RECOMMENDED DECISION
WATER PERMIT #5172
LEROY WIELAND, STREETER, NORTH DAKOTA

By Robert B. Shaver

Office of the North Dakota State Engineer
Dale L. Frink, State Engineer
October, 2005

OFFICE OF THE NORTH DAKOTA STATE ENGINEER

RECOMMENDED DECISION

MEMO TO:	Dale Frink, State Engineer
From:	Robert Shaver, Director, Water Appropriation Division
Subject:	Conditional Water Permit Application No. 5172 – Leroy Wieland
Date:	September 26, 2005

INTRODUCTION

Purpose and Scope

The Streeter aquifer is a Pleistocene, glacio-fluvial aquifer that occupies an area of about 31 square miles in north central Logan and southeastern Kidder Counties (fig. 1). Center-pivot sprinkler irrigation represents the largest use from the Streeter aquifer. Irrigation development from the Streeter aquifer began in 1974. To date, the State Engineer has approved the appropriation of 3,216.0 acre-feet of ground water from the Streeter aquifer annually, to irrigate 2,144.0 acres of land. The State Engineer has deferred action on five conditional water permit applications from the Streeter aquifer amounting to an annual irrigation appropriation of 1,304.0 acre-feet to irrigate 833.5 acres of land. The State Engineer has deferred action on those irrigation water permit applications because of uncertainty with regard to adverse affects that may occur on prior appropriators. To evaluate potential adverse affects on prior appropriators, a finite-difference model of the Streeter aquifer was developed. A conceptual hydrogeologic model of the Streeter aquifer provided the basis for the finite-difference computer model. The conceptual hydrogeologic model was constructed using geologic, climatic, hydraulic, and hydrochemical data. Using the finite-difference model, steady-state simulations were made to assess aquifer response to selected ground-water withdrawal scenarios.

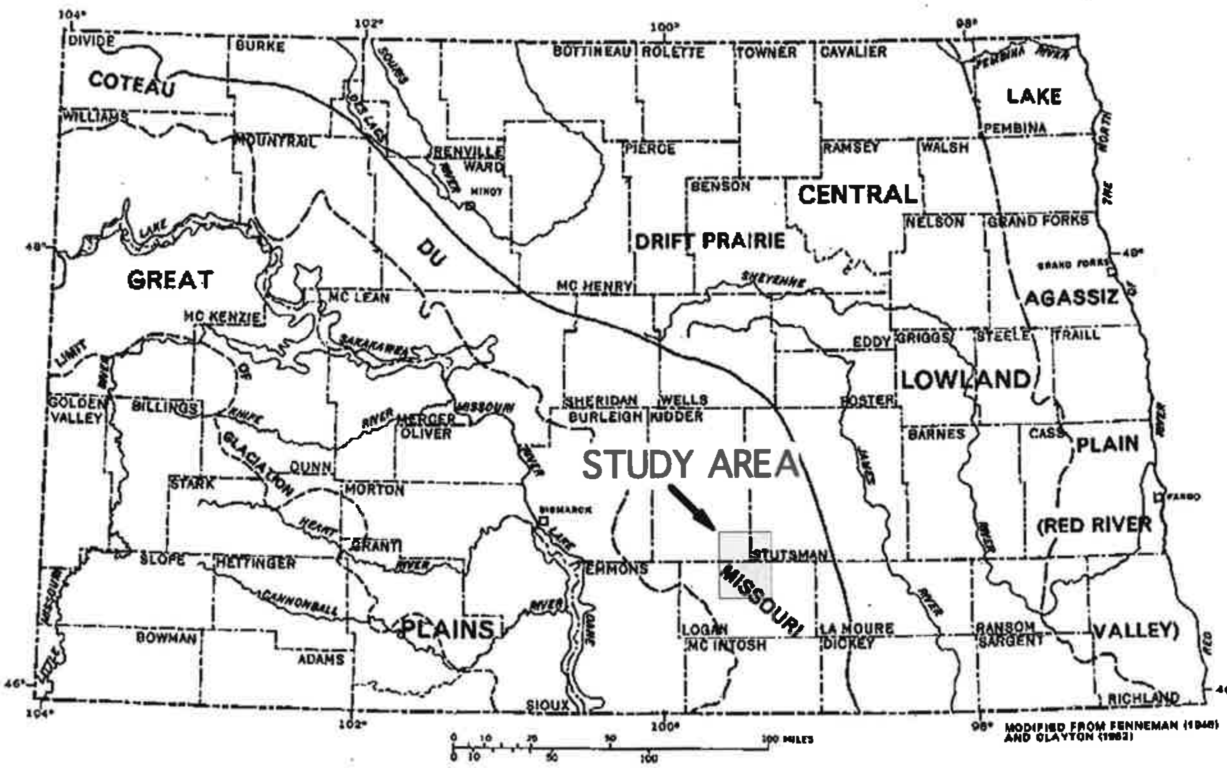


Figure 1. -- Location of study area and physiographic divisions in North Dakota

Acknowledgements

The basic hydrogeologic data used to develop the conceptual and finite-difference model were, in large part, collected and compiled by Alan Wanek, Hydrologist Manager, State Water Commission (SWC). The data is comprehensive and well organized, which allowed for ease in developing the conceptual and finite-difference model. Jon Patch and Royce Cline, Hydrologist Managers, provided guidance in developing the finite-difference model using ArcView GIS software and the Argus graphical user interface (Shapiro and others, 1997) for MODFLOW-96 MODFLOW-2000 (Harbaugh and others, 1996; Harbaugh, and others, 2000; Winston, 1999 and 2000). Thanks are extended to Dave Ripley and Royce Cline for technical review of the manuscript.

Location-Numbering System

The location-numbering system used in this report is based on the public land classification system used by the U.S. Bureau of Land Management. The system is illustrated in figure 2. The first number denotes the township north of a base line, the second number denotes the range west of the fifth principal meridian, and the third number 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 tract). For example, well 136-070-19DAA is located in the NE1/4NE1/4SE1/4 of Section 19, Township 136 North, Range 70 West. Consecutive terminal numerals are added if more than one well or test hole is located within a 10-acre tract.

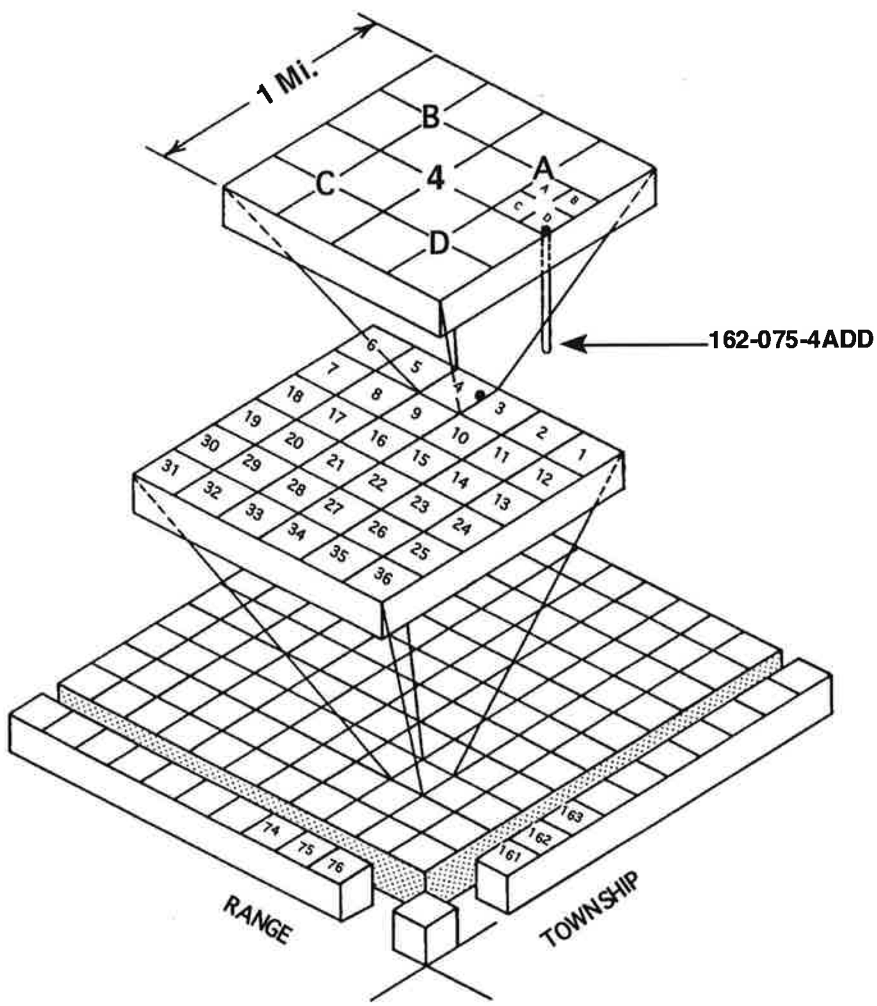


Figure 2.-- Location-numbering system

Previous Work

Paulson (1952) described the geology and occurrence of ground water in the Streeter area. Two test holes were completed in sand and gravel outwash deposits southwest of Streeter and these outwash deposits comprise what was later named the Streeter aquifer.

Clayton (1962) described the glacial geology of Logan and McIntosh Counties. A pro-glacial outwash plain (Streeter aquifer) located along the west edge of the Streeter moraine (T. 136 N., R. 70 W.) in Logan County is noted in the report.

The ground-water resources of Logan County were described in a two-part report. Part II (Klausing, 1982) presented the ground-water data, and Part III (Klausing, 1983) described the ground-water resources.

Test-drilling, Well Construction, Water-Level Measurements and Water Chemistry Sampling and Analytical Methods

Test-drilling data used in this report was provided by the North Dakota State Water Commission and commercial well-drilling firms. The locations of all test holes and wells in the study area are shown in figure 3.

The North Dakota State Water Commission used a Failing 1250 forward mud rotary rig to drill all test holes. Observation wells were constructed using 20-foot lengths of 1.25-inch diameter ABS, 1.5-inch diameter PVC and 2.0-inch diameter PVC casing. Well screen diameters were 1.25-inch (galvanized steel), 1.5-inch (PVC), and 2.0-inch (PVC). Screen lengths generally were from 3 to 6 feet, and slot size generally was 0.018 inch. A check valve was attached to the bottom of each screen. The 1.25- and 1.5-inch plastic casing, well screen, and check valve were assembled prior to insertion into the drill hole. A check valve and screen were attached to a 20-foot length of 2-inch diameter PVC plastic casing prior to insertion into the drill hole. After insertion, additional lengths of 2-inch PVC plastic casing were attached as the casing was moved

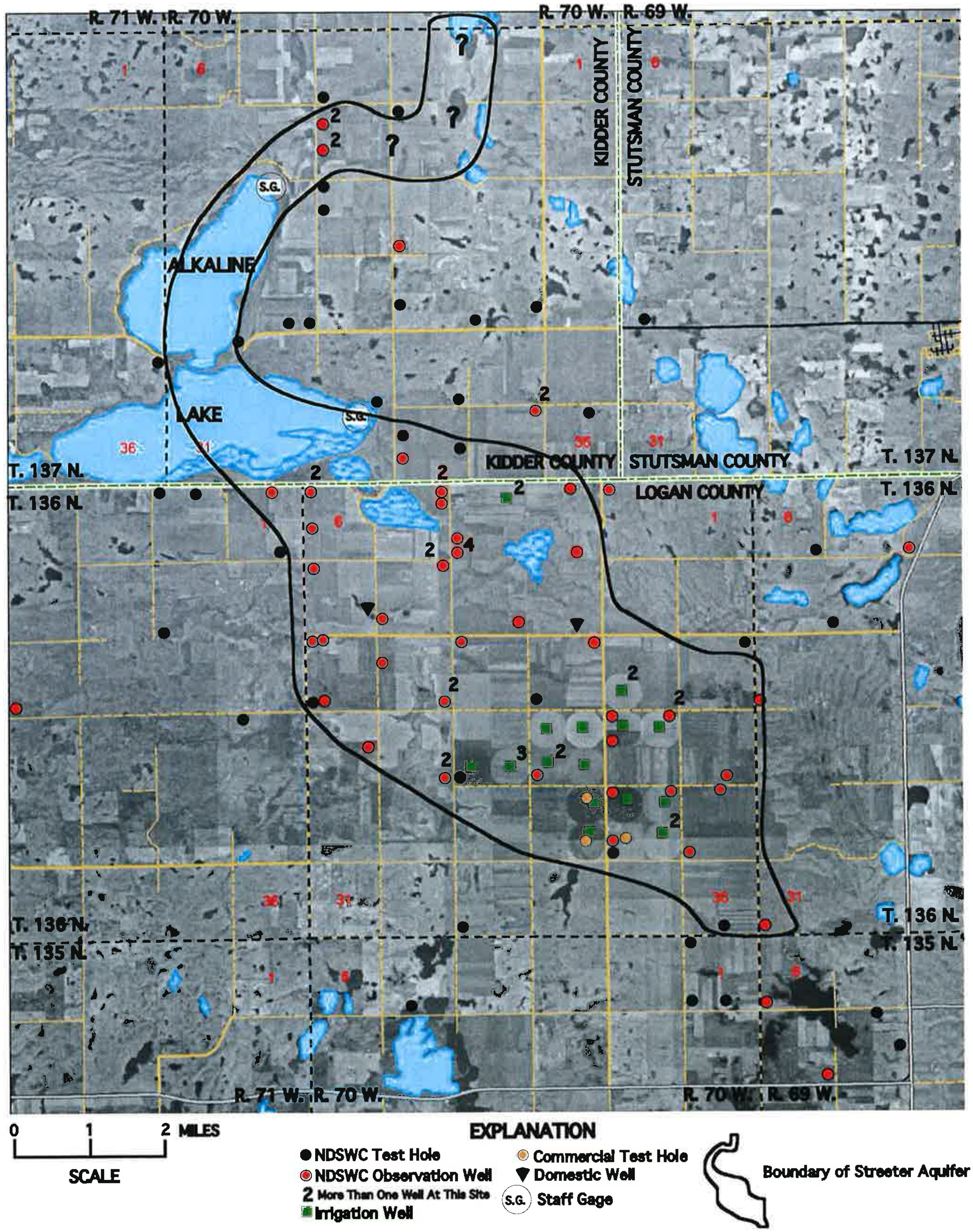


Figure 3. – Location of test holes, observation wells, irrigation wells, domestic wells, and staff gages

downward to the bottom of the drill hole. After insertion, the hole was backwashed through the screen to clean the formation. After backwashing, the hole was blown with air to collapse the formation around the screen. The remaining annular area was backfilled with drill cuttings.

Beginning in 1972, State law required commercial well drillers to submit completion reports of test holes and wells completed in North Dakota. The completion reports, submitted to the State Board of Water Well Contractors, provide additional hydrogeologic data within the study area. Summaries of all North Dakota State Water Commission and commercial well driller completion reports are in Appendix I.

The North Dakota State Water Commission began measuring water levels in observation wells completed in the Streeter aquifer in 1978. Water levels generally were measured monthly from April through October. Water levels were measured to the nearest 0.01 foot using a chalked steel tape or an electric tape. Water levels are provided in Appendix II.

Water samples for chemical analysis generally were collected by airlift techniques. Prior to sample collection, at least three well casing volumes of standing water were evacuated using an airlift pump. Temperature and specific conductance of the airlift sample were measured in the field. Occasionally, water samples were collected using a PVC point-source bailer. In addition, pH was occasionally measured in the field. This is recorded on the water chemistry analysis.

Prior to 1977, two samples were collected from each well. A 250-mL sample was filtered and acidified with nitric acid immediately upon collection. Analysis of iron and manganese was made on this sample. All other cation and anion concentrations were determined on a raw 2,000-mL sample. Beginning in 1977, three samples were collected from each well: a 250-mL raw sample, a 500-mL filtered sample, and a 500-mL filtered sample that was acidified with 2-mL nitric acid. A 0.45-micron filter was used to remove suspended matter. Concentrations of bicarbonate, carbonate, and chloride and laboratory determinations of pH and specific conductance were measured on the 250-mL raw sample. Concentrations of sulfate, fluoride, boron, nitrate, silica, and total dissolved solids were determined on the 500-mL filtered sample. Concentrations of calcium, magnesium, sodium, potassium, iron, and manganese were determined on the filtered and acidified 500-mL sample. All samples were stored in plastic bottles and transported to the North Dakota State Water Commission laboratory in Bismarck for analysis.

Prior to 1981, concentrations of the major cations were determined using a Beckman Model DU-2 spectrophotometer. Beginning in 1981, concentrations of the major cations were determined using a Perkin-Elmer Model 4000 atomic absorption spectrophotometer. Concentrations of bicarbonate, carbonate, and chloride were determined using a Fisher Model 741 titralyzer; and the concentration of sulfate was determined by gravimetric methods. The North Dakota State Water Commission laboratory participates in quality-assurance programs with the U.S. Geological Survey.

Since 1985, the North Dakota State Water Commission has developed wells using an air-lift pump, allowed at least 24 hours for the well to recover, and then sampled the well using a submersible pump or a polyvinyl-chloride point-source bailer. Specific conductance, pH, and temperature have been measured at land surface after sample collection. Water chemistry analyses are provided in Appendix III.

DESCRIPTION OF THE STUDY AREA

Physiography

The Streeter aquifer study area is located in the Coteau du Missouri district of the Great Plains physiographic province (fig. 1). The Coteau du Missouri district is characterized by very hilly moraine, completely nonintegrated drainage, numerous small lakes and sloughs, drift that is 50 to 500 feet thick and numerous landforms resulting from large-scale glacial stagnation

(Clayton, 1962). Also present are outwash plains and several end moraines. The Streeter aquifer occupies one of these outwash plains. This outwash plain is very flat having, in most areas, less than a few feet of local relief.

Climate

The climate of the Streeter aquifer study area is semiarid. The closest long-term climate station is at Napoleon located about 15 miles southwest of the Streeter aquifer. Mean annual temperature at Napoleon is 41°F (Klausing, 1983). June, July, and August are the warmest months with mean monthly temperatures ranging from about 63 °F to 70 °F. January and February are the coldest months with mean monthly temperatures ranging from about 8 °F to 12 °F. (Klausing, 1983).

Mean annual precipitation at the Napoleon station from 1901 through 2003 is 17.65 inches (U.S. Department of Commerce, no date). Minimum annual precipitation was 9.07 inches in 1936 and maximum annual precipitation was 29.41 inches in 1977. About 70 percent of the precipitation falls from April through August when needed for germination and growth for crops.

Annual precipitation and the five-year moving average of annual precipitation are shown in figure 4. From 1994 through 2003, the five-year moving average precipitation are above 20 inches per year, indicating the wettest period since records were first established in 1901.

The North Dakota Agricultural Weather Network (NDAWN) has an automated weather station at the Streeter Central Grasslands Research Station located in Section 31, T. 138 N., R. 69 W. This station is located about five miles northeast of the Streeter aquifer. The weather station monitors the following:

1) air pressure
2) air temperature

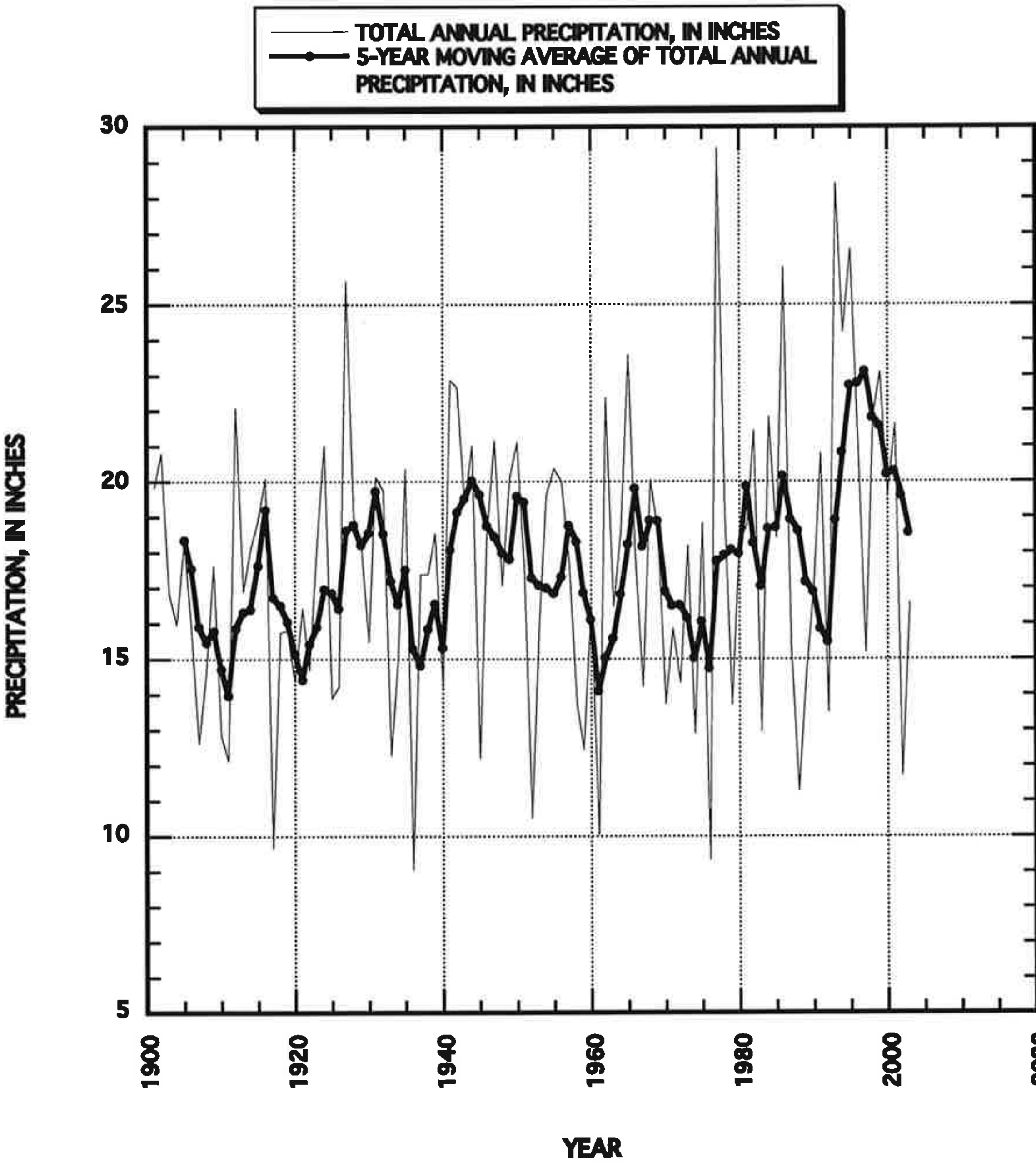


Figure 4. – Annual and 5-year moving average of annual precipitation at Napoloen, North Dakota

3) dew-point temperature (calculated)

4) degree days (growing, heating, cooling, insect) (calculated)

5) potential evapotranspiration and crop water use (calculated)

6) rainfall

7) relative humidity

8) soil temperature

9) incoming solar radiation

10) wind speed and direction

The weather station became operational in April 1990. Precipitation is measured using a tipping bucket rain gage and, as a result, winter precipitation (snowfall) is not measured. Solar radiation is measured using a photo cell type pyranometer.

Using data from the above NDAWN station, a comparison was made between monthly (April through October) potential evapotranspiration and rainfall (fig. 5). Potential evapotranspiration was calculated using the FAO-56 Penman-Monteith method (Allen and others, 1999) using daily temperature, dew point, solar radiation, and wind speed data measured at the NDAWN site. A monthly moisture budget was calculated by subtracting rainfall from potential evapotranspiration (fig. 6). Clearly, growing seasons in the Streeter aquifer study area are characterized by a significant moisture deficit. The mean annual growing season moisture deficit (1990 through 2003) is 31.02 inches.

A comparison is made between monthly April through October precipitation at the Napoleon station and the NDAWN Streeter station (fig. 7). Over most of the period of record, Napoleon monthly precipitation exceeds NDAWN Streeter monthly precipitation. With time, the differences between monthly precipitations at the two stations diminish. Napoleon precipitation is recorded manually while NDAWN Streeter precipitation is recorded electronically. Given the high

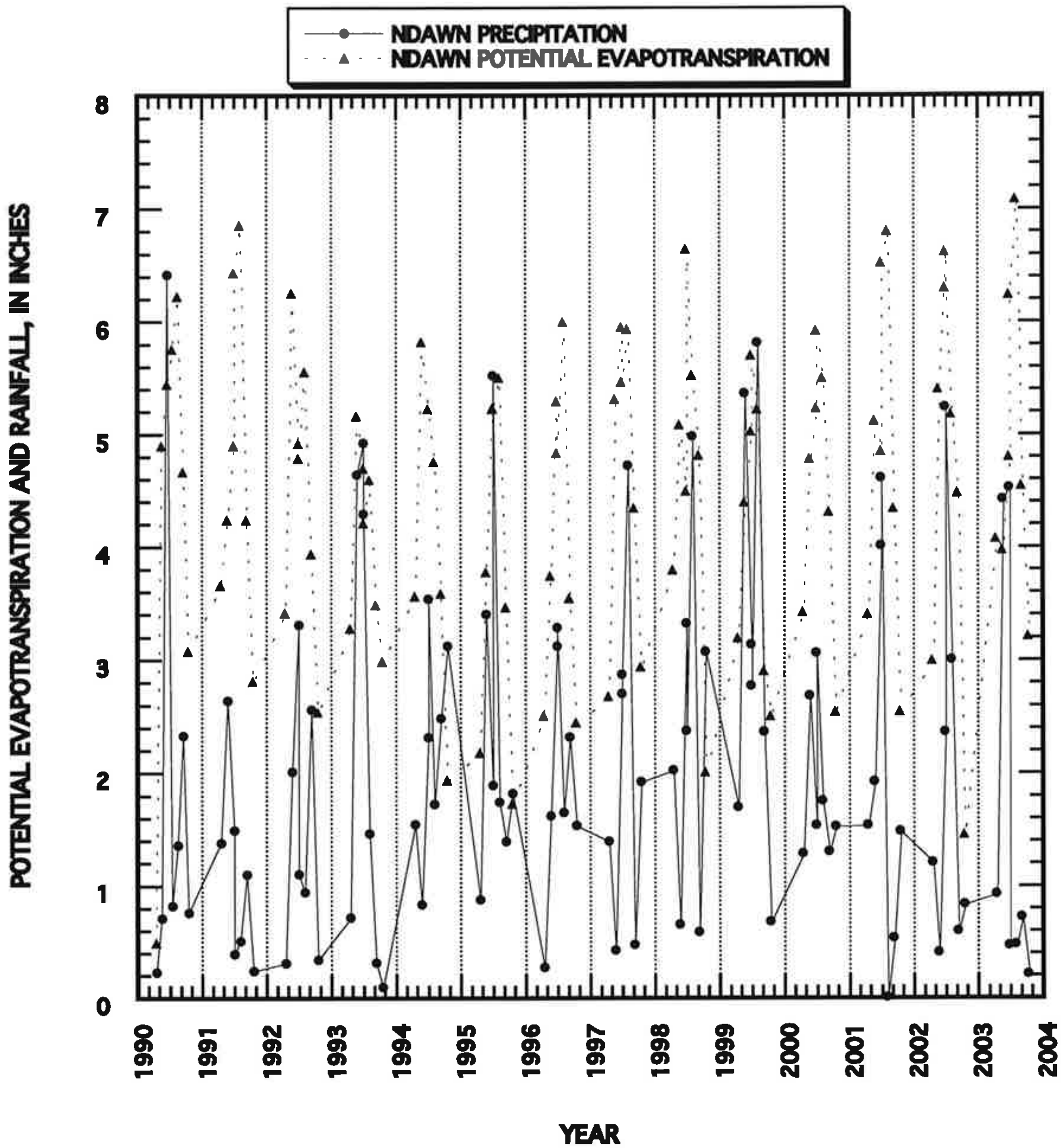


Figure 5. — Comparison of monthly (April-October) potential evapotranspiration and rainfall measured at Streeter NDAWN site

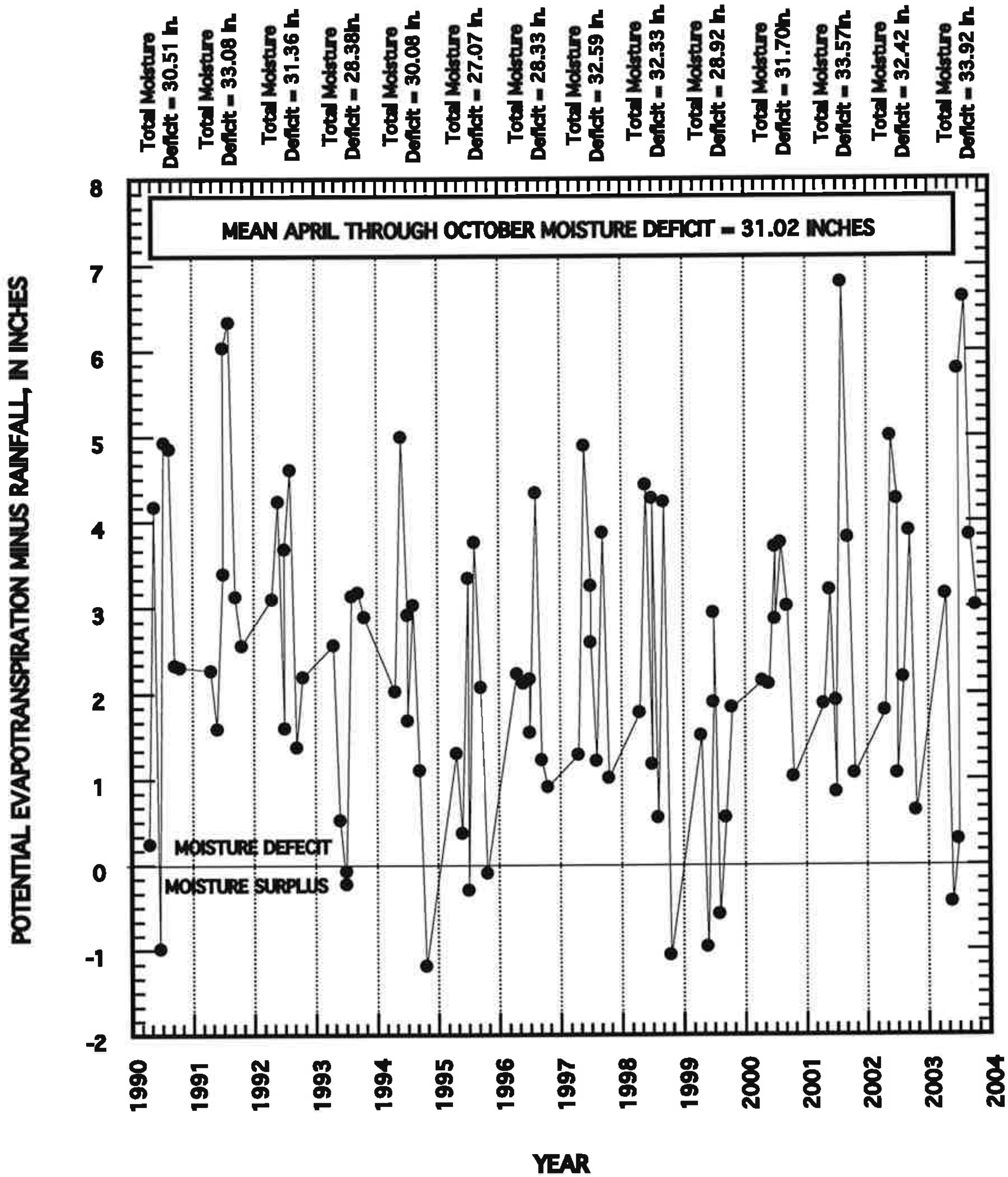


Figure 6. – Monthly (April-October) moisture budget 1990 through 2004

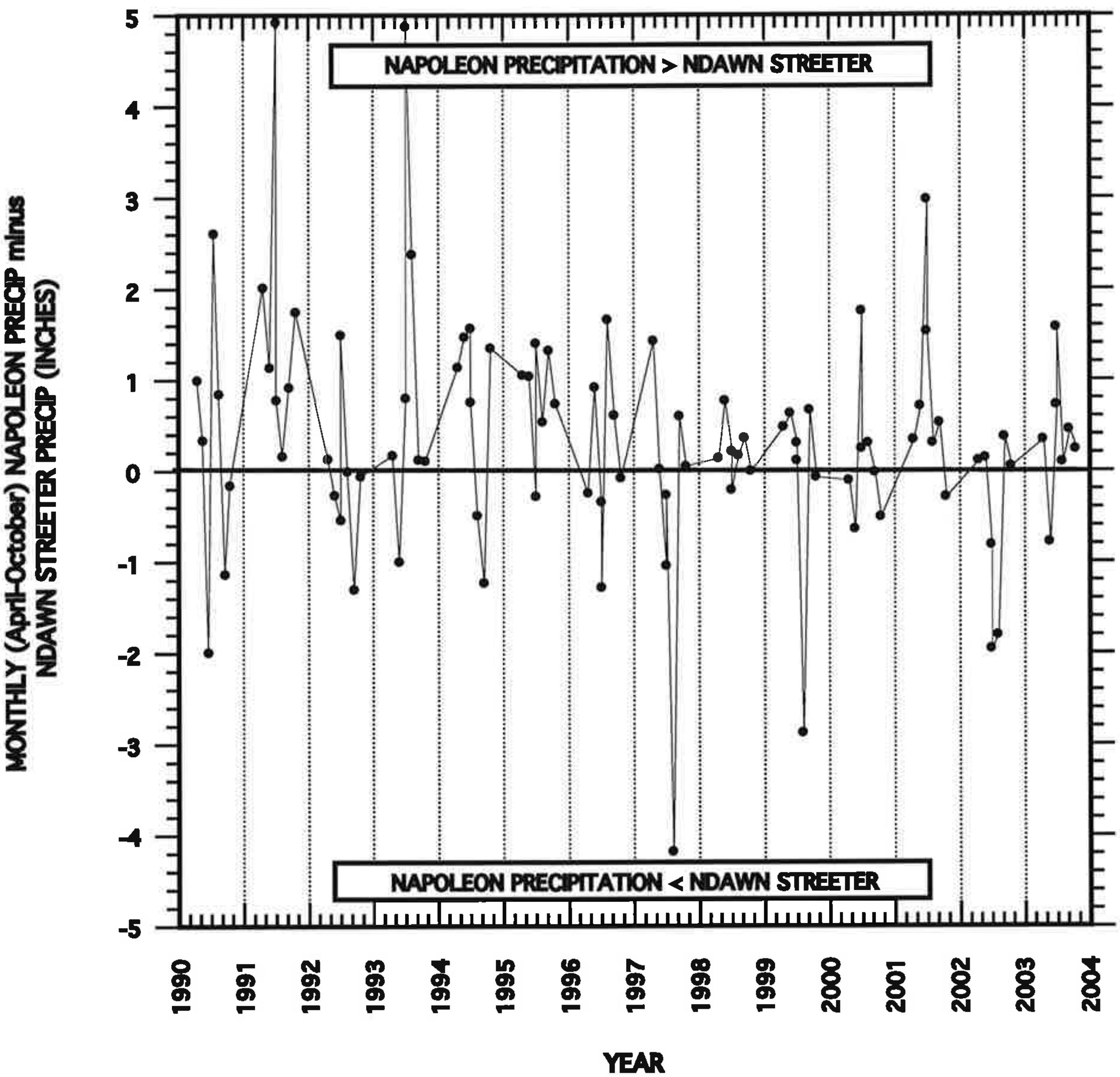


Figure 7.-- Comparison of monthly (April through October) precipitation at Napoleon and the NDAWN Streeter station

degree of variability with respect to precipitation intensity and duration for typical growing season convective thunderstorms in North Dakota, the differences in precipitation between the two weather stations are plausible.

Soils

The Streeter aquifer is predominantly overlain by soils of the Arvilla and Maddock Series (U.S. Department of Agriculture, no date and U.S. Department of Agriculture, 1988). Arvilla soils are sandy loams, which are somewhat excessively drained and derived from glacial outwash deposits (U.S. Department of Agriculture, 1993). From 0 to 19 inches below land surface, permeability ranges from 2.0 to 6.0 inches per hour (4.0 to 12 feet per day) and from 19 inches to 60 inches below land surface, permeability is greater than 6 inches per hour (12 feet per day). Available water capacity ranges from 0.13 to 0.15 inches per inch from 0 to 9 inches below land surface, 0.11 to 0.14 inches per inch from 9 to 19 inches below land surface, and 0.05 to 0.08 inches per inch from 19 to 60 inches below land surface. Thus, the available water capacity for the top 5 feet of Arvilla soils ranges from 4.32 to 6.03 inches.

The Maddock soils range from loamy fine sand to fine sandy loam that are well drained and formed on glacial lake plains (U.S. Department of Agriculture, 1993). From 0 to 60 inches below land surface, permeability ranges from 6.0 to 20 inches per hour (12 to 40 feet per day) (U.S. Department of Agriculture, 1993). Available water capacity ranges from 0.13 to 0.18 inches per inch from 0 to 9 inches below land surface and from 0.05 to 0.13 inches per inch from 9 inches to 60 inches below land surface. Thus, the available water capacity for the top 5 feet of Maddock soils ranges from 3.72 inches to 8.25 inches.

Based on the above, the soils overlying the Streeter aquifer are predominantly characterized by relatively large permeability and relatively small moisture holding capacity. A relatively large permeability coupled with relatively small moisture holding capacity facilitates deep percolation of precipitation and snowmelt (recharge) to the underlying Streeter aquifer.

Geology

Surficial Geology

The Streeter aquifer occupies a glacial outwash plain that is flanked to the east by the Streeter end moraine and to the west by the Fresh Lake end moraine (fig. 8). The outwash plain is comprised of sand and gravel. The end moraines are comprised mostly of stony, sandy, silty-clay (till) (Clayton, 1962). The till and sand and gravel deposits are facies within the Pleistocene Coleharbor Group (Bluemle, 1979). The geology of the study area in Kidder and Stutsman counties also is described in Rau and others, 1962, and Winters, 1963.

A narrow saddle (gap) in the Streeter end moraine is located in 136-069-18. The area of the saddle and larger areas to the northeast on top of the Streeter end moraine are comprised of collapsed outwash (Clayton, 1962). The outwash deposits of the Streeter aquifer probably were deposited by a meltwater stream that breached the Streeter end moraine in 136-069-18. Once the stream reached the outwash floor, the velocity decreased and the sediment load was deposited forming an outwash plain. It appears that drainage continued northeast of Alkaline Lake and eventually intersected the large outwash plain in the Tappen and Streeter area (Paulson, 1952).

Subsurface Geology

In descending order within the Streeter aquifer study area, the lithologies consist of sand and gravel, silt and clay, and till facies of the Pleistocene Coleharbor Group; claystone, siltstone and sandstone of the Cretaceous Fox Hills Formation; and shale of the Cretaceous Pierre Formation

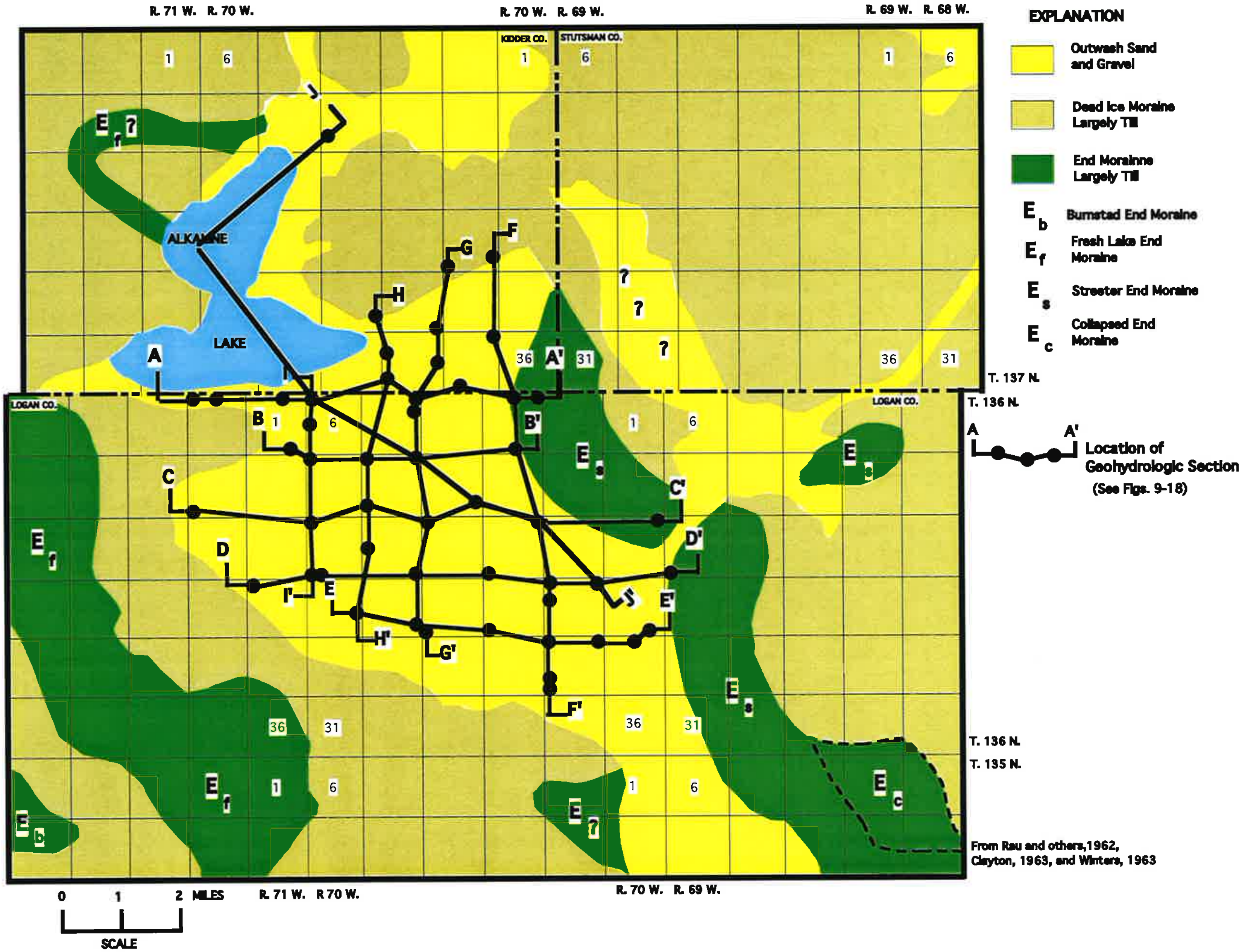


Figure 8. – Generalized surficial geology in the Streeter aquifer study area and location of geohydrologic sections A-A' through J-J'

(figs. 9-18, geohydrologic sections A-A' through J-J'). The locations of the geohydrologic sections are shown in figure 8.

The Pleistocene sand and gravel deposits of the Coleharbor Group, in the study area, generally are part of the previously described glacial outwash plain. Other, less extensive, buried sand and gravel deposits also occur in the study area (fig. 9 at 136-070-06BBB, fig. 12 at 136-070-17DDD). The sand and gravel deposits of the outwash plain (Streeter aquifer) are comprised of shield silicates, carbonates, quartz, detrital shale (Pierre Formation), and detrital claystone, siltstone, sandstone fragments (Fox Hills Formation). The sand and gravel is angular to well rounded.

In a little more than two-thirds of the outwash plain area, the sand and gravel deposits occur in two layers separated by a silty-clay/clayey-silt layer (figs. 9-18). The silty-clay/clayey-silt layer is located in the central and northwest part of the outwash plain (fig. 19). Based on lithologic logs from 34 test holes/wells, the silty-clay/clayey-silt layer ranges in thickness from less than 1 foot up to 18 feet with an average thickness of about 8 feet.

The silty-clay/clayey-silt facies of the Coleharbor Group, in places, underlies the basal sand and gravel deposits of the outwash plain (figs. 9-18). The above sequence of sand and gravel interbedded with silty clays/clayey silts indicates significant velocity changes in the depositional environment as meltwater flowed off the ice margin along the Streeter moraine.

Over most of the study area, the till facies of the Coleharbor Group directly underlies the outwash sand and gravel deposits and the silty-clay/clayey-silt deposits (figs. 9-18). The till is comprised of an olive gray, gravelly, sandy, silty-clay with occasional cobbles and boulders.

The Pleistocene Coleharbor Group is unconformably underlain by claystone, siltstone, and sandstone of the Cretaceous Fox Hills Formation and shale of the Cretaceous Pierre Formation (figs. 9-18). The sandstones of the Fox Hills Formation commonly are glauconitic and dark green

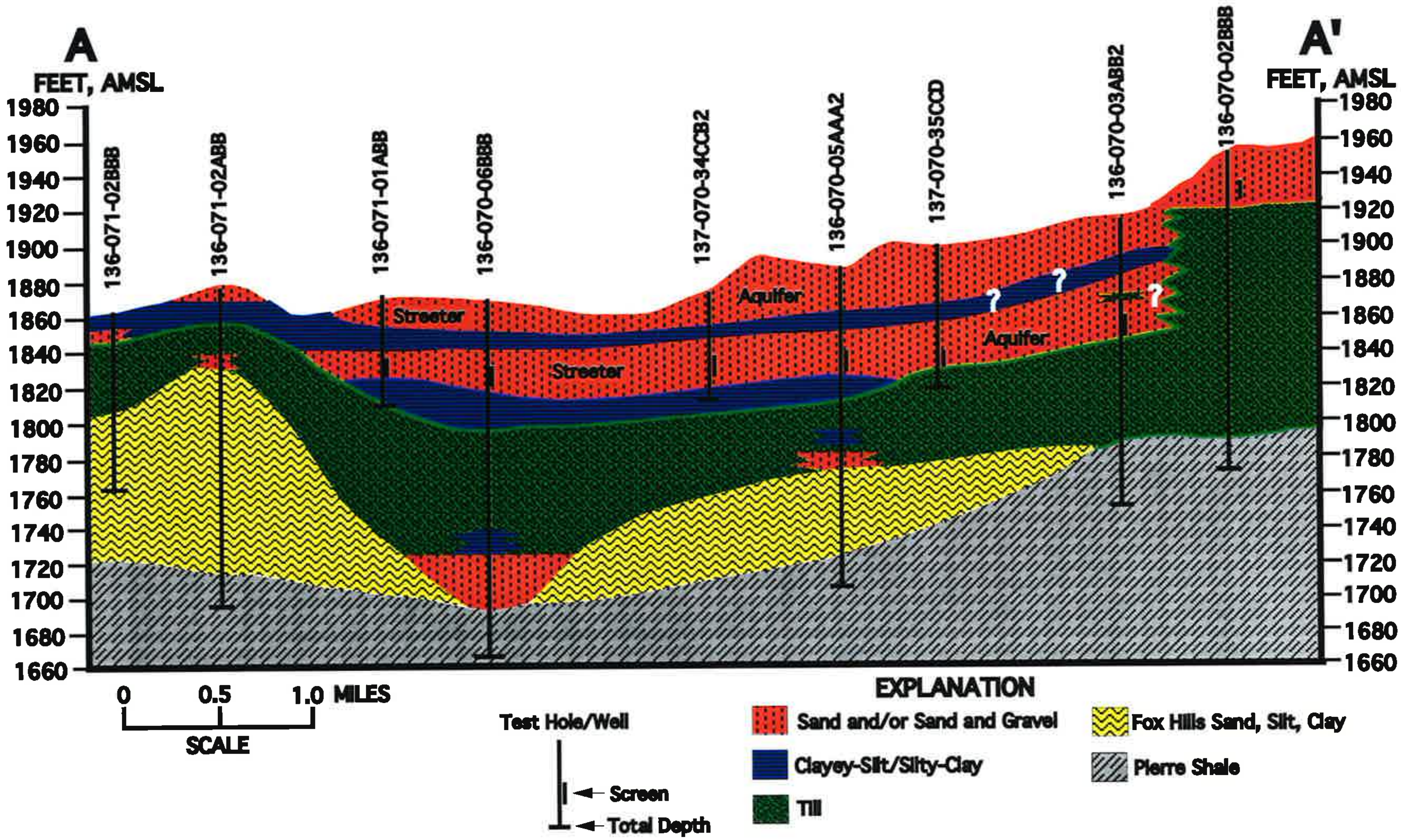


Figure 9. — Geohydrologic section A-A' showing the Streeter aquifer

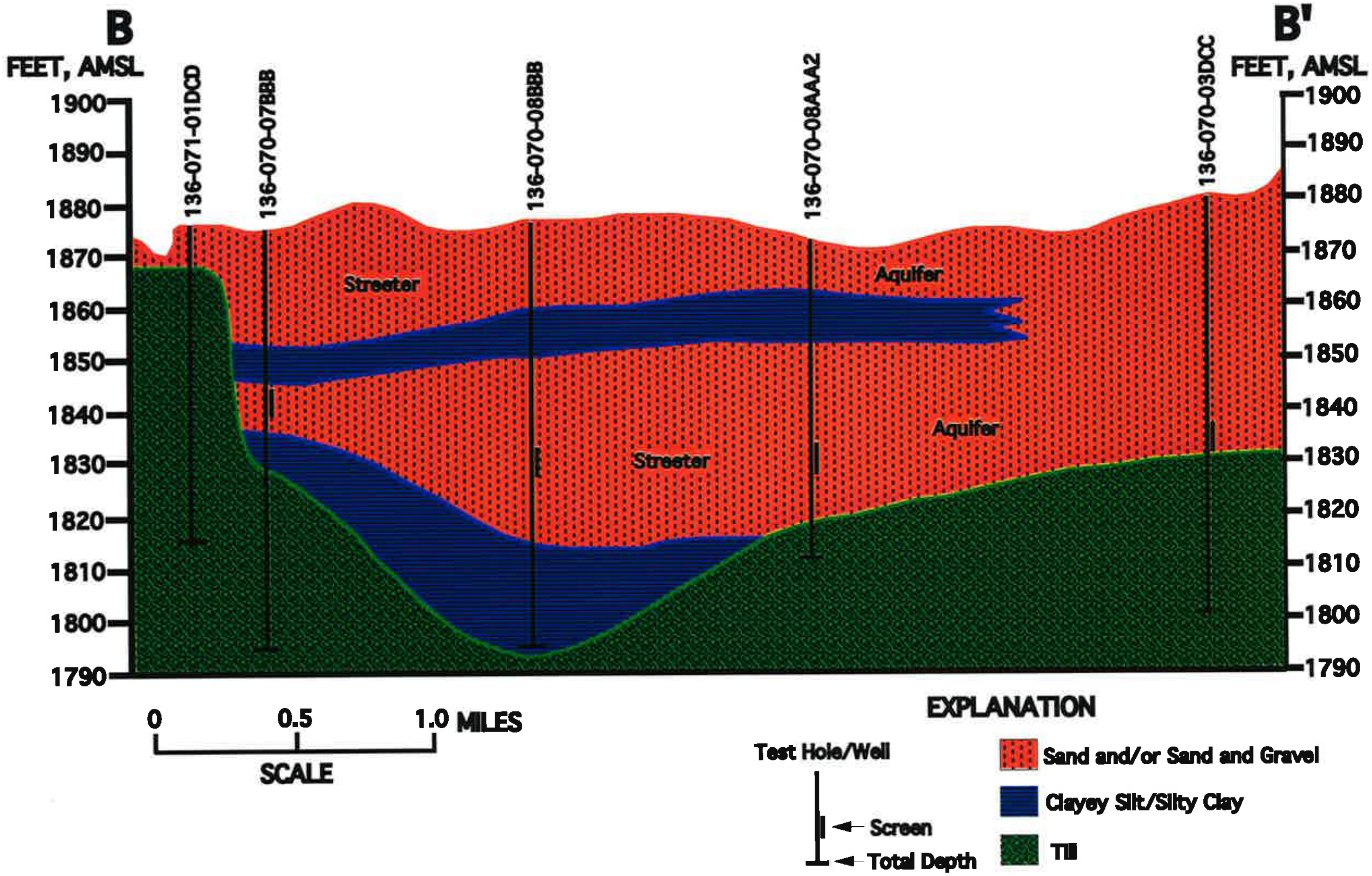


Figure 10. – Geohydrologic section B-B' showing the Streeter aquifer

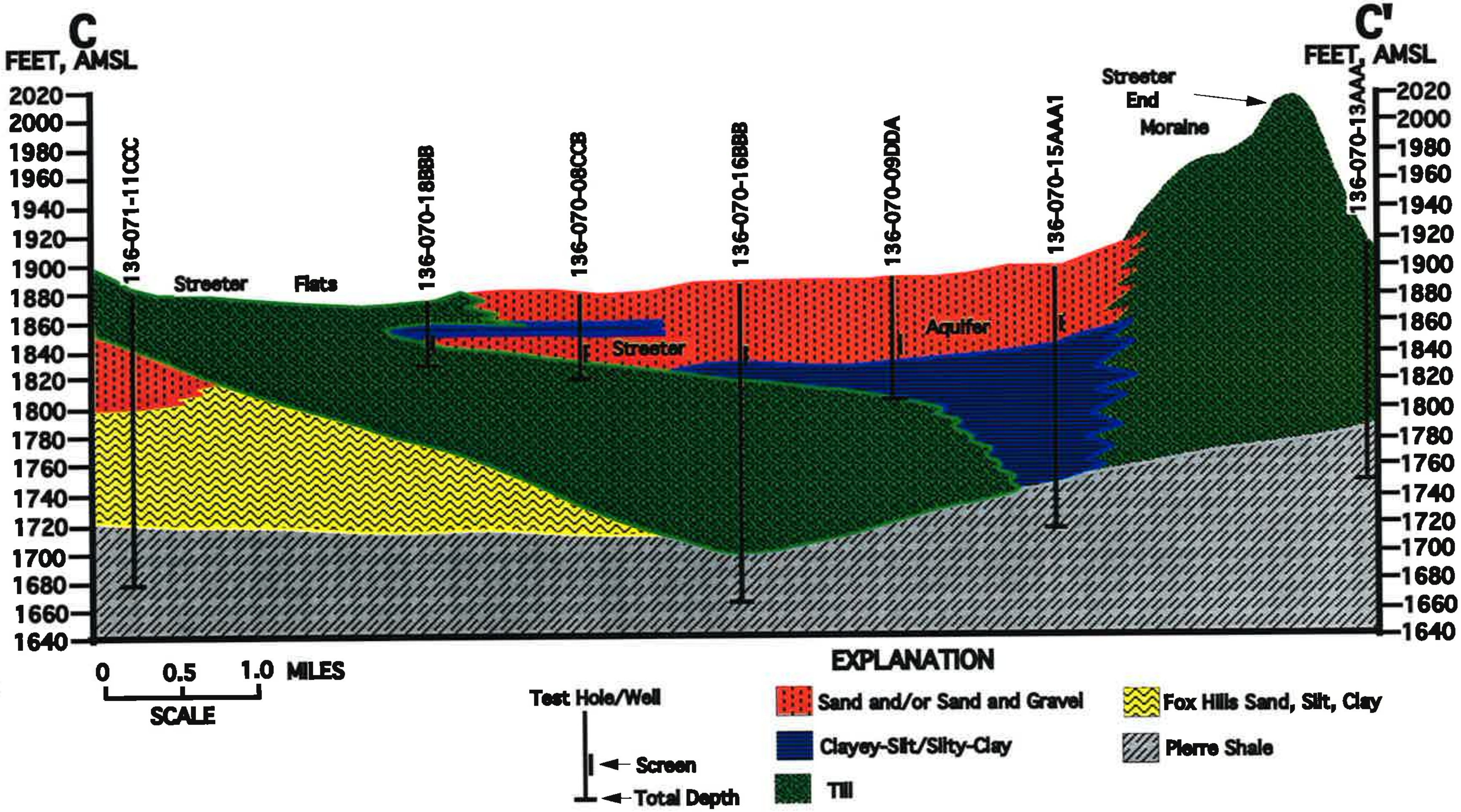


Figure 11. – Geohydrologic section C-C' showing the Streeter aquifer

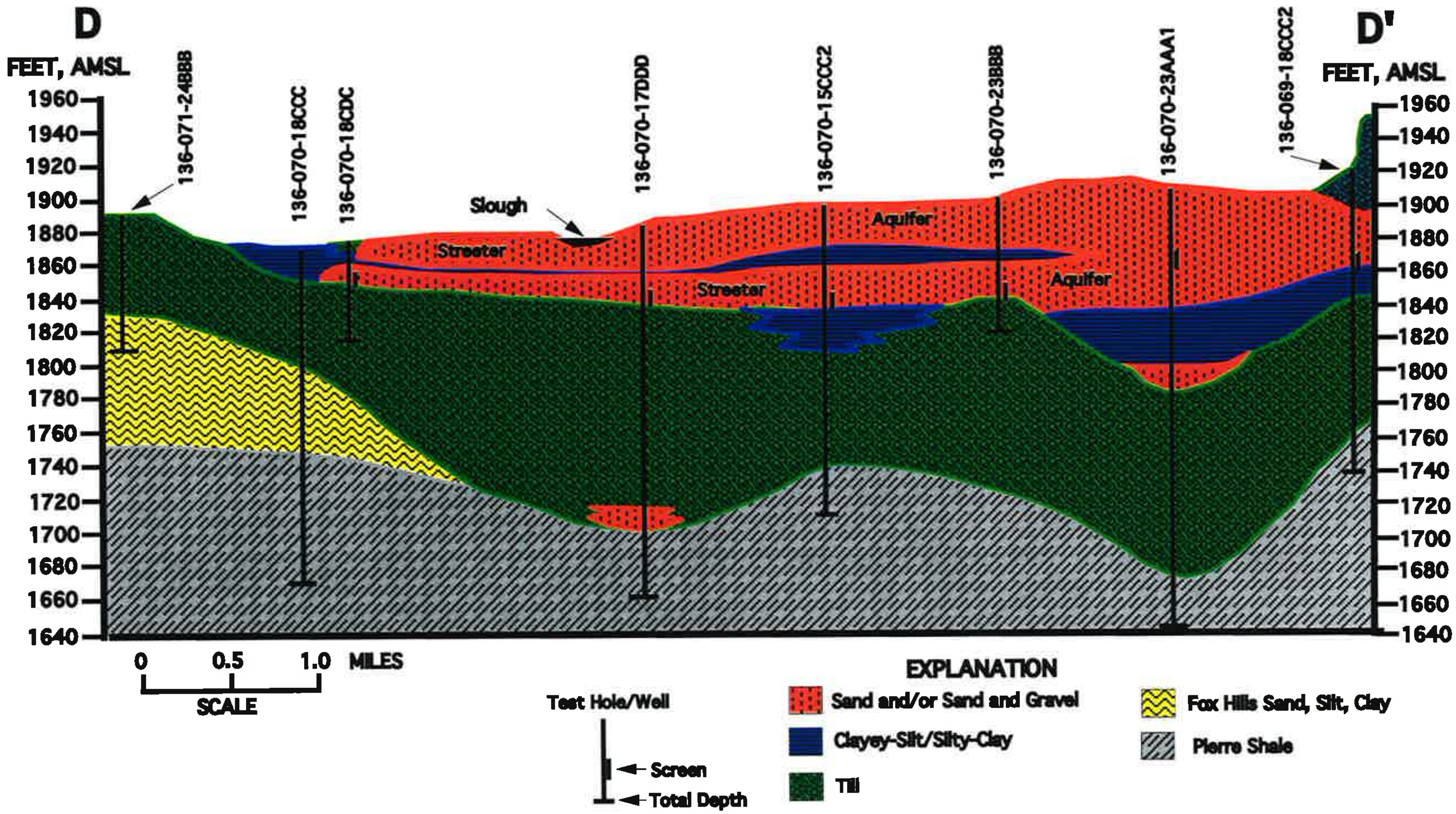


Figure 12. — Geohydrologic section D-D' showing the Streeter aquifer

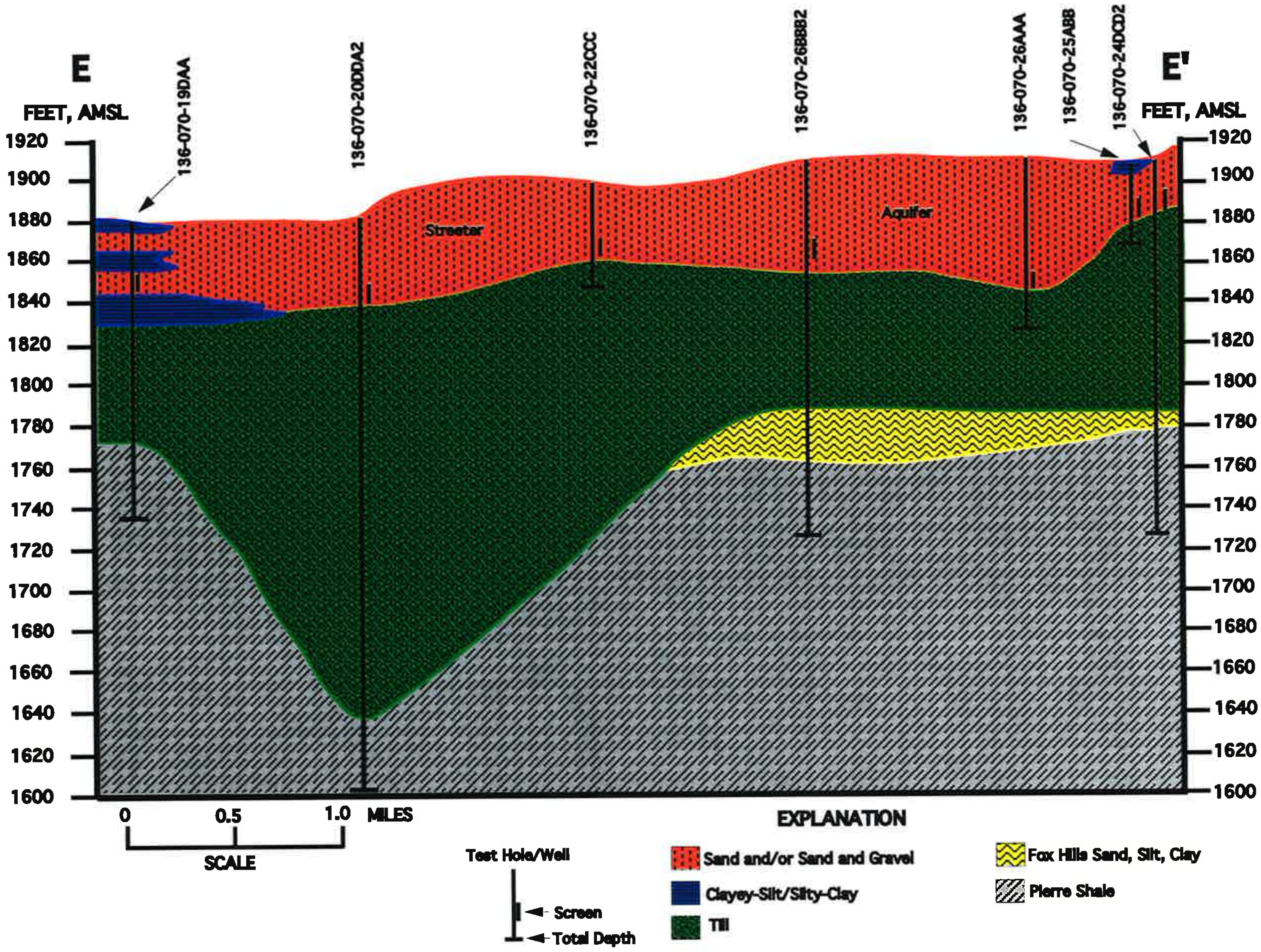


Figure 13. — Geohydrologic section E-E' showing the Streeter aquifer

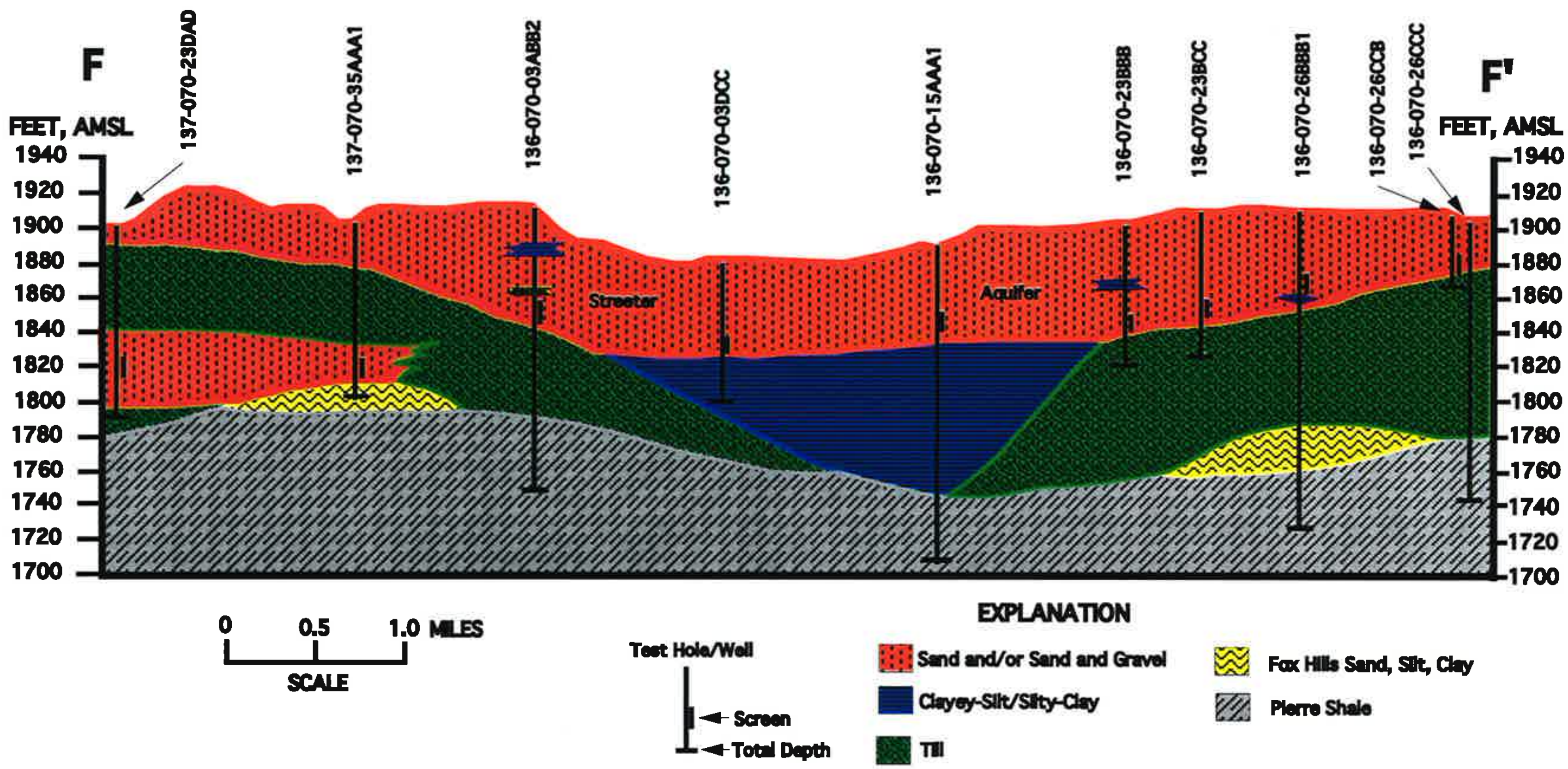


Figure 14. — Geohydrologic section F-F' showing the Streeter aquifer

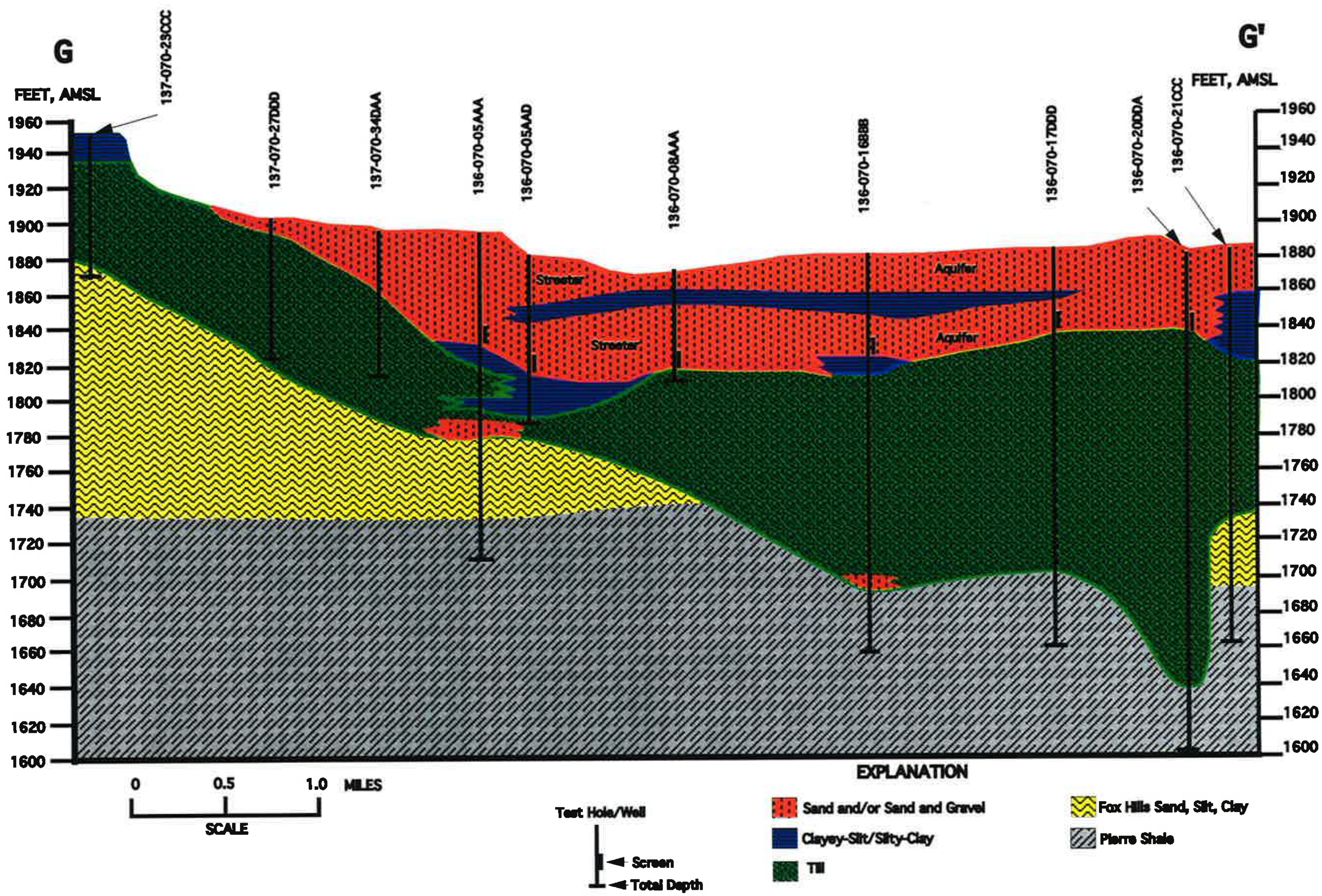


Figure 15. -- Geohydrologic section G-G' showing the Streeter aquifer

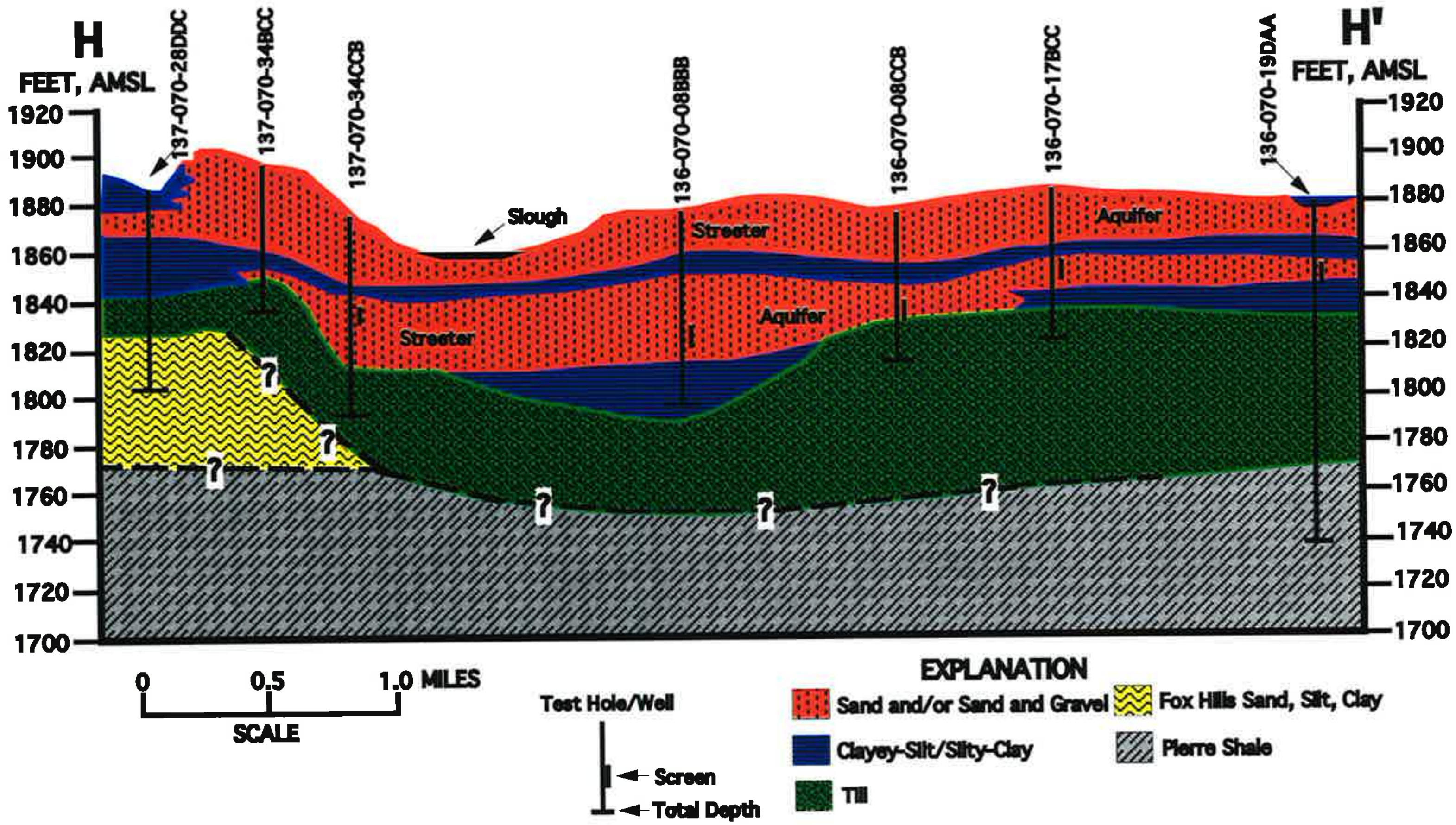


Figure 16. – Geohydrologic section H-H' showing the Streeter aquifer

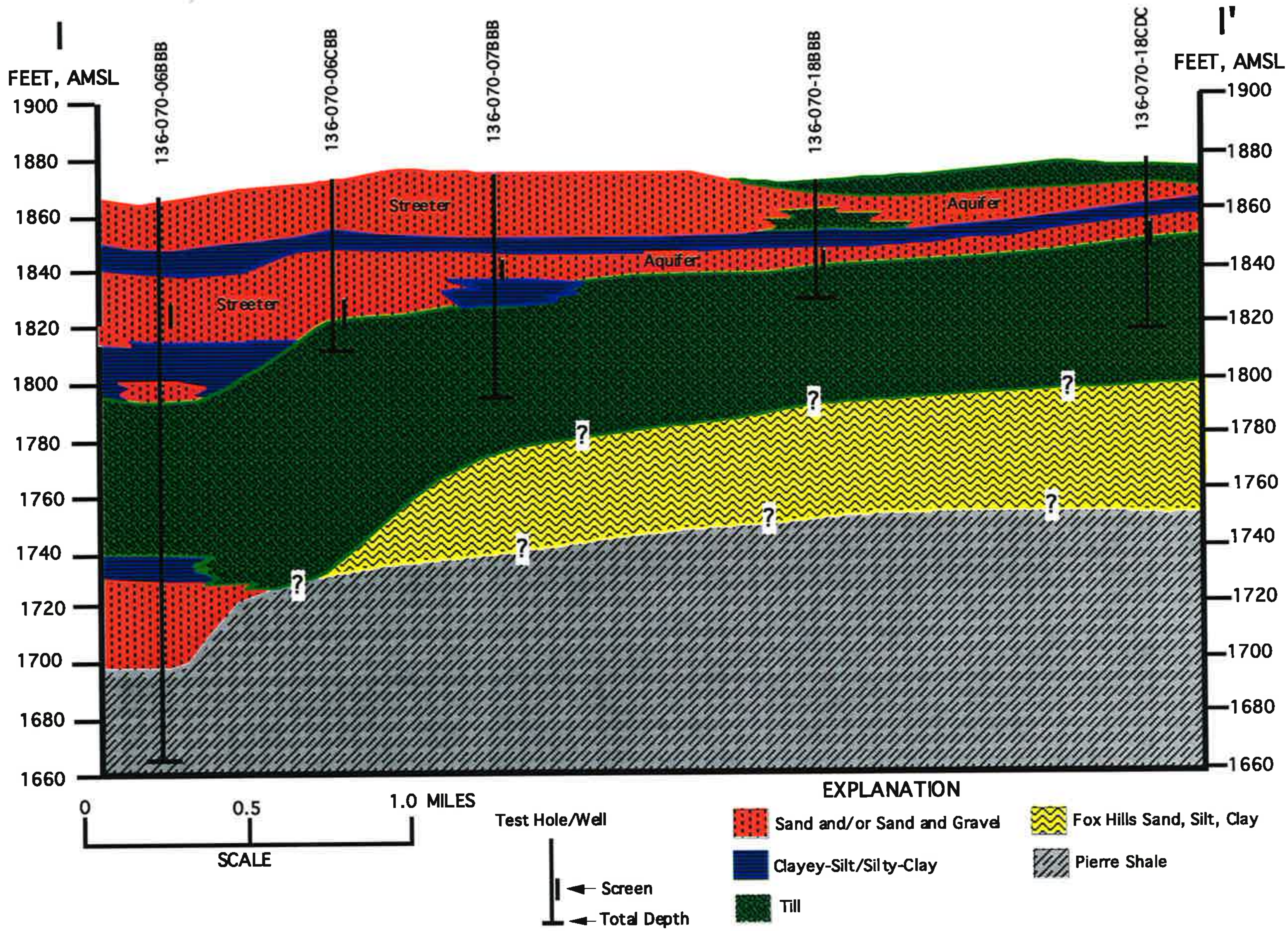


Figure 17. -- Geohydrologic section I-I' showing the Streeter aquifer

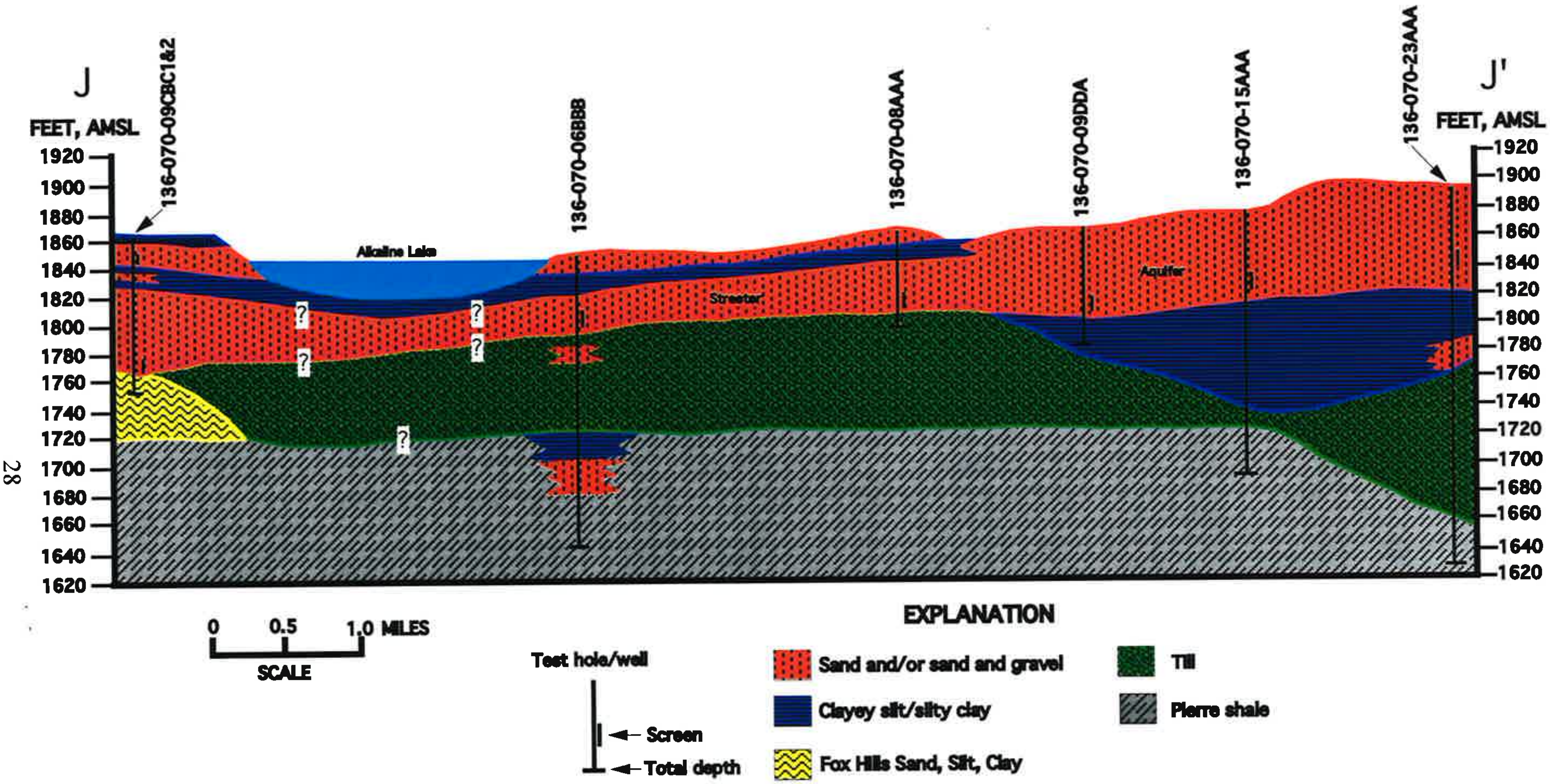


Figure 18. – Geohydrologic section J-J' showing the Streeter aquifer

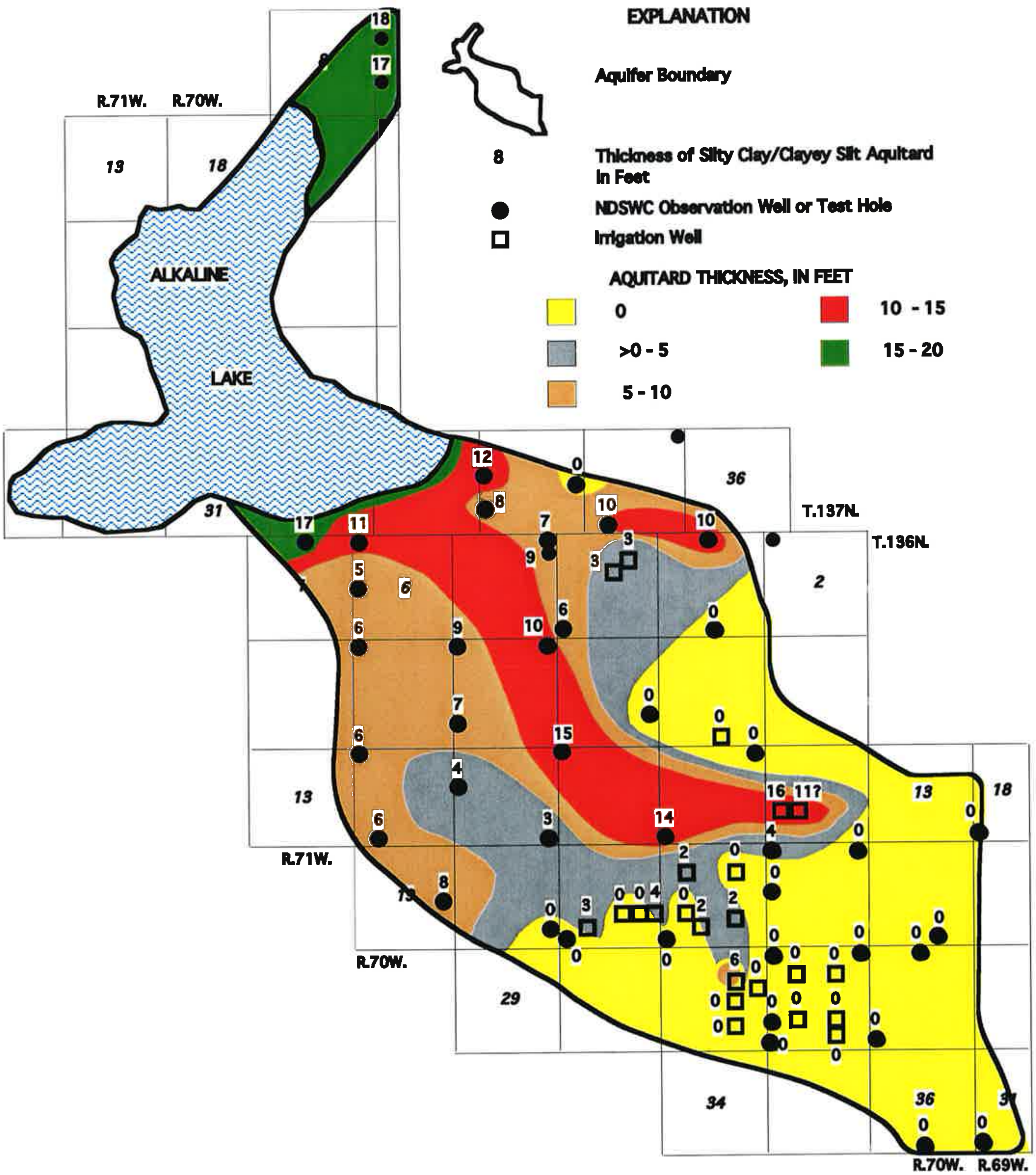


Figure 19. – Thickness of silty-clay/clayey-silt aquitard in the Streeter aquifer

in color, and generally contain considerable quantities of interstitial clay and silt. The Fox Hills Formation consists of terrestrial sediments transported by rivers and streams originating in the Rocky Mountains to the west (Bluemle, 1991).

The Pierre Shale is dark gray to black and noncalcareous. The Pierre Shale is marine shale deposited by a sea that occupied the western interior area of North America during the Cretaceous Period (Bluemle, 1991).

HYDROGEOLOGY

Geometry of the Streeter Aquifer

The Streeter aquifer occupies a southeast to northwest trending outwash plain that is about 31 square miles in area in north central Logan and southeast Kidder Counties (fig. 8). Maximum width is about $4^{1}/_{2}$ miles in the central part of the outwash plain. The Streeter aquifer probably extends to the northwest and north beneath Alkaline Lake and then continues to the northeast and north where it likely joins the Kidder County aquifer system in central Kidder County. The southeast margin of the Streeter aquifer near 136-070-36 is not well defined. In this area, the outwash deposits merge with collapsed outwash comprised of sand and gravel and minor amounts of till and lake sediment. Test-drilling data in this area indicates the sand and gravel intervals are thin and occur at higher elevations resulting in unsaturated conditions.

The Streeter aquifer ranges in thickness from less than one foot along its margins to 74 feet at 137-070-09CBC1 (fig. 20). Based on 73 test holes/wells completed in the aquifer, the average aquifer thickness is 43 feet.

As previously stated, a silty-clay/clayey-silt layer occurs over roughly two-thirds of the Streeter aquifer area, giving rise to an upper surficial sand and gravel layer and a lower sand and gravel layer. In the southeastern part of the aquifer the silty-clay/clayey-silt layer is absent and the

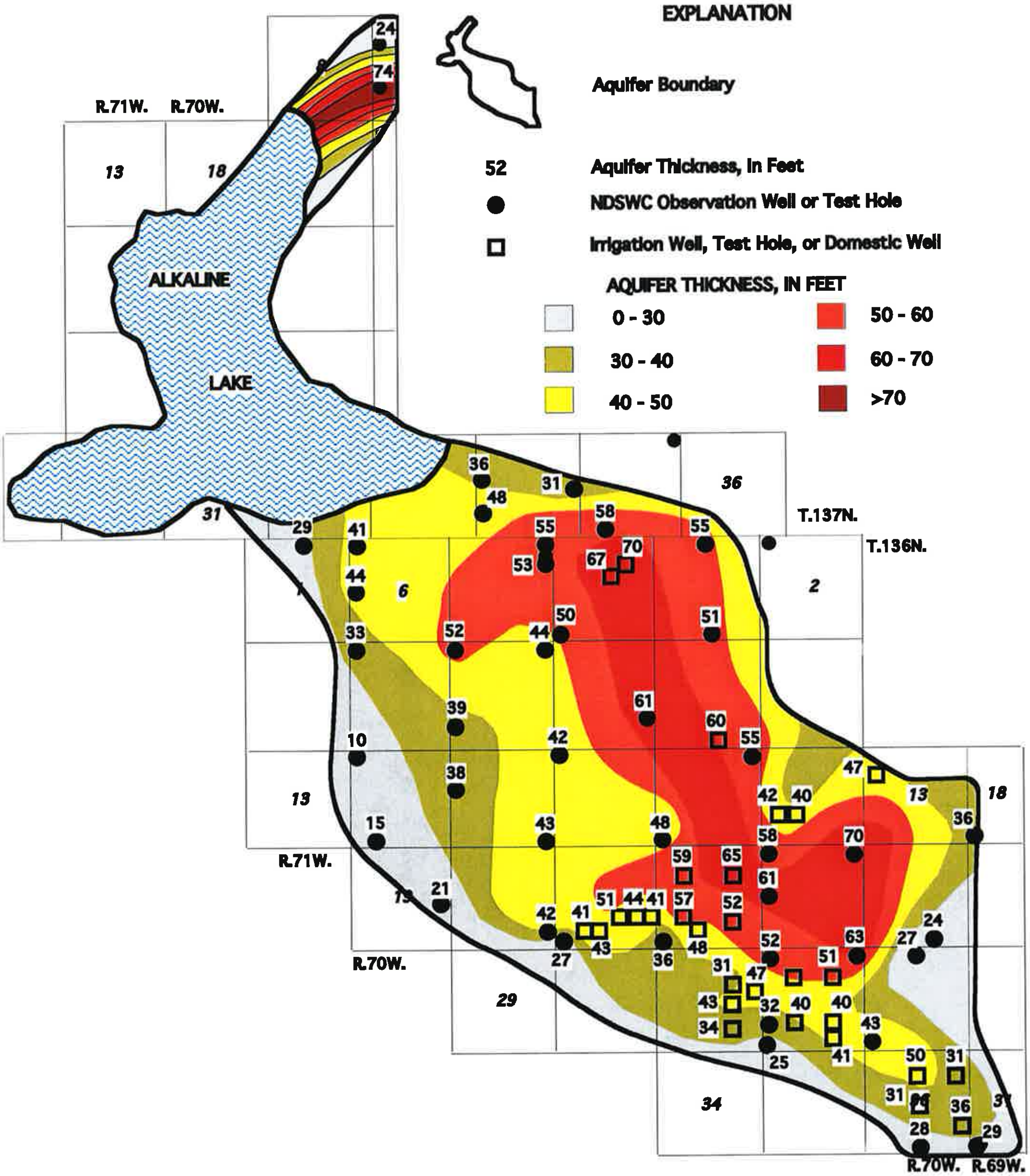


Figure 20. – Thickness of the Streeter aquifer

aquifer consists of a single, continuous sand and gravel layer (fig. 19). In land-surface topographic low areas (136-070-05, 136-070-08) the silty-clay/clayey-silt layer probably is exposed at land surface and the upper sand and gravel layer is absent.

Occurrence and Movement of Ground Water

As previously described, a silty-clay/clayey-silt layer occurs over about two-thirds of the Streeter aquifer. Generally, where the silty-clay/clayey-silt layer occurs, the Streeter aquifer consists of a surficial, unconfined sand and gravel layer and a basal sand and gravel that is confined by the overlying silty-clay/clayey-silt aquitard. Except for five observation wells (136-070-05AAD2, 15AAA3, 20DDA2, 137-070-09BCB2, and 09CBC2) that are completed in the surficial sand and gravel layer, all other observation wells are completed in the deeper confined sand and gravel or at the bottom of the aquifer where the aquitard is absent. The shape and configuration of the potentiometric surface/water table is shown in figure 21. The direction of ground-water flow is from southeast to northwest toward Alkaline Lake.

In the area where the aquifer consists of two layers separated by the silty-clay/clayey-silt aquitard, the shape and configuration of the water table associated with the surficial sand and gravel layer is not defined. In addition, water levels in the southeast part of the aquifer are affected by irrigation developmental decline. Therefore, inferences of aquifer hydraulic properties and geometry from variations in hydraulic gradient are not considered valid.

Where the silty-clay/clayey-silt aquitard occurs, water levels in the deeper, confined sand and gravel probably occur at a higher elevation than water levels in the surficial sand and gravel layer. Observation well 136-070-05AAD1 is screened from 58 to 61 feet below land surface in the deeper sand and gravel aquifer layer and observation well 136-070-05AAD2 is screened from 10 to 14.5 feet below land surface in the surficial aquifer layer. A pebbly sandy, silty, clay (till)

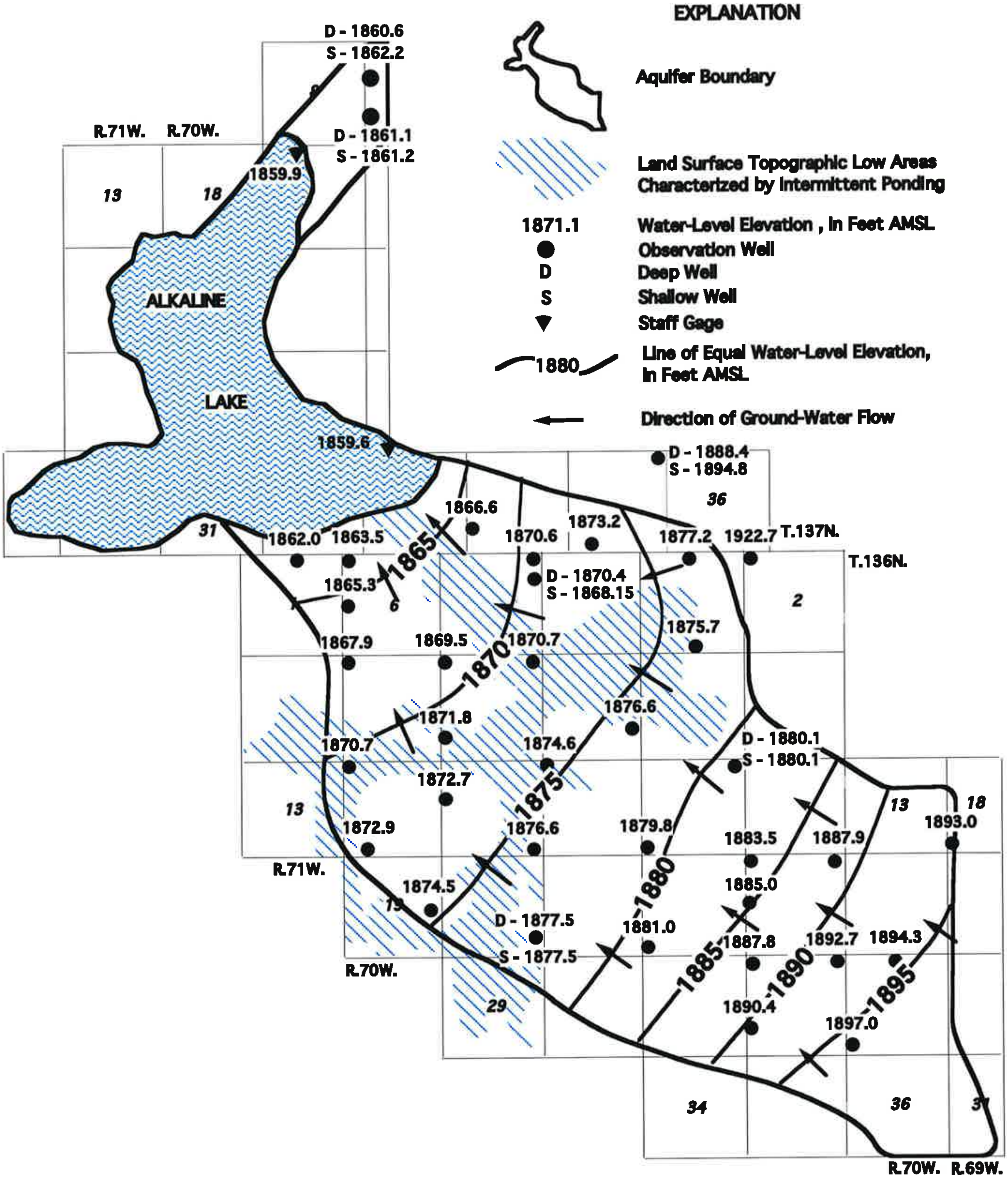


Figure 21. — Configuration of water table/potentiometric surface in the Streeter aquifer May 21, 2003

occurs from 28 to 36 feet below land surface. On May 17, 2000, the water level in observation well 05AAD1 was 1871.09 feet above mean sea level (NGVD 1929) and the water level in observation well 05AAD2 was 1869.37 feet above mean sea level. The hydraulic head at observation well 05AAD1 is 1.72 feet higher than that at observation well 05AAD2. This relationship indicates leakage is upward from the deeper sand and gravel layer, through the silty-clay/clayey-silt aquitard, into the surficial sand and gravel layer. Using the midpoint depths of both well screens, the vertical hydraulic gradient is 0.036 ft/ft.

Observation well 136-070-20DDA1 is screened from 33 to 36 feet below land surface and observation well 136-070-20DDA2 is screened from 3.5 to 8 feet below land surface. The geologist log indicates a continuous interval of sand and gravel from land surface to a depth of 42 feet below land surface. The silty-clay/clayey-silt aquitard is absent at this site. On May 17, 2000, the water level in observation well 20DDA1 was 1878.43 feet above mean sea level and the water level in observation well 20DDA2 was 1878.40 feet above mean sea level. Using the midpoint depths of both well screens, the vertical hydraulic gradient is 0.001 ft/ft, which is an order of magnitude smaller than the vertical hydraulic gradient at 136-070-05AAD.

The nature of the hydraulic interaction between Alkaline Lake and the Streeter aquifer is unclear. It is possible the upper sand and gravel layer above the silty-clay/clayey-silt aquitard is truncated by Alkaline Lake, and Alkaline Lake is situated on the aquitard. A depth survey has not been conducted for Alkaline Lake. Based on a telephone conversation with a local ND Game and Fish Department area manager, the maximum depth of the lake, during the mid to late 1980's wet cycle, is about 20 to 25 feet. It is possible the silty-clay/clayey-silt aquitard may be locally absent providing for a direct hydraulic connection between parts of the lake and the deeper sand and gravel layer of the Streeter aquifer. In either case, Alkaline Lake likely functions as a local discharge area from the Streeter aquifer.

An interval of buried outwash sand and gravel occurs just north of the north boundary of the Streeter aquifer at 137-070-23DAD and 35AAA1 (fig. 14). On May 17, 2000, the water level at 137-070-35AAA2 was 1897.3 feet above mean sea level and the water level at 136-070-03ABB2 was 1879.3 feet above mean sea level. The relatively large difference in hydraulic head between these two wells suggests the deeper sand and gravel layer, which is buried by till, is not directly connected hydraulically to the Streeter aquifer.

Aquifer/Aquitard Hydraulic Properties

Aquifer/Aquitard hydraulic properties were determined by analytical evaluation of data derived from an aquifer test conducted by the SWC, and specific capacity data from irrigation wells provided by drilling contractors on well completion reports. In September 1979, the SWC conducted an aquifer test on a test well installed in the southwest corner of Section 4, Township 136 North, Range 70 West (Johnson, 1979). The production well was continuously pumped at a rate of 598 gallons per minute for 2,880 minutes. Water levels were periodically monitored in the production well and five observation wells located at radial distances of 50, 150, 170, and 500 feet from the production well. The base of the aquifer is about 60 feet below land surface and the "static" water level was about 3 feet below land surface. A silty-clay/clayey-silt interval occurs in the aquifer test area from about 15 to 20 feet below land surface. At the radial distance of 150 feet, a well was screened within the upper silty clay from 18 to 21 feet below land surface (136-070-04CCC4) and a second well was screened near the base of the aquifer from 48 to 51 feet below land surface (136-070-04CCC3). The water level in the deeper observation well was 1.5 feet higher than the water level in the shallow observation well indicating silty-clay aquitard continuity in the aquifer test area.

A composite time divided by radial-distance-squared (t/r^2) versus drawdown plot was prepared using the aquifer test data (fig. 22). If all Theis assumptions are valid, the individual t/r^2 versus drawdown curves should form a single curve, the shape of which corresponds to a segment of a Theis type curve. The early time data up to about 10 to 15 minutes do not plot on a single curve. The pattern of upward curve displacement as radial distance increases may be caused by a significant change in transmissivity between the production well and observation wells, or possibly a change in aquitard thickness across the test site. After about 10 to 15 minutes of pumping, the individual data plots slowly cross and then the data for different wells diverge as slopes begin to flatten. The data plots from wells at larger radial distances from the production well show the greatest downward displacement. This later-time response is caused by leakage. Leakage was verified during the test by the dampened drawdown response in observation well 136-070-04CCC4, which was completed in the silty-clay/clayey-silt aquitard.

Based on the local hydrogeologic setting, the method of Hantush-Jacob (1955, in Lohman, 1972) for analyzing a leaky aquifer was used to analyze the aquifer test data and estimate aquifer/aquitard hydraulic properties. This analytical procedure assumes the aquitard is thin and, therefore, aquitard storage is negligible. The aquitard behaves as a transmitting layer though which vertical leakage occurs from one aquifer layer to another. Using the Hantush-Jacob type curves, an aquifer transmissivity of about 11,000 ft^2/day and a storativity of about 1×10^{-4} were calculated. Based on an aquifer thickness (sand and gravel layer below aquitard) of about 32 feet, hydraulic conductivity is calculated at about 340 ft/day. Based on an average aquitard thickness of two feet, vertical hydraulic conductivity of the aquitard was calculated at 0.22 ft/day at the well 500 feet from the production well, 0.005 ft/day at the well 170 feet from the production well, and 0.0025 ft/day at the well 150 feet from the production well. The average vertical hydraulic conductivity of the aquitard is 0.01 ft/day. Due to the possibility of 1) local variations in aquifer

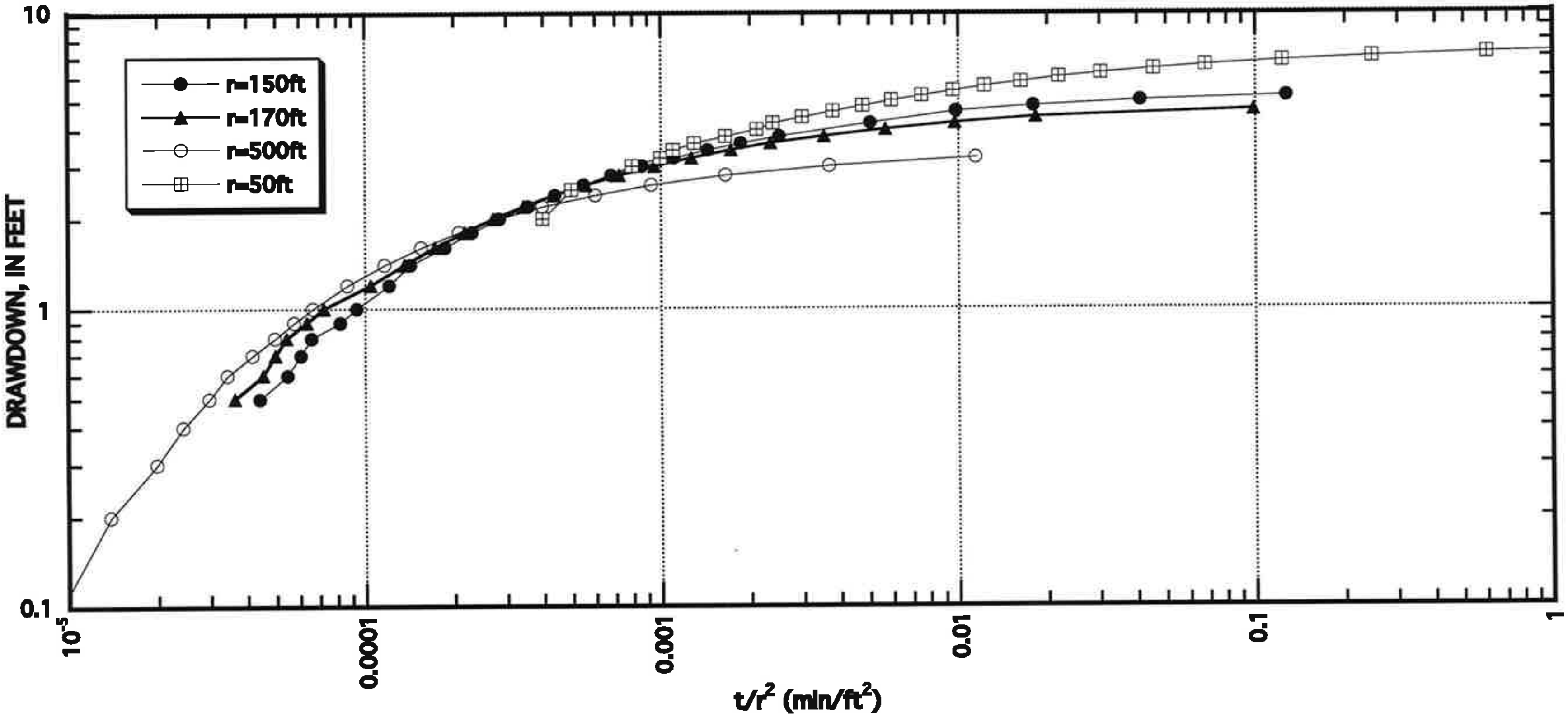


Figure 22. -- Composite plot of time divided by radius squared versus drawdown in four observation wells at aquifer test site located in the SW1/4 of Section 4, T136N-R070W

transmissivity, 2) the head in the aquifer layer overlying the aquitard not remaining constant during the aquifer test, and 3) uncertain aquitard continuity and thickness, the accuracy of these aquifer/aquitard coefficients is questionable.

