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Public Groundwater Supplies in Will County

by DOROTHY M. VVOLLER and ELLIS W. SANDERSON

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PUBLIC GROUNDWATER SUPPLIES IN WILL COUNTY

by Dorothy M. Woller and Ellis W. Sanderson

Introduction

This publication presents all available information on production wells used for public water supplies in Will County. Bulletin 60, which is divided by county into separate publications, supersedes Bulletin 40 and its Supplements 1 and 2.

The definition of public water supply as contained in the Environmental Protection Act of 1970 was used to determine those water systems and wells to be included. Systems and wells described furnish water for drinking or general domestic use in: 1) incorporated municipalities; 2) unincorporated communities where 10 or more separate lots or properties are being served or are intended to be served; 3) state-owned parks and memorials; and 4) state-owned educational, charitable, or penal institutions.

This report includes separate descriptions for 70 public water supply systems furnishing water to 22 municipalities, 43 subdivisions, 3 state institutions, 2 state parks, and 1 university in Will County. These are preceded by brief summaries of the groundwater geology of the county and the development of groundwater sources for public use. An explanation of the format used in the descriptions is also given.

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Groundwater Geology

The geology of Will County is described in Illinois State Geological Survey Circular 198, *Groundwater Possibilities in Northeastern Illinois;* Circular 406, *Bedrock Aquifers of Northeastern Illinois;* Report of Investigation218, *Cambrian and Ordovician Strata of Northeastern Illinois;* and Illinois State Water Survey and State Geological Survey Cooperative Ground-Water Report 1, *Preliminary Report on Ground-Water Resources of the Chicago Region, Illinois.* The following brief discussion of geologic conditions in the county is taken largely from these publications. More detailed information on the geology in this portion of the state can be obtained from the State Geological Survey which is located on the University of Illinois Urbana campus.

The glacial drift deposits in Will County vary in thickness from less than 1 ft along the Des Plaines and Kankakee Rivers, where bedrock is exposed, to more than 200 ft near the stair-stepped northeast border. Sand and gravel deposits offering possibility for the development of small to moderate quantities of water (10 to 100 gpm) from individual wells are present within the glacial drift in more than half of the county. Northeast of Joliet a preglacial bedrock valley contains thick deposits of sand and gravel that have been developed for a portion of the supply for Joliet. Individual wells are pumped at rates of about 600 to 1000 gpm.

Beneath the glacial deposits throughout most of the county, dolomite (a limestone-like rock) of Silurian age

occurs at the bedrock surface. The exception to this is where Pennsylvanian and Ordovician age rocks dominated by shale occur at the bedrock surface in the area south from Highway 52 to the south county line and extending about 1 to 10 miles from the west county line. The regional dip of these strata is easterly at 10 to 25 ft per mile. Bedrock formations underlying Will County range in age from Pennsylvanian to Precambrian (see generalized stratigraphic sequence in figure 1). In the central western area of this county, there is a small vertical dislocation of the rock units along the Sandwich Fault which consists of several northwesterly trending faults.

Pennsylvanian-age rock units underlie the glacial drift in about 35 square miles at the southwest corner of the county in the vicinity of Braidwood. In this area the Silurian dolomite was removed by erosion and the Pennsylvanian units rest unconformably upon older rock units of the Ordovician age Maquoketa Group. The Pennsylvanian rock units range in thickness from a featheredge where they have been eroded to a maximum of about 110 ft. These rocks consist principally of shale and are not regarded as water yielding in this area.

The Silurian dolomite that underlies the glacial drift in most of Will County (see figure 2) is part of the geohydrologic system present throughout northeastern Illinois that is referrred to as the shallow dolomite aquifer system. These rocks are encountered at land surface near the Des Plaines River and along portions of the Kankakee River and are buried to a depth of more than 200 ft in some places along the stair-stepped northeast county line. They range in thickness from a featheredge in the southwest to about 300 ft northeast of Joliet to more than 450 ft along the far east edge of the county. Erosion has removed the Silurian dolomite southwest of Joliet along the west county line in a 1- to 10-mile-wide band arcing across the southwest part of the county through Wilmington. There the underlying Maquoketa Group forms the upper bedrock surface except where it is covered by Pennsylvanian units. The yield capability of the Silurian rocks depends primarily upon the number, size, and degree of interconnection of water-filled cracks and crevices within the rock that are penetrated by a well bore. The development of such cracks and crevices and the resulting yield capability of this aquifer are enhanced in some areas where permeable deposits of water-bearing sand and gravel in the overlying drift contribute substantial amounts of water.

The Maquoketa Group (Ordovician age) underlies the Silurian dolomite in most of Will County and is beneath the glacial drift in that part of southwest Will County where the Silurian dolomite and Pennsylvanian rocks are absent. It consists primarily of nonwater-bearing shales that separate the Silurian aquifer from deeper water-bearing units. These shales generally lie at depths from about 50 ft in areas in the southwestern part of the county to more than 500 ft in the eastern part of the county. However, these Maquoketa rocks are locally exposed at the land surface along portions of the Kankakee and Des Plaines Rivers. The Maquoketa ranges in thickness from less than 100 ft west of Joliet to about 250 ft in the southeast corner. The Maquoketa Group generally is not considered as a source for moderate to large water supplies. Locally, supplies adequate for small subdivisions and domestic use are obtained from systems of cracks and crevices in the more dolomitic part of these rocks.

Below the Maquoketa Group occurs a thick sequence of hydrologically connected rocks that are referred to as the Cambrian-Ordovician aquifer system. This aquifer system consists in downward order of the Galena and Platteville Dolomite Groups, Glenwood-St. Peter Sandstone, Prairie du Chien Group, Eminence-Potosi Dolomite, Franconia Formation, and Ironton-Galesville Sandstone.

Dolomite of the Galena-Platteville (Ordovician age) lies at depths that range from approximately 400 ft in northwestern Will County to about 850 ft in the eastern area. In the southwest portion of the county south of the Sandwich Fault, it is as shallow as 150 ft. It is relatively uniform in thickness throughout the county ranging from about 310 to 380 ft. Water from this aquifer is obtained from cracks and crevices so that the yield of individual wells depends primarily upon the number, size, and degree of interconnection of the crevices intersected by a well bore.

The Glenwood-St. Peter Sandstone (Ordovician age) lies below the Galena-Platteville. This sandstone aquifer is encountered at depths from about 650 ft in the northwest part of the county to about 600 ft in the southwest area south of Wilmington and reaches a maximum of 1250 ft at the southeast corner. It ranges in thickness from about 125 to 200 ft in most of the county east and south of Joliet to as much as 600 ft in a generally north-south trending band that passes beneath Joliet. It is estimated that the Galena-Platteville and the Glenwood-St. Peter produce about 15 percent of the total potential yield from the Cambrian-Ordovician aquifer system.

Below the Glenwood-St. Peter lie the Prairie du Chien Group (Ordovician age), Eminence-Potosi Dolomite (Cambrian age), and the Franconia Formation (Cambrian age) which consists of interbedded sandstones, shales, and dolomites. These units are encountered at depths of about 800 to 900 ft in western Will County to a maximum of about 1400 ft northwest of Joliet and at the southeast corner of the county and beneath the thick St. Peter Sandstone northeast of Joliet. These units have total thicknesses varying from about 450 ft to more than 800 ft except in the area northeast of Joliet where the thickness may be reduced to about 110 ft. The shales and dolomites yield small quantities of water, but the sandy parts of these formations may contribute moderate quantities of water to wells where they are not cased off by liners. It is estimated that these formation produce about 35 percent of the total yield from

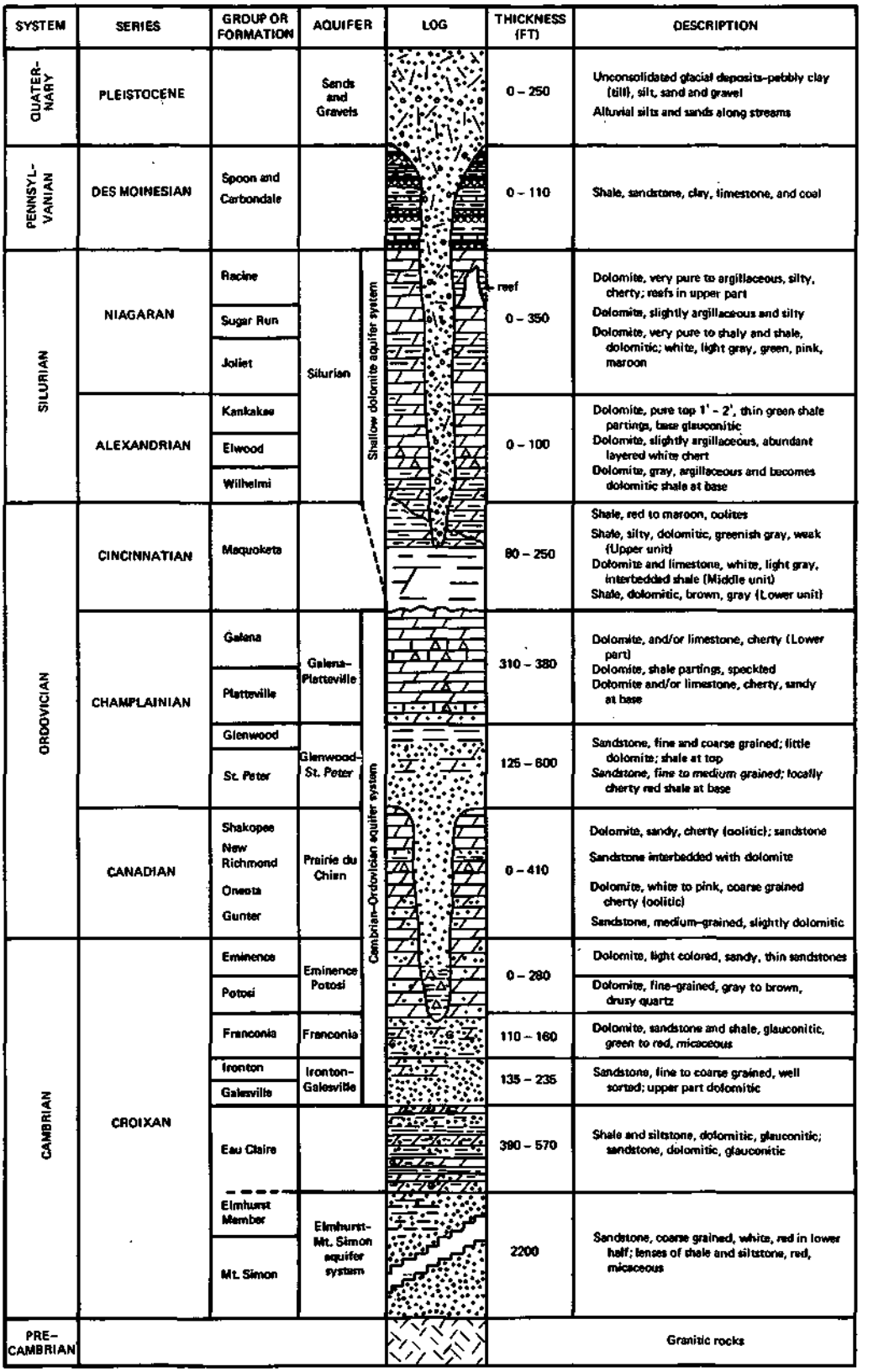

Figure 1. Generalized column of rock stratigraphic units and aquifers in Will County
(Prepared by M. L. Sargent, Illinois State Geological Survey)

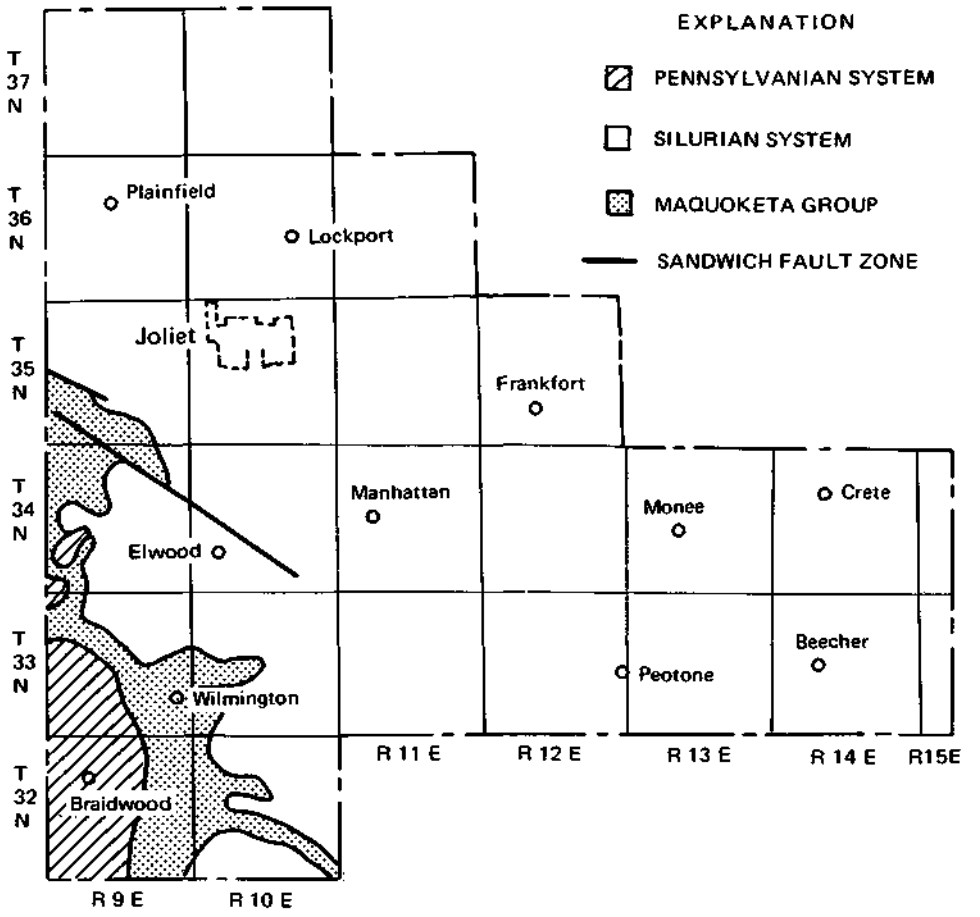

Figure 2. Areal geology of the bedrock surface
(Modified from Geologic Map of Illinois, Willman and others, 1967)

the Cambrian-Orodovician aquifer system. Wells tapping only these rock units are seldom constructed.

The Ironton-Galesville Sandstone (Cambrian age) is the most consistently permeable and productive unit of the Cambrian-Ordovician aquifer system in northeastern Illinois. It is usually about 175 to 200 ft thick in Will County. Its top occurs at a depth of about 1300 ft in the northwest part, is about 1550 ft deep in the southwest near Wilmington, and reaches a maximum of about 1950 ft in the southeast corner. It is estimated that this unit produces about 50 percent of the total yield of the Cambrian-Ordovician aquifer system.

Below the Ironton-Galesville Sandstone lies the Eau Claire Formation. The upper and middle parts of the Eau Claire contain numerous beds of nonwater-yielding shale that separate the Cambrian-Ordovician aquifer from the deeper aquifer. The Elmhurst Sandstone Member at the base of the Eau Claire Formation and the underlying Mt. Simon Sandstone are hydrologically connected and form the Elmhurst-Mt. Simon aquifer system, the deepest fresh water aquifer in northern Illinois. In Will County this aquifer lies at depths ranging from about 1900 ft in the northwest to more than 2650 ft in the southeast and ranges in thickness from about 2800 ft in the west-central part to about 2500 ft in the east-central part of the county. Water wells usually penetrate only a few hundred feet into this aquifer because the quality of the water deteriorates with depth. Water obtained below an elevation of about 1300 ft below sea level is generally too highly mineralized for domestic use.

Groundwater Development for Public Use

Groundwater is used as a source of public water supply at 22 municipalities, 43 subdivisions, 3 state institutions, 2 state parks, and 1 university in Will County. The locations of these supplies are shown in figure 3.

Sand and gravel deposits in the unconsolidated materials above bedrock are tapped by only one public water supply system in Will County. This is at Joliet where a part of their supply is obtained from 5 production wells located near Spring Creek about 4 to 5 miles northeast of the city. These

1 - Balmoral Heights Subdivision
2 - Beckwith Subdivision
3 - Beecher
4 - Bel-Air Subdivision
5 - Bolingbrook
6 - Bolingbrook (Citizens West Suburban)
7 - Bonnie Brae-Forest Manor Sanitary District
8 - Braidwood
9 - C and G Maintenance Corporation
10 - Camelot Utilities, Inc.
11 - Central States Utility Co.
12- Channahon
13 - Channahon Parkway State Park
14 - Cherry Hill Subdivision
15 - Chickasaw Hills Utility Co., Inc.
16 - Citizens Arbury Division
17 - Clearview Subdivision
18 - College View Subdivision
19-Crest Hill
20 - Crete
21 - Crystal Lawns Subdivision
22 - Derby Meadows Utility Co., Inc.
23 - Dixie Dells Subdivision (Willowbrook Utility Co.)
24 - Dixie Estates Subdivision
25 - East Lawn Subdivision
26 - East Moreland Water Association
27 - East Moreland Water Corp. (Feil Water Treatment)
28 - Elwood
29 - Fair Acres Subdivision
30 - Frankfort
31 - Frankfort Square Subdivision
32 - Governor's State University
33 - Greenfield Community Well Co.
34 - Hill View Subdivision
35 - Huntley Terrace Subdivision
36 - Illinois Youth Center (Kankakee School Camp)
37 - Ingall's Park Subdivision
38 - Joliet
39 - Joliet Correctional Center
40 - Kankakee River State Park
41 - Lakeview Improvement Association
42 - Lakewood Shores Improvement Association
43 - Lockport
44 - Lockport Heights Sanitary District
45 - Lockport Township Water System
46 - Manhattan
47 - Minooka
48 - Mokena
49 - Monee
50 - New Lenox
51 - Oak Valley Subdivision
52 - Oakview Avenue Waterworks, Inc.
53 - Park Forest South Utility Co.
54 - Park Road Water Association
55 - Peotone
56 - Plainfield
57 - Preston Utility Co.
58 - Prestwick Utility Co.
59 - Ridgewood Subdivision
60 - Rockdale
61 - Romeoville
62 - Shawnita Terrace Water Association
63 - Shorewood (Brook Forest Subdv)
64 - Shorewood (Oakwood Manor Subdv)
65 - Stateville Correctional Center
66 - Steger
67 - Sunnyland Subdivision
68 - Sunset Trails Apartments
69 - Utilities, Unlimited
70 - Willow Brook Utility Co.
71 -Wilmington

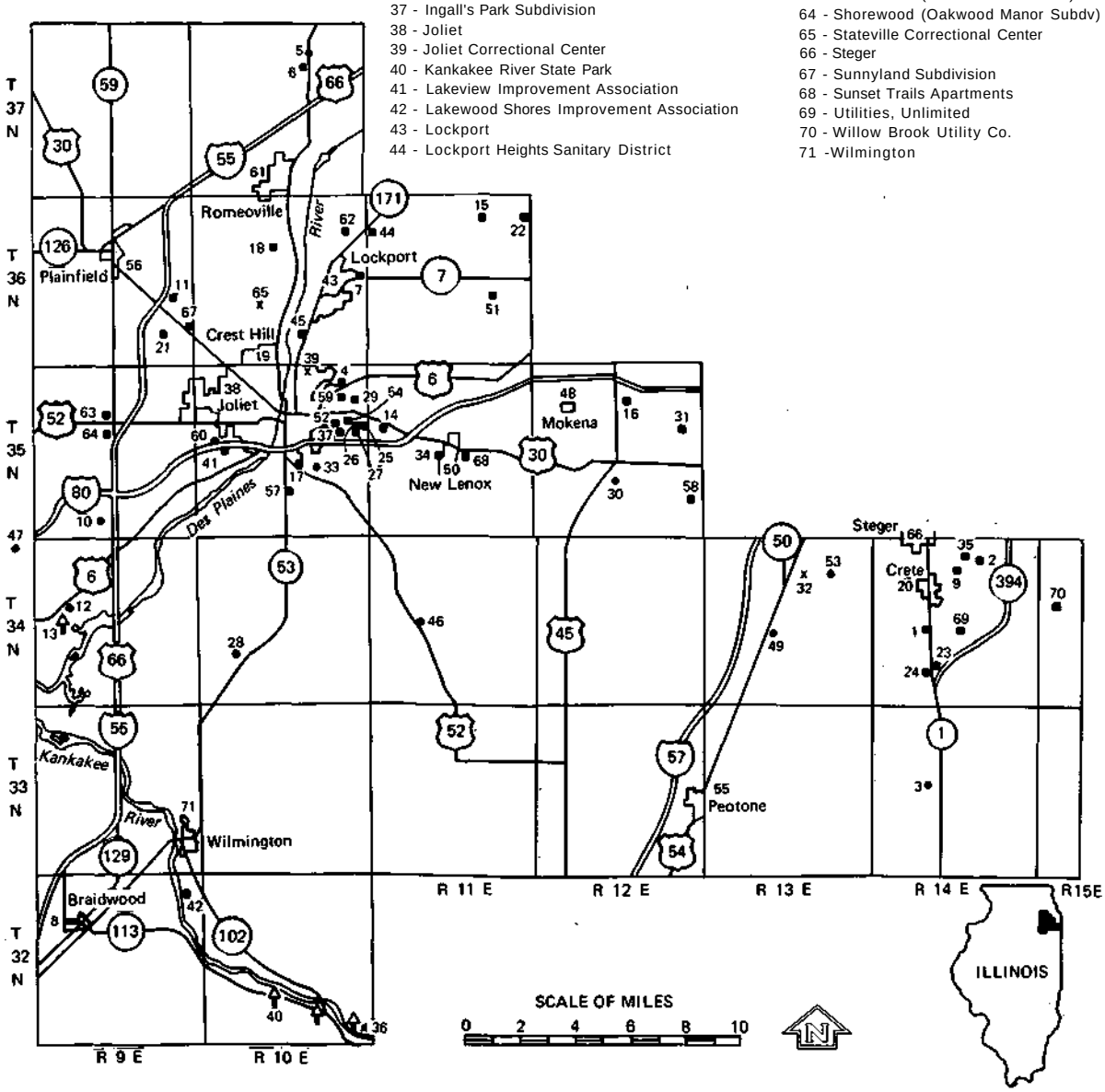

Figure 3. Location of public groundwater supply systems in Will County

wells range in depth from 83 to 113 ft and yield from 600 to 1200 gpm depending upon the permeability and thickness of the sand and gravel unit at each well site. Production from these wells for 1980 was reported to be 3,364,000 gpd.

The analyses of water from these wells show that the iron content usually ranges from 0.7 to 4.0 mg/1, sulfates from 156 to 418 mg/1, hardness from 387 to 738 mg/1, and the total dissolved minerals from 415 to 925 mg/1. Water from the sand and gravel deposits at Joliet is chlorinated, filtered, and treated with polyphosphate to keep iron in solution.

The upper bedrock units in Will County, the Silurian dolomite and the Maquoketa Group, are tapped by 58 public water systems as a source of all or a portion of their water supply. There are presently 118 production and standby wells finished only in these units. They range in depth from 102 to 570 ft and are pumped at rates of 7 to 2400 gpm. The yield of an individual well depends primarily on the thickness of the aquifer and the number, size, and degree of interconnection of the crevices intersected by the well bore. Withdrawals from the upper bedrock units for 1980 were estimated to be about 12,300,000 gpd.

Analyses of water from wells tapping only the upper bedrock units show that the iron content usually ranges from 0.0 to 4.4 mg/1, sulfates from 10 to 870 mg/1, hardness from 234 to 1288 mg/1, and the total dissolved minerals from 388 to 1581 mg/1. The barium content of water from 1 well was 1.1 mg/1. Hydrogen sulfide gas was also noted in water from 1 well. Treatment provided at the 58 supply systems is as follows: 50 chlorinate, 42 fluoridate, 1 aerates, 1 treats with sodium silicate, 2 filter, 1 softens, 19 add polyphosphate to keep iron in solution, and 8 provide no treatment.

Wells tapping combinations of formations within the Cambrian-Ordovician aquifer system are used at 15 public water systems as a source of all or a part of their water supply. There are presently 39 production and standby wells, ranging in depth from 440 to 1733 ft, finished within the Cambrian-Ordovician aquifer system. These wells are pumped at rates of 23 to 1980 gpm. Production from these wells for 1980 was estimated to be about 15,481,000 gpd.

The analysis of water from these wells show the iron content usually ranges from 0.0 to 1.2 mg/1, fluoride from 0.3 to 2.5 mg/1, chlorides from 15 to 320 mg/1, sulfates from 33 to 500 mg/1, hardness from 100 to 565 mg/1, and the total dissolved minerals from 351 to 1460 mg/1. Hydrogen sulfide gas was also noted in water from 3 wells. Water treatment for these supplies is as follows: 15 chlorinate, 1 adds fluroide, 1 aerates, 1 filters, and 3 add polyphosphate to keep iron in solution.

Throughout most of northeastern Illinois the Cambrian-Ordovician aquifer system has been overdeveloped resulting in marked declines in water levels in this aquifer. In Will County water levels have declined at an average rate of 14 ft per year for the period 1971 to 1975 and about 6 ft per year for the period 1975 to 1980.

The total public water supply pumpage from the aquifers in Will County for 1980 was about 31,155,000 gpd. Of this total approximately 11 percent was obtained from sand and gravel aquifers, 39 percent from the Silurian dolomite and Maquoketa Group, and 50 percent from combinations of formations within the Cambrian-Ordovician aquifer system.

Format

In this publication the descriptions of public water supplies are presented in alphabetical order by place name.

At the beginning of each description the U. S. Census of population for 1970 is given for incorporated places. For unincorporated places, the population is estimated on the basis of the number of services or residential units and an assumed number of 3.5 persons per service.

The number of services and quantity of water distributed at each supply are given where available for the earliest and the latest reported values.

Individual production wells for each supply are described in the order of their construction. The description for each well includes the *aquifer or aquifers tapped, date drilled, depth, driller, legal location, elevation in feet above mean sea level, log, construction features, yield, pumping equipment, and chemical analyses.*

When available, sample study logs prepared by the Illinois State Geological Survey are presented. When these are not available, drillers logs are used as reported. Commonly used drillers terms such as clay, silt, or pebbly clay generally are synonymous with the glacial tills tabulated by the State Geological Survey. Similarly, limestones or dolomites reported by drillers usually are carbonate rocks which in most of Illinois are dolomitic in composition. When stating the bedrock aquifers tapped by a well, the sample study log provided by the State Geological Survey and the drillers casing record are used to determine the geohydrologic units open to the hole. If only a drillers log is available and the geohydrologic units cannot be readily determined, only the principal rock type as described by the driller is given (dolomite, sandstone, etc.).

The screen sizes given in this publication are for continuous slot type screens unless stated otherwise. Slot sizes given indicate the width of the slot openings in thousandths of an inch. For example, a 20 slot screen has slot openings 0.020 in. wide and a 100 slot screen has slots 0.100 in. wide. Approximate equivalent slot openings for other types of screens are given in parentheses after the screen description.

Abbreviations Used

est	estimated
ft	foot (feet)
gal	gallons(s)
gpd	gallons per day
gpm	gallons per minute
HCl	hydrochloric acid
hp	horsepower
hr	hour(s)
ID	inside diameter
in	inch(es)
Lab	laboratory
lb	pound(s)
me/1	milliequivalents per liter
mg/1	milligrams per liter
min	minute(s)
No.(s)	number(s)
OD	outside diameter
oz	ounce(s)
pc/1	picocuries per liter
qt	quart(s)
R	range
rpm	revolutions per minute
T	township
TDH	total dynamic head

PUBLIC WATER SUPPLIES

(concluded on next page)

PUBLIC WATER SUPPLIES *(Concluded)*

BALMORAL HEIGHTS SUBDIVISION

Balmoral Heights Subdivision (est. 448), located about 1 mile south of Crete, installed a public water supply in 1956. The water system is owned and operated by the Balmoral Heights Water Association. Two wells are in use. In 1980 there were 128 services, all metered; the average pumpage was 21,457 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in March 1956 to a depth of 240 ft by Dreher & Schorie, Joliet. The well is located about 0.2 mile west of Illinois Route 1 and 300 ft south of Monee Road, approximately 2350 ft N and 250 ft W of the SE corner of Section 20, T34N, R14E. The land surface elevation at the well is approximately 760 ft.

A 6-in. diameter hole was drilled to a depth of 240 ft. The well is cased with 6-in. pipe from 1 ft above the pumphouse floor to a depth of 120 ft.

Upon completion, the well reportedly produced 60 gpm for 8 hr with a drawdown of 40 ft from a nonpumping water level of 50 ft below land surface.

The pumping equipment presently installed is a Red Jacket submersible pump (Model 300K1-CB) set at 145 ft, rated at 60 gpm, and powered by a 3-hp Franklin electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B108906) of a sample collected March 6, 1974, after pumping for 50 min at 60 gpm, showed the water to have a hardness of 387 mg/1, total dissolved minerals of 423 mg/1, and an iron content of 0.70 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in June 1957 to a depth of 273 ft by Dreher & Schorie, Joliet. The well is located about 200 ft southwest of Well No. 1, approximately 2250 ft N and 400 ft W of the SE corner of Section 20, T34N, R14E. The land surface elevation at the well is approximately 763 ft.

A 6-in. diameter hole was drilled to a depth of 273 ft. The well is cased with 6-in. pipe from 1.5 ft above the pumphouse floor to a depth of 130 ft.

Upon completion, the well reportedly produced 80 gpm for 8 hr with a drawdown of 50 ft from a nonpumping water level of 70 ft below land surface.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 18E6) set at 187 ft, rated at 80 gpm, and powered by a 7½-hp 3450 rpm Franklin electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C004305) is for a water sample from the well collected June 19, 1978, after 30 min of pumping at 63 gpm.

WELL NO. 2, LABORATORY NO. C004305

		mg/l	*me/l*		*mg/l*	*me/l*
Iron	Fe	0.4	Silica	SiO_2	11	
Manganese	Mn	0.01	Fluoride	F	0.5	0.03
Ammonium	NH_4	0.48 0.03	Boron	B	0.4	
Sodium	Na	10 0.44	Cyanide	CN	0.00	
Potassium	K	3.6 0.09	Nitrate	NO_3	0.04	0.00
Calcium	Ca	82 4.09	Chloride	Cl	1	0.03
Magnesium	Mg	38 3.13	Sulfate	SO_4	20	0.42
			Alkalinity (as $CaCO_3$)		380	7.60
Arsenic	As	0.000	Hardness (as $CaCO_3$)		361	7.22
Barium	Ba	0.3				
Cadmium	Cd	0.00	Total dissolved			
Chromium	Cr	0.00	minerals		408	
Copper	Cu	0.00				
Lead	Pb	0.00				
Mercury	Hg	0.0000				
Nickel	Ni	0.0				
Selenium	Se	0.00				
Silver	Ag	0.00				
Zinc	Zn	0.01	pH (as rec'd)		7.4	

BECKWITH SUBDIVISION

Beckwith Subdivision (est. 60), located within the village limits of Crete, installed a public water supply in 1940. The water system is owned and operated by the Beckwith Community Association. Two wells are in use. In 1978 there were 19 services, none metered; the estimated average pumpage was 5000 gpd. The water is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed to a depth of about 187 ft. This well is alternated with Well No. 2. The well is located about 300 ft north of Sussex Drive and 175 ft west of Beckwith Drive, approximately 1400 ft N and 500 ft W of the SE corner of Section 3, T34N, R14E. The land surface elevation at the well is approximately 722 ft.

No information is available on the hole and casing records.

The pumping equipment presently installed is a Red Jacket submersible pump set at 105 ft, and powered by a 5-hp electric motor.

WELL NO. 2, open to the Silurian dolomite, was completed about 1945 to a depth of about 187 ft. This well is alternated with Well No. 1. The well is located about 200 ft south of Sussex Drive and 200 ft west of Beckwith Drive, approximately 900 ft N and 525 ft W of the SE corner of Section 3, T34N, R14E. The land surface elevation at the well is approximately 730 ft.

No information is available on the hole and casing records.

The turbine pump is presently operating at about 90 gpm.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B050195) is for a water sample from the well collected April 14, 1981, after pumping at 90 gpm.

WELL NO. 2, LABORATORY NO. B050195

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.134		Silica	SiO_2	12	
Manganese	Mn	<0.005		Fluoride	F	0.29	0.02
Ammonium	NH_4	<0.1		Boron	B	0.20	
Sodium	Na	8	0.35	Cyanide	CN	<0.005	
Potassium	K	3.5	0.09	Nitrate	NO_3	<0.4	
Calcium	Ca	91	4.54	Chloride	Cl	3.6	0.10
Magnesium	Mg	43.8	3.60	Sulfate	SO_4	69	1.44
Strontium	Sr	0.228		Alkalinity(as $CaCO_3$)		345	6.90
Arsenic	As	<0.001		Hardness(as $CaCO_3$)		399	7.98
Barium	Ba	0.021					
Beryllium	Be	<0.0005		Total dissolved			
Cadmium	Cd	<0.004		minerals		464	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	0.017					
Lead	Pb	<0.005					
Mercury	Hg	<0.00002					
Nickel	Ni	0.006					
Selenium	Se	< 0.0005					
Silver	Ag	<0.005					
Vanadium	V	< 0.004					
Zinc	Zn	0.014		pH (as rec'd)		7.1	

BEECHER

The village of Beecher (1770) installed a public water supply in 1911. Two wells are in use. In 1949 there were 271 services, 99 percent metered; the estimated average pumpage was 25,000 gpd. In 1980 there were 627 services, all metered; the average and maximum pumpages were 250,070 and 400,000 gpd, respectively. The water is chlorinated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1910 to a depth of 164 ft by Charles H. Bahlman. The well is located at the southeast corner of Penfield and Woodward Sts., approximately 592 ft N and 660 ft E of the SW corner of Section 16, T33N, R14E. The land surface elevation at the well is approximately 712 ft.

The well is cased with 10-in. black pipe from 1.5 ft above the pump station floor to a depth of 80 ft. Below the casing, the hole was finished 10 in. in diameter to the bottom.

Upon completion, the nonpumping water level was reported to be 13 ft.

On June 19, 1923, the well reportedly produced 180 gpm for 9 min with a drawdown of 2.2 ft from a nonpumping water level of 14.7 ft below the top of the casing.

On February 12, 1974, the well reportedly produced 385 gpm with a drawdown of 2 ft from a nonpumping water level of 16 ft.

The pumping equipment presently installed is a Fairbanks-Morse Pomona vertical turbine pump rated at 300 gpm at about 220 ft TDH, and powered by a 30-hp 1770 rpm Fairbanks-Morse electric motor.

A mineral analysis of a sample (Lab. No. 38536) collected November 13, 1917, showed the water to have a hardness of 619 mg/l, total dissolved minerals of 995 mg/I, and an iron content of 0.53 mg/l.

WELL NO. 2, open to the Silurian dolomite, was completed in 1931 to a depth of 230 ft by J. O. Heflin, Joliet. The well is located 12 ft south of Well No. 1, approximately 580 ft N and 660 ft E of the SW corner of Section 16, T33N, R14E. The land surface elevation at the well is approximately 712 ft.

A 10-in diameter hole was drilled to a depth of 230 ft. The well is cased with 10-in. pipe from 1.5 ft above the pump station floor to a depth of 91 ft.

On April 27, 1944, the nonpumping water level was reported to be 26 ft below the pump base.

On February 12, 1974, the well reportedly produced 400 gpm with a drawdown of 9 ft from a nonpumping water level of 11 ft.

The pumping equipment presently installed consists of a 30-hp 1750 rpmWestinghouse electric motor (No. 8017271), an 8-in., 13-stage Fairbanks-Morse Pomona vertical turbine pump set at 50 ft, rated at 300 gpm at about 220 ft head, and has 50 ft of 6-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 03777) is for a water sample from the well collected January 25, 1972, after 30 min of pumping at 350 gpm.

WELL NO. 2, LABORATORY NO. 03777

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.0		Silica	SiO_2	8.5	
Manganese	Mn	0.0		Fluoride	F	0.7	0.04
Ammonium	NH_4	0.8	0.04	Boron	B	1.5	
Sodium	Na	50	2.18	Nitrate	NO_3	0.0	
Potassium	K	6.6	0.17	Chloride	Cl	2.5	0.07
Calcium	Ca	139	6.94	Sulfate	SO_4	388	8.07
Magnesium	Mg	46	3.78	Alkalinity(as $CaCO_3$)		244	4.88
				Hardness(as $CaCO_3$)		544	
Barium	Ba	0.0		Total dissolved			
Cadmium	Cd	0.00		minerals		830	
Chromium	Cr	0.0					
CotJper	Cu	0.0		pH (as rec'd)		7.4	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha pc/l		0	
Nickel	Ni	0.0		± deviation		0	
Silver	Ag	0.0		Beta *pc/l*		5	
Zinc	Zn	0.0		± deviation		1	

BEL-AIR SUBDIVISION

Bel-Air Subdivision (est. 100), located about 0.2 mile north of Joliet, installed a public water supply in 1940. The water system is owned and operated by the Home Owners Association. One well is in use. In 1978 there were 28 services, none metered; the estimated average and maximum pumpages were 8000 and 10,000 gpd, respectively. The water is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1940 to a depth of 365 ft. The well is located at the rear of 812 Gage St., approximately 500 ft N and 1150 ft W of the SE corner of Section 2, T35N, R10E. The land surface elevation at the well is approximately 630 ft.

The well is cased with 6-in. pipe from 0.5 ft above land surface to an unknown depth. The well is in a 6-ft deep pit.

The pumping equipment presently installed is an 18-stage Red Jacket submersible pump operated at 20 gpm, and powered by a 3-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A17871) is for a water sample from the well collected April 12, 1976, after 2 hr of pumping.

WELL NO. 1, LABORATORY NO. A17871

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.2		Silica	$S1O_2$	16	
Manganese	Mn	0.00		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.10	0.01	Boron	B	0.0	
Sodium	Na	14	0.61	Cyanide	CN	0.01	
Potassium	K	2.5	0.06	Nitrate	NO_3	0.9	0.01
Calcium	Ca	118	5.89	Chloride	Cl	13	0.37
Magnesium	Mg	55	4.53	Sulfate	SO_4	220	4.58
				Alkalinity(as $CaCO_3$)		326	6.52
Arsenic	As	0.000		Hardness (as $CaCO_3$)		520	10.40
Barium	Ba	0.0		Total dissolved			
Cadmium	Cd	0.00		minerals		610	
Chromium	Cr	0.00					
Copper	Cu	0.05					
Lead	Pb	0.00		pH (as rec'd)		7.9	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		1.4	
Selenium	Se	0.00		± deviation		2.0	
Silver	Ag	0.00		Beta *pc/l*		4.5	
Zinc	Zn	0.0		± deviation		2.2	

BOLINGBROOK

The village of Bolingbrook (8504) installed a public water supply in 1970. This village also extends into DuPage County and one of the wells is located there. Five wells (Nos. 1-5) are in use. This supply is also cross connected with the village of Woodridge. Part of this village is served by Citizens West Suburban (see Bolingbrook-Citizens West Suburban) also described in this bulletin. In 1980 there were 3500 services for the village system, all metered; the average pumpage was 1,600,000 gpd. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite, was completed in October 1970 to a depth of 320 ft by the Shaver Well Drilling Co., Lombard. The well is located at 382 East

Boughton Road, approximately 1300 ft N and 1900 ft W of the SE corner of Section 2, T37N, R10E, Will County. The land surface elevation at the well is approximately 730 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	118	118
Niagara lime	197	315
Shale	5	320

A 12-in. diameter hole was drilled to a depth of 320 ft. The well is cased with 12-in. pipe from about 1.2 ft above land surface to a depth of 118 ft. The top of the casing is equipped with a pitless adapter.

Upon completion, the well reportedly produced 1000 gpm for 24 hr with a drawdown of 45 ft from a nonpumping water level of 90 ft.

The pumping equipment presently installed is a Sumo submersible pump set at 175 ft, rated at 500 gpm at about 260 ft TDH, and powered by a 50-hp Sumo electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B100777) of a sample collected July 24, 1973, after pumping for 1.5 hr at 500 gpm, showed the water to have a hardness of 552 mg/1, total dissolved minerals of 683 mg/1, and an iron content of 0.48 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in March 1971 to a depth of 320 ft by the Shaver Well Drilling Co., Lombard. The well is located about 200 ft south of Well No. 1, approximately 1100 ft N and 1900 ft W of the SE corner of Section 2, T37N, R10E, Will County. The land surface elevation at the well is approximately 725 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	109.5	109.5
Niagara limestone	210.5	320

A 12-in. diameter hole was drilled to a depth of 320 ft. The well is cased with 12-in. pipe from about 1.2 ft above land surface to a depth of 109.5 ft. The top of the casing is equipped with a pitless adapter.

On July 1, 1971, the well reportedly produced 1000 gpm with a drawdown of 35 ft from a nonpumping water level of 120 ft.

The pumping equipment presently installed is a Peerless submersible pump set at 175 ft, rated at 500 gpm at about 305 ft TDH, and powered by a 60-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A17172) of a sample collected February 22, 1977, after pumping for 8 hr at 500 gpm, showed the water to have a hardness of 505 mg/1, total dissolved minerals of 700 mg/1, and an iron content of 0.58 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in March 1974 to a depth of 320 ft by the Layne-Western Co., Aurora. The well is located southeast of the intersection of Rockhurst Road and Melissa St., approximately 2550 ft N and 1400 ft E of the SW corner of Section 12, T37N, R10E, Will County. The land surface elevation at the well is approximately 750 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Black soil	1	1
Yellow clay and boulders	9	10
Gray clay and boulders	58	68
Boulder	2	70
Cemented sand and gravel, clay streaks	33	103
Sand and gravel, trace of clay	17	120
Clay	15	135
Lime, some chert	131	266
Lime, streaks of blue shale	9	275
Shale, little lime	45	320

A 17.2-in. diameter hole was drilled to a depth of 138 ft and finished 12 in. in diameter from 138 to 320 ft. The well is cased with 12-in. steel pipe from 4 ft above land surface to a depth of 139 ft. The annulus between the bore hole and casing is filled with cement from 0 to 40 ft and with drill cuttings and clay from 40 to 138 ft.

A production test was conducted by the driller on March8, 1974. After 8 hr of pumping at rates ranging from 556 to 599 gpm, the final drawdown was 26 ft from a nonpumping water level of 104 ft below land surface.

