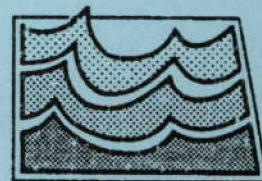

**THE WEST FARGO AQUIFER SYSTEM,
CASS and RICHLAND COUNTIES, NORTH DAKOTA
& CLAY, NORMAN and WILKIN COUNTIES, MINNESOTA:
GROUND-WATER DATA: VOLUME B**

By

**David P. Ripley,
Michael H. Hove,
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**North Dakota Ground-Water Studies
Number 106 - Part I
North Dakota State Water Commission
David Sprynczynatyk, State Engineer**

**Prepared by the
North Dakota State Water Commission
In cooperation with the
Southeast Cass Water Resource District**



ND State Water Commission

1997

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**TABLE OF CONTENTS
VOLUME B**

	<u>Page</u>
INTRODUCTION	B 1
PURPOSE	B 3
LOCATION-NUMBERING SYSTEM	B 3
ACKNOWLEDGEMENTS	B 5
EXPLANATION OF DATA TABLES AND METHODS OF DATA COLLECTION	B 6
REFERENCES	B 11

ILLUSTRATIONS:

FIGURES

1. Map showing the study areaB 2
2. Location-numbering systemB 4

TABLES

VOLUME A

- 1A. Table of inventory of wells and test holes for townships
135 to 138 (lithologic logs where available)A 18

VOLUME B

- 1B. Table of inventory of wells and test holes for townships
139 to 143 (lithologic logs where available)B 18

VOLUME C

2. Table of water levels in observation wells and
piezometersC 18
3. Table of chemical analysesC 212
4. Table of stable isotope analysesC 224
- 5A. Table of water use data sourcesC 225

5B.	Table of Minnesota municipal water use (excluding Moorhead)	C 226
5C.	Table of North Dakota municipal water use (excluding Fargo & West Fargo)	C 227
5D1.	Table of Moorhead water use from different sources	C 228
5D2.	Table of Moorhead water use from different points of diversion	C 230
5E1.	Table of Fargo water use (Red River surface water and Fargo aquifer)	C 232
5E2.	Table of monthly Fargo water use (Fargo aquifer)	C 232
5F.	Table of West Fargo water use	C 233
5G.	Table of Minnesota nonmunicipal ground-water use	C 234
5H.	Table of North Dakota nonmunicipal ground-water use	C 235
5I.	Table of summary of water use from different sources	C 236
6A.	Table of selected location name duplications listed by current location name	C 238
6B.	Table of selected location name duplications listed by name used in literature	C 239
7A.	Table of Minnesota community water supply sources in the study area	C 240
7B.	Table of North Dakota community water supply sources in the study area	C 241

PLATE

1. Plate showing most of the locations associated with the data presented in this data report(back cover of report)

INTRODUCTION

The West Fargo aquifer system (WFAS) is located predominantly in eastern Cass County and northeast Richland County. The WFAS is comprised of three aquifers that underlie an area of 10 square miles or more, and numerous, smaller subaquifers. The three aquifers of 10 square miles or more are called the West Fargo North aquifer, the West Fargo South aquifer, and the Horace aquifer. These aquifers are indirectly connected, as are many of the numerous, smaller subaquifers. The nature of the indirect connections between the aquifers and the subaquifers vary, both in nature and in degree. The total area underlain by all of the aquifers or subaquifers in the WFAS is estimated to be about 90 square miles.

Across the river in Minnesota there are additional small subaquifers, and the Buffalo aquifer. In order to ascertain if there are any connections between the WFAS and the aquifers and subaquifers in Minnesota, the study area was expanded to include part of Minnesota. Thus the study area incorporates several townships that lie partly or entirely in Minnesota. The total study area (see Figure 1) incorporates about 1,550 square miles.

The WFAS has been used as a source of water for over 100 years, dating back to the late 1800's. The utilization of the WFAS as a source of water has increased over this same time period, and as a result, the water levels in all known portions the WFAS have continued to go down in elevation. Concern over the long-term viability of the WFAS

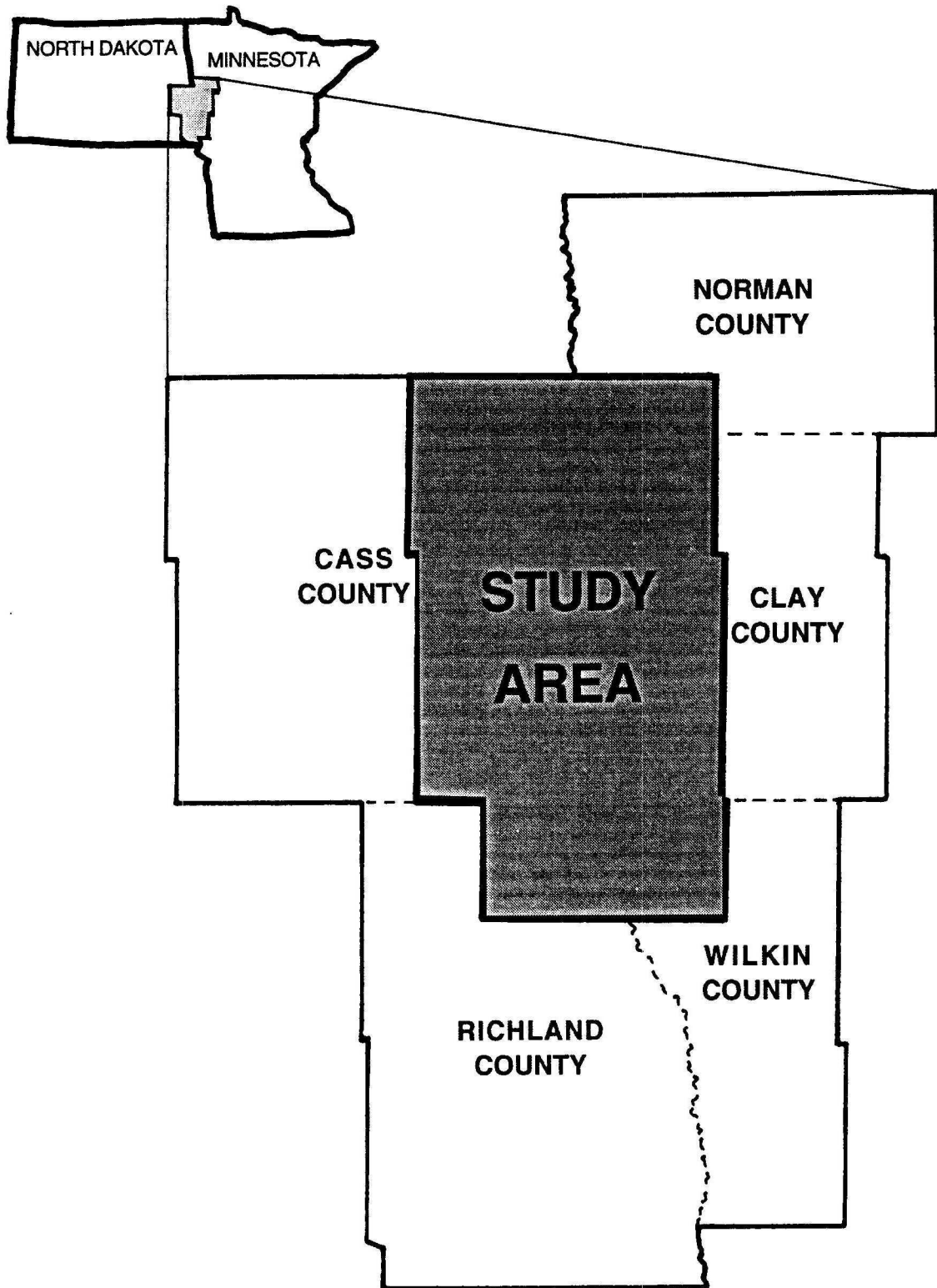


Figure 1. Location diagram of the study area.

led to the Southeast Cass Water Resource District's sponsorship of this study of the West Fargo aquifer system.

The study is divided into two parts. Part I is a compilation of the geologic and hydrologic data collected during this and previous investigations, as well as data that was not associated with any previous study. Part II is a report that discusses the ground-water resources of the study area.

PURPOSE

The purpose of this investigation was to define the nature of the ground-water resources in the vicinity of eastern Cass County, and northeastern Richland County.

LOCATION NUMBERING SYSTEM

The location numbering system used in this report (fig. 2) is based on the Federal system of rectangular surveys of the public lands. The first numeral denotes the township, the second denotes the range, and the third denotes the section in which the well or test hole 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 hectare tract); thus, well 139-049-04ADD would be located in the

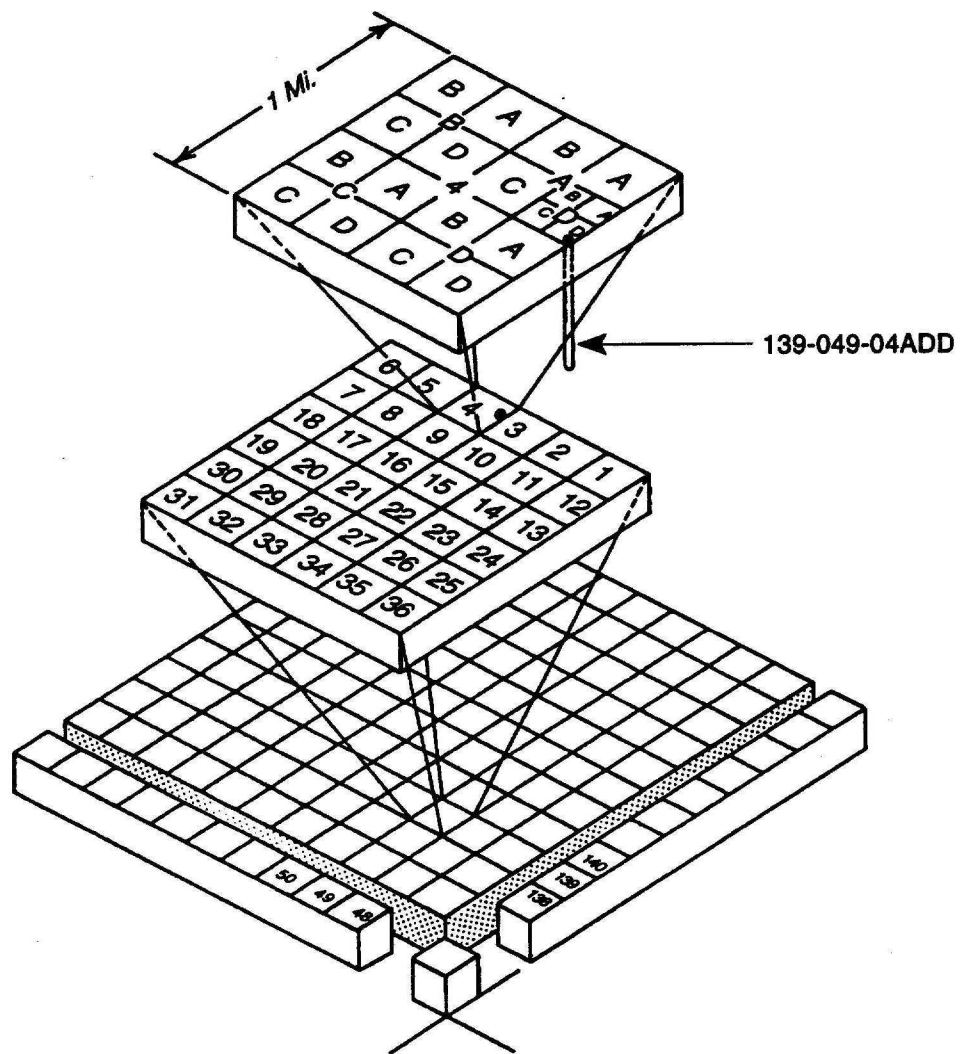


Figure 2. Location-numbering system.

SE1/4 of the SE1/4 of the NE1/4 of Section 4, Township 139 North, Range 49 West. Consecutive terminal numbers are added if more than one well or test hole is recorded within a 10-acre (4-ha) tract. Thus 139-049-04ADD3 would be the third location in the 10-acre area described by 139-049-04ADD.

In this study each 10-acre area sometimes was further divided into 2.5, 0.625, and 0.15625 acre areas in the same manner described above. Thus, well 139-47-08BACADB is located in the NW1/4 of the SE1/4 of the NE 1/4 of the SW1/4 of the NE1/4 of the NW1/4 of Section 8, Township 139 North, Range 47 West.

ACKNOWLEDGEMENTS

Local sponsorship of this study was provided by the Southeast Cass Water Resource District. Additionally, data pertaining to the water resources of the area have been gathered from numerous reports mentioned in the references, and from Cliff McLain (city of Moorhead), Bob Welton (city of Fargo), Sean Hunt (Minnesota DNR), Ken Harris & Tim Wahl (Minnesota Geological Survey), Pat McCollum (Cass Rural Water Users, Inc.), Arlen Kotta (city of Comstock), and Scott Lofgren (city of Glyndon). A special thanks to Florenz Bjorson, former mayor of West Fargo, who was part of many early discussions that led to this study.

EXPLANATION OF TABLES AND METHODS OF DATA COLLECTION

The data in this report are listed in tables 1-7. The data consist of the following: 1) an inventory of selected locations that have wells, piezometers, and test holes, with associated lithologic logs where they are available; 2) water-levels in selected wells and piezometers (up to 1996); 3) chemical analyses of ground water samples (up to 1996); 4) stable isotopic analyses of ground water samples (up to 1996); 5) historic water use (up to 1995); 6) a list of duplicate names and locations of wells; and 7) a list of community water supplies.

Depths, water quality, lithologies, and water levels of 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 materials and varying water quality in some aquifers. Some of the data listed in this publication has been presented in other reports. Because the data is distributed in so many other reports (about 40 to 50 of the reports listed in "Selected References"), this report makes an effort to list all of the previously reported data. Every effort has been made to amalgamate the data so that all data associated with one physical well is listed under one well descriptor.

Most of the locations associated with the data presented in these tables are shown on the map of the study area presented in Plate 1 found in the back of each volume of the data report.

Lithologic Logs of Wells, Piezometers, and Test Holes

Lithologic logs collected from water-well contractors and other sources and logs of test holes drilled as part of this investigation are included in Table 1. Minor changes in word order have been made on some of the contractor's logs, and logs of some of the test holes drilled during this and prior investigations. Geophysical logs are available for some test holes. These logs are useful for geologic correlation purposes. The geophysical logs are not published in this report but are available for inspection at the North Dakota State Water Commission office in Bismarck, ND. Grain-size determinations refer to the Wentworth (1922) size scale.

SWC observation wells constructed prior to this study were completed with 1 1/4" or 2" diameter ABS (acrylonitrile-Butadiene-Styrene) or PVC (polyvinyl chloride) pipe. The screens in these wells were generally 3 to 10 feet in length and either plastic, galvanized, or stainless steel with an attached check valve joined to the bottom of the pipe. The screens were most commonly 0.018 or 0.012 inch slot size. The components of an observation well were assembled on the ground at the drill site and then placed into the drill hole. The screen was set at the desired depth, the well back-flushed with clear water to clean the aquifer material and bore hole of drilling fluid, and

compressed air pumped into the well to collapse the formation around the screen. The annulus was filled to ground level with drill cuttings. Each new observation well was pumped for several hours to assure a good hydrologic connection between the well and the aquifer. Pumping was accomplished with an airline connected to a small, trailer-mounted air compressor driven by a gasoline engine.

Piezometers were constructed for this study. Construction of the piezometers involved the drilling of a deep test hole to evaluate the lithology to determine the number of piezometers to be installed at a particular site. This deep test hole (in most instances) also served as the hole for the deep piezometer, if the deepest desired screened interval was close to the bottom of the hole. First, the appropriate length of casing and screen were placed into the test hole. Silica sand was then placed around the screen using a tremie pipe with the lower end located a couple of feet above the top of the screen. After the silica sand was installed around the screen the lower end of the tremie pipe was lifted so that the bottom of the tremie pipe was a few feet above the top of the sand pack. Neat cement grout or high solids bentonite grout was then pumped down the tremie pipe and upward in the annular space. This process continued until the grout filled the entire annulus up to land surface. If the grout settled, additional grout was poured or pumped down the hole until the annular space was filled to land surface.

A day or two passed to allow the grout to "set", and then the piezometers were slugged with a small quantity of fresh water and

pumped with air for development. Each new piezometer was pumped for several hours to assure a good hydrologic connection between the piezometer and the aquifer. Subsequent piezometers, if necessary, were completed at each site by moving the drilling rig ahead 10 to 20 feet, drilling the next hole, and repeating the above described process.

Water Levels in Selected Wells and Piezometers

Table 2 lists the monthly, quarterly, and intermittently measured water levels in selected wells and piezometers, in feet below or above land surface and in elevations. The reference datum for land-surface elevation is the National Geodetic Vertical Datum (NGVD). The elevation of the land surface and/or measuring points at most sites in the database have been determined through the use of the U. S. Geological Survey 7 1/2 minute quadrangle (topographic) maps. The sites were located on the topographic map, and the elevation determined from the map. In most instances this was done in the field, and in some instances this was accomplished in an office environment. The sites determined in this fashion generally are determined to the nearest foot. Most of the observation wells and piezometers that have water level measurements associated with them have had the elevation more accurately determined through the use of differential leveling. The sites determined in this fashion are generally surveyed to the nearest tenth or hundredth of a foot.

Chemical Analyses of Ground-water

The analyses of the chemical composition and physical properties of water are reported in the Table of Chemical Analyses (Table 3). Most of these chemical analyses were done in the SWC chemical laboratory. The SWC chemical analyses were conducted on water samples collected from selected production wells, observation wells, and piezometers. The water sampling procedure involved the collection of 250 or 500 milliliters (ml) of raw water, filtered water, and filtered and acidified (nitric acid) water. Field measurements of specific conductance and water temperature were also made. Water temperature was, however, measured at land surface and does not represent an in-situ temperature. The pH was measured in the lab. Water samples were collected from domestic, industrial, and city supply wells by using the existing pumps. SWC observation wells and piezometers were sampled using several methods: these methods include bladder, gas squeeze, and peristaltic pumps, as well as airlift, and bailing procedures.

Airlift sampling was accomplished with a small diameter rubber hose attached to a portable air compressor. Sampling with a bailer involved the removal of at least two casing volumes of water by airlift and/or bailing techniques to introduce formation water into the well. After evacuating at least two casing volumes of water, a variable-capacity, point-source, bailer (pvc material) was lowered to just above the top of the well screen, except when the water level was close to the screened interval, in which case the bailer was extended into the

screened interval. Bailing continued until enough water was secured for the sample.

Stable Isotope Analyses of Ground-water

Samples from selected wells were analyzed for the stable isotopes ^{18}O (oxygen-18) and ^2H (deuterium). The results are listed in Table 4. The samples were filtered with a 0.45 micron filter and collected in 40ml bottles that were sealed with Teflon tape. No preservatives were used. The bottles were completely filled with no air headspace. The samples were refrigerated and kept out of direct sunlight.

Water Use

Historic water use in the study area dates back to the late 1800's; however, the first documented water use dates back to 1903. Documented water use records have been kept and/or reported by a number of different entities over the last 94 years. The result is a patchwork of water use records involving different time periods, with different categories, and different groupings in the amalgamation of reported water use. The water use tables (Tables 5A to 5I) make an effort to capture the recorded water use in as specific a manner as is possible, given the nature of the water use records.

In 1965 the SWC began requiring water use reports for all North Dakota water permit holders. The reporting method was self-reporting on the part of the permit holder in response to a mailing. In 1977 a cooperative effort between the U. S. Geological Survey (USGS) and the SWC was developed for the purpose of gathering more accurate water use data. From 1978 to 1982 the accuracy and the rate of reporting water use records steadily improved. Since 1983 the statewide record is generally about 94% complete, and reasonably accurate, depending on the permit holder.

In 1938 Minnesota began to collect water use data from some large permit holders. In the 1970s they began to collect water use data from all permit holders. Data collected before 1978 is on microfiche. After 1978 the water use data is on paper, and is not easily accessed, however it can be retrieved. Some computerization of the water use data records started in the late 70s, however due to the evolution of the changing computer systems, the record keeping was not stable until 1987. The first water use data considered reliable and accessible starts in 1988. The statewide record is generally about 93% complete, and moderately to fairly accurate, depending on the permit holder.

The city of Fargo has records of its use of water from the Red River that go back to 1946. The city of Moorhead has water use records that go back to 1952. Earlier Moorhead and Fargo water use data is taken from Byers et al (1946), Dennis et al (1949), and Wolf (1981). There are several amalgamations in the Moorhead water use data. The individual sources are listed and a combined total developed from the sum of those individual sources. A more accurate total is

listed in the "METERED TOTAL" column. This discrepancy is predominantly a result of the practice of bypassing the softening basin with the Moorhead East well water from 1952 until 1978. The well water that bypassed the softening basin wasn't metered. The remaining differences are the result of meter accuracy differences (1979-1995).

Well Location Descriptors

In the effort to characterize the historic water levels and the water quality of the different aquifers in the study area, many old records, raw data sheets, and old reports were investigated. Particularly useful for old water levels were the USGS Water Supply Papers that reported water levels and artesian pressures from the 1930s to the 1970s. These reports (and other reports) listed locations that had well descriptors that would sometimes change through time, and sometimes would be called more than one thing at a time. At different times the well would be described with a reference number, or a reference name, or a geographical description. Tables 6A and 6B are the results of an effort to identify the different descriptors that have been used for data sites that have had varying names.

Community Water Supplies

To identify the source of water supply for the many communities in the area, an effort was made to identify all known communities with a listing of their respective sources of water (Table 7). Table 7A lists the Minnesota communities, and table 7B lists the North Dakota communities.

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**TABLE 1B. TABLE OF INVENTORY OF WELLS AND TEST HOLES FOR
TOWNSHIPS 139 to 143 (lithologic logs where available)**

139-047-01B

Date Completed: 00/00/00
L.S. Elevation (ft): 915
Depth Drilled (ft): 0
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Irrigation Well
0" Unknown
Undefined

Lithologic Log - unavailable

139-047-01CCCCAD

Date Completed: 10/1978
L.S. Elevation (ft): 916
Depth Drilled (ft): 217
Screened Interval (ft): 207-217

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
SAND	sand, brown	1-5
SAND	lenses of sand + clay, brown	5-17
CLAY	sandy clay, blue, soft	17-82
CLAY	sandy clay, blue	82-90
SAND	sand	90-92
CLAY	sandy clay, blue	92-114
SAND	sand	114-137
CLAY	sandy clay, blue	137-140
SAND	sand, colored	140-141
CLAY	sandy clay, blue	141-150
SAND	silty sand dirty, gray	150-157
CLAY	sandy clay, blue	157-170
SAND	sand drilled good, colored	170-217

139-047-02BDDDBA

Date Completed: 3/1973
L.S. Elevation (ft): 921
Depth Drilled (ft): 118
Screened Interval (ft): 112-118

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-24
SAND	fine silty sand, brown	24-28
CLAY	shale, blue	28-87
CLAY	sandy clay, blue	87-104
SAND	fine sand, blue	104-105
CLAY	sandy clay, blue	105-112

139-047-02BDDDBA (continued)

SAND	sand, colored	112-117
CLAY	sandy clay lenses, blue	117-118

139-047-03DDCDAD

Date Completed:	11/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	821	Well Type:	4" Stainless Steel
Depth Drilled (ft):	256	Aquifer:	Undefined
Screened Interval (ft):	250-256	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-7
CLAY	silty clay, yellow	7-19
CLAY	clay, blue, soft	19-104
CLAY	sandy clay, blue, hard	104-123
SAND	sand, colored	123-125
CLAY	sandy clay, blue, hard	125-129
SAND	sand, colored	129-131
CLAY	sandy clay, blue, hard	131-194
CLAY	sandy clay, blue, soft	194-240
SAND	sand, blue	240-241
CLAY	sandy clay, blue, hard	241-246
SAND	sand, colored	246-256

139-047-03DDDBAC

Date Completed:	8/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	916	Well Type:	4" Stainless Steel
Depth Drilled (ft):	243	Aquifer:	Undefined
Screened Interval (ft):	228-234	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	silty clay with fine sand, brown	2-13
CLAY	clay, blue, soft	13-98
CLAY	sandy clay, blue	98-108
CLAY	sandy clay with small rock, blue	108-121
SAND	sand (drilled fair), varied color	121-124
BOULDERS	rock	124-125
CLAY	sandy clay, blue	125-128
SAND	sand with small lenses of clay, varied color	128-131
CLAY	sandy clay, blue	131-226

139-047-03DDDBAC (continued)

SAND	sand (drilled fair), gray	226-234
CLAY	lenses of clay and sand, gray	234-235
SAND	sand with small lenses of clay, blue	235-240
CLAY	clay (sandy)	240-243

139-047-05BDC

Date Completed:	00/00/00	Purpose:	Irrigation Well
L.S. Elevation (ft):	916	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-047-05CDDCDC

Date Completed:	10/1946	Purpose:	Municipal Well
L.S. Elevation (ft):	918	Well Type:	12"
Depth Drilled (ft):	106	Aquifer:	Buffalo
Screened Interval (ft):	68-105	Log Source:	McCarthy Well Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	clayey silt, yellow	0-9
SILT	sandy silt, yellow	9-30
SAND	clayey sand, gray	30-39
SAND	sand interbedded with clay, gray	39-44
SAND	fine to medium clayey sand, gray	44-70
SAND	coarse sand + gravel, gray	70-90
SAND	fine to medium clayey sand, gray	90-95
SAND	sand + gravel	95-105
CLAY	sandy clay + gravelly, gray	105-106

139-047-05DCC1

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	918	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-047-05DCC2

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	918	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-047-05DCC3

Date Completed: 00/00/00
L.S. Elevation (ft): 918
Depth Drilled (ft): 0
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Municipal Well
0" Unknown
Buffalo

Lithologic Log - unavailable

139-047-05DDCBBC

Date Completed: 5/1984
L.S. Elevation (ft): 916
Depth Drilled (ft): 97
Screened Interval (ft): 86-92

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Buffalo
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	topsoil, black	0-3
CLAY	clay, brown	3-8
CLAY	sandy clay, brown	8-13
SAND	sand, gray	13-92
CLAY	clay, gray	92-97

139-047-06CDCDDB

Date Completed: 6/1975
L.S. Elevation (ft): 913
Depth Drilled (ft): 172
Screened Interval (ft): 89-99

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Buffalo
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-8
CLAY	clay, brown, soft	8-13
CLAY	clay, blue, soft	13-70
SAND	fine sand drilled fine, blue	70-99
CLAY	sandy clay, blue	99-103
SAND	sand, colored	103-105
CLAY	sandy clay, blue	105-106
SAND	sand, colored	106-107
CLAY	sandy clay, blue	107-111
SAND	sand, colored	111-112
CLAY	sandy clay with small sand lenses, blue	112-115
CLAY	sandy clay, blue	115-172

139-047-07ACCCAA

Date Completed: 8/1977
L.S. Elevation (ft): 916
Depth Drilled (ft): 102
Screened Interval (ft): 96-102

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Buffalo
LTP Enterprises, Inc

139-047-07ACCCAA (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown, soft	3-16
CLAY	clay, blue, soft	16-19
SAND	sand + clay lenses, blue	19-22
SAND	sand (fine), gray	22-58
SAND	sand (fine), gray	58-73
SAND	sand (fine), gray	73-88
SAND	sand (fine), gray	88-102
CLAY	sandy clay, blue	102-102

139-047-07BBBDAD

Date Completed: 1/1959
 L.S. Elevation (ft): 912
 Depth Drilled (ft): 148
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 6"
 Buffalo
 unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	shale, gray	0-76
SAND	quick sand	76-89
CLAY	sticky shale, gray	89-97
SAND	quick sand	97-104
CLAY	shale + gravel	104-118
SAND	quick sand	118-124
CLAY	shale, gray	124-133
BOULDERS	rock	133-142
GRAVEL	coarse gravel-water	142-148

139-047-07DDDDDC

Date Completed: 10/1946
 L.S. Elevation (ft): 919
 Depth Drilled (ft): 83
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 0"
 Buffalo
 USGS

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	sandy soil, black	0-5
SAND	clayey sand, yellow	5-12
SAND	clayey sand, yel+gray	12-19
SILT	clayey silt + sand, gray	19-36
SAND	very fine clean sand	36-42

139-047-07DDDDDC (continued)

NO SAMPLE	no sample	42-71
SAND	fine sand	71-74
SAND	fine sand	74-81
CLAY	clay + gravel	81-83

139-047-08BABBBA

Date Completed:	6/1947	Purpose:	Observation Well
L.S. Elevation (ft):	919	Well Type:	0"
Depth Drilled (ft):	134	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	USGS

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, gray	0-2
CLAY	clay, yellow	2-15
CLAY	clay, gray	15-30
SILT	silt + clay, gray	30-65
SAND	very fine sand + silt + clay, gray	65-105
GRAVEL	gravel + sand + clay	105-110
TILL	sandy + gravelly till	110-134

139-047-08CAC

Date Completed:	00/00/00	Purpose:	Irrigation Well
L.S. Elevation (ft):	918	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-047-08CCCCC

Date Completed:	10/1946	Purpose:	Domestic Well
L.S. Elevation (ft):	920	Well Type:	0"
Depth Drilled (ft):	103	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	USGS

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SAND	fine sand, yellow	0-16
SAND	fine sand	16-80
SAND	fine sand + a little coarse sand	80-93
CLAY	clay + some sand and gravel	93-103

139-047-09BBCBBA

Date Completed:	9/1936	Purpose:	Industrial Well
L.S. Elevation (ft):	914	Well Type:	8"
Depth Drilled (ft):	259	Aquifer:	Buffalo
Screened Interval (ft):	253-259	Log Source:	unknown

139-047-09BBCBBA (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, yellow	0-9
CLAY	clay, blue	9-20
CLAY	hardpan	20-21
SAND	quick sand	21-63
CLAY	clay, blue	63-93
CLAY	hardpan	93-106
CLAY	sandy clay	106-111
CLAY	hard pan	111-116
CLAY	sandy clay	116-128
GRAVEL	gravel + water	128-132
CLAY	clay + boulders	132-136
CLAY	hardpan	136-151
SAND	very fine sand	151-162
GRAVEL	gravel water	162-164
CLAY	clay, blue	164-181
SAND	sand, gray, hard	181-196
CLAY	clay + gravel	196-212
SAND	sand	212-213
CLAY	clay	213-214
SAND	water sand	214-234
GRAVEL	gravel	234-236
CLAY	clay	236-239
SAND	fine sand	239-250
SAND	coarse water sand	250-259

139-047-10AADDBB

Date Completed:	10/1982	Purpose:	Domestic Well
L.S. Elevation (ft):	920	Well Type:	4" Stainless Steel
Depth Drilled (ft):	313	Aquifer:	Undefined
Screened Interval (ft):	300-310	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown, soft	2-21
CLAY	clay, blue, soft	21-98
CLAY	sandy clay, blue	98-235
CLAY	sandy clay softer, blue	235-268
CLAY	sandy clay softer, blue	268-277

139-047-10AADDDBB (continued)

ROCK	rock	277-278
CLAY	sandy clay, blue, hard	278-287
CLAY	sandy clay, blue	287-293
CLAY	sandy clay, blue, hard	293-298
SAND	sand, brown	298-310
CLAY	sandy clay, blue, rocky	310-313

139-047-10ABB

Date Completed:	00/00/00	Purpose:	Irrigation Well
L.S. Elevation (ft):	918	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-047-11ABCBC2

Date Completed:	5/6/77	Purpose:	Municipal Well
L.S. Elevation (ft):	922	Well Type:	8" Steel
Depth Drilled (ft):	282	Aquifer:	Undefined
Screened Interval (ft):	244-277	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
SAND	brown	3-15
CLAY	soft, blue	15-17
SAND	blue	17-20
CLAY	soft, blue	20-90
CLAY	sandy, blue	90-103
SAND	blue	103-110
CLAY	sandy, blue	110-148
SAND	blue	148-149
CLAY	sandy, with rocks, hard	149-152
SAND	light brown, drilled good	152-242
SAND	light brown, coarser	242-257
SAND	finer	257-262
SAND	light brown, coarser	262-277
CLAY	sandy, blue/green, decomposed	277-282

139-047-11ABCBCD

Date Completed:	11/1969	Purpose:	Municipal Well
L.S. Elevation (ft):	922	Well Type:	6" Stainless Steel
Depth Drilled (ft):	270	Aquifer:	Undefined
Screened Interval (ft):	234-267	Log Source:	Frederickson's of ND, Inc

Lithologic Log

139-047-11ABCBCD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
SAND	fine sand, brown	1-12
SAND	fine sand, blue	12-18
CLAY	shale, blue	18-90
CLAY	clay, blue	90-110
CLAY	clay lensed with sand, blue	110-115
CLAY	clay, blue	115-122
CLAY	clay, blue, very hard	122-130
SAND	dirty sand, blue	130-133
CLAY	clay, blue	133-142
SAND	dirty sand, blue	142-147
SAND	sand, blue	147-267
ROCK	rocks	267-270

139-047-11ABDBBB

Date Completed:	8/1955	Purpose:	Domestic Well
L.S. Elevation (ft):	922	Well Type:	2"
Depth Drilled (ft):	120	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
NO SAMPLE	no record	0-3
SAND	fine sand	3-20
CLAY	clay, soft	20-105
SAND	fine sand	105-108
CLAY	clay, hard	108-120

139-047-11ABDCCB

Date Completed:	7/1922	Purpose:	Industrial Well
L.S. Elevation (ft):	922	Well Type:	4" Copper
Depth Drilled (ft):	156	Aquifer:	Undefined
Screened Interval (ft):	152-156	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	sandy loam, black	0-4
SAND	quick sand	4-24
CLAY	clay	24-105
CLAY	large boulders in clay	105-108
CLAY	clay	108-145
SAND	water bearing sand	145-156

139-047-11BABBCA

Date Completed: 9/1968
L.S. Elevation (ft): 922
Depth Drilled (ft): 247
Screened Interval (ft): 239-245

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	silty sandy clay, brown	1-16
CLAY	clay, blue, soft	16-96
CLAY	sandy clay, blue	96-110
SAND	dirty sand, blue	110-113
CLAY	sandy clay, blue, hard	113-187
CLAY	sandy clay, blue, soft	187-227
SAND	sand, gray	227-232
CLAY	sandy clay, blue	232-233
SAND	sand, gray	233-247

139-047-11BACACB

Date Completed: 7/1936
L.S. Elevation (ft): 922
Depth Drilled (ft): 205
Screened Interval (ft): 180-195

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
12" Other
Undefined
Keys

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SAND	fine sand	0-16
SOIL	peat	16-18
SAND	very fine sand	18-35
CLAY	clay, gray	35-97
CLAY	hardpan	97-122
SAND	very fine sand	122-150
SAND	fine sand	150-180
SAND	not so fine sand	180-195
SAND	very fine sand	195-205

139-047-11BACACC

Date Completed: 1/1923
L.S. Elevation (ft): 922
Depth Drilled (ft): 169
Screened Interval (ft): 149-169

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
5"
Undefined
unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
NO SAMPLE	no record	0-18

139-047-11BACACC (continued)

CLAY	clay, hard	18-106
CLAY	shale	106-118
GRAVEL	stones + gravel	118-129
SAND	water bearing sand	129-169

139-047-11BDBDDA

Date Completed:	10/1956	Purpose:	Industrial Well
L.S. Elevation (ft):	922	Well Type:	4"
Depth Drilled (ft):	112	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SAND	sand, yellow	0-30
CLAY	clay, blue	30-103
GRAVEL	gravel, yellow	103-112

139-047-12ABBACC

Date Completed:	6/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	921	Well Type:	4" Stainless Steel
Depth Drilled (ft):	162	Aquifer:	Undefined
Screened Interval (ft):	156-160	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
SAND	fine sand, brown	1-15
CLAY	clay, blue	15-22
CLAY	shale, blue, soft	22-83
SAND	sand, blue	83-85
CLAY	sandy clay, blue	85-127
CLAY	sandy clay with sand lenses, blue	127-130
SAND	sand	130-162

139-047-12BBB

Date Completed:	1947	Purpose:	Test Hole
L.S. Elevation (ft):	921	Well Type:	
Depth Drilled (ft):	243	Log Source:	Bingham 1960

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SAND	very fine, silty, gray	0-3
SAND	very fine, silty, yellow	3-13
PEAT	no description	13-15

139-047-12BBB (continued)

CLAY	dark gray	15-38
CLAY	black, very plastic, contains organic matter	38-43
CLAY	dark to light gray	43-78
TILL	gravelly, gray	78-88
TILL	gray	88-93
TILL	gravelly, gray	93-95
GRAVEL	cobbles	95-98
TILL	gravelly, gray	98-103
TILL	dark gray	103-115
GRAVEL	sand, some silt and clay	115-119
TILL	dark gray	119-158
GRAVEL	sand, silt, and clay	158-168
TILL	dark gray	168-218
TILL	sandy, dark gray	218-233
GRANITE	light gray, disintegrated	233-243

139-047-12BBBBBC

Date Completed:	6/1947	Purpose:	Observation Well
L.S. Elevation (ft):	922	Well Type:	0"
Depth Drilled (ft):	243	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	USGS

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SAND	very fine sand + silt, gray	0-3
SAND	very fine sand + silt, yellow	3-13
SOIL	peat, black	13-15
CLAY	clay, dark gray	15-38
CLAY	very plastic clay + organics, black	38-43
CLAY	dark gray-light gray clay	43-78
CLAY	gravelly clay, gray	78-88
TILL	till, gray	88-93
TILL	gravelly till, gray	93-95
GRAVEL	gravel + cobbles	95-98
TILL	gravelly till, gray	98-103
TILL	till, dark gray	103-115
GRAVEL	gravel + sand + clay + silt	115-119
TILL	till, dark gray	119-158
GRAVEL	gravel + sand + clay + silt	158-168
TILL	till, dark gray	168-218
TILL	sandy till, dark gray	218-233

139-047-12BBBBBC (continued)

**WEATHERED
PRECAMBRIAN**

disintegrated granite, light gray

233-243

139-047-12BBBBCC

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

9/1988
915
207
195-203

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil with lenses, black	0-1
SAND	sand, brown	1-15
CLAY	clay, blue	15-87
CLAY	sandy clay, gray	87-101
SAND	sand, colored	101-119
CLAY	sandy clay, gray	119-176
SAND	sand, colored	176-203
SAND	sand with clay lenses, gray	203-207

139-047-12BBBBCD

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

10/1986
915
222
201-209

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, brown	0-2
SAND	sand, gray	2-15
CLAY	clay, gray	15-90
CLAY	sandy clay, gray	90-95
BOULDERS	rock	95-96
CLAY	sandy clay, gray	96-129
SAND	sand, colored	129-135
CLAY	sandy clay, gray	135-185
SAND	sand, colored	185-212
SAND	sand, gray	212-222

139-047-14DCCCCB

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

9/1973
923
177
171-177

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

139-047-14DCCCB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	silty clay, brown	1-4
CLAY	silty clay, gray	4-13
CLAY	clay, blue	13-21
CLAY	shale, blue	21-88
CLAY	sandy clay, blue	88-100
SAND	fine sand, gray	100-102
CLAY	sandy clay, blue	102-103
SAND	fine sand, gray	103-104
CLAY	sandy clay, blue, soft	104-111
SAND	fine sand, gray	111-113
CLAY	sandy clay with sand lenses, blue	113-122
SAND	fine sand, gray	122-126
CLAY	sandy clay, blue, soft	126-130
CLAY	sandy clay, blue	130-145
SAND	sand took water, blue	145-148
CLAY	sandy clay, blue	148-163
SAND	sand took water, blue	163-177

139-047-16CAA

Date Completed:	00/00/00	Purpose:	Irrigation Well
L.S. Elevation (ft):	916	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-047-17CCDDDC

Date Completed:	11/1956	Purpose:	Observation Well
L.S. Elevation (ft):	920	Well Type:	0"
Depth Drilled (ft):	163	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	USGS

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	loamy soil, black	0-1
CLAY	laminated silty clay, buff-brown, soft	1-7
SAND	very fine-fine sand, buff	7-13
CLAY	laminated clay + silty layers, buff, firm	13-21
CLAY	silty clay, gray, soft	21-35
SAND	fine-coarse sand + clay interbeds, gray	35-50
SAND	fine-coarse clean subrounded sand, gray	50-100

139-047-17CCDDDC (continued)

SAND	medium-very coarse sand + gravel	100-143
SAND	fine-very coarse sand	143-156
CLAY	clay: poor sample, gray, soft	156-163

139-047-17DCCBBA

Date Completed:	6/1977	Purpose:	Domestic Well
L.S. Elevation (ft):	921	Well Type:	4" Stainless Steel
Depth Drilled (ft):	98	Aquifer:	Buffalo
Screened Interval (ft):	92-98	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, yellow, soft	1-21
CLAY	sandy clay, blue, soft	21-30
CLAY	clay + sand	30-38
SAND	fine sand clean, gray, soft	38-73
SAND	coarse sand, gray, soft	73-98

139-047-20CDBBBB

Date Completed:	10/1976	Purpose:	Irrigation Well
L.S. Elevation (ft):	922	Well Type:	12" Stainless Steel
Depth Drilled (ft):	230	Aquifer:	Buffalo
Screened Interval (ft):	175-210	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	sandy clay, brown	3-16
CLAY	clay, blue, soft	16-52
CLAY	sandy clay, blue	52-67
SAND	fine sand, gray	67-92
SAND	fine sand, gray	92-108
CLAY	sandy clay with sand lenses, blue	108-115
CLAY	sandy clay, blue	115-140
SAND	sand, colored	140-142
CLAY	sandy clay, blue	142-145
SAND	sand drilled good, gray	145-150
SAND	sand drilled poor, colored	150-159
SAND	sand drilled better, colored	159-177
SAND	sand drilled fair, colored	177-187
SAND	sand + gravel took water, colored	187-197
GRAVEL	gravel fair took water, colored	197-209

139-047-20CDBBBB (continued)

CLAY sandy clay with rock lenses, blue

209-230

139-047-21AAAABD

Date Completed: 5/1991
 L.S. Elevation (ft): 919
 Depth Drilled (ft): 133
 Screened Interval (ft): 124-128

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-17
CLAY	sandy clay, gray	17-29
CLAY	clay, blue, soft	29-94
CLAY	sandy clay, blue	94-111
SAND	sand, varied color	111-115
SAND	lenses of sand and clay, gray	115-118
SAND	sand, gray	118-128
CLAY	sand clay, gray	128-133

139-047-22AAADCD

Date Completed: 9/1971
 L.S. Elevation (ft): 922
 Depth Drilled (ft): 272
 Screened Interval (ft): 249-259

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-6
CLAY	sandy clay, brown	6-24
CLAY	clay, blue	24-28
CLAY	shale, blue	26-90
CLAY	sandy clay, blue	90-92
SAND	dirty sand, blue	92-100
SAND	sand, blue	100-102
CLAY	sandy clay, blue	102-105
SAND	sand, blue	105-106
CLAY	sandy clay, blue	106-108
SAND	sand, blue	108-114
BOULDERS	rock	114-116
CLAY	sandy clay, blue, soft	116-185
CLAY	sandy clay, blue	185-195

139-047-22AAADCD (continued)

SAND	sand, blue	195-215
CLAY	sandy clay, blue	215-223
CLAY	clay + rock, blue	223-229
CLAY	sandy clay, blue	229-245
SAND	sand, blue	245-259
CLAY	sandy clay + rock, blue, hard	259-272

139-047-22ADABAC

Date Completed:	6/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	822	Well Type:	4" Stainless Steel
Depth Drilled (ft):	245	Aquifer:	Undefined
Screened Interval (ft):	236-241	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-6
SAND	sand, brown	6-15
SAND	sand, blue	15-23
CLAY	shale, blue, soft	23-91
SAND	dirty sand, blue	91-94
CLAY	sandy clay, blue	94-98
SAND	sand washed, blue	98-100
CLAY	sandy clay, blue	100-106
SAND	sand with rock, colored	106-110
SAND	sand with rock, colored	110-113
SAND	sand, colored	113-119
CLAY	sandy clay with rock	119-125
CLAY	sandy clay with rock, blue	125-128
CLAY	sandy clay, blue, hard	128-176
SAND	sand, blue	176-177
CLAY	sandy clay, blue	177-202
SAND	sand, blue	202-206
CLAY	sandy clay, blue	206-235
SAND	sand, blue	235-237
ROCK	rock	237-238
SAND	sand with rock, blue	238-241
PRECAMBRIAN	rock granite, colored	241-245

139-047-22ADADCA

Date Completed:	8/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	822	Well Type:	4" Stainless Steel
Depth Drilled (ft):	240	Aquifer:	Undefined
Screened Interval (ft):	223-227	Log Source:	Robertson

139-047-22ADADCA (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	dirt, black	0-3
CLAY	clay, yellow	3-12
CLAY	clay, blue, soft	12-90
CLAY	sandy clay, blue	90-142
CLAY	clay, blue, medium hardness	142-170
CLAY	clay, blue, soft	170-190
CLAY	clay, blue, soft	190-200
CLAY	clay, blue	200-222
SAND	sand	222-240

139-047-22ADDCAD

Date Completed:	8/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	922	Well Type:	4" Stainless Steel
Depth Drilled (ft):	260	Aquifer:	Undefined
Screened interval (ft):	254-258	Log Source:	Robertson

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-2
CLAY	clay, yellow, soft	2-4
SAND	sand, yellow, soft	4-10
CLAY	clay, gray, soft	10-31
CLAY	clay, gray, soft	31-94
CLAY	clay sand streaks, gray, medium hardness	94-135
CLAY	clay, gray, medium hardness	135-218
SAND	sand, gray, soft	218-219
CLAY	clay, gray, soft	219-238
SAND	fine sand, gray, soft	238-252
SAND	medium sand, gray, soft	252-260

139-047-22BBBBBD

Date Completed:	11/1981	Purpose:	Domestic Well
L.S. Elevation (ft):	917	Well Type:	4" Stainless Steel
Depth Drilled (ft):	133	Aquifer:	Undefined
Screened interval (ft):	121-133	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, yellow, soft	1-20
CLAY	clay, gray, soft	20-50

139-047-22BBBBBD (continued)

CLAY	clay, gray, soft	50-90
CLAY	clay and stones, gray, soft	90-119
SAND	sand and gravel, gray, soft	119-133

139-047-23BCCAD

Date Completed:	9/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	826	Well Type:	4" Stainless Steel
Depth Drilled (ft):	246	Aquifer:	Undefined
Screened Interval (ft):	230-236	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	silty clay, brown	2-16
CLAY	clay, blue	16-87
CLAY	sandy clay, blue	87-101
SAND	sand, varied color	101-108
CLAY	sandy clay, blue	108-210
BOULDERS	rock, red	210-211
CLAY	sandy clay, blue	211-221
SAND	sand drilled good, varied color	221-236
SAND	sand fine some clay, varied color	236-246

139-047-23CCBBAC

Date Completed:	7/1981	Purpose:	Domestic Well
L.S. Elevation (ft):	925	Well Type:	4" Stainless Steel
Depth Drilled (ft):	131	Aquifer:	Undefined
Screened Interval (ft):	119-131	Log Source:	Pasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, yellow, soft	1-19
CLAY	clay, gray, soft	19-60
CLAY	clay, gray, soft	60-100
CLAY	clay and stones, gray, soft	100-114
SAND	sand (water) clean, gray, soft	114-131

139-047-25CDCBCD

Date Completed:	9/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	928	Well Type:	4" Stainless Steel
Depth Drilled (ft):	217	Aquifer:	Undefined
Screened Interval (ft):	207-212	Log Source:	LTP Enterprises, Inc

Lithologic Log

139-047-25CDCBCD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
SAND	sand, brown	2-7
CLAY	lenses of clay + sand, brown	7-17
CLAY	sandy clay, blue, soft	17-76
CLAY	sandy clay, blue	76-100
SAND	dirty fine sand, gray	100-103
CLAY	sandy clay with sand lenses, blue-gray	103-107
CLAY	sandy clay with rock, blue	107-112
CLAY	sandy clay, blue, hard	112-127
BOULDERS	rock	127-128
CLAY	sandy clay, blue	128-149
SAND	sand, gray	149-152
CLAY	sandy clay, blue	152-164
SAND	fine sand, gray	164-166
CLAY	sandy clay with small sand lenses, blue-gray	166-171
SAND	sand, gray	171-173
CLAY	sandy clay, blue	173-178
SAND	sand, gray	178-180
CLAY	sandy clay with sand lenses, blue-gray	180-181
SAND	sand drilled fair, varied color	181-212
SAND	sand drilled poor dirty	212-217

139-047-26CBBBAD

Date Completed:	7/1977	Purpose:	Domestic Well
L.S. Elevation (ft):	926	Well Type:	4" Stainless Steel
Depth Drilled (ft):	120	Aquifer:	Undefined
Screened Interval (ft):	111-117	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, gray	1-3
CLAY	silty clay, brown	3-14
CLAY	clay, blue	14-88
CLAY	sandy clay, blue	88-95
SAND	sand, varied color	95-96
CLAY	sandy clay, blue	96-103
SAND	sand, varied color	103-107
CLAY	sandy clay, blue	107-112
SAND	sand, varied color	112-120

139-047-26DCDDCA

Date Completed: 8/1976
L.S. Elevation (ft): 927
Depth Drilled (ft): 148
Screened Interval (ft): 141-147

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
SAND	sand, brown	1-2
SAND	silty sand, brown	2-9
CLAY	clay, brown, soft	9-12
CLAY	clay, blue, soft	12-81
CLAY	sandy clay, blue	81-119
CLAY	sandy clay rocky, blue	119-122
CLAY	sandy clay, blue	122-127
SAND	sand	127-129
CLAY	sandy clay, blue	129-132
SAND	fine sand	132-135
CLAY	sandy clay, blue	135-140
SAND	sand	140-147
CLAY	sandy clay	147-148

139-047-29C

Date Completed: 00/00/00
L.S. Elevation (ft): 923
Depth Drilled (ft): 0
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Irrigation Well
0" Unknown
Buffalo

Lithologic Log - unavailable

139-047-29CBACAB

Date Completed: 10/1955
L.S. Elevation (ft): 911
Depth Drilled (ft): 186
Screened Interval (ft): 94-99

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
3"
Buffalo
unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
NO SAMPLE	no record	0-3
GRAVEL	gravel	3-10
CLAY	clay	10-50
SAND	fine sand, gray	50-100
CLAY	clay	100-120
TILL	sandy till	120-149
TILL	sandy till	149-179
SAND	fine sand	179-186

139-047-29D

Date Completed: 00/00/00
L.S. Elevation (ft): 922
Depth Drilled (ft): 0
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Irrigation Well
0" Unknown
Buffalo

Lithologic Log - unavailable

139-047-32BDD

Date Completed: 00/00/00
L.S. Elevation (ft): 922
Depth Drilled (ft): 0
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Irrigation Well
0" Unknown
Buffalo

Lithologic Log - unavailable

139-047-32CDDDBDA

Date Completed: 11/1975
L.S. Elevation (ft): 925
Depth Drilled (ft): 90
Screened Interval (ft): 84-90

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Buffalo
Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
SAND	sand, yellow, soft	1-13
CLAY	clay, blue, soft	13-22
SAND	fine sand silty, gray, soft	22-65
SAND	fine sand water, gray, soft	65-78
SAND	fine to coarse sand, gray, soft	78-90

139-047-36BBBDCB

Date Completed: 8/1973
L.S. Elevation (ft): 928
Depth Drilled (ft): 153
Screened Interval (ft): 147-151

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-12
CLAY	clay, blue	12-21
CLAY	shale, blue	21-80
CLAY	sandy clay, blue	80-118
CLAY	sandy clay with rock, blue	118-121
SAND	sandy rock, colored	121-131
CLAY	sandy clay, blue	131-142
SAND	sand, colored	142-147
BOULDERS	rock, colored	147-150

139-047-36BBBDCB (continued)

SAND	sand, colored	150-151
CLAY	sandy clay, blue	151-153

139-048-01BCBCBA

Date Completed:	10/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	4" Stainless Steel
Depth Drilled (ft):	239	Aquifer:	Undefined
Screened Interval (ft):	230-236	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, gray	2-12
CLAY	shale, blue	12-20
CLAY	shale, gray	20-82
CLAY	clay, blue	82-190
SAND	sand, blue	190-203
SAND	clay, blue	203-207
SAND	sand, blue	207-225
SAND	sand + gravel, blue	225-239

139-048-01CCDCDA

Date Completed:	8/1949	Purpose:	Municipal Well
L.S. Elevation (ft):	911	Well Type:	0"
Depth Drilled (ft):	320	Aquifer:	Dilworth
Screened Interval (ft):	0-0	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	no description	0-80
CLAY	and hardpan	80-140
SAND	no description	140-143
HARDPAN	no description	143-180
SAND & GRAVEL	no description	180-188
SAND	sand and gravel	188-200
CLAY	dark blue-gray to brown	200-268
CLAY	and sand, hard	268-269
SAND	very fine to medium	269-275
CLAY	greenish-gray	275-285
CLAY	sticky, dark blue	285-297
CLAY	white, sandy, weathered granite	297-300
CLAY	blue-green, with quartz grains and granite fragments	300-320

139-048-02DDC1

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	906	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Dilworth
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-048-02DDC3

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	906	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Dilworth
Screened Interval (ft):	135-155	Log Source:	

Lithologic Log - unavailable

139-048-02DDC4

Date Completed:	1981	Purpose:	Municipal Well
L.S. Elevation (ft):	906	Well Type:	12" Unknown
Depth Drilled (ft):	178	Aquifer:	Dilworth
Screened Interval (ft):	133-155	Log Source:	

Lithologic Log - unavailable

139-048-03CBCBDC

Date Completed:	1961	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	0"
Depth Drilled (ft):	342	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL	fill (brick and clay), brown	0-2
SOIL	top soil, black	2-3
CLAY	clay sticky, tan	3-24
CLAY	shale, blue, very soft	24-92
CLAY	shale, blue, hard	92-96
CLAY	hard clay and frequent boulders, blue	96-144
CLAY	sandy clay, blue-brown, softer	144-155
SAND	sand	155-157
CLAY	gravelly clay and boulders, blue-brown	157-162
CLAY	clay, blue, hard	162-181
CLAY	gravelly clay, blue-brown	181-191
SHALE	shale, dark blue, hard	191-212
SHALE	shale, blue, softer	212-249
SHALE	sandy clay, gray	249-262
SHALE	sandy clay, blue	262-279
SHALE	sandy clay, gray	279-291
SHALE	sandy clay, gray, hard	291-302
SHALE	sandy clay, gray, soft	302-327

139-048-03CBCBDC (continued)

SHALE	clay, brown, soft	327-332
WEATHERED PRECAMBRIAN	decomposed granite, colored	332-342

139-048-03CBCCDB

Date Completed:	1961	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	0"
Depth Drilled (ft):	351	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sticky clay, yellow	2-21
CLAY	shale, blue, very soft	21-97
CLAY	clay, blue, hard	97-105
CLAY	sandy clay, blue, hard	105-133
CLAY	sandy clay and boulder, blue, hard	133-142
CLAY	sandy clay, blue, hard	142-146
SAND	finer sand, colored	146-160
SAND	sand and gravel, colored	160-173
SAND	sand, gray	173-178
CLAY	sandy clay, blue, hard	178-237
SHALE	shale, dark gray	237-258
SHALE	shale, blue	258-290
SHALE	shale, gray	290-312
SHALE	shale, yellow	312-341
SANDSTONE	sand	341-343
WEATHERED PRECAMBRIAN	decomposed granite	343-351

139-048-03CBDACD

Date Completed:	9/1961	Purpose:	Domestic Well
L.S. Elevation (ft):	905	Well Type:	4"
Depth Drilled (ft):	356	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-14
CLAY	clay, blue	14-21
CLAY	shale, blue	21-26
CLAY	sticky shale, blue, soft	26-97

139-048-03CBDACD (continued)

CLAY	clay, blue, hard	97-107
CLAY	sandy clay and limestone, blue, hard	107-136
SAND	sand and gravel, colored	136-138
SAND	sand and gravel, colored	138-143
CLAY	clay and frequent boulders, blue	143-157
CLAY	shale, blue, soft	157-175
SHALE	shale, blue, hard	175-247
SHALE	shale, blue, softer	247-257
SHALE	shale, blue, hard	257-265
SANDSTONE	Cretaceous sandstone, gray	265-270
SHALE	shale, blue, hard	270-285
SHALE	clay and hard shale, light brown	285-313
SANDSTONE	dirty sandstone, gray	313-315
SHALE	clay and shale, blue	315-331
SANDSTONE	sand and sandstone and shale, whitish	331-346
WEATHERED PRECAMBRIAN	decomposed granite, green	346-356

139-048-04DCC1

Date Completed: 1927
 L.S. Elevation (ft): 903
 Depth Drilled (ft): 242
 Screened Interval (ft): 209-240

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 20" Steel
 East Moorhead
 McCarthy Well Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow	0-16
CLAY	blue	16-90
TILL	hardpan	90-103
GRAVEL	no description	103-107
TILL	hardpan	107-142
SAND	fine	142-208
GRAVEL & SAND	clayey, and clay	208-213
SAND	fine	213-218
SAND	coarse	218-240
CLAY	blue	240-242

139-048-04DCC2

Date Completed: 1/1/30
 L.S. Elevation (ft): 903
 Depth Drilled (ft): 265
 Screened Interval (ft): 223-263

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 20" Steel
 East Moorhead
 McCarthy Well Co

Lithologic Log

139-048-04DCC2 (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow	0-10
CLAY	blue	10-96
GRAVEL & SAND	no description	96-100
TILL	hardpan	100-154
SAND	fine	154-170
SAND	hard	170-190
SAND	fine	190-199
SAND	hard	199-215
SAND	no description	215-225
GRAVEL & SAND	no description	225-234
GRAVEL	coarse	234-263
CLAY	no description	263-265

139-048-04DCC3

Date Completed: 1932
 L.S. Elevation (ft): 903
 Depth Drilled (ft): 281
 Screened Interval (ft): 233-273

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 20" Steel
 East Moorhead
 McCarthy Well Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow	0-15
CLAY	blue	15-82
TILL	hardpan	82-155
SAND	clayey	155-170
SAND	coarse	170-230
GRAVEL	no description	230-269
TILL	clay	269-281

139-048-04DCC4

Date Completed: 00/00/00
 L.S. Elevation (ft): 903
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 0" Unknown
 East Moorhead

Lithologic Log - unavailable

139-048-04DCC5

Date Completed: 00/00/00
 L.S. Elevation (ft): 903
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 0" Unknown
 East Moorhead

Lithologic Log - unavailable

139-048-05CAB

Date Completed: 00/00/00
 L.S. Elevation (ft): 891
 Depth Drilled (ft): 241
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 0" Steel
 West Moorhead
 Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow	0-8
CLAY	blue	8-38
CLAY	blue, and very fine sand	38-43
CLAY	blue	43-94
CLAY	till, and very fine sand	94-97
CLAY	blue sand, and fine gravel, till	97-99
SAND	coarse and gravel	99-102
CLAY	blue	102-103
SAND & GRAVEL	no description	103-107
CLAY	with coarse gravel, till	107-126
GRAVEL	coarse with a little clay, till	126-127
SAND	medium	127-132
SAND	coarse	132-140
CLAY	sand and gravel, till	140-150
CLAY	blue, and fine sand, till	150-180
SAND	fine, light gray, till	180-182
SAND	fine, blue and clay, till	182-200
SAND	fine, gray	200-223
SAND	fine gray, with traces of clay	223-226
SAND	medium, gray	226-228
SAND	medium to coarse, and gravel	228-231
SAND	with trace of clay	231-233
SAND	fine, with trace of clay	233-235
TILL	sand, fine and clay	235-241

139-048-05CDC1

Date Completed: 1906
 L.S. Elevation (ft): 901
 Depth Drilled (ft): 153
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 3" Steel
 West Moorhead

Lithologic Log - unavailable

139-048-05CDC2

Date Completed: 1918
L.S. Elevation (ft): 901
Depth Drilled (ft): 150
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
4" Steel
West Moorhead

Lithologic Log - unavailable

139-048-05CDD1

Date Completed: 1923
L.S. Elevation (ft): 902
Depth Drilled (ft): 222
Screened Interval (ft): 195-222

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
16" Steel
West Moorhead
McCarthy Well Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow, silt unit	0-30
CLAY	blue, clay unit and underlying till, undifferentiated	30-130
SAND	glaciofluvial deposit	130-160
CLAY	till	160-198
SAND	glaciofluvial deposits	198-222

139-048-05CDD2

Date Completed: 1928
L.S. Elevation (ft): 902
Depth Drilled (ft): 240
Screened Interval (ft): 188-240

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
8" Steel
West Moorhead
McCarthy Well Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	Lake Agassiz deposits and underlying till, undifferentiated	0-136
SAND	glaciofluvial deposits	136-155
CLAY	till	155-185
SAND & GRAVEL	glaciofluvial deposits	185-240

139-048-05CDD3

Date Completed: 1933
L.S. Elevation (ft): 902
Depth Drilled (ft): 230
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
20" Steel
West Moorhead

Lithologic Log - unavailable

139-048-05DCC

Date Completed: 00
L.S. Elevation (ft): 901
Depth Drilled (ft): 0
Screened Interval (ft): 190-220

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
0" Steel
West Moorhead

Lithologic Log - unavailable

139-048-05DCC1

Date Completed:	00/00/00	Purpose:	Industrial Well
L.S. Elevation (ft):	901	Well Type:	8" Steel
Depth Drilled (ft):	240	Aquifer:	West Moorhead
Screened Interval (ft):	0-240	Log Source:	

Lithologic Log - unavailable

139-048-05DDD1

Date Completed:	1910	Purpose:	Municipal Well
L.S. Elevation (ft):	903	Well Type:	10" Steel
Depth Drilled (ft):	198	Aquifer:	West Moorhead
Screened Interval (ft):	168-198	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	undifferentiated, Lake Agassiz deposits and underlying till	0-180
SAND	glaciofluvial deposits	180-198

139-048-05DDD2

Date Completed:	1921	Purpose:	Municipal Well
L.S. Elevation (ft):	903	Well Type:	12" Steel
Depth Drilled (ft):	219	Aquifer:	West Moorhead
Screened Interval (ft):	166-218	Log Source:	McCarthy Well Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY & TILL	Lake Agassiz deposits and underlying till, undifferentiated clay	0-155
SAND	no description	155-219

139-048-05DDD3

Date Completed:	1922	Purpose:	Municipal Well
L.S. Elevation (ft):	903	Well Type:	12" Steel
Depth Drilled (ft):	223	Aquifer:	West Moorhead
Screened Interval (ft):	171-223	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	blue, Lake Agassiz deposits	0-108
TILL	hardpan	108-158
SAND	glaciofluvial deposits	158-223

139-048-06CCD

Date Completed:	9/1923	Purpose:	Industrial Well
L.S. Elevation (ft):	890.4	Well Type:	6" Steel
Depth Drilled (ft):	403	Aquifer:	Fargo
Screened Interval (ft):	0-180	Log Source:	Simpson, 1929

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	soil, then yellow clay, then blue clay	0-105

139-048-06CCD (continued)

SAND	no description	105-160
SAND & GRAVEL	water bearing	160-180
CLAY	sandy	180-280
SANDSTONE	green	280-395
SANDSTONE	red	395-400
SANDSTONE	gray	400-403

139-048-06CDD

Date Completed:	00/00/00	Purpose:	Industrial Well
L.S. Elevation (ft):	905	Well Type:	18" Unknown
Depth Drilled (ft):	382	Aquifer:	Fargo
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-048-07ACB1

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	900.36	Well Type:	10" Steel
Depth Drilled (ft):	228	Aquifer:	Fargo
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-048-07ACC

Date Completed:	00/00/00	Purpose:	Test Hole
L.S. Elevation (ft):	885	Well Type:	
Depth Drilled (ft):	282	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silt unit	0-3
CLAY	yellow and white, Lake Agassiz deposit	3-53
CLAY	dark, Lake Agassiz deposit	53-95
GRAVEL	glaciofluvial deposit	95-105
TILL	hardpan, gravel, and boulders	105-220
SHALE	clay?, soft, blue	220-252
GRANITE	coarse sand rock (granite?)	252-258
SOAPSTONE	decomposed granite?	258-262

139-048-07BBA

Date Completed:	9/19/91	Purpose:	Test Hole
L.S. Elevation (ft):	901	Well Type:	
Depth Drilled (ft):	220	Log Source:	NDSWC

Lithologic Log

139-048-07BBA (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL MATERIAL	no description	0-4
CLAY	yellow-brown, soft, smooth, plastic, oxidized (lake clay).	4-17
CLAY	gray, soft, smooth, plastic (lake clay).	17-100
CLAY	sandy, silty, pebbly, dark gray, fairly stiff, slightly plastic (till).	100-121
GRAVEL	sandy, fine to very coarse gravel with some sand, predominantly tan carbonates, angular to subangular.	121-124
CLAY	sandy, silty, pebbly, medium to light gray, very sandy, moderately soft, fairly plastic; some brownish portions from 136 to 150 feet (till).	124-150
CLAY	sandy, silty, pebbly, moderately firm, gray, slightly plastic; rock at 161 feet (till).	150-172
CLAY	sandy, silty, light gray, very sandy, soft, little plasticity (till).	172-182
CLAY	dark gray, soft, very plastic, occasional grains.	182-190
CLAY	sandy, silty, light gray, very sandy, soft, very little plasticity (till).	190-196
CLAY	dark brownish-black, crumbly; possibly bedrock.	196-197
CLAY	white, very soft, paste like, some green particles; becomes more greenish with depth; angular sand particles imbedded in greenish-white clay (Precambrian).	197-220

139-048-07DAA

Date Completed:	1912	Purpose:	Municipal Well
L.S. Elevation (ft):	900	Well Type:	6" Steel
Depth Drilled (ft):	250	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	blue, Lake Agassiz deposits	0-100
SAND & GRAVEL	glaciofluvial deposits	100-104
CLAY	till, hardpan	104-250

139-048-08AAA

Date Completed:	00/00/00	Purpose:	Test Hole
L.S. Elevation (ft):	903	Well Type:	
Depth Drilled (ft):	300	Log Source:	Bingham 1960

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	no description	0-14
CLAY	no description	14-95
TILL	no description	95-103
SAND	no description	103-110
CLAY	no description	110-122
SAND	no description	122-125
CLAY	no description	125-180

139-048-08AAA (continued)

SAND	no description	180-187
CLAY	no description	187-300

139-048-08ABB

Date Completed:	00/00/00	Purpose:	Industrial Well
L.S. Elevation (ft):	901	Well Type:	16" Steel
Depth Drilled (ft):	222	Aquifer:	West Moorhead
Screened Interval (ft):	0-251	Log Source:	Bingham 1960

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow	0-30
CLAY	blue	30-130
SAND	no description	130-160
CLAY	no description	160-198
SAND	no description	198-222

* WELL DEEPEENED IFROM 222 FEET TO 251 FEET IN 1949

139-048-08BAA

Date Completed:	1/1/89	Purpose:	Test Hole
L.S. Elevation (ft):	901	Well Type:	
Depth Drilled (ft):	1901	Log Source:	Bingham 1960

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-5
CLAY	yellow	5-55
CLAY	blue-gray, tough	55-110
GRAVEL	with some blue clay	110-115
GRAVEL	coarse, much limestone	115-135
GRAVEL	coarse, with sand and blue clay	135-195
CLAY	gravelly, with boulders	195-220
CLAY	sandy, blue-gray	220-300
SAND	quicksand, rounded quartz grains	300-345
SAND	quicksand, with some clay, some angular quartz grains	345-365
CLAY	light-green, gritty, decomposed gneiss	365-475
GRANITE or GNEISS	red, soft, chloritic, feldspathic	475-765
GNEISS	fine-grained, composed mostly of feldspar and quartz, chloritic	765-1120
FELSITE	greenish, with fine red mottling, soft, fissile, chloritic	1120-1205
CRYSTALLINE ROCKS	no description	1205-1901

139-048-08DAD

Date Completed: 00/00/00 Purpose: Test Hole
L.S. Elevation (ft): 907 Well Type:
Depth Drilled (ft): 40 Log Source: unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	silty, very dark grayish brown, mottled, calcareous, unbedded to vaguely laminated (Unit 10)	0-3
CLAY	silty, dark grayish brown, oxidized, calcareous, laminated (Sherack Formation)	3-15
SILT	clayey, very dark gray, laminated, some laminations contorted, organic laminae, thick bedded near base, peat (West Fargo Member)	15-33
CLAY	very dark gray, vaguely laminated, calcareous (Brenna Formation)	33-40

139-048-10CAAAAD

Date Completed: 8/1966 Purpose: Municipal Well
L.S. Elevation (ft): 904 Well Type: 0" Stainless Steel
Depth Drilled (ft): 32 Aquifer: Undefined
Screened Interval (ft): 7-32 Log Source: Trisko

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	fill mostly topsoil, black, medium hardness	0-2
CLAY	fat clay, brown-gray, medium hardness	2-13
SILT	silt loose, gray	13-15
CLAY	fat clay, gray, medium-soft	15-32

139-048-10DBBBDB

Date Completed: 8/1966 Purpose: Municipal Well
L.S. Elevation (ft): 907 Well Type: 0" Stainless Steel
Depth Drilled (ft): 17 Aquifer: Undefined
Screened Interval (ft): 12-17 Log Source: Trisko

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL	fill mostly fat clay, brown, medium hardness	0-2
CLAY	fat clay, brown-gray, medium hardness	2-10
SILT	silt loose, brown-gray	10-15
CLAY	fat clay, gray, soft	15-16
SILT	silt loose, gray	16-17

139-048-11ABADCB

Date Completed: 9/1960 Purpose: Municipal Well
L.S. Elevation (ft): 908 Well Type: 8"
Depth Drilled (ft): 155 Aquifer: Dilworth
Screened Interval (ft): 110-145 Log Source: Cichy

Lithologic Log

139-048-11ABADCB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue	0-120
CLAY	clay, blue, hard	120-135
GRAVEL	gravel & clay mixed some water	135-140
CLAY	clay, blue	140-141
SAND	water sand	141-155

139-048-11ABCBAD

Date Completed:	1936	Purpose:	Municipal Well
L.S. Elevation (ft):	908	Well Type:	10"
Depth Drilled (ft):	164	Aquifer:	Dilworth
Screened Interval (ft):	0-0	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	gumbo	0-20
CLAY	clay, soft	20-105
SAND	sand & gravel	105-108
ROCK	cobble stone	108-140
SAND	fine sand	140-150
GRAVEL	coarse gravel	150-164

139-048-11BBCDDD

Date Completed:	3/1953	Purpose:	Industrial Well
L.S. Elevation (ft):	906	Well Type:	6"
Depth Drilled (ft):	263	Aquifer:	Dilworth
Screened Interval (ft):	0-0	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-4
CLAY	clay, yellow	4-18
CLAY	sticky shale, gray	18-100
SAND	silty sand + water	100-101
CLAY	shale, hard	101-111
BOULDERS	bed rock	111-118
SAND	sand + water	118-122
CLAY	shale, hard	122-134
SAND	coarse sand + silt	134-139
CLAY	shale, hard	139-179
SAND	sand	179-180
SHALE	shale, hard	180-212
SHALE	shale + sand, hard	212-225

139-048-11BBCDDD (continued)

SHALE	shale, hard	225-235
SHALE	shale	235-238
SHALE	shale, hard	238-258
SHALE	shale	258-263

139-048-12ABD1

Date Completed:	8/1/85	Purpose:	Municipal Well
L.S. Elevation (ft):	912	Well Type:	8" Steel
Depth Drilled (ft):	207	Aquifer:	East Ditworth
Screened Interval (ft):	172-187	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-19
CLAY	blue	19-47
SAND	with lenses of soft clay	47-67
CLAY	sandy, blue	67-85
SAND	blue	85-90
CLAY	sandy, blue	90-100
CLAY	sandy, blue	100-109
SAND	no description	109-111
CLAY	sandy, blue	111-167
ROCK	no description	167-168
CLAY	sandy, blue	168-172
SAND & GRAVEL	gray, colored	172-185
SAND & GRAVEL	with lenses of clay, gray, colored	185-187
CLAY	sandy, blue	187-188
SAND	with lenses of clay	188-192
CLAY	sandy, blue	192-207

139-048-12ABD2

Date Completed:	7/31/85	Purpose:	Municipal Well
L.S. Elevation (ft):	912	Well Type:	8" Steel
Depth Drilled (ft):	212	Aquifer:	East Ditworth
Screened Interval (ft):	173-190	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown	3-18
CLAY	blue	18-44
SAND	blue, with lenses of soft clay	44-66

139-048-12ABD2 (continued)

CLAY	sandy, blue	66-83
SAND	blue	83-99
CLAY	sandy, blue	99-113
ROCK	no description	113-114
CLAY	sandy, blue	114-141
SAND	no description	141-143
CLAY	sandy, blue	143-156
ROCK	no description	156-157
CLAY	sandy, blue	157-168
CLAY	sandy, blue	168-173
SAND	gray, with lenses of clay	173-176
SAND & GRAVEL	gray	176-187
SAND	gray	187-190
SAND & GRAVEL	gray, with clay	190-192
CLAY	sandy, blue	192-193
CLAY	sandy, gray	193-195
CLAY	sandy, blue	195-198
SAND	blue, with lenses of clay	198-200
CLAY	sandy, blue	200-212

139-048-12BABDCD

Date Completed:	5/1988	Purpose:	Industrial Well
L.S. Elevation (ft):	905	Well Type:	5" Stainless Steel
Depth Drilled (ft):	175	Aquifer:	East Dilworth
Screened Interval (ft):	164-172	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SAND	sand, brown	0-4
CLAY	sandy clay, brown	4-17
CLAY	sandy clay, blue	17-100
SAND	sand	100-102
CLAY	sandy clay, blue	102-109
CLAY	sandy clay with lenses of sand, blue	109-115
SAND	sand, colored	115-118
CLAY	sandy clay, blue	118-120
SAND	sand, blue	120-121
CLAY	sandy clay with lenses, blue	121-127
CLAY	sandy clay, blue	127-160
SAND	sand, gray	160-162
CLAY	sandy clay, blue	162-163

139-048-12BABDCD (continued)

SAND	sand, gray	163-165
SAND	sand with lenses of sand, gray	165-167
SAND	sand, gray	167-172
CLAY	sandy clay, blue	172-175

139-048-13BBBADB

Date Completed:	7/1984	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	4" Stainless Steel
Depth Drilled (ft):	285	Aquifer:	Undefined
Screened Interval (ft):	80-85	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-15
CLAY	clay, blue, soft	15-62
SAND	sand	62-95
CLAY	sandy clay, gray	95-116
BOULDERS	rock, white	116-118
CLAY	sandy clay with rock, gray	118-257
WEATHERED PRECAMBRIAN	decomposed, white	257-285