The test indicates that pumping a well completed in the aquitard area will achieve quasi-steady state with the overlying water-table aquifer within a few days. For wells at large distances, the drawdown response will be that of pumping a water-table aquifer. A pumping well completed below the aquitard will capture its water from local discharge in the overlying water-table aquifer.

Aquifer transmissivity and hydraulic conductivity were also calculated using specific capacity data obtained from short-term pumping tests provided by drillers on well completion reports for newly completed irrigation wells (Table 1).

Table 1. – Estimates of aquifer transmissivity and hydraulic conductivity using specific capacity data

Well Location	Specific Capacity (GPM/Ft.)	Aquifer Thickness[1] (Ft.)	Transmissivity ($Ft.^2$/Day)	Hydraulic Conductivity (Ft./Day)
136-070-21CCA	53.3	29.5	5,900	200
136-070-21DAC	17.2	26.3	2,500	95
136-070-21DAD1	30.0	25.0	5,250	210
136-070-21DAD2	21.7	27.3	3,275	120
136-070-23BAC	100.0	43.0	16,340	380
136-070-22DBD	32.0	37.0	5,550	150
136-070-22CDB	36.1	38.0	5,510	145
136-070-22CBD	35.9	36.2	5,610	155
136-070-27AAD	41.4	31.0	6,350	205
136-070-27DAB	64.9	29.0	8,700	300
136-070-26AAC	66.7	38.0	12,540	330
136-070-22BAC	30.9	43.5	5,440	125
136-070-04ACA2	25.0	35.0	5,950	170
136-070-04ACA3	15.3	33.0	3,795	115
136-070-22ABD	66.8	44.7	11,175	250
136-070-26DCA	58.3	24.8	10,660	430
136-070-26DBD	73.2	28.1	13,490	480

[1] Does not include aquifer interval above aquitard

The functional relationship between specific capacity and transmissivity is shown by equation 1 (Lohman, 1972, p.52).

$$\frac{Q}{s} = \frac{4\pi T}{2.3 \log_{10}\left(\frac{2.25Tt}{r_w^2 S}\right)}$$

where,

T = transmissivity, in ft^2/day

t = time after pumping began, in days

r_w = well radius, in feet

S = storativity, dimensionless

Q = well discharge rate, in ft^3/day

s = drawdown, in feet

Calculated transmissivities ranged from 2,140 ft^2/day to 16,340 ft^2/day and hydraulic conductivities ranged from 45 ft/day to 480 ft/day.

It is important to note that the above calculated transmissivities and hydraulic conductivities probably are somewhat lower than actual. The drawdown component due to well loss was not accounted for in equation 1, which was used to estimate these aquifer parameters.

The areal distribution of estimated hydraulic conductivity in the aquifer domain is shown in figure 23. Except for the aquifer test well and the two irrigation wells located at 136-070-04ACA2 and ACA3, the hydraulic conductivity data are concentrated in the southeast part of the Streeter aquifer. Hydraulic conductivity generally decreases from the source area of the aquifer at 136-069-18 to the west. This distribution is consistent with the previously described depositional model of the aquifer where the outwash was deposited by a meltwater stream that breached the Streeter end

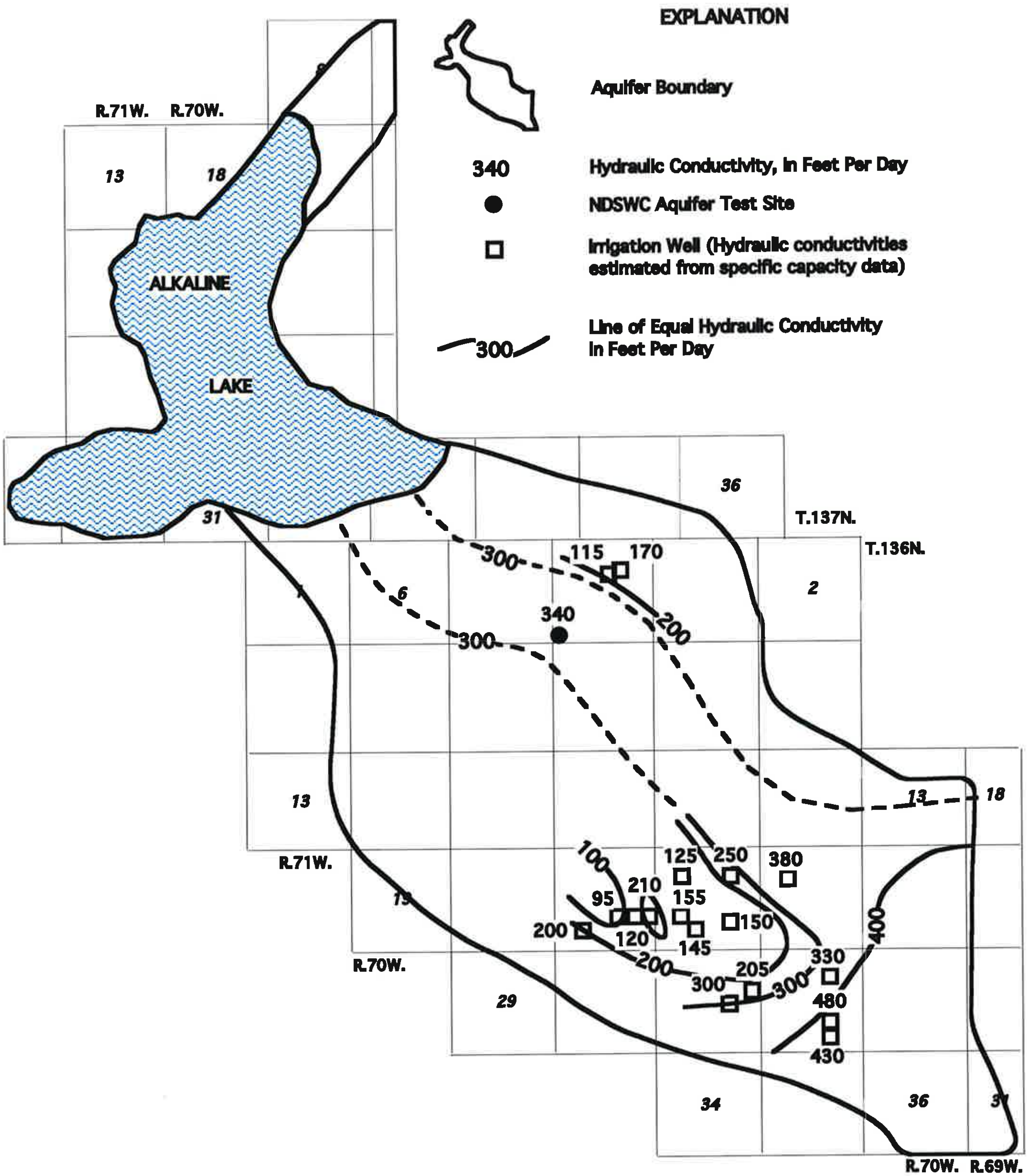


Figure 23. — Distribution of hydraulic conductivity in the Streeter aquifer based on aquifer test and specific capacity data.

moraine in 136-069-18. The larger hydraulic conductivity (340 ft/day) at the aquifer test site (136-070-04CCC) in the northwest part of the aquifer is close to those larger values estimated in the extreme southeast part of the aquifer (fig. 23). The aquifer test site at 136-070-04CCC lies along the principal axis of the outwash channel that extends to the southeast in Sections 23 and 26 (fig. 20). The principal axis of the outwash channel probably is characterized by the largest hydraulic conductivity and transmissivity.

Where the Streeter aquifer is unconfined, storativity is estimated at 0.22. This value is about midway between the typical range of specific yield (0.10 to 0.30%) reported in the literature.

Recharge and Discharge

Recharge to the Streeter aquifer occurs primarily by relatively direct infiltration of precipitation and snowmelt. The land surface of the outwash plain is characterized by numerous subtle depressions. To a great extent, recharge to the Streeter aquifer is depression focused (Lissey, 1960). During the winter, a frost zone develops at or near the water table. Snow accumulates in depressions and on adjacent topographic-high areas. In the spring, snow melts before the frost zone dissipates. Snowmelt originating in the upland areas is redistributed to the depressions as surface runoff because of the inability to infiltrate through the frost zone. Ponded water in depressions infiltrates downward to the saturated zone after the frost zone dissipates.

Recharge to the Streeter aquifer occurs primarily during the spring. Except for the years 1980 and 1981 when water levels were not measured frequently, the hydrograph in figure 24 is characterized by annual water-level rises that occur each spring.

Although soil-moisture-holding capacities are relatively small and permeabilities are relatively large, recharge, for the most part, is generally less during the summer months because potential evaporation exceeds precipitation. At times, summer precipitation events are of sufficient

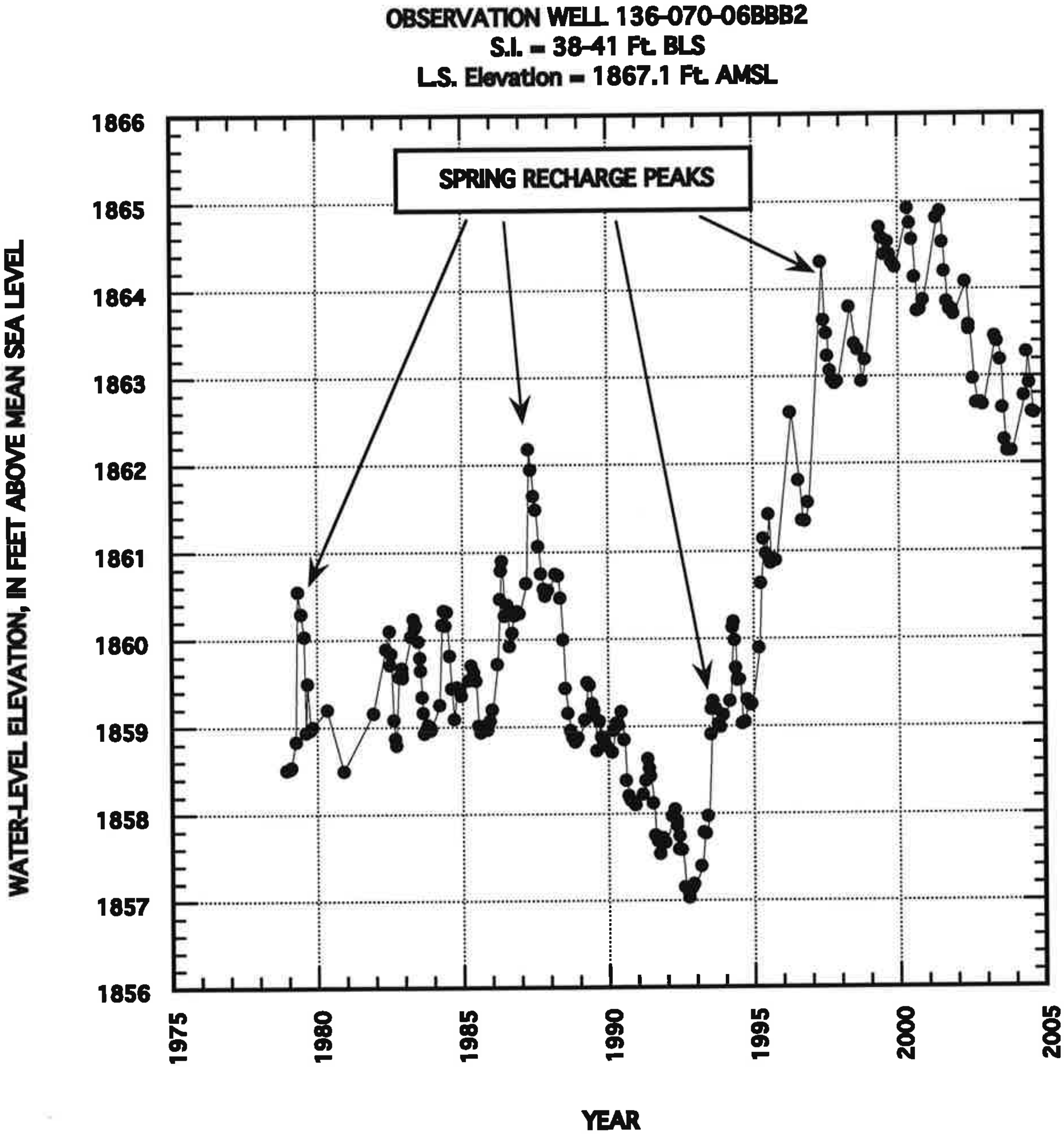


Figure 24. – Hydrograph of observation well 136-070-06BBB2 showing conspicuous spring recharge peaks

intensity and duration to overcome soil-moisture deficits and generate recharge, particularly in local depressional areas. During the fall, potential evapotranspiration decreases significantly and precipitation events can be large enough to generate recharge. Even when recharge does not occur during the fall, soil-moisture deficits commonly are reduced significantly, affecting an increase in the magnitude of the following spring recharge event(s).

Additional recharge to the Streeter aquifer occurs as underflow from the Streeter end moraine to the east and underflow from the dead-ice moraine to the west. An important area of underflow from the dead-ice moraine may be associated with the mile-wide land-surface topographic trough located at 136-070-29 and 32.

Surface runoff from the Streeter end moraine and the dead-ice moraine also is a source of aquifer recharge, particularly during the spring. The west-central flank of the Streeter aquifer near "Streeter Flats" (136-071-Sections 13, 14, and 24) is characterized by a number of intermittent streams that drain significant areas of the dead-ice moraine upland to the west. These intermittent streams converge along a drainageway that extends northward along the western flank of the Streeter aquifer and eventually drain into Alkaline Lake. These intermittent drainageways also represent areas of significant ground-water discharge that also drains into Alkaline Lake.

The southeast part of the Streeter aquifer is characterized by water-table depths generally greater than 10 feet below land surface. The central and northwestern parts of the aquifer are characterized by water-table depths less than 10 feet below land surface. Much of Sections 3, 4, 5, 8, 9, 10, 17, and 20 occupy land surface topographic low areas where water-table depths are less than 4 feet below land surface. During the wet climatic period from 1993 through 2000, these areas were characterized by surface ponding. These land-surface topographic low areas represent net ground-water discharge areas where discharge occurs from evapotranspiration.

The Streeter aquifer likely extends to the northwest beneath Alkaline Lake. This is supported by the test drilling completed in 137-070-09. Although the nature of the hydraulic interaction between the aquifer and lake is not well defined, there is little doubt that Alkaline Lake is a discharge area for the northwest part of the Streeter aquifer. Discharge from Alkaline Lake is from evapotranspiration. A schematic diagram showing directions of ground-water flow along a longitudinal profile of the Streeter aquifer system and location of recharge and discharge areas is shown in figure 25.

Water Chemistry

Mineralogy of the Streeter Aquifer

The rock types and associated mineralogy of the aquifer matrix (unsaturated and saturated zones) are the primary sources of dissolved ions in ground water in the Streeter aquifer. Due to the fact the Streeter aquifer was formed by continental glaciation where mass ice movement occurred over a large range of rock types, the mineralogy of the aquifer matrix is highly variable. The aquifer matrix is comprised of a mixture of shield silicates, carbonates, quartz, detrital shale (probably derived from the Pierre Formation) and claystone, siltstone, and sandstone fragments of the Fox Hills Formation. The carbonate minerals (limestone and dolomite) are the most soluble in relation to other primary minerals that comprise the aquifer matrix.

Ground-Water Chemistry

The relative distribution of major ions in ground water from the Streeter aquifer is shown in figure 26. The ground water is a calcium-magnesium to mixed cation-bicarbonate type. The hydrochemical facies is typical of shallow, unconfined aquifers of glacial origin in North Dakota. The chemical character of ground water at the water table is established in large part in the

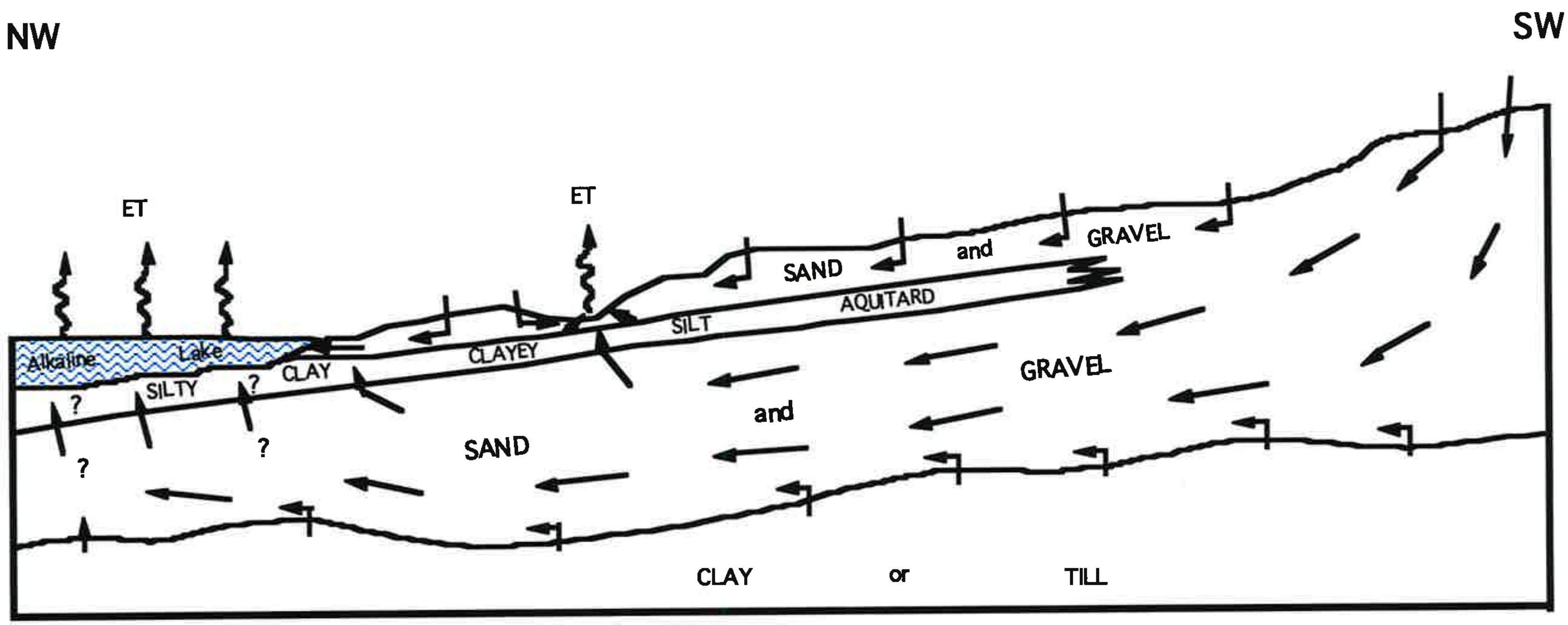


Figure 25. -- Schematic diagram showing directions of ground-water flow along a longitudinal profile of the Streeter aquifer system, and location of recharge and discharge areas

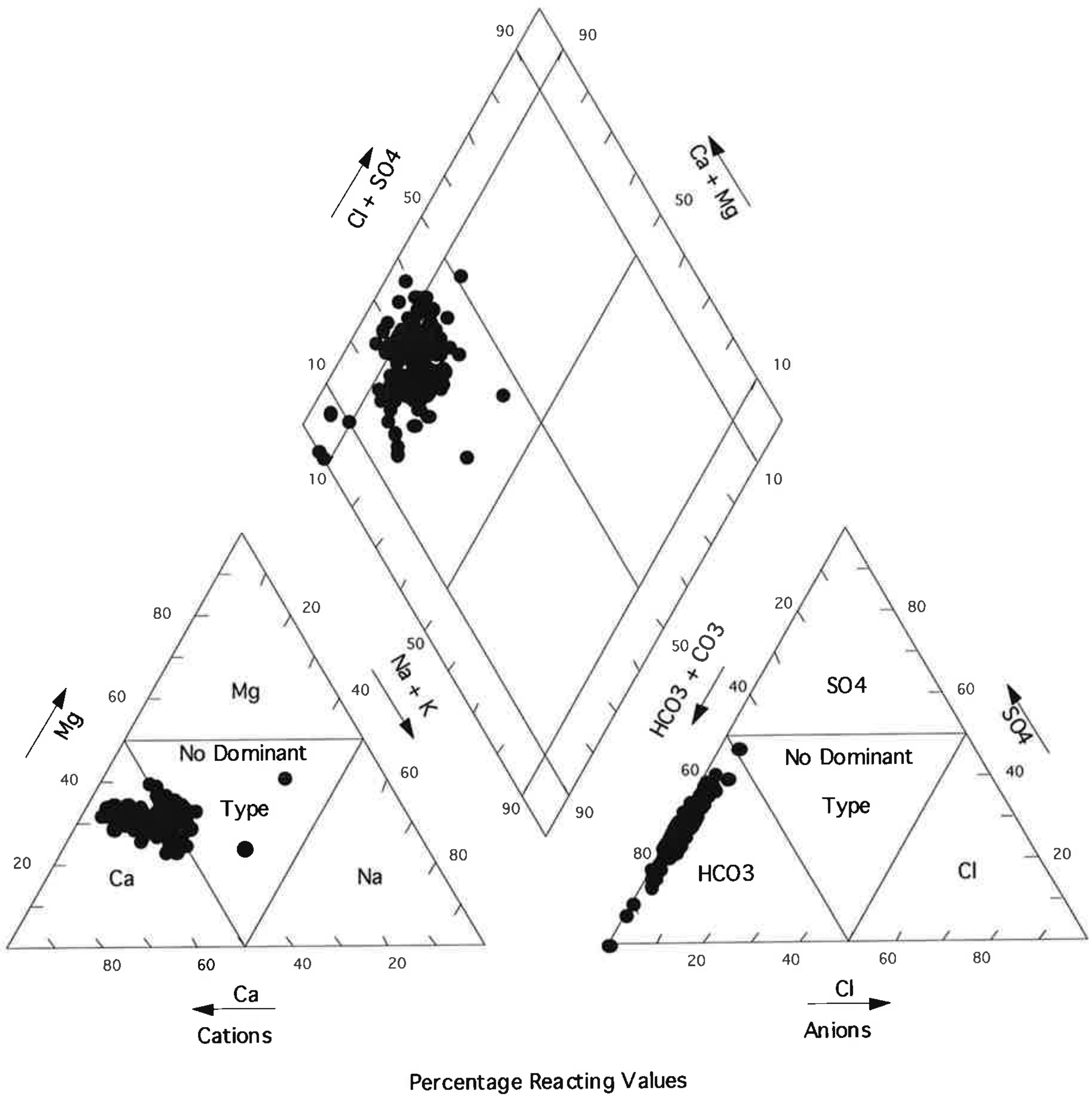


Figure 26. -- Relative distribution of major ions in ground water from the Streeter aquifer

overlying unsaturated zone. Within the unsaturated zone, organic carbon is oxidized to produce CO_2 and when dissolved in infiltrating water, forms carbonic acid ($H_2CO_3^-$). Carbonic acid dissolves carbonate minerals ($CaCO_3$ – limestone; $CaMgCO_3$ – dolomite), which are ubiquitous in the glacial drift, thereby introducing Ca^{2+}, Mg^{2+}, and HCO_3^- ions into the water infiltrating downward to the water table. Evidence to support carbonate dissolution as the primary source of Ca^{2+}, Mg^{2+}, and HCO_3^- is shown by the relationship between Ca^{2+}, Mg^{2+}, and HCO_3^- (fig. 27). If carbonate dissolution is the sole source of dissolved Ca^{2+}, Mg^{2+}, and HCO_3^-, and there are no chemical "sinks" for these ions, the points would plot along the 45-degree carbonate-dissolution line relating Ca^{2+}, Mg^{2+}, and HCO_3^- in equivalents per million. Although the points fall above this line, the slope of the linear regression equation of all points is 0.93, which is close to 1.0 suggesting carbonate-dissolution is a major source of dissolved Ca^{2+}, Mg^{2+}, and HCO_3^-.

Observation well 136-070-15AAA3 is screened from 8.5 to 13.0 feet below land surface. The water table generally fluctuates within the screened interval of this well. The observation well is located on a land-surface upland area where ground-water discharge from the water table due to evapotranspiration is negligible. Therefore, the water chemistry should reflect that of unadulterated recharge delivered to the water table through the unsaturated zone. This water should be a Ca-Mg-HCO_3 type characterized by a relatively small dissolved solids concentration and it should plot on or near the carbonate dissolution line in figure 27. The water is a Ca-Mg-HCO_3 type with a small dissolved solids concentration (290mg/L), and it plots very close to the carbonate dissolution line (fig. 27).

The fact that almost all of the data points in figure 27 plot above the carbonate dissolution line indicates additional sources of Ca^{2+} and/or Mg^{2+}. Gypsum dissolution probably is a significant source of Ca^{2+}. If gypsum dissolution is the sole source of dissolved Ca^{2+} and SO_4^{2-} and there are no chemical sinks for these ions, the points on the gypsum dissolution diagram (fig. 28) would plot

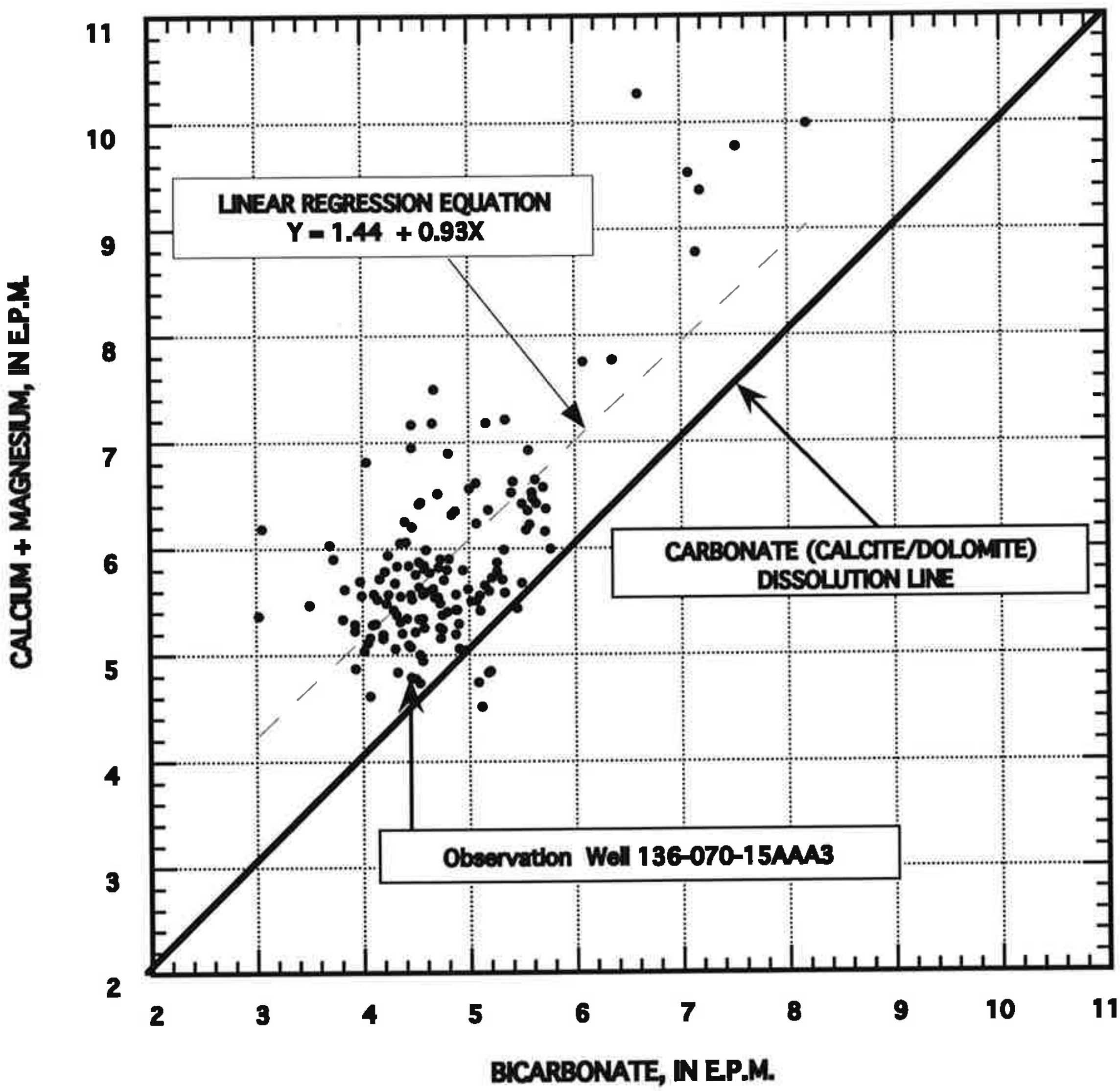


Figure 27. — Relationship between concentrations of calcium + magnesium and bicarbonate in ground water from the Streeter aquifer

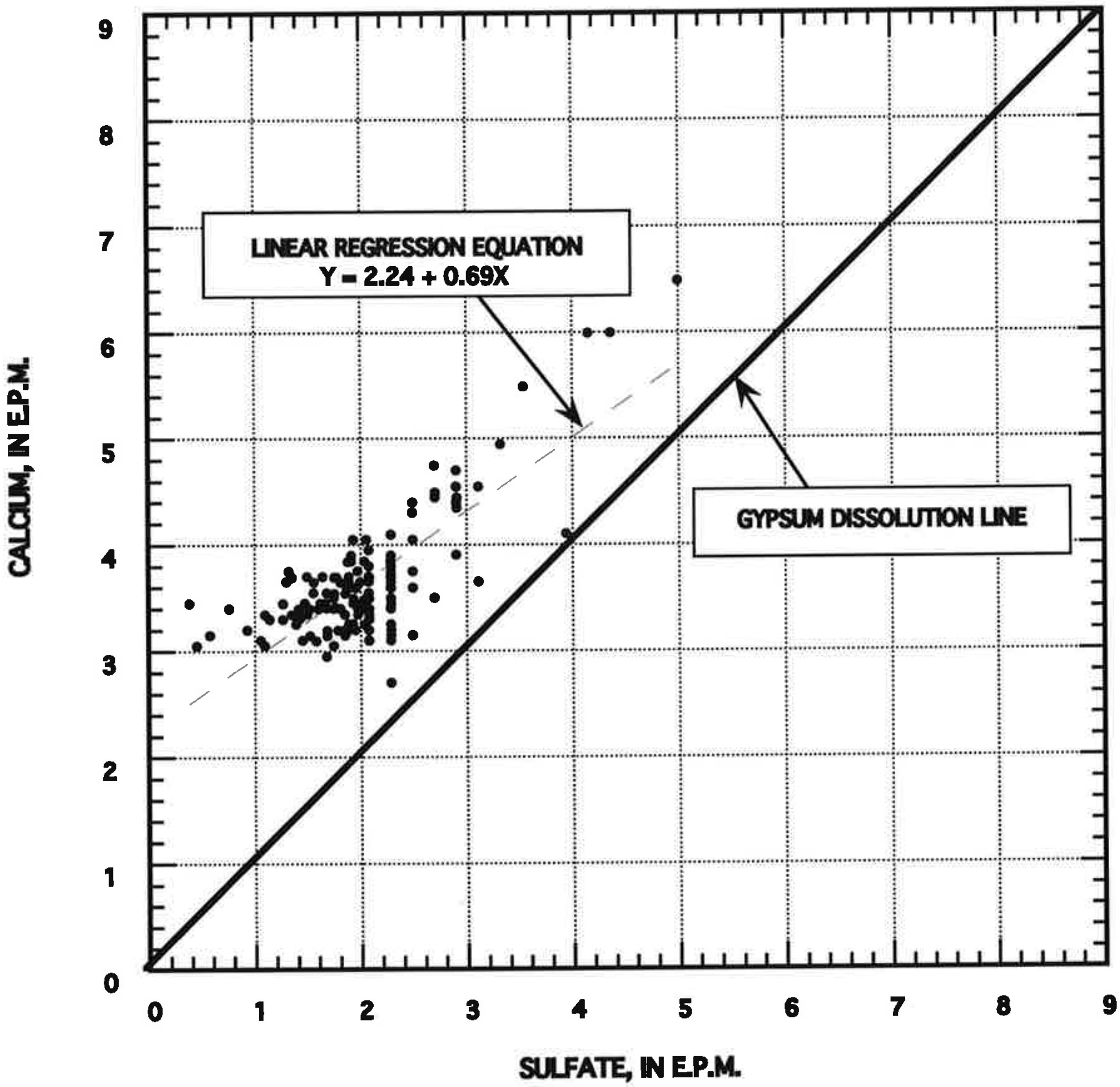


Figure 28. — Relationship between concentrations of calcium and sulfate in ground water from the Streeter aquifer

along the 45-degree gypsum-dissolution line. The points all plot above the gypsum dissolution line and the slope of the linear regression equation of all points is 0.69, which is significantly less than 1.0. The excess Ca^{2+} likely is due, in large part, to carbonate dissolution. This coupled with a Ca^{2+} sink resulting from cation exchange for Na^+ on clays may account for the slope of the linear regression equation being significantly different from 1.0.

The absolute concentration of chloride in ground water from the Streeter aquifer is small. If dissolution of halite is the sole source of dissolved Na^+ and Cl^+, and there are no chemical sinks for these ions, the points on the halite dissolution diagram (fig. 29) would plot along the 45-degree halite dissolution line. The points all plot above the halite dissolution line indicating excess Na^+. Excess Na^+ could result from cation exchange on clays, mixing of ground water from the Fox Hills formation, and to a lesser extent dissolution of sodium sulfate minerals.

The areal distribution of dissolved solids in the Streeter aquifer is shown in figure 30. Many wells have more than one chemical analysis. For these wells, the smallest dissolved-solids concentration is shown and used as a reference value to construct isopleths.

Dissolved-solids concentrations from wells shown in figure 30 are less than about 500 milligrams per liter. The southeast part of the Streeter aquifer is characterized by consistently larger dissolved-solids concentrations as compared to other areas of the aquifer. Except for observation well 136-070-25ABB, which is screened near the water table, the observation wells and irrigation wells in the southeast part of the aquifer are screened at the bottom of the aquifer. A greater percentage of recharge to this area of the aquifer may be from underflow from the surrounding drift, which consists primarily of till.

As previously mentioned, observation well 136-070-25ABB is located in the southeast part of the aquifer. However, the dissolved-solids concentration (281 mg/L) is uncharacteristically small in relation to other wells in this area of the aquifer. Observation well 136-070-25ABB is

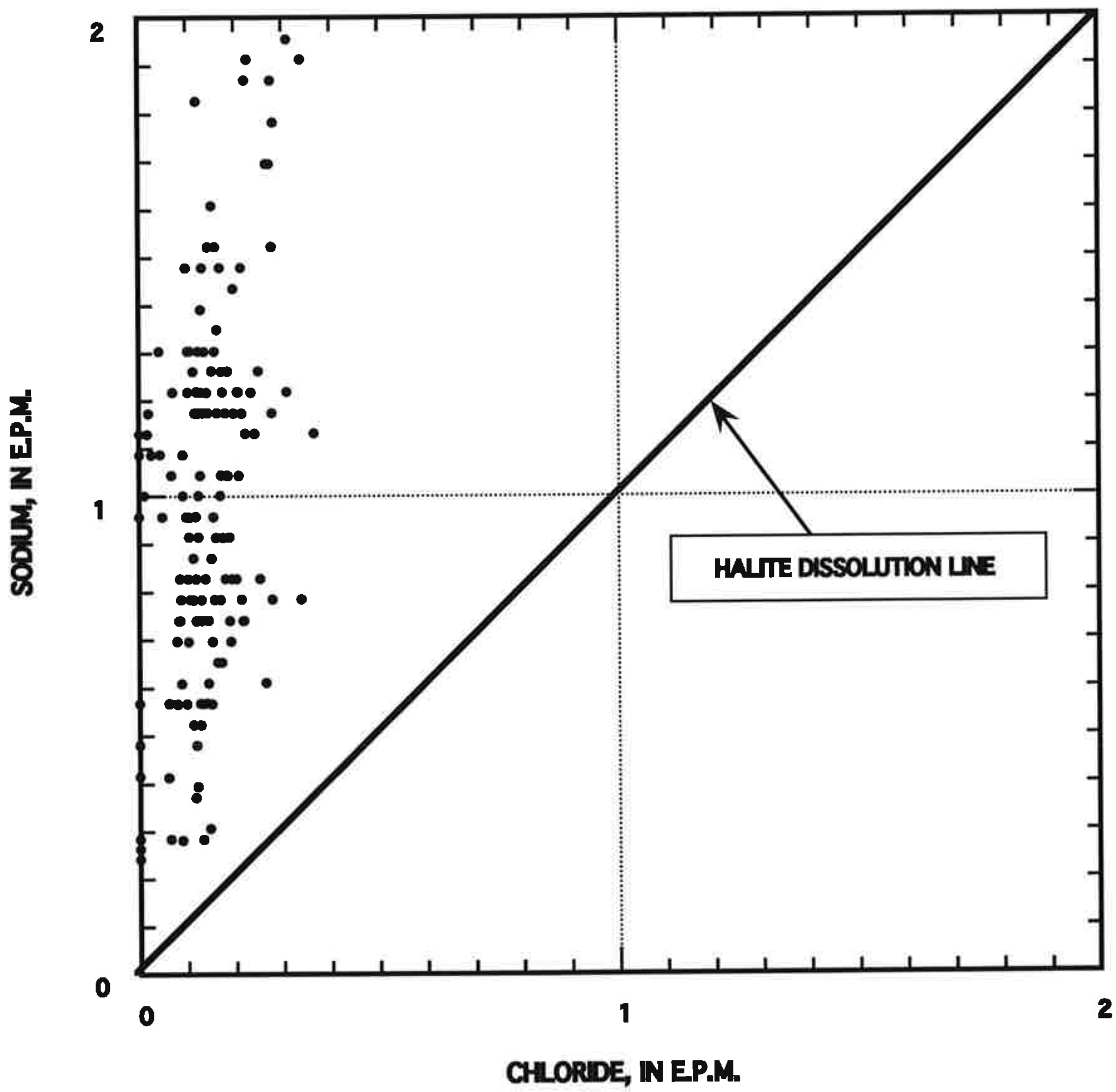


Figure 29. — Relationship between concentrations of sodium and chloride in ground water from the Streeter aquifer

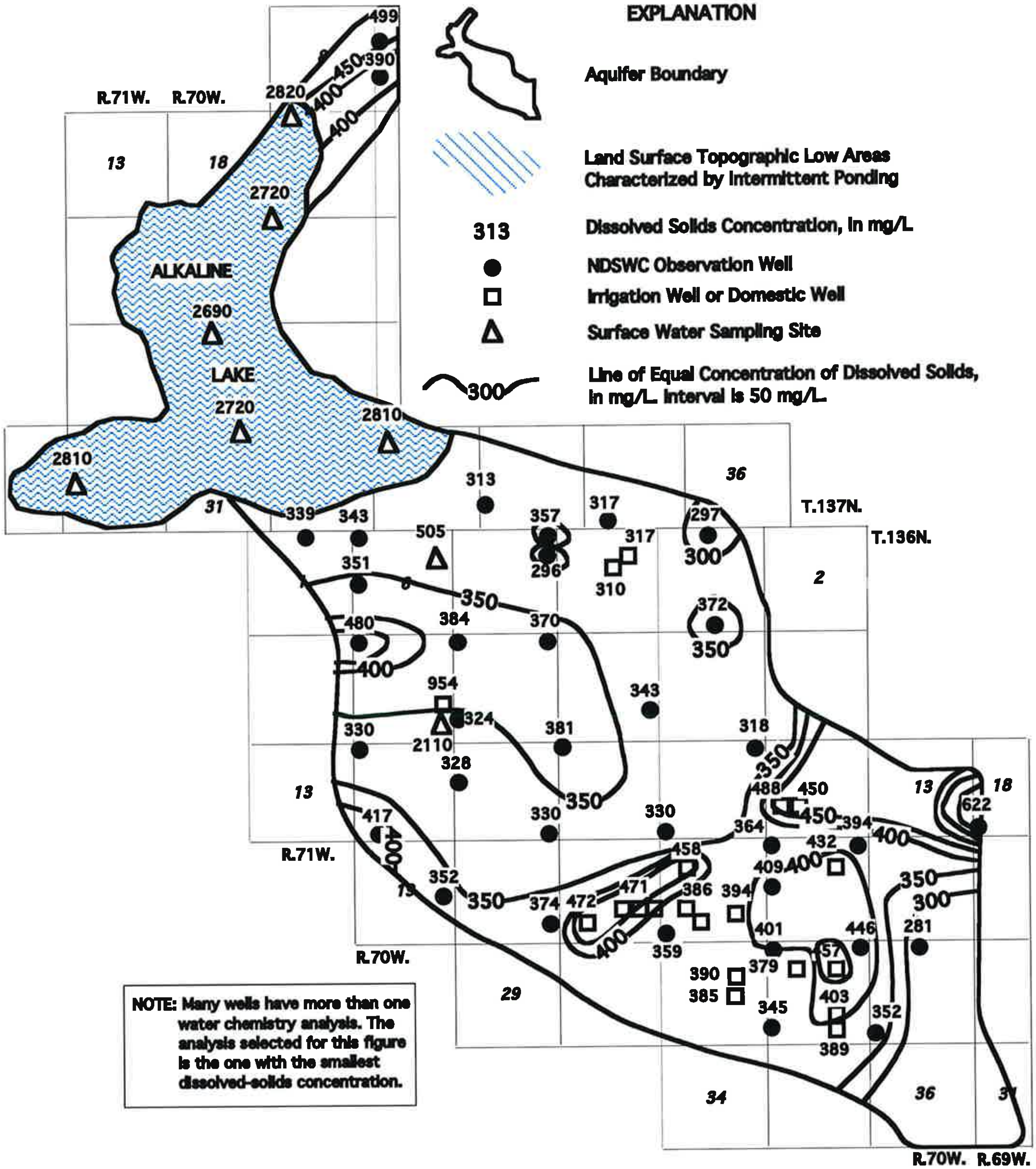


Figure 30. – Distribution of dissolved solids in the Streeter aquifer

screened from 26 to 31 feet below land surface. Prior to the wet climatic period beginning in 1993, the water level in this well was about 21.5 feet below land surface (about 4.5 feet above the top of the screen). After 1993, the water level rose to a depth of about 8.4 feet below land surface. The dramatic water-level rise (about 13.1 feet) is primarily from direct infiltration of precipitation and snowmelt that occurs at the water table. From 1991 (when the first sample was collected) to 2000, dissolved-solids concentrations decreased from 397 mg/L (8/1/91) to 304 mg/L (6/29/95), to 281 mg/L (7/17/00). Wells screened in the bottom of the aquifer in this area do not show this trend of decreasing dissolved-solids concentrations with time. This suggests that chemical stratification is a common phenomenon in surficial, unconfined aquifers and it must be considered when attempting to evaluate the areal distribution of any chemical constituent and parameter.

The capillary fringe of the water table and root zone are coupled over a significant area of the central and northwest part of the Streeter aquifer. The coupled areas are indicated by the somewhat poorly to very poorly drained soils outlined in figure 31. In the strongly coupled areas (net discharge areas) dissolved-solids concentrations should be relatively large. This should be observed in wells with shallow screened intervals. Unfortunately, the observation wells completed in this part of the aquifer are, with one exception, screened in the deeper sand and gravel layer, which is overlain by the silty-clay/clayey-silt aquitard and a thin, surficial sand and gravel layer. The one shallow SWC observation well located at 136-070-05AAD2 is associated with a land-surface topographic upland area (net recharge area) and, as a result, is characterized by a small dissolved-solids concentration. Based on limited hydraulic-head data, ground-water flow probably is upward from the deeper sand and gravel layer to the surficial sand and gravel layer in much of the area where the silty-clay/clayey-silt aquitard occurs. The concentration of dissolved-solids by evapotranspiration occurs in the net discharge areas associated with the surficial sand and gravel

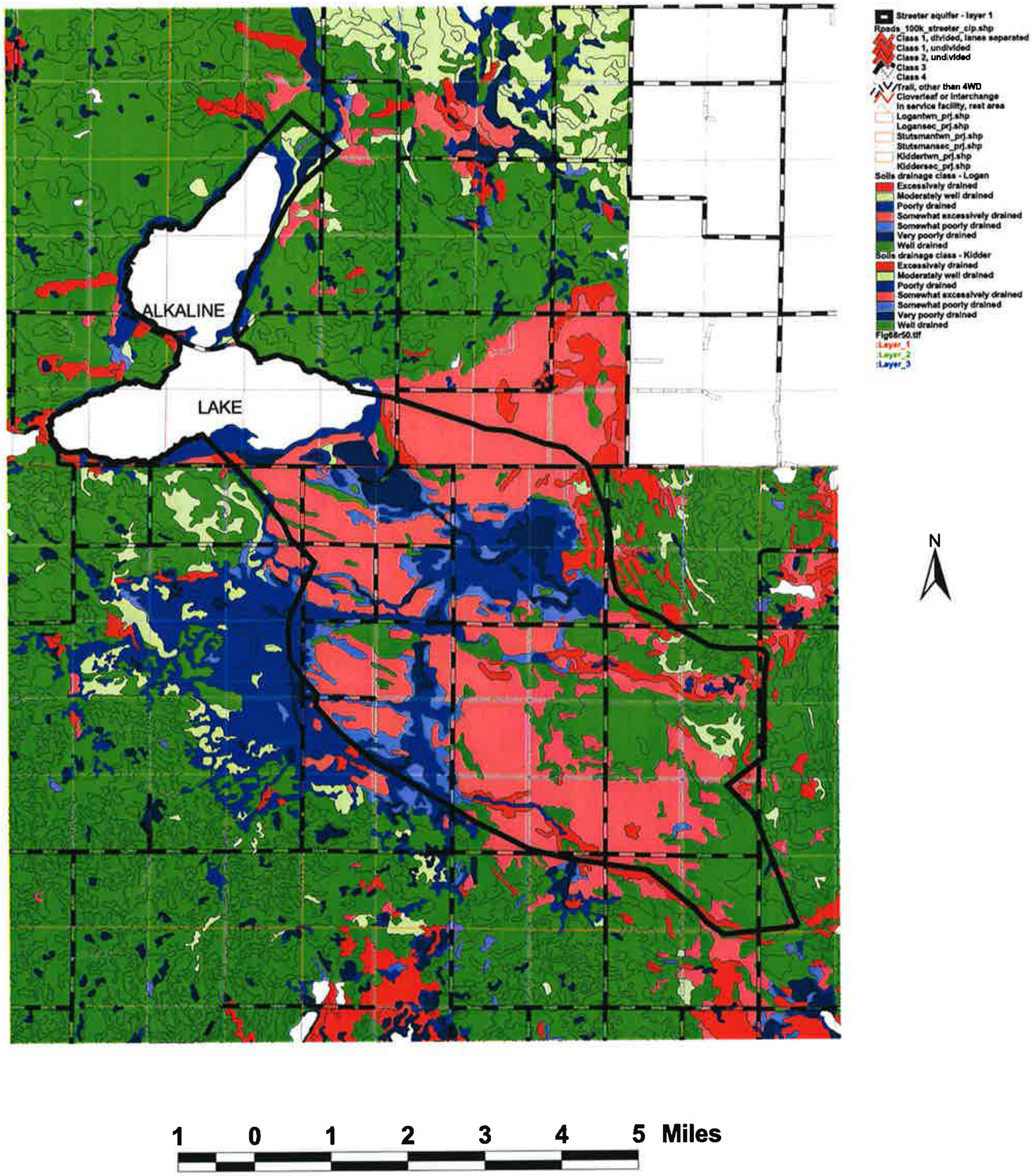


Figure 31. -- Soil drainage classification for dominate soil within mapping unit. [Derived from NRCS SSURGO data for Kidder and Logan Counties, North Dakota.]

layer. Therefore, the deeper sand and gravel layer should not be affected by evapotranspiration and associated increased dissolved-solids concentrations.

A water sample for chemical analysis was collected in November 1977 from a domestic well located at 136-070-07DAD. The well is 20 feet deep and based on local stratigraphy, is completed in the surficial sand and gravel layer. The dissolved-solids concentration is 954 mg/L and the ground water is a magnesium-sodium-bicarbonate-sulfate type. This well is located near a land-surface depression that probably represents a net discharge area where discharge occurs by evapotranspiration. In August 1983, a surface water sample was collected for chemical analysis at 136-070-07DDA, which is close to this domestic well. The dissolved-solids concentration is 2,100 mg/L and the water is a sodium-magnesium-bicarbonate-sulfate type.

The SWC has an observation well located at 136-070-08CCB, which is near the domestic well and the surface water sample site in Section 7. The well is screened in the deeper sand and gravel layer from 38 to 43 feet below land surface. In October 1999, a water sample was collected from this well for chemical analysis. The dissolved-solids concentration is 324 mg/L and the ground water is a calcium-magnesium-bicarbonate type. The hydrochemical signatures of the above three water samples support the conclusion that under natural conditions, the deeper sand and gravel layer in the central and northwest part of the aquifer is characterized by a smaller range of dissolved-solids concentrations as compared to the surficial sand and gravel layer where the primary discharge mechanism is evapotranspiration. This is an important consideration with regard to potential for water quality deterioration resulting from the withdrawal of large volumes of ground water by high capacity wells, and will be discussed in the management section of this report.

The southeast part of the Streeter aquifer is characterized by a relatively large concentration of ground-water irrigation appropriations. The larger dissolved-solids concentrations in this area could be due to large-scale ground-water pumping associated with these irrigation appropriations.

However, observation wells 136-070-23AAA2 and 136-070-26BBB2 both were characterized by relatively large dissolved-solids concentrations in 1978, which was near the beginning of irrigation development in the area. In October 1978, observation well 136-070-23AAA2 had a dissolved-solids concentration of 394 mg/L and observation well 136-070-26BBB had a dissolved-solids concentration of 441 mg/L. With time, as irrigation withdrawals increased in this area, it appears that ground-water irrigation development has affected an increase in dissolved-solids concentrations. This is addressed in the following section of the report.

Temporal Variations in Ground-Water Chemistry

Except for bicarbonate variations (some of which may be the result of lab/sampling/handling error) the water chemistry at observation wells 136-070-05AAA2, 06BBB2, 08BBB, 16BBB2, and 17DDD2 has remained relatively constant (figs. 32-36). At these observation well sites the aquifer interval that was sampled is leaky confined and likely characterized by upward ground-water flow through the overlying aquitard. Except for a single quarter section of irrigation development located in the NE1/4 of Section 4, Township 136 North, Range 70 West, irrigation development is lacking in the central and northwest part of the aquifer.

After 1993, both Ca^{2+} and SO_4^{2-} show a significant increase at observation wells 136-070-20DDA1, 23AAA2, and 26BBB2 (figs. 37-39) located in the southeast part of the aquifer. For observation wells 20DDA1 and 23AAA2, where more water chemistry samples are available, the increase in Ca^{2+} and SO_4^{2-} is close to a one-to-one increase on an equivalents-per-million basis. This suggests gypsum dissolution is the source of increased Ca^{2+} and SO_4^{2-}.

The southeastern part of the aquifer characterized by increased Ca^{2+} and SO_4^{2-} consists of a single, unconfined unit of sand and gravel. The silty-clay/clay-silt aquitard is absent. This area also is characterized by a relatively large concentration of ground-water irrigation appropriations.

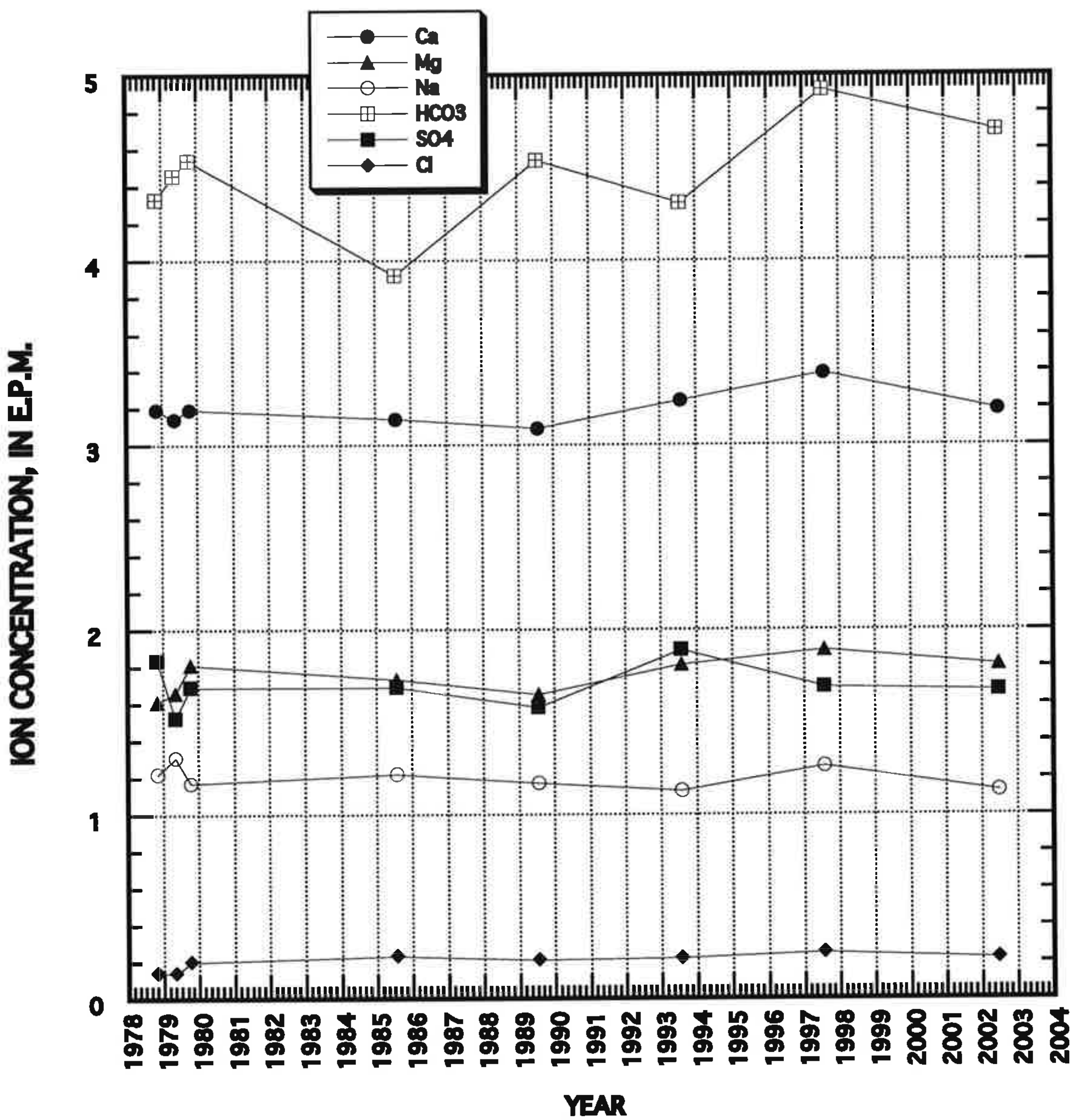


Figure 32. -- Temporal variation in major ions at observation well 136-070-05AAA2

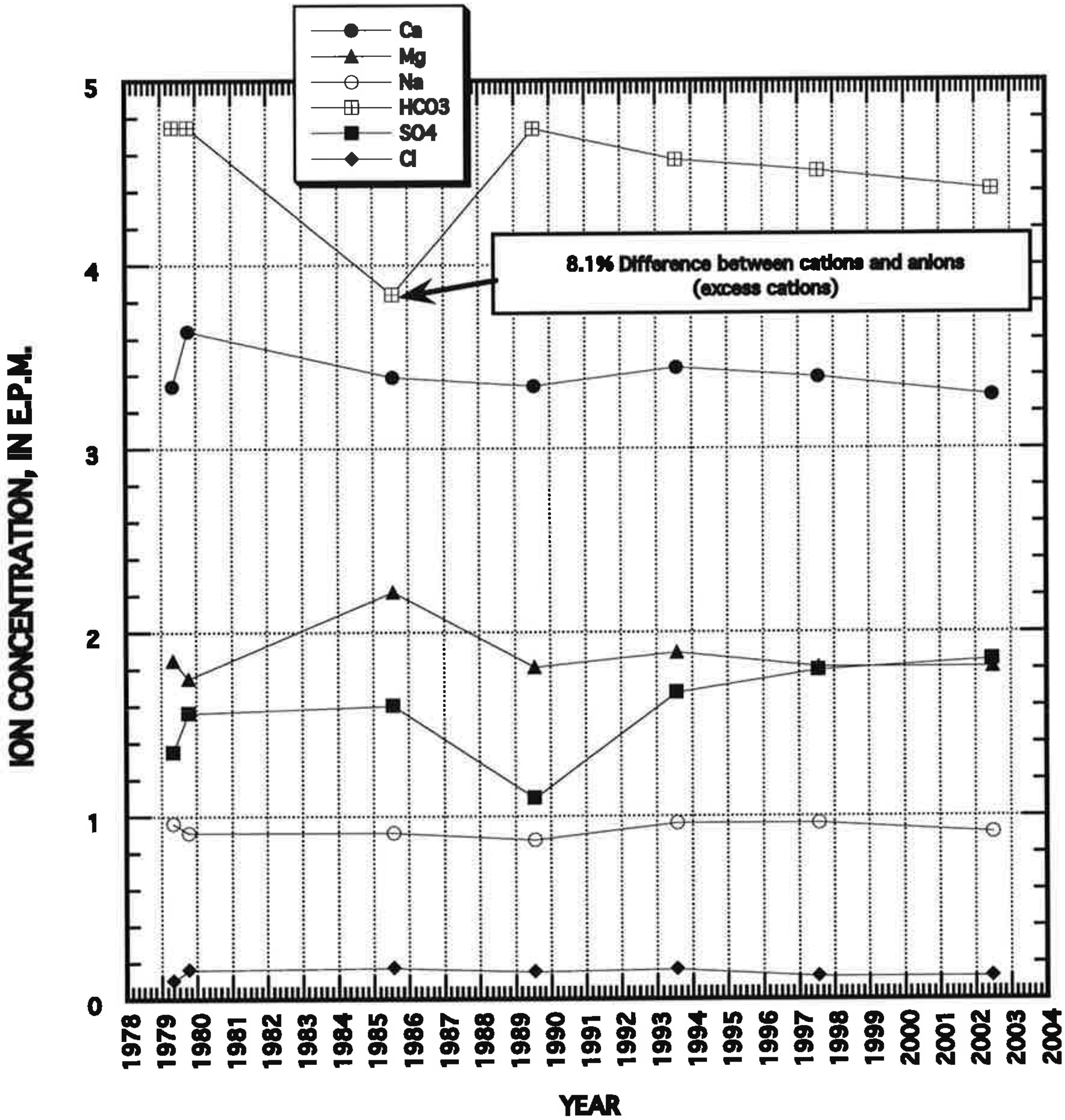


Figure 33. – Temporal variation in major ions at observation well 136-070-06BBB2

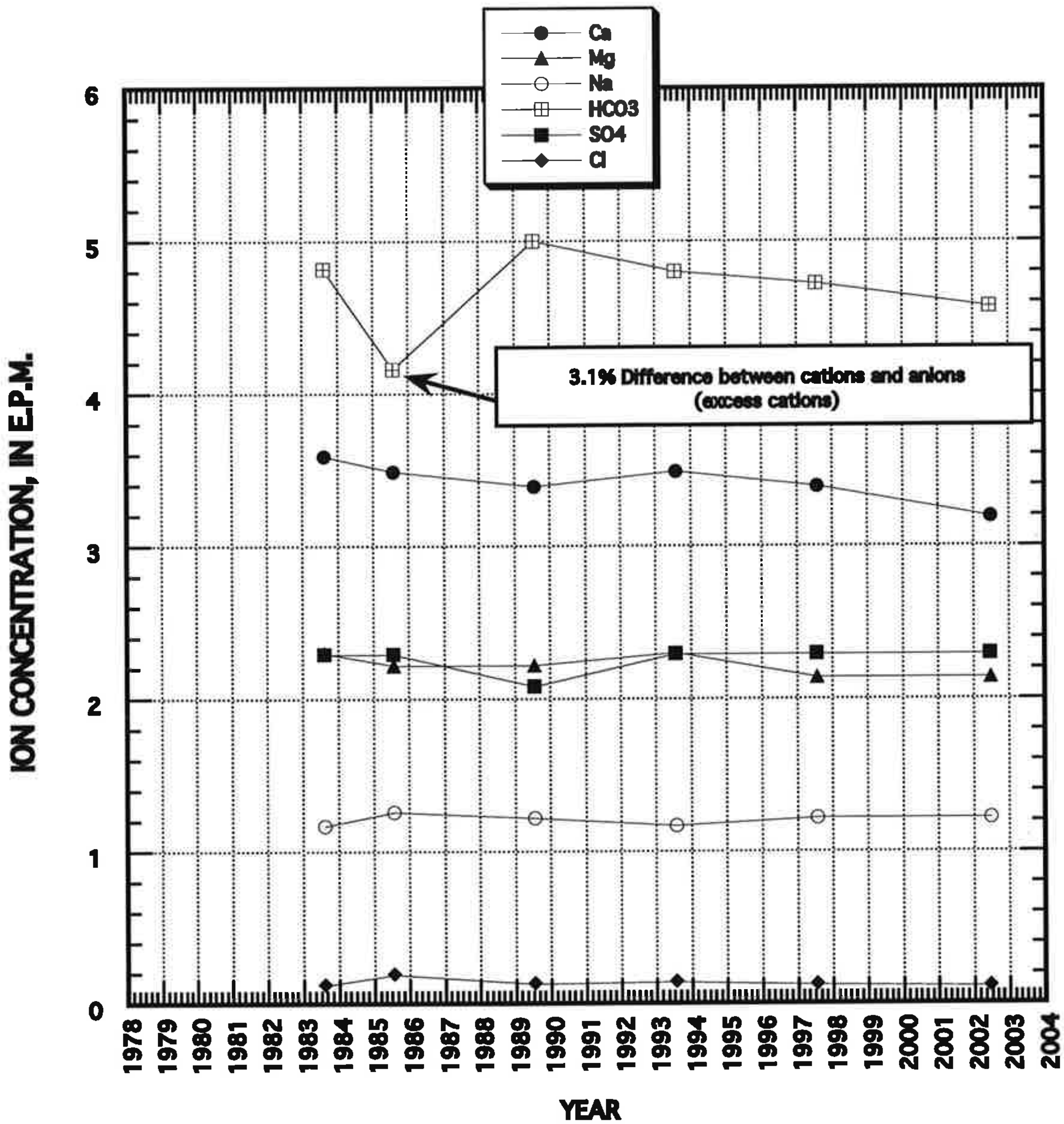


Figure 34. – Temporal variation in major ions at observation well 136-070-08BBB

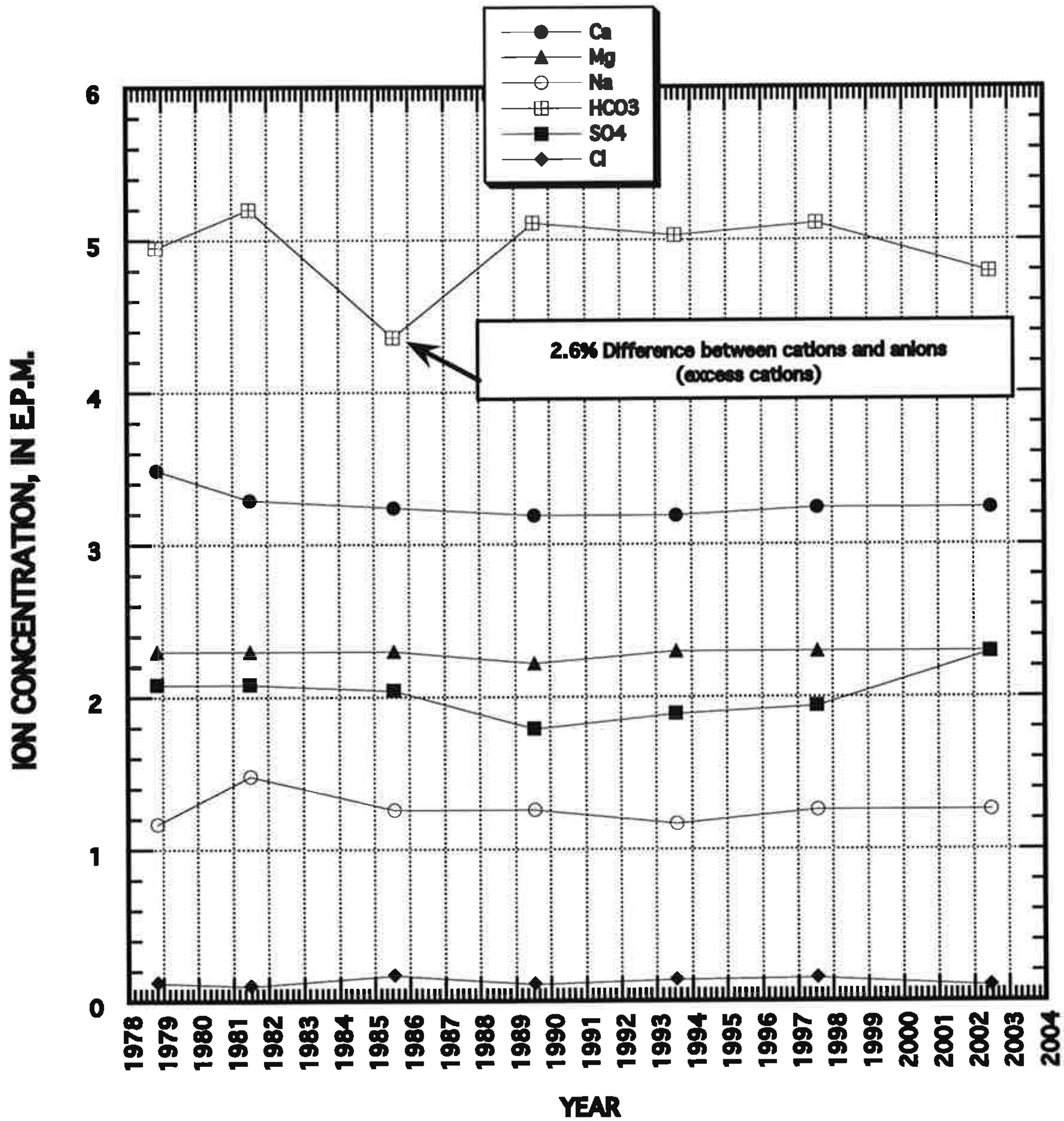


Figure 35. – Temporal variation in major ions at observation well 136-070-16BBB2

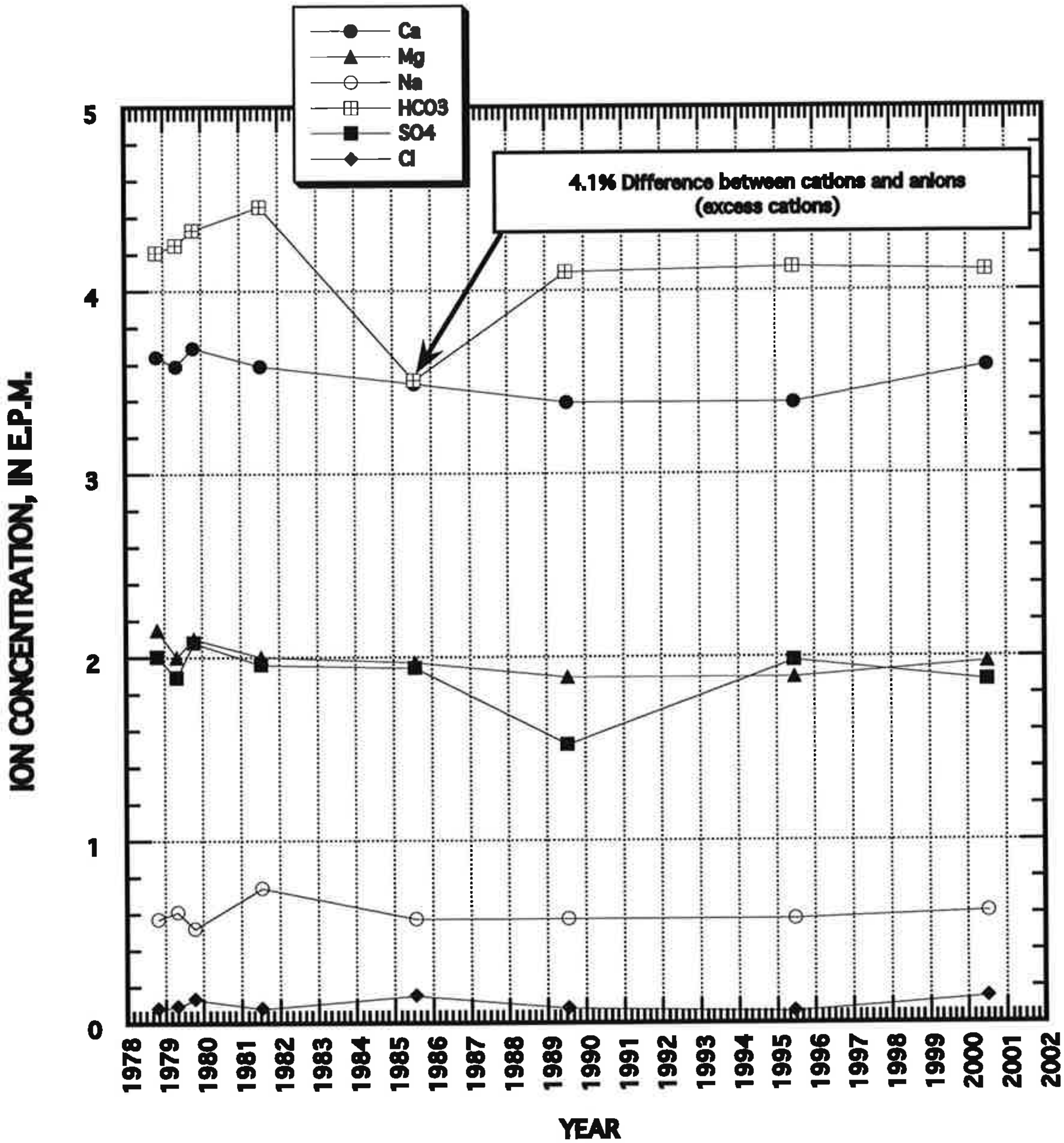


Figure 36. – Temporal variation in major ions at observation well 136-070-17DDD2

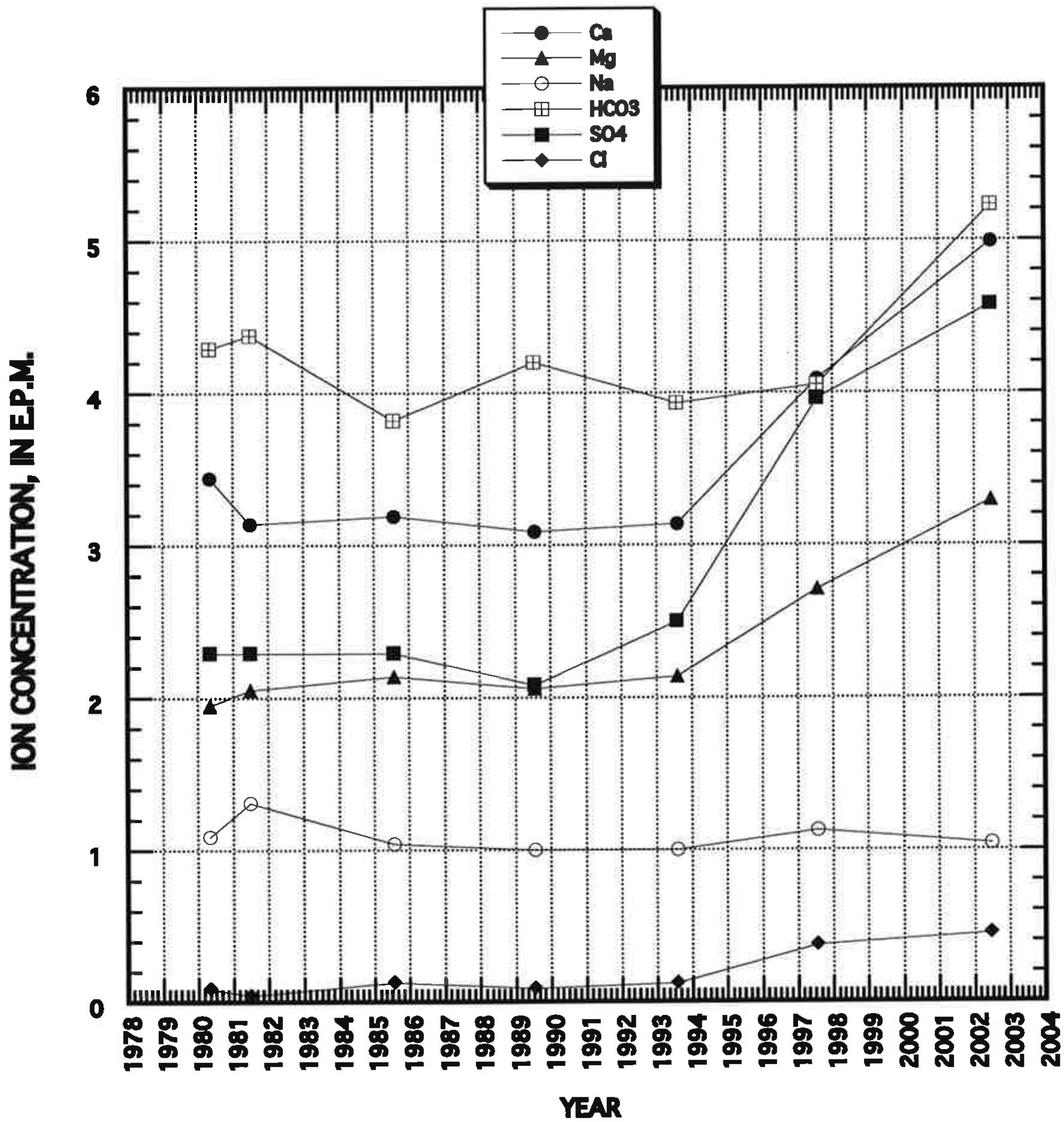


Figure 37. – Temporal variation in major ions at observation well 136-070-20DDA1

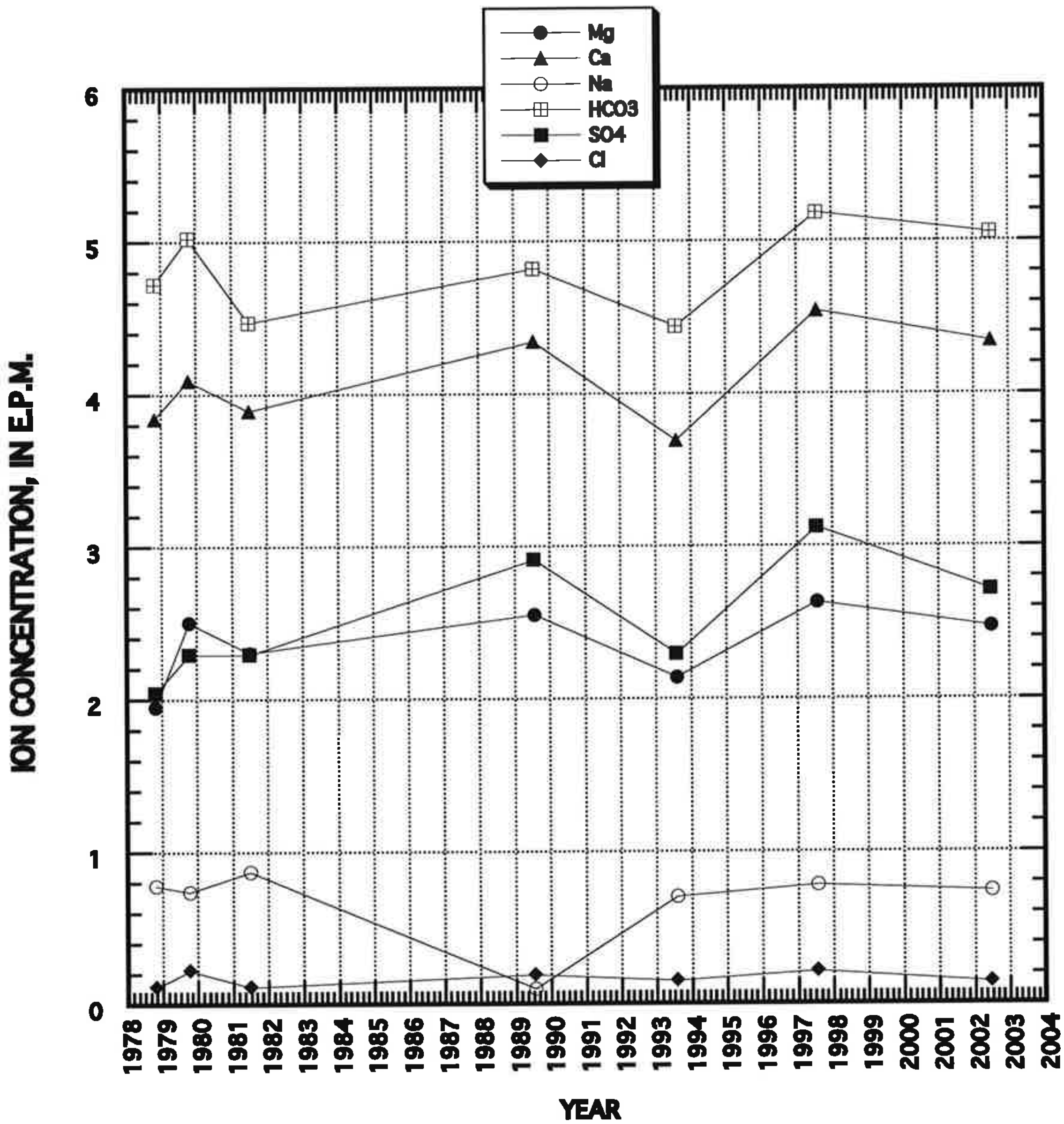


Figure 38. – Temporal variation in major ions at observation well 136-070-23AAA2

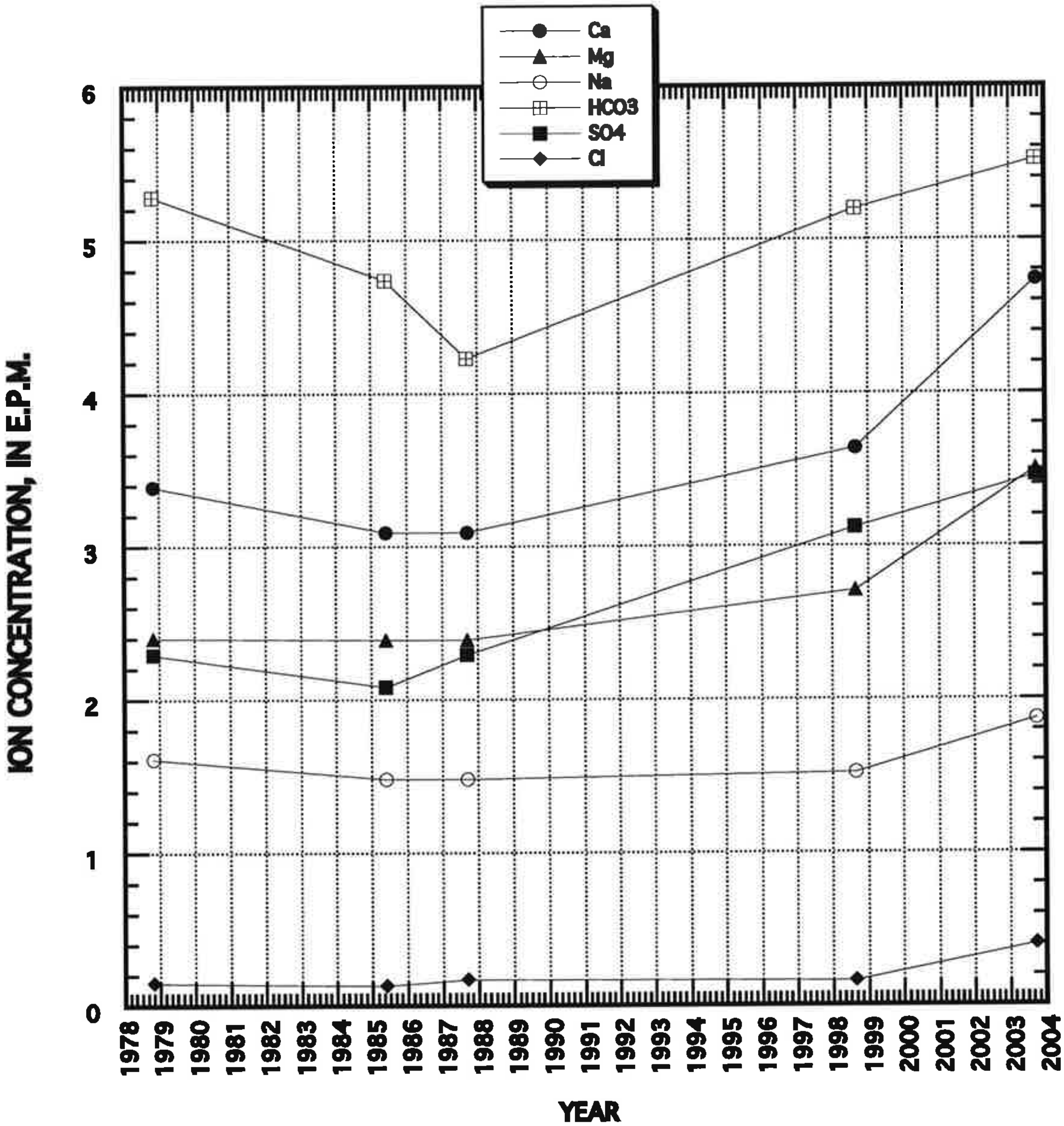


Figure 39. — Temporal variation in major ions at observation well 136-070-26BBB2

Sources of SO_4^{2-} may include:

1) oxidation of organic sulfur

2) precipitation

3) oxidation of sulfide to sulfate through autotrophic denitrification

4) sulfate fertilizer applications

5) concentration in surface ground-water discharge areas from evapotranspiration

6) movement of sulfate-enriched ground water into the aquifer from surrounding bedrock formations, and till

7) oxidation of pyrite

All of the above sources probably contribute to sulfate enrichment in the Streeter aquifer. Without further detailed investigations, it is not possible to identify the above sulfate sources.

It is important to note that increased sulfate concentration in the irrigation area occurred after 1993. This coincides with the previously described abnormally wet period, which began in 1993. During this wet period, the water table has risen 10 to 12 feet in the southeastern part of the aquifer. Resaturation of this large interval increases the potential for dissolution of secondary gypsum, which may have been deposited by evapotranspiration in the unsaturated zone during preceding drier periods. In addition, increased precipitation and associated infiltration also increase the potential for more widespread downward flushing of sulfate from the unsaturated zone to the water table.

Surface-Water Chemistry

The relative distribution of major ions and total dissolved-solids concentrations for surface water in the Streeter aquifer area are shown in figure 40. The surface water bodies, one slough, and Alkaline Lake have larger relative sodium concentrations as compared to ground water in the

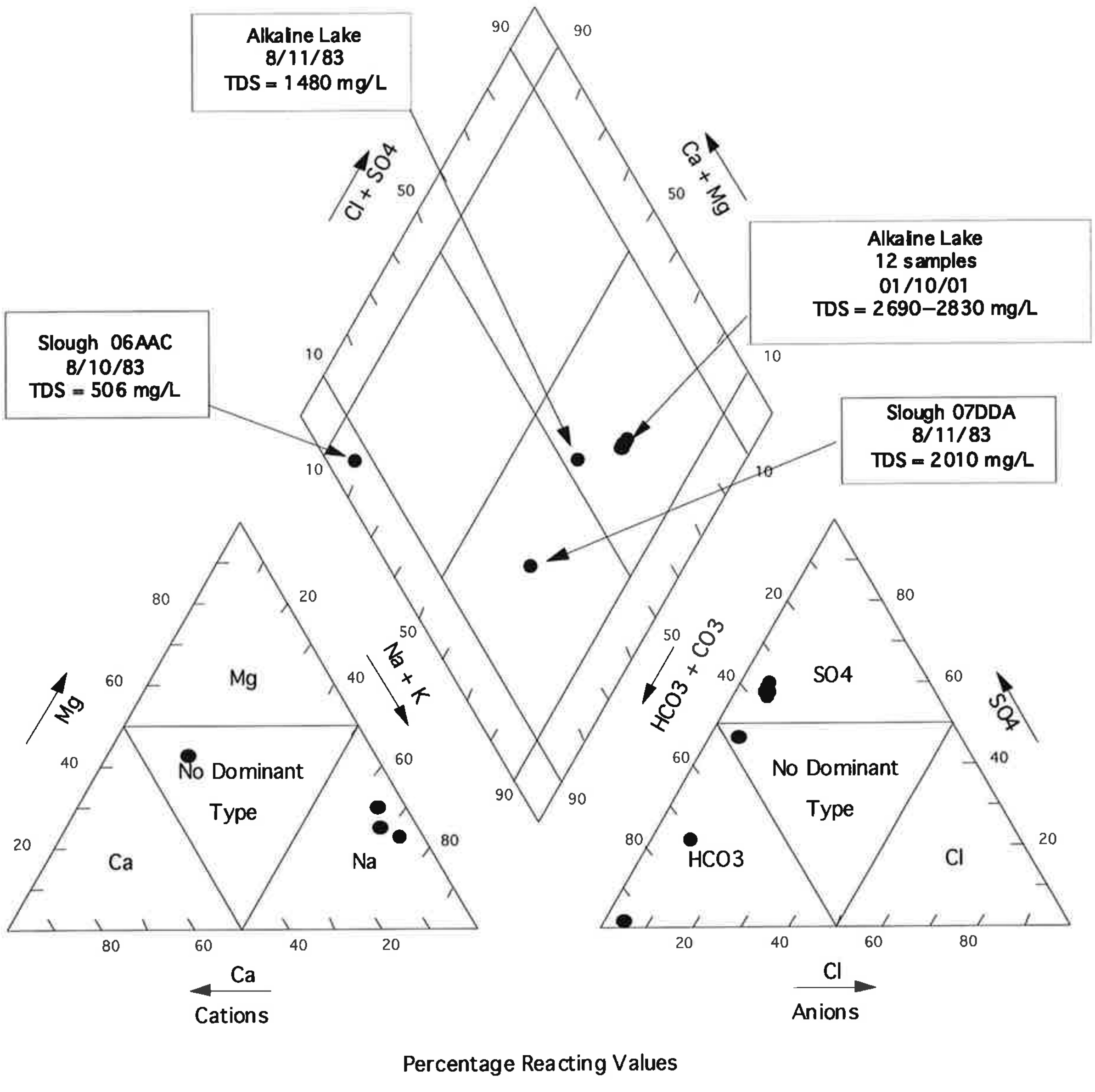


Figure 40. -- Relative distribution of major ions and dissolved solids concentrations from surface water in the Streeter aquifer study area

Streeter aquifer (figs. 26 and 40). In addition, Alkaline Lake samples have larger relative sulfate concentrations as compared to ground water in the Streeter aquifer (figs. 26 and 40). Enrichment in sodium, sulfate, and dissolved solids in Alkaline Lake probably results from upward movement of ground water from the underlying Fox Hills Formation and the Streeter aquifer and concentration due to evapotranspiration in and around the perimeter of Alkaline Lake. The relative distribution of major ions in water samples collected from nine wells completed in the Fox Hills aquifer west of the Streeter aquifer in Township 136 North, Range 71 West, is shown in figure 41. Ground water from the Fox Hills aquifer in the study area generally is a mixed cation-carbonate type. In addition, these samples indicate much larger absolute and relative sodium concentrations, as compared to ground water in the Streeter aquifer. It is likely that Alkaline Lake is a local discharge area to the underlying Fox Hills aquifer. Given the above, the Fox Hills aquifer probably provides much of the dissolved sodium to Alkaline Lake. Further sodium and sulfate enrichment in Alkaline Lake probably results from concentration due to evapotranspiration. The fact that Alkaline Lake samples are very low in both absolute and relative calcium concentrations supports concentration by evapotranspiration because less soluble carbonate and calcium-magnesium-sulfate mineral species will precipitate before more soluble sodium-sulfate mineral species.

The dissolved-solids concentrations of the 12 Alkaline Lake samples collected on January 10, 2001, range from 2,690 to 2,830 mg/L. Although these dissolved solids concentrations are about 4 to 6 times those of ground water from the Streeter aquifer, they do not reflect the extremely large dissolved solids concentrations that are associated with terminal discharge areas where discharge is due to evapotranspiration. It is possible that the increase in fresh water input to Alkaline Lake that began in 1993 has resulted in significant dilution. The water chemistry data does not provide conclusive evidence that Alkaline Lake is a terminal discharge area.

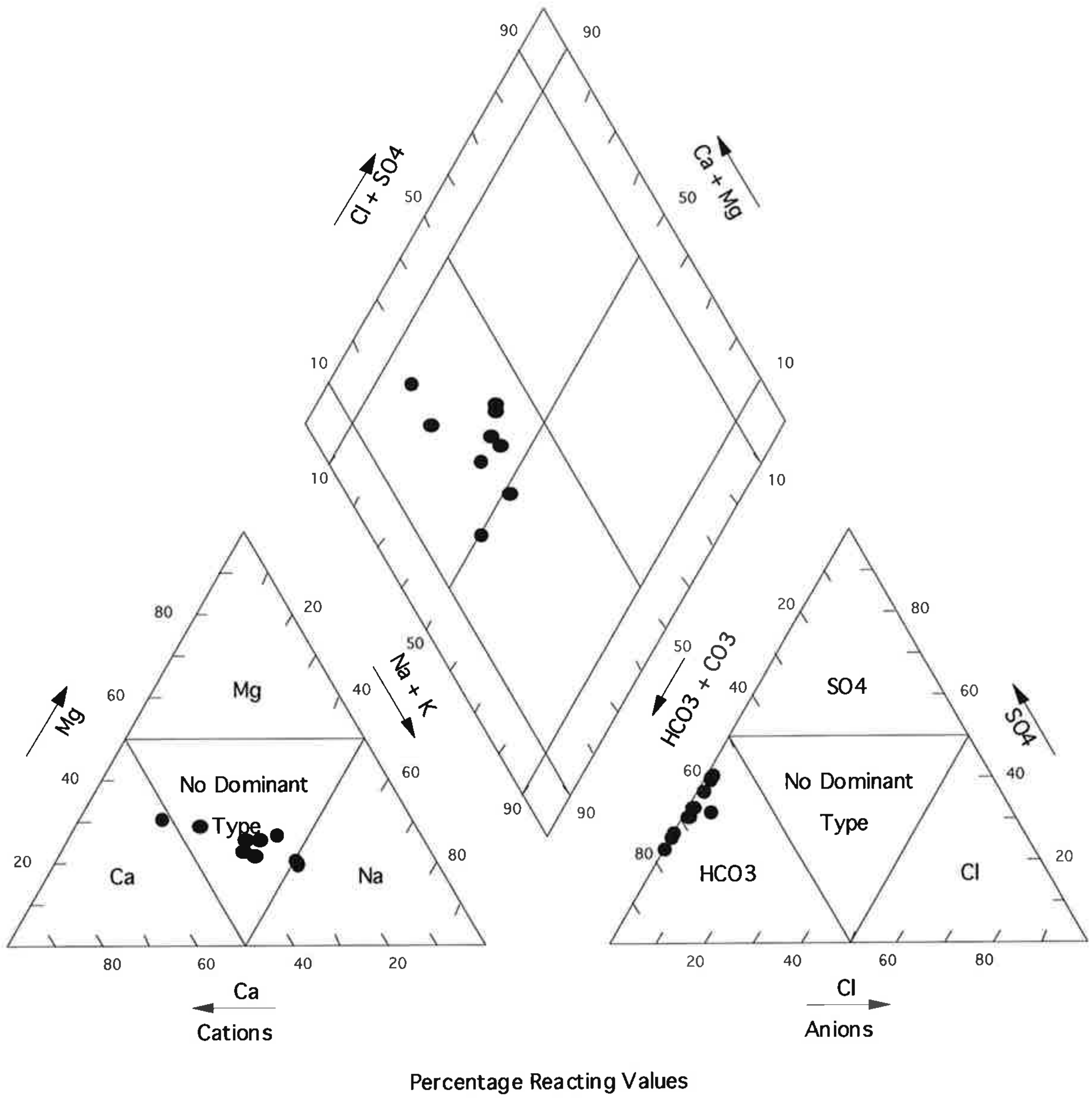


Figure 41. -- Relative distribution of major ions in the Fox Hills aquifer in T136 N - R 71 W west of the Streeter aquifer

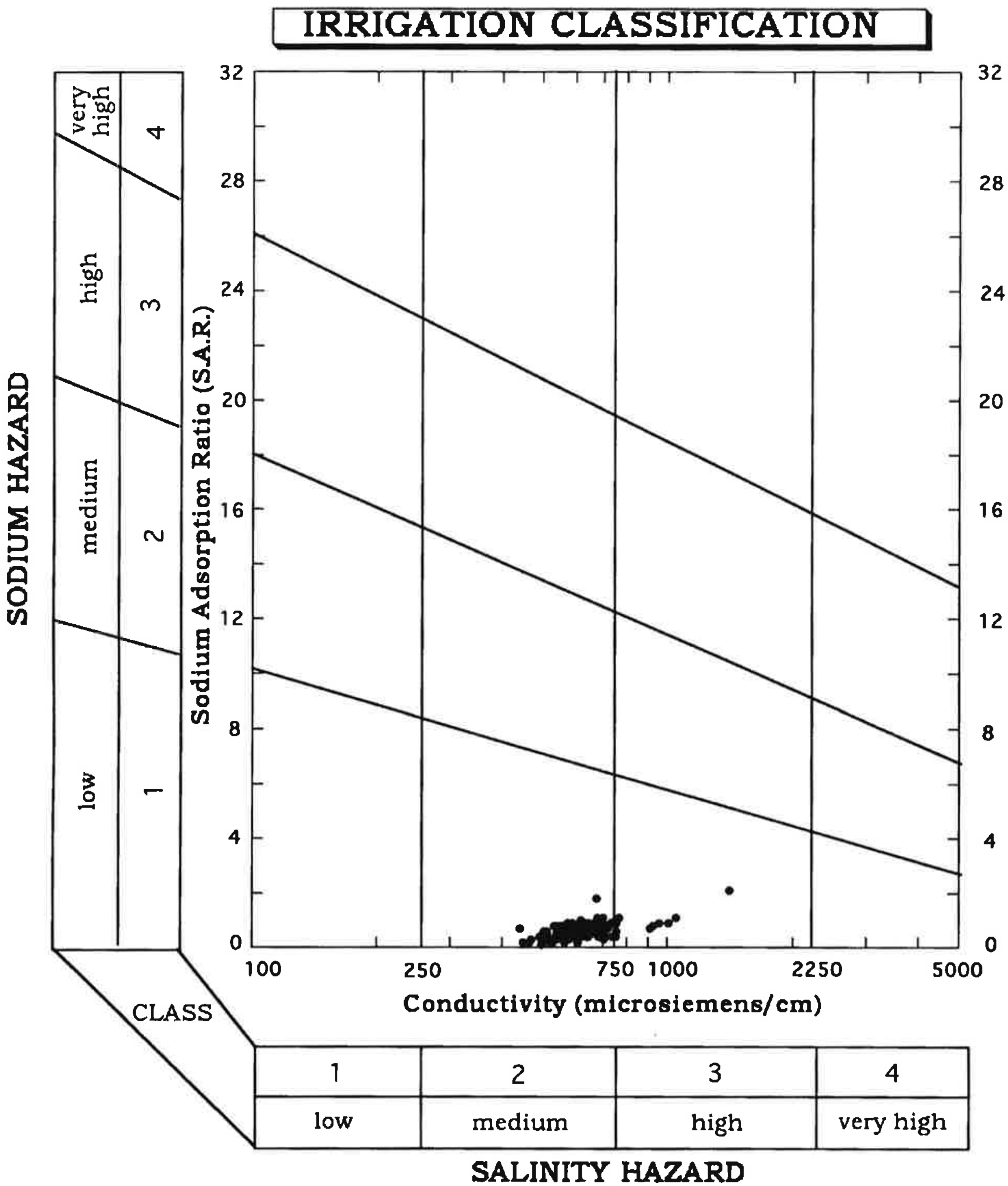


Figure 42. -- Irrigation classification of ground water in the Streeter aquifer

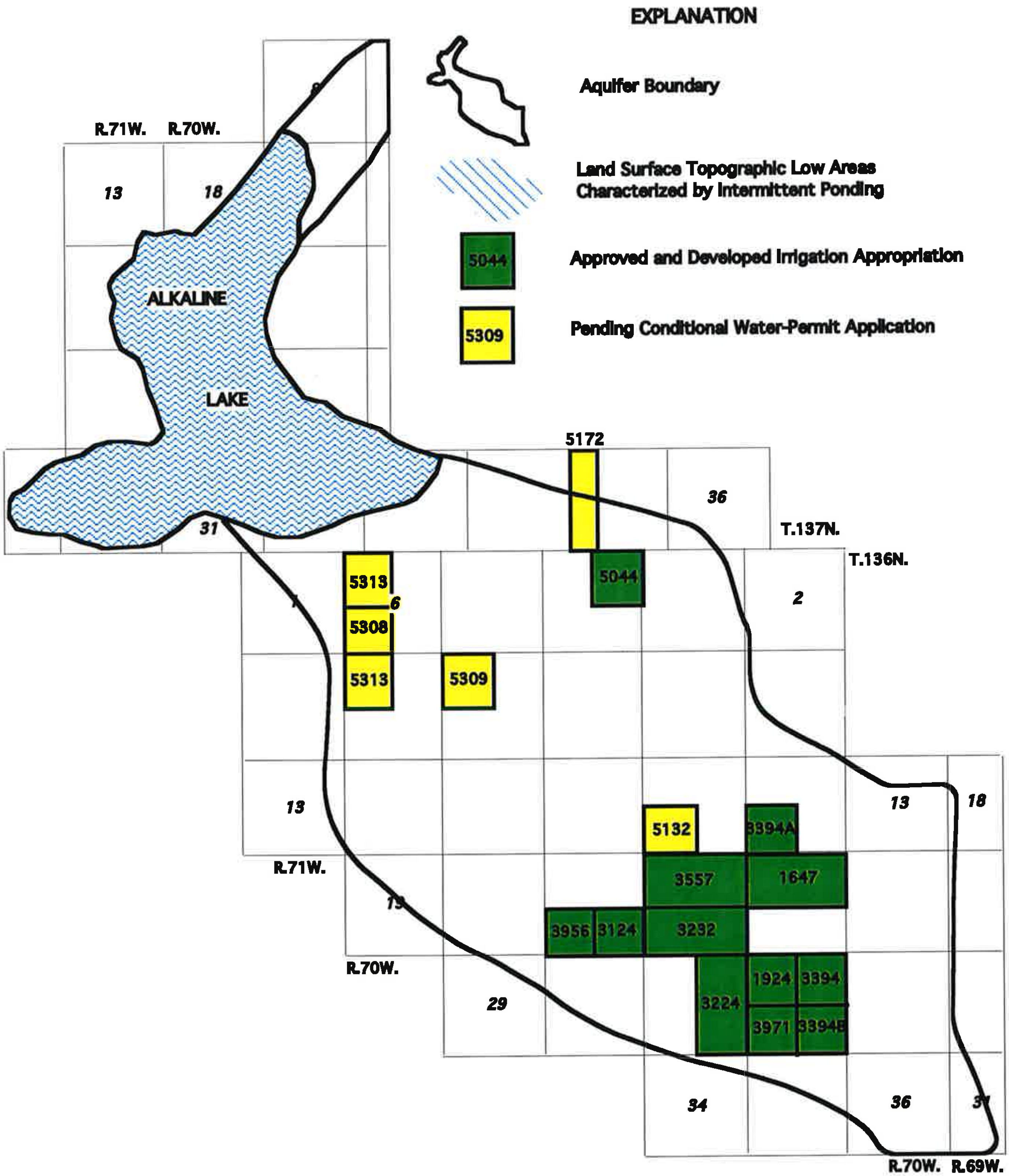


Figure 43. – Location and status of irrigation appropriations and applications in the Streeter aquifer

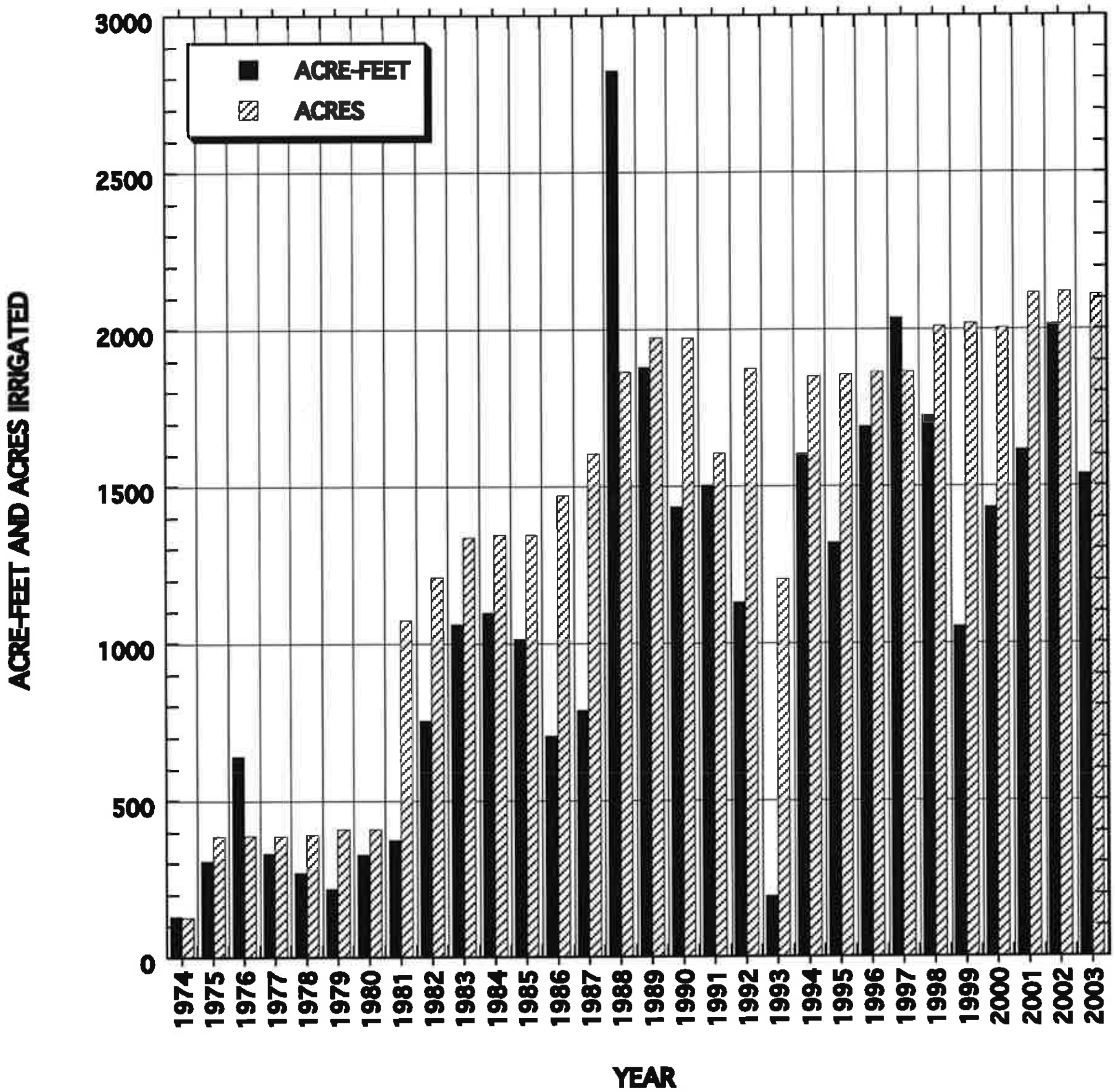


Figure 44. – Annual irrigation water use and acres irrigated in the Streeter aquifer

The average annual irrigation application rate from 1974 through 2003 is shown in figure 45. The smallest average annual application rate was 1.93 inches in 1993 and the largest average annual application rate was 19.79 inches per acre in 1976. The wettest growing season from 1974 through 2003 was 1993 with May through August precipitation at Napoleon amounting to 22.37 inches. The driest growing season from 1974 through 2003 was 1976 with May through October precipitation at Napoleon amounting to 4.11 inches. The average annual irrigation application rate from 1974 through 2003 is 9.47 inches per acre.