On September 14, 1979, the nonpumping water level was reported to be 109 ft.

The pumping equipment presently installed consists of a 50-hp 1770 rpm U. S. electric motor, a 10-in, 7-stage Layne turbine pump (No. 74206A) set at 180 ft, rated at 500 gpm at about 299 ft TDH, and has 180 ft of 8-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake. The well is equipped with 180 ft of airline.

A mineral analysis of a sample (Lab. No. 211978) collected September 14, 1979, after pumping for 3 hr at 500 gpm, showed the water to have a hardness of 546 mg/1, total dissolved minerals of 694 mg/1, and an iron content of 1.4 mg/1.

WELL NO. 4, open to the Silurian dolomite, was completed in April 1974 to a depth of 305 ft by the Layne-Western Co., Aurora. The well is located southwest of the intersection of Rockhurst Road and Janes Ave., approximately 2400 ft N and 2500 ft E of the SW corner of Section 12, T37N, R10E, Will County. The land surface elevation at the well is approximately 757 ft.

A drillers log of Well No. 4 follows:

Strata	Thickness (ft)	Depth (ft)
Black soil	1	1
Brown clay and stones	15	16
Gray clay and stones	58	74
Cemented sand and gravel, boulders	27	101
Sand and gravel	9	110
Shale	32	142
Lime	130	272
Shale, lime lenses	8	280
Shale	25	305

A 17.2-in. diameter hole was drilled to a depth of 145.5 ft and finished 12 in. in diameter from 145.5 to 305 ft. The well is cased with 12-in. steel pipe from 3 ft above land surface to a depth of 145.5 ft. The annulus between the bore hole and casing is filled with cement grout from 0 to 40 ft and with drill cuttings and clay from 40 to 145.5 ft.

A production test was conducted by the driller on April 1, 1974. After 8 hr of pumping at rates ranging from 496 to 776 gpm, the final drawdown was 40 ft from a nonpumping water level of 118 ft below land surface.

The pumping equipment presently installed consists of a 60-hp 1770 rpm U. S. electric motor, a 10-in., 8-stage Layne turbine pump (No. 71658A) set at 180 ft, rated at 500 gpm at about 315 ft TDH, and has 180 ft of 8-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake. The well is equipped with 180 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B29593) is for a water sample from the well collected January 27, 1976, after 0.5 hr of pumping at 500 gpm.

WELL NO. 4, LABORATORY NO. B29593

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.9		Silica	SiO_2	12	
Manganese	Mn	0.05		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.30	0.02	Boron	B	0.2	
Sodium	Na	12	0.52	Cyanide	CN	0.00	
Potassium	K	2.1	0.05	Nitrate	NO_3	0.09	0.00
Calcium	Ca	106	5.29	Chloride	Cl	25	0.70
Magnesium	Mg	39	3.21	Sulfate	SO_4	170	3.54
				Alkalinity (as $CaCO_3$)		260	5.20
Arsenic	As	0.00		Hardness (as $CaCO_3$)		425	8.50
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		585	
Copper	Cu	0.12					
Lead	Pb	0.00		pH (as rec'd)		7.9	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		2.5	
Selenium	Se	0.00		± deviation		2.1	
Silver	Ag	0.00		Beta *pc/l*		5.9	
Zinc	Zn	0.0		± deviation		2.1	

WELL NO. 5, open to the Silurian dolomite, was completed in April 1976 to a depth of 338 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located about 175 ft south of Falcon Ridge Way and 120 ft west of Sword Way, approximately 300 ft S and 925 ft E of the NW corner of Section 12, T37N, R10E, Will County. The land surface elevation at the well is approximately 740 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	119	119
Limestone	208	327
Shale	11	338

A 19.2-in. diameter hole was drilled to a depth of 129 ft and finished 15.2 in. in diameter from 129 to 338 ft. The well is cased with 20-in. OD pipe from land surface to a depth of 119 ft and 16-in. OD pipe from about 1.5 ft above the wellhouse floor to a depth of 129.5 ft (cemented in).

Upon completion, the well reportedly produced 1040 gpm for 5 hr with a drawdown of 7 ft from a nonpumping water level of 90 ft below the top of the casing.

The pumping equipment presently installed is a 12-in., 5-stage Peerless turbine pump set at 182 ft, rated at 1000 gpm at about 233 ft TDH, and powered by a 100-hp 1760 rpm Ideal electric motor.

A partial analysis of a sample (Lab. No. 202078) collected June 3, 1976, showed the water to have a hardness of 492 mg/l, total dissolved minerals of 620 mg/l, and an iron content of 0.5 mg/l.

WELL NO. 6, open to the Silurian dolomite, was completed in April 1977 to a depth of 361 ft by the J. P. Miller Artesian Well Co., Brookfield. As of August 1980, this well was not in use. The well is located on the west side of Janes Ave. about 0.2 mile south of 83rd St., approximately 1320 ft N and 2500 ft E of the SW corner of Section 36, T38N, R10E, DuPage County. The land surface elevation at the well is approximately 755 ft.

A drillers log of Well No. 6 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	130	130
Niagaran dolomite	221	351
Shale	10	361

A 20-in. diameter hole was drilled to a depth of 136 ft and finished 15.2 in. in diameter from 136 to 361 ft. The well is cased with 20-in. steel pipe from land surface to a depth of 130 ft and 16-in. steel pipe from land surface to a depth of 136 ft (cemented in).

Upon completion, the well reportedly produced 1150 gpm for 2 hr with a drawdown of 9 ft from a nonpumping water level of 114 ft below land surface.

The pumping equipment presently installed consists of a 150-hp electric motor, a 12-in., 5-stage Peerless turbine pump, and has 150 ft of 8-in. column pipe. A 10-ft section of suction pipe is attached to the pump intake. The well is equipped with 150 ft of airline.

WELL NOS. 7, 8, and 9 - Not yet drilled.

WELL NO. 10 (former Oak Tree Subdivision Well No.2), open to the Silurian dolomite, was completed in November 1977 to a depth of 170 ft by the J. P. Miller Artesian Well Co., Brookfield. This well, acquired from the Oak Tree Sewer and Water Company, will eventually be a part of the Bolingbrook system. The well is located about 200 ft south of Boughton Road and 0.4 mile west of Washington St. near the elevated tank, approximately 1230 ft N and 1980 ft W of the SE corner of Section 7, T37N, R10E, Will County. The land surface elevation at the well is approximately 675 ft.

A drillers log of Well No. 10 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	62	62

Strata (continued)	Thickness (ft)	Depth (ft)
Limestone	70	132
Limestone and shale	21	153
Shale	17	170

A 15-in. diameter hole was drilled to a depth of 72 ft and finished 12 in. in diameter from 72 to 170 ft. The well is cased with 16-in. steel pipe from about 2 ft above land surface to a depth of 62 ft and 12-in. pipe from about 3 ft above the wellhouse floor to a depth of 72 ft (cemented in).

A production test was conducted by the driller on November 25, 1977. After 4.8 hr of pumping at rates ranging from 360 to 300 gpm, the drawdown was 54 ft from a nonpumping water level of 41 ft below land surface. During the next 15 min, the production rate was increased and die pump broke suction. Pumping was then continued for 3.2 hr at rates of 230 to 255 gpm with a final drawdown of 32 ft. Five min after pumping was stopped, full recovery was observed.

After acidizing with 1000 gal of HC1, a production test was conducted by the driller on November 29, 1977. After 7.5 hr of pumping at rates ranging from 600 to 300 gpm, the final drawdown was 22 ft from a nonpumping water level of 41 ft below land surface.

On September 14, 1979, the nonpumping water level was reported to be 56 ft.

The pumping equipment presently installed consists of a 30-hp electric motor, an 8-in., 8-stage Peerless turbine pump rated at 300 gpm at about 195 ft TDH, and has 110 ft of 6-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake.

A mineral analysis of a sample (Lab. No. 211979) collected September 14, 1979, after pumping for 10 min at 350 gpm, showed the water to have a hardness of 362 mg/1, total dissolved minerals of 409 mg/1, and an iron content of 0.3 mg/1.

WELL NO. 11 (former Oak Tree Subdivision Well No. 1), open to the Silurian dolomite, was completed in September 1972 to a depth of 150 ft by the Shaver Well Drilling Co., Lombard. This well, acquired from the Oak Tree Sewer and Water Company, is not in use. The well is located at the northwest corner of Heritage Drive and Plymouth Square, approximately 2200 ft S and 1400 ft W of the NE corner of Section 7, T37N, R10E, Will County. The land surface elevation at the well is approximately 635 ft.

A drillers log of Well No. 11 follows:

Strata	Thickness (ft)	Depth (ft)
Black clay	5	5
Yellow clay	5	10
Gray clay, some gravel	5	15
Gray clay, heavy gravel	5	20
Gray clay boulders	5	25
White coarse gravel, boulders	5	30
Yellow lime boulders	5	35
Yellow lime soft	5	40
White lime clay	5	45
White lime medium	5	50
White lime hard	10	60
White lime hard, some water	5	65
White lime gray clay	5	70
White lime hard	20	90
White lime, white clay	5	95
White lime red chert	10	105
Broken lime	5	110
Red shale, broken lime	5	115
Red shale	5	120
Red and green shale	30	150

The well is cased with 12.8-in. pipe from land surface to a depth of 42 ft.

BOLINGBROOK (CITIZENS WEST SUBURBAN)

Bolingbrook (Citizens West Suburban) (est. 25,802), serving subdivisions located within the village of Bolingbrook, installed a public water supply in 1962. The water system is owned and operated by the Citizens Utilities Co. Six wells (Nos. 2, 6, 8, 10, 11, and 12) are in use and four wells (Nos. 1, 3,4, and 9) are available for emergency use. Part of Bolingbrook is served by a municipal owned water system also described in this bulletin. In 1963 there were 900 services, all metered. In 1980 there were 8026 services, all metered; the average pumpage was 2,226,734 gpd. The water is chlorinated, fluoridated, and treated with sodium silicate.

WELL NO. 1 (Westbury Subdivision well), open to the Silurian dolomite, was completed in September 1960 to a depth of 245 ft by L. Cliff Neely, Batavia. This well is available for emergency use. The well is located near the northwest corner of Route 5 3 and Briarcliff Lane, approximately 250 ft N and 150 ft Wof the SE corner of Section 10, T37N, R10E. The land surface elevation at the well is approximately 695 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Top soil and clay	5	5
Clay	31	36
Sand and gravel	47	83
Niagra lime	137	220
Shale	25	245

A 10-in. diameter hole was drilled to a depth of 245 ft. The well is cased with 10-in. pipe from 2 ft above the pumphouse floor to a depth of 83 ft.

A production test was conducted by the driller on September 30, 1960. After 8 hr of pumping at a rate of 351 gpm, the drawdown was 2 ft from a nonpumping water level of 50 ft below land surface. Two min after pumping was stopped, full recovery was observed.

On April 21, 1971, the well reportedly produced 365 gpm with a drawdown of 13 ft from a nonpumping water level of 80 ft.

The pumping equipment presently installed is a Layne & Bowler turbine pump set at 130 ft, rated at 365 gpm, and powered by a 25-hp 1800 rpm U. S. electric motor.

A partial analysis of a sample (Lab. No. 153588) collected during the initial production test, after pumping for 8 hr at 351 gpm, showed the water to have a hardness of 386 mg/1, total dissolved minerals of 446 mg/1, and an iron content of 1.4 mg/1.

WELL NO. 2 (Colonial Village Subdivision well), open to the Silurian dolomite, was completed in October 1961 to a depth of 231 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located near the southeast corner of Briarcliff Lane and Mellbrook Road adjacent to the elevated tank, approximately 100 ft S and 400 ft W of the NE corner of Section 14, T37N, R10E. The land surface elevation at the well is approximately 728 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	5	5
Clay	22	27
Dirty gravel	5	32
Clay and boulders	20	52
Boulders	66	118
Gray lime	57	175
Crevices, lime all colors	35	210
Brown lime	16	226
Gray shale	5	231

A 12-in. diameter hole was drilled to a depth of 156 ft and finished 8 in. in diameter from 156 to 231 ft. The well is cased with 12-in. drive pipe from 2 ft above the pumphouse floor to a depth of 118 ft and 8-in. pipe from 75 ft to a depth of 156 ft.

Upon completion, the well reportedly produced 400 gpm for 4 hr with a drawdown of 13 ft from a nonpumping water level of 80 ft below the top of the casing.

On July 29, 1963, the nonpumping water level was reported to be 96 ft.

On May 20, 1975, the well reportedly produced 339 gpm with a drawdown of 9 ft from a nonpumping water level of 95 ft.

The pumping equipment presently installed is a Layne & Bowler turbine pump (Serial No. 47226) set at 150 ft, rated at 300 gpm at about 234 ft head, and powered by a 25-hp 1800 rpm U. S. electric motor (Serial No. 3505644).

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C004764) of a sample collected March 29, 1977, after 4 hr of pumping at 270 gpm, showed the water to have a hardness of 456 mg/1, total dissolved minerals of 590 mg/1, and an iron content of 0.8 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in April 1966 to a depth of 228 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located on the west side of Cedarwood St. at the end of Idlewood St. about 10 ft south of the pumphouse, approximately 1650 ft S and 1100 ft W of the NE corner of Section 14, T37N, R10E. The land surface elevation at the well is approximately 725 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	20	20
Sand and gravel	65	85
Broken limestone	22	107
Limestone	116	223
Shale	5	228

A 12-in. diameter hole was drilled to a depth of 228 ft. The well is cased with 12-in. pipe from 1.5 ft above land surface to a depth of 107 ft.

A production test was conducted by the driller on April 14, 1966. After 10 hr of pumping at rates of 350 to 448 gpm, the final drawdown was 72 ft from a nonpumping water level of 79 ft below land surface.

On April 21, 1971, the well reportedly produced 480 gpm with a drawdown of 54 ft from a nonpumping water level of 94 ft.

On February 12, 1975, the well reportedly produced 448 gpm with a drawdown of 86 ft from a nonpumping water level of 87 ft.

On July 18, 1979, the nonpumping water level was reported to be 90 ft.

The pumping equipment presently installed is a Layne & Bowler turbine pump (Serial No. 56553) set at 200 ft, rated at 450 gpm at about 290 ft head, and powered by a 50-hp 1800 rpm U. S. electric motor (Serial No. R3933530).

The following mineral analysis (Lab. No. 211417) is for a water sample from the well collected July 18, 1979, after 30 min of pumping at 470 gpm.

WELL NO. 3, LABORATORY NO. 211417

		mg/l	*me/1*			*mg/l*	*me/l*
Iron (total)	Fe	1.2		Silica	SiO_2	18.8	
Manganese	Mn	0.09		Fluoride	F	0.1	
Ammonium	NH_4	0.0	0.00	Boron	B	0.1	
Sodium	Na	9.0	0.39	Nitrate	NO_3	0.1	0.00
Potassium	K	3.4	0.09	Chloride	Cl	35	0.99
Calcium	Ca	127	6.35	Sulfate	SO_4	210	4.37
Magnesium	Mg	59.5	4.89	Alkalinity (as $CaCO_3$)		320	6.40
Strontium	Sr	0.09	0.00				
				Hardness (as $CaCO_3$)		562	11.24
Barium	Ba	<0.05					
Cadmium	Cd	0.01		Total dissolved			
Chromium	Cr	0.00		minerals		663	
Copper	Cu	0.01					
Lead	Pb	0.02					
Lithium	Li	0.01		Turbidity		10	
Nickel	Ni	0.00		Color		0	
Silver	Ag	0.01		Odor		0	
Zinc	Zn	0.02		Temp, (reported)		52F	

WELL NO. 4 (Beaconridge Subdivision well), open to the Silurian dolomite, was completed in March 1969 to a depth of 228 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located along Beaconridge Drive east of Route 53 south of Mallview Drive, approximately 1821 ft S and 518 ft E of the NW corner of Section 14, T37N, R10E. The land surface elevation at the well is approximately 702 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black soil and clay	5	5
Clay	5	10
Clay and gravel	5	15
Gravel	15	30
Clay and gravel	5	35
Gravel	40	75
Sand and gravel	15	90
Gravel and broken limes	5	95
Hard white limestone	70	165
Hard limestone and red rock	15	180
Hard gray limestone	20	200
Hard gray and brown limestone	12	212
Medium gray limestone	4	216
Hard gray limestone	4	220
Gray and green shale	8	228

A 12-in. diameter hole was drilled to a depth of 228 ft. The well is cased with 12-in. steel pipe from about 2 ft above the pumphouse floor to a depth of 97 ft.

A production test was conducted by the driller on March 10, 1969. After 2.5 hr of pumping at a rate of 310 gpm, the drawdown was 2 ft from a nonpumping water level of 64 ft below land surface. Pumping was continued for 5.5 hr at a rate of 517 gpm with a drawdown of 13 ft.

On April 21, 1971, the well reportedly produced 560 gpm with a drawdown of 17 ft from a nonpumping water level of 70 ft.

The pumping equipment presently installed is a Layne & Bowler turbine pump set at 120 ft, rated at 550 gpm at about 245 ft TDH, and powered by a 50-hp 1800 rpm U. S. electric motor.

A mineral analysis of a sample (Lab. No. 212275) collected October 3, 1979, after pumping for 24 hr at 500 gpm, showed the water to have a hardness of 508 mg/1, total dissolved minerals of 628 mg/1, and an iron content of 1.6 mg/1.

WELL NO. 5, open to the Silurian dolomite, was completed in February 1970 to a depth of 230 ft by the Layne-Western Co., Aurora. This well is located at and serves the No. 2 sewage treatment plant only. The well is located about 0.5 mile north of Boughton Road, approximately 125 ft S and 1708 ft W of the NE corner of Section 8, T37N, R10E. The land surface elevation at the well is approximately 638 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black soil	**1**	**1**
Brown clay	**1**	**2**
Gray clay	**3**	**5**
Sand and gravel	6	11
Limestone	40	51
Green shale	1	52
Multicolored lime, few shale streaks	8	60
Light brown lime	21	81
Light brown lime with shale streaks	19	100
Multicolored shale with lime streaks	20	120
Blue green shale	32	152
Dark brown sandy lime	48	200
Dark brown sandy lime with shale breaks	18	218
Blue shale with lime streaks	12	230

A 17.8-in. diameter hole was drilled to a depth of 30 ft and finished 12 in. in diameter from 30 to 230 ft. The well is cased with 12-in. steel pipe from land surface to a depth of 30 ft. The annulus between the bore hole and casing is filled with drill mud and cuttings. In November 1972, the Layne-Western Co. installed an 8-in. pipe from land surface to a depth of 118 ft (bottom 77 ft slotted).

A production test was conducted by the driller on February 4, 1970. After 2.5 hr of pumping at rates of 122 to 75 gpm, the drawdown was 149 ft from a nonpumping water level of 5 ft below land surface.

On November 20, 1972, the well reportedly produced 50 gpm with a drawdown of 165 ft from a nonpumping water level of 10 ft.

The pumping equipment presently installed is a Layne & Bowler pump set at 180 ft, rated at 64 gpm, and powered by a 15-hp 1750 rpm U. S. electric motor.

A mineral analysis of a sample (Lab. No. 212277) collected October 3, 1979, after pumping for 10 hr, showed the water to have a hardness of 172 mg/1, total dissolved minerals of 660 mg/1, and an iron content of 0.6 mg/1.

WELL NO. 6 (Indian Oaks Subdivision well), open to the Silurian dolomite, was completed in February 1970 to a depth of 240 ft by the Layne-Western Co., Aurora. The well is located at the northeast corner of Briarcliff and Lancaster Lanes, approximately 85 ft N and 1250 ft E of the SW corner of Section 10, T37N, R10E. The land surface elevation at the well is approximately 705 ft.

A drillers log of Well No. 6 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black soil	3	3
Brown clay	8	11
Gray clay, few boulders	22	33
Sand and gravel	4	37
Broken yellow lime	26	63
Sand and gravel, trace of fine sand	24	87
Broken lime	1	88
Gray lime	4	92
Brown lime	91	183
Limestone with shale streaks	4	187
Limestone, some chert	8	195
Limestone with shale streaks	30	225
Shale	15	240

A 17-in. diameter hole was drilled to a depth of 92 ft and finished 12 in. in diameter from 92 to 240 ft. The well is cased with 12-in. steel pipe from 2 ft above land surface

to a depth of 92 ft. The annulus between the bore hole and casing is filled with drill mud and cuttings.

A production test was conducted by the driller on February 16, 1970. After 3 hr of pumping at a rate of 412 gpm, the drawdown was 8 ft from a nonpumping water level of 62 ft below land surface. Pumping was continued for 5.5 hr at rates of 644 to 656 gpm with a final drawdown of 20 ft. Three min after pumping was stopped, the water level had recovered to 63 ft.

The pumping equipment presently installed is a Layne & Bowler pump set at 120 ft, rated at 500 gpm at about 270 ft TDH, and powered by a 50-hp 1750 rpm U. S. electric motor.

A mineral analysis of a sample (Lab. No. 212274) collected October 3, 1979, after pumping for 24 hr at 500 gpm, showed the water to have a hardness of 532 mg/1, total dissolved minerals of 661 mg/1, and an iron content of 0.3 mg/1.

WELL NO.7 (Sugarbrook Subdivision well), open to the Silurian dolomite, was completed in December 1970 to a depth of 208.7 ft by the Layne-Western Co., Aurora. As of July 1978, this well was not in use. The well is located at the southwest corner of Rockhurst and Malibu Drives, approximately 2550 ft N and 1397 ft E of the SW corner of Section 11, T37N, R10E. The land surface elevation at the well is approximately 710 ft.

A drillers log of Well No. 7 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black top soil	5	5
Brown silty clay	4	9
Gray sandy clay, gravel intermixed	49	58
Boulder	2	60
Sand, gravel, and boulders	26	86
Limestone and white shale layers	33	119
Green shale and limestone streaks	2	121
White limestone	6	127
Light brown and pink limestone	7	134
Light grayish limestone, some streaks of shale	16	150
Limestone with shaley streaks	28	178
Red shale and shaley limestone	13	191
Light brown limestone	2	193
Green shale with limestone streaks	5	198
Brownish limestone	6	204
Green shale	4.7	208.7

A 17-in. diameter hole was drilled to a depth of 20 ft, reduced to 15 in. between 20 and 93 ft, and finished 12 in. in diameter from 93 to 208.7 ft. The well is cased with 12-in. steel pipe from 2 ft above land surface to a depth of 93 ft. The annulus between the 17-in. bore hole and the casing is filled with drill mud and lime cuttings.

A production test was conducted by the driller on December 8, 1970. After 8 hr of pumping at rates of 530 to 692 gpm, the final drawdown was 5 ft from a nonpumping water level of 68 ft below land surface.

The pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 184466) collected December 8, 1970, after pumping for 7 hr at 530 gpm, showed the water to have a hardness of 476 mg/1, total dissolved minerals of 555 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 8, open to the Silurian dolomite, was completed in December 1970 to a depth of 222.7 ft by the Layne-Western Co., Aurora. The well is located on the east side of Schmidt Road about 300 ft south of Boughton Road, approximately 2101 ft S and 85 ft E of the NW corner of Section 10, T37N, R10E. The land surface elevation at the well is approximately 728 ft.

A drillers log of Well No. 8 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Brown top soil	2	2
Brown clay, gravel embedded	5	7
Gray sandy clay, gravel embedded	29.5	36.5
Sand and gravel, clay streaks	4.5	41
Gray sandy clay, gravel embedded	3	44
Sand and gravel - boulders	59	103
Lime ledges, weathered lime and white shale, soft	11	114
Grayish white limestone	70	184
Grayish lime with shale streaks	13	197
Shale with limestone streaks	12	209
Shale	13.7	222.7

A 17-in. diameter hole was drilled to a depth of 20 ft, reduced to 15 in. between 20 and 129.5 ft, and finished 12 in. in diameter from 129.5 to 222.7 ft. The well is cased with 12-in. steel pipe from 2 ft above land surface to a depth of 129.5 ft. The annulus between the 17-in. bore hole and casing is filled with bentonite and limestone cuttings.

A production test was conducted by the driller on December 30, 1970. After 8 hr of pumping at rates ranging from 433 to 545 gpm, the final drawdown was 52 ft from a nonpumping water level of 85 ft below land surface.

On July 18, 1979, the nonpumping water level was reported to be 98 ft.

The pumping equipment presently installed is a Layne & Bowler pump set at 180 ft, rated at 485 gpm at about 272 ft TDH, and powered by a 50-hp 1760 rpm U. S. electric motor.

A mineral analysis of a sample (Lab. No. 211418) collected July 18, 1979, after pumping for 10 min at 320 gpm, showed the water to have a hardness of 516 mg/1, total dissolved minerals of 599 mg/1, and an iron content of 1.6 mg/1.

WELL NO. 9 (Sugarbrook Subdivision well), open to the Silurian dolomite, was completed in May 1972 to a depth of 250 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located at 263 Galewood Drive east of Creekside Drive, approximately 2330 ft S and 2067 ft W of the NE corner of Section 16, T37N, R10E. The land surface elevation at the well is approximately 668 ft.

A drillers log of Well No. 9 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay fill	2	2
Black soil	3	5
Brown clay with large stones and boulders	25	30

Strata (continued)	Thickness (ft)	Depth (ft)
Gray clay, sand streaks, few large stones	24	54
Lime, very hard, some chert	66	120
Streak of red shale, lime	45	165
Shale and lime lines	75	240
Shale	10	250

A 17-in. diameter hole was drilled to a depth of 20 ft, reduced to 15 in. between 20 and 64 ft, and finished 12 in. in diameter from 64 to 250 ft. The well is cased with 12-in. pipe from 5 ft above land surface to a depth of 64 ft.

A production test was conducted by the driller on May 16, 1972. After 7.5 hr of pumping at rates ranging from 690 to 408 gpm, the drawdown was 61 ft from a nonpumping water level of 19 ft below land surface.

On September 27, 1973, the well reportedly produced 570 gpm with a drawdown of 43 ft from a nonpumping water level of 29 ft.

On July 18, 1979, the nonpumping water level was reported to be 55 ft.

The pumping equipment presently installed is a Layne & Bowler pump set at 120 ft, rated at 500 gpm at about 301 ft TDH, and powered by a 50-hp 1750 rpm U. S. electric motor.

A mineral analysis of a sample (Lab. No. 211419) collected July 18, 1979, after pumping for 10 min at 280 gpm, showed the water to have a hardness of 400. mg/1, total dissolved minerals of 454 mg/1, and an iron content of 0.5 mg/1.

WELL NO. 10 (Cinnamon Creek Subdivision well), open to the Silurian dolomite, was completed in April 1972 to a depth of 250 ft by the Layne-Western Co., Aurora. The well is located at the northwest corner of Orchard and Westwind Drives, approximately 56 ft S and 1363 ft E of the NW corner of Section 16, T37N, R10E. The land surface elevation at the well is approximately 680 ft.

A drillers log of Well No. 10 follows:

Strata	Thickness (ft)	Depth (ft)
Fill	1	1
Black soil	2	3
Brown clay and stones	16	19
Gray clay with streaks of sand, boulders at 35 ft	68	87
Broken lime	1	88
Lime, different colors	90	178
Red shale with lime, reddish fluid	57	235
Shale, gray	15	250

A 17-in. diameter hole was drilled to a depth of 20 ft, reduced to 15 in. between 20 and 89 ft, and finished 12 in. in diameter from 89 to 250 ft. The well is cased with 12-in. pipe from land surface to a depth of 89 ft.

A production test was conducted by the driller on April 27, 1972. After 8 hr of pumping at a rate of 578 gpm, the final drawdown was 52 ft from a nonpumping water level of 34 ft below land surface.

The pumping equipment presently installed is a Layne & Bowler pump set at 140 ft, rated at 600 gpm at about 306 ft TDH, and powered by a 60-hp 1800 rpm U. S. electric motor.

A mineral analysis of a sample (Lab. No. 212276) collected October 3, 1979, after pumping for 24 hr at 600 gpm, showed the water to have a hardness of 444 mg/1, total dissolved minerals of 564 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 11 (Indian Oaks Subdivision well), open to the Silurian dolomite, was completed in October 1972 to a depth of 206.3 ft by the Layne-Western Co., Aurora. The well is located at the northwest corner of Denver and Blackhawk Drives, approximately 1240 ft N and 2460 ft W of the SE corner of Section 9, T37N, R10E. The land surface elevation at the well is approximately 695 ft.

A drillers log of Well No. 11 follows:

Strata	Thickness (ft)	Depth (ft)
Brown clay	4	4
Brown sand and silt, some gravel	6	10
Dense gray clayey sand and silt, some gravel, boulders	26	36
Gray clayey sand and silt, some gravel	31	67
Gray fine sand to small gravel	10	77
Broken rock	2	79
Gray limestone	8	87
Brown limestone	27	114
Gray limestone	32	146
Reddish brown and gray limestone, some shale seams	4	150
Brown limestone	15	165
Gray limestone	33	198
Blue, gray shale	1	199
Red shale	7.3	206.3

A 20-in. diameter hole was drilled to a depth of 20 ft, reduced to 17 in. between 20 and 81 ft, and finished 12 in. in diameter from 81 to 206.3 ft. The well is cased with 12-in. pipe from land surface to a depth of 81 ft.

A production test was conducted by the driller on October 26, 1972. After 1.8 hr of pumping at a rate of 401 gpm, the drawdown was 80 ft from a nonpumping water level of 49 ft below land surface. After a l0-min idle period, pumping was continued for 6.1 hr at a rate of 337 gpm with a final drawdown of 50 ft.

On July 16, 1974, the well reportedly produced 375 gpm with a drawdown of 45 ft from a nonpumping water level of 60 ft.

The pumping equipment presently installed is a Layne & Bowler pump set at 160 ft, rated at 375 gpm at about 317 ft TDH, and powered by a 40-hp 1750 rpm U. S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C004765) is for a water sample from the well collected March 29, 1977, after 5 hr of pumping at 370 gpm.

WELL NO. 11, LABORATORY NO. COO4765

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Slica	SiO_2	12	
Manganese	Mn	0.00		Fluoride	F	0.1	0.00
Ammonium	NH_4	0.11	0.01	Boron	B	0.2	
Sodium	Na	20	0.87	Nitrate	NO_3	3.52	0.06
Potassium	K	2.3	0.06	Chloride	Cl	55	1.55
Calcium	Ca	90	4.49	Sulfate	SO_4	130	2.70
Magnesium	Mg	45	3.70	Alkalinity(as$CaC0_3$)		292	5.84
Arsenic	As	0.000		Hardness(as$CaCO_3$)		410	8.20
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		556	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.00		pH (as rec'd)		8.1	

WELL NO. 12, open to the Silurian dolomite, was completed in March 1976 to a depth of 157 ft by the Layne-Western Co., Aurora. The well is located about 400 ft south of Ridgewood Drive, approximately 1500 ft S and 2000 ft W of the NE corner of Section 17, T37N, R10E. The land surface elevation at the well is approximately 665 ft.

A drillers log of Well No. 12 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black soil	2	2
Brown clay	9	11
Gray and brown clay	19	30
Boulder, lime ledges, lime gravel	9	39
Gray clay	5	44
Lime ledge, lime gravel	6	50
White lime	40	90
Gray lime	4	94
Red and blue shale	6	100
Pink lime	46	146
Shale	11	157

A 17-in. diameter hole was drilled to a depth of 53 ft and finished 12 in. in diameter from 53 to 157 ft. The well is cased with 12-in. steel pipe from 7 ft above land surface to a depth of 53 ft (slotted from 45 to 50 ft). The annulus between the bore hole and casing is filled with cement grout from 0 to 20 ft, with clay and cuttings from 20 to 43 ft, and with Muscatine gravel from 43 to 53 ft.

A production test was conducted by the driller on March 26, 1976. After 8 hr of pumping at rates of 439 to 554 gpm, the final drawdown was 35 ft from a nonpumping water level of 22 ft below land surface.

The pumping equipment presently installed is a Layne vertical turbine pump (Serial No. 83204) set at 80 ft, rated at 500 gpm at about 129 ft TDH, and powered by a 25-hp U. S. electric motor.

A partial analysis of a sample (Lab. No. 201499) collected during the initial production test, after pumping for 6 hr at rates of 439 to 503 gpm, showed the water to have a hardness of 396 mg/l, total dissolved minerals of 485 mg/l, and an iron content of 0.1 mg/I.

WELL NO. 13, open to the Silurian dolomite, was completed in April 1976 to a depth of 196 ft by the Layne-Western Co., Aurora. As of July 1978, this well was not in use. The well is located approximately 50 ft N and 1350 ft E of the SW corner of Section 17, T37N, R10E. The land surface elevation at the well is approximately 652 ft.

A drillers log of Well No. 13 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black soil	**2**	**2**
Brown clay	**8**	**10**
Gray clay and stones	**6**	**16**
Gravelly lime and boulders, lime ledges	**7**	**23**
Lime ledge - boulder	**4**	**27**
Lime	**111**	**138**
Shale	**22**	**160**
Gray shaley lime, shale streaks	**36**	**196**

A 17-in. diameter hole was drilled to a depth of 40 ft and finished 12 in. in diameter from 40 to 196 ft. The well is cased with 12-in. steel pipe from 5 ft above land surface to a depth of 40 ft (cemented in).

A production test was conducted by the driller on April 9, 1976. After 8.5 hr of pumping at rates of 305 to 412 gpm, the final drawdown was 48 ft from a nonpumping water level of 9 ft below land surface.

The pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 201543) collected during the initial production test, after pumping for 7 hr at rates of 305 to 412 gpm, showed the water to have a hardness of 398 mg/l, total dissolved minerals of 490 mg/l, and an iron content of 1.2 mg/l.

WELL NO. 14, open to the Silurian dolomite, was completed in April 1978 to a depth of 163 ft by the Layne-Western Co., Aurora. As of July 1978, this well was not in use. The well is located about 50 ft east and 50 ft south of Towner Drive just east of Naperville Road and south of Boughton Road, approximately 50 ft N and 1900 ft W of the SE corner of Section 8, T37N, R10E. The land surface elevation at the well is approximately 676 ft.

A drillers log of Well No. 14 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay fill and boulders	3	3
Brown clay	12	15
Gray clay	12	27
Gray clay, lime ledges and boulders	15	42
Cemented gravel, boulders and lime ledges	13	55
Lime	3	58
White and tan lime	25	83
Hard gray lime	17	100
Shaly lime	10	110
Hard white lime	13	123
White and pink lime, softer crevices	20	143
Softer yellow rock	7	150
Hard lime	3	153
Shale, reddish brown	10	163

A 17-in diameter hole was drilled to a depth of 20 ft, reduced to 15 in. between 20 and 58 ft, and finished 12 in. in diameter from 58 to 163 ft. The well is cased with 12-in. pipe from about 5 ft above land surface to a depth of 58 ft (cemented in from 0 to 20 ft).

A production test was conductedby the driller on April 10, 1978. After 8 hr of pumping at rates of 524 to 942 gpm, the final drawdown was 4 ft from a nonpumping water level of 34 ft below land surface.

The pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 207999) collected during the initial production test, after pumping for 8 hr at rates of 524 to 942 gpm, showed the water to have a hardness of 428 mg/1, total dissolved minerals of 498 mg/1, and an iron content of 0.1 mg/1.

BONNIE BRAE-FOREST MANOR SANITARY DISTRICT

Bonnie Brae-Forest Manor Sanitary District (est. 2200), located about 1 mile east of Lockport, installed a public water supply in 1964. One well is in use. In 1961 there were 350 services, all metered; the average and maximum pumpages were 30,000 and 50,000 gpd, respectively. In 1980 there were 561 services, all metered; the average pumpage was 134,520 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in March 1957 to a depth of 310 ft by Harry C. Neely, Elburn. The well is located in the rear of the waterworks building at 1113 Highland Ave., approximately 500 ft N and 1900 ft W of the SE corner of Section 13, T36N, R10E. The land surface elevation at the well is approximately 690 ft.

A sample study summary log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
No sample	5	5
Silt, calcareous, brownish gray, spores	10	15
Till, silty, calcareous, brownish gray-yellowish brown, with angular chert	40	55
SILURIAN SYSTEM		
Niagaran Series		
Chert, white; dolomite, light buff, fine	20	75
Dolomite, light gray-white, some buff, some pinkish, fine; chert, white, dense	105	180
Dolomite, pink-brown, some buff, fine, some speckled	8	188
Alexandrian Series		
Kankakee Dolomite		
Dolomite, white-greenish gray, some buff, fine	37	225
Elwood Dolomite		
Dolomite, light buff-light gray, fine; chert, white	50	275
Wilhelmi Formation		
Dolomite, gray, fine, some medium grains, porous, speckled; chert, white, dense	27	302
ORDOVICIAN SYSTEM		
Maquoketa Group		
Brainard Shale		
Shale, white-gray, weak; dolomite, light gray, fine, silty	8	310

An 18-in. diameter hole was drilled to a depth of 310 ft. The well is cased with 18-in. pipe from 2 ft above the pumphouse floor to a depth of 61 ft.

Upon completion, the well reportedly produced 850 gpm for 10.5 hr with a drawdown of 31 ft from a nonpumping water level of 58 ft below land surface.

On May 2, 1973, the nonpumping water level was reported to be 60 ft.

The pumping equipment presently installed is a 10-in., 4-stage Deming turbine pump (Serial No. 30575) set at 100 ft, rated at 450 gpm, and powered by a 25-hp 1800 rpm U. S. electric motor (Serial No. 1091736). A 10-ft section of 6-in. suction pipe is attached to the pump intake.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40779) is for a water sample from the well collected April 13, 1976, after 1 hr of pumping at 450 gpm.

WELL NO. 1, LABORATORY NO. B40779

		mg/1	*me/I*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	12	
Manganese	Mn	0.00		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.06	0.00	Boron	B	0.5	
Sodium	Na	11	0.48	Cyanide	CN	0.00	
Potassium	K	2.1	0.05	Nitrate	NO_3	18	0.29
Calcium	Ca	95	4.74	Chloride	Cl	24	0.68
Magnesium	Mg	53	4.36	Sulfate	SO_4	130	2.70
				Alkalinity(as $CaCO_3$)		300	6.00
Arsenic	As	0.00		Hardness(as $CaCO_3$)		455	9.10
Barium	Ba	0.1					
				Total dissolved			
Cadmium	Cd	0.00		minerals		572	
Chromium	Cr	0.00					
Copper	Cu	0.00					
Lead	Pb	0.02		PH (as rec'd)		7.4	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		0.5	
Selenium	Se	0.00		± deviation		1.5	
Silver	Ag	0.00		Beta *pc/l*		1.8	
Zinc	Zn	0.0		± deviation		1.9	

BRAIDWOOD

The city of Braidwood (2323) installed a public water supply in 1883. Three wells are in use. In 1949 there were 170 services, none metered; the average pumpage was 50,000 gpd. In 1979 there were 1164 services, none metered; the average pumpage in 1980 was 322,580 gpd. The water is aerated and chlorinated.

Prior to the installation of the first deep sandstone well (Well No. 1), water was obtained from driven wells and a dug well located on city property about 100 to 235 ft south of Main St. and 150 to 300 ft west of Center St. in the southwest quarter of Section 8, T32N, R9E. The first seven of the driven wells, finished in sand and gravel, were constructed to a depth of 12 ft, and deepened in 1920 to a depth of 16.5 ft by Mr. Crichton. Originally, the wells were cased with 3-in. pipe from 1 ft above the bottom of 4-ft deep pits to a depth of 9 ft followed by 3-ft long strainers. In 1920, when the wells were deepened, the wells were reported to be equipped with No. 90 gauze strainers. Two additional driven wells were constructed in 1920 to a depth of 16.5 ft. These two wells were cased with 2-in. pipe to a depth of 13.5 ft followed by 3-ft lengths of No. 90 gauze strainers. The strainers were frequently replaced because of corrosion. These driven wells were abandoned about 1943.

A dug well, finished in sand and gravel, was constructed to a depth of 20 ft. The well was about 6 ft by 10 ft in plan with side walls of concrete. This well was abandoned about 1924.

About 1888, a 2-in. diameter well, 900 ft deep, was constructed jointly by the city and a coal company on city property. It was a test hole to locate coal deposits. The well flowed having an 0.5-in. diameter stream and furnished water for a public drinking fountain and water trough until about 1900 when it was abandoned.

WELL NO. 1, presently open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was constructed in July 1937 to a dep± of 1410 ft by C. W. Varner, Dubuque, Iowa, and was continued in 1937 to a reported depth of 1647 ft by the W. L. Thorne Co., Des Plaines. This well was rehabilitated in 1944 to a depth of 1025 ft (reported to be 740 ft deep in 1962 and measured at 716 ft in 1980) by the J. P. Miller Artesian Well Co., Brookfield. The well is located in the rear of the city hall about 183 ft south of Main St. and 257 ft west of Center St., approximately 1350 ft N and 2200 ft E of the SW corner of Section 8, T32N, R9E. The land surface elevation at the well is approximately 575 ft.

A sample study log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Sand	10	10
Till	5	15
Sand, silty	5	20
Till	25	45
PENNSYLVANIAN SYSTEM		
Shale, thin limestone, coal and sandstone beds	100	145
ORDOVICIAN SYSTEM		
Maquoketa Group		
Limestone and shale	115	260
Galena and Platteville Groups		
Limestone and dolomite	385	645
Ancell Group		
Glenwood Formation		
Sandstone, some dolomite	10	655
St. Peter Sandstone		
Sandstone	195	850
Sandstone, some shale and dolomite	12	862
Prairie du Chien Group		
Shakopee Dolomite		
Dolomite	83	945
New Richmond Sandstone		
Shale and sandstone	45	990
Oneota Dolomite		
Dolomite, some sandstone at base	220	1210
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite	175	1385
Franconia Formation		
Sandstone, some shale and dolomite	165	1550
Ironton-Galesville Sandstone		
"Sandstone"	32	1582
"Lime"	4	1586
"Sandstone"	61	1647

Originally, a 19-in. diameter hole was drilled to a depth of 32 ft, reduced to 15 in. between 32 and 61 ft, reduced to 12 in. between 61 and 143 ft, and finished 10 in. in diameter from 143 to 1647 ft. The well was cased with 16-in. OD pipe from 1 ft above the pump station floor to a depth of 32 ft, 12.5-in. OD pipe from 1 ft above the pump station floor to a depth of 61 ft, and 10-in. pipe from 1 ft above the pump station floor to a depth of 143 ft. After rehabilitating in 1945, the hole was reported to be 10 in. in diameter from land surface to a depth of 300 ft and finished 8 in. in diameter from 300 to 1025 ft. The old casing was removed and the well was cased with 8-in. OD pipe from 1 ft above land surface to a depth of 300 ft and an 8-in. liner pipe from 764 ft to a depth of 844 ft.

