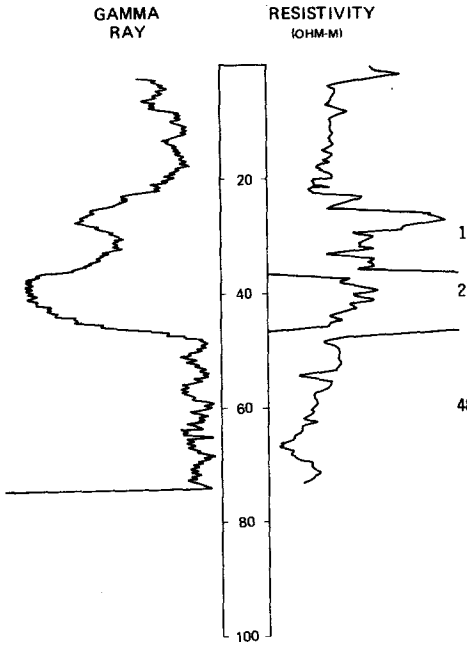
NDSWC 5802

LOCATION: 160-070-30CDD

DATE DRILLED: 10/01/80

ALTITUDE: 1610 (FT, NGVD)

DEPTH: 81 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-15 Clay, very silty, sandy, yellowish-brown, oxidized (till).

15-23 Clay, very silty, sandy, pebbly, olive-gray (till).

23-48 Silt, argillaceous, greenish-gray; interbedded with fine to coarse rounded sand.

FOX HILLS SANDSTONE

48-81 Siltstone, bentonitic, argillaceous, carbonaceous, greenish-gray; interbedded with very fine argillaceous poorly indurated sandstone.

160-071-02DDC
NDSWC 11429

Altitude: 1660 feet

Date drilled: 10/16/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, silty, brownish-black	3	3
	Gravel, medium to coarse; about 40 percent fine to coarse subangular to rounded sand: about 35 percent silicate, 30 percent carbonate, 25 percent detrital shale, and 10 percent quartz pebbles	4	7
	Silt, clayey, dark-yellowish-brown	2	9
Fox Hills Sandstone:			
	Siltstone, clayey, olive-gray; interbedded with fine dark-green sandstone	11	20

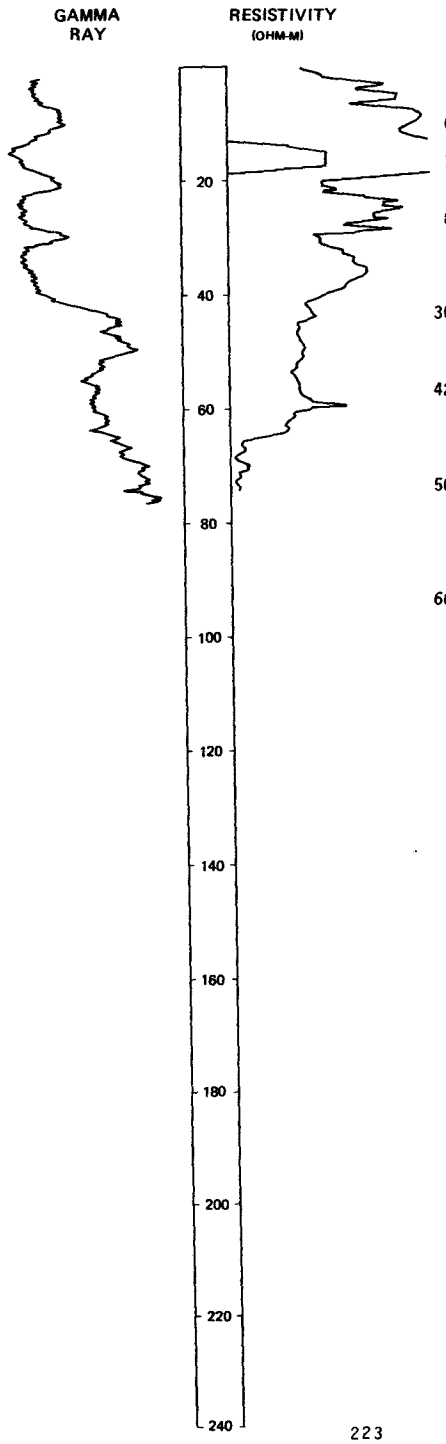
NDSWC 5792

LOCATION: 160-071-03CCC

DATE DRILLED: 9/26/80

ALTITUDE: 1685 (FT, NGVD)

DEPTH: 80 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-8	Gravel, fine to coarse, angular to rounded, oxidized.
8-30	Sand, fine to medium, rounded, oxidized; about 70 percent quartz and 30 percent carbonate grains.
30-42	Sand, fine to medium, rounded; predominately quartz with detrital lignite grains.
42-50	Silt, clayey, dark-greenish-gray.

FOX HILLS SANDSTONE

50-66	Sandstone, fine, argillaceous, greenish-gray; carbonaceous streaks; interbedded with bentonitic siltstone.
66-80	Siltstone, bentonitic, argillaceous, moderately indurated, brownish-gray.

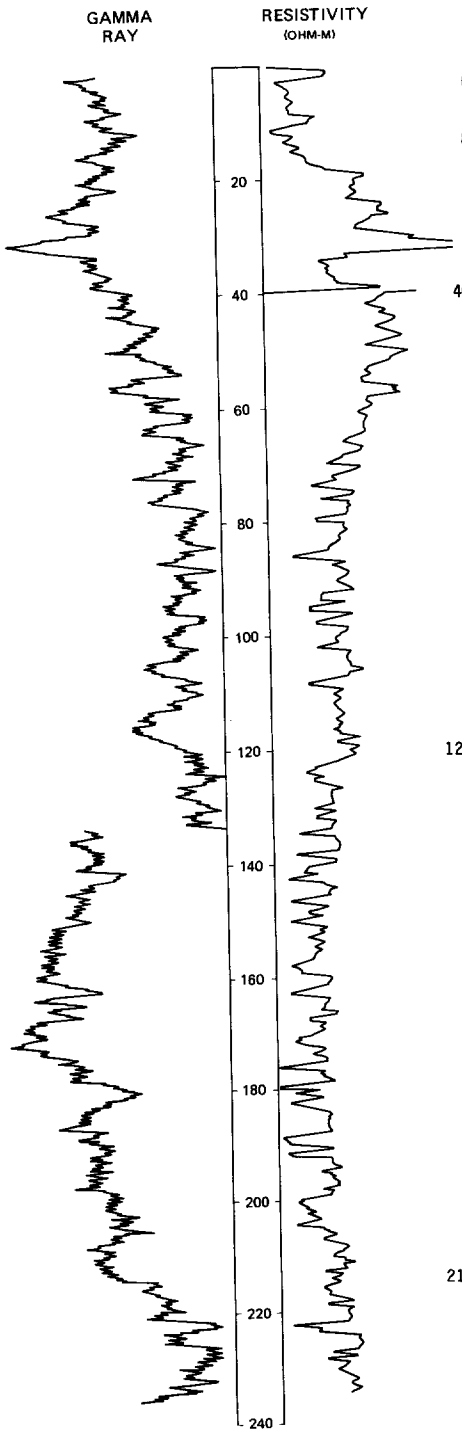
NDSWC 5599

LOCATION: 160-071-05AAA

DATE DRILLED: 10/11/79

ALTITUDE: 1655
(FT, NGVD)

DEPTH: 242
(FT)



DESCRIPTION OF DEPOSITS

0-8	Clay, very silty, sandy, yellowish-brown, oxidized.
8-40	Clay, very silty, sandy, olive-gray.
	FOX HILLS SANDSTONE
40-123	Siltstone, slightly sandy, brittle, olive-gray.
123-214	Claystone, dark-olive-gray.
	PIERRE SHALE
214-242	Shale, slightly silty, dark-olive-gray; possibly transition zone between the Pierre Shale and Fox Hills Sandstone.

160-071-05BAA
NDSWC 11408

Altitude: 1646 feet — Date drilled: 10/14/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, medium to very coarse, subrounded to rounded, oxidized; about 50 percent quartz, 30 percent silicate, and 20 percent carbonate grains	11	12
	Sand, medium to very coarse, and medium subrounded gravel to pebbles; about 45 percent silicate, 30 percent carbonate, and 25 percent quartz grains and pebbles	23	35
Fox Hills Sandstone:			
	Siltstone, argillaceous; interbedded with very fine greenish-gray sandstone	12	47

160-071-07AAA
NDSWC 11407

Altitude: 1628 feet — Date drilled: 10/14/80

Glacial drift:			
	Soil	1	1
	Sand, coarse to very coarse, subrounded to rounded, oxidized; about 50 percent quartz, 30 percent silicate, and 20 percent carbonate grains	10	11
	Sand, fine to coarse, subrounded to rounded; about 70 percent quartz, 15 percent carbonate, and 15 percent silicate grains	30	41
Fox Hills Sandstone:			
	Siltstone, clayey; interbedded with very fine indurated greenish-gray sandstone	19	60

160-071-07BBC
NDSWC 5889

Altitude: 1620 feet — Date drilled: 11/11/80

Glacial drift:			
	Soil	1	1
	Sand, coarse, and fine rounded oxidized gravel	4	5
	Sand, fine to very coarse, angular to rounded, oxidized	40	45
	Sand, fine, well-sorted, subrounded; predominately quartz with some detrital lignite grains	14	59
	Silt, olive-gray	36	95
	Sand, coarse, and fine rounded gravel	4	99
	Clay, silty to sandy, brownish-gray to greenish-gray (till)	3	102
	Gravel, fine to medium, and fine to coarse subrounded sand	14	116
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, greenish-gray	25	141

160-071-07BCC
NDSWC 5931

Altitude: 1620 feet — Date drilled: 6/03/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Sand, fine, subrounded, oxidized	11	12
	Sand, fine, subangular to rounded	8	20
	Sand, fine to medium, subrounded	18	38
	Sand, fine to very coarse, gravelly, subangular to rounded	18	56
	Silt, very clayey, olive-gray	15	71
	Sand, fine to medium, subrounded	2	73
	Silt, very clayey, dark-gray	14	87
Fox Hills Sandstone:			
	Siltstone, brownish-gray; interbedded with carbonaceous poorly indurated clay	13	100

160-071-07DDD
NDSWC 5926

Altitude: 1629 feet — Date drilled: 6/02/81

Glacial drift:			
	Topsoil	1	1
	Sand, fine, subrounded, oxidized	16	17
	Sand, fine to coarse, subangular to rounded; interbedded with lenses of silt and clay	21	38
	Silt, clayey, olive-gray	56	94
Fox Hills Sandstone:			
	Siltstone, clayey, moderately indurated, brownish-gray	26	120

160-071-14BBB
NDSWC 11430

Altitude: 1636 feet — Date drilled: 10/16/80

Glacial drift:			
	Soil, silty, brownish-black	2	2
	Sand, very fine to medium, subrounded; about 30 percent quartz, 20 percent silicate, and 20 percent carbonate and detrital shale grains	12	14
	Sand, very fine to medium; with fine to coarse gravel; predominately silicate and carbonate grains	1	15
Fox Hills Sandstone:			
	Siltstone, clayey, gray to greenish-gray	5	20

160-071-16AAA
NDSWC 5791

Altitude: 1650 feet — Date drilled: 9/26/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, and coarse rounded oxidized gravel	7	8
	Clay, very silty to sandy, pebbly, yellowish-brown, oxidized (till)	7	15
	Clay, very silty, sandy, greenish-gray; interbedded with thin lenses of gravel	15	30
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, moderately indurated, greenish-gray	10	40
	Siltstone, argillaceous, carbonaceous, brownish-gray; interbedded with fine greenish-gray sandstone	20	60

160-071-16BBB
NDSWC 11406

Altitude: 1627 feet — Date drilled: 10/10/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, very fine to very coarse, subangular; about 40 percent silicate, 30 percent carbonate, 20 percent quartz, and 10 percent detrital shale grains	14	15
	Sand, very fine to medium, slightly clayey, subrounded; about 70 percent quartz, 15 percent carbonate, and 15 percent silicate grains	38	53
	Clay, olive-gray	13	66
	Sand, very fine to fine, well-rounded; about 80 percent quartz, 10 percent carbonate, and 10 percent detrital lignite grains	68	134
	Clay, sandy, olive-gray	9	143
	Sand, very coarse, subrounded; about 50 percent quartz, 20 percent carbonate, 20 percent silicate, and 10 percent detrital shale grains	4	147
Fox Hills Sandstone:			
	Siltstone, clayey, indurated, greenish-gray	13	160

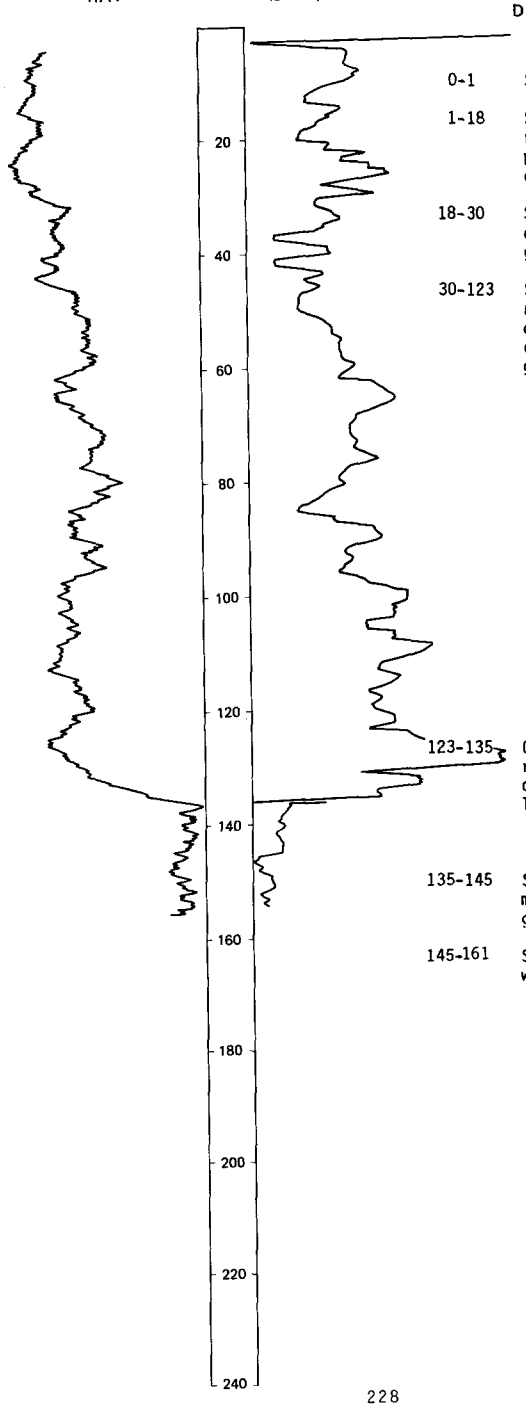
NDSWC 5790

LOCATION: 160-071-16DDD

DATE DRILLED: 9/26/80

ALTITUDE: 1635 (FT, NGVD)

DEPTH: 161 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-18	Sand, fine, well-sorted, rounded, oxidized; about 90 percent quartz and 10 percent detrital shale grains.
18-30	Sand, fine, and fine to coarse angular to rounded gravel.
30-123	Sand, fine to coarse, rounded; about 80 percent quartz and 20 percent detrital shale and carbonate grains.
123-135	Gravel, medium, angular to rounded; predominately carbonate and detrital lignite pebbles.

FOX HILLS SANDSTONE

135-145	Siltstone, argillaceous, moderately indurated, greenish-gray.
145-161	Siltstone, very argillaceous, well-indurated, dark-gray.

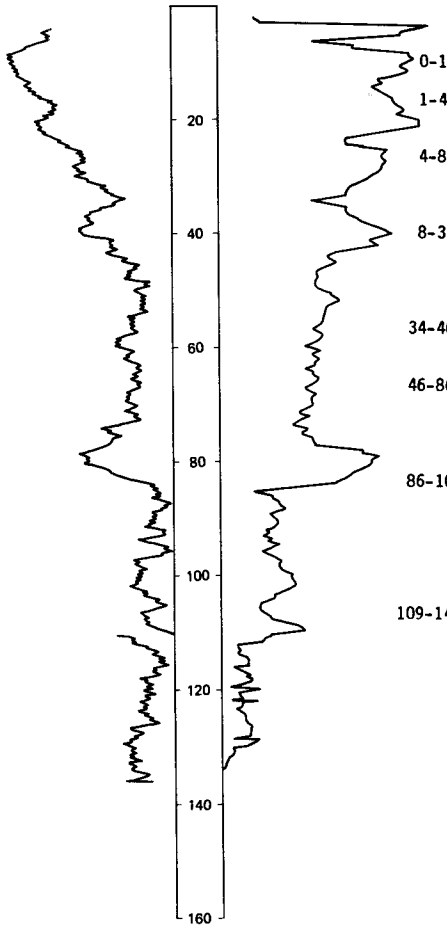
NDSWC 5788

LOCATION: 160-071-19DDD

DATE DRILLED: 9/25/80

ALTITUDE: 1615
(FT, NGVD)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-4	Silt, clayey, yellowish-brown, oxidized.
4-8	Sand, fine to coarse, and fine to medium subrounded to rounded oxidized gravel.
8-34	Sand, fine, well-sorted, rounded; about 90 percent quartz and 10 percent detrital lignite grains.
34-46	Silt, clayey, dark-greenish-gray.
46-86	Clay, silty to sandy, pebbly, greenish-gray (till).

FOX HILLS SANDSTONE

86-109	Siltstone, bentonitic, argillaceous, moderately indurated, greenish-gray.
109-140	Siltstone, very argillaceous, well-indurated, greenish-gray.

160-071-20DAD
(Log from Virg's Well Drilling)

Altitude: 1625 feet

Date drilled: 7/19/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand----------	20	20

160-071-20DBC
(Log from C. A. Simpson & Son)

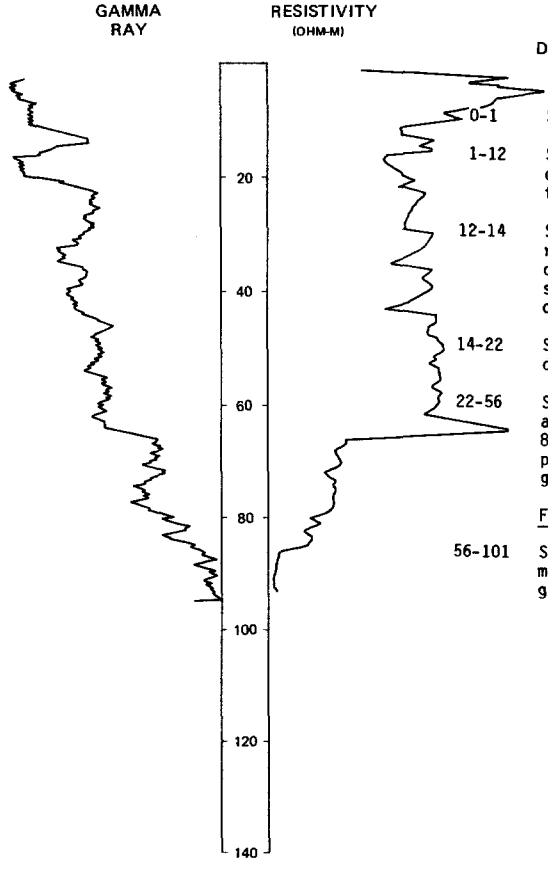
Altitude: 1620 feet — Date drilled: 9/23/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Fill----------	0.5	0.5
	Soil, black----------	2.5	3
	Clay, sandy, yellow----------	4	7
	Clay, sandy, gray----------	7	14
	Sand, fine, slightly clayey, gray----------	6	20
	Sand, fine, clayey, gray----------	12	32
	Sand, fine, slightly clayey, gray----------	6	38
	Sand, fine, clayey, gray----------	6	44
	Clay or shale, gray----------	7	51

NDSWC 5789

LOCATION: 160-071-21BBB — DATE DRILLED: 9/26/80

ALTITUDE: 1630 (FT, NGVD) — DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-12	Sand, fine to coarse, and coarse poorly sorted angular to rounded oxidized gravel.
12-14	Sand, fine, well-sorted, rounded; about 80 percent quartz, 10 percent detrital shale, and 10 percent carbonate grains.
14-22	Silt, clayey, dark-greenish-gray.
22-56	Sand, very fine to medium, angular to subrounded; about 80 percent quartz and 20 percent detrital shale grains.

FOX HILLS SANDSTONE

56-101	Siltstone, very argillaceous, moderately indurated, dark-greenish-gray.

160-071-21CCB
(Log modified from Lee's Well Drilling)

Altitude: 1640 feet — Date drilled: 3/25/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, sandy, yellow	21	21
	Clay, sandy, blue	14	35
	Sand, fine	14	49

160-071-22DDD
NDSWC 5533

Altitude: 1619 feet — Date drilled: 8/21/79

	Soil	1	1
	Sand, predominately coarse, subangular to rounded; no sorting; contains about 30 percent fine to coarse gravel	29	30
	Sand, predominately fine, silty, moderately well sorted, rounded	26	56
	Clay, very sandy, olive-gray; contains some interbedded sand	8	64
Fox Hills Sandstone:			
	Siltstone, slightly sandy, hard, olive-gray	13	77

160-071-24DDD
NDSWC 5784

Altitude: 1620 feet — Date drilled: 9/25/80

Glacial drift:			
	Soil	1	1
	Sand, fine, and fine to coarse subrounded to rounded oxidized gravel	5	6
	Silt, clayey, yellowish-brown, oxidized	8	14
	Silt, clayey, greenish-gray	7	21
	Clay, very silty, pebbly, dark-greenish-gray (till)	26	47
	Sand, fine, and fine to coarse subrounded to rounded gravel; about 45 percent quartz, 45 percent carbonate, and 10 percent detrital shale grains and pebbles	21	68
	Silt, clayey, dark-greenish-gray	31	99
	Gravel, fine to coarse, subangular to rounded; about 90 percent carbonate and detrital shale and 10 percent quartz and igneous pebbles	8	107
	Clay, silty to sandy, pebbly, dark-gray (till)	8	115
Fox Hills Sandstone:			
	Siltstone, very argillaceous, moderately indurated, greenish-gray	7	122
	Shale, silty, moderately indurated, medium-dark-gray	19	141

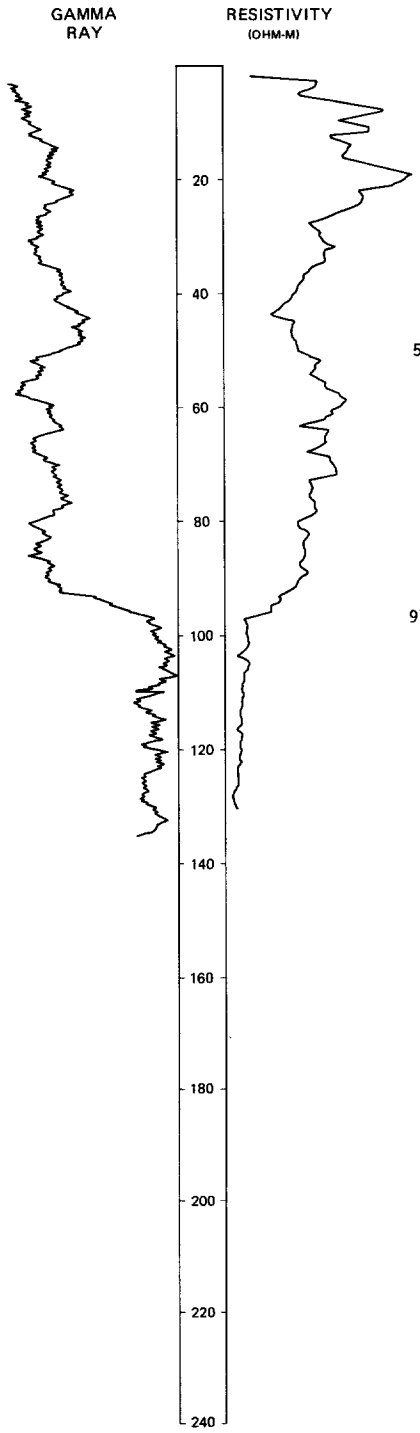
NDSWC 5783

LOCATION: 160-071-26AAA

DATE DRILLED: 9/25/80

ALTITUDE: 1640
(FT, NGVD)

DEPTH: 140
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-8	Sand, fine to medium, gravelly, subangular to rounded, oxidized.
8-50	Sand, fine, clayey, lignitic, well-sorted, subrounded to rounded; predominately quartz, carbonate, and detrital lignite grains.
50-97	Sand, fine to coarse, subrounded to rounded; predominately quartz grains.

FOX HILLS SANDSTONE

97-140	Siltstone, argillaceous, greenish-gray; interbedded with lenses of shale and fine greenish-gray sandstone.

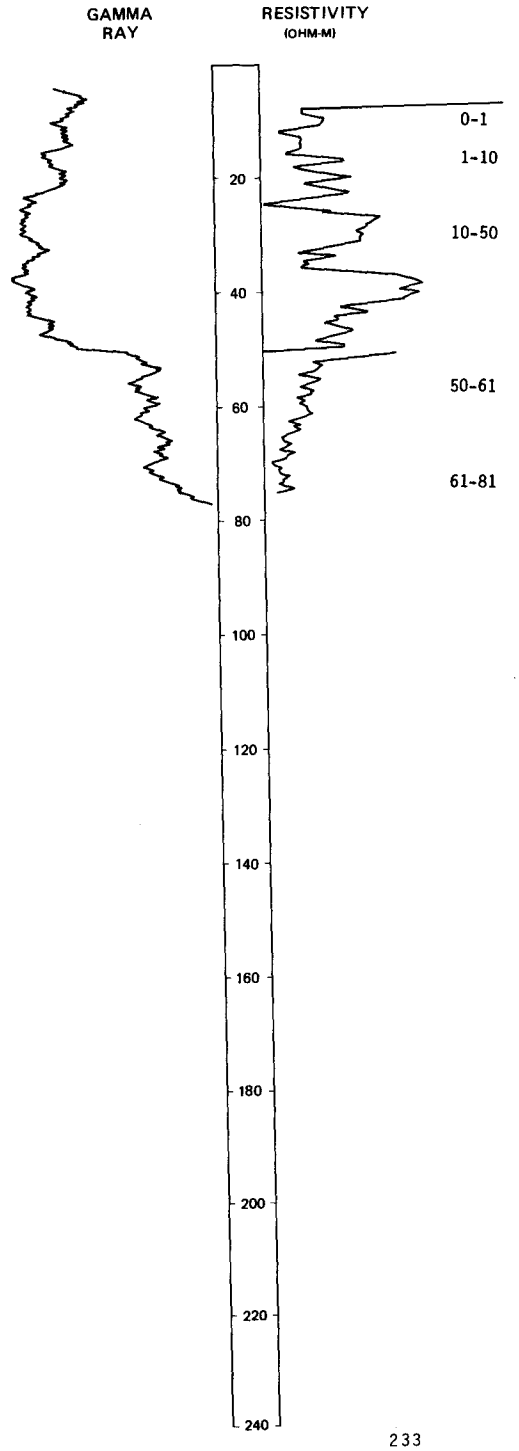
NDSWC 5803

LOCATION: 160-071-28AAA

DATE DRILLED: 10/01/80

ALTITUDE: 1622
(FT, NGVD)

DEPTH: 81
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Sand, fine, and fine to coarse angular to rounded oxidized gravel.
10-50	Sand, fine, well-sorted; oxidized to 14 feet; predominately quartz, carbonate, and detrital shale grains.

FOX HILLS SANDSTONE

50-61	Sandstone, very fine, argillaceous, carbonaceous, glauconitic, greenish-gray.
61-81	Siltstone, bentonitic, very argillaceous, carbonaceous; with thin lenses of fine greenish-gray sandstone.

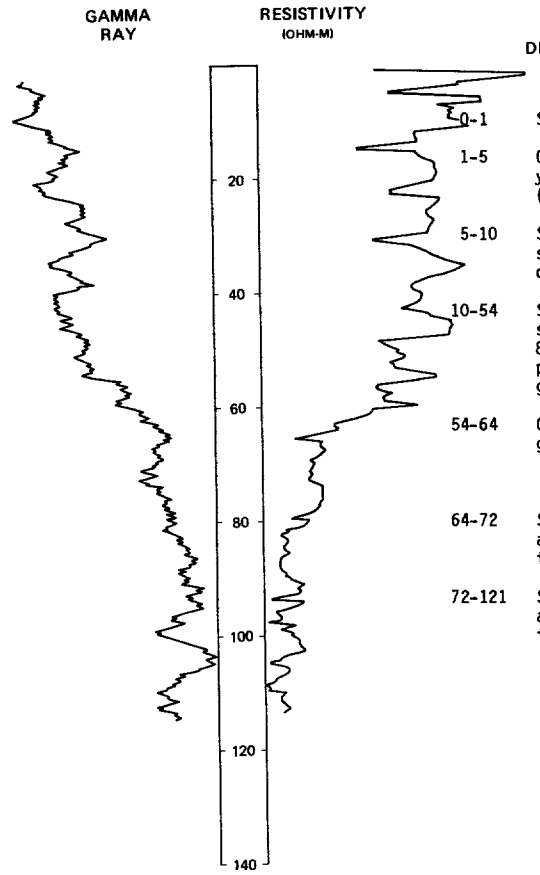
NDSWC 5785

LOCATION: 160-071-29ADD

DATE DRILLED: 10/25/80

ALTITUDE: 1620 (FT, NGVD)

DEPTH: 121 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-5	Clay, very silty to sandy, yellowish-brown, oxidized (till).
5-10	Sand, fine to coarse, subrounded to rounded, oxidized.
10-54	Sand, fine to medium, subrounded to rounded; about 80 percent quartz and 20 percent detrital shale grains.
54-64	Clay, silty, pebbly, greenish-gray (till).

FOX HILLS SANDSTONE

64-72	Sandstone, very fine, argillaceous, moderately indurated, greenish-gray.
72-121	Siltstone, bentonitic, very argillaceous, moderately indurated, greenish-gray.

160-071-29CCD
(Log from Lee's Well Drilling)

Altitude: 1610 feet

Date drilled: 6/29/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Clay, sandy	33	34
	Sand	8	42

160-071-32AAD
(Log from Church Well Boring)

Altitude: 1610 feet

Date drilled: 12/01/76

	Soil, sandy, black	1	1
	Sand, yellow, dry	14	15
	Sand, yellow, wet	2	17
	Sand, fine, blue	15	32

160-072-01ADD
NDSWC 5887

Altitude: 1631 feet — Date drilled: 11/10/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine, well-sorted, oxidized	4	5
	Sand, fine, and medium to coarse rounded gravel; oxidized to 10 feet	11	16
	Clay, silty, sandy, pebbly, greenish-gray (till)	24	40
Fox Hills Sandstone:			
	Siltstone, bentonitic, very argillaceous, carbonaceous, moderately indurated, brownish-gray to greenish-gray	41	81

160-072-02AAA
NDSWC 5653

Altitude: 1621 feet — Date drilled: 10/15/79

	Soil	3	3
	Sand, fine to very coarse, predominately medium to coarse, subrounded; contains about 15 percent fine to medium oxidized gravel	10	13
	Sand, coarse, rounded; contains some gravel	19	32
Fox Hills Sandstone:			
	Siltstone, sandy, olive-gray; contains a few carbonaceous streaks and a few grains of glauconite(?)	15	47

160-072-02CBB
NDSWC 5891

Altitude: 1632 feet — Date drilled: 11/11/80

Glacial drift:			
	Soil	1	1
	Sand, fine, well-sorted, subrounded, oxidized	4	5
	Sand, fine, and fine to very coarse angular to rounded gravel	21	26
Fox Hills Sandstone:			
	Siltstone, siliceous, moderately indurated, greenish-gray	35	61

160-072-02CBC
NDSWC 11482

Altitude: 1613 feet — Date drilled: 12/04/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine, clayey, subrounded to rounded; about 70 percent quartz and 30 percent carbonate and silicate grains	19	20
	Sand, fine, well-sorted, subrounded to rounded; about 80 percent quartz and 20 percent carbonate and silicate grains	20	40
	Sand, very coarse, subrounded; about 50 percent quartz, 20 percent igneous, and 10 percent detrital shale grains	14	54
Fox Hills Sandstone:			
	Siltstone, argillaceous, medium-gray	36	90
	Shale, silty, indurated, dark-gray	30	120

160-072-03ADA
NDSWC 11480

Altitude: 1635 feet — Date drilled: 12/04/80

Glacial drift:			
	Soil	1	1
	Clay, silty, dark-yellowish-brown, oxidized	9	10
	Clay, silty to sandy, gravelly, yellowish-brown, oxidized (till)	13	23
	Sand, fine to coarse; about 20 percent fine to coarse subangular gravel; about 50 percent quartz and 50 percent carbonate and igneous grains	11	34
	Sand, very fine to fine, clayey; predominately quartz grains	22	56
Fox Hills Sandstone:			
	Siltstone, argillaceous, indurated, dark-gray	24	80

160-072-03BBB1
NDSWC 5893

Altitude: 1642 feet — Date drilled: 11/11/80

Glacial drift:			
	Soil	1	1
	Silt, yellowish-brown, oxidized	1	2
	Sand, fine to coarse, and fine angular to rounded oxidized gravel	10	12
	Silt, clayey, yellowish-brown, oxidized	7	19
	Sand, fine, well-sorted, subrounded	3	22
	Sand, fine to very coarse, gravelly, subangular to rounded; oxidized to 40 feet; interbedded with olive-gray silt from 40 to 60 feet; predominately quartz	68	90
	Clay, very silty, pebbly, greenish-gray (till)	11	101
Fox Hills Sandstone:			
	Siltstone, argillaceous, siliceous, moderately indurated, brownish-gray	20	121

160-072-03BBB2
NDSWC 5930

Altitude: 1642 feet — Date drilled: 6/03/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized	9	10
	Gravel, medium to coarse, subangular, oxidized	2	12
	Clay, silty, yellowish-brown, oxidized	5	17
	Sand, very fine to fine, well-sorted, subrounded; interbedded with lenses of oxidized clay	13	30
	Sand, coarse, gravelly, subangular to rounded, oxidized	40	70
Fox Hills Sandstone:			
	Sandstone, fine, glauconitic, well-indurated to cemented, greenish-gray	1	71
	Sandstone, very fine, poorly indurated, greenish-gray	9	80

160-072-03BBC
NDSWC 5896

Altitude: 1630 feet — Date drilled: 11/12/80

Glacial drift:			
	Soil	1	1
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	9	10
	Clay, sandy, greenish-gray (till)	12	22
	Sand, fine to coarse, and medium angular to rounded gravel; interbedded with silt from 30 to 40 feet; predominately gravel from 70 to 75 feet	53	75
	Clay, sandy, greenish-gray (till)	9	84
Fox Hills Sandstone:			
	Siltstone, bentonitic, argillaceous, carbonaceous, greenish-gray	17	101

160-072-04ADD
NDSWC 5929

Altitude: 1650 feet — Date drilled: 6/03/81

Glacial drift:			
	Topsoil	1	1
	Gravel, fine to coarse, subangular, oxidized	4	5
	Clay, silty, yellowish-brown, oxidized	6	11
	Gravel, coarse, sandy, cobbly, subangular, oxidized	2	13
	Clay, very silty to sandy, yellowish-brown, oxidized (till)	10	23
	Sand, very fine to fine, rounded	17	40
	Sand, medium to very coarse, subangular to rounded	20	60
	Sand, coarse, gravelly, subrounded; interbedded with lenses of clay	15	75
Fox Hills Sandstone:			
	Sandstone, fine, glauconitic, well-indurated, greenish-gray	3	78
	Sandstone, very fine, glauconitic, poorly consolidated, greenish-gray	22	100

160-072-04BBC
NDSWC 5913

Altitude: 1600 feet — Date drilled: 3/18/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, coarse, well-sorted, rounded, oxidized	9	10
	Silt, clayey, yellowish-brown, oxidized	8	18
	Sand, very fine, well-sorted, subangular; about 20 percent detrital lignite grains	20	38
	Silt, clayey, olive-gray	2	40
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, glauconitic; carbonaceous greenish-gray streaks	20	60

160-072-04BCB
NDSWC 5915

Altitude: 1600 feet — Date drilled: 3/19/81

Glacial drift:			
	Soil	1	1
	Silt, clayey; with thin lenses of yellowish-brown oxidized sand at 10 and 18 feet	19	20
	Sand, medium to very coarse, subrounded to rounded; occasional thin lenses of clay; abundant detrital lignite grains	21	41
Fox Hills Sandstone:			
	Sandstone, very fine; interbedded with lenses of argillaceous glauconitic greenish-gray siltstone	19	60

160-072-04DAA
NDSWC. 5895

Altitude: 1628 feet — Date drilled: 11/12/80

Glacial drift:			
	Soil	1	1
	Sand, medium to coarse, and fine to coarse angular to rounded oxidized gravel; interbedded with lenses of yellowish-brown silt	29	30
	Clay, very silty to sandy, olive-gray (till)	10	40
Fox Hills Sandstone:			
	Sandstone, fine, siliceous, glauconitic; poorly indurated carbonaceous greenish-gray streaks	21	61

160-072-05ADD
NDSWC 11494

Altitude: 1615 feet — Date drilled: 12/10/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, yellowish-brown, oxidized; interbedded with thin lenses of sand and gravel	9	10
	Sand, fine to medium, subrounded; interbedded with lenses of silt from 20 to 40 feet	42	52
	Clay, silty, olive-gray	4	56
	Sand, fine to very coarse, subrounded; predominately quartz, carbonate, and igneous grains	34	90
	Sand, fine to coarse; predominately quartz, carbonate, and detrital shale grains; about 40 percent fine to very coarse subangular to rounded gravel; caving; abundant hole	30	120

160-072-05DAD
NDSWC 5912

Altitude: 1610 feet — Date drilled: 3/18/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	3	4
	Gravel, fine to coarse, oxidized	8	12
	Sand, fine, subrounded to rounded; predominately quartz and carbonate with detrital shale and lignite grains	38	50
	Sand, medium, well-sorted, subrounded to rounded	10	60
	Sand, fine, well-sorted, subangular to subrounded	70	130
	Sand, fine to medium, subrounded to rounded	10	140
	Sand, very fine, well-sorted, subrounded	12	152
	Sand, medium to coarse, and very coarse subangular to rounded gravel; predominately quartz grains	3	155
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, slightly glauconitic; interbedded with well-indurated greenish-gray shale	3	158

160-072-06BBB
NDSWC 5810

Altitude: 1585 feet — Date drilled: 10/03/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, yellowish-brown, oxidized	1	2
	Sand, fine to coarse, rounded, oxidized; about 80 percent quartz and 20 percent carbonate and detrital shale grains	9	11
	Clay, silty, sandy, yellowish-brown, oxidized (till)	3	14
	Clay, silty, pebbly, olive-gray (till)	2	16
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, siliceous, poorly indurated, greenish-gray	12	28
	Siltstone, argillaceous; greenish gray to brownish gray from 60 to 81 feet	53	81

160-072-06BCC
NDSWC 11478

Altitude: 1574 feet — Date drilled: 12/03/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, dark-gray	4	5
	Clay, silty, dark-greenish-gray	4	9
	Sand, medium; about 20 percent fine to very coarse subangular gravel; about 70 percent detrital shale and 30 percent carbonate and igneous grains	2	11
	Silt, clayey, greenish-gray	10	21
	Clay, silty, sandy, gravelly (till); interbedded with lenses of sand and gravel	20	41
	Sand, coarse; about 20 percent medium to very coarse subrounded to angular gravel; about 30 percent quartz, 30 percent igneous, 30 percent carbonate, and 10 percent detrital shale grains	54	95
Fox Hills Sandstone:			
	Siltstone, argillaceous, dark-gray; interbedded with very fine argillaceous greenish-gray sandstone	12	107

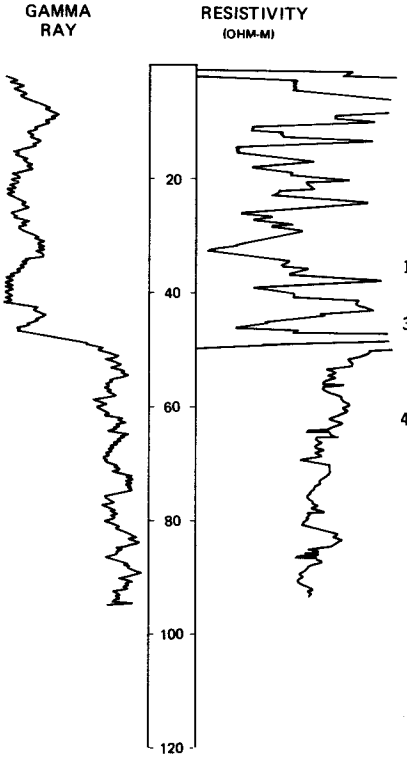
NDSWC 5809

LOCATION: 160-072-07BBB

DATE DRILLED: 10/02/80

ALTITUDE: 1590 (FT, NGVD)

DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-18	Clay, very silty, sandy, pebbly, yellowish-brown, oxidized (till); interbedded with lenses of fine to medium gravel.
18-32	Clay, very silty, gravelly, olive-gray (till).
32-48	Clay, very silty, gravelly, olive-gray (till); boulders.

FOX HILLS SANDSTONE

48-101	Siltstone, bentonitic, very argillaceous; carbonaceous greenish-gray streaks.

160-072-08AAA
NDSWC 5914

Altitude: 1590 feet

Date drilled: 3/19/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Sand, fine to very coarse, subangular to rounded, oxidized----------	14	15
	Clay, silty, pebbly, yellowish-brown, oxidized----------	3	18
	Silt, very clayey, olive-gray; with lenses of sand and gravel from 63 to 64, 79 to 80, and 85 to 86 feet----------	68	86
Fox Hills Sandstone:			
	Siltstone, very argillaceous, siliceous, moderately indurated, greenish-gray----------	14	100

160-072-10AAA
NDSWC 11432

Altitude: 1623 feet — Date drilled: 10/18/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, very fine to very coarse, gravelly, subangular; about 60 percent quartz and silicate, 30 percent carbonate, and 10 percent detrital shale grains	12	13
	Clay, moderate-yellowish-brown, oxidized	10	23
Fox Hills Sandstone:			
	Siltstone, argillaceous, medium-gray; very poor samples	37	60

160-072-10ADA
NDSWC 5892

Altitude: 1620 feet — Date drilled: 11/11/80

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, angular to rounded, oxidized	2	3
	Silt, clayey, yellowish-orange, oxidized	16	19
	Silt, clayey, greenish-gray	6	25
Fox Hills Sandstone:			
	Siltstone, bentonitic, siliceous; carbonaceous greenish-gray streaks	30	55
	Sandstone, very fine, siliceous, moderately indurated, greenish-gray	6	61

160-072-10DAA
NDSWC 5890

Altitude: 1608 feet — Date drilled: 11/11/80

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, and medium angular to rounded oxidized gravel	14	15
	Clay, silty, olive-gray	5	20
	Sand, fine to coarse, and fine angular to rounded gravel	6	26
Fox Hills Sandstone:			
	Siltstone, argillaceous, siliceous, moderately indurated, greenish-gray	35	61

160-072-11CBB
NDSWC 5901

Altitude: 1620 feet — Date drilled: 11/12/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, sandy, yellowish-brown, oxidized (till)	9	10
	Sand, fine, well-sorted, subangular, oxidized	10	20
	Sand, fine to very coarse, subrounded	28	48
	Silt, clayey, olive-gray	12	60
	Sand, fine to coarse, gravelly, subrounded	20	80
	Gravel, fine to coarse, sandy, subrounded; caving; abundant hole	32	112

160-072-11DDA
NDSWC 5885

Altitude: 1610 feet — Date drilled: 11/10/80

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, rounded, oxidized	9	10
	Silt, clayey, olive-gray	30	40
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, greenish-gray; interbedded with carbonaceous brownish-gray siltstone	21	61

160-072-12AAB
NDSWC 5655

Altitude: 1632 feet — Date drilled: 10/15/79

	Sand, fine to very coarse, predominately very coarse, rounded to subrounded; contains agout 10 percent fine to medium oxidized gravel	17	17
	Sand, fine to very coarse, predominately very coarse, bluish-gray	15	32
	Sand, fine to very coarse, predominately fine	15	47
	Sand, very fine to fine, silty; samples contained considerable medium to very coarse sand; apparently caving from above	18	65
Fox Hills Sandstone:			
	Sandstone, very fine, silty, olive-gray; contains a few carbonaceous streaks	12	77

160-072-12ADD
NDSWC 5886

Altitude: 1622 feet — Date drilled: 11/10/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, and fine to medium subangular gravel; oxidized to 20 feet	39	40
	Sand, very fine, silty, subangular	50	90
	Silt, clayey, olive-gray	7	97
Fox Hills Sandstone:			
	Siltstone, very argillaceous, carbonaceous, moderately indurated, brownish-gray	24	121

160-072-12DAD
NDSWC 5888

Altitude: 1615 feet — Date drilled: 11/11/80

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, gravelly, angular to rounded, oxidized	4	5
	Sand, fine, well-sorted, subangular, oxidized	6	11
	Sand, coarse, and fine angular to rounded gravel	4	15
	Clay, silty, brownish-gray	4	19
	Sand, fine to coarse, and fine subrounded gravel	45	64
	Silt, clayey, olive-gray	30	94
Fox Hills Sandstone:			
	Siltstone, bentonitic, argillaceous, siliceous, moderately indurated, greenish-gray	27	121

160-072-12DDD
NDSWC 11431

Altitude: 1630 feet — Date drilled: 10/16/80

Glacial drift:			
	Soil, silty, brownish-black	2	2
	Sand, fine to very coarse, subrounded; grading coarser with depth; oxidized to 32 feet; predominately quartz, carbonate, detrital shale, and igneous grains	57	59
Fox Hills Sandstone:			
	Siltstone, argillaceous, greenish-gray	21	80

160-072-13CCC
NDSWC 5536

Altitude: 1594 feet — Date drilled: 8/22/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, sandy, yellowish-brown, oxidized----------	3	4
	Sand, predominately medium; about 10 percent oxidized gravel----------	3	7
	Clay, silty, dark-olive-gray to black----------	3	10
	Sand, fine, silty----------	5	15
	Clay, silty, olive-gray----------	3	18
	Sand, predominately coarse; interval contains about 15 percent olive-gray clay in lenses----------	8	26
	Clay, very silty, sandy, olive-gray----------	6	32
Fox Hills Sandstone:			
	Sandstone, clayey, slightly sandy, olive-gray----------	20	52
	Sandstone, very fine to fine, predominately very fine, well-sorted, olive-gray; contains some interstitial silt and clay----------	3	55
	Sandstone, indurated----------	--	55

160-072-13DDD
NDSWC 5534

Altitude: 1609 feet — Date drilled: 8/21/79

	Soil----------	1	1
	Clay, yellowish-brown, oxidized----------	4	5
	Sand, fine to medium, predominately fine, well-sorted, rounded to subrounded; contains detrital lignite grains----------	50	55
Fox Hills Sandstone:			
	Siltstone, slightly sandy, brittle, olive-gray----------	22	77

160-072-15AAA
NDSWC 5884

Altitude: 1620 feet — Date drilled: 11/10/80

Glacial drift:			
	Soil----------	1	1
	Silt, yellowish-brown, oxidized----------	1	2
	Sand, fine, well-sorted, oxidized----------	1	3
	Silt, gravelly, yellowish-brown, oxidized----------	17	20
	Silt, clayey, olive-gray----------	16	36
Fox Hills Sandstone:			
	Siltstone, argillaceous, carbonaceous, brownish-gray; interbedded with fine siliceous greenish-gray sandstone----------	29	65
	Sandstone, fine, argillaceous, poorly indurated, greenish-gray----------	16	81

160-072-21AAA
NDSWC 5805

Altitude: 1585 feet — Date drilled: 10/02/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Gravel, fine to medium, oxidized	1	2
	Clay, very silty, gravelly, yellowish-brown, oxidized (till)	11	13
	Clay, very silty, pebbly, olive-gray (till); boulders at 21 feet	9	22
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous; carbonaceous greenish-gray streaks	28	50
	Siltstone, bentonitic, very argillaceous, moderately indurated, greenish-gray	11	61

160-072-22DA
(Log modified from D. E. Hansen, 1956)

Altitude: 1591 feet — Date drilled: 7/22/55

QUATERNARY SYSTEM			
Glacial drift:			
	Gravel and sand; mainly angular quartz grains with feldspar fragments and yellowish-brown dolomite	70	70
CRETACEOUS SYSTEM			
Fox Hills Sandstone:			
	Silt, sand, gravel; gray calcareous silt; sand and gravel composed of mainly angular quartz grains with feldspar fragments and yellowish-brown dolomite	120	190
Pierre Shale:			
	Shale, silty, bentonitic, compact to lumpy, medium-gray; traces of soft flaky medium-dark-gray shale	230	420
Niobrara Formation (top):			1004
DEVONIAN SYSTEM			
Nisku Formation (top):			3093

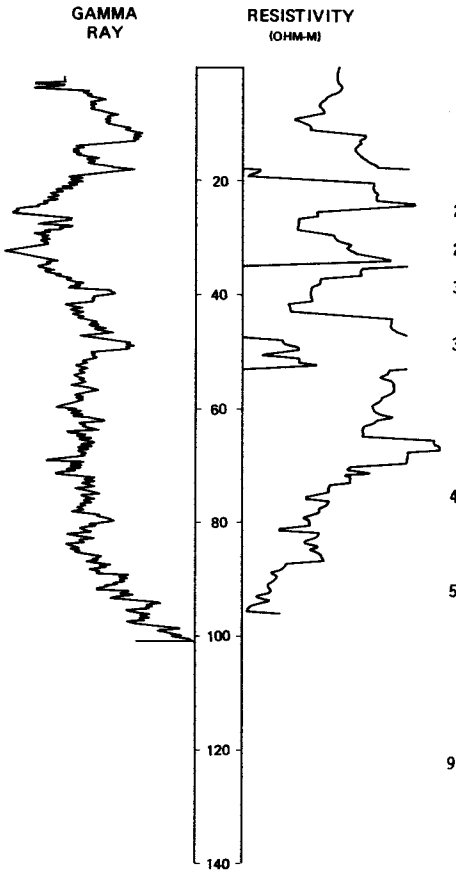
NDSWC 5537

LOCATION: 160-072-23BBB

DATE DRILLED: 8/22/79

ALTITUDE: 1621
(FT, NGVD)

DEPTH: 107
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-22	Silt, clayey, sandy, yellowish-brown, oxidized.
22-26	Sand, fine to very fine.
26-31	Silt, sandy, gray.
31-35	Sand, fine to very fine, well-sorted.
35-44	Sandstone, fine to very fine, well-sorted, rounded; contains abundant interstitial clay and some magnetite and glauconite may be a block from the Fox Hills Sandstone.
44-53	Clay, sandy, silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

53-92	Sandstone, very fine to fine, predominately very fine, clayey, silty, bluish-gray; predominately quartz but contains about 10 percent glauconite, 5 percent magnetite, and 2 percent mica grains.
92-107	Siltstone, sandy, clayey, brittle, bluish-gray.

160-072-24CCB
NDSWC 5535

Altitude: 1600 feet

Date drilled: 8/21/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, sandy, silty, pebbly, yellowish-brown, oxidized (till)----------	5	6
	Sand, very fine to very coarse, predominately medium to coarse, angular to rounded; becomes coarser with depth----------	21	27
Fox Hills Sandstone:			
	Sandstone, very fine to fine, clayey, olive-gray; contains some glauconite and magnetite----------	50	77

160-072-25AAA
NDSWC 5804

Altitude: 1600 feet — Date drilled: 10/02/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Sand, fine, rounded, oxidized; interbedded with lenses of lignitic clay; about 90 percent quartz and 10 percent detrital shale grains----------	21	22
	Clay, very silty, pebbly, olive-gray (till); boulder at 43 feet----------	35	57
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, greenish-gray----------	18	75
	Siltstone, very argillaceous; carbonaceous greenish-gray streaks----------	6	81

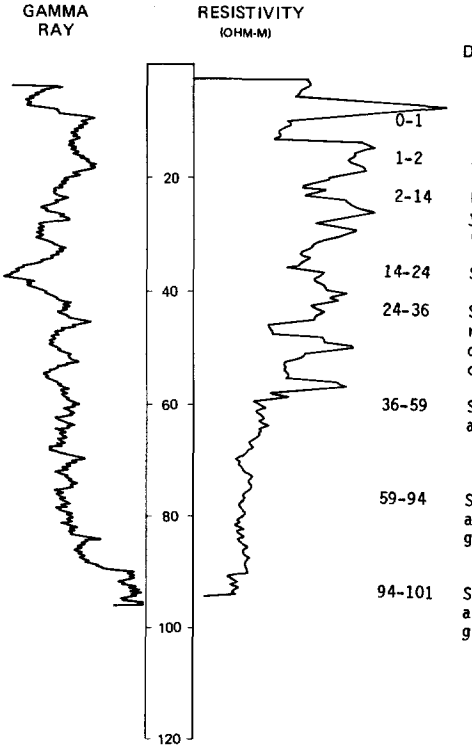
NDSWC 5806

LOCATION: 160-072-28DDD

DATE DRILLED: 10/02/80

ALTITUDE: 1605 (FT, NGVD)

DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-2	Sand, fine, oxidized.
2-14	Clay, very silty, pebbly, yellowish-brown, oxidized (till).
14-24	Silt, clayey, greenish-gray.
24-36	Sand, fine, well-sorted, rounded; about 90 percent quartz and 10 percent detrital shale grains.
36-59	Silt, clayey, olive-gray; abundant detrital lignite.

FOX HILLS SANDSTONE

59-94	Sandstone, fine, argillaceous, glauconitic, greenish-gray.
94-101	Siltstone, bentonitic, argillaceous, carbonaceous, greenish-gray.

160-072-29CBB
(Log from Church Well Boring)

Altitude: 1585 feet — Date drilled: 6/29/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, black	1	1
	Clay, sandy, yellow	1	2
	Sand, yellow	8	10
	Sand, blue; with pea size gravel	8	18

160-072-30ADC
(Log from C. A. Simpson & Son)

Altitude: 1595 feet — Date drilled: 7/01/64

	Soil	1	1
	Clay, yellow	14	15
	Clay, blue	112	127
	Sand, green; about 30 gallons overnight	8	135
	Clay	5	140
	Shale	125	265

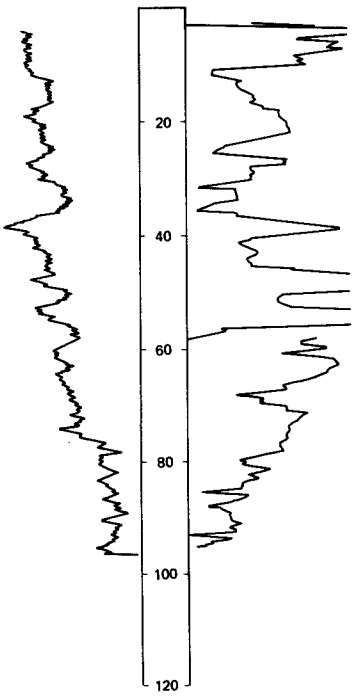
NDSWC 5808

LOCATION: 160-072-32DCC

DATE DRILLED: 10/02/80

ALTITUDE: 1590 (FT, NGVD)

DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-7	Sand, fine, well-sorted; interbedded with lenses of oxidized clay.
7-12	Sand, fine, clayey, oxidized.
12-18	Sand, fine, silty, oxidized.
18-38	Silt, greenish-gray; interbedded with thin lenses of sand and gravel.
38-46	Sand, fine to coarse, silty, and fine to coarse angular to rounded gravel.
46-56	Sand, fine, silty.

FOX HILLS SANDSTONE

56-78	Sandstone, fine, argillaceous, glauconitic; carbonaceous greenish-gray streaks.
78-101	Siltstone, bentonitic, argillaceous; carbonaceous greenish-gray streaks.

160-073-01BCB1
(Log from C. A. Simpson & Son)

Altitude: 1568 feet — Date drilled: 11/19/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Clay, yellow	11	12
	Sand, brown	10	22
	Clay, sticky	13	35
	Clay, sandy	17	52
	Sand, clayey	6	58
	Sand	--	58

160-073-01BCB2
(Log from C. A. Simpson & Son)

Altitude: 1568 feet — Date drilled: 4/25/64

	Soil	1	1
	Clay, yellow	11	12
	Clay, brown	10	22
	Clay, sticky	13	35
	Clay, sandy	17	52
	Sand, clayey	6	58
	Sand; somewhat clayey	4	62

160-073-12DAA
NDSWC 11477

Altitude: 1597 feet — Date drilled: 12/03/80

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	10	11
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, yellowish-brown, oxidized	15	26
	Sandstone, fine, argillaceous, carbonaceous, moderately indurated, brownish-gray	14	40

160-073-13AAA
NDSWC 11476

Altitude: 1580 feet — Date drilled: 12/03/80

Glacial drift:			
	Soil	1	1
	Sand, medium, rounded to subrounded, oxidized; about 80 percent quartz and 20 percent carbonate and igneous grains	13	14
	Clay, very silty, sandy, pebbly, yellowish-brown, oxidized (till)	10	24
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, medium-gray	16	40

160-073-14DDD
NDSWC 5518

Altitude: 1552 feet — Date drilled: 8/14/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	16	17
Fox Hills Sandstone:			
	Siltstone, slightly sandy, micaceous, grayish-olive-green; somewhat glauconitic below 32 feet	65	82
	Sandstone, very fine to fine, well-sorted, angular to rounded, glauconitic, micaceous	8	90
	Siltstone, sandy to slightly sandy, brittle, light-olive-gray; locally carbonaceous	32	122

160-073-17CCC
NDSWC 5538

Altitude: 1541 feet — Date drilled: 8/22/79

	Soil	1	1
	Clay, silty, sandy, yellowish-brown, oxidized	14	15
	Clay, silty, sandy, olive-gray; contains a few small pebbles	13	28
Fox Hills Sandstone:			
	Siltstone, clayey, slightly sandy, brittle, olive-gray	12	40
	Sandstone, very fine, grayish-olive; contains some interstitial clay	22	62

160-073-27DDD
NDSWC 5519

Altitude: 1551 feet — Date drilled: 8/14/79

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	7	8
Fox Hills Sandstone:			
	Sandstone, very fine to fine, yellowish-brown, oxidized; contains magnetite	17	25
	Sandstone, very fine to fine, glauconitic, grayish-blue-green	7	32
	Siltstone, sandy to slightly sandy, brittle, olive-gray; locally contains some carbonaceous material	60	92

160-073-30DDD
NDSWC 5826

Altitude: 1520 feet — Date drilled: 10/09/80

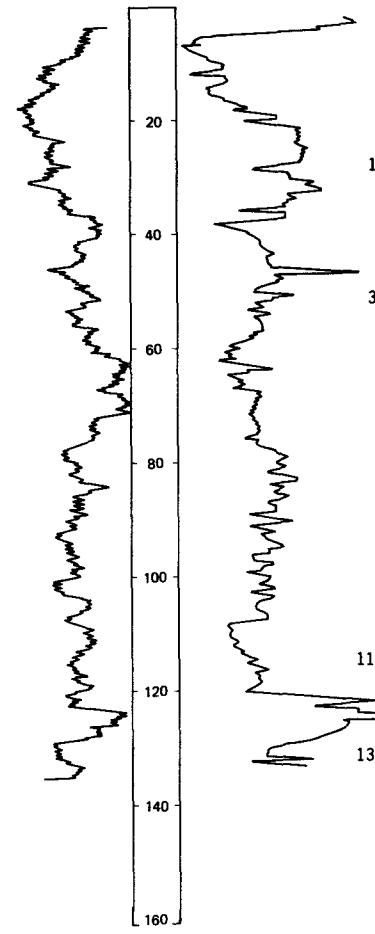
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, yellowish-brown, oxidized (lacustrine)	9	10
	Clay, very silty, pebbly, yellowish-brown, oxidized (till)	10	20
Fox Hills Sandstone:			
	Siltstone, argillaceous, yellowish-brown, oxidized	15	35
	Sandstone, fine, poorly indurated, yellowish-brown, oxidized	5	40
	Shale, silty, yellowish-brown, oxidized	10	50
	Shale, medium-dark-gray	10	60
	Siltstone, argillaceous, siliceous; carbonaceous greenish-gray to medium-gray streaks	40	100
	Sandstone, fine, glauconitic, cemented	2	102
	Sandstone, fine, glauconitic, poorly indurated, dark-greenish-gray	13	115
	Siltstone, argillaceous, carbonaceous, brownish-gray	6	121

LOCATION: 160-073-31DDD NDSWC 5825

DATE DRILLED: 10/09/80

ALTITUDE: 1515 (FT, NGVD)

DEPTH: 141 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-18 Clay, yellowish-brown, oxidized (lacustrine).

18-33 Clay, very sandy, pebbly, yellowish-brown, oxidized (till); interbedded with thin lenses of sand and gravel.

FOX HILLS SANDSTONE

33-114 Siltstone, bentonitic, argillaceous, brownish-gray to greenish-gray; oxidized to 42 feet; interbedded with fine sandstone from 75 to 114 feet.

114-130 Sandstone, fine, glauconitic, poorly indurated, dark-greenish-gray.

130-141 Siltstone, argillaceous, greenish-gray; interbedded with very fine argillaceous greenish-gray sandstone.

160-074-12BAB
(Log from C. A. Simpson & Son)

Altitude: 1550 feet

Date drilled: 10/24/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, sandy, yellow----------	24	25
	Clay, gray----------	13	38
	Clay, blue----------	38	76
	Clay, green----------	6	82
	Clay, blue, or shale----------	106	188

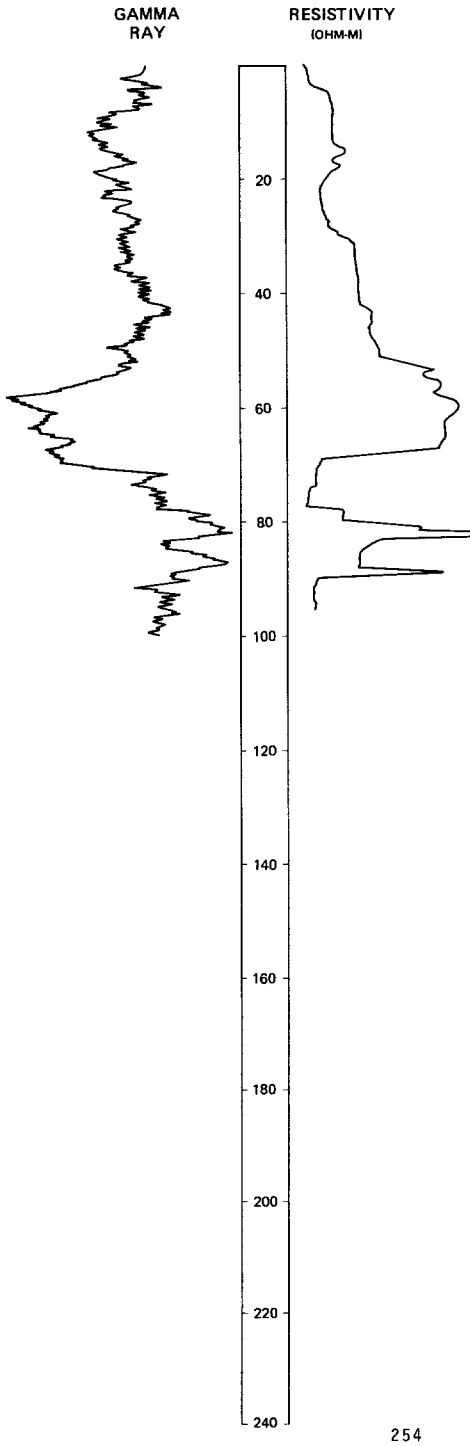
NDSWC 5539

LOCATION: 160-074-21BBA

DATE DRILLED: 8/22/79

ALTITUDE: 1523
(FT, NGVD)

DEPTH: 107
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Clay, silty, sandy, slightly pebbly, yellowish-brown, oxidized.
10-20	Clay, very silty, slightly sandy, yellowish-brown, oxidized.
20-30	Clay, very silty, slightly sandy, light-olive-gray to grayish-olive.
30-52	Clay, silty, sandy, pebbly, olive-gray (till).
52-62	Sand, fine to very coarse; contains some gravel.
62-68	Sand, very fine to very coarse, predominately coarse; contains about 5 percent fine gravel; composed of about 50 percent silicate, 30 percent carbonate, 15 percent shale, and 5 percent unidentified grains.

FOX HILLS SANDSTONE

68-78	Sandstone, predominately very fine, silty, clayey, glauconitic, olive-gray.
78-90	Sandstone, predominately fine, well-sorted, well-rounded, glauconitic, micaceous, dusky-green.
90-107	Siltstone, sandy, brittle, light-olive-gray.

160-074-27DDD
NDSWC 5827

Altitude: 1530 feet — Date drilled: 10/09/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very silty to sandy, pebbly, yellowish-brown, oxidized (till)	33	34
	Silt, clayey, olive-gray	24	58
	Clay, very sandy, gravelly, olive-gray (till)	12	70
Fox Hills Sandstone:			
	Sandstone, fine, glauconitic, poorly indurated, greenish-gray	5	75
	Siltstone, argillaceous, carbonaceous, brownish-gray	5	80
	Sandstone, fine, glauconitic, poorly indurated, greenish-gray	21	101

160-074-31DDD
NDSWC 23
(Log from Naplin, 1968)

Altitude: 1472 feet — Date drilled: 7/14/67

Glacial drift:			
	Topsoil, silty, sandy, brownish-black	1	1
	Sand, coarse to very coarse, subangular to subrounded, well-sorted; greater than 50 percent quartz; oxidized	8	9
	Clay, silty, olive-gray to medium-dark-gray, moderately cohesive, calcareous	31	40
	Clay, silty, pebbly, medium-gray to medium-dark-gray, cohesive, calcareous (till)	58	98
	Clay, silty, pebbly, medium-dark-gray, lignitic, cohesive, calcareous (till)	8	106
	Clay, silty, sandy, pebbly, olive-gray to medium-dark-gray, cohesive; calcareous grading to noncalcareous bottom 10 feet (till)	98	204
Fox Hills Sandstone:			
	Shale, clayey, grayish-black to brownish-black, well-indurated, noncalcareous	16	220

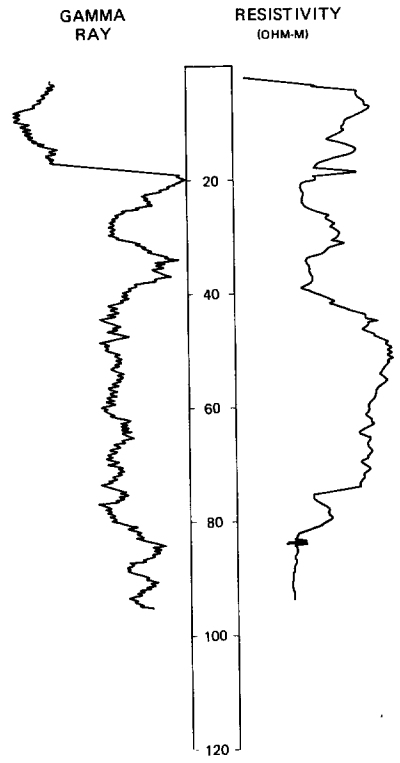
NDSWC 5829

LOCATION: 160-074-32DDD

DATE DRILLED: 10/09/80

ALTITUDE: 1480 (FT, NGVD)

DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-3	Silt, yellowish-brown, oxidized.
3-5	Clay, very sandy, yellowish-brown, oxidized (till).
5-17	Sand, fine, well-sorted; about 80 percent quartz and 20 percent detrital shale grains.
17-30	Silt, clayey, olive-gray.
30-35	Clay, cohesive, olive-gray.
35-43	Silt, clayey, olive-gray.
43-75	Clay, very silty, pebbly, greenish-gray (till).

FOX HILLS SANDSTONE

75-82	Sandstone, fine, silty, clayey, glauconitic, greenish-gray.
82-101	Siltstone, argillaceous, carbonaceous, brownish-gray.

160-074-33BBB
NDSWC 5828

Altitude: 1490 feet

Date drilled: 10/09/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, yellowish-brown, oxidized	4	5
	Sand, fine, well-sorted, rounded, oxidized	3	8
	Clay, yellowish-brown, oxidized (lacustrine)	4	12
	Clay, very sandy, pebbly, yellowish-brown, oxidized (till)	11	23
	Sand, coarse, well-sorted, rounded, oxidized	5	28
	Clay, very sandy, gravelly, yellowish-brown, oxidized (till)	7	35
	Clay, sandy, gravelly, olive-gray (till)	7	42
Fox Hills Sandstone:			
	Sandstone, fine, silty, glauconitic, poorly indurated, greenish-gray	11	53
	Siltstone, argillaceous, carbonaceous, brownish-gray	22	75
	Sandstone, fine, bentonitic, glauconitic, dark-greenish-gray	8	83
	Siltstone, argillaceous, carbonaceous, brownish-gray	18	101

160-075-03BCA
(Log from Church Well Boring)

Altitude: 1530 feet — Date drilled: 5/25/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, black	2	2
	Clay, yellow	6	8
	Sand, coarse	1	9
	Sand, yellow	1	10
	Sand, blue	10	20

160-075-08AAD
NDSWC 5543

Altitude: 1499 feet — Date drilled: 8/23/79

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	21	22
	Clay, silty, sandy, pebbly, olive-gray (till)	16	38
Fox Hills Sandstone:			
	Siltstone and sandy clay; olive gray to light olive gray; brittle	39	77

160-075-14ADD
(Log from Lee's Well Drilling)

Altitude: 1505 feet — Date drilled: 6/18/75

	Soil	1	1
	Clay, sandy, yellow	15	16
	Clay, sandy, blue	22	38
	Shale	42	80

160-075-30BBD
(Log from Virg's Well Drilling)

Altitude: 1455 feet — Date drilled: 10/23/74

	Soil	1	1
	Sand	9	10
	Clay, blue	14	24
	Gravel and sand	4	28

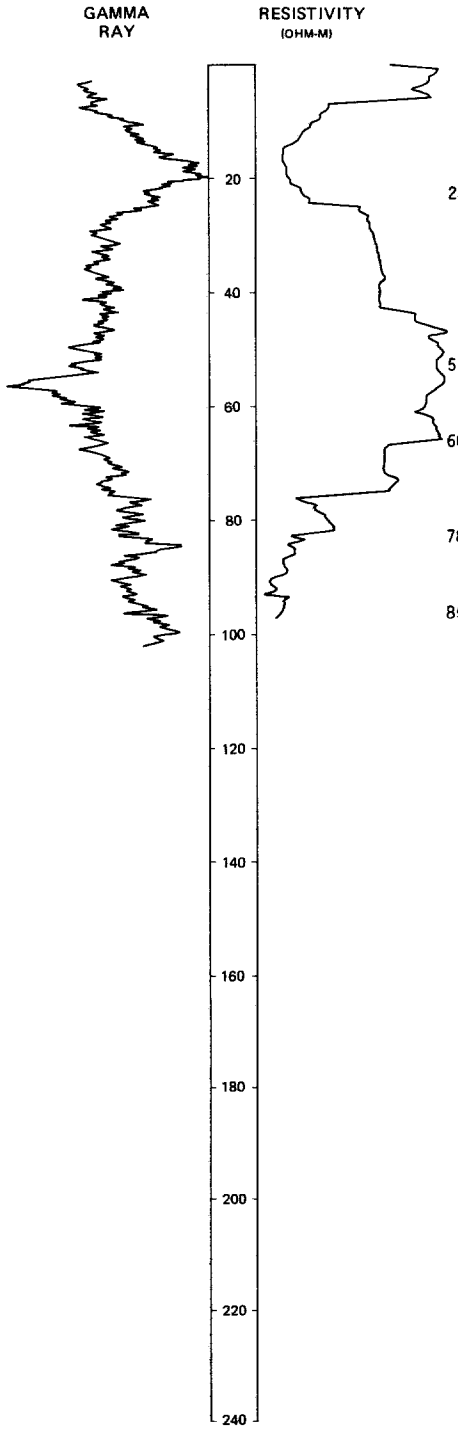
NDSWC 5542

LOCATION: 160-075-31DDD

DATE DRILLED: 8/22/79

ALTITUDE: 1465
(FT, NGVD)

DEPTH: 107
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-25	Clay, silty, sandy, sticky, yellowish-brown, oxidized.
25-54	Clay, sandy, silty, slightly pebbly, olive-gray (till).
54-60	Sand, very fine to coarse, predominately medium, poorly sorted, rounded.
60-78	Clay, very sandy, silty, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
78-85	Sandstone, very fine to fine, silty, clayey, glauconitic, olive-gray.
85-107	Siltstone, sandy, clayey, light-olive-gray.

160-075-35DAD
NDSWC 24
(Log from Naplin, 1968)

Altitude: 1463 feet — Date drilled: 7/13/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, brownish-black	1	1
	Clay, silty, medium-yellowish-orange, cohesive, oxidized, calcareous	7	8
	Clay, sandy, pebbly, medium-light-gray to olive-gray, cohesive, moderately plastic, calcareous (till)	44	52
	Gravel, sandy, fine, angular to subrounded, moderately well sorted	4	56
	Clay, silty, sandy, medium-light-gray, cohesive, calcareous (till)	12	68
	Sand, very fine to fine, angular to subrounded, moderately well sorted; greater than 70 percent quartz	8	76
	Clay, sandy, pebbly, olive-gray, cohesive, calcareous (till)	3	79
	Sand, very fine to fine, angular to subrounded, well-sorted; greater than 70 percent quartz	3	82
	Clay, sandy, pebbly, olive-gray, cohesive, lignitic, calcareous (till)	18	100
	Sand, medium- to coarse-grained, subangular to subrounded, moderately well sorted; greater than 80 percent quartz	8	108
Fox Hills Sandstone:			
	Shale, dark-greenish-gray, well-indurated, noncalcareous	12	120

160-075-36BBB
NDSWC 25
(Log from Naplin, 1968)

Altitude: 1470 feet — Date drilled: 7/13/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, sandy, brownish-black	1	1
	Clay, silty, sandy, medium-yellowish-orange, moderately cohesive, oxidized, calcareous (till)	20	21
	Clay, sandy, pebbly, olive-gray to medium-light-gray, cohesive, calcareous (till)	54	75
	Gravel, sandy, medium to coarse, angular to subrounded; fair sorting; predominately limestone and dolomite with some stained (limonitic, light brown) quartz	12	87
	Clay, sandy, lignitic, olive-gray to medium-light-gray, cohesive, calcareous (till)	18	105
	Sand, very fine to fine, angular to subrounded; fair sorting; greater than 80 percent quartz	2	107
	Clay, sandy, lignitic, medium-gray, cohesive, slightly plastic, calcareous (till)	5	112
	Sand, very fine to fine, angular to subrounded; fair sorting; greater than 80 percent quartz	2	114
	Clay, gravelly, medium-light-gray, cohesive, slightly plastic, calcareous (till)	12	126
	Gravel, medium to coarse, angular to subangular, poorly sorted	4	130
	Clay, sandy, pebbly, medium-dark-gray to dark-gray, cohesive, calcareous (till)	13	143
Fox Hills Sandstone:			
	Shale, sandy, brownish-gray to brownish-black, well-indurated, noncalcareous	17	160

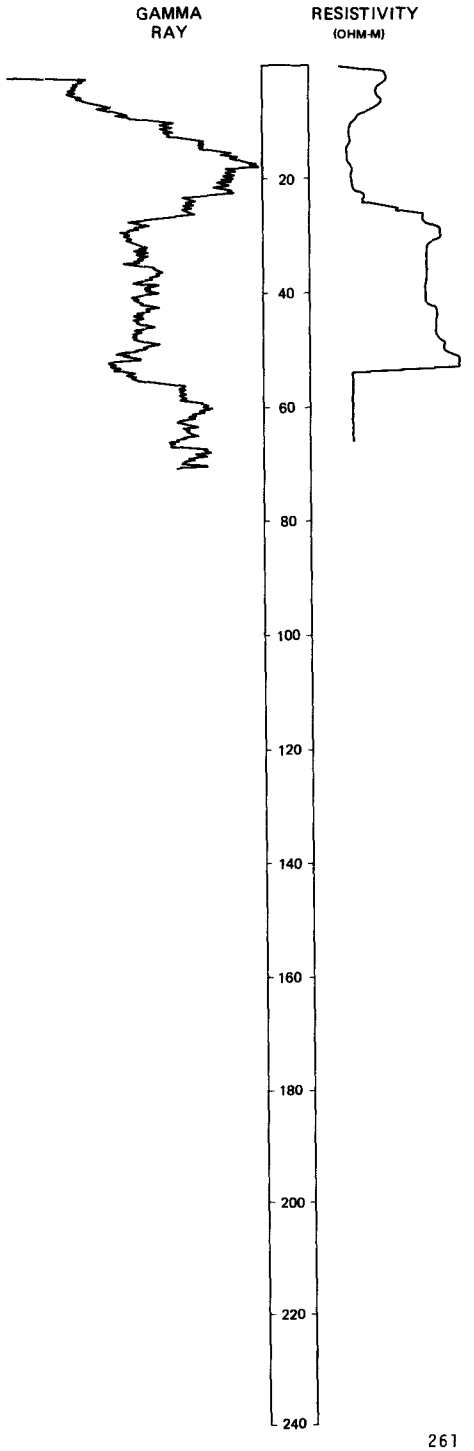
NDSWC 5544

LOCATION: 160-076-02AAA

DATE DRILLED: 8/23/79

ALTITUDE: 1473
(FT, NGVD)

DEPTH: 77
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-10	Clay, sandy, silty, pebbly, yellowish-brown (till).
10-25	Clay, slightly sandy, sticky, olive-gray.
25-52	Clay, sandy, silty, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
52-77	Siltstone, sandy, clayey, brittle, light-olive-gray.

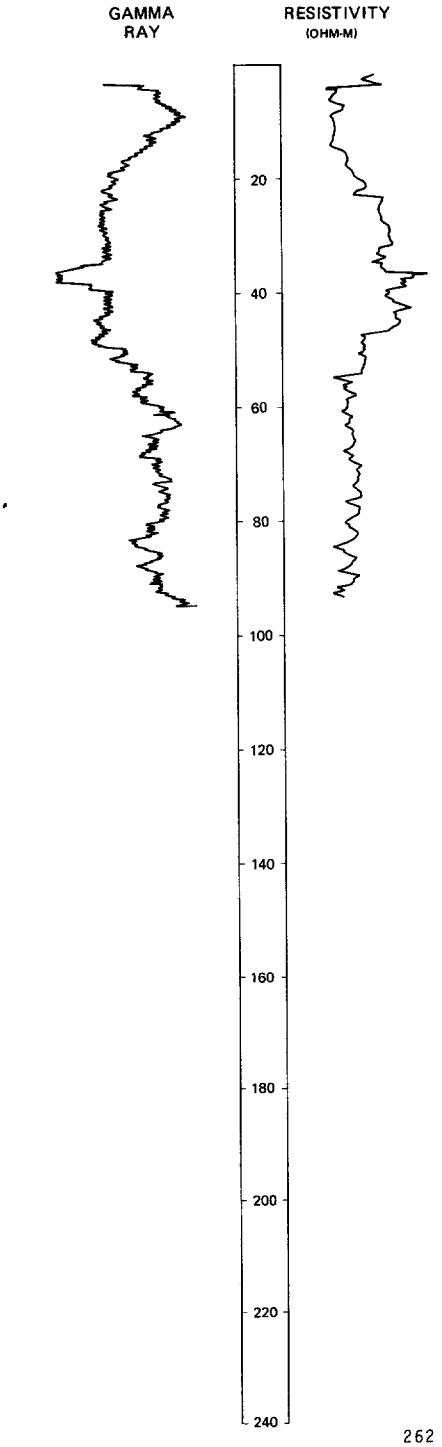
NDSWC 5837

LOCATION: 160-076-02BBB

DATE DRILLED: 10/14/80

ALTITUDE: 1470
(FT, NGVD)

DEPTH: 101
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-19	Clay, cohesive, yellowish-brown, oxidized (lacustrine).
19-34	Clay, very sandy, yellowish-brown, oxidized (till).
34-54	Clay, very silty, olive-gray (till); interbedded with lenses of fine gravel.

FOX HILLS SANDSTONE

54-96	Siltstone, bentonitic, very argillaceous, slightly carbonaceous, moderately indurated, greenish-gray.
96-101	Sandstone, fine, glauconitic, moderately indurated, greenish-gray.

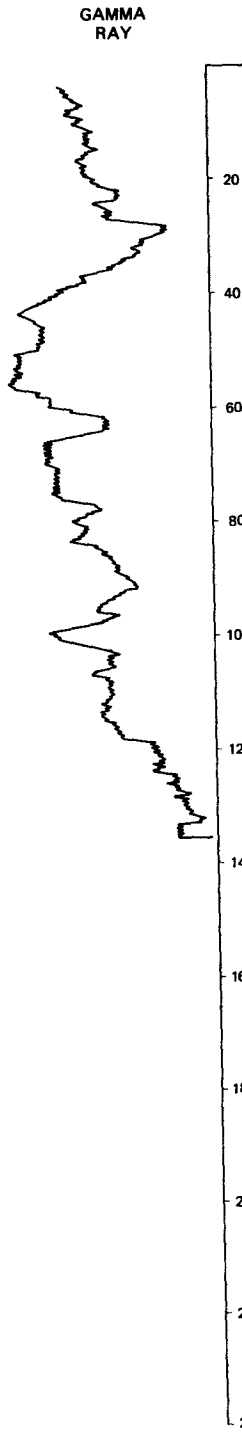
NDSWC 5838

LOCATION: 160-076-03BBB

DATE DRILLED: 10/14/80

ALTITUDE: 1480 (FT, NGVD)

DEPTH: 141 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-12	Sand, fine, rounded, oxidized; predominately quartz and detrital shale grains.
12-23	Silt, clayey, yellowish-brown, oxidized.
23-36	Clay, silty, olive-gray.
36-40	Clay, very sandy, pebbly, olive-gray (till).
40-62	Sand, fine to coarse, and fine to medium angular to rounded gravel.
62-66	Clay, very sandy, lignitic, olive-gray (till).
66-76	Sand, medium, well-sorted, rounded; about 80 percent quartz and 15 percent detrital lignite grains.
76-105	Clay, very sandy, gravelly, olive-gray (till).

FOX HILLS SANDSTONE

105-118	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray.
118-141	Sandstone, fine, bentonitic, argillaceous, glauconitic, moderately indurated, dark-greenish-gray.

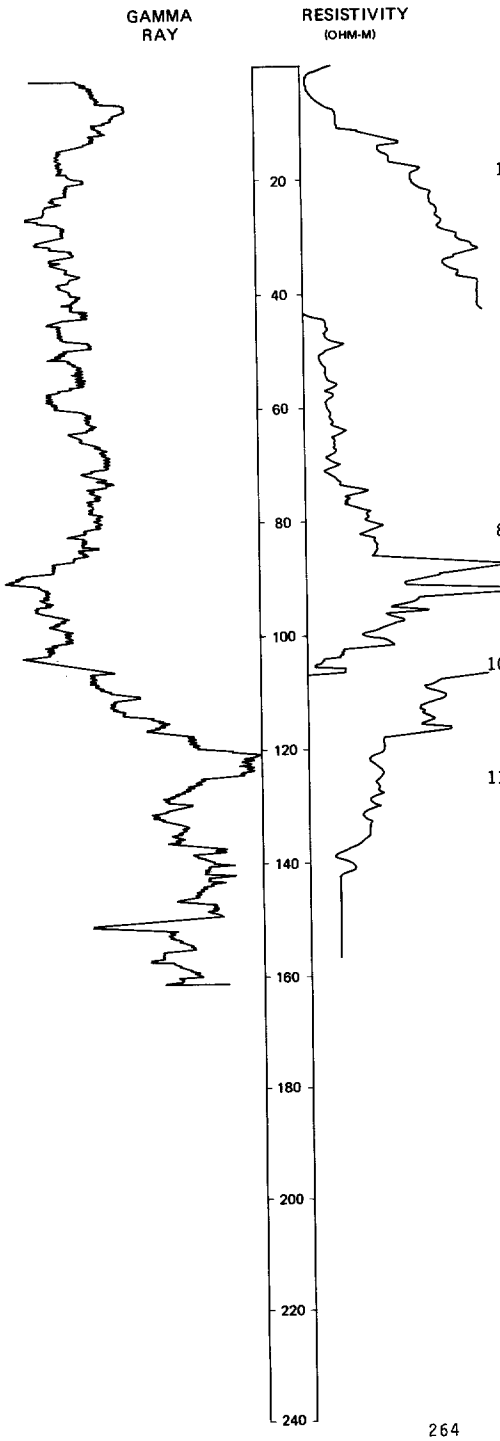
NDSWC 5545

LOCATION: 160-076-05DDD

DATE DRILLED: 8/28/79

ALTITUDE: 1460
(FT, NGVD)

DEPTH: 167
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-14	Clay, very cohesive, sticky, yellowish-brown.
14-86	Clay, very sandy, silty, pebbly, olive-gray (till).
86-108	Clay, sandy, silty, pebbly, olive-gray (till); contains a few very thin sand or gravel lenses.
	FOX HILLS SANDSTONE
108-118	Sandstone, very fine to fine, well-sorted, rounded, glauconitic, dusky-green; contains some magnetite and a few mica flakes.
118-167	Shale, brittle, black to grayish-black; contains a few sand grains.

160-076-09BCC
(Log from Church Well Boring)

Altitude: 1470 feet — Date drilled: 7/25/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, black	1	1
	Sand, yellow	9	10
	Clay, yellow	31	41
	Sand, yellow	4	45
	Sand, coarse; water	5	50
	Clay, blue	14	64
	Clay, sandy, blue	2	66
	Sand, coarse; water	6	72

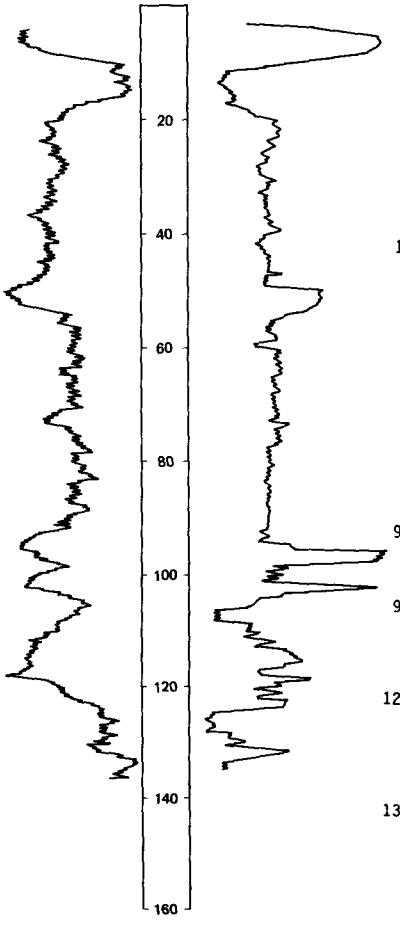
NDSWC 5835

LOCATION: 160-076-10CCC

DATE DRILLED: 10/13/80

ALTITUDE: 1465 (FT, NGVD)

DEPTH: 141 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-3	Silt, yellowish-brown, oxidized.
3-9	Sand, very fine, oxidized.
9-19	Clay, very cohesive, yellowish-brown, oxidized.
19-96	Clay, sandy, pebbly, olive-gray (till); interbedded with thin sand and gravel lenses from 50 to 96 feet.

FOX HILLS SANDSTONE

96-98	Sandstone, fine, glauconitic, well-indurated, greenish-gray.
98-124	Siltstone, very argillaceous, moderately indurated, greenish-gray.
124-135	Sandstone, fine, argillaceous, siliceous, glauconitic, moderately indurated, dark-greenish-gray.
135-141	Siltstone, argillaceous, moderately indurated, greenish-gray.

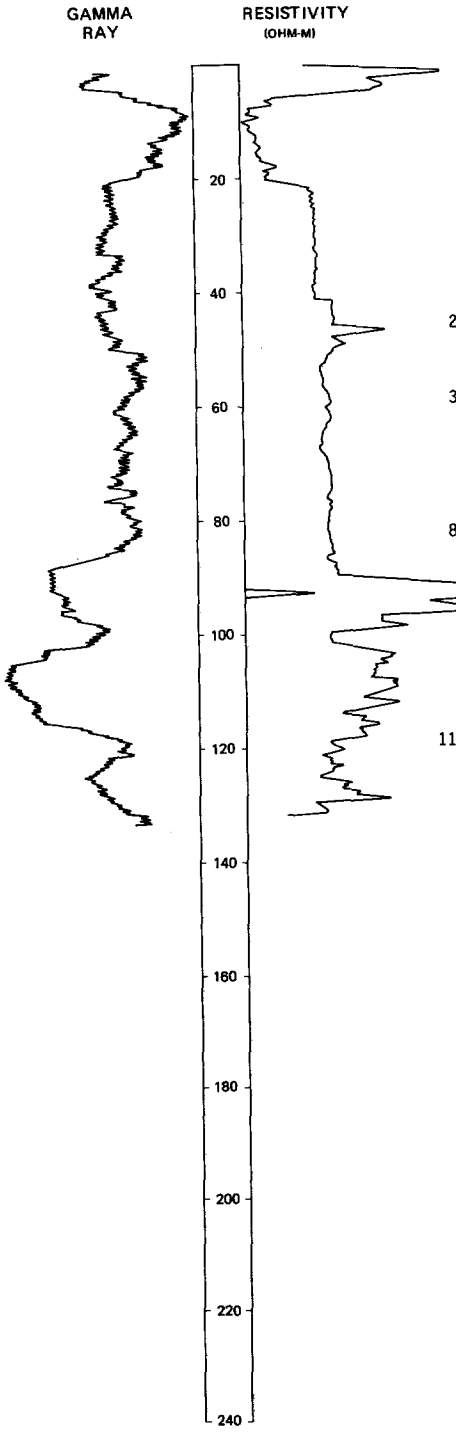
NDSWC 5836

LOCATION: 160-076-11CCC

DATE DRILLED: 10/13/80

ALTITUDE: 1460
(FT, NGVD)

DEPTH: 141
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-5	Sand, very fine, oxidized.
5-8	Clay, very cohesive, yellowish-brown, oxidized (lacustrine).
8-23	Clay, very cohesive, olive-gray (lacustrine).
23-32	Clay, very sandy, pebbly, yellowish-brown, oxidized (till).
32-86	Clay, very sandy, pebbly, olive-gray (till); boulders.
86-118	Sand, fine to coarse, and fine rounded gravel; lens of clay from 100 to 104 feet; predominately quartz and carbonate grains.

FOX HILLS SANDSTONE

118-141	Siltstone, very argillaceous; interbedded with thin lenses of fine greenish-gray sandstone.

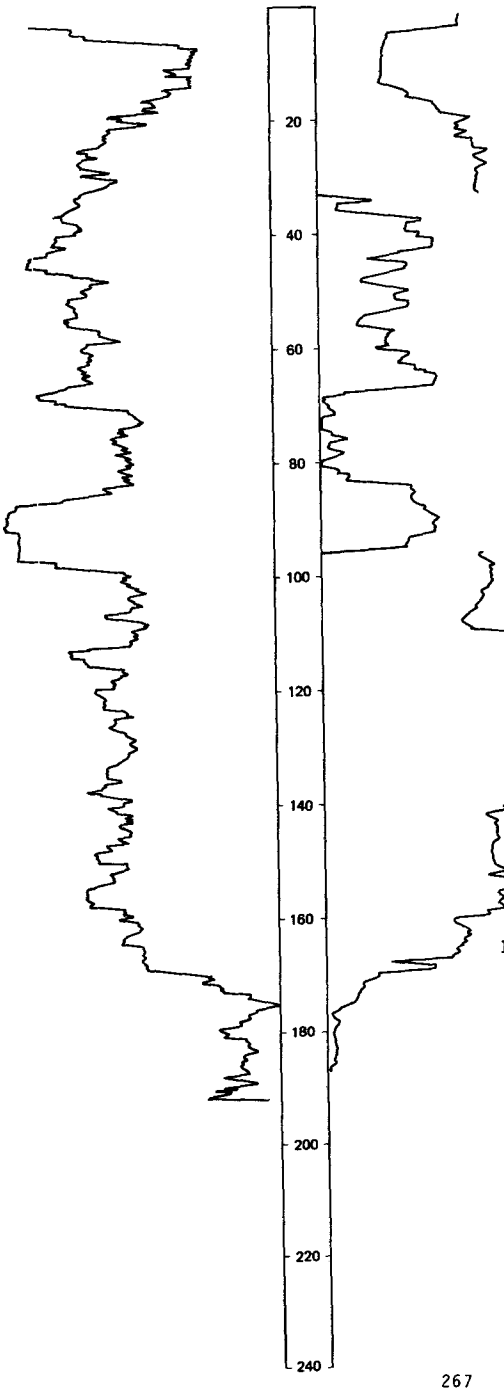
NDSWC 5546, 5546A

LOCATION: 160-076-23CCC1,2

DATE DRILLED: 8/23/79

ALTITUDE: 1460 (FT, NGVD)

DEPTH: 197 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-15	Clay, slightly sandy, sticky, yellowish-brown.
15-35	Clay, silty, sandy, pebbly, olive-gray (till).
35-48	Sand, very fine to coarse, predominately medium, rounded to angular; somewhat dirty.
48-83	Clay, sandy, silty, pebbly, olive-gray (till).
83-98	Sand, very fine to very coarse, predominately medium to coarse, rounded to angular.
98-169	Clay, sandy, silty, pebbly, olive-gray (till); contains a few sand lenses.

PIERRE SHALE

169-197	Shale, brittle, black.

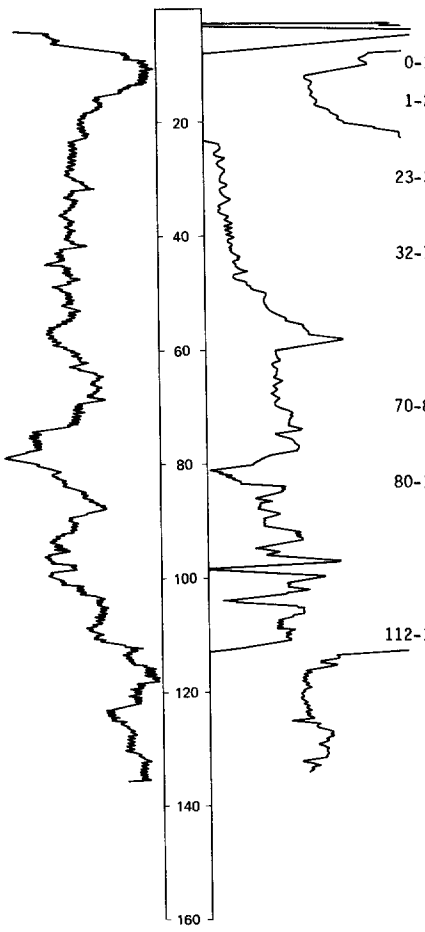
NDSWC 5833

LOCATION: 160-076-23DDD

DATE DRILLED: 10/10/80

ALTITUDE: 1460 (FT, NGVD)

DEPTH: 141 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-23	Clay, very cohesive, yellowish-brown, oxidized (lacustrine).
23-32	Clay, very silty, gravelly, yellowish-brown, oxidized (till).
32-70	Clay, very silty, pebbly (till); with thin lenses of olive-gray gravel.
70-80	Sand, fine to coarse, and fine to medium angular to rounded gravel.
80-112	Clay, very sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

112-141	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray.

160-076-27BBB
NDSWC 5834

Altitude: 1460 feet

Date drilled: 10/13/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Silt, yellowish-brown, oxidized (lacustrine)----------	1	2
	Clay, silty, yellowish-brown, oxidized (lacustrine)----------	14	16
	Clay, silty, olive-gray (lacustrine)----------	11	27
	Clay, very silty, gravelly, olive-gray (till)----------	36	63
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, greenish-gray----------	38	101

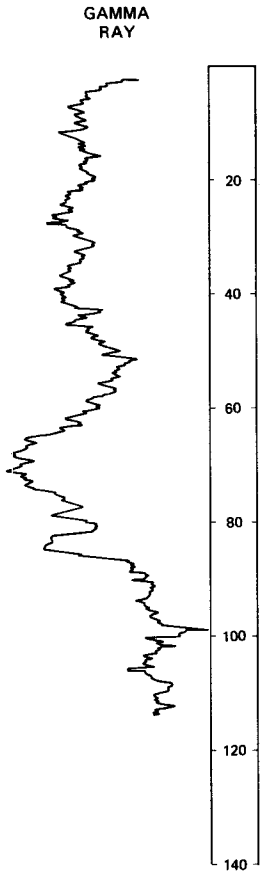
NDSWC 5547

LOCATION: 160-077-08ADD

DATE DRILLED: 8/28/79

ALTITUDE: 1444 (FT, NGVD)

DEPTH: 122 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-15	Clay, sticky, yellowish-brown, oxidized.
15-33	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
33-67	Clay, silty, sandy, pebbly, olive-gray (till).
67-73	Sand, very fine to very coarse, predominately coarse; contains about 10 percent gravel.
73-86	Clay, silty, sandy, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
86-122	Siltstone, slightly sandy, brittle, light-olive-gray.

160-077-14ADD
NDSWC 5839

Altitude: 1443 feet

Date drilled: 10/14/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	19	20
	Clay, very silty and sandy, gravelly, olive-gray (till)	24	44
	Sand, fine, well-sorted, rounded; predominately quartz and carbonate grains	10	54
	Clay, very sandy, pebbly, greenish-gray (till)	40	94
	Sand, fine to coarse, and fine to medium angular to rounded gravel	6	100
Fox Hills Sandstone:			
	Shale, carbonaceous, brownish-gray	4	104
	Siltstone, argillaceous, brownish-gray; carbonaceous greenish-gray streaks; interbedded with fine sandstone	17	121

160-077-19BBB
NDSWC 5840

Altitude: 1455 feet

Date drilled: 10/14/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Silt, yellowish-brown, oxidized	2	3
	Clay, very sandy, pebbly, yellowish-brown, oxidized (till)	22	25
	Clay, very sandy, pebbly, olive-gray (till); interbedded with gravel from 40 to 50 feet	25	50
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, greenish-gray	10	60
	Siltstone, bentonitic, argillaceous, moderately indurated, brownish-gray; interbedded with fine greenish-gray sandstone	21	81

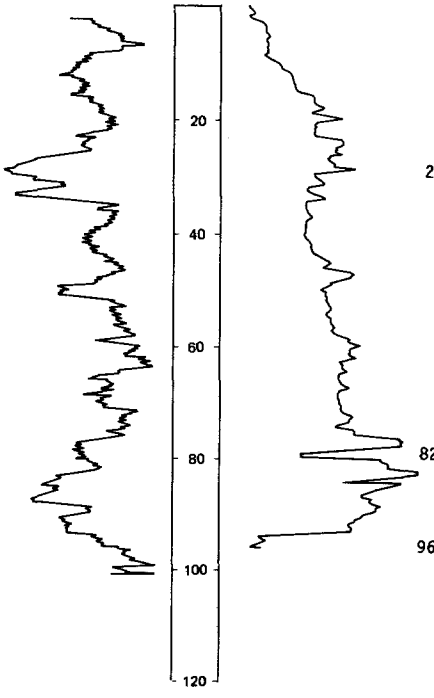
NDSWC 5548

LOCATION: 160-078-11CCC

DATE DRILLED: 8/28/79

ALTITUDE: 1452 (FT, NGVD)

DEPTH: 107 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-23 Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).

23-82 Clay, sandy, silty, pebbly, olive-gray (till); somewhat softer below 35 feet.

FOX HILLS SANDSTONE

82-96 Sandstone, very fine to fine, predominately fine, glauconitic; micaceous, magnetitic, pale-blue-green.

96-107 Siltstone, sandy, brittle, light-olive-gray.

160-078-17DDD
NDSWC 5842

Altitude: 1444 feet | Date drilled: 10/14/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Clay, very sandy, pebbly, yellowish-brown, oxidized (till)----------	25	26
	Clay, very sandy, pebbly, olive-gray (till); becoming gravelly at 90 feet----------	99	125
	Clay, very silty, greenish-gray; bedrock shove block----------	10	135
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, greenish-gray----------	5	140
	Sandstone, fine, siliceous, well-indurated, greenish-gray----------	21	161

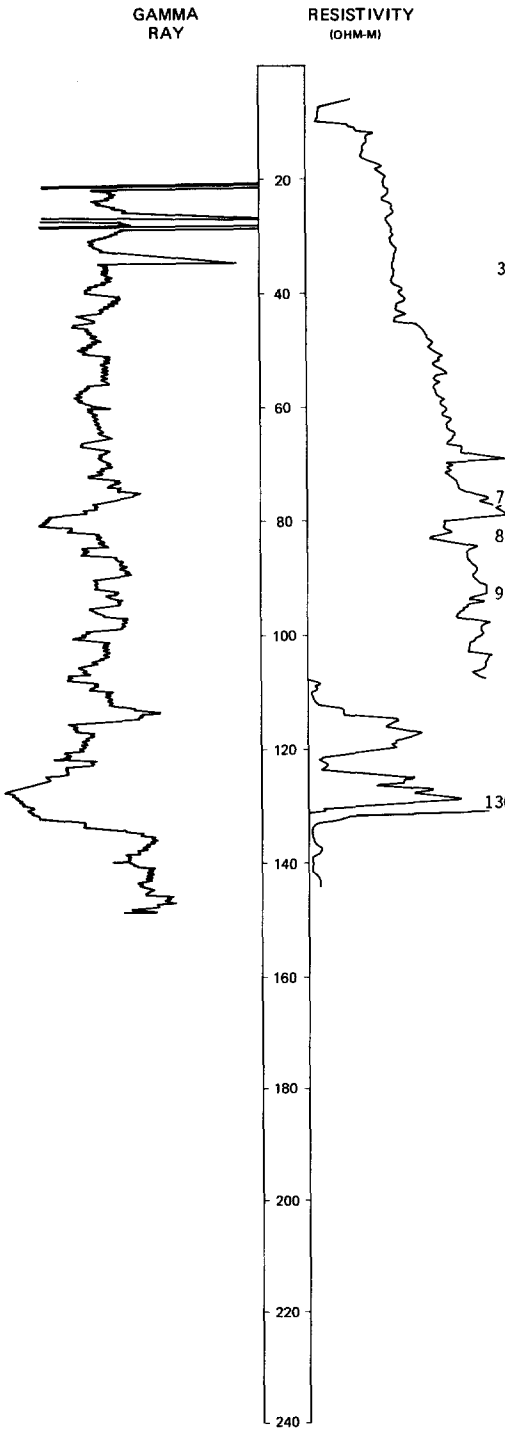
NDSWC 5550

LOCATION: 160-079-06AAA

DATE DRILLED: 8/28/79

ALTITUDE: 1460
(FT, NGVD)

DEPTH: 152
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-37	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
37-78	Clay, silty, sandy, pebbly, olive-gray (till).
78-83	Sand.
83-92	Clay, silty, sandy, pebbly, olive-gray (till).
92-130	Clay, sandy, silty, pebbly, olive-gray (till); contains several sand and gravel lenses 6 inches to 1 foot thick.
	FOX HILLS SANDSTONE
130-152	Siltstone, sandy, clayey, slightly micaceous, brittle, light-olive-gray.

160-079-06ACC
(Log from Verne R. Peterson Well Drilling)

Altitude: 1465 feet — Date drilled: 9/12/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil and fill dirt	3	3
	Clay, yellow	35	38
	Clay, sandy, gray	32	70
	Sand	24	94
	Sand, fine; with some gravel	7	101
	Gravel, coarse, clean	6	107

160-079-17AAB
(Log from Verne R. Peterson Well Drilling)

Altitude: 1455 feet — Date drilled: 9/20/74

	Soil	2	2
	Clay, yellow	34	36
	Gravel	2	38
	Clay, yellow	8	46
	Clay, gray	17	63
	Gravel	2	65
	Clay, gray	5	70
	Coal	2	72
	Clay, gray	8	80
	Gravel	6	86
	Clay, gray	12	98
	Stones	2	100
	Clay, gray	10	110
	Gravel and clay	15	125
	Clay	75	200

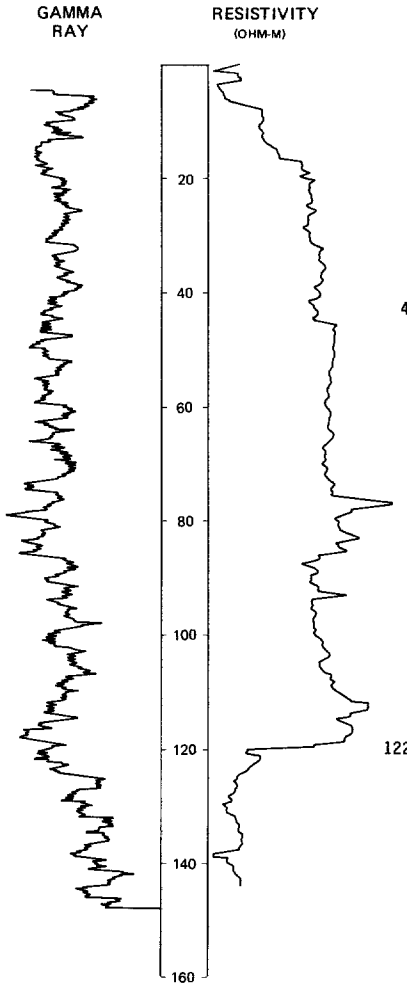
NDSWC 5549

LOCATION: 160-079-21BBB

DATE DRILLED: 8/28/79

ALTITUDE: 1462
(FT, NGVD)

DEPTH: 152
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-7	Clay, silty, slightly sandy, yellowish-brown, oxidized.
7-45	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
45-122	Clay, sandy, silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

122-152	Siltstone, sandy, micaceous, brittle, light-olive-gray to dark-olive-gray.

160-080-02DDD
(Log from C. A. Simpson & Son)

Altitude: 1475 feet

Date drilled: 7/16/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, sandy, yellow----------	19	20
	Clay, blue----------	75	95
	Gravel; no water----------	2	97
	Clay, blue; with stones----------	13	110
	Clay, sandy, blue----------	49	159
	Sand, fine; with pebbles; stopped-- water getting salty----------	11	170

160-080-05AC
(Log from Peterson, 1957)

Altitude: 1503 feet — Date drilled: 9/12/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
CRETACEOUS SYSTEM:			
Pierre Formation (top):			290
Niobrara Formation (top):			1547
Greenhorn Formation (top):			1870
Dakota Group Sands (top):			2356
JURASSIC SYSTEM:			
Piper Formation (top):			3184
TRIASSIC SYSTEM:			
Spearfish Formation (top):			3408

160-080-09DDA
(Log from Nick Erck Well Drilling)

Altitude: 1480 feet — Date drilled: 10/03/75

Soil, black	1	1
Sand, yellow	7	8
Clay, yellow	24	32
Clay, gray	58	90
Sand; water	4	94

160-080-14CDD
(Log from Verne R. Peterson Well Drilling)

Altitude: 1485 feet

Soil	2	2
Sand, fine	9	11
Clay, gray	55	66
Gravel	2	68
Till	10	78
Gravel	2	80
Till	8	88
Gravel	5	93
Clay, gray	3	96
Clay, gravelly	2	98
Gravel	4	102
Sand, fine	21	123
No description	17	140

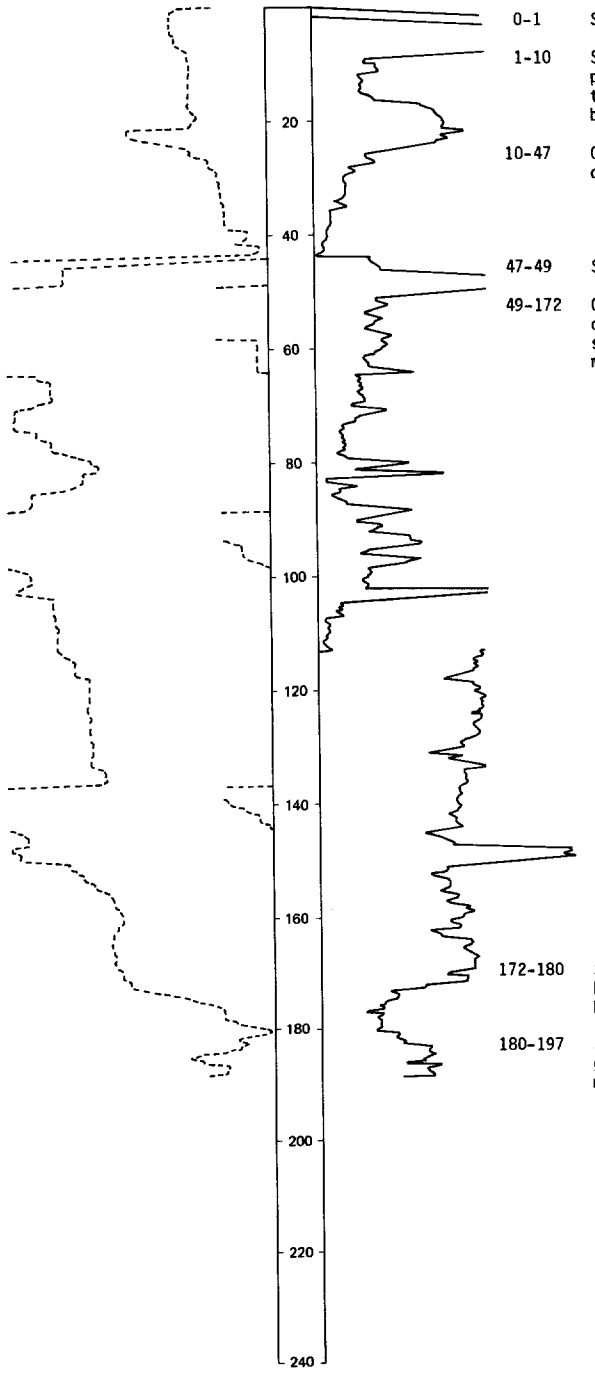
NDSWC 5552

LOCATION: 160-080-19CCC

DATE DRILLED: 8/29/79

ALTITUDE: 1493 (FT, NGVD)

DEPTH: 197 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-10	Sand, very fine to coarse, predominately fine, rounded to subangular, yellowish-brown.
10-47	Clay, very sandy, pebbly, olive-gray.
47-49	Sand.
49-172	Clay, very sandy, pebbly, olive-gray (till); contains sand and gravel lenses as much as 6 inches thick.

FOX HILLS SANDSTONE

172-180	Siltstone, sandy, clayey, brittle, dusky-yellowish-brown.
180-197	Sandstone, very fine to fine, glauconitic, micaceous, magnetitic, grayish-green.

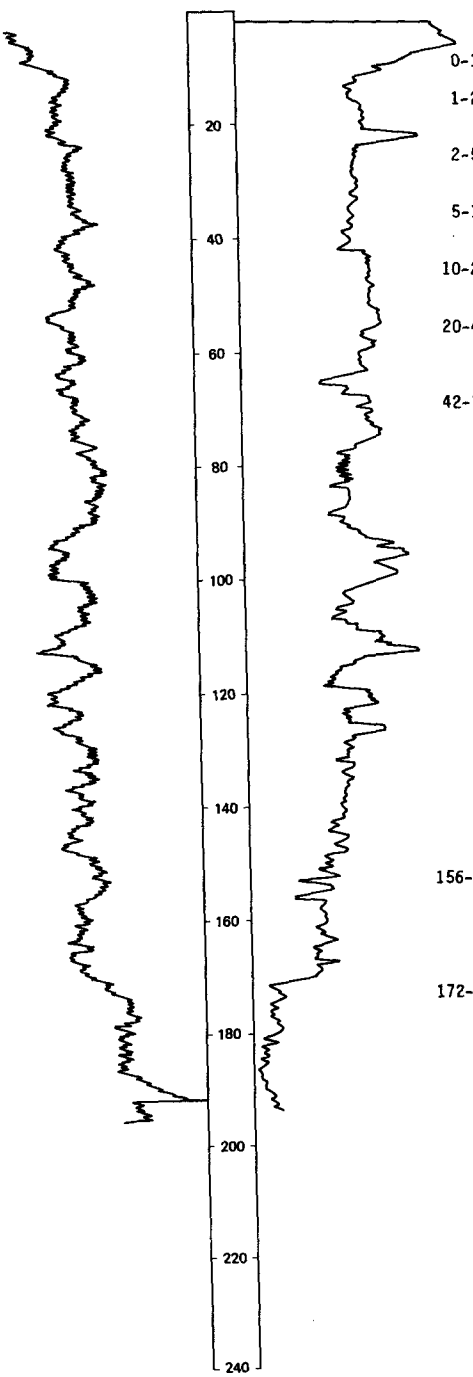
NDSWC 5844

LOCATION: 160-080-20AAA

DATE DRILLED: 10/15/80

ALTITUDE: 1490
(FT, NGVD)

DEPTH: 201
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-2	Silt, yellowish-brown, oxidized.
2-5	Sand, fine, well-sorted, rounded, oxidized.
5-10	Silt, yellowish-brown, oxidized.
10-20	Silt, clayey, olive-gray (lacustrine?).
20-42	Clay, very silty, olive-gray (till); interbedded with lenses of gravel.
42-156	Clay, very silty, pebbly, olive-gray (till); interbedded with lenses of gravel to 138 feet.

FOX HILLS SANDSTONE

156-172	Sandstone, fine, argillaceous, fractured, greenish-gray; interbedded with bentonitic carbonaceous brownish-gray siltstone.
172-201	Siltstone, argillaceous, moderately indurated, brownish-gray.

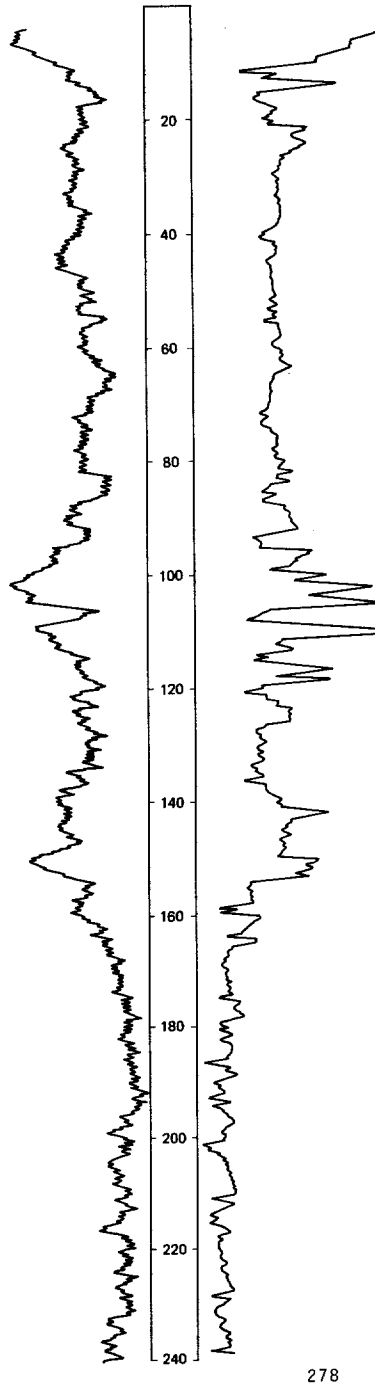
NDSWC 5843

LOCATION: 160-080-23BBB

DATE DRILLED: 10/15/80

ALTITUDE: 1480
(FT, NGVD)

DEPTH: 371
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-7	Sand, very fine, rounded, oxidized; predominately quartz and lignite grains.
7-14	Silt, yellowish-brown, oxidized.
14-18	Silt, olive-gray.
18-95	Clay, very silty, pebbly, olive-gray (till).
95-105	Sand, coarse, and very fine to medium subrounded to angular gravel; predominately igneous, quartz, and carbonate grains and pebbles.
105-166	Clay, very silty, olive-gray (till); interbedded with lenses of fine to medium sandy gravel.
166-210	Silt, very clayey, olive-gray.
210-230	Clay, silty, olive-gray.
230-320	Silt, very clayey, olive-gray.

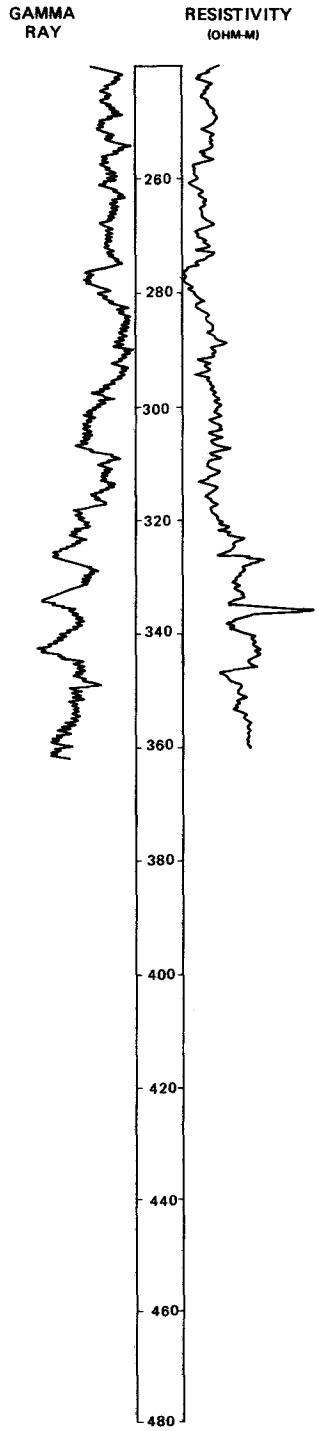
NDSWC 5843, continued

LOCATION: 160-080-23BBB

DATE DRILLED: 10/15/80

ALTITUDE: 1480
(FT, NGVD)

DEPTH: 371
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

320-371 Silt, clayey, sandy, olive-gray; abundant detrital lignite.

160-080-30DDD
(Log from Mariner Drilling Service)

Altitude: 1490 feet — Date drilled: 8/31/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Surface	1	1
	Sand, fine	9	10
	Clay, blue and yellow	37	47
	Mud and little rocks	1	48
	Sand, fine; some water	22	70
	Clay, blue	56	126
	Sand, fine; rock; and mud	2	128

160-081-01ADD
NDSWC 11447

Altitude: 1495 feet — Date drilled: 11/04/80

Glacial drift:			
	Soil	1	1
	Clay, silty, yellowish-brown, oxidized	10	11
	Clay, silty, gravelly, yellowish-brown, oxidized (till)	12	23
	Clay, silty, gravelly, olive-gray (till); interbedded with occasional lenses of sand and gravel	158	181
Fox Hills Sandstone:			
	Sandstone, fine to medium, clayey, quartzose, greenish-gray	19	200

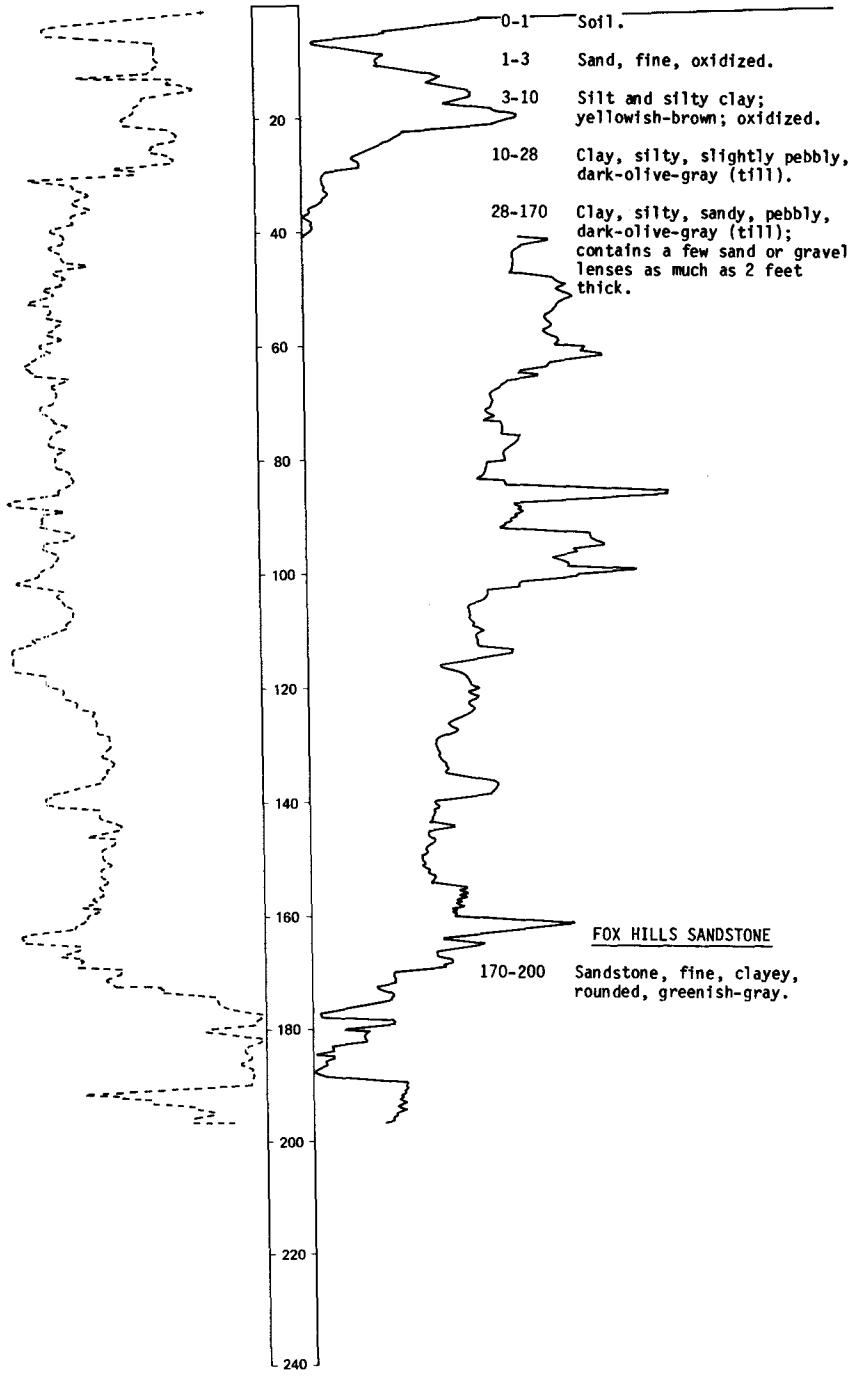
NDSWC 11068

LOCATION: 160-081-25AAA

DATE DRILLED: 9/13/79

ALTITUDE: 1494 (FT, NGVD)

DEPTH: 200 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-3	Sand, fine, oxidized.
3-10	Silt and silty clay; yellowish-brown; oxidized.
10-28	Clay, silty, slightly pebbly, dark-olive-gray (till).
28-170	Clay, silty, sandy, pebbly, dark-olive-gray (till); contains a few sand or gravel lenses as much as 2 feet thick.
	FOX HILLS SANDSTONE
170-200	Sandstone, fine, clayey, rounded, greenish-gray.

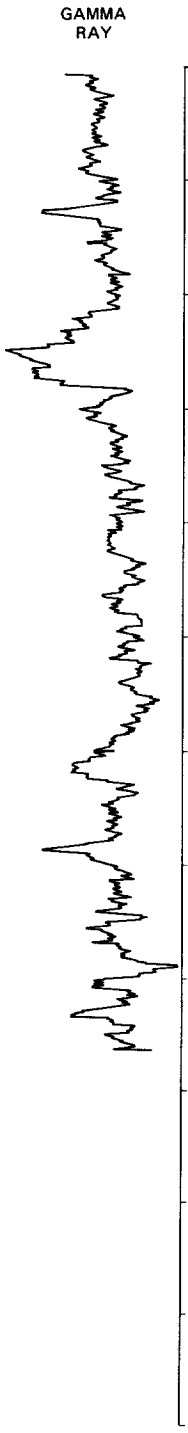
NDSWC 5553

LOCATION: 160-081-33BBB

DATE DRILLED: 8/29/79

ALTITUDE: 1489
(FT, NGVD)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-5	Sand, coarse, yellowish-brown, oxidized.
5-22	Clay, silty, sandy, pebbly, dark-yellowish-brown, oxidized.
22-47	Clay, very sandy, pebbly, olive-gray; contains a few sand and gravel lenses.
47-57	Clay, sandy, olive-gray; interbedded with coarse sand and gravel.
57-165	Clay, sandy, silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

165-182	Sandstone, very fine to fine, well-sorted, rounded, glauconitic, micaceous, grayish-green.