The relationship between annual irrigation application rate from 1974 through 2003 and May through August precipitation from the Napoleon station is shown in figure 46. The linear regression equation indicates a correlation coefficient $R = 0.67$, which means that 45 percent of the variability in irrigation application rate can be explained by May through August precipitation. Although annual irrigation application rate is directly proportional to May through August precipitation, the correlation is rather weak. The scatter in figure 46 may be due to inaccuracies in available water capacity at the start of the growing season, variations in PET, crops with different water requirements, measuring/estimating annual water use, inefficient irrigation applications (both over and under watering) and differences between precipitation measured at Napoleon and precipitation that actually occurred over the Streeter aquifer.

A relationship between NDAWN Streeter station May through August precipitation and Napoleon station May through August precipitation (1990-2003) with annual irrigation application rate in the Streeter aquifer is compared by linear regression analysis (figs. 47 and 48). The general pattern for both data plots is the drier the growing season, the greater the water use. The slopes and y-intercepts of the two regression equations are about the same with the regression using NDAWN Streeter station precipitation showing more scatter. The regression equation correlation coefficients indicate a stronger relationship between Napoleon station May through August precipitation and

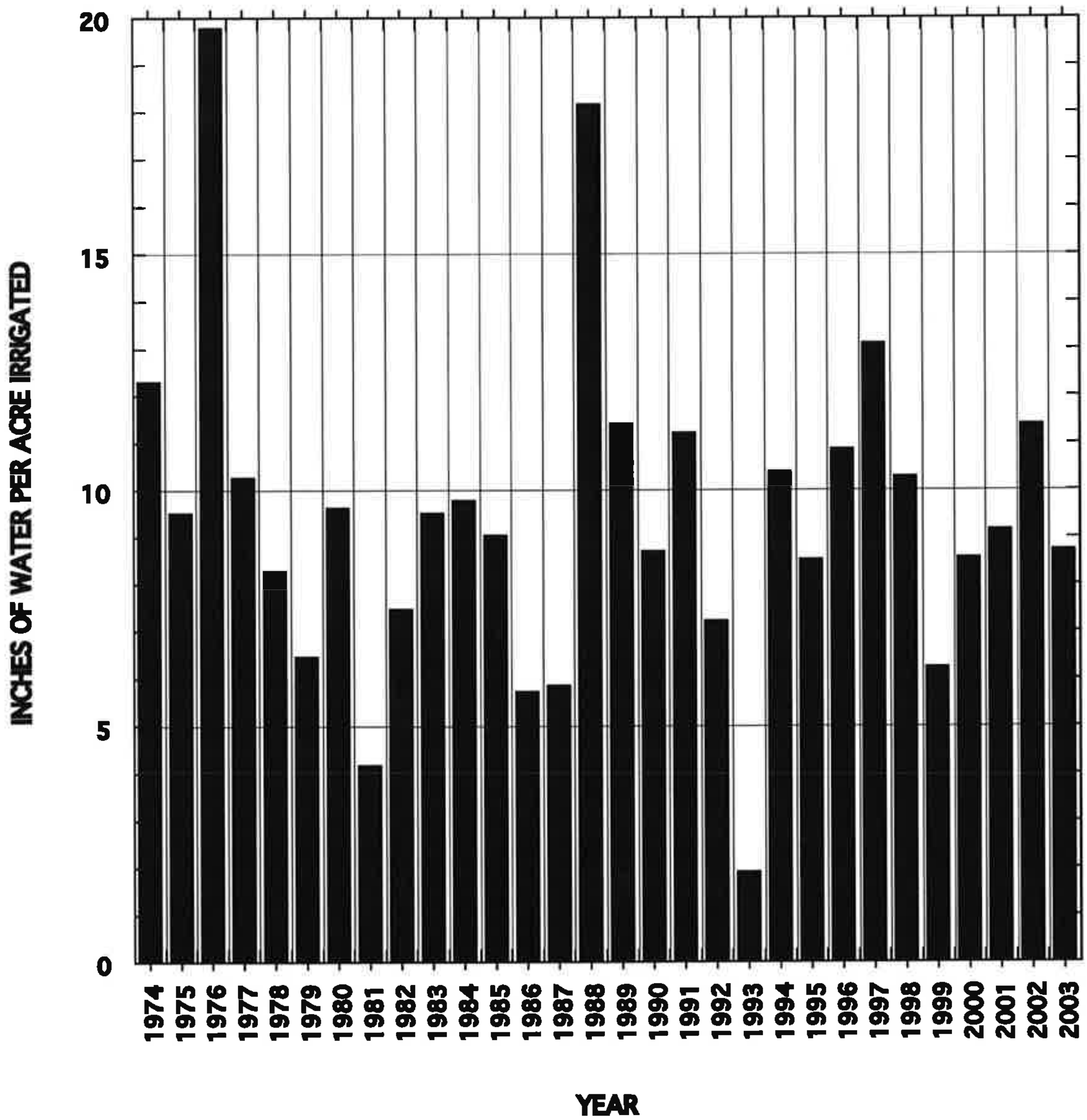


Figure 45. – Average annual irrigation application rates in the Streeter aquifer

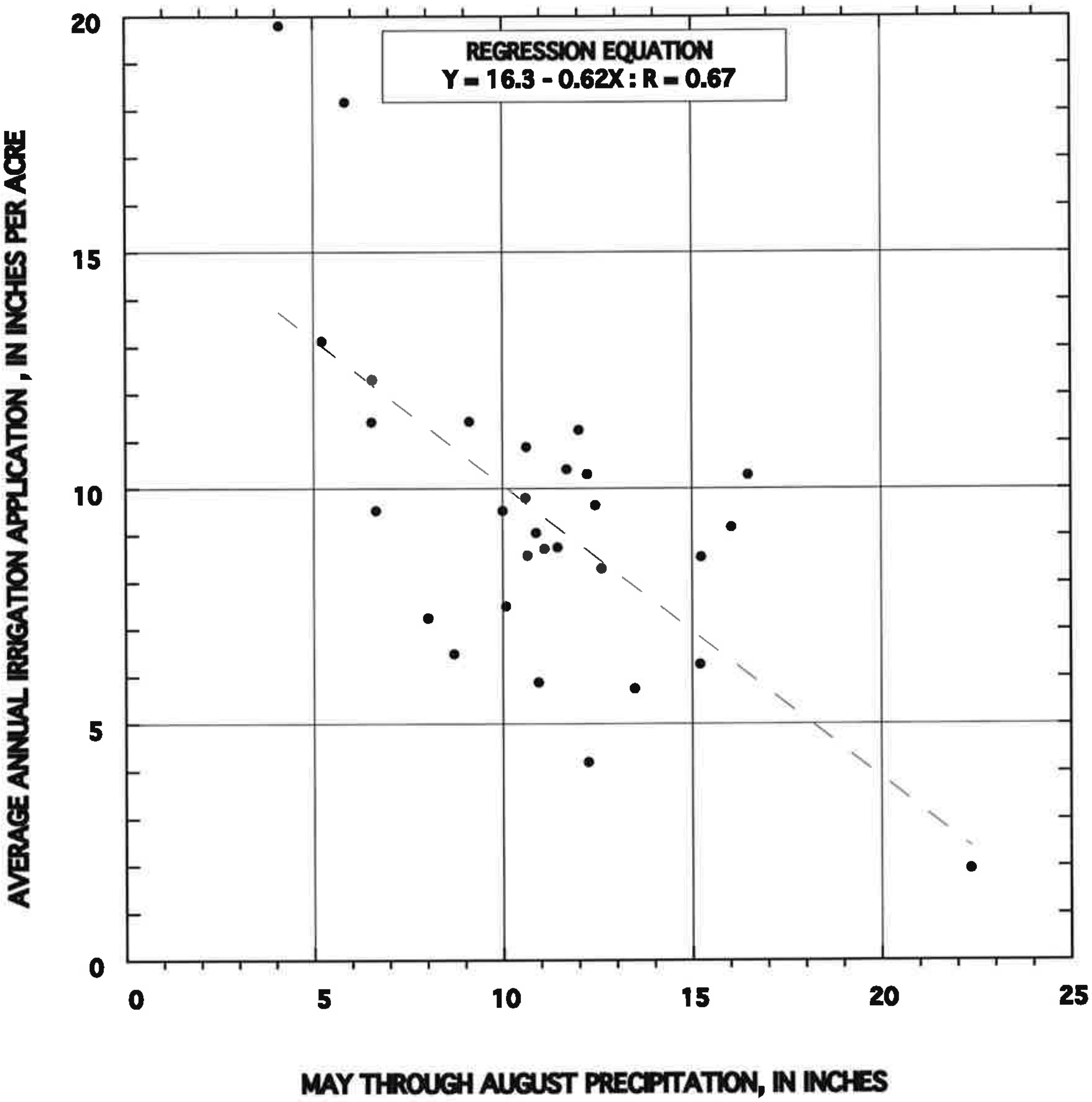
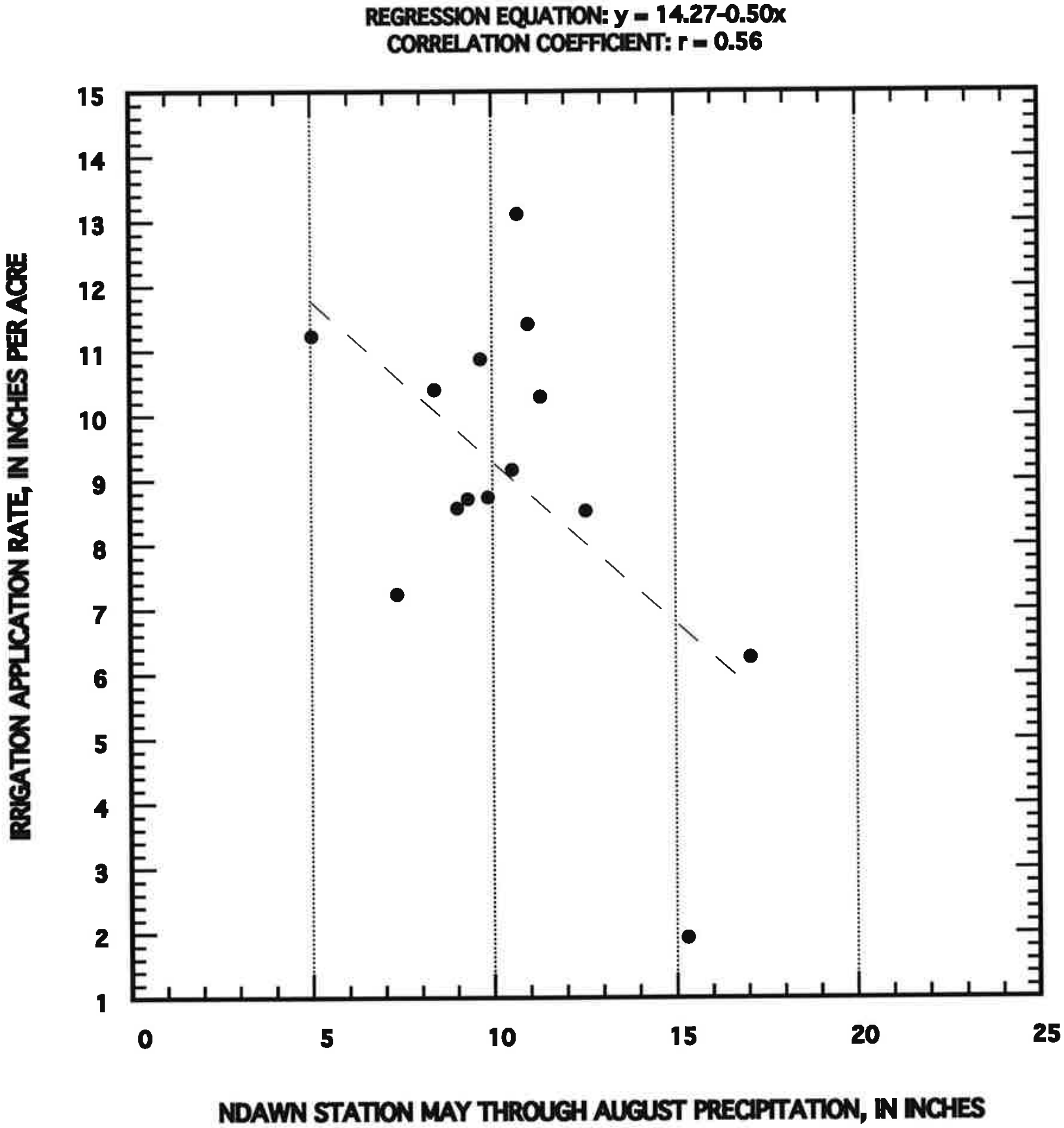
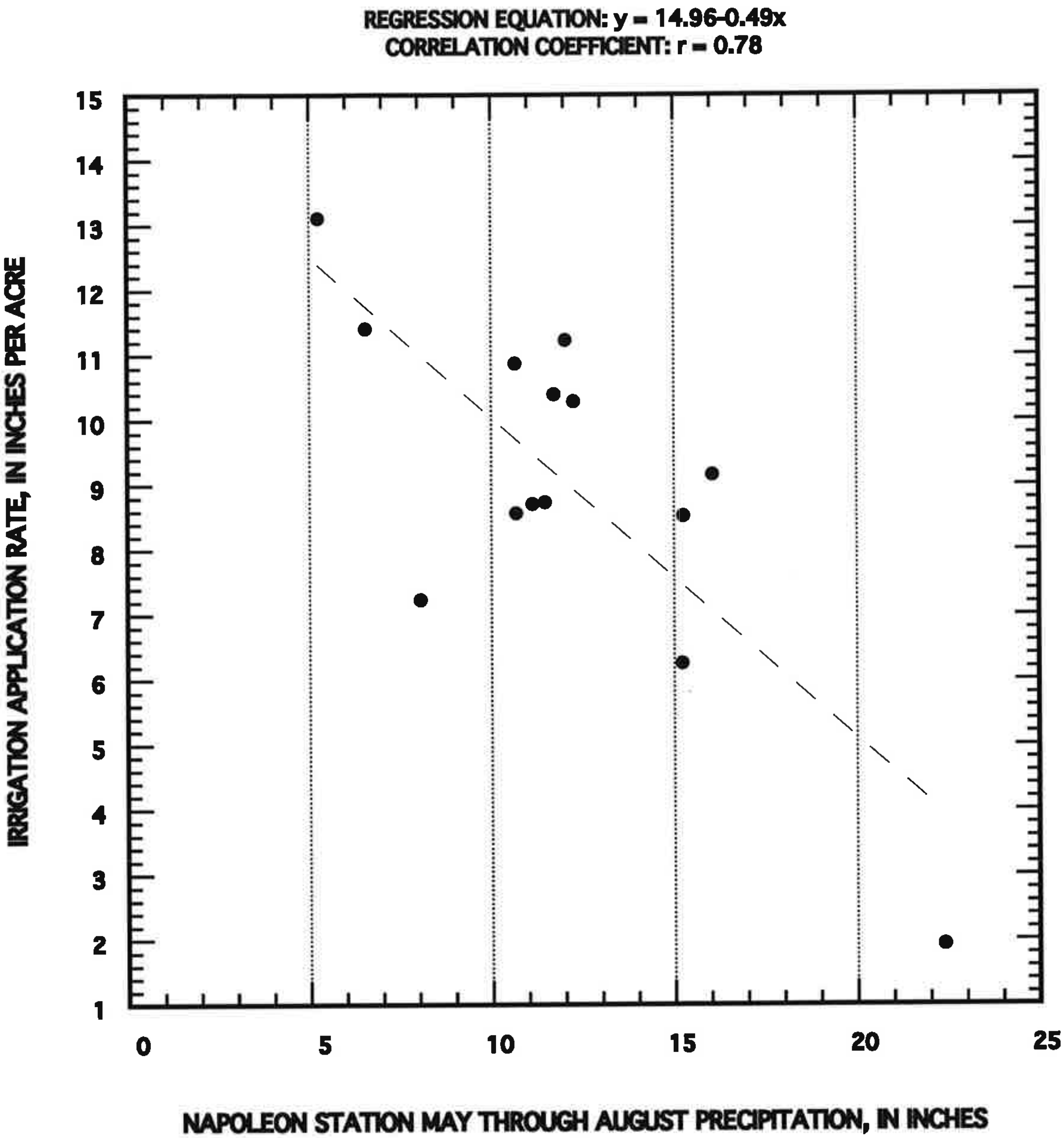


Figure 46. – Relationship between May through August precipitation at Napoleon and average annual irrigation application in the Streeter aquifer



Fgure 47. — Relationship between May through August precipitation at NDAWN Streeter station and average annual irrigation application in the Streeter aquifer



Fgure 48. — Relationship between May through August precipitation at Napoleon station and average annual irrigation application in the Streeter aquifer

annual irrigation water use from the Streeter aquifer. A correlation coefficient of R=0.78 indicates that about 61 percent of the variability in annual irrigation application rate can be explained by May through August NDAWN station precipitation. Thus, for model calibration simulations (to be presented later in this report) it appears that Napoleon station climate data may be more representative for the Streeter aquifer area than the climate data reported at the NDAWN Streeter station.

AQUIFER DYNAMICS AND MANAGEMENT CONSIDERATIONS

A basis for an aquifer management plan must include an evaluation of aquifer dynamical response, that is, how fast do water levels respond to changes in recharge and discharge (both natural and anthropogenic). A brief summary of the conceptual model of the Streeter aquifer follows to identify the important factors affecting aquifer dynamics. The reader will be referred to figures 21, 25, 43, 49, and 50 during this discussion.

The Streeter aquifer is a shallow, relatively thin aquifer (average thickness = 46 feet) that occupies an area of about 31 square miles. Ground water in the Streeter aquifer occurs under both leaky-confined and unconfined conditions. A relatively thin, shallow, silty-clay/clayey-silt aquitard occurs in about two-thirds of the aquifer area in the central and northwest part of the aquifer. The silty-clay/clayey-silt aquitard is absent in the east and southeast parts of the aquifer. Storativity is about three orders of magnitude smaller (1×10^{-4}) in the leaky confined parts of the aquifer as compared to storativity in the unconfined parts of the aquifer (0.22).

The aquifer is comprised of sand and gravel characterized by relatively large hydraulic conductivity. Although the hydraulic conductivity of the silty-clay/clayey-silt aquitard is 5 to 6 orders of magnitude smaller than that of the aquifer, the aquitard transmits ground water at a relatively fast rate as indicated by the previously described aquifer test.

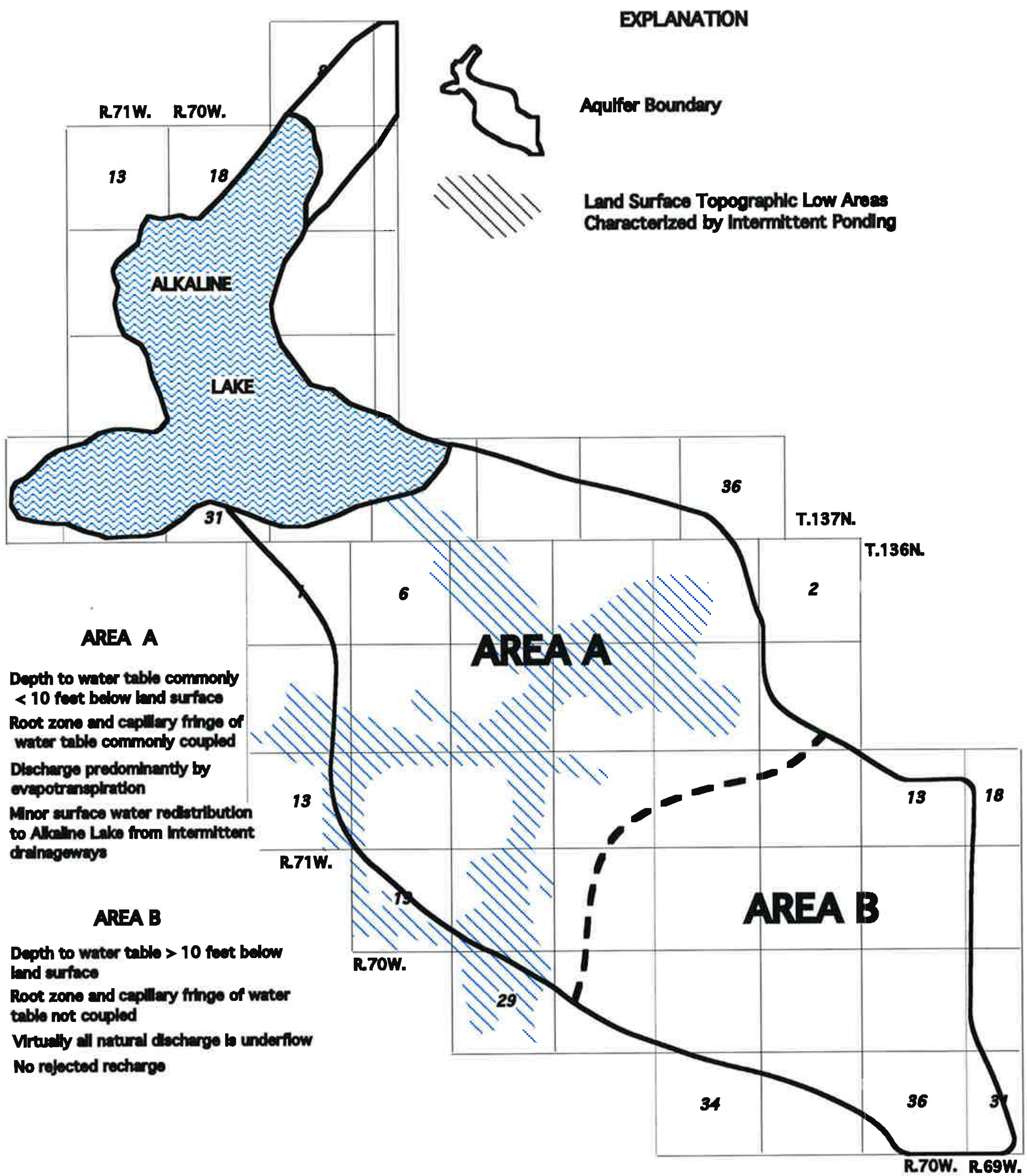


Figure 49. – Areas of natural discharge and rejected recharge in the Streeter aquifer

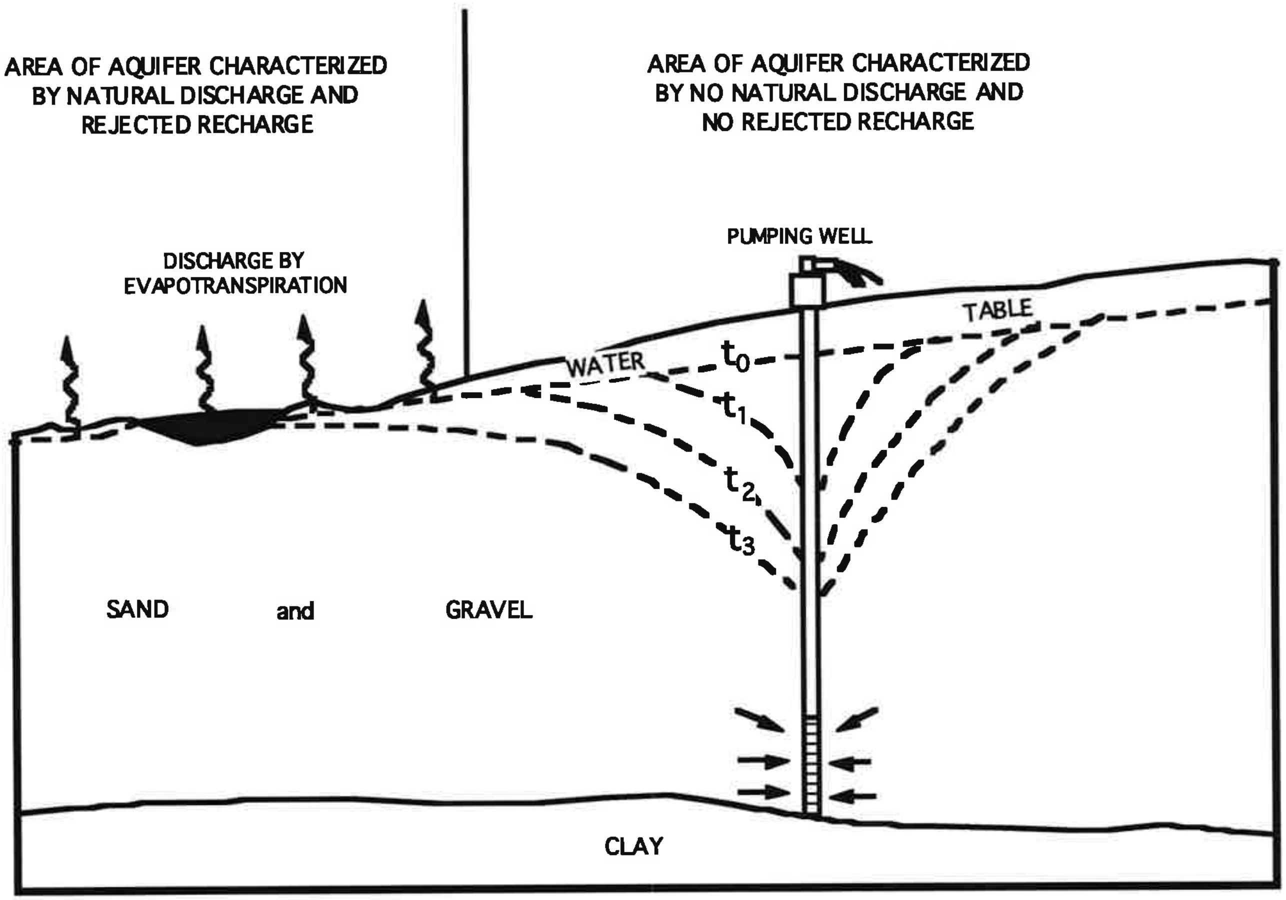


Figure 50. -- Schematic diagram showing development of a ground-water capture area in an unconfined aquifer

The overall direction of ground-water flow in the Streeter aquifer is from southeast to northwest toward Alkaline Lake (figs. 21 and 25). The north part of Alkaline Lake may be a terminal discharge area. Locally, ground-water flows toward land-surface topographical low areas that primarily occur in the central and northwest parts of the aquifer. Except during periods of drought, these topographic low areas likely are filled with water and form drainageways that discharge into Alkaline Lake.

Recharge to the Streeter aquifer occurs primarily from relatively direct infiltration of precipitation and snowmelt. Minor amounts of recharge occur as underflow from the surrounding glacial drift comprised predominantly of till and from surface runoff from intermittent streams originating in the adjacent glacial drift uplands (moraines).

Natural discharge from the Streeter aquifer is almost entirely by evapotranspiration. The depth to water table below land surface is less than 10 feet over much of the central and northwest parts of the aquifer. In about one-half of this area of the aquifer, the capillary fringe of the water table and the root zone are coupled. Discharge by evaporation occurs from Alkaline Lake, which is directly or indirectly (by leakage) connected hydraulically to the aquifer. During all but drought periods, areas of the central part of the aquifer are occupied by surface water bodies (intermittent surface drainageways, sloughs, ponds), which are hydraulically connected to the aquifer. Discharge by evaporation also occurs in these areas. As compared to large-scale regional aquifers, the annual volumes of natural recharge and discharge typically are relatively large in relation to the volume of water in storage in the aquifer.

Intermittent drainageways in the central part of the aquifer redistribute ground-water discharge northwest into Alkaline Lake. These intermittent drainageways are also fed by runoff from the south.

The east and southeast parts of the aquifer generally are characterized by water-table depths greater than 10 feet below land surface. Surface-water bodies and intermittent surface drainageways are absent. This part of the aquifer is not characterized by areas of discharge.

Most of the approved and developed ground-water irrigation appropriations are located in the southeast part of the aquifer where discharge from evapotranspiration does not occur and rejected recharge areas are absent (figs. 31 and 49). Therefore, when pumping occurs in this area, steady-state (equilibrium) conditions cannot be established until the capture area extends to the northwest and pumping is balanced by "salvaging" discharge by evapotranspiration at the water table, and by reducing discharge to the drainageways. Until discharge is captured in an amount equal to that pumped, water levels will continue to decline in the pumping area. This means that within the area of influence resulting from pumping, ground-water is removed from storage and local ground-water mining occurs. The diagram in figure 50 illustrates this condition. The position of the "static" water table is shown at time t_o. A production well is located in the part of the aquifer where discharge/rejected recharge areas do not occur. After pumping for period's $t_1$and t_2, the drawdown cone does not reach the part of the aquifer where discharge/rejected recharge occurs. During these time periods, the volume of water pumped is withdrawn entirely from storage and local ground-water mining takes place.

At time t_3, the drawdown cone reaches well into the discharge/rejected recharge area of the aquifer, and when the rate of capture of discharge/rejected recharge equals the rate of well discharge, the drawdown cone ceases to expand (equilibrium is reached) and no additional water is removed from storage in the aquifer. In the example illustrated in figure 50, the saturated thickness of the aquifer in the pumping area is large enough to accommodate the drawdown required for the water table to reach the new steady-state (equilibrium) position. However, if the aquifer in figure 50 was one-half the thickness shown, the water-table drawdown at the well would be excessive, resulting in a yield reduction. To remedy this situation, the pumping rate of the well would have to be reduced or the well would have to be moved closer to the discharge/rejected recharge area, to reduce the drawdown that would occur at the well.

The Streeter aquifer is relatively thin, and as a result, long periods of relatively large-scale ground-water mining are not possible. In short, the level of ground-water withdrawals in the Streeter aquifer is constrained primarily by the speed with which capture of discharge or rejected recharge occurs, and by the saturated thickness in the pumping areas.

There are three factors that determine capture speed of discharge and/or rejected recharge. These are:

1) distance from the pumping area to the discharge/rejected recharge area,
2) aquifer transmissivity, and
3) aquifer storativity.

Bear (1979, p. 322) presents a formula for determining the radius of zero drawdown from a pumping well at any time t (equation 2).

$$r(t) = 1.5\left(\frac{Tt}{S}\right)^{\frac{1}{2}} \qquad (2)$$

where,

$r(t)$ = radius of zero drawdown at time t, in feet

T = aquifer transmissivity in square feet per day

S = aquifer storativity, dimensionless

t = time, in days since pumping began

Note the three variables in equation 2 are the three variables that constrain capture speed. Therefore, by rearranging equation 2 into equation 3, estimates can be made of capture speed, that is when the cone or depression (area of influence) first intersects the discharge area located at some known distance from the pumping well.

$$t = \frac{Sr_{(t)}^2}{2.25T} \tag{3}$$

It is important to note, the above time t represents first contact of the drawdown cone with an area of discharge and/or rejected recharge and not the time it takes for the drawdown cone to stabilize when well discharge is balanced by capturing an equal amount of natural discharge and/or rejected recharge (i.e., equilibrium conditions established). Travel times for the extent (point of zero drawdown) of the drawdown cone at selected distances from a pumping well are summarized in Table 2.

Table 2. – Travel times for extent of a drawdown cone at selected distances from a production well

DISTANCE (Miles)	0.1	0.5	1.0	2.0	3.0	4.0
TIME (Days)	3.9	97	387	1558	3505	62370
TIME (Years)	0.01	0.3	1.1	4.3	9.6	17.1

Transmissivity used to compile travel times in Table 2 was 7,000 ft^2/day, which is the average value from Table 1 for the Streeter aquifer. Storativity was estimated at 0.22.

As can be seen in figure 43, most of the ground-water irrigation development in the Streeter aquifer is located about one to three miles away from areas characterized by natural discharge and/or rejected recharge. From Table 2 travel times for drawdown cones to reach these areas range from about 1 to 10 years.

The existence of the silty-clay/clayey-silt aquitard to the northwest of the irrigation area will facilitate a decrease in travel time in the confined part of the aquifer, because storativity is about three orders of magnitude smaller and travel time is directly proportional to storativity. However, the travel time to capture discharge will be increased in proportion to aquitard diffusivity ($K^l / S^l{}_s$) which links the deeper confined part of the aquifer to the surficial part of the aquifer where natural discharge and/or rejected recharge occurs.

Earlier in this discussion it was pointed out that when the volume of ground water pumped is eventually balanced by capturing discharge and/or rejected recharge, the area of influence (drawdown cone) stabilizes indicating equilibrium conditions (i.e., ground water is no longer removed from storage). In the Streeter aquifer, and other shallow unconfined aquifers in North Dakota, this condition is rarely, if ever, achieved because of climate variability. From season to season, year to year, natural aquifer recharge and discharge vary in response to changes in climate. In addition, and particularly in relation to irrigation use, climate directly affects the volume of irrigation withdrawals from growing season to growing season. Because natural recharge and discharge can be relatively large in relation to aquifer storage, and irrigation withdrawals can be highly variable from growing season to growing season, capture area boundaries and areal drawdown distributions can change rather dramatically from season to season and year to year. This is the main reason why it is difficult to differentiate between natural and anthropogenic effects on water-level hydrographs from shallow, unconfined aquifers in North Dakota.

Two important ramifications of the above discussion are:

1) Single-season well interference calculations using analytical methods should <u>not</u> be used as a basis for the allocation of ground-water in shallow, unconfined aquifers in North Dakota.

2) A water budget approach, which determines the maximum total ground-water allocation based strictly on total aquifer recharge should <u>not</u> be used for allocating ground water in shallow, unconfined aquifers in North Dakota.

Depending on the distance between the pumping and discharge/rejected recharge areas, aquifer transmissivity and storativity, single-season well interference (drawdown) will likely be small in relation to the total equilibrium/quasi-equilibrium drawdown (i.e: when pumping is balanced by capture of discharge and rejected recharge). Using single-season well interference calculations as a basis for determining the maximum ground-water allocation can result in significant over appropriation and severe local ground-water mining in shallow, unconfined aquifers in North Dakota.

The water-budget approach, which determines the maximum ground-water allocation based strictly on total aquifer recharge does not consider aquifer dynamics, i.e. distance between pumping areas and discharge areas and the time required to balance pumping with capture of discharge and/or rejected recharge. Further, this budget approach does not consider aquifer transmissivity and storativity between pumping and discharge/rejected recharge areas, which are major constraints on capture speed of discharge/rejected recharge. Finally, the relationship between capture speed and saturated thickness in the pumping area is not considered. As a result, this water budget approach can result in significant over appropriation and severe local ground-water mining in shallow, unconfined aquifers in North Dakota.

Ground-Water Management in Surficial Unconfined Aquifers – A Fixed or Variable Yield Approach

Given that storage in surficial unconfined aquifers is highly variable over time, a variable yield approach to maximize beneficial use seems appropriate. During wet periods, more water is available for capture and appropriation can be increased. During dry periods, less water is available for capture and appropriation can be decreased.

In the Streeter aquifer from 1993 through 2000, the average water-level rise was about seven feet. Based on a specific yield of 0.22 and an aquifer area of about 31 square miles, this amounts to an increase aquifer storage of about 30,500 acre-feet. During that period a significant amount of this increased storage could be put to beneficial use. In addition, during wet periods, significant areas of the aquifer (central and northwest areas) are ponded or characterized by waterlogged soils preventing agricultural use. Pumping for irrigation or for other consumptive uses during wet periods lowers the water table, thereby reducing the extent and duration of ponded and waterlogged areas, thereby increasing agricultural production.

Given the above, to optimize beneficial use, aquifer yield should ideally vary over time in response to changes in climate and associated aquifer storage. During wet periods ground-water withdrawals increase and during dry periods some pumping is curtailed, and ground-water withdrawals decrease to prevent excessive ground-water mining. However, the aquifer dynamics coupled with legal constraints is not conducive to the goal of optimizing beneficial use by accommodating a variable yield in response to changes in climate.

An example demonstrating this problem is illustrated in figure 51. The aquifer is a shallow, relatively thin, unconfined aquifer of limited areal extent. There are seven irrigation appropriators in the aquifer and they are numbered in order of priority from 1 through 7, number 1 being the most senior appropriator and number 7 being the most junior appropriator. North Dakota, like many other western states, applies the Prior Appropriation Doctrine for allocating water resources. The foundation of the Prior Appropriation Doctrine is – priority in time provides for the superior water right. Thus, during dry periods when ground-water withdrawals need to be reduced, reductions will occur based on priority date, with the appropriator having the most junior priority date being temporarily suspended from pumping.

For discussion sake, assume drought conditions prevail in the area occupied by aquifer A. Ground-water mining is close to lowering water levels to the point where well yields will decline for appropriators 1 and 2. The capture systems of appropriators 1 and 2 cannot be modified to

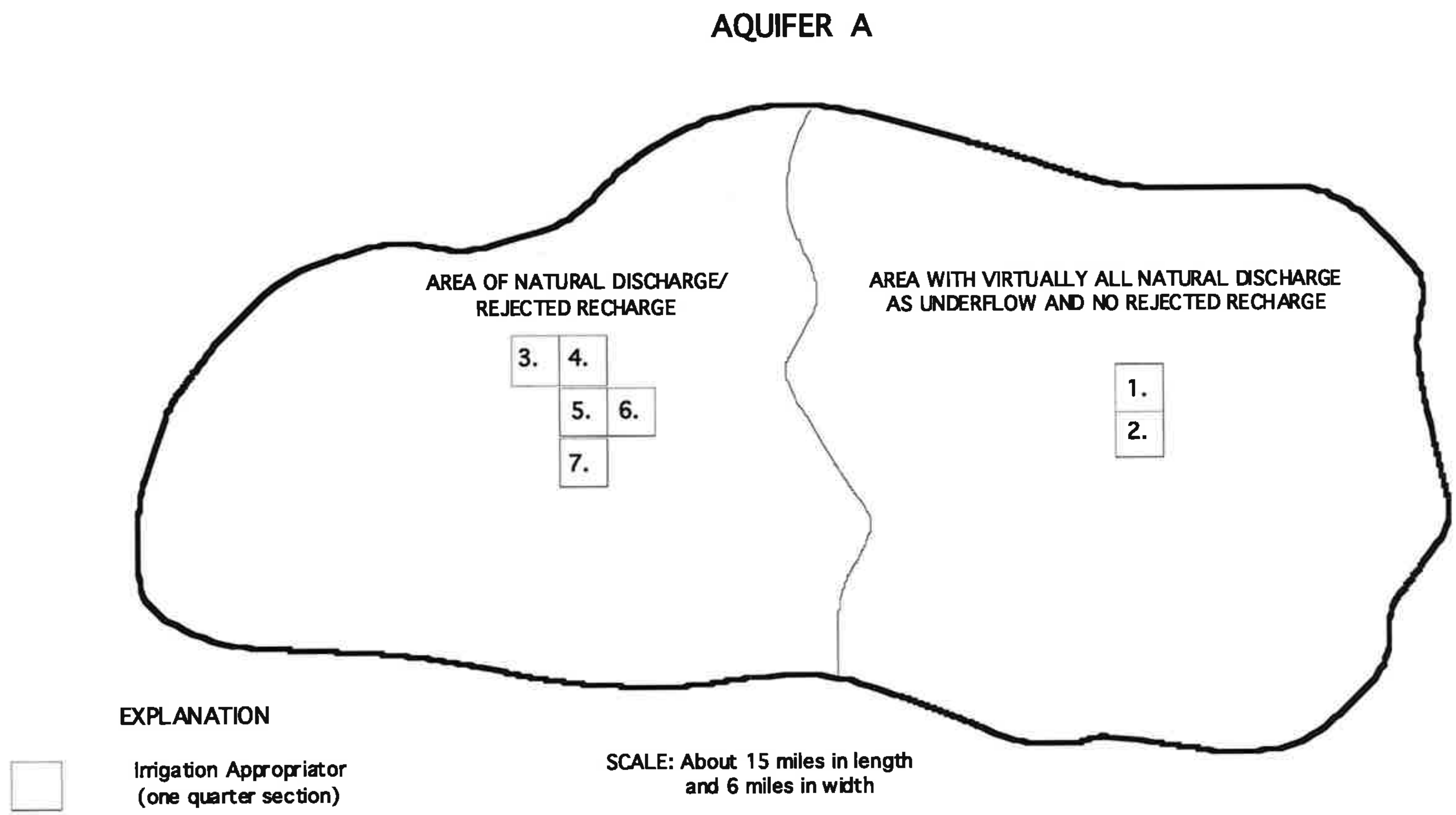


Figure 51. -- Aquifer characterized by a distinct area of natural discharge/rejected recharge

improve capture efficiency. Pumping must be curtailed to mitigate the adverse effects of local ground-water mining. The legal framework (Prior Appropriation Doctrine) mandates that the most junior appropriators must cease pumping. It is conceivable that appropriators 3 through 7 might have to temporarily curtail pumping to mitigate ground-water mining in the area occupied by appropriators 1 and 2. The same level of mitigation could conceivably be achieved by temporarily curtailing pumping only by appropriator 2. In terms of maximizing beneficial use in the aquifer it would obviously be better to temporarily curtail pumping by appropriator 2 rather than by appropriators 3 through 7. Unfortunately, the Prior Appropriation Doctrine will not accommodate this action.

Furthermore, the legal framework does not consider aquifer dynamics in restricting pumping during periods of drought. As previously pointed out, the level of local ground-water mining is constrained by the square of the distance between pumping area and area of discharge/rejected recharge capture, and the transmissivity and storativity of the aquifer between these two areas. These same variables also constrain the time it takes for a management action (pumping curtailment) to cause the desired affect (reduction of ground-water mining and associated water-level drawdown) in the mitigation area. The greater the distance, the smaller the transmissivity, and larger the storativity between the management action area and the mitigation area, the longer the time required to accomplish the desired effect.

Unconfined aquifers of glacio-fluvial origin in North Dakota have storativities ranging from about 0.20 to 0.25. These large storativities, coupled with some relatively large distances between the management action area and the mitigation area (commonly a few miles or more) translate to significant lag times (commonly between 1 to 10 years) for the desired effect to occur in the mitigation area. During this lag period, climate may change abruptly by moving into a wet cycle, as in 1993, and the increased recharge coupled with decreased water use during the growing season can mitigate the localized problem of ground-water mining well before the mitigation brought about by curtailing pumping of appropriators 3 through 7. Given the above, the manager can over react by temporarily curtailing pumping too soon, under react by not curtailing pumping soon enough, or react at the right time by temporarily curtailing pumping and achieving the desired effect in the mitigation area. The closer the action area is to the mitigation area, the better the chances of reacting at the right time and achieving the desired water level outcome.

The above three outcomes are constrained in large part by climate. Thus, an important basis for making any of the above management decisions is the ability to predict future climate. This poses a major stumbling block for ground-water management in relatively thin, shallow, unconfined aquifers in North Dakota. Precipitation data is nonstationary. This means, for example, that the statistical mean annual precipitation changes over time. Having annual precipitation data for the past 100 years does not provide a basis for statistically predicting with any degree of certainty annual precipitation amounts for the next 100 years.

Annual precipitation amounts are not statistically independent. The lengths of both wet and dry cycles are affected by internal feedback mechanisms. For example, anomalously large amounts of moisture from gulf air masses can be imported to North Dakota to initiate a wet cycle. Additional moisture available for evapotranspiration from surface and ground-water sources is recycled locally into the atmosphere during the growing season. This produces convective thunderstorms, which release significant amounts of precipitation back to the land surface and through infiltration to the subsurface. Convective thunderstorms are an important source of precipitation throughout North Dakota during the growing season. Given the above, conventional statistical methods used to predict future precipitation trends are not valid because annual precipitation amounts are not statistically independent.

Even if annual precipitation data were stationary and statistically independent, a major problem exists with regard to predicting timing of precipitation. We are just beginning to understand and evaluate the effects of insolation variability, ocean circulation, volcanic activity and other climate forcing.

An example of climate predictive uncertainty is presented using Napoleon station precipitation data. The annual and five-year moving average of annual precipitation at Napoleon is shown in figure 4. The period of record shown is from 1901 through 2003. For the years 1993, 1994, and 1995, annual precipitation at Napoleon exceeded 24 inches. A probability plot of annual precipitation from 1901 through 1992 is shown in figure 52. The probability of receiving 24 inches annual precipitation in one year is 3.6 percent (about four times in 100 years). Is there a statistical technique that would have predicted with any degree of certainty in 1992 that in 1993, 1994, and 1995 annual precipitation would exceed 24 inches?

In 1992, water levels in the Streeter aquifer reached their lowest elevation over the period of record (figs. 53-59). During the period from 1988 through 1992 significant local ground-water mining occurred in the southeast part of the aquifer where almost all irrigation development is located. Based on these water-level trends, the State Engineer curtailed pumping of some junior irrigation appropriators to protect the rights of senior appropriators. With the dramatic increase in precipitation/recharge beginning in 1993, local ground-water mining was almost entirely mitigated in the Streeter aquifer. It appears the action to curtail pumping of some junior appropriators was unnecessary. However, the odds of receiving the precipitation amounts from 1993 through 1995 were likely very small. In terms of reducing risk on senior appropriators, the pumping curtailment action was the correct decision given the unpredictability of future climate.

It is clear that aquifer response lag times coupled with uncertainty in climate prediction places additional risk on prior appropriators when a variable yield management plan is used. If you

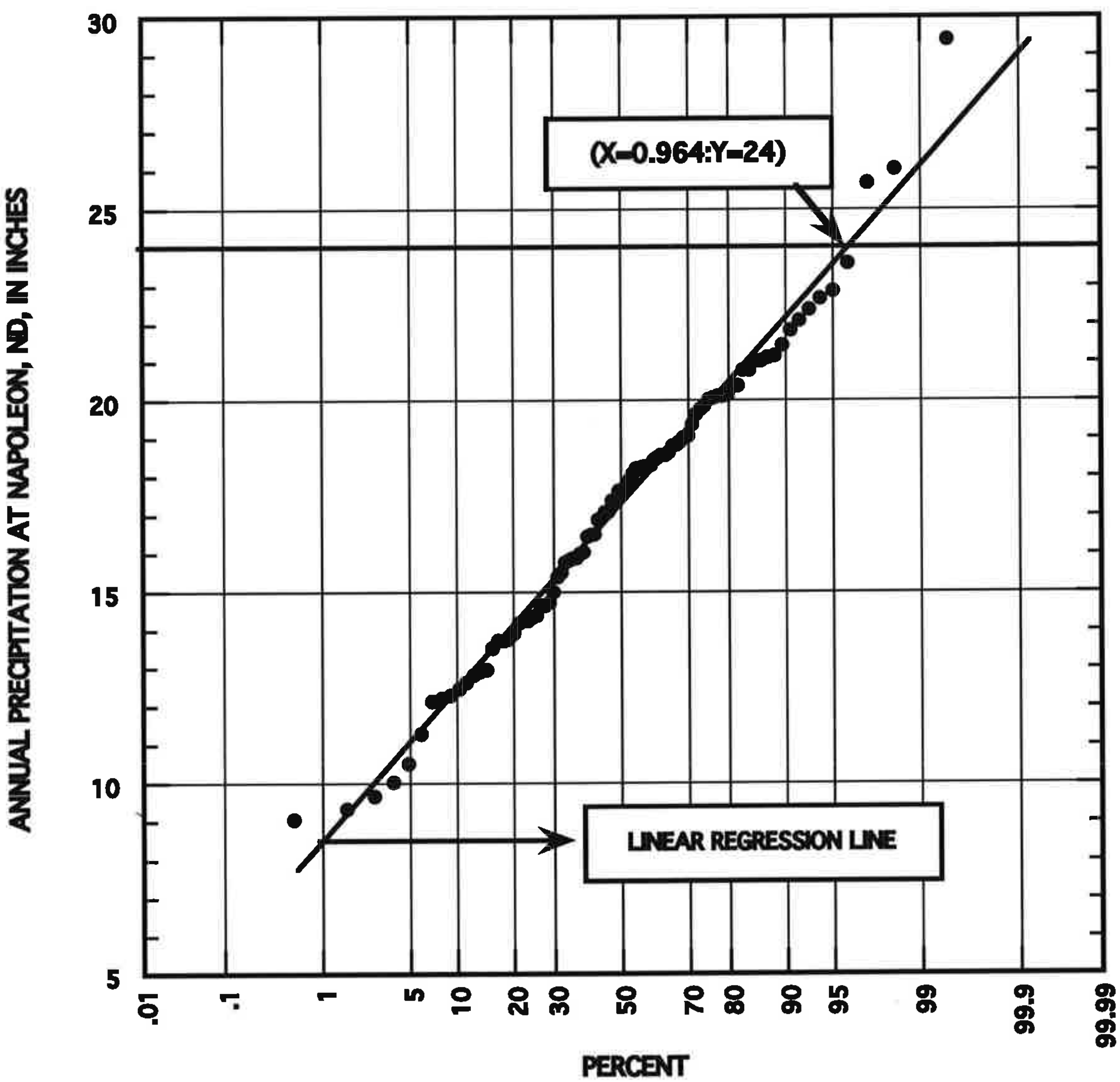


Figure 52. – Probability distribution of annual precipitation at Napoleon, ND, from 1901 through 1992

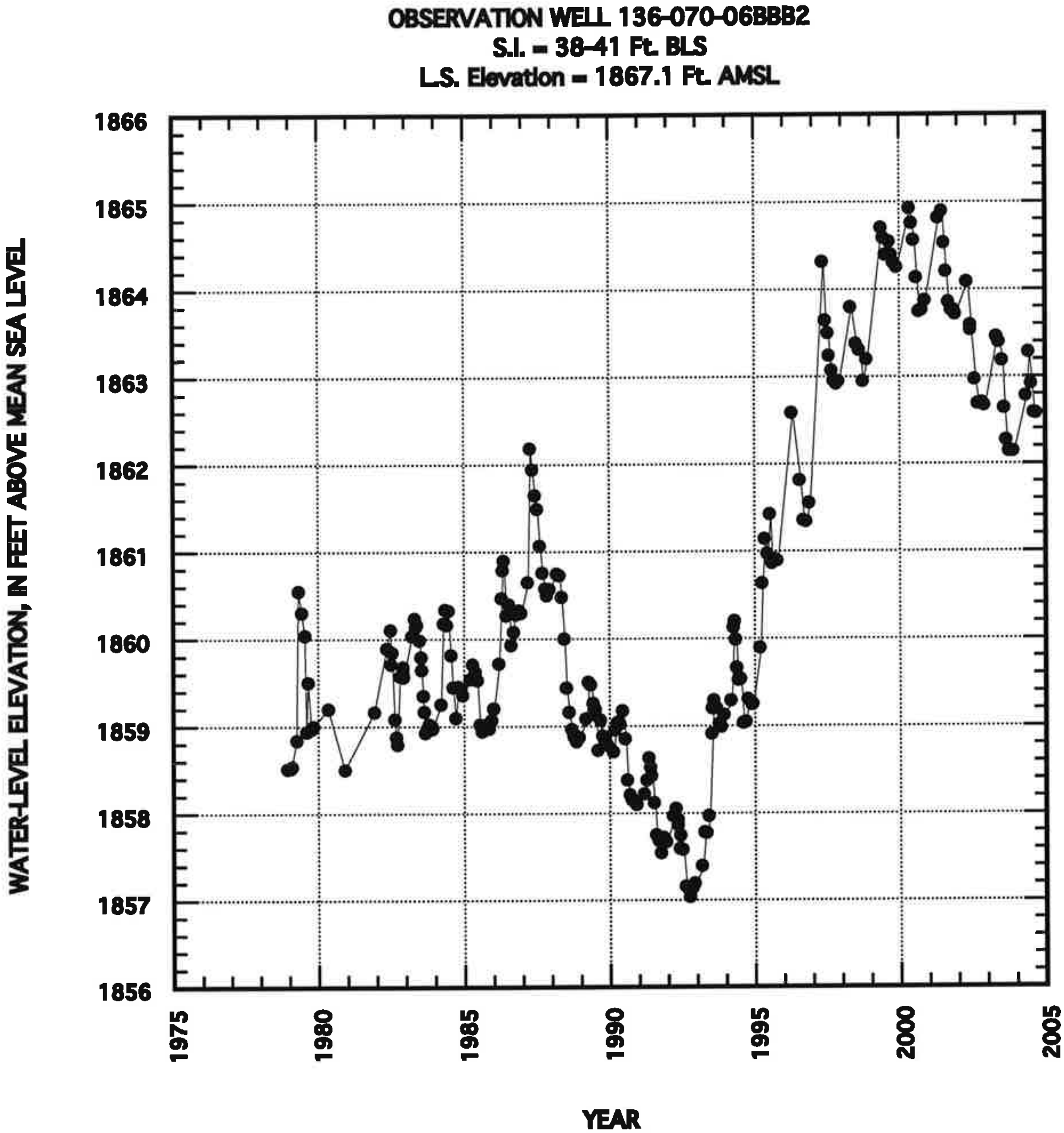


Figure 53. – Hydrograph of observation well 136-070-06BBB2

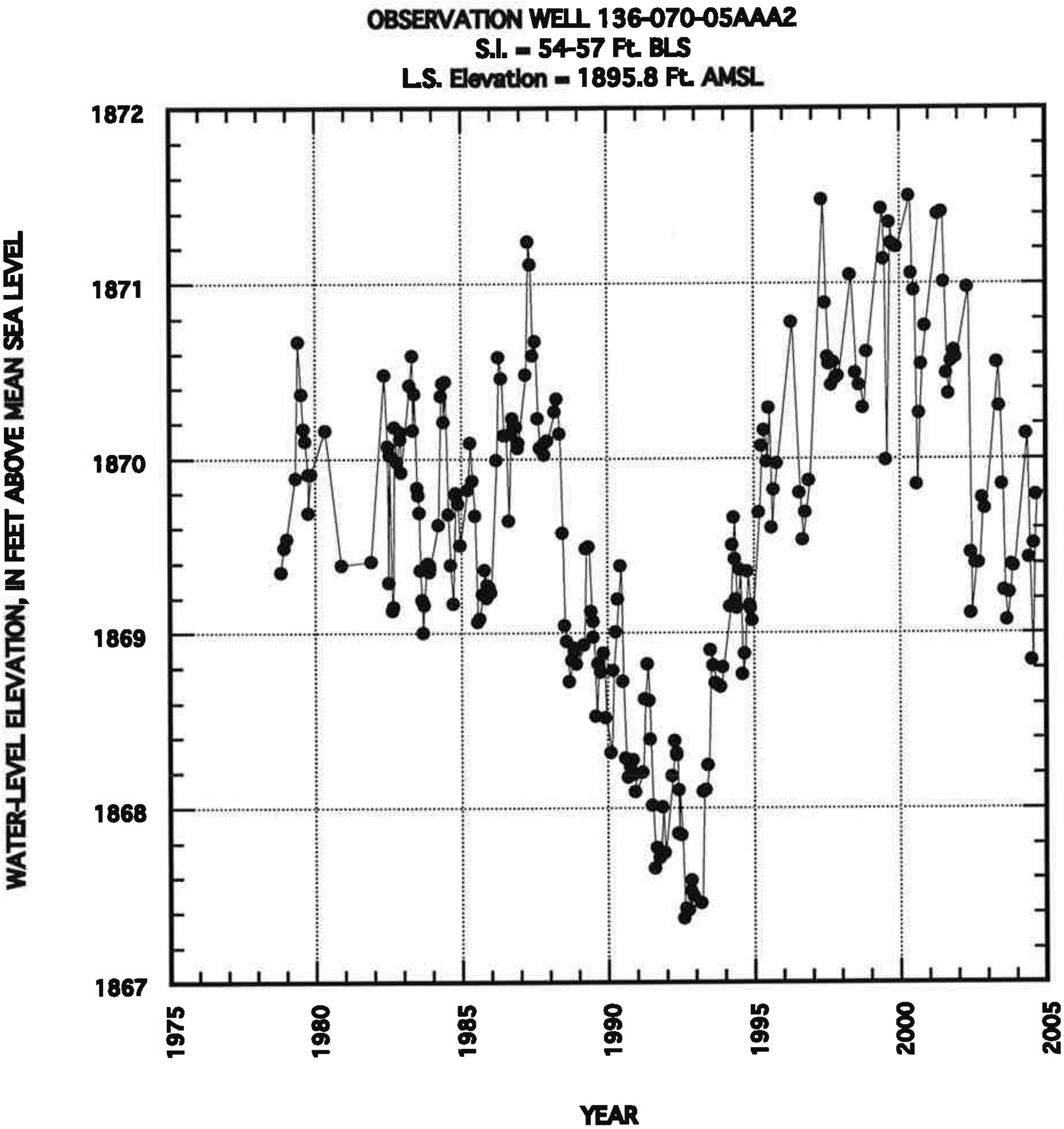


Figure 54. – Hydrograph of observation well 136-070-05AAA2

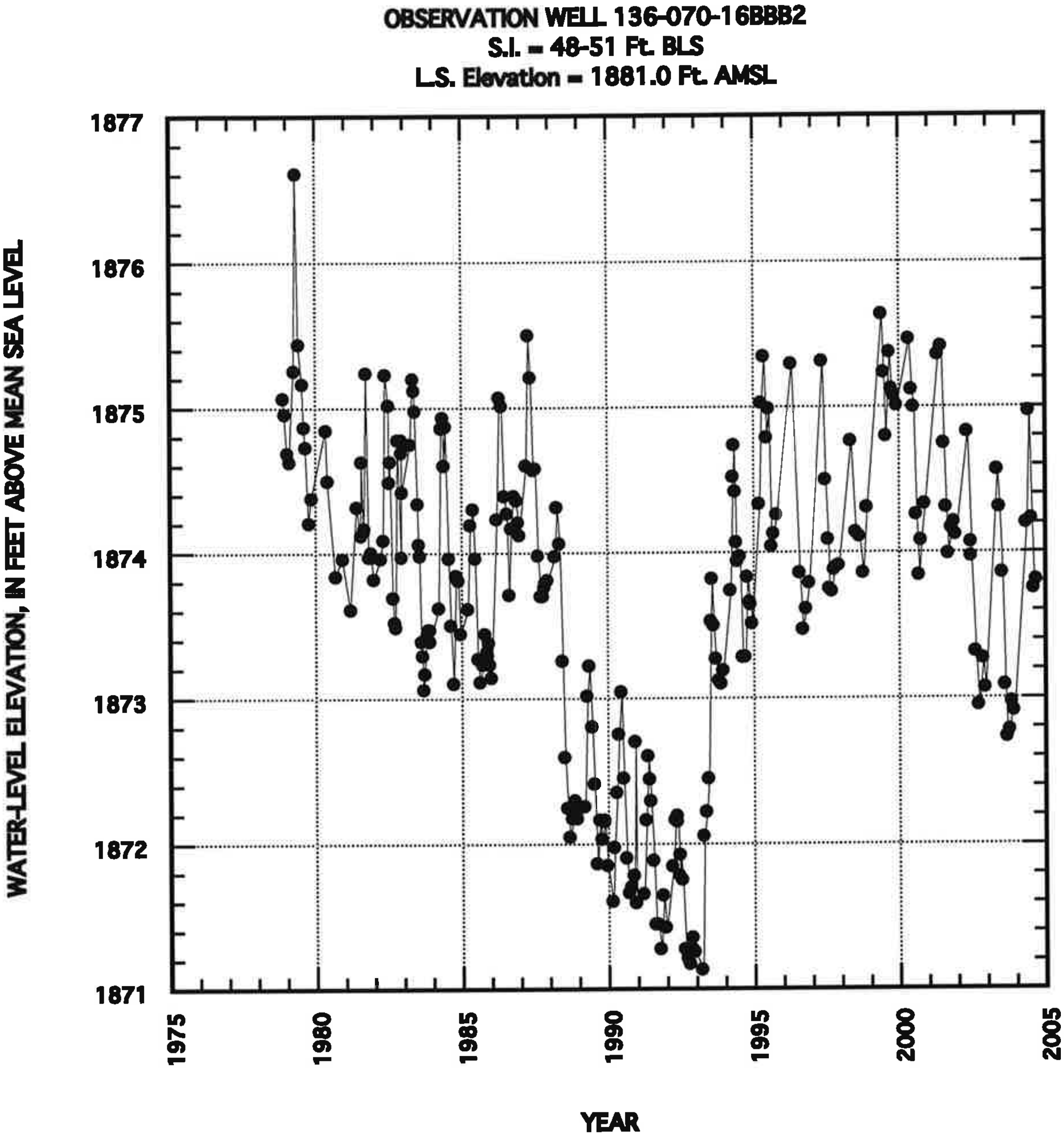


Figure 55. – Hydrograph of observation well 136-070-16BBB2

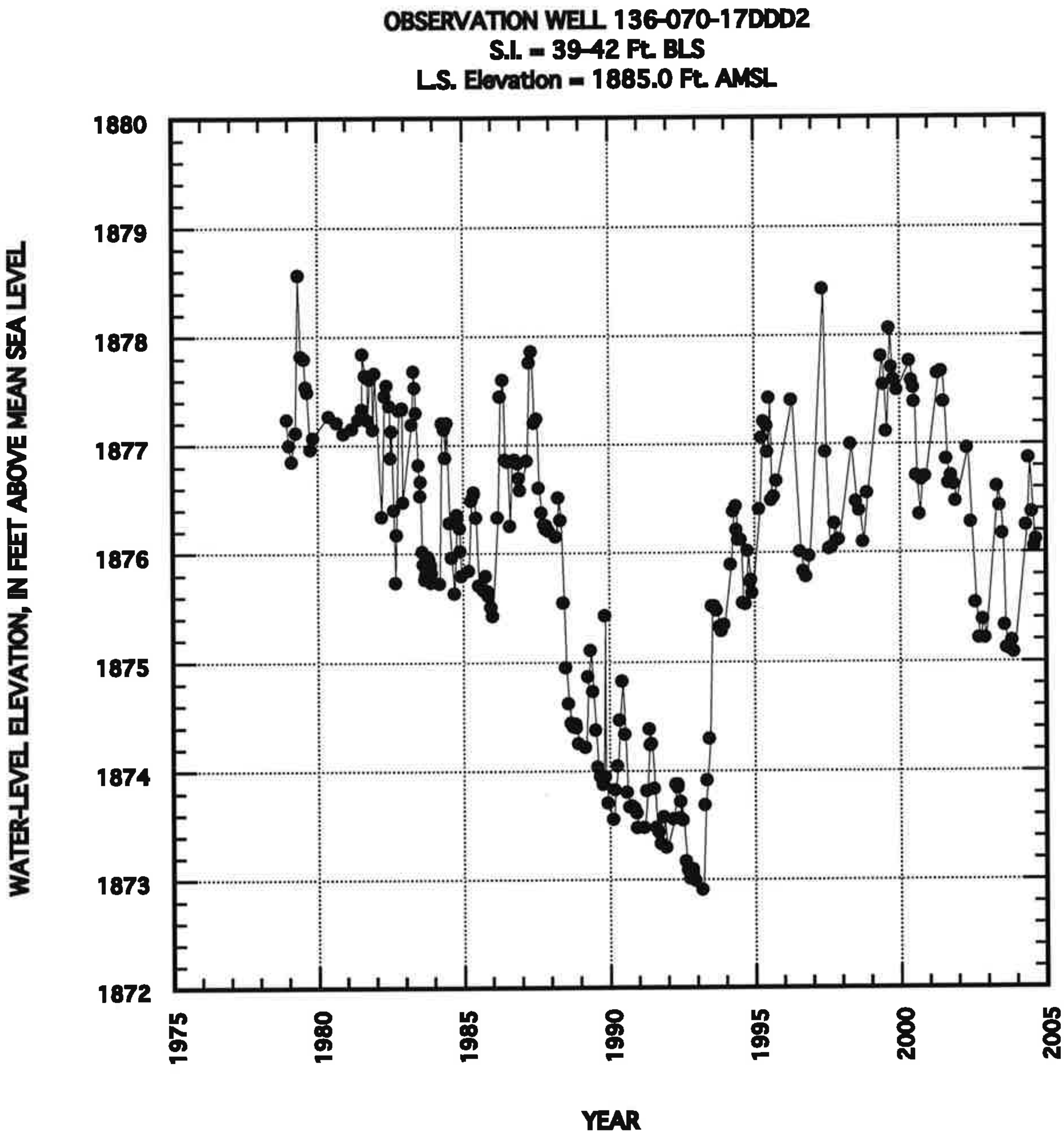


Figure 56. – Hydrograph of observation well 136-070-17DDD2

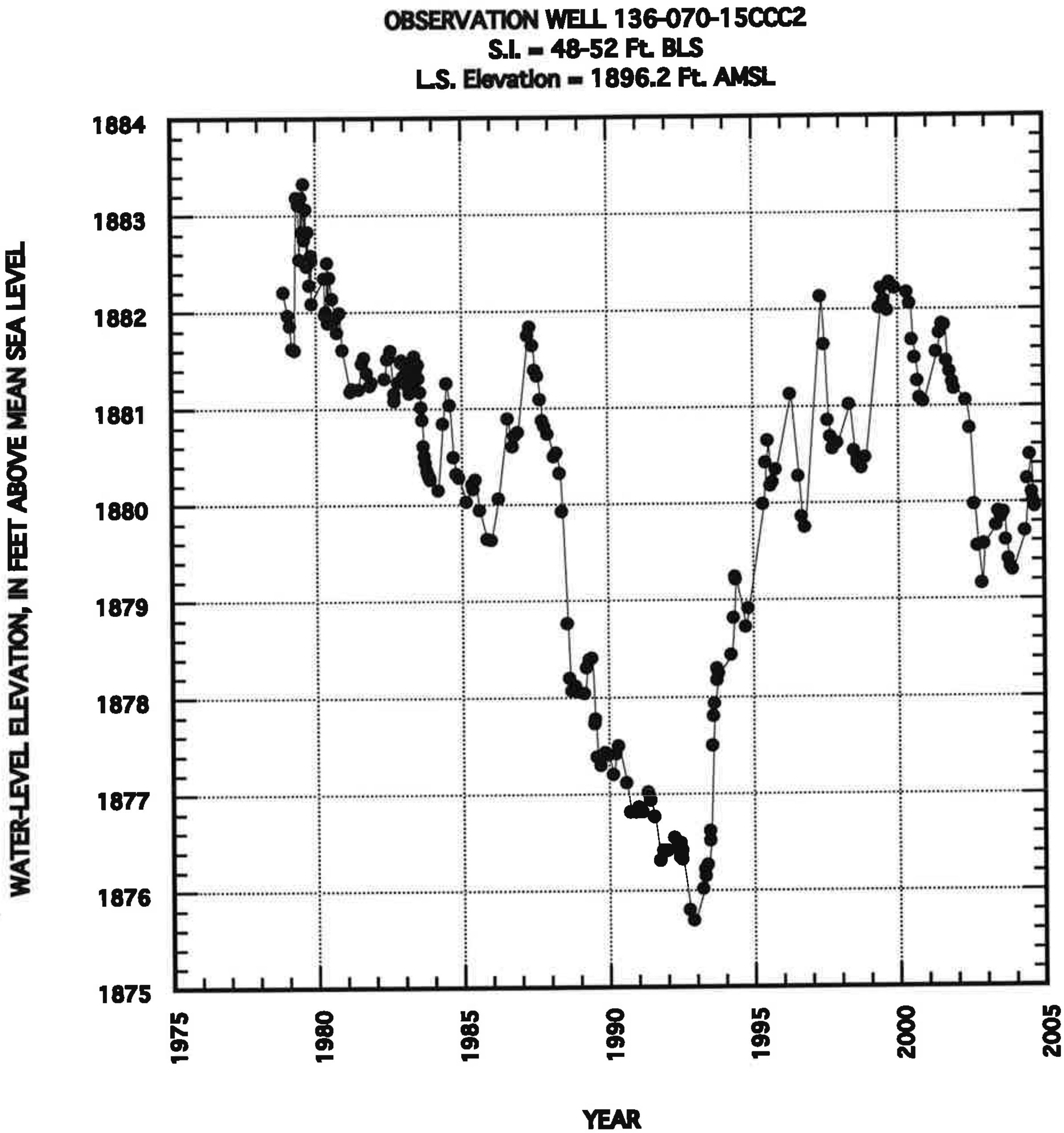


Figure 57. – Hydrograph of observation well 136-070-15CCC2

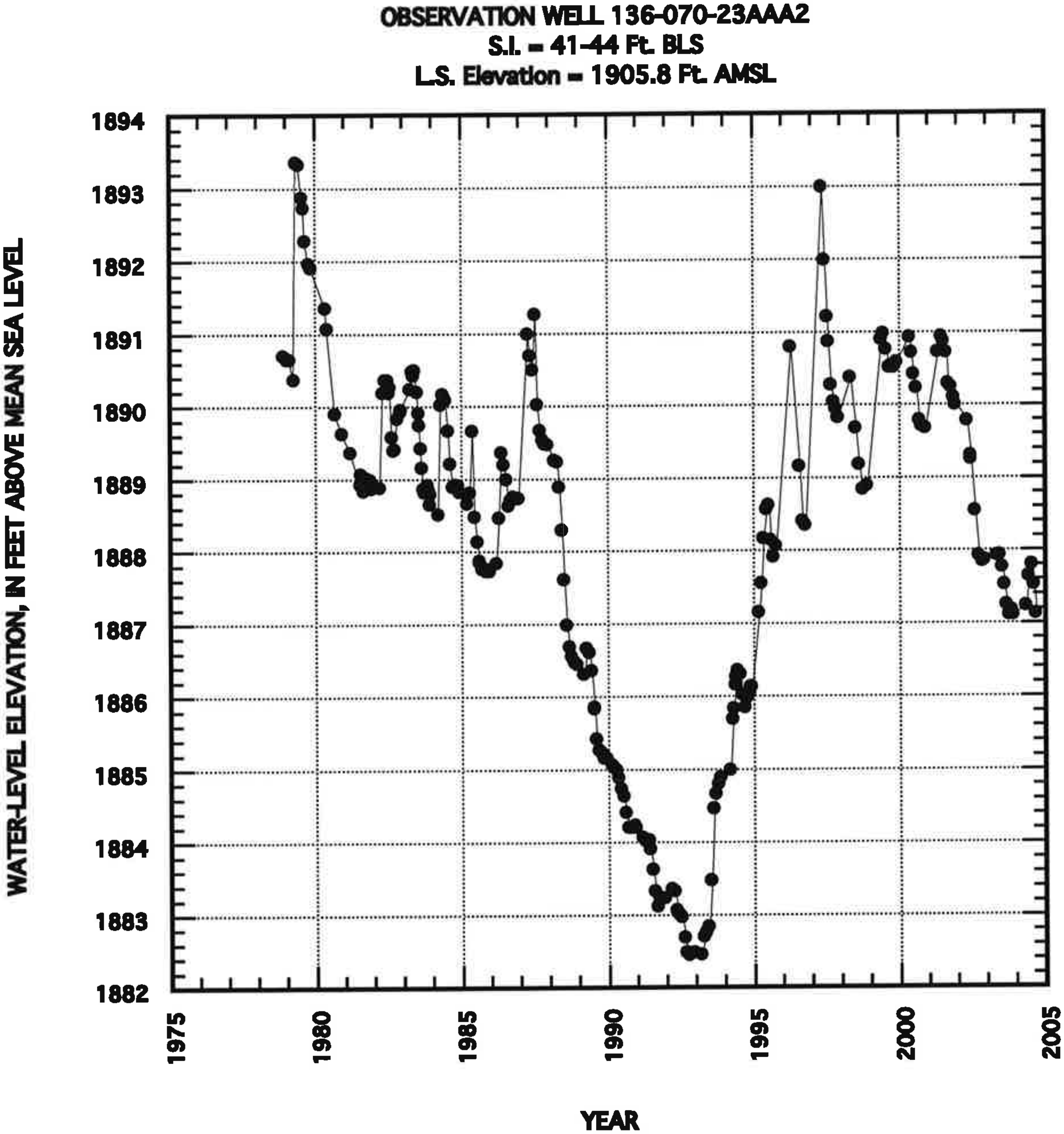


Figure 58. – Hydrograph of observation well 136-070-23AAA2

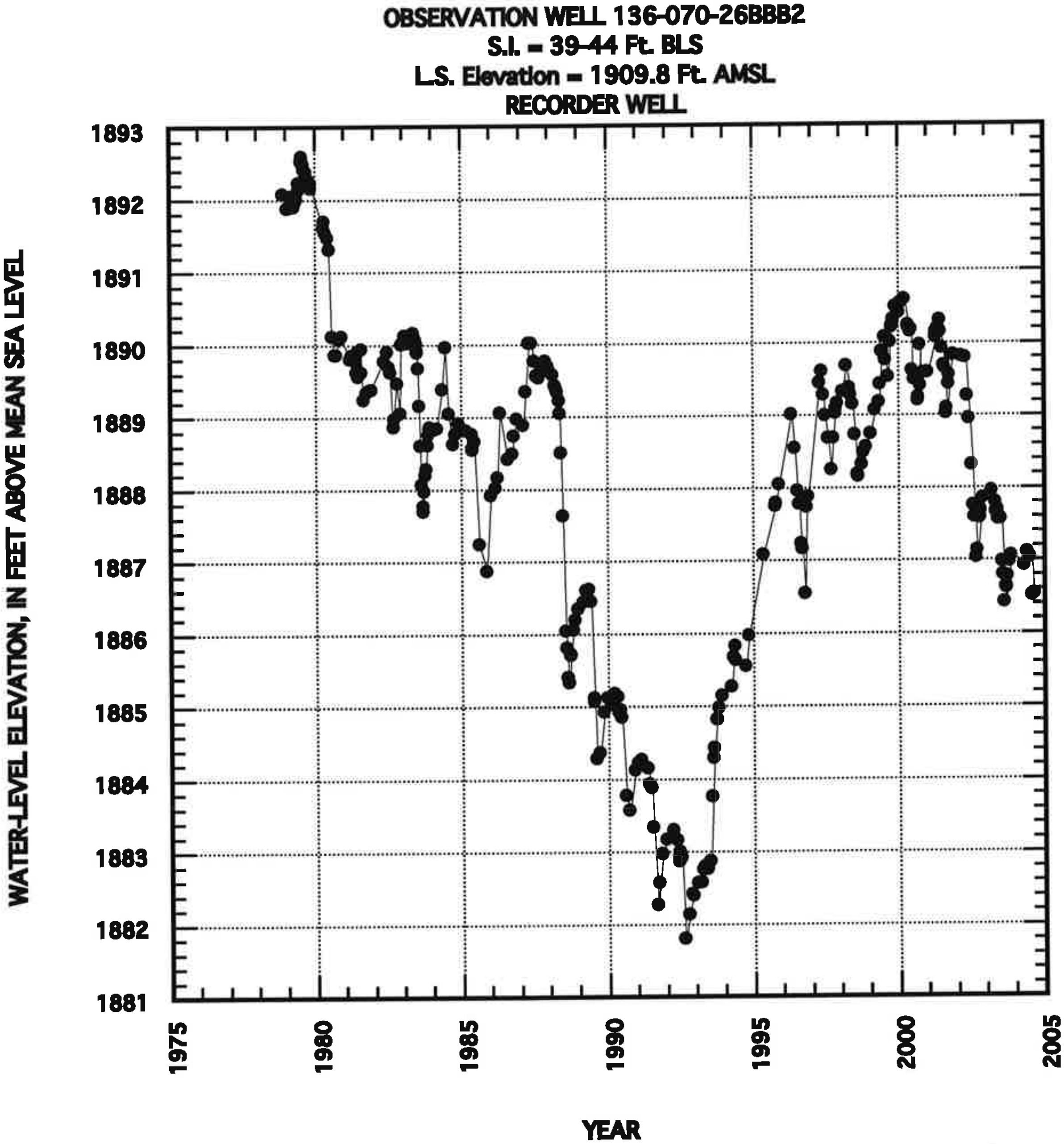


Figure 59. – Hydrograph of observation well 136-070-26BBB2

cannot predict the timing and duration of climate cycles with certainty and aquifer response times are characterized by significant "time lags", then the manager will generally overshoot or undershoot the target water level used as a basis for temporarily increasing or decreasing the amount of ground-water appropriation. When the target water level is unexpectedly exceeded while junior appropriators continue pumping, ground water is captured by these junior appropriators that could have been beneficially used later by senior appropriators as the drought persisted. As a result, during drought periods, the rights of prior appropriators may not be adequately protected as stipulated by law.

Based on the above, a variable-yield management approach is not practical for surficial unconfined aquifers in North Dakota. Due to 1) legal constraints, 2) uncertainty with respect to climate prediction, and 3) aquifer response lag times, prior appropriators cannot be protected to the extent mandated by the Prior Appropriation Doctrine.

Aquifer Hydrochemical Considerations

The previous discussion of aquifer dynamics focused on water-level response to changes in natural inputs (recharge), natural outputs (discharge via ET), and anthropogenic outputs (pumping). The hydrochemical response of an aquifer to pumping is another important management consideration. In some cases, changes in water chemistry may be the most important constraint on the limit of ground-water development.

Dissolved solids in the Streeter aquifer are derived from:

1) dissolution of minerals that comprise the aquifer/unsaturated zone matrix,
2) the atmosphere (precipitation and particulate matter), and
3) anthropogenic sources.

The unsaturated and saturated zones consist of a solid matrix comprised of various minerals. As water infiltrates through the unsaturated zone and moves though the saturated zone, these minerals dissolve and ions are mobilized. Dissolved solids also occur in precipitation and are directly delivered to the ground-water flow system. Salts can also be introduced to the ground-water flow system by dry atmospheric deposition of windblown dust and particulate matter. Finally, dissolved solids can be introduced into the aquifer system by anthropogenic sources, which include land-fills, septic system tile drain fields, feedlots, and agricultural chemicals. Agricultural chemicals probably are the primary anthropogenic source of dissolved solids in the Streeter aquifer.

There are three general hydrochemical areas in relatively thin, shallow, unconfined aquifers in North Dakota where discharge occurs primarily by evapotranspiration. These are:

1) net recharge areas,
2) transition areas, and
3) net discharge areas.

These hydrochemical areas are differentiated based on the relationship between the root zone and the capillary fringe (rise) of the water table. Each of these areas is characterized by a relatively distinct hydrochemical facies.

Net recharge areas occur in land-surface topographic uplands and are characterized by a plant-root zone that does not intersect the capillary fringe of the water table. In these areas, the water table and root zone are decoupled. Salts that accumulate in the unsaturated zone during the growing season typically are flushed to the water table on an annual basis. Long-term salt build up in soils in net recharge areas does not occur. These areas are characterized by small dissolved solids concentrations (200-500 mg/L) and calcium-magnesium-bicarbonate type ground waters.

Transition areas occur between net recharge and net discharge areas. During extended wet climatic periods, the water-table capillary rise is within the root zone and the water table and root zone are coupled. Ground-water discharge occurs by evapotranspiration and as a result, salts accumulate in the unsaturated zone and locally at and near the water table. During the wet periods, these areas function as net discharge areas. During extended dry climatic periods, the water-table capillary rise falls below the root zone and the water table and root zone become decoupled. Salts that were deposited in the unsaturated zone when the area functioned as a net discharge area are now flushed downward to the water table and transported toward net discharge areas primarily by advection. Ground water in transition areas typically is characterized by dissolved solids concentrations ranging from about 500 to 1000 mg/L. These ground waters generally are a mixed cation-bicarbonate-sulfate type.

Net discharge areas occur in land-surface topographic lowlands (depressions) and are characterized by a depth to water-table capillary rise that is less than the root zone depth. In these areas, the water table and root zone are strongly coupled. These areas commonly are marshy and are occupied by surface water, particularly during wet periods. Net discharge areas represent areas of salt accumulation by concentration due to evapotranspiration. Dissolved-solids concentrations in ground water in these areas typically range from about 1,000 to 20,000 mg/L with the dominate hydrochemical facies being a mixed cation to magnesium-sodium-sulfate type.

In the Streeter aquifer, and many other shallow water table aquifers in North Dakota, the maximum sustainable level of ground-water withdrawal is a function of how much ground water can be "salvaged" from evapotranspiration resulting in water table/root zone decoupling. Water table/root zone decoupling in net discharge areas over prolonged periods of time allows for the conversion of these net discharge areas to net recharge areas. Pumping wells become new net discharge areas and highly saline ground waters formerly sequestered in the natural net discharge areas is captured by these wells. Additional salts are mobilized in the natural discharge areas as recharge dissolves the highly soluble minerals previously deposited within the soil and aquifer matrix.

Water-quality deterioration is an additional consideration in the previously described water budget myth that would establish the level of ground-water appropriation based strictly on the volume natural recharge. In surficial water-table aquifers where discharge is almost entirely due to evapotranspiration, it is not possible to "salvage" all natural discharge without causing water-quality deterioration to the extent that the water may no longer be usable for the desired application. The water table and root zone must remain coupled most of the time in net discharge areas to prevent salt mobilization. This means that in these areas, ground-water discharge due to evapotranspiration must be preserved. Ground-water divides must be maintained between pumping wells and net discharge areas to prevent capture of highly saline ground water. Therefore, the maximum level of ground-water appropriation must be significantly less than total discharge/rejected recharge. The main target for salvaging discharge from evapotranspiration should be the transition areas of the aquifer and not the net discharge areas.

Pending conditional water permits 5308, 5309, and 5313 are located on a local land-surface topographic upland (fig. 43). This upland is almost entirely surrounded by land-surface topographic low areas that contain wetlands and intermittent drainageways. The chemical character of ground/surface water associated with these wetlands and intermittent drainageways is poorly defined. Very limited data suggests these areas may be characterized by ground/surface water in excess of 2,000 mg/L dissolved solids concentrations (see page 55).

The above local land surface topographic upland area is flanked to the north by Alkaline Lake. Dissolved-solids concentrations of 12 water samples collected on January 10, 2001 range from 2,690 to 2,830 mg/L. The water is a sodium-sulfate type. As previously mentioned, it is inconclusive as to whether Alkaline Lake is a terminal discharge area. Available water-chemistry data collected from Alkaline Lake during the abnormally wet climatic period indicates elevated salinity that could pose a hazard for irrigation applications. If Alkaline Lake is a terminal discharge area, then a substantial salt reservoir (both dissolved and solid) exists in and around the perimeter of the lake. Capture of highly saline ground water may occur during periods of drought if wells are located too close to the lake.

The distribution of dissolved solids in ground/surface waters associated with the wetlands/intermittent drainageways is poorly defined. In addition, the distribution of secondary salt deposits associated with these net discharge areas is poorly defined. Therefore, care must be taken to limit ground-water withdrawals in this area of the Streeter aquifer.

FINITE-DIFFERENCE MODEL OF GROUND-WATER FLOW

The U.S. Geological Survey finite-difference model MODFLOW-96 (McDonald and Harbaugh, 1996) and MODFLOW 2000 (Harbaugh and others, 2000) were used to develop a ground-water flow model for the Streeter aquifer. ArcView GIS software and the Argus graphical user interface software were used as preprocessors to generate MODFLOW-2000 input.

Modeling Approach

Before presenting the model specifics of the Streeter aquifer, a discussion of the modeling approach is in order. The modeling process occurs in three phases:

1) calibration
2) verification
3) prediction

Steady-state simulations are used in the calibration phase to adjust aquifer parameters and boundary conditions to achieve a "goodness of fit" between simulated and observed water levels at a point in time. Transient simulations are used in the verification phase to accommodate variable inputs (recharge) and outputs (discharge) to achieve a "goodness of fit" between simulated and observed water-level response over time. During these two phases, aquifer parameters and boundary conditions are adjusted with the goal of achieving a better "goodness of fit." If the model is accepted as a suitable representation of the physical system, it can then be used to predict transient water-level response to changes in recharge and discharge (both natural and anthropogenic).

Many of the aquifers in North Dakota have 20 to 25 years of water-level response data. This period of record provides a fair range of natural climate variability and associated water use. Achieving acceptable "goodness of fit" with transient simulations over these time periods increases confidence in the values of model parameters and boundary conditions. In addition, many areas have basic climate data for up to about the past 100^{+}_{-} years. This data can be used to evaluate transient water-level response to the current level of development over these time periods.

For most surficial, unconfined aquifers in North Dakota, the three input/output variables are recharge, evapotranspiration, and pumping. Each of these three variables is controlled by soil characteristics and climate. Therefore, a method must be developed to calculate recharge, evapotranspiration, and pumping (water use) using soil and climate data. If the model area is largely uncoupled, that is recharge is not dependent on water-level elevation, then recharge can be estimated external to the model and a reasonable approximation of ET from ground water can be made. The Streeter aquifer meets this assumption with most of the soils overlying the aquifer well drained to excessive drained (fig. 31). The Versatile Soil Moisture Budget Model (VB-2000) (Baier, 2000) was selected for estimating ground water recharge and ET. It can be run using readily available climate data (precipitation and maximum and minimum temperature) and SSVRGO soils data. Cline (NDSWC – unpublished computer programs) has developed pre- and post-processing programs for VB2000 to run the program and generate MODFLOW input. Recharge, evapotranspiration, and irrigation use calculated externally from the model are used as input for long-term transient simulations over the period of climate record. It is these long-term transient simulations that are used to evaluate the sustainable level of ground-water appropriation.

Steady-State Simulation of the Streeter Aquifer

A schematic diagram of a longitudinal profile of the Streeter aquifer model is shown in figure 60. Layers 1 and 3 are simulated hydrogeologic units and the salty-clay/clayey-silt aquitard, layer 2, is a nonsimulated hydrogeologic unit. Hydraulic head solutions are achieved in the simulated layers and not in the nonsimulated layer. The nonsimulated aquitard is treated as a semi-confining unit and quasi-steady vertical flow is assumed to exist through that unit. Storage in the silty-clay/clayey-silt aquitard is considered negligible and the aquitard functions merely as a transmission unit between the two-aquifer layers.

The model area was discretized into 20,230 cells with a length and width of 330 feet. The finite-difference grid consists of 238 rows and 85 columns. The active cells of the aquifer domain are shown in figure 61.

Land-surface elevations were taken from the U.S. Geological Survey Digitable Elevation Model (DEM). The DEMs are a 30-meter grid derived from a mathematical fit of the contours on a 7.5-minute USGS topographic map. Evapotranspiration in MODFLOW-2000 is calculated using a linear decay function, the slope of which is the ratio of maximum ET rate to extinction depth. ET is 100 percent of the specified rate at land surface and decreases to zero at the specified ET extinction depth. Land surface is set to the maximum 30-m grid value occurring within a model node. The extinction depth is set to the elevation range within a node plus a root depth value.

The surficial sand and gravel (layer 1) is thin to absent in land-surface topographic low areas in the north-central and northwest part of the aquifer. In these areas, model cells can go dry

Irrigation Classification

The U.S. Department of Agriculture developed an irrigation classification of water based on the relationship between sodium adsorption ratio and electrical conductivity (U.S. Salinity Laboratory Staff, 1954). The sodium adsorption ratio is referred to as the sodium hazard and the electrical conductivity is referred to as the salinity hazard. The irrigation classification of ground water in the Streeter aquifer is shown in figure 42. Ground water in the Streeter aquifer is characterized by a low sodium hazard and a medium to high salinity hazard. Excessive salinity build-up in the soils overlying the Streeter aquifer can be avoided by proper irrigation management, which would include periodic fall applications to flush salts from the soil profile.

Ground-Water Use

Ground-water use in the Streeter aquifer is for domestic, stock, and irrigation purposes. In relation to irrigation use, domestic/stock use is negligible. To date, the State Engineer has approved the appropriation of 3,216.0 acre-feet of ground water from the Streeter aquifer annually, to irrigate 2,144.0 acres of land (fig. 43). The State Engineer has deferred action on five conditional water permit applications from the Streeter aquifer amounting to a total annual irrigation appropriation of 1,304.0 acre-feet to irrigate 833.5 acres of land.

Ground-water irrigation development in the Streeter aquifer began in 1974. Annual irrigation water use and acres irrigated from 1974 through 2003 is shown in figure 44. The smallest annual use was 133.4 acre-feet to irrigate 130.0 acres in 1974 and the largest annual use was 2,825.3 acre-feet to irrigate 1865.0 acres in 1988. The third driest growing season from 1974 through 2003 was 1988 with May through August precipitation at Napoleon amounting to 5.86 inches.

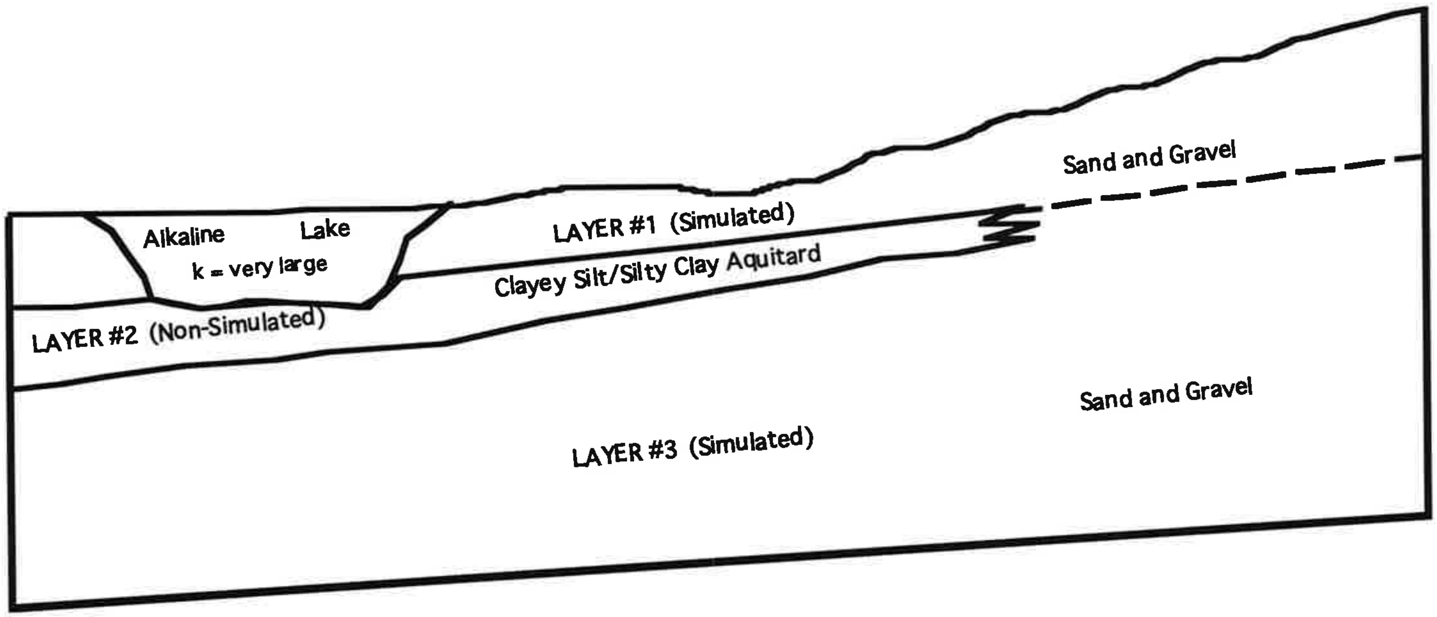


Figure 60. -- Schematic diagram showing model layers along a longitudinal profile of the Streeter aquifer

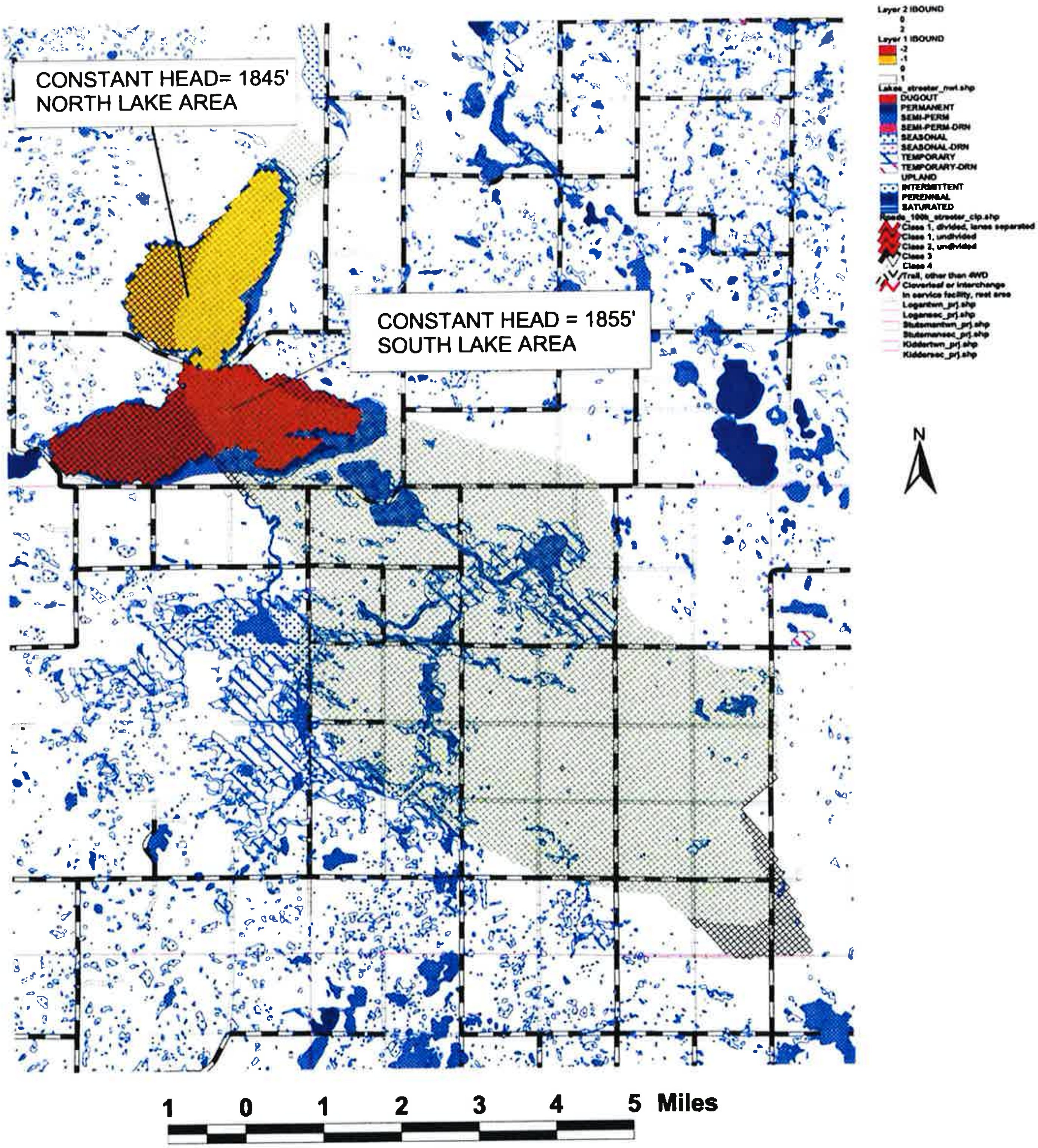


Figure 61. -- Map showing model aquifer domain, active model cells, and location of constant head nodes. [Layer 1 black and where layer 2 underlies layer 1 green.]

and the specified recharge at that cell is therefore not applied. To prevent the omission of recharge, an option in the recharge package is used to apply recharge to the highest active cell in each vertical column.

As previously mentioned, hydraulic conductivity was calculated using specific capacity data from irrigation wells. The irrigation wells where specific capacity data is available are located in the southeast part of the aquifer. A trend of decreasing hydraulic conductivity from southeast to northwest within this irrigation area was identified. Because of large areal gaps in hydraulic conductivity there was little basis to develop variable hydraulic conductivity arrays for layers 1 and 2. The mean hydraulic conductivity in Table 1 was 216 feet per day. A uniform hydraulic conductivity of 200 feet per day was selected for layers 1 and 2.

As previously described, aquitard hydraulic conductivity was calculated using the method of Hantush-Jacob (1955, in Lohman, 1972) applied to aquifer-test data obtained by pumping a production well located at 136-070-04CCC. The average aquitard hydraulic conductivity was calculated at 0.01 Ft/Day. During the "calibration" phase of the modeling analysis, aquitard hydraulic conductivity was varied from 0.01, 0.001, and 0.0001 Ft/Day.

Center-pivot, irrigation withdrawals began in the Streeter aquifer in 1974 (fig. 44). Observation wells were first constructed in the Streeter aquifer in 1978 as part of the Logan County ground-water study. The steady-state simulation was "calibrated" using water levels measured on January 8-9, 1979 in seven observation wells. The observation wells were located at 136-070-05AAA2, -06BBB2,-15CCC2, -16BBB2, -17DDD2, -23AAA2, and -26BBB2 (fig. 62). The January 8-9, 1979 water-levels were selected for "calibration" because these water levels would not be strongly affected by irrigation pumping, which increase significantly in 1981 (fig. 44). Irrigation pumping occurred from 1974 through 1978 in the NE1/4 and NW1/4 of Section 23, Township 136 North, Range 70 West. (Perfected Water Permit #1647) and the NW1/4 of Section 26, Township

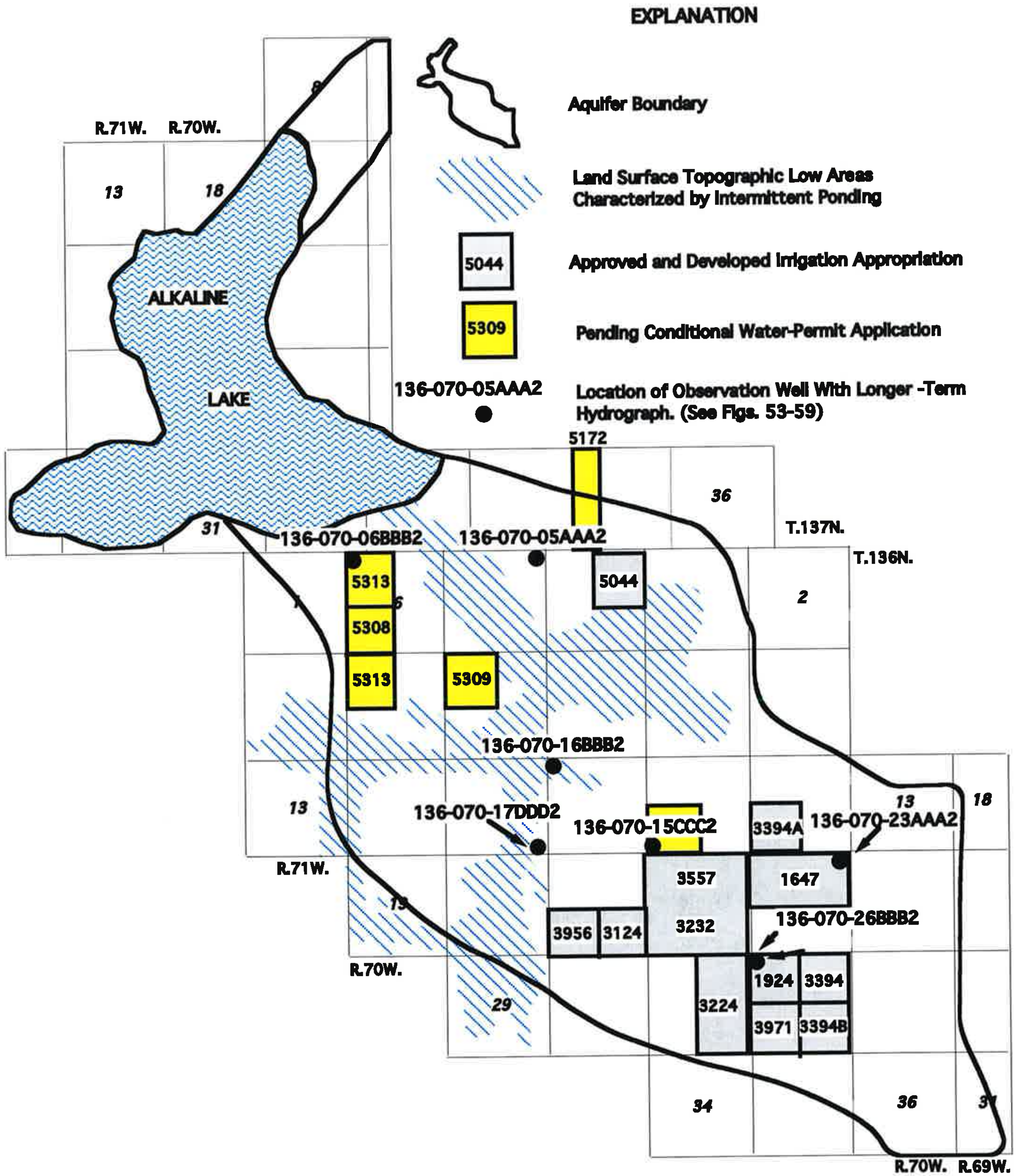


Figure 62. — Location of observation wells with longer-term water-level data and location of irrigation appropriations in the Streeter aquifer

136 North, Range 70 West. (Perfected Water Permit #1924) (fig. 62). This pumping was not accounted for in the steady-state simulations and as a result, simulated water levels at observation wells 136-070-23AAA2 and 136-070-26BBB2 are likely somewhat higher than actual.

The affects of irrigation pumping on aquifer water levels can be seen in the long-term hydrographs of seven observation wells used in the steady-state calibration process. The locations of the seven observation wells are shown in figure 62 and the observation well hydrographs are shown in figures 53 through 59. Observation well 136-070-06BBB2 is the farthest well from large capacity irrigation appropriations (fig. 62). This hydrograph is characterized by contemporary water levels that are about 3 to 4 feet above peak 1979 water levels. Moving to the southeast toward the large concentration of irrigation appropriations, contemporary water levels are close to the peak 1979 water levels. Within the area of irrigation development, contemporary water levels are below peak 1979 water levels (136-070-15CCC2, 23AAA2, and 26BBB2). In addition, the largest amount of water removed from storage (local ground-water mining) from 1988 to 1993 is greater in the irrigation development area (136-070-15CCC2, 23AAA2, and 26BBB2) than other areas of the aquifer. Based on the previous discussion of aquifer dynamics, it is not surprising that observation wells 136-070-23AAA2 and 26BBB2 are characterized by the largest amount of irrigation developmental decline. These two wells are closest to the large block of irrigation appropriators and they are located the farthest from the natural discharge/rejected recharge areas of the aquifer.

Alkaline Lake was simulated by constant head cells in layer 1 (fig. 61). The constant heads for the north and south lakes of 1855 and 1845 respectively, were based on digital elevation model (DEM) data from 1976. The lake DEM values are within ±5 feet (based on a 10-foot contour interval). For the January 1979 steady-state simulation, these constant heads are likely lower than those in January 1979. This relationship is inferred from annual precipitation data (fig. 4) and not actual lake-stage measurements. Lake-stage measurements were not made until May 2001.

Initially, recharge, ET and aquitard hydraulic conductivity were varied to achieve a "goodness of fit" between simulated and measured water levels. Simulated water levels were compared to water levels measured on January 8-9 1979. A comparison of simulated versus measured water-level elevations in the observation well network is shown in figure 63 and the areal distribution of differences between measured and simulated steady-state water levels is shown in figure 64. For this steady-state simulation, the recharge rate was 3.5 inches per year, ET was 22 inches per year, and the aquitard hydraulic conductivity was 0.001 feet per day.

Various methods are available to evaluate error in the calibrated model (Anderson and Woessner, 1992). Evaluation of the root mean squared error (RMS) was selected for this study because the RMS is usually thought to be the best measure of error if the errors are normally distributed. The differences between measured and simulated water levels displays a linear pattern on a probability plot and it is concluded the distribution of water-level differences is normal (fig. 65). The RMS is the square root of the average of the squared differences in measured and simulated water levels and is shown by equation 5.

$$RMS = [(1/N)\sum_{i=1}^{n}(h_m - h_s)_i^2]^{0.5} \qquad (5)$$

where,

N = number of water-level differences

h_m = measured water level

h_s = simulated water level

For the steady-state simulation accounting for irrigation pumping, the RMS error equals 1.61 feet. The total measured head loss in the Streeter aquifer on January 8-9, 1979 was 33.4 feet.