Upon completion in 1937, the nonpumping water level was reported to be 70 ft below the top of the casing and the well produced only 50 gpm. The well was capped and not equipped for service.

On December 4, 1941, the nonpumping water level was reported to be 85.4 ft below the top of the casing.

On August 5-6, 1942, a geophysical survey was made by the Schlumberger Well Surveying Corporation and the State Geological Survey. The depth of the well was reported as 1627 ft deep.

A production test was conducted by the State Water Survey on April 22-23, 1943. After 24 hr of pumping at a rate of 84 gpm, the drawdown was 251.3 ft from a nonpumping water level of 108.7 ft below the pump base. The water level recovered to 135.0 ft after the pumping had been stopped for 2.1 hr.

On July 11, 1944, the nonpumping water level was reported to be 118 ft.

In the fall and winter of 1944-45, this well was shot and rehabilitated by the J. P. Miller Artesian Well Co. An attempt was made to deepen the well to completely penetrate the Galesville Sandstone, but after drilling 8 ft, the formation was so hard that only 1 ft of hole could be made per shift. The St. Peter Sandstone was then shot with a total of 500 lb of blasting gelatin at three different levels. After the first shot, the hole was cleaned but the original bore hole below the St. Peter was never located. At this time, a new 8-in. hole was drilled to a depth of 1025 ft and the 8-in. casing and liner was installed.

A production test was conducted on February 14-15, 1945, by representatives of the J. P. Miller Artesian Well Co. and the State Water Survey. After 24.2 hr of pumping at rates of 168 to 137 gpm, the final drawdown was 213 ft from a nonpumping water level of 140 ft below the top of the casing. Fifty-seven min after pumping was stopped, the water level had recovered to 184 ft.

Nonpumping water levels were reported to be 166 ft below the pump base after an idle period of 1.8 hr on December 6, 1945; and 180 ft on September 1, 1953.

A production test was conducted by the Layne-Western Co., Aurora, on May 7-8, 1980. After 15 min of pumping at a rate of 105 gpm, the drawdown was 50 ft from a nonpumping water level of 320 ft. Pumping was continued for 13.2 hr at a rate of 94 gpm with a final drawdown of 141 ft.

The pumping equipment presently installed is a 16-stage Red Jacket submersible pump set at 565 ft, rated at 105 gpm, and powered by a 20-hp Red Jacket electric motor. The well is equipped with 565 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A16664) of a sample collected March 22, 1976, after pumping for 3 hr at 140 gpm, showed the water to have a hardness of 405 mg/1, total dissolved minerals of 1200 mg/1, and an iron content of 0.1 mg/1.

Seven driven wells were constructed in 1943 to a depth of 14 ft. The wells were cased with 2-in. pipe from 1 ft above the bottom of 4-ft deep pits to a depth of 11 ft followed by 3-ft long gauze strainers. These wells were abandoned by 1949.

Three test holes were constructed in April 1950 by J. Bolliger & Sons, Fairbury, to depths of 75, 30, and 79 ft. These test holes were located in the northwest and southeast quarters of Section 17, T32N, R9E, and the northeast quarter of Section 18, T32N, R9E, respectively. The third hole, finished in Pennsylvanian shale and sandstone, was 6 in. in diameter to a depth of 79 ft and cased with 36 ft of 6-in. pipe. A production test was conducted on April 25, 1950, by representatives of the driller and the State Water Survey. After 4.9 hr of pumping at rates ranging from 37.5 to 65 gpm, the drawdown was 41.0 ft from a nonpumping water level of 2.5 ft below the top of the casing. A second production test using one observation well was conducted on this hole by the Layne-Western Co., Aurora, on October 30, 1956. After 6 hr of pumping at rates ranging from 70 to 50 gpm, the maximum drawdown was 56 ft from a nonpumping water level of 6 ft. Ten min after pumping was stopped, the water level had recovered to 14 ft.

In 1954, a test hole, finished in Pennsylvanian sandstone, was constructed to a depth of 80 ft by the J. P. Miller Artesian Well Co., Brookfield. The hole was located in the northeast quarter of Section 18, T32N, R9E, and was cased with 12-in. pipe from land surface to a depth of 49 ft. A production test using one observation well was conducted by the Layne-Western Co., Aurora, on October 31, 1956. After 4 hr of pumping at rates of 12 to less than 10 gpm, the drawdown was 58 ft from a nonpumping water level of 7 ft. One hr after pumping was stopped, the water level had recovered to 14 ft.

Three test holes, finished in Pennsylvanian shale and sandstone, were constructed in July 1955 by the J. P. Miller Artesian Well Co., Brookfield, to depths of 106, 80, and 56 ft. These holes were located in the northeast quarter of Section 18,T32N, R9E, and in the northwest quarter of Section 17, T32N, R9E.

A test hole, finished in Pennsylvanian shale, was constructed in February 1957 to a depth of 65 ft by the Layne-Western Co., Aurora. This hole was located in the southwest quarter of Section 9, T32N, R9E.

In an attempt to develop the shallow sand and gravel, a well point-suction header installation was completed in July 1964 by the Moretrench Corporation, Chicago. Five operating wells and four observation wells, 24 to 24.5 ft deep, were located in the northwest quarter of Section 17, T32N, R9E. The five operating well points were set on 25-ft centers covering a length of 100 ft and the four observation wells were placed perpendicular to this line covering a length of 75 ft from the center well point. A production test was conducted on July 30-31, 1964, by the State Water Survey and Robert E. Hamilton, Consulting Engineer. The system was balanced to pump approximately 10 gpm from each well. The total yield of the five wells was set at 50 gpm and then was pumped continuously for a period of 22.8 hr. Analyses of the production test data indicated that the water yield potential of the field was excellent and that 10 or more small capacity wells, properly constructed, could

safely produce 50 gpm (72,000 gpd) on a long-term basis.

WELL NO. 2, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in June 1967 to a depth of 846 ft by the Wehling Well Works, Beecher. The well is located about 600 ft north of the city hall just east of Lincoln Ave., approximately 2200 ft N and 2200 ft E of the SW corner of Section 8, T32N, R9E. The land surface elevation at the well is approximately 572 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Sand	13	15
Mud	37	52
Muddy shale	68	120
Shale	147	267
Lime	378	645
Sand	198	843
Shale	3	846

A 15-in. diameter hole was drilled to a depth of 52 ft, reduced to 12 in. between 52 and 277 ft, and finished 8 in. in diameter from 277 to 846 ft. The well is cased with 15-in. pipe from 1.7 ft above land surface to a depth of 52 ft, 12-in. pipe from 120 ft to a depth of 277 ft, and 8-in. pipe from 1.7 ft above land surface to a depth of 277 ft (cemented in).

A production test wasconducted by the driller on June 1-2, 1967. After 24 hr of pumping at rates ranging from 175 to 110 gpm, the maximum drawdown was 280 ft from a nonpumping water level of 212 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 272 ft.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 03686) is for a water sample from the well collected January 18, 1972, after 2 hr of pumping at 190 gpm.

WELL NO. 2 LABORATORY NO. 03686

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	8.5	
Manganese	Mn	0.0		Fluoride	F	1.1	0.06
Ammonium	NH_4	1.7	0.09	Boron	B	0.7	
Sodium	Na	260	11.31	Nitrate	NO_3	0.0	
Potassium	K	23	0.59	Chloride	Cl	250	7.05
Calcium	Ca	86	4.29	Sulfate	SO_4	387	8.05
Magnesium	Mg	45	3.70	Alkalinity(as $CaCO_3$)		244	4.88
				Hardness(as $CaCO_3$)		412	

Barium	Ba	0.0
Cadmium	Cd	0.00
Chromium	Cr	0.0
Copper	Cu	0.0
Lead	Pb	0.00
Mercury	Hg	<0.0005
Nickel	Ni	0.0
Silver	Ag	0.0
Zinc	Zn	0.0

Total dissolved minerals	1270
pH (as rec'd)	7.6
Radioactivity	
Alpha *pc/l*	11
± deviation	5
Beta *pc/l*	26
± deviation	6

The pumping equipment presently installed is a Red Jacket submersible pump (Serial No. 4006F5-12KA6) set at 600 ft, rated at 200 gpm, and powered by a 40-hp Red Jacket electric motor. The well is equipped with 600 ft of airline.

WELL NO. 3, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in July 1979 to a depth of 1733 ft by the Wehling Well Works, Beecher. The well is located about 0.4 mile north of Cermark Road and 300 ft east of North School St. (extended), east of the waste water treatment plant, approximately 2005 ft N and 1770 ft E of the SW corner of Section 5, T32N, R9E. The land surface elevation at the well is approximately 560 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift, clay, some sand *on* top	60	60
Shale, some coal	50	110
Shale	140	250
Dolomite and lime	375	625
Sandstone	110	735
Sandstone lime and shale	65	800
Lime and dolomite (some sand 900 to 950 ft)	570	1370
Lime, sand, and shale	245	1615
Sandstone	75	1690
Shale (some sand to 1708 ft)	43	1733

A 25-in. diameter hole was drilled to a depth of 63 ft, reduced to 21 in. between 63 and 805 ft, and finished 15 in. in diameter from 805 to 1733 ft. The well is cased with 22-in. steel pipe from land surface to a depth of 63 ft and 16-in. steel pipe from about 2 ft above land surface to a depth of 805 ft (cemented in). The top of the casing is equipped with an 8-in. diameter Baker monitor pitless adapter.

A production test was conducted by the driller on July 26, 1979. After 7.7 hr of pumping at rates ranging from 1120 to 1276 gpm, the drawdown was 178 ft from a nonpumping water level of 235 ft below land surface. Pumping was continued for 30 min at a rate of 977 gpm with a final drawdown of 143 ft.

A production test was conducted by the driller on July 30, 1979. After 8.6 hr of pumping at rates ranging from 510 to 1006 gpm, the final drawdown was 138 ft from a nonpumping water level of 235 ft below land surface.

A production test was conducted by the Layne-Western Co., Aurora, on July 21, 1980. After 2.5 hr of pumping at rates ranging from 715 to 742 gpm, the final drawdown was 86 ft from a nonpumping water level of 258 ft. It was later reported that the nonpumping water level may have been at 238 ft.

The pumping equipment presently installed consists of a 150-hp 1750 rpm electric motor, a 10-in., 13-stage Byron Jackson submersible pump (Serial No. 806-M-0303) rated at 600 gpm at about 600 ft TDH, and has 567 ft of 8-in. column pipe. The well is equipped with 574 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B34150) is for a water sample from the well collected January 14, 1981, after 9 hr of pumping.

WELL NO. 3, LABORATORY NO. B34150

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.257		Silica	SiO_2	8.2	
Manganese	Mn	0.011		Fluoride	F	1.12	0.06
Ammonium	NH_4	1.3	0.07	Boron	B	.0.94	
Sodium	Na	250	10.88	Cyanide	CN	<0.005	
Potassium	K	21	0.54	Nitrate	NO_3	<0.4	
Calcium	Ca	113	5.64	Chloride	Cl	251	7.08
Magnesium	Mg	44.9	3.70	Sulfate	SO_4	409	8.51
Strontium	Sr	4.013		Alkalinity(as$CaCO_3$)		244	4.88
Arsenic	As	<0.001		Hardness(as$CaCO_3$)		467	9.34
Barium	Ba	0.022					
Beryllium	Be	<0.0005		Total dissolved			
Cadmium	Cd	<0.004		minerals		1287	
Chromium	Cr	<0.008					
Cobalt	Co	<0.005					
Copper	Cu	0.027					
Lead	Pb	0.009					
Mercury	Hg	<0.00005					
Nickel	Ni	0.003					
Selenium	Se	<0.001					
Silver	Ag	<0.005					
Vanadium	V	<0.004					
Zinc	Zn	0.020		pH (as rec'd)		7.2	

C AND G MAINTENANCE CORPORATION

C and G Maintenance Corporation (est. 40), located about 1 mile east of the center of Crete, installed a public water supply in 1940. One well is in use. In 1977 there were 10 services, none metered; the estimated average and maximum pumpages were 2000 and 2500 gpd, respectively. The water is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed about 1930 to a depth of 150 ft. The well is located north of Exchange Road between Crete Road and Gloucester Lane, approximately 2500 ft N and 2050 ft E of the SW corner of Section 10, T34N, R14E. The land surface elevation at the well is approximately 712 ft.

A 6-in. diameter hole was drilled to a depth of 150 ft. The well is cased with 6-in. pipe from about 0.2 ft above land surface to a depth of 120 ft.

In 1950, the nonpumping water level was reported to be 50 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 84 ft and rated at 11 gpm.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B43695) is for a water sample from the well collected April 27, 1977.

WELL NO. 1, LABORATORY NO. B43695

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.4		Silica	SiO_2	12	
Manganese	Mn	0.03		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.15	0.01	Boron	B	0.2	
Sodium	Na	8	0.35	Nitrate	NO_3	0.0	0.00
Potassium	K	2.7	0.07	Chloride	Cl	8.9	0.25
Calcium	Ca	116	5.79	Sulfate	SO_4	200	4.16
Magnesium	Mg	56	4.61	Alkalinity(as$CaCO_3$)		329	6.58
Arsenic	As	0.00		Hardness(as$CaCO_3$)		552	11.04
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		664	
Copper	Cu	0.02					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.3		pH (as rec'd)		7.2	

CAMELOT UTILITIES, INC.

Camelot Utilities, Inc. (est. 385), located about 3 miles south of Shorewood, installed a public water supply in 1968. One well (No. 1) is in use and another well (No. 3) is available for emergency use. In 1980 there were 134 services, all metered; the average pumpage was 28,635 gpd. The water is chlorinated.

WELL NO. 1, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was constructed in 1966 to a depth of 900 ft by the Shaver Well Drilling Co., Lombard, and deepened in October 1973 to a reported depth of 1435 ft by the K & K Well Drilling Co., Mokena. The well is located in the pumphouse, approximately 350 ft S and 2500 ft W of the NE corner of Section 33, T35N, R9E. The land surface elevation at the well is approximately 575 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
No record	860	860
Lime	13	873
Red rock and shale (caving)	9	882
Lime	13	895
Sand	10	905
Lime	390	1295
Sand	15	1310
Lime and sand	97	1407
Sand	22	1429
No record	6	1435

A partial record of the hole diameter indicates that the well was 10 in. between 810 and 905 ft, and finished 7.9 in. in diameter from 905 to 1435 ft. The well is cased with 10-in. pipe from 1.7 ft above land surface to a depth of 235 ft and 8-in. pipe from land surface to a depth of 905 ft (cemented in). The top of the casing is equipped with a Martinson pitless adapter.

In 1966, before deepening, the well reportedly produced 160 gpm with a drawdown of 50 ft from a nonpumping water level of 200 ft.

In October 1973, after deepening, the nonpumping water level was reported to be 434 ft.

The pumping equipment presently installed consists of a 40-hp electric motor, a Barnes submersible pump set at 504 ft, rated at 250 gpm at about 900 ft TDH, and has 504 ft of column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006732) is for a water sample from the well collected March 27, 1974, after 30 min of pumping at 250 gpm.

WELL NO. 1, LABORATORY NO. C006732

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.2		Silica	SiO_2	8,0	
Manganese	Mn	0.00		Fluoride	F	1.2	0.06
Ammonium	NH_4	1.0	0.06	Boron	B	0.9	
Sodium	Na	62	2.70	Cyanide	CN	0.00	
Potassium	K	13.3	0.34	Nitrate	NO_3	0.4	0.01.
Calcium	Ca	60	2.99	Chloride	Cl	28	0.79
Magnesium	Mg	20	1.65	Sulfate	SO_4	94	1.96
				Alkalinity (as $CaCO_3$)		262	5.24
Arsenic	As	0.00		Hardness (as $CaCO_3$)		232	4.64
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		490	
Copper	Cu	0.01					
Lead	Pb	0.00		pH (as rec'd)	8.1		
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*	11.1		
Selenium	Se	0.00		± deviation	3.8		
Silver	Ag	0.00		Beta *pc/l*	25.8		
Zinc	Zn	0.09		± deviation	3.4		

WELL NO. 2, open to the Silurian dolomite, was completed in 1969 to a depth of 280 ft by the K & K Well Drilling Co., Mokena. This well was abandoned and sealed in 1973. The well was located 15 ft southeast of the pumphouse, approximately 350 ft S and 2480 ft W of the NE corner of Section 33, T35N, R9E. The land surface elevation at the well is approximately 575 ft.

A 5-in. diameter hole was drilled to a depth cf 280 ft. The well was cased with 5-in. pipe from 2.5 ft above land surface to a depth of 37 ft. The top of the well casing was equipped with a pitless adapter.

Upon completion, this well was acidized with 210 gal of 27 percent HCl.

On June 12, 1969, the well reportedly produced 35 gpm for 4 hr with a drawdown of 10 ft from a nonpumping water level of 198 ft below land surface.

WELL NO. 3, open to the Galena-Platteville dolomite, was completed in October 1970 to a depth of 440 ft by the K & K Well Drilling Co., Mokena. This well is not in regular use because of hydrogen sulfide. The well is located about 45 ft east of the pumphouse, approximately 350 ft S and 2455 ft W of the NE corner of Section 33, T35N, R9E. The land surface elevation at the well is approximately 575 ft.

The well is cased with 8-in. drive pipe from 2.5 ft above land surface to a depth of 40 ft and 6-in. pipe from 2.5 ft above land surface to a depth of 230 ft (cemented in). The top of the well casing is equipped with a pitless adapter.

The pumping equipment presently installed is a 6-in. Barnes submersible pump rated at 75 gpm, and powered by a 15-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B008455) is for a water sample from the well collected March 6, 1972, after 30 min of pumping at 40 gpm.

WELL NO. 3, LABORATORY NO. B008455

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.4	0.02	Silica	SiO_2	8.1	
Manganese	Mn	0.0		Fluoride	F	2.0	0.10
Ammonium	NH_4	0.77	0.04	Boron	B	0.83	
Sodium	Na	111	4.83	Nitrate	NO_3	0.4	0.01
Potassium	K	18.0	0.46	Chloride	Cl	50.5	1.42
Calcium	Ca	39.2	1.96	Sulfate	SO_4	66	1.39
Magnesium	Mg	20	1.64	Alkalinity(as $CaCO_3$)		284	5.68
				Hardness(as $CaCO_3$)		180	
				Total dissolved			
Barium	Ba	0.0		minerals		510	
Cadmium	Cd	0.00					
Chromium	Cr	0.0		pH (as rec'd)		7.6	
Copper	Cu	0.0		Radioactivity			
Lead	Pb	0.00		Alpha pc//		3	
Mercury	Hg	<0.0005		± deviation		2	
Nickel	Ni	0.0		Beta pc//		9	
Zinc	Zn	0.0		± deviation		2	

CENTRAL STATES UTILITY CO.

Central States Utility Co. (est. 18), located about 2 miles southeast of Plainfield, installed a public water supply in 1976. One well is in use. In 1979 there were 5 services, all metered; the estimated average pumpage in 1980 was 4000 gpd. The water is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed in June 1975 to a depth of 260 ft by the Shaver Well Drilling Co., Lombard. The well is located about 1140 ft east of Interstate 55 frontage road and 0.5 mile south of Renwick Road, approximately 2550 ft S and 1140 ft E of the NW corner of Section 24, T36N, R9E. The land surface elevation at the wellis approximately 615 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay, some gravel	46	46
Lime,medium to soft	214	260

The well is cased with 16-in. OD pipe from about 2 ft above land surface to a depth of 46 ft and 10-in. ID pipe from about 2 ft above land surface to a depth of 46 ft (cemented in).

Upon completion, the well reportedly produced 350 gpm for 8 hr with a drawdown of 60 ft from a nonpumping water level of 38 ft below land surface.

The pumping equipment presently installed is a Sta-Rite submersible pump set at 200 ft, rated at 250 gpm, and powered by a 25-hp electric motor.

The following mineral analysis (Lab. No. 207630) is for a water sample from the well collected March 6, 1978, after 30 min of pumping at 300 gpm.

WELL NO. 1, LABORATORY NO. 207630

		mg/l	*me/l*			*mg/l*	*me/l*
Iron(total)	Fe	1.2		Silica	SiO_2	17.0	
Manganese	Mn	0.00		Fluoride	F	0.3	
Ammonium	NH_4	0.4	0.02	Boron	B	0.1	
Sodium	Na	10.4	0.45	Nitrate	NO_3	0.2	0.00
Potassium	K	2.0	0.05	Chloride	Cl	4	0.11
Calcium	Ca	84.4	4.21	Sulfate	SO_4	71.0	1.55
Magnesium	Mg	42.7	3.51	Alkalinity(as $CaCO_3$)		330	6.60
Strontium	Sr	0.29	0.01				
				Hardness(as $CaCO_3$)		386	7.72
Barium	Ba	<0.1					
Cadmium	Cd	0.00		Total dissolved.			
Chromium	Cr	0.00		minerals		423	
Copper	Cu	0.00					
Lead	Pb	<0.05					
Lithium	Li	0.01		Turbidity		6	
Nickel	Ni	<0.05		Color		0	
Silver	Ag	0.00		Odor		0	
Zinc	Zn	0.09		Temp, (reported)		53.5F	

CHANNAHON

The village of Channahon (1505) installed a public water supply in 1978. One well is in use. In 1980 there were 27 services, all metered; the average pumpage was 7534 gpd. The water is chlorinated.

WELL NO. 1, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in October 1977 to a depth of 765 ft by the Lockport Well & Pump Co., Joliet. The well is located about 105 ft north of Bluff Road, 75 ft west of Valley Drive just east of the elevated tank and 0.5 mile west of Interstate 55, approximately 105 ft N and 2500 ft W of the SE corner of Section 9, T34N, R9E. The land surface elevation at the well is approximately 570 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	5	5
Gravel	45	50
Shale	35	85
Broken lime and shale	10	95
Lime and shale	150	245
Brown lime and shale	95	340
Hard brown lime	225	565
Sandstone (St. Peter)	200	765

A 12-in. diameter hole was drilled to a depth of 350 ft and finished 8 in. in diameter from 350 to 765 ft. The well is cased with 12 in. pipe from about 0.7 ft above land surface to a depth of 98 ft and 8-in. pipe from land surface to a depth of 350 ft (cemented in). The top of the casing is equipped with a pitless adapter.

Upon completion, the well reportedly produced 200 gpm for 8 hr with a drawdown of 80 ft from a nonpumping water level of 270 ft.

In February 1978, after 10 hr of pumping at a rate of 200 gpm, the drawdown was 60 ft from a nonpumping water level of 359 ft below land surface.

The pumping equipment presently installed consists of a 40-hp electric motor, a Red Jacket submersible pump (Model No. 8PB6) set at 525 ft, rated at 200 gpm at about 490 ft TDH, and has 525 ft of 4-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C002610) is for a water sample from the well collected in January 1978.

WELL NO. 1, LABORATORY NO. C002610

		mg/l	*me/I*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	8	
Manganese	Mn	0.00		Fluoride	F	1.3	0.07
Ammonium	NH_4	1.5	0.08	Boron	B	1.1	
Sodium	Na	136	5.92	Cyanide	CN	0.00	
Potassium	K	16.8	0.43	Nitrate	NO_3	0.0	0.00
Calcium	Ca	42	2.10	Chloride	Cl	58	1.64
Magnesium	Mg	24	1.98	Sulfate	SO_4	152	3.16
				Alkalinity(as $CaCO_3$)		288	5.76
Arsenic	As	0.000		Hardness(as $CaCO_3$)		203	4.06
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		626	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.11		pH (as rec'd)		7.8	

CHANNAHONPARKWAYSTATEPARK

Channahon Parkway State Park, located on both sides of the Illinois-Michigan Canal adjacent to the village of Channahon, installed a public water supply in 1947. This park is managed as part of the I & M Canal State Parkway. One well (No. 2) serves the ranger's home, 3 hydrants, and the maintenance building. In 1977 the estimated average and maximum pumpages were 2000 and 3000 gpd, respectively. The water is not treated.

WELL NO. 1, open to the Maquoketa Group and the Galena dolomite, was completed in 1937 to a depth of 215 ft by Peter W. Dittmeyer, Joliet. This well was abandoned and capped prior to 1953. The well is located east of the DuPage River downstream from the dam and locks, approximately 510 ft N and 1620 ft E of the SW corner of Section 17, T34N, R9E. The land surface elevation at the well is approximately 515 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Sand and gravel	**26**	**26**
Shale	**66**	**92**
Limestone	**34**	**126**
Shale	**82**	**208**
Limestone	**7**	**215**

A 6-in. diameter hole was drilled to a depth of 215 ft. The well is cased with 6-in. pipe from about 3 ft above land surface to a depth of 95 ft.

WELL NO. 2, open to the Maquoketa Group and the Galena dolomite, was completed in June 1942 to a depth of 266 ft by the W. J. Fulton Engineering Co., Waukegan. The well is located 50 ft east of the northeast corner of the canal lock on the east side of the DuPage River, approximately

1300 ft N and 1200 ft E of the SW corner of Section 17, T34N, R9E. The land surface elevation at the well is approximately 518 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay and coarse gravel	52	52
Shale	13	65
Dolomite (?)	110	175
Limestone	80	255
Sandy dolomite, light brown	11	266

A 10-in. diameter hole was drilled to a depth of 16 ft, reduced to 8 in. between 16 and 180 ft, and finished 6 in. in diameter from 180 to 266 ft. The well is cased with 6-in. pipe from 1.5 ft above land surface to a depth of 180 ft (cemented in).

A production test was conducted by the State Water Survey on June 18, 1942. After 12 hr of pumping at a rate of 21 gpm, the drawdown was 9.0 ft from a nonpumping water level of 58.0 ft below land surface. Pumping was continued for 3 hr at a rate of 27 gpm with a drawdown of 11.5 ft. After an additional 7 hr of pumping at a rate of 3 5 gpm, the final drawdown was 15.2 ft. Five min after pumping was stopped, the water level had recovered to 59.0 ft.

The pumping equipment presently installed is a Peabody-Barnes submersible pump (Serial No. 436T300-14-31897-675) rated at 10 gpm, and powered by a 3-hp 3450 rpm electric motor.

The following mineral analysis (Lab. No. 208182) is for a water sample from the well collected April 27, 1978, after 2 hr of pumping.

WELL NO. 2, LABORATORY NO. 208182

		mg/l	*me/l*			*mg/l*	*me/*l
Iron(total)	Fe	0.5		Silica	SiO_2	7.9	
Manganese	Mn	0.03		Fluoride	F	1.2	
Ammonium	NH_4	0.5	0.03	Boron	B	1.1	
Sodium	Na	105	4.57	Nitrate	NO_3	1.2	0.02
Potassium	K	17.0	0.43	Chloride	Cl	59	1.66
Calcium	Ca	56.4	2.81	Sulfate	SO_4	125.3	2.61
Magnesium	Mg	23.7	1.95	Alkalinity(as $CaCO_3$)		276	5.52
Strontium	Sr	2.07	0.05				
				Hardness(as $CaCO_3$)		238	4.76
Barium	Ba	<0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		558	
Copper	Cu	0.00					
Lead	Pb	<0.05					
Lithium	Li	0.06		Turbidity		4	
Nickel	Ni	<0.05		Color		0	
Silver	Ag	0.00		Odor		0	
Zinc	Zn	0.37		Temp, (reported)		57.5F	

CHERRY HILL SUBDIVISION

Cherry Hill Subdivision (est. 790), located about 3 miles east of Joliet, installed a public water supply in 1926. The water system is owned and operated by Utilities, Inc. One well (No. 2) is in use and another well (No. 1) is available for emergency use. In 1961 there were 85 services. In 1980 there were 230 services, all metered; the average pumpage was 48,394 gpd. The water from Well No. 2 is chlorinated and treated with polyphosphate to keep iron in solution.

Initially, water was obtained from one or more private wells. No data are available on the depths, construction details, or the exact locations of these wells.

WELL NO. 1, open to the Silurian dolomite, was completed in 1938 to a depth of 145 ft by Peter W. Dittmeyer, Joliet, and repaired by J. A. Kramer, Joliet, in 1939. This well is available for emergency use. The well is located at 2400 Erskine Lane, approximately 300 ft N and 1200 ft E of the SW corner of Section 7, T35N, R11E. The land surface elevation at the well is approximately 633 ft.

An 8-in. diameter hole was drilled to a depth of 95 ft and finished 6 in. in diameter from 95 to 145 ft. The well is cased with 8-in. pipe from land surface to a depth of 65 ft and 6-in. pipe from 3 ft above land surface to a depth of 95 ft.

In May 1956, the well reportedly produced 200 gpm for 2 hr with a drawdown of 8 ft from a nonpumping water level of 37 ft below the pump base.

On June 10, 1958, after pumping at a rate of 200 gpm, the drawdown was 25 ft from a nonpumping water level of 45 ft.

On March 9, 1965, the nonpumping water level was reported to be 48 ft below land surface.

The pumping equipment presently installed is a 6-in. Jacuzzi submersible pump set at 63 ft, rated at 110 gpm, and powered by a 10-hp electric motor.

A partial analysis of a sample (Lab. No. 125398) collected May 25, 1951, showed the water to have a hardness of 420 mg/1, total dissolved minerals of 471 mg/1, and an iron content of 0.6 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in April 1968 to a depth of 260 ft by the Layne-Western Co., Aurora. The well is located adjacent to the elevated tank at 2445 Erskine Lane, approximately 600 ft S and 2500 ft E of the NW corner of Section 18,T35N, R11E. The land surface elevation at the well is approximately 632 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Black top soil	1	1
Brown sandy clay with boulders	12	13
Brown sand and gravel with boulders	29	42
Gray clayey silt	7	49
Broken limestone and shale	S	57
Hard limestone and some shale	199	256
Shale	4	260

A 14-in. diameter hole was drilled to a depth of 58 ft and finished 8 in. in diameter from 58 to 260 ft. The well is equipped with a pitless adapter from 1.5 ft above land surface to a depth of 6 ft and cased with 8-in. steel pipe from 6 ft to a depth of 58 ft (cemented in).

A production test was conducted by the driller on April 29, 1968. After 1.9 hr of pumping at rates ranging from 263 to 201 gpm, the maximum drawdown was 87 ft from a nonpumping water level of 28 ft below land surface.

After acidizing with 1000 gal of 15 percent HC1, a production test was conducted by the driller on May 2, 1968. After 1.5 hr of pumping at rates ranging from 201 to 212 gpm, the drawdown was 51 ft from a nonpumping water level of 28 ft below land surface.

A production test was conducted by the driller on May 3, 1968. After 7.9 hr of pumping at rates of 201 to 230 gpm, the drawdown was 59 ft from a nonpumping water level of 28 ft below land surface.

The pumping equipment presently installed is an 8-in. Sumo submersible pump set at 168 ft, rated at 300 gpm, and powered by a 25-hp Sumo electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A20572) is for a water sample from the well collected May 18, 1976, after 30 min of pumping at 150 gpm.

WELL NO. 2, LABORATORY NO. A20572

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.3		Silica	SiO_2	10	
Manganese	Mn	0.10		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.5	0.03	Boron	B	0.4	
Sodium	Na	20	0.87	Cyanide	CN	0.01	
Potassium	K	5.2	0.13	Nitrate	NO_3	0.0	0.00
Calcium	Ca	143	7.14	Chloride	Cl	5	0.14
Magnesium	Mg	61	5.02	Sulfate	SO_4	350	7.28
				Aikalinity(as$CaCO_3$)		300	6.00
Arsenic	As	0.000		Hardness(as$CaCO_3$)		607	12.14
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		810	
Copper	Cu	0.02					
Lead	Pb	0.00					
Mercury	Hg	0.0001					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.4	

CHICKASAW HILLS UTILITY CO., INC.

Chickasaw Hills Utility Co., Inc. (est. 2775), located about 6 miles northeast of Lockport, installed a public water supply in 1968. Two wells (Nos. 1 and 2) are in use and another well (No. 3) is available for emergency use. In 1980 there were 988 services, all metered; the average pumpage was 347,397 gpd. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite, was completed in 1967 to a depth of 325 ft by the Allen Well Drillers, Mokena. The well is located about 100 ft east of Kickapoo Trail between Pawnee and Catawba Lanes, approximately 1750 ft N and 1650 ft E of the SW corner of Section 2, T36N, RUE. The land surface elevation at the well is approximately 720 ft.

An 8-in. diameter hole was drilled to a depth of 325 ft. The well is cased with 8-in. steel pipe from 0.4 ft above land surface to a depth of 90 ft. The top of the well casing is equipped with a pitless adapter.

The pumping equipment presently installed is a submersible pump set at 150 ft, rated at 250 gpm, and powered by a 20-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41263) of a sample collected April 8, 1977, after 30 min of pumping at 250 gpm, showed the water to have a hardness of 427 mg/l, total dissolved minerals of 557 mg/l, and an iron content of 0.9 mg/l.

WELL NO. 2, open to the Silurian dolomite, was completed in September 1974 to a depth of 360 ft by the Shaver Well Drilling Co., Lombard. The well is located north of Choctaw Trail east of Park Road, approximately 40 ft S and 758 ft E of the NW corner of Section 2, T36N, R11E. The land surface elevation at the well is approximately 715 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Yellow clay	10	10
Gray clay	70	80
Gray clay and gravel	40	120
Gray clay	20	140
Lime hard	65	205
Lime medium gray	95	300
Lime soft gray to white	40	340
Green shale	20	360

A 12-in. diameter hole was drilled to a depth of 360 ft. The well is cased with 12-in. steel pipe from 3 ft above land surface to a depth of 140 ft.

A production test was conducted by the driller on October 4, 1974. After 8 hr of pumping at rates of 300 to 668 gpm, the drawdown was 100 ft from a nonpumping water level of 57 ft below land surface.

The pumping equipment presently installed is a Layne & Bowler turbine pump set at 200 ft, operated at 700 gpm, and powered by a 50-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40482) is for a water sample from the well collected March 23, 1978, after 30 min of pumping at 700 gpm.

WELL NO. 2, LABORATORY NO. B40482

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.3		Silica	SiO_2	16	
Manganese	Mn	0.03		Rluoride	F	0.3	0.02
Ammonium	NH_4	0.5	0.03	Boron	B	0.1	
Sodium	Na	18	0.78	Cyanide	CN	0.00	
Potassium	K	2.7	0.07	Nitrate	NO_3	0.0	0.00
Calcium	Ca	94	4.69	Chloride	Cl	8.5	0.24
Magnesium	Mg	49	4.03	Sulfate	SO_4	116	2.41
				Alkalinity (as $CaCO_3$)		333	6.66
Arsenic	As	0.01		Hardness (as $CaCO_3$)		435	8.70
Barium	Ba	0.1					
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved			
Copper	Cu	0.00		minerals		538	
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.5	

WELL NO. 3, open to the Silurian dolomite, was completed in 1979 to a depth of 320 ft by the Shaver Well Drilling Co., Lombard. This well is available for emergency use. The well is located on lot 212 in Pebble Creek Subdivision Unit 3, approximately 1993 ft S and 2569 ft W of the NE corner of Section 10, T36N, R11E. The land surface elevation at the well is approximately 759 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Yellow clay	20	20
Gray clay	40	60
Gravel	20	80
Sand	20	100
Medium gravel	20	120
Hardpan sand	19.5	139.5
White limestone, medium hard	90.5	230
White hard limestone	90	320

The well is cased with 12-in. pipe from about 1 ft above land surface to a depth of 140 ft.

Upon completion, the well reportedly produced 600 gpm for 8 hr with a drawdown of 60 ft from a nonpumping water level of 100 ft.

The pumping equipment presently installed consists of a 60-hp 1760 rpm U. S. electric motor (Serial No. 1029229), a 10-in., 10-stage Johnston vertical turbine pump (Serial No. GB1216) set at 205 ft, rated at 600 gpm at about 300 ft TDH, and has 205 ft of 6-in. column pipe.

CITIZENS ARBURY DIVISION

Citizens Arbury Division (est. 1442), located about 2 miles east of Mokena, installed a public water supply in 1960. The water system is owned and operated by the Citizens Utilities Co. One well (No. 1) is in use and another well (No. 2) is available for emergency use. In 1963 there were 261 services, all metered. In 1980 there were 448 services, all metered; the average and maximum pumpages were 154,624 and 220,000 gpd, respectively. The water is treated with polyphosphate to keep iron in solution; in addition, the water from Well No. 1 is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in March 1960 to a depth of 457 ft by the Wehling Well Works, Beecher. The well is located 100 ft north of Birch St. and 125 ft east of Oak St., approximately 1380 ft S and 1306 ft E of the NW corner of Section 10, T35N, R12E. The land surface elevation at the well is approximately 735 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	5	5
Clay, yellow	15	20
Clay, brown	25	45
Clay and gravel	65	110
Clay, gravel, sand and lime	5	115
Lime	335	450
Shale	7	457

A 19-in. diameter hole was drilled to a depth of 457 ft. The well is cased with 20-in. OD pipe from about 1.2 ft above the pumphouse floor to a depth of 121 ft.

A production test was conducted by the driller on March 25, 1960. After 2.4 hr of pumping at a rate of 300 gpm, the drawdown was 227 ft from a nonpumping water level of 56 ft below the pump base. Pumping was continued for 4.1 hr at a rate of 25 3 gpm with a final drawdown of 164 ft.

The pumping equipment presently installed is a Layne turbine pump set at 400 ft, rated at 325 gpm at about 473 ft head, and powered by a 50-hp U. S. Holloshaft electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006619) is for a water sample from the well collected March 4, 1975, after 2 hr of pumping at 305 gpm.

WELL NO. 1, LABORATORY NO. C006619

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.4		Silica	SiO_2	9-5	
Manganese	Mn	0.01		Fluoride	F	0.6	0.03
Ammonium	NH_4	0.66	0.04	Boron	B	0.8	
Sodium	Na	61	2.65	Cyanide	CN	0.00	
Potassium	K	7.2	0.18	Nitrate	NO_3	0.5	0.01
Calcium	Ca	150	7.48	Chloride	Cl	4	0.11
Magnesium	Mg	96	7.90	Sulfate	SO_4	536	11.15
				Alkalinity(as $CaCO_3$)		332	6.64
Arsenic	As	0.000		Hardness(as $CaCO_3$)		770	15.40
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		1150	
Copper	Cu	0.01					
Lead	Pb	0.00		pH (as rec'd)		7.6	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc//		1.3	
Selenium	Se	0.00		± deviation		3.2	
Silver	Ag	0.00		Beta pc//		7.6	
Zinc	Zn	0.06		± deviation		3.2	

WELL NO. 2, open to the Silurian dolomite, was completed in August 1970 to a depth of 435 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located 100 ft south of Willow between Walnut and Sycamore Sts., approximately 2550 ft N and 2058 ft E of the SW corner of Section 10, T35N, R12E. The land surface elevation at the well is approximately 752 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Fill	5	5
Gray clay	15	20
Clay and boulders	25	45
Sandy clay and boulders	30	75
Clay and boulders	20	95
Gravel	19	114
Medium gray limestone	11	125
Hard gray limestone	15	140
Medium limestone with shale streaks	60	200
Medium brown limestone	25	225
Medium brown limestone with shale streaks	5	230
Medium gray limestone with shale streaks	30	260
Hard gray limestone	15	275
Soft gray limestone	40	315
Soft brown limestone	5	320
Hard brown limestone	10	330
Medium brown limestone	25	355
Medium gray limestone	30	385
Medium dark gray limestone	30	415
Medium gray limestone with shale streaks	10	425
Blue shale	10	435

A 12-in. diameter hole was drilled to a depth of 435 ft. The well is cased with 12-in. steel pipe from 2 ft above land surface to a depth of 117 ft.

A production test was conducted by the driller on August 5, 1970. After 7.9 hr of pumping at rates ranging from 257 to 500 gpm, the final drawdown was 24 ft from a nonpumping water level of 83 ft below land surface. Fifteen min after pumping was stopped, full recovery was observed.

The pumping equipment presently installed is a 10-in., 6-stage Layne & Bowler turbine pump set at 140 ft, rated at 500 gpm, and powered by a 60-hp 1750 rpm U. S. electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003176) of a sample collected March 22, 1978, after pumping for 4 hr at 500 gpm, showed the water to have a hardness of 691 mg/l, total dissolved minerals of 924 mg/l, and an iron content of 0.3 mg/l.

CLEARVIEW SUBDIVISION

Clearview Subdivision (est. 420), located about 0.5 mile south of Joliet, installed a public water supply in 1929. The water system is owned and operated by the Clearview Water Association. Two wells are in use. In 1963 there were 97 services, none metered. In 1978 there were 120 services, none metered; the estimated average and maximum pumpages were 47,000 and 55,000 gpd, respectively. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1929 to a depth of 240 ft by Mr. Gray, Piainfield. The well is located at the intersection of Nowell Ave., Retta Court, and Charity Ave., approximately 1925 ft S and 1550 ft E of the NW corner of Section 22, T35N, R10E. The land surface elevation at the well is approximately 595 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Loam	3	3
Clay	9	12
Rock	228	240

The well is cased with 6-in. pipe from 1.5 ft above the concrete floor of a 5-ft deep wellhouse to a depth of about 100 ft.

In 1939, the nonpumping water level was reported to be 40 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 100 ft, rated at 50 gpm, and powered by a 3-hp Red Jacket electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41475) of a sample collected April 12, 1977, after pumping for 30 min at 60 gpm, showed the water to have a hardness of 658 mg/1, total dissolved minerals of 853 mg/1, and an iron content of 1.3 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in August 1950 to a depth of 220 ft by Dreher & Schorie, Joliet. The well is located about 350 ft south of Well No. 1 at the intersection of Nowell Ave. and Sherman St., approximately 2275 ft S and 1575 ft E of the NW corner of Section 22, T35N, R10E. The land surface elevation at the well is approximately 608 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	3	3
Clay (brown)	32	35
Limestone	185	220

An 8-in. diameter hole was drilled to a depth of 42 ft and finished 6 in. in diameter from 42 to 220 ft. The well is cased with 8-in. pipe from about 2 ft above the floor of a 7-ft deep well pit to a depth of 42 ft and 6-in. pipe from about 2 ft above the well pit floor to a depth of 60 ft (cemented in).