139-048-13CDCDBD

Date Completed:	5/1971	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	4" Stainless Steel
Depth Drilled (ft):	232	Aquifer:	Undefined
Screened Interval (ft):	222-230	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
SAND	sand, gray	1-4
CLAY	clay, brown	4-11
SAND	sand, brown	11-14
CLAY	shale, blue	14-78
SAND	sand washed, blue	78-89
CLAY	clay lensed with sand, blue	89-97
CLAY	sandy clay, blue	97-140
CLAY	clay + rock, blue	140-152
CLAY	sandy clay, blue	152-185
SAND	sand, blue	185-188
CLAY	clay + dirty sand lenses, blue	188-212

139-048-13CDCDBD (continued)

SAND	sand, blue	212-230
CLAY	clay, blue	230-232

139-048-13CDDDBB

Date Completed:	5/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	4" Stainless Steel
Depth Drilled (ft):	287	Aquifer:	Undefined
Screened Interval (ft):	275-281	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-11
CLAY	clay, gray, soft	11-17
CLAY	clay, blue, soft	17-82
SAND	silty sand	82-93
CLAY	sandy clay, blue	93-101
SAND	sand	101-102
CLAY	sandy clay, blue	102-119
SAND	sand	119-120
CLAY	sandy clay, blue	120-139
CLAY	sandy clay with rock hard, blue	139-140
CLAY	sandy clay, blue	140-148
SAND	sand	148-149
CLAY	sandy clay, blue	149-220
SAND	sand	220-237
SAND	sand very fine	237-267
SAND	sand	267-287

139-048-14AAAAAC

Date Completed:	11/1968	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	4"
Depth Drilled (ft):	192	Aquifer:	Undefined
Screened Interval (ft):	187-192	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, yellow	2-12
CLAY	shale, blue	12-98
CLAY	clay, blue	98-115
CLAY	sandy clay with sand lenses, blue	115-134
CLAY	clay, blue	134-165

139-048-14AAAAAC (continued)

SAND	sand, blue	165-178
CLAY	clay, blue	178-192

139-048-14CDDCBC

Date Completed:	6/1967	Purpose:	Industrial Well
L.S. Elevation (ft):	909	Well Type:	0"
Depth Drilled (ft):	312	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, brown	2-15
CLAY	shale, blue	15-93
CLAY	clay, blue	93-142
SAND	sand, colored	142-147
CLAY	clay, blue	147-179
SAND	sand, blue	179-182
CLAY	shale, blue	182-226
SHALE	shale, brown-blue	226-259
SANDSTONE	very dirty sand, blue	259-274
SANDSTONE	dirty sand, blue	274-295
SHALE	shale white-blue-green	295-312

139-048-14DCCDBA

Date Completed:	6/1967	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	4" Stainless Steel
Depth Drilled (ft):	262	Aquifer:	Undefined
Screened Interval (ft):	246-262	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, brown	2-6
CLAY	shale, blue	6-92
CLAY	clay + sand lenses, blue	92-122
CLAY	clay, blue	122-137
SAND	sand, brown	137-142
CLAY	clay, blue	142-187
SHALE	shale, brown-blue	187-241
SAND	sand fine, blue	241-262

139-048-15CDDCDA

Date Completed: 2/1972
 L.S. Elevation (ft): 909
 Depth Drilled (ft): 145
 Screened Interval (ft): 137-143

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-15
CLAY	clay, blue	15-22
CLAY	shale, blue	22-96
CLAY	sandy clay, blue	96-122
CLAY	clay with lenses, blue	122-126
CLAY	sandy clay, blue	126-136
SAND	sand, colored	136-139
CLAY	clay, blue	139-140
SAND	sand, blue	140-143
CLAY	sandy clay, blue	143-145

139-048-15DCDCBD

Date Completed: 6/1976
 L.S. Elevation (ft): 911
 Depth Drilled (ft): 190
 Screened Interval (ft): 150-156

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-3
SAND	silty sand, brown	3-7
CLAY	clay, brown	7-14
CLAY	clay, blue, soft	14-94
CLAY	sandy clay, blue	94-111
SAND	dirty sand	111-113
CLAY	sandy clay, blue	113-134
SAND	sand coarser	134-136
CLAY	sandy clay, blue	136-138
SAND	sand	138-141
CLAY	sandy clay, blue	141-148
SAND	sand drilled little dirty	148-156
CLAY	sandy clay, blue	156-163
SAND	sand	163-164
CLAY	sandy clay, blue	164-190

139-048-17BAA

Date Completed:	1917	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	3" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-133	Log Source:	

Lithologic Log - unavailable

139-048-18ABA

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	904.67	Well Type:	8" Steel
Depth Drilled (ft):	242	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	tan, silt and clay	0-25
CLAY	gray, yellow-gray in upper part	25-95
TILL	clay, gray, and considerable sand and gravel	95-100
SILT	gray, with considerable gravel and sand	100-152
GRAVEL	fine, and coarse sand, silty	152-155
SAND	coarse	155-160
GRAVEL	with coarse sand	160-165
GRAVEL	no description	165-170
TILL	clay, gray, pebbly, with some sand	170-185
CLAY	gray	185-190
CLAY	silty, gray	190-200
CLAY	buff	200-205
CLAY	silty, gray, some gravel	205-215
SAND & SILT	buff	215-230
GRANITE	clay, white, and some sand	230-242

139-048-19BDA

Date Completed:	3/1/75	Purpose:	Irrigation Well
L.S. Elevation (ft):	905	Well Type:	4" Steel
Depth Drilled (ft):	227	Aquifer:	Undefined
Screened Interval (ft):	155-160	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-26
CLAY	blue, soft	26-92
CLAY	blue, sandy, with small rock	92-105
CLAY	blue, sandy	105-129
SAND	colored, coarse	129-132
CLAY	blue, sandy	132-141

139-048-19BDA (continued)

SAND	no description	141-143
CLAY	blue, sandy	143-156
SAND	dirty	156-157
SAND	no description	157-159
CLAY	blue, sandy	159-173
SAND	dirty, fine	173-179
CLAY	blue, sandy	179-224
PRECAMBRIAN	white	224-227

139-048-19BDD

Date Completed: 3/11/76
 L.S. Elevation (ft): 903
 Depth Drilled (ft): 182
 Screened Interval (ft): 169-179

Purpose: Irrigation Well
 Well Type: 4" Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-10
CLAY	blue, soft	10-95
CLAY	blue, sandy	95-106
SAND	no description	106-108
CLAY	blue, sandy	108-118
SAND	with clay lenses, fine	118-122
SAND	fine	122-128
CLAY	blue, sandy	128-142
SAND	no description	142-182

139-048-19DDBDDC

Date Completed: 9/1977
 L.S. Elevation (ft): 901
 Depth Drilled (ft): 196
 Screened Interval (ft): 182-188

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-18
CLAY	clay, blue, soft	18-95
CLAY	sandy clay, blue	95-116
SAND	sand	116-118
CLAY	sandy clay, blue	118-124
SAND	sand	124-126

139-048-19DDBDDC (continued)

CLAY	sandy clay, blue	126-136
SAND	sand	136-142
CLAY	sandy clay, blue	142-143
SAND	sand	143-160
CLAY	sandy clay	160-161
SAND	sand	161-190
CLAY	sandy clay, blue	190-192
SAND	sand	192-195
CLAY	sandy clay, blue	195-196

139-048-20ACBACB

Date Completed:	6/1962	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	4" Other
Depth Drilled (ft):	282	Aquifer:	Undefined
Screened Interval (ft):	260-266	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL	fill, colored	0-4
CLAY	clay, yellow	4-19
CLAY	shale, blue	19-98
CLAY	sandy clay, blue	98-130
CLAY	hard sandy clay + sand lenses, blue	130-156
CLAY	hard sandy clay, blue	156-191
CLAY	softer sandy clay, blue	191-208
CLAY	hard sandy clay, blue	208-233
CLAY	softer sandy clay, blue	233-239
CLAY	sandy clay + sand lenses, gray, soft	239-267
SAND	sand, gray	267-269
WEATHERED PRECAMBRIAN	decomposed granite, colored	269-282

139-048-20CAAAAA

Date Completed:	7/1957	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	3"
Depth Drilled (ft):	145	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue	0-139
GRAVEL	gravel, gray-yellow	139-145

139-048-20CAADBC

Date Completed: 7/1965
L.S. Elevation (ft): 904
Depth Drilled (ft): 204
Screened Interval (ft): 198-204

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-17
CLAY	clay, blue, soft	17-86
CLAY	sandy clay, blue, hard	86-95
SAND	sand dirty, blue	95-102
CLAY	sandy clay with sand lenses, blue, soft	102-125
SAND	sand dirty, blue	125-129
CLAY	sandy clay + boulders, blue, hard	129-144
CLAY	sandy clay, blue, hard	144-178
CLAY	sandy clay with lenses, blue, softer	178-187
CLAY	sandy clay mixed with shale, gray, softer	187-196
SAND	sand, gray	196-204

139-048-20CBDCBB

Date Completed: 10/1958
L.S. Elevation (ft): 903
Depth Drilled (ft): 187
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
3"
Undefined
unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue, soft	0-115
TILL	till	115-175
SAND	sand, gray	175-187

139-048-20CDBABA

Date Completed: 8/1957
L.S. Elevation (ft): 904
Depth Drilled (ft): 190
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
3"
Undefined
unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue	0-96
BOULDERS	boulders	96-104
CLAY	clay, blue	104-127
BOULDERS	boulders	127-130
TILL	drift, gray	130-141

139-048-20CDBABA (continued)

CLAY	clay, blue	141-152
SAND	sand	152-155
CLAY	clay, blue	155-176
SAND	sand, white	176-190
CLAY	clay	190-190

139-048-23AAADAB

Date Completed:	7/1988	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	2" Stainless Steel
Depth Drilled (ft):	227	Aquifer:	Undefined
Screened Interval (ft):	219-223	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-16
CLAY	clay, gray	16-92
CLAY	sandy clay, gray	92-93
SAND	sand, colored	93-96
CLAY	sandy clay, gray	96-112
CLAY	clay, gray	112-137
SAND	sand, gray	137-142
CLAY	sandy clay, gray	142-169
CLAY	clay, gray	169-185
SAND	sand, colored	185-186
CLAY	sandy clay rock, gray	186-205
CLAY	sandy clay, gray	205-207
SAND	sand, colored	207-223
CLAY	sandy clay, gray	223-227

139-048-23CCDCCB

Date Completed:	6/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	4" Stainless Steel
Depth Drilled (ft):	328	Aquifer:	Undefined
Screened Interval (ft):	310-326	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, gray	1-3
CLAY	clay, yellow	3-12
CLAY	clay, blue, soft	12-33
CLAY	soft clay with limestone, blue	33-37

139-048-23CCDCB (continued)

CLAY	clay, blue, soft	37-87
CLAY	sandy clay, gray	87-97
SAND	sand + few clay lenses, colored	97-100
CLAY	sandy clay, gray	100-110
SAND	sand + hard black shale, colored	110-118
CLAY	sandy clay, gray	118-120
SAND	sand, colored	120-121
CLAY	sandy clay, gray	121-129
ROCK	rock, colored	129-130
CLAY	sandy clay with limestone, gray	130-135
CLAY	sandy clay, gray	135-180
CLAY	hard sandy clay with limestone, gray	180-205
CLAY	sandy clay, gray, hard	205-260
CLAY	sandy clay, gray, softer	260-270
SAND	sand with decomposed, colored	270-278
CLAY	sandy clay, gray	278-303
SAND	sand with clay lenses, colored	303-306
CLAY	sandy clay, gray	306-308
SAND	sand drilled good took water, colored	308-326
PRECAMBRIAN	granite, green	326-328

139-048-25BBCCA

Date Completed:	6/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	917	Well Type:	4" Stainless Steel
Depth Drilled (ft):	263	Aquifer:	Undefined
Screened Interval (ft):	250-260	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
GRAVEL	gravel, brown	0-1
SOIL	top soil, black	1-2
CLAY	clay, brown	2-17
CLAY	clay (soft), blue	17-94
CLAY	sandy clay, blue	94-118
BOULDERS	rock	118-119
CLAY	sandy clay, blue	119-137
SAND	sand drilled coarse	137-142
CLAY	sandy clay, blue	142-164
CLAY	sandy clay (rocky), blue	164-170
SAND	sand with lenses of dirty sand	170-178
SAND	sandy drilled dirty	178-181

139-048-25BBCCCA (continued)

CLAY	sandy clay, blue	181-191
SAND	sand	191-193
CLAY	sandy clay, blue	193-200
SAND	sand little dirty	200-202
SAND	sand	202-203
CLAY	sandy clay, blue	203-204
SAND	sand with lenses of clay	204-207
CLAY	sandy clay, blue	207-241
CLAY	sandy clay with lenses of sand, blue	241-245
SAND	sand	245-247
CLAY	sandy clay, blue	247-249
SAND	sand	249-260
CLAY	sandy clay, blue	260-263

139-048-25CBBCAC

Date Completed:	5/1991	Purpose:	Domestic Well
L.S. Elevation (ft):	915	Well Type:	4" Stainless Steel
Depth Drilled (ft):	157	Aquifer:	Undefined
Screened Interval (ft):	147-151	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-3
CLAY	clay, gray, soft	3-4
CLAY	clay, brown, soft	4-10
CLAY	clay, gray, soft	10-91
CLAY	sandy clay, gray	91-141
SAND	sand, varied color	141-152
CLAY	sandy clay, gray	152-157

139-048-26BBABAC

Date Completed:	8/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	0"
Depth Drilled (ft):	341	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-15
CLAY	soft clay, blue, soft	15-90
CLAY	hard sandy clay, blue, hard	90-103
BOULDERS	limestone - boulder, white	103-104

139-048-26BBABAC (continued)

CLAY	hard sandy clay, blue, hard	104-123
CLAY	hard sandy clay boulders, blue, hard	123-142
SAND	sand, blue	142-144
CLAY	hard sandy clay, blue, hard	144-166
SAND	sand, colored	166-178
CLAY	sandy clay, blue	178-179
SAND	sand, colored	179-184
CLAY	sandy clay boulders, blue, hard	184-264
CLAY	softer sandy clay, blue	264-309
BOULDERS	boulder, red	309-310
SAND	sand, green	310-312
CLAY	sandy clay, blue, hard	312-324
WEATHERED PRECAMBRIAN	weathered granite, green	324-339
PRECAMBRIAN	granite, green-black	339-341

139-048-26BBABCA

Date Completed:	8/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	4" Stainless Steel
Depth Drilled (ft):	290	Aquifer:	Undefined
Screened Interval (ft):	277-288	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-14
CLAY	clay, blue, soft	14-92
CLAY	sandy clay, blue, hard	92-111
CLAY	shale + limestone, colored	111-114
CLAY	sandy clay + boulders, blue, hard	114-133
CLAY	sandy clay, blue, hard	133-187
CLAY	sandy clay + boulders, blue, hard	187-218
CLAY	sandy clay, blue, hard	218-276
SAND	sand, gray	276-288
CLAY	sandy clay, blue, hard	288-290

139-048-26BBCCD

Date Completed:	9/1971	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	0"
Depth Drilled (ft):	342	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

139-048-26BBBCCD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-13
CLAY	soft clay, blue, soft	13-103
CLAY	sandy clay, blue, hard	103-124
SAND	fine sand, gray	124-127
CLAY	sandy clay, blue, hard	127-143
BOULDERS	boulder, gray-white	143-145
CLAY	sandy clay, blue	145-146
SAND	sand, gray	146-148
CLAY	sandy clay, blue, hard	148-157
CLAY	sandy clay-boulders, blue, hard	157-207
CLAY	sandy clay, blue, hard	207-278
CLAY	sandy clay, blue, softer	278-299
SAND	sand, gray	299-300
CLAY	sandy clay, blue	300-301
SAND	sand, gray	301-302
WEATHERED PRECAMBRIAN	weathered granite, green	302-342

139-048-26BBBCDC

Date Completed:	00/00/00	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	0*
Depth Drilled (ft):	312	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-14
CLAY	clay, blue, soft	14-105
CLAY	sandy clay, blue, hard	105-120
SAND	fine sand, blue	120-122
CLAY	sandy clay, blue	122-124
SAND	fine sand, gray	124-128
CLAY	sandy clay + boulder, blue	128-142
SAND	dirty sand, colored	142-146
SAND	sand, colored	146-150
CLAY	sandy clay, blue, hard	150-181
SAND	sand, gray	181-182
CLAY	sandy clay, blue, hard	182-258

139-048-26BBBCDC (continued)

CLAY	sandy clay, blue, softer	258-300
SAND	sand, gray	300-301
WEATHERED PRECAMBRIAN	weathered granite, green	301-312

139-048-28ADDDDB

Date Completed:	10/1964	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	4"
Depth Drilled (ft):	251	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-14
CLAY	clay, blue	14-91
CLAY	sandy clay, blue, soft	91-103
SAND	dirty sand, gray	103-106
CLAY	sandy hard clay + boulders, gray	106-126
SAND	dirty sand, gray	126-131
CLAY	sandy clay with sand lenses + boulder, gray	131-157
SAND	sand, colored	157-160
CLAY	sandy hard clay + boulders, gray	160-191
SHALE	sandy hard clay, gray	191-233
SHALE	shale, gray	233-251

139-048-29BABBCDC

Date Completed:	9/1987	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	4" Stainless Steel
Depth Drilled (ft):	202	Aquifer:	Undefined
Screened Interval (ft):	193-198	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-25
CLAY	clay, blue	25-50
CLAY	sandy clay, gray	50-114
SAND	sand, brown	114-115
CLAY	sandy clay, gray	115-120
BOULDERS	rock, white	120-121
CLAY	sandy clay, gray	121-126
SAND	sand, colored	126-128

139-048-29BABBD C (continued)

CLAY	sandy clay, gray	128-131
SAND	sand, colored	131-132
CLAY	sand clay, gray	132-160
SAND	sand, colored	160-165
CLAY	sandy clay, gray	165-175
SAND	sand, colored	175-177
CLAY	sandy clay, gray	177-178
SAND	sand, colored	178-180
CLAY	sandy clay, gray	180-185
SAND	sand with clay lenses, gray	185-187
CLAY	sandy clay, gray	187-192
SAND	sand, gray	192-198
CLAY	sandy clay, gray	198-202

139-048-29DCBCAA

Date Completed: 11/1973
 L.S. Elevation (ft): 907
 Depth Drilled (ft): 222
 Screened Interval (ft): 135-139

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 4" Stainless Steel
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	shale, brown	1-9
CLAY	shale, brown, soft	9-13
CLAY	shale, blue, soft	13-82
CLAY	sandy clay, blue	82-86
SAND	sand, colored	86-87
CLAY	sandy clay, blue, soft	87-99
SAND	sand, colored	99-100
CLAY	sandy clay, blue	100-134
SAND	sand, blue	134-138
CLAY	sandy clay, blue	138-162
SAND	sand, blue	162-163
CLAY	sandy clay, blue	163-173
SAND	sand, blue	173-174
CLAY	sandy clay, blue	174-175
SAND	sand, blue	175-176
CLAY	sandy clay, blue	176-177
SAND	fine dirty sand + clay lenses, gray	177-182
CLAY	sandy clay, blue	182-191

139-048-29DCBCAA (continued)

SAND	sand washed, gray	191-192
CLAY	sandy clay, blue	192-202
WEATHERED PRECAMBRIAN	sandy clay + decomposed, colored	202-217
WEATHERED PRECAMBRIAN	shale with decomposed, colored	217-222

139-048-29DCBDBB

Date Completed:	9/1973	Purpose:	Industrial Well
L.S. Elevation (ft):	907	Well Type:	0"
Depth Drilled (ft):	267	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, gray, hard	2-5
CLAY	clay, brown	5-12
CLAY	shale, blue, soft	12-78
CLAY	sandy clay with rock, blue	78-90
CLAY	sandy clay, blue	90-124
SAND	dirty sand, blue	124-127
CLAY	sandy clay, blue	127-128
SAND	sand, gray	128-129
CLAY	sand clay, blue	129-135
ROCK	rock, white-red	135-137
CLAY	sandy clay with rock, blue	137-155
SAND	sand + coarser lenses, colored	155-162
CLAY	sandy clay with rock, blue	162-165
SAND	sand washed, gray	165-168
CLAY	sandy clay, blue	168-183
SAND	fine sand drilled good, gray	183-187
SAND	sand + clay lenses, gray-blue	187-189
CLAY	sandy clay, blue	189-192
SHALE	sandy shale, blue	192-246
SHALE	shale white brown blue gray	246-252
SHALE	sandy shale, blue-gray, hard	252-267

139-048-29DCBDCB

Date Completed:	11/1973	Purpose:	Industrial Well
L.S. Elevation (ft):	907	Well Type:	0"
Depth Drilled (ft):	237	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

139-048-29DC:BDCB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	shale, yellow	3-17
CLAY	shale, blue	17-72
CLAY	clay, blue	72-105
SAND	sand, brown	105-108
CLAY	clay, blue	108-217
SAND	sand, white	217-218
WEATHERED PRECAMBRIAN	decomposed, brown-white	218-237

139-048-29DCCADB

Date Completed:	11/1980	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	4" Stainless Steel
Depth Drilled (ft):	217	Aquifer:	Undefined
Screened Interval (ft):	140-146	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown, soft	2-21
CLAY	clay, blue, soft	21-77
CLAY	sandy clay, gray	77-123
SAND	sand drilled fair #8, colored	123-127
SAND	sand drilled poor, colored	127-130
CLAY	sandy clay, gray	130-133
CLAY	sandy clay with lenses, gray	133-135
SAND	sand, colored	135-136
CLAY	sandy clay, gray	136-138
SAND	sand drilled good, colored	138-146
CLAY	sandy clay with lenses sand	146-147
SAND	sand, colored	147-148
CLAY	sandy clay, gray	148-149
SAND	sand, colored	149-152
CLAY	sandy clay, gray	152-155
SAND	sand drilled dirty, colored	155-161
CLAY	sandy clay with small lenses, gray	161-163
CLAY	sandy clay, gray	163-217

139-048-29DCCCAC

Date Completed: 12/1969
L.S. Elevation (ft): 907
Depth Drilled (ft): 199
Screened Interval (ft): 191-197

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-16
CLAY	clay, blue, soft	16-84
CLAY	sandy clay, blue, hard	84-129
SAND	sand, blue	129-131
CLAY	sandy clay, blue, hard	131-151
SAND	sand, blue	151-154
CLAY	sandy clay, blue, hard	154-178
SAND	sand, blue	178-179
CLAY	sandy clay, blue	179-186
SAND	sand, gray	186-191
CLAY	clay, blue	191-197
SHALE	shale, purple	197-199

139-048-30ABCAAB

Date Completed: 12/1971
L.S. Elevation (ft): 903
Depth Drilled (ft): 152
Screened Interval (ft): 146-152

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-10
CLAY	shale, brown	10-18
CLAY	shale, blue	18-85
CLAY	clay + sand, colored	85-91
CLAY	sandy clay with rock, blue	91-137
SAND	sand, blue	137-152

139-048-30ABDABB

Date Completed: 1955
L.S. Elevation (ft): 903
Depth Drilled (ft): 157
Screened Interval (ft): 150-157

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
3"
Undefined
unknown

Lithologic Log

139-048-30ABDABB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
NO SAMPLE	no record	0-3
CLAY	clay	3-95
TILL	sandy till	95-130
SAND	sand	130-133
CLAY	clay	133-134
SAND	sand	134-136
CLAY	clay	136-138
SAND	sand	138-140
CLAY	clay	140-150
SAND	sand	150-157

139-048-30ABDCAD

Date Completed:	11/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	4" Stainless Steel
Depth Drilled (ft):	182	Aquifer:	Undefined
Screened Interval (ft):	176-182	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-25
CLAY	clay, blue	25-77
CLAY	sandy clay, blue	77-92
CLAY	clay, blue	92-142
SAND	sand + gravel, colored	142-182

139-048-30ABDDDC

Date Completed:	7/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	900	Well Type:	4" Stainless Steel
Depth Drilled (ft):	165	Aquifer:	Undefined
Screened Interval (ft):	157-163	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	shale, yellow	1-18
CLAY	shale, blue	18-109
CLAY	clay, blue	109-142
CLAY	clay lensed with sand, blue	142-146
SAND	sand, blue	146-163
CLAY	clay, blue	163-165

139-048-30ADDBAB

Date Completed: 11/1973
L.S. Elevation (ft): 906
Depth Drilled (ft): 173
Screened Interval (ft): 155-160

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, brown	0-5
CLAY	shale, brown, soft	5-22
CLAY	shale, blue, soft	22-95
CLAY	sandy clay, blue, soft	95-100
SAND	sand	100-102
CLAY	sandy clay, blue, soft	102-139
SAND	sand with clay lenses, blue	139-142
CLAY	sandy clay, blue	142-144
SAND	sand, gray	144-148
CLAY	sandy clay, blue, soft	148-154
SAND	sand drilled good took water, colored	154-160
SAND	very dirty sand with clay, colored	160-165
SAND	sand drilled dirty, colored	165-170
CLAY	sandy clay, blue	170-173

139-048-30BAABDD

Date Completed: 11/1977
L.S. Elevation (ft): 895
Depth Drilled (ft): 181
Screened Interval (ft): 175-181

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, brown-yellow, soft	1-12
CLAY	clay, blue, soft	12-93
CLAY	clay + stones, gray, medium hard	93-140
SAND	sand, white, soft	140-181

139-048-30BABAAC

Date Completed: 4/1971
L.S. Elevation (ft): 890
Depth Drilled (ft): 127
Screened Interval (ft): 116-124

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-5

139-048-30BABAAC (continued)

CLAY	clay, brown	5-22
CLAY	shale, blue	22-78
SAND	sand, blue	78-81
CLAY	sandy clay, blue	81-87
CLAY	clay with rock, blue	87-93
CLAY	sandy clay, blue	93-100
CLAY	clay lensed with sand, blue	100-111
SAND	sand, blue	111-124
CLAY	clay, blue	124-127

139-048-30BABABA

Date Completed:	5/1960	Purpose:	Domestic Well
L.S. Elevation (ft):	890	Well Type:	4" Other
Depth Drilled (ft):	131	Aquifer:	Undefined
Screened Interval (ft):	112-119	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil	0-5
CLAY	clay, brown	5-27
CLAY	clay, blue	27-35
CLAY	sticky shale, blue, soft	35-78
CLAY	sandy clay + sand lenses, blue, sof:	78-89
CLAY	sandy clay, blue, hard	89-106
CLAY	sandy clay, blue	106-110
SAND	sand, gray	110-116
CLAY	clay, blue	116-117
SAND	sand + gravel, whitish	117-119
CLAY	sandy clay, blue, hard	119-131

139-048-30DACAAB

Date Completed:	3/1973	Purpose:	Domestic Well
L.S. Elevation (ft):	906	Well Type:	4" Stainless Steel
Depth Drilled (ft):	207	Aquifer:	Undefined
Screened Interval (ft):	141-146	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, gray	3-6
CLAY	clay, brown	6-15
CLAY	shale, blue	15-90
CLAY	sandy clay, blue	90-101

139-048-30DACAAB (continued)

CLAY	sandy clay with rock, blue	101-108
CLAY	sandy clay, blue	108-137
SAND	sand, colored	137-138
CLAY	sandy clay, blue	138-140
SAND	sand with clay lenses, colored	140-146
CLAY	sandy clay, blue	146-147
SAND	sand, colored	147-151
CLAY	sandy clay, blue	151-154
SAND	sand, colored	154-158
CLAY	sandy clay, blue	158-161
SAND	sand, colored	161-163
CLAY	clay-sandy, blue	163-168
SAND	sand, colored	168-172
CLAY	clay, blue	172-187
SAND	dirty sand with clay lenses, colored	187-192
SAND	fine sand, blue	192-197
SHALE	clay + black shale, blue-black	197-202
SHALE	sandy clay + shale, varied color	202-204
SHALE	shale, black	204-207

139-048-32ABBBCA

Date Completed:	4/1957	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	3"
Depth Drilled (ft):	145	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SAND	sand, yellow	0-20
CLAY	clay, blue	20-89
TILL	drift, gray	89-140
GRAVEL	coarse gravel	140-145

139-048-32DBDCAD

Date Completed:	8/1987	Purpose:	Domestic Well
L.S. Elevation (ft):	910	Well Type:	4" Stainless Steel
Depth Drilled (ft):	177	Aquifer:	Undefined
Screened Interval (ft):	164-172	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-12

139-048-32DBDCAD (continued)

CLAY	clay, blue	12-85
CLAY	sandy clay, gray	85-155
SAND	sand, colored	155-172
CLAY	sandy clay, gray	172-177

139-048-33CCCCDB

Date Completed:	4/1971	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	4" Stainless Steel
Depth Drilled (ft):	91	Aquifer:	Undefined
Screened Interval (ft):	85-89	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-6
CLAY	shale, brown	6-10
CLAY	shale, blue	10-68
SAND	sand + gravel, blue	68-89
SAND	sand + gravel dirty, blue	89-91

139-048-34BBCBCD

Date Completed:	10/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	912	Well Type:	4" Stainless Steel
Depth Drilled (ft):	173	Aquifer:	Undefined
Screened Interval (ft):	162-168	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-18
CLAY	clay, blue, soft	18-96
CLAY	sandy clay, blue, soft	96-124
CLAY	sandy clay rocky, blue, hard	124-153
SAND	sand with clay layers, blue	153-161
SAND	sand (fine), blue	161-168
CLAY	sandy clay, blue	168-173

139-048-35ABBABC

Date Completed:	5/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	913	Well Type:	4" Stainless Steel
Depth Drilled (ft):	171	Aquifer:	Undefined
Screened Interval (ft):	166-171	Log Source:	LTP Enterprises, Inc

Lithologic Log

139-048-35ABBABC (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-15
CLAY	sandy clay, blue, soft	15-100
SAND	sand fine dirty, gray	100-102
CLAY	sandy clay, blue	102-163
SAND	sand with small lenses, varied color	163-171

139-048-36DDDDDA

Date Completed:	3/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	917	Well Type:	4" Stainless Steel
Depth Drilled (ft):	258	Aquifer:	Undefined
Screened Interval (ft):	252-258	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-2
CLAY	clay, yellow, soft	2-21
CLAY	clay, blue, soft	21-115
CLAY	gray clay + stones, gray, medium hard	115-167
SAND	fine silty sand, gray, soft	167-169
CLAY	gray clay + stones, gray, medium hard	169-193
BOULDERS	boulder, gray, very hard	193-195
CLAY	clay + stones, gray, medium hard	195-250
SAND	medium water sand, gray, soft	250-258

139-049-01BAD

Date Completed:	5/30/47	Purpose:	Test Hole
L.S. Elevation (ft):	899	Well Type:	
Depth Drilled (ft):	200	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
TILL	yellow clay with fine shale pebbles	4-18
CLAY	lake clay	18-93
TILL	blue clay, fine gravel, shale pebbles, and a few specks of coal	93-112
GRAVEL	fine to medium, with shale pebbles	112-116
TILL	gray clay, with gravel, shale pebbles, and limestone cuttings	116-124
GRAVEL	fine to medium, with shale pebbles	124-125
TILL	gray clay, gravel and shale pebbles	125-132
TILL	gray clay, gritty, hard, with a lot of medium gravel, and shale pebbles	132-165

139-049-01BAD (continued)

TILL	blue clay, hard, gravel and shale pebbles	165-170
TILL	blue clay, hard, fine gravel and shale pebbles	170-191
TILL	light brown clay, fine gravel, and fine shale pebbles	191-197
WEATHERED PRECAMBRIAN	decayed granite	197-200

139-049-01BBB

Date Completed:	5/27/47	Purpose:	Test Hole
L.S. Elevation (ft):	899	Well Type:	
Depth Drilled (ft):	190	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
TILL	yellow clay, with shale pebbles	3-18
TILL	lake clay mixed with some brown sandy clay and a few small gravels	18-34
CLAY	lake clay	34-89
TILL	blue clay, with fine gravel, limestone cuttings and shale pebbles	89-132
TILL	light gray clay, with fine and medium gravel and shale pebbles	132-140
GRAVEL	fine and medium, with a granite boulder at 164 feet	140-164
SAND	fine, dirty sand, with fine gravel, and a few specks of coal	164-184
WEATHERED PRECAMBRIAN	decayed granite	184-190

139-049-01BCD

Date Completed:	5/22/47	Purpose:	Test Hole
L.S. Elevation (ft):	898	Well Type:	
Depth Drilled (ft):	220	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
TILL	yellow clay, with fine gravel and shale pebbles	1-16
CLAY	lake clay	16-82
TILL	blue clay, with fine and coarse gravel, shale pebbles, limestone cuttings, and a few specks of coal	82-132
TILL	blue clay, mixed with a little brown clay, fine gravel, and shale pebbles	132-152
GRAVEL	fine, medium and coarse, with sand, and shale pebbles	152-157
TILL	gray sandy clay, with fine gravel, and shale pebbles	157-170
TILL	gray sandy clay, with fine and medium sand, fine and medium gravel, shale pebbles, and a little coal	170-190
TILL	same as above, with a little more gray clay	190-198

139-049-01BCD (continued)

WEATHERED
PRECAMBRIAN

decayed granite

198-220

139-049-01CAA

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

5/29/47
899
190

Purpose: Test Hole
Well Type:
Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
TILL	clay, yellow, a few shale pebbles, and fine gravels	4-18
CLAY	lake	18-88
TILL	clay, gray, a lot of fine gravel, limestone cuttings, and shale pebbles	88-109
TILL	sandy, gravelly, a few shale pebbles	109-121
GRAVEL	fine and medium	121-124
TILL	clay, gray, with a lot of fine and medium gravel, and shale pebbles	124-135
TILL	clay, gray, fine gravel, shale pebbles, and limestone cuttings	135-140
TILL	clay, gray, a few fine gravels, fine shale pebbles, and a little coal	140-156
TILL	clay, sandy, gravelly, gray, gritty, with fine gravel	156-178
GRANITE	decayed	178-190

139-049-01CAC

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

0/0
904
0
0-0

Purpose: Municipal Well
Well Type: 0" Steel
Aquifer: Fargo
Log Source:

Lithologic Log - unavailable

139-049-01CBB

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

5/24/47
900
225

Purpose: Test Hole
Well Type:
Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
TILL	yellow clay and fine shale pebbles	2-20
TILL	brown sandy clay mixed with lake clay	20-25
CLAY	lake clay	25-28
SAND	fine, medium, and coarse sand with some fine gravel and a little coal	28-52
CLAY	lake clay	52-94
TILL	blue gray clay with fine and coarse gravel and shale pebbles	94-152

139-049-01CBB (continued)

SAND & GRAVEL	fine to coarse sand and fine to medium gravel with shale pebbles	152-158
TILL	blue clay, with fine gravel and shale pebbles	158-174
TILL	blue clay, with fine gravel, shale pebbles, brown clay, and some decayed granite	174-180
TILL	brown clay, with some blue clay, fine gravel, shale pebbles, and a little granite	180-188
WEATHERED PRECAMBRIAN	decayed granite	188-193
WEATHERED PRECAMBRIAN	decayed granite, sampled with core barrel	220-225

139-049-01CBD1

Date Completed:	00/00/00	Purpose:	Observation Well
L.S. Elevation (ft):	903.19	Well Type:	2" Unknown
Depth Drilled (ft):	192	Aquifer:	Fargo
Screened Interval (ft):	0-183	Log Source:	Byers et al, 1946

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
NOT REPORTED	no description	0-25
CLAY	yellow	25-35
CLAY	blue	35-95
CLAY	sandy	95-105
SAND	clayey	105-110
CLAY	blue, some sand	110-115
CLAY	yellow, with sand	115-125
CLAY	blue, with gravel	125-130
CLAY	yellow, sand	130-147
SAND	clear quartz, coarse gravel	147-155
SAND	clear quartz	155-170
SAND	clear quartz, coarse gravel	170-191
SAND	clear quartz	191-192

139-049-01CBD2

Date Completed:	1936	Purpose:	Municipal Well
L.S. Elevation (ft):	903.16	Well Type:	24" Steel
Depth Drilled (ft):	200	Aquifer:	Fargo
Screened Interval (ft):	0-192	Log Source:	

Lithologic Log - unavailable

139-049-01CCA

NDSWC 11625

Date Completed:	7/30/81	Purpose:	Observation Well
L.S. Elevation (ft):	903.5	Well Type:	1.25" PVC
Depth Drilled (ft):	220	Aquifer:	Fargo
Screened Interval (ft):	184-190	Log Source:	NDSWC

Lithologic Log

139-049-01CCA (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	lacustrine, dark yellow brown, oxidized, plastic	4-20
CLAY	lacustrine, olive gray, unoxidized, plastic	20-37
SAND	very fine to fine, medium sand about 20%, rounded to subrounded, fair to poor sorting	37-55
CLAY	lake clay, olive gray, plastic	55-85
TILL	clay, olive gray, silty, sandy, gravelly	85-120
TILL	very gravelly	120-142
SAND	medium to very coarse grained, subrounded to subangular, granules to fine pebbles about 5-10%, fair sorting	142-200
CLAY	grayish green-blue, firm, slightly silty	200-201
GRAVEL	granules to fine pebbles, subrounded to angular, 90 % quartz	201-204
CLAYSTONE	very light gray, pasty	204-220

139-049-01CCA2

Date Completed:	4/24/82	Purpose:	Industrial Well
L.S. Elevation (ft):	901	Well Type:	12" Steel
Depth Drilled (ft):	213	Aquifer:	Fargo
Screened Interval (ft):	170-200	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
GRAVEL	no description	0-4
CLAY	yellow	4-25
CLAY	gray	25-32
SILT	no description	32-43
SAND	no description	43-73
CLAY	gray	73-94
TILL	no description	94-143
SAND	coarse, gravel layers	143-200
SILT	no description	200-206
GRANITE	weathered	206-213

139-049-01CCD1

Date Completed:	00/00/00	Purpose:	Test Hole
L.S. Elevation (ft):	901	Well Type:	
Depth Drilled (ft):	417	Log Source:	Byers, 1946 & Dennis, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
NO RECORD	no description	0-20
SILT	buff	20-35

139-049-01CCD1 (continued)

SAND	fine to medium, silty, buff	35-40
SILT	clayey, gray	40-45
SAND	silty, fine to medium, buff	45-62
CLAY	gray	62-95
CLAY	blue, sandy	95-110
CLAY	blue with broken gravel	110-125
GRAVEL	coarse, angular, rounded, and small pebbles	125-127
CLAY	bluish, with small angular pebbles	127-129
SAND	fine with clay	129-135
CLAY	sandy	135-140
CLAY	blue with angular pebbles	140-160
CLAY	blue with fine quartz sand	160-190
CLAY	blue with small pebbles	190-195
CLAY	blue, with a little sand and gravel	195-225
CLAY	blue	225-247
GRAVEL	no description	247-249
CLAY	light green, with fragments of quartz and granite	249-254
SAND	coarse, angular, white	254-260
CLAY	light green with sand, and some angular granite pebbles	260-265
CLAY	light green, with pebbles of schist and granite (kaolin?)	265-417

139-049-01CCD2

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	903.39	Well Type:	8" Steel
Depth Drilled (ft):	196	Aquifer:	Fargo
Screened Interval (ft):	0-196	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	no record	0-50
SAND	medium, clean	50-62
CLAY	blue, silty in lower part	62-90
TILL	clay, blue, and fine silty sand	90-125
TILL	blue clay, gravel and silty sand	125-140
TILL	gravel, coarse sand, and blue clay	140-150
TILL	clay, sandy, gray, and some gravel	150-155
GRAVEL & SAND	fine to medium, water rose to 25 feet	155-158
GRAVEL	fine, and coarse sand	158-165
SAND	medium to coarse	165-180
SAND	some gravel, clean	180-195
TILL	clay, silty, black	195-196

139-049-01CDB

Date Completed: 1956 Purpose: Industrial Well
L.S. Elevation (ft): 904 Well Type: 16" Unknown
Depth Drilled (ft): 0 Aquifer: Fargo
Screened Interval (ft): 0-192 Log Source:

Lithologic Log - unavailable

139-049-01DBB

Date Completed: 5/21/47 Purpose: Test Hole
L.S. Elevation (ft): 902 Well Type:
Depth Drilled (ft): 190 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow, mixed with gray clay and fine gravel	1-25
CLAY	lake clay	25-92
TILL	blue-gray clay, with fine and medium gravel, limestone cuttings, shale pebbles, and a little coal	92-133
GRAVEL	fine and medium with shale pebbles	133-136
TILL	blue-gray clay, fine gravel, fine shale pebbles, some limestone cuttings, and a little coal	136-172
TILL	blue clay mixed with brown clay, fine gravel and shale pebbles	172-178
WEATHERED PRECAMBRIAN	DECAYED GRANITE	178-190

139-049-02AA3

Date Completed: 00/00/00 Purpose: Domestic Well
L.S. Elevation (ft): 901 Well Type: 42" Unknown
Depth Drilled (ft): 0 Aquifer: Undefined
Screened Interval (ft): 0-22 Log Source:

Lithologic Log - unavailable

139-049-02AAC

Date Completed: 1933 Purpose: Domestic Well
L.S. Elevation (ft): 902 Well Type: 3" Unknown
Depth Drilled (ft): 140 Aquifer: Fargo
Screened Interval (ft): 0-0 Log Source:

Lithologic Log - unavailable

139-049-02ADC

Date Completed: 00/00/00 Purpose: Domestic Well
L.S. Elevation (ft): 902 Well Type: 5.5" Unknown
Depth Drilled (ft): 116 Aquifer: Fargo
Screened Interval (ft): 0-0 Log Source:

Lithologic Log - unavailable

139-049-02BAA

NDSWC CW11
Date Completed: 6/14/47 Purpose: Test Hole
L.S. Elevation (ft): 898 Well Type:
Depth Drilled (ft): 278 Log Source: NDSWC

139-049-02BAA (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	yellow, and shale pebbles	3-15
SAND	fine, yellow	15-16
CLAY	lake	16-91
GRAVEL	medium to coarse with shale pebbles	91-97
TILL	blue clay, with fine and coarse gravel, shale pebbles, and limestone cuttings	97-110
TILL	gray sandy clay, fine and coarse gravel, shale pebbles, coal, and limestone cuttings	110-130
TILL	gray sandy clay, fine and coarse gravel, and shale pebbles	130-160
TILL	gray sandy clay, fine gravel, fine shale pebbles, and a few specks of coal	160-182
TILL	fine sandy clay and fine gravel with a little coal	182-248
SAND & GRAVEL	fine sand and medium gravel, limestone cuttings, and some decayed granite	248-271
BOULDER	granite boulder	271-272
WEATHERED PRECAMBRIAN	decayed granite	272-278

139-049-02CCD

Date Completed:	00	Purpose:	Industrial Well
L.S. Elevation (ft):	900	Well Type:	2" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-25	Log Source:	

Lithologic Log - unavailable

139-049-02CCD3

Date Completed:	6/18/62	Purpose:	Industrial Well
L.S. Elevation (ft):	901.2	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	346-356	Log Source:	

Lithologic Log - unavailable

139-049-02CCD4

Date Completed:	11/1/80	Purpose:	Observation Well
L.S. Elevation (ft):	899	Well Type:	1.25" PVC
Depth Drilled (ft):	388	Aquifer:	Nodak
Screened Interval (ft):	237-242	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>	
FILL MATERIAL	no description	0-4	
CLAY	yellowish brown, red mottling, soft, plastic (oxidized lake clay)	4-23	
CLAY	gray, soft, plastic (lake clay)	23-92	1st screen @ 80
TILL	clay, gray, sandy, silty, firm, pebbly, layer of sand and gravel at 93 ft, numerous rocky layers 112 to 115 ft	92-115	
TILL	clay, light gray, very sandy, silty, some pebbles	115-127	@ 120

139-049-02CCD4 (continued)

SAND	fine to coarse, dirty, poorly sorted, silts included, gravel sized lignite	127-131	screen
TILL	light gray (slightly brownish), very sandy, very silty, pebbles, not very plastic	131-192	@ 160'
SAND	fine to coarse, silty, poorly sorted, coarse material mostly carbonates	192-231	
SAND	medium to coarse, some fine gravel, angular to subrounded, poorly sorted, coarser material mostly carbonates and shales, dirty, lots of fine material	231-280	
CLAY OR SILT	no sample returns, drilled slowly with a small amount of chatter	280-322	
SAND	fine to medium, poorly sorted, mostly fine sand, clayey?	322-372	
SAND & GRAVEL	angular to subrounded, carbonates, shales, igneous and quartz	372-385	380?
ROCKS AND BOULDERS	no description	385-388	

139-049-02DBB

Date Completed:	1940	Purpose:	Observation Well
L.S. Elevation (ft):	898	Well Type:	1.5" Unknown
Depth Drilled (ft):	168	Aquifer:	Fargo
Screened Interval (ft):	0-155	Log Source:	Byers, 1946 & Dennis, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	no description	0-3
CLAY	yellow	3-15
CLAY	blue	15-22
SAND	very fine, dirty, no water	22-24
CLAY	soft, blue	24-112
TILL	boulder, clay	112-133
SAND	medium and coarse, with some gravel (water)	133-156
TILL	clay, boulder	156-168

139-049-03BBB

NDSWC 11987

Date Completed:	9/22/82	Purpose:	Observation Well
L.S. Elevation (ft):	898.8	Well Type:	1.25" PVC
Depth Drilled (ft):	200	Aquifer:	West Fargo North
Screened Interval (ft):	175-180	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	fill material	0-10
CLAY	yellow tan, oxidized	10-15
CLAY	gray, plastic	15-18
SAND	washed out, no returns	18-20
CLAY	gray, plastic, lake clay	20-86
TILL	clay, silty, sandy with layers of gravel and rocks	86-133
GRAVEL	poorly sorted, rounded to angular, pebbles up to 3/4 in. diameter composed of igneous and sedimentary rocks; rough drilling	133-154

139-049-03BBB (continued)

GRAVEL	sandy, more rounded particles, not as coarse as the gravel above	154-189
SHALE	gray clay, gray-brown in places, fairly stiff, micaceous in some layers, some layers bentonitic	189-200

139-049-03BCC2

NDSWC 11989

Date Completed:	9/22/82	Purpose:	Observation Well
L.S. Elevation (ft):	898.9	Well Type:	1.25" PVC
Depth Drilled (ft):	200	Aquifer:	West Fargo North
Screened Interval (ft):	169-174	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	tan, oxidized	1-13
SAND	poor returns	13-15
CLAY	tan, oxidized	15-18
CLAY	gray, very plastic, lake clay	18-83
TILL	clay, sandy with gravel layers at 112 ft, 125, and 131 ft	83-136
GRAVEL	poorly sorted, subangular to subrounded, abundance of dolomitic and limestone pebbles	136-160
GRAVEL	sandy, very dirty and poorly sorted	160-174
SHALE	clay, gray with greenish and greenish white portions; many layers, some bentonitic; some very dark gray with mica particles; some dark reddish brown	174-200

139-049-03BCC3

NDSWC 12545

Date Completed:	5/17/90	Purpose:	Observation Well
L.S. Elevation (ft):	899.91	Well Type:	2" PVC
Depth Drilled (ft):	180	Aquifer:	West Fargo North
Screened Interval (ft):	168-173	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow, very plastic, very soft, oxidized	1-12
SAND & GRAVEL	coarse sand and fine gravel, subangular to subrounded	12-14
CLAY	yellow, very little returns, losing water	14-29
CLAY	gray, very plastic, soft, lake clay	29-85
TILL	clay, gray, sandy, silty, pebbles, occasional thin gravel layers	85-136
SAND	medium to coarse, heavy mud and continuous drilling fluid loss result in very little sample return	136-177
CLAY	no returns	177-178
SAND	no returns	178-180

139-049-03CDD2

Date Completed:	1961	Purpose:	Industrial Well
L.S. Elevation (ft):	900	Well Type:	6" Steel
Depth Drilled (ft):	358	Aquifer:	Undefined
Screened Interval (ft):	0-358	Log Source:	

139-049-03CDD2 (continued)

Lithologic Log - unavailable

139-049-03DBB

Date Completed: 9/23/82 Purpose: Test Hole
L.S. Elevation (ft): 898 Well Type:
Depth Drilled (ft): 220 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow-tan, plastic, oxidized	1-16
SAND	yellow, medium to fine, oxidized	16-26
CLAY	gray, very plastic, lake clay	26-88
TILL	clay, gray, sandy with gravel layers	88-147
SHALE	gray and brown, many different layers of gray, brown, black, and light gray	147-188
WEATHERED PRECAMBRIAN	brown and white mixed clay with irregularly shaped quartz grains	188-220

139-049-04AAA1

Date Completed: 7/28/94 Purpose: Observation Well
L.S. Elevation (ft): 897.3 Well Type: 2" PVC
Depth Drilled (ft): 20 Aquifer: Undefined
Screened Interval (ft): 10-20 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	stiff, medium gray	1-3
CLAY	yellowish-brown	3-12
SAND	fine grained, silty, yellowish-brown	12-14
CLAY	silty, medium gray	14-20

139-049-04AAA2

Date Completed: 7/28/94 Purpose: Observation Well
L.S. Elevation (ft): 897.03 Well Type: 2" PVC
Depth Drilled (ft): 20 Aquifer: Undefined
Screened Interval (ft): 10-20 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	gray	1-2
CLAY	yellowish-brown	2-11
CLAY	silty, yellowish-brown	11-17
CLAY	gray	17-20

139-049-04AAB1

Date Completed: 7/28/94
L.S. Elevation (ft): 895.87
Depth Drilled (ft): 20
Screened Interval (ft): 10-20

Purpose:
Well Type:
Aquifer:
Log Source:

Observation Well
2" PVC
Undefined
NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	dark gray	1-3
CLAY	yellowish-brown	3-11
CLAY	silty, dark reddish-orange	11-13
SAND	fine grained, silty	13-14
CLAY	gray	14-20

139-049-04AAB2

Date Completed: 6/28/89
L.S. Elevation (ft): 899.9
Depth Drilled (ft): 19
Screened Interval (ft): 9-19

Purpose:
Well Type:
Aquifer:
Log Source:

Observation Well
2" PVC
Undefined

Lithologic Log - unavailable

139-049-04AAD1

Date Completed: 12/29/82
L.S. Elevation (ft): 898.5
Depth Drilled (ft): 35
Screened Interval (ft): 30-35

Purpose:
Well Type:
Aquifer:
Log Source:

Observation Well
2" PVC
Undefined

Lithologic Log - unavailable

139-049-04AAD2

Date Completed: 6/27/89
L.S. Elevation (ft): 900.9
Depth Drilled (ft): 19.8
Screened Interval (ft): 9.8-19.8

Purpose:
Well Type:
Aquifer:
Log Source:

Observation Well
2" PVC
Undefined

Lithologic Log - unavailable

139-049-04ABB

Date Completed: 6/29/89
L.S. Elevation (ft): 899.9
Depth Drilled (ft): 20
Screened Interval (ft): 9-19

Purpose:
Well Type:
Aquifer:
Log Source:

Observation Well
2" PVC
Undefined
Twin City Testing Corp

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL	organic clay and fat clay mixture, black and gray	0-5
CLAY	fat, gray and brown mottled, soft to medium, laminations of silt	5-11
SAND	silty, fine grained, brown	11-12
CLAY	fat, gray mottled, rather stiff to medium, with 2-inch layer of sand at 13 1/2 to 14 feet	12-17
CLAY	fat, gray, soft	17-20

139-049-04ABB1

Date Completed: 00/00/00
 L.S. Elevation (ft): 897.1
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" PVC
 Undefined

Lithologic Log - unavailable

139-049-04ABB2

Date Completed: 7/11/89
 L.S. Elevation (ft): 899
 Depth Drilled (ft): 19
 Screened Interval (ft): 9-19

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" PVC
 Undefined

Lithologic Log - unavailable

139-049-04ACB

Date Completed: 6/28/89
 L.S. Elevation (ft): 902
 Depth Drilled (ft): 20
 Screened Interval (ft): 9-19

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" PVC
 Undefined
 Twin City Testing Corp

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL OR TOPSOIL	organic clay, black	0-2
POSSIBLE FILL	mostly fat clay, brown and gray	2-6
CLAY	fat, brown and gray mottled, medium, laminations and lenses of silt	6-13
SAND	silty, fine grained, brown	13-14
CLAY	lean, brownish gray, soft	14-17
CLAY	fat, gray, medium	17-20

139-049-04ACC

Date Completed: 3/21/85
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 165
 Screened Interval (ft): 160-165

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 4" PVC
 West Fargo North
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-18
CLAY	gray	18-77
ROCK	colored	77-78
CLAY	gray	78-87
ROCK	colored	87-89
CLAY	gray	89-110
SAND & GRAVEL	brown	110-120
SAND	colored	120-165

139-049-04ACCD1

Date Completed:	6/29/89	Purpose:	Observation Well
L.S. Elevation (ft):	901.2	Well Type:	2" PVC
Depth Drilled (ft):	18	Aquifer:	Undefined
Screened Interval (ft):	8-18	Log Source:	

Lithologic Log - unavailable

139-049-04ACCD2

Date Completed:	6/29/89	Purpose:	Observation Well
L.S. Elevation (ft):	901.5	Well Type:	2" PVC
Depth Drilled (ft):	18	Aquifer:	Undefined
Screened Interval (ft):	8-18	Log Source:	

Lithologic Log - unavailable

139-049-04ACD1

Date Completed:	7/28/94	Purpose:	Observation Well
L.S. Elevation (ft):	898.25	Well Type:	2" PVC
Depth Drilled (ft):	20	Aquifer:	Undefined
Screened Interval (ft):	10-20	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	gray	1-5
CLAY	yellowish-brown	5-15
SAND	fine grained, silty	15-16
CLAY	gray	16-20

139-049-04ACD2

Date Completed:	7/28/94	Purpose:	Observation Well
L.S. Elevation (ft):	898.24	Well Type:	2" PVC
Depth Drilled (ft):	20	Aquifer:	Undefined
Screened Interval (ft):	10-20	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	gray	1-5
CLAY	yellowish-brown	5-13
SAND	fine grained, silty	13-14
CLAY	gray	14-20

139-049-04BCB2

Date Completed:	10/8/75	Purpose:	Domestic Well
L.S. Elevation (ft):	899	Well Type:	4" Steel
Depth Drilled (ft):	193	Aquifer:	West Fargo North
Screened Interval (ft):	160-170	Log Source:	Lako Drilling

Lithologic Log

139-049-04BCB2 (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	yellow	3-17
CLAY	gray	17-79
TILL	no description	79-90
GRAVEL	no description	90-173
GRANITE	weathered	173-193

139-049-05AAA

Date Completed:	6/2/47	Purpose:	Test Hole
L.S. Elevation (ft):	902	Well Type:	
Depth Drilled (ft):	240	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
TILL	yellow clay and fine shale pebbles	4-11
SAND	fine to medium	11-22
CLAY	blue	22-24
SAND	fine to medium	24-34
CLAY	lake clay	34-82
TILL	blue clay, fine and medium gravel with shale pebbles and a little coal	82-83
GRAVEL	fine to medium with shale pebbles and a little coal	83-84
TILL	gray clay, a lot of fine gravel and shale pebbles	84-103
SAND	medium and coarse, fine gravel and shale pebbles	103-119
GRAVEL	medium and coarse, with shale pebbles	119-140
GRAVEL	fine, medium, and coarse gravel and shale pebbles, rocks from 180 to 184 ft	140-184
TILL	blue-gray clay, fine gravel and shale pebbles	184-190
TILL	blue-gray clay, with a few fine gravels and shale pebbles	190-202
TILL	blue and brown clay, with fine gravel, shale pebbles, and a little decayed granite	202-205
TILL	brown and black clays, fine gravel, and shale pebbles	205-211
TILL	light gray clay, fine gravel, and shale pebbles	211-223
CLAY	reddish brown	223-234
WEATHERED PRECAMBRIAN	decayed granite	234-240

139-049-05BAD

Date Completed:	6/18/79	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" PVC
Depth Drilled (ft):	242	Aquifer:	West Fargo North
Screened Interval (ft):	208-223	Log Source:	unknown

Lithologic Log

139-049-05BAD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	gray	2-3
CLAY	brown	3-12
CLAY	blue	12-66
SAND	blue	66-74
CLAY	sandy, blue	74-112
SAND	with lenses of clay, colored	112-124
SAND	colored	124-223
CLAY	sandy clay with rock, blue	223-242

139-049-05BDA

Date Completed: 6/11/79
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 257
 Screened Interval (ft): 218-223

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 2" Steel
 West Fargo North
 unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	gray	2-4
CLAY	brown	4-16
CLAY	soft, blue	16-71
CLAY	sandy, blue	71-89
SAND	colored	89-90
CLAY	sandy, blue	90-97
SAND	colored	97-253
CLAY	sandy, blue	253-257

139-049-05BDA2

Date Completed: 10/3/79
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 273
 Screened Interval (ft): 243-261

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 8" Steel
 West Fargo North
 unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	sandy, black	0-2
SAND	fine, brown	2-7
CLAY	sandy, brown	7-17
CLAY	soft, blue	17-77
SAND	blue	77-213
SAND	gray	213-261

139-049-05BDA2 (continued)

CLAY sandy clay with decomposed granite, green and blue 261-273

139-049-05BDA3

Date Completed:	7/29/91	Purpose:	Industrial Well
L.S. Elevation (ft):	896	Well Type:	10" Steel
Depth Drilled (ft):	290	Aquifer:	West Fargo North
Screened Interval (ft):	251-281	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
ASPHALT	no description	0-1
FILL	fine sand	1-7
CLAY	sandy, brown	7-19
CLAY	soft, blue	19-76
CLAY	sandy, blue, with lenses of sand	76-82
CLAY	sandy, blue	82-83
SAND	blue	93-207
CLAY	sandy, gray	207-210
SAND	fine, gray	210-281
PRECAMBRIAN	decomposed, gray/green, with lenses of clay	281-290

139-049-05BDD

Date Completed:	11/2/79	Purpose:	Observation Well
L.S. Elevation (ft):	895.8	Well Type:	2" Steel
Depth Drilled (ft):	226	Aquifer:	West Fargo North
Screened Interval (ft):	218-223	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-16
CLAY	blue	16-86
ROCK	red	86-87
CLAY	blue	87-98
SAND	colored	98-226

139-049-05DCD

Date Completed:	5/19/47	Purpose:	Test Hole
L.S. Elevation (ft):	897	Well Type:	
Depth Drilled (ft):	220	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1

139-049-05DCD (continued)

TILL	clay, yellow, with shale pebbles	1-10
CLAY	gray, turning to blue	10-75
TILL	clay, gravelly, pebbly, blue, fine and medium gravel and shale pebbles	75-91
SAND & GRAVEL	sand, coarse, and gravel, fine and medium, with fine and medium shale pebbles	91-99
SAND	fine and medium, with a little fine and medium gravel, shale pebbles, and a few specks of coal	180-190
SAND	fine, medium, and coarse, with a few fine and medium gravels	190-200
GRANITE	decayed	200-220

139-049-06AC

Date Completed:	1935	Purpose:	Industrial Well
L.S. Elevation (ft):	898	Well Type:	8" Steel
Depth Drilled (ft):	236	Aquifer:	West Fargo North
Screened Interval (ft):	0-236	Log Source:	Byers, 1946 & Dennis, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	and alluvium	0-3
CLAY	gumbo	3-8
SILT	(?)	8-73
TILL	boulder, clay	73-88
GRAVEL & SAND	no description	88-223
SHALE	clay (?), black	223-228
SHALE	clay (?), black and gray streaked	228-236

139-049-06ACA

Date Completed:	1935	Purpose:	Industrial Well
L.S. Elevation (ft):	897	Well Type:	24" Steel
Depth Drilled (ft):	240	Aquifer:	West Fargo North
Screened Interval (ft):	0-240	Log Source:	Byers, 1946 & Dennis, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	and alluvium	0-3
CLAY	gumbo	3-9
SILT	(?)	9-85
CLAY	boulders, (till)	85-100
GRAVEL & SAND	no description	100-210
SAND	no description	210-240

139-049-06ACC

Date Completed:	10/31/57	Purpose:	Industrial Well
L.S. Elevation (ft):	897	Well Type:	16" Steel
Depth Drilled (ft):	208	Aquifer:	West Fargo North
Screened Interval (ft):	0-208	Log Source:	McCarthy Well Co

Lithologic Log

139-049-06ACC (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	no description	2-63
CLAY	and boulders	63-73
CLAY	with boulders, and gravel	73-81
CLAY	and boulders	81-86
CLAY	with lenses of fine sand, numerous boulders	86-90
CLAY	and boulders with lenses of gravel and fine sand	90-98
CLAY	and boulders	98-101
GRAVEL	coarse, numerous boulders	101-107
CLAY	hard	107-111
CLAY	and boulders	111-115
GRAVEL	coarse, numerous boulders and clay lenses	115-118
GRAVEL	coarse	118-130
GRAVEL	coarse, clay lenses	130-186
GRAVEL	coarse, numerous boulders	186-189
SAND	gravelly, coarse	189-208

139-049-06ADB

Date Completed: 00
 L.S. Elevation (ft): 899.4
 Depth Drilled (ft): 230
 Screened Interval (ft): 0-230

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 8" Steel
 West Fargo North
 Byers et al, 1946

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	soil and alluvium	0-2
CLAY	gumbo	2-5
SILT	no description	5-70
CLAY	boulder	70-103
GRAVEL & SAND	no description	103-215
SHALE	light gray	215-230

139-049-06BDA

Date Completed: 1960
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 210
 Screened Interval (ft): 0-210

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 16" Steel
 West Fargo North
 unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	no description	0-76
TILL	clay and boulders	76-103

139-049-06BDA (continued)

SAND	fine, some gravel and boulders	103-117
SAND	fine	117-135
SAND	fine, with a little gravel	135-145
SAND	fine	145-155
SAND & GRAVEL	sand and gravel mixed	155-210

139-049-06BDD

Date Completed:	9/26/75	Purpose:	Industrial Well
L.S. Elevation (ft):	898	Well Type:	16" Steel
Depth Drilled (ft):	222	Aquifer:	West Fargo North
Screened Interval (ft):	167-170	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-16
CLAY	blue, soft	16-65
CLAY	blue, sandy soft	65-74
CLAY	blue, sandy	74-136
SAND	no description	136-138
CLAY	blue, sandy	138-139
CLAY	blue, sandy	139-140
SAND	coarser	140-208
CLAY	blue, sandy	208-209
SAND	coarse	209-217
CLAY	blue, sandy	217-218
SAND	dirty	218-219
CLAY	blue, sandy	219-222

139-049-06CDD

Date Completed:	0/0	Purpose:	Industrial Well
L.S. Elevation (ft):	900	Well Type:	8" Steel
Depth Drilled (ft):	0	Aquifer:	West Fargo North
Screened Interval (ft):	0-192	Log Source:	

Lithologic Log - unavailable

139-049-06DCD1

Date Completed:	10/19/63	Purpose:	Municipal Well
L.S. Elevation (ft):	892	Well Type:	12" Steel
Depth Drilled (ft):	237	Aquifer:	West Fargo North
Screened Interval (ft):	0-216	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3

139-049-06DCD1 (continued)

CLAY	silty, grayish yellow brown, cohesive	3-12
CLAY	dark olive gray, plastic	12-67
CLAY	sandy, dark olive gray, scattered gravel	67-71
CLAY	sandy, gravelly, bluish gray, scattered lignite fragments	71-84
CLAY	sandy, gravelly, bluish gray, abundant boulders	84-86
CLAY	sandy, gravelly, olive gray	86-91
CLAY	silty, olive gray, numerous fine sand lenses	91-101
CLAY	sandy, gravelly, olive gray	101-128
SAND	very fine to very coarse, clean, scattered fine gravel	128-131
SAND	silty, very fine to very coarse, scattered fine gravel	131-143
CLAY	sandy, olive gray, scattered fine gravel	143-151
SAND	clayey, fine	151-160
SAND	very fine to very coarse	160-219
CLAY	sandy, dark olive gray	219-222
CLAY	sandy, dark greenish gray	222-237

139-049-06DCD2

Date Completed:	11/3/63	Purpose:	Observation Well
L.S. Elevation (ft):	892	Well Type:	2" Steel
Depth Drilled (ft):	182	Aquifer:	West Fargo North
Screened Interval (ft):	0-182	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	silty, grayish yellow-brown, plastic, laminated	3-12
CLAY	dark olive-gray, plastic	12-60
CLAY	sandy, scattered fine gravel, dark olive-gray (till)	60-72
CLAY	sandy, gravelly, olive-gray, boulders 107 to 109 feet (till)	72-122
SAND	fine, no samples	122-132
CLAY	silty, olive-gray, lenses of fine sand	132-137
CLAY	sandy, olive-gray, scattered fine gravel	137-149
CLAY	sandy, olive gray	149-152
SAND	very fine to fine, occasional clay lenses	152-162
SAND	silty, very fine to fine	162-167
SAND	very fine to very coarse	167-182

139-049-06DDC

Date Completed:	11/4/63	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	2" Steel
Depth Drilled (ft):	0	Aquifer:	West Fargo North
Screened Interval (ft):	0-182	Log Source:	

Lithologic Log - unavailable

139-049-07ABB2

Date Completed: 1960
L.S. Elevation (ft): 899
Depth Drilled (ft): 204
Screened Interval (ft): 0-204

Purpose:
Well Type:
Aquifer:
Log Source:

Municipal Well
16" Steel
West Fargo North
Layne Minnesota Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	no description	0-69
CLAY	with gravel	69-75
CLAY	and boulders	75-120
CLAY	with gravel	120-161
CLAY	with gravel, and lignite	161-190
SAND	with gravel	190-204

139-049-07BBB

Date Completed: 3/5/75
L.S. Elevation (ft): 800
Depth Drilled (ft): 257

Purpose:
Well Type:
Log Source:

Test Hole
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown, soft	3-15
SHALE	blue	15-70
CLAY	blue, sandy, with small rock	70-80
ROCK	colored	80-83
CLAY	blue, sandy, with small rock	83-108
CLAY	blue, sandy, hard	108-131
SAND	colored	131-160
CLAY	blue, sandy	160-213
SAND	colored	213-250
PRECAMBRIAN	green	250-257

139-049-07CCD

Date Completed: 3/6/75
L.S. Elevation (ft): 899
Depth Drilled (ft): 212

Purpose:
Well Type:
Log Source:

Test Hole
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown, soft	3-18
SHALE	blue	18-69

139-049-07CCD (continued)

CLAY	blue, sandy, with small rock	69-112
SAND	colored	112-127
CLAY	blue, sandy	127-137
SAND	colored	137-162
CLAY	blue, sandy, with sand lenses	162-173
SAND	colored	173-180
CLAY	blue, sandy, with sand lenses	180-184
CLAY	blue, sandy	184-210
CLAY	blue, white, sandy, decomposed	210-212

139-049-07DCC

Date Completed:	0	Purpose:	Test Hole
L.S. Elevation (ft):	899	Well Type:	
Depth Drilled (ft):	207	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-13
CLAY	blue, soft	13-67
CLAY	blue, sandy	67-88
SAND	colored	88-89
CLAY	blue, sandy	89-90
SAND	colored	90-91
CLAY	blue, sandy	91-92
SAND	colored	92-115
ROCK	no description	115-116
SAND	colored	116-117
CLAY	blue, sandy	117-129
SAND	colored	129-139
CLAY	blue, sandy	139-149
SAND	colored	149-152
CLAY	blue, sandy	152-156
SAND	gray, fine	156-167
CLAY	blue, sandy	167-186
SAND	gray, fine	186-194
CLAY	blue, sandy	194-200
GRANITE	green, decomposed	200-207

139-049-07DDC

Date Completed: 1963
 L.S. Elevation (ft): 901
 Depth Drilled (ft): 237
 Screened Interval (ft): 0-193

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined

Lithologic Log - unavailable

139-049-08BA2

Date Completed: 00/00/00
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 87
 Screened Interval (ft): 0-87

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 3.5" Unknown
 West Fargo North

Lithologic Log - unavailable

139-049-08BDA

Date Completed: 1954
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 164
 Screened Interval (ft): 0-155

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 16" Steel
 West Fargo North
 Layne Minnesota Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-6
CLAY	gravelly	6-64
CLAY	with gravel, and boulders	64-89
SAND	with gravel	88-90
CLAY	with gravel, and boulders	90-98
SAND	medium, gray	98-108
CLAY	with boulders	108-121
CLAY	gray	121-127
SAND	medium to coarse	127-156
CLAY	blue	156-164

139-049-08CDD

Date Completed: 0
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 212

Purpose:
 Well Type:
 Log Source:

Test Hole
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-5
CLAY	brown	5-16
CLAY	blue, soft	16-70
CLAY	blue, sandy	70-90
SAND	gray	90-202
GRANITE	green, white, decomposed	202-212

139-049-08DCD

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

4/25/76
900
0
183-223

Purpose:
Well Type:
Aquifer:
Log Source:

Municipal Well
16" Steel
West Fargo North

Lithologic Log - unavailable

139-049-08DDA

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

9/6/75
902
242

Purpose:
Well Type:
Log Source:

Test Hole

LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-17
SHALE	blue, soft	17-72
SHALE	blue, soft, sandy	72-78
CLAY	blue, sandy	78-82
SAND	colored, with clay lenses	82-87
CLAY	blue, sandy, with rock	87-92
ROCK	no description	92-93
CLAY	blue, sandy, with rock	93-117
SAND	gray	117-142
SAND	gray	142-157
SAND	gray	157-162
SAND	gray	162-167
SAND	gray, with clean sand lenses	167-172
SAND	gray, with dirty sand lenses	172-177
SAND	gray, fine	177-183
SAND	fine, very dirty	183-188
SAND	gray, fine	188-195
CLAY	blue	195-197
SAND	gray	197-202
SAND	colored, with clay lenses	202-208
SAND	no description	208-227
SAND	fine	227-232
CLAY	green, decomposed	232-242

139-049-09AAA
NDSWC 11985

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

9/21/82
902
220

Purpose:
Well Type:
Log Source:

Test Hole

NDSWC

139-049-09AAA (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	tan, oxidized	1-15
CLAY	gray, very plastic, lake clay	15-77
TILL	clay, sandy with gravelly layers at 133, 138, 168, 181, & 201 ft	77-220

139-049-09ADD

NDSWC 11984

Date Completed:	9/20/82	Purpose:	Observation Well
L.S. Elevation (ft):	901.1	Well Type:	1.25" PVC
Depth Drilled (ft):	200	Aquifer:	West Fargo South
Screened Interval (ft):	172-177	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
TILL	clay, tan, sandy silty	1-5
CLAY	tan, very plastic	5-13
SAND	fine	13-18
CLAY	gray, plastic, lake clay	18-73
TILL	clay, gray, very sandy, some gravelly layers	73-125
TILL	gray, sandy	125-164
TILL	gray with lots of sand and gravel lenses	164-170
SAND	medium to coarse, poorly sorted, with some gravel; abundance of angular quartz grains	170-183
CLAY	greenish-white and white weathered bedrock, mixed in with shale and bentonitic shale; a regular smorgasbord	183-200

139-049-09BAA2

Date Completed:	5/21/75	Purpose:	Test Hole
L.S. Elevation (ft):	903	Well Type:	
Depth Drilled (ft):	280	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-15
SAND	brown, washed	15-22
CLAY	blue, sandy	22-26
CLAY	blue, soft	26-80
SAND	colored	80-83
CLAY	blue, sandy	83-105
SAND	colored	105-108

139-049-09BAA2 (continued)

SAND	colored, with rock	108-111
ROCK	colored	111-112
CLAY	blue, sandy	112-142
SAND	colored	142-145
LENSES	blue, colored	145-147
SAND	colored, with rock lenses	147-152
SAND	colored	152-155
SAND	colored, with lenses of coarser material	155-158
CLAY	blue, sandy	158-178
SAND	gray, with lenses	178-180
SAND	gray	180-186
CLAY	blue, sandy	186-201
SAND	blue, with clay lenses	201-207
CLAY	blue, sandy	207-230
CLAY	blue, sandy, with soft, small, sand lenses	230-240
SAND	gray	240-243
CLAY	blue, sandy	243-250
SAND	blue	250-251
CLAY	blue, sandy, very small sand lenses	251-259
SAND	blue	259-263
CLAY	blue, sandy	263-276
CLAY	blue, green, sandy, with decomposed	276-278
SHALE	colored, decomposed	278-280

139-049-09BAB
NDSWC 8343A

Date Completed:	5/18/72	Purpose:	Observation Well
L.S. Elevation (ft):	902	Well Type:	2" Steel
Depth Drilled (ft):	200	Aquifer:	West Fargo North
Screened Interval (ft):	188-194	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	grayish black silty clay loam	0-1
CLAY	yellowish brown clay, highly plastic, oxidized, lake clay	1-10
SAND	fine to medium, subangular to subrounded, oxidized, some silt and clay	10-22
CLAY	olive gray, very cohesive, highly plastic, highly calcareous, silty, lake clay	22-78
TILL	clay, silty, sandy, cobbles and boulders, numerous carbonate pebbles, olive gray, moderately cohesive, slightly plastic, calcareous	78-102
SAND	fine to very coarse, slightly gravelly, subangular to rounded, well sorted	102-160
SAND & GRAVEL	coarse to very coarse, subangular to rounded, well sorted	160-180
GRAVEL	fine to coarse, very sandy, fair to good sorting, mostly igneous and metamorphic rocks with some shale and carbonates	180-200

139-049-09BBA

Date Completed: 6/8/72
 L.S. Elevation (ft): 901
 Depth Drilled (ft): 217
 Screened Interval (ft): 172-203

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 16" Steel
 West Fargo North
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brown	1-7
SHALE	brown	7-16
SHALE	blue	16-79
CLAY	blue, sandy	79-85
CLAY	blue, sandy, with small rock	85-101
SAND	no description	101-203
SAND	colored, with clay rock	203-217

139-049-09BBA2

NDSWC 8343

Date Completed: 5/18/72
 L.S. Elevation (ft): 902
 Depth Drilled (ft): 220
 Screened Interval (ft): 189-195

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" Steel
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	grayish black silty clay loam	0-1
CLAY	yellowish brown, very silty, laminated, moderately cohesive, plastic, lake clay	1-10
SAND	very fine to medium, silty, moderately well sorted, subrounded, oxidized	10-14
CLAY	olive gray, laminated, some medium light gray layers, very cohesive, highly plastic, very silty to silty, calcareous, lake clay	14-71
TILL	clay, silty, sandy, gravelly with numerous cobbles and boulders, olive gray, moderately cohesive, slightly plastic, calcareous	71-97
SAND & GRAVEL	sand, very gravelly, mostly coarse to very coarse, angular to subrounded, moderately well sorted, about 50% quartz, 20% feldspars, 20% carbonates, and 10% shale and reworked igneous and metamorphics	97-117
SAND	fine to very coarse, well sorted, subangular to rounded, mostly quartz and igneous rock fragments	117-176
GRAVEL	fine to coarse, about 40% medium to coarse sand, angular to subrounded, moderately well sorted	176-210
WEATHERED PRECAMBRIAN	clay, slightly silty, very light gray to white, relatively soft, very smooth, talc-like feel, non-calcareous	210-220

