WATER IN SAND AND GRAVEL DEPOSITS

IN McHENRY COUNTY, ILLINOIS

By J. R. Nicholas and J. T. Krohelski

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PREFACE

In McHenry County, potable water in shallow sand and gravel aquifers is a prime natural resource. The demand for potable water parallels the increasing land development in the county, and it is anticipated that continued development will cause increased interest toward using these aquifers for additional sources of water.

Because of the complex distribution, stratigraphy, and composition of glacial materials in the county, the number, extent, and water-bearing potential of sand and gravel aquifers is uncertain. The information provided in this report is basic to understanding the ground-water resources of the county. The report should aid the development of land-use policies for protection of local ground-water resources. The information provides the opportunity to begin serious consideration and evaluation of the potential of the shallow aquifers for sources of water and their suitability for various uses.

It is not the intent of this report to define water levels in individual aquifers. Many sand and gravel aquifers are semiconfined by less permeable materials. Because of this, water levels in the confining beds and in sand and gravel units may differ at any given location. Therefore, the water-level-contour map presented here should not be used to determine the depth that water will be encountered at a selected site. Instead the maps indicate average ground-water levels in the composite aquifer system.

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CONVERSION FACTORS

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound unit	By	To obtain SI unit
inch (in.)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)
micromho per centimeter at 25° Celcius (µmho/cm at 25°C)	1.000	microsiemen per centimeter at 25° Celcius (µS/cm at 25°C)
	Temperature	
degree Fahrenheit (°F)	°C = 5/9 (°F-32)	degree Celsius (°C)

National Geodetic Vertical Datum of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called mean sea level. Altitudes in this report are referenced to the NGVD of 1929.

GLOSSARY

Aquifer. A geologic formation or unit that can yield quantities of water that are sufficient for the intended use. In this report the term refers to sand and gravel deposits known or suspected to be capable of yielding moderate to very large amounts of water to individual wells.

Evapotranspiration. Loss of water to the atmosphere by direct evaporation from water surfaces and moist soil combined with transpiration from living plants.

Ground-water discharge. The loss of water from the saturated zone by (1) natural processes such as ground-water runoff and ground-water evapotranspiration, and (2) artificial discharge through wells and other manmade structures. In discharge areas ground water flows generally upward, toward the water table.

Ground-water recharge. The addition of water to the saturated zone by (1) natural processes such as percolation of infiltrating precipitation, and (2) artificial recharge from basins, sumps, and other manmade structures. In recharge areas, ground water flows generally downward.

Outwash. A sorted sediment laid down by meltwater from a glacier; includes layered sand-and-gravel deposits.

Permeability. The capacity of a porous medium to transmit a liquid under a potential gradient.

Semiconfined aquifer. An aquifer in which the water is under pressure greater than atmospheric, and its upper limit is the bottom of a bed of lower permeability than that of the material in which the semiconfined water occurs. Water moves through the semiconfining bed, but at a lesser rate than through the aquifer.

Specific conductance of water. A measure of the ability of water to conduct an electrical current, expressed in micromhos per centimeter at 25°C. It is related to the dissolved-solids concentration and serves as a quantitative indicator thereof.

Till. Unsorted, ice-deposited debris consisting of a matrix of silt, clay, and sand in which pebbles, cobbles, and large boulders are commonly imbedded.

Unconsolidated material. A sediment that is loosely arranged, or whose particles are not cemented together.

Unconfined aquifer. An aquifer that has a water table as its upper boundary.

Water table. The upper surface of a ground-water body at which the water pressure equals atmospheric pressure.

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ABSTRACT

Two general types of sand and gravel aquifers occur in McHenry County--unconfined aquifers, which are at or near the land surface, and semiconfined aquifers, which are overlain by one or more till members.

Water levels in both types of aquifers are mapped from measurements made in the spring of 1979. The water-level configuration roughly parallels the land surface. Moraines and other topographically high features coincide with ground-water divides of local flow systems. Flow paths from divides to lowlands are relatively short--a few miles or less. Recharge predominates in uplands, whereas discharge predominates in lowlands. Water levels change seasonally in response to variations in recharge and discharge conditions. The highest water levels occur during spring and decline during the rest of the year.

Ground water is of the calcium magnesium bicarbonate type and is of acceptable quality for most uses. However, for domestic and some industrial uses, treatment may be required to reduce hardness and to remove iron. Hardness ranged from 130 to 600 milligrams per liter as calcium carbonate, and dissolved iron concentrations ranged from less than 10 to 6,200 micrograms per liter. The specific conductance of ground water ranged from 260 to 1,170 micromhos per centimeter. Specific conductance exceeded 1,000 micromhos per centimeter near Huntley and Hebron. Nitrate concentration was generally less than 0.68 milligrams per liter.

INTRODUCTION

McHenry County has an area of approximately 630 square miles in northeastern Illinois adjacent to the Wisconsin border (fig. 1). Woodstock, the county seat, is near the center of the county, 40 miles northwest of Chicago.

A large part of western McHenry County is devoted to agriculture; the eastern half is a residential part of the Chicago metropolitan area. The population in 1970 was 111,555 (U.S. Department of Commerce, 1977). The population in 1979 was approximately 150,000 (McHenry County Regional Planning Commission, oral commun., 1980).

In 1980, 53 percent of the public ground-water supply in the county was derived from sand and gravel aquifers (Kirk and others, 1982). In addition,

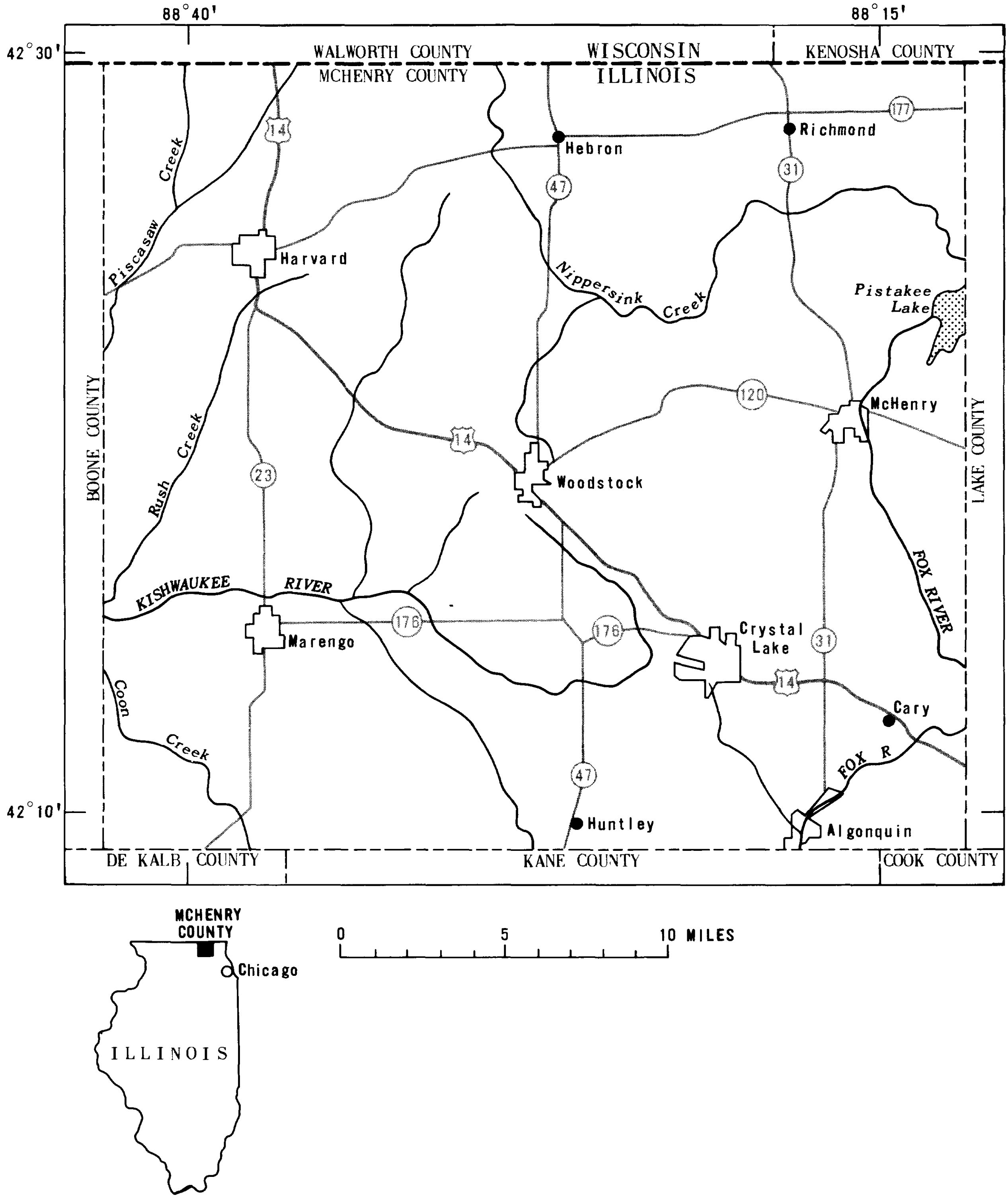


Figure 1.-- Location of McHenry County, Illinois.

these aquifers are tapped by many private wells. Because these aquifers are the major source of water, more hydrogeologic information is needed for their proper management.

Purpose and Scope

The purpose of this report is to describe the movement and quality of water in sand and gravel aquifers in McHenry County. Hydrographs and a map of water levels are presented to aid in understanding ground-water movement and to establish a baseline for detecting changes in water levels. A table of water-quality analyses is included to provide a baseline for detection of future changes in ground-water quality.

During 1979-80, water levels were measured in 131 wells tapping sand and gravel. Initial measurements in the spring of 1979 were followed by monthly measurements in 24 wells and continuous recording of water levels in 5 wells. Water-level fluctuations were analyzed for relation to seasonal changes in infiltration and recharge. Water samples were collected from 25 wells and analyzed for common constituents and some nutrients.

Acknowledgments

The authors acknowledge the cooperation and assistance of the McHenry County Planning Commission in conducting this study. Appreciation is given to the many property owners who allowed access to their land and water wells. Acknowledgment is given to the Illinois State Geological Survey for providing well logs.