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 300K-4) set at 120 ft, rated at 50 gpm, and powered by a 3-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B0024132) is for a water sample from the well collected June 9, 1972, after 40 min of pumping at 50 gpm.

WELL NO. 2, LABORATORY NO. B0024132

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.1	0.00	Silica	SiO_2	13.2	
Manganese	Mn	0.0		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.3	0.02	Boron	B	0.31	
Sodium	Na	51	2.22	Nitrate	NO_3	0.4	0.01
Potassium	K	3.5	0.09	Chloride	Cl	112	3.16
Calcium	Ca	157	7.83	Sulfate	SO_4	264	5.49
Magnesium	Mg	72	5.92	Alkalinity (as $CaCO_3$)		355	7.10
				Hardness (as $CaCO_3$)		688	
Barium	Ba	0.0		Total dissolved minerals		900	
Cadmium	Cd	0.00					
Chromium	Cr	0.0					
Copper	Cu	0.0		PH (as rec'd)		7.5	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha *pc/l*		0.0	
Nickel	Ni	0.0		± deviation		2.9	
Silver	Ag	0.0		Beta *pc/l*		0.0	
Zinc	Zn	0.0		± deviation		2.2	

COLLEGE VIEW SUBDIVISION

College View Subdivision (est. 665), located about 2 miles northwest of Lockport, installed a public water supply in 1957. The water system is owned and operated by the College View Community Association. Three wells are in use. In 1980 there were 190 services, none metered; the average pumpage was 43,358 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in September 1957 to a depth of 342 ft by Dreher & Schorie, Joliet. The well is located at 16112 Jacquie Ave., approximately 150 ft N and 150 ft E of the SW corner of Section 10, T36N, R10E. The land surface elevation at the well is approximately 675 ft.

A 6-in. diameter hole was drilled to a depth of 342 ft. The well is cased with 6-in. pipe from 0.7 ft above the pumphouse floor to a depth of 47 ft.

Nonpumping water levels were reported to be 65.5 ft in 1958, 75 ft in 1970, and 66 ft on February 12, 1976.

The pumping equipment presently installed consists of a 7 ½-hp 3600 rpm U. S. electric motor (Model No. 756F4, Serial No. 1379735), an 8-stage Red Jacket submersible pump (Model No. 8L6) set at 230 ft, rated at 67 gpm at about 240 ft head, and has 230 ft of 2-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B108802) of a sample collected March 4, 1974, after pumping for 33 min at 59 gpm, showed the water to have a hardness of 409 mg/1, total dissolved minerals of 509 mg/1, and an iron content of 0.00 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in May 1959 to a depth of 296 ft (reported to be 294 ft deep in 1966) by Dreher & Schorie, Joliet. The well is located on Lewis Drive between Janet and Kirkham Sts., approximately 800 ft N and 400 ft W of the SE corner of Section 9, T36N, R10E. The land surface elevation at the well is approximately 682 ft.

A 6-in. diameter hole was drilled to a depth of 296 ft. The well is cased with 6-in. pipe from 1.3 ft above the pumphouse floor to a depth of 47 ft.

Upon completion, the well reportedly produced 60 gpm with a nonpumping water level of 70 ft.

On February 12, 1976, the well reportedly produced 35 gpm for 7 min with a drawdown of 34 ft from a nonpumping water level of 75 ft.

The pumping equipment presently installed consists of a 5-hp electric motor, a Red Jacket submersible pump set at 225 ft, rated at 60 gpm, and has 225 ft of 2-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B31484) of a sample collected December 29, 1980, showed the water to have a hardness of 430 mg/1, total dissolved minerals of 497 mg/1, and an iron content of 0.006 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in September 1962 to a depth of 327 ft by Dreher & Schorie, Joliet. The well is located at Terminal Court and Dawson Drive, approximately 1250 ft N and 50 ft W of the SE corner of Section 9, T36N, R10E. The land surface elevation at the well is approximately 680 ft.

A 6-in. diameter hole was drilled to a depth of 327 ft. The well is cased with 6-in. pipe from 1.3 ft above the 4-ft deep pumphouse floor to a depth of 42 ft.

Upon completion, this well was reportedly acidized by the driller and a test showed it could produce 60 gpm.

In 1968, the nonpumping water level was reported to be 50 ft.

On February 12, 1976, the well reportedly produced 60 gpm for 15 min with a drawdown of 69 ft from a nonpumping water level of 107 ft.

The pumping equipment presently installed consists of a 7 V½hp 3450 rpm Franklin electric motor (Model No. 3P1027B9D1), a Red Jacket submersible pump (Model No. 18E6) set at 240 ft, rated at 60 gpm, and has 240 ft of 2-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40783) is for a water sample from the well collected April 13, 1976, after 30 min of pumping at 64 gpm.

WELL NO. 3, LABORATORY NO. B40783

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	10	
Manganese	Mn	0.01		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.01	0.00	Boron	B	0.3	
Sodium	Na	30	1.30	Cyanide	CN	0.00	
Potassium	K	2.8	0.07	Nitrate	NO_3	3.9	0.06
Calcium	Ca	76	3.79	Chloride	Cl	13	0.37
Magnesium	Mg	48	3.95	Sulfate	SO_4	100	2.08
				Alkalinity<asCaCO3)		330	6.60
Arsenic	As	0.00		Hardness(asCaC03)		387	7.74
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		475	
Copper	Cu	0.02					
Lead	Pb	0.00		pH (as rec'd)		7.5	
Mercury	Hg	0.0005		Radioactivity			
Nickel	Ni	0.0		Alpha pc/l		4.0	
Selenium	Se	0.00		± deviation		2.1	
Silver	Ag	0.00		Beta pc/l		3.9	
Zinc	Zn	0.0		± deviation		1.8	

CREST HILL

The city of Crest Hill (7460) installed a public water supply in 1963. Four wells (Nos. 1, 3, 4, and 6) are in use. This supply is also cross connected with the city of Joliet. In 1966 there were 165 services, all metered. In 1980 there were 2509 services, all metered; the average pumpage was 1,000,984 gpd. The water is chlorinated and fluoridated; in addition, the water from Well Nos. 1 and 4 is treated with polyphosphate.

WELL NO. 1 (East Well), open to the Silurian dolomite, was completed in August 1963 to a depth of 303 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located at the elevated tank at Oakland and Chaney Sts., approximately 2400 ft S and 1050 ft E of the NW corner of Section 33, T36N, R10E. The land surface elevation at the well is approximately 620 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	35	35
Limestone	265	300
Shale	3	303

A 12-in. diameter hole was drilled to a depth of 59 ft and finished 8 in. in diameter from 59 to 303 ft. The well is cased with 12-in. drive pipe from about 1.2 ft above the pump station floor to a depth of 35 ft and 8-in. pipe from about 1.2 ft above the pump station floor to a depth of 59 ft (cemented in).

Upon completion, the well was pumped for 9.5 hr and reportedly produced 300 gpm with a drawdown of 17 ft and 535 gpm with a drawdown of 65 ft from a nonpumping water level of 40 ft below the top of the casing.

The pumping equipment presently installed consists of a 25-hp 1760 rpm General Electric motor, an 8-in., 10-stage Peerless turbine pump set at 250 ft, rated at 225 gpm at about 250 ft TDH, and has 250 ft of 5-in. column pipe. The well is equipped with 250 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C002334) of a sample collected December 20, 1977, showed the water to have ahardness of 394 mg/1, total dissolved minerals of 526 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 2 (formerly Lidice Subdivision Well No. 3), open to the Cambrian-Ordovician aquifer, was completed in September 1945 to a depth of 1652 ft by the J. P. Miller Artesian Well Co., Brookfield. This well is not in use. The well is located at the northwest corner of Theodore St. and Raynor Ave., approximately 120 ft N and 55 ft W of the

SE corner of Section 32, T36N, R10E. The land surface elevation at the well is approximately 656 ft.

A sample study and drillers log of Well No. 2 furnished by the State-Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
"Glacial drift"	69	69
"Gravel"	6	75
"Shale, thin bed of limestone"	37	112
SILURIAN SYSTEM		
Niagaran and Alexandrian-Series		
"Limestone"	168	280
Dolomite, shaly	15	295
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
"Limestone"	41	336
Scales Shale		
Shale	50	386
Galena and Platteville Groups		
Dolomite, some limestone	367	753
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, incoherent	129	882
Shale, some dolomitic, sandstone chert	48	930
Prairie du Chien Group		
Shakopee Dolomite		
Dolomite, thin bed of.sandstone	20	950
Oneota Dolomite		
Dolomite, some sandstone, thin beds of shale	221	1171
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	164	'1335
Franconia Formation		
Dolomite, sandstone, shale	124	1459
Ironton-Galesville Sandstone		
Sandstone, partly dolomitic	66	1525
Sandstone, incoherent	65	1590
Sandstone, partly dolomitic	45	1635
Eau Claire Formation		
Dolomite and shale	17	1652

An 18Mn. diameter hole was drilled to a depth of 432 ft, reduced to 10 in. between 432 and 975 ft, and finished 8 in. in diameter from 975 to 1652 ft. The well is cased with 18-in. OD pipe from about-0.2 ft above the pumphouse floor to a depth of 112 ft, 10-in. ID pipe from about 0.2 ft above the pumphouse floor to a depth of 432 ft (cemented in), and an 8-in. ID liner from 810 ft to a depth of 975 ft.

After the well was shot with 150 lb of nitrogel at 1585 ft, a production test was conducted on October 19-20,1945, by representatives of the driller and the State Water Survey. After '13 hr of intermittent pumping at rates ranging from 82 to 110 gpm, the drawdown was 20 ft from a nonpumping water level of 440 ft below the pump base.

The pumping equipment presently installed consists of a 100-hp U. S. electric motor, a 41-stage Peerless turbine pump set at 850 ft, rated at 250 gpm, and has 850 ft of 6-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake. The well is equipped with 850 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A16672) is for a water sample from the well collected March 23, 1976, after 24 hr of pumping at 200 gpm.

WELL NO. 2, LABORATORY NO. A16672

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.2		Silica	SiO_2	8	
Manganese	Mn	0.02		Fluoride	F	1.8	0.10
Ammonium	NH_4	1.16	0.06	Boron	B	1.0	
Sodium	Na	60	2.61	Cyanide	CN	0.00	
Potassium	K	14	0.36	Nitrate	NO_3	0.0	0.00
Calcium	Ca	55	2.74	Chloride	Cl	25	0.70
Magnesium	Mg	17	1.40	Sulfate	SO_4	60	1.25
				Alkalinity(as$CaCO_3$)		264	5.28
Arsenic	As	0.002		Hardness(as$CaCO_3$)		207	4.14
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.03		minerals		390	
Copper	Cu	0.00					
Lead	Pb	0.00		PH (as rec'd)		7.6	
Mercury	Hg	0.0003		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		34.3	
Selenium	Se	0.00		± deviation		5.2	
Silver	Ag	0.00		Beta *pc/l*		35.5	
Zinc	Zn	0.0		± deviation		3.4	

WELL NO. 3 (West Well, formerly known as Well No. 2), open to the Silurian dolomite, was completed in August 1963 to a depth of 310 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located on Root St. near Leness Lane, approximately 950 ft S and 3700 ft E of the NW corner of Section 31, T36N, R10E. The land surface elevation at the well is approximately 633 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	73	73
Limestone	229	302
Shale	8	310

A 12-in. diameter hole was drilled to a depth of 73 ft and finished 8 in. in diameter from 73 to 310 ft. The well is cased with 12-in. drive pipe from about 0.8 ft above the pumphouse floor to a depth of 73 ft and 8-in. pipe from about 0.8 ft above the pumphouse floor to a depth of 74 ft (cemented in).

Upon completion, the well reportedly produced from 200 to 250 gpm for 8.5 hr with drawdowns ranging from 48 to 60 ft from a nonpumping water level of 55 ft below the top of the casing.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 300643) set at 250 ft, rated at 180 gpm, and powered by a 20-hp 1800 rpm U. S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B46303) is for a water sample from the well collected April 21, 1980, after 24 hr of pumping at 160 gpm.

WELL NO. 3, LABORATORY NO. B46303

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.39		Silica	SiO_2	14	
Manganese	Mn	<0.005		Fluoride	F	0.50	0.03
Ammonium	NH_4	0.9	0.05	Boron	B	0.29	
Sodium	Na	27	1.17	Cyanide	CN	0.01	
Potassium	K	4.7	0.12	Nitrate	NO_3	<0.4	
Calcium	Ca	88	4.39	Chloride	Cl	20	0.56
Magnesium	Mg	41	3.37	Sulfate	SO_4	78	1.62
Strontium	Sr	0.84		Alkalinity (as $CaCO_3$)		348	6.96
Arsenic	As	0.003		Hardness(as $CaCO_3$)		389	7.78
Barium	Ba	0.12					
Beryllium	Be	<0.0005		Total dissolved			
Cadmium	Cd	<0.0005		minerals		496	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	<0.005					
Lead	Pb	<0.005					
Lithium	Li	0.09					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.005					
Selenium	Se	<0.0005					
Silver	Ag	<0.01					
Vanadium	V	<0.005					
Zinc	Zn	<0.005		pH (as rec'd)	7.8		

WELL NO. 4 (formerly Richland Subdivision Well No. 3), open to the Silurian dolomite and the Maquoketa Group, was completed in March 1951 to a depth of 300 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located at the corner of Park Rose and Webb Sts., approximately 1485 ft S and 833 ft E of the NW corner of Section 31, T36N, R10E. The land surface elevation at the well is approximately 622 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Surface	5	5
Yellow clay	15	20
Blue clay	15	35
Lime	20	55
Hard gray lime	25	80
Shale and blue clay	10	90
Lime shells, shale	20	110
Gray lime	10	120
Pink rock	10	130
Blue lime	10	140
Gray lime	25	165
Blue lime gray	20	185
Hard gray lime	20	205
No record	10	215
Sandy lime shells	25	240
No record	10	250
Sandy gray lime	5	255
Sandy brown lime	5	260
Brown sandy lime	5	265
Lime and shale	35	300

A 12-in. diameter hole was drilled to a depth of 55 ft, reduced to 10 in. between 55 and 165 ft, and finished 8 in. in diameter from 165 to 300 ft. The well is cased with 10-in. pipe from about 1.5 ft above the pumphouse floor to a depth of 55 ft and 8-in. pipe from land surface to a depth of 165 ft.

Upon completion, the well reportedly produced 210 gpm for 1.2 hr with a drawdown of 15 ft from a nonpumping water level of 30 ft below the top of the casing.

The pumping equipment presently installed consists of a 30-hp U. S. electric motor, an 11-stage Peerless turbine pump set at 160 ft, rated at 370 gpm, and has 160 ft of 5-in. column pipe. A 10-ft section of 5-in. suction pipe is attached to the pump intake. The well is equipped with 160 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003011) is for a water sample from the well collected March 8, 1978, after 1 hr of pumping at 335 gpm.

WELL NO, 4, LABORATORY NO. C003011

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.1		Silica	SiO_2	8	
Manganese	Mn	0.03		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.55	0.03	Boron	B	0.4	
Sodium	Na	26	1.13	Cyanide	CN	0.00	
Potassium	K	2.2	0.06	Nitrate	NO_3	0.00	0.00
Calcium	Ca	104	5.19	Chloride	Cl	55	1.55
Magnesium	Mg	44	3.62	Sulfate	SO_4	120	2.50
				Alkalinity(as $CaCO_3$)		320	6.40
Arsenic	As	0.000		Hardness(as $CaCO_3$)		442	8.84
Barium	Ba	0.3					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		606	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.04		pH (as rec'd)	7.3		

WELL NO. 5 (Hillcrest Well, formerly called Well No. 3), open to the Silurian dolomite, was completed in August 1959 to a depth of 282 ft by the J. P. Miller Artesian Well Co., Brookfield. This well is not in use. The well is located in the Hillcrest Shopping Center about 50 ft northwest of the elevated tank, approximately 1215 ft N and 2004 ft W of the SE corner of Section 31, T36N, R10E. The land surface elevation at the well is approximately 590 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	5	5
Limestone	263	268
Shale	14	282

A 15-in. diameter hole was drilled to a depth of 43 ft, reduced to 12 in. between 43 and 212 ft, and finished 10 in. in diameter from 212 to 282 ft. The well is cased with 12-in. pipe from land surface to a depth of 43 ft (cemented in) and a 10-in. perforated liner from 80 ft to a depth of 212 ft.

On September 6, 1959, the well reportedly produced 200 gpm for 5 hr with a drawdown of 62 ft from a nonpumping water level of 5 ft.

The pumping equipment presently installed is a Peerless submersible pump set at 105 ft, rated at 200 gpm at about 201 ft head, and powered by a 15-hp U. S. electric motor.

WELL NO. 6, open to the Silurian dolomite and the Maquoketa Group, was completed in August 1947 to a depth of 352 ft (reported to be 315 ft deep in 1979) by the J. P. Miller Artesian Well Co., Brookfield. This well was acquired from the Coca Cola Bottling Co. in 1978. The well is located on Route 30, approximately 200 ft N and 125 ft W of the SE corner of Section 31, T36N, R10E. The land surface elevation at the well is approximately 625 ft.

A drillers log of Well No. 6 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	15	15
Sand and gravel	25	40
Limestone	70	110
Shale	25	135
Limestone	17	152
Shale	4	156
Limestone	149	305
Shale	10	315
Limestone	37	352

Originally, a 10-in. diameter hole was drilled to a depth of 35? ft. In 1979, it was reported that the hole was 10 in. in diameter to a depth of 102.3 ft and 8 in.in diameter from 102.3 to 315 ft. The well is cased with 10-in. pipe from land surface to a depth of 40 ft.

A production test was conducted by the driller on August 6, 1947. After 5.9 hr of pumping at rates ranging from 230 to 110 gpm, the final drawdown was 82 ft from a nonpumping water level of 46 ft below the top of the casing.

On January 6, 1961, the nonpumping water level was reported to be 40 ft below the pump base.

A production test was conducted by the driller on April 24, 1979. After 3.2 hr of pumping at rates ranging from 195 to 240 gpm, the drawdown was 49 ft from a nonpumping water level of 58 ft. Pumping was continued for 1.4 hr at a rate of 190 gpm with a drawdown of 40 ft. After an additional 1.9 hr of pumping at a rate of 150 gpm, the final drawdown was 31 ft. Twenty min after pumping was stopped, the water level had recovered to 60 ft.

The pumping equipment presently installed is a submersible pump rated at 210 gpm, and powered by a 25-hp electric motor.

A partial analysis of a sample (Lab. No. 153955) collected January 6, 1961, after pumping for 5 min at 100± gpm, showed the water to have a hardness of 388 mg/1, total dissolved minerals of 442 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 7, open to the Silurian dolomite, was completed in October 1979 to a depth of 296 ft by the J. P. Miller Artesian Well Co., Brookfield. As of October 1980, this well was not in use. The well is located approximately 2400 ft N and 350 ft W of the SE corner of Section 32, T36N, R10E. The land surface elevation at the well is approximately 610 ft.

A drillers log of Well No. 7 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	26	26
Limestone	265	291
Shale	5	296

A 15-in. diameter hole was drilled to a depth of 40 ft and finished 12 in. in diameter from 40 to 296 ft. The well is cased with 16-in. OD steel pipe from land surface to a depth of 26 ft and 12-in. steel pipe from land surface to a depth of 40 ft (cemented in).

Upon completion, the well reportedly produced 440 gpm for 8 hr with a drawdown of 86 ft from a nonpumping water level of 47 ft below land surface.

The permanent pumping equipment is not yet installed.

CRETE

The village of Crete (4656) installed a public water supply in 1903. Three wells (Nos. 3, 4, and 5) are in use. In 1949 there were 350 services, 98 percent metered; the estimated average pumpage was 75,000 gpd. In 1980 there were 1415 services, all metered; the average pumpage was 439,408 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1903 to a depth of 192 ft. This well was abandoned in 1979. The well is located in the west end of the village hall building at 524 Exchange St., approximately 730 ft N and 180 ft W of the SE corner of Section 8, T34N, R14E. The land surface elevation at the well is approximately 725 ft.

A 10-in. diameter hole was drilled to a depth of 192 ft. The well is cased with 10-in. pipe from land surface to a depth of 150 ft.

On June 29, 1915, the nonpumping water level was reported to be 30 ft below the pump base.

A production test was conducted on December 5, 1945, by representatives of the State Water Survey and Miller Engineering Co. After 1.2 hr of pumping at a rate of 123

gpm, the drawdown was 4.5 ft from a nonpumping water level of 48.5 ft below the pump base. Pumping was continued for 34 min at a rate of 139 gpm with a drawdown of 5.5 ft. Pumping was continued for 25 min at a rate of 147 gpm with a drawdown of 6.5 ft. After an additional 44 min of pumping at rates ranging from 169 to 193 gpm, the drawdown was 10.5 ft. Nine min after pumping was stopped, full recovery was observed.

A production test was conducted by the State Water Survey on September 6, 1949. After 5.8 hr of pumping at rates ranging from 210 to 261 gpm, the drawdown was 11.5 ft from a nonpumping water level of 51.5 ft. During this test, Well No. 2 was pumping continuously.

On December 3, 1968, the well reportedly produced 200 gpm for 15 min with a drawdown of 21 ft from a nonpumping water level of 61 ft.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003524) of a sample collected December 27, 1976, after pumping for 1.5 hr at 130 gpm, showed the water to have a hardness of 436 mg/1, total dissolved minerals of 480 mg/1, and an iron content of 0.8 mg/1.

WELL NO. 2, open to the Silurian dolomite, was constructed in 1924 to a depth of 264 ft by the W. L. Thorne Co., Des Plaines, and deepened in 1958 to a reported depth of 279 ft by the Wehling Well Works, Beecher. This well was abandoned in 1979. The well is located about 70 ft south of Well No. 1, approximately 660 ft N and 180 ft W of the SE corner of Section 8, T34N, R14E. The land surface elevation at the well is approximately 725 ft.

A sample study log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Clay	12	12
Sand, silty	8	20
Sand, clean	15	35
Sand, dirty	45	80
SILURIAN SYSTEM		
Niagaran Series		
Dolomite	70	150
Dolomite, silty, siltstone, thin shale bed at top	65	215
Dolomite	30	245
Dolomite, partly silty	19	264

A 12-in. diameter hole was drilled to a depth of 215 ft and finished 10 in. in diameter from 215 to 279 ft. The well is cased with 12-in. ID pipe from land surface to a depth of 99 ft and 10-in. ID liner from 166 ft to a depth of 215 ft.

Upon completion, the well reportedly produced 300 gpm with a drawdown of 32 ft from a nonpumping water level of 40 to 45 ft below the pump base.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C002588) of a sample collected in November 1978, after pumping for 2 hr at 140 gpm, showed the water to have a hardness of 449 mg/1, total dissolved minerals of 518 mg/1, and an iron content of 1.1 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in November 1955 to a depth of 265 ft by Kramer Bros., Harvey. The well is located in the northwest corner of the village park, approximately 2050 ft N and 150 ft W of the SE corner of Section 8, T34N, R14E. The land surface elevation at the well is approximately 720 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	100	100
Niagaran limestone	163	263

A 12-in. diameter hole was drilled to a depth of 265 ft. The well is cased with 12-in. ID pipe from about 1 ft above the pump station floor to a depth of 98 ft.

Upon completion, the well reportedly produced 450 gpm for 4 hr with a drawdown of 64 ft from a nonpumping water level of 42 ft below the top of the pump base.

This well was acidized in 1964 by the Wehling Well Works, Beecher.

The pumping equipment presently installed is an 8-in., 11-stage Fairbanks-Morse Pomona turbine pump (No. AV3722) set at 130 ft, rated at 400 gpm at about 234 ft TDH, and powered by a 30-hp 1770 rpm Fairbanks-Morse electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C002586) is for a water sample from the well collected in November 1978, after 1.5 hr of pumping at 200 gpm.

WELL NO. 3, LABORATORY NO. C002586

		mg/l	*me/l*		*mg/1*	*me/l*
Iron	Fe	1.4	Silica	SiO_2	16	
Manganese	Mn	0.02	Fluoride	F	0.2	0.01
Ammonium	NH_4	0.09 0.00	Boron	B	0.3	
Sodium	Na	10 0.44	Cyanide	CN	0.00	
Potassium	K	3.0 0.08	Nitrate	NO_3	0.48	0.01
Calcium	Ca	94 4.69	Chloride	Cl	7	0.20
Magnesium	Mg	48 3.95	Sulfate	SO_4	61	1.27
			Alkalinity (as $CaCO_3$)		376	7.52
Arsenic	As	0.000	Hardness (as $CaCO_3$)		434	8.68
Barium	Ba	0.0				
Cadmium	Cd	0.00	Total dissolved			
Chromium	Cr	0.00	minerals		514	
Copper	Cu	0.00				
Lead	Pb	0.00				
Mercury	Hg	0.0000				
Nickel	Ni	0.0				
Selenium	Se	0.00				
Silver	Ag	0.00				
Zinc	Zn	0.01	pH (as rec'd)	8.1		

WELL NO. 4 (former Chapman Swiss Valley Subdivision well), open to the Silurian dolomite, was completed in September 1967 to a depth of 350 ft by the Wehling Well Works, Beecher. The well is located about 50 ft east of Haweswood Drive, approximately 350 ft S and 1550 ft E of the NW corner of Section 3, T34N, R14E. The land surface elevation at the well is approximately 670 ft.

A drillers log of Well Np. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Mud	55	55
Mud and gravel	5	60
Lime	290	350

A 12-in. diameter hole was drilled to a depth of 63 ft and finished 11.9 in. in diameter from 63 to 350 ft. The well is equipped with a Baker pitless adapter from about 1.5 ft above land surface to a depth of 6 ft and cased with 12-in. pipe to a depth of 63 ft.

A production test was conducted by the driller on September 20-21, 1967. After 18 hr of pumping at rates of 1040 to 1200 gpm, the final drawdown was 23 ft from a nonpumping water level of 15 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 80 ft, rated at 1040 gpm, and powered by a 15-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A17025) is for a water sample from the well collected March 30, 1976, after 3P min of pumping at 275 gpm,

WELL NO. 4, LABORATORY NO. A1 7025

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.1		Silica	SiO_2	13	
Manganese	Mn	0.02		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.10	0.01	Boron	B	0.3	
Sodium	Na	11	0.48	Cyanide	CN	0.01	
Potassium	K	4.5	0.12	Nitrate	NO_3	0.0	0.00
Calcium	Ca	143	7.14	Chloride	Cl	10	0.28
M'agnesium	Mg	75	6.17	Sulfate	SO_4	300	6.24
				Alkalinity(as$CaCO_3$)		368	7.36
Arsenic	As	0.000		Hardness(as$CaCO_3$)		666	13.32
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		800	
Copper	Cu	0.03					
Lea.d	Pb	0.00		pH(asrec'd)		7.3	
Mercury	Hg	0.0001		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		4.5	
Selenium	Se.	0.00		± deviation		3.2	
Silver,	Ag	0.00		Beta *pc/l*		5.2	
Zinc	Zn	0.0		± deviation		3.0	

WELL NO. 5, open to the Silurian dolomite, was completed in 1935 to a depth of 265 ft (reported to be 263 ft deep in 1975) by the W. L. Thome Co., Des Plaines. This well, was acquired from the Pralle Dairy in 1979. The well is located; near the corner of Burville Road and, Wood, St., approximately 2000 ft N and 850 ft E of the SW corner of Section 16, T34N, R14E. The land surface elevation at the well is approximately 730 ft.

The well is cased with 8-in. pipe from land surface to a depth of 87 ft.

Upon completion, the nonpumping water level was reported to be 16 ft.

A production test was conducted by the Wehling Well Works, Beecher, on July 11, 1966. After 2.1 hr of pumping at rates of 102 to 325 gpm, the drawdown was 62 ft from a nonpumping water level of 15 ft. After a 10-min idle period, pumping was continued for 1.8 hr at rates of 350 to 300 gpm with a final drawdown of 105 ft.

A production test was conducted by the Wehling Well Works on May 12, 1975. After 3.1 hr of pumping at rates ranging from 270 to 380 gpm, the drawdown was 114 ft from a nonpumping water level of 28 ft. Pumping was continued for 2 hr at rates of 300 to 350 gpm with a final drawdown of 90 ft. Fifteen min after pumping was stopped, the water level had recovered to 3 5 ft.

The pumping equipment presently installed is a Red Jacket submersible pump (No. 2506R5-6-290PE) set at 147 ft, rated at 225 gpm, and powered by a 25-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B29359) of a sample collected December 10, 1980, after pumping for 30 min, showed the water to have a hardness of 420 mg/l, total dissolved minerals of 462 mg/l, and an iron content of 0.75 mg/l.

WELL NO. 6, open to the Silurian dolomite, was completed in November 1979 to a depth of 520 ft by the Wehling Well Works, Beecher. As of October 1980, this well was not in use. The well is located on the north side of Richton Road about 0.5 mile west of Illinois Route 394, approximately 200 ft N and 2600 ft W of the SE corner of Section 2, T34N, R14E. The land surface elevation at the well is approximately 722 ft.

A drillers log of Well No. 6 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	122	122
Limestone	398	520

A 17-in. diameter hole was drilled to a depth of 122 ft and finished 12 in. in diameter from 122 to 520 ft. Thewell is cased with 18-in. black steel pipe from about 1 ft above land surface to a depth of 10 ft and 12-in. black steel pipe from about 1 ft above land surface to a depth of 122 ft (cemented in).

A production test was conducted by the driller on December 3, 1979. After 8 hr of pumping at rates ranging from 176 to 390 gpm, the final drawdown was 105 ft from anonpumping water level of 59 ft below land surface. Six min after pumping was stopped, the water level had recovered to 64 ft.

On December 4, 1979, this well was treated with 1000 gal of acid.

After acidizing, a production test was conducted by the driller on December 5, 1979. After 8 hr of pumping at rates ranging from 538 to 246 gpm, the final drawdown was 54

ft from a nonpumping water level of 55 ft below land surface. Five min after pumping was stopped, the water level had recovered to 64 ft.

The permanent pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 213905) collected December 5, 1979, showed the water to have a hardness of 332 mg/1, total dissolved minerals of 465 mg/1, and an iron content of 0.9 mg/1.

CRYSTAL LAWNS SUBDIVISION

Crystal Lawns Subdivision (est. 1488), located about 3 miles southeast of Plainfield, installed a public water supply in 1959. The water system is owned and operated by the Crystal Lawns Addition Improvement Association. Five wells are in use. In 1978 there were 425 services, all metered; the estimated average and maximum pumpages in 1973 were 50,000 and 75,000 gpd, respectively. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in December 1959 to a depth of 250 ft by Dreher & Schorie, Joliet. The well is located at 2403 Satellite Drive, approximately 200 ft N and 1150 ft W of the SE corner of Section 26, T36N, R9E. The land surface elevation at the well is approximately 602 ft.

An 8-in. diameter hole was drilled to a depth of 120 ft and finished 6 in. in diameter from 120 to 250 ft. The well is cased with 8-in. pipe from about 1.5 ft above the pumphouse floor to a depth of 47 ft.

In September 1970, the nonpumping water level was reported to be 15 ft.

The pumping equipment presently installed is a Jacuzzi submersible pump set at 130 ft, rated at 120 gpm, and powered by a 15-hp Jacuzzi electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41467) of a sample collected April 11, 1977, after pumping for 5 min at 120 gpm, showed the water to have a hardness of 432 mg/1, total dissolved minerals of 508 mg/1, and an iron content of 1.9 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in March 1963 to a depth of 250 ft by Dreher & Schorie, Joliet. The well is located at Willshire Road and Satellite Drive, approximately 1200 ft N and 1050 ft W of the SE corner of Section 26, T36N, R9E. The land surface elevation at the well is approximately 595 ft.

An 8-in. diameter hole was drilled to a depth of 120 ft and finished 6 in. in diameter from 120 to 250 ft. The well is cased with 8-in. pipe from about 0.1 ft above the pumphouse floor to a depth of 32 ft.

The pumping equipment presently installed is a Goulds submersible pump set at 120 ft, rated at 70 gpm, and powered by a 7 Vi-hp Franklin electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006545) of a sample collected March 20, 1974, after pumping for 1 hr at 75 gpm, showed the water to have a hardness of 388 mg/1, total dissolved minerals of 476 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in August 1966 to a depth of 250 ft by Dreher & Schorie, Joliet. The well is located at Westline Drive and Willshire Road, approximately 1200 ft N and 2500 ft W of the SE corner of Section 26, T36N, R9E. The land surface elevation at the well is approximately 595 ft.

An 8-in. diameter hole was drilled to a depth of 250 ft. The well is equipped with a Merrill Manufacturing Co. pitless adapter from about 0.3 ft above the wellhouse roof to a depth of 4 ft and cased with 8-in. pipe from 4 ft to a depth of 42 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 130 ft, rated at 100 gpm, and powered by a 7 ½-hp Red Jacket electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41471) of a sample collected April 11, 1977, after pumping for 5 min at 120 gpm, showed the water to have a hardness of 369 mg/1, total dissolved minerals of 463 mg/1, and an iron content of 0.7 mg/1.

WELL NO. 4, open to the Silurian dolomite, was completed in January 1967 to a depth of 250 ft by Dreher & Schorie, Joliet. The well is located at Hollylynn Lane and Von Esch St., approximately 1350 ft N and 750 ft E of the SW corner of Section 26, T36N, R9E. The land surface elevation at the well is approximately 615 ft.

An 8-in. diameter hole was drilled to a depth of 250 ft. The well is cased with 8-in. steel pipe from about 1.5 ft above the pumphouse floor to a depth of 76 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 150 ft, rated at 75 gpm, and powered by a 7 ½-hp Red Jacket electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B47790) of a sample collected April 29, 1980, showed the water to have a hardness of 364 mg/1, total dissolved minerals of 467 mg/1, and an iron content of 0.26 mg/1.

WELL NO. 5, open to the Silurian dolomite, was completed in April 1972 to a depth of 250 ft by Dreher & Schorie, Joliet. The well is located on the west side of Byrum Road between Prieboy Ave. and Lockner Blvd., approximately 2450 ft N and 2300 ft E of the SW corner of Section

26, T36N, R9E. The land surface elevation at the well is approximately 610 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	22	22
Sand and gravel	3	25
Clay	7	32
Limestone	70	102
Clay	3	105
Limestone	98	203
Shale	7	210
Limestone	28	238
Shale	7	245
Limestone	5	250

An 8-in. diameter hole was drilled to a depth of 250 ft. The well is cased with 8-in. black steel pipe from about 1 ft above the pumphouse floor to a depth of 42 ft.

Upon completion, the nonpumping water level was reported to be 13 ft below land surface.

The pumping equipment presently installed is a Red Jacket submersible pump set at 140 ft, rated at 90 gpm, and powered by a 10-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41242) is for a water sample from the well collected April 4, 1978, after pumping continuously at 50 gpm.

WELL NO. 5, LABORATORY NO. B41242

		mg/l	*me/l*			*mg/l*	*me/I*
Iron	Fe	0.2		Silica	SiO_2	14	
Manganese	Mn	0.00		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.3	0.02	Boron	B	0.3	
Sodium	Na	26	1.13	Cyanide	CN	0.00	
Potassium	K	5.1	0.13	Nitrate	NO_3	0.0	0.00
Calcium	Ca	78	3.89	Chloride	Cl	15	0.42
Magnesium	Mg	47	3.87	Sulfate	SO_4	70	1.46
				Alkalinity(as $CaCO_3$)		347	6.94
Arsenic	As	0.00		Hardness(as $CaCO_3$)		387	7.74
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		483	
Copper	Cu	0.01					
Lead	Pb	0.00					
Mercury	Hg	0.0005					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.00		pH (as rec'd)		7.5	

DERBY MEADOWS UTILITY CO., INC.

Derby Meadows Utility Co., Inc. (est. 3900), located about 4 miles west of Orland Park, installed a public water supply in 1968. One well (No. 1) is in use and another well (No. 2) is available for emergency use. In 1979 there were about 1100 services, all metered; the average and maximum pumpages were 400,000 and 1,400,000 gpd, respectively. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in August 1968 to a depth of 403 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located south of Derby Lane about 0.2 mile west of the Will-Cook Road, approximately 1900 ft N and 1300 ft W of the SE corner of Section 1, T36N, R11E. The land surface elevation at the well is approximately 696 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Glacial drift	113	113
Niagaran dolomite	288	401
Shale	2	403

A 10-in. diameter hole was drilled to a depth of 403 ft. The well is cased with 10-in. steel pipe from 1.7 ft above the pumphouse floor to a depth of 113 ft.

A production test was conducted by the driller on August 26, 1968. After 2.5 hr of pumping at a rate of 400 gpm, the drawdown was 6 ft from a nonpumping water level of 34 ft below land surface. Pumping was continued for 1.3 hr at rates ranging from 550 to 700 gpm with a final drawdown of 14 ft.

The pumping equipment presently installed consists of a 60-hp General Electric motor, a 10-in., 5-stage Peerless turbine pump set at 100 ft, rated at 650 gpm at about 170 ft TDH, and has 100 ft of 6-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B00656) is for a water sample from the well collected July 5, 1978, after 4 hr of pumping at about 280 gpm.

WELL NO. 1, LABORATORY NO. B00656

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.6		Silica	SiO_2	13	
Manganese	Mn	0.00		Fluoride	F	0.5	0.03
Ammonium	NH_4	0.8	0.04	Boron	B	0.5	
Sodium	Na	30	1.30	Cyanide	CN	O.OO	
Potassium	K	4.5	0.12	Nitrate	NO_3	0.0	0.00
Calcium	Ca	115	5.74	Chloride	Cl	1.5	0.04
Magnesium	Mg	57	4.69	Sulfate	SO_4	270	5.62
				Alkalinity(as $CaCO_3$)		323	6.46
Arsenic	As	0.00		Hardness(as $CaCO_3$)		530	10.60
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		716	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	<0.0001					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.5	

WELL NO. 2, open to the Silurian dolomite, was completed in June 1972 to a depth of 410 ft by the Shaver Well Drilling Co., Lombard. This well is available for emergency use. The well is located about 10 ft west of Well No. 1, approximately 1900 ft N and 1310 ft W of the SE corner of Section 1, T36N, R11E. The land surface elevation at the well is approximately 700 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	114	114
Dolomite	291	405
Shale	5	410

A 10-in. diameter hole was drilled to a depth of 410 ft. The well is cased with 10-in. pipe from about 2 ft above land surface to a depth of 114 ft.

The pumping equipment presently installed is a Layne & Bowler turbine pump set at 160 ft, rated at 600 gpm at about 265 ft TDH, and powered by a 50-hp General Electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C000404) of a sample collected July 27, 1977, after pumping for 30 min, showed the water to have a hardness of 509 mg/1, total dissolved minerals of 702 mg/1, and an iron content of 0.7 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in August 1980 to a depth of 408 ft by the Wehling Well Works, Beecher. As of February 1981, this well was not in use. The well is located about 473 ft east of Bell Road and 0.5 mile north of 151st St., approximately 2824 ft N and 473 ft E of the SW corner of Section 12, T36N, R11E. The land surface elevation at the well is approximately 760 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	**10**	**10**
Clay and rock	**140**	**150**
Lime	**2**	**152**
Broken rock	**7**	**159**
Lime	**219**	**378**
Shale and clay	**3**	**381**
Lime and shale	**25**	**406**
Shale	**2**	**408**

A 19-in. diameter hole was drilled to a depth of 152 ft, reduced to 16 in. between 152 and 163 ft, and finished 11.9 in. in diameter from 163 to 408 ft. The well is cased with 16-in. pipe from about 1 ft above land surface to a depth of 152 ft (cemented in) and 12-in. pipe from about 1 ft above land surface to a depth of 163 ft (cemented in).

A production test was conducted by the driller on August 27, 1980. After 3.5 hr of pumping at rates ranging from 1406 to 1680 gpm, the final drawdown was 4 ft from a nonpumping water level of 112 ft.

A second production test was conducted by the driller on September 2, 1980. After 15.9 hr of pumping at rates ranging from 1743 to 1966 gpm, the maximum drawdown was 30 ft from a nonpumping water level of 101 ft below land surface.

The permanent pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 214333) collected September 2, 1980, after pumping at rates of 1500 to 1850 gpm, showed the water to have a hardness of 568 mg/1, total dissolved minerals of 729 mg/1, and an iron content of 0.2 mg/1.

DIXIE DELLS SUBDIVISION (WILLOWBROOK UTILITY CO.)

Dixie Dells Subdivision (Willowbrook Utility Co.) (est. 550), located about 2.5 miles south of Crete, installed a public water supply in 1962. The water system is owned and operated by the Willowbrook Utility Co. One well is in use. In 1964 there were 50 services, all metered; the estimated average pumpage was 5500 gpd. In 1980 there were 154 services, 50 percent metered; the average pumpage in 1979 was 37,740 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in January 1962 to a depth of 526 ft by the Wehling Well Works, Beecher. The well is located between Routes 1 and 394 about 50 ft south of the pumphouse, approximately 133 ft S and 1726 ft E of the NW corner of Section 33, T34N, R14E. The land surface elevation at the well is approximately 738 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil and clay	30	30
Clay, sand, gravel	55	85
Sand	10	95
Sand and gravel	5	100
Gravel	10	110
Sand and gravel	5	115
Lime, broken	5	120
Lime	145	265
Shale and broken lime	35	300
Broken lime	60	360
Lime, light gray	20	380
Lime	20	400
Lime, hard	20	420
Lime	85	505
Lime, hard	5	510
Hard lime	7	517
Red rock and brown shale, little lime	3	520
Red rock, brown shale	6	526

A 14-in. diameter hole was drilled to a depth of 122 ft and finished 13.2 in. in diameter from 122 to 526 ft. The well is cased with 14-in. pipe from 1.5 ft above land surface to a depth of 122 ft.

A production test was conducted by the driller on January 24-25, 1962. After 14.2 hr of pumping at a rate of 980 gpm, the drawdown was 10 ft from a nonpumping water level of 50 ft.

In September 1970, the nonpumping water level was reported to be 60 ft.

The pumping equipment presently installed is a Pomona turbine pump set at 150 ft, rated at 300 gpm at about 149 ft head, and powered by a 25-hp 1750 rpm General Electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006513) is for a water sample from the well collected March 21, 1974.