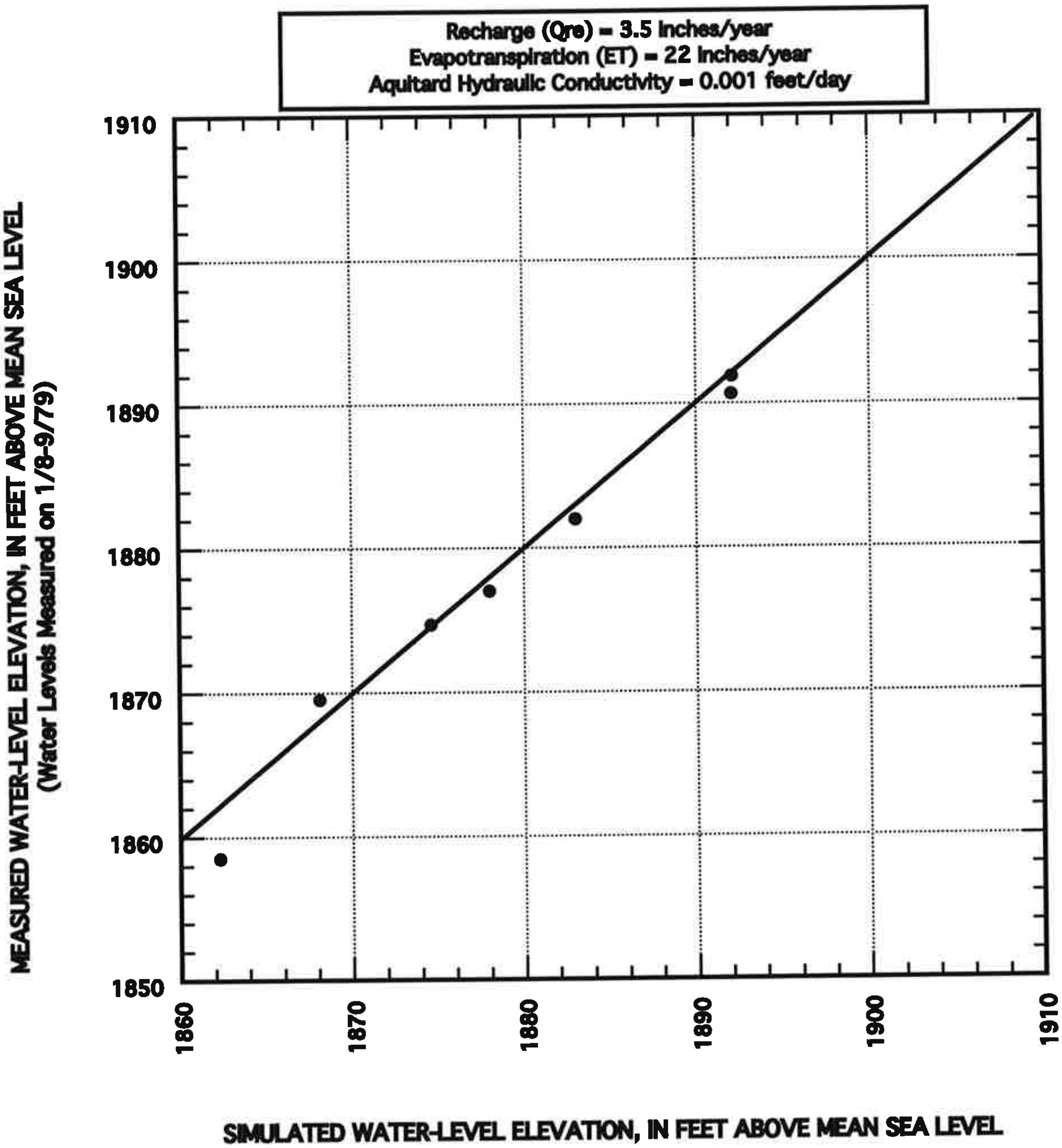


Figure 63. – Comparison of measured and simulated steady-state water levels in the Streeter aquifer

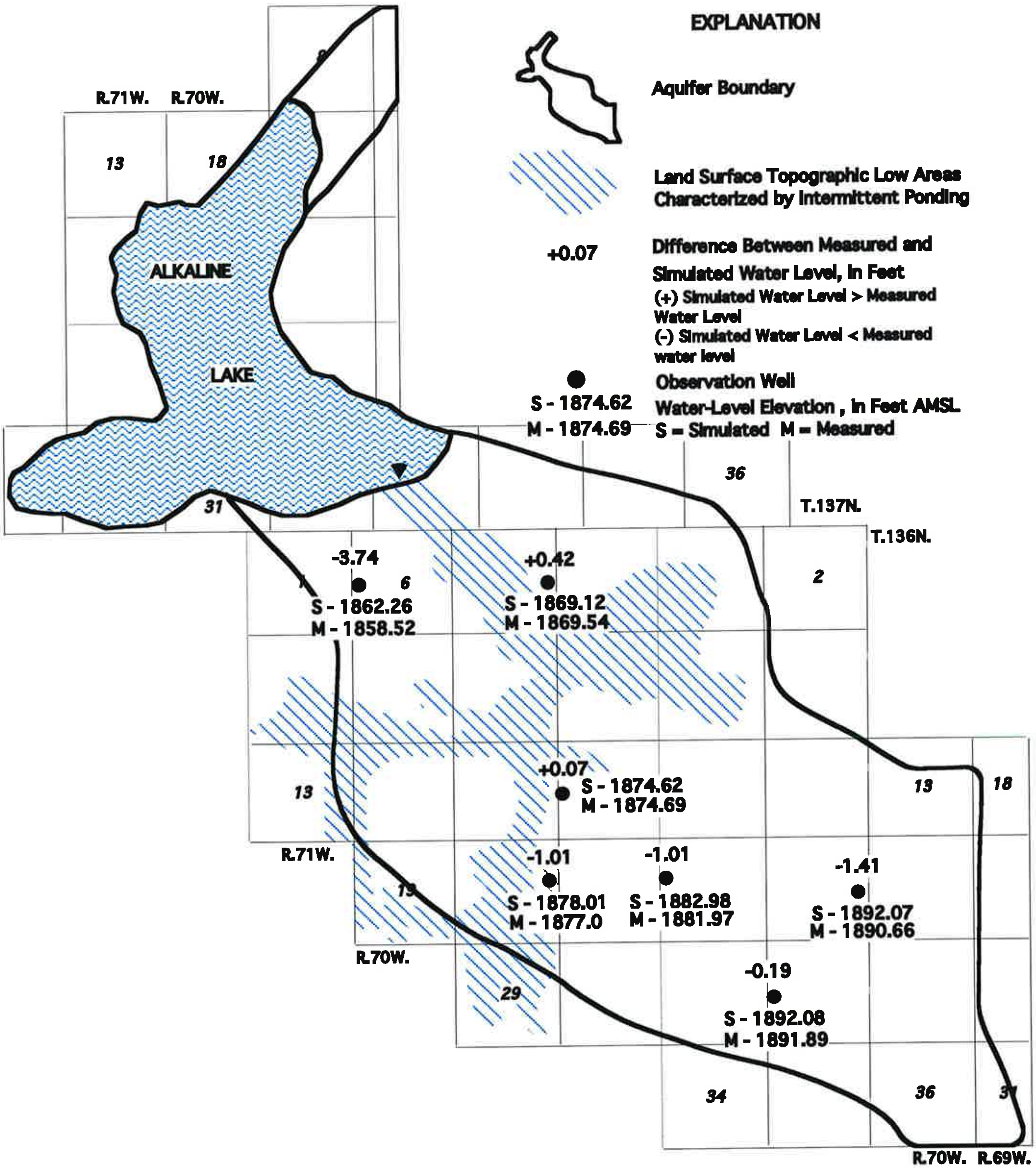


Figure 64. – Difference between simulated steady-state water level and measured water level

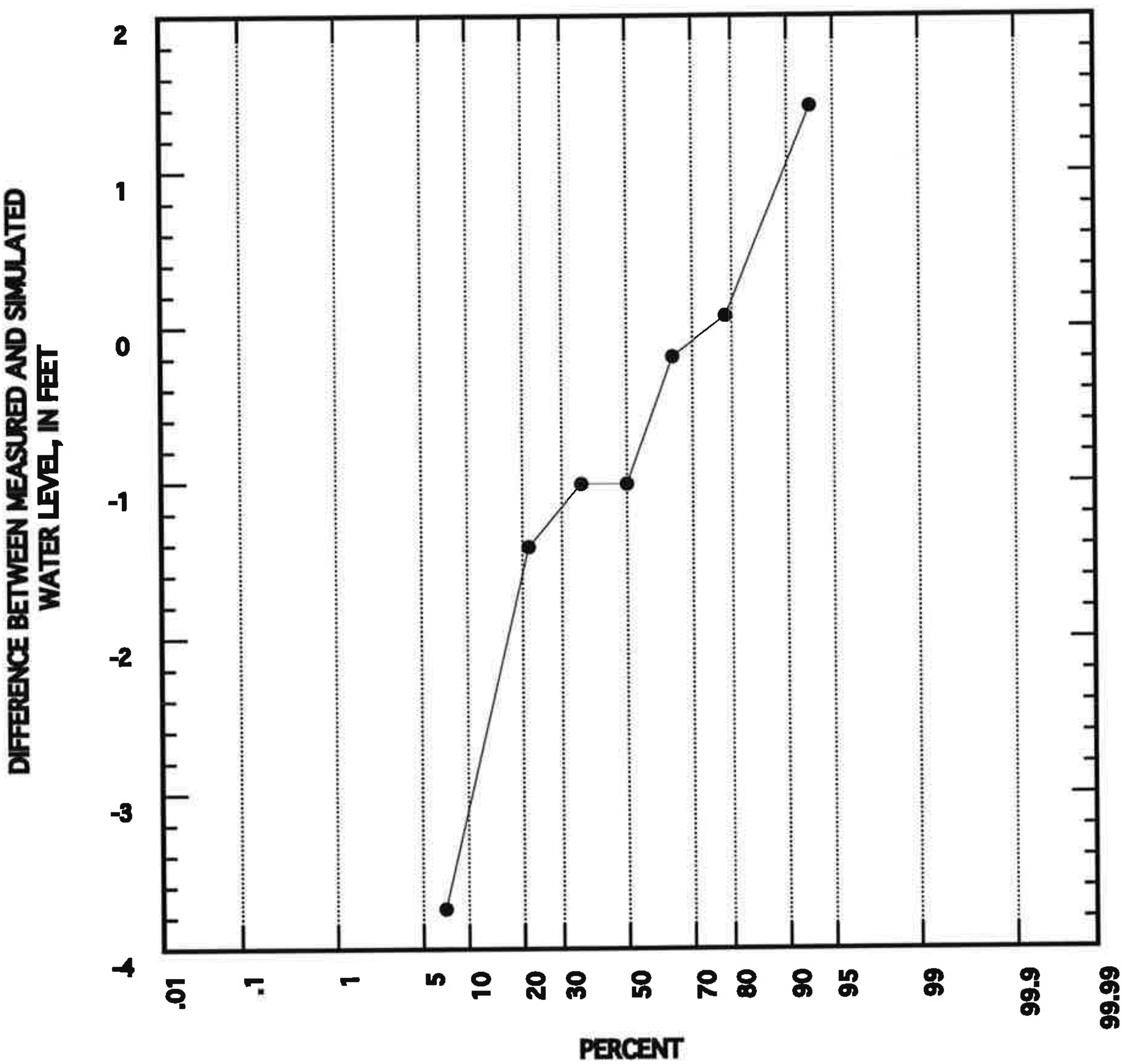


Figure 65. — Probability distribution of differences between measured and simulated steady-state water levels

The ratio of the RMS error to total head loss is 4.8 percent. The model errors are only a small part of the overall model response and it is therefore concluded that overall the steady-state model satisfactorily approximates ground-water level observations.

ZONEBDGT (Harbaugh, 1990) is a computer program for calculating subregional water budgets from MODFLOW budget output. ZONEBDGT is an important tool used to quantify ground-water fluxes into and out of areas delineated in the active model domain. It is particularly useful in assessing areas where ground-water capture occurs in response to pumping. The Streeter aquifer model domain was divided into 16 budget zones, 10 zones in model layer 1 (fig. 66), and six zones in model layer 2 (fig. 67).

Flows into and out of the major budget zones in the steady-state simulation are shown in figure 68. Zones 10 and 16 delineate the southeast part of the Streeter aquifer where the aquitard is absent. In this area of the aquifer the capillary fringe of the water table generally is below the depth of the root zone. As a result, discharge due to evapotranspiration in this area of the aquifer is minor (fig. 68). Discharge from this area of the aquifer occurs mostly as underflow down-gradient to the northwest into zones 6, 9, 12, and 15.

Discharge from the Streeter aquifer occurs as evapotranspiration predominantly in zones 6 and 9 (4,724 acre-feet/yr) (fig. 68). Zones 6 and 9 are characterized by intermittent drainage areas and ponds that drain into Alkaline Lake. The areal distribution of steady-state discharge from evapotranspiration compares favorably with the National Wetlands Inventory Map (fig. 69) and the soil drainage classification map (fig. 31).

Evaluation of Conditional Water Permit #5172

On October 13, 1997, Mr. Leroy Wieland applied for a conditional water permit (#5172) to divert 234.0 acre-feet of ground water annually from a point(s) of diversion located in the

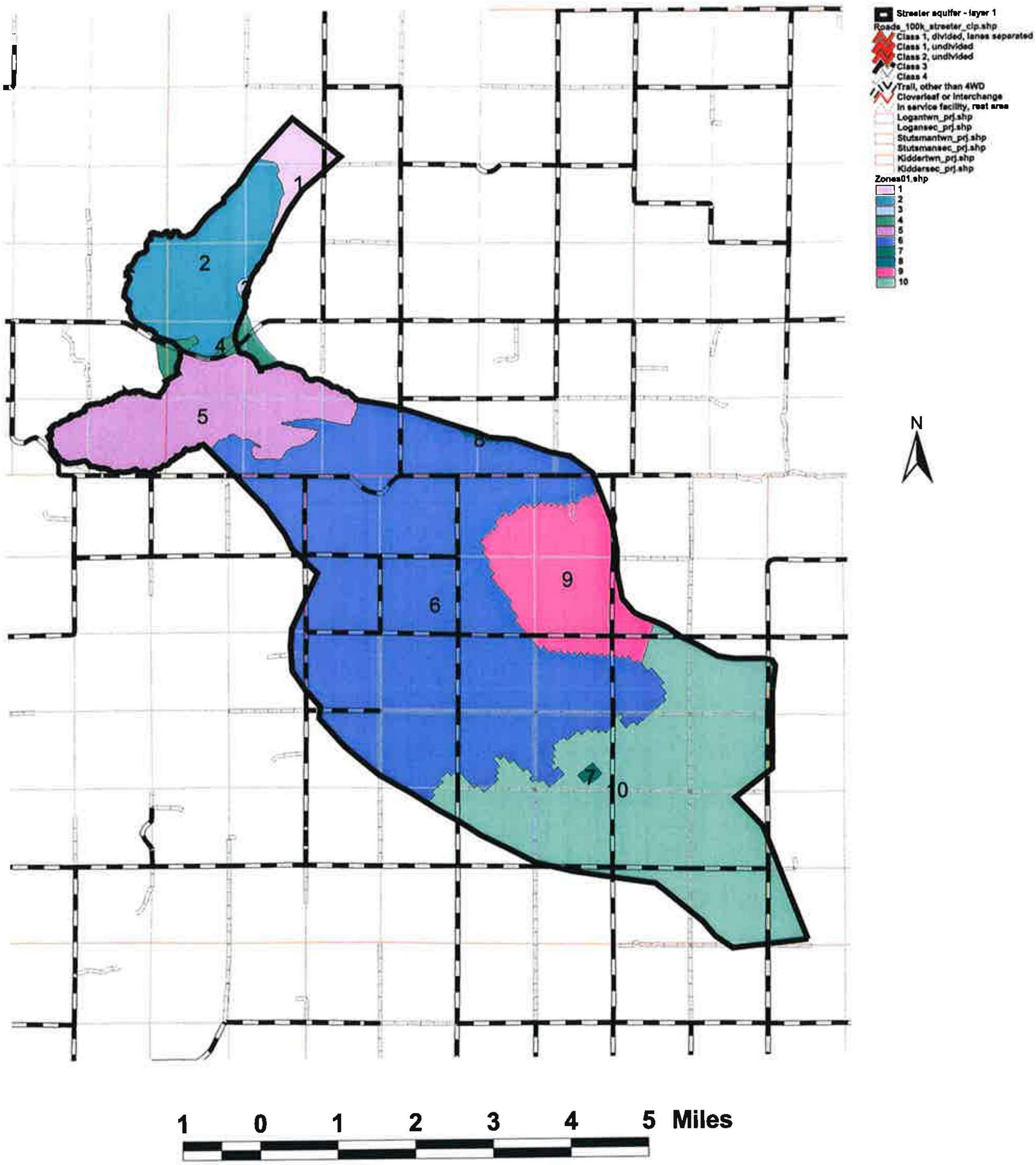


Figure 66 -- Location of zones in model layer #1 as described in ZONEBUDGET.

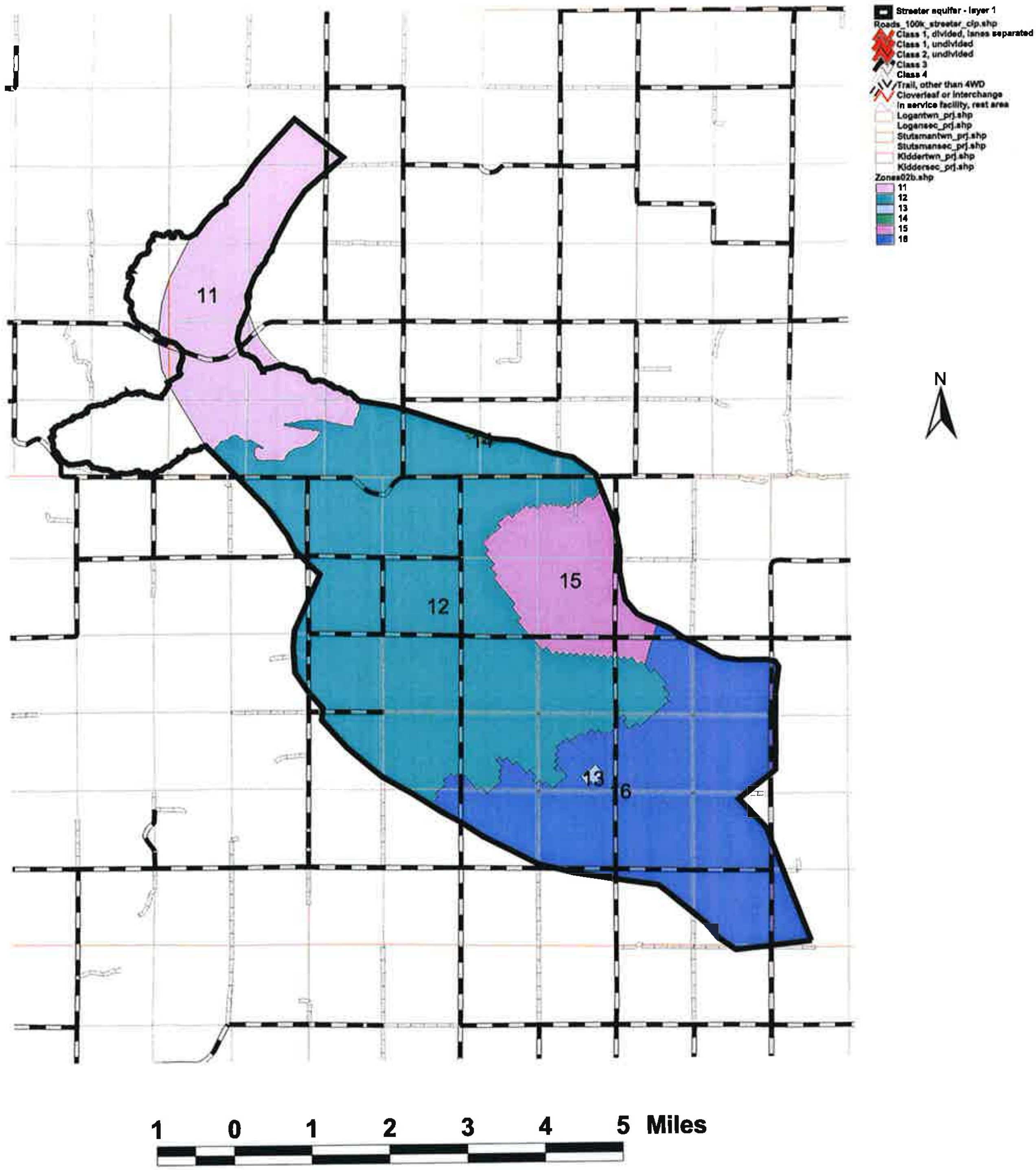


Figure 67 -- Location of zones in model layer #2 as described in ZONEBUDGET.

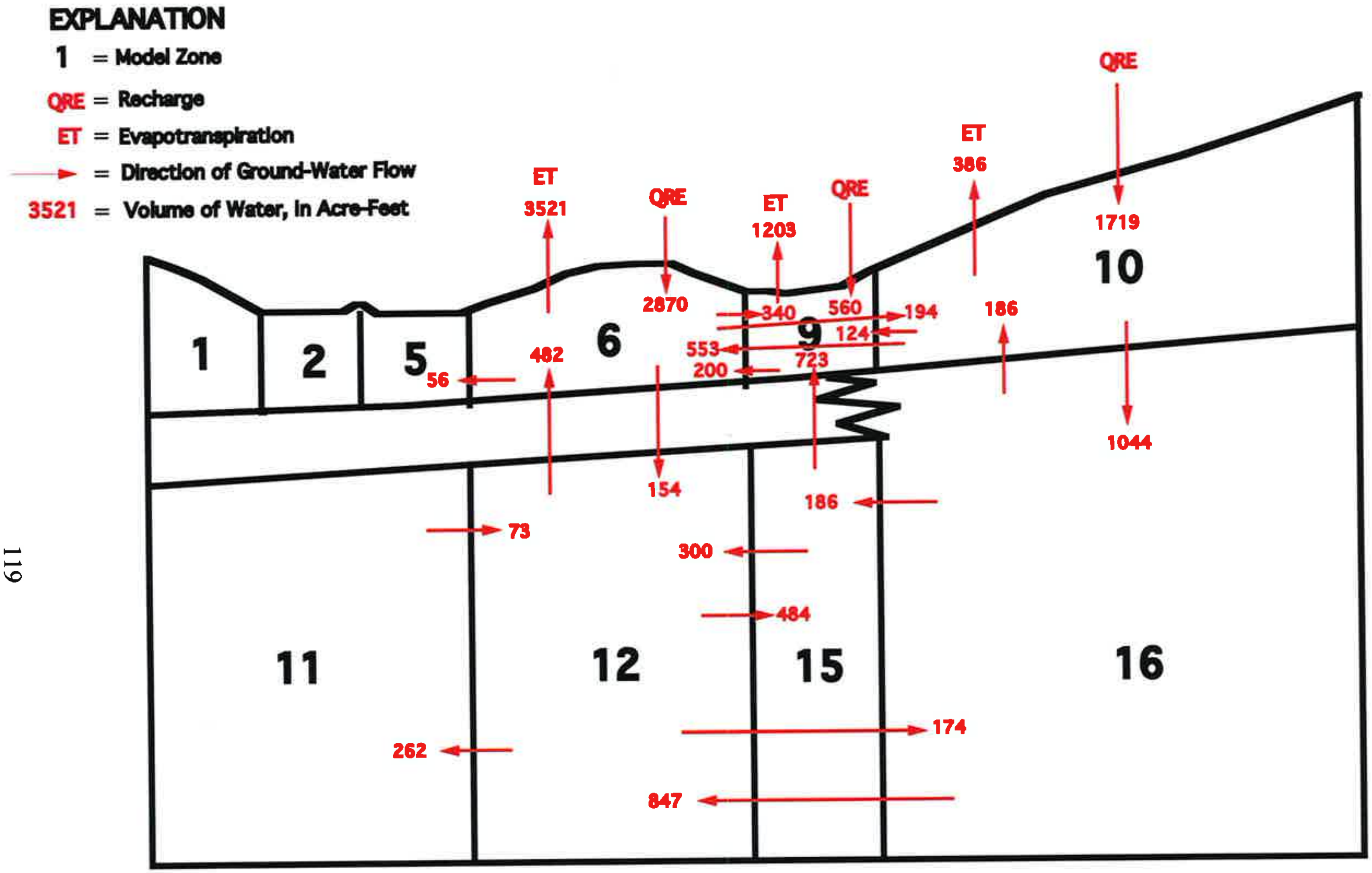


Figure 68. – Movement of water in acre-feet, into and out of major zones in the Streeter aquifer model area

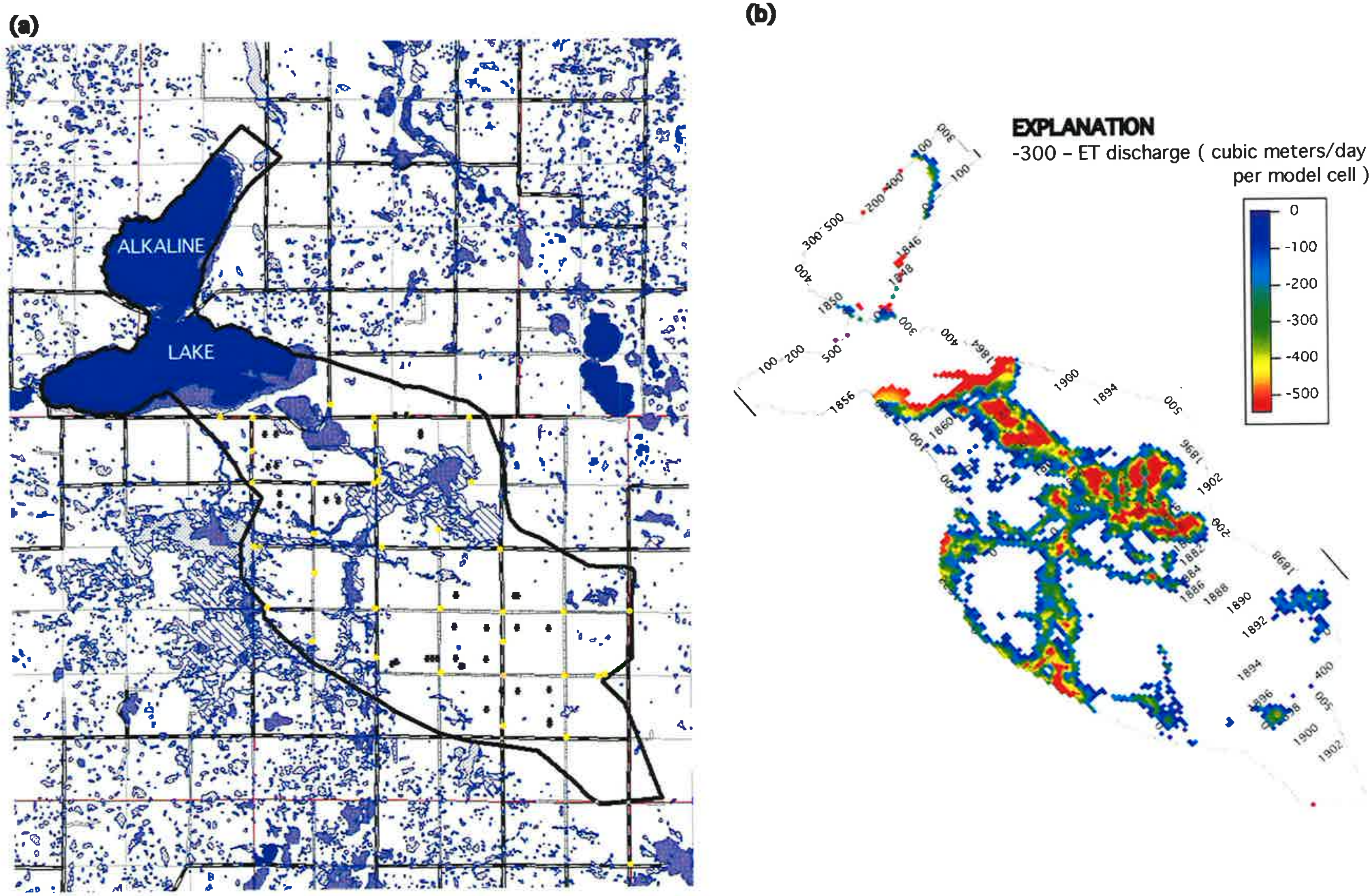


Figure 69. – Comparison of mapped wetlands from National Wetland Inventory (a) and simulated steady-state ET (b)

W1/2NW1/4 and W1/2SW1/4 of Section 35, Township 137 North, Range 70 West, to irrigate 156.0 acres of land located in the W1/2NW1/4 and the W1/2SW1/4 of Section 35, Township 137 North, Range 70 West at a maximum pumping rate of 1200 gallons per minute. The priority date is October 13, 1997.

Ms. Cheryl C. Williss, Chief, Division of Water Resources, U.S. Fish and Wildlife Service, submitted a letter of concern "about the impacts of these proposed diversion as the W1/2W1/2 of Section 35, Township 137 North, Range 70 West is covered by a wetland easement and is part of the National Wildlife Refuge System, as is the E1/2 of Section 34; S1/2 Section 27; and E1/2 Section 26."

No other letters of concern or comments were received concerning water permit application #5172.

In a November 23, 1998 memo, Mr. Steve W. Pusc and Alan Wanek, Hydrologists, NDSWC, recommended the State Engineer defer action on Water Permit Application #5172. The basis for the recommendation was 1) the uncertainty of aquifer saturated thickness in the area, and 2) the inability to determine possible undue impacts from the proposed appropriation on prior appropriators. Water permit application #5172 is currently in a deferred status.

Based on additional test drilling, water-level monitoring, and the development and operation of a digital computer model of the Streeter aquifer, conditional water permit #5172 was reevaluated. A discussion of the analysis follows.

Additional test drilling was accomplished around Alkaline Lake to better define the geometry of the Streeter aquifer and local directing of ground-water flow. This data along with existing data provided the basis for developing the previously described computer model of the Streeter aquifer.

It was planned that the modeling effort would consist of three phases. Phase I consisted of developing a steady-state model to simulate water levels at a selected point in time. During the steady-state phase of the modeling study, various aquifer/aquitard parameters and recharge/discharge values were tested which ultimately led to accepting parameters/values that achieved the best "goodness of fit" between simulated and measured water levels.

Phase II was planned as a transient simulation over the period of record/use which began in 1974. The steady-state water levels would be used as starting water levels for the transient simulation. Local climate and soils data would be used to estimate aquifer recharge and discharge due to evapotranspiration. Irrigation withdrawals would be based on annual water use reports provided by each irrigator. Simulated water levels would be compared with measured water levels over the period of record and based on the comparisons, selected model parameters would be adjusted to achieve a better "goodness of fit."

Phase III was to consist of long-term transient simulations beginning with the first year of available climate record. The climate data coupled with soils data would provide the basis for estimating aquifer recharge, discharge and irrigation water use. The long-term transient simulation would provide insight into the viability of existing and pending irrigation appropriations within the context of approximately the last 100 years.

Once the steady-state (Phase I) of the modeling study was completed, it was decided that the steady-state model could be used to evaluate the affects, if any, on prior appropriators. Of the deferred water permit applications, all but one (#5132) are located about two to four miles northwest of the large block of prior irrigation appropriations (fig. 62). Based on the location of the four deferred irrigation applications with respect to the predominant discharge areas and prior irrigation appropriations, it was posited that pumping by the deferred applications would cause virtually no drawdown interference on the block of prior irrigation appropriators to the southeast.

Thus, if the steady-state simulations indicated virtually no drawdown interference would occur on the block of prior appropriators, then the deferred water-permit applications could be approved. This action(s) would not preclude approval on deferred water permit application #5132, which has the most senior priority date of all of the deferred water-permit applications. Given the spatial relationship between application #5132, the discharge areas and the block of prior appropriators, it was concluded that the transient analyses (Phases II and III) would be required to adequately evaluate impacts on prior appropriators from pumping under water permit application #5132.

Steady-State Computer Model Analysis

The steady-state analysis of pumping affects on pending water permit application #5172 (136-070-35C) included the following:

1) Recharge rate = 3.5 inches/year
2) ET rate = 22 inches/year
3) Aquifer hydraulic conductivity = 200 feet/day
4) Aquitard hydraulic conductivity = 0.001 feet/day
5) Irrigation water use = 9.5 inches/year

Prior to simulating pumping of pending water permit application #5172, the previously described steady-state model was run to simulate the affects of pumping from all approved irrigation appropriations. The same steady-state model with all approved irrigation appropriations pumping, plus pending water permit #5172 was then run to evaluate the additional drawdown interference that occurred throughout the model domain.

The steady-state drawdown distribution resulting from pumping in 137-070-35C (water permit application #5172) is shown in figure 70. Within the area occupied by the large block of prior irrigation appropriators in the southeast part of the model area, the steady-state drawdown interference is generally less than about 0.10 feet. This amount of drawdown interference on prior irrigation appropriations in the area is negligible. As a result, no adverse affects on prior

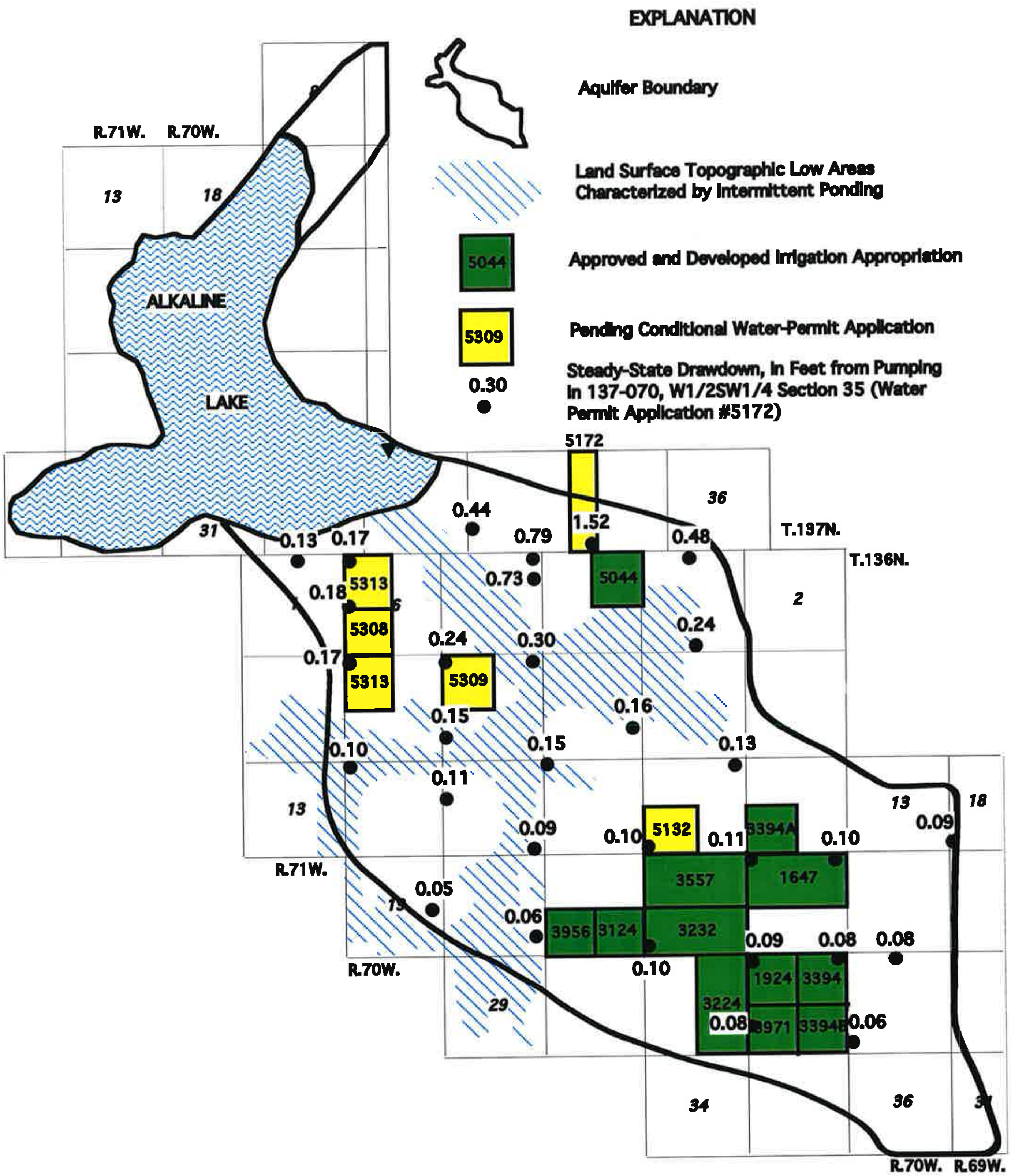


Figure 70.– Steady-state drawdown resulting from pumping in the W1/2SW1/4 of Section 35, T.137N., R. 70 W. (Water Permit Application #5172)

appropriators in this area of the Streeter aquifer should occur if approval is granted on pending water permit application #5172.

Perfected water permit #5044 is located adjacent to and south of pending water permit #5172 (fig 61). The capture system for Perfected Water Permit #5044 consists of two wells located near the center of the NE1/4 of Section 4, Township 136 North, Range 70 West. One well is 12 inches in diameter and is screened from 54 to 71 feet below land surface. Sand and sand and gravel occurs 0 to 35 and from 38 to 73 feet below land surface. Sandy, silty, clay occurs from 35 to 38 feet below land surface. At the time the well was installed in May 1998, the static water level was reported at 17.5 feet below land surface. This leaves about 36.5 feet of head above the top of the well screen and 24.1 feet of available drawdown if one-third of the total available head is reserved for additional drawdown interference and natural water-level fluctuations.

The driller's log indicates 6.2 feet of drawdown after pumping one hour at a rate of 155 gallons per minute. Based on the above, specific capacity is calculated at about 25 gallons per minute per foot of drawdown. Thus, using 24.1 feet of available drawdown, a maximum pumping rate of 602 gallons per minute is calculated.

The second well is located about 200 feet north of the 12-inch well, which is located at the pivot. This well is eight inches in diameter and is screened from 60.5 to 69.5 feet below land surface. Sand and sand and gravel occur from 0 to 34 feet and 37 to 70 feet below land surface. Clay occurs from 34 to 37 feet below land surface. At the time the well was installed in May 1998, the static water level was reported at 19.43 feet below land surface. This leaves about 41.1 feet of head above the top of the well screen and 27.1 feet of available drawdown if one-third of the total available head is reserved for additional drawdown interference and natural water-level fluctuations.

The driller's log indicates 9.8 feet of drawdown after pumping one hour at a rate of 150 gallons per minute. Based on the above, specific capacity is calculated at about 15.3 gallons per minute per foot of drawdown. Thus, using 27.1 feet of available drawdown, a maximum pumping rate of about 415 gallons per minute is calculated.

The above estimated maximum pumping rates and associated well drawdowns do not account for the affects of partial penetration and decreasing transmissivity with time as the aquifer saturated thickness decreases. Therefore, the estimated maximum well pumping rates may be too large and a third well may be required to acquire the adequate cumulative pumping rate as the water table declines.

Steady-state drawdown interference from pumping pending water permit #5172 is about one foot (fig. 70). Based on the above pumping as proposed under water permit #5172, will not cause undue affects on the rights established by Perfected Water Permit #5044.

U.S. Fish and Wildlife Service Concerns

In a letter received by the State Engineer on January 12, 1998, the USF&WS indicated the land described by the W1/2W1/2 of Section 35, the E1/2 of Section 34, the S1/2 of Section 27, and the E1/2 of Section 26, all in Township 137 North, Range 70 West are covered by wetland easements, and are part of the National Wildlife Refuge System. The letter states, "If the wetland area is connected to the aquifers, then water table drawdown caused by the well pumping would aggravate the effects of annual evaporation losses and climatic cycles. If pumping adversely affects the wetland area, then the proposed appropriation would not be in the public interest because of (1) the effect on fish and game resources; (2) harm to the Service and its real property interests; and (3) the inability of the applicant to complete the appropriation if it would violate the terms of the wetland easement."

The surficial deposits consist of glacial till in the N1/2S1/2 of Section 27, Township 137 North, Range 70 West (fig. 71). There are numerous potholes/wetlands located in the N1/2S1/2 of Section 27. These potholes/wetlands are situated in a hummocky till landscape located about one mile north of the northern boundary of the Streeter aquifer (area A, Fig. 71). Soils maps show this area is occupied by Barnes-Svea and Buse-Barnes soils which are derived from glacial till. Pumping from the Streeter aquifer in the W1/2NW1/4 and W1/2SW1/4 of Section 35, Township 131 North, Range 70 West as described in conditional water permit application #5172 will cause no adverse effects on water levels associated with the potholes/wetlands located in the N1/2S1/2 of Section 27, Township 137 North, Range 70 West.

The E1/2 of Section 26, the E1/2 of Section 34, and the W1/2W1/2 of Section 35, all in Township 137 North, Range 70 West are occupied by Arvilla sandy loam soils, which are derived from glacial outwash deposits (area B, fig. 71). Wetlands/ponds occur in the northwest corner and the southeast corner of the E1/2 of Section 26. The NDSWC has a pair of observation wells located in the northeast corner (137-070-35AAA1 - AAA2) of Section 35 (Fig. 71). The geologist's log indicates sand and gravel from 0 to 26 feet, glacial till from 26 to 71 feet, sand and gravel interbedded with clay from 71 to 94 feet, and bedrock sand of the Fox Hills Formation from 94 to 100 feet below land surface. Observation well 137-070-35AAA2 is screened from 21 to 26 feet below land surface in the surficial sand and gravel. The highest water level at this site was 1897.55 feet above mean sea level (6.95 feet below land surface) on July 24, 2001. Observation well 137-070-35AAA2 is located about ¾-mile north of the north boundary of the Streeter aquifer.

The geologist's log of observation well 137-070-35CCD indicates sand and gravel from 0 to 35 feet, clayey silt from 35 to 42 feet, sand and gravel from 42 to 49 feet, clayey silt from 49 to 52 feet, sand and gravel from 52 to 68 feet, and glacial till from 68 to 80 feet below land surface. The observation well is screened from 58 to 63 feet below land surface in the bottom layer of the

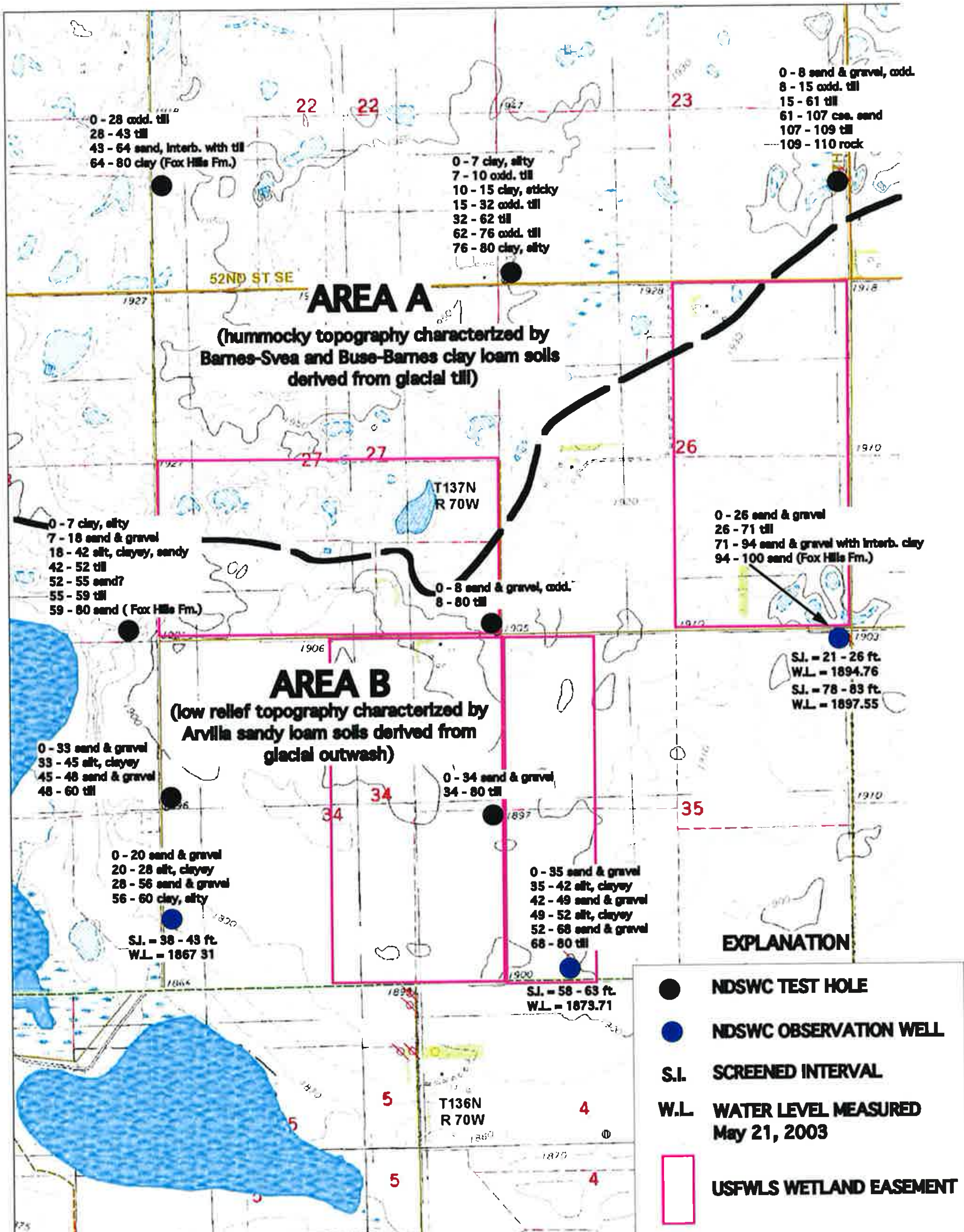


Figure 71. – Location of USFWLS wetland easements and associated hydrogeologic data

Streeter aquifer. The water level elevation measured on July 24, 2001, when observation well 137-070-35AAA2 was at its highest level was 1873.71 feet above mean sea level. The difference in water levels between observation well 35AAA2 and 35CCD was 23.84 feet. The distance between the two observation wells is about 1.25-mile giving a hydraulic and gradient of about 19 feet per mile. The average hydraulic gradient in the Streeter aquifer is about five feet per mile (fig. 21). This water level difference indicates a very poor hydraulic connection between the surficial sand interval at 137-070-35AAA2 and the bottom layer of the Streeter aquifer located about one mile southwest. Given the above, pumping from the bottom layer of the Streeter aquifer in the W1/2NW1/4 and the W1/2 of the SW1/4 of Section 35, Township 137 North, Range 70 West as described in water permit application #5172 will cause no adverse affects on water levels associated with the ponds/wetland located in the E1/2 of Section 26, Township 137 North, Range 70 West.

The screened intervals of observation wells 137-070-34CCB2 and 35CCD are completed in the bottom layer of the Streeter aquifer below the clayey silt aquitard. The highest water level measured at 137-070-35CCD was 23.98 feet below land surface on July 24, 2001. The driller's log of observation well 137-070-35CCD indicates an oxidized zone at 16 feet below land surface. (Land surface = 1897.7). The land surface elevations in the E1/2 of Section 34 and the W1/2W1/2 of Section 35 range from about 1895 to 1905 feet above mean sea level. It is estimated that the depth to water table below land surface in this area within the surficial layer of the Streeter aquifer is greater than about 15 feet below land surface when water levels are highest. Therefore, the capillary fringe of the water table is below the root zone and ground water evapotranspiration does not occur in this area. Furthermore, there is no evidence of surface ponds/wetlands in the E1/2 of Section 34 and the W1/2W1/2 of Section 35. In these areas occupied by Arvilla sandy loam soils, infiltration capacities are large and water-holding capacities are small, which facilitate aquifer recharge. Ponds/wetlands could only occur if they were deep enough to intersect the water table, which at its highest elevation, is about 15 feet below land surface, or if they occur as "perched" ground water bodies. Based on the above, pumping from the bottom layer of the Streeter layer of the Streeter aquifer as described in water permit application #5172 will cause no adverse effects on water levels associated with ponds/wetlands in the E1/2 of Section 34 and the W1/2W1/2 of Section 35, Township 137 North, Range 70 West.

Efficient Management in the Streeter Aquifer

The point of diversion area (W1/2W1/2 of Section 35, Township 137 North, Range 70 West) described in conditional water permit application #5172 partially overlies the north flank of the Streeter aquifer. It is possible that this flank area may be characterized by a thinner, shallow part of the Streeter aquifer. As a result, the saturated thickness may be significantly smaller than that associated with the more central parts of the Streeter aquifer. Therefore, a reasonably constructed ground-water capture system may not provide the required well yield under drought conditions (periods of high water use and low aquifer recharge). Based on the potential for inefficient well location, approval of the proposed irrigation water permit will carry the following condition to eliminate the possibility of this permit to unreasonably restrict more efficiently located junior appropriators from putting water to beneficial use.

> Condition: "The point(s) of diversion in the W1/2W1/2 of Section 35, Township 137 North, Range 70 West located along the northern flank of the Streeter aquifer may not be a location that will allow the efficient development of the aquifer. The presence and use of such wells shall, therefore, not be sufficient reason for the future limitation of local development of the Streeter aquifer, even though such future development may cause a decline in the water level of the aquifer and thereby reduce the producing capacity of the production wells associated with this permit."

Recommendation

According to NDCC Section 61-04-06, the State Engineer shall issue a permit if he finds all of the following:

1) The rights of a prior appropriator will not be unduly affected.

2) The proposed means of diversion or construction are adequate.

3) The proposed use of water is beneficial.

4) The proposed appropriation is in the public interest. In determining the public interest, the state engineer shall consider all of the following:

   a. The benefit to the applicant resulting from the proposed appropriation.

   b. The effect of the economic activity resulting from the proposed appropriation.

   c. The effect on fish and game resources and public recreational opportunities.

   d. The effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation.

   e. Harm to other persons resulting from the proposed appropriation.

   f. The intent and ability of the applicant to complete the appropriation.

Based on the previously described ground-water model analysis, the rights of prior appropriators in the area of influence of the proposed irrigation area as described in conditional water permit application #5172 will not be unduly affected. The proposed means of diversion or construction will consist of wells. The wells must be completed by a North Dakota certified water well contractor. In addition, the design specifications of the wells must confirm to North Dakota State Department of Health "Rules and Regulations for Water Well Construction and Water Well Pump Installation (Regulation 43-35)." Based on the above, the proposed means of diversion or construction are deemed adequate.

The proposed use for conditional water permit application #5172 is irrigation. Irrigation means the use of water for application to more than one acre of land to stimulate the growth of agricultural crops. The stimulation of agricultural crop growth is consistent with the best interests of the people of the state and, as such, represents a beneficial use.

The following criteria demonstrate the proposed appropriation is in the public interest:

a) The applicant will benefit from the proposed irrigation appropriation by increasing crop yields and providing a dependable water supply to facilitate specialty crop production, thereby enhancing crop diversity.

b) Increased crop yield, a stable water supply, specialty crop production, and crop diversity will increase economic activity both locally and at the state level.

c) The land proposed for irrigation development in conditional water permit application #5172 is currently used for agricultural purposes. Diverting ground water as described in this conditional water permit application will have no significant adverse affect on fish and game resources and public recreational opportunities.

d) Available data indicates that approval of the proposed irrigation application will not preclude or hinder alternate uses of water made within a reasonable time. The proposed permit area is not located near municipal and, industrial areas where a significant increase in demand is expected, and, as such, alternate use competition for the ground-water resource is not likely.

e) The ground-water modeling analysis indicates harm to others will not occur as a result of the proposed appropriation.

f) While in deferred status, the applicant has expressed that he both intends to and has the ability to complete the appropriation.

Based on the above, I recommend approval of conditional water permit application #5172 to divert 202.5 acre-feet of ground water annually from a point(s) of diversion located in the W1/2W1/2 of Section 35, Township 137 North, Range 70 West to irrigate 135.0 acres of land located in the W1/2 W1/2 of Section 35, Township 137 North, Range 70 West. The pumping rate of the well(s) shall not exceed 810 gallons per minute. The beneficial use date will be May 1, 2006.

The following Conditions shall apply:

1) The well(s) shall be placed in such a location, constructed to such a depth, have such an efficiency, and pumped at such a rate that will not unreasonably restrict further development of the aquifer system.

2) The point(s) of diversion in the W1/2W1/2 of Section 35, Township 137 North, Range 70 West located along the northern flank of the Streeter aquifer may not be a location that will allow the efficient development of the aquifer. The presence and use of such wells shall, therefore, not be sufficient reason for the future limitation of local development of the Streeter aquifer, even though such future development may cause a decline in the water level of the aquifer and thereby reduce the producing capacity of the production wells associated with this permit.

3) The location and construction details of the well(s) must be approved by the State Engineer prior to construction.

4) The irrigation well(s) shall be constructed with a measuring port and a tube having a minimum 3/4-inch inside diameter installed in the annular space between the pump column and well casing and extending to the top of the bowl assembly or submersible pump to allow the measurement of water levels in the well(s). The bottom end of the tube shall be plugged and the bottom 2 feet perforated. Any other facility for water level measurement must be approved by the State Engineer.

5) The pumping rate shall be subject to the results of an aquifer test.

6) Prior to the beneficial use of water, an automatic backflow prevention device (check valve) shall be installed in the above ground portion of the pipeline near the pump discharge. The injection of fertilizer, pesticides, other chemicals or crop stimulants into the pipeline shall be downstream from the check valve. Other automatic backflow devices and the placement of those devices may be utilized upon written approval of the State Engineer.

7) Prior to the beneficial use of water, instrumentation shall be installed from which the quantity of water pumped can be determined. The instruments are subject to approval by the State Engineer and shall be available for inspection by representatives of the State Engineer.

8) The annular space between the casing and the production well(s) and the drilled hole shall be sealed in accordance with the Rules for Water Well Construction and Water Well {Pump Installation, Article 33-18.

9) A completion report for the production well(s) shall be filed with the State Engineer within 30 days of completion of construction, or before the beneficial use of water, whichever occurs first. The report shall include but not be limited to, information on the location, depth length and types of casing used, depth to which annular space was sealed, a log of the materials penetrated by drilling, static water level, and pumping water level.

10) Failure to comply with any order of the State Engineer may result in forfeiture of this water permit.

References Cited

Allen, R.G., Perera, L.S., Raes, D., and Smith, M., 1999, Crop evapotranspiration, Guidelines for completing crop water requirements, Irrigation and drainage paper No. 56, Food and agricultural organization of the United Nations, Rowe, 300 p.

Anderson, M.P., and Woessner, W.W., 1992, Applied groundwater modeling, simulation of flow and advective transport, Academic Press, Inc., New York, N.Y., 381 p.

Baier, W., Boisvert, J.B., and Dyer, J.A., The Versatile soil moisture budget (VB) reference manual, Eastern Cereal and Oils Research (centre, Agriculture ands Agri-Food Canada, 87 p.

Bear, Jacob, 1979, Hydraulics of groundwater, McGraw-Hill Inc., New York, N.Y., 567 p.

Blumele, John, P., 1979, Geology of Dickey and LaMoure Counties, North Dakota Geological Survey, Bulleting 70 part I and North Dakota State Water Commission County Ground Water Studies 28 part I, 72 p.

Bluemle, John, P., 1991, The face of North Dakota, revised edition, North Dakota Geological Survey Educational Series 21, 177 p.

Clayton, Lee, 1962, Glacial geology of Logan and McIntosh Counties, North Dakota: North Dakota Geological Survey Bulletin 37, 84 p.

Harbaugh, Arlen W., and McDonald, Michael G., 1996, Users documentation for MODFLOW-96, an update to the U.S. Geological Survey Modular – finite difference ground-water flow model: U.S. Geological Survey Open-File Report 96-485, 56 P.

Harbaugh, A.W., 1990, A computer program for calculating subregional water budgets using results from the U.S. Geological Survey modular three-dimensional ground-water flow model: U.S. Geological Survey Open-File Report 90-392, 46 p.

Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G., 2000, MODFLOW-2000, the U.S. Geological Survey modular ground-water model – User guide to modularization concepts and the Ground-Water Flow Process: U.S. Geological Survey Open-File Report 00-92, 121 p.

Johnson, Thomas, 1979, Streeter aquifer test, North Dakota State Water Commission Open-File Report, 5 p.

Klausing, R.L., 1982, Ground-water data for Logan County, North Dakota: North Dakota Geological Survey Bulletin 77 part II, and North Dakota State Water Commission County Ground-Water Studies 34 part II, 299 p.

Klausing, R.L., 1983, Ground-water resources of Logan County, North Dakota: North Dakota Geological Survey Bulletin 77 part III, and North Dakota State Water Commission County Ground-Water Studies 34 part III, 42 p.

Lissey, Allen, 1968, Surficial mapping of ground-water flow systems with application to the Oak River basin, Manitoba: University of Saskatchewan, Ph.D. thesis, 105 p.

Lohman, S.W., 1972, Ground-water hydraulics, U.S. Geological Survey Professional Paper 708, 70 p.

N.D. Agricultural Weather Network, no date, Internet Website, http://www/ext/nodak.edu/weather/ndawn/

Paulson, Quentin F., 1952, Geology and occurrence of ground water in the Streeter area, Stutsman, Logan, and Kidder counties, North Dakota: North Dakota Ground-Water Studies No. 20, 48 p.

Rau, Jon L., Bakken, W.E., Chmelik, J., and Williams, B.J., 1962, Geology and ground water resources of Kidder County, North Dakota, part I, Geology, North Dakota Geological Survey, Bulletin 36 and North Dakota State Water Conservation Commission County Ground Water Studies 1, 70 p.

Shapiro, Allen M., Margolin, Joshua, Dolev, Shahar, and Ben-Israel, Yaacor, 1997, A graphical-user interface for the U.S. Geological Survey modular three-dimensional finite-difference ground-water flow model (MODFLOW-96) using Argus numerical environments: U.S. Geological Survey Open-File Report 97-121, 53 p.

U.S. Department of Commerce, National Oceanic-Atmosphere Administration, no date, Precipitation data: National Climate Data Center, Ashville, NC.

U.S. Department of Agriculture, no date, unpublished soil survey of Logan County, North Dakota, Natural Resources Conservation Service.

U.S. Department of Agriculture, 1988, Soil Survey of Kidder County, North Dakota, Soil Conservation Service, 166 p.

U.S. Department of Agriculture, 1993, Soil survey of Dickey County, North Dakota, Soil Conservation Service, 257 p.

U.S. Salinity Laboratory Staff, 1954, Diagnosis and improvement of saline and alkali soils: U.S. Department of Agriculture, Agricultural Handbook No. 60, 160 p.

Winston, R.B., 1999, Upgrade to MODFLOW-GUI: Addition of MODPATH, ZONEBDGT, and additional MODFLOW packages to the U.S. Geological Survey MODFLOW-96 Graphical-User Interface: U.S. Geological Survey Open-File Report 99-184, 63 p.

Winston, R.B., 2000, Graphical User Interface for MODFLOW, Version 4: U.S. Geological Survey Open-File Report 00-315, 27 p.

Winters, Harold A., 1963, Geology and Ground Water Resources of Stutsman County, North Dakota, part I Geology, North Dakota Geological Survey, Bulletin 41, and North Dakota State Water Conservation Commission, County Ground Water Studies 2, 84 p.

APPENDIX I

LITHOLOGIC LOGS OF WELLS AND TEST HOLES

135-069-06CAC
Harley Ketterling

Date Completed:	04/11/1973	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	42	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	Frederickson's Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-29	SAND AND GRAVEL	
29-32	SAND AND GRAVEL	With lenses of clay
32-42	CLAY	Sandy

135-069-06CCC
NDSWC 11883

Date Completed:	06/17/1982	Purpose:	Observation Well
L.S. Elevation (ft):	1931.5	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	48-53	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:
SWC measurements changed to reflect MP used by USGS

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-57	SAND & GRAVEL	60% sand, 40% gravel; gravel 2/3 granules, 1/3 larger; subrounded to subangular, primarily dark red & dark green shield silicates, some tan carbonates, granite, quartz sand, 2 bags mud; top 20- appears oxidized; after 20- sample 1/4 to 1/4 tabular to rounded Pierre Shale clasts, rock at 56'
57-80	CLAY	Olive gray, slightly cohesive, w/silt, sand & gravel clasts (sandy till)

135-069-07DDD1
NDSWC 5390

Date Completed:	10/19/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1946		
Depth Drilled (ft):	142	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-16	SAND	fine to very coarse, predominantly medium, gravelly, oxidized
16-20	CLAY	silty, yellowish brown
20-25	SAND	medium
25-28	CLAY	(TILL), silty, sandy, pebbly, olive gray
28-30	GRAVEL	fine to medium, sandy
30-34	CLAY	(TILL), silty, sandy, pebbly, olive gray
34-40	GRAVEL	sandy
40-46	GRAVEL	clayey
46-126	CLAY	(TILL), silty, sandy, olive gray
126-142	SHALE	(PIERRE), medium dark gray, siliceous

135-069-07DDD2
NDSWC 5390A

Date Completed:	10/19/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1946	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	42	Aquifer:	Streeter
Screen Int. (ft.):	21-24	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:
well has gone dry

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13506907DDD1 (#5390)

135-069-07DDD3
NDSWC 12799

Date Completed:	07/17/1991	Purpose:	Test Hole
L.S. Elevation (ft):	1945		
Depth Drilled (ft):	60	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:
Insufficient aquifer for replacement well

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-27	SAND	Coarse grained, fair sorting, subrounded, quartzose
27-29	CLAY	Olive gray, silty
29-36	TILL	Clay, olive gray, 30%, w/clastics
36-39	SAND & GRAVEL	30% gravel, graded, silicates
39-60	TILL	Clay, olive gray, 30%, w/clastics, sandy

135-069-08ABB
NDSWC 11886

Date Completed:	06/17/1982	Purpose:	Test Hole
L.S. Elevation (ft):	N/A		
Depth Drilled (ft):	56		
		Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-7	SAND AND GRAVEL	Two-thirds sand, two-thirds gravel granules, silicates, some carbonates, and others, oxidized
7-8	CLAY	Moderate yellowish brown, 30% with silt, sand and gravel clasts (oxidized till)
8-14	SAND AND GRAVEL	As above
14-15	CLAY	(Till), as above
15-26	SAND AND GRAVEL	As above
26-56	CLAY	Olive-gray, 25 to 30% with silt, sand and gravel clasts (till)

135-069-08DAA
NDSWC 5389

Date Completed:	10/19/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1960		
Depth Drilled (ft):	202	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	black
1-14	CLAY	(TILL), sandy, yellowish brown
14-48	CLAY	(TILL), gravelly, medium dark gray
48-83	CLAY	(TILL), silty, medium bluish gray; abundant shale pebbles
83-142	CLAY	(TILL), silty, dark gray; abundant shale pebbles; gravel lenses at 84-102 ft
142-155	CLAY	(TILL), silty, pebbly, medium gray
155-172	SHALE	medium gray, siliceous; interbedded with thin very fine grained glauconitic sandstone, (Fox Hills Sandstone)
172-202	SHALE	(PIERRE), slightly silty, dark gray to grayish black, hard

135-069-09CCC
BEN MILLER

Date Completed:	09/12/1974	Purpose:	Stock Well
L.S. Elevation (ft):	N/A	Well Type:	24 in. - Unknown
Depth Drilled (ft):	33	Aquifer:	Streeter
Screen Int. (ft.):	0-33	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-20	CLAY	Yellow
20-33	SAND	

135-069-09CCD
Ben Miller

Date Completed:	09/11/1974	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	24 in. - Unknown
Depth Drilled (ft):	23	Aquifer:	Streeter
Screen Int. (ft.):	0-23	Data Source:	Jacob Thurn

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-3	TOPSOIL	
3-15	CLAY	Yellow
15-20	CLAY	Blue
20-23	SAND	

135-070-01BBB
NDSWC 11881

Date Completed:	06/16/1982	Purpose:	Test Hole
L.S. Elevation (ft):	N/A		
Depth Drilled (ft):	80		
		Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-22	CLAY	Dark yellowish brown, 35% with silt, sand and gravel clasts (oxidized silt, argillaceous till); at 16 to 17, silt; 17 to 22, dark reddish brown (orangish), silty till
22-36	CLAY AND SILT	Dark yellowish brown to olive-gray, consolidated (Bedrock block?), with very fine-grained sand
36-78	SILT	Clay and very fine sand, olive-gray to medium dark gray, consolidated (Bedrock)
78-80	SAND	Fine- to medium-grained, moderately well-sorted, subangular, quartzose, glauconitic (Fox Hills)

135-070-01CCC
NDSWC 11884

Date Completed:	06/17/1982	Purpose:	Test Hole
L.S. Elevation (ft):	N/A		
Depth Drilled (ft):	60	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-25	CLAY	Dark yellowish brown, moderately cohesive, 25 to 30%, with silt, sand and gravel clasts, (oxidized till)
25-46	CLAY	Olive-gray, moderately cohesive, 30% with silt, sand and gravel (70%), (till); at 30 ft., silt lens? and rock
46-60	SILT	Dark yellowish brown, argillaceous; [Bedrock (Fox Hills?)]; color changes to olive-gray at 51 ft.

135-070-01DCC
NDSWC 11885

Date Completed:	06/17/1982	Purpose:	Test Hole
L.S. Elevation (ft):	N/A		
Depth Drilled (ft):	120		
		Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-27	SAND AND GRAVEL	60% sand, 40% gravel; gravel, 2/3 granules, subrounded to subangular, primarily dark red and dark green shield silicates, some granite, quartz, tan carbonates, many grains/clasts, coated with a patina of iron-oxide
27-93	CLAY	Olive-gray, slightly cohesive, 25% with silt, sand and gravel clasts 75%, (sandy till)
93-94	SANDSTONE	Medium grain, olive-gray-green, indurated, quartzose
94-98		Either bedrock as below or till as above, probably bedrock
98-120	SILT	Dark olive-gray, argillaceous, consolidated (Bedrock)

135-070-02BCC1
ROLAND BECKER

Date Completed:	1/1964	Purpose:	Domestic Well
L.S. Elevation (ft):	N/A	Well Type:	4 in. - Unknown
Depth Drilled (ft):	250	Aquifer:	Fox Hills
Screen Int. (ft.):	0-250	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

135-070-05CDD
NDSWC 5386

Date Completed:	10/18/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1899		
Depth Drilled (ft):	202	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-5	CLAY	(Till), very sandy, silty, yellowish brown; abundant shale pebbles
5-54	CLAY	(Till), silty, sandy, pebbly, dark gray
54-69	CLAY	(Lacustrine?), silty, dark gray, plastic
69-146	CLAY	(Till), silty, sandy, pebbly, dark gray
146-174	SHALE	Silty, slightly sandy, dark gray, brittle; contains numerous thin very fine-grained, glauconitic sand beds (Fox Hills Sandstone)
174-202	SHALE	Dark gray, siliceous [Pierre Shale(?)]

135-070-12CD
Lennie Freier

Date Completed:	06/13/1975	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	50	Aquifer:	Undefined
Screen Int. (ft.):	0-50	Data Source:	Jacob Thurn

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-12	SAND AND GRAVEL	
12-40	CLAY	Blue
40-50	SAND	

135-070-12CDD
LONNIE FREIER

Date Completed:	1975	Purpose:	Domestic Well
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	135	Aquifer:	Fox Hills
Screen Int. (ft.):	0-135	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

135-071-08BDC
DELANE RAU

Date Completed:	09/08/1977	Purpose:	Stock Well
L.S. Elevation (ft):	N/A	Well Type:	4 in. - Unknown
Depth Drilled (ft):	268	Aquifer:	Fox Hills
Screen Int. (ft.):	196-268	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

136-069-04CCC1
NDSWC 5515

Date Completed:	08/07/1979	Purpose:	Test Hole
L.S. Elevation (ft):	1854		
Depth Drilled (ft):	242	Data Source:	NDSWC - Phil Burke

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-0.5	TOPSOIL	black
0.5-30	GRAVEL	fine to medium, predominantly fine, sandy, well rounded to angular; 30% carbonate, 30% shale, 30% silicate, and 10% sandstone pebbles
30-86	SAND	coarse, gravelly, well rounded to angular; 60% shale, 10% carbonate, and 30% igneous and metamorphic grains
86-94	CLAY	sandy
94-100	SAND	clayey
100-170	CLAY	silty, slightly sandy, olive gray; clayey sand from 144-152 ft, (TILL)
170-216	CLAY	very sandy, olive gray; abundant shale pebbles; scattered lignite fragments, (TILL)
216-242	SHALE	(PIERRE), shale, black, hard

136-069-04CCC2
NDSWC 5515A

Date Completed:	08/07/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1845.3	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	73	Aquifer:	Streeter
Screen Int. (ft.):	70-73	Data Source:	NDSWC - Phil Burke

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13606904CCC1 (#5515)

136-069-06DDD
NDSWC 11178

Date Completed:	10/22/1979	Purpose:	Test Hole
L.S. Elevation (ft):	1873		
Depth Drilled (ft):	300	Data Source:	NDSWC - Allen Comeskey

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	dark brown
1-3	CLAY	silty, sandy, pebbly, moderate yellowish brown, (TILL)
3-15	SAND	fine to very coarse, gravelly, subangular to rounded; 50% quartz, 20% shale, 20% carbonate, and 10% igneous grains
15-133	CLAY	sandy, pebbly, olive gray, (TILL)
133-145	SAND	clayey
145-237	CLAY	silty, sandy, pebbly, olive gray; numerous thin sand lenses, (TILL)
237-256	CLAY	very sandy, pebbly, silty, olive gray; few thin sand and gravel lenses, (TILL)
256-277	CLAY	very silty, sandy, olive brown, (TILL)
277-284	CLAY	very sandy, (TILL)
284-289	CLAY	silty, sandy, olive brown, (TILL)
289-300	SHALE	(PIERRE), brownish gray, hard

136-069-08CCC
NDSWC 5394

Date Completed:	10/24/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1881		
Depth Drilled (ft):	202	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-22	CLAY	silty, sandy, gravelly, yellowish brown, (TILL)
22-35	CLAY	sandy, medium gray, (TILL)
35-45	SAND & GRAVEL	clayey; interbedded with till
45-62	CLAY	silty, medium dark gray, (TILL)
62-102	CLAY	(lacustrine), silty, medium dark gray to olive gray, plastic
102-160	CLAY	silty, grayish black; abundant shale pebbles, (TILL)
160-184	CLAY	dark gray to grayish black; abundant shale pebbles, (TILL)
184-202	SHALE	(PIERRE?), dark gray to grayish black, fractured, siliceous

136-069-09DAD
LAWRENCE DOCKTER

Date Completed:	09/20/1974	Purpose:	Stock Well
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	46	Aquifer:	Streeter
Screen Int. (ft.):	0-46	Data Source:	Jacob Thurn

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-3	TOPSOIL	
3-20	GRAVEL	
20-40	CLAY	
40-46	SAND	

136-069-18CCC1
NDSWC 11177

Date Completed:	10/14/1979	Purpose:	Test Hole
L.S. Elevation (ft):	1865		
Depth Drilled (ft):	180	Data Source:	NDSWC - Allen Comeskey

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	black
1-16	CLAY	silty, sandy, pebbly, yellowish brown, (TILL)
16-24	CLAY	silty, sandy, pebbly, olive gray, (TILL)
24-33	SAND	fine to very coarse, gravelly, subangular to rounded; 40% carbonate, 40% shale, and 20% quartz grains
33-55	GRAVEL	very fine to coarse, subrounded to rounded; 40% carbonate, 30% shale, and 30% igneous pebbles
55-78	CLAY	silty, olive gray to dark gray, plastic
78-155	CLAY	silty, sandy, pebbly, medium dark gray, (TILL)
155-180	SHALE	(PIERRE), medium dark gray

136-069-18CCC2
NDSWC 11177A

Date Completed:	10/14/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1917.85	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	55	Aquifer:	Streeter
Screen Int. (ft.):	52-55	Data Source:	NDSWC - Allen Comeskey

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-16	CLAY	Yellowish-brown, silty, sandy, pebbly (till)
16-24	CLAY	Olive-gray, silty, sandy, pebbly (till)
24-33	SAND	Fine to very coarse grained, gravelly, subangular to rounded, 40% carbonate, 40% shale, 20% quartz
33-55	GRAVEL	Very fine to coarse, subrounded to rounded, 40% carbonate, 30% shale, 30% igneous
55-78	CLAY	Olive-gray to dark-gray, silty, plastic
78-155	CLAY	Medium-dark-gray, silty, sandy, pebbly (till)
155-180	SHALE	Medium-dark-gray

136-069-20ABA
Clarence Schultes

Date Completed:	09/13/1974	Purpose:	Stock Well
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	20	Aquifer:	Undefined
Screen Int. (ft.):	0-20	Data Source:	Jacob Thurn

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-3	TOPSOIL	
3-15	CLAY	Yellow
15-20	SAND	

136-069-21BAA
ART DOCKTER

Date Completed:	10/15/1972	Purpose:	Stock Well
L.S. Elevation (ft):	N/A	Well Type:	4 in. - Unknown
Depth Drilled (ft):	200	Aquifer:	Undefined
Screen Int. (ft.):	180-200	Data Source:	Gross Well Drilling

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-60	CLAY	Yellow
60-80	GRAVEL	
80-180	CLAY	
180-200	GRAVEL	Coarse

136-069-31CBC
Harley Ketterling

Date Completed:	04/12/1973	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	62	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	Frederickson's Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-32	SAND AND GRAVEL	
32-60	CLAY	Sandy, gravelly
60-62	CLAY	Sandy, blue

136-069-31CCC1
NDSWC 5391

Date Completed:	10/19/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1939		
Depth Drilled (ft):	142	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-32	SAND	fine to very coarse, gravelly; 30% quartz, 30% shale, 40% carbonate and igneous grains
32-35	CLAY	silty, pebbly, medium dark gray, (TILL)
35-37	GRAVEL	fine
37-46	CLAY	silty, pebbly, medium dark gray ,(TILL)
46-50	SAND	clayey
50-64	CLAY	sandy, silty, olive gray to medium dark gray; abundant shale and limestone pebbles, (TILL)
64-98	SHALE	medium dark gray, glauconitic; interbedded with very fine sandstone
98-132	SANDSTONE	silty, clayey, medium gray
132-142	SHALE	medium dark gray to grayish black, siliceous

136-069-31CCC2
NDSWC 5391A

Date Completed:	10/19/1978	Purpose:	Observation Well - Plugged
L.S. Elevation (ft):	1939	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	0	Aquifer:	Streeter
Screen Int. (ft.):	25-29	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:
SWC 5391. Pumped poorly in 1990. Reported destroyed, not found on 11 November 1997

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13606931CCC1 (#5391)

136-069-31CCC3
NDSWC 12798

Date Completed:	07/17/1991	Purpose:	Test Hole
L.S. Elevation (ft):	1939		
Depth Drilled (ft):	40	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-19	SAND & GRAVEL	30% gravel, well graded, subangular, predominantly silicates
19-21	CLAY	dark yellowish brown, 30% with clastics (till-oxidized)
21-31	SAND & GRAVEL	as above
31-40	CLAY	(TILL), as above

136-070-02BBA
NDSWC 11239

Date Completed:	04/30/1980	Purpose:	Observation Well
L.S. Elevation (ft):	1951.27	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	180	Aquifer:	Streeter
Screen Int. (ft.):	28-31	Data Source:	NDSWC - Allen Comeskey

Completion Info:

Remarks:
07/28/93, well does Not pump!

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	black
1-32	SAND & GRAVEL	fine sand to coarse gravel, poorly sorted, predominantly coarse sand, 15% gravel, subangular to rounded, oxidized
32-102	TILL	olive gray, very silty and clayey, slightly pebbly, very cohesive and plastic, calcareous, becomes sandier with depth
102-163	SILT	brownish gray, calcareous, clayey, difficult to drill, moderately indurated
163-180	SHALE	Grayish black, noncalcareous, well indurated (bedrock)

136-070-03ABB
NDSWC 5401

Date Completed:	10/30/1978	Purpose:	Observation Well - Plugged
L.S. Elevation (ft):	1911.9	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	162	Aquifer:	Streeter
Screen Int. (ft.):	39-42	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:
07/27/93 this well does not pump!

Lithologic Log

Depth (ft)	Unit	Description
0-69	GRAVEL	mixed 3 mud at 0 ft, sandy (60-40); gravel: fine to coarse, predominantly fine to medium; approximately 60% limestone, 30% igneous and quartz, 10% shale, sand: medium to very coarse, approximately 50% igneous and quartz, 30% limestone, 20% shale; clean, loose, caving, taking water, oxidized upper zone, very shaley bottom, mixed 1 mud at 40 ft
69-93	TILL	very sandy; greenish gray; gravel layers
93-111	TILL	silty, clayey; olive gray, tight, pebbly (limestone)
111-113	TILL	clayey; medium gray with yellowish brown mottling, partially oxidized
113-120	TILL	very silty, dark yellowish brown; oxidized
120-162	SHALE	siliceous, dark gray; tight (kp)

136-070-03ABB2
NDSWC 11432

Date Completed:	09/27/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1912.12	Well Type:	2 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	58-63	Data Source:	NDSWC - Gary Calheim

Completion Info: Used 3 bags of drill mud in first 20 feet and another bag at 60 feet. After drilling hole reamed with 6.25 inch bit. Screened with 18 slot PVC screen. Sealed casing with 4 bags of bentonite chips and 2 bags of high density bentonite grout.

Remarks: Located in ditch south of road, about 100 feet east of road along north-south quarter line, about seven feet from well 3ABB, which was drilled out and plugged.

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-21	SAND & GRAVEL	Coarse, (oxidized)
21-31	SILT	Dark yellowish brown, clayey (oxidized)
31-42	SAND & GRAVEL	Fine to coarse sand and medium gravel
42-46	CLAY	Olive gray, 30% with silt, sand & gravel (till)
46-69	SAND & GRAVEL	Fine to coarse grained, composed primarily of shale
69-80	CLAY	Gray

136-070-03DCC
NDSWC 12336

Date Completed:	07/19/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1880.7	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	43-48	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-51	SAND & GRAVEL	2/3 sand, 1/3 gravel, well graded, subangular to subrounded, silicates and carbonates, at 30-40 ft abundant shale clasts, reduced
51-80	CLAY	olive gray, silty

136-070-04ACA1
NDSWC BS#2

Date Completed:	12/17/1997	Purpose:	Observation Well
L.S. Elevation (ft):	1880	Well Type:	5 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	55-68	Data Source:	Water Supply

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-13	SAND	
13-38	GRAVEL	
38-40	CLAY	
40-71	SAND & GRAVEL	
71-80	CLAY	

136-070-04ACA2
NDSWC P#5044

Date Completed:	05/07/1998	Purpose:	Irrigation Well
L.S. Elevation (ft):	1880	Well Type:	12 in. - Steel
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	54-71	Data Source:	Water Supply

Completion Info: BS#3

Remarks: Collect sample at well only.#701-424-3748 Napoleon ND Permit#5044

Lithologic Log

Depth (ft)	Unit	Description
0-1.5	TOPSOIL	
1.5-12	SAND	
12-35	GRAVEL	
35-38	CLAY	
38-73	SAND & GRAVEL	
73-80	CLAY	

136-070-04ACA3
NDSWC P#5044

Date Completed:	05/22/1998	Purpose:	Irrigation Well
L.S. Elevation (ft):	1880	Well Type:	8 in. - Steel
Depth Drilled (ft):	75	Aquifer:	Streeter
Screen Int. (ft.):	60.5-69.5	Data Source:	Water Supply

Completion Info: BS#4

Remarks: Collect sample at well only. #701-424-3748 Napoleon ND Permit#5044

Lithologic Log

Depth (ft)	Unit	Description
0-3	TOPSOIL	
3-34	SAND & GRAVEL	
34-37	CLAY	
37-70	GRAVEL	
70-75	CLAY	

136-070-04ACC
NDSWC BS#1

Date Completed:	05/01/1973	Purpose:	Test Hole
L.S. Elevation (ft):	1880		
Depth Drilled (ft):	74	Data Source:	Water Supply

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-71	SAND	
71-74	CLAY	

136-070-04BBC
Bert Spitzer

Date Completed:	06/03/1975	Purpose:	Stock Well
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	24	Aquifer:	Streeter
Screen Int. (ft.):	0-24	Data Source:	Frederickson's Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-3	TOPSOIL	
3-24	SAND	

136-070-04BCD
Bert Spitzer

Date Completed:	05/01/1973	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	74	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	Frederickson's Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	Black
2-27	SAND AND GRAVEL	
27-35	SAND	Mixed with clay
35-47	SAND	Gravel, and shale fragments
47-71	SAND AND SHALE	Fragments
71-74	CLAY	Sandy

136-070-04CCB

NDSWC TH 4

Date Completed:	08/28/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1870.4	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	48-51	Data Source:	NDSWC -Tom Johnson

Completion Info:

Remarks: Spitzer aquifer test - 500 feet distant well from production well

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-5	SAND	fine to coarse, gravelly, light brown
5-22	SAND	fine to coarse, gravelly, silty, light gray; light gray clay layers from 16-22 ft
22-56	SAND	medium to coarse, and fine to coarse grave; some shale pebbles and lignite
56-60	CLAY	dark olive gray, sticky, compact, brittle

136-070-04CCC1
NDSWC 5506

Date Completed:	07/25/1979	Purpose:	Test Hole
L.S. Elevation (ft):	1873		
Depth Drilled (ft):	197	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-22	SAND	Very fine to very coarse, predominantly coarse, gravelly, well-rounded to subangular; 60 percent quartz, 20 percent carbonate, and 20 percent shale and silicate grains
22-40	SAND	Fine to medium, well-rounded to subangular; 60 percent quartz, 20 percent carbonate, and 20 percent shale and silicate grains
40-60	SAND	Very coarse, well-rounded to subangular; 60 percent shale and 40 percent carbonate and silicate grains
60-78	CLAY	Silty, slightly sandy, olive-gray
78-145	CLAY	(Till), very sandy, olive-gray; abundant pebbles
145-159	SAND	Very fine to very coarse, predominantly medium, gravelly, silty, clayey
159-182	CLAY	(Till), sandy, olive-gray; abundant pebbles
182-197	SHALE	Black, brittle (Pierre Shale)

136-070-04CCC2
NDSWC TH 6

Date Completed:	08/28/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1872.8	Well Type:	5.5 in. - Unknown
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	31-56	Data Source:	NDSWC - Tom Johnson

Completion Info:

Remarks:
Spitzer aquifer test - production well

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-5	SAND	80% sand, 20% gravelly, ranging from a very fine sand to medium gravel, predominantly a very coarse sand, no sorting, well rounded to subangular, predominantly subrounded, 60% quartz, 20% carbonates, 20% shales and silicates, taking some water
5-20	SAND	Fine to medium, gravelly, light gray
20-59	SAND	Fine to coarse, and fine to coarse gravel
22-40	SAND	similar to above, predominantly a medium to fine, moderately to poorly sorted, drilling fast and smooth
40-58	SAND	90% sand, gravelly 90%, ranging from a fine sand to medium gravel, predominantly a very coarse sand, no sorting, well rounded to subangular, abundant shale 60% (well rounded) rest is composed mostly of carbonates, some silicates, somewhat coarser with depth, taking little water
58-76	CLAY	very silty, slightly sandy, few pebbles, poorly compact, drilling smooth, somewhat sticky, moderately to poorly cohesive, possibly glacial fluvial, olive gray
76-98	CLAY	very sandy, very pebbly sand to poorly compact, drilling smooth, olive gray, (TILL)
98-145	CLAY	same as above, more sandy some interbedded small approximately 6 inches to 1 ft gravel lens, predominantly a medium shale, no sorting
145-158	SAND	dirty, ranging forma very fine sand to medium gravel, predominantly a medium sand, predominantly shale, some quartz and carbonates, drilling as if interbedded with clays
158-179	CLAY	same as above, very sandy, very pebbly, poorly compact, poor cohesive, olive gray, abundant shale pebbles, (TILL)
179-197	SHALE	(k PIERRE), drilling slow, brittle, well compact, black

136-070-04CCC3
NDSWC TH 2

Date Completed:	08/28/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1872.5	Well Type:	4 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	39-59	Data Source:	NDSWC - Tom Johnson

Completion Info:

Remarks: SWC TH2 (Should be ccc3), 50 feet from production well - Spitzer aquifer test

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-8	SAND	Fine to medium, light brown
8-15	SAND	Fine to medium, light gray
15-20	SAND	Fine to coarse, gravelly
20-23	SAND	Fine, silty
23-26	CLAY	Silty, sandy
26-59	SAND	Fine to coarse, predominantly coarse, gravelly
59-60	CLAY	Light olive-gray

136-070-04CCC4
NDSWC TH 3

Date Completed:	08/28/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1872.3	Well Type:	Unknown
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	50-53	Data Source:	NDSWC - Tom Johnson

Completion Info:

Remarks: Spitzer aquifer test - 150 feet distant from production well, deep well

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-5	SAND	Medium to coarse, gravelly, light brown
5-23	SAND	Light gray; scattered gravel; clay lenses from 10 to 23 ft.
23-58	SAND	Coarse
58-60	CLAY	

136-070-04CCC5
NDSWC NDSWC TH3A

Date Completed:	08/28/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1872.3	Well Type:	Unknown
Depth Drilled (ft):	21	Aquifer:	Streeter
Screen Int. (ft.):	18-21	Data Source:	NDSWC - Tom Johnson

Completion Info:

Remarks: Spitzer aquifer test - 150 feet distant from production well, shallow well

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607004CCC4 (#3)

136-070-05AAA1
NDSWC 5400

Date Completed:	10/27/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1894.18	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	182	Aquifer:	Streeter
Screen Int. (ft.):	112-115	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: EAST WELL

Lithologic Log

Depth (ft)	Unit	Description
0-62	SAND	gravelly; (75/25), sand: fine to very coarse, predominantly coarse to very coarse, approximately 75% quartz and igneous, 15% limestone, 10% shale; gravel: fine to medium with some coarse lenses, predominantly pea to medium size, approximately 70% limestone, 15% igneous and quartz, 15% shale, dark gray to gray black waxy clay lenses at 27-34 ft; interbedded; fairly clean, some caving, taking some water; oxidized upper zone from approximately 0-20 ft
62-77	CLAY	very silty; olive gray; soft, sticky, (glaciolacustrine-glaciofluvial?)
77-88	TILL	very clayey; olive gray to medium gray; occasional gravel lens
88-94	TILL	very sandy and silty; light yellow brown, tight, iron staining; oxidized
94-103	CLAY	very silty; olive gray; occasional shale pebbles, soft, very sticky
103-106	TILL	very clayey; moderately gray to dark olive gray, soft, very plastic
106-116	GRAVEL	sandy; (80/20); gravel: 50% limestone, 40% igneous and quartz, 10% shale; sand: very coarse, 80% limestone, 10% quartz and igneous, 10% shale, rough drilling, loose, caving, taking water
116-129	SANDSTONE	very silty, dark gray to gray black with much dark green glauconite; tight, fairly brittle, (kfh)
129-161	SHALE	slightly siliceous, very glauconitic, tight, dark gray to grayish black, (kfh)

136-070-05AAA2
NDSWC 5400A

Date Completed:	10/27/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1893.94	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	62	Aquifer:	Streeter
Screen Int. (ft.):	54-57	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: WEST WELL

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607005AAA1 (#5400)

136-070-05AAD1
NDSWC 5507

Date Completed:	07/25/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1880.1	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	92	Aquifer:	Streeter
Screen Int. (ft.):	58-61	Data Source:	NDSWC - Phil Burke

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-28	SAND	gravelly; ranging from fine to medium gravel, predominantly coarse to very coarse sand, no sorting, well rounded to subangular, predominantly subrounded, abundant shale 50%, some carbonates 25%, rest is composed of silicates, oxidized to 10 ft, somewhat more fine with depth, drilling very fast and smooth
28-37	CLAY	silty, sandy, pebbly, moderately to poorly compact, olive gray, (TILL)
37-62	SAND	80% sand, 20% gravelly, ranging form a fine sand to medium gravel, predominantly a medium to coarse sand, no sorting, well rounded (shale) to subangular, drilling fast, taking some water, 33% shale composed most of gravel, 33% carbonates, 33% silicates, 1% detrital lignite
62-92	CLAY	very silty, slightly sandy, very compact, somewhat brittle, poor to moderate cohesion, olive gray, glacial fluvial deposit

136-070-05AAD2
NDSWC SNA 1A

Date Completed:	11/07/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1879.98	Well Type:	1.25 in. - Steel
Depth Drilled (ft):	13	Aquifer:	Streeter
Screen Int. (ft.):	11.5-16	Data Source:	NDSWC - Alan Wanek

Completion Info: Augered hole & inserted/pounded sand point into ground, later added 3 feet casing to original 10.5 feet of casing & 4.5 feet of screen.

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	SAND	silty, argillaceous, dusky yellowish brown, coarse, well graded (topsoil)
1-2.5	SAND	silty, argillaceous, dark yellowish brown, medium grained, poorly sorted, B horizon
2.5-3	SAND	medium grained, poorly sorted, oxidized, subrounded to subangular, quartzose, siliceous
3-3.4	SAND & GRAVEL	80% sand, gravel granules, well graded, silty, argillaceous, appears like disintegrated Pierre shale clasts
3.4-4.2	SAND	medium grained, dark yellowish brown (overall color), poorly sorted (fine to coarse predominantly), siliceous
4.2-5.7	SAND & GRAVEL	with clasts of Pierre, partially disintegrated; 80% sand, well graded
5.7-7.7	SAND	very coarse, poorly sorted, quartzose with some shale clasts, granules, grains, silt
7.7-13	SAND	medium grained, moderately sorted, quartzose, some shale clast, etc, layers; wet at 11 ft

136-070-06BBB1
NDSWC 5403

Date Completed:	11/01/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1866.56	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	202	Aquifer:	Streeter
Screen Int. (ft.):	158-161	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: WEST WELL

Lithologic Log

Depth (ft)	Unit	Description
0-17	GRAVEL	sandy (50-50); gravel: fine to medium, 70% limestone, 20% igneous and quartz; 10% shale; sand: coarse to very coarse, 60% limestone, 30% quartz, 10% igneous and shale; silty clay lenses, partially oxidized
17-28	CLAY	silty; greenish gray; soft, sticky, (lacustrine)
28-52	SAND	slightly gravelly (80-20); sand: fine to coarse, predominantly medium to coarse, approximately 50% quartz, 30% shale, 20% igneous and limestone; gravel: fine, 80% limestone, 10% igneous and quartz, 10% shale, silty, taking water
52-68	CLAY	very silty, slightly sandy; olive gray, plastic, sticky (lacustrine?)
68-72	GRAVEL & SAND	gravel and sand lens (as above)
72-88	TILL	very silty, very clayey; shale and limestone; pebbles; olive gray; soft, plastic, sticky
88-107	TILL	sandy, silty; olive gray to medium gray; fairly tight, occasional gravel stringer at 95 ft
107-130	TILL	sandy; dark gray; much shale, tight
130-139	SILT	very clayey, medium gray; soft, sticky
139-172	SAND	gravelly (70-30); sand: fine to very coarse, predominantly medium to very coarse, approximately 80% quartz, 15% limestone, 5% igneous and shale; gravel: fine to medium, approximately 70% limestone, 20% igneous and quartz, 10% shale, dirty
172-202	SHALE	siliceous; dark gray to gray black, tight, blocky fracture, (kp)

136-070-06BBB2
NDSWC 5403A

Date Completed:	11/01/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1866.56	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	62	Aquifer:	Streeter
Screen Int. (ft.):	38-41	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: EAST WELL

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607006BBB1 (#5403)

136-070-06CBB
NDSWC 14111

Date Completed:	09/13/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1871.91	Well Type:	2 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	43-48	Data Source:	NDSWC - Alan Wanek

Completion Info: Installed 45 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used no drilling mud. Sealed annulus with 3 bags of bentonite chips.

Remarks: Located in ditch east of road, 90 feet south of quarter line

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-17	SAND & GRAVEL	25% gravel, composed of silicates and carbonates, with shale near the lower part of the interval (oxidized)
17-19	SAND	Medium to fine grained
19-24	CLAY	Olive gray, silty
24-29	SAND	Medium to coarse grained, fair sorting
29-43	SAND	Medium to coarse grained with some interbedded silty clay
43-49	SAND & GRAVEL	30% gravel, composed of silicates, carbonates, and shale
49-60	CLAY	Olive gray, 30%, with silt, sand, and gravel (till)

136-070-07BBB
NDSWC 12339

Date Completed:	07/19/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1874.87	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	30-35	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-13	SAND	well graded, coarse, coarser with depth, subrounded, quartzose, silicates, carbonates
13-23	SAND & GRAVEL	well graded, silicates and carbonates, shale clasts with depth; mostly sand
23-29	CLAY	olive gray, silty
29-39	SAND & GRAVEL	as above, coarser
39-46	CLAY	olive gray, silty
46-80	CLAY	olive gray, 30% with silt, sand, and gravel, (TILL)

136-070-07DAD
DAVID KAISER

Date Completed:	07/27/1977	Purpose:	Stock Well
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	20	Aquifer:	Streeter
Screen Int. (ft.):	0-20	Data Source:	Jacob Thurn

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-3	TOPSOIL	
3-20	SAND	

136-070-07DDA

Date Completed:	0/0	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: SLOUGH; 12 miles E. and 7 N. of Napoleon

Lithologic Log

Depth (ft)	Unit	Description

136-070-08AAA
NDSWC NDSWC TH5

Date Completed:	08/28/1979	Purpose:	Observation Well
L.S. Elevation (ft):	1871.3	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	49-52	Data Source:	NDSWC - Tom Johnson

Completion Info:

Remarks: Spitzer aquifer test, 170 feet distant from production well

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	black
1-5	SAND	fine to coarse, gravelly, light brown
5-18	SAND	fine to coarse, gravelly, light gray
18-22	SAND	fine to medium
22-23	CLAY	
23-55	SAND	fine to coarse, gravelly; scattered shale pebbles
55-60	CLAY	

136-070-08AAA2
NDSWC 14113

Date Completed:	09/14/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1871.75	Well Type:	2 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	38-43	Data Source:	NDSWC - Alan Wanek

Completion Info: Installed 40 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 2 bags of drilling mud. Sealed annulus with 3 bags of bentonite chips.

Remarks: Located in ditch south of road, 150 feet west of section line

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-10	SAND & GRAVEL	30% gravel, primarily coarse sand and fine gravel, silicates and carbonates (oxidized)
10-20	SILT	Olive gray, sandy, clayey
20-54	SAND & GRAVEL	20% gravel, primarily well graded sand, primarily shale with silicates, carbonates, and lignite
54-60	CLAY	Olive gray, 30%, with silt and sand (till)

136-070-08BBB
NDSWC 12338

Date Completed:	07/19/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1876.32	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	42-47	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-16	SAND & GRAVEL	50% sand, 50% gravel, subangular, silicates, carbonates, well graded
16-25	CLAY	olive gray, silty
25-61	SAND & GRAVEL	2/3 sand, 1/3 gravel, mostly granules, silicates, carbonates, shale, may be some interbedded silt and clay; after 45 ft mainly sand, very coarse with some granules
61-80	CLAY	olive gray, silty

136-070-08CCB
NDSWC 14114

Date Completed:	09/14/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1875.01	Well Type:	2 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	38-43	Data Source:	NDSWC - Alan Wanek

Completion Info: Installed 40 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 1 bag of drilling mud. Sealed annulus with 3 bags of bentonite chips.

Remarks: Located in ditch east of road, 0.2 mile north of section line, 100 to 200 feet south of slough

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-15	SAND	Coarse grained, poorly sorted, some gravel, primarily silicates, carbonates, shale, lignite (oxidized)
15-22	SAND	Medium grained, poorly sorted, some intaerbedded clay or silt
22-29	SILT	Olive gray, clayey
29-46	SAND & GRAVEL	25% gravel, shale, silicates, carbonates, lignite
46-60	CLAY	Olive gray, with some silt and clay (till?)

136-070-09DDA
NDSWC 12337

Date Completed:	07/19/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1881.9	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	38-43	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-3	TOPSOIL	organic
3-10	SAND	well graded, quartz, other silicates, carbonates, subrounded
10-61	SAND & GRAVEL	50% sand, 50% gravel, subangular to subrounded, silicates, carbonates, shale
61-80	CLAY	olive gray, silty

136-070-11DDD
NDSWC 309

Date Completed:	1950	Purpose:	Test Hole
L.S. Elevation (ft):	1958		
Depth Drilled (ft):	190		
		Data Source:	USGS - Quentin Paulson

Completion Info:

Remarks:
Paulson 1952 Streeter area study

Lithologic Log

Depth (ft)	Unit	Description
0-1	SOIL	black, clayey
1-9	TILL	tan
9-11	GRAVEL	
11-50	CLAY	buff to dark gray; containing very few pebbles; may be lacustrine clay
50-184	TILL	bluish gray
184-190	CLAY	bluish gray

136-070-13AAA
NDSWC 11238

Date Completed:	04/29/1980	Purpose:	Test Hole
L.S. Elevation (ft):	1960		
Depth Drilled (ft):	160	Data Source:	NDSWC - Allen Comeskey

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-5	TILL	moderate yellowish brown, oxidized, calcareous, very silty, very sandy, pebbly, moderately cohesive, plastic, small lenses of silt, also oxidized, boulders 12-13 ft
5-11	SAND & GRAVEL	medium sand to fine gravel, poorly sorted, subrounded to rounded, oxidized, 30% carbonates, 30% quartz, 30% igneous, 10% shale
11-22	TILL	as above
22-121	TILL	olive black, unoxidized; very silty and sandy, slightly pebbly, calcareous, cohesive, taking much water through fracture system in till
121-129	SAND	coarse sand to gravel, poorly sorted, subangular to rounded
129-133	TILL	as above
133-160	BEDROCK SHALE	brownish black, noncalcareous, well indurated

136-070-13BCC
WILLIAM SCHULER

Date Completed:	10/20/1972	Purpose:	Domestic Well
L.S. Elevation (ft):	N/A	Well Type:	4 in. - Unknown
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	40-60	Data Source:	Gross Well Drilling

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-10	CLAY	Sandy
10-35	GRAVEL	
35-38	CLAY	
38-60	GRAVEL	Clay

136-070-14CCA
Marvin Grenz

Date Completed:	04/14/1983	Purpose:	Irrigation Well
L.S. Elevation (ft):	1904.4	Well Type:	8 in. - Steel
Depth Drilled (ft):	75	Aquifer:	Streeter
Screen Int. (ft.):	48-58	Data Source:	Traut Wells

Completion Info: Eight inch diameter, 120 slot stainless steel screen, 10 feet of cement grout

Remarks: Collect sample at well only.
Grenz west irrigation well, Aug. 1983 combined pumping rate with east well of 695 gpm

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-15	GRAVEL	Coarse
15-19	CLAY	Yellow, sandy
19-20	CLAY	Gray, soft
20-36	SAND & GRAVEL	Coarse
36-47	CLAY	Gray
47-58	SAND & GRAVEL	Coarse
58-60	CLAY	Gray, silty
60-63	SAND & GRAVEL	Coarse
63-75	CLAY	Gray, silty

136-070-14CDB
Marvin Grenz

Date Completed:	03/29/1983	Purpose:	Irrigation Well
L.S. Elevation (ft):	1905.4	Well Type:	12 in. - Steel
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	49-64	Data Source:	Traut Well Drilling

Completion Info: 12 inch diameter, 120 slot stainless steel screen, 10 feet of cement grout

Remarks: Collect sample at well only.
Grenz east irrigation well, Aug 1983 combined pumping rate with west well of 695 gpm.

Lithologic Log

Depth (ft)	Unit	Description
0-4	CLAY	Sandy
4-15	SAND & GRAVEL	Coarse
15-27	CLAY	Yellow, with sand
27-36	GRAVEL	Coarse
36-37	CLAY	Gray
37-39	GRAVEL	Coarse
39-49	CLAY	Gray
49-58	GRAVEL	Coarse, clean
58-59	CLAY	Gray, with gravel
59-64	GRAVEL	Coarse, clean
64-80	CLAY	Gray, silty

136-070-15AAA1
NDSWC 12335

Date Completed:	07/08/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1889.9	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	180	Aquifer:	Streeter
Screen Int. (ft.):	38-43	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks: SOUTH WELL

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-10	SAND	coarse, well graded, subrounded, quartzose
10-55	SAND & GRAVEL	50% sand, 50% gravel, subrounded to subangular, silicates, carbonates, shale, primarily granules
55-145	CLAY	olive gray to medium gray, cohesive, silty
145-150	TILL?	some rattling, no sample return
150-180	SHALE?	slow drilling, possibly Pierre, Pierre cuttings

136-070-15AAA2
NDSWC 12349

Date Completed:	07/20/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1889.55	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	50	Aquifer:	Streeter
Screen Int. (ft.):	37-42	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks: NORTH WELL

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-10	SAND	as log 12335
10-50	SAND & GRAVEL	as log 12235, (oxidized to approximately 18 ft)

136-070-15AAA3
NDSWC SNA 6A

Date Completed:	11/07/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1889.6	Well Type:	1.25 in. - Steel
Depth Drilled (ft):	12.2	Aquifer:	Streeter
Screen Int. (ft.):	8.5-13	Data Source:	NDSWC - Alan Wanek

Completion Info: Sand point well in augered hole

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	SAND	dusky yellowish brown, moderately sorted, slightly silty (topsoil) medium grained
2-3	SAND	medium grained, dark yellowish brown, moderately well sorted, quartzose
3-4.7	SAND	medium grained, poorly sorted, quartzose
4.7-8	SAND	fine to medium grained, moderately well sorted
8-8.5	SAND	coarse grained, poorly sorted
8.5-12.2	SAND & GRAVEL	well graded, approximately gravel granules, wet at 9 ft

136-070-15CCC1
NDSWC 5398

Date Completed:	10/26/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1896		
Depth Drilled (ft):	182		
		Data Source:	NDSWC - Lou Smith

Completion Info: Pilot or test hole for recorder well

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-60	SAND	Coarse to very coarse, and fine to medium gravel; sand is composed of 70 percent igneous and quartz, 15 percent carbonate, and 15 percent shale grains; gravel is composed of 70 percent carbonate, 15 percent igneous and quartz, and 15 percent shale pebbles; clay lenses from 20 to 24, 30 to 32, and 38 to 40 ft.
60-84	SILT	Clayey, pebbly, olive-gray
84-88	CLAY	
88-146	CLAY	(Till), silty, medium gray to dark gray; abundant limestone pebbles
146-152	CLAY	(Till), sandy, silty, pebbly, dark gray
152-182	SHALE	Dark gray, siliceous [Pierre Shale(?)]

136-070-15CCC2
NDSWC 5398A

Date Completed:	10/26/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1895.81	Well Type:	6 in. - PVC
Depth Drilled (ft):	62	Aquifer:	Streeter
Screen Int. (ft.):	48-52	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:
Former Recorder well

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log 13607015CCC1 (#5398)

136-070-15DDD
NDSWC 307

Date Completed:	1950	Purpose:	Test Hole
L.S. Elevation (ft):	1903		
Depth Drilled (ft):	210	Data Source:	Quentin Paulson - USGS

Completion Info:

Remarks:
USGS test - Paulson 1952 Streeter area study

Lithologic Log

Depth (ft)	Unit	Description
0-4	SOIL	Sandy, black
4-5	SAND	Fine to medium
5-20	SAND	Coarse to very coarse, and gravel
20-25	GRAVEL	Mostly shale
25-50	GRAVEL	Pebbly
50-64	GRAVEL	Pebbly; coarser than above
64-196	TILL	Bluish gray; layers of shale gravel occur from 125 to 130 and 155 to 160 ft.
196-210	SHALE	Bluish gray (Pierre Shale)

136-070-16BBB1
NDSWC 5399

Date Completed:	10/26/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1881		
Depth Drilled (ft):	222	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-57	SAND	gravelly (75/25); 3 mud at 0 ft; sand: fine to very coarse, predominantly coarse to very coarse, approximately 80% quartz and igneous, 15% limestone, 5% shale; gravel: fine to medium, predominantly fine, approximately 80% limestone, 10% igneous and quartz, 10% shale; interbedded, several thin clayey silt lenses (olive gray); taking some mud; slightly caving, more gravelly 40-50 ft, predominantly medium limestone with igneous (90/10)
57-68	CLAY	very silty; olive gray; laminated in some samples, pebbly; soft, sticky (glacio-lacustrine)
68-81	TILL	sandy, medium gray, limestone and shale pebbles; soft, plastic, gravel lenses at 92 and 98 ft
81-101	TILL	very clayey; dark olive gray, tight, gravel lenses
101-154	TILL	very shaley; dark gray; many shale pebbles, some limestone; very tight
154-169	TILL	very shaley; brownish gray; soft to moderately tight, (looks like KFH parent material), few shale pebbles (drilled slower)
169-182	TILL	sandy, dark gray; shaley; tight
182-188	GRAVEL	sandy (70/30); gravel: fine to coarse, predominantly medium, approximately 60% limestone, 30% quartz and igneous, 10% shale; sand: coarse; 90% limestone, 10% quartz and igneous, occasional cobble fragments (freshly broken)
188-222	SHALE	siliceous; dark gray; tight, occasional fossil fragments

136-070-16BBB2
NDSWC 5399A

Date Completed:	10/26/1976	Purpose:	Observation Well
L.S. Elevation (ft):	1880.37	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	48-51	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: 1/10 MILE EAST OF CORNER

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607016BBB1 (#5399)

136-070-17BCC
NDSWC 14115

Date Completed:	09/14/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1884.36	Well Type:	2 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	29-34	Data Source:	NDSWC - Alan Wanek

Completion Info: Installed 31 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 2 bags of drilling mud. Sealed annulus with 3 bags of bentonite chips.