Previous Investigations

The geology and ground-water resources of drift in McHenry County have been the subject of many reports published by the Illinois State Geological Survey and Illinois State Water Survey. The geology of the Chicago area from the Precambrian to the Quaternary is summarized by Willman (1971). Horberg (1950) prepared a bedrock topography map of Illinois from well and outcrop data, and McGinnis, Kempton, and Heigold (1963) delineated buried bedrock valleys in northwestern McHenry County using gravity-anomaly data. The thickness of drift in Illinois was mapped by Piskin and Bergstrom (1967), and Kempton (1963) made a detailed study of the subsurface stratigraphy of Pleistocene deposits in an area including western McHenry County. Anderson and Block (1962) mapped the thickness and distribution of sand and gravel deposits in McHenry County as a resource evaluation.

The most detailed geological studies are by Hackett and McComas (1969) and Specht and Westerman (1976). In both studies the Quaternary geology in McHenry County is related to specific planning problems such as construction and waste disposal.

The ground-water resources of the Chicago region are summarized by Suter and others (1959). Prickett and others (1964) and Walton (1965) give a detailed ground-water evaluation of the Woodstock area that includes values of transmissivity, storage, and leakage from confining units. The public ground-water supplies for each municipality in McHenry County are summarized by Woller and Sanderson (1976). Schicht, Adams, and Stall (1976) discuss the cost and availability of ground water in northeastern Illinois. A few water-quality data on McHenry County sand and gravel aquifers are tabulated in Larson (1963).

PHYSICAL DESCRIPTION

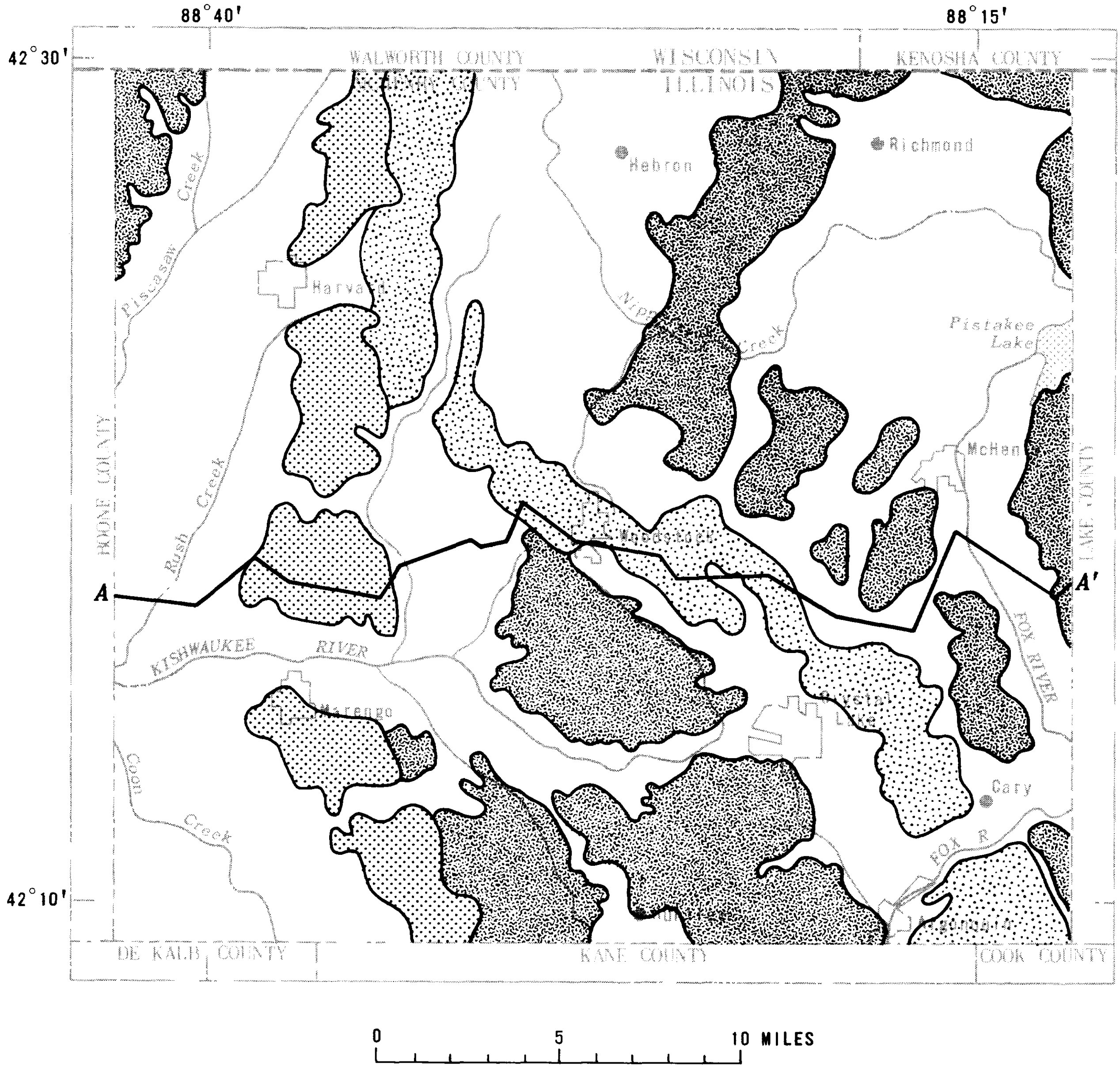
The topography of McHenry County is the product of glaciation--ice and meltwater. Moraines, kames, and eskers are high-relief features; between them lie relatively flat outwash plains and undulatory till plains (Hackett and McComas, 1969).

McHenry County is in the Kishwaukee and Fox River basins (fig. 2). The Kishwaukee River and its tributaries--Coon, Rush, and Piscasaw Creeks--flow westward to the Rock River, draining the western part of the county. The Fox River and its major tributary--Nippersink Creek--drain the eastern part. The drainage divide between the two river basins trends generally from northwest to southeast along the top of the West Chicago Moraine from the State line to near Crystal Lake, where it turns southwest and passes near Huntley. Locations of principal streams and moraines are shown in figure 2.

Silurian dolomite and Ordovician shale lie beneath the drift in most of McHenry County. Silurian dolomite crops out in small areas in the southwestern and northwestern parts of the county (Hackett and McComas, 1969). In the western part, the bedrock surface is deeply dissected by preglacial streams (McGinnis and others, 1963).

Drift covers the bedrock in thicknesses generally greater than 100 feet (fig. 3). Most of the drift consists of till and outwash. Till sequences tend to be thicker above bedrock highs, and outwash, interbedded with till, tends to be thicker above bedrock lows (Specht and Westerman, 1976).

Specht and Westerman (1976) identified six till members and three outwash members. Till composition is fairly consistent within members but differs considerably between members. Most till has high silt and(or) clay content with only a small fraction of larger grains. Most of the outwash is clean sand and gravel deposited as outwash plains or valley trains. Kames and eskers, which are common in the eastern part of the county, are composed of poorly sorted sand and gravel interspersed with clay and silt. Stratigraphic relations of the drift are complex, as depicted in cross section in figure 4.



EXPLANATION

BLOOMINGTON MORAINE

OTHER MORAINES

WEST CHICAGO MORAINE

A——A' LOCATION OF GEOLOGIC SECTION--Shown on figure 4

Figure 2.-- Moraine ridges and streams in McHenry County (Modified from Ray and Wascher, 1965).

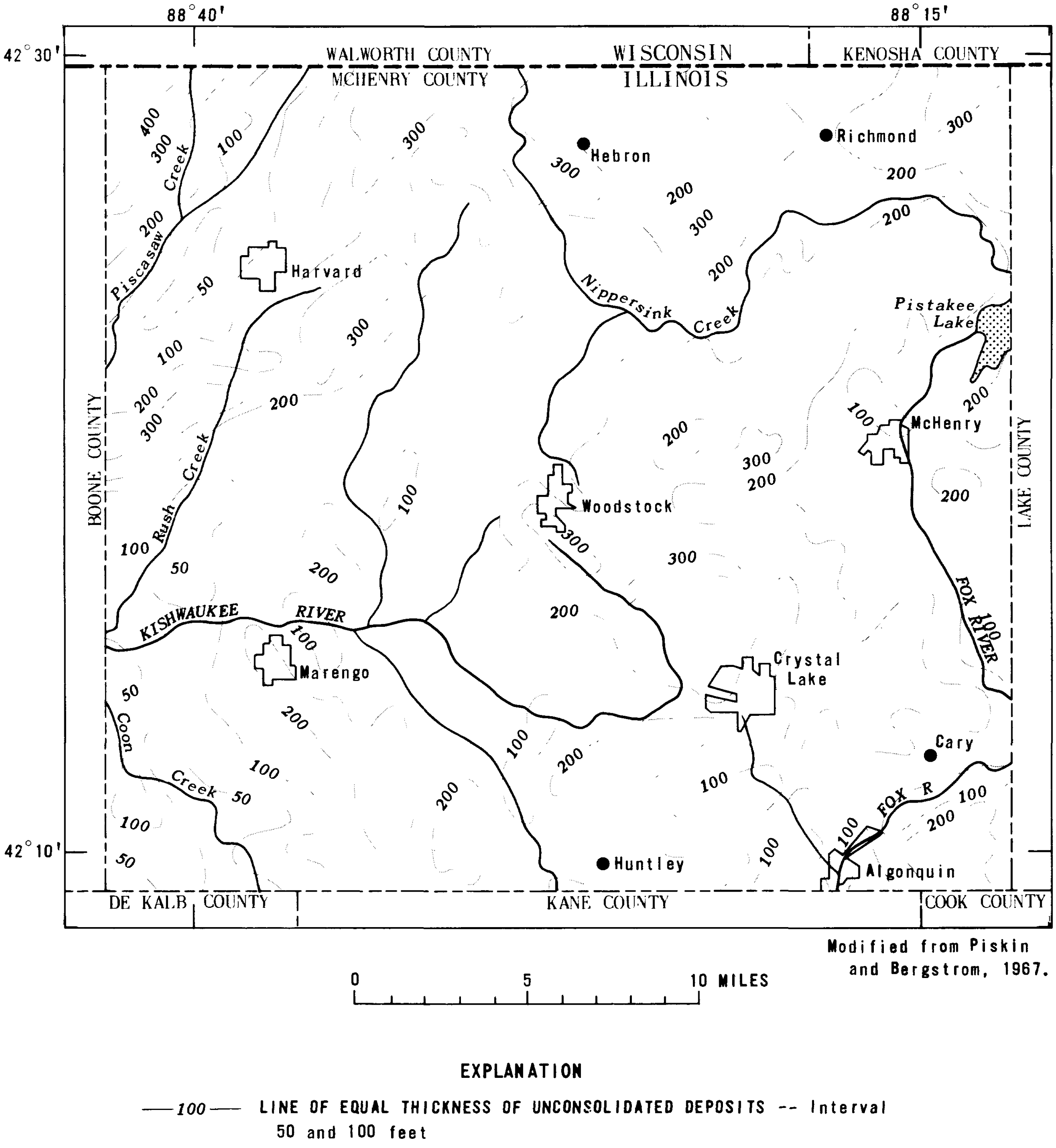


Figure 3.-- Thickness of unconsolidated deposits in McHenry County.