139-049-09BBB

NDSWC 8343B

Date Completed: 5/19/72
 L.S. Elevation (ft): 902
 Depth Drilled (ft): 220
 Screened Interval (ft): 187-195

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" Steel
 West Fargo North
 NDSWC

Lithologic Log

139-049-09BBB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty, black	0-1
CLAY	olive gray, silty	1-11
CLAY	gray, silty	11-76
TILL	clay, silty, rocky, olive gray	76-100
SAND	fine to medium to coarse	100-131
SAND & GRAVEL	fine to coarse sand, fine to medium gravel	131-140
SAND	fine to medium	140-175
GRAVEL	fine to medium, some gravel, some rocks	175-220

139-049-09CAD

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

5/7/75
902
252

Purpose:
Well Type:

Test Hole

Log Source:

LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
SHALE	brown	3-13
SAND	brown	13-25
SHALE	blue	25-28
SHALE	blue, soft	28-92
CLAY	blue, sandy	92-100
ROCK	no description	100-102
CLAY	blue, sandy, with small rock	102-112
ROCK	no description	112-114
CLAY	blue, sandy, with small rock	114-123
ROCK	no description	123-124
CLAY	blue, sandy, with small rock	124-127
SAND	colored	127-129
CLAY	blue, sandy, with small rock	129-140
SAND	colored	140-142
CLAY	blue, sandy	142-144
SAND	no description	144-147
CLAY	blue, brown, sandy, with shale	147-176
SAND	no description	176-178
CLAY	blue, brown, sandy, with brown shale	178-182
SAND	colored, dirty	182-194
CLAY	blue, brown, sandy, with shale	194-196
SAND	no description	196-198

139-049-09CAD (continued)

CLAY	blue, brown, sandy, with shale	198-200
SAND	colored, dirty	200-208
CLAY	blue, brown, black, sandy, with shale	208-214
ROCK	no description	214-215
CLAY	blue, brown, black, sandy, with shale	215-245
CLAY	sandy, with shale & decomposed	245-252

139-049-09CBC

Date Completed:	6/8/60	Purpose:	Domestic Well
L.S. Elevation (ft):	900	Well Type:	0" Unknown
Depth Drilled (ft):	351	Aquifer:	Undefined
Screened Interval (ft):	0-158	Log Source:	

Lithologic Log - unavailable

139-049-09CCCD

Date Completed:	00	Purpose:	Observation Well
L.S. Elevation (ft):	902.5	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-049-09DDD3

NDSWC 3113

Date Completed:	7/6/64	Purpose:	Observation Well
L.S. Elevation (ft):	905	Well Type:	1.25" ABS
Depth Drilled (ft):	257	Aquifer:	West Fargo South
Screened Interval (ft):	168-178	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	silty, yellow-brown, cohesive, highly calcareous, oxidized, with some very fine sand	1-14
CLAY	silty, olive gray, calcareous, very sticky, some very fine sand	14-15
SAND	very fine, up to 1/2 mm, predominantly quartz, subrounded, with carbonates, shale, and some lignite, oxidized	15-20
CLAY	olive gray, calcareous, sticky	20-79
TILL	clay through gravel, olive gray, carbonates, shales, and quartz, calcareous	79-88
SILT	clayey to sandy, light olive gray, cohesive, with sand lenses, may be a very fine grained till	98-107
TILL	clay through gravel, light olive gray to olive gray, cohesive, rocky, predominantly quartz with granite, carbonates, and shale	107-118
SAND	very fine to coarse (4mm), subrounded to rounded, quartz, carbonates, granite with shale, lignite, and pyrite, pebbles up to 12 mm	118-222
SILT	brownish black, cohesive, seems organic or lignitic, noncalcareous; to black, greasy silty clay with light brownish gray silty clay	222-237
CLAY	white or very light gray, with quartz grains up to 1/4 mm, slightly greenish tint in some places (possibly weathered Precambrian)	237-257

139-049-10BAA

NDSWC 11983

Date Completed: 9/16/82
 L.S. Elevation (ft): 904.4
 Depth Drilled (ft): 240
 Screened Interval (ft): 204-210

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 Undefined
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL MATERIAL	clay, sand, silt, wood chunks,	0-4
CLAY	oxidized, iron stained, some silty layers	4-18
CLAY	gray, very plastic	18-21
SAND	poorly sorted, oxidized	21-25
CLAY	gray, very plastic, stiff, some iron stains, lake clay	25-91
TILL	clay, silty, sandy, gravelly, with small layers of sand and gravel, shale and lignite, with some dolomitic fragments, and dolomitic fragments becoming more predominant with depth	91-129
SAND	poor returns	129-132
TILL	clay, silty, sandy, with thin gravel lenses	132-140
TILL	clay, sandy, slightly plastic, rock at 170'	140-178
CLAY	very silty, finely laminated, fluvial clay	178-202
SAND	fine to very fine, some medium, poorly sorted with some silt	202-210
CLAY	slightly silty, fluvial clay	210-212
TILL	clay, sandy, light gray, lense of sand at 231', poor returns	212-240

139-049-10BDD

NDSWC 11986

Date Completed: 9/21/82
 L.S. Elevation (ft): 900
 Depth Drilled (ft): 220

Purpose:
 Well Type:
 Log Source:

Test Hole

 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
TILL	clay, tan, silty, sandy, oxidized, irregular iron staining	2-21
CLAY	gray, plastic, lake clay	21-82
TILL	clay, sandy, with gravelly layers at 97 & 113 ft, and rocks at 103, 120, 132, and 163 ft	82-168
CLAY	dark gray, very silty, no sand, slightly plastic, finely laminated, fluvial	168-189
SAND	very little returns	189-191
CLAY	very silty, micaceous, bentonitic, with some very dark layers mixed with lighter bentonitic layers, slightly indurated	191-220

139-049-10CCC

NDSWC 11598

Date Completed: 6/16/81
 L.S. Elevation (ft): 901.1
 Depth Drilled (ft): 200
 Screened Interval (ft): 178-181

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 West Fargo South
 NDSWC

Lithologic Log

139-049-10CCC (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	dark yellowish brown, plastic, lacustrine	0-15
SAND	medium, well sorted, predominantly quartz	15-16
CLAY	olive gray, plastic, lacustrine	16-85
TILL	clay, olive gray, moderately cohesive, silty, sandy, and gravelly	85-105
TILL	clay, olive gray, with sand, silt, and gravel	105-122
SAND & GRAVEL	medium sand to pebbles, well graded, subrounded to subangular,	122-141
SAND & GRAVEL	as above, interbedded with clay layers	141-164
SAND & GRAVEL	primarily very coarse sand, and gravel, rounded to angular, silicates and carbonates, lesser shales and granite	164-180
SAND & GRAVEL	predominantly medium sand and pebbles	180-200

139-049-11AAA

Date Completed:	7/29/46	Purpose:	Industrial Well
L.S. Elevation (ft):	898	Well Type:	0" Unknown
Depth Drilled (ft):	170	Aquifer:	Fargo
Screened Interval (ft):	0-0	Log Source:	Layne Western Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	yellow clay	0-5
CLAY	yellow	5-20
CLAY	gray and yellow	20-25
CLAY	gray	25-70
TILL	clay, gray, some gravel	70-95
TILL	clay, gray, silt and gravel	95-135
TILL	clay, gray, silt, and loose gravel at 137 ft	135-140
SAND & GRAVEL	no description	140-160
SAND & GRAVEL	some gray clay	160-170

139-049-11AAB

Date Completed:	7/19/46	Purpose:	Test Hole
L.S. Elevation (ft):	898	Well Type:	
Depth Drilled (ft):	198	Log Source:	Layne Western Co

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	no description	0-75
CLAY	clay and boulders	75-77
CLAY	no description	77-93
TILL	clay, boulders, and fine sand	93-98
TILL	clay, boulders, gravel, shale, limestone, and hardpan	98-142

139-049-11AAB (continued)

GRAVEL	fine, with clay	142-148
TILL	clay, with fissured rock, silt, and gravel	148-198

139-049-11BAA

Date Completed:	1938	Purpose:	Industrial Well
L.S. Elevation (ft):	900	Well Type:	18" Unknown
Depth Drilled (ft):	30	Aquifer:	Undefined
Screened Interval (ft):	0-16	Log Source:	

Lithologic Log - unavailable

139-049-11BAA2

Date Completed:	8/12/83	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	377	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	brown, sandy	0-12
CLAY	blue, sandy, soft	12-109
CLAY	blue, sandy	109-116
CLAY	blue, sandy, with a few sand lenses	116-118
CLAY	blue, sandy, rocky	118-131
SAND	blue	131-134
CLAY	blue, sandy	134-187
SAND	blue	187-189
CLAY	blue, sandy	189-212
SANDSTONE	white	212-213
PRECAMBRIAN	white	213-256
PRECAMBRIAN	green, very hard	256-377

139-049-11CBB

Date Completed:	4/29/63	Purpose:	Industrial Well
L.S. Elevation (ft):	901.8	Well Type:	8" Steel
Depth Drilled (ft):	428	Aquifer:	Undefined
Screened Interval (ft):	377-403	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellow	2-15
SHALE	blue	15-90
CLAY	blue, hard, sandy, with lenses	90-131
CLAY	blue, hard, sandy	131-206
SAND	gray	206-208

139-049-11CBB (continued)

CLAY	blue, softer, sandy	208-220
CLAY	blue, hard, sandy	220-252
SAND	gray, dirty	252-257
SAND	gray	257-317
SAND	gray, dirty	317-326
CLAY	blue, soft, sandy	326-330
CLAY	blue, soft, sandy, with lenses	330-341
SAND	gray	341-372
SAND	brown, coarser	372-426
GRANITE	colored	426-428

139-049-11CDC2

Date Completed:	7/28/61	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	4" Steel
Depth Drilled (ft):	318	Aquifer:	Undefined
Screened Interval (ft):	0-311	Log Source:	

Lithologic Log - unavailable

139-049-11DDD

NDSWC 11597

Date Completed:	6/12/61	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	220	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	brownish black, carbonaceous	0-3
CLAY	medium to dark yellow-brown, with dark reddish brown stringers, slightly silty, lacustrine	3-18
CLAY	olive gray, slightly silty, lacustrine	18-24
SILT	olive gray, slightly argillaceous, plant debris at 25'	24-45
CLAY	olive gray, high plasticity, lacustrine	45-98
TILL	clay, olive gray, with silt, sand, and gravel, gravel layers at 117 & 130 ft, and numerous small layers from 137 to 146 ft	98-146
TILL	clay, olive gray, with silt, sand, and gravel, not as rocky as above	146-165
CLAY	olive gray, slightly silty, consolidated	165-180
CLAY	olive gray to olive black, moderately plastic, greasy	180-185
CLAY	brownish black and dusky brown, silty, carbonaceous	185-196
CLAY	grayish olive green, silty	196-198
CLAY	medium dark brown, plastic, greasy	198-199
SAND	drilled rocky, no returns	199-200
CLAY	medium dark gray, plastic, greasy	200-220

139-049-12ACA

Date Completed:	00/00/00	Purpose:	Domestic Well
L.S. Elevation (ft):	900	Well Type:	4" Unknown
Depth Drilled (ft):	175	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

139-049-12BAB

Date Completed:	00/00/00	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	190	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	no record	0-20
CLAY	silty, yellow	20-40
CLAY	gray	40-95
TILL	silt, sandy, with a little gravel, gray	95-135
TILL	silt, sandy, gray, and considerable fine gravel	135-155
TILL	silt, sandy, with a little gravel, gray	155-190

139-049-12CAD

Date Completed:	00/00/00	Purpose:	Industrial Well
L.S. Elevation (ft):	901	Well Type:	8" Unknown
Depth Drilled (ft):	205	Aquifer:	Fargo
Screened Interval (ft):	0-140	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	grayish-tan	0-20
CLAY	dark gray	20-90
TILL	silt, sandy, gray clay, and some gravel	90-130
TILL	sand and some gravel, silty, and some gray clay	130-150
SAND	fine to coarse, fairly clean	150-170
SAND	fine, silty, dark gray	170-180
SAND	fine, clean	180-185
TILL	clay, dark gray, hard	185-195
TILL	clay and silt, dark gray, hard	195-205

139-049-12DCB

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

00/00/00
901
232

Purpose:
Well Type:
Log Source:

Test Hole

Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	grayish tan	0-20
CLAY	dark gray	20-80
TILL	clay, gray, and some gravel	80-95
SAND	silty, fine to medium, gray	95-120
GRAVEL	fine to medium	120-126
TILL	silt, sandy, gray	126-135
TILL	silt, sandy, gray, and coarse gravel	135-150
SAND	fine to medium, loose, clean	150-175
CLAY	dark gray	175-178
TILL	silt, sandy, dark gray	178-180
TILL	sand, silty, dark brown	180-205
TILL	clay, carbonaceous, black and gray streaks	205-210
WEATHERED GRANITE	clay, (kaolin?), marly (?), white	210-232

139-049-13ABC

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

6/18/47
902
200

Purpose:
Well Type:
Log Source:

Test Hole

NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gray	1-4
TILL	clay, pebbly, yellow, fine shale pebbles	4-14
CLAY	lake	14-101
TILL	clay, gravelly, pebbly, gray and blue, fine gravel, limestone cuttings, and shale pebbles	101-111
GRAVEL	fine, with shale pebbles	111-115
TILL	clay, sandy, gravelly and pebbly, gray, fine and medium gravel, with shale pebbles	115-145
SAND & GRAVEL	fine sand, and fine gravel, with shale pebbles and a little clay	145-155
CLAY	blue, with fine gravel, and shale pebbles	155-157
CLAY	black, soft	157-158
TILL	clay, light brown, with fine gravel	158-160

139-049-13ABC (continued)

TILL	clay, blue, with fine gravel	160-166
TILL	clay, light brown, with fine gravel	166-174
CLAY	black, soft	174-180
CLAY	dark brown	180-187
CLAY	light gray, some fine gravel	187-189
GRANITE	decayed	189-200

139-049-13CCC

NDSWC 2174

Date Completed:	8/30/63	Purpose:	Test Hole
L.S. Elevation (ft):	903	Well Type:	
Depth Drilled (ft):	178	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	clay loam, silty, black	0-2
CLAY	light gray to yellowish gray, weathered, blocky texture, soft, smooth, but does contain some pebbles in upper part, cohesive, plastic, moderately calcareous, oxidized	2-10
CLAY	silty, yellowish gray, smooth, soft, cohesive, plastic, easy drilling	10-20
CLAY	silty, olive gray, soft, cohesive, plastic, easy smooth drilling	20-90
SAND	fine to coarse, medium sorted, dirty to clay, sandy with pebbles, cobbles and boulders, olive gray, moderately soft, moderately compacted (till)	90-100
TILL	clay, sandy, silty, with gravel layers, rocky, rough drilling, light olive gray, boulder at 115 ft	100-115
TILL	clay, sandy, with alternating beds of sandy clay and gravel, olive gray, moderately rough drilling, occasional cobbles or boulders	115-160
SAND & GRAVEL	sandy, gravelly, and rocky, very rough drilling, (till?)	160-170
PRECAMBRIAN	granite, green, very hard, returns more metal filings than granite chips	170-178

139-049-14CDA

Date Completed:	8/15/75	Purpose:	Irrigation Well
L.S. Elevation (ft):	904	Well Type:	4" Steel
Depth Drilled (ft):	144	Aquifer:	Undefined
Screened Interval (ft):	118-144	Log Source:	Hicks Bros

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gray	1-40
CLAY	blue	40-80
CLAY	gray	80-90
ROCK & SAND	no description	90-118

139-049-14CDA (continued)

WATER SAND no description

118-144

139-049-14DCA

Date Completed: 8/20/75
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 141
 Screened interval (ft): 122-141

Purpose: Irrigation Well
 Well Type: 4" Steel
 Aquifer: Undefined
 Log Source: Hicks Bros

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gray	1-40
CLAY	blue	40-80
ROCK & SAND	no description	80-119
WATER SAND	no description	119-141

139-049-14DCA2

NDSWC 13344

Date Completed: 10/21/93
 L.S. Elevation (ft): 902
 Depth Drilled (ft): 220

Purpose: Test Hole
 Well Type:
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow brown, soft, very plastic, very smooth, (oxidized lake clay)	1-13
CLAY	medium gray, soft, very plastic, very smooth, (lake clay)	13-88
CLAY	light gray, soft, sandy, plastic, with sand and gravel layers, (till)	88-95
CLAY	dark gray, firm, sandy, silty, (till)	95-101
CLAY	light gray, sandy, silty, pebbly, soft, many sand and gravel layers, (till)	101-110
ROCKS	no description	110-111
CLAY	gray to dark gray, firm, very sandy, and pebbly, (till)	111-115
SAND	medium to coarse, some gravel, some fine sand, angular to subrounded	115-127
CLAY	gray, sandy, silty, (till)	127-129
SAND	medium to coarse, with gravel and rocks at 132 feet, poorly sorted	129-132
CLAY	gray, sandy, silty, pebbly, layers of sand and rocks occasionally, boulder at 138 feet, (till)	132-139
CLAY	light gray, very sandy, soft, fairly plastic, (till)	139-161

139-049-14DCA2 (continued)

CLAY	gray to dark gray, silty, occasional sand grain, fairly soft, drills hard, slightly plastic	161-176
SILT	brownish gray, clayey, and silty clay, slightly plastic to slightly crumbly	176-183
CLAY	black, silty, moderately soft, looks like Cretaceous shale, highly micaceous, leaves dark silty shiny smear, (Cretaceous bedrock)	183-187
CLAY	light gray, soft, smooth, not much sample return	187-189
SILT	dark brownish gray, clayey, crumbly, micaceous, soft, becoming darker with depth, occasional light brown streaks, (Cretaceous bedrock)	189-198
CLAY	black to dark gray, silty, shiny, predominantly soft, occasional firm layers, very occasional hard layer, (Cretaceous bedrock)	198-216
CLAY	white, very soft, sandy, (weathered Precambrian)	216-220

139-049-14DDC

Date Completed:	8/10/75	Purpose:	Irrigation Well
L.S. Elevation (ft):	904	Well Type:	4" Steel
Depth Drilled (ft):	139	Aquifer:	Undefined
Screened Interval (ft):	115-139	Log Source:	Hicks Bros

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gray	1-40
CLAY	blue	40-80
CLAY	gray	80-90
ROCK & SAND	no description	90-113
WATER SAND	no description	113-139

139-049-15AAA
NDSWC 11595

Date Completed:	6/10/81	Purpose:	Test Hole
L.S. Elevation (ft):	902	Well Type:	
Depth Drilled (ft):	320	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	light olive gray and yellowish brown, plastic, very slightly argillaceous	0-11
CLAY	as above, only dark greenish gray and more silt	11-16
CLAY	as above, and interbedded with olive black carbonaceous organic plant debris	16-23
SAND	medium to coarse, moderately well sorted, subrounded, 70% quartz, with carbonates, gray shale clasts, and brown and green silicates	23-43
CLAY	olive gray, plastic, sticky, lacustrine	43-96
TILL	clay, silty, sandy, and gravelly, olive gray, rock at 99 ft	96-105
SAND	coarse, subrounded, poorly sorted	105-110

139-049-15AAA (continued)

TILL	clay, silty, sandy, gravelly, olive gray, rocks at 204 and 252 ft	110-252
CLAY	olive gray, plastic, with some rocks	252-275
TILL	clay, silty, sandy, gravelly, olive gray	275-296
CLAY	interbedded with silt, and very fine sand, olive gray, with very fine frosted quartzose sand, and pale blue green clay	296-313
WEATHERED PRECAMBRIAN	granite regolith, coarse and very coarse clasts of angular quartz in a matrix of light gray clay and silt	313-320

139-049-15ABB

Date Completed:	7/2/84	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	257	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	soft, brown	2-14
SAND	silty, with clay, blue	14-40
CLAY	soft, blue	40-81
SAND	with a little clay, blue	81-86
CLAY	sandy, with a few lenses of sand, blue	86-96
CLAY	sandy, blue	96-107
SAND	good, #15, gray	107-118
CLAY	sandy, blue	118-148
SAND	blue	148-149
CLAY	sandy, blue	149-182
CLAY	sandy, blue, black	182-213
DECOMPOSED	with clay, white	213-240
DECOMPOSED	green	240-257

139-049-15ACC

Date Completed:	7/3/84	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	257	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	soft, black	0-10
CLAY	soft, brown	10-17
CLAY	soft, blue	17-27
SAND	blue	27-32

139-049-15ACC (continued)

CLAY	soft, blue	32-88
CLAY	very sandy, blue	88-95
CLAY	sandy, blue	95-112
SAND	gray	112-115
CLAY	sandy, blue	115-155
CLAY	sandy (mixed coarse sand), blue	155-163
CLAY	sandy, blue	163-194
CLAY	sandy, blue, black	194-225
DECOMPOSED	white, blue	225-232
NO DESCRIPTION	no description	232-249
DECOMPOSED	green	249-257

139-049-15CDC

Date Completed:	9/1964	Purpose:	Domestic Well
L.S. Elevation (ft):	905	Well Type:	4" Steel
Depth Drilled (ft):	281	Aquifer:	Undefined
Screened Interval (ft):	0-281	Log Source:	

Lithologic Log - unavailable

139-049-15DAA

	NDSWC 11596A		
Date Completed:	6/11/81	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	376	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	clay, silty, brownish black, organic	0-5
CLAY	medium to dark yellowish brown with dark reddish brown stringers, slightly silty, oxidized lacustrine sediments	5-16
CLAY	olive gray, plastic, lacustrine	16-81
SAND & GRAVEL	primarily very coarse granules, subrounded, primarily carbonates, shale, and silicates	81-86
TILL	clay, silty, sandy, gravelly, olive gray	86-103
TILL	as above, more silty, drilled faster	103-115
TILL	clay, silty, sandy, gravelly, olive gray, rocky	115-121
TILL	as above, with lenses of gravel, rough drilling	121-126
TILL	clay, silty, sandy, gravelly, well compacted, slow drilling, rock at 214 ft	126-271
CLAY	olive gray, plastic, lacustrine	271-287
SILT	sandy, slightly argillaceous, olive gray, sandier from 312 to 320 ft	287-320
SAND	very fine grained, well sorted, subrounded, quartzose, lightly argillaceous, very light gray with a slight greenish tint	320-335
SAND	as above, with some clasts of grayish green shale and brownish black stringers, some weathered granite	335-376

139-049-16BAA
NDSWC 5693

Data Completed: 5/20/80
L.S. Elevation (ft): 899.6
Depth Drilled (ft): 240
Screened Interval (ft): 229-232

Purpose:
Well Type:
Aquifer:
Log Source:

Observation Well
1.25" PVC
West Fargo South
NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow brown, very cohesive and plastic, slightly calcareous, oxidized	1-6
SAND	no description	6-8
CLAY	olive gray, very cohesive and plastic, slightly calcareous, unoxidized	8-76
TILL	very sandy and pebbly, brownish gray, moderately cohesive, calcareous, boulder at 87 ft	76-122
GRAVEL	medium to coarse, subangular to subrounded	122-124
TILL	very sandy and pebbly, very cohesive, very calcareous, light brownish gray, with small gravel lenses	124-154
TILL	very sandy and pebbly, very cohesive, calcareous, brownish gray	154-196
SHALE	dark greenish gray, very calcareous, moderately to well indurated, fissile	196-212
SAND & GRAVEL	medium sand to gravel, predominantly coarse sand, poorly sorted, subrounded to rounded, becoming coarser with depth	212-233
CLAY	bentonitic, pinkish gray, contains glass shards	233-240

139-049-16BDC

Date Completed: 2/24/83
L.S. Elevation (ft): 903
Depth Drilled (ft): 273
Screened Interval (ft): 211-261

Purpose:
Well Type:
Aquifer:
Log Source:

Municipal Well
16" Steel
West Fargo South
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	brown, soft	4-17
CLAY	blue, soft	17-80
CLAY	blue, sandy	80-99
ROCK	colored	99-101
CLAY	blue, sandy	101-127
SAND	blue, dirty, with clay lenses	127-153
CLAY	blue, colored, sandy, with rock, gravelly	153-168
SAND	gray, fine	168-183
SAND	gray, fine	183-208
SAND	gray	208-258
SAND	gray, with clay lenses	258-263
SAND	gray, dirty	263-268
GRANITE	green, decomposed	268-273

139-049-16BDCD1

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

7/7/82
902
257
232-262

Purpose:
Well Type:
Aquifer:
Log Source:

Observation Well
4" Steel
West Fargo South
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	brown	0-2
CLAY	gray	2-76
CLAY	gray, sandy	76-121
CLAY	gray	121-130
CLAY	colored, sandy, dirty	130-145
SAND	colored	145-172
SAND	colored, fine	172-197
SAND	colored	197-227
SAND	colored, dirty	227-231
SAND	colored	231-262
CLAY	colored	262-267

139-049-16BDCD2

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

2/1/83
903
263

Purpose:
Well Type:
Log Source:

Test Hole

LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	brown, soft	4-21
CLAY	blue, soft	21-83
CLAY	blue, sandy, with lenses of sand	83-107
SAND	blue, fine	107-112
CLAY	blue, sandy	112-114
SAND	colored	114-116
CLAY	blue, sandy	116-135
SAND	blue, dirty	135-183
SAND	gray, fine, took water, drilled good	183-232
CLAY	blue, sandy	232-233
SAND	gray, took water	233-234
CLAY	gray, soft, rocky	234-235
SAND	gray, took water	235-238
CLAY	blue, sandy, with lenses of sand	238-240
SAND	colored, with lenses of clay	240-243

139-049-16BDCD2 (continued)

SAND	colored, drilled fair, poor sample returns	243-251
GRANITE	red, white, decomposed	251-263

139-049-16CAD

Date Completed:	7/21/82	Purpose:	Test Hole
L.S. Elevation (ft):	903	Well Type:	
Depth Drilled (ft):	287	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gray	1-2
CLAY	brown	2-17
CLAY	blue, soft	17-75
CLAY	blue, sandy	75-92
SAND	colored	92-102
CLAY	blue, sandy	102-109
SAND	colored, dirty	109-110
CLAY	blue, sandy	110-117
SAND	colored	117-125
CLAY	blue, sandy	125-132
SAND	colored, fine	132-162
SAND	colored, dirty	162-177
SAND	colored, fine	177-182
SAND	colored, fine	182-207
SAND	colored, fine	207-217
SAND	colored, fine	217-237
SAND	colored	237-257
SAND	blue, with clay lenses, fine	257-263
SAND	blue, dirty, fine	263-282
GRANITE	green, decomposed	282-287

139-049-16CCC

Date Completed:	7/15/82	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	287	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gray	1-5

139-049-16CCC (continued)

CLAY	brown	5-14
CLAY	blue, soft	14-75
CLAY	blue, sandy	75-77
SAND	blue, silty	77-82
CLAY	blue, sandy	82-90
CLAY	blue, sandy, rock	90-95
CLAY	blue, sandy	95-139
SAND	colored, with clay lenses, fine	139-144
CLAY	blue, sandy	144-147
SAND	colored, fine	147-148
CLAY	blue, sandy	148-154
SAND	colored	154-160
CLAY	blue, sandy	160-168
SAND	colored	168-169
CLAY	blue, sandy	169-176
SAND	colored	176-178
CLAY	blue, sandy	178-181
SAND	colored, dirty, fine	181-187
SAND	colored, with clay lenses, fine	187-201
SAND	colored	201-217
CLAY	blue, sandy	217-226
SAND	colored	226-227
CLAY	blue, sandy	227-237
SAND	colored, dirty, fine	237-241
CLAY	blue, sandy	241-247
SAND	colored, medium	247-257
CLAY	blue, sandy	257-258
SAND	colored, medium	258-267
CLAY	blue, sandy	267-272
GRANITE	green, decomposed	272-287

139-049-16CDD

Date Completed: 6/22/83
 L.S. Elevation (ft): 903.1
 Depth Drilled (ft): 260
 Screened Interval (ft): 238-243

NDSWC 12326
 Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 West Fargo South
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow brown, oxidized, iron stained	1-16

139-049-16CDD (continued)

CLAY	olive gray, plastic, sticky, lake clay	16-76
TILL	clay, silty, sandy, with pebbles, olive gray, rocky, extremely rocky 93 to 95 ft	76-123
TILL	clay, olive gray, silty, layered with medium to coarse sands and some gravels	123-128
TILL	clay, interbedded with shale and limestone gravels, drills smooth with alternating chatter, poor returns	128-142
CLAY	silty, olive gray, drills smooth	142-147
TILL	clay, sandy, with coal, alternating chatter and smooth drilling	147-162
SAND	very fine to fine, lignite chips, layered with sandy silty clay	162-176
SAND	very fine to fine, well rounded, good sorting, lignite chips, drills clean	176-260

139-049-16CDD2

Date Completed:	1992	Purpose:	Municipal Well
L.S. Elevation (ft):	903	Well Type:	16" Steel
Depth Drilled (ft):	310	Aquifer:	West Fargo South
Screened Interval (ft):	222-298	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	gray	2-11
CLAY	very silty, brown	11-15
CLAY	soft, gray-blue	15-80
CLAY	sandy, gray	80-133
SAND	drilled dirty, gray	133-139
SAND	very dirty, gray	139-175
SAND	fine, drilled better, gray	175-189
SAND	very dirty, gray	189-194
SAND	fine, drilled dirty, #6, gray	194-213
SAND	drilled better, #12, gray	213-233
SAND	drilled fair, #12, gray	233-253
SAND	drilled fair, #12-15, gray	253-290
CLAY	sandy, gray	290-293
SAND	drilled fair, #12-15, gray	293-298
CLAY	lenses of clay and sand, blue-gray	298-301
CLAY	sandy, blue	301-310

139-049-16CDDD

Date Completed:	7/23/82	Purpose:	Observation Well
L.S. Elevation (ft):	904	Well Type:	4" Steel
Depth Drilled (ft):	302	Aquifer:	West Fargo South
Screened Interval (ft):	269-299	Log Source:	LTP Enterprises, Inc

Lithologic Log

139-049-16CDDD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	gray	2-12
CLAY	brown	12-19
CLAY	blue	19-78
CLAY	blue, sandy	78-98
SAND	colored, coarse	98-99
CLAY	blue, sandy	99-102
SAND	colored	102-103
CLAY	blue, sandy	103-123
SAND	colored, dirty	123-134
SAND	colored	134-136
CLAY	blue, sandy	136-142
SAND	colored, with clay lenses	142-152
SAND	colored, fine	152-172
SAND	colored, with clay lenses, fine	172-202
SAND	colored, fine	202-291
CLAY	blue, sandy	291-302

139-049-17AAD

Date Completed:	5/20/80	NDSWC 5692	Observation Well
L.S. Elevation (ft):	894	Purpose:	1.25" PVC
Depth Drilled (ft):	340	Well Type:	Undefined
Screened Interval (ft):	298-301	Aquifer:	NDSWC
		Log Source:	

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow-brown, calcareous, very cohesive and plastic, oxidized	1-18
CLAY	olive gray, very cohesive and plastic, slightly calcareous, unoxidized	18-62
TILL	clay, brownish gray, very sandy and pebbly, calcareous, moderately cohesive, numerous small gravel lenses	62-84
TILL	clay, brownish gray to light brownish gray, very sandy, pebbly, calcareous, very cohesive, boulders at 128 ft	84-164
TILL	clay, light brown, less sandy, more clayey, gravel lens at 197 ft	164-198
TILL	clay, brownish gray, very silty, sandy, pebbly, very calcareous, moderately to very cohesive, boulder at 200 ft	198-202
CLAY	pale brown, slightly silty, slightly calcareous, non-cohesive, slightly plastic	202-204
TILL	clay, brownish gray, very sandy, silty, pebbly, moderately to very cohesive, gravel lens at 248 ft, many small sand lenses from 252 to 260 ft	204-259
SAND	fine to coarse, poorly sorted, subangular to subrounded, 85 % quartz, interbedded with clay	259-308
CLAY	slightly silty, brownish black, very plastic, very cohesive, non-calcareous, with gravel lens at 327 ft	308-333

139-049-17AAD (continued)

CLAY pale green, slightly calcareous, with coarse angular grains of quartz grains 333-340

139-049-17BCB

Date Completed:	7/31/75	Purpose:	Test Hole
L.S. Elevation (ft):	901	Well Type:	
Depth Drilled (ft):	232	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-17
SHALE	blue	17-73
CLAY	blue, sandy	73-94
SAND	no description	94-96
CLAY	blue, sandy	96-102
SAND	blue	102-107
CLAY	sandy	107-132
SAND	fine	132-139
CLAY	blue, sandy, with sand lenses, fine	139-157
SAND	gray, fine, dirty	157-202
SAND	gray	202-228
CLAY	sandy	228-230
PRECAMBRIAN	green	230-232

139-049-17BCC

Date Completed:	5/20/75	Purpose:	Test Hole
L.S. Elevation (ft):	897	Well Type:	
Depth Drilled (ft):	257	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown, soft	3-11
CLAY	gray	11-17
CLAY	brown	17-22
CLAY	blue, soft	22-72
CLAY	blue, sandy	72-95
CLAY	blue, sandy, with sand lenses	95-98
SAND	colored	98-103
CLAY	blue, sandy	103-117
SAND	colored	117-122

139-049-17BCC (continued)

SAND	colored	122-125
CLAY	blue, sandy	125-130
SAND	colored	130-132
CLAY	blue, sandy	132-179
SAND	gray, dirty, fine	179-210
SAND	gray, fine	210-222
SAND	gray	222-227
SAND	gray	227-232
CLAY	blue, sandy	232-237
CLAY	blue, green, sandy	237-247
PRECAMBRIAN	green	247-257

139-049-18AAD

Date Completed:	00	Purpose:	Industrial Well
L.S. Elevation (ft):	900	Well Type:	8" Unknown
Depth Drilled (ft):	202	Aquifer:	Undefined
Screened interval (ft):	0-198	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brown	1-11
SAND	silty, brown	11-16
CLAY	silty, blue	16-22
CLAY	blue, plastic	22-80
CLAY	gray, numerous limestone pebbles	80-83
CLAY	blue, hard	83-97
CLAY	sandy, blue, soft	97-100
CLAY	sandy, blue, hard	100-102
CLAY	gravelly, blue	102-104
CLAY	blue, hard	104-106
CLAY	blue, soft	106-122
CLAY	blue, hard	122-169
CLAY	sandy, blue	169-188
SAND	coarse, multicolored	188-198
GRANITE	decomposed, clay, brown and white	198-202

139-049-18BBB

Date Completed:	8/26/63	NDSWC 2169	Purpose:	Observation Well
L.S. Elevation (ft):	893.9		Well Type:	1.25" ABS
Depth Drilled (ft):	231		Aquifer:	Undefined
Screened Interval (ft):	150-210		Log Source:	NDSWC

Lithologic Log

139-049-18BBB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
ROAD FILL	no description	0-4
CLAY	silty, dusky yellow, soft, cohesive, plastic, calcareous	4-10
CLAY	as above to clay as above, but olive gray	10-20
CLAY	silty, soft, cohesive, plastic, calcareous, molds easily, sticky	20-70
TILL	clay, silty to gravelly, with cobbles and boulders, olive gray, fairly tight, moderately cohesive, calcareous	70-90
TILL	as above, to SAND, fine to coarse, moderately sorted, subrounded, predominantly quartz	90-100
TILL	as above the sand, to CLAY, very sandy, olive gray to olive black, slightly to moderately calcareous	100-110
CLAY	as above, to SAND, fine to coarse, moderately well sorted, generally subrounded, clean, predominantly quartz and igneous and metamorphic rock derivatives	110-120
SAND	as above, with clay stringers	120-140
SAND	as above, to CLAY, silty, olive gray, smooth, soft, sticky, plastic, cohesive, calcareous	140-150
SAND	fine to coarse, moderately well sorted, subrounded to rounded, sugary, moderately calcareous, predominantly quartz, looks like reworked Dakota Sandstone, some clay stringers	150-210
CLAY	sandy, light greenish gray to greenish gray, soft, cohesive, noncalcareous	210-231

139-049-18CCD

NDSWC 2177

Date Completed:	9/5/63	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	294	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL AND FILL	silty, moderately plastic, dark gray calcareous	0-11
TILL	clay, silty, sandy, plastic, dark brownish gray, calcareous, some oxidized material	11-21
CLAY	silty, moderately plastic to plastic, olive gray to dark gray, calcareous	21-74
TILL	clay, sandy, silty, gravelly, plastic, dark olive gray, calcareous	74-87
SAND	fine, loose	87-92
TILL	as in 74 to 87 ft	92-105
SAND	as in 87 to 92 ft	105-116
TILL	clay, sandy, silty, gravelly, plastic, olive gray, calcareous	116-147
CLAY	silty, plastic, bluish gray, calcareous	147-158
CLAY	silty, plastic, blackish gray, non-calcareous	158-221
CLAY	sandy, silty, soft, plastic, blackish gray, non-calcareous	221-247
CLAY	sandy, silty, plastic, non-calcareous, pale green	247-294

139-049-18CCD2

Date Completed:	1/5/81	Purpose:	Domestic Well
L.S. Elevation (ft):	902	Well Type:	4" Steel
Depth Drilled (ft):	198	Aquifer:	Undefined
Screened Interval (ft):	181-187	Log Source:	LTP Enterprises, Inc

139-049-18CCD2 (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-27
CLAY	blue, soft	27-67
CLAY	gray, sandy	67-80
ROCK	no description	80-81
CLAY	gray, sandy, hard	81-105
SAND	colored	105-106
CLAY	gray, sandy	106-107
SAND	colored	107-109
CLAY	gray, sandy	109-121
SAND	colored	121-123
SAND	colored	123-128
CLAY	gray, sandy	128-161
SAND	colored	161-162
CLAY	gray, sandy	162-163
SAND	colored	163-165
CLAY	gray, sandy	165-166
SAND & GRAVEL	colored	166-171
SAND	colored	171-187
SAND	colored, with clay lenses	187-195
CLAY	gray, sandy	195-198

139-049-19AAA

NDSWC 2170

Date Completed:	8/26/63	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	242	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty clay loam, black	0-3
CLAY	silty, light olive gray to yellowish gray, soft, smooth, cohesive, calcareous	3-20
CLAY	light olive gray, soft, cohesive, smooth, plastic, sticky, calcareous	20-66
TILL	clay, silty to gravelly, very sandy, olive gray, soft to moderately soft, cohesive, rocky in spots	66-71
GRAVEL	fine to coarse, sandy, poorly sorted, subangular to subrounded	71-78
TILL	as above, with a high percentage of sand, rocky rough drilling	78-96
SAND	medium to coarse with some gravel, moderately sorted, subangular to subrounded	96-108
TILL	clay, very sandy with gravel and rocks, olive gray, moderately cohesive, rough drilling	108-129
SAND	fine to coarse, some gravel, moderately sorted, some clay stringers	129-152

139-049-19AAA (continued)

TILL	clay, silty, sandy, with pebbles, olive gray, moderately cohesive, fairly tight, moderately plastic, calcareous	152-167
TILL	clay, silty, sandy, with clay-silt-sand ratio varying from pure clay to every combination, occasional rocks, thinly laminated, lacustrine or fluvial?	167-226
WEATHERED PRECAMBRIAN	clay, light greenish gray, with partially decomposed rock particles, non-calcareous	226-242

139-049-21AAA1

Date Completed:	6/1/83	Purpose:	Observation Well
L.S. Elevation (ft):	909.1	Well Type:	1" Steel
Depth Drilled (ft):	271	Aquifer:	Dakota Group
Screened Interval (ft):	265-268	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>	
CLAY	yellow-brown, plastic, oxidized lake clay	0-21	
CLAY	gray, plastic, lake clay	21-34	
SAND	medium to fine, well rounded, some coarse grains, quartz and carbonates with some lignite, transition to clay tough to pick, drills with a gradual change	34-52	875
CLAY	gray, plastic, lake clay	52-88	857
TILL	clay, sandy, gravelly, cohesive	88-92	
SAND	poorly sorted, very dirty, very angular, predominantly carbonates and lignite	92-95	
TILL	clay, gray, sandy, silty, firm, boulder at 101 ft	95-113	
SAND	medium to coarse, angular, poorly sorted	113-116	
TILL	clay, gray, sandy, silty, firm	116-121	
SAND	clayey, dirty	121-127	
TILL	clay, sandy, silty, cut up with frequent layers of sands, and silts	127-148	
SAND	medium to coarse	148-222	761
CLAY	green, silty, friable, gritty	222-227	687
CLAY	dark gray, silty, micaceous	677-674 (227-235)	
CLAY	light gray, soft, bentonitic, with layers of black, micaceous, silty, clay	235-245	
CLAY	very light gray, silty, bentonitic, drills easily, most sample returns washing out	665-660 (245-249)	
CLAY	medium gray, micaceous, silty	249-257	
CLAY	gray, moderately plastic, slightly silty, occasional light gray streaks	257-261	
CLAY	dark gray, firm, silty	261-264	
CLAY	clay, black, silty, no mica particles	644-641 (264-268)	
CLAY	medium gray, moderately plastic	268-271	

139-049-21AAA2

Date Completed:	6/7/83	Purpose:	Observation Well
L.S. Elevation (ft):	909.1	Well Type:	1" Steel
Depth Drilled (ft):	235	Aquifer:	Dakota Group
Screened Interval (ft):	232-235	Log Source:	LTP Enterprises, Inc

Lithologic Log

139-049-21AAA2 (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
	see log for 139-049-21AAA1	0-235

139-049-21AAA3

Date Completed:	6/8/83	Purpose:	Observation Well
L.S. Elevation (ft):	908.8	Well Type:	1.25" Steel
Depth Drilled (ft):	252	Aquifer:	Dakota Group
Screened Interval (ft):	244-249	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
	see log for 139-049-21AAA1	0-252

139-049-21AAA4

Date Completed:	6/9/83	Purpose:	Observation Well
L.S. Elevation (ft):	908.7	Well Type:	1" Steel
Depth Drilled (ft):	76	Aquifer:	Till
Screened Interval (ft):	72-75	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
	see log for 139-049-21AAA1	0-76

139-049-21AAA5

Date Completed:	6/14/83	Purpose:	Observation Well
L.S. Elevation (ft):	908.5	Well Type:	1" Steel
Depth Drilled (ft):	106	Aquifer:	Till
Screened Interval (ft):	102-105	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
	see log for 139-049-21AAA1	0-107

139-049-21AAA6

	NDSWC 12319		
Date Completed:	6/15/83	Purpose:	Observation Well
L.S. Elevation (ft):	908.6	Well Type:	1.25" PVC
Depth Drilled (ft):	60	Aquifer:	Lake Clay Sed.
Screened Interval (ft):	43-48	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow-brown, plastic, cohesive, oxidized, iron stained	2-17
CLAY	olive gray, very plastic, unoxidized	17-26
SAND	very fine to fine, good sorting, well rounded, 40% shale, 40 % quartz, and the rest limestone and igneous	26-31
SILT	olive gray, clayey, poor returns	31-34

139-049-21AAA6 (continued)

SAND	fine to coarse, well rounded, composition same as that of the sand above	34-46
CLAY	olive gray, very plastic, lake clay	46-60

139-049-21BBB

NDSWC 2171

Date Completed:	8/27/63	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	294	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	clay, silty, black	0-4
CLAY	yellowish gray, soft, smooth, slippery, plastic, cohesive, molds easily, calcareous, oxidized, tight	4-17
CLAY	light olive gray, soft, smooth, drills easily	17-72
SAND	fine to medium	72-74
TILL	clay, silty, sandy, with pebbles and cobbles, olive gray, soft, fairly tight, cohesive, fairly plastic, calcareous	74-100
TILL	silt and fine sandy clay, olive gray, soft, fairly smooth to gritty, moderately cohesive, slightly plastic, occasional cobble or boulder, sandler areas lighter in color	100-183
TILL	clay, sandy, silty, occasional pebbles, light olive gray, poorly consolidated, slightly cohesive, poor sample return	183-252
SAND	medium to very coarse, with fine and medium gravel, moderately sorted, generally subrounded, not too clean	252-270
TILL	clay, sandy, silty, moderately consolidated, light olive gray, some pebbles	270-280
CLAY	brownish black and pure white, smooth, soft, non-calcareous, grading into a light greenish gray and hematite red clay	280-294

139-049-21DCD

NDSWC 11602

Date Completed:	6/22/81	Purpose:	Observation Well
L.S. Elevation (ft):	907.7	Well Type:	1.25" PVC
Depth Drilled (ft):	280	Aquifer:	West Fargo South
Screened Interval (ft):	191-197	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	light olive gray, oxidized, plastic	0-14
CLAY	dark gray, unoxidized, plastic	14-20
CLAY	silty, plastic	20-72
CLAY & SILT	olive gray, very sandy, with some finer-sized gravel, rock at 84 feet (till)	72-105
SAND & GRAVEL	coarse, with boulders, poorly sorted	105-109
CLAY	very silty, very sandy, olive gray (till)	109-114
CLAY	silty, olive gray, plastic	114-117
CLAY	very sandy, silty, some finer-sized gravel, brownish-gray, rock at 122 feet (till)	117-126
CLAY	sandy, silty, olive gray, plastic	126-136
SAND	fine grained, dirty	136-137

139-049-21DCD (continued)

CLAY	sandy, silty, olive gray, plastic	137-143
SAND	interbedded with silt layers, dark gray, fine to medium grained, fair sorting, occasional coarse grains	143-161
SAND	medium to coarse grained, fair sorting	161-163
CLAY	silty, olive gray	163-164
SAND	fine grained, probably silty, poor sorting	164-184
SAND	medium to coarse grained, pebbly, brownish-gray, poor sorting	184-225
BOULDERS	gravelly, sandy, poorly sorted	225-229
GRAVEL & SAND	coarse sands, and pebble-granule gravel, with some boulders, subrounded to subangular	229-247
GRAVEL & CLAY	interbedded, gravel as above, interbedded till and fluvial material	247-267
MUDSTONE	silty, slightly sandy, gray-white, soft (weathered bedrock)	267-280

139-049-22BBB

NDSWC 2172

Date Completed: 8/28/63
 L.S. Elevation (ft): 908.4
 Depth Drilled (ft): 464
 Screened Interval (ft): 130-220

Purpose: Observation Well
 Well Type: 1.25" ABS
 Aquifer: West Fargo South
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty clay loam	0-2
CLAY	yellowish gray, soft, smooth, slippery, sticky, molds easily, calcareous, oxidized	2-10
CLAY	as above, turning to light olive gray	10-20
TILL	clay, extremely sandy, olive gray, soft, moderately cohesive, very slightly plastic	20-30
SAND	very fine to medium, moderately well sorted, generally subrounded, slightly clayey, predominantly quartz, contains pelecypod shells, becoming coarser and cleaner with depth, taking some water	30-40
SAND	medium and coarse, same composition as above, to CLAY, olive gray, smooth, soft, slippery, calcareous	40-50
CLAY	as above, smooth easy drilling	50-90
TILL	clay, silty to very sandy, with pebbles, cobbles, and boulders, olive gray, fairly tight, cohesive, very slightly plastic, calcareous, pebbles predominantly limestone, fairly rough drilling	90-110
TILL	as above, to GRAVEL, fine to very coarse, pebbles to boulders, some sand, poorly to moderately sorted, subangular to rounded, predominantly limestone and granitic rocks	110-120
GRAVEL	as above, to CLAY, silty, olive gray, very soft, smooth, sticky, calcareous	120-130
SAND & GRAVEL	medium to very coarse sand, and fine to coarse gravel, subangular to subrounded, predominantly quartz, granitic rocks, limestone and shale	130-220
SAND & GRAVEL	as above, to CLAY, silty, smooth, soft, cohesive plastic, sticky, light olive gray to olive black, noncalcareous, (Cretaceous clay)	220-230
CLAY	as above, olive black to greenish black, kelly rattles occasionally	230-270
WEATHERED PRECAMBRIAN	clay, light gray, with greenish and reddish colorations, gritty, noncalcareous, some smooth talcum-like layers, some light green layers	270-463
GRANITE	very hard, green	463-464

139-049-22DBB

Date Completed: 9/19/83
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 193

Purpose:
 Well Type:
 Log Source:

Test Hole
 Lako Drilling & Water Smith, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL	clay	0-1
CLAY	no description	1-77
GRAVEL & TILL	no description	77-99
TILL & GRAVEL	medium	99-110
TILL & GRAVEL	medium to fine sand	110-117
SAND	medium to fine	117-129
SAND	clean, medium to fine	129-150
SAND	uniform, medium	150-160
SAND	clean, medium to fine	160-170
SAND	medium to fine	170-183
SAND & TILL	no description	183-190
GRAVEL & TILL	no description	190-193

139-049-22DCA

Date Completed: 9/15/83
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 244

Purpose:
 Well Type:
 Log Source:

Test Hole
 Lako Drilling & Water Smith, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	till	0-75
TILL	gray, streaks fine sand	75-79
GRAVEL	medium to fine	79-82
TILL	no description	82-181
CLAY	dark gray	181-189
TILL	no description	189-217
SAND	medium to fine	217-220
TILL	no description	220-223
SAND	fine	223-228
TILL	no description	228-244

139-049-22DCB1

Date Completed: 9/20/83
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 250
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" PVC
 West Fargo South
 Lako Drilling & Water Smith, Inc

Lithologic Log

139-049-22DCB1 (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	lake bottom	0-75
GRAVEL & TILL	no description	75-90
SAND	medium	90-92
GRAVEL	with mixed till	92-110
SAND	mixed	110-197
TILL & SAND	with clay, coal	197-201
SAND	mixed, fine, coarse	201-230
CLAY	mixed till	230-250

139-049-22DDCA

Date Completed: 9/16/83
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 400

Purpose:
 Well Type:
 Log Source:

Test Hole
 Lako Drilling & Water Smith, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	no description	0-72
TILL	gravelly, drift	72-81
SAND	medium, fine	81-84
TILL	no description	84-155
SAND	fractured rock, mixed, not clean	155-185
SHALE	hard	185-214
SILT	fine, sandy	214-217
SHALE	no description	217-222
SHALE	no description	222-226
TILL	no description	226-237
SILT	black	237-241
SAND	silt	241-242
CLAY	white, silty	242-260
CLAY	white, silty	260-290
SAND	white, fine	290-310
SILT	white, sandy	310-361
CLAY & GRANITE	no description	361-400

bdrk

139-049-22DDCB

Date Completed: 9/14/83
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 250

Purpose:
 Well Type:
 Log Source:

Test Hole
 Lako Drilling & Water Smith, Inc

139-049-22DDCB (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	lake bottom	0-72
TILL	gravelly	72-75
GRAVEL	medium, coarse	75-80
CLAY	mixed with till	80-85
SAND	40% shale	85-89
TILL & SAND	medium, fine	89-149
SAND	gray	149-164
GRAVEL	with layers of till	164-173
ROCK	coarse, fractured, not uniform	173-178
GRAVEL	with till, clay, streaks	178-185
TILL	dark gray	185-205
CLAY	dark, with shale	205-214
SAND	fine, silty	214-222
SAND	fine, silty, clay streaks	222-236
CLAY	silty	236-250

bedrock

139-049-23ADC

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

6/17/87
901
171
0-167

Purpose:
Well Type:
Aquifer:
Log Source:

Industrial Well
5" PVC
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-15
CLAY	blue	15-87
CLAY	sandy, blue	87-103
ROCK	no description	103-104
CLAY	sandy, blue	104-143
SAND	gray	143-146
ROCK	no description	146-148
SAND	gray	148-149
ROCK	no description	149-150
SAND	light gray	150-167
CLAY	sandy, blue	167-171

139-049-23BAA2

Date Completed: 5/24/88
 L.S. Elevation (ft): 905
 Depth Drilled (ft): 304
 Screened Interval (ft): 284-304

Purpose: Domestic Well
 Well Type: 4" PVC
 Aquifer: Undefined
 Log Source: Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	brown	2-18
CLAY	gray	18-74
TILL	no description	74-130
GRAVEL	no description	130-132
TILL	no description	132-135
GRAVEL	no description	135-137
TILL	no description	137-139
GRAVEL	silty	139-142
TILL	no description	142-275
SILT	gray	275-284
SILT & SAND	silt and sand layer	284-304

139-049-23BBB

NDSWC 2173

Date Completed: 8/29/63
 L.S. Elevation (ft): 905
 Depth Drilled (ft): 440

Purpose: Test Hole
 Well Type:
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellowish gray, soft, smooth, sticky, cohesive, plastic, calcareous, oxidized	1-14
CLAY	olive gray, soft, smooth, sticky, cohesive, plastic, calcareous, unoxidized	14-76
TILL	clay, silty, sandy, with pebbles, cobbles and boulders, moderately cohesive, slightly plastic, calcareous, fairly tight	76-116
TILL	clay, with much fine and medium sand, light olive gray, moderately cohesive, very slightly plastic, calcareous	116-280
CLAY	silty, olive black, tight, cohesive, plastic, calcareous, sandy in spots, thinly laminated to massive, smooth drilling	280-310
TILL	clay, very sandy, olive gray, poorly consolidated or very tight, poor sample return, much sand showing up in mud pit	310-407
SAND	fine to coarse, with gravel, moderately well sorted, subangular to subrounded, predominantly quartz, limestone, and igneous & metamorphic derivatives, fairly clean	407-425
WEATHERED PRECAMBRIAN	clay, light greenish gray, soft, gritty, contains particles of partially decomposed granite, non-calcareous	425-439
PRECAMBRIAN	granite, green, hard	439-440

bank

139-049-23CDC

Date Completed:	7/9/75	Purpose:	Industrial Well
L.S. Elevation (ft):	906	Well Type:	4" Steel
Depth Drilled (ft):	363	Aquifer:	Undefined
Screened Interval (ft):	349-369	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-5
CLAY	brown	5-18
SHALE	blue, soft	18-84
CLAY	blue, sandy	84-88
CLAY	blue, sandy, with sand lenses	88-92
CLAY	blue, sandy	92-271
ROCK	no description	271-272
CLAY	blue, sandy	272-287
SAND	no description	287-288
CLAY	blue, sandy	288-303
SAND	no description	303-304
CLAY	blue, sandy, with small sand lenses	304-347
SAND	fine	347-379
SAND	dirty	379-383

bdr/k

139-049-23DAD

Date Completed:	8/7/80	Purpose:	Industrial Well
L.S. Elevation (ft):	905	Well Type:	5" PVC
Depth Drilled (ft):	161	Aquifer:	Undefined
Screened Interval (ft):	146-155	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	black	0-2
CLAY	brown	2-12
CLAY	soft, blue	12-84
CLAY	sandy, blue	84-95
SAND	colored	95-96
CLAY	sandy, blue	96-146
SAND	colored	146-156
CLAY	sandy, blue	156-161

139-049-23DCD

Date Completed:	5/22/79	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	392	Log Source:	LTP Enterprises, Inc

Lithologic Log

139-049-23DCD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brown	1-16
CLAY	blue, soft	16-83
CLAY	blue, sandy	83-85
CLAY	blue, sandy, with sand lenses	85-92
CLAY	sandy	92-124
CLAY	sandy, with sand lenses	124-132
SAND	no description	132-135
CLAY	blue, sandy	135-147
SAND	no description	147-149
CLAY	blue, sandy	149-172
SAND	no description	172-175
CLAY	blue, sandy	175-226
SAND	fine	226-229
CLAY	blue, sandy	229-257
CLAY	white, blue, sandy	257-337
PRECAMBRIAN	green	337-392

139-049-23DDC

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

3/16/79
904
357

Purpose:
Well Type:

Test Hole

Log Source:

LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	gray	2-3
CLAY	brown	3-15
CLAY	blue	15-85
CLAY	blue, sandy	85-89
SAND	colored	89-91
CLAY	blue, sandy	91-113
SAND	colored	113-117
CLAY	blue, sandy	117-157
SAND	colored	157-159
CLAY	blue, sandy	159-166
SAND	colored, dirty	166-168
CLAY	blue, sandy	168-183
CLAY	blue, sandy	183-207

139-049-23DDC (continued)

SAND	blue, with clay lenses	207-211
CLAY	blue, sandy	211-212
SAND	colored	212-228
CLAY	blue, sandy	228-238
SAND	colored	238-242
CLAY	white, blue, sandy	242-347
PRECAMBRIAN	green	347-357

139-049-23DDCB

Date Completed: 12/7/79
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 257

Purpose:
 Well Type:
 Log Source:

Test Hole
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	gray	2-3
CLAY	brown	3-12
CLAY	blue, soft	12-87
CLAY	blue, sandy	87-95
SAND	blue, fine	95-97
CLAY	blue, sandy	97-116
SAND	colored, fine	116-119
CLAY	blue, sandy	119-127
SAND	colored, fine	127-129
CLAY	blue, sandy	129-171
SAND	colored, fine	171-179
CLAY	blue, sandy	179-208
SAND	colored	208-218
CLAY	blue, sandy	218-227
SAND	colored	227-252
CLAY	blue, sandy	252-257

139-049-24AAA

Date Completed: 2/20/60
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 298
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 0* Unknown
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1

139-049-24AAA (continued)

CLAY	yellow	1-16
CLAY	blue, soft, plastic	16-92
CLAY	sandy, blue, hard	92-107
CLAY	sandy, blue, soft	107-119
CLAY	sandy, blue, hard	119-128
SAND	dirty, white	128-131
CLAY	sandy, gray, hard, numerous boulders	131-149
CLAY	blue, hard	149-184
CLAY	sandy, blue	184-193
CLAY	black, lenses of lignite	193-201
CLAY	multicolored, hard	201-223
CLAY	hard, sandstone lenses	223-239
GRANITE	decomposed, clay, white, green, and blue	239-298

139-049-24DAA

Date Completed:	1960	Purpose:	Irrigation Well
L.S. Elevation (ft):	906	Well Type:	4" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-90	Log Source:	

Lithologic Log - unavailable

139-049-25AAA

Date Completed:	9/3/63	NDSWC 2175	Purpose:	Test Hole
L.S. Elevation (ft):	906		Well Type:	
Depth Drilled (ft):	519		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	moderately plastic, black, non-calcareous	0-3
CLAY	silty, plastic, calcareous, yellowish brown	3-16
CLAY	clay, silty, plastic, olive gray, calcareous	16-86
SAND	fine to coarse, some fine gravel, becoming coarser from 99 to 105 ft	86-105
TILL	clay, sandy, silty, moderately plastic, dark olive gray, calcareous	105-178
TILL	clay, silty, sandy, olive gray, non-calcareous	178-215
TILL	clay, silty, moderately plastic, dark olive black, small amount of sand and gravel	215-221
CLAY	silty, plastic, dark olive black to dark olive gray	221-231
CLAY	silty, plastic, dark olive gray, non-calcareous, some fine sand and fragments of coal	231-262
CLAY	moderately plastic, grayish white, slightly calcareous, grades into greenish gray clay starting at 304 ft	262-441
CLAY	with fine to medium quartz sand, soft, moderately plastic, light to medium green, slightly calcareous	441-518
PRECAMBRIAN	granite, very hard chips of white and pink crystalline bedrock	518-519

139-049-26CCC

Date Completed:	00/00/00	Purpose:	Test Hole
L.S. Elevation (ft):	903	Well Type:	
Depth Drilled (ft):	96	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT and CLAY	brown to black, granular texture, blocky structure, dispersed organics in the upper part (Unit 10)	0-8
NO SAMPLES	(Sherack Formation)	8-10
CLAY	brownish gray to gray, mostly lean clay, some fat clay banding, vaguely laminated (?), mostly unbedded (Brenna Formation)	10-55
CLAY	gray, unbedded, clay stringers (marbled), silt pebble inclusions, gritty appearance (Argusville Formation)	55-73
CLAY	pebbly, loamy, silty, sandy (Unit A)	73-96

139-049-27AAD

Date Completed:	11/8/84	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	4" Steel
Depth Drilled (ft):	156	Aquifer:	Undefined
Screened Interval (ft):	146-151	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-28
CLAY	gray, soft	28-87
ROCK	colored	87-88
CLAY	gray, soft	88-106
CLAY	gray, sandy	106-118
SAND	colored	118-119
CLAY	gray, sandy, some sand	119-126
SAND	colored, some clay	126-139
SAND	colored	139-148
ROCK	colored	148-149
SAND	colored	149-151
CLAY	gray	151-156

139-049-27ADA2

Date Completed:	7/22/74	Purpose:	Industrial Well
L.S. Elevation (ft):	903	Well Type:	4" Steel
Depth Drilled (ft):	176	Aquifer:	Undefined
Screened Interval (ft):	167-173	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1

139-049-27ADA2 (continued)

SAND	brown	1-12
CLAY	brown, sandy	12-22
CLAY	blue, sandy	22-25
SHALE	blue	25-75
CLAY	blue, sandy	75-114
SAND	blue	114-116
CLAY	blue, sandy	116-119
SAND	no description	119-120
CLAY	no description	120-121
SAND	no description	121-122
CLAY	blue, sandy	122-127
ROCK	no description	127-128
CLAY	blue, sandy	128-134
SAND	no description	134-140
CLAY	blue, sandy	140-143
SAND	no description	143-176

139-049-27BAA

Date Completed: 5/26/95
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 248
 Screened Interval (ft): 228-248

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Industrial Well
 5" PVC
 West Fargo South
 Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-31
CLAY	lake, gray	31-120
TILL	no description	120-193
SAND	no description	193-248

139-049-28BAB

NDSWC 2176

Date Completed: 9/4/63
 L.S. Elevation (ft): 909
 Depth Drilled (ft): 309

Purpose:
 Well Type:
 Log Source:

Test Hole

 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	sandy, silty, moderately plastic, light yellowish brown, highly calcareous	0-5
CLAY	silty, sandy, plastic, yellowish brown, calcareous	5-12
CLAY	plastic, light olive gray, calcareous	12-18

139-049-28BAB (continued)

SAND	very fine to medium, loose, dark gray, fossiliferous, gastropods and pelecypods, some coal and small pieces of wood	18-40
CLAY	silty, plastic, dark olive gray, calcareous	40-78
TILL	clay, sandy, silty, moderately, plastic, calcareous	78-105
SAND	fine to coarse, some fine gravel, loose	105-110
TILL	clay, sandy, silty, moderately plastic, calcareous	110-126
TILL	clay, silty, sandy, plastic, highly calcareous, dark brownish gray	126-168
TILL	clay, sandy, moderately, plastic, dark olive gray, calcareous, some coal fragments	168-284
TILL	clay, very sandy, no good sample return, losing water	284-305
CLAY	very little sample return, soft, white	305-308
PRECAMBRIAN	granite, very hard chips of white, black, and pink crystalline bedrock	308-309

139-049-28BCC

Date Completed:	5/13/91	Purpose:	Domestic Well
L.S. Elevation (ft):	908	Well Type:	5" PVC
Depth Drilled (ft):	197	Aquifer:	West Fargo South
Screened Interval (ft):	183-185	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-11
CLAY	soft, blue	11-83
CLAY	sandy, blue	83-137
CLAY	with lenses, blue	137-143
SAND	fine, gray	143-167
SAND	colored	167-188
SAND	finer, gray	188-197

139-049-28CBB2

Date Completed:	5/23/84	Purpose:	Domestic Well
L.S. Elevation (ft):	908	Well Type:	4" Steel
Depth Drilled (ft):	194	Aquifer:	West Fargo South
Screened Interval (ft):	188-194	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown	3-8
SAND	brown	8-14
CLAY	blue	14-20
SAND	gray, dirty	20-36
CLAY	gray	36-84

139-049-28CBB2 (continued)

ROCK	colored	84-85
CLAY	gray	85-92
ROCK	colored	92-94
CLAY	gray	94-107
SAND	gray	107-122
CLAY	gray, sandy	122-131
SAND	gray	131-139
SAND	gray	139-194

139-049-28DDD

NDSWC 5688

Date Completed:	5/15/80	Purpose:	Observation Well
L.S. Elevation (ft):	902	Well Type:	1.25" PVC
Depth Drilled (ft):	200	Aquifer:	West Fargo South
Screened Interval (ft):	148-151	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	brownish black, clayey	0-1
CLAY	grayish orange, oxidized, calcareous, moderately cohesive and plastic	1-4
CLAY	olive gray, very cohesive, plastic, drills as ribbons, slightly to non-calcareous	4-68
TILL	clay, very silty and pebbly, brownish gray, calcareous, moderately to very cohesive, many small lenses of gravel	68-97
SILT	brownish gray, clayey, calcareous	97-102
TILL	clay, sandy, some layers of sand	102-109
SILT	brownish gray, clayey, calcareous, some sand and gravel layers	109-140
SAND	medium grained, well sorted, well rounded. 85% quartz, 10% carbonates, and 5% lignite	140-153
TILL	brownish gray, very silty and sandy, very calcareous, moderately to very cohesive	153-160
SHALE	brownish dark gray to dusky brown, non-calcareous, slightly silty, micaceous, bentonitic, moderately to well indurated	160-200

139-049-29ABB

Date Completed:	12/23/94	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	4" PVC
Depth Drilled (ft):	143	Aquifer:	Undefined
Screened Interval (ft):	132-136	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	no description	1-8
CLAY	soft	8-72
CLAY	sandy	72-95
SAND	no description	95-136
CLAY	hard	136-143

139-049-29BCD

Date Completed:	9/1961	Purpose:	Domestic Well
L.S. Elevation (ft):	902	Well Type:	4" Unknown
Depth Drilled (ft):	238	Aquifer:	Ponderosa
Screened Interval (ft):	0-238	Log Source:	

Lithologic Log - unavailable

139-049-29CCCA

Date Completed:	6/24/87	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	4" PVC
Depth Drilled (ft):	218	Aquifer:	Ponderosa
Screened Interval (ft):	205-209	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-32
CLAY	blue	32-75
CLAY	sandy, gray	75-84
ROCK	white	84-85
CLAY	sandy clay with rock, gray	85-89
SAND	colored	89-117
SAND	colored	117-180
SAND	colored	180-213
CLAY	sandy, gray	213-217
ROCK	black	217-218

139-049-29CDC

Date Completed:	9/16/94	Purpose:	Domestic Well
L.S. Elevation (ft):	905	Well Type:	4" Stainless Steel
Depth Drilled (ft):	182	Aquifer:	Ponderosa
Screened Interval (ft):	169-177	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	no description	2-40
CLAY	soft	40-72
CLAY	sandy, hard	72-99
SAND	no description	99-103
CLAY	sandy	103-122
CLAY	sandy, hard, sticky	122-158
SAND	drilled fine	158-179

139-049-29CDC (continued)

CLAY sandy 179-182

139-049-29DCC

NDSWC 12670

Date Completed: 10/10/90 Purpose: Test Hole
L.S. Elevation (ft): 902 Well Type:
Depth Drilled (ft): 220 Log Source: NDSWC

Lithologic Log

Table with 3 columns: Unit, Description, Depth (ft). Rows include TOPSOIL, CLAY, TILL, SAND & GRAVEL, SILT, and CLAY with detailed descriptions and depth ranges.

139-049-29DDD1

NDSWC 12666

Date Completed: 10/9/90 Purpose: Observation Well
L.S. Elevation (ft): 907.31 Well Type: 2" PVC
Depth Drilled (ft): 260 Aquifer: West Fargo South
Screened Interval (ft): 238-243 Log Source: NDSWC

Lithologic Log

Table with 3 columns: Unit, Description, Depth (ft). Rows include TOPSOIL, CLAY, SAND, GRAVEL, SAND & GRAVEL, SILT, and SAND with detailed descriptions and depth ranges. Some depth values are highlighted in yellow.