Remarks: Located between trail and fence to east, 260 feet north of 1/4 line, 50 feet north of Miller Cemetary

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-22	SAND	Medium grained, poorly sorted, some gravel, silicates, carbonates, shale (oxidized to 20 feet)
22-26	SILT	Olive gray, clayey
26-42	SAND & GRAVEL	25% gravel, primarily very coarse sand and fine gravel, shale, silicates, carbonates
42-51	SILT	Olive gray, clayey
51-60	CLAY	Olive gray, 35%, with silt and sand (clayey till)

136-070-17DDD1
NDSWC 5397

Date Completed:	10/26/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1884.3	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	222	Aquifer:	Streeter
Screen Int. (ft.):	161-164	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: EAST WELL
07/29/93 well was pumped out with no recharge.

Lithologic Log

Depth (ft)	Unit	Description
0-26	SAND	80% sand, 20% gravelly, interbedded; sand: fine to very coarse, predominantly coarse to very coarse, 60% igneous and quartz, 20% limestone, 20% shale; gravel: fine t medium, 60% limestone, 20% igneous and quartz, 20% shale; fairly clean; taking mud, occasional thin clayey silt lenses; partially oxidized
26-29	SILT	very clayey; occasional pebbles of shale and limestone, olive gray to medium gray; soft, shaley (glacio-lacustrine or fluvial?)
29-46	SAND	70% sand, 30% gravel; as above
46-57	TILL	very clayey; silty; medium gray; plastic to moderately tight
57-94	TILL	sandy; medium gray to dark gray; fairly tight
94-148	TILL	sandy; dark gray; much kp pebbles in cuttings, tight
148-167	TILL	dark gray to dark olive gray; tight; predominantly limestone pebbles, occasional gravel lens or rock, rock at 166-167 ft
167-180	GRAVEL	50% gravel, 50% sand; gravel: fine to medium, some broken cobbles in samples; 70% limestone, 20% igneous and quartz, 10% shale; angular to subrounded; sand: medium to very coarse, predominantly very coarse, 50% igneous and quartz; 40% limestone, 10% shale, angular to well rounded; clean, loose, caving
180-222	SHALE	siliceous, slightly micaceous; dark gray, tight, (kp)

136-070-17DDD2
NDSWC 5397A

Date Completed:	10/26/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1884.13	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	52	Aquifer:	Streeter
Screen Int. (ft.):	39-42	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: WEST WELL

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607017DDD1 (#5397)

136-070-18BBA1
NDSWC 11236

Date Completed:	04/28/1980	Purpose:	Observation Well - Plugged
L.S. Elevation (ft):	1873	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	200	Aquifer:	Streeter
Screen Int. (ft.):	150-153	Data Source:	NDSWC - Allen Comeskey

Completion Info:

Remarks: SWC 11236 WEST
destroyed road work

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-6	SAND	fine to coarse to fine gravel, oxidized, poorly sorted, subangular to rounded
6-11	SILT	greenish black, calcareous, slightly clayey, slightly cohesive, well sorted
11-38	SAND	fine to medium, moderate sorting, predominantly fine grain, rounded, 50% quartz, 30% shale, 20% carbonates, becoming predominantly coarse sand at 30 ft, much shale particles to 39 ft
38-44	CLAY	coarse sand and fine to coarse gravel, medium coarse gravel, predominantly shale pebbles, taking water, boulder at 42 ft, clay from 38-44 ft no return sample
44-140	TILL	brownish gray, slightly calcareous, clayey, silty, predominantly sandy, pebbly, intermittent boulders, moderately cohesive to very cohesive, many shale pebbles, 115-116 ft silt, well sorted, calcareous, brownish gray
140-156	SAND & GRAVEL	coarse sand to fine grave; predominantly coarse sand, moderately sorted, angular to rounded, 50% carbonates, 30% quartz, 10% shale; 10% detrital lignite; coarser with depth to coarse gravel; much igneous gravel
156-200	BEDROCK	siltstone, brownish black, noncalcareous, micaceous, moderately indurated, argillaceous

136-070-18BBA2
NDSWC 11236A

Date Completed:	04/28/1980	Purpose:	Observation Well - Plugged
L.S. Elevation (ft):	1873.6	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	40	Aquifer:	Streeter
Screen Int. (ft.):	33-36	Data Source:	NDSWC - Allen Comeskey

Completion Info:

Remarks: SWC 11236A EAST
Destroyed road work

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607018BBA1 (#11236)

136-070-18BBB
NDSWC 12791

Date Completed:	07/16/1991	Purpose:	Observation Well
L.S. Elevation (ft):	1869.55	Well Type:	2 in. - PVC
Depth Drilled (ft):	40	Aquifer:	Streeter
Screen Int. (ft.):	23-28	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-4	CLAY	olive gray, 30% with silt, sand, and gravel, (sandy till)
4-8	SAND	Coarse grained, quartzose
8-16	CLAY	as above, (TILL)
16-22	CLAY	Olive gray, silty
22-28	SAND & GRAVEL	Mostly granules, silicates, carbonates, shale
28-40	CLAY	as above, gravelly 30-32 ft (till)

136-070-18CCC
NDSWC 5402

Date Completed:	10/31/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1872		
Depth Drilled (ft):	202	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-6	SILT	very clayey; olive gray; very soft, very sticky, (nearby slough, alkali soft surface)
6-23	CLAY	very silty, olive gray to medium dark gray, soft, plastic, pebbly (glaciofluvial-glaciolacustrine?)
23-48	TILL	very clayey and silty, medium to dark gray, predominantly shale pebbles, soft, plastic
48-76	TILL	sandy; limestone and shale pebbles, dark olive gray, fairly tight
76-84	GRAVEL	fine to coarse, 70% limestone, 20% igneous, 5% quartz, 5% shale, rough sloughing, took some water
84-105	SANDSTONE	very silty, glauconitic, dark blue gray with green, (kfh)
105-126	SHALE	very siliceous; grayish black, glauconitic, tight, sandy intervals, (kfh)
126-170	SHALE	slightly siliceous, gray black; very very slightly glauconitic, (looks like Pierre) (kfh)
170-202	SHALE	slightly siliceous, micaceous; gray black, tight, slightly fissile, (kp); (no log below 127 ft)

136-070-18CDC
NDSWC 14116

Date Completed:	09/14/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1876.83	Well Type:	2 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	21-26	Data Source:	NDSWC - Alan Wanek

Completion Info: Installed 24 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 0 bags of drilling mud. Sealed annulus with 2 bags of bentonite chips.

Remarks: Located about 20 feet north of trail, 0.3 mile east of section line

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-7	CLAY	Medium yellowish brown, 25% with silt, sand & gravel (oxidized till)
7-14	SAND	Medium to coarse grained, poorly sorted, shale, silicates and carbonates
14-20	CLAY	Olive gray, silty
20-28	SAND & GRAVEL	15% gravel, primarily coarse sand, shale, silicates, carbonates
28-60	CLAY	Olive gray, 30% with sand and silt (till)

136-070-19DAA
NDSWC 14117

Date Completed:	09/14/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1878.5	Well Type:	2 in. - PVC
Depth Drilled (ft):	140	Aquifer:	Streeter
Screen Int. (ft.):	25-30	Data Source:	NDSWC - Alan Wanek

Completion Info: Installed 27 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 1 bag of drilling mud. Sealed annulus with 1.5 bags of bentonite chips.

Remarks: Located 20 feet west of trail, 40 feet south of 1/4 line

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-3	CLAY	Dark to medium yellowish brown, silty
3-14	SAND & GRAVEL	15% gravel, silicates, shale, carbonates, primarily well graded, coarse sand
14-22	CLAY	Olive Gray, silty
22-32	SAND & GRAVEL	20% gavel, shale, silicates, carbonates
32-46	CLAY	Olive gary, 30%, with silt and sand (till)
46-93	CLAY	Olive gray, 30%, moderately stiff, with silt, sand & gravel (till)
93-96	SAND & GRAVEL	Primarily granules of shale
96-106	CLAY	Olive gray, 30%, as above (till)
106-140	SHALE	Olive black, fractures

136-070-20DDA1
NDSWC 11237

Date Completed:	04/29/1980	Purpose:	Observation Well
L.S. Elevation (ft):	1882.21	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	280	Aquifer:	Streeter
Screen Int. (ft.):	33-36	Data Source:	NDSWC - Allen Comeskey

Completion Info: A steel, 1.25" dia. sand point well was added at the location in 1983 (136-70-20DDA2), changing the original well designation from 20DDA to 20DDA1

Remarks:
3" P.C

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-33	SAND & GRAVEL	fine sand to fine gravel, predominantly medium sand, 10% gravel, well rounded, oxidized, taking water
33-42	SAND & GRAVEL	coarse sand and fine gravel, from 33 ft well rounded, 50% quartz, 30% shale pebbles, 20% carbonates, becoming coarse gravel with depth, well rounded
42-246	TILL	olive gray, calcareous, silty, very sandy, pebbly, moderately cohesive, moderately plastic, small gravel lense at 77 ft; 82 ft shale gravel lense, at 91 ft gravel lense, from 201 ft becomes very sandy, at 128 ft either very sandy or small lenses of sands, 244 ft few boulders
246-280	BEDROCK SHALE	brownish black, noncalcareous, unlaminated, micaceous, slightly silty, moderately to moderately well indurated

136-070-20DDA2
NDSWC SNA 5A

Date Completed:	11/07/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1882	Well Type:	1.25 in. - Steel
Depth Drilled (ft):	11.5	Aquifer:	Streeter
Screen Int. (ft.):	3.5-8	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:
SNA 5A IRON A .010 inch slotted, sand point screen to measure the water table.

Lithologic Log

Depth (ft)	Unit	Description
0-1.5	SAND	dusky yellowish brown, coarse grained, poorly sorted, silty, (topsoil)
1.5-3	SAND	yellowish gray, silty, medium coarse grained, poorly sorted, silty
3-3.7	SAND	medium to coarse grained, fair sorting
3.7-7.5	SAND & GRAVEL	well graded, fine to granules; 5-15% gravel, wet at approximately 5.5 ft
7.5-11.5		no log (sand point driven into hole)

136-070-21CCA
Galen Opp

Date Completed:	07/29/1989	Purpose:	Irrigation Well
L.S. Elevation (ft):	1895	Well Type:	10 in. - Steel
Depth Drilled (ft):	50	Aquifer:	Streeter
Screen Int. (ft.):	36-44	Data Source:	Water Supply, Inc.

Completion Info: 10 inch diameter stainless steel, 125 slot screen, grouted to 22 feet with bentonite, 53 gpm/ft specific capacity

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Silty, black
1-24	SAND	Gray, well graded
24-27	CLAY	Medium gray, silty
27-44	GRAVEL	Well graded, 10% sand
44-50	CLAY	Silty, olive gray (till)

136-070-21CCC
NDSWC 5396

Date Completed:	10/26/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1882		
Depth Drilled (ft):	202	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-27	GRAVEL	50% gravel, 50% sand; gravel: predominantly fine, 60% limestone, 25% igneous and quartz, 15% shale (kp), sand: predominantly medium to very coarse, 60% quartz and igneous (higher quartz in finer sands), 30% limestone, 10% shale; clean (few thin clay lenses), loose, taking some water (2 bags mud before drilling)
27-63	SILT	clayey, few sand grains; medium gray, soft, sticky (glaciolacustrine)
63-75	TILL	sandy, clayey; medium gray to dark gray, soft, much shale in cuttings
75-145	SILT	very sandy, olive gray, fairly tight
145-151	TILL	sandy; dark gray to gray black, tight
151-189	SHALE	siliceous, silty; greenish gray to medium gray, fairly brittle (kfh)
189-222	SHALE	siliceous, medium dark gray; tight, blocky fracture, (kp)

136-070-21DAC
Reinhold Opp

Date Completed:	03/19/1981	Purpose:	Irrigation Well
L.S. Elevation (ft):	1899	Well Type:	10 in. - Steel
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	35-44	Data Source:	Traut Well Drilling

Completion Info: 10 inch diameter, 120 slot stainless steel screen, grouted to 10 feet

Remarks: WEST

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-28	SAND	With brown clay lenses mixed in
28-43	GRAVEL	Coarse, clean, with sand
43-60	CLAY	Gray, soft

136-070-21DAD1
Reinhold Opp

Date Completed:	03/22/1981	Purpose:	Irrigation Well
L.S. Elevation (ft):	1898.1	Well Type:	10 in. - Steel
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	32-42	Data Source:	Traut Well Drilling

Completion Info: 10 inch stainless steel, 120 slot screen

Remarks: middle well

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-28	SAND	Brown, 40-50 slot
28-44	SAND & GRAVEL	50-60 slot
44-60	CLAY	Gray, soft

136-070-21DAD2
Reinhold Opp

Date Completed:	03/23/1981
L.S. Elevation (ft):	1897.9
Depth Drilled (ft):	60
Screen Int. (ft.):	35-45
Purpose:	Irrigation Well
Well Type:	10 in. - Steel
Aquifer:	Streeter
Data Source:	Traut Well Drilling

Completion Info: 10 inch stainless steel, 120 slot screen

Remarks: east well

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-24	SAND	Brown, with clay
24-28	CLAY	Brown
28-45	SAND & GRAVEL	50-60 slot
45-60	CLAY	Gray, soft

136-070-21DDB
Ed Liechty

Date Completed:	06/26/1978	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	4 in. - Unknown
Depth Drilled (ft):	55	Aquifer:	Streeter
Screen Int. (ft.):	25-45	Data Source:	Traut Well Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-45	SAND AND GRAVEL	Coarse
45-55	CLAY	Gray

136-070-22ABD
NDSWC P#3557

Date Completed:	03/31/1988	Purpose:	Irrigation Well
L.S. Elevation (ft):	1905	Well Type:	0 in. - Unknown
Depth Drilled (ft):	0	Aquifer:	Streeter
Screen Int. (ft.):	0-0	Data Source:	LTP Enterprises, Inc.

Completion Info:

Remarks: #701-424-3660 Napoleon ND Permit#3557 No well driller's report from LTP

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Gray
1-41	SAND & GRAVEL	Brown
41-65	GRAVEL	Colored (not oxidized)
65-77	CLAY	Sandy, gray

136-070-22BAC
Marvin Grenz

Date Completed:	05/15/1987	Purpose:	Irrigation Well
L.S. Elevation (ft):	1900	Well Type:	12 in. - Unknown
Depth Drilled (ft):	65	Aquifer:	Streeter
Screen Int. (ft.):	46-61	Data Source:	K & K Drilling

Completion Info: 12 inch diameter, 60 slot stainless steel screen, grouted to 20 feet with bentonite

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-15	SAND & GRAVEL	Brown
15-31	SAND & GRAVEL	Dark
31-33	CLAY	Gray (till)
33-61	SAND & GRAVEL	Coarse
61-65	CLAY	Gray, soft (till)

136-070-22CCA
Reinhold Opp

Date Completed:	03/11/1980	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	60	Aquifer:	Undefined
Screen Int. (ft.):	Unknown	Data Source:	Traut Well Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	Black
2-23	SAND	Fine to medium
23-34	CLAY	Gray, and cobbles
34-50	SAND	Coarse, and gravel
50-60	CLAY	Gray

136-070-22CCC
NDSWC 12794

Date Completed:	07/16/1991	Purpose:	Observation Well
L.S. Elevation (ft):	1898.19	Well Type:	2 in. - PVC
Depth Drilled (ft):	50	Aquifer:	Streeter
Screen Int. (ft.):	32-37	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:
Needs to be resurveyed. Needs a concrete pad.

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-36	SAND	coarse grained, poorly sorted, subrounded, silicates, carbonates, shale
36-50	CLAY	olive gray, 30% with clastics (sandy till)

136-070-22CDB
NDSWC P#3232

Date Completed:	01/01/1981	Purpose:	Irrigation Well
L.S. Elevation (ft):	1894.7	Well Type:	12 in. - Steel
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	35-50	Data Source:	Traut Well Drilling

Completion Info: 12 inch diameter, 120 slot stainless steel screen, grouted to 10 feet with bentonite

Remarks: #701-424-3439 Napoleon Permit#3232

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-28	SAND	Brown, 40-50 slot
28-30	CLAY	Gray, soft
30-50	SAND & GRAVEL	Coarse, clean
50-60	CLAY	Gray, soft

136-070-22DBA
NDSWC P#3232

Date Completed:	05/25/1990	Purpose:	Irrigation Well
L.S. Elevation (ft):	1898	Well Type:	12 in. - Steel
Depth Drilled (ft):	62	Aquifer:	Streeter
Screen Int. (ft.):	43-57	Data Source:	Water Supply, Inc.

Completion Info: 10 inch diameter, 50 slot stainless steel screen, specific capacity of 36.9 gpm/ft

Remarks: #701-424-3439 Napoleon Permit#3232

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Silty, black
1-28	SAND	Graded, 10% gravel
28-57	GRAVEL	Coarse, 10% sand
57-62	CLAY	Silty, olive gray (till)

136-070-22DBD
NDSWC P#3232

Date Completed:	03/05/1981	Purpose:	Irrigation Well
L.S. Elevation (ft):	1904.4	Well Type:	12 in. - Steel
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	40-55	Data Source:	Traut Well Drilling

Completion Info: 12 inch diameter, 120 slot stainless steel screen, grouted to 10 feet

Remarks: #701-424-3439 Napoleon Permit#3232

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-29	SAND	Brown, 40-50 slot
29-31	CLAY	Gray
31-54	GRAVEL	50-60 slot, clean
54-60	CLAY	Gray

136-070-22DCA
Reinhold Opp

Date Completed:	03/11/1980	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	60	Aquifer:	Undefined
Screen Int. (ft.):	Unknown	Data Source:	Traut Well Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	Black
2-20	SAND	Fine to medium
20-27	CLAY	Gray
27-50	SAND AND GRAVEL	
50-60	CLAY	Gray

136-070-22DDD
NDSWC 308

Date Completed:	1950	Purpose:	Test Hole
L.S. Elevation (ft):	1908		
Depth Drilled (ft):	50	Data Source:	Quentin Paulson - USGS

Completion Info:

Remarks:
Paulson 1952 Streeter area study

Lithologic Log

Depth (ft)	Unit	Description
0-2	SOIL	sandy, brown
2-25	SAND	mostly medium to coarse but also some very coarse
25-39	PEBBLE GRAVEL	becoming very coarse at bottom
39-50	TILL	bluish gray

136-070-23AAA1
NDSWC 5393

Date Completed:	10/20/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1905.03	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	262	Aquifer:	Streeter
Screen Int. (ft.):	113-116	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: EAST WELL
Wouldn't pump at all 8/8/96

Lithologic Log

Depth (ft)	Unit	Description
0-54	GRAVEL	70% gravel, 30% medium sandy interbedded; fine to medium with some coarse; 30% igneous, 30% shale, 30% limestone, 10% quartz; sand: coarse to very coarse, 60% limestone, 20% igneous, 20% shale; clean, caving, loose; iron staining (black) on limestone; occasional red clay streak (iron), (2 1/2 bags mud before drilling); limestone and shale gravel fraction increasing in 20-40 ft interval
54-70	SAND	slightly gravelly (as above)
70-82	SHALE	very silty, greenish gray to medium dark gray, occasional sand grains makes it appear to be reworked kfh, plastic
82-107	SILT	greenish gray to olive gray (lacustrine), laminated with interbedded sandstone, very soft, slightly glauconitic (kfh); occasional shale grains and quartz, grains in silt, (lacustrine reworked, kfh)
107-123	GRAVEL	sandy; interbedded; gravel: fine to coarse, predominantly pea limestone (60%) and shale (30%); igneous 10%; sand: medium to very coarse, predominantly quartz (60%), igneous and limestone (30%), shale (10%); clean, loose, caving; with till layers
123-231	TILL	very sandy; medium dark gray; soft to moderately tight; occasional gravel lenses, rock at 138 ft with sand lens; gravel lens at 194 ft
231-262	SHALE	siliceous; grayish black, tight (kp); hard streak at approximately 250 ft

136-070-23AAA2
NDSWC 5393A

Date Completed:	10/20/1978	Purpose:	Observation Well
L.S. Elevation (ft):	1905.55	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	62	Aquifer:	Streeter
Screen Int. (ft.):	41-44	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: WEST WELL

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607023AAA1 (#5393)

136-070-23ADB
NDSWC P#1647

Date Completed:	00/00/00	Purpose:	Irrigation Well
L.S. Elevation (ft):	1913.1	Well Type:	12 in. - Steel
Depth Drilled (ft):	Unknown	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	

Completion Info:

Remarks: #701-485-3206 Gackle Permit#1647
pumping rate measured (?) at 670 gpm

Lithologic Log

Depth (ft)	Unit	Description

136-070-23BBB
NDSWC 12792

Date Completed:	06/15/1991	Purpose:	Observation Well
L.S. Elevation (ft):	1903.83	Well Type:	2 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	52-57	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-11	SAND	Fine to medium grained, subrounded, quartzose, fair sorting
11-35	SAND & GRAVEL	35% gravel, silicates & carbonates, shale, well graded, subangular
35-39	CLAY	Olive gray, silty, lacusterine
39-62	SAND & GRAVEL	As above, coarser from 55-62
62-80	CLAY	olive gray, 30% with clastics (sandy till)

136-070-23BCC
NDSWC 12793

Date Completed:	07/16/1991	Purpose:	Observation Well
L.S. Elevation (ft):	1907.92	Well Type:	2 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	48-53	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-61	SAND & GRAVEL	25% gravel, silicates, carbonates, shale, subangular, well graded, coarser with depth
61-80	CLAY	olive gray, 30% with clastics (till)

136-070-23BDB
NDSWC P#1647

Date Completed:	0/0	Purpose:	Irrigation Well
L.S. Elevation (ft):	1912.4	Well Type:	12 in. - Steel
Depth Drilled (ft):	0	Aquifer:	Streeter
Screen Int. (ft.):	0-65	Data Source:	

Completion Info:

Remarks: #701-485-3206 Gackle Permit#1647
Pumping rate measured (?) at 710 gpm

Lithologic Log

Depth (ft)	Unit	Description

136-070-24DCD1
NDSWC 5392

Date Completed: 10/20/1978
L.S. Elevation (ft): 1917
Depth Drilled (ft): 182

Purpose: Test Hole

Data Source: NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-24	SAND	70% sand, 30% gravelly, sand: 70% fine to 80% very coarse; 60% quartz, 70% limestone, 70% igneous and shale, gravel: predominantly fine to pea; 70% limestone, 20% igneous and quartz, 10% shale; interbedded, occasional thin clay lenses less than .5 ft; clean, loose, caving, taking water (mixed 2 1/2 bags mud); partially oxidized
24-42	TILL	silty, medium gray to dark gray; plastic
42-48	TILL	very sandy, medium dark gray; slightly friable, drilled fast
48-55	TILL	silty, sandy, medium dark gray; moderately tight, occasional gravel lenses
55-58	TILL	very silty, olive gray to medium dark gray, soft, sticky
58-71	TILL	olive gray to medium gray; tight, occasional gravel lens; (predominantly limestone and shale grains)
71-86	TILL	very very silty, dark gray; soft, sticky, shale grains and pebbles
86-92	TILL	very very sandy, dark gray; moderately friable, shale grains
92-93	SAND	gravelly; predominantly shale sand with limestone pea gravel
93-106	TILL	very sandy; medium gray (looks like reworked kfh)
106-124	TILL	silty, sandy; medium dark gray to dark gray, tight, increasing shale content 110-120 ft
124-133	SHALE	very silty, slightly siliceous, greenish gray to medium dark gray; tight, (reworked kp?)
133-182	SHALE	very slightly siliceous, dark gray, tight (kp)

136-070-24DCD2
NDSWC 5392A

Date Completed: 10/20/1978
L.S. Elevation (ft): 1917
Depth Drilled (ft): 24
Screen Int. (ft.): 21-24

Purpose: Observation Well
Well Type: 1.25 in. - PVC
Aquifer: Streeter
Data Source: NDSWC - Lou Smith

Completion Info:

Remarks:
Pumped poorly in 1990.

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607024DCD1 (#5392)

136-070-25ABB
NDSWC 12797

Date Completed:	07/17/1991	Purpose:	Observation Well
L.S. Elevation (ft):	1908.61	Well Type:	2 in. - PVC
Depth Drilled (ft):	40	Aquifer:	Streeter
Screen Int. (ft.):	26-31	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-4	CLAY	olive gray
4-9	SAND	coarse grained, well graded, subrounded, quartzose
9-31	SAND & GRAVEL	20-40% gravel, well graded, subangular, primarily silicates
31-40	CLAY	olive gray, 30% with clastics (TILL)

136-070-25CCC
NDSWC 11880

Date Completed:	06/16/1982	Purpose:	Observation Well
L.S. Elevation (ft):	1912.16	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	140	Aquifer:	Streeter
Screen Int. (ft.):	38-43	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-3	TOPSOIL	silt, sand
3-43	SAND & GRAVEL	60% sand, 40% gravel, primarily coarse to very coarse sand and granules of gravel; subangular, silicates, red and dark brown, primarily quartz in sand fraction, lesser tan carbonates, granite, a clast of soft light gray, poorly indurated argillaceous very fine sandstone, (tertiary appearing); some highly oxidized concretions, some clasts of very dark gray (Pierre) shale, by 40 ft abundant Pierre clasts, pebbles, hole caving, 3 bags of mud at 42 ft; (rock at 42 ft, rock bit)
43-113	CLAY	olive gray, 25% with silt, sand, and gravel clasts (sandy till)
113-140	CLAY	dark gray, slightly silty, at 138 ft less silts, tighter; (Bedrock kp)

136-070-26AAA
NDSWC 12796

Date Completed:	07/17/1991	Purpose:	Observation Well
L.S. Elevation (ft):	1909.32	Well Type:	2 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	57-62	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-63	SAND & GRAVEL	30% gravel (coarser than other nearest locations near surface), subangular, well graded, silicates, secondary carbonates
63-80	CLAY	olive gray, 30% with clastics (TILL)

136-070-26AAC
Marvin Grenz

Date Completed:	04/06/1982	Purpose:	Irrigation Well
L.S. Elevation (ft):	1908	Well Type:	12 in. - Steel
Depth Drilled (ft):	64	Aquifer:	Streeter
Screen Int. (ft.):	37-54	Data Source:	Traut wells, Inc.

Completion Info: 12 inch diameter, 120 slot stainless steel screen, specific capacity of 67 gpm/ft

Remarks: about 150 feet north of center, Aug 1983 pumping rate measured at 710 gpm.

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-28	SAND	Brown
28-39	SAND	50 slot
39-53	GRAVEL	Coarse, clay lens at 39-40 & 42-43 feet
53-64	CLAY	Gray, soft

136-070-26BAC1
Henry Becker

Date Completed:	04/26/1973	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	62	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	Midwest Valley Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-18	SAND AND GRAVEL	Red, dry
18-45	SAND AND GRAVEL	Poorly sorted, hard, tight
45-48	SAND	Fine, silty, gray
48-62	CLAY	Soft, gray

136-070-26BAC2
NDSWC P#1924

Date Completed:	04/26/1973	Purpose:	Irrigation Well
L.S. Elevation (ft):	1908.3	Well Type:	16 in. - Steel
Depth Drilled (ft):	57	Aquifer:	Streeter
Screen Int. (ft.):	31-51	Data Source:	Frederickson's Inc.

Completion Info: 16 inch diameter, 50 slot screen

Remarks: #701-424-3688 Napoleon Permit#1924
Aug. 1983 pumping rate measured at 899 gpm

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-30	SAND	
30-51	SAND & GRAVEL	
51-57	CLAY	Sandy, blue

136-070-26BBB1
NDSWC 5395

Date Completed:	10/24/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1910		
Depth Drilled (ft):	182	Data Source:	NDSWC - Lou Smith

Completion Info: Pilot hole for recorder well

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-54	SAND	medium to very coarse, predominantly coarse to very coarse, gravelly; 60% quartz and igneous, 30% carbonates, and 10% shale grains; clayey silt lens from 19-26 ft; clay lens from 51-53 ft
54-80	TILL	medium gray with olive gray (upper?); soft, plastic, occasional gravel lenses approximately 1 ft thick, between 60-100 ft; samples of glacio-lacustrine greenish gray clayey silt with limestone and shale pebbles; no clearly defined interval
80-123	TILL	sandy; dark gray; very shaley, tight
123-148	SHALE	very siliceous, greenish gray to medium gray; occasional glauconitic; blocky (kfh); fossil shell in one sample (approximately 150 ft)
148-182	SHALE	siliceous, grayish black, tight, (kp)
165-182	SHALE	Grayish black, siliceous [Pierre Shale(?)]

136-070-26BBB2
NDSWC 5395A

Date Completed:	10/24/1978	Purpose:	Observation Well - Recorder
L.S. Elevation (ft):	1909.57	Well Type:	6 in. - PVC
Depth Drilled (ft):	62	Aquifer:	Streeter
Screen Int. (ft.):	39-44	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks: Recorder well.

Lithologic Log

Depth (ft)	Unit	Description
0-0		See log for 13607026BBB1 (#5399)

136-070-26BBD
Henry Becker

Date Completed:	08/18/1972	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	58	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	Farmers Supply Co.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-19	GRAVEL	Fine to medium
19-32	GRAVEL	Fine
32-42	GRAVEL	Medium to coarse
42-45	SAND	Fine to medium
45-58	GRAVEL	Coarse; clay, gray

136-070-26BCD
Henry Becker

Date Completed:	03/19/1973	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-18	SAND	Dry
18-30	SAND AND GRAVEL	Coarse, very dirty, wet
30-35	SAND	Dirty, soft
35-44	SAND AND GRAVEL	Gray
44-60	SAND	Poorly sorted, dirty; some clay

136-070-26BDC
Henry Becker

Date Completed:	03/19/1973	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	52	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	Midwest Valley Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-18	SAND AND GRAVEL	Dry, red
18-34	SAND AND GRAVEL	Red
34-50	SAND	Fairly sorted, gray
50-52	CLAY	Soft, gray

136-070-26CAC
Henry Becker

Date Completed:	03/19/1973	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	47	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	Midwest Valley Inc.

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-18	SAND	Dry
18-30	SAND AND GRAVEL	Wet, brown
30-40	SAND AND GRAVEL	Gray sand
40-47	CLAY	

136-070-26CCB
NDSWC 12795

Date Completed:	07/16/1991	Purpose:	Observation Well
L.S. Elevation (ft):	1907.78	Well Type:	2 in. - PVC
Depth Drilled (ft):	40	Aquifer:	Streeter
Screen Int. (ft.):	26-31	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-32	SAND & GRAVEL	20% gravel, well graded, subangular, silicates, carbonates, shale
32-40	CLAY	olive gray, 30% with clastics (sandy till)

136-070-26CCC
NDSWC 11176

Date Completed:	10/19/1979	Purpose:	Test Hole
L.S. Elevation (ft):	1904		
Depth Drilled (ft):	160	Data Source:	NDSWC - Allen Comeskey

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-25	SAND & GRAVEL	medium sand to gravel, poorly sorted, oxidized, subangular to rounded, 50% quartz, 30% carbonates, 20% igneous, approximately 10% gravel, increasing coarseness with depth to large gravel and pebbles, increase in detrital shale
25-125	TILL	olive gray, silty, sand, moderately cohesive, increasing cohesiveness and sand content with depth also becoming more pebbly
125-160	BEDROCK	shale, greenish gray

136-070-26DBD
NDSWC P#3394B

Date Completed:	04/21/1986	Purpose:	Irrigation Well
L.S. Elevation (ft):	1910	Well Type:	Unknown
Depth Drilled (ft):	47	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	LTP Enterprises, Inc.

Completion Info:

Remarks: 701-424-3660 Napoleon Permit#3394B Located about 150 feet north of center

Lithologic Log

Depth (ft)	Unit	Description
0-5	CLAY	And topsoil, brown
5-40	SAND & GRAVEL	
40-47	CLAY	Blue

136-070-26DCA
NDSWC P#3394B

Date Completed:	04/22/1986	Purpose:	Irrigation Well
L.S. Elevation (ft):	1910	Well Type:	Unknown
Depth Drilled (ft):	52	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	LTP Enterprises, Inc.

Completion Info:

Remarks: 701-424-3660 Napoleon Permit#3394B Located about 150 feet south of center

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	Black
2-41	SAND & GRAVEL	
41-52	CLAY	Blue

136-070-27AAD
NDSWC P#3224

Date Completed:	06/12/1980	Purpose:	Irrigation Well
L.S. Elevation (ft):	1907.3	Well Type:	12 in. - Steel
Depth Drilled (ft):	47	Aquifer:	Streeter
Screen Int. (ft.):	27-47	Data Source:	LTP Enterprises, Inc.

Completion Info: 12 inch diameter, 100 slot screen, 40 feet of column

Remarks: #701-424-3688 Napoleon Permit#3224

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-25	SAND	Brown
25-47	SAND	Drilled very good

136-070-27ACA
Henry Becker

Date Completed:	02/22/1980	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	70	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	K&K Drilling

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-4	TOPSOIL	
4-17	SAND AND GRAVEL	Fine
17-23	CLAY	Yellow, and gravel
23-37	SAND AND GRAVEL	Fine
37-54	CLAY	Gray
54-59	SAND AND GRAVEL	Fine
59-70	CLAY	Gray

136-070-27DAA
Henry Becker

Date Completed:	02/19/1980	Purpose:	Unknown
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	Unknown	Data Source:	K&K Drilling

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-17	SAND AND GRAVEL	
17-23	CLAY	Yellowish gray
23-39	SAND AND GRAVEL	Fine
39-60	CLAY	Gray

136-070-27DAB
NDSWC P#3224

Date Completed:	05/16/1980	Purpose:	Irrigation Well
L.S. Elevation (ft):	1905.9	Well Type:	12 in. - Steel
Depth Drilled (ft):	43	Aquifer:	Streeter
Screen Int. (ft.):	28-43	Data Source:	LTP Enterprises, Inc.

Completion Info: 12 inch diameter, 50 slot (28-38) & 100 slot (38-43) screen, 30 feet of column

Remarks: #701-424-3688 Napoleon Permit#3224

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-16	SAND	
16-43	GRAVEL	
43-47	CLAY	Blue

136-070-29DDA
REINHOLD OPP

Date Completed:	0/0	Purpose:	Stock Well
L.S. Elevation (ft):	1882	Well Type:	3 in. - Unknown
Depth Drilled (ft):	190	Aquifer:	Fox Hills
Screen Int. (ft.):	Unknown	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

136-070-33CCC
NDSWC 5387

Date Completed:	10/18/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1893		
Depth Drilled (ft):	162	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-8	GRAVEL	fine to coarse, igneous and limestone; sandy, coarse to medium, predominantly limestone with shale, clean, partially oxidized
8-33	CLAY	silty, sandy, few pebbles (predominantly shale), soft, sticky, reworked? (TILL)
33-126	TILL	alternating silty and sandy beds; medium dark gray
126-162	SHALE	very silty, sandy; medium to dark gray; slightly friable (Fh)

136-070-36DCC
NDSWC 11882

Date Completed:	06/17/1982	Purpose:	Test Hole
L.S. Elevation (ft):	1934		
Depth Drilled (ft):	56	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-28	SAND & GRAVEL	60% sand, gravel is 2/3 granules and 1/3 larger, subrounded to subangular, primarily shield silicates; at least 20 ft (first) appear oxidized, (2 bags mud)
28-35	CLAY	olive gray, slightly cohesive, 25% with silt, sand, and gravel clasts (sandy till)
35-56	SILT	clay and very fine green sand, consolidated (Bedrock, kfh, like bedrock 1/2 mile west); (teeth marks from bit remain in cuttings)

136-071-01ABB
NDSWC 14110

Date Completed:	09/13/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1869.38	Well Type:	2 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	42-47	Data Source:	NDSWC - Alan Wanek

Completion Info: Installed 44 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 0 bags of drilling mud. Sealed annulus with 6 bags of bentonite chips.

Remarks: Located in ditch south of road, 0.4 mile west of section line, 40 feet west of approach, 100 feet SE of lake

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-3	CLAY	Dark yellowish brown, silty, sandy (oxidized)
3-18	SAND & GRAVEL	25% gravel, silicates and carbonates
18-20	SILT	Dark yellowish brown to olive gray, clayey (oxidized)
20-31	CLAY	Olive gray, plastic, slightly silty
31-38	SAND & GRAVEL	30% gravel, silicates, shale, carbonates
38-42	CLAY	Olive gray, silty
42-46	SAND & GRAVEL	40% gravel, silicates, carbonates, shale
46-60	CLAY	Olive gray, silty

136-071-01DCD
NDSWC 14112

Date Completed:	09/14/1999	Purpose:	Test Hole
L.S. Elevation (ft):	1875		
Depth Drilled (ft):	60	Data Source:	NDSWC - Alan Wanek

Completion Info: Used no bags of drilling mud. Sealed annulus with 3 bags of bentonite chips.

Remarks:
Located in ditchnorth of road, 0.3 mile west of sectionline, 300 feet east of north trending creek

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-7	SAND & GRAVEL	30% gravel, silicates & carbonates (oxidized)
7-14	CLAY	Dark yellowish brown, 30% with silt, sand, & gravel (oxidized till)
14-18	CLAY	Olive gray, silty
18-60	CLAY	Olive gray 30%, with silt, sand, and gravel (till)

136-071-02ABB
NDSWC 5404

Date Completed:	11/01/1978	Purpose:	Test Hole
L.S. Elevation (ft):	1880		
Depth Drilled (ft):	182		
		Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-12	SAND	
12-22	CLAY	
22-44	TILL	
44-50	GRAVEL	
50-76	SANDSTONE	
76-102	SANDSTONE	
102-182	SHALE	

136-071-02BBB
NDSWC 12340

Date Completed:	07/19/1983	Purpose:	Test Hole
L.S. Elevation (ft):	1863		
Depth Drilled (ft):	100	Data Source:	NDSWC - Alan Wanek

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-9	CLAY	dark to moderate yellowish brown, slightly silty, moderately cohesive
9-18	SAND & GRAVEL	2/3 sand, well graded, primarily very coarse sand and gravel granules, subangular, silicates and carbonates
18-57	CLAY	olive gray, 35% with silt, sand, and gravel, (TILL)
57-100	SAND	fine, moderately well sorted, subrounded, silty, argillaceous, overall dark green color, KFH Bedrock

136-071-02CDD
DWIGHT RAU

Date Completed:	6/1969	Purpose:	Domestic Well
L.S. Elevation (ft):	N/A	Well Type:	4 in. - Unknown
Depth Drilled (ft):	200	Aquifer:	Fox Hills
Screen Int. (ft.):	Unknown	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

136-071-10DBA
EMMA RAU

Date Completed:	0/0	Purpose:	Stock Well
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	100	Aquifer:	Fox Hills
Screen Int. (ft.):	Unknown	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

136-071-11CCC
NDSWC 5405

Date Completed:	11/01/1978	Purpose:	Test Hole
L.S. Elevation (ft):	N/A		
Depth Drilled (ft):	202		
		Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-4	CLAY	(Till), silty, gravelly, yellowish brown
4-14	CLAY	(Till), silty, pebbly, medium gray
14-20	CLAY	(Lacustrine?), medium dark gray, plastic
20-32	CLAY	(Till), silty, medium gray; contains small pieces of glauconitic sandstone; shale gravel lens from 20 to 24 ft.
32-38	SAND	Fine to coarse, gravelly
38-46	CLAY	(Till), silty, dark gray; abundant shale pebbles
46-50	GRAVEL	Sandy
50-58	SAND	Medium to coarse, gravelly, silty, clayey
58-66	GRAVEL	Fine to coarse, predominantly fine, sandy; 50 percent limestone, 30 percent shale, and 20 percent igneous and quartz pebbles
66-73	SAND	Gravelly, clayey
73-79	GRAVEL	Sandy, silty (flow)
79-103	SANDSTONE	Fine, grayish blue-green to greenish gray, glauconitic; thin shale beds (Fox Hills Sandstone)
103-158	SHALE	Dark gray, siliceous; numerous green spots (Fox Hills Sandstone)
158-202	SHALE	Medium gray to dark gray, siliceous (Fox Hills Sandstone)

136-071-16CCC
NDSWC 5406

Date Completed:	11/01/1978	Purpose:	Observation Well
L.S. Elevation (ft):	N/A	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	322	Aquifer:	Fox Hills
Screen Int. (ft.):	158-164	Data Source:	NDSWC - Lou Smith

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-18	CLAY	(Till), sandy, silty, dark yellowish brown; numerous thin gravel lenses
18-26	BOULDERS AND GRAVEL	Lenses; clayey
26-45	CLAY	(Till), sandy, silty, dark yellowish brown
45-58	CLAY	(Till), sandy, silty, medium gray; abundant limestone and shale pebbles
58-91	CLAY	(Till), silty, sandy, dark olive-gray
91-151	SHALE	Very silty, medium gray, slightly glauconitic; few thin sandstone interbeds (Fox Hills Sandstone)
151-210	SANDSTONE	Fine, silty, clayey, very glauconitic (Fox Hills Sandstone)
210-246	SANDSTONE	Fine, silty, dark gray, glauconitic; thin shale interbeds (Fox Hills Sandstone)
246-254	SHALE	Very silty, dark gray to grayish black, slightly glauconitic, siliceous (Fox Hills Sandstone)
254-290	SILTSTONE	Sandy, dark gray to medium gray (Fox Hills Sandstone)
290-322	SHALE	Grayish blue, slightly siliceous (Fox Hills Sandstone)

136-071-24BBB
NDSWC 11175

Date Completed: 10/18/1979
L.S. Elevation (ft): N/A
Depth Drilled (ft): 80

Purpose: Test Hole

Data Source: NDSWC - Allen Comeskey

Completion Info:

Remarks:
30 feet south of gate on west side of road, east side of fence

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-14	CLAY	(Till), silty, sandy, pebbly, yellowish brown
14-60	CLAY	(Till), silty, sandy, pebbly, olive-gray
60-72	SHALE	Silty, yellowish brown (Fox Hills Sandstone)
72-80	SANDSTONE	Fine, dusky green, rounded, glauconitic (Fox Hills Sandstone)

136-071-28CCC
EUGENE RAU

Date Completed:	0/0	Purpose:	Domestic Well
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	220	Aquifer:	Fox Hills
Screen Int. (ft.):	Unknown	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

136-071-34CBB
KENNETH BOLSTAD

Date Completed:	1/1968	Purpose:	Domestic Well
L.S. Elevation (ft):	N/A	Well Type:	Unknown
Depth Drilled (ft):	193	Aquifer:	Fox Hills
Screen Int. (ft.):	Unknown	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

136-071-35AAA
RUBEN WENTZ

Date Completed:	06/20/1972	Purpose:	Stock Well
L.S. Elevation (ft):	1932	Well Type:	4.25 in. - Unknown
Depth Drilled (ft):	73	Aquifer:	Fox Hills
Screen Int. (ft.):	61-73	Data Source:	Brunner Well Drilling

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-11	CLAY	Yellow
11-64	CLAY	Blue
64-73	SHALE	Sandy

137-069-19CDC
NDSWC 1912

Date Completed:	06/01/1961	Purpose:	Test Hole
L.S. Elevation (ft):	N/A		
Depth Drilled (ft):	441		
		Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	Black
1-6	CLAY	Light gray silty
6-22	CLAY	Yellowish brown silty
22-35	CLAY	Gray silty
35-41	TILL	Gray silty clay with coal fragment and also shale pebbles
41-63	CLAY	Gray silty
63-77	CLAY	Olive gray silty
77-94	TILL	Olive gray silty clay with coal fragment and also shale pebbles
94-104	CLAY	Olive gray silty
104-210	TILL	Olive gray silty clay with coal fragment and also shale pebbles
210-310	TILL	Olive gray silty clay with coal fragment and also shale pebbles
310-357	TILL	Olive gray silty clay with coal fragment and also shale pebbles, drills hard
357-410	TILL	Olive gray silty clay with coal fragment and also shale pebbles, hard drilling
410-425	SHALE	Pierre with hard rocks mixed in the shale. looks like limestone
425-441	SHALE	Pierre, its about half shale gravel

Elec. logged

137-070-04CCC
NDSWC 14724

Date Completed:	08/06/2001	Purpose:	Test Hole
L.S. Elevation (ft):	1870		
Depth Drilled (ft):	40	Data Source:	NDSWC Geologist Log

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-8	SAND	vfn. to vcse., pred. med to cse, gvlly, 10%, up to 1/2 in. in diam., yellow stained, oxid., subang. to well rnded.
8-9	CLAY	sl. silty, pale yellow brown, soft, sticky.
9-18	CLAY	sl. silty, olive gray, sticky.
18-40	CLAY	sl. silty, harder than above, somewhat brittle, some ribbon like cuttings, drills slow, occas. vfn silty, clayey, sand, dark green, cohesive (Fox Hills Fm.)

137-070-05BBC

Date Completed:	04/29/2005	Purpose:	Surface Water Stage Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Streeter
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Culvert - North side of road M.P. is arrow on top of culvert.

Lithologic Log

Depth (ft)	Unit	Description

137-070-05DDA

Date Completed:	04/29/2005	Purpose:	Surface Water Stage Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Streeter
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Culvert - West side of road M.P. is arrow on top of culvert,

Lithologic Log

Depth (ft)	Unit	Description

137-070-09BCB1
NDSWC 14725

Date Completed:	08/07/2001	Purpose:	Observation Well
L.S. Elevation (ft):	1864.35	Well Type:	2 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	42-47	Data Source:	NDSWC Geologist Log

Completion Info: SWC surveyed this well 8/23/01

Remarks: North Well of Pair

Lithologic Log

Depth (ft)	Unit	Description
0-5	CLAY	silty, sandy, vfn, cohesive, lt. gray, oxid.
5-18	SAND	vfn. to vcse., pred. med to cse, and gravel 10 to 20%, up to 1/2 in. in diam., comprised of shale, carb., shield silic., qtz., subang. to well rnded, stratified, takes water, yellow stained, oxid.
18-36	CLAY	greenish gray, to olive gray, sticky, good recovery, drills smooth, from 32 to 36 ft., more silty, drills faster.
36-47	SAND	vfn to vcse., pred. fn to med., v.sl. gvlly., up to 1/4 in. in diam., qtz, carb., shield silic., shale, some detrital lignite frags., much into suspension.
47-60	CLAY	silty, sandy, vfn., cohesive, greenish gray, (Fox Hills Fm.)

137-070-09BCB2
NDSWC 14726

Date Completed:	08/07/2001	Purpose:	Observation Well
L.S. Elevation (ft):	1864.71	Well Type:	2 in. - PVC
Depth Drilled (ft):	24	Aquifer:	Streeter
Screen Int. (ft.):	13-15	Data Source:	NDSWC Geologist Log

Completion Info: SWC surveyed this well 8/23/01

Remarks: South Well of Pair

Lithologic Log

Depth (ft)	Unit	Description
0-6	CLAY	silty, sandy,vfn to fn., cohesive, soft, lt. gray, oxid., (fluvial or till?)
6-18	SAND	vfn., to vcse., predom. med. to cse.,10 to 20% gravel, up to 1/2 in. in diam., comprised of shale, carb., shield silic., qtz., subang to well rnded., takes water, yellow stained, oxid.
18-24	CLAY	sticky, greenish gray to olive gray, good recovery, drills smooth.

137-070-09CBC1
NDSWC 14722

Date Completed:	08/06/2001	Purpose:	Observation Well
L.S. Elevation (ft):	1862.77	Well Type:	2 in. - PVC
Depth Drilled (ft):	110	Aquifer:	Streeter
Screen Int. (ft.):	92-97	Data Source:	NDSWC Geologist Log

Completion Info: SWC surveyed this well 8/23/01

Remarks: North Well of Pair

Lithologic Log

Depth (ft)	Unit	Description
0-6	CLAY	silty, lt. gray with red-yellow stringers, soft, oxid.
6-11	SAND	v. fn. to v.cse., sl. gvlly, up to 1/4 in. dia., subangular to well rounded, poorly sorted, lots of detrital shale, carb., shield silic., qtz.
11-16	SAND	v.fn. to v. cse., pred. med., lots of detrital shale and lignite frags., and qtz., minor shield silic., and carb., subangular to well rounded, drills smooth.
16-26	CLAY	sticky, olive gray
26-31	SAND	vfn.- to fn., bit slipped smooth, much in suspension, lots of detrital lignite and shale.
31-38	CLAY	sticky, olive gray
38-92	SAND	vfn. - to vcse., predom. med to cse., 20% gvl,.up to 1/2 in. in diam., stratified sequence, comprised of mixture of shale, carb., shield silic., qtz., subang. to well rounded, poorly sorted, mixed 1 bag mud
92-97	GRAVEL	sandy, strong bit chatter, up to 1 in. in diam., comprised of shale , carb., shield silic., subang. to well rnded.
97-110	CLAY	silty, sl. sandy (vfn.), dark green, cohesive (Fox Hills Fm.)

137-070-09CBC2
NDSWC 14723

Date Completed:	08/06/2001	Purpose:	Observation Well
L.S. Elevation (ft):	1862.53	Well Type:	2 in. - PVC
Depth Drilled (ft):	20	Aquifer:	Streeter
Screen Int. (ft.):	11-16	Data Source:	NDSWC Geologist Log

Completion Info: SWC surveyed this well 8/23/01

Remarks: South Well of Pair

Lithologic Log

Depth (ft)	Unit	Description
0-8	CLAY	silty, lt. gray, with red-yellow stringers, oxid., soft.
8-14	SAND	vfn. to vcse., sl. gvlly, up to 1/4 in. in diam., subangular to well rounded, poorly sorted, lots of shale, carb., shield silic.,qtz.
14-16	SAND	vfn. to vcse., pred. med., lots of detrital shale and lignite frags. and qtz., some shield silic. and carb., subang to well rnded., drills smoooth.
16-20	CLAY	sticky, olive gray, sl. silty?.

137-070-10BBB
NDSWC 8129

Date Completed:	09/13/1971	Purpose:	Test Hole
L.S. Elevation (ft):	N/A		
Depth Drilled (ft):	200	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description

137-070-15CCC
NDSWC 12347

Date Completed:	07/20/1983	Purpose:	Observation Well - Plugged
L.S. Elevation (ft):	1922	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	56-61	Data Source:	

Completion Info:

Remarks:
Records checked in 1993, they indicate this well may never have been sampled. Attempt to sample in 93. Hard file says it would not pump. Attempted on 07/29/93 does not pump!

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-23	CLAY	dark yellowish brown, moderately cohesive, 30% with silt, sand, and gravel clasts, primarily shale (oxidized till)
23-49	CLAY	olive gray, as above, (reduced till)
49-62	SAND	coarse grained, poorly sorted, (some granules gravel), primarily quartz, at 53 ft clay lens
62-80	CLAY	olive gray, silty, some fine Fox Hills Sand KFH (greenish)

137-070-16BBB
NDSWC 14727

Date Completed:	08/07/2001	Purpose:	Test Hole
L.S. Elevation (ft):	1872		
Depth Drilled (ft):	40	Data Source:	NDSWC - Geologist Log

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-6	TILL	clay, silty, sandy, sl. pebbly, pale yellow gray brown, soft, oxid., (till)
6-12	SAND	vfn. to med., predom. vfn to fn., much into suspension, drills fast and smooth, no bit chatter, comprised of qtz., carb., shield silic., shale, fair sorting, prob. stratified.
12-22	CLAY	greenish gray, sticky, greasy
22-40	SAND	vfn to fn, silty, sl. clayey, mod. cohesive, dark greenish gray, (Fox Hills Fm.)

137-070-16BCC
NDSWC 14728

Date Completed:	08/07/2001	Purpose:	Test Hole
L.S. Elevation (ft):	1905		
Depth Drilled (ft):	80	Data Source:	NDSWC Geologist Log

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-10	SILT	sl. sandy, vfn., sl. clayey, soft, pale yellow brown, oxid.
10-21	SILT	as above, lt. greenish gray, oxid.
21-39	SAND	vfn to med. , comprised of qtz., shale, carb., shield silic.,drills smooth, yellow stained, oxid., clay layer at 28 to 29 ft.
39-40	SILT	as above, yellow gray brown to brown gray, soft.
40-51	SAND	as above
51-59	SILT	as above, yellow gray brown, oxid., could be an oxid. Fox Hills interval.
59-80	SILT	sl. clayey, sl. sandy, vfn., greenish gray, more sandy with depth, dark greenish gray, (Fox Hills Fm.)

137-070-17ABB
NDSWC

Date Completed:	00/00/00	Purpose:	Surface Water Stage Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info: Surveyed on 04/20/05 by NDSWC.
TBM #1 = 1867.74; #4 Rebar; next to steel fence post; 1st post W. of wooden fence posts
TBM #2 = 1865.66; #4 Rebar; next to 3rd steel post W. of wooden fence post located by staff guage.
(original height 1865.66)

Remarks: Staff gauge; Alkaline Lake (north side of county road);

Zero elev of guage equal to MP elev; wl measurements entered as negative values

Lithologic Log

Depth (ft)	Unit	Description

137-070-17BB1

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (north side of county road); BOTTOM OF LAKE (north)

Lithologic Log

Depth (ft)	Unit	Description

137-070-17BB2

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (north side of county road); TOP OF LAKE (north)

Lithologic Log

Depth (ft)	Unit	Description

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (north side of county road); BOTTOM OF LAKE (middle)

Lithologic Log

Depth (ft)	Unit	Description

137-070-17CC2

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (north side of county road); TOP OF LAKE (middle)

Lithologic Log

Depth (ft)	Unit	Description

137-070-19CD1

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (north side of county road); BOTTOM OF LAKE (south)

Lithologic Log

Depth (ft)	Unit	Description

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (north side of county road); TOP OF LAKE (south)

Lithologic Log

Depth (ft)	Unit	Description

137-070-20ABB

Date Completed:	04/29/2005	Purpose:	Surface Water Stage Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Streeter
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Culvert - South side of road. M.P. is arrow on top of culvert.

Lithologic Log

Depth (ft)	Unit	Description

137-070-20CDD
NDSWC 08/07/01

Date Completed:	08/07/2001	Purpose:	Test Hole
L.S. Elevation (ft):	1880		
Depth Drilled (ft):	60	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-16	TILL	clay, silty, sandy, pebbly, pale yellow brown with red-yellow stringers, soft, oxid.
16-47	TILL	as above, olive gray.
47-59	SILT	mod. sandy, vfn., sl. clayey. mod. cohesive, pale yellow brown, Fox Hills Fm.?
59-60	SILT	as above, dark greenish gray, Fox Hills Fm.

137-070-20DDD
NDSWC 14729

Date Completed:	08/07/2001	Purpose:	Test Hole
L.S. Elevation (ft):	1908		
Depth Drilled (ft):	80	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-22	TILL	clay, silty, sandy, pebbly, cohesive, soft, pale yellow gray brown.
0-0		
22-37	SILT	sl. to mod. sandy, vfn., v. sl. clayey, cohesive, soft, drills faster, smoother than above till.
37-40	SAND	vfn to vcse, sl. gvlly., bit slipped fast, no chatter, comprised of shale, carb., shield silic.,qtz., subang. to well rnded.
40-41	TILL	as above, olive gray, unoxid.
41-49	TILL	as above, pale yellow brown, oxid.
49-58	CLAY	silty, yellow brown, oxid.
58-67	CLAY	yellow brown, soft, oxid. Fox Hills?
67-71	SHALE	hard, brittle, yellow brownish gray, oxid, Fox Hills Fm.?
71-80	CLAY	silty, sl. sandy, vfn., greenish gray, soft, Fox Hills Fm.

137-070-22CBC
NDSWC 12348

Date Completed:	07/20/1983	Purpose:	Test Hole
L.S. Elevation (ft):	1925		
Depth Drilled (ft):	80	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-28	CLAY	dark yellowish brown, 30% with silt, sand, and gravel, (oxidized till)
28-43	CLAY	olive gray, as above (reduced till)
43-64	SAND	coarse green, poorly sorted, quartzose, subrounded, with interbedded dark yellowish brown colored clay (TILL)
64-80	CLAY	medium gray, consolidated (Bedrock, KFH)

137-070-23CCC
NDSWC 12342

Date Completed:	07/19/1983	Purpose:	Test Hole
L.S. Elevation (ft):	1950		
Depth Drilled (ft):	80	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-7	CLAY	medium gray, silty
7-10	CLAY	moderate dark yellowish brown, 30% with silt, sand, and gravel (TILL)
10-15	CLAY	moderate yellowish brown, cohesive, (sticky)
15-32	CLAY	dark yellowish to reddish brown, (oxidized till)
32-62	CLAY	olive gray, with silt, sand, gravel, (TILL)
62-76	CLAY	medium to dark yellowish brown, 30% with silt, sand, and gravel, (oxidized till)
76-80	SILT & CLAY	moderate to dark yellowish brown, bedrock?

137-070-23DAD
NDSWC 12343

Date Completed:	07/20/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1899.8	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	110	Aquifer:	Streeter
Screen Int. (ft.):	77-82	Data Source:	NDSWC

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-8	SAND & GRAVEL	1/2 sand, 1/2 gravel, well graded, subangular, silicates & carbonates (oxidized)
8-15	CLAY	Dark yellowish brown, 30% w/silt, sand & gravel (oxidized till)
15-61	CLAY	Olive gray, 30% w/silt, sand & gravel (till)
61-107	SAND	Moverately well graded, coarse grained, subrounded, quartz, silicates, & carbonates
107-109	CLAY	Olive gray, 30% w/silt, sand & gravel (till)
109-110	ROCK	Put on rock bit, ended hole on very hard granite boulder

137-070-27DDD
NDSWC 12345

Date Completed:	07/20/1983	Purpose:	Test Hole
L.S. Elevation (ft):	1905		
Depth Drilled (ft):	80	Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-8	SAND & GRAVEL	2/3 sand, well graded, subangular to subrounded, silicates, carbonates, oxidized
8-80	CLAY	olive gray, 30% with silt, sand and gravel (TILL); gravel lens at 22-23 ft; rock at 56 ft

137-070-28DDC
NDSWC 12341

Date Completed:	07/19/1983	Purpose:	Test Hole
L.S. Elevation (ft):	1880		
Depth Drilled (ft):	80		
		Data Source:	

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-7	CLAY	medium gray, silty
7-18	SAND & GRAVEL	2/3 sand, very coarse granules, well graded, subrounded to subangular, silicates, carbonates, shale, becoming coarser with depth
18-42	SILT	olive gray, argillaceous, some very fine to fine argillaceous sand, some lenses of coarse sand and gravel, predominantly shale clasts
42-52	CLAY	olive gray, 30% with silt, sand and gravel (TILL)
52-55	SAND?	no recovery
55-59	CLAY	(TILL), as above
59-80	SAND	fine grained, moderately well sorted, quartzose with dark and green grains, argillaceous and silty, K Fox Hills, Bedrock

137-070-29BBC
NDSWC 14731

Date Completed:	08/07/2001	Purpose:	Test Hole
L.S. Elevation (ft):	1858		
Depth Drilled (ft):	80	Data Source:	NDSWC - Geologist Log

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-8	TILL	clay, silty, sandy, pebbly, pale yellow brown, with red-yellow stringers, soft, interb. with thin sand and gravel layers, oxid.
8-16	TILL	clay, silty, sandy, pebbly, pale yellow brown, oxid., soft.
16-22	TILL	as above, olive gray, unoxid.
22-23	SAND & GRAVEL	mostly detrital shale
23-77	TILL	as above, olive gray.
77-80	SILT	v. sandy, vfn., v. sl clayey, cohesive, soft, dark greenish gray, Fox Hills Fm.

137-070-30DC1

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (south side of county road); BOTTOM OF LAKE (north)

Lithologic Log

Depth (ft)	Unit	Description

137-070-30DC2

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (south side of county road); TOP OF LAKE (north)

Lithologic Log

Depth (ft)	Unit	Description

137-070-33ABA
NDSWC

Date Completed:	00/00/00	Purpose:	Surface Water Stage Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info: Surveyed on 04/20/05 by NDSWC.
TBM #1 = 1869.46; #4 Rebar; next to 1st steel fence post W. of 2 wooden fence posts
TBM #2 = 1868.74; #4 Rebar; next to 3rd steel post W. of wooden fence posts (original height 1868.76);
No change to the MP elevation in 2004.

Remarks: Staff guage; Alkaline Lake (south side of county road);

Zero elev of guage equal to MP elev; wl measurements entered as negative values

Lithologic Log

Depth (ft)	Unit	Description

137-070-33BB1

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (south side of county road); BOTTOM OF LAKE (west)

Lithologic Log

Depth (ft)	Unit	Description

137-070-33BB2

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	0 in. -
Depth Drilled (ft):	0	Aquifer:	Surface Water
Screen Int. (ft.):	0-0	Data Source:	

Completion Info:

Remarks: Alkaline Lake (south side of county road); TOP OF LAKE (west)

Lithologic Log

Depth (ft)	Unit	Description

137-070-34BCC
NDSWC 14109

Date Completed:	09/13/1999	Purpose:	Test Hole
L.S. Elevation (ft):	1896		
Depth Drilled (ft):	60	Data Source:	Alan Wanek & Gary Calheim

Completion Info: Sealed annulus with 3 bags of bentonite chips.

Remarks:
Located in ditch east of road, 65 feet north of quarter line, east of cemetary

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-33	SAND & GRAVEL	25% gravel, silicates and carbonates
33-45	SILT	Olive gray, clayey (oxidized dark yellowish brown from 33-34)
45-48	SAND & GRAVEL	40% gravel, primarily shale, with silicates and carbonates
48-60	CLAY	Olive gray, 35%, with silt, sand, and gravel (till)

137-070-34CCB1
NDSWC 14108

Date Completed:	09/13/1999	Purpose:	Observation Well - Plugged
L.S. Elevation (ft):	1868	Well Type:	2 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	38-43	Data Source:	Alan Wanek & Gary Calheim

Completion Info: Installed 40 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 2 bags of drilling mud. Sealed annulus with 2 bags of bentonite chips.

Remarks: PLUGGED WITH RIG. GJC
Located in ditch east of road, 750 feet north of county line road, about 100 feet north of slough, 300 feet south of 34CCB2

Lithologic Log

Depth (ft)	Unit	Description
1-26	SAND & GRAVEL	25% gravel, silicates & carbonates
26-33	SILT	Olive gray, clayey
33-63	SAND & GRAVEL	35% gravel, silicates, shale, carbonates
63-80	CLAY	Olive gray, 40% with silt, sand, & gravel (till)

137-070-34CCB2
NDSWC 14118

Date Completed:	09/14/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1875.2	Well Type:	2 in. - PVC
Depth Drilled (ft):	60	Aquifer:	Streeter
Screen Int. (ft.):	38-43	Data Source:	Alan Wanek & Gary Calheim

Completion Info: Installed 40 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 0 bags of drilling mud. Sealed annulus with 1.5 bags of bentonite chips.

Remarks: Located in ditch east of road, 1050 feet north of county line road, 300 feet north of CCB1 well

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-22	SAND & GRAVEL	25% gravel, silicates, carbonates, shale (oxidized)
22-28	SILT	Olive gray, clayey
28-56	SAND & GRAVEL	30% gravel, shale, silicates, carbonates, primarily well graded coarse sand and fine gravel
56-60	CLAY	Olive gray, plastic, slightly silty

137-070-34DAA
NDSWC 9/13/99

Date Completed:	09/13/1999	Purpose:	Test Hole
L.S. Elevation (ft):	1897		
Depth Drilled (ft):	80		
		Data Source:	Alan Wanek & Gary Calheim

Completion Info: Sealed hole with 2 bags of bentonite chips.

Remarks:
Located 20 feet west of trail center, 15 feet south of 1/4 line

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-32	SAND & GRAVEL	25% gravel, silicates and carbonates
32-34	CLAY	Dark yellowish brown, silty
34-43	CLAY	Olive gray, silty
43-80	CLAY	Olive gray, 40%, with silt and sand (clayey till)

137-070-35AAA1
NDSWC 12346

Date Completed:	07/19/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1902.7	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	100	Aquifer:	Streeter
Screen Int. (ft.):	78-83	Data Source:	NDSWC

Completion Info:

Remarks: WEST WELL

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-26	SAND & GRAVEL	2/3 sand, well graded, primarily coarse to very coarse sand & gravel granules, subangular, silicates & carbonates
26-71	CLAY	Olive gray, 30% w/silt, sand & gravel (till)
71-94	SAND & GRAVEL	As above, with some interbedded clay (as above?), (both gravel & till oxidized)
94-100	SAND	Quartzose w/glauconite?, fine grained, moderately well sorted, subrounded, with dark green clay (Cretaceous Fox Hills Fm. bedrock)

137-070-35AAA2
NDSWC 12346A

Date Completed:	07/20/1983	Purpose:	Observation Well
L.S. Elevation (ft):	1902.7	Well Type:	1.25 in. - PVC
Depth Drilled (ft):	40	Aquifer:	Streeter
Screen Int. (ft.):	21-26	Data Source:	NDSWC

Completion Info:

Remarks: EAST WELL

Lithologic Log

Depth (ft)	Unit	Description
0-2	TOPSOIL	
2-26	SAND & GRAVEL	As in log 12346 (137-70-35AAA1), rock at 26 feet
26-40	CLAY	(till), as in log 12346 (137-70-35AAA1)

137-070-35CCD
NDSWC 14106

Date Completed:	09/13/1999	Purpose:	Observation Well
L.S. Elevation (ft):	1895.98	Well Type:	2 in. - PVC
Depth Drilled (ft):	80	Aquifer:	Streeter
Screen Int. (ft.):	58-63	Data Source:	Alan Wanek & Gary Calheim

Completion Info: Installed 60 feet of casing and five feet of eight slot, two inch diameter PVC screen. Used 0 bags of drilling mud. Sealed annulus with 5 bags of bentonite chips.

Remarks: Located in ditch north of road, 20 feet west of 1/4 1/4 property line

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-16	SAND & GRAVEL	25% gravel, quartz, granite, dark silicates, carbonates, shale (oxidized)
16-35	SAND & GRAVEL	25% gravel, silicates, carbonates, shale
35-42	SILT	Olive gray, clayey
42-49	SAND & GRAVEL	As above
49-52	SILT	Olive gray, clayey
52-68	SAND & GRAVEL	40% gravel, silicates, shale, carbonates
68-80	CLAY	Olive gray, 30%, with silt, sand, and gravel (till)

137-070-36ABB
NDSWC 12344

Date Completed: 07/20/1983
L.S. Elevation (ft): 1920
Depth Drilled (ft): 80

Purpose: Test Hole

Data Source:

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-1	TOPSOIL	
1-19	SAND & GRAVEL	2/3 sand, 1/3 gravel, primarily coarse sand to gravel granules, subangular to subrounded, well graded, silicates, carbonates, shale oxidized to about 11 ft
19-25	CLAY	olive gray, silty
25-80	CLAY	olive gray, 30% with silt, sand, and gravel, (TILL); at 53-53 ft sand and gravel lens; rocky till

137-071-01DCC

Date Completed:	04/29/2005	Purpose:	Surface Water Stage Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Streeter
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Culvert - North side of road. M.P. is arrow on top of culvert.

Lithologic Log

Depth (ft)	Unit	Description

137-071-24ADD

Date Completed:	04/29/2005	Purpose:	Surface Water Stage Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Streeter
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Culvert - West sideof road. M.P. is arrow on top of culvert.

Lithologic Log

Depth (ft)	Unit	Description

137-071-25ADA
NDSWC 14721

Date Completed:	08/06/2001	Purpose:	Test Hole
L.S. Elevation (ft):	1865		
Depth Drilled (ft):	140	Data Source:	Geologist Log

Completion Info:

Remarks:

Lithologic Log

Depth (ft)	Unit	Description
0-4	SAND	vfn. to vcse., pred. cse., sl. gvlly, gvl up to 1/2-inch in dia., comprised of quartz, shield silicates, carbonates, sub-angular to well rounded, prob. stratified.
4-7	SAND	as above, 40-50% gravel up to 11/2 -inch diameter, caving, takes water
7-24	TILL	clay, silty, sandy, pebbly, light gray with red-brown stringers, soft, oxidized
24-29	CLAY	olive gray, very sticky, unoxidized
29-40	TILL	clay, silty, sandy, pebbly, olive gray, soft, unoxid.
40-41	SAND	much in suspension, mud is thick, lots of small lignite frags., bit slipped fast,mixed 1 bag mud at 40 Ft.
41-49	CLAY	olive gray, very sticky, unoxid.
49-98	CLAY	silty, sandy, pebbly, olive gray, soft, rocks at 49 and 76 ft., mixed 2 bags of mud at 76 ft. and 1 bag of mud at 100 ft., taking water
98-109	CLAY	brownish black, some hard, brittle cuttings (Pierre Shale shove block?)
109-129	CLAY	silty, sandy, pebbly, olive gray, soft.
129-140	CLAY	v. silty, sl. sandy(vfn), dark green, cohesive, mod. plastic, at 129-130 ft., very hard claystone layer (Fox Hills Fm.)

137-071-35DA1

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (south side of county road); BOTTOM OF LAKE (east)

Lithologic Log

Depth (ft)	Unit	Description

137-071-35DA2

Date Completed:	00/00/00	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: Alkaline Lake (south side of county road); TOP OF LAKE (west)

Lithologic Log

Depth (ft)	Unit	Description

137-071-36DDC

Date Completed:	0/0	Purpose:	Surface Water Sample Site
L.S. Elevation (ft):	N/A	Well Type:	N/A
Depth Drilled (ft):	N/A	Aquifer:	Surface Water
Screen Int. (ft.):	N/A	Data Source:	

Completion Info:

Remarks: ALKALINE LAKE SAMPLE

Lithologic Log

Depth (ft)	Unit	Description

APPENDIX II

WATER LEVELS IN WELLS

135-069-06CCC
Streeter Aquifer

MP Elev (msl,ft)=1,933.50
SI (ft.)=48-53

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/08/82	13.88	1919.62
08/22/82	14.39	1919.11
09/08/82	14.52	1918.98
09/22/82	14.75	1918.75
10/22/82	14.35	1919.15
12/06/82	14.40	1919.10
12/13/82	14.29	1919.21
03/31/83	14.46	1919.04
04/30/83	14.15	1919.35
05/11/83	14.18	1919.32
05/29/83	14.08	1919.42
06/27/83	14.32	1919.18
07/14/83	14.49	1919.01
07/27/83	14.64	1918.86
08/10/83	14.90	1918.60
08/25/83	15.09	1918.41
09/13/83	15.40	1918.10
09/25/83	15.43	1918.07
10/25/83	15.55	1917.95
11/08/83	15.69	1917.81
11/27/83	15.79	1917.71
11/30/83	15.80	1917.70
12/04/83	15.90	1917.60
03/22/84	16.33	1917.17
04/24/84	14.86	1918.64
05/15/84	14.30	1919.20
05/30/84	14.26	1919.24
06/20/84	14.33	1919.17
07/24/84	14.74	1918.76
08/21/84	15.09	1918.41
09/22/84	15.51	1917.99
10/23/84	15.55	1917.95
10/25/84	15.53	1917.97
11/25/84	15.66	1917.84
12/06/84	15.84	1917.66
12/20/84	15.81	1917.69
03/22/85	16.26	1917.24
04/21/85	16.08	1917.42
05/25/85	16.10	1917.40
06/21/85	16.17	1917.33
07/24/85	16.54	1916.96
08/21/85	16.76	1916.74
08/22/85	16.75	1916.75
09/23/85	16.69	1916.81
10/20/85	16.74	1916.76
11/14/85	16.84	1916.66
11/22/85	16.87	1916.63
12/21/85	17.00	1916.50
01/10/86	17.16	1916.34
03/20/86	16.52	1916.98
04/20/86	16.04	1917.46
05/23/86	14.50	1919.00
06/22/86	14.53	1918.97
07/21/86	14.54	1918.96
08/20/86	14.60	1918.90
09/17/86	14.50	1919.00

Date	Depth to Water (ft)	WL Elev (msl, ft)
09/19/86	14.50	1919.00
10/19/86	13.93	1919.57
11/23/86	13.79	1919.71
12/11/86	13.78	1919.72
12/22/86	13.90	1919.60
03/20/87	14.03	1919.47
04/20/87	11.24	1922.26
05/21/87	11.18	1922.32
06/21/87	11.15	1922.35
07/20/87	11.52	1921.98
08/20/87	12.00	1921.50
09/21/87	12.50	1921.00
10/21/87	12.80	1920.70
11/13/87	13.13	1920.37
11/20/87	13.08	1920.42
12/19/87	13.23	1920.27
03/20/88	13.51	1919.99
04/21/88	13.54	1919.96
05/21/88	13.85	1919.65
06/21/88	14.18	1919.32
07/20/88	14.80	1918.70
08/20/88	15.21	1918.29
09/19/88	15.58	1917.92
10/20/88	15.83	1917.67
11/21/88	15.99	1917.51
11/23/88	16.02	1917.48
12/20/88	16.17	1917.33
03/20/89	16.75	1916.75
04/20/89	16.12	1917.38
05/21/89	16.04	1917.46
06/21/89	16.21	1917.29
07/19/89	16.60	1916.90
07/20/89	16.62	1916.88
08/21/89	17.07	1916.43
09/19/89	17.25	1916.25
10/20/89	17.43	1916.07
11/21/89	17.71	1915.79
11/22/89	17.60	1915.90
12/22/89	17.73	1915.77
02/27/90	18.10	1915.40
03/21/90	18.19	1915.31
04/21/90	18.19	1915.31
05/19/90	18.01	1915.49
06/19/90	17.96	1915.54
07/20/90	17.90	1915.60
08/20/90	18.31	1915.19
09/21/90	18.55	1914.95
10/20/90	18.64	1914.86
11/21/90	18.75	1914.75
12/10/90	18.80	1914.70
12/22/90	18.85	1914.65
03/21/91	19.26	1914.24
04/21/91	19.20	1914.30
05/21/91	18.98	1914.52
06/07/91	18.98	1914.52

135-069-06CCC
Streeter Aquifer

MP Elev (msl,ft)=1,933.50
SI (ft.)=48-53

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/20/91	19.08	1914.42
07/21/91	19.22	1914.28
08/19/91	19.53	1913.97
09/20/91	19.67	1913.83
10/21/91	19.81	1913.69
11/20/91	19.85	1913.65
12/22/91	19.99	1913.51
03/22/92	20.09	1913.41
04/20/92	20.12	1913.38
05/18/92	20.08	1913.42
05/20/92	20.08	1913.42
06/12/92	20.16	1913.34
06/19/92	20.13	1913.37
07/18/92	20.09	1913.41
08/23/92	20.39	1913.11
09/16/92	20.45	1913.05
09/20/92	20.51	1912.99
11/18/92	20.86	1912.64
11/23/92	20.69	1912.81
12/21/92	20.80	1912.70
03/20/93	21.14	1912.36
04/21/93	20.71	1912.79
05/22/93	20.54	1912.96
06/19/93	20.39	1913.11
07/21/93	19.61	1913.89
08/22/93	17.55	1915.95
09/20/93	17.21	1916.29
10/22/93	17.31	1916.19
11/19/93	17.38	1916.12
12/07/93	17.39	1916.11
12/20/93	17.44	1916.06
03/20/94	17.49	1916.01
04/20/94	15.27	1918.23
05/05/94	14.73	1918.77
05/21/94	14.20	1919.30
06/02/94	14.20	1919.30
06/19/94	14.26	1919.24
07/20/94	14.25	1919.25
08/21/94	14.60	1918.90
09/21/94	14.91	1918.59
10/19/94	14.99	1918.51
11/22/94	15.10	1918.40
12/01/94	15.19	1918.31
12/20/94	15.12	1918.38
03/20/95	14.58	1918.92
04/19/95	13.42	1920.08
05/21/95	12.02	1921.48
06/22/95	11.87	1921.63
07/21/95	11.50	1922.00
08/20/95	11.94	1921.56
09/19/95	12.40	1921.10
10/26/95	12.54	1920.96
05/02/96	10.63	1922.87
08/08/96	10.94	1922.56
09/20/96	11.47	1922.03

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/24/96	11.72	1921.78
12/05/96	11.78	1921.72
05/22/97	8.64	1924.86
06/30/97	9.13	1924.37
08/12/97	9.23	1924.27
09/16/97	9.59	1923.91
10/14/97	9.83	1923.67
11/11/97	9.98	1923.52
12/10/97	10.06	1923.44
05/12/98	9.09	1924.41
07/15/98	9.61	1923.89
08/25/98	9.85	1923.65
10/13/98	10.44	1923.06
11/30/98	10.18	1923.32
06/01/99	8.54	1924.96
06/29/99	8.76	1924.74
07/27/99	8.92	1924.58
09/08/99	8.41	1925.09
10/05/99	8.66	1924.84
11/02/99	8.75	1924.75
12/07/99	8.77	1924.73
05/17/00	8.41	1925.09
06/14/00	8.66	1924.84
07/12/00	9.05	1924.45
08/15/00	9.51	1923.99
09/19/00	9.92	1923.58
10/17/00	10.23	1923.27
11/30/00	10.15	1923.35
05/10/01	9.07	1924.43
06/26/01	8.89	1924.61
07/24/01	9.14	1924.36
08/21/01	9.30	1924.20
09/19/01	9.79	1923.71
10/23/01	9.98	1923.52
11/29/01	10.19	1923.31
12/18/01	10.42	1923.08
05/14/02	10.39	1923.11
06/25/02	10.97	1922.53
06/27/02	10.98	1922.52
08/20/02	11.77	1921.73
10/01/02	12.39	1921.11
11/19/02	12.66	1920.84
12/17/02	12.85	1920.65
05/21/03	12.62	1920.88
06/17/03	12.64	1920.86
07/22/03	12.74	1920.76
08/20/03	13.20	1920.30
09/16/03	13.65	1919.85
10/21/03	13.98	1919.52
11/18/03	14.12	1919.38
12/09/03	14.28	1919.22
05/19/04	14.09	1919.41

135-069-06CCC
Streeter Aquifer

MP Elev (msl,ft)=1,933.50
SI (ft.)=48-53

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/22/04	12.58	1920.92
07/27/04	12.90	1920.60
08/25/04	13.37	1920.13
09/21/04	13.66	1919.84
10/18/04	13.71	1919.79
11/22/04	13.77	1919.73
12/13/04	13.98	1919.52
04/13/05	14.55	1918.95
05/18/05	14.36	1919.14
06/13/05	14.05	1919.45
07/26/05	13.58	1919.92
08/24/05	13.75	1919.75
09/20/05	14.10	1919.40

135-069-07DDD2
Streeter Aquifer

MP Elev (msl,ft)=1,948.00
SI (ft.)=21-24

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/10/79	20.07	1927.93
07/08/82	21.98	1926.02
09/08/82	22.98	1925.02
12/13/82	22.50	1925.50
05/11/83	22.84	1925.16
07/14/83	23.10	1924.90
05/15/84	20.27	1927.73
05/07/86	22.36	1925.64
10/07/86	21.03	1926.97

136-069-04CCC2
Streeter Aquifer

MP Elev (msl,ft)=1,846.70
SI (ft.)=70-73

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/13/79	13.57	1833.13
07/08/82	15.13	1831.57
09/08/82	15.56	1831.14
12/13/82	15.27	1831.43
05/11/83	14.63	1832.07
07/14/83	15.28	1831.42
08/10/83	15.54	1831.16
09/13/83	15.84	1830.86
11/08/83	15.83	1830.87
05/15/84	14.45	1832.25
10/25/84	15.35	1831.35
05/23/85	15.14	1831.56
11/14/85	15.14	1831.56
05/07/86	14.52	1832.18
10/07/86	15.11	1831.59
07/19/89	16.63	1830.07
02/27/90	17.02	1829.68

136-069-18CCC2
Streeter Aquifer

MP Elev (msl,ft)=1,919.50
SI (ft.)=52-55

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/08/79	21.57	1897.78
05/06/80	22.50	1896.85
07/15/81	24.65	1894.85
07/21/81	25.54	1893.96
07/25/81	25.54	1893.96
08/23/81	25.22	1894.28
09/23/81	25.27	1894.23
10/24/81	25.65	1893.85
11/21/81	24.93	1894.57
12/22/81	26.01	1893.49
03/18/82	26.33	1893.17
04/25/82	25.48	1894.02
05/23/82	24.93	1894.57
06/25/82	25.64	1893.86
07/08/82	24.57	1894.93
07/21/82	24.63	1894.87
08/22/82	24.73	1894.77
09/08/82	24.81	1894.69
09/22/82	24.85	1894.65
10/22/82	24.84	1894.66
12/03/82	24.84	1894.66
12/06/82	24.81	1894.69
12/13/82	24.66	1894.84
03/31/83	24.83	1894.67
04/30/83	24.67	1894.83
05/11/83	24.70	1894.80
05/29/83	24.55	1894.95
06/27/83	24.61	1894.89
07/14/83	24.62	1894.88
07/27/83	24.72	1894.78
08/10/83	24.98	1894.52
08/25/83	25.07	1894.43
09/13/83	25.38	1894.12
09/25/83	25.35	1894.15
10/25/83	25.44	1894.06
11/08/83	25.71	1893.79
11/27/83	25.72	1893.78
11/30/83	25.77	1893.73
12/01/83	25.82	1893.68
03/22/84	26.29	1893.21
04/24/84	25.28	1894.22
05/15/84	24.93	1894.57
05/30/84	24.68	1894.82
06/20/84	24.58	1894.92
07/24/84	24.79	1894.71
08/21/84	24.94	1894.56
09/22/84	25.21	1894.29
10/23/84	25.42	1894.08
10/25/84	25.22	1894.28
11/25/84	25.45	1894.05
12/06/84	25.70	1893.80
12/20/84	25.49	1894.01
03/22/85	25.96	1893.54
04/21/85	25.91	1893.59

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/25/85	25.83	1893.67
06/21/85	25.97	1893.53
07/24/85	26.25	1893.25
08/21/85	26.43	1893.07
09/23/85	26.64	1892.86
10/20/85	26.74	1892.76
11/14/85	26.99	1892.51
11/22/85	26.87	1892.63
01/10/86	27.15	1892.35
03/20/86	26.98	1892.52
04/20/86	26.47	1893.03
05/23/86	25.55	1893.95
06/22/86	25.36	1894.14
07/21/86	25.26	1894.24
08/20/86	25.56	1893.94
09/19/86	25.50	1894.00
10/19/86	25.58	1893.92
11/23/86	25.67	1893.83
12/11/86	25.72	1893.78
12/22/86	25.66	1893.84
03/20/87	25.60	1893.90
04/20/87	24.38	1895.12
05/21/87	23.76	1895.74
06/21/87	23.46	1896.04
07/20/87	23.58	1895.92
08/20/87	23.68	1895.82
09/21/87	24.06	1895.44
10/21/87	24.15	1895.35
11/13/87	24.50	1895.00
11/20/87	24.42	1895.08
12/19/87	24.47	1895.03
03/20/88	24.93	1894.57
04/21/88	24.88	1894.62
05/21/88	25.04	1894.46
06/21/88	25.14	1894.36
07/20/88	25.64	1893.86
08/20/88	25.86	1893.64
09/19/88	26.25	1893.25
10/20/88	26.45	1893.05
11/21/88	26.79	1892.71
11/23/88	26.79	1892.71
12/20/88	27.12	1892.38
03/20/89	27.67	1891.83
04/20/89	27.21	1892.29
05/21/89	27.12	1892.38
06/21/89	27.33	1892.17
07/19/89	27.61	1891.89
07/20/89	27.56	1891.94
08/21/89	27.69	1891.81
09/19/89	28.00	1891.50
10/20/89	27.99	1891.51
11/21/89	28.36	1891.14
11/22/89	28.40	1891.10
12/22/89	28.47	1891.03
02/27/90	28.97	1890.53

136-069-18CCC2
Streeter Aquifer

MP Elev (msl,ft)=1,919.50
SI (ft.)=52-55

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/21/90	28.82	1890.68
04/21/90	29.01	1890.49
05/19/90	29.08	1890.42
06/12/90	29.16	1890.34
06/19/90	29.13	1890.37
07/20/90	29.27	1890.23
08/20/90	29.37	1890.13
09/21/90	29.51	1889.99
10/20/90	29.72	1889.78
11/21/90	29.79	1889.71
12/10/90	29.75	1889.75
12/22/90	29.89	1889.61
03/21/91	30.26	1889.24
04/21/91	30.27	1889.23
05/21/91	30.29	1889.21
06/07/91	30.37	1889.13
06/20/91	30.36	1889.14
07/21/91	30.49	1889.01
08/19/91	30.51	1888.99
09/20/91	30.63	1888.87
10/21/91	30.83	1888.67
11/20/91	30.86	1888.64
12/22/91	31.07	1888.43
03/22/92	31.05	1888.45
04/20/92	31.16	1888.34
05/18/92	31.17	1888.33
05/20/92	31.19	1888.31
06/12/92	31.33	1888.17
06/19/92	31.33	1888.17
07/18/92	31.33	1888.17
08/23/92	31.51	1887.99
09/16/92	31.65	1887.85
09/20/92	31.54	1887.96
10/19/92	31.57	1887.93
11/18/92	31.99	1887.51
11/23/92	31.87	1887.63
12/21/92	31.96	1887.54
03/20/93	32.17	1887.33
04/21/93	31.90	1887.60
05/22/93	31.78	1887.72
06/19/93	31.75	1887.75
07/21/93	31.34	1888.16
08/22/93	30.46	1889.04
09/20/93	30.16	1889.34
10/22/93	29.91	1889.59
11/19/93	29.85	1889.65
12/20/93	29.19	1890.31
03/20/94	29.66	1889.84
04/20/94	28.60	1890.90
05/05/94	28.11	1891.39
05/21/94	27.59	1891.91
06/02/94	27.35	1892.15
06/19/94	26.89	1892.61
07/20/94	26.36	1893.14
08/21/94	26.10	1893.40
09/21/94	26.32	1893.18

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/19/94	26.29	1893.21
11/22/94	26.37	1893.13
12/01/94	26.31	1893.19
12/20/94	26.37	1893.13
03/20/95	26.26	1893.24
04/19/95	25.68	1893.82
05/21/95	24.69	1894.81
06/22/95	24.00	1895.50
07/21/95	23.46	1896.04
08/20/95	23.47	1896.03
09/19/95	23.60	1895.90
10/26/95	23.46	1896.04
05/02/96	23.84	1895.66
08/08/96	23.78	1895.72
09/20/96	24.03	1895.47
10/24/96	24.36	1895.14
12/05/96	24.38	1895.12
05/22/97	21.65	1897.85
06/30/97	21.14	1898.36
08/12/97	21.58	1897.92
09/16/97	21.94	1897.56
10/14/97	22.55	1896.95
11/11/97	22.66	1896.84
12/10/97	22.95	1896.55
05/12/98	22.74	1896.76
07/15/98	23.29	1896.21
08/25/98	23.65	1895.85
10/13/98	24.17	1895.33
11/30/98	24.36	1895.14
06/01/99	23.34	1896.16
06/29/99	23.14	1896.36
07/27/99	23.00	1896.50
09/08/99	23.14	1896.36
10/05/99	23.21	1896.29
11/02/99	23.19	1896.31
12/07/99	23.10	1896.40
05/17/00	23.01	1896.49
06/14/00	23.11	1896.39
07/12/00	23.27	1896.23
08/15/00	23.53	1895.97
09/19/00	23.74	1895.76
10/17/00	24.04	1895.46
11/30/00	24.14	1895.36
05/10/01	23.13	1896.37
06/26/01	22.86	1896.64
07/24/01	22.83	1896.67
08/21/01	22.80	1896.70
09/19/01	23.16	1896.34
10/23/01	23.30	1896.20
11/29/01	23.51	1895.99
12/18/01	23.94	1895.56
05/14/02	24.16	1895.34

136-069-18CCC2
Streeter Aquifer

MP Elev (msl,ft)=1,919.50
SI (ft.)=52-55

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/25/02	24.58	1894.92
06/27/02	24.60	1894.90
08/20/02	25.19	1894.31
10/01/02	25.84	1893.66
11/19/02	26.06	1893.44
12/17/02	26.12	1893.38
05/21/03	26.46	1893.04
06/17/03	26.46	1893.04
07/22/03	26.39	1893.11
08/20/03	26.52	1892.98
09/16/03	26.84	1892.66
10/21/03	27.06	1892.44
11/18/03	27.24	1892.26
12/09/03	27.39	1892.11

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/19/04	27.15	1892.35
06/22/04	27.05	1892.45
07/27/04	27.00	1892.50
08/25/04	27.12	1892.38
09/21/04	27.44	1892.06
10/18/04	27.34	1892.16
11/22/04	27.32	1892.18
12/13/04	27.65	1891.85
04/13/05	27.92	1891.58
05/18/05	27.70	1891.80
06/13/05	27.64	1891.86
07/26/05	27.60	1891.90
08/24/05	27.57	1891.93
09/20/05	27.82	1891.68

136-069-31CCC2
Streeter Aquifer

MP Elev (msl,ft)=1,941.00
SI (ft.)=25-29

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/24/78	24.95	1915.35
12/06/78	25.23	1915.07
01/08/79	25.37	1914.93
02/05/79	25.52	1914.78
04/03/79	25.94	1914.36
04/30/79	25.28	1915.02
06/06/79	25.36	1915.64
07/18/79	24.93	1916.07
08/07/79	24.84	1916.16
08/28/79	24.82	1916.18
10/10/79	25.02	1915.98
11/08/79	25.20	1915.80
05/06/80	26.20	1914.80
07/15/80	28.24	1912.76
07/25/81	28.78	1912.22
08/23/81	28.94	1912.06
09/23/81	28.93	1912.07
10/24/81	29.20	1911.80
11/21/81	29.34	1911.66
12/22/81	29.46	1911.54
03/81/82	28.42	1912.58
04/25/82	29.47	1911.53
05/23/82	28.75	1912.25
06/25/82	29.07	1911.93
07/08/82	29.02	1911.98
07/21/82	28.90	1912.10
08/22/82	28.78	1912.22
09/08/82	28.81	1912.19
09/22/82	28.80	1912.20
10/22/82	28.92	1912.08
12/03/82	28.68	1912.32
12/06/82	28.72	1912.28
12/13/82	28.76	1912.24
03/31/83	28.85	1912.15
04/30/83	28.84	1912.16
05/11/83	28.89	1912.11
05/29/83	28.75	1912.25
06/27/83	28.76	1912.24
07/14/83	28.77	1912.23
07/27/83	28.73	1912.27
08/10/83	28.89	1912.11
08/26/83	28.86	1912.14
09/13/83	29.06	1911.94
09/25/83	29.03	1911.97
10/25/83	29.17	1911.83
11/08/83	29.33	1911.67
11/27/83	29.32	1911.68
12/06/83	29.42	1911.58
03/22/84	29.88	1911.12
04/24/84	29.43	1911.57
05/15/84	29.35	1911.65
05/30/84	29.11	1911.89
06/20/84	28.96	1912.04
07/24/84	28.88	1912.12
08/21/84	28.92	1912.08
09/22/84	29.07	1911.93
10/23/84	29.23	1911.77
10/25/84	29.28	1911.72
11/25/84	29.33	1911.67
12/20/84	29.41	1911.59
03/22/85	29.87	1911.13
04/21/85	29.92	1911.08
05/25/85	30.05	1910.95
06/21/85	30.10	1910.90
07/24/85	30.16	1910.84
08/21/85	30.50	1910.50
08/22/85	30.23	1910.77
09/23/85	30.35	1910.65
10/20/85	30.39	1910.61
11/14/85	30.66	1910.34
11/22/85	30.47	1910.53
12/21/85	30.52	1910.48
04/20/86	30.53	1910.47
05/23/86	29.83	1911.17
06/22/86	29.33	1911.67
07/21/86	29.13	1911.87
08/20/86	29.09	1911.91
09/17/86	29.06	1911.94
10/19/86	29.05	1911.95
11/23/86	29.02	1911.98
12/11/86	29.35	1911.65
12/22/86	28.97	1912.03
03/20/87	28.99	1912.01
04/20/87	27.88	1913.12
05/21/87	27.47	1913.53
06/21/87	27.23	1913.77
07/20/87	27.09	1913.91
08/20/87	27.00	1914.00
09/21/87	27.07	1913.93
10/21/87	27.13	1913.87
11/13/87	27.33	1913.67
11/20/87	27.28	1913.72
12/19/87	27.38	1913.62
03/20/88	27.84	1913.16
04/21/88	27.94	1913.06
05/21/88	28.04	1912.96
06/21/88	28.16	1912.84
07/20/88	28.39	1912.61
08/20/88	28.61	1912.39
09/19/88	28.92	1912.08
10/20/88	29.19	1911.81
11/21/88	29.46	1911.54
11/23/88	29.65	1911.35
12/20/88	29.67	1911.33
03/20/89	30.28	1910.72
04/20/89	30.33	1910.67
05/21/89	30.34	1910.66
06/21/89	30.39	1910.61
07/19/89	30.66	1910.34

136-070-02BBA
Streeter Aquifer

MP Elev (msl,ft)=1,952.39
SI (ft.)=28-31

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/06/80	29.13	1923.26
07/08/82	28.73	1923.66
09/08/82	28.82	1923.57
12/13/82	29.21	1923.18
05/11/83	28.67	1923.72
07/14/83	28.80	1923.59
08/10/83	28.91	1923.48
09/12/83	29.03	1923.36
11/08/83	29.11	1923.28
05/15/84	28.65	1923.74
10/25/84	29.02	1923.37
05/23/85	29.16	1923.23
11/14/85	29.45	1922.94
05/07/86	28.69	1923.70
10/07/86	28.84	1923.55
07/24/89	29.44	1922.95
08/15/89	29.48	1922.91
02/27/90	29.71	1922.68
06/07/91	29.97	1922.42
05/18/92	30.03	1922.36
06/12/92	30.12	1922.27
07/27/93	29.56	1922.83
05/05/94	28.37	1924.02
06/02/94	28.20	1924.19
10/26/95	28.31	1924.08
05/02/96	27.64	1924.75
08/08/96	28.31	1924.08
09/20/96	28.50	1923.89
10/24/96	28.61	1923.78
12/05/96	28.75	1923.64
05/22/97	26.23	1926.16
06/30/97	26.70	1925.69
08/12/97	27.27	1925.12
09/16/97	27.60	1924.79
10/14/97	27.85	1924.54
11/11/97	28.04	1924.35
12/10/97	28.28	1924.11
05/12/98	28.06	1924.33
07/15/98	28.51	1923.88
08/25/98	28.70	1923.69
10/13/98	28.89	1923.50
11/30/98	29.04	1923.35

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/01/99	28.03	1924.36
06/29/99	27.74	1924.65
07/27/99	27.97	1924.42
09/08/99	28.29	1924.10
10/05/99	28.44	1923.95
11/02/99	28.58	1923.81
12/07/99	28.72	1923.67
05/17/00	28.93	1923.46
06/14/00	29.00	1923.39
07/12/00	29.08	1923.31
08/15/00	28.80	1923.59
09/19/00	29.00	1923.39
10/17/00	29.12	1923.27
11/30/00	29.20	1923.19
05/10/01	28.63	1923.76
06/26/01	28.80	1923.59
07/24/01	28.64	1923.75
08/21/01	28.65	1923.74
09/19/01	28.80	1923.59
10/23/01	28.93	1923.46
11/29/01	29.07	1923.32
12/18/01	29.18	1923.21
05/14/02	29.39	1923.00
06/25/02	29.46	1922.93
08/20/02	29.48	1922.91
10/01/02	29.58	1922.81
11/19/02	29.60	1922.79
12/17/02	29.61	1922.78
05/21/03	29.72	1922.67
06/17/03	29.69	1922.70
07/22/03	29.55	1922.84
08/20/03	29.58	1922.81
09/16/03	29.63	1922.76
10/21/03	29.70	1922.69
11/18/03	29.73	1922.66
12/09/03	29.75	1922.64
05/19/04	29.45	1922.94
06/22/04	29.29	1923.10
07/27/04	28.74	1923.65
08/25/04	28.70	1923.69
09/21/04	28.86	1923.53
10/18/04	28.97	1923.42
11/22/04	29.10	1923.29
12/13/04	29.20	1923.19
04/13/05	29.47	1922.92
05/18/05	29.44	1922.95
06/13/05	29.50	1922.89
07/26/05	29.73	1922.66
08/24/05	29.23	1923.16
09/20/05	29.21	1923.18

136-070-03ABB
Streeter Aquifer

MP Elev (msl,ft)=1,913.80
SI (ft.)=39-42

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/06/78	35.92	1877.88
07/08/82	35.71	1878.09
09/08/82	35.92	1877.88
12/13/82	35.61	1878.19
05/11/83	35.23	1878.57
07/14/83	35.28	1878.52
08/10/83	35.45	1878.35
09/12/83	35.69	1878.11
11/08/83	35.86	1877.94
05/15/84	35.48	1878.32
10/25/84	35.87	1877.93
05/23/85	35.88	1877.92
11/14/85	36.32	1877.48
10/07/86	35.35	1878.45
07/24/89	36.75	1877.05
08/15/89	36.83	1876.97
02/27/90	37.31	1876.49
06/07/91	37.91	1875.89
05/18/92	38.58	1875.22
06/12/92	38.63	1875.17

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/27/93	38.68	1875.12
05/05/94	37.33	1876.47
06/02/94	37.23	1876.57
10/26/95	35.79	1878.01
05/02/96	35.66	1878.14
08/08/96	35.85	1877.95
09/20/96	36.10	1877.70
10/24/96	36.17	1877.63
12/05/96	36.21	1877.59
05/22/97	34.75	1879.05
06/30/97	34.80	1879.00
08/12/97	34.94	1878.86
09/16/97	35.03	1878.77
10/14/97	35.20	1878.60
11/11/97	35.21	1878.59
12/10/97	35.24	1878.56
05/12/98	34.89	1878.91
07/15/98	35.12	1878.68
08/25/98	35.41	1878.39
10/13/98	35.63	1878.17
11/30/98	35.55	1878.25
06/01/99	35.08	1878.72

136-070-03ABB2
Streeter Aquifer

MP Elev (msl,ft)=1,914.14
SI (ft.)=58-63

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/04/99	35.26	1878.88
10/05/99	35.26	1878.88
11/02/99	35.19	1878.95
12/07/99	35.06	1879.08
05/17/00	34.81	1879.33
06/14/00	34.87	1879.27
07/12/00	35.08	1879.06
08/15/00	35.30	1878.84
09/19/00	35.53	1878.61
10/17/00	35.63	1878.51
11/30/00	35.58	1878.56
05/10/01	35.22	1878.92
06/26/01	35.21	1878.93
07/24/01	35.36	1878.78
08/21/01	35.44	1878.70
09/19/01	35.66	1878.48
10/23/01	35.70	1878.44
11/29/01	35.73	1878.41
12/18/01	35.81	1878.33
05/14/02	35.71	1878.43
06/25/02	35.97	1878.17
08/20/02	36.45	1877.69
10/01/02	36.79	1877.35
11/19/02	36.94	1877.20

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/17/02	36.91	1877.23
05/21/03	36.93	1877.21
06/17/03	36.79	1877.35
07/22/03	36.95	1877.19
08/20/03	37.18	1876.96
09/16/03	37.37	1876.77
10/21/03	37.57	1876.57
11/18/03	37.62	1876.52
12/09/03	37.65	1876.49
05/19/04	37.42	1876.72
06/22/04	37.33	1876.81
07/27/04	37.30	1876.84
08/25/04	37.43	1876.71
09/07/04	37.45	1876.69
09/21/04	37.34	1876.80
10/18/04	37.15	1876.99
11/22/04	36.97	1877.17
12/13/04	36.94	1877.20
04/13/05	36.97	1877.17
05/18/05	36.80	1877.34
06/13/05	36.83	1877.31
07/26/05	36.97	1877.17
08/24/05	37.15	1876.99
09/20/05	37.25	1876.89

136-070-03DCC
Streeter Aquifer

MP Elev (msl,ft)=1,882.50
SI (ft.)=43-48

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/10/83	9.36	1873.14
08/26/83	9.56	1872.94
09/12/83	9.85	1872.65
09/25/83	9.69	1872.81
10/25/83	9.21	1873.29
11/08/83	9.06	1873.44
11/27/83	8.97	1873.53
11/30/83	9.16	1873.34
12/06/83	9.05	1873.45
04/24/84	7.30	1875.20
05/15/84	7.38	1875.12
05/30/84	7.91	1874.59
06/20/84	7.51	1874.99
07/24/84	8.77	1873.73
08/21/84	9.32	1873.18
09/22/84	9.71	1872.79
10/23/84	8.73	1873.77
10/25/84	8.68	1873.82
11/25/84	8.66	1873.84
12/20/84	9.01	1873.49
03/22/85	8.55	1873.95
04/21/85	7.79	1874.71
05/25/85	7.87	1874.63
06/21/85	8.46	1874.04
07/24/85	9.35	1873.15
08/21/85	9.50	1873.00
08/22/85	9.47	1873.03
09/23/85	9.17	1873.33
10/20/85	8.85	1873.65
11/14/85	8.98	1873.52
04/20/86	6.50	1876.00
05/23/86	7.32	1875.18
06/22/86	8.07	1874.43
07/21/86	8.42	1874.08
08/20/86	9.01	1873.49
09/17/86	8.32	1874.18
10/19/86	8.02	1874.48
04/20/87	7.09	1875.41
05/21/87	7.67	1874.83
06/21/87	8.42	1874.08
07/20/87	8.09	1874.41
08/20/87	8.70	1873.80
09/21/87	8.97	1873.53
10/21/87	8.84	1873.66
11/13/87	8.80	1873.70
11/20/87	8.65	1873.85
12/19/87	8.57	1873.93
03/20/88	8.13	1874.37
04/21/88	7.84	1874.66
05/21/88	8.17	1874.33
06/21/88	8.98	1873.52
07/20/88	9.80	1872.70
08/20/88	10.28	1872.22
09/19/88	10.51	1871.99
10/20/88	10.11	1872.39
11/21/88	9.85	1872.65
11/23/88	9.87	1872.63
12/20/88	9.88	1872.62
03/20/89	9.75	1872.75
04/20/89	8.58	1873.92
05/21/89	8.47	1874.03
06/21/89	9.00	1873.50
07/19/89	9.36	1873.14
07/20/89	9.25	1873.25
08/21/89	10.12	1872.38
09/19/89	9.42	1873.08
10/20/89	9.67	1872.83
11/21/89	9.61	1872.89
11/22/89	9.49	1873.01
02/27/90	10.43	1872.07
03/21/90	9.91	1872.59
04/21/90	9.23	1873.27
05/19/90	8.67	1873.83
06/19/90	8.45	1874.05
07/20/90	9.26	1873.24
08/20/90	10.00	1872.50
09/21/90	10.29	1872.21
10/20/90	10.21	1872.29
11/21/90	9.98	1872.52
12/10/90	10.05	1872.45
03/21/91	10.20	1872.30
04/21/91	9.36	1873.14
05/21/91	8.62	1873.88
06/07/91	9.00	1873.50
06/20/91	9.37	1873.13
07/21/91	9.83	1872.67
08/19/91	10.48	1872.02
09/20/91	10.36	1872.14
10/21/91	10.45	1872.05
11/20/91	10.14	1872.36
12/22/91	10.32	1872.18
03/22/92	9.64	1872.86
04/20/92	9.20	1873.30
05/18/92	9.11	1873.39
05/20/92	9.12	1873.38
06/12/92	9.68	1872.82
06/19/92	9.50	1873.00
07/18/92	9.81	1872.69
08/23/92	10.48	1872.02
09/16/92	10.50	1872.00
09/20/92	10.54	1871.96
10/19/92	10.66	1871.84
04/21/93	9.22	1873.28
05/22/93	9.11	1873.39
06/19/93	8.99	1873.51
07/21/93	7.13	1875.37
08/22/93	8.08	1874.42
09/20/93	8.68	1873.82
10/22/93	8.97	1873.53
11/19/93	9.04	1873.46

136-070-03DCC
Streeter Aquifer

MP Elev (msl,ft)=1,882.50
SI (ft.)=43-48

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/20/94	7.28	1875.22
05/05/94	6.90	1875.60
05/21/94	7.65	1874.85
06/02/94	8.10	1874.40
06/19/94	8.36	1874.14
07/20/94	8.19	1874.31
08/21/94	9.16	1873.34
09/21/94	9.12	1873.38
10/19/94	8.45	1874.05
03/20/95	7.82	1874.68
04/19/95	7.00	1875.50
05/21/95	6.94	1875.56
06/22/95	7.82	1874.68
07/21/95	7.32	1875.18
08/20/95	8.45	1874.05
09/19/95	8.19	1874.31
10/26/95	7.93	1874.57
08/08/96	8.84	1873.66
09/20/96	9.34	1873.16
10/24/96	8.74	1873.76
05/22/97	7.07	1875.43
06/30/97	8.17	1874.33
08/12/97	8.69	1873.81
09/16/97	8.74	1873.76
10/14/97	8.52	1873.98
11/11/97	8.36	1874.14
05/12/98	7.21	1875.29
07/15/98	8.10	1874.40
08/25/98	8.13	1874.37
10/13/98	8.49	1874.01
06/01/99	6.69	1875.81
06/29/99	7.28	1875.22
07/27/99	7.85	1874.65
09/08/99	7.33	1875.17
10/05/99	7.78	1874.72
11/02/99	7.90	1874.60
12/07/99	7.98	1874.52
05/17/00	7.40	1875.10
06/14/00	7.93	1874.57
07/12/00	7.85	1874.65