LOCATION: 160-081-33BBB

DATE DRILLED: 8/29/79

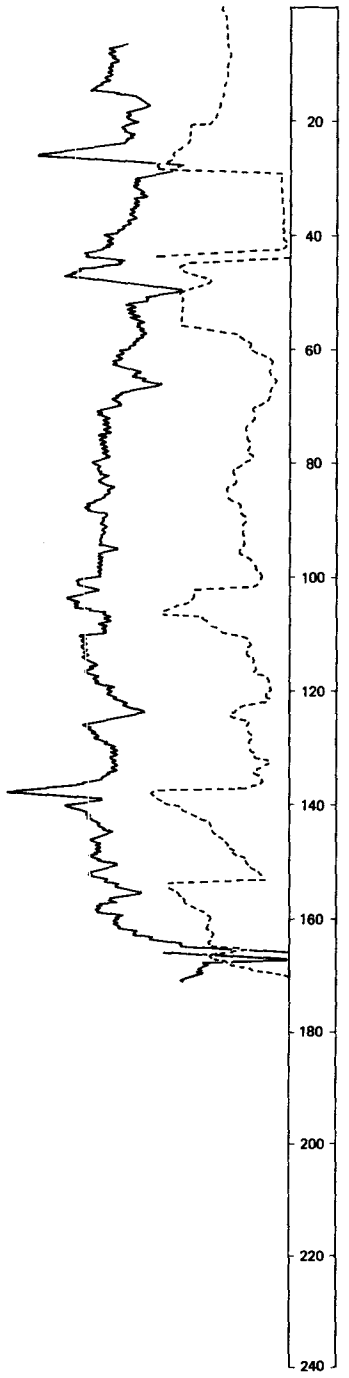
ALTITUDE: 1489
(FT, NGVD)

DEPTH: 182
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



160-081-35DC
(Log from LaRocque, 1963)

Altitude: 1480 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	3	3
	Sand, fine, and gravel	9	12
	Clay, sandy, gray; with some gravel	13	25
	Sand, fine; with some lignite fragments	19	44
	Clay, silty, sandy, gray; with some gravel	71	115
	Clay, sandy, gray; with some lignite fragments and gravel	21	136
	Sand, fine, and gravel; with some gray clay	29	165
Bedrock:			
	Clay, sandy, gray	8	173
	Lignite	2	175
	Clay, brown; with some gray sandy clay	10	185

160-081-35DCC
USGS 66-47

Altitude: 1490 feet Date drilled: 7/29/47

	Soil	3	3
	Sand, fine, and gravel	9	12
	Clay, sandy, gray; with large pebbles	10	22
	Clay, sandy, gray; with some gravel	3	25
	Sand, fine; some coal fragments	19	44
	Clay, silty, sandy, gray; with some gravel	71	115
	Clay, sandy, gray; with some coal fragments and gravel	21	136
	Sand, fine, and gravel; with some clay	29	165
Bedrock(?):			
	Clay, sandy, light-gray	8	173
	Coal	2	175
	Clay, brown; with some sandy light-gray clay	10	185

160-081-36AAA
NDSWC 11067

Altitude: 1493 feet Date drilled: 9/13/79

	Soil	1	1
	Sand, fine, rounded to subrounded, oxidized	9	10
	Clay, silty, sandy, pebbly, olive-gray (till); contains thin sand lenses	56	66
	Sand and clay lenses	7	73
	Clay, silty, sandy, pebbly, olive-gray (till)	43	116
	Sand, coarse, gravelly, poorly sorted, rounded to angular	2	118
	Clay, silty, sandy, pebbly, olive-gray (till); contains thin sand lenses	51	169
	Sand	8	177
Fox Hills Sandstone:			
	Sandstone, fine, clayey, greenish-gray	23	200

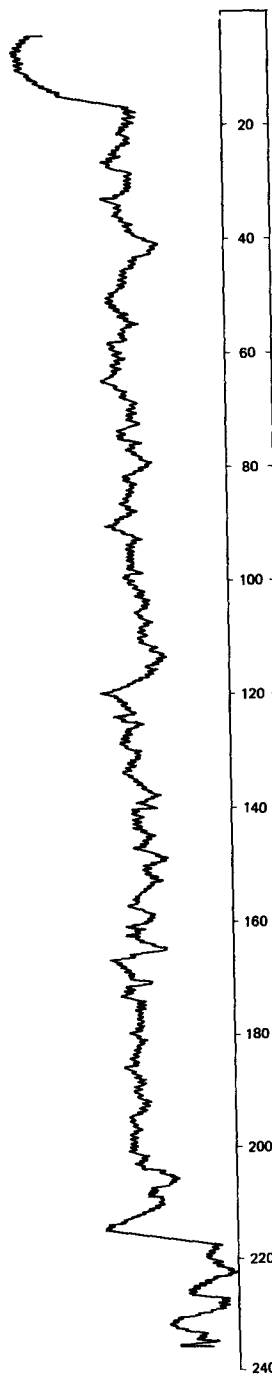
NDSWC 5848

LOCATION: 160-082-01AAA

DATE DRILLED: 10/16/80

ALTITUDE: 1513 (FT, NGVD)

DEPTH: 241 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-12	Sand, fine to coarse, and fine to medium rounded gravel; oxidized to 10 feet; predominately quartz grains and pebbles.
12-56	Clay, silty, olive-gray (till); interbedded with gravel from 40 feet.
56-64	Sand, coarse, and fine to medium angular to rounded gravel; interbedded with till.
64-216	Clay, silty, pebbly, olive-gray (till); interbedded with gravel from 106 to 216 feet.

FOX HILLS SANDSTONE

216-224	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray.
224-241	Sandstone, fine, argillaceous, greenish-gray; interbedded with bentonitic greenish-gray siltstone.

160-082-02BBB
NDSWC 11433

Altitude: 1522 feet — Date drilled: 10/20/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	27	28
	Clay, sandy, pebbly, olive-gray (till); interbedded with occasional lenses of sand and gravel with some boulders	171	199
Fox Hills Sandstone:			
	Sandstone, very fine to fine, bentonitic, argillaceous, poorly indurated; some carbonaceous greenish-gray streaks	10	209
	Siltstone, clayey, argillaceous, carbonaceous, brownish-gray; interbedded with thin lenses of fine greenish-gray sandstone	11	220

160-082-02CCC
NDSWC 11457

Altitude: 1517 feet — Date drilled: 11/11/80

Glacial drift:			
	Soil	1	1
	Sand, fine to very coarse, subangular, oxidized; about 50 percent quartz, 40 percent granitic and carbonate, and 10 percent detrital shale grains	11	12
	Clay, silty to very sandy, yellowish-brown, oxidized (till)	1	13
	Clay, silty to sandy, olive-gray (till); gravelly in places	190	203
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, quartzose, greenish-gray	37	240

160-082-02DCC
NDSWC 11450

Altitude: 1515 feet — Date drilled: 11/05/80

Glacial drift:			
	Soil	1	1
	Sand, fine to very coarse, oxidized; predominately igneous, quartz, and carbonate grains; with about 40 percent fine to coarse subangular to subrounded gravel	12	13
	Clay, silty, pebbly, olive-gray (till); interbedded with occasional lenses of sand and gravel	161	174
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, moderately indurated, greenish-gray	26	200

160-082-02DDC
NDSWC 11458

Altitude: 1513 feet — Date drilled: 11/11/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, coarse to very coarse, oxidized; predominately quartz, igneous, and carbonate grains; about 20 percent fine to pebble-size subangular gravel	13	14
	Clay, silty, pebbly, olive-gray (till); interbedded with lenses of sand and gravel	162	176
	Sand, very coarse; interbedded with lenses of silt and clay; about 40 percent medium to pebble-size subrounded gravel	153	329
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, moderately indurated, dark-greenish-gray	11	340

160-082-03BBB
NDSWC 11434

Altitude: 1520 feet — Date drilled: 10/21/80

Glacial drift:			
	Soil	2	2
	Clay, very sandy, pebbly, yellowish-brown, oxidized (till)	14	16
	Clay, silty, sandy, pebbly, olive-gray (till); interbedded with occasional lenses of sand and gravel	195	211
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, greenish-gray; interbedded with lenses of very fine glauconitic greenish-gray sandstone and slightly carbonaceous dark-brownish-black shale	29	240

160-082-05DAD
NDSWC 11448

Altitude: 1530 feet — Date drilled: 11/05/80

Glacial drift:			
	Soil	2	2
	Clay, silty, yellowish-brown, oxidized	5	7
	Clay, silty to sandy, gravelly, yellowish-brown, oxidized (till)	15	22
	Clay, silty to sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel at 29, 65, 80, and 92 feet	186	208
Fox Hills Sandstone:			
	Sandstone, fine to medium, clayey; carbonaceous greenish-gray streaks; interbedded with lenses of sandy greenish-gray siltstone	52	260

160-082-06BBB
NDSWC 8904

Altitude: 1522 feet — Date drilled: 9/27/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Silt, clayey, sandy, moderate-yellowish-brown, oxidized	2	2
	Sand, fine to medium, subrounded, oxidized	4	6
	Clay, silty, pebbly, calcareous, olive-gray (till)	5	11
	Sand, very fine to medium, silty, gray	2	13
	Clay, silty, pebbly, olive-gray (till); contains a few thin sand lenses	87	100

160-082-06DDA
NDSWC 8906

Altitude: 1520 feet — Date drilled: 9/27/73

	Clay, silty, pebbly, dusky-yellow, oxidized (till)	2	2
	Sand, fine to medium, angular to subrounded, dark-yellowish-brown, oxidized; contains about 40 percent gravel	2	4
	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till)	6	10
	Clay, silty, pebbly, olive-gray (till)	12	22
	Sand, fine to coarse	2	24
	Clay, silty, pebbly, olive-gray (till)	76	100

160-082-10CCC
USGS 57-47

Altitude: 1519 feet — Date drilled: 7/25/47

	Soil	2	2
	Clay, yellow; with some large pebbles	14	16
	Clay, dark-brown; with some large pebbles	6	22
	Clay, sandy, gray; with few pebbles	3	25
	Sand and gravel	3	28
	Clay, sandy, gray; with a few pebbles	7	35
	Clay, gray; with a large rock	2	37
	Clay, sandy, gray; with a few pebbles	48	85
	Sand and gravel	8	93
	Clay, sandy; with a few pebbles	22	115
	Clay, sandy, soft, gray; with a few pebbles and coal fragments	20	135
	Clay, sandy, gray; with some gravel and coal fragments	50	185
	Clay, tight, dark-brown; with some light sandy clay	10	195
	Clay, sandy, light; tight drilling	10	205

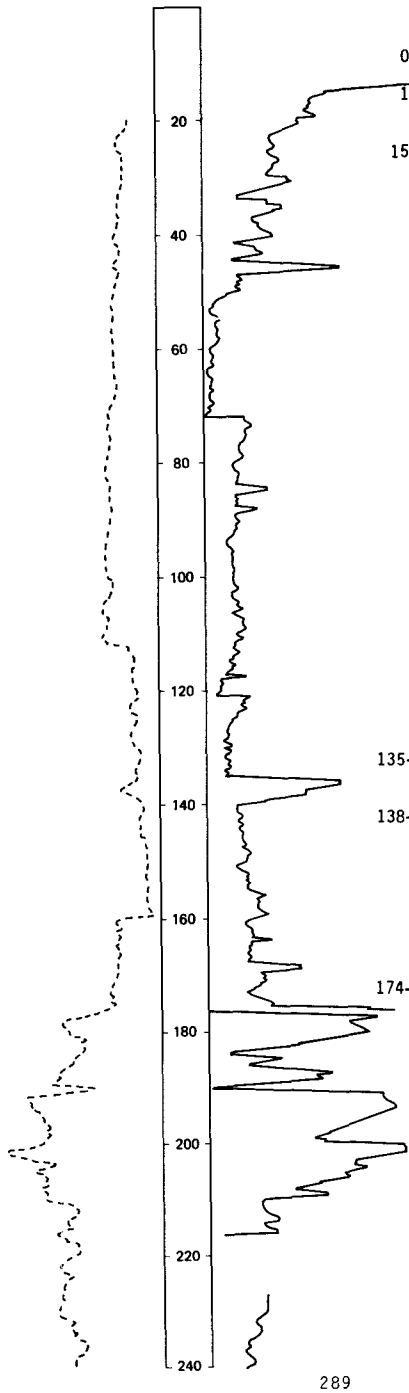
NDSWC 11451

LOCATION: 160-082-11BCC

DATE DRILLED: 11/06/80

ALTITUDE: 1520
(FT, NGVD)

DEPTH: 400
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-15	Sand, coarse, gravelly, subrounded, oxidized.
15-135	Clay, sandy, gravelly, olive-gray (till).
135-138	Gravel, fine to coarse, sandy.
138-174	Clay, silty to sandy, gravelly, olive-gray (till).

FOX HILLS SANDSTONE

174-260	Sandstone, fine, silty, quartzose, moderately indurated, dark-greenish-gray.

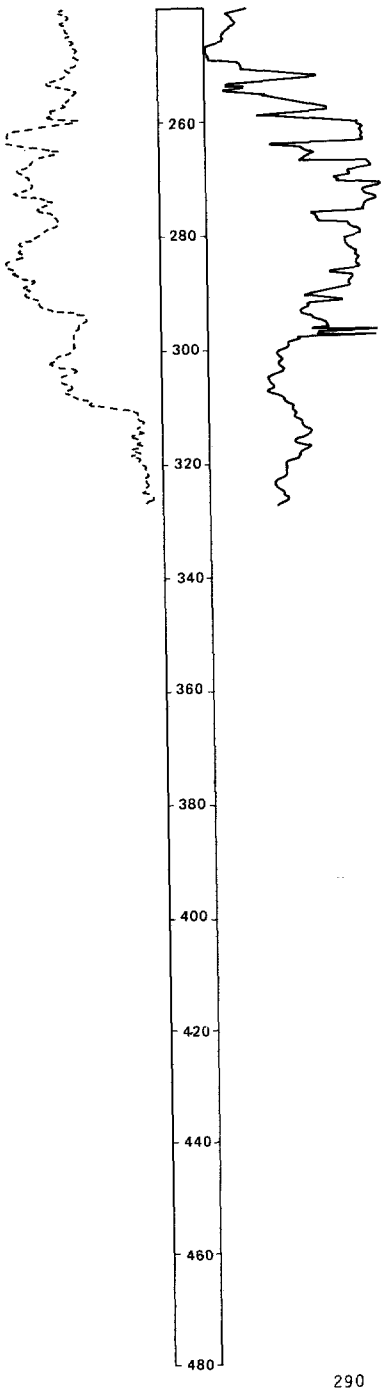
NDSWC 11451, continued

LOCATION: 160-082-11BCC

DATE DRILLED: 11/06/80

ALTITUDE: 1520 (FT, NGVD)

DEPTH: 400 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

260-298 Sandstone, fine, quartzose, poorly indurated, dark-greenish-gray.

298-400 Sandstone, fine, argillaceous, moderately indurated, greenish-gray; interbedded with bentonitic carbonaceous greenish-gray siltstone.

160-082-12ABB
NDSWC 11446

Altitude: 1517 feet — Date drilled: 11/04/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty to very sandy, yellowish-brown, oxidized (till)	19	20
	Clay, very sandy, pebbly, olive-gray (till)	63	83
	Sand, fine to medium, very silty, clayey	3	86
	Clay, very sandy, pebbly, olive-gray (till)	122	208
	Sand, fine to coarse, gravelly, subangular to rounded	4	212
Fox Hills Sandstone:			
	Siltstone, bentonitic, argillaceous; interbedded with fine quartzose moderately indurated greenish-gray sandstone	8	220

160-082-12BBA
NDSWC 11445

Altitude: 1515 feet — Date drilled: 11/03/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, very fine to very coarse, poorly sorted, subrounded, oxidized	6	7
	Sand, very fine to very coarse; predominately silicate, carbonate, and detrital shale grains; with about 30 percent fine to granitic subrounded gravel	11	18
	Clay, silty, sandy, pebbly, olive-gray (till)	77	95
	Sand, fine to coarse, gravelly	2	97
	Clay, silty, sandy, pebbly, olive-gray (till)	57	154
	Sand, fine to coarse, gravelly	4	158
	Clay, silty, pebbly, olive-gray (till)	4	162
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	9	171
	Clay, silty, sandy, gravelly, olive-gray (till)	17	188
	Clay, silty, pebbly, olive-gray (till); interbedded with lenses of sand and gravel	10	198
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous; interbedded with lenses of moderately indurated greenish-gray siltstone	22	220

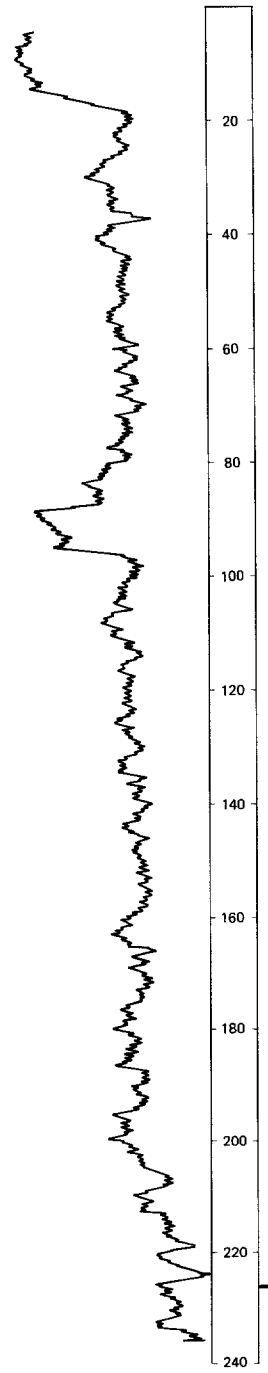
NDSWC 5849

LOCATION: 160-082-12BBB

DATE DRILLED: 10/16/80

ALTITUDE: 1520 (FT, NGVD)

DEPTH: 241 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-18	Sand, coarse to very coarse, and fine to medium angular to rounded oxidized gravel.
18-42	Clay, sandy, pebbly, olive-gray (till).
42-60	Silt, clayey, olive-gray.
60-80	Clay, sandy, pebbly, olive-gray (till).
80-87	Sand, coarse, and fine to medium angular to rounded gravel; predominately quartz, carbonate, and igneous grains and pebbles.
87-97	Clay, very sandy to gravelly, olive-gray (till); cobbles.
97-206	Clay, very sandy (till); some thin lenses of olive-gray gravel.
206-221	Silt, clayey, greenish-gray.

FOX HILLS SANDSTONE

221-241	Sandstone, fine, light-greenish-gray; interbedded with bentonitic carbonaceous brownish-gray siltstone.

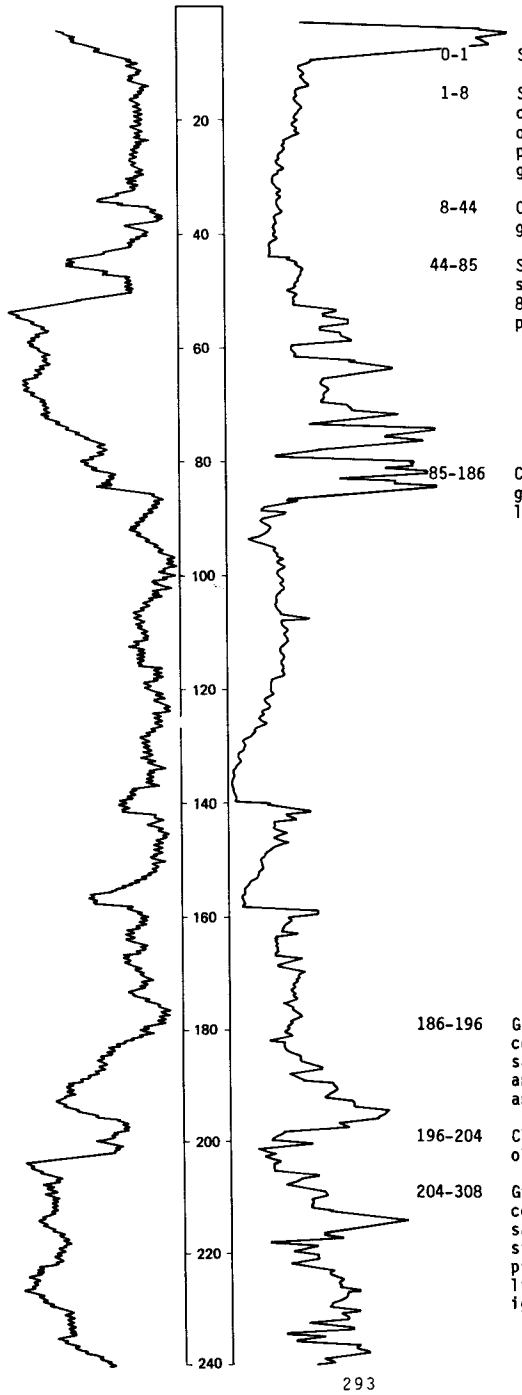
NDSWC 5850, 5850-2

LOCATION: 160-082-14AAA1,2

DATE DRILLED: 10/17/80

ALTITUDE: 1513 (FT, NGVD)

DEPTH: 321 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

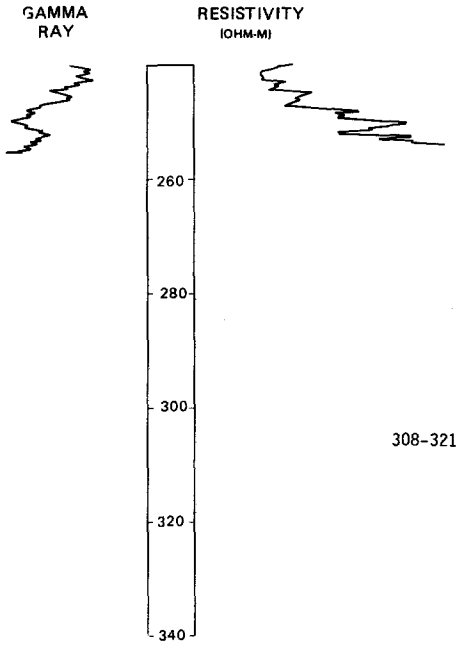
0-1	Soil.
1-8	Sand, coarse, and fine to coarse angular to rounded oxidized gravel; predominately carbonate grains and pebbles.
8-44	Clay, silty to sandy, olive-gray (till).
44-85	Sand, fine to coarse, subrounded to rounded; about 80 percent quartz and 20 percent carbonate grains.
85-186	Clay, silty, sandy, olive-gray (till); occasional thin lenses of sand and gravel.
186-196	Gravel, fine to coarse, and coarse angular to rounded sand; predominately carbonate and detrital shale pebbles and grains.
196-204	Clay, very sandy to gravelly, olive-gray (till).
204-308	Gravel, fine to coarse, and coarse angular to rounded sand; interbedded with very silty to sandy clay; predominately detrital lignite, carbonate, and igneous pebbles and grains.

LOCATION: 160-082-14AAA1,2

DATE DRILLED: 10/17/80

ALTITUDE: 1513 (FT, NGVD)

DEPTH: 321 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

308-321 Siltstone, bentonitic, argillaceous, brownish-gray.

160-082-14AAD
NDSWC 11455

Altitude: 1515 feet

Date drilled: 11/10/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine to very coarse; predominately quartz, igneous, and carbonate grains; about 10 percent fine to granule subangular gravel	15	16
	Clay, silty, sandy, pebbly, olive-gray (till); with lenses of sand and gravel from 27 to 29, 36 to 38, and 182 to 185 feet	180	196
	Sand, fine to coarse, and fine silty to clayey gravel	11	207
	Sand, very fine to fine, clayey, greenish-gray; shove block	15	222
	Sand, fine, silty, clayey	19	241
	Sand, very coarse, gravelly; predominately quartz, igneous, detrital shale, and lignite grains	5	246
	Cobbles and boulders; with clayey sand and gravel	7	253
Fox Hills Sandstone:			
	Siltstone, clayey, moderately indurated, light-gray	10	263
	Sandstone, fine to medium, glauconitic, dark-greenish-gray	12	275
	Sandstone, fine, argillaceous, greenish-gray	5	280

160-082-14ABA
NDSWC 11456

Altitude: 1515 feet — Date drilled: 11/11/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Sand, fine to coarse, gravelly, subangular to subrounded; predominately quartz, igneous, and carbonate grains----------	11	12
	Gravel, fine to granule, subangular; predominately silicate and carbonate pebbles----------	3	15
	Clay, very sandy, gravelly, olive-gray (till)----------	36	51
	Sand, fine to medium, gravelly, subangular; with some detrital lignite and shale pebbles; predominately carbonate, and igneous grains----------	36	87
	Clay, silty to sandy, olive-gray (till); some boulders; interbedded with occasional thin lenses of sand and gravel----------	189	276
	Clay, sandy, greenish-gray (till); reworked localized bedrock----------	26	302
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous; interbedded with moderately indurated greenish-gray siltstone----------	18	320

160-082-14BBB
NDSWC 11452

Altitude: 1513 feet — Date drilled: 11/06/80

Glacial drift:			
	Soil----------	1	1
	Clay, sandy to very gravelly, yellowish-brown, oxidized (till)----------	13	14
	Clay, silty, pebbly, olive-gray (till); interbedded with lenses of sand and gravel----------	170	184
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, greenish-gray; interbedded with carbonaceous brownish-black siltstone----------	16	200

160-082-14CBB
NDSWC 11454

Altitude: 1521 feet — Date drilled: 11/07/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	2	2
	Sand, fine to very coarse; about 30 percent fine granule subangular to subrounded oxidized gravel	13	15
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	2	17
	Clay, silty to sandy, pebbly, olive-gray (till)	157	174
	Clay, very sandy, pebbly, olive-gray (till)	11	185
Fox Hills Sandstone:			
	Sandstone, fine to medium; interbedded with argillaceous greenish-gray siltstone	15	200

160-082-14CCC
NDSWC 11453

Altitude: 1523 feet — Date drilled: 11/06/80

Glacial drift:			
	Soil	1	1
	Clay, silty to sandy, gravelly, yellowish-brown, oxidized (till)	22	23
	Clay, silty, very sandy, olive-gray (till); interbedded with lenses of fine to coarse sandy subangular gravel; predominately quartz, carbonate, igneous, and detrital shale pebbles	43	66
	Sand, fine to coarse, gravelly, subangular	8	74
	Clay, silty, sandy, olive-gray (till); interbedded with lenses of sand and subangular gravel; occasional boulder	120	194
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, greenish-gray; interbedded with carbonaceous brownish-gray siltstone	26	220

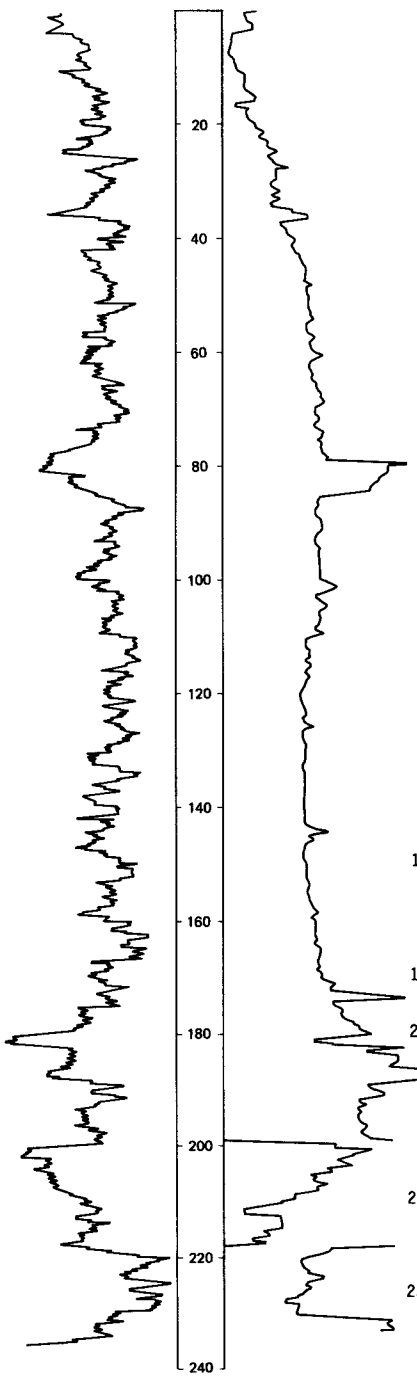
NDSWC 5554

LOCATION: 160-082-23AAA

DATE DRILLED: 8/29/79

ALTITUDE: 1506
(FT, NGVD)

DEPTH: 242
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-10	Clay, sandy, silty, pebbly, yellowish-brown, oxidized (till).
10-77	Clay, sandy, silty, pebbly, olive-gray (till).
77-172	Clay, very sandy, silty, slightly pebbly, dark-olive-gray (till).
172-182	Clay(?), very sandy, silty, dark-olive-gray (till?); geophysical logs indicate silt or very fine sand and clay lenses.
182-200	Sand, very fine, and silt.
200-218	Sand, very fine to very coarse, angular to rounded; no sorting; contains about 5 percent fine gravel; composed of about 90 percent quartz, 5 to 7 percent carbonate, and 3 percent shale and lignite fragments.
218-235	Clay, very sandy, silty, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
235-242	Sandstone, very fine to fine, glauconitic (10 percent), magnetitic (5 percent); greenish-gray mica and organic material (5 percent).

LOCATION: 160-082-23AAA

DATE DRILLED: 8/29/79

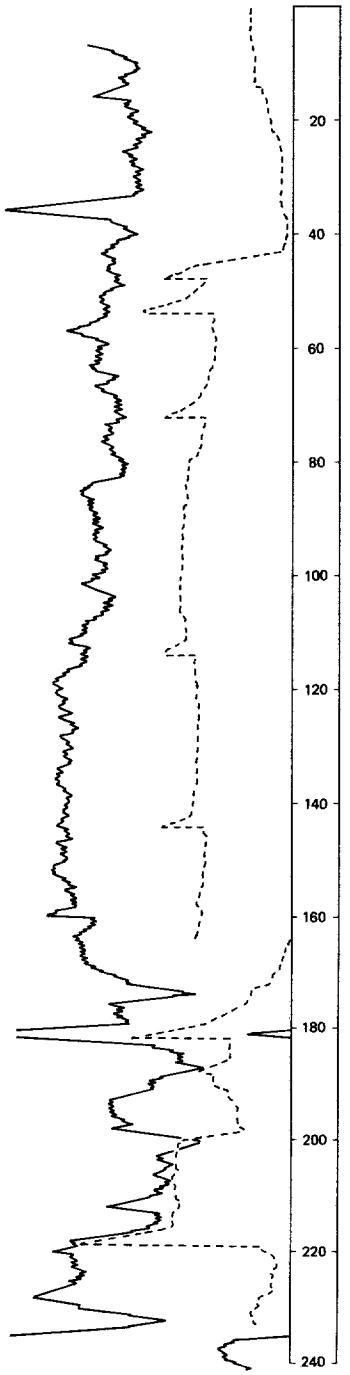
ALTITUDE: 1506
(FT, NGVD)

DEPTH: 242
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



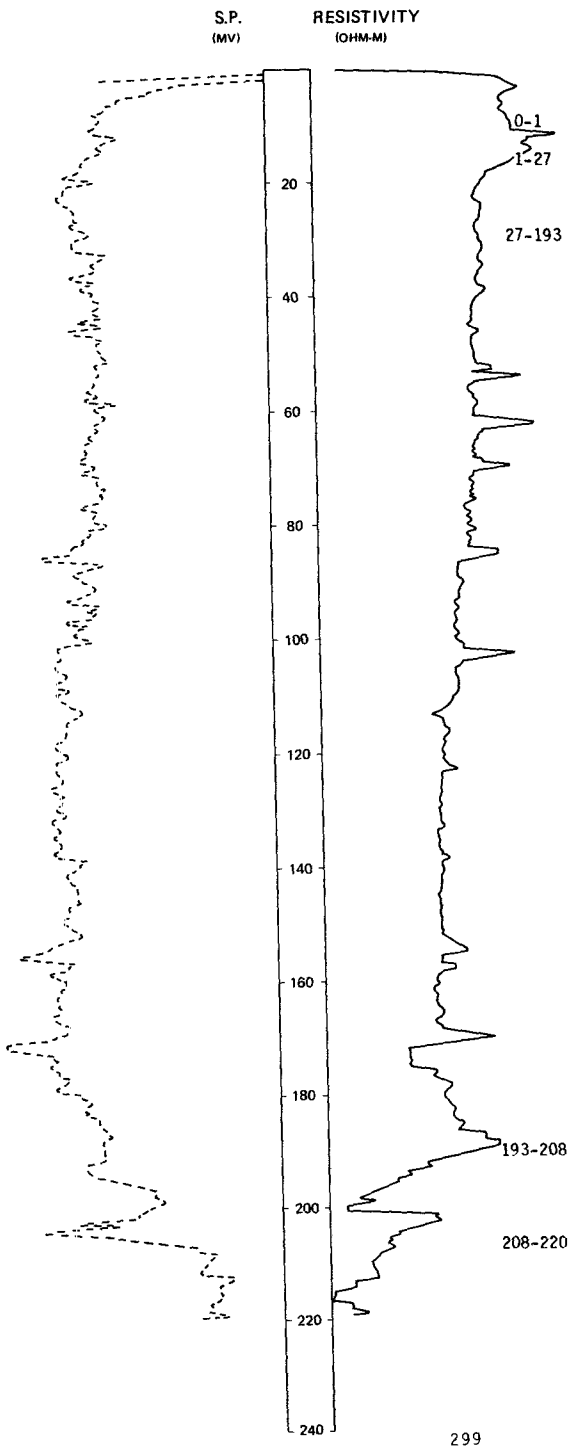
NDSWC 11436

LOCATION: 160-082-26CCC

DATE DRILLED: 10/21/80

ALTITUDE: 1530
(FT, NGVD)

DEPTH: 220
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-27 Clay, very sandy, pebbly, yellowish-brown, oxidized (till).

27-193 Clay, silty, sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel from 62 to 63, 72 to 73, 102 to 103, 122 to 123, and 151 to 152 feet.

FOX HILLS SANDSTONE

193-208 Sandstone, very fine to fine, argillaceous, moderately indurated, greenish-gray.

208-220 Siltstone, argillaceous, carbonaceous, brownish-gray.

160-082-28AAA
NDSWC 11437

Altitude: 1535 feet — Date drilled: 10/28/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	2	2
	Silt, clayey, yellowish-brown, oxidized	6	8
	Clay, sandy, gravelly, yellowish-brown, oxidized (till)	10	18
	Clay, silty, sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel from 29 to 30, 142 to 145, 173 to 174, 178 to 184, and 192 to 194 feet	186	204
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, quartzitic, moderately indurated, greenish-gray	16	220

160-082-29BAA
NDSWC 11036

Altitude: 1561 feet — Date drilled: 8/23/79

	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	17	17
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	49	66
	Sand, fine to coarse, predominately medium	2	68
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	23	91
	Sand, fine to coarse, gravelly	3	94
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	30	124
	Clay, silty, sandy, medium-dark-gray; interval contains several gravelly sand lenses less than 2 feet thick	57	181
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	43	224
Hell Creek Formation:			
	Clay, grayish-brown; interbedded with fine to very fine carbonaceous gray to brown sand	16	240

160-082-29DCD
(Log from Mariner Drilling Service)

Altitude: 1560 feet — Date drilled: 9/18/72

Surface	2	2
Clay, yellow	26	28
Clay, blue	176	204
Hardpan	2	206
Coal	1	207
Sand and water	1	208

160-082-30DCC
NDSWC 11037

Altitude: 1565 feet — Date drilled: 8/23/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till)----------	29	30
	Clay, silty, sandy, pebbly, medium-dark-gray (till)----------	19	49
	Sand, fine, gray----------	4	53
	Clay, silty, sandy, pebbly, medium-dark-gray (till)----------	11	64
	Sand, gravelly----------	3	67
	Clay, silty, sandy, pebbly, medium-dark-gray (till)----------	154	221
	Gravel, fine, and coarse sand----------	3	224
Hell Creek Formation:			
	Sandstone, very fine to fine, clayey, carbonaceous; interbedded with sandy carbonaceous brownish-gray clay----------	16	240

160-082-30DDD
NDSWC 11035

Altitude: 1560 feet — Date drilled: 8/23/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	17	18
	Clay, silty, sandy, pebbly, medium-dark-gray (till)----------	48	66
	Sand, gravelly----------	1	67
	Clay, silty, sandy, pebbly, medium-dark-gray (till)----------	26	93
	Sand and gravel----------	1	94
	Clay, silty, sandy, pebbly, medium-dark-gray (till)----------	30	124
	Clay, silty, sandy, medium-gray; interbedded with fine to coarse sand; about 20 percent of section is sand----------	44	168
	Clay, silty, sandy, pebbly, medium-dark-gray (till)----------	68	236
Hell Creek Formation(?):			
	Sand, very fine, clayey, yellowish-green, oxidized----------	4	240
	Clay, sandy, gray; maybe reworked bedrock----------	17	257
Hell Creek Formation:			
	Clay, carbonaceous, brownish-gray; interbedded with very fine to fine carbonaceous gray to brown sand----------	23	280

160-082-31BBB
NDSWC 11031

Altitude: 1566 feet — Date drilled: 8/21/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	24	25
	Clay, silty, sandy, pebbly, yellowish-brown to olive-gray, partially oxidized (till)	6	31
	Sand	2	33
	Clay, silty, sandy, pebbly, olive-gray (till); contains a few thin sand lenses	152	185
	Clay, silty, sandy, pebbly, medium-dark-gray; interval contains about 25 percent medium sand and fine gravel in lenses	15	200
Hell Creek Formation:			
	Sand, very fine, clayey; interbedded with carbonaceous brownish-gray to dark-brown clay with thin lignite seams	11	211
	Sandstone, calcareous, light-gray; interbedded with carbonaceous brownish-gray clay and light-gray clay; interval also contains a thin light-yellowish-brown limestone layer	16	227
	Sandstone, very calcareous, hard, light-gray; interbedded with thin beds of bentonitic light-gray clay	5	232
	Sandstone, fine to very fine, clayey, greenish-gray; contains thin indurated layers	8	240

160-082-31DCD
NDSWC 11033

Altitude: 1550 feet — Date drilled: 8/22/79

	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	22	23
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	12	35
	Sand, fine to medium	3	38
	Clay, silty, sandy, pebbly, medium-dark-gray (till)	25	63
	Sand, predominately fine to medium	4	67
	Clay, silty, sandy, pebbly, medium-dark-gray (till); contains several thin sand lenses less than 1 foot thick; lignite fragments are scattered throughout the interval	126	193
Hell Creek Formation:			
	Claystone, sandy, light-gray; interbedded with carbonaceous brown clay	30	223
	Lignite	3	226
	Claystone, sandy, light-gray; interbedded with carbonaceous brown clay	14	240

160-082-32BBA
NDSWC 11038

Altitude: 1565 feet — Date drilled: 8/23/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	23	24
	Clay, silty, sandy, pebbly, medium-dark-gray (till); contains gravelly sand lenses from 39 to 42, 44 to 45, and 64 to 66 feet	200	224
Hell Creek Formation:			
	Sandstone, very fine to fine, locally carbonaceous, gray to brownish-gray; interbedded with carbonaceous dark-brownish-gray clay	16	240

160-082-35DDD
NDSWC 11435

Altitude: 1521 feet — Date drilled: 10/21/80

Glacial drift:			
	Soil	1	1
	Clay, dark-yellowish-brown, oxidized	4	5
	Clay, sandy, pebbly, yellowish-brown, oxidized	14	19
	Clay, silty to very sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel from 54 to 57, 62 to 63, 79 to 80, 92 to 93, 152 to 153, 158 to 159, and 176 to 177 feet	158	177
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, quartzose, greenish-gray; interbedded with argillaceous carbonaceous brownish-gray siltstone	23	200

160-082-36AAA
NDSWC 11070

Altitude: 1507 feet — Date drilled: 9/14/79

	Soil	1	1
	Clay, yellowish-brown, oxidized	2	3
	Gravel	1	4
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	8	12
	Clay, silty, sandy, pebbly, olive-gray (till)	130	142
	Sand, fine to coarse, subangular to subrounded; composed of about 80 percent quartz, 10 percent carbonate, and 10 percent lignitic fragments	20	162
	Clay, silty, sandy, pebbly (till); weathered zone	3	165
	Clay, silty, sandy, pebbly, olive-gray (till)	17	182
Fox Hills Sandstone:			
	Silt, carbonaceous, brownish-gray; interbedded with fine sandstone	18	200

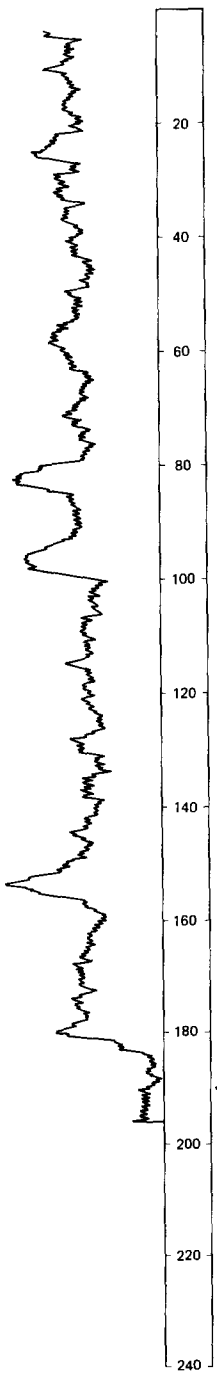
NDSWC 5847

LOCATION: 160-082-36DDD

DATE DRILLED: 10/16/80

ALTITUDE: 1515
(FT, NGVD)

DEPTH: 201
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-26	Clay, very sandy, pebbly, yellowish-brown, oxidized (till).
26-80	Clay, sandy, pebbly, olive-gray (till).
80-85	Gravel, fine, sandy, subangular to rounded.
85-94	Clay, sandy, pebbly, olive-gray (till).
94-100	Silt, clayey, olive-gray.
100-146	Clay, sandy, pebbly, olive-gray (till).
146-156	Silt, clayey, sandy, olive-gray.
156-175	Clay, sandy, silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

175-182	Sandstone, fine, well-indurated, greenish-gray.
182-201	Siltstone, bentonitic, argillaceous, carbonaceous, brownish-gray.

160-083-01AAA
NDSWC 11440

Altitude: 1520 feet — Date drilled: 10/29/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	2	3
	Sand, coarse, subrounded, oxidized; predominately quartz with silicate and carbonate grains	4	7
	Clay, silty, sandy, pebbly, olive-gray (till); interbedded with lenses of subangular to subrounded sand and gravel from 95 to 96, 104 to 105, 116 to 117, and 137 to 141 feet	166	173
Hell Creek Formation:			
	Lignite, brownish-black	9	182
	Siltstone, argillaceous, very carbonaceous, brownish-black	2	184
	Sandstone, fine, argillaceous, quartzose, moderately indurated, greenish-gray	16	200

160-083-01AAB
NDSWC 8905

Altitude: 1523 feet — Date drilled: 9/27/73

	Clay, very silty, pebbly, moderate-yellowish-brown, oxidized (till)	4	4
	Sand, medium to very coarse, oxidized	2	6
	Clay, silty, pebbly, dark-yellowish-brown (till)	4	10
	Clay, silty, pebbly, olive-gray (till)	6	16
	Sand, fine to coarse, subangular	2	18
	Clay, silty, pebbly, olive-gray (till)	82	100

160-083-06DDA
NDSWC 11449

Altitude: 1580 feet — Date drilled: 11/05/80

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse; about 40 percent fine to granule subangular oxidized gravel	6	7
	Clay, very silty to sandy, yellowish-brown, oxidized (till)	4	11
	Clay, silty to sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel from 23 to 24, 91 to 92, 133 to 134, 139 to 140, 148 to 149, and 158 to 159 feet	153	164
Hell Creek Formation:			
	Sandstone, fine to medium, argillaceous, greenish-gray; interbedded with lenses of lignite and lignitic brownish-black shale	16	180

160-083-13CCC
NDSWC 11439

Altitude: 1572 feet — Date drilled: 10/29/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very sandy to gravelly, yellowish-brown, oxidized (till)	17	18
	Clay, silty to sandy, gravelly, olive-gray (till); with a lens of sand from 42 to 43 feet	179	197
Hell Creek Formation:			
	Siltstone, argillaceous, very lignitic, brownish-black	20	217
	Sandstone, fine, argillaceous, carbonaceous, brownish-gray	3	220

160-083-14ADD
(Log from Nick Erck Well Drilling)

Altitude: 1575 feet — Date drilled: 4/28/73

	Topsoil, black	3	3
	Clay, yellow	18	21
	Sand, muddy	32	53
	Clay, gray	137	190
	Gravel and water	--	190

160-083-16DDD
NDSWC 8901

Altitude: 1605 feet — Date drilled: 9/18/73

	Soil, silty, grayish-black; clay loam	1	1
	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till)	20	21
	Clay, silty, sandy, pebbly, olive-gray (till)	37	58
	Sand, medium to coarse, angular	2	60
	Clay, silty, sandy, pebbly, olive-gray (till)	6	66
	Sand, medium to very coarse, subangular	2	68
	Clay, silty, sandy, pebbly, olive-gray (till)	7	75
	Sand, fine to very coarse, slightly gravelly, subangular to subrounded	7	82
	Clay, silty, sandy, pebbly, olive-gray (till)	153	235
	Sand, medium to coarse, clayey, subangular to rounded, lignitic, dirty	8	243
Hell Creek Formation:			
	Sandstone, fine, clayey, highly calcareous, dark-greenish-gray; cemented from 248 to 250 feet	7	250

160-083-20DDD
NDSWC 11051

Altitude: 1592 feet — Date drilled: 9/04/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	35	36
	Sand, fine to coarse, oxidized	1	37
	Clay, sandy, pebbly, brownish-gray, partially oxidized (till)	13	50
	Sand, fine to very coarse, gravelly; 90 percent quartz and 10 percent shale grains	5	55
	Silt, clayey, slightly sandy, pebbly, dark-gray (till); contains thin gravel lenses	161	216
Hell Creek Formation:			
	Sandstone, fine, subrounded, glauconitic, olive-green and gray	6	222
	Shale, carbonaceous, brownish-gray	18	240

160-083-21CDD
NDSWC 11052

Altitude: 1560 feet — Date drilled: 9/05/79

	Soil, sandy, brownish-black	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till); contains thin sand and gravel lenses	16	17
	Clay, silty, pebbly, brownish-gray, partially oxidized (till)	7	24
	Clay, silty, medium-dark-gray (till)	18	42
	Sand, medium to very coarse, gravelly, subangular to rounded	1	43
	Clay, silty, pebbly, medium-dark-gray (till)	42	85
	Clay, silty, dark-gray; contains thin lenses of sand and gravel	48	133
	Sand, medium to very coarse, predominately coarse, subangular to rounded	9	142
	Clay, silty, pebbly, dark-gray; contains a few cobbles and small boulders	42	184
	Sand, medium to very coarse, bouldery, subangular to subrounded	8	192
Hell Creek Formation:			
	Sandstone, very fine to medium, clayey, poorly indurated, light-greenish-gray	1	193
	Shale, carbonaceous, dark-brown	7	200
	Sandstone, very fine to medium, clayey, moderately indurated, dark-green	20	220

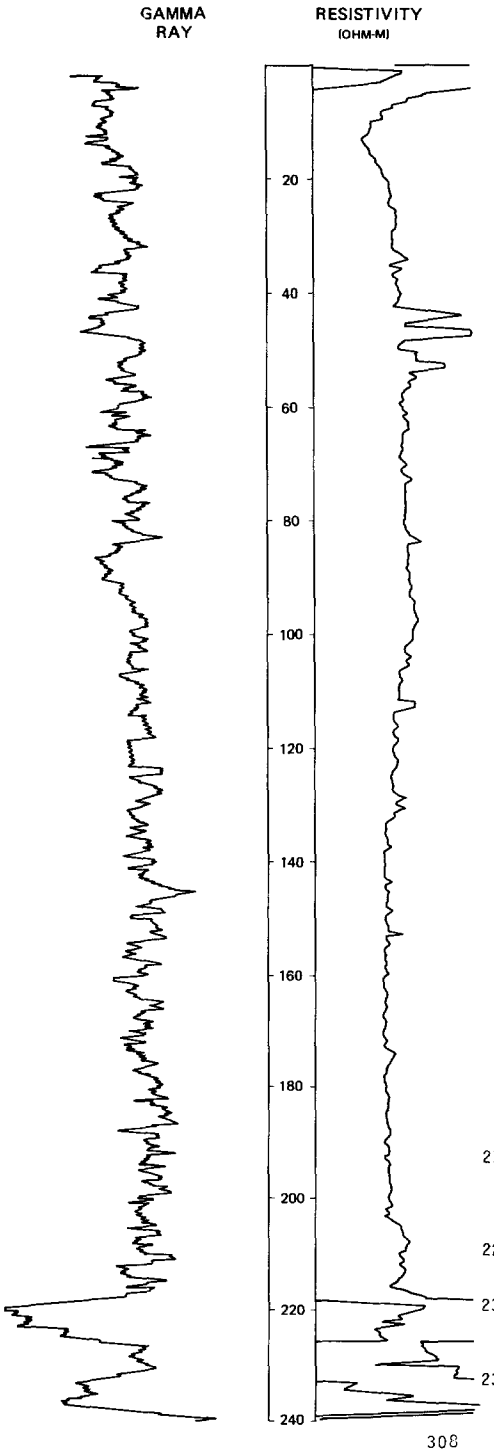
NDSWC 11048

LOCATION: 160-083-21DDD

DATE DRILLED: 8/30/79

ALTITUDE: 1594
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-24	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
24-46	Clay, silty, sandy, pebbly, medium-gray to dark-gray (till); contains a few thin sand lenses.
46-48	Sand, fine, rounded.
48-90	Clay, silty, sandy, pebbly, dark-gray (till); contains thin sand and gravel lenses.
90-91	Gravel and coarse sand; limonite stained.
91-219	Clay, silty, sandy, pebbly, dark-gray (till); contains thin sand and gravel lenses.
219-226	Sand and gravel; 80 percent quartz, 10 percent lignite, and 10 percent carbonate grains and pebbles.
226-231	Clay, silty, sandy, pebbly, dark-gray (till).
231-239	Clay, bouldery (till).
	HELL CREEK FORMATION
239-251	Shale, silty, bentonitic, dark-gray; locally carbonaceous.

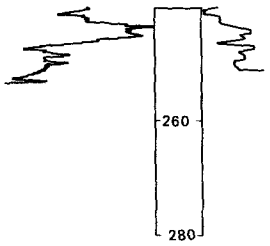
NDSWC 11048, continued

LOCATION: 160-083-21DDD

DATE DRILLED: 8/30/79

ALTITUDE: 1594
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

251-260 Sandstone, fine, greenish-gray.

160-083-22DCC
NDSWC 11054

Altitude: 1590 feet

Date drilled: 9/05/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, brownish-black	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	15	16
	Clay, silty, pebbly, brownish-gray, partially oxidized (till)	10	26
	Clay, silty, pebbly, medium-olive-gray (till); contains thin lenses of sand and gravel	84	110
	Clay, silty, pebbly, medium-dark-gray (till)	120	230
Hell Creek Formation:			
	Shale, carbonaceous, fissile, dusky-brown	10	240
	Sandstone, very fine to fine, clayey, moderately indurated, dark-green	6	246
	Sandstone, highly indurated, greenish-gray to light-gray	4	250
	Shale, bentonitic, light-gray	10	260

160-083-23DCC
NDSWC 11055

Altitude: 1582 feet

Date drilled: 9/05/79

	Soil, sandy, brownish-black	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	16	17
	Clay, silty, pebbly, grayish-brown	6	23
	Sand, medium to very coarse, gravelly, subangular to rounded, oxidized	8	31
	Clay, silty, pebbly, medium-gray (till); contains thin lenses of sand and gravel	68	99
	Sand, medium to very coarse, gravelly, subrounded to rounded	5	104
	Clay, silty, pebbly, medium-dark-gray (till)	122	226
	Sand, medium to very coarse, gravelly	2	228
Hell Creek Formation:			
	Shale, carbonaceous to bentonitic, dusky-brown to light-gray	6	234
	Sandstone, very fine to fine	4	238
	Shale, dark-gray; interbedded with very fine to fine sandstone	22	260

160-083-26AAA
NDSWC 11438

Altitude: 1573 feet — Date drilled: 10/28/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	34	35
	Clay, silty to very sandy, pebbly, olive-gray (till); some cobbles and boulders; interbedded with lenses of subangular sand and gravel from 54 to 55, 90 to 92, 100 to 101, and 162 to 163 feet	168	203
Hell Creek Formation:			
	Sandstone, very fine to fine, argillaceous, greenish-gray	7	210
	Siltstone, argillaceous, dark-greenish-gray	10	220

160-083-26DDD
NDSWC 11049

Altitude: 1580 feet — Date drilled: 8/31/79

	Soil	1	1
	Clay, sandy, silty, pebbly, yellowish-brown, oxidized (till)	8	9
	Clay, sandy, pebbly, olive-gray to brownish-gray, partially oxidized (till)	19	28
	Clay, sandy, silty, pebbly, dark-gray (till)	16	44
	Sand, fine to very coarse, gravelly	8	52
	Clay, sandy, silty, gravelly, dark-gray (till)	157	209
	Boulder	2	211
Hell Creek Formation:			
	Shale, sandy, bentonitic, light-gray	2	213
	Shale, sandy, carbonaceous, dark-gray	9	222
	Shale, lignitic, dark-gray and brownish-gray; nearly peat	9	231
	Sandstone, fine, glauconitic, olive-gray	9	240

160-083-27BCC
NDSWC 8900

Altitude: 1565 feet — Date drilled: 9/17/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, sandy, pebbly, moderate-yellowish-brown, oxidized (till)----------	3	3
	Sand, medium to very coarse, gravelly, angular to subrounded, moderate-yellowish-brown, oxidized----------	6	9
	Clay, sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till)----------	6	15
	Sand, coarse to very coarse, gravelly, angular, dark-yellowish-brown, oxidized----------	2	17
	Clay, silty, sandy, pebbly, dark-yellowish-brown, oxidized (till)----------	4	21
	Sand, fine to very coarse, subangular----------	2	23
	Clay, silty, sandy, pebbly, partially oxidized (till); dark yellowish brown with olive gray mottling----------	12	35
	Clay, slightly sandy, pebbly, olive-gray (till)----------	2	37
	Sand, fine to coarse, subrounded----------	3	40
	Clay, silty, sandy, pebbly, olive-gray (till); contains a few cobbles in lower 35 feet----------	157	197
	Clay, very sandy, pebbly, olive-gray (till)----------	11	208
Hell Creek	Formation:		
	Sandstone, fine, clayey, glauconitic; brownish gray with greenish gray mottling; interbedded with calcareous light-brownish-gray siltstone----------	12	220

160-083-27CDC
NDSWC 11050

Altitude: 1575 feet — Date drilled: 9/04/79

	Soil----------	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)----------	37	38
	Clay, silty, pebbly, olive-gray (till)----------	12	50
	Clay, silty, sandy, pebbly, dark-gray (till); contains thin fine to coarse sand lenses----------	150	200
Hell Creek	Formation:		
	Sandstone, fine, glauconitic, olive-green----------	22	222
	Sandstone, fine to medium, glauconitic, biotitic, well-indurated, olive-green----------	1	223

160-083-27CDD
NDSWC 3

Altitude: 1560 feet — Date drilled: 7/08/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Loam, silty, black	2	2
	Gravel, fine to medium, sandy, subrounded, oxidized	3	5
	Clay, silty, sandy, dusky-yellow to olive-gray; with sand and gravel layers	14	19
	Clay, silty, sandy, pebbly, olive-gray (till)	25	44
	Sand, medium, well-sorted, subrounded, lignitic, light-olive-gray	5	49
	Clay, silty, sandy, pebbly, olive-gray (till)	132	181
	Clay, silty, sandy, gravelly, olive-gray (till)	6	187
	Clay, silty, sandy, pebbly, dark-greenish-gray (till)	22	209
Hell Creek	Formation:		
	Shale, light-olive-gray	7	216
	Sandstone, fine to medium, friable, dark-greenish-gray	6	222
	Shale, silty, moderately soft, light-olive-gray to olive-gray	9	231

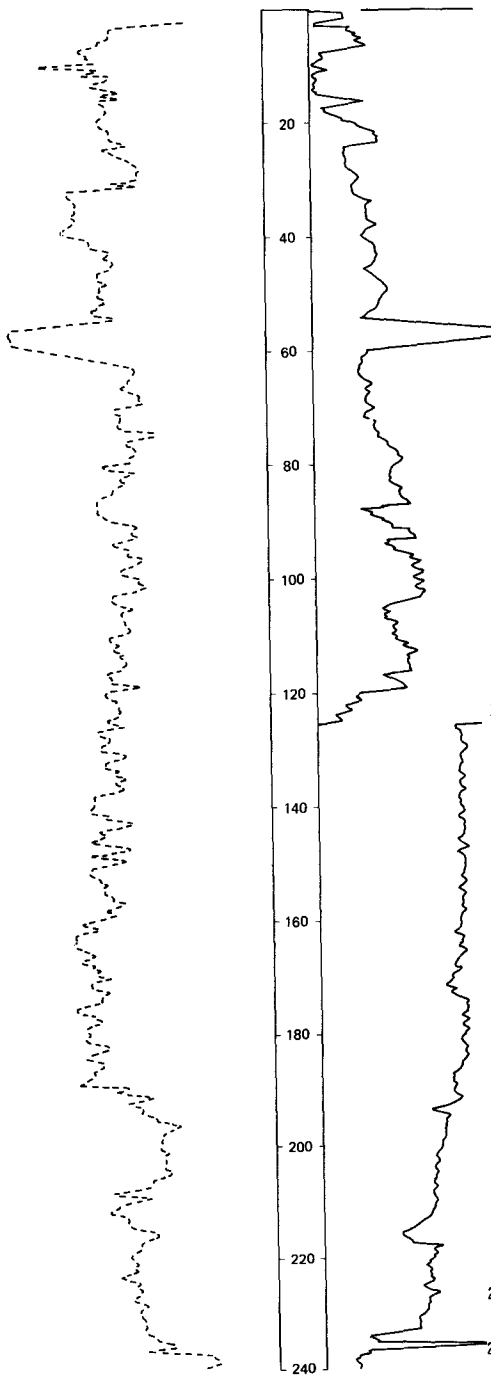
NDSWC 11053

LOCATION: 160-083-28CBB

DATE DRILLED: 9/05/79

ALTITUDE: 1615
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, sandy, brownish-black.
1-16	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
16-28	Clay, silty, sandy, pebbly, brownish-gray, partially oxidized (till).
28-54	Clay, silty, sandy, pebbly, medium-gray (till).
54-61	Gravel, fine to coarse, subrounded to rounded; about 30 percent medium to very coarse sand.
61-126	Clay, silty, pebbly, medium-gray (till).
126-237	Clay, silty, pebbly, dark-gray (till).

HELL CREEK FORMATION

237-238	Sandstone, very fine to medium, clayey, light-gray.
238-246	Shale, carbonaceous, dusky-brown.

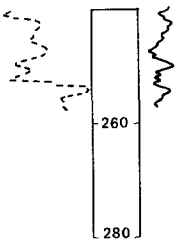
NDSWC 11053, continued

LOCATION: 160-083-28CBB

DATE DRILLED: 9/05/79

ALTITUDE: 1615 (FT, NGVD)

DEPTH: 260 (FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

246-260 Shale, fissile, grayish-black.

160-083-33AAB
NDSWC 11047

Altitude: 1605 feet

Date drilled: 8/30/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	20	21
	Clay, silty, sandy, pebbly, medium-gray to brownish-gray (till)----------	10	31
	Sand, medium, oxidized----------	11	42
	Clay, silty, sandy, pebbly, medium-gray to brownish-gray (till)----------	2	44
	Sand; 80 percent quartz, 10 percent carbonate, and 10 percent lignite grains----------	7	51
	Clay, silty, sandy, pebbly, medium-gray to brownish-gray (till)----------	7	58
	Gravel----------	3	61
	Sand, fine, well-rounded----------	13	74
	Clay, silty, sandy, pebbly, medium-gray (till)----------	16	90

160-083-34CCC
NDSWC 5557

Altitude: 1607 feet

Date drilled: 9/06/79

Glacial drift:			
	Soil----------	1	1
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)----------	13	14
	Clay, sandy, pebbly, brownish-gray (till)----------	6	20
	Clay, sandy, pebbly, olive-black (till)----------	46	66
	Sand and gravel----------	1	67
	Clay, sandy, pebbly, olive-black (till); contains thin sand lenses----------	160	227
Hell Creek Formation:			
	Sandstone, very fine, well-sorted, subrounded, carbonaceous, olive-gray----------	30	257

160-083-35BBB
NDSWC 11046

Altitude: 1585 feet — Date drilled: 8/29/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, yellowish-brown, oxidized (till)	9	10
	Clay, silty, sandy, brownish-gray (till)	7	17
	Clay, silty, sandy, pebbly, dark-gray (till)	21	38
	Sand, medium to coarse	4	42
	Clay, silty, sandy, pebbly, dark-gray (till)	35	77
	Sand, medium to fine	3	80
	Clay, silty, sandy, pebbly, dark-gray (till); contains thin lenses of sand and gravel and a few boulders	145	225
Hell Creek Formation:			
	Shale, bentonitic, light-gray	7	232
	Shale, carbonaceous, brownish-gray	8	240

160-083-35CCC
NDSWC 11045

Altitude: 1590 feet — Date drilled: 8/29/79

	Soil	1	1
	Clay, silty, sandy, yellowish-brown, oxidized (till)	9	10
	Clay, silty, sandy, brown	22	32
	Gravel and coarse to medium sand; oxidized to 38 feet	60	92
	Clay, sandy, silty, brown (till)	2	94
	Sand, coarse to medium, subrounded	6	100

160-083-35DCC
NDSWC 8897

Altitude: 1560 feet — Date drilled: 9/13/73

	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till)	14	14
	Clay, silty, sandy, pebbly, olive-gray (till); contains a few gravel stringers	161	175
	Sand, fine to very coarse, gravelly and clayey, lignitic; dirty looking	10	185
Hell Creek Formation:			
	Sandstone, slightly clayey, micaceous, friable, medium-gray; contains carbonaceous brownish-gray laminae	15	200

160-083-35DDA
NDSWC 11044

Altitude: 1580 feet — Date drilled: 8/28/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Clay, silty, sandy, yellowish-brown, oxidized (till)	23	24
	Clay, silty, sandy, pebbly, brownish-gray to dark-gray (till)	24	48
	Gravel, lignitic	23	71
	Clay, silty, sandy, dark-gray (till); contains thin sand or gravel lenses	133	204
	Gravel and coarse sand	18	222
	Gravel, coarse	10	232
Hell Creek Formation:			
	Sandstone, gray	28	260

161-069-04AAD
(Log from Church Well Drilling)

Altitude: 1780 feet — Date drilled: 10/08/76

	Topsoil, black	1	1
	Clay, yellow	17	18
	Clay, sandy, blue	6	24
	Clay, hard, blue	10	34
	Clay, blue, and streaks of blue sand	22	56
	Clay, blue	18	74
	Clay, gravelly, blue	8	82
	Clay, hard, blue	6	88
	Sand, coarse, gravelly	4	92

161-069-04CCC
NDSWC 5665

Altitude: 1787 feet — Date drilled: 10/23/79

	Soil, brown	2	2
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	5	7
	Clay, silty, sandy, pebbly, olive-gray (till); contains a few thin sand lenses	40	47
	Clay, sandy, silty, pebbly, olive-gray (till)	109	156
	Clay, silty, sandy, pebbly, dark-olive-gray (till); cuttings generally resemble Pierre Shale	21	177
Pierre Shale:			
	Claystone, olive-gray; interbedded with olive-gray siltstone	11	188
	Shale, siliceous, brittle, black	24	212

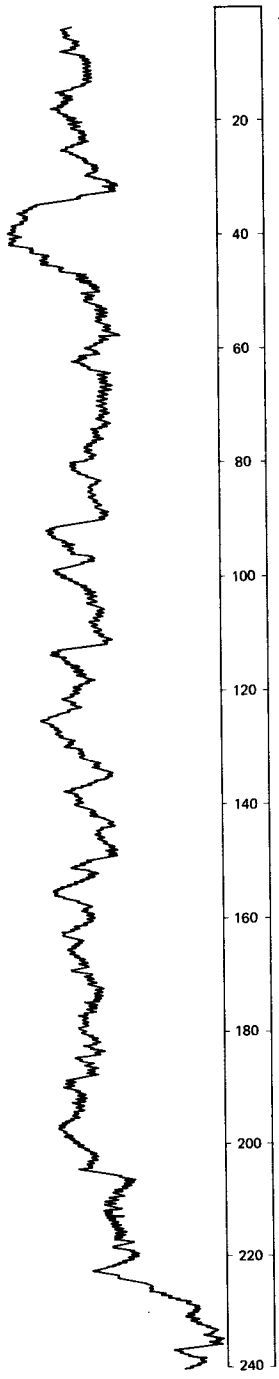
NDSWC 5873

LOCATION: 161-069-05BAA

DATE DRILLED: 10/31/80

ALTITUDE: 1815
(FT, NGVD)

DEPTH: 261
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-20	Clay, silty, pebbly, yellowish-brown, oxidized (till).
20-26	Clay, silty, gravelly, olive-gray (till); cobbles and boulders.
26-28	Sand, fine, rounded; predominately quartz and detrital lignite grains.
28-92	Clay, sandy, gravelly, olive-gray (till).
92-102	Gravel, medium to coarse, sandy, angular to rounded; interbedded with lenses of olive-gray clay; predominately carbonate pebbles.
102-140	Clay, silty to sandy, pebbly, brownish-gray (till).
140-144	Clay, silty, pebbly, yellowish-brown, oxidized (till).
144-165	Clay, silty, pebbly, olive-gray (till); interbedded with thin lenses of sand and gravel with some cobbles.
165-229	Clay, silty to sandy, brownish-gray (till); interbedded with thin lenses of sand and gravel.

FOX HILLS SANDSTONE

229-261	Siltstone, bentonitic, argillaceous; carbonaceous brownish-gray streaks.

NDSWC 5873, continued

LOCATION: 161-069-05BAA

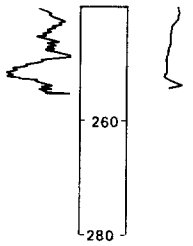
DATE DRILLED: 10/31/80

ALTITUDE: 1815
(FT, NGVD)

DEPTH: 261
(FT)

GAMMA RAY

RESISTIVITY
(OHM-M)



DESCRIPTION OF DEPOSITS

161-069-16BDD
(Log modified from C. A. Simpson & Son)

Altitude: 1800 feet

Date drilled: 10/19/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Cement----------	1	1
	Clay, yellow----------	24	25
	Clay, sandy, blue----------	95	120
	Sand, fine----------	7	127

161-069-19DDD
NDSWC 10353

Altitude: 1740 feet

Date drilled: 10/20/78

	Soil----------	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	11	12
	Clay, silty, sandy, pebbly, olive-gray (till)----------	26	38
	Gravel, fine to medium; contains about 30 percent fine to coarse sand; composed of about 60 percent shale, 30 percent silicate, and 10 percent carbonate pebbles----------	18	56
	Clay, silty, sandy, pebbly, olive-gray (till); contains thin sand or gravel lenses and a few boulders----------	121	177
Pierre Shale:			
	Shale, slightly silty, black----------	23	200

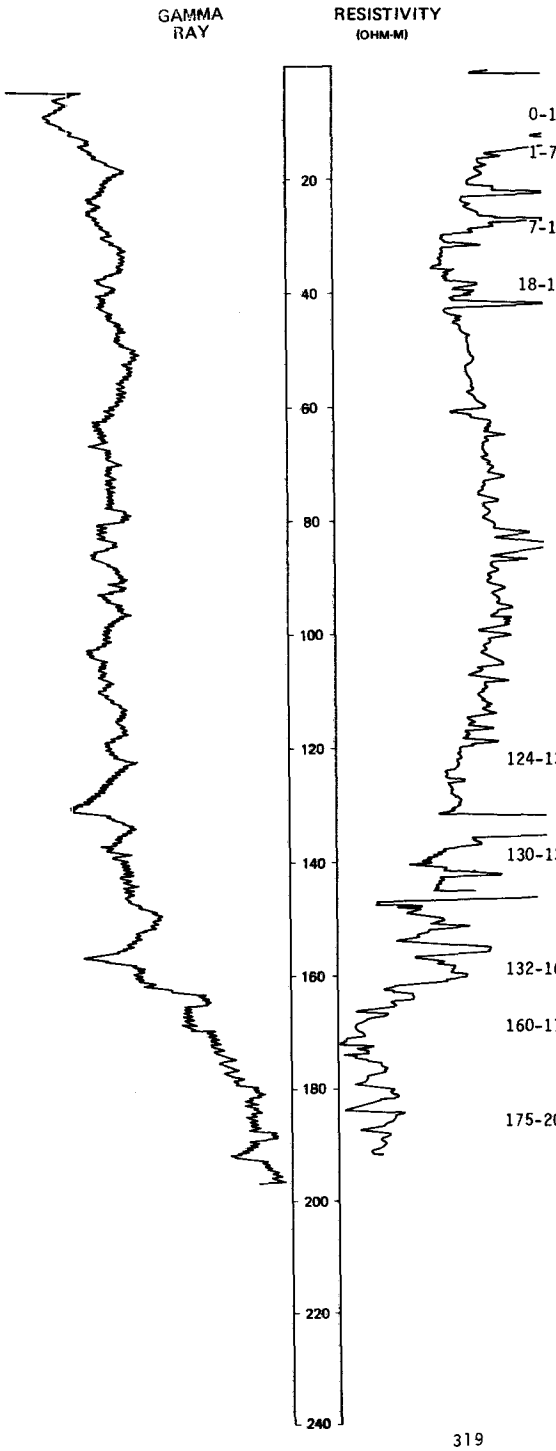
NDSWC 5881

LOCATION: 161-069-20DDD

DATE DRILLED: 11/05/80

ALTITUDE: 1772
(FT, NGVD)

DEPTH: 201
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-7	Sand, fine to coarse, and fine to medium angular to rounded oxidized gravel.
7-18	Clay, silty, yellowish-brown, oxidized (till).
18-124	Clay, silty, gravelly, olive-gray (till).
124-130	Sand, medium to coarse, angular to rounded; predominately detrital shale grains.
130-132	Gravel, medium, and clayey angular to rounded sand; predominately carbonate and detrital shale pebbles and grains.
132-160	Clay, silty, gravelly, olive-gray (till).
160-175	Clay, silty, pebbly, brownish-gray (till).

FOX HILLS SANDSTONE

175-201	Shale, silty, siliceous, dark-gray.

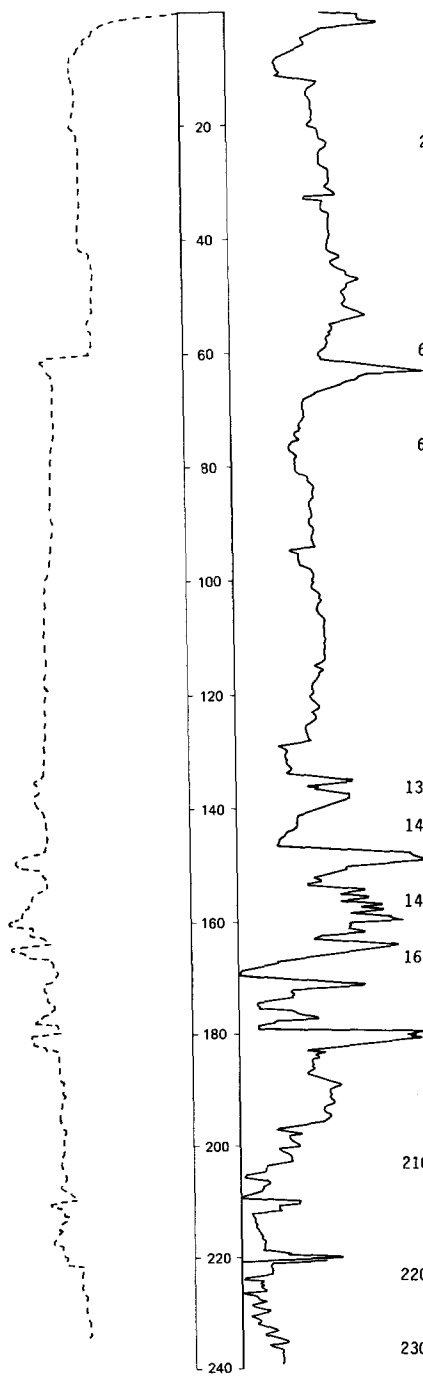
NDSWC 10354

LOCATION: 161-069-21DDD

DATE DRILLED: 10/26/78

ALTITUDE: 1780 (FT, NGVD)

DEPTH: 240 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-24	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
24-63	Clay, silty, sandy, pebbly, olive-gray (till).
63-66	Gravel, sandy; 80 percent shale and 20 percent carbonate and silicate pebbles.
66-138	Clay, silty, sandy, pebbly, olive-gray (till).
138-140	Sand.
140-147	Clay, sandy, olive-gray; interbedded with very fine to medium sand.
147-167	Gravel; about 90 percent shale pebbles.
167-210	Clay, silty, sandy, pebbly, olive-gray; contains thin beds of sand and fine gravel.
210-220	Clay, silty, sandy, olive-gray (till); interbedded with carbonaceous dark-brown clay.
	FOX HILLS SANDSTONE
220-230	Clay, silty, sandy, light-greenish-gray to dark-greenish-gray.
230-240	Clay, silty, light-gray to olive-gray.

161-069-22BBB
(Log modified from C. A. Simpson & Son)

Altitude: 1790 feet — Date drilled: 9/28/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	17	18
	Clay, blue	77	95
	Clay, sandy, blue	20	115
	Clay, blue	20	135
	Sand, clayey; little water	23	158
	Sand, fine, slightly clayey	9	167
	Sand, clayey	18	185

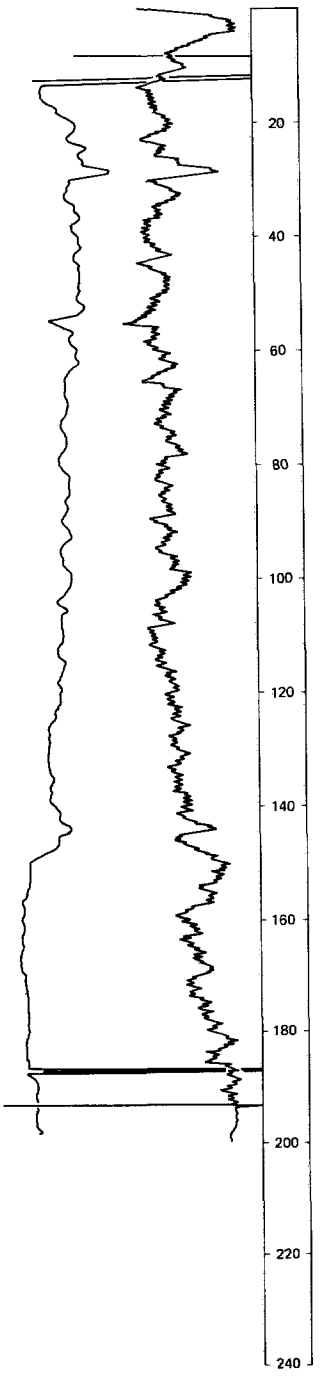
NDSWC 5371

LOCATION: 161-069-24CCC

DATE DRILLED: 9/07/78

ALTITUDE: 1767
(FT, NGVD)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15	Clay, silty, sandy, pebbly, bouldery, moderate-yellowish-brown, oxidized (till).
15-148	Clay, silty, sandy, pebbly, bouldery, dark-gray to olive-gray (till).

PIERRE SHALE

148-200	Shale, brittle, black to grayish-black.

161-069-30ADD
(Log from Church Well Boring)

Altitude: 1760 feet — Date drilled: 9/06/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	1	1
	Clay, yellow	14	15
	Clay, dark-gray	8	23
	Clay, blue	22	45
	Sand, fine and coarse	2	47
	Clay, blue	44	91
	Sand, coarse; water	4	95

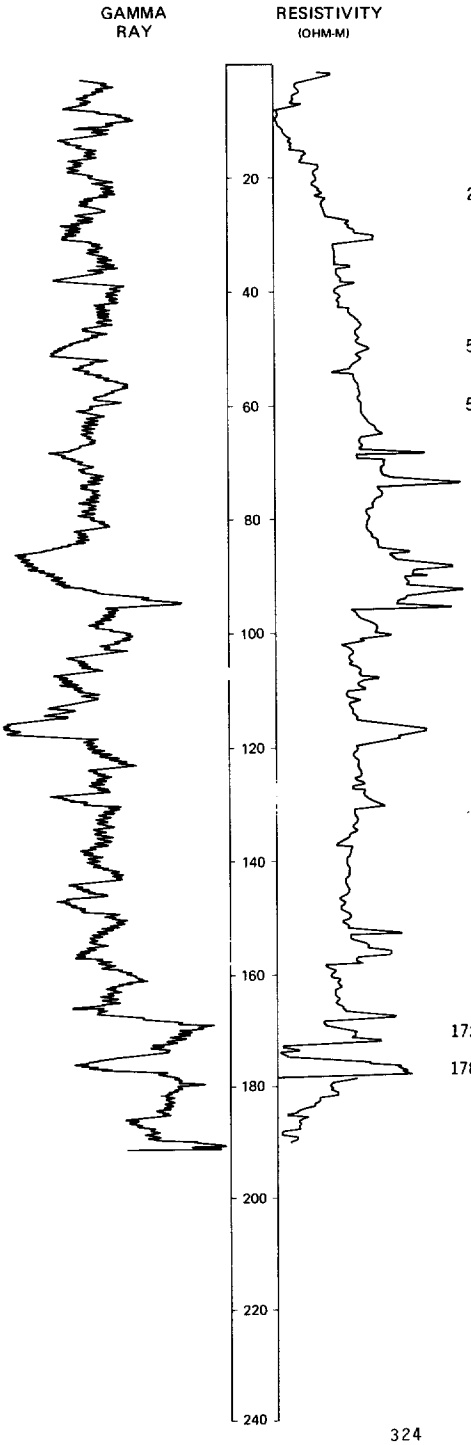
NDSWC 5662

LOCATION: 161-069-35BBB

DATE DRILLED: 10/18/79

ALTITUDE: 1773
(FT, NGVD)

DEPTH: 197
(FT)



DESCRIPTION OF DEPOSITS

0-2	Soil.
2-20	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
20-50	Clay, silty, sandy, pebbly, olive-gray (till).
50-52	Sand, gravelly; predominately shale.
52-172	Clay, silty, sandy, pebbly, dark-gray to black (till); contains a few cobbles.

PIERRE SHALE

172-178	No identified returns.
178-197	Shale, silty, slightly sandy, black; also a few cuttings of siltstone.

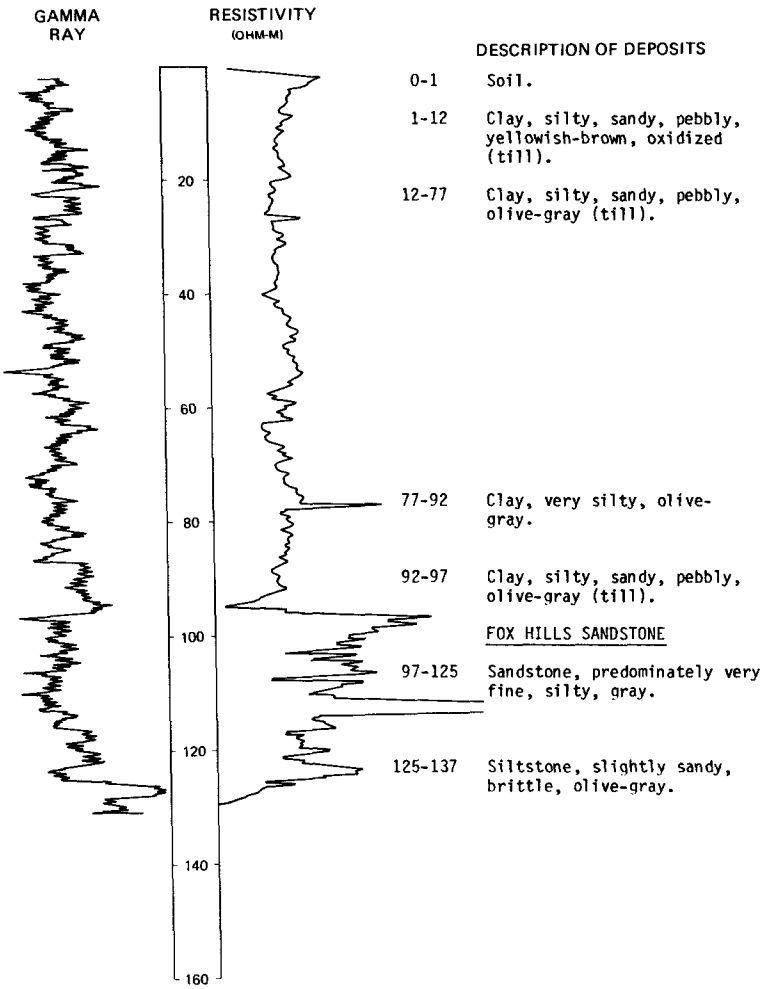
NDSWC 5663

LOCATION: 161-070-08DDC

DATE DRILLED: 10/18/79

ALTITUDE: 1817 (FT, NGVD)

DEPTH: 137 (FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-12	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
12-77	Clay, silty, sandy, pebbly, olive-gray (till).
77-92	Clay, very silty, olive-gray.
92-97	Clay, silty, sandy, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
97-125	Sandstone, predominately very fine, silty, gray.
125-137	Siltstone, slightly sandy, brittle, olive-gray.

161-070-25BAB
(Log from Church Well Boring)

Altitude: 1750 feet

Date drilled: 6/08/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	0.6	0.6
	Clay, yellow	13.4	14
	Clay, blue	9	23
	Clay, blue; with coarse sand	6	29
	Clay, pebbly, blue	9	38
	Gravel, coarse; water	4	42
	Clay, pebbly, blue	10	52
	Sand, blue; water	2	54
	Clay, blue	--	54

NDSWC 5372

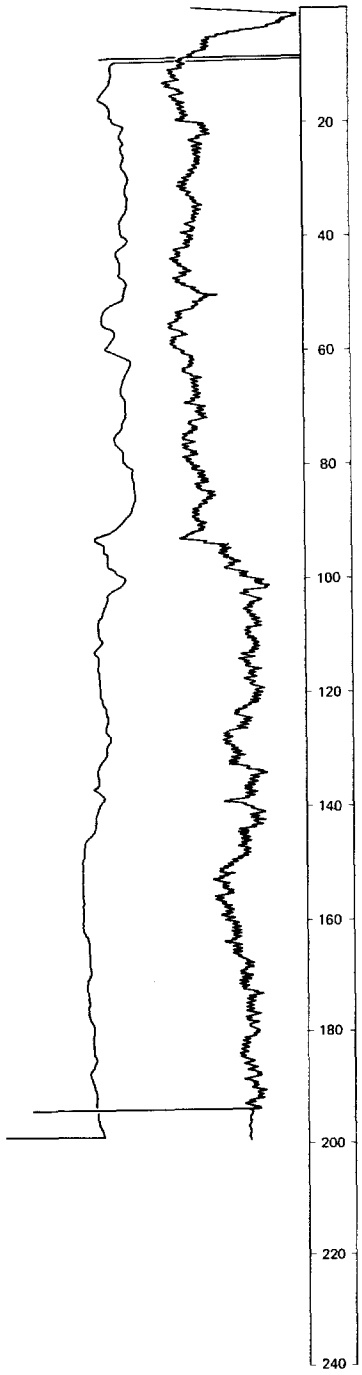
LOCATION: 161-070-26AAA

DATE DRILLED: 9/07/78

ALTITUDE: 1740
(FT, NGVD)

DEPTH: 200
(FT)

NEUTRON GAMMA
(API) RAY



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-30 Clay, sandy, silty, pebbly, yellowish-brown, oxidized (till).

30-95 Clay, sandy, silty, pebbly, dark-gray (till).

FOX HILLS SANDSTONE

95-147 Siltstone, sandy, clayey, bentonitic, brittle, medium-light-gray to bluish-gray.

PIERRE SHALE

147-200 Shale, brittle, black to grayish-black.

161-070-29AAA1
(Log modified from C. A. Simpson & Son)

Altitude: 1765 feet — Date drilled: 11/11/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	20	21
	Clay, sandy, blue	26	47
	Sand, fine	8	55

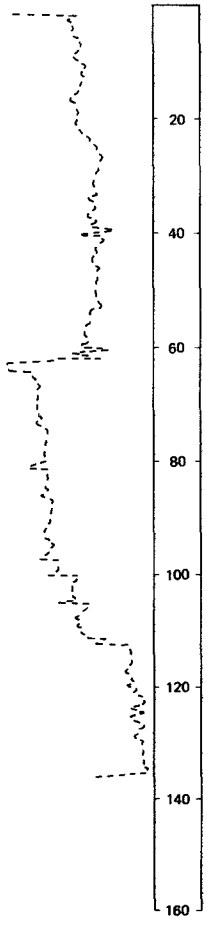
NDSWC 10352

LOCATION: 161-070-29AAA2

DATE DRILLED: 10/26/78

ALTITUDE: (FT, NGVD) 1767

DEPTH: (FT) 140



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-21 Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).

21-59 Clay, silty, sandy, pebbly, olive-gray (till).

59-64 Gravel, fine to coarse, predominately fine, angular to subrounded; contains about 50 percent fine to very coarse sand.

64-107 Clay, silty, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

107-140 Clay, sandy, olive-gray, and olive-gray siltstone.

161-070-33BBB
(Log modified from Virg's Well Drilling)

Altitude: 1745 feet — Date drilled: 8/04/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	16	17
	Clay, blue	53	70
	Sand, blue	12	82
	Rock and gravel	11	93

161-071-02AAA
USGS 16
(Log from Randich, 1975)

Altitude: 1805 feet — Date drilled: 12/10/73

Glacial drift:			
	Gravel, fine to very coarse; cobbles	12	12
	Sand, medium to very coarse, gravelly	6	18
	Till, olive-gray; sand and gravel lenses from 37 to 38, 45 to 46, 75 to 76, and 150 to 153 feet	138	156
	Till, olive-gray, sandy; very tight in places; fairly loose and sandy to 220 feet	96	252
Fox Hills Sandstone:			
	Shale, light-gray, silty, smooth; leached appearance	10	262
	Shale, dark-brownish-gray, tight, silty	18	280

161-071-02BBC
USGS 18
(Log modified from Randich, 1975)

Altitude: 1785 feet — Date drilled: 12/11/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, medium-gray, silty to sandy	12	12
	Gravel, medium to coarse, subrounded; about 60 percent carbonate, 30 percent shale, and 10 percent granitic and quartz pebbles	23	35
	Sand, medium to coarse, gravelly	10	45
	Till, olive-gray, silty	7	52
	Gravel, medium, sandy	1	53
	Till, olive-gray, silty; sand and gravel lenses from 57 to 58, 63 to 64, 70 to 72, and 95 to 96 feet	54	107
	Till, olive-gray, silty; interbedded with thin lenses of sand; some cobbles and boulders	51	158
	Till, light-gray, sandy, silty; leached appearance	14	172
	Till, medium-dark-gray, silty; some boulders	43	215
Fox Hills Sandstone:			
	Shale, dark-brownish-gray, bentonitic; interbedded with lenses of siltstone	25	240

161-071-02BCC
NDSWC 33
(Log from Randich, 1975)

Altitude: 1770 feet — Date drilled: 10/29/74

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel, fine to coarse, sandy	18	19
	Sand, medium; interbedded with lenses of silt	11	30
	Sand, medium, gravelly	6	36
	Till, olive-gray, sandy	2	38
	Sand, medium, gravelly, silty	2	40

161-071-02BCD
NDSWC 27
(Log from Randich, 1975)

Altitude: 1768 feet — Date drilled: 10/29/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, fine to coarse, gravelly	6	8
	Gravel, fine to medium, sandy	12	20
	Sand, very fine to medium, silty	12	32
	Till, olive-gray, very sandy; interbedded with thin lenses of gravel	8	40

161-071-02BDC
NDSWC 28
(Log from Randich, 1975)

Altitude: 1765 feet — Date drilled: 10/29/74

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel; cobbles	4	5
	Sand, fine to medium, silty to clayey	5	10
	Sand, fine to coarse; interbedded with thin lenses of silty clay	8	18
	Gravel, fine to medium, sandy	4	22
	Sand, fine to coarse, silty	8	30
	Till, olive-gray, sandy	6	36
	Gravel, fine, sandy	2	38
	Till, olive-gray, sandy	2	40

161-071-02CBB1
NDSWC 23
(Log from Randich, 1975)

Altitude: 1762 feet — Date drilled: 10/28/74

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Gravel, fine to medium, sandy; silty in places	15	17
	Silt, medium-gray; sandy in places; some gravel streaks	21	38
	Gravel, fine to medium	1	39
	Clay, medium-gray, silty	1	40

161-071-02CBB2
NDSWC 24
(Log from Randich, 1975)

Altitude: 1760 feet — Date drilled: 10/28/74

Glacial drift:			
	Topsoil, brown, sandy	1	1
	Gravel, medium to coarse, sandy	6	7
	Gravel, fine to coarse; about 25 percent coarse sand	5	12
	Gravel, granule to medium, sandy	15	27
	Sand, medium to coarse, gravelly, silty	3	30
	Gravel, fine to coarse	4	34
	Sand, medium, silty	4	38
	Gravel, medium to coarse, sandy to silty	6	44
	Till, olive-gray, silty	6	50

161-071-02CBB3
NDSWC 29
(Log from Randich, 1975)

Altitude: 1760 feet — Date drilled: 10/29/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brown, sandy	1	1
	Gravel, fine to coarse, sandy	14	15
	Sand, medium, gravelly	2	17
	Gravel, fine to medium; interbedded with lenses of fine sand and silt	17	34
	Till, olive-gray, silty to sandy; very tight from 38 to 40 feet	6	40

161-071-02CBB4
NDSWC 30
(Log from Randich, 1975)

Altitude: 1760 feet — Date drilled: 10/29/74

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel, fine to coarse; sandy lenses	11	12
	Sand, fine to coarse, gravelly	10	22
	Sand, fine to coarse; interbedded with lenses of silt	10	32
	Clay, olive-gray, sandy	4	36
	Sand, fine, gravelly	9	45
	Till, olive-gray, silty	5	50

161-071-02CBB5
NDSWC 31
(Log from Randich, 1975)

Altitude: 1760 feet — Date drilled: 10/29/74

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel, fine to very coarse, sandy	11	12
	Sand, fine to medium	2	14
	Gravel, fine to very coarse; interbedded with lenses of very fine to coarse sand	8	22
	Sand, medium; interbedded with lenses of silt and some gravel	8	30
	Gravel, medium, sandy	2	32
	Till, olive-gray, very sandy	3	35

161-071-02CBB6
NDSWC 32
(Log from Randich, 1975)

Altitude: 1760 feet — Date drilled: 10/29/74

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel, medium to coarse, sandy	11	12
	Sand, medium; interbedded with lenses of silt	10	22
	Sand, medium, clayey	8	30
	Sand, medium, silty	3	33
	Till, olive-gray, silty	2	35

161-071-02CBB7
NDSWC 40
(Log from Randich, 1975)

Altitude: 1760 feet — Date drilled: 10/30/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, fine to coarse, gravelly	4	6
	Gravel, fine to coarse, sandy	5	11
	Sand, fine to very coarse; interbedded with lenses of silt	3	14
	Gravel, fine to coarse; interbedded with fine to coarse sand	6	20
	Sand, very fine to medium, very silty	2	22
	Gravel, fine, sandy to silty	3	25
	Sand, fine to medium; gravelly	5	30
	Sand, fine to medium; interbedded with thin lenses of gravel and silt	5	35

161-071-02CBC1
NDSWC 25
(Log from Randich, 1975)

Altitude: 1760 feet — Date drilled: 10/28/74

Glacial drift:			
	Topsoil, black, sandy	2	2
	Gravel, fine to coarse; fine to coarse sand	5	7
	Gravel, medium to very coarse; fine to coarse sand	8	15
	Gravel and cobbles, granule to very coarse, rounded	7	22
	Till, olive-gray, sandy	3	25

161-071-02CBC2
NDSWC 26
(Log from Randich, 1975)

Altitude: 1760 feet — Date drilled: 10/28/74

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Gravel, fine to very coarse; fine to coarse sand	21	23
	Sand, medium-gray, silty (no samples; all carried in the mud)	15	38
	Gravel, fine; about 50 percent very fine to medium sand	6	44
	Till, olive-gray, silty to sandy	6	50

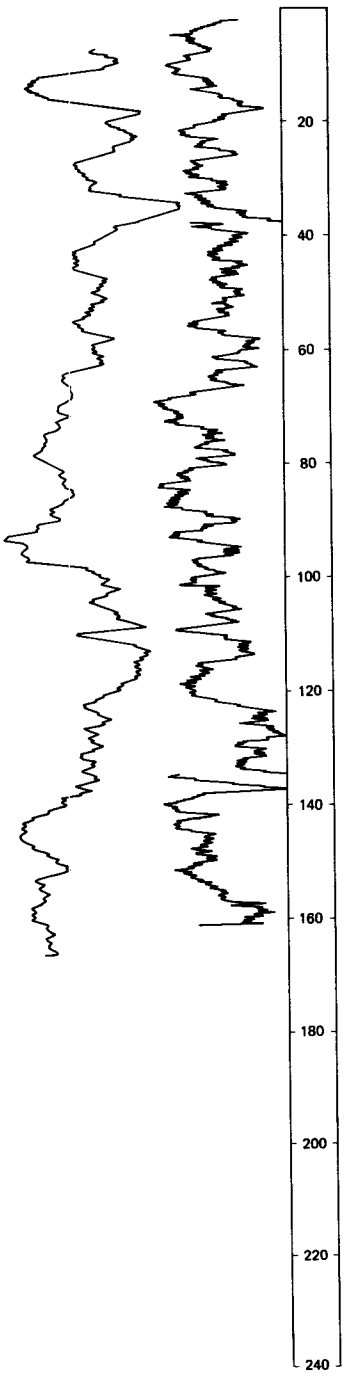
NDSWC 5595, 5595A

LOCATION: 161-071-03BCC1,2

DATE DRILLED: 10/10/79

ALTITUDE: 1752
(FT, NGVD)

DEPTH: 167
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-25	Sand, fine to very coarse, predominately medium to coarse, yellowish-brown, oxidized; contains 20 percent fine to medium gravel.
25-38	Sand, fine to very coarse, predominately medium; contains about 20 percent gravel.
38-66	Clay, silty, sandy, pebbly, olive-gray (till).
66-98	Clay, very silty, sticky, olive-gray.
98-140	Clay, silty, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

140-167	Siltstone, slightly sandy, brittle, light-olive-gray.

161-071-03CCD
PHS 34
(Log from Randich, 1975)

Altitude: 1749 feet — Date drilled: 10/29/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Gravel, fine to medium; about 25 percent fine to medium sand	13	15
	Gravel, fine to medium; coarse sand	23	38
	Clay, olive-gray, sandy to silty	2	40

161-071-03CDC1
PHS 38
(Log from Randich, 1975)

Altitude: 1754 feet — Date drilled: 10/30/74

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, medium to coarse, gravelly	4	6
	Gravel, fine to coarse; interbedded with lenses of coarse sand	19	25
	Sand, medium to coarse; interbedded with lenses of medium to coarse sand	10	35
	Sand, medium to coarse, gravelly	2	37
	Gravel, fine to coarse; interbedded with lenses of medium to coarse sand	2	39
	Sand, very fine to medium, silty	1	40

161-071-03CDC2
PHS 39
(Log from Randich, 1975)

Altitude: 1750 feet — Date drilled: 10/31/74

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, fine to coarse, gravelly	3	5
	Gravel, fine to coarse; interbedded with thin lenses of medium sand	11	16
	Gravel, fine to medium; interbedded with lenses of medium to coarse sand	19	35
	Sand, medium to coarse, gravelly	4	39
	Sand, very fine to medium, silty	1	40

161-071-03CDD1
PHS 35
(Log from Randich, 1975)

Altitude: 1754 feet — Date drilled: 10/29/74

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel, fine to medium; some very coarse lenses; interbedded with lenses of fine to very coarse sand	18	19
	Sand, fine to coarse, gravelly, silty	11	30
	Sand, fine to coarse, gravelly	8	38
	Gravel, fine; interbedded with very fine sand	4	42
	Sand, very fine to medium, silty	12	54
	Till, olive-gray, silty to sandy	6	60

161-071-03CDD2
PHS 36
(Log from Randich, 1975)

Altitude: 1751 feet — Date drilled: 10/30/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, fine to very coarse, gravelly	4	5
	Gravel, fine to medium; interbedded with fine to medium sand	11	16
	Sand, medium to very coarse, gravelly	14	30
	Sand, fine to very coarse; interbedded with lenses of fine gravel	10	40

161-071-03CDD3
PHS 37
(Log from Randich, 1975)

Altitude: 1750 feet — Date drilled: 10/30/74

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, medium to coarse, gravelly	3	5
	Gravel, fine to coarse; interbedded with medium to very coarse sand	20	25
	Sand, medium to very coarse, gravelly	6	31
	Gravel, fine to coarse; interbedded with lenses of medium to very coarse sand	7	38
	Sand, very fine to medium, silty	2	40

161-071-03CDD4
PHS 41
(Log from Randich, 1975)

Altitude: 1752 feet — Date drilled: 11/04/74

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, medium to very coarse; fine to medium gravel	16	18
	Gravel, medium, well-rounded	7	25
	Gravel, fine to coarse; interbedded with some lenses of medium to coarse sand	13	38
	Sand, fine to medium	4	42

161-071-03CDD5
PHS 42
(Log from Randich, 1975)

Altitude: 1751 feet — Date drilled: 11/05/74

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Gravel, fine to coarse; about 30 percent fine to coarse sand	16	18
	Sand, fine to very coarse; about 25 percent fine to medium gravel	7	25
	Gravel, fine to medium; interbedded with about 50 percent medium to very coarse sand	15	40

161-071-04CCC
NDSWC 5902

Altitude: 1720 feet — Date drilled: 11/13/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very silty, pebbly, yellowish-brown, oxidized (till)	6	7
	Sand, fine to coarse, and fine to medium angular to rounded gravel; about 70 percent quartz and 30 percent carbonate and detrital shale grains and pebbles	35	42
	Silt, clayey, olive-gray; interbedded with occasional lenses of till and gravel	58	100
Fox Hills Sandstone:			
	Siltstone, argillaceous, carbonaceous, brownish-gray; interbedded with thin lenses of fine argillaceous moderately indurated greenish-gray sandstone	61	161

161-071-04DDC
NDSWC 20
(Log from Randich, 1975)

Altitude: 1740 feet — Date drilled: 1974

Glacial drift:			
	Gravel, fine to coarse	10	10
	Silt, olive-gray	4	14
	Sand, fine to coarse	6	20
	Clay, olive-gray, silty	4	24
	Gravel, medium to coarse, sandy	11	35
	Sand, silty to clayey	5	40

161-071-06DDC
NDSWC 11484

Altitude: 1698 feet — Date drilled: 12/04/80

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	7	8
	Sand, fine, gravelly, subrounded, oxidized	2	10
	Clay, sandy, pebbly, olive-gray (till)	19	29
	Clay, sandy, dark-gray (till); reworked localized bedrock with lenses of sand	54	83
Fox Hills Sandstone:			
	Sandstone, very fine, argillaceous, quartzose, moderately indurated, greenish-gray	17	100

161-071-07AAA
Indian Health Service

Altitude: 1700 feet — Date drilled: 4/20/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Yellow clay	5	6
	Coarse strips of gravel; mixed with fine sand	12	18
	Dark fine sand	21	39
	Dark clay	17	56
	Fine sand	14	70
	Blue and gray clay	30	100
	Bedrock	20	120

161-071-07DCC1
NDSWC 5905

Altitude: 1710 feet — Date drilled: 11/14/80

Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	25	26
	Clay, silty, pebbly, olive-gray (till)	58	84
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, glauconitic, greenish-gray	16	100
	Siltstone, argillaceous, siliceous, poorly indurated, greenish-gray	21	121

161-071-07DCC2
Indian Health Service

Altitude: 1705 feet — Date drilled: 5/11/81

	Topsoil	1	1
	Gravel and yellow clay	9	10
	Yellow sand	12	22
	Clay	68	90
	Bedrock	10	100

161-071-07DCD
NDSWC 11493

Altitude: 1696 feet — Date drilled: 12/09/80

Glacial drift:			
	Soil	1	1
	Clay, silty to very sandy, yellowish-brown, oxidized (till)	19	20
	Clay, silty, sandy, gravelly, olive-gray (till)	7	27
	Sand, fine to very coarse, gravelly, subangular to rounded	4	31
	Clay, silty to sandy, pebbly, olive-gray (till); interbedded with sand, gravel, and cobbles from 44 to 45, 48 to 49, and 60 to 61 feet	35	66
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, dark-green to brownish-green; thin carbonaceous lenses	14	80

161-071-07DDC
NDSWC 11492

Altitude: 1708 feet — Date drilled: 12/09/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	21	22
	Clay, sandy, pebbly, olive-gray (till); some boulders	42	64
	Silt, clayey, sandy, olive-gray; reworked localized bedrock	21	85
Fox Hills Sandstone:			
	Siltstone, argillaceous; interbedded with lenses of very fine greenish-gray sandstone	15	100

161-071-07DDD1
NDSWC 5904

Altitude: 1695 feet — Date drilled: 11/13/80

Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	9	10
	Clay, silty, olive-gray (till); interbedded with lenses of sand and gravel	28	38
	Silt, clayey, olive-gray	7	45
	Clay, silty to sandy, gravelly, olive-gray (till)	17	62
	Sand, coarse, and fine to coarse angular to rounded gravel; predominately detrital shale and carbonate grains and pebbles	16	78
Fox Hills Sandstone:			
	Siltstone, bentonitic, argillaceous, siliceous, moderately indurated, greenish-gray	23	101

161-071-07DDD2
Indian Health Service

Altitude: 1695 feet — Date drilled: 4/27/81

Topsoil	1	1
Yellow clay; with shale strips	17	18
Blue clay	2	20
Fine sand	7	27
Clay	48	75
Fine sand; with shale strips	10	85
Coarse sand	15	100
Fine sand	30	130
Coarse sand to medium gravel	22	152
Clay	8	160

161-071-08ABA
NDSWC 11485

Altitude: 1716 feet — Date drilled: 12/04/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, yellowish-brown, oxidized	13	14
	Sand, fine to very coarse, subrounded; predominately quartz, carbonate, and detrital shale grains	5	19
	Silt, clayey, olive-gray; interbedded with very fine sand	25	44
	Sand, very fine to fine; mostly quartz grains	12	56
	Clay, very silty to sandy, olive-gray (till)	40	96
Fox Hills Sandstone:			
	Sandstone, fine to medium, argillaceous, moderately indurated, dark-greenish-gray	14	110
	Siltstone, argillaceous, indurated, dark-gray	10	120

161-071-08ADD
NDSWC A

Altitude: 1711 feet — Date drilled: 10/07/80

Glacial drift:			
	Gravel, sandy, poorly sorted; medium sand to coarse gravel; predominately very coarse sand; 30 percent carbonate, 10 percent silicate, 20 percent igneous, and 40 percent quartz	10	10
	Sand, predominately coarse, gravelly; very fine sand to medium gravel	5	15
	Sand, predominately fine; very fine sand to medium gravel; some lignite; predominately quartz grains	15	30
	Silt, sandy, gray	8	38
	Sand, predominately fine to very fine, silty	4	42
	Silt	4	46
	Sand, very fine to fine	2	48
	Silt, clayey	7	55
	Sand, coarse, to very fine gravel	5	60
	Silt	19	79
	Sand, very fine to coarse	1	80
	Silt	4	84
	Sand, very fine to coarse	1	85
	Silt	42	127
Fox Hills Sandstone:			
	Clay, silty, gray	13	140

161-071-08BCB
NDSWC 11425

Altitude: 1695 feet — Date drilled: 10/15/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Clay, silty, yellowish-brown, oxidized----------	8	9
	Clay, olive-gray; interbedded with coarse sand; abundant detrital lignite----------	17	26
	Sand, very fine to very coarse, gravelly, subrounded; predominately quartz, carbonate, and detrital shale grains----------	11	37
	Clay, silty to very sandy, olive-gray (till)----------	64	101
	Sand, very coarse, gravelly, subangular to angular; about 40 percent detrital shale, 20 percent detrital lignite, and 40 percent carbonate, igneous, and quartz grains----------	3	104
	Silt, clayey, sandy, olive-gray----------	13	117
	Sand, very coarse; about 50 percent coarse angular to subangular gravel----------	5	122
	Clay, silty to sandy, olive-gray----------	4	126
Fox Hills Sandstone:			
	Siltstone, argillaceous; interbedded with fine agrillaceous greenish-gray sandstone----------	26	152
	Siltstone, bentonitic, argillaceous, carbonaceous, brownish-gray----------	8	160

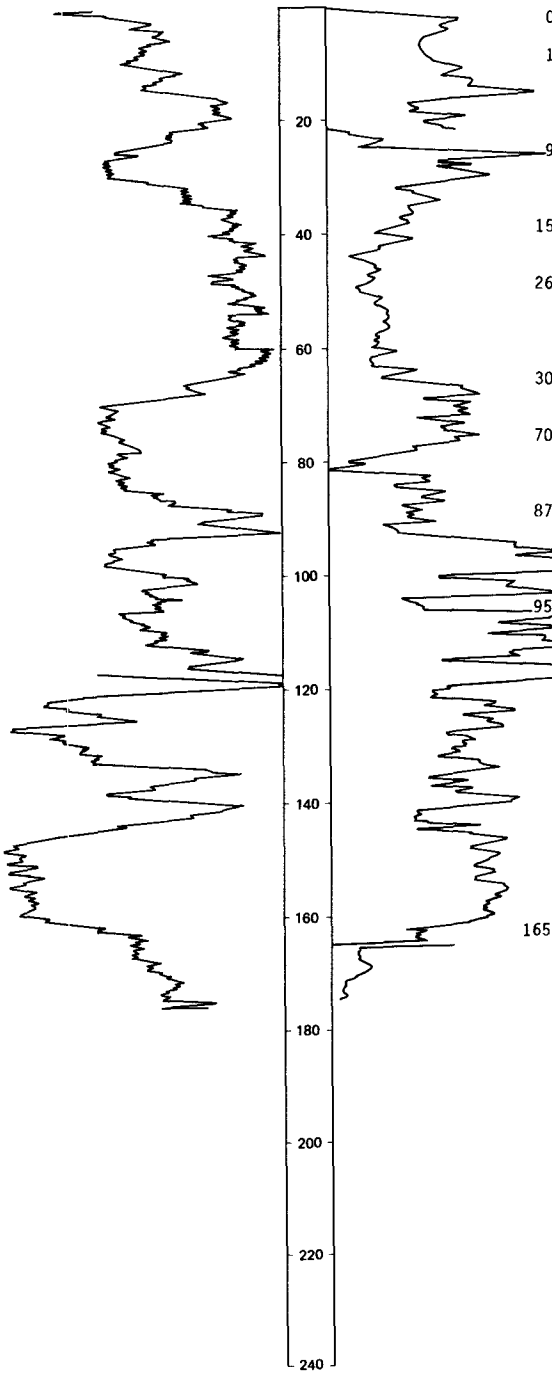
NDSWC 5589

LOCATION: 161-071-08CBB

DATE DRILLED: 10/09/79

ALTITUDE: 1695
(FT, NGVD)

DEPTH: 182
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-9	Clay, very sandy, silty, yellowish-brown, oxidized; contains thin lenses of very fine sand.
9-15	Clay, very sandy, silty, olive-gray; contains thin lenses of very fine sand.
15-26	Sand, very fine, silty, clayey, dirty, olive-gray.
26-30	Sand, very fine to very coarse, predominately medium to coarse, rounded to subrounded.
30-70	Silt, slightly sandy, light-olive-gray; somewhat clayey.
70-87	Clay, sandy, silty, pebbly, olive-gray (till); contains thin gravel lenses.
87-95	Gravel, fine to medium; contains fine to coarse sand; composed of about 90 percent shale pebbles and grains.
95-165	Sand, very fine to coarse, predominately fine, generally rounded, olive-gray; contains many thin clay lenses.

FOX HILLS SANDSTONE

165-182	Siltstone and claystone, olive-gray to black; interbedded.

LOCATION: 161-071-08CBB

DATE DRILLED: 10/09/79

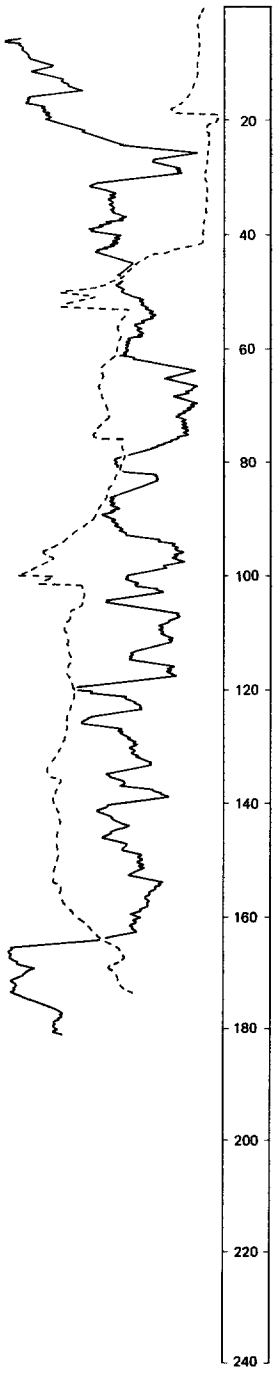
ALTITUDE: 1695
(FT, NGVD)

DEPTH: 182
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



161-071-08CCB
NDSWC 11426

Altitude: 1691 feet — Date drilled: 10/15/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very silty to sandy, yellowish-brown, oxidized (till)	4	5
	Sand, coarse, gravelly, oxidized	1	6
	Clay, silty to very sandy, olive-gray (till)	16	22
	Sand, fine to very coarse, subrounded; predominately detrital shale, lignite, quartz, and carbonate grains	4	26
	Sand, fine to very coarse; about 50 percent fine to granule subrounded gravel	3	29
	Clay, silty to very sandy, olive-gray (till); some boulders	46	75
	Silt, sandy, clayey, olive-gray	15	90
	Silt, clayey; interbedded with fine to coarse sand; abundant lignite	51	141
	Sand, very coarse, gravelly, subangular; about 50 percent detrital shale and lignite, 20 percent quartz, and 30 percent igneous and carbonate grains	24	165
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, greenish-gray	10	175
	Siltstone, argillaceous; carbonaceous brownish-gray streaks	5	180

161-071-08CCD
NDSWC 11491

Altitude: 1695 feet — Date drilled: 12/09/80

Glacial drift:			
	Soil	1	1
	Sand, fine to very coarse, gravelly, oxidized	11	12
	Clay, silty, olive-gray	13	25
	Sand, fine to very coarse, gravelly; predominately quartz, igneous, carbonate, and detrital shale grains	6	31
	Clay, silty, olive-gray	14	45
	Silt, clayey, olive-gray	5	50
	Clay, silty, sandy, gravelly, olive-gray (till)	16	66
Fox Hills Sandstone:			
	Siltstone, argillaceous, well-indurated, greenish-gray	14	80

161-071-08CDC
NDSWC 11490

Altitude: 1693 feet — Date drilled: 12/09/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Clay, silty, yellowish-brown, oxidized----------	3	4
	Sand, fine to medium, subrounded; about 50 percent quartz and 50 percent carbonate and detrital shale grains----------	14	18
	Clay, silty to very sandy, olive-gray (till)----------	8	26
	Sand, fine to very coarse; about 20 percent fine to granule subangular to subrounded gravel----------	9	35
	Clay, sandy, pebbly, olive-gray (till)----------	13	48
Fox Hills Sandstone:			
	Siltstone, argillaceous, poorly indurated, greenish-gray----------	32	80

NDSWC 5588

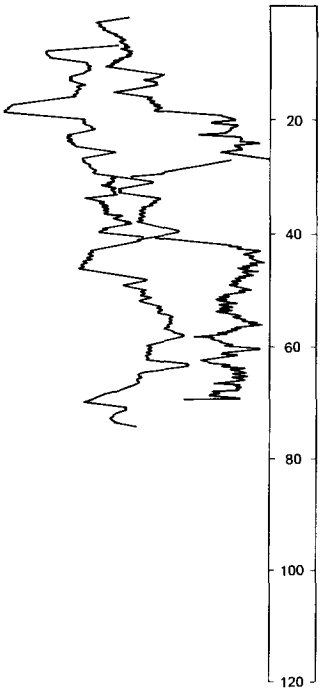
LOCATION: 161-071-08DCD

DATE DRILLED: 10/09/79

ALTITUDE: 1694 (FT, NGVD)

DEPTH: 77 (FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-17	Sand, very fine to very coarse, gravelly, well-rounded; predominately quartz, carbonate, igneous, and detrital shale grains.
17-30	Sand, fine, silty; some detrital lignite.
30-42	Sand, medium to coarse, well-rounded; predominately detrital shale, carbonate, and quartz grains

FOX HILLS SANDSTONE

42-77	Siltstone, argillaceous, quartzose, poorly indurated, greenish-gray.

161-071-09AAD1
(Log modified from Water Supply Inc.)

Altitude: 1735 feet — Date drilled: 6/06/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Gravel, sandy; fine sand to pebbles but predominately gravel and very coarse sand; subrounded to well rounded; predominately carbonate, shale, and quartz pebbles with some granitics	46	47
	Gravel, sandy; with high percent of very coarse to coarse sand; predominately quartz and shale pebbles	8	55
	Silt, olive-gray, clayey to sandy	2	57
	Till, olive-gray; clay to pebbles	3	60

161-071-09ADD
(Log from Water Supply Inc.)

Altitude: 1730 feet — Date drilled: 6/05/79

	Topsoil	2	2
	Gravel, granular to pebbly, sandy; predominately carbonate with shale and granitic pebbles increasing with depth; subrounded to well rounded	46	48
	Sand, very fine to coarse; predominately quartz grains	12	60

161-071-09BAA
NDSWC 11486

Altitude: 1730 feet — Date drilled: 12/05/80

Glacial drift:			
	Soil	1	1
	Silt, clayey, yellowish-brown, oxidized	5	6
	Sand, coarse; about 50 percent fine to granule subangular gravel; about 40 percent silicate, 40 percent carbonate, and 20 percent quartz grains	3	9
	Sand, very fine, clayey	5	14
	Clay, very silty and sandy, olive-gray (till); some boulders	96	110
Fox Hills Sandstone:			
	Sandstone, fine, quartzose, well-indurated, greenish-gray	1	111
	Siltstone, argillaceous, moderately indurated, dark-gray	29	140

161-071-09BBC
NDSWC 11487

Altitude: 1715 feet — Date drilled: 12/05/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine to coarse; predominately quartz, igneous, carbonate, and detrital shale grains; about 30 percent fine to granule subangular to subrounded oxidized gravel	9	10
	Sand, very fine to very coarse, silty; about 60 percent quartz and 40 percent carbonate, igneous, and detrital shale and lignite grains	36	46
	Gravel, fine, to pebbles; about 30 percent fine subangular to subrounded sand; about 80 percent carbonate and detrital shale and 20 percent quartz and igneous pebbles	6	52
	Clay, silty to very sandy, gravelly, olive-gray (till)	36	88
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, quartzose, greenish-gray	13	101
	Siltstone, argillaceous, well-indurated, dark-gray	19	120

161-071-09CBC1
NDSWC 11488

Altitude: 1708 feet — Date drilled: 12/05/80

Glacial drift:			
	Soil	1	1
	Sand, fine to very coarse; about 20 percent fine gravel to pebbles; about 50 percent quartz, 20 percent igneous, 20 percent carbonate, and 10 percent detrital shale grains; oxidized	10	11
	Silt, clayey, olive-gray	50	61
	Clay, sandy, olive-gray (till)	30	91
	Clay, very silty to sandy, gravelly, olive-gray (till)	11	102
	Boulders, granite; abundant shale	1	103

161-071-09CBC2
NDSWC 11489

Altitude: 1708 feet — Date drilled: 12/08/80

Glacial drift:			
	Soil	1	1
	Sand, fine to very coarse; about 40 percent fine to granule oxidized gravel	12	13
	Silt, clayey, olive-gray	48	61
	Clay, very silty to sandy, gravelly, olive-gray (till)	27	88
Fox Hills Sandstone:			
	Sandstone, very fine, slightly argillaceous, quartzose, greenish-gray	12	100

161-071-09CCC
NDSWC B

Altitude: 1703 feet — Date drilled: 10/07/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand, predominately coarse, gravelly; oxidized to 19 feet; fine sand to fine gravel	25	25
	Sand, fine to very coarse, predominately medium, moderately well sorted	5	30
	Sand, very fine to coarse, predominately fine	8	38
	Silt, sandy	17	55
	Silt	13	68
	Clay, silty to sandy, olive-gray (till)	46	114
Fox Hills Sandstone:			
	Siltstone, medium-gray	6	120

161-071-09CCD
(Log modified from Schimelfenig Well Drilling, Inc.)

Altitude: 1705 feet — Date drilled: 12/04/79

	Topsoil	1	1
	Gravel, medium to coarse	34	35

161-071-09DDB
(Log modified from Schimelfenig Well Drilling, Inc.)

Altitude: 1720 feet — Date drilled: 12/03/79

	Topsoil	6	6
	Gravel, medium to coarse	66	72
	Clay, gray	3	75

161-071-10ABB
PHS 43
(Log from Randich, 1975)

Altitude: 1753 feet — Date drilled: 11/05/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel, fine to medium; interbedded with lenses of medium to coarse sand	7	8
	Sand, medium to very coarse; about 30 percent fine to medium gravel	17	25
	Gravel, fine to coarse, sandy	7	32
	Sand, medium to very coarse; about 25 percent fine gravel	8	40

161-071-10BBB
PHS 19
(Log from Randich, 1975)

Altitude: 1742 feet — Date drilled: 12/11/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Gravel, medium to coarse, subrounded; about 60 percent carbonate, 20 percent shale, and 20 percent granitic and quartz pebbles	14	16
	Sand, medium to coarse, gravelly	6	22
	Gravel, fine to medium, sandy	9	31
	Till, olive-gray; interbedded with lenses of very sandy clay	51	82
	Till, olive-gray, silty	42	124
	Till, medium-gray, silty	17	141
	Till, dark-gray, silty; interbedded with lenses of sandy clay	47	188
Fox Hills Sandstone:			
	Shale, medium-gray; interbedded with lenses of brown sandy siltstone	52	240

161-071-15BAA
NDSWC 11413

Altitude: 1735 feet — Date drilled: 10/14/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Silt, sandy, clayey, olive-gray	2	3
	Sand, coarse; about 50 percent fine to granule subangular to subrounded gravel; 45 percent silicate, 25 percent carbonate, 20 percent quartz, and 10 percent detrital shale and lignite grains; oxidized	9	12
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, greenish-gray	28	40

161-071-15BBA
NDSWC 11412

Altitude: 1715 feet — Date drilled: 10/14/80

Glacial drift:			
	Soil	2	2
	Sand, medium; with some detrital shale; about 50 percent medium to granule subrounded gravel; 50 percent silicate, 30 percent carbonate, and 20 percent quartz grains	8	10
	Sand, medium to very coarse, gravelly, subrounded; about 40 percent silicate, 20 percent shale, 20 percent carbonate, and 20 percent quartz grains	36	46
	Gravel, fine to very coarse, sandy, subrounded; predominately quartz, carbonate, and igneous pebbles	9	55
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately consolidated, greenish-gray	12	67

161-071-15CDC
NDSWC 11415

Altitude: 1698 feet — Date drilled: 10/14/80

Glacial drift:			
	Soil	1	1
	Clay, silty, carbonaceous, yellowish-brown, oxidized	4	5
	Sand, fine to coarse, and very coarse to granule subrounded oxidized gravel; predominately carbonate, igneous, quartz, and detrital shale grains and pebbles	8	13
Fox Hills Sandstone:			
	Siltstone, argillaceous, slightly indurated, greenish-gray	7	20

161-071-15DCB
(Log modified from Peterson Well Co.)

Altitude: 1690 feet — Date drilled: 1/04/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Sand, yellow	6	7
	Gravel	3	10
	Sand, clayey, yellow	15	25
	Clay, sandy, gray	13	38

161-071-16AAB1
(Log modified from Schimelfenig Well Drilling, Inc.)

Altitude: 1695 feet — Date drilled: 10/15/77

Glacial drift:			
	Topsoil	1	1
	Till, gray	2	3
	Gravel, coarse and medium	22	25
	Gravel, coarse and medium; with black shale rock	30	55
	Gravel, coarse	5	60

161-071-16AAB2
(Log modified from Schimelfenig Well Drilling, Inc.)

Altitude: 1710 feet — Date drilled: 10/12/77

	Topsoil	1	1
	Till, gray	2	3
	Gravel, medium	27	30
	Gravel, medium and coarse	5	35
	Gravel, medium and coarse; with fine sand	5	40
	Gravel, medium and coarse; with black shale rock	20	60

161-071-16ABA
(Log modified from Schimelfenig Well Drilling, Inc.)

Altitude: 1710 feet — Date drilled: 10/18/77

	Topsoil	1	1
	Gravel, medium to fine	14	15
	Gravel, medium	5	20
	Gravel, medium and fine	5	25
	Gravel, medium to coarse	20	45
	Coarse black shale rock	5	50
	Gravel, medium and coarse	17	67
	Clay, gray	3	70

161-071-16BCC
NDSWC C

Altitude: 1695 feet — Date drilled: 10/08/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to medium, predominately coarse, gravelly, oxidized; 30 percent carbonate, 40 percent igneous, and 30 percent quartz grains	12	12
	Sand, fine to medium, predominately medium, oxidized; predominately quartz grains; some shale and carbonate grains	5	17
	Sand, very fine to very coarse, predominately medium, blue-green; predominately quartz grains	8	25
	Sand, fine to very coarse, predominately fine to coarse	3	28
	Sand, very fine to very coarse, predominately fine to medium; 10 percent shale grains	13	41
	Silt; cobbles at 44 feet; poor recovery; sand caving from above	19	60

161-071-16BDD
(Log from Schimelfenig Well Drilling, Inc.)

Altitude: 1680 feet — Date drilled: 3/02/77

	Topsoil	1	1
	Gravel, medium	14	15
	Gravel, medium and very coarse	18	33
	Clay, gray	2	35

161-071-16CCD
NDSWC 11419

Altitude: 1688 feet — Date drilled: 10/15/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Silt, organic, dark-brown	2	3
	Sand, coarse to very coarse, and fine to granule subrounded to subangular gravel; predominately quartz, silicate, carbonate, and detrital shale grains and pebbles	28	31
Fox Hills Sandstone:			
	Siltstone, sandy, agrillaceous, indurated, greenish-gray	9	40

161-071-16CDC
NDSWC 11420

Altitude: 1692 feet — Date drilled: 10/15/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	2	2
	Sand, fine to very coarse; about 10 percent fine to coarse subangular to subrounded gravel; about 30 percent carbonate, 30 percent silicate, 30 percent quartz, and 10 percent detrital shale grains	33	35
Fox Hills Sandstone:			
	Siltstone, sandy, argillaceous, moderately indurated, greenish-gray	15	50
	Sandstone, very fine to fine, argillaceous, moderately indurated, greenish-gray	10	60

161-071-16CDD
NDSWC D

Altitude: 1690 feet — Date drilled: 10/08/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand, fine to medium, gravelly, oxidized	8	8
	Sand, fine to very coarse; oxidized to 12 feet; predominately quartz grains; some shale and carbonate grains	6	14
	Sand, fine to coarse, predominately medium; interbedded with lenses of silt or clay from 25 to 26 feet; 10 to 15 percent sandstone, 10 to 25 percent carbonate, and remainder quartz	15	29
	Silt, sandy, olive-gray; interbedded with lenses of sand from 31 to 33 and 35 to 36 feet	31	60

161-071-16DCD1
NDSWC 11414

Altitude: 1695 feet — Date drilled: 10/14/80

Glacial drift:			
	Soil	1	1
	Sand, very coarse, and fine to coarse subangular to subrounded gravel; about 40 percent silicate, 30 percent carbonate, and 30 percent quartz, detrital shale, and lignite grains	27	28
	Sand, fine to medium, gravelly, subangular	7	35
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, greenish-gray	25	60

161-071-16DCD2
NDSWC 11421

Altitude: 1693 feet — Date drilled: 10/15/80

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse; about 50 percent medium to granule subrounded oxidized gravel	16	17
	Sand, medium, subrounded; predominately quartz, igneous, carbonate, and detrital shale grains	20	37
	Sand, coarse; about 50 percent medium angular to subrounded gravel; predominately quartz, carbonate, and detrital shale grains	4	41
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous; interbedded with argillaceous moderately indurated greenish-gray siltstone	19	60

161-071-16DDA
NDSWC 11418

Altitude: 1697 feet — Date drilled: 10/14/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, medium to very coarse, and fine to granule gravel; oxidized to 10 feet; about 50 percent quartz, 20 percent silicate, 20 percent carbonate, and 10 percent detrital shale, and lignite grains	22	23
Fox Hills Sandstone:			
	Siltstone, argillaceous, indurated, greenish-gray	17	40

161-071-16DDC
NDSWC 11417

Altitude: 1690 feet — Date drilled: 10/14/80

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, and very coarse to granule gravel; predominately silicate, carbonate, quartz, and detrital shale grains	20	21
	Sand, very fine to medium, subrounded to rounded; about 60 percent quartz and 40 percent silicate, carbonate, and detrital shale grains	14	35
Fox Hills Sandstone:			
	Sandstone, very fine to medium, very argillaceous, well-indurated, greenish-gray	5	40

161-071-16DDD
NDSWC 11422

Altitude: 1688 feet — Date drilled: 10/15/80

Glacial drift:			
	Soil	3	3
	Sand, medium, and fine to very coarse gravel; predominately carbonate, silicate, and quartz grains	10	13
	Sand, fine to very coarse, subrounded; about 30 percent each carbonate, silicate, and detrital shale grains	12	25
Fox Hills Sandstone:			
	Siltstone, argillaceous; interbedded with very fine moderately indurated greenish-gray sandstone	15	40

161-071-17CDC
NDSWC 11424

Altitude: 1705 feet — Date drilled: 10/15/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very sandy and gravelly, yellowish-brown, oxidized (till)	15	16
	Silt, clayey, yellowish-orange, oxidized	1	17
	Clay, sandy, pebbly, dark-gray (till)	8	25
	Clay, sandy, gravelly, olive-gray (till); interbedded with a lens of fine to granule gravel from 38 to 40 feet	24	49
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, well-indurated, greenish-gray	31	80

161-071-17DCC
NDSWC E

Altitude: 1681 feet — Date drilled: 10/08/80

Glacial drift:			
	Sand, fine to coarse, gravelly, oxidized; some shale 30; percent carbonate grains	12	12
	Sand, very fine to fine, gravelly	2	14
	Silt, sandy, clayey, olive-gray (till); poor recovery	26	40

161-071-18DCC
NDSWC 5907

Altitude: 1672 feet — Date drilled: 11/14/80

Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	17	18
	Clay, silty, pebbly, olive-gray (till)	16	34
	Sand, coarse, and medium *subrounded gravel*	3	37
Fox Hills Sandstone:			
	Sandstone, fine, siliceous, glauconitic, poorly indurated, greenish-gray	13	50
	Siltstone, argillaceous, carbonaceous, brownish-gray	11	61

161-071-20AAB
NDSWC 11423

Altitude: 1685 feet — Date drilled: 10/15/80

Glacial drift:			
	Soil, sandy	3	3
	Gravel, fine to granule; about 30 percent very coarse subrounded sand; predominately quartz, carbonate, igneous, and detrital shale pebbles	12	15
Fox Hills Sandstone:			
	Siltstone, argillaceous; interbedded with very fine greenish-gray sandstone	25	40

161-071-21BAD
(Log from Church Well Boring)

Altitude: 1690 feet — Date drilled: 6/27/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, sandy, black	1	1
	Sand, yellow	16	17
	Clay, yellow	1	18
	Sand, yellow, wet	4	22
	Clay	3	25
	Clay, sandy, blue	--	25

161-071-21BBB
(Log from Water Supply Inc.)