139-049-29DDD1 (continued)

GRAVEL	fine to medium to coarse, clean, subangular to subrounded, quartz, carbonates, and granitics (weathered and unweathered)	225-248
SILT	clayey, dark brown, slightly plastic, soft, slightly micaceous, becoming more clayey and harder with depth (bedrock)	248-260

139-049-29DDD2

NDSWC 12667

Date Completed:	10/9/90	Purpose:	Observation Well
L.S. Elevation (ft):	907.42	Well Type:	2" PVC
Depth Drilled (ft):	151	Aquifer:	West Fargo South
Screened Interval (ft):	142-147	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellowish brown, soft, very plastic (oxidized lake clay)	2-4
SILT	coarse, brown, with some fine silt	4-5
CLAY	yellowish brown, soft, plastic, (oxidized lake clay)	5-10
CLAY	gray, plastic, soft (lake clay)	10-23
SAND	fine to medium, predominantly quartz and shale, some clay lenses	23-29
CLAY	gray, plastic, soft (lake clay)	29-80
TILL	clay, sandy, silty, pebbly, with gravel layers at 81 and 84 ft, soft and very sandy	80-98
SAND	fine to coarse, some gravel, granitics, shale, quartz, and carbonates, dirty, poorly sorted, coarse sand and gravel is subangular to subrounded	98-122
GRAVEL	rocky, bouldery, carbonates and igneous, put on rock bit at 126 ft	122-132
SAND & GRAVEL	carbonates, igneous, shales, and quartz	132-147
CLAY	silty, brown, firm, plastic	147-151

139-049-30CCC

NDSWC 12671

Date Completed:	10/11/90	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	380	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellowish brown, mottled brown portions, very plastic, moderately stiff (oxidized lake clay)	2-16
CLAY	gray, very plastic (lake clay)	16-57
TILL	clay, sandy, silty, gravelly, with several gravelly layers, stiff	57-102
SAND	fine to coarse, poorly sorted, dirty	102-106
TILL	clay, sandy, silty, gravelly, stiff, moderately plastic	106-117
SAND & GRAVEL	coarse sand, fine to medium gravel, angular to subangular	117-120
TILL	clay, sandy, silty, gravelly, gray, plastic, stiff	120-143
CLAY	very silty, medium gray, slight plasticity, firm (fluvial)	143-155

139-049-30CCC (continued)

SILT	clayey, light gray, slight plasticity, soft, more clayey 170 to 180 ft, not much sample return 180 to 195 ft, occasional chatter suggests sand layers, but only a hint of fine sand (fluvial)	155-195
TILL	clay, light gray, very silty, sandy, occasional pebbles, slightly plastic	195-315
GRAVEL	fine to coarse, angular to subrounded, mostly shale and carbonates, with some quartz and igneous material, dirty	315-321
TILL	clay, sandy, silty, very gravelly	321-328
GRAVEL	medium to coarse, subangular to subrounded, predominantly shale and carbonates	328-338
CLAY	green soft	338-340
TILL	clay, gray, sandy, silty, some pebbles	340-355
TILL	clay, gray with brown portions, some brown with red portions, sandy, silty, slightly plastic, occasional pebbles	355-361
CLAY	gray-brown, stiff, silty, slightly plastic (bedrock)	361-380

139-049-30DCC

NDSWC 12674

Date Completed:	10/16/90	Purpose:	Observation Well
L.S. Elevation (ft):	899.18	Well Type:	2" PVC
Depth Drilled (ft):	200	Aquifer:	Ponderosa
Screened Interval (ft):	165-170	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellowish brown, plastic, soft, smooth (oxidized lake clay)	1-15
CLAY	gray, plastic, soft, smooth (lake clay)	15-57
TILL	clay, sandy, silty, pebbly, gray, soft, plastic, rocky layers at 68, 71, and 81 ft, change to rock bit for rock at 81 ft	57-84
GRAVEL	fine, medium and coarse, angular to subrounded, quartz, carbonates, igneous, shales and carbonates, clay layers from 91 to 101 ft	84-101
GRAVEL	as above, only very clean, some of the gravel up to 3/4 to 1 inch diameter, used 3 bags of drilling mud	101-173
CLAY	dark gray, stiff, slightly plastic, smooth, some layers a little softer, not much sample return with the heavy mud (bedrock)	173-200

139-049-31DDD2

Date Completed:	10/25/88	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	4" PVC
Depth Drilled (ft):	162	Aquifer:	Undefined
Screened Interval (ft):	155-159	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow	1-25
CLAY	blue	25-70
CLAY	sandy, gray	70-96
SAND	with lenses of clay, gray	96-122

139-049-31DDD2 (continued)

SAND colored
 SAND colored
 SAND with lenses of clay and rock, black and gray

122-127
 127-158
 158-162

139-049-32AACC

Date Completed: 9/3/87
 L.S. Elevation (ft): 908
 Depth Drilled (ft): 282

Purpose:
 Well Type:
 Log Source:

Test Hole
 LTP Enterprises, Inc

Lithologic Log

Unit	Description	Depth (ft)	
TOPSOIL	black	0-1	
CLAY	brown	1-15	
CLAY	blue	15-30	
SAND	gray	30-45	15
CLAY	blue	45-73	
CLAY	sandy, blue	73-94	
SAND	gray	94-107	13
CLAY	sandy, blue	107-117	
SAND	gray	117-120	3
CLAY	sandy, blue	120-130	
SAND	gray	130-132	2
CLAY	sandy, blue	132-135	
SAND	gray	135-138	
SAND	gray	138-145	10
CLAY	blue	145-159	
SAND	gray	159-165	6
CLAY	blue	165-170	
SAND	gray	170-175	5
CLAY	blue	175-178	
SAND	gray	178-182	4
CLAY	blue	182-186	
SAND	gray	186-188	2
CLAY	blue	188-196	
SAND	gray	196-197	1
CLAY	blue	197-198	
SAND	gray	198-203	5
CLAY	blue	203-212	
SAND	gray	212-216	4
CLAY	blue	216-220	

139-049-32AACC (continued)

SAND	gray	220-222	7
SAND	gray	222-227	
CLAY	sandy, blue	227-232	
CLAY	sandy clay with shale, white and black	232-265	
SAND	white	265-267	
SHALE	sandy clay shale, black	267-272	
GRANITE	white	272-282	

139-049-32AACD

Date Completed:	9/9/87	Purpose:	Domestic Well
L.S. Elevation (ft):	910	Well Type:	4" Steel
Depth Drilled (ft):	246	Aquifer:	West Fargo South
Screened Interval (ft):	237-242	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>	
TOPSOIL	black	0-1	
CLAY	brown	1-16	
CLAY	blue	16-27	
SAND	gray	27-37	10
CLAY	blue	37-74	
CLAY	sandy clay, rock, blue	74-95	
SAND	gray	95-97	2
CLAY	sandy, blue	97-99	
CLAY	sandy clay with lenses of sand, blue	99-109	
SAND	gray	109-131	22
CLAY	sandy, blue	131-141	
SAND	gray	141-146	5
CLAY	sandy clay with lenses of sand, blue	146-152	
ROCKS	gray	152-153	
CLAY	sandy, blue	153-157	
SAND	gray	157-161	4
CLAY	sandy, blue	161-164	
SAND	gray	164-168	4
CLAY	sandy, blue	168-172	
SAND	gray	172-174	2
CLAY	sandy, blue	174-182	
SAND	gray	182-187	5
SAND	with layers of clay, gray	187-194	16
SAND	gray	194-198	4
CLAY	sandy, blue	198-202	

139-049-32AACD (continued)

SAND	gray	202-205	3
CLAY	sandy, blue	205-208	
SAND	gray	208-212	4
SAND	with layer of clay	212-232	
SAND	rocky, colored	232-242	10
CLAY	rock, sandy clay, blue	242-246	

139-049-32ACA

Date Completed:	12/17/74	Purpose:	Domestic Well
L.S. Elevation (ft):	906	Well Type:	4" Steel
Depth Drilled (ft):	280	Aquifer:	Undefined
Screened Interval (ft):	94-100	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>	
TOPSOIL	black	0-2	
CLAY	brown, sandy	2-6	
SAND	brown	6-9	
CLAY	brown, sandy	9-15	
CLAY	blue, soft	15-77	
CLAY	blue, sandy, with small rock	77-92	
SAND	colored	92-100	
CLAY	blue, sandy	100-122	
SAND	with fine clay lenses	122-134	
CLAY	sandy, blue	134-147	
SAND	fine	147-153	6
CLAY	blue	153-155	
SAND	fine	155-165	10
CLAY	blue, sandy with lenses	165-171	
SAND	fine	171-175	4
CLAY	sandy, blue	175-185	
SAND	gray	185-187	2
CLAY	blue, sandy	187-190	
SAND	blue, with clay lenses	190-192	2
CLAY	blue, sandy	192-217	
SAND	blue, fine	217-220	3
CLAY	blue, sandy	220-222	
SAND	gray	222-227	5
CLAY	blue, sandy	227-264	
SAND	no description	264-267	3
SHALE	black, white	267-280	

139-049-32CCA

Date Completed:	6/1960	Purpose:	Domestic Well
L.S. Elevation (ft):	900	Well Type:	4" Unknown
Depth Drilled (ft):	0	Aquifer:	Ponderosa
Screened Interval (ft):	0-183	Log Source:	

Lithologic Log - unavailable

139-049-32DDC

NDSWC 12668

Date Completed:	10/10/90	Purpose:	Observation Well
L.S. Elevation (ft):	907.17	Well Type:	2" PVC
Depth Drilled (ft):	260	Aquifer:	Ponderosa
Screened Interval (ft):	240-245	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellowish brown, very plastic, stiff, (oxidized lake clay)	1-18
CLAY	gray, very plastic, stiff (lake clay)	18-71
TILL	clay, gray, sandy, silty, gravelly, stiff, rocks at 75 ft	71-77
SAND	fine to coarse, predominantly shale	77-81
GRAVEL	rocky	81-82
TILL	clay, sandy, silty, rocky	82-87
SAND	fine, medium, and coarse, dirty, poorly sorted	87-91
TILL	clay, very sandy, silty, some pebbles, light gray, soft, drills surprisingly slowly for as soft a clay as the clay is	91-107
SAND	fine to coarse, poorly sorted, subangular to subrounded, better sorted after 120 ft	107-143
GRAVEL	clean, fine to medium, angular to rounded, quartz, granitics, some carbonates and shales	143-185
GRAVEL	medium to coarse, rocks at 192 ft, angular to subrounded, predominantly very coarse, mixed four bags of mud	185-260

139-049-33DDC

Date Completed:	3/9/76	Purpose:	Industrial Well
L.S. Elevation (ft):	908	Well Type:	4" Steel
Depth Drilled (ft):	242	Aquifer:	West Fargo South
Screened Interval (ft):	222-232	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-16
CLAY	blue, soft	16-70
CLAY	blue, sandy	70-81
ROCK	no description	81-82
CLAY	blue, sandy	82-126
SAND	no description	126-127
CLAY	blue, sandy	127-128
SAND	no description	128-130

139-049-33DDC (continued)

CLAY	blue, sandy	130-133
SAND	washed	133-142
CLAY	blue, sandy	142-147
SAND	with clay lenses	147-157
CLAY	blue, sandy	157-162
SAND	no description	162-189
SAND	dirty	189-198
SAND	no description	198-206
CLAY	blue, sandy	206-207
SAND	dirty	207-212
SAND	no description	212-232
SAND	dirty	232-237
SAND	no description	237-242

139-049-35BAB

Date Completed:	12/23/87	Purpose:	Domestic Well
L.S. Elevation (ft):	902	Well Type:	4" Steel
Depth Drilled (ft):	324	Aquifer:	Undefined
Screened Interval (ft):	304-312	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-22
CLAY	blue	22-72
CLAY	sandy, gray	72-122
ROCK	black	122-123
CLAY	sandy, gray	123-218
SAND	gray	218-220
CLAY	sandy, gray	220-225
ROCK	white	225-226
CLAY	sandy, gray	226-237
SAND	gray	237-252
CLAY	sandy clay with lenses of sand, gray	252-257
SAND	gray	257-267
SAND	colored	267-287
SAND	colored	287-312
SAND	gray	312-317
SAND	gray	317-324

139-049-36DAD

Date Completed: 8/24/77
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 283
 Screened Interval (ft): 269-279

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Dakota Group
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-23
CLAY	soft, blue	23-81
CLAY	sandy, blue	81-174
SAND	fine	174-177
CLAY	sandy, blue	177-178
SAND	no description	178-179
CLAY	sandy, blue	179-192
SAND	no description	192-194
CLAY	sandy, blue	194-256
SANDSTONE	white	256-279
CLAY	sandy, and decomposed, white, blue	279-283

139-049-36DDB

Date Completed: 4/16/79
 L.S. Elevation (ft): 900
 Depth Drilled (ft): 292
 Screened Interval (ft): 278-283

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	soft, brown	3-32
CLAY	soft, sandy, blue	32-90
CLAY	sandy, hard, blue	90-101
CLAY	with lenses of sand	101-105
CLAY	sandy, blue	105-123
SAND	colored	123-130
CLAY	sandy, blue	130-142
SAND	colored	142-144
CLAY	sandy, blue	144-179
SAND	gray	179-183
CLAY	sandy, blue	183-184
SAND	drilled poor, gray	184-188
CLAY	sandy, blue	188-200
SAND	colored	200-202

139-049-36DDB (continued)

CLAY	sandy, blue	202-262
CLAY	sandy, with lenses	262-266
CLAY	sandy, blue	266-267
SAND	colored	267-290
CLAY	sandy, with decomposed, blue. white	290-292

139-050-01CCC

NDSWC 5694

Date Completed:	5/21/80	Purpose:	Observation Well
L.S. Elevation (ft):	897.4	Well Type:	1.25" PVC
Depth Drilled (ft):	280	Aquifer:	94/10 Channel
Screened Interval (ft):	258-261	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	moderate yellowish-brown, slightly calcareous, very cohesive and plastic; small sand lens.	1-8
CLAY	olive-gray, slightly calcareous, very cohesive and plastic.	8-60
TILL	brownish-gray, very sandy and pebbly, calcareous, moderately cohesive; small gravel lens at 75 feet.	60-90
SAND	no return; till lens at 93 feet, medium sand to gravel, predominantly medium sand, subrounded and rounded; taking water.	90-98
TILL	as above; few lenses at 97 to 100 feet, no return; gravel lens at 100 feet; boulder at 120 and 137 feet.	98-138
TILL	light brownish-gray, very sandy and pebbly, very calcareous, moderate to very cohesive.	138-158
SAND & GRAVEL	medium sand to fine gravel, predominantly coarse sand, medium sorting, angular to rounded; coarser with depth, medium gravel, subrounded and rounded, coarse sand; clay, pale brown, calcareous, moderate cohesive, few small gravel lenses from 196 to 200 feet; taking some water.	158-202
GRAVEL	as above; interbedded with till, as above.	202-236
GRAVEL	coarse sand to gravel, predominantly gravel, medium sorting, subrounded and rounded; interbedded clay, moderate brown, slightly calcareous from 264 feet; taking water.	236-274
CLAY	light brown, slightly calcareous, very sandy and pebbly.	274-278
CLAY	moderate reddish-brown, slightly calcareous; contains many weathered pebbles and sand grains.	278-280

139-050-01DC

Date Completed:	0/0	Purpose:	Industrial Well
L.S. Elevation (ft):	899	Well Type:	4" Unknown
Depth Drilled (ft):	0	Aquifer:	94/10 Channel
Screened Interval (ft):	187-212	Log Source:	

Lithologic Log - unavailable

139-050-01DDD

Date Completed:	1/1/46	Purpose:	Test Hole
L.S. Elevation (ft):	899	Well Type:	
Depth Drilled (ft):	260	Log Source:	Dennis et al, 1949

Lithologic Log

139-050-01DDD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	yellow	4-19
CLAY	blue gray	19-24
CLAY	dark gray	24-69
TILL	gravel, sand, and blue clay	69-79
TILL	gravel, coarse, and blue clay	79-89
TILL	cobbles and blue sandy clay	89-99
TILL	gravel, coarse, sand and clay	99-109
TILL	clay, blue	109-119
TILL	clay, blue gray	119-129
TILL	clay, sandy, blue gray	129-134
TILL	clay, sandy, blue gray, with gravel	134-144
TILL	gravel, sand, and blue clay	144-149
GRAVEL	with sand	149-159
TILL	gravel, sand, and clay	159-179
TILL	gravel, sand, and clay (?)	179-234
GRAVEL	with sand	234-249
GRANITE	decomposed	249-260

139-050-02ABB2

Date Completed: 5/29/87
 L.S. Elevation (ft): 901
 Depth Drilled (ft): 240
 Screened Interval (ft): 228-238

Purpose: Domestic Well
 Well Type: 4" PVC
 Aquifer: Prosper
 Log Source: Water Smith, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	no description	1-140
SAND	clay sand streaks, and gravel streaks	140-200
SAND & GRAVEL	fine sand and small gravel	200-240

139-050-02BAA

NDSWC 12922

Date Completed: 10/22/91
 L.S. Elevation (ft): 897.3
 Depth Drilled (ft): 260
 Screened Interval (ft): 225-230

Purpose: Observation Well
 Well Type: 2" PVC
 Aquifer: Prosper
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-2
CLAY	yellow-brown, soft, smooth, very plastic, oxidized (lake clay).	2-17

139-050-02BAA (continued)

CLAY	gray, soft, smooth, very plastic (lake clay).	17-64
CLAY	gravelly, sandy, silty, gray to dark gray, moderately stiff, slightly plastic (till).	64-78
CLAY	sandy, silty, pebbly, gray to light gray, very sandy, soft, slightly plastic (till).	78-96
CLAY	silty, sandy, occasional pebbles, gray to dark gray, moderately stiff (till).	96-101
SAND	no description	101-102
CLAY	very sandy, silty, pebbly, gray to light gray, moderately stiff, no plasticity; sand layers from 118 to 121 feet; gravel layer from 131 to 132 feet; small sand layers from 132 to 140 feet, drills choppy (till).	102-140
SAND	fine, poor sample return.	140-146
SILT	gray, soft, some mica; some very fine sand layers.	146-161
SAND	fine to very fine.	161-168
SAND	fine to medium.	168-176
CLAY	sandy, silty, pebbly, gray to light gray, moderately soft, moderately to fairly plastic (till).	176-196
SILT	clayey, and clay, silty, gray with slight tannish tint, layered, soft, some layers plastic, some very plastic.	196-212
SAND	fine to medium, some coarse material, predominantly quartz, a little igneous and a little carbonate material; interbedded clay layers from 223 to 226 feet and 235 to 236 feet; some gravel towards bottom.	212-240
CLAY	gray, with reddish and greenish inclusions, moderately soft, fairly plastic; possibly bedrock.	240-253
CLAY	greenish-white with quartz grains and greenish-grayish-white without quartz grains.	253-260

139-050-02DAD

Date Completed:	12/11/90	Purpose:	Domestic Well
L.S. Elevation (ft):	899	Well Type:	4" PVC
Depth Drilled (ft):	212	Aquifer:	94/10 Channel
Screened Interval (ft):	198-202	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brown	1-20
CLAY	blue	20-66
CLAY	sandy, gray	66-67
SAND	brown	67-70
CLAY	sandy clay with rock, gray	70-155
CLAY	sandy clay with lenses of sand, gray	155-169
ROCK	white	169-171
SAND	colored	171-172
CLAY	sandy clay with rock, gray	172-177
SAND	with rock, colored	177-180
SAND	with cobbles and lenses, colored	180-186
SAND	with cobbles, colored	186-191
SAND	colored	191-197

139-050-02DAD (continued)

SAND	colored	197-202
SAND	and cobbles, colored	202-212

139-050-02DBC

Date Completed:	0/0	Purpose:	Municipal Well
L.S. Elevation (ft):	900	Well Type:	4" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-250	Log Source:	

Lithologic Log - unavailable

139-050-03DDA

	NDSWC 5696		
Date Completed:	5/22/80	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	250	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	pale yellowish brown, calcareous, very cohesive and plastic	1-14
CLAY	dark greenish gray, slightly calcareous, very cohesive and plastic	14-66
TILL	brownish gray, very sandy and pebbly, calcareous, moderately cohesive, small interbedded gravel lenses	66-75
TILL	dark brownish gray, very silty and fine sand, few pebbles, very calcareous, moderately cohesive	75-82
SAND	fine grained, well sorted, rounded, clay interbedded at 81-86 ft	82-92
GRAVEL	coarse sand and fine to medium gravel, predominantly medium gravel, subangular to rounded	92-93
TILL	dark greenish gray, very sandy and pebbly, very calcareous, moderately to very cohesive	93-114
SAND	fine to coarse, predominantly medium grained, moderate sorting, subangular to subrounded, taking water	114-116
TILL	as above	116-202
CLAY	grayish brown, very calcareous, very cohesive and plastic	202-234
TILL	no sample	234-238
CLAY	pale green, sandy, becoming moderately brown in color with depth	238-250

139-050-03DDD

Date Completed:	3/9/76	Purpose:	Test Hole
L.S. Elevation (ft):	902	Well Type:	
Depth Drilled (ft):	272	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	sandy, brown	2-16
CLAY	soft, blue	16-68

139-050-03DDD (continued)

CLAY	sandy, blue	68-82
SAND	with small lenses of clay, blue	82-85
CLAY	sandy, blue	85-91
SAND	with lenses of clay	91-92
SAND	blue	92-95
CLAY	sandy, blue	95-141
SAND	fair, blue	141-146
CLAY	blue	146-147
SAND	blue	147-148
CLAY	with lenses of sand, blue	148-149
SAND	drilled good, gray	149-158
CLAY	sandy, blue	158-242
GRANITE	decomposed, colored	242-251
ROCK	colored	251-252
DECOMPOSED	colored	252-258
GRANITE	decomposed, very sandy, colored	258-267
GRANITE	decomposed, gray, colored	267-272

139-050-04DCD

Date Completed:	1975	Purpose:	Stock Well
L.S. Elevation (ft):	901	Well Type:	12' Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-60	Log Source:	

Lithologic Log - unavailable

139-050-05CCC

Date Completed:	1946	Purpose:	Test Hole
L.S. Elevation (ft):	902	Well Type:	
Depth Drilled (ft):	329	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	buff	3-19
CLAY	brown	19-24
CLAY	brown and gray	24-29
CLAY	dark gray	29-34
CLAY	gray	34-49
TILL	sand and gray clay	49-52
TILL	silt, gray, and some sand and gravel	52-63
TILL	clay, silty, gray, and some sand and gravel	63-69
TILL	gravel, fine, coarse sand, and gray silty clay	69-74

139-050-05CCC (continued)

TILL	silt, gray, and some sand and gravel	74-109
TILL	silt, gray, and considerable sand and gravel	109-114
TILL	silt, gray, and some sand and gravel	114-209
TILL	silt, gray, and some dark gray clay, sand and gravel	209-214
TILL	clay, black, and some sand and gravel	214-219
TILL	gravel, sand, silt, and gray clay	219-224
TILL	clay, silty, light and dark gray	224-229
TILL	clay, gray	229-234
TILL	clay, gray, and considerable sand and gravel	234-249
TILL	clay, silty, gray, and considerable sand and gravel	249-254
TILL	clay, silty gray	254-259
TILL	clay, white and black, and some sand and gravel	259-264
CLAY	micaceous, black and brown (bedrock?)	264-269
CLAY	light gray and black (bedrock)	269-274
CLAY	silty, white (bedrock)	274-279
CLAY	light to dark gray, in part black carbonaceous (bedrock)	279-284
CLAY	white and gray (bedrock)	284-289
CLAY	silty, gray (bedrock)	289-294
CLAY	gray and orange (bedrock)	294-299
WEATHERED PRECAMBRIAN	clay, white (kaolin)	299-304
WEATHERED PRECAMBRIAN	clay, white and light gray (kaolin)	304-309
WEATHERED PRECAMBRIAN	clay, light greenish gray (kaolin)	309-314
WEATHERED PRECAMBRIAN	sand, quartz, angular, and light greenish gray clay (kaolin)	314-324
WEATHERED PRECAMBRIAN	clay, light green (kaolin) and rock (granite?)	324-329

139-050-06ABB

Date Completed:	0/0	Purpose:	Industrial Well
L.S. Elevation (ft):	904	Well Type:	0* Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-150	Log Source:	

Lithologic Log - unavailable

139-050-06BBB

Date Completed:	7/16/47	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	314	Log Source:	NDSWC

Lithologic Log

139-050-06BBB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-2
CLAY	yellow, few fine gravel and shale pebbles.	2-22
CLAY	lake clay.	22-47
CLAY	sandy, gray, fine gravel and shale pebbles.	47-52
CLAY	gray, a lot of fine and medium gravel and shale pebbles; rock at 67 feet.	52-76
GRAVEL	fine and medium, shale pebbles; losing water.	76-94
CLAY	sandy, fine gravel and shale pebbles, gray, few specks of lignite; possible gravel or cobbles from 97 to 100 feet and 107 to 110 feet.	94-130
CLAY	fine gravel, shale pebbles, gray, little lignite.	130-180
CLAY	fine gravel and shale pebbles, blue-gray.	180-195
CLAY	fine gravel and shale pebbles, blue, hard.	195-238
CLAY	fine gravel and shale pebbles, gray.	238-250
CLAY	sandy, fine gravel and shale pebbles, gray.	250-260
CLAY	maybe a little sandy, fine gravel and shale pebbles, gray.	260-300
CLAY	sandy, fine gravel and shale pebbles, gray; rock at 314 feet.	300-314

139-050-06BBB2

Date Completed:	00	Purpose:	Municipal Well
L.S. Elevation (ft):	904	Well Type:	6" Steel
Depth Drilled (ft):	207	Aquifer:	Undefined
Screened Interval (ft):	0-165	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-22
CLAY	blue	22-43
CLAY	blue	43-74
SAND	coarse	74-79
CLAY	blue	79-150
SAND	fine	150-165
CLAY	sandy	165-207

139-050-10DA

Date Completed:	7/7/64	Purpose:	Domestic Well
L.S. Elevation (ft):	900	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-116	Log Source:	

Lithologic Log - unavailable

139-050-10DAC

Date Completed: 8/1964 Purpose: Test Hole
L.S. Elevation (ft): 900 Well Type:
Depth Drilled (ft): 241 Log Source:

Lithologic Log - unavailable

139-050-11BBB

Date Completed: 1946 Purpose: Test Hole
L.S. Elevation (ft): 901 Well Type:
Depth Drilled (ft): 309 Log Source: Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black, with brown clay	0-4
CLAY	buff	4-19
CLAY	sandy, buff	19-29
CLAY	brown and gray	29-34
CLAY	gray	34-39
CLAY	light gray and black streaked	39-44
CLAY	dark gray	44-64
CLAY	light and dark gray streaked	64-66
TILL	clay, silty, light gray, and sand	66-69
TILL	clay, silty, light and dark gray, and some sand and gravel	69-74
TILL	clay, silty, gray, and some sand and gravel	74-84
TILL	gravel, sand, and gray silt	84-109
TILL	silt, gray, and some sand and gravel	109-129
TILL	silt, gray, and some black clay, sand, and gravel	129-134
TILL	silt, gray, and some sand and gravel	134-214
TILL	silt and clay, gray, and some sand and gravel	214-219
CLAY	gray, with some silt, sand and gravel	219-224
CLAY	dark gray	224-229
CLAY	gray, with some silt, sand and gravel	229-234
CLAY	gray to black and some red, and sand and gravel	234-239
CLAY	gray and white, and sand and gravel	239-249
CLAY	gray and olive drab, and sand and gravel	249-254
WEATHERED GRANITE	clay, gray and white (kaolin?)	254-257
WEATHERED GRANITE	clay, dark greenish gray and white (kaolin?)	257-259
CLAY	white, gray, and reddish brown, and considerable sand and gravel	259-264
WEATHERED GRANITE	clay, reddish brown, and rock fragments	264-265
WEATHERED GRANITE	clay, white, and rock fragments	265-269

139-050-11BBB (continued)

WEATHERED GRANITE	rock, white or light buff	269-279
WEATHERED GRANITE	rock, buff and black, and red clay	279-289
WEATHERED GRANITE	rock, buff and black, and red and white clay	289-299
WEATHERED GRANITE	rock, buff and black, and red and blue kaolin	299-304
WEATHERED GRANITE	rock, and red and white clay	304-309

139-050-12BBC

NDSWC 2178

Date Completed:	9/6/63	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	280	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty, black, plastic, calcareous.	0-5
CLAY	silty, brownish-gray, plastic, highly calcareous; grades to dark olive-gray at 15.5 feet.	5-63
TILL	silty, sandy, gravelly, plastic, calcareous.	63-137
SAND	fine to coarse, loose.	137-142
TILL	as above; rough drilling.	142-185
CLAY	silty, sandy, dark olive-gray, plastic, calcareous.	185-189
SAND	fine and medium, some fine gravel, loose.	189-196
TILL	sandy, silty, gravelly, dark olive-gray, plastic, calcareous; boulder at 199.5 ft.	196-200
TILL	sandy, gravelly, dark olive-gray, slightly plastic, calcareous.	200-205
SAND & GRAVEL	sand, medium to coarse, gravel, fine to medium.	205-221
TILL	silty, with abundant sand and gravel, dark olive-gray, moderate plasticity, calcareous.	221-273
TILL	as above, with boulders, some fragments of decomposed granite.	273-277
ROCK	hard, return consisted of green decomposed granite and fragments of fresh granite.	277-280

139-050-12CCC

NDSWC 12294

Date Completed:	12/7/82	Purpose:	Observation Well
L.S. Elevation (ft):	898.2	Well Type:	1.25" PVC
Depth Drilled (ft):	280	Aquifer:	94/10 Channel
Screened Interval (ft):	178-183	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellowish-brown, oxidized, cohesive, very plastic (lacustrine).	2-16
CLAY	olive-gray, unoxidized, cohesive, very plastic (lacustrine).	16-50
TILL	olive-gray, silty and sandy, moderately cohesive and plastic; becomes cobbly and gravelly below 70 feet.	50-85

139-050-12CCC (continued)

TILL	brownish-gray, sandy, little pebbly and cobbly; boulder at 141 feet.	85-145
SAND & GRAVEL	coarse sand to fine gravel, predominantly very coarse sand, subangular, equal proportions quartz and carbonate.	145-151
SAND	coarse and very coarse, predominantly coarse, subrounded, quartz.	151-180
SAND & GRAVEL	very coarse sand to coarse gravel, predominantly fine gravel, subrounded, equal proportions of quartz and carbonate; rough drilling between 200 and 225 feet; predominantly very coarse sand and fine gravel below 225 feet.	180-258
SILT	greenish-gray, slightly clayey.	258-260
SAND & GRAVEL	as above; rough drilling at 278 feet; cobbles at 280 feet.	260-280

139-050-23AAA

NDSWC 3103

Date Completed:	6/3/64	Purpose:	Observation Well
L.S. Elevation (ft):	900.1	Well Type:	1.25" ABS
Depth Drilled (ft):	219	Aquifer:	Horace
Screened Interval (ft):	148-151	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	grayish-orange, clayey, some very fine sand, calcareous, cohesive, oxidized; few laminations.	0-18
SILT	olive-gray, clayey, calcareous, cohesive.	18-53
TILL	olive-gray, clay through gravel, shale, carbonate, quartz and igneous, cohesive, highly calcareous.	53-70
TILL	light olive-gray, clay through gravel, carbonate, quartz, shale, igneous and lignite, cohesive, highly calcareous; very silty, light and dark mottled from 98 to 100 feet; quite silty after 98 feet.	70-84
TILL	light olive-gray, clay through sand, or silt, clayey and sandy, sand up to .5 mm, very silty, cohesive, highly calcareous; possible rock from 118 to 122 feet.	84-122
TILL	light olive to olive-gray, clay through gravel, carbonate, quartz, igneous, shale and lignite, cohesive, highly calcareous; wood fragments; sandy with depth.	122-145
SAND	0.13 to 14 mm, angular to rounded, fines are predominantly quartz, granules are varied, including carbonate, quartz, igneous and shale.	145-154
TILL	light olive-gray, clay through sand, some gravel, very silty and sandy, soft, carbonate, quartz, igneous, shale and lignite, highly calcareous; dark areas, possible lignite or sandy clay.	154-169
SAND	very fine to 10 mm, angular to rounded, predominantly quartz with abundant igneous granules and pebbles, carbonate and shale; washes out quickly, must be quite clean.	169-187
SILT	brownish-black, dark greenish-gray and light olive-gray, mostly brownish-black and olive-gray, occasional sand grains, very soft, highly calcareous, lignite; laminations; shell fragments and few snails about 205 feet.	187-214
CLAY	greenish-gray, silty, hard, slightly calcareous to calcareous; lignite or organic areas, brownish-black; drills rough (weathered granite).	214-219

139-050-23DDD

Date Completed:	0	Purpose:	Test Hole
L.S. Elevation (ft):	907	Well Type:	
Depth Drilled (ft):	255	Log Source:	USBR

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2

139-050-23DDD (continued)

CLAY	silty, tan, plastic	2-20
SAND	silty, fine, well sorted	20-35
SILT	sandy, tan	35-39
SAND	silty, fine, tan	39-52
SAND	clayey, fine, tan	52-60
SAND	silty, fine, gray, well sorted	60-65
CLAY	gravelly, gray, compact	65-115
SAND	no description	115-129
CLAY	gravelly, gray, compact	129-227
SAND	gravelly, coarse	227-231
CLAY	gravelly, gray, compact	231-255

139-050-24CCD

Date Completed:	4/7/54	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	282	Log Source:	USBR

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	gray, plastic	2-67
CLAY	gravelly, gray, compact	67-82
SAND	silty, very fine, gray	82-110
SAND	fine, gray, well sorted	110-112
CLAY	silty, gray, firm, laminated	112-163
CLAY	gravelly, gray	163-282

139-050-24CDD3

Date Completed:	4/15/54	Purpose:	Test Hole
L.S. Elevation (ft):	903	Well Type:	
Depth Drilled (ft):	220	Log Source:	USBR

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	silty, gray, plastic	2-62
CLAY	silty, sandy, gravelly, gray	62-80
SILT	clayey, sandy, gray, laminated	80-85
SAND	very fine, light gray, loose, clay lense 97-100 ft	85-105
SAND	fine, light gray, loose	105-110
SAND	fine to medium, light gray, loose, scattered silt lenses and gravel	110-125

139-050-24CDD3 (continued)

SAND	medium to coarse, light gray, loose	125-135
SAND	coarse, light gray, loose scattered fine gravel	135-154
SAND	clayey, gray	154-155
SAND	coarse, gray, loose	155-157
SAND	clayey, fine, gray	157-158
SILT	clayey, sandy, gray	158-161
SAND	medium, gray	161-164
SILT	sandy, clayey, gray	164-165
SAND	coarse, gray, scattered gravel	165-174
SAND	silty, coarse	174-175
SAND	gravelly, medium	175-189
SAND	silty, fine, gray	189-201
SAND	gravelly	201-208
SAND	silty, fine to medium	208-210
SAND	gravelly, fine to medium	210-220

139-050-24DDD2

Date Completed:	9/19/80	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	4" Steel
Depth Drilled (ft):	287	Aquifer:	Horace
Screened Interval (ft):	281-287	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	brown	4-25
CLAY	blue, soft	25-72
CLAY	blue, colored, sandy	72-74
ROCK	no description	74-75
CLAY	blue, sandy	75-89
SAND	colored	89-91
CLAY	blue, sandy	91-94
SAND	colored	94-97
CLAY	blue, sandy	97-196
SAND LENSES	colored	196-200
SAND	colored	200-218
CLAY	blue, sandy	218-234
SAND	colored	234-236
SAND	colored	236-272
SAND	no description	272-287

139-050-28AAA

NDSWC 3135

Date Completed: 7/29/64
 L.S. Elevation (ft): 911
 Depth Drilled (ft): 227

Purpose: Test Hole
 Well Type:
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-1
SILT	clayey, dark yellowish-brown, to moderate yellowish-brown, many lignite particles, highly calcareous, cohesive, soft, oxidized; laminated.	1-7
CLAY	moderate yellowish-brown to dark yellowish-brown, cohesive, soft, slightly calcareous to calcareous, oxidized.	7-20
CLAY	dark greenish-gray to slightly olive-gray, cohesive, soft, calcareous; boulder, granite, at 27 feet, ice rafted.	20-56
TILL	silty, olive-gray, cohesive, soft to hard, shale, dolomite, pyrite, quartz, lignite, highly calcareous, angular to rounded, grain size varies greatly, boulders, dolomite and igneous.	56-89
SAND & GRAVEL	coarse, quartz, relatively much pyrite, shale, dolomite, limestone and igneous crystals, angular to rounded, sphericity poor to excellent, average size 1 to 1.5 mm, maximum boulders.	89-99
TILL	olive-gray, shale, quartz, dolomite, limestone, lignite and igneous, cohesive, hard, angular to subrounded, highly calcareous, maximum grain size 2 mm, ranging to clay, predominantly 1 mm or slightly less; clayey with depth.	99-125
SAND	quartz, shale, pyrite, limestone, dolomite, igneous and lignite, predominant grain size .5 mm, angular to rounded, poor to excellent sphericity.	125-136
CLAY	sandy, mostly dark greenish-gray, cohesive, very hard, little white, fine sand, highly calcareous; occasionally laminated very fine lignite.	136-146
SAND	predominantly quartz, with shale dolomite, limestone, pyrite, lignite and igneous, predominantly .5 mm, maximum 2.25 mm, angular to rounded; lense of sandy clay, as above, 162 to 167 feet.	146-175
CLAY	sandy, as above.	175-183
SAND	as above.	183-185
SHALE	olive-black, cohesive, hard, noncalcareous, little white, fine sand laminations, also pockets of fine pyrite sand, muscovite flakes, lignite flakes and fragments, rare pyrite fragments up to 1 mm.	185-227

139-050-28BDC2

Date Completed: 5/21/96
 L.S. Elevation (ft): 911
 Depth Drilled (ft): 137
 Screened Interval (ft): 127-131

Purpose: Domestic Well
 Well Type: 4" PVC
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	brown	3-20
CLAY	gray	20-51
CLAY	sandy	51-90
ROCK	no description	90-91
CLAY	sandy	91-106
SAND	drilled good	106-131

139-050-28BDC2 (continued)

CLAY no description

131-137

139-050-31BBB

Date Completed:	1958	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	3" Steel
Depth Drilled (ft):	0	Aquifer:	Dakota Group
Screened Interval (ft):	0-417	Log Source:	

Lithologic Log - unavailable

139-050-35DDD

NDSWC 3107

Date Completed:	6/11/64	Purpose:	Test Hole
L.S. Elevation (ft):	904	Well Type:	
Depth Drilled (ft):	320	Log Source:	NDSWC

Lithologic Log

Unit	Description	Depth (ft)
TOPSOIL	no description	0-1
CLAY	grayish-orange, silty, cohesive, calcareous, oxidized.	1-13
CLAY	olive-gray, silty, cohesive, calcareous.	13-24
CLAY	moderate yellowish-brown, silty, cohesive, calcareous, oxidized.	24-28
CLAY	olive-gray, silty, cohesive, calcareous.	28-52
TILL	olive-gray, clay through gravel, cohesive, shale, quartz, carbonate, with igneous and lignite, highly calcareous, soft; carbonate boulder from 66 to 70 feet.	52-70
TILL	dark gray, clay through gravel, very solid, clayey, carbonate, shale, quartz, igneous, lignite fragments, cohesive, highly calcareous; light olive-gray, clay spots.	70-75
TILL	olive-gray or lighter, clay through gravel, cohesive, carbonate, shale, quartz, igneous, lignite, quite sandy, highly calcareous; wood fragments.	75-94
SAND	with granules, .5 mm to 6 mm, very angular chips to rounded, shale quartz, carbonate, igneous; boulders seem quite prominent from 95 to 102 feet; wood at 99 feet; pyrite, boulders, wood and abundant igneous from 102 to 104 feet.	94-104
TILL	light olive-gray, clay through gravel, very sandy, quartz, carbonate, igneous, highly calcareous; poor return.	104-155
TILL	olive-gray, and dark greenish-gray, clay through gravel, very solid, clayey, cohesive, shale, carbonate, igneous, quartz, highly calcareous.	155-175
CLAY	silty; no return; takes water when pump on, gives back water when pump off, thickens mud; drill clanged at 210 feet, abundant pale yellowish-brown angular chips, possible limestone.	175-222
SILT	olive-black, noncalcareous, cohesive, clayey; light brownish-gray and olive-gray silt approximately 220 feet; black lignite, silty clay at 240 feet; lignite at 253 feet; light olive-gray about 270 feet.	222-280
SAND	quartz, up to 2 mm, predominantly angular; resembles sand found before in weathered granite; bottom boundary uncertain.	280-282
SILT	noncalcareous, clayey, cohesive, lignite fragments; variegated as above, little black lignite material.	282-300
CLAY	light greenish-gray, silty, soapy, noncalcareous (weathered granite).	303-320

139-050-36ABB

NDSWC 12672

Date Completed: 10/11/90
 L.S. Elevation (ft): 901
 Depth Drilled (ft): 300

Purpose:
 Well Type:

Test Hole

Log Source:

NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellowish brown, plastic (oxidized lake clay)	1-17
CLAY	gray, plastic (lake clay)	17-65
TILL	clay, sandy, silty, some pebbles, medium gray, fairly stiff, rocks at 67 ft	65-71
SAND	fine to medium, occasional coarse grains	71-84
TILL	sandy, silty, some gravel, stiff, medium gray	84-94
SILT	clayey, gray, slightly plastic, soft	94-102
SAND	fine to coarse, fairly clean	102-108
SILT	clayey, and CLAY, silty, with lenses of fine sand	108-123
SAND	fine to coarse, some fine gravel	123-127
TILL	sandy, silty, light gray, not many pebbles or gravelly pieces, moderately soft, but drill slowly	127-241
CLAY	with numerous lenses of sand and gravel, especially 241-246 and 252-256 ft, very little sample return of the clay	241-258
SAND & GRAVEL	medium to coarse sand, fine gravel, subangular to subrounded	258-262
TILL	clay, (sandy, silty)?, very few sample returns	262-271
CLAY	brown and brownish gray, silty, moderately stiff, slightly plastic, and white, silty, small amounts of mica, very soft (bedrock)	271-292
CLAY	dark gray, stiff, shiny (bedrock)	292-294
CLAY	dark gray, drills very hard, lithified, brittle, (lowgrade coal?), (bedrock)	294-295
CLAY	gray, stiff shiny (bedrock)	295-300

139-051-02CDC

Date Completed: 1/1/67
 L.S. Elevation (ft): 905
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-107

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 4" Steel
 Undefined

Lithologic Log - unavailable**139-051-04CDD**

Date Completed: 1946
 L.S. Elevation (ft): 916
 Depth Drilled (ft): 419

Purpose:
 Well Type:
 Log Source:

Test Hole

Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black and gray	0-5
CLAY	yellow	5-24
SAND	coarse	24-34

139-051-02CDC (continued)

SAND	coarse and gray	34-39
SAND	fine	39-44
CLAY	blue, and some fine gravel and sand	44-49
CLAY	blue, and some fine gravel	49-64
GRAVEL	with blue clay	64-69
GRAVEL	with fine sand	69-74
GRAVEL	coarse	74-79
GRAVEL	coarse and fine, and blue clay	79-84
GRAVEL	coarse	84-85
GRAVEL	coarse and fine	85-89
GRAVEL	and blue clay	89-104
GRAVEL	sand, and blue clay	104-114
GRAVEL	coarse, with coarse sand	114-134
GRAVEL	sand, and blue clay	134-169
GRAVEL	coarse, and fine sand	169-179
GRAVEL	fine sand, and clay	179-194
GRAVEL	and very fine sand	194-209
SAND	fine, and brown clay	209-219
SAND	fine	219-249
GRAVEL	coarse, and fine sand	249-259
GRAVEL	fine sand, and some brown clay	259-269
GRAVEL	and fine sand	269-274
GRAVEL	and sand, fine	274-299
GRAVEL	and sand, fine, and gray clay	299-314
CLAY	light gray, and some fine gravel	314-339
CLAY	light and dark gray	339-344
CLAY	black, and some gravel	344-352
GRAVEL	fine, and gray clay	352-369
GRAVEL	fine, and gray and green clay	369-374
GRAVEL	with gray and white clay	374-379
GRAVEL	fine, and gray clay	379-389
WEATHERED GRANITE	clay, yellow and gray	389-399
WEATHERED GRANITE	decomposed, gray clay, and fine gravel	399-412
WEATHERED GRANITE	less decomposed than above	412-419

139-051-06DDC

Date Completed: 1946
 L.S. Elevation (ft): 920
 Depth Drilled (ft): 402

Purpose:
 Well Type:
 Log Source:

Test Hole
 Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-4
CLAY	yellow	4-24
CLAY	gray	24-34
CLAY	blue gray	34-39
TILL	gravel and blue clay	39-59
TILL	gravel, coarse sand, and blue clay	59-64
TILL	gravel, fine sand, and blue clay	64-69
SAND	fine	69-74
GRAVEL	coarse, and fine sand	74-79
SAND	fine, and cobbles at base	79-89
TILL	gravel, fine, and blue gray clay	89-104
TILL	clay, blue gray, and some fine gravel	104-154
GRAVEL	fine, and some blue clay	154-159
TILL	gravel, fine, and gray clay	159-169
GRAVEL	fine, coarse sand, and gray clay	169-199
CLAY	blue gray, and some fine gravel	199-219
GRAVEL	fine, sand, and gray clay	219-229
GRAVEL	and blue and brown clay	229-239
GRAVEL	sand, and blue and brown clay	239-249
GRAVEL	sand and blue clay	249-269
CLAY	blue	269-274
GRAVEL	sand, and blue clay	274-299
GRAVEL	fine sand, and blue clay	299-329
GRAVEL	fine, and blue and yellow clay	329-339
GRAVEL	fine, and blue and yellow clay, with some decayed granite pebbles	339-349
GRAVEL	fine, and blue and yellow clay	349-369
NO RECORD	no description	369-376
WEATHERED GRANITE	decomposed	376-402

139-051-07BCC

Date Completed: 00
 L.S. Elevation (ft): 915
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-300

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Stock Well
 0" Steel
 Undefined

Lithologic Log - unavailable

139-051-10CAD2

Date Completed: 12/18/92
 L.S. Elevation (ft): 906
 Depth Drilled (ft): 381
 Screened Interval (ft): 359-376

Purpose: Domestic Well
 Well Type: 4" PVC
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellow	2-15
CLAY	blue	15-45
CLAY	sandy, with rock, hard, gray	45-146
SAND	dirty, washed, gray	146-151
CLAY	sandy, with rock, hard, gray	151-197
CLAY	sandy, drilled better, gray	197-274
SAND	fine, gray	274-275
CLAY	sandy, soft, gray	275-314
CLAY	sandy, hard, gray	314-358
SAND	fine, dirty, white	358-370
SAND	drilled better, white	370-374
CLAY	sandy, gray	374-381

bdrk

139-051-11BBB

Date Completed: 1946
 L.S. Elevation (ft): 908
 Depth Drilled (ft): 349

Purpose: Test Hole
 Well Type:
 Log Source: Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	gray	4-19
CLAY	yellow	19-24
CLAY	gray	24-29
CLAY	gray, and some very fine sand	29-39
TILL	gravel, coarse, and blue clay	39-44
TILL	gravel, coarse, sand, and blue clay	44-49
TILL	gravel, coarse, and blue clay	49-94
GRAVEL	fine, sand, and blue clay	94-99
GRAVEL	fine, coarse sand, and some blue clay	99-109
GRAVEL	fine, and some blue clay	109-139
TILL	gravel, fine, coarse sand, and blue and gray clay	139-144
TILL	clay, blue, and some gravel	144-149
TILL	clay, blue, and some coarse gravel	149-159

139-051-11BBB (continued)

TILL	gravel, fine, and grayish blue clay	159-169
CLAY	dark gray	169-194
CLAY	blue, and some sand	194-204
GRAVEL	sand, and blue clay	204-249
GRAVEL	and blue clay	249-264
GRAVEL	and gray clay	264-274
CLAY	dark gray	274-279
CLAY	gray	279-329
WEATHERED GRANITE	granite pebbles, and gray clay (kaolin?)	329-339
WEATHERED GRANITE	white, and gray clay (kaolin?)	339-344
WEATHERED GRANITE	decomposed	344-349

139-051-12ABD

Date Completed:	4/30/91	Purpose:	Industrial Well
L.S. Elevation (ft):	904	Well Type:	4" PVC
Depth Drilled (ft):	257	Aquifer:	Undefined
Screened Interval (ft):	223-253	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	green	1-27
CLAY	gray	27-50
TILL	no description	50-52
GRAVEL	no description	52-54
TILL	no description	54-69
ROCK	no description	69-70
TILL	no description	70-176
SAND	no description	176-180
TILL	no description	180-182
SAND	no description	182-189
SAND & GRAVEL	coarse	189-196
SAND	no description	196-199
TILL	no description	199-245
SAND	no description	245-253
TILL	no description	253-257

139-051-14BBB1

Date Completed: 00
 L.S. Elevation (ft): 905
 Depth Drilled (ft): 184
 Screened Interval (ft): 0-184

Purpose: Domestic Well
 Well Type: 4" Unknown
 Aquifer: Undefined
 Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-12
CLAY	blue	12-46
CLAY	sandy, brown	46-52
SAND	no description	52-55
CLAY	sandy, hard, brown	55-61
CLAY	sandy, hard, blue	61-76
CLAY	sandy, soft, blue	76-81
CLAY	sandy, hard, blue	81-105
CLAY	sandy, with boulders	105-131
SAND	gray	131-146
CLAY	sandy, soft, blue	146-156
CLAY	sandy, hard, blue	156-165
SAND	blue	165-184

139-051-19ADDC1

Date Completed: 7/6/74
 L.S. Elevation (ft): 925
 Depth Drilled (ft): 115
 Screened Interval (ft): 105-115

Purpose: Domestic Well
 Well Type: 4" Steel
 Aquifer: Undefined
 Log Source: Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow	3-22
SAND	no description	22-28
CLAY	gray	28-68
TILL	no description	68-96
SAND	no description	96-99
TILL	rocky	99-102
SAND	no description	102-115

139-051-19ADDC2

Date Completed: 9/4/74
 L.S. Elevation (ft): 925
 Depth Drilled (ft): 393
 Screened Interval (ft): 383-393

Purpose: Domestic Well
 Well Type: 4" Steel
 Aquifer: Undefined
 Log Source: Lako Drilling

Lithologic Log

139-051-19ADDC2 (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
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139-051-11BBB (continued)

TILL	gravel, fine, and grayish blue clay	159-169
CLAY	dark gray	169-194
CLAY	blue, and some sand	194-204
GRAVEL	sand, and blue clay	204-249
GRAVEL	and blue clay	249-264
GRAVEL	and gray clay	264-274
CLAY	dark gray	274-279
CLAY	gray	279-329
WEATHERED GRANITE	granite pebbles, and gray clay (kaolin?)	329-339
WEATHERED GRANITE	white, and gray clay (kaolin?)	339-344
WEATHERED GRANITE	decomposed	344-349

139-051-12ABD

Date Completed:	4/30/91	Purpose:	Industrial Well
L.S. Elevation (ft):	904	Well Type:	4" PVC
Depth Drilled (ft):	257	Aquifer:	Undefined
Screened Interval (ft):	223-253	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	green	1-27
CLAY	gray	27-50
TILL	no description	50-52
GRAVEL	no description	52-54
TILL	no description	54-69
ROCK	no description	69-70
TILL	no description	70-176
SAND	no description	176-180
TILL	no description	180-182
SAND	no description	182-189
SAND & GRAVEL	coarse	189-196
SAND	no description	196-199
TILL	no description	199-245
SAND	no description	245-253
TILL	no description	253-257

139-051-19CCD2 (continued)

SILT	olive-gray, clayey, cohesive, calcareous.	31-53
TILL	olive-gray, clay through gravel, very clayey, cohesive, shale, carbonate, quartz, igneous, highly calcareous.	53-72
SILT	olive-gray, very soft to solid clay; drills easy.	72-77
GRAVEL	coarse sand to large pebbles up to 25 mm, angular fragments of larger rock, subrounded to rounded pebbles, predominantly carbonate, with quartz, igneous, shale and pyrite.	77-79
TILL	olive-gray, clay through gravel, quite gravelly in places and very silty or clayey in others, very poorly sorted, cohesive, shale, carbonate, igneous, quartz, calcareous; approximate boundary below.	79-97
TILL	olive-gray, clay through gravel, cohesive, tough, shale, carbonate, quartz, igneous, lignite, highly calcareous; sand from 176 to 178 feet, predominantly shale with quartz and carbonate, subrounded.	97-182
TILL	olive-gray, clay through gravel, cohesive, tough, shale, carbonate, quartz, igneous, lignite fragments, highly calcareous; lenses of sand, fine to medium, up to 0.5 mm, predominantly quartz with shale, carbonate, igneous, rounded.	182-196
SAND	very fine to coarse, predominantly medium, quartz, carbonate, shale, igneous, lignite, angular to rounded; clay layers from 202 to 209 feet; coarser up to granules and small pebbles from 209 to 219 feet.	196-219
TILL	olive to light olive-gray, clay through gravel, carbonate, shale, igneous, quartz, tight cuttings, very little shale, cohesive, tough, highly calcareous; gradational boundary below.	219-230
TILL	light olive-gray, clay through gravel, carbonate, quartz, igneous, sandy, cohesive, highly calcareous.	230-238
SILT	olive-gray to olive-black, clayey and very fine sand, lignite fragments, highly calcareous, cohesive, solid; laminae of light colored very fine and fine sand.	238-284
TILL	olive-gray, clay through gravel, cohesive, shale, carbonate, igneous with pyrite, lignite, highly calcareous.	284-293
TILL	light olive-gray, clay through gravel, very sandy, quite gravelly, quartz, carbonate, igneous, lignite fragments, highly calcareous; less clayey, cohesive, fairly solid by 300 feet; very tough, solid with some areas of very silty till without gravel and only fine sand by 310 feet.	293-318
SILT	olive-gray to black and brownish-black, clayey, sandy, lignite and organic material, calcareous, soft; some cuttings are black.	318-332
SAND	very fine to very coarse, predominantly medium, quartz, angular to rounded, with shale, carbonate, igneous and some lignite.	332-351
SILT	olive-gray, clay through very fine sand, lignite, noncalcareous; lenses of gravel, up to medium pebble, carbonate, shale, igneous, angular to subrounded, unsorted.	351-363
SAND	very fine to medium, silty, predominantly fine sand, angular to rounded quartz, some carbonate, shale, igneous and lignite; silt, olive-gray, slight brownish-gray tinge, clay through very fine sand, lignite fragments and organic material, noncalcareous; boulder at 390 feet.	363-392
SILT	light bluish-gray, noncalcareous, clayey, with quartz sand grains up to 0.25 mm; colors vary to light olive-gray and brownish-gray; samples are quite clayey, cohesive; sand lenses in silt, predominantly angular and subangular, very fine to medium quartz with lignite.	392-439
CLAY	light brown, silty, cohesive, noncalcareous, oxidized; possibly weathered granite.	439-446
SAND	angular, white or clear, up to 2 mm; clay, light greenish-gray, cohesive, noncalcareous at base (weathered granite).	446-463
IGNEOUS	solid, unweathered, white and very dark green or black; only a few very small scrapings.	463-464

139-051-21CCC

NDSWC 3117

Date Completed: 7/11/64
 L.S. Elevation (ft): 915
 Depth Drilled (ft): 152

Purpose: Test Hole
 Well Type:
 Log Source: NDSWC

Lithologic Log

139-051-21CCC (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	dusky to dark yellowish-brown, very silty, small white specks, highly calcareous.	1-6
CLAY	moderate yellowish-brown, silty, some white granular spots, calcareous, cohesive.	6-27
CLAY	olive-gray, cohesive, calcareous.	27-48
TILL	olive-gray, clay through gravel, cohesive, silty, carbonate, shale, quartz, igneous, lignite, highly calcareous.	48-55
TILL	as above, gravel up to large pebble, sandy, composition varies with abundant carbonate in the gravel, shale, igneous, quartz, some pyrite, angular to rounded.	55-71
TILL	olive to light olive-gray, clay through gravel, very silty, sandy, predominantly quartz, shale, some igneous, little shale, highly calcareous.	71-82
TILL	olive-gray, clay through gravel, cohesive, shale, quartz, carbonate, igneous, calcareous; medium sand lenses from 82 to 87 feet, lignite fragments and boulders.	82-119
SILT	olive-gray, clayey, cohesive, highly calcareous; also light olive-gray and very clayey.	119-125
GRAVEL	small pebble, granular, sandy, angular chips, subangular to rounded, carbonate, igneous, quartz and shale.	125-132
SILT	clayey to sandy, slightly cohesive, dark greenish-gray, up to fine sand, mica, quartz, and abundant greenish shale grains, calcareous.	132-152

139-051-22BAC

Date Completed:	7/11/75	Purpose:	Domestic Well
L.S. Elevation (ft):	912	Well Type:	4" Steel
Depth Drilled (ft):	267	Aquifer:	Undefined
Screened Interval (ft):	246-262	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown	3-18
CLAY	brown, soft	18-26
CLAY	blue, soft	26-52
CLAY	blue, sandy	52-69
ROCK	no description	69-70
CLAY	blue, sandy, hard	70-102
CLAY	blue, sandy	102-120
ROCK	no description	120-122
SAND	blue, fine, washed	122-127
CLAY	blue, sandy	127-225
ROCK	no description	225-226
CLAY	blue, sandy	226-241
SAND	blue, fine	241-254
CLAY	blue, sandy	254-256
SAND	blue, fine	256-263
SAND	no description	263-266

139-051-22BAC (continued)

CLAY blue, sandy

266-267

139-051-26AAA

Date Completed: 00
 L.S. Elevation (ft): 906
 Depth Drilled (ft): 160
 Screened Interval (ft): 0-160

Purpose: Domestic Well
 Well Type: 3" Unknown
 Aquifer: Undefined
 Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	blue	1-3
CLAY	yellow	3-24
CLAY	blue	24-48
CLAY	sandy, blue	48-61
CLAY	with gravel lenses, blue	61-72
CLAY	sandy, hard, blue	72-104
CLAY	with gravel lenses, blue	104-114
SAND	gravelly	114-127
CLAY	hard, blue	127-130
SAND	gray	130-132
CLAY	hard, blue	132-147
SAND	gray	147-160

139-051-29CBB

Date Completed: 10/20/75
 L.S. Elevation (ft): 919
 Depth Drilled (ft): 449
 Screened Interval (ft): 425-435

Purpose: Domestic Well
 Well Type: 4" Steel
 Aquifer: Dakota Group
 Log Source: Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL	no description	0-3
CLAY	yellow	3-21
CLAY	gray	21-49
TILL	no description	49-71
GRAVEL	with shale	71-75
TILL	no description	75-226
TILL	no description	226-289
SANDSTONE	fine	289-292
SHALE	no description	292-338
SANDSTONE	no description	338-340
SHALE	no description	340-401

139-051-29CBB (continued)

SANDSTONE no description
 SHALE no description
 SANDSTONE no description
 SHALE no description
 SANDSTONE no description

401-405
 405-415
 415-435
 435-448
 448-449

bdrK

139-051-31BBAC

Date Completed: 12/11/92
 L.S. Elevation (ft): 919
 Depth Drilled (ft): 167
 Screened Interval (ft): 156-167

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Stock Well
 4" PVC
 Undefined
 Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-14
CLAY	gray	14-64
TILL	no description	64-156
SAND	clean	156-167

139-051-32CAB1

Date Completed: 1950
 L.S. Elevation (ft): 919
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-180

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 3" Steel
 Undefined

Lithologic Log - unavailable

139-051-34CCD2

Date Completed: 6/14/72
 L.S. Elevation (ft): 921
 Depth Drilled (ft): 151
 Screened Interval (ft): 144-149

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	tan	1-27
CLAY	tan	27-32
CLAY	blue	32-42
CLAY	blue	42-57
CLAY	blue	57-68
SAND	brown	68-69
CLAY	blue, sandy	69-72
CLAY	blue, sandy	72-75
SAND	brown, washed	75-77

139-051-34CCD2 (continued)

CLAY	blue, sandy, rocks	77-87
CLAY	blue, sandy, rocks	87-92
SAND	brown	92-93
CLAY	blue, sandy	93-95
SAND	blue, washed	95-97
CLAY	blue, sandy, rocks	97-102
CLAY	blue, hard, sandy, rocks	102-117
CLAY	hard, sandy, rocks	117-132
CLAY	hard, sandy, boulders	132-143
SAND	brown	143-147
SAND	brown	147-150
CLAY	blue, hard, sandy	150-151

140-047-01DDACAA

Date Completed:	10/1929	Purpose:	Industrial Well
L.S. Elevation (ft):	915	Well Type:	6"
Depth Drilled (ft):	101	Aquifer:	Undefined
Screened Interval (ft):	97-101	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, yellow	0-27
CLAY	clay, blue, soft	27-52
SAND	fine sand + clay	52-97
SAND	dirty sand	97-101

140-047-03BCCACD

Date Completed:	8/1987	Purpose:	Domestic Well
L.S. Elevation (ft):	910	Well Type:	0"
Depth Drilled (ft):	203	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-14
CLAY	clay, blue	14-82
CLAY	sandy clay, gray	82-95
SAND	sand, colored	95-97
CLAY	sandy clay, gray	97-108
SAND	sand, gray	108-110
CLAY	sand clay, gray	110-133
SAND	sand with clay rock gravel, colored	133-137

140-047-03BCCACD (continued)

BOULDERS	granite, black-white	137-139
SAND	sand clay + rock, gray	139-198
SAND	sand, colored	198-201
CLAY	sandy clay, gray	201-202
PRECAMBRIAN	granite, black	202-203

140-047-03BCCDAC

Date Completed:	8/1987	Purpose:	Domestic Well
L.S. Elevation (ft):	910	Well Type:	4" Stainless Steel
Depth Drilled (ft):	156	Aquifer:	Undefined
Screened Interval (ft):	139-151	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-12
CLAY	clay, blue	12-93
CLAY	sandy clay, gray	93-123
SAND	sand, brown	123-124
CLAY	sandy clay, gray	124-126
CLAY	sandy clay with small lenses, gray	126-127
CLAY	sandy clay, gray	127-134
SAND	sand, colored	134-151
CLAY	sandy clay, gray	151-156

140-047-03BCCDBD

Date Completed:	8/1987	Purpose:	Domestic Well
L.S. Elevation (ft):	910	Well Type:	0"
Depth Drilled (ft):	174	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-13
CLAY	clay, blue	13-75
CLAY	sandy clay, gray	75-102
SAND	sand, colored	102-112
CLAY	sandy clay, gray	112-112
SAND	sand, colored	112-117
CLAY	sandy clay, gray	117-132
BOULDERS	rock, black	132-136
CLAY	sandy clay + rock, gray	136-166

140-047-03BCCDBD (continued)

PRECAMBRIAN rock, black-white

166-174

140-047-07AACACD

Date Completed: 10/1977
 L.S. Elevation (ft): 902
 Depth Drilled (ft): 195
 Screened Interval (ft): 186-195

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Buffalo
 Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, yellow, soft	1-12
CLAY	clay, blue, soft	12-115
GRAVEL	gravel + boulders, gray, varied hardness	115-127
CLAY	clay + stones, gray, medium hard	127-143
BOULDERS	boulder, gray, very hard	143-144
CLAY	clay + stones, gray, varied hardness	144-183
SAND	medium water sand, gray, soft	183-195

140-047-07DDDCCA

Date Completed: 2/1989
 L.S. Elevation (ft): 906
 Depth Drilled (ft): 105
 Screened Interval (ft): 96-101

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 5" Stainless Steel
 Buffalo
 Olson Well Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, yellow, soft	0-25
CLAY	clay, blue, soft	25-80
CLAY	sand and clay, gray, soft	80-89
SAND	sand, gray, soft	89-102
SAND	sand and clay, gray, soft	102-105

140-047-15BABBCB

Date Completed: 8/1978
 L.S. Elevation (ft): 909
 Depth Drilled (ft): 102
 Screened Interval (ft): 93-98

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-8
CLAY	clay, blue	8-92
CLAY	sandy clay, blue	92-93

140-047-15BABBCB (continued)

SAND	sand, varied color	93-98
CLAY	sandy clay, blue	98-102

140-047-17BABABA

Date Completed:	6/1980	Purpose:	Domestic Well
L.S. Elevation (ft):	905	Well Type:	4" Stainless Steel
Depth Drilled (ft):	105	Aquifer:	Buffalo
Screened Interval (ft):	100-105	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-2
CLAY	clay, yellow, soft	2-19
CLAY	clay, gray, soft	19-99
SAND	water sand	99-105

140-047-18DCB

Date Completed:	9/27/88	Purpose:	Municipal Well
L.S. Elevation (ft):	909	Well Type:	12" Steel
Depth Drilled (ft):	205	Aquifer:	Buffalo
Screened Interval (ft):	148-190	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	silty, brown	2-15
CLAY	soft, blue	15-28
CLAY	sandy, and lenses of sand, blue	28-68
SAND	lenses of clay, blue	68-82
SAND	blue	82-113
SAND	with light gravel, colored	113-133
GRAVEL	poor sample, colored	133-138
GRAVEL & ROCK	colored	138-183
GRAVEL	light	183-190
SAND	with light gravel, drilled dirty, small lenses of clay	190-198
GRAVEL & ROCK	colored	198-203
ROCK	no description	203-205

140-047-19ABB

Date Completed:	9/26/88	Purpose:	Municipal Well
L.S. Elevation (ft):	909	Well Type:	12" Steel
Depth Drilled (ft):	243	Aquifer:	Buffalo
Screened Interval (ft):	147-203	Log Source:	LTP Enterprises, Inc

Lithologic Log

140-047-19ABB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	silty, brown	2-13
CLAY	sandy, blue	13-35
SAND	fine, gray	35-59
SAND	with lenses of clay, blue-gray	59-94
SAND	with light gravel, colored	94-103
SAND	dirty, gray	103-111
SAND & GRAVEL	colored, drilled good	111-133
GRAVEL	colored	133-198
GRAVEL	rocky, colored	198-203
SAND	with light gravel, colored, dirty, poor sample returns	203-216
GRAVEL & ROCK	colored	216-233
CLAY	with lenses of gravel and rock, poor sample, colored, gray	233-243

140-047-19CDDDDC

Date Completed:	6/1977	Purpose:	Observation Well
L.S. Elevation (ft):	913	Well Type:	0"
Depth Drilled (ft):	95	Aquifer:	Buffalo
Screened Interval (ft):	0-0	Log Source:	USGS

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	brown clayey silt	20-45
SAND	fine sand grades to medium	45-65
SAND	medium sand + some fine sand	65-95
TILL	till	95-95

140-047-21BCCABA

Date Completed:	4/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	912	Well Type:	4" Stainless Steel
Depth Drilled (ft):	210	Aquifer:	Undefined
Screened Interval (ft):	203-209	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, brown, soft	1-9
CLAY	clay, blue, soft	9-85
CLAY	clay, gray, soft	85-95
CLAY	clay + stones, gray, medium hardness	95-186
SAND	sand + gravel, varied color, medium hard	186-198
SAND	sand + gravel, varied color, soft	198-210

140-047-21BCCABC

Date Completed:	4/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	912	Well Type:	0*
Depth Drilled (ft):	198	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, brown, soft	1-19
CLAY	clay, blue, soft	19-88
CLAY	clay + gravel, gray, soft	88-90
CLAY	clay + gravel, gray, soft	90-92
SAND	fine to coarse sand no water, gray, soft	92-98
CLAY	clay + stones, gray, medium hardness	98-115
SAND	fine to coarse sand no water, gray, soft	115-118
CLAY	clay + stones, gray, medium hardness	118-142
BOULDERS	boulder, varied color, hard	142-143
CLAY	clay + stones, gray, medium hardness	143-151
BOULDERS	boulder, varied color, hard	151-152
CLAY	clay + stones, gray, medium hardness	152-160
CLAY	clay + stones, gray, medium hardness	160-189
ROCK	rocks + gravel no water, varied, medium hardness	189-197
PRECAMBRIAN	granite, varied color, hard	197-198

140-047-21BCCACA

Date Completed:	4/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	912	Well Type:	0*
Depth Drilled (ft):	200	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL	top soil, black, soft	0-1
FILL	clay, brown, soft	1-2
SOIL	top soil, black, soft	2-4
CLAY	clay, brown, soft	4-19
CLAY	clay, blue, soft	19-85
CLAY	clay	85-124
BOULDERS	boulder, varied color, hard	124-125
CLAY	clay + stones, gray, medium hardness	125-129
BOULDERS	layer of small boulders, varied, hard	129-131
BOULDERS	boulder, varied color, hard	131-132
CLAY	clay + stones, gray, medium hardness	132-133

140-047-21BCCACA (continued)

BOULDERS	boulder, varied color, hard	133-134
CLAY	clay + stones, gray, medium hardness	134-150
SAND	dirty sand, gray, soft	150-155
CLAY	clay + stones, gray, medium hardness	155-197
CLAY	clay + gravel, gray, medium hardness	197-199
PRECAMBRIAN	granite, varied color, very hard	199-200

140-047-24BBBBDB

Date Completed:	6/1975	Purpose:	Domestic Well
L.S. Elevation (ft):	916	Well Type:	4" Stainless Steel
Depth Drilled (ft):	157	Aquifer:	Undefined
Screened Interval (ft):	146-151	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-10
SAND	sand, brown	10-13
CLAY	very sandy clay, brown	13-22
CLAY	sandy clay, blue	22-25
CLAY	clay, blue, soft	25-90
CLAY	sandy clay, blue	90-97
SAND	sand, colored	97-98
CLAY	sandy clay, blue	98-120
SAND	sand drilled good, colored	120-157

140-047-25CDCCAB

Date Completed:	8/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	919	Well Type:	4" Stainless Steel
Depth Drilled (ft):	205	Aquifer:	Undefined
Screened Interval (ft):	198-204	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
SAND	silty sand, brown	1-12
SAND	silty sand, gray	12-16
CLAY	clay, blue, soft	16-18
CLAY	clay, blue, soft	18-87
CLAY	sandy clay, blue	87-92
SAND	sand	92-96
CLAY	sandy clay, blue	96-127
CLAY	sandy clay, blue, softer	127-175

140-047-25CDCCAB (continued)

SAND	sand chattered good	175-176
CLAY	sandy clay + rock, blue	176-177
SAND	sand	177-178
CLAY	sandy clay + rock, blue	178-179
SAND	sand beautiful	179-205
CLAY	sandy clay + rock, blue	205-205

140-047-28BBBBAA

Date Completed:	5/1984	Purpose:	Domestic Well
L.S. Elevation (ft):	906	Well Type:	5" Stainless Steel
Depth Drilled (ft):	135	Aquifer:	Buffalo
Screened Interval (ft):	123-129	Log Source:	Olson Well Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, yellow, soft	1-25
CLAY	clay, blue, soft	25-95
CLAY	clay, blue, hard	95-105
SAND	sand, gray, soft	105-110
CLAY	clay, blue, soft	110-115
SAND	sand, gray, soft	115-118
CLAY	clay, blue, soft	118-120
SAND	sand and clay, gray, soft	120-123
SAND	sand, gray, soft	123-135

140-047-28CBACAB

Date Completed:	8/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	909	Well Type:	4" Stainless Steel
Depth Drilled (ft):	90	Aquifer:	Buffalo
Screened Interval (ft):	85-90	Log Source:	Olson Well Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-2
CLAY	clay, yellow, soft	2-82
SAND	sand, gray, soft	82-90

140-047-31DDDAC A

Date Completed:	10/1969	Purpose:	Domestic Well
L.S. Elevation (ft):	916	Well Type:	4" Stainless Steel
Depth Drilled (ft):	96	Aquifer:	Buffalo
Screened Interval (ft):	88-96	Log Source:	Frederickson's of ND, Inc

Lithologic Log

140-047-31DDACA (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-27
SAND	sand, brown	27-72
GRAVEL	gravel, brown	72-96

140-047-32CABBCA

Date Completed:	10/1976	Purpose:	Irrigation Well
L.S. Elevation (ft):	917	Well Type:	12" Stainless Steel
Depth Drilled (ft):	107	Aquifer:	Buffalo
Screened Interval (ft):	70-100	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	sandy clay, brown	3-16
CLAY	sandy clay, blue	16-21
SAND	sand, blue	21-27
SAND	sand drilled good, gray	27-37
SAND	sand drilled good took water, varied color	37-42
SAND	sand drilled good took water, varied color	42-47
SAND	sand + gravel drilled good, varied color	47-82
ROCK	rock + gravel drilled good, varied color	82-95
ROCK	rock drilled good, colored	95-97
GRAVEL	gravel drilled good, varied color	97-101
ROCK	rock drilled good	101-102
GRAVEL	gravel with rock (no water), varied color	102-103
ROCK	rock, varied color	103-104
ROCK	rock with gravel lenses, varied color	104-107

140-047-32CDDADC

Date Completed:	10/1980	Purpose:	Domestic Well
L.S. Elevation (ft):	915	Well Type:	4" Stainless Steel
Depth Drilled (ft):	101	Aquifer:	Buffalo
Screened Interval (ft):	91-101	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-19
CLAY	clay, blue	19-37
CLAY	sandy clay with lenses sand, blue	37-46
SAND	fine sand, gray	46-77

140-047-32CDDADC (continued)

SAND fine sand clean, gray

77-101

140-047-35DCADBCDate Completed: 3/1957
L.S. Elevation (ft): 907
Depth Drilled (ft): 180
Screened Interval (ft): 100-110Purpose:
Well Type:
Aquifer:
Log Source:Observation Well
0"
Undefined
USGS**Lithologic Log**

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
NO SAMPLE	no record	0-3
SAND	sand	3-20
CLAY	clay	20-90
TILL	sandy till	90-100
SAND	sand	100-110
TILL	sandy till	110-180

140-047-35DCDCCADate Completed: 9/1974
L.S. Elevation (ft): 913
Depth Drilled (ft): 255
Screened Interval (ft): 237-247Purpose:
Well Type:
Aquifer:
Log Source:Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc**Lithologic Log**

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, gray	2-5
CLAY	sandy clay silty, brown	5-10
SAND	very fine sand, brown	10-20
CLAY	sandy clay, blue	20-26
CLAY	clay, blue, soft	26-92
CLAY	sandy clay, blue	92-112
SAND	sand, gray	112-121
CLAY	clay, blue	121-126
SAND	sand, gray	126-128
CLAY	sandy clay, blue	128-131
SAND	sand, gray	131-132
CLAY	sandy clay, blue	132-133
SAND	sand, gray	133-135
CLAY	sandy clay, blue	135-136
SAND	sand with small clay lenses, gray	136-142
CLAY	sandy clay, blue	142-148
SAND	washed sand, gray	148-151

140-047-35DCDCCA (continued)

CLAY	sandy clay, blue	151-166
SAND	sand, gray	166-167
CLAY	sandy clay, blue	167-186
SAND	sand	186-187
CLAY	shale, blue	187-214
SAND	sand took water, gray	214-248
CLAY	sandy clay, blue	248-252
BOULDERS	rock	252-255

140-047-36CCDBBC

Date Completed:	10/1989	Purpose:	Domestic Well
L.S. Elevation (ft):	922	Well Type:	4" Stainless Steel
Depth Drilled (ft):	125	Aquifer:	Undefined
Screened Interval (ft):	116-120	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
SAND	sand, brown	2-25
CLAY	sandy clay, gray	25-86
CLAY	sandy clay, gray	86-93
SAND	sand	93-94
CLAY	sandy clay, gray	94-107
SAND	sand, gray	107-109
CLAY	sandy clay, gray	109-116
SAND	sand, gray-black	116-120
CLAY	sandy clay, gray	120-125

140-047-36CCDDBD

Date Completed:	8/1977	Purpose:	Domestic Well
L.S. Elevation (ft):	921	Well Type:	4" Stainless Steel
Depth Drilled (ft):	182	Aquifer:	Undefined
Screened Interval (ft):	171-176	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	silty clay with rock, brown	1-12
CLAY	clay, blue, soft	12-87
CLAY	sandy clay, blue	87-137
SAND	sand, varied color	137-140
CLAY	sandy clay, blue	140-162
SAND	sand with clay lense, varied color	162-165

140-047-36CCDDBD (continued)

SAND	sand, varied color	165-176
CLAY	clay, blue	176-182

140-048-01CCDADA

Date Completed:	12/1961	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	4" Other
Depth Drilled (ft):	168	Aquifer:	Undefined
Screened Interval (ft):	162-168	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, yellow	2-23
CLAY	shale, blue	23-126
SAND	sand, white	126-127
CLAY	sandy clay, blue, hard	127-159
SAND	sand, colored	159-168

140-048-01CCDADB

Date Completed:	12/1961	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	0"
Depth Drilled (ft):	312	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
SAND	sand, brown	2-17
CLAY	clay, blue	17-42
CLAY	sandy clay, blue	42-112
CLAY	sticky clay, blue, hard	112-142
SAND	coarse sand, brown	142-150
CLAY	clay, blue	150-232
CLAY	clay, colored	232-270
SHALE	sand clay brown blue green	270-282
SHALE	shale, colored	282-297
WEATHERED PRECAMBRIAN	granite	297-312

140-048-02ABDCAC

Date Completed:	6/1961	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Other
Depth Drilled (ft):	254	Aquifer:	Undefined
Screened Interval (ft):	250-254	Log Source:	Frederickson's of ND, Inc

Lithologic Log

140-048-02ABDCAC (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-10
CLAY	silty clay, yellow	10-22
CLAY	shale, blue, soft	22-111
CLAY	sandy clay, blue, hard	111-150
CLAY	sandy clay, blue, very hard	150-157
SAND	dirty sand, gray	157-160
CLAY	sandy clay, blue, hard	160-170
CLAY	shale, blue	170-177
NO SAMPLE	no record	177-254

140-048-03AABACB

Date Completed:	5/1963	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	4"
Depth Drilled (ft):	131	Aquifer:	Undefined
Screened Interval (ft):	125-131	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-22
CLAY	shale, blue	22-113
ROCK	rocks + sand	113-117
GRAVEL	gravel	117-131

140-048-04AAABCB

Date Completed:	9/1988	Purpose:	Domestic Well
L.S. Elevation (ft):	893	Well Type:	5" Stainless Steel
Depth Drilled (ft):	187	Aquifer:	Undefined
Screened Interval (ft):	182-187	Log Source:	Olson Well Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	no record	0-2
CLAY	clay, gray, hard	2-40
CLAY	clay, gray, soft	40-100
BOULDERS	boulders and cobbles, red, hard	100-110
CLAY	clay and stones, blue, hard	110-145
CLAY	clay and fine sand, gray, soft	145-180
SAND	clean medium sand, gray, soft	180-187
BOULDERS	stones, hard	187-187

140-048-04CBB

Date Completed:	00/00/00	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	3" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

140-048-06ACCCAC

Date Completed:	9/1981	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	4" Stainless Steel
Depth Drilled (ft):	170	Aquifer:	Undefined
Screened Interval (ft):	161-166	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-44
CLAY	clay, blue, soft	44-107
CLAY	sandy clay, gray	107-127
SAND	sand, varied color	127-129
CLAY	sandy clay with lenses, gray	129-131
SAND	sand, varied color	131-132
CLAY	sandy clay, gray	132-158
SAND	sand, varied color	158-159
CLAY	sandy clay, gray	159-160
SAND	sand, varied color	160-166
CLAY	sandy clay, gray	166-170

140-048-06ADCABB

Date Completed:	1/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	893	Well Type:	4"
Depth Drilled (ft):	270	Aquifer:	Undefined
Screened Interval (ft):	264-270	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, brown	0-12
CLAY	clay, blue	12-128
GRAVEL	gravel, colored	128-129
CLAY	clay, blue	129-151
SAND	sand, colored	151-157
CLAY	clay, blue	157-201
CLAY	shale, blue	201-262
SAND	sand, blue	262-270

140-048-06CBDAAB

Date Completed:	9/1966	Purpose:	Domestic Well
L.S. Elevation (ft):	880	Well Type:	3" Other
Depth Drilled (ft):	272	Aquifer:	Undefined
Screened Interval (ft):	155-165	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	shale, yellow	1-31
CLAY	shale, blue	31-127
CLAY	clay, blue	127-155
SAND	sand, blue	155-157
CLAY	clay lensed with sand, blue	157-165
CLAY	clay, blue	165-269
WEATHERED PRECAMBRIAN	decomposed granite, colored	269-272

140-048-07CAABCD

Date Completed:	5/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	0"
Depth Drilled (ft):	272	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-22
SAND	sand	22-29
CLAY	clay, brown	29-31
CLAY	sandy clay, blue	31-36
CLAY	clay, blue, soft	36-106
CLAY	sandy clay, blue	106-123
SAND	sand (washed)	123-124
CLAY	sandy clay, blue	124-126
SAND	sand	126-127
CLAY	sandy clay, blue	127-133
SAND	sand	133-134
CLAY	sandy clay, blue	134-146
ROCK	rock	146-147
CLAY	sandy clay, blue	147-224
CLAY	clay, blue, softer	224-256
CLAY	sandy clay, blue	256-261
WEATHERED PRECAMBRIAN	sandy clay with decomposed, blue-green	261-272

140-048-07CABAAC

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

5/1976
892
270
0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
0"
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, brown	0-2
CLAY	clay, brown	2-19
CLAY	clay, blue	19-27
SAND	sand	27-32
CLAY	sandy clay, blue, soft	32-105
SAND	sand	105-109
CLAY	sandy clay, blue	109-110
SAND	sand	110-111
CLAY	sandy clay, blue	111-129
CLAY	sandy clay lenses of sand, blue	129-136
CLAY	sandy clay, blue	136-229
CLAY	clay, blue, softer	229-259
CLAY	sandy clay, blue	259-263
WEATHERED PRECAMBRIAN	sandy clay with decomposed, blue-green, hard	263-270

140-048-07CDADCD

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

6/1973
895
179
165-174

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, gray	3-5
CLAY	clay, brown	5-16
CLAY	shale, brown, soft	16-26
CLAY	shale, blue	26-102
CLAY	sandy clay, blue	102-108
SAND	sand, blue	108-110
BOULDERS	rock, white	110-111
CLAY	sandy clay + small rocks, blue	111-152
SAND	sand, blue	152-174
SAND	sand with lenses of clay, blue	174-178
CLAY	clay, blue	178-179