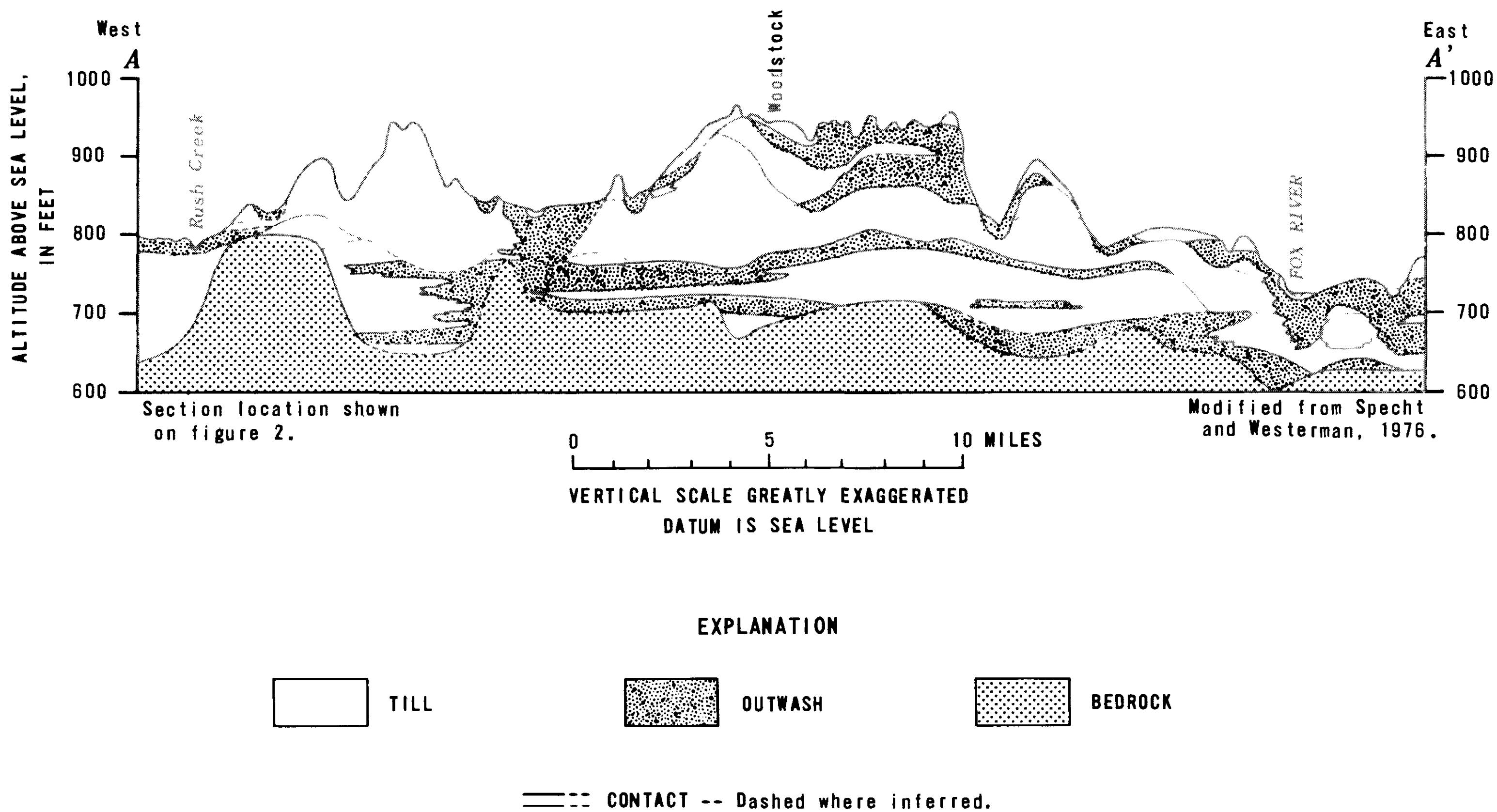


Figure 4.-- East-west geologic section in McHenry County.

GROUND-WATER OCCURRENCE AND FLOW

Sand and gravel outwash deposits form highly permeable aquifers in McHenry County. Specht and Westerman (1976) divide these aquifers into two general types. The first type, surficial aquifers, which are present at or near land surface, underlie approximately 65 percent of the county. The second type, buried aquifers, are overlain by one or more till members. Although buried aquifers are most extensive above bedrock lows, they are present throughout the county. Surficial aquifers are unconfined; buried aquifers are semiconfined.

The sand and gravel aquifers are recharged by precipitation. Recharge to an unconfined (water-table) aquifer is by percolation through overlying soils; recharge to a semiconfined aquifer is by vertical leakage from the less permeable semiconfining till.

Perched water bodies may be present where a lens of clay or silt within a sand and gravel deposit causes water to pond above the true water table. Perched water bodies are common in glacial deposits and are typically seasonal.

Silurian and Ordovician rocks are hydraulically connected to the sand and gravel aquifers that overlie them. Silurian dolomite forms a major aquifer in McHenry County and provides 7 percent of the public water supply (Woller and Sanderson, 1976). It is recharged by water percolating through the drift.

Water from sand and gravel aquifers is discharged mainly into surface-water bodies and by evapotranspiration into the atmosphere; pumping from wells and seepage into mine pits and ditches are also a part of discharge.

Recharge and discharge fluctuate seasonally. When the ground is frozen, little or no recharge to the ground-water system occurs. During the growing season, evapotranspiration accounts for considerable discharge, and during dry spells, irrigation pumpage increases discharge.

When discharge exceeds recharge, as in the summer, fall, and winter, water levels in aquifers decline (fig. 5). When recharge exceeds discharge, as in the spring, water levels rise. In an undisturbed system, discharge and recharge tend toward a net annual balance. However, overpumping will locally depress water levels, as at Woodstock (Prickett and others, 1964).

The hydrographs in figure 5 were constructed from daily water levels at five unpumped wells during 1979-80. In general, levels rose in the spring and declined during other seasons. The hydrographs indicate three phenomena other than the seasonal recharge-discharge relation: (1) The decline in water levels is greater in summer than in fall and winter, as a result of evapotranspiration and probably also increased pumping. (2) The hydrograph of well 32 shows the effect of a nearby irrigation well--it decreases in July during pumping and increases in August, when pumping stopped. (3) Well 75, which is 60 feet from a municipal well in Huntley, shows the daily effect of the pumping from that well.

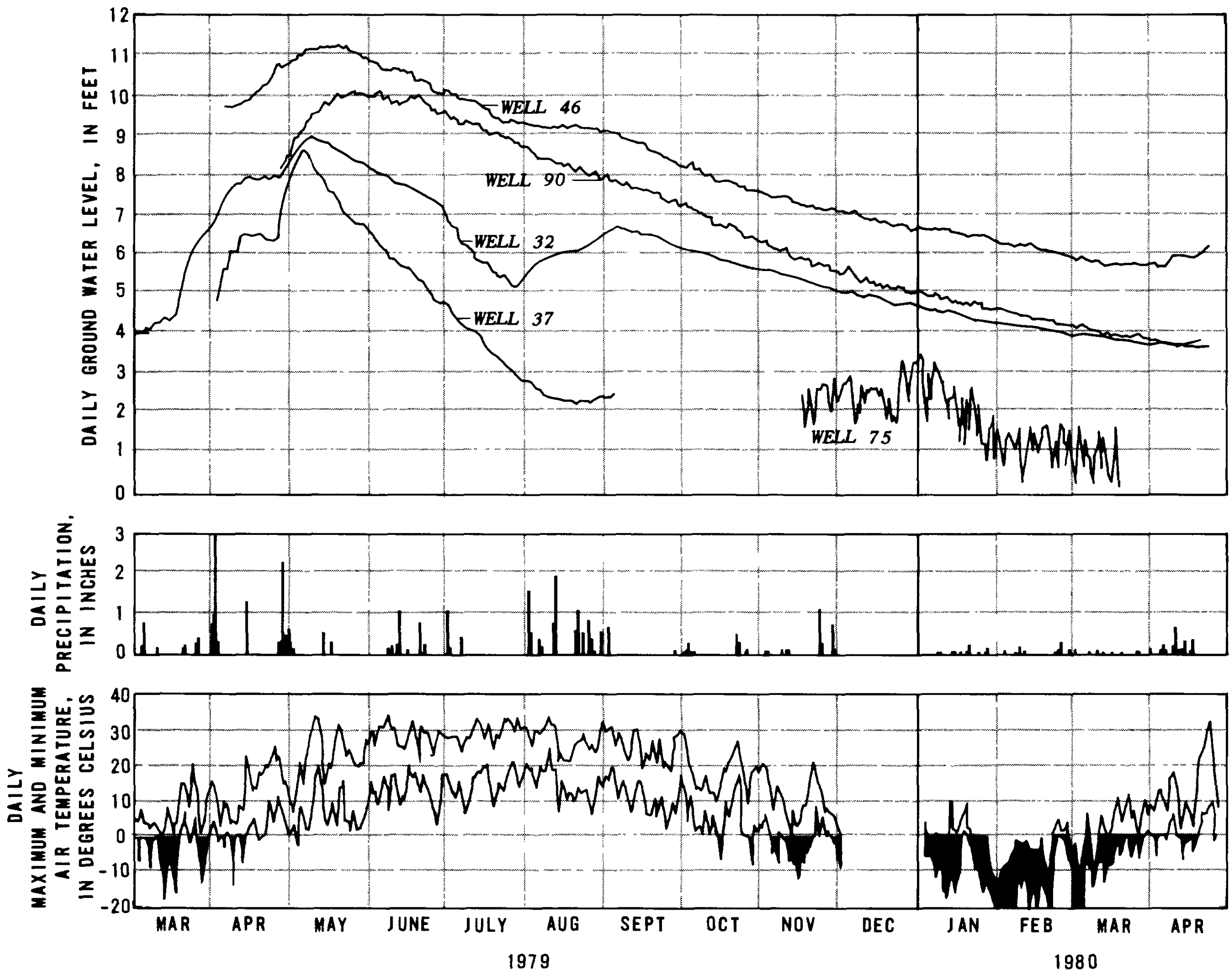


Figure 5.-- Ground-water levels, precipitation, and air temperature in McHenry County, March 1979 to April 1980 (Well locations are shown on plate 1).