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/15/00	8.51	1873.99
09/19/00	9.01	1873.49
10/17/00	8.64	1873.86
11/30/00	8.23	1874.27
05/10/01	6.81	1875.69
06/26/01	7.10	1875.40
07/24/01	7.94	1874.56
08/21/01	8.54	1873.96
09/19/01	8.86	1873.64
10/23/01	8.53	1873.97
11/29/01	8.47	1874.03
12/18/01	8.61	1873.89
05/14/02	7.44	1875.06
06/25/02	8.63	1873.87
06/27/02	8.70	1873.80
08/20/02	9.29	1873.21
10/01/02	9.63	1872.87
11/19/02	9.02	1873.48
12/17/02	9.29	1873.21
05/21/03	6.80	1875.70
06/17/03	7.78	1874.72
07/22/03	8.49	1874.01
08/20/03	9.45	1873.05
09/16/03	10.01	1872.49
10/21/03	9.86	1872.64
11/18/03	9.62	1872.88
12/09/03	9.51	1872.99
05/19/04	7.84	1874.66
06/22/04	7.08	1875.42
07/27/04	8.23	1874.27
08/25/04	8.90	1873.60
09/21/04	8.90	1873.60
10/18/04	8.76	1873.74
11/22/04	8.46	1874.04
12/13/04	8.71	1873.79
04/13/05	8.22	1874.28
05/18/05	7.69	1874.81
06/13/05	7.20	1875.30
07/26/05	8.50	1874.00
08/24/05	8.72	1873.78
09/20/05	8.75	1873.75

136-070-05AAA1
Streeter Aquifer

MP Elev (msl,ft)=1,895.81
SI (ft.)=112-115

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/06/78	25.28	1870.53
07/08/82	26.06	1869.75
09/08/82	27.01	1868.80
12/13/82	26.36	1869.45
05/11/83	26.03	1869.78
07/14/83	26.37	1869.44
08/10/83	26.73	1869.08
09/12/83	27.11	1868.70
11/08/83	26.94	1868.87
05/15/84	26.05	1869.76
10/25/84	26.68	1869.13
05/23/85	26.58	1869.23
11/14/85	27.13	1868.68
10/07/86	26.24	1869.57
07/21/89	27.38	1868.43
08/15/89	27.77	1868.04
02/27/90	27.95	1867.86
06/07/91	27.87	1867.94
05/18/92	28.29	1867.52
06/12/92	28.53	1867.28
05/05/94	26.98	1868.83
06/02/94	27.26	1868.55
10/26/95	26.42	1869.39
05/02/96	25.73	1870.08
08/08/96	26.33	1869.48
09/20/96	26.61	1869.20
10/24/96	26.53	1869.28
12/05/96	26.36	1869.45
05/22/97	24.98	1870.83
06/30/97	25.33	1870.48
07/30/97	25.52	1870.29
08/12/97	25.68	1870.13
09/16/97	25.73	1870.08
10/14/97	25.79	1870.02
11/11/97	25.76	1870.05
12/10/97	25.73	1870.08
05/12/98	25.24	1870.57
07/15/98	25.64	1870.17
08/25/98	25.89	1869.92
10/13/98	25.98	1869.83
11/30/98	25.70	1870.11
06/01/99	24.90	1870.91

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/29/99	25.12	1870.69
07/27/99	25.33	1870.48
09/08/99	24.99	1870.82
10/05/99	24.98	1870.83
11/02/99	24.95	1870.86
12/07/99	24.98	1870.83
05/17/00	24.68	1871.13
06/14/00	24.92	1870.89
07/12/00	25.25	1870.56
08/15/00	25.72	1870.09
09/19/00	25.77	1870.04
10/17/00	25.64	1870.17
11/30/00	25.39	1870.42
05/10/01	24.90	1870.91
06/26/01	24.83	1870.98
07/24/01	25.27	1870.54
08/21/01	25.53	1870.28
09/19/01	25.78	1870.03
10/23/01	25.60	1870.21
11/29/01	25.56	1870.25
12/18/01	25.60	1870.21
05/14/02	25.32	1870.49
06/25/02	25.96	1869.85
06/27/02	26.10	1869.71
08/20/02	26.72	1869.09
10/01/02	26.76	1869.05
11/19/02	26.42	1869.39
12/17/02	26.49	1869.32
05/21/03	25.79	1870.02
06/17/03	25.90	1869.91
07/22/03	26.32	1869.49
08/20/03	26.80	1869.01
09/16/03	27.02	1868.79
10/21/03	26.90	1868.91
11/18/03	26.82	1868.99
12/09/03	26.82	1868.99
05/19/04	26.21	1869.60
06/22/04	25.98	1869.83
07/27/04	26.63	1869.18
08/25/04	26.81	1869.00
09/21/04	26.54	1869.27
10/18/04	26.19	1869.62
11/22/04	26.03	1869.78
12/13/04	26.11	1869.70
04/13/05	26.10	1869.71
05/18/05	25.88	1869.93
06/13/05	25.77	1870.04
07/26/05	26.36	1869.45
08/24/05	26.40	1869.41
09/20/05	26.44	1869.37

136-070-05AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,895.79
SI (ft.)=54-57

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/30/78	26.44	1869.35
12/06/78	26.30	1869.49
01/09/79	26.25	1869.54
05/01/79	25.90	1869.89
06/06/79	25.12	1870.67
07/18/79	25.42	1870.37
08/07/79	25.62	1870.17
08/28/79	25.69	1870.10
10/08/79	25.88	1869.91
10/09/79	26.10	1869.69
11/08/79	25.88	1869.91
05/06/80	25.63	1870.16
11/26/80	26.40	1869.39
12/02/81	26.38	1869.41
05/13/82	25.31	1870.48
06/25/82	25.72	1870.07
07/08/82	26.50	1869.29
07/21/82	25.77	1870.02
08/22/82	26.66	1869.13
09/08/82	26.64	1869.15
09/22/82	25.61	1870.18
10/21/82	25.81	1869.98
12/03/82	25.68	1870.11
12/06/82	25.64	1870.15
12/13/82	25.87	1869.92
03/31/83	25.37	1870.42
04/30/83	25.20	1870.59
05/11/83	25.63	1870.16
05/29/83	25.42	1870.37
06/27/83	25.96	1869.83
07/14/83	26.00	1869.79
07/27/83	26.10	1869.69
08/10/83	26.43	1869.36
08/25/83	26.60	1869.19
09/12/83	26.79	1869.00
09/25/83	26.63	1869.16
10/25/83	26.40	1869.39
11/08/83	26.39	1869.40
11/27/83	26.40	1869.39
11/30/83	26.44	1869.35
12/06/83	26.42	1869.37
03/22/84	26.17	1869.62
04/24/84	25.43	1870.36
05/15/84	25.36	1870.43
05/30/84	25.58	1870.21
06/20/84	25.35	1870.44
07/24/84	26.11	1869.68
08/21/84	26.40	1869.39
09/22/84	26.62	1869.17
10/23/84	26.00	1869.79
10/25/84	25.99	1869.80
11/25/84	26.05	1869.74
12/20/84	26.29	1869.50

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/22/85	25.97	1869.82
04/21/85	25.70	1870.09
05/25/85	25.92	1869.87
06/21/85	26.12	1869.67
07/24/85	26.73	1869.06
08/21/85	26.71	1869.08
09/23/85	26.57	1869.22
10/20/85	26.43	1869.36
11/14/85	26.59	1869.20
11/22/85	26.52	1869.27
12/21/85	26.53	1869.26
01/10/86	26.56	1869.23
03/20/86	25.80	1869.99
04/20/86	25.21	1870.58
05/23/86	25.33	1870.46
06/22/86	25.66	1870.13
07/21/86	25.66	1870.13
08/20/86	26.15	1869.64
09/17/86	25.65	1870.14
10/07/86	25.56	1870.23
10/19/86	25.61	1870.18
11/23/86	25.61	1870.18
12/11/86	25.73	1870.06
12/22/86	25.70	1870.09
03/20/87	25.31	1870.48
04/20/87	24.55	1871.24
05/21/87	24.68	1871.11
06/21/87	25.20	1870.59
07/20/87	25.12	1870.67
08/20/87	25.56	1870.23
09/21/87	25.73	1870.06
10/21/87	25.72	1870.07
11/13/87	25.77	1870.02
11/20/87	25.70	1870.09
12/19/87	25.69	1870.10
03/20/88	25.52	1870.27
04/21/88	25.45	1870.34
05/21/88	25.65	1870.14
06/21/88	26.22	1869.57
07/20/88	26.75	1869.04
08/20/88	26.84	1868.95
09/19/88	27.07	1868.72
10/20/88	26.95	1868.84
11/21/88	26.88	1868.91
11/23/88	26.90	1868.89
12/20/88	26.97	1868.82
03/20/89	26.86	1868.93
04/20/89	26.31	1869.48
05/21/89	26.30	1869.49
06/21/89	26.67	1869.12
07/20/89	26.73	1869.06
07/21/89	26.82	1868.97
08/21/89	27.27	1868.52
09/19/89	26.97	1868.82
10/20/89	27.02	1868.77
11/21/89	26.91	1868.88

136-070-05AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,895.79
SI (ft.)=54-57

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/22/89	27.28	1868.51
02/27/90	27.48	1868.31
03/21/90	27.01	1868.78
04/21/90	26.79	1869.00
05/19/90	26.60	1869.19
06/19/90	26.41	1869.38
07/20/90	27.07	1868.72
08/20/90	27.51	1868.28
09/21/90	27.62	1868.17
10/20/90	27.56	1868.23
11/21/90	27.52	1868.27
12/10/90	27.60	1868.19
12/22/90	27.70	1868.09
03/21/91	27.59	1868.20
04/21/91	27.17	1868.62
05/21/91	26.97	1868.82
06/07/91	27.18	1868.61
06/20/91	27.40	1868.39
07/21/91	27.78	1868.01
08/19/91	28.14	1867.65
09/20/91	28.02	1867.77
10/21/91	28.08	1867.71
11/20/91	27.79	1868.00
12/22/91	28.05	1867.74
03/22/92	27.61	1868.18
04/20/92	27.41	1868.38
05/18/92	27.49	1868.30
05/20/92	27.48	1868.31
06/12/92	27.94	1867.85
06/19/92	27.69	1868.10
07/18/92	27.95	1867.84
08/23/92	28.43	1867.36
09/20/92	28.37	1867.42
10/19/92	28.38	1867.41
11/18/92	28.27	1867.52
11/23/92	28.21	1867.58
12/21/92	28.30	1867.49
03/20/93	28.34	1867.45
04/21/93	27.70	1868.09
05/22/93	27.69	1868.10
06/19/93	27.55	1868.24
07/21/93	26.89	1868.90
08/22/93	26.98	1868.81
09/20/93	27.08	1868.71
10/22/93	27.09	1868.70
11/19/93	27.10	1868.69
12/20/93	26.99	1868.80
03/20/94	26.64	1869.15
04/20/94	26.29	1869.50
05/05/94	26.13	1869.66
05/21/94	26.37	1869.42
06/02/94	26.60	1869.19
06/19/94	26.65	1869.14
07/20/94	26.43	1869.36
08/21/94	27.03	1868.76

Date	Depth to Water (ft)	WL Elev (msl, ft)
09/21/94	26.91	1868.88
10/19/94	26.44	1869.35
11/22/94	26.63	1869.16
12/01/94	26.65	1869.14
12/20/94	26.72	1869.07
03/20/95	26.10	1869.69
04/19/95	25.72	1870.07
05/21/95	25.63	1870.16
06/22/95	25.81	1869.98
07/21/95	25.50	1870.29
08/20/95	26.19	1869.60
09/19/95	25.97	1869.82
10/26/95	25.82	1869.97
05/02/96	25.01	1870.78
08/08/96	25.99	1869.80
09/20/96	26.26	1869.53
10/24/96	26.10	1869.69
12/05/96	25.92	1869.87
05/22/97	24.31	1871.48
06/30/97	24.90	1870.89
07/30/97	25.21	1870.58
08/12/97	25.25	1870.54
09/16/97	25.37	1870.42
10/14/97	25.24	1870.55
11/11/97	25.33	1870.46
12/10/97	25.32	1870.47
05/12/98	24.74	1871.05
07/15/98	25.30	1870.49
08/25/98	25.37	1870.42
10/13/98	25.50	1870.29
11/30/98	25.18	1870.61
06/01/99	24.36	1871.43
06/29/99	24.65	1871.14
07/27/99	25.80	1869.99
09/08/99	24.44	1871.35
10/05/99	24.56	1871.23
11/02/99	24.57	1871.22
12/07/99	24.58	1871.21
05/17/00	24.29	1871.50
06/14/00	24.73	1871.06
07/12/00	24.83	1870.96
08/15/00	25.94	1869.85
09/19/00	25.53	1870.26
10/17/00	25.25	1870.54
11/30/00	25.03	1870.76
05/10/01	24.39	1871.40
06/26/01	24.38	1871.41
07/24/01	24.78	1871.01
08/21/01	25.30	1870.49
09/19/01	25.42	1870.37
10/23/01	25.23	1870.56
11/29/01	25.17	1870.62
12/18/01	25.21	1870.58

136-070-05AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,895.79
SI (ft.)=54-57

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/14/02	24.81	1870.98
06/25/02	26.33	1869.46
06/27/02	26.68	1869.11
08/20/02	26.39	1869.40
10/01/02	26.39	1869.40
11/19/02	26.02	1869.77
12/17/02	26.08	1869.71
05/21/03	25.24	1870.55
06/17/03	25.49	1870.30
07/22/03	25.94	1869.85
08/20/03	26.55	1869.24
09/16/03	26.72	1869.07
10/21/03	26.56	1869.23
11/18/03	26.40	1869.39
12/09/03	26.41	1869.38

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/19/04	25.65	1870.14
06/22/04	26.36	1869.43
07/27/04	26.95	1868.84
08/25/04	26.28	1869.51
09/21/04	26.00	1869.79
10/18/04	25.69	1870.10
11/22/04	25.51	1870.28
12/13/04	25.63	1870.16
04/13/05	25.42	1870.37
05/18/05	25.34	1870.45
06/13/05	25.16	1870.63
07/26/05	25.89	1869.90
08/24/05	25.94	1869.85
09/20/05	25.97	1869.82

136-070-05AAD1
Streeter Aquifer

MP Elev (msl,ft)=1,881.97
SI (ft.)=58-61

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/14/79	12.33	1869.64
07/08/82	12.55	1869.42
09/08/82	13.20	1868.77
12/13/82	12.38	1869.59
05/11/83	11.70	1870.27
07/14/83	12.58	1869.39
08/10/83	13.06	1868.91
09/12/83	13.41	1868.56
09/27/83	13.22	1868.75
10/11/83	13.06	1868.91
10/26/83	12.95	1869.02
11/07/83	12.88	1869.09
05/15/84	11.84	1870.13
10/25/84	12.53	1869.44
05/23/85	12.39	1869.58
11/14/85	13.05	1868.92
05/07/86	11.71	1870.26
10/07/86	11.99	1869.98
07/21/89	13.28	1868.69
08/15/89	13.98	1867.99
02/27/90	13.97	1868.00
06/07/91	13.48	1868.49
08/21/91	14.63	1867.34
09/19/91	14.44	1867.53
10/18/91	14.56	1867.41
11/27/91	14.20	1867.77
04/16/92	13.76	1868.21
05/18/92	13.69	1868.28
06/12/92	14.24	1867.73
07/10/92	14.17	1867.80
08/20/92	14.85	1867.12
12/03/92	14.56	1867.41
03/17/93	14.67	1867.30
04/07/93	13.93	1868.04
05/05/93	13.94	1868.03
06/02/93	13.78	1868.19
07/06/93	13.40	1868.57
07/28/93	12.75	1869.22
08/06/93	13.08	1868.89
09/02/93	13.08	1868.89
10/06/93	13.51	1868.46
10/27/93	13.42	1868.55
12/08/93	13.33	1868.64
05/05/94	12.34	1869.63
06/02/94	12.94	1869.03
06/19/94	12.07	1869.90
07/20/94	12.71	1869.26
08/21/94	13.42	1868.55
09/21/94	13.26	1868.71
10/19/94	12.70	1869.27
11/22/94	12.95	1869.02
12/01/94	13.00	1868.97
12/20/94	13.08	1868.89
03/20/95	12.33	1869.64
04/19/95	11.96	1870.01
05/21/95	11.94	1870.03
06/22/95	12.18	1869.79
07/21/95	11.89	1870.08
08/20/95	12.72	1869.25
09/19/95	12.45	1869.52
10/26/95	12.32	1869.65
05/02/96	11.46	1870.51
08/08/96	12.54	1869.43
09/20/96	12.79	1869.18
10/24/96	12.61	1869.36
12/05/96	12.40	1869.57
05/22/97	10.92	1871.05
06/30/97	11.59	1870.38
07/30/97	11.62	1870.35
08/12/97	12.12	1869.85
09/16/97	12.06	1869.91
10/14/97	11.85	1870.12
11/11/97	11.97	1870.00
12/10/97	11.95	1870.02
05/12/98	11.34	1870.63
07/15/98	11.92	1870.05
08/25/98	11.94	1870.03
10/13/98	12.06	1869.91
11/30/98	11.70	1870.27
06/01/99	10.90	1871.07
06/29/99	11.23	1870.74
07/27/99	12.38	1869.59
09/08/99	10.98	1870.99
10/05/99	11.19	1870.78
11/02/99	11.22	1870.75
12/07/99	11.26	1870.71
05/17/00	10.88	1871.09
06/14/00	11.37	1870.60
07/12/00	11.34	1870.63
08/15/00	12.59	1869.38
09/19/00	12.24	1869.73
10/17/00	11.89	1870.08
11/30/00	11.66	1870.31
05/10/01	10.93	1871.04
06/26/01	10.95	1871.02
07/24/01	11.40	1870.57
08/21/01	11.94	1870.03
09/19/01	12.08	1869.89
10/23/01	11.85	1870.12
11/29/01	11.82	1870.15
12/18/01	11.86	1870.11

136-070-05AAD1
Streeter Aquifer

MP Elev (msl,ft)=1,881.97
SI (ft.)=58-61

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/14/02	11.35	1870.62
06/25/02	12.80	1869.17
06/27/02	13.15	1868.82
08/20/02	12.96	1869.01
10/01/02	13.02	1868.95
11/19/02	12.57	1869.40
12/17/02	12.65	1869.32
05/21/03	11.62	1870.35
06/17/03	11.96	1870.01
07/22/03	12.50	1869.47
08/20/03	13.19	1868.78
09/16/03	13.35	1868.62
10/21/03	13.09	1868.88
11/18/03	12.92	1869.05
12/09/03	12.87	1869.10

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/19/04	12.05	1869.92
06/22/04	12.62	1869.35
07/27/04	13.32	1868.65
08/25/04	12.80	1869.17
09/21/04	12.50	1869.47
10/18/04	12.20	1869.77
11/22/04	12.03	1869.94
12/13/04	12.13	1869.84
04/13/05	11.78	1870.19
05/18/05	11.77	1870.20
06/13/05	11.57	1870.40
07/26/05	12.38	1869.59
08/24/05	12.43	1869.54
09/20/05	12.47	1869.50

136-070-05AAD2
Streeter Aquifer

MP Elev (msl,ft)=1,882.38
SI (ft.)=11.5-16

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/08/83	14.19	1868.19
11/10/83	14.20	1868.18
04/10/84	13.13	1869.25
04/25/84	13.16	1869.22
05/15/84	12.87	1869.51
05/16/84	12.85	1869.53
06/22/84	13.12	1869.26
07/05/84	13.20	1869.18
07/19/84	13.35	1869.03
08/06/84	13.56	1868.82
08/17/84	13.74	1868.64
08/30/84	13.90	1868.48
09/12/84	14.02	1868.36
10/25/84	14.08	1868.30
05/23/85	13.81	1868.57
11/14/85	14.51	1867.87
05/07/86	13.01	1869.37
10/07/86	13.47	1868.91
07/21/89	14.68	1867.70
08/15/89	14.99	1867.39
02/27/90	15.16	1867.22
06/07/91	15.18	1867.20
08/21/91	15.75	1866.63
09/19/91	15.75	1866.63
10/18/91	15.80	1866.58
06/02/93	15.73	1866.65
07/06/93	15.71	1866.67
08/06/93	15.14	1867.24
09/02/93	15.17	1867.21
10/06/93	15.37	1867.01
10/27/93	15.38	1867.00
12/08/93	15.39	1866.99
05/05/94	14.08	1868.30
06/02/94	14.16	1868.22
06/19/94	14.34	1868.04
12/01/94	14.89	1867.49
03/20/95	13.64	1868.74
04/19/95	13.93	1868.45
05/21/95	13.48	1868.90
06/22/95	13.72	1868.66
07/21/95	13.70	1868.68
08/20/95	14.11	1868.27
09/19/95	14.33	1868.05
10/26/95	14.30	1868.08
05/02/96	13.44	1868.94
08/08/96	14.45	1867.93
09/20/96	14.85	1867.53
10/24/96	14.74	1867.64
12/05/96	14.68	1867.70

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/22/97	11.51	1870.87
06/30/97	12.56	1869.82
08/12/97	13.29	1869.09
09/16/97	13.64	1868.74
10/14/97	13.86	1868.52
11/11/97	13.74	1868.64
12/10/97	13.76	1868.62
05/12/98	13.26	1869.12
07/15/98	13.88	1868.50
08/25/98	14.24	1868.14
10/13/98	14.44	1867.94
11/30/98	14.22	1868.16
06/01/99	12.83	1869.55
06/29/99	12.97	1869.41
07/27/99	13.13	1869.25
09/08/99	13.20	1869.18
10/05/99	13.18	1869.20
11/02/99	13.18	1869.20
12/07/99	13.20	1869.18
05/17/00	13.01	1869.37
06/14/00	13.25	1869.13
07/12/00	13.52	1868.86
08/15/00	13.81	1868.57
09/19/00	14.15	1868.23
10/17/00	13.97	1868.41
11/30/00	13.94	1868.44
05/10/01	13.05	1869.33
06/26/01	13.16	1869.22
07/24/01	13.55	1868.83
08/21/01	13.80	1868.58
09/19/01	14.10	1868.28
10/23/01	14.09	1868.29
11/29/01	14.03	1868.35
12/18/01	13.99	1868.39
05/14/02	13.76	1868.62
06/25/02	14.14	1868.24
08/20/02	14.66	1867.72
10/01/02	14.91	1867.47
11/19/02	14.78	1867.60
12/17/02	14.76	1867.62
05/21/03	14.23	1868.15
06/17/03	14.18	1868.20
07/22/03	14.41	1867.97
08/20/03	14.89	1867.49
09/16/03	15.12	1867.26
10/21/03	15.17	1867.21
11/18/03	14.81	1867.57
12/09/03	15.06	1867.32
05/19/04	14.20	1868.18
06/22/04	13.56	1868.82
07/27/04	13.83	1868.55
08/25/04	14.19	1868.19
09/21/04	14.35	1868.03

136-070-05AAD2
Streeter Aquifer

MP Elev (msl,ft)=1,882.38
SI (ft.)=11.5-16

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/18/04	14.23	1868.15
11/22/04	14.13	1868.25
12/13/04	14.20	1868.18
04/13/05	14.29	1868.09

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/18/05	14.05	1868.33
06/13/05	14.02	1868.36
07/26/05	14.14	1868.24
08/24/05	14.39	1867.99
09/20/05	14.57	1867.81

136-070-06BBB1
Streeter Aquifer

MP Elev (msl,ft)=1,868.64
SI (ft.)=158-161

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/06/78	7.92	1860.72
07/08/82	7.16	1861.48
09/08/82	7.55	1861.09
12/13/82	7.11	1861.53
05/11/83	6.79	1861.85
07/14/83	6.95	1861.69
08/10/83	7.08	1861.56
09/12/83	7.32	1861.32
11/08/83	7.37	1861.27
05/15/84	6.61	1862.03
10/25/84	7.00	1861.64
05/23/85	6.91	1861.73
11/14/85	7.29	1861.35
05/07/86	6.33	1862.31
10/07/86	6.42	1862.22
07/20/89	7.04	1861.60
07/21/89	7.04	1861.60
02/27/90	7.34	1861.30
06/07/91	7.77	1860.87
05/18/92	8.39	1860.25
06/12/92	8.55	1860.09
07/28/93	7.46	1861.18
05/05/94	7.09	1861.55
06/02/94	7.38	1861.26
10/26/95	6.18	1862.46
05/02/96	4.95	1863.69
08/08/96	5.19	1863.45
09/20/96	5.36	1863.28
10/24/96	5.38	1863.26
12/05/96	5.13	1863.51
05/22/97	3.45	1865.19
06/30/97	3.58	1865.06
07/30/97	3.67	1864.97
08/12/97	3.83	1864.81
09/16/97	3.86	1864.78
10/14/97	3.90	1864.74
11/11/97	3.85	1864.79
12/10/97	3.85	1864.79
05/12/98	3.26	1865.38
07/15/98	3.50	1865.14
08/25/98	3.44	1865.20
10/13/98	3.70	1864.94
11/30/98	3.51	1865.13

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/01/99	2.58	1866.06
06/29/99	2.54	1866.10
07/27/99	2.62	1866.02
09/08/99	2.50	1866.14
10/05/99	2.59	1866.05
11/02/99	2.59	1866.05
12/07/99	2.59	1866.05
05/17/00	2.12	1866.52
06/14/00	2.13	1866.51
07/12/00	2.15	1866.49
08/15/00	2.48	1866.16
09/19/00	2.71	1865.93
10/17/00	2.77	1865.87
11/30/00	2.62	1866.02
05/10/01	2.15	1866.49
06/26/01	2.07	1866.57
07/24/01	3.24	1865.40
08/21/01	2.36	1866.28
09/19/01	2.59	1866.05
10/23/01	2.66	1865.98
11/29/01	2.70	1865.94
12/18/01	2.74	1865.90
05/14/02	2.55	1866.09
06/25/02	2.80	1865.84
06/27/02	2.80	1865.84
08/20/02	3.21	1865.43
10/01/02	3.47	1865.17
11/19/02	3.51	1865.13
12/17/02	3.53	1865.11
05/21/03	3.10	1865.54
06/17/03	3.16	1865.48
07/22/03	3.29	1865.35
08/20/03	3.60	1865.04
09/16/03	3.85	1864.79
10/21/03	4.00	1864.64
11/18/03	4.01	1864.63
12/09/03	4.02	1864.62
05/19/04	3.71	1864.93
06/22/04	3.44	1865.20
07/27/04	3.65	1864.99
08/25/04	3.82	1864.82
09/21/04	3.83	1864.81
10/18/04	3.82	1864.82
11/22/04	3.76	1864.88
12/13/04	3.83	1864.81
04/13/05	3.75	1864.89
05/18/05	3.73	1864.91
06/13/05	3.58	1865.06
07/26/05	3.87	1864.77
08/24/05	3.95	1864.69
09/20/05	4.10	1864.54

136-070-06BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,868.74
SI (ft.)=38-41

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/06/78	10.23	1858.51
01/09/79	10.22	1858.52
02/05/79	10.20	1858.54
04/03/79	9.90	1858.84
05/01/79	8.19	1860.55
06/06/79	8.44	1860.30
07/18/79	8.70	1860.04
08/07/79	9.80	1858.94
08/28/79	9.24	1859.50
10/09/79	9.77	1858.97
11/02/79	9.74	1859.00
05/06/80	9.54	1859.20
11/26/80	10.24	1858.50
12/02/81	9.58	1859.16
05/13/82	8.85	1859.89
06/25/82	8.64	1860.10
07/08/82	9.03	1859.71
07/21/82	8.90	1859.84
08/22/82	9.66	1859.08
09/08/82	9.87	1858.87
09/22/82	9.95	1858.79
10/22/82	9.17	1859.57
12/03/82	9.14	1859.60
12/06/82	9.07	1859.67
12/13/82	9.18	1859.56
03/31/83	8.71	1860.03
04/30/83	8.51	1860.23
05/11/83	8.61	1860.13
05/29/83	8.58	1860.16
06/27/83	8.76	1859.98
07/14/83	8.95	1859.79
07/27/83	9.10	1859.64
08/10/83	9.40	1859.34
08/25/83	9.58	1859.16
09/12/83	9.82	1858.92
09/25/83	9.78	1858.96
10/25/83	9.72	1859.02
11/08/83	9.76	1858.98
11/27/83	9.75	1858.99
11/30/83	9.78	1858.96
12/06/83	9.77	1858.97
03/22/84	9.49	1859.25
04/24/84	8.57	1860.17
05/15/84	8.41	1860.33
05/30/84	8.58	1860.16
06/20/84	8.42	1860.32
07/24/84	8.93	1859.81
08/21/84	9.30	1859.44
09/22/84	9.65	1859.09
10/23/84	9.29	1859.45
10/25/84	9.30	1859.44
11/25/84	9.32	1859.42
12/20/84	9.39	1859.35

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/22/85	9.21	1859.53
04/21/85	9.04	1859.70
05/25/85	9.12	1859.62
06/21/85	9.22	1859.52
07/24/85	9.73	1859.01
08/21/85	9.81	1858.93
09/23/85	9.76	1858.98
10/20/85	9.73	1859.01
11/14/85	9.78	1858.96
11/22/85	9.73	1859.01
12/21/85	9.68	1859.06
01/10/86	9.55	1859.19
03/20/86	9.03	1859.71
04/20/86	8.28	1860.46
05/07/86	7.96	1860.78
05/23/86	7.85	1860.89
06/22/86	8.48	1860.26
07/21/86	8.35	1860.39
08/20/86	8.82	1859.92
09/19/86	8.67	1860.07
10/07/86	8.44	1860.30
10/19/86	8.47	1860.27
11/23/86	8.42	1860.32
12/11/86	8.45	1860.29
12/22/86	8.45	1860.29
03/20/87	8.10	1860.64
04/20/87	6.56	1862.18
05/21/87	6.80	1861.94
06/21/87	7.10	1861.64
07/20/87	7.26	1861.48
08/20/87	7.68	1861.06
09/21/87	7.99	1860.75
10/21/87	8.17	1860.57
11/13/87	8.25	1860.49
11/20/87	8.21	1860.53
12/19/87	8.18	1860.56
03/20/88	8.00	1860.74
04/21/88	8.02	1860.72
05/21/88	8.27	1860.47
06/21/88	8.75	1859.99
07/20/88	9.31	1859.43
08/20/88	9.59	1859.15
09/19/88	9.79	1858.95
10/20/88	9.87	1858.87
11/21/88	9.87	1858.87
11/23/88	9.93	1858.81
12/20/88	9.88	1858.86
03/20/89	9.67	1859.07
04/20/89	9.25	1859.49
05/21/89	9.28	1859.46
06/21/89	9.49	1859.25
07/20/89	9.56	1859.18
07/21/89	9.63	1859.11
08/21/89	10.03	1858.71
09/19/89	9.69	1859.05
10/20/89	9.87	1858.87

136-070-06BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,868.74
SI (ft.)=38-41

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/21/89	9.91	1858.83
11/22/89	9.88	1858.86
12/22/89	9.98	1858.76
02/27/90	10.05	1858.69
03/21/90	9.80	1858.94
04/21/90	9.71	1859.03
05/19/90	9.73	1859.01
06/19/90	9.58	1859.16
07/20/90	9.90	1858.84
08/20/90	10.37	1858.37
09/21/90	10.54	1858.20
10/20/90	10.60	1858.14
11/21/90	10.61	1858.13
12/10/90	10.65	1858.09
12/22/90	10.65	1858.09
03/21/91	10.53	1858.21
04/21/91	10.37	1858.37
05/21/91	10.12	1858.62
06/07/91	10.23	1858.51
06/20/91	10.32	1858.42
07/21/91	10.63	1858.11
08/19/91	11.00	1857.74
09/20/91	11.07	1857.67
10/21/91	11.21	1857.53
11/20/91	11.03	1857.71
12/22/91	11.08	1857.66
03/22/92	10.78	1857.96
04/20/92	10.70	1858.04
05/18/92	10.89	1857.85
05/20/92	10.83	1857.91
06/12/92	11.16	1857.58
06/19/92	11.01	1857.73
07/18/92	11.17	1857.57
08/23/92	11.60	1857.14
09/20/92	11.62	1857.12
10/19/92	11.72	1857.02
11/18/92	11.61	1857.13
11/23/92	11.59	1857.15
12/21/92	11.56	1857.18
03/20/93	11.36	1857.38
04/21/93	10.97	1857.77
05/22/93	10.98	1857.76
06/19/93	10.78	1857.96
07/21/93	9.84	1858.90
07/28/93	9.55	1859.19
08/22/93	9.46	1859.28
09/20/93	9.55	1859.19
10/22/93	9.72	1859.02
11/19/93	9.76	1858.98
12/20/93	9.62	1859.12
03/20/94	9.46	1859.28
04/20/94	8.62	1860.12
05/05/94	8.55	1860.19
05/21/94	8.76	1859.98
06/02/94	9.08	1859.66

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/19/94	9.22	1859.52
07/20/94	9.21	1859.53
08/21/94	9.71	1859.03
09/21/94	9.70	1859.04
10/19/94	9.44	1859.30
11/22/94	9.47	1859.27
12/01/94	9.50	1859.24
12/20/94	9.49	1859.25
03/20/95	8.85	1859.89
04/19/95	8.11	1860.63
05/21/95	7.60	1861.14
06/22/95	7.77	1860.97
07/21/95	7.32	1861.42
08/20/95	7.88	1860.86
09/19/95	7.83	1860.91
10/26/95	7.85	1860.89
05/02/96	6.15	1862.59
08/08/96	6.93	1861.81
09/20/96	7.39	1861.35
10/24/96	7.40	1861.34
12/05/96	7.19	1861.55
05/22/97	4.42	1864.32
06/30/97	5.09	1863.65
07/30/97	5.24	1863.50
08/12/97	5.50	1863.24
09/16/97	5.67	1863.07
10/14/97	5.78	1862.96
11/11/97	5.82	1862.92
12/10/97	5.79	1862.95
05/12/98	4.94	1863.80
07/15/98	5.36	1863.38
08/25/98	5.43	1863.31
10/13/98	5.79	1862.95
11/30/98	5.54	1863.20
06/01/99	4.03	1864.71
06/29/99	4.15	1864.59
07/27/99	4.34	1864.40
09/08/99	4.19	1864.55
10/05/99	4.34	1864.40
11/02/99	4.43	1864.31
12/07/99	4.48	1864.26
05/17/00	3.81	1864.93
06/14/00	3.98	1864.76
07/12/00	4.17	1864.57
08/15/00	4.60	1864.14
09/19/00	4.99	1863.75
10/17/00	4.97	1863.77
11/30/00	4.86	1863.88
05/10/01	3.92	1864.82
06/26/01	3.84	1864.90
07/24/01	4.20	1864.54
08/21/01	4.53	1864.21
09/19/01	4.88	1863.86

136-070-06BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,868.74
SI (ft.)=38-41

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/23/01	4.97	1863.77
11/29/01	4.97	1863.77
12/18/01	5.02	1863.72
05/14/02	4.65	1864.09
06/25/02	5.15	1863.59
06/27/02	5.20	1863.54
08/20/02	5.77	1862.97
10/01/02	6.05	1862.69
11/19/02	6.04	1862.70
12/17/02	6.07	1862.67
05/21/03	5.28	1863.46
06/17/03	5.34	1863.40
07/22/03	5.55	1863.19
08/20/03	6.10	1862.64
09/16/03	6.47	1862.27
10/21/03	6.60	1862.14
11/18/03	6.60	1862.14
12/09/03	6.60	1862.14
05/19/04	5.96	1862.78
06/22/04	5.46	1863.28
07/27/04	5.82	1862.92
08/25/04	6.15	1862.59
09/21/04	6.16	1862.58
10/18/04	6.14	1862.60
11/22/04	6.05	1862.69
12/13/04	6.10	1862.64
04/13/05	5.98	1862.76
05/18/05	5.92	1862.82
06/13/05	5.70	1863.04
07/26/05	6.06	1862.68
08/24/05	6.26	1862.48
09/20/05	6.45	1862.29

136-070-06CBB
Streeter Aquifer

MP Elev (msl,ft)=1,873.95
SI (ft.)=43-48

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/04/99	7.67	1866.28
10/05/99	7.68	1866.27
11/02/99	7.76	1866.19
12/07/99	7.83	1866.12
05/17/00	7.24	1866.71
06/14/00	7.41	1866.54
07/12/00	7.64	1866.31
08/15/00	8.13	1865.82
09/19/00	8.52	1865.43
10/17/00	8.50	1865.45
11/30/00	8.33	1865.62
05/10/01	7.40	1866.55
06/26/01	7.28	1866.67
07/24/01	7.68	1866.27
08/21/01	8.07	1865.88
09/19/01	8.42	1865.53
10/23/01	8.44	1865.51
11/29/01	8.47	1865.48
12/18/01	8.51	1865.44
05/14/02	8.11	1865.84
06/25/02	8.63	1865.32
08/20/02	9.30	1864.65
10/01/02	9.58	1864.37
11/19/02	9.48	1864.47
12/17/02	9.54	1864.41
05/21/03	8.64	1865.31
06/17/03	8.70	1865.25
07/22/03	9.00	1864.95
08/20/03	9.50	1864.45
09/16/03	9.88	1864.07
10/21/03	9.96	1863.99
11/18/03	9.95	1864.00
12/09/03	9.97	1863.98
05/19/04	9.24	1864.71
06/22/04	8.67	1865.28
07/27/04	9.07	1864.88
08/25/04	9.42	1864.53
09/07/04	9.35	1864.60
09/21/04	9.42	1864.53
10/18/04	9.35	1864.60
11/22/04	9.25	1864.70
12/13/04	9.32	1864.63
04/13/05	9.24	1864.71
05/18/05	9.09	1864.86
06/13/05	8.83	1865.12
07/26/05	9.25	1864.70
08/24/05	9.40	1864.55
09/20/05	9.57	1864.38

136-070-07BBB
Streeter Aquifer

MP Elev (msl,ft)=1,876.20
SI (ft.)=30-35

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/10/83	10.17	1866.03
08/25/83	10.32	1865.88
09/12/83	10.55	1865.65
09/25/83	10.47	1865.73
10/25/83	10.37	1865.83
11/08/83	10.38	1865.82
11/27/83	10.38	1865.82
11/30/83	10.55	1865.65
12/06/83	10.43	1865.77
03/22/84	10.29	1865.91
04/24/84	9.24	1866.96
05/15/84	9.01	1867.19
05/30/84	9.25	1866.95
06/20/84	9.02	1867.18
07/24/84	9.74	1866.46
08/21/84	10.12	1866.08
09/22/84	10.46	1865.74
10/23/84	9.97	1866.23
10/25/84	9.96	1866.24
11/25/84	10.00	1866.20
12/20/84	10.21	1865.99
03/22/85	10.12	1866.08
04/21/85	9.80	1866.40
05/25/85	9.83	1866.37
06/21/85	9.98	1866.22
07/24/85	10.56	1865.64
08/21/85	10.60	1865.60
09/23/85	10.51	1865.69
10/20/85	10.40	1865.80
11/14/85	10.48	1865.72
11/22/85	10.47	1865.73
12/21/85	10.53	1865.67
01/10/86	10.60	1865.60
03/20/86	9.66	1866.54
04/20/86	8.92	1867.28
05/23/86	8.64	1867.56
06/22/86	9.07	1867.13
07/21/86	9.21	1866.99
08/20/86	9.77	1866.43
09/19/86	9.44	1866.76
10/19/86	9.20	1867.00
11/23/86	9.21	1866.99
12/11/86	9.27	1866.93
12/22/86	9.37	1866.83
03/20/87	9.08	1867.12
04/20/87	7.92	1868.28
05/21/87	8.19	1868.01
06/21/87	8.53	1867.67
07/20/87	8.63	1867.57
08/20/87	9.10	1867.10
09/21/87	9.41	1866.79
10/21/87	9.54	1866.66
11/13/87	9.70	1866.50
11/20/87	9.55	1866.65
12/19/87	9.55	1866.65

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/20/88	9.50	1866.70
04/21/88	9.36	1866.84
05/21/88	9.57	1866.63
06/21/88	10.12	1866.08
07/20/88	10.67	1865.53
08/20/88	10.91	1865.29
09/19/88	11.10	1865.10
10/20/88	11.09	1865.11
11/21/88	11.05	1865.15
11/23/88	11.08	1865.12
12/20/88	11.12	1865.08
03/20/89	11.05	1865.15
04/20/89	10.45	1865.75
05/21/89	10.40	1865.80
06/21/89	10.67	1865.53
07/20/89	10.77	1865.43
08/21/89	11.25	1864.95
09/19/89	10.83	1865.37
10/20/89	10.99	1865.21
11/21/89	11.10	1865.10
11/22/89	10.98	1865.22
12/22/89	11.18	1865.02
02/27/90	11.36	1864.84
03/21/90	11.14	1865.06
04/21/90	10.91	1865.29
05/19/90	10.74	1865.46
06/19/90	10.57	1865.63
07/20/90	10.98	1865.22
08/20/90	11.46	1864.74
09/21/90	11.62	1864.58
10/20/90	11.62	1864.58
11/21/90	11.62	1864.58
12/10/90	11.65	1864.55
12/22/90	11.71	1864.49
03/21/91	11.67	1864.53
04/21/91	11.36	1864.84
05/21/91	11.01	1865.19
06/07/91	11.10	1865.10
06/20/91	11.29	1864.91
07/21/91	11.63	1864.57
08/19/91	11.99	1864.21
09/20/91	12.01	1864.19
10/21/91	12.10	1864.10
11/20/91	11.90	1864.30
12/22/91	12.02	1864.18
03/22/92	11.68	1864.52
04/20/92	11.64	1864.56
05/18/92	11.58	1864.62
05/20/92	11.58	1864.62
06/12/92	11.92	1864.28
06/19/92	11.81	1864.39
07/18/92	11.99	1864.21
08/23/92	12.40	1863.80
09/20/92	12.42	1863.78
10/19/92	12.47	1863.73
11/18/92	12.52	1863.68

136-070-07BBB
Streeter Aquifer

MP Elev (msl,ft)=1,876.20
SI (ft.)=30-35

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/23/92	12.33	1863.87
12/21/92	12.37	1863.83
03/20/93	12.39	1863.81
04/21/93	11.69	1864.51
05/22/93	11.61	1864.59
06/19/93	11.36	1864.84
07/21/93	10.30	1865.90
07/28/93	10.30	1865.90
08/22/93	10.12	1866.08
09/20/93	10.29	1865.91
10/22/93	10.44	1865.76
11/19/93	10.48	1865.72
12/20/93	10.43	1865.77
04/20/94	9.37	1866.83
05/05/94	9.15	1867.05
05/21/94	9.39	1866.81
06/02/94	9.63	1866.57
06/19/94	9.82	1866.38
07/20/94	9.77	1866.43
08/21/94	10.37	1865.83
09/21/94	10.40	1865.80
10/19/94	10.01	1866.19
11/22/94	10.08	1866.12
12/01/94	10.20	1866.00
12/20/94	10.19	1866.01
03/20/95	9.51	1866.69
04/19/95	8.82	1867.38
05/21/95	8.32	1867.88
06/22/95	8.68	1867.52
07/21/95	8.27	1867.93
08/20/95	9.05	1867.15
09/19/95	9.01	1867.19
10/26/95	8.93	1867.27
05/02/96	7.84	1868.36
08/08/96	8.91	1867.29
09/20/96	9.43	1866.77
10/24/96	9.32	1866.88
12/05/96	9.15	1867.05
05/22/97	6.98	1869.22
06/30/97	7.78	1868.42
07/30/97	8.13	1868.07
08/12/97	8.47	1867.73
09/16/97	8.65	1867.55
10/14/97	8.65	1867.55
11/11/97	8.65	1867.55
12/10/97	8.64	1867.56
05/12/98	7.74	1868.46
07/15/98	8.31	1867.89
08/25/98	8.35	1867.85
10/13/98	8.70	1867.50
11/30/98	8.32	1867.88

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/01/99	6.77	1869.43
06/29/99	7.06	1869.14
07/27/99	7.36	1868.84
09/08/99	7.05	1869.15
10/05/99	7.25	1868.95
11/02/99	7.32	1868.88
12/07/99	7.40	1868.80
05/17/00	6.83	1869.37
06/14/00	7.10	1869.10
07/12/00	7.36	1868.84
08/15/00	7.92	1868.28
09/19/00	8.33	1867.87
10/17/00	8.23	1867.97
11/30/00	8.06	1868.14
05/10/01	7.14	1869.06
06/26/01	6.97	1869.23
07/24/01	7.48	1868.72
08/21/01	7.90	1868.30
09/19/01	8.25	1867.95
10/23/01	8.22	1867.98
11/29/01	8.26	1867.94
12/18/01	8.31	1867.89
05/14/02	7.88	1868.32
06/25/02	8.43	1867.77
06/27/02	8.55	1867.65
08/20/02	9.11	1867.09
10/01/02	9.19	1867.01
11/19/02	9.24	1866.96
12/17/02	9.36	1866.84
05/21/03	8.29	1867.91
06/17/03	8.35	1867.85
07/22/03	8.65	1867.55
08/20/03	9.31	1866.89
09/16/03	9.65	1866.55
10/21/03	9.67	1866.53
11/18/03	9.63	1866.57
12/09/03	9.64	1866.56
05/19/04	8.72	1867.48
06/22/04	8.07	1868.13
07/27/04	8.56	1867.64
08/25/04	8.92	1867.28
09/21/04	8.90	1867.30
10/18/04	8.80	1867.40
11/22/04	8.64	1867.56
12/13/04	8.74	1867.46
04/13/05	8.69	1867.51
05/18/05	8.44	1867.76
06/13/05	8.15	1868.05
07/26/05	8.62	1867.58
08/24/05	8.71	1867.49
09/20/05	8.90	1867.30

136-070-08AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,873.91
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/04/99	3.26	1870.65
10/05/99	3.32	1870.59
11/02/99	3.37	1870.54
12/07/99	3.43	1870.48
05/17/00	3.02	1870.89
06/14/00	3.36	1870.55
07/12/00	3.22	1870.69
08/15/00	4.47	1869.44
09/19/00	4.63	1869.28
10/17/00	3.96	1869.95
11/30/00	3.74	1870.17
05/10/01	2.99	1870.92
06/26/01	3.03	1870.88
07/24/01	3.55	1870.36
08/21/01	4.34	1869.57
09/19/01	4.35	1869.56
10/23/01	3.98	1869.93
11/29/01	3.92	1869.99
12/18/01	3.97	1869.94
05/14/02	3.18	1870.73
06/25/02	4.23	1869.68
08/20/02	4.98	1868.93
10/01/02	5.06	1868.85
11/19/02	4.43	1869.48

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/17/02	4.60	1869.31
05/21/03	3.17	1870.74
06/17/03	3.66	1870.25
07/22/03	4.40	1869.51
08/20/03	5.37	1868.54
09/16/03	5.48	1868.43
10/21/03	5.05	1868.86
11/18/03	4.77	1869.14
12/09/03	4.75	1869.16
05/19/04	3.50	1870.41
06/22/04	3.54	1870.37
07/27/04	4.42	1869.49
08/25/04	4.62	1869.29
09/07/04	4.05	1869.86
09/21/04	4.22	1869.69
10/18/04	3.98	1869.93
11/22/04	3.81	1870.10
12/13/04	3.94	1869.97
04/13/05	3.21	1870.70
05/18/05	3.31	1870.60
06/13/05	3.07	1870.84
07/26/05	4.14	1869.77
08/24/05	4.20	1869.71
09/20/05	4.22	1869.69

136-070-08BBB
Streeter Aquifer

MP Elev (msl,ft)=1,877.99
SI (ft.)=42-47

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/11/83	10.14	1867.85
08/25/83	10.33	1867.66
09/12/83	10.54	1867.45
09/25/83	10.42	1867.57
10/25/83	10.23	1867.76
11/08/83	10.22	1867.77
11/27/83	10.24	1867.75
11/30/83	10.42	1867.57
12/06/83	10.28	1867.71
03/22/84	10.09	1867.90
04/24/84	9.04	1868.95
05/15/84	8.87	1869.12
05/30/84	9.17	1868.82
06/20/84	8.88	1869.11
07/24/84	9.73	1868.26
08/21/84	10.12	1867.87
09/22/84	10.47	1867.52
10/23/84	9.80	1868.19
10/25/84	9.80	1868.19
11/25/84	9.86	1868.13
12/20/84	10.15	1867.84
03/22/85	9.94	1868.05
04/21/85	9.55	1868.44
05/25/85	9.63	1868.36
06/21/85	9.84	1868.15
07/24/85	10.50	1867.49
08/21/85	10.51	1867.48
09/23/85	10.38	1867.61
10/20/85	10.25	1867.74
11/14/85	10.33	1867.66
11/22/85	10.32	1867.67
12/21/85	10.38	1867.61
01/10/86	10.44	1867.55
03/20/86	9.52	1868.47
04/20/86	8.64	1869.35
05/23/86	8.62	1869.37
06/22/86	9.09	1868.90
07/21/86	9.22	1868.77
08/20/86	9.81	1868.18
09/19/86	9.36	1868.63
10/19/86	9.17	1868.82
11/23/86	9.20	1868.79
12/11/86	9.28	1868.71
12/22/86	9.36	1868.63
03/20/87	9.00	1868.99
04/20/87	8.03	1869.96
05/21/87	8.24	1869.75
06/21/87	8.73	1869.26
07/20/87	8.76	1869.23
08/20/87	9.30	1868.69
09/21/87	9.58	1868.41
10/21/87	9.63	1868.36
11/13/87	9.75	1868.24
11/20/87	9.63	1868.36
12/19/87	9.63	1868.36

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/20/88	9.50	1868.49
04/21/88	9.33	1868.66
05/21/88	9.55	1868.44
06/21/88	10.19	1867.80
07/20/88	10.79	1867.20
08/20/88	10.99	1867.00
09/19/88	11.17	1866.82
10/20/88	11.08	1866.91
11/21/88	11.02	1866.97
11/23/88	11.02	1866.97
12/20/88	11.09	1866.90
03/20/89	10.96	1867.03
04/20/89	10.30	1867.69
05/21/89	10.27	1867.72
06/21/89	10.63	1867.36
07/20/89	10.70	1867.29
08/21/89	11.25	1866.74
09/19/89	10.85	1867.14
10/20/89	10.99	1867.00
11/21/89	11.06	1866.93
11/22/89	10.91	1867.08
12/22/89	11.21	1866.78
02/27/90	11.39	1866.60
03/21/90	11.05	1866.94
04/21/90	10.75	1867.24
05/19/90	10.53	1867.46
06/19/90	10.27	1867.72
07/20/90	10.85	1867.14
08/20/90	11.36	1866.63
09/21/90	11.53	1866.46
10/20/90	11.47	1866.52
11/21/90	11.45	1866.54
12/10/90	11.50	1866.49
12/22/90	11.59	1866.40
03/21/91	11.50	1866.49
04/21/91	11.07	1866.92
05/21/91	10.70	1867.29
06/07/91	10.86	1867.13
06/20/91	11.08	1866.91
07/21/91	11.48	1866.51
08/19/91	11.87	1866.12
09/20/91	11.80	1866.19
10/21/91	11.89	1866.10
11/20/91	11.61	1866.38
12/22/91	11.83	1866.16
03/22/92	11.40	1866.59
04/20/92	11.16	1866.83
05/18/92	11.20	1866.79
05/20/92	11.29	1866.70
06/12/92	11.63	1866.36
06/19/92	11.45	1866.54
07/18/92	11.69	1866.30
08/23/92	12.17	1865.82
09/20/92	12.14	1865.85
10/19/92	12.18	1865.81
11/18/92	12.17	1865.82

136-070-08BBB
Streeter Aquifer

MP Elev (msl,ft)=1,877.99
SI (ft.)=42-47

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/23/92	11.99	1866.00
12/21/92	12.07	1865.92
03/20/93	12.11	1865.88
04/21/93	11.30	1866.69
05/22/93	11.25	1866.74
06/19/93	10.97	1867.02
07/21/93	9.88	1868.11
07/28/93	10.45	1867.54
08/22/93	9.92	1868.07
09/20/93	10.10	1867.89
10/22/93	10.21	1867.78
11/19/93	10.30	1867.69
12/20/93	10.22	1867.77
03/20/94	9.85	1868.14
04/20/94	9.17	1868.82
05/05/94	8.93	1869.06
05/21/94	9.23	1868.76
06/02/94	9.50	1868.49
06/19/94	9.67	1868.32
07/20/94	9.56	1868.43
08/21/94	10.27	1867.72
09/21/94	10.24	1867.75
10/19/94	9.73	1868.26
11/22/94	9.88	1868.11
12/01/94	10.02	1867.97
12/20/94	10.01	1867.98
03/20/95	9.30	1868.69
04/19/95	8.65	1869.34
05/21/95	8.29	1869.70
06/22/95	8.67	1869.32
07/21/95	8.32	1869.67
08/20/95	9.21	1868.78
09/19/95	9.10	1868.89
10/26/95	8.98	1869.01
05/02/96	8.00	1869.99
08/08/96	9.20	1868.79
09/20/96	9.63	1868.36
10/24/96	9.48	1868.51
12/05/96	9.31	1868.68
05/22/97	7.54	1870.45
06/30/97	8.31	1869.68
07/30/97	8.63	1869.36
08/12/97	9.01	1868.98
09/16/97	9.09	1868.90
10/14/97	9.00	1868.99
11/11/97	9.02	1868.97
12/10/97	8.99	1869.00
05/12/98	8.17	1869.82
07/15/98	8.74	1869.25
08/25/98	8.73	1869.26
10/13/98	9.04	1868.95
11/30/98	8.60	1869.39

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/01/99	7.21	1870.78
06/29/99	7.52	1870.47
07/27/99	7.96	1870.03
09/08/99	7.43	1870.56
10/05/99	7.68	1870.31
11/02/99	7.78	1870.21
12/07/99	7.85	1870.14
05/17/00	7.37	1870.62
06/14/00	7.69	1870.30
07/12/00	7.83	1870.16
08/15/00	8.58	1869.41
09/19/00	8.87	1869.12
10/17/00	8.72	1869.27
11/30/00	8.52	1869.47
05/10/01	7.60	1870.39
06/26/01	7.48	1870.51
07/24/01	7.97	1870.02
08/21/01	8.48	1869.51
09/19/01	8.75	1869.24
10/23/01	8.66	1869.33
11/29/01	8.67	1869.32
12/18/01	8.76	1869.23
05/14/02	8.21	1869.78
06/25/02	8.88	1869.11
06/27/02	9.08	1868.91
08/20/02	9.60	1868.39
10/01/02	9.84	1868.15
11/19/02	9.59	1868.40
12/17/02	9.72	1868.27
05/21/03	8.50	1869.49
06/17/03	8.68	1869.31
07/22/03	9.06	1868.93
08/20/03	9.78	1868.21
09/16/03	10.09	1867.90
10/21/03	10.00	1867.99
11/18/03	9.89	1868.10
12/09/03	9.91	1868.08
05/19/04	8.86	1869.13
06/22/04	8.33	1869.66
07/27/04	8.92	1869.07
08/25/04	9.28	1868.71
09/21/04	9.20	1868.79
10/18/04	9.01	1868.98
11/22/04	8.88	1869.11
12/13/04	8.97	1869.02
04/13/05	8.82	1869.17
05/18/05	8.60	1869.39
06/13/05	8.31	1869.68
07/26/05	8.93	1869.06
08/24/05	9.01	1868.98
09/20/05	9.19	1868.80

136-070-08CCB
Streeter Aquifer

MP Elev (msl,ft)=1,876.76
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/04/99	4.05	1872.71
10/05/99	4.10	1872.66
11/02/99	4.20	1872.56
12/07/99	4.29	1872.47
05/17/00	3.77	1872.99
06/14/00	4.10	1872.66
07/12/00	4.29	1872.47
08/15/00	5.04	1871.72
09/19/00	5.49	1871.27
10/17/00	5.30	1871.46
11/30/00	5.08	1871.68
05/10/01	4.10	1872.66
06/26/01	3.94	1872.82
07/24/01	4.53	1872.23
08/21/01	5.02	1871.74
09/19/01	5.39	1871.37
10/23/01	5.28	1871.48
11/29/01	5.26	1871.50
12/18/01	5.34	1871.42
05/14/02	4.76	1872.00
06/25/02	5.42	1871.34
08/20/02	6.22	1870.54
10/01/02	6.52	1870.24
11/19/02	6.25	1870.51

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/17/02	6.42	1870.34
05/21/03	5.00	1871.76
06/17/03	5.14	1871.62
07/22/03	5.55	1871.21
08/20/03	6.35	1870.41
09/16/03	6.69	1870.07
10/21/03	6.66	1870.10
11/18/03	6.53	1870.23
12/09/03	6.57	1870.19
05/19/04	5.31	1871.45
06/22/04	4.58	1872.18
07/27/04	5.24	1871.52
08/25/04	5.68	1871.08
09/07/04	5.50	1871.26
09/21/04	5.63	1871.13
10/18/04	5.46	1871.30
11/22/04	5.26	1871.50
12/13/04	5.39	1871.37
04/13/05	5.25	1871.51
05/18/05	4.92	1871.84
06/13/05	4.56	1872.20
07/26/05	5.20	1871.56
08/24/05	5.30	1871.46
09/20/05	5.52	1871.24

136-070-09DDA
Streeter Aquifer

MP Elev (msl,ft)=1,883.40
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/10/83	8.64	1874.76
08/25/83	8.85	1874.55
09/12/83	9.10	1874.30
09/25/83	8.80	1874.60
09/27/83	8.80	1874.60
10/11/83	8.76	1874.64
10/25/83	8.38	1875.02
11/08/83	8.21	1875.19
11/27/83	8.27	1875.13
11/30/83	8.61	1874.79
12/06/83	8.36	1875.04
03/22/84	8.10	1875.30
04/10/84	6.87	1876.53
04/24/84	6.62	1876.78
04/25/84	6.65	1876.75
05/15/84	6.64	1876.76
05/16/84	6.68	1876.72
05/30/84	7.19	1876.21
06/20/84	6.88	1876.52
06/22/84	6.93	1876.47
07/05/84	7.27	1876.13
07/19/84	7.93	1875.47
07/24/84	8.15	1875.25
08/06/84	8.19	1875.21
08/17/84	8.61	1874.79
08/21/84	8.65	1874.75
08/30/84	8.84	1874.56
09/12/84	8.87	1874.53
09/22/84	8.94	1874.46
10/23/84	7.93	1875.47
10/25/84	7.88	1875.52
11/25/84	8.02	1875.38
12/20/84	8.43	1874.97
03/22/85	8.07	1875.33
04/21/85	7.39	1876.01
05/25/85	7.27	1876.13
06/21/85	7.79	1875.61
07/24/85	8.83	1874.57
09/23/85	8.56	1874.84
10/20/85	8.30	1875.10
11/14/85	8.48	1874.92
11/22/85	8.55	1874.85
03/20/86	7.40	1876.00
04/20/86	6.22	1877.18
05/07/86	6.54	1876.86
05/23/86	6.79	1876.61
06/22/86	7.58	1875.82
07/21/86	7.75	1875.65
08/20/86	8.40	1875.00
09/19/86	7.73	1875.67
10/19/86	7.45	1875.95
12/11/86	7.68	1875.72
04/20/87	6.25	1877.15
05/21/87	6.91	1876.49
06/21/87	7.53	1875.87
07/20/87	7.37	1876.03

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/20/87	7.99	1875.41
09/21/87	8.25	1875.15
10/21/87	8.16	1875.24
11/13/87	8.22	1875.18
11/20/87	8.01	1875.39
12/19/87	8.00	1875.40
03/20/88	7.67	1875.73
04/21/88	7.30	1876.10
05/21/88	7.66	1875.74
06/21/88	8.47	1874.93
07/20/88	9.34	1874.06
08/20/88	9.72	1873.68
09/19/88	9.97	1873.43
10/20/88	9.72	1873.68
11/21/88	9.53	1873.87
11/23/88	9.53	1873.87
12/20/88	9.72	1873.68
03/20/89	9.71	1873.69
04/20/89	8.51	1874.89
05/21/89	8.40	1875.00
06/21/89	8.89	1874.51
07/19/89	9.36	1874.04
07/20/89	9.29	1874.11
08/21/89	9.99	1873.41
09/19/89	9.51	1873.89
10/20/89	9.74	1873.66
11/21/89	9.81	1873.59
11/22/89	9.58	1873.82
12/22/89	9.94	1873.46
02/27/90	10.29	1873.11
03/21/90	9.93	1873.47
04/21/90	9.34	1874.06
05/19/90	8.86	1874.54
06/19/90	8.75	1874.65
07/20/90	9.35	1874.05
08/20/90	10.05	1873.35
09/21/90	10.21	1873.19
10/20/90	10.20	1873.20
11/21/90	10.07	1873.33
12/10/90	10.15	1873.25
12/22/90	10.30	1873.10
03/21/91	10.23	1873.17
04/21/91	9.55	1873.85
05/21/91	9.05	1874.35
06/07/91	9.33	1874.07
06/20/91	9.61	1873.79
07/21/91	9.99	1873.41
08/19/91	10.55	1872.85
09/20/91	10.44	1872.96
10/21/91	10.56	1872.84
11/20/91	10.26	1873.14
12/22/91	10.48	1872.92
03/22/92	9.95	1873.45
04/20/92	9.78	1873.62
05/18/92	9.57	1873.83

136-070-09DDA
Streeter Aquifer

MP Elev (msl,ft)=1,883.40
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/20/92	9.53	1873.87
06/12/92	9.98	1873.42
06/19/92	9.89	1873.51
07/18/92	10.08	1873.32
08/23/92	10.65	1872.75
09/20/92	10.70	1872.70
10/19/92	10.80	1872.60
11/23/92	10.52	1872.88
12/21/92	10.65	1872.75
03/20/93	10.83	1872.57
04/21/93	9.67	1873.73
05/22/93	9.47	1873.93
06/19/93	9.37	1874.03
07/21/93	7.80	1875.60
07/28/93	7.90	1875.50
08/22/93	8.47	1874.93
09/20/93	8.89	1874.51
10/22/93	8.99	1874.41
11/19/93	8.97	1874.43
04/20/94	7.15	1876.25
05/05/94	6.93	1876.47
05/21/94	7.55	1875.85
06/02/94	7.94	1875.46
06/19/94	8.15	1875.25
07/20/94	8.02	1875.38
08/21/94	8.92	1874.48
09/21/94	8.80	1874.60
10/19/94	8.21	1875.19
11/22/94	8.39	1875.01
12/01/94	8.59	1874.81
12/20/94	8.54	1874.86
03/20/95	7.36	1876.04
04/19/95	6.64	1876.76
05/21/95	6.55	1876.85
06/22/95	7.44	1875.96
07/21/95	7.05	1876.35
08/20/95	8.24	1875.16
09/19/95	8.08	1875.32
10/26/95	7.77	1875.63
05/02/96	6.38	1877.02
08/08/96	8.20	1875.20
09/20/96	8.68	1874.72
10/24/96	8.26	1875.14
05/22/97	6.46	1876.94
06/30/97	7.52	1875.88
07/30/97	7.78	1875.62
08/12/97	8.19	1875.21
09/16/97	8.18	1875.22
10/14/97	7.98	1875.42
11/11/97	7.88	1875.52
12/10/97	7.84	1875.56
05/12/98	6.90	1876.50
07/15/98	7.70	1875.70
08/25/98	7.78	1875.62

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/13/98	8.03	1875.37
11/30/98	7.48	1875.92
06/01/99	6.24	1877.16
06/29/99	6.81	1876.59
07/27/99	7.24	1876.16
09/08/99	6.56	1876.84
10/05/99	6.88	1876.52
11/02/99	6.94	1876.46
12/07/99	7.04	1876.36
05/17/00	6.40	1877.00
06/14/00	6.89	1876.51
07/12/00	7.10	1876.30
08/15/00	7.72	1875.68
09/19/00	8.20	1875.20
10/17/00	7.82	1875.58
11/30/00	7.50	1875.90
05/10/01	6.21	1877.19
06/26/01	6.45	1876.95
07/24/01	7.24	1876.16
08/21/01	7.78	1875.62
09/19/01	8.01	1875.39
10/23/01	7.66	1875.74
11/29/01	7.65	1875.75
12/18/01	7.73	1875.67
05/14/02	6.78	1876.62
06/25/02	7.78	1875.62
06/27/02	7.85	1875.55
08/20/02	8.60	1874.80
10/01/02	8.91	1874.49
11/19/02	8.50	1874.90
12/17/02	8.76	1874.64
05/21/03	6.80	1876.60
06/17/03	7.43	1875.97
07/22/03	8.08	1875.32
08/20/03	9.03	1874.37
09/16/03	9.35	1874.05
10/21/03	9.15	1874.25
11/18/03	8.93	1874.47
12/09/03	8.87	1874.53
05/19/04	7.47	1875.93
06/22/04	6.63	1876.77
07/27/04	7.70	1875.70
08/25/04	8.34	1875.06
09/21/04	8.20	1875.20
10/18/04	7.99	1875.41
11/22/04	7.79	1875.61
12/13/04	7.97	1875.43
04/13/05	7.72	1875.68
05/18/05	7.22	1876.18
06/13/05	6.95	1876.45
07/26/05	8.07	1875.33
08/24/05	7.98	1875.42
09/20/05	8.01	1875.39

136-070-14CCA
Streeter Aquifer

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/11/83	20.16	1885.74
08/10/83	21.09	1884.81
09/13/83	21.10	1884.80
11/08/83	21.22	1884.68
05/15/84	20.74	1885.16

MP Elev (msl,ft)=1,905.90
SI (ft.)=48-58

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/25/84	21.36	1884.54
11/14/85	22.28	1883.62
07/19/89	25.02	1880.88

136-070-14CDB
Streeter Aquifer

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/11/83	20.08	1885.82
08/10/83	21.04	1884.86
09/13/83	21.03	1884.87
11/08/83	21.08	1884.82
05/15/84	20.61	1885.29

MP Elev (msl,ft)=1,905.90
SI (ft.)=49-64

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/25/84	21.20	1884.70
11/14/85	22.09	1883.81
07/19/89	24.88	1881.02

136-070-15AAA1
Streeter Aquifer

MP Elev (msl,ft)=1,891.69
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/10/83	11.60	1880.09
09/12/83	11.99	1879.70
11/07/83	11.74	1879.95
11/08/83	11.77	1879.92
05/15/84	10.46	1881.23
10/25/84	11.65	1880.04
05/23/85	11.48	1880.21
11/14/85	12.37	1879.32
05/07/86	10.61	1881.08
08/15/89	12.90	1878.79
02/27/90	14.42	1877.27
05/21/91	14.13	1877.56
06/07/91	14.20	1877.49
05/18/92	14.59	1877.10
06/12/92	14.81	1876.88
04/07/93	15.09	1876.60
05/05/93	14.86	1876.83
06/02/93	14.72	1876.97
07/06/93	14.39	1877.30
08/06/93	12.99	1878.70
09/02/93	13.00	1878.69
10/06/93	13.31	1878.38
10/27/93	13.32	1878.37
12/08/93	13.40	1878.29
05/05/94	11.85	1879.84
06/02/94	12.02	1879.67
05/18/95	10.94	1880.75
06/29/95	11.11	1880.58
10/26/95	11.67	1880.02
05/02/96	10.59	1881.10
08/08/96	11.59	1880.10
09/20/96	12.12	1879.57
10/24/96	12.06	1879.63
12/05/96	11.95	1879.74
05/22/97	9.22	1882.47
06/30/97	9.94	1881.75
08/12/97	10.69	1881.00
09/16/97	11.08	1880.61
10/14/97	11.17	1880.52
11/11/97	11.20	1880.49
12/10/97	11.24	1880.45
05/12/98	10.49	1881.20
07/15/98	11.08	1880.61
08/25/98	11.41	1880.28
10/13/98	11.65	1880.04
11/30/98	11.43	1880.26

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/01/99	9.60	1882.09
06/29/99	9.99	1881.70
07/27/99	10.27	1881.42
09/08/99	10.28	1881.41
10/05/99	10.33	1881.36
11/02/99	10.37	1881.32
12/07/99	10.40	1881.29
05/17/00	9.98	1881.71
06/14/00	10.23	1881.46
07/12/00	10.32	1881.37
07/18/00	10.38	1881.31
08/15/00	10.76	1880.93
09/19/00	11.22	1880.47
10/17/00	11.20	1880.49
11/30/00	11.16	1880.53
05/10/01	9.98	1881.71
06/26/01	10.00	1881.69
07/24/01	10.38	1881.31
08/21/01	10.65	1881.04
09/19/01	10.97	1880.72
10/23/01	10.97	1880.72
11/29/01	11.04	1880.65
12/18/01	11.16	1880.53
05/14/02	10.70	1880.99
06/25/02	11.30	1880.39
08/20/02	11.95	1879.74
10/01/02	12.44	1879.25
11/19/02	12.40	1879.29
12/17/02	12.56	1879.13
04/11/03	12.30	1879.39
05/21/03	11.58	1880.11
06/17/03	11.68	1880.01
07/22/03	11.92	1879.77
08/20/03	12.45	1879.24
09/16/03	12.80	1878.89
10/21/03	12.90	1878.79
11/18/03	12.83	1878.86
12/09/03	12.86	1878.83
05/19/04	11.84	1879.85
06/22/04	10.94	1880.75
07/27/04	11.30	1880.39
08/25/04	11.77	1879.92
09/21/04	11.99	1879.70
10/18/04	11.97	1879.72
11/22/04	11.87	1879.82
12/13/04	12.02	1879.67
04/13/05	12.08	1879.61
05/18/05	11.76	1879.93
06/13/05	11.70	1879.99
07/26/05	11.83	1879.86
08/23/05	12.00	1879.69
08/24/05	11.94	1879.75
09/20/05	12.10	1879.59

136-070-15AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,892.42
SI (ft.)=37-42

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/10/83	12.26	1880.16
08/25/83	12.47	1879.95
09/12/83	12.72	1879.70
09/25/83	12.65	1879.77
09/27/83	12.68	1879.74
10/11/83	12.57	1879.85
10/25/83	12.50	1879.92
10/26/83	12.50	1879.92
11/07/83	12.37	1880.05
11/08/83	12.34	1880.08
11/27/83	12.50	1879.92
11/30/83	12.53	1879.89
12/06/83	12.61	1879.81
03/22/84	12.48	1879.94
04/24/84	11.29	1881.13
05/15/84	11.18	1881.24
05/30/84	11.45	1880.97
06/20/84	11.26	1881.16
07/24/84	11.90	1880.52
08/21/84	12.33	1880.09
09/22/84	12.76	1879.66
10/23/84	12.40	1880.02
10/25/84	12.39	1880.03
11/25/84	12.44	1879.98
12/20/84	12.66	1879.76
03/22/85	12.49	1879.93
04/21/85	12.18	1880.24
05/25/85	12.12	1880.30
06/21/85	12.32	1880.10
07/24/85	12.92	1879.50
08/21/85	13.10	1879.32
09/23/85	13.07	1879.35
10/20/85	12.97	1879.45
11/14/85	13.10	1879.32
11/22/85	13.14	1879.28
12/21/85	13.17	1879.25
01/10/86	13.22	1879.20
03/20/86	12.30	1880.12
04/20/86	11.64	1880.78
05/07/86	11.35	1881.07
05/23/86	11.33	1881.09
06/22/86	11.67	1880.75
07/21/86	11.94	1880.48
08/20/86	12.32	1880.10
09/19/86	12.15	1880.27
10/07/86	11.92	1880.50
10/19/86	11.98	1880.44
11/23/86	12.07	1880.35
12/11/86	12.17	1880.25
12/22/86	12.22	1880.20
03/20/87	11.88	1880.54
04/20/87	10.48	1881.94
05/21/87	11.01	1881.41
06/21/87	11.35	1881.07
07/20/87	11.41	1881.01
08/20/87	11.82	1880.60

Date	Depth to Water (ft)	WL Elev (msl, ft)
09/21/87	12.15	1880.27
10/21/87	12.25	1880.17
11/13/87	12.36	1880.06
11/20/87	12.23	1880.19
12/19/87	12.20	1880.22
03/20/88	12.11	1880.31
04/21/88	11.89	1880.53
05/21/88	12.09	1880.33
06/21/88	12.64	1879.78
07/20/88	13.32	1879.10
08/20/88	13.79	1878.63
09/19/88	14.17	1878.25
10/20/88	14.30	1878.12
11/21/88	14.33	1878.09
11/23/88	14.35	1878.07
12/20/88	14.42	1878.00
03/20/89	14.41	1878.01
04/20/89	13.62	1878.80
05/21/89	13.47	1878.95
06/20/89	13.76	1878.66
06/21/89	13.76	1878.66
07/20/89	14.19	1878.23
08/15/89	14.63	1877.79
08/21/89	14.64	1877.78
09/19/89	14.59	1877.83
10/20/89	14.81	1877.61
11/21/89	14.94	1877.48
11/22/89	14.81	1877.61
12/22/89	14.90	1877.52
02/27/90	15.14	1877.28
03/21/90	15.05	1877.37
04/21/90	14.75	1877.67
05/19/90	14.40	1878.02
05/25/90	14.41	1878.01
06/12/90	14.41	1878.01
06/19/90	14.35	1878.07
07/20/90	14.67	1877.75
08/20/90	15.10	1877.32
09/21/90	15.34	1877.08
10/20/90	15.44	1876.98
11/21/90	15.43	1876.99
12/22/90	15.51	1876.91
03/21/91	15.54	1876.88
04/21/91	15.27	1877.15
05/21/91	14.85	1877.57
06/07/91	14.93	1877.49
06/20/91	15.07	1877.35
07/01/91	15.08	1877.34
07/21/91	15.33	1877.09
08/19/91	15.70	1876.72
09/20/91	15.76	1876.66
10/21/91	15.89	1876.53
11/20/91	15.82	1876.60
12/22/91	15.93	1876.49
03/22/92	15.57	1876.85

136-070-15AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,892.42
SI (ft.)=37-42

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/20/92	15.42	1877.00
05/18/92	15.33	1877.09
05/20/92	15.31	1877.11
06/12/92	15.51	1876.91
06/19/92	15.52	1876.90
07/18/92	15.64	1876.78
08/23/92	16.02	1876.40
09/16/92	16.20	1876.22
09/20/92	16.17	1876.25
10/19/92	16.33	1876.09
11/18/92	16.45	1875.97
11/23/92	16.29	1876.13
12/21/92	16.31	1876.11
03/20/93	16.41	1876.01
04/07/93	15.82	1876.60
04/21/93	15.67	1876.75
05/05/93	15.52	1876.90
05/22/93	15.48	1876.94
06/02/93	15.45	1876.97
06/19/93	15.38	1877.04
07/06/93	15.12	1877.30
07/21/93	14.26	1878.16
08/06/93	13.73	1878.69
08/22/93	13.71	1878.71
08/23/93	13.74	1878.68
09/02/93	13.73	1878.69
09/20/93	13.94	1878.48
10/06/93	14.05	1878.37
10/22/93	14.09	1878.33
10/27/93	14.05	1878.37
11/19/93	14.17	1878.25
12/08/93	14.12	1878.30
12/20/93	14.11	1878.31
05/05/94	12.72	1879.70
06/02/94	12.75	1879.67
12/01/94	13.62	1878.80
04/26/95	12.04	1880.38
05/18/95	11.67	1880.75
05/21/95	11.62	1880.80
06/22/95	11.78	1880.64
06/29/95	11.95	1880.47
07/21/95	11.64	1880.78
08/20/95	12.29	1880.13
09/19/95	12.49	1879.93
10/26/95	12.40	1880.02
05/02/96	11.33	1881.09
08/08/96	12.32	1880.10
09/20/96	12.86	1879.56
10/24/96	12.79	1879.63
12/05/96	12.69	1879.73
05/22/97	9.96	1882.46
06/30/97	10.69	1881.73
08/12/97	11.43	1880.99
09/16/97	11.81	1880.61
10/14/97	11.90	1880.52

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/11/97	11.93	1880.49
12/10/97	11.98	1880.44
05/12/98	11.23	1881.19
07/15/98	11.82	1880.60
08/25/98	12.14	1880.28
10/13/98	12.40	1880.02
11/30/98	12.18	1880.24
06/01/99	10.36	1882.06
06/29/99	10.74	1881.68
07/27/99	11.02	1881.40
09/08/99	11.00	1881.42
10/05/99	11.08	1881.34
11/02/99	11.11	1881.31
12/07/99	11.14	1881.28
05/17/00	10.72	1881.70
06/14/00	10.97	1881.45
07/12/00	11.07	1881.35
07/18/00	11.22	1881.20
08/15/00	11.50	1880.92
09/19/00	11.92	1880.50
10/17/00	11.95	1880.47
11/30/00	11.90	1880.52
05/10/01	10.70	1881.72
06/26/01	10.74	1881.68
07/24/01	11.09	1881.33
08/21/01	11.41	1881.01
09/19/01	11.71	1880.71
10/23/01	11.70	1880.72
11/29/01	11.78	1880.64
12/18/01	11.92	1880.50
05/14/02	11.44	1880.98
06/25/02	12.04	1880.38
08/20/02	12.69	1879.73
10/01/02	13.17	1879.25
11/19/02	13.12	1879.30
12/17/02	13.33	1879.09
04/11/03	13.01	1879.41
05/21/03	12.31	1880.11
06/17/03	12.41	1880.01
07/22/03	12.66	1879.76
08/20/03	13.19	1879.23
09/16/03	13.55	1878.87
10/21/03	13.65	1878.77
11/18/03	13.58	1878.84
12/09/03	13.64	1878.78
05/19/04	12.58	1879.84
06/22/04	11.68	1880.74
07/27/04	12.04	1880.38
08/25/04	12.51	1879.91
09/21/04	12.72	1879.70
10/18/04	12.70	1879.72
11/22/04	12.61	1879.81
12/13/04	12.76	1879.66

136-070-15AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,892.42
SI (ft.)=37-42

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/13/05	12.85	1879.57
05/18/05	12.50	1879.92
06/13/05	12.43	1879.99

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/26/05	12.57	1879.85
08/23/05	12.70	1879.72
08/24/05	12.67	1879.75
09/20/05	12.83	1879.59

136-070-15AAA3
Streeter Aquifer

MP Elev (msl,ft)=1,891.25
SI (ft.)=8.5-13

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/08/83	11.49	1879.76
11/10/83	11.50	1879.75
04/10/84	10.40	1880.85
04/25/84	10.30	1880.95
05/15/84	10.13	1881.12
05/16/84	10.12	1881.13
06/01/84	10.45	1880.80
10/25/84	11.32	1879.93
05/23/85	11.01	1880.24
11/14/85	12.04	1879.21
05/07/86	10.24	1881.01
10/07/86	10.83	1880.42
08/15/89	13.54	1877.71
02/27/90	14.07	1877.18
05/25/90	13.32	1877.93
05/21/91	13.70	1877.55
06/07/91	13.82	1877.43
08/21/91	14.63	1876.62
09/19/91	14.70	1876.55
10/18/91	14.84	1876.41
11/27/91	14.70	1876.55
04/16/92	14.39	1876.86
05/18/92	14.22	1877.03
06/12/92	14.40	1876.85
07/10/92	14.50	1876.75
08/20/92	14.94	1876.31
12/03/92	15.23	1876.02
03/17/93	15.40	1875.85
04/07/93	14.70	1876.55
05/05/93	14.52	1876.73
06/02/93	14.35	1876.90
07/06/93	14.01	1877.24
08/06/93	12.57	1878.68
08/23/93	12.63	1878.62
09/02/93	12.62	1878.63
10/06/93	12.97	1878.28
10/27/93	13.01	1878.24
12/08/93	13.06	1878.19
05/05/94	11.44	1879.81
06/02/94	11.65	1879.60
06/19/94	11.73	1879.52
07/20/94	11.82	1879.43
08/21/94	12.36	1878.89
09/21/94	12.51	1878.74
10/19/94	12.31	1878.94
11/22/94	12.39	1878.86
12/01/94	12.42	1878.83
12/20/94	12.50	1878.75
03/20/95	11.25	1880.00
04/19/95	10.97	1880.28

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/18/95	10.56	1880.69
05/21/95	10.46	1880.79
06/22/95	10.71	1880.54
06/29/95	10.80	1880.45
07/21/95	10.55	1880.70
08/20/95	11.21	1880.04
09/19/95	11.41	1879.84
10/26/95	11.35	1879.90
05/02/96	10.23	1881.02
08/08/96	11.25	1880.00
09/20/96	11.82	1879.43
10/24/96	11.73	1879.52
12/05/96	11.65	1879.60
05/22/97	8.88	1882.37
06/30/97	9.65	1881.60
08/12/97	10.37	1880.88
09/16/97	10.76	1880.49
10/14/97	10.86	1880.39
11/11/97	10.88	1880.37
12/10/97	10.93	1880.32
05/12/98	10.15	1881.10
07/15/98	10.73	1880.52
08/25/98	11.09	1880.16
10/13/98	11.34	1879.91
11/30/98	11.11	1880.14
06/01/99	9.29	1881.96
06/29/99	9.67	1881.58
07/27/99	9.96	1881.29
09/08/99	9.94	1881.31
10/05/99	10.03	1881.22
11/02/99	10.07	1881.18
12/07/99	10.10	1881.15
05/17/00	9.67	1881.58
06/14/00	9.92	1881.33
07/12/00	9.98	1881.27
07/18/00	10.05	1881.20
08/15/00	10.43	1880.82
09/19/00	10.91	1880.34
10/17/00	10.90	1880.35
11/30/00	10.84	1880.41
05/10/01	9.62	1881.63
06/26/01	9.64	1881.61
07/24/01	10.04	1881.21
08/21/01	10.35	1880.90
09/19/01	10.67	1880.58
10/23/01	10.66	1880.59
11/29/01	10.74	1880.51
12/18/01	10.88	1880.37
05/14/02	10.36	1880.89
06/25/02	10.97	1880.28
08/20/02	11.61	1879.64
10/01/02	12.12	1879.13
11/19/02	12.05	1879.20

136-070-15AAA3
Streeter Aquifer

MP Elev (msl,ft)=1,891.25
SI (ft.)=8.5-13

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/17/02	12.22	1879.03
04/11/03	11.95	1879.30
05/21/03	11.20	1880.05
06/17/03	11.30	1879.95
07/22/03	11.54	1879.71
08/20/03	12.13	1879.12
09/16/03	12.49	1878.76
10/21/03	12.59	1878.66
11/18/03	12.53	1878.72
12/09/03	12.58	1878.67
05/19/04	11.50	1879.75
06/22/04	10.56	1880.69

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/27/04	10.94	1880.31
08/25/04	11.42	1879.83
09/21/04	11.64	1879.61
10/18/04	11.62	1879.63
11/22/04	11.53	1879.72
12/13/04	11.68	1879.57
04/13/05	11.76	1879.49
05/18/05	11.41	1879.84
06/13/05	11.34	1879.91
07/26/05	11.49	1879.76
08/23/05	11.60	1879.65
08/24/05	11.59	1879.66
09/20/05	11.76	1879.49

136-070-15CCC2
Streeter Aquifer

MP Elev (msl,ft)=1,897.91
SI (ft.)=48-52

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/15/78	15.20	1882.21
01/08/79	15.44	1881.97
02/05/79	15.55	1881.86
03/03/79	15.78	1881.63
04/04/79	15.80	1881.61
04/30/79	14.22	1883.19
05/30/79	14.30	1883.11
06/10/79	14.86	1882.55
06/30/79	14.22	1883.19
07/10/79	14.58	1882.83
07/30/79	14.08	1883.33
08/10/79	14.66	1882.75
08/30/79	14.34	1883.07
09/10/79	14.93	1882.48
09/25/79	14.58	1882.83
10/10/79	15.13	1882.28
10/30/79	14.82	1882.59
11/09/79	14.88	1882.53
11/10/79	15.32	1882.09
04/15/80	15.06	1882.35
04/21/80	15.43	1881.98
05/06/80	15.41	1882.00
05/27/80	14.90	1882.51
06/02/80	15.52	1881.89
06/24/80	15.05	1882.36
07/29/80	15.27	1882.14
09/02/80	15.48	1881.93
09/23/80	15.62	1881.79
10/28/80	15.42	1881.99
11/26/80	15.80	1881.61
03/10/81	16.23	1881.18
03/31/81	16.20	1881.21
06/23/81	16.21	1881.20
07/28/81	15.94	1881.47
08/25/81	15.88	1881.53
09/29/81	16.04	1881.37
11/10/81	16.17	1881.24
12/02/81	16.14	1881.27
05/13/82	16.10	1881.31
06/15/82	15.90	1881.51
07/08/82	15.88	1881.53
07/27/82	15.81	1881.60
09/08/82	16.33	1881.08
09/09/82	16.25	1881.16
10/26/82	16.14	1881.27
12/03/82	15.93	1881.48
12/13/82	15.91	1881.50
01/01/83	16.08	1881.33
01/16/83	16.12	1881.29
01/25/83	15.95	1881.46
02/01/83	16.06	1881.35
02/16/83	16.13	1881.28
02/28/83	16.17	1881.24
03/22/83	16.25	1881.16
04/08/83	16.20	1881.21

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/22/83	16.15	1881.26
05/11/83	15.98	1881.43
05/18/83	15.87	1881.54
05/25/83	16.01	1881.40
06/09/83	16.01	1881.40
06/25/83	16.10	1881.31
07/06/83	15.96	1881.45
07/14/83	16.10	1881.31
07/28/83	16.24	1881.17
08/11/83	16.40	1881.01
08/25/83	16.53	1880.88
09/13/83	16.80	1880.61
09/27/83	16.91	1880.50
10/10/83	16.98	1880.43
10/25/83	17.06	1880.35
11/08/83	17.10	1880.31
11/22/83	17.13	1880.28
11/30/83	17.13	1880.28
12/06/83	17.15	1880.26
03/14/84	17.26	1880.15
05/15/84	16.57	1880.84
06/25/84	16.15	1881.26
08/06/84	16.38	1881.03
09/24/84	16.92	1880.49
10/25/84	17.09	1880.32
12/03/84	17.13	1880.28
03/01/85	17.38	1880.03
05/17/85	17.20	1880.21
05/23/85	17.25	1880.16
06/19/85	17.15	1880.26
08/13/85	17.47	1879.94
11/14/85	17.77	1879.64
01/10/86	17.78	1879.63
04/10/86	17.35	1880.06
08/08/86	16.52	1880.89
10/07/86	16.81	1880.60
10/28/86	16.70	1880.71
12/11/86	16.66	1880.75
04/15/87	15.66	1881.75
05/13/87	15.57	1881.84
06/12/87	15.76	1881.65
07/13/87	16.02	1881.39
08/13/87	16.08	1881.33
09/15/87	16.32	1881.09
10/16/87	16.54	1880.87
11/13/87	16.60	1880.81
12/18/87	16.68	1880.73
03/04/88	16.92	1880.49
04/11/88	16.88	1880.53
05/19/88	17.09	1880.32
06/14/88	17.49	1879.92
08/16/88	18.65	1878.76
09/12/88	19.22	1878.19
10/06/88	19.35	1878.06
11/23/88	19.30	1878.11

136-070-15CCC2
Streeter Aquifer

MP Elev (msl,ft)=1,897.91
SI (ft.)=48-52

Date	Depth to Water (ft)	WL Elev (msl, ft)
01/05/89	19.36	1878.05
03/15/89	19.38	1878.03
04/11/89	19.11	1878.30
05/16/89	19.03	1878.38
06/16/89	19.01	1878.40
07/19/89	19.69	1877.72
07/25/89	19.64	1877.77
08/15/89	20.03	1877.38
09/26/89	20.12	1877.29
11/21/89	19.99	1877.42
01/02/90	20.01	1877.40
02/27/90	20.21	1877.20
04/03/90	20.00	1877.41
05/09/90	19.92	1877.49
08/16/90	20.30	1877.11
09/28/90	20.60	1876.81
12/10/90	20.60	1876.81
01/17/91	20.55	1876.86
02/28/91	20.60	1876.81
05/16/91	20.40	1877.01
06/07/91	20.48	1876.93
07/23/91	20.65	1876.76
10/03/91	21.10	1876.31
11/14/91	21.00	1876.41
01/06/92	21.00	1876.41
03/31/92	20.87	1876.54
05/18/92	20.97	1876.44
06/12/92	21.07	1876.34
06/19/92	20.92	1876.49
07/09/92	21.00	1876.41
07/10/92	21.09	1876.32
10/13/92	21.62	1875.79
12/03/92	21.73	1875.68
04/07/93	21.40	1876.01
04/29/93	21.20	1876.21
05/05/93	21.27	1876.14
06/02/93	21.15	1876.26
07/06/93	20.90	1876.51
07/09/93	20.80	1876.61
08/06/93	19.92	1877.49
08/23/93	19.61	1877.80
09/02/93	19.48	1877.93
10/06/93	19.24	1878.17
10/08/93	19.12	1878.29
10/27/93	19.17	1878.24
04/04/94	18.98	1878.43
05/05/94	18.60	1878.81
05/24/94	18.17	1879.24
06/02/94	18.20	1879.21
10/03/94	18.69	1878.72
11/10/94	18.50	1878.91
05/21/95	17.42	1879.99
06/22/95	16.99	1880.42
07/21/95	16.76	1880.65
08/20/95	17.23	1880.18
09/19/95	17.69	1880.22
10/26/95	17.56	1880.35
05/02/96	16.78	1881.13
08/08/96	17.63	1880.28
09/20/96	18.05	1879.86
10/24/96	18.16	1879.75
05/22/97	15.77	1882.14
06/30/97	16.27	1881.64
08/12/97	17.05	1880.86
09/16/97	17.22	1880.69
10/14/97	17.35	1880.56
11/11/97	17.29	1880.62
12/10/97	17.29	1880.62
05/12/98	16.89	1881.02
07/15/98	17.37	1880.54
08/25/98	17.50	1880.41
08/27/98	17.46	1880.45
10/13/98	17.55	1880.36
11/30/98	17.44	1880.47
06/01/99	15.89	1882.02
06/29/99	15.69	1882.22
07/27/99	15.81	1882.10
09/08/99	15.92	1881.99
10/05/99	15.63	1882.28
11/02/99	15.66	1882.25
12/07/99	15.69	1882.22
05/17/00	15.73	1882.18
06/14/00	15.85	1882.06
07/12/00	16.22	1881.69
08/15/00	16.41	1881.50
09/19/00	16.65	1881.26
10/17/00	16.82	1881.09
11/30/00	16.86	1881.05
05/10/01	16.35	1881.56
06/26/01	16.15	1881.76
07/24/01	16.06	1881.85
08/21/01	16.07	1881.84
09/19/01	16.44	1881.47
10/23/01	16.55	1881.36
11/29/01	16.66	1881.25
12/18/01	16.73	1881.18
05/14/02	16.85	1881.06
06/25/02	17.14	1880.77
08/20/02	17.93	1879.98
10/01/02	18.36	1879.55
11/19/02	18.75	1879.16
12/17/02	18.34	1879.57
05/21/03	18.15	1879.76
06/17/03	18.00	1879.91
07/22/03	18.06	1879.85

136-070-15CCC2
Streeter Aquifer

MP Elev (msl,ft)=1,897.91
SI (ft.)=48-52

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/20/03	18.01	1879.90
09/16/03	18.30	1879.61
10/21/03	18.50	1879.41
11/18/03	18.58	1879.33
12/09/03	18.61	1879.30
05/19/04	18.21	1879.70
06/22/04	17.67	1880.24
07/27/04	17.42	1880.49
08/25/04	17.81	1880.10
09/07/04	17.90	1880.01

Date	Depth to Water (ft)	WL Elev (msl, ft)
09/21/04	17.96	1879.95
10/18/04	17.82	1880.09
11/22/04	17.72	1880.19
12/13/04	17.80	1880.11
04/13/05	18.14	1879.77
05/18/05	18.43	1879.48
06/13/05	18.15	1879.76
07/26/05	18.03	1879.88
08/24/05	17.96	1879.95
09/20/05	18.05	1879.86

136-070-16BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,882.27
SI (ft.)=48-51

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/15/78	7.20	1875.07
12/06/78	7.31	1874.96
01/08/79	7.58	1874.69
02/05/79	7.64	1874.63
04/03/79	7.01	1875.26
04/30/79	5.66	1876.61
06/06/79	6.83	1875.44
07/18/79	7.10	1875.17
08/07/79	7.40	1874.87
08/28/79	7.54	1874.73
10/09/79	8.06	1874.21
11/09/79	7.89	1874.38
05/06/80	7.42	1874.85
05/27/80	7.77	1874.50
09/02/80	8.43	1873.84
11/26/80	8.31	1873.96
03/10/81	8.66	1873.61
05/27/81	7.95	1874.32
07/15/81	8.15	1874.12
07/21/81	7.64	1874.63
08/23/81	8.12	1874.15
08/25/81	8.10	1874.17
09/23/81	7.03	1875.24
10/24/81	8.30	1873.97
11/21/81	8.27	1874.00
12/02/81	8.30	1873.97
12/22/81	8.45	1873.82
03/18/82	8.31	1873.96
04/23/82	8.18	1874.09
05/23/82	7.04	1875.23
06/25/82	7.25	1875.02
07/08/82	7.78	1874.49
07/21/82	7.64	1874.63
08/22/82	8.58	1873.69
09/08/82	8.75	1873.52
09/22/82	8.78	1873.49
10/22/82	7.49	1874.78
12/02/82	8.30	1873.97
12/03/82	7.58	1874.69
12/06/82	7.49	1874.78
12/13/82	7.85	1874.42
03/31/83	7.52	1874.75
04/30/83	7.07	1875.20
05/11/83	7.15	1875.12
05/29/83	7.29	1874.98
06/27/83	7.93	1874.34
07/14/83	8.21	1874.06
07/27/83	8.29	1873.98
08/11/83	8.88	1873.39
08/25/83	8.98	1873.29
09/12/83	9.21	1873.06
09/25/83	9.10	1873.17
10/25/83	8.83	1873.44
11/08/83	8.80	1873.47
11/27/83	8.80	1873.47

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/30/83	8.88	1873.39
03/22/84	8.65	1873.62
04/24/84	7.41	1874.86
05/15/84	7.34	1874.93
05/30/84	7.67	1874.60
06/20/84	7.40	1874.87
07/24/84	8.31	1873.96
08/21/84	8.77	1873.50
09/22/84	9.17	1873.10
10/23/84	8.43	1873.84
10/25/84	8.44	1873.83
11/25/84	8.46	1873.81
12/20/84	8.83	1873.44
03/22/85	8.66	1873.61
04/21/85	8.08	1874.19
05/25/85	7.97	1874.30
06/21/85	8.31	1873.96
07/24/85	9.00	1873.27
08/21/85	9.16	1873.11
09/23/85	9.04	1873.23
10/20/85	8.83	1873.44
11/14/85	8.95	1873.32
11/22/85	8.98	1873.29
12/06/85	8.89	1873.38
12/21/85	9.04	1873.23
01/10/86	9.13	1873.14
03/20/86	8.04	1874.23
04/20/86	7.20	1875.07
05/23/86	7.26	1875.01
06/22/86	7.88	1874.39
07/21/86	8.00	1874.27
08/20/86	8.56	1873.71
09/19/86	8.10	1874.17
10/19/86	7.88	1874.39
11/23/86	7.91	1874.36
12/11/86	8.06	1874.21
12/22/86	8.15	1874.12
03/20/87	7.67	1874.60
04/20/87	6.77	1875.50
05/21/87	7.06	1875.21
06/21/87	7.70	1874.57
07/20/87	7.69	1874.58
08/20/87	8.29	1873.98
09/21/87	8.57	1873.70
10/21/87	8.57	1873.70
11/13/87	8.51	1873.76
11/20/87	8.48	1873.79
12/19/87	8.46	1873.81
03/20/88	8.30	1873.97
04/21/88	7.96	1874.31
05/21/88	8.21	1874.06
06/21/88	9.02	1873.25
07/20/88	9.68	1872.59
08/20/88	10.03	1872.24
09/19/88	10.23	1872.04

136-070-16BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,882.27
SI (ft.)=48-51

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/20/88	10.10	1872.17
11/21/88	9.98	1872.29
11/23/88	10.04	1872.23
12/20/88	10.10	1872.17
03/20/89	10.02	1872.25
04/20/89	9.26	1873.01
05/21/89	9.05	1873.22
06/21/89	9.47	1872.80
07/20/89	9.86	1872.41
08/21/89	10.41	1871.86
09/19/89	10.11	1872.16
10/20/89	10.24	1872.03
11/21/89	10.11	1872.16
11/22/89	10.12	1872.15
12/22/89	10.42	1871.85
02/27/90	10.67	1871.60
03/21/90	10.30	1871.97
04/21/90	9.92	1872.35
05/19/90	9.52	1872.75
06/19/90	9.23	1873.04
07/20/90	9.82	1872.45
08/20/90	10.37	1871.90
09/21/90	10.61	1871.66
10/20/90	10.57	1871.70
11/21/90	10.49	1871.78
12/10/90	9.57	1872.70
12/22/90	10.68	1871.59
03/21/91	10.62	1871.65
04/21/91	10.11	1872.16
05/21/91	9.67	1872.60
06/07/91	9.83	1872.44
06/20/91	9.98	1872.29
07/21/91	10.39	1871.88
08/19/91	10.83	1871.44
09/20/91	10.83	1871.44
10/21/91	11.00	1871.27
11/20/91	10.63	1871.64
12/22/91	10.85	1871.42
03/22/92	10.43	1871.84
04/20/92	10.11	1872.16
05/18/92	10.12	1872.15
05/20/92	10.08	1872.19
06/12/92	10.49	1871.78
06/19/92	10.35	1871.92
07/18/92	10.52	1871.75
08/23/92	11.00	1871.27
09/20/92	11.06	1871.21
10/19/92	11.10	1871.17
11/18/92	11.00	1871.27
11/23/92	10.92	1871.35
12/21/92	11.02	1871.25
03/20/93	11.14	1871.13
04/21/93	10.22	1872.05
05/22/93	10.05	1872.22
06/19/93	9.82	1872.45
07/21/93	8.74	1873.53
07/29/93	8.45	1873.82
08/22/93	8.77	1873.50
09/20/93	9.00	1873.27
10/22/93	9.15	1873.12
11/19/93	9.17	1873.10
12/20/93	9.08	1873.19
03/20/94	8.53	1873.74
04/20/94	7.75	1874.52
05/05/94	7.53	1874.74
05/21/94	7.85	1874.42
06/02/94	8.20	1874.07
06/19/94	8.33	1873.94
07/20/94	8.30	1873.97
08/21/94	8.99	1873.28
09/21/94	8.99	1873.28
10/19/94	8.44	1873.83
11/22/94	8.61	1873.66
12/01/94	8.63	1873.64
12/20/94	8.76	1873.51
03/20/95	7.94	1874.33
04/19/95	7.24	1875.03
05/21/95	6.92	1875.35
06/22/95	7.48	1874.79
07/21/95	7.28	1874.99
08/20/95	8.23	1874.04
09/19/95	8.14	1874.13
10/26/95	8.01	1874.26
05/02/96	6.97	1875.30
08/08/96	8.41	1873.86
09/20/96	8.80	1873.47
10/24/96	8.66	1873.61
12/05/96	8.48	1873.79
05/22/97	6.95	1875.32
06/30/97	7.77	1874.50
07/30/97	8.18	1874.09
08/12/97	8.52	1873.75
09/16/97	8.54	1873.73
10/14/97	8.39	1873.88
11/11/97	8.37	1873.90
12/10/97	8.36	1873.91
05/12/98	7.50	1874.77
07/15/98	8.13	1874.14
08/25/98	8.16	1874.11
10/13/98	8.41	1873.86
11/30/98	7.96	1874.31
06/01/99	6.63	1875.64
06/29/99	7.03	1875.24
07/27/99	7.47	1874.80
09/08/99	6.89	1875.38
10/05/99	7.14	1875.13
11/02/99	7.19	1875.08
12/07/99	7.26	1875.01

136-070-16BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,882.27
SI (ft.)=48-51

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/17/00	6.80	1875.47
06/14/00	7.15	1875.12
07/12/00	7.27	1875.00
08/15/00	8.01	1874.26
09/19/00	8.43	1873.84
10/17/00	8.19	1874.08
11/30/00	7.94	1874.33
05/10/01	6.91	1875.36
06/26/01	6.85	1875.42
07/24/01	7.52	1874.75
08/21/01	7.96	1874.31
09/19/01	8.28	1873.99
10/23/01	8.10	1874.17
11/29/01	8.06	1874.21
12/18/01	8.15	1874.12
05/14/02	7.44	1874.83
06/25/02	8.20	1874.07
06/27/02	8.30	1873.97
08/20/02	8.95	1873.32
10/01/02	9.32	1872.95
11/19/02	9.00	1873.27
12/17/02	9.20	1873.07

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/21/03	7.70	1874.57
06/17/03	7.96	1874.31
07/22/03	8.41	1873.86
08/20/03	9.18	1873.09
09/16/03	9.54	1872.73
10/21/03	9.49	1872.78
11/18/03	9.30	1872.97
12/09/03	9.36	1872.91
05/19/04	8.07	1874.20
06/22/04	7.30	1874.97
07/27/04	8.04	1874.23
08/25/04	8.52	1873.75
09/21/04	8.46	1873.81
10/18/04	8.30	1873.97
11/22/04	8.12	1874.15
12/13/04	8.29	1873.98
04/13/05	8.13	1874.14
05/18/05	7.78	1874.49
06/13/05	7.49	1874.78
07/26/05	8.15	1874.12
08/24/05	8.26	1874.01
09/20/05	8.47	1873.80

136-070-17BCC
Streeter Aquifer

MP Elev (msl,ft)=1,885.98
SI (ft.)=29-34

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/04/99	11.46	1874.52
10/05/99	11.46	1874.52
11/02/99	11.64	1874.34
12/07/99	11.77	1874.21
05/17/00	11.06	1874.92
06/14/00	11.39	1874.59
07/12/00	11.81	1874.17
08/15/00	12.32	1873.66
09/19/00	12.84	1873.14
10/17/00	12.91	1873.07
11/30/00	12.79	1873.19
05/10/01	11.72	1874.26
06/26/01	11.48	1874.50
07/24/01	12.12	1873.86
08/21/01	12.40	1873.58
09/19/01	12.87	1873.11
10/23/01	12.93	1873.05
11/29/01	12.98	1873.00
12/18/01	13.04	1872.94
05/14/02	12.75	1873.23
06/25/02	13.12	1872.86
08/20/02	13.74	1872.24
10/01/02	14.09	1871.89
11/19/02	14.10	1871.88

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/17/02	14.21	1871.77
05/21/03	13.25	1872.73
06/17/03	12.99	1872.99
07/22/03	13.08	1872.90
08/20/03	13.70	1872.28
09/16/03	14.09	1871.89
10/21/03	14.25	1871.73
11/18/03	14.27	1871.71
12/09/03	14.34	1871.64
05/19/04	13.34	1872.64
06/22/04	12.18	1873.80
07/27/04	12.61	1873.37
08/25/04	13.07	1872.91
09/07/04	13.15	1872.83
09/21/04	13.21	1872.77
10/18/04	13.09	1872.89
11/22/04	12.94	1873.04
12/13/04	13.05	1872.93
04/13/05	13.34	1872.64
05/18/05	12.75	1873.23
06/13/05	12.35	1873.63
07/26/05	12.51	1873.47
08/24/05	12.76	1873.22
09/20/05	12.95	1873.03

136-070-17DDD1
Streeter Aquifer

MP Elev (msl,ft)=1,886.07
SI (ft.)=161-164

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/06/78	8.47	1877.60
01/08/79	8.32	1877.75
02/05/79	8.37	1877.70
04/03/79	8.11	1877.96
04/30/79	8.18	1877.89
06/06/79	8.20	1877.87
07/18/79	8.20	1877.87
08/07/79	8.25	1877.82
08/28/79	8.27	1877.80
10/09/79	8.39	1877.68
11/08/79	8.33	1877.74
05/27/80	8.34	1877.73
09/02/80	8.40	1877.67
11/26/80	8.50	1877.57
03/10/81	8.46	1877.61
05/27/81	8.37	1877.70
07/15/81	9.29	1876.78
07/25/81	8.97	1877.10
08/23/81	9.41	1876.66
08/25/81	8.38	1877.69
09/23/81	9.57	1876.50
10/24/81	9.59	1876.48
11/21/81	9.57	1876.50
12/02/81	8.47	1877.60
12/22/81	9.68	1876.39
03/18/82	8.21	1877.86
04/25/82	8.20	1877.87
05/23/82	8.16	1877.91
06/25/82	8.20	1877.87
07/08/82	8.34	1877.73
07/21/82	8.25	1877.82
08/22/82	8.46	1877.61
09/08/82	8.49	1877.58
09/22/82	8.45	1877.62
10/22/82	8.11	1877.96
12/03/82	8.10	1877.97
12/13/82	8.10	1877.97
03/31/83	7.93	1878.14
04/30/83	8.02	1878.05
05/11/83	8.15	1877.92
05/29/83	8.09	1877.98
06/27/83	8.21	1877.86
07/14/83	8.31	1877.76
07/27/83	8.22	1877.85
08/11/83	8.43	1877.64
08/26/83	8.33	1877.74
09/13/83	8.55	1877.52
09/25/83	8.49	1877.58
10/25/83	8.48	1877.59
11/08/83	8.55	1877.52
11/27/83	8.50	1877.57
11/30/83	8.56	1877.51
12/06/83	8.52	1877.55
03/22/84	8.33	1877.74