140-048-09CBBBCD

Date Completed:	9/1971	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	0"
Depth Drilled (ft):	230	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-21
CLAY	clay, blue, soft	21-108
CLAY	sandy clay + boulders, blue	108-143
SAND	sand, blue	143-145
CLAY	sandy clay, blue, hard	145-169
CLAY	sandy clay + shale, blue, hard	169-226
PRECAMBRIAN	granite, black-gray	226-230

140-048-10ADDABA

Date Completed:	11/1959	Purpose:	Domestic Well
L.S. Elevation (ft):	897	Well Type:	4"
Depth Drilled (ft):	161	Aquifer:	Undefined
Screened Interval (ft):	153-160	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-4
CLAY	clay + shale (sticky), yellow-black	4-24
CLAY	shade (sticky), blue, soft	24-107
CLAY	sandy clay + boulders, blue, harder	107-152
SAND	fine sand, brown	152-156
SAND	coarser dirty sand drills harder, brown	156-160
CLAY	clay, blue	160-161

140-048-10DCCDBA

Date Completed:	11/1975	Purpose:	Domestic Well
L.S. Elevation (ft):	899	Well Type:	4" Stainless Steel
Depth Drilled (ft):	162	Aquifer:	Undefined
Screened Interval (ft):	157-162	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown, soft	2-25
CLAY	clay (till), blue, soft	25-110
CLAY	sandy clay, blue	110-147
SAND	sand took water, colored	147-162

140-048-11CCBBDB

Date Completed: 6/1977
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 217
 Screened Interval (ft): 185-190

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown, soft	3-20
SAND	sand, brown	20-24
CLAY	sandy clay, blue, soft	24-106
CLAY	sandy clay, blue	106-114
SAND	sand, gray	114-115
CLAY	sandy clay, blue	115-125
CLAY	sandy clay + sand lenses, blue	125-132
CLAY	sandy clay, blue	132-148
CLAY	sandy clay + sand lenses, blue	148-151
SAND	sand drilled good, varied color	151-158
SAND	sand + small clay lenses, varied color	158-162
SAND	sand took water, varied color	162-166
SAND	sand + small clay lenses, varied color	166-176
SAND	coarse sand	176-186
SAND	sand drilled good, varied color	186-195
CLAY	sandy clay, blue	195-196
SAND	sand, varied color	196-208
CLAY	sandy clay, blue	208-217

140-048-11CCBCAC

Date Completed: 1/1977
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 202
 Screened Interval (ft): 189-195

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-19
CLAY	clay, blue	19-111
CLAY	sandy clay, blue	111-131
SAND	sand	131-132
CLAY	sandy clay, blue	132-141
CLAY	sandy clay + sand lenses, blue	141-143
CLAY	sandy clay, blue	143-148

140-048-11CCBCAC (continued)

SAND	sand	148-195
SAND	sand + clay lenses, blue	195-200
CLAY	sandy clay + rock, blue	200-202

140-048-11CCDACD

Date Completed:	5/1982	Purpose:	Domestic Well
L.S. Elevation (ft):	900	Well Type:	4" Stainless Steel
Depth Drilled (ft):	167	Aquifer:	Undefined
Screened Interval (ft):	156-162	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
SAND	silty sand, brown	2-4
CLAY	clay, brown	4-16
CLAY	silty clay, brown	16-23
CLAY	clay, blue, soft	23-109
CLAY	sandy clay, blue	109-130
SAND	sand, varied color	130-131
CLAY	sandy clay, blue	131-147
SAND	sand, varied color	147-167

140-048-12AAAACA

Date Completed:	7/1973	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	0"
Depth Drilled (ft):	280	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-12
CLAY	clay + fine silty sand, brown	12-17
CLAY	clay, blue	17-26
CLAY	shale, blue	26-105
CLAY	silty clay, blue, soft	105-123
CLAY	sandy clay, blue	123-143
SAND	sand + shale, colored	143-145
CLAY	sandy clay + rock, blue	145-171
CLAY	sandy clay, blue	171-230
SAND	dirty sand, colored	230-277
PRECAMBRIAN	granite, green	277-280

140-048-12AAADBC

Date Completed: 8/1973
 L.S. Elevation (ft): 903
 Depth Drilled (ft): 277
 Screened Interval (ft): 175-181

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-16
CLAY	clay, blue	16-22
CLAY	shale, blue	22-101
CLAY	silty clay, blue, soft	101-124
CLAY	sandy clay, blue	124-133
SAND	sand, colored	133-134
CLAY	sandy clay, blue	134-137
SAND	sand, colored	137-138
CLAY	sandy clay, blue	138-155
ROCK	rock, red, hard	155-156
CLAY	sandy clay + rock, blue	156-165
SAND	sand, colored	165-166
CLAY	sandy clay + rock, blue	166-174
SAND	sand, colored	174-181
CLAY	sandy clay, blue	181-277

140-048-17BBABDA

Date Completed: 9/1955
 L.S. Elevation (ft): 894
 Depth Drilled (ft): 123
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 3"
 Undefined
 unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
NO SAMPLE	no record	0-3
CLAY	clay, blue, hard	3-18
GRAVEL	gravel	18-19
CLAY	clay, soft	19-115
TILL	sandy till	115-120
SAND	cemented sand	120-123

140-048-17BBCBBA

Date Completed: 8/1984
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 148
 Screened Interval (ft): 123-133

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 Falk Bros Well Drilling

Lithologic Log

140-048-17BBCBBA (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, yellow, soft	1-14
CLAY	shale, black, soft	14-108
CLAY	shale, black, hard	108-114
SAND	sand lens, gray, medium hardness	114-120
CLAY	shale, black, medium hardness	120-122
SAND	sand lens, yellow, medium hardness	122-128
CLAY	shale, black, medium hardness	128-130
SAND	sand lens, gray, medium hardness	130-133
CLAY	shale and small sand lens, black, medium hardness	133-148

140-048-17BBCBCA

Date Completed:	8/1984	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	135	Aquifer:	Undefined
Screened Interval (ft):	123-133	Log Source:	Falk Bros Well Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, yellow, soft	1-14
CLAY	shale, black, soft	14-104
CLAY	shale, black, medium hardness	104-112
SAND	sand lens, gray, medium hardness	112-118
CLAY	shale, black, medium hardness	118-122
SAND	sand lens, gray, medium hardness	122-126
CLAY	shale, black, medium hardness	126-127
SAND	sand lens, gray	127-128
CLAY	shale, black	128-129
SAND	sand lens, gray, medium hardness	129-133
CLAY	shale, black, medium hardness	133-135

140-048-17BBCCCA

Date Completed:	8/1959	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	3"
Depth Drilled (ft):	135	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue, soft	0-112
TILL	till	112-116

140-048-17BBCCA (continued)

CLAY	clay	116-120
TILL	till	120-126
SAND	sand + gravel	126-135

140-048-17BDBAAB

Date Completed:	8/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	893	Well Type:	4" Stainless Steel
Depth Drilled (ft):	334	Aquifer:	Undefined
Screened Interval (ft):	320-331	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-21
CLAY	clay, blue	21-30
CLAY	clay, blue, soft	30-107
SAND	sand drilled coarse	107-109
CLAY	sandy clay, blue	109-145
CLAY	sandy clay + rock, blue, hard	145-146
CLAY	sandy clay, blue	146-148
CLAY	sandy clay + rock, blue, hard	148-149
CLAY	sandy clay, blue	149-157
SAND	sand	157-161
CLAY	sandy clay, blue	161-255
SAND	sand	255-265
SAND	sand	265-287
SAND	sand	287-292
SHALE	shale silty clay, black-blue	292-310
SANDSTONE	sand drilled good, colored	310-312
SHALE	shale silty clay, black-blue	312-314
SANDSTONE	sand, colored	314-317
SHALE	shale silty clay, black blue	317-319
SANDSTONE	sand, colored	319-331
SHALE	shale + clay, black-blue	331-334

140-048-17CBBBDC

Date Completed:	5/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	4" Stainless Steel
Depth Drilled (ft):	262	Aquifer:	Undefined
Screened Interval (ft):	141-156	Log Source:	LTP Enterprises, Inc

Lithologic Log

140-048-17CBBBDC (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-21
CLAY	sandy clay, blue	21-34
CLAY	clay, blue, soft	34-107
CLAY	sandy clay, blue	107-132
SAND	sand	132-133
CLAY	sandy clay, blue	133-142
SAND	sand	142-144
CLAY	sandy clay, blue	144-152
SAND	sand	152-153
CLAY	sandy clay, blue	153-154
SAND	sand	154-155
CLAY	sandy clay, blue	155-242
CLAY	sandy clay, blue, softer	242-259
SAND	sand	259-260
CLAY	sandy clay, blue, softer	260-262
CLAY	sandy clay with decomposed, blue-green, hard	262-262

140-048-17CCBCAC

Date Completed:	10/1986	Purpose:	Domestic Well
L.S. Elevation (ft):	897	Well Type:	4" Stainless Steel
Depth Drilled (ft):	177	Aquifer:	Undefined
Screened Interval (ft):	164-169	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-19
CLAY	clay, blue	19-105
CLAY	sandy clay rocky, blue	105-110
CLAY	sandy clay, blue	110-130
SAND	sand, gray	130-131
CLAY	sandy clay rocky, blue	131-144
SAND	sand, gray	144-145
CLAY	sandy clay rocky, blue	145-156
SAND	sand gravel rock, gray	156-170
CLAY	sandy clay, blue	170-177

140-048-17CCBCBD

Date Completed: 10/1986
 L.S. Elevation (ft): 897
 Depth Drilled (ft): 272
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 0"
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-21
CLAY	clay, blue	21-107
CLAY	sandy clay, blue	107-112
BOULDERS	boulders, gray	112-113
CLAY	sandy clay, blue	113-127
CLAY	sandy clay rocky, blue	127-166
SAND	sand, gray	166-167
CLAY	sandy clay, blue	167-256
SAND	sand, gray	256-257
CLAY	sandy clay with small sand lenses, gray	257-261
WEATHERED PRECAMBRIAN	sandy clay with weathered granite, green	261-272

140-048-17CCBCCA

Date Completed: 12/1967
 L.S. Elevation (ft): 894
 Depth Drilled (ft): 220
 Screened Interval (ft): 215-219

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, brown	2-15
CLAY	shale, blue	15-89
CLAY	clay, blue	89-115
SAND	sand (dirty), blue	115-119
CLAY	clay + rocks, blue	119-201
CLAY	clay, blue	201-217
SAND	sand, blue	217-219
CLAY	clay, colored	219-220

140-048-17CCBCDB

Date Completed: 10/1989
 L.S. Elevation (ft): 897
 Depth Drilled (ft): 166
 Screened Interval (ft): 150-158

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

140-048-17CCBCDB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-24
CLAY	sandy clay, gray	24-105
CLAY	sandy clay, gray	105-127
SAND	sand, gray	127-130
CLAY	sandy clay, gray	130-141
SAND	sand, gray	141-142
CLAY	sandy clay, gray	142-144
SAND	sand, gray	144-145
CLAY	sandy clay, gray	145-150
SAND	sand, gray	150-152
BOULDERS	rock	152-155
SAND	sand, gray	155-158
CLAY	sandy clay	158-166
SAND	sand	166-166

140-048-17CCCBAC

Date Completed:	7/1989	Purpose:	Domestic Well
L.S. Elevation (ft):	897	Well Type:	4" PVC
Depth Drilled (ft):	160	Aquifer:	Undefined
Screened Interval (ft):	140-160	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-8
CLAY	clay, yellow	8-32
CLAY	shale, gray	32-102
SAND	sand	102-105
CLAY	sandy shale	105-126
SAND	sand	126-128
CLAY	shale	128-142
SAND	sand	142-145
CLAY	shale	145-150
SAND	sand	150-160

140-048-17CDCDBB

Date Completed:	9/1973	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	187	Aquifer:	Undefined
Screened Interval (ft):	181-187	Log Source:	Frederickson's of ND, Inc

140-048-17CDCDBB (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-24
CLAY	clay, blue	24-32
CLAY	shale, blue	32-112
CLAY	sandy clay, blue	112-146
SAND	sand, colored	146-147
CLAY	sandy clay, blue	147-163
SAND	sand, blue	163-164
CLAY	sandy clay + small rock, blue	164-169
SAND	sand, colored	169-171
CLAY	sandy clay, blue	171-172
SAND	sand, blue	172-187

140-048-17CDDDBD

Date Completed:	6/1988	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	4" Stainless Steel
Depth Drilled (ft):	174	Aquifer:	Undefined
Screened Interval (ft):	163-167	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, gray	2-4
CLAY	clay, brown	4-25
CLAY	clay, blue, soft	25-107
CLAY	sandy clay, blue	107-110
SAND	sand, colored	110-111
CLAY	sandy clay, blue	111-157
SAND	sand, colored	157-158
CLAY	sandy clay, blue	158-160
SAND	sand, colored	160-171
CLAY	sandy clay, blue	171-174

140-048-17DABCDB

Date Completed:	8/1989	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	5" Stainless Steel
Depth Drilled (ft):	277	Aquifer:	Undefined
Screened Interval (ft):	244-268	Log Source:	LTP Enterprises, Inc

Lithologic Log

140-048-17DABCDB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	topsoil, black	0-1
CLAY	clay, brown	1-15
CLAY	clay, blue	15-113
CLAY	sand clay, gray	113-120
SAND	sand, gray	120-123
CLAY	sandy clay, gray	123-135
SAND	sand, colored	135-137
CLAY	sandy clay, gray	137-148
BOULDERS	rock, white	148-149
CLAY	sandy clay, gray	149-239
SAND	sand, colored	239-254
SAND	sand, colored	254-257
SAND	sand, colored	257-262
SAND	sand, colored	262-268
SHALE	sandy clay, gray-white	268-277

140-048-17DADCCC

Date Completed:	6/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	296	Aquifer:	Undefined
Screened Interval (ft):	250-263	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-23
CLAY	clay, blue, soft	23-112
CLAY	sandy clay, blue, soft	112-126
SAND	sand, blue	126-127
CLAY	sandy clay, blue, hard	127-249
SAND	sand, blue	249-251
CLAY	sandy clay, blue, soft	251-252
SAND	sand, blue	252-254
CLAY	sandy clay + sand, blue	254-263
WEATHERED PRECAMBRIAN	weathered granite, colored	263-296

140-048-17DADCCD

Date Completed:	6/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	267	Aquifer:	Undefined
Screened Interval (ft):	250-260	Log Source:	Frederickson's of ND, Inc

140-048-17DADCCD (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-11
CLAY	shale, brown	11-27
CLAY	shale, blue	27-110
CLAY	sandy clay, blue	110-125
SAND	sand, colored	125-128
CLAY	sandy clay, blue	128-131
SAND	sand, colored	131-133
CLAY	sandy clay, blue	133-142
ROCK	rock, colored	142-143
CLAY	sandy clay, blue	143-162
CLAY	sandy clay, blue-brown	162-169
CLAY	clay, blue	169-208
CLAY	sandy clay, blue	208-245
SAND	sand dirty fine, colored	245-246
CLAY	clay, blue	246-247
SAND	sand, colored	247-262
WEATHERED PRECAMBRIAN	sand dirty with clay, green	262-267

140-048-17DCCDC

Date Completed:	6/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	891	Well Type:	4" Stainless Steel
Depth Drilled (ft):	207	Aquifer:	Undefined
Screened Interval (ft):	200-205	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-23
CLAY	clay, blue, soft	23-42
SAND	fine sand + clay layers, blue	42-53
CLAY	sandy clay, blue	53-109
CLAY	sandy clay, blue	109-120
CLAY	sandy clay with sand lenses, blue	120-125
SAND	sand, colored	125-127
CLAY	sandy clay, blue	127-140
SAND	sand, colored	140-142
CLAY	sandy clay, blue, hard	142-162

140-048-17DCCDC (continued)

SAND	sand washed, blue	162-163
CLAY	sandy clay, blue	163-178
CLAY	shale, blue	178-199
SAND	sand, colored	199-205
WEATHERED PRECAMBRIAN	weathered granite, green	205-207

140-048-17DCCDCB

Date Completed:	8/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	891	Well Type:	4" Stainless Steel
Depth Drilled (ft):	250	Aquifer:	Undefined
Screened Interval (ft):	240-248	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-22
CLAY	clay, blue	22-45
CLAY	clay, blue, soft	45-105
CLAY	sandy clay, blue	105-112
SAND	sand drilled dirty	112-116
CLAY	sandy clay, blue	116-117
SAND	sand drilled better	117-123
CLAY	sandy clay, blue	123-149
SAND	sand washed into	149-150
CLAY	sandy clay rocky, blue	150-151
SAND	sand	151-152
CLAY	sandy clay, blue	152-240
SAND	sand	240-241
CLAY	sandy clay, blue	241-242
SAND	sand	242-248
PRECAMBRIAN	granite, green	248-250

140-048-17DDABDB

Date Completed:	4/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	0"
Depth Drilled (ft):	272	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-17

140-048-17DDABDB (continued)

CLAY	clay, blue, soft	17-109
CLAY	sandy clay, blue	109-151
CLAY	sandy clay + small very hard rock, blue	151-152
CLAY	sandy clay, blue	152-240
CLAY	sandy clay, blue, softer	240-267
WEATHERED PRECAMBRIAN	sandy clay + decomposed, varied color	267-272

140-048-17DDACAD

Date Completed:	5/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	267	Aquifer:	Undefined
Screened Interval (ft):	255-265	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-26
CLAY	sandy clay, blue, soft	26-108
CLAY	sandy clay, blue	108-122
BOULDERS	rock, white	122-123
CLAY	sandy clay, blue	123-159
SAND	sand, varied color	159-161
CLAY	sandy clay, blue	161-177
BOULDERS	rock	177-178
SAND	sand drilled poor, varied color	178-181
CLAY	sandy clay, blue	181-242
SAND	fine dirty sand drilled poor, gray	242-246
CLAY	sandy clay, blue	246-248
SAND	fine dirty sand drilled poor, gray	248-251
CLAY	sandy clay silty, blue	251-255
SAND	fine sand drilled fair, varied color	255-262
CLAY	sandy clay, blue	262-267

140-048-17DDACDA

Date Completed:	8/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	4"
Depth Drilled (ft):	283	Aquifer:	Undefined
Screened Interval (ft):	255-265	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1

140-048-17DDACDA (continued)

CLAY	clay, yellow	1-22
CLAY	clay, blue, soft	22-107
CLAY	sandy clay, blue, hard	107-146
CLAY	sandy clay + boulders, blue, hard	146-160
SAND	sand, blue	160-169
CLAY	sandy clay, blue	169-181
SAND	dirty sand, blue	181-184
CLAY	sandy clay, blue, hard	184-238
CLAY	shale, blue	238-254
SAND	fine sand, gray	254-256
SHALE	shale, black	256-262
SANDSTONE	fine sand, gray	262-265
SHALE	shale, black	265-280
WEATHERED PRECAMBRIAN	weathered granite, black-green	280-283

140-048-17DDADCB

Date Completed:	7/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	0"
Depth Drilled (ft):	291	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-22
CLAY	clay, blue, soft	22-108
CLAY	sandy clay, blue, hard	108-134
CLAY	sandy clay + sand lenses, blue, hard	134-145
CLAY	sandy clay, blue, hard	145-168
CLAY	sandy clay + boulders, blue, hard	168-188
CLAY	sandy clay + sand lenses, blue, hard	188-194
CLAY	sandy clay, blue, hard	194-229
CLAY	shale, blue, soft	229-256
WEATHERED PRECAMBRIAN	sandy clay + shale, blue, hard	256-281
WEATHERED PRECAMBRIAN	weathered granite, green	281-291

140-048-17DDBDAC

Date Completed:	6/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	0"
Depth Drilled (ft):	287	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

140-048-17DDBDAC (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-11
CLAY	shale, brown	11-22
CLAY	shale, blue	22-110
CLAY	sandy clay, blue	110-152
SAND	sand dirty	152-154
CLAY	sandy clay, blue	154-162
CLAY	clay, blue, hard	162-243
SAND	sand fine dirty	243-244
CLAY	sandy clay, blue, org (?)	244-257
CLAY	sandy clay, varied color	257-262
SAND	sand fine, colored	262-264
SHALE	clay + shale	264-282
ROCK	rock, colored	282-283
CLAY	clay + shale, colored	283-287

140-048-17DDBDAD

Date Completed:	6/1972	Purpose:	Industrial Well
L.S. Elevation (ft):	896	Well Type:	0*
Depth Drilled (ft):	261	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, tan	2-27
CLAY	clay, tan	27-37
CLAY	clay, blue	37-42
CLAY	clay, blue	42-72
CLAY	clay, blue	72-102
CLAY	clay, blue	102-117
CLAY	sandy clay, blue, hard	117-132
CLAY	sandy clay, blue, hard	132-136
SAND	lenses, brown	136-142
CLAY	sandy clay + boulders, blue, hard	142-147
CLAY	sandy clay, blue, hard	147-152
SAND	sand, brown	152-156
CLAY	sandy clay, blue	156-157
CLAY	sandy clay, blue, hard	157-180

140-048-17DDBDAD (continued)

SAND	sand washed, blue	180-183
CLAY	sandy clay, blue, hard	183-246
CLAY	sandy clay, brown, hard	246-252
CLAY	sandy clay, brown, soft	252-259
PRECAMBRIAN	granite, white	259-261

140-048-17DDDCAB

Date Completed:	5/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	238	Aquifer:	Undefined
Screened Interval (ft):	227-235	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-23
CLAY	clay, blue, soft	23-107
CLAY	sandy clay, blue	107-123
SAND	dirty sand, blue	123-129
CLAY	sandy clay + boulders, blue, hard	129-156
CLAY	sandy clay, blue, hard	156-171
BOULDERS	boulder, blue	171-172
CLAY	sandy clay, blue, hard	172-227
SANDSTONE	fine sand + layers shale, blue	227-235
PRECAMBRIAN	granite, green	235-238

140-048-17DDDCBA

Date Completed:	4/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	247	Aquifer:	Undefined
Screened Interval (ft):	230-242	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-6
CLAY	clay, light brown	6-14
CLAY	clay, brown, soft	14-17
CLAY	clay, blue, soft	17-109
CLAY	sandy clay, blue, soft	109-115
SAND	sand	115-116
CLAY	sandy clay, blue	116-126
SAND	sand	126-127

140-048-17DDDCBA (continued)

CLAY	sandy clay, blue	127-136
SAND	sand	136-138
CLAY	sandy clay, blue	138-144
ROCK	rock	144-145
CLAY	sandy clay, blue	145-162
SAND	sand	162-163
CLAY	sandy clay + small sand lenses, blue	163-166
CLAY	sandy clay, blue	166-168
SAND	sand	168-169
CLAY	sandy clay, blue	169-178
SAND	sand + small clay lenses	178-181
CLAY	sandy clay, blue	181-231
SAND	sand	231-234
SAND	sand (very dirty)	234-236
CLAY	sandy clay, blue	236-238
SAND	sand	238-240
CLAY	sandy clay, blue	240-241
SAND	sand (dirty)	241-242
WEATHERED PRECAMBRIAN	sandy clay with decomposed, blue-green, hard	242-247

140-048-17DDDCBB

Date Completed:	4/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	252	Aquifer:	Undefined
Screened Interval (ft):	244-250	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-4
CLAY	clay, brown	4-22
CLAY	clay, blue, soft	22-112
CLAY	sandy clay, blue	112-135
CLAY	sandy clay + rock, blue	135-136
CLAY	sandy clay, blue	136-231
SAND	dirty sand	231-232
CLAY	sandy clay + small sand lenses, blue	232-238
CLAY	sandy clay, blue	238-241
SAND	sand	241-250
CLAY	sandy clay, blue	250-252

140-048-18AAAAAD

Date Completed: 10/1989
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 59
 Screened Interval (ft): 49-53

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-28
CLAY	sandy clay, gray	28-40
SAND	sand, gray	40-53
CLAY	sandy clay, gray	53-59

140-048-18AAABAC

Date Completed: 3/1988
 L.S. Elevation (ft): 895
 Depth Drilled (ft): 70
 Screened Interval (ft): 59-63

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-24
CLAY	sandy clay, blue	24-34
SAND	sand, gray	34-40
SAND	sand, gray	40-63
CLAY	sandy clay, blue	63-70

140-048-18AAADDC

Date Completed: 9/1980
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 137
 Screened Interval (ft): 126-130

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	sandy clay, brown	1-25
CLAY	clay, blue	25-110
CLAY	sandy clay rocky, blue	110-116
SAND	sand, colored	116-117
CLAY	sandy clay, blue	117-126
SAND	sand 18-25 slot, colored	126-129
CLAY	sandy clay, blue	129-137

140-048-18ADD1

Date Completed: 9/24/81
 L.S. Elevation (ft): 894
 Depth Drilled (ft): 265

Purpose:
 Well Type:

Test Hole

Log Source:

LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-20
CLAY	soft, blue	20-108
SAND	colored	108-110
CLAY	sandy, gray	110-123
SAND	colored	123-125
CLAY	sandy, gray	125-127
SAND	colored	127-128
CLAY	sandy, with small lenses of sand, gray	128-130
SAND	colored	130-131
CLAY	sandy, gray	131-134
SAND	colored	134-135
CLAY	sandy, gray	135-144
ROCK	white	144-145
CLAY	sandy, gray	145-260
DECOMPOSED	green	260-265

140-048-18ADD2

Date Completed: 9/28/81
 L.S. Elevation (ft): 894
 Depth Drilled (ft): 137
 Screened Interval (ft): 118-129

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-20
CLAY	blue	20-109
SAND	colored	109-110
CLAY	sandy, gray	110-118
SAND	colored	118-124
CLAY	sandy, gray	124-127
SAND	colored	127-129
CLAY	sandy, gray	129-137

140-048-18BBABDB

Date Completed: 10/1984
 L.S. Elevation (ft): 890
 Depth Drilled (ft): 276
 Screened Interval (ft): 264-274

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-20
CLAY	clay, blue, soft	20-111
CLAY	sandy clay, gray	111-115
SAND	sand, varied color	115-116
CLAY	sandy clay, gray	116-119
SAND	sand drilled dirty, varied color	119-121
CLAY	sandy clay, gray	121-122
SAND	sand + coarse sand drilled better, varied color	122-124
CLAY	sandy clay, gray	124-163
SAND	sand, varied color	163-164
CLAY	sandy clay, gray	164-165
SAND	sand, varied color	165-167
CLAY	sandy clay, gray	167-178
SAND	sand, varied color	178-179
CLAY	sandy clay, gray	179-189
SAND	sand, varied color	189-191
CLAY	sandy clay, gray	191-236
CLAY	sandy clay, gray, very soft	236-264
SAND	sand, varied color	264-267
CLAY	sandy clay, gray	267-268
SAND	sand, varied color	268-270
CLAY	lenses of clay + sand, gray	270-274
WEATHERED PRECAMBRIAN	decomposed, green	274-276

140-048-18BDDDBD

Date Completed: 9/1982
 L.S. Elevation (ft): 895
 Depth Drilled (ft): 237
 Screened Interval (ft): 141-146

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	topsoil, black	0-2
CLAY	clay, brown, soft	2-26
CLAY	clay, blue, soft	26-38

140-048-18BDDDBDD (continued)

SAND	sand little dirty, brown-blue	38-58
CLAY	clay, blue, soft	58-105
SAND	sand little clay, blue	105-108
CLAY	sandy clay, blue	108-113
CLAY	sandy clay rocky, blue	113-127
SAND	sand, blue	127-128
CLAY	sandy clay, blue	128-135
SAND	sand, blue	135-136
CLAY	sandy clay, blue	136-140
SAND	sand, blue	140-141
CLAY	sandy clay, blue	141-143
SAND	sand with clay + rock	143-144
SAND	sand	144-146
CLAY	sandy clay, blue	146-147
BOULDERS	rock	147-149
CLAY	sandy clay, blue	149-180
CLAY	very sticky sandy clay, blue	180-197
CLAY	sandier clay, blue, softer	197-205
CLAY	sandy clay, blue	205-217
CLAY	sandier clay, blue, softer	217-225
WEATHERED PRECAMBRIAN	decomposed, green, harder	225-237

140-048-18CADAAC

Date Completed:	8/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	4" Stainless Steel
Depth Drilled (ft):	147	Aquifer:	Undefined
Screened Interval (ft):	108-135	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-11
CLAY	shale, brown	11-25
CLAY	shale, blue	25-100
SAND	dirty sand, colored	100-115
CLAY	sandy clay of lenses, blue	115-118
CLAY	sandy clay + rock, blue	118-125
SAND	sand, blue	125-126
CLAY	sandy clay, blue	126-131
ROCK	rock lenses + sand, colored	131-133

140-048-18CADAAC (continued)

CLAY	sandy clay, blue	133-134
SAND	sand, blue	134-135
CLAY	sandy clay + rock, blue	135-147

140-048-18CADDAB

Date Completed:	5/1982	Purpose:	Domestic Well
L.S. Elevation (ft):	893	Well Type:	4" Stainless Steel
Depth Drilled (ft):	146	Aquifer:	Undefined
Screened Interval (ft):	133-141	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-25
CLAY	sandy clay, blue	25-31
CLAY	sandy clay, blue	31-99
SAND	sand, blue	99-103
CLAY	sandy clay, blue	103-116
SAND	sand	116-118
CLAY	sandy clay, blue	118-133
SAND	sand, light brown	133-141
CLAY	sandy clay, blue	141-146

140-048-18DBBBBC

Date Completed:	3/1980	Purpose:	Domestic Well
L.S. Elevation (ft):	898	Well Type:	4" Stainless Steel
Depth Drilled (ft):	211	Aquifer:	Undefined
Screened Interval (ft):	203-208	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-17
CLAY	clay, blue	17-43
SAND	sand, brown	43-57
CLAY	sandy clay, blue	57-73
CLAY	clay soft, blue	73-102
CLAY	sandy clay, blue	102-123
BOULDERS	rock, red	123-126
CLAY	sandy clay, blue	126-138
SAND	sand, blue	138-139
CLAY	sandy clay, blue	139-159
SAND	sand, blue	159-161

140-048-18DBBBBC (continued)

CLAY	sandy clay, blue	161-193
CLAY	shale, black	193-193
CLAY	brown shale, brown	193-203
SAND	sand, varied color	203-208
WEATHERED PRECAMBRIAN	decomposed, green	208-211

140-048-18DBBBBCB

Date Completed:	10/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	0"
Depth Drilled (ft):	240	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-22
CLAY	clay, blue	22-35
SAND	dirty sand + minor clay	35-72
CLAY	clay, blue, soft	72-106
SAND	sand	106-107
CLAY	sandy clay, blue	107-118
SAND	sand	118-119
CLAY	sandy clay, blue, hard	119-144
SAND	sand drilled coarse	144-146
CLAY	sandy clay, blue	146-189
SAND	very dirty sand rocky	189-191
CLAY	clay, blue, soft	191-213
CLAY	sandy clay, blue, soft	213-220
WEATHERED PRECAMBRIAN	decomposed, green	220-240

140-048-18DBBBCC

Date Completed:	10/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	220	Aquifer:	Undefined
Screened Interval (ft):	211-216	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-22
CLAY	clay, blue	22-33
SAND	sand drilled dirty	33-56

140-048-18DBBBCC (continued)

CLAY	clay, blue	56-101
CLAY	sandy clay rocky, blue, hard	101-112
CLAY	sandy clay, blue	112-118
SAND	sand washed into	118-120
CLAY	sandy clay, blue	120-126
SAND	sand	126-128
CLAY	sandy clay, blue	128-137
SAND	sand drilled coarse	137-138
CLAY	sandy clay, blue	138-208
SAND	dirty sand	208-209
CLAY	sandy clay, blue	209-212
SAND	sand with clay lenses	212-215
WEATHERED PRECAMBRIAN	decomposed, green	215-220

140-048-18DBBCBD

Date Completed:	3/1981	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	4" Stainless Steel
Depth Drilled (ft):	162	Aquifer:	Undefined
Screened Interval (ft):	152-162	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1
CLAY	clay, yellow, soft	1-19
CLAY	clay, gray, soft	19-119
SAND	clay sand, gray, soft	119-141
GRAVEL	clay gravel, gray, medium hard	141-148
SAND	clay sand, gray, medium soft	148-151
SAND	water sand	151-162

140-048-18DCBBDB

Date Completed:	3/1977	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	4" Stainless Steel
Depth Drilled (ft):	141	Aquifer:	Undefined
Screened Interval (ft):	135-141	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-1
CLAY	clay, yellow, soft	1-13
CLAY	clay, blue, soft	13-108
CLAY	clay + stones, gray, varied hardness	108-127

140-048-18DCBBDB (continued)

GRAVEL gravel + stones, gray, varied hardness

127-141

140-048-18DCCDC

Date Completed: 10/1978
L.S. Elevation (ft): 895
Depth Drilled (ft): 167
Screened Interval (ft): 133-137

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, gray	2-3
CLAY	clay, brown	3-32
CLAY	clay, blue	32-99
CLAY	sandy clay, blue	99-120
SAND	sand, colored	120-122
CLAY	sandy clay, blue	122-133
SAND	sand, colored	133-138
CLAY	sandy clay, blue	138-141
SAND	sand, colored	141-142
CLAY	sandy clay, blue	142-167

140-048-18DDAB1

Date Completed: 00/00/00
L.S. Elevation (ft): 894
Depth Drilled (ft): 238

Purpose:
Well Type:
Log Source:

Test Hole
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-23
CLAY	blue	23-33
CLAY	soft, blue	33-102
SAND	fair, colored	102-105
CLAY	sandy, blue	105-162
ROCK	no description	162-163
CLAY	sandy, blue	163-165
SAND	drilled good, #12, colored	165-169
CLAY	sandy, blue	169-232
DECOMPOSED	green	232-238

140-048-18DDAB2

Date Completed: 6/11/75
L.S. Elevation (ft): 894
Depth Drilled (ft): 241
Screened Interval (ft): 225-229

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-23
CLAY	blue	23-33
CLAY	soft, blue	33-101
SAND	very fine, didn't chatter	101-107
CLAY	sandy, blue	107-116
SAND	no description	116-117
CLAY	sandy, blue	117-128
SAND	no description	128-129
CLAY	sandy, blue	129-225
SAND	no description	225-226
SAND	dirty	226-227
SAND	no description	227-229
CLAY	sandy, blue	229-235
DECOMPOSED	white, green	235-241

140-048-19AAADCD

Date Completed: 2/1968
L.S. Elevation (ft): 894
Depth Drilled (ft): 237
Screened Interval (ft): 229-237

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-22
CLAY	clay, blue, soft	22-104
SAND	sand, colored	104-106
CLAY	sandy clay + boulders, blue	106-128
SAND	sand, colored	128-149
CLAY	sandy clay + sand lenses, blue, hard	149-162
CLAY	clay, blue	162-227
SAND	sand, colored	227-237
WEATHERED PRECAMBRIAN	decomposed granite, green	237-237

140-048-19ABCCCA

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

6/1988
892
177
171-176

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-20
CLAY	clay, blue	20-116
CLAY	sandy clay, blue	116-131
SAND	sand lenses of clay, colored	131-135
CLAY	sandy clay, blue	135-148
SAND	sand, colored	148-150
CLAY	sandy clay, blue	150-153
SAND	sand, colored	153-154
CLAY	sandy clay, blue	154-156
SAND	sand, colored	156-157
CLAY	sandy clay, blue	157-164
SAND	sand, colored	164-170
SAND	sand, colored	170-177
CLAY	clay, blue	177-177

140-048-19ABCDCC

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

4/1961
895
257
251-255

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Other
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-26
CLAY	shale, blue	26-32
CLAY	shale, blue, soft	32-105
CLAY	sandy clay + sand lenses, blue	105-112
CLAY	sandy clay, blue, hard	112-137
SAND	lenses of sand, gray	137-138
CLAY	sandy clay, blue, very hard	138-156
BOULDERS	granite boulder, green	156-157
CLAY	sandy clay, blue, hard	157-217
BOULDERS	limestone, white	217-218
CLAY	sandy clay, blue	218-250

140-048-19ABCDCC (continued)

SAND	fine sand, brown	250-255
CLAY	clay, blue	255-257

140-048-19ABCDDB

Date Completed:	11/1962	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	4" Other
Depth Drilled (ft):	267	Aquifer:	Undefined
Screened Interval (ft):	262-267	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-16
CLAY	shale, blue, soft	16-104
CLAY	sandy clay + sand lenses, blue, hard	104-111
CLAY	sandy clay, blue, hard	111-123
SAND	sand, blue	123-124
CLAY	sandy clay, blue, hard	124-134
CLAY	sandy clay + boulders, blue, hard	134-151
SAND	sand washed, colored	151-153
CLAY	sandy clay + sand lenses, blue, hard	153-159
SAND	sand washed, blue	159-160
CLAY	sandy clay, blue, hard	160-164
CLAY	sandy clay + shale, blue, hard	164-247
SAND	sand, gray	247-249
CLAY	shale + sand lenses, brown	249-260
SANDSTONE	sand, gray	260-267

140-048-19DDD1

Date Completed:	5/15/64	NDSWC 3094	Purpose:	Test Hole
L.S. Elevation (ft):	897		Well Type:	
Depth Drilled (ft):	135		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellowish-brown, very silty, cohesive, highly calcareous, oxidized; laminae.	1-19
SILT	dark gray, clay and very fine sand, organic material, calcareous.	19-28
CLAY	dark greenish-gray, slightly silty, very cohesive, calcareous.	28-103
TILL	dark greenish-gray, clay through gravel, calcareous, carbonate, shale, quartz; poor return.	103-106
GRAVEL	0.5 to 8 mm, abundant granule gravel, predominantly shale chips, with carbonate, quartz, igneous, some pyrite fragments, angular to rounded; shale pebbles up to 20 mm, very little fine material.	106-114

140-048-19DDD1 (continued)

TILL	dark greenish-gray, clay through gravel, cohesive, predominantly shale, carbonate, some quartz, igneous, calcareous.	114-122
TILL	olive-gray, clay through gravel, abundant carbonate, with quartz, igneous, shale, highly calcareous; contains boulders, granite boulder at 134 ft	122-135

140-048-19DDD2

Date Completed:	5/16/64	NDSWC 3094A	Purpose:	Test Hole
L.S. Elevation (ft):	897		Well Type:	
Depth Drilled (ft):	132		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellowish-brown, silty, sandy, cohesive, highly calcareous, oxidized; laminae.	1-19
SILT	dark gray, clayey with very fine sand, organic material, calcareous; laminae.	19-30
CLAY	dark greenish-gray, silty to smooth, sticky, calcareous.	30-104
TILL	dark greenish-gray, clay through gravel, quite gravelly, shale, carbonate, quartz, highly calcareous.	104-105
GRAVEL	up to 24 mm, many granules, predominantly shale, with carbonate, quartz and igneous.	105-110
TILL	olive-black, clay through gravel, abundant shale, with carbonate, quartz and igneous, calcareous.	110-118
TILL	olive-gray, clay through gravel, very silty, abundant carbonate, shale, with igneous, quartz and lignite, highly calcareous.	118-132
IGNEOUS	dusky blue-green, hard, angular (bedrock).	132-132

140-048-20BBDABD

Date Completed:	5/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	4" Stainless Steel
Depth Drilled (ft):	191	Aquifer:	Undefined
Screened Interval (ft):	163-167	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, tan, hard	1-31
CLAY	clay, blue	31-41
CLAY	clay, blue	41-71
CLAY	clay, blue	71-86
CLAY	clay, blue	86-106
SAND	lenses, brown	106-111
CLAY	sandy clay, blue, hard	111-126
SAND	lenses, brown	126-132
CLAY	sandy clay, blue, hard	132-162
SAND	sand, brown	162-167

140-048-21BCDDCB

Date Completed: 6/1973
L.S. Elevation (ft): 897
Depth Drilled (ft): 167
Screened Interval (ft): 162-165

Purpose: Domestic Well
Well Type: 4" Stainless Steel
Aquifer: Undefined
Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-24
CLAY	clay, blue	24-28
CLAY	shale, blue	28-107
CLAY	sandy clay + small rock, blue	107-126
SAND	sand, colored	126-127
CLAY	sandy clay, blue	127-144
SAND	dirty sand, colored	144-149
CLAY	sandy clay, blue	149-162
SAND	sand, blue	162-164
BOULDERS	rock	164-165
CLAY	sandy clay, blue	165-167

140-048-21CBA2

Date Completed: 1947
L.S. Elevation (ft): 897
Depth Drilled (ft): 213
Screened Interval (ft): 0-213

Purpose: Domestic Well
Well Type: 6" Steel
Aquifer: Undefined
Log Source: Bingham 1960

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	silty, with some sandy layers, yellow	0-18
CLAY	rock at 94 feet	18-103
SAND	coarse, with gravel	103-106
TILL	thin layers of sand at 116 and 165 feet	106-183
TILL	clayey, gray, tough	183-203
TILL	brown	203-212
GRANITE	decayed	212-213

140-048-21CBADDB

Date Completed: 3/1967
L.S. Elevation (ft): 896
Depth Drilled (ft): 167
Screened Interval (ft): 162-167

Purpose: Domestic Well
Well Type: 4" Stainless Steel
Aquifer: Undefined
Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1

140-048-21CBADDB (continued)

CLAY	clay, yellow	1-21
CLAY	clay, blue, soft	21-101
SAND	dirty sand + shale, colored	101-108
CLAY	sandy clay + boulders, blue, hard	108-126
SAND	sand, colored	126-129
CLAY	sandy clay, blue, hard	129-144
SAND	sand, gray	144-145
CLAY	sandy clay, blue, hard	145-153
SAND	sand, gray	153-154
CLAY	sandy clay + sand lenses, blue	154-161
SAND	sand, gray	161-167

140-048-23ADDCAB

Date Completed:	9/1960	Purpose:	Domestic Well
L.S. Elevation (ft):	905	Well Type:	4" Other
Depth Drilled (ft):	176	Aquifer:	Undefined
Screened Interval (ft):	163-171	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-21
CLAY	clay, blue	21-28
CLAY	soft shale, blue	28-105
CLAY	sandy clay, blue	105-133
SAND	dirty sand	133-139
SAND	sand + clay + sand lenses, blue, soft	139-147
CLAY	sandy clay, blue, hard	147-157
SAND	sand, gray	157-176

140-048-23BCBBCA

Date Completed:	5/1969	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	4" Stainless Steel
Depth Drilled (ft):	159	Aquifer:	Undefined
Screened Interval (ft):	150-154	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, yellow	2-18
CLAY	shale, blue	18-77
CLAY	clay, blue	77-141
SAND	sand, brown	141-143

140-048-23BCBBCA (continued)

CLAY	clay, blue	143-148
SAND	sand, blue	148-154
BOULDERS	decomposed granite, green-black	154-156
BOULDERS	granite	156-159

140-048-23DDD

Date Completed:	00/00/00	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	3" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

140-048-25CCBBAB

Date Completed:	11/1957	Purpose:	Domestic Well
L.S. Elevation (ft):	906	Well Type:	4"
Depth Drilled (ft):	166	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	sandy clay, yellow	1-15
CLAY	shale, blue	15-97
CLAY	sandy clay, blue	97-149
SANDSTONE	sand dry, brown	149-155
PRECAMBRIAN	granite, black	155-166

140-048-28ABBCAD

Date Completed:	7/1969	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	0"
Depth Drilled (ft):	365	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, yellow	2-18
CLAY	shale, blue	18-104
CLAY	clay, blue	104-156
SAND	sand, blue	156-160
CLAY	clay, blue	160-168
SAND	sand, colored	168-170
CLAY	clay, blue	170-181
SAND	sand, blue	181-189
CLAY	clay, blue	189-207

140-048-28ABBCAD (continued)

CLAY	clay + sand lens, blue	207-214
SAND	sand, blue	214-216
CLAY	clay, blue	216-217
SAND	sand, blue	217-220
CLAY	clay, blue	220-353
SAND	sand, blue	353-356
CLAY	clay, green-white	356-364
PRECAMBRIAN	granite, red	364-365

140-048-28ABCCAB

Date Completed:	9/1973	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	199	Aquifer:	Undefined
Screened Interval (ft):	187-197	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-15
CLAY	clay, blue	15-17
SAND	fine sand, blue	17-19
CLAY	shale, blue	19-93
SAND	sand, colored	93-100
CLAY	sandy clay + sand lenses, blue	100-102
SAND	sand washed, blue	102-107
CLAY	sandy clay, blue	107-127
SAND	sand + gravel, colored	127-130
CLAY	sandy clay, blue	130-137
SAND	sand, blue	137-138
CLAY	sandy clay, blue	138-144
SAND	sand + gravel dirty, colored	144-147
CLAY	sandy clay, blue	147-157
SAND	sand drilled dirty, colored	157-160
SAND	sand drilled cleaner, colored	160-161
CLAY	sandy clay + sand lenses, blue	161-165
SAND	sand + clay lenses, colored	165-168
CLAY	sandy clay, blue	168-186
SAND	sand fine, gray	186-197
CLAY	sandy clay, blue	197-199

140-048-28ABCDBD

Date Completed: 8/1977
 L.S. Elevation (ft): 893
 Depth Drilled (ft): 199
 Screened Interval (ft): 188-196

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	silty clay, brown	2-27
CLAY	clay, blue, soft	27-97
CLAY	sandy clay, blue	97-120
SAND	sand with clay lenses, varied color	120-127
CLAY	sandy clay, blue	127-128
SAND	sand, varied color	128-129
CLAY	sandy clay, blue	129-143
SAND	sand, varied color	143-144
CLAY	sandy clay, blue	144-165
SAND	sand, varied color	165-167
CLAY	sandy clay, blue	167-168
SAND	sand, varied color	168-170
CLAY	sandy clay, blue	170-177
SAND	sand, varied color	177-196
CLAY	sandy clay, blue	196-199

140-048-28ACBDBB

Date Completed: 1/1976
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 347
 Screened Interval (ft): 0-0

Purpose: Domestic Well
 Well Type: 0"
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-14
CLAY	clay, blue, soft	14-98
CLAY	sandy clay fairly soft, blue	98-103
CLAY	sandy clay, blue, hard	103-125
SAND	sand (dirty)	125-126
CLAY	sandy clay, blue	126-128
SAND	sand (dirty) + clay lenses	128-131
CLAY	sandy clay, blue	131-140
SAND	sand	140-141
CLAY	sandy clay, blue	141-145

140-048-28ACBDBB (continued)

ROCK	rock	145-146
CLAY	sandy clay, blue	146-147
SAND	sand	147-148
CLAY	sandy clay, blue	148-150
SAND	sand (dirty)	150-151
CLAY	sandy clay + sand lenses, blue	151-162
SAND	sand (very dirty)	162-164
CLAY	sandy clay + gravel, blue	164-170
CLAY	sandy clay + rock, blue, hard	170-171
CLAY	sandy clay + gravel, blue	171-184
SAND	sand	184-185
CLAY	sandy clay + gravel, blue	185-232
SAND	sand	232-233
CLAY	sandy clay, blue	233-240
CLAY	clay, brown	240-257
CLAY	clay, brown-blue	257-287
CLAY	sandy clay, blue	287-340
WEATHERED PRECAMBRIAN	sandy clay + decomposed, blue-green	340-347

140-048-28ADDDDB

Date Completed:	8/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	4" Stainless Steel
Depth Drilled (ft):	182	Aquifer:	Undefined
Screened Interval (ft):	173-181	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, tan	2-18
CLAY	sticky clay, blue	18-101
CLAY	sandy clay, blue	101-158
CLAY	clay + lenses of sand, blue	158-172
SAND	sand + clay, blue	172-182
CLAY	sandy clay, blue	182-182

140-048-29AAADAD

Date Completed:	1/1975	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" Stainless Steel
Depth Drilled (ft):	205	Aquifer:	Undefined
Screened Interval (ft):	176-182	Log Source:	LTP Enterprises, Inc

Lithologic Log

140-048-29AAADAD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-25
CLAY	clay, blue, soft	25-102
SAND	sand, blue	102-104
CLAY	sandy clay + sand lenses, blue	104-115
SAND	sand + clay lenses, colored	115-118
SAND	sand (washed), colored	118-121
CLAY	sandy clay, blue	121-141
BOULDERS	rock, colored	141-142
CLAY	sandy clay, blue	142-175
SAND	sand, blue	175-183
CLAY	sandy clay, blue	183-205

140-048-29CDB

Date Completed:	8/9/63	NDSWC 2165	Purpose:	Test Hole
L.S. Elevation (ft):	896		Well Type:	
Depth Drilled (ft):	389		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty, slightly plastic, black, noncalcareous.	0-3
CLAY	silty, plastic, moderate yellowish-brown, highly calcareous.	3-11
CLAY	silty, some fine sand, plastic, dusky yellow, highly calcareous.	11-16
CLAY	silty, plastic, light olive-gray, highly calcareous.	16-21
CLAY	silty, sandy, plastic, light olive-gray, few shell fragments; grades into dark gray clay near bottom.	21-26
CLAY	slightly silty, very plastic, dark greenish-gray, highly calcareous.	26-90
CLAY	silty, with very fine to fine sand, plastic, dark greenish-gray, highly calcareous.	90-95
SAND	silt, gravel, till pebbles; till pebbles highly calcareous.	95-100
TILL	much coarse material as above, plastic to slightly loose, dark greenish-gray, highly calcareous.	100-113
SAND	very fine to very coarse, loose to slightly plastic, olive-gray.	113-122
TILL	as above, some lignite fragments.	122-126
TILL	silty, sandy, gravelly, plastic to slightly loose, dark greenish-gray, highly calcareous; percentage of coarse material and clay fraction varies throughout interval.	126-155
SAND & GRAVEL	with till pebbles, loose to slightly plastic, dark greenish-gray; till pebbles highly calcareous.	155-159
TILL	sandy, silty, gravelly, dark greenish-gray, highly calcareous.	159-206
CLAY	silty, plastic to slightly firm, olive-gray to dark greenish-gray, highly calcareous; some sand and silt lenses throughout interval.	206-326
CLAY	as above, grading into sandy, silty, gravelly till near bottom, highly calcareous, olive-gray to brownish-gray; clay is plastic; till is firm to slightly friable.	326-336

140-048-29CDB (continued)

TILL	mostly clay with silt, sand, and gravel, firm to slightly plastic, dark greenish-gray to brownish-gray, highly calcareous; color and percent of coarse material varies throughout interval.	336-363
SAND	with fine gravel and till pebbles, some possible chlorite; till pebbles very sandy, olive-gray, highly calcareous.	363-378
SAND	as above, with greenish-gray clay; possibly decomposed granite.	378-389

140-048-31CBD

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	901	Well Type:	0" Unknown
Depth Drilled (ft):	338	Aquifer:	Undefined
Screened Interval (ft):	0-338	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow	0-30
CLAY	blue	30-108
TILL	clay and sand	108-190
TILL	clay, blue	190-211
ROCK	rocks	211-215
TILL	clay, blue	215-312
WEATHERED GRANITE	granite (?), sand and clay	312-324
WEATHERED GRANITE	granite (?), sand	324-338

140-048-32CBB2

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	900	Well Type:	3" Unknown
Depth Drilled (ft):	131	Aquifer:	West Moorhead
Screened Interval (ft):	0-131	Log Source:	

Lithologic Log - unavailable

140-048-33DBBBDC

Date Completed:	1/1976	Purpose:	Industrial Well
L.S. Elevation (ft):	904	Well Type:	4" Stainless Steel
Depth Drilled (ft):	177	Aquifer:	Undefined
Screened Interval (ft):	160-175	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-15
CLAY	clay, blue, soft	15-98
CLAY	sandy clay with small sand lenses, blue	98-107
CLAY	sandy clay, blue	107-117
SAND	sand (dirty)	117-118
CLAY	sandy clay, blue	118-136

140-048-33DBBBDC (continued)

SAND	sand	136-137
CLAY	sandy clay + gravel, blue	137-146
SAND	sand + clay lenses	146-147
CLAY	sandy clay + gravel, blue	147-156
SAND	sand	156-157
CLAY	sandy clay + gravel, blue	157-162
SAND	sand (dirty)	162-164
CLAY	sandy clay with sand lenses, blue	164-167
SAND	sand	167-169
CLAY	sandy clay, blue	169-173
SAND	sand	173-174
SAND	dirty sand with clay lenses	174-177
CLAY	sandy clay, blue	177-177

140-049-05BBA

Date Completed:	6/19/80	Purpose:	Observation Well
L.S. Elevation (ft):	887.5	Well Type:	1.25" PVC
Depth Drilled (ft):	260	Aquifer:	West Fargo North
Screened Interval (ft):	244-247	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gray, plastic, cohesive, slightly calcareous	1-3
CLAY	yellow brown, cohesive, slightly calcareous, oxidized	3-13
CLAY	gray, cohesive, plastic, slightly calcareous	13-71
TILL	gray, slightly sandy, rocks, gravel, rock at 90 feet	71-90
TILL	gray, calcareous, cohesive	90-112
TILL	grayish brown, silty, cohesive, calcareous	112-118
CLAY	brownish gray, sandy, slightly calcareous, silty layers	118-145
SAND	fine, gray, slightly coarser at 171 ft, lignite chips at 185 ft	145-193
SAND	coarse, lignite chips	193-252
CLAY	white, cohesive, (bedrock)	252-260

140-049-07ADD

Date Completed:	11/3/76	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" Steel
Depth Drilled (ft):	218	Aquifer:	West Fargo North
Screened Interval (ft):	209-215	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1

140-049-07ADD (continued)

CLAY	brown	1-17
CLAY	blue, soft	17-79
CLAY	blue, sandy, with rock	79-94
SAND	no description	94-216
PRECAMBRIAN	green	216-218

140-049-07DAD3

Date Completed:	6/26/87	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" PVC
Depth Drilled (ft):	200	Aquifer:	West Fargo North
Screened Interval (ft):	190-200	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-9
CLAY	gray	9-90
TILL	no description	90-138
SAND & GRAVEL	no description	138-200

140-049-07DCA1

Date Completed:	1961	Purpose:	Domestic Well
L.S. Elevation (ft):	890	Well Type:	4" Unknown
Depth Drilled (ft):	163	Aquifer:	West Fargo North
Screened Interval (ft):	0-154	Log Source:	

Lithologic Log - unavailable

140-049-07DDB1

Date Completed:	5/23/91	Purpose:	Test Hole
L.S. Elevation (ft):	892	Well Type:	
Depth Drilled (ft):	205	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	silty, brown	3-22
CLAY	soft, gray	22-75
CLAY	sandy, gray	75-125
SAND	drilled poorly, colored	125-135
CLAY	sandy, gray	135-136
CLAY	hard, gray	136-201
SAND	colored	201-202
ROCK	granite, green	202-205

140-049-07DDB2

Date Completed: 5/31/91
L.S. Elevation (ft): 892
Depth Drilled (ft): 203
Screened Interval (ft): 191-195

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" PVC
West Fargo North
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown	3-20
CLAY	soft, gray	20-74
CLAY	sandy, gray	74-82
SAND	fine, colored	82-90
CLAY	sandy, gray	90-107
SAND	colored	107-132
CLAY	sandy, gray	132-149
CLAY	hard, gray	149-180
SAND	colored	180-196
CLAY	with rock, gray	196-198
SAND	colored	198-202
CLAY	gray	202-203

140-049-07DDDB

Date Completed: 10/30/76
L.S. Elevation (ft): 890
Depth Drilled (ft): 206
Screened Interval (ft): 196-201

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Steel
West Fargo North
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-17
CLAY	blue	17-74
CLAY	sandy, blue	74-77
CLAY	sandy, with rock, blue	77-80
CLAY	sandy, blue	80-96
SAND	no description	96-101
CLAY	sandy, blue	101-126
SAND	no description	126-197
SAND	drilled best	197-202
SAND	dirtier	202-204
DECOMPOSED	green	204-206

140-049-08DDA

NDSWC 11271

Date Completed: 6/23/80
 L.S. Elevation (ft): 888.9
 Depth Drilled (ft): 160
 Screened Interval (ft): 148-151

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow gray, silty, slightly calcareous, oxidized	1-13
CLAY	olive gray, slightly laminated, slightly calcareous	13-73
TILL	clay, with rocks, gravel, interbedded, gray, slightly calcareous	73-78
SAND	fine to medium	78-80
TILL	gray, as above, with rocks and gravel	80-85
ROCKS	no description	85-86
TILL	as above	86-92
SAND	fine to medium, 80% quartz, slightly calcareous, some lenses of fine to medium gravel	92-146
GRAVEL	medium to coarse	146-154
CLAY	greenish, with quartz grains (weathered Precambrian)	154-160

140-049-09CBB

Date Completed: 10/24/77
 L.S. Elevation (ft): 888
 Depth Drilled (ft): 190
 Screened Interval (ft): 165-182

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 8" Steel
 West Fargo North
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow	1-14
CLAY	soft, blue	14-72
CLAY	sandy, soft, blue	72-77
CLAY	sandy, rocky, hard, blue	77-88
SAND	blue	88-90
CLAY	sandy, hard, blue	90-94
SAND	colored	94-107
SAND	mixed with gravel	107-122
SAND	colored	122-183
GRANITE	weathered, green	183-190

140-049-13ABB1

Date Completed: 8/4/72
 L.S. Elevation (ft): 893
 Depth Drilled (ft): 219

Purpose:
 Well Type:
 Log Source:

Test Hole

Frederickson's of ND, Inc

140-049-13ABB1 (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellow	2-22
CLAY	soft, blue	22-97
CLAY	sandy, hard, limestone, blue	97-114
SHALE	limestone, colored	114-116
CLAY	sandy, hard, blue	116-140
SAND	blue	140-141
CLAY	sandy, hard, boulders, blue	141-150
SAND	blue	150-152
CLAY	sandy, hard, bloulders, blue	152-198
CLAY	sandy, softer, blue	198-211
SAND	with clay, blue	211-213
SAND	clean, blue	213-217
GRANITE	weathered, green	217-219

140-049-13ABB2

Date Completed: 8/14/72
 L.S. Elevation (ft): 893
 Depth Drilled (ft): 191
 Screened Interval (ft): 140-148

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellow	2-22
CLAY	soft, blue	22-98
CLAY	sandy, hard, blue	98-111
SAND	with shale and coal, blue	111-118
CLAY	sandy, blue	118-140
SAND	blue	140-142
CLAY	sandy, hard, boulders, blue	142-147
SAND	blue	147-148
CLAY	sandy, hard, blue	148-174
SAND	washed, brown	174-181
CLAY	sandy, blue	181-191

140-049-13ABD

Date Completed: 4/26/74
 L.S. Elevation (ft): 893
 Depth Drilled (ft): 232

Purpose:
 Well Type:
 Log Source:

Test Hole
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow	1-19
CLAY	soft, blue	19-95
CLAY	sandy, rocky, blue	95-114
SAND	washed, colored	114-116
CLAY	sandy, hard, blue	116-127
CLAY	sandy, hard, boulders, blue	127-168
CLAY	sandy, hard, blue	168-224
SAND	blue	224-226
GRANITE	weathered, green	226-230
GRANITE	green	230-232

140-049-14DCC1

Date Completed: 9/9/83
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 262

Purpose:
 Well Type:
 Log Source:

Test Hole
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	gray	3-8
CLAY	brown	8-17
CLAY	gray	17-31
CLAY	gray	31-84
ROCK	colored	84-85
CLAY	gray	85-97
SAND	colored	97-98
CLAY	gray	98-120
SAND	colored	120-122
CLAY	gray	122-157
ROCK & CLAY	gray	157-163
CLAY	gray	163-241
SAND	colored	241-242
PRECAMBRIAN	green	242-262

140-049-14DCC2

Date Completed:	9/9/83	Purpose:	Industrial Well
L.S. Elevation (ft):	892	Well Type:	4" Steel
Depth Drilled (ft):	202	Aquifer:	University
Screened Interval (ft):	191-197	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-19
CLAY	gray	19-28
CLAY	gray, soft	28-67
CLAY	gray, hard	67-83
ROCK & CLAY	gray	83-98
CLAY	gray	98-126
CLAY	gray, sandy	126-149
CLAY	gray, hard	149-162
CLAY	gray, sandy	162-178
SAND	colored, fine	178-187
SAND	colored	187-197
CLAY	gray	197-202

140-049-14DCD

Date Completed:	5/14/64	NDSWC 3093	Purpose:	Test Hole
L.S. Elevation (ft):	890		Well Type:	
Depth Drilled (ft):	275		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	clayey, with silty and very fine sandy layers, oxidized, highly calcareous	0-13
CLAY	very cohesive, with silty laminations, highly calcareous	13-90
TILL	clay through gravel, shale, limestone, quartz and lignite grains, tough, cohesive, calcareous, silty	90-110
TILL	clay through gravel, very silty and sandy, abundant limestone, rockier after 131 ft, highly calcareous	110-146
TILL	clay through gravel, shale, granite, quartz, and limestone grains, solid, not particularly rocky	146-186
TILL	clay through gravel, limestone, quartz, and greenish granite, highly calcareous, may be weathered	186-217
GRAVEL	1/2 to 8 mm in size, angular to rounded, granite, limestone, quartz, shale, and pyrite rocks	217-222
TILL	as above, with abundant fragments of weathered granite	222-231
SAND	very fine to granules (4mm), angular to subrounded, abundant weathered granite, some pyrite	231-262
GRANITE	weathered, cuttings are mush, drills solid, calcareous, drills harder with depth	262-275

140-049-15DDC1

Date Completed: 0/0
 L.S. Elevation (ft): 893
 Depth Drilled (ft): 80
 Screened Interval (ft): 0-80

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Stock Well
 24" Unknown
 Undefined

Lithologic Log - unavailable

140-049-16CDD

Date Completed: 7/2/47
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 180

Purpose:
 Well Type:
 Log Source:

Test Hole

 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	gray	4-8
CLAY	yellow, fine gravel and shale pebbles	8-20
CLAY	lake	20-84
TILL	clay, sandy, gray, fine and medium gravel, shale pebbles, a little coal and limestone cuttings, rock at 106 ft	84-115
GRAVEL	fine to medium, with some sand and shale pebbles	115-175
ROCKS	no description	175-176
GRANITE	decayed, greenish gray	176-180

140-049-16DAA

Date Completed: 0/0
 L.S. Elevation (ft): 894
 Depth Drilled (ft): 146
 Screened Interval (ft): 0-146

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 2" Unknown
 West Fargo North

Lithologic Log - unavailable

140-049-17BBB

NDSWC 11268

Date Completed: 6/19/80
 L.S. Elevation (ft): 891.8
 Depth Drilled (ft): 240
 Screened Interval (ft): 212-215

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	black, cohesive, slightly calcareous	1-4
CLAY	grayish brown, calcareous, cohesive, plastic	4-16
CLAY	olive gray, cohesive, plastic, unoxidized, slightly calcareous	16-72
TILL	clay, olive gray, sand and gravel lenses	72-76
ROCKS	no description	76-77
TILL	as above	77-81
ROCK	no description	81-82

140-049-17BBB (continued)

TILL	gray, sandy	82-84
TILL	clay, shaley, black shale pieces	84-85
TILL	clay, dark gray, sandy	85-113
SAND	medium to fine, 80% quartz	113-162
SAND & GRAVEL	coarse	162-221
GRANITE	decomposed, yellowish brown	221-236
GRANITE	decomposed, bluish green with quartz grains	236-240

140-049-18BAA

NDSWC 11272

Date Completed:	6/23/80	Purpose:	Test Hole
L.S. Elevation (ft):	892	Well Type:	
Depth Drilled (ft):	200	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	olive gray to brownish gray, slightly calcareous, silty, cohesive, plastic	1-13
CLAY	olive gray to dark olive gray, slightly calcareous, plastic, cohesive	13-51
TILL	gray, slightly calcareous, some sand lenses, sand is angular	51-74
TILL	as above, with gravel lenses	74-93
CLAY	grayish green, silty, cohesive, noncalcareous	93-104
CLAY	greenish black, sandy, wood fragments, clam and snail shell fragments	104-194
CLAY	grayish black with green highlights	194-200

140-049-18BBB

NDSWC 3095

Date Completed:	5/18/64	Purpose:	Test Hole
L.S. Elevation (ft):	892	Well Type:	
Depth Drilled (ft):	290	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
SILT	clayey, with some fine sand laminae, oxidized, very calcareous	4-17
CLAY	silty, very sticky, calcareous	17-69
TILL	clay through gravel, abundant shale, limestone, granite, and quartz, highly calcareous, cohesive	69-80
BOULDER	granite	80-81
TILL	clay through gravel, very silty and very sandy, highly calcareous, drills fairly easily, wood fragments 100-105 ft and 185-190 ft, sandier after 200 ft, many green sand grains after 220 ft	81-219
CLAY	silty, cohesive, highly calcareous, laminated	219-226
TILL	clay through sand, very silty, highly calcareous, limestone, quartz, granitic, and lignite fragments, rocks fairly abundant after 250 ft, sandy from 250-260 ft	226-278

140-049-18BBB (continued)

GRANITE weathered and solid, pebbles up to 10 mm, more light colored and soft granite after 285 ft 278-290

140-049-18DDD

NDSWC 12896

Date Completed:	9/19/91	Purpose:	Observation Well
L.S. Elevation (ft):	891.83	Well Type:	2" PVC
Depth Drilled (ft):	180	Aquifer:	West Fargo North
Screened Interval (ft):	165-170	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow brownish gray, soft, smooth, very plastic (oxidized lake clay)	1-18
CLAY	gray, soft, smooth, very plastic (lake clay)	18-66
TILL	clay, sandy, silty, pebbly, gray, soft, plastic, rock at 80 ft	66-94
SAND	fine to medium, some coarse material, clay layer at 96 ft	94-100
SAND & GRAVEL	fine, medium and coarse, angular to subangular, lignitic, with quartz, granitics, and carbonates	100-122
GRAVEL	as above, only coarser	122-155
ROCKS AND GRAVEL	as above, only coarser	155-174
CLAY	green, greenish white, very soft, some coarse gritty material (weathered Precambrian)	174-180

140-049-19BAB

Date Completed:	8/29/84	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" PVC
Depth Drilled (ft):	186	Aquifer:	West Fargo North
Screened Interval (ft):	176-181	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	sandy, soft, brown	1-22
CLAY	sandy, soft, blue	22-79
CLAY	sandy, blue	79-110
SAND	drilled a little dirty	110-115
CLAY	sandy, blue	115-125
SAND	blue	125-130
CLAY	sandy, blue	130-141
SAND	blue	141-145
CLAY	sandy, blue	145-154
SAND	#15-18, brown	154-181
DECOMPOSED	green	181-186

140-049-19CCC

Date Completed:	1963	Purpose:	Domestic Well
L.S. Elevation (ft):	890	Well Type:	4" Steel
Depth Drilled (ft):	177	Aquifer:	Undefined
Screened Interval (ft):	0-177	Log Source:	

Lithologic Log - unavailable**140-049-19CDB1**

Date Completed:	7/11/74	Purpose:	Test Hole
L.S. Elevation (ft):	892	Well Type:	
Depth Drilled (ft):	260	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-17
CLAY	silty, soft, with sand, blue	17-76
CLAY	sandy, with rock, blue	76-106
SAND	with lenses of clay, blue	106-108
SAND	drilled good, blue	108-111
CLAY	sandy, with lenses of sand, blue	111-113
SAND	with lenses of clay, blue	113-114
SAND	fine, blue	114-126
CLAY	sandy, blue	126-136
SAND	fine, blue	136-145
CLAY	sandy, blue	145-182
CLAY	sandy, with shale, gray, blue, black, green	182-220
CLAY	sandy, with lenses of sand, blue	220-222
SAND	blue	222-227
CLAY	with shale, brown, blue, black	227-244
CLAY	sandy, with lenses of sand, blue	244-247
SAND	fine, blue	247-252
CLAY	sandy, with decomposed, green, blue	252-256
DECOMPOSED	green	256-260

140-049-19CDB2

Date Completed:	7/12/74	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" Steel
Depth Drilled (ft):	227	Aquifer:	West Fargo North
Screened Interval (ft):	207-223	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brown	1-15

140-049-19CDB2 (continued)

SAND	silty, soft, blue	15-20
CLAY	soft, blue	20-78
CLAY	sandy, with rock, blue	78-93
SAND	fine, blue	93-100
CLAY	sandy, blue	100-101
SAND	fine, blue	101-123
CLAY	blue	123-128
SAND	drilled good, blue	128-137
SAND	fine, blue	137-150
CLAY	sandy, with shale, black, blue	150-162
CLAY	sandy, with shale, blue	162-166
SAND	fine, blue	166-173
CLAY	sandy, with shale, blue, brown, black	173-202
SAND	fine, no sample	202-207
SAND	colored	207-217
SAND	with rock, didn't drill as good, colored	217-224
CLAY	with rock, blue	224-227

140-049-19DDD

NDSWC 3091

Date Completed: 5/11/64
 L.S. Elevation (ft): 897
 Depth Drilled (ft): 230
 Screened Interval (ft): 98-101

Purpose: Observation Well
 Well Type: 1.25" ABS
 Aquifer: West Fargo North
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
SILT	organic material, highly calcareous, clay through sand, some oxidized spots	3-5
SILT	highly calcareous, laminated, some very fine sand, oxidized	5-18
CLAY	smooth to silty, calcareous, cohesive	18-78
GRAVEL	sandy, 1/2 to 10 mm, angular to subrounded, predominantly limestone, shale, and granitic rocks	78-82
TILL	clay through sand, highly calcareous, quartz, limestone, and lignite, fairly gravelly	82-95
GRAVEL	1 to 15 mm, very angular chips to rounded, limestone, quartz, and granitic rocks, (caved here at 95 ft over night)	95-105
TILL	clay through gravel, highly calcareous, limestone fragments	105-118
GRAVEL & SAND	layers, (could be some clay also), 1/4 to 8 mm, very angular chips to well rounded, quartz, limestone, and granitic rocks with some pyrite and lignite; sand portion is predominantly well rounded quartz, chips are from larger gravel	118-130
SAND	very fine to 1 mm, angular to well rounded, predominantly quartz, with some granule sized rocks and gravel sized lignite	130-141
SAND	1/2 to 1 1/2 mm, well sorted, rounded to well rounded, predominantly quartz	141-150
SAND	as above with gravel and boulders (maybe some clay), rough drilling with abundant granitic rocks and pyrite sand	150-185

140-049-19DDD (continued)

GRANITE	weathered, soft mushy material, and some that resembles a very fine grained friable sandstone, green, highly calcareous	185-225
GRANITE	as above, but all cuttings going into the mud, mud is very thick, takes about 5 minutes for 1 ft	225-230

140-049-19DDD2

NDSWC 11270

Date Completed:	6/23/80	Purpose:	Observation Well
L.S. Elevation (ft):	893	Well Type:	1.25" PVC
Depth Drilled (ft):	197	Aquifer:	West Fargo North
Screened Interval (ft):	153-156	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brownish gray, slightly calcareous	1-9
SAND	fine, silty	9-12
CLAY	gray, slightly calcareous	12-70
TILL	clay, olive gray, slightly calcareous, interbedded with sand and gravel, with pieces of gray shale	70-78
TILL	gray, as above	78-80
TILL	clay, olive gray, with lenses of gravel	80-85
GRAVEL	medium, angular	85-103
ROCK	no description	103-104
GRAVEL	medium, grades to gray fine sand, coarse gravel 142-156 ft	104-169
ROCKS	with gravel	169-172
GRANITE	decomposed, bluish green with quartz grains	175-197

140-049-19DDD3

Date Completed:	9/9/91	Purpose:	Observation Well
L.S. Elevation (ft):	894	Well Type:	4" PVC
Depth Drilled (ft):	185	Aquifer:	West Fargo North
Screened Interval (ft):	159-179	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	black	2-3
CLAY	gray	3-5
CLAY	brown	5-18
CLAY	blue	18-73
CLAY	sandy, blue	73-88
SAND	with lenses, colored	88-90
SAND	blue	90-121
CLAY	blue	121-125
SAND	with lenses, colored	125-179

140-049-19DDD3 (continued)

GRANITE weathered, green

179-185

140-049-19DDD4

NDSWC 13413

Date Completed: 9/7/94
L.S. Elevation (ft): 895.17
Depth Drilled (ft): 170
Screened Interval (ft): 153-158

Purpose:
Well Type:
Aquifer:
Log Source:

Observation Well
2" PVC
West Fargo North
NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	black, clayey	0-3
CLAY	yellowish, oxidized	3-16
CLAY	gray (lake clay)	16-76
TILL	gravelly, gray	76-81
COAL	no description	81-82
TILL	gravelly, gray, with layers of shale gravel	82-87
SAND & GRAVEL	coarse sand and gravel	87-106
SAND & GRAVEL	coarse sand and fine to medium gravel	106-122
SAND & GRAVEL	fine to coarse sand and fine gravel	122-142
ROCKS	no description	142-143
SAND & GRAVEL	coarse sand and gravel	143-167
CLAY	sandy, greenish, bedrock	167-170

140-049-20AAA1

Date Completed: 7/5/47
L.S. Elevation (ft): 891
Depth Drilled (ft): 154

Purpose: Test Hole
Well Type:
Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gray	1-4
CLAY	yellow, with fine gravel and a few shale pebbles	4-16
CLAY	lake	16-73
TILL	clay, gray, sandy with fine to medium gravel, shale pebbles, and limestone cuttings, a lot of rocks 87-99 ft	73-106
TILL	clay, gray, a lot of fine gravel, shale pebbles, decayed granite, and a little coal	106-120
TILL	clay, gray, fine gravel, shale pebbles, quite a little coal	120-147
GRANITE	decayed	147-154

140-049-21AAA

NDSWC 3092

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):5/13/64
893
165Purpose:
Well Type:

Test Hole

Log Source:

NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
TILL	clay, sandy, cohesive, calcareous	2-5
TILL	clay through sand, a few limestone grains, organic material, calcareous	5-8
SILT	with very fine sand laminae, a few rootlets, oxidized	8-15
SILT	with very fine sand laminae	15-20
CLAY	silty to smooth, highly calcareous, sticky	20-82
TILL	clay through gravel, rough drilling, shale, limestone, and quartz, highly calcareous, very sandy, fairly solid	82-98
GRAVEL	granules and sand, very angular chips to rounded, limestone, granite, shale, with some pyrite and lignite	98-104
TILL	clay through boulders, very gravelly, rough drilling, poor samples, small pieces are very sandy	104-115
SAND	gravelly, well sorted, 1 to 4 mm, angular to rounded, granite, limestone, shale, quartz, and pyrite	115-119
TILL	as above, very sandy, very poor samples	119-126
GRAVEL	1 to 15 mm, very angular chips to rounded pebbles, predominantly granitic with limestone, and some pyrite	126-136
TILL	silt through gravel, mostly silt and very fine sand, unsorted, not very cohesive, highly calcareous, poor samples	136-141
BOULDERS	limestone and some granite, very solid	141-145
TILL	as above	145-147
GRAVEL	granite chips abundant, red or pink and green, also limestone, pyrite, and varied granules	147-153
TILL	nonexistent samples, fairly steady drilling as a clay or till, some rough spots, rock at 164 ft, abandoned hole on granitic boulder	153-165