In addition to the five wells at which continuous recorders were operated, 24 wells were measured at monthly intervals during 1979-80; the levels are listed in table 1. These data are useful in evaluating general water-level trends.

A map of water levels in sand and gravel aquifers in McHenry County (pl. 1) was prepared from water levels measured in 131 wells in the spring of 1979 (table 2). The map represents a generalization of water levels from unconfined and semiconfined aquifers.

The water-level configuration roughly parallels the land surface. Consequently, major topographic features such as the Bloomington and West Chicago Moraines and the high plain north of McHenry are outlined by water-level contours.

Flow directions can be deduced from water-level contours because water flows from higher levels to lower levels and perpendicular to the contours. Flow directions indicate that the county contains several small local systems. Moraines and other topographically high features act as flow divides; these divides approximately coincide with surface-water divides. Flow paths in the local systems are relatively short, ranging from less than a mile near the Fox River to more than 10 miles from Woodstock to McHenry.

Most of the county can be divided into recharge and discharge areas. Recharge predominates in uplands, where water levels are highest; discharge predominates in stream valleys and other lowlands, where water levels are lowest.

Locations of seven flowing wells are included on plate 1. Wells 20, 26, 51, 55, 61, and 62 flow because of upward movement of ground water in discharge areas; pressure, applied by a semiconfining till, probably causes well 80 to flow.

GROUND-WATER QUALITY

Principal-terrain maps and surficial-geology maps (Hackett and McComas, 1969) were used to guide the selection of wells for water sampling. Twenty-five wells tapping sand and gravel aquifers throughout McHenry County were selected. Water-supply systems with water softeners were sampled between the well and the softener.

Chemical analyses of samples were made during 1979 and 1980 to define the chemical quality of the ground water and to provide a baseline for use in future monitoring. Analyses for common cations and anions, total organic carbon, nitrogen, temperature, pH, specific conductance, dissolved solids, and hardness are listed in table 3.

Water from sand and gravel in McHenry County is a calcium magnesium bicarbonate type, as indicated by the plot in figure 6. As noted by Borman (1976) and Hutchinson (1970), this is also the characteristic type of water from sand

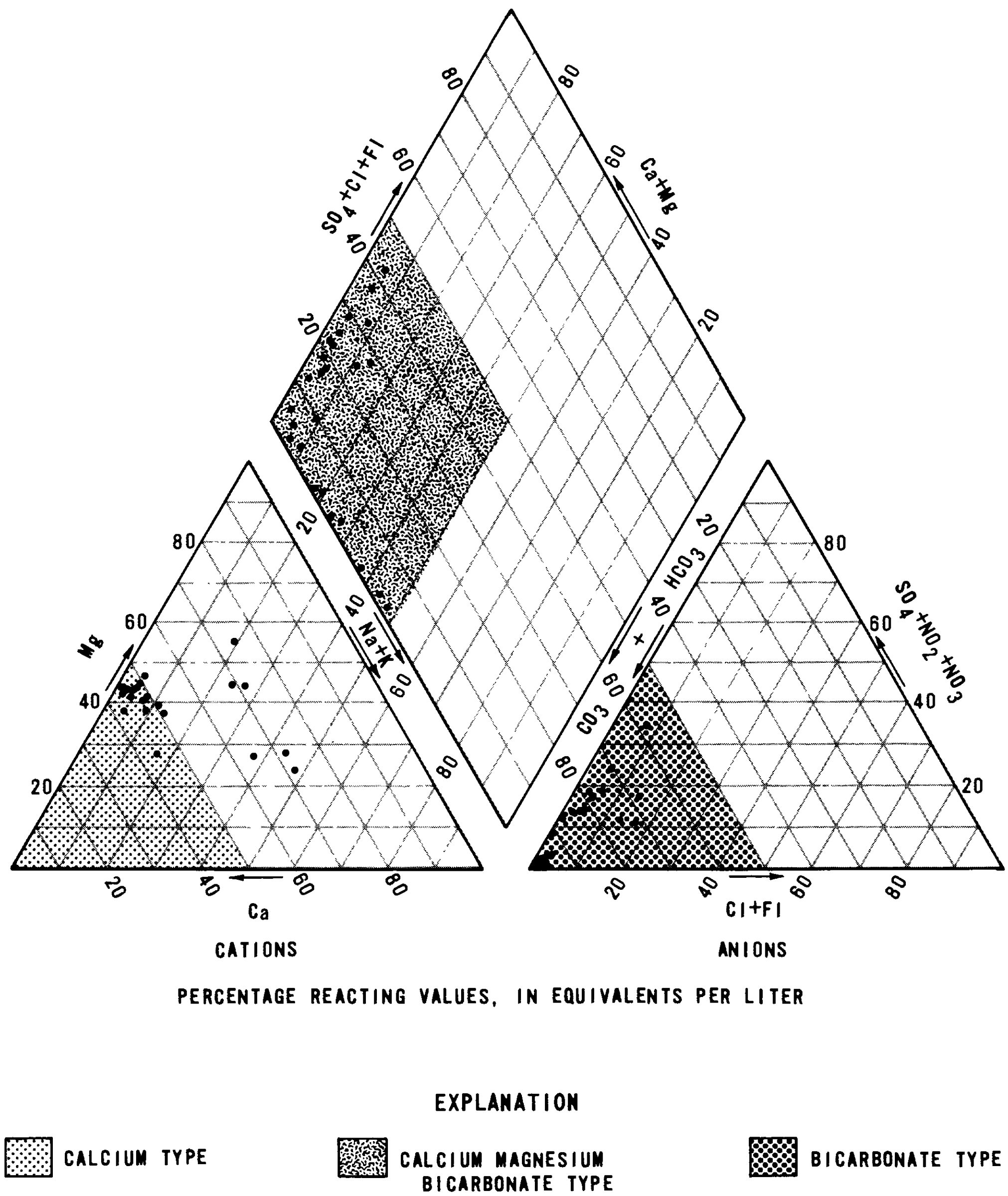


Figure 6-- Trilinear plot of chemical analyses of ground water in McHenry County, spring 1979.

and gravel in the adjacent Wisconsin counties of Walworth and Kenosha. Samples from six wells (C, D, F, H, Q, W, see table 3) had concentrations of calcium approximately 20 percent lower than other samples. This difference may result from mixing with water from the underlying Silurian aquifer.

The chemical analyses indicate that water from sand and gravel in McHenry County is acceptable for most uses. Some water must be treated to reduce hardness and dissolved iron concentration if used for domestic and industrial purposes. Seasonal variation in the concentrations of inorganic constituents is slight.

Specific Conductance and Dissolved Solids

Dissolved-solids concentration and specific conductance of ground water in McHenry County have a high degree of linear correlation (coefficient of linear correlation, (r) = 0.95) (fig. 7). Specific conductance is often used as an indirect measure of dissolved-solids concentration because it can be easily measured in the field. The relationship between specific conductance, in micromhos per centimeter at 25°C (µmhos), and dissolved solids, in milligrams per liter (mg/L), can be used to estimate dissolved-solids concentrations by the regression equation:

$$\text{Dissolved-solids concentration} = 0.58 \times \text{specific conductance.}$$

The range of specific conductance of samples obtained during the spring of 1979 (table 2) is from 260 to 1,170 µmhos; the median value is 670 µmhos. The higher values were in samples from wells near the towns of Marengo, Huntley, Hebron, and McHenry (fig. 8). These higher values may be the result of the application of deicing chemicals to nearby roads.

High dissolved-solids concentrations are generally objectionable in drinking water because of possible physiological effects, unpalatable mineral taste, and costs related either to additional treatment, corrosion damage, or deposition of scale. Dissolved-solids concentrations ranged from 277 to 706 mg/L, with a median value of 387 mg/L. The maximum allowable concentration for public water supply set by the Illinois Pollution Control Board (1974) is 500 mg/L.

Total Hardness

Total hardness in water is related mainly to concentrations of calcium and magnesium. Iron, manganese, and other polyvalent metals also contribute to hardness. Hardness in water increases the amount of soap required for lather formation and causes scale formation in boilers and water heaters. Total hardness is commonly reported in terms of an equivalent amount of calcium carbonate. The following classification of hardness, by range, has been used by Durfor and Becker (1964):