Altitude: 1685 feet — Date drilled: 5/23/79

	Topsoil	2	2
	Gravel, granular to pebbly; limestone, granitics, and shale	12	14
	Silt, yellowish-brown, oxidized	2	16
	Gravel, granular to pebbly	2	18
	Silt, olive-gray	3	21
	Gravel, granular to pebbly	1	22
	Silt, olive-gray	5	27
	Till, olive-gray; clay to sand with occasional gravel	13	40

161-071-21CBC
(Log from Water Supply Inc.)

Altitude: 1670 feet — Date drilled: 5/23/79

	Topsoil	2	2
	Sand, fine to coarse; predominately well-rounded quartz with occasional gravel; predominately limestone and shale with granitics	24	26
	Gravel, granular to pebbly; predominately limestone and shale with granitics and quartz sand	5	31
	Till, olive-gray; clay, silt, sand, and gravel	9	40

161-071-21CDD
(Log from Water Supply Inc.)

Altitude: 1670 feet — Date drilled: 5/23/79

	Fill and topsoil (old road bed)	5	5
	Sand, fine to coarse; predominately quartz; becoming coarser with depth	10	15
	Sand, gravelly; coarse sand to granular gravel; subrounded to well rounded; predominately shale and limestone	5	20
	Silt, very clayey, bluish-gray	5	25

161-071-22BBB
NDSWC 5596

Altitude: 1690 feet — Date drilled: 10/11/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Sand, fine to very coarse; predominately fine to medium near top and medium with depth; contains about 10 percent fine to medium gravel	22	23
Fox Hills Sandstone:			
	Clay, sandy, light-olive-gray; contains thin very fine sand beds and carbonaceous streaks	24	47

161-071-22CCC
NDSWC 5597

Altitude: 1682 feet — Date drilled: 10/11/79

	Sand, fine to very coarse, predominately coarse, yellowish-brown, oxidized; contains about 25 percent fine to coarse gravel	14	14
	Clay, very sandy, yellowish-brown, oxidized	3	17
	Sand, fine to very coarse, predominately coarse; contains about 25 percent fine to coarse gravel	18	35
Fox Hills Sandstone:			
	Sandstone, very fine, silty, clayey, glauconitic, greenish-gray; contains a few carbonaceous streaks	27	62

161-071-23CCC
NDSWC 5373

Altitude: 1678 feet — Date drilled: 9/08/78

	Sand, fine to very coarse, predominately coarse, yellowish-brown, oxidized; contains about 20 percent fine to medium gravel	13	13
Fox Hills Sandstone:			
	Siltstone, sandy, clayey, brittle, medium-light-gray to greenish-gray	4	17
	Sandstone, fine, rounded, glauconitic, greenish-gray	11	28
	Siltstone, sandy, clayey, medium-light-gray to greenish-gray	125	153
Pierre Shale:			
	Shale, slightly bentonitic, brittle, black to grayish-black	47	200

161-071-26CCC
NDSWC 11427

Altitude: 1662 feet — Date drilled: 10/16/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Silt, clayey, yellowish-brown, oxidized	3	4
	Sand, very coarse; about 20 percent medium subangular oxidized gravel	1	5
	Clay, silty to very sandy, yellowish-brown, oxidized (till)	4	9
Fox Hills Sandstone:			
	Siltstone, sandy, argillaceous, greenish-gray	11	20

161-071-27BAA
NDSWC 11416

Altitude: 1675 feet — Date drilled: 10/14/80

Glacial drift:			
	Soil	1	1
	Clay, silty; sandy from 5 to 6 feet	10	11
	Sand, fine to medium, and medium to granule subangular gravel; about 40 percent silicate, 20 percent quartz, and 40 percent carbonate and detrital shale grains and pebbles	3	14
	Clay, olive-gray	7	21
	Sand, medium to very coarse, gravelly; mostly carbonate and detrital shale grains	2	23
Fox Hills Sandstone:			
	Siltstone, argillaceous, well-indurated, greenish-gray	17	40

161-071-28BAB
NDSWC 10351

Altitude: 1665 feet — Date drilled: 10/26/78

	Soil	1	1
	Gravel, fine to coarse, predominately medium, subrounded to angular; contains about 40 percent fine to very coarse sand	25	26
Fox Hills Sandstone:			
	Clay, very silty to sandy, olive-gray	34	60

161-071-29AAB
NDSWC 5598

Altitude: 1661 feet — Date drilled: 10/11/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till?)	5	6
	Sand, fine to very coarse, predominately medium to coarse; contains about 10 percent fine gravel	27	33
	Clay, silty, sandy, pebbly, olive-gray (till)	6	39
Fox Hills Sandstone:			
	Siltstone, very sandy, silty, brittle, greenish-gray to light-olive-gray	23	62

161-071-29DAD
NDSWC F

Altitude: 1660 feet — Date drilled: 10/08/80

	Sand, fine to very fine, gravelly, oxidized	15	15
	Sand, coarse, gravelly	10	25
	Silt, clayey, slightly sandy, gray	10	35
Fox Hills Sandstone:			
	Siltstone, clayey, hard, brittle; good recovery	5	40

161-071-30CDD
NDSWC 11428

Altitude: 1640 feet — Date drilled: 10/18/80

Glacial drift:			
	Soil	1	1
	Sand, medium; about 40 percent medium to granule subangular gravel; 30 percent silicate, 30 percent carbonate, and 40 percent quartz and detrital shale grains	2	3
	Clay, very sandy, yellowish-brown, oxidized (till)	8	11
Fox Hills Sandstone:			
	Siltstone, argillaceous; interbedded with fine moderately indurated greenish-gray sandstone	9	20

161-071-32CCC
NDSWC 11410

Altitude: 1620 feet — Date drilled: 10/14/80

Glacial drift:			
	Soil	1	1
	Silt, clayey, yellowish-brown, oxidized	7	8
	Clay, silty to very sandy, yellowish-orange, oxidized (till)	9	17
Fox Hills Sandstone:			
	Siltstone, argillaceous, greenish-gray	23	40

161-071-32CDC
NDSWC 11411

Altitude: 1625 feet — Date drilled: 10/14/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Silt, clayey, sandy, olive-gray	2	3
	Sand, medium to very coarse, subangular	6	9
	Sand, medium to very coarse, gravelly, subangular to rounded	8	17
Fox Hills Sandstone:			
	Siltstone, argillaceous; interbedded with fine moderately indurated greenish-gray sandstone	23	40

161-071-32DCC
NDSWC 5652

Altitude: 1635 feet — Date drilled: 10/11/79

	Sand, very fine to coarse, predominately medium, dark-yellowish-brown, oxidized	5	5
	Sand, very fine to coarse, predominately medium, rounded; mostly quartz grains	20	25
Fox Hills Sandstone:			
	Siltstone, slightly sandy, olive-gray	7	32

161-071-33CCC
NDSWC 11409

Altitude: 1640 feet — Date drilled: 10/14/80

Glacial drift:			
	Soil	1	1
	Sand, medium to very coarse, subrounded, oxidized	8	9
	Sand, medium, and fine to coarse subrounded gravel; 40 percent silicate, 40 percent carbonate, and 20 percent quartz grains and pebbles	13	22
	Clay, silty, olive-gray	1	23
Fox Hills Sandstone:			
	Sandstone, very fine to fine; interbedded with argillaceous greenish-gray siltstone	37	60

161-071-33CDD
NDSWC 5651

Altitude: 1650 feet — Date drilled: 10/11/79

	Sand, fine to very coarse, predominately medium to coarse, yellowish-brown, oxidized; contains about 10 percent fine gravel	17	17
	Sand, fine to very coarse, predominately medium to coarse; contains about 10 percent fine gravel	18	35
Fox Hills Sandstone:			
	Siltstone, sandy, carbonaceous, olive-gray	12	47

161-071-34DDD
(Log from Water Supply Inc.)

Altitude: 1650 feet — Date drilled: 5/24/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil----------	2	2
	Clay, silty, yellowish-gray, cohesive----------	11	13
	Sand, gravelly, to sandy gravel; becoming coarser with depth; medium to very coarse sand to pebbly gravel; quartz sand, limestone, and shale; some granitic gravel; subrounded to well rounded----------	17	30
	Sandstone, greenish-gray to bluish-gray; with organics (lignite material); bedrock; Fox Hills(?)----------	10	40

161-071-35CDA
(Log from C. A. Simpson & Son)

Altitude: 1665 feet — Date drilled: 8/10/64

	Topsoil----------	1	1
	Clay, yellow----------	24	25
	Clay or shale, sandy, blue----------	275	300

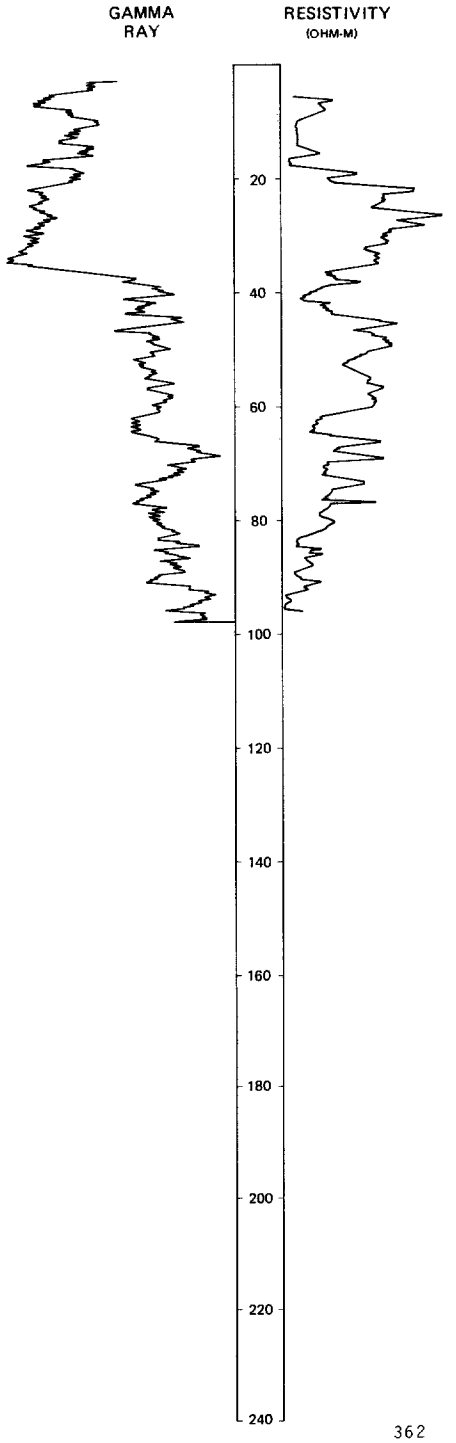
NDSWC 5590

LOCATION: 161-072-01DDD

DATE DRILLED: 10/09/79

ALTITUDE: 1694
(FT, NGVD)

DEPTH: 107
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-7	Clay, sticky, yellowish-brown, oxidized.
7-21	Sand, very fine, silty, well-rounded; predominately quartz grains.
21-36	Sand, fine to very coarse, predominately very coarse; contains about 25 percent fine to medium gravel; composed of about 50 percent carbonate, 30 percent silicate, 15 percent detrital shale, and 5 percent sandstone and lignite grains.
36-74	Silt, sticky, olive-gray.
	FOX HILLS SANDSTONE
74-107	Claystone, olive-gray; sandy and silty in beds.

161-072-02BBB
NDSWC 5591

Altitude: 1725 feet — Date drilled: 10/09/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil	1	1
	Sand, very fine to very coarse, predominately medium to coarse; contains about 20 percent gravel; also contains silt and clay from 9 to 14 feet	13	14
	Clay, olive-gray	3	17
	Silt, clayey, slightly sandy, olive-gray	23	40
	Sand, very fine to very coarse, predominately medium to coarse; contains about 20 percent fine gravel	15	55
	Silt, sandy, clayey, olive-gray; poor cohesion	9	64
	Sand, predominately very fine, silty, dirty	34	98
Fox Hills Sandstone:			
	Sandstone, very fine, well-rounded, glauconitic, slightly micaceous, greenish-gray	24	122

161-072-03CCC
NDSWC 5587

Altitude: 1681 feet — Date drilled: 10/05/79

	Soil	1	1
	Sand, very fine to very coarse, predominately medium; contains some yellowish-brown oxidized gravel	11	12
	Clay, silty, sandy, pebbly, olive-gray (till); contains thin sand and gravel lenses	25	37
	Clay, silty, olive-gray	17	54
Fox Hills Sandstone:			
	Sandstone, very fine, silty, well-sorted, light-olive-gray; contains thin beds of silty olive-gray clay and carbonaceous dark-brown streaks	23	77

161-072-04BAA
NDSWC 5898

Altitude: 1682 feet — Date drilled: 11/12/80

Glacial drift:			
	Soil	1	1
	Clay, sandy, pebbly, gray (till)	4	5
	Sand, fine to coarse, and medium *angular to rounded* gravel	17	22
Fox Hills Sandstone:			
	Sandstone, fine, siliceous; carbonaceous poorly indurated greenish-gray streaks	18	40

161-072-12CDC
NDSWC 5903

Altitude: 1675 feet — Date drilled: 11/13/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, yellowish-brown, oxidized (till)	9	10
	Silt, clayey, olive-gray	20	30
	Clay, silty, sandy, olive-gray (till)	8	38
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, well-indurated, greenish-gray	1	39
	Sandstone, fine, glauconitic, poorly indurated, green	22	61

161-072-13CDD
NDSWC 5813

Altitude: 1660 feet — Date drilled: 10/03/80

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	5	6
	Silt, clayey, yellowish-brown, oxidized	6	12
	Clay, very silty, pebbly, olive-gray (till)	9	21
Fox Hills Sandstone:			
	Sandstone, fine, glauconitic; carbonaceous greenish-gray streaks	8	29
	Siltstone, bentonitic, argillaceous, carbonaceous, greenish-gray	32	61

161-072-13DAA
NDSWC 5906

Altitude: 1665 feet — Date drilled: 11/14/80

Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	12	13
	Clay, silty, pebbly, olive-gray (till)	17	30
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, well-indurated, greenish-gray	1	31
	Sandstone, fine, glauconitic, poorly indurated, greenish-gray	7	38
	Sandstone, very fine, argillaceous, carbonaceous, brownish-gray	12	50
	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray	11	61

161-072-18DDD
NDSWC 5933

Altitude: 1695 feet — Date drilled: 6/03/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Clay, very silty, yellowish-brown, oxidized (till)	15	16
	Clay, very silty, olive-gray (till); boulders	39	55
Fox Hills Sandstone:			
	Sandstone, very fine, poorly indurated, greenish-gray	5	60

161-072-19BBA
NDSWC 5932

Altitude: 1660 feet — Date drilled: 6/03/81

Glacial drift:			
	Topsoil	1	1
	Clay, silty, yellowish-brown, oxidized (till)	15	16
	Clay, very silty, olive-gray (till)	4	20
	Sand, medium; interbedded with fine subrounded gravel; predominately carbonate grains	7	27
	Silt, clayey, olive-gray	15	42
	Sand, medium; interbedded with fine gravel; predominately detrital shale grains	2	44
	Silt, dark-gray	3	47
	Sand, medium, gravelly, subrounded	3	50
Fox Hills Sandstone:			
	Siltstone, brownish-gray; carbonaceous poorly indurated streaks; interbedded with fine sandstone	10	60

161-072-20CCC
NDSWC 10349

Altitude: 1615 feet — Date drilled: 10/25/78

	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	10	11
	Clay, silty, sandy, pebbly, olive-gray (till)	4	15
Fox Hills Sandstone:			
	Clay, very silty, moderately compacted to well-compacted, olive-gray	25	40

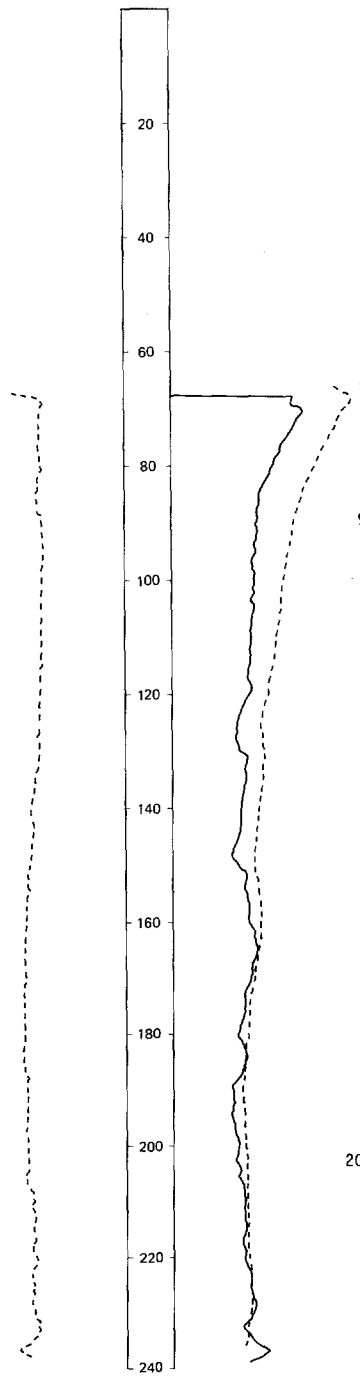
NDSWC 5374

LOCATION: 161-072-23CCC

DATE DRILLED: 9/08/78

ALTITUDE: 1633
(FT, NGVD)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

0-25	Clay, sandy, silty, pebbly, gravelly, moderate-yellowish-brown, oxidized (till).
25-40	Clay, sandy, silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

40-55	Sandstone, fine to medium, well-sorted, rounded, glauconitic, semiconsolidated, greenish-gray.
55-58	Sandstone, indurated.
58-90	Sandstone, fine to medium, rounded, glauconitic, semiconsolidated, greenish-gray.
90-205	Siltstone, sandy, clayey, brittle, light-gray to greenish-gray; contains some dark-green sandstone below 160 feet.

PIERRE SHALE

205-240	Shale, brittle, black to grayish-black.

NOTE:

------Long normal

———Short normal

161-072-24AAA
NDSWC 5894

Altitude: 1655 feet — Date drilled: 11/11/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, very silty, yellowish-brown, oxidized (till)	9	10
	Clay, very silty, pebbly, olive-gray (till)	9	19
	Sand, fine, well-sorted	3	22
	Clay, very silty, olive-gray (till); interbedded with lenses of gravel	6	28
Fox Hills Sandstone:			
	Sandstone, fine, siliceous, poorly indurated, greenish-gray	7	35
	Siltstone, bentonitic, argillaceous; carbonaceous greenish-gray streaks	26	61

161-072-25AAA
NDSWC 10350

Altitude: 1645 feet — Date drilled: 10/26/78

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	13	14
	Clay, very silty, sandy, pebbly, olive-gray (till); contains a sand and gravel lens from 28 to 29 feet	16	30
Fox Hills Sandstone:			
	Claystone, very silty, well-compacted, olive-gray	19	49
	Claystone, silty, sandy, greenish-gray to dark-olive-gray; contains some 2- to 3-inch bentonitic beds between 74 and 90 feet and some carbonaceous brown streaks between 90 and 100 feet	51	100
	Claystone, silty, greenish-gray; interbedded with fine dark-green sandstone	42	142
Pierre Shale(?):			
	Shale, dark-gray to black; locally contains a few sand grains	38	180

161-072-26AAA
NDSWC 5812

Altitude: 1635 feet — Date drilled: 10/03/80

Glacial drift:			
	Soil	1	1
	Clay, very silty to sandy, pebbly, yellowish-brown, oxidized (till)	17	18
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, yellowish-brown, oxidized; interbedded with siltstone	6	24
	Sandstone, fine, glauconitic, moderately indurated, greenish-gray	4	28
	Siltstone, bentonitic, argillaceous, carbonaceous, greenish-gray to brownish-gray	12	40
	Sandstone, fine, glauconitic, moderately indurated, greenish-gray	21	61

161-072-27DDC
NDSWC 5900

Altitude: 1625 feet — Date drilled: 11/12/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, gravelly, yellowish-brown, oxidized (till)	15	16
	Clay, silty, gravelly, olive-gray (till)	10	26
Fox Hills Sandstone:			
	Siltstone, argillaceous, greenish-gray	4	30
	Sandstone, fine, glauconitic, poorly indurated, greenish-gray	11	41

161-072-28AAD
(Log modified from C. A. Simpson & Son)

Altitude: 1610 feet — Date drilled: 11/21/65

	Topsoil	3	3
	Clay, sandy, yellow	20	23
	Clay, sandy, blue	26	49
	Clay, blue	151	200

161-072-30DDD
NDSWC 5811

Altitude: 1615 feet — Date drilled: 10/03/80

Glacial drift:			
	Soil	1	1
	Clay, yellowish-gray, oxidized	1	2
	Clay, very silty, pebbly, yellowish-brown, oxidized (till)	13	15
Fox Hills Sandstone:			
	Sandstone, fine, yellowish-brown, oxidized	6	21
	Sandstone, fine, argillaceous, glauconitic, greenish-gray; interbedded with carbonaceous brownish-gray siltstone	21	42
	Siltstone, argillaceous, carbonaceous, moderately indurated, greenish-gray to brownish-gray	19	61

161-072-32ADD
(Log modified from Church Well Boring)

Altitude: 1602 feet — Date drilled: 9/29/76

	Topsoil, sandy, black	1	1
	Sand, yellow	6	7
	Clay, sandy, yellow	4	11
	Clay, gravelly, yellow	2	13
	Sand, coarse, blue	4	17
	Sand, blue	7	24

161-072-33ABB
(Log modified from Church Well Boring)

Altitude: 1600 feet — Date drilled: 7/18/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	1	1
	Clay, white	1	2
	Sand, fine, yellow	9	11
	Sand, fine, blue	25	36

161-072-34ADB
(Log modified from Church Well Boring)

Altitude: 1630 feet — Date drilled: 8/27/75

	Sand, yellow; trace of water	15	15
	Clay, yellow	1	16
	Clay, blue	20	36
	Clay, sandy, blue	3	39
	Sand, blue	41	80

161-072-34DAA
NDSWC 5899

Altitude: 1606 feet — Date drilled: 11/12/80

Glacial drift:			
	Soil	1	1
	Sand, fine, oxidized	4	5
	Clay, silty, gravelly, yellowish-brown, oxidized (till)	5	10
	Clay, silty, gravelly, olive-gray (till)	6	16
Fox Hills Sandstone:			
	Sandstone, fine, greenish-gray; interbedded with carbonaceous brownish-gray siltstone	25	41

161-072-34DCD
NDSWC 5897

Altitude: 1595 feet — Date drilled: 11/12/80

Glacial drift:			
	Soil	1	1
	Clay, pebbly, yellowish-brown, oxidized (till)	6	7
	Silt, clayey; oxidized to 10 feet	7	14
Fox Hills Sandstone:			
	Sandstone, fine, light-greenish-gray; interbedded with bentonitic greenish-gray siltstone	7	21

161-072-35CCD
NDSWC 5928

Altitude: 1620 feet — Date drilled: 6/02/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Clay, silty, gravelly, yellowish-brown, oxidized (till)	10	11
	Gravel, fine to coarse, subangular to rounded, oxidized	9	20
	Sand, fine to coarse, subrounded; interbedded with lenses of silt clay	37	57
	Sand, coarse to very coarse, subangular to rounded	24	81
Fox Hills Sandstone:			
	Siltstone, clayey, moderately indurated, brownish-gray	9	90
	Sandstone, very fine, glauconitic, semiconsolidated, greenish-gray	10	100

161-072-35DDD
NDSWC 5927

Altitude: 1630 feet — Date drilled: 6/02/81

Glacial drift:			
	Topsoil	1	1
	Clay, gravelly, yellowish-brown, oxidized (till)	19	20
	Sand, very fine to medium, subrounded, oxidized	9	29
	Clay, sandy, yellowish-brown, oxidized (till)	8	37
	Sand, fine to coarse; interbedded with lenses of fine to medium rounded gravel	65	102
Fox Hills Sandstone:			
	Siltstone, brownish-gray; carbonaceous poorly indurated streaks	18	120

161-072-36BAA
NDSWC 11483

Altitude: 1626 feet — Date drilled: 12/04/80

Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	8	9
	Sand, coarse, subrounded; predominately quartz grains	14	23
	Silt, clayey, olive-gray	12	35
Fox Hills Sandstone:			
	Siltstone, well-indurated, medium-dark-gray	11	46
	Sandstone, fine, slightly argillaceous, quartzose, greenish-gray	14	60

161-072-36BAD
NDSWC 5917

Altitude: 1640 feet — Date drilled: 3/19/81

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, very fine to very coarse, and fine angular to rounded oxidized gravel	9	10
	Clay, very silty to sandy, yellowish-brown, oxidized (till)	5	15
	Sand, fine to very coarse, gravelly, angular to rounded	5	20
	Sand, coarse to very coarse, subangular to rounded; about 50 percent quartz, 25 percent carbonate, and 25 percent detrital shale grains	25	45
Fox Hills Sandstone:			
	Siltstone, greenish-gray; very poor sample recovery makes this a questionable pick	15	60

161-072-36BBB
NDSWC 5916

Altitude: 1626 feet — Date drilled: 3/19/81

Glacial drift:			
	Soil	1	1
	Clay, silty, gravelly, yellowish-brown, oxidized (till)	18	19
	Clay, silty, pebbly, olive-gray (till); cobbles	12	31
Fox Hills Sandstone:			
	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray	7	38
	Sandstone, fine, argillaceous, glauconitic, well-indurated, greenish-gray	19	57

161-072-36BDD
NDSWC 11479

Altitude: 1648 feet — Date drilled: 12/03/80

Glacial drift:			
	Soil	1	1
	Sand, very fine, clayey, oxidized	4	5
	Clay, silty, yellowish-brown, oxidized	7	12
	Clay, silty, sandy, yellowish-brown, oxidized (till)	18	30
	Sand, medium, gravelly, subrounded; predominately quartz, carbonate, and detrital shale grains	18	48
	Silt, clayey, dark-gray; interbedded with fine sand from 61 to 65 feet	25	73
Fox Hills Sandstone:			
	Sandstone, very fine, argillaceous, greenish-gray	3	76
	Siltstone, argillaceous, indurated, dark-gray	24	100

NDSWC 5654

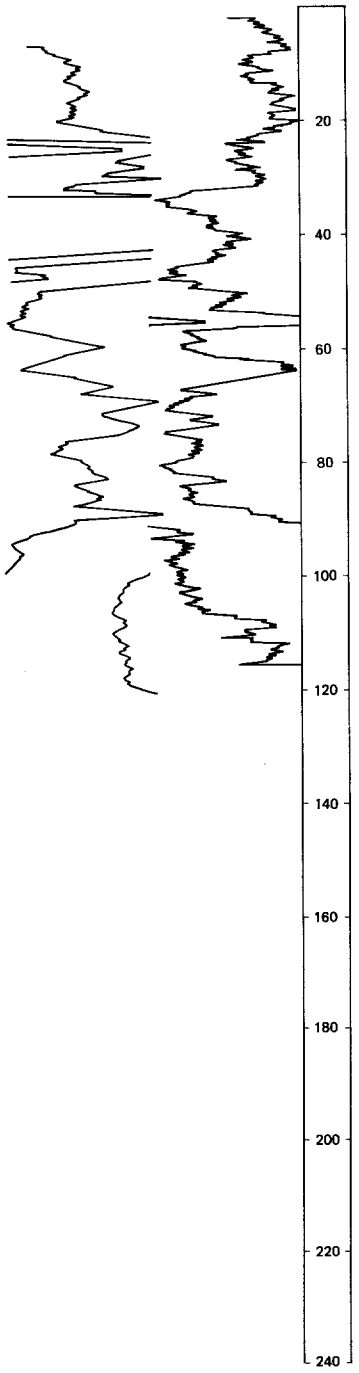
LOCATION: 161-072-36DCC

DATE DRILLED: 10/15/79

ALTITUDE: 1663
(FT, NGVD)

DEPTH: 122
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-17	Silt, sandy, yellowish-brown, oxidized; contains a few carbonaceous streaks.
17-32	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till); contains gravel lenses as much as 6 inches thick.
32-48	Clay, very silty, sandy, yellowish-brown, oxidized.
48-70	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
70-77	Clay, silty, sandy, pebbly, olive-gray (till).
77-92	Silt, clayey, sandy, bouldery, olive-gray (till?).

FOX HILLS SANDSTONE

92-122	Siltstone, sandy (very fine sand), moderately compacted, olive-gray.

161-072-36DDD
NDSWC 11481

Altitude: 1639' feet — Date drilled: 12/04/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Silt, clayey, yellowish-brown, oxidized	23	24
	Sand, fine to very coarse, gravelly, subangular to subrounded; predominately quartz grains	20	44
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, moderately indurated, greenish-gray	36	80

161-073-18DBC
(Log modified from Empire Irrigation & Drilling Co., Inc.)

Altitude: 1600 feet — Date drilled: 7/15/68

	Topsoil	2	2
	Clay, yellow	16	18
	Gravel	2	20
	Clay	15	35
	Clay; bedrock	25	60

161-073-21CCC
NDSWC 10348

Altitude: 1578 feet — Date drilled: 10/25/78

	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	8	9
	Clay, silty, sandy, pebbly, olive-gray (till)	3	12
Fox Hills Sandstone:			
	Clay, very silty, olive-gray	28	40

NDSWC 5375

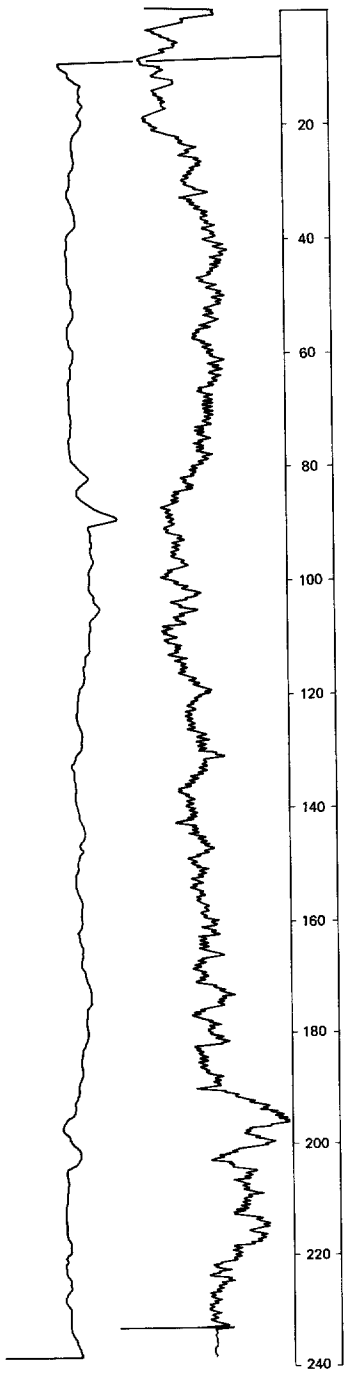
LOCATION: 161-073-23CCC

DATE DRILLED: 9/11/78

ALTITUDE: 1600
(FT, NGVD)

DEPTH: 240
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

0-22	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
	FOX HILLS SANDSTONE
22-82	Siltstone, sandy, bentonitic, light-gray.
82-92	Sandstone, fine, clayey, well-sorted, rounded, glauconitic, dark-green.
92-222	Siltstone, sandy, light-gray; very sandy from 200 to 206 feet.
	PIERRE SHALE
222-240	Shale, brittle, black to grayish-black.

161-073-30BBB
NDSWC 10347

Altitude: 1580 feet — Date drilled: 10/25/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	15	16
	Clay, silty, sandy, pebbly, dark-yellowish-brown, partially oxidized (till)----------	5	21
	Clay, silty, sandy, pebbly, olive-gray (till)----------	10	31
Fox Hills Sandstone:			
	Siltstone, clayey, light-olive-gray; grading to olive gray with depth----------	29	60

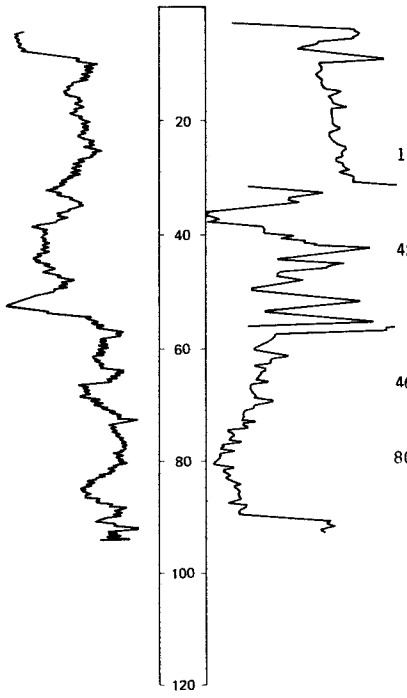
NDSWC 5866

LOCATION: 161-074-05DDD

DATE DRILLED: 10/28/80

ALTITUDE: 1620 (FT, NGVD)

DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Clay, silty, yellowish-brown, oxidized (till).
10-42	Clay, silty, pebbly, olive-gray (till); interbedded with thin lenses of silty gravel from 25 to 42 feet.
42-46	Sand, very coarse, and coarse angular to rounded gravel; predominately carbonate grains and pebbles.

FOX HILLS SANDSTONE

46-80	Siltstone, argillaceous, moderately indurated, greenish-gray.
80-101	Sandstone, fine, glauconitic, poorly indurated to moderately indurated, green.

161-074-21CCC
NDSWC 10346

Altitude: 1580 feet — Date drilled: 10/25/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	22	23
	Clay, silty, sandy, pebbly, olive-gray (till)----------	16	39
	Sand, medium to very coarse, predominately very coarse; contains about 40 percent fine to coarse gravel----------	9	48
	Clay, silty, sandy, pebbly, olive-gray; interbedded lenses of sand----------	15	63
Fox Hills Sandstone:			
	Siltstone, sandy, dark-olive-gray; contains some very fine sandstone----------	17	80

NDSWC 5376

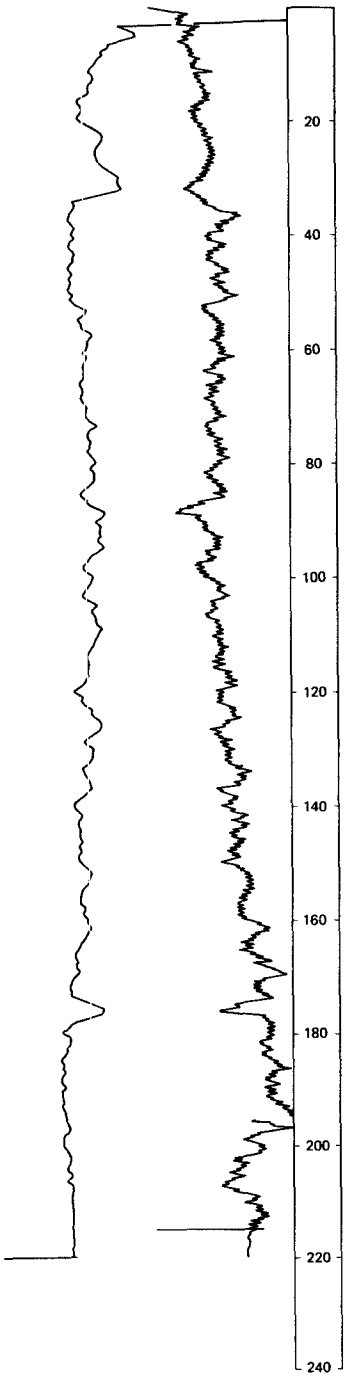
LOCATION: 161-074-27AAA

DATE DRILLED: 9/11/78

ALTITUDE: 1575
(FT, NGVD)

DEPTH: 220
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

0-20	Clay, sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till).
20-33	Clay, sandy, silty, pebbly, olive-gray (till).
	FOX HILLS SANDSTONE
33-201	Siltstone, brittle, light-gray to bluish-gray; locally sandy.
	PIERRE SHALE
201-220	Shale, brittle, black to grayish-black.

161-074-30BBB
NDSWC 10345

Altitude: 1561 feet

Date drilled: 10/25/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	21	22
	Clay, silty, sandy, pebbly, olive-gray (till)----------	5	27
Fox Hills Sandstone:			
	Sandstone, very fine to medium, silty, olive-gray to grayish-green----------	33	60

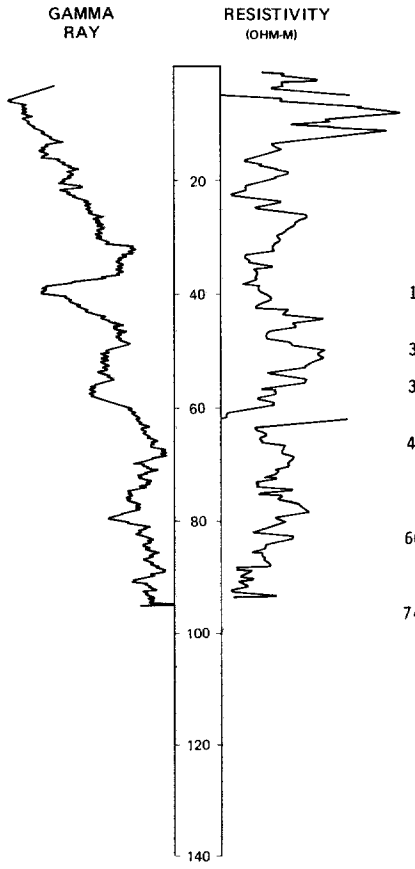
NDSWC 5865

LOCATION: 161-075-01AAA

DATE DRILLED: 10/28/80

ALTITUDE: 1650
(FT, NGVD)

DEPTH: 101
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-2	Silt, yellowish-gray, oxidized.
2-15	Sand, coarse, and fine to coarse angular to rounded gravel; oxidized to 10 feet.
15-32	Sand, fine, subangular; predominately quartz grains.
32-34	Silt, olive-gray.
34-42	Sand, fine, subangular to rounded.
42-60	Clay, very silty, olive-gray (till).

FOX HILLS SANDSTONE

60-74	Siltstone, argillaceous, moderately indurated, greenish-gray.
74-101	Sandstone, very fine, argillaceous; carbonaceous poorly indurated greenish-gray streaks.

161-075-02CCC
(Log modified from C. A. Simpson & Son)

Altitude: 1600 feet — Date drilled: 8/30/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Clay, yellow	5	8
	Clay, sandy, brown	17	25
	Clay, gray, soft; some sand	22	47
	Clay, sandy, gray, hard	8	55
	Sand, muddy	7	62
	Clay, gray	19	81
	Clay, slightly sandy, gray	4	85
	Sand rocks; hard layer	1	86
	Shale, gray	24	110

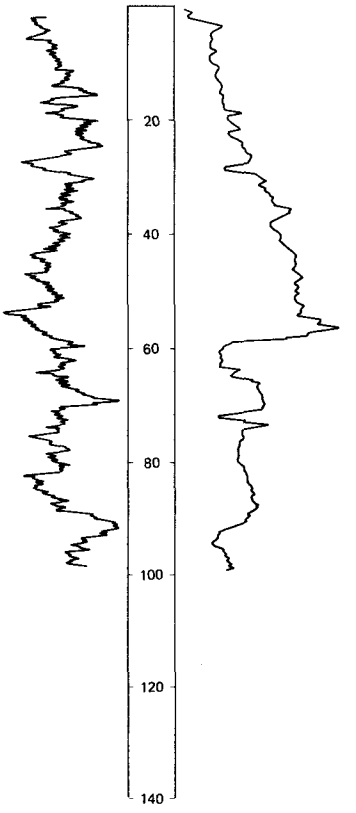
NDSWC 5577

LOCATION: 161-075-05BBB

DATE DRILLED: 9/25/79

ALTITUDE: 1598 (FT, NGVD)

DEPTH: 107 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-18	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
18-58	Clay, silty, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

58-62	Siltstone, sandy, clayey, olive-gray; locally carbonaceous.
62-107	Sandstone, very fine, silty, clayey, glauconitic, magnetitic, greenish-gray; locally bentonitic; grades into sandy light-olive-gray siltstone with depth.

161-075-13BBB
(Log from Lee's Well Drilling)

Altitude: 1590 feet — Date drilled: 9/15/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	16	17
	Clay, sandy, blue	88	105
	Shale	57	162

161-075-15CB
(Log modified from C. A. Simpson & Son)

Altitude: 1560 feet — Date drilled: 6/ /65

	Topsoil	1	1
	Clay, yellow	39	40
	Clay, slightly sandy, blue	42	82
	Clay, blue	13	95
	Shale, blue	90	185

161-075-20BBB
NDSWC 5578

Altitude: 1531 feet — Date drilled: 9/25/79

Glacial drift:			
	Soil	1	1
	Clay, sticky, yellowish-brown, oxidized	7	8
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	26	34
Fox Hills Sandstone:			
	Siltstone, sandy, clayey, slightly glauconitic, grayish-green	16	50
	Sandstone, fine, well-rounded, glauconitic, greenish-gray; locally carbonaceous; contains thin indurated bed at 55 feet	12	62

161-075-21CCC
NDSWC 10344

Altitude: 1537 feet — Date drilled: 10/25/78

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	23	24
	Clay, silty, sandy, pebbly, olive-gray (till)	12	36
Fox Hills Sandstone:			
	Sandstone, very fine to medium, predominately fine, moderately indurated, greenish-gray; contains considerable interstitial clay	24	60

161-075-22BC
(Log modified from C. A. Simpson & Son)

Altitude: 1540 feet — Date drilled: 1965

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	39	40
	Clay, slightly sandy, blue	40	80
	Clay, blue	20	100
	Clay, sandy, blue	1	101
	Shale, blue	89	190

161-075-26BAB
NDSWC 5377

Altitude: 1550 feet — Date drilled: 9/12/78

Glacial drift:			
	Clay, sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till)	18	18
	Gravel, fine to medium, sandy, poorly sorted, angular to subrounded	18	36
	Clay, sandy, silty, pebbly, medium-dark-gray to olive-gray (till)	14	50
Fox Hills Sandstone:			
	Siltstone; from drill action; no returns	10	60

161-075-30BBB
NDSWC 10343

Altitude: 1505 feet — Date drilled: 10/25/78

Glacial drift:			
	Soil	1	1
	Clay, silty, sticky, yellowish-brown, oxidized	13	14
	Clay, silty, sandy, olive-gray	26	40
Fox Hills Sandstone:			
	Sandstone, very fine to medium, predominately fine, greenish-black; contains considerable interstitial clay	9	49
	Sandstone, indurated	1	50
	Claystone, very silty, olive-gray to black	10	60

161-076-02DCA
(Log modified from Virg's Well Drilling)

Altitude: 1560 feet — Date drilled: 10/21/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, blue	33	34
	Gravel and sand	7	41

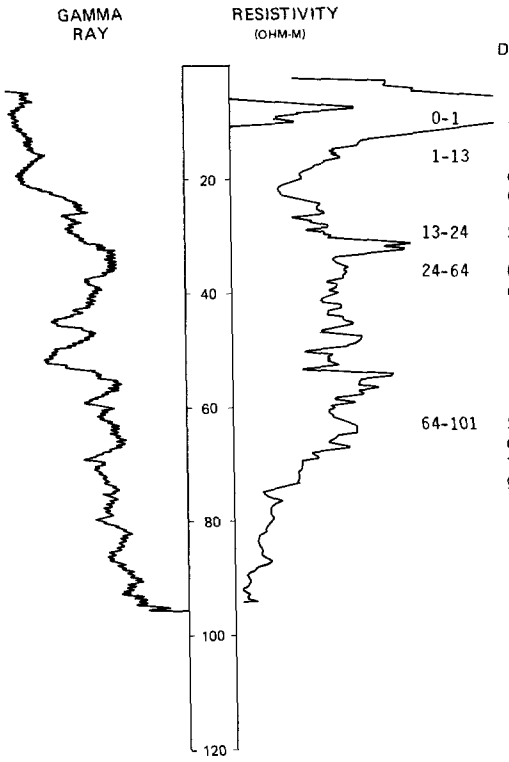
NDSWC 5863

LOCATION: 161-076-10AAA

DATE DRILLED: 10/27/80

ALTITUDE: 1550 (FT, NGVD)

DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-13	Sand, fine, and fine to coarse angular to rounded oxidized gravel.
13-24	Silt, olive-gray.
24-64	Clay, very silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

64-101	Siltstone, argillaceous, carbonaceous, brownish-gray; interbedded with very fine greenish-gray sandstone.

161-076-19CCC
NDSWC 10341B

Altitude: 1469 feet

Date drilled: 10/24/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)----------	41	42
	Clay, silty, sandy, pebbly (till); dark brown (top few feet) grading into olive gray----------	26	68
	Sand, very fine to coarse, poorly sorted----------	3	71
Fox Hills Sandstone:			
	Claystone, very silty, olive-gray----------	5	76
	Sandstone, very fine to medium, predominately fine, moderately compacted, greenish-black----------	13	89
	Claystone, very silty, moderately compacted to well-compacted, olive-gray to black----------	11	100

NDSWC 5378

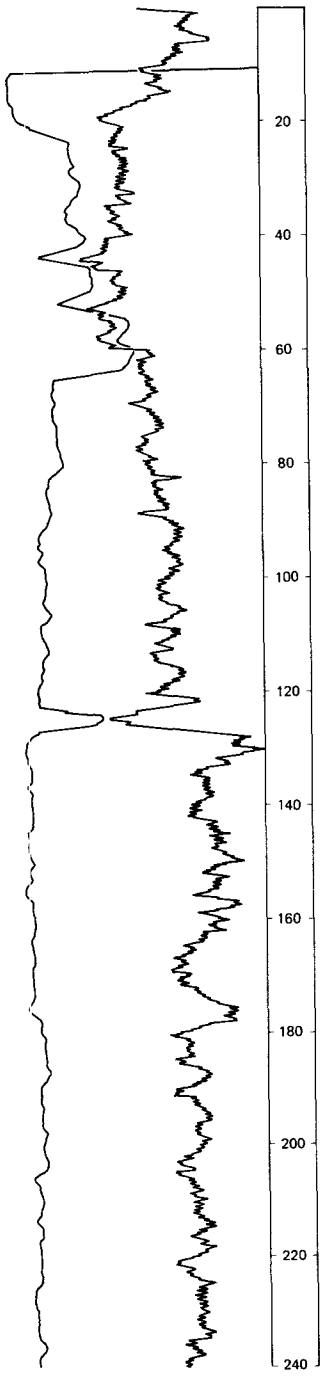
LOCATION: 161-076-27AAA

DATE DRILLED: 9/14/78

ALTITUDE: 1485
(FT, NGVD)

DEPTH: 280
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-25 Clay, sandy, silty, pebbly, yellowish-brown, oxidized (till).

25-64 Clay, sandy, silty, pebbly, medium-dark-gray to olive-gray (till); contains thin sand lenses.

FOX HILLS SANDSTONE

64-179 Siltstone, sandy, bentonitic, slightly glauconitic, brittle, light-gray to greenish-gray.

179-256 Siltstone, slightly sandy, brittle, dark-gray to dark-greenish-gray.

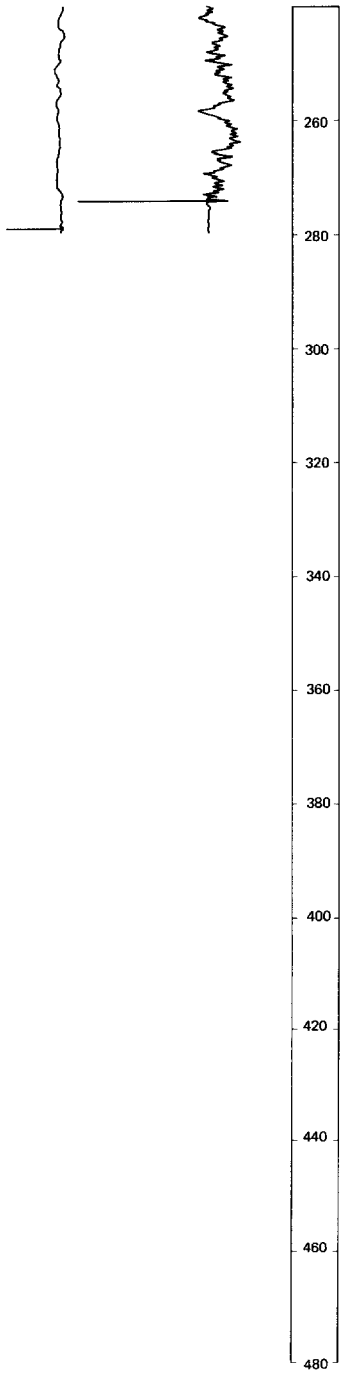
LOCATION: 161-076-27AAA

DATE DRILLED: 9/14/78

ALTITUDE: 1485
(FT, NGVD)

DEPTH: 280
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

PIERRE SHALE

256-280 Shale, brittle, black to grayish-black.

161-076-28BBB
NDSWC 10342

Altitude: 1475 feet — Date drilled: 10/25/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized	6	7
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	22	29
	Clay, silty, sandy, pebbly, olive-gray (till)	9	38
	Sand, gravelly	1	39
	Clay, silty, sandy, pebbly, olive-gray (till)	19	58
	Gravel, fine to coarse, sandy	2	60
Fox Hills Sandstone:			
	Claystone, silty, moderately compacted to well-compacted, olive-gray	20	80

161-076-28DDD
(Log modified from C. A. Simpson & Son)

Altitude: 1478 feet — Date drilled: 10/15/66

	Topsoil	2	2
	Clay, sandy, yellow	16	18
	Clay, sandy, blue	78	96
	Shale, gray	8	104
	Shale, sandy, green	17	121
	Shale	54	175

161-076-32DAA
(Log modified from Virg's Well Drilling)

Altitude: 1465 feet — Date drilled: 6/05/75

	Topsoil	3	3
	Clay, yellow	25	28
	Sand	16	44

161-077-11CBB
(Log modified from C. A. Simpson & Son)

Altitude: 1470 feet — Date drilled: 10/22/66

	Topsoil	1	1
	Clay, sandy, yellow	34	35
	Gravel and rocks; hard; dry	11	46
	Clay, sandy, yellow	32	78
	Shale, sandy, green	7	85
	Shale, blue	10	95

161-077-11CCC
(Log modified from C. A. Simpson & Son)

Altitude: 1470 feet — Date drilled: 10/20/66

	Topsoil	1	1
	Clay, sandy, yellow	93	94
	Shale, sandy, green	12	106
	Shale, blue	119	225

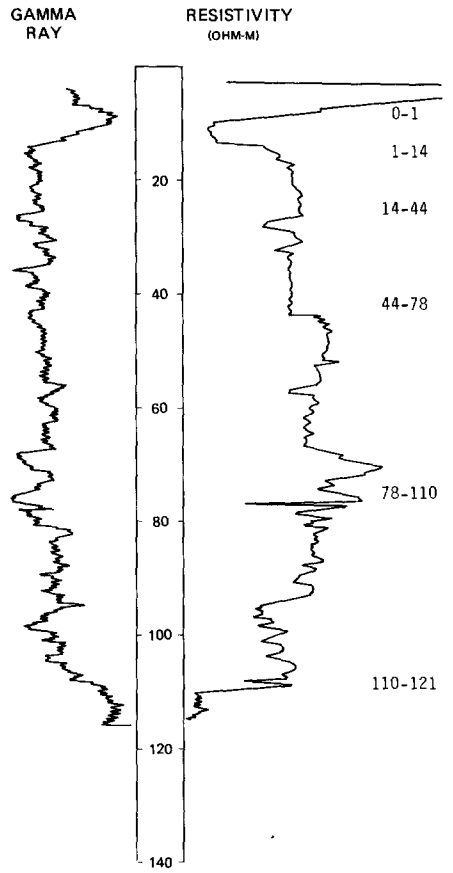
NDSWC 5841

LOCATION: 161-077-20CCC

DATE DRILLED: 10/14/80

ALTITUDE: 1467 (FT, NGVD)

DEPTH: 121 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-14	Clay, yellowish-brown, oxidized.
14-44	Clay, very sandy, pebbly, yellowish-brown, oxidized (till).
44-78	Clay, very sandy, olive-gray (till); gravel lenses.
78-110	Clay, very sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

110-121	Siltstone, argillaceous, carbonaceous, moderately well indurated, gray to brownish-gray.

161-077-21CCC
NDSWC 10340

Altitude: 1470 feet

Date drilled: 10/24/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	37	38
	Clay, silty, sandy, pebbly, brownish-gray, partially oxidized (till)	5	43
	Clay, silty, sandy, pebbly, olive-gray (till)	25	68
	Clay, very sandy, olive-gray	9	77
	Gravel, fine, very sandy, clayey	5	82
	Clay, sandy, silty, well-compacted, olive-gray (till?)	32	114
Fox Hills Sandstone:			
	Sandstone, very fine to fine, moderately compacted to well-compacted, greenish-black	8	122
	Claystone, very silty, dark-olive-gray	18	140

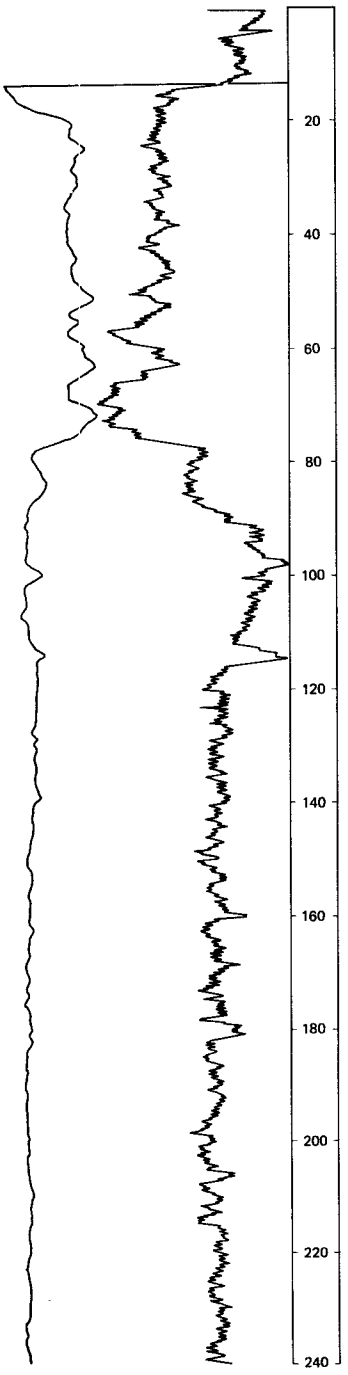
NDSWC 5379

LOCATION: 161-077-23CCC

ALTITUDE: 1472
(FT, NGVD)

DATE DRILLED: 9/14/78

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
10-20	Clay, silty, sandy, light-yellowish-brown, oxidized.
20-40	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
40-65	Clay, sandy, silty, pebbly, medium-gray (till).
65-76	Gravel, fine to medium, angular to subangular, partially oxidized; predominately carbonate and shale pebbles.
76-87	Clay, sandy, silty, pebbly, medium-gray (till).

FOX HILLS SANDSTONE

87-115	Siltstone, slightly sandy, glauconitic, pyritic, black to greenish-black.
115-150	Siltstone, slightly sandy, brittle, medium-gray to light-bluish-gray.
150-215	Siltstone, slightly sandy, brittle, greenish-black.

PIERRE SHALE

215-280	Shale, brittle, black to greenish-black; contains a few sand inclusions.

NDSWC 5379, continued

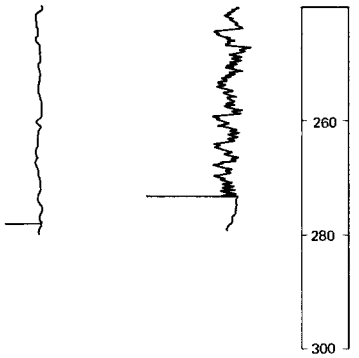
LOCATION: 161-077-23CCC

DATE DRILLED: 9/14/78

ALTITUDE: 1472
(FT, NGVD)

DEPTH: 280
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

161-077-24CCC
(Log modified from C. A. Simpson & Son)

Altitude: 1465 feet Date drilled: 11/05/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Clay, yellow	25	27
	Clay, sandy, blue	27	54
	Gravel; no water	2	56
	Clay, gravelly, blue	14	70
	Gravel	1	71

161-077-31BC
(Log modified from Verne R. Peterson Well Drilling)

Altitude: 1465 feet Date drilled: 4/08/76

	Topsoil	2	2
	Clay, yellow	8	10
	Clay, gravelly, yellow	22	32
	Clay, gravelly, gray	13	45
	Clay, sandy, blue	17	62
	Sand, blue, dirty	13	75
	Sand, fine, blue	12	87
	Hardpan	1	88
	Clay, gray	12	100

161-078-12DDC
(Log modified from Virg's Well Drilling)

Altitude: 1475 feet Date drilled: 10/26/74

	Topsoil	1	1
	Clay, yellow	39	40
	Sand and gravel	2	42
	Clay	8	50
	Sand and gravel	6	56

161-078-17DDD
NDSWC 5842

Altitude: 1444 feet — Date drilled: 10/14/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Clay, sandy, yellowish-brown, oxidized (till)	25	26
	Clay, sandy, olive-gray (till); interbedded with lenses of gravel from 90 to 125 feet	99	125
	Clay, very silty to sandy, greenish-gray; macerated bedrock	10	135
Fox Hills Sandstone:			
	Siltstone, clayey, moderately indurated, greenish-gray	5	140
	Sandstone, fine, glauconitic, well-indurated, greenish-gray	21	161

161-078-20BBD
(Log modified from Virg's Well Drilling)

Altitude: 1460 feet — Date drilled: 10/29/74

	Topsoil	1	1
	Clay, yellow	29	30
	Clay, blue	25	55
	Clay and sand	5	60
	Clay, blue	12	72
	Sand, black; with small rocks or coarse sand	5	77

161-078-25AAA1
(Log modified from C. A. Simpson & Son)

Altitude: 1470 feet — Date drilled: 9/27/74

	Clay, yellow	30	30
	Clay, blue	78	108
	Sand, clayey	12	120

161-078-25AAA2
NDSWC 10339

Altitude: 1467 feet — Date drilled: 10/24/78

Glacial drift:			
	Soil, clayey, black	1	1
	Clay, silty, sandy, pebbly, yellowish-brown (till)	26	27
	Clay, silty, sandy, pebbly, olive-gray (till)	13	40
	Clay, silty, well-compacted, light-brown	29	69
	Gravel, fine to coarse, angular to rounded	5	74
	Clay, silty, sandy, pebbly, olive-gray (till)	18	92
	Gravel, fine to coarse, angular to subrounded	5	97
	Clay, very silty, sandy, olive-gray	4	101
	Gravel, fine to very coarse; contains about 30 percent coarse sand	6	107
Fox Hills Sandstone:			
	Claystone, very silty, well-compacted, olive-gray	5	112
	Claystone, silty, well-compacted, black; contains some black sand	12	124
	Shale, black	16	140

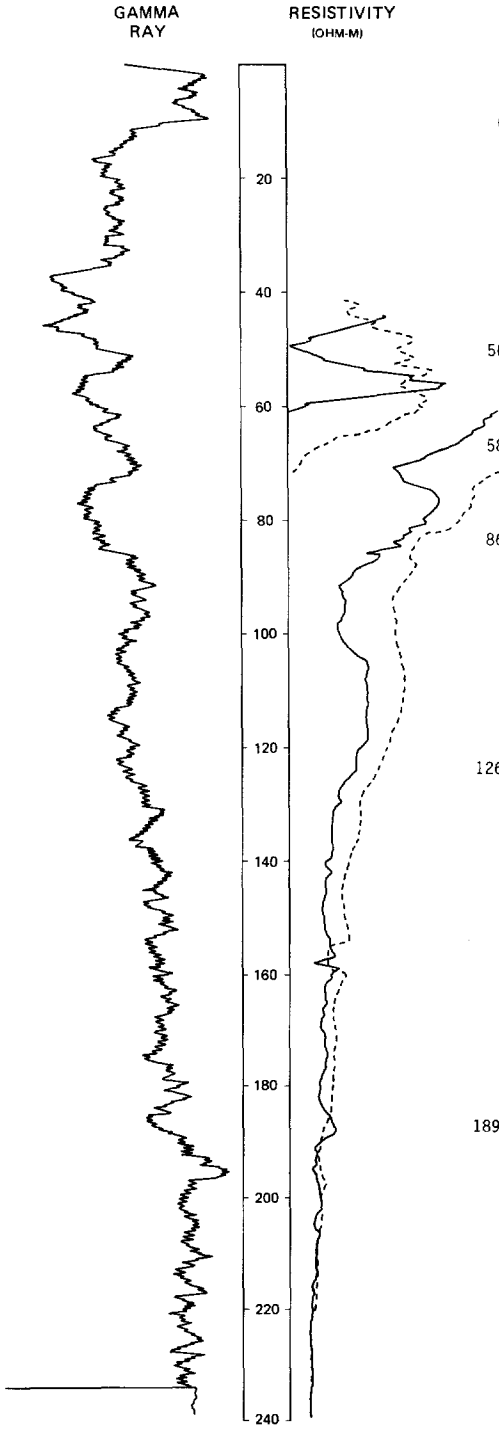
NDSWC 5380

LOCATION: 161-078-26BBB

DATE DRILLED: 9/14/78

ALTITUDE: (FT, NGVD) 1480

DEPTH: (FT) 240



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-50 Clay, sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till); contains a few thin sand and gravel lenses.

50-58 Clay, sandy, silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

58-86 Sandstone, fine to medium, well-sorted, rounded, glauconitic, greenish-gray.

86-126 Siltstone, sandy, bentonitic, glauconitic, brittle to friable, greenish-gray.

126-189 Siltstone, clayey, bentonitic, brittle, light-gray to light-greenish-gray.

PIERRE SHALE

189-240 Shale, brittle, black to grayish-black.

NOTE:

------Long normal

———Short normal

LOCATION: 161-078-26BBB

DATE DRILLED: 9/14/78

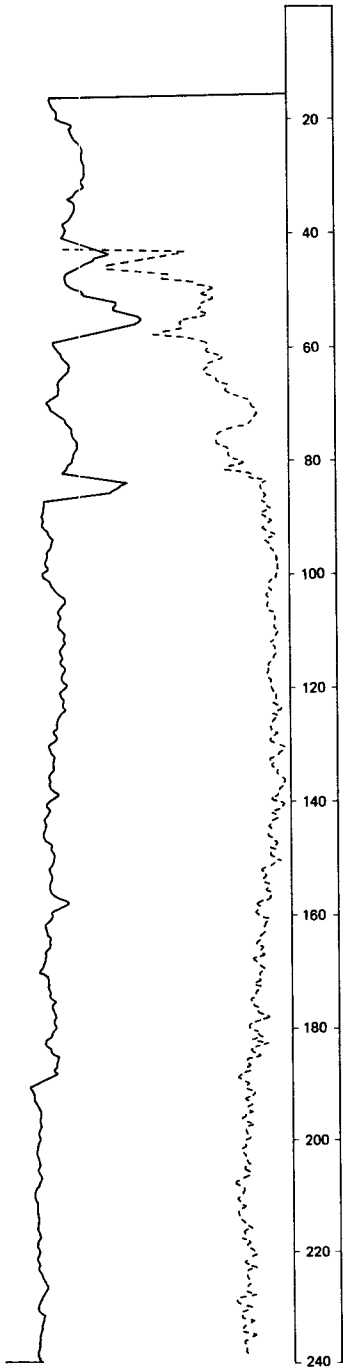
ALTITUDE: 1480
(FT, NGVD)

DEPTH: 240
(FT)

NEUTRON (API)

S.P. (MV)

DESCRIPTION OF DEPOSITS



161-078-30AAA
NDSWC 10338

Altitude: 1440 feet — Date drilled: 10/24/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	27	28
	Clay, silty, sandy, pebbly, olive-gray (till)	18	46
	Gravel, fine to very coarse, subangular to angular	3	49
	Clay, silty, sandy, pebbly, olive-gray (till)	12	61
Fox Hills Sandstone:			
	Sandstone, very fine to medium, predominately medium, well-sorted, locally carbonaceous, light-brown and light-greenish-gray; contains some carbonaceous clay beds	6	67
	Claystone, silty, slightly carbonaceous, moderately compacted to well-compacted, light-brown	16	83
	Sandstone, very fine to medium, clayey, gray	17	100

161-078-32DAD
(Log modified from Olson Water Wells)

Altitude: 1440 feet — Date drilled: 11/08/72

	Topsoil	1	1
	Clay, yellow	19	20
	Clay, blue	69	89
	Gravel	1	90
	Clay, blue	1	91
	Gravel	4	95

161-079-03BBB
NDSWC 10355

Altitude: 1470 feet — Date drilled: 10/27/78

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	34	35
	Clay, silty, sandy, pebbly, olive-gray (till)	86	121
	Gravel, fine to coarse, angular to rounded; contains about 35 percent very fine to coarse sand	4	125
Fox Hills Sandstone:			
	Sandstone, very fine to medium, predominately fine, clayey, light-green to light-greenish-gray	15	140

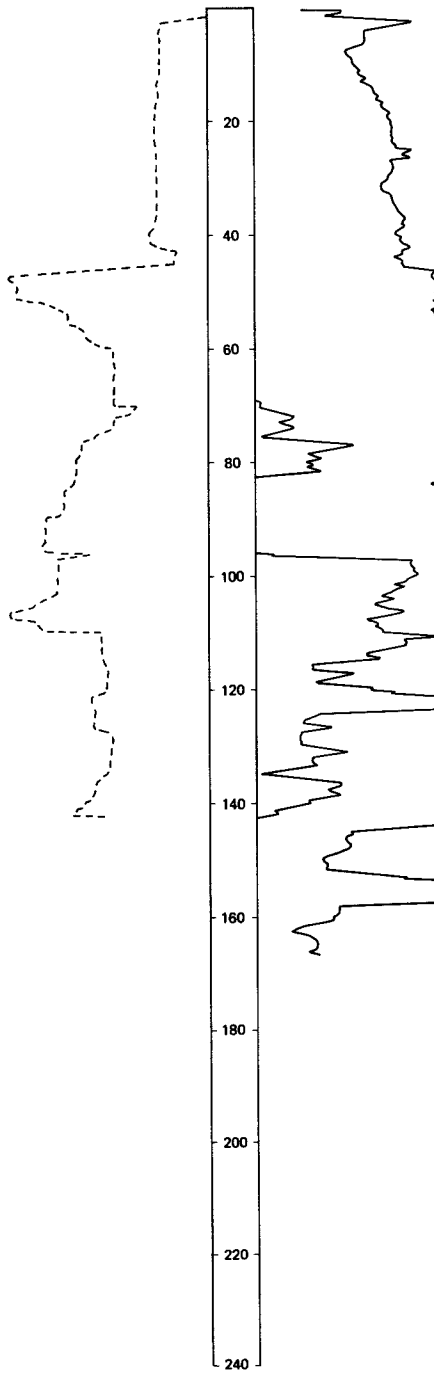
NDSWC 5551

LOCATION: 161-079-16DDD

DATE DRILLED: 8/28/79

ALTITUDE: 1471
(FT, NGVD)

DEPTH: 167
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-45	Clay, silty, sandy, pebbly, dark-yellowish-brown, oxidized (till).
45-75	Clay, silty, sandy, pebbly, olive-gray (till).
75-81	Sand, very fine to coarse, predominately medium, clayey, silty, angular to rounded.
81-119	Clay, sandy, silty, pebbly, olive-gray (till).
119-122	Sand, very fine to very coarse, predominately medium, angular to rounded.
122-143	Clay, sandy, silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

143-167	Sandstone, very fine to fine, well-rounded, glauconitic, micaceous, light-olive-gray.

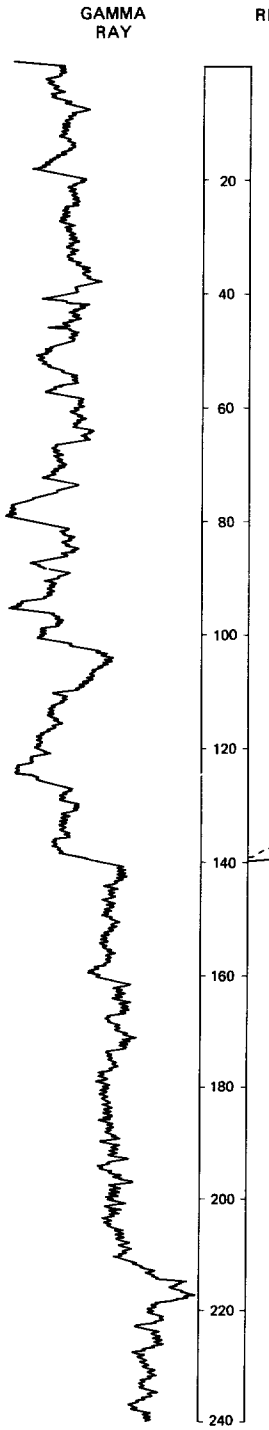
NDSWC 5381

LOCATION: 161-079-23CCC

DATE DRILLED: 9/15/78

ALTITUDE: 1470
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-50 Clay, sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till).

50-140 Clay, sandy, silty, pebbly, medium-dark-gray to olive-gray (till); contains thin lenses of sand and gravel.

FOX HILLS SANDSTONE

140-186 Siltstone, clayey, bentonitic, brittle, medium-light-gray.

186-236 Siltstone, very sandy (sand is very fine grained), glauconitic, brittle, greenish-gray to green.

PIERRE SHALE

236-260 Shale, brittle, black to grayish-black.

NOTE:

----- Long normal

——— Short normal

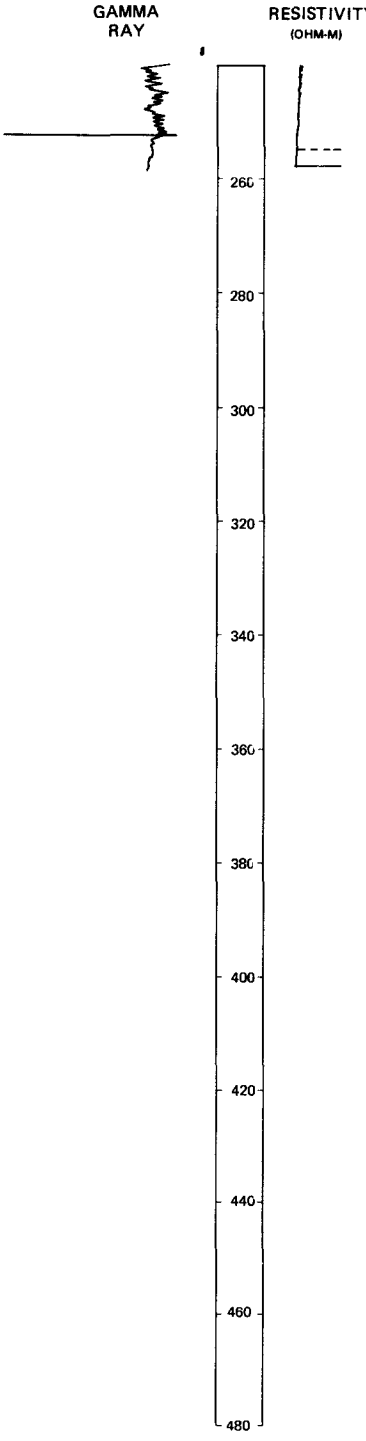
NDSWC 5381, continued

LOCATION: 161-079-23CCC

DATE DRILLED: 9/15/78

ALTITUDE: 1470
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

NOTE:

------ Long normal

——— Short normal

LOCATION: 161-079-23CCC

DATE DRILLED: 9/15/78

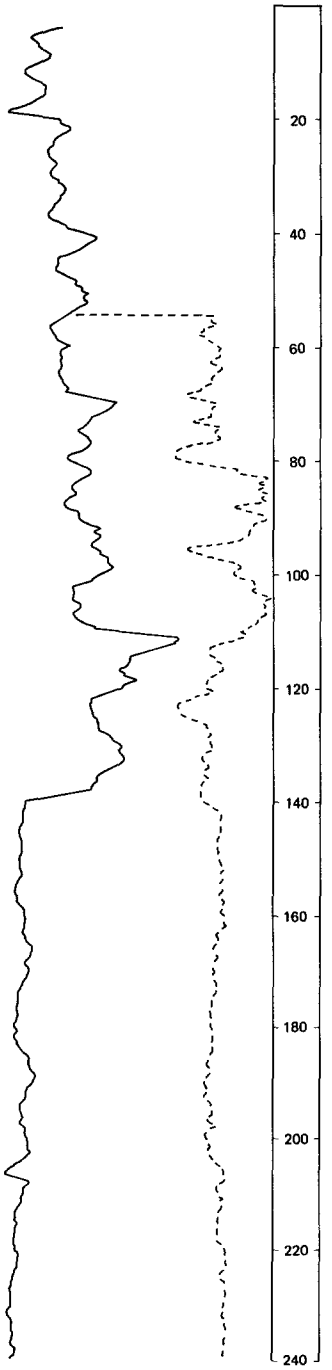
ALTITUDE: 1470
(FT, NGVD)

DEPTH: 260
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



NDSWC 5381, *continued*

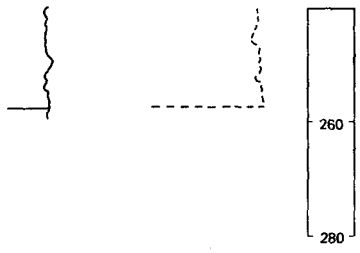
LOCATION: 161-079-23CCC

DATE DRILLED: 9/15/78

ALTITUDE: 1470
(FT, NGVD)

DEPTH: 260
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

161-079-28CDC
(Log from Donald & Keith Erck Well Drilling, Inc.)

Altitude: 1465 feet Date drilled: 9/04/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	2.5	2.5
	Clay, yellow	103.5	106
	Sand, coarse; with some water	6	112
	Clay, blue	25	137
	Sand, blue	35	172

161-079-29AAA
NDSWC 10337

Altitude: 1470 feet Date drilled: 10/24/78

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	36	37
	Clay, silty, sandy, pebbly, olive-gray (till)	81	118
	Clay and interbedded gravel; fine to coarse sand; E log indicates more sand than clay	23	141
Fox Hills Sandstone:			
	Sandstone, fine to medium, predominately medium, light-green to dark-green; contains interstitial clay	19	160

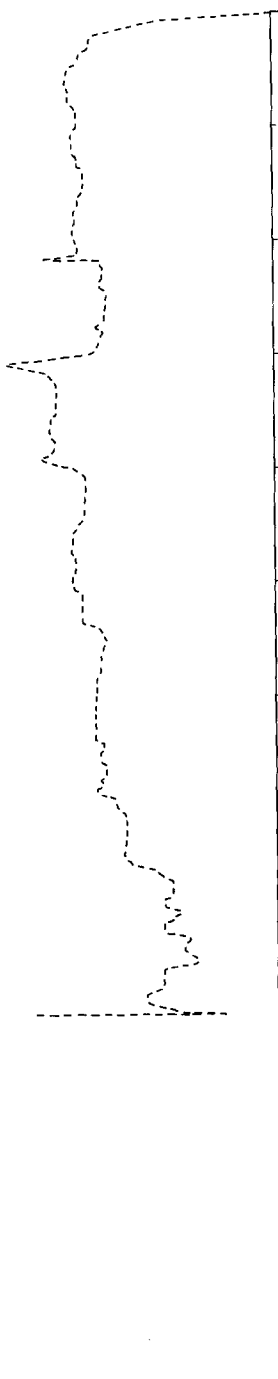
NDSWC 10336

LOCATION: 161-079-30BBB

DATE DRILLED: 10/24/78

ALTITUDE: 1490
(FT, NGVD)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-16	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
16-76	Clay, silty, sandy, pebbly, olive-gray (till).
76-79	Sand, fine to medium.
79-140	Clay, very silty, sandy, olive-gray (till?); contains several thin beds of fine to medium sand.
140-156	Clay, very sandy, olive-gray.

FOX HILLS SANDSTONE

156-180	Sandstone, fine to medium, clayey, light-green to dark-green; contains some interbedded carbonaceous clay beds.

161-079-31DDD
(Log modified from C. A. Simpson & Son)

Altitude: 1475 feet — Date drilled: 5/29/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	19	20
	Clay, slightly sandy, light-yellow	60	80
	Clay, blue	70	150
	Shale, sticky	80	230

161-079-32CDC
(Log modified from C. A. Simpson & Son)

Altitude: 1480 feet — Date drilled: 3/09/77

	Topsoil	1	1
	Clay, very sandy, yellow	19	20
	Clay, yellow	7	27
	Clay, blue	18	45
	Gravel, coarse; a little water	8	53
	Clay, sandy, blue	53	106
	Sand	6	112
	Clay, very gravelly, blue	28	140
	Gravel, coarse; water 1/2 gallon per minute at 120 feet	1	141
	Clay, blue	4	145
	Clay, blue, tight	18	163

161-079-34DDC
(Log modified from C. A. Simpson & Son)

Altitude: 1465 feet — Date drilled: 11/02/64

	Topsoil	1	1
	Clay, yellow	39	40
	Clay, blue	55	95
	Clay, sandy, blue	15	110
	Clay, gravelly, blue	1	111
	Clay, sandy, blue	4	115
	Gravel; no water	1	116
	Clay, sandy, blue	12	128
	Gravel	3	131
	Clay, gray	45	176
	Clay, sandy, green	9	185
	Clay, gray	15	200

161-080-23CCC2
(Log modified from C. A. Simpson & Son)

Altitude: 1489 feet — Date drilled: 10/28/64

	Topsoil	2	2
	Clay, gravelly, yellow	24	26
	Clay, sandy, blue	148	174
	Sand	2	176

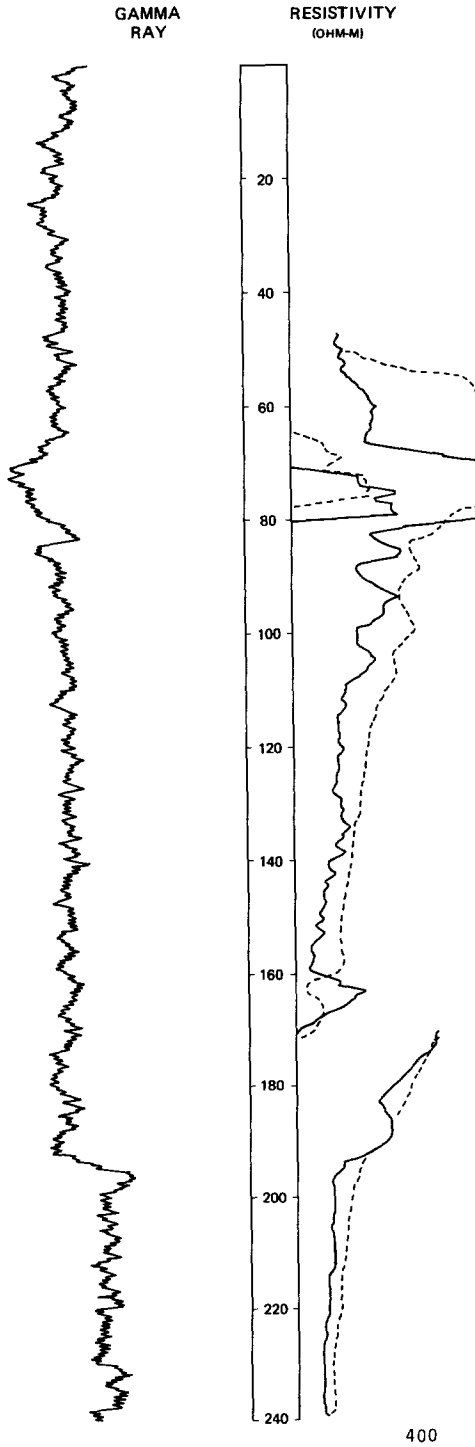
NDSWC 5382, 5382A

LOCATION: 161-080-26BBB1,2

DATE DRILLED: 9/18/78

ALTITUDE: 1490 (FT, NGVD)

DEPTH: 320 (FT)



400

DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-25 Clay, sandy, silty, pebbly, moderate-yellowish-brown, oxidized (till).

25-66 Clay, sandy, silty, pebbly.

66-80 Sand, fine to very coarse, predominately coarse, gravelly, moderately well-sorted.

80-161 Clay, sandy, silty, pebbly, gravelly, medium-dark-gray to olive-gray (till).

FOX HILLS SANDSTONE

161-183 Sandstone, fine to medium, very clayey, glauconitic, green to greenish-gray.

183-302 Siltstone, slightly sandy, bentonitic, brittle, medium-light-gray.

NOTE:

------Long normal

———Short normal

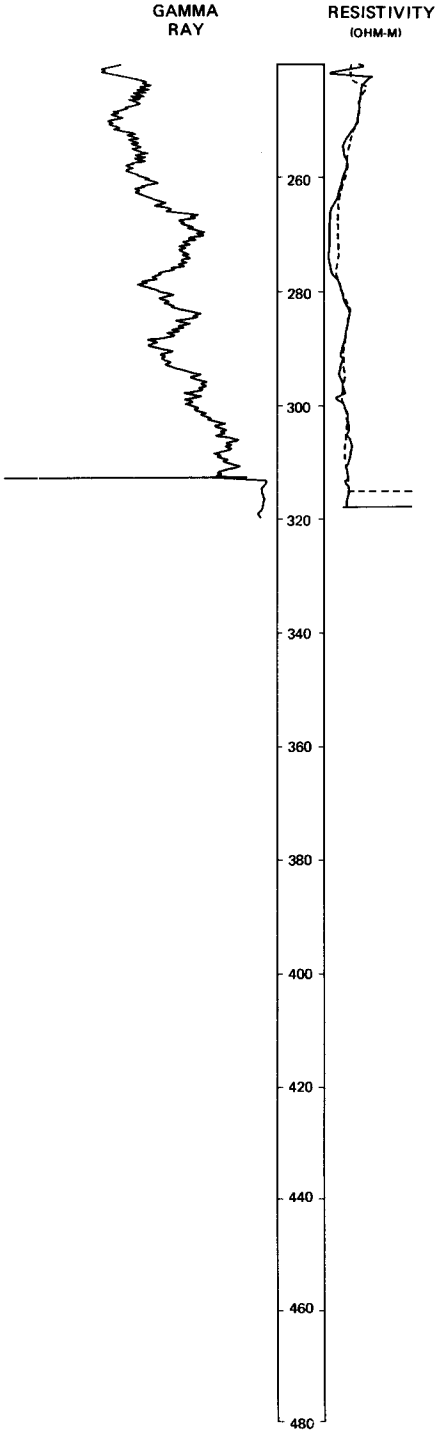
NDSWC 5382, 5382A, continued

LOCATION: 161-080-26BBB1,2

DATE DRILLED: 9/18/78

ALTITUDE: 1490
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

PIERRE SHALE

302-320 Shale, brittle, black to grayish-black.

NOTE:

----- Long normal

——— Short normal

LOCATION: 161-080-26BBB1,2

DATE DRILLED: 9/18/78

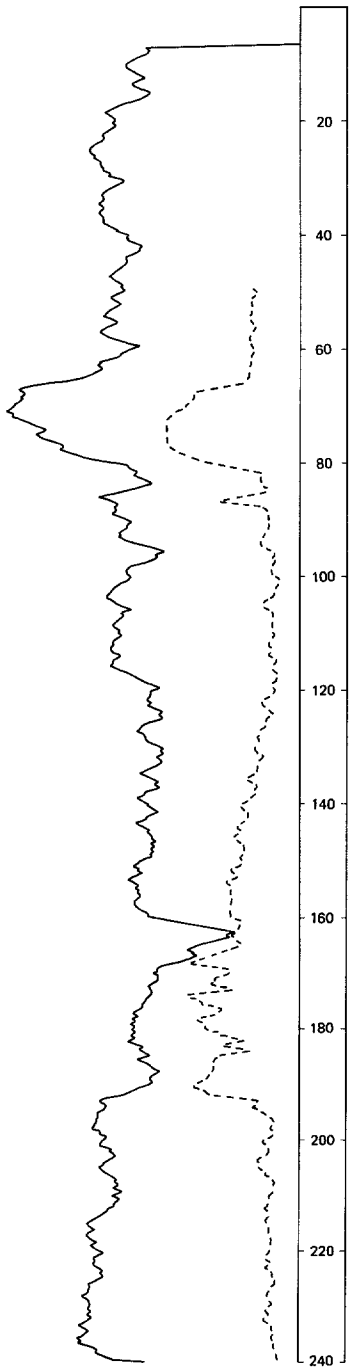
ALTITUDE: 1490
(FT, NGVD)

DEPTH: 320
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



LOCATION: 161-080-26BBB1,2

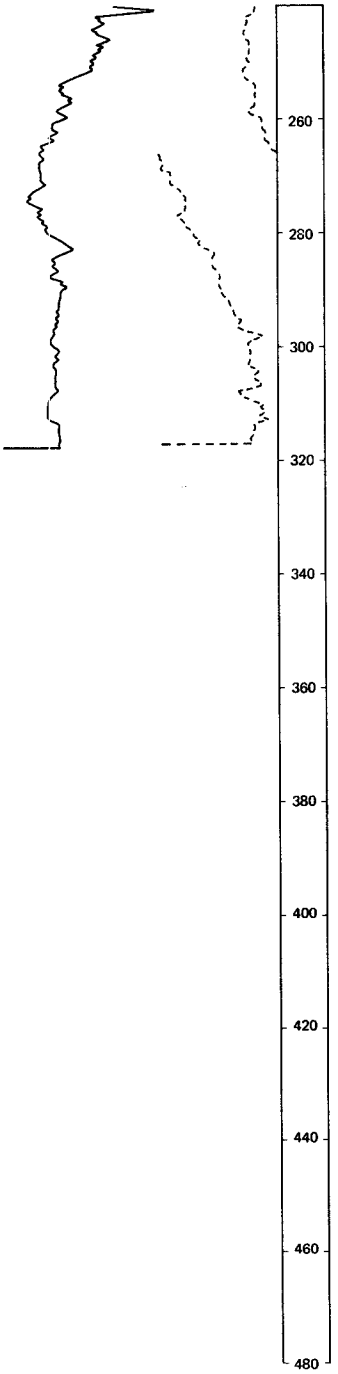
DATE DRILLED: 9/18/78

ALTITUDE: 1490
(FT, NGVD)

DEPTH: 320
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

161-080-36AAA
(Log modified from C. A. Simpson & Son)

Altitude: 1480 feet — Date drilled: 5/07/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	9	10
	Clay, yellow; rocks	16	26
	Clay, sandy, gray	63	89
	Sand, fine, clayey, gray	5	94
	Clay, sandy, gray	60	154
	Sand, light-gray; rock	7	161
	Sandstone, gray	18	179
	Shale, gray	16	195

161-080-36ACB
(Log modified from C. A. Simpson & Son)

Altitude: 1480 feet — Date drilled: 5/ /65

	Topsoil	1	1
	Clay, sandy, yellow	1	2
	Sand, clayey, yellow	3	5
	Clay, yellow	15	20
	Clay, gray; some rocks	45	65
	Clay, gray; somewhat hard	17	82
	Clay, sandy	15	97
	Sand, fine, clayey; little water	4	101
	Clay, gray	17	118
	Clay, sandy, gray	7	125
	Sand, very clayey	2	127
	Clay, sandy, gray	11	138
	Hard layer	3	141
	Shale, sandy, gray	14	155
	Hard layer	10	165
	Shale, slightly sandy, gray	20	185
	Shale, gray	36	221
	Shale, slightly sandy, dark-green	9	230
	Shale, gray	23	253

161-081-03DCD
(Log modified from C. A. Simpson & Son)

Altitude: 1498 feet — Date drilled: 9/10/63

	Topsoil	1	1
	Clay, brown	1	2
	Clay, yellow	18	20
	Clay, gray	42	62
	Clay, gravelly	34	96
	Hard layer	1	97
	Sand, fine, very clayey	15	112
	Sand, fine, and pebbles; no water	5	117
	Clay, gravelly, sandy, blue	63	180
	Clay, gray	8	188
	Gravel, clayey	1	189
	Clay, gray	13	202
	Shale, light-gray, hard	38	240
	Shale, green	15	255
	Shale, gray	5	260
	Rock	3	263
	Shale, gray	43	306
	Shale; with slate pebbles	24	330
	Shale, gray	23	353

161-081-05CCC
NDSWC 11461

Altitude: 1515 feet — Date drilled: 11/13/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, gravelly, yellowish-brown, oxidized (till)	21	22
	Clay, silty, gravelly, olive-gray (till); occasional boulders; with lenses of sand and gravel from 86 to 87 and 167 to 168 feet	167	189
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, quartzose, greenish-gray	31	220

161-081-05CDC
NDSWC 11457

Altitude: 1512 feet — Date drilled: 11/13/80

Glacial drift:			
	Soil	1	1
	Clay, silty to sandy, gravelly, yellowish-brown, oxidized (till)	17	18
	Clay, sandy to gravelly, olive-gray (till); lenses of sand and gravel from 72 to 75 and 81 to 82 feet	171	189
Fox Hills Sandstone:			
	Sandstone, very fine to fine, quartzose, greenish-gray; interbedded with argillaceous carbonaceous moderately indurated brownish-gray siltstone	31	220

161-081-05DDD
NDSWC 11459

Altitude: 1514 feet — Date drilled: 11/13/80

Glacial drift:			
	Soil	1	1
	Clay, sandy, gravelly, yellowish-brown, oxidized (till)	18	19
	Clay, silty, sandy, pebbly, olive-gray (till); lenses of sand and gravel from 61 to 62, 91 to 93, 122 to 124, 167 to 169, and 188 to 190 feet	177	196
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, quartzose, greenish-gray	24	220

161-081-08ABA
NDSWC 11464

Altitude: 1510 feet — Date drilled: 11/18/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty to sandy, pebbly, yellowish-brown, oxidized (till)	22	23
	Clay, silty, sandy, pebbly, olive-gray (till); with lenses of sand and gravel from 87 to 88, 92 to 93, 112 to 115, and 122 to 123 feet	153	176
	Sand, fine to coarse; about 30 percent medium silty to clayey gravel	10	186
	Clay, sandy, gravelly, olive-gray (till)	6	192
Fox Hills Sandstone:			
	Sandstone, very fine to medium, argillaceous, micaceous, quartzose; carbonaceous greenish-gray streaks	28	220

161-081-08ABB
NDSWC 11460

Altitude: 1513 feet — Date drilled: 11/13/80

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	22	23
	Clay, silty, pebbly, olive-gray (till); with a lens of sand and gravel from 50 to 52 feet	38	61
	Sand, fine to very coarse; about 10 percent medium to coarse subangular to subrounded gravel; about 50 percent quartz, 20 percent detrital shale and lignite, 15 percent silicate, and 15 percent carbonate grains	19	80
	Clay, silty to sandy, pebbly, olive-gray (till); lenses of sand and gravel from 90 to 92, 129 to 131, and 139 to 141 feet	62	142
	Clay, silty, pebbly, olive-gray (till)	48	190
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, quartzose, greenish-gray	30	220

161-081-09AAB
NDSWC 11467

Altitude: 1505 feet — Date drilled: 11/18/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	23	24
	Clay, silty, sandy, pebbly, olive-gray (till); with lenses of sand and gravel from 49 to 51, 61 to 62, 86 to 87, and 91 to 93 feet	178	202
	Clay, very sandy (till); reworked localized bedrock	20	222
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous; interbedded with sandy greenish-gray siltstone	18	240

161-081-09ABB
NDSWC 11465

Altitude: 1505 feet — Date drilled: 11/18/80

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, yellowish-brown, oxidized (till)	23	24
	Clay, silty to sandy, gravelly, olive-gray (till); with lenses of sand and gravel from 88 to 90, 110 to 111, and 116 to 118 feet	170	194
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, quartzose, greenish-gray	26	220

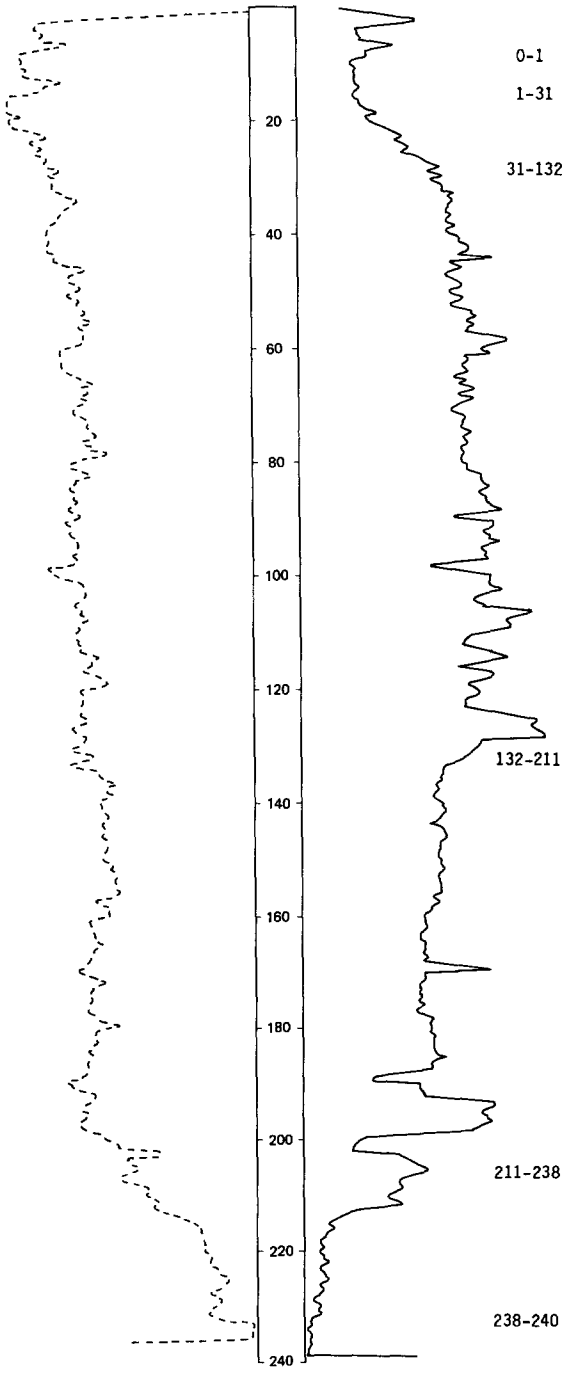
NDSWC 11468

LOCATION: 161-081-10ABB

DATE DRILLED: 11/19/80

ALTITUDE: 1497 (FT, NGVD)

DEPTH: 240 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-31	Clay, silty, pebbly, yellowish-brown, oxidized (till).
31-132	Clay, silty, sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel from 98 to 103 and 106 to 109 feet.
132-211	Clay, silty, pebbly, olive-gray (till); lenses of sand and gravel from 143 to 144, 186 to 189, and 204 to 206 feet.

FOX HILLS SANDSTONE

211-238	Siltstone, very sandy, argillaceous, moderately indurated, greenish-gray.
238-240	Sandstone, fine, argillaceous, well-indurated, greenish-gray.

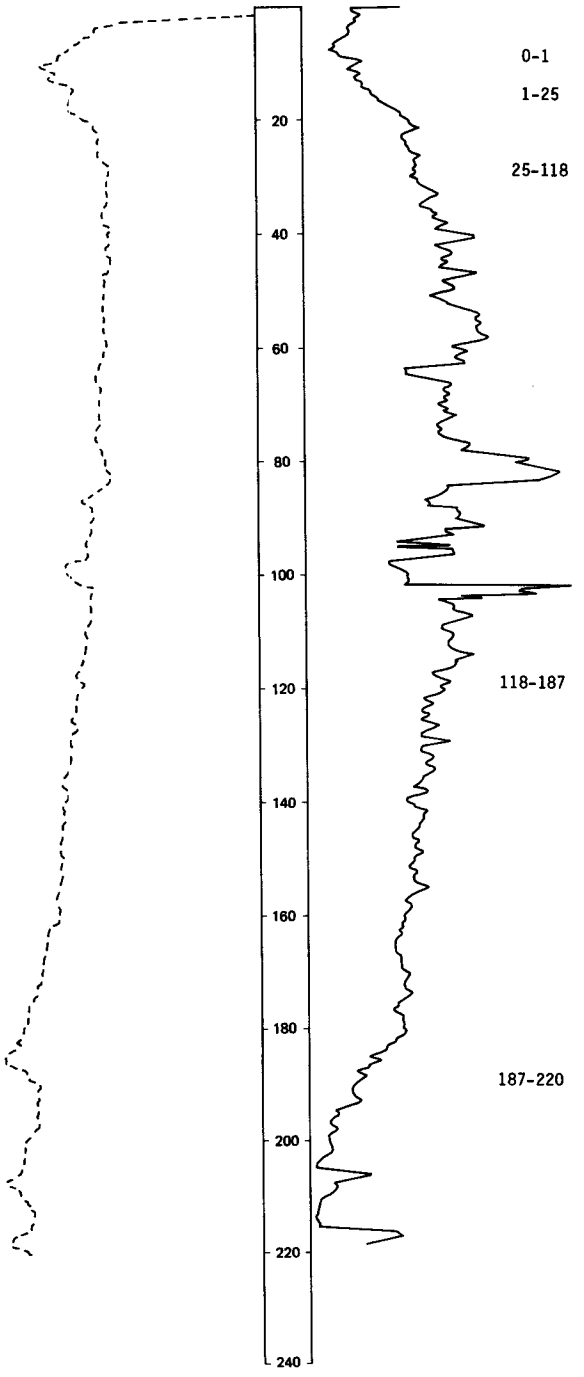
NDSWC 11469

LOCATION: 161-081-10BAB

DATE DRILLED: 11/19/80

ALTITUDE: 1500
(FT. NGVD)

DEPTH: 220
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-25	Clay, silty to gravelly, yellowish-brown oxidized (till).
25-118	Clay, sandy, gravelly, olive-gray (till); with lenses of sand and gravel from 64 to 65, 81 to 86, 93 to 94, 97 to 98, and 116 to 118 feet.
118-187	Clay, silty, pebbly, olive-gray (till); with lenses of sand from 121 to 122 and 181 to 185 feet.

FOX HILLS SANDSTONE

187-220	Sandstone, fine, moderately indurated; carbonaceous greenish-gray streaks; interbedded with argillaceous siltstone.

161-081-10BBB
NDSWC 11466

Altitude: 1500 feet — Date drilled: 11/18/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	15	16
	Clay, very sandy, gravelly, olive-gray (till); interbedded with lenses of sand and gravel from 93 to 97, 102 to 107, 152 to 153, and 162 to 164 feet	178	194
	Clay, sandy, brownish-gray (till); very lignitic from 203 to 205 feet; bedrock shove block	36	230
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, moderately indurated, greenish-gray	10	240

161-081-13DAD
(Log modified from Carter Water Well Drilling Service)

Altitude: 1520 feet — Date drilled: 7/09/76

	Topsoil	3	3
	Gravel	1	4
	Clay, yellow	24	28
	Clay, blue	9	37
	Sand	3	40

161-081-14DDD
NDSWC 5851

Altitude: 1500 feet — Date drilled: 10/21/80

Glacial drift:			
	Soil	1	1
	Clay, very silty, pebbly, yellowish-brown, oxidized (till)	16	17
	Clay, silty, pebbly, olive-gray (till)	33	50
	Sand, coarse, and fine to medium angular to rounded gravel; predominately carbonate grains and pebbles	10	60
	Clay, sandy, pebbly, olive-gray (till)	106	166
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, poorly indurated, greenish-gray	35	201

161-081-20CCC
NDSWC 11471

Altitude: 1508 feet — Date drilled: 11/21/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	20	21
	Clay, sandy, gravelly, olive-gray (till)	44	65
	Clay, silty, pebbly, olive-gray (till)	131	196
Fox Hills Sandstone:			
	Sandstone, fine, argillaceous, glauconitic, moderately indurated, greenish-gray	24	220

161-081-20DCD
NDSWC 11473

Altitude: 1505 feet — Date drilled: 11/25/80

Glacial drift:			
	Soil	1	1
	Clay, sandy, gravelly, yellowish-brown, oxidized (till)	20	21
	Clay, very sandy to gravelly, olive-gray (till)	89	110
	Clay, sandy, pebbly, olive-gray (till)	87	197
Fox Hills Sandstone:			
	Sandstone, fine, glauconitic, quartzose, greenish-gray	11	208
	Siltstone, argillaceous, carbonaceous, brownish-gray	14	222
	Sandstone, fine, argillaceous, moderately indurated, greenish-gray	18	240

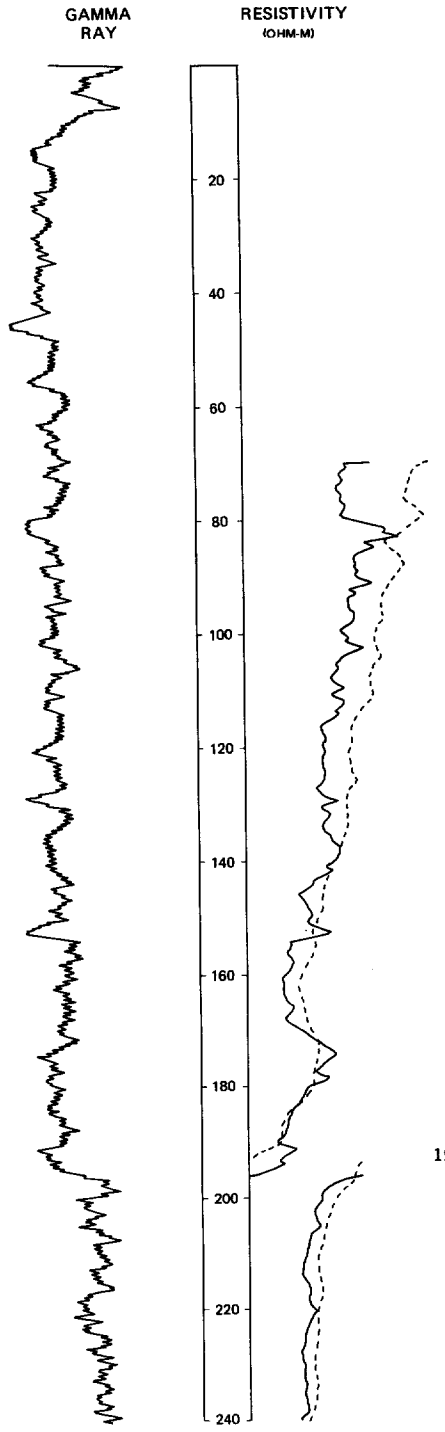
NDSWC 5383

LOCATION: 161-081-27BAA

DATE DRILLED: 9/19/78

ALTITUDE: 1504 (FT, NGVD)

DEPTH: 400 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay, sandy, silty, dusky-yellow, oxidized; appears to be lake deposits.
8-15	Clay, sandy, silty, dusky-yellow, oxidized (till).
15-79	Clay, sandy, silty, pebbly, olive-gray (till); contains thin sand and gravel lenses.
79-84	Sand, very fine to very coarse, gravelly.
84-195	Clay, sandy, silty, pebbly, olive-gray (till); contains thin lenses of sand, silt, or gravel.

FOX HILLS SANDSTONE

195-253	Siltstone, slightly sandy, bentonitic, glauconitic, brittle, medium-light-gray to light-greenish-gray.

NOTE:

----- Long normal

——— Short normal

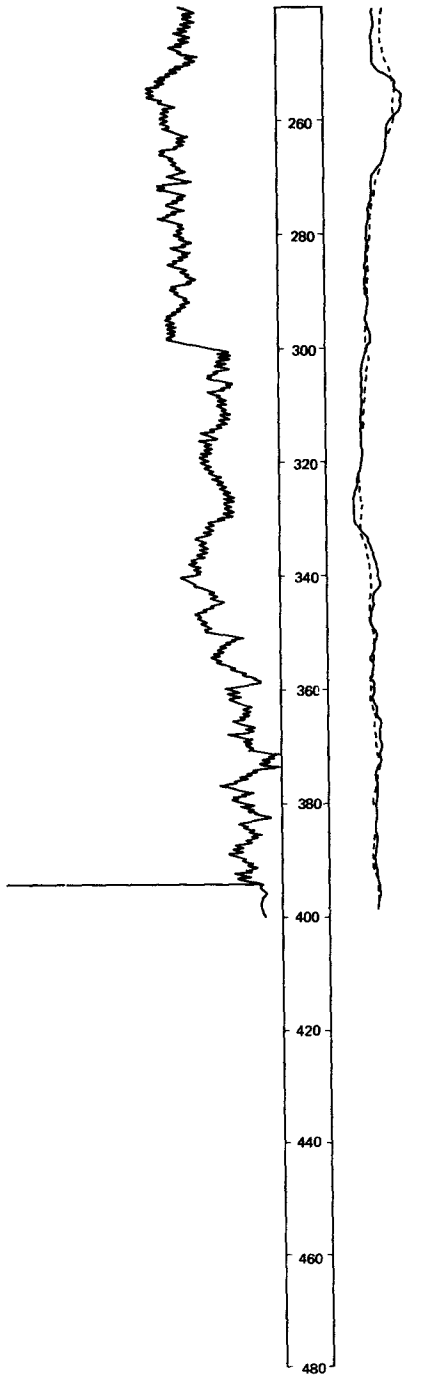
NDSWC 5383, continued

LOCATION: 161-081-27BAA

DATE DRILLED: 9/19/78

ALTITUDE: 1504
(FT, NGVD)

DEPTH: 400
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

253-262 Sandstone, clayey, dark-green.

262-356 Siltstone, slightly sandy, bentonitic, glauconitic, brittle, medium-light-gray to light-greenish-gray.

PIERRE SHALE

356-400 Shale, brittle, black to grayish-black.

NOTE:

-----Long normal

———Short normal

LOCATION: 161-081-27BAA

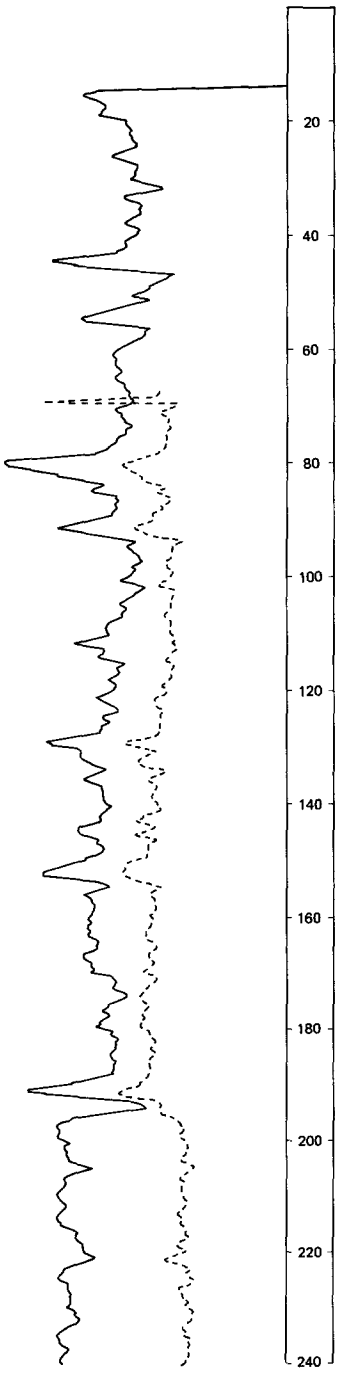
DATE DRILLED: 9/19/78

ALTITUDE: 1504
(FT, NGVD)

DEPTH: 400
(FT)

NEUTRON (API) S.P. (MV)

DESCRIPTION OF DEPOSITS



LOCATION: 161-081-27BAA

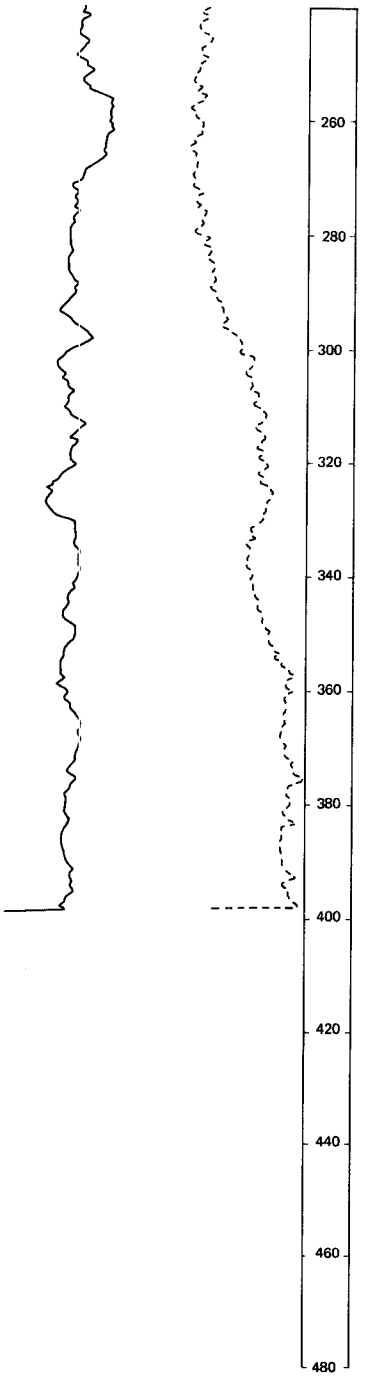
DATE DRILLED: 9/19/78

ALTITUDE: 1504
(FT, NGVD)

DEPTH: 400
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

161-081-28BAB
NDSWC 11474

Altitude: 1505 feet — Date drilled: 11/25/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	2	2
	Sand, very fine to very coarse, subangular, oxidized	5	7
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	2	9
	Clay, sandy, gravelly, olive-gray (till); interbedded lenses of sand and gravel from 46 to 47, 58 to 60, and 103 to 105 feet	96	105
	Clay, sandy, pebbly, olive-gray (till)	105	210
Fox Hills Sandstone:			
	Siltstone, argillaceous, moderately indurated, greenish-gray	11	221
	Sandstone, fine to medium, argillaceous, siliceous; carbonaceous greenish-gray streaks	19	240

161-081-29AAA
NDSWC 10335

Altitude: 1506 feet — Date drilled: 10/23/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Gravel, fine to medium, angular to subrounded; contains about 30 percent coarse sand	12	13
	Clay, very silty, olive-gray	2	15
	Clay, silty, sandy, pebbly, olive-gray (till); contains sand lenses as much as 2 feet thick	209	224
Fox Hills Sandstone:			
	Claystone, silty, compacted, light-gray and medium-brown; locally carbonaceous	56	280

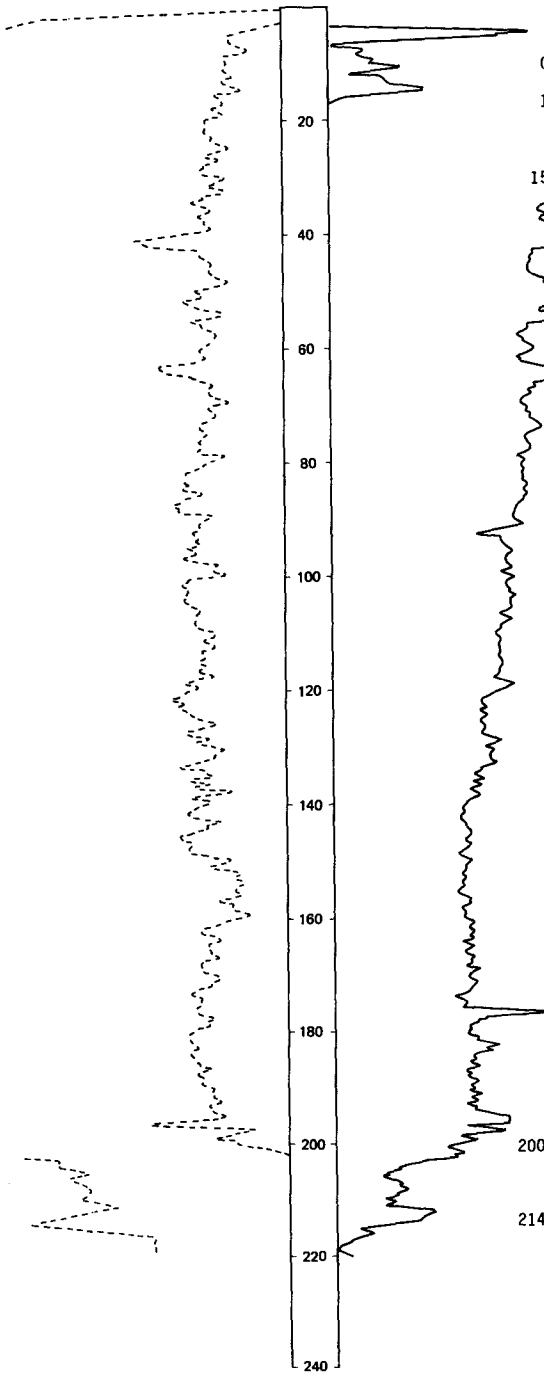
NDSWC 11472

LOCATION: 161-081-30AAB

DATE DRILLED: 11/25/80

ALTITUDE: 1516 (FT, NGVD)

DEPTH: 220 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-15 Clay, silty to sandy, gravelly, yellowish-brown, oxidized (till).

15-200 Clay, silty, pebbly, olive-gray (till); interbedded with lenses of sand and gravel from 63 to 65, 76 to 77, 124 to 125, 182 to 183, and 194 to 195 feet.

FOX HILLS SANDSTONE

200-214 Sandstone, very fine to fine, agrillaceous, greenish-gray.

214-220 Siltstone, argillaceous, moderately indurated, greenish-gray.

161-081-31DDC
NDSWC 11470

Altitude: 1517 feet — Date drilled: 11/20/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, sandy, gravelly, yellowish-brown, oxidized (till)	17	18
	Clay, silty, pebbly, olive-gray (till); interbedded lenses of sand and gravel from 63 to 64, 68 to 69, 101 to 102, and 141 to 142 feet	174	192
	Clay, silty, olive-gray (till); interbedded with sand and gravel	15	207
	Sand, fine to very coarse, and very coarse to granular subrounded gravel; about 35 percent detrital shale, 25 percent carbonate, 20 percent igneous, and 20 percent quartz grains and pebbles	61	268
Fox Hills Sandstone:			
	Sandstone, fine, indurated, greenish-gray; carbonaceous greenish-gray streaks; interbedded with argillaceous siltstone	32	300

161-081-35CAC
(Log from Donald & Keith Erck Well Drilling Service)

Altitude: 1500 feet — Date drilled: 3/14/73

Sand, fine	8	8
Clay, yellow	2	10
Clay, blue	28	38
Clay; with trace of sand	12	50
Clay	28	78
Clay; with heavy formation of sand	8	86
Clay; with slight trace of water	42	128
Clay; with some sand	52	180
Clay; with some sand and gravel; small trace of water	17	197
Clay, blue	6	203
Sand, blue; with 1/2 gallon per minute of water	9	212

161-082-19DDD
NDSWC 10334

Altitude: 1560 feet — Date drilled: 10/20/78

Glacial drift:		
Soil	1	1
Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	25	26
Clay, silty, sandy, pebbly, olive-gray (till)	47	73
Sand, fine to very coarse; contains about 50 percent fine to medium gravel	1	74
Clay, silty, sandy, pebbly, olive-gray (till)	130	204
Sand, fine to coarse, predominately medium, subangular to angular; contains about 10 percent gravel	3	207
Clay, silty, sandy, pebbly, olive-gray (till)	9	216
Hell Creek Formation:		
Clay, silty, carbonaceous, dark-brown	24	240

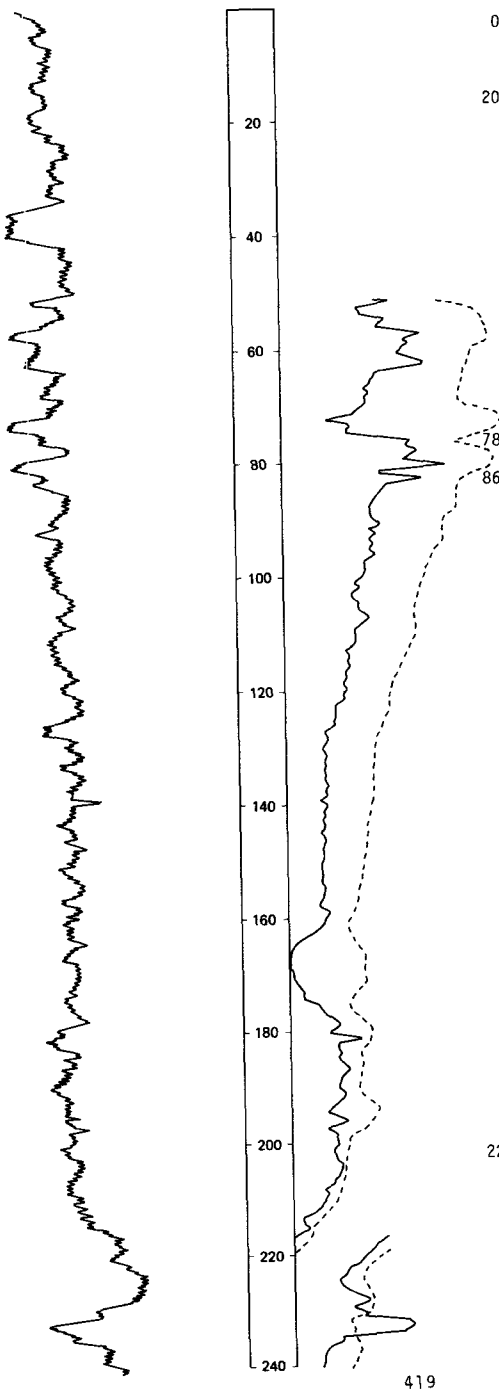
NDSWC 5384

LOCATION: 161-082-26BBB

DATE DRILLED: 9/19/78

ALTITUDE: 1535 (FT, NGVD)

DEPTH: 500 (FT)



DESCRIPTION OF DEPOSITS

0-20	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
20-78	Clay, silty, sandy, pebbly, olive-gray (till).
78-86	Sand and gravel, silty.
86-222	Clay, silty, sandy, pebbly, olive-gray (till).

HELL CREEK FORMATION

222-249	Siltstone, slightly sandy, bentonitic, carbonaceous, brittle, dark-gray to light-bluish-gray.

NOTE:

------Long normal

———Short normal

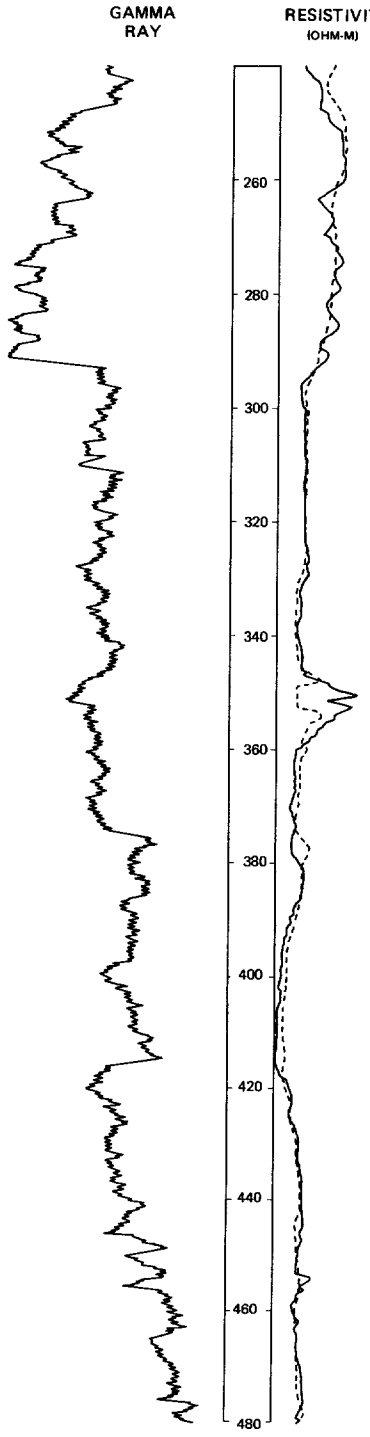
NDSWC 5384, continued

LOCATION: 161-082-26BBB

DATE DRILLED: 9/19/78

ALTITUDE: 1535
(FT, NGVD)

DEPTH: 500
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

249-293 Sandstone, fine to medium, clayey, slightly glauconitic, light-gray to light-greenish-gray.

293-484 Siltstone and claystone, brittle, light-gray to greenish-gray; contains thin sand beds between 348 and 356 feet.

NOTE:

------Long normal

———Short normal

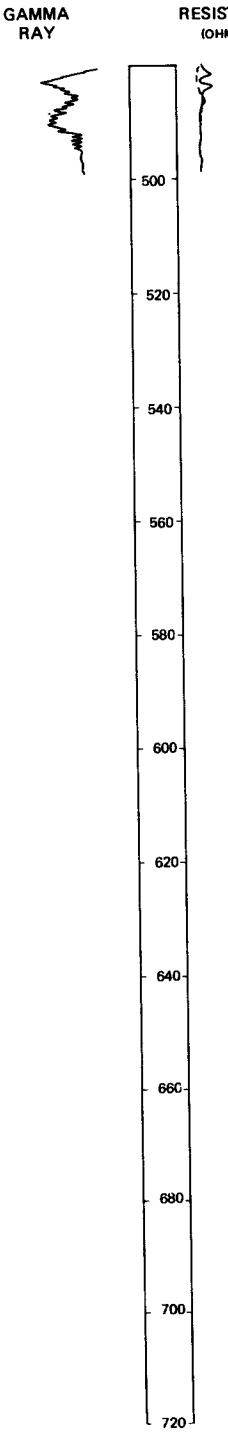
NDSWC 5384, continued

LOCATION: 161-082-26BBB

DATE DRILLED: 9/19/78

ALTITUDE: 1535
(FT, NGVD)

DEPTH: 500
(FT)



DESCRIPTION OF DEPOSITS

PIERRE SHALE

484-500 Shale, brittle, black to grayish-black.