140-049-21BBADate Completed:
L.S. Elevation (ft):
Depth Drilled (ft):7/1/47
890
165Purpose:
Well Type:

Test Hole

Log Source:

NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	gray with fine gravel	4-8
CLAY	yellow, with fine gravel and shale pebbles	8-20
SAND	fine	20-23
CLAY	lake	23-82
TILL	clay, fine gravel, fine shale pebbles, and a few specks of coal	82-90
TILL	clay, sandy, gray, with fine gravel and shale pebbles and a few specks of coal	90-111

140-049-21BBA (continued)

TILL	clay, sandy, light gray, lots of fine shale pebbles and fine gravel	111-122
GRAVEL	fine to medium, fine shale pebbles, and maybe a little gray clay	122-130
GRAVEL	fine to medium, shale pebbles, a few specks of coal	130-155
TILL	clay, gray, with a lot of fine gravel	155-158
GRANITE	decayed, green to gray	158-165

140-049-21CCC

Date Completed:	6/30/47	Purpose:	Test Hole
L.S. Elevation (ft):	890	Well Type:	
Depth Drilled (ft):	180	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	gravelly, pebbly, gray, shale pebbles	1-9
SAND	fine to medium	9-33
CLAY	lake	33-72
CLAY	gravelly, lignitic, gray, shale pebbles	72-103
CLAY	gravelly, gray, shale pebbles	103-150
CLAY	gravelly, pebbly, lignitic, gray	150-167
GRAVEL	sandy, some decayed granite, fine shale pebbles, a little gray clay	167-175
ROCK	granite (decayed), greenish gray	175-180

140-049-21DAB

Date Completed:	3/9/94	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	4" PVC
Depth Drilled (ft):	151	Aquifer:	West Fargo North
Screened Interval (ft):	136-140	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	no description	2-16
CLAY	soft	16-76
CLAY	sandy, hard	76-96
ROCK	no description	96-97
CLAY	sandy, hard	97-130
SAND	drills poor	130-136
SAND	no description	136-141
SAND	dirty	141-146
SAND	fine	146-151

140-049-21DDA1

Date Completed: 8/18/72
 L.S. Elevation (ft): 893
 Depth Drilled (ft): 157
 Screened Interval (ft): 144-154

Purpose: Domestic Well
 Well Type: 4" Steel
 Aquifer: West Fargo North
 Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-10
SHALE	brown	10-15
SHALE	blue	15-75
CLAY	sandy, blue	75-120
SAND	with decomposed mixed blue and green	120-154
DECOMPOSED	green	154-157

140-049-23CDC2

Date Completed: 11/25/96
 L.S. Elevation (ft): 897
 Depth Drilled (ft): 190
 Screened Interval (ft): 162-182

Purpose: Domestic Well
 Well Type: 0" PVC
 Aquifer: Nodak
 Log Source: Water Smith, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	tan	2-18
CLAY	gray	18-102
SAND	silty	102-112
TILL	gray clay	112-160
SAND	silty, fine, gray, dirty	160-190

140-049-24DDD

Date Completed: 0/0
 L.S. Elevation (ft): 895
 Depth Drilled (ft): 80
 Screened Interval (ft): 0-80

Purpose: Stock Well
 Well Type: 36" Unknown
 Aquifer: Undefined
 Log Source:

Lithologic Log - unavailable

140-049-25BAA2

Date Completed: 9/29/79
 L.S. Elevation (ft): 896
 Depth Drilled (ft): 201
 Screened Interval (ft): 190-196

Purpose: Irrigation Well
 Well Type: 4" Steel
 Aquifer: University
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-20

140-049-25BAA2 (continued)

CLAY	blue	20-42
SAND	colored	42-61
CLAY	blue	61-87
SAND	blue, silty, with clay	87-96
CLAY	blue, hard, sandy, small rocks	96-176
CLAY LENSES	blue, sandy	176-188
ROCK	red	188-189
SAND & ROCK	colored	189-191
SAND	no description	191-193
ROCK	red	193-194
ROCKS & SAND	colored	194-196
SAND	colored	196-198
CLAY	blue, hard, sandy	198-201

140-049-25BAB

Date Completed:	1/11/96	Purpose:	Industrial Well
L.S. Elevation (ft):	896	Well Type:	6" Steel
Depth Drilled (ft):	257	Aquifer:	University
Screened Interval (ft):	218-233	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	brown	2-18
CLAY	soft, gray	18-105
CLAY	sandy, hard	105-163
SAND	no description	163-237
SAND	dirty	237-257

140-049-25DCC

Date Completed:	9/17/91	NDSWC 12892	Purpose:	Test Hole
L.S. Elevation (ft):	900		Well Type:	
Depth Drilled (ft):	240		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	yellow gray, soft, smooth, very plastic (oxidized lake clay)	3-19
CLAY	medium to light gray, soft, smooth, very plastic (lake clay)	19-92
TILL	clay, sandy, silty, pebbly, gray, moderately soft, slightly plastic, some gravelly layers	92-136
TILL	clay, sandy, silty, some pebbles, light gray, very soft, few returns	136-145
TILL	clay, sandy, silty, pebbly, gray, soft, slightly plastic	145-161

140-049-25DCC (continued)

TILL	clay, occasional sand or pebble sized particles, dark gray, very plastic, somewhat stiff, looks like lacustrine or fluvial clay, except for sand grains	161-172
TILL	clay, sandy, silty, occasional pebbles, light gray, moderately soft, slightly plastic	172-182
CLAY	gray to light gray with a bluish tint, soft, very plastic, small gravel layer at 206'	182-221
CLAY	gray, moderately stiff, slightly silty, drills slowly, fairly plastic in some layers, and almost crumbly in others, some sections darker gray (bedrock)	221-240

140-049-26DDD

Date Completed:	8/8/63	NDSWC 2164	Purpose:	Test Hole
L.S. Elevation (ft):	900		Well Type:	
Depth Drilled (ft):	226		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty, clayey, black, plastic, calcareous, grading into light olive gray color near bottom	0-3
CLAY	silty, plastic, light olive gray, highly calcareous	3-6
CLAY	as above, only moderately yellowish brown	6-21
CLAY	silty, plastic, light olive gray, calcareous	21-84
TILL	clay, silty, with occasional sand grains and pebbles, plastic, olive gray, calcareous	84-92
SAND & GRAVEL	very fine to coarse sand, very fine to very coarse gravel	92-96
TILL	clay, silty, sandy, gravelly, plastic to slightly loose, olive gray, calcareous	96-126
SAND & GRAVEL	fine sand and gravel, clayey, loose to slightly plastic, clay fraction calcareous	126-131
TILL	fine gravel with sand, silt, and clay, loose to moderately plastic, clay fraction highly calcareous, till pebbles from 137-158 ft	131-158
TILL	gravelly, sandy, plastic to slightly loose	158-168
TILL	gravelly, sandy, olive gray, highly calcareous	168-173
TILL	sandy, gravelly, tough to plastic, olive gray, highly calcareous	173-194
TILL	clay, gravelly, some sand, tough to plastic, olive gray, highly calcareous, sandier from 200-226 ft	194-226
GRANITE	very hard, chips of greenish black crystalline rock with white splotches	226-226

140-049-26DDD2

Date Completed:	9/17/91	NDSWC 12891	Purpose:	Test Hole
L.S. Elevation (ft):	902		Well Type:	
Depth Drilled (ft):	200		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-6
CLAY	yellow gray, soft, smooth, very plastic (oxidized lake clay)	6-18
CLAY	gray, soft, smooth, very plastic (lake clay)	18-92
TILL	clay, sandy, silty, pebbly, very gravelly, moderately soft to moderately stiff, light gray, little sand, but sandier with depth, rock at 168 ft	92-169

140-049-26DDD2 (continued)

TILL clay, sometimes sandy, light gray, soft 169-200

140-049-28CBB

Date Completed:	10/5/90	Purpose:	Industrial Well
L.S. Elevation (ft):	898	Well Type:	5" PVC
Depth Drilled (ft):	150	Aquifer:	West Fargo North
Screened Interval (ft):	136-144	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brown	1-15
SAND	brown	15-20
CLAY	blue	20-72
SAND & CLAY	lenses of sand and clay, gray	72-82
CLAY	sandy clay with rock, gray	82-106
SAND	gray	106-107
CLAY	sandy clay with rock, gray	107-119
SAND	colored	119-149
ROCK	black and white	149-150

140-049-28CCC

Date Completed:	6/27/47	Purpose:	Test Hole
L.S. Elevation (ft):	895	Well Type:	
Depth Drilled (ft):	200	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
TILL	clay, gray and yellow, with fine shale pebbles	1-13
SAND	fine and medium	13-26
CLAY	lake	26-77
TILL	gray clay, alot of fine to coarse gravel, shale pebbles, and a little coal	77-104
SAND & GRAVEL	fine to medium sand, fine to medium gravel, shale pebbles, and a little coal	104-126
ROCK CUTTINGS	some fine gravel, shale pebbles, and maybe a little gray sandy clay	126-140
GRAVEL	fine, rock cuttings, shale pebbles, and maybe a little gray sandy clay	140-170
SAND & GRAVEL	fine sand, fine gravel, fine shale pebbles, and maybe a little gray clay	170-194
GRANITE	decayed, gray to green	194-200

140-049-28DDD

Date Completed:	8/5/63	Purpose:	Test Hole
L.S. Elevation (ft):	896	Well Type:	
Depth Drilled (ft):	189	Log Source:	NDSWC

140-049-28DDD (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black, clayey, plastic	0-3
CLAY	olive gray to yellowish brown, plastic, calcareous	3-10
CLAY	silty, greenish gray, plastic, calcareous, a few small pebbles	10-15
CLAY	as above, only slightly calcareous	15-21
CLAY	slightly silty, dark olive gray, very plastic, calcareous	21-84
TILL	sandy, gravelly, dark gray, slight to moderate plasticity, calcareous	84-100
TILL	clay, sand, and fine gravel, slightly plastic to loose	100-110
SAND	very fine to very coarse, loose, some fine gravel	110-167
BOULDER	no description	167-168
GRANITE	decomposed, sand, fine gravel, and white clay	168-175
GRANITE	as above, except, with red and white clay	175-179
GRANITE	as above, except back to white clay	179-189

140-049-29DDD

NDSWC 2160

Date Completed:	7/30/63	Purpose:	Observation Well
L.S. Elevation (ft):	891.6	Well Type:	1.25" ABS
Depth Drilled (ft):	212	Aquifer:	West Fargo North
Screened Interval (ft):	0-210.7	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black, clayey, moderately plastic	0-4
CLAY	pale brown, moderately plastic, streaks and spots of oxidized material	4-11
CLAY	dark olive gray with pale brown spots, slightly fissile to plastic, calcareous	11-13
NO RECOVERY	no description	13-15
CLAY	dark olive gray, plastic, calcareous, occasional pebbles	15-17
CLAY	dark olive gray with brownish tint, plastic, becoming slightly fissile near bottom, calcareous	17-20
NO RECOVERY	no description	20-25
CLAY	dark olive gray, plastic, calcareous	25-54
TILL	clay, olive gray, plastic, pebbles, some sand, calcareous, some cobbles	54-95
SAND	very fine to very coarse, fine gravel, occasional cobbles, slightly clayey	95-158
GRAVEL	pebble sized, consists of bits of shale, granite, and limestone, some coarse sand	158-168
TILL	clay, silty, sandy, some fine gravel, olive gray, moderately plastic, calcareous	168-174
TILL	clay, silty, sandy, some fine gravel, reddish brown, moderately plastic, slightly calcareous	174-178
TILL	clay, sandy, some fine gravel, dark olive gray, moderately plastic, slightly calcareous	178-189
GRANITE	decomposed, clayey, slightly sandy, greenish gray to black, with red and black inclusions, calcareous	189-210
GRANITE	decomposed, greenish black, noncalcareous except for white inclusions	210-212

140-049-30ADD1

NDSWC 12893

Date Completed: 9/18/91
 L.S. Elevation (ft): 894.4
 Depth Drilled (ft): 220
 Screened Interval (ft): 156-161

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" PVC
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellow gray, soft, smooth, very plastic (oxidized lake clay)	2-19
CLAY	gray, soft, smooth, very plastic (lake clay)	19-68
TILL	clay, sandy, silty, pebbly, gray, fairly stiff, with gravel layers	68-83
SAND & GRAVEL	fine sand to medium gravel, subangular to subrounded, rocky from 88 to 90 ft	83-90
TILL	clay, sandy, silty, pebbly, dark gray, fairly stiff, moderately plastic	90-101
SAND	fine to coarse, predominantly fine to medium, silty clay layers at 107 and 113 ft, fairly clean sand otherwise	101-177
TILL	clay, sandy, silty, brownish gray, very soft, plastic drills easily	177-190
GRAVEL	sandy, medium to coarse, subangular to subrounded, dirty	190-212
CLAY	grayish green, bright green and dark green, soft in places, gritty in others (weathered Precambrian)	212-220

140-049-30ADD2

NDSWC 12894

Date Completed: 9/18/91
 L.S. Elevation (ft): 894.39
 Depth Drilled (ft): 220
 Screened Interval (ft): 198-208

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" PVC
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellow gray, soft, smooth, very plastic (oxidized lake clay)	2-17
CLAY	gray, soft, smooth, very plastic (lake clay)	17-68
TILL	clay, sandy, silty, pebbly, gray	68-83
SAND	fine to coarse	83-89
TILL	clay, sandy, silty, pebbly, gray, stiff, plastic	89-101
SAND	fine to coarse	101-108
CLAY	silty, brown (fluvial)	108-113
SAND	fine to medium, predominantly medium	113-177
TILL	clay, sandy, silty, pebbly, brown, with rocks at 186 and 188 ft	177-191
SAND & GRAVEL	layers of clay at 191, 197 to 200 ft, and 204 ft	191-210
CLAY	greenish (weathered Precambrian)	210-220

140-049-30BAAB

Date Completed: 10/30/87
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 197
 Screened Interval (ft): 186-190

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" PVC
 West Fargo North
 LTP Enterprises, Inc

140-049-30BAAB (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brown	1-30
CLAY	blue	30-70
CLAY	sandy, gray	70-142
SAND	gray	142-152
SAND	gray	152-183
CLAY	sandy, gray	183-197

140-049-31ACB

Date Completed:	0/0	Purpose:	Domestic Well
L.S. Elevation (ft):	890	Well Type:	0" Unknown
Depth Drilled (ft):	18	Aquifer:	Undefined
Screened Interval (ft):	0-18	Log Source:	

Lithologic Log - unavailable

140-049-31BAB

Date Completed:	8/14/63	NDSWC 2167	Purpose:	Test Hole
L.S. Elevation (ft):	895		Well Type:	
Depth Drilled (ft):	251		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty, plastic, black, calcareous	0-2
CLAY	silty, slightly sandy, plastic, light olive gray, highly calcareous	2-8
CLAY	silty, plastic, dusky yellow to moderate yellowish brown, highly calcareous	8-21
CLAY	slightly silty, plastic, dark greenish gray, highly calcareous	21-72
TILL	clay, silty, sandy, few pebbles, dark greenish gray to olive gray	72-79
TILL	as above, only with lenses of very fine to very coarse sand and some fine gravel	79-84
CLAY	silty, some fine sand, micaceous, plastic, dark greenish gray, highly calcareous	84-121
TILL	clay, sandy, silty, few pebbles, plastic, dark greenish gray, highly calcareous	121-126
TILL	clay, very sandy, silty, some fine gravel, plastic to slightly plastic, dark greenish gray, highly calcareous	126-168
SILT	loose, no sample return	168-179
CLAY	very sandy, some loose silt, no sample return	179-242
SAND & GRAVEL	loose, clean	242-250
GRANITE	no description	250-251

140-049-31CDC

Date Completed:	8/20/63	NDSWC 2168	Purpose:	Observation Well
L.S. Elevation (ft):	895		Well Type:	1.25" ABS
Depth Drilled (ft):	242		Aquifer:	West Fargo North
Screened Interval (ft):	0-200		Log Source:	NDSWC

140-049-31CDC (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty, moderately plastic, black, highly calcareous	0-4
CLAY	plastic, light olive brown, calcareous	4-16
CLAY	silty, plastic, olive gray, highly calcareous	16-63
TILL	sandy, silty, few pebbles, plastic, olive gray, highly calcareous, abundant gravel in interval between 78 1/2 to 84 ft	63-84
SAND	fine to coarse, some fine gravel, loose, clean	84-95
CLAY	silty, plastic, olive gray, highly calcareous	95-100
SAND	as in 84-95 ft	100-105
CLAY	silty as in 95-100 ft, some fine sand	105-111
SAND	as in 84-95 ft	111-116
SAND & GRAVEL	loose, both sand and gravel, range from medium to coarse	116-126
SAND	medium to coarse, loose	126-194
SAND & GRAVEL	loose, sand medium to coarse, gravel fine to medium	194-200
SAND & GRAVEL	as above, only gravel is coarser	200-205
KAOLINITE?	hard, yellowish gray, (decomposed granite?)	205-219
CLAY	plastic, moderate reddish brown, noncalcareous, few sand grains and streaks of light greenish gray clay	219-221
CLAY	as above changing to light bluish gray, plastic, sandy, some fine gravel, noncalcareous	221-231
CLAY	as above	231-242

140-049-32ADD

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):

6/20/47
900
180

Purpose:
Well Type:

Log Source:

Test Hole

Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
TILL	clay, with fine shale pebbles, yellow	1-13
SAND	fine and medium	13-29
CLAY	lake	29-74
TILL	clay, blue, with fine and coarse gravel, and shale pebbles	74-80
TILL	clay, sandy, gray, fine gravel and shale pebbles	80-107
SAND	coarse, with fine to medium gravel, shale pebbles, and a little coal	107-110
GRAVEL	fine and medium, with shale pebbles and rock cuttings	110-128
SAND & GRAVEL	fine and medium sand, fine gravel and shale pebbles, limestone boulders at 147 ft	128-150
GRAVEL	fine and medium, shale pebbles, and maybe a little gray sandy clay	150-159
TILL	clay, a little fine sand and gravel, light gray	159-165
SLATE	green and red, decomposed	165-172

140-049-32ADD (continued)

GRANITE decayed, very light gray

172-180

140-049-32BBB

NDSWC 2166

Date Completed: 8/12/63
 L.S. Elevation (ft): 896.4
 Depth Drilled (ft): 237
 Screened Interval (ft): 174-228

Purpose: Observation Well
 Well Type: 1.25" ABS
 Aquifer: West Fargo North
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty, clayey, plastic, black, grading into clay, silty, plastic, light olive gray, highly calcareous	0-3
CLAY	silty, plastic, light olive gray, highly calcareous, changing to moderate yellowish brown at 10 ft	3-22
CLAY	silty, plastic, dark greenish gray, highly calcareous	22-67
TILL	clay, silty, sandy, gravelly, plastic, dark greenish gray, highly calcareous, very little gravel from 73-77 ft	67-77
GRAVEL	sandy, loose, few till pebbles	77-81
TILL	as in 67-77 ft till	81-138
TILL	gravelly, sandy, loose to plastic, dark greenish gray, highly calcareous	138-147
TILL	clay, silty, sandy, some gravel, dark greenish gray, highly calcareous	147-174
SAND & GRAVEL	sand mostly coarse, gravel fine, some coal, shale, limestone, and granitic material, loose	174-189
GRAVEL	sandy, loose, fine to very coarse, sand mostly coarse	189-200
SAND & GRAVEL	slightly clayey in upper 5 ft, loose, sand mostly coarse, gravel fine	200-221
CLAY	bluish green, fine gravel and coarse sand	221-228
GRANITE	decomposed, grayish blue-green, soft, plastic, with chips of fresh crystalline rock	228-237

- 722
 - 675

140-049-32BBB2

Date Completed: 6/13/83
 L.S. Elevation (ft): 895.5
 Depth Drilled (ft): 130
 Screened Interval (ft): 127-130

Purpose: Observation Well
 Well Type: 1" Steel
 Aquifer: Till
 Log Source:

Lithologic Log - unavailable

140-049-32BBB3

Date Completed: 6/14/83
 L.S. Elevation (ft): 895.5
 Depth Drilled (ft): 100
 Screened Interval (ft): 97-100

Purpose: Observation Well
 Well Type: 1" Steel
 Aquifer: Till
 Log Source:

Lithologic Log - unavailable

140-049-32BBC

Date Completed: 00
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 176
 Screened Interval (ft): 170-176

Purpose: Domestic Well
 Well Type: 4" Unknown
 Aquifer: West Fargo North
 Log Source:

Lithologic Log - unavailable

140-049-33ABB

NDSWC 12253

Date Completed: 10/4/82
 L.S. Elevation (ft): 891.3
 Depth Drilled (ft): 209
 Screened Interval (ft): 184-189

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellowish brown, very plastic, (oxidized lake clay)	1-14
CLAY	gray, very plastic (lake clay)	14-73
TILL	clay, sandy, with gravel layers	73-89
SAND & GRAVEL	very poorly sorted, sands fine, medium and coarse, gravel up to 2.5 mm in diameter, clay layer from 92-95 ft	89-102
GRAVEL	sandy, subrounded to rounded, predominantly carbonates, very coarse (2.5 mm diameter) from 140-148 ft, green Precambrian material 170-190 ft	102-191
CLAY	light green, sandy, talc-like when dry	191-209

140-049-33DDD

Date Completed: 6/9/47
 L.S. Elevation (ft): 900
 Depth Drilled (ft): 173

Purpose:
 Well Type:

Test Hole

Log Source:

NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
TILL	clay, yellow, and fine gravel	4-22
CLAY	lake	22-82
TILL	clay, blue, fine gravel and shale pebbles, limestone rock at 88 ft	82-90
TILL	clay, gray with gravel and shale pebbles	90-126
TILL	sandy, gray, fine gravel and shale pebbles	126-138
TILL	clay, blue, fine gravel and shale pebbles	138-145
SAND & GRAVEL	fine to coarse sand, fine and medium gravel and shale pebbles	145-148
GRAVEL	fine and medium, with shale pebbles	148-169
BOULDERS	limestone and granite	169-173

140-049-34ABB

NDSWC 12251

Date Completed: 10/4/82
 L.S. Elevation (ft): 897
 Depth Drilled (ft): 110

Purpose:
 Well Type:

Test Hole

Log Source:

NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow brown, plastic, (oxidized lake clay)	1-13

140-049-34ABB (continued)

CLAY	gray, very plastic (lake clay)	13-18
SAND	very fine to fine, moderately sorted	18-26
CLAY	gray, very plastic (lake clay)	26-90
TILL	clay, gray, sandy, lost circulation and moved to new hole	90-110

140-049-34ABB2

NDSWC 12252

Date Completed:	10/4/82	Purpose:	Observation Well
L.S. Elevation (ft):	895.6	Well Type:	1.25" PVC
Depth Drilled (ft):	180	Aquifer:	Nodak
Screened Interval (ft):	163-168	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellowish brown, very plastic (oxidized lake clay)	1-13
CLAY	gray, very plastic (lake clay)	13-18
SAND	fine to very fine	18-26
CLAY	gray, very plastic (lake clay)	26-95
GRAVEL	coarse, very angular	95-96
TILL	clay, lots of sands and gravels, gravel layer 105-106 ft, rock at 109 ft, rocks at 121 ft	96-126
SAND	medium, fairly well rounded, large amount of weathered Precambrian material	126-131
GRAVEL	with layered clays, large quartz grains, grains have more angularity with depth, also more green rock material with depth	131-169
CLAY	light reddish tan, slightly mottled, silty	169-172
CLAY	light tan, silty, slightly benonitic	172-176
CLAY	light reddish brown, crumbly, very silty, mottled (oxidized weathered Precambrian)	176-180

140-049-34ABB3

NDSWC 13412

Date Completed:	9/6/94	Purpose:	Observation Well
L.S. Elevation (ft):	895.55	Well Type:	2" PVC
Depth Drilled (ft):	180	Aquifer:	Nodak
Screened Interval (ft):	163-168	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellowish, oxidized	2-14
CLAY	gray	14-23
SAND	fine	23-24
CLAY	gray	24-92
TILL	gravelly, dark gray	92-95
TILL	dark gray	95-102
TILL	sandy, gravelly, light gray	102-107

140-049-34ABB3 (continued)

ROCK	no description	107-108
TILL	sandy, light gray	108-109
ROCKS	no description	109-110
TILL	sandy, gray, with rocks	110-111
TILL	sandy, gravelly, light gray	111-123
TILL	gravelly, sandy, gray	123-130
SAND & GRAVEL	fine to coarse sand and medium gravel	130-151
SAND & GRAVEL	coarse sand and gravel, and layers of greenish clay	151-171
CLAY	white and greenish, bedrock	171-180

140-049-34BBB

NDSWC 12890

Date Completed:	9/16/91	Purpose:	Observation Well
L.S. Elevation (ft):	893.05	Well Type:	2" PVC
Depth Drilled (ft):	185	Aquifer:	West Fargo North
Screened Interval (ft):	165-170	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL MATERIAL	black clay	0-5
CLAY	grayish tan with reddish mottling, soft very plastic (oxidized lake clay)	5-15
CLAY	light gray, very soft, very plastic (lake clay)	15-84
TILL	clay, sandy, silty, pebbly, soft, gray, moderately plastic, lots of pebbles	84-96
TILL	clay, sandy, silty, pebbly, dark gray, stiff, not much sand	96-98
TILL	clay, sandy, silty, pebbly, soft, light gray, very silty with fine sand, drills slow in spite of being soft, very little plasticity, rocks at 101, 106, and 107 ft	98-136
SAND & GRAVEL	fine sand to very coarse gravel (up to 1.5 mm in dia.), dirty, poorly sorted	136-170
GRAVEL	medium to coarse, predominantly quartz and green Precambrian material, angular to subangular	170-182
CLAY	white with some green particles, soft, plastic, smooth (weathered Precambrian)	182-185

140-049-34CBB

NDSWC 11992

Date Completed:	9/23/82	Purpose:	Test Hole
L.S. Elevation (ft):	896	Well Type:	
Depth Drilled (ft):	190	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow tan (oxidized lake clay)	1-15
SAND	poor sample return	15-16
CLAY	gray, very plastic (lake clay)	16-84
TILL	clay, gray, sandy, with gravelly layers, rocks at 101, 106, 108, and 120 ft	84-162

140-049-34CBB (continued)

SAND & GRAVEL	very dirty, full of small lenses of clay	162-167
CLAY	dark gray, silty, low plasticity (bedrock)	167-190

140-049-34CCCA

Date Completed:	7/5/89	Purpose:	Observation Well
L.S. Elevation (ft):	899.6	Well Type:	2" PVC
Depth Drilled (ft):	20	Aquifer:	Undefined
Screened Interval (ft):	8-18	Log Source:	Twin City Testing Corp

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
FILL	organic clay, black, rather stiff	0-1
TOPSOIL	organic clay, black, rather stiff	1-4
CLAY	fat, brown and gray mottled, medium, laminations of silt	4-14
SILT	sandy, brown and gray, moist, loose	14-16
CLAY	fat, gray mottled	16-20

140-049-34CCD

Date Completed:	00/00/00	Purpose:	Industrial Well
L.S. Elevation (ft):	899	Well Type:	0" Unknown
Depth Drilled (ft):	248	Aquifer:	West Fargo North
Screened Interval (ft):	0-248	Log Source:	

Lithologic Log - unavailable

140-049-34CDD

Date Completed:	6/12/47	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	210	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	yellow, with fine shale pebbles	3-12
CLAY	blue, lake	12-16
SAND	fine and medium	16-22
CLAY	lake	22-88
TILL	clay, gray, fine and medium gravel, a few specks of coal and fine shale pebbles, limestone rock at 99 ft	88-103
GRAVEL	fine and medium with shale pebbles	103-112
TILL	clay, sandy, gray, fine to coarse gravel and shale pebbles	112-115
TILL	clay, sandy, gray, fine and coarse gravel, shale pebbles and a little coal	115-160
GRANITE	decayed, greenish gray	150-210

140-049-34DCC

NDSWC 11990

Date Completed: 9/22/82
 L.S. Elevation (ft): 895
 Depth Drilled (ft): 200

Purpose:
 Well Type:

Test Hole

Log Source:

NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	plastic, yellow tan, (oxidized lake clay)	1-16
SAND	yellow, oxidized, very fine to medium	16-20
CLAY	gray, very plastic (lake clay)	20-85
TILL	clay, light gray, very sandy	85-101
SAND	gravelly, poorly sorted	101-105
TILL	clay, gray, sandy, gravelly, rocks at 109, 124, 136 ft	105-159
CLAY	whitish, bentonitic, with weathered granite, some firmer layered dark clays, slightly bluish green from 170-180 ft, reddish material 180 ft, then greenish toward 200 ft	159-200

140-049-35BAA

NDSWC 12254

Date Completed: 10/5/82
 L.S. Elevation (ft): 898.7
 Depth Drilled (ft): 220
 Screened Interval (ft): 171-176

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 Nodak
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-6
CLAY	yellow brown, very plastic, (oxidized lake clay)	6-18
CLAY	gray, very plastic (lake clay)	18-88
TILL	clay, gray, sandy, sand and gravel layers at 116-119, 121, 125-127, 132-135, and 144-147 ft	88-160
GRAVEL	sandy, poorly sorted, angular to subrounded, predominantly carbonates with some clay layers	160-182
CLAY	gray, silty, poor sample return	182-193
GRAVEL	coarse, subangular to subrounded, predominantly carbonates with some granitic material	193-203
ROCK	no description	203-204
CLAY	light green, sand particles	204-207
PRECAMBRIAN	dark green, brittle rock	207-220

140-049-35BBB

NDSWC 2162

Date Completed: 8/6/63
 L.S. Elevation (ft): 895
 Depth Drilled (ft): 188

Purpose:
 Well Type:

Test Hole

Log Source:

NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	clayey, silty, black, plastic, calcareous, some sand	0-1
CLAY	silty, grayish brown, plastic, calcareous	1-5

140-049-35BBB (continued)

CLAY	silty, yellow brown, plastic, calcareous, with streaks and splotches of oxidized material	5-15
CLAY	slightly silty, dark olive gray, to greenish gray, plastic, calcareous	15-21
SAND	loose, very fine to medium, olive gray to olive brown	21-26
CLAY	slightly silty, olive gray, plastic, calcareous	26-30
CLAY	slightly silty, olive gray, plastic, calcareous, some sand and pebbles	30-89
TILL	sand, gravel and clay, loose to slightly plastic	89-94
TILL	sandy, gravelly, olive gray, tough, calcareous	94-105
TILL	sand, fine gravel, and clay, loose to plastic, calcareous, rough drilling	105-123
BOULDER	no description	123-124
TILL	sand, gravel, and clay, loose to plastic, calcareous, rough drilling	124-165
BOULDER	no description	165-166
GRAVEL	rocks, and some sand, mostly loose, very little clay	166-184
GRANITE	very hard	184-188

140-049-35CA

Date Completed:	00/00/00	Purpose:	Industrial Well
L.S. Elevation (ft):	896	Well Type:	36" Unknown
Depth Drilled (ft):	70	Aquifer:	Undefined
Screened Interval (ft):	0-70	Log Source:	

Lithologic Log - unavailable

140-049-35DDD

Date Completed:	12/22/60	Purpose:	Industrial Well
L.S. Elevation (ft):	901	Well Type:	8" Steel
Depth Drilled (ft):	191	Aquifer:	Undefined
Screened Interval (ft):	0-189	Log Source:	

Lithologic Log - unavailable

140-049-36AAA

NDSWC 2163

Date Completed:	8/7/63	Purpose:	Observation Well
L.S. Elevation (ft):	896.63	Well Type:	1.25" ABS
Depth Drilled (ft):	291	Aquifer:	University
Screened Interval (ft):	157-228	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	silty, clayey, black, plastic, calcareous	0-2
CLAY	silty, some fine sand, olive brown, plastic, calcareous	2-16
CLAY	slightly silty, light olive gray, plastic, calcareous	16-31
CLAY	dark olive gray, very plastic, calcareous	31-74
CLAY	as above, only slightly sandy	74-96
TILL	sand, gravel and clay, loose to slightly plastic, calcareous	96-105
TILL	clay, sandy, gravelly, slightly plastic, very calcareous, olive gray	105-121
SAND	fine to coarse, some gravel, calcareous	121-126

140-049-36AAA (continued)

TILL	clay, sandy, gravelly, slightly plastic, olive gray, calcareous	126-158
SAND & GRAVEL	loose	158-179
SAND	fine to coarse, loose	179-216
GRAVEL	some medium to coarse sand, loose	216-221
SAND	fine to coarse, some fine gravel, loose	221-228
TILL	clay, sandy, moderate plasticity, olive gray, very calcareous	228-252
CLAY	silty, some sand, light olive gray, plastic, calcareous	252-291
GRANITE	very hard	291-291

140-049-36BCC

Date Completed:	10/20/93	NDSWC 13343	Purpose:	Test Hole
L.S. Elevation (ft):	892		Well Type:	
Depth Drilled (ft):	196		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow brown, soft, smooth, very plastic, (oxidized lake clay)	1-14
CLAY	medium gray, soft, smooth, very plastic, (lake clay)	14-87
CLAY	gray, sandy, silty, pebbly, (till)	87-97
CLAY	gray, sandy, soft, more gravel from 101 to 109 feet, (till)	97-109
CLAY	gray, very sandy, soft, with rocks at 111 and 117 feet, (till)	109-118
CLAY	gray, very sandy, firm, rocks, (till)	118-125
ROCKS	no description	125-126
CLAY	light gray, sandy, soft, rocks at 130 feet, (till)	126-138
CLAY	light gray and brownish, soft, sandy, layered, (till)	138-143
CLAY	brownish, sandy, with layers of coal and layers of greenish clay, (till)	143-149
SILT	gray brown, clayey, some sand	149-156
CLAY	dark gray, silty, fairly firm, fairly plastic	156-162
CLAY	black, silty, slightly plastic, (Cretaceous bedrock?)	162-181
CLAY	white, very soft, light greenish tint in places, sandy, (weathered Precambrian)	181-196

140-050-02ADB2

Date Completed:	8/21/73	Purpose:	Domestic Well
L.S. Elevation (ft):	889	Well Type:	4" Steel
Depth Drilled (ft):	192	Aquifer:	Undefined
Screened Interval (ft):	180-186	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	no description	2-7

140-050-02ADB2 (continued)

CLAY	no description	7-10
SHALE	soft	10-64
CLAY	sandy	64-116
SAND	no description	116-117
CLAY	sandy	117-156
SAND	no description	156-157
CLAY	sandy	157-158
SAND	fine	158-162
CLAY	sandy	162-163
SAND	no description	163-186
SAND	dirty	186-192

140-050-03BCC2

Date Completed:	3/15/73	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	3" Steel
Depth Drilled (ft):	162	Aquifer:	Prosper
Screened Interval (ft):	155-160	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-4
CLAY	yellow	4-19
CLAY	gray	19-61
TILL	dark gray	61-73
GRAVEL	coarse	73-74
TILL	dark gray	74-87
TILL	light	87-141
GRAVEL	coarse	141-162

140-050-03DCC

Date Completed:	6/21/83	NDSWC 12324	Purpose:	Test Hole
L.S. Elevation (ft):	897		Well Type:	
Depth Drilled (ft):	253		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	slightly silty, yellow-brown, oxidized, plastic, cohesive.	2-17
CLAY	very slightly silty, olive-gray, plastic, cohesive.	17-62
CLAY	silty, sandy, pebbly, rocky, olive-gray, poorly sorted; shale gravel from 64 to 66 feet (till).	62-83
SAND	medium and coarse, some gravel, angular to subrounded, some silts; poor return.	83-88
TILL	as above, very sandy and rocky.	88-243

140-050-03DCC (continued)

GRAVEL	fine to pea size, predominantly shale and carbonate, some quartz, igneous, subrounded, few rounded, poor to fair sorting; drills rough.	243-250
CLAY	greenish, sandy, silty, bedrock clay.	250-253
GRAVEL	rocks, some bedrock clay; could not get through.	253-253

140-050-04CBB

Date Completed:	6/17/88	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	5" PVC
Depth Drilled (ft):	119	Aquifer:	Prosper
Screened Interval (ft):	108-116	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	gray	2-4
CLAY	brown	4-13
CLAY	blue	13-60
CLAY	sandy, blue	60-72
SAND	colored	72-75
SANDY	blue	75-76
SAND	colored	76-77
CLAY	sandy, blue	77-82
SAND	colored	82-87
CLAY	sandy, blue	87-90
SAND	colored	90-116
CLAY	sand clay, blue	116-119

140-050-04CBB2

Date Completed:	11/9/81	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	4" PVC
Depth Drilled (ft):	95	Aquifer:	Prosper
Screened Interval (ft):	82-90	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-25
CLAY	blue, soft	25-62
CLAY	gray, sandy	62-71
ROCK	white	71-72
CLAY	gray, sandy, with sand lenses	72-80
SAND	colored	80-90
CLAY	gray, colored	90-95

140-050-06CCB2

Date Completed:	3/26/85	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	4" PVC
Depth Drilled (ft):	107	Aquifer:	Undefined
Screened Interval (ft):	101-107	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-20
CLAY	gray, soft	20-61
CLAY	gray	61-70
SAND	colored	70-107

140-050-08CBB

Date Completed:	4/23/82	Purpose:	Domestic Well
L.S. Elevation (ft):	902	Well Type:	5" PVC
Depth Drilled (ft):	142	Aquifer:	Undefined
Screened Interval (ft):	120-130	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-21
CLAY	gray	21-56
TILL	no description	56-77
SAND	no description	77-82
SAND & TILL	no description	82-99
SAND	no description	99-112
SAND & TILL	no description	112-118
SAND	no description	118-132
SAND & TILL	no description	132-142

140-050-09ABB

Date Completed:	6/21/83	NDSWC 12325	Purpose:	Observation Well
L.S. Elevation (ft):	894.5		Well Type:	1.25" PVC
Depth Drilled (ft):	320		Aquifer:	Prosper
Screened Interval (ft):	258-263		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	very little silt, black, sticky.	2-5
CLAY	yellow-brown, cohesive, plastic, oxidized.	5-17
CLAY	olive-gray, plastic, cohesive (lake clay).	17-58
CLAY	olive-gray, silty, sandy, pebbly, rocky, poorly sorted (till).	58-81

140-050-09ABB (continued)

CLAY	slightly silty, drills smooth.	81-86
TILL	as above.	86-88
SAND	medium and coarse, subrounded and rounded, good sorting, predominantly quartz, with shale, carbonate and igneous.	88-109
GRAVEL	pea size to 0.5 inch diameter, interbedded with medium to very coarse sand, composition as above, subrounded and rounded, taking water.	109-113
GRAVEL	with medium to coarse sand, minor interbeds of clay.	113-121
GRAVEL	predominantly shale, junky return.	121-125
CLAY	silty, olive-gray; drills smooth.	125-129
GRAVEL	shale; drills rough.	129-130
TILL	as above, sandy, occasional stringer of sand and gravel.	130-208
CLAY	very silty, olive-gray.	208-216
SAND	fine and medium, predominantly quartz and shale, with carbonate and igneous, subrounded and rounded; poor return; drill chatters, clean.	216-287
CLAY	greenish-brown and reddish, lignite chips, bentonite specks; sandstone and greenish shale sand from 317 to 320 feet.	287-320

140-050-10AAA

Date Completed:	7/18/91	Purpose:	Domestic Well
L.S. Elevation (ft):	893	Well Type:	5" PVC
Depth Drilled (ft):	171	Aquifer:	Undefined
Screened Interval (ft):	140-160	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-4
CLAY	yellow	4-23
CLAY	gray	23-68
TILL	gravelly	68-125
SAND	no description	125-171

140-050-12BBC2

Date Completed:	7/7/80	Purpose:	Municipal Well
L.S. Elevation (ft):	893	Well Type:	4" Steel
Depth Drilled (ft):	182	Aquifer:	Undefined
Screened Interval (ft):	162-172	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown	3-17
CLAY	blue, soft	17-70
CLAY	blue, sandy	70-112
SAND	colored	112-120
CLAY	blue, sandy	120-129

140-050-12BBC2 (continued)

SAND	colored	129-131
CLAY	blue, sandy	131-150
SAND	colored	150-180
SAND	blue	180-182

140-050-13CCC

NDSWC 12320

Date Completed:	6/15/83	Purpose:	Observation Well
L.S. Elevation (ft):	897.5	Well Type:	1.25" PVC
Depth Drilled (ft):	240	Aquifer:	94/10 Channel
Screened Interval (ft):	164-169	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	slightly silty, black, sticky (fill material).	1-9
CLAY	yellow-brown, oxidized, iron stained.	9-22
CLAY	olive-gray, cohesive, sticky, unoxidized (lake clay).	22-74
CLAY	silty, sandy, pebbly, numerous rocks, olive-gray, poorly sorted (till).	74-101
GRAVEL	with medium and coarse sand, predominantly shale and quartz, with carbonate and igneous, subrounded.	101-106
TILL	as above.	106-123
CLAY	very silty, no pebbles, brown to black.	123-129
SAND	medium and coarse, with 0.5 inch gravel, predominantly shale and quartz, with carbonate and igneous, subrounded; drills fast.	129-137
TILL	as above.	137-141
CLAY	silty, sandy, with layers of gravel; real junky.	141-153
CLAY	silty, sandy, olive-gray, not as plastic as above.	153-163
SAND	medium and coarse, with gravel, predominantly shale, with quartz and igneous, fair sorting; drills rough, choppy, appears clean.	163-172
TILL	clay, more silty, olive-gray.	172-214
CLAY	silty, olive-gray, with layer of sand and gravel; very poor return.	214-223
CLAY	some silts, greenish (bedrock).	223-240

140-050-15BBB

NDSWC 12923

Date Completed:	10/22/91	Purpose:	Observation Well
L.S. Elevation (ft):	893.83	Well Type:	2" PVC
Depth Drilled (ft):	303	Aquifer:	Prosper
Screened Interval (ft):	251-256	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-2
CLAY	yellow-brown, soft, smooth, very plastic, oxidized (lake clay).	2-16
CLAY	gray, soft, smooth, very plastic (lake clay).	16-59

140-050-15BBB (continued)

CLAY	sandy, silty, pebbly, gray to dark gray, soft, moderately plastic; very gravelly; rock at 76 feet (till).	59-76
CLAY	very sandy, silty, pebbly, light gray, soft, moderately plastic (till).	76-84
SAND	fine to coarse, poorly sorted.	84-87
CLAY	silty, sandy, pebbly, gray, moderately stiff, slightly plastic (till).	87-95
CLAY	very sandy, silty, pebbly, brownish-gray, soft, low plasticity (till).	95-98
SAND	fine and medium, poorly sorted.	98-101
CLAY	very sandy, very silty, pebbly, light to brownish-gray, soft, slightly plastic; rock at 105 feet (till).	101-105
CLAY	silty, dark gray, fairly stiff, mica flakes, moderate plasticity (fluvial or lacustrine).	105-115
CLAY	very few returns; possibly till.	115-118
CLAY	with numerous sand and gravel layers; igneous rock at 130 feet (till).	118-131
CLAY	silty, gray, soft, moderately plastic; some layers soft, some fairly firm; some layers silt, clayey, micaceous (fluvial or lacustrine).	131-211
SAND	fine and medium, silty layers; clay from 215 to 216 feet; poor return.	211-220
SAND	medium and coarse, some gravel, some fine sand and silt, predominantly quartz with shale pieces and some carbonate; cleaner with depth.	220-266
CLAY	little sample return; rock at 269 feet; possibly till.	266-284
SAND & GRAVEL	sand, medium and coarse, gravel, fine and medium, quartz and carbonate, some shale, coarser material, igneous and metamorphic.	284-300
CLAY	green (weathered Precambrian).	300-303

140-050-15DDDC1 (east)

Date Completed:	6/16/83	NDSWC 12321A	Observation Well
L.S. Elevation (ft):	895.7	Purpose:	1.25" PVC
Depth Drilled (ft):	340	Well Type:	Prosper
Screened Interval (ft):	298-303	Aquifer:	NDSWC
		Log Source:	

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	silty, sandy, pebbles, yellow-brown. oxidized (till).	1-5
CLAY	yellow-brown, plastic, cohesive, oxidized.	5-18
CLAY	olive-gray, very plastic (lake clay).	18-66
CLAY	silty, sandy, shale pebbles, olive-gray, poorly sorted; drills rough (till).	66-173
SAND	fine and medium, predominantly shale and quartz, rounded, good sorting; drills choppy; poor return.	173-181
SAND	layered with black to brown clay; drills slow then fast; poor return.	181-186
SAND	medium and coarse, with pebble gravels, subrounded and rounded, fair to good sorting, predominantly shale and quartz with carbonate and igneous; appears layered; drills choppy but smooth.	186-226
GRAVEL	with medium and coarse sand, subrounded and rounded, composition roughly the same as above, occasional cobble, fair sorting; drills real clean.	226-240
GRAVEL	as above, much coarser, cobbles and rocks, occasional chunk of greenish shale; rocks at 312 and 326 feet; extremely rough drilling.	240-328
CLAY	silty with sandy pebbles within, green; drills real smooth (bedrock).	328-340

140-050-15DDDC2 (west)
NDSWC 12321B

Date Completed:	6/16/83	Purpose:	Observation Well
L.S. Elevation (ft):	895.7	Well Type:	1.25" PVC
Depth Drilled (ft):	200	Aquifer:	Prosper
Screened Interval (ft):	189-194	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow-brown, plastic, cohesive, oxidized.	1-18
CLAY	olive-gray, very plastic, cohesive; drills fast (lake clay).	18-66
CLAY	silty, sandy, pebbles, olive-gray, poorly sorted; occasional layer of clay (till).	66-166
CLAY	layered with sand, fine and medium; poor return.	166-177
SAND	layered with clay and till; poor return.	177-185
SAND	fine to coarse, rounded, occasional gravel, predominantly shale and quartz with carbonate and igneous; drills choppy but continuous.	185-200

140-050-18DBD2

Date Completed:	11/21/85	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	5" PVC
Depth Drilled (ft):	102	Aquifer:	Undefined
Screened Interval (ft):	91-97	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-30
CLAY	brown	30-56
CLAY	gray, sandy	56-64
SAND	colored	64-97
CLAY	gray, rocky	97-102

140-050-19DAD
NDSWC 3133

Date Completed:	7/28/64	Purpose:	Test Hole
L.S. Elevation (ft):	913	Well Type:	
Depth Drilled (ft):	197	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-2
SILT	coarse, very sandy, brownish-black to brownish-gray, oxidized, cohesive, moderately hard, highly calcareous.	2-3
CLAY	silty, some sand up to 0.5 mm, dark yellowish-brown, oxidized, cohesive, hard, lignite flakes, calcareous; some white sand laminations.	3-9
SILT	dark greenish-gray, lignite flakes, calcareous, cohesive, soft; mostly silt except lignite flakes.	9-15
CLAY	silty, dark greenish-gray, cohesive, very slightly calcareous.	15-22

140-050-19DAD (continued)

SILT	clayey, dark yellowish-brown, lignite fragments, calcareous; laminated; sand lenses, oxidized, mainly quartz, shale, lignite, carbonate, igneous, angular to rounded, up to 1.5 mm.	22-27
SAND	with clay layers, less oxidized with depth.	27-36
CLAY	olive-gray, slightly calcareous, very cohesive, soft.	36-56
TILL	olive-gray, cohesive, hard, shale, quartz, carbonate, small lignite fragments, pyrite, particles up to 2 mm, highly calcareous, very little sand; increasing sand, angular to subrounded and lighter color with depth; very occasional boulder; igneous boulder at 139 feet.	56-139
PEBBLES	carbonate, igneous, pyrite, angular to rounded, maximum size 10 mm, average 5 mm; wood fragments and clay lenses at bottom.	139-161
SHALE	dark greenish-gray at top, olive-black with depth, cohesive, very hard, highly calcareous; lignite at top, calcite pockets toward bottom; slightly to noncalcareous, with white sand laminae at 192 feet.	161-197

140-050-21CBB

Date Completed:	1960	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Steel
Depth Drilled (ft):	176	Aquifer:	Undefined
Screened Interval (ft):	0-174	Log Source:	

Lithologic Log - unavailable

140-050-23ADD

Date Completed:	10/14/80	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Steel
Depth Drilled (ft):	207	Aquifer:	94/10 Channel
Screened Interval (ft):	196-202	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
SAND	brown, silty	2-5
CLAY	brown	5-20
CLAY	blue, soft	20-76
LENSES	colored, blue, sand, clay	76-81
CLAY	blue, sandy	81-137
ROCK	black	137-138
CLAY	gray, sandy	138-146
SAND	no description	146-147
CLAY	gray, sandy	147-148
SAND	no description	148-149
SAND	no description	149-151
CLAY	gray, sandy	151-158
SAND	colored	158-162
CLAY	gray, sandy	162-171
SAND	colored	171-172
CLAY	gray, sandy	172-194
SAND	colored	194-202

140-050-23ADD (continued)

SAND	colored	202-205
CLAY	sandy	205-207

140-050-24ADD

Date Completed:	5/8/61	Purpose:	Domestic Well
L.S. Elevation (ft):	891	Well Type:	4" Steel
Depth Drilled (ft):	252	Aquifer:	Undefined
Screened Interval (ft):	0-148	Log Source:	

Lithologic Log - unavailable

140-050-25ABD

Date Completed:	9/9/75	Purpose:	Domestic Well
L.S. Elevation (ft):	886	Well Type:	4" Steel
Depth Drilled (ft):	143	Aquifer:	94/10 Channel
Screened Interval (ft):	136-142	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown	3-18
SHALE	blue, soft	18-72
CLAY	blue, sandy, soft	72-75
CLAY	blue, sandy	75-79
CLAY	blue, sandy	79-82
CLAY	sandy, with rock	82-84
CLAY	blue, sandy	84-121
SAND	dirty	121-137
SAND	no description	137-142
CLAY	blue, sandy	142-143

140-050-26CCC

NDSWC 12313

Date Completed:	6/8/83	Purpose:	Observation Well
L.S. Elevation (ft):	897.9	Well Type:	1.25" PVC
Depth Drilled (ft):	260	Aquifer:	Prosper
Screened Interval (ft):	218-223	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow-brown, oxidized, organics in clay, cohesive.	3-17
CLAY	slightly silty, olive-gray, slightly cohesive; no sand detected in matrix.	17-23
CLAY	olive-gray, cohesive; drills fast; return is bacon like in appearance (lake clay).	23-57
CLAY	silty, sandy, pebbles, olive-gray, poorly sorted; sand and gravel, carbonate and shale from 68 to 69 and 82 to 84 feet (till).	57-87
CLAY	slightly silty, olive-gray to black; snaps slightly when broken; not till.	87-93

140-050-26CCC (continued)

TILL	as above, rocky.	93-97
CLAY	gray to black, mica specks, slightly brittle.	97-101
TILL	as above, olive-gray.	101-174
CLAY	silty, olive-gray to brown; small white specks and lenses; layers of lignite from 181 to 201 feet.	174-201
SAND	very fine to medium, rounded, predominantly quartz grains, with carbonate, shale, some lignite, good sorting.	201-235
ROCKS	returns of sand and gravel; drills real rough.	235-237
CLAY	green, weathered igneous; possibly bedrock.	237-260

140-050-26DAA

Date Completed:	0/0	Purpose:	Domestic Well
L.S. Elevation (ft):	897	Well Type:	4" PVC
Depth Drilled (ft):	216	Aquifer:	Prosper
Screened Interval (ft):	196-216	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-16
CLAY	gray	16-72
TILL	gravelly	72-200
GRAVEL & SAND	no description	200-208
GRAVEL	coarse	208-216

140-050-27CCC

NDSWC 12315

Date Completed:	6/9/83	Purpose:	Observation Well
L.S. Elevation (ft):	895.9	Well Type:	1.25" PVC
Depth Drilled (ft):	220	Aquifer:	Undefined
Screened Interval (ft):	152-157	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow-brown, oxidized, iron stains.	2-17
CLAY	as above, olive-gray, unoxidized (lake clay).	17-56
CLAY	silty, sandy, pebbles, rocky, olive-gray to black, poorly sorted; interbedded 1 foot layers of shale gravel and sand from 64 to 75 feet (till).	56-87
CLAY	silty, brownish-black; drills smooth.	87-91
TILL	as above, brownish-black, rocks and cobbles.	91-95
SAND	very fine to medium, predominantly quartz, with shale, igneous and carbonate, subrounded and rounded, good sorting; medium and coarse sand, occasional fine gravel from 140 to 180 feet.	95-164
CLAY	gray to black, fairly brittle, shimmers on broken edge; slight chatter of rig and slight return of sandstone from 211 to 214 feet; poor return (bedrock).	164-214
WEATHERED GRANITE	pinkish; drill rig chatters.	214-220

140-050-32DCC

Date Completed:	0/0	Purpose:	Domestic Well
L.S. Elevation (ft):	902	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-198	Log Source:	

Lithologic Log - unavailable

140-050-33BBA

NDSWC 12317

Date Completed:	6/9/83	Purpose:	Test Hole
L.S. Elevation (ft):	899	Well Type:	
Depth Drilled (ft):	260	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow-brown, oxidized.	2-21
CLAY	olive-gray (lake clay).	21-57
CLAY	silty, sandy, pebbles, olive-gray, poorly sorted (till).	57-194
CLAY	very little silt, gray to black; interbedded till.	194-200
CLAY	brown to black, chunks of mica; bentonite at 245 feet; weather granules at 255 feet; smooth drilling, occasional chatter from rig.	200-260

140-050-33CCC

Date Completed:	12/29/63	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	4" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-82	Log Source:	

Lithologic Log - unavailable

140-050-34ABB

NDSWC 12316

Date Completed:	6/9/83	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	240	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow-brown, oxidized.	2-21
CLAY	olive-gray, unoxidized (lake clay).	21-64
CLAY	silty, sandy, pebbles, rocky, olive-gray, poorly sorted (till).	64-77
SAND	medium and coarse, occasional gravel, predominantly shale, with quartz and igneous, subrounded and rounded, fair sorting.	77-88
GRAVEL	pebble, with medium and coarse sand, sorting and roundness as above; drills rough.	88-89
TILL	as above; interbedded sand and gravel from 102 to 108 feet; drills slow and rough.	89-108
SAND	medium and coarse, gravelly, abundant shale, subangular and subrounded; drills fast and rough.	108-122
CLAY	slightly silty, olive-gray, slightly plastic, breaks.	122-125

140-050-34ABB (continued)

TILL	as above.	125-166
SILT	with clay, olive-gray.	166-187
SAND	very fine and fine, rounded, good sorting; occasional silt lenses; drills fast.	187-204
SILT	brownish, some green, occasional sandstone piece; weathered bedrock at 238 feet (bedrock).	204-240

140-050-34CCC2

NDSWC 3134

Date Completed:	7/28/64	Purpose:	Test Hole
L.S. Elevation (ft):	900	Well Type:	
Depth Drilled (ft):	242	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-1
CLAY	pale yellowish-brown to grayish orange, cohesive, hard, calcareous, very little lignite, oxidized.	1-14
CLAY	dark greenish-gray to olive-gray, cohesive, hard, calcareous, few rare quartz fragments.	14-44
TILL	olive-gray, cohesive, hard, shale, quartz, carbonate, lignite, average size 0.5 mm, maximum 2 mm, carbonate and igneous boulders; more clay with depth; boulder at 78 feet; silt increases at about 82 feet, material harder; sand lenses starting about 97 feet.	88-122
TILL	olive-gray, very sandy, contains pyrite, otherwise similar to above till.	122-178
SAND	mostly quartz with shale, carbonate and lignite, average size 0.5 mm, maximum 1 mm, angular to rounded, poor to excellent sphericity.	178-185
SILT	with sand lenses, sand similar to above, color varies from olive-gray to dark greenish-gray, lignite flakes, fine white sand pockets, calcareous, cohesive, hard to very hard.	185-196
CLAY	silty, olive-gray, very hard; probably as above without sand lenses.	196-202
TILL	olive-gray to olive-black, highly calcareous, cohesive, hard, some brown oxidized patches, quartz, carbonate and lignite, sand fragments are scarce; lenses of greenish-gray to dark greenish-gray till, more fragments, cohesive, soft to hard, shale, quartz, little lignite, very slightly calcareous to noncalcareous, sharp boundaries; lenses of gravel and sand.	202-208
GRAVEL	quartz, shale, pyrite, carbonate, igneous and lignite, average size 2.5 mm, angular to rounded, poor to excellent sphericity, much sand associated.	208-225
CLAY	greenish-gray and grayish-yellow-green, cohesive, soft, noncalcareous; grayish-yellow-green towards top, possibly oxidized; small rounded quartz fragments, good sphericity.	225-242

140-050-35ABB

NDSWC 12314

Date Completed:	6/8/83	Purpose:	Observation Well
L.S. Elevation (ft):	898.8	Well Type:	1.25" PVC
Depth Drilled (ft):	240	Aquifer:	Prosper
Screened Interval (ft):	198-203	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow-brown, oxidized, iron stains; peels off like bacon (lake clay).	3-25
CLAY	olive-gray, unoxidized (lake clay).	25-67
CLAY	silty, sandy, pebbles, real rocky, olive-gray, poorly sorted (till).	67-142
SAND	medium and coarse, igneous, shale and carbonate, subrounded and rounded, fair sorting.	142-155

140-050-35ABB (continued)

GRAVEL	fine to 2 inch, with medium and coarse sand, subrounded and rounded, same composition as above; coarser with depth; extremely rocky from 234 to 236 feet; taking water.	155-236
CLAY	shaley, greenish, some silt and sand size particles (bedrock).	236-240

140-050-35CDC

Date Completed:	1932	Purpose:	Domestic Well
L.S. Elevation (ft):	898	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-96	Log Source:	

Lithologic Log - unavailable

140-050-35DDD

Date Completed:	1937	Purpose:	Domestic Well
L.S. Elevation (ft):	898	Well Type:	3" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-70	Log Source:	

Lithologic Log - unavailable

140-050-36BAA

NDSWC 12318

Date Completed:	6/10/83	Purpose:	Observation Well
L.S. Elevation (ft):	892.53	Well Type:	1.25" PVC
Depth Drilled (ft):	210	Aquifer:	94/10 Channel
Screened Interval (ft):	138-143	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow-brown, oxidized, iron stained.	2-14
CLAY	olive-gray, plastic (lake clay).	14-66
CLAY	silty, sandy, pebbles, rocky, olive-gray, poorly sorted, slightly plastic (till).	66-88
CLAY	slightly silty, plastic, cohesive.	88-93
GRAVEL	coarse sand to 1 inch gravel; layers of interbedded till, junky return; rough drilling.	93-97
TILL	as above, rocky; drills rough.	97-109
CLAY	olive-gray, plastic, cohesive.	109-123
TILL	as above, interbedded with sand and gravel.	123-129
CLAY	silty, olive-gray, not as plastic or cohesive.	129-135
GRAVEL	with coarse sand, subrounded, fair sorting, predominantly shale and igneous, with carbonate; several 0.5 to 1 inch pebbles; drills rough.	135-150
TILL	with interbedded gravel.	150-157
TILL	as above.	157-199
CLAY	red, some greens, silty, sandy; possibly oxidized; weathered bedrock.	199-210

140-050-36BBB

NDSWC 5695

Date Completed:	5/21/80	Purpose:	Observation Well
L.S. Elevation (ft):	894.06	Well Type:	2" PVC
Depth Drilled (ft):	228	Aquifer:	Prosper
Screened Interval (ft):	186-191	Log Source:	NDSWC

140-050-36BBB (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	pale yellowish-brown, oxidized, calcareous, very cohesive, plastic.	1-18
CLAY	dark greenish-gray, unoxidized, slightly calcareous, very cohesive, plastic.	18-60
TILL	brownish-gray, calcareous, very silty and pebbly, moderately cohesive to very cohesive; small gravel lenses at 68, 69 and 70 feet; becomes very cohesive from 76 feet.	60-79
TILL	brownish-gray, very silty, very calcareous, moderately cohesive.	79-96
TILL	light brownish-gray, very silty, pebbly, very calcareous, moderately cohesive.	96-103
SAND & GRAVEL	coarse sand and gravel, subangular to rounded.	103-111
CLAY	light gray; very little sample.	111-112
TILL	as above; alternating color to dark brownish-gray; becoming more cohesive; boulder at 135 feet.	112-136
SAND	fine to coarse, well sorted, rounded, predominantly quartz, with carbonate and lignite.	136-142
TILL	light brownish-gray, very calcareous, very sandy, pebbly, bouldery, moderately to very cohesive; numerous small gravel lenses and boulders.	142-182
BOULDER	granite.	182-186
TILL	brownish-gray, very sandy, very calcareous, moderately cohesive; boulder at 193 feet.	186-194
GRAVEL	coarse sand to medium gravel, predominantly fine gravel, medium sorting, subrounded and rounded; interbedded till from 213 feet.	194-220
CLAY	pale green, sandy.	220-228

140-050-36CCC

Date Completed:	5/22/80	NDSWC 5697	
L.S. Elevation (ft):	900	Purpose:	Test Hole
Depth Drilled (ft):	194	Well Type:	
		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	pale yellowish-brown, calcareous, very cohesive and plastic.	1-6
SAND	fine, well sorted, rounded.	6-9
CLAY	dark greenish-gray, slightly calcareous, very cohesive and plastic.	9-66
TILL	olive-gray, calcareous, very sandy and pebbly, moderately cohesive; gravel lenses at 68 and 76 feet; many small gravel lenses; gravel from 94 to 96 feet.	66-104
GRAVEL	with rocks.	104-106
TILL	gray; interbedded gravel from 106 to 125 and 161 to 187 feet; gravel from 110 to 111 feet; rock at 160 feet.	106-187
CLAY	no description	187-194
ROCKS	no description	194-194

140-051-06CCC

Date Completed:	1962	Purpose:	Domestic Well
L.S. Elevation (ft):	936	Well Type:	5" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-84	Log Source:	

Lithologic Log - unavailable

140-051-14DDB2

Date Completed:	3/30/88	Purpose:	Domestic Well
L.S. Elevation (ft):	906	Well Type:	4" Steel
Depth Drilled (ft):	332	Aquifer:	Undefined
Screened Interval (ft):	318-330	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-25
CLAY	gray	25-45
CLAY	sandy, gray	45-57
SAND	colored	57-59
CLAY	sandy, gray	59-200
SAND	gray	200-202
CLAY	sandy, gray	202-204
SAND	colored	204-206
CLAY	sandy, gray	206-247
SAND	with small lenses of clay, gray	247-272
SAND	colored	272-287
SAND	colored	287-302
SAND	colored	302-332

140-051-33ABB

Date Completed:	00	Purpose:	Test Hole
L.S. Elevation (ft):	914	Well Type:	
Depth Drilled (ft):	350	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellow	2-20
CLAY	blue	20-47
CLAY	sandy, blue	47-102
CLAY	blue	102-110
SAND	multicolored	110-112
CLAY	blue	112-195
CLAY	sandy, blue	195-203

140-051-33ABB (continued)

SAND	fine, blue	203-206
SHALE	gray	206-285
SHALE	variegated	285-305
GRANITE	decomposed, clay, green	305-350

140-051-34CCD

Date Completed:	7/7/47	Purpose:	Test Hole
L.S. Elevation (ft):	920	Well Type:	
Depth Drilled (ft):	330	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-3
CLAY	yellow, fine gravel and shale pebbles.	3-26
SAND	fine and medium, fine gravel and shale pebbles.	26-35
CLAY	lake clay; 35-40 feet is mixture.	35-56
CLAY	gray, a lot of fine and medium gravel and shale pebbles; limestone at 67 feet.	56-70
CLAY	sandy, gray, a lot of fine and medium gravel and shale pebbles; rock like, pink limestone at 80 feet; limestone at 87 feet.	70-100
CLAY	sandy, blue-gray, a lot of fine and medium gravel and shale pebbles.	100-130
CLAY	blue, hard, fine to coarse gravel and shale pebbles.	130-154
GRAVEL	with rocks.	154-155
SAND	fine, dirty, fine gravel, shale pebbles, maybe a little gray clay.	155-170
CLAY	blue, hard, fine gravel and shale pebbles.	170-210
CLAY	blue, hard, looks like shale, fine gravel and shale pebbles; poor return.	210-263
CLAY	dark brown.	263-293
CLAY	light gray.	293-305
CLAY	very dark brown.	305-316
CLAY	light brown.	316-319
GRANITE	light gray, possibly decayed igneous; firm from 325 to 330 feet.	319-330

140-051-34DAA

Date Completed:	7/11/47	Purpose:	Test Hole
L.S. Elevation (ft):	915	Well Type:	
Depth Drilled (ft):	350	Log Source:	Dennis et al, 1949

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-4
CLAY	sandy, gray.	4-8
CLAY	yellow, a few fine gravels and shale pebbles.	8-25

140-051-34DAA (continued)

SAND	fine to coarse, fine gravel and shale pebbles.	25-35
GRAVEL	fine to coarse, gravel and shale pebbles.	35-41
CLAY	lake clay.	41-50
CLAY	blue-gray, a lot of fine and medium gravel, limestone cuttings and shale pebbles.	50-71
CLAY	light gray, a lot of fine and medium gravel and shale pebbles.	71-82
SAND	fine and medium, fine and medium gravel and shale pebbles.	82-99
GRAVEL	fine, shale pebbles, a little lignite, maybe a little gray clay.	99-115
SAND	fine and medium, fine gravel; taking water.	115-161
CLAY	blue, maybe a little fine gravel and shale pebbles.	161-195
CLAY	blue, maybe shale.	195-262
CLAY	dark brown.	262-267
CLAY	light gray.	267-270
CLAY	gray.	270-286
CLAY	dark brown.	286-291
CLAY	light gray.	291-305
CLAY	blue-gray.	305-311
CLAY	light gray.	311-314
CLAY	black.	314-317
CLAY	light brown.	317-320
CLAY	light gray.	320-338
DECAYED IGNEOUS	decomposed, light gray	338-350

141-047-08AADCAD

Date Completed:	10/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	92	Aquifer:	Undefined
Screened Interval (ft):	77-83	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-36
SAND	sand	36-59
SAND	sand drilled finer	59-66
SAND	sand drilled coarser	66-72
SAND	sand drilled finer	72-92

141-047-14AAADBA

Date Completed:	12/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	4" Stainless Steel
Depth Drilled (ft):	124	Aquifer:	Undefined
Screened Interval (ft):	119-124	Log Source:	LTP Enterprises, Inc

141-047-14AAADBA (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown, very soft	3-21
CLAY	clay, blue, soft	21-102
CLAY	sandy clay, blue	102-114
SAND	sand, colored	114-124

141-047-14BCAADB

Date Completed:	1962	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	0"
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

141-047-14BCADAA

Date Completed:	4/1962	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	3"
Depth Drilled (ft):	191	Aquifer:	Undefined
Screened Interval (ft):	96-131	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, tan	1-15
CLAY	shale, blue, soft	15-96
CLAY	sandy clay + sand lenses, blue, soft	96-130
CLAY	sandy clay, blue, soft	130-139
SAND	sand washed, colored	139-141
CLAY	harder sandy clay, blue, hard	141-154
SAND	sand, blue	154-155
CLAY	sticky clay, blue, hard	155-175
WEATHERED PRECAMBRIAN	decomposed granite, green	175-191

141-047-14BCADDA

Date Completed:	1962	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	0"
Depth Drilled (ft):	211	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, tan	2-18

141-047-14BCADDA (continued)

CLAY	shale, blue	
CLAY	sandy hard clay, blue, hard	18-101
CLAY	softer sandy clay with sand lenses, blue, soft	101-111
CLAY	sandy clay, blue	111-118
CLAY	sandy clay with sand lenses, blue	118-123
CLAY	sandy clay, blue	123-127
SAND	sand, colored	127-130
CLAY	sandy clay, blue	130-134
CLAY	sandy clay with sand lenses, blue	134-138
CLAY	sandy clay, blue, soft	138-144
CLAY	sandy clay with sand lenses, blue, soft	144-148
CLAY	clay, blue	148-153
CLAY	sandy clay, blue, hard	153-163
PRECAMBRIAN	granite, green, very hard	163-185
		185-211

141-047-18CCCDCA

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

8/1978
897
207
186-192

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	
CLAY	clay, brown	0-2
CLAY	clay, blue, soft	2-15
CLAY	sandy clay, blue	15-102
SAND	sand	102-132
CLAY	sandy clay, blue	132-134
CLAY	sandy clay with sand lenses, blue	134-140
CLAY	sandy clay, blue	140-142
SAND	sand	142-153
CLAY	sandy clay, blue	153-154
SAND	sand drilled dirty	154-166
CLAY	sandy clay, blue	166-174
SAND	sand with clay lenses	174-175
SAND	sand	175-180
		180-207

141-047-19AAADCD

Date Completed:
L.S. Elevation (ft):
Depth Drilled (ft):
Screened Interval (ft):

3/1976
899
237
225-231

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

141-047-19AAADCD (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
		0-2
SOIL	top soil, black	2-3
CLAY	clay, light brown	3-11
CLAY	clay, brown	11-112
CLAY	clay, blue, soft	112-120
CLAY	sandy clay, blue	120-122
CLAY	sandy clay, blue, hard	122-123
CLAY	sandy clay, blue	123-124
SAND	sand	124-137
CLAY	sandy clay, blue	137-142
CLAY	sandy clay with sand lenses, blue	142-159
CLAY	sandy clay, blue	159-161
SAND	sand	161-166
CLAY	sandy clay, blue	166-168
SAND	sand	168-180
CLAY	sandy clay, blue	180-181
ROCK	rock	181-223
CLAY	sandy clay with rock, blue	223-232
SAND	sand washed	232-237
CLAY	sandy clay, blue	

141-047-19BCCACD

Date Completed: 12/1988
 L.S. Elevation (ft): 898
 Depth Drilled (ft): 237
 Screened Interval (ft): 221-225

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
		0-1
SOIL	top soil, black	1-15
CLAY	clay, brown	15-111
CLAY	clay, blue	111-116
CLAY	sandy clay, gray	116-117
SAND	sand, gray	117-158
CLAY	sandy clay, gray	158-160
SAND	sand, brown	160-188
CLAY	sandy clay, gray	188-190
SAND	sand, colored	190-193
CLAY	sandy clay, gray	193-195
SAND	sand with clay lenses, gray	

141-047-19BCCACD (continued)

SAND	sand, colored	195-197
CLAY	clay, gray	197-198
SAND	sand, gray	198-206
CLAY	sandy clay, gray	206-207
SAND	sand, gray	207-212
SAND	sand, gray	212-218
SAND	sand, gray	218-219
SAND	sand, colored	219-232
SAND	lenses of sand + clay, gray	232-237

141-047-20CCDBDD

Date Completed:	4/1991	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	5" PVC
Depth Drilled (ft):	174	Aquifer:	Undefined
Screened Interval (ft):	154-174	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-18
CLAY	clay, gray, soft	18-117
TILL	till	117-149
SAND	sand	149-152
TILL	till	152-153
SAND	sand	153-157
TILL	sand and till layers	157-174

141-047-20CCDDBD

Date Completed:	11/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	903	Well Type:	4" Stainless Steel
Depth Drilled (ft):	170	Aquifer:	Undefined
Screened Interval (ft):	162-167	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-18
CLAY	soft clay, blue, soft	18-109
CLAY	sandy clay, blue	109-152
SAND	sand, varied color	152-154
BOULDERS	boulder, red	154-155
CLAY	sandy clay, blue	155-157
SAND	sand, varied color	157-168

141-047-20CCDDBD (continued)

CLAY sandy clay, blue

168-170

141-047-25BABBBB

Date Completed: 10/1962
L.S. Elevation (ft): 906
Depth Drilled (ft): 155
Screened Interval (ft): 80-115

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
3"
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-16
CLAY	shale, blue	16-90
CLAY	sandy clay, blue	90-98
CLAY	sandy clay + sand lenses, blue, hard	98-100
CLAY	hard sandy clay + limestone, blue, hard	100-109
CLAY	sandy clay + sand lenses, blue, soft	109-115
CLAY	sandy clay, blue, hard	115-137
BOULDERS	granite boulder, green	137-141
CLAY	sandy clay, blue, hard	141-151
PRECAMBRIAN	granite, green	151-155

141-047-25DDAADD

Date Completed: 5/1976
L.S. Elevation (ft): 908
Depth Drilled (ft): 119
Screened Interval (ft): 113-119

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-2
CLAY	clay, yellow, soft	2-11
CLAY	clay, blue, soft	11-90
GRAVEL	gravel + stones, gray, hard	90-100
SAND	sand, gray, soft	100-101
GRAVEL	gravel + stones, gray, hard	101-115
GRAVEL	gravel, gray, hard	115-117
GRAVEL	gravel + boulders, gray, hard	117-119

141-047-26BAABDA

Date Completed: 11/1974
L.S. Elevation (ft): 904
Depth Drilled (ft): 244
Screened Interval (ft): 0-0

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
0"
Undefined
LTP Enterprises, Inc

Lithologic Log

141-047-26BAABDA (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-20
CLAY	clay, blue, soft	20-97
CLAY	sandy clay, blue	97-132
SAND	sand, blue	132-135
CLAY	sandy clay, blue	135-141
SAND	sand, blue	141-142
CLAY	very sandy clay, blue	142-144
CLAY	sandy clay with rock, blue	144-146
SAND	sand, blue	146-147
CLAY	sandy clay, blue	147-217
SAND	sand, colored	217-218
SAND	sand + clay lenses with rock, colored	218-219
CLAY	sandy clay, blue	219-236
CLAY	sandy clay with decomposed, green-blue	236-239
WEATHERED PRECAMBRIAN	decomposed, green	239-244

141-047-26BAABDD

Date Completed:	11/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	4" Stainless Steel
Depth Drilled (ft):	242	Aquifer:	Undefined
Screened Interval (ft):	231-236	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown, soft	2-12
CLAY	sandy clay, brown	12-19
CLAY	clay, blue, soft	19-96
CLAY	sandy clay, blue	96-112
SAND	sand, colored	112-114
CLAY	sandy clay, blue	114-142
CLAY	sandy clay with sand lenses, blue	142-147
SAND	sand, colored	147-148
CLAY	sandy clay, blue	148-153
SAND	sand	153-154
CLAY	sandy clay, blue	154-213
SAND	sand, colored	213-215
SAND	sand drilled better, colored	215-236

141-047-26BAABDD (continued)

CLAY sandy clay, blue

236-242

141-047-27ABBBAC

Date Completed: 12/1976
 L.S. Elevation (ft): 902
 Depth Drilled (ft): 161
 Screened Interval (ft): 149-155

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-12
CLAY	clay, blue, soft	12-88
CLAY	sandy clay, blue	88-101
SAND	sand	101-102
CLAY	sandy clay, blue	102-141
SAND	sand lenses dirty	141-146
SAND	dirty sand	146-149
SAND	sand	149-155
SAND	dirty sand	155-156
CLAY	sandy clay, blue	156-161