WELL NO. 1, LABORATORY NO. C006513

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.5		Silica	SiO_2	12.0	
Manganese	Mn	0.00		Fluoride	F	0.5	0.03
Ammonium	NH_4	0.84	0.05	Boron	B	0.8	
Sodium	Na	20	0.87	Cyanide	CN	0.00	
Potassium	K	6.6	0.17	Nitrate	NO_3	0.1	0.00
Calcium	Ca	88	4.39	Chloride	Cl	2	0.06
Magnesium	Mg	40	3.29	Sulfate	SO_4	75	1.56
				Alkalinity(as$CaCO_3$)		368	7.36
Arsenic	As	0.00		Hardness(as$CaCO_3$)		385	7.70
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		476	
Copper	Cu	0.02					
Lead	Pb	0.00		pH (as rec'd)		7.8	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc/l		1.7	
Selenium	Se	0.00		± deviation		1.7	
Silver	Ag	0.00		Beta pc/l		7.3	
Zinc	Zn	0.00		± deviation		2.3	

DIXIE ESTATES SUBDIVISION

Dixie Estates Subdivision (est. 203), located about 2 miles south of Crete, installed a public water supply in 1959. The water system is owned and operated by the Dixie Estates Improvement Association. One well is in use. In 1980 there were 58 services, all metered; the average pumpage was 14,700 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in January 1959 to a depth of 300 ft by Dreher & Schorie, Joliet. The well is located at the rear of 501 Arlington Lane, approximately 2100 ft N and 450 ft E of the SW corner of Section 28, T34N, R14E. The land surface elevation at the well is approximately 765 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
No record	147	147
Limestone	153	300

A 6-in. diameter hole was drilled to a depth of 300 ft. The well is cased with 6-in. galvanized pipe from about 2 ft above the pumphouse floor to a depth of 147 ft.

In December 1968, the nonpumping water level was reported to be 60 ft.

The pumping equipment presently installed is a Sta-Rite submersible pump set at 150 ft, rated at 80 gpm, and powered by a 7 ½-hp 3450 rpm Franklin electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C002223) is for a water sample from the well collected November 1, 1978, after pumping at 75 gpm.

WELL NO. 1, LABORATORY NO. C002223

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.5		Silica	SiO_2	10	
Manganese	Mn	0.00		Fluoride	F	0.5	0.03
Ammonium	NH_4	0.67	0.04	Boron	B	0.7	
Sodium	Na	20	0.87	Cyanide	CN	0.00	
Potassium	K	5.0	0.13	Nitrate	NO_3	0.0	0.00
Calcium	Ca	81	4.04	Chloride	Cl	2	0.06
Magnesium	Mg	36	2.96	Sulfate	SO_4	71	1.48
				Alkalinity(as$CaC0_3$)		336	6.72
Arsenic	As	0.000		Hardness(as$CaCO_3$)		351	7.02
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		456	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.01		pH (as rec'd)		8.3	

EAST LAWN SUBDIVISION

East Lawn Subdivision (est. 21), located about 1.5 miles east of Joliet, installed a public water supply in 1928. The water system is owned and operated by the East Lawn Improvement Association. One well is in use. In 1980 there were 11 services, none metered; the average pumpage was 5474 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed about 1928 to a depth of 110 ft by Peter W. Dittmeyer, Joliet. The well is located at the rear of 38 Argyle Ave., approximately 680 ft S and 785 ft W of the NE corner of Section 13, T35N, R10E. The land surface elevation at the well is approximately 625 ft.

The well is cased with 4.5-in. pipe from 2 ft above land surface to an unknown depth.

The pumping equipment presently installed is a submersible pump rated at 18 gpm, and powered by a 3-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41810) is for a water sample from the well collected March 6, 1978, after 2 hr of pumping at 18 gpm.

WELL NO. 1, LABORATORY NO. B41810

		mg/l	*me/l*			*mg/l*	*me/I*
Iron	Fe	0.2		Silica	SiO_2	10	
Manganese	Mn	0.12		Fluoride	F	0.2	0.01
Ammonium	NH4	0.0	0.00	Boron	B	0.2	
Sodium	Na	37	1.61	Cyanide	CN	0.00	
Potassium	K	3.9	0.10	Nitrate	NO_3	4.4	0.07
Calcium	Ca	106	5.29	Chloride	Cl	89	2.51
Magnesium	Mg	63	5.18	Sulfate	SO_4	155	3.22
				Alkalinity(as $CaCO_3$)		323	6.46
Arsenic	As	0.00		Hardness(as $CaCO_3$)		524	10.48
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		701	
Copper	Cu	0.01					
Lead	Pb	0.01					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.7	

EAST MORELAND WATER ASSOCIATION

East Moreland Water Association (est. 753), located at the southeast edge of Joliet, installed a public water supply in 1931. Two wells are in use. In 1980 there were 225 services, none metered; the average pumpage in 1979 was 44,100 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in August 1931 to a depth of 265 ft by J. O. Heflin, Joliet. The well is located on the east side of Circle Drive and south of Third Ave., approximately 2150 ft S and 2525 ft W of the NE corner of Section 13, T35N, R10E. The land surface elevation at the well is approximately 630 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	**79**	**79**
Dolomite	**186**	**265**

A 6-in. diameter hole was drilled to a depth of 265 ft. The well is cased with 6-in. pipe from about 1.5 ft above land surface to a depth of 80 ft. The top of the well casing is equipped with a pitless adapter.

In 1931, the well reportedly produced 21 gpm for 5.5 hr with very little drawdown from a nonpumping water level of 27 ft below land surface.

The pumping equipment presently installed is a submersible pump rated at 70 gpm, and powered by a 5-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40799) is for a water sample from the well collected April 10, 1979, after 2 hr of pumping at 70 gpm.

WELL NO. 1, LABORATORY NO. B40799

		mg/l	*me/I*			*mg/l*	*me/1*
Iron	Fe	0.17		Silica	SiO_2	13	
Manganese	Mn	0.02		Fluoride	F	0.3	0.02
Ammonium	NH_4	<0.1		Boron	B	0.2	
Sodium	Na	18	0.78	Cyanide	CN	<0.005	
Potassium	K	2.1	0.05	Nitrate	NO_3	5.3	0.08
Calcium	Ca	110	5.49	Chloride	Cl	40	1.13
Magnesium	Mg	54	4.44	Sulfate	SO_4	128	2.66
				Alkalinity(as $CaCO_3$)		332	6.64
Arsenic	As	<0.001		Hardness(as $CaCO_3$)		504	10.08
Barium	Ba	0.1					
Cadmium	Cd	<0.0005		Total dissolved			
Chromium	Cr	<0.005		minerals		566	
Copper	Cu	0.02					
Lead	Pb	0.006					
Mercury	Hg	<0.00001					
Nickel	Ni	<0.05					
Selenium	Se	<0.001					
Silver	Ag	<0.005					
Zinc	Zn	<0.005		pH (as rec'd)		7.4	

WELL NO. 2, open to the Silurian dolomite, was completed in 1967 to a depth of 258 ft. The well is located at 116 Barr Elm Ave., approximately 1200 ft S and 1340 ft E of the NW corner of Section 13, T35N, R10E. The land surface elevation at the well is approximately 615 ft.

The well is cased with 8-in. pipe from 1.5 ft above land surface to an unknown depth.

The pumping equipment presently installed is a Red Jacket submersible pump rated at 70 gpm, and powered by a 5-hp electric motor.

EAST MORELAND WATER CORPORATION (FEIL WATER TREATMENT)

East Moreland Water Corporation (Feil Water Treatment) (est. 119), located at the southeast edge of Joliet, installed a public water supply in 1966. One well is in use. In 1980 there were 36 services, none metered; the estimated average pumpage was 9000 gpd. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite, was completed in 1938 to a depth of 286 ft. The well is located at the rear of 1917 Washington St., approximately 700 ft S and 2370 ft E of the NW corner of Section 13, T35N, R10E. The land surface elevation at the well is approximately 620 ft.

A 6-in. diameter hole was drilled to a depth of 286 ft. The well is cased with 6-in. pipe from 1.5 ft above land surface to an unknown depth.

In June 1972, the nonpumping water level was reported to be 38 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 107 ft, rated at 60 gpm, and powered by a 5-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B24113) is for a water sample from the well collected November 27, 1979, after 30 min of pumping at 23 gpm.

WELL NO. 1, LABORATORY NO. B24113

		mg/l	me/l			mg/l	me/l
Iron	Fe	2.37		Silica	SiO_2	15	
Manganese	Mn	0.052		Fluoride	F	0.15	0.01
Ammonium	NH_4	<0.1		Boron	B	0.1	
Sodium	Na	9	0.39	Cyanide	CN	<0.005	
Potassium	K	2.2	0.06	Nitrate	NO_3	<0.4	
Calcium	Ca	108	5.39	Chloride	Cl	34	0.96
Magnesium	Mg	57	4.69	Sulfate	SO_4	171	3.56
Strontium	Sr	0.177		Alkalinity(as $CaCO_3$)		288	5.76
Arsenic	As	<0.001		Hardness(as $CaCO_3$)		510	10.20
Barium	Ba	0.05					
Cadmium	Cd	0.001		Total dissolved			
Chromium	Cr	<0.005		minerals		590	
Cobalt	Co	<0.005					
Copper	Cu	0.011					
Lead	Pb	0.01					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.005					
Selenium	Se	<0.001					
Silver	Ag	<0.005					
Zinc	Zn	<0.005		pH (as rec'd)		7.4	

ELWOOD

The village of Elwood (794) installed a public water supply in 1943. Three wells (Nos. 2, 3, and 4) are in use. In 1949 there were 96 services, none metered; the average and maximum pumpages were 20,000 and 70,000 gpd, respectively. In 1978 there were 245 services, all metered; the estimated average and maximum pumpages were 80,000 and 100,000 gpd, respectively. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in November 1942 to a depth of 934 ft by the S. B. Geiger & Co., Chicago. This well was abandoned prior to 1954. The well is located about 124 ft north of Mississippi Ave. and 131 ft west of the Illinois Central Gulf RR tracks, approximately 1208 ft S and 1960 ft E of the NW corner of Section 29, T34N, R10E. The land surface elevation at the well is approximately 648 ft.

A sample study log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
"Glacial drift"	65	65
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite, silty	115	180
Dolomite	22	202
Dolomite and siltstone	18	220
ORDOVICIAN SYSTEM		
Maquoketa Group		
Brainard Shale		
Shale and siltstone	83	303

Strata (continued)	Thickness (ft)	Depth (ft)
Ft. Atkinson Limestone		
Dolomite	34	337
Scales Shale		
Shale	75	412
Galena and Platteville Groups		
Dolomite, some limestone	338	750
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, partly dolomitic, shale at base	70	820
Sandstone, incoherent	70	890
Sandstone, chert	13	903
Prairie du Chien Group		
Shakopee Dolomite		
Dolomite, thin shale and sandstone bed	31	934

A 16-in. diameter hole was drilled to a depth of 73 ft, reduced to 12 in. between 73 and 305 ft, reduced to 10 in. between 305 and 449 ft, and finished 8 in. in diameter from 449 to 934 ft. The well is cased with 16-in. drive pipe from land surface to a depth of 10 ft, 12-in. pipe from about 1 ft above the pumphouse floor to a depth of 72.2 ft, 10-in. pipe from 64 ft to a depth of 305 ft, and 8-in. pipe from 303 ft to a depth of 449 ft.

A production test was conducted on December 17-19, 1942, by representatives of the driller, Federal Works Agency, the State Water Survey, and McCoy and Mulford. After 22.9 hr of pumping at rates ranging from 100 to 90.5 gpm, the water level was about 300 to 330 ft below the pump base from a nonpumping water level of 18.2 ft below land surface. After pumping had been stopped for 18.6 hr, the water level had recovered to 190.2 ft. During the test, the well was shut down for 20 min to add more discharge pipe.

Nonpumping water levels were reported to be 63 ft on June 1, 1944, after a 3-week idle period; and 188 ft on July 19, 1948, after a 7-day idle period.

A mineral analysis of a sample (Lab. No. 107916) collected October 11, 1946, showed the water to have a hardness of 244 mg/1, total dissolved minerals of 458 mg/1, and an iron content of 0.6 mg/1.

WELL NO. 2, open to the Silurian dolomite, was constructed in 1920 to a depth of 180 ft and deepened in January 1953 to a reported depth of 225 ft by Dreher & Schorie, Joliet. This well was originally built for a highway construction job and then donated to the village. The village put it into operation in March 1953. The well is located 1 block west and 1 block north of the post office on Spencer St. just east of the RR tracks, approximately 900 ft S and 2200 ft E of the NW corner of Section 29, T34N, R10E. The land surface elevation at the well is approximately 645 ft.

The well is cased with 8-in. black pipe from about 3 ft above the pumphouse floor to a depth of 80 ft. Below the casing, the hole was finished 6 in. in diameter to the bottom.

On October 30, 1940, before deepening, the nonpumping water level was reported to be 13.4 ft below the top of the casing.

In 1953, the nonpumping water level was reported to be 18 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 140 ft, rated at 60 gpm, and powered by a 5-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C002527) of a sample collected November 21, 1978, after pumping at 85 gpm, showed the water to have a hardness of 322 mg/1, total dissolved minerals of 448 mg/1, and an iron content of 0.4 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in January 1956 to a depth of 230 ft by Dreher & Schorie, Joliet. The well is located west of Wood St. one-half block south of Mississippi Ave., approximately 1425 ft S and 1380 ft E of the NW corner of Section 29, T34N, R10E. The land surface elevation at the well is approximately 646 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Top soil	3	3
Clay	63	66
Gravel - no water	3	69
Limestone	157	226
Shale	4	230

A 6-in. diameter hole was drilled to a depth of 230 ft. The well is cased with 6-in. pipe from about 2.5 ft above the pumphouse floor to a depth of 69 ft.

Upon completion, the well reportedly produced 30 gpm with very little drawdown from a nonpumping water level of 42 ft.

In September 1958, the well reportedly produced 80 gpm for 3 min with a drawdown of 35 ft from a nonpumping water level of 23 ft below the pumphouse floor.

The pumping equipment presently installed is a Red Jacket submersible pump set at 140 ft, rated at 90 gpm, and powered by a 7 ½-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 06148) of a sample collected in February 1972, after pumping for 30 min at 90 gpm, showed the water to have a hardness of 260 mg/1, total dissolved minerals of 390 mg/1, and an iron content of 0.6 mg/1.

WELL NO. 4, open to the Silurian dolomite, was completed in December 1969 to a depth of 300 ft by the Lockport Well & Pump Co., Joliet. The well is located near the south end of Chicago St. at the city limits, approximately 2700 ft N and 1250 ft E of the SW corner of Section 29, T34N, R10E. The land surface elevation at the well is approximately 643 ft.

An 8-in. diameter hole was drilled to a depth of 265 ft and finished 6 in. in diameter from 265 to 300 ft. The well is cased with 8-in. pipe from above the pumphouse floor to a depth of 76 ft and 6-in. pipe from 200 ft to a depth of 265 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 120 ft, rated at 90 gpm, and powered by a 7 Vi-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006153) is for a water sample from the well collected March 6, 1974, after 30 min of pumping at 90 gpm.

WELL NO. 4, LABORATORY NO. C006153

		mg/1	*me/1*			*mg/1*	*me/1*
Iron	Fe	0.7		Silica	SiO_2	13.5	
Manganese	Mn	0.01		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.77	0.04	Boron	B	0.5	
Sodium	Na	33	1.44	Cyanide	CN	0.00	
Potassium	K	2.9	0.07	Nitrate	NO_3	0.4	0.01
Calcium	Ca	67	3.34	Chloride	Cl	3	0.08
Magnesium	Mg	35	2.88	Sulfate	SO_4	53	1.10
				Alkalinity(asCaC03)		344	6.88
Arsenic	As	0.00		Hardness(asCaC03		312	6.24
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		398	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		7.8	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc//		2.7	
Selenium	Se	0.00		± deviation		1.5	
Silver	Ag	0.00		*Betapc/l*		4.5	
Zinc	Zn	0.02		± deviation		1.8	

FAIR ACRES SUBDIVISION

Fair Acres Subdivision (est. 125), located about 1 mile east of Joliet, installed a public water supply in 1924. The water system is owned and operated by the Fair Acres Home Owners Association. One well (No. 1) is in use. In 1980 there were 52 services, none metered; the average pumpage was 8989 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1920 to a depth of 250 ft. The well is located in the front of the lot at 408 North Briggs St., approximately 2375 ft S and 25 ft E of the NW corner of Section 12, T3'5N, R10E. The land surface elevation at the well is approximately 663 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	36	36
Niagara limestone	213.5	249.5

A 4-in. diameter hole was drilled to a depth of 250 ft. The well is cased with 4-in. iron pipe from 1.5 ft above land surface to an unknown depth. The top of the casing is equipped with a pitless adapter.

On February 18, 1969, the well reportedly produced 20 gpm with a drawdown of 12 ft from a nonpumping water level of 60 ft.

The pumping equipment presently installed is a Clayton Mark submersible pump (Model No. 491501-R) set at 126 ft, and powered by a ½-hp 3450 rpm Sta-Rite electric motor (Model No. CP4F2-7, Serial No. C-66).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41258) is for a water sample from the well collected April 10, 1977, after 30 min of pumping at 17 gpm.

WELL NO. 1, LABORATORY NO. B41258

		mg/1	*me/1*			*mg/1*	*me/1*
Iron	Fe	7.0		Silica	SiO_2	12	
Manganese	Mn	0.05		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.19	0.01	Boron	B	0.2	
Sodium	Na	16	0.70	Cyanide	CN	0.00	
Potassium	K	3.0	0.08	Nitrate	NO_3	0.0	0.00
Calcium	Ca	210	10.48	Chloride	Cl	13	0.37
Magnesium	Mg	120	9.88	Sulfate	SO_4	600	12.48
				Alkalinity(as$CaCO_3$)		414	8.28
Arsenic	As	0.02		Hardness(as$CaCO_3$)		1006	20.12
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		1320	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.3	

WELL NO. 2, open to the Silurian dolomite, was completed in 1930 to a depth of 250 ft. This well was not in use during 1980. The well is located in the rear of the lot at 408 North Briggs St., approximately 2375 ft S and 150 ft E of the NW corner of Section 12, T35N, R10E. The land surface elevation at the well is approximately 663 ft.

A 6-in. diameter hole was drilled to a depth of 250 ft. The well is cased with 6-in. pipe from 1 ft above the concrete floor of a 6-ft deep pit to a depth of 100 ft. The top of the casing is equipped with a pitless adapter.

On February 18, 1969, the nonpumping water level was reported to be 60 ft.

The pumping equipment presently installed is a Goulds submersible pump set at 120 ft, rated at 20 gpm, and powered by a ½-hp 3450 rpm Franklin electric motor (Model No. 3821001100).

FRANKFORT

The village of Frankfort (2325) installed a public water supply in 1905. Three wells (Nos. 2, 3, and 4) are in use. In 1949 there were 245 services, all metered; the estimated average pumpage was 20,000 gpd. In 1980 there were 1299 services, all metered; the average pumpage was 634,418 gpd. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite, was completed in 1905 to a depth of 165 ft (measured in 1931 at 161 ft and in 1959 at 156 ft) by John E. Sass, Monee. This well was abandoned between 1971 and 1974. The well is located about 75 ft north of Kansas St. at the north end of Hickory St., approximately 150 ft S and 4400 ft E of the NW corner of Section 28, T35N, R12E. The land surface elevation at the well is approximately 760 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth t (ft)*
Drift	102	102
Limestone	20	122
Hard blue rock	43	165

The well is cased with 8-in. pipe from 0.7 ft above the pit floor of a 5-ft deep pit to a depth of 102 ft.

Nonpumping water levels were reported to be 40 ft on March 1, 1923, and 69 ft below land surface on December 22, 1931.

The pumping equipment presently installed consists of a 20-hp U.S. electric motor (No. 102320), an 8-in., 13-stage Deming turbine pump (No. DC-4095) set at 96 ft, rated at 240 gpm at about 210 ft head, and has *96* ft of 5-in. column pipe. A 10-ft section of 5-in. suction pipe is attached to the pump intake.

A mineral analysis of a sample (Lab. No. 107859) collected October 4, 1946, after pumping for 40 min at 240 gpm, showed the water to have a hardness of 456 mg/1, total dissolved minerals of 495 mg/1, and an iron content of 1.1 mg/1.

WELL NO. 2 (leased from the Elgin, Joliet & Eastern RR), open to the Silurian dolomite, was completed in 1929 to a depth of 315 ft by the W. L. Thorne Co., Des Plaines. The well is located at Center Road and Ohio St. just north of the Elgin, Joliet & Eastern RR tracks, approximately 2800 ft N and 250 ft W of the SE corner of Section 28, T35N, R12E. The land surface elevation at the well is approximately 765 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	120	120
Limestone	195	315

A 16-in. diameter hole was drilled to a depth of 125 ft and finished 12 in. in diameter from 125 to 315 ft. The well is cased with 16-in. pipe from 1 ft above land surface to a depth of 125 ft.

Nonpumping water levels were reported to be 90 ft on January 25, 1932, and 64 ft below the pump base in September 1943.

On December 10, 1975, the well reportedly produced 375 gpm for 2 hr with a drawdown of 11 ft from a nonpumping water level of 95 ft.

The pumping equipment presently installed consists of a 25-hp 1750 rpm Fairbanks Morse electric motor, a 9-stage Johnston submersible pump set at 150 ft, rated at 200 gpm, and has 150 ft of 6-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B31456) of a sample collected January 16, 1980, after pumping for 2 hr, showed the water to have a hardness of 5 33 mg/1, total dissolved minerals of 709 mg/1, and an iron content of 1.50 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in June 1968 to a depth of 433 ft by the Wehling Well Works, Beecher. The well is located on the south side of Nebraska St. at the northwest corner of the village park, approximately 750 ft S and 2000 ft E of the NW corner of Section 28, T35N, R12E. The land surface elevation at the well is approximately 754 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	100	100
Lime	333	433

A 12-in. diameter hole was drilled to a depth of 433 ft. The well is cased with 12-in. galvanized pipe from about 1.2 ft above the wellhouse floor to a depth of 110 ft.

A production test was conducted by the driller on June 20, 1968. After 3.4 hr of pumping at rates of 725 to 780 gpm, the drawdown was 60 ft from a nonpumping water level of 75 ft below land surface. Pumping was continued for 2 hr at a rate of 500 gpm with a drawdown of 35 ft. Pumping was continued for 1.8 hr at rates of 1000 to 920 gpm with a drawdown of 113 ft. After an additional 5 hr of pumping at rates of 850 to 500 gpm, the final drawdown was 40 ft.

In April 1970, the nonpumping water level was reported to be 84 ft.

On December 10, 1975, the well reportedly produced 630 gpm for 1 hr with a drawdown of 29 ft from a nonpumping water level of 84 ft.

The pumping equipment presently installed is a Johnston vertical turbine pump (Serial No. GA3820) set at 150 ft, rated at 650 gpm, and powered by a 50-hp 1760 rpm General Electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B31072) of a sample collected December 19, 1980, after pumping for 3 hr at 625 gpm, showed the water to have a hardness of 559 mg/1, total dissolved minerals of 718 mg/1, and an iron content of 1.09 mg/1.

WELL NO. 4, open to the Silurian dolomite, was completed in November 1973 to a depth of 390 ft by the Wehling Well Works, Beecher. The well is located at 630 Tanglewood Lane, approximately 230 ft S and 470 ft E of the NW corner of Section 21, T35N, R12E. The land surface elevation at the well is approximately 700 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Yellow Clay	15	15
Sandy yellow clay	11	26
Blue sandy clay	28	54
Sand and gravel	12	66
Silt	14	80
Lime	310	390

A 16-in. diameter hole was drilled to a depth of 80 ft and finished 12 in. in diameter from 80 to 390 ft. The well is cased with 16-in. pipe from land surface to a depth of 80 ft and 12.8-in. pipe from land surface to a depth of 85 ft (cemented in).

A production test was conducted by the driller on November 20, 1973. After 3.1 hr of pumping at rates of 380 to 1040 gpm, the drawdown was 50 ft from a nonpumping water level of 51 ft. Pumping was continued for 3.5 hr at rates ranging from 786 to 940 gpm with a drawdown of 40 ft.

A second production test was conducted by the driller on November 27, 1973. After 6 hr of pumping at rates ranging from 1420 to 1020 gpm, the maximum drawdown was 115 ft from a nonpumping water level of 48 ft. Pumping was continued for 1.5 hr at rates of 886 to 593 gpm with a final drawdown of 25 ft. One min after pumping was stopped, the water level had recovered to 49 ft.

The pumping equipment presently installed is a Johnston vertical turbine pump set at 150 ft, rated at 700 gpm, and powered by a 125-hp 1770 rpm General Electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B36576) is for a water sample from the well collected March 1, 1978, after 3 hr of pumping at 550 gpm.

WELL NO. 4, LABORATORY NO. B36576

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.6		Silica	SiO_2	14	
Manganese	Mn	0.05		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.6	0.03	Boron	B	0.5	
Sodium	Na	21	0.91	Cyanide	CN	0.00	
Potassium	K	4.9	0.12	Nitrate	NO_3	0.0	0.00
Calcium	Ca	132	6.59	Chloride	Cl	3.3	0.00
Magnesium	Mg	66	5.43	Sulfate	SO_4	255	5.30
				Alkalinity(as$CaCO_3$)		382	7.64
Arsenic	As	0.02		Hardness(as$CaCO_3$)		606	12.12
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		774	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.3	

WELL NO. 5, open to the Silurian dolomite, was completed in September 1979 to a depth of 428 ft by the Wehling Well Works, Beecher. As of February 1981, this well was not in use. The well is located just west of the elevated tank about 600 ft east of Lambrecht Road and 500 ft north of Industry Ave., approximately 1173 ft S and 1916 ft E of the NW corner of Section 34, T35N, R12E. The land surface elevation at the well is approximately 758 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	113	113
Lime	132	245
Brown, gravelly lime	5	250
Lime	30	280
Lime and shale	143	423
Shale	5	428

A 16-in. diameter hole was drilled to a depth of 112 ft, reduced to 15 in. between 112 and 117 ft, and finished 12 in. in diameter from 117 to 428 ft. The well is cased with 16-in. black steel pipe from land surface to a depth of 110 ft and 12.8-in. black steel pipe from land surface to a depth of 115 ft (cemented in).

A production test was conducted by the driller on September 21, 1979. After 11.7 hr of pumping at rates ranging from 246 to 526 gpm, the maximum drawdown was 99 ft

from a nonpumping water level of 88 ft below land surface. Ten min after pumping was stopped, the water level had recovered to 98 ft.

The pumping equipment presently installed is a Johnston vertical turbine pump set at 140 ft, and rated at 400 gpm.

A partial analysis of a sample (Lab. No. 212208) collected during the initial production test, after pumping for 11 hr at rates of 246 to 526 gpm, showed the water to have a hardness of 860 mg/1, total dissolved minerals of 1226 mg/1, and an iron content of 0.4 mg/1.

FRANKFORT SQUARE SUBDIVISION

Frankfort Square Subdivision (est. 4690), located about 2.5 miles northeast of Frankfort, installed a public water supply in 1971. The water system is owned and operated by Utilities, Inc. One well (No. 1) is in use. In 1980 there were 1389 services, all metered; the average pumpage was 286,579 gpd. The water is chlorinated.

WELL NO. 1, open to the Silurian dolomite, was completed in March 1971 to a depth of 500 ft by the K & K Well Drilling Co., Mokena. The well is located 20 ft southwest of the pumphouse on the west side of Graceland Lane north of St. Francis Road, approximately 2450 ft S and 1400 ft E of the NW corner of Section 13, T35N, R12E. The land surface elevation at the well is approximately 712 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Overburden	120	120
Rock formation	380	500

A 10-in. diameter hole was drilled to a depth of 122 ft and finished 6 in. in diameter from 122 to 500 ft. The well is cased with 10-in. black pipe from 1.7 ft above land surface to a depth of 122 ft. The top of the casing is equipped with a pitless adapter.

The pumping equipment presently installed is a Barnes submersible pump set at 210 ft, rated at 600 gpm, and powered by a 50-hp Barnes electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C005068) of a sample collected April 13, 1977, after pumping for 2 hr at 600gpm, showed the water to have a hardness of 506 mg/1, total dissolved minerals of 610 mg/1, and an iron content of 0.5 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in June 1977 to a depth of 505 ft by the K & K Well Drilling Co., Mokena. This well was not in use during 1980. The well is located about 25 ft northwest of the water treatment plant 50 ft north of Well No. 1, approximately 2400 ft S and 1400 ft E of the NW corner of Section 13, T35N, R12E. The land surface elevation at the well is approximately 712 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Overburden	116	116
Green rock	44	160
Strata (continued)	*Thickness (ft)*	*Depth (ft)*
Light lime	41	201
Rock and shale	4	205
Broken rock	10	215
Rock	205	420
Shale	18	438
Rock	22	460
Shale	45	505

A 12-in. diameter hole was drilled to a depth of 505 ft. The well is cased with 12-in. pipe from about 1.5 ft above land surface to a depth of 116 ft. The top of the casing is equipped with a Baker pitless adapter.

A production test was conducted by the driller on August 19, 1977. After 2.2 hr of pumping at a rate of 1016 gpm, the final drawdown was 12 ft from a nonpumping water level of 55 ft below land surface. One min after pumping was stopped, full recovery was observed. During this test, Well No. 1 was operated for 1 hr.

The pumping equipment presently installed consists of a 75-hp electric motor, a Peabody Barnes submersible pump (Model No. 1070) set at 126 ft, rated at 1000 gpm, and has 126 ft of 5-in. column pipe. The well is equipped with 126 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40881) is for a water sample from the well collected April 3, 1978, after 30 min of pumping at 1000 gpm.

WELL NO. 2, LABORATORY NO. B40881

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.2		Silica	SiO_2	15	
Manganese	Mn	0.01		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.0	0.00	Boron	B	0.1	
Sodium	Na	14	0.61	Cyanide	CN	0.01	
Potassium	K	2.3	0.06	Nitrate	NO_3	0.4	0.01
Calcium	Ca	100	4.99	Chloride	Cl	9.6	0.27
Magnesium	Mg	63	5.18	Sulfate	SO_4	154	3.20
				Alkalinity(as$CaCO_3$)		374	7.48
Arsenic	As	0.00		Hardness(as$CaCO_3$)		524	10.48
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		615	
Copper	Cu	0.01					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)	7.3		

GOVERNOR'S STATE UNIVERSITY

Governor's State University (est. 21), located about 1 mile southwest of Park Forest, installed a public water supply about 1970. Water for the main campus is obtained from the Park Forest South Utilities Co. One well(No. 1) is in use for Hantack House. In 1980 the average pumpage from Well No. 1 was 3 30 gpd. The water from the well is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed to an unknown depth. The well is located in a building about 200 ft from the Hantack House, approximately 1325 ft S and 2100 ft E of the NW corner of Section 10, T34N, R13E. The land surface elevation at the well is approximately 790 ft.

The well is cased from 1 ft above land surface to an unknown depth.

The pumping equipment presently installed is a Red Jacket submersible pump rated at about 15 gpm, and powered by a 1-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B4095.9) of a sample collected April 14, 1976, after pumping for 30 min, showed the water to have a hardness of 483 mg/l, total dissolved minerals of 677 mg/1, and an iron content of 2.9 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in June 1970 to a depth of 201 ft by the Wehling Well Works, Beecher. This well was not in use during 1980. The well is located at Stuenkel Road and the Illinois Central RR tracks about 200 ft from the planning building, approximately 800 ft S and 1075 ft E of the NW corner of Section 10, T34N, R13E. The land surface elevation at the well is approximately 780 ft.

A drillers log of Well No. 2 follows:

'Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	2	2
Clay	38	40
Clay and gravel	20	60
Muddy sand	38	98
Sand	22	120
Clay	15	135
Lime	66	201

A 5-in. diameter hole was drilled to a depth of 138 ft and finished 4.9 in. in diameter from 138 to 201 ft. The well is cased with 5-in. pipe from land surface to a depth of 138 ft. The top of the well casing is equipped with a pitless adapter.

Upon completion, the well reportedly produced 18 gpm for 3 hr with a drawdown of 1 ft from a nonpumping water level of 77 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 95 ft, rated at about 15 gpm, and powered by a 1-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40957) is for a water sample from the well collected April 14, 1976.

WELL NO. 2, LABORATORY NO. B40957

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.1		Silica	SiO_2	17	
Manganese	Mn	0.02		Fluoride	F	0.5	0.03
Ammonium	NH_4	0.83	0.05	Boron	B	0.8	
Sodium	Na	31	1.35	Cyanide	CN	0.00	
Potassium	K	4.1	0.10	Nitrate	NO_3	0.0	0.00
Calcium	Ca	128	6.39	Chloride	Cl	1.8	0.05
Magnesium	Mg	34	2.80	Sulfate	SO_4	230	4.78
				Alkalinity (as $CaCO_3$)		306	6.12
Arsenic	As	0.01		Hardness(as $CaCO_3$)		459	9.18
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		653	
Copper	Cu	0.00					
Lead	Pb	0.00		PH (as rec'd)		6.8	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc/l		0.5	
Selenium	Se	0.00		± deviation		1.9	
Silver	Ag	0.00		Beta *pc//*		5.2	
Zinc	Zn	1.1		± deviation		2.4	

WELL NO. 3, open to the Silurian dolomite, was completed to an unknown depth. This well was not in use during 1980. The well is located about 30 ft from Krabbe House on Stuenkel Road west of Governor's Highway, approximately 200 ft S and 100 ft E of the NW corner of Section 10, T34N, R13E. The land surface elevation at the well is approximately 785 ft.

The well is cased from above the floor of a 6-ft deep pit to an unknown depth.

The pumping equipment presently installed is a submersible pump rated at about 15 gpm, and powered by a 1-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40958) of a sample collected April 14, 1976, after pumping for 30 min, showed the water to have a hardness of 459 mg/l, total dissolved minerals of 652 mg/l, and an iron content of 6.5 mg/l.

WELL NO. 4, open to the Silurian dolomite, was completed to an unknown depth. This well has been disconnected. The well is located about 100 ft from the Vick House, approximately 175 ft N and 50 ft E of the SW corner of Section 10, T34N, R13E. The land surface elevation at the well is approximately 780 ft.

The well is cased from 1 ft above land surface to an unknown depth.

The pumping equipment presently installed is a submersible pump rated at 15 gpm, and powered by a 1-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40956) of a sample collected April 14, 1976, showed the water to have a hardness of 569 mg/1, total dissolved minerals of 792 mg/1, and an iron content of 5.5 mg/1.

WELL NO. 5, open to the Silurian dolomite, was completed to an unknown depth. This well has been disconnected. The well is located about 500 ft from the conference center at the north end of the grounds in a frame shed, approximately 50 ft S and 1650 ft W of the NE corner of Section 15, T34N, R13E. The land surface elevation at the well is approximately 780 ft.

The well is cased from the wellhouse floor to an unknown depth.

The pumping equipment presently installed is a submersible pump rated at about 15 gpm, and powered by 1-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40960) of a sample collected April 14, 1976, after pumping for 30 min, showed the water to have a hardness of 407 mg/1, total dissolved minerals of 441 mg/1, and an iron content of 2.2 mg/1.

GREENFIELD COMMUNITY WELL CO.

Greenfield Community Well Co. (est. 50), located on the southeast edge of Joliet, installed a public water supply in 1938. One well is in use. In 1974 there were 14 services, none metered; the estimated average and maximum pumpages were 2500 and 3000 gpd, respectively. In 1979 there were 14 services, none metered; the estimated average pumpage was 4000 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in September 1938 to a depth of 120 ft by Mr. Belasich. The well is located at 815 Harlow Ave., approximately 450 ft S and 600 ft E of the NW corner of Section 23, T35N, R10E. The land surface elevation at the well is approximately 610 ft.

A 5-in. diameter hole was drilled to a depth of 120 ft. The well is cased with 5-in. pipe from about 0.8 ft above a pit cover to an unknown depth.

The pumping equipment presently installed is a Red Jacket submersible pump set at 100 ft, rated at 30 gpm, and powered by a ¾-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41121) is for a water sample from the well collected April 4, 1978, after 28 min of pumping at 28 gpm.

WELL NO. 1, LABORATORY NO. B41121

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	12	
Manganese	Mn	0.00		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.0	0.00	Boron	B	0.1	
Sodium	Na	22	0.96	Cyanide	CN	0.00	
Potassium	K	3.1	0.08	Nitrate	NO_3	0.9	0.01
Calcium	Ca	145	7.24	Chloride	Cl	53	1.50
Magnesium	Mg	76	6.26	Sulfate	SO_4	280	5.82
				Alkalinity (as $CaCO_3$)		344	6.88
Arsenic	As	0.00		Hardness (as $CaCO_3$)		678	13.56
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		875	
Copper	Cu	0.02					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.2	

HILL VIEW SUBDIVISION

Hill View Subdivision (est. 100), located just north of New Lenox, installed a public water supply in 1941. The water system is owned and operated by the Hill View Water Association. One well is in use. In 1963 there were 26 services, none metered. In 1980 there were 34 services; the average pumpage was 8120 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1940 to a depth of 127 ft. The well is located at 1023 North Cedar Road, approximately 1400 ft S and 25 ft

W of the NE comer of Section 16, T35N, R11E. The land surface elevation at the well is approximately 650 ft.

The well is cased with 5-in. galvanized steel pipe from about 3 ft above the pumphouse floor to a depth of 80 ft.

In May 1970, the nonpumping water level was reported to be 30 ft.

The pumping equipment presently installed is a Jacuzzi submersible pump (Serial No. 556J4-T2) set at 80 ft, rated at 120 gpm at about 60 ft head, and powered by a 5-hp Franklin electric motor (Model No. 3P1014C56D).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41088) is for a water sample from the well collected April 3, 1978, after 30 min of pumping.

WELL NO. 1, LABORATORY NO. B41088

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.0		Silica	SiO_2	14	
Manganese	Mn	0.00		Fluoride	F	0.1	0.00
Ammonium	NH_4	0.0	0.00	Boron	B	0.1	
Sodium	Na	40	1.74	Cyanide	CN	0.00	
Potassium	K	2.3	0.06	Nitrate	NO_3	4.0	0.06
Calcium	Ca	103	5.14	Chloride	Cl	82	2.31
Magnesium	Mg	55	4.53	Sulfate	SO_4	116	2.41
				Alkalinity(as$CaCO_3$)		318	6.36
Arsenic	As	0.00		HardnesslasCaCO_3)		483	9.66
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		616	
Copper	Cu	0.03					
Lead	Pb	0.01					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.1		pH (as rec'd)		7.5	

HUNTLEY TERRACE SUBDIVISION

Huntley Terrace Subdivision (est. 50), located on the northeast side of Crete, installed a public water supply in 1938. The water system is owned and operated by the Huntley Community Association. One well is in use. In 1980 there were 16 services; the average pumpage was 5103 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed about 1935 to a depth of about 155 ft. The well is located at 626 Huntley Terrace, approximately 1800 ft N and 1450 ft W of the SE corner of Section 3, T34N, R14E. The land surface elevation at the well is approximately 713 ft.

A 6-in. diameter hole was drilled to a depth of about 155 ft. The well is cased with 6-in. pipe from about 1.5 ft above the pumphouse floor to a depth of 125 ft.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 300T1-11DC) set at 136 ft, rated at 30 gpm, and powered by a 3-hp 3450 rpm Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B0020735) is for a water sample from the well collected May 17, 1972, after 1.5 hr of pumping at about 45 gpm.

WELL NO. 1, LABORATORY NO. B0020735

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.1	0.00	Silica	SiO_2	11-5	
Manganese	Mn	0.0		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.1	0.01	Boron	B	0.47	
Sodium	Na	9	0.39	Nitrate	NO_3	0.4	0.01
Potassium	K	3.7	0.10	Chloride	Cl	10.0	0.28
Calcium	Ca	82	4.09	Sulfate	SO_4	105	2.18
Magnesium	Mg	47	3.86	Alkalinity(as$CaCO_3$)		280	5.60
				Hardness(as$CaCO_3$)		389	
Barium	Ba	0.0					
				Total dissolved			
Cadmtum	Cd	0.00		minerals		492	
Chromium	Cr	0.0					
Copper	Cu	0.0		pH (as rec'd)		7.8	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha pc//		0.0	
Nickel	Ni	0.0		± deviation		2.0	
Silver	Ag	0.0		Betapc//		2.7	
Zinc	Zn	0.0		± deviation		1.6	

ILLINOIS YOUTH CENTER (KANKAKEE SCHOOL CAMP)

Illinois Youth Center (Kankakee School Camp) (est. 48), located about 6 miles southeast of Custer Park near the Kankakee River State Park, installed a public water supply in 1962. One well (No. 2) is in use. Water is furnished for the kitchen, boys' living quarters, and the custodian's home. In 1980 the estimated average pumpage was 1370 gpd. The water is chlorinated.

WELL NO. 1, open to the Silurian dolomite and the Maquoketa Group, was completed in 1948 to a depth of 255 ft by Elmer D. Wills, Coal City. This well was abandoned and reportedly was filled with gravel and covered over with soil. The well was located on the camp site at the southeast corner of the building, approximately 2600 ft N and 1300 ft W of the SE corner of Section 36, T32N, R10E. The land

surface elevation at the well is approximately 613 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil	1	1
Yellow clay	4	5
Limestone	57	62
Soapstone	50	112
Dark shale	26	138
Blue rock	45	183
Dark shale	72	255

A 4-in. diameter hole was drilled to a depth of 42.5 ft and finished 3.9 in. in diameter from 42.5 to 255 ft. The well was cased with 4-in. pipe from land surface to a depth of 42.5 ft.

A production test was conducted on September 16, 1960, by representatives of the State Water Survey and the Illinois Youth Commission. After 4.1 hr of pumping at rates ranging from 3.3 to 2.5 gpm, the final drawdown was 24.03 ft from a nonpumping water level of 61.79 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 63.45 ft. The results of this test indicated that it was doubtful if the well would yield much over 5 gpm.