NOTE:

------Long normal

———Short normal

LOCATION: 161-082-26BBB

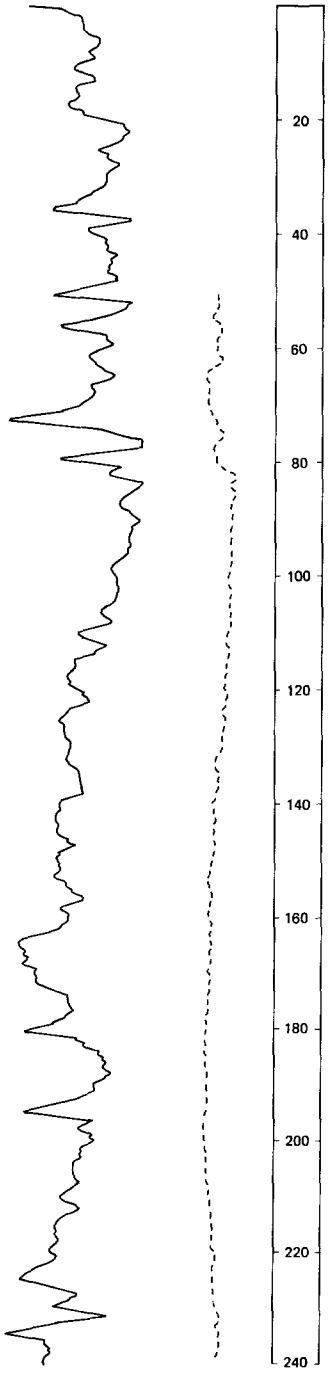
DATE DRILLED: 9/19/78

ALTITUDE: 1535
(FT, NGVD)

DEPTH: 500
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

LOCATION: 161-082-26BBB

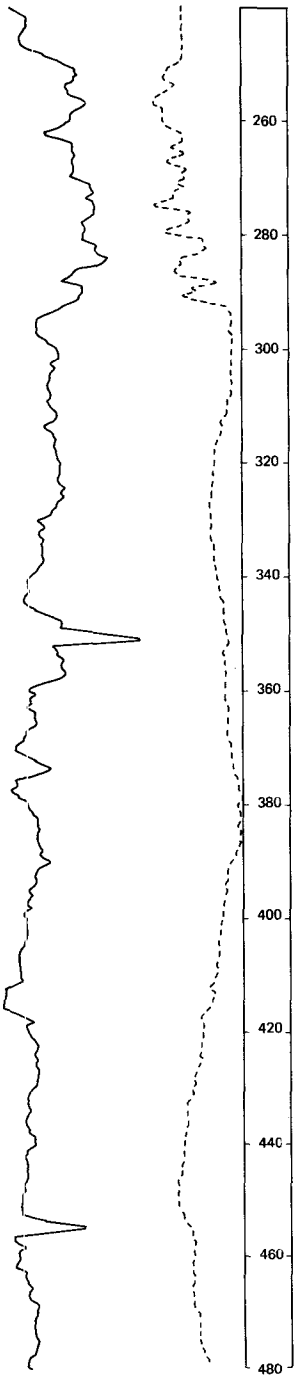
DATE DRILLED: 9/19/78

ALTITUDE: 1535
(FT, NGVD)

DEPTH: 500
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

NDSWC 5384, continued

LOCATION: 161-082-26BBB

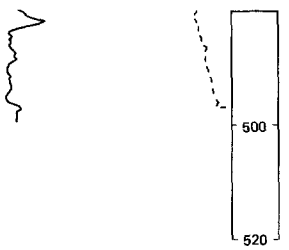
DATE DRILLED: 9/19/78

ALTITUDE: 1535
(FT, NGVD)

DEPTH: 500
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

161-082-31ABB
NDSWC 11462

Altitude: 1542 feet

Date drilled: 11/13/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil----------	1	1
	Sand, fine to very coarse, gravelly, oxidized----------	8	9
	Clay, silty, pebbly, olive-gray (till); interbedded lenses of sand and gravel from 30 to 32, 61 to 62, 87 to 88, 103 to 104, and 115 to 117 feet----------	190	199
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, quartzose, moderately indurated, greenish-gray----------	21	220

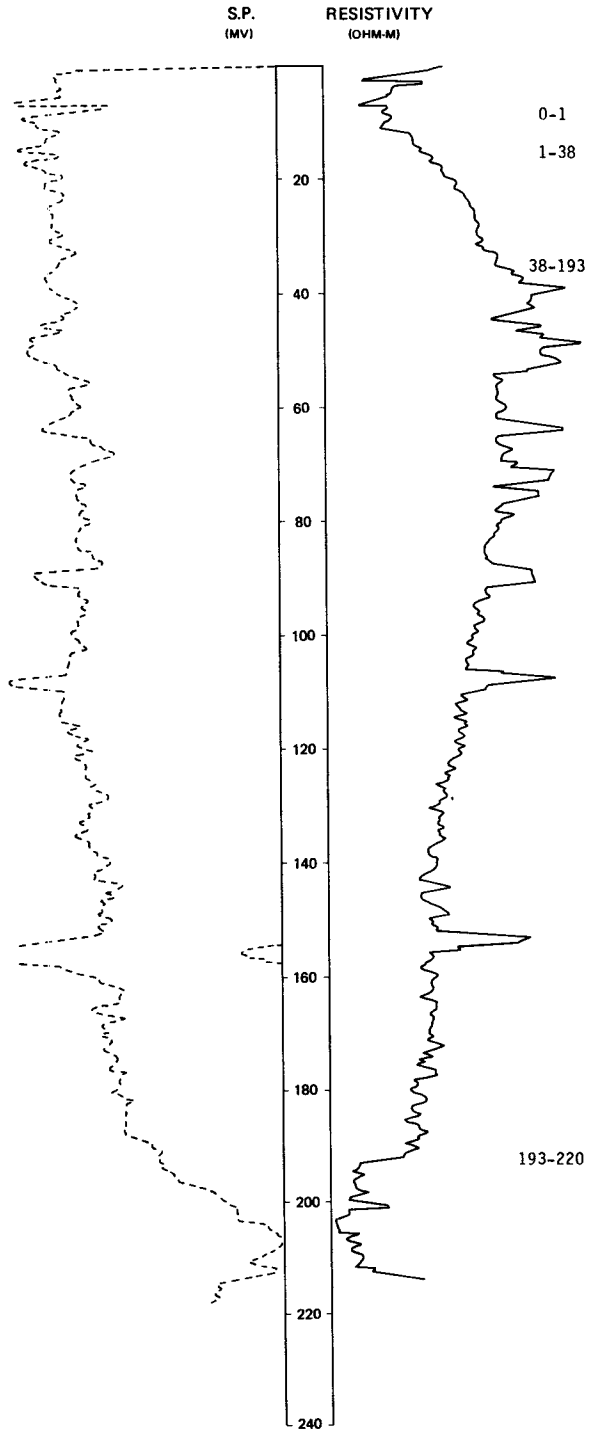
NDSWC 11463

LOCATION: 161-082-31DCC

DATE DRILLED: 11/14/80

ALTITUDE: 1577 (FT, NGVD)

DEPTH: 220 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-38	Clay, sandy, gravelly, yellowish-brown, oxidized (till).
38-193	Clay, silty, pebbly, olive-gray (till); interbedded with sand and gravel lenses from 48 to 52, 63 to 65, 89 to 91, 108 to 112, and 154 to 156 feet.

FOX HILLS SANDSTONE

193-220	Siltstone, argillaceous, carbonaceous, grayish-black to brownish-black; interbedded with very fine to fine indurated greenish-gray sandstone.

161-082-33CCC
NDSWC 8904

Altitude: 1522 feet — Date drilled: 9/27/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Silt, clayey, sandy, sticky, moderate-yellowish-brown	2	2
	Sand, fine to medium, subrounded, medium-gray	4	6
	Clay, silty, pebbly, olive-gray (till)	5	11
	Sand, very fine to medium, silty, gray	2	13
	Clay, silty, sandy, pebbly, olive-gray (till); contains a few thin sand stringers	87	100

161-083-06CCC
USGS 16
(Log modified from Akin, 1951)

Altitude: 1601 feet — Date drilled: 10/22/48

Alluvium:			
	Soil, sandy, black	1	1
	Sand, medium to coarse, and fine to medium gravel	10	11
	Sand, coarse, silty, gravelly	9	20
Glacial drift:			
	Clay, silty, gray, and some sand and gravel	22	42
	Sand, silty, and gravel	8	50
	Sand, very silty and gravelly, gray	20	70
	Clay, silty, gravelly, gray; very abundant coarse sand	25	95
	Clay, gray, and some very coarse sand; samples contain nearly 50 percent sand and 50 percent clay	95	190
	Gravel, fine, and very coarse very dirty sand	36	226
Bedrock (undifferentiated):			
	Drillers report a brown smooth clay	4	230

161-083-06CDC1
USGS 12
(Log modified from Akin, 1951)

Altitude: 1600 feet — Date drilled: 10/20/48

Alluvium:			
	Soil, clayey, black	1	1
	Clay, light-gray	1	2
	Sand, coarse	2	4
Glacial drift:			
	Clay, silty, yellowish-brown	15	19
	Clay, silty, gray, and some coarse gravel	20	39
	Sand, coarse	2	41
	Clay, silty, grayish-tan, and some fine and medium gravel	19	60

161-083-06CDC2
USGS 14

Altitude: 1602 feet — Date drilled: 10/21/48

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, black	1	1
	Clay, yellow, and fine to medium gravel; shale pebbles	23	24
	Clay, gray, and fine to medium gravel; shale and coal pebbles	4	28
	Sand, coarse, and fine gravel; a few shale pebbles	3	31
	Clay, gray, and fine to medium gravel; some coal	18	49
	Sand, coarse, and fine to medium gravel	7	56
	Clay, gray, and fine gravel and shale pebbles	11	67
	Sand, medium to coarse, and fine gravel	2	69
	Clay, gray, and fine to medium gravel; shale and coal pebbles	11	80

161-083-06CDD
USGS 15
(Log modified from Akin, 1951)

Altitude: 1605 feet — Date drilled: 10/22/48

Till and associated glaciofluvial deposits:			
	Soil, clayey, black	1	1
	Clay, light-gray, and some coarse gravel	1	2
	Clay, silty, slightly sandy, tan	13	15
	Clay, silty, light-brown	20	35
	Clay, silty, gray	25	60

161-083-07BBA
USGS 13
(Log modified from Akin, 1951)

Altitude: 1602 feet — Date drilled: 8/21/48

Alluvium:			
	Soil, silty, black	1	1
	Clay, light-gray	1	2
	Sand, medium, light-brown	7	9
Glacial drift:			
	Silt, pebbly, grayish-brown	51	60

161-083-11DDD
USGS 2
(Log modified from Akin, 1951)

Altitude: 1535 feet — Date drilled: 9/ /48

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Soil, sandy, black	1	1
	Sand, very fine, light-gray	1	2
	Gravel and very coarse sand	8	10
Glacial drift:			
	Clay, silty, dark-gray	6	16
	Sand, medium to coarse	2	18
	Clay, silty, pebbly, dark-gray	5	23
	Sand, medium to coarse	2	25
	Gravel, fine to medium, clean; partly shale	12	37
	Clay, sandy, dark-gray	13	50

161-083-12CCC
USGS 1
(Log modified from Akin, 1951)

Altitude: 1535 feet — Date drilled: 9/29/48

Alluvium:			
	Soil, silty, black	1	1
	Gravel, fine to coarse, and some silty light-gray clay	2	3
	Sand, medium to coarse	2	5
Glacial drift:			
	Clay, silty, buff, and gravel	7	12
	Clay, silty, pebbly, gray	3	15
	Sand, medium to coarse	3	18
	Clay, pebbly, gray	21	39
	Sand, fine to coarse	1	40
	Clay, silty, gray	20	60
	Clay and abundant very coarse sand	137	197
Hell Creek Formation:			
	Clay, slightly sandy, dark-gray	8	205
	Clay, dark-gray; some carbonaceous material present	15	220
	Silt, light-gray	5	225
	Clay, dark-gray	5	230

161-083-13CCC
Mohall 1

Altitude: 1560 feet — Date drilled: 3/24/61

	Topsoil, black	1	1
	Clay, silty, yellow	11	12
	Clay, silty, yellowish-brown (till); contains coal fragments	10	22
	Clay, silty, gray (till); with coal fragments	20	42

161-083-13CCD
Mohall 4

Altitude: 1540 feet — Date drilled: 3/27/61

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	1	1
	Clay, silty, yellow	10	11
	Sand, fine to medium	6	17
	Clay, silty, yellow	5	22
	Sand, medium to coarse	6	28
	Clay, silty, gray (till); with coal fragments	14	42

161-083-13CDC
Mohall 8

Altitude: 1535 feet — Date drilled: 3/28/61

	Topsoil, black	1	1
	Clay, silty, yellow (till)	1	2
	Sand, fine to medium	2	4
	Clay, silty, yellow (till)	16	20
	Clay, silty, gray (till); with coal fragments	14	34

161-083-13CDD
Mohall 9

Altitude: 1535 feet — Date drilled: 3/28/61

	Topsoil, black	1	1
	Clay, silty, yellow	2	3
	Sand, medium to coarse	17	20
	Clay, silty, gray (till); with coal fragments	22	42

161-083-13DCC1
USGS 56-47
(Log modified from LaRocque and others, 1963b)

Altitude: 1535 feet — Date drilled: 7/26/47

Glacial drift:			
	Soil	1	1
	Sand and gravel	12	13
	Clay, sandy, gray	37	50
	Clay, sandy, gray; with some gravel and lignite fragments	98	148
	Clay, sandy, gray, and fine sand	7	155
	Clay, sandy, silty, gray	30	185
	Sand and gravel	14	199
Bedrock:			
	Lignite, hard	4	203
	Clay, brown	2	205

161-083-13DCC2
Mohall 11

Altitude: 1534 feet — Date drilled: 3/29/61

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	1	1
	Clay, silty, grayish-yellow	4	5
	Gravel, medium to coarse; with small clay layers	4	9
	Clay, silty, gray (till); with coal fragments	25	34

161-083-13DCD
Mohall 14

Altitude: 1545 feet — Date drilled: 4/04/61

	Topsoil, black	1	1
	Sand, fine to medium; with thin gravel layers	9	10
	Clay, silty, gray (till); with coal fragments	24	34

161-083-13DDC
Mohall 17

Altitude: 1546 feet — Date drilled: 4/05/61

	Topsoil, black	1	1
	Clay, silty, yellow (till); with coal fragments	3.5	4.5
	Sand, fine to medium	.5	5
	Clay, silty, yellow (till); with coal fragments	9	14
	Clay, silty, gray (till); with coal fragments	20	34

161-083-14AAB
USGS 3
(Log modified from Akin, 1951)

Altitude: 1540 feet — Date drilled: 10/02/48

Alluvium:			
	Soil, clayey, black	1	1
	Clay, gravelly, light-gray	6	7
	Sand, medium and coarse, and some fine gravel	20	27
Glacial drift:			
	Silt and clay, pebbly, dark-gray	13	40

161-083-14ABA
USGS 4
(Log modified from Akin, 1951)

Altitude: 1542 feet — Date drilled: 10/04/48

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Soil, clayey, black	1	1
	Clay, light-gray	2	3
	Sand, medium, brown, and some coarse gravel	5	8
Glacial drift:			
	Clay, silty, pebbly, gray	73	81
	Sand, fine to medium, quartzitic; abundant clay and silt	16	97
	Clay, silty, pebbly, gray	105	202
Hell Creek Formation:			
	Clay, sandy, light-gray to white	3	205
	Clay, silty, brown to black	15	220

161-083-14ADD
NDSWC 11444

Altitude: 1537 feet — Date drilled: 10/31/80

Glacial drift:			
	Soil	1	1
	Silt, clayey, yellowish-brown, oxidized	4	5
	Sand, fine to coarse; 30 percent fine to granular subangular to subrounded gravel; predominately silicate, carbonate, and quartz grains	8	13
	Clay, silty, sandy, gravelly, olive-gray (till)	7	20

161-083-19DD
(Log modified from LaRocque and others, 1963b)

Altitude: 1595 feet — Date drilled: 1929

Glacial drift:			
	Clay and sand	320	320
Hell Creek Formation:			
	Sandstone	8	328
	Lignite and shale	2	330
	Sandstone	4	334
	Shale	42	376
	Shale, sandy	1	377
	Lignite and shale	3	380
	Shale, sandy; water	11	391

161-083-22CCC
NDSWC 10333

Altitude: 1602 feet — Date drilled: 10/19/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil----------	1	1
	Clay, silty, sandy, pebbly, brownish-yellow, oxidized (till)----------	23	24
	Clay, silty, sandy, pebbly, olive-gray (till)----------	16	40
	Clay, sandy, silty, pebbly, olive-gray (till); contains interbedded fine sand lenses 1 to 3 feet thick----------	20	60
	Clay, silty, sandy, pebbly, olive-gray (till)----------	44	104
	Sand, medium to very coarse, gravelly----------	2	106
	Clay, silty, sandy, pebbly, olive-gray (till)----------	103	209
	Gravel, sandy, poorly sorted, subangular to subrounded----------	5	214
	Clay, silty, sandy, pebbly, olive-gray----------	53	267
Hell Creek Formation:			
	Siltstone, carbonaceous, stratified, dark-brown----------	33	300

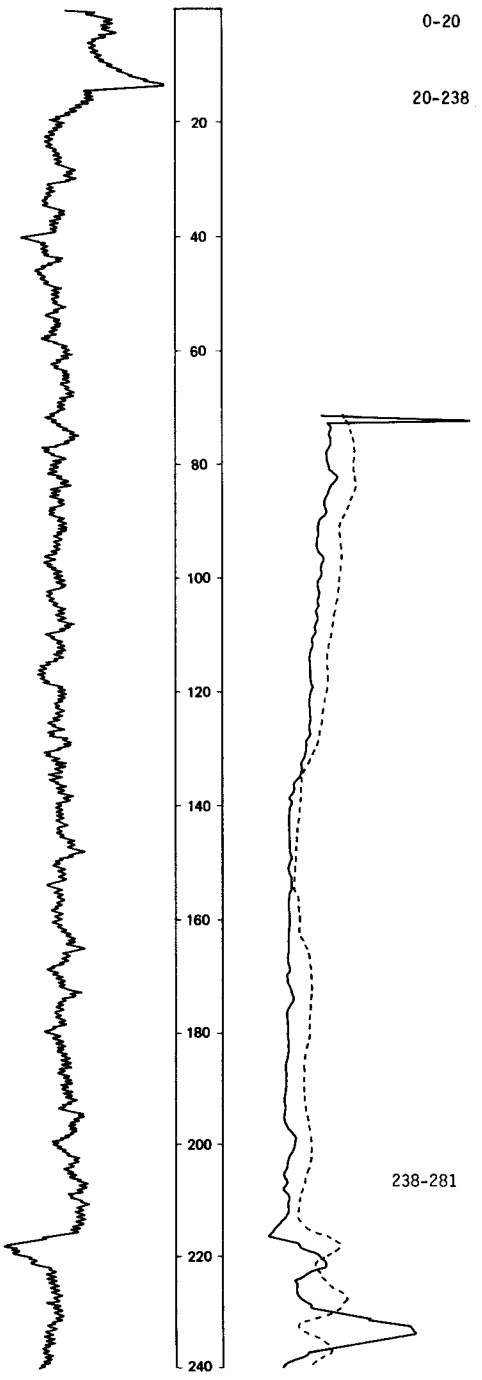
NDSWC 5385

LOCATION: 161-083-23DDD

DATE DRILLED: 9/20/78

ALTITUDE: 1585
(FT, NGVD)

DEPTH: 700
(FT)



DESCRIPTION OF DEPOSITS

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

20-238 Clay, sandy, silty, pebbly, olive-gray (till); contains a few thin lenses of sand and gravel.

HELL CREEK FORMATION

238-281 Sandstone, fine, silty, well-sorted, rounded, bentonitic, poorly consolidated, light-gray.

NOTE:

------Long normal

———Short normal

433

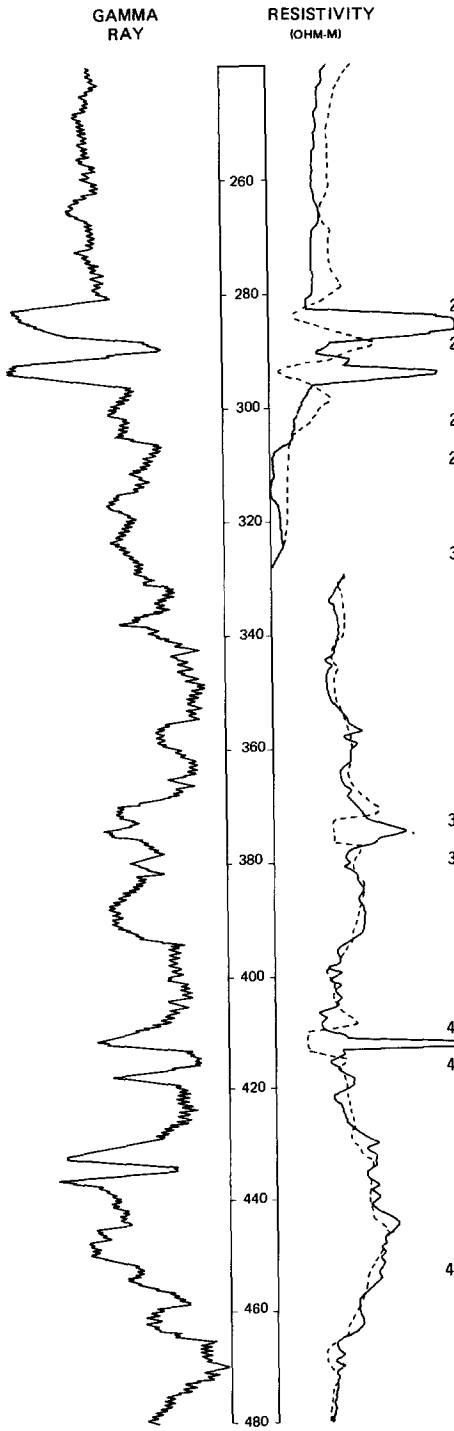
NDSWC 5385, continued

LOCATION: 161-083-23DDD

DATE DRILLED: 9/20/78

ALTITUDE: 1585 (FT, NGVD)

DEPTH: 700 (FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

281-288 Lignite, brittle, black.

288-292 Siltstone, slightly sandy, bentonitic, brittle, medium-light-gray.

292-296 Lignite, brittle, black.

296-326 Sandstone, very fine, very silty, semiconsolidated; light-gray with carbonaceous brown streaks.

326-373 Siltstone, sandy, bentonitic, brittle, medium-light-gray; contains thin beds of carbonaceous brown siltstone.

FOX HILLS SANDSTONE

373-375 Sandstone, indurated.

375-410 Siltstone, sandy, bentonitic, medium-light-gray; contains a few thin semiconsolidated sandstone beds.

410-412 Sandstone, indurated.

412-456 Sandstone, very fine to medium, silty, glauconitic, greenish-gray; contains thin beds of siltstone and claystone.

456-531 Siltstone, sandy, bentonitic, semiconsolidated, medium-light-gray.

NOTE:

-----Long normal

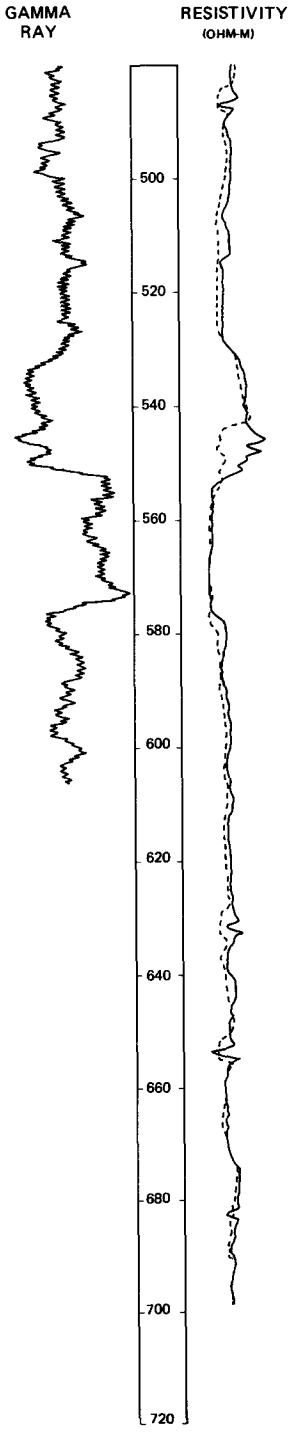
———Short normal

LOCATION: 161-083-23DDD

DATE DRILLED: 9/20/78

ALTITUDE: 1585
(FT, NGVD)

DEPTH: 700
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

531-542 Sandstone, fine, very silty, glauconitic, semiconsolidated, dark-green; indurated zone from 544 to 546 feet.

542-554 Siltstone, very clayey, bentonitic, brittle, light-gray.

PIERRE SHALE

554-700 Shale, hard, brittle, black to grayish-black.

NOTE:

----- Long normal

——— Short normal

LOCATION: 161-083-23DDD

ALTITUDE: 1585
(FT, NGVD)

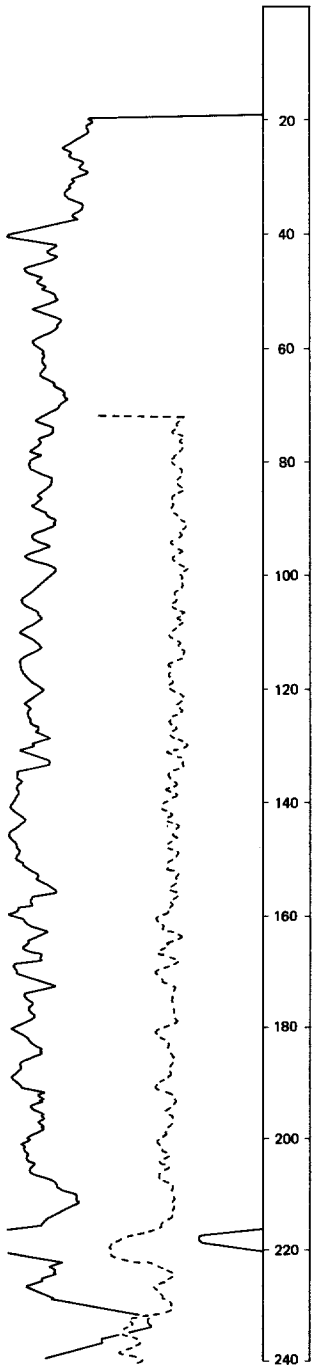
DATE DRILLED: 9/20/78

DEPTH: 700
(FT)

NEUTRON (API)

S.P. (MV)

DESCRIPTION OF DEPOSITS



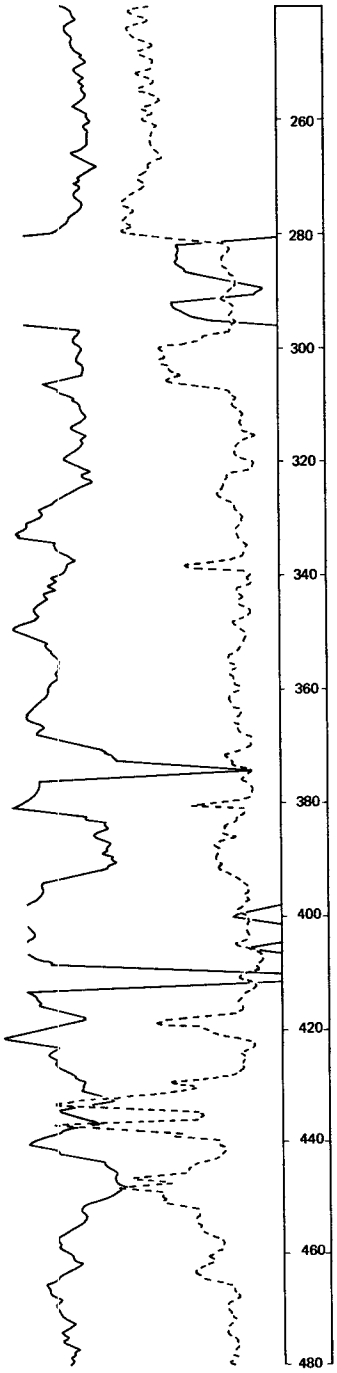
LOCATION: 161-083-23DDD

DATE DRILLED: 9/20/78

ALTITUDE: 1585
(FT, NGVD)

DEPTH: 700
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

LOCATION: 161-083-23DDD

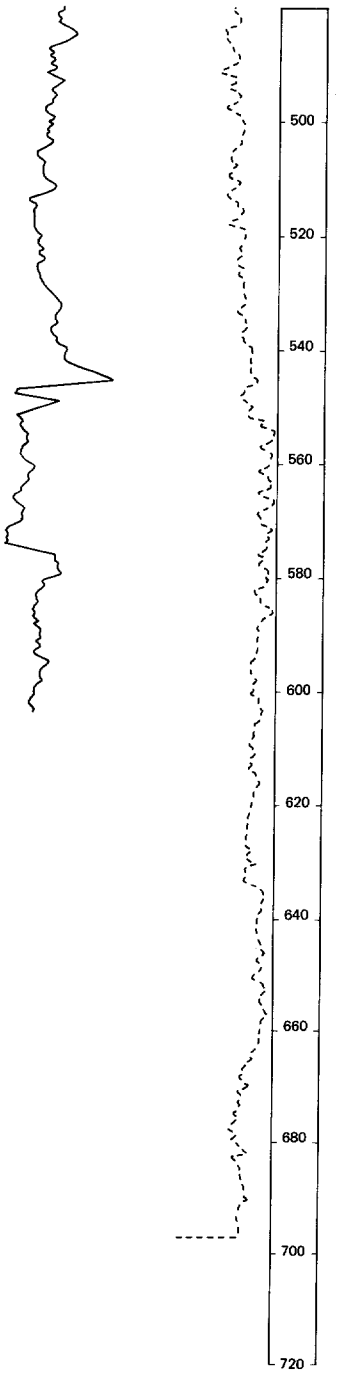
DATE DRILLED: 9/20/78

ALTITUDE: 1585
(FT, NGVD)

DEPTH: 700
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

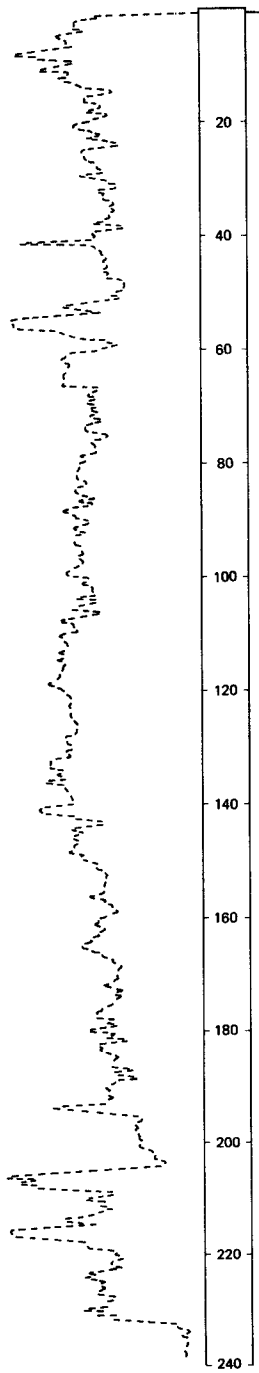
NDSWC 10332

LOCATION: 161-083-29BBB

DATE DRILLED: 10/19/78

ALTITUDE: 1587
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-21	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
21-51	Clay, silty, sandy, pebbly, olive-gray (till).
51-58	Gravel, fine to coarse; contains about 50 percent coarse to very coarse poorly sorted sand.
58-232	Clay, silty, sandy, pebbly, olive-gray (till).

HELL CREEK FORMATION

232-260	Siltstone, sandy, clayey, semiconsolidated, light-gray; contains beds of carbonaceous dark-brown clay.

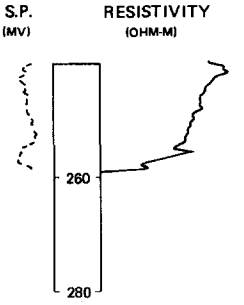
NDSWC 10332, continued

LOCATION: 161-083-29BBB

DATE DRILLED: 10/19/78

ALTITUDE: 1587
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

161-083-33CCB
USGS 55-47
(Log modified from Akin, 1951)

Altitude: 1587 feet

Date drilled: 7/25/47

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	4	4
	Clay, sandy, yellow, and some gravel	8	12
	Sand, fine	1	13
	Clay, sandy, yellow	1	14
	Clay, sandy, gray, and some gravel	15	29
	Gravel	1	30
	Clay, sandy, gray, and some gravel	7	37
	Clay, sandy, gray, and thin strips of gravel	2	39
	Clay, sandy, gray, and some gravel	30	69
	Clay, sandy, gray, and thin strips of gravel	33	102
	Clay, sandy, gray, and some gravel and fine sand	38	140
	Gravel	2	142
	Clay, sandy, gray, and thin strips of gravel	66	208
	Clay, sandy, gray, and thin strips of lignite fragments	3	211
Hell Creek Formation:			
	Clay, sandy, white	1	212
	Shale, hard, white	1	213
	Clay, sandy, gray	21	234
	Shale, brown	1	235
	Clay, sandy, brown	5	240

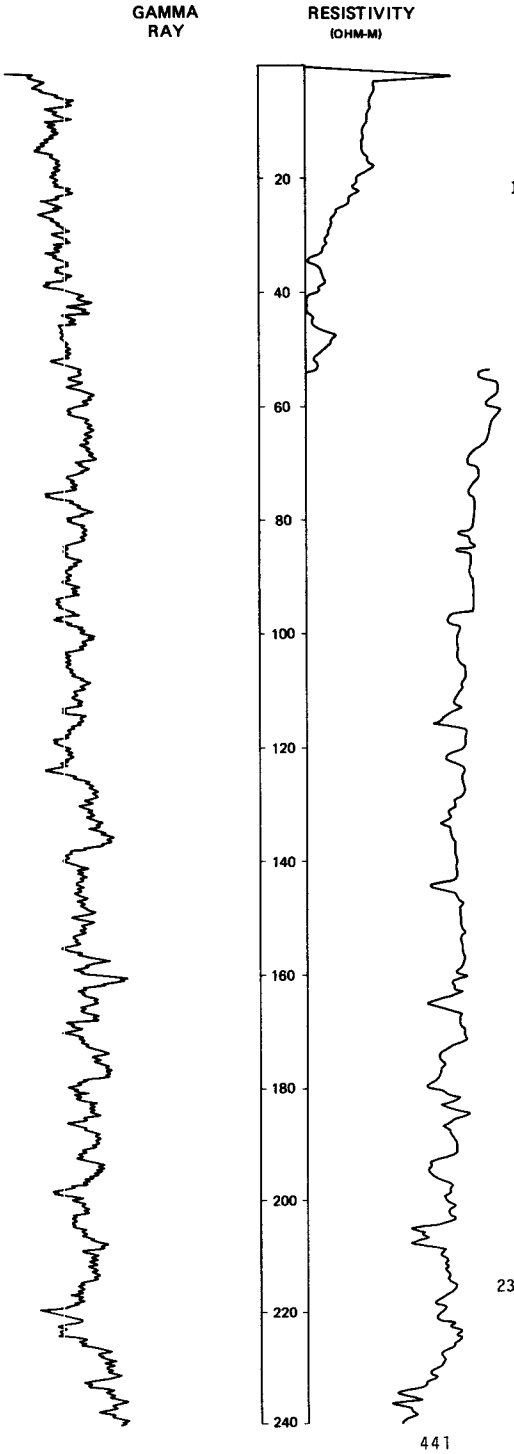
NDSWC 5556

LOCATION: 161-084-24DDD

DATE DRILLED: 8/30/79

ALTITUDE: 1619
(FT, NGVD)

DEPTH: 662
(FT)



DESCRIPTION OF DEPOSITS

0-1	Soil.
1-10	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
10-235	Clay, silty, sandy, pebbly, olive-gray (till).

HELL CREEK FORMATION

235-282	Siltstone, sandy, carbonaceous, blackish-red; contains about 60 percent carbonaceous material, 25 percent silt, 10 percent glauconite, 2 percent magnetite, and 2 percent mica flakes.

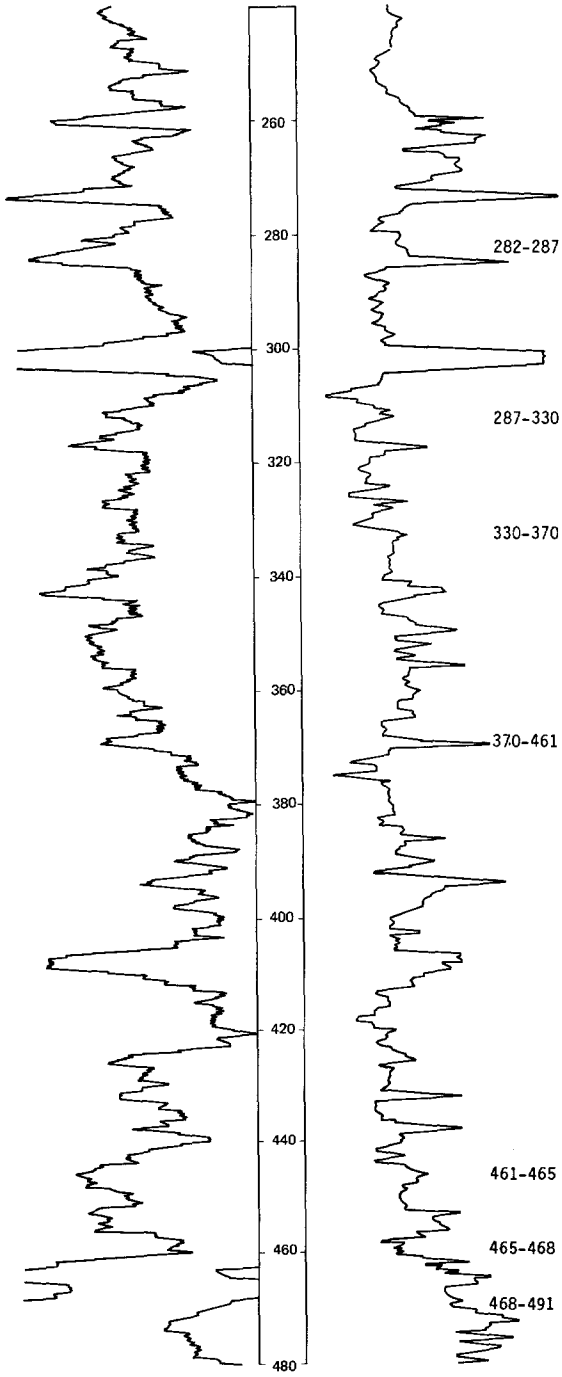
NDSWC 5556, continued

LOCATION: 161-084-24DDD

DATE DRILLED: 8/30/79

ALTITUDE: 1619 (FT, NGVD)

DEPTH: 662 (FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

282-287 Sandstone, very fine to fine, silty, clayey, grayish-green; contains about 80 percent quartz, 10 percent glauconite, and 10 percent mica and magnetite; interstitial clay abundant to missing.

287-330 Siltstone, clayey, slightly sandy, olive-gray; contains a few carbonaceous streaks.

FOX HILLS SANDSTONE

330-370 Sandstone, very fine to fine, predominately very fine, silty, glauconitic, olive-gray; contains some magnetite and mica.

370-461 Claystone, slightly sandy, light-olive-gray; contains some carbonaceous material.

461-465 Sandstone, very fine to fine, clayey; interbedded with shale.

465-468 Siltstone, sandy, clayey, dark-greenish-gray.

468-491 Sandstone, very fine, glauconitic, subrounded to subangular, grayish-blue-green.

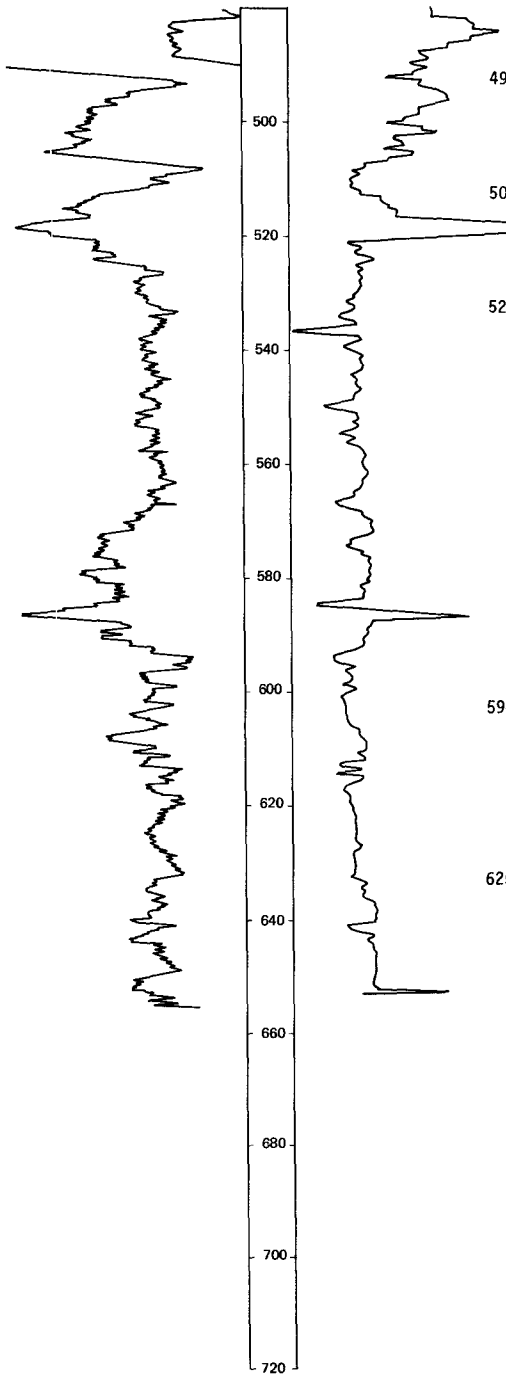
NDSWC 5556, continued

LOCATION: 161-084-24DDD

DATE DRILLED: 8/30/79

ALTITUDE: 1619 (FT, NGVD)

DEPTH: 662 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

491-506 Shale, slightly sandy, brittle, dark-olive-gray to olive-black.

506-521 Siltstone, slightly sandy; poor cohesion.

521-594 Shale, brittle, olive-gray to greenish-gray; contains a few sand grains.

PIERRE SHALE

594-625 Shale, silty, grayish-black.

625-662 Shale, brittle, dark-gray.

LOCATION: 161-084-24DDD

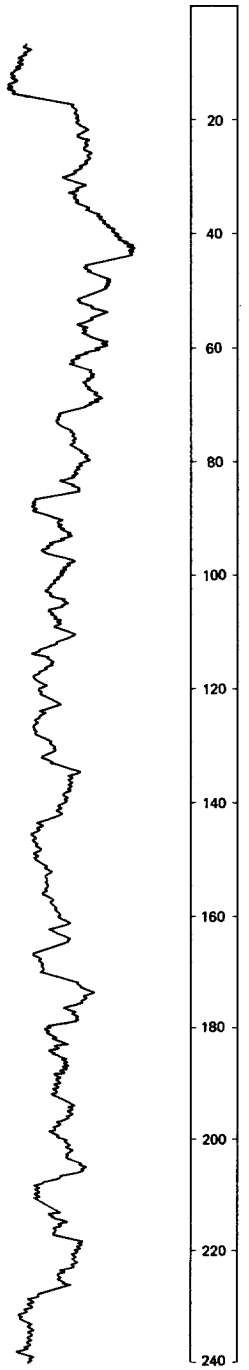
DATE DRILLED: 8/30/79

ALTITUDE: 1619
(FT, NGVD)

DEPTH: 662
(FT)

NEUTRON
(API)

DESCRIPTION OF DEPOSITS



LOCATION: 161-084-24DDD

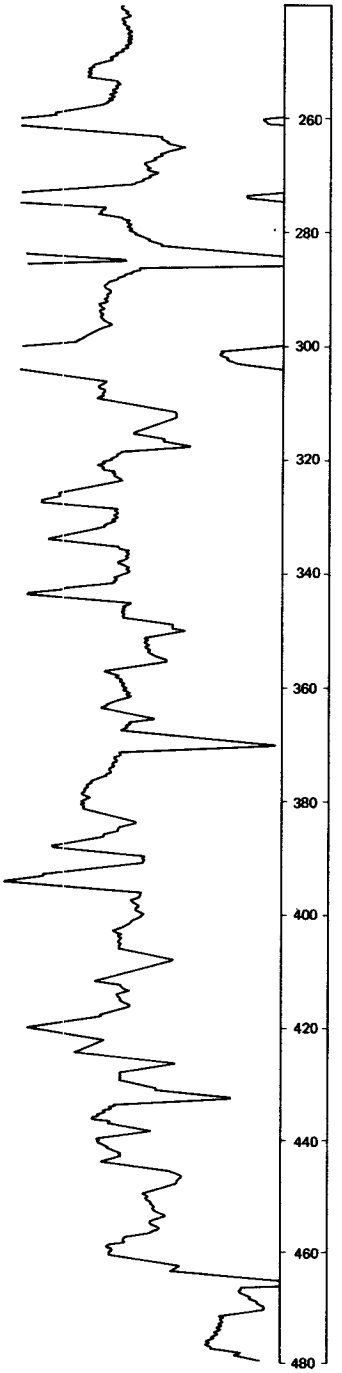
DATE DRILLED: 8/30/79

ALTITUDE: 1619
(FT, NGVD)

DEPTH: 662
(FT)

NEUTRON
(API)

DESCRIPTION OF DEPOSITS



LOCATION: 161-084-24DDD

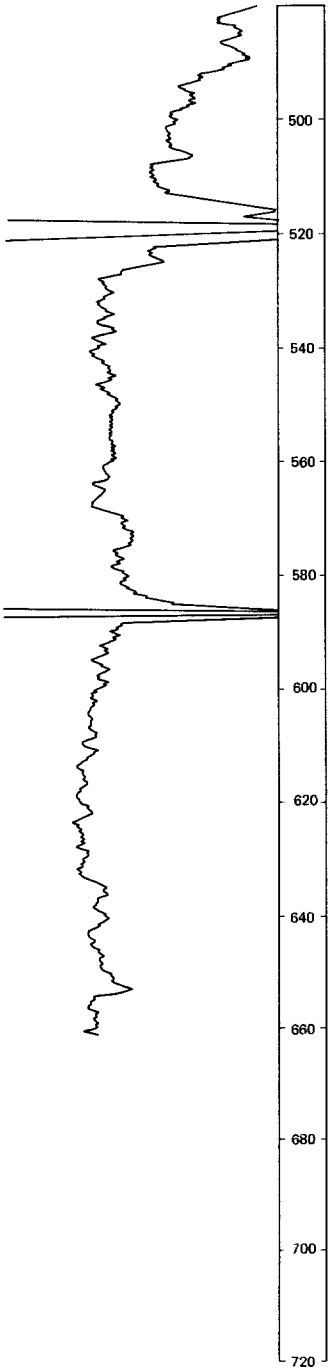
DATE DRILLED: 8/30/79

ALTITUDE: 1619
(FT, NGVD)

DEPTH: 662
(FT)

NEUTRON
(API)

DESCRIPTION OF DEPOSITS



162-069-03CCA
(Log modified from C. A. Simpson & Son)

Altitude: 1820 feet — Date drilled: 5/26/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	19	20
	Clay, sandy, blue	15	35
	Rocks	28	63
	Clay, gravelly, yellow, hard	17	80
	Clay, sandy, blue	14	94

162-069-05ABB
NDSWC 2-797
(Log modified from Schmid and Lindvig, 1964)

Altitude: 1820 feet — Date drilled: 7/15/63

Glacial drift:			
	Soil	1	1
	Gravel, granular to pebbly, sandy, subangular to rounded	8	9
	Till, olive-gray, calcareous	9	18
	Sand, granular, angular to rounded; predominately quartz and shale grains	2	20
	Till, olive-gray, calcareous	5	25
	Gravel, granular to pebbly, sandy, subrounded to rounded	7	32
	Sand, fine to very coarse, gravelly	6	38
	Till, olive-gray, calcareous	62	100
Fox Hills Sandstone:			
	Silt, light-olive-brown, lignitic, calcareous, oxidized	10	110
	Silt, light-olive-brown, sandy, calcareous, oxidized	6	116

162-069-05DAD
(Log modified from C. A. Simpson & Son)

Altitude: 1810 feet — Date drilled: 9/12/69

	Clay, sandy, yellow	11	11
	Clay, sandy, blue	36	47
	Gravel	2	49
	Clay, gravelly, yellow	3	52

162-069-05DCD
NDSWC 3-797
(Log from Schmid and Lindvig, 1964)

Altitude: 1810 feet — Date drilled: 7/17/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Gravel, granular to pebbly, sandy, subangular to rounded	6	7
	Till, moderate-yellowish-brown, calcareous, oxidized	5	12
	Till, olive-gray, calcareous	3	15
	Gravel, granular to pebbly, sandy, rounded	2	17
	Till, olive-gray, calcareous	2	19
	Gravel, granular to pebbly, sandy, rounded	5	24
	Till, olive-gray, calcareous	31	55
	Till, moderate-yellowish-brown, calcareous, oxidized	6	61
	Till, greenish-gray, calcareous	2	63

162-069-05DDD
NDSWC 1-797
(Log modified from Schmid and Lindvig, 1964)

Altitude: 1808 feet — Date drilled: 7/15/63

Glacial drift:			
	Soil	1	1
	Till, moderate-yellowish-brown, calcareous, oxidized	10	11
	Till, olive-gray, calcareous	18	29
	Till, dusky-yellow, calcareous, oxidized	6	35
	Silt, dusky-yellow, calcareous, oxidized	4	39
	Silt, olive-gray, clayey, calcareous	5	44
	Till, olive-gray, calcareous; medium to very coarse sand from 51 to 52 feet	21	65
	Till, dark-yellowish-orange, calcareous, oxidized	22	87
Fox Hills Sandstone:			
	Silt, dark-yellowish-orange, sandy, slightly calcareous, oxidized	13	100
	Silt, bluish-gray, sandy, calcareous	13	113
	Silt, yellowish-gray through dark-greenish-gray, clayey, calcareous	21	134
	Shale, greenish-gray, silty, calcareous	29	163
	Shale, brownish-gray to brownish-black; abundant lignitic laminae; slightly calcareous	5	168

162-069-06BAB
NDSWC 6-797
(Log modified from Schmid and Lindvig, 1964)

Altitude: 1863 feet — Date drilled: 7/22/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Till, moderate-yellowish-brown, calcareous, oxidized	25	26
	Gravel, granular to pebbly, sandy, angular to rounded, poorly sorted	2	28
	Till, olive-gray, calcareous	7	35
	Sand, medium to very coarse, gravelly, angular to rounded, unsorted	1	36
	Till, olive-gray, calcareous	3	39
	Gravel, granular to pebbly, sandy, rounded, unsorted	3	42
	Till, olive-gray, calcareous	5	47
	Till, grayish-olive, calcareous, partially oxidized; probably reworked oxidized till	4	51
	Till, light-olive-brown, calcareous, oxidized	43	94
	Gravel, granular to pebbly, subangular to rounded	5	99
	Till, olive-gray, calcareous, sandy; granular to pebbly gravel from 103 to 106 feet	20	119
	Till, light-olive-brown, calcareous, oxidizd	15	134
	Till, light-olive-gray, calcareous, partially oxidized	12	146
Fox Hills Sandstone:			
	Silt, light-olive-brown, clayey, calcareous, oxidized	11	157
	Silt, greenish-gray, clayey, calcareous	5	162
	Sand, bluish-gray, very fine to fine, silty, calcareous	4	166
	Sandstone, bluish-gray, calcareous	2	168

162-069-06CAB
(Log modified from C. A. Simpson & Son)

Altitude: 1855 feet — Date drilled: 7/29/66

	Topsoil	2	2
	Clay, sandy, yellow	14	16
	Clay, sandy, blue, hard	5	21
	Clay, blue, hard	10	31
	Gravel	--	31

162-069-08CAA
USGS 445
(Log modified from Brookhart and Powell, 1961)

Altitude: 1828 feet — Date drilled: 7/12/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, brown	0.5	0.5
	Sand, very coarse, gray-brown, and coarse clayey gravel	2.5	3
	Gravel, fine to coarse, and fine sand	30	33
	Clay, gray, and fine to medium gravel	40	73
	Clay, gray, and fine gravel	33	106
	Sand, medium, gray, and fine clayey gravel	12	118
Pierre Shale:			
	Shale, gray	12	130

162-069-08DBC
USGS 447
(Log from Schmid and Lindvig, 1964)

Altitude: 1820 feet — Date drilled: 7/16/51

Glacial drift:			
	Soil	2	2
	Sand, clayey to gravelly	3	5
	Gravel, granular to pebbly	13	18
	Till, yellow, oxidized	1	19
	Till, gray	11	30

162-069-08DCD1
USGS 446
(Log modified from Brookhart and Powell, 1961)

Altitude: 1816 feet — Date drilled: 7/13/51

Till and associated sand and gravel deposits:			
	Road fill	2	2
	Sand, very fine to very coarse, light-brown, clayey	8	10
	Sand, medium to very coarse, brown, and fine clayey gravel	15	25
	Gravel, very fine to medium, and shale pebbles	13	38
	Clay, gray, and fine to medium gravel and shale pebbles	18	56
	Clay, light-brown, and fine to medium gravel and shale pebbles	4	60

162-069-08DCD2
USGS 450
(Log from Brookhart and Powell, 1961)

Altitude: 1816 feet — Date drilled: 7/21/51

Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Sand, fine to coarse, light-brown, clayey	2	4
	Gravel, fine to medium	4	8
	Sand, very coarse, and fine gravel	9	17
	Clay, gray, and fine to medium gravel and shale pebbles	23	40

162-069-08DCD3
USGS 453
(Log from Brookhart and Powell, 1961)

Altitude: 1816 feet — Date drilled: 7/28/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Sand, fine to coarse, light-brown	3	3
	Sand, fine to very coarse, light-brown, and fine gravel	6	9
	Gravel, fine to medium, and very coarse angular sand and shale pebbles	7	16
	Clay, gray, and fine to medium gravel and shale pebbles	14	30

162-069-08DDC1
USGS 439
(Log from Brookhart and Powell, 1961)

Altitude: 1810 feet — Date drilled: 7/02/51

Till and associated sand and gravel deposits:			
	Topsoil, black	0.5	0.5
	Gravel, fine to coarse	4.5	5
	Gravel, fine to medium, and medium to very coarse sand; slightly clayey	15	20
	Clay, gray, and fine to medium gravel and shale pebbles	10	30

162-069-08DDC2
USGS 443
(Log modified from Brookhart and Powell, 1961)

Altitude: 1815 feet — Date drilled: 7/06/51

Till and associated sand and gravel deposits:			
	Sand, coarse, silty, gray-brown, and medium very clayey gravel	3	3
	Gravel, fine to medium, and coarse sand	43	46
	Clay, gray, and fine to medium gravel	32	78
	Sand, very coarse, gray-brown, and fine gravel and shale pebbles	13	91
	Sand, very coarse, gray, and fine gravel and shale pebbles	24	115
	Clay, sandy, gray, and shale pebbles	13	128
Undifferentiated:			
	Shale, gray-brown	36	164
Pierre Shale:			
	Shale, gray	6	170

162-069-09BCB
NDSWC 7-797
(Log from Schmid and Lindvig, 1964)

Altitude: 1810 feet — Date drilled: 7/23/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, moderate-yellowish-brown, calcareous, oxidized	3	3
	Sand, medium to very coarse, granular, angular to well-rounded	3	6
	Till, moderate-yellowish-brown, calcareous, oxidized	3	9
	Till, olive-gray, calcareous	50	59

162-069-09CBA
USGS 442
(Log modified from Brookhart and Powell, 1961)

Altitude: 1813 feet — Date drilled: 7/05/51

Till and associated sand and gravel deposits:			
	Gravel, fine to coarse, and very fine to very coarse sand; clay; light brown in the last 2 feet	7	7
	Gravel, fine to coarse, light-brown, and medium to very coarse clayey sand	13	20
	Clay, light-brown, and coarse gravel and shale pebbles	6	26
	Clay, gray, and fine to coarse gravel and shale pebbles	14	40

162-069-09CBD
USGS 441
(Log modified from Brookhart and Powell, 1961)

Altitude: 1819 feet — Date drilled: 7/04/51

Till and associated sand and gravel deposits:			
	Topsoil, brown	1	1
	Sand, gray, and fine very clayey gravel	2	3
	Gravel, fine to coarse	24	27
	Clay, gray, and fine to medium gravel and shale pebbles	13	40

162-069-09CCB
USGS 440
(Log from Brookhart and Powell, 1961)

Altitude: 1811 feet — Date drilled: 7/03/51

Till and associated sand and gravel deposits:			
	Gravel, fine to coarse, and very coarse sand	15	15
	Clay, sandy, gray-brown, and fine to medium gravel and shale pebbles	77	92
Undifferentiated:			
	Shale, gray-brown	29	121
Pierre Shale:			
	Shale, gray	29	150

162-069-09CCD
NDSWC 167
(Log from Schmid and Lindvig, 1964)

Altitude: 1802 feet — Date drilled: 1964

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	2	2
	Till, yellow, oxidized	14	16
	Till, gray	46	62
	Sand, medium to very coarse, gravelly	8	70
	Gravel, granular to pebbly	15	85
	Till, brown, partially oxidized	5	90
	Till, gray	4	94
	Sand, very coarse, gravelly	7	101
	Till, gray	15	116
Undifferentiated bedrock:			
	Clay, yellow, oxidized	10	126
	Shale, gray	9	135

162-069-09CDB
(Log modified from C. A. Simpson & Son)

Altitude: 1810 feet — Date drilled: 9/14/64

	Topsoil	1	1
	Clay, blue	21	22
	Clay, sandy, blue	56	78
	Hard layer	4	82
	Sand, clayey	3	85
	Sand, clean	1	86

162-069-09CDC
USGS 167
(Log modified from Brookhart and Powell, 1961)

Altitude: 1802 feet — Date drilled: 7/20/49

Glacial drift:			
	Topsoil, black	2	2
	Clay, light-brown, and fine to medium gravel; fragmental gypsum	14	16
	Clay, gray, and fine to medium gravel and shale pebbles	46	62
	Sand, medium to very coarse, and fine to medium gravel and shale pebbles	8	70
	Gravel, fine to coarse, and medium sand and shale pebbles	15	85
	Clay, gray-brown, and fine to medium gravel and shale pebbles	5	90
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	4	94
	Sand, very coarse, gray, and fine gravel and shale pebbles	7	101
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	15	116
Undifferentiated:			
	Shale, light-brown	10	126
Pierre Shale:			
	Shale, gray	9	135

162-069-09CDD
(Log modified from C. A. Simpson & Son)

Altitude: 1810 feet — Date drilled: 8/24/68

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	23	24
	Clay, gravelly, blue	35	59
	Sand, coarse	11	70

162-069-09DCC1
NDSWC 10-797

Altitude: 1810 feet — Date drilled: 7/25/63

Glacial drift:			
	Soil, black	1	1
	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till)	3	4
	Sand, medium, angular to rounded, oxidized; predominately quartz grains	2	6
	Clay, silty, sandy, pebbly, dark-greenish-gray (till); contains lignite fragments	38	44
	Sand, fine to very coarse, gravelly, subrounded; contains shale and limestone pebbles	9	53
	Clay, silty, sandy, pebbly, medium-gray; contains shale, limestone, quartz, and lignite fragments	6	59
	Gravel, fine to medium, sandy	6	65
	Sand, medium to very coarse, gravelly; contains thin clay lenses	22	87
	Clay, silty, sandy, pebbly, olive-gray (till)	29	116
	Gravel, fine to coarse, sandy, subangular to rounded; predominately shale and limestone pebbles	5	121
	Clay, silty to gravelly, dark-greenish-gray to olive-gray; contains shale, limestone, granitic, and lignitic fragments	2	123
	Silt, sandy, dark-greenish-gray	3	126
	Clay, silty to gravelly, dark-greenish-gray to olive-gray (till)	6	132
	Clay, silty to gravelly, dark-greenish-gray to olive-gray (gravelly till)	20	152
Fox Hills Sandstone:			
	Siltstone, clayey, calcareous, micaceous, hard, dark-greenish-gray to greenish-gray	16	168

162-069-09DCC2
(Log modified from C. A. Simpson & Son)

Altitude: 1810 feet — Date drilled: 7/10/69

	Topsoil	1	1
	Clay, sandy, yellow	18	19
	Clay, sandy, blue	47	66
	Sand, coarse	6	72

162-069-09DCD
(Log modified from C. A. Simpson & Son)

Altitude: 1805 feet — Date drilled: 5/29/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	17	18
	Rocks	18	36
	Clay, sandy, blue	17	53
	Sand, fine	5	58
	Sand, coarse	6	64

162-069-09DDC1
(Log modified from C. A. Simpson & Son)

Altitude: 1807 feet — Date drilled: 8/21/70

	Topsoil	1	1
	Clay, yellow	9	10
	Clay and rocks; gravelly, yellow	18	28
	Sand, fine, clayey	23	51
	Clay, gravelly, yellow	5	56
	Sand, clayey, fine	3	59
	Sand and gravel	10	69

162-069-09DDC2
(Log modified from C. A. Simpson & Son)

Altitude: 1805 feet — Date drilled: 6/30/72

	Topsoil	1	1
	Clay, yellow	11	12
	Clay, very gravelly, yellow	6	18
	Clay, sandy, blue	26	44
	Sand; with some gravel	8	52

162-069-09DDC3
(Log modified from C. A. Simpson & Son)

Altitude: 1808 feet — Date drilled: 6/05/71

	Topsoil	1	1
	Clay, yellow	9	10
	Gravel and rocks; clayey	18	28
	Clay, sandy, blue	21	49
	Gravel	2	51
	Sand, coarse	22	73

162-069-10DCB
(Log modified from C. A. Simpson & Son)

Altitude: 1818 feet — Date drilled: 4/09/64

	Clay, yellow	12	12
	Clay, sandy, yellow	16	28
	Clay, blue; and rocks	36	64
	Clay, blue	60	124
	Sand, clayey	11	135
	Sand and gravel; coarse, clean	2	137

162-069-11BBB
NDSWC 5875

Altitude: 1812 feet — Date drilled: 11/03/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	17	18
	Clay, silty, pebbly, olive-gray (till)	7	25
	Clay, gravelly, dark-gray (till); boulders	48	73
	Clay, sandy, gravelly, dark-gray (till)	29	102
	Gravel, fine to very coarse; about 10 percent very coarse subrounded to rounded sand; predominately carbonate and granitic pebbles	18	120
	Clay, sandy, gravelly, olive-gray (till)	21	141

162-069-13AAA
USGS 170
(Log modified from Brookhart and Powell, 1961)

Altitude: 1756 feet — Date drilled: 7/27/49

Glacial drift:			
	Topsoil, black	2	2
	Sand, very fine to very coarse, silty, gray, clayey	1	3
	Clay, light-brown, and fine to medium gravel	19	22
	Clay, gray, and fine to medium gravel	92	114
	Sand, very coarse, gray, and fine to medium clayey gravel	5	119
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	11	130
	Clay, sandy, gray, and coarse gravel and shale pebbles	46	176
	Sand, very coarse, gray, and fine gravel and shale pebbles	21	197
Pierre Shale:			
	Shale, gray	13	210

162-069-15AAA
USGS 169
(Log modified from Brookhart and Powell, 1961)

Altitude: 1797 feet — Date drilled: 7/25/49

Glacial drift:			
	Topsoil, black	1	1
	Clay, light-brown, and fine to medium gravel	16	17
	Clay, gray, and fine to medium gravel	69	86
	Clay, very silty, sandy and pebbly, gray; probably till but may be in part lacustrine deposits	14	100
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	54	154
	Sand, very coarse, gray, and fine gravel and shale pebbles	9	163
	Clay, gray, and fine to medium gravel and shale pebbles	10	173
Pierre Shale:			
	Shale, gray	37	210

162-069-15CCC
USGS 168
(Log modified from Brookhart and Powell, 1961)

Altitude: 1807 feet — Date drilled: 7/21/49

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine to medium gravel	14	15
	Clay, sandy, gray, and coarse gravel	41	56
	Clay, sandy, gray-brown, and fine to medium gravel	17	73
	Clay, gray, and fine to medium gravel and shale pebbles	6	79
	Sand, very coarse, and fine to medium gravel and shale pebbles	6	85
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	39	124
	Sand, coarse to very coarse, and fine to medium gravel and shale pebbles	57	181
Pierre Shale:			
	Shale, gray	19	200

162-069-16BAB
(Log modified from C. A. Simpson & Son)

Altitude: 1805 feet — Date drilled: 5/20/69

	Clay, sandy, yellow	17	17
	Clay, sandy, blue	43	60
	Clay, gravelly, blue	6	66
	Sand, fine, mushy	12	78
	Gravel, coarse, clayey	7	85

162-069-16BBB
USGS 166
(Log modified from Brookhart and Powell, 1949)

Altitude: 1807 feet — Date drilled: 7/19/49

Glacial drift:			
	Clay, sandy, light-brown, and fine to medium gravel	12	12
	Sand, medium to very coarse, light-brown, and fine to medium gravel and shale pebbles	12	24
	Clay, gray, and fine to medium gravel and shale pebbles	31	55
	Clay, gray-brown, and fine to medium gravel and shale pebbles	5	60
	Clay, gray, and medium gravel and shale pebbles	51	111
Undifferentiated:			
	Shale, light-brown	11	122
Pierre Shale:			
	Shale, gray	8	130

162-069-16BCC
USGS 468
(Log modified from Brookhart and Powell, 1961)

Altitude: 1807 feet — Date drilled: 9/18/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine to medium gravel	11	12
	Sand, very coarse, gray, and fine gravel and shale pebbles	18	30
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	21	51
	Gravel, fine to medium, gray, and coarse sand and shale pebbles	31	82
	Sand, very coarse, gray, and fine gravel and shale pebbles	18	100

162-069-16BCD
USGS 469
(Log modified from Brookhart and Powell, 1961)

Altitude: 1806 feet — Date drilled: 9/19/51

Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine gravel	13	14
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	6	20
	Sand, medium to very coarse, gray, and fine clayey gravel; the coarser fraction consists of shale fragments	29	49
	Sand, medium to very coarse, gray, and fine to medium clayey gravel; the coarser fraction consists of shale fragments	21	70
	Sand, very coarse, and fine to medium gravel; the coarser fraction consists of shale fragments	22	92
	Gravel, medium to coarse	3	95

162-069-17AAB
USGS 165
(Log modified from Brookhart and Powell, 1961)

Altitude: 1809 feet — Date drilled: 7/18/49

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	2	2
	Clay, light-brown, medium to very coarse sand, and very fine gravel and shale pebbles	3	5
	Sand, medium to very coarse, light-brown, and fine gravel and shale pebbles	10	15
	Gravel, fine to medium, and medium sand and shale pebbles	6	21
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	20	41
	Clay, gray-brown, and fine to medium gravel and shale pebbles	11	52
	Clay, gray, and fine to medium gravel and shale pebbles	55	107
Undifferentiated:			
	Shale, light-brown	10	117
Pierre Shale:			
	Shale, gray	13	130

162-069-17ABA1
USGS 451
(Log modified from Brookhart and Powell, 1961)

Altitude: 1813 feet — Date drilled: 7/23/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Road fill	3	3
	Topsoil, black	1	4
	Sand, medium to very coarse, brown, and fine clayey gravel; the coarser fraction consists of shale fragments	13	17
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	10	27
	Gravel, fine to medium, and very few shale fragments	7	34
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	6	40

162-069-17ABA2
USGS 452
(Log modified from Brookhart and Powell, 1961)

Altitude: 1811 feet — Date drilled: 7/25/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	2	2
	Clay, sandy, light-brown, and fine to medium gravel	2	4
	Sand, medium to coarse, brown, and fine slightly clayey gravel	3	7
	Sand, very fine to very coarse, light-brown, very clayey	7	14
	Clay, sandy, gray, and fine gravel and shale pebbles	7	21
	Sand, medium to very coarse, gray, and fine to coarse clayey gravel; the coarser fraction consists of shale fragments	7	28
	Clay, sandy, gray, and fine gravel and shale pebbles	11	39
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	1	40

162-069-17ABB
USGS 164
(Log modified from Brookhart and Powell, 1961)

Altitude: 1809 feet — Date drilled: 7/15/49

Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	3	4
	Sand, medium to coarse, light-brown, and fine gravel; the coarser fraction consists of shale fragments	15	19
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	30	49
	Clay, sandy, gray-brown, and fine to medium gravel and shale pebbles	8	57
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	48	105
	Sand, coarse, gray, and fine clayey gravel; the coarser fraction consists of shale fragments	2	107
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	5	112
Undifferentiated:			
	Shale, light-brown	10	122
Pierre Shale:			
	Shale, gray	18	140

162-069-17ACD
USGS 444
(Log modified from Brookhart and Powell, 1961)

Altitude: 1807 feet — Date drilled: 7/10/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Gravel, fine to coarse, and very coarse clayey sand	14	14
	Clay, gray, and fine to medium gravel and shale pebbles	23	37
	Gravel, fine to medium, gray, clayey; the coarser fraction consists of shale fragments	11	48
	Clay, gray-brown, and fine to medium gravel and shale pebbles	6	54
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	48	102
	Gravel, fine, gray, very clayey; the coarser fraction consists of shale fragments	18	120
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	11	131
Pierre Shale:			
	Shale, gray	9	140

162-069-17DCA
(Log modified from C. A. Simpson & Son)

Altitude: 1805 feet — Date drilled: 9/ /66

Topsoil	1	1
Clay, gray	1	2
Clay, yellow	11	13
Sand and gravel, very clayey	6	19
Sand and gravel; some clayey	3	22
Clay, gravelly; and rocks	2	24
Gravel, hardpacked; no water	1	25
Clay, gravelly, blue; rocks	9	34
Rock	1	35
Sand and gravel, hard	3	38
Sand and gravel, clayey	3	41
Sand and gravel, slightly clayey; water	11	52

162-069-17DCD
(Log modified from C. A. Simpson & Son)

Altitude: 1802 feet — Date drilled: 6/14/62

Topsoil	2	2
Clay, yellow	8	10
Clay, gravelly	4	14
Gravel	11	25
Clay, blue	2	27

162-069-18AAA
USGS 160
(Log modified from Brookhart and Powell, 1961)

Altitude: 1825 feet — Date drilled: 7/06/49

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, light-brown, and fine to medium gravel and shale pebbles	11	12
	Clay, gray, and fine to medium gravel and shale pebbles	2	14
	Sand, very coarse, gray, and medium clayey, gravel; the coarser fraction consists of shale fragments	5	19
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	20	39
	Clay, gray-brown, and fine gravel and shale pebbles	31	70
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	20	90
	Clay, gray, and fine to medium gravel and shale pebbles	23	113
Undifferentiated:			
	Sand, very fine, silty, gray; probably drift but may be in part Pierre Shale or other bedrock	20	133
Pierre Shale:			
	Shale, gray	17	150

162-069-18BBB
NDSWC 4-797
(Log from Schmid and Lindvig, 1964)

Altitude: 1855 feet — Date drilled: 7/17/63

Glacial drift:			
	Gravel, granular to pebbly, sandy, subangular to rounded	2	2
	Till, moderate-yellowish-brown, calcareous, oxidized	10	12
	Till, olive-gray, calcareous	20	32
	Till, dusky-yellowish-brown to olive-black, calcareous, partially oxidized; may be reworked oxidized till	19	51
	Sand, clayey; rounded quartz	1.5	52.5
	Till, moderate-yellowish-brown, calcareous, oxidized	10.5	63
	Gravel, granular to pebbly, sandy, subangular to rounded	4	67
	Till, moderate-yellowish-brown, calcareous, oxidized	33	100
	Till, olive-gray, calcareous	7	107
	Gravel, granular to cobbly, sandy, very angular to rounded	18	125
	Till, olive-gray, calcareous	12	137
	Till, light-olive-brown, calcareous, oxidized	21	158
	Till, olive-gray	10	168
	Sand, clayey to gravelly	8	176
	Till, olive-gray, calcareous	112	288
Pierre Shale:			
	Shale, dark-greenish-gray, silty, noncalcareous	16	304

162-069-18DDD
USGS 171
(Log modified from Brookhart and Powell, 1961)

Altitude: 1836 feet — Date drilled: 7/29/49

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine to medium gravel	17	18
	Sand, medium to very coarse, and fine gravel; the coarser fraction consists of shale fragments	21	39
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	17	56
	Clay, sandy, gray-brown, and fine to medium gravel and shale pebbles	15	71
	Clay, gray, and fine to medium gravel and shale pebbles	14	85
	Clay, gray-brown, and medium gravel and shale pebbles	10	95
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	5	100
	Clay, gray, and fine to medium gravel and shale pebbles	44	144
	Silt, sandy and pebbly; probably till but may be in part lacustrine deposits	31	175
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	21	196
Pierre Shale:			
	Shale, gray	14	210

162-069-20AAB1
NDSWC 9-797

Altitude: 1810 feet — Date drilled: 7/23/63

Glacial drift:			
	Soil	2	2
	Gravel, fine to vey coarse, oxidized; contains considerable coarse sand	10	12
	Sand, medium to very coarse, gravelly	15	27
	Clay, silty, sandy, pebbly, dark-greenish-gray to olive-gray (till)	26	53
	Gravel, fine to very coarse; contains cobbles	11	64
	Clay, silty, sandy, gravelly, olive-gray	3	67
	Gravel, sandy	27	94

162-069-20AAB2
(Log modified from C. A. Simpson & Son)

Altitude: 1810 feet — Date drilled: 10/26/65

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow; stones	17	18
	Clay, blue	22	40
	Clay, sandy, blue	14	54
	Sand	4	58

162-069-20ABA1
USGS 448
(Log modified from Brookhart and Powell, 1961)

Altitude: 1804 feet — Date drilled: 7/17/51

Glacial drift:			
	Topsoil, black	2	2
	Sand, coarse, light-brown, and fine to medium gravel	2	4
	Sand, very coarse, and fine to coarse angular gravel	24	28
	Clay, gray, and medium gravel and shale pebbles	16	44
	Sand, very coarse, gray, and fine to coarse gravel; the finer fraction consists of shale fragments	26	70
	Sand, very coarse, gray, and fine clayey gravel; the coarser fraction consists of shale fragments	11	81
	Clay, gray, and fine gravel and shale pebbles	43	124
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	7	131
Pierre Shale:			
	Shale, gray	9	140

162-069-20ACD
USGS 449
(Log from Brookhart and Powell, 1961)

Altitude: 1803 feet — Date drilled: 7/20/51

Till and associated sand and gravel deposits:			
	Topsoil, black	3	3
	Sand, medium to very coarse	5	8
	Gravel, fine; the finer fraction consists of shale fragments	15	23
	Clay, gray, and fine to medium gravel and shale pebbles	17	40

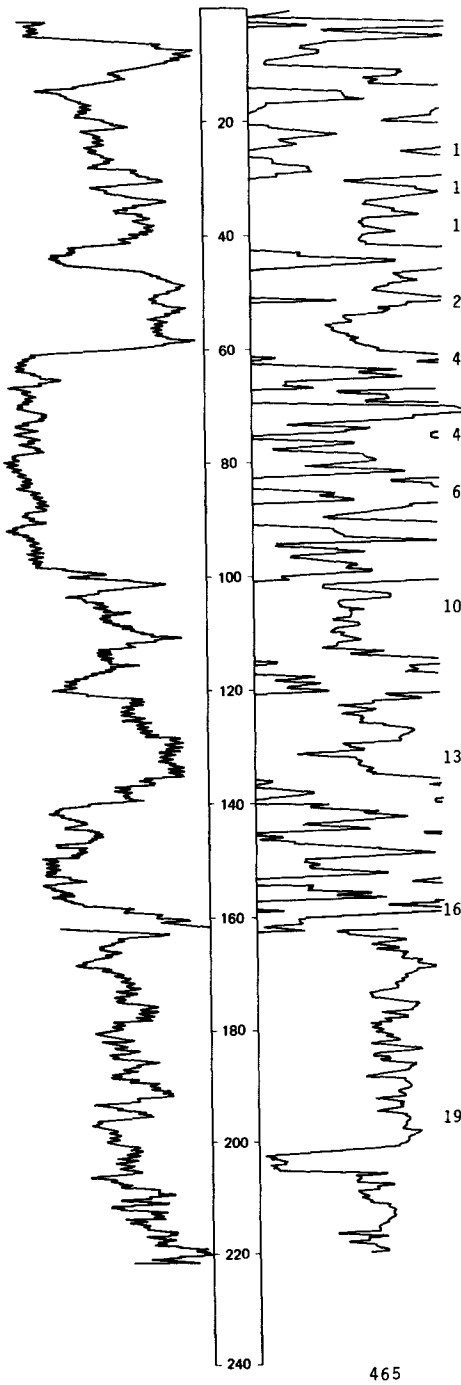
NDSWC 5664, 5664A

LOCATION: 162-069-20DDD1,2

DATE DRILLED: 10/19/79

ALTITUDE: 1797
(FT, NGVD)

DEPTH: 227
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-3	Soil, clayey, dark-brown.
3-10	Clay, silty, sandy, pebbly, dark-brown, oxidized (till?).
10-12	Clay, sandy, olive-gray.
12-14	Sand, gravelly.
14-28	Sand, very fine, silty, dirty, olive-gray; contains lenses of clayey silt.
28-42	Clay, silty, sandy, pebbly, olive-gray (till).
42-45	Sand, very fine to very coarse, predominately fine to medium.
45-60	Clay, sandy, silty, pebbly, olive-gray (till).
60-100	Sand, very fine to very coarse, predominately medium to coarse; contains about 25 percent fine to medium gravel and several silty lenses.
100-135	Clay, silty, sandy, pebbly, olive-gray (till).
135-161	Sand, very fine to very coarse, predominately coarse; contains several silty and clayey lenses and about 20 percent gravel.

FOX HILLS SANDSTONE

161-197	Siltstone, sandy, calcareous, brittle, olive-gray.

PIERRE SHALE

197-227	Shale, slightly silty, black.

162-069-22CCB
(Log modified from C. A. Simpson & Son)

Altitude: 1800 feet — Date drilled: 11/26/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	21	22
	Clay, sandy, blue; rocks	167	189
	Sand, coarse; clean	2	191

162-069-27CBC
(Log modified from Church Well Boring)

Altitude: 1805 feet — Date drilled: 7/27/76

	Topsoil, black	1	1
	Clay, yellow	13	14
	Gravel	8	22
	Clay, blue	12	34

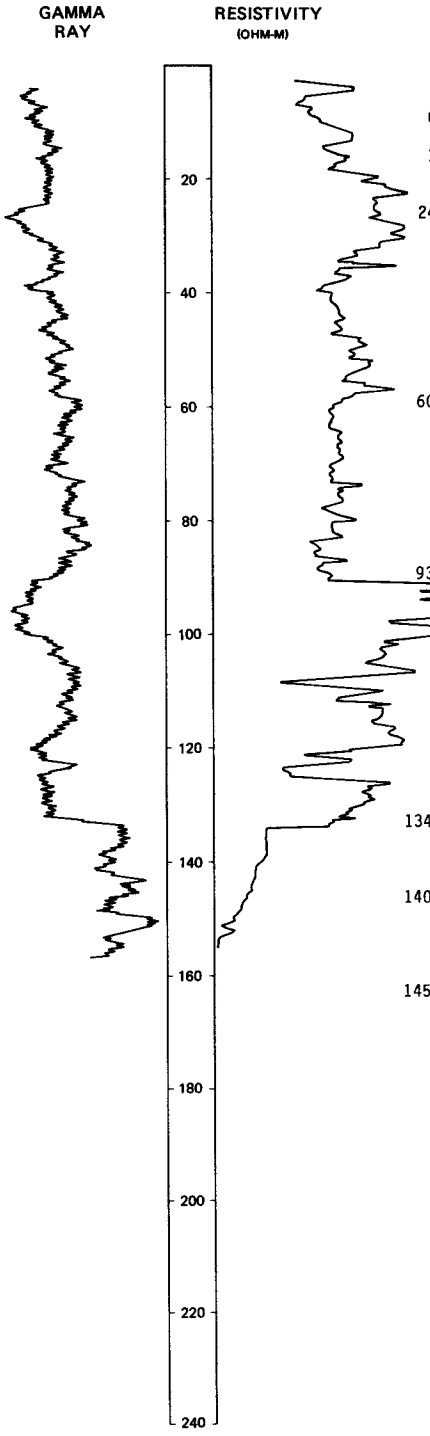
NDSWC 5874

LOCATION: 162-069-34DDD

DATE DRILLED: 10/03/80

ALTITUDE: 1785
(FT, NGVD)

DEPTH: 161
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-24	Clay, very silty, yellowish-brown, oxidized (till).
24-60	Clay, silty, olive-gray (till); interbedded with lenses of coarse gravel.
60-93	Clay, very silty, pebbly, olive-gray (till).
93-134	Clay, sandy, pebbly, brownish-gray, oxidized (till).
134-140	Clay, sandy, pebbly, yellowish-brown, oxidized (till).
140-145	Clay, very silty, dark-brownish-gray (till).

PIERRE SHALE

145-161	Shale, siliceous, well-indurated, dark-gray.

162-070-01BDC
(Log modified from C. A. Simpson & Son)

Altitude: 1930 feet — Date drilled: 10/20/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Clay, gravelly, yellow	2	4
	Sand and gravel, clayey	6	10
	Clay, very sandy, blue; rocks	78	88
	Sand and gravel, clayey	2	90
	Clay, very gravelly	3	93

162-070-05DBA
(Log modified from C. A. Simpson & Son)

Altitude: 2050 feet — Date drilled: 4/24/64

	Topsoil	1	1
	Clay	1	2
	Clay, gravelly, hard; pebbles and boulders	10	12
	Clay, gravelly, gray	3	15
	Clay, slightly sandy, gray, soft	95	110
	Clay, sandy and gravelly, blue; with a few rocks	87	197
	Sand and gravel	3	200

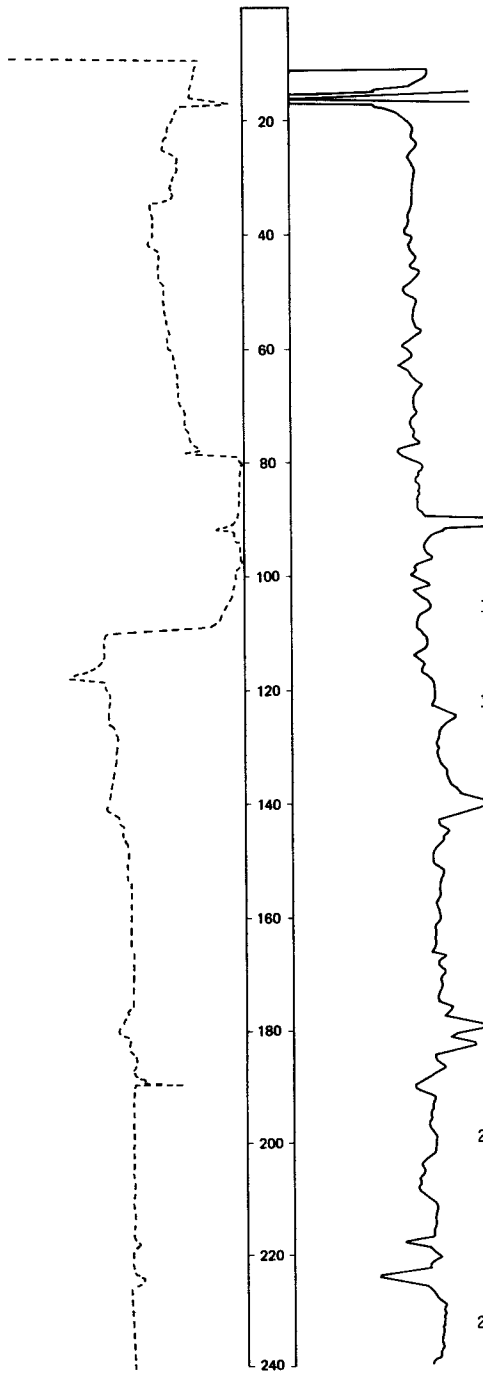
USGS 5

LOCATION: 162-070-06DAA

DATE DRILLED: 8/15/71

ALTITUDE: 2020
(FT, NGVD)

DEPTH: 283
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-24	Till, sandy, calcareous, moderate-yellowish-brown, oxidized.
24-63	Till, sandy, calcareous, medium-gray.
63-90	Till, olive-gray; occasional cobbles and boulders.
90-91	Boulder, granite.
91-103	Till, calcareous, olive-gray.
103-124	Till, olive-gray; gravelly in places.
124-203	Till, olive-gray; interbedded with thin lenses of sandy gravel; occasional cobble or boulder.
203-236	Till, calcareous, olive-gray; occasional cobble or boulder.
236-252	Till, sandy, gravelly, iron-stained, moderate-yellowish-brown, oxidized.

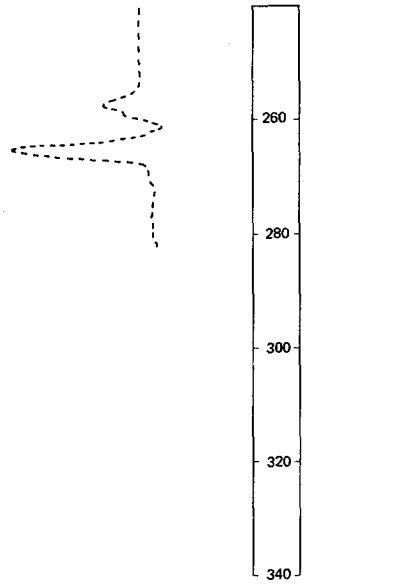
USGS 5, continued

LOCATION: 162-070-06DAA

DATE DRILLED: 8/15/71

ALTITUDE: 2020 (FT, NGVD)

DEPTH: 283 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

252-256	Gravel, medium to coarse, sandy, subrounded to rounded; oxidized iron; about 50 percent detrital shale, 30 percent carbonate, and 20 percent granitic and sandstone pebbles.
256-259	Till, gravelly, medium-gray.
259-267	Gravel, fine to coarse, subrounded to rounded; about 20 percent coarse sand, 30 percent detrital shale, and 30 percent carbonate pebbles; remainder granitic and sandstone pebbles.
267-283	Till, gravelly to sandy, olive-gray; granite boulder at 283 feet.

162-070-07ACA
(Log modified from C. A. Simpson & Son)

Altitude: 2040 feet — Date drilled: 6/03/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, gravelly, yellow; rocks	136	137
	Hard layer	1	138
	Clay, blue; bad odor; a little clayey water	7	145
	Hard layer	1	146
	Clay, gravelly, gray; rocks	4	150
	Gravel, coarse, very clayey	1	151
	Clay, gravelly, gray; rocks	3	154
	Sand, fine, clayey, and coarse gravel	1	155
	Clay, very sandy and gravelly, gray; rocks	15	170
	Clay, gravelly, blue	16	186
	Sand and gravel	10	196

162-070-08ADC
(Log modified from C. A. Simpson & Son)

Altitude: 2020 feet — Date drilled: 8/21/64

	Topsoil	1	1
	Clay, yellow	1	2
	Clay, gravelly, yellow; boulders	3	5
	Gravel, clayey; rocks	7	12
	Clay, very sandy, soft, gray	42	54
	Clay, gravelly, gray	43	97
	Sand	3	100

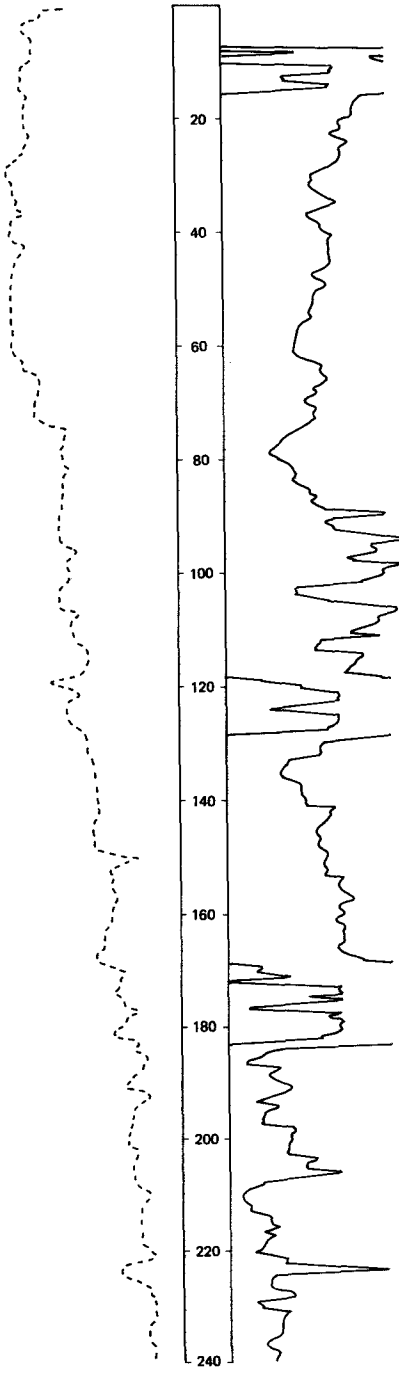
USGS 8

LOCATION: 162-070-08DAA1

DATE DRILLED: 12/05/73

ALTITUDE: 2020 (FT, NGVD)

DEPTH: 360 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-2	Gravel, fine to medium, reddish-brown, oxidized.
2-16	Till, sandy, yellowish-brown, oxidized.
16-87	Till, medium-dark-gray; some very thin lenses of gravel.
87-96	Sand, fine to medium, subrounded; predominately carbonate and shale grains.
96-99	Clay, silty, olive-gray.
99-102	Sand, fine to medium, subrounded.
102-105	Clay, silty, olive-gray.
105-112	Sand, fine to medium, subrounded to rounded; carbonate, shale, and granitic grains.
112-117	Clay, olive-gray.
117-130	Sand, fine to medium, subrounded to rounded; carbonate, shale, and granitic grains.
130-150	Till, sandy, olive-gray.
150-151	Boulder, limestone.
151-155	Till, sandy, olive-gray.
155-156	Boulder, limestone.
156-167	Till, sandy to gravelly, olive-gray.
167-168	Boulder.
168-182	Sand, medium to coarse, subrounded to rounded; about 25 percent medium gravel; mostly carbonate and shale grains.
182-207	Till, sandy, yellowish-brown; about 50 percent sand.
207-250	Till, olive-gray; occasional thin lenses of sand and gravel.

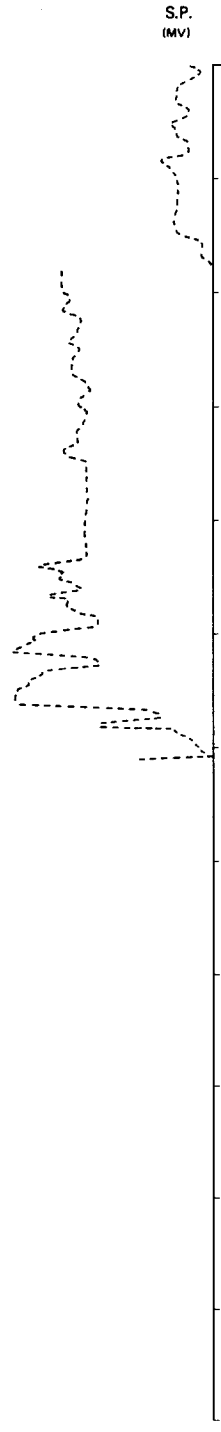
USGS 8, continued

LOCATION: 162-070-08DAA1

DATE DRILLED: 12/05/73

ALTITUDE: 2020
(FT, NGVD)

DEPTH: 360
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

250-275	Till, sandy, olive-gray; more gravelly till than from 207 to 250 feet.
275-295	Till, sandy, medium-gray.
295-326	Till, dark-gray, tight.

FOX HILLS SANDSTONE

326-340	Siltstone, clayey, greenish-gray.
340-346	Sandstone, very fine to fine, indurated, greenish-gray.
346-353	Sandstone, fine, unconsolidated, greenish-gray.
353-360	Shale, silty, greenish-gray.

162-070-08DAA2
USGS 9
(Log modified from Randich, 1975)

Altitude: 2020 feet — Date drilled: 12/05/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, fine to coarse, oxidized; mostly carbonate, shale, and granitic pebbles	18	18
	Till, medium-gray, silty; boulder at 93 feet	76	94
	Sand, fine to medium, clayey	3	97
	Boulder	1	98
	Till, medium-gray, very silty	20	118
	Sand, fine to coarse, silty to clayey, subrounded, fairly tight	13	131
	Boulder, sandstone	1	132
	Till, olive-gray, silty	3	135
	Boulder, limestone	1	136
	Till, olive-gray, silty to sandy	6	142
	Gravel, fine to coarse, sandy; interbedded with thin lenses of silty clay	4	146
	Till, olive-gray, sandy	14	160
	Till, olive-gray, gravelly to bouldery	13	173
	Till, olive-gray; interbedded with lenses of sandy gravel	5	178
	Boulder, dolomite	1	179
	Till, yellowish-buff, sandy, oxidized	26	205
	Boulder, granite	1	206
	Till, medium-gray, tight; older till	14	220

162-070-08DDD
(Log modified from C. A. Simpson & Son)

Altitude: 2000 feet — Date drilled: 11/17/69

	Topsoil	1	1
	Gravel; rocks	16	17
	Clay, sandy, blue	142	159
	Sand, coarse	1	160
	Sand, fine, clayey	110	270
	Sandstone	10	280

162-070-09CBB
(Log modified from Aberle Well Co.)

Altitude: 2020 feet — Date drilled: 1973

	Topsoil	1	1
	Rock and gravel	6	7
	Clay, yellow	16	23
	Clay, sandy, blue	7	30
	Sand, blue	6	36
	Clay, blue	4	40
	Sand, gravelly	1	41
	Clay, blue	14	55

162-070-11BAA1
NDSWC 8-797
(Log from Schmid and Lindvig, 1964)

Altitude: 2000 feet — Date drilled: 7/23/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Fill	6	6
	Sand, medium to very coarse, gravelly	6	12
	Till, moderate-yellowish-brown, calcareous, oxidized	6	18
	Till, olive-gray, calcareous	45	63

162-070-11BAA2
(Log modified from Aberle Well Co.)

Altitude: 2005 feet — Date drilled: 1973

	Topsoil	1	1
	Rocks and gravel	3	4
	Clay, yellow	16	20
	Gravel	4	24
	Clay, blue	16	40

162-070-12CCC
USGS 162
(Log modified from Brookhart and Powell, 1961)

Altitude: 1945 feet — Date drilled: 7/09/49

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, silty, light-brown, and fine gravel	18	19
	Clay, silty, gray, and fine gravel and shale pebbles	20	39
	Sand, coarse, gray, and fine clayey gravel and shale pebbles	3	42
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	8	50
	Clay, gray, and fine to medium gravel and shale pebbles	40	90
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	8	98
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	14	112
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	55	167
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	59	226
	Clay, sandy, gray-brown, and fine to medium gravel and shale pebbles	9	235
Undifferentiated:			
	Clay, silty, gray-brown, sandy and pebbly; probably till but may be in part lacustrine deposits	8	243
	Clay, sandy, gray, and fine gravel and shale pebbles	30	273
Pierre Shale:			
	Shale, silty, gray	17	290

162-070-12DDD
USGS 161
(Log modified from Brookhart and Powell, 1961)

Altitude: 1855 feet — Date drilled: 7/07/49

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine to medium gravel	7	8
	Sand, medium to very coarse, light-brown, and fine clayey gravel	6	14
	Sand, medium to very coarse, gray-brown, clayey; the coarser fraction consists of shale fragments	26	40
	Sand, very coarse, gray-brown, and fine clayey gravel; the coarser fraction consists of shale fragments	10	50
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	32	82
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	21	103
	Gravel, fine to medium, and very coarse clayey sand; the coarser fraction consists of shale fragments	25	128
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	13	141
Undifferentiated:			
	Clay, sandy, gray-brown, and fine gravel; could be either till or bedrock	9	150
	Clay, silty, gray, very fine sand, and fine gravel; could be either till or bedrock	30	180
	Clay, silty and pebbly, gray, and very fine sand	35	215
	Clay, silty, gray, fine sand, and fine gravel; could be either till or bedrock	75	290
Pierre Shale:			
	Shale, gray	30	320

162-070-14BBB
USGS 163
(Log modified from Brookhart and Powell, 1961)

Altitude: 1990 feet — Date drilled: 7/12/49

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Clay, sandy, light-gray, and fine to medium gravel	2	4
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	7	11
	Gravel, medium to coarse, and shale pebbles	3	14
	Gravel, fine to medium, and very coarse sand	13	27
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	129	156
	Clay, sandy, gray-brown, and fine to medium gravel and shale pebbles	12	168
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	7	175
Undifferentiated:			
	Clay, silty and sandy, light-brown, and very fine to fine gravel; could be either till or bedrock	42	217
	Clay, silty, gray, and very fine sand; could be either till or bedrock	23	240

162-070-14CBC
(Log modified from Aberle Well Co.)

Altitude: 1990 feet — Date drilled: 1973

	Topsoil	1	1
	Clay, yellow	29	30
	Clay, blue	26	56
	Sand, fine	18	74

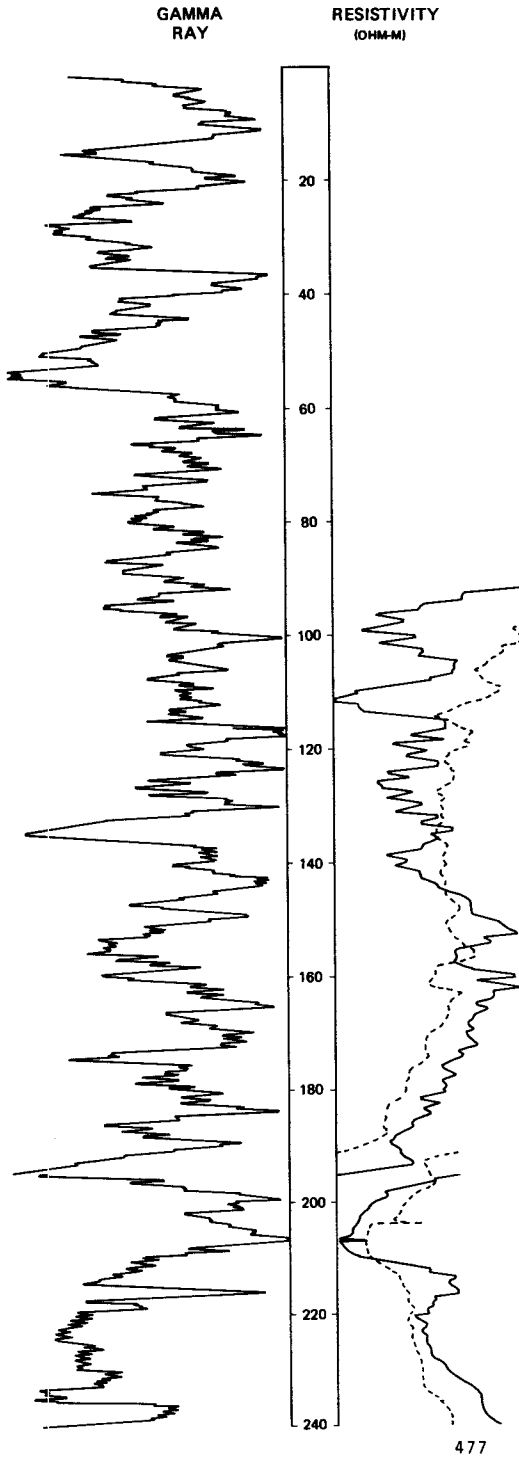
NDSWC 10

LOCATION: 162-070-15BAB1

DATE DRILLED: 12/06/73

ALTITUDE: 2000
(FT, NGVD)

DEPTH: 360
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, sandy, brownish-black.
1-2	Gravel, fine to coarse, sandy, oxidized.
2-30	Till, sandy, yellowish-brown, oxidized.
30-32	Gravel, medium to coarse, well-rounded.
32-44	Till, silty, olive-gray.
44-47	Gravel, medium, sandy, rounded.
47-115	Till, sandy, olive-gray; some cobbles and boulders.
115-147	Till, sandy to gravelly, olive-gray.
147-153	Gravel, sandy, fine to coarse.
153-197	Till, olive-gray; occasional cobbles and boulders.
197-252	Till, sandy to gravelly, grayish-brown.

NOTE:

----- Long normal

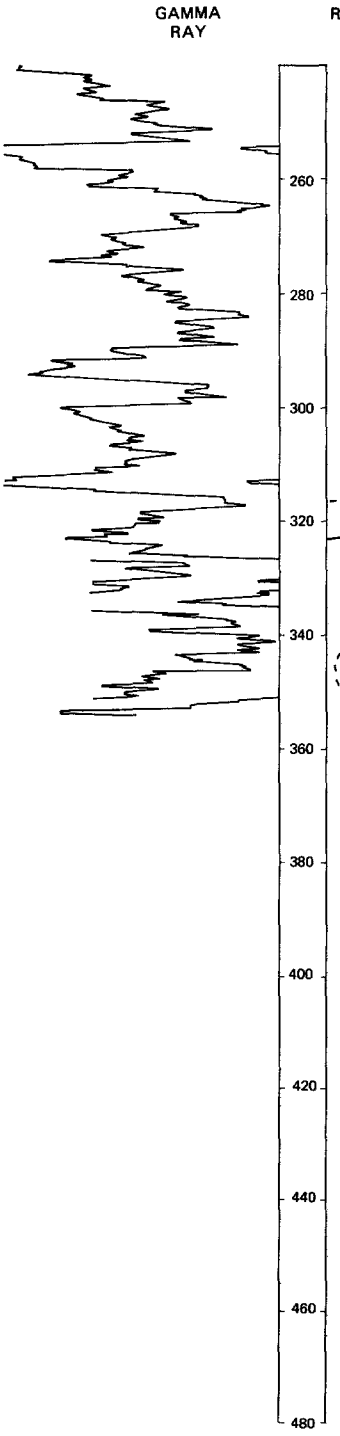
——— Short normal

LOCATION: 162-070-15BAB1

DATE DRILLED: 12/06/73

ALTITUDE: 2000
(FT, NGVD)

DEPTH: 360
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

252-255 Gravel, sandy, fine to coarse.

255-291 Till, silty, olive-gray.

291-295 Sand, rounded, fine to coarse.

295-312 Till, sandy, yellowish-gray to brown, oxidized; older till.

312-314 Sand, silty, fine to medium.

314-326 Till, very sandy, dark-gray.

FOX HILLS SANDSTONE

326-332 Clay, plastic, greenish-gray.

332-347 Sandstone, very fine to fine, clayey, grayish-green.

347-360 Siltstone, semiconsolidated, grayish-green.

NOTE:

-----Long normal

———Short normal

162-070-15BAB2
NDSWC 10A
(Log from Randich, 1975)

Altitude: 2000 feet — Date drilled: 1974

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Till, yellowish-brown, sandy, oxidized	29	30
	Gravel, medium to coarse, sandy, rounded	15	45
	Till, olive-gray, silty	15	60

162-070-16ADA
(Log *modified from C. A. Simpson & Son*)

Altitude: 2010 feet — Date drilled: 12/16/67

	Clay, sandy, yellow	24	24
	Clay, sandy, blue	191	215
	Gravel	6	221
	Clay, sandy, yellow	13	234
	Clay, sandy, blue	67	301
	Sand, coarse	5	306
	Clay	--	306

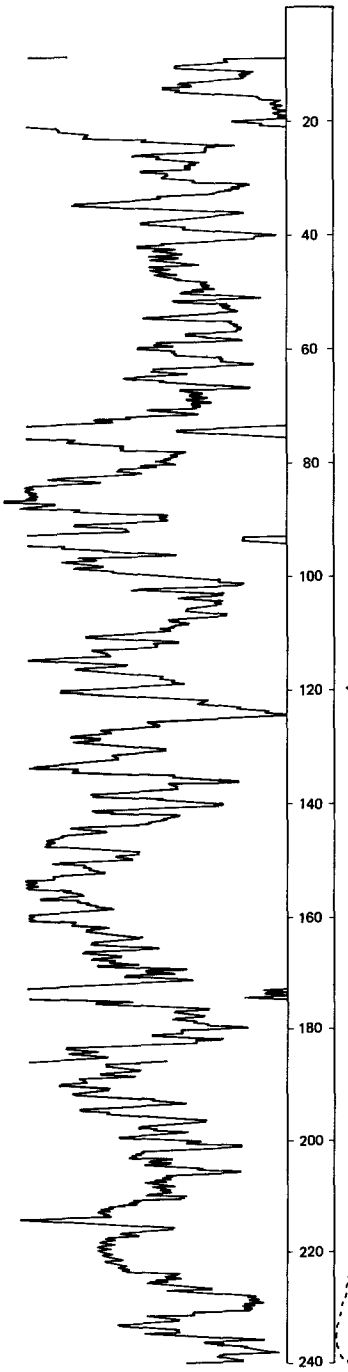
USGS 11

LOCATION: 162-070-17AAA

DATE DRILLED: 12/07/73

ALTITUDE: 2009 (FT, NGVD)

DEPTH: 320 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12	Gravel, fine to coarse, subrounded, oxidized; carbonate, granitic, and silicate pebbles.
12-41	Sand, fine to coarse, rounded; interbedded with thin lenses of silty clay; about 60 percent detrital shale and 30 percent carbonate grains.
41-100	Till, silty, tight, medium-gray; interbedded thin sand lenses at 72 and 92 feet.
100-115	Till, silty, tight, olive-gray.
115-119	Cobbles and boulders.
119-157	Till, silty, medium-gray.
157-159	Gravel, sandy, fine to coarse; saturated.
159-162	Till, sandy, dark-gray.
162-163	Gravel, sandy, fine to coarse.
163-188	Till, gravelly, olive-gray; boulders.
188-205	Till, sandy, medium-gray.
205-217	Till, sandy, yellowish-brown, oxidized; boulders.
217-221	Gravel, fine to medium, silty to sandy; boulders.
221-250	Till, silty, tight, dark-gray.

NOTE:

------Long normal

———Short normal

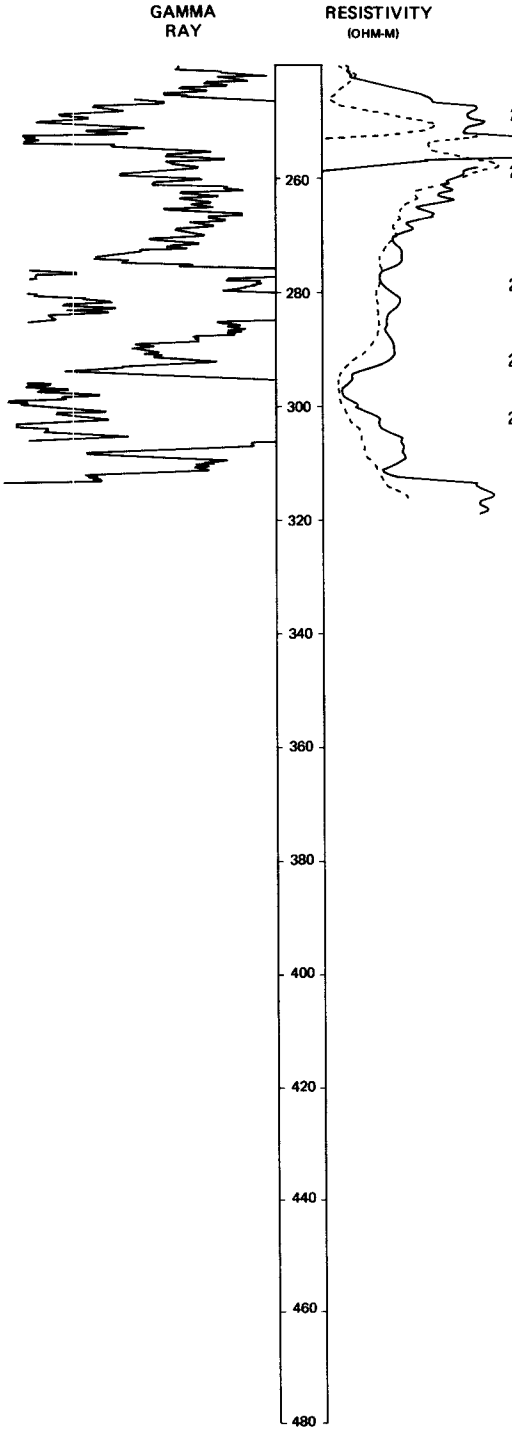
USGS 11, continued

LOCATION: 162-070-17AAA

DATE DRILLED: 12/07/73

ALTITUDE: 2009
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

250-257 Gravel, sandy, silty, fine to medium; saturated.

257-270 Till, silty, dark-gray.

FOX HILLS SANDSTONE

270-288 Siltstone, bentonitic, medium-light-gray.

288-298 Shale, silty, light-gray; leached appearance.

298-320 Siltstone, sandy, bentonitic, light-gray.

NOTE:

----- Long normal

——— Short normal

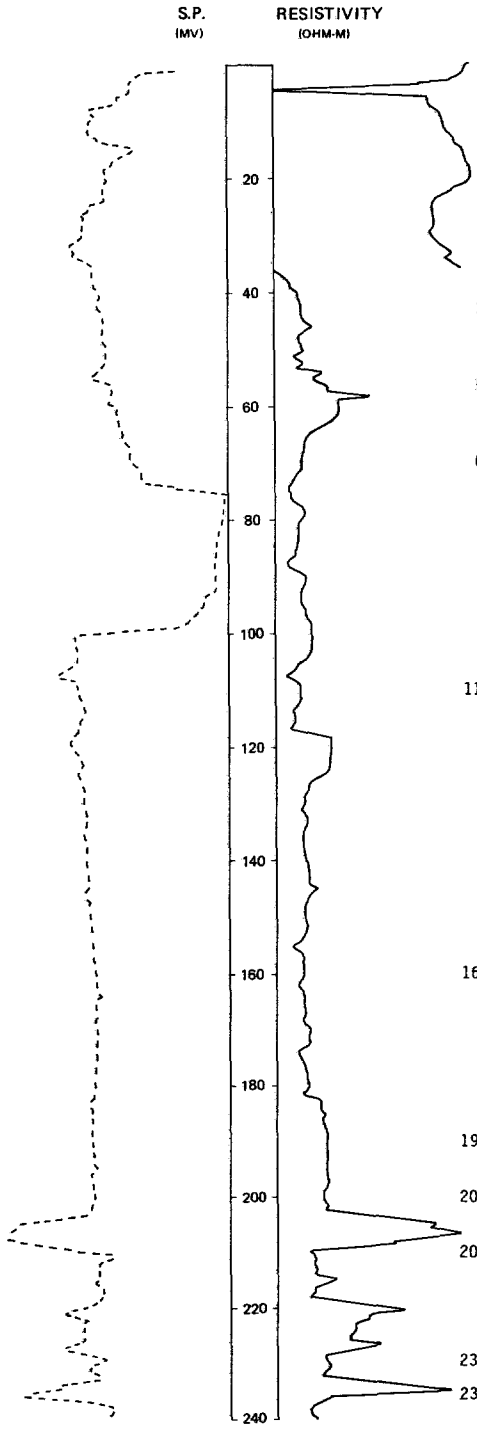
USGS 6

LOCATION: 162-070-18ADD

DATE DRILLED: 8/15/71

ALTITUDE: 2040 (FT, NGVD)

DEPTH: 380 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-3	Till, clayey, moderate-yellowish-brown; silty in places.
3-32	Clay, laminated, medium-light-gray; iron stains; lignite smears.
32-58	Till, silty, medium-dark-gray.
58-67	Till, silty to sandy, olive-gray; some boulders; occasional gravel lenses.
67-110	Till, very silty, olive-gray.
110-161	Till, very silty to sandy, olive-gray.
161-190	Till, silty to sandy, olive-gray; lignite smears.
190-203	Till, gravelly, olive-gray; occasional cobble or boulder.
203-209	Gravel, sandy, fine to medium.
209-234	Till, olive-gray; interbedded with thin lenses of gravel.
234-236	Gravel, sandy, medium.
236-242	Till, yellowish-brown, oxidized.

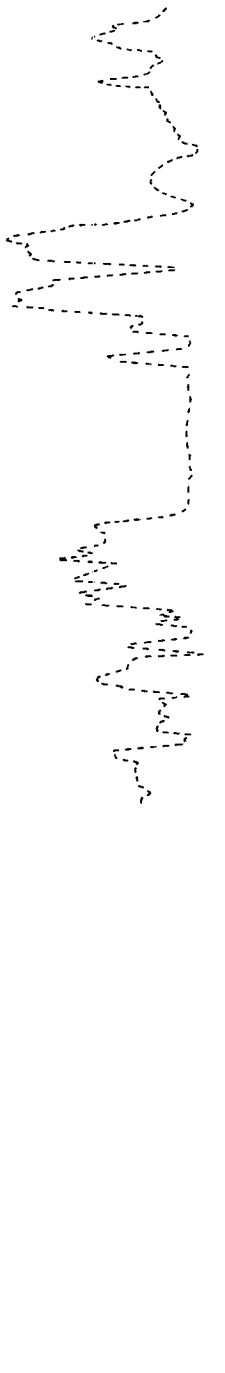
USGS 6, continued

LOCATION: 162-070-18ADD

DATE DRILLED: 8/15/71

ALTITUDE: 2040
(FT, NGVD)

DEPTH: 380
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

242-248	Gravel, medium to coarse, sandy, oxidized.
248-258	Till, gravelly, yellowish-brown, oxidized.
258-276	Till, moderate-yellowish-brown, oxidized; iron stains.
276-284	Gravel, medium to coarse; some clayey till lenses.
284-286	Till, silty, olive-gray.
286-293	Gravel, medium, sandy.
293-336	Till, sandy to gravelly, olive-gray.
336-344	Gravel, fine to medium, sandy.

FOX HILLS SANDSTONE

344-380	Clay, silty to sandy, medium-bluish-gray.

162-070-19ABC
(Log modified from Aberle Well Co.)

Altitude: 2020 feet — Date drilled: 11/11/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, brown	29	30
	Clay, blue; rocks	54	84

162-070-19DBA
(Log modified from Aberle Well Co.)

Altitude: 1990 feet — Date drilled: 9/24/74

	Topsoil	1	1
	Clay, brown	15	16
	Gravel, brown	2	18
	Clay, blue	26	44

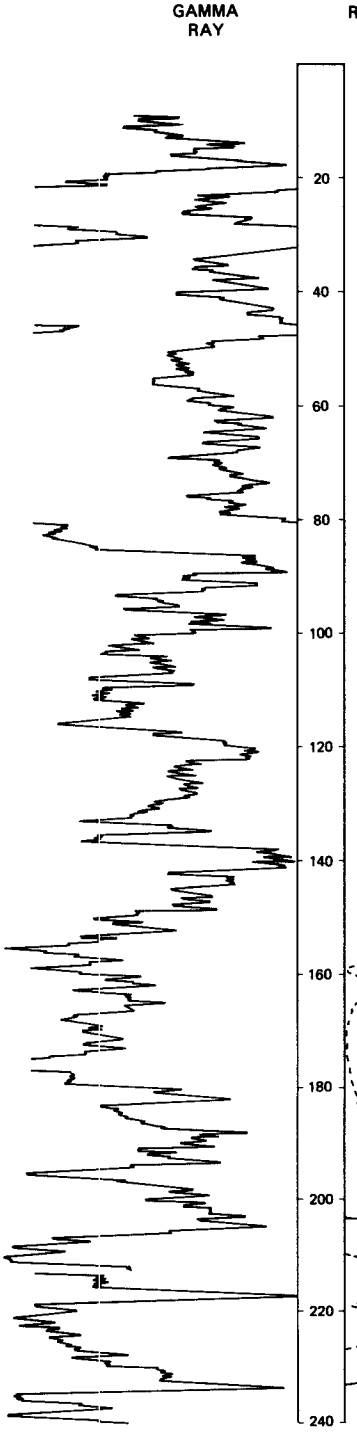
USGS 12

LOCATION: 162-070-20AAB

DATE DRILLED: 12/07/73

ALTITUDE: 1970
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12	Gravel, fine to coarse, subangular, oxidized.
12-22	Till, silty, olive-gray.
22-83	Gravel, fine to medium; sand from 29 to 32 and 45 to 47 feet; thin silty clay lenses from 73 to 83 feet; about 30 percent carbonate, 40 percent shale, and 30 percent granitic pebbles;
83-130	Till, brownish-gray, oxidized; some cobbles.
130-136	Gravel, clayey, fine to medium.
136-153	Till, silty, olive-gray.
153-173	Till, sandy, gravelly, yellowish-brown, oxidized.
173-178	Gravel, clayey, medium, angular.
178-206	Till, silty, medium-gray.
206-211	Sand, silty to clayey, medium.
211-214	Clay, silty, olive-gray.
214-218	Gravel, sandy, fine to medium.
218-221	Till, sandy, olive-gray.
221-231	Gravel, fine to medium; interbedded with lenses of silty clay.
231-263	Till, silty, medium-dark-gray.

NOTE:

-----Long normal

———Short normal

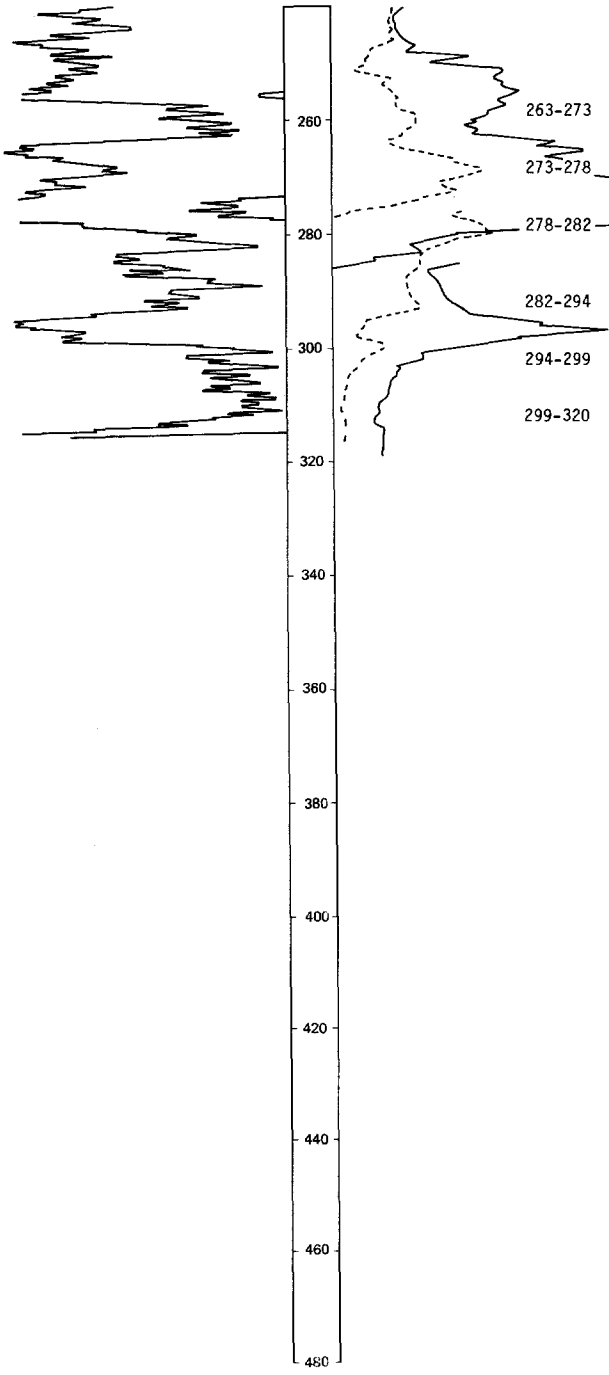
USGS 12, continued

LOCATION: 162-070-20AAB

DATE DRILLED: 12/07/73

ALTITUDE: 1970
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, CONTINUED

263-273 Till, sandy, dark-gray.

273-278 Gravel, fine to medium, angular.

278-282 Till, silty, dark-gray.

FOX HILLS SANDSTONE

282-294 Clay, silty, bentonitic, medium-gray.

294-299 Sandstone, fine, indurated, medium-gray.

299-320 Siltstone, sandy, bentonitic, light-gray.

NOTE:

----- Long normal

——— Short normal

162-070-20AAC
USGS 21
(Log from Randich, 1975)

Altitude: 1960 feet — Date drilled: 12/12/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, fine to coarse, subrounded to rounded; cobbles; mostly carbonate pebbles	12	12
	Till, olive-gray, silty to sandy	26	38
	Till, olive-gray, very sandy, gravelly	5	43
	Till, olive-gray, silty	27	70
	Gravel, medium; interbedded with thin lenses of silty clay	10	80
	Till, olive-gray, silty	18	98
	Sand, fine to medium, gravelly	1	99
	Till, olive-gray, silty	3	102

162-070-20DBA
(Log modified from C. A. Simpson & Son)

Altitude: 1990 feet — Date drilled: 7/25/66

	Clay, yellow	22	22
	Clay, sandy, blue	56	78
	Clay, blue	72	150
	Clay, sandy, blue	77	227
	Sand, fine	25	252
	Sandstone	33	285

162-070-25BAA
(Log modified from C. A. Simpson & Son)

Altitude: 1900 feet — Date drilled: 10/ /65

	Clay, yellow	18	18
	Clay, blue	37	55
	Clay, gravelly, blue	9	64
	Clay, sandy, blue	48	112
	Clay, blue	8	120
	Sand, clayey	4	124
	Sand, clean	6	130

162-070-26AAA
(Log modified from Lee's Well Drilling)

Altitude: 1905 feet — Date drilled: 4/16/76

	Topsoil	1	1
	Clay, yellow	20	21
	Clay, blue	170	191
	Sandstone, dirty	3	194
	Shale, gray	2	196
	Sandstone, green	6	202
	Shale, gray	98	300

162-070-26CDC
(Log modified from C. A. Simpson & Son)

Altitude: 1880 feet — Date drilled: 10/12/68

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, gravelly, yellow	17	18
	Clay, sandy, blue	86	104
	Sand	3	107

162-070-26DAD
(Log modified from Lee's Well Drilling)

Altitude: 1890 feet — Date drilled: 3/10/73

	Topsoil	1	1
	Clay, sandy, yellow	18	19
	Clay, sandy, blue	115	134
	Sand	6	140

162-070-27BAB
(Log modified from Aberle Well Co.)

Altitude: 1920 feet — Date drilled: 11/11/74

	Topsoil	1	1
	Clay, brown	29	30
	Clay, blue	20	50
	Sand, blue	6	56
	Clay, blue	25	81

162-070-27CBC
(Log modified from Lee's Well Drilling)

Altitude: 1880 feet — Date drilled: 2/27/73

	Topsoil	1	1
	Clay, sandy, yellow	20	21
	Clay, sandy, blue	51	72
	Sand	4	76

162-070-28CCD
(Log modified from Lee's Well Drilling)

Altitude: 1890 feet — Date drilled: 2/23/73

	Topsoil	1	1
	Sand, yellow	18	19
	Sand, blue	150	169
	Sand	5	174

162-070-29BDB
(Log modified from C. A. Simpson & Son)

Altitude: 1930 feet — Date drilled: 11/20/70

	Fill	3	3
	Gravel and rocks	7	10
	Clay, sandy, blue	12	22
	Sand, fine, clayey	27	49
	Clay, sandy, blue	58	107
	Gravel, coarse	1	108

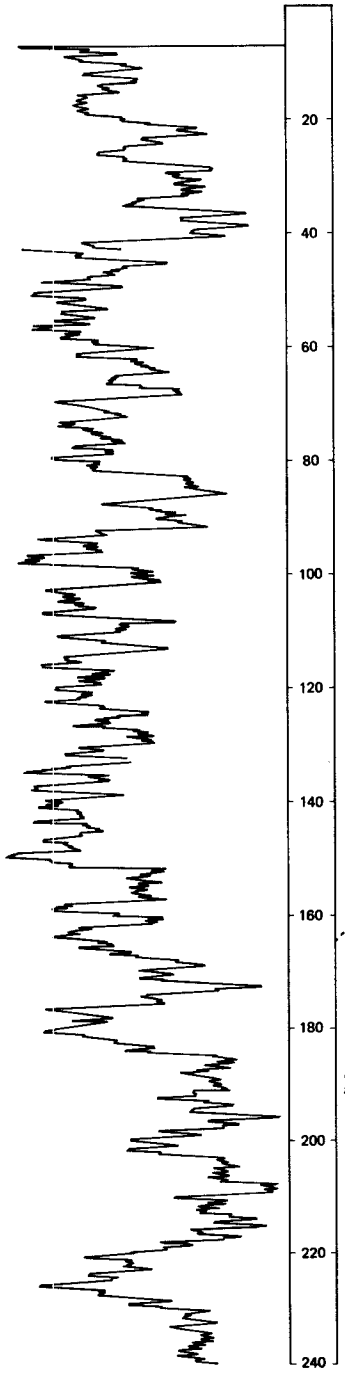
USGS 13

LOCATION: 162-070-29CBC

DATE DRILLED: 12/08/73

ALTITUDE: 1884
(FT, NGVD)

DEPTH: 500
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-4	Gravel, fine to medium, oxidized.
4-19	Sand, very fine to very coarse, oxidized.
19-82	Till, silty, olive-gray.
82-92	Till, tight, medium-gray.
92-115	Till, silty, olive-gray.
115-118	Till, sandy to gravelly, olive-gray.
118-146	Till, olive-gray; sandy gravel from 138 to 139 feet.
146-148	Gravel, fine, sandy.
148-152	Till, sandy, olive-gray.

FOX HILLS SANDSTONE

152-184	Clay, silty to sandy, light-gray; leached appearance.
184-218	Shale, silty, medium-gray.
218-230	Sandstone, very fine to medium, clayey, dark-greenish-gray.
230-316	Siltstone, semiconsolidated, greenish-gray.

NOTE:

------Long normal

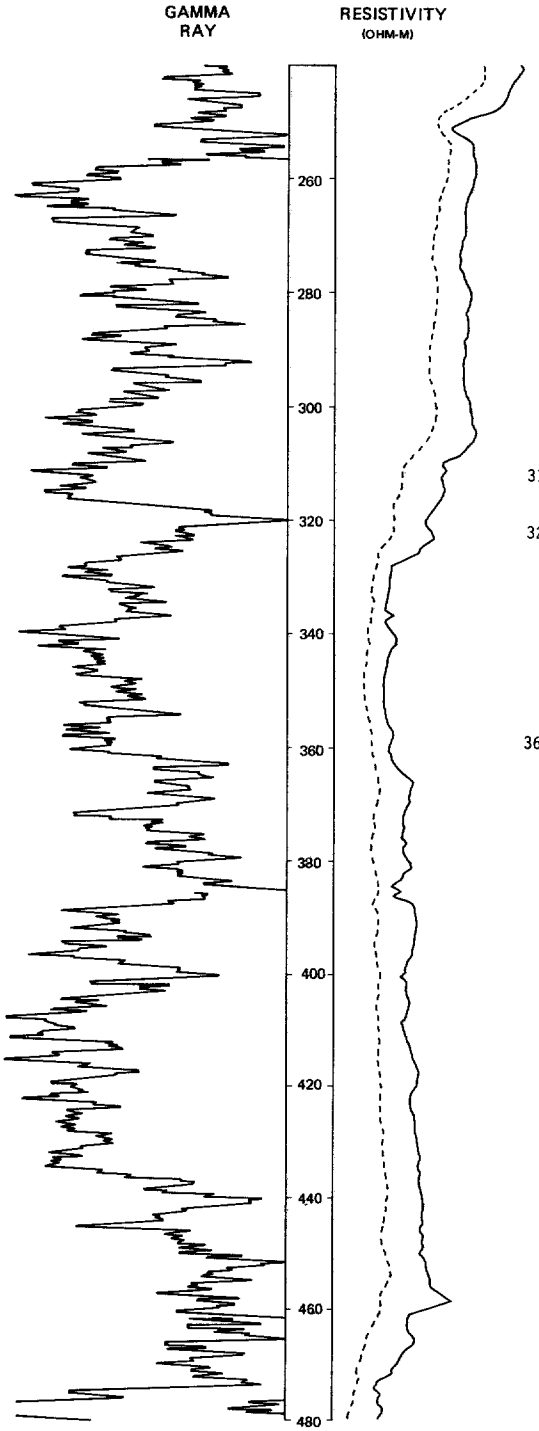
———Short normal

LOCATION: 162-070-29CBC

DATE DRILLED: 12/08/73

ALTITUDE: 1884
(FT, NGVD)

DEPTH: 500
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE,
Continued

316-326 Shale, fissile, grayish-brown.