141-047-29BAABCB

Date Completed: 2/1983
 L.S. Elevation (ft): 900
 Depth Drilled (ft): 224
 Screened Interval (ft): 205-215

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 5" Stainless Steel
 Undefined
 Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-14
CLAY	clay, gray	14-108
TILL	till, gray	108-147
TILL	gravelly till, light gray	147-161
TILL	till, gray	161-177
CLAY	red	177-219
WEATHERED PRECAMBRIAN	weathered granite, green	219-224

141-047-30DCCCAD

Date Completed: 4/1991
 L.S. Elevation (ft): 902
 Depth Drilled (ft): 175
 Screened Interval (ft): 155-175

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" PVC
 Undefined
 Lako Drilling

141-047-30DCCCAD (continued)**Lithologic Log**

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-18
CLAY	clay, gray	18-129
TILL	till	129-155
SAND	sand with layers of till	155-175

141-047-33CCDACA

Date Completed:	3/1990	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	5" Stainless Steel
Depth Drilled (ft):	227	Aquifer:	Undefined
Screened Interval (ft):	217-227	Log Source:	Olson Well Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue, soft	0-120
SAND	sand + clay, gray, soft	120-150
CLAY	clay + stones, blue, hard	150-210
CLAY	clay, blue, soft	210-212
SAND	fine sand, gray, soft	212-227
PRECAMBRIAN	green granite, green, hard	227-227

141-048-03CBCAAD

Date Completed:	4/1964	Purpose:	Domestic Well
L.S. Elevation (ft):	881	Well Type:	4" Stainless Steel
Depth Drilled (ft):	204	Aquifer:	Undefined
Screened Interval (ft):	195-200	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-18
CLAY	shale, blue, soft	18-117
CLAY	sandy clay, blue, hard	117-135
SAND	sand, colored	135-140
CLAY	sandy clay, blue, hard	140-159
BOULDERS	boulder, white	159-160
CLAY	sandy clay + boulders, blue, hard	160-173
SAND	sand, blue	173-175
CLAY	sandy clay, blue, hard	175-177
SAND	sand, blue	177-178
CLAY	sandy clay, blue, hard	178-184

141-048-03BCAAD (continued)

SAND	sand, gray	184-201
CLAY	sandy clay, blue	201-204

141-048-09ADACDA

Date Completed:	11/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4" Stainless Steel
Depth Drilled (ft):	172	Aquifer:	Undefined
Screened Interval (ft):	161-166	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-6
CLAY	clay, brown, soft	6-23
CLAY	clay, blue, soft	23-117
CLAY	sandy clay, blue	117-141
SAND	sand, colored	141-142
CLAY	sandy clay, blue	142-156
ROCK	rock	156-157
SAND	sand, colored	157-166
CLAY	sandy clay with rock, blue	166-172

141-048-09DDABAD

Date Completed:	11/1982	Purpose:	Domestic Well
L.S. Elevation (ft):	885	Well Type:	4" Stainless Steel
Depth Drilled (ft):	200	Aquifer:	Undefined
Screened Interval (ft):	193-199	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	silty clay, brown	3-10
CLAY	clay, brown	10-26
CLAY	clay, blue, soft	26-120
CLAY	sandy clay, blue	120-137
SAND	sand coarse, varied color	137-139
CLAY	sandy clay, blue	139-175
SAND	sand drilled dirty, varied color	175-182
CLAY	sandy clay, blue	182-195
SAND	sand drilled good, varied color	195-200
CLAY	sandy clay, blue	200-200

141-048-15ACDCBD

Date Completed:	11/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	886	Well Type:	4" Stainless Steel
Depth Drilled (ft):	192	Aquifer:	Undefined
Screened Interval (ft):	174-182	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-24
CLAY	clay, blue, soft	24-120
CLAY	sandy clay, blue	120-126
SAND	sand, colored	126-127
CLAY	sandy clay, blue	127-129
SAND	sand, blue	129-130
CLAY	sandy clay + sand lenses, blue	130-137
SAND	sand washed, blue	137-139
CLAY	sandy clay, blue	139-158
SAND	sand, blue	158-163
CLAY	sandy clay, blue	163-171
SAND	sand	171-182
CLAY	sandy clay, blue	182-192

141-048-15DCCCAD

Date Completed:	10/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4" Stainless Steel
Depth Drilled (ft):	192	Aquifer:	Undefined
Screened Interval (ft):	179-185	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-15
CLAY	soft clay, blue, soft	15-122
CLAY	sandy clay, blue	122-166
SAND	sand, varied color	166-167
CLAY	sandy clay, blue	167-178
SAND	sand, varied color	178-189
CLAY	sandy clay, blue	189-192

141-048-17DAADB

Date Completed:	6/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	0"
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

141-048-18BBCADD

Date Completed: 12/1976
 L.S. Elevation (ft): 881
 Depth Drilled (ft): 271
 Screened Interval (ft): 266-271

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-25
CLAY	clay, blue, soft	25-97
CLAY	sandy clay, blue	97-112
SAND	sand	112-113
CLAY	sandy clay, blue	113-121
SAND	sand	121-122
CLAY	sandy clay, blue	122-123
SAND	sand	123-124
CLAY	sandy clay, blue	124-132
CLAY	sandy clay + rock, blue	132-135
CLAY	sandy clay, blue	135-152
CLAY	sandy clay, blue, softer	152-170
CLAY	sandy clay, blue	170-224
SAND	sand	224-225
CLAY	sandy clay, blue	225-226
SAND	sand fine	226-230
CLAY	sandy clay	230-233
SAND	sand fine bad	233-237
CLAY	sandy clay, blue	237-257
CLAY	sandy clay, red	257-268
SAND	sand, green	268-271
WEATHERED PRECAMBRIAN	decomposed, green	271-271

141-048-18BCCCBD

Date Completed: 6/1972
 L.S. Elevation (ft): 881
 Depth Drilled (ft): 217
 Screened Interval (ft): 205-214

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown	1-11
CLAY	shale, brown	11-36
CLAY	shale, blue	36-92

141-048-18BCCCB (continued)

CLAY	sandy clay + gravel, blue	92-104
SAND	sand, colored	104-107
CLAY	sandy clay, blue	107-130
CLAY	sandy clay + rock, blue	130-133
CLAY	sandy clay, blue	133-202
SAND	sand, colored	202-214
CLAY	sandy clay, blue	214-217

141-048-19CCDADA

Date Completed:	12/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4" Stainless Steel
Depth Drilled (ft):	222	Aquifer:	Undefined
Screened Interval (ft):	209-217	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown, soft	3-32
CLAY	shale, blue	32-98
CLAY	sandy clay, blue	98-116
SAND	sand, colored	116-118
CLAY	sandy clay, blue	118-155
CLAY	sandy clay, gray-blue	155-178
CLAY	sandy clay with sand lenses, blue	178-181
CLAY	sandy clay, blue	181-184
SAND	sand, blue	184-191
CLAY	sandy clay, blue	191-195
SAND	sand, blue	195-217
CLAY	sandy clay with sand lenses, blue	217-222

141-048-19CDCBBC

Date Completed:	12/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4"
Depth Drilled (ft):	247	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown, soft	3-32
CLAY	shale, blue	32-99
CLAY	sandy clay with small rock, blue	99-129
SAND	sand, colored	129-131

141-048-19CDCBBC (continued)

CLAY	sandy clay with rock, blue	131-151
SAND	sand, colored	151-153
CLAY	sandy clay with rock, blue-gray	153-182
ROCK	rock, colored, very hard	182-186
CLAY	sandy clay, blue	186-187
SAND	fine sand, gray	187-188
CLAY	sandy clay, blue	188-189
SAND	fine sand, gray	189-190
CLAY	sandy clay, blue	190-191
SAND	fine sand, gray	191-193
CLAY	sandy clay, blue	193-195
SAND	fine silty sand, gray	195-201
CLAY	sandy clay, blue	201-240
WEATHERED PRECAMBRIAN	decomposed, green	240-247

141-048-19DCCDCD

Date Completed:	4/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	886	Well Type:	4" Stainless Steel
Depth Drilled (ft):	252	Aquifer:	Undefined
Screened Interval (ft):	152-156	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-27
CLAY	clay, blue, soft	27-96
CLAY	sandy clay, blue	96-152
SAND	sand, blue	152-156
CLAY	sandy clay, blue	156-163
CLAY	sandy clay + sand lenses, blue	163-167
CLAY	sandy clay, blue	167-197
SAND	sand, blue	197-204
CLAY	sandy clay, blue	204-208
CLAY	sandy clay + lenses sand, blue	208-213
CLAY	sandy clay, blue, hard	213-252

141-048-22ACCDAD

Date Completed:	9/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	891	Well Type:	4" Stainless Steel
Depth Drilled (ft):	216	Aquifer:	Undefined
Screened Interval (ft):	207-211	Log Source:	Frederickson's of ND, Inc

Lithologic Log

141-048-22ACCDAD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-25
CLAY	clay, blue	25-34
CLAY	shale, blue	34-115
CLAY	sandy clay with lenses, blue	115-118
CLAY	sandy clay, blue	118-142
ROCK	rock, white	142-143
CLAY	sandy clay, blue	143-151
SAND	sand, colored	151-152
CLAY	sandy clay with rock, blue	152-156
SAND	sand, colored	156-158
CLAY	sandy clay, blue	158-177
SAND	sand, blue	177-179
CLAY	sandy clay, blue	179-201
CLAY	sandy clay, blue, soft	201-206
SAND	sand, colored	206-211
SAND	dirty sand, colored	211-213
ROCK	rock, colored	213-215
SAND	dirty sand + rock, colored	215-216

141-048-22DABCAB

Date Completed:	6/1977	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4' Stainless Steel
Depth Drilled (ft):	311	Aquifer:	Undefined
Screened Interval (ft):	250-265	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-24
CLAY	sandy clay, blue, soft	24-118
CLAY	sandy clay, blue	118-128
SAND	sand, colored	128-131
CLAY	sandy clay, blue	131-140
SAND	sand	140-141
CLAY	sandy clay, blue	141-172
SAND	sand, gray	172-174
CLAY	sandy clay, blue	174-181
SAND	sand with dirty clay lenses, blue-gray	181-186
CLAY	sandy clay with sand lenses, blue-gray	186-192

141-048-22DABCAB (continued)

CLAY	sandy clay, blue	192-198
SAND	sand fine dirty	198-202
CLAY	sandy clay, blue	202-231
SAND	sand	231-232
CLAY	sandy clay, blue	232-250
SAND	sand drilled fair fine, colored	250-256
CLAY	sandy clay, blue	256-259
SAND	sand, colored	259-261
CLAY	sandy clay, blue	261-262
SAND	sand, colored	262-265
CLAY	sandy clay, blue	265-266
SAND	sand	266-267
CLAY	sandy clay, blue	267-311
CLAY	sandy clay, hard	311-311

141-048-25BCCDC

Date Completed:	8/1984	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Stainless Steel
Depth Drilled (ft):	221	Aquifer:	Undefined
Screened Interval (ft):	213-217	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	topsoil, black	0-2
CLAY	clay, brown, soft	2-20
CLAY	clay, blue, soft	20-119
CLAY	sandy clay, gray	119-123
SAND	sand 8 & 10 slot, colored	123-129
CLAY	sandy clay with small sand lenses, gray	129-134
SAND	sand, colored	134-136
CLAY	sandy clay, gray	136-180
SAND	sand, blue	180-183
SAND	sand, rocky	183-185
CLAY	sandy clay with rock, gray	185-199
SAND	sand 6 & 8 slot, colored	199-202
BOULDERS	rock, black	202-206
CLAY	sandy clay with rock, colored	206-211
CLAY	sandy clay, gray	211-212
SAND	sand, colored	212-217
CLAY	clay, gray	217-221

141-048-29AABBCA

Date Completed:	9/1975	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" Stainless Steel
Depth Drilled (ft):	181	Aquifer:	Undefined
Screened Interval (ft):	160-175	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown, soft	3-16
CLAY	clay, blue, soft	16-33
SAND	sand, blue	33-35
CLAY	sandy clay, blue	35-37
SAND	sand drilled dirty, blue	37-62
CLAY	clay, blue, soft	62-117
CLAY	sandy clay, blue	117-121
SAND	sand, blue	121-122
CLAY	sandy clay, blue	122-136
ROCK	rock	136-137
CLAY	sandy clay, blue	137-150
SAND	sand, blue	150-152
CLAY	sandy clay, blue	152-161
SAND	sand + rock, colored	161-163
SAND	sand fine, blue	163-175
CLAY	sandy clay, blue	175-181

141-048-30BBAAAD

Date Completed:	4/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	886	Well Type:	4" Stainless Steel
Depth Drilled (ft):	247	Aquifer:	Undefined
Screened Interval (ft):	212-220	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-27
CLAY	sandy clay, blue, soft	27-102
CLAY	sandy clay, blue	102-180
SAND	sand	180-181
CLAY	sandy clay, blue	181-182
SAND	sand	182-183
CLAY	sandy clay, blue	183-188
SAND	sand drilled poor, varied color	188-192
SAND	sand drilled fair, varied color	192-212

141-048-30BBAAAD (continued)

SAND	sand drilled fair, varied color	212-220
SAND	sand with small clay lenses, varied color	220-225
CLAY	sandy clay	225-226
SAND	sand, varied color	226-229
CLAY	sandy clay, blue	229-243
CLAY	sandy clay with decomposed, blue-green	243-247

141-048-31DAAADB

Date Completed:	7/1977	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" Stainless Steel
Depth Drilled (ft):	248	Aquifer:	Undefined
Screened Interval (ft):	232-248	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-22
CLAY	clay, blue, soft	22-102
CLAY	sandy clay rocky, blue	102-108
SAND	sand	108-109
CLAY	sandy clay, blue	109-123
SAND	sand	123-124
CLAY	sandy clay, blue	124-137
SAND	sand	137-138
CLAY	sandy clay, blue	138-142
SAND	sand	142-143
CLAY	sandy clay, blue	143-158
SAND	sand with clay lenses	158-160
CLAY	sandy clay, blue	160-232
SAND	fine sand	232-236
CLAY	sandy clay with sand lenses, blue	236-238
CLAY	sandy clay, blue	238-241
SAND	sand	241-242
CLAY	sandy clay, blue	242-244
SAND	sand	244-245
CLAY	sandy clay with fine	245-248

141-048-31DAADAB

Date Completed:	7/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" Stainless Steel
Depth Drilled (ft):	266	Aquifer:	Undefined
Screened Interval (ft):	238-248	Log Source:	LTP Enterprises, Inc

Lithologic Log

141-048-31DAADAB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-17
CLAY	clay, gray, soft	17-22
CLAY	clay, blue, soft	22-105
SAND	sand	105-106
CLAY	sandy clay, blue	106-120
SAND	sand	120-122
CLAY	sandy clay, blue	122-123
SAND	sand	123-124
CLAY	sandy clay, blue	124-125
SAND	sand	125-127
CLAY	sandy clay, blue	127-140
SAND	sand	140-142
CLAY	sandy clay, blue	142-150
SAND	sand	150-152
CLAY	sandy clay + rock hard, blue	152-153
CLAY	sandy clay, blue	153-158
SAND	sand	158-159
CLAY	sandy clay, blue	159-174
SAND	sand	174-176
CLAY	sandy clay, blue	176-187
SAND	sand	187-189
CLAY	sandy clay, blue	189-220
CLAY	sandy clay softer, soft	220-240
SAND	sand	240-241
CLAY	sandy clay	241-242
SAND	sand	242-243
CLAY	sandy clay, blue, softer	243-245
CLAY	sandy clay, blue, hard	245-247
CLAY	sandy clay, blue, softer	247-249
CLAY	sandy clay with sand lenses, blue	249-256
WEATHERED PRECAMBRIAN	sandy clay with traces of decomposed, blue, softer	256-258
SANDSTONE	dirty sand	258-259
WEATHERED PRECAMBRIAN	sandy clay with traces of decomposed, blue	259-261
WEATHERED PRECAMBRIAN	sandy clay with decomposed, blue-green, harder	261-266

141-048-31DADAAB

Date Completed: 5/1977
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 252
 Screened Interval (ft): 246-250

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-24
CLAY	clay, blue, soft	24-104
CLAY	sandy clay, blue	104-145
SAND	sand with clay lenses	145-148
CLAY	sandy clay, blue	148-163
SAND	sand with clay lenses	163-165
CLAY	sandy clay, blue	165-167
SAND	sand	167-168
CLAY	sandy clay, blue	168-171
SAND	sand	171-172
CLAY	sandy clay, blue	172-242
SAND	sand	242-243
CLAY	sandy clay, blue	243-245
SAND	sand	245-250
WEATHERED PRECAMBRIAN	sandy clay + decomposed, blue-brown	250-252

141-048-31DADDDAA

Date Completed: 8/1977
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 263
 Screened Interval (ft): 255-261

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, gray	2-4
CLAY	clay, brown	4-32
CLAY	clay, blue, soft	32-104
CLAY	sandy clay, blue	104-118
SAND	sand, varied color	118-121
CLAY	sandy clay, blue	121-162
SAND	sand, varied color	162-163
CLAY	sandy clay, blue	163-240
SAND	sand, varied color	240-247
CLAY	sandy clay, blue	247-252

141-048-31DADDAA (continued)

SAND	sand, varied color	252-258
WEATHERED PRECAMBRIAN	decompose, green	258-263

141-048-31DADDAD

Date Completed:	10/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	0"
Depth Drilled (ft):	261	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-22
CLAY	clay, blue	22-112
CLAY	clay, blue, soft	112-119
SAND	dirty fine sand	119-122
CLAY	sandy clay, blue	122-123
SAND	sand	123-124
CLAY	sandy clay with small sand lenses, blue	124-127
CLAY	sandy clay, blue	127-130
SAND	sand	130-131
CLAY	sandy clay, blue	131-133
SAND	sand	133-134
CLAY	sandy clay, blue	134-139
SAND	sand	139-141
CLAY	sandy clay, blue	141-142
SAND	sand	142-143
CLAY	sandy clay, blue	143-157
SAND	sand	157-158
CLAY	sandy clay, blue	158-191
SAND	sand	191-193
CLAY	sandy clay, blue	193-232
CLAY	sandy clay with sand lenses, blue	232-234
CLAY	sandy clay, blue	234-251
WEATHERED PRECAMBRIAN	decomposed, green	251-253
WEATHERED PRECAMBRIAN	decomposed, green, hard	253-261

141-048-31DDAABD

Date Completed: 4/1977
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 256
 Screened Interval (ft): 139-160

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown, soft	2-24
CLAY	sandy clay, blue, soft	24-105
CLAY	sandy clay, blue	105-125
SAND	sand, varied color	125-126
CLAY	sandy clay, blue	126-130
SAND	sand, varied color	130-131
CLAY	sandy clay, blue	131-140
CLAY	sandy clay with sand lenses, varied color	140-146
SAND	sand, varied color	146-148
SAND	sand with clay lenses, varied color	148-152
CLAY	sandy clay, blue	152-155
SAND	sand, varied color	155-157
ROCK	rock, black	157-158
SAND	sand, varied color	158-159
CLAY	sandy clay, blue	159-164
SAND	sand, varied color	164-165
CLAY	sandy clay, blue	165-169
SAND	sand, gray	169-170
CLAY	sandy clay, blue	170-176
CLAY	sandy clay with sand lenses, blue	176-180
CLAY	sandy clay, blue	180-232
CLAY	sandy clay, blue, soft	232-246
SAND	sand	246-247
ROCK	rock, black	247-248
CLAY	sandy clay, blue	248-249
CLAY	sandy clay with rock, hard	249-256

141-048-31DDAADB

Date Completed: 10/1976
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 272
 Screened Interval (ft): 0-0

Purpose: Domestic Well
 Well Type: 0"
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

141-048-31DDAADB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-20
CLAY	clay, blue	20-34
CLAY	clay, blue, soft	34-105
CLAY	sandy clay, blue	105-116
SAND	fine sand	116-118
CLAY	sandy clay, blue	118-121
SAND	fine sand	121-122
ROCK	rock, blue	122-123
CLAY	sandy clay, blue	123-139
SAND	fine dirty sand	139-141
CLAY	sandy clay, blue	141-152
SAND	sand	152-153
CLAY	sandy clay, blue	153-187
SAND	sand	187-188
CLAY	sandy clay, blue	188-257
SAND	sand	257-258
WEATHERED PRECAMBRIAN	sandy clay + decomposed, blue	258-265
WEATHERED PRECAMBRIAN	sandy clay + granite, blue-green	265-268
WEATHERED PRECAMBRIAN	decomposed drilled harder, green	268-272

141-048-31DDABCA

Date Completed:	10/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	892	Well Type:	4" Stainless Steel
Depth Drilled (ft):	155	Aquifer:	Undefined
Screened Interval (ft):	147-155	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-20
CLAY	clay, blue, soft	20-100
CLAY	sandy clay, blue	100-105
CLAY	sandy clay rocky, blue	105-108
CLAY	sandy clay, blue	108-141
SAND	sand drilled coarse	141-142
CLAY	sandy clay rocky, blue	142-148
SAND	fine sand + clay lenses	148-155

141-048-32BCBCBD

Date Completed: 7/1975
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 210
 Screened Interval (ft): 0-0

Purpose: Domestic Well
 Well Type: 0"
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-27
CLAY	clay, blue, soft	27-105
SAND	sand with clay lenses, colored	105-107
CLAY	sandy clay, blue	107-108
SAND	sand drilled good, colored	108-114
CLAY	sandy clay, blue	114-152
CLAY	sandy clay with sand lenses, blue	152-153
SAND	sand, colored	153-155
CLAY	sandy clay, blue	155-156
SAND	dirty sand	156-161
CLAY	sandy clay, blue	161-191
SAND	sand	191-192
CLAY	sandy clay, blue	192-193
SAND	sand	193-194
CLAY	sandy clay, blue	194-195
SAND	sand	195-196
CLAY	sandy clay with and lenses, blue	196-197
CLAY	sandy clay, blue	197-200
SAND	fine sand with clay lenses, gray	200-207
CLAY	sandy clay, blue	207-208
SAND	sand + clay lenses, blue	208-210

141-048-32BCBCDB

Date Completed: 8/1975
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 115
 Screened Interval (ft): 108-113

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	sandy clay, brown	2-27
CLAY	clay, blue, soft	27-106
CLAY	sandy clay, blue	106-108
SAND	sand, colored	108-113

141-048-33CCCCDB (continued)

CLAY	sandy clay, blue	153-155
SAND	sand	155-156
CLAY	sandy clay, blue	156-164
SAND	sand took water	164-198
CLAY	sandy clay	198-201
SAND	sand very fine	201-212

141-048-33DDCDAB

Date Completed:	7/1971	Purpose:	Domestic Well
L.S. Elevation (ft):	890	Well Type:	0"
Depth Drilled (ft):	232	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-17
CLAY	clay, blue, soft	17-111
CLAY	sandy clay + boulders, blue, hard	111-124
SAND	sand, black	124-127
CLAY	sandy clay, blue, hard	127-157
SAND	washed sand, gray	157-159
CLAY	sandy clay, blue	159-167
SAND	sand, gray	167-168
CLAY	sandy clay, blue, hard	168-225
SAND	sand, gray	225-227
BOULDERS	boulder, green	227-229
WEATHERED PRECAMBRIAN	weathered granite, green	229-231
PRECAMBRIAN	granite, green	231-232

141-048-34BCACBB

Date Completed:	4/1988	Purpose:	Industrial Well
L.S. Elevation (ft):	865	Well Type:	4" Stainless Steel
Depth Drilled (ft):	234	Aquifer:	Undefined
Screened Interval (ft):	224-232	Log Source:	Olson Well Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue, soft	0-105
CLAY	clay & sand, blue, soft	105-120
CLAY	clay, blue, hard	120-220
SAND	sand, gray, soft	220-232

141-048-34BCACBB (continued)

CLAY clay, blue, soft

232-234

141-048-34BCBAAA

Date Completed: 10/1966
L.S. Elevation (ft): 891
Depth Drilled (ft): 163
Screened Interval (ft): 156-161

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, blue	2-124
CLAY	clay, blue	124-145
CLAY	clay with sand lenses, blue	145-152
SAND	sand, blue	152-161
CLAY	clay, blue	161-163

141-048-35AAAAAC

Date Completed: 5/1980
L.S. Elevation (ft): 899
Depth Drilled (ft): 227
Screened Interval (ft): 218-224

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-15
CLAY	soft clay, blue	15-120
CLAY	sandy clay, blue	120-123
SAND	sand, varied color	123-124
CLAY	sandy clay, blue	124-133
SAND	sand, varied color	133-134
CLAY	sandy clay, blue	134-167
SAND	sand (drilled dirty), varied color	167-177
SAND	sand (drilled good), varied color	177-182
SAND	sand (drilled good), varied color	182-187
CLAY	sandy clay, blue	187-194
SAND	sand fine 8-10 slot, varied color	194-227

141-048-35BAABDA

Date Completed: 9/1977
L.S. Elevation (ft): 893
Depth Drilled (ft): 181
Screened Interval (ft): 172-177

Purpose:
Well Type:
Aquifer:
Log Source:

Domestic Well
4" Stainless Steel
Undefined
LTP Enterprises, Inc

Lithologic Log

141-048-35BAABDA (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-15
CLAY	clay, blue, soft	15-115
CLAY	sandy clay, blue	115-116
SAND	sand	116-119
CLAY	sandy clay, blue	119-121
SAND	sand with clay lenses	121-123
CLAY	sandy clay, blue, hard	123-171
SAND	sand	171-177
CLAY	sandy clay, blue	177-181

141-048-35DCCADC

Date Completed:	5/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	895	Well Type:	4" Stainless Steel
Depth Drilled (ft):	175	Aquifer:	Undefined
Screened Interval (ft):	160-170	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-25
CLAY	clay, blue, soft	25-120
CLAY	sandy clay, blue	120-137
CLAY	sandy clay, blue, hard	137-155
CLAY	sandy clay with sand lenses, blue	155-160
SAND	sand drilled fine	160-164
CLAY	sandy clay, blue	164-165
SAND	sand drilled good	165-167
CLAY	sandy clay, blue	167-171
SAND	sand	171-172
CLAY	sandy clay, blue	172-175

141-048-36DABADC

Date Completed:	11/1983	Purpose:	Domestic Well
L.S. Elevation (ft):	900	Well Type:	4" Stainless Steel
Depth Drilled (ft):	262	Aquifer:	Undefined
Screened Interval (ft):	256-260	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay with sand, brown	1-16

141-048-36DABADC (continued)

CLAY	clay, blue, soft	16-107
CLAY	sandy clay, gray	107-124
CLAY	sandy clay with rock, gray, hard	124-129
SAND	sand, colored	129-130
CLAY	sandy clay, gray, hard	130-255
SAND	sand #8 + #10, colored	255-260
WEATHERED PRECAMBRIAN	decomposed	260-262

141-049-03CCC

NDSWC 11612

Date Completed:	7/21/81	Purpose:	Observation Well
L.S. Elevation (ft):	879.8	Well Type:	1.25" PVC
Depth Drilled (ft):	198	Aquifer:	West Fargo North
Screened Interval (ft):	166-169	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow gray, plastic, oxidized (lacustrine)	0-12
CLAY	olive gray, plastic, unoxidized (lacustrine)	12-74
CLAY	olive gray, 25% clay, with silt, sand and gravel (sandy till) by 108 till is about 10 % clay, predominantly graded sand	74-124
SAND & GRAVEL	granules and pebbles of gravel, coarse to very coarse sand, subrounded, tan carbonates, brown, black silicates, some granite rock	124-127
CLAY	olive gray, 10% clay with 60% sand, along with silt and gravel (sandy till, as above)	127-134
SILT	olive gray	134-141
CLAY	olive gray 10% clay with 90% sand et. al., (very sandy till) (as above)	141-151
SAND	very coarse grained, moderately well sorted, some coarse sand and granules, subrounded, silicates, carbonates, quartz, granite rock clasts, one clast of light gray putty clay bedrock material	151-180
SAND & GRAVEL	composition as in sand immediately above, after 185 ft rocks-cobbles	180-191
CLAY	light gray with blue-green tint, pasty, poor recovery (apparently a bedrock boulder or slump block at bottom of sand and gravel)	191-195
TILL	(as above?)	195-198
ROCK	green, fine grained or crystalline bedrock boulder or bedrock, stopped drilling at 198 ft - very hard rock to drill through - probably bedrock	198-198

141-049-05CCC

NDSWC 11606

Date Completed:	6/24/81	Purpose:	Test Hole
L.S. Elevation (ft):	885	Well Type:	
Depth Drilled (ft):	240	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow gray, plastic (lacustrine), oxidized	0-15
CLAY	olive gray, plastic (lacustrine)	15-69

141-049-05CCC (continued)

TILL	olive gray, gummy, silty with some sand, gravel, and occasional boulder	69-83
SAND	speckled, fine to medium grained, fair sorting, occasional coarse-grained, subangular to subrounded, quartz and lithic	83-87
TILL	as in interval 69-83 ft	87-133
SILT	dark gray, lumpy, sandy	133-141
BOULDERS	granitic	141-142
TILL	gray to gray brown, silty with variable portions of sand, gravel, and an occasional boulder; upper part near boulder at 141 ft, perhaps oxidized (light red-brown and white)?	142-197
CLAY	brownish gray, silty, lumpy	197-218
GRAVEL	75% gravel, 25% sand, pebble-granule with some boulders, sand-coarse, subrounded-subangular, fair sorting, clayey toward base	218-231
MUDSTONE	dark red brown, flaky, soft, silty with some soft greenish gray mudstone (bedrock)	231-235
MUDSTONE	gray white, silty, soft, pasty	235-240

141-049-06CDB

Date Completed:	1951	Purpose:	Industrial Well
L.S. Elevation (ft):	885	Well Type:	6" Stainless Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-225	Log Source:	

Lithologic Log - unavailable

141-049-06CDBC

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	883	Well Type:	0" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

141-049-07ABB

		NDSWC 11601	
Date Completed:	6/17/81	Purpose:	Test Hole
L.S. Elevation (ft):	885	Well Type:	
Depth Drilled (ft):	240	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	dark gray to black, silty, cohesive, occasional sand (top soil, fill)	0-11
CLAY	light yellow gray, cohesive, oxidized (lacustrine)	11-19
CLAY	olive gray, cohesive (lacustrine)	19-62
SAND	brown speckled, very fine to fine-grained, fair sorting, predominantly quartz and carbonate	62-63
TILL	olive gray, predominantly clay and silt with sand and gravel: predominantly composed of carbonate, some igneous rock at 75 ft	63-124
TILL	clay and silt, olive gray, minor sand and gravel, rock at 136 ft	124-136
TILL	silt, olive gray, with clay and minor sand and gravel	136-155
SILT	dark gray, with some clay	155-161
SAND & SILT	interbedded, silt is dark gray with clay; sand is coarse to very coarse - grained with some granules (fluvial)	161-164

141-049-07ABB (continued)

TILL	clay and silt, olive gray, with sand and gravel, rock at 174 ft	164-176
CLAY	brownish gray, silty, occasional boulders, gravel and sand	176-207
CLAY	brownish gray, sandy, silty	207-211
SAND	fine-grained, silty (?)	211-216
SAND	medium to coarse grained with gravel; boulder at 216 ft (bedrock)	216-219
MUDSTONE	dark brownish gray to black, soft, silty and sandy, carbonaceous	219-227
MUDSTONE	light orange brown, soft, silty with white mottling	227-235
MUDSTONE	greenish-white to light gray, silty, soft	235-240

141-049-09BAA2

NDSWC 3096A

Date Completed:	5/20/64	Purpose:	Test Hole
L.S. Elevation (ft):	886	Well Type:	
Depth Drilled (ft):	274	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	silty, sticky, occasional laminae, oxidized, highly calcareous	2-15
CLAY	silty, sticky, calcareous	15-72
TILL	clay through gravel with boulders, carbonates, shale, quartz and granitic rocks - boulders predominant	72-91
TILL	clay through boulders, carbonates, shale and quartz, highly calcareous, also very rocky as above with layers of gravel, very fine sand (16 mm), very angular chips and sub-angular to rounded, predominantly carbonates with abundant granite crystals, quartz sand, also abundant limy sandstone, pebbles and granules	91-107
TILL	clay through gravel, shale, carbonates and quartz grains, highly calcareous, cohesive, tough, not near as rocky or gravelly as above, solid drilling	107-172
TILL	clay through gravel, very sandy, predominantly carbonates with quartz and granite crystals, very highly calcareous	172-242
TILL	clay through gravel, shale and carbonate grains, tough, highly calcareous - may have been a little silt, clay in here	242-249
TILL	clay through gravel, grains of varied composition including quartz, carbonates, granite, etc., highly calcareous, quite sandy and gravelly pink till, oxidized?	249-273
GRANITE	very angular, hard chips - cuttings of weathered granite are calcareous - oxidized?, stains are present on the granite chips	273-274

141-049-10DDD

Date Completed:	6/17/83	Purpose:	Test Hole
L.S. Elevation (ft):	882	Well Type:	
Depth Drilled (ft):	255	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown	3-32

141-049-10DDD (continued)

CLAY	blue	32-75
CLAY	sandy, blue	75-250
GRANITE	decomposed, green	250-251
GRANITE	green	251-255

141-049-11BBB

NDSWC 11613

Date Completed:	7/21/81	Purpose:	Test Hole
L.S. Elevation (ft):	882	Well Type:	
Depth Drilled (ft):	261	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow brown, plastic, oxidized soil profile at top (lacustrine)	0-13
CLAY	olive gray, plastic, unoxidized (lacustrine)	13-83
TILL	olive gray, soft, silty, sandy, slightly plastic, gravelly; predominantly clay; siltier from 110 ft; black shale fragments and gravel very common with tan carbonate	83-143
TILL	olive gray, slightly silty, sandy	143-153
TILL	olive gray, silty, sandy, gravelly; by 210 ft much harder and predominantly clay	153-223
CLAY	mottled gray and reddish-brown, firm, contains sand and granules, but predominantly clay and silt; (may be weathered surface of older till)	223-233
ROCK	no description	233-234
TILL	brown gray, silty with sand and gravel; gravel partly composed of green claystone and shale; at 250 ft becoming very sandy and gravelly	234-260
ROCK	no description	260-261

141-049-14ACB

Date Completed:	5/1/89	Purpose:	Domestic Well
L.S. Elevation (ft):	881	Well Type:	4" PVC
Depth Drilled (ft):	128	Aquifer:	Undefined
Screened Interval (ft):	108-128	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-4
CLAY	yellow	4-18
CLAY	gray	18-84
TILL	rocky	84-108
SAND & TILL	sand and till in layers	108-128

141-049-16DDD2

Date Completed:	4/4/95	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	5" Steel
Depth Drilled (ft):	252	Aquifer:	West Fargo North
Screened Interval (ft):	225-237	Log Source:	LTP Enterprises, Inc

Lithologic Log

141-049-16DDD2 (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow	1-22
CLAY	no description	22-65
CLAY	sandy	65-110
SAND	no description	110-117
SAND	with rock	117-131
CLAY	sandy	131-170
SAND	no description	170-175
CLAY	silty	175-181
SAND	no description	181-182
CLAY	sandy	182-192
SAND	silty	192-197
SAND	no description	197-238
SAND	with lenses of clay	238-252

141-049-21DAC2

Date Completed: 6/21/79
L.S. Elevation (ft): 887
Depth Drilled (ft): 172
Screened Interval (ft): 150-163

Purpose: Domestic Well
Well Type: 4" Steel
Aquifer: West Fargo North
Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-17
CLAY	blue	17-79
ROCK	red	79-80
ROCKS	blue, hard, sandy, clay	80-87
ROCK	red	87-88
ROCKS	blue, hard, sandy clay	88-107
LENSES	blue, sand, clay	107-119
SAND	colored	119-165
SAND	blue, with clay layer	165-169
CLAY	blue, sandy	169-172

141-049-22BBB

NDSWC 11611

Date Completed: 7/14/81
L.S. Elevation (ft): 885
Depth Drilled (ft): 280

Purpose: Test Hole
Well Type:
Log Source: NDSWC

Lithologic Log

141-049-22BBB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	light brown, silty, plastic	0-10
CLAY	yellow gray, plastic (lacustrine), oxidized	10-17
CLAY	olive gray, plastic, unoxidized (lacustrine)	17-77
CLAY	olive gray, silty, sandy, gravelly, very gravelly near top of unit	77-92
GRAVEL	granule to pebble, 40% sand: coarse to very coarse, subrounded to subangular, fair sorting; composition mostly tan carbonates and dark gray shale, some igneous	92-101
TILL	sandy, olive gray, silty, clayey, granule gravel, poor sorting	101-150
SAND	clean, medium to coarse-grained, fair sorting, granular gravel (20%), composition: quartz, black shale, tan carbonates, subrounded to subangular	150-155
SAND	dirty, as in interval 101 to 150	155-162
SILT	olive gray, clayey, some sand	162-176
SAND	probably fine to medium grained, poor returns, some granular gravel, coarser sand	176-182
SILT	gray, sandy, to very sandy, clayey, with some lenses of sand(?), returns not good	182-216
CLAY	gray, sandy with some sand lens	216-226
SAND	(?), poor returns, probably fine to medium grained	226-241
SILT & SAND	interbedded, gray, poor returns	241-255
TILL	very bouldery, with gravel	255-263
CLAYSTONE	light grayish white, slightly silty, pasty, soft, slightly sandy (gives speckled appearance), noncalcareous (bedrock)	263-280

141-049-27DCC

Date Completed:	10/1991	Purpose:	Industrial Well
L.S. Elevation (ft):	886	Well Type:	5" PVC
Depth Drilled (ft):	251	Aquifer:	Undefined
Screened Interval (ft):	212-238	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow	3-17
CLAY	gray	17-23
SAND	fine, dirty	23-39
CLAY	soft, gray	39-89
TILL	no description	89-104
ROCKS	no description	104-105
TILL	no description	105-107
GRAVEL	coarse	107-109
TILL	gravelly	109-130
GRAVEL	no description	130-131
TILL	no description	131-136
GRAVEL	no description	136-138

141-049-27DCC (continued)

TILL	no description	138-155
SAND	dirty	155-158
TILL	no description	158-161
SAND	dirty	161-164
TILL	no description	164-170
SAND	dirty	170-173
TILL	no description	173-175
GRAVEL	nice	175-180
TILL	no description	180-181
GRAVEL	no description	181-186
SAND	fine	186-195
SAND	with layers of fine sand	195-212
SAND	nice	212-221
TILL	no description	221-226
SAND	no description	226-238
TILL	no description	238-251

141-049-28ABB

Date Completed:	10/3/79	Purpose:	Domestic Well
L.S. Elevation (ft):	886	Well Type:	4" Steel
Depth Drilled (ft):	165	Aquifer:	West Fargo North
Screened Interval (ft):	155-161	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-5
CLAY	brown	5-22
CLAY	blue	22-80
CLAY	blue, sandy	80-91
SAND	colored	91-96
SAND	colored	96-99
CLAY	blue, sandy	99-148
SAND	colored	148-165

141-049-28ACA

Date Completed:	1963	Purpose:	Domestic Well
L.S. Elevation (ft):	890	Well Type:	3" Steel
Depth Drilled (ft):	193	Aquifer:	West Fargo North
Screened Interval (ft):	0-193	Log Source:	

Lithologic Log - unavailable

141-049-28BBB

NDSWC 11615

Date Completed: 7/23/81
 L.S. Elevation (ft): 886.4
 Depth Drilled (ft): 240
 Screened Interval (ft): 205-208

Purpose: Observation Well
 Well Type: 1.25" PVC
 Aquifer: West Fargo North
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	dark yellowish brown, plastic, (oxidized lacustrine sediments deposited in glacial lake Agassiz)	0-12
CLAY	olive gray, plastic, (lacustrine)	12-67
SCREENED TILL	olive gray, moderately cohesive, approximately 30 % clay with approximately 30% silt, 30 % sand and 10 % gravel (some sand or sand and till lenses) clayey lens @ 91-92 ft	67-101
SCREENED SAND	coarse grained, fair sorting, subrounded, quartzose with secondary shale, carbonate and other silicate grains; interbedded with clay or till lenses	101-111
SAND	as above without the interbedded clay lenses	111-118
CLAY	olive gray, cohesive, 50% with silt, sand and gravel 50% (argillaceous till) by 140 ft the till is about 30% clay, 70% others	118-141
CLAY	olive gray, somewhat plastic, moderately cohesive	141-150
SILT	olive gray, slightly argillaceous	150-156
SCREENED SAND	fine to medium grained, texture and lithology as above, medium-coarse grained at 180 ft, course sand at 190 ft, medium to very coarse, poorly sorted sand at 200 ft	156-205
SAND & GRAVEL	30% sand, 70% gravel; gravel 60% granules, 40% pebbles, subrounded to subangular, gravel, clasts primarily dark gray, red, other color (green) silicates, some carbonates & shale	205-220
SCREENED CLAY	very light gray, pasty, (bedrock)	220-240

141-049-28BDB

Date Completed: 8/22/61
 L.S. Elevation (ft): 890
 Depth Drilled (ft): 207
 Screened Interval (ft): 0-206

Purpose: Industrial Well
 Well Type: 4" Steel
 Aquifer: West Fargo North
 Log Source:

Lithologic Log - unavailable**141-049-29BCB**

Date Completed: 7/21/88
 L.S. Elevation (ft): 888
 Depth Drilled (ft): 158
 Screened Interval (ft): 148-158

Purpose: Domestic Well
 Well Type: 4" PVC
 Aquifer: Undefined
 Log Source: Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	yellow	4-14
CLAY	gray	14-77
TILL	rocky	77-85
TILL	gray	85-132
SAND & GRAVEL	no description	132-158

141-049-30AAB

NDSWC 11622

Date Completed: 7/28/81
 L.S. Elevation (ft): 886.5
 Depth Drilled (ft): 280
 Screened Interval (ft): 180-186

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	dark yellow brown, plastic oxidized (lake)	0-11
CLAY	olive gray, plastic, unoxidized (lake)	11-62
TILL	olive gray, silty, sandy, gravelly sand and gravel lens at 95-96 ft	62-115
CLAY	olive gray, silty	115-118
TILL	olive gray, silty, sandy, gravelly	118-124
CLAY	olive gray, silty, some sand or gravel, firm	124-146
SILT and CLAY	interbedded, olive gray, silt is sandy; clay is slightly; both silt and clay are firm (deltaic or fluvial)	146-160
SILT	sandy, or silty sand, olive gray, poor returns, kelly chattered due to compaction or cementation (deltaic or fluvial)	160-175
CLAY and SILT	interbedded, as in interval 146-160 ft (deltaic or fluvial)	175-178
SAND	very fine-grained, occasionally medium grained, dirty, silty and slightly clayey, mostly quartz, subrounded, poor returns, fines 25% to 50% of total, chattering as though compacted or cemented (deltaic or fluvial)	178-220
SAND	interbedded silty sand and sandy silt (?), poor returns	220-228
GRAVEL	very dirty, sandy, silty, and clayey (probably till), color is gray brown, drilled rocky	228-242
TILL	gray brown, sandy, silty, some gravel	242-247
CLAYSTONE	very light gray, slightly silty, pasty, (bedrock)	247-248
CLAYSTONE	grayish blue-green, slightly silty, pasty (bedrock)	248-260

141-049-30BBB

NDSWC 11623

Date Completed: 7/28/81
 L.S. Elevation (ft): 887.5
 Depth Drilled (ft): 280
 Screened Interval (ft): 158-161

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow brown, plastic, oxidized (lake)	0-18
CLAY	olive gray, plastic, unoxidized (lake)	18-67
TILL	olive gray, silty, sandy, gravelly - very gravelly in parts; sand and gravel lens at 112-115 ft; rock at 95 ft; after 104 ft, about 75% clay and silt	67-151
GRAVEL	granule with fine pebbles and very coarse sand (30%) subrounded to subangular, good sorting, composition: black shale, tan carbonate, igneous gravel coarsens downward and is interbedded with some silty sand units and gravelly, poorly-sorted units toward base - rock at 180 ft	151-172
TILL	olive gray, silty, sandy, gravelly, very sandy in part	172-200
SAND	fine to medium grained, poor sorting, clay silt and very fine grained sand portion 30-50%, sand mostly quartz with some lithics subrounded to rounded, some gravel, may be intercalated fine sand with silt and clay, contains some lignite	200-231
CLAY	olive gray, silty, interbedded with sand and gravels	231-241

141-049-30BBB (continued)

SAND	as in interval 200-231 ft - probably coarser with more gravel	241-253
GRAVEL	granule to fine pebble with coarse to very coarse sand (25%), subrounded to subangular, fair sorting, composed of black shale, tan carbonate and igneous rock, quartz, at 270 ft, samples medium to coarse pebbles (broken), probably dirty	253-274
SILTSTONE	light brown, sandy, soft	274-276
CLAYSTONE	very light gray and gray greenish blue, silty, soft, pasty	276-280

141-049-31CCC

Date Completed:	7/23/81	NDSWC 11617	Purpose:	Test Hole
L.S. Elevation (ft):	890		Well Type:	
Depth Drilled (ft):	200		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	dark yellowish-brown, plastic, oxidized (lacustrine).	0-10
CLAY	olive-gray, plastic (lacustrine).	10-62
CLAY	olive-gray, slightly cohesive, silt, sand, gravel, primarily sand; sand and gravel, very coarse sand, granules, shale and carbonate from 79 to 80 feet (till).	62-87
SAND & GRAVEL	very coarse sand, granules, subangular and subrounded, shale, carbonate, silicate.	87-93
CLAY	olive-gray, sandy till as above; sand and gravel from 98 to 101 feet; rock at 105 feet; interbedded sand and gravel, with cobbles from 105 to 110 feet; sand and gravel from 115 to 116 feet.	93-127
CLAY	olive-gray, slightly cohesive, silt, sand, gravel, primarily sand; rock at 127 feet; sand and gravel from 130 to 131 feet (till).	127-133
CLAY	olive-gray, moderately plastic, moderately cohesive; greenish tint from 133 to 135 feet, bedrock.	133-140
SILT	olive-gray, some very fine grains and carbonaceous material; gradation from clay to silt from 140 to 145 feet (bedrock).	140-160
CLAY	silty, olive-gray.	160-176
SILT	slightly clayey, greenish-olive-gray; greenish-gray silt by 181 feet (bedrock).	176-200

141-049-32CCD

Date Completed:	7/24/81	NDSWC 11619	Purpose:	Observation Well
L.S. Elevation (ft):	888		Well Type:	1.25" PVC
Depth Drilled (ft):	180		Aquifer:	West Fargo North
Screened Interval (ft):	144-147		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	dark yellowish brown, plastic, (lacustrine-oxidized)	0-11
CLAY	olive gray, plastic (lacustrine) at 35 ft rock	11-69
TILL	sandy, olive gray 30%, with silt, sand and gravel 70% at 71-75 ft, sand and gravel lens - poor recovery	69-103
SILT and CLAY	olive gray, silt in the first few feet underlain by plastic, cohesive clay	103-116
SAND & GRAVEL	70% sand, 30% gravel, gravel predominantly granules, sand coarse, poorly sorted, subangular to subrounded, quartz (in sand fraction), silicates, carbonates, shale; primarily silicates, 116-120 ft coarser, rock at 136 ft, found a few grains of pyrite	116-136

141-049-32CCD (continued)

SAND & GRAVEL	30% sand, 70% gravel, gravel 1/2 granules, 1/2 pebbles and cobbles, primarily silicates, some green claystone, probably clasts	136-171
SILT	olive gray, slightly argillaceous, compacted(?) at 177 ft, green fine-grained rock	171-180

141-049-32DCC1

NDSWC 11618

Date Completed:	7/24/81	Purpose:	Observation Well
L.S. Elevation (ft):	888.2	Well Type:	1.25" PVC
Depth Drilled (ft):	280	Aquifer:	West Fargo North
Screened Interval (ft):	240-246	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow gray, oxidized, plastic (lacustrine)	0-13
CLAY	olive gray, unoxidized, plastic (lacustrine)	13-69
TILL	olive gray, cohesive, silty, sandy, gravelly, very silty in parts	69-89
GRAVEL	granule to fine pebble, with 40% coarse to very coarse sand, good sorting, rounded to subrounded, clean, gravel composition: black shale, tan carbonate, and igneous	89-105
SAND	coarse to very coarse, rounded to subrounded, 25% granule gravel, good sorting, 50% quartz, 50% lithic, occasional gravel lenses	105-154
CLAY	gray, silty, soft, sandy(?), some lignite, micaceous	154-160
SAND	medium to coarse, rounded, 90% quartz, some lignite and lithic, good sorting, caves, probably graded some granule to fine pebble gravel in parts, but rare, may be cavings, coarsens downward	160-217
GRAVEL	granule to fine pebble, coarse to very coarse sand (25%), sand mostly quartz, gravel composition: black shale, tan carbonate, igneous, quartz, subrounded to rounded, fair sorting	217-257
CLAYSTONE	white gray, silty, pasty, lumpy, soft slight greenish tint (bedrock)	257-280

141-049-32DCC2

NDSWC 11618A

Date Completed:	7/24/81	Purpose:	Observation Well
L.S. Elevation (ft):	888.2	Well Type:	1.25" PVC
Depth Drilled (ft):	120	Aquifer:	West Fargo North
Screened Interval (ft):	103-109	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow gray, oxidized, plastic (lacustrine)	0-13
CLAY	olive gray, unoxidized, plastic (lacustrine)	13-67
TILL	olive gray, cohesive, silty, sandy, gravelly, very silty in part, rock at 87 ft	67-90
CLAY	as interval 67-90 ft, but interbedded with gravel and sand lenses (probably fluvial)	90-120

141-049-33CAAB1

Date Completed:	9/22/72	Purpose:	Municipal Well
L.S. Elevation (ft):	889	Well Type:	8" Steel
Depth Drilled (ft):	214	Aquifer:	West Fargo North
Screened Interval (ft):	193-213	Log Source:	Frederickson's of ND, Inc

Lithologic Log

141-049-33CAAB1 (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	brown	3-16
SHALE	brown	16-18
SHALE	blue	18-67
CLAY	sandy, with rock, blue	67-70
SAND	colored	70-73
CLAY	sandy, with small rock, blue	73-103
CLAY	sandy, blue	103-152
CLAY	sandy, soft, blue	152-161
SAND	blue	161-165
CLAY	blue	165-166
SAND	blue	166-214

141-049-33CAAB2

Date Completed:	9/3/82	Purpose:	Municipal Well
L.S. Elevation (ft):	889	Well Type:	8" Steel
Depth Drilled (ft):	217	Aquifer:	West Fargo North
Screened Interval (ft):	178-208	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-16
CLAY	soft, blue	16-71
CLAY	sandy, soft, blue	71-74
CLAY	sandy, with small rock, blue	74-89
ROCK	hard	89-90
CLAY	sandy, blue	90-98
ROCK	no description	98-99
CLAY	sandy, blue	99-100
SAND	blue	100-102
CLAY	sandy, blue	102-172
CLAY	sandy, with lenses of sand, blue	172-177
ROCK	no description	177-178
SAND	fine, 8-slot, blue	178-211
CLAY	sandy, blue	211-217

141-049-33CAB

Date Completed: 5/19/61
 L.S. Elevation (ft): 891
 Depth Drilled (ft): 185
 Screened Interval (ft): 0-185

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 West Fargo North

Lithologic Log - unavailable**141-049-33DAB**

Date Completed: 7/20/72
 L.S. Elevation (ft): 894
 Depth Drilled (ft): 191

Purpose:
 Well Type:
 Log Source:

Test Hole
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow	1-23
CLAY	soft, blue	23-65
CLAY	sandy, blue	65-73
CLAY	sandy, hard, rocks, blue	73-91
BOULDERS	colored	91-92
CLAY	sandy, hard, rocks, blue	92-103
SAND	with layers of clay, colored	103-126
SAND	clean, colored	126-137
CLAY	sandy, hard, blue	137-181
GRANITE	weathered, white, pink	181-191

141-049-33DBA

Date Completed: 7/26/72
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 200

Purpose:
 Well Type:
 Log Source:

Test Hole
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow	1-21
CLAY	soft, blue	21-79
CLAY	sandy, hard, with rock, blue	79-87
CLAY	sandy, hard, boulders, blue	87-98
CLAY	sandy, with lenses of sand, blue	98-105
CLAY	sandy, hard, with rocks, blue	105-121
SAND	dirty, with layers of clay, blue	121-138
CLAY	sandy, hard, blue	138-148
SAND	blue	148-150
CLAY	sandy, hard, blue	150-158

141-049-33DBA (continued)

BOULDER	granite, green	158-160
CLAY	sandy, hard, blue	160-181
CLAY	sandy, with lenses of sand, blue	181-186
SAND	gray	186-191
GRANITE	weathered, white	191-196
GRANITE	weathered	196-200

141-049-33DCC

NDSWC 11616

Date Completed:	7/23/81	Purpose:	Observation Well
L.S. Elevation (ft):	891	Well Type:	1.25" PVC
Depth Drilled (ft):	240	Aquifer:	West Fargo North
Screened Interval (ft):	201-204	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow gray, oxidized, plastic (lacustrine)	0-13
CLAY	olive gray, unoxidized, plastic (lacustrine) - wood at 28 ft	13-87
TILL	olive gray, silty, sandy, gravelly; very silty and sandy in parts	87-104
CLAY	olive gray, silty, cohesive, coarsens downward (fluvial?)	104-112
SAND	with gravel, poor returns	112-117
CLAY	olive gray, silty, cohesive, sandy	117-120
SAND	medium to coarse, clean, mostly quartz, remainder lithic, rounded to subrounded, good sorting	120-126
CLAY	gray brown, silty, sandy, gravelly, very silty and sandy in parts, sand lens at 140-141 ft becomes sandy toward base	126-179
GRAVEL	granule to fine pebble, with coarse sand (mostly quartz); sand percentage (25%) composed of tan carbonate, dark gray shale, and igneous rock; good sorting, subrounded	179-200
SAND	coarse to very coarse, mostly rounded to subrounded quartz with lithic, good sorting, 20% granule gravel	200-218
CLAYSTONE	nearly white, soft, slightly silty, cohesive, lumpy (bedrock), noncalcareous	218-240

141-050-03DDA

Date Completed:	8/28/72	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	4" Steel
Depth Drilled (ft):	198	Aquifer:	Prosper
Screened Interval (ft):	186-192	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown	2-8
CLAY	blue	8-14
SHALE	blue	14-68
CLAY	blue, sandy	68-146
SAND	blue, fine	146-152

141-050-03DDA (continued)

CLAY	blue, sandy	152-170
SAND	blue	170-171
CLAY	blue, sandy	171-180
SAND	blue	180-196
CLAY	blue, sandy	196-198

141-050-05CCD

Date Completed:	6/25/76	Purpose:	Domestic Well
L.S. Elevation (ft):	904	Well Type:	4" Steel
Depth Drilled (ft):	340	Aquifer:	Dakota Group
Screened Interval (ft):	233-243	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow	3-24
CLAY	gray	24-64
GRAVEL	no description	64-66
TILL	no description	66-88
SHALE	no description	88-142
TILL	no description	142-148
GRAVEL	no description	148-151
TILL	with streaks of gravel	151-178
TILL & SHALE	no description	178-227
SANDSTONE	(Dakota) with streaks of shale	227-244
SHALE	no description	244-298
GRANITE	weathered	298-340

141-050-05DDC2

Date Completed:	6/12/72	Purpose:	Domestic Well
L.S. Elevation (ft):	902	Well Type:	4" Steel
Depth Drilled (ft):	237	Aquifer:	Dakota Group
Screened Interval (ft):	224-234	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-17
CLAY	gray, lake	17-60
TILL	gray, silty, gravel	60-198
TILL	coarse	198-218
SAND	white, clean, uniform	218-237

141-050-06DDD

NDSWC 3098

Date Completed: 5/23/64
 L.S. Elevation (ft): 908
 Depth Drilled (ft): 355
 Screened Interval (ft): 128-131

Purpose: Observation Well
 Well Type: 1.25" ABS
 Aquifer: Undefined
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	silty, moderate yellowish-brown and dark yellowish-brown, cohesive, calcareous spots, yellowish-gray, with clay only slightly calcareous, oxidized; approximate boundary below.	1-6
CLAY	silty, grayish-orange, sticky, calcareous, oxidized.	6-17
CLAY	silty, dark gray, sticky, calcareous.	17-64
TILL	clay through gravel, dark gray, shale carbonate, igneous, quartz, some lignite, cohesive, highly calcareous.	64-82
SILT	clayey, dark gray, very soft, lignite, highly calcareous.	82-85
TILL	clay through gravel, dark gray, carbonate and shale, with some quartz and igneous, cohesive, highly calcareous.	85-103
SAND	very fine or silty to 1 mm, maybe some clay, occasional coarse sand and gravel, predominantly quartz with abundant carbonate and shale, some lignite and igneous.	103-115
SAND	up to 2 mm, abundant carbonate, with igneous, shale, quartz, metamorphic, few pyrite and lignite fragments, predominantly subrounded and rounded, coarser with depth, 8 mm to boulders; few lenses of very fine sand.	115-143
CLAY	silty, dark greenish-gray; no samples; probably till from 143 to 163 feet.	143-245
SILT	clayey, dark gray to black, cohesive, noncalcareous, soft, lignite; laminated; approximate boundary below.	245-280
SILT	dark gray to black and dark greenish-gray and olive-black, some very fine sand, lignite material, noncalcareous; some laminations and oxidation lines.	280-331
WEATHERED IGNEOUS	light olive-brown to pale blue-green, soft, igneous cuttings, noncalcareous with white calcareous inclusions; evidently oxidized at top, 1 to 2 mm concretions, very hard.	331-355

141-050-09AAA2

NDSWC 3097A

Date Completed: 5/22/64
 L.S. Elevation (ft): 893.51
 Depth Drilled (ft): 312
 Screened Interval (ft): 250-280

Purpose: Observation Well
 Well Type: 1.25" ABS
 Aquifer: Prosper
 Log Source: NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SILT	pale yellowish-brown, highly calcareous, cohesive, oxidized.	0-13
SILT	very clayey, pale yellowish-brown to dark greenish-gray, also light olive-gray, highly calcareous, partially oxidized.	13-25
SILT	very clayey, dark greenish-gray, highly calcareous, sticky.	25-40
CLAY	silty, dark greenish-gray, slightly calcareous, sticky; yellowish-gray spots, sandy, highly calcareous, most less than 2 mm in diameter.	40-65
TILL	clay through gravel, olive-gray, shale carbonate, igneous, quartz, some lignite, cohesive, highly calcareous.	65-82
SILT	clay and very fine sand, olive-gray, lignite material, cohesive, highly calcareous.	82-100
TILL	clay through gravel, olive-gray to very dark gray, tough, cohesive, shale, carbonate, quartz, igneous, highly calcareous.	100-117

141-050-09AAA2 (continued)

TILL	clay through gravel, olive-gray, predominantly silt to fine sand, shale, carbonate, solid, dry, highly calcareous.	117-147
SILT	very fine sand, olive-gray, highly calcareous, solid, dry; laminae of very fine, white sand.	147-210
TILL	clay through gravel, quite sandy, a few rocks, olive-gray, shale, carbonate, quartz, igneous, highly calcareous, slightly cohesive; poor return.	210-260
SAND	0.25 to 8 mm, abundant granules, angular chips, subangular to rounded, quartz, shale, carbonate, igneous, lignite; more very fine and fine sand with depth.	260-312
WEATHERED IGNEOUS	pale blue-green, calcareous, soft, solid.	312-312

141-050-11CDC

Date Completed:	2/22/61	Purpose:	Domestic Well
L.S. Elevation (ft):	893	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Prosper
Screened Interval (ft):	0-195	Log Source:	

Lithologic Log - unavailable

141-050-12AAA

	NDSWC 11600		
Date Completed:	6/17/81	Purpose:	Test Hole
L.S. Elevation (ft):	884	Well Type:	
Depth Drilled (ft):	220	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	clay, olive-black, organic, oxidized (fill).	0-3
CLAY	dark yellowish-brown, moderately cohesive, oxidized (lacustrine).	3-29
CLAY	olive-gray, plastic, cohesive (lacustrine).	29-73
CLAY	silt, sand, gravel, very sandy, olive-gray; sand from 93 to 95 feet (till).	73-103
CLAY	silt, sand, olive-gray, cohesive, calcareous; silt and clay lens at 129 feet; sand from 150 to 151 feet (till).	103-160
CLAY	silty, olive-gray, moderately cohesive, some small, tan grains and stringers, noncalcareous; silty, fine sandy clay underlain by light gray stringers, possibly bentonite, from 180 to 200 feet (bedrock).	160-220

141-050-15DAA

	NDSWC 12927		
Date Completed:	10/24/91	Purpose:	Observation Well
L.S. Elevation (ft):	892.92	Well Type:	2" PVC
Depth Drilled (ft):	255	Aquifer:	Prosper
Screened Interval (ft):	138-143	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-2
CLAY	yellow-brown, smooth, soft, very plastic, oxidized (lake clay).	2-27
CLAY	gray, soft, smooth, very plastic (lake clay).	27-64
CLAY	very sandy, silty, pebbly, gray, soft, moderately plastic; rocks at 67 and 73 feet (till).	64-82
SAND	medium and coarse, some gravel, lots of carbonate.	82-106

141-050-15DAA (continued)

GRAVEL	medium and coarse, some sand.	106-111
SAND	coarse.	111-125
GRAVEL	medium and coarse, some coarse sand, subangular and subrounded, quartz, carbonate, some shale; rocks from 143 to 145 feet.	125-145
CLAY	slightly silty, gray to dark gray, moderately firm, moderately plastic; rock at 164 to 165 feet (fluvial or lacustrine).	145-165
CLAY	gray, moderately soft, plastic, smooth, sticky; similar to lake clay (lacustrine).	165-190
SAND & GRAVEL	mostly gravel, quartz, carbonate, shale, subangular to rounded; rock at 199 to 200 feet.	190-200
SAND	with many small clay layers; poor return.	200-222
GRAVEL	poor return; drills rough; probably sandy, some clay.	222-253
ROCKS	with clay, pink, some soft, some hard, some hard material crumbles.	253-255

141-050-23CCC1

NDSWC 12925

Date Completed:	10/23/91	Purpose:	Observation Well
L.S. Elevation (ft):	890.86	Well Type:	2" PVC
Depth Drilled (ft):	300	Aquifer:	Prosper
Screened Interval (ft):	278-283	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-2
CLAY	yellow-brown, soft, smooth, very plastic, oxidized (lake clay).	2-16
CLAY	gray, soft, smooth, very plastic (lake clay).	16-64
CLAY	sandy, silty, pebbly, gray, stiff, fairly sandy; sand layer from 68 to 69 feet (till).	64-81
CLAY	silty, gray, fairly stiff, slightly plastic; light gray-brown streaks (fluvial or lacustrine).	81-101
CLAY	sandy, silty, pebbly, gray to dark gray (till).	101-110
CLAY	very silty, almost clayey silt, gray, soft, no plasticity.	110-118
SAND	fine to coarse, some gravel, fairly clean, predominantly quartz, with a lot of shale and carbonate; coarser with depth.	118-143
GRAVEL	medium to very coarse, angular to subrounded; 1 to 2 inch layers of clay from 143 to 160 feet, lots of pyrite.	143-178
CLAY	poor return.	178-185
SAND & GRAVEL	with clay; layered.	185-191
CLAY	dark gray, some portions above 200 feet are sandy, most have occasional pebbles or sand sized grains, moderately soft, plastic, sticky; drills almost like bedrock (goofy till).	191-221
CLAY	very sandy, silty, pebbly, gray to dark gray, moderately soft, slightly to moderately plastic (till).	221-232
SILT	clayey, brownish-gray, very soft, some mica flakes.	232-242
GRAVEL	fine to medium, angular to subrounded, quartz, shale, some carbonate and igneous; coarser with depth; rock at 251 feet.	242-252
SAND & GRAVEL	with clay layers; very little clay return; drill like thin clay layers; rock at 267 feet.	252-268
GRAVEL	fine to coarse, with sand, quartz and igneous.	268-298
CLAY	silty, greenish-yellow-brown, soft, speckled to dark greenish-brown spots (weathered Precambrian).	298-300

141-050-23CCC2

NDSWC 12926

Date Completed: 10/23/91
 L.S. Elevation (ft): 891.07
 Depth Drilled (ft): 140
 Screened Interval (ft): 130-135

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 2" PVC
 Prosper
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow-brown, soft, smooth, very plastic, oxidized (lake clay).	2-16
CLAY	gray, soft, smooth, very plastic (lake clay).	16-64
CLAY	silty, sandy, pebbly, gray to dark gray, moderately firm to firm, slightly plastic (till).	64-79
CLAY	silty, gray, fairly stiff, moderately plastic, some light tan specks (fluvial or lacustrine).	79-98
CLAY	very silty, pebbly, sandy, gray, firm, slightly plastic (till).	98-107
CLAY	slightly silty, gray, firm, plastic, smooth (lacustrine or fluvial).	107-118
SAND	fine and medium, clean.	118-139
SAND & GRAVEL	twisted off.	139-140

141-050-23DDD

NDSWC 11624

Date Completed: 7/29/81
 L.S. Elevation (ft): 888.2
 Depth Drilled (ft): 280
 Screened Interval (ft): 118-121

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 Prosper
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	dark yellow-brown, plastic, oxidized (lake).	0-16
CLAY	olive-gray, plastic, unoxidized (lake).	16-64
CLAY	olive-gray, silty, sandy, gravelly, tan carbonate and black shale dominant gravel (till).	64-96
SAND	predominantly medium and coarse, subrounded and rounded, fair sorting, very fine to fine sand and silt, granule to fine pebble gravel, quartz and lithic; interbedded sand and gravel lenses.	96-129
CLAY	olive-gray, silty; poor return.	129-131
SAND	as above.	131-135
GRAVEL	fine to medium, some sand.	135-136
SILT	olive-gray, slightly sandy, clayey.	136-168
GRAVEL	granule to medium, with sand, coarse and very coarse, subangular and subrounded, tan carbonate, black shale, igneous; interbedded gravel lenses; sorting in unit probably good.	168-180
SILT	olive-gray, sandy, clayey, some gravel; till or poorly sorted fluvial.	180-185
GRAVEL	as above.	185-186
SAND & GRAVEL	with clay, interbedded; rock at 192 feet.	186-192
GRAVEL	fine to coarse, some cobbles possible, tan carbonate, igneous, black shale; losing water; clay lenses at 207 and 209 feet.	192-216
CLAY	silty, olive-gray.	216-219
SAND	fine and medium, some coarse and very coarse, granules, some silt or very fine sand, predominantly quartz, subrounded and rounded; sand either cemented or compacted; interbedded; probably fluvial.	219-263
SILT	with fine sand; no return.	263-273

141-050-23DDD (continued)

GRAVEL	drilled very rocky; probably dirty.	273-276
CLAYSTONE	very light gray, slightly silty, paste like, noncalcareous (bedrock).	276-280

141-050-28AAA

NDSWC 12322

Date Completed:	6/16/83	Purpose:	Observation Well
L.S. Elevation (ft):	894.3	Well Type:	2" PVC
Depth Drilled (ft):	360	Aquifer:	Prosper
Screened Interval (ft):	278-283	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow-brown, very plastic, iron stained, oxidized.	2-15
CLAY	olive-gray, very plastic (lake clay).	15-63
CLAY	olive-gray, silty, sandy, pebbles, poorly sorted; interbedded sand and gravel from 70 to 73 feet (till).	63-90
SAND	medium and coarse, gravel, subrounded; poor return.	90-95
CLAY	olive-gray, silty, no pebbles; drills smooth.	95-97
CLAY	till as above, very silty; shale gravel from 105 to 107 feet.	97-124
CLAY	gray to black, very sandy and silty; drills real smooth.	124-127
CLAY	olive-gray, very silty, no pebbles or sand; not as plastic as lake clay.	127-135
CLAY	till as above; extremely interbedded with sand and very sandy clay; drills choppy; real trashy return.	135-150
CLAY	olive-gray, slightly silty, no pebbles, some sandy clay mixed in; drills smooth.	150-161
CLAY	olive-gray; interbedded with sands and gravels; choppy drilling.	161-237
CLAY	olive-gray.	237-239
CLAY	white-gray, silty, very sandy, small pebbles, poorly sorted; possibly till.	239-249
CLAY	brown to black, very sticky, occasional greenish tint when broken, some white specks.	249-261
SAND	drills choppy; poor return.	261-263
CLAY	drills smooth.	263-264
SAND	very fine and fine; drills choppy; poor return.	264-272
CLAY	drills smooth and slow; poor return.	272-273
SAND	very fine and fine; drills choppy; poor return.	273-285
CLAY	drills smooth and slow; poor return.	285-286
SAND	very fine and fine; drills choppy as if coarser; poor return.	286-301
CLAY	olive-gray, silty, sandy, pebbles, poorly sorted; interbedded with clay; gravel from 314 to 315 feet (till).	301-336
CLAY	reddish-brown and greenish, silty, sandy (bedrock).	336-360

Screen
263-68

Screen
90-95

Screen
145-150

Screen →
210-215

between
273-301

Screen
350-355

141-050-33DDD

NDSWC 13342

Date Completed:	10/20/83	Purpose:	Observation Well
L.S. Elevation (ft):	894.48	Well Type:	2" PVC
Depth Drilled (ft):	300	Aquifer:	Prosper
Screened Interval (ft):	108-113	Log Source:	NDSWC

141-050-33DDD (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow brown, soft, very smooth, very plastic, (oxidized lake clay)	1-21
CLAY	medium gray, soft, very smooth, very plastic, (lake clay)	21-57
CLAY	medium to light gray, sandy, silty, pebbly, moderately soft, moderately plastic, (till)	57-63
CLAY	medium gray, sandy, silty, pebbly, very sandy in places, clay is stiffer, more pebbles, (till)	63-71
CLAY	gray, very sandy, very pebbly, lots of rocks and gravel, drilling difficult, slightly plastic, soft, (till)	71-83
SAND	medium to coarse, some gravel, subangular to subrounded, predominantly quartz with much shale, more gravel and rocks and more carbonates with depth	83-111
GRAVEL	coarse, angular to subangular, quartz, shales and carbonates	111-113
CLAY	dark gray, soft, plastic, occasional sand-sized particles, drills slowly, (till)	113-139
SAND & GRAVEL	coarse, poorly sorted, angular to subrounded	139-141
CLAY	light gray, very, very, sandy, with numerous layers of gravel, one gravelly layer from 150 to 156 feet, (till)	141-160
SAND & GRAVEL	rocky, poorly sorted, angular to subrounded	160-163
CLAY	dark gray, stiff, fluvial or lacustrine except for occasional sand-sized grains, (till)	163-171
CLAY	dark gray, soft, very plastic, slight greenish tint, some sand, gritty, after 200 feet the clay is not so sandy, with occasional sand-sized particles, (till)	171-246
SAND	not much sample return	246-249
CLAY	not much sample return	249-252
SAND	not much sample return	252-253
CLAY	not much sample return	253-256
SAND & GRAVEL	poorly sorted, fine to coarse sand, fine to medium gravel, shale, some coal, some weathered Precambrian, some carbonates	256-267
CLAY	brownish gray, sandy, plastic, drilling 'chatters' occasionally, some layers seem sandier than others, (till)	267-281
CLAY	brownish gray, very silty, not very plastic, sandy, (till)	281-293
CLAY	brownish gray, very silty, soft, not very plastic, (till?)	293-297
CLAY	green, soft, angular sand grains, (weathered Precambrian)	297-300

141-051-19CDD

Date Completed:	1962	Purpose:	Domestic Well
L.S. Elevation (ft):	947	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-319	Log Source:	

Lithologic Log - unavailable

141-051-21DDB

Date Completed:	8/15/63	Purpose:	Stock Well
L.S. Elevation (ft):	927	Well Type:	0" Unknown
Depth Drilled (ft):	175	Aquifer:	Undefined
Screened Interval (ft):	138-144	Log Source:	Lako Drilling

Lithologic Log

141-051-21DDB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow.	2-18
CLAY	sand, yellow.	18-25
CLAY	blue.	25-60
CLAY	blue, little sand.	60-80
SAND	some fine sand.	80-90
SAND	gray.	90-130
CLAY	blue.	130-175

141-051-25DDD

NDSWC 3132

Date Completed:	7/27/64	Purpose:	Test Hole
L.S. Elevation (ft):	909	Well Type:	
Depth Drilled (ft):	257	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black.	0-2
SILT	pale yellowish-brown, cohesive, soft, fine lignite flakes, slightly calcareous, oxidized; patches of dark yellowish orange surrounding a core of dark brown material.	2-25
SILT	dark greenish to olive-gray, cohesive, soft, similar to above, slightly calcareous.	25-56
TILL	olive-gray, silty, shale, quartz, carbonate, angular to subrounded, grains up to 3 mm, highly calcareous, cohesive, hard.	56-87
TILL	as above, getting very silty, grains 1 mm maximum, scarce; calcite shell observed.	87-116
SILT	dusky yellowish-brown to brownish-black, wood fragments, lignite, rare carbonate fragments; also till, light olive-gray and dark greenish-gray, composition same as above, cohesive, soft; possibly beach deposit.	116-133
SILT	dark greenish to olive-gray, cohesive, hard, highly calcareous, occasional medium and coarse sand, quartz, carbonate; laminated with white fine sand.	133-137
TILL	fine sandy, occasional medium and coarse sand, dark yellowish-brown, veined with moderate yellowish-brown, oxidized, carbonate, quartz, lignite, highly calcareous.	137-143
SILT	dark greenish-gray, laminated with fine white sand, shale, quartz, fine lignite flakes, highly calcareous.	143-150
TILL	silty, dark greenish to olive-gray, cohesive, hard, carbonate, lignite, quartz, shale, angular to rounded, 1 mm in size, highly calcareous.	150-166
SAND	mainly quartz, shale, lignite, carbonate, size mostly below 0.5 mm, angular to rounded, sphericity varies greatly.	166-180
SILT	clayey, sandy, greenish-gray, quartz, lignite, highly calcareous, cohesive, soft; sand lenses, similar to above.	180-230
SHALE	dark greenish-gray, cohesive, very hard; laminations of sand, slightly calcareous, lignite flakes.	230-257

142-047-06DABDAB

Date Completed:	12/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	886	Well Type:	4" Stainless Steel
Depth Drilled (ft):	225	Aquifer:	Undefined
Screened Interval (ft):	220-225	Log Source:	Olson Well Service

142-047-06DABDAB (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-2
CLAY	clay, yellow, soft	2-23
CLAY	clay, gray, soft	23-136
CLAY	clay sand, gray, medium soft	136-151
SAND	sand, gray, soft	151-153
SAND	clay sand, gray, soft	153-186
CLAY	sand clay, gray, medium soft	186-193
CLAY	clay, gray, medium soft	193-208
SAND	sand, gray, soft	208-219
SAND	water sand	219-225