A partial analysis of a sample (Lab. No. 15 3044) collected August 23, I960, after pumping for 1 hr at 3 gpm, showed the water to have a hardness of 391 mg/1, total dissolved minerals of 449 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 2, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in November 1962 to a depth of 751 ft by the Layne-Western Co., Aurora. The well is located 200 ft east of the old stone house and 50 ft west of the office building, approximately 2400 ft N and 1250 ft W of the SE corner of Section 36, T32N, R10E. The land surface elevation at the well is approximately 612 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black soil	1	1
Brown clay	2	3
Light brown lime	39	42
Hard gray lime	12	54
Brown lime	4	58
Green lime with thin shale streaks	6	64
Red shale, soft	5	69
Green and brown lime with shale streaks	6	75
Green shale, soft	19	94
Hard greenish gray shale	46	140
Gray lime	20	160
Gray lime with shale lenses	25	185
Hard dark gray shale	83	268
Brown limestone (Galena)	371	639
St. Peter sandstone	112	751

A 13.8-in. diameter hole was drilled to a depth of 8 ft, reduced to 11.8 in. between 8 and 278 ft, and finished 8 in. in diameter from 278 to 751 ft. The well is cased with 12-in. standard steel drive pipe from land surface to a depth of 8 ft and 8-in. standard steel pipe from 1.5 ft above land surface to a depth of 278 ft (cemented in).

A production test was conducted on November 7-8, 1962, by the driller, the State Water Survey, and the Illinois Youth Commission. After 21.7 hr of pumping at rates of 92 to 50 gpm, the maximum drawdown was 102 ft from a nonpumping water level of 182 ft. The water level recovered to 189 ft after pumping had been stopped for 1.7 hr. On the basis of the production test data, it was estimated that this well should yield 50 gpm (72,000 gpd) on a long-term basis.

A second production test was conducted on July 27, 1970, by the Wehling Well Works, Beecher. The well reportedly produced at rates ranging from 50 to 70 gpm for 4.7 hr with a final drawdown of 42 ft from a nonpumping water level of 239 ft below the top of the casing.

The pumping equipment presently installed is a Red Jacket submersible pump set at 294 ft, and powered by a 7½-*hp* Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A16671) is for a water sample from the well collected March 24, 1976, after 2 hr of pumping at 50 gpm.

WELL NO. 2, LABORATORY NO. A16671

		mg/l	*me/l*		*mg/l*	*me/l*
Iron	Fe	1.0		Silica	SiO_2 8	
Manganese	Mn	0.02		Fluoride	F 2.2	0.12
Ammonium	NH_4	1.67	0.09	Boron	B 1.4	
Sodium	Na	305	13.27	Cyanide	CN 0.00	
Potassium	K	24	0.61	Nitrate	NO_3 0.0	0.00
Calcium	Ca	85	4.24	Chloride	Cl 300	8.46
Magnesium	Mg	48	3.95	Sulfate	SO_4 460	9.57
				Alkalinity(as$CaCO_3$)	220	4.40
Arsenic	As	0.000		Hardness(as$CaCO_3$)	409	8.18
Barium	Ba	0.0				
Cadmium	Cd	0.00		Total dissolved		
Chromium	Cr	0.00		minerals	1400	
Copper	Cu	0.00				
Lead	Pb	0.00		pH (as rec'd)	7.4	
Mercury	Hg	0.0000		Radioactivity		
Nickel	Ni	0.0		Alpha *pc/l*	56.8	
Selenium	Se	0.00		± deviation	12.8	
Silver	Ag	0.00		Beta *pc/l*	52.8	
Zinc	Zn	0.2		± deviation	8.6	

INGALL'S PARK SUBDIVISION

Ingall's Park Subdivision (est. 805), located on the east edge of Joliet, installed a public water supply in 1930. The water system is owned and operated by the Ingall's Park Water Association. Two wells are in use. In 1961 there were 174 services; the average and maximum pumpages were 20,000 and 30,000 gpd, respectively. In 1980 there were 245 services, all metered; the average pumpage was 54,000 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, the Maquoketa Group, and the Galena-Platteville dolomite, was completed in 1930 to a depth of 700 ft by the Heflin Well Drillers, Joliet. The well is located at the northwest corner of Peale St. and Fourth Ave., approximately 2550 ft S and 600 ft E of the NW corner of Section 13, T35N, R10E. The land surface elevation at the well is approximately 640 ft.

The well is cased with 6-in. pipe from about 0.2 ft above the wellhouse floor to a depth of 200 ft.

Nonpumping water levels were reported to be 30 ft on May 1, 1942, and 86 ft on May 27, 1970.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41300) is for a water sample from the well collected April 6, 1978, after 30 min of pumping at 120 gpm.

WELL NO. 1, LABORATORY NO. B41300

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.1		Silica	SiO_2	12	
Manganese	Mn	0.01		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.1	0.01	Boron	B	0.1	
Sodium	Na	36	1.57	Cyanide	CN	0.00	
Potassium	K	2.4	0.06	Nitrate	NO_3	7.5	0.12
Calcium	Ca	120	5.99	Chloride	Cl	110	3.10
Mangesium	Mg	62	5.10	Sulfate	SO_4	132	2.75
				Alkalinity(as$CaCO_3$)		343	6.86
Arsenic	As	0.00		Hardness(as$CaCO_3$)		564	11.28
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		742	
Copper	Cu	0.01					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.3	

The pumping equipment presently installed is a submersible pump set at 221 ft, rated at 60 gpm, and powered by an electric motor.

WELL NO. 2, open to the Silurian dolomite, was completed in 1976 to a depth of 305 ft by the Lockport Well & Pump Co., Joliet. The well is located about 50 ft west of Well No. 1, approximately 2550 ft S and 550 ft E of the NW corner of Section 13, T35N, R10E. The land surface elevation at the well is approximately 640 ft.

Information on the hole and casing records are not available.

The pumping equipment presently installed is a 12-stage Red Jacket submersible pump set at 250 ft, rated at 100 gpm, and powered by an electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B18240) is for a water sample from the well collected October 27, 1976, after 30 min of pumping at 120 gpm.

WELL NO. 2, LABORATORY NO. B18240

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.0		Silica	SiO_2	11-7	
Manganese	Mn	0.06		Fluoride	F	0.1	0.00
Ammonium	NH_4	0.2	0.01	Boron	B	0.2	
Sodium	Na	21	0.91	Cyanide	CN	0.00	
Potassium	K	2.9	0.07	Nitrate	NO_3	0.4	0.01
Calcium	Ca	121	6.04	Chloride	Cl	69	1.95
Magnesium	Mg	59	4.86	Sulfate	SO_4	120	2.50
				Alkalinity(as$CaCO_3$)		356	7.12
Arsenic	As	0.00		Hardness(as$CaCO_3$)		546	10.92
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		646	
Copper	Cu	0.01					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.1		pH (as rec'd)		7.3	

JOLIET

The city of Joliet (80,378) installed a public water supply in 1884. Water was supplied by a private company until 1888 when the city purchased the company. Fourteen wells (Washington St. No. 1, Ottawa St., Spruce Slip, Jasper St., Williamson Ave., Campbell St., Essington Road, Gravel Wells 1-5, and Rock Wells 1 and 2) are in use. Water from this supply is also furnished to the Lockport Township Water System and to the village of Rockdale. The supplies of Crest Hill and Preston Utility Co. are cross connected to Joliet. In 1951 the average and maximum pumpages were 5,620,000 and 6,430,000 gpd, respectively. In 1980 there were 20,973 services, all metered; the average pumpage was 13,550,780

gpd. The water is chlorinated; water from Gravel Wells 1-5 and Rock Wells 1 and 2 is also filtered.

Initially, water was obtained from twenty 6-in. diameter wells finished in sand and gravel to depths of about 40 ft. These wells were abandoned prior to 1960. The wells were located in the valley of Hickory Creek north of Washington St., west of the Elgin, Joliet & Eastern RR in the eastern part of the city in the northwest quarter of Section 14, T35N, R10E. These wells supplied the city until a supplementary supply consisting of the first six deep sandstone wells were drilled.

At times water was taken from Hickory Creek and from a stone quarry nearby to supplement the city supply. These sources of supply were abandoned after about 1930.

A description of the sandstone wells at the Washington St. Pumping Station follows:

OLD WELL NO. 1, open to the Cambrian-Ordovician aquifer, was completed prior to 1900 to a depth of 1785 ft. This well was abandoned in 1937 and sealed between 1948 and 1960. The well was located north of Washington St. west of the Elgin, Joliet & Eastern RR, approximately 445 ft S and 1350 ft E of the NW corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 565 ft.

A 12-in. diameter hole was drilled to a depth of 553 ft and finished at an unknown diameter below 553 ft. The well was cased with 8-in. pipe from about 3 ft above the bottom of a pit floor to a depth of 400 ft.

In 1896 and 1899, the well reportedly flowed. Nonpumping water levels were reported to be 40 ft in 1900 and 209 ft in 1923.

A mineral analysis of a sample (Lab. No. 68211) collected December 17, 1930, showed the water to have a hardness of 311 mg/1, total dissolved minerals of 624 mg/1, and an iron content of 0 mg/1.

OLD WELL NO. 2, open to the Cambrian-Ordovician aquifer, was completed prior to 1900 to a depth of 1600 ft. This well was abandoned in 1937 and sealed between 1948 and 1960. The well was located about 20 ft north of Well No. 1, approximately 425 ft S and 1345 ft E of the NW corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 565 ft.

The well was cased with 6-in. pipe from about 3 ft above the bottom of a pit floor to a depth of 400 ft.

In 1896 and 1899, the well reportedly flowed. In 1900, the nonpumping water level was reported to be 40 ft.

OLD WELL NO. 3, open to the Cambrian-Ordovician aquifer, was completed prior to 1900 to a depth of 1600 ft. This well was abandoned in 1937 and sealed between 1948 and 1960. The well was located about 130 ft north of Well No. 1, approximately 315 ft S and 1350 ft E of the NW corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 565 ft.

The well was cased with 4-in. pipe to a depth of 400 ft.

In 1896 and 1899, the well reportedly flowed. In 1900, the nonpumping water level was reported to be 40 ft.

OLD WELL NO. 4, open to the Cambrian-Ordovician aquifer, was completed prior to 1900 to a depth of 1686 ft (measured in 1929 at 1409 ft deep). This well was abandoned about 1933 and sealed prior to 1960. The well was located about 210 ft north of Well No. 1, approximately 235 ft S and 1350 ft E of the NW corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 565 ft.

The well was cased with 8-in. pipe from land surface to a depth of 400 ft.

In 1896 and 1899, the well reportedly flowed. Nonpumping water levels were reported to be 40 ft in 1900, 209 ft in 1923, 248.7 ft in October 1929, 229.2 ft in October 1933, and 324 ft in 1942.

OLD WELL NO. 5 (also known as Washington St. Well No. 2), open to the Cambrian-Ordovician aquifer, was completed prior to 1900 to a depth of 1704 ft (cleaned out in 1934 to 1665 ft and in 1937 to 1611 ft). This well was abandoned about 1948 and sealed in 1952. The well was located about 367 ft north of Washington St. and 250 ft west of the Elgin, Joliet & Eastern RR, approximately 160 ft S and 1500 ft E of the NW corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 565 ft.

A 12-in. diameter hole was drilled to a depth of 450 ft, reduced to 10 in. between 450 and 610 ft, reduced to 8 in. between 610 and 1300 ft, and finished 6 in. in diameter from 1300 to 1704 ft. The well was cased with 8-in. pipe to a depth of 400 ft.

In 1896 and 1899, the well reportedly flowed. Nonpumping water levels were reported to be 40 ft in 1900 and 209 ft in 1923.

In December 1929, the well reportedly produced 800 gpm with a drawdown of 141 ft from a nonpumping water level of 240 ft.

In October 1933, the nonpumping water level was reported to be 223.2 ft below the top of the well.

In 1934, J. O. Heflin, Joliet, shot this well with 52 qt of nitroglycerin at a depth of 1600 ft. The well was cleaned out and was reported to be 1665 ft deep.

In 1937, this well was shot with 50 lb of dynamite at 1540 ft and cleaned out by C. W. Varner, Dubuque, Iowa. After shooting, the well reportedly produced 450 gpm for 14 hr with a drawdown of 114 ft from a nonpumping water level of 242 ft below the top of the casing.

In 1940 and 1941, the nonpumping water level was reported to be 238 ft.

A mineral analysis of a sample (Lab. No. 79943) collected April 22, 1937, showed the water to have a hardness of 288 mg/1, total dissolved minerals of 535 mg/1, and an iron content of 0.4 mg/1.

OLD WELL NO. 6, open to the Cambrian-Ordovician aquifer, was completed prior to 1900 to a depth of 1419 ft. This well was abandoned in 1937 and sealed between 1948 and 1960. The well was located about 450 ft east of Well No. 4, approximately 240 ft S and 1800 ft E of the NW corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 565 ft.

A 12-in. diameter hole was drilled to a depth of 455 ft and finished at an unknown diameter below 455 ft. The well was cased with 6-in. pipe to a depth of 400 ft.

In 1896 and 1899, the well reportedly flowed. Nonpumping water levels were reported to be 40 ft in 1900 and 209 ft in 1923.

A mineral analysis of a sample (Lab. No. 68216) collected December 17, 1930, showed the water to have a hardness of 344 mg/1, total dissolved minerals of 624 mg/1, and an iron content of 0 mg/1.

WASHINGTON ST. WELL NO. 1 (also known as Well 5D), open to the Cambrian-Ordovician aquifer, was completed in 1937 to a depth of 1608 ft (measured on April 10, 1946 at 1677 ft deep and cleaned out in 1956 to 1609 ft) by C. W. Varner, Dubuque, Iowa. The well is located at the southeast corner of the Washington St. Station at 921 East Washington St., approximately 480 ft S and 1460 ft E of the NW corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 564 ft.

A sample study log of the Washington St. Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	37	37
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomites, water bearing	183	220
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
Limestone	36	256
Scales Shale		
Shale	74	330
Galena and Platteville Groups		
Dolomite	345	675
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	254	929
Shale and lime, caving	53	982
ORDOVICIAN AND CAMBRIAN SYSTEMS		
Oneota, Eminence, Potosi, and Franconia Formations		
Dolomite and sandstone	449	1431
CAMBRIAN SYSTEM		
Ironton-Galesville Sandstone		
Sandstone, water bearing	116	1547
Eau Claire Formation		
Shale and dolomite	61	1608

A 23-in. diameter hole was drilled to a depth of 350 ft, reduced to 15 in. between 350 and 980 ft, reduced to 12 in. between 980 and 1134 ft, and finished 10 in. in diameter from 1134 to 1608 ft. Originally, the well was cased with 24-in. drive pipe from land surface to a depth of 39 ft, 18-in. OD pipe from land surface to a depth of 68.5 ft, 18-in. OD pipe from 239 ft to a depth of 350 ft, 12-in. pipe from 917.5 ft to a depth of 980 ft, and 10-in. pipe from 1076.4 ft to a depth of 1134 ft. In November 1956, the 18-in. casing was removed, the hole was reamed out to 16 in. in diameter from 350 to 380 ft, and a new 16-in. OD casing was installed from land surface to a depth of 358 ft (cemented in). In 1971, the 12- and 10-in. diameter liners were removed and the hole was reamed out to 15.2 in. in diameter from 380 to 1134 ft and 12 in. in diameter from 1134 to 1609 ft. The well was then cased with a 12-in. liner from 915.2 ft to a depth of 1134 ft.

In July 1937, the well reportedly produced 1050 gpm with a drawdown of 125 ft from a nonpumping water level of 270 ft below the top of the casing.

In 1944, when the production dropped off, the pump was pulled and the hole was found bridged at 1192 ft and filled with sand to 1484 ft. The sand was bailed out to 1595 ft, a complete string of tools left in the hole in previous years was removed, and the hole cleaned to its original depth by October 30, 1944.

On October 4, 1946, the nonpumping water level was reported to be 409 ft below the pump base after a 45-min idle period.

From November 1956 through January 1957, the J. P. Miller Artesian Well Co., Brookfield, removed the 18-in. casing and reamed the hole out from 350 to 380 ft. A new liner was installed and a fill of 90 ft of material was cleaned out of the well to a depth of 1609 ft. The well was then shot with 114 lb of nitrogel and 4 lb of 60 percent dynamite between 1544 and 1550 ft. A second shot of 185 lb of 100 percent nitrogel and 10 lb of 60 percent dynamite was exploded between 1527 and 1540 ft. The well was cleaned out to 1609 ft and the nonpumping water level was reported to be 402 ft.

A production test was conducted by the J. P. Miller Artesian Well Co. on February 21, 1957. After 3 hr of pumping at a rate of 1000 gpm, the drawdown was 70 ft from a nonpumping water level of 420 ft.

In March 1962 the pump was pulled and the well was cleaned out.

In 1971, this well was rehabilitated by the J. P. Miller Artesian Well Co. The 12- and 10-in. diameter liners were removed, the hole reamed out, and a new liner installed.

The pumping equipment presently installed consists of a 200-hp 1775 rpm General Electric motor (Model No. 12F5159, Serial No. 6328607), a 12-in., 9-stage Peerless turbine pump (No. 8004) set at 800 ft, rated at 1200 gpm, and has 800 ft of 10-in. column pipe. A 20-ft section of 8-in. suction pipe is attached to the pump intake. The well is equipped with 800 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B052856) is for a water sample from the well collected April 29, 1981, after 24 hr of pumping at 796 gpm.

WASHINGTON ST. WELL NO. 1, LABORATORY NO. B052856

		mg/l	me/I			mg/l	me/I
Iron	Fe	0.28		Silica	SiO_2	7.7	
Manganese	Mn	0.006		Fluoride	F	1.33	0.07
Ammonium	NH_4	0.6	0.03	Boron	B	0.59	
Sodium	Na	63	2.74	Cyanide	CN	<0.005	
Potassium	K	10.8	0.28	Nitrate	NO_3	<0.4	
Calcium	Ca	75	3.74	Chloride	Cl	34	0.96
Magnesium	Mg	22.5	1.85	Sulfate	SO_4	114	2.37
Strontium	Sr	2.66		Alkalinitv(as$CaCO_3$)		278	5.56
Arsenic	As	<0.001		Hardness(as$CaCO_3$)		281	5.62
Barium	Ba	0.034					
Beryllium	Be	<0.0005		Total dissolved			
Cadmium	Cd	<0.003		minerals		515	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	<0.003					
Lead	Pb	0.007					
Mercury	Hg	<0.00005					
Nickel	Ni	0.005					
Selenium	Se	<0.0005					
Silver	Ag	<0.005					
Vanadium	V	<0.004					
Zinc	Zn	0.054		pH (as rec'd)	7.4		

Other wells located throughout the city are listed as follows:

OTTAWA ST. WELL (also known as Well ID), presently open to the Cambrian-Ordovician aquifer, was completed in September 1907 to a depth of 1621 ft (reported to be 1525 ft in 1944) by L. Wilson & Co., Chicago. The well is located at the southwest corner of Ottawa St. and Crowley Ave., approximately 2425 ft N and 425 ft W of the SE corner of Section 9, T35N, R10E. The land surface elevation at the well is approximately 533 ft.

A sample study log of the Ottawa St. Well furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Drift	5	5
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite, water bearing	213	218
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale	140	358
Galena and Platteville Groups		
Dolomite	360	718
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	410	1128
Kress Member		
Shale and marl	59	1187
CAMBRIAN SYSTEM		
Potosi, Franconia, Ironton, and Galesville Formations		
Dolomites and sandstones	409	1596
Eau Claire Formation		
Shale	25	1621

Originally, a 19-in. diameter hole was drilled to a depth of 198 ft, reduced to 10 in. between 198 and 1195 ft, reduced to 8 in. between 1195 and 1288 ft, and finished 7 in. in diameter from 1288 to 1621 ft. The well was cased with 16-in. OD pipe from land surface to a depth of 198 ft, 8-in. liner from 1102 ft to a depth of 1195 ft, and 7-in. liner from 1195 ft to a depth of 1288 ft. In 1937, a 5-in. diameter perforated liner was placed from 1521 ft to a depth of 1621 ft. After rehabilitation in 1944, the well was reported to be 20 in. in diameter from land surface to 200 ft, 15.2 in. between 200 and 615 ft, 12 in. between 615 and 1209 ft, and 10 in. between 1209 and 1525 ft. The casing consisted of 16-in. OD pipe from about 0.2 ft above the pump station floor to a depth of 200 ft and a 10-in. ID liner from 1088 ft to a depth of 1209 ft. The top of the 5-in. perforated liner was in bad condition at a depth of 1525 ft but was not removed. In 1953, the 16-in. casing was removed and a new 12-in. pipe was installed from about 0.2 ft above the pump station floor to a depth of 303 ft (cemented in).

When originally completed in 1907, the well was left open to the base of the Silurian dolomite, th'e Maquoketa Group, and the Cambrian-Ordovician aquifer. The nonpumping water level was reported to be 8 ft below land surface in September 1907.

In July 1913, after pumping at a rate of 700 gpm, the drawdown was 82 ft from a nonpumping water level of 58 ft.

In 1923, the nonpumping water level was reported to be 180 ft.

In 1932, this well was shot with nitroglycerin and cleaned by J. O. Heflin, Joliet. The nonpumping water level was reported to be 246 ft after shooting.

In October 1933, the nonpumping water level was reported to be 264 ft.

In 1937, C. W. Varner, Dubuque, Iowa, cleaned the well, did some further shooting, and placed 100 ft of 5-in. perforated pipe at the bottom of the well.

On April 21, 1937, after 4 hr of pumping at rates ranging from 650 to 840 gpm, the final drawdown was 87 ft from a nonpumping water level of 236 ft.

In December 1938, the well reportedly produced 800 gpm with a drawdown of 93 ft from a nonpumping water level of 236 ft.

In 1944, this well was rehabilitated and reamed out by the J. P. Miller Artesian Well Co., Brookfield.

On March 9, 1945, after pumping at rates of 1100 to 1000 gpm, the drawdown was 92 ft from a nonpumping water level of 338 ft below the pump base.

Nonpumping water levels were reported to be 381 ft below the pump base after a 45-min idle period on October 4, 1946, and 362 ft on June 6, 1953.

During rehabilitation work in October 1953, the Silurian dolomite and Maquoketa Group were sealed from the hole leaving the well open to the Cambrian-Ordovician aquifer.

On August 19, 1959, the nonpumping water level was reported to be 414 ft.

In March 1974, the well reportedly produced 1025 gpm for 22 hr with a drawdown of 55 ft from a nonpumping water level of 605 ft below land surface.

The pumping equipment presently installed consists of a 200-hp General Electric motor, a 12-in. Peerless turbine pump set at 710 ft, rated at 1000 gpm, and has 710 ft of 8-in. column pipe. A 10-ft section of 8-in. suction pipe is attached to the pump intake. The well is equipped with 710 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003737) of a sample collected April 2, 1979, after pumping for 24 hr, showed the water to have a hardness of 263 mg/1, total dissolved minerals of 564 mg/1, and an iron content of 0.3 mg/1. Hydrogen sulfide was apparent when a previous sample was collected.

CANAL ST. WELL, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in 1911 to a depth of 1575 ft by the Ohio Drilling Co., Massillon, Ohio. This well was abandoned in 1931 and sealed prior to 1948. The well was located at the corner of Canal and Division Sts. near the west bank of the Des Plaines River, approximately 2640 ft S and 1125 ft W of the NE corner of Section 9, T35N, R10E. The land surface elevation at the well is approximately 532 ft.

A sample study log of the Canal St. Well furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	3	3
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomites, water bearing	212	215
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
Dolomite	10	225
Scales Shale		
Shale, some dolomite	70	295
Galena and Platteville Groups		
Dolomite	325	620
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	200	820
Canadian Group		
Shakopee-Oneota Dolomite	225	1045
CAMBRIAN SYSTEM		
Eminence Dolomite		
Sandy dolomite	30	1075
Potosi Dolomite	165	1240
Franconia Formation		
Sandstone and dolomite	90	1330
Ironton-Galesville Sandstone		
Sandstone, water bearing	185	1515
Eau Claire Formation		
Sandstone and dolomite	55	1570

A 14-in. diameter hole was drilled to a depth of 318 ft, reduced to 11 in. between 318 and 893 ft, and finished 10.6 in. in diameter from 893 to 1575 ft. The well was cased with 14-in. pipe to a depth of 318 ft and 10.6-in. pipe from land surface to a depth of 893 ft (cemented in).

In 1922, the well reportedly produced 292 gpm with a drawdown of 129 ft from a nonpumping water level of 160 ft below the top of the well.

On October 5, 1933, the nonpumping water level was reported to be 187.2 ft below the pump station floor.

A mineral analysis of a sample (Lab. No. 68217) collected December 17, 1930, showed the water to have a hardness of 183 mg/1, total dissolved minerals of 550 mg/1, and an iron content of 0 mg/1.

SPRUCE SLIP WELL (also known as Well 2D), open to the Cambrian-Ordovician aquifer, was completed in 1912 to a depth of 1565 ft (cleaned out to 1535 ft in 1948 and to 1556 ft in 1958) by the Ohio Drilling Co., Massillon, Ohio. The well is located on Spruce Slip St. just east of South Chicago St., approximately 2100 ft S and 255 ft E of the NW corner of Section 15, T35N, R10E. The land surface elevation at the well is approximately 529 ft.

A sample study log of the Spruce Slip Well furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomites	200	200
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite and shale	80	280
Galena and Platteville Groups		
Dolomite	330	610
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	230	840
ORDOVICIAN AND CAMBRIAN SYSTEMS		
Oneota, Eminence, and Potosi Dolomites	395	1235
CAMBRIAN SYSTEM		
Franconia Formation		
Sandstone and dolomite	105	1340
Ironton-Galesville Sandstone		
Sandstone, water bearing	180	1520
Eau Claire Formation	10	1530

A 16-in. diameter hole was drilled from 35 ft to a depth of 320 ft, reduced to 13 in. between 320 and 882 ft, and finished 10 in. in diameter from 882 to 1565 ft. Originally, the well was cased with 14-in. pipe from about 1 ft above the wellhouse floor to a depth of 320 ft. In 1948, the casing was removed and an 18-in. OD surface pipe was placed from land surface to a depth of 35 ft, 14-in. pipe from land surface to a depth of 326 ft (cemented in), and a 10-in. liner from 717.5 ft to a depth of 882 ft.

Upon completion, the well reportedly produced 400 gpm with a drawdown of 106 ft from a nonpumping water level of 36 ft below land surface.

In 1922, after pumping at a rate of 184 gpm, the drawdown was 334.0 ft from a nonpumping water level of 142.6 ft.

From January to May 1948, the J. P. Miller Artesian Well Co., Brookfield, shot this well with 200 lb blasting gelatin but no sand was released. Further shooting consisted of 300 lb of gel at 1490 ft, 356 lb of gel at 1470 ft, and 400 lb of nitrogel between 1416 and 1438 ft. New casings and liner were installed.

A production test was conducted by the J. P. Miller Artesian Well Co. on May 25-26, 1948. After 28.5 hr of pumping at rates ranging from 250 to 500 gpm, the maximum drawdown was 180 ft from a nonpumping water level of 320 ft.

A production test was conducted by the J. P. Miller Artesian Well Co. on July 3, 1950. After 6.5 hr of pumping at rates of 805 to 791 gpm, the final drawdown was 210 ft from a nonpumping water level of 368 ft. Forty min after pumping was stopped, the water level had recovered to 386 ft.

Nonpumping water levels were reported to be 383 ft in June 1951 and 388 ft on January 20, 1958.

From January to April 1958, this well was rehabilitated. The well had filled in to 1470 ft, presumably from an earlier shooting. About 19 cubic yards of material was cleaned out to a depth of 1556 ft.

This well was rehabilitated and cleaned in July 1962 and 1973.

The pumping equipment presently installed consists of a 200-hp 1775 rpm General Electric motor (Model No. 12F5983, Serial No. WD6781582), a 15-stage Peerless turbine pump (Serial No. 50439) set at 960 ft, rated at 1000 gpm, and has 960 ft of 8-in. column pipe. The well is equipped with 960 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003733) of a sample collected April 2, 1979, after pumping for 24 hr at 300 gpm, showed the water to have a hardness of 255 mg/1, total dissolved minerals of 594 mg/1, and an iron content of 0.1 mg/1.

VAN BUREN ST. WELL, open to the Cambrian-Ordovician aquifer, was completed in 1913 to a depth of 1547.5 ft by the Ohio Drilling Co., Massillon, Ohio. This well was abandoned in 1941 and sealed about 1955. The well was located on Van Buren St. west of Eastern Ave., approximately 780 ft N and 1400 ft E of the SW corner of Section 10, T35N, R10E. The land surface elevation at the well is approximately 538 ft.

A sample study log of the Van Buren St. Well furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
No record	330	330
ORDOVICIAN SYSTEM		
Galena and Platteviile Groups		
Dolomite	290	620
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	300	920
Prairie du Chien Group		
Oneota Dolomite	100	1020
Gunter Sandstone	30	1050
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	170	1220
Franconia Formation		
Dolomite and sandstone	140	1360
Ironton-Galesville Sandstone	160	1520
Eau Claire Formation		
Sandstone and shale	30	1550

A 14-in. diameter hole was drilled to a depth of 328 ft, reduced to 10 in. between 328 and 965 ft, reduced to 9.6 in. between 965 and 1430 ft, and finished 7.6 in. in diameter from 1430 to 1547.5 ft. The well was cased with 14-in. pipe from 1 ft above land surface to a depth of 328 ft and 10-in. liner from 800 ft to a depth of 900 ft.

Upon completion, after pumping at a rate of 450 gpm, the drawdown was 177 ft from a nonpumping water level of 63 ft below land surface.

In 1922, the well reportedly produced 485 gpm with a drawdown of 229.5 ft from a nonpumping water level of 188.5 ft.

On October 5, 1933, the nonpumping water level was reported to be 223.5 ft below land surface.

A mineral analysis of asample (Lab. No. 68213) collected December 17, 1930, showed the water to have a hardness of 233 mg/1, total dissolved minerals of 567 mg/1, and an iron content of 0 mg/1.

DES PLAINES ST. WELL, open to the Cambrian-Ordovician aquifer, was completed in 1913 to a depth of 1575 ft by the Ohio Drilling Co., Massillon, Ohio. This well is presently in use only as an observation well by the State Water Survey. The well is located west of Des Plaines St. near Lafayette St. and the east bank of the Des Plaines River, approximately 360 ft S and 1240 ft W of the NE corner of Section 16, T35N, R10E. The land surface elevation at the well is approximately 531 ft.

A sample study log of the Des Plaines St. Well furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite and limestone	190	190
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
Dolomite	10	200
Scales Shale	80	280
Galena Group		
Dolomite	190	470
Platteviile Group		
Dolomite and limestone	125	595
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, incoherent	485	1080
Shale and chert, caving	20	1100

Strata (continued)	Thickness (ft)	Depth (ft)
CAMBRIAN SYSTEM		
Potosi Dolomite	150	1250
Franconia Formation		
Sandy limestone and sandstone	150	1400
Ironton-Galesville Sandstone		
Sandstone, water bearing	160	1560

The well is reportedly cased with 14-in. pipe from 2.5 ft above land surface to a depth of 300 ft, 7-in. liner from 600 ft to a depth of 824 ft, and 5.9-in. liner from 1200 ft to a depth of 1300 ft.

Upon completion, after pumping at a rate of 450 gpm, the drawdown was 116 ft from a nonpumping water level of 64 ft below land surface.

In 1922, the well reportedly produced 305 gpm with a drawdown of 89 ft from a nonpumping water level of 189 ft.

Nonpumping water levels were reported to be 222 ft below land surface on October 4, 1933, and 219 ft below the top of the casing on July 21, 1941.

Monthly measurements of the nonpumping water level during the period July 1942 to March 1981 ranged from about 259 to 618 ft below land surface.

A mineral analysis of asample (Lab. No. 68218) collected December 17, 1930, showed the water to have a hardness of 246 mg/1, total dissolved minerals of 532 mg/1, and an iron content of 0 mg/1.

RUBY ST. WELL, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in 1915 to a depth of 1564 ft (reported to be 1565 ft in 1931, sounded in 1940 at 1544 ft, and rehabilitated in 1944-1945 to a depth of 1568 ft) by the Ohio Drilling Co., Massillon, Ohio. This well was abandoned in 1951 and sealed in 1956. The well was located just south of the Ruby St. bridge on the west bank of the Des Plaines River, approximately 565 ft S and 470 ft W of the NE corner of Section 9, T35N, R10E. The land surface elevation at the well is approximately 546 ft.

A sample study log of the Ruby St. Well furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite, water bearing	180	180
ORDOVICIAN SYSTEM		
Maquoketa Group		
Scales Shale	80	260
Galena and Platteville Groups		
Dolomite	340	600
Ancell Group		
Glenwood-St. Peter Sandstone	390	990
Prairie du Chien Group		
Oneota Dolomite	20	1010
Gunter Sandstone	10	1020
CABRIANSYSTEM		
Eminence-Potosi Dolomite	210	1230
Franconia Formation		
Dolomite and sandstone	120	1350
Ironton-Galesville Sandstone		
Sandstone, water bearing	130	1480
Eau Claire Formation		
Dolomite and shale	80	1560

Originally, a 14-in. diameter hole was drilled to a depth of 303 ft, reduced to 12 in. between 303 and 1019 ft, and finished 10 in. in diameter from 1019 to 1564 ft. The well was cased with 14-in. pipe to a depth of 303 ft. In 1931, when the well was repaired, the hole was reported to be 17 in. in diameter from land surface to a depth of 303 ft, 13 in. between 303 and 1170 ft, and 10 in. between 1170 and 1565 ft. The well was cased with 12-in. pipe to a depth of 410 ft, 10-in. pipe from 410 ft to a depth of 1237.5 ft, and an 8-in. perforated pipe from 1237.5 ft to a depth of 1438 ft. After rehabilitation in 1944-1945, the hole was reported to be 18 in. in diameter from 0 to 440 ft, 12 in. from 440 to 1237 ft, and 10 in. from 1237 to 1568 ft. The well was then cased with 14-in. pipe from land surface to a depth of 440 ft, 12-in. standard pipe from land surface to a depth of 437 ft, 10-in. pipe from 437 ft to a depth of 1237 ft, and an 8-in. perforated pipe from 1237 ft to a depth of 1438 ft.

In 1922, the well reportedly produced 5 32 gpm with a drawdown of 188 ft from a nonpumping water level of 185 ft.

After repairing in 1931 by the S. B. Geiger & Co., Chicago, the depth was reported to be 1565 ft. The old casing was removed and new casings and a liner were installed.

On October 5, 1933, the nonpumping water level was reported to be 210 ft below land surface.

On January 4, 1940, the J. P. Miller Artesian Well Co., Brookfield, sounded this well and the depth was reported to be 1544 ft and the nonpumping water level was 228 ft below the pump base.

This well was rehabilitated in 1944-1945 by the J. P. Miller Artesian Well Co. The old casing was removed, the hole reamed out, and new casings installed.

On February 19, 1945, the well reportedly produced 680 gpm with the pumping level below the 458-ft airline from a nonpumping water level of 348 ft below the pump base.

On October 4, 1946, the well reportedly produced 600 gpm with the pumping level below the 458-ft airline. After pumping was stopped for 45 min, the water level had recovered to 398 ft below the pump base.

In September 1951, the nonpumping water level was reported to be 434 ft.

A mineral analysis of a sample (Lab. No. 108174) collected October 31, 1946, after pumping for 20 min at 600 gpm, showed the water to have a hardness of 263 mg/1, total dissolved minerals of 475 mg/1, and an iron content of 0.5 mg/1.

JASPER ST. WELL (also known as Well 3D), open to the Cambrian-Ordovician aquifer, was completed in 1924 to a depth of 1565 ft (reported to be 1558 ft in 1933 and cleaned out to 15 36 ft in 1947) by William H. Cater, Chicago. The well is located at 325 Jasper St. just off Center St. near the west bank of the Des Plaines River, approximately 1850 ft N and 2630 ft E of the SW corner of Section 16, T35N, R10E. The land surface elevation at the well is approximately 5 37 ft.

A sample study log of the Jasper St. Well furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
SILURIAN SYSTEM		
Niagaran Series		
Joliet Dolomite	50	50
Alexandrian Series		
Kankakee Dolomite	30	80
Elwood Dolomite	20	100
Wilhelmi Formation	70	170
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone	20	190
Scales Shale	80	270
Galena Group	200	470
Platteville Group	125	595
Ancell Group		
Glenwood Formation		
Dolomite and sandstone	20	615
St. Peter Sandstone, water bearing	175	790
Prairie du Chien Group		
Shakopee Dolomite	55	845
Oneota Dolomite	205	1050
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	185	1235
Franconia Formation		
Dolomite and sandstone	140	1375
Ironton-Galesville Sandstone		
Sandstone, water bearing	165	1540
Eau Claire Formation		
Shale and sandstone	25	1565

A 21-in. diameter hole was drilled to a depth of 303 ft and finished 15 in. in diameter from 303 to 1565 ft. The well is cased with 17-in. OD pipe from about 0.4 ft above the wellhouse floor to a depth of 303 ft (cemented in).

Upon completion, the well reportedly produced 1250 gpm with a drawdown of 100 ft from a nonpumping water level of 165 ft.

In 1927, the driller sealed in the 17-in. pipe with cement grout, and the nonpumping water level was reported to be 165 ft.

In 1933, the Layne-North Central Co., Chicago, shot the well with 4 charges of nitroglycerin (25 qt each) at depths of 1207, 1321, 1435, and 1549 ft. The depth was reported to be 1558 ft after shooting.

On August 24, 1933, the nonpumping water level was reported to be 165 ft below land surface.

In 1937, this well was cleaned out and the pump repaired.

On September 8, 1938, the well reportedly produced 940 gpm with a drawdown of 166 ft from a nonpumping water level of 261 ft.

Nonpumping water levels were reported to be 259 ft below the pump base on July 25, 1941, and 306 ft on March 7, 1947.

On March 18, 1947, the J. P. Miller Artesian Well Co., Brookfield, shot the well with 500 lb of nitrogel at a depth of 1530 ft. On April 9, 1947, a second shot of 500 lb of nitrogel was exploded at a depth of 1492 ft. A carload of sand was removed and the well cleaned out to 1536 ft.

In October 1952, after the pump shaft was found to be broken, the J. P. Miller Artesian Well Co. shot the well with 228 lb of 100 percent nitrogel and 5 lb of 60 percent primer between the depths of 1530 and 1540 ft. After the well was cleaned out to 1560 ft, the nonpumping water level was reported to be 342 ft on January 15, 1953. The pump was repaired and reinstalled.

In June 1961, this well was cleaned and the pump was lowered.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 54925) rated at 1000 gpm, and powered by a 250-hp 1800 rpm U. S. electric motor (Serial No. 1078963). The well is equipped with 768 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003738) of a sample collected April 2, 1979, after pumping for 24 hr at 850 gpm, showed the water to have a hardness of 255 mg/1, total dissolved minerals of 510 mg/1, and an iron content of 0.2 mg/1.

WILLIAMSON AVE. WELL (also known as Well 4D), open to the Cambrian-Ordovician aquifer, was completed in 1924 to a depth of 1608 ft (reported to be 1613 ft in 1929, drilled and bailed out to 1609 ft in 1945, and cleaned out to 1575 ft in 1957) by the Sewell Well Co., St. Louis, Mo. The well is located at 806 Williamson Ave. near Charlesworth Ave., approximately 1250 ft N and 180 ft E of the SW corner of Section 2, T35N, R10E. The land surface elevation at the well is approximately 558 ft.

A sample study log of the Williamson Ave. Well furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	15	15
SILURIAN SYSTEM		
Niagaran Series	85	100
Alexandrian Series		
Kankakee Dolomite	30	130
Elwood Dolomite	25	155
Wilhelmi Formation	50	205
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
Dolomite	30	235
Scales Shale	80	315
Galena Group		
Dolomite	205	520

Strata	Thickness (ft)	Depth (ft)
Platteville Group		
Dolomite	130	650
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	495	1145
Shale and chert	25	1170
CAMBRIAN SYSTEM		
Potosi Dolomite	60	1230
Franconia Formation		
Sandstone and dolomite	115	1345
Ironton-Galesville Sandstone		
Sandstone, water bearing	185	1530
Eau Claire Formation		
Sandstone and shale	78	1608

Originally, a 19-in. diameter hole was drilled to a depth of 346 ft, reduced to 17 in. between 346 and 1161 ft, and finished 12 in. in diameter from 1161 to 1608 ft. The well was cased with 16-in. pipe from land surface to a depth of 346 ft and a 13-in. liner from 1101 ft to a depth of 1161 ft. In 1929 after shooting, the well was reported to be cased with 20-in. ID pipe from land surface to a depth of 20 ft, 15.2-in. pipe from land surface to a depth of 391 ft (cemented in), 8-in. liner from 1260 ft to a depth of 1613 ft (from 1408 to 1568 ft the liner was perforated). After rehabilitation in 1945, the well was reported to be 19.2 in. in diameter from 0 to 386 ft, 15.2 in. between 386 and 1170 ft, and 12 in. between 1170 and 1609 ft. The casing consists of 20-in. OD pipe from land surface to a depth of 20 ft, 16-in. OD pipe from land surface to a depth of 386 ft, 13-in. OD liner from 1108.5 ft to a depth of 1170 ft, and 10-in. ID liner from 1170 ft to a depth of 1414.8 ft. In 1957, the old liners were removed and a new 16-in. OD pipe was installed from land surface to a depth of 367 ft (cemented in) and a 13-in. OD liner was placed from 1105 ft to a depth of 1170 ft.

In March 1927, after pumping at a rate of 765 gpm, the drawdown was 100 ft from a nonpumping water level of 195 ft.

In 1929, the S. B. Geiger & Co., Chicago, shot this well with 1500 lb of dynamite at a depth of about 1550 ft. The well was cleaned and the depth was reported to be 1613 ft. New casing was also installed during this rehabilitation.

In September 1938, the well reportedly produced 960 gpm with a pumping water level below 400 ft from a nonpumping water level of 209 ft.

From April 24 to November 29, 1945, this well was rehabilitated by the J. P. Miller Artesian Well Co., Brookfield. The well was shot in the Galesville Sandstone at depths of 1525, 1514, 1500, 1489, and 1458 ft. After shooting, the well was drilled and bailed out to 1609 ft.

A production test was conducted by the State Water Survey on February 15, 1946. After 9.8 hr of pumping at rates ranging from 1005 to 825 gpm, the pumping water level was 453 ft below the pump base. Fourteen hr after pumping was stopped, the water level had recovered to 348 ft.

Nonpumping water levels were reported to be 410 ft below the pump base after an idle period of 36 min on October 4, 1946, and 452 ft in September 1951.