326-362 Siltstone, bentonitic, greenish-gray; carbonaceous streaks.

PIERRE SHALE

362-436 Shale, dark-gray; some brownish-gray; some lenses are indurated.

NOTE:

- - - - - Long normal

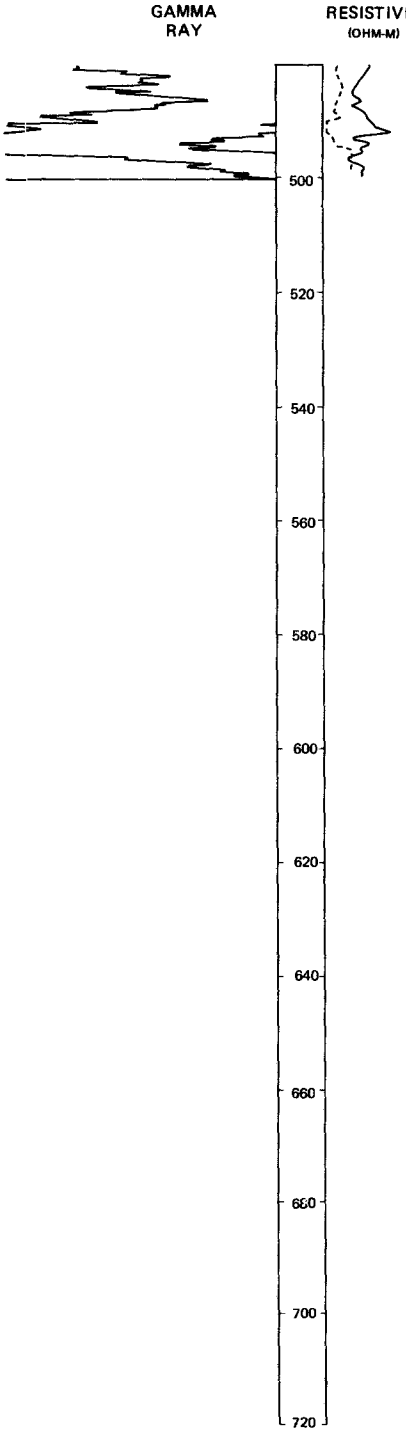
——— Short normal

LOCATION: 162-070-29CBC

DATE DRILLED: 12/08/73

ALTITUDE: 1884
(FT, NGVD)

DEPTH: 500
(FT)



DESCRIPTION OF DEPOSITS

PIERRE SHALE, Continued

436-500 Shale, siliceous, tight, bluish-black; bentonitic in places.

NOTE:

----- Long normal

———Short normal

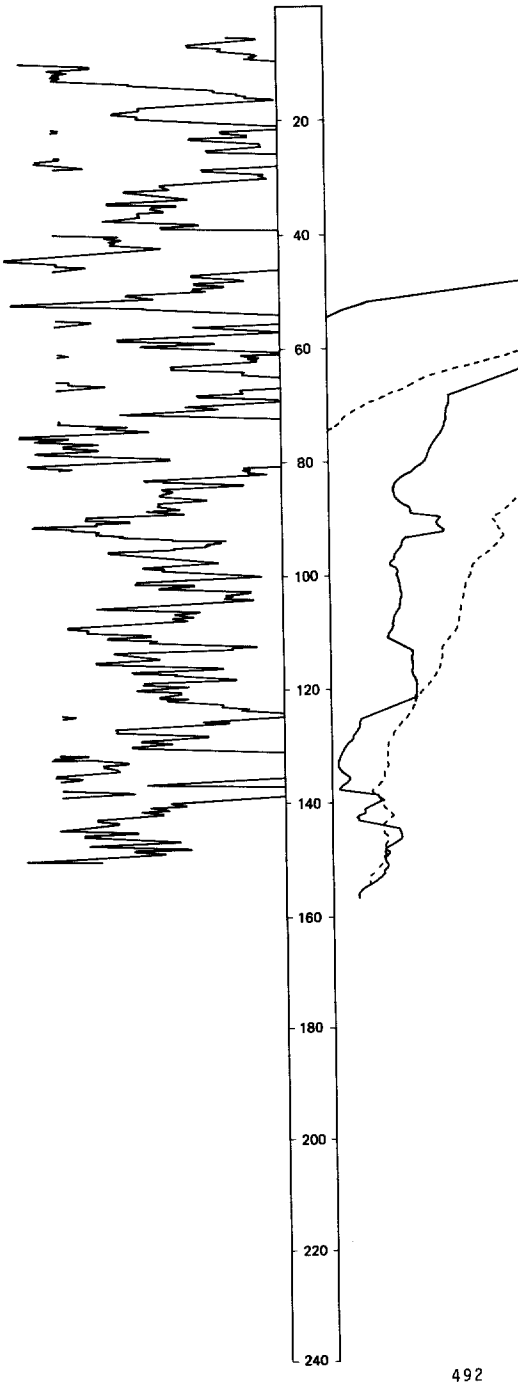
USGS 14

LOCATION: 162-070-30CCC

DATE DRILLED: 12/09/73

ALTITUDE: (FT, NGVD) 1850

DEPTH: (FT) 160



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12	Gravel, sandy, fine to coarse, subangular to rounded, oxidized.
12-17	Sand, fine to coarse, subrounded.
17-21	Clay, silty to sandy, medium-gray.
21-90	Till, olive-gray; occasional thin lenses of gravel; sandy from 51 to 52, 58 to 60, and 71 to 72 feet.
90-93	Gravel, sandy, fine to medium; mostly detrital shale.
93-112	Till, silty, olive-gray; some cobbles.
112-122	Sand, fine to coarse, gravelly, very clayey.
122-127	Till, silty, medium-gray.

FOX HILLS SANDSTONE

127-136	Clay, sandy, light-gray; leached appearance.
136-142	Sandstone, fine to medium, grayish-blue.
142-144	Siltstone, sandy to clayey, bluish-gray.
144-154	Sandstone, fine to medium, semiconsolidated, friable, grayish-blue; flows.
154-160	Shale, bluish-gray; interbedded with thin lenses of indurated sandstone.

NOTE:

----- Long normal

——— Short normal

162-070-32BBA
(Log modified from Aberle Well Co.)

Altitude: 1890 feet — Date drilled: 12/18/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	22	23
	Clay, blue	35	58
	Sand, fine	4	62

162-070-32CAA
(Log modified from Aberle Well Co.)

Altitude: 1870 feet — Date drilled: 6/05/73

	Topsoil	1	1
	Clay, yellow	21	22
	Clay, blue	48	70
	Sand, fine	1	71
	Clay, sandy	5	76

162-071-02BBA
(Log modified from Aberle Well Co.)

Altitude: 2130 feet — Date drilled: 1973

	Topsoil	1	1
	Clay, yellow	24	25
	Gravel	1	26
	Clay, blue	21	47

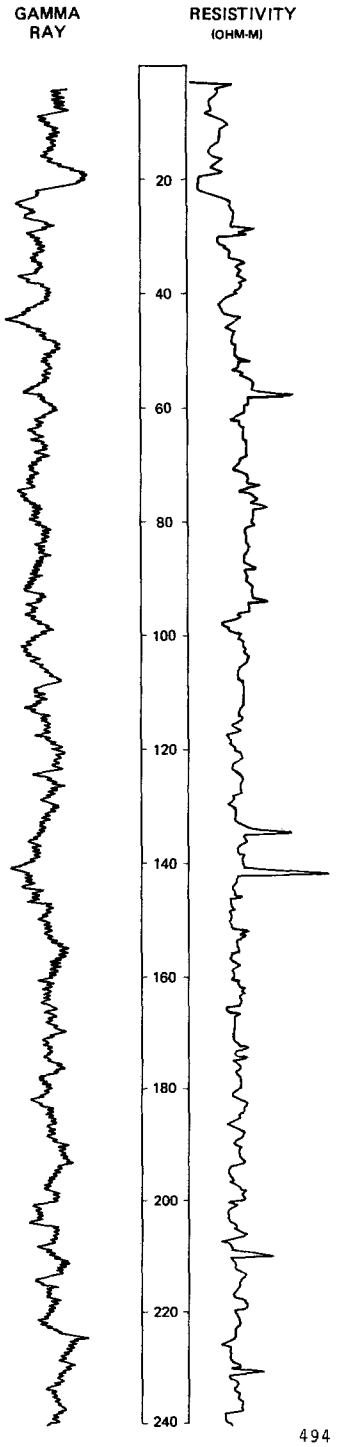
NDSWC 5872

LOCATION: 162-071-03AAB

DATE DRILLED: 10/30/80

ALTITUDE: 2160
(FT, NGVD)

DEPTH: 301
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Clay, sandy, pebbly, yellowish-brown, oxidized (till).
10-23	Clay, olive-gray.
23-274	Clay, very silty, pebbly, olive-gray (till); occasional cobble or boulder.

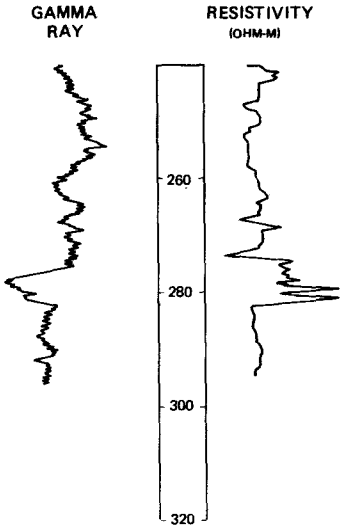
NDSWC 5872, continued

LOCATION: 162-071-03AAB

DATE DRILLED: 10/30/80

ALTITUDE: 2160
(FT, NGVD)

DEPTH: 301
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

274-301 Clay, sandy, gravelly, yellowish-brown, oxidized (till).

162-071-03DDD
(Log modified from C. A. Simpson & Son)

Altitude: 2100 feet

Date drilled: 11/27/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	15	16
	Clay, sandy, blue; rocks	274	290
	Sand	4	294

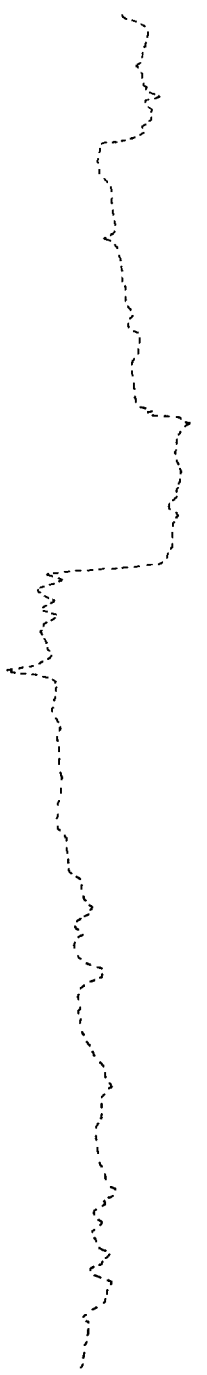
USGS 4

LOCATION: 162-071-04ACC

DATE DRILLED: 8/14/71

ALTITUDE: 2160
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

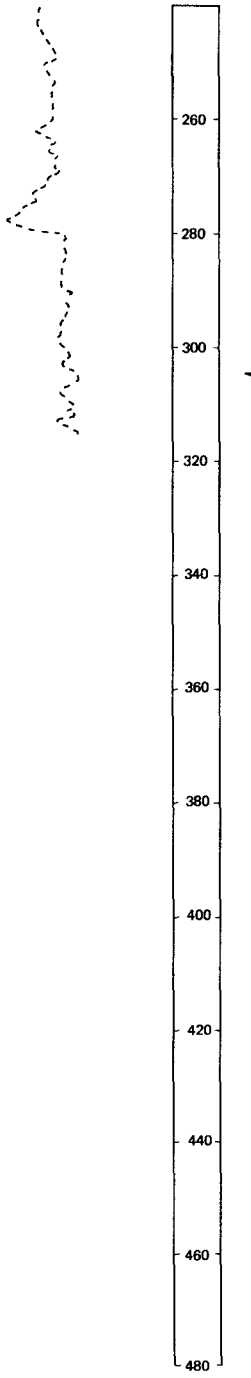
0-1	Topsoil, sandy, brownish-black.
1-29	Till, sandy, moderate-yellowish-brown, oxidized; lignite smears.
29-42	Till, silty to sandy, cohesive, medium-gray.
42-99	Till, silty, sandy, medium-dark-gray.
99-108	Gravel, sandy, clayey, medium to coarse.
108-148	Till, silty to sandy, olive-gray; some cobbles and boulders; thin lenses of gravel.
148-178	Till, silty to sandy, olive-gray; occasional cobble or boulder.
178-190	Till, olive-gray; lenses of gravel.
190-230	Till, silty, olive-gray; occasional cobble or boulder.
230-258	Till, silty, dark-gray; occasional boulder.

LOCATION: 162-071-04ACC

DATE DRILLED: 8/14/71

ALTITUDE: 2160
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

258-261	Till, silty to gravelly, dark-gray.
261-295	Till, silty, dark-gray; occasional boulders.
295-320	Till, silty, moderate-yellowish-brown, oxidized; iron stains.

162-071-09ABB
(Log modified from Aberle Well Co.)

Altitude: 2165 feet — Date drilled: 1973

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	5	6
	Gravel, sandy	4	10
	Clay, yellow	8	18
	Gravel	1	19
	Clay, blue	41	60

162-071-13ADA
(Log modified from Aberle Well Co.)

Altitude: 2046 feet — Date drilled: 11/09/72

	Topsoil	1	1
	Clay, sandy, yellow	29	30
	Clay, blue	70	100

162-071-13DCC
(Log modified from C. A. Simpson & Son)

Altitude: 2050 feet — Date drilled: 9/20/60

	Topsoil	1	1
	Clay, sandy, yellow	25	26
	Clay, sandy, blue	182	208
	Clay, sandy, yellow	32	240
	Clay, sandy, blue; rocks	45	285
	Sand	4	289

162-071-18CDB
(Log modified from Aberle Well Co.)

Altitude: 2075 feet — Date drilled: 1973

	Topsoil	1	1
	Clay, yellow	17	18
	Clay, sandy	5	23
	Clay, blue	32	55

162-071-19DDD
(Log modified from C. A. Simpson & Son)

Altitude: 2020 feet — Date drilled: 7/16/65

	Topsoil	1	1
	Clay, yellow	23	24
	Clay, blue	26	50
	Sand, muddy	7	57
	Clay, blue	31	88
	Sand	8	96

162-071-25DDB
(Log modified from Aberle Well Co.)

Altitude: 1900 feet — Date drilled: 1973

	Topsoil	1	1
	Rocks	7	8
	Gravel	18	26
	Clay, blue	9	35

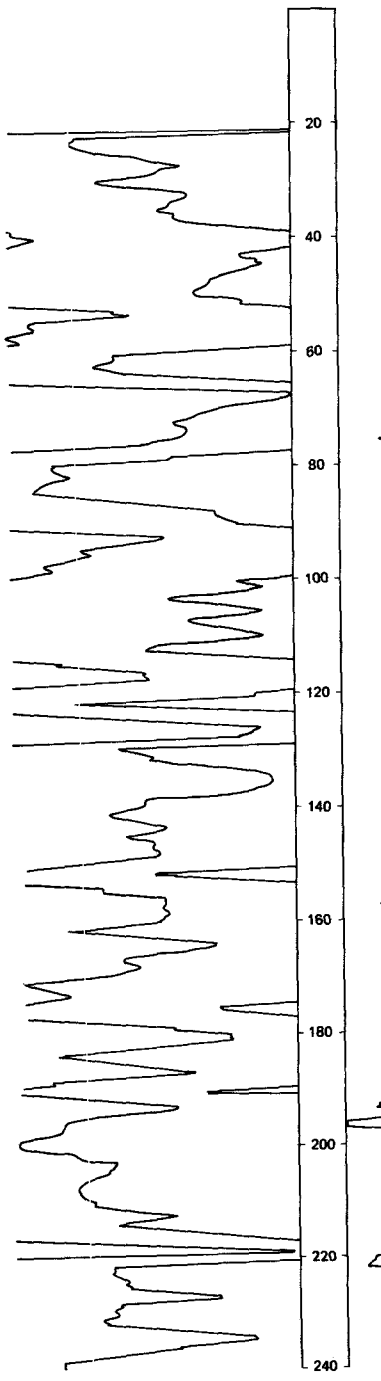
NDSWC 22

LOCATION: 162-071-26BAA1

DATE DRILLED: 12/13/73

ALTITUDE: 1965
(FT, NGVD)

DEPTH: 482
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-4	Topsoil, sandy, brownish-black.
4-12	Till, sandy, silty, yellowish-brown, oxidized.
12-37	Till, silty, olive-gray.
37-38	Gravel, medium, rounded.
38-64	Till, silty, olive-gray.
64-67	Gravel, medium, sandy; mostly carbonate pebbles.
67-82	Till, silty, olive-gray.
82-94	Till, sandy, yellowish-brown, oxidized.
94-102	Gravel, medium, subangular; mostly carbonate pebbles.
102-104	Clay, silty, medium-gray.
104-107	Gravel, fine to medium, sandy.
107-130	Till, silty, sandy, yellowish-brown, oxidized.
130-136	Till, very carbonaceous, dark-brown; wood fragments.
136-137	Sand, fine to coarse, gravelly.
137-150	Till, sandy, yellowish-brown, oxidized.
150-175	Till, silty, dark-gray.
175-176	Sand, medium, gravelly.

FOX HILLS SANDSTONE

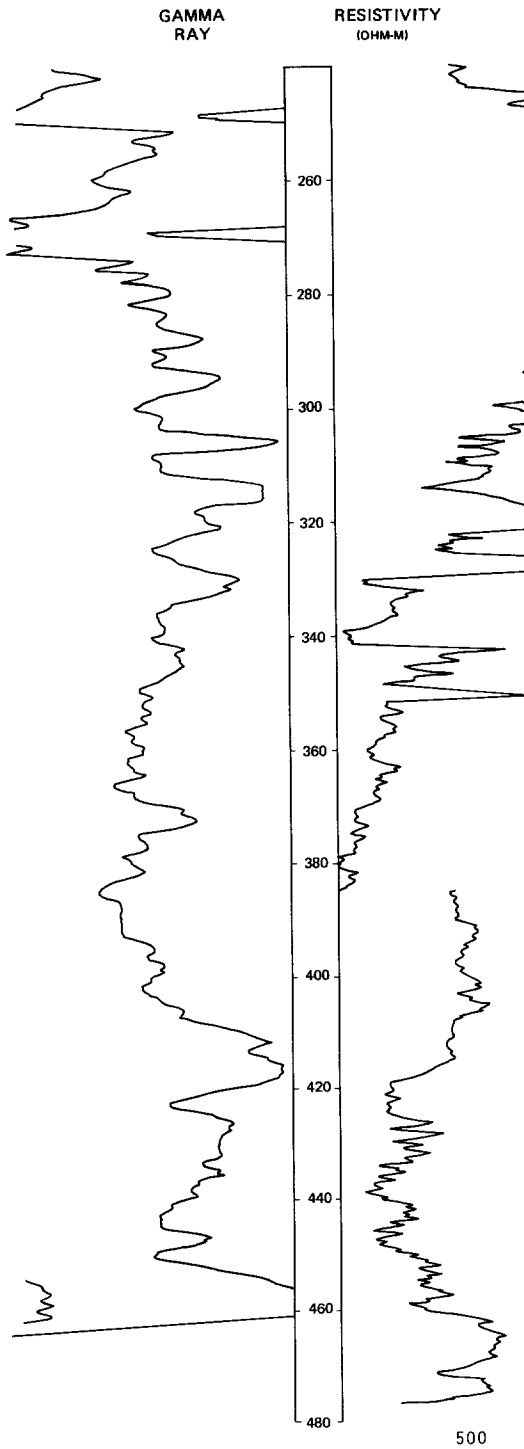
176-185	Sandstone, very fine, clayey, dark-grayish-green.
185-212	Shale, silty, grayish-green.
212-216	Sandstone, very fine, grayish-green.
216-228	Shale, silty, grayish-green.
228-244	Siltstone, clayey, greenish-gray.

LOCATION: 162-071-26BAA1

DATE DRILLED: 12/13/73

ALTITUDE: 1965 (FT, NGVD)

DEPTH: 482 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

244-300 Sandstone, very fine to fine, grayish-green; indurated in places; lignite chips.

300-313 Siltstone, sandy, cohesive, greenish-gray.

313-322 Sandstone, very fine, silty, greenish-gray.

322-326 Siltstone, greenish-gray.

326-330 Sandstone, very fine, greenish-gray.

330-350 Siltstone, sandy, greenish-gray; clayey in places.

350-417 Shale, silty, dark-greenish-gray.

PIERRE SHALE

417-460 Shale, tight, dark-gray to medium-gray.

460-482 Shale, silty, bentonitic, medium-gray.

LOCATION: 162-071-26BAA1

DATE DRILLED: 12/13/73

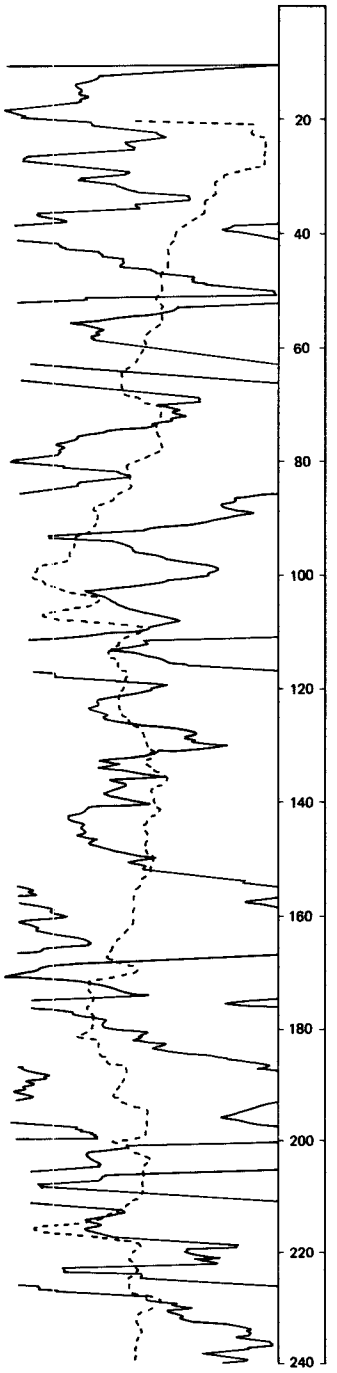
ALTITUDE: 1965
(FT, NGVD)

DEPTH: 482
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



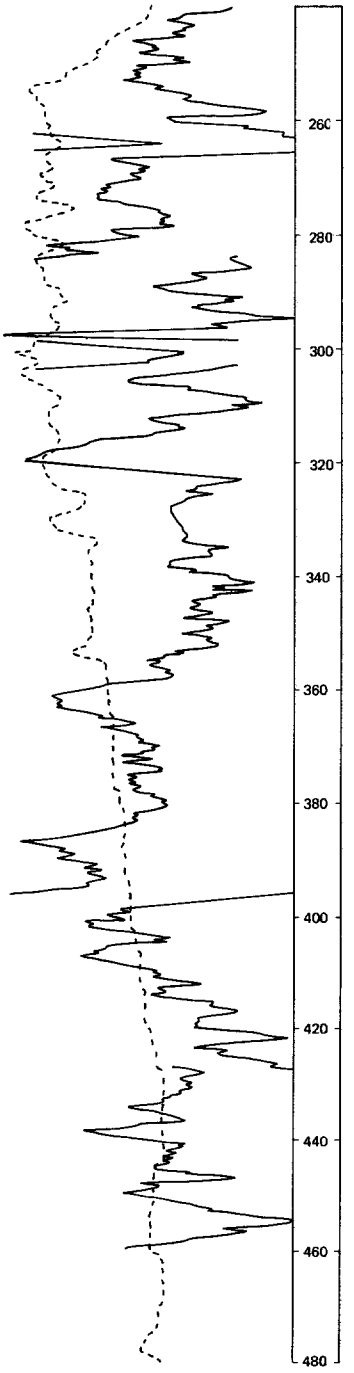
LOCATION: 162-071-26BAA1

DATE DRILLED: 12/13/73

ALTITUDE: 1965
(FT, NGVD)

DEPTH: 482
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

162-071-26BAA2
NDSWC 22A
(Log from Randich, 1975)

Altitude: 1965 feet — Date drilled: 1974

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	4	4
	Till, yellowish-brown, sandy, silty, oxidized	8	12
	Till, olive-gray, silty	25	37
	Gravel, medium, rounded	1	38
	Till, olive-gray, silty	8	46

162-071-26CCD
NDSWC 5593

Altitude: 1870 feet — Date drilled: 10/10/79

Glacial drift:			
	Soil	1	1
	Gravel, fine to coarse, oxidized; contains considerable fine to coarse sand	11	12
	Clay, sandy, silty, medium-dark-gray	20	32

162-071-28DDB
(Log modified from Aberle Well Co.)

Altitude: 1900 feet — Date drilled: 10/14/76

	Topsoil	1	1
	Sand, brown	33	34
	Clay, blue; mixed sand	6	40
	Clay, blue; mixed gravel	28	68
	Gravel, blue	10	78

162-071-29BCC
(Log modified from C. A. Simpson & Son)

Altitude: 2000 feet — Date drilled: 1/14/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Clay, yellow	20	22
	Clay, blue	34	56
	Clay, sandy, blue	89	145
	Sand, fine; with yellow clay	10	155

162-071-30DCB
(Log modified from Aberle Well Co.)

Altitude: 1900 feet — Date drilled: 1973

	Topsoil	1	1
	Clay, sandy, yellow	84	85
	Clay, blue	10	95
	Gravel	2	97

162-071-32CBB
(Log modified from Aberle Well Co.)

Altitude: 1850 feet — Date drilled: 1973

	Topsoil	1	1
	Clay, yellow	17	18
	Clay, blue	24	42
	Sand	2	44
	Clay, blue	2	46
	Rocks	--	46

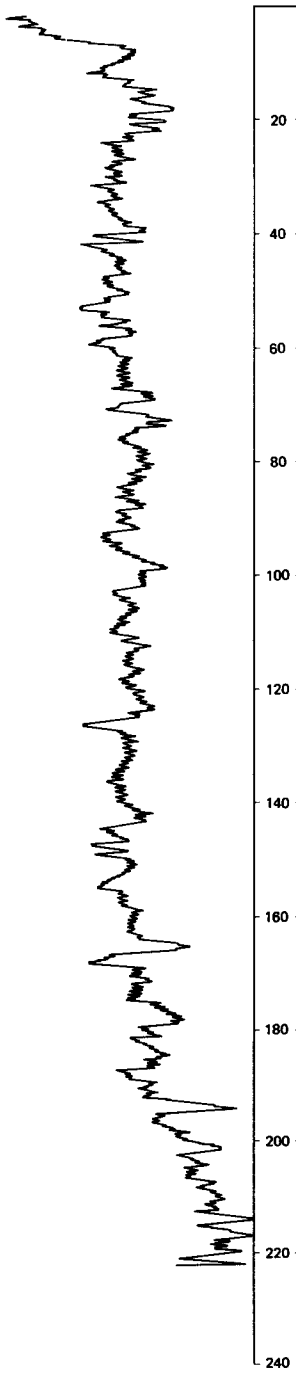
NDSWC 5592

LOCATION: 162-071-32DAD

DATE DRILLED: 10/10/79

ALTITUDE: 1815
(FT, NGVD)

DEPTH: 227
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-6	Sand, predominately coarse, yellowish-brown, oxidized; contains about 10 percent gravel.
6-43	Clay, silty, slightly sandy, sticky, olive-gray.
43-81	Clay, silty, sandy, pebbly, olive-gray (till).
81-125	Clay, soft, sticky, olive-gray.
125-160	Clay, very silty, soft, olive-gray.
160-199	Clay, silty, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

199-227	Siltstone, slightly sandy, well-compacted, olive-gray.

LOCATION: 162-071-32DAD

DATE DRILLED: 10/10/79

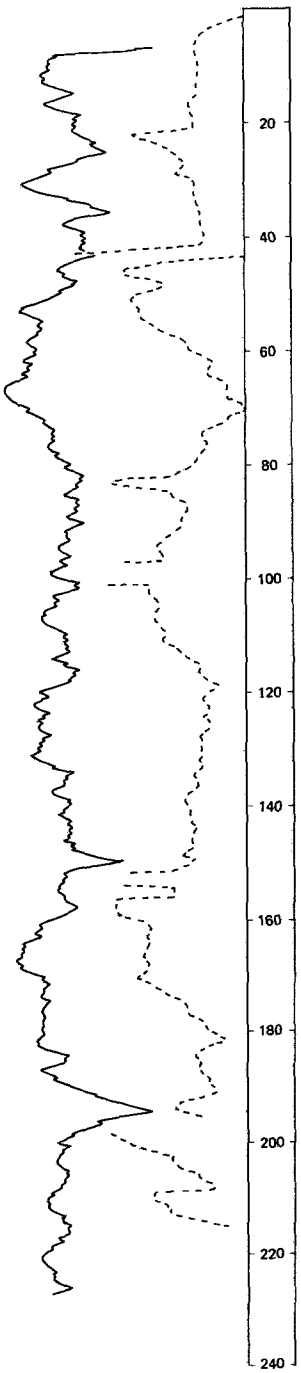
ALTITUDE: 1815
(FT, NGVD)

DEPTH: 227
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



162-071-34DBB
(Log modified from Aberle Well Co.)

Altitude: 1860 feet — Date drilled: 10/08/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Gravel	5	6
	Sand, brown	28	34
	Sand, blue	16	50

162-071-35CDA
(Log modified from Aberle Well Co.)

Altitude: 1810 feet — Date drilled: 1973

	Topsoil	1	1
	Clay, sandy	19	20
	Gravel	3	23
	Clay, sandy, blue	27	50

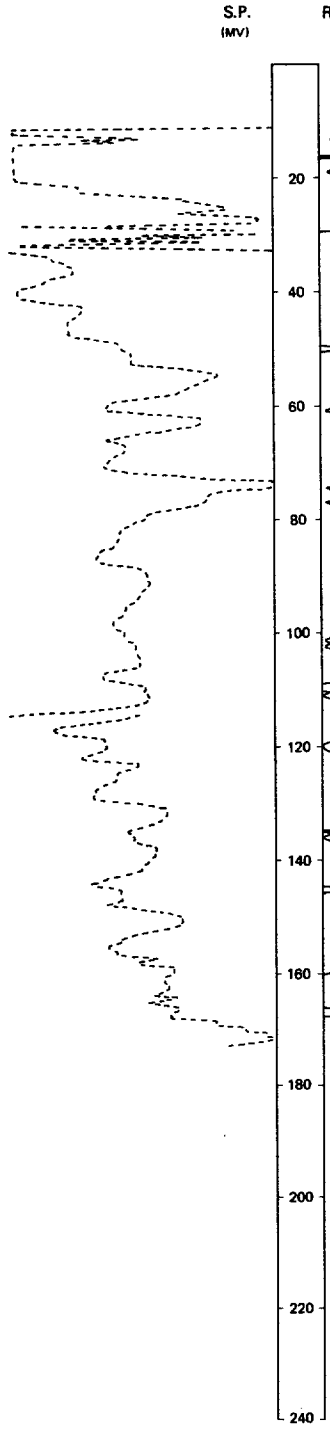
USGS 17

LOCATION: 162-071-35CDD

DATE DRILLED: 12/11/73

ALTITUDE: 1800
(FT, NGVD)

DEPTH: 190
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-30	Gravel, fine to very coarse, oxidized; some cobbles; predominately carbonate, detrital shale, and igneous pebbles.
30-35	Sand, medium to coarse; saturated.
35-50	Till, silty to sandy, olive-gray.
50-52	Gravel, medium to coarse, sandy.
52-65	Till, olive-gray; sandy streaks.
65-70	Sand, coarse, gravelly, silty.
70-122	Till, silty, olive-gray; sandy interval from 104 to 108 feet.
122-134	Till, very sandy, olive-gray.
134-142	Till, silty, olive-gray.
142-146	Gravel, medium, subrounded.
146-156	Till, very sandy, olive-gray.
156-158	Gravel and cobbles.
158-162	Till, sandy, olive-gray.
162-163	Cobbles and boulders.
163-174	Till, silty, olive-gray.
174-175	Cobbles and boulders.
175-190	Till, silty, olive-gray; boulders from 180 to 190 feet.

162-071-36BAA
(Log modified from C. A. Simpson & Son)

Altitude: 1840 feet — Date drilled: 7/18/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Sand, clayey	7	8
	Gravel and rocks	14	22
	Clay, sandy	33	55
	Clay, blue	79	134
	Clay, sandy, blue	3	137
	Sand, fine, blue-gray	--	137

162-071-36CBC1
USGS 15
(Log from Randich, 1975)

Altitude: 1815 feet — Date drilled: 12/09/73

Glacial drift:			
	Gravel, coarse, sandy; cobbles and boulders	21	21
	Sand, medium-coarse, gravelly	4	25
	Till, olive-gray, sandy	6	31
	Sand, coarse, gravelly, subangular	5	36
	Clay, medium-gray, silty to sandy	9	45
	Gravel, medium to coarse, sandy; abundant detrital shale	11	56
	Till, olive-gray, sandy	5	61
	Gravel, medium, subrounded	10	71
	Gravel, medium, uniform	5	76
	Clay, olive-gray, silty to sandy	3	79
	Gravel, medium to coarse, sandy, rounded	18	97
	Till, olive-gray, sandy	13	110
	Gravel, medium, rounded	1	111
	Till, olive-gray, silty to sandy	4	115
	Gravel, medium, sandy	1	116
	Till, olive-gray, silty	2	118
	Gravel, medium, sandy	1	119
	Sand, fine to medium, subrounded	1	120

162-071-36CBC2
NDSWC 5594

Altitude: 1814 feet — Date drilled: 10/10/79

Glacial drift:			
	Soil, sandy	0.5	0.5
	Gravel, fine to coarse, oxidized; contains about 20 percent fine to coarse sand	21.5	22
	Clay; no cuttings but drilled smooth	4	26
	Sand, gravelly	16	42
	Drilled as though clay; no returns	11	53
	Sand; no returns	4	57

162-072-05CDD
(Log modified from C. A. Simpson & Son)

Altitude: 2130 feet — Date drilled: 10/18/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	54	55
	Clay, blue; rocks	105	160
	Sand, clayey	45	205
	Clay, sandy	25	230
	Shale, sandy, light-gray, or soft sandstones	40	270

162-072-07BCC1
(Log modified from C. A. Simpson & Son)

Altitude: 2070 feet — Date drilled: 5/21/69

	Topsoil	1	1
	Clay, yellow	23	24
	Clay, gray; some sandy; some rocks; a little water at 80 feet	200	224
	Sand, very clayey; with water	10	234

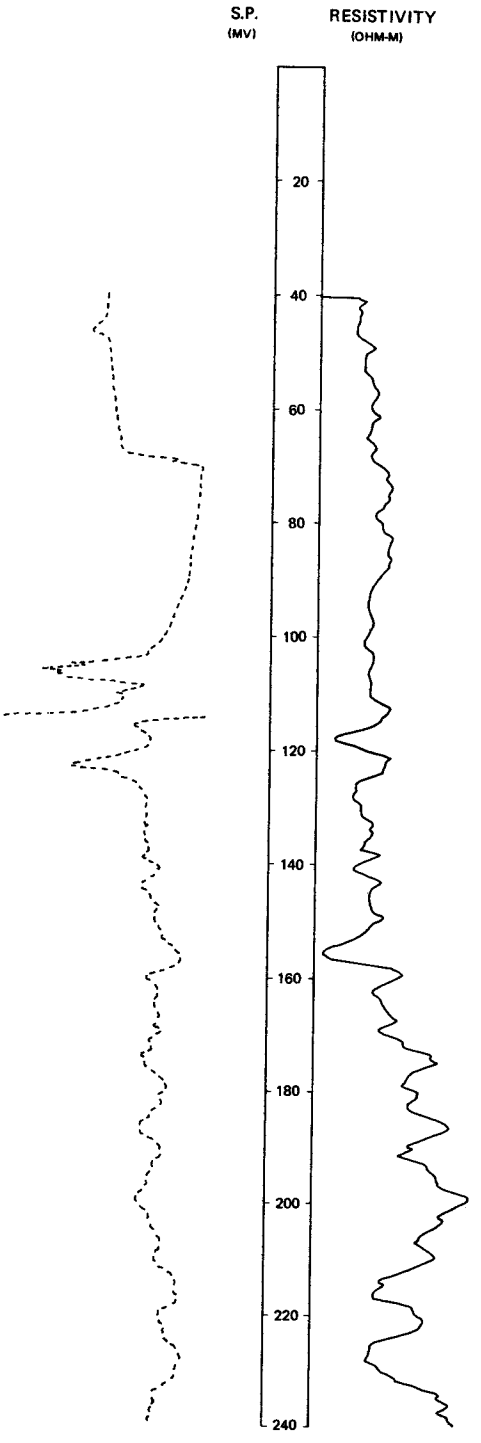
USGS 2

LOCATION: 162-072-07BCC2

DATE DRILLED: 8/13/71

ALTITUDE: 2070
(FT, NGVD)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil, brownish-black.
1-4	Clay, silty, moderate-yellowish-brown, oxidized.
4-22	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till).
22-70	Clay, silty, sandy, pebbly, grayish-brown, partially oxidized (till).
70-198	Clay, silty, sandy, pebbly, medium-dark-gray (till).
198-200	Gravel, fine to medium.
200-261	Clay, silty, sandy, pebbly, olive-gray (till).

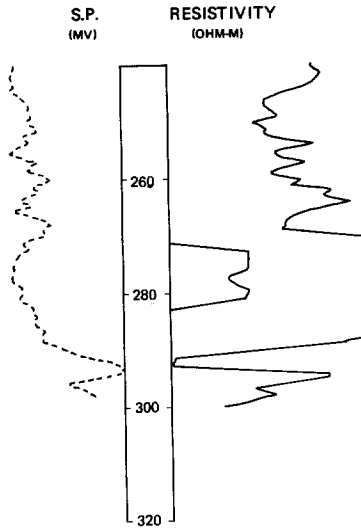
USGS 2, continued

LOCATION: 162-072-07BCC2

DATE DRILLED: 8/13/71

ALTITUDE: 2070 (FT, NGVD)

DEPTH: 300 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

261-265	Sand, fine to medium, gravelly.
265-270	Clay, silty, sandy, pebbly, olive-gray (till).
270-289	Gravel, medium to coarse, subangular to rounded; contains about 10 percent coarse sand.

HELL CREEK FORMATION

289-294	Clay, cohesive, bluish-gray.
294-300	Clay, sandy, bluish-gray.

162-072-13DDD
(Log modified from Aberle Well Co.)

Altitude: 2040 feet

Date drilled: 9/24/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, brown	19	20
	Clay, brown, and gravel; mixed	14	34
	Clay, blue	30	64
	Gravel, blue	3	67
	Clay, blue	9	76

162-072-17DCD
(Log modified from C. A. Simpson & Son)

Altitude: 2000 feet

Date drilled: 6/25/72

	Clay, yellow	20	20
	Clay, blue	27	47
	Gravel	9	56

162-072-18CBB
(Log modified from Lee's Well Drilling)

Altitude: 2030 feet

Date drilled: 7/23/76

	Dirt, black	4	4
	Clay, blue	15	19
	Clay, yellow	19	38
	Clay, blue	12	50
	Clay, gravelly, blue	189	239
	Clay, sandy, yellow	24	263
	Clay, blue	14	277
	Clay, blue, sandy	9	286
	Clay, yellow	13	299
	Clay, blue	21	320

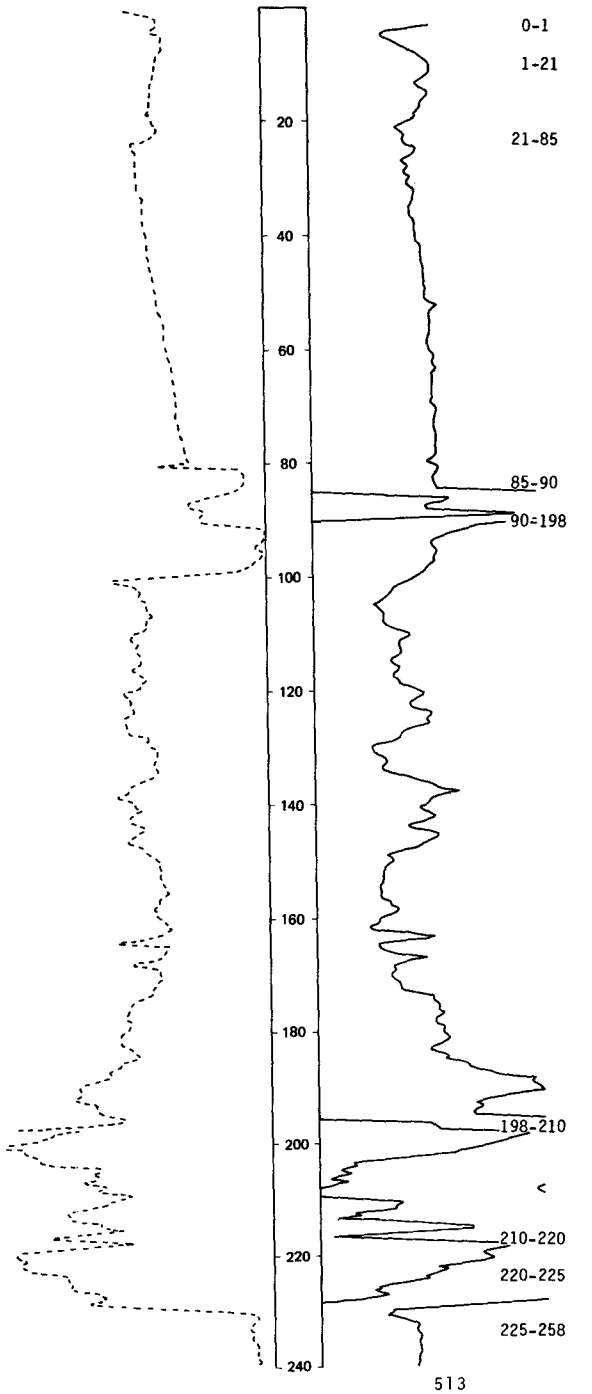
USGS 1

LOCATION: 162-072-19BBA

DATE DRILLED: 8/12/71

ALTITUDE: (FT, NGVD) 2000

DEPTH: (FT) 325



DESCRIPTION OF DEPOSITS

0-1	Soil, brownish-black.
1-21	Clay, silty, sandy, pebbly, moderate-yellowish-brown, oxidized (till).
21-85	Clay, silty, sandy, pebbly, olive-gray to medium-gray (till).
85-90	Gravel, coarse.
90-198	Clay, silty, sandy, pebbly, medium-gray to medium-dark-gray (till).
198-210	Gravel, medium to coarse, subrounded to rounded; about 60 percent carbonate, 20 percent shale, and 20 percent granitic pebbles.
210-220	Sand, medium to coarse.
220-225	Gravel, medium to coarse, clayey.
225-258	Clay, silty to sandy, medium-gray (till).

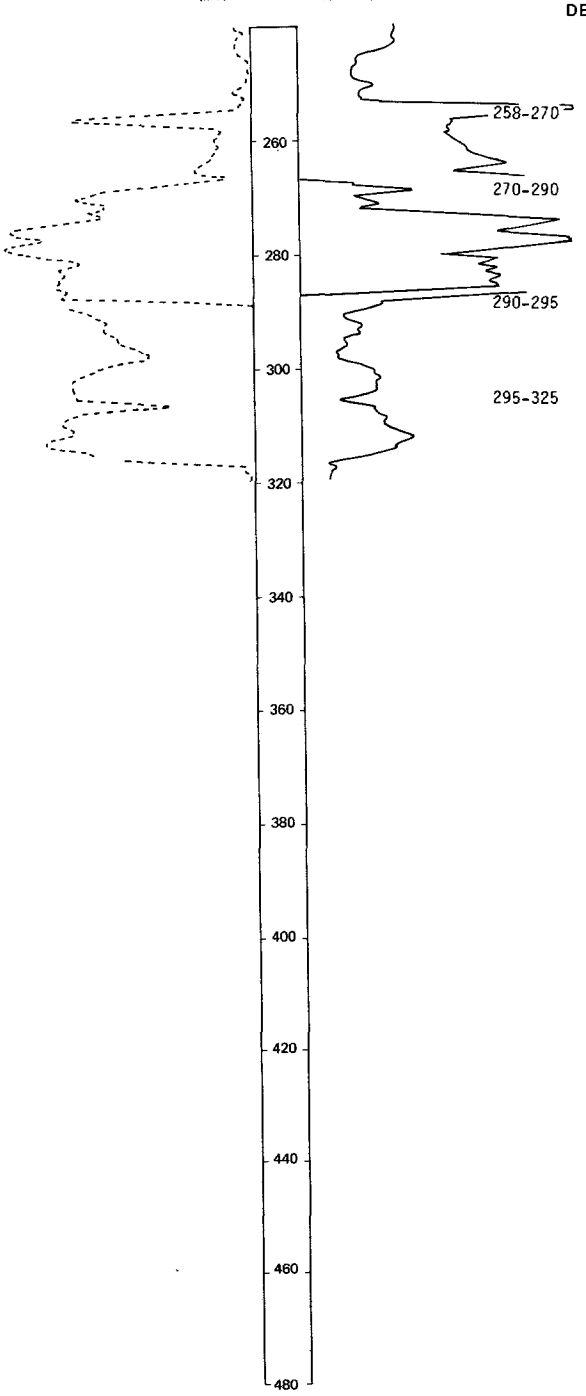
USGS 1, continued

LOCATION: 162-072-19BBA

DATE DRILLED: 8/12/71

ALTITUDE: 2000 (FT, NGVD)

DEPTH: 325 (FT)



DESCRIPTION OF DEPOSITS

258-270	Sand, medium to coarse.
270-290	Gravel, medium to coarse, angular.
290-295	Clay, sandy, silty, olive-gray (till).
	FOX HILLS SANDSTONE
295-325	Claystone, silty to sandy, medium-bluish-gray.

162-072-19BDC
(Log modified from Lee's Well Drilling)

Altitude: 1980 feet — Date drilled: 5/25/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	16	17
	Clay, blue	29	46
	Sand	5	51

162-072-31CAC
(Log modified from Russell Drilling Co.)

Altitude: 1690 feet — Date drilled: 4/06/71

Glacial drift:			
	Soil	2	2
	Gravel, medium to coarse, oxidized	11	13
	Sand, medium to very coarse, oxidized; about 30 percent fine gravel; consists of about 50 percent carbonate, 30 percent quartz and igneous, and 20 percent detrital shale grains	14	27
	Clay, silty, very sandy, olive-gray (till)	55	82
Fox Hills Sandstone:			
	Sandstone, fine to medium, micaceous; carbonaceous greenish-gray streaks	12	94
	Sand, fine to medium, dark-greenish-gray, noncalcareous, glauconitic, predominately quartz; ferruginous specks; some red specks; slightly cohesive	16	110
	Shale, brownish-gray, noncalcareous	13	123
	Sandstone, very fine grained, cemented, very calcareous; appears to be interbedded with siltstone	4	127
	Sand and siltstone, interbedded, olive-gray, micaceous; biotite specks; slightly calcareous; much lighter color than above	13	140
	Siltstone, olive-gray, slightly calcareous; uniform bedding and texture; biotite flakes; some mica; occasional iron concretion	10	150
	Shale, olive-gray, micaceous, slightly calcareous	15	165
	Clay, olive-gray, cohesive, slightly calcareous, pliable, plastic; carbonaceous streaks	25	190
	Shale, olive-gray, brittle, micaceous; drills tighter than above; carbonaceous streaks	20	210
	Siltstone, olive-gray, micaceous; carbonaceous streaks	20	230
	Siltstone, very fine grained, olive-gray; interbedded with thin lenses of sandstone; carbonaceous dark-greenish-gray streaks; abundant quartz and feldspar	40	270
	Siltstone, olive-gray, unconsolidated; interbedded with fine to medium grained sandstone; carbonaceous dark-greenish-gray streaks; biotite; quartz	30	300
	Shale, medium-dark-gray to grayish-black; interbedded with light-olive-gray shale	10	310

162-072-31CDB
(Log modified from Russell Drilling Co.)

Altitude: 1695 feet — Date drilled: 4/07/71

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	2	2
	Gravel, medium to coarse; about 20 percent coarse angular to rounded oxidized sand	10	12
	Sand, medium to coarse, subangular to rounded; predominately carbonate grains	22	34
	Clay, sandy, gravelly, olive-gray (till)	29	63
	Gravel, medium to coarse, sandy, subangular to well-rounded; predominately carbonate, quartz, and detrital shale pebbles	13	76
Fox Hills Sandstone:			
	Sandstone, fine; interbedded with lenses of greenish-gray siltstone	7	83
	Sandstone, very fine to medium, argillaceous, siliceous, moderately indurated	14	97
	Sandstone, very fine to medium, greenish-gray; interbedded with brownish-gray siltstone	5	102
	Shale; carbonaceous moderately indurated greenish-gray streaks	13	115

162-072-33ABB
(Log modified from C. A. Simpson & Son)

Altitude: 1760 feet — Date drilled: 10/12/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	14	15
	Clay, blue	95	110
	Shale, slightly sandy	8	118

162-072-33DAD
(Log modified from C. A. Simpson & Son)

Altitude: 1715 feet — Date drilled: 6/ /68

	Topsoil	1	1
	Clay, sandy, yellow	17	18
	Clay, sandy, blue	22	40
	Clay, gravelly, blue	34	74
	Clay, sandy, blue	6	80
	Sandstone	10	90

162-072-35BDC
(Log modified from C. A. Simpson & Son)

Altitude: 1745 feet — Date drilled: 6/02/66

	Topsoil	2	2
	Gravel, hard, dry; rocks	45	47
	Sand and clay, fine	4	51
	Clay, gravelly	6	57
	Sand, fine	8	65

162-073-06ABA
(Log modified from C. A. Simpson & Son)

Altitude: 2050 feet — Date drilled: 6/07/75

	Topsoil	1	1
	Clay, sandy, yellow	24	25
	Clay, blue	185	210
	Sand, fine	4	214

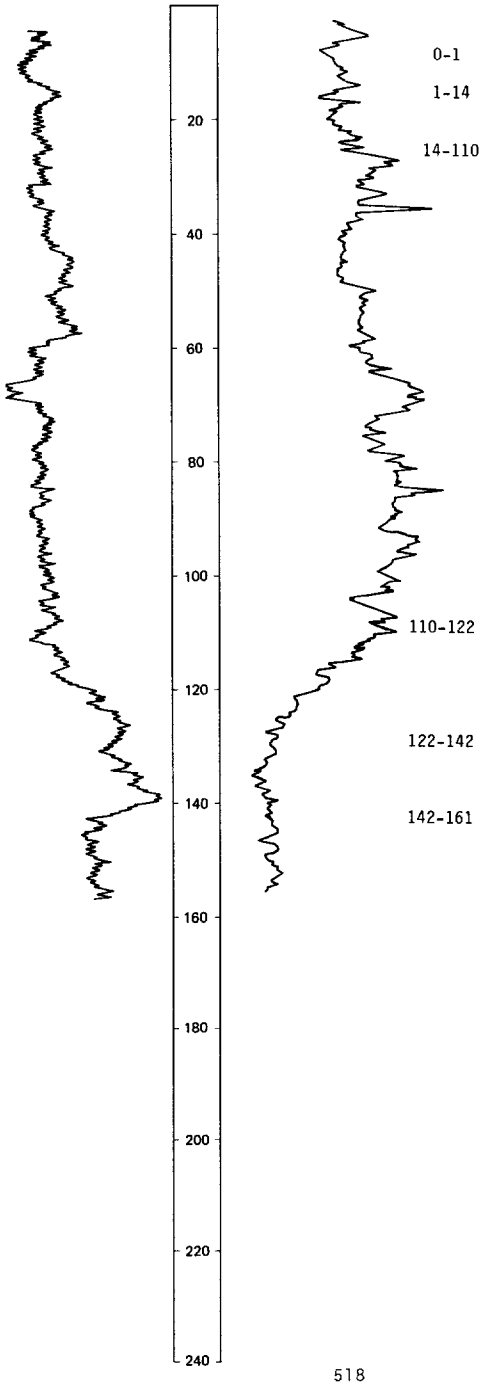
NDSWC 5868

LOCATION: 162-073-21BBB

DATE DRILLED: 10/29/80

ALTITUDE: 2000
(FT, NGVD)

DEPTH: 161
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-14	Clay, sandy, yellowish-brown, oxidized (till).
14-110	Clay, silty to sandy, olive-gray (till); interbedded with thin lenses of sand and gravel.
110-122	Clay, sandy, light-olive-gray, slightly oxidized (till).

HELL CREEK FORMATION

122-142	Siltstone, argillaceous, moderately indurated, yellowish-orange, oxidized.
142-161	Siltstone, very argillaceous, moderately indurated, dark-gray.

162-073-21CCB
(Log modified from C. A. Simpson & Son)

Altitude: 1960 feet — Date drilled: 6/19/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	34	35
	Clay, sandy, blue; rocks	114	149
	Clay, sandy, yellow	11	160
	Sand, coarse; somewhat clayey	11	171

162-073-25AAD
(Log modified from C. A. Simpson & Son)

Altitude: 1885 feet — Date drilled: 11/12/63

	Topsoil	1	1
	Clay, gray	9	10
	Clay, yellow	12	22
	Clay, gray; somewhat sandy	84	106
	Sand, clayey	39	145
	Sand, very clayey	5	150
	Clay, gray or shale	33	183
	Shale, dark-tan	12	195
	Hard layer	1	196
	Shale, rust-colored	2	198
	Sandstone, fine, clayey	25	223
	Sandstone, very clayey	4	227
	Sandstone, clayey, gray	8	235
	Sandrock, hard	4	239
	Sandstone, clayey, gray	17	256
	Shale, slightly sandy, gray	5	261

162-073-27CCC
(Log modified from C. A. Simpson & Son)

Altitude: 1720 feet — Date drilled: 12/14/65

	Topsoil	1	1
	Clay, yellow	21	22
	Clay, blue	26	48
	Clay, sandy, blue	16	64
	Sandstone, green	8	72

162-073-28CBC
(Log modified from C. A. Simpson & Son)

Altitude: 1875 feet — Date drilled: 9/10/68

	Topsoil	1	1
	Clay, sandy, yellow	20	21
	Clay, sandy, blue; rocks	84	105
	Sand, fine	1	106

162-073-29CCD
(Log modified from C. A. Simpson & Son)

Altitude: 1745 feet — Date drilled: 2/25/65

	Topsoil	1	1
	Clay, gravelly, yellow	11	12
	Clay, sandy, blue	83	95
	Sand, fine	10	105

162-073-30DBC
(Log modified from C. A. Simpson & Son)

Altitude: 1760 feet — Date drilled: 10/07/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Gravel and rocks	14	15
	Clay, blue	85	100
	Shale, slightly sandy	15	115

162-073-32CCD
(Log modified from C. A. Simpson & Son)

Altitude: 1665 feet — Date drilled: 11/01/63

	Soil, black	15	15
	Clay, yellow	30	45
	Clay, blue	61	106
	Clay, sandy, gray	6	112

162-073-34AAA
NDSWC 5869

Altitude: 1705 feet — Date drilled: 10/29/80

Glacial drift:			
	Soil	1	1
	Clay, very silty, gravelly, yellowish-brown, oxidized (till)	20	21
Fox Hills Sandstone:			
	Sandstone, fine, glauconitic, poorly indurated, greenish-gray; becoming carbonaceous at 50 feet	40	61

162-074-02CDD1
(Log modified from C. A. Simpson & Son)

Altitude: 2190 feet — Date drilled: 6/21/71

	Topsoil	1	1
	Clay, yellow	11	12
	Sand and gravel	4	16
	Clay, yellow	26	42
	Clay, blue	5	47
	Clay, gravelly, blue	6	53
	Clay, blue	32	85
	Sand, coarse	1	86
	Sand, clean	44	130

162-074-02CDD2
(Log modified from C. A. Simpson & Son)

Altitude: 2190 feet Date drilled: 6/ /71

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	34	35
	Clay, blue	28	63
	Clay, gravelly, blue	5	68
	Clay, blue	87	155
	Clay, yellow; rocks	43	198
	Sand	2	200
	Clay, yellow	5	205
	Clay, gravelly, yellow	2	207
	Clay, yellow	29	236
	Clay, blue	24	260
	Clay, blue, soft	48	308

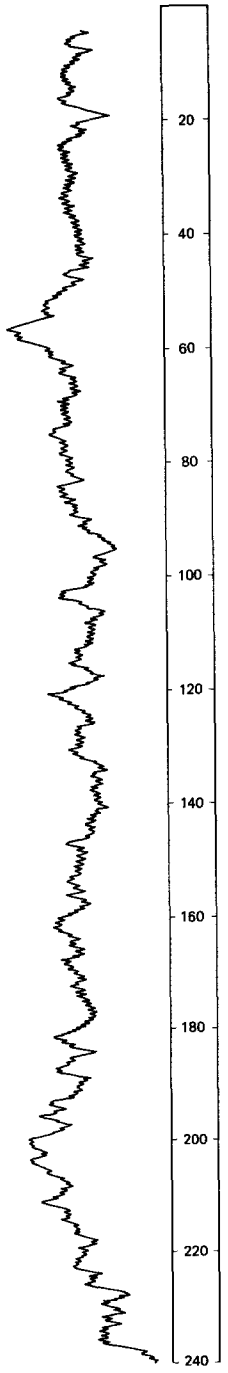
NDSWC 5867

LOCATION: 162-074-03CCC

DATE DRILLED: 10/28/80

ALTITUDE: 2200
(FT, NGVD)

DEPTH: 281
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-22	Clay, silty, gravelly, yellowish-brown, oxidized (till).
22-58	Clay, silty, olive-gray (till); interbedded with thin lenses of fine gravel.
58-62	Gravel, fine to coarse, and coarse angular to rounded sand; predominately carbonate and igneous pebbles and grains.
62-148	Clay, sandy, pebbly, dark-greenish-gray (till).
148-155	Clay, very sandy, light-olive-gray (till).
155-161	Clay, sandy, yellowish-brown, oxidized (till).
161-172	Silt, yellowish-brown, oxidized.
172-182	Gravel, fine to coarse, sandy, rounded, oxidized.
182-200	Silt, yellowish-brown, oxidized.
200-216	Clay, sandy, pebbly, olive-gray (till).
216-238	Silt, clayey, olive-gray.

HELL CREEK FORMATION

238-281	Siltstone, bentonitic, argillaceous, slightly carbonaceous, olive-gray.

LOCATION: 162-074-03CCC

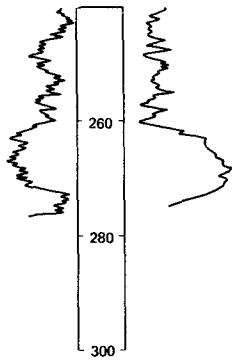
DATE DRILLED: 10/28/80

ALTITUDE: 2200
(FT, NGVD)

DEPTH: 281
(FT)

GAMMA RAY

RESISTIVITY
(OHM-M)



DESCRIPTION OF DEPOSITS

162-074-25CCA
(Log modified from C. A. Simpson & Son)

Altitude: 1785 feet

Date drilled: 6/10/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil----------	1	1
	Clay, sandy, yellow----------	16	17
	Clay, blue----------	19	36
	Coal; brown water----------	3	39
	Clay, sandy, blue----------	56	95
	Shale, brown----------	25	120
	Shale, gray----------	23	143

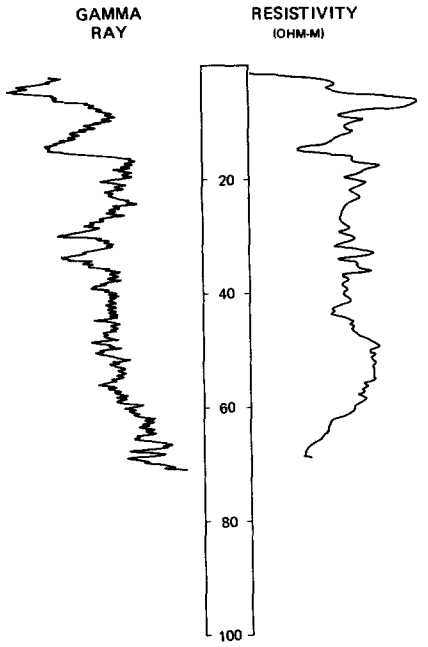
NDSWC 5576

LOCATION: 162-074-27CCC

DATE DRILLED: 9/25/79

ALTITUDE: 1753 (FT, NGVD)

DEPTH: 77 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-14	Gravel, fine to very coarse, clayey; about 15 percent medium to very coarse sand; boulders; predominately carbonate and quartz pebbles.
14-42	Clay, very silty to sandy, pebbly, olive-gray (till).
42-64	Clay, very silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

64-77	Sandstone, very fine, argillaceous, greenish-gray.

162-074-29DAD
(Log modified from Nick Erck Well Drilling)

Altitude: 1785 feet — Date drilled: 8/21/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	1	1
	Rock; gravel	10	11
	Clay, yellow	5	16
	Clay, gray	36	52
	Sand, muddy	3	55
	Clay, gray	62	117
	Sand, muddy	3	120
	Clay, gray	7	127
	Sand, blue	13	140

162-074-30ACB
(Log modified from C. A. Simpson & Son)

Altitude: 1790 feet — Date drilled: 1/31/64

	Topsoil	1	1
	Clay, yellow; boulders	11	12
	Clay, blue	43	55
	Clay, sandy, blue, sticky	8	63
	Clay, blue	5	68
	Shale, sandy, gray	12	80

162-074-30DAA
(Log modified from Neff Drilling Company)

Altitude: 1770 feet — Date drilled: 11/08/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	15	16
	Clay, blue	18	34
	Lignite	2	36
	Clay, gray	4	40
	Clay, blue	70	110
	Shale, gray	10	120
	Shale, blue	12	132
	Sand, silty, green	36	168

162-074-31DCC
(Log modified from C. A. Simpson & Son)

Altitude: 1660 feet — Date drilled: 10/24/67

	Topsoil	1	1
	Clay, gravelly, yellow	18	19
	Clay, sandy, blue, hard	43	62
	Shale; no water	48	110
	Shale	54	164

162-074-36AAA
(Log modified from C. A. Simpson & Son)

Altitude: 1720 feet — Date drilled: 11/03/66

	Topsoil, rocks	3	3
	Clay, sandy, yellow	16	19
	Clay, gravelly, blue	33	52
	Clay, sandy, blue	75	127
	Clay, sandy, brown	25	152
	Sandstone, fine	6	158

162-074-36DAA
(Log modified from C. A. Simpson & Son)

Altitude: 1690 feet — Date drilled: 11/07/66

	Gravel, rocks	11	11
	Clay, sandy, blue	42	53
	Sand, coarse	5	58

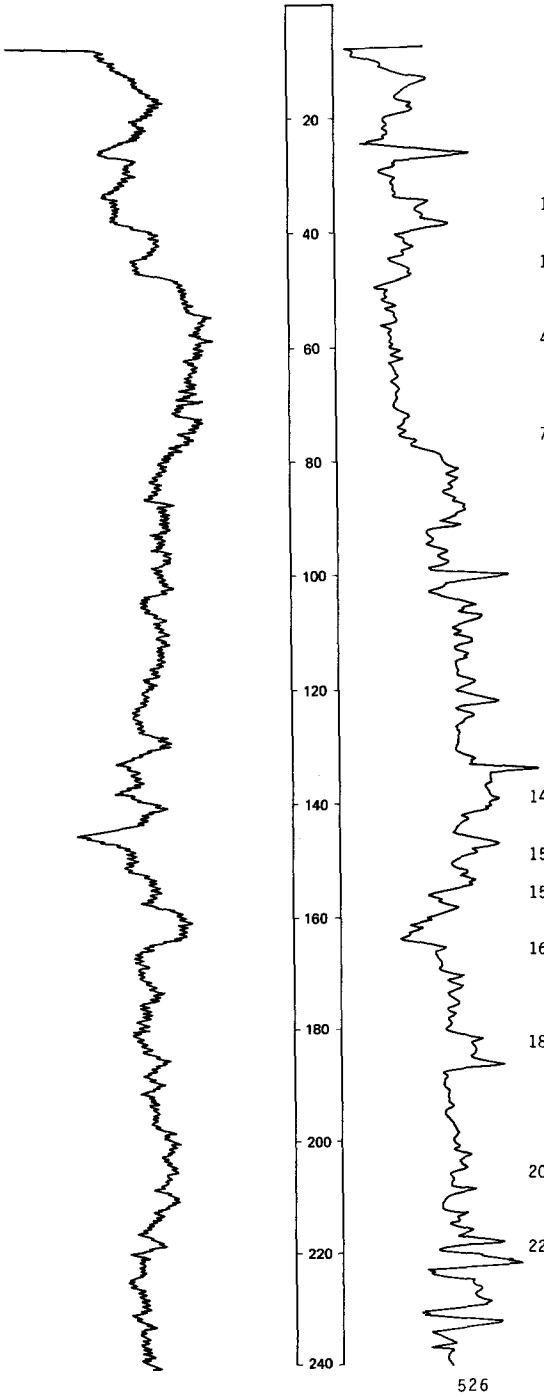
NDSWC 5860

LOCATION: 162-075-03CCC

DATE DRILLED: 10/23/80

ALTITUDE: 2150
(FT, NGVD)

DEPTH: 321
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-5	Silt, yellowish-gray, oxidized.
5-10	Clay, very silty, yellowish-brown, oxidized (till).
10-16	Clay, very silty, gravelly, olive-gray (till).
16-48	Clay, silty, pebbly to gravelly, dark-olive-gray (till).
48-78	Clay, silty, pebbly, dark-olive-gray (till).
78-143	Clay, silty to sandy, gravelly, olive-gray (till).
143-150	Silt, clayey, olive-gray.
150-153	Clay, silty, olive-gray.
153-165	Clay, silty to sandy, gravelly, olive-gray (till).
165-185	Clay, very sandy, gravelly, yellowish-brown, oxidized (till).
185-209	Clay, very sandy, gravelly, olive-gray (till).
209-220	Clay, very sandy, gravelly, yellowish-brown, oxidized (till).
220-252	Clay, sandy, gravelly, yellowish-green (till).

526

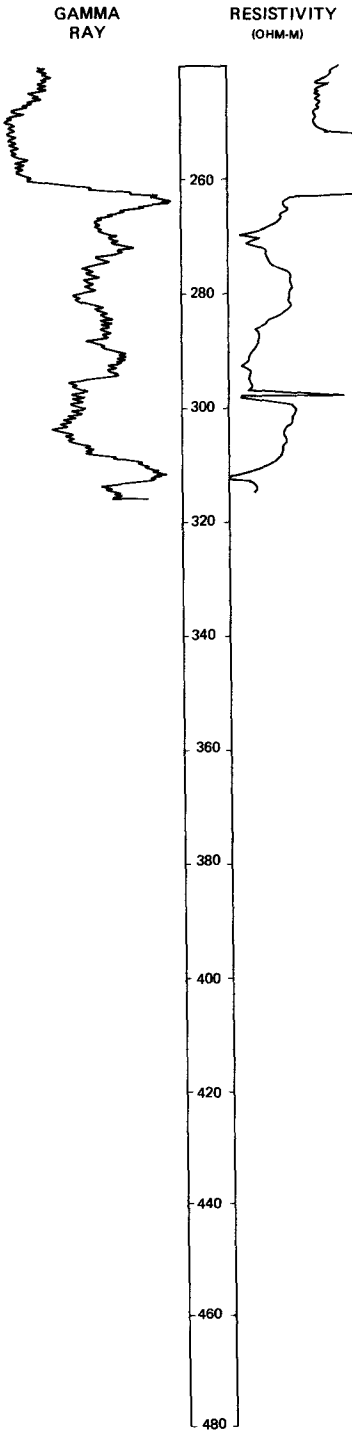
NDSWC 5860, continued

LOCATION: 162-075-03CCC

DATE DRILLED: 10/23/80

ALTITUDE: 2150 (FT, NGVD)

DEPTH: 321 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

252-262 Sand, coarse, and fine to medium angular to rounded gravel; predominately carbonate grains and pebbles.

HELL CREEK FORMATION

262-295 Siltstone, very argillaceous, fractured, greenish-gray; may be a shove block.

295-321 Siltstone, very argillaceous, gypsiferous, well-indurated.

NDSWC 5580

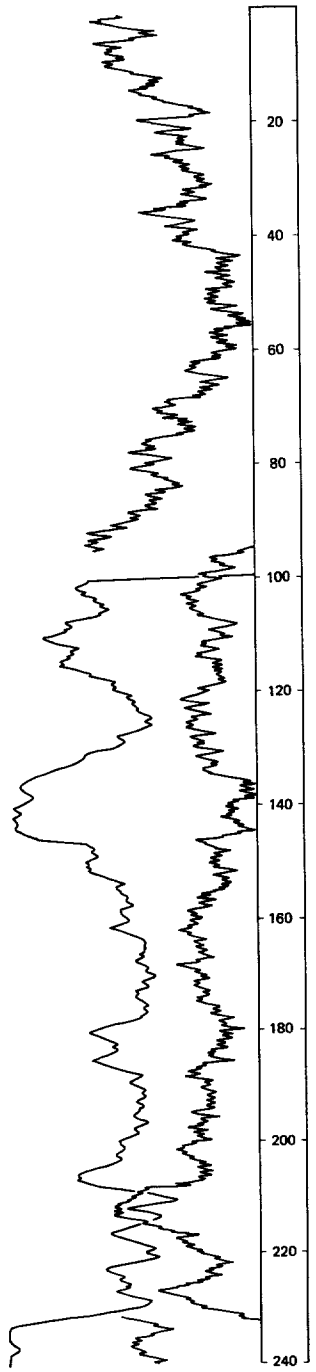
LOCATION: 162-075-04CDC

DATE DRILLED: 9/25/79

ALTITUDE: 2120
(FT, NGVD)

DEPTH: 347
(FT)

NEUTRON GAMMA
(API) RAY



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-15	Clay, very silty, pebbly, yellowish-brown, oxidized (till).
15-80	Clay, yellowish-brown; olive gray from 32 to 80 feet; oxidized to 32 feet.
80-196	Clay, silty, pebbly, olive-gray (till).
196-208	Clay, silty to sandy (till); occasional thin lenses of olive-gray gravel.
208-230	Clay, silty to sandy, gravelly, yellowish-brown, oxidized.

HELL CREEK FORMATION

230-260	Siltstone, argillaceous, yellowish-brown, oxidized.

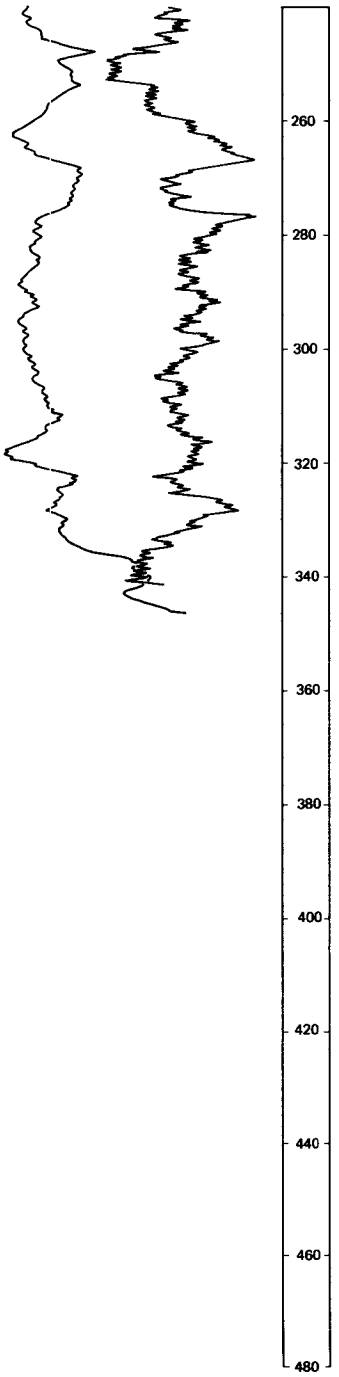
LOCATION: 162-075-04CDC

DATE DRILLED: 9/25/79

ALTITUDE: 2120
(FT, NGVD)

DEPTH: 347
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

260-268	Shale, indurated, brownish-black.
268-336	Siltstone, argillaceous, dark-gray; interbedded with thin lenses of bentonitic clay.
336-347	Sandstone, fine, argillaceous, moderately indurated, greenish-gray.

162-075-05BAB
NDSWC 10-738
(Log modified from Froelich, 1963)

Altitude: 2142 feet — Date drilled: 1962

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Turtle Mountains moraine:			
	Topsoil, black	1	1
	Clay, silty to gravelly, moderate-yellowish-brown, oxidized, calcareous (till)	10	11
	Clay, silty to gravelly, moderate-yellowish-brown and dark-yellowish-brown, oxidized calcareous (till)	8	19
	Silt, dark-yellowish-brown to olive-gray, cohesive, highly calcareous	11	30
	Clay, silty to sandy, dark-yellowish-brown to dark-greenish-gray, highly calcareous (till)	15	45
	Clay, silty to gravelly, dark-greenish-gray, calcareous (till)	13	58
	Clay, very silty, olive-gray, cohesive, calcareous (till)	69	127
	Sand, medium to very coarse, gravelly, subangular to subrounded	2	129
	Clay, very silty, olive-gray, cohesive, calcareous (till)	67	196
	Silt, sandy to pebbly, olive-gray (till)	38	234
	Gravel, fine to coarse, sandy, subrounded to rounded	13	247
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	31	278
	Clay, silty to gravelly, dark-yellowish-orange and grayish-orange to light-olive, oxidized, calcareous (till)	12	290
	Clay, silty to gravelly, dark-yellowish-orange and grayish-orange to light-olive, partially oxidized (till)	6	296
	Gravel, fine to medium, sandy, angular to well-rounded	6	302
	Clay, very gravelly, dark-greenish-gray, calcareous (till)	38	340
Hell Creek Formation:			
	Sand, very fine to medium, silty to clayey; medium bluish gray with light-greenish-gray and brownish-black areas	6	346

162-075-06ADD
(Log modified from C. A. Simpson & Son)

Altitude: 2110 feet — Date drilled: 10/02/65

Topsoil	1	1
Clay, yellow; rocks	24	25
Clay, blue; rocks	35	60
Clay, blue	88	148
Sand, clayey	12	160
Sand, coarse	27	187

162-075-06CBC
NDSWC 35-738
(Log modified from Froelich, 1963)

Altitude: 1960 feet — Date drilled: 6/27/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty, dark, organic	1	1
	Silt, clayey, sandy to pebbly, moderate-olive-brown, oxidized, highly calcareous (till)	21	22
	Clay, silty, olive-gray, highly calcareous (till)	31	53
	Sand, fine to coarse; with fine and medium gravel; subangular to subrounded	7	60
	Silt, clayey, light-olive-gray, cohesive, highly calcareous (till)	14	74
	Gravel, fine to medium; with fine to coarse sand; subangular to subrounded	9	83
	Silt, clayey to gravelly, moderate-olive-brown, slightly oxidized, highly calcareous (till)	9	92
	Silt, clayey, olive-gray, highly compacted, highly calcareous (till)	12	104
Hell Creek Formation:			
	Silt, dark-greenish-gray, smooth, well-sorted, cohesive, noncalcareous	12	116
	Sand, fine, clayey, olive-gray, subangular to subrounded, nonindurated, very slightly calcareous	10	126

162-075-06CD
NDSWC 27-738
(Log modified from Froelich, 1963)

Altitude: 1960 feet — Date drilled: 6/19/62

Glacial drift:			
	Topsoil, silty, dark, organic	1	1
	Clay, silty, moderate-olive-brown, oxidized, highly calcareous (till)	44	45
Hell Creek Formation:			
	Sand, fine, grayish-green, well-sorted, slightly indurated, noncalcareous	7	52

162-075-06DDA
NDSWC 9-738
(Log modified from Froelich, 1963)

Altitude: 2062 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, silty to gravelly, dark-yellowish-brown, oxidized, highly calcareous (till)	16	17
	Clay, silty to gravelly, dark-greenish-gray, calcareous (till)	86	103
	Sand, very fine to medium, very silty, grayish-olive, calcareous	39	142
	Silt, light-olive-gray, cohesive, calcareous	6	148
	Clay, silty, olive-gray to dark-greenish-gray, cohesive to tough, calcareous (till)	8	156
	Gravel, fine to medium, sandy, subrounded	7	163
	Gravel, fine to coarse; with coarse to very coarse sand; subrounded to rounded	7	170
	Gravel, fine, sandy, subrounded	9	179
	Clay, silty to gravelly, dark-greenish-gray, very tough, highly calcareous (till)	21	200
	Gravel, fine, sandy, subrounded	3	203
	Clay, silty to gravelly, dark-greenish-gray, very tough, highly clacareous (till)	28	231
	Gravel, fine, sandy, angular to rounded	11	242
Undifferentiated:			
	Clay, very silty, olive-gray, indurated, noncalcareous	10	252

162-075-07AAA
NDSWC 8-738
(Log modified from Froelich, 1963)

Altitude: 2061 feet Date drilled: 5/21/62

Glacial drift:			
	Topsoil, black	2	2
	Clay, silty to gravelly, dark-yellowish-orange, oxidized, calcareous (till)	24	26
	Clay, silty to gravelly, dark-yellowish-brown, oxidized, calcareous (till)	7	33
	Clay, silty to gravelly, dark-greenish-gray, calcareous (till)	21	54
	Clay, silty to gravelly, dark-greenish-gray, calcareous; with layers of fine to coarse sandy gravel	4	58
	Silt, dark-yellowish-brown, partially oxidized, calcareous	5	63
	Silt, sandy, olive-gray; with layers of very fine to very coarse subrounded sand and fine to coarse subangular gravel	11	74
	Gravel, fine to medium, clayey to sandy, subrounded	8	82
	Gravel, fine to medium, sandy, angular to rounded	9	91
Undifferentiated:			
	Clay (?), very indurated; no samples	3	94

162-075-07ACC
(Log from C. A. Simpson & Son)

Altitude: 1880 feet — Date drilled: 11/ /80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, gray	2	3
	Gravel	21	24
	Clay, blue	20	44
	Gravel	1	45
	Clay, blue; some rocks	22	67
	Gravel and rocks	1	68
	Clay, blue	33	101

162-075-07ADB
(Log from C. A. Simpson & Son)

Altitude: 1940 feet — Date drilled: 11/ /80

	Soil, black	2	2
	Gravel; mostly shale	6	8
	Clay, yellow	6	14
	Clay, blue	3	17
	Gravel	13	30
	Clay, blue	11	41

162-075-07ADC1
(Log from C. A. Simpson & Son)

Altitude: 1900 feet — Date drilled: 11/ /80

	Soil, black	1	1
	Clay, gray	1	2
	Clay, yellow	12	14
	Clay, gray	38	52
	Sand, fine to medium, yellow; with some rocks	11	63
	Sand and gravel; some coarse	4	67
	Clay	1	68
	Sand and gravel; coarse with pebbles	12	80
	Clay	5	85

162-075-07ADC2
(Log from C. A. Simpson & Son)

Altitude: 1900 feet — Date drilled: 11/ /80

	Topsoil	2	2
	Clay, gray	1	3
	Clay, yellow	9	12
	Clay, yellow; stones	12	24
	Clay, blue; stones	29	53
	Sand, yellow, medium; some stones	13	66
	Clay, blue; gravel layers	6	72
	Gravel, medium to coarse	13	85
	Clay, blue	--	85

162-075-07ADD
(Log from C. A. Simpson & Son)

Altitude: 1950 feet — Date drilled: 5/06/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow, sandy	7	8
	Clay, blue; a few gravel particles	13	21
	Rock	1	22
	Clay, blue	1	23
	Sand, gravel, and pebbles; mostly shale	7	30
	Clay, blue	20	50
	Sand, fine to coarse, to small gravel; mostly shale	16	66
	Clay	2	68
	Sand and gravel	3	71
	Clay, yellow	9	80

162-075-07BAC
(Log modified from C. A. Simpson & Son)

Altitude: 1880 feet — Date drilled: 9/29/65

	Topsoil	1	1
	Clay, yellow	17	18
	Clay, blue	27	45
	Clay, sandy, blue	7	52
	Clay, blue; rocks	27	79
	Sand and gravel	2	81

162-075-07BBB
NDSWC 26-738
(Log modified from Froelich, 1963)

Altitude: 1890 feet — Date drilled: 6/19/62

Glacial drift:			
	Topsoil, silty, black, organic	3	3
	Silt, sandy, olive-gray, noncohesive	1	4
	Gravel, fine to coarse, sandy, yellowish-brown, subangular to rounded	4	8
	Clay, silty, yellowish-brown, oxidized, slightly calcareous (till)	2	10
	Clay, silty to pebbly, moderate-olive-brown, oxidized, slightly calcareous (till)	5	15
	Sand, fine to coarse; with fine gravel; well rounded	3	18
	Clay, silty, grayish-olive, cohesive and plastic, slightly calcareous (till)	14	32
	Silt, clayey, dark-greenish-gray, smooth	16	48
	Gravel, fine to coarse, subangular to subrounded, clean	4	52
	Sand, fine to coarse, silty and clayey, angular to subrounded	10	62
Hell Creek Formation:			
	Sandstone, fine, grayish-olive, subangular to rounded, highly indurated; calcareous cement	12	74
	Clay, moderate-olive-brown, smooth, soapy	19	93
	Sand, fine, grayish-olive, rounded, well-sorted, slightly indurated	11	104
	Shale, silty, dark-brown, oily; high organic content; slightly indurated	22	126

162-075-07CBB
NDSWC 33-738
(Log modified from Froelich, 1963)

Altitude: 1825 feet — Date drilled: 6/27/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, medium to coarse; with fine to coarse gravel, pebbles, cobbles, and boulders	5	5
Hell Creek Formation:			
	Sand, fine, silty, moderate-olive-brown, subangular to subrounded, oxidized, noncalcareous	5	10
	Sand, fine, silty, dark-greenish-gray, noncalcareous	14	24
	Silt, dark-greenish-gray, compacted	7	31
	Sand, fine, silty, dark-greenish-gray; progressively more indurated with depth	11	42

162-075-07DAA1
(Log from C. A. Simpson & Son)

Altitude: 1930 feet — Date drilled: 11/ /80

	Topsoil, sandy	1	1
	Clay, yellow; with fine to coarse sand	11	12
	Clay, blue; with gravel and pebbles	6	18
	Clay, blue, very gravelly	2	20
	Gravel; somewhat clayey	4	24
	Clay	2	26
	Gravel and pebbles	4	30
	Clay, blue	3	33
	Clay, yellow, gravelly; rocks	5	38
	Gravel and sand; fine to coarse; nice	11	49
	Clay, gray	12	61
	Sand, fine to coarse, to gravel; some clayey; upper part fine	17	78
	Clay, gray; some pebbles and shale particles	10	88
	Sand and gravel; some clay; not much fine	22	110
	Clay	30	140

162-075-07DAA2
(Log from C. A. Simpson & Son)

Altitude: 1930 feet — Date drilled: 11/ /80

	Soil, black	2	2
	Clay, gray	14	16
	Clay, yellow; with a few pebbles	8	24
	Sand, gravel, and rocks	9	33
	Clay, gray; pebbles	23	56
	Sand and gravel; 50 percent shale with clay chunks and layers	13	69
	Clay, yellow	3	72
	Sand and gravel	10	82
	Sand and gravel	4	86
	Clay; losing fluid; no samples	8	94
	Rock, soft	2	96
	Clay	4	100

162-075-07DAB
(Log from C. A. Simpson & Son)

Altitude: 1900 feet — Date drilled: 11/ /80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Soil, black	3	3
	Clay, yellow	11	14
	Clay, blue; with a few pebbles	36	50
	Sand and gravel; small and large pebbles and rocks	12	62
	Shale boulder	2	64
	Clay, blue; with some small gravel; some rocks	36	100

162-075-07DAC
(Log from C. A. Simpson & Son)

Altitude: 1870 feet — Date drilled: 11/ /80

	Topsoil	1	1
	Clay; somewhat sandy	9	10
	Sand, gravel, and pebbles; with quite a few shale particles and some clay	10	20
	Sand, fine, gray	5	25
	Clay, gray; some gravel	57	82
	Sand, very fine, gray	14	96
	Clay or shale, gray; no sand	24	120

162-075-07DBA
(Log from C. A. Simpson & Son)

Altitude: 1900 feet — Date drilled: 11/ /80

	Topsoil	1	1
	Clay, yellow	9	10
	Clay, blue; with few stones	29	39
	Sand to gravel; some shale particles	6	45
	Clay, gray	3	48
	Shale rocks	1	49
	Clay; with small gravel	11.5	60.5
	Clay, very gravelly	.5	61
	Clay or shale	39	100

162-075-07DBB1
(Log from C. A. Simpson & Son)

Altitude: 1875 feet — Date drilled: 11/ /80

	Topsoil, black	1	1
	Clay, gray; a little sandy	2	3
	Clay, yellow	4	7
	Gravel	3	10
	Clay, blue-gray	12	22
	Sand, fine, clayey	8	30
	Clay, blue	11	41
	Sand, fine, clayey; with shale particles	29	70
	Clay, blue, soft	21	91
	Clay, blue	9	100

162-075-07DBB2
(Log from C. A. Simpson & Son)

Altitude: 1875 feet — Date drilled: 11/ /80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, gray	2	3
	Clay, yellow	2	5
	Gravel	11	16
	Clay, blue	23	39
	Rock	1	40
	Clay, blue	9	49
	Gravel and shale rock; layers	9	58
	Clay, blue	3	61

162-075-07DDA
(Log modified from C. A. Simpson & Son)

Altitude: 1870 feet — Date drilled: 11/ /80

	Topsoil, black	0.5	0.5
	Clay, yellow	20.5	21
	Clay, blue	2	23
	Sand, blue, fine	4	27
	Clay, blue	41	68
	Shale, blue, hard	7	75
	Shale, sandy	6	81

162-075-07DDC
(Log from C. A. Simpson & Son)

Altitude: 1840 feet — Date drilled: 11/ /80

	Topsoil, black	1	1
	Clay, yellow	17	18
	Clay, blue	8	26
	Rock, white	1	27
	Sand, green, fine; layers	3	30
	Clay, blue	21	51
	Sand, fine, blue; with small clay layers	18	69
	Sandstone	2	71
	Shale, blue	30	101

162-075-07DDD
NDSWC 7-738
(Log modified from Froelich, 1963)

Altitude: 1854 feet — Date drilled: 5/21/62

Glacial drift:			
	Topsoil, black	2	2
	Gravel, fine to coarse, sandy, subrounded	5	7
	Clay, silty to gravelly, dark-yellowish-orange, cohesive, oxidized, calcareous (till)	6	13
	Clay, silty to gravelly, dark-greenish-gray, cohesive (till)	25	38
	Gravel, fine to medium, sandy, subrounded to rounded	2	40
	Clay, silty to gravelly, dark-greenish-gray, cohesive (till)	1	41
Hell Creek Formation:			
	Sand, very fine to medium, very silty, angular to subrounded	9	50
	Silt, clayey to sandy, olive-gray, noncalcareous	13	63

162-075-08CAD
(Log modified from Lee's Well Drilling)

Altitude: 1950 feet — Date drilled: 6/16/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	16	17
	Clay, blue	123	140
	Sandstone, green	20	160
	Shale, sandy	20	180

162-075-08CDC1
(Log modified from C. A. Simpson & Son)

Altitude: 1900 feet — Date drilled: 6/30/63

	Topsoil	1	1
	Clay, gravelly, yellow; with rocks	16	17
	Gravel, clayey; rocks	8	25
	Clay, sandy, gray; rocks	109	134
	Clay or shale, sandy	15	149
	Hard layer	3	152
	Clay or shale, sandy	9	161

162-075-08CDC2
(Log modified from C. A. Simpson & Son)

Altitude: 1900 feet — Date drilled: 4/26/64

	Topsoil	1	1
	Gravel, clayey; boulders	9	10
	Clay, sandy, blue; rocks	47	57
	Rock layer	3	60
	Clay or shale, sandy, blue	60	120
	Sand, very clayey, fine	5	125
	Sand, slightly clayey, fine	5	130
	Sand, clayey, fine	44	174
	Clay, slightly sandy, brown	6	180
	Clay or shale, sandy, gray	15	195
	Shale, dark	5	200
	Shale, gray	19	219
	Shale, black	6	225
	Shale, gray	19	244
	Shale, sandy, gray	--	244

162-075-08CDD
NDSWC 15-738
(Log modified from Froelich, 1963)

Altitude: 1930 feet — Date drilled: 6/07/62

Glacial drift:			
	Clay, silty, moderate-olive-brown, oxidized calcareous (till)	9	9
	Sand, medium to very coarse; with fine to medium gravel; subrounded to rounded; loosely consolidated	11	20
	Sand, fine to medium; with some gravel; subrounded to rounded	7	27
	Clay, silty, olive-black, fairly cohesive (till)	24	51
Undifferentiated:			
	Shale, silty, olive-black, smooth, sticky, noncalcareous	12	63

162-075-08DCB
(Log modified from C. A. Simpson & Son)

Altitude: 2010 feet — Date drilled: 4/25/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Gravel and rocks	15	16
	Clay, sandy, blue	55	71
	Clay, gravelly, yellow	43	114
	Clay, sandy, blue	52	166
	Sandstone, fine	12	178

162-075-08DCC
(Log modified from C. A. Simpson & Son)

Altitude: 1970 feet — Date drilled: 8/02/68

	Topsoil	1	1
	Clay, sandy, yellow; rocks	36	37
	Clay, sandy, blue; rocks	56	93
	Gravel, coarse, dry	5	98
	Clay, sandy, yellow	35	133
	Clay, mushy, sandy, yellow	1	134
	Shale	80	214
	Sandstone	8	222

162-075-12CCA
(Log from Neff Drilling Company)

Altitude: 2200 feet — Date drilled: 10/07/72

	Topsoil	1	1
	Clay, yellow, sandy	13	14
	Clay, blue	59	73
	Sand and gravel, fine to medium	12	85
	Clay, blue	1	86

162-075-16BCA
(Log from Lee's Well Drilling)

Altitude: 2000 feet — Date drilled: 6/13/74

	Topsoil	1	1
	Sand, yellow	17	18
	Sand, blue	34	52
	Sand	30	82

162-075-17ABB
(Log modified from C. A. Simpson & Son)

Altitude: 1940 feet — Date drilled: 3/22/66

	Topsoil	2	2
	Gravel and stones	9	11
	Clay, sandy, blue	86	97
	Sand, fine	13	110

162-075-17CCC
(Log modified from C. A. Simpson & Son)

Altitude: 1735 feet — Date drilled: 5/ /66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	27	28
	Clay, sandy, blue	60	88
	Coal	2	90
	Sand, clayey, fine	3	93
	Sand, fine	7	100
	Sand, clayey	--	100

162-075-18BB
NDSWC 17-738
(Log modified from Froelich, 1963)

Altitude: 1780 feet — Date drilled: 6/11/62

Lake Souris deposits:			
	Topsoil, sandy, black	1	1
	Sand, medium, dark-yellowish-brown, subangular to rounded, well-sorted	5	6
Glacial drift:			
	Gravel, very coarse; no samples	3	9
	Sand, fine to medium; with some silt and fine gravel; light olive gray; well rounded	8	17
	Sand, fine to coarse, silty to gravelly	5	22
Fox Hills Sandstone:			
	Sand, fine, dark-greenish-gray, well-rounded, well-sorted, noncalcareous	21	43
	Shale, olive-black, thinly laminated, platy, noncalcareous	9	52

162-075-18BCC
NDSWC 24-738
(Log modified from Froelich, 1963)

Altitude: 1730 feet — Date drilled: 6/18/62

Glacial drift:			
	Topsoil, sandy, black, organic	1	1
	Silt, clayey to sandy; with some fine gravel; light olive gray	3	4
	Gravel, fine to coarse, yellowish-orange, subangular to rounded	5	9
	Clay, silty; with some fine sand; dark yellowish brown; oxidized; calcareous	9	18
	Clay, silty, olive-gray, calcareous	4	22
	Silt, clayey, olive-gray, calcareous	4	26
Fox Hills Sandstone:			
	Sand, fine, dark-greenish-gray, well-sorted, noncalcareous	12	38
	Shale, silty, dark-greenish-gray, smooth, moderately indurated	4	42
	Carbonaceous material, brownish-black, oily	6	48
	Shale, black, smooth, tar-like, very sticky	4	52

162-075-18DAA
NDSWC 3-738
(Log modified from Froelich, 1963)

Altitude: 1785 feet — Date drilled: 5/15/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, fine, sandy, subrounded	7	7
	Clay, silty, dark-yellowish-orange, slightly cohesive, highly calcareous	4	11
	Gravel, granular, sandy, subrounded	6	17
	Clay, silty to gravelly, dark-greenish-gray, cohesive (till)	33	50
Fox Hills Sandstone:			
	Sandstone, very fine to fine, clayey to silty, olive-black, indurated, noncalcareous	8	58
	Lignite, black, fissile	1	59
	Sandstone, very fine, clayey to silty, greenish-gray, indurated, noncalcareous	2	61
	Sandstone, very fine to fine, clayey to silty, olive-black, indurated, noncalcareous	2	63

162-075-19CCD
(Log modified from C. A. Simpson & Son)

Altitude: 1660 feet — Date drilled: 5/15/65

	Topsoil	1	1
	Clay, yellow	20	21
	Clay, sandy, blue	20	41
	Sandstone, gray	35	76

162-075-20BAB
NDSWC 25-738
(Log modified from Froelich, 1963)

Altitude: 1770 feet — Date drilled: 6/19/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, dark, organic----------	1	1
	Silt, sandy; with some clay; moderate olive brown; oxidized; slightly calcareous (till)----------	5	6
	Silt, clayey; with some sand; moderate olive brown; oxidized; very slightly calcareous (till)----------	4	10
	Silt, clayey to sandy, light-olive-gray, fairly cohesive, slightly oxidized, moderately calcareous (till)----------	15	25
	Clay, silty, olive-gray, very cohesive and plastic, moderately calcareous (till)----------	27	52
	Silt, clayey, olive-gray, cohesive (till)----------	15	67
Undifferentiated:			
	Shale, olive-black, indurated, noncalcareous----------	12	79
	Shale, olive-gray, smooth, moderately indurated, noncalcareous----------	5	84

162-075-20BCB
(Log modified from Neff Drilling Company)

Altitude: 1715 feet — Date drilled: 10/16/72

Topsoil----------	1	1
Sand and gravel----------	16	17
Clay, blue----------	62	79
Sand, green, silty----------	21	100

162-075-20BCC
(Log modified from Church Well Boring)

Altitude: 1710 feet — Date drilled: 9/05/75

Topsoil----------	1	1
Gravel and rocks, very coarse----------	28	29
Sand, light-gray; water----------	1	30
Clay, sandy, yellow----------	3	33
Sand, yellow and blue----------	7	40
Clay, blue----------	2	42

162-075-21ABA
NDSWC 22-738
(Log modified from Froelich, 1963)

Altitude: 1845 feet — Date drilled: 6/14/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, dark	1	1
	Silt, clayey; with some fine sand; light olive brown; oxidized; highly calcareous (till)	5	6
	Silt, clayey to sandy, moderate-olive-brown, slightly cohesive, oxidized, highly calcareous (till)	13	19
	Silt, clayey to sandy, brownish-olive-gray, slightly cohesive, slightly oxidized, calcareous (till)	3	22
	Silt, clayey; with some fine sand; olive gray; very cohesive; calcareous (till)	41	63
	Silt, clayey, olive-gray, very cohesive, calcareous (till)	19	82
	Gravel, fine to coarse; with some sand; subangular to subrounded	8	90
	Clay, silty to gravelly, olive-gray, very cohesive, plastic, calcareous (till)	44	134
Undifferentiated:			
	Sand, very fine, silty, dark-greenish-gray, subangular to subrounded, slightly indurated	2	136
	Shale, silty; with very fine sand; brownish olive gray; slightly calcareous	15	151
	Lignite, black, fissile	2	153
	Shale, brownish-gray to olive-gray, moderately indurated to well-indurated, noncalcareous	17	170
	Siltstone, clayey, olive-black, fissile, poorly indurated, noncalcareous	7	177
	Sandstone, dark-greenish-gray, subangular to subrounded, moderately indurated	11	188
	Shale, silty; with fine sand; brownish olive black; organic; laminated with thin layers of above sandstone	5	193
	Sandstone, very fine, dark-greenish-gray, subangular to subrounded, moderately well indurated	2	195
	Sandstone, clayey and silty, light-gray, smooth, soapy, noncalcareous	5	200
	Lignite, fissile	2	202
	Siltstone, clayey, greenish-gray, noncalcareous	19	221
	Shale, silty and sandy, brownish-olive-gray	10	231

162-075-21DAA
(Log from Neff Drilling Company)

Altitude: 1792 feet — Date drilled: 9/12/72

	Gravel, fine to medium to coarse	70	70

162-075-22AAD
NDSWC 21-738
(Log modified from Froelich, 1963)

Altitude: 1940 feet — Date drilled: 6/12/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty to gravelly, light-olive-brown to moderate-olive-brown, cohesive, oxidized, highly calcareous (till)	11	11
	Clay, silty to gravelly, light-olive-brown to moderate-olive-brown, cohesive, oxidized, highly calcareous; with some subrounded to rounded gravel (till)	18	29
	Clay, very silty, greenish-black, highly calcareous (till)	12	41
	Sand, fine to coarse; with some fine gravel; subangular to rounded	9	50
	Clay, very silty, greenish-black, cohesive, sticky, highly calcareous	18	68
Undifferentiated:			
	Silt, clayey, greenish-black, smooth, fairly cohesive, slightly calcareous	28	96
	Silt, clayey, light-greenish-black, brittle, tight	8	104
	Silt, clayey, light-greenish-black, brittle, tight; blue tint	12	116
	Silt, clayey, light-greenish-black, brittle, tight; brown tint	10	126

162-075-23BCC
(Log modified from C. A. Simpson & Son)

Altitude: 1860 feet — Date drilled: 8/17/66

Topsoil	1	1
Clay, sandy, yellow	6	7
Gravel, coarse, dry; rocks	8	15
Clay, sandy, blue	35	50
Gravel, dry, coarse	18	68
Clay, sandy, blue	33	101
Sandstone	5	106

162-075-24AAC
(Log modified from C. A. Simpson & Son)

Altitude: 2040 feet — Date drilled: 10/03/75

Topsoil	1	1
Clay, blue	19	20
Clay, sandy, blue	77	97
Clay, yellow	43	140
Clay, blue	20	160

162-075-27DCC
NDSWC 5-738
(Log modified from Froelich, 1963)

Altitude: 1670 feet — Date drilled: 5/16/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Topsoil, black	1	1
	Silt, clayey to sandy, dark-yellowish-orange, cohesive, oxidized, highly calcareous	6	7
Glacial drift:			
	Clay, silty to gravelly, dark-yellowish-orange to pale-yellowish-orange to dark-yellowish-brown, noncohesive to slightly cohesive, oxidized, highly calcareous (till)	3	10
	Clay, silty to gravelly, dark-greenish-gray, cohesive (till)	20	30
	Sand, fine to medium, angular to well-rounded, well-sorted	2	32
	Clay, silty to gravelly, dark-greenish-gray, cohesive	23.5	55.5
Fox Hills Sandstone:			
	Sand, very fine to fine, greenish-gray, noncalcareous	7.5	63

162-075-29ABB
(Log modified from Neff Drilling Company)

Altitude: 1680 feet — Date drilled: 10/20/72

	Topsoil	1	1
	Sand and gravel, fine to medium to coarse	21	22
	Clay, blue, sandy	33	55
	Sand and gravel, fine to medium	6	61
	Till, green, sandy	35	96
	Clay, gray, firm	5	101
	Sand, green; with silt	27	128

162-075-30ADA
(Log modified from C. A. Simpson & Son)

Altitude: 1665 feet — Date drilled: 12/10/69

	Topsoil	1	1
	Gravel	5	6
	Clay, sandy, yellow	18	24
	Clay, sandy, blue	59	83
	Shale, brown	7	90
	Shale, sandy, blue	45	135

162-075-30CBB
(Log modified from C. A. Simpson & Son)

Altitude: 1630 feet

	Topsoil	1	1
	Clay, yellow	16	17
	Clay, slightly sandy, gray	38	55
	Clay, blue	25	80
	Clay, slightly sandy, gray	13	93
	Shale, blue	39	132
	Hard layer	2	134
	Shale, blue	22	156

162-075-30DCA
(Log modified from C. A. Simpson & Son)

Altitude: 1640 feet — Date drilled: 5/05/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	19	20
	Clay, blue	18	38
	Sand, soupy	2	40
	Sandstone, gray, fine	25	65
	Clay, gray	--	65

162-075-30DDD
NDSWC 4-738
(Log modified from Froelich, 1963)

Altitude: 1635 feet — Date drilled: 5/16/62

Glacial drift:			
	Clay, silty to gravelly, dark-yellowish-orange to dark-yellowish-brown, cohesive, oxidized, calcareous (till)	22	22
	Clay, silty to gravelly, moderate-yellowish-brown to dark-greenish-gray, partially oxidized, calcareous (till)	11	33
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	29	62
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous; with lenses of fine sandy subrounded gravel	5	67
	Boulder	2	69
	Clay, silty to gravelly, dark-greenish-gray, tough, calcareous (till)	11	80
Fox Hills Sandstone:			
	Siltstone, clayey to sandy, greenish-gray, indurated, noncalcareous	5	85
	Shale, very silty to silty to slightly silty, dark-greenish-gray to greenish-gray to yellowish-gray, indurated to poorly indurated	5	90
	Sandstone, very fine to fine, clayey, greenish-gray to brownish-black, very poorly indurated	4	94

162-075-31BBB
(Log modified from C. A. Simpson & Son)

Altitude: 1615 feet — Date drilled: 12/03/64

	Topsoil and fill	8	8
	Clay, sandy, yellow	11	19
	Clay, sandy, blue	28	47
	Hard gravelly layer	3	50
	Clay, sandy, blue	25	75
	Shale	35	110

162-075-31CCA
(Log modified from Marchus Drilling)

Altitude: 1580 feet — Date drilled: 5/13/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Dirt, black	1	1
	Clay, yellow	15	16
	Clay, gray	99	115
	Sand and gravel, coarse	3	118

162-075-31CCC
NDSWC 6-738
(Log modified from Froelich, 1963)

Altitude: 1586 feet — Date drilled: 5/16/62

Alluvium:			
	Topsoil, black	1	1
	Silt, clayey to sandy, yellowish-gray, noncohesive to slightly cohesive, oxidized, very highly calcareous	5	6
	Silt, dark-yellowish-orange to moderate-yellowish-brown, slightly cohesive to cohesive, calcareous	6	12
Glacial drift:			
	Clay, silty to gravelly, moderate-yellowish-brown, cohesive, oxidized, highly calcareous (till)	5	17
	Clay, silty to gravelly, moderate-yellowish-brown to olive-gray, cohesive, partially oxidized, calcareous (till)	5	22
	Gravel, fine to medium, angular to rounded	2	24
	Clay, silty to gravelly, olive-gray, cohesive, calcareous (till)	8	32
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	6	38
	Sand, fine to coarse, angular to rounded	1	39
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	13	52
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous; abundant fine gravel	12	64
Fox Hills Sandstone:			
	Sandstone, very fine, greenish-gray, indurated, noncalcareous	10	74

162-075-31DBC
(Log modified from C. A. Simpson & Son)

Altitude: 1603 feet — Date drilled: 11/26/65

	Topsoil	1	1
	Clay, yellow	27	28
	Clay, sandy, blue	5	33
	Sand, very clayey	17	50
	Clay, blue	40	90
	Shale, sandy, gray	10	100
	Shale, gray	70	170
	Shale, blue	30	200

162-075-32CCC
(Log modified from C. A. Simpson & Son)

Altitude: 1602 feet — Date drilled: 5/21/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	22	23
	Clay, sandy, blue	35	58
	Clay, sandy, hard	59	117
	Shale	83	200

162-075-34BDB
(Log modified from C. A. Simpson & Son)

Altitude: 1650 feet — Date drilled: 6/20/69

	Topsoil	1	1
	Clay, sandy, yellow	15	16
	Clay, sandy, blue	44	60
	Sandstone	10	70

162-075-34DDC
(Log from C. A. Simpson & Son)

Altitude: 1629 feet — Date drilled: 7/13/65

	Topsoil	1	1
	Clay, yellow	21	22
	Clay, slightly sandy, blue	33	55
	Shale, blue	130	185

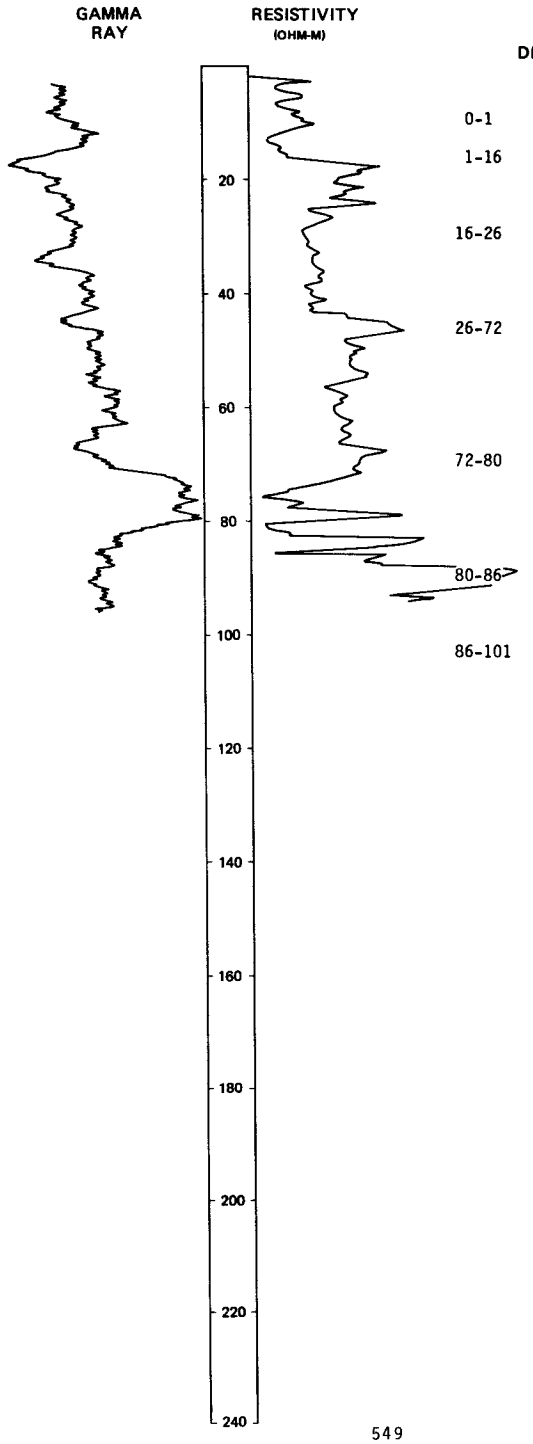
NDSWC 5864

LOCATION: 162-075-35AAA

DATE DRILLED: 10/28/80

ALTITUDE: 1695
(FT, NGVD)

DEPTH: 101
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-16	Clay, silty, pebbly, yellowish-brown, oxidized (till).
16-26	Gravel, fine to coarse; oxidized to 20 feet; about 30 percent coarse subrounded sand.
26-72	Clay, very silty, pebbly, olive-gray (till); interbedded with thin lenses of gravel from 44 to 72 feet.

FOX HILLS SANDSTONE

72-80	Siltstone, argillaceous, carbonaceous, brownish-gray; interbedded with thin lenses of fine greenish-gray sandstone.
80-86	Siltstone, argillaceous, very carbonaceous to lignitic, brown.
86-101	Sandstone, fine, silty, slightly glauconitic, poorly indurated.

162-076-01BCB
NDSWC 32-738
(Log modified from Froelich, 1963)

Altitude: 1850 feet — Date drilled: 6/26/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Silt, clayey; with much fine sand, dark yellowish brown; loose and noncohesive	4	5
	Clay, silty to pebbly, moderate-olive-brown, cohesive, oxidized, highly calcareous (till)	16	21
	Clay, silty, olive-gray, cohesive, compacted, calcareous (till)	9	30
Hell Creek Formation:			
	Sand, fine, greenish-gray, nonindurated	12	42

162-076-02ABA
NDSWC 18-738
(Log modified from Froelich, 1963)

Altitude: 1860 feet — Date drilled: 6/12/62

Glacial drift:			
	Topsoil, sandy, dark	1	1
	Gravel, fine to coarse, sandy to bouldery, rusty, subangular to rounded; coarser with depth	18	19
	Clay, silty to sandy, moderate-olive-brown, oxidized, calcareous (till)	2	21
	Clay, silty to sandy, olive-gray, cohesive (till)	21	42
	Silt; some fine sand; olive gray; uniform; calcareous	11	53
Hell Creek Formation:			
	Silt, sandy to shaly, brown, noncalcareous	10	63
	Silt, sandy, brown, micaceous	10	73

162-076-02DAC
(Log modified from C. A. Simpson & Son)

Altitude: 1800 feet — Date drilled: 9/09/65

Topsoil	1	1
Clay, yellow	14	15
Clay, blue	15	30
Clay, brown	10	40
Clay, slightly sandy, blue	15	55
Clay, sandy, brown	5	60
Shale, sandy	17	77
Shale, slightly sandy	65	142

162-076-02DAD
(Log modified from C. A. Simpson & Son)

Altitude: 1810 feet — Date drilled: 1967

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	10	11
	Clay, gravelly, yellow	16	27
	Clay, brown	20	47
	Clay, sandy, blue	15	62
	Sandstone	21	83
	Shale	5	88

162-076-05BAD
(Log from A. E. Anderson Driller)

Altitude: 1654 feet — Date drilled: 6/05/28

	Black topsoil	1	1
	Yellow clay	23	24
	Blue clay and rocks	11	35
	Rock and lignite	6	41
	Blue shale	11	52
	Soft blue clay and fine sand	70	122
	Gray clay and fine sand	13	135
	Hard blue shale	29	164
	Sand and clay	6	170
	Dry blue clay	26	196
	Green clay and shale	12	208
	Hard black shale	7	215

NDSWC 5575

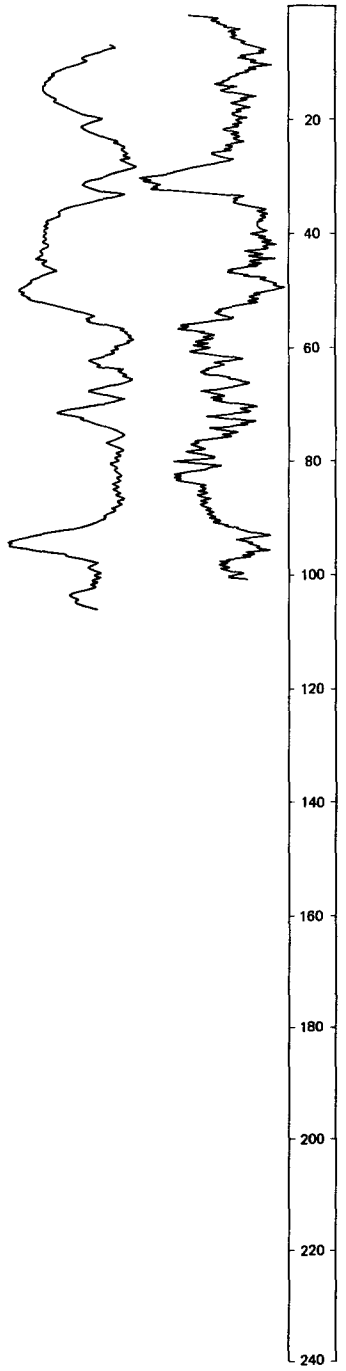
LOCATION: 162-076-05DAA

DATE DRILLED: 9/25/79

ALTITUDE: 1661
(FT, NGVD)

DEPTH: 107
(FT)

NEUTRON (API) GAMMA RAY



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-33	Clay, sandy, pebbly, yellowish-brown, oxidized (till); lenses of sand and gravel from 28 to 33 feet.
33-54	Clay, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

54-92	Sandstone, very fine to fine, argillaceous, glauconitic; carbonaceous indurated greenish-gray streaks.
92-107	Sandstone, very fine to fine, very argillaceous, glauconitic, and greenish-gray siltstone; becoming carbonaceous.

162-076-09AAA
NDSWC 20-738
(Log modified from Froelich, 1963)

Altitude: 1660 feet — Date drilled: 6/12/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Topsoil, sandy, dark, organic----------	1	1
	Silt, clayey to sandy, white, marly, soapy, highly calcareous----------	2	3
	Silt, clayey to sandy, light-gray----------	3	6
	Silt, sandy, light-olive-gray, leached, oxidized, calcareous----------	5	11
	Sand, fine to coarse; some silt and gravel; oxidized----------	7	18
Glacial drift:			
	Clay, silty, olive-black, cohesive, calcareous (till)----------	2	20
	Sand, fine to medium, gray; coarser with depth----------	5	25
Fox Hills Sandstone:			
	Sand, fine, dark-greenish-gray, rounded, well-sorted, uniform----------	17	42

162-076-11ABA
NDSWC 30-738
(Log modified from Froelich, 1963)

Altitude: 1790 feet — Date drilled: 6/26/62

Glacial drift:			
	Topsoil, sandy, dark, organic----------	1	1
	Silt, clayey; with much fine sand; moderate olive brown; moderately cohesive; oxidized; moderately calcareous (till)----------	15	16
	Silt, clayey; with a little fine sand; olive gray; cohesive; plastic; moderately calcareous (till)----------	2	18
	Sand, fine; with much silt; olive gray; subrounded; moderately calcareous----------	10	28
	Silt, olive-gray, well-sorted, smooth, loose and noncohesive, slightly calcareous to moderately calcareous----------	5	33
	Silt, clayey, olive-gray, cohesive, plastic, moderately calcareous----------	11	44
Fox Hills Sandstone:			
	Sand, fine, dark-greenish-gray, subrounded, well-sorted----------	19	63

162-076-11DAD
NDSWC 23-738
(Log modified from Froelich, 1963)

Altitude: 1755 feet — Date drilled: 6/14/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine, clayey and silty, moderate-olive-brown, oxidized, highly calcareous	11	11
	Sand, fine to coarse; with fine to medium gravel; subangular to rounded; oxidized	4	15
	Sand, very fine; with silty clay; light olive gray; slightly oxidized to moderately oxidized, calcareous	11	26
	Gravel, fine to coarse; with sand; silt, and clay; olive gray; subangular to subrounded	13	39
	Clay, silty; with minor amounts of sand and gravel; olive gray; slightly calcareous	12	51
	Sand, fine to coarse, gray	3	54
	Clay, very silty; with some sand and gravel; olive gray; cohesive and compacted; slightly calcareous (till)	7	61
	Gravel, fine to coarse; with some sand; angular to subrounded	9	70
	Clay, silty to gravelly, olive-gray, extremely compacted and cohesive, slightly calcareous (till)	24	94
	Gravel, fine to coarse, gray	11	105
	Sand, fine to coarse; with some gravel; subangular to rounded	11	116
	Gravel, fine to coarse; with much sand; frequently changes from gravel to sand	39	155
	Clay, very silty; with fine sand; dark greenish gray; highly calcareous (till)	29	184
	Sand, fine, clayey to silty, brownish-olive-gray	6	190
	Clay, silty, dark-greenish-gray, slightly cohesive, calcareous (till)	10	200
Fox Hills Sandstone:			
	Sand, fine, dark-greenish-gray, well-sorted, noncalcareous	10	210

162-076-12BBB
NDSWC 31-738
(Log modified from Froelich, 1963)

Altitude: 1800 feet — Date drilled: 6/26/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, moderate-olive-brown, cohesive, plastic, oxidized, moderately calcareous to highly calcareous (till)----------	12	12
	Clay, very silty, dark-yellowish-brown, slightly oxidized, moderately calcareous to highly calcareous (till)----------	4	16
	Clay, silty, olive-gray, very cohesive and tenaceous, plastic (till)----------	12	28
Hell Creek Formation:			
	Sandstone, fine, dark-greenish-gray, well-sorted, nonindurated----------	5	33
	Shale, brownish-black, fissile, oily, moderately indurated; interbedded with smooth greenish-white slightly calcareous soapstone and carbonaceous material----------	9	42

162-076-13AAA
(Log modified from C. A. Simpson & Son)

Altitude: 1784 feet — Date drilled: 5/02/71

Topsoil----------	1	1
Clay, very sandy, yellow----------	10	11
Hardpan, gravelly; rocks----------	9	20
Clay, gravelly, blue; rocks----------	3	23
Clay, sandy, light-blue----------	22	45
Clay or shale, gray----------	38	83
Shale and coal----------	8	91
Shale, sandy, gray----------	3	94
Shale, sandy, light-gray----------	3	97
Shale, sandy, gray----------	6	103
Shale, sandy, light-brown----------	5	108
Shale, light-green----------	7	115
Shale, sandy, gray----------	15	130
Shale, quite sandy, gray; with a little water----------	31	161
Clay, sandy, gray----------	77	238
Sand, fine, clayey, blue----------	3	241
Shale, gray----------	9	250

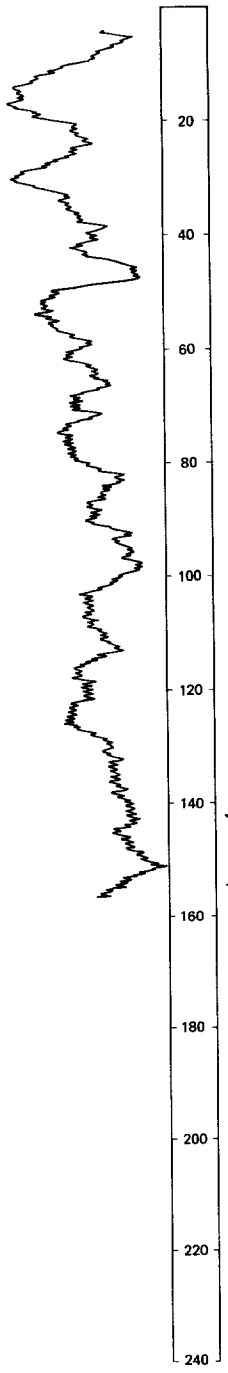
NDSWC 5862

LOCATION: 162-076-14ABA

DATE DRILLED: 10/27/80

ALTITUDE: 1710 (FT, NGVD)

DEPTH: 161 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-3	Silt, yellowish-brown, oxidized.
3-15	Sand, fine to coarse, and fine angular to rounded oxidized gravel.
15-20	Clay, very silty, yellowish-brown, oxidized (till).
20-31	Clay, very silty, olive-gray (till); interbedded with thin lenses of sand and gravel.
31-34	Clay, very sandy, pebbly, olive-gray (till).
34-38	Silt, clayey; carbonaceous brownish-gray streaks.

FOX HILLS SANDSTONE

38-52	Siltstone, carbonaceous to lignitic, moderately indurated, brownish-gray.
52-82	Sandstone, fine, glauconitic, poorly indurated, greenish-gray.
82-100	Sandstone, fine, silty, very argillaceous; carbonaceous greenish-gray streaks.
100-141	Sandstone, fine, siliceous, glauconitic, poorly indurated, green.
141-161	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray.

162-076-14BBB
(Log modified from Froelich, 1963)

Altitude: 1668 feet — Date drilled: 7/09/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, medium to coarse; clear white angular to rounded quartz; buff angular dolomite; angular fragments of white to clear pink feldspar; angular fragments of greenstone; rounded gray chert fragments	30	30
Fox Hills Sandstone:			
	Silt, light-gray, micaceous, sandy; with brownish-gray silt	30	60
	Sand; very fine to trace medium; quartzose; light gray; glauconitic; with grayish-brown silt and sand	60	120
	Sand, light-gray, quartzose, fine, micaceous, salt and pepper, slightly calcareous	30	150
	Silt and sand; with brownish-gray shale from 210 to 270	120	270
Pierre Shale:			
	Shale, black	---	270
	Partial log; no free oil	---	3,917

162-076-17AAD
(Log modified from Mariner Drilling Service)

Altitude: 1530 feet — Date drilled: 8/25/76

Surface	1	1
Clay, yellow	19	20
Clay, sandy, hard	30	50
Clay, blue	18	68
Sand, muddy; water	13	81

162-076-22CDC
(Log modified from Church Well Boring)

Altitude: 1478 feet — Date drilled: 4/19/76

Topsoil, black	1	1
Clay, yellow	27	28
Clay and rocks, blue	8	36
Sand, dry, green	6	42
Sand, gray; water	39	81

162-076-23CDD
(Log modified from Church Well Boring)

Altitude: 1620 feet — Date drilled: 9/01/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	1	1
	Clay, yellow	11	12
	Gravel	5	17
	Clay, yellow	2	19
	Clay, blue	4	23
	Sand, blue	1	24
	Clay, sandy, blue	3	27
	Clay, blue	5	32
	Sand, blue; water	6	38
	Clay, blue, hard	4	42
	Sand, blue, and sandy blue clay; alternating layers	18	60

162-076-24AAA
NDSWC 5579

Altitude: 1695 feet — Date drilled: 9/25/76

Glacial drift:			
	Soil	1	1
	Sand, fine to coarse, and medium angular to subrounded gravel; predominately carbonate, igneous, and detrital shale grains and pebbles	14	15
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	5	20
	Clay, silty, sandy, pebbly, olive-gray (till)	32	52
Fox Hills Sandstone:			
	Siltstone, slightly sandy, argillaceous, greenish-gray	25	77

162-076-24ADD1
(Log from Lee's Well Drilling)

Altitude: 1680 feet — Date drilled: 4/25/74

	Topsoil	1	1
	Sand, yellow	17	18
	Sand, blue	50	68
	Sandstone, dry	19	87
	Sandstone, fine, green	5	92

162-076-24ADD2
NDSWC 2-738
(Log modified from Froelich, 1963)

Altitude: 1682 feet — Date drilled: 5/15/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty to gravelly, dark-yellowish-orange to dark-yellowish-brown, slightly cohesive to cohesive, oxidized (till)----------	10	10
	Clay, silty to gravelly, olive-gray, cohesive (till)----------	37	47
Fox Hills Sandstone:			
	Sand, very fine to medium, greenish-gray, fairly well indurated, noncalcareous----------	15	62
	Shale, silty, dusky-yellowish-brown; lignite laminae; fairly well indurated; noncalcareous----------	12	74
	Shale, silty, greenish-gray, indurated, noncalcareous----------	5	79
	Shale, silty, light-olive-gray to olive-gray, indurated, noncalcareous----------	4	83
	Sandstone, fine to very fine, silty, dusky-yellowish-brown; lignite seams; indurated; noncalcareous----------	7	90
	Sandstone, fine to very fine, silty, medium-bluish-gray, poorly indurated, noncalcareous----------	5	95
	Sandstone, fine, clayey to silty, medium-bluish-gray, indurated, noncalcareous----------	10	105
	Limestone; silty to very fine sand; light olive gray and dark greenish gray; very well indurated; highly calcareous----------	2	107
	Sandstone, silty to clayey, greenish-gray, poorly indurated, noncalcareous----------	12	119
	Siltstone, clayey; with very fine sand; light olive gray; indurated; noncalcareous----------	11	130
	Siltstone, clayey to sandy, greenish-gray, indurated, noncalcareous----------	7	137
	Siltstone, clayey to sandy, light-olive-gray, indurated, noncalcareous----------	9	146
	Sandstone, fine to very fine, silty, greenish-gray, poorly indurated, noncalcareous----------	11	157
	Shale, very silty, light-olive-gray to greenish-gray, indurated, noncalcareous----------	14	171
	Sandstone, very fine to fine, clayey to silty, dark-greenish-gray, poorly indurated, noncalcareous----------	8	179
	Shale, silty, greenish-gray, indurated, noncalcareous----------	10	189
	Sandstone, very fine to fine, dark-greenish-gray, very well indurated; calcareous cement----------	2	191

162-076-25AAA
(Log from C. M. Wick, Driller)

Altitude: 1655 feet — Date drilled: 5/28/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Yellow clay	20	20
	Blue clay	40	60
	Gray clay	39	99
	Black sand and dark clay; water	11	110

162-076-25AAD
NDSWC 33-738
(Log modified from Froelich, 1963)

Altitude: 1646 feet — Date drilled: 6/26/62

Glacial drift:			
	Clay, silty; with fine sand; leached; highly calcareous (till)	5	5
	Clay, silty to pebbly, moderate-olive-brown, cohesive, fairly plastic, oxidized, highly calcareous (till)	11	16
	Clay, silty to sandy, olive-gray, cohesive, highly calcareous	3	19
	Silt, clay, olive-gray, cohesive, tenaceous and pliable	11	30
	Sand, fine to medium, light-brown, subangluar to subrounded, fairly well sorted	2	32
	Silt, clayey, olive-gray, cohesive; occasional gravel and boulders	18	50
Fox Hills Sandstone:			
	Sand, fine, dark-greenish-gray, well-sorted, friable, nonindurated, noncalcareous	13	63
	Sand, fine, dark-greenish-gray, well-sorted, friable, nonindurated, noncalcareous; core	5	68

162-076-26BAB
NDSWC 1-738
(Log modified from Froelich, 1963)

Altitude: 1592 feet — Date drilled: 5/15/62

Alluvium:			
	Topsoil, black	1	1
	Clay, silty, light, marly	3	4
	Gravel, fine; with medium to very coarse sand; subangular to subrounded	2	6
	Gravel, fine to medium; with medium to very coarse sand; subangular to subrounded	2	8
	Clay, silty to sandy, olive-gray, cohesive, highly calcareous	2	10
	Sand, medium to very coarse, granular, subangular to rounded	9	19
Fox Hills Sandstone:			
	Clay, silty, dark-greenish-gray, slightly cohesive, calcareous	8	27
	Clay, very sandy, dark-greenish-gray, slightly cohesive, noncalcareous; with silty to sandy olive-gray slightly cohesive calcareous clay and silty clay; dusky-yellowish-brown cohesive highly calcareous organic streaks	15	42

162-076-26DCD
(Log modified from C. A. Simpson & Son)

Altitude: 1605 feet — Date drilled: 11/14/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	26	27
	Clay, sandy, blue	21	48
	Sand, hard, and sandy clay	27	75
	Sandstone, hard	15	90

162-076-29BAA
(Log modified from Church Well Boring)

Altitude: 1560 feet — Date drilled: 8/07/73

	Topsoil	2	2
	Clay, yellow	28	30
	Clay, blue	25	55
	Sand, bluish-green, hard	35	90
	Clay, blue	8	98

162-076-35AAB
(Log modified from C. A. Simpson & Son)

Altitude: 1592 feet — Date drilled: 9/23/74

	Gravel	2	2
	Topsoil	1	3
	Clay, gravelly, yellow; with rocks	17	20
	Clay, blue	47	67
	Sand, soupy; hole fills with water overnight	3	70
	Shale	180	250

162-077-06DAD
(Log from C. A. Simpson & Son)

Altitude: 1498 feet — Date drilled: 5/24/67

	Topsoil	1	1
	Clay, sandy, yellow	31	32
	Clay, sandy, blue	23	55
	Clay, gravelly, blue	15	70
	Clay, blue	16	86
	Shale	29	115

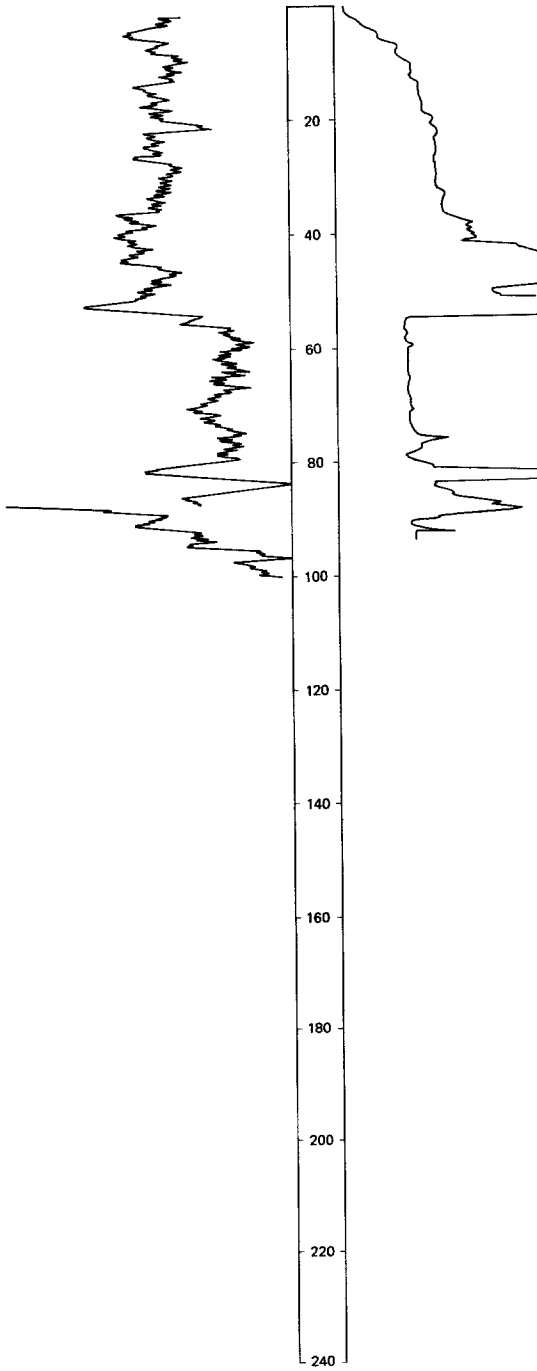
NDSWC 5574

LOCATION: 162-077-07DAA

DATE DRILLED: 9/24/79

ALTITUDE: 1495
(FT, NGVD)

DEPTH: 107
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-18 Clay, sandy, pebbly, yellowish-brown, oxidized (till).