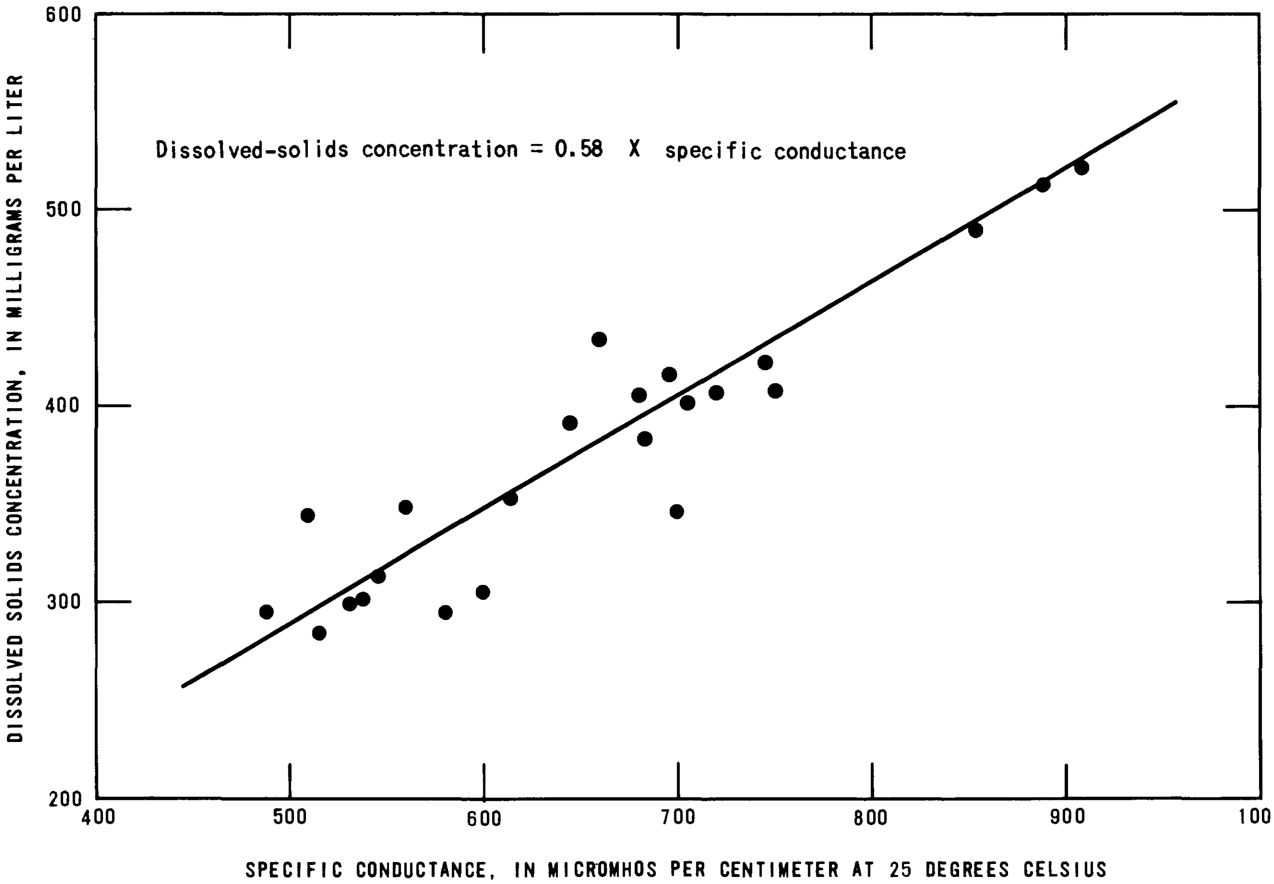
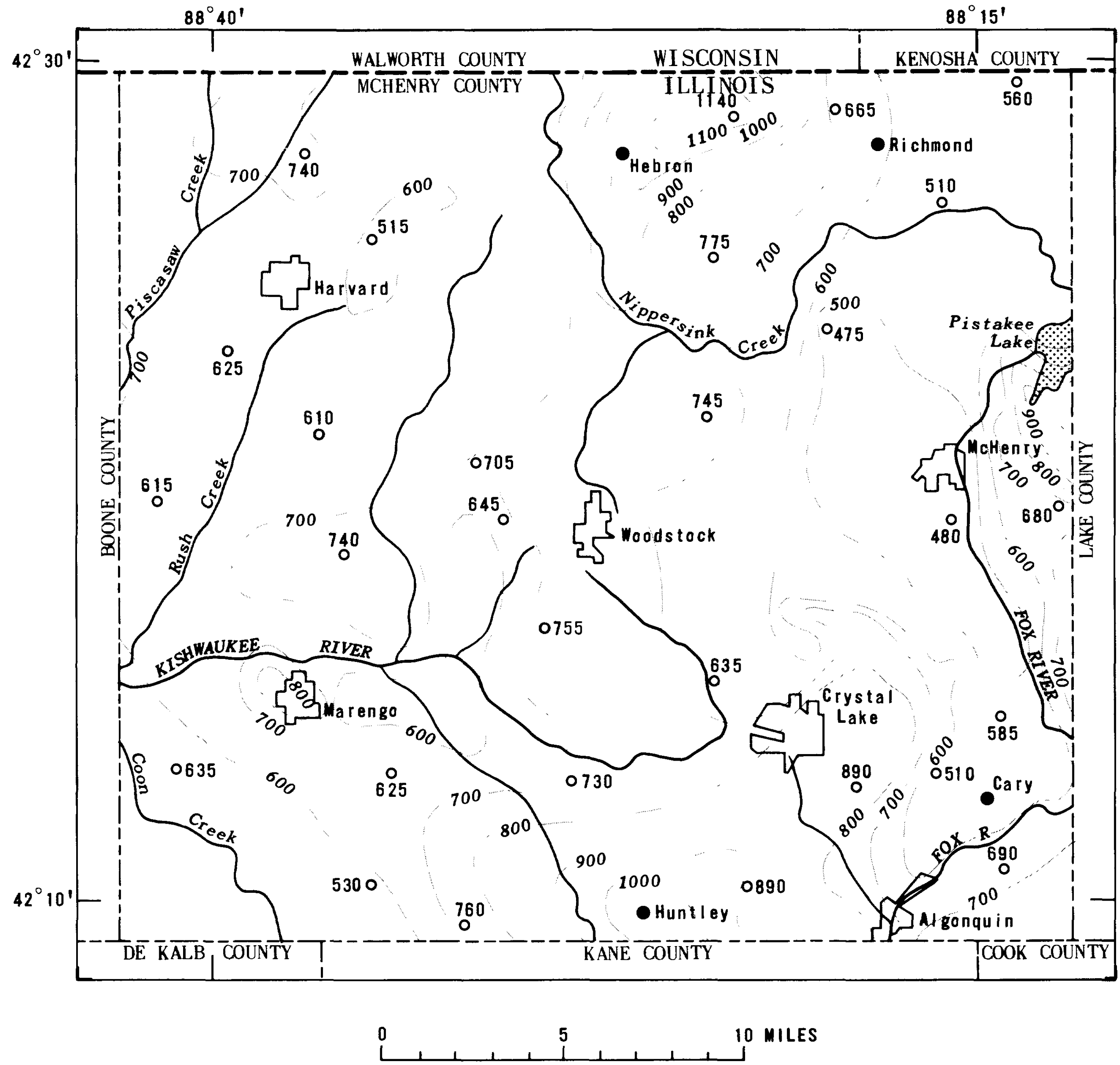


Figure 7.-- Dissolved solids versus specific conductance in McHenry County groundwater, spring 1979.



EXPLANATION

—800— LINE OF EQUAL SPECIFIC CONDUCTANCE (SPRING 1979) -- Interval 100 micromhos per centimeter at 25 degrees Celsius.

o890 WELL -- Number indicates specific conductance value

Figure 8.-- Specific conductance of ground water in McHenry County, spring 1979.

0- 60 mg/L - soft

61-120 mg/L - moderately hard

121-180 mg/L - hard

More than 180 mg/L - very hard

Ground water in McHenry County is generally in the "very hard" range. Total hardness values ranged from 130 to 600 mg/L, with a median value of 340 mg/L.

Iron and Manganese

Iron and manganese are abundant and are in many types of rocks. They are commonly used as measures of the suitability of water for many uses, even though they may be present in small amounts. If the concentration of dissolved iron exceeds 300 µg/L (micrograms per liter) or the concentration of dissolved manganese exceeds 200 µg/L, these metals can cause stains on porcelain, enameled ware, plumbing fixtures, and fabrics (National Academy of Sciences and National Academy of Engineering, 1972). The ground water in McHenry County has dissolved iron concentrations that often exceed 300 µg/L (table 3). Concentrations of iron in domestic supplies may be influenced by low rates of water consumption, which tend to allow concentration of iron in wells, especially those with steel casings.

The maximum concentrations of dissolved iron and dissolved manganese were 6,200 and 180 µg/L, respectively; both values were in a sample from well S. Minimum values for both dissolved iron and dissolved manganese were less than 10 µg/L; median values were 140 and 40 µg/L, respectively.

Nitrogen and Organic Carbon

Nitrogen is becoming widespread in ground water because of its agricultural use in fertilizers and disposal of sewage on or beneath the land surface. Nitrate (NO_3) is the most commonly identified nitrogen species in ground water, although ammonia (NH_3 + NH_4^+), nitrite (NO_2), and organic nitrogen are also usually present. In McHenry County the prevalent form of nitrogen in ground-water samples was ammonia. Results of nitrogen analyses are listed in table 3.

Except for well B, the maximum, minimum, and median values of total nitrogen concentrations in McHenry County ground-water samples were 2.3, 0.09, and 0.80 mg/L as nitrogen. Nitrite concentrations were very low (median value less than 0.01 mg/L). The maximum nitrate concentration was 0.68 mg/L (median value 0.01 mg/L). Organic nitrogen concentrations can be calculated by subtracting total ammonia nitrogen from total "ammonia plus organic" nitrogen (also called total Kjeldahl nitrogen). Maximum, minimum, and median values for ammonia nitrogen in ground water were 2.3, 0.05, and 0.22 mg/L, respectively. For "ammonia plus organic" nitrogen the maximum, minimum, and median values were 2.3, 0.06, and 0.64 mg/L, respectively.

Two samples from well B, which is near a feed lot, had nitrate concentrations of 10 and 11 mg/L. The U.S. Environmental Protection Agency (1976) recommends 10 mg/L nitrate as the upper limit for domestic water supply. Ammonia concentrations in both samples from well B were 0.01 mg/L.

Concentrations of ammonia, nitrogen, organic nitrogen, and total organic carbon in samples from six wells are plotted in figure 9.

Total organic carbon is a gross measure of plant detritus, biological decay products, living cells, and synthetic organic compounds in water. At present, there are no established standards against which to compare total organic carbon data. The maximum, minimum, and median values of total organic carbon in ground water in McHenry County were 7.3, 0.2, and 2.6 mg/L, respectively.

SUMMARY

McHenry County derives a major part of its ground-water supply from sand and gravel aquifers. Twenty-six public water systems tap these aquifers for all or part of their supply.

Two general types of sand and gravel aquifers are present in McHenry County. The first, unconfined, are at or near the surface. The second, semiconfined, are buried beneath one or more till members.

Ground-water levels fluctuate seasonally. Recharge exceeds discharge during spring, which causes water levels to rise. Discharge exceeds recharge during the other seasons, which causes water levels to decline.

A map of ground-water levels was prepared from measurements made in 1979 in wells finished in unconfined and semiconfined aquifers. Water-level contours indicate that ground-water divides approximately coincide with surface-water divides, resulting in small local flow systems. Flow directions deduced from the contours indicate that recharge predominates in topographically high areas and discharge predominates in lowlands. Distances between ground-water divides and discharge areas may be as much as several miles.

Ground water is a calcium magnesium bicarbonate type, and seasonal variation in the concentrations of inorganic constituents is slight. The range of specific conductance of water from wells sampled in the spring of 1979 was from 260 to 1,170 µmhos. Specific conductances exceeded 1,000 µmhos in water from wells near Huntley and Hebron.