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/24/84	8.25	1877.82
05/15/84	8.27	1877.80
05/30/84	8.31	1877.76
06/20/84	8.24	1877.83
07/24/84	8.48	1877.59
08/21/84	8.48	1877.59
09/22/84	8.58	1877.49
10/23/84	8.41	1877.66
10/25/84	8.45	1877.62
11/25/84	8.40	1877.67
12/03/84	8.50	1877.57
12/20/84	8.43	1877.64
03/22/85	8.47	1877.60
04/21/85	8.50	1877.57
05/25/85	8.43	1877.64
06/21/85	8.49	1877.58
07/24/85	8.66	1877.41
08/22/85	8.70	1877.37
09/23/85	8.69	1877.38
10/20/85	8.68	1877.39
11/14/85	8.75	1877.32
11/22/85	8.68	1877.39
12/21/85	8.56	1877.51
01/10/86	8.61	1877.46
03/20/86	8.54	1877.53
04/20/86	8.45	1877.62
05/23/86	8.35	1877.72
06/22/86	8.48	1877.59
07/21/86	8.50	1877.57
08/20/86	8.62	1877.45
09/17/86	8.52	1877.55
10/19/86	8.42	1877.65
11/23/86	8.34	1877.73
12/11/86	8.34	1877.73
12/22/86	8.33	1877.74
03/20/87	8.11	1877.96
04/20/87	8.12	1877.95
05/21/87	8.24	1877.83
06/21/87	8.25	1877.82
07/20/87	8.29	1877.78
08/20/87	8.34	1877.73
09/21/87	8.43	1877.64
10/21/87	8.49	1877.58
11/13/87	8.58	1877.49
11/20/87	8.51	1877.56
12/19/87	8.50	1877.57
03/20/88	8.45	1877.62
04/21/88	8.49	1877.58
05/21/88	8.53	1877.54
06/21/88	8.59	1877.48
07/20/88	8.74	1877.33
08/20/88	8.87	1877.20
09/19/88	8.99	1877.08
10/20/88	9.08	1876.99
11/21/88	9.14	1876.93
11/23/88	9.22	1876.85

136-070-17DDD1
Streeter Aquifer

MP Elev (msl,ft)=1,886.07
SI (ft.)=161-164

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/20/88	9.18	1876.89
03/20/89	9.22	1876.85
04/20/89	9.21	1876.86
05/21/89	9.22	1876.85
06/21/89	9.27	1876.80
07/20/89	9.48	1876.59
08/21/89	9.50	1876.57
09/19/89	9.50	1876.57
10/20/89	9.64	1876.43
11/21/89	9.68	1876.39
11/22/89	9.63	1876.44
12/22/89	9.66	1876.41
02/27/90	9.79	1876.28
03/21/90	9.67	1876.40
04/21/90	9.76	1876.31
05/19/90	9.76	1876.31
06/19/90	9.68	1876.39
07/20/90	9.83	1876.24
08/20/90	9.96	1876.11
09/21/90	9.96	1876.11
10/20/90	9.99	1876.08
11/21/90	10.04	1876.03
12/16/90	10.00	1876.07
12/22/90	10.08	1875.99
03/21/91	10.12	1875.95
04/21/91	10.15	1875.92
05/21/91	9.98	1876.09
06/07/91	10.08	1875.99
06/20/91	10.10	1875.97
07/21/91	10.20	1875.87
08/19/91	10.31	1875.76
09/20/91	10.27	1875.80
10/21/91	10.36	1875.71
11/20/91	10.25	1875.82
12/22/91	10.28	1875.79
03/22/92	10.32	1875.75
04/20/92	10.35	1875.72
05/18/92	10.45	1875.62
05/20/92	10.40	1875.67
06/12/92	10.57	1875.50
06/19/92	10.46	1875.61
07/18/92	10.53	1875.54
08/23/92	10.69	1875.38
09/20/92	10.70	1875.37
10/19/92	10.78	1875.29
11/18/92	10.72	1875.35
11/23/92	10.66	1875.41
12/21/92	10.67	1875.40
03/20/93	10.66	1875.41
04/21/93	10.70	1875.37
05/22/93	10.63	1875.44
06/19/93	10.54	1875.53
07/21/93	10.23	1875.84
07/29/93	10.23	1875.84
08/22/93	10.30	1875.77
09/20/93	10.28	1875.79
10/22/93	10.33	1875.74
11/19/93	10.30	1875.77
12/20/93	10.08	1875.99
03/20/94	9.96	1876.11
04/20/94	9.86	1876.21
05/05/94	9.80	1876.27
05/21/94	9.78	1876.29
06/02/94	9.89	1876.18
06/19/94	9.88	1876.19
07/20/94	9.84	1876.23
08/21/94	9.99	1876.08
09/21/94	9.96	1876.11
10/19/94	9.80	1876.27
11/22/94	9.75	1876.32
12/01/94	9.75	1876.32
12/20/94	9.68	1876.39
03/20/95	9.56	1876.51
04/19/95	9.43	1876.64
05/21/95	9.32	1876.75
06/22/95	9.43	1876.64
06/29/95	9.50	1876.57
07/21/95	9.26	1876.81
08/20/95	9.45	1876.62
09/19/95	9.38	1876.69
10/26/95	9.40	1876.67
05/02/96	9.10	1876.97
08/08/96	9.36	1876.71
09/20/96	9.35	1876.72
10/24/96	9.26	1876.81
12/05/96	9.08	1876.99
05/22/97	8.88	1877.19
06/30/97	9.01	1877.06
08/12/97	9.17	1876.90
09/16/97	9.11	1876.96
10/14/97	9.08	1876.99
11/11/97	9.10	1876.97
12/10/97	9.00	1877.07
05/12/98	8.80	1877.27
07/15/98	8.97	1877.10
08/25/98	8.85	1877.22
10/13/98	8.95	1877.12
11/30/98	8.74	1877.33
06/01/99	8.40	1877.67
06/29/99	8.54	1877.53
07/27/99	8.56	1877.51
09/08/99	8.23	1877.84
10/05/99	8.29	1877.78
11/02/99	8.30	1877.77
12/07/99	8.30	1877.77
05/17/00	8.06	1878.01
06/14/00	8.08	1877.99
07/12/00	8.18	1877.89

136-070-17DDD1
Streeter Aquifer

MP Elev (msl,ft)=1,886.07
SI (ft.)=161-164

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/15/00	8.29	1877.78
09/19/00	8.37	1877.70
10/17/00	8.36	1877.71
11/30/00	8.18	1877.89
05/10/01	8.02	1878.05
06/26/01	7.95	1878.12
07/24/01	8.13	1877.94
08/21/01	8.18	1877.89
09/19/01	8.26	1877.81
10/23/01	8.20	1877.87
11/29/01	8.22	1877.85
12/18/01	8.23	1877.84
05/14/02	8.18	1877.89
06/25/02	8.32	1877.75
08/20/02	8.49	1877.58
10/01/02	8.58	1877.49
11/19/02	8.64	1877.43
12/17/02	8.69	1877.38
05/21/03	8.37	1877.70
06/17/03	8.44	1877.63

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/22/03	8.58	1877.49
08/20/03	8.71	1877.36
09/16/03	8.77	1877.30
10/21/03	8.84	1877.23
11/18/03	8.83	1877.24
12/09/03	8.84	1877.23
05/19/04	8.62	1877.45
06/22/04	8.41	1877.66
07/27/04	8.63	1877.44
08/25/04	8.68	1877.39
09/21/04	8.62	1877.45
10/18/04	8.57	1877.50
11/22/04	8.53	1877.54
12/13/04	8.53	1877.54
04/13/05	8.57	1877.50
05/18/05	8.50	1877.57
06/13/05	8.39	1877.68
07/26/05	8.63	1877.44
08/23/05	8.50	1877.57
08/24/05	50.98	1835.09
09/20/05	8.56	1877.51

136-070-17DDD2
Streeter Aquifer

MP Elev (msl,ft)=1,886.11
SI (ft.)=39-42

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/06/78	8.87	1877.24
01/08/79	9.11	1877.00
02/05/79	9.26	1876.85
04/03/79	8.99	1877.12
04/30/79	7.54	1878.57
06/06/79	8.29	1877.82
07/18/79	8.31	1877.80
08/07/79	8.57	1877.54
08/28/79	8.62	1877.49
10/09/79	9.15	1876.96
11/08/79	9.04	1877.07
05/27/80	8.84	1877.27
09/02/80	8.90	1877.21
11/26/80	9.00	1877.11
03/10/81	8.96	1877.15
05/27/81	8.87	1877.24
07/15/81	8.78	1877.33
07/25/81	8.27	1877.84
08/23/81	8.47	1877.64
09/23/81	8.49	1877.62
09/25/81	8.88	1877.23
10/24/81	8.50	1877.61
11/21/81	8.47	1877.64
12/02/81	8.97	1877.14
12/22/81	8.45	1877.66
03/18/82	9.77	1876.34
04/25/82	8.66	1877.45
05/23/82	8.56	1877.55
06/25/82	8.75	1877.36
07/08/82	9.23	1876.88
07/21/82	8.98	1877.13
08/22/82	9.71	1876.40
09/08/82	10.38	1875.73
09/22/82	9.94	1876.17
10/22/82	8.79	1877.32
12/03/82	8.77	1877.34
12/06/82	8.78	1877.33
12/13/82	9.64	1876.47
03/31/83	8.92	1877.19
04/30/83	8.43	1877.68
05/11/83	8.58	1877.53
05/29/83	8.81	1877.30
06/27/83	9.29	1876.82
07/14/83	9.58	1876.53
07/27/83	9.45	1876.66
08/11/83	10.09	1876.02
08/26/83	10.21	1875.90
09/13/83	10.35	1875.76
09/25/83	10.30	1875.81
10/25/83	10.14	1875.97
11/08/83	10.17	1875.94
11/27/83	10.22	1875.89
11/30/83	10.38	1875.73
12/06/83	10.29	1875.82

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/22/84	10.39	1875.72
04/24/84	8.91	1877.20
05/15/84	8.97	1877.14
05/30/84	9.23	1876.88
06/20/84	8.91	1877.20
07/24/84	9.83	1876.28
08/21/84	10.15	1875.96
09/22/84	10.48	1875.63
10/23/84	9.76	1876.35
10/25/84	9.78	1876.33
11/25/84	9.88	1876.23
12/03/84	10.09	1876.02
12/20/84	10.32	1875.79
03/22/85	10.27	1875.84
04/21/85	9.63	1876.48
05/23/85	9.55	1876.56
05/25/85	9.57	1876.54
06/21/85	9.78	1876.33
07/24/85	10.41	1875.70
09/23/85	10.45	1875.66
10/20/85	10.32	1875.79
11/14/85	10.46	1875.65
11/22/85	10.50	1875.61
12/21/85	10.61	1875.50
01/10/86	10.69	1875.42
03/20/86	9.78	1876.33
04/20/86	8.67	1877.44
05/23/86	8.51	1877.60
06/22/86	9.25	1876.86
07/21/86	9.27	1876.84
08/20/86	9.86	1876.25
09/17/86	9.26	1876.85
10/19/86	9.25	1876.86
11/23/86	9.28	1876.83
12/11/86	9.42	1876.69
12/22/86	9.53	1876.58
03/20/87	9.26	1876.85
04/20/87	8.35	1877.76
05/21/87	8.25	1877.86
06/21/87	8.91	1877.20
07/20/87	8.87	1877.24
08/20/87	9.51	1876.60
09/21/87	9.74	1876.37
10/21/87	9.85	1876.26
11/13/87	9.89	1876.22
11/20/87	9.86	1876.25
12/19/87	9.91	1876.20
03/20/88	9.96	1876.15
04/21/88	9.60	1876.51
05/21/88	9.81	1876.30
06/21/88	10.57	1875.54
07/20/88	11.17	1874.94
08/20/88	11.50	1874.61
09/19/88	11.68	1874.43
10/20/88	11.71	1874.40
11/21/88	11.69	1874.42

136-070-17DDD2
Streeter Aquifer

MP Elev (msl,ft)=1,886.11
SI (ft.)=39-42

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/23/88	11.72	1874.39
12/20/88	11.87	1874.24
03/20/89	11.90	1874.21
04/20/89	11.25	1874.86
05/21/89	11.01	1875.10
06/21/89	11.39	1874.72
07/20/89	11.74	1874.37
08/21/89	12.08	1874.03
09/19/89	12.17	1873.94
10/20/89	12.24	1873.87
11/21/89	10.69	1875.42
11/22/89	12.17	1873.94
12/22/89	12.41	1873.70
02/27/90	12.56	1873.55
03/21/90	12.29	1873.82
04/21/90	12.07	1874.04
05/19/90	11.65	1874.46
06/19/90	11.29	1874.82
07/20/90	11.78	1874.33
08/20/90	12.31	1873.80
09/21/90	12.45	1873.66
10/20/90	12.44	1873.67
11/21/90	12.46	1873.65
12/16/90	12.50	1873.61
12/22/90	12.64	1873.47
03/21/91	12.64	1873.47
04/21/91	12.30	1873.81
05/21/91	11.73	1874.38
06/07/91	11.88	1874.23
06/20/91	11.87	1874.24
07/21/91	12.28	1873.83
08/19/91	12.64	1873.47
09/20/91	12.68	1873.43
10/21/91	12.79	1873.32
11/20/91	12.54	1873.57
12/22/91	12.82	1873.29
03/22/92	12.56	1873.55
04/20/92	12.24	1873.87
05/18/92	12.27	1873.84
05/20/92	12.24	1873.87
06/12/92	12.55	1873.56
06/19/92	12.40	1873.71
07/18/92	12.57	1873.54
08/23/92	12.95	1873.16
09/20/92	13.03	1873.08
10/19/92	13.11	1873.00
11/18/92	13.06	1873.05
11/23/92	13.02	1873.09
12/21/92	13.13	1872.98
03/20/93	13.21	1872.90
04/21/93	12.43	1873.68
05/22/93	12.20	1873.91
06/19/93	11.82	1874.29
07/21/93	10.60	1875.51
08/22/93	10.60	1875.51

Date	Depth to Water (ft)	WL Elev (msl, ft)
09/20/93	10.64	1875.47
10/22/93	10.79	1875.32
11/19/93	10.83	1875.28
12/20/93	10.77	1875.34
03/20/94	10.22	1875.89
04/20/94	9.73	1876.38
05/21/94	9.68	1876.43
06/02/94	9.90	1876.21
06/19/94	9.99	1876.12
07/20/94	9.99	1876.12
08/21/94	10.57	1875.54
09/21/94	10.58	1875.53
10/19/94	10.09	1876.02
11/22/94	10.38	1875.73
12/01/94	10.36	1875.75
12/20/94	10.48	1875.63
03/20/95	9.71	1876.40
04/19/95	9.05	1877.06
05/21/95	8.90	1877.21
06/22/95	8.94	1877.17
06/29/95	9.18	1876.93
07/21/95	8.68	1877.43
08/20/95	9.63	1876.48
09/19/95	9.59	1876.52
10/26/95	9.45	1876.66
05/02/96	8.70	1877.41
08/08/96	10.10	1876.01
09/20/96	10.28	1875.83
10/24/96	10.33	1875.78
12/05/96	10.14	1875.97
05/22/97	7.68	1878.43
06/30/97	9.18	1876.93
08/12/97	10.07	1876.04
09/16/97	10.06	1876.05
10/14/97	9.84	1876.27
11/11/97	10.00	1876.11
12/10/97	9.99	1876.12
05/12/98	9.11	1877.00
07/15/98	9.64	1876.47
08/25/98	9.72	1876.39
10/13/98	10.01	1876.10
11/30/98	9.56	1876.55
06/01/99	8.30	1877.81
06/29/99	8.56	1877.55
07/27/99	8.99	1877.12
09/08/99	8.04	1878.07
10/05/99	8.40	1877.71
11/02/99	8.51	1877.60
12/07/99	8.61	1877.50
05/17/00	8.34	1877.77
06/14/00	8.52	1877.59
07/12/00	8.59	1877.52
07/18/00	8.72	1877.39

136-070-17DDD2
Streeter Aquifer

MP Elev (msl,ft)=1,886.11
SI (ft.)=39-42

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/15/00	9.40	1876.71
09/19/00	9.76	1876.35
10/17/00	9.44	1876.67
11/30/00	9.41	1876.70
05/10/01	8.46	1877.65
06/26/01	8.44	1877.67
07/24/01	8.72	1877.39
08/21/01	9.25	1876.86
09/19/01	9.47	1876.64
10/23/01	9.40	1876.71
11/29/01	9.48	1876.63
12/18/01	9.64	1876.47
05/14/02	9.15	1876.96
06/25/02	9.83	1876.28
08/20/02	10.57	1875.54
10/01/02	10.90	1875.21
11/19/02	10.73	1875.38
12/17/02	10.90	1875.21
05/21/03	9.50	1876.61
06/17/03	9.68	1876.43

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/22/03	9.94	1876.17
08/20/03	10.78	1875.33
09/16/03	10.99	1875.12
10/21/03	11.00	1875.11
11/18/03	10.92	1875.19
12/09/03	11.03	1875.08
05/19/04	9.86	1876.25
06/22/04	9.24	1876.87
07/27/04	9.74	1876.37
08/25/04	10.06	1876.05
09/21/04	9.99	1876.12
10/18/04	9.85	1876.26
11/22/04	9.70	1876.41
12/13/04	9.88	1876.23
04/13/05	9.75	1876.36
05/18/05	9.47	1876.64
06/13/05	8.99	1877.12
07/26/05	9.72	1876.39
08/23/05	9.76	1876.35
08/24/05	9.78	1876.33
09/20/05	10.00	1876.11

136-070-18BBA1
Streeter Aquifer

MP Elev (msl,ft)=1,875.60
SI (ft.)=150-153

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/06/80	4.84	1870.76
07/15/81	4.81	1870.79
07/25/81	4.66	1870.94
08/23/81	3.96	1871.64
09/23/81	4.83	1870.77
10/24/81	4.79	1870.81
11/21/81	4.73	1870.87
12/22/81	4.66	1870.94
03/18/82	4.52	1871.08
04/25/82	4.43	1871.17
05/23/82	4.38	1871.22
06/25/82	4.32	1871.28
07/08/82	4.46	1871.14
07/21/82	4.36	1871.24
08/22/82	4.74	1870.86
09/08/82	4.66	1870.94
09/22/82	4.66	1870.94
10/22/82	4.24	1871.36
12/03/82	4.12	1871.48
12/06/82	4.10	1871.50
12/13/82	4.09	1871.51
04/30/83	4.84	1870.76
05/11/83	4.02	1871.58
05/29/83	3.98	1871.62
06/27/83	4.10	1871.50
07/14/83	4.23	1871.37
07/27/83	4.23	1871.37
08/11/83	4.45	1871.15
08/26/83	4.50	1871.10
09/12/83	4.69	1870.91
09/25/83	4.67	1870.93
10/25/83	4.64	1870.96
11/08/83	4.70	1870.90
11/27/83	4.68	1870.92
11/30/83	4.70	1870.90
12/06/83	4.70	1870.90
03/22/84	4.58	1871.02
04/24/84	4.37	1871.23

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/15/84	4.34	1871.26
05/30/84	4.40	1871.20
06/20/84	4.27	1871.33
07/24/84	4.56	1871.04
08/21/84	4.61	1870.99
09/22/84	4.78	1870.82
10/23/84	4.59	1871.01
10/25/84	4.60	1871.00
11/25/84	4.54	1871.06
12/20/84	4.54	1871.06
03/22/85	4.62	1870.98
04/21/85	4.67	1870.93
05/25/85	4.69	1870.91
06/21/85	4.62	1870.98
07/24/85	4.85	1870.75
08/22/85	4.85	1870.75
09/23/85	4.86	1870.74
10/20/85	4.83	1870.77
11/14/85	4.85	1870.75
11/22/85	4.74	1870.86
12/21/85	4.61	1870.99
01/10/86	4.68	1870.92
03/20/86	4.55	1871.05
04/20/86	4.34	1871.26
05/23/86	4.32	1871.28
06/22/86	4.41	1871.19
07/21/86	4.33	1871.27
08/20/86	4.51	1871.09
09/17/86	4.32	1871.28
10/19/86	4.22	1871.38
11/23/86	4.02	1871.58
12/11/86	4.00	1871.60
12/22/86	3.95	1871.65
03/20/87	3.63	1871.97
04/20/87	3.70	1871.90
05/21/87	3.68	1871.92
06/21/87	3.80	1871.80
07/20/87	3.75	1871.85
08/20/87	3.93	1871.67

136-070-18BBA2
Streeter Aquifer

MP Elev (msl,ft)=1,875.00
SI (ft.)=33-36

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/06/80	4.20	1870.80
07/15/81	4.69	1870.31
07/25/81	4.02	1870.98
08/23/81	4.55	1870.45
09/23/81	4.90	1870.10
10/24/81	4.89	1870.11
11/21/81	4.78	1870.22
12/22/81	5.00	1870.00
03/18/82	5.07	1869.93
04/25/82	3.47	1871.53
05/23/82	3.08	1871.92
06/25/82	3.24	1871.76
07/08/82	3.74	1871.26
07/21/82	3.51	1871.49
08/22/82	4.74	1870.26
09/08/82	5.02	1869.98
09/22/82	5.12	1869.88
10/22/82	3.44	1871.56
12/03/82	3.50	1871.50
12/06/82	3.46	1871.54
12/13/82	3.90	1871.10
03/31/83	3.54	1871.46
04/20/83	5.44	1869.56
04/30/83	3.08	1871.92
05/11/83	3.01	1871.99
05/29/83	3.28	1871.72
06/27/83	3.93	1871.07
07/14/83	4.34	1870.66
07/27/83	4.59	1870.41
08/11/83	4.99	1870.01
08/26/83	5.22	1869.78
09/12/83	5.49	1869.51
09/25/83	5.43	1869.57
10/25/83	5.31	1869.69
11/08/83	5.29	1869.71
11/27/83	5.30	1869.70
12/06/83	5.35	1869.65
03/22/84	5.25	1869.75
04/24/84	3.63	1871.37

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/15/84	3.74	1871.26
05/30/84	3.71	1871.29
06/20/84	3.39	1871.61
07/24/84	4.52	1870.48
08/21/84	5.03	1869.97
09/22/84	5.48	1869.52
10/23/84	4.73	1870.27
10/25/84	4.70	1870.30
11/25/84	4.73	1870.27
12/20/84	5.08	1869.92
03/22/85	5.07	1869.93
04/21/85	4.39	1870.61
05/25/85	4.41	1870.59
06/21/85	4.61	1870.39
07/24/85	5.38	1869.62
08/22/85	5.37	1869.63
09/23/85	5.25	1869.75
10/20/85	5.04	1869.96
11/14/85	5.13	1869.87
11/22/85	5.16	1869.84
12/21/85	5.33	1869.67
01/10/86	5.44	1869.56
03/20/86	4.23	1870.77
04/20/86	3.05	1871.95
05/23/86	3.01	1871.99
06/22/86	3.64	1871.36
07/21/86	3.77	1871.23
08/20/86	4.61	1870.39
09/17/86	4.05	1870.95
10/19/86	3.71	1871.29
11/23/86	3.75	1871.25
12/11/86	3.89	1871.11
12/22/86	4.08	1870.92
03/20/87	3.70	1871.30
04/20/87	2.51	1872.49
05/21/87	2.84	1872.16
06/21/87	3.45	1871.55
07/20/87	3.51	1871.49
08/20/87	4.20	1870.80

136-070-18BBB
Streeter Aquifer

MP Elev (msl,ft)=1,872.90
SI (ft.)=23-28

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/21/91	3.95	1867.00
09/19/91	3.93	1867.02
10/18/91	4.00	1866.95
11/27/91	3.55	1867.40
04/16/92	2.91	1868.04
05/18/92	2.97	1867.98
06/12/92	3.45	1867.50
07/10/92	3.46	1867.49
08/20/92	4.14	1866.81
12/03/92	4.00	1866.95
04/07/93	2.95	1868.00
05/05/93	2.48	1868.47
06/02/93	2.10	1868.85
10/06/93	0.96	1869.99
10/27/93	1.07	1869.88
12/08/93	1.10	1869.85
11/22/94	0.73	1872.17
12/01/94	0.80	1872.10
09/26/95	2.10	1870.80
08/08/96	2.99	1869.91
09/20/96	3.99	1868.91
10/24/96	3.62	1869.28
12/05/96	3.24	1869.66
05/22/97	1.12	1871.78
06/30/97	2.51	1870.39
08/12/97	3.76	1869.14
09/16/97	3.86	1869.04
10/14/97	3.65	1869.25
11/11/97	3.54	1869.36
12/10/97	3.46	1869.44
05/12/98	1.86	1871.04
07/15/98	2.76	1870.14
08/25/98	2.58	1870.32
10/13/98	3.21	1869.69
11/30/98	2.34	1870.56
06/01/99	0.70	1872.20
06/29/99	1.08	1871.82
07/27/99	1.62	1871.28
09/08/99	1.02	1871.88
10/05/99	1.40	1871.50
11/02/99	1.51	1871.39
12/07/99	1.63	1871.27

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/17/00	0.98	1871.92
06/14/00	1.45	1871.45
07/12/00	1.77	1871.13
07/17/00	1.82	1871.08
08/15/00	2.69	1870.21
09/19/00	3.48	1869.42
10/17/00	3.15	1869.75
11/30/00	2.72	1870.18
05/10/01	1.29	1871.61
06/26/01	1.08	1871.82
07/24/01	1.91	1870.99
08/21/01	2.51	1870.39
09/19/01	3.20	1869.70
10/23/01	3.03	1869.87
11/29/01	3.02	1869.88
12/18/01	3.01	1869.89
05/14/02	2.10	1870.80
06/25/02	2.89	1870.01
08/20/02	4.26	1868.64
10/01/02	4.63	1868.27
11/19/02	4.32	1868.58
12/17/02	4.43	1868.47
05/21/03	2.17	1870.73
06/17/03	2.32	1870.58
07/22/03	2.76	1870.14
08/20/03	4.08	1868.82
09/16/03	4.68	1868.22
10/21/03	4.64	1868.26
11/18/03	4.52	1868.38
12/09/03	4.50	1868.40
05/19/04	2.59	1870.31
06/22/04	1.64	1871.26
07/27/04	2.38	1870.52
08/25/04	2.95	1869.95
09/21/04	2.99	1869.91
10/18/04	2.75	1870.15
11/22/04	2.47	1870.43
05/18/05	2.04	1870.86
06/13/05	1.59	1871.31
07/26/05	2.34	1870.56
08/23/05	2.35	1870.55
08/24/05	2.36	1870.54
09/20/05	2.71	1870.19

136-070-18CDC
Streeter Aquifer

MP Elev (msl,ft)=1,879.00
SI (ft.)=21-26

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/05/99	4.95	1874.05
11/02/99	5.08	1873.92
12/07/99	5.23	1873.77
05/17/00	4.31	1874.69
06/14/00	4.97	1874.03
07/12/00	5.07	1873.93
08/15/00	6.28	1872.72
09/19/00	6.99	1872.01
10/17/00	6.83	1872.17
11/30/00	6.47	1872.53
05/10/01	4.92	1874.08
06/26/01	4.80	1874.20
07/24/01	5.68	1873.32
08/21/01	6.43	1872.57
09/19/01	6.95	1872.05
10/23/01	6.87	1872.13
11/29/01	6.80	1872.20
12/18/01	6.87	1872.13
05/14/02	6.11	1872.89
06/25/02	6.97	1872.03
08/20/02	7.78	1871.22
10/01/02	8.16	1870.84
11/19/02	8.01	1870.99
12/17/02	8.10	1870.90

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/21/03	6.11	1872.89
06/17/03	6.28	1872.72
07/22/03	6.70	1872.30
08/20/03	7.69	1871.31
09/16/03	8.15	1870.85
10/21/03	8.20	1870.80
11/18/03	8.19	1870.81
12/09/03	8.20	1870.80
05/19/04	6.65	1872.35
06/22/04	5.47	1873.53
07/27/04	6.40	1872.60
08/25/04	7.02	1871.98
09/07/04	6.82	1872.18
09/21/04	6.95	1872.05
10/18/04	6.62	1872.38
11/22/04	6.24	1872.76
12/13/04	6.41	1872.59
04/13/05	6.18	1872.82
05/18/05	5.51	1873.49
06/13/05	4.74	1874.26
07/26/05	5.94	1873.06
08/24/05	5.90	1873.10
09/20/05	6.38	1872.62

136-070-19DAA
Streeter Aquifer

MP Elev (msl,ft)=1,880.52
SI (ft.)=25-30

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/05/99	5.70	1874.82
11/02/99	5.81	1874.71
12/07/99	5.96	1874.56
05/17/00	5.45	1875.07
06/14/00	5.78	1874.74
07/12/00	5.77	1874.75
08/15/00	6.98	1873.54
09/19/00	7.67	1872.85
10/17/00	6.98	1873.54
11/30/00	6.57	1873.95
05/10/01	5.45	1875.07
06/26/01	5.38	1875.14
07/24/01	5.73	1874.79
08/21/01	6.82	1873.70
09/19/01	7.28	1873.24
10/23/01	7.07	1873.45
11/29/01	7.00	1873.52
12/18/01	7.14	1873.38
05/14/02	6.10	1874.42
06/25/02	7.18	1873.34
08/20/02	8.33	1872.19
10/01/02	8.71	1871.81
11/19/02	8.22	1872.30
12/17/02	8.55	1871.97

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/21/03	6.02	1874.50
06/17/03	6.10	1874.42
07/22/03	6.84	1873.68
08/20/03	8.30	1872.22
09/16/03	8.84	1871.68
10/21/03	8.75	1871.77
11/18/03	8.55	1871.97
12/09/03	8.59	1871.93
05/19/04	6.52	1874.00
06/22/04	6.05	1874.47
07/27/04	7.22	1873.30
08/25/04	7.70	1872.82
09/07/04	7.10	1873.42
09/21/04	7.41	1873.11
10/18/04	6.96	1873.56
11/22/04	6.54	1873.98
12/13/04	6.73	1873.79
04/13/05	6.23	1874.29
05/18/05	5.88	1874.64
06/13/05	4.98	1875.54
07/26/05	6.55	1873.97
08/24/05	6.25	1874.27
09/20/05	6.57	1873.95

136-070-20DDA1
Streeter Aquifer

MP Elev (msl,ft)=1,883.69
SI (ft.)=33-36

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/06/80	5.63	1878.06
07/15/81	6.02	1877.67
07/25/81	5.60	1878.09
08/23/81	6.25	1877.44
09/23/81	6.51	1877.18
10/24/81	6.40	1877.29
11/21/81	6.37	1877.32
12/22/81	6.52	1877.17
03/18/82	6.97	1876.72
04/25/82	5.28	1878.41
05/23/82	5.17	1878.52
06/25/82	5.47	1878.22
07/08/82	5.86	1877.83
07/21/82	5.85	1877.84
08/22/82	6.79	1876.90
09/08/82	6.99	1876.70
09/22/82	7.04	1876.65
10/22/82	5.80	1877.89
12/02/82	5.60	1878.09
12/06/82	5.56	1878.13
12/13/82	5.85	1877.84
03/31/83	5.72	1877.97
04/30/83	5.10	1878.59
05/11/83	5.24	1878.45
05/29/83	5.48	1878.21
06/27/83	6.05	1877.64
07/14/83	6.35	1877.34
07/27/83	6.53	1877.16
08/11/83	6.93	1876.76
08/26/83	7.19	1876.50
09/13/83	7.48	1876.21
09/25/83	7.43	1876.26
09/27/83	7.45	1876.24
10/11/83	7.32	1876.37
10/25/83	7.21	1876.48
10/26/83	7.24	1876.45
11/07/83	7.18	1876.51
11/27/83	7.16	1876.53
11/30/83	7.32	1876.37
12/06/83	7.25	1876.44
03/22/84	7.19	1876.50
04/24/84	5.81	1877.88
05/15/84	5.67	1878.02
05/30/84	6.02	1877.67
06/20/84	5.85	1877.84
07/24/84	6.69	1877.00
08/21/84	7.07	1876.62
09/22/84	7.52	1876.17
10/23/84	6.90	1876.79
10/25/84	6.88	1876.81
11/25/84	6.77	1876.92
12/03/84	6.89	1876.80
12/20/84	7.09	1876.60
03/22/85	7.17	1876.52
04/21/85	6.55	1877.14

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/25/85	6.29	1877.40
06/21/85	6.61	1877.08
07/24/85	7.35	1876.34
08/22/85	7.49	1876.20
09/23/85	7.33	1876.36
10/20/85	7.15	1876.54
11/14/85	7.13	1876.56
11/22/85	7.19	1876.50
12/21/85	7.31	1876.38
01/10/86	7.41	1876.28
03/20/86	6.35	1877.34
04/20/86	5.21	1878.48
05/07/86	5.47	1878.22
05/23/86	5.52	1878.17
06/22/86	6.03	1877.66
07/21/86	6.01	1877.68
08/20/86	6.64	1877.05
09/17/86	6.24	1877.45
10/07/86	5.89	1877.80
10/19/86	5.97	1877.72
11/23/86	5.92	1877.77
12/11/86	5.99	1877.70
12/22/86	6.15	1877.54
03/20/87	5.74	1877.95
04/20/87	5.05	1878.64
05/21/87	5.17	1878.52
06/21/87	5.85	1877.84
07/20/87	5.73	1877.96
08/20/87	6.23	1877.46
09/21/87	6.63	1877.06
10/21/87	6.74	1876.95
11/13/87	6.78	1876.91
11/20/87	6.66	1877.03
12/19/87	6.61	1877.08
03/20/88	6.85	1876.84
04/21/88	6.35	1877.34
05/21/88	6.41	1877.28
06/21/88	7.16	1876.53
07/20/88	8.09	1875.60
08/20/88	8.84	1874.85
09/19/88	9.30	1874.39
10/20/88	9.08	1874.61
11/21/88	8.90	1874.79
11/22/88	8.92	1874.77
12/20/88	8.88	1874.81
03/20/89	8.77	1874.92
04/20/89	8.19	1875.50
05/21/89	7.93	1875.76
06/21/89	8.27	1875.42
07/19/89	9.13	1874.56
07/20/89	9.15	1874.54
08/21/89	9.57	1874.12
09/19/89	9.96	1873.73
10/20/89	9.71	1873.98
11/21/89	9.45	1874.24
11/22/89	9.50	1874.19

136-070-20DDA1
Streeter Aquifer

MP Elev (msl,ft)=1,883.69
SI (ft.)=33-36

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/22/89	9.48	1874.21
02/27/90	9.60	1874.09
03/21/90	9.40	1874.29
04/21/90	9.15	1874.54
05/19/90	8.75	1874.94
06/19/90	8.49	1875.20
07/20/90	8.70	1874.99
08/20/90	9.64	1874.05
09/21/90	9.88	1873.81
10/20/90	9.70	1873.99
11/21/90	9.51	1874.18
12/10/90	9.47	1874.22
12/22/90	9.52	1874.17
03/21/91	9.51	1874.18
04/21/91	9.23	1874.46
05/21/91	8.53	1875.16
06/07/91	8.58	1875.11
06/20/91	8.64	1875.05
07/21/91	9.31	1874.38
08/19/91	10.09	1873.60
09/20/91	10.20	1873.49
10/21/91	9.99	1873.70
11/20/91	9.77	1873.92
12/22/91	9.68	1874.01
03/22/92	9.46	1874.23
04/20/92	9.21	1874.48
05/18/92	9.24	1874.45
05/20/92	9.19	1874.50
06/12/92	9.53	1874.16
06/19/92	9.46	1874.23
07/18/92	9.49	1874.20
08/23/92	10.37	1873.32
09/20/92	10.49	1873.20
10/19/92	10.33	1873.36
11/18/92	10.13	1873.56
11/23/92	10.10	1873.59
12/21/92	10.03	1873.66
03/20/93	10.11	1873.58
04/07/93	9.29	1874.40
04/21/93	9.14	1874.55
05/05/93	9.05	1874.64
05/22/93	8.79	1874.90
06/02/93	8.70	1874.99
06/19/93	8.34	1875.35
07/06/93	7.92	1875.77
07/21/93	6.57	1877.12
08/06/93	6.48	1877.21
08/22/93	6.79	1876.90
08/23/93	6.84	1876.85
09/02/93	6.76	1876.93
09/20/93	7.17	1876.52
10/06/93	7.31	1876.38
10/22/93	7.39	1876.30
10/27/93	7.37	1876.32
11/19/93	7.42	1876.27
12/08/93	7.42	1876.27

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/20/93	7.39	1876.30
03/20/94	6.98	1876.71
04/20/94	6.24	1877.45
05/05/94	6.00	1877.69
05/21/94	6.37	1877.32
06/02/94	6.58	1877.11
06/19/94	6.86	1876.83
07/20/94	7.12	1876.57
08/21/94	8.07	1875.62
09/21/94	8.02	1875.67
10/19/94	7.51	1876.18
11/22/94	7.26	1876.43
12/01/94	7.23	1876.46
12/20/94	7.30	1876.39
03/20/95	6.28	1877.41
04/19/95	5.77	1877.92
05/21/95	5.42	1878.27
06/22/95	5.65	1878.04
07/21/95	5.22	1878.47
08/20/95	6.74	1876.95
09/19/95	7.03	1876.66
10/26/95	6.54	1877.15
05/02/96	5.49	1878.20
08/08/96	7.63	1876.06
09/20/96	8.49	1875.20
10/24/96	7.68	1876.01
12/05/96	7.29	1876.40
05/22/97	5.48	1878.21
06/30/97	7.06	1876.63
07/30/97	7.12	1876.57
08/12/97	7.69	1876.00
09/16/97	8.04	1875.65
10/14/97	7.90	1875.79
11/11/97	7.46	1876.23
12/10/97	7.27	1876.42
05/12/98	5.95	1877.74
07/15/98	6.83	1876.86
08/25/98	7.20	1876.49
10/13/98	7.66	1876.03
11/30/98	6.78	1876.91
06/01/99	5.45	1878.24
06/29/99	5.66	1878.03
07/27/99	6.15	1877.54
09/08/99	5.33	1878.36
10/05/99	5.57	1878.12
11/02/99	5.53	1878.16
12/07/99	5.51	1878.18
05/17/00	5.26	1878.43
06/14/00	5.59	1878.10
07/12/00	5.96	1877.73
08/15/00	6.89	1876.80
09/19/00	7.33	1876.36
10/17/00	6.82	1876.87

136-070-20DDA1
Streeter Aquifer

MP Elev (msl,ft)=1,883.69
SI (ft.)=33-36

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/30/00	6.33	1877.36
05/10/01	5.24	1878.45
06/26/01	5.02	1878.67
07/24/01	5.43	1878.26
08/21/01	6.37	1877.32
09/19/01	7.07	1876.62
10/23/01	6.67	1877.02
11/29/01	6.46	1877.23
12/18/01	6.51	1877.18
05/14/02	5.87	1877.82
06/25/02	6.69	1877.00
06/27/02	6.75	1876.94
08/20/02	7.95	1875.74
10/01/02	8.49	1875.20
11/19/02	7.96	1875.73
12/17/02	7.96	1875.73
05/21/03	6.18	1877.51
06/17/03	6.13	1877.56
07/22/03	6.44	1877.25

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/20/03	8.01	1875.68
09/16/03	8.77	1874.92
10/21/03	8.52	1875.17
11/18/03	8.31	1875.38
12/09/03	8.25	1875.44
05/19/04	6.67	1877.02
06/22/04	6.71	1876.98
07/27/04	6.49	1877.20
08/25/04	7.32	1876.37
09/21/04	7.49	1876.20
10/18/04	7.05	1876.64
11/22/04	6.66	1877.03
12/13/04	6.80	1876.89
04/13/05	6.93	1876.76
05/18/05	6.24	1877.45
06/13/05	5.79	1877.90
07/26/05	6.80	1876.89
08/24/05	7.13	1876.56
09/20/05	7.23	1876.46

136-070-20DDA2
Streeter Aquifer

MP Elev (msl,ft)=1,883.94
SI (ft.)=3.5-8

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/08/83	7.44	1876.50
11/10/83	7.45	1876.49
04/10/84	6.33	1877.61
04/25/84	6.07	1877.87
05/15/84	5.92	1878.02
05/16/84	5.95	1877.99
06/22/84	6.09	1877.85
07/05/84	6.38	1877.56
07/19/84	6.81	1877.13
08/06/84	6.93	1877.01
08/17/84	7.29	1876.65
08/30/84	7.50	1876.44
09/12/84	7.66	1876.28
10/25/84	7.11	1876.83
05/23/85	6.49	1877.45
11/14/85	7.37	1876.57
05/07/86	5.71	1878.23
10/07/86	6.12	1877.82
07/19/89	9.38	1874.56
08/15/89	9.82	1874.12
02/27/90	9.85	1874.09
06/07/91	8.82	1875.12
08/23/91	10.42	1873.52
09/19/91	10.49	1873.45
10/18/91	10.30	1873.64
11/27/91	9.94	1874.00
04/16/92	9.53	1874.41
05/18/92	9.50	1874.44
06/12/92	9.78	1874.16
07/10/92	9.69	1874.25
08/28/92	10.62	1873.32
12/03/92	10.35	1873.59
03/17/93	10.43	1873.51
04/07/93	9.59	1874.35
05/05/93	9.30	1874.64
06/02/93	8.95	1874.99
07/06/93	8.18	1875.76
08/06/93	6.73	1877.21
08/23/93	7.09	1876.85
09/02/93	7.00	1876.94
10/06/93	7.55	1876.39
10/27/93	7.62	1876.32
12/08/93	7.67	1876.27
05/05/94	6.25	1877.69
06/02/94	6.88	1877.06
06/19/94	7.08	1876.86
07/20/94	7.34	1876.60
08/21/94	8.29	1875.65
09/21/94	8.24	1875.70
10/19/94	7.73	1876.21
11/22/94	7.50	1876.44

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/01/94	7.47	1876.47
12/20/94	7.53	1876.41
03/20/95	6.51	1877.43
04/19/95	5.98	1877.96
05/21/95	5.65	1878.29
06/22/95	5.86	1878.08
07/21/95	5.44	1878.50
08/20/95	6.95	1876.99
09/19/95	7.24	1876.70
10/26/95	6.77	1877.17
05/02/96	5.75	1878.19
08/08/96	7.86	1876.08
09/20/96	8.76	1875.18
10/24/96	7.93	1876.01
12/05/96	7.55	1876.39
05/22/97	5.73	1878.21
06/30/97	7.50	1876.44
08/12/97	7.93	1876.01
09/16/97	8.29	1875.65
10/14/97	8.15	1875.79
11/11/97	7.72	1876.22
12/10/97	7.52	1876.42
05/12/98	6.21	1877.73
07/15/98	7.08	1876.86
08/25/98	7.45	1876.49
10/13/98	7.91	1876.03
11/30/98	7.04	1876.90
06/01/99	5.71	1878.23
06/29/99	5.92	1878.02
07/27/99	6.41	1877.53
09/08/99	5.60	1878.34
10/05/99	5.84	1878.10
11/02/99	5.79	1878.15
12/07/99	5.70	1878.24
05/17/00	5.54	1878.40
06/14/00	5.88	1878.06
07/12/00	6.22	1877.72
08/15/00	7.18	1876.76
09/19/00	7.64	1876.30
10/17/00	7.16	1876.78
11/30/00	6.64	1877.30
05/10/01	5.53	1878.41
06/26/01	5.34	1878.60
07/24/01	5.73	1878.21
08/21/01	6.66	1877.28
09/19/01	7.36	1876.58
10/23/01	6.98	1876.96
11/29/01	6.77	1877.17
12/18/01	6.83	1877.11
05/14/02	6.18	1877.76
06/25/02	6.99	1876.95
08/20/02	8.23	1875.71

136-070-20DDA2
Streeter Aquifer

MP Elev (msl,ft)=1,883.94
SI (ft.)=3.5-8

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/01/02	8.78	1875.16
11/19/02	8.28	1875.66
12/17/02	8.33	1875.61
05/21/03	6.46	1877.48
06/17/03	6.41	1877.53
07/22/03	6.70	1877.24
08/20/03	8.28	1875.66
09/16/03	9.01	1874.93
10/21/03	8.81	1875.13
11/18/03	8.60	1875.34
12/09/03	8.53	1875.41
05/19/04	6.97	1876.97
06/22/04	6.01	1877.93
07/27/04	6.77	1877.17
08/25/04	7.60	1876.34
09/21/04	7.77	1876.17
10/18/04	7.34	1876.60
11/22/04	6.96	1876.98
12/13/04	7.10	1876.84
04/13/05	7.26	1876.68
05/18/05	6.54	1877.40
06/13/05	6.10	1877.84
07/26/05	7.08	1876.86
08/24/05	7.41	1876.53
09/20/05	7.52	1876.42

136-070-21DAC
Streeter Aquifer

MP Elev (msl,ft)=1,900.60
SI (ft.)=35-44

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/08/82	17.73	1882.87
09/08/82	19.39	1881.21
12/13/82	16.94	1883.66
05/11/83	17.48	1883.12
07/14/83	18.14	1882.46
09/14/83	20.10	1880.50
11/08/83	18.48	1882.12
05/15/84	17.92	1882.68
10/25/84	18.50	1882.10
11/14/85	18.99	1881.61

136-070-21DAD1
Streeter Aquifer

MP Elev (msl,ft)=1,899.30
SI (ft.)=32-42

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/08/82	16.06	1883.24
09/08/82	18.03	1881.27
12/13/82	15.26	1884.04
05/11/83	15.54	1883.76
07/14/83	16.62	1882.68
09/14/83	17.73	1881.57
11/08/83	16.77	1882.53
05/15/84	16.09	1883.21
10/25/84	16.80	1882.50
11/14/85	17.30	1882.00
07/19/89	20.51	1878.79

136-070-21DAD2
Streeter Aquifer

MP Elev (msl,ft)=1,899.50
SI (ft.)=35-45

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/08/82	14.72	1884.78
09/08/82	17.74	1881.76
12/13/82	15.01	1884.49
05/11/83	15.44	1884.06
07/14/83	16.26	1883.24
09/14/83	17.50	1882.00
11/08/83	16.50	1883.00

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/15/84	15.71	1883.79
10/25/84	16.54	1882.96
11/14/85	17.06	1882.44
07/19/89	20.19	1879.31

136-070-22CCC
Streeter Aquifer

MP Elev (msl,ft)=1,898.19
SI (ft.)=32-37

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/21/91	20.46	1879.33
09/19/91	20.63	1879.16
10/18/91	20.54	1879.25
11/27/91	20.42	1879.37
04/16/92	20.33	1879.46
05/18/92	20.62	1879.17
06/12/92	20.66	1879.13
07/10/92	20.62	1879.17
08/20/92	21.18	1878.61
12/03/92	21.25	1878.54
04/07/93	20.78	1879.01
05/05/93	20.72	1879.07
06/02/93	20.72	1879.07
07/06/93	20.60	1879.19
08/06/93	19.72	1880.07
09/02/93	19.12	1880.67
10/06/93	18.96	1880.83
10/27/93	18.80	1880.99
05/05/94	18.00	1881.79
06/02/94	17.77	1882.02
06/19/94	17.62	1880.57
07/20/94	17.70	1880.49
08/21/94	18.33	1879.86
09/21/94	18.43	1879.76
10/19/94	18.23	1879.96
11/22/94	17.92	1880.27
12/01/94	17.82	1880.37
12/20/94	17.73	1880.46
03/20/95	17.11	1881.08
04/19/95	16.79	1881.40
05/21/95	16.36	1883.43
06/22/95	15.83	1883.96
06/29/95	15.84	1883.95
07/21/95	15.89	1883.90
08/20/95	16.46	1883.33
09/19/95	16.54	1883.25
10/26/95	16.46	1883.33
05/02/96	15.27	1884.52
08/08/96	16.66	1883.13
09/20/96	17.48	1882.31
10/24/96	17.16	1882.63
12/05/96	16.85	1882.94
05/22/97	14.07	1885.72
06/30/97	15.01	1884.78
08/12/97	15.90	1883.89
09/16/97	16.26	1883.53
10/14/97	16.55	1881.64
11/11/97	16.33	1881.86
12/10/97	16.24	1881.95
05/12/98	15.56	1882.63
07/15/98	16.25	1881.94
08/25/98	16.84	1881.35
10/13/98	16.78	1881.41
11/30/98	16.56	1881.63
06/01/99	14.88	1883.31
06/29/99	14.89	1883.30
07/27/99	15.09	1883.10
09/08/99	15.19	1883.00
10/05/99	14.91	1883.28
11/02/99	14.73	1883.46
12/07/99	14.62	1883.57
05/17/00	14.56	1883.63
06/14/00	14.65	1883.54
07/12/00	15.22	1882.97
07/17/00	15.18	1883.01
08/15/00	15.47	1882.72
09/19/00	15.94	1882.25
10/17/00	15.83	1882.36
11/30/00	15.73	1882.46
05/10/01	15.03	1883.16
06/26/01	14.79	1883.40
07/24/01	14.97	1883.22
08/21/01	15.22	1882.97
09/19/01	15.81	1882.38
10/23/01	15.53	1882.66
11/29/01	15.51	1882.68
12/18/01	15.57	1882.62
05/14/02	15.61	1882.58
06/25/02	16.14	1882.05
08/20/02	17.14	1881.05
10/01/02	17.65	1880.54
11/19/02	17.40	1880.79
12/17/02	17.33	1880.86
05/21/03	17.16	1881.03
06/17/03	16.99	1881.20
07/22/03	17.27	1880.92
08/20/03	17.68	1880.51
09/16/03	18.29	1879.90
10/21/03	18.03	1880.16
11/18/03	17.88	1880.31
12/09/03	17.87	1880.32
05/19/04	17.28	1880.91
06/22/04	16.78	1881.41
07/27/04	16.78	1881.41
08/25/04	17.55	1880.64
09/21/04	17.97	1880.22
10/18/04	17.62	1880.57
11/22/04	17.36	1880.83
12/13/04	17.34	1880.85
04/13/05	17.36	1880.83
05/18/05	17.26	1880.93
06/13/05	17.30	1880.89
07/26/05	17.23	1880.96
08/23/05	17.75	1880.44
08/24/05	17.71	1880.48
09/20/05	17.76	1880.43

136-070-22CDB
Streeter Aquifer

MP Elev (msl,ft)=1,895.80
SI (ft.)=35-50

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/08/82	10.64	1885.16
12/13/82	10.62	1885.18
05/11/83	10.65	1885.15
09/14/83	13.00	1882.80
11/08/83	12.20	1883.60
05/15/84	11.03	1884.77

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/25/84	12.05	1883.75
11/14/85	12.66	1883.14
07/19/89	16.12	1879.68
06/25/90	16.94	1878.86

136-070-22DBD
Streeter Aquifer

MP Elev (msl,ft)=1,905.30
SI (ft.)=40-55

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/13/82	19.99	1885.31
05/11/83	19.01	1886.29
07/14/83	19.71	1885.59
11/08/83	20.28	1885.02

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/15/84	19.56	1885.74
10/25/84	20.33	1884.97
11/14/85	21.02	1884.28

136-070-23AAA1
Streeter Aquifer

MP Elev (msl,ft)=1,907.01
SI (ft.)=113-116

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/26/78	12.70	1894.31
11/15/78	11.45	1895.56
12/06/78	11.74	1895.27
01/08/79	11.72	1895.29
02/05/79	11.43	1895.58
04/03/79	12.21	1894.80
04/30/79	11.20	1895.81
06/06/79	10.10	1896.91
07/18/79	9.75	1897.26
08/07/79	9.76	1897.25
08/28/79	9.75	1897.26
10/10/79	10.16	1896.85
11/08/79	10.35	1896.66
05/27/80	11.49	1895.52
09/02/80	12.33	1894.68
11/26/80	12.84	1894.17
03/10/81	13.06	1893.95
07/15/81	13.66	1893.35
07/25/81	13.54	1893.47
08/23/81	13.49	1893.52
08/25/81	13.51	1893.50
09/23/81	12.48	1894.53
10/24/81	12.97	1894.04
11/21/81	13.82	1893.19
12/02/81	13.20	1893.81
12/22/81	13.95	1893.06
03/18/82	14.32	1892.69
04/25/82	13.38	1893.63
05/23/82	12.55	1894.46
06/25/82	12.60	1894.41
07/08/82	12.58	1894.43
07/21/82	12.48	1894.53
08/22/82	12.68	1894.33
09/08/82	12.80	1894.21
09/22/82	12.88	1894.13
10/22/82	12.82	1894.19
12/06/82	12.65	1894.36
12/13/82	12.70	1894.31
03/31/83	12.75	1894.26
04/30/83	12.59	1894.42
05/11/83	11.61	1895.40
05/29/83	12.47	1894.54
06/27/83	12.54	1894.47
07/14/83	12.58	1894.43
07/27/83	12.64	1894.37
08/12/83	12.90	1894.11
08/26/83	13.03	1893.98
09/13/83	13.30	1893.71
09/25/83	13.30	1893.71
10/11/83	13.42	1893.59
10/25/83	13.45	1893.56
10/26/83	13.48	1893.53
11/08/83	13.55	1893.46
11/10/83	13.58	1893.43
11/27/83	13.65	1893.36

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/22/84	14.14	1892.87
04/24/84	13.13	1893.88
04/25/84	13.20	1893.81
05/15/84	12.82	1894.19
05/16/84	12.75	1894.26
05/30/84	12.69	1894.32
06/01/84	12.75	1894.26
06/20/84	12.53	1894.48
06/22/84	12.52	1894.49
07/05/84	12.57	1894.44
07/19/84	12.67	1894.34
07/24/84	12.74	1894.27
08/03/84	12.74	1894.27
08/17/84	13.03	1893.98
08/21/84	12.90	1894.11
08/30/84	13.06	1893.95
09/12/84	13.08	1893.93
09/22/84	13.18	1893.83
10/23/84	13.36	1893.65
10/25/84	13.31	1893.70
11/25/84	13.35	1893.66
12/20/84	13.53	1893.48
03/22/85	13.94	1893.07
04/21/85	13.90	1893.11
05/25/85	13.86	1893.15
06/21/85	13.90	1893.11
07/24/85	14.25	1892.76
08/22/85	14.47	1892.54
09/23/85	14.69	1892.32
10/20/85	14.77	1892.24
11/14/85	14.95	1892.06
11/22/85	14.87	1892.14
12/21/85	14.92	1892.09
03/20/86	15.01	1892.00
04/20/86	14.35	1892.66
05/23/86	13.49	1893.52
06/22/86	13.35	1893.66
07/21/86	13.27	1893.74
08/20/86	13.46	1893.55
09/17/86	13.45	1893.56
10/19/86	13.46	1893.55
11/23/86	13.53	1893.48
12/22/86	13.54	1893.47
04/20/87	12.16	1894.85
05/21/87	11.64	1895.37
06/21/87	11.47	1895.54
07/20/87	11.55	1895.46
08/20/87	11.70	1895.31
09/21/87	12.04	1894.97
10/21/87	12.20	1894.81
11/20/87	12.42	1894.59
12/19/87	12.46	1894.55
03/20/88	12.89	1894.12
04/21/88	12.89	1894.12
05/21/88	13.07	1893.94

136-070-23AAA1
Streeter Aquifer

MP Elev (msl,ft)=1,907.01
SI (ft.)=113-116

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/21/88	13.29	1893.72
07/20/88	13.77	1893.24
08/20/88	14.08	1892.93
09/19/88	14.41	1892.60
10/20/88	14.67	1892.34
11/21/88	14.97	1892.04
12/20/88	15.16	1891.85
03/20/89	15.70	1891.31
04/20/89	15.22	1891.79
05/21/89	15.24	1891.77
06/21/89	15.40	1891.61
07/19/89	15.74	1891.27
07/20/89	15.69	1891.32
08/21/89	15.90	1891.11
09/19/89	16.11	1890.90
10/20/89	16.17	1890.84
11/22/89	16.49	1890.52
12/22/89	16.61	1890.40
02/27/90	18.04	1888.97
03/21/90	16.94	1890.07
04/21/90	17.07	1889.94
05/19/90	17.11	1889.90
06/19/90	17.15	1889.86
07/20/90	17.32	1889.69
08/20/90	17.45	1889.56
09/21/90	17.60	1889.41
10/20/90	17.72	1889.29
11/21/90	17.78	1889.23
12/22/90	17.94	1889.07
03/21/91	18.24	1888.77
04/21/91	18.32	1888.69
05/21/91	18.32	1888.69
06/07/91	18.43	1888.58
06/20/91	18.33	1888.68
07/21/91	18.57	1888.44
08/19/91	18.64	1888.37
09/20/91	18.72	1888.29
10/21/91	18.85	1888.16
11/20/91	18.92	1888.09
12/22/91	19.03	1887.98
03/22/92	19.04	1887.97
04/20/92	19.10	1887.91
05/18/92	19.19	1887.82
05/20/92	19.16	1887.85
06/12/92	19.35	1887.66
06/19/92	19.28	1887.73
07/18/92	19.35	1887.66
08/23/92	19.48	1887.53
09/20/92	20.17	1886.84
10/19/92	20.24	1886.77
11/23/92	20.40	1886.61
12/21/92	20.45	1886.56
03/20/93	20.67	1886.34
04/21/93	20.34	1886.67
05/22/93	20.16	1886.85

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/19/93	20.16	1886.85
07/21/93	19.67	1887.34
08/22/93	18.81	1888.20
09/20/93	18.43	1888.58
10/22/93	18.17	1888.84
11/19/93	18.08	1888.93
03/20/94	17.84	1889.17
04/20/94	16.78	1890.23
05/05/94	16.20	1890.81
05/21/94	15.53	1891.48
06/02/94	15.40	1891.61
06/19/94	15.11	1891.90
07/20/94	14.53	1892.48
08/21/94	14.40	1892.61
09/21/94	14.77	1892.24
10/19/94	14.40	1892.61
11/22/94	14.45	1892.56
12/20/94	14.50	1892.51
03/20/95	14.67	1892.34
04/19/95	13.92	1893.09
05/21/95	13.08	1893.93
06/22/95	12.23	1894.78
07/21/95	11.75	1895.26
08/20/95	11.58	1895.43
09/19/95	11.65	1895.36
10/26/95	11.82	1895.19
05/02/96	12.35	1894.66
08/08/96	11.84	1895.17
09/20/96	12.18	1894.83
10/24/96	12.31	1894.70
05/22/97	9.75	1897.26
06/30/97	9.11	1897.90
07/30/97	9.20	1897.81
08/12/97	9.37	1897.64
09/16/97	9.86	1897.15
10/14/97	10.23	1896.78
11/11/97	10.55	1896.46
12/10/97	10.77	1896.24
05/12/98	11.21	1895.80
07/15/98	11.05	1895.96
08/25/98	11.26	1895.75
10/13/98	11.65	1895.36
11/30/98	11.97	1895.04
06/01/99	11.92	1895.09
06/29/99	11.53	1895.48
07/27/99	11.27	1895.74
09/08/99	11.11	1895.90
10/05/99	11.03	1895.98
11/02/99	11.12	1895.89
12/07/99	11.08	1895.93
05/17/00	10.90	1896.11
06/14/00	10.97	1896.04
07/12/00	11.19	1895.82

136-070-23AAA1
Streeter Aquifer

MP Elev (msl,ft)=1,907.01
SI (ft.)=113-116

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/15/00	11.42	1895.59
09/19/00	11.69	1895.32
10/17/00	12.01	1895.00
11/30/00	12.15	1894.86
05/10/01	11.13	1895.88
06/26/01	10.80	1896.21
07/24/01	10.86	1896.15
08/21/01	10.86	1896.15
09/19/01	11.23	1895.78
10/23/01	11.40	1895.61
11/29/01	11.62	1895.39
12/18/01	11.88	1895.13
05/14/02	12.32	1894.69
06/25/02	12.66	1894.35
08/20/02	13.33	1893.68
10/01/02	13.90	1893.11
11/19/02	14.19	1892.82
12/17/02	14.37	1892.64
05/21/03	14.53	1892.48
06/17/03	14.54	1892.47

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/22/03	14.51	1892.50
08/20/03	14.68	1892.33
09/16/03	14.88	1892.13
10/21/03	15.20	1891.81
11/18/03	15.32	1891.69
12/09/03	15.46	1891.55
05/19/04	15.25	1891.76
06/22/04	15.01	1892.00
07/27/04	15.11	1891.90
08/25/04	15.13	1891.88
09/21/04	15.36	1891.65
10/18/04	15.32	1891.69
11/22/04	15.33	1891.68
12/13/04	15.56	1891.45
04/13/05	15.84	1891.17
05/18/05	15.66	1891.35
06/13/05	15.60	1891.41
07/26/05	15.53	1891.48
08/24/05	15.51	1891.50
09/20/05	15.84	1891.17

136-070-23AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,907.53
SI (ft.)=41-44

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/15/78	16.82	1890.71
12/06/78	16.84	1890.69
01/08/79	16.87	1890.66
02/05/79	16.87	1890.66
04/03/79	17.15	1890.38
04/30/79	14.17	1893.36
06/06/79	14.20	1893.33
07/18/79	14.65	1892.88
08/07/79	14.79	1892.74
08/28/79	15.24	1892.29
10/10/79	15.56	1891.97
11/08/79	15.61	1891.92
05/06/80	16.17	1891.36
05/27/80	16.45	1891.08
09/02/80	17.62	1889.91
11/26/80	17.90	1889.63
03/10/81	18.16	1889.37
07/15/81	18.60	1888.93
07/25/81	18.46	1889.07
08/23/81	18.63	1888.90
08/25/81	18.69	1888.84
09/23/81	18.51	1889.02
10/24/81	18.55	1888.98
11/21/81	18.54	1888.99
12/02/81	18.66	1888.87
12/22/81	18.62	1888.91
03/18/82	18.65	1888.88
04/25/82	17.34	1890.19
05/23/82	17.16	1890.37
06/25/82	17.16	1890.37
07/08/82	17.34	1890.19
07/21/82	17.26	1890.27
08/22/82	17.95	1889.58
09/08/82	18.13	1889.40
09/22/82	18.12	1889.41
10/22/82	17.69	1889.84
12/03/82	17.60	1889.93
12/06/82	17.58	1889.95
12/13/82	17.57	1889.96
03/31/83	17.29	1890.24
04/30/83	17.04	1890.49
05/11/83	17.10	1890.43
05/29/83	17.03	1890.50
06/27/83	17.32	1890.21
07/14/83	17.61	1889.92
07/27/83	17.78	1889.75
08/10/83	18.10	1889.43
08/26/83	18.37	1889.16
09/13/83	18.66	1888.87
09/25/83	18.71	1888.82
10/25/83	18.63	1888.90
11/08/83	18.61	1888.92
11/27/83	18.70	1888.83
12/01/83	18.88	1888.65
12/06/83	18.74	1888.79

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/22/84	19.02	1888.51
04/24/84	17.50	1890.03
05/15/84	17.36	1890.17
05/30/84	17.40	1890.13
06/20/84	17.44	1890.09
07/24/84	17.86	1889.67
08/21/84	18.32	1889.21
09/22/84	18.64	1888.89
10/23/84	18.65	1888.88
10/25/84	18.61	1888.92
11/25/84	18.62	1888.91
12/20/84	18.71	1888.82
03/22/85	18.87	1888.66
04/21/85	18.72	1888.81
05/25/85	17.87	1889.66
06/21/85	19.05	1888.48
07/24/85	19.40	1888.13
08/21/85	19.68	1887.85
08/22/85	19.66	1887.87
09/23/85	19.77	1887.76
10/20/85	19.78	1887.75
11/14/85	19.80	1887.73
11/22/85	19.77	1887.76
12/21/85	19.80	1887.73
03/20/86	19.69	1887.84
04/20/86	19.07	1888.46
05/23/86	18.17	1889.36
06/22/86	18.33	1889.20
07/21/86	18.54	1888.99
08/20/86	18.90	1888.63
09/17/86	18.82	1888.71
10/19/86	18.78	1888.75
11/23/86	18.80	1888.73
12/11/86	18.79	1888.74
12/22/86	18.80	1888.73
04/20/87	16.53	1891.00
05/21/87	16.83	1890.70
06/21/87	17.03	1890.50
07/20/87	16.26	1891.27
08/20/87	17.50	1890.03
09/21/87	17.86	1889.67
10/21/87	17.99	1889.54
11/13/87	18.04	1889.49
11/20/87	18.05	1889.48
12/19/87	18.06	1889.47
03/20/88	18.28	1889.25
04/21/88	18.30	1889.23
05/21/88	18.65	1888.88
06/21/88	19.24	1888.29
07/20/88	19.93	1887.60
08/20/88	20.55	1886.98
09/19/88	20.85	1886.68
10/20/88	20.98	1886.55
11/21/88	21.05	1886.48
11/23/88	21.07	1886.46

136-070-23AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,907.53
SI (ft.)=41-44

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/20/88	21.09	1886.44
03/20/89	21.23	1886.30
04/20/89	20.87	1886.66
05/21/89	20.93	1886.60
06/21/89	21.18	1886.35
07/19/89	21.70	1885.83
07/20/89	21.68	1885.85
08/21/89	22.12	1885.41
09/19/89	22.27	1885.26
10/20/89	22.31	1885.22
11/21/89	22.38	1885.15
11/22/89	22.35	1885.18
12/22/89	22.38	1885.15
02/27/90	22.47	1885.06
03/21/90	22.50	1885.03
04/21/90	22.54	1884.99
05/19/90	22.65	1884.88
06/19/90	22.80	1884.73
07/20/90	22.90	1884.63
08/20/90	23.13	1884.40
09/21/90	23.33	1884.20
10/20/90	23.33	1884.20
11/21/90	23.33	1884.20
12/10/90	23.30	1884.23
12/22/90	23.33	1884.20
03/21/91	23.47	1884.06
04/21/91	23.51	1884.02
05/21/91	23.53	1884.00
06/07/91	23.50	1884.03
06/20/91	23.63	1883.90
07/21/91	23.91	1883.62
08/19/91	24.21	1883.32
09/20/91	24.42	1883.11
10/21/91	24.32	1883.21
11/20/91	24.31	1883.22
12/22/91	24.31	1883.22
03/22/92	24.18	1883.35
04/20/92	24.21	1883.32
05/18/92	24.47	1883.06
05/20/92	24.48	1883.05
06/12/92	24.53	1883.00
06/19/92	24.53	1883.00
07/18/92	24.57	1882.96
08/23/92	24.85	1882.68
09/16/92	25.05	1882.48
09/20/92	25.06	1882.47
10/19/92	25.09	1882.44
11/23/92	25.06	1882.47
12/21/92	25.05	1882.48
03/20/93	25.08	1882.45
04/21/93	24.84	1882.69
05/22/93	24.78	1882.75
06/19/93	24.70	1882.83
07/21/93	24.06	1883.47
08/22/93	23.07	1884.46

Date	Depth to Water (ft)	WL Elev (msl, ft)
09/20/93	22.86	1884.67
10/22/93	22.73	1884.80
11/19/93	22.64	1884.89
03/20/94	22.54	1884.99
04/20/94	21.84	1885.69
05/05/94	21.69	1885.84
05/21/94	21.37	1886.16
06/02/94	21.26	1886.27
06/19/94	21.17	1886.36
07/20/94	21.22	1886.31
08/21/94	21.50	1886.03
09/21/94	21.68	1885.85
10/19/94	21.55	1885.98
11/22/94	21.49	1886.04
12/01/94	21.40	1886.13
12/20/94	21.40	1886.13
03/20/95	20.38	1887.15
04/19/95	19.98	1887.55
05/21/95	19.36	1888.17
06/22/95	18.96	1888.57
07/21/95	18.90	1888.63
08/20/95	19.38	1888.15
09/19/95	19.61	1887.92
10/26/95	19.46	1888.07
05/02/96	16.72	1890.81
08/08/96	18.36	1889.17
09/20/96	19.12	1888.41
10/24/96	19.18	1888.35
05/22/97	14.52	1893.01
06/30/97	15.53	1892.00
07/30/97	16.31	1891.22
08/12/97	16.65	1890.88
09/16/97	17.24	1890.29
10/14/97	17.48	1890.05
11/11/97	17.57	1889.96
12/10/97	17.69	1889.84
05/12/98	17.14	1890.39
07/15/98	17.84	1889.69
08/25/98	18.34	1889.19
10/13/98	18.68	1888.85
11/30/98	18.63	1888.90
06/01/99	16.62	1890.91
06/29/99	16.54	1890.99
07/27/99	16.76	1890.77
09/08/99	17.00	1890.53
10/05/99	16.98	1890.55
11/02/99	17.00	1890.53
12/07/99	16.93	1890.60
05/17/00	16.59	1890.94
06/14/00	16.80	1890.73
07/12/00	17.10	1890.43
08/15/00	17.29	1890.24
09/19/00	17.73	1889.80

136-070-23AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,907.53
SI (ft.)=41-44

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/17/00	17.81	1889.72
11/30/00	17.84	1889.69
05/10/01	16.79	1890.74
06/26/01	16.58	1890.95
07/24/01	16.65	1890.88
08/21/01	16.80	1890.73
09/19/01	17.23	1890.30
10/23/01	17.27	1890.26
11/29/01	17.42	1890.11
12/18/01	17.52	1890.01
05/14/02	17.74	1889.79
06/25/02	18.22	1889.31
06/27/02	18.27	1889.26
08/20/02	18.98	1888.55
10/01/02	19.60	1887.93
11/19/02	19.68	1887.85
12/17/02	19.66	1887.87
05/21/03	19.60	1887.93
06/17/03	19.59	1887.94
07/22/03	19.76	1887.77
08/20/03	20.00	1887.53
09/16/03	20.28	1887.25
10/21/03	20.41	1887.12
11/18/03	20.35	1887.18
12/09/03	20.41	1887.12
05/19/04	20.29	1887.24
06/22/04	19.88	1887.65
07/27/04	19.72	1887.81
08/25/04	20.00	1887.53
09/21/04	20.40	1887.13
10/18/04	20.23	1887.30
11/22/04	20.13	1887.40
12/13/04	20.20	1887.33
04/13/05	20.36	1887.17
05/18/05	20.28	1887.25
06/13/05	20.35	1887.18
07/26/05	20.50	1887.03
08/24/05	20.55	1886.98
09/20/05	20.73	1886.80

136-070-23ADB
Streeter Aquifer

MP Elev (msl,ft)=1,914.70
SI (ft.)=0-65

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/25/78	24.42	1890.28
07/08/82	25.37	1889.33
09/08/82	24.93	1889.77
12/13/82	23.86	1890.84
05/11/83	23.73	1890.97
07/14/83	24.42	1890.28
08/10/83	26.28	1888.42
09/13/83	25.00	1889.70
11/08/83	24.93	1889.77
05/15/84	24.24	1890.46
10/25/84	24.87	1889.83
11/14/85	26.02	1888.68
07/19/89	37.51	1877.19

136-070-23BBB
Streeter Aquifer

MP Elev (msl,ft)=1,906.33
SI (ft.)=52-57

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/21/91	26.72	1879.61
09/19/91	26.84	1879.49
10/18/91	26.76	1879.57
11/27/91	26.59	1879.74
04/16/92	26.46	1879.87
05/18/92	26.76	1879.57
06/12/92	26.98	1879.35
07/10/92	27.00	1879.33
08/20/92	27.72	1878.61
12/03/92	27.25	1879.08
03/17/93	27.78	1878.55
04/07/93	27.00	1879.33
05/05/93	26.88	1879.45
06/02/93	26.82	1879.51
07/06/93	26.62	1879.71
08/06/93	25.57	1880.76
09/02/93	25.14	1881.19
10/06/93	24.88	1881.45
10/27/93	24.75	1881.58
12/08/93	24.60	1881.73
05/05/94	24.25	1882.08
06/02/94	23.97	1882.36
06/19/94	23.83	1882.50
07/20/94	23.99	1882.34
08/21/94	24.16	1882.17
09/21/94	24.20	1882.13
10/19/94	24.02	1882.31
11/22/94	23.91	1882.42
12/01/94	23.82	1882.51
12/20/94	23.81	1882.52
03/20/95	23.50	1882.83
04/19/95	23.29	1883.04
05/21/95	22.88	1883.45
06/22/95	22.22	1884.11
06/29/95	22.24	1884.09
07/21/95	22.17	1884.16
08/20/95	22.77	1883.56
09/19/95	22.77	1883.56
10/26/95	22.32	1884.01
05/02/96	21.56	1884.77
08/08/96	22.60	1883.73
09/20/96	22.95	1883.38
10/24/96	22.60	1883.73
12/05/96	22.46	1883.87
05/22/97	20.39	1885.94
06/30/97	20.85	1885.48
08/12/97	21.65	1884.68
09/16/97	21.50	1884.83
10/14/97	21.42	1884.91
11/11/97	21.34	1884.99
12/10/97	21.40	1884.93
05/12/98	21.19	1885.14
07/15/98	21.97	1884.36
08/25/98	22.30	1884.03
10/13/98	21.93	1884.40
11/30/98	21.85	1884.48
06/01/99	20.55	1885.78
06/29/99	20.29	1886.04
07/27/99	20.60	1885.73
09/08/99	20.65	1885.68
10/05/99	20.25	1886.08
11/02/99	20.11	1886.22
12/07/99	20.03	1886.30
05/17/00	20.27	1886.06
06/14/00	20.52	1885.81
07/12/00	21.05	1885.28
07/18/00	20.95	1885.38
08/15/00	21.03	1885.30
09/19/00	21.28	1885.05
10/17/00	21.20	1885.13
11/30/00	21.15	1885.18
05/10/01	20.74	1885.59
06/26/01	20.57	1885.76
07/24/01	20.70	1885.63
08/21/01	20.78	1885.55
09/19/01	20.91	1885.42
10/23/01	20.79	1885.54
11/29/01	20.84	1885.49
12/18/01	20.98	1885.35
05/14/02	21.19	1885.14
06/25/02	21.69	1884.64
08/20/02	22.88	1883.45
10/01/02	23.14	1883.19
11/19/02	22.91	1883.42
12/17/02	22.83	1883.50
05/21/03	22.86	1883.47
06/17/03	23.03	1883.30
07/22/03	23.35	1882.98
08/20/03	23.05	1883.28
09/16/03	23.24	1883.09
10/21/03	23.20	1883.13
11/18/03	23.24	1883.09
12/09/03	23.27	1883.06
05/19/04	23.07	1883.26
06/22/04	22.77	1883.56
07/27/04	22.87	1883.46
08/25/04	23.21	1883.12
09/21/04	23.24	1883.09
10/18/04	22.71	1883.62
11/22/04	22.52	1883.81
12/13/04	22.61	1883.72
04/13/05	23.00	1883.33
05/18/05	22.95	1883.38
06/13/05	23.36	1882.97
07/26/05	23.56	1882.77
08/23/05	23.25	1883.08

136-070-23BBB
Streeter Aquifer

MP Elev (msl,ft)=1,906.33
SI (ft.)=52-57

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/24/05	23.23	1883.10
09/20/05	23.22	1883.11

136-070-23BCC
Streeter Aquifer

MP Elev (msl,ft)=1,909.42
SI (ft.)=48-53

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/21/91	29.05	1880.37
09/19/91	29.23	1880.19
10/18/91	28.91	1880.51
11/27/91	28.60	1880.82
04/16/92	28.37	1881.05
05/18/92	28.74	1880.68
06/12/92	29.01	1880.41
07/10/92	29.03	1880.39
08/20/92	29.76	1879.66
12/03/92	29.20	1880.22
03/17/93	29.01	1880.41
04/07/93	28.88	1880.54
05/05/93	28.86	1880.56
06/02/93	28.81	1880.61
07/06/93	28.69	1880.73
08/06/93	27.92	1881.50
09/02/93	27.26	1882.16
10/06/93	26.84	1882.58
10/27/93	26.66	1882.76
12/08/93	26.53	1882.89
05/05/94	26.13	1883.29
06/02/94	25.88	1883.54
06/19/94	25.77	1883.65
07/20/94	25.97	1883.45
08/21/94	26.41	1883.01
09/21/94	26.29	1883.13
10/19/94	25.95	1883.47
11/22/94	25.75	1883.67
12/01/94	25.63	1883.79
03/20/95	25.20	1884.22
04/19/95	25.06	1884.36
05/21/95	24.75	1884.67
06/22/95	24.03	1885.39
06/29/95	24.05	1885.37
07/21/95	23.88	1885.54
08/20/95	24.58	1884.84
09/19/95	24.69	1884.73
10/26/95	24.10	1885.32
05/02/96	23.17	1886.25
08/08/96	24.42	1885.00
09/20/96	24.99	1884.43
10/24/96	24.39	1885.03
12/05/96	24.07	1885.35
05/22/97	22.00	1887.42
06/30/97	22.63	1886.79
08/12/97	23.49	1885.93
09/16/97	23.39	1886.03
10/14/97	23.18	1886.24
11/11/97	22.95	1886.47
12/10/97	22.94	1886.48
05/12/98	22.65	1886.77
07/15/98	23.53	1885.89
08/25/98	23.96	1885.46

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/13/98	23.58	1885.84
11/30/98	23.43	1885.99
06/01/99	22.39	1887.03
06/29/99	21.84	1887.58
07/27/99	22.17	1887.25
09/08/99	22.34	1887.08
10/05/99	21.90	1887.52
11/02/99	21.66	1887.76
12/07/99	21.51	1887.91
05/17/00	21.79	1887.63
06/14/00	21.98	1887.44
07/12/00	22.61	1886.81
07/18/00	22.58	1886.84
08/15/00	22.68	1886.74
09/19/00	22.89	1886.53
10/17/00	22.74	1886.68
11/30/00	22.61	1886.81
05/10/01	22.22	1887.20
06/26/01	22.07	1887.35
07/24/01	22.24	1887.18
08/21/01	22.41	1887.01
09/19/01	22.60	1886.82
10/23/01	22.35	1887.07
11/29/01	22.32	1887.10
12/18/01	22.40	1887.02
05/14/02	22.56	1886.86
06/25/02	23.15	1886.27
08/20/02	24.45	1884.97
10/01/02	24.85	1884.57
11/19/02	24.50	1884.92
12/17/02	24.39	1885.03
05/21/03	24.40	1885.02
06/17/03	24.53	1884.89
07/22/03	24.95	1884.47
08/20/03	24.99	1884.43
09/16/03	25.24	1884.18
10/21/03	24.99	1884.43
11/18/03	24.90	1884.52
12/09/03	24.90	1884.52
05/19/04	24.69	1884.73
06/22/04	24.60	1884.82
07/27/04	24.68	1884.74
08/25/04	25.11	1884.31
09/21/04	25.11	1884.31
10/18/04	24.63	1884.79
11/22/04	24.30	1885.12
12/13/04	24.36	1885.06
04/13/05	24.64	1884.78
05/18/05	24.60	1884.82
06/13/05	24.88	1884.54
07/26/05	25.38	1884.04
08/23/05	25.40	1884.02
08/24/05	25.38	1884.04

136-070-23BCC
Streeter Aquifer

MP Elev (msl,ft)=1,909.42
SI (ft.)=48-53

Date	Depth to Water (ft)	WL Elev (msl, ft)
09/20/05	25.28	1884.14

136-070-23BDB
Streeter Aquifer

MP Elev (msl,ft)=1,912.50
SI (ft.)=0-65

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/11/83	24.62	1887.88
07/14/83	25.13	1887.37
08/10/83	25.41	1887.09
09/13/83	25.78	1886.72
11/08/83	25.69	1886.81
05/15/84	25.30	1887.20
10/25/84	25.80	1886.70
11/14/85	26.75	1885.75

136-070-24DCD2
Streeter Aquifer

MP Elev (msl,ft)=1,919.00
SI (ft.)=21-24

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/06/78	19.09	1899.71
01/08/79	19.30	1899.50
02/05/79	19.40	1899.40
04/30/79	15.65	1903.15
06/06/79	17.07	1901.93
07/18/79	17.16	1901.84
08/07/79	17.33	1901.67
08/28/79	17.35	1901.65
10/10/79	17.66	1901.34
11/08/79	17.90	1901.10
05/06/80	19.35	1899.65
07/15/81	22.53	1896.47
07/25/81	22.25	1896.75
08/23/81	22.60	1896.40
09/23/81	22.73	1896.27
10/24/81	22.84	1896.16
11/21/81	22.97	1896.03
12/22/81	23.10	1895.90
03/18/82	22.47	1896.53
04/25/82	20.37	1898.63
05/23/82	20.92	1898.08
07/08/82	21.32	1897.68
08/22/82	21.24	1897.76
09/08/82	21.32	1897.68
09/22/82	21.23	1897.77
10/22/82	21.46	1897.54
12/06/82	21.18	1897.82
12/13/82	21.14	1897.86
03/31/83	20.23	1898.77
04/30/83	20.17	1898.83
05/11/83	20.37	1898.63
05/29/83	20.56	1898.44
06/27/83	20.85	1898.15
07/14/83	20.94	1898.06
07/27/83	21.00	1898.00
08/10/83	21.14	1897.86
08/26/83	21.21	1897.79
09/13/83	21.42	1897.58
09/25/83	21.48	1897.52
10/25/83	21.73	1897.27
11/08/83	21.90	1897.10
11/27/83	22.07	1896.93
04/24/84	21.13	1897.87
05/15/84	21.41	1897.59
05/30/84	21.43	1897.57
06/20/84	21.50	1897.50
07/24/84	21.54	1897.46
08/21/84	21.56	1897.44
09/22/84	21.68	1897.32
10/23/84	21.89	1897.11
10/25/84	21.88	1897.12
11/25/84	22.10	1896.90
12/20/84	22.25	1896.75
03/22/85	22.78	1896.22
04/21/85	23.00	1896.00
05/25/85	23.20	1895.80
06/21/85	23.32	1895.68
07/24/85	23.44	1895.56
08/22/85	23.57	1895.43
09/23/85	23.74	1895.26
10/20/85	23.87	1895.13
11/14/85	24.04	1894.96
11/22/85	24.04	1894.96
03/20/86	23.22	1895.78
04/20/86	23.86	1895.14
05/23/86	23.46	1895.54
06/22/86	23.16	1895.84
07/21/86	22.85	1896.15
08/20/86	22.66	1896.34
09/17/86	22.55	1896.45
10/19/86	22.61	1896.39
04/20/87	17.86	1901.14
05/21/87	19.31	1899.69
06/21/87	19.84	1899.16
07/20/87	20.15	1898.85
08/20/87	20.36	1898.64
09/21/87	20.68	1898.32
10/21/87	20.77	1898.23
11/20/87	21.04	1897.96
12/19/87	21.24	1897.76
03/20/88	21.95	1897.05
04/21/88	22.18	1896.82
05/21/88	22.40	1896.60
06/21/88	22.57	1896.43
07/20/88	22.84	1896.16
08/20/88	23.13	1895.87
09/19/88	23.47	1895.53
10/20/88	23.87	1895.13
11/21/88	24.26	1894.74
12/20/88	24.55	1894.45
03/20/89	25.19	1893.81
04/20/89	25.24	1893.76
05/21/89	25.39	1893.61
07/19/89	25.73	1893.27
07/20/89	25.64	1893.36

136-070-25ABB
Streeter Aquifer

MP Elev (msl,ft)=1,910.21
SI (ft.)=26-31

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/21/91	21.39	1888.82
09/19/91	21.56	1888.65
10/18/91	21.74	1888.47
11/27/91	21.86	1888.35
03/22/92	21.72	1888.49
04/16/92	21.90	1888.31
04/20/92	21.90	1888.31
05/18/92	22.10	1888.11
05/20/92	22.08	1888.13
06/12/92	22.20	1888.01
06/19/92	22.19	1888.02
07/10/92	22.27	1887.94
07/18/92	22.27	1887.94
08/20/92	22.39	1887.82
08/23/92	22.44	1887.77
09/16/92	22.47	1887.74
09/20/92	22.47	1887.74
10/19/92	22.58	1887.63
11/23/92	22.71	1887.50
12/03/92	22.83	1887.38
12/21/92	22.80	1887.41
04/07/93	22.94	1887.27
04/21/93	22.96	1887.25
05/05/93	23.01	1887.20
05/22/93	23.04	1887.17
06/02/93	23.09	1887.12
06/19/93	23.08	1887.13
07/06/93	23.13	1887.08
07/21/93	23.01	1887.20
08/06/93	22.58	1887.63
08/22/93	21.98	1888.23
09/02/93	21.67	1888.54
09/20/93	21.26	1888.95
10/06/93	21.03	1889.18
10/22/93	20.84	1889.37
10/27/93	20.80	1889.41
11/19/93	20.60	1889.61
05/05/94	19.43	1890.78
06/02/94	18.80	1891.41
12/01/94	17.47	1892.74
04/26/95	15.77	1894.44
05/21/95	15.49	1894.72
06/22/95	15.06	1895.15
06/29/95	15.04	1895.17
07/21/95	14.92	1895.29
08/20/95	14.99	1895.22
09/19/95	15.11	1895.10
10/26/95	15.04	1895.17
05/02/96	9.97	1900.24
08/08/96	13.30	1896.91
09/20/96	13.91	1896.30
10/24/96	14.39	1895.82
05/22/97	11.54	1898.67
06/30/97	11.90	1898.31

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/12/97	12.32	1897.89
09/16/97	12.48	1897.73
10/14/97	12.80	1897.41
11/11/97	12.89	1897.32
12/10/97	13.08	1897.13
05/12/98	12.91	1897.30
07/15/98	13.37	1896.84
08/25/98	13.65	1896.56
10/13/98	14.00	1896.21
11/30/98	14.26	1895.95
06/01/99	13.13	1897.08
06/29/99	12.76	1897.45
07/27/99	12.70	1897.51
09/08/99	12.86	1897.35
10/05/99	12.91	1897.30
11/02/99	12.80	1897.41
12/07/99	12.66	1897.55
05/17/00	12.54	1897.67
06/14/00	12.50	1897.71
07/12/00	12.64	1897.57
07/17/00	12.68	1897.53
08/15/00	12.87	1897.34
09/19/00	12.93	1897.28
10/17/00	13.18	1897.03
11/30/00	13.34	1896.87
05/10/01	12.80	1897.41
06/26/01	12.68	1897.53
07/24/01	12.41	1897.80
08/21/01	12.26	1897.95
09/19/01	12.32	1897.89
10/23/01	12.44	1897.77
11/29/01	12.65	1897.56
12/18/01	12.90	1897.31
05/14/02	13.44	1896.77
06/25/02	13.70	1896.51
08/20/02	14.09	1896.12
10/01/02	14.54	1895.67
11/19/02	14.91	1895.30
12/17/02	15.09	1895.12
05/21/03	15.94	1894.27
06/17/03	16.02	1894.19
07/22/03	15.95	1894.26
08/20/03	15.87	1894.34
09/16/03	16.01	1894.20
10/21/03	16.18	1894.03
11/18/03	16.33	1893.88
12/09/03	16.45	1893.76
05/19/04	16.92	1893.29
06/22/04	16.92	1893.29
07/27/04	16.48	1893.73
08/25/04	16.37	1893.84
09/21/04	16.49	1893.72
10/18/04	16.56	1893.65

136-070-25ABB
Streeter Aquifer

MP Elev (msl,ft)=1,910.21
SI (ft.)=26-31

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/22/04	16.69	1893.52
12/13/04	16.84	1893.37
04/13/05	17.23	1892.98
05/18/05	17.22	1892.99
06/13/05	17.33	1892.88
07/26/05	17.04	1893.17
08/23/05	17.00	1893.21
08/24/05	16.98	1893.23
09/20/05	17.13	1893.08

136-070-25CCC
Streeter Aquifer

MP Elev (msl,ft)=1,914.16
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/08/82	16.33	1897.83
08/03/82	18.06	1896.10
08/22/82	16.08	1898.08
09/08/82	16.18	1897.98
09/22/82	16.23	1897.93
10/22/82	16.09	1898.07
12/06/82	15.86	1898.30
12/13/82	15.80	1898.36
03/31/83	15.94	1898.22
04/30/83	16.02	1898.14
05/11/83	16.07	1898.09
05/29/83	16.05	1898.11
06/27/83	16.05	1898.11
07/14/83	16.00	1898.16
07/27/83	16.06	1898.10
08/10/83	16.17	1897.99
08/26/83	16.24	1897.92
09/13/83	16.40	1897.76
09/25/83	16.44	1897.72
09/27/83	16.45	1897.71
10/11/83	16.56	1897.60
10/25/83	16.58	1897.58
10/26/83	16.64	1897.52
11/08/83	16.69	1897.47
11/10/83	16.73	1897.43
11/27/83	16.76	1897.40
12/01/83	16.89	1897.27
12/06/83	16.80	1897.36
03/22/84	17.25	1896.91
04/10/84	16.60	1897.56
04/24/84	16.55	1897.61
04/25/84	16.60	1897.56
05/15/84	16.40	1897.76
05/16/84	16.39	1897.77
05/30/84	16.29	1897.87
06/01/84	16.34	1897.82
06/20/84	16.25	1897.91
06/22/84	16.29	1897.87
07/05/84	16.27	1897.89
07/24/84	16.30	1897.86
08/21/84	16.31	1897.85
08/30/84	16.40	1897.76
09/12/84	16.42	1897.74
09/22/84	16.44	1897.72
10/23/84	16.60	1897.56
11/25/84	16.67	1897.49
12/20/84	16.76	1897.40
03/22/85	17.08	1897.08
04/21/85	17.22	1896.94
05/25/85	17.34	1896.82
06/21/85	17.43	1896.73
07/24/85	17.55	1896.61
08/21/85	17.70	1896.46
08/22/85	17.70	1896.46
09/23/85	17.84	1896.32
10/20/85	17.94	1896.22
11/14/85	18.04	1896.12

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/22/85	18.10	1896.06
12/21/85	18.13	1896.03
01/10/86	18.29	1895.87
03/20/86	18.11	1896.05
04/20/86	18.10	1896.06
05/23/86	17.46	1896.70
06/22/86	17.13	1897.03
07/21/86	17.08	1897.08
08/20/86	17.37	1896.79
09/17/86	17.40	1896.76
10/19/86	17.36	1896.80
11/23/86	17.33	1896.83
12/11/86	17.32	1896.84
12/22/86	17.34	1896.82
03/20/87	17.47	1896.69
04/20/87	16.08	1898.08
05/21/87	16.22	1897.94
06/21/87	16.24	1897.92
07/20/87	16.16	1898.00
08/20/87	15.79	1898.37
09/21/87	15.74	1898.42
10/21/87	15.75	1898.41
11/13/87	15.89	1898.27
11/20/87	15.85	1898.31
12/19/87	15.90	1898.26
03/20/88	16.23	1897.93
04/20/88	16.35	1897.81
04/21/88	16.35	1897.81
05/21/88	16.65	1897.51
06/21/88	17.03	1897.13
07/20/88	17.67	1896.49
08/20/88	17.88	1896.28
09/19/88	18.40	1895.76
10/20/88	18.59	1895.57
11/21/88	18.65	1895.51
11/23/88	18.40	1895.76
12/20/88	18.76	1895.40
01/21/89	20.55	1893.61
03/20/89	19.11	1895.05
04/20/89	19.06	1895.10
05/21/89	19.19	1894.97
06/21/89	19.35	1894.81
07/19/89	19.82	1894.34
07/20/89	19.80	1894.36
08/21/89	20.29	1893.87
09/19/89	20.37	1893.79
10/20/89	20.38	1893.78
11/22/89	20.61	1893.55
12/22/89	20.61	1893.55
02/27/90	20.89	1893.27
03/21/90	20.95	1893.21
04/21/90	21.07	1893.09
05/19/90	21.19	1892.97
05/25/90	21.23	1892.93
06/12/90	21.30	1892.86

136-070-25CCC
Streeter Aquifer

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/19/90	21.35	1892.81
06/25/90	21.38	1892.78
07/20/90	21.50	1892.66
08/20/90	21.77	1892.39
09/21/90	22.08	1892.08
10/20/90	22.11	1892.05
11/21/90	22.17	1891.99
12/10/90	22.10	1892.06
12/22/90	22.26	1891.90
03/21/91	22.53	1891.63
04/21/91	22.63	1891.53
05/21/91	22.74	1891.42
06/07/91	22.78	1891.38
06/20/91	22.84	1891.32
07/01/91	22.93	1891.23
07/21/91	23.15	1891.01
08/19/91	23.57	1890.59
09/20/91	23.68	1890.48
10/21/91	23.65	1890.51
11/20/91	23.68	1890.48
12/22/91	23.71	1890.45
03/22/92	23.84	1890.32
04/20/92	23.91	1890.25
05/18/92	24.04	1890.12
05/20/92	24.03	1890.13
06/12/92	24.10	1890.06
06/19/92	24.07	1890.09
07/18/92	24.14	1890.02
08/23/92	24.25	1889.91
09/16/92	24.38	1889.78
09/20/92	24.37	1889.79
10/19/92	24.49	1889.67
11/18/92	24.65	1889.51
11/23/92	24.57	1889.59
12/21/92	24.73	1889.43
03/20/93	24.82	1889.34
04/21/93	24.84	1889.32
05/22/93	24.89	1889.27
06/02/93	24.93	1889.23
06/19/93	24.91	1889.25
07/06/93	24.90	1889.26
07/21/93	24.57	1889.59
08/06/93	23.53	1890.63
08/22/93	22.99	1891.17
08/23/93	22.98	1891.18
09/02/93	22.76	1891.40
09/20/93	22.48	1891.68
10/06/93	22.35	1891.81
10/22/93	22.25	1891.91
10/27/93	22.21	1891.95
11/19/93	22.16	1892.00
12/07/93	22.06	1892.10
12/08/93	22.13	1892.03
12/20/93	22.12	1892.04
05/05/94	21.60	1892.56
06/02/94	21.20	1892.96

MP Elev (msl,ft)=1,914.16
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/01/94	20.45	1893.71
04/26/95	19.80	1894.36
05/18/95	19.52	1894.64
05/21/95	19.40	1894.76
06/22/95	18.66	1895.50
07/21/95	18.43	1895.73
08/20/95	18.30	1895.86
09/19/95	18.25	1895.91
10/26/95	18.10	1896.06
05/02/96	16.80	1897.36
08/08/96	17.38	1896.78
09/20/96	17.67	1896.49
10/24/96	17.62	1896.54
12/05/96	17.54	1896.62
05/22/97	15.12	1899.04
06/30/97	15.23	1898.93
08/12/97	15.74	1898.42
09/16/97	15.63	1898.53
10/14/97	15.68	1898.48
11/11/97	15.62	1898.54
12/10/97	15.68	1898.48
05/12/98	15.47	1898.69
07/15/98	15.93	1898.23
08/25/98	16.24	1897.92
10/13/98	16.41	1897.75
11/30/98	16.40	1897.76
06/01/99	15.00	1899.16
06/29/99	15.00	1899.16
07/27/99	14.85	1899.31
09/08/99	14.78	1899.38
10/05/99	14.63	1899.53
11/02/99	14.62	1899.54
12/07/99	14.54	1899.62
05/17/00	14.38	1899.78
06/14/00	14.41	1899.75
07/12/00	14.65	1899.51
08/15/00	14.93	1899.23
09/19/00	14.95	1899.21
10/17/00	14.98	1899.18
11/30/00	15.02	1899.14
05/10/01	14.56	1899.60
06/26/01	14.28	1899.88
07/24/01	14.43	1899.73
08/21/01	14.51	1899.65
09/19/01	14.80	1899.36
10/23/01	14.67	1899.49
11/29/01	14.72	1899.44
12/18/01	14.85	1899.31
05/14/02	15.09	1899.07
06/25/02	15.51	1898.65
06/27/02	15.55	1898.61
08/20/02	15.93	1898.23

136-070-25CCC
Streeter Aquifer

MP Elev (msl,ft)=1,914.16
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/01/02	16.27	1897.89
11/19/02	16.52	1897.64
12/17/02	16.62	1897.54
04/11/03	17.13	1897.03
05/21/03	17.20	1896.96
06/17/03	17.28	1896.88
07/22/03	17.20	1896.96
08/20/03	17.70	1896.46
09/16/03	18.13	1896.03
10/21/03	18.08	1896.08
11/18/03	18.09	1896.07
12/09/03	18.17	1895.99
05/19/04	18.41	1895.75

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/22/04	18.45	1895.71
07/27/04	18.48	1895.68
08/25/04	18.30	1895.86
09/21/04	18.35	1895.81
10/18/04	18.33	1895.83
11/22/04	18.40	1895.76
12/13/04	18.55	1895.61
04/13/05	18.83	1895.33
05/18/05	18.80	1895.36
06/13/05	18.85	1895.31
07/26/05	18.95	1895.21
08/24/05	19.06	1895.10
09/20/05	19.01	1895.15

136-070-26AAA
Streeter Aquifer

MP Elev (msl,ft)=1,912.67
SI (ft.)=57-62

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/21/91	26.28	1886.39
09/19/91	26.35	1886.32
10/18/91	26.28	1886.39
11/27/91	26.16	1886.51
03/22/92	26.13	1886.54
04/16/92	26.19	1886.48
04/20/92	26.15	1886.52
05/18/92	26.26	1886.41
05/20/92	26.25	1886.42
06/12/92	26.36	1886.31
06/19/92	26.36	1886.31
07/10/92	26.41	1886.26
07/18/92	26.41	1886.26
08/20/92	26.18	1886.49
08/23/92	26.21	1886.46
09/16/92	26.30	1886.37
09/20/92	26.43	1886.24
10/19/92	26.30	1886.37
11/23/92	26.22	1886.45
12/03/92	26.30	1886.37
12/21/92	26.21	1886.46
04/07/93	26.21	1886.46
04/21/93	26.23	1886.44
05/05/93	26.27	1886.40
05/22/93	26.24	1886.43
06/02/93	26.26	1886.41
06/19/93	26.23	1886.44
07/06/93	26.18	1886.49
07/21/93	25.87	1886.80
08/06/93	25.24	1887.43
08/22/93	24.94	1887.73
09/02/93	24.64	1888.03
09/20/93	24.43	1888.24
10/06/93	24.25	1888.42
10/22/93	24.10	1888.57
10/27/93	24.04	1888.63
11/19/93	23.94	1888.73
05/05/94	23.24	1889.43
06/02/94	22.90	1889.77
04/26/95	21.62	1891.05
05/21/95	21.25	1891.42
06/22/95	20.60	1892.07
07/21/95	20.32	1892.35
08/20/95	20.75	1891.92
09/19/95	20.58	1892.09
10/26/95	20.22	1892.45
05/02/96	18.97	1893.70
08/08/96	19.73	1892.94
09/20/96	20.20	1892.47
10/24/96	19.99	1892.68
05/22/97	17.57	1895.10
06/30/97	17.68	1894.99
08/12/97	18.30	1894.37
09/16/97	18.43	1894.24
10/14/97	18.43	1894.24
11/11/97	18.33	1894.34
12/10/97	18.34	1894.33
05/12/98	18.07	1894.60
07/15/98	18.66	1894.01
08/25/98	18.93	1893.74
10/13/98	19.11	1893.56
11/30/98	19.01	1893.66
06/01/99	17.53	1895.14
06/29/99	17.32	1895.35
07/27/99	17.59	1895.08
09/08/99	17.67	1895.00
10/05/99	17.46	1895.21
11/02/99	17.38	1895.29
12/07/99	17.23	1895.44
05/17/00	17.23	1895.44
06/14/00	17.31	1895.36
07/12/00	17.70	1894.97
08/15/00	17.69	1894.98
09/19/00	17.80	1894.87
10/17/00	17.91	1894.76
05/10/01	17.36	1895.31
06/26/01	16.99	1895.68
07/24/01	17.13	1895.54
08/21/01	17.31	1895.36
09/19/01	17.80	1894.87
10/23/01	17.58	1895.09
11/29/01	17.59	1895.08
12/18/01	17.67	1895.00
05/14/02	17.87	1894.80
06/25/02	18.40	1894.27
06/27/02	18.45	1894.22
08/20/02	19.03	1893.64
10/01/02	19.74	1892.93
11/19/02	19.66	1893.01
12/17/02	19.59	1893.08
05/21/03	19.95	1892.72
06/17/03	19.91	1892.76
07/22/03	20.22	1892.45
08/20/03	20.50	1892.17
09/16/03	20.92	1891.75
10/21/03	20.76	1891.91
11/18/03	20.69	1891.98
12/09/03	20.73	1891.94
05/19/04	20.80	1891.87
06/22/04	20.69	1891.98
07/27/04	20.81	1891.86
08/25/04	20.73	1891.94
09/21/04	20.87	1891.80
10/18/04	20.81	1891.86
11/22/04	20.76	1891.91
12/13/04	20.87	1891.80

136-070-26AAA
Streeter Aquifer

MP Elev (msl,ft)=1,912.67
SI (ft.)=57-62

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/13/05	21.00	1891.67
05/18/05	20.93	1891.74
06/13/05	21.02	1891.65

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/26/05	21.33	1891.34
08/24/05	21.57	1891.10
09/20/05	21.54	1891.13

136-070-26AAC
Streeter Aquifer

MP Elev (msl,ft)=1,909.20
SI (ft.)=37-54

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/08/82	17.48	1891.72
09/08/82	17.36	1891.84
12/13/82	16.10	1893.10
05/11/83	16.14	1893.06
08/11/83	17.96	1891.24
11/08/83	17.26	1891.94

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/15/84	16.60	1892.60
10/25/84	17.12	1892.08
11/14/85	18.44	1890.76
07/19/89	21.42	1887.78

136-070-26BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,911.37
SI (ft.)=39-44

Date	Depth to Water (ft)	WL Elev (msl, ft)
11/15/78	19.28	1892.09
01/09/79	19.48	1891.89
02/05/79	19.47	1891.90
03/03/79	19.31	1892.06
04/03/79	19.46	1891.91
04/30/79	19.38	1891.99
05/05/79	19.34	1892.03
05/10/79	19.35	1892.02
06/05/79	19.13	1892.24
06/10/79	19.23	1892.14
07/05/79	18.83	1892.54
07/15/79	18.77	1892.60
08/05/79	18.87	1892.50
08/10/79	18.94	1892.43
09/05/79	18.98	1892.39
09/10/79	19.04	1892.33
10/10/79	19.09	1892.28
11/05/79	19.20	1892.17
11/09/79	19.14	1892.23
04/15/80	19.75	1891.62
04/21/80	19.66	1891.71
05/06/80	19.82	1891.55
06/02/80	19.89	1891.48
06/24/80	20.05	1891.32
07/29/80	21.25	1890.12
09/02/80	21.50	1889.87
09/23/80	21.50	1889.87
10/28/80	21.28	1890.09
11/26/80	21.25	1890.12
03/10/81	21.56	1889.81
03/31/81	21.51	1889.86
05/13/81	21.59	1889.78
05/27/81	21.74	1889.63
06/15/81	21.46	1889.91
06/23/81	21.80	1889.57
07/27/81	21.74	1889.63
07/28/81	21.42	1889.95
08/25/81	22.12	1889.25
09/29/81	22.02	1889.35
11/10/81	21.99	1889.38
12/02/81	21.98	1889.39
05/13/82	21.59	1889.78
06/15/82	21.46	1889.91
07/08/82	21.67	1889.70
07/27/82	21.74	1889.63
09/08/82	22.50	1888.87
09/09/82	22.39	1888.98
10/26/82	21.90	1889.47
12/03/82	22.31	1889.06
12/13/82	21.36	1890.01
01/01/83	21.35	1890.02
01/16/83	21.32	1890.05
01/25/83	21.24	1890.13
02/01/83	21.31	1890.06
02/16/83	21.32	1890.05
03/01/83	21.34	1890.03
03/16/83	21.31	1890.06
03/22/83	21.23	1890.14
04/01/83	21.29	1890.08
04/16/83	21.28	1890.09
05/01/83	21.28	1890.09
05/11/83	21.31	1890.06
05/18/83	21.20	1890.17
05/25/83	21.30	1890.07
06/10/83	21.30	1890.07
06/25/83	21.36	1890.01
07/01/83	21.47	1889.90
07/06/83	21.45	1889.92
07/14/83	21.69	1889.68
07/29/83	22.21	1889.16
08/11/83	22.76	1888.61
08/25/83	23.30	1888.07
09/12/83	23.67	1887.70
09/13/83	23.60	1887.77
09/27/83	23.39	1887.98
10/12/83	23.17	1888.20
10/22/83	23.08	1888.29
11/08/83	22.75	1888.62
11/20/83	22.61	1888.76
12/01/83	22.52	1888.85
12/06/83	22.51	1888.86
02/07/84	22.54	1888.83
03/14/84	22.52	1888.85
05/15/84	21.98	1889.39
06/25/84	21.40	1889.97
08/06/84	22.32	1889.05
09/24/84	22.74	1888.63
10/25/84	22.60	1888.77
12/03/84	22.45	1888.92
03/01/85	22.55	1888.82
05/17/85	22.60	1888.77
05/23/85	22.82	1888.55
05/24/85	22.80	1888.57
06/19/85	22.70	1888.67
08/13/85	24.13	1887.24
11/14/85	24.50	1886.87
01/10/86	23.45	1887.92
03/14/86	23.35	1888.02
04/10/86	23.20	1888.17
05/07/86	22.31	1889.06
08/08/86	22.95	1888.42
10/07/86	22.88	1888.49
10/28/86	22.63	1888.74
12/11/86	22.40	1888.97
02/26/87	22.48	1888.89
04/01/87	22.02	1889.35
05/13/87	21.35	1890.02
06/12/87	21.35	1890.02
07/13/87	21.60	1889.77
08/13/87	21.80	1889.57
09/15/87	21.83	1889.54