18-55 Clay, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

55-62 Siltstone, argillaceous, indurated, dark-gray.

62-74 Sandstone, very fine, poorly indurated, greenish-gray.

74-107 Claystone, silty, grayish-black.

LOCATION: 162-077-07DAA

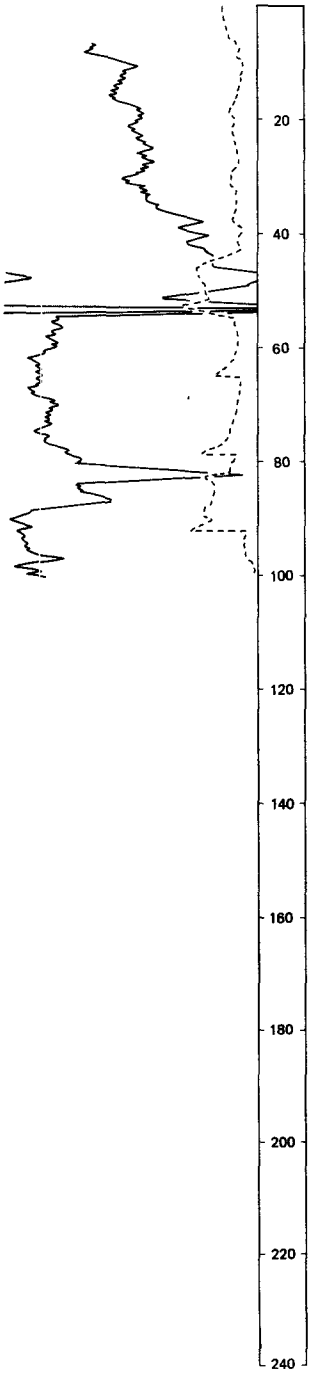
DATE DRILLED: 9/24/79

ALTITUDE: 1495
(FT, NGVD)

DEPTH: 107
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

162-078-01DAC1
(Log modified from C. A. Simpson & Son)

Altitude: 1511 feet — Date drilled: 9/20/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	34	35
	Clay, gray	14	49
	Hardpan, gravelly	10	59
	Clay, sandy, gray	5	64
	Hard layer	2	66
	Clay, very sandy, gray	6	72
	Gravel	1	73
	Rock	1	74
	Clay, sandy	11	85
	Shale	15	100

162-078-01DAC2
(Log modified from C. A. Simpson & Son)

Altitude: 1511 feet — Date drilled: 10/06/65

	Topsoil	1	1
	Clay, yellow	24	25
	Clay, blue	25	50
	Clay, sandy, blue	15	65
	Clay, slightly sandy, blue	5	70

162-078-01DDB
(Log modified from Church Well Boring)

Altitude: 1500 feet — Date drilled: 9/18/75

	Topsoil, black	1	1
	Clay, yellow	35	36
	Clay, blue	12	48
	Clay, sandy, blue	3	51
	Sand, coarse. blue	8	59
	Clay, sandy, blue	--	59

162-078-05ABB
(Log modified from Verne R. Peterson Well Drilling)

Altitude: 1495 feet — Date drilled: 6/ /74

	Topsoil	2	2
	Clay, yellow	32	34
	Clay, gray	10	44
	Gravel	5	49
	Hardpan	25	74
	Clay, gray	16	90
	Gravel	2	92
	Clay, gray	42	134
	Sand, blue, and clay; mixed	31	165
	Shale	59	224
	Hardpan	2	226
	Shale	179	405
	Shale, black, hard	8	413
	Shale, soft	7	420
	Shale, black, very hard	24	444
	Shale, soft	13	457
	Shale, hard	43	500

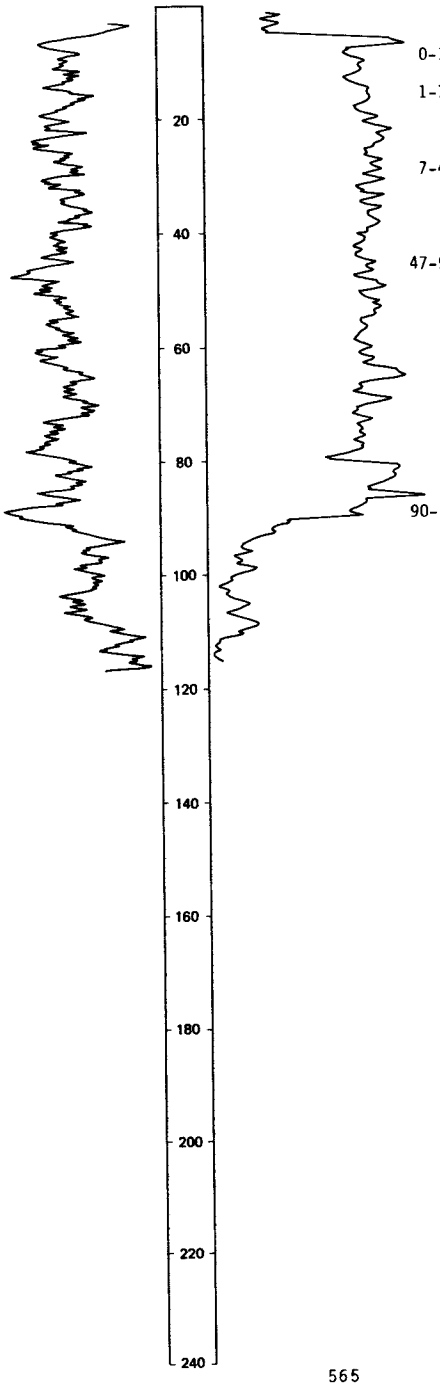
NDSWC 5573

LOCATION: 162-078-15CCC

DATE DRILLED: 9/21/79

ALTITUDE: 1493
(FT, NGVD)

DEPTH: 122
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-7	Clay, sandy, pebbly, yellowish-brown, oxidized (till).
7-47	Clay, silty to sandy, pebbly, olive-gray (till).
47-90	Clay, very silty and sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

90-122	Sandstone, very fine, glauconitic; carbonaceous greenish-gray streaks.

LOCATION: 162-078-15CCC

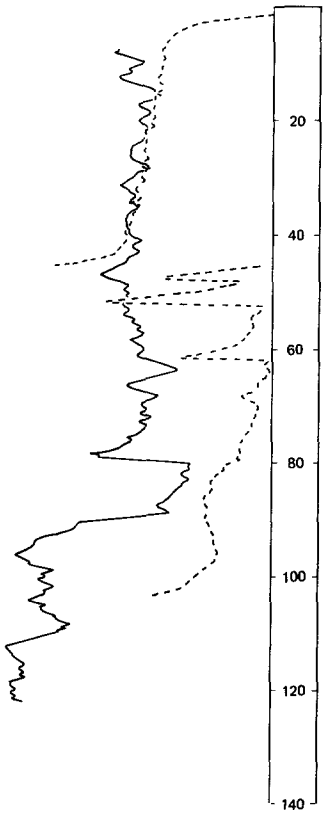
DATE DRILLED: 9/21/79

ALTITUDE: 1493
(FT, NGVD)

DEPTH: 122
(FT)

NEUTRON (API) S.P. (MV)

DESCRIPTION OF DEPOSITS



162-078-21BBB
(Log modified from C. A. Simpson & Son)

Altitude: 1496 feet

Date drilled: 6/15/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	19	20
	Clay, blue	40	60
	Clay, sandy, blue	35	95
	Sand, clayey	22	117
	Sand, coarse	6	123

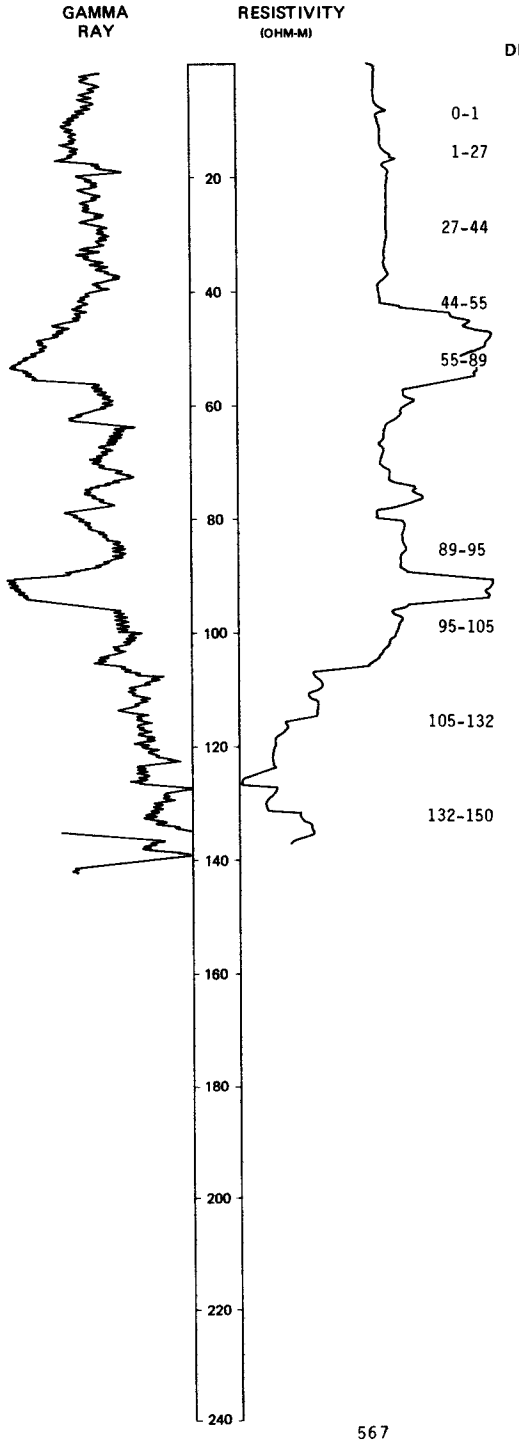
NDSWC 5568

LOCATION: 162-079-03CCC

DATE DRILLED: 9/18/79

ALTITUDE: 1484
(FT, NGVD)

DEPTH: 150
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-27	Clay, sandy, pebbly, yellowish-brown, oxidized (till).
27-44	Clay, silty to very sandy, pebbly, olive-gray (till).
44-55	Sand, fine to medium, subangular.
55-89	Clay, sandy, gravelly, olive-gray (till).
89-95	Sand, very fine to coarse, gravelly; predominately quartz and carbonate grains.
95-105	Clay, sandy, pebbly, olive-green (till).

FOX HILLS SANDSTONE

105-132	Sandstone, very fine to fine, argillaceous, glauconitic; carbonaceous dusky-green streaks.
132-150	Siltstone, sandy, argillaceous, indurated, dark-gray.

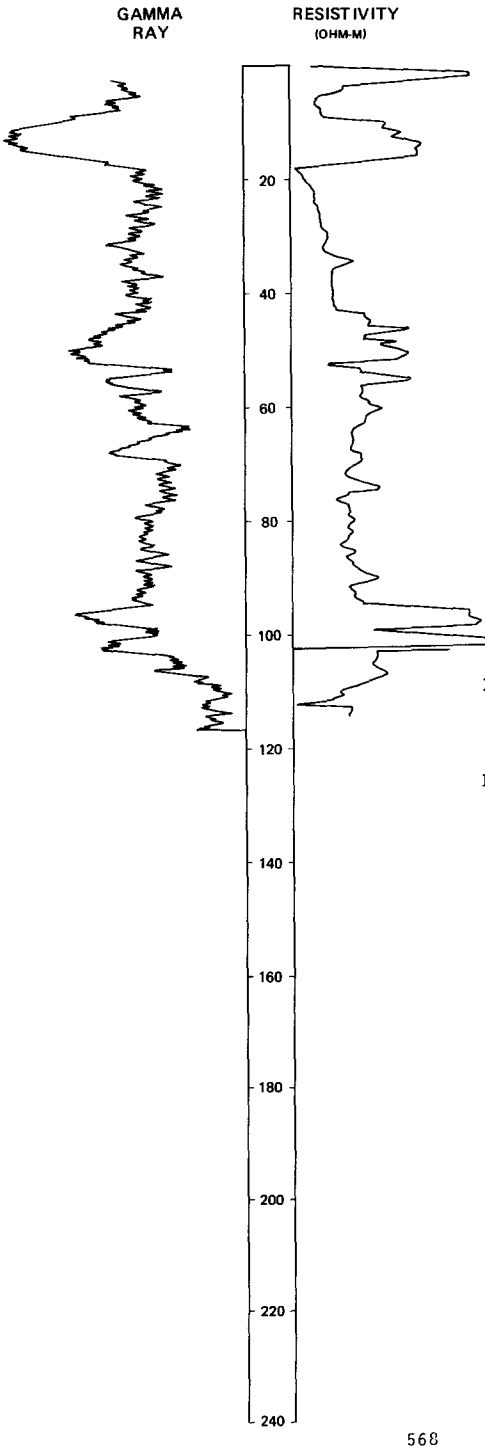
NDSWC 5569

LOCATION: 162-079-05ABA

DATE DRILLED: 9/18/79

ALTITUDE: 1442 (FT, NGVD)

DEPTH: 122 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-9	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
9-17	Sand, fine to coarse, gravelly, subrounded to rounded; predominately carbonate, silicate, and detrital shale grains.
17-43	Clay, silty, pebbly, olive-gray (till).
43-94	Clay, sandy, gravelly, olive-gray (till).
94-101	Sand, medium to coarse, gravelly; predominately carbonate, igneous, and metamorphic grains.
101-102	Clay, sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

102-122	Siltstone, argillaceous; with thin lenses of glauconitic green to greenish-gray sandstone.

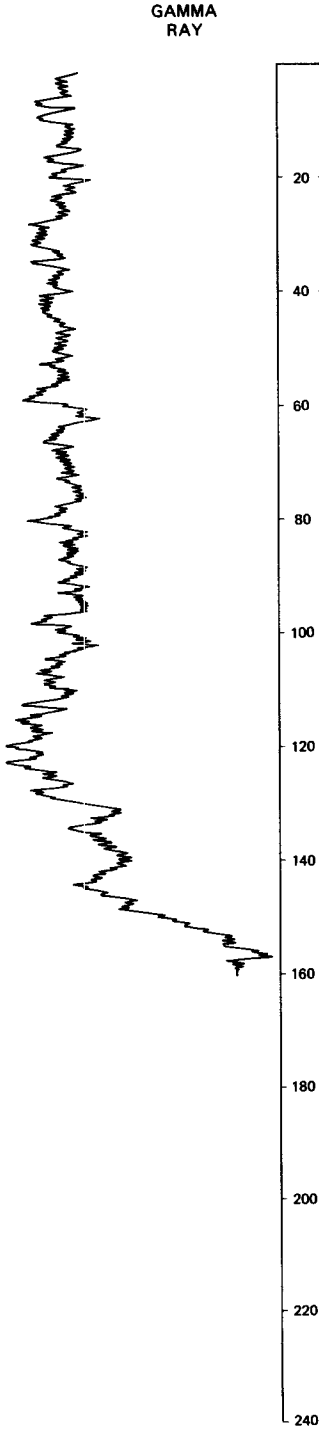
NDSWC 5565

LOCATION: 162-079-06CDC

DATE DRILLED: 9/17/79

ALTITUDE: 1473
(FT, NGVD)

DEPTH: 167
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-29	Clay, silty to sandy, yellowish-brown, oxidized (till).
29-90	Clay, silty to sandy, pebbly, olive-gray (till).
90-122	Clay, very sandy, pebbly, olive-gray (till).
122-129	Sand, coarse, gravelly; predominately carbonate and detrital shale grains.

FOX HILLS SANDSTONE

129-149	Sandstone, very fine to fine, silty, glauconitic, greenish-gray.
149-167	Siltstone, sandy, indurated, greenish-gray.

162-079-14BCC
(Log modified from C. A. Simpson & Son)

Altitude: 1484 feet

Date drilled: 7/09/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	30	31
	Clay, hard, sandy, blue	38	69
	Sand	5	74

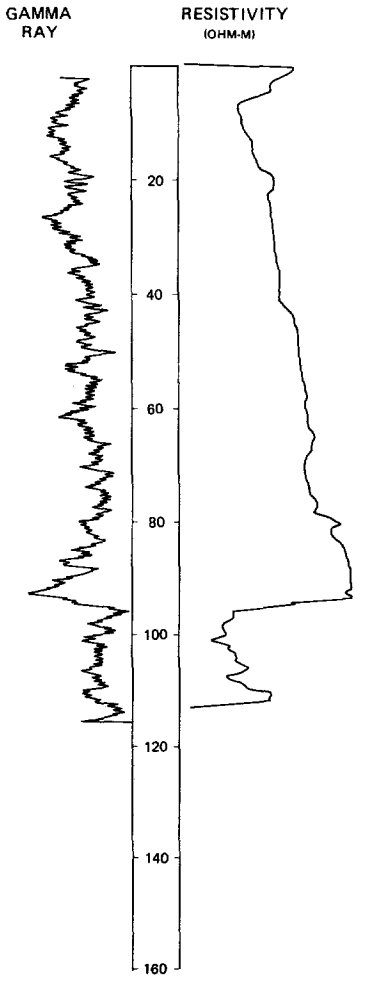
NDSWC 5570

LOCATION: 162-079-14CCC

DATE DRILLED: 9/18/79

ALTITUDE: 1479
(FT, NGVD)

DEPTH: 122
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-47 Clay, silty, pebbly, yellowish-brown, oxidized (till).

47-94 Clay, silty, pebbly, olive-gray (till); occasional boulders.

FOX HILLS SANDSTONE

94-122 Siltstone, very sandy, argillaceous, indurated, greenish-gray.

162-079-17AAA
(Log modified from C. A. Simpson & Son)

Altitude: 1472 feet — Date drilled: 6/03/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	19	20
	Clay, blue	65	85
	Clay, sandy, blue	5	90
	Clay, blue	26	116
	Sand; somewhat coarse	1	117

162-079-23BBB
(Log modified from C. A. Simpson & Son)

Altitude: 1484 feet — Date drilled: 6/16/65

	Topsoil	1	1
	Clay, yellow	44	45
	Clay, slightly sandy, blue	45	90
	Clay, blue	8	98
	Shale, blue	52	150

162-079-29DDD
(Log modified from Nick Erck Well Drilling)

Altitude: 1465 feet — Date drilled: 6/29/75

	Topsoil, black	2	2
	Clay, yellow	37	39
	Clay, gray	34	73
	Sand, muddy	57	130
	Gravel; water	--	130

162-079-34BCB
(Log modified from Nick Erck Well Drilling)

Altitude: 1433 feet — Date drilled: 10/02/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	2	2
	Gravel; rock	6	8
	Clay, yellow	18	26
	Clay, gray	38	64

162-080-03AAA
(Log fron Neff Drilling Company)

Altitude: 1490 feet — Date drilled: 6/14/72

	Topsoil	3	3
	Clay, sandy, yellow	21	24
	Clay, sandy, gray	18	42
	Clay, blue	46	88
	Clay, gray, sandy	4	92
	Clay, blue, sandy	17	109
	Gravel	1	110
	Clay, sandy, blue; with silt	50	160

162-080-03ABB
NDSWC 958
(Log modified from Powell, 1959)

Altitude: 1491 feet — Date drilled: 8/24/54

Glacial Lake Souris deposits:			
	Topsoil, sandy, black	2	2
	Clay, yellow; and fine to medium gravel	35	37
Till and associated sand and gravel deposits:			
	Clay, gray, and fine to medium gravel	67	104
	Gravel, fine, clean	3	107
	Clay, gray, and fine to medium gravel	3	110
	Gravel, fine to medium	2	112
	Clay, gray, and fine gravel	56	168
Fox Hills Sandstone:			
	Clay, smooth, gray	3	171
	Shale, gray	4	175

162-080-03DCC
NDSWC 959
(Log modified from Powell, 1959)

Altitude: 1490 feet — Date drilled: 8/25/54

GEOLOGIC SORUCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Lake Souris deposits:			
	Topsoil, sandy, black	2	2
	Clay, yellow, and fine to medium gravel	36	38
Till and associated sand and gravel deposits:			
	Clay, gray, and fine to medium gravel	138	176
Fox Hills Sandstone:			
	Clay, smooth, gray	2	178
	Shale, gray	2	180

162-080-11ABA
(Log modified from Verne R. Peterson Well Drilling)

Altitude: 1465 feet — Date drilled: 11/29/76

	Topsoil	1	1
	Clay, yellow	17	18
	Gravel	2	20
	Till	14	34
	Gravel	1	35
	Till	13	48
	Gravel	1	49
	Till; with small gravel layers	77	126
	Sand	4	130
	Till	10	140
	Gravel	4	144
	Bedrock	11	155

162-080-11CAA
(Log from C. A. Simpson & Son)

Altitude: 1490 feet — Date drilled: 1958

	Topsoil	1	1
	Yellow clay	37	38
	Sandy clay	4	42
	Blue clay	18	60
	Sandy blue clay	2	62
	Blue clay	8	70
	Sandy and gravelly blue clay	71	141
	Good sand	2	143
	Sand and gravel and clay	2	145
	Gravelly blue clay	15	160
	Shale	50	210

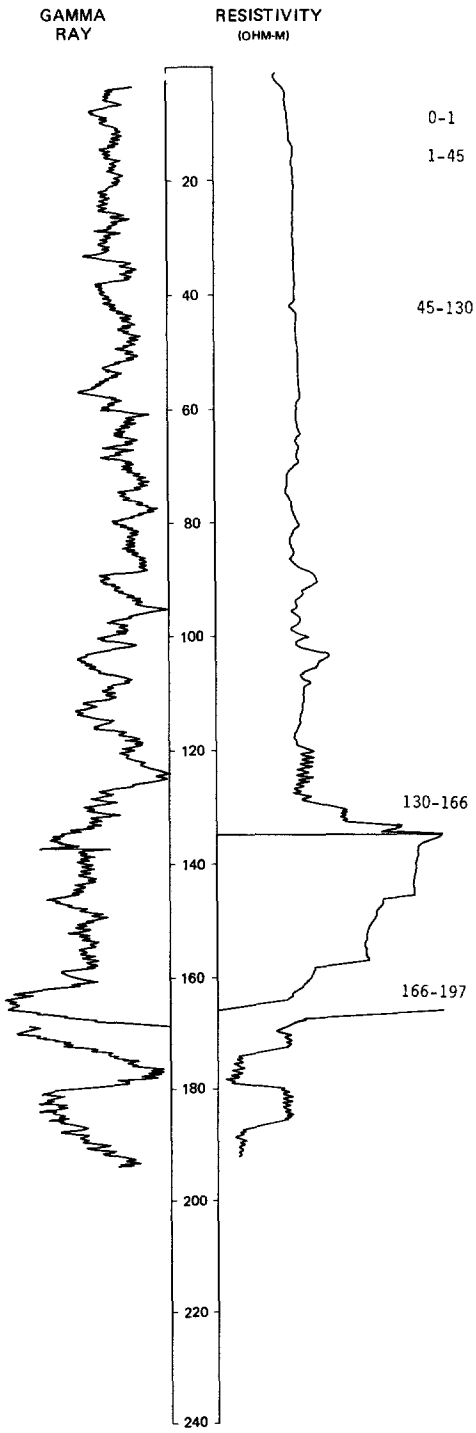
NDSWC 5564

LOCATION: 162-080-11CCC

DATE DRILLED: 9/13/79

ALTITUDE: 1487
(FT, NGVD)

DEPTH: 197
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-45 Clay, silty to sandy, pebbly, yellowish-brown, oxidized (till).

45-130 Clay, silty to sandy, pebbly, olive-gray (till).

130-166 Clay, very sandy, gravelly, olive-gray (till).

FOX HILLS SANDSTONE

166-197 Siltstone, argillaceous, indurated, greenish-gray; becoming sandy at 130 feet.

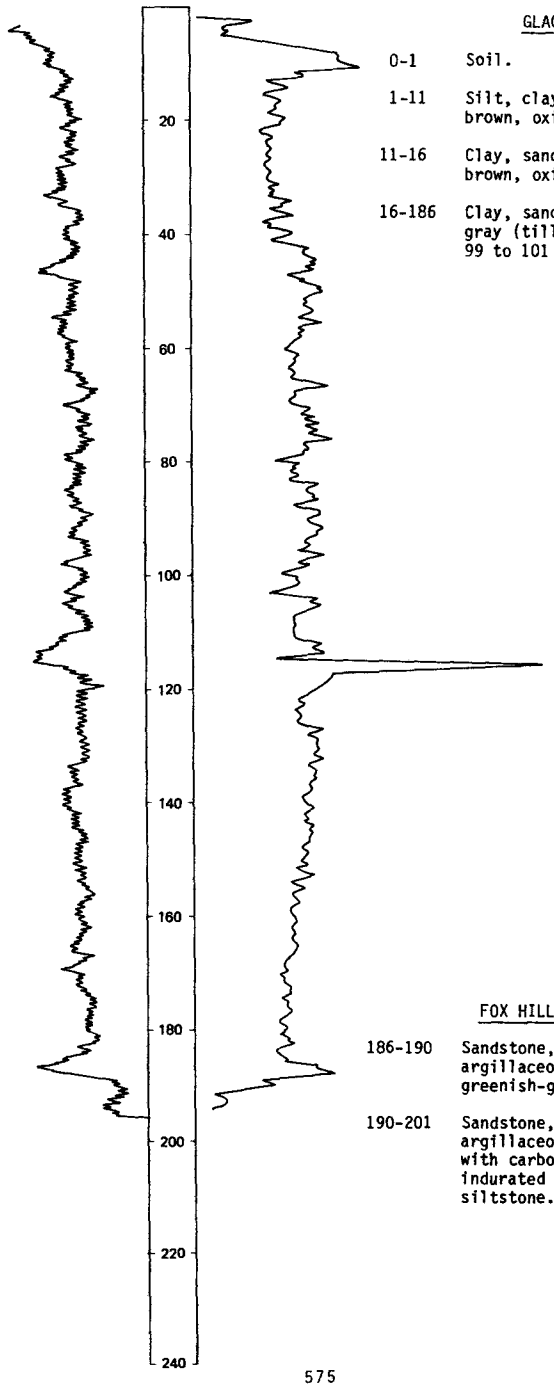
NDSWC 5854

LOCATION: 162-081-13CCC

DATE DRILLED: 10/21/80

ALTITUDE: 1495
(FT, NGVD)

DEPTH: 201
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-11	Silt, clayey, yellowish-brown, oxidized (till).
11-16	Clay, sandy, yellowish-brown, oxidized (till).
16-186	Clay, sandy, pebbly, olive-gray (till); sand lens from 99 to 101 feet.

FOX HILLS SANDSTONE

186-190	Sandstone, very fine, argillaceous, indurated, greenish-gray.
190-201	Sandstone, very fine, argillaceous; interbedded with carbonaceous moderately indurated brownish-gray siltstone.

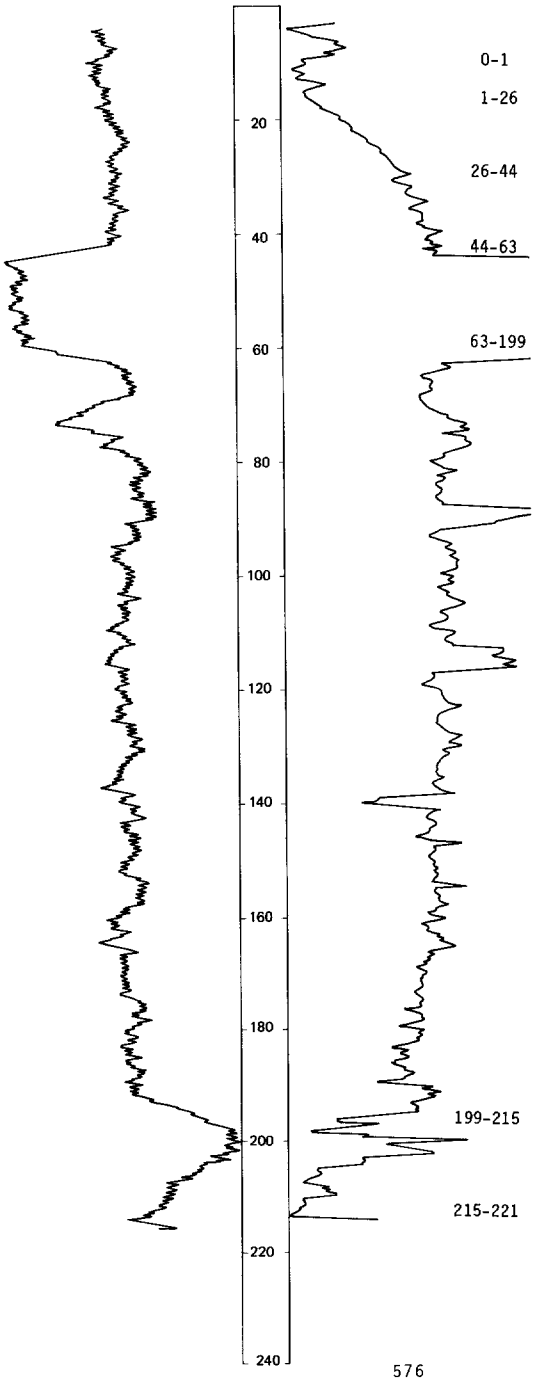
NDSWC 5853

LOCATION: 162-081-16CCC

DATE DRILLED: 10/21/80

ALTITUDE: 1510
(FT, NGVD)

DEPTH: 221
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-26	Clay, sandy, pebbly, yellowish-brown, oxidized (till).
26-44	Clay, sandy, pebbly, olive-gray (till).
44-63	Sand, fine to very coarse, angular to rounded; about 80 percent quartz and 20 percent carbonate grains.
63-199	Clay, very silty, sandy, olive-gray (till); gravel lenses from 71 to 73 and 162 to 164 feet.

FOX HILLS SANDSTONE

199-215	Sandstone, fine, argillaceous; bentonitic poorly indurated greenish-gray streaks.
215-221	Siltstone, bentonitic, argillaceous, carbonaceous, moderately indurated, brownish-gray.

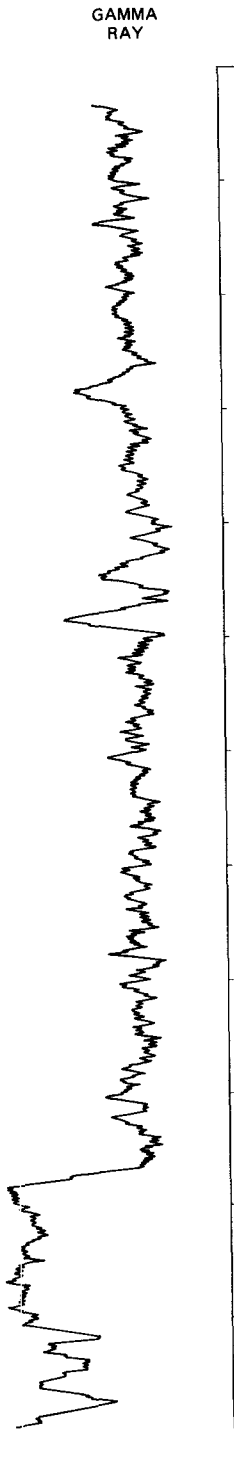
NDSWC 5563

LOCATION: 162-081-22AAA

DATE DRILLED: 9/13/79

ALTITUDE: 1489 (FT, NGVD)

DEPTH: 512 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-17	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
17-92	Clay, silty to sandy, pebbly, olive-gray (till).
92-97	Sand, very fine to coarse, silty, subrounded to well-rounded; predominately quartz grains.
97-195	Clay, silty, very sandy, pebbly, olive-gray (till).
195-227	Sand, very fine to very coarse, silty, angular; some carbonaceous material.
227-274	Sand, fine to coarse; interbedded with lenses of carbonaceous silt; about 10 percent fine subrounded gravel.

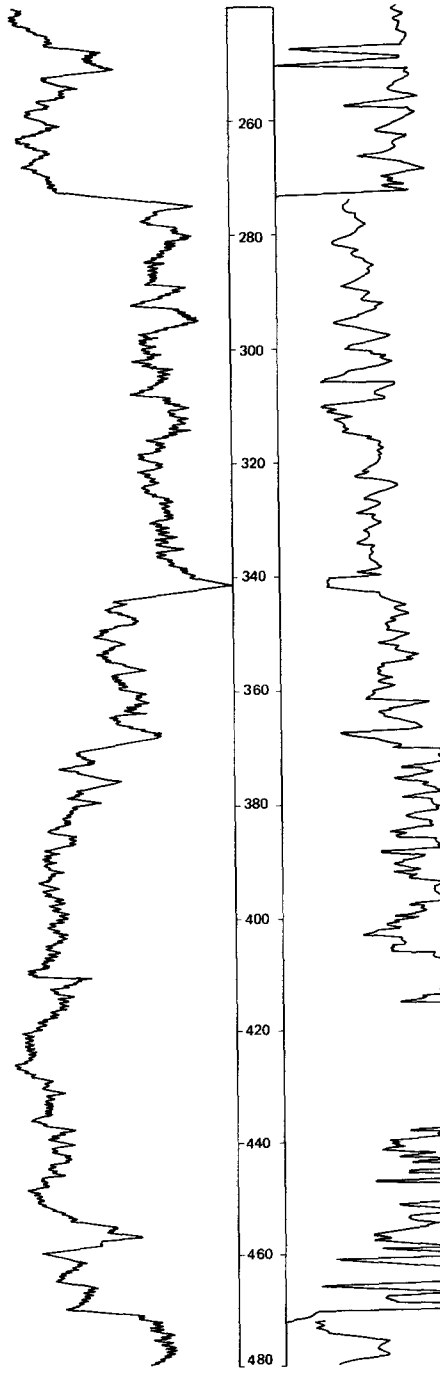
NDSWC 5563, continued

LOCATION: 162-081-22AAA

DATE DRILLED: 9/13/79

ALTITUDE: 1489 (FT, NGVD)

DEPTH: 512 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

274-342 Siltstone, greenish-gray; interbedded with carbonaceous brownish-gray claystone.

342-370 Siltstone, argillaceous, siliceous, moderately indurated, greenish-gray.

370-470 Siltstone, argillaceous, brownish-gray; interbedded with fine greenish-gray sandstone.

470-492 Siltstone, very argillaceous, carbonaceous, moderately indurated, brownish-green.

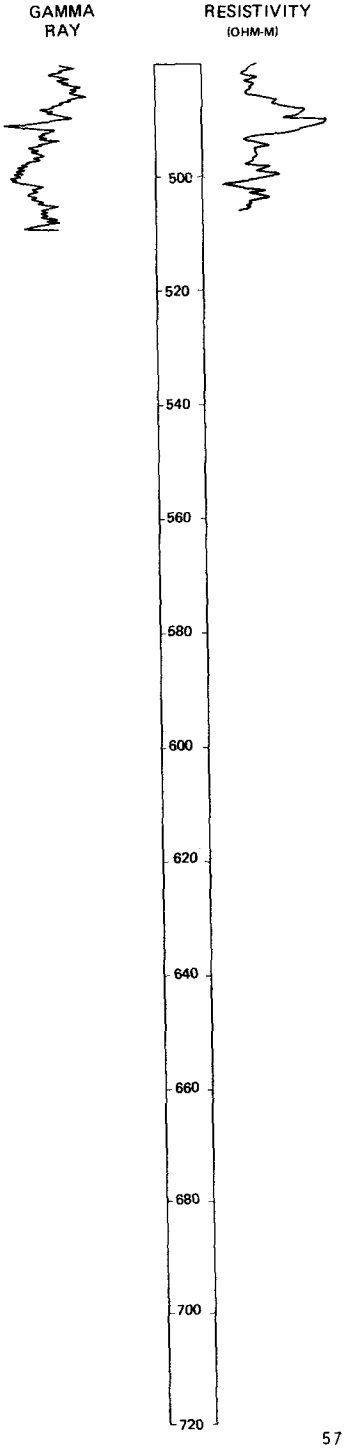
NDSWC 5563, continued

LOCATION: 162-081-22AAA

DATE DRILLED: 9/13/79

ALTITUDE: 1489
(FT, NGVD)

DEPTH: 512
(FT)



DESCRIPTION OF DEPOSITS

PIERRE SHALE

492-512 Shale, siliceous, indurated, grayish-black.

LOCATION: 162-081-22AAA

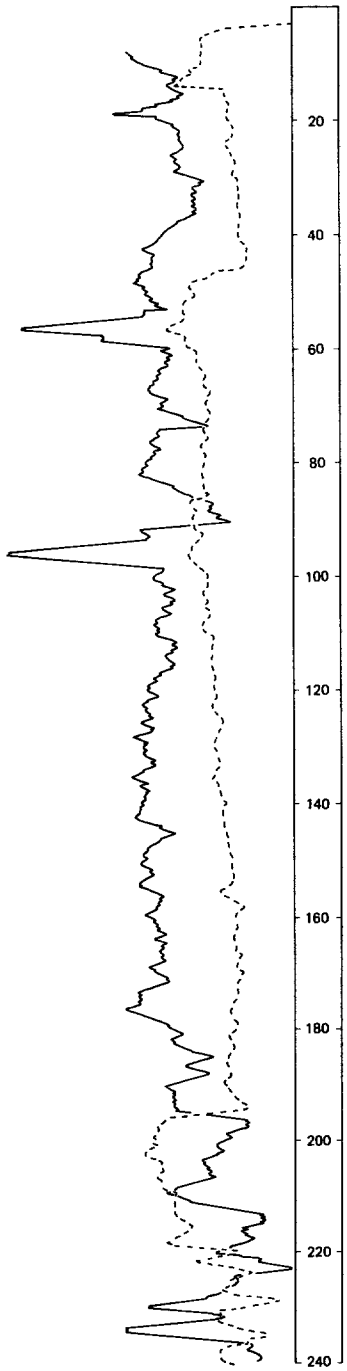
DATE DRILLED: 9/13/79

ALTITUDE: 1489
(FT, NGVD)

DEPTH: 512
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

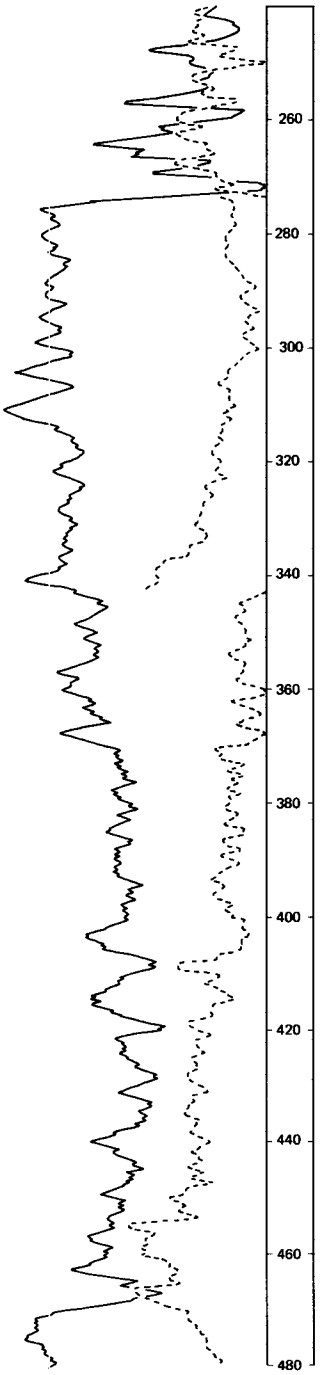
LOCATION: 162-081-22AAA

DATE DRILLED: 9/13/79

ALTITUDE: 1489
(FT, NGVD)

DEPTH: 512
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

LOCATION: 162-081-22AAA

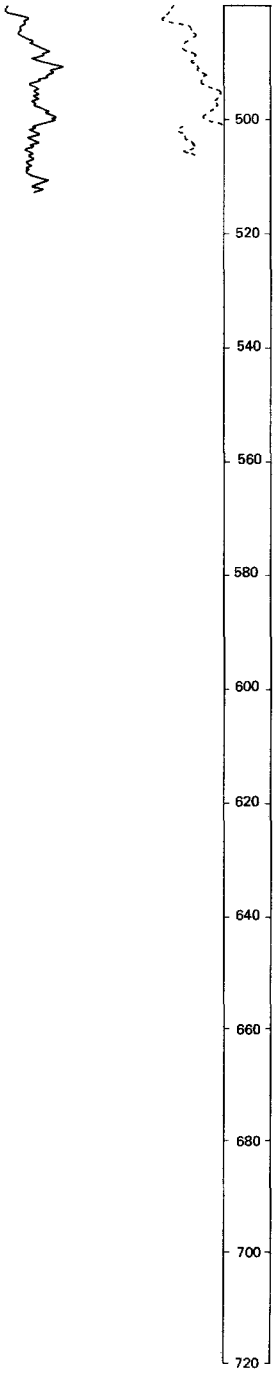
DATE DRILLED: 9/13/79

ALTITUDE: 1489
(FT, NGVD)

DEPTH: 512
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

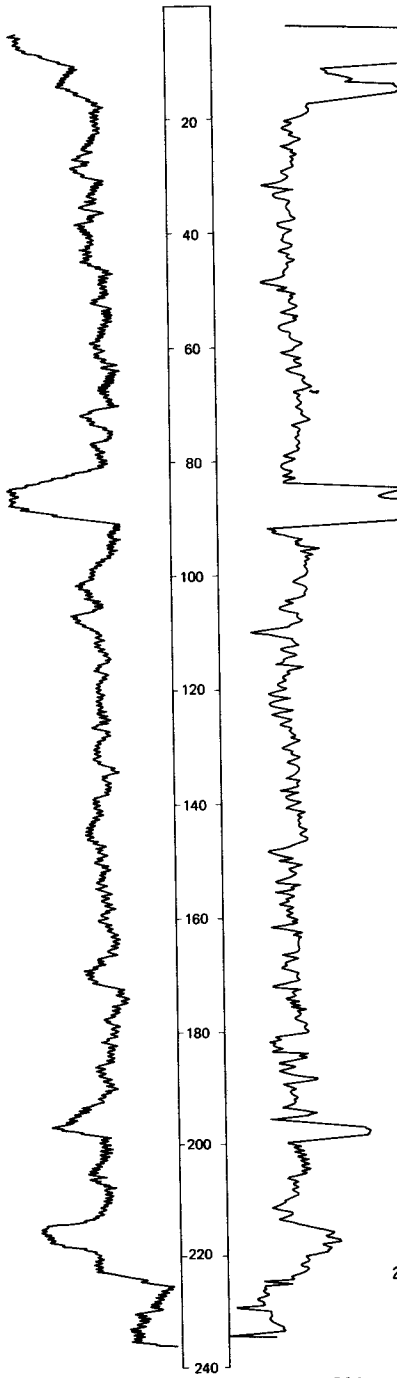
NDSWC 5852

LOCATION: 162-081-34AAA

DATE DRILLED: 10/21/80

ALTITUDE: 1495 (FT, NGVD)

DEPTH: 241 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-6	Sand, fine, rounded, oxidized; mostly quartz grains.
6-12	Silt, yellowish-brown, oxidized.
12-18	Clay, silty, pebbly, yellowish-brown, oxidized.
18-84	Clay, silty, pebbly, olive-gray (till).
84-91	Sand, very fine, rounded; quartz grains.
91-225	Clay, silty, pebbly, olive-gray (till); with lenses of sand and gravel from 102 to 104, 197 to 200, and 214 to 218 feet.

FOX HILLS SANDSTONE

225-241	Siltstone, bentonitic, carbonaceous, brownish-gray; interbedded with fine argillaceous poorly indurated greenish-gray sandstone.

162-082-11BBB
(Log from Water Supply Inc.)

Altitude: 1525 feet — Date drilled: 6/16/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black	1	1
	Clay, silty, sandy, yellowish-brown	2	3
	Sand, fine, medium to coarse	4	7
	Clay, silty, olive-gray (till)	33	40

162-082-13CCC
NDSWC 11441

Altitude: 1527 feet — Date drilled: 10/30/80

Glacial drift:			
	Soil	1	1
	Clay, sandy to gravelly, yellowish-brown, oxidized (till)	29	30
	Clay, silty, sandy, pebbly, olive-gray (till); with a lens of sand and gravel from 67 to 69 feet	44	74
	Sand, fine to very coarse; about 20 percent medium to coarse clayey subangular gravel	5	79
	Clay, silty to sandy, pebbly, olive-gray (till); with lenses of sand and gravel from 88 to 89, 129 to 130, and 147 to 149 feet	137	216
Fox Hills Sandstone:			
	Sandstone, very fine to fine, argillaceous, quartzose; carbonaceous greenish-gray streaks	14	230

162-082-17BBB
NDSWC 11442

Altitude: 1534 feet — Date drilled: 10/30/80

Glacial drift:			
	Soil	1	1
	Sand, very coarse; about 40 percent medium to granular subangular oxidized gravel	5	6
	Clay, sandy, gravelly, olive-gray (till)	40	46
	Sand, fine; about 30 percent silty clay; predominately quartz grains	27	73
	Clay, sandy, gravelly, olive-gray (till); about 20 percent sand and gravel	148	221
Fox Hills Sandstone:			
	Sandstone, very fine to fine, glauconitic, quartzose, greenish-gray; interbedded with argillaceous carbonaceous brownish-gray siltstone	19	240

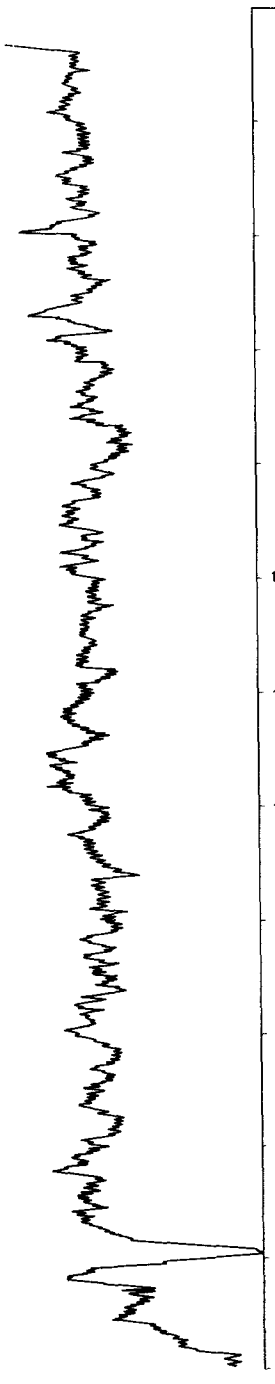
NDSWC 5562

LOCATION: 162-082-20ABB

DATE DRILLED: 9/12/79

ALTITUDE: 1540 (FT, NGVD)

DEPTH: 257 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-17	Clay, sandy, pebbly, yellowish-brown, oxidized (till).
17-32	Clay, sandy, pebbly, olive-gray (till).
32-140	Clay, silty to sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel from 46 to 72 and 128 to 138 feet.
140-218	Clay, silty to sandy, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

218-257	Sandstone, fine, argillaceous, indurated, greenish-gray; interbedded with argillaceous carbonaceous brownish-gray siltstone at 232 feet.

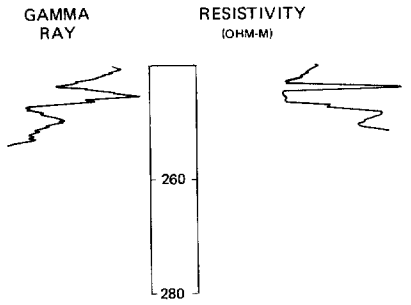
585

LOCATION: 162-082-20ABB

DATE DRILLED: 9/12/79

ALTITUDE: 1540 (FT, NGVD)

DEPTH: 257 (FT)



DESCRIPTION OF DEPOSITS

162-082-20DAD
(Log modified from Water Supply Inc.)

Altitude: 1525 feet — Date drilled: 6/08/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black	1	1
	Gravel, fine to medium to coarse; about 30 percent sand	13	14
	Clay, silty, olive-gray (till)	6	20

162-082-28ABA
(Log from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 6/08/77

	Topsoil, silty, black	1	1
	Gravel, fine to medium to coarse; about 20 percent sand	13	14
	Clay, silty, olive-gray (till)	22	36
	Sand, fine to medium to coarse	2	38
	Clay, silty, olive-gray (till)	12	50

162-083-01ADD
(Log modified from Water Supply Inc.)

Altitude: 1545 feet — Date drilled: 4/08/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown	4	5
	Gravel and rocks	4	9
	Clay, silty, olive-gray (till)	43	52
	Sand, fine to medium to coarse	2	54
	Clay, silty, olive-gray (till)	6	60

162-083-02CB
(Log modified from C. A. Simpson & Son)

Altitude: 1595 feet — Date drilled: 1929

Glacial drift:			
	Clay, sandy	240	240
	Clay	10	250
	Clay and sand	12	262
	Gravel	23	285
Fox Hills Sandstone:			
	Shale; with hard streaks	11	296
	Sandstone, fine, gray	18	314
	Sandstone, hard, gray; water	30	344

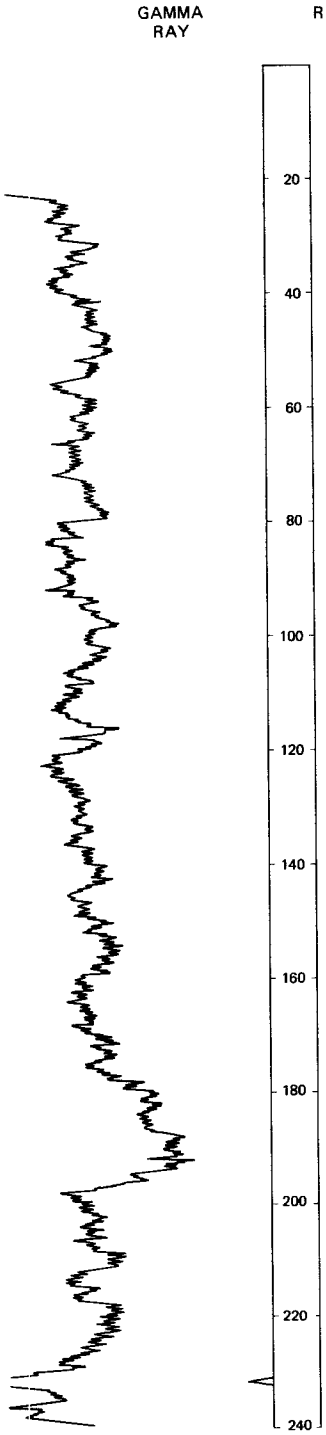
NDSWC 5561

LOCATION: 162-083-15CCD

DATE DRILLED: 9/12/79

ALTITUDE: 1565
(FT, NGVD)

DEPTH: 278
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-22	Sand, very fine to coarse; about 10 percent medium subrounded gravel; mostly quartz and carbonate grains.
22-55	Clay, silty to very sandy, pebbly, olive-gray (till).
55-120	Clay, very sandy and gravelly, olive-gray (till).
120-124	Sand, very fine to coarse, subrounded; predominately quartz, carbonate, and detrital shale grains.
124-176	Clay, very sandy, gravelly, olive-gray (till).
176-196	Siltstone, argillaceous; mixed with fluvial material (till); shove block.
196-232	Clay, silty, very sandy, pebbly, olive-gray (till).
232-244	Sand, medium to coarse, well-rounded; predominately quartz and detrital shale grains.

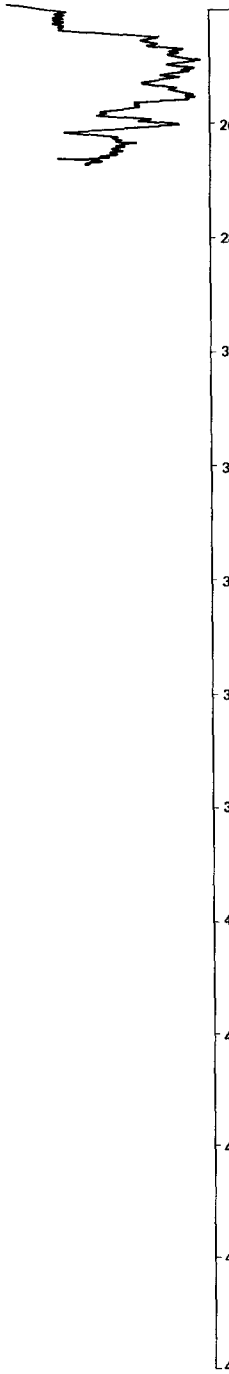
NDSWC 5561, continued

LOCATION: 162-083-15CCD

DATE DRILLED: 9/12/79

ALTITUDE: 1565
(FT, NGVD)

DEPTH: 278
(FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION

244-257 Siltstone, argillaceous, carbonaceous, dusky-yellowish-brown.

257-278 Sandstone, very fine to fine, argillaceous, glauconitic, quartzose, indurated, grayish-green.

LOCATION: 162-083-15CCD

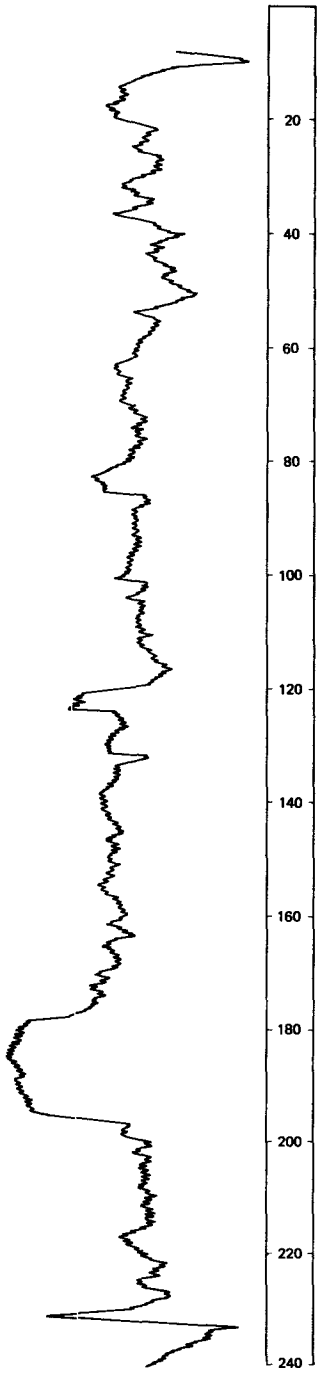
DATE DRILLED: 9/12/79

ALTITUDE: 1565
(FT, NGVD)

DEPTH: 278
(FT)

NEUTRON
(API)

DESCRIPTION OF DEPOSITS



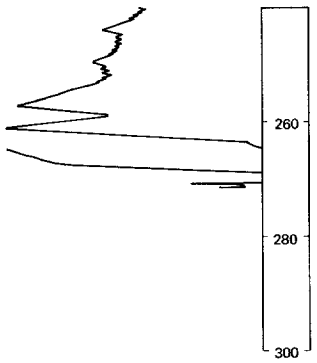
LOCATION: 162-083-15CCD

DATE DRILLED: 9/12/79

ALTITUDE: 1565
(FT, NGVD)

DEPTH: 278
(FT)

NEUTRON
(API)



DESCRIPTION OF DEPOSITS

162-083-17BBA
NDSWC 11443

Altitude: 1565 feet

Date drilled: 10/31/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, very fine to very coarse; about 40 percent fine to granular subangular to subrounded oxidized gravel	9	10
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	1	11
	Clay, silty, sandy, pebbly, olive-gray (till); lenses of sand and gravel from 23 to 24, 27 to 28, 184 to 185, and 191 to 192 feet	202	213
Hell Creek Formation:			
	Sandstone, very fine to medium, very argillaceous; carbonaceous greenish-gray streaks	27	240

162-083-31CCD
NDSWC 10

Altitude: 1596 feet

Date drilled: 10/19/48

Glacial drift:			
	Soil	1	1
	Clay, gray	1	2
	Sand, medium to coarse, gravelly	2	4
	Clay, gravelly, yellowish-brown, oxidized (till)	12	16
	Clay, gravelly, olive-gray (till)	19	35
	Sand, fine to medium, gravelly	6	41
	Clay, sandy, pebbly, olive-gray (till)	9	50
	Clay, very gravelly, olive-gray (till)	10	60

162-083-31CDC
NDSWC 11

Altitude: 1598 feet — Date drilled: 10/20/48

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, cobbly	2	3
	Clay, gravelly, yellowish-brown, oxidized (till)	12	15
	Clay, gravelly, olive-gray (till)	24	39
	Sand, medium to coarse, gravelly	2	41
	Clay, gravelly, olive-gray (till)	9	50
	Clay, sandy, pebbly, olive-gray (till)	10	60

162-083-32CCB
NDSWC 8

Altitude: 1591 feet — Date drilled: 10/09/48

Glacial drift:			
	Soil	2	2
	Sand, medium to coarse, gravelly	2	4
	Clay, gravelly, yellowish-brown, oxidized (till)	15	19
	Clay, gravelly, olive-gray (till)	24	43
	Sand, medium to coarse, gravelly	2	45
	Clay, sandy, gravelly, olive-gray (till)	3	48
	Sand, medium to coarse, and fine gravel	4	52
	Clay, sandy, pebbly, olive-gray (till)	8	60

162-083-32CCC
NDSWC 7

Altitude: 1578 feet — Date drilled: 10/06/48

Glacial drift:			
	Soil	1	1
	Sand, medium to coarse, and fine to medium gravel	3	4
	Clay, gravelly, brown, oxidized (till)	7	11
	Clay, gravelly, olive-gray (till)	15	26
	Clay, sandy to gravelly, olive-gray (till)	34	60
	Clay, sandy, pebbly, olive-gray (till)	55	115
	Clay, silty to sandy, olive-gray (till)	75	190
	Clay, gravelly, olive-gray (till); boulders	34	224
	Lignite	4	228

162-083-33DA
(Log modified from C. A. Simpson & Son)

Altitude: 1585 feet — Date drilled: 1929

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay and sand	205	205
Bedrock:			
	Sandstone	55	260
	Shale	8	268
	Sandstone, soft	11	279
	Sandstone, hard	9	288
	Sandstone, soft	28	316
	Sandstone, hard	37	353
	Shale, sandy	17	370
	Sandstone, fine	10	380
	Shale, sandy	90	470
	Shale and sandstone, hard	184	654

163-069-02BBB
NDSWC 5879

Altitude: 1803 feet — Date drilled: 11/05/80

Glacial drift:			
	Soil	1	1
	Clay, silty to sandy, yellowish-brown, oxidized (till)	13	14
	Clay, silty, gravelly, dusky-yellowish-brown, oxidized (till)	10	24
	Clay, silty, gravelly, olive-gray (till)	17	41
	Clay, sandy, yellowish-brown, oxidized (till)	14	55
	Sand, very coarse, and fine angular gravel; predominately carbonate grains and pebbles	8	63
	Clay, very gravelly, yellowish-brown, oxidized (till)	19	82
	Sand, fine, subrounded, oxidized; predominately quartz grains	10	92
	Clay, very gravelly, yellowish-brown, oxidized (till)	7	99
	Sand, fine, subrounded; predominately quartz and detrital shale grains	13	112
	Clay, olive-gray	10	122
	Sand, fine, silty, subrounded	20	142
	Silt, clayey, olive-gray	12	154
Pierre Shale(?):			
	Shale, indurated, dark-gray	27	181

163-069-05BAB
NDSWC 5877

Altitude: 1825 feet — Date drilled: 11/04/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, silty to sandy, yellowish-brown, oxidized (till)	15	16
	Clay, silty, pebbly, olive-gray (till)	9	25
	Gravel, fine, and fine to coarse subangular oxidized sand	5	30
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	27	57
	Clay, silty, sandy, light-olive-gray (till)	13	70
	Clay, silty, pebbly, olive-gray (till)	16	86
	Sand, fine to coarse, and fine rounded gravel; predominately detrital shale grains and pebbles	14	100
	Silt, clayey, light-olive-gray, slightly oxidized	24	124
	Sand, coarse, and fine angular gravel; predominately detrital shale grains and pebbles	10	134
	Silt, clayey, greenish-gray	36	170
Fox Hills Sandstone:			
	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray	31	201

163-069-09DDD
(Log modified from C. A. Simpson & Son)

Altitude: 1825 feet — Date drilled: 9/28/65

	Topsoil	1	1
	Clay, yellow	24	25
	Clay, blue	45	70
	Clay, sticky, blue	42	112
	Clay, sandy, blue	2	114
	Sand and gravel, slightly clayey	4	118
	Sand, slightly clayey	7	125

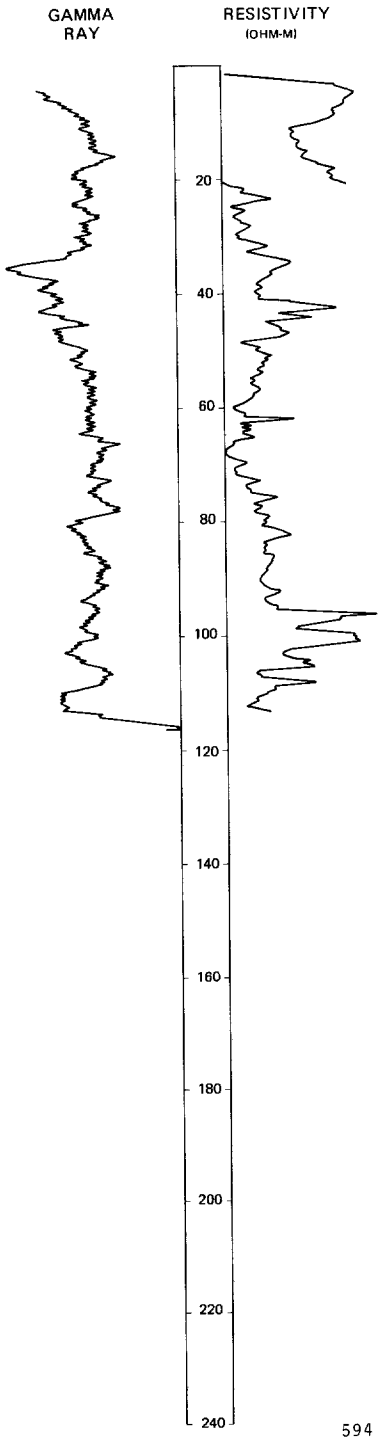
NDSWC 5880

LOCATION: 163-069-12BBB

DATE DRILLED: 11/05/80

ALTITUDE: 1785
(FT, NGVD)

DEPTH: 121
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-9	Clay, silty, pebbly, yellowish-brown, oxidized (till).
9-12	Clay, pebbly, dusky-yellowish-brown, oxidized (till).
12-34	Clay, silty, gravelly, olive-gray (till).
34-41	Gravel, coarse, and coarse to very coarse angular sand; predominately carbonate pebbles and grains.
41-49	Clay, silty, pebbly, yellowish-brown, oxidized (till).
49-65	Clay, silty, pebbly, very gravelly to cobbly, olive-gray (till).
65-110	Clay, silty, sandy, greenish-gray (till).

PIERRE SHALE

110-121	Shale, siliceous, well-indurated, dark-gray.

163-069-15AAA
NDSWC 5370

Altitude: 1810 feet — Date drilled: 9/07/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty to sandy, yellowish-brown, oxidized (till); boulders	15	15
	Clay, silty to sandy, bouldery, olive-gray (till); gravelly from 117 to 124 feet	140	155
	Gravel, fine to medium, sandy, angular to subrounded; predominately carbonate and detrital shale pebbles	19	174
Pierre Shale:			
	Shale, siliceous, indurated, brittle, grayish-black	46	220

163-069-16BBC
NDSWC 5669

Altitude: 1829 feet — Date drilled: 10/24/79

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	26	27
	Clay, silty to sandy, pebbly, olive-gray (till)	47	74
	Gravel, fine to very coarse, and coarse subrounded to well-rounded sand; predominately carbonate pebbles and grains; caving	17	91
Fox Hills Sandstone:			
	Shale, carbonaceous, indurated, brittle, brownish-black; interbedded with sandy greenish-gray siltstone	46	137

163-069-25AAA1
NDSWC 5668

Altitude: 1775 feet — Date drilled: 10/24/79

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, pebbly, oxidized (till); yellowish brown to 25 feet; olive gray from 25 to 35 feet	34	35
	Gravel, fine to coarse; about 40 percent fine to very coarse subrounded sand; predominately carbonate and detrital shale pebbles	16	51
	Clay, silty, sandy, olive-gray (till)	11	62

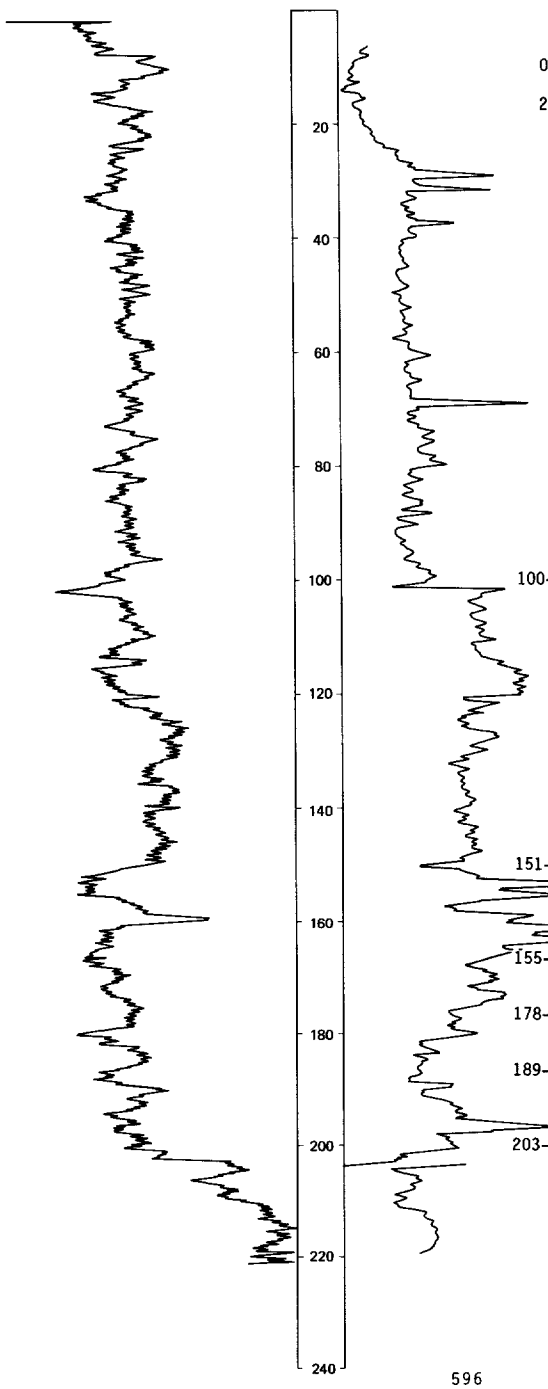
NDSWC 5668A

LOCATION: 163-069-25AAA2

DATE DRILLED: 10/24/79

ALTITUDE: 1773
(FT, NGVD)

DEPTH: 227
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-2	Soil.
2-100	Clay, silty, sandy, pebbly, oxidized (till); yellowish-brown to 25 feet; olive-gray from 25 to 100 feet.
100-151	Clay, silty, very sandy, olive-gray (till).
151-155	Sand, very coarse; about 30 percent fine gravel; predominately carbonate grains.
155-178	Clay, very silty, sandy, olive-gray.
178-189	Clay, silty, sandy, pebbly, dark-gray (till).
189-203	Clay, silty, olive-gray.

PIERRE SHALE

203-227	Shale, siliceous, indurated, brittle, grayish-black.

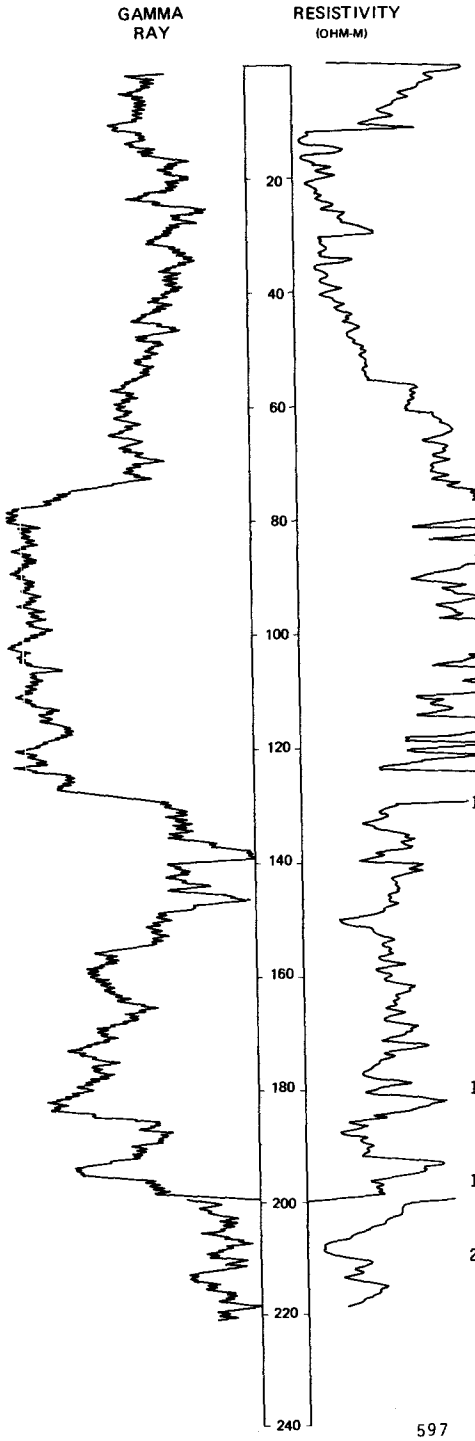
NDSWC 5667

LOCATION: 163-069-25CCC

DATE DRILLED: 10/23/79

ALTITUDE: 1792
(FT, NGVD)

DEPTH: 227
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-74	Clay, silty, sandy, pebbly, oxidized (till); yellowish brown to 32 feet; olive gray from 32 to 74 feet.
74-130	Sand, fine to very coarse; about 30 percent fine to medium angular to well-rounded gravel; predominately carbonate and detrital shale grains.
130-182	Clay, silty, very sandy, pebbly, dark-gray (till).
182-185	Sand, very coarse, gravelly, rounded; predominately carbonate and detrital shale grains.
185-200	Clay, very silty, olive-gray.

PIERRE SHALE

200-227	Shale, brittle, black.

163-069-34DDD
NDSWC 5666

Altitude: 1802 feet — Date drilled: 10/23/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	2	2
	Clay, silty, sandy, pebbly, oxidized (till); yellowish brown to 10 feet; olive gray from 10 to 56 feet; some cobbles	54	56
	Gravel, fine to coarse; about 35 percent medium to very coarse angular to subrounded sand; predominately detrital shale pebbles	7	63
	Clay, silty, sandy, pebbly, olive-gray (till)	4	67

163-070-02CCC
NDSWC 798-12
(Log modified from Froelich, 1967)

Altitude: 1885 feet — Date drilled: 6/29/66

Glacial drift:			
	Loam, sandy and silty, dusky-brown, loose	1	1
	Gravel, fine to coarse, sandy, subangular and subrounded; mostly shale and limestone; rusty	3	4
	Clay, very silty; with much sand and gravel; dusky yellow; oxidized; rough drilling (till)	6	10
	Sand, fine and medium, clayey; with gravel; olive gray; rough drilling (till)	2	12
	Gravel, fine and medium; with coarse sand; subangular to subrounded; mostly shale and limestone; drills fast	8	20
	Clay, silty to gravelly, olive-gray; rough drilling because of large rocks (till)	8	28
	Gravel, fine and medium, well-sorted, subangular and subrounded; taking large amounts of water	12	40
	Gravel, fine and medium, well-sorted, subangular and subrounded; very sandy; with occasional silt and very fine sandy clay lenses; moderately sorted	13	53
	Clay, silty; with some sand and gravel; olive gray to dark greenish gray; moderately rough drilling (till)	5	58
	Sand, medium; with lenses of fine sand and silt; gray; drills fast and easy	16	74
	Clay, silty; with sand grains and pebbles; moderate olive brown; cohesive; partially oxidized; moderately smooth drilling (till)	20	94

163-070-03BBA
NDSWC 798-9
(Log from Froelich, 1967)

Altitude: 1888 feet — Date drilled: 6/28/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, fine and medium, sandy, poorly sorted, rusty	2	2
	Clay, silty to very sandy; with pebbles; dusky yellow; oxidized (till)	10	12
	Clay, silty to sandy; with pebbles and cobbles; olive gray (till)	8	20
	Boulder, limestone	1	21
Undifferentiated:			
	Clay, silty, dusky-yellow, soft, noncalcareous	10	31
	Sand, fine, silty, dusky-yellow, soft	11	42
	Sand, fine, silt, and silty clay; all interbedded; dusky yellow to moderate olive brown to dark greenish gray; soft; noncalcareous; drills easy but fairly tight	42	84

163-070-04ACC
(Log modified from Church Well Boring)

Altitude: 1915 feet — Date drilled: 6/26/75

	Topsoil, black	1	1
	Clay, yellow	17	18
	Sand, coarse, gray; trace of water	5	23
	Clay, blue	19	42
	Sand, coarse, gray	2	44
	Clay, sandy, blue	3	47
	Sand, coarse	1	48

163-070-04DAA
NDSWC 798-8
(Log from Froelich, 1967)

Altitude: 1880 feet — Date drilled: 6/27/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, dusky-yellow, soft, cohesive, moderately plastic, oxidized (till)	10	10
	Clay, silty; with sand and gravel; olive gray; unoxidized (till)	4	14
	Gravel, sandy, moderately sorted, subangular to subrounded; large percentage of shale pebbles	6	20
	Clay, silty; with sand, gravel, and boulders; olive gray; cohesive; rough drilling (till)	5	25
	Gravel, silty to sandy, poorly sorted, subangular to subrounded; many shale pebbles and lignite fragments	6	31
	Sand, medium to coarse; with lenses of fine to medium gravel; moderately sorted; subangular to subrounded; drills fast	19	50
	Sand, coarse; with fine gravel; moderately well sorted; subangular to subrounded	9	59
	Sand, fine to coarse; with occasional lenses of silt and silty clay; interbedded; easy drilling	37	96
	Clay, silty to sandy, olive-gray; interbedded lenses; easy drilling	5	101
	Gravel, fine to coarse, poorly sorted, subangular to subrounded; rough drilling	3	104
	Clay, silty; with pebbles and cobbles; olive gray; moderately soft; cohesive; drills tight and rough	6	110
	Clay, silty, olive-gray, cohesive, plastic	16	126

163-070-04DDA
(Log from Church Well Boring)

Altitude: 1915 feet — Date drilled: 9/29/75

Soil, black	1	1
Gravel, rocky	7	8
Clay, blue	15	23
Sand, blue	1	24
Clay, rocky, yellow	17	41
Sand, coarse, yellow	4	45

163-070-05BBD
(Log from Lee's Well Drilling)

Altitude: 1985 feet — Date drilled: 6/28/74

Topsoil	1	1
Clay, yellow	21	22
Clay, blue	78	100
Rocks	22	122
Sand	6	128

163-070-07DBD
(Log modified from C. A. Simpson & Son)

Altitude: 2125 feet — Date drilled: 2/15/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	31	32
	Clay, blue; rocks	93	125
	Clay, gravelly, blue; rocks	5	130
	Clay, brown	36	166
	Sand and gravel, clayey	2	168
	Clay, gravelly, blue	87	255

163-070-08AAA
(Log from Church Well Boring)

Altitude: 1970 feet — Date drilled: 9/23/75

	Topsoil, black	1	1
	Clay, sandy, yellow	2	3
	Clay, yellow	29	32
	Clay, blue	6	38
	Clay, sandy, yellow	1	39
	Gravel, coarse, rocky	3	42
	Clay, yellow	6	48

163-070-09AAA
NDSWC 798-10
(Log modified from Froelich, 1967)

Altitude: 1910 feet — Date drilled: 6/28/66

Glacial drift:			
	Silt, clayey, dusky-brown, soft	1	1
	Clay, silty; with occasional sand and gravel; dusky yellow; cohesive; oxidized (till)	15	16
	Clay, silty; with sand grains and pebbles; olive gray; moderately soft; cohesive (till)	5	21
	Clay, silty; with occasional sand, gravel, and cobbles; dusky yellow to moderate olive brown; cohesive; oxidized (till)	10	31
	Clay, silty to sandy; with pebbles and occasional cobbles and boulders; olive gray; moderately soft; cohesive (till)	20	51
	Gravel, fine and medium, subangular and subrounded, moderately well sorted	10	61
	Gravel, fine to coarse; with lenses of sand, silt, and silty clay; interbedded; poorly sorted; dirty	13	74
	Clay, silty; with sand grains, pebbles, cobbles, and boulders; olive gray; moderately soft; cohesive; rough drilling (till)	10	84

163-070-09BCA
(Log modified from C. A. Simpson & Son)

Altitude: 1960 feet — Date drilled: 7/07/70

	Topsoil	1	1
	Clay, sandy, yellow	15	16
	Clay, sandy, blue; rocks	171	187
	Sand, coarse	1	188
	Clay, sandy, blue	8	196
	Sand, fine	4	200

163-070-10CBB
NDSWC 798-11
(Log from Froelich, 1967)

Altitude: 1935 feet — Date drilled: 6/29/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, clayey, dusky-brown	1	1
	Clay, silty; with sand grains and pebbles; dusky yellow; calcareous; oxidized (till)	18	19
	Clay, silty; with sand grains and pebbles; olive gray; soft; cohesive (till)	24	43
	Sand, coarse; with fine gravel; moderately well sorted; subangular to subrounded; mostly limestone and shale particles	11	54
	Clay, silty, variegated; predominately pale olive and moderate yellow; cohesive; tight; calcareous; oxidized (till)	6	60
	Clay, silty and sandy, dusky-yellow to moderate-olive-brown, cohesive, oxidized (till)	13	73
	Clay, silty to sandy; with pebbles, cobbles, and occasional lenses of sand and gravel; olive gray; moderately soft; cohesive; drills good (till)	54	127
	Clay, silty; with sand grains and pebbles; dusky yellow to moderate olive brown; moderately soft; cohesive; tight; oxidized (till)	11	138
	Clay, silty; with sand grains and pebbles; olive-gray; moderately soft to slightly hard; very cohesive and tight (till)	21	159
	Clay, silty to sandy; with pebbles, cobbles, and lenses of sand and gravel; olive gray; moderately soft; cohesive; moderately rough drilling (till)	43	202
	Gravel, sandy, layered, moderately well sorted, subangular to subrounded; drills rough	10	212
Undifferentiated:			
	Clay, silty, light-olive-gray to olive-gray, brittle, slightly calcareous, tight	19	231

163-070-10CDD
NDSWC 462
(Log from Brookhart and Powell, 1961)

Altitude: 1910 feet — Date drilled: 8/28/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	24	25
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	21	46
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	28	74
	Clay, sandy, gray, and medium gravel and shale pebbles	62	136
	Gravel, fine to medium, clayey	2	138
	Clay, gray; very coarse sand, fine gravel, and shale pebbles	80	218
Undifferentiated:			
	Clay, sandy, gray-brown, and fine gravel; about one-half the material consists of shale fragments; could be either till or bedrock	14	232

163-070-10DCD
NDSWC 463
(Log from Brookhart and Powell, 1961)

Altitude: 1890 feet — Date drilled: 8/31/51

Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	16	18
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	49	67
	Gravel, fine to medium, and medium to very coarse sand	8	75
	Gravel, medium	15	90
	Gravel, coarse	10	100
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	20	120
	Clay, sandy, gray, and fine to medium gravel; about one-half the material consists of shale fragments	105	225
Pierre Shale:			
	Shale, gray	22	247

163-070-11DCC
NDSWC 467
(Log from Brookhart and Powell, 1961)

Altitude: 1881 feet — Date drilled: 9/15/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Sand, coarse, light-brown, and fine gravel	2	4
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	12	16
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	36	52
	Clay, sandy, light-brown, and medium gravel and shale pebbles	25	77
	Sand, coarse, light-brown, and fine gravel	3	80
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	40	120
	Clay, gray; very coarse sand, fine to medium gravel, and abundant shale pebbles	42	162

163-070-12CDC
NDSWC 798-1
(Log from Froelich, 1967)

Altitude: 1865 feet — Date drilled: 6/21/66

Glacial drift:			
	Clay, silty, dusky-brown	2	2
	Clay, silty; with lenses of sand and gravel; dusky yellow; oxidized (till)	18	20
	Clay, sandy; with pebbles and gravel; olive gray; moderately cohesive (till)	6	26
	Clay, silty; with sand grains and pebbles; dusky yellow to light olive gray; cohesive (till)	12	38
	Clay, silty; with sand, pebbles, cobbles, and occasional boulders; olive gray; moderately soft; cohesive; rough drilling (till)	34	72
	Sand, fine to coarse; with gravel; poorly sorted; subangular to subrounded	4	76
	Clay, silty; with numerous sand and gravel lenses; olive gray; moderately rough drilling (till)	14	90
Undifferentiated:			
	Shale, silty to sandy, with beds of silt and loose very fine to fine sand; light olive gray to greenish gray; loose to slightly hard; friable to brittle; drills tight	26	116

163-070-14CBB
NDSWC 798-3
(Log modified from Froelich, 1967)

Altitude: 1905 feet — Date drilled: 6/22/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, clayey, dusky-brown, slightly cohesive	2	2
	Clay, silty; with sand grains, pebbles, and occasional cobbles; dusky yellow to moderate olive brown; soft; moderately cohesive; oxidized (till)	15	17
	Clay, silty; with sand grains, pebbles, and occasional cobbles and sand lenses; olive gray; moderately soft (till)	24	41
	Gravel, fine to medium; with some coarse sand; moderately well sorted; subangular to subrounded; moderately rough drilling	3	44
	Clay, silty, olive-gray, soft, smooth	2	46
	Gravel, coarse, poorly sorted; rough drilling	3	49
	Clay, silty to sandy; with pebbles and cobbles; olive gray; moderately soft; cohesive; tight (till)	15	64
	Gravel, fine to coarse; with beds of medium to very coarse sand; poorly sorted; interbedded; rough drilling; taking water	16	80
	Clay, silty; with sand, pebbles, and occasional cobbles or boulders; olive gray; cohesive; tight (till)	25	105

163-070-14CCC
NDSWC 798-4
(Log modified from Froelich, 1967)

Altitude: 1935 feet — Date drilled: 6/23/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, clayey to pebbly, dusky-brown	1	1
	Clay, silty; with sand grains, pebbles, and occasional cobbles; dusky yellow; soft; moderately cohesive; oxidized (till)	14	15
	Till, silty, soft, moderately cohesive, oxidized, moderate-olive-brown	14	29
	Clay, silty; with sand grains, pebbles, cobbles, and occasional boulders; olive gray; moderately soft (till)	32	61
	Clay, silty to sandy; with numerous sand and gravel lenses; moderate olive brown to olive gray; very rough drilling (till)	15	76
	Gravel, fine to coarse, poorly sorted; rough drilling	6	82
	Clay, silty to sandy; with gravel; olive gray; moderately soft; tight (till)	7	89
	Gravel, fine to very coarse, sandy; with possible clay layers; poorly sorted; dirty; rough drilling	11	100
	Clay, silty to sandy; with lenses of gravel; olive gray; rough drilling (till)	13	113
	Clay, silty to sandy; with pebbles and occasional cobbles or boulders; olive gray; moderately soft to slightly hard; tight (till)	13	126
	Till, silty to sandy, olive-gray, moderately soft to slightly hard, tight; with layers of fine to coarse; rough drilling gravel	18	144
	Clay, silty; with sand grains and pebbles; olive gray; tight (till)	7	151
	Clay, silty, olive-gray, soft, plastic, tight	11	162
	Clay, silty to sandy; with lenses of sand and gravel; olive gray; moderately rough drilling (till)	16	178
Undifferentiated:			
	Silt and very fine to fine sand, olive-gray to dark-greenish-gray, slightly brittle, noncalcareous, tight	22	200

163-070-14CDC
NDSWC 798-5
(Log modified from Froelich, 1967)

Altitude: 1910 feet — Date drilled: 6/23/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, clayey, dusky-brown, slightly cohesive	2	2
	Clay, silty; with sand grains and pebbles; dusky yellow to moderate olive brown; iron stained; oxidized (till)	16	18
	Clay, silty; with sand grains and pebbles; olive gray; soft to moderately soft; tight	18	36
	Gravel, fine to coarse, clayey to sandy, poorly sorted, angular to subrounded; rough drilling	6	42
	Silt, clayey, light-olive-gray, to fine olive-gray sand to clay; interbedded with silt and fine sand; soft; easy drilling	13	55
	Gravel, fine to coarse, sandy, poorly sorted, subangular to subrounded; drills rough	10	65
	Clay, silty; with sand grains, pebbles, and occasional cobbles; olive gray; tight (till)	29	94

163-070-14DDD
NDSWC 798-6

Altitude: 1870 feet — Date drilled: 6/24/66

Glacial drift:			
	Soil	1	1
	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till)	9	10
	Clay, silty, sandy, pebbly, olive-gray (till)	8	18
	Sand and gravel, subangular to subrounded	2	20
	Clay, silty, sandy, gravelly, olive-gray (till)	35	55
	Sand and gravel, subangular to subrounded	8	63
	Clay, silty, sandy, pebbly, olive-gray (till)	22	85
	Clay, very silty, sandy, pebbly, yellowish-brown, oxidized (till)	8	93
Fox Hills Sandstone:			
	Siltstone, sandy, argillaceous, indurated, greenish-gray	23	116

163-070-15AAA1
NDSWC 798-13
(Log from Froelich, 1967)

Altitude: 1910 feet — Date drilled: 6/30/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, clayey, dusky-brown	1	1
	Clay, silty and sandy, yellowish-gray to dusky-yellow, oxidized (till)	10	11
	Clay, silty; with sand grains, pebbles, and occasional cobbles; olive-gray; moderately soft; cohesive (till)	14	25
	Till, silty, olive-gray, moderately soft; cohesive; with lenses of fine to medium sand	11	36
	Clay, silty to sandy; with pebbles, cobbles, and occasional sand and gravel; olive gray; moderately soft; variable drilling (till)	63	99
	Gravel, fine to very coarse, sandy, poorly sorted, subangluar to subrounded, very shaly; rough drilling	4	103
	Clay, silty; with sand grains, pebbles, and occasional cobbles or boulders; olive gray; moderately soft to slightly hard; tight (till)	16	119
Undifferentiated:			
	Silt, clayey to sandy, light-olive-gray to olive-gray, moderately brittle, noncalcareous, tight	17	136

163-070-15AAA2
NDSWC 5369

Altitude: 1900 feet — Date drilled: 9/06/78

Glacial drift:			
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	15	15
	Clay, silty, sandy, pebbly, olive-gray (till)	23	38
	Sand, fine to very coarse, and fine to medium clayey angular to rounded gravel	14	52
	Clay, silty, sandy, gravelly, olive-gray (till)	82	134
Fox Hills Sandstone:			
	Siltstone, argillaceous; carbonaceous indurated brownish-gray streaks	142	276
	Claystone, silty, indurated, grayish-black	22	298
Pierre Shale:			
	Shale, indurated, brittle, black	62	360

163-070-15ACA
NDSWC 460
(Log modified from Brookhart and Powell, 1961)

Altitude: 1935 feet — Date drilled: 8/17/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Road fill	2	2
	Clay, sandy, light-brown, and fine gravel	8	10
	Sand, fine to very coarse, light-brown, silty and clayey	17	27
	Sand, very coarse, gray, and fine clayey gravel; the coarser fraction consists of shale fragments	13	40
	Clay, very sandy, gray, and fine to medium gravel and shale pebbles	14	54
	Clay, sandy, gray-brown, and fine to medium gravel and shale pebbles	10	64
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	52	116
	Clay, sandy, gray-brown, and fine to medium gravel and shale pebbles	21	137
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	41	178
	Clay, very sandy, gray, and fine gravel and shale pebbles	87	265
Pierre Shale:			
	Shale, gray	15	280

163-070-15ADA1
NDSWC 798-2
(Log from Froelich, 1967)

Altitude: 1900 feet — Date drilled: 6/21/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, clayey, dusky-brown----------	1	1
	Clay, silty; with sand grains and pebbles; dusky yellow; slightly calcareous; oxidized; drills easy (till)----------	16	17
	Clay, silty; with sand grains and pebbles; olive gray; moderately soft (till)----------	14	31
	Clay, sandy; with pebbles and cobbles and lenses of fine to coarse sand and fine to coarse gravel; poorly sorted----------	20	51
	Boulder, granite----------	1	52
	Clay, silty to sandy, olive-gray, soft, slightly gritty, moderately plastic----------	9	61
	Sand, fine, well-sorted, olive-gray----------	5	66
	Silt, clayey, smooth and plastic; with occasional sand grains and pebbles; sandy; moderately plastic with occasional pebbles; olive gray; soft (till)----------	18	84
	Clay, sandy; with pebbles; occasional cobbles and streaks of sand and gravel; olive gray; soft to moderately soft; easy drilling (till)----------	20	104
	Clay, silty; with sand grains and pebbles; olive gray; moderately soft; tight (till)----------	19	123
	Clay, sand to gravelly, olive-gray, moderately soft; moderately rough drilling (till)----------	13	136
Undifferentiated:			
	Sand, very fine to fine; with interbedded thin siltstone and shale layers; sand is light greenish gray; moderately friable; silt and shale vary from light olive gray to olive gray; drills tight----------	14	150
	Sand, silt, and shale, light-olive-gray to olive-gray; interbedded in layers generally from 2 to 4 feet thick; variegated green and gray tones with occasional streaks of brownish-black carbonaceous material; micaceous; noncalcareous; tight drilling----------	92	242

163-070-15ADA2
NDSWC 461
(Log modified from Brookhart and Powell, 1961)

Altitude: 1900 feet — Date drilled: 8/22/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Sand, very fine to very coarse, light-brown, very clayey	19	20
	Sand, medium to coarse, gray, silty and clayey	25	45
	Sand, medium to very coarse, gray, and fine clayey gravel; the coarser fraction consists of shale fragments	17	62
	Clay, sandy, gray, and fine gravel and shale pebbles	52	114
	Gravel, fine, gray, and coarse, very clayey sand; the coarser fraction consists of shale fragments	12	126
	Clay, sandy, gray, and fine gravel and shale pebbles	34	160
	Clay, very sandy, gray, and fine to medium gravel and shale pebbles	28	188
Pierre Shale:			
	Shale, gray	15	203

163-070-15ADA3
NDSWC 465
(Log modified from Brookhart and Powell, 1961)

Altitude: 1900 feet — Date drilled: 9/11/51

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, very sandy, light-gray, and fine gravel	3	4
	Clay, sandy, light-brown, and fine to medium gravel	9	13
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	22	35
	Clay, very sandy, gray, and fine to medium gravel and shale pebbles	27	62
	Sand, medium to very coarse, gray, and fine to medium clayey gravel; the coarser fraction consists of shale fragments	8	70
	Sand, very coarse, and fine gravel	12	82
	Sand, very coarse, gray, and fine clayey gravel; the coarser fraction consists of shale fragments	11	93
	Gravel, fine, and very coarse sand; this material consists of about one-half shale fragments	7	100
	Clay, very sandy, gray, and fine gravel and shale pebbles	5	105
	Gravel, fine to coarse, and very few shale fragments	16	121
	Clay, very sandy, gray, and fine to medium gravel and shale pebbles	19	140

163-070-15ADB
NDSWC 464
(Log from Brookhart and Powell, 1961)

Altitude: 1907 feet — Date drilled: 9/10/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	21	22
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	56	78
	Clay, sandy, gray-brown, and fine to medium gravel and shale pebbles	10	88
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	17	105
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	17	122
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	56	178
Pierre Shale:			
	Shale, gray	22	200

163-070-15BDD
NDSWC 172
(Log modified from Brookhart and Powell, 1961)

Altitude: 1955 feet — Date drilled: 8/01/49

Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Clay, sandy, light-brown, and fine gravel and shale pebbles	19	21
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	45	66
	Sand, very coarse, gray, and fine clayey gravel; the coarser fraction consists of shale fragments	11	77
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	49	126
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	23	149
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	41	190
Undifferentiated:			
	Clay, gray; very coarse sand; and fine gravel; abundant shale fragments; could be either till or bedrock	110	300

163-070-15CAB
NDSWC 457
(Log modified from Brookhart and Powell, 1961)

Altitude: 1970 feet — Date drilled: 8/08/51

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Clay, sandy, light-brown, and fine gravel and shale pebbles	23	23
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	12	35
	Sand, very coarse, gray, and fine clayey gravel	2	37
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	56	93
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	12	105
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	52	157
	Sand, medium to very coarse, gray, and fine clayey gravel; the coarser fraction consists of shale fragments	4	161
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	22	183
	Sand, medium to very coarse, gray, and fine clayey gravel; about one-half the material consists of shale fragments	2	185
Undifferentiated:			
	Clay, sandy, gray-brown, and fine gravel; abundant shale fragments; could be either till or bedrock	20	205

163-070-15CAD
NDSWC 459
(Log from Brookhart and Powell, 1961)

Altitude: 1960 feet — Date drilled: 8/16/51

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	15	16
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	51	67
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	17	84
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	54	138
	Clay, very sandy, light-brown, and fine gravel; the material consists of about one-half shale fragments	18	156
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	15	171
Pierre Shale:			
	Shale, gray	9	180

163-070-15DBA
NDSWC 798-7
(Log from Froelich, 1967))

Altitude: 1940 feet — Date drilled: 6/27/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, clayey, dusky-brown	1	1
	Clay, silty; with sand grains and pebbles; dusky yellow to moderate olive-brown; soft; moderately cohesive; oxidized (till)	31	32
	Clay, silty; with sand grains, pebbles, and occasional cobbles or boulders; olive gray; soft (till)	15	47
	Gravel, fine and medium; with lenses of sand and silty clay; interbedded; subangular to subrounded	9	56
	Clay, silty to sandy; with pebbles; moderate olive brown to grayish olive; moderately soft; tight; oxidized (till)	19	75
	Gravel, fine and medium, sandy	2	77
	Clay, silty to sandy; with pebbles and occasional lenses of sand and gravel; olive gray; moderately soft; tight (till)	53	130
	Till, silty to sandy; olive gray; moderately soft; tight; with numerous lenses of gravel; moderately rough drilling	48	178
	Sand, medium to coarse; some gravel; highly lignitic; moderately well sorted; silty streaks; easy drilling	10	188
Undifferentiated:			
	Shale, silty to sandy, light-greenish-gray to light-olive-gray, moderately brittle, noncalcareous, tight	22	210

163-070-15DCD
NDSWC 466
(Log from Brookhart and Powell, 1961)

Altitude: 1955 feet — Date drilled: 9/12/51

Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Clay, very sandy, light-brown, and fine to medium gravel and shale pebbles	27	29
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	93	122
	Clay, sandy, gray-brown, and fine gravel and shale pebbles	11	133
	Clay, sandy, light-gray, and fine gravel and shale pebbles	1	134
	Clay, sandy, gray-brown, and fine gravel and shale pebbles	24	158
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	58	216
Pierre Shale:			
	Shale, gray	14	230

163-070-16AAA
NDSWC 173
(Log from Brookhart and Powell, 1961)

Altitude: 1959 feet — Date drilled: 8/04/47

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Till and associated sand and gravel deposits:			
	Topsoil, black	2	2
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	33	35
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	159	194
	Clay, sandy, light-gray, and fine to medium gravel and shale pebbles	16	210
Undifferentiated:			
	Clay, sandy, gray, and fine gravel; abundant shale fragments; could be either till or bedrock	80	290
Pierre Shale:			
	Shale, gray	15	305

163-070-16DAA
NDSWC 458
(Log from Brookhart and Powell, 1961)

Altitude: 2005 feet — Date drilled: 8/13/51

Till and associated sand and gravel deposits:			
	Topsoil, black	1	1
	Clay, sandy, light-brown, and fine gravel and shale pebbles	26	27
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	100	127
	Clay, sandy, light-brown, and fine to medium gravel and shale pebbles	31	158
	Clay, sandy, gray, and fine to medium gravel and shale pebbles	103	261
Undifferentiated:			
	Clay, very sandy, gray, and fine gravel; abundant shale fragments; could be either till or bedrock	19	280

163-070-16DAB
(Log modified from C. A. Simpson & Son)

Altitude: 2030 feet — Date drilled: 10/21/72

	Topsoil	1	1
	Clay, yellow	39	40
	Clay, sandy, blue	100	140
	Clay, light-gray	20	160
	Clay, yellow-red	10	170
	Clay, blue	41	211
	Sand	4	215
	Clay, blue	--	215

163-070-17ABC
(Log modified from C. A. Simpson & Son)

Altitude: 2060 feet — Date drilled: 8/14/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay	1	1
	Topsoil	1	2
	Clay, yellow	33	35
	Clay, blue	45	80
	Clay, sandy, blue	30	110
	Clay, blue	38	148
	Clay, coarse, gravelly, yellow	10	158
	Clay, blue	7	165
	Clay, coarse, gravelly, blue	15	180
	Clay, sandy, blue	15	195
	Clay, gravelly, blue	12	207
	Sand, clayey	2	209
	Clay, very sandy, blue	22	231
	Sand	7	238

163-070-24DDD
(Log from Lee's Well Drilling)

Altitude: 1860 feet — Date drilled: 2/01/73

	Topsoil	1	1
	Clay, sandy, yellow	17	18
	Gravel	32	50

163-070-29BCB
(Log modified from C. A. Simpson & Son)

Altitude: 2110 feet — Date drilled: 5/07/68

	Topsoil	1	1
	Clay, yellow	18	19
	Clay, blue	16	35
	Gravel; almost no water	6	41
	Clay, sandy, blue	29	70

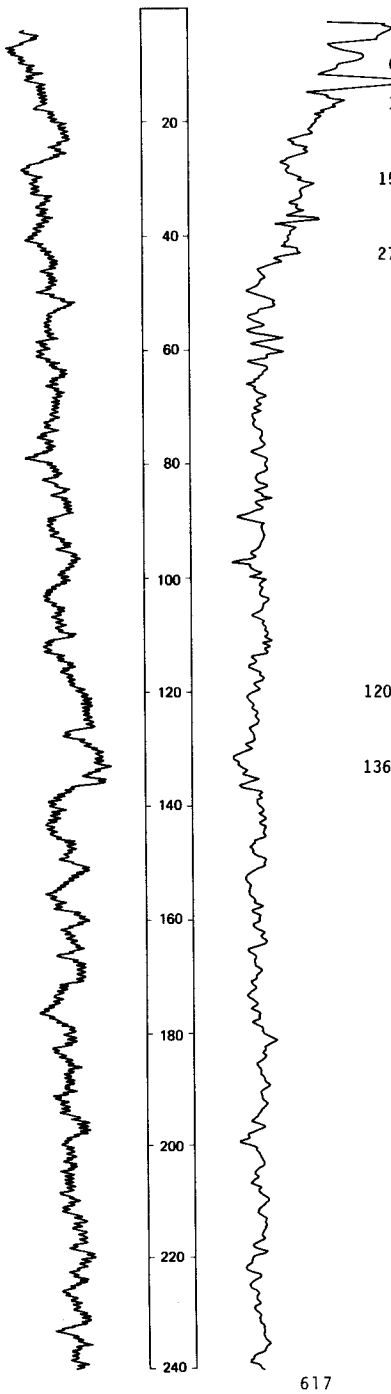
NDSWC 5876

LOCATION: 163-070-29BCC

DATE DRILLED: 11/04/80

ALTITUDE: 2110
(FT, NGVD)

DEPTH: 478
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-15	Clay, silty, pebbly, yellowish-brown, oxidized (till).
15-27	Clay, silty, cobbly, olive-gray (till); oxidation streaks.
27-120	Clay, silty, pebbly, olive-gray (till).
120-136	Clay, olive-gray.
136-321	Till, silty, gravelly; some cobbles and boulders.

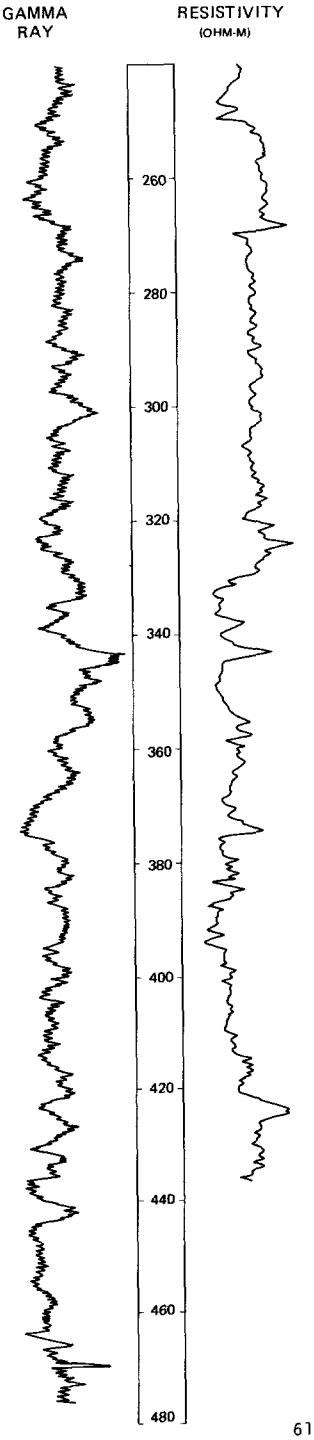
NDSWC 5876, continued

LOCATION: 163-070-29BCC

DATE DRILLED: 11/04/80

ALTITUDE: 2110
(FT, NGVD)

DEPTH: 478
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

321-330	Silt, clayey, greenish-gray.
330-355	Silt, olive-gray; abundant fossil fragments.
355-376	Silt, yellowish-green, partially oxidized; fossil fragments.
376-420	Silt, clayey; occasional thin lenses of olive-gray gravel.
420-478	Clay, silty, sandy, light-olive-gray (till); oxidation streaks; cobbles at 459 feet; boulders at 477 feet.

163-070-30ABA1
(Log modified from C. A. Simpson & Son)

Altitude: 2100 feet — Date drilled: 4/29/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay and rocks, yellow	26	27
	Clay, sandy, gray	46	73
	Clay, very sandy and gravelly	4	77
	Clay, gravelly, gray	14	91
	Clay, gray	79	170
	Clay, gravelly, gray; with a few rocks	62	232
	Clay, sandy, yellow	18	250
	Clay, gravelly, gray; rocks	7	257
	Clay, very gravelly, gray	3	260
	Clay, gravelly, gray	17	277
	Clay, gravelly, gray; rocks; thin gravel seams	15	292
	Clay, gray	5	297
	Clay, very sandy, gray	8	305
	Clay, yellow	7	312
	Sand and gravel, clayey	1	313
	Clay, gravelly, gray	22	335
	Clay, very dark, sandy, gray; with coal particles and a little thick water	24	359

163-070-30ABA2
(Log modified from C. A. Simpson & Son)

Altitude: 2100 feet — Date drilled: 5/20/64

	Topsoil	1	1
	Clay, gray	4	5
	Clay, yellow	35	40
	Clay, slightly sandy, gray; with a few rocks	100	140
	Clay, gravelly, gray; rocks	20	160
	Clay, slightly sandy, gray	53	213
	Sand, clayey, medium	1	214
	Sand	1	215
	Sand, clayey	--	215

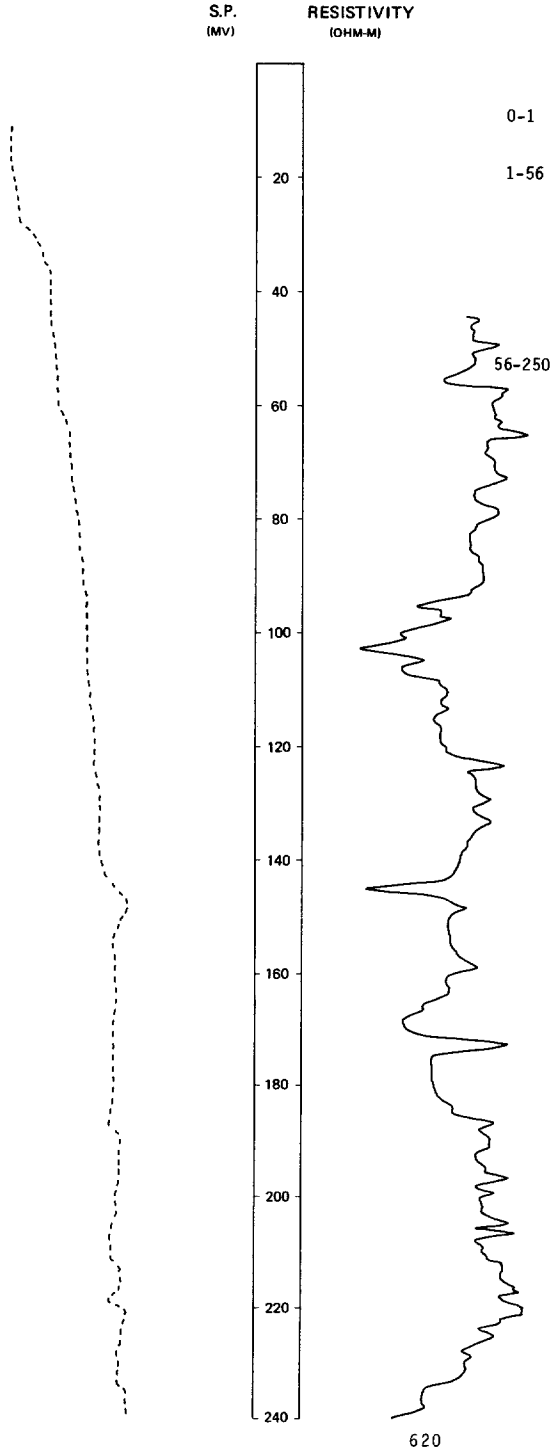
NDSWC 7

LOCATION: 163-070-32DDD

DATE DRILLED: 12/04/73

ALTITUDE: 2062
(FT, NGVD)

DEPTH: 460
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, sandy, yellowish-brown.
1-56	Till, moderate-yellowish-brown, oxidized; thin lenses of gravel.
56-250	Till, gravelly, sandy, olive-gray.

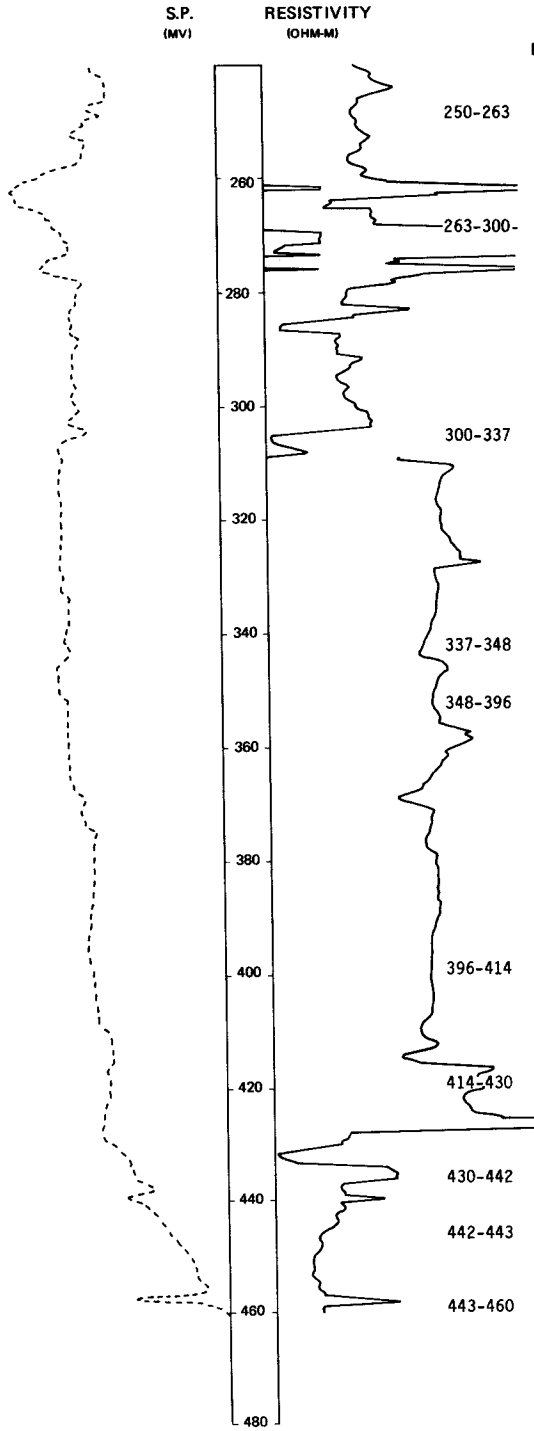
NDSWC 7, continued

LOCATION: 163-070-32DDD

DATE DRILLED: 12/04/73

ALTITUDE: 2062 (FT, NGVD)

DEPTH: 460 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

250-263	Till, very gravelly, yellowish-gray; cobbles and boulders; mostly carbonates; weathered bentonitic light-gray material.
263-300-	Till, sandy to gravelly, tight, medium-gray; older till.
300-337	Till, tight, dark-gray.
337-348	Till, sandy, dark-gray.
348-396	Till, tight, very dark gray.
396-414	Till, sandy, dark-gray; boulder at 405 feet.
414-430	Till, tight, dark-gray.

FOX HILLS SANDSTONE

430-442	Shale, dark-greenish-gray.
442-443	Sandstone, fine to medium, clayey, indurated, greenish-gray.
443-460	Shale, slightly silty, tight, dark-grayish-black.

163-070-35CDD
NDSWC 5-797
(Log from Schmid, 1964)

Altitude: 2020 feet — Date drilled: 7/18/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, granular to pebbly, sandy	5	5
	Till, moderate-yellowish-brown, calcareous, oxidized	7	12
	Till, olive-gray, calcareous	28	40
	Silt, olive-gray, calcareous	21	61
	Silt, olive-gray, clayey, calcareous	111	172
	Till, olive-gray, calcareous	83	255
	Silt; olive gray with dark yellowish orange oxidized areas; calcareous	20	275
	Silt, olive-gray, calcareous	13	288
	Till, olive-gray; contains silty lenses	22	310
Undifferentiated bedrock:			
	Shale; light gray with brownish black lignitic areas; calcareous	16	326

163-071-01BDB
(Log modified from C. A. Simpson & Son)

Altitude: 2185 feet — Date drilled: 11/17/66

	Topsoil	1	1
	Clay, sandy, yellow; rocks	26	27
	Clay, sandy, blue; rocks	169	196
	Clay, sandy, yellow; rocks	13	209
	Clay, sandy, blue; rocks	70	279
	Clay, sandy, yellow	33	312
	Clay, sandy, blue	5	317
	Sand	11	328

163-071-02CCC
(Log modified from Church Well Boring)

Altitude: 2140 feet — Date drilled: 4/30/76

	Topsoil, black	1	1
	Clay, yellow	8	9
	Gravel, coarse	4	13
	Clay, yellow	2	15
	Clay, blue	77	92

163-071-07ADB
(Log modified from C. A. Simpson & Son)

Altitude: 2185 feet — Date drilled: 3/15/74

	Topsoil	1	1
	Clay, yellow	34	35
	Clay, blue	240	275
	Clay, gravelly, blue	23	298
	Sand and gravel	18	316

163-071-10DDD1,2
NDSWC 5368, 5368A

Altitude: 2165 feet — Date drilled: 8/31/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, gravelly, subangular to rounded, oxidized	7	7
	Clay, silty, pebbly, yellowish-brown, oxidized (till)	23	30
	Clay, silty, gravelly, olive-gray (till)	85	115
	Clay, silty to very sandy, medium-dark-gray	32	147
	Clay, silty, sandy, pebbly, olive-gray (till)	146	293
	Gravel, fine to medium, and coarse angular to subrounded oxidized sand; predominately carbonate and detrital shale pebbles and grains	9	302
	Clay, silty to gravelly, olive-gray (till)	9	311
	Gravel, fine to medium, and coarse subangular to subrounded sand; occasional thin lenses of clay; predominately carbonate, detrital shale, and some granitic pebbles and grains	50	361
	Clay, silty to gravelly, olive-gray (till)	20	381
	Sand, fine to very coarse, gravelly, angular to rounded; predominately quartz, carbonate, and detrital lignite grains	63	444
	Clay, silty, pebbly, olive-gray (till)	11	455
Fox Hills Sandstone:			
	Sandstone, fine to medium, argillaceous, glauconitic, light-green	41	496
	Siltstone, argillaceous, carbonaceous, indurated, brownish-gray	27	523
	Sandstone, fine, argillaceous, greenish-gray	17	540
	Siltstone, slightly sandy, argillaceous, carbonaceous, brownish-gray	104	644
Pierre Shale:			
	Shale, siliceous, indurated, grayish-black	56	700

163-071-16BDA
(Log modified from C. A. Simpson & Son)

Altitude: 2150 feet — Date drilled: 12/17/76

	Topsoil	1	1
	Clay, yellow	15	16
	Clay, blue	29	45
	Clay, very sandy, blue	5	50
	Clay, blue	18	68
	Gravel, coarse, dry	4	72
	Clay, blue	10	82
	Sand	1	83
	Clay, blue	12	95
	Clay, blue; some stones	29	124

163-071-19CDD
(Log modified from Aberle Well Co.)

Altitude: 2205 feet — Date drilled: 11/18/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, gray	14	15
	Gravel	3	18
	Clay, blue	22	40

163-071-26AAD
(Log modified from C. A. Simpson & Son)

Altitude: 2100 feet — Date drilled: 12/29/67

	Topsoil	1	1
	Clay, sandy, yellow	23	24
	Clay, sandy, blue; rocks	208	232
	Clay, sandy, yellow	12	244
	Clay, sandy, blue	27	271
	Sand	5	276

163-071-31CCA
NDSWC 3

Altitude: 2180 feet — Date drilled: 8/14/71

Glacial drift:			
	Soil	1	1
	Clay, sandy, yellowish-brown, oxidized (till)	23	24
	Clay, yellowish-brown, oxidized (till); interbedded with lenses of sand; lignite smears	18	42
	Clay, silty to sandy, olive-gray (till)	33	75
	Clay, olive-gray (till); interbedded with lenses of sand and gravel	8	83
	Clay, silty to sandy, olive-gray (till); occasional cobbles and boulders	31	114
	Gravel, medium to coarse; about 30 percent coarse subangular to rounded sand; about 60 percent carbonate, 25 percent igneous, and 15 percent quartz and detrital lignite pebbles	20	134
	Clay, sandy to gravelly, olive-gray (till)	15	149
	Clay, sandy to gravelly, olive-gray (till); abundant cobbles and boulders	22	171
	Till, sandy, olive-gray; lenses of silt, cobbles, and boulders	49	220

163-071-32DDC
(Log modified from Aberle Well Co.)

Altitude: 2165 feet — Date drilled: 1972

	Topsoil	1	1
	Clay, yellow	21	22
	Clay, blue	14	36
	Sand	2	38
	Clay, blue	16	54

163-071-35BBA
(Log from Lee's Well Drilling)

Altitude: 2125 feet — Date drilled: 7/10/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Sand, yellow	18	19
	Sand, blue	149	168
	Sand	4	172

163-071-35BBC
(Log modified from Church Well Boring)

Altitude: 2140 feet — Date drilled: 7/08/75

	Topsoil, black	1	1
	Sand, coarse, gray	1	2
	Clay, yellow	5	7
	Clay, rocky, blue	5	12
	Clay, blue	13	25

163-071-35BBD
(Log modified from Lee's Well Drilling)

Altitude: 2140 feet — Date drilled: 8/05/74

	Topsoil	1	1
	Clay, yellow	17	18
	Clay, blue	272	290
	Clay, yellow	24	314
	Sand	4	318

163-071-36CDD
(Log modified from C. A. Simpson & Son)

Altitude: 2110 feet — Date drilled: 6/08/65

	Topsoil	1	1
	Clay, yellow	45	46
	Clay, blue; a few rocks	184	230
	Clay or shale, blue	70	300

163-072-01BBC
(Log modified from C. A. Simpson & Son)

Altitude: 2240 feet — Date drilled: 8/10/70

	Topsoil	1	1
	Clay, sandy, yellow	22	23
	Clay, sandy, blue; rocks	212	235
	Clay, hard, gravelly, blue	134	369
	Rocks and coarse sand	11	380

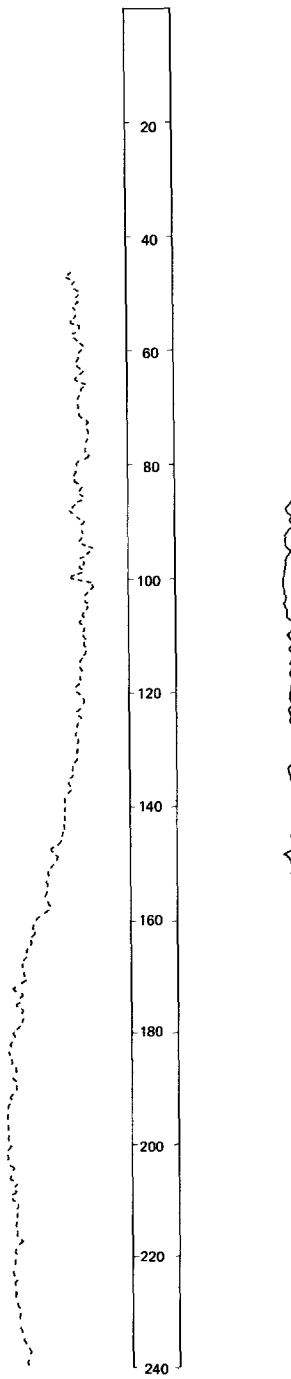
NDSWC 5367

LOCATION: 163-072-14ABB

DATE DRILLED: 8/29/78

ALTITUDE: 2250
(FT, NGVD)

DEPTH: 820
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-12	Sand, fine to very coarse, gravelly, subangular to rounded, oxidized.
12-20	Clay, silty, cohesive, yellowish-brown, oxidized (lacustrine).
20-164	Clay, silty, cohesive, dark-gray.
164-398	Clay, silty to sandy, pebbly, bouldery, olive-gray (till).

NOTE:

------Long normal

———Short normal

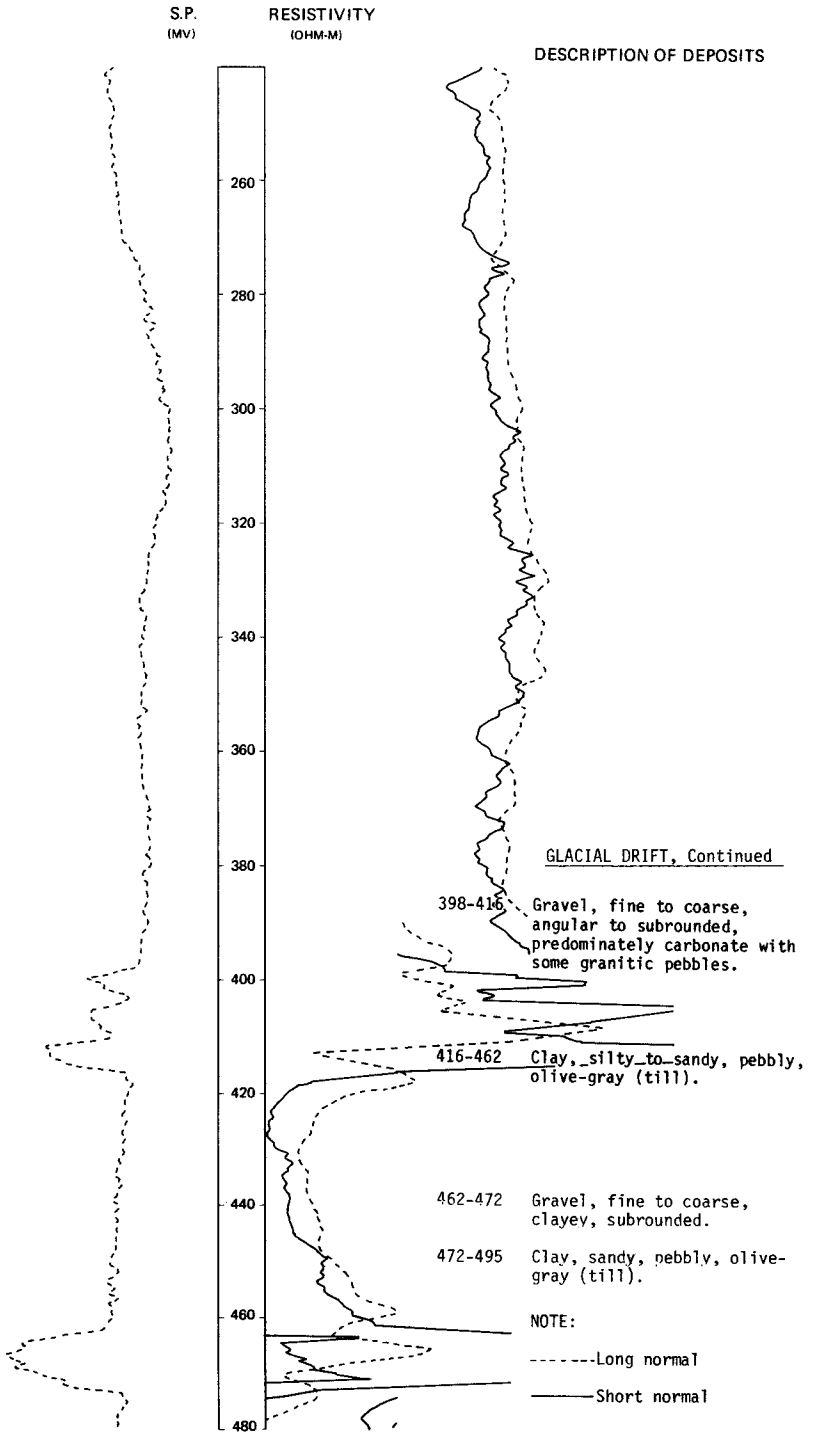
NDSWC 5367, continued

LOCATION: 163-072-14ABB

DATE DRILLED: 8/29/78

ALTITUDE: 2250
(FT, NGVD)

DEPTH: 820
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

398-416 Gravel, fine to coarse, angular to subrounded, predominately carbonate with some granitic pebbles.