The chemical analyses indicate the water from sand and gravel aquifers in McHenry County is acceptable for most uses. However, for domestic and some industrial uses, treatment may be required to reduce hardness and dissolved iron. The water is generally very hard, with a maximum total hardness of 600 mg/L, a minimum of 130 mg/L, and a median of 340 mg/L. The concentrations of dissolved iron ranged from less than 10 to 6,200 µg/L with a median value of 140 µg/L. With the exception of samples from one well (well B), near a feed lot, the maximum nitrate concentration was 0.68 mg/L. Ammonia was the predominant form of nitrogen in most samples.

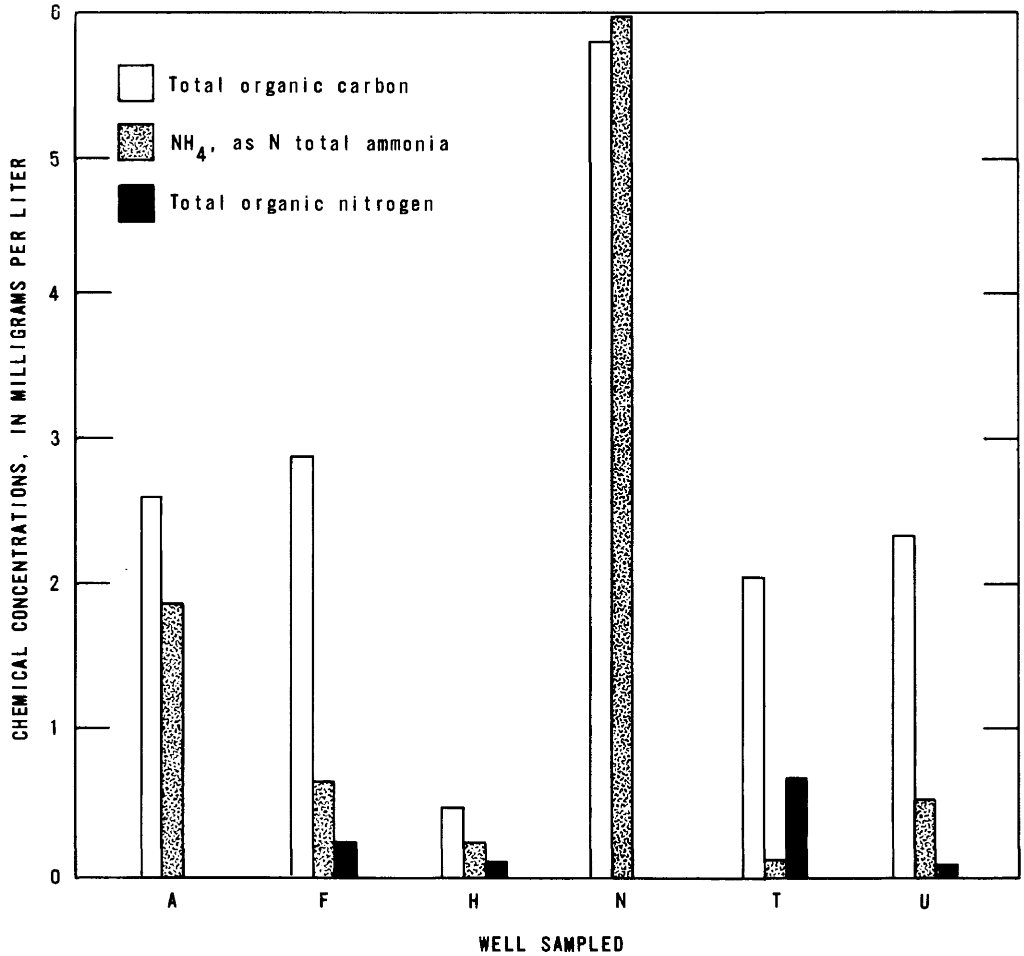


Figure 9.-- Concentrations of total organic carbon and forms of nitrogen from six wells in McHenry County (well locations are shown on plate 1).

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page 20 follows

TABLES 1, 2, and 3

Table 1.--Monthly ground-water altitudes

[Well locations are shown on plate 1.

Well	Apr.	May	June	July	Aug.	Sept.
A	926(30)	-------	923(05)	923(05)	922(01)	924(05)
B	-------	919(02)	-------	916(09)	915(01)	915(05)
C	918(30)	-------	916(05)	918(09)	914(01)	915(05)
D	-------	-------	953(05)	945(09)	946(01)	946(05)
E	-------	873(02)	-------	870(09)	869(01)	870(05)
F	-------	795(03)	792(06)	789(10)	789(01)	790(05)
G	817(30)	-------	817(06)	817(10)	816(01)	816(06)
H	-------	837(02)	-------	836(10)	836(01)	836(06)
I	-------	761(02)	-------	761(10)	759(01)	761(06)
J	-------	738(01)	-------	735(10)	735(01)	735(06)
K	-------	863(01)	860(05)	859(10)	858(01)	857(05)
M	851(25)	-------	850(05)	847(10)	847(01)	847(05)
N	844(30)	-------	841(05)	841(10)	840(01)	841(05)
O	-------	870(02)	868(06)	868(10)	867(01)	867(06)
Q	-------	852(01)	855(06)	858(11)	859(02)	857(06)
R	-------	737(01)	-------	735(11)	734(01)	735(06)
S	-------	746(01)	755(06)	745(11)	745(01)	750(06)
T	736(30)	-------	733(06)	732(11)	732(01)	-------
U	781(30)	-------	778(05)	777(09)	777(01)	778(05)
V	824(30)	-------	820(05)	818(09)	817(01)	817(05)
W	-------	862(02)	858(05)	855(09)	855(01)	856(05)
Y	-------	864(01)	864(06)	864(11)	863(01)	864(06)
76	868(30)	848(30)	-------	854(11)	855(01)	849(06)
104	-------	820(02)	821(01)	821(11)	820(02)	820(06)

--- Indicates no data.

in McHenry County, April 1979 through April 1980

Number in parentheses indicates day of month]

Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
921(02)	921(01)	923(04)	923(15)	923(28)	-------	925(22)
908(02)	913(01)	913(04)	914(15)	914(28)	-------	913(22)
912(02)	913(01)	915(04)	914(15)	914(28)	-------	914(22)
946(02)	945(01)	945(04)	-------	945(28)	-------	945(22)
868(02)	868(01)	868(04)	869(17)	868(28)	-------	870(22)
792(09)	791(13)	794(06)	794(17)	-------	791(04)	791(23)
816(09)	815(13)	817(06)	817(17)	-------	816(04)	816(23)
835(09)	835(13)	836(06)	830(17)	-------	833(04)	834(23)
752(09)	760(13)	760(06)	761(17)	-------	761(04)	761(23)
725(09)	734(13)	735(06)	734(17)	-------	732(04)	735(23)
855(04)	854(01)	845(04)	854(17)	854(28)	-------	854(22)
841(04)	846(01)	846(04)	846(17)	845(28)	-------	846(22)
838(04)	838(01)	840(04)	840(17)	840(28)	-------	841(22)
866(12)	865(01)	866(04)	865(17)	864(28)	-------	866(22)
847(04)	861(15)	862(06)	848(29)	-------	870(04)	860(23)
733(09)	-------	-------	-------	-------	-------	-------
743(09)	744(13)	745(06)	745(17)	-------	745(04)	746(23)
-------	729(13)	733(06)	733(29)	-------	733(07)	734(24)
736(02)	762(01)	768(04)	771(15)	777(28)	-------	780(22)
815(02)	815(01)	816(04)	815(15)	815(28)	-------	815(22)
852(02)	852(01)	856(04)	851(15)	856(28)	-------	856(22)
862(04)	862(13)	863(06)	863(29)	-------	863(07)	862(24)
849(09)	850(16)	-------	847(29)	-------	853(07)	855(24)
820(04)	819(13)	819(06)	-------	-------	820(07)	819(24)

Table 2.--Well data and specific conductance of ground water in McHenry County, spring 1979

[Well locations are shown on plate 1]

Well	Date	Well depth below land surface (feet)	Altitude of land surface (feet)	Altitude of water level (feet)	Specific conductance (µmhos/cm at 25°C)
1	Apr. 30	---	965	955	---
2	Apr. 30	---	905	903	640
3	May 3	---	903	895	610
4	May 3	---	883	879	---
5	May 3	---	860	852	725
6	May 3	---	890	885	625
7	May 2	---	1,040	955	---
8	May 1	194	952	923	605
9	Apr. 30	182	985	932	600
10	May 2	---	950	918	---
11	May 2	---	920	908	1,055
12	May 8	---	903	888	1,170
13	May 8	---	895	892	740
14	May 7	60	925	881	775
15	May 1	80	860	799	---
16	May 1	---	830	813	560
17	May 1	132	825	800	---
18	May 1	178	860	804	475
19	May 8	---	882	848	665
20	May 3	---	820	Flowing	570
21	May 2	---	790	774	510
22	May 3	146	835	819	555
23	May 3	300	912	845	560
24	May 2	185	880	834	560
25	May 2	---	875	828	505
26	May 2	---	765	Flowing	---
27	May 3	240	848	842	615
28	May 3	---	830	816	685
29	May 3	---	858	855	---
30	May 1	---	982	893	655

--- Indicates no data.

Table 2.--Well data and specific conductance of ground water in McHenry County, spring 1979--Continued

[Well locations are shown on plate 1]

Well	Date	Well depth below land surface (feet)	Altitude of land surface (feet)	Altitude of water level (feet)	Specific conductance (µmhos/cm at 25°C)
31	May 1	110	940	874	610
32	May 1	52	803	792	---
33	Apr. 25	208	880	807	670
34	May 2	---	1,015	885	740
35	May 1	---	920	871	720
36	May 1	70	843	879	755
37	May 1	65	888	868	---
38	May 1	---	930	875	770
39	Apr. 25	305	865	850	---
40	Apr. 30	---	895	847	755
41	May 2	202	892	871	700
42	May 3	146	835	819	---
43	May 7	---	918	865	745
44	May 4	230	905	816	---
45	May 3	218	900	806	580
46	May 1	55	830	792	---
47	May 1	178	820	745	480
48A	May 3	130	795	785	---
48B	May 3	107	790	763	435
49	May 1	180	805	751	---
50	May 1	75	755	742	860
51	May 1	84	742	Flowing	790
52	May 1	---	743	741	590
53	Apr. 28	---	765	741	---
54	May 1	---	758	740	820
55	May 1	46	742	Flowing	---
56	May 1	84	765	743	635
57	Apr. 24	71	745	741	710
58	Apr. 30	97	748	744	525
59	Apr. 30	93	752	746	530

--- Indicates no data.