In February 1957, the J. P. Miller Artesian Well Co. removed the old liners and installed a new 16-in. casing and a 13-in. liner. The well was then shot at five levels as follows: 228 lb of nitrogel and 8 lb of dynamite between 1515 and 1525 ft, 228 lb of nitrogel and 8 lb of dynamite between 1495 and 1505 ft, 285 lb of nitrogel and 8 lb of dynamite between 1475 and 1485 ft, 242 lb of nitrogel and 12 lb of dynamite between 1557 and 1570 ft, and 228 lb of nitrogel and 8 lb of dynamite between 1525 and 1535 ft. The well was cleaned out to 1575 ft and the nonpumping water level was reported to be 438 ft.

On February 16,1958, the nonpumping water level was reported to be 422 ft and the well was placed back in operation.

On October 8, 1980, the nonpumping water level was reported to be 677 ft.

The pumping equipment presently installed consists of a 200-hp 1775 rpm General Electricmotor (Serial No. 6328604), a 12-in., 10-stage Peerless turbine pump (No. 31940) set at 860 ft, rated at 1000 gpm at about 463 ft head, and has 860 ft of 10-in. column pipe. The well is equipped with 860 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B052860) of a sample collected April 29, 1981, after pumping for 24 hr at 934gpm, showed the water to have a hardness of 253 mg/1, total dissolved minerals of 491 mg/1, and an iron content of 0.21 mg/1.

CAMPBELL ST. WELL (also known as Well 9D), open to the Cambrian-Ordovician aquifer, was completed in August 1964 to a depth of 1671 ft (cleaned out to 1600 ft in 1965) by the J. P. Miller Artesian Well Co., Brookfield. The well is located at 1919 Campbell St. on the west side of the city, approximately 1200 ft N and 2450 ft W of the SE corner of Section 7, T35N, R10E. The land surface elevation at the well is approximately 647 ft.

A drillers log of the Campbell St. Well follows:

Strata	Thickness (ft)	Depth (ft)
Drift	60	60
Light lime hard	5	65
Lime changing gray	10	75
Dark gray lime, hard	35	110
Lime light gray	20	130
Lime changing to light brown	20	150
Gray lime	40	190
Gray lime, medium	10	200
Gray shaly lime	30	230
Shale and dark lime	10	240
Gray shaly lime	40	280
Squeeze	5	285
Lime streak	5	290
Gray shale (water at 75 ft)	20	310
Dark brown shale	53	363
Brown lime, medium	117	480
Light brown lime, medium	80	560
Brown lime	30	590
Dark green lime	14	604

Strata (continued)	Thickness (ft)	Depth (ft)
Brown lime, hard	16	620
Hard brown lime	20	640
Light brown lime	15	655
Brown lime	45	700
Sandy lime	4	704
St. Peter sand	271	975
Medium hard sand	8	983
Soft sand	47	1030
Hard brown sand	9	1039
Shale, blue	5	1044
Hard lime shells	5	1049
Green shale	46	1095
Sandy lime and shale	15	1110
Shaly lime	5	1115
Lime and shale	15	1130
White lime	20	1150
Gray sand hard sharp	5	1155
Gray sand lime streaks	10	1165
Lime and shale breaks	35	1200
Shale, sand and lime	10	1210
Shale, lime shells	10	1220
Broken lime	30	1250
Light gray lime hard	50	1300
Green lime shaly	25	1325
Green shaly lime	50	1375
Gray lime	25	1400
Light brown lime	25	1425
Light brown sandy lime hard	23	1448
Sand light brown	2	1450
White sand	40	1490
Medium white sand	10	1500
Soft sand	46	1546
Hard sand	4	1550
Medium sand	25	1575
Hard sand	20	1595
Medium sand	18	1613
Black lime hard	11	1624
Green lime and shale	2	1626
Green and blue shale, tough	24	1650
Gray shaly lime	21	1671

A 25-in. diameter hole was drilled to a depth of 404 ft, reduced to 19 in. between 404 and 1103 ft, reduced to 17 in. between 1103 and 1256 ft, and finished 13.2 in. in diameter from 1256 to 1671 ft. The well is cased with 26-in. drive pipe from land surface to a depth of 63.5 ft, 20-in. pipe from land surface to a depth of 401 ft (cemented in), 18-in. liner from 1006 ft to a depth of 1103 ft, and 16-in. liner from 1134 ft to a depth of 1256 ft.

The well was shot at seven levels as follows: 206 lb from 1602 to 1608 ft, 408 lb from 1583 to 1595 ft, 408 lb from 1566 to 1578 ft, 408 lb from 1548 to 1560 ft, 408 lb from 1530 to 1542 ft, 409 lb from 1510 to 1522 ft, and 610 lb from 1553 to 1570 ft.

A production test was conducted by the driller on August 31-September 1, 1964. After 25 hr of pumping at a rate of 1059 gpm, the drawdown was 176 ft from a nonpumping water level of 487 ft below land surface. After testing, the well was shot with 100 lb of dynamite.

A second production test was conducted on November 2-3, 1964, by representatives of the driller and Casler & Associates, Consulting Engineers. After 4.8 hr of pumping at rates of 600 to 812 gpm, the drawdown was 111 ft from a nonpumping water level of 501 ft below land surface. Pumping was continued for 16.6 hr at rates ranging from 1001 to 968 gpm with a drawdown of 144 ft. After an additional 3.4 hr of pumping at rates ranging from 728 to 1319 gpm, the maximum drawdown was about 157 ft. After pumping was stopped for 3.8 hr, the water level had recovered to 548 ft.

In December 1964, the well reportedly produced 1000 gpm for 8 hr with a drawdown of 124 ft from a nonpumping water level of 5 32 ft below land surface.

After the well was cleaned out in 1965 to a depth of 1600 ft, a production test was conducted by the Wehling Well Works, Beecher, on December 16-21, 1965. After 122.5 hr of pumping at rates ranging from 1746 to 1416 gpm, the final drawdown was 193 ft from a nonpumping water level of 549 ft below land surface.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 252089) set at 915 ft, operated at 1210 gpm, and powered by a 600-hp 1780 rpm U. S. Hollo-shaft electric motor. The well is equipped with 915 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42693) of a sample collected April 22, 1977, after pumping for 24 hr at 1120 gpm, showed the water to have a hardness of 207 mg/1, total dissolved minerals of 485 mg/1, and an iron content of 0.3 mg/1. Hydrogen sulfide was apparent when previous samples were collected.

ESSINGTON ROAD WELL (also known as Well 10D), open to the Cambrian-Ordovician aquifer, was completed in 1970 to a depth of 1572 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located west of Essington Road, south of Twin Oaks Drive, approximately 700 ft N and 454 ft W of the SE corner of Section 11, T35N, R9E. The land surface elevation at the well is approximately 610 ft.

A drillers log of the Essington Road Well follows:

Strata	Thickness (ft)	Depth (ft)
Sand and gravel	40	40
Dolomite	170	210
Dolomite and shale	10	220
Shale, some dolomite	20	240
Shale	70	310
Limestone	325	635
Sandstone	145	780
Limestone and shale	80	860
Limestone	375	1235
Limestone and shale	45	1280
Sandstone	20	1300
Limestone	30	1330
Limestone and shale	20	1350
Limestone	40	1390
Sandstone	140	1530
Limestone and shale	42	1572

A 30-in. diameter hole was drilled to a depth of 43 ft, reduced to 25.5 in. between 43 and 380 ft, reduced to 19.2 in. between 380 and 860 ft, and finished 15.2 in. in diameter from 860 to 1572 ft. The well is cased with 30-in. pipe from land surface to a depth of 43 ft, 26-in. pipe from land surface to a depth of 59 ft, 20-in. pipe from land surface to a depth of 363 ft (cemented in), and 16-in. liner from 760 ft to a depth of 860 ft.

The well was shot at eight levels as follows: 200 lb from 1510 to 1520 ft, 250 lb from 1493 to 1505 ft, 250 lb from 1471 to 1483 ft, 250 lb from 1449 to 1461 ft, 250 lb from 1429 to 1441 ft, 250 lb from 1503 to 1515 ft, 250 lb from 1483 to 1493 ft, and 300 lb from 1458 to 1471 ft.

A production test was conducted by the driller on June 12, 1970. After 4.2 hr of pumping at rates ranging from 490 to 800 gpm, the drawdown was 122 ft from a nonpumping water level of 510 ft below the top of the casing.

A second production test was conducted by the driller on June 15, 1970. After 16 hr of pumping at rates ranging from 500 to 1300 gpm, the final drawdown was 202 ft from a nonpumping water level of 510 ft below the top of the casing.

The pumping equipment presently installed is a Peerless turbine pump set at 850 ft, rated at 1200 gpm at about 960 ft TDH, and powered by a 500-hp Ideal electric motor. The well is equipped with 850 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003736) is for a water sample from the well collected April 2, 1979, after pumping for 24 hr at 1300 gpm.

ESSINGTON ROAD WELL, LABORATORY NO. C003736

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.8		Silica	SiO_2	8	
Manganese	Mn	0.00		Fluoride	F	1.3	0.07
Ammonium	NH_4	1.4	0.08	Boron	B	0.7	
Sodium	Na	60	2.61	Cyanide	CN	0.01	
Potassium	K	20.2	0.52	Nitrate'	NO_3	27.4	0.44
Calcium	Ca	60	2.99	Chloride	Cl	29	0.82
Magnesium	Mg	22	1.81	Sulfate	SO_4	87	1.81
				Alkalinity(as$CaCO_3$)		260	5.20
Arsenic	As	0.000		Hardness(as$CaCO_3$)		242	4.84
Barium	Ba	<0.1					
Cadmium	Cd	<0.01		Total dissolved			
Chromium	Cr	<0.02		minerals		484	
Copper	Cu	<0.02					
Lead	Pb	<0.01					
Mercury	Hg	0.0000					
Nickel	Ni	<0.1					
Selenium	Se	0.00					
Silver	Ag	<0.02					
Zinc	Zn	0.04		pH (as rec'd)		8.0	

ROONEY SITE WELL (also known as Well 11D), open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in December 1975 to a depth of 1623 ft by the Wehling Well Works, Beecher. This well was not in use during 1980. The well is located about 75 ft north and 145 ft west of the intersection of Ingalls Ave. and Gaylord Road, approximately 2540 ft S and 1495 ft W of the NE corner of Section 1, T35N, R9E. The land surface elevation at the well is approximately 619 ft.

A drillers log of the Rooney Site Well follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	18	18
Lime	57	75
White lime	35	110
Gray lime	10	120
Gray and brown lime	15	135
Lime	105	240
Lime dark gray with shale	15	255
Shale dark gray	15	270
White lime with shale	5	275
Dark gray shale	90	365
Lime	70	435
Brown lime	85	520
Lime	85	605
Brown lime	55	660
Brown and white lime with sand	35	695
Sand	25	720
St. Peter sand	40	760
Sand, shale "Gumbo"	20	780
Sand shale	20	800
Sand	55	855
White lime with sand and shale	50	905
Brown lime with sand and shale	30	935
Sand with shale and lime	50	985
Lime with sand	40	1025
Lime	270	1295
Lime, sand and shale	172	1467
Sand with some lime	23	1490
Sand	90	1580
Shale	10	1590
Shale with lime and sand	33	1623

A 20-in. diameter hole was drilled to a depth of 22 ft, reduced to 19 in. between 22 and 1014 ft, and finished 15 in. in diameter from 1014 to 1623 ft. The well is cased with 20-in. black steel pipe from land surface to a depth of 22 ft and 16-in. black steel pipe from land surface to a depth of 1014 ft (cemented in).

This well was shot with 560 qt of nitrogel in 7 shots plus 320 qt of nitrogel in 3 shots between the depths of 1515 and 1572 ft. A production test was then conducted by the driller on March 25-26, 1976. After 24 hr of pumping at rates ranging from 1057 to 416 gpm, the drawdown was 144 ft from a nonpumping water level of 640 ft. After this test, this well was shot again with 1100 lb of explosives between 1440 and 1480 ft and with 300 lb of explosives between 15 32 and 1542 ft.

A second production test was conducted by the driller on August 2-3, 1976. After 23.5 hr of pumping at rates ranging from 810 to 1193 gpm, the final drawdown was 157 ft from a nonpumping water level of 647 ft below land surface.

The pumping equipment presently installed is a Johnston turbine pump set at 950 ft, rated at 1000 gpm, and powered by a 500-hp electric motor.

A partial analysis of a sample (Lab. No. 201597) collected during the initial production test, showed the water to have a hardness of 222 mg/1, total dissolved minerals of 470 mg/1, and an iron content of 0.5 mg/1.

HOMART SITE WELL (also known as Well 12D), open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in October 1975 to a depth of 1557 ft by the Wehling Well Works, Beecher. This well was not in use during 1980. The well is located about 350 ft south and 80 ft east of the intersection of Central Drive and Glosgow St., approximately 2415 ft N and 1415 ft E of the SW corner of Section 25, T36N, R9E. The land surface elevation at the well is approximately 602 ft.

A drillers log of the Homart Site Well follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	25	25
Lime	80	105
Lime with green shale	20	125
Lime	111	236
Lime with shale	9	245
Shale	80	325
Shale with lime	5	330
Lime with shale	10	340
Lime	115	455
Lime with sand	80	535
Lime	148	683
Sand	127	810
Sand with lime stringers	30	840
Sand	60	900
Sand with shale	15	915
Sand, shale and lime	5	920
Lime and shale	5	925
Shale with lime	10	935
Lime with shale	5	940
Lime	115	1055
Lime white, brown	15	1070
Lime	75	1145
Hard lime	35	1180
Lime	50	1230
Lime with sand	45	1275
Sand with lime	70	1345
Sand	15	1360
Lime with sand	190	1550
Shale	7	1557

A 20-in. diameter hole was drilled to a depth of 34 ft, reduced to 19 in. between 34 and 964 ft, and finished 15 in. in diameter from 964 to 1557 ft. The well is cased with 20-in. black steel pipe from land surface to a depth of 34 ft and 16-in. black steel pipe from land surface to a depth of 964 ft (cemented in).

After the well was shot with 45 5 qt of nitrogel between 1450 and 1515 ft, a production test was conducted by the driller on March 1-2, 1976. After 22.8 hr of pumping at rates ranging from 960 to 1406 gpm, the maximum drawdown was 100 ft from a nonpumping water level of 570 ft. Thirty min after pumping was stopped, the water level had recovered to 599 ft.

A second production test was conducted by the driller on April 6-7, 1976. After 20 hr of pumping at rates of 986 to 1706 gpm, the drawdown was 110 ft from a nonpumping water level of 570 ft. Pumping was continued for 7 hr at rates ranging from 1496 to 853 gpm with a final drawdown of 70 ft.

A third production test was conducted by the driller on May 4-5, 1976. After 20.2 hr of pumping at rates ranging from 820 to 1980 gpm, the drawdown was 100 ft from a nonpumping water level of 573 ft.

The pumping equipment presently installed is a Johnston vertical turbine pump set at 800 ft, rated at 1000 gpm, and powered by a 400-hp Ideal electric motor.

A partial analysis of a sample (Lab. No. 201598) collected during the second production test, after pumping for 25 hr at rates of 986 to 1706 gpm, showed the water to have a hardness of 228 mg/1, total dissolved minerals of 423 mg/1, and an iron content of 0.9 mg/1.

A description of the wells in the Hadley Bedrock Valley follows:

In 1941, it was noted that during the previous 30 years, nonpumping water levels in the city wells had lowered 200 to 250 ft. In 1942-43, a study was made on two large buried bedrock valleys east of Joliet, which roughly coincide with the existing valleys of Spring and Hickory Creeks and a third, called Hadley Bedrock Valley, which forms a connecting channel between the two. As a result of field studies and reports on the respective hydrologic and geologic factors involved, 11 test wells and a number of observation wells were drilled in an area extending 1 mile in width and from 8 to 10 miles northeast of Joliet. Pumping tests were conducted to determine the potential capabilities of the glacial drift and shallow bedrock aquifers. As a result of this study, 5 gravel wells and 3 deep sandstone wells were constructed.

GRAVEL WELL NO. 1 (Site 6), finished in sand and gravel, was completed in May 1950 to a depth of 103 ft by the Layne-Western Co., Aurora. The well is located east of Gougar Road about 0.4 mile north of U. S. Route 6, approximately 562 ft S and 740 ft E of the NW corner of Section 5, T35N, R11E. The land surface elevation at the well is approximately 650 ft.

A sample study log of Gravel Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Soil, silty, brownish black	1	1
Gravel, sandy, white to gray, dark yellowish orange at top; numerous dolomite pebbles and granules; few calcite grains	74	75
Gravel, light gray to buff; numerous dolomite pebbles, average 5 mm., maximum 8 mm.	30	105

Strata (continued)	Thickness (ft)	Depth (ft)
Sand and gravel, silty; numerous dolomite pebbles and grains; few calcite grains	10	115
Sand, slightly silty, fine to coarse, numerous dolomite grains; few calcite grains	10	125

A 48-in. diameter hole was drilled to a depth of 25 ft and finished 36 in. in diameter from 25 to 103 ft. The well is cased with 48-in. surface pipe from land surface to a depth of 25 ft, 36-in. pipe from land surface to a depth of 50 ft, and 18-in. pipe from about 0.8 ft above land surface to a depth of 63 ft followed by 40 ft of 18-in. No. 6 (0.080 in.) Layne brass shutter screen. The annulus between the 48- and 36-in. casings is filled with cement from 0 to 25 ft and the annulus between the 36- and 18-in. casings and between the bore hole and casing-screen assembly is filled with selected gravel from 0 to 103 ft.

Upon completion, the well reportedly produced 970 gpm for 14 hr with a drawdown of 60 ft from a nonpumping water level of 9 ft below the pump base.

A production test using four observation wells was conducted on June 21-22, 1950, by representatives of the driller, the State Water Survey, and Consoer, Townsend & Associates, Consulting Engineers. After 2.6 hr of pumping at rates of 508 to 950 gpm, the drawdown was 19 ft from a nonpumping water level of 4 ft below land surface. Pumping was continued for 7.5 hr at rates ranging from 717 to 1148 gpm with a drawdown of 25 ft. After an additional 14.2 hr of pumping at a rate of 1280 gpm, the final drawdown was 31 ft. Twenty min after pumping was stopped, the water level had recovered to 11 ft.

In May 1962, the pump was pulled and the well was cleaned to the bottom. The column pipe and screen were replaced where needed.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 73353) set at about 85 ft, rated at 1000 gpm, and powered by a 50-hp 1800 rpm U. S. electric motor (Serial No. 818311). The well is equipped with 85 ft of airline.

A mineral analysis of a sample (Lab. No. 157250) collected April 13, 1962, showed the water to have a hardness of 731 mg/1, total dissolved minerals of 905 mg/1, and an iron content of 2.9 mg/1.

GRAVEL WELL NO. 2 (Site 2),finished in sand and gravel, was completed in May 1950 to a depth of 90 ft by the Layne-Western Co., Aurora. The well is located on the south side of U. S. Route 6 about 0.2 mile east of Gougar Road, approximately 2500 ft N and 980 ft E of the SW corner of Section 5, T35N, R11E. The land surface elevation at the well is approximately 668 ft.

A 48-in. diameter hole was drilled to a depth of 25 ft and finished 36 in. in diameter from 25 to 90 ft. The well is cased with 48-in. steel pipe from land surface to a depth of 25 ft, 36-in. pipe from land surface to a depth of 50 ft, and 18-in. steel pipe from about 3 ft above the pumphouse floor to a depth of 60 ft followed by 30 ft of 18-in. No. 6 (0.080 in.) Layne bronze shutter screen. The annulus between the 48- and 36-in. casings is filled with cement from 0 to 25 ft and the annulus between the 36- and 18-in. casings and between the bore hole and casing-screen assembly is filled with 1/16 to 1/8 in. gravel from 0 to 90 ft.

A production test using one observation well was conducted on May 11-12, 1950, by representatives of the driller and the State Water Survey. After 7.9 hr of pumping at rates of 195 to 812 gpm, the drawdown was 47.5 ft from a nonpumping water level of 28.5 ft below land surface. Fifteen min after pumping was stopped, the water level had recovered to 30.5 ft. Pumping was then continued for 15.3 hr at a rate of 609 gpm with a final drawdown of 34.5 ft.

In November 1963, the pump was pulled and the well was cleaned to the bottom. Parts were replaced where needed.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 73351) set at 70 ft, rated at 600 gpm, and powered by a 50-hp 1800 rpm U. S. electric motor (Serial No. 817302). The well is equipped with 70 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B052947) of a sample collected April 30, 1981, after pumping for 24 hr at 575 gpm, showed the water to have a hardness of 498 mg/1, total dissolved minerals of 604 mg/1, and an iron content of 2.23 mg/1.

GRAVEL WELL NO. 3 (Site 5), finished in sand and gravel, was completed in August 1950 to a depth of 83 ft by the Layne-Western Co., Aurora. The well is located east of Gougar Road about 0.5 mile south of U. S. Route 6, approximately 60 ft S and 540 ft E of the NW corner of Section 8, T35N, R11E. The land surface elevation at the well is approximately 674 ft.

A drillers log of Gravel Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Water	4	4
Concrete	1.5	5.5
Sand, rock cuttings	18.5	24
Concrete	3	27
Clay	21.5	48.5
Coarse gravel and boulders	34.5	83
Blue clay below		

A 48-in. diameter hole was drilled to a depth of 25 ft and finished 36 in. in diameter from 25 to 83 ft. The well is cased with 48-in. steel pipe from land surface to a depth of 25 ft, 36-in. pipe from 2 ft above land surface to a depth of 50.8 ft, and 18-in. steel pipe from about 1.5 ft above the pumphouse floor to a depth of 58 ft followed by 25 ft of 18-in. No. 6 (0.080 in.) Layne bronze shutter screen. The

annulus between the 48- and 36-in. casings is filled with cement from 0 to 25 ft and the annulus between the 36- and 18-in. casings and between the bore hole and casing-screen assembly is filled with pea gravel and flint sand from 0 to 83 ft.

A production test using one observation well was conducted on August 14, 1950, by representatives of the driller and Consoer, Townsend & Associates, Consulting Engineers. After 1.3 hr of pumping at rates of 421 to 433 gpm, the drawdown was 6.6 ft from a nonpumping water level of 35.3 ft below land surface. Pumping was continued for 1.7 hr at a rate of 618 gpm with a drawdown of 10.5 ft. Pumping was continued for 1.7 hr at a rate of 805 gpm with a drawdown of 14.0 ft. After an additional 19.3 hr of pumping at rates ranging from 1007 to 1227 gpm, the final drawdown was 27.0 ft. Twenty min after pumping was stopped, the water level had recovered to 43.8 ft.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 73352) set at 78 ft, rated at 1200 gpm, and powered by a 50-hp 1800 rpm U. S. electric motor (Serial No. 818313). The well is equipped with 78 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C007017) of a sample collected April 9, 1974, after pumping for 8 hr at 850 gpm, showed the water to have a hardness of 544 mg/1, total dissolved minerals of 634 mg/1, and an iron content of 2.4 mg/1.

GRAVEL WELL NO. 4 (Site 9), finished in sand and gravel, was completed in September 1950 to a depth of 113 ft by the Layne-Western Co., Aurora. The well is located about 0.8 mile north of U. S. Route 6 and 0.7 mile east of Gougar Road, approximately 1863 ft N and 1700 ft W of the SE corner of Section 32, T36N, R11E. The land surface elevation at the well is approximately 688 ft.

A drillers log of Gravel Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	1	1
Blue clay and boulders	39	40
Boulders	30	70
Fine sand	40	110
Cemented gravel	2	112
Blue clay below		

A 48-in. diameter hole was drilled to a depth of 25 ft and finished 36 in. in diameter from 25 to 113 ft. The well is cased with 48-in. pipe from land surface to a depth of 25 ft, 36-in. pipe from 1.5 ft above land surface to a depth of 52 ft, and 18-in. pipe from 2 ft above land surface to a depth of about 73 ft followed by 40 ft of 18-in. No. 6 (0.080 in.) Layne brass shutter screen. The annulus between the 48- and 36-in. casings is filled with cement from 0 to 25 ft and the annulus between the 36- and 18-in. casings and between the bore hole and casing-screen assembly is filled with pea gravel and flint sand from 0 to 113 ft.

A production test using one observation well was conducted on September 8-9, 1950, by representatives of the driller and Consoer, Townsend & Associates, Consulting Engineers. After 17 hr of pumping at a rate of 1130 gpm, the drawdown was 22.0 ft from a nonpumping water level of 34.8 ft below land surface. Pumping was continued for 6 hr at rates of 901 to 458 gpm with a drawdown of 7.0 ft. After an additional 1.5 hr of pumping at rates of 1120 to 1125 gpm, the final drawdown was 21.0 ft. Ten min after pumping was stopped, the water level had recovered to 35.0 ft.

In 1963, the pump was pulled and the well was cleaned to the bottom. Parts were replaced where needed.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 73355) set at 101 ft, rated at 1000 gpm, and powered by a 50-hp 1800 rpm U. S. electric motor (Serial No. 818581). The well is equipped with 101 ft of airline.

A partial analysis of a sample (Lab. No. 163084) collected June 1, 1964, showed the water to have a hardness of 540 mg/1, total dissolved minerals of 676 mg/1, and an iron content of 1.6 mg/1.

GRAVEL WELL NO. 5 (Site 3), finished in sand and gravel, was completed in August 1950 to a depth of 94 ft by the Layne-Western Co., Aurora. The well is located about 0.6 mile north of U. S. Route 6 and 0.5 mile east of Gougar Road, approximately 579 ft N and 2740 ft E of the SW corner of Section 32, T36N, R11E. The land surface elevation at the well is approximately 662 ft.

A drillers log of Gravel Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	25	25
Blue gravelly clay	5	30
Gravel with large rocks	5	35
Hard packed gravel	20	55
Gravel	15	70
Loose gravel	25	95

A 48-in. diameter hole was drilled to a depth of 25 ft and finished 36 in. in diameter from 25 to 94 ft. The well is cased with 48-in. steel pipe from land surface to a depth of 25 ft, 36-in. pipe from land surface to a depth of 50 ft, and 18-in. steel pipe from about 0.4 ft above the wellhouse floor to a depth of about 59 ft followed by 35 ft of 18-in. No. 6 (0.080 in.) Layne shutter screen. The annulus between the 48- and 36-in. casings is filled with cement from 0 to 25 ft and the annulus between the 36- and 18-in. casings and between the bore hole and casing-screen assembly is filled with gravel from 0 to 94 ft.

A production test using one observation well was conducted on August 21-22, 1950, by representatives of the driller and Consoer, Townsend & Associates, Consulting Engineers. After 18 hr of pumping at a rate of 1018 gpm, the drawdown was 47.0 ft from a nonpumping water level of 16.8 ft below land surface. Pumping was continued for 5.5 hr at rates of 805 to 408 gpm with a drawdown of 22.0

ft. After an additional 30 min of pumping at an increased rate of 1029 gpm, the final drawdown was 47.5 ft. Twenty min after pumping was stopped, the water level had recovered to 18.3 ft.

In 1963, the pump was pulled and the well was cleaned to the bottom. The column pipe was replaced where needed.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 73354) set at about 85 ft, rated at 1000 gpm, and powered by a 50-hp 1800 rpm U. S. electric motor (Serial No. 818313). The well is equipped with 84 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B43425) is for a water sample from the well collected April 27, 1977, after 24 hr of pumping at 420 gpm.

GRAVEL WELL NO. 5, LABORATORY NO. B43425

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.4		Silica	SiO_2	14	
Manganese	Mn	0.04		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.28	0.02	Boron	B	0.3	
Sodium	Na	21	0.91	Cyanide	CN	0.00	
Potassium	K	3.3	0.08	Nitrate	NO_3	0.0	0.00
Calcium	Ca	140	6.99	Chloride	Cl	4.4	0.12
Magnesium	Mg	58	4.77	Sulfate	SO_4	290	6.03
				Alkalinity(as $CaCO_3$)		330	6.60
Arsenic	As	0.00		Hardness(as $CaCO_3$)		600	12.00
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		791	
Copper	Cu	0.01					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.3	

ROCK WELL NO. 1 (Site 6, Warren - also known as Well 8D), open to the Cambrian-Ordovician aquifer, was completed in August 1949 to a depth of 1660 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located north of U. S. Route 6 and east of Gougar Road in the same pumphouse as Gravel Well No. 1, approximately 562 ft S and 730 ft E of the NW corner of Section 5, T35N, R11E. The land surface elevation at the well is approximately 648 ft.

A drillers log of Rock Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Surface material	8	8
Gravel	8	16
Sand and gravel	12	28
Sand	62	90
Gravel	15	105
Blue mud and gravel	11	116
Sand and gravel	14	130
Gray lime	205	335
Lime	10	345
Shale	5	350
Lime and shale breaks	5	355
Shale	6	361
Lime	84	445
Shale	3	448
Lime	7	455
Shale	2	457
Lime	20	477
Shale	80	557
Lime and shale	11	568
Brown lime	84	652
Gray lime	33	685
Brown lime	128	813
White sand	215	1028
Lime	335	1363
Broken and green shale lime	20	1383
Brown lime	92	1475
Sand	139	1614
Limestone and shale	46	1660

A 28-in. diameter hole was drilled to a depth of 652 ft, reduced to 19 in. between 652 and 1028 ft, and finished 15 in. in diameter from 1028 to 1660 ft. The well is cased with 28-in. ID pipe from land surface to a depth of 140 ft, 19-in. ID pipe from about 0.8 ft above the pumphouse floor to a depth of 652 ft (cemented in), and a 15-in. liner from 955 ft to a depth of 1028 ft.

Between August and November 1949, this well was shot at five levels as follows: 400 lb of nitrogel between 1597.6 and 1610 ft, 400 lb of gel between 1572.6 and 1585 ft, 600 lb of gel and 10 lb primer between 1612 and 1625 ft, 500 lb of gel between 1584 and 1594 ft, and 400 lb of gel between 1563 and 1575 ft. Sandstone was found to be very soft and caved into the well. Bailing was discontinued at 1608 ft in February 1950.

A production test was conducted on March 6-7, 1950, by representatives of the driller, the State Water Survey, and Consoer, Townsend & Associates, Consulting Engineers. After 15.8 hr of pumping at rates ranging from 475 to 1005 gpm, the final drawdown was 164 ft from a nonpumping water level of 427 ft.

A second production test was conducted on March 24-25, 1950, by representatives of the driller and Consoer, Townsend & Associates, Consulting Engineers. After 17.7 hr of pumping at rates ranging from 800 to 1040 gpm, the final drawdown was 160 ft from a nonpumping water level of 425 ft. Four hr after pumping was stopped, the water level had recovered to 444 ft.

From May to November 1962, the pump was pulled and the well was cleaned to the bottom.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 73356) set at 950 ft, rated at 900 gpm, and powered by a 300-hp 1800 rpm U. S. electric motor (Serial No. 818501). The well is equipped with 950 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B052854) of a sample collected April 29, 1981, after pumping for 24 hr, showed the water to have a hardness of 251 mg/l, total dissolved minerals of 530 mg/l, and an iron content of 0.37 mg/l.

ROCK WELL NO. 2 (Site 5, Woodruff - also known as Well 7D), open to the Cambrian-Ordovician aquifer, was completed in May 1950 to a depth of 1701 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located east of Gougar Road in the same pumphouse as Gravel Well No. 3, approximately 60 ft S and 530 ft E of the NW corner of Section 8, T35N, R11E. The land surface elevation at the well is approximately 674 ft.

A sample study summary log of Rock Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Till, clayey, dark yellowish orange	14	14
Till, silty, yellowish gray	56	70
Sand, gravel to ½ in., yellowish gray	20	90
Till, silty, gray	15	105
Gravel to ½ in., yellowish gray	7	112
SILURIAN SYSTEM		
Niagaran Series		
Dolomite, silty, light yellowish gray, fine to very fine; dolomite, yellowish gray, pink, green at base	118	230
Alexandrian Series		
Dolomite, light yellowish gray to dark yellowish gray, fine	75	305
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, light yellowish gray to yellowish brown, fine	70	375
Shale, dark yellowish gray, weak	60	43i
Galena Group		
Dolomite, light yellowish gray, fine to coarse	195	630
Platteville Group		
Dolomite, light yellowish brown, fine to coarse	145	775
Ancell Group		
Glenwood Formation		
Limestone, light yellowish gray to light yellowish brown, very fine; sandstone, gray, fine to coarse, incoherent	20	795
St. Peter Sandstone		
Sandstone, light gray, very fine to coarse, incoherent, shale, yellowish gray to green, weak at base	115	910
Canadian Group		
Shakopee Dolomite		
Dolomite, light yellowish brown, very fine to medium; sandstone, light gray, medium to coarse, incoherent; shale, light green, weak	30	940
Oneota Dolomite		
Dolomite, light yellowish gray, white, pink, fine to coarse; shale, pink, light green, weak at base	260	1200
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, light yellowish brown, fine to medium	163	1363
Franconia Formation		
Dolomite, purplish pink, grayish green, fine to coarse; sandstone light gray, incoherent to compact; dolomite, gray to brownish gray, fine to medium	132	1495
Ironton Sandstone		
Sandstone, light gray, very fine to coarse, incoherent	55	1550
Galesville Sandstone		
Sandstone, light gray, very fine to very coarse, incoherent to compact	115	1665
Eau Claire Formation		
Dolomite, grayish brown, fine to medium; shale, yellowish gray, weak; sandstone, yellowish gray, fine to compact	35	1700

A 27-in. diameter hole was drilled to a depth of 141 ft, reduced to 20 in. between 141 and 1294 ft, and finished 15 in. in diameter from 1294 to 1701 ft. The well is cased with 28-in. OD pipe from land surface to a depth of 113.5 ft, 20-in. OD pipe from about 0.8 ft above the pumphouse floor to a depth of 549 ft (cemented in), and a 16-in. OD liner from 1183 ft to a depth of 1303 ft.

On May 23, 1950, the well was shot with 400 lb of 100 percent nitrogel and 60 lb of 60 percent dynamite between the depths of 1623 and 1635 ft following which the well was filled with sand up to 1600 ft.

A production test was conducted on June 26, 1950, by representatives of the driller, the State Water Survey, and Consoer, Townsend & Associates, Consulting Engineers. After 6 hr of pumping at rates of 515 to 990 gpm, the drawdown was 95 ft from a nonpumping water level of 457 ft. After a 17-min idle period, pumping was continued for 17.1 hr at rates ranging from 1100 to 1040 gpm with a drawdown of 128 ft. After an additional 1.6 hr of pumping at rates ranging from 905 to 630 gpm, the drawdown was *99* ft.

On June 6, 1960, the pump was removed because of a leak in the shaft tubing. The well had filled up to 1606 ft and 130 cubic yards of sand was removed. The nonpumping water level was reported to be 5 3 3 ft.

In 1963, the pump was pulled, the well was cleaned to the bottom, and the pump was placed at a lower depth. Column pipe was replaced as needed.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 73358) set at 960 ft, rated at 900 gpm, and powered by a 500-hp 1770 rpm Ideal electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B052853) of a sample collected April 29, 1981, after pumping for 24 hr, showed the water to have a hardness of 261 mg/1, total dissolved minerals of 573 mg/1, and an iron content of 0.33 mg/1.

ROCK WELL NO. 3 (Site 1, Briick Farm - also known as Well 6D), open to the Cambrian-Ordovician aquifer, was completed in March 1950 to a depth of 1656 ft by the J. P. Miller Artesian Well Co., Brookfield. This well is not in use. The well is located east of Farrell Road about 0.6 mile north

of U. S. Route 6, approximately 560 ft N and 570 ft E of the SW corner of Section 31, T36N, R11E. The land surface elevation at the well is approximately 642 ft.

A drillers log of Rock Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Surface	14	14
Gray	26	40
Sand	35	75
Blue mud	23	98
Lime	108	206
Shale	2	208
Lime and shale	10	218
Green shale	9	227
Lime	88	315
Lime and shale breaks	13	328
Shale	10	338
Lime and shale	9	347
Shale	81	428
Lime	31	459
Lime and shale break	4	463
Lime	137	600
Gray lime	30	630
Brown lime	135	765
St. Peter sand	495	1260
Red mud	1	1261
Lime	5	1266
Red mud	6	1272
Red mud and lime	11	1283
Lime shell and red mud	95	1378
Red rock	9	1387
Gray shale and lime	19	1406
Green lime	4	1410
Shale and lime	7	1417
Brown lime	21	1438
Shale	4	1442
Lime	23	1465
Sand	144	1609
Green lime and shale	47	1656

A 25-in. diameter hole was drilled to a depth of 577 ft, reduced to 19 in. between 577 and 1451 ft, and finished 16 in. in diameter from 1451 to 1656 ft. The well is cased with 26-in. steel pipe from land surface to a depth of 104 ft, 20-in. OD steel pipe from about 1.5 ft above the pumphouse floor to a depth of 577 ft (cemented in), and 16-in. steel liner from 1210 ft to a depth of 1451 ft.

On April 21, 1950, the well reportedly produced 660 gpm for 5 hr with a drawdown of 166 ft from a nonpumping water level of 434 ft below land surface.

A production test was conducted on May 25-26, 1950, by representatives of the driller and the State Water Survey. After 20.2 hr of pumping at rates ranging from 355 to 795 gpm, the final drawdown was 153 ft from a nonpumping water level of 447 ft below land surface. Fifty min after pumping was stopped, the water level had recovered to 488 ft.

From November 1961 to March 1962, the pump was pulled and the well was cleaned to the bottom.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 73357) set at 950 ft, rated at 900 gpm, and powered by a 300-hp 1800 rpm U. S. electric motor (Serial No. 818503).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B43412) is for a water sample from the well collected April 25, 1977, after 24 hr of pumping at 750 gpm.

ROCK WELL NO. 3, LABORATORY NO. B43412

		mg/1	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.3		Silica	SiO_2	6.9	
Manganese	Mn	0.01		Fluoride	F	1.4	0.07
Ammonium	NH_4	0.98	0.05	Boron	B	0.7	
Sodium	Na	92	4.00	Cyanide	CN	0.00	
Potassium	K	14.9	0.38	Nitrate	NO_3	0.0	0.00
Calcium	Ca	64	3.19	Chloride	Cl	54	1.52
Magnesium	Mg	22	1.81	Sulfate	SO_4	130	2.70
				Alkalinity(as $CaCO_3$)		265	5.30
Arsenic	As	0.00		Hardness(as $CaCO_3$)		256	5.12
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		578	
Copper	Cu	0.03					
Lead	Pb	0.00					
Mercury	Hg	0.0002					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.6	

JOLIET CORRECTIONAL CENTER

Joliet Correctional Center (est. 1780), located on the north edge of Joliet east of Route 171, installed a public water supply in 1926. One well (No. 2) is in use. In 1952 the estimated average pumpage was 350,000 to 400,000 gpd. In 1979 the estimated average and maximum pumpages were 300,000 and 400,000 gpd, respectively. The water is chlorinated.

WELL NO. 1, finished in the St. Peter Sandstone, was constructed prior to 1917 to a depth of 575 ft and deepened prior to 1933 to a reported depth of about 780 ft. This well was abandoned in 1952. The well is located back of the general kitchen, approximately 2915 ft N and 3240 ft W of the SE corner of Section 3, T35N, R10E. The land surface elevation at the well is approximately 550 ft.

The well is cased with 6-in. pipe to an unknown depth.

In 1921, the nonpumping water level was reported to be 35 ft below land surface.

In 1942, the well reportedly produced at a rate of 320 gpm with a drawdown of 10 ft from a nonpumping water level of 292 ft.

On August 4, 1948, during a production test in a new well (Well No. 3), the pump in this well broke suction. The pumping water level was reported to be 538 ft. Four hr after the test was stopped, the water level recovered and the pump resumed production at its normal rate.

A partial analysis of a sample (Lab. No. 97799) collected October 18, 1943, showed the water to have a hardness of 373 mg/1, total dissolved minerals of 848 mg/1, and an iron content of 0.3 mg/1.

WELL NO. 2, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in February 1928 to a depth of 1550 ft (cleaned out in 1970 to a depth of 1533 ft) by the Gray Well Drilling Co., Milwaukee, Wis. The well is located adjacent to the southwest corner of the powerhouse within the walls of the Correctional Center, approximately 2880 ft N and 3265 ft W of the SE corner of Section 3, T35N, R10E. The land surface elevation at the well is approximately 549 ft.

A sample study log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
No record	40	40
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomites, water bearing	155	195
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
Dolomite and some shale	35	230
Scales Shale	75	305
Galena and Platteville Groups		
Dolomites	330	635
Ancell Group		
Glenwood Formation		
Sandstone and dolomite	40	675
St. Peter Sandstone		
Sandstone, water bearing	195	870
Sandy shale and chert	73	943
ORDOVICIAN AND CAMBRIAN SYSTEMS		
Oneota, Eminence, and Potosi Dolomites	287	1230
CAMBRIAN SYSTEM		
Franconia Formation		
Sandstone, dolomitic	155	1385
Ironton-Galesville Sandstone		
Sandstone, water bearing	150	1535
Eau Claire Formation		
Shale and sandstone	15	1550

A 19.2-in. diameter hole was drilled to a depth of 40 ft, reduced to 15 in. between 40 and 552.9 ft, reduced to 12.5 in. between 552.9 and 944 ft, and finished 10 in. in diameter from 944 to 1550 ft. The well is cased with 20-in. OD pipe from land surface to a depth of 8 ft, 16-in. OD pipe from land surface to a depth of 40 ft, and 12.5-in. OD steel pipe from land surface to a depth of 552.9 ft (cemented in from 0 to 118 ft). Originally, a 10-in. liner pipe was installed from 602 ft to a depth of 944 ft. In 1942, the 10-in. liner pipe was removed and was apparently replaced with 10-in. pipe from 820 ft to a depth of 944 ft. In 1970, the 10-in. liner pipe was removed again and a 10-in. diameter casing was installed from land surface to a depth of 919 ft (cemented in).

In 1931, the nonpumping water level was reported to be 245 ft.

In 1933, after 1 hr of pumping at a rate of 650 gpm, the drawdown was 6.01 ft from a nonpumping water level of 221.80 ft.

On May 15, 1942, this well was shot at five levels as follows: 75 lb at 1305 ft, 75 lb at 1350 ft, 100 lb at 1385 ft, 100 lb at 1470 ft, and 100 lb at 1530 ft.

On August 10-11, 1942, after the well was shot and the 10-in. liner replaced, the well reportedly produced at rates of 280 to 370 gpm for 28 hr with a drawdown of 19 ft from a nonpumping water level of 292 ft.

In 1944, the well reportedly produced 270 gpm with a drawdown of 11 ft from a nonpumping water level of 342 ft.