416-462 Clay, silty to sandy, pebbly, olive-gray (till).

462-472 Gravel, fine to coarse, clayey, subrounded.

472-495 Clay, sandy, pebbly, olive-gray (till).

NOTE:

-------Long normal

———Short normal

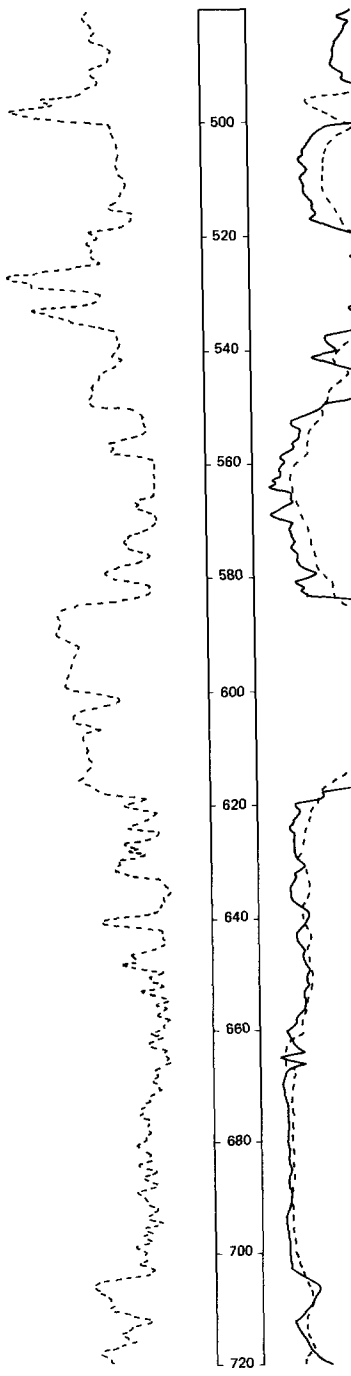
NDSWC 5367, continued

LOCATION: 163-072-14ABB

DATE DRILLED: 8/29/78

ALTITUDE: 2250 (FT, NGVD)

DEPTH: 820 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

495-499 Gravel, fine to coarse, silty to sandy, subrounded.

HELL CREEK FORMATION

499-519 Siltstone, argillaceous; carbonaceous dark-gray to brownish-gray streaks.

519-537 Sandstone, fine to medium, argillaceous, moderately indurated, light-greenish-gray.

537-584 Siltstone, bentonitic, argillaceous; carbonaceous streaks; occasional thin lenses of greenish-gray sandstone.

FOX HILLS SANDSTONE

584-618 Sandstone, fine to medium, glauconitic, indurated, grayish-green.

618-704 Siltstone, bentonitic; carbonaceous moderately indurated greenish-gray streaks.

704-731 Sandstone, fine, argillaceous, glauconitic, moderately indurated, dark-green.

NOTE:

------Long normal

———Short normal

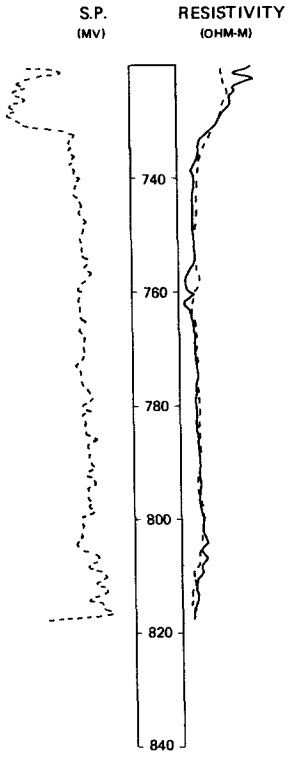
NDSWC 5367, continued

LOCATION: 163-072-14ABB

DATE DRILLED: 8/29/78

ALTITUDE: 2250 (FT, NGVD)

DEPTH: 820 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

731-779 Siltstone, very argillaceous, tight, dark-gray.

PIERRE SHALE

779-820 Shale, siliceous, brittle, grayish-black to black.

NOTE:

----- Long normal

———Short normal

163-072-14BBA
(Log modified from Aberle Well Co.)

Altitude: 2270 feet

Date drilled: 1972

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Sand, yellow	19	20
	Gravel	16	36

163-072-16ADD
(Log modified from C. A. Simpson & Son)

Altitude: 2220 feet

Date drilled: 6/16/69

	Clay, sandy, yellow	8	8
	Clay, sandy, blue	30	38
	Gravel, coarse; rocks	24	62
	Clay, sandy, blue; rocks	120	182
	Sand, coarse	3	185
	Clay, sandy, blue; rocks	127	312
	Gravel	3	315

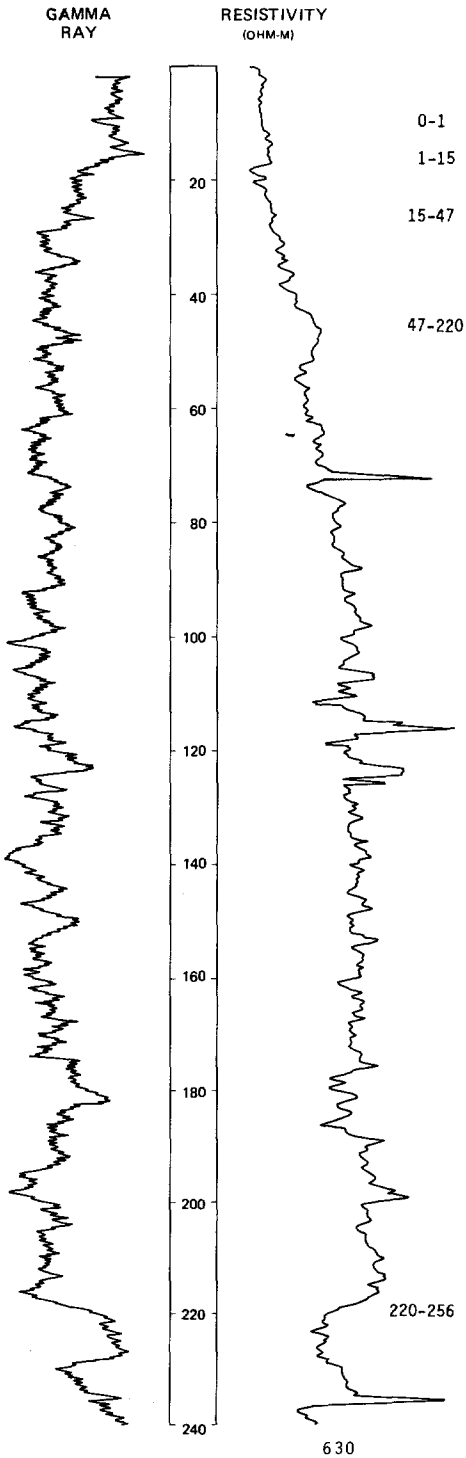
NDSWC 5585

LOCATION: 163-072-18BBC

DATE DRILLED: 10/02/79

ALTITUDE: 2200
(FT, NGVD)

DEPTH: 452
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-15	Clay, cohesive, yellowish-brown, oxidized.
15-47	Clay, silty to sandy, pebbly, yellowish-brown, oxidized (till).
47-220	Clay, silty, sandy, pebbly, olive-gray (till).
220-256	Clay, silty, sandy to gravelly, olive-gray (till).

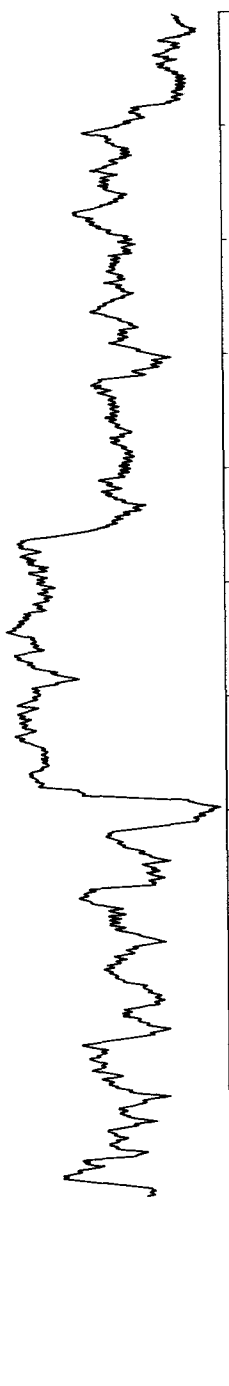
NDSWC 5585, continued

LOCATION: 163-072-18BBC

DATE DRILLED: 10/02/79

ALTITUDE: 2200 (FT, NGVD)

DEPTH: 452 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

256-332 Clay, silty to sandy (till); with thin lenses of olive-gray gravel.

332-378 Gravel, fine to coarse; about 40 percent fine to very coarse angular to rounded sand; predominately carbonate pebbles.

378-408 Clay, sandy, pebbly, olive-gray (till).

HELL CREEK FORMATION

408-452 Siltstone, argillaceous, yellowish-brown to greenish-gray; upper part is oxidized; interbedded with moderately indurated sandstone.

LOCATION: 163-072-18BBC

DATE DRILLED: 10/02/79

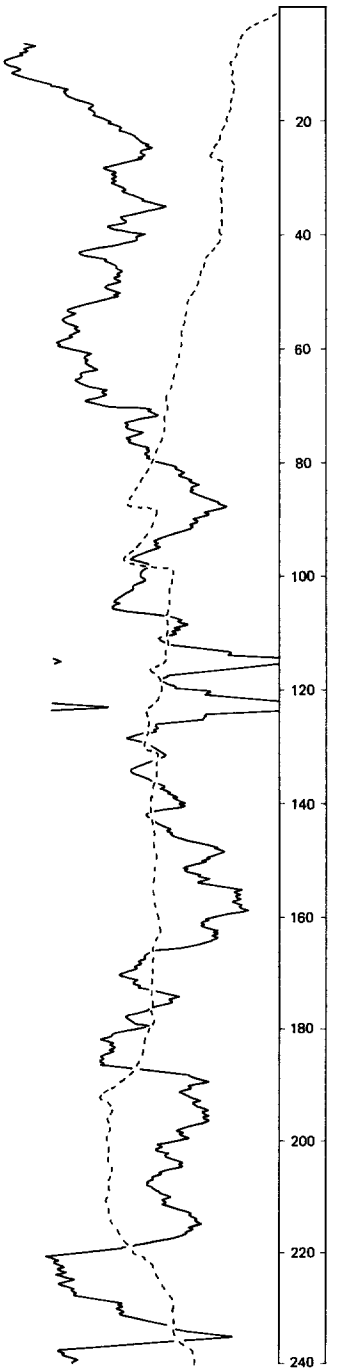
ALTITUDE: 2200
(FT, NGVD)

DEPTH: 452
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



LOCATION: 163-072-18BBC

DATE DRILLED: 10/02/79

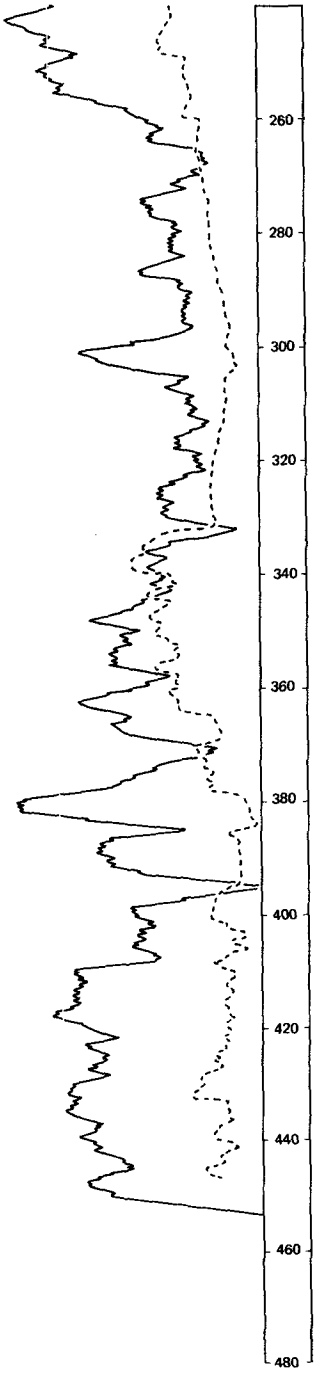
ALTITUDE: 2200
(FT, NGVD)

DEPTH: 452
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



163-072-24ADB
(Log modified from Lee's Well Drilling)

Altitude: 2130 feet — Date drilled: 12/11/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	17	18
	Gravel, blue	328	346
	Sand	5	351

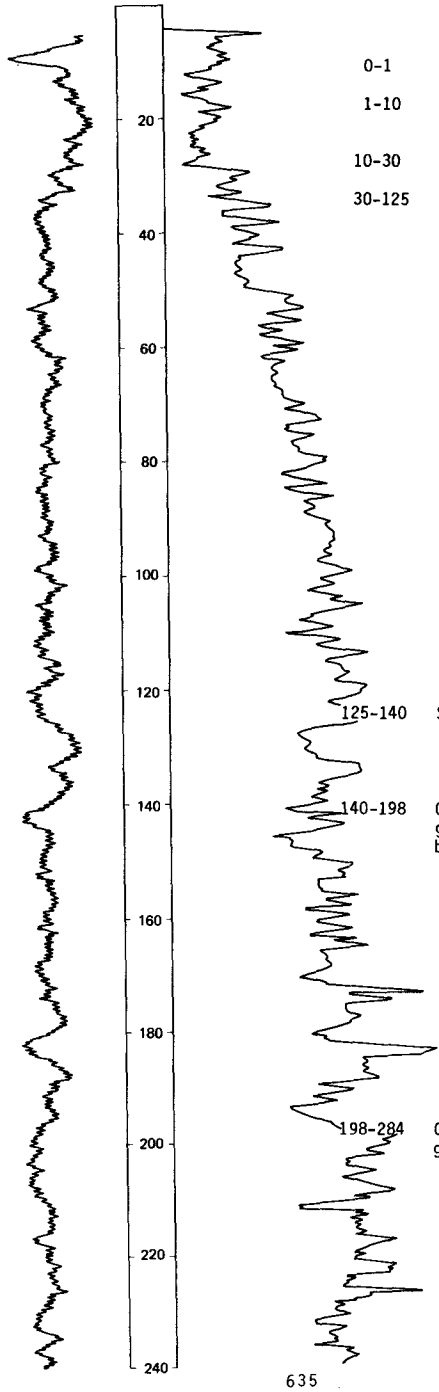
NDSWC 5870

LOCATION: 163-072-30BBB

DATE DRILLED: 10/29/80

ALTITUDE: 2120
(FT, NGVD)

DEPTH: 361
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Clay, silty, yellowish-brown, oxidized.
10-30	Clay, silty, olive-gray.
30-125	Clay, very silty, gravelly, olive-gray (till).
125-140	Silt, clayey, olive-gray.
140-198	Clay, silty, pebbly, olive-gray (till); cobbles and boulders.
198-284	Clay, sandy, pebbly, olive-gray (till).

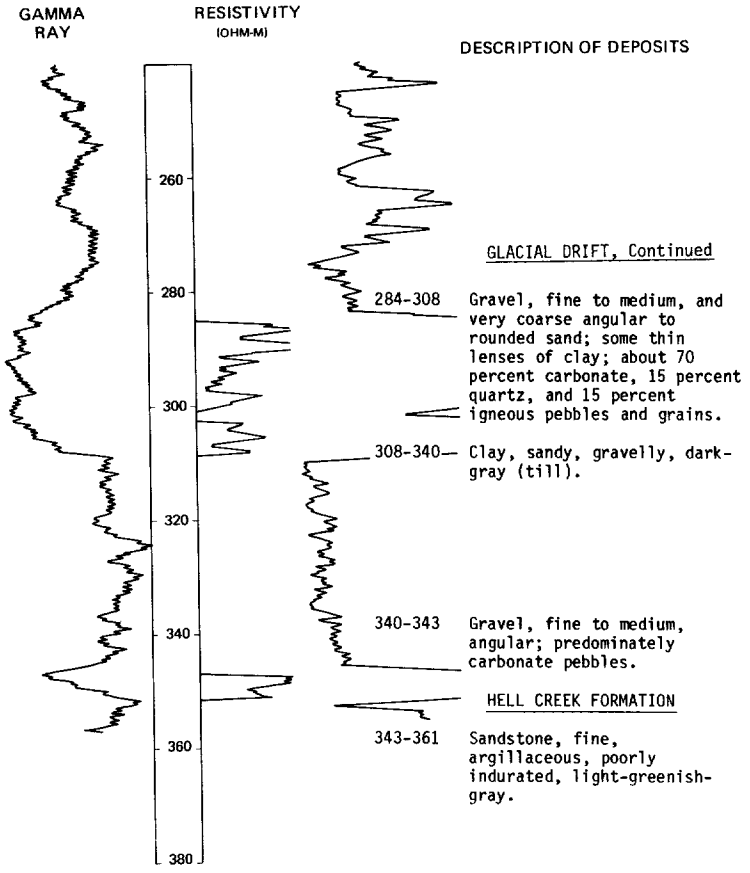
NDSWC 5870, continued

LOCATION: 163-072-30BBB

DATE DRILLED: 10/29/80

ALTITUDE: 2120 (FT, NGVD)

DEPTH: 361 (FT)



163-072-32CBD
(Log modified from C. A. Simpson & Son)

Altitude: 2130 feet

Date drilled: 10/30/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	39	40
	Clay, blue	65	105
	Clay, sticky, blue	119	224
	Clay, sandy	2	226
	Sand, medium; somewhat clayey	12	238
	Sand, coarse	--	238

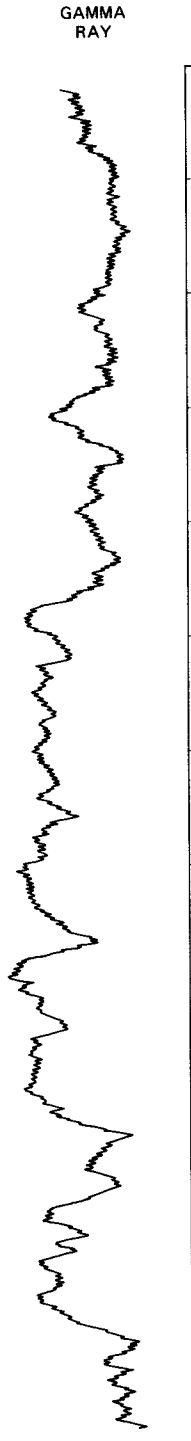
NDSWC 5871

LOCATION: 163-072-36CCC

DATE DRILLED: 10/30/80

ALTITUDE: 2195
(FT, NGVD)

DEPTH: 501
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-18	Clay, silty to sandy, yellowish-brown, oxidized (till).
18-59	Clay, silty, pebbly, dark-gray (till).
59-62	Gravel, fine to coarse, sandy, angular to rounded; predominately carbonate pebbles.
62-76	Clay, silty, pebbly, olive-gray (till).
76-78	Gravel, coarse, sandy, angular to rounded.
78-97	Clay, silty, pebbly, dark-greenish-gray (till); interbedded with lenses of gravel.
97-140	Gravel, fine to coarse; about 30 percent coarse angular to rounded sand; about 30 percent carbonate, 30 percent igneous, and 30 percent detrital shale pebbles.
140-185	Gravel, fine to coarse, sandy, angular to rounded; interbedded with yellowish-brown oxidized silt.
185-246	Silt, clayey, olive-gray; interbedded with lenses of gravel from 200 to 220 feet.

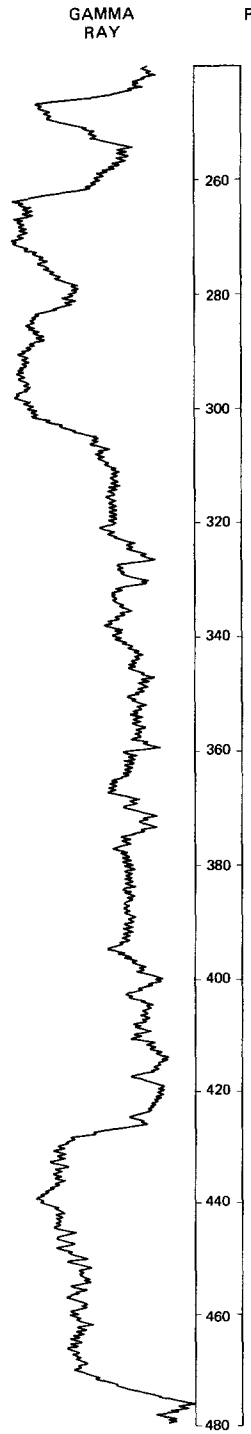
NDSWC 5871, continued

LOCATION: 163-072-36CCC

DATE DRILLED: 10/30/80

ALTITUDE: 2195 (FT, NGVD)

DEPTH: 501 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

246-304 Clay, silty to sandy, dark-gray (till); interbedded lenses of gravel.

304-400 Silt, clayey, brownish-gray; bedrock shove block.

400-429 Clay, silty to sandy, pebbly, olive-gray (till).

429-440 Clay, sandy, yellowish-orange, oxidized (till); cobbles and boulders.

440-475 Clay, sandy, gravelly, olive-gray (till); boulders.

475-501 Clay, silty to sandy, olive-gray (till).

NDSWC 5871, continued

LOCATION: 163-072-36CCC

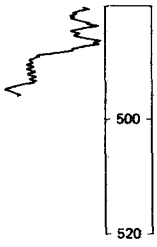
DATE DRILLED: 10/30/80

ALTITUDE: 2195
(FT, NGVD)

DEPTH: 501
(FT)

GAMMA RAY

RESISTIVITY
(OHM-M)



DESCRIPTION OF DEPOSITS

163-073-03CDA
(Log modified from Church Well Boring)

Altitude: 2105 feet

Date drilled: 10/02/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, rocky, yellow----------	26	26
	Clay, gravelly, blue----------	1	27
	Sand, yellow----------	1	28
	Sand, blue----------	5	33
	Clay, blue----------	6	39

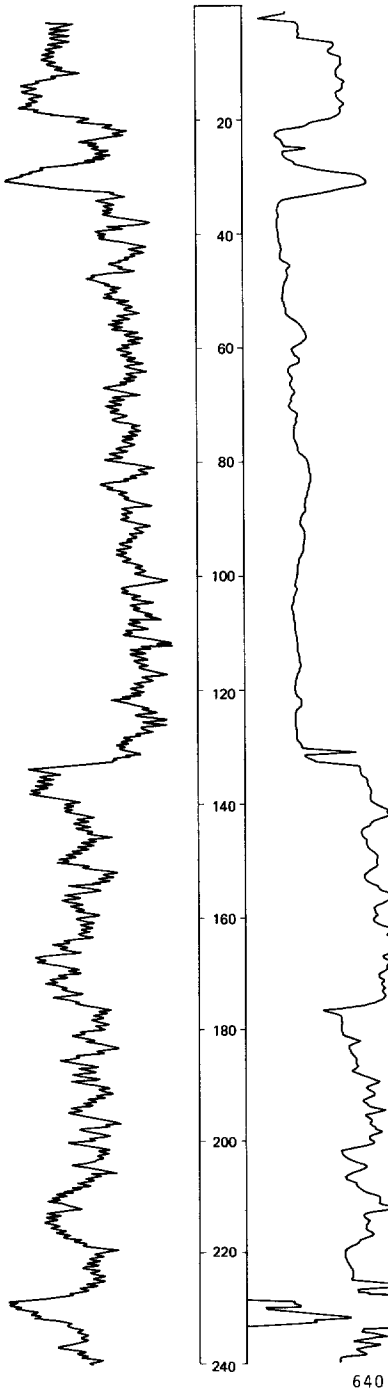
NDSWC 5584

LOCATION: 163-073-07DDD

DATE DRILLED: 10/02/79

ALTITUDE: 2171
(FT, NGVD)

DEPTH: 287
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-21	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
21-133	Clay, cohesive, dark-gray; lens of very fine sand from 29 to 32 feet (fluvial).
133-226	Clay, silty, sandy, gravelly, olive-gray (till).
226-234	Clay, sandy, gravelly, olive-gray (till); cobbles and boulders.
234-238	Clay, cohesive, olive-gray (fluvial).

CANNONBALL FORMATION

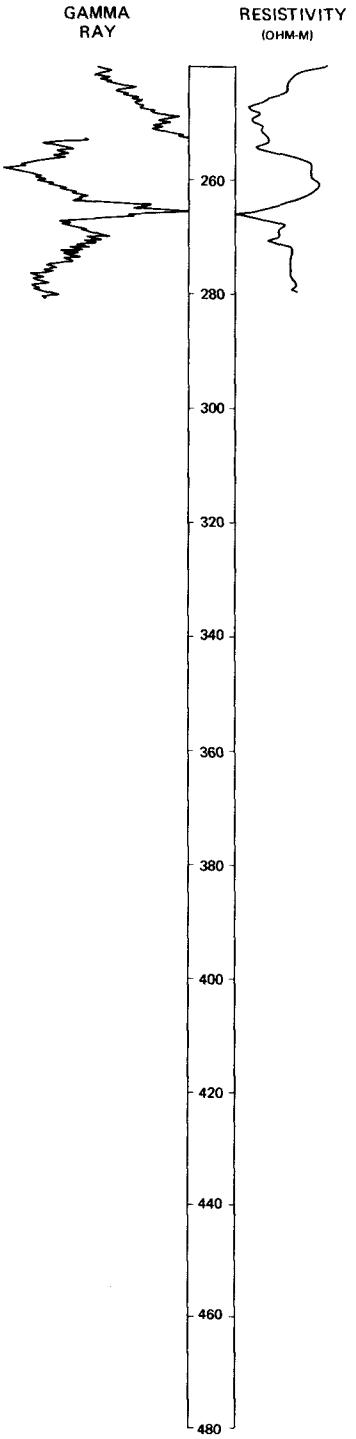
238-287	Siltstone, slightly sandy, indurated, greenish-gray.

LOCATION: 163-073-07DDD

DATE DRILLED: 10/02/79

ALTITUDE: 2171
(FT, NGVD)

DEPTH: 287
(FT)



DESCRIPTION OF DEPOSITS

LOCATION: 163-073-07DDD

DATE DRILLED: 10/02/79

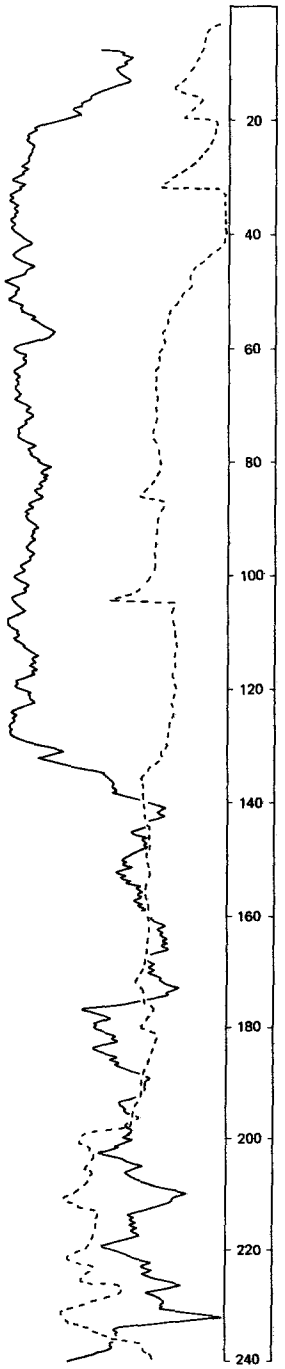
ALTITUDE: 2171
(FT, NGVD)

DEPTH: 287
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



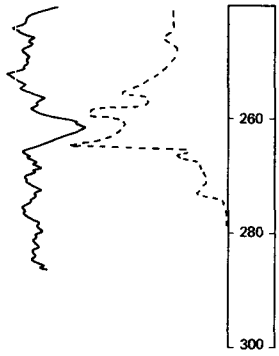
LOCATION: 163-073-07DDD

DATE DRILLED: 10/02/79

ALTITUDE: 2171
(FT, NGVD)

DEPTH: 287
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

163-073-08ABB
(Log modified from C. A. Simpson & Son)

Altitude: 2120 feet

Date drilled: 12/22/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	27	28
	Clay, sandy, blue	69	97
	Boulder	3	100
	Clay, sandy, blue	134	234
	Clay, sandy, yellow	34	268
	Clay, blue	27	295
	Clay, sandy	91	386
	Sandstone	1	387
	Clay, green, sandy	8	395

163-073-10DCC
(Log modified from C. A. Simpson & Son)

Altitude: 2100 feet

Date drilled: 1/31/68

	Topsoil	1	1
	Clay, sandy, yellow	14	15
	Clay, sandy, blue	76	91
	Gravel	4	95
	Clay, sandy, blue	11	106
	Gravel	4	110
	Clay, sandy, blue	5	115
	Gravel; no water	35	150
	Sand, coarse	11	161

163-073-11CCC1,2,3
NDSWC 5366, 5366A, 5366B

Altitude: 2123 feet — Date drilled: 8/22/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, pebbly, dusky-brown, oxidized (till)	25	25
	Clay, silty, cohesive (fluvial); light brown to 35 feet; changing to medium gray	32	57
	Clay, silty, sandy, pebbly, olive-gray (till); interbedded gravel from 168 to 172 feet	130	187
	Sand, fine to very coarse; about 20 percent fine to medium subangular to rounded gravel; predominately carbonate and detrital shale grains	15	202
	Clay, silty, sandy, pebbly, olive-gray (till)	9	211
	Gravel, fine to coarse, angular to subrounded, oxidized; predominately carbonate, detrital shale, and granitic pebbles	22	233
Cannonball Formation:			
	Siltstone, argillaceous, yellowish-brown to dark-gray; oxidized; limonitic concretions	17	250
	Siltstone, bentonitic, brittle, dark-gray	19	269
Hell Creek Formation:			
	Sandstone, fine, argillaceous, greenish-gray	11	280
	Siltstone, sandy, argillaceous, medium-gray	6	286
	Limestone, well-indurated, light-gray	2	288
	Siltstone, bentonitic, argillaceous, slightly carbonaceous, dark-gray; interbedded with fine sandstone from 306 to 350 feet	99	387
	Sandstone, fine, argillaceous, greenish-gray	6	393
	Claystone, carbonaceous to lignitic, brown	5	398
Fox Hills Sandstone:			
	Sandstone, fine to medium, argillaceous, glauconitic, light-green; cemented from 417 to 421 feet	39	437
	Siltstone, bentonitic, argillaceous, carbonaceous, brownish-gray	53	490
	Sandstone, fine, argillaceous, indurated, greenish-gray	17	507
	Siltstone, argillaceous; carbonaceous medium-gray streaks	46	553
	Sandstone, fine, glauconitic, indurated, medium-green	19	572
	Siltstone, argillaceous, carbonaceous, greenish-gray to light-brown	64	636
	Sandstone, fine to medium, argillaceous, glauconitic, dark-green	5	641
	Siltstone, argillaceous, carbonaceous, brownish-gray	49	690
Pierre Shale:			
	Shale, siliceous, brittle, grayish-black	25	715

163-073-18DDA
(Log modified from C. A. Simpson & Son)

Altitude: 2130 feet — Date drilled: 1/22/68

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Clay, sandy, yellow	16	18
	Clay, sandy, blue	85	103
	Clay, mushy, gravelly, yellow	13	116
	Clay, gravelly	15	131
	Clay, gravelly, yellow	34	165
	Gravel, coarse	3	168

163-073-23DBD
(Log modified from C. A. Simpson & Son)

Altitude: 2175 feet — Date drilled: 1/07/64

	Topsoil	1	1
	Clay, yellow	14	15
	Clay, blue; rocks	125	140
	Clay, sandy, yellow	50	190
	Clay, sticky, blue	95	285
	Clay, gravelly	4	289
	Sand, clayey	13	302
	Sand	8	310

163-073-26DAA
(Log modified from C. A. Simpson & Son)

Altitude: 2115 feet — Date drilled: 6/22/72

	Topsoil	1	1
	Clay, sandy, yellow	29	30
	Clay, sandy, blue	35	65
	Clay, blue	35	100
	Sand and gravel	18	118
	Sand, dry	24	142
	Clay, blue	18	160
	Clay, sandy, blue	10	170
	Sand, muddy, gray	12	182
	Sand, gravel, and rocks	16	198
	Clay, very sandy, blue	22	220
	Clay, blue	20	240
	Clay, gray	34	274
	Sand and gravel	6	280

163-073-27DDD
(Log modified from Church Well Boring)

Altitude: 2168 feet — Date drilled: 6/17/80

	Topsoil, black	1	1
	Clay, pebbly, yellow	2	3
	Sand, yellow	4	7
	Clay, blue	15	22
	Gravel, yellow	19	41

163-073-30CCC
(Log modified from C. A. Simpson & Son)

Altitude: 2120 feet — Date drilled: 1/25/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	19	20
	Clay, blue; rocks	150	170
	Clay, sandy, yellow	20	190
	Sandstone, light-gray	10	200
	Sandstone, blue	5	205
	Clay, blue	--	205

163-073-30DDD
(Log modified from C. A. Simpson & Son)

Altitude: 2080 feet — Date drilled: 5/26/69

	Topsoil	1	1
	Clay, sandy, yellow	27	28
	Clay, sandy, blue	62	90
	Clay, sandy, yellow	14	104
	Clay, blue	146	250
	Shale or sandstone, sandy, gray	5	255

163-073-31CAD
(Log modified from Church Well Boring)

Altitude: 2125 feet — Date drilled: 9/02/75

	Topsoil, black	1	1
	Clay, yellow	22	23
	Clay, yellow and dark-gray	8	31
	Clay, dark-gray and blue	36	67
	Sand and gravel, coarse	2	69

163-074-12DCC
(Log modified from C. A. Simpson & Son)

Altitude: 2125 feet — Date drilled: 8/18/64

	Soil, black	3	3
	Clay, yellow	27	30
	Clay, sandy, blue	117	147
	Gravel	7	154

163-074-13BBA
(Log modified from C. A. Simpson & Son)

Altitude: 2135 feet — Date drilled: 7/29/76

	Topsoil	1	1
	Clay, yellow	29	30
	Clay, sandy, blue	45	75
	Clay, gravelly, blue	15	90
	Clay, sandy, blue	20	110
	Clay, yellow	20	130
	Clay, sandy, blue	6	136
	Sand, dry	3	139
	Clay, sandy, blue	29	168
	Sand, fine	2	170
	Clay, blue	2	172

163-074-15ABA1,2
NDSWC 5365, 5365A

Altitude: 2190 feet — Date drilled: 8/21/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till)	15	15
	Clay, silty, sandy, pebbly, olive-gray (till)	7	22
	Sand, fine to very coarse; about 20 percent fine to medium subangular to subrounded gravel	13	35
	Clay, silty, sandy, pebbly, olive-gray (till)	110	145
	Clay, sandy, gravelly, oxidized, yellowish-brown (till)	27	172
Cannonball Formation:			
	Claystone, silty, yellowish-brown to dark brown	35	207
	Limestone, well-indurated	4	211
	Siltstone, sandy, argillaceous, greenish-gray	71	282
Hell Creek Formation:			
	Siltstone, bentonitic, argillaceous, medium-gray	70	352
	Sandstone, fine, argillaceous, brownish-gray	22	374
	Siltstone, bentonitic, carbonaceous, brownish-gray	45	419
	Claystone, very carbonaceous to lignitic, brown	9	428
	Sandstone, fine, argillaceous, light-green	14	442
	Siltstone, argillaceous; carbonaceous greenish-gray streaks	35	477
Fox Hills Sandstone:			
	Sandstone, fine to medium, glauconitic, green; argillaceous carbonaceous siltstone; brown from 483 to 487 and 496 to 503 feet	52	529
	Claystone; interbedded with greenish-gray siltstone; fine sandstone from 538 to 544 feet	145	674
	Sandstone, fine to medium, argillaceous, indurated, dark-green	6	680
	Siltstone, bentonitic, light-gray to medium-gray	79	759
Pierre Shale:			
	Shale, siliceous, indurated, brittle, grayish-black	36	795

163-074-16AA
(Log modified from C. A. Simpson & Son)

Altitude: 2225 feet — Date drilled: 8/04/70

	Topsoil	1	1
	Clay, yellow, and rocks	62	63
	Clay, sandy, blue	77	140
	Sand, clayey; no water	2	142
	Sand; no water	2	144
	Clay, sandy, yellow	10	154
	Clay, sandy, gray; rocks	98	252

163-074-16BAB
(Log modified from C. A. Simpson & Son)

Altitude: 2190 feet — Date drilled: 9/17/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	49	50
	Clay, sandy, blue	30	80
	Clay, blue	20	100
	Clay, sandy, blue	40	140
	Clay, blue	28	168
	Clay, sandy, gray; rocks	37	205
	Clay, sandy, gray	145	350
	Sandstone, clayey	42	392

163-074-21BAC
(Log modified from C. A. Simpson & Son)

Altitude: 2175 feet — Date drilled: 6/03/69

	Topsoil	1	1
	Clay, yellow; rocks	39	40
	Clay, sandy, blue	2	42
	Clay, gravelly, blue; rocks	17	59
	Gravel	1	60
	Clay, sticky, gravelly, blue	25	85
	Clay, gravelly, blue	23	108
	Sand and gravel	2	110

163-074-34ABA
(Log modified from Church Well Boring)

Altitude: 2200 feet — Date drilled: 9/06/76

	Topsoil, black	2	2
	Clay, yellow	15	17
	Gravel and water	9	26
	Clay, blue	16	42

163-074-34CBA
(Log modified from Lee's Well Drilling)

Altitude: 2240 feet — Date drilled: 1974

	Topsoil	1	1
	Clay, yellow	18	19
	Clay, blue	55	74
	Sand	36	110

163-074-35DAB
(Log modified from C. A. Simpson & Son)

Altitude: 2190 feet — Date drilled: 5/02/73

	Topsoil	1	1
	Clay, yellow	34	35
	Clay, blue	105	140
	Clay, slightly sandy, blue	16	156
	Clay, yellow; rocks	28	184
	Clay, blue	82	266
	Sand, fine	9	275

163-075-01BCC
(Log modified from C. A. Simpson & Son)

Altitude: 2150 feet — Date drilled: 8/21/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, yellow	30	30
	Clay, blue	30	60
	Clay, sandy, blue	30	90
	Sand, clayey	55	145

163-075-02AAA
(Log modified from C. A. Simpson & Son)

Altitude: 2150 feet — Date drilled: 5/08/69

	Topsoil	1	1
	Clay, yellow	9	10
	Clay, sandy, yellow	8	18
	Clay, gray	40	58
	Clay, slightly gravelly, blue; with rocks	14	72
	Clay, very sandy, blue	16	88
	Clay, gravelly, blue	27	115
	Sand and gravel	9	124

163-075-02AAC
(Log modified from C. A. Simpson & Son)

Altitude: 2155 feet — Date drilled: 2/08/64

	Topsoil	1	1
	Clay, yellow	19	20
	Clay, blue	85	105
	Clay, sandy, gray	10	115
	Clay, sandy, brown	12	127
	Sand, fine	17	144
	Sand	8	152

163-075-02CAA
(Log modified from C. A. Simpson & Son)

Altitude: 2145 feet — Date drilled: 5/08/71

	Topsoil	1	1
	Clay, yellow	33	34
	Clay, blue	11	45
	Clay, sandy, blue	10	55
	Clay, blue	54	109
	Sand	11	120

163-075-02DDB
(Log modified from C. A. Simpson & Son)

Altitude: 2175 feet — Date drilled: 8/15/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Gravel and clay	4	4
	Clay, sandy, yellow	17	21
	Clay, sandy, blue	153	174
	Clay, sandy	26	200
	Clay, blue	3	203
	Gravel	--	203

163-075-03DDD
(Log modified from C. A. Simpson & Son)

Altitude: 2160 feet — Date drilled: 11/21/69

	Fill and black soil	3	3
	Clay, sandy, yellow	31	34
	Clay, sticky, gray	48	82
	Clay, sandy, gray	16	98
	Sand and gravel; mostly clayey shale	5	103
	Clay, gravelly, gray; rocks	13	116
	Gravel, clayey	1	117
	Clay, hard, gravelly, gray	20	137
	Gravel, hard, clayey, and rocks	6	143
	Clay, gravelly, gray; rocks	39	182
	Sand and gravel; mostly shale	7	189

163-075-10CDB
(Log modified from C. A. Simpson & Son)

Altitude: 2140 feet — Date drilled: 11/07/64

	Topsoil	1	1
	Clay, yellow	21	22
	Clay, blue; with some rocks	168	190
	Sand, slightly clayey	7	197
	Sand	10	207

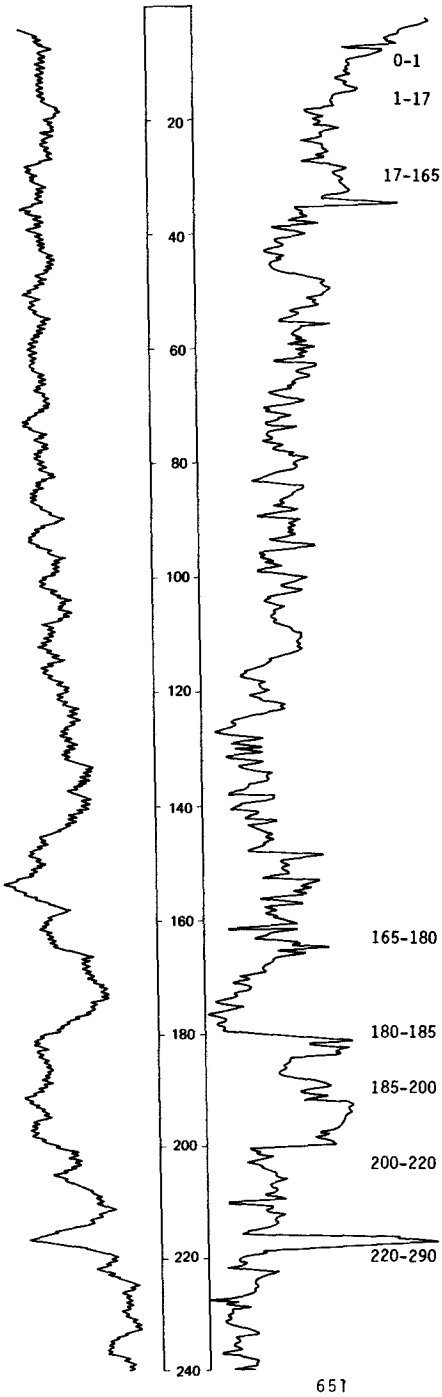
NDSWC 5861

LOCATION: 163-075-11AAA

DATE DRILLED: 10/24/80

ALTITUDE: 2220 (FT, NGVD)

DEPTH: 321 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-17	Clay, silty, pebbly, yellowish-brown, oxidized (till).
17-165	Clay, silty, pebbly, olive-gray (till); gravelly from 144 to 165 feet.
165-180	Clay, cohesive, olive-gray.
180-185	Clay, sandy, pebbly, light-olive-gray (till).
185-200	Clay, very silty, pebbly, yellowish-orange, oxidized (till).
200-220	Clay, silty, yellowish-brown, oxidized.
220-290	Silt, clayey; carbonaceous dark-gray streaks.

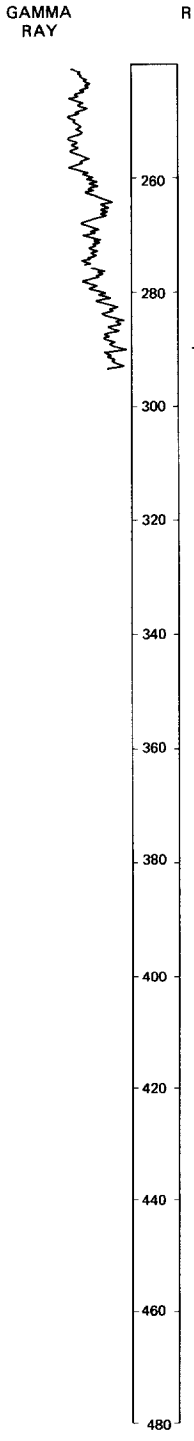
NDSWC 5861, continued

LOCATION: 163-075-11AAA

DATE DRILLED: 10/24/80

ALTITUDE: 2220
(FT, NGVD)

DEPTH: 321
(FT)



DESCRIPTION OF DEPOSITS

CANNONBALL FORMATION

290-321 Siltstone, argillaceous, moderately indurated, dark-gray.

163-075-11CDA
(Log modified from C. A. Simpson & Son)

Altitude: 2160 feet — Date drilled: 4/17/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, very hard, yellow	7	8
	Sand and gravel, very clayey	9	17
	Clay, gravelly, yellow	12	29
	Clay, gravelly, blue	6	35
	Clay, sandy, blue	81	116
	Clay, blue	54	170
	Sand, clayey	2	172
	Sand, blue	8	180
	Sand, white	4	184

163-075-11CDD
(Log modified from C. A. Simpson & Son)

Altitude: 2155 feet — Date drilled: 12/29/71

	Topsoil	1	1
	Clay, yellow; rocks	33	34
	Clay, gravelly, blue; some very gravelly	73	107
	Gravel, clayey, coarse, and fine sand	1	108
	Clay, gravelly, gray	74	182
	Clay, very gravelly, blue	21	203
	Sand and gravel	1	204
	Clay, gravelly, blue	10	214
	Sand, fine, clayey; with a little water	7	221
	Clay, gravelly, blue	64	285
	Clay, blue; no sand	14	299
	Sand, very clayey, fine	10	309
	Hard layer	2	311
	Clay, sandy, or sandstone	8	319
	Clay or shale, blue	1	320

163-075-12DCA
(Log modified from C. A. Simpson & Son)

Altitude: 2215 feet — Date drilled: 11/02/67

	Clay, sandy, yellow	34	34
	Clay, sandy, blue; rocks	146	180
	Clay, sandy, yellow	1	181
	Gravel	11	192
	Clay, sandy, yellow	32	224
	Clay, sandy, blue	148	372
	Clay, brown	8	380
	Sand or sandstone, green	2	382

163-075-13BAB
(Log modified from Neff Drilling Company)

Altitude: 2180 feet — Date drilled: 7/24/73

	Topsoil	2	2
	Clay, yellow	15	17
	Clay, blue	105	122
	Sand and gravel	19	141

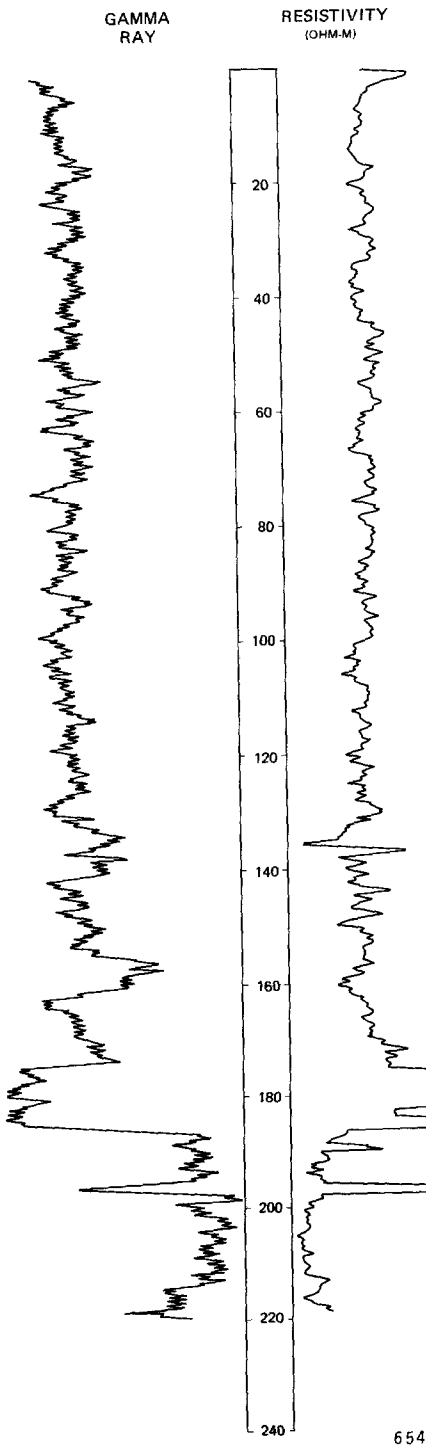
NDSWC 5583

LOCATION: 163-075-14AAA

DATE DRILLED: 10/02/79

ALTITUDE: 2165
(FT, NGVD)

DEPTH: 227
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-17	Clay, silty, sandy, yellowish-brown, oxidized (till).
17-124	Clay, silty to very sandy, olive-gray (till).
124-142	Clay, silty, pebbly, olive-gray (till).
142-147	Sand, very fine to coarse, gravelly; predominately carbonate grains.
147-174	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
174-185	Gravel, fine to medium; about 20 percent medium angular sand; predominately carbonate pebbles with oxidized surfaces.

CANNONBALL FORMATION

185-197	Sandstone, fine, argillaceous, yellowish-brown, oxidized.
197-227	Siltstone, argillaceous, indurated, greenish-gray.

LOCATION: 163-075-14AAA

DATE DRILLED: 10/02/79

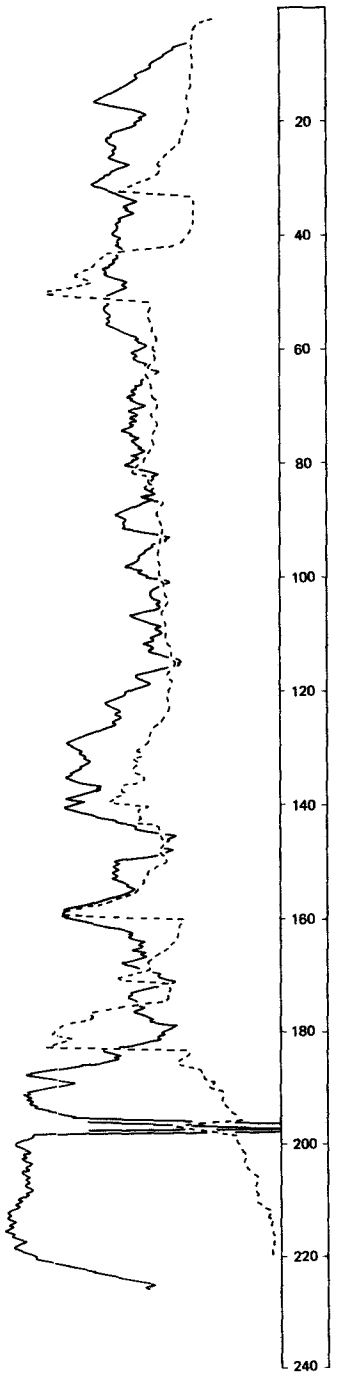
ALTITUDE: 2165
(FT, NGVD)

DEPTH: 227
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



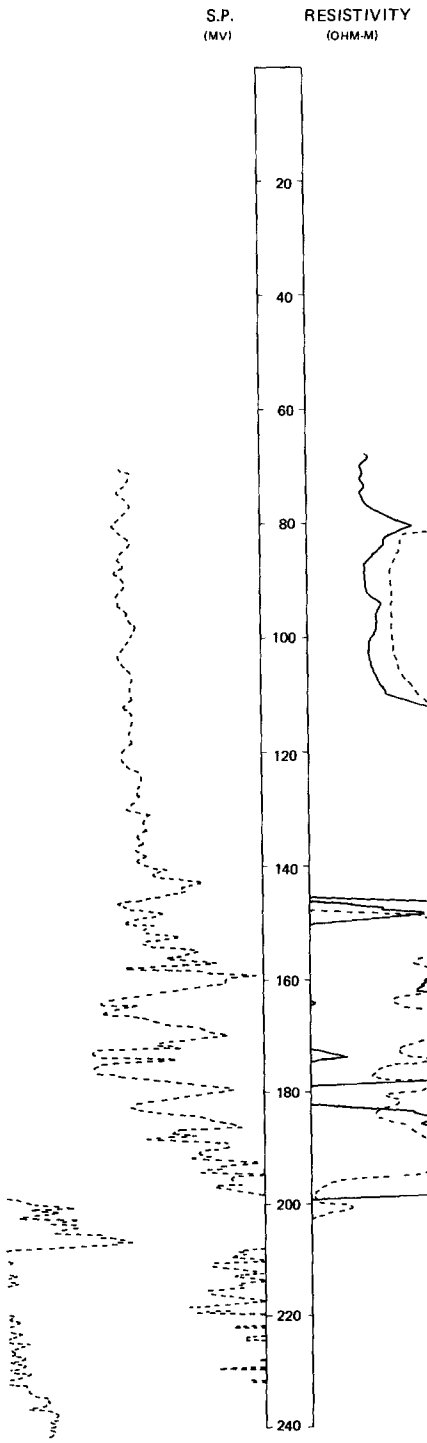
NDSWC 5364, 5364A

LOCATION: 163-075-15AAB1,2

DATE DRILLED: 8/15/78

ALTITUDE: 2150 (FT, NGVD)

DEPTH: 735 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10	Sand, fine to coarse, rounded, oxidized.
10-25	Clay, silty to sandy, pebbly, yellowish-brown, oxidized (till).
25-50	Clay, silty, pebbly, olive-gray (till).
50-111	Clay, silty, cohesive, dark-gray (fluvial).
111-145	Clay, silty to sandy, pebbly, olive-gray (till); boulders.
145-178	Sand, fine to very coarse; predominately carbonate, quartz, granitic, and detrital shale grains; about 40 percent fine to coarse angular to rounded oxidized gravel.
178-182	Clay, silty to sandy, pebbly, olive-gray (till).
182-199	Gravel, fine to very coarse, sandy, angular to rounded; cobbles and boulders; predominately carbonate, granitic, and detrital shale pebbles.
199-295	Clay, silty to sandy, pebbly, dark-gray to olive-gray (till).

NOTE:

----- Long normal

——— Short normal

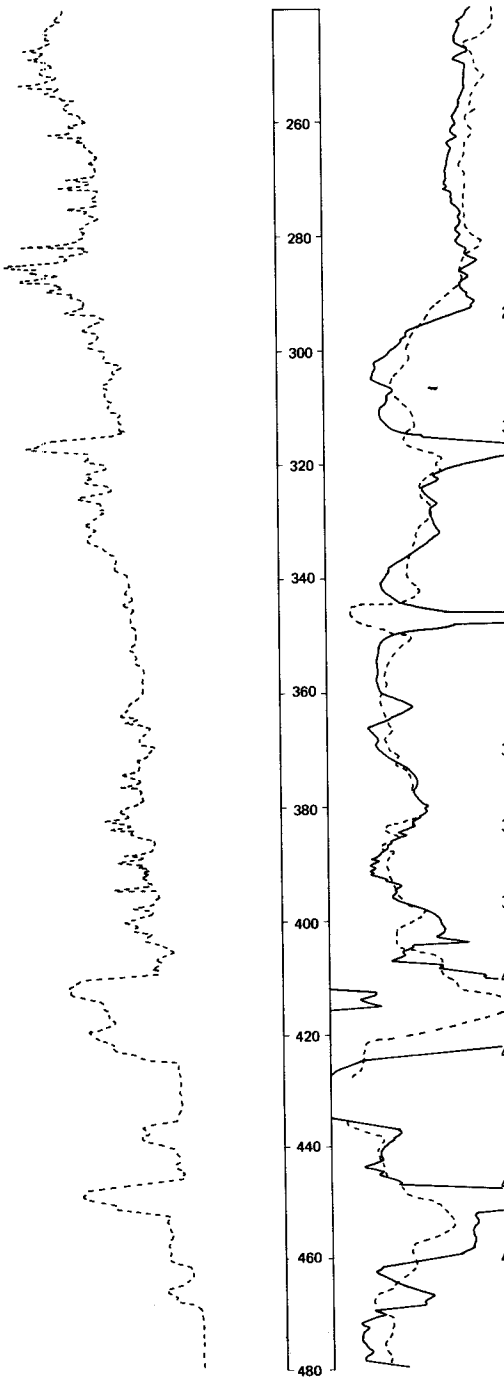
NDSWC 5364, 5364A, continued

LOCATION: 163-075-15AAB1,2

DATE DRILLED: 8/15/78

ALTITUDE: 2150 (FT, NGVD)

DEPTH: 735 (FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION

295-315 Claystone, bentonitic, medium-dark-gray.

315-372 Siltstone, bentonitic; carbonaceous dark-gray streaks.

372-383 Siltstone, bentonitic; interbedded with thin lenses of medium-gray sandstone.

383-398 Claystone, bentonitic, dark-gray.

398-410 Siltstone, slightly sandy, argillaceous, dark-gray.

410-424 Sandstone, fine to medium, argillaceous, moderately indurated, greenish-gray.

424-448 Claystone, bentonitic, slightly carbonaceous, medium-gray.

448-460 Sandstone, fine, argillaceous, greenish-gray.

460-481 Claystone, bentonitic, light-gray to greenish-gray.

NOTE:

----- Long normal

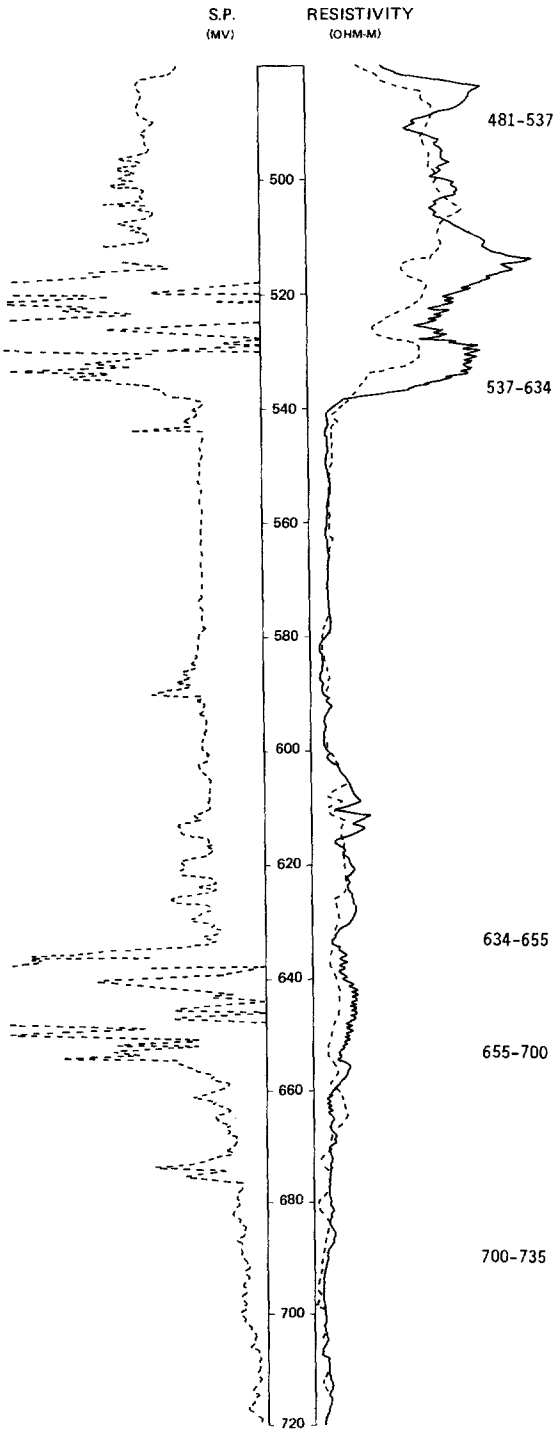
——— Short normal

LOCATION: 163-075-15AAB1,2

DATE DRILLED: 8/15/78

ALTITUDE: 2150 (FT, NGVD)

DEPTH: 735 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

481-537 Sandstone, fine to medium, argillaceous, glauconitic, light-grayish-green.

537-634 Claystone, bentonitic, brittle, greenish-gray.

634-655 Siltstone, bentonitic, greenish-gray.

655-700 Claystone, indurated, brittle, light-greenish-gray.

PIERRE SHALE

700-735 Shale, siliceous, brittle, dark-grayish-black.

NOTE:

----- Long normal

——— Short normal

NDSWC 5364, 5364A, continued

LOCATION: 163-075-15AAB1,2

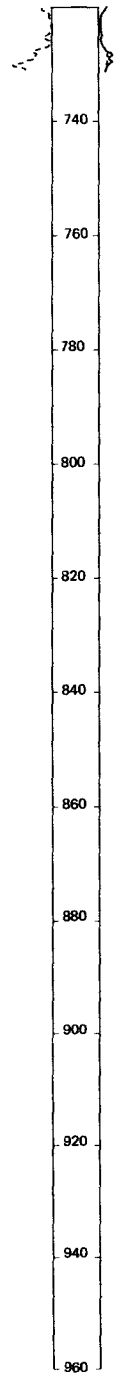
DATE DRILLED: 8/15/78

ALTITUDE: 2150
(FT, NGVD)

DEPTH: 735
(FT)

S.P.
(MV)

RESISTIVITY
(OHM-M)



DESCRIPTION OF DEPOSITS

NOTE:

- - - - - Long normal

——— Short normal

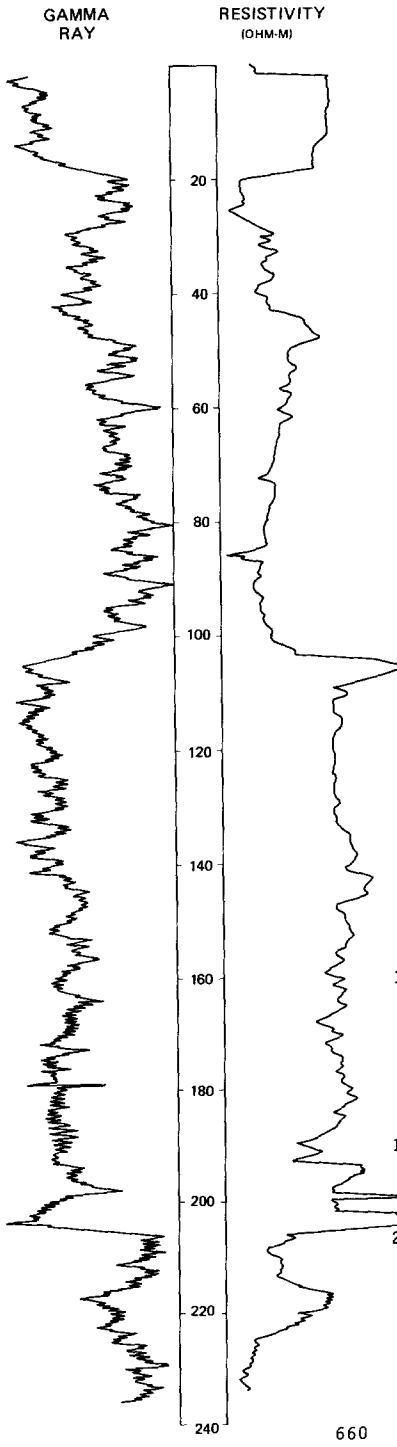
NDSWC 5582

LOCATION: 163-075-15BBB

DATE DRILLED: 9/27/79

ALTITUDE: 2142
(FT, NGVD)

DEPTH: 242
(FT)



660

DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-19	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
19-104	Clay, silty, cohesive, olive-gray (fluvial).
104-160	Clay, silty, sandy, pebbly, olive-gray (till).
160-193	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
193-206	Clay, very sandy, gravelly, olive-gray (till).

CANNONBALL FORMATION

206-242	Siltstone, argillaceous, indurated, yellowish-brown to greenish-gray, partially oxidized.

LOCATION: 163-075-15BBB

DATE DRILLED: 9/27/79

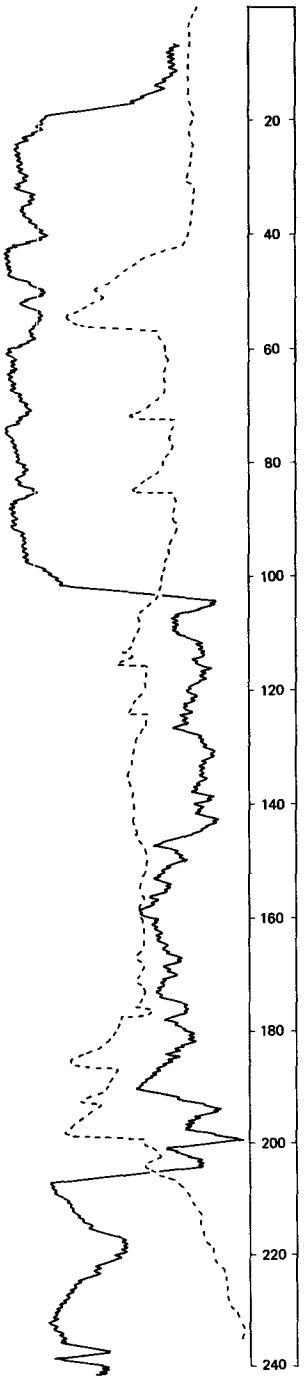
ALTITUDE: 2142
(FT, NGVD)

DEPTH: 242
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



163-075-17BAA
NDSWC 16-738
(Log modified from Froelich, 1963)

Altitude: 2260 feet — Date drilled: 6/08/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, silty to sandy, moderate-olive-brown, fairly cohesive, oxidized, calcareous (till)	22	22
	Clay, silty, olive-black, very cohesive, moderately calcareous (till)	11	33
	Sand, fine to coarse, silty to gravelly, subrounded to rounded	2	35
	Clay, very silty, olive-black, very cohesive	2	37
	Sand, fine to coarse; some gravel; yellowish to reddish brown; generally well rounded	3	40
	Clay, silty, olive-black, very cohesive and compacted (till)	42	82
	Silt, olive-black, smooth, uniform	3	85
	Clay, silty, olive-black, very compacted	31	116
	Gravel, fine to coarse, angular to subrounded	1	117
	Clay, silty to gravelly, dark-greenish-gray, very tough, calcareous (till)	25	142
	Clay, silty; with abundant fine to medium angular to rounded sandy gravel; dark greenish gray; tough; calcareous (till)	16	158
	Silt, clayey, olive-gray, very cohesive, calcareous	6	164
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	5	169
	Silt, clayey, olive-gray, very cohesive, calcareous	11	180
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	50	230
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous; abundant gravel and boulders	43	273

163-075-20DBC
(Log modified from C. A. Simpson & Son)

Altitude: 2165 feet — Date drilled: 12/09/65

Fill	8	8
Clay, yellow	6	14
Clay, blue	38	52
Clay, sandy, blue	50	102
Gravel	7	109

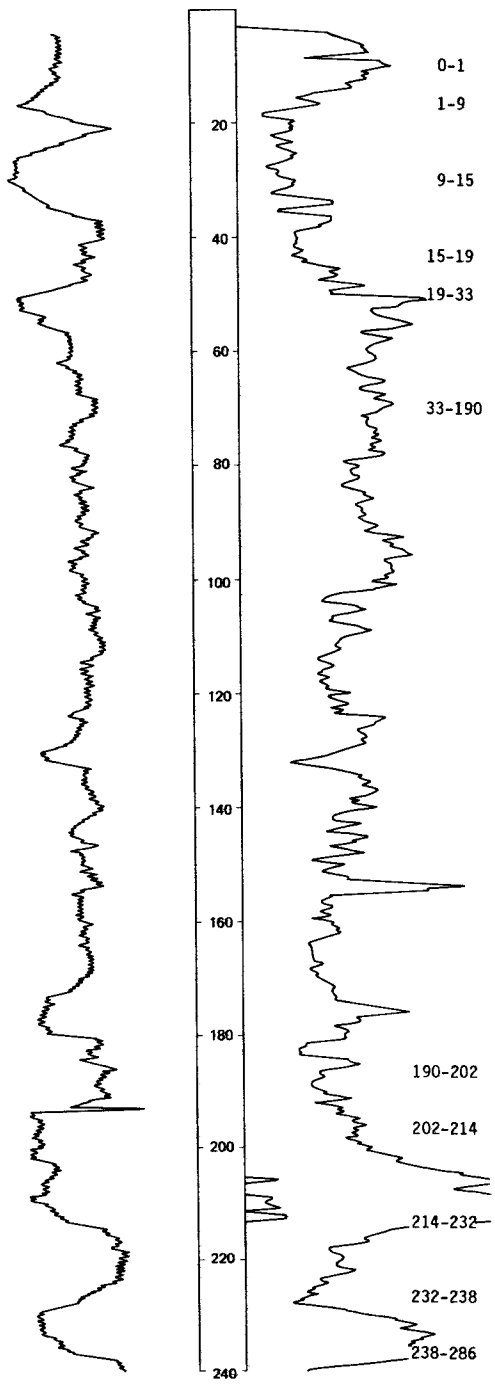
NDSWC 5859

LOCATION: 163-075-22CDC

DATE DRILLED: 10/22/80

ALTITUDE: 2140
(FT, NGVD)

DEPTH: 310
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-9	Clay, silty to sandy, yellowish-brown, oxidized (till).
9-15	Gravel, fine to medium, rounded; predominately detrital shale pebbles.
15-19	Clay, silty, dark-gray.
19-33	Sand, fine to coarse, and medium angular to rounded gravel; predominately carbonate and detrital shale grains and pebbles.
33-190	Clay, sandy, olive-gray (till).
190-202	Sand, coarse, angular to rounded.
202-214	Gravel, fine to coarse, sandy, angular to rounded; predominately detrital shale and carbonate pebbles.
214-232	Clay, sandy, gravelly, olive-gray (till).
232-238	Gravel, fine to coarse, sandy, angular to rounded.
238-286	Clay, sandy, pebbly, greenish-gray (till).

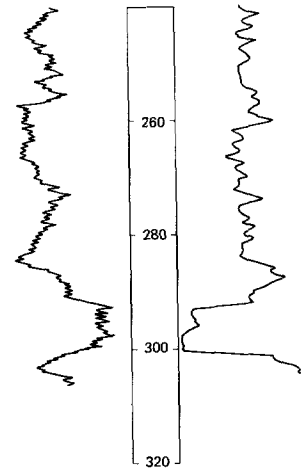
NDSWC 5859, continued

LOCATION: 163-075-22CDC

DATE DRILLED: 10/22/80

ALTITUDE: (FT, NGVD) 2140

DEPTH: (FT) 310



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION

286-310 Siltstone, argillaceous, gypsiferous, moderately indurated; carbonaceous brownish-gray streaks.

163-075-25DAB
(Log modified from C. A. Simpson & Son)

Altitude: 2228 feet

Date drilled: 11/12/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	23	24
	Clay, sandy, blue	184	208
	Clay, gravelly, blue	10	218
	Gravel; no water	1	219
	Clay, gravelly, yellow	5	224
	Clay, yellow	27	251
	Clay, blue	67	318
	Clay, sandy, blue	7	325
	Sand, green	1	326
	Clay, blue	9	335

163-075-28AAD
NDSWC 13-738
(Log modified from Froelich, 1963)

Altitude: 2140 feet — Date drilled: 6/06/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, silty to sandy, dusky-yellow, fairly cohesive, oxidized (till)	18	19
	Clay, silty to sandy, olive-black, very cohesive (till)	10	29
	Gravel, coarse, generally rounded	8	37
	Clay, silty to sandy, olive-black, sticky, tight (till)	111	148
	Clay, silty to gravelly, olive-black, very cohesive (till)	15	163
	Silt, olive-gray, smooth, laminated, highly calcareous	14	177
	Silt, moderate-olive-brown, smooth, slightly calcareous	10	187
	Gravel, fine to coarse; some sand; subangular to subrounded; oxidized	9	196
	Clay, silty, moderate-olive-brown, oxidized (till)	4	200
	Clay, silty to gravelly, olive-black, very cohesive (till)	67	267
	Silt, moderate-olive-brown, smooth, slightly calcareous	3	270
Hell Creek Formation:			
	Shale, silty, olive-black, smooth, moderately indurated, laminated	14	284

163-075-29ABB
NDSWC 11-738
(Log modified from Froelich, 1963)

Altitude: 2150 feet — Date drilled: 6/04/62

Glacial drift:			
	Clay, silty, moderate-yellowish-brown, cohesive, oxidized, calcareous (till)	10	10
	Clay, silty to sandy, moderate-olive-brown, oxidized, calcareous (till)	11	21
	Clay, silty, moderate-olive-brown, cohesive, oxidized, calcareous (till)	7	28
	Clay, slightly silty, olive-gray, cohesive, calcareous (till)	19	47
	Sand, medium to very coarse, rounded	1	48
	Clay, silty to sandy, dark-greenish-gray, cohesive, calcareous (till)	22	70
	Clay, very silty, dark-greenish-gray to olive-gray, cohesive, calcareous (till)	9	79
	Gravel, fine to medium, sandy, rounded	5	84
	Sand, medium to very coarse, very gravelly, angular to rounded; occasional clay layers	33	117
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	9	126

163-075-29BDA
(Log modified from C. A. Simpson & Son)

Altitude: 2175 feet — Date drilled: 1972

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	18	19
	Gravel, dry	4	23
	Clay, yellow	17	40
	Clay, blue	140	180
	Clay, sandy, blue	40	220
	Sand and gravel, coarse	6	226
	Clay, gravelly, blue	4	230
	Sand and gravel	20	250

163-075-30BBC
NDSWC 12-738
(Log modified from Froelich, 1963)

Altitude: 2250 feet — Date drilled: 6/05/62

Glacial drift:			
	Silt, clayey, yellowish-gray, noncohesive, oxidized, calcareous	1	1
	Gravel, fine, very sandy, rounded; with layers of yellowish-gray clayey silt	32	33
	Silt, clayey, yellowish-gray, noncohesive to cohesive, very calcareous	6	39
	Silt, clayey, dark-greenish-gray, cohesive, calcareous	10	49
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	41	90
	Gravel, fine to coarse, sandy, to very large pebbles; angular to rounded	34	124
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	29	153
	Clay, silty to gravelly, dusky-yellow, cohesive, oxidized, very calcareous (till)	3	156
	Gravel, fine, sandy, angular to rounded	11	167
	Clay, silty to gravelly, dusky-yellow, cohesive, oxidized, very calcareous (till)	40	207
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous (till)	50	257
	Clay, silty to gravelly, dark-greenish-gray, cohesive, calcareous; abundant gravel	24	281
	Clay, silty to sandy, dark-greenish-gray, cohesive, slightly calcareous (till)	55	336
	Gravel, fine to medium, angular to rounded	2	338
Hell Creek Formation:			
	Sandstone, very fine to fine, silty; with clay matrix; light greenish gray to greenish gray; nonindurated; noncalcareous	19	357

163-075-31AAA
(Log modified from Virg's Well Drilling)

Altitude: 2170 feet — Date drilled: 8/30/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, yellow	30	30
	Clay, blue, and rocks	69	99

163-075-31CB
NDSWC 28-738
(Log from Froelich, 1963)

Altitude: 2130 feet — Date drilled: 6/20/62

Glacial drift:			
	Topsoil, clayey, dark, organic	1	1
	Clay, silty to sandy; marly matrix; light olive gray; leached; highly calcareous (till)	3	4
	Clay, silty to sandy, moderate-olive-brown, oxidized, extremely calcareous (till)	12	16
	Clay, silty to sandy, olive-gray, cohesive and compacted, extremely calcareous (till)	74	90
	Gravel, fine and medium, sandy, angular to subrounded, clean	2	92
	Clay, silty, olive-gray, cohesive, plastic, very calcareous (till)	20	112
	Silt, clayey, olive-gray, smooth, cohesive, plastic, highly calcareous (till)	5	117
	Gravel, fine to medium, subangular to subrounded, well-sorted, clean	4	121
	Clay, silty to sandy, light-olive-brown, cohesive, oxidized, highly calcareous (till)	10	131
	Clay, silty, moderate-olive-brown, fairly cohesive and compacted, oxidized, highly calcareous (till)	31	162
	Clay, very silty, olive-gray, very compacted and tight, highly calcareous (till)	64	226
	Clay, silty to slightly gravelly, dusky-yellowish-brown, cohesive, compacted, tight, oxidized, extremely calcareous (till)	20	246
Hell Creek Formation:			
	Shale, silty, olive-gray, platy, noncalcareous	5	251
	Shale, silty, olive-black, noncalcareous	11	262

163-075-31CBB
(Log modified from C. A. Simpson & Son)

Altitude: 2135 feet — Date drilled: 6/04/66

	Topsoil	1	1
	Clay, sandy, yellow	26	27
	Clay, sandy, blue	52	79
	Sand	8	87

163-075-34BCB
(Log modified from C. A. Simpson & Son)

Altitude: 2140 feet — Date drilled: 8/15/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Clay, yellow, and rocks	25	27
	Clay, blue, and rocks	56	83
	Clay, gravelly, blue	14	97
	Clay, sandy, blue	27	124
	Gravel, coarse, hard, dry	20	144
	Clay, sandy, blue	9	153
	Sand, fine, clayey	70	223
	Clay, sandy, blue	18	241
	Gravel, coarse	4	245

163-076-01CCA
(Log modified from C. A. Simpson & Son)

Altitude: 2455 feet — Date drilled: 3/17/66

	Topsoil	1	1
	Clay, sandy, blue, and rocks	17	18
	Clay, sandy, blue	9	27
	Gravel, hard, dry	31	58
	Clay, sandy, blue	192	250

163-076-01CCB
(Log modified from C. A. Simpson & Son)

Altitude: 2450 feet — Date drilled: 3/11/66

	Topsoil	1	1
	Clay, sandy, yellow	22	23
	Clay, sandy, blue	147	170
	Clay, sticky, blue	120	290

163-076-01CCD
(Log modified from Christenson & Olson)

Altitude: 2460 feet — Date drilled: 9/07/72

	Clay, brown	21	21
	Clay, blue	16	37
	Sand	1	38
	Clay, blue	10	48

163-076-05CCB
(Log from C. A. Simpson & Son)

Altitude: 1830 feet — Date drilled: 2/26/77

	Topsoil	1	1
	Clay, yellow	34	35
	Clay, blue	35	70
	Rock	1	71
	Clay, blue	53	124
	Clay, sandy, blue	14	138
	Clay, blue	34	172
	Sand, clayey, very fine	10	182
	Clay, gray	18	200
	Clay; mixed layers of white and gray	68	268
	Clay, very sandy and gravelly, hard; a little water	4	272
	Clay or shale, tight, gray	60	332

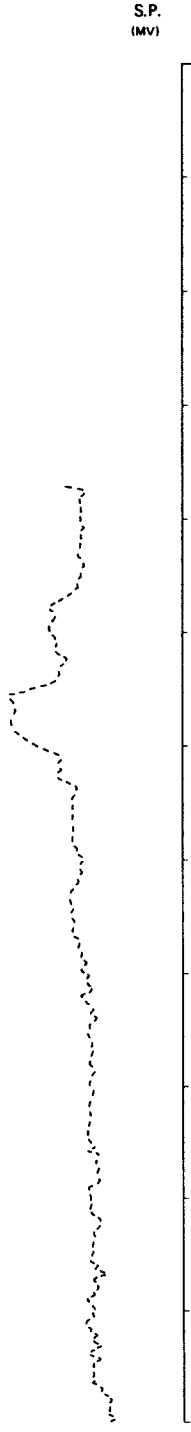
NDSWC 5363, 5363A

LOCATION: 163-076-10DDD1,2

DATE DRILLED: 8/10/78

ALTITUDE: 2260
(FT, NGVD)

DEPTH: 815
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15 Sand, fine to very coarse; about 40 percent fine to coarse subangular to rounded oxidized gravel.

15-97 Clay, silty, sandy, pebbly, olive-gray (till).

97-107 Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till).

107-128 Sand, fine to very coarse; about 40 percent fine to coarse subangular to rounded gravel; predominately quartz, carbonate, granitic, and detrital shale grains.

128-315 Clay, silty, sandy, pebbly, bouldery, olive-gray (till).

NOTE:

------Long normal

———Short normal

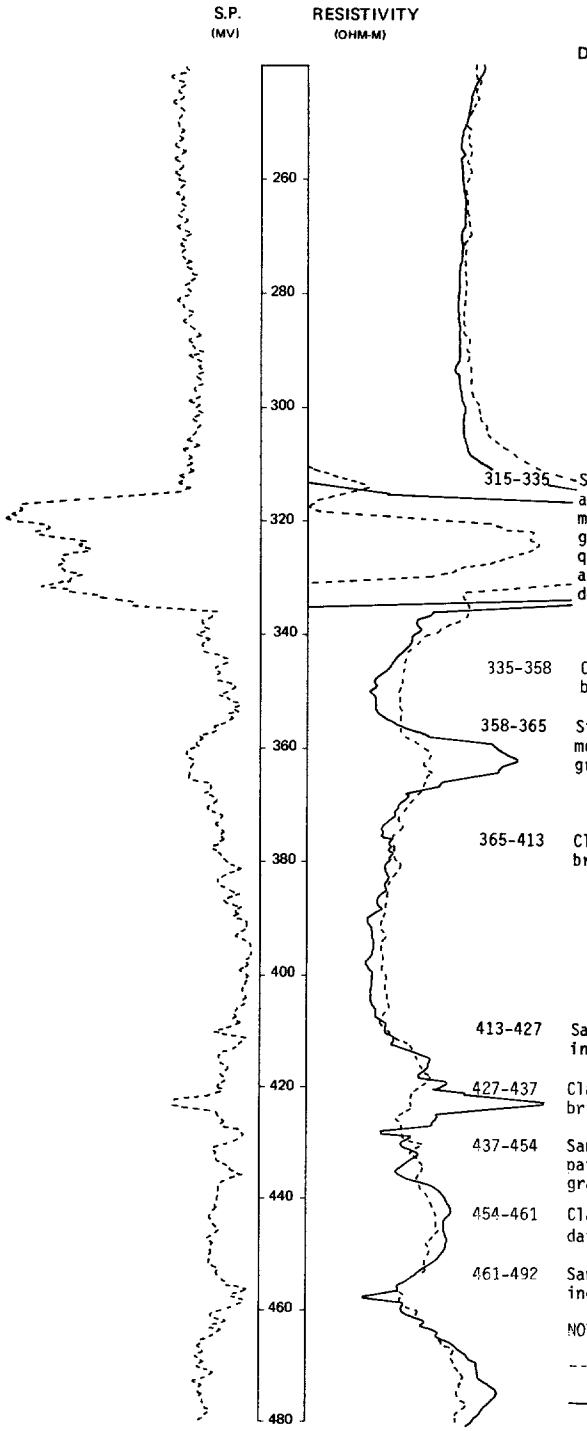
NDSWC 5363, 5363A, continued

LOCATION: 163-076-10DDD1,2

DATE DRILLED: 8/10/78

ALTITUDE: 2260 (FT, NGVD)

DEPTH: 815 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

315-335 Sand, fine to very coarse; about 15 percent fine to medium subrounded to rounded gravel; about 50 percent quartz, 30 percent carbonate, and 20 percent granitic and detrital shale grains.

CANNONBALL FORMATION

335-358 Claystone, indurated, brittle, dark-gray.

358-365 Siltstone, very sandy, moderately indurated, dark-gray.

HELL CREEK FORMATION

365-413 Claystone, indurated, brittle, dark-gray.

413-427 Sandstone, very fine, indurated, light-gray.

427-437 Claystone, indurated, brittle, dark-gray.

437-454 Sandstone, very fine, partially indurated, light-gray.

454-461 Claystone, indurated, brittle dark-gray.

461-492 Sandstone, very fine, indurated, greenish-gray.

NOTE:

------Long normal

———Short normal

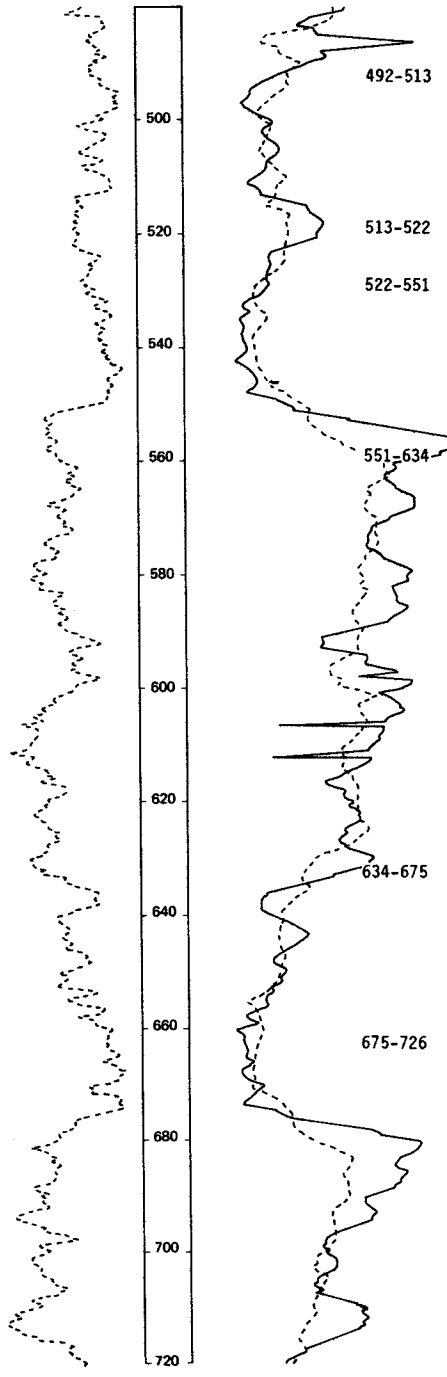
NDSWC 5363, 5363A, continued

LOCATION: 163-076-10DDD1,2

DATE DRILLED: 8/10/78

ALTITUDE: 2260 (FT, NGVD)

DEPTH: 815 (FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

492-513 Claystone, indurated, brittle, dark-gray.

513-522 Sandstone, very fine to fine, indurated, greenish-gray.

522-551 Claystone; carbonaceous light-green streaks.

FOX HILLS SANDSTONE

551-634 Sandstone, fine to medium, argillaceous, glauconitic, poorly indurated, greenish-gray.

634-675 Siltstone, bentonitic, argillaceous, medium-gray.

675-726 Sandstone, fine to medium, argillaceous, glauconitic, greenish-gray; siltstone from 696 to 708 feet.

NOTE:

----- Long normal

——— Short normal

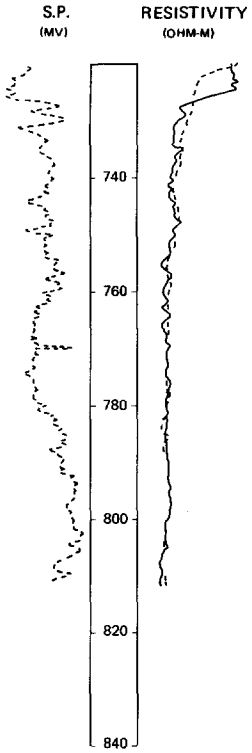
NDSWC 5363, 5363A, continued

LOCATION: 163-076-10DDD1,2

DATE DRILLED: 8/10/78

ALTITUDE: 2260
(FT, NGVD)

DEPTH: 815
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

726-768 Siltstone, bentonitic, argillaceous, tight, dark-gray.

PIERRE SHALE

768-815 Shale, siliceous, brittle, very light grayish black.

NOTE:

-----Long normal

———Short normal

163-076-15BCB
(Log modified from C. A. Simpson & Son)

Altitude: 2180 feet

Date drilled: 6/20/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil----------	1	1
	Clay, yellow; rocks----------	13	14
	Gravel and rocks, very clayey----------	1	15
	Clay and rocks, gravelly, yellow----------	27	42
	Clay, sticky, blue; rocks----------	18	60
	Clay, blue, and some rocks----------	22	82
	Sand and gravel----------	--	82

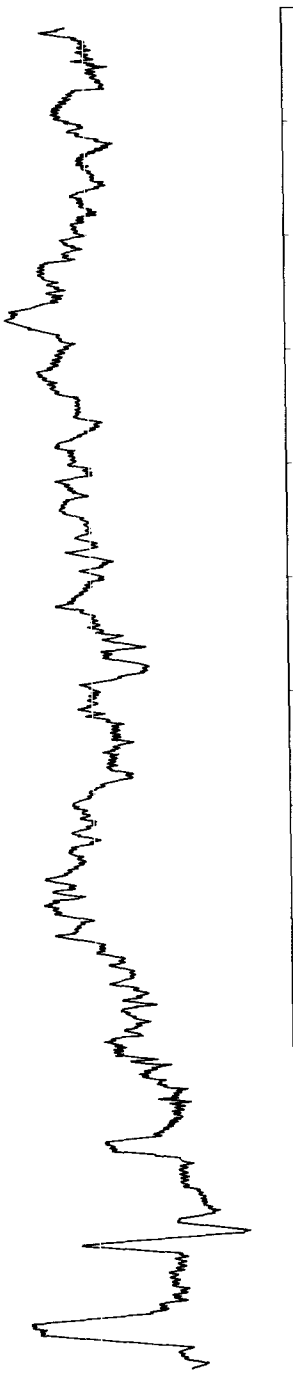
NDSWC 5572, 5572A, 5572B

LOCATION: 163-076-16BAD1,2,3

DATE DRILLED: 9/20/79

ALTITUDE: 2110 (FT, NGVD)

DEPTH: 497 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-15 Clay, very silty, pebbly, yellowish-brown, oxidized (till).

15-37 Clay, silty to sandy, olive-gray (till).

37-42 Gravel, medium; about 25 percent fine to coarse subrounded to rounded sand; predominately carbonate pebbles.

42-90 Clay, silty, sandy, pebbly (till); thin lenses of olive-gray gravel.

90-134 Clay, silty, gravelly, yellowish-brown, oxidized (till).

CANNONBALL FORMATION

134-166 Siltstone, argillaceous, yellowish-brown, oxidized; limonite concretions.

166-216 Siltstone, sandy, argillaceous, greenish-gray; limonite concretions.

HELL CREEK FORMATION

216-228 Siltstone, argillaceous, lignitic, brownish-gray; carbonaceous streaks.

228-234 Sandstone, very fine, indurated, dark-gray.

234-256 Shale, carbonaceous, indurated, black.

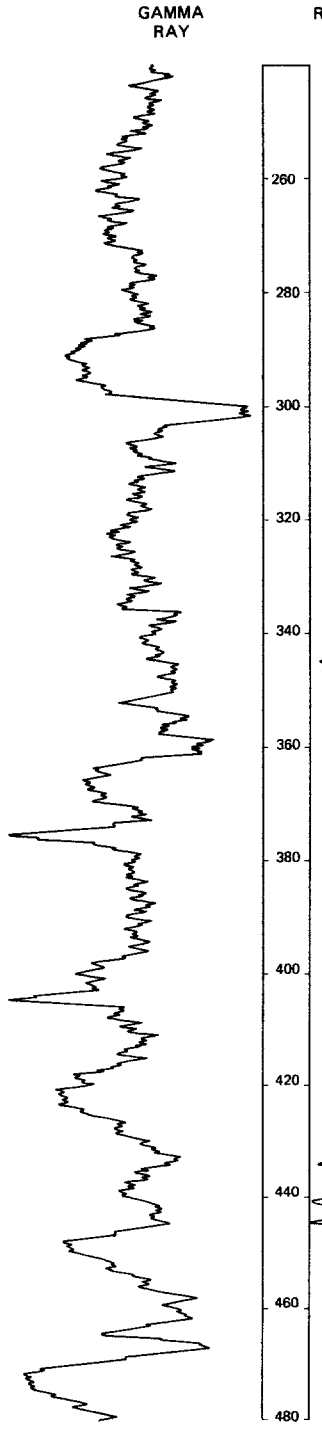
NDSWC 5572, 5572A, 5572B, continued

LOCATION: 163-076-16BAD1,2,3

DATE DRILLED: 9/20/79

ALTITUDE: 2110 (FT, NGVD)

DEPTH: 497 (FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

256-270 Siltstone, argillaceous, brittle, greenish-gray.

270-288 Shale, carbonaceous, indurated, brittle, brown.

288-300 Sandstone, very fine, argillaceous, dark-gray.

300-305 Siltstone, argillaceous, indurated, dark-grayish-black.

305-348 Siltstone, sandy, carbonaceous, greenish-gray.

348-378 Siltstone, bentonitic, moderately indurated, dark-gray.

378-410 Siltstone, bentonitic; interbedded with very fine sandstone; carbonaceous light-gray streaks.

FOX HILLS SANDSTONE

410-468 Sandstone, fine, glauconitic; interbedded with carbonaceous green to brownish-gray siltstone.

468-497 Sandstone, very fine, argillaceous, quartzitic, poorly indurated, light-greenish-gray.

NDSWC 5572, 5572A, 5572B, continued

LOCATION: 163-076-16BAD1,2,3

DATE DRILLED: 9/20/79

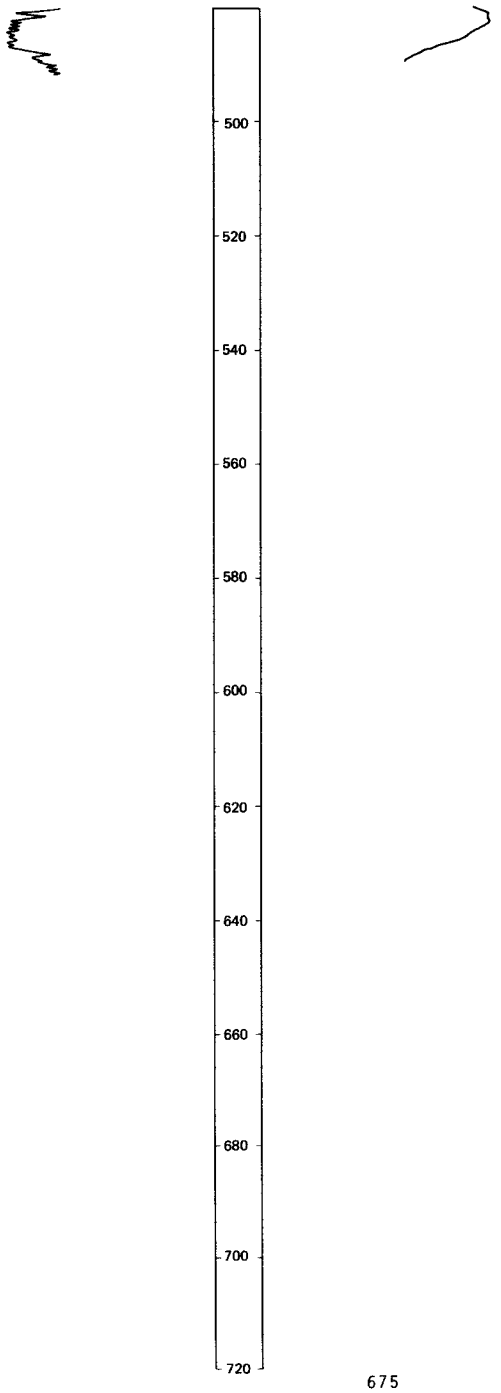
ALTITUDE: 2110
(FT, NGVD)

DEPTH: 497
(FT)

GAMMA RAY

RESISTIVITY
(OHM-M)

DESCRIPTION OF DEPOSITS



LOCATION: 163-076-16BAD1,2,3

DATE DRILLED: 9/20/79

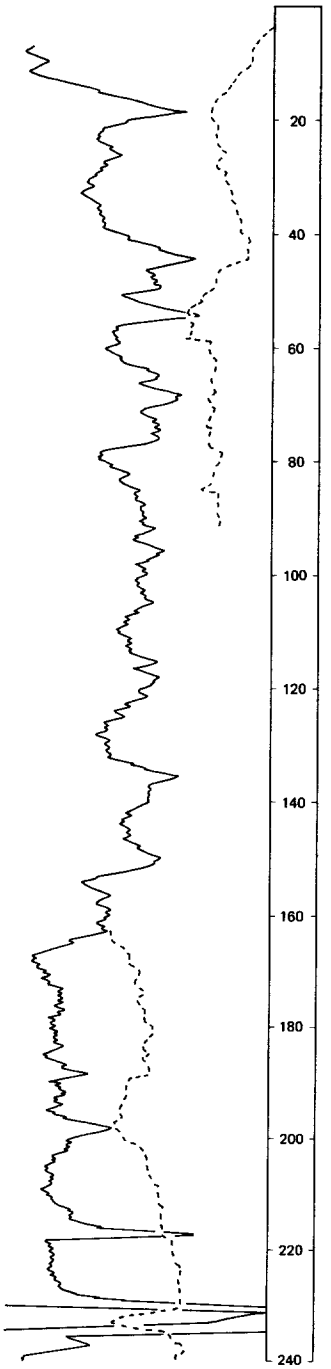
ALTITUDE: 2110
(FT, NGVD)

DEPTH: 497
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



LOCATION: 163-076-16BAD1,2,3

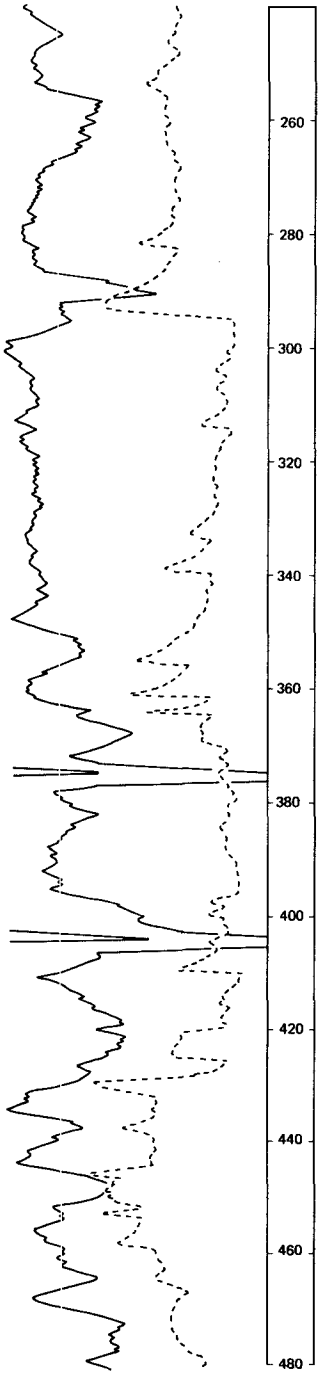
DATE DRILLED: 9/20/79

ALTITUDE: 2110
(FT, NGVD)

DEPTH: 497
(FT)

NEUTRON
(API)

S.P.
(MV)



DESCRIPTION OF DEPOSITS

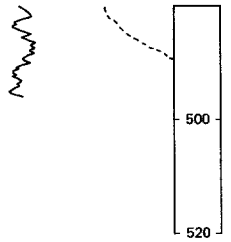
LOCATION: 163-076-16BAD1,2,3

DATE DRILLED: 9/20/79

ALTITUDE: 2110 (FT, NGVD)

DEPTH: 497 (FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

163-076-16BBB
NDSWC 5571

Altitude: 1965 feet

Date drilled: 9/19/79

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Clay, sandy to gravelly, yellowish-brown, oxidized (till)	16	17
	Clay, very silty, pebbly, yellowish-brown, oxidized (till)	26	43
Cannonball Formation:			
	Siltstone, sandy, poorly indurated, greenish-black to grayish-black	19	62

163-076-16BCD
(Log modified from C. A. Simpson & Son)

Altitude: 2250 feet

Date drilled: 7/30/69

Topsoil	1	1
Clay, gravelly, yellow; rocks	21	22
Clay, blue; many rocks	20	42
Clay, very gravelly, yellow	10	52
Gravel	1	53
Clay, gravelly, blue; with rocks	50	103
Clay, light-yellow	15	118
Clay, very sandy, yellow	5	123
Clay, sticky, yellow; caves	40	163
Clay or shale, gray	31	194
Rock	1	195
Clay or shale, gray	7	202

163-076-18AAB
(Log modified from Verne R. Peterson Well Drilling)

Altitude: 1720 feet

Date drilled: 9/10/74

Topsoil	2	2
Sand	2	4
Clay, yellow	41	45
Stones	12	57
Clay, stony	13	70
Sandstone, gray	55	125
Shale, gray	220	345
Shale, dark-gray	55	400

163-076-21DDB
(Log modified from Lee's Well Drilling)

Altitude: 1850 feet — Date drilled: 6/17/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Gravel, yellow	15	16
	Gravel, blue	99	115
	Sandstone, green	7	122
	Shale, gray	8	130

163-076-23ADD
NDSWC 18-738
(Log modified from Froelich, 1963)

Altitude: 2240 feet — Date drilled: 6/11/62

Glacial drift:			
	Topsoil, sandy, dark	1	1
	Gravel, fine to coarse; with medium to coarse sand; subrounded; coarser with depth	19	20
	Clay, silty, olive-gray, cohesive, tight, calcareous (till)	33	53
	Gravel, fine to coarse, angular to subrounded	7	60
	Clay, silty, olive-black, very cohesive (till)	46	106
	Gravel, fine to coarse, sandy, subangular to subrounded	8	114
	Clay, silty, olive-black, very cohesive and tight; boulders common (till)	16	130
	Gravel, fine to coarse, silty and sandy, subangular to rounded	12	142
	Clay, very silty, olive-black, very cohesive	7	149
	Clay, silty to sandy, olive-gray, cohesive, calcareous (till)	36	185
	Clay, very silty, olive-black, very cohesive, highly calcareous (till)	89	274
	Clay, silty, dark-yellowish-brown, weathered, oxidized, calcareous (till)	5	279
	Limestone boulder	1	280

163-076-24DAB
(Log modified from C. A. Simpson & Son)

Altitude: 2280 feet — Date drilled: 8/08/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Gravel, clayey	1	2
	Clay, sandy, yellow	26	28
	Clay, blue	2	30
	Clay, soupy, gravelly, blue	10	40
	Clay, blue	15	55
	Gravel	4	59
	Clay, blue	6	65
	Gravel and rocks, dry	32	97
	Clay, yellow	13	110
	Clay, sandy, blue	50	160
	Clay, sandy, yellow	10	170
	Clay, very sandy, yellow	5	175
	Clay, dark-blue	117	292
	Clay, brown	3	295
	Sand, fine, clayey, blue	5	300
	Sand, very fine, clayey, gray	17	317
	Clay, blue	8	325
	Clay, blue; with coal	2	327
	Clay, sandy, blue	18	345
	Clay, soupy, sandy, blue	20	365
	Clay, blue	5	370
	Clay, slightly sandy, gray	25	395
	Clay, brown	2	397
	Clay, slightly sandy, gray	21	418
	Clay, mushy, sandy, blue	6	424
	Sand, fine, blue	34	458

163-076-27CAA
(Log modified from Neff Drilling Company)

Altitude: 1890 feet — Date drilled: 10/02/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
✓	Rock and gravel	32	32
	Clay, yellow	2	34
	Clay, blue	66	100
	Clay, blue; streaks of fine gray sand	20	120
	Clay, blue	50	170
	Clay, gray	16	186
	Sand, green	13	199
	Clay, gray	1	200

163-076-33ACC
(Log modified from C. A. Simpson & Son)

Altitude: 1710 feet — Date drilled: 8/10/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	26	27
	Clay, sandy, blue	57	84
	Sandstone, gray, dry	14	98
	Clay, sandy, brown	9	107
	Sand, fine, and clay	13	120
	Sandstone	13	133

163-076-35CAB
(Log modified from Church Well Boring)

Altitude: 1900 feet — Date drilled: 8/19/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black	5	5
	Clay, yellow	10	15
	Clay, sandy, yellow	4	19
	Clay, blue	14	33
	Clay, sandy, blue	17	50
	Sand, blue	12	62

163-076-35DAB
(Log modified from Church Well Boring)

Altitude: 1910 feet — Date drilled: 5/26/77

	Topsoil, black	2	2
	Clay, pebbly, yellow	22	24
	Clay, dry, sandy, blue	14	38
	Clay, pebbly, blue	14	52
	Gravel, coarse	1	53
	Sand, coarse	1	54
	Clay, pebbly, blue	1	55
	Gravel, coarse	1	56
	Clay, pebbly, blue	1	57

163-076-36DAD
NDSWC 29-738
(Log modified from Froelich, 1963)

Altitude: 2145 feet — Date drilled: 6/20/62

Glacial drift:			
	Topsoil, sandy, dark, organic	1	1
	Clay, silty to sandy, light-olive-gray, slightly cohesive, highly calcareous (till)	10	11
	Clay, silty to sandy, moderate-olive-brown, oxidized, highly calcareous (till)	22	33
	Clay, silty, olive-gray, very cohesive and tight, highly calcareous (till)	42	75
	Silt, clayey, olive-gray, cohesive, plastic, sticky, smooth, very calcareous	7	82
	Clay, silty, dusky-yellow, cohesive, tight, oxidized (till)	11	93
	Clay, silty to gravelly, olive-gray, cohesive, highly calcareous (till)	84	177
	Gravel, fine to medium, angular to subrounded	4	181
Hell Creek Formation:			
	Silt, olive-black, slightly cohesive, noncalcareous	19	200

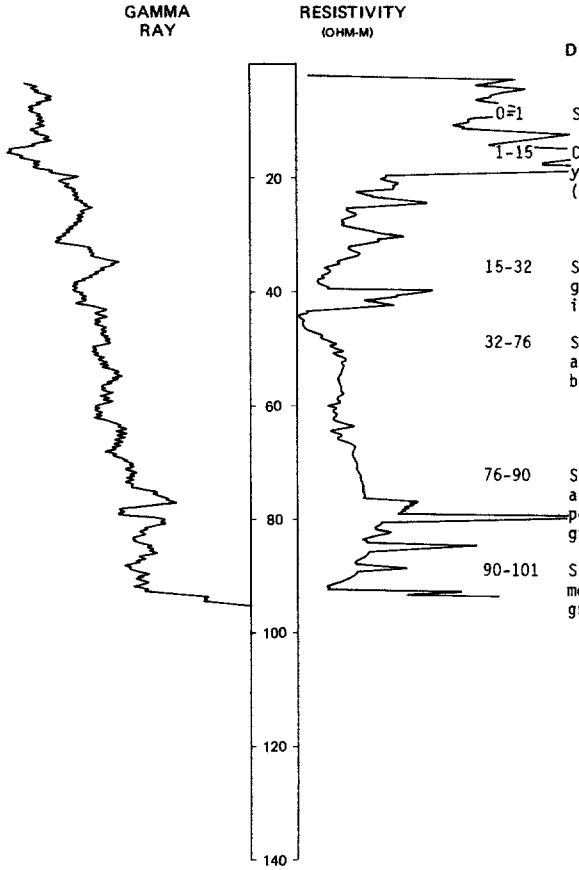
NDSWC 5858

LOCATION: 163-077-09ABB

DATE DRILLED: 10/22/80

ALTITUDE: 1570
(FT, NGVD)

DEPTH: 101
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Soil.

1-15 Clay, sandy, gravelly, yellowish-brown, oxidized (till).

FOX HILLS SANDSTONE

15-32 Sandstone, fine, siliceous, glauconitic, poorly indurated, greenish-gray.

32-76 Siltstone, bentonitic, argillaceous; carbonaceous brownish-gray streaks.

76-90 Sandstone, fine, argillaceous, glauconitic, poorly indurated, dark-greenish-gray.

90-101 Siltstone, argillaceous, moderately indurated, greenish-gray.

163-077-12DBB
(Log modified from C. A. Simpson & Son)

Altitude: 1695 feet

Date drilled: 5/14/64

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil----------	1	1
	Clay, yellow----------	17	18
	Clay, blue----------	42	60
	Sand, green, dry----------	19	79
	Sandstone, light-gray, firm, clean----------	45	124

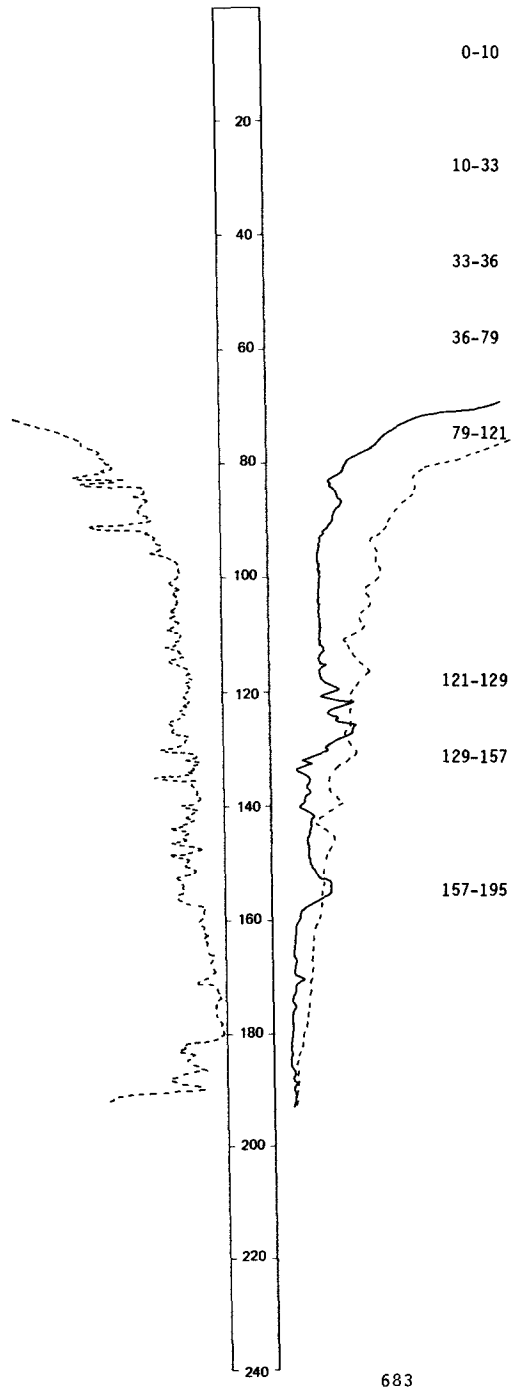
NDSWC 5362

LOCATION: 163-077-15AAA

DATE DRILLED: 8/09/78

ALTITUDE: 1640 (FT, NGVD)

DEPTH: 195 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10 Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).

FOX HILLS SANDSTONE

10-33 Sandstone, fine to medium, argillaceous, poorly indurated, yellowish-brown, oxidized.

33-36 Sandstone, fine, argillaceous, indurated, bluish-gray.

36-79 Sandstone, fine to medium, glauconitic, poorly indurated; some lenses of greenish-gray claystone.

79-121 Claystone, bentonitic, tight, medium-light-gray.

121-129 Sandstone, fine to medium, glauconitic, indurated, dark-green.

129-157 Siltstone, bentonitic, argillaceous, tight; carbonaceous dark-gray streaks.

PIERRE SHALE

157-195 Shale, bentonitic, siliceous, grayish-black.

NOTE:

----- Long normal

——— Short normal

163-077-27CBC
NDSWC 5857

Altitude: 1540 feet — Date drilled: 10/22/80

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil	1	1
	Sand, fine to very coarse, gravelly, rounded, oxidized; 50 percent quartz, 25 percent carbonate, and 25 percent detrital shale grains	29	30
Fox Hills Sandstone:			
	Sandstone, fine, indurated, greenish-gray	7	37
	Siltstone, argillaceous, carbonaceous, moderately indurated, brownish-gray	39	76
	Sandstone, fine, siliceous, glauconitic, poorly indurated, green	4	80
	Siltstone, argillaceous, siliceous, moderately indurated, greenish-gray	21	101

163-078-11CCC
NDSWC 5361

Altitude: 1511 feet — Date drilled: 8/09/78

Glacial drift:			
	Clay, silty, pebbly, black (till)	5	5
	Clay, silty, sandy, dusky-yellow, oxidized (till)	25	30
	Clay, silty, sandy, pebbly, olive-gray (till)	18	48
Fox Hills Sandstone:			
	Sandstone, fine, indurated, greenish-gray	2	50
	Claystone, bentonitic, brittle, greenish-gray	2	52
	Sandstone, fine, indurated, green	2	54
	Sandstone, fine to medium, glauconitic; carbonaceous brownish-gray streaks	11	65
Pierre Shale:			
	Shale, greasy, fissile, grayish-black	50	115

163-078-15AAB
(Log modified from Neff Drilling Company)

Altitude: 1515 feet — Date drilled: 7/12/73

Topsoil	1	1
Clay, yellow	16	17
Clay, blue	62	79
Sand, green, silty	5	84
Rock	--	84

163-078-19ADD
(Log modified from C. A. Simpson & Son)

Altitude: 1507 feet — Date drilled: 5/03/71

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	44	45
	Clay, blue	32	77
	Gravel, coarse; with very little water	2	79
	Clay, blue	48	127
	Shale	23	150

163-078-25DCD
(Log from Neff Drilling Company)

Altitude: 1503 feet — Date drilled: 5/14/72

	Topsoil	3	3
	Clay, yellow, sandy	28	31
	Clay, blue, sandy	19	50
	Sand, fine, silt	9	59

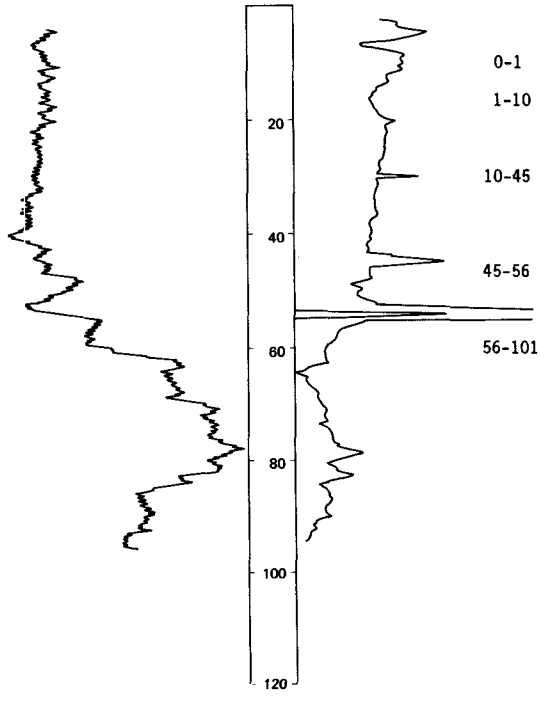
NDSWC 5856

LOCATION: 163-078-36BBB

DATE DRILLED: 10/22/80

ALTITUDE: 1508 (FT, NGVD)

DEPTH: 101 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-10	Clay, silty, gravelly, yellowish-brown, oxidized (till).
10-45	Clay, sandy, gravelly, olive-gray (till).

FOX HILLS SANDSTONE

45-56	Sandstone, fine, argillaceous, poorly indurated, yellowish-brown.
56-101	Shale, siliceous, moderately indurated, dark-greenish-gray.

163-079-08CCC
(Log from C. A. Simpson & Son)

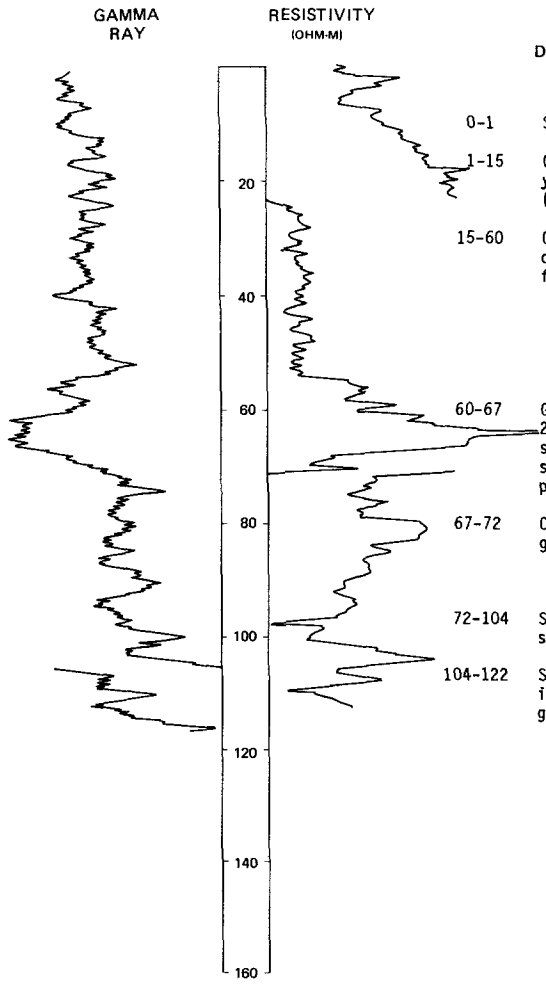
Altitude: 1488 feet — Date drilled: 4/11/67

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, sandy, yellow	23	24
	Clay, sandy, blue	86	110
	Shale, blue	30	140

NDSWC 5566

LOCATION: 163-079-09AAA — DATE DRILLED: 9/18/79

ALTITUDE: 1495 (FT, NGVD) — DEPTH: 122 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-15	Clay, silty, sandy, yellowish-brown, oxidized (till).
15-60	Clay, silty, sandy, pebbly, olive-gray (till); gravelly from 55 to 60 feet.
60-67	Gravel, fine to coarse; about 20-percent medium to coarse subangular to subrounded sand; predominately carbonate pebbles.
67-72	Clay, silty, pebbly, olive-gray (till).

FOX HILLS SANDSTONE

72-104	Sandstone, very fine to fine, silty, greenish-gray.
104-122	Siltstone, argillaceous, indurated, brittle, dark-greenish-gray.

163-079-14BBB
NDSWC 5360

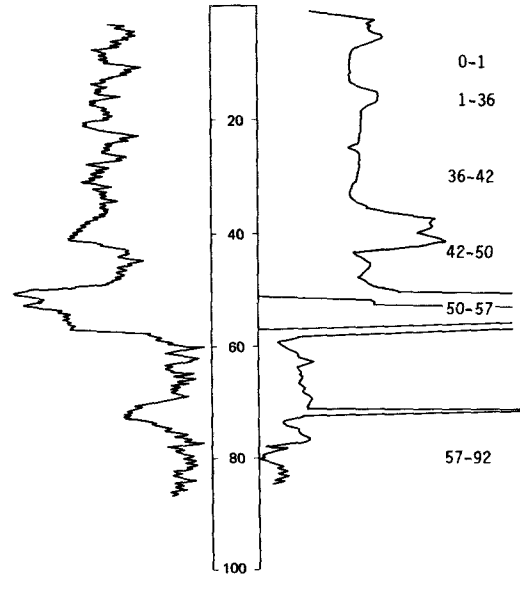
Altitude: 1500 feet — Date drilled: 8/09/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, sandy, pebbly, yellowish-brown, oxidized (till)	35	35
	Clay, silty, sandy, pebbly, dark-gray (till)	23	58
	Sand, medium to coarse, well-sorted, subangular	12	70
	Clay, silty, sandy, pebbly, olive-gray (till)	12	82
Fox Hills Sandstone:			
	Claystone; carbonaceous brownish-gray streaks	3	85
	Sandstone, fine, glauconitic, very dark-green	5	90
	Siltstone, argillaceous, indurated, greenish-gray	18	108
	Limestone, indurated, very hard, black	2	110
	Sandstone, very fine to fine, argillaceous, glauconitic, quartzose, indurated	5	115
Pierre Shale:			
	Shale or claystone	40	155

NDSWC 5567

LOCATION: 163-079-27BBB — DATE DRILLED: 9/18/79

ALTITUDE: 1486 (FT, NGVD) — DEPTH: 92 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-36	Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).
36-42	Sand, fine to coarse, gravelly, silty to clayey, subangular.
42-50	Clay, silty, pebbly, olive-gray (till).
50-57	Sand, fine to coarse; about 20 percent medium subangular gravel; predominately carbonate and detrital shale grains.

FOX HILLS SANDSTONE

57-92	Siltstone, argillaceous, compact; interbedded with fine greenish-gray sandstone.

163-079-30CAB
NDSWC 971
(Log modified from Powell, 1959)

Altitude: 1415 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, brown	1	2
	Clay, yellow, and fine to medium gravel and shale pebbles	3	5
	Sand, coarse, and fine to medium gravel	5	10
	Sand, medium to coarse, silty; contains shale fragments	10	20
	Clay, plastic, gray, and fine gravel and shale pebbles	25	45
	Sand, medium to coarse, silty; fine gravel	10	55
	Clay, gray, and fine to medium gravel and shale pebbles (till)	15	70

163-079-30CBC
NDSWC 950
(Log modified from Powell, 1959)

Altitude: 1415 feet Date drilled: 8/09/54

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, sandy, brown	2	3
	Sand, fine to coarse, silty	8	11
	Clay, yellow, oxidized	10	21
	Sand, fine to coarse, silty	4	25
	Gravel, coarse, silty	5	30
	Sand, fine to coarse; fine to medium gravel	10	40
	Clay, gray, and fine to medium gravel (till)	65	105
Fox Hills Sandstone:			
	Shale, gray	5	110

163-079-30CBD
NDSWC 962
(Log modified from Powell, 1959)

Altitude: 1415 feet Date drilled: 8/27/54

Glacial drift:			
	Clay, gray; fine to medium gravel	5	5
	Sand, fine to medium; fine gravel	5	10
	Clay, gray; fine to coarse sand; fine gravel	10	20
	Clay, gray-brown; fine to medium gravel and shale pebbles	15	35
	Clay, smooth, gray	27	62
	Sand, fine to medium, gray, silty	3	65
	Clay, gray; fine gravel and coarse sand (till)	35	100
Fox Hills Sandstone:			
	Clay, smooth, gray	1	101
	Shale, gray	9	110

163-079-30CCB
NDSWC 975
(Log modified from Powell, 1959)

Altitude: 1416 feet — Date drilled: 9/09/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	2	2
	Clay, yellow; medium to coarse sand	8	10
	Gravel, fine; medium to coarse sand	5	15
	Sand, medium to coarse; yellow clay; fine gravel	15	30
	Clay, gray; medium to coarse sand and fine gravel (till)	25	55
	Clay, gray, and fine sand (till)	15	70
	Clay, gray, medium to coarse sand and fine gravel (till)	39	109
Fox Hills Sandstone:			
	Shale, gray	1	110

163-079-30CCC
NDSWC 58-4
(Log modified from C. A. Simpson & Son)

Altitude: 1420 feet — Date drilled: 1958

	Topsoil	1	1
	Clay, sandy, yellow	24	25
	Clay, blue	10	35
	Sand, clayey, and gravel; very dirty water	1	36
	Clay, gravelly, blue	14	50
	Clay, sandy, blue	41	91
	Sand, hard, and gravel; a little water	2	93
	Clay, sandy, blue	5	98
	Shale, rather hard; no water	44	142

163-079-31ABA
NDSWC 948
(Log modified from Powell, 1959)

Altitude: 1420 feet — Date drilled: 8/07/54

Glacial drift:			
	Road fill	12	12
	Clay, smooth, light-gray	9	21
	Clay, sandy, gray	10	31
	Sand, fine to coarse, clayey	4	35
	Sand, fine to medium, clayey	35	70
	Clay, gray, and fine to medium gravel (till)	16	86
Fox Hills Sandstone:			
	Shale, gray	4	90

163-079-31BAB
NDSWC 947
(Log modified from Powell, 1959)

Altitude: 1417 feet — Date drilled: 8/06/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Road fill	8	8
	Clay, yellow; fine to medium gravel	2	10
	Clay, gray-green	10	20
	Sand, fine to medium, silty	17	37
	Clay, sandy, gray	11	48
	Sand, coarse; fine gravel	7	55
	Clay, gray, and fine to medium gravel (till)	27	82
	Sand, medium to coarse; fine gravel	4	86
	Clay, gray, and fine to medium gravel (till)	10	96
Fox Hills Sandstone:			
	Shale, gray	4	100

163-079-31BBB
NDSWC 946
(Log modified from Powell, 1959)

Altitude: 1425 feet — Date drilled: 8/06/54

Glacial drift:			
	Road fill	8	8
	Clay, smooth, gray	18	26
	Clay, smooth, light-gray	22	48
	Clay, smooth, gray	17	65
	Sand, medium to coarse; fine gravel	3	68
	Clay, gray, and fine gravel (till)	8	76
	Sand, coarse, and fine to medium gravel	2	78
	Clay, gray, and fine to medium gravel (till)	23	101
Fox Hills Sandstone:			
	Shale, gray	9	110

163-079-32BBB
NDSWC 949
(Log modified from Powell, 1959)

Altitude: 1485 feet — Date drilled: 8/07/54

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, light-gray	3	4
	Clay, yellow, oxidized; fine to medium gravel	27	31
	Clay, gray, and fine to medium gravel (till)	95	126
Fox Hills Sandstone:			
	Shale, gray	4	130

163-079-33DBD
NDSWC 970
(Log modified from Powell, 1959)

Altitude: 1482 feet — Date drilled: 1954

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, yellow; fine to medium gravel	15	16
	Clay, gray; fine to medium gravel and shale pebbles (till)	86	102
Fox Hills Sandstone:			
	Shale, gray	8	110

163-079-33DCA
NDSWC 966
(Log modified from Powell, 1959)

Altitude: 1482 feet — Date drilled: 9/01/54

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, gray	1	2
	Clay, yellow, oxidized, fine to medium gravel and shale pebbles	15	17
	Clay, gray, and fine to medium gravel and shale pebbles (till)	44	61
	Sand, coarse; fine gravel and shale pebbles	5	66
	Clay, sandy, gray; fine gravel and shale pebbles	42	108
	Clay, gray; fine gravel and angular shale pebbles (till)	12	120

163-079-33DCD1
NDSWC 965
(Log modified from Powell, 1959)

Altitude: 1482 feet — Date drilled: 9/01/54

Glacial drift:			
	Road fill	2	2
	Clay, yellow, oxidized; fine to medium gravel and shale pebbles	36	38
	Clay, gray; fine to medium gravel and shale pebbles (till)	19	57
	Gravel, fine to medium	3	60
	Clay, gray; fine gravel and medium to coarse sand (till)	58	118
Fox Hills Sandstone:			
	Shale, gray	12	130

163-079-33DCD2
NDSWC 969
(Log modified from Powell, 1959)

Altitude: 1483 feet — Date drilled: 9/04/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, light-gray	3	4
	Clay, yellow; fine to medium gravel and shale pebbles	32	36
	Clay, gray; fine to medium gravel and shale pebbles (till)	32	68
	Sand, medium to coarse; fine gravel and shale pebbles	10	78
	Clay, gray; fine gravel and coarse sand (till)	34	112
	Clay, gray, and medium to coarse sand (till)	8	120

163-079-33DDB
NDSWC 963
(Log modified from Powell, 1959)

Altitude: 1482 feet — Date drilled: 8/28/54

Glacial drift:			
	Road fill	2	2
	Clay, yellow; fine to medium gravel and shale pebbles	41	43
	Clay, gray, and fine to medium gravel (till)	17	60
	Sand, fine to medium, silty	10	70
	Clay, gray, and fine to medium gravel (till)	31	101
Fox Hills Sandstone:			
	Shale, gray	9	110

163-079-33DDC1
NDSWC 964
(Log modified from Powell, 1959)

Altitude: 1482 feet — Date drilled: 8/30/54

Glacial drift:			
	Road fill	2	2
	Clay, yellow, oxidized; fine to medium gravel	36	38
	Clay, gray; fine to medium gravel (till)	28	66
	Gravel, fine to medium, silty	8	74
	Clay, gray; hard at base (till)	26	100

163-079-33DDC2
NDSWC 967
(Log modified from Powell, 1959)

Altitude: 1482 feet — Date drilled: 9/02/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	2	2
	Clay, yellow; fine to medium gravel and shale pebbles	13	15
	Clay, brown; fine to medium gravel and shale pebbles	26	41
	Clay, gray; fine gravel and shale pebbles (till)	17	58
	Gravel, fine medium to coarse sand	2	60
	Sand, gray; silty gravel	5	65
	Sand, medium to coarse; fine silty gravel	10	75
	Clay, gray; coarse sand; fine gravel; and shale pebbles (till)	31	106
	Clay, gray-green; coarse sand (till)	3	109
Fox Hills Sandstone:			
	Shale, gray	1	110

163-079-34CBC
(Log modified from C. A. Simpson & Son)

Altitude: 1481 feet — Date drilled: 3/29/67

	Topsoil	1	1
	Clay, gray	5	6
	Clay, sandy, yellow	9	15
	Clay, sandy, blue	66	81
	Sand, fine	5	86
	Sand, clayey	--	86

163-080-05DCC
(Log modified from C. A. Simpson & Son)

Altitude: 1495 feet — Date drilled: 10/10/66

	Topsoil	1	1
	Clay, sandy, yellow	17	18
	Clay, sandy, blue	44	62
	Clay, gravelly, blue	34	96
	Sand	13	109
	Clay, sandy, blue	41	150

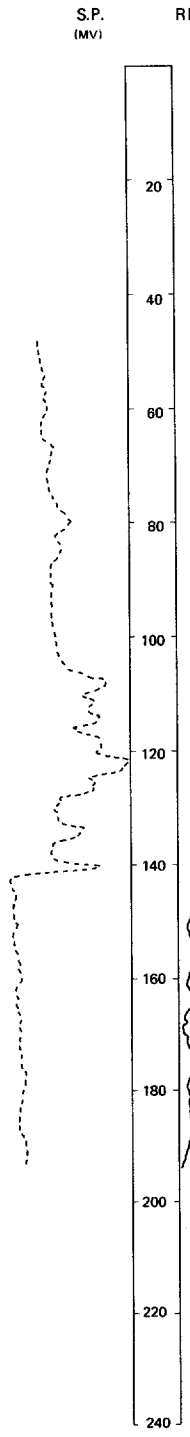
NDSWC 5359

LOCATION: 163-080-11CCC

DATE DRILLED: 8/08/78

ALTITUDE: 1490
(FT, NGVD)

DEPTH: 195
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-5 Sand, fine to medium, rounded, oxidized.