142-047-08ADDAAC

Date Completed:	1/1964	Purpose:	Domestic Well
L.S. Elevation (ft):	880	Well Type:	4" Stainless Steel
Depth Drilled (ft):	181	Aquifer:	Undefined
Screened Interval (ft):	176-180	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, yellow	2-12
CLAY	shale, blue	12-126
CLAY	sandy clay, blue, hard	126-137
SAND	fine sand, blue	137-139
CLAY	sandy clay with sand lenses, blue, softer	139-171
CLAY	sandy clay, blue, hard	171-174
SAND	sand, colored	174-181

142-047-09BCBCAB

Date Completed:	9/1966	Purpose:	Domestic Well
L.S. Elevation (ft):	889	Well Type:	4" Stainless Steel
Depth Drilled (ft):	212	Aquifer:	Undefined
Screened Interval (ft):	204-212	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, yellow	2-7
CLAY	shale, blue	7-126
CLAY	clay, blue	126-130
CLAY	clay lensed with sand, blue	130-174

142-047-09BCBCAB (continued)

SAND	sand, blue	174-177
CLAY	clay, blue	177-200
SAND	sand, blue	200-212

142-047-14ADACBB

Date Completed:	2/1962	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Other
Depth Drilled (ft):	192	Aquifer:	Undefined
Screened Interval (ft):	185-192	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-16
CLAY	shale, blue, soft	16-115
SAND	sand, colored	115-118
CLAY	sandy clay, blue, hard	118-139
CLAY	sandy clay + lenses of sand, blue, soft	139-152
CLAY	sandy clay, blue, hard	152-175
SAND	dirty sand, gray	175-180
CLAY	clay, blue	180-182
SAND	sand, colored	182-192

142-047-20BCCBAA

Date Completed:	4/1977	Purpose:	Domestic Well
L.S. Elevation (ft):	889	Well Type:	0"
Depth Drilled (ft):	181	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-17
CLAY	sandy clay, blue, soft	17-117
BOULDERS	rock, black	117-118
CLAY	sandy clay, blue, hard	118-161
PRECAMBRIAN	rocky granite	161-181

142-047-23DCDDAD

Date Completed:	9/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	897	Well Type:	4" Stainless Steel
Depth Drilled (ft):	224	Aquifer:	Undefined
Screened Interval (ft):	211-217	Log Source:	LTP Enterprises, Inc

Lithologic Log

142-047-23DCDDAD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-17
CLAY	sandy clay, blue, soft	17-112
SAND	sand, gray	112-113
CLAY	sandy clay, blue	113-114
SAND	sand, gray	114-115
CLAY	sandy clay, blue	115-120
SAND	sand drilled poor fine, varied color	120-124
CLAY	sandy clay, blue	124-139
SAND	dirty sand drilled poor, varied color	139-144
CLAY	sandy clay, blue	144-152
SAND	sand	152-154
CLAY	sandy clay, blue	154-155
SAND	sand drilled dirty, varied color	155-159
CLAY	sandy clay, blue	159-165
SAND	sand drilled dirty, varied color	165-169
SAND	lenses of sand + clay, gray-blue	169-177
SAND	sand, varied color	177-178
CLAY	sandy clay, blue	178-203
SAND	sand drilled clean fine, varied color	203-209
CLAY	sandy clay, blue	209-210
SAND	sand	210-217
SAND	sand with clay lenses, varied color	217-221
CLAY	sandy clay, blue	221-224

142-047-24CDDDCD

Date Completed:	7/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	899	Well Type:	4" Stainless Steel
Depth Drilled (ft):	230	Aquifer:	Undefined
Screened Interval (ft):	152-162	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, brown, soft	1-22
CLAY	clay, blue, soft	22-110
CLAY	sandy clay, blue	110-151
SAND	sand - washed, colored	151-152
CLAY	sandy clay, blue	152-153
SAND	sand drilled good, colored	153-156

142-047-24CDDDCD (continued)

SAND	sand drilled dirty, colored	156-158
CLAY	sandy clay, blue	158-161
SAND	sand	161-162
CLAY	sandy clay with rock, blue	162-165
BOULDERS	rock	165-168
CLAY	sandy clay with small rock, blue	168-185
SAND	sand, gray	185-187
CLAY	clay, blue	187-188
SAND	sand, gray	188-189
CLAY	sandy clay, blue, hard	189-190
SAND	sand	190-191
CLAY	sandy clay, blue	191-216
BOULDERS	rock	216-219
CLAY	sandy clay with rock, blue, hard	219-221
SAND	sand	221-225
CLAY	sandy clay, blue	225-227
CLAY	sandy clay with decomposed, green	227-228
PRECAMBRIAN	granite, colored	228-230

142-047-25DDDADC

Date Completed:	10/1968	Purpose:	Domestic Well
L.S. Elevation (ft):	901	Well Type:	0"
Depth Drilled (ft):	236	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-13
CLAY	clay, blue	13-101
CLAY	sandy clay hard lenses, blue	101-114
CLAY	sandy clay with sand lenses, blue	114-139
CLAY	sandy clay, blue, hard	139-144
SAND	dirty sand, blue	144-147
CLAY	sandy clay, blue, hard	147-165
CLAY	sandy clay boulders, blue, hard	165-193
WEATHERED PRECAMBRIAN	weathered granite, red-green	193-236

142-047-25DDDADC

Date Completed: 10/1968
 L.S. Elevation (ft): 904
 Depth Drilled (ft): 203
 Screened Interval (ft): 194-200

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-13
CLAY	clay, blue, soft	13-100
CLAY	sandy clay, blue, hard	100-141
CLAY	sandy clay, blue, soft	141-162
SAND	sand, blue	162-163
CLAY	sandy clay, blue, hard	163-172
SAND	sand, blue	172-174
CLAY	sandy clay, blue, hard	174-187
CLAY	sandy clay with sand lenses, colored	187-193
SAND	sand boulders, colored	193-201
WEATHERED PRECAMBRIAN	weathered granite, green	201-203

142-047-30CCDDAC

Date Completed: 6/1970
 L.S. Elevation (ft): 890
 Depth Drilled (ft): 204
 Screened Interval (ft): 197-202

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	shale, yellow	2-18
CLAY	shale, blue	18-122
CLAY	clay, blue	122-144
SAND	sand-washed, brown	144-146
CLAY	clay, blue	146-162
SAND	sand, brown	162-164
CLAY	clay, blue	164-195
SAND	coarse sand, brown	195-202
CLAY	clay, blue	202-204

142-047-30DDCDDC

Date Completed: 7/1974
 L.S. Elevation (ft): 892
 Depth Drilled (ft): 202
 Screened Interval (ft): 187-195

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

142-047-30DDCDDC (continued)

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	shale, brown	1-13
CLAY	shale, blue	13-119
CLAY	sandy clay, blue	119-128
SAND	sand, blue	128-130
CLAY	sandy clay, blue, soft	130-156
SAND	sand, blue	156-157
CLAY	sandy clay, blue, soft	157-169
SAND	sand with lenses of clay, colored	169-173
SAND	sand, colored	173-202

142-047-32CDADCB

Date Completed:	1984	Purpose:	Domestic Well
L.S. Elevation (ft):	893	Well Type:	4"
Depth Drilled (ft):	258	Aquifer:	Undefined
Screened Interval (ft):	237-247	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-25
CLAY	clay, gray	25-115
TILL	sandy till with gravel layers, gray	115-237
SAND	sand	237-238
TILL	sandy till	238-239
SAND	sand	239-240
TILL	sandy till	240-241
SAND	sand	241-243
TILL	sandy till	243-244
SAND	sand	244-247
TILL	gravelly till	247-248
TILL	sandy till	248-258

142-047-32DDDCDA

Date Completed:	11/1963	Purpose:	Domestic Well
L.S. Elevation (ft):	894	Well Type:	4" Stainless Steel
Depth Drilled (ft):	222	Aquifer:	Undefined
Screened Interval (ft):	215-221	Log Source:	Frederickson's of ND, Inc

Lithologic Log

142-047-32DDDCDA (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-7
CLAY	clay, brown	7-18
CLAY	shale, blue, soft	18-99
CLAY	sandy clay, blue, soft	99-133
CLAY	sandy clay with sand lenses, blue, soft	133-141
CLAY	sandy clay, blue	141-158
CLAY	sandy clay boulder, blue, hard	158-163
CLAY	sandy clay, blue, hard	163-205
SAND	dirty sand, blue, hard	205-212
SAND	sand, blue	212-222

142-047-33ADDDC

Date Completed:	11/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	897	Well Type:	4" Stainless Steel
Depth Drilled (ft):	229	Aquifer:	Undefined
Screened Interval (ft):	218-222	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-15
CLAY	clay, blue, soft	15-103
CLAY	sandy clay, blue	103-200
SAND	sand, colored	200-201
CLAY	sandy clay, blue, hard	201-217
SAND	sand, colored	217-222
WEATHERED PRECAMBRIAN	weathered granite, reddish	222-227
PRECAMBRIAN	granite, red-white	227-229

142-047-33ADDDCD

Date Completed:	11/1970	Purpose:	Domestic Well
L.S. Elevation (ft):	897	Well Type:	0"
Depth Drilled (ft):	237	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, yellow	1-13
CLAY	clay, blue, soft	13-101

142-047-33ADDDCD (continued)

CLAY	sandy clay, blue	101-160
SAND	dirty sand, colored	160-164
CLAY	sandy clay, blue, hard	164-214
CLAY	sandy clay with sand lenses, blue	214-226
SAND	dirty sand, gray	226-232
WEATHERED PRECAMBRIAN	weathered granite, green	232-236
PRECAMBRIAN	granite, green	236-237

142-047-33DCCADB

Date Completed:	9/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	898	Well Type:	4" Stainless Steel
Depth Drilled (ft):	174	Aquifer:	Undefined
Screened Interval (ft):	168-174	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	topsoil, black, soft	0-1
CLAY	clay, brown, soft	1-13
CLAY	clay, blue, soft	13-104
CLAY	clay + stones, gray, medium hardness	104-164
SAND	sand medium clean, gray, soft	164-174

142-048-05CDCDAD

Date Completed:	10/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	877	Well Type:	4" Stainless Steel
Depth Drilled (ft):	208	Aquifer:	Undefined
Screened Interval (ft):	196-208	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-5
CLAY	clay, yellow, soft	5-22
CLAY	clay, gray, soft	22-115
CLAY	clay + medium boulders, gray, medium hardness	115-180
SAND	coarse clean sand, gray, soft	180-208

142-048-09ABAADD

Date Completed:	7/1983	Purpose:	Domestic Well
L.S. Elevation (ft):	879	Well Type:	4" Stainless Steel
Depth Drilled (ft):	220	Aquifer:	Undefined
Screened Interval (ft):	214-220	Log Source:	Paasch

Lithologic Log

142-048-09ABAADD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-2
CLAY	clay, gray, soft	2-7
CLAY	clay, brown, soft	7-16
CLAY	clay, gray, soft	16-23
CLAY	clay, gray, soft	23-126
BOULDERS	boulder, hard	126-127
CLAY	clay, gray, medium hard	127-151
CLAY	clay + fine sand, gray, soft	151-152
CLAY	clay, gray, medium hard	152-155
CLAY	clay + stones, gray, medium hard	155-158
BOULDERS	boulder, hard	158-159
CLAY	clay	159-185
SAND	clean water sand, gray, soft	185-220

142-048-10DDDDDB

Date Completed:	10/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	880	Well Type:	3" Stainless Steel
Depth Drilled (ft):	174	Aquifer:	Undefined
Screened Interval (ft):	169-174	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1
CLAY	clay, yellow, soft	1-19
CLAY	clay, gray, soft	19-111
CLAY	clay sand, gray, soft	111-127
CLAY	clay gravel, gray, medium hardness	127-130
SAND	sand, gray, soft	130-132
CLAY	clay sand, gray, soft	132-143
CLAY	clay gravel, gray, medium hardness	143-156
CLAY	clay, gray, soft	156-163
CLAY	clay sand, gray, soft	163-168
SAND	water sand	168-174

142-048-12BCBBAD

Date Completed:	2/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	880	Well Type:	4" Stainless Steel
Depth Drilled (ft):	307	Aquifer:	Undefined
Screened Interval (ft):	202-212	Log Source:	LTP Enterprises, Inc

Lithologic Log

142-048-12BCBBAD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, gray	2-4
CLAY	clay, brown	4-17
CLAY	clay, blue, soft	17-117
CLAY	sandy clay, blue	117-145
SAND	sand, varied color	145-146
CLAY	sandy clay, blue	146-180
SAND	sand, varied color	180-181
CLAY	sandy clay, blue	181-187
SAND	sand, varied color	187-190
CLAY	sandy clay, blue	190-204
SAND	sand took water, varied color	204-212
CLAY	sandy clay, blue	212-219
CLAY	sandy clay, blue	219-231
SAND	sand, varied color	231-232
CLAY	sandy clay, blue	232-302
WEATHERED PRECAMBRIAN	decomposed granite, blue-green	302-307

142-048-13BABDBC

Date Completed:	9/1982	Purpose:	Domestic Well
L.S. Elevation (ft):	880	Well Type:	4" Stainless Steel
Depth Drilled (ft):	238	Aquifer:	Undefined
Screened Interval (ft):	232-238	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-19
CLAY	clay, blue	19-108
CLAY	sandy clay, blue	108-111
SAND	sand drilled poorly, varied color	111-119
CLAY	sandy clay, blue	119-184
SAND	sand with clay lens, varied color	184-190
SAND	sand, varied color	190-192
CLAY	sandy clay, blue	192-198
SAND	sand, varied color	198-200
CLAY	sandy clay, blue	200-233
SAND	coarse sand, varied color	233-238

142-048-19CCCDAD

Date Completed: 7/1976
 L.S. Elevation (ft): 877
 Depth Drilled (ft): 277
 Screened Interval (ft): 0-0

Purpose: Domestic Well
 Well Type: 0"
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-27
CLAY	clay, gray	27-31
CLAY	clay, blue	31-46
CLAY	clay, blue, soft	46-94
CLAY	sandy clay, blue, soft	94-98
CLAY	sandy clay, blue	98-107
SAND	sand	107-108
CLAY	sandy clay, blue	108-128
SAND	sand	128-130
CLAY	sandy clay, blue	130-136
SAND	sand	136-137
CLAY	sandy clay, blue	137-151
CLAY	sandy clay + rock, blue, hard	151-152
CLAY	sandy clay, blue	152-171
SAND	sand	171-173
CLAY	sandy clay, blue	173-177
SAND	sand	177-178
CLAY	sandy clay, blue	178-215
SAND	sand	215-216
CLAY	sandy clay, blue	216-267
WEATHERED PRECAMBRIAN	decomposed, white-green	267-277

142-048-19CCDDB

Date Completed: 7/1976
 L.S. Elevation (ft): 877
 Depth Drilled (ft): 280
 Screened Interval (ft): 0-0

Purpose: Domestic Well
 Well Type: 0"
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-16
CLAY	clay, gray	16-25
CLAY	clay, blue, soft	25-102
CLAY	sandy clay, blue	102-106

142-048-19CCDDB (continued)

SAND	sand	106-107
CLAY	sandy clay, blue	107-172
SAND	sand dirty	172-175
SAND	dirty sand with clay lenses	175-176
CLAY	sandy clay, blue, hard	176-208
SAND	sand washed	208-211
CLAY	sandy clay, blue, soft	211-266
CLAY	sandy clay with rock, blue, hard	266-269
CLAY	sandy clay, blue	269-270
WEATHERED PRECAMBRIAN	decomposed, green-white	270-280

142-048-26CCCCAC

Date Completed:	10/1962	Purpose:	Domestic Well
L.S. Elevation (ft):	885	Well Type:	4" Other
Depth Drilled (ft):	115	Aquifer:	Undefined
Screened Interval (ft):	105-115	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, yellow	3-20
CLAY	shale, blue, soft	20-67
CLAY	sandy clay, blue, hard	67-86
CLAY	sandy clay, blue, soft	86-100
SAND	sand, brown	100-115

142-048-27DDDDBB

Date Completed:	8/1963	Purpose:	Domestic Well
L.S. Elevation (ft):	891	Well Type:	4" Stainless Steel
Depth Drilled (ft):	87	Aquifer:	Undefined
Screened Interval (ft):	73-84	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-12
CLAY	shale, blue, soft	12-41
SAND	sand dirty, gray	41-51
SAND	sand, gray	51-86
CLAY	clay	86-87

142-048-28CCADB

Date Completed:	8/1980	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4" Stainless Steel
Depth Drilled (ft):	172	Aquifer:	Undefined
Screened Interval (ft):	159-167	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-18
CLAY	clay, blue	18-124
CLAY	sandy clay, blue	124-133
SAND	sand, colored	133-135
CLAY	sandy clay, blue	135-155
SAND	sand drilled fair, colored	155-167
CLAY	sandy clay with lenses sand, blue	167-169
CLAY	sandy clay, blue	169-172

142-048-29CCBAAC

Date Completed:	6/1924	Purpose:	Industrial Well
L.S. Elevation (ft):	880	Well Type:	6"
Depth Drilled (ft):	268	Aquifer:	Undefined
Screened Interval (ft):	240-250	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue	0-136
ROCK	hard rock	136-150
CLAY	hard shale	150-196
SAND	fine water bearing sand	196-207
CLAY	sticky clay, blue	207-220
SAND	layers of sand + shale	220-240
SAND	fine sand	240-255
SAND	coarser sand + clay	255-259
CLAY	clay	259-268

142-048-30DDA1

Date Completed:	3/19/87	Purpose:	Municipal Well
L.S. Elevation (ft):	880	Well Type:	6" Steel
Depth Drilled (ft):	302	Aquifer:	Undefined
Screened Interval (ft):	278-290	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	brown	0-27
CLAY	sandy, soft, gray	27-111

142-048-30DDA1 (continued)

CLAY	sandy, gray	111-123
SAND	gray	123-125
CLAY	sandy, gray	125-193
ROCK	no description	193-194
CLAY	sandy, gray	194-269
CLAY	sandy, gray, with little sand lenses	269-271
SAND	gray, clean	271-281
SAND	gray, a little dirty	281-284
SAND	gray, clean	284-292
CLAY	sandy, gray	292-293
SAND	gray, a little dirty	293-295
CLAY	sandy, blue/green, decomposed	295-302

142-048-30DDA2

Date Completed:	00/00/00	Purpose:	Municipal Well
L.S. Elevation (ft):	880	Well Type:	0' Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

142-048-30DDDDBA

Date Completed:	2/1964	Purpose:	Domestic Well
L.S. Elevation (ft):	881	Well Type:	4' Other
Depth Drilled (ft):	275	Aquifer:	Undefined
Screened Interval (ft):	269-273	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, gray	2-20
CLAY	clay, yellow	20-23
CLAY	shale, blue, soft	23-90
CLAY	sandy hard clay, blue	90-93
SAND	sand, gray	93-94
SAND	sand + soft clay, blue	94-109
CLAY	sandy soft clay with sand lenses, blue, soft	109-115
BOULDERS	boulder, gray	115-116
CLAY	sandy hard clay, blue	116-150
SAND	sand, gray	150-152
CLAY	clay, blue	152-153
SAND	sand, gray	153-155
CLAY	sandy clay, blue, hard	155-160
CLAY	sandy clay with sand lenses, blue, soft	160-163

142-048-30DDDDBA (continued)

CLAY	sandy clay, blue, hard	163-187
CLAY	sandy clay with shale, blue, hard	187-268
WEATHERED PRECAMBRIAN	sandstone, white	268-273
WEATHERED PRECAMBRIAN	decomposed granite, green	273-275

142-048-33AACDCC

Date Completed:	7/1977	Purpose:	Domestic Well
L.S. Elevation (ft):	881	Well Type:	4" Stainless Steel
Depth Drilled (ft):	197	Aquifer:	Undefined
Screened Interval (ft):	195-195	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
CLAY	clay, gray	1-3
CLAY	clay, brown	3-27
CLAY	clay, blue	27-111
CLAY	sandy clay, blue	111-140
SAND	sand, varied color	140-141
CLAY	sandy clay, blue	141-152
SAND	sand, varied color	152-153
CLAY	sandy clay, blue	153-156
SAND	sand, varied color	156-157
CLAY	sandy clay, blue	157-160
SAND	sand, varied color	160-163
CLAY	sandy clay, blue	163-183
SAND	sand, varied color	183-197

142-048-33ADBDBAB

Date Completed:	7/1990	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4" Stainless Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	235-239	Log Source:	

Lithologic Log - unavailable

142-048-33ADDBCC

Date Completed:	10/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	881	Well Type:	4" Stainless Steel
Depth Drilled (ft):	194	Aquifer:	Undefined
Screened Interval (ft):	188-194	Log Source:	Paasch

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-2

142-048-33ADDBCC (continued)

CLAY	clay, yellow, soft	2-17
CLAY	clay, gray, medium hard	17-23
CLAY	clay, blue, soft	23-103
CLAY	clay + stones, blue, medium hard	103-143
GRAVEL	coarse gravel shale, black, medium hard	143-146
CLAY	clay + stones, gray, medium hard	146-168
SAND	clean sand, gray, soft	168-194

142-049-02AAD

Date Completed:	9/30/73	Purpose:	Domestic Well
L.S. Elevation (ft):	875	Well Type:	4" Steel
Depth Drilled (ft):	252	Aquifer:	Undefined
Screened Interval (ft):	237-252	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-17
CLAY	gray	17-97
TILL	no description	97-150
SAND	no description	150-153
TILL	no description	153-156
SAND	no description	156-158
TILL	no description	158-207
SAND	no description	207-216
TILL	no description	216-218
SAND	no description	218-252

142-049-03AAB

Date Completed:	6/8/79	Purpose:	Domestic Well
L.S. Elevation (ft):	874	Well Type:	4" Steel
Depth Drilled (ft):	172	Aquifer:	Undefined
Screened Interval (ft):	154-164	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-18
CLAY	gray	18-85
TILL	no description	85-145
SAND	no description	145-165
TILL	no description	165-172

142-049-04ABA2

Date Completed: 1990
 L.S. Elevation (ft): 878
 Depth Drilled (ft): 146
 Screened Interval (ft): 120-140

Purpose: Domestic Well
 Well Type: 4" PVC
 Aquifer: Undefined
 Log Source: Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-22
CLAY	gray	22-78
SAND	no description	78-79
TILL	no description	79-96
SAND	no description	96-101
TILL	no description	101-108
SAND	no description	108-111
TILL	no description	111-122
SAND	no description	122-128
TILL	no description	128-131
SAND	no description	131-140
SHALE	blue	140-146

142-049-12DDCDBB

Date Completed: 3/1978
 L.S. Elevation (ft): 877
 Depth Drilled (ft): 232
 Screened Interval (ft): 221-227

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown, soft	2-30
CLAY	sandy clay, gray, soft	30-101
CLAY	sandy clay, blue, hard	101-121
SAND	sand, varied color	121-122
CLAY	sandy clay, blue	122-157
CLAY	sandy clay with rock, blue-white	157-168
CLAY	sandy clay, blue	168-185
SAND	sand drilled poor fine, gray	185-192
SAND	sand drilled better, gray	192-197
SAND	sand drilled fair, gray	197-202
SAND	sand drilled fair, varied color	202-207
SAND	sand drilled fair, varied color	207-227
SAND	sand drilled poor finer, gray	227-232

142-049-18CDD

Date Completed:	1955	Purpose:	Domestic Well
L.S. Elevation (ft):	884	Well Type:	0* Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-240	Log Source:	

Lithologic Log - unavailable

142-049-20CAC

Date Completed:	10/18/77	Purpose:	Domestic Well
L.S. Elevation (ft):	883	Well Type:	4* Steel
Depth Drilled (ft):	200	Aquifer:	Undefined
Screened Interval (ft):	175-185	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-17
CLAY	gray	17-78
TILL	no description	78-129
SAND	silty, clay layers	129-140
TILL	no description	140-152
SAND	with till lenses	152-160
SAND	no description	160-200

142-049-22CDD

NDSWC 11620

Date Completed:	7/27/81	Purpose:	Test Hole
L.S. Elevation (ft):	876	Well Type:	
Depth Drilled (ft):	200	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	yellow-gray, plastic, oxidized (lacustrine).	0-12
CLAY	olive-gray, plastic, unoxidized (lacustrine).	12-75
CLAY	olive-gray, silty, sandy, gravelly; very gravelly in part (till).	75-125
CLAYSTONE	gray, possibly slightly silty, firm, plastic, noncalcareous (bedrock).	125-138
CLAYSTONE	grayish-black to dark gray, firm, plastic, slightly carbonaceous, noncalcareous.	138-196
CLAYSTONE	black, firm, carbonaceous, noncalcareous.	196-200

142-049-22DDA

Date Completed:	00	Purpose:	Domestic Well
L.S. Elevation (ft):	872	Well Type:	0*
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-305	Log Source:	

Lithologic Log - unavailable

142-049-22DDD

NDSWC 11621

Date Completed: 7/28/81
 L.S. Elevation (ft): 875.8
 Depth Drilled (ft): 280
 Screened Interval (ft): 228-234

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Observation Well
 1.25" PVC
 West Fargo North
 NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	dark yellow-brown, plastic, oxidized (lake).	0-18
CLAY	olive-gray, plastic, unoxidized (lake).	18-82
CLAY	olive-gray, silty, sandy, gravelly (till).	82-126
SAND	olive-gray, silty, clayey, gravelly, very poor sorting; very gravelly from 151 to 153 feet; sand from 162 to 164 feet (till).	126-175
CLAY	dark gray, firm, noncalcareous; occasional drill chatter, possible cemented zones (older lake clay).	175-217
SILT	dark yellowish-brown, clayey, sandy, gravelly, firm, possibly oxidized (till).	217-224
SAND	medium to very coarse, gravel, granule to fine pebble, fair sorting, dirty in places, subangular to rounded, mostly quartz, with lithic and igneous, some very fine and fine sand and silt in places.	224-240
CLAY	interbedded with silt, sand and gravel.	240-245
SILT	dark yellow-brown till as above, more clayey in parts.	245-261
CLAY	olive-gray, bears some wood, paste like, noncalcareous to slightly calcareous; poor return; possibly bedrock.	261-280

142-049-26BAA

Date Completed: 1/1962
 L.S. Elevation (ft): 880
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-125

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 2" Unknown
 Undefined

Lithologic Log - unavailable

142-049-26DAA

Date Completed: 12/13/90
 L.S. Elevation (ft): 878
 Depth Drilled (ft): 156
 Screened Interval (ft): 136-146

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" PVC
 Undefined
 Water Smith, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	no description	2-40
CLAY	gray	40-96
CLAY & TILL	no description	96-112
ROCKS	no description	112-113
TILL	gravelly till, sandy	113-123
SAND	loose	123-130
SAND	gravelly	130-140
SAND	medium	140-146

142-050-02AAB

Date Completed: 9/12/75
 L.S. Elevation (ft): 886
 Depth Drilled (ft): 237
 Screened Interval (ft): 225-235

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined
 Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow	3-21
CLAY	gray	21-82
TILL	no description	82-136
SAND	dirty	136-141
TILL	no description	141-206
SAND	no description	206-213
TILL	sandy	213-221
SAND	no description	221-237

142-050-02CCC

Date Completed: 0
 L.S. Elevation (ft): 888
 Depth Drilled (ft): 248
 Screened Interval (ft): 237-243

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	yellow	1-31
CLAY	blue, soft	31-67
BOULDERS	hard, sandy, clay	67-95
SAND	colored	95-103
BOULDERS	blue, hard, sandy, clay	103-109
CLAY	sandy, with sand lenses	109-118
CLAY	blue, hard, sandy	118-198
BOULDERS	red	198-199
CLAY	blue, sandy, sand lenses	199-204
CLAY	blue, sandy	204-218
CLAY	blue, sandy, sand lenses	218-224
SAND	fine	224-235
SAND	colored, coarse	235-248

142-050-02DABA

Date Completed: 00/00/00
 L.S. Elevation (ft): 888
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Municipal Well
 0" Unknown
 Undefined

142-050-02DABA (continued)

Lithologic Log - unavailable

142-050-03BBB

NDSWC 3100

Date Completed:	5/27/64	Purpose:	Test Hole
L.S. Elevation (ft):	896	Well Type:	
Depth Drilled (ft):	355	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	light yellowish-brown, very to slightly silty, highly calcareous to calcareous, cohesive, oxidized.	0-32
CLAY	olive-gray, silty, cohesive, highly calcareous.	32-57
TILL	olive-gray, clay through gravel, very silty, carbonate, shale, quartz, slightly cohesive, very calcareous; less silty and quite cohesive after 65 feet.	57-88
TILL	olive-gray to light olive-gray, clay through gravel, carbonate, quartz, shale, igneous, lignite, very silty and sandy, highly calcareous.	88-108
TILL	olive-gray to moderate olive-gray, clay through sand, carbonate, shale, quartz, lignite, cohesive, highly calcareous.	108-145
TILL	fine grained as above, with carbonate, igneous and lignite chips of large rocks; rough drilling in spots.	145-149
SILT	olive-gray, till as above, cohesive, highly calcareous, laminae, occasional sand grains, very silty; lenses of silt.	149-224
SILT	with lignite, gray clayey silt matrix, very abundant black lignite, soft to solid, slightly cohesive, soft, calcareous, very fine sand.	224-237
SILT	as above, with abundant sand up to 1 mm, shale, quartz, carbonate, igneous; poor return; taking some water.	237-318
SILT	light olive-gray, very soft, laminations of lignite material, highly calcareous.	318-332
TILL	pale brown, clay through gravel, abundant quartz, with carbonate, igneous, highly calcareous, rocky; boulders, carbonate and igneous from 338 to 340 feet.	332-340
LIMESTONE	variegated, gray, white, orange and pyrite zones, laminated, very hard, highly calcareous, apparent quartz sand grains.	340-344
WEATHERED IGNEOUS	clay, light olive, slightly oxidized and pale blue-green, solid, quartz sand grains; oxidized material is calcareous, otherwise noncalcareous.	344-355

142-050-08AAB2

Date Completed:	1959	Purpose:	Domestic Well
L.S. Elevation (ft):	905	Well Type:	4" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-342	Log Source:	

Lithologic Log - unavailable

142-050-09ABB

Date Completed:	3/7/78	Purpose:	Domestic Well
L.S. Elevation (ft):	898	Well Type:	4" Steel
Depth Drilled (ft):	260	Aquifer:	Undefined
Screened Interval (ft):	238-248	Log Source:	Lako Drilling

Lithologic Log

142-050-09ABB (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-19
CLAY	gray	19-78
TILL	no description	78-95
SAND	no description	95-97
TILL	no description	97-100
SAND	no description	100-102
TILL	no description	102-134
SAND	no description	134-140
SAND	silty	140-148
TILL	no description	148-158
SAND	with layers of clay	158-168
TILL	no description	168-220
SAND	no description	220-260

142-050-18CCC2

Date Completed:	1/18/73	Purpose:	Domestic Well
L.S. Elevation (ft):	918	Well Type:	4" Steel
Depth Drilled (ft):	120	Aquifer:	Undefined
Screened Interval (ft):	98-103	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow	3-26
CLAY	gray	26-70
TILL	no description	70-95
GRAVEL	no description	95-103
TILL	no description	103-120

142-050-19BCC

Date Completed:	00	Purpose:	Stock Well
L.S. Elevation (ft):	921	Well Type:	3" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-120	Log Source:	

Lithologic Log - unavailable

142-050-26CBB2

Date Completed:	5/18/79	Purpose:	Domestic Well
L.S. Elevation (ft):	891	Well Type:	4" Steel
Depth Drilled (ft):	262	Aquifer:	Undefined
Screened Interval (ft):	242-248	Log Source:	LTP Enterprises, Inc

Lithologic Log

142-050-26CBB2 (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
CLAY	brown	1-42
CLAY	blue	42-71
CLAY	blue, sandy	71-162
SAND	no description	162-168
CLAY	blue, sandy	168-171
SAND	washed	171-175
CLAY	blue, sandy	175-177
SAND	no description	177-181
CLAY	blue, sandy	181-182
SAND	no description	182-184
CLAY	blue, sandy	184-223
SAND	with rock lenses	223-226
SAND	no description	226-227
SAND	dirty	227-230
SAND	no description	230-262

142-050-29BAA

Date Completed:	6/20/83	NDSWC 12323	
L.S. Elevation (ft):	905	Purpose:	Test Hole
Depth Drilled (ft):	420	Well Type:	
		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow-brown, very silty, iron stained.	1-9
CLAY	yellow-brown, plastic, cohesive (lake clay).	9-26
CLAY	olive-gray, plastic, cohesive, (lake clay).	26-49
CLAY	silty, sandy, with pebbles, rocky, poorly sorted, olive-gray, (till).	49-89
CLAY	till, very silty and sandy, few pebbles, olive-gray.	89-101
CLAY	till, very rocky, with pebbles; interbedded with black clay.	101-144
SILT	gray to black, clayey; till from 152 to 162 feet.	144-184
CLAY	olive-gray, silty, sandy, with pebbles and rocks; interbedded with shale gravel.	184-191
SAND	with gravel, subrounded and rounded, fair sorting; poor return; appears interbedded with till.	191-197
TILL	gray, with gravel layers.	197-205
NO RETURN	chatterly drilling, drills like sand and gravel, possibly till interbedded with very sandy clay.	205-217
CLAY	olive-gray, sandy; drills tight.	217-251
CLAY	gray to white, silty, sandy, with pebbles (till).	251-300
CLAY	dark brown, very cohesive, sticky, drills smooth; occasional till.	300-390

142-050-29BAA (continued)

CLAY	black, carbonaceous, silty, bentonite specks (bedrock).	390-395
CLAY	whitish-red, interbedded with carbonaceous black clay, some lignite specks; greenish clay at 410 feet.	395-420

142-050-34BCC

Date Completed:	11/8/75	Purpose:	Domestic Well
L.S. Elevation (ft):	896	Well Type:	4" Steel
Depth Drilled (ft):	347	Aquifer:	Undefined
Screened Interval (ft):	328-338	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow	3-21
CLAY	gray	21-69
TILL	no description	69-102
SHALE	no description	102-207
TILL	no description	207-254
SHALE	no description	254-294
SAND	streaked	294-299
SAND	no description	299-347

142-050-35ADD

Date Completed:	5/25/60	Purpose:	Domestic Well
L.S. Elevation (ft):	891	Well Type:	4" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-219	Log Source:	

Lithologic Log - unavailable

142-051-10BBBA

Date Completed:	8/2/74	Purpose:	Domestic Well
L.S. Elevation (ft):	937	Well Type:	4" Steel
Depth Drilled (ft):	362	Aquifer:	Undefined
Screened Interval (ft):	345-355	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	sandy, brown	3-5
CLAY	brown	5-30
CLAY	soft, blue	30-62
CLAY	sandy, blue	62-70
SAND	drilled fine	70-72
CLAY	sandy, blue	72-93
ROCK	no description	93-94

142-051-10BBBA (continued)

CLAY	sandy, blue	94-249
SAND	drilled dirty, blue	249-268
SAND	drilled and came up very dirty, blue	268-277
SAND	drilled dirty, blue	277-330
SAND	fine, drilled good, blue	330-349
SAND	colored	349-355
SAND	with lenses of clay	355-357
SAND	drilled dirty, blue	357-362

142-051-17DAA

Date Completed:	1/1/38	Purpose:	Domestic Well
L.S. Elevation (ft):	943	Well Type:	3" Steel
Depth Drilled (ft):	0	Aquifer:	Dakota Group
Screened Interval (ft):	0-411	Log Source:	

Lithologic Log - unavailable

142-051-18DCD

Date Completed:	1/1948	Purpose:	Domestic Well
L.S. Elevation (ft):	957	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-212	Log Source:	

Lithologic Log - unavailable

142-051-18DCD2

Date Completed:	5/17/76	Purpose:	Domestic Well
L.S. Elevation (ft):	957	Well Type:	4" Steel
Depth Drilled (ft):	273	Aquifer:	Undefined
Screened Interval (ft):	262-272	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-31
CLAY	gray, silty	31-46
SAND	no description	46-51
CLAY	gray, silty	51-81
TILL	no description	81-119
GRAVEL	no description	119-125
TILL	no description	125-168
SAND	no description	168-173
TILL	no description	173-259
GRAVEL	no description	259-272
TILL	no description	272-273

142-051-20DCD

Date Completed:	1920	Purpose:	Domestic Well
L.S. Elevation (ft):	946	Well Type:	4" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-160	Log Source:	

Lithologic Log - unavailable

142-051-30BBB

Date Completed:	1/4/75	Purpose:	Domestic Well
L.S. Elevation (ft):	966	Well Type:	4" Steel
Depth Drilled (ft):	212	Aquifer:	Undefined
Screened Interval (ft):	207-212	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-21
TILL	silty	21-49
TILL	gray	49-84
SAND	no description	84-86
TILL	no description	86-139
SAND	no description	139-140
TILL	no description	140-206
SAND	no description	206-212

142-051-30CDD

Date Completed:	6/7/58	Purpose:	Domestic Well
L.S. Elevation (ft):	957	Well Type:	4" Steel
Depth Drilled (ft):	165	Aquifer:	Undefined
Screened Interval (ft):	0-136	Log Source:	

Lithologic Log - unavailable

142-051-34BAAB

Date Completed:	5/16/79	Purpose:	Domestic Well
L.S. Elevation (ft):	947	Well Type:	4" Steel
Depth Drilled (ft):	97	Aquifer:	Hillsboro
Screened Interval (ft):	91-96	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-16
SAND	silty, gray, fine	16-80
SAND	dirty, gray, fine	80-90
SAND	uniform, gray	90-97

142-051-35BCB2

Date Completed: 7/7/73
 L.S. Elevation (ft): 931
 Depth Drilled (ft): 183
 Screened Interval (ft): 168-178

Purpose: Domestic Well
 Well Type: 4" Unknown
 Aquifer: Undefined
 Log Source: Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-19
CLAY	gray	19-42
SAND	no description	42-65
TILL	no description	65-93
ROCK	red, granite	93-97
TILL	no description	97-114
SAND	no description	114-142
TILL	no description	142-150
SAND	no description	150-153
TILL	no description	153-162
GRAVEL	bottom dirty	162-183

143-047-05DCCCBA

Date Completed: 8/1986
 L.S. Elevation (ft): 888
 Depth Drilled (ft): 209
 Screened Interval (ft): 198-208

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1
CLAY	clay, yellow, soft	1-17
CLAY	clay, gray, soft	17-131
SAND	muddy sand, gray, soft	131-134
GRAVEL	clay gravel, gray, medium hardness	134-150
SAND	clay sand, gray, medium hard	150-162
CLAY	clay, gray, medium soft	162-194
NO SAMPLE	water	194-209

143-047-06BAACAD

Date Completed: 9/1985
 L.S. Elevation (ft): 882
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-0

Purpose: Domestic Well
 Well Type: 4"
 Aquifer: Undefined
 Log Source:

Lithologic Log - unavailable

143-047-06CCCBDA

Date Completed: 8/1962
 L.S. Elevation (ft): 883
 Depth Drilled (ft): 200
 Screened Interval (ft): 190-200

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 3"
 Undefined
 Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue	0-114
CLAY	clay & gravel & few stones	114-125
CLAY	stones & some clay, hard	125-134
CLAY	clay & gravel	134-143
CLAY	clay & some gravel	143-164
BOULDERS	stone	164-165
GRAVEL	gravel, hard	165-167
BOULDERS	stone	167-168
GRAVEL	gravel & some clay, hard	168-170
BOULDERS	stone	170-171
GRAVEL	gravel some clay, hard	171-174
BOULDERS	stone	174-175
CLAY	clay some gravel	175-188
GRAVEL	gravel & some clay & small stones, hard	188-192
BOULDERS	stone	192-193
GRAVEL	gravel and sand	193-200

143-047-08DCDCCA

Date Completed: 11/1982
 L.S. Elevation (ft): 887
 Depth Drilled (ft): 324
 Screened Interval (ft): 310-320

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Stainless Steel
 Undefined
 Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-2
CLAY	clay, yellow, soft	2-24
CLAY	clay, gray, soft	24-119
SAND	sand, gray, soft	119-123
CLAY	clay sand, gray, soft	123-154
SAND	sand, gray, soft	154-165
CLAY	clay sand, gray, medium-soft	165-190
CLAY	clay gravel, gray, medium hardness	190-241
CLAY	clay, gray, soft	241-269
CLAY	clay sand + gravel, gray, medium-hard	269-284
CLAY	clay sand, gray, medium-soft	284-305

143-047-08DCDCCA (continued)

SAND

water, gray, soft

305-324

143-047-09AAAABD

Date Completed: 12/1949
 L.S. Elevation (ft): 883
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-0

Purpose: Domestic Well
 Well Type: 2"
 Aquifer: Undefined
 Log Source:

Lithologic Log - unavailable

143-047-12AABDDD

Date Completed: 12/1983
 L.S. Elevation (ft): 895
 Depth Drilled (ft): 135
 Screened Interval (ft): 130-135

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-2
CLAY	clay, yellow, soft	2-24
CLAY	clay, gray, soft	24-129
NO SAMPLE	water	129-135

143-047-14DCABAC

Date Completed: 4/1984
 L.S. Elevation (ft): 891
 Depth Drilled (ft): 152
 Screened Interval (ft): 147-152

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1
CLAY	clay, yellow, soft	1-21
CLAY	clay, gray, soft	21-109
SAND	clay sand, gray, medium hardness	109-123
CLAY	clay, gray, medium soft	123-140
SAND	clay sand, gray, medium hardness	140-147
NO SAMPLE	water	147-152

143-047-18ABBCAA

Date Completed: 11/1990
 L.S. Elevation (ft): 884
 Depth Drilled (ft): 186
 Screened Interval (ft): 175-185

Purpose: Domestic Well
 Well Type: 4" Stainless Steel
 Aquifer: Undefined
 Log Source: Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1

143-047-18ABBCAA (continued)

CLAY	clay, yellow, soft	1-21
CLAY	clay, gray, soft	21-134
SAND	sand, gray, soft	134-136
CLAY	clay, gray, soft	136-145
SAND	sand, gray, soft	145-146
CLAY	clay, gray, medium hardness	146-148
SAND	fine muddy sand, gray, soft	148-151
CLAY	clay, gray, medium soft	151-174
SAND	sand, gray, soft	174-186

143-047-18CCDBCC

Date Completed:	3/1984	Purpose:	Domestic Well
L.S. Elevation (ft):	870	Well Type:	4" Stainless Steel
Depth Drilled (ft):	256	Aquifer:	Undefined
Screened Interval (ft):	251-256	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1
CLAY	clay, yellow, soft	1-23
CLAY	clay, gray, soft	23-127
CLAY	clay gravel sand, gray, medium hardness	127-131
CLAY	clay, gray, medium soft	131-142
CLAY	clay sand, gray, medium hardness	142-148
CLAY	clay, gray, soft	148-162
SAND	sand, gray, soft	162-164
CLAY	clay sand, gray, medium soft	164-189
CLAY	clay thin sand layer, gray, soft	189-201
CLAY	clay, gray, soft	201-219
SAND	sand, gray, soft	219-221
CLAY	clay little sand, gray, medium soft	221-237
CLAY	clay, gray, soft	237-243
CLAY	clay sand gravel, gray, soft	243-251
NO SAMPLE	water	251-256

143-047-21CDACDA

Date Completed:	9/1967	Purpose:	Domestic Well
L.S. Elevation (ft):	886	Well Type:	4"
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

143-047-22DDDADC

Date Completed:	5/1974	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4"
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable**143-047-25DADDBD**

Date Completed:	8/1987	Purpose:	Domestic Well
L.S. Elevation (ft):	898	Well Type:	4" Stainless Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	105-110	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1
CLAY	clay, yellow, soft	1-14
CLAY	clay, gray, soft	14-105
NO SAMPLE	water	105-110

143-047-29ABBAAB

Date Completed:	1/1976	Purpose:	Domestic Well
L.S. Elevation (ft):	885	Well Type:	4" Stainless Steel
Depth Drilled (ft):	256	Aquifer:	Undefined
Screened Interval (ft):	251-256	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3
CLAY	clay, brown	3-15
CLAY	clay, blue	15-24
CLAY	soft clay, blue	24-104
CLAY	sandy clay, blue	104-120
SAND	coarse sand, blue	120-121
CLAY	sandy clay, blue	121-128
CLAY	sandy clay & hard rock, blue	128-129
CLAY	sandy clay, blue	129-150
SAND	sand & gravel, blue	150-162
CLAY	sandy clay, blue	162-174
CLAY	sandy clay & lenses of sand, blue	174-176
CLAY	sandy clay, blue	176-202
SAND	sand, blue	202-204
CLAY	sandy clay, blue	204-205
SAND	sand, blue	205-206
CLAY	sandy clay, blue	206-226
SAND	sand, blue	226-228

143-047-29ABBAAB (continued)

CLAY	sandy clay, blue	228-231
SAND	sand, blue	231-243
CLAY	sandy clay, blue	243-247
SAND	sand, blue	247-256
CLAY	sandy clay, blue	256-256

143-047-29CCBCAC

Date Completed:	6/1965	Purpose:	Domestic Well
L.S. Elevation (ft):	886	Well Type:	2"
Depth Drilled (ft):	249	Aquifer:	Undefined
Screened Interval (ft):	241-249	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	clay, blue	0-124
CLAY	clay	124-190
CLAY	clay and some sand	190-199
GRAVEL	gravel	199-208
BOULDERS	stone	208-209
GRAVEL	gravel	209-210
CLAY	clay	210-226
SAND	sand	226-242
SAND	coarse sand and gravel	242-249

143-047-31BBABBC

Date Completed:	5/1973	Purpose:	Domestic Well
L.S. Elevation (ft):	883	Well Type:	4" Stainless Steel
Depth Drilled (ft):	302	Aquifer:	Undefined
Screened Interval (ft):	285-295	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, gray	2-4
CLAY	clay, brown, hard	4-12
CLAY	clay, brown	12-15
CLAY	clay, blue	15-18
SHALE	shale, blue	18-111
CLAY	sandy clay & rock, blue	111-136
SAND	fine sand, blue	136-138
CLAY	sandy clay & rock, blue	138-145
CLAY	sandy clay, blue, soft	145-177
BOULDERS	rock	177-178

143-047-31BBABBC (continued)

CLAY	sandy clay, blue	178-183
SAND	fine sand, blue	183-186
CLAY	sandy clay, blue	186-197
SAND	fine sand, blue	197-198
CLAY	sandy clay, blue	198-213
SAND	fine sand, blue	213-215
CLAY	sandy clay & rock, blue	215-237
SAND	sand, blue	237-238
CLAY	sandy clay, blue	238-259
SAND	sand & lenses of clay, gray	259-270
SAND	fine sand, gray	270-278
SAND	sand & lenses of fine clay, gray	278-282
SAND	fine sand, gray	282-295
SAND	sand & lenses of clay, gray	295-298
SAND	dirty sand with clay, gray	298-302

143-047-33BCCBCD

Date Completed:	5/1986	Purpose:	Domestic Well
L.S. Elevation (ft):	889	Well Type:	24"
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

Lithologic Log - unavailable

143-048-02DCCCBA

Date Completed:	6/1989	Purpose:	Domestic Well
L.S. Elevation (ft):	876	Well Type:	4" Stainless Steel
Depth Drilled (ft):	128	Aquifer:	Undefined
Screened Interval (ft):	123-128	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1
CLAY	clay, yellow, soft	1-21
CLAY	clay, gray, soft	21-122
SAND	water sand	122-128

143-048-04CCDCDB

Date Completed:	8/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	876	Well Type:	4" Stainless Steel
Depth Drilled (ft):	64	Aquifer:	Undefined
Screened Interval (ft):	58-64	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-3

143-048-04CCDCDB (continued)

CLAY	sandy clay, brown	3-28
CLAY	sandy clay, blue, soft	28-55
SAND	sand drilled fair, colored	55-64
CLAY	sandy clay, blue	64-64

143-048-05CBDBDC

Date Completed:	9/1988	Purpose:	Domestic Well
L.S. Elevation (ft):	871	Well Type:	4" Stainless Steel
Depth Drilled (ft):	178	Aquifer:	Undefined
Screened Interval (ft):	173-177	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-1
SAND	sand, brown	1-9
CLAY	sandy clay, brown	9-28
CLAY	clay, gray	28-114
CLAY	sandy clay, gray	114-118
SAND	sand, gray	118-119
CLAY	sandy clay, gray	119-156
SAND	sand, gray	156-164
SAND	sand, gray	164-178

143-048-12CCDDBB

Date Completed:	6/1989	Purpose:	Domestic Well
L.S. Elevation (ft):	878	Well Type:	4" Stainless Steel
Depth Drilled (ft):	177	Aquifer:	Undefined
Screened Interval (ft):	172-177	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-2
CLAY	clay, yellow, soft	2-23
CLAY	clay, gray, soft	23-131
GRAVEL	clay gravel, gray, medium hardness	131-141
SAND	sand, gray, soft	141-142
SAND	clay sand, gray, medium soft	142-149
CLAY	clay, gray, soft	149-171
NO SAMPLE	water	171-177

143-048-13DCDBDC

Date Completed:	8/1984	Purpose:	Domestic Well
L.S. Elevation (ft):	874	Well Type:	4"
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-0	Log Source:	

143-048-13DCDBDC (continued)

Lithologic Log - unavailable

143-048-16CCCAA

Date Completed:	9/1981	Purpose:	Domestic Well
L.S. Elevation (ft):	876	Well Type:	4" Stainless Steel
Depth Drilled (ft):	194	Aquifer:	Undefined
Screened Interval (ft):	181-191	Log Source:	Olson Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-2
CLAY	clay, yellow, soft	2-23
CLAY	clay, gray, soft	23-121
SAND	clay sand, gray, medium soft	121-136
CLAY	clay, gray, soft	136-152
SAND	sand, gray, soft	152-154
CLAY	clay, gray, soft	154-173
SAND	fine sand, gray, soft	173-180
SAND	water sand	180-194

143-048-17BBBACB

Date Completed:	9/1983	Purpose:	Domestic Well
L.S. Elevation (ft):	873	Well Type:	4" Stainless Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	188-194	Log Source:	

Lithologic Log - unavailable

143-048-19DCC

Date Completed:	8/14/70	Purpose:	Test Hole
L.S. Elevation (ft):	873	Well Type:	
Depth Drilled (ft):	280	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	mixed with clay, brownish	0-5
CLAY	yellow	5-28
CLAY	blue	28-104
TILL	gray	104-122
GRAVEL	shale, coarse, black	122-124
TILL	gray	124-127
GRAVEL	coarse, clean, light brown	127-130
TILL	gray	130-135
SAND	dirty	135-141
TILL	gray	141-186

143-048-19DCC (continued)

SHALE	blue	186-257
CLAY	silty, yellow, pink, green, bedrock	257-280

143-048-20BBBBDC

Date Completed:	7/1983	Purpose:	Domestic Well
L.S. Elevation (ft):	874	Well Type:	4" Stainless Steel
Depth Drilled (ft):	142	Aquifer:	Undefined
Screened Interval (ft):	136-141	Log Source:	Oison Well Service

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black, soft	0-1
CLAY	clay, yellow, soft	1-21
CLAY	clay, gray, soft	21-119
SAND	sand, gray, soft	119-123
SAND	clay sand, gray, medium soft	123-136
NO SAMPLE	water	136-142

143-048-25ADADAC

Date Completed:	3/1978	Purpose:	Domestic Well
L.S. Elevation (ft):	875	Well Type:	4" Stainless Steel
Depth Drilled (ft):	258	Aquifer:	Undefined
Screened Interval (ft):	249-254	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black	0-2
CLAY	clay, brown	2-17
CLAY	clay, blue, soft	17-108
SAND	sand	108-111
CLAY	sandy clay & rock, blue	111-125
SAND	sand	125-126
CLAY	sandy clay, blue	126-138
CLAY	sandy clay, drilled poor	138-141
CLAY	sandy clay & lenses of sand, blue	141-148
CLAY	sandy clay, blue	148-154
SAND	sand	154-156
CLAY	sandy clay, blue	156-172
SAND	sand	172-173
CLAY	sandy clay, blue	173-186
BOULDERS	rock	186-187
CLAY	sandy clay, blue	187-188
SAND	sand	188-189

143-048-25ADADAC (continued)

CLAY	sandy clay & rock, blue	189-245
SAND	sand washed into	245-247
CLAY	sandy clay & rock, blue	247-248
SAND	sand	248-255
CLAY	sandy clay, blue	255-258

143-048-26BCABDD

Date Completed:	10/1979	Purpose:	Domestic Well
L.S. Elevation (ft):	876	Well Type:	4" Stainless Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	261-266	Log Source:	

Lithologic Log - unavailable

143-048-30BADAAA

Date Completed:	00	Purpose:	Municipal Well
L.S. Elevation (ft):	875	Well Type:	6"
Depth Drilled (ft):	185	Aquifer:	Undefined
Screened Interval (ft):	177-185	Log Source:	Thein

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	dirt, black	0-4
CLAY	clay, yellow	4-21
CLAY	clay, blue	21-112
CLAY	clay and boulders, blue	112-136
CLAY	clay, blue	136-177
SAND	sand	177-185

143-048-33DDDCDA

Date Completed:	7/1975	Purpose:	Domestic Well
L.S. Elevation (ft):	879	Well Type:	2" Stainless Steel
Depth Drilled (ft):	186	Aquifer:	Undefined
Screened Interval (ft):	177-186	Log Source:	Hicks Bros

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	top soil, black, soft	0-2
CLAY	clay, gray, soft	2-6
CLAY	clay, yellow, soft	6-15
CLAY	clay, brown, soft	15-45
CLAY	clay, blue, soft	45-125
SAND	silty sand, gray, soft	125-165
SAND	water sand, gray, solid	165-186

143-048-35CBAAAD

Date Completed: 10/1985
 L.S. Elevation (ft): 876
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-0

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4"
 Undefined

Lithologic Log - unavailable**143-049-06CCC2**

Date Completed: 1/14/72
 L.S. Elevation (ft): 880
 Depth Drilled (ft): 307
 Screened Interval (ft): 301-307

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Unknown
 Undefined
 Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow	3-19
CLAY	gray	19-87
TILL	no description	87-300
GRAVEL	coarse	300-306
TILL	no description	306-307

143-049-08ABB2

Date Completed: 8/9/72
 L.S. Elevation (ft): 874
 Depth Drilled (ft): 306
 Screened Interval (ft): 297-306

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined
 Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	yellow	2-26
CLAY	blue, soft	26-81
CLAY	blue, hard, sandy	81-95
SAND	blue	95-96
BOULDERS	blue, hard, sandy, clay	96-118
SAND	blue	118-119
CLAY	blue, hard, sandy	119-148
SAND	blue	148-150
CLAY	blue	150-151
SAND	blue	151-152
CLAY	blue, sandy	152-168
SAND	blue	168-170
CLAY	blue, sandy	170-171
SAND	blue	171-172
CLAY	blue, hard, sandy	172-199

143-049-08ABB2 (continued)

CLAY	blue, sticky, sandy	199-295
SAND	gray	295-306

143-049-11ADA2

Date Completed:	11/1/76	Purpose:	Test Hole
L.S. Elevation (ft):	871	Well Type:	
Depth Drilled (ft):	228	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-15
CLAY	gray	15-104
TILL	gravelly	104-117
BOULDER	granite	117-119
TILL	no description	119-154
ROCK	limestone	154-156
TILL	no description	156-210
SHALE	no description	210-228

143-049-11ADA3

Date Completed:	11/4/76	Purpose:	Domestic Well
L.S. Elevation (ft):	871	Well Type:	4" Steel
Depth Drilled (ft):	248	Aquifer:	Undefined
Screened Interval (ft):	224-234	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-20
CLAY	gray	20-98
TILL	no description	98-148
TILL	with sand	148-152
SAND	no description	152-248

143-049-16DAD

Date Completed:	7/1989	Purpose:	Domestic Well
L.S. Elevation (ft):	876	Well Type:	4" PVC
Depth Drilled (ft):	170	Aquifer:	Undefined
Screened Interval (ft):	160-170	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3

143-049-16DAD (continued)

CLAY	yellow	3-34
CLAY	gray	34-75
TILL	no description	75-120
SAND	no description	120-122
TILL	no description	122-133
SAND & GRAVEL	no description	133-170

143-049-25AAC

Date Completed:	9/1970	Purpose:	Municipal Well
L.S. Elevation (ft):	872	Well Type:	6" Steel
Depth Drilled (ft):	265	Aquifer:	Undefined
Screened Interval (ft):	215-235	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-5
CLAY	yellow	5-100
TILL	rocky, gray	100-121
GRAVEL	shale, coarse, black	121-126
TILL	gray	126-165
SAND	fine, white	165-169
TILL	gray	169-179
SAND	very fine, clean, white	179-235
SHALE	white to brown, turns green at bottom of hole	235-265

143-049-25CDA2

Date Completed:	5/1988	Purpose:	Domestic Well
L.S. Elevation (ft):	872	Well Type:	4" PVC
Depth Drilled (ft):	245	Aquifer:	Undefined
Screened Interval (ft):	220-240	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-4
CLAY	yellow	4-14
CLAY	gray	14-84
TILL	gray till, rocky	84-116
TILL	gray	116-205
SAND	no description	205-245

143-049-30CDD

Date Completed:	0/0	Purpose:	Domestic Well
L.S. Elevation (ft):	883	Well Type:	3" Steel
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-460	Log Source:	

143-049-30CDD (continued)

Lithologic Log - unavailable

143-049-33BCC

Date Completed:	5/27/64	Purpose:	Test Hole
L.S. Elevation (ft):	876	Well Type:	
Depth Drilled (ft):	265	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	and subsoil, dark yellowish brown, clay with sand, limestone and quartz grains, oxidized, very highly calcareous, cohesive, snail shell	0-6
CLAY	moderate yellowish brown, silty, cohesive, calcareous, oxidized	6-36
CLAY	olive gray, silty, cohesive, calcareous	36-77
TILL	olive gray, clay through gravel, cohesive, limestone, shale, granite, calcareous; red granite boulder at 82 ft; green granite boulder at 85 ft; pink granite boulder at 95 ft	77-98
TILL	olive gray to light olive gray, clay through gravel, very sandy and silty, limestone, quartz, and granite, highly calcareous	98-110
GRAVEL	granules 1-10 mm, fair sorting, predominantly limestone and granitics, very angular chips but predominantly rounded granules of limestone and subangular to subrounded granitics	110-115
TILL	very poor samples, very sandy, silty, up to 1 mm, predominantly quartz with limestone, granite, shale, and what may be lignite, angular to rounded, predominantly medium sand (less than .5 mm), evidently in a clay matrix as it doesn't seem to wash out, may be more of the light olive gray sandy till or sandy clay	115-178
GRAVEL	with sand, limestone, granitics, and shale with quartz and lignite, angular to rounded	178-184
SAND	as above, or till as above	184-200
GRAVEL	as above	200-202
CLAY	dark greenish gray, silty, noncalcareous, very cohesive, solid	202-250
TILL	between pale and dark reddish brown, also pale brown, clay through gravel, abundant quartz with granite, highly calcareous, very sandy, quartz with up to 1 mm and rounded, limestone	250-258
GRANITE	weathered, pale to grayish blue green, with small aluminum colored veins or spot, noncalcareous, soft cuttings, hard drilling	258-265

143-049-36ADBCDA

Date Completed:	4/1987	Purpose:	Domestic Well
L.S. Elevation (ft):	873	Well Type:	4' Stainless Steel
Depth Drilled (ft):	180	Aquifer:	Undefined
Screened Interval (ft):	168-173	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
SOIL	soil, black	0-1
CLAY	clay, brown	1-19
CLAY	clay, blue	19-98
CLAY	sandy clay, blue	98-105
SAND	sand, colored	105-108
CLAY	sandy clay, blue	108-110
SAND	sand, colored	110-112

143-049-36ADBCDA (continued)

CLAY	sandy clay, blue	112-118
SAND	sand, colored	118-120
CLAY	sandy clay, blue	120-121
SAND	sand, colored	121-122
CLAY	sandy clay, blue	122-124
SAND	sand, gray	124-127
CLAY	sandy clay, blue	127-128
SAND	sand, gray	128-129
CLAY	clay, blue	129-130
SAND	sand, gray	130-180

143-050-08DAA2

Date Completed:	6/3/77	Purpose:	Domestic Well
L.S. Elevation (ft):	898	Well Type:	4" Steel
Depth Drilled (ft):	250	Aquifer:	Undefined
Screened Interval (ft):	229-239	Log Source:	Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	yellow	1-19
CLAY	gray	19-75
TILL	no description	75-219
GRAVEL	no description	219-240
TILL	no description	240-250

143-050-15CAD

Date Completed:	00/00/00	Purpose:	Test Hole
L.S. Elevation (ft):	896	Well Type:	
Depth Drilled (ft):	101	Log Source:	unknown

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
CLAY	silty, brown to black, dispersed organics, oxidized (Unit 10)	0-7
CLAY	silty, grayish brown to light gray, laminated to vaguely laminated, lean to fat, soft white carbonate pebbles, gypsum crystals (Sherack Formation)	7-30
CLAY	gray, unbedded to vaguely laminated, abundant soft carbonate inclusions, gypsum crystals, lean to fat (Brenna Formation)	30-50
CLAY	silty, gray, contorted laminations, clay stringers, abundant sand pebbles, silty inclusions, gritty appearance (Argusville Formation)	50-68
CLAY	pebbly, loamy, sandy, silty (Unit A)	68-101

143-050-17BBB2

Date Completed: 6/1989
 L.S. Elevation (ft): 918
 Depth Drilled (ft): 80
 Screened Interval (ft): 60-80

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" PVC
 Hillsboro
 Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-3
CLAY	yellow	3-21
SHALE	gray	21-58
SAND	gray	58-80

143-050-19ABA

Date Completed: 00
 L.S. Elevation (ft): 897
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-80

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 3"
 Undefined

Lithologic Log - unavailable**143-050-29ADD**

Date Completed: 4/25/75
 L.S. Elevation (ft): 901
 Depth Drilled (ft): 410
 Screened Interval (ft): 395-405

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 4" Steel
 Undefined
 Lako Drilling

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	yellow	3-27
CLAY	blue	27-65
TILL	no description	65-279
SAND	no description	279-283
TILL	sandy	283-305
TILL	very gravelly	305-321
TILL	gravelly, with streaks of gravel	321-335
ROCK	hard, with granite	335-337
TILL	rocky	337-359
SAND	no description	359-365
TILL	no description	365-380
SAND	no description	380-410

143-050-29DAA

Date Completed: 4/25/74
 L.S. Elevation (ft): 902
 Depth Drilled (ft): 0
 Screened Interval (ft): 0-370

Purpose:
 Well Type:
 Aquifer:
 Log Source:

Domestic Well
 3" Steel
 Undefined

143-050-29DAA (continued)**Lithologic Log - unavailable****143-050-31CCC2**

Date Completed:	5/26/64	NDSWC 3099	Purpose:	Test Hole
L.S. Elevation (ft):	923		Well Type:	
Depth Drilled (ft):	455		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-1
CLAY	cohesive, calcareous, contains root of some organic material	1-26
CLAY	cohesive, slightly calcareous, silty	26-30
TILL	clay through gravel, very soft, cohesive, shale, quartz, limestone and granite, highly calcareous	30-32
SAND	very fine (1/8 mm) and silt, shale, quartz, limestone, and lignite settles out in mud pit and does not seem to thicken the mud; very little silt content and no clay	32-66
GRAVEL	sand to 8 mm, predominantly limestone with other rocks of varied composition, subangular to rounded	66-70
GRAVEL	sand to 8 mm, 1/2 shale with limestone and other rocks of varied composition, subrounded to well rounded	70-74
TILL	clay through gravel, shale, limestone, quartz, granite, occasional lignite fragments, cohesive, fairly soft, easy drilling not many boulders, highly calcareous, abundant shale pebbles in some places	74-113
SAND	very fine sand to 14 mm, predominantly very coarse sand and granules, predominantly shale with limestone, granite, quartz, etc., subangular to rounded	113-124
TILL	clay through gravel, abundant shale with limestone, quartz, etc., rocky, rougher drilling than above (gravel from 145-147 ft); highly calcareous	124-149
SAND	very fine to 1 mm, predominantly quartz, with shale and limestone, poorly sorted, angular to rounded	149-153
TILL	clay through gravel, shale, limestone, quartz and granite, highly calcareous, rocky	153-170
SILT	with lighter colored laminae, very fine sand, highly calcareous	170-208
SILT & TILL	very highly calcareous, silt has light colored areas of very fine sand; till is quite silty and sandy, and contains shale, limestone, quartz, granite and lignite; drills rough in places and smooth in others, samples consist of till and/or silt	208-273
SILT	clay through very fine sand, variegated, laminated, noncalcareous lignitic material, calcareous sandy laminae were noted about 300 ft, some small (up to 1/2 mm) veins or lenses of oxidized or organic material appear in the lighter cuttings, hard zone at 402 ft may have been pyrite or a very fine-grained quartz sandstone, both appeared in samples afterward (Graneros Shale)	273-422
CLAY	two colors, both soft and noncalcareous, first is oxidized while second contains small oxidized specks (weathered Precambrian)	422-430
CLAY	as above with small, up to 2 mm, hard pieces of reddish granite (weathered Precambrian)	430-450
CLAY	noncalcareous and getting greener and harder (weathered Precambrian)	450-455

143-050-35DCD

Date Completed:	4/27/79	Purpose:	Domestic Well
L.S. Elevation (ft):	887	Well Type:	4" Steel
Depth Drilled (ft):	232	Aquifer:	Undefined
Screened Interval (ft):	217-227	Log Source:	Lako Drilling

Lithologic Log

143-050-35DCD (continued)

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	yellow	2-19
CLAY	gray	19-73
TILL	gravelly toward bottom, gray	73-189
SAND	no description	189-232

143-051-18DAA

Date Completed:	00/00/00	Purpose:	Domestic Well
L.S. Elevation (ft):	940	Well Type:	3" Unknown
Depth Drilled (ft):	0	Aquifer:	Undefined
Screened Interval (ft):	0-400	Log Source:	

Lithologic Log - unavailable

143-051-18DAD

Date Completed:	00	Purpose:	Domestic Well
L.S. Elevation (ft):	911	Well Type:	4" Steel
Depth Drilled (ft):	358	Aquifer:	Dakota Group
Screened Interval (ft):	0-352	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-3
CLAY	tan	3-30
CLAY	blue	30-65
CLAY	sandy, blue	65-85
CLAY	with sand lenses, blue	85-92
CLAY	sandy, blue	92-112
SAND	no description	112-115
CLAY	sandy, blue	115-138
CLAY	with sand lenses, blue	138-145
CLAY	sandy, blue	145-206
CLAY	sandy, with boulders, blue	206-220
SHALE	blue (Graneros Shale)	220-248
SANDSTONE	brown (Graneros Shale)	248-250
SHALE	blue (Graneros Shale)	250-263
SANDSTONE	(Graneros Shale)	263-266
SHALE	blue (Graneros Shale)	266-268
SANDSTONE	(Graneros Shale)	268-271
SHALE	sandy, blue (Graneros Shale)	271-288
SANDSTONE	white (Graneros Shale)	288-290
SHALE	blue (Graneros Shale)	290-304

143-051-18DAD (continued)

SANDSTONE	white (Graneros Shale)	304-307
SHALE	(Dakota Sandstone)	307-343
SANDSTONE	white (Dakota Sandstone)	343-358

143-051-19BAA

Date Completed:	10/3/53	Purpose:	Test Hole
L.S. Elevation (ft):	945	Well Type:	
Depth Drilled (ft):	300	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	light gray, smooth	2-4
CLAY	smooth, yellow	4-7
CLAY	yellow, sandy, a few fine gravel and shale pebbles	7-16
SAND & GRAVEL	fine, medium to coarse dirty sand, fine gravel and a few shale pebbles	16-18
CLAY	yellow clay, fine to medium gravel, and shale pebbles (till)	18-27
SAND	fine, dirty	27-53
SAND & CLAY	fine sand and gray clay	53-58
CLAY	smooth, gray	58-66
CLAY	gray, a few fine gravel, and shale pebbles, rock at 69 ft (till)	66-75
CLAY	same as above but with more gravel, a rock at 76 ft; rock falling in from 88-99 ft	75-99
SAND	fine, medium to coarse dirty sand, fine gravel and a few shale pebbles	99-102
CLAY	gray, fine to medium gravel, shale pebbles and rocks (till)	102-107
GRAVEL	fine to medium, few shale pebbles	107-112
CLAY	gray, fine to medium gravel, shale pebbles and rocks, gravel caving in at 107 ft, gravel falling in from above and dropping to 120 ft, changed to new hawthorn bit at 160 ft, lots of rocks 177-190 ft (till)	112-188
CLAY	dark gray, sandy, sandy clay mixing with water so hard to get samples from 230-300 ft	188-240
CLAY	same as above, but with a little coal	240-300

143-051-20BBB

Date Completed:	6/18/54	Purpose:	Test Hole
L.S. Elevation (ft):	938	Well Type:	
Depth Drilled (ft):	318	Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black, on graded road	0-3
CLAY	smooth, yellow	3-27
TILL	yellow clay, fine gravel and shale pebbles	27-56
CLAY	smooth, gray	56-64

143-051-20BBB (continued)

TILL	gray clay, fine gravel to shale pebbles	64-70
TILL	gray clay, fine to medium, gravel and shale pebbles	70-73
SAND	fine, medium to coarse, dirty, fine gravel and shale pebbles	73-75
CLAY	gray, fine to medium gravel and shale pebbles, a lot of rocks beginning at 92-136 ft (till)	75-130
SAND	medium to coarse sand, fine gravel and shale pebbles	130-132
CLAY	gray, fine to medium gravel, shale pebbles and a few rocks (till)	132-200
CLAY	gray, fine to medium, gravel and shale pebbles and rocks, hard rock at 252 ft (till)	200-258
CLAY & GRAVEL	about 1/3 gray clay and 2/3 fine gravel, and shale pebbles of some fine, medium to coarse sand	258-318

143-051-34CCC

Date Completed:	6/2/64	NDSWC 3102B	Purpose:	Test Hole
L.S. Elevation (ft):	925		Well Type:	
Depth Drilled (ft):	138		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black, sandy	0-2
SILT	dark yellowish brown to grayish orange, clay cohesive, calcareous, oxidized with gypsum crystals, became nearly olive gray in the 27-34 ft area but not quite	2-38
SILT	light olive brown, cohesive, calcareous, oxidized with laminae and gypsum crystals	38-49
GRAVEL	sand up to 10 mm, subrounded, predominantly limestone with granite, shale, etc., some grains are oxidized	49-51
TILL	moderate olive brown, clay through gravel, very sandy, calcareous, abundant quartz with shale and limestone, also some pyrite and lignite	51-55
TILL	olive gray, clay through gravel, cohesive, limestone, shale, quartz, lignite and granite, quite rocky, highly calcareous, shale very abundant 75-81 ft	55-81
TILL	lighter than above, clay through gravel, limestone, quartz, granite, and lignite with some shale, silty, very highly calcareous, cohesive, quite rocky, boulders from 115 ft, small pieces of wood at about 136 ft, abandoned hole on rock at 138 ft	81-138

143-051-35DAA

Date Completed:	5/2/58	Purpose:	Domestic Well
L.S. Elevation (ft):	928	Well Type:	4" Unknown
Depth Drilled (ft):	225	Aquifer:	Undefined
Screened Interval (ft):	0-225	Log Source:	Frederickson's of ND, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	no description	0-2
CLAY	silty, yellow	2-28
CLAY	silty, blue	28-86
CLAY	hard, dark green	86-98
CLAY	soft, gray	98-115
CLAY	blue	115-152
CLAY	with sand lenses, blue	152-170

143-051-35DAA (continued)

SAND	clayey, blue	170-182
CLAY	sandy, soft, blue	182-187
SAND	fine, blue	187-225

143-051-35DAA2

Date Completed:	9/22/77	Purpose:	Domestic Well
L.S. Elevation (ft):	931	Well Type:	4" Steel
Depth Drilled (ft):	257	Aquifer:	Undefined
Screened Interval (ft):	239-249	Log Source:	LTP Enterprises, Inc

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-2
CLAY	brown, sandy	2-17
SAND	silty	17-86
CLAY	blue, sandy	86-125
SAND	no description	125-127
CLAY	blue, sandy, with sand lenses	127-160
CLAY	blue, sandy	160-167
SAND	no description	167-169
CLAY	blue, sandy	169-171
SAND	no description	171-186
CLAY	blue, sandy	186-187
SAND	no description	187-257

143-051-36DDD

Date Completed:	7/27/64	NDSWC 3131	
L.S. Elevation (ft):	929	Purpose:	Test Hole
Depth Drilled (ft):	272	Well Type:	
		Log Source:	NDSWC

Lithologic Log

<u>Unit</u>	<u>Description</u>	<u>Depth (ft)</u>
TOPSOIL	black	0-1
SILT	dark yellowish brown, pockets of higher oxidation, cohesive, hard, very calcareous, slightly sandy	1-17
SILT	dark to moderate yellowish brown, cohesive, hard, very calcareous, sandy, sand grains consist of quartz, shale, and tiny lignite flakes	17-32
SILT	sandy, numerous lignite flakes, numerous sand laminations, sand consists of quartz, lignite, pyrite, oxidized	32-55
SILT	cohesive, soft, dark greenish gray, very fine sand, sand consists of quartz, pyrite, lignite, highly calcareous	55-65
SILT	gradual decrease to a sandless silt, cohesive, hard, olive gray to black, highly calcareous	65-77
BOULDER	limestone	77-79

143-051-36DDD (continued)

TILL	dark greenish gray, highly calcareous, cohesive, hard, contains dolomite, limestone, shale, quartz, lignite flakes, grains up to 1 mm, increase in shale downward	79-117
TILL	lighter color than above olive gray; dolomite, granite, limestone, quartz, lignite, highly calcareous, particles subrounded to angular, particles up to 2 mm, sandy	117-128
SAND	coarse, quartz, limestone, shale, granite, tourmaline(?), muscovite; particles well rounded to angular, sphericity in some grains is excellent, Inoceramus fragments	128-131
TILL	sandy, (very poor samples), non-cohesive, soft, with lenses of sand, sand similar to above, occasional small boulders, till is similar to till obtained between (117-128 ft), till gradually getting more cohesive and hard, at about 197 ft, it gets very hard, limestone increases downward	131-197
TILL	dark greenish to olive gray, sand is much decreased, dolomite, limestone, shale, lignite, quartz, cohesive, very hard, highly calcareous, particles subangular to subrounded	197-217
SHALE	olive black, hard, cohesive, bentonite laminae, biotite, muscovite, pyrite, dolomite, quartz, shale, cohesive, hard, sand laminations, slightly calcareous, shell fragment (Graneros Shale)	217-262
SHALE	same as above, except containing much fine sand changing its color to dark greenish gray, the sand occurs disseminated throughout the shale and concentrated in laminations (Graneros Shale)	262-272