136-070-26BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,911.37
SI (ft.)=39-44

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/01/87	21.75	1889.62
10/16/87	21.72	1889.65
11/01/87	21.63	1889.74
11/13/87	21.67	1889.70
12/01/87	21.60	1889.77
12/18/87	21.66	1889.71
01/01/88	21.67	1889.70
02/01/88	21.75	1889.62
03/01/88	21.79	1889.58
03/03/88	21.79	1889.58
04/01/88	21.93	1889.44
04/11/88	21.97	1889.40
05/01/88	22.02	1889.35
05/19/88	22.14	1889.23
06/01/88	22.32	1889.05
06/14/88	22.86	1888.51
07/01/88	23.73	1887.64
08/01/88	25.33	1886.04
08/16/88	25.56	1885.81
09/01/88	25.97	1885.40
09/12/88	26.04	1885.33
10/01/88	25.66	1885.71
10/06/88	25.65	1885.72
11/01/88	25.31	1886.06
11/23/88	25.18	1886.19
01/05/89	25.02	1886.35
03/15/89	24.93	1886.44
04/11/89	24.77	1886.60
05/16/89	24.75	1886.62
06/16/89	24.92	1886.45
07/19/89	26.25	1885.12
07/25/89	26.30	1885.07
08/15/89	27.09	1884.28
09/26/89	27.01	1884.36
11/21/89	26.45	1884.92
01/02/90	26.25	1885.12
02/27/90	26.35	1885.02
04/03/90	26.19	1885.18
05/09/90	26.24	1885.13
05/25/90	26.45	1884.92
06/12/90	26.42	1884.95
06/25/90	26.52	1884.85
08/16/90	27.60	1883.77
09/28/90	27.80	1883.57
12/10/90	27.25	1884.12
01/17/91	27.15	1884.22
02/28/91	27.10	1884.27
05/16/91	27.22	1884.15
06/07/91	27.44	1883.93
07/01/91	27.49	1883.88
07/23/91	28.03	1883.34
09/12/91	29.10	1882.27
10/03/91	28.80	1882.57
11/14/91	28.40	1882.97
01/06/92	28.20	1883.17

Date	Depth to Water (ft)	WL Elev (msl, ft)
03/31/92	28.07	1883.30
05/18/92	28.21	1883.16
06/09/92	28.50	1882.87
06/12/92	28.42	1882.95
06/19/92	28.37	1883.00
07/10/92	28.45	1882.92
08/20/92	29.57	1881.80
10/13/92	29.23	1882.14
11/18/92	28.95	1882.42
12/03/92	28.97	1882.40
01/29/93	28.80	1882.57
03/17/93	28.79	1882.58
04/07/93	28.62	1882.75
04/26/93	28.57	1882.80
04/29/93	28.60	1882.77
05/05/93	28.60	1882.77
06/02/93	28.61	1882.76
07/06/93	28.51	1882.86
07/09/93	28.50	1882.87
08/06/93	27.61	1883.76
08/23/93	27.08	1884.29
09/02/93	26.94	1884.43
10/06/93	26.55	1884.82
10/08/93	26.55	1884.82
10/27/93	26.39	1884.98
12/08/93	26.22	1885.15
04/04/94	26.10	1885.27
05/05/94	25.69	1885.68
05/24/94	25.54	1885.83
06/02/94	25.73	1885.64
10/03/94	25.82	1885.55
11/10/94	25.39	1885.98
05/18/95	24.28	1887.09
10/18/95	23.61	1887.76
10/26/95	23.57	1887.80
12/01/95	23.31	1888.06
05/08/96	22.35	1889.02
06/19/96	22.81	1888.56
07/23/96	23.40	1887.97
08/08/96	23.58	1887.79
09/10/96	24.13	1887.24
09/20/96	24.20	1887.17
10/24/96	24.82	1886.55
11/14/96	23.63	1887.74
12/05/96	23.48	1887.89
04/29/97	21.91	1889.46
05/22/97	21.75	1889.62
06/10/97	22.08	1889.29
06/30/97	22.36	1889.01
08/12/97	22.67	1888.70
08/14/97	22.67	1888.70
09/16/97	23.11	1888.26
10/14/97	22.67	1888.70
11/11/97	22.33	1889.04
11/17/97	22.27	1889.10

136-070-26BBB2
Streeter Aquifer

MP Elev (msl,ft)=1,911.37
SI (ft.)=39-44

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/10/97	22.19	1889.18
02/11/98	22.03	1889.34
04/02/98	21.68	1889.69
05/12/98	21.98	1889.39
05/19/98	22.08	1889.29
06/18/98	22.21	1889.16
07/15/98	22.63	1888.74
08/18/98	23.18	1888.19
08/25/98	23.19	1888.18
08/27/98	23.20	1888.17
10/13/98	23.04	1888.33
10/29/98	22.87	1888.50
11/30/98	22.80	1888.57
01/29/99	22.62	1888.75
03/26/99	22.29	1889.08
05/17/99	22.18	1889.19
06/01/99	21.93	1889.44
06/18/99	21.48	1889.89
06/29/99	21.48	1889.89
07/27/99	21.28	1890.09
08/02/99	21.60	1889.77
09/08/99	21.83	1889.54
10/05/99	21.35	1890.02
10/25/99	21.15	1890.22
11/02/99	21.12	1890.25
11/10/99	21.04	1890.33
12/07/99	20.86	1890.51
01/25/00	20.94	1890.43
02/08/00	20.82	1890.55
03/30/00	20.76	1890.61
05/15/00	21.12	1890.25
05/17/00	21.14	1890.23
06/14/00	21.20	1890.17
06/22/00	21.18	1890.19
07/12/00	21.74	1889.63
08/07/00	21.87	1889.50
08/15/00	21.83	1889.54
09/19/00	22.16	1889.21
09/27/00	22.11	1889.26
10/17/00	21.39	1889.98
10/23/00	21.95	1889.42
11/30/00	21.78	1889.59
01/24/01	21.77	1889.60
05/03/01	21.28	1890.09
05/10/01	21.21	1890.16
06/04/01	21.16	1890.21
06/26/01	21.05	1890.32
07/06/01	21.21	1890.16
07/24/01	21.44	1889.93
08/17/01	21.68	1889.69
08/21/01	21.71	1889.66
09/17/01	22.34	1889.03
09/19/01	22.27	1889.10

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/18/01	21.93	1889.44
10/23/01	21.81	1889.56
11/29/01	21.54	1889.83
12/18/01	21.53	1889.84
03/26/02	21.55	1889.82
05/14/02	21.57	1889.80
06/04/02	22.10	1889.27
06/25/02	22.41	1888.96
07/29/02	23.05	1888.32
08/20/02	23.61	1887.76
08/28/02	23.77	1887.60
09/19/02	24.33	1887.04
10/01/02	24.23	1887.14
11/06/02	23.79	1887.58
11/12/02	23.77	1887.60
11/19/02	23.68	1887.69
12/17/02	23.51	1887.86
04/09/03	23.41	1887.96
05/21/03	23.57	1887.80
05/29/03	23.70	1887.67
06/17/03	23.67	1887.70
06/24/03	23.80	1887.57
07/22/03	23.79	1887.58
07/28/03	23.80	1887.57
08/20/03	24.39	1886.98
09/03/03	24.57	1886.80
09/16/03	24.95	1886.42
10/09/03	24.75	1886.62
10/14/03	24.73	1886.64
10/21/03	24.59	1886.78
11/18/03	24.41	1886.96
12/03/03	24.33	1887.04
12/09/03	24.31	1887.06
03/23/04	24.11	1887.26
05/03/04	23.91	1887.46
05/19/04	24.45	1886.92
06/08/04	24.60	1886.77
06/22/04	24.27	1887.10
07/09/04	23.49	1887.88
07/27/04	24.34	1887.03
08/18/04	24.88	1886.49
08/25/04	24.86	1886.51
09/21/04	24.84	1886.53
09/22/04	24.83	1886.54
10/18/04	24.42	1886.95
11/22/04	24.09	1887.28
12/13/04	24.05	1887.32
05/18/05	23.97	1887.40
06/13/05	24.09	1887.28
07/26/05	25.49	1885.88
08/24/05	25.78	1885.59
09/20/05	25.70	1885.67

136-070-26CCB
Streeter Aquifer

MP Elev (msl,ft)=1,909.78
SI (ft.)=26-31

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/21/91	24.45	1885.33
09/19/91	24.67	1885.11
10/18/91	24.68	1885.10
11/27/91	24.62	1885.16
04/16/92	24.68	1885.10
05/18/92	24.73	1885.05
06/12/92	24.79	1884.99
07/10/92	24.85	1884.93
08/20/92	25.17	1884.61
12/03/92	25.37	1884.41
03/17/93	25.41	1884.37
04/07/93	25.32	1884.46
05/05/93	25.26	1884.52
06/02/93	25.24	1884.54
07/06/93	25.17	1884.61
08/06/93	23.74	1886.04
08/23/93	22.91	1886.87
09/02/93	22.61	1887.17
10/06/93	22.16	1887.62
10/27/93	22.10	1887.68
12/08/93	22.15	1887.63
05/05/94	21.60	1888.18
06/02/94	21.11	1888.67
06/19/94	20.87	1888.91
07/20/94	20.83	1888.95
08/21/94	21.17	1888.61
09/21/94	21.15	1888.63
10/19/94	21.09	1888.69
11/22/94	21.06	1888.72
12/01/94	20.97	1888.81
12/20/94	20.96	1888.82
03/20/95	20.64	1889.14
04/19/95	20.45	1889.33
05/21/95	19.93	1889.85
06/22/95	18.87	1890.91
06/29/95	18.74	1891.04
07/21/95	18.55	1891.23
08/20/95	18.63	1891.15
09/19/95	18.95	1890.83
10/26/95	18.73	1891.05
05/02/96	18.03	1891.75
08/08/96	18.46	1891.32
09/20/96	18.98	1890.80
10/24/96	19.03	1890.75
12/05/96	18.95	1890.83
05/22/97	16.48	1893.30
06/30/97	16.76	1893.02
08/12/97	17.02	1892.76
09/16/97	17.42	1892.36
10/14/97	17.62	1892.16
11/11/97	17.58	1892.20
12/10/97	17.63	1892.15
05/12/98	17.28	1892.50

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/15/98	18.03	1891.75
08/25/98	18.42	1891.36
10/13/98	18.53	1891.25
11/30/98	18.47	1891.31
06/01/99	17.32	1892.46
06/29/99	16.99	1892.79
07/27/99	16.84	1892.94
09/08/99	17.11	1892.67
10/05/99	16.83	1892.95
11/02/99	16.69	1893.09
12/07/99	16.56	1893.22
05/17/00	16.72	1893.06
06/14/00	16.77	1893.01
07/12/00	16.98	1892.80
07/17/00	17.00	1892.78
08/15/00	17.26	1892.52
09/19/00	17.30	1892.48
10/17/00	17.40	1892.38
11/30/00	17.41	1892.37
05/10/01	16.80	1892.98
06/26/01	16.66	1893.12
07/24/01	16.77	1893.01
08/21/01	16.78	1893.00
09/19/01	17.17	1892.61
10/23/01	17.16	1892.62
11/29/01	17.15	1892.63
12/18/01	17.22	1892.56
05/14/02	17.33	1892.45
06/25/02	17.85	1891.93
08/20/02	18.62	1891.16
10/01/02	19.11	1890.67
11/19/02	19.12	1890.66
12/17/02	19.10	1890.68
05/21/03	19.39	1890.39
06/17/03	19.46	1890.32
07/22/03	19.20	1890.58
08/20/03	19.54	1890.24
09/16/03	19.87	1889.91
10/21/03	20.08	1889.70
11/18/03	20.05	1889.73
12/09/03	20.10	1889.68
05/19/04	20.13	1889.65
06/22/04	19.97	1889.81
07/27/04	19.88	1889.90
08/25/04	20.30	1889.48
09/21/04	20.27	1889.51
10/18/04	20.09	1889.69
11/22/04	20.04	1889.74
12/13/04	20.14	1889.64
04/13/05	20.30	1889.48
05/18/05	20.23	1889.55
06/13/05	20.30	1889.48
07/26/05	20.78	1889.00

136-070-26CCB
Streeter Aquifer

MP Elev (msl,ft)=1,909.78
SI (ft.)=26-31

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/23/05	20.95	1888.83
08/24/05	20.90	1888.88
09/20/05	20.83	1888.95

136-070-27AAD
Streeter Aquifer

MP Elev (msl,ft)=1,907.80
SI (ft.)=27-47

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/08/82	14.57	1893.23
09/08/82	18.54	1889.26
12/13/82	17.06	1890.74
05/11/83	17.07	1890.73
09/12/83	20.28	1887.52
11/08/83	18.55	1889.25
05/15/84	17.66	1890.14
10/25/84	18.32	1889.48
11/14/85	19.31	1888.49
06/07/91	23.28	1884.52

136-070-27DAB
Streeter Aquifer

MP Elev (msl,ft)=1,906.80
SI (ft.)=28-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
09/08/82	17.98	1888.82
12/13/82	16.56	1890.24
05/11/83	16.62	1890.18
09/14/83	19.03	1887.77
11/08/83	18.13	1888.67
05/15/84	17.15	1889.65
10/25/84	18.03	1888.77
11/14/85	18.97	1887.83
06/07/91	23.03	1883.77

136-071-01ABB
Streeter Aquifer

MP Elev (msl,ft)=1,870.86
SI (ft.)=42-47

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/04/99	7.90	1862.96
10/05/99	7.95	1862.91
11/02/99	7.99	1862.87
12/07/99	8.03	1862.83
05/17/00	7.36	1863.50
06/14/00	7.47	1863.39
07/12/00	7.59	1863.27
08/15/00	7.99	1862.87
09/19/00	8.41	1862.45
10/17/00	8.53	1862.33
11/30/00	8.35	1862.51
05/10/01	7.38	1863.48
06/26/01	7.34	1863.52
07/24/01	7.65	1863.21
08/21/01	7.91	1862.95
09/19/01	8.30	1862.56
10/23/01	8.45	1862.41
11/29/01	8.47	1862.39
12/18/01	8.49	1862.37
05/14/02	8.14	1862.72
06/25/02	8.55	1862.31
08/20/02	9.21	1861.65
10/01/02	9.50	1861.36
11/19/02	9.52	1861.34

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/17/02	9.58	1861.28
05/21/03	8.86	1862.00
06/17/03	8.87	1861.99
07/22/03	9.08	1861.78
08/20/03	9.60	1861.26
09/16/03	9.98	1860.88
10/21/03	10.15	1860.71
11/18/03	10.17	1860.69
12/09/03	10.18	1860.68
05/19/04	9.64	1861.22
06/22/04	9.13	1861.73
07/27/04	9.46	1861.40
08/25/04	9.76	1861.10
09/07/04	9.75	1861.11
09/21/04	9.79	1861.07
10/18/04	9.85	1861.01
11/22/04	9.76	1861.10
12/13/04	9.80	1861.06
04/13/05	9.68	1861.18
05/18/05	9.64	1861.22
06/13/05	9.45	1861.41
07/26/05	9.79	1861.07
08/24/05	10.03	1860.83
09/20/05	10.20	1860.66

137-070-05BBC
Streeter Aquifer

MP Elev (msl,ft)=0.00
SI (ft.)=0-0

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/13/05	1.92	-1.92
05/18/05	1.61	-1.61
06/13/05	1.56	-1.56

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/26/05	2.20	-2.20
08/24/05	2.06	-2.06
09/20/05	2.02	-2.02

137-070-05DDA
Streeter Aquifer

MP Elev (msl,ft)=0.00
SI (ft.)=0-0

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/13/05	2.30	-2.30
05/18/05	2.23	-2.23
06/13/05	2.16	-2.16

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/26/05	2.90	-2.90
08/24/05	2.83	-2.83
09/20/05	2.84	-2.84

137-070-09BCB1
Streeter Aquifer

MP Elev (msl,ft)=1,866.14
SI (ft.)=42-47

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/14/01	3.90	1862.24
08/21/01	4.05	1862.09
09/19/01	4.56	1861.58
10/23/01	4.63	1861.51
11/29/01	4.76	1861.38
12/18/01	4.85	1861.29
05/14/02	4.89	1861.25
06/25/02	5.27	1860.87
08/20/02	5.80	1860.34
10/01/02	6.19	1859.95
11/19/02	6.22	1859.92
12/17/02	6.31	1859.83
05/21/03	5.58	1860.56
06/17/03	5.44	1860.70
07/22/03	5.52	1860.62
08/20/03	6.03	1860.11
09/16/03	6.46	1859.68

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/21/03	6.70	1859.44
11/18/03	6.73	1859.41
12/09/03	6.83	1859.31
05/19/04	6.13	1860.01
06/22/04	5.08	1861.06
07/27/04	5.21	1860.93
08/25/04	5.63	1860.51
09/21/04	5.87	1860.27
10/18/04	5.76	1860.38
11/22/04	5.70	1860.44
12/13/04	5.91	1860.23
04/13/05	6.35	1859.79
05/18/05	6.00	1860.14
06/13/05	5.78	1860.36
07/26/05	5.85	1860.29
08/24/05	6.29	1859.85
09/20/05	6.61	1859.53

137-070-09BCB2
Streeter Aquifer

MP Elev (msl,ft)=1,866.35
SI (ft.)=13-15

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/14/01	5.10	1861.25
08/21/01	5.66	1860.69
09/19/01	6.47	1859.88
10/23/01	6.08	1860.27
11/29/01	5.80	1860.55
12/18/01	5.84	1860.51
05/14/02	4.60	1861.75
06/25/02	5.73	1860.62
08/20/02	6.89	1859.46
10/01/02	7.38	1858.97
11/19/02	6.89	1859.46
12/17/02	7.04	1859.31
05/21/03	4.11	1862.24
06/17/03	4.53	1861.82
07/22/03	5.63	1860.72
08/20/03	7.33	1859.02
09/16/03	7.93	1858.42

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/21/03	7.87	1858.48
11/18/03	7.65	1858.70
12/09/03	7.62	1858.73
05/19/04	5.03	1861.32
06/22/04	4.16	1862.19
07/27/04	5.41	1860.94
08/25/04	6.65	1859.70
09/21/04	6.65	1859.70
10/18/04	6.13	1860.22
11/22/04	5.76	1860.59
12/13/04	6.05	1860.30
04/13/05	5.95	1860.40
05/18/05	5.08	1861.27
06/13/05	4.27	1862.08
07/26/05	6.04	1860.31
08/24/05	7.33	1859.02
09/20/05	7.58	1858.77

137-070-09CBC1
Streeter Aquifer

MP Elev (msl,ft)=1,864.32
SI (ft.)=92-97

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/14/01	1.90	1862.42
08/21/01	2.04	1862.28
09/19/01	2.46	1861.86
10/23/01	2.55	1861.77
11/29/01	2.62	1861.70
12/18/01	2.70	1861.62
05/14/02	2.59	1861.73
06/25/02	2.86	1861.46
08/20/02	3.39	1860.93
10/01/02	3.72	1860.60
11/19/02	3.78	1860.54
12/17/02	3.83	1860.49
05/21/03	3.26	1861.06
06/17/03	3.20	1861.12
07/22/03	3.29	1861.03
08/20/03	3.70	1860.62
09/16/03	4.07	1860.25
10/21/03	4.29	1860.03
11/18/03	4.30	1860.02
12/09/03	4.39	1859.93
05/19/04	3.88	1860.44
06/22/04	3.14	1861.18
07/27/04	3.29	1861.03
08/25/04	3.62	1860.70
09/21/04	3.77	1860.55
10/18/04	3.71	1860.61
11/22/04	3.66	1860.66
12/13/04	3.79	1860.53
04/13/05	3.98	1860.34
05/18/05	3.78	1860.54
06/13/05	3.57	1860.75
07/26/05	5.59	1858.73
08/24/05	4.04	1860.28
09/20/05	4.30	1860.02

137-070-09CBC2
Streeter Aquifer

MP Elev (msl,ft)=1,864.23
SI (ft.)=11-16

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/14/01	3.60	1860.63
08/21/01	4.10	1860.13
09/19/01	4.90	1859.33
10/23/01	4.46	1859.77
11/29/01	4.21	1860.02
12/18/01	4.42	1859.81
05/14/02	3.30	1860.93
06/25/02	5.49	1858.74
08/20/02	6.26	1857.97
10/01/02	6.20	1858.03
11/19/02	4.91	1859.32
12/17/02	5.04	1859.19
05/21/03	3.05	1861.18
06/17/03	3.85	1860.38
07/22/03	5.48	1858.75
08/20/03	6.90	1857.33
09/16/03	7.02	1857.21
10/21/03	6.62	1857.61
11/18/03	6.07	1858.16
12/09/03	5.99	1858.24
05/19/04	3.83	1860.40
06/22/04	3.50	1860.73
07/27/04	5.85	1858.38
08/25/04	6.33	1857.90
09/21/04	5.98	1858.25
10/18/04	4.74	1859.49
11/22/04	4.27	1859.96
12/13/04	4.74	1859.49
04/13/05	3.46	1860.77
05/18/05	3.47	1860.76
06/13/05	2.85	1861.38
07/26/05	3.75	1860.48
08/24/05	6.70	1857.53
09/20/05	6.01	1858.22

137-070-15CCC
Streeter Aquifer

MP Elev (msl,ft)=1,924.00
SI (ft.)=56-61

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/11/83	47.69	1876.31
09/12/83	48.07	1875.93
11/07/83	47.58	1876.42
05/15/84	47.97	1876.03
10/25/84	47.57	1876.43
05/23/85	47.50	1876.50
11/14/85	47.81	1876.19
05/07/86	47.79	1876.21
10/07/86	47.14	1876.86
07/24/89	46.35	1877.65
02/27/90	46.69	1877.31

137-070-17ABB
Surface Water Aquifer

MP Elev (msl,ft)=1,856.90
SI (ft.)=0-0

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/10/01	-1.98	1861.12
06/11/01	-1.92	1861.06
06/26/01	-2.06	1861.20
07/24/01	-1.89	1861.03
08/21/01	-1.66	1860.80
09/19/01	-1.26	1860.40
10/23/01	-0.96	1860.10
10/30/01	-0.94	1860.08
05/29/02	-2.08	1860.27
06/25/02	-1.90	1860.09
08/20/02	-1.32	1859.51
10/01/02	-0.96	1859.15
11/07/02	-0.80	1858.99
05/01/03	-2.19	1859.26
05/21/03	-2.48	1859.55
06/17/03	-2.50	1859.57
07/22/03	-2.40	1859.47
08/20/03	-1.98	1859.05
09/16/03	-1.47	1858.54
10/21/03	-1.18	1858.25
10/31/03	-1.12	1858.19
05/19/04	-2.40	1858.59
06/22/04	-2.90	1859.09
07/27/04	-2.68	1858.87
08/25/04	-2.38	1858.57
09/21/04	-2.28	1858.47
10/18/04	-2.18	1858.37
11/01/04	-2.30	1858.49
04/20/05	-1.54	1858.44
05/18/05	-1.60	1858.50
06/13/05	-1.72	1858.62
07/26/05	-1.48	1858.38
08/24/05	-1.28	1858.18
09/20/05	-1.06	1857.96

137-070-20ABB
Streeter Aquifer

MP Elev (msl,ft)=0.00
SI (ft.)=0-0

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/13/05	0.78	-0.78
05/18/05	0.57	-0.57
06/13/05	0.37	-0.37
07/26/05	1.17	-1.17
08/24/05	0.84	-0.84
09/20/05	9999.00	<<

137-070-23DAD
Streeter Aquifer

MP Elev (msl,ft)=1,901.80
SI (ft.)=77-82

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/10/83	17.58	1884.22
08/26/83	17.60	1884.20
09/12/83	17.71	1884.09
09/25/83	17.65	1884.15
10/25/83	17.58	1884.22
11/08/83	17.58	1884.22
11/27/83	17.52	1884.28
11/30/83	17.50	1884.30
03/22/84	17.28	1884.52
04/24/84	17.09	1884.71
05/15/84	17.03	1884.77
05/30/84	17.16	1884.64
06/20/84	17.01	1884.79
07/24/84	17.31	1884.49
08/21/84	17.42	1884.38
09/22/84	17.53	1884.27
10/23/84	17.26	1884.54
10/25/84	17.26	1884.54
11/25/84	17.21	1884.59
12/20/84	17.21	1884.59
03/22/85	17.14	1884.66
04/21/85	17.16	1884.64
05/25/85	17.32	1884.48
06/21/85	17.34	1884.46
07/24/85	17.56	1884.24
08/21/85	17.64	1884.16
08/22/85	17.64	1884.16
09/23/85	17.61	1884.19
10/20/85	17.60	1884.20
11/14/85	17.63	1884.17
11/22/85	17.57	1884.23
12/21/85	17.46	1884.34
03/20/86	17.49	1884.31
04/20/86	17.23	1884.57
05/23/86	17.24	1884.56
06/22/86	17.36	1884.44
07/21/86	17.38	1884.42
08/20/86	17.54	1884.26
09/17/86	17.33	1884.47
09/19/86	17.33	1884.47
10/19/86	17.20	1884.60
11/23/86	17.02	1884.78
12/22/86	17.00	1884.80
03/20/87	16.68	1885.12
04/20/87	16.53	1885.27
05/21/87	16.56	1885.24
06/21/87	16.71	1885.09
07/20/87	16.61	1885.19
08/20/87	16.77	1885.03
09/21/87	16.86	1884.94
10/21/87	16.87	1884.93
11/20/87	16.87	1884.93
12/19/87	16.76	1885.04
03/20/88	16.62	1885.18
04/21/88	16.75	1885.05

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/21/88	16.93	1884.87
06/21/88	17.10	1884.70
07/20/88	17.32	1884.48
08/20/88	17.42	1884.38
09/19/88	17.45	1884.35
10/20/88	17.53	1884.27
11/21/88	17.50	1884.30
12/20/88	17.51	1884.29
03/20/89	17.50	1884.30
04/20/89	17.44	1884.36
05/21/89	16.60	1885.20
06/21/89	17.72	1884.08
07/20/89	17.77	1884.03
07/24/89	17.87	1883.93
08/21/89	17.99	1883.81
09/19/89	18.00	1883.80
10/20/89	18.11	1883.69
11/21/89	18.18	1883.62
11/22/89	18.14	1883.66
12/22/89	18.19	1883.61
02/27/90	18.28	1883.52
03/21/90	18.17	1883.63
04/21/90	18.33	1883.47
05/19/90	18.35	1883.45
06/19/90	18.26	1883.54
07/20/90	18.46	1883.34
08/20/90	18.71	1883.09
09/21/90	18.80	1883.00
10/20/90	18.84	1882.96
11/21/90	18.88	1882.92
12/13/90	18.07	1883.73
12/22/90	19.00	1882.80
03/21/91	19.00	1882.80
04/21/91	19.08	1882.72
05/21/91	19.03	1882.77
06/07/91	19.14	1882.66
06/20/91	19.14	1882.66
07/21/91	19.38	1882.42
08/19/91	19.57	1882.23
09/20/91	19.57	1882.23
10/21/91	19.68	1882.12
11/14/91	19.60	1882.20
11/20/91	19.60	1882.20
12/22/91	19.65	1882.15
03/22/92	19.72	1882.08
04/20/92	19.82	1881.98
05/18/92	19.94	1881.86
05/20/92	19.95	1881.85
06/12/92	20.14	1881.66
06/19/92	20.01	1881.79
07/18/92	20.12	1881.68
08/23/92	20.33	1881.47
09/20/92	20.33	1881.47
10/19/92	20.42	1881.38
11/17/92	20.41	1881.39
11/23/92	20.38	1881.42

137-070-23DAD
Streeter Aquifer

MP Elev (msl,ft)=1,901.80
SI (ft.)=77-82

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/21/92	20.38	1881.42
03/20/93	20.49	1881.31
04/21/93	20.55	1881.25
05/22/93	20.53	1881.27
06/19/93	20.53	1881.27
07/21/93	20.19	1881.61
08/22/93	20.28	1881.52
09/20/93	20.31	1881.49
10/22/93	20.38	1881.42
11/19/93	20.33	1881.47
12/20/93	20.07	1881.73
03/20/94	19.83	1881.97
04/20/94	19.78	1882.02
05/05/94	19.70	1882.10
05/21/94	19.76	1882.04
06/02/94	19.85	1881.95
06/19/94	19.82	1881.98
07/20/94	19.61	1882.19
08/21/94	19.72	1882.08
09/21/94	19.59	1882.21
10/19/94	19.29	1882.51
11/22/94	19.21	1882.59
11/30/94	19.12	1882.68
12/20/94	19.08	1882.72
03/20/95	18.77	1883.03
04/19/95	18.57	1883.23
05/21/95	18.45	1883.35
06/22/95	18.51	1883.29
07/21/95	18.29	1883.51
08/20/95	18.50	1883.30
09/19/95	18.40	1883.40
10/26/95	18.20	1883.60
05/02/96	17.46	1884.34
08/08/96	17.67	1884.13
09/20/96	17.68	1884.12
10/24/96	17.66	1884.14
12/05/96	17.36	1884.44
05/22/97	16.82	1884.98
06/30/97	16.92	1884.88
07/30/97	17.00	1884.80
08/12/97	17.00	1884.80
09/16/97	16.84	1884.96
10/14/97	16.81	1884.99
11/11/97	16.74	1885.06
12/10/97	16.64	1885.16
05/12/98	16.22	1885.58
07/15/98	16.42	1885.38
08/25/98	16.44	1885.36
10/13/98	16.53	1885.27
11/30/98	16.32	1885.48

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/01/99	15.90	1885.90
06/29/99	15.93	1885.87
07/27/99	15.95	1885.85
09/08/99	15.67	1886.13
10/05/99	15.68	1886.12
11/02/99	15.65	1886.15
12/07/99	15.56	1886.24
05/17/00	15.33	1886.47
06/14/00	15.40	1886.40
07/12/00	15.36	1886.44
08/15/00	15.61	1886.19
09/19/00	15.73	1886.07
10/17/00	15.71	1886.09
11/30/00	15.49	1886.31
05/10/01	15.34	1886.46
06/26/01	15.41	1886.39
07/24/01	15.60	1886.20
08/21/01	15.73	1886.07
09/19/01	15.88	1885.92
10/23/01	15.84	1885.96
11/29/01	15.84	1885.96
12/18/01	15.85	1885.95
05/14/02	15.91	1885.89
06/25/02	16.22	1885.58
06/27/02	16.25	1885.55
08/20/02	16.45	1885.35
10/01/02	16.70	1885.10
11/19/02	16.63	1885.17
12/17/02	16.67	1885.13
05/21/03	16.62	1885.18
06/17/03	16.74	1885.06
07/22/03	16.95	1884.85
08/20/03	17.23	1884.57
09/16/03	17.39	1884.41
10/21/03	17.46	1884.34
11/18/03	17.42	1884.38
12/09/03	17.45	1884.35
05/19/04	17.26	1884.54
06/22/04	17.08	1884.72
07/27/04	17.34	1884.46
08/25/04	17.41	1884.39
09/21/04	17.40	1884.40
10/18/04	17.32	1884.48
11/22/04	17.20	1884.60
12/13/04	17.23	1884.57
04/13/05	17.24	1884.56
05/18/05	17.18	1884.62
06/13/05	17.05	1884.75
07/26/05	17.37	1884.43
08/24/05	17.49	1884.31
09/20/05	17.60	1884.20

137-070-33ABA
Surface Water Aquifer

MP Elev (msl,ft)=1,856.52
SI (ft.)=0-0

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/10/01	-2.60	1861.22
06/11/01	-2.53	1861.15
06/26/01	-2.71	1861.33
07/24/01	-2.53	1861.15
08/21/01	-2.28	1860.90
09/19/01	-1.86	1860.48
10/23/01	-1.60	1860.22
10/30/01	-1.58	1860.20
05/29/02	-2.99	1860.40
06/25/02	-2.80	1860.21
08/20/02	-2.20	1859.61
10/01/02	-1.90	1859.31
11/07/02	-1.62	1859.03
05/01/03	-2.74	1859.34
05/21/03	-3.04	1859.64
06/17/03	-3.08	1859.68
07/22/03	-2.98	1859.58
08/20/03	-2.50	1859.10
09/16/03	-2.06	1858.66
10/21/03	-1.74	1858.34
10/31/03	-1.74	1858.34
05/19/04	-2.06	1858.66
06/22/04	-2.56	1859.16
07/27/04	-2.28	1858.88
08/25/04	-2.00	1858.60
09/21/04	-1.98	1858.58
10/18/04	-1.76	1858.36
11/01/04	-1.98	1858.58
04/20/05	-2.02	1858.54
05/18/05	-1.96	1858.48
06/13/05	-2.20	1858.72
07/26/05	-1.98	1858.50
08/24/05	-1.66	1858.18
09/20/05	-1.48	1858.00

137-070-34CCB2
Streeter Aquifer

MP Elev (msl,ft)=1,876.71
SI (ft.)=38-43

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/04/99	9.35	1867.36
10/05/99	9.37	1867.34
11/02/99	9.41	1867.30
12/07/99	9.49	1867.22
05/17/00	9.00	1867.71
06/14/00	9.25	1867.46
07/12/00	9.42	1867.29
08/15/00	10.13	1866.58
09/19/00	10.17	1866.54
10/17/00	10.07	1866.64
11/30/00	9.87	1866.84
05/10/01	9.07	1867.64
06/26/01	8.99	1867.72
07/24/01	9.40	1867.31
08/21/01	9.83	1866.88
09/19/01	10.06	1866.65
10/23/01	10.00	1866.71
11/29/01	10.02	1866.69
12/18/01	10.06	1866.65
05/14/02	9.65	1867.06
06/25/02	10.35	1866.36
08/20/02	10.93	1865.78
10/01/02	11.11	1865.60
11/19/02	10.89	1865.82
12/17/02	10.98	1865.73
05/21/03	10.09	1866.62
06/17/03	10.25	1866.46
07/22/03	10.67	1866.04
08/20/03	11.23	1865.48
09/16/03	11.49	1865.22
10/21/03	11.46	1865.25
11/18/03	11.40	1865.31
12/09/03	11.38	1865.33
05/19/04	10.67	1866.04
06/22/04	10.49	1866.22
07/27/04	10.95	1865.76
08/25/04	11.06	1865.65
09/07/04	10.90	1865.81
09/21/04	10.96	1865.75
10/18/04	10.82	1865.89
11/22/04	10.68	1866.03
12/13/04	10.76	1865.95
04/13/05	10.59	1866.12
05/18/05	10.48	1866.23
06/13/05	10.29	1866.42
07/26/05	10.87	1865.84
08/24/05	10.97	1865.74
09/20/05	11.09	1865.62

137-070-35AAA1
Streeter Aquifer

MP Elev (msl,ft)=1,904.70
SI (ft.)=78-83

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/10/83	15.69	1889.01
08/26/83	15.66	1889.04
09/12/83	15.72	1888.98
09/25/83	15.69	1889.01
10/25/83	15.68	1889.02
11/08/83	15.73	1888.97
11/27/83	15.73	1888.97
11/30/83	15.71	1888.99
03/22/84	15.85	1888.85
04/24/84	15.66	1889.04
05/15/84	15.61	1889.09
05/30/84	15.64	1889.06
06/20/84	15.54	1889.16
07/24/84	15.73	1888.97
08/21/84	15.69	1889.01
09/22/84	15.75	1888.95
10/23/84	15.63	1889.07
10/25/84	15.63	1889.07
11/25/84	15.66	1889.04
12/20/84	15.73	1888.97
03/22/85	15.94	1888.76
04/21/85	15.99	1888.71
05/25/85	16.05	1888.65
06/21/85	16.06	1888.64
07/24/85	16.26	1888.44
08/21/85	16.37	1888.33
08/22/85	16.35	1888.35
09/23/85	16.38	1888.32
10/20/85	16.43	1888.27
11/14/85	16.50	1888.20
11/22/85	16.46	1888.24
12/21/85	16.50	1888.20
03/20/86	16.69	1888.01
04/20/86	16.37	1888.33
05/23/86	16.24	1888.46
06/22/86	16.22	1888.48
07/21/86	16.17	1888.53
08/20/86	16.16	1888.54
09/17/86	15.95	1888.75
09/19/86	15.95	1888.75
10/19/86	15.91	1888.79
11/23/86	15.80	1888.90
12/22/86	15.82	1888.88
03/20/87	15.72	1888.98
04/20/87	15.46	1889.24
05/21/87	15.07	1889.63
06/21/87	15.10	1889.60
07/20/87	14.96	1889.74
08/20/87	15.07	1889.63
09/21/87	15.11	1889.59
10/21/87	15.11	1889.59
11/20/87	15.15	1889.55
12/19/87	15.12	1889.58
03/20/88	15.27	1889.43
04/21/88	15.40	1889.30

Date	Depth to Water (ft)	WL Elev (msl, ft)
05/21/88	15.53	1889.17
06/21/88	15.67	1889.03
07/20/88	15.82	1888.88
08/20/88	15.90	1888.80
09/19/88	16.03	1888.67
10/20/88	16.15	1888.55
11/21/88	16.23	1888.47
12/20/88	16.32	1888.38
03/20/89	14.61	1890.09
04/20/89	14.62	1890.08
05/21/89	14.75	1889.95
06/21/89	14.91	1889.79
07/20/89	14.84	1889.86
07/24/89	14.95	1889.75
08/21/89	15.07	1889.63
09/19/89	15.16	1889.54
10/20/89	15.28	1889.42
11/21/89	17.48	1887.22
11/22/89	15.36	1889.34
12/22/89	15.44	1889.26
02/27/90	17.70	1887.00
03/21/90	15.65	1889.05
04/21/90	15.80	1888.90
05/19/90	15.85	1888.85
06/19/90	15.80	1888.90
07/20/90	16.11	1888.59
08/20/90	16.27	1888.43
09/21/90	16.30	1888.40
10/20/90	16.38	1888.32
11/21/90	16.47	1888.23
12/13/90	18.45	1886.25
12/22/90	16.54	1888.16
03/21/91	18.80	1885.90
04/21/91	18.89	1885.81
05/21/91	18.88	1885.82
06/07/91	19.04	1885.66
06/20/91	19.06	1885.64
07/21/91	19.25	1885.45
08/19/91	19.35	1885.35
09/20/91	19.35	1885.35
10/21/91	19.47	1885.23
11/14/91	19.35	1885.35
11/20/91	19.43	1885.27
12/22/91	19.53	1885.17
03/22/92	19.72	1884.98
04/20/92	19.81	1884.89
05/18/92	19.94	1884.76
05/20/92	19.94	1884.76
06/12/92	20.15	1884.55
06/19/92	19.99	1884.71
07/18/92	20.14	1884.56
08/23/92	20.50	1884.20
09/20/92	20.31	1884.39
10/19/92	20.41	1884.29
11/23/92	20.38	1884.32
12/21/92	20.44	1884.26

137-070-35AAA1
Streeter Aquifer

MP Elev (msl,ft)=1,904.70
SI (ft.)=78-83

Date	Depth to Water (ft)	WL Elev (msl, ft)
12/26/92	20.44	1884.26
03/20/93	20.64	1884.06
04/21/93	20.71	1883.99
05/22/93	20.68	1884.02
06/19/93	20.71	1883.99
07/21/93	20.46	1884.24
08/22/93	20.46	1884.24
09/20/93	20.28	1884.42
10/22/93	20.21	1884.49
11/19/93	20.10	1884.60
12/20/93	19.86	1884.84
03/20/94	19.79	1884.91
04/20/94	19.72	1884.98
05/05/94	19.61	1885.09
05/21/94	19.59	1885.11
06/02/94	19.62	1885.08
06/19/94	19.55	1885.15
07/20/94	19.30	1885.40
08/21/94	19.32	1885.38
09/21/94	19.18	1885.52
10/19/94	18.94	1885.76
11/22/94	18.89	1885.81
11/30/94	18.83	1885.87
12/20/94	18.80	1885.90
03/20/95	18.73	1885.97
04/19/95	18.44	1886.26
05/21/95	18.24	1886.46
06/22/95	18.15	1886.55
07/21/95	17.85	1886.85
08/20/95	17.86	1886.84
09/19/95	17.65	1887.05
10/26/95	17.42	1887.28
05/02/96	16.78	1887.92
08/08/96	16.76	1887.94
09/20/96	16.68	1888.02
10/24/96	16.71	1887.99
12/05/96	16.54	1888.16
05/22/97	15.80	1888.90
06/30/97	15.55	1889.15
07/30/97	15.42	1889.28
08/12/97	15.48	1889.22
09/16/97	15.33	1889.37
10/14/97	15.27	1889.43
11/11/97	15.28	1889.42
12/10/97	15.24	1889.46
05/12/98	15.05	1889.65
07/15/98	15.27	1889.43
08/25/98	15.29	1889.41
10/13/98	15.42	1889.28
11/30/98	15.36	1889.34

Date	Depth to Water (ft)	WL Elev (msl, ft)
06/01/99	15.08	1889.62
06/29/99	14.96	1889.74
07/27/99	14.90	1889.80
09/08/99	14.54	1890.16
10/05/99	14.60	1890.10
11/02/99	14.53	1890.17
12/07/99	14.46	1890.24
05/17/00	14.36	1890.34
06/14/00	14.46	1890.24
07/12/00	14.40	1890.30
08/15/00	14.72	1889.98
09/19/00	14.77	1889.93
10/17/00	14.78	1889.92
11/30/00	14.65	1890.05
05/10/01	14.69	1890.01
06/26/01	14.67	1890.03
07/24/01	14.82	1889.88
08/21/01	14.89	1889.81
09/19/01	14.95	1889.75
10/23/01	14.89	1889.81
11/29/01	14.96	1889.74
12/18/01	14.98	1889.72
05/14/02	15.30	1889.40
06/25/02	15.53	1889.17
06/27/02	15.55	1889.15
08/20/02	15.80	1888.90
10/01/02	16.03	1888.67
11/19/02	16.13	1888.57
12/17/02	16.14	1888.56
05/21/03	16.33	1888.37
06/17/03	16.48	1888.22
07/22/03	16.70	1888.00
08/20/03	16.81	1887.89
09/16/03	16.88	1887.82
10/21/03	16.94	1887.76
11/18/03	16.88	1887.82
12/09/03	16.98	1887.72
05/19/04	17.05	1887.65
06/22/04	16.94	1887.76
07/27/04	17.01	1887.69
08/25/04	16.95	1887.75
09/21/04	16.83	1887.87
10/18/04	16.70	1888.00
11/22/04	16.60	1888.10
12/13/04	16.65	1888.05
04/13/05	16.83	1887.87
05/18/05	16.79	1887.91
06/13/05	16.71	1887.99
07/26/05	16.99	1887.71
08/24/05	16.97	1887.73
09/20/05	16.99	1887.71

137-070-35AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,904.50
SI (ft.)=21-26

Date	Depth to Water (ft)	WL Elev (msl, ft)
08/10/83	8.67	1895.83
08/26/83	8.68	1895.82
09/25/83	8.79	1895.71
10/25/83	8.70	1895.80
11/08/83	8.77	1895.73
11/27/83	8.77	1895.73
11/30/83	8.77	1895.73
03/22/84	8.91	1895.59
04/24/84	8.15	1896.35
05/15/84	8.14	1896.36
05/30/84	8.35	1896.15
06/20/84	8.27	1896.23
07/24/84	8.65	1895.85
08/21/84	8.82	1895.68
09/22/84	9.04	1895.46
10/23/84	8.70	1895.80
10/25/84	8.70	1895.80
12/20/84	8.83	1895.67
03/22/85	8.88	1895.62
04/21/85	8.87	1895.63
05/25/85	9.22	1895.28
06/21/85	9.32	1895.18
07/24/85	9.68	1894.82
08/21/85	9.90	1894.60
08/22/85	9.90	1894.60
09/23/85	9.94	1894.56
10/20/85	9.91	1894.59
11/14/85	10.06	1894.44
11/22/85	10.05	1894.45
12/21/85	10.14	1894.36
03/20/86	9.56	1894.94
04/20/86	9.01	1895.49
05/23/86	8.98	1895.52
06/22/86	9.11	1895.39
07/21/86	9.12	1895.38
08/20/86	9.41	1895.09
09/17/86	9.12	1895.38
09/19/86	9.12	1895.38
10/19/86	9.01	1895.49
11/23/86	8.97	1895.53
12/22/86	9.03	1895.47
03/20/87	8.77	1895.73
04/20/87	8.09	1896.41
05/21/87	7.95	1896.55
06/21/87	8.17	1896.33
07/20/87	7.94	1896.56
08/20/87	8.17	1896.33
09/21/87	8.33	1896.17
10/21/87	8.34	1896.16
11/20/87	8.38	1896.12
12/19/87	8.38	1896.12
03/20/88	8.55	1895.95
04/21/88	8.66	1895.84
05/21/88	8.88	1895.62
06/21/88	9.29	1895.21

Date	Depth to Water (ft)	WL Elev (msl, ft)
07/20/88	9.74	1894.76
08/20/88	9.97	1894.53
09/19/88	9.99	1894.51
10/20/88	10.12	1894.38
11/21/88	10.20	1894.30
12/20/88	10.37	1894.13
03/20/89	10.60	1893.90
04/20/89	9.97	1894.53
05/21/89	10.25	1894.25
06/21/89	10.44	1894.06
07/20/89	10.66	1893.84
07/24/89	10.89	1893.61
08/21/89	11.10	1893.40
09/19/89	11.27	1893.23
10/20/89	11.33	1893.17
11/21/89	11.44	1893.06
11/22/89	11.42	1893.08
12/22/89	11.67	1892.83
02/27/90	11.95	1892.55
03/21/90	11.85	1892.65
04/21/90	11.88	1892.62
05/19/90	11.69	1892.81
06/19/90	11.47	1893.03
07/20/90	12.17	1892.33
08/20/90	12.54	1891.96
09/21/90	12.56	1891.94
10/20/90	12.61	1891.89
11/21/90	12.77	1891.73
12/13/90	12.80	1891.70
12/22/90	12.92	1891.58
03/21/91	13.16	1891.34
04/21/91	13.01	1891.49
05/21/91	12.92	1891.58
06/07/91	13.22	1891.28
06/20/91	13.31	1891.19
07/21/91	13.69	1890.81
08/19/91	13.94	1890.56
09/20/91	13.91	1890.59
10/21/91	14.02	1890.48
11/14/91	13.95	1890.55
11/20/91	13.85	1890.65
12/22/91	14.18	1890.32
03/22/92	14.15	1890.35
04/20/92	14.15	1890.35
05/18/92	14.15	1890.35
05/20/92	14.20	1890.30
06/12/92	14.48	1890.02
06/19/92	14.25	1890.25
07/18/92	14.58	1889.92
08/23/92	14.70	1889.80
09/20/92	14.93	1889.57
10/19/92	14.94	1889.56
11/23/92	15.02	1889.48
12/21/92	15.02	1889.48
03/20/93	15.30	1889.20

137-070-35AAA2
Streeter Aquifer

MP Elev (msl,ft)=1,904.50
SI (ft.)=21-26

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/21/93	14.84	1889.66
05/22/93	14.96	1889.54
06/19/93	15.07	1889.43
07/21/93	14.23	1890.27
08/22/93	14.08	1890.42
09/20/93	13.90	1890.60
10/22/93	13.77	1890.73
11/19/93	13.73	1890.77
12/20/93	13.70	1890.80
03/20/94	13.24	1891.26
04/20/94	12.95	1891.55
05/05/94	12.64	1891.86
05/21/94	12.80	1891.70
06/02/94	12.96	1891.54
06/19/94	12.86	1891.64
07/20/94	12.61	1891.89
08/21/94	12.73	1891.77
09/21/94	12.55	1891.95
10/19/94	12.19	1892.31
11/22/94	12.39	1892.11
11/30/94	12.32	1892.18
12/20/94	12.43	1892.07
03/20/95	11.41	1893.09
04/19/95	11.12	1893.38
05/21/95	10.80	1893.70
06/22/95	10.68	1893.82
07/21/95	10.33	1894.17
08/20/95	10.69	1893.81
09/19/95	10.45	1894.05
10/26/95	10.20	1894.30
05/02/96	8.89	1895.61
08/08/96	9.58	1894.92
09/20/96	9.63	1894.87
10/24/96	9.75	1894.75
12/05/96	9.66	1894.84
05/22/97	7.88	1896.62
06/30/97	7.87	1896.63
07/30/97	7.91	1896.59
08/12/97	8.05	1896.45
09/16/97	8.06	1896.44
10/14/97	8.02	1896.48
11/11/97	8.04	1896.46
12/10/97	8.05	1896.45
05/12/98	7.65	1896.85
07/15/98	8.14	1896.36
08/25/98	8.28	1896.22
10/13/98	8.52	1895.98
11/30/98	8.42	1896.08
06/01/99	7.52	1896.98
06/29/99	7.37	1897.13
07/27/99	7.43	1897.07
09/08/99	7.07	1897.43
10/05/99	7.20	1897.30
11/02/99	7.16	1897.34
12/07/99	7.16	1897.34
05/17/00	7.20	1897.30
06/14/00	7.36	1897.14
07/12/00	7.26	1897.24
08/15/00	7.75	1896.75
09/19/00	8.00	1896.50
10/17/00	7.99	1896.51
11/30/00	7.86	1896.64
05/10/01	7.56	1896.94
06/26/01	7.67	1896.83
07/24/01	6.95	1897.55
08/21/01	8.11	1896.39
09/19/01	8.34	1896.16
10/23/01	8.30	1896.20
11/29/01	8.36	1896.14
12/18/01	8.44	1896.06
05/14/02	8.61	1895.89
06/25/02	9.09	1895.41
06/27/02	9.15	1895.35
08/20/02	9.55	1894.95
10/01/02	9.84	1894.66
11/19/02	9.87	1894.63
12/17/02	9.95	1894.55
05/21/03	9.74	1894.76
06/17/03	10.05	1894.45
07/22/03	10.45	1894.05
08/20/03	10.84	1893.66
09/16/03	10.90	1893.60
10/21/03	10.89	1893.61
11/18/03	10.79	1893.71
12/09/03	10.85	1893.65
05/19/04	10.64	1893.86
06/22/04	10.18	1894.32
07/27/04	10.16	1894.34
08/25/04	10.22	1894.28
09/21/04	10.16	1894.34
10/18/04	10.05	1894.45
11/22/04	9.99	1894.51
12/13/04	10.17	1894.33
04/13/05	10.37	1894.13
05/18/05	10.31	1894.19
06/13/05	10.18	1894.32
07/26/05	10.56	1893.94
08/24/05	10.59	1893.91
09/20/05	10.66	1893.84

137-070-35CCD
Streeter Aquifer

MP Elev (msl,ft)=1,897.69
SI (ft.)=58-63

Date	Depth to Water (ft)	WL Elev (msl, ft)
10/04/99	23.62	1874.07
10/05/99	23.63	1874.06
11/02/99	23.58	1874.11
12/07/99	23.57	1874.12
05/17/00	23.35	1874.34
06/14/00	23.80	1873.89
07/12/00	24.06	1873.63
08/15/00	25.19	1872.50
09/19/00	24.59	1873.10
10/17/00	24.31	1873.38
11/30/00	24.09	1873.60
05/10/01	23.50	1874.19
06/26/01	23.52	1874.17
07/24/01	23.98	1873.71
08/21/01	24.39	1873.30
09/19/01	24.47	1873.22
10/23/01	24,22	1873.47
11/29/01	24.19	1873.50
12/18/01	24.27	1873.42
05/14/02	23.94	1873.75
06/25/02	26.72	1870.97
08/20/02	25.72	1871.97
10/01/02	25.65	1872.04
11/19/02	25.17	1872.52
12/17/02	25.18	1872.51
05/21/03	24.54	1873.15
06/17/03	24.65	1873.04
07/22/03	25.15	1872.54
08/20/03	25.72	1871.97
09/16/03	25.85	1871.84
10/21/03	25.61	1872.08
11/18/03	25.49	1872.20
12/09/03	25.49	1872.20
05/19/04	24.92	1872.77
06/22/04	26.80	1870.89
07/27/04	27.59	1870.10
08/25/04	25.75	1871.94
09/07/04	25.35	1872.34
09/21/04	25.30	1872.39
10/18/04	24.80	1872.89
11/22/04	24.54	1873.15
12/13/04	24.63	1873.06
04/13/05	24.58	1873.11
05/18/05	24.45	1873.24
06/13/05	24.38	1873.31
07/26/05	25.06	1872.63
08/24/05	25.14	1872.55
09/20/05	25.12	1872.57

137-071-01DCC
Streeter Aquifer

MP Elev (msl,ft)=0.00
SI (ft.)=0-0

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/13/05	3.06	-3.06
05/18/05	2.83	-2.83
06/13/05	2.37	-2.37
07/26/05	2.58	-2.58
08/24/05	2.60	-2.60
09/20/05	2.79	-2.79

137-071-24ADD
Streeter Aquifer

MP Elev (msl,ft)=0.00
SI (ft.)=0-0

Date	Depth to Water (ft)	WL Elev (msl, ft)
04/13/05	1.00	-1.00
05/18/05	0.49	-0.49
06/13/05	-0.41	0.41
07/26/05	0.87	-0.87
08/24/05	0.65	-0.65
09/20/05	1.02	-1.02

APPENDIX III

WATER CHEMISTRY ANALYSES

Appendix III.--Chemical analyses for water samples collected in the Streeter aquifer study area.

Location	Screened Interval (ft)	Date Sampled	(milligrams per liter) SiO_2	Fe	Mn	Ca	Mg	Na	K	HCO_3	CO_3	SO_4	Cl	F	NO_3	B	TDS	Hardness as $CaCO_3$	NCH	Na	SAR	Spec Cond (µmho)	Temp (°C)	pH
135-069-06CCC	48-53	8/3/82	28	4	1.6	88	51	85	14	589	0	130	9.6	0.2	2.2	0.21	704	430	0	29	2	1100	15	
135-069-06CCC	48-53	7/19/89	27	3	1.3	79	45	85	13	550	0	100	9.1	0.2	1	0.21	635	380	0	32	1.9	423	10	
135-069-06CCC	48-53	9/16/92	28	0.02	0.63	77	45	75	12	545	0	100	8.9	0.2	4.5	0.25	620	380	0	29	1.7	974	8	7.41
135-069-06CCC	48-53	8/8/96		4.2	1.3	83	47	73	11	519	0	160	9	0.2	1.2		646	400	0	28	1.6	990		
135-069-06CCC	48-53	6/27/02		4.2	1.5	94	49	80	12	664	0	120	14	0.2	0.1		702	440	0	28	1.7	1033		
135-069-07AAA	0-0	8/10/83	30	0.03	0.02	27	140	170	60	742	55	310	53	0.2	1	0.36	1210	640	0	34	2.9	1800	24	
135-069-09CCC	0-33	6/16/78	21	0	1.1	270	62	57	8.2	476	0	450	130	0.2	31	0.2	1260	930	540	12	0.8	1750	7.9	7.2
135-070-02BCC1	0-250	8/14/79	21	14	0.48	110	43	310	13	686	0	560	14	0.1	0	0.73	1420	450	0	59	6.4	2000	8	7
135-070-12CDD	0-135	5/25/78	26	0.4	0.65	100	46	230	14	577	0	440	17	0.1	4.8	0.64	1160	440	0	52	4.8	1600	10	7
135-071-08BDC	196-268	6/14/78	15	0.45	0.08	78	21	42	8.8	386	0	66	2.6	0.1	1	0	425	280	0	24	1.1	680	9.4	7.4
136-069-04CCC2	70-73	8/10/79	29	0.22	0.62	130	38	210	11	516	0	420	39	0.2	1	0.13	1130	480	57	48	4.2	1600	8.5	7.9
136-069-04CCC2	70-73	7/27/93	26	0.02	0.01	130	42	190	15	477	0	470	43	0.2	3.2	0.26	1150	500	110	44	3.5	1419	11	
136-069-09DAD	0-46	10/27/77	24	0.16	0.46	210	64	64	5	388	0	340	160		4.3	0.1	1060	790	470	15	1	1750	8	7.3
136-069-18CCC2	52-55	10/23/79	28	0.28	0.88	110	40	41	5.4	436	0	170	10	0.2	1	0.03	622	440	82	17	0.8	790	7	7.4
136-069-18CCC2	52-55	7/1/81	25	2.8	1.3	130	40	57	7.5	459	0	240	8.5	0.2	1	0.19	739	490	110	20	1.1	1000	9	
136-069-18CCC2	52-55	7/19/89	26	1.4	1.2	130	46	45	6.3	403	0	240	11	0.2	1	0.19	707	510	180	16	0.9	1070	10	
136-069-18CCC2	52-55	9/16/92	25	0.04	0.76	120	41	43	5.2	439	0	200	7.9	0.2	2.7	0.2	662	470	110	16	0.9	944	8	7.45
136-069-18CCC2	52-55	8/8/96		1.9	0.88	120	43	35	4.3	433	0	210	9.9	0.1	0.6		639	480	120	14	0.7	950		
136-069-18CCC2	52-55	6/27/02		0.66	0.83	100	35	55	5.3	423	0	180	8.5	0.2	0.1		594	390	47	23	1.2	874		
136-069-21BAA	180-200	10/27/77	28	1.9	2.5	210	55	63	11	550	0	420	10	0.1	1	0.1	1070	750	300	15	1	1400	8.5	7
136-070-03ABB2	58-63	10/4/99		0.01	0.26	61	23	13	1.9	279	0	53	4.5	0.1	3.7		297	250	18	10	0.4	515		
136-070-03ABB2	58-63	9/7/04	26.2	<0.01	0.374	67.4	23.2	5.6	2.2	264	<1	47.7	2.89	0.106	12.6		294	264	46	4.3	0.15	489	9.8	7.95
136-070-03DCC	43-48	8/11/83	30	0	0.71	77	27	6.5	3.3	269	0	90	3.1	0.2	1	0.04	372	300	83	4	0.2	600	21	
136-070-03DCC	43-48	9/16/92	27	0.03	0.64	81	29	6.5	2.5	278	0	120	4.7	0.1	0.6	0.06	409	320	94	4	0.2	620	8	7.8
136-070-03DCC	43-48	8/8/96		0.02	0.7	88	31	7	2.2	273	0	140	5.2	0.2	1		409	350	120	4	0.2	640		
136-070-03DCC	43-48	6/27/02		0.1	0.89	99	35	11	3	321	0	160	7.1	0.2	0.1		474	390	130	6	0.2	715		
136-070-04ACA2	54-71	7/18/00		0.07	0.91	71	24	6	1.9	253	0	81	0	0.1	0.1		310	280	68	4	0.2	496		
136-070-04ACA3	60.5-69.5	7/18/00		0.53	0.88	74	24	6.5	2.1	263	0	72	0	0.1	6.8		317	280	68	5	0.2	506		
136-070-04CCB	48-51	9/11/79	29	0.45	1.2	74	28	27	4	352	0	65	0.7	0.2	1	0.07	404	300	11	16	0.7	650	9	
136-070-04CCC2	31-56	9/4/79	30	0.2	1.1	72	32	26	3.9	340	0	90	0	0.2	0.9	0	423	310	31	15	0.6	720	11	
136-070-04CCC2	31-56	9/5/79	29	0.18	1.1	71	32	26	4	338	0	84	0	0.2	1	0.07	416	310	33	15	0.6	680	7	
136-070-04CCC2	31-56	9/6/79	29	0.18	1.1	73	33	26	3.8	339	0	87	0	0.2	1	0.33	422	320	42	15	0.6		9	
136-070-04CCC3	39-59	9/11/79	29	0.02	1.2	74	30	26	4	349	0	84	0.6	0.2	1	0	422	310	24	15	0.6	700	10	
136-070-04CCC4	50-53	9/11/79	28	0.06	1.2	74	35	25	4	348	0	85	0	0.2	1	0.1	425	330	45	14	0.6	690	11	
136-070-04CCC5	18-21	9/11/79	28	0.06	0.74	71	35	25	4	344	0	89	0.9	0.2	1	0.17	424	320	38	14	0.6	690	12	
136-070-05AAA1	112-115	10/31/78	25	0	0.31	67	42	200	8.3	549	0	240	70	0.5	1	0.16	924	340	0	55	4.7	1065	9	7.5
136-070-05AAA1	112-115	10/11/79	27	0.32	0.76	68	44	200	8	562	0	240	70	0.4	1	0.36	937	350	0	55	4.6	1380	9	8.3
136-070-05AAA1	112-115	7/21/89	25	0.04	0.39	59	41	200	9.8	506	0	220	69	0.4	1	0.47	875	320	0	57	4.9	1550	10	
136-070-05AAA1	112-115	7/28/93	24	0.02	0.01	61	43	190	9.9	518	0	230	69	0.4	0.8	0.41	884	330	0	55	4.5	1253	10	
136-070-05AAA1	112-115	7/30/97		0.05	0.19	39	39	210	11	504	0	230	74	0.5	0.09		852	260	0	63	5.7	1208	8	
136-070-05AAA1	112-115	6/27/02		0.04	0.11	25	36	210	9.2	463	0	230	56	0.4	0.3		795	210	0	67	6.3	1171		
136-070-05AAA2	54-57	11/2/78	26	0.06	0.96	64	20	28	3.2	264	0	88	5	0.2	0.2	0.16	366	240	24	20	0.8	565	9	6.4
136-070-05AAA2	54-57	5/7/79	30	0	1.2	63	20	30	3.4	272	0	73	4.8	0.1	0.1	0.24	360	240	17	21	0.8	445	7.5	6.6
136-070-05AAA2	54-57	10/11/79	29	0.02	0.98	64	22	27	3.4	277	0	81	7	0.2	1	0.03	372	250	23	19	0.7	530	8.5	7.25
136-070-05AAA2	54-57	7/25/85	30	1	1.1	63	21	28	4.4	240	0	81	8.3	0.2	1	0.11	357	240	47	20	0.8	570	9	7.5
136-070-05AAA2	54-57	7/21/89	29	0.2	1.1	62	20	27	4.1	277	0	76	7.6	0.4	1	0.13	365	240	10	19	0.8	617	12	
136-070-05AAA2	54-57	7/27/93	27	0.01	0.82	65	22	26	3.4	263	0	91	7.9	0.2	0.7	0.1	374	250	37	18	0.7	500	9	
136-070-05AAA2	54-57	7/30/97		0.22	1.1	68	23	29	3.8	300	0	81	8.9	0.2	0.09		363	260	18	19	0.8	574	8	
136-070-05AAA2	54-57	6/27/02		0.32	1.1	64	22	26	3.1	287	0	80	7.9	0.2	0.1		346	250	15	18	0.7	548		
136-070-05AAD1	58-61	8/8/79	29	0	1	68	20	9.5	2.8	245	0	68	2.1	0.1	1	0	323	250	49	7	0.3	530	8	7.5
136-070-05AAD1	58-61	7/28/93	28	0.02	1.1	67	22	8.5	3.8	249	0.	72	4.1	0.1	0.4	0.05	330	260	54	7	0.2	471	9	
136-070-05AAD1	58-61	7/30/97		0.21	1	66	22	9	2.5	248	0	69	4.3	0.1	0.09		296	260	52	7	0.2	463	8	
136-070-05AAD1	58-61	6/27/02		0.17	0.96	61	22	10	2.5	239	0	80	1.5	0.1	0.1		296	240	47	8	2.8	478		
136-070-06AAA1	0-161	11/6/78	22	0	1.1	70	23	22	3.8	284	0	71	4.6	0.1	1	0.03	359	270	37	15	0.6	1520	7.5	7.5
136-070-06AAC	0-0	8/10/83	57	0.04	1.1	70	50	36	7	528	0	9.9	14	0.3	1	0	506	380	0	17	0.8	800	24	
136-070-06BBB1	158-161	11/6/78	22	0.06	0.88	55	20	270	10	650	0	130	100	0.4	1	0.66	930	220	0	72	7.9	590	9	6.8
136-070-06BBB1	158-161	4/30/79	28	0	1	54	18	280	9.1	649	7	120	100	0.4	0.2	0.67	938	210	0	73	8.4	1450	8	7.1
136-070-06BBB1	158-161	10/11/79	28	0.06	0.86	54	21	280	8.8	684	0	140	110	0.4	1	0.68	982	220	0	72	8.2	1380	8.2	8
136-070-06BBB1	158-161	7/21/89	27	0.16	0.85	49	18	280	12	651	0	130	100	0.1	1	0.9	940	200	0	74	8.6	1519	9	
136-070-06BBB1	158-161	7/28/93	25	0.03	0.85	49	19	270	12	672	0	130	100	0.4	8.3	0.86	946	200	0	73	8.3	1265	9	
136-070-06BBB1	158-161	7/30/97		0.16	0.76	48	18	280	12	668	0	140	100	0.4	0.09		924	190	0	74	8.8	1342	8	
136-070-06BBB1	158-161	6/27/02		0.59	0.71	43	19	280	11	692	0	140	100	0.4	0.1		936	190	0	75	8.8	1372		
136-070-06BBB2	38-41	4/30/79	29	0.02	1.2	67	23	22	3.6	290	0	65	3.7	0.1	1	0.03	359	260	22	15	0.6	550	8.5	6.09
136-070-06BBB2	38-41	10/11/79	29	0.14	0.96	73	21	21	3.3	290	0	75	5.7	0.2	0.3	0	373	270	32	14	0.6	570	8	7.3
136-070-06BBB2	38-41	7/25/85	31	0.38	1.1	68	27	21	4.5	234	0	77	6.2	0.2	1	0.08	352	280	89	14	0.5	560	9	7.4
136-070-06BBB2	38-41	7/20/89	30	0.34	1.1	67	22	20	4.4	289	0	53	5.3	0.1	1	0.1	346	260	21	14	0.5	669	10	
136-070-06BBB2	38-41	7/28/93	27	0.02	0.92	69	23	22	3.7	279	0	80	5.5	0.2	0.8	0.07	369	270	38	15	0.6	536	10	
136-070-06BBB2	38-41	7/30/97		0.67	0.97	68	22	22	3.7	275	0	86	4.2	0.2	0.09		343	260	35	15	0.6	538	9	
136-070-06BBB2	38-41	6/27/02		0.21	1	66	22	21	3.5	269	0	89	4.3	0.2	0.1		340	260	35	15	0.6	573		

Appendix III.--Chemical analyses for water samples collected in the Streeter aquifer study area.

Location	Screened Interval (ft)	Date Sampled	(milligrams per liter)																		Spec	Temp	
			SiO_2	Fe	Mn	Ca	Mg	Na	K	HCO_3	CO_3	SO_4	Cl	F	NO_3	B	TDS	Hardness $CaCO_3$	as NCH	% Na	SAR	Cond (µmho)	(°C)	pH
136-070-06CBB	43-48	10/4/99		0.01	1.2	74	21	21	3.4	299	0	79	4.4	0.2	0.1		351	270	26	14	0.6	589		
136-070-06CBB	43-48	9/7/04	29.7	<0.01	1.17	74.2	21.1	20	3.9	287	<1	79.6	3.31	0.163	0.13		346	272	36	13.5	0.53	558	9.1	7.68
136-070-07BBB	30-35	8/5/83	31	0.05	1.5	90	24	44	7.5	342	0	130	8.1	0.2	1	0.18	506	320	43	22	1.1	890	10	
136-070-07BBB	30-35	7/25/85	32	0.05	1.6	89	24	44	7.2	277	0	140	12	0.2	1.6	0.18	488	320	94	22	1.1	750	8	7.3
136-070-07BBB	30-35	7/20/89	28	0.05	1.6	89	24	43	6.8	336	0	130	9.8	0.2	1	0.15	500	320	45	22	1			
136-070-07BBB	30-35	7/28/93	28	0.02	1.5	88	24	39	6.1	350	0	120	9.7	0.2	2	0.16	491	320	31	21	0.9	672	9	
136-070-07BBB	30-35	7/30/97		0.02	1.6	91	24	39	6.1	342	0	140	9.5	0.2	0.09		480	330	45	20	0.9	683	8	
136-070-07BBB	30-35	6/27/02		0.07	1.4	81	22	42	5.7	364	0	110	7.4	0.2	0.1		449	290	0	23	1.1	680		
136-070-07DAD	0-20	11/1/77	17	0.06	0.16	65	82	110	61	500	15	320	33	0.2	4.5	0.24	954	500	65	29	2.1	1400	9.5	7.7
136-070-07DDA	0-0	8/11/83	43	0.02	0.03	48	110	420	210	1280	140	400	110	0.1	1	0.26	2110	570	0	52	7.6	3150	27	
136-070-08AAA	49-52	9/11/79	28	0.2	1.2	74	28	27	4	331	0	79	0.5	0.2	1	0.2	406	300	28	16	0.7	600	11	
136-070-08AAA2	38-43	10/4/99		0.01	1	67	28	24	3.4	315	0	89	2.4	0.2	0.1		370	280	24	15	0.6	624		
136-070-08AAA2	38-43	9/7/04	28.5	<0.01	1.03	65.3	27	23.3	3.8	300	<1	88	2.8	0.193	0.09		360	274	27	15.3	0.61	584	8.9	7.7
136-070-08BBB	42-47	8/11/83	30	0.01	1.2	72	28	27	4.9	294	0	110	4.4	0.1	0	0.07	423	290	54	16	0.7	740	10	
136-070-08BBB	42-47	8/11/83	30	0.02	1.2	72	28	27	5	228	0	110	4.7	0.1	0	0.08	390	290	110	16	0.7	730	11	
136-070-08BBB	42-47	7/25/85	31	0.02	1.1	70	27	29	5	254	0	110	6.6	0.2	1	0.08	406	290	78	18	0.7	625	8.5	7.8
136-070-08BBB	42-47	7/20/89	28	0.03	1.1	68	27	28	4.7	305	0	100	4.5	0.1	1	0.09	413	280	31	18	0.7	697	9	
136-070-08BBB	42-47	7/28/93	28	0.02	1.1	70	28	27	4	293	0	110	5.1	0.2	0.7	0.07	419	290	50	17	0.7	585	9	
136-070-08BBB	42-47	7/30/97		0.02	1.1	68	26	28	4.1	288	0	110	4.3	0.2	0.09		384	280	41	18	0.7	576	9	
136-070-08BBB	42-47	6/27/02		0.05	1.1	64	26	28	3.6	279	0	110	3.9	0.2	0.1		374	270	38	18	0.7	590		
136-070-08CCB	38-43	10/4/99		0.01	1.1	70	22	13	2.5	266	0	84	0	0.1	0.1		324	270	47	10	0.3	554		
136-070-08CCB	38-43	9/7/04	30	<0.01	1.09	68.8	22.1	12.3	3.1	252	<1	89.1	2.15	0.134	<0.09		324	263	55	9.1	0.33	515	9.5	7.75
136-070-09DDA	38-43	8/11/83	30	0	1.1	81	26	12	3.4	187	0	93	4	0.2	0	0.04	343	310	160	8	0.3	710	10	
136-070-09DDA	38-43	7/25/85	31	0.02	1	78	26	13	3.5	226	0	92	5.3	0.1	1	0.06	362	300	120	9	0.3	590	9	7.7
136-070-09DDA	38-43	7/21/89	29	0.04	1	77	25	13	3.3	289	0	92	3.5	0.1	1	0.07	387	300	58	9	0.3			
136-070-09DDA	38-43	7/28/93	28	0.02	0.96	74	25	13	2.5	275	0	91	4.7	0.1	0.2	0.04	375	290	62	9	0.3	526	9.5	
136-070-09DDA	38-43	7/30/97		0.01	0.98	75	25	13	2.6	280	0	95	5	0.2	0.09		355	290	61	9	0.3	533	8	
136-070-09DDA	38-43	6/27/02		0.05	0.96	73	24	12	2.6	269	0	93	4.5	0.1	0.1		343	280	60	8	0.3	560		
136-070-13BBB	0-0	6/12/78	24	0.06	0.16	78	16	22	3.6	326	0	34	5.2	0.1	2.5	0.1	347	260	0	15	0.6	550	8	7.3
136-070-13BCC	40-60	10/28/77	25	0.04	0.08	69	21	26	3.4	331	0	29	8.1		1	0.24	346	260	0	18	0.7	660		7.4
136-070-14CCA	48-58	7/31/97		0.03	1	99	31	18	3.4	286	0	160	12	0.22	1.77		488	370	140	9	0.4	660	9	
136-070-14CDB	49-64	7/31/97		0.07	1	94	30	14	3.4	273	0	140	9.4	0.22	3.63		450	360	130	8	0.3	628	9	
136-070-15AAA1	38-43	6/29/95		0.33	0.66	66	23	17	3.4	298	0	55	4.2	0.1	1		318	260	15	12	0.5	488	8.8	
136-070-15AAA1	38-43	7/18/00		0.37	0.67	73	25	18	3.5	325	0	63	3.1	0.1	0.1		347	290	19	12	0.5	549		
136-070-15AAA1	38-43	8/23/05	30.3	0.425	0.674	68.9	22.8	15.9	3.7	295	<1	69.6	2.38	0.144	<0.09		331	266	23	11.3	0.42	550	9.8	7.16
136-070-15AAA2	37-42	8/5/83	30	0.24	0.73	73	25	16	4.9	291	0	91	3.6	0.2	1	0.06	389	290	47	11	0.4	670	9	
136-070-15AAA2	37-42	9/16/92	28	0.02	0.59	69	24	17	3.9	298	0	71	3	0.1	1.2	0.1	365	270	27	12	0.5	575	8	7.7
136-070-15AAA2	37-42	6/29/95		0.4	0.65	65	22	18	3.5	300	0	67	4.6	0.2	1		330	250	7	13	0.5	494	9	
136-070-15AAA2	37-42	7/18/00		0.44	0.68	75	24	19	3.6	319	0	64	3	0.1	0.1		347	290	24	13	0.5	550		
136-070-15AAA2	37-42	8/23/05	30.2	0.427	0.682	68.8	22.5	17	3.8	293	<1	69.7	2.62	0.152	<0.09		331	265	23	12	0.45	553	10.5	7.01
136-070-15AAA3	8.5-13	6/29/95		0.01	0.05	61	21	6.5	1.2	275	0	22	2.3	0.2			259	240	13	6	0.2	426	9.8	
136-070-15AAA3	8.5-13	7/18/00		0.02	0.03	69	22	5.5	1.2	280	0	19	0	0.1	35		290	260	33	4	0.1	475		
136-070-15AAA3	8.5-13	8/23/05	27.2	0.158	0.059	65.6	19.5	6.1	1.8	274	<1	16.1	0.78	0.157	36.3		283	244	18	5.1	0.17	488	14.2	7.25
136-070-15CCC2	48-52	11/2/78	26	0.04	0.8	67	25	30	4.5	293	0	100	4.4	0.2	0.2	0.2	402	270	30	19	0.8	525	9.5	7.61
136-070-15CCC2	48-52	5/24/85	31	0.1	0.79	67	27	28	5.3	298	0	89	2.5	0.1	1	0.03	399	280	34	18	0.7	640	9.2	7.72
136-070-15CCC2	48-52	9/15/87	21	0.07	0.72	63	27	28	5.7	185	0	89	3.6	0.1	1	0.06	330	270	120	18	0.7	625	12	7.1
136-070-15CCC2	48-52	8/27/98		0.14	0.76	72	29	34	4.3	326	0	110	7.6	0.2	0.1		419	300	32	20	0.9	628		
136-070-15CCC2	48-52	9/7/04	26.5	0.061	0.96	82.7	33.5	32.9	5.2	314	<1	155	14	0.13	<0.09		480	345	86	16.9	0.77	743	9.6	7.62
136-070-16BBB2	48-51	11/1/78	27	0.02	1	70	28	27	4.4	302	0	100	4.1	0.1	0.2	0.1	411	290	42	17	0.7	650	9.5	7.25
136-070-16BBB2	48-51	7/1/81	27	0.27	1.1	66	28	34	5.6	317	0	100	3.5	0.2	1	0.03	423	280	20	21	0.9	610	9	
136-070-16BBB2	48-51	7/25/85	30	1	1	65	28	29	5.7	266	0	98	6.1	0.2	1	0.09	396	280	59	18	0.8	600	8.5	7.2
136-070-16BBB2	48-51	7/20/89	27	0.58	1	64	27	29	5.2	312	0	86	4	0.1	1	0.09	399	270	15	19	0.8	670	10	
136-070-16BBB2	48-51	7/29/93	27	0.03	0.77	64	28	27	4.7	307	0	91	5	0.1	0.4	0.08	399	270	23	17	0.7	458	8.7	
136-070-16BBB2	48-51	7/30/97		0.42	0.99	65	28	29	5	312	0	93	5.4	0.2	0.09		381	280	22	18	0.8	567	8	
136-070-16BBB2	48-51	6/27/02		0.49	1	65	28	29	4.7	292	0	110	3.7	0.2	0.1		386	280	38	18	0.8	614		
136-070-17BCC	29-34	10/4/99		0.35	0.87	59	29	16	3	277	0	81	2.8	0.2	0.1		328	270	40	11	0.4	551		
136-070-17BCC	29-34	9/7/04	30	0.46	0.876	65.8	30.3	15.9	3.3	297	<1	81.1	1.46	0.182	<0.09		346	289	45	10.5	0.41	566	9.1	7.7
136-070-17DDD1	161-164	10/27/78	26	0	1.1	84	15	320	12	664	0	190	190	0.3	0.7	0.55	1170	270	0	71	8.5	1950	9.5	7.6
136-070-17DDD2	39-42	10/27/78	26	0	1.1	73	26	13	3.2	257	0	96	2.8	0.1	1	0.1	369	290	79	9	0.3	560	9	6.3
136-070-17DDD2	39-42	4/30/79	29	0.08	1.1	72	24	14	3.2	259	0	91	3.1	0.1	0.1	0.12	366	280	67	10	0.4	550	8	7.3
136-070-17DDD2	39-42	10/11/79	29	0.06	0.98	74	26	12	2.4	264	0	100	4.5	0.1	1	0.06	380	290	73	8	0.3	530	8	7.8
136-070-17DDD2	39-42	7/15/81	28	0.26	1.1	72	24	17	3.7	272	0	94	2.9	0.1	1	0.37	378	280	57	12	0.4	520	9	
136-070-17DDD2	39-42	7/25/85	31	0.27	1	70	24	13	3.6	214	0	93	5.3	0.1	1	0.04	347	270	98	9	0.3	550	8.5	7.7
136-070-17DDD2	39-42	7/20/89	30	0.14	1	68	23	13	3.4	250	0	73	2.8	0.1	1	0.06	339	260	59	10	0.4	545	12	
136-070-17DDD2	39-42	6/29/95		0.28	1	68	23	13	2.7	252	0	95	2.2	0.1	1		330	260	58	10	0.4	488	8.7	
136-070-17DDD2	39-42	7/18/00		0.33	0.97	72	24	14	2.4	251	0	90	5.1	0.1	0.1		333	280	73	10	0.4	529		
136-070-17DDD2	39-42	8/23/05	29.4	0.254	0.976	71.5	23.6	12.2	2.9	238	<1	111	5.47	0.124	<0.09		346	276	80	8.6	0.32	564	12.6	8.07
136-070-18BBA1	150-153	5/6/80	25	0.01	0.91	43	15	250	7.3	560	0	200	51	0.5	1	0.64	870	170	0	75	8.3		7.5	7.6
136-070-18BBA1	150-153	7/15/81	18	0.48	1.4	39	15	250	12	570	0	200	44	0.6	1	1.3	864	160	0	76	8.6	1200	9	

Appendix III.--Chemical analyses for water samples collected in the Streeter aquifer study area.

Location	Screened Interval (ft)	Date Sampled	SiO_2	Fe	Mn	Ca	Mg	Na	K	HCO_3	CO_3	SO_4	Cl	F	NO_3	B	TDS	Hardness $CaCO_3$	as NCH	% Na	SAR	Spec Cond (µmho)	Temp (°C)	pH
			(milligrams per liter)																					
136-070-18BBA1	150-153	7/25/85	27	0.06	0.71	38	14	250	10	477	8	200	47	0.6	1	0.6	832	150	0	77	8.9	1250	9	7.9
136-070-18BBA2	33-36	5/5/80	27	0.01	1.2	69	26	24	2.8	326	0	61	6.6	0.2	1	0.16	380	280	13	16	0.6		8	7
136-070-18BBA2	33-36	7/15/81	29	0.11	1.2	66	26	30	4.9	333	0	55	5.6	0.2	1	0.46	383	270	0	19	0.8	540	9	
136-070-18BBA2	33-36	7/25/85	31	0.4	1.1	66	23	24	4.6	256	0	61	7.4	0.2	1	0.12	346	260	49	16	0.6	560	8	7.3
136-070-18BBB	23-28	8/2/91	27	0.01	1.2	62	20	30	4	311	0	51	3.8	0.2	1	0.13	353	240	0	21	0.8	549	10	
136-070-18BBB	23-28	6/29/95		0.02	1.3	62	21	31	4.1	317	0	70	5.8	0.2	1		352	240	0	22	0.9	533	8	
136-070-18BBB	23-28	7/17/00		0.4	2.1	64	20	32	4.1	318	0	45	4.6	0.2	0.1		330	240	0	22	0.9	551		
136-070-18BBB	23-28	8/23/05	28.1	0.169	1.6	62.2	19.4	31	4.1	309	<1	59.8	4.1	0.179	<0.09		335	235	0	21.8	0.88	556	9.4	5.8
136-070-18CDC	21-26	10/5/99		0.05	1.5	74	24	42	4.5	336	0	100	4.3	0.2	0.1		417	280	8	24	1.1	672		
136-070-18CDC	21-26	9/7/04	29.8	0.021	1.63	84.3	25.6	38.8	4.5	338	<1	121	4.48	0.168	<0.09		447	316	38	20.7	0.95	700	8.5	7.72
136-070-19DAA	25-30	10/5/99		0.03	1.1	69	23	21	3.7	270	0	97	3.7	0.2	0.1		352	270	45	14	0.6	564		
136-070-19DAA	25-30	9/7/04	30	<0.01	1.08	69.5	21.9	18.4	3.6	256	<1	100	3.09	0.143	<0.09		345	264	53	12.9	0.49	540	9.2	7.84
136-070-20DDA1	33-36	5/5/80	27	0.01	0.65	69	24	25	2.1	262	0	110	3.2	0.1	1	0.16	391	270	55	17	0.7		8.5	7
136-070-20DDA1	33-36	7/1/81	28	0.27	0.71	63	25	30	3.9	267	0	110	1.5	0.2	1	0.13	396	260	41	20	0.8	580	9	
136-070-20DDA1	33-36	7/25/85	31	0.21	0.64	64	26	24	3.9	233	4	110	4.5	0.2	1	0.09	385	270	69	16	0.6	570	9	7.2
136-070-20DDA1	33-36	7/19/89	29	0.16	0.65	62	25	23	3.5	256	0	100	3.2	0.1	1	0.1	374	260	48	16	0.6	564	14	
136-070-20DDA1	33-36	7/29/93	28	0.03	0.6	63	26	23	2.8	240	0	120	4.4	0.2	0	0.07	386	260	68	16	0.6	542	9	
136-070-20DDA1	33-36	7/30/97		0.3	0.82	82	33	26	3.3	247	0	190	13	0.2	0.09		471	340	140	14	0.6	667	8	
136-070-20DDA1	33-36	6/27/02		0.35	0.95	100	40	24	3.2	319	0	220	16	0.1	0.1		562	410	150	11	0.5	819		
136-070-22ABD	0-0	6/26/02		0.41	0.65	89	35	24	4.3	351	0	110	10	0.2	7.3		454	370	79	12	0.5	721		
136-070-22BAC	46-61	7/31/97		0.29	0.68	78	33	28	4.9	310	0	140	11	0.2	4.29		453	330	76	15	0.7	660	9	
136-070-22BAC	46-61	6/26/02		0.39	0.72	90	39	28	4.8	333	0	170	15	0.1	5.8		518	390	110	13	0.6	788		
136-070-22CCC	32-37	8/2/91	28	0.03	0.53	65	24	19	2.5	240	0	110	3.6	0.2	1	0.07	372	260	64	14	0.5	564	11	
136-070-22CCC	32-37	6/29/95		0.25	0.65	70	25	18	3	244	0	130	5.6	0.3	1		374	280	78	12	0.5	558	8.5	
136-070-22CCC	32-37	7/17/00		0.31	0.55	71	24	19	2.9	273	0	100	7.2	0.2	0.1		359	230	52	13	0.5	558		
136-070-22CCC	32-37	8/23/05	29.8	0.333	0.794	89.5	31.2	20.2	3.7	248	<1	203	8.9	0.144	<0.09		481	352	148	10.9	0.47	732	11.6	7.85
136-070-22CDB	35-50	7/28/89	26	0.07	0.7	74	25	13	3.8	244	0	110	11	0.2	2.5	0.09	386	290	88	9	0.3	664	12	
136-070-22CDB	35-50	6/27/02		0.14	0.8	89	31	13	2.8	277	0	150	13	0.1	1.9		438	350	120	7	0.3	677		
136-070-22DBA	43-57	6/27/02		0.64	0.65	90	38	33	5.5	322	0	180	14	0.1	2.5		523	380	120	16	0.7	800		
136-070-22DBD	40-55	7/23/85	28	0.22	0.44	67	27	27	4.9	279	0	95	6.4	0.2	1	0.09	394	280	50	17	0.7	635	11	
136-070-22DBD	40-55	6/27/02		0.27	0.69	87	36	32	4.9	324	0	170	17	0.1	0.1		508	370	100	16	0.7	748		
136-070-23AAA1	113-116	10/25/78	27	0	1.1	100	17	61	7.9	355	0	160	10	0.2	0	0.23	559	320	29	29	1.5	900	9	6.9
136-070-23AAA1	113-116	5/2/79	27	0.08	1.3	100	24	66	8.8	420	0	140	14	0.2	1	0.33	590	350	6	28	1.5	895	8	7.7
136-070-23AAA1	113-116	7/1/81	27	0.63	1.3	100	27	72	11	408	0	160	12	0.2	1	0.16	613	360	25	30	1.6	900	9	
136-070-23AAA1	113-116	7/19/89	28	0.03	1.1	95	30	61	9.5	367	0	150	13	0.2	1	0.24	570	360	60	26	1.4	807	12	
136-070-23AAA1	113-116	9/16/92	27	0.01	0.74	79	28	16	3.2	284	0	120	4.3	0.1	1.1	0.08	420	310	80	10	0.4	655	8	7.55
136-070-23AAA1	113-116	6/27/02		0.5	0.95	90	26	56	7.5	388	0	140	15	0.2	0.1		527	330	14	26	1.3	801		
136-070-23AAA2	41-44	10/26/78	26	0	0.88	77	24	18	3	288	0	98	4	0.2	1	0.16	394	290	54	12	0.5	610	9.5	7.13
136-070-23AAA2	41-44	10/11/79	29	0.55	0.81	82	30	17	3.1	306	0	110	7.7	0.2	1	0	432	330	79	10	0.4	612	8.5	7.8
136-070-23AAA2	41-44	7/1/81	26	1.1	0.98	78	28	20	4.1	273	0	110	4	0.2	1	0	407	310	86	12	0.5	620	9	
136-070-23AAA2	41-44	7/19/89	29	0.37	1	87	31	17	3.9	294	0	140	6.7	0.2	1	0.08	462	340	100	10	0.4	745	10	
136-070-23AAA2	41-44	7/29/93	28	0.02	0.72	74	26	16	3	271	0	110	5.4	0.2	0	0.06	396	290	70	11	0.4	528	10	
136-070-23AAA2	41-44	7/30/97		0.18	1	91	32	18	3.5	316	0	150	7.6	0.2	0.09		460	360	100	10	0.4	661	8	
136-070-23AAA2	41-44	6/27/02		0.2	0.97	87	30	17	3	308	0	130	5.1	0.1	0.1		425	340	88	10	0.4	654		
136-070-23ADB	0-65	8/15/79	30	0.65	0.6	82	26	23	3.2	310	0	110	0.4	0.1	2.3	0.3	432	310	56	14	0.6	660	8	7.1
136-070-23ADB	0-65	7/17/00		0.44	0.62	95	30	27	3.6	327	0	130	9.9	0.1	7.8		465	360	93	14	0.6	694		
136-070-23BBB	52-57	8/2/91	27	0.07	0.77	70	26	18	2.9	277	0	99	3.8	0.2	1	0.07	385	280	55	12	0.5	584	11	
136-070-23BBB	52-57	6/29/95		0.01	0.89	73	27	16	2.8	277	0	100	6.8	0.2	1		364	290	66	11	0.4	543	8.7	
136-070-23BBB	52-57	7/18/00		0.01	0.88	79	28	17	2.6	269	0	100	7.8	0.1	0.1		368	310	92	10	0.4	589		
136-070-23BBB	52-57	8/23/05	29.4	0.043	0.952	80.7	28.1	16.2	3.1	282	<1	117	11.5	0.162	<0.09		398	317	85	9.8	0.4	649	11	7.61
136-070-23BCC	48-53	8/2/91	29	0.14	0.53	64	28	30	3.9	310	0	100	3.6	0.2	1	0.06	413	270	21	19	0.8	634	11	
136-070-23BCC	48-53	6/29/95		0.64	0.56	68	30	28	4.4	322	0	110	7.4	0.2	1		409	290	29	16	0.7	603	9	
136-070-23BCC	48-53	7/18/00		0.64	0.61	77	34	27	4.4	344	0	110	5.8	0.2	0.1		429	330	50	15	0.6	670		
136-070-23BCC	48-53	8/23/05	30.7	0.824	0.69	84.8	36.3	24.8	4.6	343	<1	135	10.6	0.158	<0.09		467	361	79	12.8	0.57	753	11.3	7.69
136-070-23BDB	0-65	6/27/02		0.05	0.92	76	35	23	4.3	330	0	110	8.7	0.2	22		443	330	63	13	0.5	671		
136-070-25ABB	26-31	8/1/91	24	0.03	0.03	71	27	18	2.9	283	0	75	6	0.1	34	0.07	397	290	56	12	0.5	586	9	
136-070-25ABB	26-31	6/29/95		0.03	0.01	68	26	11	2.2	286	0	37	4.2	0.1			304	280	42	8	0.3	503	7.5	
136-070-25ABB	26-31	7/17/00		0.45	0.39	63	23	11	2.1	304	0	28	0	0.1	3.1		281	250	3	9	0.3	478		
136-070-25ABB	26-31	8/23/05	24.8	0.053	0.184	66.1	25.1	10.4	2.4	284	<1	53.1	6.36	0.157	6.91		312	269	35	7.7	0.28	531	10.7	8.04
136-070-25CCC	38-43	8/3/82	26	0.05	0.4	62	24	35	5	272	0	100	5.1	0.2	1	0.09	393	250	30	23	1	630	13	
136-070-25CCC	38-43	7/19/89	27	0.07	0.43	69	26	24	4.4	280	0	95	6.5	0.1	1	0.09	392	280	50	15	0.6	646	10	
136-070-25CCC	38-43	9/16/92	28	0.02	0.35	68	26	26	3.9	286	0	97	8.6	0.1	1.4	0.12	400	280	42	17	0.7	610	8	7.74
136-070-25CCC	38-43	8/8/96		0.12	0.38	69	26	17	2.8	281	0	93	5.1	0.1	0.6		352	280	49	12	0.4	575		
136-070-25CCC	38-43	6/27/02		0.18	0.51	83	31	20	3.7	310	0	120	5.7	0.1	0.1		417	330	81	11	0.5	666		
136-070-26AAA	57-62	8/1/91	28	0.02	0.9	75	35	21	4.6	331	0	110	6.7	0.2	1	0.08	446	330	60	12	0.5	684	10	
136-070-26AAA	57-62	9/16/92	29	0.01	0.9	76	38	19	4.8	340	0	110	6.9	0.2	2	0.08	454	350	68	11	0.4	722	8	7.66
136-070-26AAA	57-62	8/8/96		0.03	0.98	86	42	18	4.1	372	0	120	9.9	0.2	0.8		466	390	82	9	0.4	730		
136-070-26AAA	57-62	6/27/02		0.05	1.1	94	44	21	5.2	433	0	120	14	0.2	0.1		513	420	61	10	0.4	787		
136-070-26AAC	37-54	7/23/85	28	0.7	0.5	73	35	33	6.3	330	0	110	7	0.2	4.6	0.1	461	330	56	18	0.8	748	11	

Appendix III.--Chemical analyses for water samples collected in the Streeter aquifer study area.

Location	Screened Interval (ft)	Date Sampled	(milligrams per liter)															Hardness				Spec		
			SiO_2	Fe	Mn	Ca	Mg	Na	K	HCO_3	CO_3	SO_4	Cl	F	NO_3	B	TDS	$CaCO_3$	as NCH	% Na	SAR	Cond (µmho)	Temp (°C)	pH
136-070-26AAC	37-54	7/28/89	26	0.67	0.56	73	35	28	6.5	342	0	110	6.2	0.2	2.1	0.1	457	330	46	15	0.7			
136-070-26AAC	37-54	8/8/96		0.69	0.61	88	41	28	5.3	389	0	140	7.3	0.2	5		508	390	69	13	0.6	785		
136-070-26BAC2	31-51	8/10/79	27	0.18	0.44	68	27	22	3.6	285	0	87	1.7	0.1	2	0.27	379	280	46	14	0.6	600	8	7.3
136-070-26BAC2	31-51	7/28/89	27	0.35	0.55	72	29	23	4.5	281	0	120	6	0.2	3.2	0.09	424	300	69	14	0.6	709	9	
136-070-26BAC2	31-51	8/21/00		0.38	0.54	77	30	24	3.3	296	0	110	6.1	0.1	0.5		398	320	73	14	0.6	631		
136-070-26BBB2	39-44	10/31/78	26	0.14	0.5	68	29	37	4.5	322	0	110	5.4	0.1	1	0	441	290	26	21	0.9	630	7.5	7.5
136-070-26BBB2	39-44	5/24/85	27	0.83	0.53	62	29	34	5.3	289	0	100	4.7	0.2	1	0.04	407	270	37	21	0.9	650	15.6	7.58
136-070-26BBB2	39-44	9/15/87	25	0.21	0.47	62	29	34	6.3	258	0	110	6	0.1	1	0.07	401	270	0	21	0.9	675	13	6.7
136-070-26BBB2	39-44	8/27/98		2.4	0.49	73	33	35	4	317	0	150	5.7	0.1	0.1		460	320	58	19	0.9	720		
136-070-26BBB2	39-44	10/9/03	29.4	3.1	0.736	95	42.6	43.1	6.2	337	<1	166	14.1	0.135			535	413	136	18.1	0.92			
136-070-26BBB2	39-44	7/9/04	28.3	1.81	0.63	82.7	36.8	37.6	5.5	355	<1	161	14.3	0.138			515	358	66	18.2	0.86			
136-070-26CCB	26-31	8/2/91	26	0.01	0.29	54	22	62	4.2	313	0	110	2.4	0.2	6.1	0.07	441	230	0	37	1.8	655	11	
136-070-26CCB	26-31	6/29/95		0.02	0.25	64	23	22	3.6	271	0	94	3.5	0.2	1		345	250	32	16	0.6	513	8.5	
136-070-26CCB	26-31	7/17/00		0.05	0.25	74	26	25	3.6	280	0	110	1.6	0.2	7.1		386	290	62	16	0.6	603		
136-070-26CCB	26-31	8/23/05	27.5	0.029	0.258	62.4	22.7	21.2	3.4	281	<1	73.2	1.4	0.148	0.93		326	249	18	15.3	0.58	544	11.5	7.97
136-070-26DBD	0-0	7/17/00		0.21	0.42	81	30	19	3.3	288	0	99	9	0.1	19		403	330	90	10	0.5	646		
136-070-26DCA	0-0	7/17/00		0.22	0.35	81	28	15	3.1	298	0	93	5.8	0.1	15		389	320	73	9	0.4	611		
136-070-27AAD	27-47	7/23/85	28	0.23	0.42	76	26	15	3.7	259	0	100	6.1	0.1	6.3	0.06	390	300	85	10	0.4	640	12	
136-070-27AAD	27-47	8/21/00		0.17	0.43	91	32	19	3.2	285	0	140	6.4	0.1	4.2		437	360	130	10	0.4	661		
136-070-27DAB	28-43	7/23/85	27	0.06	0.3	71	26	19	3.9	243	3	100	4.9	0.1	10	0.07	385	280	80	18	0.4	620	11	
136-070-27DAB	28-43	7/28/89	25	0.07	0.34	75	28	17	4.2	266	0	120	4.6	0.2	12	0.08	417	300	84	11	0.4	701	9	
136-070-27DAB	28-43	6/26/02		0.08	0.35	78	28	18	3.6	294	0	110	4.8	0.1	9.2		397	310	69	11	0.4	615		
136-070-29DDA	0-190	9/6/79	28	0.49	0.84	51	20	300	8.3	677	0	250	36	0.4	0.4	0.37	1030	210	0	75	9	1550	9.2	7.2
136-071-01ABB	42-47	10/4/99		0.02	1.1	69	22	19	3.2	289	0	78	4.2	0.1	0.1		339	260	26	13	0.5	571		
136-071-01ABB	42-47	9/7/04	29.6	0.014	1.03	70.1	21.6	17.5	3.6	282	<1	79.4	3.33	0.149	0.09		337	264	32	12.4	0.47	542	9.5	7.73
136-071-02CDD	0-200	6/7/78	21	0.04	0.2	87	42	120	8.4	506	0	210	28	0.2	3.3	0.54	770	390	0	39	2.6	1150	9.1	7.3
136-071-10DBA	0-100	5/3/79	28	1	0.42	79	37	170	10	580	0	230	6.8	0.1	0.3	0.39	849	350	0	51	3.9	1225	7	8.7
136-071-16CCC	158-164	11/7/78	19	0.1	0.12	76	44	130	10	488	0	240	6.6	0.1	1	0.31	767	370	0	43	2.9	1300	8	6.55
136-071-16CCC	158-164	5/2/79	25	0	0.13	100	39	130	11	584	0	220	5.8	0.1	1	0.3	820	410	0	40	2.8	1200	7.9	7.8
136-071-28CCC	0-220	6/7/78	26	1.4	0.06	70	35	150	9.9	599	0	150	4.1	0.1	1.5	0.54	744	320	0	50	3.6	1080	6.9	7.4
136-071-34CBB	0-140	6/13/78	25	1.2	0.04	100	41	64	11	516	0	150	2.8	0.1	1	0.1	650	420	0	24	1.4	960	9.5	7.2
136-071-35AAA	61-73	5/3/79	6.4	0.1	0.47	130	50	150	10	638	0	350	7.2	0.1	1	0.24	1020	530	7	38	2.8	1450	8	5.7
136-071-35AAA	61-73	10/11/79	26	1	0.42	130	57	150	9.9	649	0	370	7.2	0.2	1	0.1	1070	560	28	36	2.8	1475	8	7.3
137-070-09BCB1	42-47	8/14/01		0.06	0.34	62	24	80	8.9	397	0	120	7.4	0.2	0.1		499	250	0	40	2.2	721		7.62
137-070-09BCB2	13-15	8/14/01		0.13	0.6	85	33	22	4.2	239	0	180	18	0.2	14		475	350	150	12	0.5	698		7.39
137-070-09CBC1	92-97	8/14/01		0.04	0.9	60	21	47	6.3	337	0	77	11	0.2	0.1		390	240	0	29	1.3	662		8.21
137-070-09CBC2	16-Nov	8/14/01		2.9	2.1	160	89	140	26	486	0	680	14	0.3	0.1		1350	770	370	28	2.2	1573		7.23
137-070-17BB1	0-0	1/10/01		0.07	0.01	33	130	710	91	741	84	1300	110	0.1	0.3		2820	620	0	68	12	3280		9.46
137-070-17BB2	0-0	1/10/01		0.07	0.02	33	130	710	92	755	77	1200	110	0.1	1.4		2730	620	0	68	12	3610		9.46
137-070-17CC1	0-0	1/10/01		0.07	0.02	33	130	710	93	750	74	1200	110	0.1	0.5		2720	620	0	68	12	3550		9.35
137-070-17CC2	0-0	1/10/01		0.07	0.02	33	130	710	94	737	83	1300	110	0.1	0.4		2820	620	0	68	12	3580		9.42
137-070-19CD1	0-0	1/10/01		0.06	0.02	30	130	690	95	718	87	1200	100	0.1	0.3		2690	610	0	67	12	3820		9.62
137-070-19CD2	0-0	1/10/01		0.07	0.02	33	130	710	95	747	80	1300	110	0.1	0.4		2830	620	0	68	12	3720		9.52
137-070-23DAD	77-82	8/10/83	31	0.02	0.41	30	14	82	5.5	323	0	50	5	0.5	1	0.25	379	130	0	56	3.1	650	22	
137-070-23DAD	77-82	7/29/93	27	0.05	0.38	30	14	78	4.4	323	0	50	7.1	0.6	1.6	0.34	372	130	0	55	3	532	9	
137-070-23DAD	77-82	7/30/97		0.02	0.38	30	14	84	4.9	327	0	51	6.6	0.7	0.09		353	130	0	57	3.2	560	8	
137-070-23DAD	77-82	6/27/02		0.13	0.39	29	13	82	4.3	335	0	46	4.9	0.6	0.1		345	130	0	58	3.1	565		
137-070-30DC1	0-0	1/10/01		0.07	0.02	33	130	690	93	784	63	1200	120	0.1	0.4		2720	620	0	67	12	3640		9.34
137-070-30DC2	0-0	1/10/01		0.08	0.02	33	130	700	93	765	74	1200	110	0.1	0.4		2720	620	0	67	12	3600		9.41
137-070-33BB1	0-0	1/10/01		0.07	0.02	33	130	700	93	770	71	1300	99	0.1	0.4		2810	620	0	67	12	3650		9.43
137-070-33BB2	0-0	1/10/01		0.07	0.02	33	130	710	94	765	77	1300	110	0.1	0.4		2830	620	0	68	12	3690		9.43
137-070-34CCB2	38-43	10/4/99		0.01	1	61	19	22	3	249	0	84	0	0.2	0.1		313	230	26	17	0.6	527		
137-070-34CCB2	38-43	9/7/04	30	<0.01	0.997	60.9	18.9	23.8	3.6	241	<1	83.1	1.75	0.178	<0.09		313	230	31	18	0.68	496	9.3	7.69
137-070-35AAA1	78-83	8/10/83	27	0.03	0.29	27	11	120	7.1	385	0	50	17	0.4	0	0.48	450	110	0	68	5	760	23	
137-070-35AAA1	78-83	7/29/93	24	0.03	0.34	26	10	120	5.9	393	0	49	20	0.5	1.8	0.69	452	110	0	70	5	671	8.9	
137-070-35AAA1	78-83	7/30/97		0.01	0.31	27	10	130	6.4	398	0	49	19	0.5	0.09		438	110	0	71	5.4	684	8	
137-070-35AAA1	78-83	6/27/02		0.08	0.31	27	10	120	5.8	389	0	47	32	0.5	0.1		435	110	0	69	5	684		
137-070-35AAA2	21-26	8/11/83	27	0.04	0.49	74	26	7.5	2.7	244	0	100	1.3	0.1	1	0.01	360	290	92	5	0.2	580	22	
137-070-35AAA2	21-26	7/29/93	26	0.03	0.46	70	25	9	2.2	269	0	79	3.2	0.1	0	0.06	348	280	57	7	0.2	492	8	
137-070-35AAA2	21-26	7/30/97		0.02	0.46	70	24	8	2.2	267	0	82	1.5	0.1	0.09		320	270	54	6	0.2	502	9	
137-070-35AAA2	21-26	6/27/02		0.13	0.49	68	24	8.5	2.6	267	0	68	0	0.1	0.1		304	270	49	6	0.2	522		
137-070-35CCD	58-63	10/4/99		0.01	0.93	68	24	9.5	2.1	264	0	84	0	0.1	0.1		319	270	52	7	0.3	544		
137-070-35CCD	58-63	9/7/04	29.9	<0.01	0.948	72.6	25.1	10	2.9	276	<1	78.5	2.03	0.12	0.09		329	285	57	7	0.26	536	9.2	7.8
137-071-35DA1	0-0	1/10/01		0.09	0.02	33	130	700	90	758	74	1300	110	0.1	0.4		2810	620	0	68	12	3750		9.41
137-071-35DA2	0-0	1/10/01		0.08	0.02	33	130	690	93	717	94	1300	110	0.1	0.4		2800	620	0	67	12	3780		9.44
137-071-36DDC	0-0	8/11/83	28	0.05	0.01	23	91	330	60	630	30	550	55	0.1	1	0.81	1480	430	0	59	6.9	2300	24	