5-15 Clay, silty, sandy, pebbly, dusky-yellow, oxidized (till).

15-141 Clay, silty, sandy, pebbly (till); interbedded with lenses of olive-gray gravel.

FOX HILLS SANDSTONE

141-176 Siltstone, argillaceous, indurated, grayish-black.

PIERRE SHALE

176-195 Shale, siliceous, indurated, grayish-black.

NOTE:

----- Long normal

——— Short normal

163-080-14CDD
NDSWC 936
(Log modified from Powell, 1959)

Altitude: 1492 feet — Date drilled: 7/21/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	2	2
	Clay, yellow; fine to medium gravel	24	26
	Clay, gray; fine to medium gravel (till)	91	117
	Gravel, fine; coarse clean sand	11	128
	Clay, gray, and fine to medium gravel (till)	8	136
Fox Hills Sandstone:			
	Shale, gray	4	140

163-080-15BAA
NDSWC 935
(Log modified from Powell, 1959)

Altitude: 1485 feet — Date drilled: 7/20/54

Glacial drift:			
	Topsoil, black	2	2
	Sand, fine to medium, silty	1	3
	Clay, gray	1	4
	Clay, yellow; fine to medium gravel	12	16
	Clay, gray; fine to medium gravel (till)	74	90
	Gravel, fine; coarse sand	10	100
	Clay, gray; fine to medium gravel (till)	8	108
	Gravel, fine, silty	3	111
	Clay, gray; fine to medium gravel (till)	31	142
Fox Hills Sandstone:			
	Shale, gray	8	150

163-080-15CAA
NDSWC 934
(Log modified from Powell, 1959)

Altitude: 1496 feet — Date drilled: 7/19/54

Glacial drift:			
	Topsoil, sandy, gray	2	2
	Sand, fine to medium, silty	3	5
	Clay, yellow; fine to medium gravel	16	21
	Clay, gray; fine to medium gravel (till)	133	154
Pierre Shale:			
	Shale, gray	6	160

163-080-15DCC
NDSWC 933
(Log modified from Powell, 1959)

Altitude: 1490 feet — Date drilled: 7/17/54

Glacial drift:			
	Topsoil, black	3	3
	Clay, smooth, yellow	2	5
	Clay, yellow; fine to medium gravel	9	14
	Clay, gray; fine to medium gravel (till)	61	75
	Sand, medium to coarse; fine silty gravel	6	81
	Clay, gray; fine to medium gravel (till)	69	150
Fox Hills Sandstone:			
	Shale, gray	8	158

163-080-21DAD
NDSWC 937
(Log modified from Powell, 1959)

Altitude: 1492 feet — Date drilled: 7/24/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, yellow	2	3
	Clay, yellow; fine to medium gravel	20	23
	Clay, gray; fine to medium gravel (till)	43	66
	Sand, medium to coarse; fine gravel	2	68
	Sand, coarse; fine silty gravel	21	89
	Clay, gray; fine to medium gravel (till)	35	124
	Sand, coarse; fine gravel and shale pebbles	2	126
	Clay, gray; fine to medium gravel (till)	30	156
	Sand, fine to coarse; fine gravel	2	158
	Clay, gray; fine to medium gravel (till)	4	162
	Sand, fine to coarse; fine gravel	4	166
Fox Hills Sandstone:			
	Shale, gray	14	180

163-080-21DDD
NDSWC 931
(Log modified from Powell, 1959)

Altitude: 1492 feet — Date drilled: 7/16/54

Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, yellow	2	4
	Clay, yellow; fine to medium gravel	26	30
	Clay, gray; fine to medium gravel (till)	32	62
	Sand, medium to coarse; fine to medium silty gravel	3	65
	Clay, gray; fine to medium gravel (till)	28	93
	Sand, medium to coarse; fine silty gravel	3	96
	Clay, gray; fine gravel (till)	22	118
	Sand, medium to coarse; fine gravel	2	120
	Clay, gray; fine to medium gravel	22	142
	Sand, coarse; fine to medium gravel	4	146
	Clay, gray; fine gravel (till)	22	168
Fox Hills Sandstone:			
	Shale, gray	2	170

163-080-22CAA
NDSWC 932
(Log modified from Powell, 1959)

Altitude: 1490 feet — Date drilled: 7/16/54

Glacial drift:			
	Sand, fine; gray clay	5	5
	Clay, yellow; fine to medium gravel	6	11
	Sand, medium to coarse; yellow clay; fine to medium gravel	2	13
	Clay, yellow; fine to medium gravel	5	18
	Clay, gray; fine to medium gravel (till)	64	82
	Sand, fine to coarse; fine to medium silty gravel	3	85
	Clay, gray; fine to medium gravel (till)	28	113
	Sand, coarse; fine to medium clean gravel	5	118
	Clay, gray; fine to medium gravel (till)	40	158
Fox Hills Sandstone:			
	Shale, gray	12	170

163-080-22CDD
NDSWC 930
(Log modified from Powell, 1959)

Altitude: 1496 feet — Date drilled: 7/15/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	3	3
	Gravel, fine; shale pebbles	1	4
	Clay, yellow; fine to medium gravel (till)	22	26
	Clay, gray; fine to medium gravel (till)	78	104
	Sand, coarse; fine to medium silty gravel	2	106
	Clay, gray; fine to medium gravel (till)	54	160
Fox Hills Sandstone:			
	Clay, smooth, gray	2	162
	Clay, sandy, gray-green	8	170

163-080-22DDD
(Log modified from C. A. Simpson & Son)

Altitude: 1490 feet — Date drilled: 6/26/73

	Topsoil, sandy	2	2
	Clay, sandy, yellow	18	20
	Clay, sandy, blue	40	60
	Clay, very sandy, blue	10	70
	Gravel, coarse, and fine sand	4	74
	Clay, blue	16	90
	Clay, very sandy, blue	35	125
	Clay, gravelly, blue; rocks	25	150
	Clay, sandy, blue	15	165
	Clay, green	8	173
	Clay, blue	92	265
	Clay, blue; with shale chunks	40	305

163-080-23DCC
NDSWC 953
(Log modified from Powell, 1959)

Altitude: 1485 feet — Date drilled: 8/12/54

Glacial drift:			
	Topsoil, sandy, black	2	2
	Clay, yellow, oxidized; fine to medium gravel	20	22
	Clay, gray; fine to medium gravel (till)	45	67
	Sand, medium to coarse; fine silty gravel	3	70
	Clay, gray; fine to medium gravel (till)	64	134
	Gravel, fine to medium	15	149
Fox Hills Sandstone:			
	Shale, gray	11	160

163-080-24DAC
NDSWC 973
(Log modified from Powell, 1959)

Altitude: 1430 feet — Date drilled: 1954

Glacial drift:			
	Topsoil, black	1	1
	Clay, yellow, oxidized; fine to medium gravel	15	16
	Clay, gray; fine gravel	14	30
	Clay, gray; coarse sand and fine to medium gravel (till)	20	50

163-080-25BBB
NDSWC 952
(Log modified from Powell, 1959)

Altitude: 1481 feet — Date drilled: 8/11/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellow, oxidized; fine to medium gravel	27	27
	Clay, gray; fine to medium gravel (till)	112	139
Fox Hills Sandstone:			
	Shale, gray	11	150

163-080-25CCC1
(Log modified from C. A. Simpson & Son)

Altitude: 1489 feet — Date drilled: 1953

Glacial drift:			
	Clay, yellow	25	25
	Clay, sandy, blue (till)	38	63
	Sand and clay, blue	59	122
	Sand, silty	12	134
	Sand and gravel	11	145
	Clay, blue; with gravel (till)	1	146

163-080-25CCC2
(Log modified from C. A. Simpson & Son)

Altitude: 1489 feet — Date drilled: 12/ /54

Glacial drift:			
	Topsoil, black	1	1
	Clay, yellow	34	35
	Clay, blue (till)	25	60
	Clay, sandy, blue (till)	23	83
	Clay, very sandy, blue (till)	17	100
	Clay and sand (till)	20	120
	Gravel and clay	15	135
	Gravel	11	146
Fox Hills Sandstone:			
	Shale, blue	2	148

163-080-25CCD
(Log modified from C. A. Simpson & Son)

Altitude: 1485 feet — Date drilled: 9/ /53

Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, light-yellow	2	3
	Clay, yellow	19	22
	Clay, sandy, blue (till)	36	58
	Clay, gravelly (till)	48	106
	Sand, fine to coarse	5	111
	Clay, gravelly (till)	11	122
	Clay, gray (till)	6	128
	Clay, sandy, gray (till)	2	130
	Sand, fine to coarse, silty	1	131
Fox Hills Sandstone:			
	Shale, blue	29	160

163-080-26ACC
NDSWC 955
(Log modified from Powell, 1959)

Altitude: 1489 feet — Date drilled: 1954

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, brown	2	3
	Clay, yellow; fine to medium	13	16
	Clay, gray; fine to medium gravel (till)	108	124
	Sand, coarse; fine to medium silty gravel	3	127
	Clay, gray; fine gravel (till)	19	146
Fox Hills Sandstone:			
	Shale, gray	4	150

163-080-26ACD
NDSWC 954
(Log modified from Powell, 1959)

Altitude: 1490 feet — Date drilled: 8/19/54

Glacial drift:			
	Clay, sandy, brown	2	2
	Clay, sandy, dark-gray	3	5
	Clay, smooth, yellow	12	17
	Clay, gray; fine to medium gravel (till)	133	150
Fox Hills Sandstone:			
	Shale, gray	1	151

163-080-26BAB
NDSWC 956
(Log modified from Powell, 1959)

Altitude: 1492 feet — Date drilled: 8/20/54

Glacial drift:			
	Topsoil, sandy, black	2	2
	Clay, sandy, brown	2	4
	Clay, yellow, oxidized; fine gravel	26	30
	Clay, gray; fine gravel (till)	119	149
Fox Hills Sandstone:			
	Shale, gray	1	150

163-080-26DAA
NDSWC 951
(Log modified from Powell, 1959)

Altitude: 1490 feet — Date drilled: 1954

Glacial drift:			
	Clay, sandy, gray	2	2
	Clay, light-gray; fine gravel	2	4
	Clay, yellow; fine to medium gravel	24	28
	Clay, gray; fine to medium gravel (till)	34	62
	Sand, fine, silty	3	65
	Clay, gray; fine to medium gravel (till)	50	115
	Clay, gray; fine to medium gravel; hard drilling (till)	26	141
Fox Hills Sandstone:			
	Shale, gray	9	150

163-080-26DAC
NDSWC 976
(Log modified from Powell, 1959)

Altitude: 1490 feet — Date drilled: 9/10/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, yellow	40	41
	Clay, gray; fine to medium gravel and shale pebbles (till)	29	70
	Clay, gray; medium to very coarse sand (till)	10	80
	Gravel, fine; medium to coarse silty sand	15	95
	Clay, gray; fine to medium gravel and shale pebbles (till)	49	144
Fox Hills Sandstone:			
	Sand, medium to coarse, silty, gray	5	149
	Shale, gray	1	150

163-080-26DDD
(Log modified from C. A. Simpson & Son)

Altitude: 1489 feet

Glacial drift:			
	Clay, yellow	35	35
	Clay, blue (till)	25	60
	Clay, sandy, blue (till)	23	83
	Gravel	4	87
	Clay, sandy, blue (till)	52	139
	Sand, coarse; gravel	10	149

163-080-27AAA
(Log modified from C. A. Simpson & Son)

Altitude: 1488 feet — Date drilled: 7/ /73

	Topsoil	1	1
	Clay, yellow	19	20
	Clay, blue	45	65
	Sand, clayey	10	75
	Clay, sandy, blue	35	110
	Clay, very sandy, blue	4	114
	Sand; no water	2	116
	Clay, fine, sandy, blue	21	137
	Sand; no water	2	139
	Clay, sandy, blue	13	152
	Clay, blue	1	153

163-080-27BDD
NDSWC 929
(Log modified from Powell, 1959)

Altitude: 1496 feet — Date drilled: 7/14/54

Glacial drift:			
	Topsoil, sandy, black	2	2
	Sand, fine, silty	1	3
	Clay, light-gray	1	4
	Clay, yellow; fine to medium gravel	20	24
	Clay, gray; fine to medium gravel (till)	35	59
	Sand, medium to coarse; fine to medium silty gravel	9	68
	Clay, gray; fine to medium gravel (till)	93	161
Fox Hills Sandstone:			
	Shale, gray	9	170

163-080-27CCC
NDSWC 941
(Log modified from Powell, 1959)

Altitude: 1495 feet — Date drilled: 7/29/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, sandy, brown	2	3
	Clay, gray	2	5
	Clay, yellow; fine to medium gravel	10	15
	Clay, gray; fine to medium gravel (till)	112	127
	Sand, fine to medium, silty	3	130
	Clay, gray; fine to medium gravel (till)	40	170
Fox Hills Sandstone:			
	Clay, smooth, gray	2	172
	Clay, sandy, gray	5	177
	Shale, gray	3	180

163-080-27CDA
(Log modified from C. A. Simpson & Son)

Altitude: 1493 feet — Date drilled: 9/ /53

Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, gray	7	8
	Clay, yellow	10	18
	Clay, blue (till)	36	54
	Clay, sandy, gray (till)	14	68
	Clay, gray; gravel (till)	70	138
	Sand, silty	12	150
	Clay, gray; gravel (till)	15	165
Fox Hills Sandstone:			
	Shale, gray	75	240

163-080-27DBB
(Log modified from C. A. Simpson & Son)

Altitude: 1495 feet — Date drilled: 1958

	Topsoil	1	1
	Clay, yellow	24	25
	Clay, blue	40	65
	Sand and gravel	2	67
	Clay, sandy	9	76
	Clay, very sandy	24	100
	Sand and gravelly clay	20	120
	Clay, very sandy and gravelly; not much water	48	168
	Shale	6	174

163-080-28CCC
NDSWC 939
(Log modified from Powell, 1959)

Altitude: 1497 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, brown	2	2
	Clay, light-gray	2	4
	Clay, yellow; fine to medium gravel	20	24
	Clay, gray; fine to medium gravel (till)	98	122
	Sand, fine to coarse, silty	3	125
	Clay, gray; fine to medium gravel (till)	62	187
Fox Hills Sandstone:			
	Clay, smooth, gray	5	192
	Clay, sandy, green	1	193
	Shale, gray	7	200

163-080-28DCC
NDSWC 940
(Log modified from Powell, 1959)

Altitude: 1495 feet Date drilled: 7/28/54

Glacial drift:			
	Topsoil, sandy, black	2	2
	Clay, light-gray	1	3
	Clay, sandy, gray	2	5
	Clay, sandy, yellow	9	14
	Clay, gray; fine to medium gravel (till)	110	124
	Sand, medium to coarse; fine to medium silty gravel	4	128
	Clay, gray; fine to medium gravel (till)	6	134
	Sand, medium to coarse; fine to medium gravel	2	136
	Clay, gray; fine to medium gravel (till)	49	185
Fox Hills Sandstone:			
	Shale, gray	5	190

163-080-32BBB
NDSWC 938
(Log modified from Powell, 1959)

Altitude: 1500 feet Date drilled: 7/26/54

Glacial drift:			
	Topsoil, black	2	2
	Clay, sandy, yellow	7	9
	Clay, yellow; fine to medium gravel	14	23
	Clay, gray; fine to medium gravel (till)	47	70
	Sand, fine to medium; fine gravel	2	72
	Clay, gray; fine to medium gravel (till)	3	75
	Sand, medium to coarse; fine gravel	3	78
	Clay, gray; fine to medium gravel (till)	3	81
	Sand, fine to coarse, silty; fine to medium gravel	2	83
	Clay, gray; fine to medium gravel (till)	103	186
Fox Hills Sandstone:			
	Clay, sandy, green	2	188
	Shale, gray	2	190

163-080-32BCA
(Log modified from C. A. Simpson & Son)

Altitude: 1505 feet — Date drilled: 11/06/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Clay, yellow	21	22
	Clay, blue	48	70
	Clay, very sandy, blue	70	140
	Clay, very gravelly, blue	47	187
	Gravel	3	190

163-080-34BAA
NDSWC 928
(Log modified from Powell, 1959)

Altitude: 1498 feet — Date drilled: 7/13/54

Glacial drift:			
	Topsoil, sandy, black	2	2
	Clay, light-gray	1	3
	Sand, fine	2	5
	Clay, yellow	12	17
	Clay, gray; fine to medium gravel (till)	45	62
	Sand, medium to coarse; fine gravel	2	64
	Clay, gray; fine to medium gravel (till)	96	160
	Sand, medium to coarse; fine silty gravel	2	162
	Clay, gray; fine to medium gravel (till)	5	167
Fox Hills Sandstone:			
	Clay, gray to green; fine gravel	12	179
	Shale, gray	1	180

163-080-34DBB
NDSWC 957
(Log modified from Powell, 1959)

Altitude: 1495 feet — Date drilled: 8/21/54

Glacial drift:			
	Topsoil, sandy, black	2	2
	Clay, sandy, brown	2	4
	Clay, yellow; fine to medium gravel and shale pebbles	13	17
	Clay, gray; fine to medium gravel (till)	149	166
	Clay, smooth, gray (till)	3	169
Fox Hills Sandstone:			
	Shale, gray	1	170

163-080-35AAB
NDSWC 961
(Log modified from Powell, 1959)

Altitude: 1490 feet — Date drilled: 8/26/54

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, smooth, yellow	2	3
	Clay, yellow; fine gravel	20	23
	Clay, gray; fine to medium gravel (till)	119	142
	Gravel, fine; shale pebbles	3	145
Fox Hills Sandstone:			
	Clay, gray-green	2	147
	Shale, gray	3	150

163-080-35ABB1
NDSWC 943
(Log modified from Powell, 1959)

Altitude: 1490 feet — Date drilled: 7/31/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, yellow; fine to medium gravel	21	22
	Clay, gray; fine to medium gravel (till)	38	60
	Sand, coarse; fine to medium gravel and shale pebbles	23	83
	Clay, gray; fine to medium gravel (till)	69	152
Fox Hills Sandstone:			
	Shale, gray	8	160

163-080-35ABB2
(Log modified from C. A. Simpson & Son)

Altitude: 1490 feet — Date drilled: 1958

	Topsoil	1	1
	Clay, yellow	37	38
	Clay, blue	17	55
	Clay, sandy, blue	20	75
	Gravel; with a little water	7	82
	Clay, blue, and gravel; mixed	5	87
	Clay, blue	28	115
	Clay, sandy and gravelly, blue	37	152
	Shale	10	162

163-080-35BBB
NDSWC 942
(Log modified from Powell, 1959)

Altitude: 1496 feet — Date drilled: 7/30/54

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, yellow; fine to medium gravel	18	19
	Clay, gray; fine to medium gravel (till)	132	151
	Gravel, fine; shale pebbles	1	152
	Clay, gray; fine to medium gravel (till)	9	161
Fox Hills Sandstone:			
	Shale, gray	9	170

163-080-36BAA
NDSWC 945
(Log modified from Powell, 1959)

Altitude: 1481 feet — Date drilled: 8/05/54

Glacial drift:			
	Topsoil, black	1	1
	Clay, light-gray	1	2
	Clay, yellow, oxidized; fine to medium gravel	25	27
	Clay, gray; fine to medium gravel (till)	104	131
Fox Hills Sandstone:			
	Shale, gray	9	140

163-080-36BBA
NDSWC 960
(Log modified from Powell, 1959)

Altitude: 1485 feet — Date drilled: 8/26/54

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, yellow, oxidized; fine to medium gravel	37	38
	Clay, gray; fine to medium gravel (till)	44	82
	Gravel, fine to medium	6	88
	Gravel, fine to medium, silty	8	96
	Clay, gray; fine to medium gravel (till)	43	119
Fox Hills Sandstone:			
	Shale, gray	11	150

163-080-36BBB
NDSWC 944
(Log modified from Powell, 1959)

Altitude: 1491 feet — Date drilled: 8/03/54

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, yellow; fine gravel	42	43
	Clay, gray; fine to medium gravel; coarser at base (till)	99	142
Fox Hills Sandstone:			
	Sand, fine to medium, silty	3	145
	Clay, gray; medium to coarse sand	4	149
	Shale, gray	12	161

163-081-09AAB2
(Log modified from C. A. Simpson & Son)

Altitude: 1507 feet — Date drilled: 8/28/65

	Topsoil	1	1
	Clay, slightly sandy, yellow	15	16
	Clay, slightly sandy, blue	42	58
	Clay, blue	43	101
	Sand, clayey	12	113

163-081-09BCD
(Log modified from Water Supply Inc.)

Altitude: 1505 feet — Date drilled: 4/13/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown (till)	12	13
	Clay, silty, olive-gray (till)	20	33
	Sand, fine to medium	1	34
	Clay, silty, olive-gray (till)	6	40

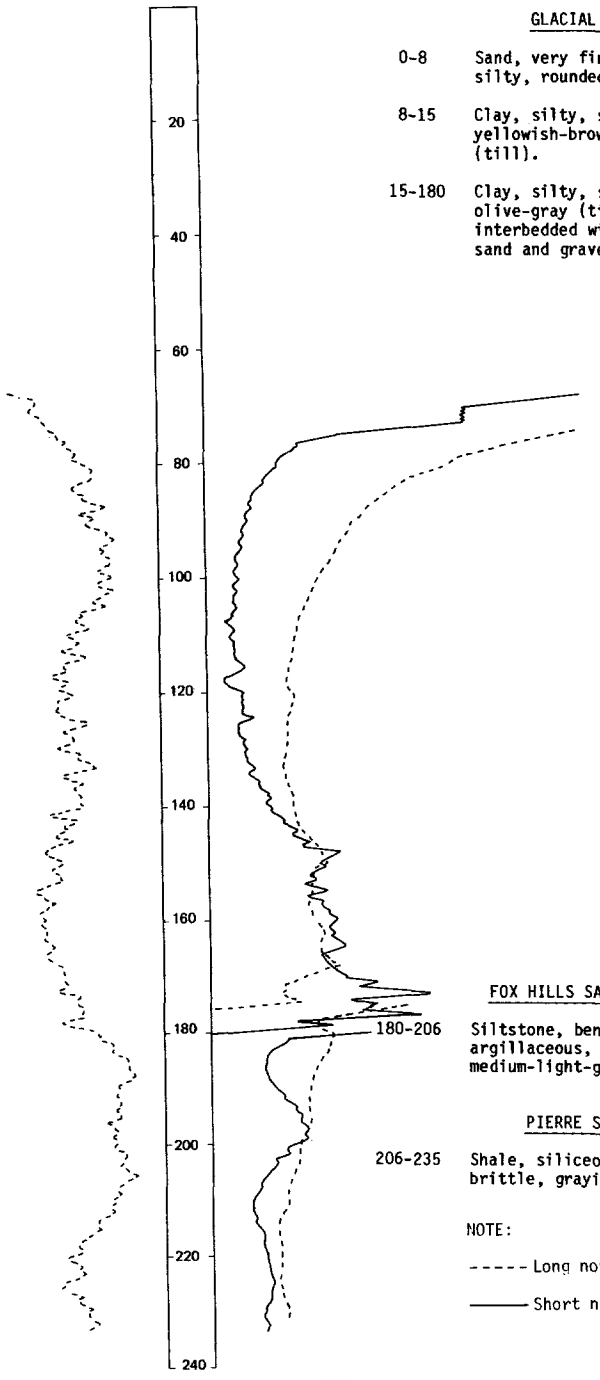
NDWSC 5358

LOCATION: 163-081-11CCC

DATE DRILLED: 8/08/78

ALTITUDE: 1505 (FT, NGVD)

DEPTH: 235 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8 Sand, very fine to medium, silty, rounded, oxidized.

8-15 Clay, silty, sandy, pebbly, yellowish-brown, oxidized (till).

15-180 Clay, silty, sandy, pebbly, olive-gray (till); interbedded with lenses of sand and gravel.

FOX HILLS SANDSTONE

180-206 Siltstone, bentonitic, argillaceous, indurated, medium-light-gray.

PIERRE SHALE

206-235 Shale, siliceous, indurated, brittle, grayish-black.

NOTE:

----- Long normal

——— Short normal

163-081-22DDD
(Log modified from Water Supply Inc.)

Altitude: 1498 feet Date drilled: 4/07/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black----------	1	1
	Clay, sandy, silty, yellowish-brown----------	14	15
	Clay, silty, olive-gray (till)----------	28	43
	Sand, fine to medium to coarse----------	5	48
	Clay, silty, olive-gray (till)----------	26	74
	Gravel, fine to medium to coarse----------	2	76
	Gravel, fine to medium to coarse; with clay layers------	2	78
	Clay, silty, olive-gray (till)----------	92	170
	Sand, fine to medium to coarse----------	3	173
	Clay, silty, olive-gray (till)----------	2	175
	Sand, fine to medium to coarse----------	4	179
	Clay, silty, olive-gray (till)----------	13	192
	Clay, sandy, silty, light-brown; bedrock----------	8	200

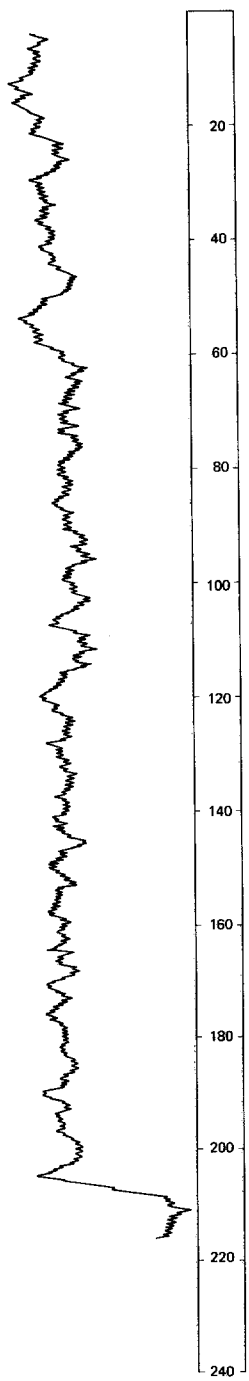
NDSWC 5855

LOCATION: 163-081-34DDD

DATE DRILLED: 10/21/80

ALTITUDE: 1505
(FT, NGVD)

DEPTH: 221
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-16	Silt, yellowish-brown, oxidized (lacustrine).
16-33	Clay, very silty, pebbly, yellowish-brown, oxidized (till).
33-70	Clay, very sandy, pebbly, olive-gray (till).
70-73	Sand, fine to very coarse; about 50 percent fine angular to rounded gravel; predominately detrital shale grains.
73-200	Clay, sandy, pebbly (till); with thin lenses of olive-gray gravel.

FOX HILLS SANDSTONE

200-221	Siltstone, argillaceous, indurated, brownish-gray to greenish-gray.

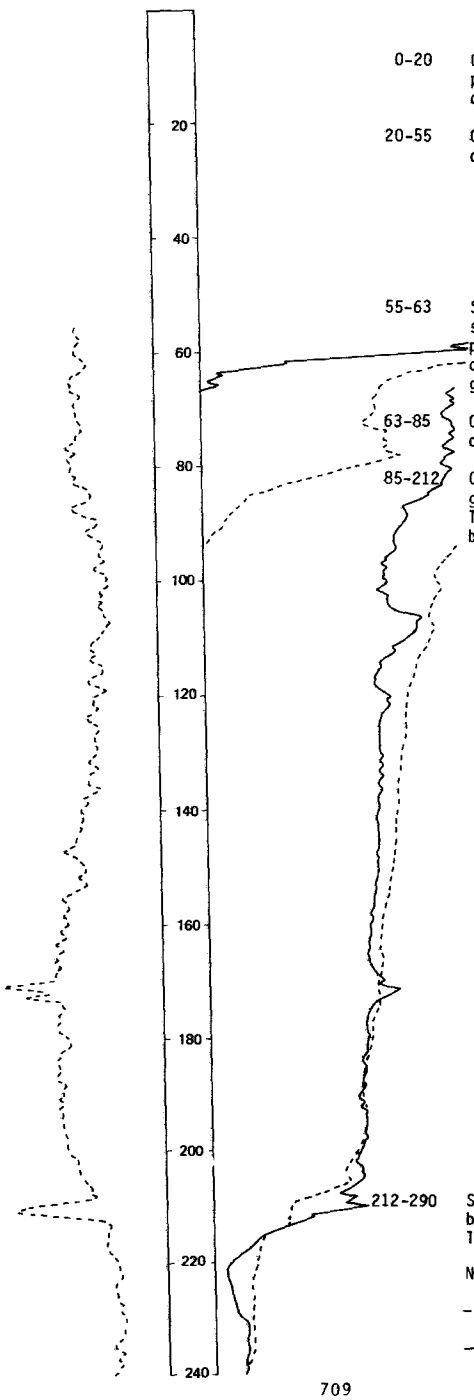
NDSWC 5357

LOCATION: 163-082-10DDD

DATE DRILLED: 8/08/78

ALTITUDE: 1525 (FT, NGVD)

DEPTH: 335 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Clay, silty to very sandy, pebbly, yellowish-brown, oxidized (till).

20-55 Clay, silty, sandy, pebbly, olive-gray (till).

55-63 Sand, fine to very coarse, subangular to rounded; predominately quartz, carbonate, and granitic grains.

63-85 Clay, very sandy, gravelly, olive-gray (till).

85-212 Clay, silty, pebbly, olive-gray (till); occasional thin lenses of sand and some boulders.

FOX HILLS SANDSTONE

212-290 Siltstone, moderately sandy, bentonitic, argillaceous, light-gray.

NOTE:

- - - - - Long normal

——— Short normal

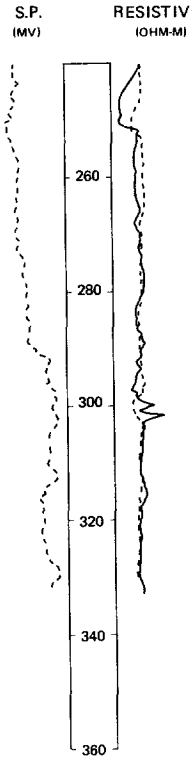
NDSWC 5357, continued

LOCATION: 163-082-10DDD

DATE DRILLED: 8/08/78

ALTITUDE: 1525 (FT, NGVD)

DEPTH: 335 (FT)



DESCRIPTION OF DEPOSITS

PIERRE SHALE

290-335 Shale, siliceous, indurated, brittle, grayish-black.

NOTE:

----- Long normal

——— Short normal

163-082-26BCA
(Log modified from Water Supply Inc.)

Altitude: 1525 feet

Date drilled: 4/15/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black----------	1	1
	Clay, silty, yellowish-brown (till)----------	4	5
	Sand, fine to medium to coarse----------	2	7
	Clay, silty, olive-gray (till)----------	33	40

163-082-27AAA
(Log modified from Water Supply Inc.)

Altitude: 1528 feet

Date drilled: 6/08/77

	Topsoil, silty, black----------	1	1
	Sand, fine to medium to coarse; about 25 percent gravel----------	7	8
	Clay, silty, olive-gray (till)----------	10	18
	Sand, fine to medium to coarse; about 20 percent gravel----------	4	22
	Gravel, fine to medium to coarse----------	3	25
	Clay, silty, olive-gray (till)----------	15	40

163-082-32ACC
(Log modified from Water Supply Inc.)

Altitude: 1551 feet — Date drilled: 6/10/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black	1	1
	Clay, sandy, silty, yellowish-brown	3	4
	Gravel, fine to medium to coarse	7	11
	Clay, silty, olive-gray (till)	41	52
	Clay, silty, olive-gray (till); with sand layers	8	60

163-082-36DDD
(Log modified from Water Supply Inc.)

Altitude: 1513 feet — Date drilled: 6/09/77

	Topsoil, silty, black	1	1
	Clay, sandy, silty, yellowish-brown	3	4
	Sand, fine to medium	4	8
	Clay, silty, yellowish-brown (till)	4	12
	Clay, silty, olive-gray (till)	37	49
	Sand, fine to medium	2	51
	Clay, silty, olive-gray (till)	9	60

163-083-05BCB
(Log modified from Russell Drilling Co.)

Altitude: 1600 feet — Date drilled: 10/21/76

	Till	31	31
	Sand	2	33
	Till	10	43
	Sand	22	65
	Till	10	75

NDSWC 5356

LOCATION: 163-083-11CCC

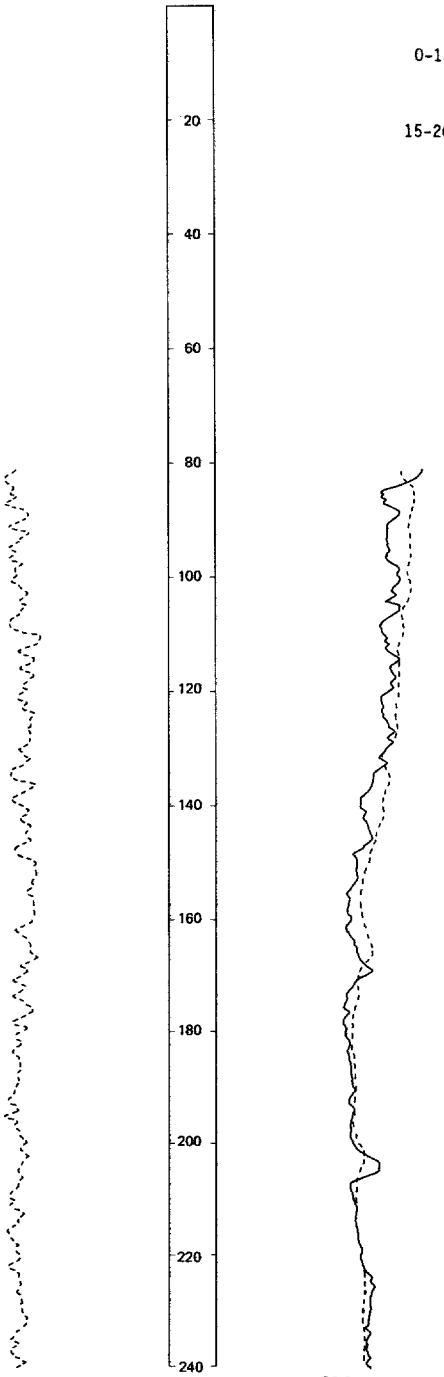
DATE DRILLED: 8/07/78

ALTITUDE: 1578
(FT, NGVD)

DEPTH: 415
(FT)

S.P.
(MV)

RESISTIVITY
(OHM-M)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15 Clay, silty to sandy, pebbly, yellowish-brown, oxidized (till).

15-263 Clay, silty to sandy, pebbly, olive-gray (till); gravelly at 100 feet; bouldery from 215 to 255 feet.

NOTE:

----- Long normal

———Short normal

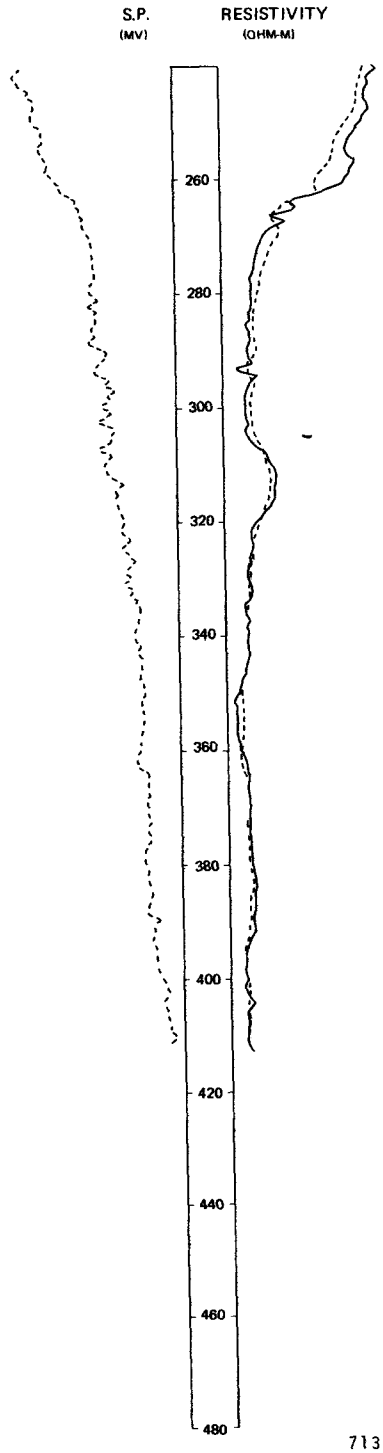
712

LOCATION: 163-083-11CCC

DATE DRILLED: 8/07/78

ALTITUDE: 1578 (FT, NGVD)

DEPTH: 415 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

263-268 Sandstone, fine to medium, argillaceous, glauconitic, dark-green.

268-392 Claystone, bentonitic, light-gray; interbedded with occasional lenses of very fine glauconitic dark-green sandstone.

PIERRE SHALE

392-415 Shale, brittle, grayish-black.

NOTE:

_____Long normal

———Short normal

163-083-21AAD
(Log modified from Water Supply Inc.)

Altitude: 1560 feet — Date drilled: 4/08/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black----------	1	1
	Clay, silty, yellowish-brown----------	3	4
	Sand, fine to medium to coarse----------	4	8
	Clay, silty, olive-gray (till)----------	52	60

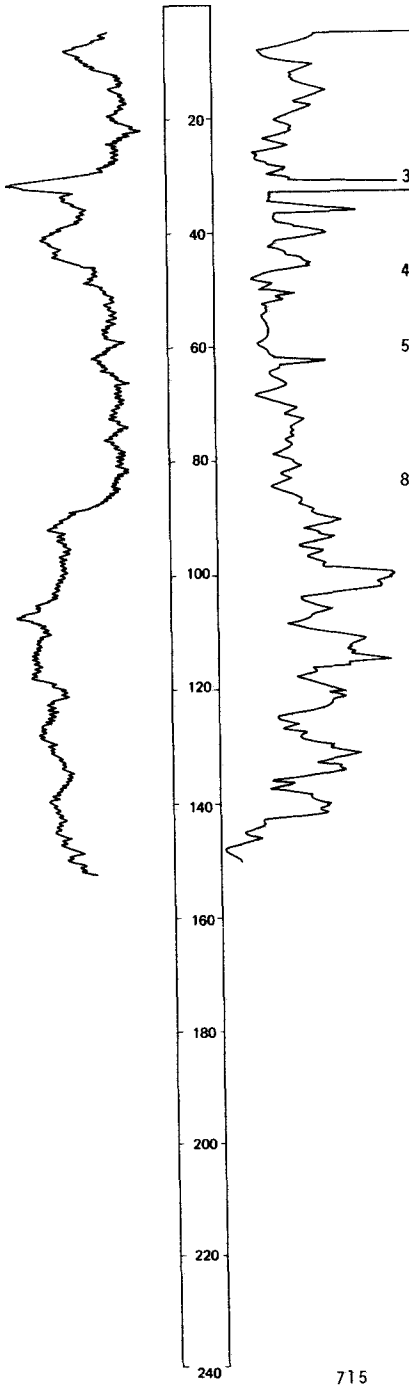
NDSWC 5878

LOCATION: 164-069-28DDD

DATE DRILLED: 11/04/80

ALTITUDE: 1811
(FT, NGVD)

DEPTH: 171
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-30	Clay, silty, gravelly, yellowish-brown, oxidized (till).
30-43	Clay, silty, sandy, yellowish-brown, oxidized (till); with lenses of sand and gravel.
43-55	Clay, silty, sandy, gravelly, yellowish-brown, oxidized (till).
55-85	Clay, silty, sandy, pebbly, olive-gray (till).
85-171	Gravel, fine to coarse; about 50 percent coarse to very coarse subangular sand; predominately detrital shale pebbles.

164-070-31BDB
(Log modified from Lee's Well Drilling)

Altitude: 1970 feet — Date drilled: 3/31/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Sand, yellow	23	25
	Sand, blue	20	45
	Gravel and blue clay	55	100
	Sand, yellow	25	125
	Sand, blue	70	195
	Shale	22	217
	Shale, sandy, blue	23	240

164-072-32CCB
(Log modified from C. A. Simpson & Son)

Altitude: 2320 feet — Date drilled: 9/02/66

	Topsoil	1	1
	Clay, sandy, yellow	20	21
	Clay, blue	74	95
	Clay, sandy, blue	195	290
	Clay, gravelly, blue; rocks	30	320
	Sand	5	325

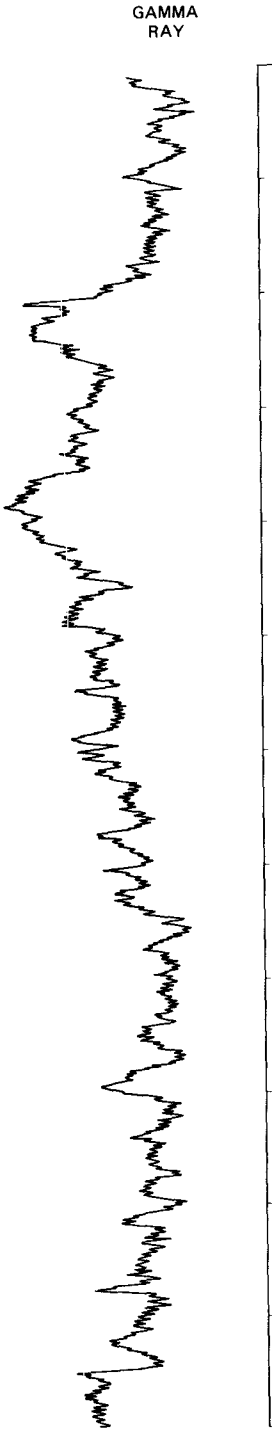
NDSWC 5586

LOCATION: 164-073-25DCB

DATE DRILLED: 10/04/79

ALTITUDE: 2256
(FT, NGVD)

DEPTH: 392
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-39	Clay, cohesive, yellowish-brown, oxidized (lacustrine).
39-47	Clay, silty to sandy, pebbly, olive-gray (till).
47-62	Clay, sandy to gravelly, olive-gray (till).
62-72	Clay, silty (till); with thin lenses of olive-gray sand.
72-80	Clay, very sandy, olive-gray (till); abundant shale pebbles.
80-130	Clay, silty, olive-gray (fluvial).
130-230	Clay, silty, cohesive, sticky, olive-gray (fluvial).
230-260	Clay, silty to sandy, pebbly, olive-gray (till).

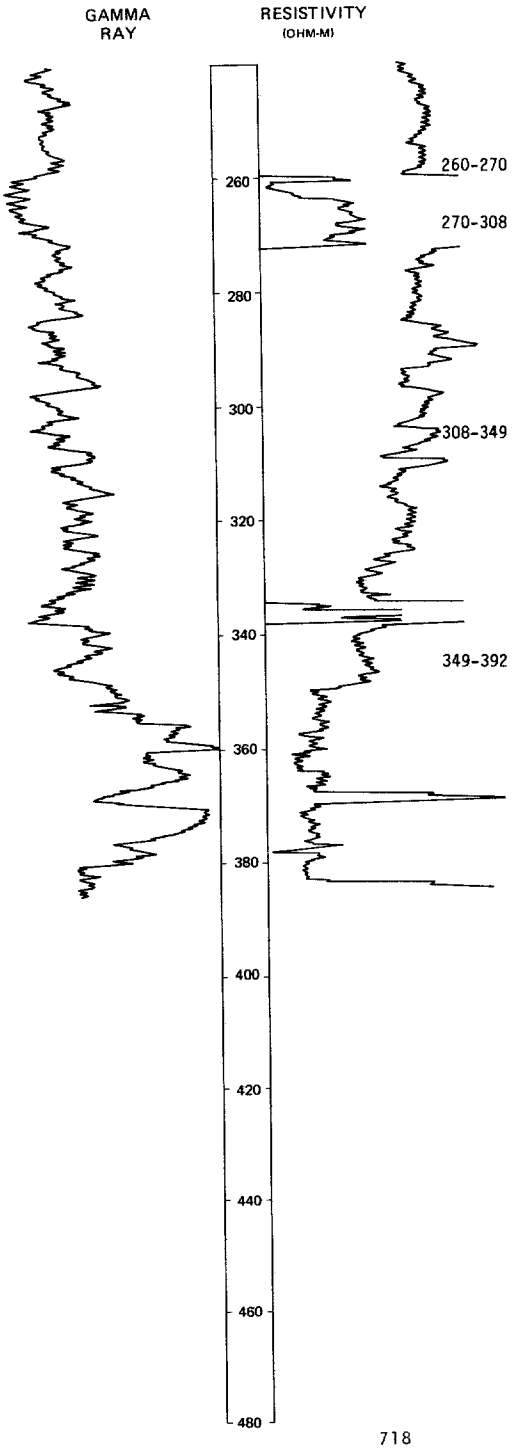
NDSWC 5586, continued

LOCATION: 164-073-25DCB

DATE DRILLED: 10/04/79

ALTITUDE: 2256 (FT, NGVD)

DEPTH: 392 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

260-270 Sand, fine to coarse, gravelly, subangular.

270-308 Clay, silty to very sandy, pebbly, olive-gray (till).

308-349 Clay, silty, pebbly, gravelly, olive-gray (till).

HELL CREEK FORMATION

349-392 Siltstone, argillaceous; interbedded with fine indurated greenish-gray sandstone.

LOCATION: 164-073-25DCB

DATE DRILLED: 10/04/79

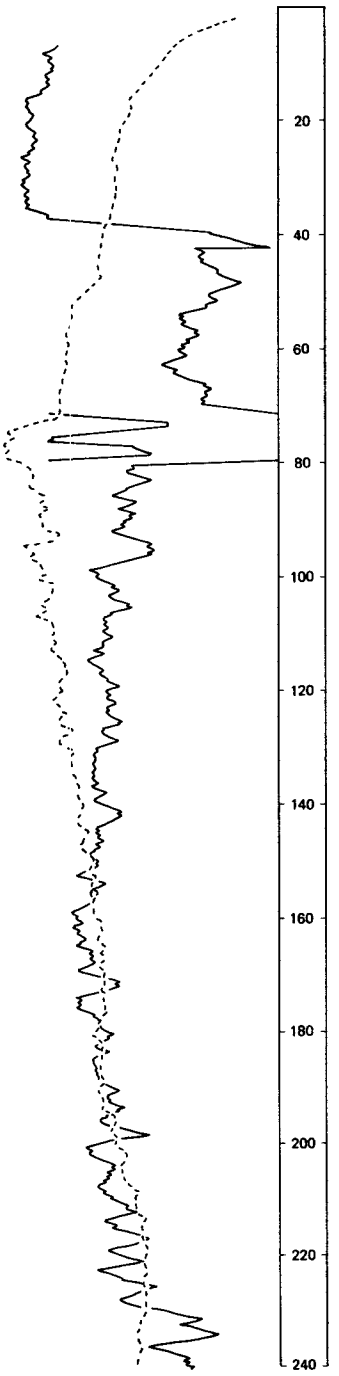
ALTITUDE: 2256
(FT, NGVD)

DEPTH: 392
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



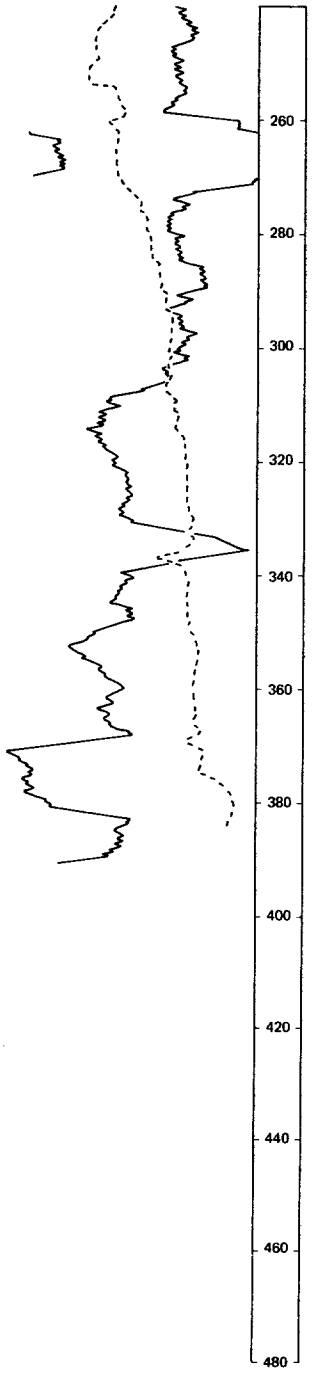
LOCATION: 164-073-25DCB

DATE DRILLED: 10/04/79

ALTITUDE: 2256
(FT, NGVD)

DEPTH: 392
(FT)

NEUTRON (API) S.P. (MV)



DESCRIPTION OF DEPOSITS

164-075-27ACD
NDSWC 738
(Log modified from Knutson Well Drilling)

Altitude: 2160 feet — Date drilled: 6/06/62

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, yellow, silty	6	6
	Gravel, fine to coarse	11	17
	Clay, yellow, silty (till)	4	21
	Gravel, fine to coarse	7	28
	Gravel, fine to coarse; with clay layers	7	35
	Clay, olive-gray, silty (till)	8	43
	Clay, olive-gray, silty	10	53
	Gravel, fine to medium; about 50 percent coarse sand	21	74
	Gravel, fine to medium; about 50 percent sand and clay layers	9	83
	Clay, olive-gray, silty	29	112
	Clay, olive-gray, silty (till)	33	145
	Rock	1	146
	Clay, olive-gray, silty	18	164
	Gravel, fine to coarse	10	174
	Clay, olive-gray, silty (till)	--	174

164-075-33ABC
(Log modified from C. A. Simpson & Son)

Altitude: 2255 feet — Date drilled: 10/27/70

	Clay, sandy, yellow	15	15
	Clay, sandy, blue	60	75
	Sand	9	84

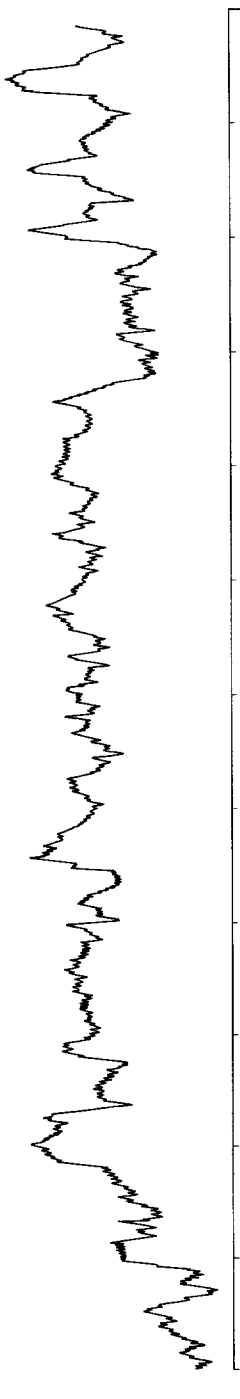
NDSWC 5581

LOCATION: 164-075-34CDD

DATE DRILLED: 9/26/79

ALTITUDE: 2152 (FT, NGVD)

DEPTH: 407 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Soil.
1-40	Clay, silty, pebbly, yellowish-brown, oxidized (till); interbedded lenses of sand and gravel.
40-65	Clay, silty, olive-gray (fluvial).
65-130	Clay, silty, pebbly, olive-gray (till).
130-195	Clay, silty, pebbly, olive-gray (till); with lenses of sand and gravel.
195-210	Cobbles and boulders.

CANNONBALL FORMATION

210-327	Siltstone, sandy; carbonaceous yellowish-brown oxidized streaks; interbedded with lenses of cemented sandstone.

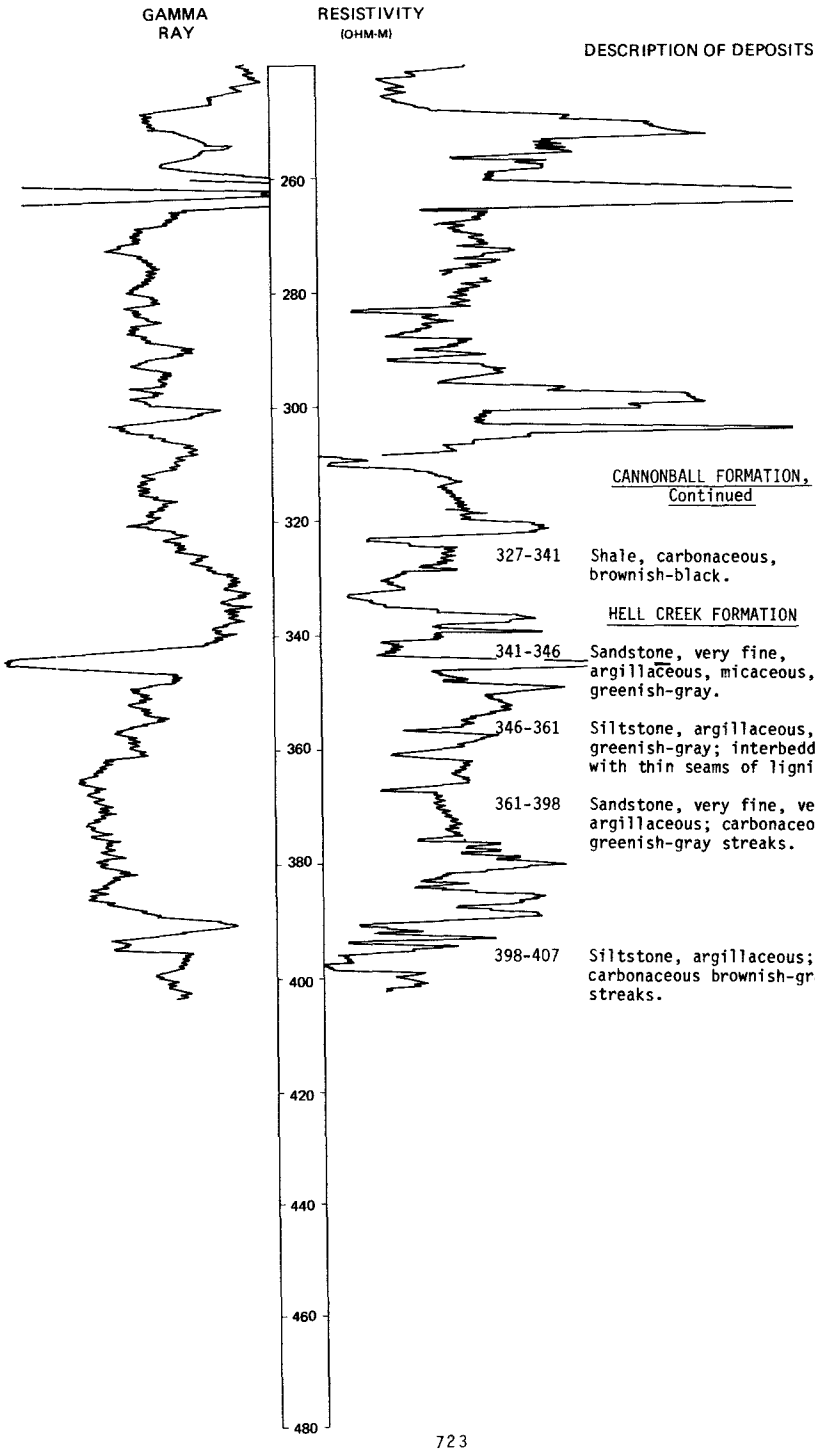
NDSWC 5581, continued

LOCATION: 164-075-34CDD

DATE DRILLED: 9/26/79

ALTITUDE: 2152 (FT, NGVD)

DEPTH: 407 (FT)



DESCRIPTION OF DEPOSITS

CANNONBALL FORMATION, Continued

327-341 Shale, carbonaceous, brownish-black.

HELL CREEK FORMATION

341-346 Sandstone, very fine, argillaceous, micaceous, greenish-gray.

346-361 Siltstone, argillaceous, greenish-gray; interbedded with thin seams of lignite.

361-398 Sandstone, very fine, very argillaceous; carbonaceous greenish-gray streaks.

398-407 Siltstone, argillaceous; carbonaceous brownish-gray streaks.

LOCATION: 164-075-34CDD

DATE DRILLED: 9/26/79

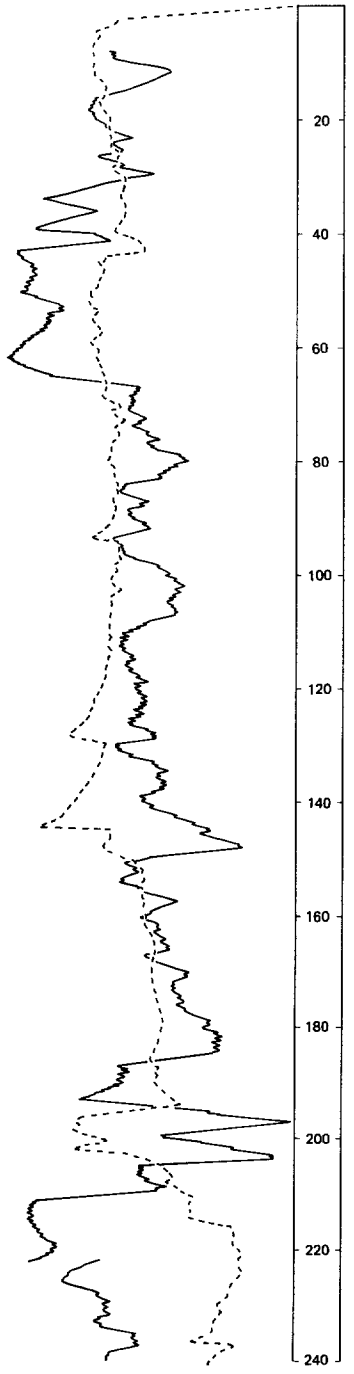
ALTITUDE: 2152
(FT, NGVD)

DEPTH: 407
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



LOCATION: 164-075-34CDD

DATE DRILLED: 9/26/79

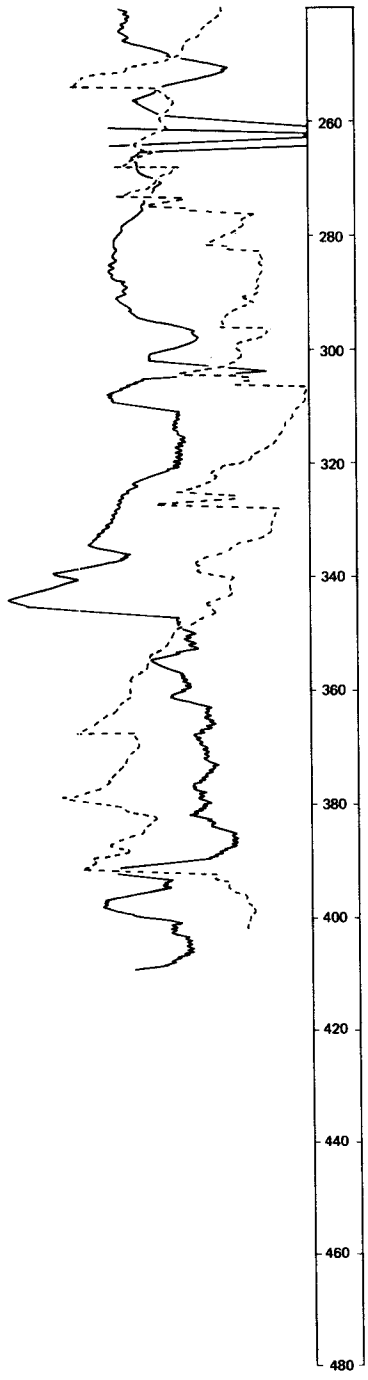
ALTITUDE: 2152
(FT, NGVD)

DEPTH: 407
(FT)

NEUTRON
(API)

S.P.
(MV)

DESCRIPTION OF DEPOSITS



164-075-34DBB
(Log modified from Marchus Drilling)

Altitude: 2150 feet — Date drilled: 7/07/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, yellow	47	47
	Clay, gray, sandy	154	201
	Gravel	2	203

164-075-35ADB
(Log modified from Stemen Drilling Co.)

Altitude: 2152 feet — Date drilled: 7/05/72

	Gravel	5	5
	Clay, brown	14	19
	Clay, gray	58	77
	Sand and gravel	3	80

164-075-35BDA
(Log modified from C. A. Simpson & Son)

Altitude: 2155 feet — Date drilled: 5/10/66

	Clay, sandy, yellow	27	27
	Clay, gravelly, blue	11	38
	Clay, gravelly, yellow	9	47
	Sand, fine, and clay	34	81
	Clay, sandy, blue	23	104
	Sand	3	107

164-075-35CAD
(Log modified from C. A. Simpson & Son)

Altitude: 2148 feet — Date drilled: 5/07/71

	Topsoil	1	1
	Sand; no water	34	35
	Clay, sandy, blue	41	76
	Sand	6	82

164-075-35CCB
(Log modified from C. A. Simpson & Son)

Altitude: 2145 feet — Date drilled: 1/09/75

	Topsoil	1	1
	Clay, sandy, yellow	19	20
	Clay, very sandy, yellow	12	32
	Sand	15	47
	Clay, blue	44	91
	Sand, fine	7	98

164-075-35DDB
(Log modified from C. A. Simpson & Son)

Altitude: 2142 feet — Date drilled: 9/16/67

	Topsoil	2	2
	Clay, sandy, yellow	19	21
	Clay, blue	52	73
	Clay, sandy, blue	10	83
	Gravel, coarse	4	87

164-075-35DDC
NDSWC LM-6

Altitude: 2148 feet — Date drilled: 10/18/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dusky-brown	1	1
	Clay, silty, oxidized, yellowish-gray to dusky-yellow (lacustrine)	20	21
	Sand, medium to coarse; about 25 percent subangular to subrounded gravel; 60 percent quartz, 20 percent limestone, and 10 percent shale grains	7	28
	Clay, silty, olive-gray (lacustrine)	38	66
	Clay, silty, olive-gray (till); about 5 percent sand and gravel; mostly limestone and shale	10	76
	Sand, fine to medium; about 5 percent coarse well-sorted subangular to subrounded sand; 75 percent quartz, 10 percent limestone, and 10 percent detrital shale grains	6	82
	Sand, fine to coarse; about 25 percent subangular to subrounded gravel	13	95
	Clay, silty, olive-gray (till); about5 percent sand and gravel	5	100
	Sand, medium to coarse; about 25 percent subangular to subrounded gravel; 35 percent limestone, 30 percent shale, and 25 percent quartz grains	37	137
	Clay, silty, olive-gray (till); about 5 percent sand and gravel	6	143
	Sand, medium to coarse; about 25 percent subangular to subrounded gravel and erratics; 35 percent limestone, 30 percent shale, and 25 percent quartz grains	5	148
	Clay, silty, olive-gray (till); about 15 percent sand, gravel, and erratics	10	158

164-075-36ADA
NDSWC LM-5

Altitude: 2150 feet — Date drilled: 10/18/66

Glacial drift:			
	Soil, dusky-brown	1	1
	Clay, silty, yellowish-gray to dusky-yellow (lacustrine)	12	13
	Gravel, medium to coarse; about 35 percent coarse subangular to subrounded oxidized sand; 35 percent limestone, 35 percent quartz, and 20 percent shale pebbles	3	16
	Clay, silty, olive-gray (lacustrine)	25	41
	Sand, fine to medium, subangular to subrounded, oxidized; 75 percent quartz, 10 percent limestone, and 5 percent shale grains	8	49
	Clay, silty, sandy, gravelly, olive-gray (till)	95	144
	Sand, medium to coarse; about 50 percent subangular to subrounded gravel; 30 percent limestone, 30 percent shale, and 30 percent quartz grains	8	152
	Clay, silty, sandy, gravelly, yellow, oxidized (till)	16	168

164-075-36BB
NDSWC LM-1

Altitude: 2150 feet — Date drilled: 10/12/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand, fine to coarse, gravelly, clayey, silty, subangular to subrounded, oxidized; about 50 percent quartz, 25 percent limestone, and 10 percent shale grains	12	12
	Clay, silty, dusky-yellow, oxidized (lacustrine)	6	18
	Clay, silty, olive-gray (lacustrine)	25	43
	Clay, silty, pebbly, olive-gray (till)	21	64
	Sand, medium to coarse; about 40 percent fine to medium subangular to subrounded gravel; 10 percent shale, 30 percent limestone, 20 percent quartz, and 15 percent lignite grains	49	113
	Clay, silty, sandy to gravelly, olive-gray (till)	21	134
	Sand, medium to coarse; about 50 percent fine to coarse subangular to subrounded gravel; 40 percent shale, 30 percent limestone, and 20 percent quartz grains	8	142
	Clay, silty, sandy, olive-gray to dusky-yellow (till)	44	186
	Sand, medium to coarse; about 50 percent fine to medium subangular to subrounded gravel; 40 percent limestone, 30 percent shale, and 40 percent quartz grains	12	198
	Clay, silty, sandy, gravelly, olive-gray (till)	33	231

164-075-36CBB
NDSWC LM-2

Altitude: 2168 feet — Date drilled: 10/17/66

Glacial drift:			
	Soil, dusky-brown	4	4
	Clay, silty, yellowish-gray, oxidized (lacustrine)	4	8
	Clay, silty, sandy, dusky-yellow, oxidized (till)	12	20
	Clay, silty, sandy, gravelly, olive-gray (till)	38	58
	Sand, fine to coarse, gravelly, subangular to subrounded; about 65 percent quartz, 15 percent limestone, and 15 percent shale grains	7	65
	Sand, fine to coarse, gravelly, subangular to subrounded; about 40 percent shale, 35 percent quartz, and 15 percent limestone grains	37	102
	Gravel, fine to coarse; about 25 percent subangular to subrounded sand; 50 percent limestone, 25 percent shale, and 15 percent quartz pebbles	12	114
	Clay, silty, olive-gray (till); 5 percent to 10 percent sand and gravel; mostly limestone and shale	12	126

164-075-36CBC
(Log modified from Neff Drilling Company)

Altitude: 2142 feet — Date drilled: 5/12/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Sand and gravel	8	9
	Clay, yellow	11	20
	Clay, gray	6	26
	Clay, blue	30	56
	Clay, blue, gravelly	4	60
	Sand and gravel	13	73
	Clay, blue, gravelly	7	80
	Sand and gravel; clay streaks	20	100
	Sand and gravel, fine to medium to coarse	20	120

164-075-36CDA
NDSWC LM-4

Altitude: 2160 feet — Date drilled: 10/18/66

Glacial drift:			
	Soil, dusky-brown	1	1
	Clay, silty, dusky-yellow, oxidized (till); about 35 percent medium to coarse sand; mostly limestone and quartz	8	9
	Clay, silty, dusky-yellow, oxidized (fluvial)	10	19
	Clay, silty, olive-gray (fluvial)	13	32
	Clay, silty, sandy, gravelly, olive-gray (till)	106	138
	Sand, fine to coarse, partially oxidized; about 30 percent medium to coarse subangular to subrounded gravel; 35 percent limestone, 30 percent shale, and 25 percent quartz grains	8	146
	Clay, silty, sandy, gravelly, dusky-yellow, oxidized (till)	17	163
	Clay, silty, sandy, gravelly, olive-gray (till)	41	204
	Sand, medium to coarse; about 35 percent subangular to subrounded gravel; 35 percent limestone, 30 percent shale, and 25 percent quartz grains	10	214
Cannonball Formation:			
	Siltstone, clayey, dusky-yellow and light-olive-gray, oxidized	48	262

164-075-36DDA
NDSWC LM-7

Altitude: 2170 feet — Date drilled: 10/19/66

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dusky-brown	1	1
	Clay, silty, dusky-yellow, oxidized (lacustrine)	17	18
	Clay, silty, olive-gray (lacustrine)	13	31
	Clay, silty, sandy, olive-gray (till)	13	44
	Sand, fine to medium, subangular to subrounded, light-olive-gray; about 45 percent silt; sand is about 80 percent quartz and 10 percent limestone grains	5	49
	Clay, silty, sandy, gravelly, olive-gray (till)	102	151
	Sand, fine to coarse; about 50 percent medium to coarse subangular to subrounded gravel; about 40 percent shale, 40 percent limestone, and 15 percent quartz grains	9	160
	Clay, silty, sandy, dusky-yellow, oxidized (till)	9	169
	Sand, medium to coarse, oxidized; about 30 percent fine to coarse subangular to subrounded gravel; 40 percent limestone, 30 percent quartz, and 20 percent shale grains	10	179
	Clay, silty, sandy, olive-gray (till)	22	201
	Silt, clayey, and silty clay; 2 percent to 5 percent sand and gravel; mostly limestone and dusky-yellow and olive-gray shale	19	220
	Clay, silty, sandy, gravelly, olive-gray (till)	50	270
	Sand, fine to coarse; about 15 percent fine to coarse subangular to subrounded gravel; 40 percent limestone, 30 percent shale, and 20 percent quartz grains	4	274
Cannonball Formation:			
	Claystone, silty, argillaceous, olive-gray to medium-bluish-gray	41	315

164-077-25CCD
(Log modified from C. A. Simpson & Son)

Altitude: 1718 feet — Date drilled: 3/12/66

	Topsoil	1	1
	Clay, sandy, yellow	13	14
	Clay, sandy, brown	14	28
	Sandstone, green	40	68

164-080-33DAD
(Log modified from C. A. Simpson & Son)

Altitude: 1495 feet — Date drilled: 10/12/60

	Topsoil	2	2
	Clay, sandy, yellow	22	24
	Clay, sandy, blue	127	151
	Shale	14	165

164-081-29CBB
(Log modified from Water Supply Inc.)

Altitude: 1515 feet — Date drilled: 4/12/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black	1	1
	Sand, fine to medium to coarse	7	8
	Clay, silty, olive-gray (till)	9	17
	Sand, fine to medium	4	21
	Clay, silty, olive-gray (till)	19	40

164-081-29CCA
(Log modified from Water Supply Inc.)

Altitude: 1516 feet — Date drilled: 4/12/77

	Topsoil, silty, black	1	1
	Sand, fine to medium to coarse	9	10
	Clay, silty, olive-gray (till)	10	20

164-081-29CCB
(Log modified from Water Supply Inc.)

Altitude: 1515 feet — Date drilled: 4/12/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown	4	5
	Sand, fine to medium to coarse	5	10
	Clay, silty, olive-gray (till)	30	40

164-081-31AAA
(Log modified from Water Supply Inc.)

Altitude: 1517 feet — Date drilled: 4/12/77

	Topsoil, silty, black	1	1
	Sand, fine to medium to coarse	5	6
	Clay, silty, yellowish-brown (till)	8	14
	Clay, silty, olive-gray (till)	6	20

164-081-31AAC
(Log modified from Water Supply Inc.)

Altitude: 1515 feet — Date drilled: 4/12/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown (till)	17	18
	Clay, silty, olive-gray (till)	22	40

164-082-26CDA
(Log modified from Water Supply Inc.)

Altitude: 1520 feet — Date drilled: 6/14/77

	Topsoil, silty, black	1	1
	Clay, sandy, silty, yellowish-brown	10	11
	Sand, fine to medium to coarse; about 15 percent gravel	10	21
	Gravel, fine to medium to coarse; about 15 percent sand	6	27
	Clay, silty, olive-gray (till)	13	40

164-082-26DAD
(Log modified from Water Supply Inc.)

Altitude: 1520 feet — Date drilled: 6/15/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black	1	1
	Clay, sandy, silty, yellowish-brown; with small sand layers	18	19
	Sand, fine to medium to coarse; about 20 percent gravel	8	27
	Clay, silty, olive-gray (till)	13	40

164-082-27CDD
(Log modified from Water Supply Inc.)

Altitude: 1525 feet — Date drilled: 6/23/77

	Topsoil, silty, black	1	1
	Clay, sandy, silty, yellowish-brown	11	12
	Sand, fine to medium to coarse	10	22
	Gravel, fine to medium to coarse; about 20 percent sand	4	26
	Clay, silty, olive-gray (till)	14	40

164-082-27DCC
(Log modified from Water Supply Inc.)

Altitude: 1525 feet — Date drilled: 6/14/77

	Topsoil, silty, black	1	1
	Gravel, fine to medium to coarse	2	3
	Clay, silty, yellowish-brown (till)	17	20
	Clay, silty, olive-gray (till)	20	40

164-082-27DDA
(Log modified from Water Supply Inc.)

Altitude: 1525 feet — Date drilled: 6/13/77

	Topsoil, silty, black	1	1
	Sand, fine to medium to coarse	8	9
	Gravel, fine to medium to coarse	3	12
	Clay, silty, olive-gray (till)	28	40

164-082-28CCC
(Log modified from Water Supply Inc.)

Altitude: 1531 feet — Date drilled: 6/ /77

	Topsoil, silty, black	1	1
	Gravel, fine to medium to coarse	6	7
	Clay, silty, yellowish-brown (till)	4	11
	Clay, silty, olive-gray (till)	29	40

164-082-28DCA
(Log modified from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 6/22/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black	1	1
	Sand, fine to medium	4	5
	Clay, silty, yellowish-brown (till)	11	16
	Clay, silty, olive-gray (till)	3	19
	Sand, fine to medium to coarse; about 20 percent gravel	5	24
	Gravel, fine to medium to coarse; about 20 percent sand	6	30
	Clay, silty, olive-gray (till)	10	40

164-082-28DDA
(Log modified from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 6/22/77

	Topsoil, silty, black	1	1
	Sand, fine to medium	2	3
	Clay, sandy, silty, yellowish-brown	11	14
	Sand, fine to medium to coarse	6	20
	Gravel, fine to medium to coarse; about 20 percent sand	7	27
	Clay, silty, olive-gray (till)	13	40

164-082-31BBD
(Log modified from Water Supply Inc.)

Altitude: 1550 feet — Date drilled: 6/10/77

	Topsoil, silty, black	1	1
	Gravel, fine to medium to coarse; with lots of rocks	9	10
	Sand, fine to medium to coarse	11	21
	Clay, silty, olive-gray (till)	19	40

164-082-31BDA
(Log modified from Water Supply Inc.)

Altitude: 1540 feet — Date drilled: 6/10/77

	Topsoil, silty, black	1	1
	Gravel, fine to medium to coarse; with lots of rocks	4	5
	Gravel, fine to medium to coarse; about 15 percent sand	5	10
	Clay, silty, olive-gray (till)	30	40

164-082-33AAA
(Log modified from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 6/22/77

	Topsoil, silty, black	1	1
	Sand, fine to medium	3	4
	Clay, silty, yellowish-brown (till)	17	21
	Clay, silty, olive-gray (till)	16	37
	Sand, fine to medium to coarse	1	38
	Clay, silty, olive-gray (till)	2	40

164-082-33DCD
(Log modified from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 6/10/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown (till)	11	12
	Clay, silty, olive-gray (till)	28	40
	Gravel fine to medium to coarse	2	42
	Clay, silty, olive-gray (till)	18	60

164-082-33DDB
(Log modified from Water Supply Inc.)

Altitude: 1535 feet — Date drilled: 4/08/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown (till)	13	14
	Clay, silty, olive-gray (till)	14	28
	Gravel, fine to medium to coarse; about 30 percent sand	7	35
	Clay, silty, olive-gray (till)	25	60

164-082-33DDD
(Log modified from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 4/08/77

	Topsoil, silty, black	1	1
	Sand, fine to medium	4	5
	Clay, silty, yellowish-brown (till)	11	16
	Clay, silty, olive-gray (till)	23	39
	Gravel, fine to medium to coarse	1	40
	Clay, silty, olive-gray (till)	20	60

164-082-34AAA
(Log modified from Water Supply Inc.)

Altitude: 1520 feet — Date drilled: 4/11/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown	19	20
	Sand, fine to medium to coarse	2	22
	Clay, silty, olive-gray (till)	38	60

164-082-34AAC
(Log modified from Water Supply Inc.)

Altitude: 1520 feet — Date drilled: 4/15/77

	Topsoil, silty, black	1	1
	Clay, sandy, silty, yellowish-brown	17	18
	Sand, fine to medium	2	20
	Sand, fine to medium to coarse; about 30 percent gravel	8	28
	Clay, silty, olive-gray (till)	12	40

164-082-34AAD1
(Log modified from Water Supply Inc.)

Altitude: 1520 feet — Date drilled: 4/13/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown	17	18
	Sand, fine to medium to coarse	3	21
	Gravel, fine to medium to coarse; about 30 percent sand	6	27
	Clay, silty, olive-gray (till)	13	40

164-082-34AAD2
(Log modified from Water Supply Inc.)

Altitude: 1520 feet — Date drilled: 4/11/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown	17	18
	Gravel, fine to medium to coarse; about 20 percent sand	7	25
	Clay, silty, olive-gray (till)	15	40

164-082-34ADA
(Log modified from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 4/11/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown	17	18
	Sand, fine to medium to coarse	3	21
	Gravel, fine to medium to coarse; about 15 percent sand	6	27
	Clay, silty, olive-gray (till)	13	40

164-082-34ADD
(Log modified from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 4/12/77

	Topsoil, silty, black	1	1
	Clay, silty, yellowish-brown (till)	20	21
	Clay, silty, olive-gray (till)	19	40

164-082-34BAD
(Log modified from Water Supply Inc.)

Altitude: 1525 feet — Date drilled: 6/22/77

	Topsoil, silty, black	1	1
	Gravel, fine to medium to coarse	5	6
	Clay, silty, yellowish-brown (till)	21	27
	Clay, silty, olive-gray (till)	11	38
	Sand, fine to medium to coarse	3	41
	Clay, silty, olive-gray (till)	5	46
	Sand, fine to medium to coarse	3	49
	Clay, silty, olive-gray (till)	11	60

164-082-34BBA
(Log modified from Water Supply Inc.)

Altitude: 1530 feet — Date drilled: 6/23/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, silty, black----------	1	1
	Clay, sandy, silty, yellowish-brown----------	13	14
	Gravel, fine to medium to coarse; about 20 percent sand----------	6	20
	Gravel, fine to medium to coarse; about 30 percent sand----------	8	28
	Clay, silty, olive-gray (till)----------	12	40

164-082-35BBB1
(Log modified from Water Supply Inc.)

Altitude: 1520 feet — Date drilled: 6/14/77

	Topsoil, silty, black----------	1	1
	Clay, sandy, silty, yellowish-brown; with sand layers----------	18	19
	Gravel, fine to medium to coarse; about 20 percent sand----------	7	26
	Clay, silty, olive-gray (till)----------	14	40

164-082-35BBB2
(Log modified from Water Supply Inc.)

Altitude: 1520 feet — Date drilled: 6/14/77

	Topsoil, silty, black----------	1	1
	Clay, sandy, silty, yellowish-brown----------	13	14
	Gravel, fine to medium to coarse; about 15 percent sand----------	12	26
	Clay, silty, olive-gray (till)----------	14	40

TABLE 4.--Chemical analyses of ground water from wells

[Chemical analyses of ground water for major constituents are grouped according to aquifer.]

Principal aquifer

112, Pleistocene
125, Paleocene
211, Upper Cretaceous

BGFV, buried glaciofluvial deposits
CBLD, Cannonball-Ludlow members of Fort Union Formation
FXHL, Fox Hills Sandstone
GLNB, Glenburn aquifer
HLCK, Hell Creek Formation
LKSO, Lake Souris aquifer
OTSH, outwash deposits
PIRR, Pierre Shale
ROLL, Rolla aquifer
SLVL, Shell Valley aquifer

Specific conductance

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

LOCAL IDENTIFIER	GEOLOGIC UNIT	DEPTH OF WELL, TOTAL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (µMHO/CM AT 25°C)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE FET-FLD (MG/L AS HCO3)	CARBONATE FET-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	BORON, DISSOLVED (UG/L AS B)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
159-069-23ADD	112BGFV	89	78-06-07	2400	7.3	8.0	400	20	120	24	380	67	8.3	11	462	0	700	79	.2	25	1600	.23	830	1900	480
159-070-17DDD	112BGFV	56	79-09-20	800	8.6	8.0	280	5	76	22	24	15	.6	3.7	336	0	51	.3	.2	27	345	.23	100	280	560
159-070-29BBB	112BGFV	61	80-10-09	440	8.2	7.0	220	0	54	21	20	16	.6	2.0	293	0	25	1.8	.3	26	294	.23	60	370	240
159-073-19CBB	112BGFV	200	80-11-12	2200	8.6	6.0	210	0	48	22	460	82	16	6.9	474	0	260	370	.3	25	1390	.23	790	60	60
159-073-22BBB	112BGFV	50	79-09-20	2100	8.1	8.5	580	0	160	48	550	67	9.9	7.4	733	0	970	100	.3	28	2180	.23	370	160	440
159-074-32AAA	112BGFV	60	77-10-26	2600	8.3	11.0	45	0	7.9	6.2	640	97	41	6.0	984	23	500	47	.2	35	1770	.23	50	240	<10
159-075-02BAA	112BGFV	80	67-07-07	2200	7.8	8.5	220	0	77	5.8	433	81	13	3.2	781	0	39	280	.5	20	1370	22.0	1400	3300	--
159-083-10CDA2	112BGFV	28	65-07-16	a/ 8720	8.0	8.0	4200	3800	550	680	1200	38	8.1	15	508	0	6270	100	.9	37	10400	2.50	1100	11000	--
160-069-27ACD	112BGFV	141	79-09-11	2250	9.1	8.0	660	300	180	51	330	51	5.6	17	440	0	790	160	.4	28	1830	.23	370	100	680
160-069-31CAC1	112BGFV	37	79-08-15	1750	--	8.0	880	540	230	74	45	10	.7	8.5	420	0	330	190	.1	22	1330	6.70	200	100	760
160-070-23DDD	112BGFV	75	79-11-01	2150	8.3	5.0	220	0	59	18	590	85	17	8.6	672	0	630	210	.5	26	1810	.23	1000	380	260
160-072-29CBB	112BGFV	18	76-06-08	900	7.4	6.0	220	0	54	21	110	51	3.2	5.1	370	0	150	8.4	.2	22	560	.23	<20	1700	240
160-073-01BCB2	112BGFV	62	81-01-07	1220	--	5.0	250	0	61	24	130	52	3.6	4.4	350	0	190	8.1	.2	26	594	.23	290	970	80
160-074-21BBA	112BGFV	66	79-09-28	1980	--	7.0	270	0	73	21	370	74	9.8	5.6	513	0	410	99	.3	26	1290	.23	140	1300	<10
160-075-04CAA	112BGFV	34	79-08-15	6000	--	8.0	3100	2700	490	460	620	30	4.8	20	526	0	3600	310	.3	19	6230	5.90	270	140	1300
160-076-03BBB	112BGFV	53	80-11-12	1080	8.1	6.0	390	66	100	34	110	36	2.4	5.8	395	0	250	18	.2	25	706	.23	60	300	290
160-076-11CCC	112BGFV	111	80-11-12	2390	8.0	6.5	260	0	73	19	500	80	13	7.3	546	0	630	190	.2	25	1630	.23	370	160	120
160-076-23CCC2	112BGFV	92	79-09-28	1700	--	7.0	360	0	99	27	330	66	7.6	6.5	469	0	520	110	.4	27	1330	.16	650	550	100
160-079-06ACC	112BGFV	107	77-10-27	2200	7.3	12.0	360	0	90	33	360	68	8.3	7.2	571	0	370	210	.1	22	1360	.45	100	2800	160
160-082-29DCD	112BGFV	208	78-06-01	1300	7.6	--	340	0	85	31	200	55	4.7	9.8	873	0	.8	62	.6	25	869	.23	<20	8700	220
160-083-35CCC	112BGFV	82	79-09-13	3580	7.4	7.0	1900	1400	450	190	390	31	3.9	20	586	0	2200	22	.4	28	3750	.23	330	7200	480
161-069-21DDD	112BGFV	161	76-11-01	1550	7.4	5.5	900	610	210	91	280	40	4.1	16	355	0	1100	58	.3	25	2120	1.60	260	3200	680
161-071-08CBB	112BGFV	156	79-10-17	1400	8.0	5.5	350	0	97	26	190	54	4.4	6.3	491	0	350	25	.2	29	977	.23	520	650	360
161-071-08CDB	112BGFV	141	80-10-30	1220	8.1	6.0	270	0	68	24	210	62	5.6	5.6	525	0	220	68	.3	28	886	.05	580	50	300
161-077-23CCC	112BGFV	71	78-09-28	--	8.2	7.0	400	0	100	36	800	81	17	8.9	836	0	1100	260	.2	29	2650	.23	200	160	300
161-082-26BBB	112BGFV	84	78-10-25	a/ 3700	7.6	7.0	710	370	180	63	610	65	10	12	409	0	1000	470	.3	14	2590	.23	620	5300	480
162-070-08DAA1	112BGFV	180	73-12-08	2550	7.5	6.0	1600	1200	470	110	72	9	.8	9.7	501	0	1400	9.8	.5	30	--	--	--	<10	9200
162-075-07ABA	112BGFV	76	79-08-16	1290	7.5	7.0	790	310	210	64	41	10	.6	7.3	585	0	400	.6	.2	29	1130	.07	330	160	2000
162-075-07ACA	112BGFV	70	79-08-16	1480	7.7	7.0	750	270	200	61	52	13	.8	7.3	590	0	390	<.1	.2	30	1110	.11	230	360	2800
162-075-07BCD	112BGFV	70	79-08-16	1400	7.6	7.5	770	280	200	66	46	11	.7	7.3	595	0	390	.4	.2	30	1110	.07	300	950	1600
162-075-21DAA	112BGFV	70	77-11-29	1800	8.5	7.0	25	0	4.6	3.3	440	97	38	2.0	575	17	390	51	.1	16	1200	.43	1700	120	10
162-078-21BBB	112BGFV	123	77-11-30	2200	8.0	11.0	340	0	63	44	390	71	9.2	6.5	620	0	310	230	.1	18	1450	1.60	810	40	160
162-080-09BBC	112BGFV	40	79-06-26	1250	--	7.0	630	350	150	62	29	9	.5	3.6	346	0	240	97	.2	8.9	872	2.90	<20	<10	80
162-080-11ABA	112BGFV	144	77-11-30	2900	7.6	8.0	170	0	42	16	560	87	19	5.2	579	0	5.4	660	.1	22	1660	.23	760	40	140
162-081-16CCC	112BGFV	56	80-11-11	2600	7.7	6.0	880	490	230	74	380	48	5.6	10	478	0	1200	43	.2	24	2200	.23	700	1500	320
162-083-15CCD	112BGFV	238	79-10-15	5000	--	9.0	290	0	63	32	1000	88	26	8.5	528	0	.0	1500	.4	26	2840	.45	1400	160	140
163-070-15ABB	112BGFV	50	79-07-26	1400	7.1	8.0	800	390	210	67	92	20	1.4	7.5	502	0	570	11	.3	27	1270	.23	370	1200	1100
163-070-17ABC	112BGFV	238	78-06-27	2500	6.9	9.0	1600	1200	390	150	72	9	.8	11	469	0	1300	7.3	.2	27	2400	.49	590	5800	2100
163-071-26AAD	112BGFV	276	76-06-21	1800	7.3	7.0	1000	520	250	91	54	10	.7	16	585	0	610	3.7	.2	26	1410	.23	290	9900	4000
163-072-18BBC	112BGFV	367	79-10-23	1500	--	5.0	970	610	240	90	39	8	.5	7.5	441	0	660	5.3	.3	27	1380	.23	290	180	3200
163-073-10DCC	112BGFV	161	78-06-28	a/ 1860	7.3	6.0	750	370	220	89	52	13	.8	6.0	461	0	470	4.4	.2	22	1130	.23	440	7600	1800
163-073-11CCC3	112BGFV	220	78-08-29	1300	7.5	7.0	580	320	210	14	67	20	1.2	7.7	322	0	440	5.5	.1	21	957	.34	30	610	2500
163-073-27DDD	112BGFV	41	80-09-10	710	7.8	8.0	390	7	82	45	6.8	5	.2	3.6	467	0	28	4.7	.2	21	518	.23	0	10	680
163-075-15AAB2	112BGFV	158	76-08-23	1350	6.9	8.0	680	320	220	32	55	15	.9	11	447	0	440	7.9	.2	26	1070	.11	260	160	1100
163-076-10DDD2	112BGFV	323	78-08-17	1300	7.7	7.5	540	210	160	22	21	8	.4	5.7	400	0	250	3.7	.2	27	721	.23	200	40	1100
163-076-35DAB	112BGFV	57	78-07-05	a/ 1450	9.6	8.5	640	180	170	65	62	16	1.0	4.5	622	0	310	4.0	.2	31	985	.23	50	450	1700
163-079-14BBB	112BGFV	68	78-08-29	a/ 5010	7.7	9.0	560	0	140	51	1000	79	18	10	748	0	1400	500	.2	23	3470	2.50	880	80	160
163-080-02DCD	112BGFV	85	79-06-21	4500	7.6	7.5	2100	1700	290	330	290	23	2.8	52	506	0	1700	270	.5	16	3660	77.0	310	80	60
163-080-22AB8	112BGFV	150	79-06-21	5000	7.5	8.0	2300	1900	340	350	480	26	3.6	190	517	0	2600	140	.3	14	4660	56.0	250	1100	520
164-075-35DDC	112BGFV	146	66-10-19	1430	7.7	--	810	280	170	93	24	6	.4	9.8	636	0	330	2.6	.2	27	1030	.00	20	1100	--
164-075-36BB	112BGFV	105	66-10-17	1250	7.6	--	670	330	170	59	28	8	.5	6.7	417	0	380	3.3	.2	27	940	.00	550	560	--
164-075-36CBB	112BGFV	110	66-10-17	1390	7.5	--	730	360	190	59	38	9	.5	8.2	440	0	430	3.9	.2	26	1060	.05	360	160	--
164-075-36CBC	112BGFV	108	78-06-02	1400	7.1	7.2	810	300	240	51	40	10	.6	6.5	623	0	360	4.6	.2	27	1130	.23	200	970	1600
159-081-08DDA	112GLNB	181	79-09-10	1600	7.7	8.5	320	0	84	27	410	73	10	8.8	872	0	63	300	.4	26	1370	.16	130	1300	840
159-081-17AAA	112GLNB	206	77-08-19	2250	--	13.0	240	0	61	21	430	79	12	8.6	906	0	97	260	.2	26	1340	.23	240	20	360
159-081-20BBB	112GLNB	206	78-10-26	1500	7.4	8.0	210	0	59	15	440	61	13	7.7	874	0	84	280	.4	23	1360	1.10	260	730	320
	112GLNB	201	77-08-17	2800	--	10.5	230	0	61	19	540	63	15	9.2	735	13	22	550	.2	27	1530	.23	570	80	390
	112GLNB	201	78-10-25	1500	8.2	7.0	160	0	61	2.0	540	67	19	9.0	690	0	18	570	.3	25	1570	.23	490	120	320
159-082-05BBA	112GLNB	228	79-09-10	1100	8.1	8.0	260	0	51	32	190	61	5.1	8.2	725	0	3.3	42	.7	25	773	.23	70	40	160
159-082-05CCD	112GLNB	223	79-09-13	2400	8.1	8.0	310	0	84	24	510	78	13	8.6	789	0	580	130	.5	26	1790	.09	170	60	200

a/Value shown is the laboratory specific conductance.

LOCAL IDENTIFIER	GEOLOGIC UNIT	DEPTH OF WELL, TOTAL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (µMHO/CM AT 25°C)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE FET-FLD (MG/L AS HCO3)	CARBONATE FET-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	BORON, DISSOLVED (UG/L AS B)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
159-082-21AAA	112GLNB	151	77-08-19	1850	8.0	--	260	0	63	25	310	71	6.4	11	757	0	<1.0	250	.4	23	1050	.23	50	5000	320
	112GLNB	151	80-11-11	1850	8.0	7.0	260	0	64	24	330	73	8.9	9.3	772	0	.4	250	.7	22	1090	.23	30	5700	290
159-082-24ADA	112GLNB	177	77-08-19	2250	--	8.0	62	0	14	6.6	590	95	33	5.4	798	14	<1.0	490	.6	17	1510	.23	1300	1600	100
159-082-27AAD	112GLNB	162	77-08-19	1400	--	8.0	290	0	69	34	410	75	10	6.8	804	10	3.3	350	.5	21	1340	.23	590	1000	180
159-082-34DDC	112GLNB	241	77-11-30	1650	--	7.0	350	0	86	33	280	62	6.5	12	657	0	8.6	170	.1	22	1050	.11	190	2700	100
159-082-35BBB1	112GLNB	262	77-11-30	2000	--	8.0	250	0	62	23	380	76	10	6.1	858	7	2.9	270	.2	23	1170	.23	520	1000	160
159-082-35BBB2	112GLNB	181	77-11-30	1750	--	7.0	240	0	59	23	330	74	9.2	10	670	14	10	220	.4	23	1110	.23	330	870	140
160-082-14AAA1	112GLNB	193	80-11-11	2220	7.1	7.5	410	0	110	33	400	67	8.6	9.9	639	0	290	350	.2	26	1500	.23	320	3000	240
160-082-14AAA2	112GLNB	75	80-11-11	2420	7.8	7.0	750	350	210	55	380	52	6.0	8.7	486	0	1100	36	.2	23	2050	.23	320	1300	540
160-082-36AAA	112GLNB	151	80-06-09	2200	7.5	8.0	290	0	69	29	440	76	11	8.2	993	0	26	300	.5	29	1410	.23	330	650	400
160-083-35DDA	112GLNB	233	79-09-13	2280	7.6	7.5	370	0	97	31	410	70	9.3	9.8	916	0	21	350	.4	28	1400	.07	70	1300	160
161-081-31DDC	112GLNB	227	80-12-02	2900	8.0	2.0	360	0	110	21	500	74	11	9.9	634	0	16	680	.2	28	1660	.23	760	460	410
162-081-15DAD	112GLNB	285	79-09-27	1750	7.8	8.0	310	0	95	18	348	70	8.4	6.4	969	0	4.9	180	.4	30	1170	.29	450	1600	80
159-075-12A	112LKBO	33	77-10-26	1080	7.0	10.0	450	37	110	43	64	23	1.3	8.8	505	0	150	27	.1	17	690	.23	100	120	320
159-075-12BBC	112LKBO	25	67-07-07	979	7.5	8.9	410	0	130	18	69	27	1.5	3.9	503	0	120	18	.2	25	605	.00	160	360	--
159-075-12CAD	112LKBO	15	67-07-07	a/1470	7.7	7.2	480	120	86	44	156	41	3.1	2.3	437	0	310	35	.6	15	998	30.0	550	80	--
159-075-12CCC	112LKBO	28	67-07-17	a/2530	7.7	7.2	660	350	240	63	501	63	4.5	7.9	621	0	890	89	.2	22	1940	.00	20	4500	--
159-075-12DDD	112LKBO	52	67-07-17	a/1210	8.0	7.2	500	100	132	41	97	29	1.9	8.3	486	0	280	25	.2	17	843	.02	0	80	--
159-075-13BAA	112LKBO	31	67-07-17	a/913	8.0	6.7	340	0	105	18	87	36	2.1	5.0	511	0	78	17	.2	23	580	.00	60	900	--
160-074-13ACD	112LKBO	22	79-08-15	1250	--	5.5	750	340	120	110	36	9	.6	2.9	507	0	360	18	.4	27	1000	.54	130	60	240
160-081-02BBB	112LKBO	15	79-08-14	1400	--	10.0	600	180	120	73	97	26	1.7	10	508	0	260	88	.2	25	1010	1.20	170	790	340
160-081-04BBB	112LKBO	12	77-11-29	1500	8.3	10.0	650	230	130	79	96	24	1.6	14	909	0	270	110	.1	22	1020	.56	420	60	480
162-081-08AAA1	112LKBO	12	79-06-26	2120	--	7.0	810	71	190	81	60	7	.6	280	899	0	170	120	.1	11	1610	43.0	300	60	2700
162-081-08AAA2	112LKBO	8	79-06-26	525	--	6.5	250	10	68	22	3.7	3	.1	9.9	293	0	19	4.1	.2	7.9	290	.79	420	<10	<10
162-081-11BCC	112LKBO	12	79-06-27	2150	--	4.0	1300	740	310	130	42	6	.5	12	700	0	640	110	.1	10	1700	13.0	70	<10	<10
163-077-33AAA	112LKBO	26	79-08-14	1300	--	7.5	290	0	77	24	310	61	5.4	3.1	458	0	370	4.1	.2	25	975	.02	300	1700	280
163-081-09AAB1	112LKBO	14	79-06-20	850	--	3.0	430	68	92	49	23	10	.5	4.1	443	0	120	5.0	.3	13	531	.23	80	20	40
163-081-10ABD	112LKBO	15	79-06-20	600	--	9.0	290	110	65	31	10	7	.3	2.9	221	0	62	14	.2	17	371	13.0	80	80	<10
159-083-02BCC	112QTSH	12	65-07-16	a/1890	7.2	6.6	1200	630	320	84	31	5	.6	13	388	0	820	43	.0	15	1700	.20	200	1800	--
159-083-04BCB	112QTSH	10	65-07-16	a/1020	7.5	7.8	500	190	150	53	34	12	.7	16	388	0	240	8.5	.1	18	725	1.20	0	140	--
159-083-11CCC2	112QTSH	18	65-07-16	a/791	7.6	8.9	370	130	100	29	17	9	.4	7.6	297	0	140	3.5	.2	17	551	5.20	320	100	--
161-072-02BBB	112QTSH	53	79-10-15	1450	8.1	6.0	690	360	179	65	75	19	1.2	4.3	410	0	580	8.6	.2	27	1100	.23	290	510	360
162-070-20AAB	112QTSH	75	73-12-07	598	8.1	6.0	330	58	76	35	6.9	4	.2	3.3	361	0	35	4.1	.3	27	--	--	--	0	840
162-082-21DDA	112QTSH	11	79-06-27	2800	--	9.0	1300	980	280	190	95	12	1.1	59	629	0	730	330	.1	13	2230	4.30	200	120	2100
163-082-01ACD	112QTSH	12	79-06-14	800	8.0	5.5	300	60	80	24	19	11	.5	39	283	0	41	21	.1	16	545	20.0	150	0	80
163-082-03ACD	112QTSH	13	79-06-14	525	7.3	5.0	230	71	57	21	18	14	.5	15	194	0	100	8.3	.1	7.3	342	1.60	90	<10	20
163-082-28AAB	112QTSH	15	79-06-19	600	--	6.0	260	25	58	28	22	15	.6	12	287	0	26	29	.2	15	365	2.10	80	20	30
163-083-02CAA	112QTSH	12	79-06-13	1300	6.9	7.0	660	160	130	81	17	5	.3	7.1	611	0	98	9.6	.1	17	799	25.0	170	80	40
163-083-10ABA	112QTSH	12	79-06-13	380	7.3	5.0	170	17	42	16	9.1	10	.3	7.9	187	0	38	4.2	.1	12	238	1.40	30	100	40
163-083-22DCA	112QTSH	18	79-06-13	640	8.6	4.0	310	120	68	34	14	9	.3	4.0	233	0	130	7.3	.1	14	408	1.60	30	<10	20
162-069-11BBB	112ROLL	118	80-11-13	2100	--	5.0	1200	780	320	97	100	15	1.3	8.6	532	0	920	22	.2	26	1810	.23	240	4300	2200
162-069-17ADB	112ROLL	30	79-07-26	1000	7.3	6.0	480	140	120	44	43	16	.9	5.3	415	0	170	58	.2	23	665	3.20	800	80	220
162-069-17DCA	112ROLL	52	78-06-13	2900	6.9	6.5	940	480	230	89	140	24	2.6	15	566	0	760	28	.2	25	1690	.23	290	710	1600
162-069-20ABA2	112ROLL	29	79-07-26	925	7.5	6.0	440	170	110	40	38	16	.8	5.8	329	0	230	20	.3	22	639	.88	2100	430	220
162-069-20DDD1	112ROLL	153	79-10-30	2100	7.3	5.0	870	420	190	96	260	39	3.8	12	554	0	940	38	.4	28	1840	.07	420	4100	540
162-069-20DDD2	112ROLL	99	79-10-30	2000	8.2	5.0	950	490	220	97	210	32	3.0	12	562	0	910	39	.4	30	1860	.07	450	950	860
	112ROLL	99	79-10-30	2000	8.2	5.0	980	530	230	98	220	32	3.1	15	--	--	870	34	.3	33	1900	--	470	580	850
163-069-02BBB	112ROLL	106	80-11-13	1600	--	5.5	620	520	210	72	100	21	1.5	7.9	366	0	660	11	.3	28	1340	.23	180	40	2700
163-069-15AAA	112ROLL	100	78-10-04	2250	8.2	7.0	1300	920	360	97	100	14	1.2	15	463	0	1100	10	.2	26	2100	.60	390	80	1400
163-069-25CCC	112ROLL	121	79-11-01	1550	8.1	4.0	710	310	110	110	190	36	3.1	11	493	0	650	34	.4	29	1390	.05	520	120	940
164-069-28DDD	112ROLL	141	80-11-13	1520	--	6.0	690	520	240	71	57	12	.8	5.4	447	0	600	9.1	.3	29	1260	.23	180	1500	2400
160-071-05BAA	112SLVL	35	80-11-04	760	8.3	7.0	340	57	65	43	64	29	1.5	2.9	345	0	170	5.7	.2	23	591	.25	120	110	110
160-071-07AAA	112SLVL	41	80-11-04	965	8.3	6.5	280	0	66	28	140	52	3.6	4.2	421	0	220	11	.2	26	713	.23	30	180	130
160-071-07BBC	112SLVL	111	80-12-04	1450	8.1	6.0	200	0	46	21	290	75	6.9	6.3	680	0	240	28	.2	28	993	.05	180	20	10
160-071-07BCC	112SLVL	51	81-06-09	1500	7.7	7.0	600	4	130	67	150	34	2.7	17	727	0	360	7.6	.2	31	1120	.23	160	3400	500
160-071-16BBB	112SLVL	84	80-10-30	915	7.6	7.0	380	0	63	54	80	30	1.8	14	657	0	31	11	.1	30	592	1.20	0	3100	180
160-071-19DDD	112SLVL	32	80-10-29	645	8.3	7.0	260	0	51	32	77	39	2.1	2.2	452	0	30	8.8	.2	23	454	.23	210	2500	1100
160-071-21CCB	112SLVL	49	78-06-08	625	7.3	6.0	280	21	80	19	15	10	.4	1.6	316	0	50	6.2	.1	24	365	.45	420	1700	360
160-071-22DDD	112SLVL	51	79-09-20	1000	8.6	8.0	72	0	15	8.4	180	83	9.2	4.4	407	0	82	44	.4	22	516	.29	300	60	200
160-071-24DDD	112SLVL	103	80-10-27	1290	8.4	5.0	340	0	69	41	220	58	5.2	8.2	946	0	36	26	.2	27	887	8.20	320	150	200

a/Value shown is the laboratory specific conductance.

LOCAL IDENTIFIER	GEOLOGIC UNIT	DEPTH OF WELL, TOTAL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (µMHO/CM AT 25°C)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE FET-FLD (MG/L AS HCO3)	CARBONATE FET-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	BORON, DISSOLVED (UG/L AS B)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
160-071-26AAA	112SLVL	98	80-10-21	790	8.1	7.0	270	0	66	26	110	46	2.9	5.4	561	0	49	13	.1	27	572	.23	260	120	40
160-071-28AAA	112SLVL	44	80-10-28	420	8.1	7.0	200	0	52	17	28	21	.7	1.5	246	0	42	4.7	.2	26	301	.23	60	180	310
160-071-29ADD	112SLVL	44	80-10-29	600	7.9	7.0	320	49	84	27	18	11	.4	1.4	330	0	61	17	.2	25	430	.23	180	60	540
160-072-02AAA	112SLVL	32	79-10-31	1350	7.9	5.5	560	180	68	83	130	33	2.4	6.8	483	0	420	16	.2	25	1020	.20	130	850	180
160-072-03BBB1	112SLVL	81	80-12-03	1100	7.8	5.0	430	0	92	49	100	33	2.1	6.6	524	0	220	14	.2	24	754	.23	90	390	250
160-072-03BBC	112SLVL	71	80-12-04	1400	8.0	5.5	450	21	87	57	170	44	3.5	9.7	523	0	360	14	.1	24	983	.23	180	270	160
160-072-05AUD	112SLVL	101	61-01-07	1100	--	6.0	400	34	72	54	89	32	1.9	3.7	446	0	180	12	.1	22	601	.23	0	640	140
160-072-12AAB	112SLVL	45	79-10-31	1700	8.0	5.0	640	210	100	95	220	42	3.8	8.0	526	0	680	12	.2	26	1400	.16	0	810	260
160-072-12DAD	112SLVL	49	80-12-03	790	7.9	5.7	330	0	81	31	54	26	1.3	4.7	411	0	110	4.9	.1	26	531	.23	180	1500	300
160-072-12DDD	112SLVL	41	80-11-04	1450	8.2	7.0	540	0	49	100	180	41	3.4	17	495	0	130	21	.4	41	1090	.23	310	120	530
160-072-13CCC	112SLVL	24	79-09-17	900	7.5	8.0	440	7	80	58	120	37	2.5	7.2	528	0	270	6.5	.2	30	835	.34	500	750	620
160-072-13DDD	112SLVL	53	79-09-17	1000	8.7	10.0	70	0	22	3.7	230	87	12	5.5	596	0	79	8.3	.3	24	642	1.40	300	5900	460
160-072-24CCB	112SLVL	25	79-09-17	620	8.4	8.0	190	0	42	21	80	47	2.5	3.2	337	0	65	.2	.3	22	406	4.30	300	60	120
161-071-02BCD	112SLVL	32	74-11-06	820	8.1	5.0	360	93	100	27	23	12	.5	7.1	327	--	140	4.8	.1	25	506	--	110	80	590
161-071-02BDC	112SLVL	26	74-11-06	750	8.0	5.0	350	82	92	28	14	8	.3	5.2	321	--	110	3.1	.1	24	447	--	50	320	520
161-071-02CBB2	112SLVL	41	74-11-06	880	8.2	5.0	390	120	98	35	23	11	.5	5.1	331	--	160	5.3	.1	24	523	--	80	60	370
161-071-02CBC1	112SLVL	20	74-11-13	800	8.0	5.0	420	130	91	48	23	10	.5	4.1	363	--	170	5.1	.2	24	566	--	90	20	140
161-071-03BCC2	112SLVL	38	79-10-17	1550	7.9	5.0	820	440	200	78	76	17	1.2	7.5	467	0	610	10	.2	24	1350	.23	320	1300	200
161-071-03CCD	112SLVL	32	74-11-05	880	8.1	5.0	420	120	73	57	14	7	.3	4.8	360	--	140	4.7	.2	25	532	--	70	<10	20
161-071-03CDC1	112SLVL	32	74-11-05	880	8.1	5.0	410	120	83	50	17	8	.4	4.9	356	--	150	5.1	.2	25	529	--	90	<10	<10
161-071-03CDD1	112SLVL	39	74-11-05	700	8.0	5.0	330	130	78	33	7.5	5	.2	3.1	249	--	130	4.9	.1	22	438	--	40	20	90
161-071-03CDD4	112SLVL	38	74-11-21	600	7.8	5.0	280	64	66	27	12	9	.3	3.3	256	--	83	3.3	.1	23	364	--	60	20	50
	112SLVL	38	74-11-21	450	7.7	5.0	280	70	65	29	13	9	.3	3.6	258	--	83	3.4	.1	23	365	--	50	30	40
	112SLVL	38	74-11-22	500	--	5.0	170	--	23	27	13	14	.4	3.4	--	--	70	.1	<.1	<.1	--	--	90	<10	30
	112SLVL	38	74-11-25	500	7.7	5.0	280	69	65	29	13	9	.3	3.5	259	--	80	2.3	.1	23	323	--	50	<10	40
	112SLVL	38	74-11-27	500	7.7	5.0	280	71	66	29	13	9	.3	3.4	260	--	83	2.3	.1	23	362	--	80	<10	30
161-071-04CCC	112SLVL	41	80-12-04	850	8.1	4.9	410	100	97	41	46	19	1.0	3.9	375	0	200	5.4	.1	24	601	.23	60	80	350
161-071-07DDD1	112SLVL	78	80-12-03	1250	7.8	5.5	490	100	120	46	130	36	2.6	6.3	473	0	350	8.7	.1	26	930	.05	150	1200	420
161-071-08BCB	112SLVL	38	80-11-05	1220	8.0	6.5	590	260	160	46	97	26	1.7	6.1	403	0	430	11	.2	26	993	.23	90	450	410
161-071-08DCD	112SLVL	40	80-10-29	880	7.4	6.0	440	160	110	40	44	18	.9	3.7	317	0	250	7.3	.2	24	668	.23	30	500	310
161-071-09CCC	112SLVL	39	80-11-06	890	8.2	7.0	390	110	88	41	91	33	2.0	4.2	337	0	310	7.4	.2	24	750	.23	150	70	300
161-071-10BAB	112SLVL	30	73-12-13	895	7.8	5.0	400	100	100	37	45	19	1.0	4.9	364	0	190	5.2	.2	26	--	--	--	<10	240
161-071-15BBA	112SLVL	51	80-11-05	875	7.7	7.0	500	140	110	55	27	10	.5	3.1	445	0	190	11	.2	25	629	.23	260	2000	490
161-071-16AAB2	112SLVL	60	79-07-25	620	7.7	12.0	340	100	86	30	19	11	.6	4.2	290	0	130	1.9	.2	26	415	.81	530	200	360
161-071-16ABA	112SLVL	65	79-07-25	800	7.6	8.0	360	110	85	36	18	10	.4	3.8	303	0	140	3.6	.2	25	458	1.10	270	950	440
161-071-16BCC	112SLVL	40	80-11-06	760	7.8	6.0	410	130	89	46	27	12	.6	2.6	336	0	190	7.4	.2	26	560	.23	60	270	480
161-071-16CCD	112SLVL	29	80-11-06	860	7.9	6.5	490	32	100	58	27	11	.5	3.8	558	0	93	7.8	.2	27	600	.23	60	2100	630
161-071-16CDD	112SLVL	30	80-11-05	690	8.1	7.5	360	95	80	39	23	12	.5	2.9	323	0	140	6.4	.2	26	500	.23	90	20	200
	112SLVL	30	80-11-06	860	7.9	6.5	490	31	100	58	27	11	.5	3.8	558	0	93	7.8	.2	27	600	.23	60	2100	630
161-071-16DCD1	112SLVL	28	80-11-05	840	7.7	7.5	460	140	97	53	23	10	.5	3.0	392	0	190	8.4	.2	27	615	.05	0	1000	540
161-071-22BBB	112SLVL	23	79-10-18	1050	8.3	8.0	600	180	120	73	32	10	.6	5.3	518	0	250	7.5	.2	27	799	.23	130	550	380
161-071-28BAB	112SLVL	26	78-11-01	750	8.5	8.0	360	130	86	40	18	9	.4	3.6	308	0	160	10	.1	21	508	.23	0	60	500
161-071-29AAB	112SLVL	32	79-10-18	800	8.4	7.0	400	87	91	42	34	15	.7	3.8	382	0	170	9.4	.2	26	577	.23	160	100	440
161-071-29DAD	112SLVL	25	80-11-04	565	8.4	6.5	300	69	71	30	15	10	.4	1.4	282	0	100	5.1	.2	25	373	.23	30	70	380
161-071-32DCC	112SLVL	25	79-10-31	1050	8.0	5.0	400	24	91	42	140	43	3.0	5.8	459	0	330	7.4	.2	27	845	.23	100	490	140
161-071-33CDD	112SLVL	35	79-10-25	1450	--	6.0	530	73	110	62	180	42	3.4	7.9	557	0	470	8.6	.2	26	1150	.23	230	1500	200
161-072-01DDD	112SLVL	36	79-10-25	1250	--	5.0	560	220	120	63	72	22	1.5	5.8	417	0	360	6.6	.2	24	891	.20	290	160	250
161-072-35CCD	112SLVL	71	81-06-10	1000	7.8	4.5	370	0	97	31	97	36	2.2	8.4	468	0	200	11	.2	28	701	.23	100	1700	360
161-072-35DDD	112SLVL	91	81-06-11	1400	7.8	6.8	500	0	100	61	150	39	2.9	13	668	0	290	13	.2	27	958	.23	30	1600	250
162-071-36CBC1	112SLVL	84	73-12-12	2220	7.9	5.5	370	0	110	24	380	68	8.6	14	545	0	690	53	.3	27	--	--	--	20	910
162-071-36CBC2	112SLVL	55	79-10-18	2000	8.3	7.0	590	230	180	34	270	49	4.8	11	836	0	710	56	.2	28	1530	.23	680	260	840

LOCAL IDENTIFIER	GEOLOGIC UNIT	DEPTH OF WELL, TOTAL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (µMHO/CM AT 25°C)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE FET-FLD (MG/L AS HCO3)	CARBONATE FET-FLD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	BORON, DISSOLVED (UG/L AS B)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
163-076-16BAD3	125CBLO	153	79-10-04	2200	8.3	9.0	1500	1200	390	130	46	6	.5	9.2	376	0	1300	10	.2	27	2310	.23	360	0	2500
160-074-12BAB	211FXHL	188	77-10-26	3750	7.8	15.0	57	0	13	6.0	820	97	47	4.5	813	0	.0	870	.1	11	2300	.23	190	300	20
160-080-02DDD	211FXHL	170	77-10-27	6000	7.5	15.0	110	0	27	10	1200	96	50	5.6	616	0	2.5	1610	.1	11	3300	.23	140	200	40
160-083-27CD	211FXHL	500	65-07-16	a/4070	8.2	6.1	54	0	16	3.4	926	97	55	3.2	946	0	48	930	.4	9.4	2410	.50	2600	1700	--
161-072-23CCC	211FXHL	92	78-10-04	2000	8.6	6.5	210	0	45	24	630	86	19	10	593	0	1000	63	.4	16	2120	1.90	820	280	80
161-072-34ADB	211FXHL	80	78-06-12	1000	7.5	7.0	230	0	58	21	230	68	6.6	4.9	450	0	350	15	.1	25	963	.84	340	80	140
161-075-13BBB	211FXHL	162	77-11-09	1100	7.6	13.0	130	0	35	10	200	76	7.7	4.1	444	0	83	79	.1	23	680	.07	520	<10	120
161-076-25AAA1	211FXHL	120	77-11-09	2400	6.9	7.0	190	0	52	15	490	84	15	4.7	865	0	190	250	.1	21	1460	.23	910	280	150
161-079-28CCC	211FXHL	184	77-11-29	5500	7.7	11.0	160	0	43	13	940	92	32	6.1	487	0	4.1	1300	.1	23	2570	.23	1300	1160	120
161-080-12AAA	211FXHL	120	79-07-11	2200	7.4	7.5	140	0	36	12	450	87	17	5.1	516	0	2.9	500	.6	28	1260	.23	630	1300	80
161-080-22DDD	211FXHL	190	79-07-11	5700	8.0	8.0	300	0	60	36	1100	88	28	11	667	0	37	1500	.3	14	2850	1.60	1900	260	120
161-080-23CCC1	211FXHL	180	79-07-11	6000	7.9	9.5	71	0	22	3.9	1100	97	57	4.1	646	0	6.6	1400	.3	13	2770	.23	1800	870	40
161-083-23DDD	211FXHL	450	78-11-02	a/11300	8.1	9.0	250	47	73	17	2500	95	68	8.7	248	0	16	4000	.2	2.2	6690	7.20	1800	20	260
161-084-24DDD	211FXHL	488	79-10-04	a/10700	7.9	8.0	300	91	93	16	2900	95	73	9.4	252	0	9.1	4700	.3	5.6	7200	.23	2300	830	120
162-070-20DBA	211FXHL	285	78-06-26	1800	7.6	--	500	160	110	55	230	49	4.5	10	415	0	610	43	.1	14	1310	.23	200	2600	160
162-074-29DAD	211FXHL	127	77-11-29	2000	8.7	9.0	30	0	6.1	3.7	490	97	39	2.4	532	7	580	10	.2	7.7	1380	.56	2100	610	20
162-076-05DAA	211FXHL	84	79-10-04	1800	8.7	9.0	80	0	17	9.1	510	93	25	3.5	761	9	410	110	.2	17	1410	.14	650	80	60
162-080-35ADD	211FXHL	155	79-06-26	a/2340	7.6	9.0	95	0	24	8.5	480	91	21	3.7	495	0	2.5	510	.6	11	1250	.11	430	790	<10
162-080-35BBB	211FXHL	166	79-06-26	a/2190	7.8	9.5	10	0	2.2	1.1	500	99	69	3.9	618	0	<1.0	410	.6	11	1250	.23	470	60	<10
162-082-16AAB	211FXHL	300	79-06-27	7900	--	6.5	140	0	43	7.9	1700	96	63	7.1	382	0	6.6	2500	.2	3.9	4060	.23	1000	280	<10
162-082-17ABB1	211FXHL	200	79-06-27	7000	--	7.0	79	0	24	4.6	1400	97	69	4.4	398	0	23	2000	.3	7.0	3260	.23	1300	220	<10
163-072-14ABB	211FXHL	596	78-09-28	1600	8.3	8.0	26	0	7.0	2.1	410	97	35	3.0	491	0	420	59	.4	13	1190	1.20	1300	200	60
163-073-11CCC1	211FXHL	412	78-09-26	1250	8.6	7.0	20	0	5.3	1.7	340	97	33	2.6	496	6	260	48	.5	7.3	818	.25	230	750	60
163-074-15ABA1	211FXHL	516	78-09-27	2300	8.6	7.0	290	0	100	9.7	570	81	15	5.7	444	0	1100	17	<.1	9.8	2110	.07	620	530	120
163-075-15AAB1	211FXHL	515	78-09-27	1500	8.9	9.0	39	0	4.9	6.6	360	95	25	4.2	661	0	230	53	.5	2.7	990	.36	1100	2100	80
163-076-15AAB	211FXHL	84	77-12-01	5500	7.3	6.0	460	0	120	39	1300	86	26	7.5	1200	0	2000	150	.1	13	4270	.56	2100	13000	480
163-080-26DDC	211FXHL	160	79-06-21	2050	--	8.0	54	0	12	5.8	460	94	27	4.3	654	53	210	150	.5	8.4	1240	.23	270	240	40
159-083-03ABC	211MLCK	290	65-07-16	4450	8.2	8.9	37	0	12	1.7	1030	98	74	2.2	860	0	36	1100	.6	6.0	2620	.29	3100	340	--
159-083-03DAA	211MLCK	266	79-08-13	4000	7.9	12.0	50	0	11	5.5	1000	98	61	2.8	844	0	11	1100	.6	10	2690	.23	1700	100	80
	211MLCK	266	79-08-13	4000	7.9	12.0	41	0	11	3.8	1000	98	68	3.6	--	--	15	1100	.7	8.9	2400	--	2600	30	20
159-083-10DDA	211MLCK	247	77-10-26	3750	8.1	14.0	17	0	1.8	3.0	850	99	90	2.5	962	0	.8	790	.4	8.4	2140	.23	100	220	0
159-083-11ABA	211MLCK	408	65-07-16	a/4240	7.8	7.8	390	130	84	43	800	81	18	8.2	316	0	880	710	.1	2.0	2720	.41	1700	11000	--
162-073-06ABA	211MLCK	214	78-06-15	2000	8.2	7.0	640	130	190	40	240	45	4.1	8.1	620	0	610	8.6	<.1	17	1470	.23	830	8200	180
162-073-25AAD	211MLCK	260	78-06-15	1600	8.2	10.0	16	0	6.3	.1	390	98	42	2.1	610	0	260	51	.5	17	1050	.23	2100	240	60
163-073-11CCC2	211MLCK	275	78-09-21	1400	8.4	6.9	740	440	210	52	80	19	1.3	6.6	371	0	610	8.9	.1	17	1250	.23	160	320	880
163-074-15ABA2	211MLCK	363	78-09-21	a/2460	8.2	7.5	45	0	14	2.4	550	96	36	3.0	668	0	690	16	.1	23	1720	.90	550	280	80
163-074-16BAB	211MLCK	392	78-06-28	2300	7.7	8.0	1200	980	250	140	130	19	1.6	10	267	0	1200	9.5	<.1	13	1990	.23	730	16000	280
163-076-27CAA	211MLCK	200	77-12-01	2300	7.8	6.5	440	0	120	34	410	66	8.5	9.1	679	0	750	8.1	<.1	9.9	1710	.23	620	6800	230
159-072-11BCC	211PIRR	213	78-06-07	4000	8.4	--	39	0	12	2.2	850	98	59	5.9	750	0	8.1	900	.5	43	2200	.23	2200	830	60
164-070-31BDB	211PIRR	217	78-06-14	2400	7.0	7.5	1200	600	330	91	170	23	2.1	12	728	0	970	16	.1	22	2220	.23	490	15000	420

a/Value shown is the laboratory specific conductance.

Table 5.--Chemical analyses of water from streams during low flow

	161-071-10AAB Wolf Creek	161-071-28BAA Wolf Creek	162-070-08DAA Ox Creek	162-070-20AAD Ox Creek
Date of sample	4-08-80	4-08-80	9-18-79	9-18-79
Streamflow, instantaneous (ft^3/s)	1.87	3.09	--	--
Specific conductance (umho/cm @ 25°C)	650	580	800	1300
pH (units)	7.9	8.3	9.2	9.8
Temperature (Deg C)	.5	1.0	16.0	15.0
Hardness (mg/L as $CaCO_3$)	340	280	250	730
Hardness, noncarbonate (mg/L $CaCO_3$)	140	130	56	470
Calcium, dissolved (mg/L as Ca)	70	50	31	79
Magnesium, dissolved (mg/L as Mg)	40	38	42	130
Sodium, dissolved (mg/L as Na)	20	17	6.5	65
Percent sodium	11	11	5	16
Sodium adsorption ratio	.5	.4	.2	1.0
Potassium, dissolved (mg/L as K)	7.8	10	9.1	20
Bicarbonate (mg/L as HCO_3)	241	188	237	318
Carbonate (mg/L as CO_3)	0	0	0	0
Sulfate, dissolved (mg/L as SO_4)	180	160	79	530
Chloride, dissolved (mg/L as Cl)	9.7	6.8	<.1	76
Fluoride, dissolved (mg/L as F)	.2	.1	.1	.2
Silica, dissolved (mg/L as SiO_2)	17	15	10	35
Solids, residue at 180°C dissolved (mg/L)	512	426	350	1160
Nitrogen, nitrate dissolved (mg/L as N)	.23	.23	.32	.41
Boron, dissolved (ug/L as B)	60	0	30	330
Iron, dissolved (ug/L as Fe)	80	50	20	140
Manganese, dissolved (ug/L as Mn)	100	20	100	80