Table 2.--Well data and specific conductance of ground water in McHenry County, spring 1979--Continued

[Well locations are shown on plate 1]

Well	Date	Well depth below land surface (feet)	Altitude of land surface (feet)	Altitude of water level (feet)	Specific conductance (µmhos/cm at 25°C)
60	Apr. 30	76	747	740	470
61	Apr. 30	53	745	Flowing	490
62	Apr. 30	73	743	Flowing	490
63	May 1	42	745	738	650
64	May 1	120	773	746	680
65	May 1	60	762	751	980
66	Apr. 24	66	755	743	675
67	May 2	165	770	734	625
68	May 2	110	765	743	680
69	May 1	---	765	751	615
70	May 3	300	870	811	---
71	May 1	180	820	803	885
72	May 2	200	913	860	625
73	May 3	100	900	879	760
74	May 3	---	870	863	---
75	May 3	62	890	---	---
76	Apr. 30	62	885	868	---
77	Apr. 30	---	883	879	---
78	May 2	---	889	875	890
79	May 2	---	848	843	730
80	May 2	78	855	Flowing	---
81	May 2	172	923	848	530
82	May 2	---	930	901	---
83	Apr. 30	150	925	889	635
84	May 1	221	925	890	650
85	May 1	104	903	898	765
86	May 1	72	902	867	870
87	May 2	280	956	863	645
88	May 1	165	833	805	480
89	May 3	113	890	834	775

--- Indicates no data.

Table 2.--Well data and specific conductance of ground water in McHenry County, spring 1979--Continued

[Well locations are shown on plate 1]

Well	Date	Well depth below land surface (feet)	Altitude of land surface (feet)	Altitude of water level (feet)	Specific conductance (µmhos/cm at 25°C)
90	May 1	107	970	925	---
91	May 3	264	940	850	505
92	Apr. 30	85	920	875	830
93	Apr. 30	124	885	819	760
94	Apr. 30	150	910	818	550
95	Apr. 30	164	825	794	635
96	May 1	---	765	739	770
97	May 1	115	735	733	585
98	May 1	127	738	735	590
99	May 1	---	780	742	490
100	Apr. 30	---	848	755	---
101	Apr. 30	93	847	777	585
102	May 2	150	830	759	510
103	May 2	---	910	812	510
104	May 2	95	888	820	---
105	Apr. 24	89	740	734	605
106	May 8	120	845	760	690
A	Apr. 30	120	938	926	720
B	May 2	---	935	919	680
C	Apr. 30	185	990	918	515
D	May 2	270	1,042	1,011	545
E	May 2	77	878	873	855
F	May 3	185	840	795	490
G	Apr. 30	211	865	817	531
H	May 2	265	935	837	560
I	May 2	164	770	761	510
J	May 1	70	768	738	660
K	May 1	80	880	863	635
L	May 3	137	893	876	705
M	Apr. 25	300	865	851	645

--- Indicates no data.

Table 2.--Well data and specific conductance of ground water in McHenry County, spring 1979--Continued

[Well locations are shown on plate 1]

Well	Date	Well depth below land surface (feet)	Altitude of land surface (feet)	Altitude of water level (feet)	Specific conductance (μmhos/cm at 25°C)
N	Apr. 30	202	885	844	745
O	May 2	103	883	870	700
P	May 7	58	860	851	750
Q	May 1	203	905	852	260
R	May 1	91	750	737	615
S	May 1	49	760	746	910
T	Apr. 30	54	738	736	695
U	Apr. 30	220	792	781	535
V	Apr. 30	149	830	824	600
W	May 2	--	903	862	580
X	Apr. 30	73	890	850	1,040
Y	May 1	50	895	864	690

Table 3.--Chemical analyses of water from wells in McHenry County, April 1979 through April 1980

[Well locations are shown on plate 1]

WELL	STATION NUMBER	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	PH (STANDARD UNITS)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
A	422730088363001	79-04-30	720	11.5	7.6	360	0	84	37	11
		79-07-31	730	13.5	7.2	370	0	84	38	11
		79-10-02	725	13.0	7.0	--	--	--	--	--
		79-11-01	710	13.0	7.1	360	0	83	37	12
		80-01-15	725	10.5	7.1	360	160	83	38	12
		80-01-17	725	10.5	7.1	--	--	--	--	--
		80-01-22	--	--	--	--	--	--	--	--
B	422426088362601	79-05-02	680	11.0	7.7	320	34	72	35	4.4
		79-10-02	--	--	--	--	--	--	--	--
		80-01-17	--	--	--	--	--	--	--	--
		80-01-22	--	--	--	--	--	--	--	--
C	422548088342301	79-04-30	515	11.5	8.0	150	0	29	18	51
		79-10-02	550	12.0	7.7	--	--	--	--	--
		80-01-17	510	10.5	--	--	--	--	--	--
		80-01-22	510	10.5	7.1	--	--	--	--	--
D	422926088305901	79-05-02	545	11.0	7.6	190	0	42	20	49
		79-10-02	--	--	--	--	--	--	--	--
E	422450088270201	79-05-02	855	11.0	7.6	440	160	100	47	6.5
		79-10-02	810	12.0	7.1	--	--	--	--	--
		80-01-17	735	10.5	--	--	--	--	--	--
		80-01-22	--	--	--	--	--	--	--	--
F	422357088211001	79-05-03	490	11.0	7.6	220	0	36	31	32
		79-08-01	515	13.0	7.6	210	0	33	31	40
		79-10-09	485	13.0	7.6	--	--	--	--	--
		79-11-13	480	11.5	7.6	210	0	34	30	36
		80-01-22	500	11.0	7.2	220	0	35	32	36
G	422427088190301	79-04-30	--	10.5	--	250	0	49	31	25
		79-10-09	550	13.0	7.6	--	--	--	--	--
H	422921088141601	79-05-02	560	11.0	7.6	310	0	68	35	6.9
		79-08-01	630	14.5	7.5	330	0	72	37	7.0
		79-10-09	625	12.0	7.6	--	--	--	--	--
		79-11-13	600	11.0	7.4	330	0	72	36	6.9
		80-01-22	620	10.5	7.1	340	0	72	39	7.8
I	422621088131201	79-05-02	510	11.0	--	310	32	69	34	4.9
		79-10-09	570	11.5	7.6	--	--	--	--	--
J	422234088145401	79-05-01	660	11.0	7.6	380	61	85	41	5.3
		79-10-09	750	11.0	7.4	--	--	--	--	--
K	422026088320301	79-05-01	685	11.5	8.0	320	41	71	35	16
L	422025088311801	79-05-03	705	11.0	7.8	370	69	82	40	4.4
		79-10-04	560	12.0	7.4	--	--	--	--	--
M	421900088303501	79-04-25	645	11.0	7.5	360	68	79	39	3.4

Table 3.--Chemical analyses of water from wells in McHenry County, April 1979 through April 1980--Continued

WELL	STATION NUMBER	DATE OF SAMPLE	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)
A	422730088363001	79-04-30	1.4	400	.7	5.9	.2	22	407	--
		79-07-31	1.2	390	.0	6.2	.3	21	396	--
		79-10-02	--	--	--	--	--	--	--	.01
		79-11-01	1.4	400	1.7	5.7	.3	22	408	--
		80-01-15	1.5	400	.0	6.4	.3	21	285	--
		80-01-17	--	--	--	--	--	--	--	.00
		80-01-22	--	--	--	--	--	--	--	--
B	422426088362601	79-05-02	1.5	290	39	13	.1	14	408	--
		79-10-02	--	--	--	--	--	--	--	10
		80-01-17	--	--	--	--	--	--	--	11
		80-01-22	--	--	--	--	--	--	--	--
C	422548088342301	79-04-30	1.4	280	.7	1.6	.9	15	286	--
		79-10-02	--	--	--	--	--	--	--	.03
		80-01-17	--	--	--	--	--	--	--	.00
		80-01-22	--	--	--	--	--	--	--	--
D	422926088305901	79-05-02	1.6	300	.7	1.7	.6	15	312	--
		79-10-02	--	--	--	--	--	--	--	.01
E	422450088270201	79-05-02	1.2	280	130	26	.1	12	491	--
		79-10-02	--	--	--	--	--	--	--	.14
		80-01-17	--	--	--	--	--	--	--	.01
		80-01-22	--	--	--	--	--	--	--	--
F	422357088211001	79-05-03	2.6	290	.7	1.0	.7	21	299	--
		79-08-01	2.4	280	.0	.9	.7	21	298	--
		79-10-09	--	--	--	--	--	--	--	.01
		79-11-13	2.5	290	.9	1.0	.8	21	301	--
		80-01-22	2.0	290	.0	1.0	.8	22	303	--
G	422427088190301	79-04-30	1.8	250	23	1.9	.3	18	300	--
		79-10-09	--	--	--	--	--	--	--	.10
H	422921088141601	79-05-02	1.2	350	2.7	1.2	.4	20	349	--
		79-08-01	1.1	340	3.5	1.2	.3	20	347	--
		79-10-09	--	--	--	--	--	--	--	.01
		79-11-13	1.1	310	4.4	1.2	.4	21	361	--
		80-01-22	1.1	350	2.4	1.4	.4	22	357	--
I	422621088131201	79-05-02	1.2	280	44	3.3	.2	18	344	--
		79-10-09	--	--	--	--	--	--	--	.01
J	422234088145401	79-05-01	1.1	320	76	16	.2	16	434	--
		79-10-09	--	--	--	--	--	--	--	.03
K	422026088320301	79-05-01	2.1	280	45	30	.2	16	384	--
L	422025088311801	79-05-03	1.5	300	67	10	.1	16	401	--
		79-10-04	--	--	--	--	--	--	--	.00
M	421900088303501	79-04-25	1.4	290	69	7.7	.1	16	390	--

Table 3.--Chemical analyses of water from wells in McHenry County, April 1979 through April 1980--Continued

WELL	STATION NUMBER	DATE OF SAMPLE	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)
A	422730088363001	79-04-30	--	--	--	--	--	4200	30	--
		79-07-31	--	--	--	--	--	30	30	--
		79-10-02	.00	1.9	.00	1.4	1.4	--	--	--
		79-11-01	--	--	--	--	--	4800	40	--
		80-01-15	--	--	--	--	--	740	30	--
		80-01-17	.00	2.3	.00	2.3	2.3	--	--	--
		80-01-22	--	--	--	--	--	--	--	2.6
B	422426088362601	79-05-02	--	--	--	--	--	30	1	--
		79-10-02	.00	.01	.10	.11	10	--	--	--
		80-01-17	.00	.01	.05	.06	11	--	--	--
		80-01-22	--	--	--	--	--	--	--	1.1
C	422548088342301	79-04-30	--	--	--	--	--	300	20	--
		79-10-02	.00	1.3	.20	1.5	1.5	--	--	--
		80-01-17	.00	1.3	.40	1.7	1.7	--	--	--
		80-01-22	--	--	--	--	--	--	--	5.3
D	422926088305901	79-05-02	--	--	--	--	--	910	6	--
		79-10-02	.02	.55	.21	.76	.79	--	--	5.3
E	422450088270201	79-05-02	--	--	--	--	--	10	80	--
		79-10-02	.00	.18	.04	.22	.36	--	--	--
		80-01-17	.01	.18	.15	.33	.35	--	--	--
		80-01-22	--	--	--	--	--	--	--	1.9
F	422357088211001	79-05-03	--	--	--	--	--	20	3	--
		79-08-01	--	--	--	--	--	200	5	--
		79-10-09	.00	.70	.24	.94	.95	--	--	2.9
		79-11-13	--	--	--	--	--	340	1	--
		80-01-22	--	--	--	--	--	70	0	--
G	422427088190301	79-04-30	--	--	--	--	--	0	50	--
		79-10-09	.00	.17	.36	.53	.63	--	--	.5
H	422921088141601	79-05-02	--	--	--	--	--	1500	40	--
		79-08-01	--	--	--	--	--	110	30	--
		79-10-09	.00	.22	.11	.33	.34	--	--	.4
		79-11-13	--	--	--	--	--	1600	30	--
		80-01-22	--	--	--	--	--	70	40	--
I	422621088131201	79-05-02	--	--	--	--	--	980	50	--
		79-10-09	.00	.05	.03	.08	.09	--	--	2.8
J	422234088145401	79-05-01	--	--	--	--	--	440	30	--
		79-10-09	.01	.13	.51	.64	.68	--	--	1.0
K	422026088320301	79-05-01	--	--	--	--	--	10	50	--
L	422025088311801	79-05-03	--	--	--	--	--	0	60	--
		79-10-04	.00	.10	.22	.32	.32	--	--	1.8
M	421900088303501	79-04-25	--	--	--	--	--	160	70	--

Table 3.--Chemical analyses of water from wells in McHenry County, April 1979 through April 1980--Continued

WELL	STATION NUMBER	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (UMHOS)	TEMPERATURE (DEG C)	PH (STANDARD UNITS)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
N	421632088291501	79-04-30	745	11.0	7.6	330	0	73	37	29
		79-08-01	760	13.0	7.3	330	0	73	36	30
		79-11-01	660	11.0	7.0	330	0	71	36	31
		80-01-17	740	10.5	--	340	--	72	38	29
O	421935088260201	79-05-02	700	12.0	7.3	360	39	78	40	7.1
		79-10-12	615	12.0	7.4	--	--	--	--	--
P	421708088212401	79-05-07	750	12.0	7.5	360	17	77	40	4.0
Q	421604088194201	79-05-01	260	11.0	7.7	130	0	29	15	58
		79-10-04	480	11.0	7.7	--	--	--	--	--
R	421849088140801	79-05-01	615	12.0	--	350	26	79	36	2.3
		79-10-09	650	13.0	7.2	--	--	--	--	--
S	421958088122901	79-05-01	910	11.0	7.3	430	81	100	44	28
		79-10-09	910	13.0	7.2	--	--	--	--	--
T	421600088130601	79-04-30	695	10.0	7.8	380	34	78	46	7.0
		79-08-01	725	12.0	7.4	370	33	77	44	6.0
		79-10-09	690	11.0	7.4	--	--	--	--	--
		79-11-13	685	11.0	7.5	360	13	76	42	5.8
		80-01-29	685	10.5	7.4	380	30	78	45	6.3
U	421307088403201	79-04-30	535	10.5	7.8	280	0	64	30	5.9
		79-07-31	545	12.5	7.6	280	0	63	29	6.5
		79-10-02	555	12.0	7.4	--	--	--	--	--
		79-11-01	555	11.0	7.0	290	0	66	30	7.0
		80-01-15	550	11.0	7.2	290	110	64	31	6.5
V	421425088301301	79-04-30	600	12.0	7.8	320	82	73	34	4.2
		79-10-02	620	14.0	7.0	--	--	--	--	--
		80-01-17	645	11.5	--	--	--	--	--	--
		80-01-22	645	11.5	7.1	--	--	--	--	--
W	421020088334501	79-05-02	580	11.5	8.0	220	0	30	36	24
		79-10-02	555	12.0	7.9	--	--	--	--	--
		80-01-17	560	11.0	--	--	--	--	--	--
		80-01-22	560	11.0	7.2	--	--	--	--	--
X	421012088254601	79-04-30	1040	12.0	7.6	600	230	140	60	13
		79-08-02	940	12.0	7.4	490	130	110	53	15
		79-10-04	915	11.5	7.4	--	--	--	--	--
Y	421258088185401	79-05-01	890	11.5	7.6	440	110	98	48	15

Table 3.--Chemical analyses of water from wells in McHenry County, April 1979 through April 1980--Continued

WELL	STATION NUMBER	DATE OF SAMPLE	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)
N	421632088291501	79-04-30	2.9	420	1.3	1.4	.4	20	420	--
		79-08-01	2.1	420	.5	1.5	.4	19	415	--
		79-11-01	2.9	420	1.9	1.5	.4	20	426	--
		80-01-17	2.9	--	1.3	2.4	.4	20	169	--
O	421935088260201	79-05-02	1.9	320	2.1	5.2	.4	21	348	--
		79-10-12	--	--	--	--	--	--	--	.00
P	421708088212401	79-05-07	1.2	295	56	7.3	.2	17	407	--
Q	421604088194201	79-05-01	1.3	260	1.2	1.7	.8	13	277	--
		79-10-04	--	--	--	--	--	--	--	.00
R	421849088140801	79-05-01	1.1	320	19	3.8	.1	19	353	--
		79-10-09	--	--	--	--	--	--	--	.00
S	421958088122901	79-05-01	4.8	350	42	60	.1	17	522	--
		79-10-09	--	--	--	--	--	--	--	.01
T	421600088130601	79-04-30	1.2	350	44	2.8	.3	25	415	--
		79-08-01	1.1	340	45	2.7	.3	24	405	--
		79-10-09	--	--	--	--	--	--	--	.03
		79-11-13	1.2	310	44	2.5	.4	25	409	--
		80-01-29	1.1	350	35	2.5	.4	26	406	--
U	421307088403201	79-04-30	1.3	300	.4	1.1	.3	17	301	--
		79-07-31	1.1	290	.0	1.2	.2	16	291	--
		79-10-02	--	--	--	--	--	--	--	.00
		79-11-01	1.4	310	1.7	1.3	.3	18	314	--
		80-01-15	1.5	180	.0	1.0	.3	17	230	--
V	421425088301301	79-04-30	1.0	240	26	6.9	.1	14	304	--
		79-10-02	--	--	--	--	--	--	--	.68
		80-01-17	--	--	--	--	--	--	--	.17
		80-01-22	--	--	--	--	--	--	--	--
W	421020088334501	79-05-02	1.2	310	.3	2.0	.6	14	295	--
		79-10-02	--	--	--	--	--	--	--	.01
		80-01-17	--	--	--	--	--	--	--	.02
		80-01-22	--	--	--	--	--	--	--	--
X	421012088254601	79-04-30	2.9	370	220	31	.4	16	706	--
		79-08-02	2.0	360	110	24	.3	16	547	--
		79-10-04	--	--	--	--	--	--	--	.10
Y	421258088185401	79-05-01	3.3	330	86	51	.1	12	513	--

Table 3.--Chemical analyses of water from wells in McHenry County, April 1979 through April 1980--Continued

WELL	STATION NUMBER	DATE OF SAMPLE	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)
N	421632088291501	79-04-30	--	--	--	--	--	2000	20	--
		79-08-01	--	--	--	--	--	310	30	--
		79-11-01	--	--	--	--	--	3200	20	--
		80-01-17	--	--	--	--	--	3400	30	--
O	421935088260201	79-05-02	--	--	--	--	--	40	40	--
		79-10-12	.00	1.9	.40	2.3	2.3	--	--	5.2
P	421708088212401	79-05-07	--	--	--	--	--	120	40	--
Q	421604088194201	79-05-01	--	--	--	--	--	200	9	--
		79-10-04	.00	.99	.31	1.3	1.3	--	--	5.1
R	421849088140801	79-05-01	--	--	--	--	--	20	60	--
		79-10-09	.01	.16	.25	.41	.42	--	--	7.3
S	421958088122901	79-05-01	--	--	--	--	--	6200	180	--
		79-10-09	.00	.76	.22	.98	.99	--	--	4.7
T	421600088130601	79-04-30	--	--	--	--	--	10	40	--
		79-08-01	--	--	--	--	--	190	40	--
		79-10-09	.00	.13	.72	.85	.88	--	--	2.1
		79-11-13	--	--	--	--	--	2000	40	--
		80-01-29	--	--	--	--	--	1400	40	--
U	421307088403201	79-04-30	--	--	--	--	--	360	20	--
		79-07-31	--	--	--	--	--	1	20	--
		79-10-02	.00	.51	.08	.59	.59	--	--	2.4
		79-11-01	--	--	--	--	--	1600	20	--
		80-01-15	--	--	--	--	--	110	20	--
V	421425088301301	79-04-30	--	--	--	--	--	190	110	--
		79-10-02	.02	.24	.04	.28	.98	--	--	--
		80-01-17	.01	.22	.06	.28	.46	--	--	--
		80-01-22	--	--	--	--	--	--	--	3.4
W	421020088334501	79-05-02	--	--	--	--	--	10	7	--
		79-10-02	.00	.72	.07	.79	.80	--	--	--
		80-01-17	.00	.75	.35	1.1	1.1	--	--	--
		80-01-22	--	--	--	--	--	--	--	5.2
X	421012088254601	79-04-30	--	--	--	--	--	10	90	--
		79-08-02	--	--	--	--	--	200	60	--
		79-10-04	.00	.22	.00	.20	.30	--	--	1.8
Y	421258088185401	79-05-01	--	--	--	--	--	0	100	--

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