On August 20, 1948, after 15 min of pumping at a rate of 212 gpm, the drawdown was 5 ft from a nonpumping water level of 417 ft.

On April 19, 1949, the nonpumping water level was reported to be 405 ft. Well No. 1 was in operation at this time.

On March 20, 1950, the well reportedly produced 575 gpm for 2 hr with a drawdown of 18 ft from a nonpumping water level of 412 ft.

In 1970, this well was rehabilitated by the J. P. Miller Artesian Well Co., Brookfield, to increase its capacity. A bridge was found at a depth of 905 ft. The well was cleaned out to a depth of 1533 ft, the 10-in. diameter liner pipe was removed and a new 10-in. casing was installed from land surface to a depth of 919 ft (cemented in).

After rehabilitation, a production test was conducted by the J. P. Miller Artesian Well Co. on September 21, 1970. After 8 hr of pumping at a rate of 500 gpm, the drawdown was 42 ft from a nonpumping water level of 580 ft below land surface.

The pumping equipment presently installed consists of a 125-hp 1800 rpm U. S. electric motor (Serial No. 742100), a 10-in., 20-stage Peerless vertical turbine pump set at 840 ft, rated at 565 gpm, and has 840 ft of 7-in. column pipe. A 20-ft section of 6-in. suction pipe is attached to the pump intake.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40460) of a sample collected in March 1978, showed the water to have a hardness of 331 mg/1, total dissolved minerals of 750 mg/1, and an iron content of 0.5 mg/1.

WELL NO. 3, open to the Cambrian-Ordovician aquifer, was completed in July 1948 to a depth of 1600 ft (reported to be 1518 ft in 1957) by the J. P. Miller Artesian Well Co., Brookfield. This well was not in use during 1980. The well is located across the street from the Correctional Center in back of the Joliet Reception and Diagnostic Center, approximately 2850 ft N and 2300 ft W of the SE corner of Section 3, T35N, R10E. The land surface elevation at the well is approximately 560 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	2	2
Broken limestone	20	22
White limestone	43	65
Gray limestone	146	211
Gray limestone and shale breaks	29	240
Shale	72	312
Limestone, gray	64	376
Brown limestone	272	648
St. Peter sandstone	214	862
Shale	8	870
Limestone	5	875
Green shale	2	877
Limestone	17	894
Brown limestone	59	953
White limestone	57	1010
Brown limestone	167	1177
Brown limestone (washing cuttings out)	28	1205
Mud (caving)	11	1216
Limestone	19	1235
Limestone (hole caving)	33	1268
Green limestone	32	1300
Shale	10	1310
Limestone	43	1353
Sandstone and limestone	7	1360
Brown limestone	4	1364
Limestone and sandstone	46	1410
Sandstone	140	1550
Green limestone	26	1576
Limestone and shale	11	1587
Shale	13	1600

A 24-in. diameter hole was drilled to a depth of 453 ft, reduced to 15 in. between 453 and 953 ft, and finished 12 in. in diameter from 953 to 1600 ft. The well is cased with 23-in. OD pipe from 0.5 ft above land surface to a depth of 60.5 ft, 16-in. OD pipe from 2.5 ft above land surface to a depth of 449 ft (cemented in), and a 12-in. OD liner pipe from 848 ft to a depth of 95 3 ft.

A production test was conducted on August 3-4, 1948, by representatives of the driller and the State Water Survey. After 20 hr of pumping at rates ranging from 290 to 595 gpm, the drawdown was 90.0 ft from a nonpumping water level of 420.0 ft below the top of the 16-in. casing. Thirty-four min after pumping was stopped, the water level had recovered to 482.0 ft.

On September 8 and 15, and on October 26, 1948, this well was shot with 3 charges of blasting gelatin as follows: 300 lb from 1517 to 1538 ft, 350 lb from 1508 to 1520 ft, and 200 lb from 1471 to 1481 ft. Loose sand was removed and the hole cleaned out to 1600 ft.

After shooting, a production test was conducted on December 7, 1948, by representatives of the driller and the State Water Survey. After 14 hr of pumping at rates ranging from 430 to 654 gpm, the drawdown was 55 ft from a nonpumping water level of 424 ft. Forty min after pumping was stopped, the water level had recovered to 443 ft.

Nonpumping water levels were reported to be 401.2 ft on November 30, 1949, and 444 ft on February 22, 1954.

On February 17, 1971, the J. P. Miller Artesian Well Co. reported that the well produced 750 gpm with a drawdown of 32 ft from a nonpumping water level of 598 ft.

The pumping equipment presently installed consists of a 250-hp U. S. electric motor, a 12-in., 21-stage Peerless turbine pump (Serial No. 75682) set at 770 ft, operated at 800 gpm, and has 770 ft of 7-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40461) is for a water sample from the well collected in March 1978.

WELL NO. 3, LABORATORY NO. B40461

		mg/l	*me/I*			*mg/l*	*me/l*
Iron	Fe	0.3		Silica	SiO_2	9.3	
Manganese	Mn	0.04		Fluoride	F	1.4	0.07
Ammonium	NH_4	0.0	0.05	Boron	B	0.8	
Sodium	Na	95	4.13	Cyanide	CN	0.01	
Potassium	K	15.9	0.41	Nitrate	NO_3	0.0	0.00
Calcium	Ca	73	3.64	Chloride	Cl	81	2.28
Magnesium	Mg	23	1.89	Sulfate	SO_4	103	2.14
				Alkalinity(as $CaCO_3$)		270	5.40
Arsenic	As	0.00		Hardness(as $CaCO_3$)		275	5.50
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		578	
Copper	Cu	0.01					
Lead	Pb	0.00					
Mercury	Hg	0.0001					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.6	

KANKAKEE RIVER STATE PARK

Kankakee River State Park, located just off Illinois Route 113N about halfway between Wilmington and Bourbonnais, installed a public water supply in 1953. This park also extends into Kankakee County and all but one of the wells are located there. Seven wells (Nos. 1 and 3-8) are in use. The average pumpage is estimated to be about 6850 gpd. The water is hypochlorinated.

PARK WELL NO. 1 (Maintenance Building), open to the Silurian dolomite, was completed in April 1953 to a depth of 96 ft (reported to be about 75 ft deep in 1964) by the Milaeger Well & Pump Co., Brookfield, Wis. This well serves the office area and hydrants. The well is located near the main entrance of the park within the maintenance building about 200 ft north of the ranger's office, approximately 850 ft S and 1450 ft W of the NE corner of Section 5, T31N, R11E, Kankakee County. The land surface elevation at the well is approximately 595 ft.

A correlated drillers log of Park Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Soil and Yellow stone	6	6
SILURIAN SYSTEM		
Gray limestone	20	26
White limestone	45	71
ORDOVICIAN SYSTEM		
Maquoketa Group		
Brainard Shale		
Blue shale	25	96

A 10-in. diameter hole was drilled to a depth of 43 ft and finished 6 in. in diameter from 43 to 96 ft. The well is cased with 10-in. drive pipe from 0.5 ft above land surface to a depth of 6 ft and 6-in. pipe from 1 ft above land surface to a depth of 25 ft (cemented in). Originally, the 6-in. casing was set to a depth of 43 ft but was pulled back to 25 ft just above a crevice to increase the yield of the well. The well was then acidized with 500 gal of HCl.

A production test was conducted on May 6-7, 1953, by representatives of the driller and the State Water Survey. After 23.2 hr of pumping at rates ranging from 9.0 to 6.9 gpm, the drawdown was 25.2 ft from a nonpumping water level of 12.0 ft below land surface. After pumping was stopped for 1.1 hr, the water level had recovered to 14.5 ft.

The pumping equipment presently installed is a Goulds submersible turbine pump set at 65 ft, rated at about 30 gpm, and powered by a 1-hp 3450 rpm Century electric motor.

A partial analysis of a sample (Lab. No. 202777) collected July 20, 1976, showed the water to have a hardness of 444 mg/1, total dissolved minerals of 513 mg/1, and an iron content of 0.0 mg/1.

PARK WELL NO. 2 (Old Potawatomi Campgrounds), open to the Silurian dolomite, was completed to a depth of 80 ft. This well was abandoned and plugged in 1969. The well was located at the west end of Camp Site 1, approximately 2025 ft N and 725 ft E of the SW corner of Section 4, T31N, R11E, Kankakee County. The land surface elevation at the well is approximately 585 ft.

The well was cased with 6-in. pipe to an unknown depth.

PARK WELL NO. 3 (Old Potawatomi Campgrounds pumphouse), open to the Silurian dolomite, was completed to a depth of 95 ft. This well serves 1 fountain and 1 hydrant. The well is located about 200 ft east of the river at the east end of former Camp Site 1, approximately 1500 ft N and 1200 ft E of the SW corner of Section 4, T31N, RUE, Kankakee County. The land surface elevation at the well is approximately 585 ft.

The well is cased with 4-in. pipe from 1.6 ft above land surface to a depth of 42 ft.

The pumping equipment presently installed is a Goulds submersible pump rated at about 30 gpm, and powered by a 1/3-hp 3450 rpm Franklin electric motor.

A partial analysis of a sample (Lab. No. 129305) collected July 14, 1952, showed the water to have a hardness of 382 mg/1, total dissolved minerals of 429 mg/1, and an iron content of 0.3 mg/1.

PARK WELL NO. 4 (Concession Stand), open to the Silurian dolomite, was completed in March 1966 to a depth of 83 ft by Cecil Griffy, Kankakee. This well serves the concession stand and one drinking fountain. The well is located near the old Rock Creek clubhouse about 25 ft east of the Kankakee River, approximately 500 ft S and 2100 ft E of the NW corner of Section 5, T31N, R11E, Kankakee County. The land surface elevation at the well is approximately 575 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil and clay	4	4
Brown limestone and clay	11	15
Brown limestone	15	30
White limestone	30	60
Gray limestone	5	65
Dark gray (with particles of white) limestone	14	79
Limestone (some shale)	3	82
Shale	1	83

A 10-in. diameter hole was drilled to a depth of 45 ft and finished 6 in. in diameter from 45 to 83 ft. The well is cased with 6-in. galvanized pipe from 2 ft above land sur-

face to a depth of 45 ft. The top of the well casing is equipped with a Baker pitless adapter.

Upon completion, the well reportedly produced 20 gpm for 4 hr with a drawdown of 6 ft from a nonpumping water level of 30 ft. Twelve min after pumping was stopped, full recovery was observed.

The pumping equipment presently installed is a 15-stage Myers submersible pump (No. SE10A21) set at 45 ft, rated at 15 gpm at about 160 ft head, and powered by a 1-hp electric motor.

A partial analysis of a sample (Lab. No. 202779) collected July 20, 1976, showed the water to have a hardness of 464 mg/1, total dissolved minerals of 548 mg/1, and an iron content of 0.8 mg/1.

PARK WELL NO. 5 (Camp Site 2, Chippewa Campgrounds), open to the Silurian dolomite and the Maquoketa Group, was completed in October 1958 to a depth of 102 ft by Cecil Griffy, Kankakee. This well serves one fountain and four taps in Camp Site 2 of the park. The well is located within the trailer camp site area in the north section of the park, approximately 2500 ft S and 1850 ft E of the NW corner of Section 36, T32N, R10E, Will County. The land surface elevation at the well is approximately 610 ft.

A drillers log of Park Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	1	1
Clay	3	4
Broken limestone and clay	8	12
Brown chalky limestone	38	50
Broken limestone and brown shale	10	60
Broken limestone and gray shale	5	65
Blue gray shale	37	102

A 10-in. diameter hole was drilled to a depth of 50 ft and finished 6 in. in diameter from 50 to 102 ft. The well is cased with 6-in. galvanized pipe from 2 ft above land surface to a depth of 66.5 ft (bottom 5 ft slotted) and 5-in. galvanized pipe from 65.5 ft to a depth of 102 ft.

Upon completion, the well reportedly produced 10 gpm with a drawdown of 11 ft from a nonpumping water level of 50 ft below land surface.

The pumping equipment presently installed is a Goulds submersible pump (Model No. VEM07412) set at 50 ft, rated at 15.5 gpm at about 149 ft head, and powered by a 3/4-hp 3450 rpm Franklin electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B7724) is for a water sample from the well collected August 14, 1972, after 1 hr of pumping.

PARK WELL NO. 5, LABORATORY NO. B7724

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	8	
Manganese	Mn	0.0		Fluoride	F	0.1	0.00
Ammonium	NH_4	0.06	0.00	Boron	B	0.20	
Sodium	Na	5.2	0.23	Nitrate	NO_3	44	0.71
Potassium	K	1.35	0.04	Chloride	Cl	24	0.68
Calcium	Ca	72.5	3.62	Sulfate	SO_4	66	1.37
Magnesium	Mg	54.3	4.46	Alkalinity(as$CaCO_3$)		278	5.56
Arsenic	As	0.00		Hardness(as$CaCO_3$)		404	
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		516	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		7.5	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc//		10.3	
Selenium	Se	0.00		± deviation		4.2	
Silver	Ag	0.00		Beta pc//		6.1	
Zinc	Zn	0.96		± deviation		2.3	

PARK WELL NO. 6, open to the Silurian dolomite, was completed in April 1973 to a depth of 125 ft by Cecil Griffy, Kankakee. This well serving one fountain is located in the Rock Creek Picnic Area north of Route 102, approximately 320 ft N and 2500 ft E of the SW corner of Section 32, T32N, RUE, Kankakee County. The land surface elevation at the well is approximately 610 ft.

A drillers log of Park Well No. 6 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil, clay	4	4
Limestone, brown (soft)	11	15
Limestone, brown	25	40
Limestone, white	40	80
Limestone, gray	10	90
Limestone, blue, gray	15	105
Limestone, some shale	18	123
Shale	2	125

A 10-in. diameter hole was drilled to a depth of 51.5 ft and finished 6 ia in diameter from 51.5 to 125 ft. The well is cased with 6-in. galvanized steel pipe from 2 ft above land surface to a depth of 51.5 ft (cemented in to 49 ft).

Upon completion, the well reportedly produced 12.5 gpm for 4 hr with a drawdown of 3 ft from a nonpumping water level of 45 ft below land surface.

The pumping equipment presently installed is a Goulds submersible pump (Model No. E75-NI-12BC-B) set at 84 ft, rated at 10 gpm, and powered by a 3/4-hp 3450 rpm Franklin electric motor.

PARK WELL NO. 7 (Davis Creek Youth Camping Area), open to the Silurian dolomite, was completed in October 1965 to a depth of 125 ft by Cecil Griffy, Kankakee. This well serves the youth group camp area. The well is located approximately 1200 ft S and 2500 ft W of the NE corner of Section 23, T31N, R11E, Kankakee County. The land surface elevation at the well is approximately 630 ft.

A drillers log of Park Well No. 7 follows:

Strata	Thickness (ft)	Depth (ft)
Top soil, clay	5	5
Clay	10	15
Brown rock and clay	10	25
Brown limestone (broken)	20	45
Limestone, brown	15	60
Limestone, blue gray	5	65
Limestone, brownish gray	25	90
Limestone, gray	35	125

An 8-in. diameter hole was drilled to a depth of 54.8 ft and finished 5 in. in diameter from 54.8 to 125 ft. The well is cased with 5-in. pipe from 1.5 ft above land surface to a depth of 54.8 ft.

Upon completion, the well reportedly produced 30 gpm for 3 hr with a drawdown of 5 ft from a nonpumping water level of 45 ft below the top of the casing.

The pumping equipment presently installed is a Goulds submersible pump set at 60 ft, and powered by a 1-hp Goulds electric motor.

PARK WELL NO. 8, open to the Silurian dolomite, was completed in September 1975 to a depth of 150 ft by the Wehling Well Works, Beecher. This well serves restrooms, fountains, dump station, and the sewage disposal. The well is located in the New Potawatomi Campground east of Altorf northwest of the campers utility building, approximately 2100 ft S and 850 ft W of the NE corner of Section 9, T31N, R11E, Kankakee County. The land surface elevation at the well is approximately 620 ft.

A drillers log of Park Well No. 8 follows:

Strata	Thickness (ft)	Depth (ft)
Sand and clay	6	6
Yellow lime	64	70
Red green gray lime	10	80
Gray white lime	35	115
Green shale	35	150

A 10-in. diameter hole was drilled to a depth of 4 ft and finished 6 in. in diameter from 4 to 150 ft. The well is cased with 10-in. black pipe from 3 ft above land surface to a depth of 4 ft and 6-in. galvanized seamless pipe to a depth of 51 ft. The top of the casing is equipped with a Baker pitless adapter.

A production test was conducted by the driller on October 11, 1975. After 11.5 hr of pumping at rates ranging from 83 to 67 gpm, the final drawdown was 35.5 ft from a nonpumping water level of 32.3 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 84 ft, rated at 70 gpm, and powered by a 5-hp Red Jacket electric motor.

A partial analysis of a sample (Lab. No. 202783) collected July 20, 1976, showed the water to have a hardness of 424 mg/1, total dissolved minerals of 496 mg/I, and an iron content of 0.5 mg/1.

LAKEVIEW IMPROVEMENT ASSOCIATION

Lakeview Improvement Association (est. 116), located in the northwest part of Rockdale, installed a public water supply in 1947. Two wells (Nos. 2 and 3) are in use. In 1980 there were 33 services, none metered; the estimated average pumpage was 10,000 gpd. The water is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1940 to a depth of 155 ft. This well was abandoned about 1978. The well is located at 626 Howard St., approximately 600 ft N and 850 ft E of the SW corner of Section 17, T35N, R10E. The land surface elevation at the well is approximately 645 ft.

The well is cased with 6-in. pipe from about 0.7 ft above the pumphouse floor to an unknown depth.

The pumping equipment presently installed is a Reda submersible pump set at 78 ft, rated at 30 gpm, and powered by a l½-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B44155) is for a water sample from the well collected April 24, 1978, after 1 hr of pumping.

WELL NO. 1, LABORATORY NO. B44155

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.3		Silica	SiO_2	21	
Manganese	Mn	0.07		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.8	0.04	Boron	B	0.3	
Potassium	K	3.1	0.08	Chloride	Cl	0.0	0.00
Calcium	Ca	95	4.74	Sulfate	SO_4	3.4	0.10
Magnesium	Mg	63	5.18	Alkalinity(asCaC03)		171	3.56
Arsenic	As	0.00		Hardness(asCaC03)		362	7.24
Barium	Ba	0.1				490	9.80
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		599	
Copper	Cu	0.02					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.1					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.4		pH (as rec'd)		7.4	

WELL NO. 2, open to the Silurian dolomite, was completed in 1954 to a depth of 245 ft by the Joliet Pump Co.,

Joliet. The well is located at 626 Howard St. about 75 ft west of Well No. 1, approximately 600 ft N and 775 ft E of the SW corner of Section 17, T35N, R10E. The land surface elevation at the well is approximately 645 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil	3	3
Yellow clay	8	11
Blue clay	74	85
Yellow lime	7	92
Mud cave	2	94
Yellow lime	8	102
Mud cave	2	104
Yellow lime	46	150
White lime	35	185
White sand, gray lime	30	215
Gray lime	30	245

The well is cased with 6-in. black pipe from about 1.5 ft above land surface to a depth of 87 ft and 5-in. liner pipe from 81.5 ft to a depth of 109 ft. The top of the well casing is equipped with a pitless adapter.

Upon completion, the well reportedly produced 7 gpm with very little drawdown from a nonpumping water level of 60 ft.

In September 1970, the nonpumping water level was reported to be 80 ft.

The pumping equipment presently installed is a Reda submersible pump rated at 30 gpm, and powered by a 1½-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003578) is for a water sample from the well collected April 23, 1978, after 1 hr of pumping.

WELL NO. 2, LABORATORY NO. C003578

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.3		Silica	SiO_2	20	
Manganese	Mn	0.05		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.68	0.04	Boron	B	0.5	
Sodium	Na	26	1.13	Cyanide	CN	0.00	
Potassium	K	3.0	0.08	Nitrate	NO_3	0.13	0.00
Calcium	Ca	96	4.79	Chloride	Cl	4	0.11
Magnesium	Mg	56	4.61	Sulfate	SO_4	156	3.24
				Alkalinity (as $CaCO_3$)		372	7.44
Arsenic	As	0.000		Hardness (as $CaCO_3$)		470	9.40
Barium	Ba	0.3					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		636	
Copper	Cu	0.03					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.31		pH (as rec'd)		8.2	

WELL NO. 3, open to the Silurian dolomite, was completed about 1958 to a depth of 225 ft by the Lockport Well & Pump Co., Joliet. The well is located about 50 ft west of Well No. 2 at 625 Howard St., approximately 600 ft N and 725 ft E of the SW corner of Section 17, T35N, R10E. The land surface elevation at the well is approximately 645 ft.

The well is cased from about 1.5 ft above land surface to an unknown depth.

The pumping equipment presently installed is a submersible pump set at 100 ft, operated at 15 gpm, and powered by an electric motor.

LAKEWOOD SHORES IMPROVEMENT ASSOCIATION

Lakewood Shores Improvement Association (est. 885), located about 1.5 miles south of Wilmington, installed a public water supply in 1957. Four wells are in use. In 195?? there were 130 services. In 1979 there were 253 services, all metered; the estimated average and maximum pumpages were 70,800 and 85,000 gpd, respectively. The water is hypochlorinated.

WELL NO. 1, open to the Maquoketa Group, the Galena-Platteville dolomite, and the Glenwood-St. Peter Sandstone, was completed in October 195 3 to a depth of 700 ft by Dreher & Schorie, Joliet. The well is located at 1800 Roberts St., approximately 1500 ft S and 1300 ft E of the NW corner of Section 1, T32N, R9E. The land surface elevation at the well is approximately 558 ft.

A 5-in. diameter hole was drilled to a depth of 700 ft. The well is cased with 5-in. steel pipe from about 0.7 ft above the pumphouse floor to a depth of 30 ft.

In 1970, the nonpumping water level was reported to be 190 ft.

The pumping equipment presently installed is a Sta-Rite submersible pump set at 327 ft, and powered by a 5-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006898) of a sample collected April 1, 1974, after pumping for 2 hr, showed the water to have a hardness of 387 mg/l, total dissolved minerals of 1168 mg/l, and an iron content of 0.0 mg/l.

WELL NO. 2, open to the Maquoketa Group, the Galena-Platteville dolomite, and the Glenwood-St. Peter Sandstone, was completed in August 1956 to a depth of 700 ft by Dreher & Schorie, Joliet. The well is located at 411 Trout St., approximately 1050 ft N and 1350 ft E of the SW corner of Section 1, T32N, R9E. The land surface elevation at the well is approximately 561 ft.

A 6-in. diameter hole was drilled to a depth of 700 ft. The well is cased with 6-in. pipe from about 0.2 ft above the pumphouse floor to a depth of 30 ft.

In 1970, the nonpumping water level was reported to be 190 ft.

The pumping equipment presently installed is a submersible pump operated at 23 gpm, and powered by an electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B23294) of a sample collected December 7, 1976, after pumping for 4 hr at 8 gpm, showed the water to have a hardness of 404 mg/1, total dissolved minerals of 1211 mg/1, and an iron content of 0.0 mg/1.

WELL NO. 3, open to the Maquoketa Group, the Galena-Platteville dolomite, and the Glenwood-St. Peter Sandstone, was constructed in 1952 to a depth of 300 ft and deepened in October 1953 to a reported depth of 700 ft by Dreher & Schorie, Joliet. The well is located at 332 Sumac St., approximately 1650 ft N and 1850 ft E of the SW corner of Section 1, T32N, R9E. The land surface elevation at the well is approximately 562 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	**15**	**15**
Limestone	**125**	**140**
Shale	**50**	**190**
Limestone	**110**	**300**
Limestone hard, flinty	**217**	**517**
St. Peter sandstone	**158**	**675**
Limestone	**25**	**700**

A 6-in. diameter hole was drilled to a depth of 700 ft. The well is cased with 6-in. steel pipe from about 0.4 ft above the pumphouse floor to a depth of 30 ft.

In 1970, the nonpumping water level was reported to be 190 ft.

The pumping equipment presently installed is a Red Jacket submersible pump powered by a 7½-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006834) of a sample collected April 1, 1974, after pumping for 2 hr at 17 gpm, showed the water to have a hardness of 397 mg/1, total dissolved minerals of 1130 mg/1, and an iron content of 0.0 mg/1.

WELL NO. 4, open to the Maquoketa Group, the Galena-Platteville dolomite, and the Glenwood-St. Peter Sandstone, was completed in May 1961 to a depth of 700 ft by Dreher 5c Schorie, Joliet. The well is located at 331 Bass St., approximately 2630 ft N and 1550 ft E of the SW corner of Section 1, T32N, R9E. The land surface elevation at the well is approximately 564 ft.

A 6-in. diameter hole was drilled to a depth of 700 ft. The well is cased with 6-in. pipe from about 0.8 ft above the pumphouse floor to a depth of 60 ft.

Nonpumping water levels were reported to be 195 ft in 1970, and 230 ft in 1978.

The pumping equipment presently installed is a submersible pump operated at 32 gpm, and powered by an electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B47549) is for a water sample from the well collected April 29, 1980, after 2 hr of pumping at 38 gpm.

WELL NO. 4, LABORATORY NO. B47549

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.08		Silica	SiO_2	7.7	
Manganese	Mn	<0.005		Fluoride	F	1.23	0.06
Ammonium	NH_4	1.4	0.08	Boron	B	0.92	
Sodium	Na	240	10.44	Cyanide	CN	<0.005	
Potassium	K	27	0.69	Nitrate	NO_3	<0.4	
Calcium	Ca	91	4.54	Chloride	Cl	228	6.43
Magnesium	Mg	46	3.79	Sulfate	SO_4	376	7.82
Strontium	Sr	3.3		Alkalinity(as $CaCO_3$)		244	4.88
Arsenic	As	<0.0005		Hardness(as $CaCO_3$)		417	8.34
Barium	Ba	0.02					
Beryllium	Be	<0.0001		Total dissolved			
Cadmium	Cd	<0.0005		minerals		1190	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	<0.005					
Lead	Pb	<0.005					
Lithium	Li	0.11					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.005					
Selenium	Se	<0.0005					
Silver	Ag	<0.01					
Vanadium	V	<0.005					
Zinc	Zn	0.10		pH (as rec'd)		7.4	

LOCKPORT

The city of Lockport (9985) installed a public water supply in 1896. Three wells (Nos. 2, 4, and 5) are in use and another well (No. 3) is available for emergency use. Water from this supply is also furnished to the north area of the Lockport Township Water System. In 1949 there were 1100 services, all metered; the average pumpage was 325,000 gpd. In 1980 there were about 3024 services, all metered; the average pumpage was 1,378,908 gpd. The water is chlorinated and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite and the Cambrian-Ordovician aquifer, was completed in 1895 to a depth of 1922 ft (plugged to 1650 ft) by the J. P. Miller Artesian Well Co., Brookfield. This well was abandoned about 1928 and sealed in 1940. The well was located near the intersection of Tenth and Ames Sts., approximately 2620 ft N and 625 ft E of the SW corner of Section 23, T36N, R10E. The land surface elevation at the well is approximately 563 ft.

A correlated drillers log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	3	3
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomites	200	203
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale	87	290
Galena and Platteville Groups		
Dolomite	340	630
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	230	860
Shale and chert, caving	60	920
Canadian Group		
Oneota Dolomite	70	990
CAMBRIAN SYSTEM		
Eminence Dolomite	70	1060
Potosi Dolomite	140	1200
Franconia Formation		
Sandstone, dolomitic and glauconitic	110	1310
Ironton-Galesville Sandstone	165	1475
Eau Claire Formation		
"Shale and marl"	375	1850
Mt. Simon Sandstone		
"Sandstone, water bearing"	72	1922

A 10-in. diameter hole was drilled to a depth of 78.5 ft, reduced to 8 in. between 78.5 and 325 ft, reduced to 7 in. between 325 and 860 ft, reduced to 6 in. between 860 and 1210 ft, and finished 5 in. in diameter from 1210 to 1922 ft. The well was cased with 10-in. pipe from 2 ft above land surface to a depth of 51 ft and 6-in. pipe from 860 ft to a depth of 930 ft.

Upon completion, water flowed from the well at a rate of 275 gpm.

In 1915, after pumping at a rate of 160 gpm, the drawdown was 94 ft from a nonpumping water level of 6 ft.

On September 28, 1922, the well reportedly produced 140 gpm for 4.2 hr with a drawdown of 159.0 ft from a nonpumping water level of 11.0 ft. Thirty-five min after pumping was stopped, the water level had recovered to 17.5 ft.

In 1924, the nonpumping water level was reported to be 40 ft.

A mineral analysis of a sample (Lab. No. 48280) collected in September 1922, showed the water to have a hardness of 639 mg/1, total dissolved minerals of 1458 mg/1, and an iron content of 0.0 mg/1.

WELL NO. 2, open to the Cambrian-Ordovician aquifer, was constructed in April 1927 to a depth of 1475 ft (measured in 1928 at 1428.8 ft deep) and deepened in January 1944 to a reported depth of 1555 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located about 180 ft south of Ninth St. and 165 ft west of State St., approximately 2420 ft N and 1650 ft E of the SW corner of Section 23, T36N, R10E. The land surface elevation at the well is approximately 589 ft.

A sample study log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	7	7
SILURIAN SYSTEM		
Niagaran Series		
Racine-Joliet Dolomite	123	130
Alexandrian Series		
Kankakee Dolomite	40	170
Elwood Dolomite	45	215
Wilhelmi Formation		
Dolomite, silty and argillaceous	35	250
"Shale"	24	274
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone	27	301
Scales Shale	69	370
Galena Group	170	540
Platteville Group	100	640
Ancell Group		
Glenwood Formation	12	652
St. Peter Sandstone		
Sandstone, water bearing	193	845
Sandstone, shale and chert	60	905
Prairie du Chien Group		
Oneota Dolomite	85	990
CAMBRIAN SYSTEM		
Eminence Dolomite	70	1060
Potosi Dolomite	140	1200
Franconia Formation		
Sandstone and dolomite	105	1305
Ironton-Galesville Sandstone		
Sandstone water bearing	123	1428

Strata (continued)	Thickness (ft)	Depth (ft)
"Settled hard sand"	47	1475
Interval not studied	80	1555

Originally, a 25-in. diameter hole was drilled to a depth of 9 ft, reduced to 19 in. between 9 and 364.8 ft, reduced to 15.2 in. between 364.8 and 406.2 ft, reduced to 12 in. between 406.2 and 913.4 ft, and finished 10 in. in diameter from 913.4 to 1475 ft. Originally, the well was cased with 24-in. OD pipe from land surface to a depth of 9 ft, 16-in. OD pipe from land surface to a depth of 364.8 ft, 12-in. pipe from 351.3 ft to a depth of 406.2 ft (cemented in), and 10-in. liner pipe from 843 ft to a depth of 913.4 ft. In 1944, the 10-in. hole was deepened from 1475 to 1555 ft, a 2.7-ft length of 16-in. pipe was welded to the top of the 16-in. pipe, and the 10-in. liner pipe was replaced. The 24-in. pipe was removed from above the pump pit. In 1968, during rehabilitation, the hole was reamed out to 20 in. in diameter to a depth of 442 ft, 15.2 in. from 442 to 910 ft, and 12 in. from 910 to 1555 ft. The well was then cased with 16-in. OD pipe from land surface to a depth of 431 ft (cemented in) and 12-in. pipe from 826.4 ft to a depth of 910 ft.

On May 14, 1928, the well reportedly produced 330 gpm for 24 hr with a drawdown of 70 ft from a nonpumping water level of 220 ft.

On June 28, 1928, after an idle period of 43 days, the nonpumping water level was reported to be 205.4 ft below the pumphouse floor.

In 1935, the well reportedly produced 375 gpm with a drawdown of 90 ft from a nonpumping water level of 207 ft.

In 1939, the nonpumping water level was reported to be 220 ft below the pumphouse floor.

By July 1943, the production of the well had dropped to 180 gpm. An electric log of the well was made by the State Geological Survey on November 24 and 26, 1943. The depth of the well was found to be 1453 ft and the nonpumping water level was 285 ft.

In 1944, this well was cleaned out to its original depth and deepened by the J. P. Miller Artesian Well Co. A production test conducted on February 7, 1944, indicated that the well had a very low yield. In March 1944, the well was shot with 5 charges (1000 lb) of nitroglycerin placed 8 ft apart with the first shot at the lower level of 1458 ft. After casing repair work in May 1944, a production test was conducted on July 15-16, 1944, by representatives of the driller, the city, and the State Water Survey. After 21.5 hr of pumping at rates of 250 to 455 gpm, the drawdown was 73 ft from a nonpumping water level of 316 ft below the top of the casing. Fifteen min after pumping was stopped, the water level had recovered to 333 ft.

Nonpumping water levels were reported to be 317 ft below the pump base on September 15,1944, after a 1-week idle period, and 356 ft on October 13, 1946, after a 45-min idle period.

On June 28, 1955, the well was shot with 413 lb of 100 percent nitrogel and 9 lb of 60 percent primer from 1538 to 1548 ft.

Nonpumping water levels were reported to be 421.6 ft on August 22, 1955, and 422 ft below the pump base in February 1956.

In March 1956, the well reportedly produced 540 gpm for 8 min with a drawdown of 64 ft from a nonpumping water level of 412 ft.

In 1968, this well was reamed out and new casing installed by the J. P. Miller Artesian Well Co. On May 24, 1968, after 24 hr of pumping at a rate of 1000 gpm, the drawdown was 175 ft from a nonpumping water level of 545 ft below land surface.

A production test was conducted by the J. P. Miller Artesian Well Co. on November 25, 1975. After 8.4 hr of pumping at rates of 890 to 880 gpm, the drawdown was 131 ft from a nonpumping water level of 630 ft. The well was then chlorinated and on November 28, 1975, the well reportedly produced from 895 to 890 gpm for 6.5 hr with a drawdown of 131 ft. Thirty min after pumping was stopped, the water level had recovered to 661 ft.

The pumping equipment presently installed consists of a 250-hp 1770 rpm General Electric motor, a 12-in., 17-stage Peerless turbine pump set at 880 ft, rated at 1000 gpm, and has 880 ft of 10-in. column pipe. The well is equipped with 880 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41241) of a sample collected April 4, 1978, after pumping for 16 hr at 825 gpm, showed the water to have a hardness of 243 mg/1, total dissolved minerals of 517 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 3, open to the Cambrian-Ordovician aquifer, was completed in July 1940 to a depth of 1571 ft (reported in 1962 at 1544 ft deep) by the S. B. Geiger & Co., Chicago. This well is available for emergency use. The well is located near the intersection of 14th and Division Sts., approximately 100 ft N and 2490 ft E of the SW corner of Section 23, T36N, R10E. The land surface elevation at the well is approximately 662 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
QUATERNARY SYSTEM		
Pleistocene Series		
Soil and till	60	60
SILURIAN SYSTEM		
Niagaran Series	135	195
Alexandrian Series		
Kankakee Dolomite	40	235
Elwood Dolomite	15	250

Strata (continued)	Thickness (ft)	Depth (ft)
SILURIAN AND ORDOVICIAN SYSTEMS		
"Shale and lime shells"	75	325
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone	10	335
Scales Shale	80	415
Galena Group	217	632
Platteville Group	98	730
Ancell Group		
Glenwood Formation		
Sandstone, dolomitic	7	737
St. Peter Sandstone		
Sandstone, incoherent	313	1050
Sandstone, partly compact	112	1162
Shale, chert, some sandstone	133	1295
CAMBRIAN SYSTEM		
Franconia Formation		
Sandstone, dolomitic and shaly	80	1375
Ironton-Galesville Sandstone		
Sandstone, partly dolomitic	194	1569
Eau Claire Formation		
Dolomite	2	1571

A 16-in. diameter hole was drilled to a depth of 442 ft, reduced to 12 in. between 442 and 1284 ft, reduced to 10 in. between 1284 and 1364 ft, and finished 8 in. in diameter from 1364 to 1571 ft. The well is cased with 14-in. OD drive pipe from about 1.2 ft above the pump station floor to a depth of 442 ft, 10-in. liner pipe from 1111 ft to a depth of 1290 ft, and 8-in. liner pipe from 1284 ft to a depth of 1364 ft. In 1956, the J. P. Miller Artesian Well Co., Brookfield, reamed out the well to 17 in. in diameter to a depth of 443 ft, installed an 18-in. pipe from land surface to a depth of 60 ft, and replaced the 14-in. casing from land surface to a depth of 442 ft (cemented in).

Upon completion, after pumping at a rate of 340 gpm, the drawdown was 127 ft from a nonpumping water level of 322 ft below the pump base. Pumping was continued at a rate of 450 gpm with a drawdown of 177 ft.

In September 1946, the average nonpumping water level was reported to be 430 ft.

In April 1953, the well reportedly produced 325 gpm for 13 min with a drawdown of more than 89 ft from a nonpumping water level of 453 ft.

In September 1954, after 2 hr of pumping at a rate of 325 gpm, the drawdown was 57 ft from a nonpumping water level of 490 ft below the pump base.

In August 1956, this well was rehabilitated by the J. P. Miller Artesian Well Co. The hole was reamed out to a depth of 443 ft, an 18-in. pipe installed, and the old 14-in. pipe was removed and replaced. The well was then shot (7 oz of glycerin per shot) by the Dowell Co. as follows: 2 shots per ft at intervals between 1560 and 1517 ft and 1 shot per ft at intervals between 1516 and 1480 ft. After shooting, the nonpumping water level was reported to be 493 ft.

In October 1969, the well reportedly produced 320 gpm with a drawdown of 62 ft from a nonpumping water level of 640 ft.

The pumping equipment presently installed is a 21-stage Peerless turbine pump set at 730 ft, and powered by an electric motor.

A partial analysis of a sample (Lab. No. 169204) collected June 20, 1966, after pumping for several hours, showed the water to have a hardness of 232 mg/1, total dissolved minerals of 468 mg/1, and an iron content of 0.6 mg/1.

WELL NO. 4, open to the Cambrian-Ordovician aquifer, was completed in November 1954 to a depth of 1572 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located at the northeast corner of Madison and Fifth Sts. at 428 South Madison St., approximately 1887 ft S and 1054 ft W of the NE corner of Section 23, T36N, R10E. The land surface elevation at the well is approximately 650 ft.

A sample study log of Well No. 4 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
QUATERNARY SYSTEM		
Pleistocene Series		
"Drift" — no samples	48	48
SILURIAN SYSTEM		
Niagaran Series		
Dolomite, cherty, white to buff, very fine	17	65
Dolomite, silty, white to pink, extra fine	30	95
Dolomite, white to buff, very fine, porous	20	115
Dolomite, silty, buff, extra fine	20	135
Dolomite, silty, green, buff, extra fine	10	145
Alexandrian Series		
Kankakee Dolomite		
Dolomite, white to gray, extra fine	40	185
Elwood Dolomite		
Dolomite, cherty, sandy, buff to gray	40	225
Wilhelmi Formation		
Dolomite, cherty, silty, gray to buff	20	245
Dolomite, silty, gray to buff, speckled	20	265
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
Dolomite, silty, sandy, gray to buff	10	275
Limestone, buff, gray; shale, white to gray	20	295
Dolomite, gray, fine to medium, porous	5	300
Scales Shale		
Shale, silty, calcareous, gray, green	81	381
Galena Group		
Dolomite, buff to gray, pyritic	14	395
Limestone, buff to gray, speckled black	50	445
Limestone, buff to gray, fine to medium	85	530
Limestone, buff gray, speckled red and black	35	565

Strata (continued)	Thickness (ft)	Depth (ft)
Platteville Group		
Limestone, buff to gray, cherty, silty	45	610
Dolomite, gray to buff; shale at top	35	645
Limestone, gray to buff, extra fine	25	670
Dolomite, silty, buff to gray, fine	25	695
Limestone, gray to buff; dolomite, buff	22	717
Ancell Group		
Glenwood Formation		
Sandstone, white, fine, very coarse	38	755
St. Peter Sandstone		
Sandstone, white, gray, frosted	165	920
Sandstone silty calcareous, white	60	980
Sandstone, white, frosted	35	1015
Dolomite, silty, sandy, white, buff, pink	30	1045
No sample	5	1050
Kress Member		
Shale, oolitic chert, red, green, white	45	1095
Sandstone, cherty, white to gray, coarse	10	1105
Shale, cherty; dolomite, oolitic chert	20	1125
Sandstone, white to gray, fine to coarse	35	1160
CAMBRIAN SYSTEM		
Eminence Dolomite		
Dolomite, sandy, silty, white to buff	37	1197
Potosi Dolomite		
Dolomite, buff, white, pink, glauconitic	58	1255
Franconia Formation		
Dolomite, glauconitic, sandy, gray buff	10	1265
Sandstone, glauconitic, greenish gray, buff	75	1340
Ironton Sandstone		
Dolomite, silty, glauconitic, buff	20	1360
Sandstone, white, pink, gray, fine, coarse	65	1425
Galesville Sandstone		
Sandstone, white, buff, gray, red, silty	70	1495
Dolomite, very sandy, buff, fine to medium	10	1505
Sandstone, white to buff, fine to coarse	48	1553
Eau Claire Formation		
Dolomite, brown to grayish brown	7	1560

A 24-in. diameter hole was drilled to a depth of 500 ft, reduced to 17.2 in. between 500 and 1150 ft, and finished 13.2 in. in diameter from 1150 to 1572 ft. The well is cased with 24-in. OD pipe from land surface to a depth of 50 ft, 18-in. OD pipe from land surface to a depth of 500 ft (cemented in), and 14-in. OD liner pipe from 990 ft to a depth of 1150 ft.

After the well was shot between the depths of 1464 and 1534 ft, a production test was conducted by the driller on November 9-10, 1954. After 24.5 hr of pumping at rates ranging from 770 to 680 gpm, the final drawdown was 87 ft from a nonpumping water level of 455 ft below land surface. Five min after pumping was stopped, the water level had recovered to 489 ft.

In August 1956, the well reportedly produced 1125 gpm for 1.1 hr with a drawdown of 87 ft from a nonpumping water level of 484 ft below the pump base.

Nonpumping water levels were reported to be 575 ft below the pump base on September 18, 1962, and 640 ft in 1966.

In October 1969, after pumping at a rate of 900 gpm, the drawdown was 95 ft from a nonpumping water level of 625 ft.

On March 11, 1971, the nonpumping water level was reported to be 640 ft.

In 1971, this well was rehabilitated by the J. P. Miller Artesian Well Co. and the production capacity was reportedly increased from 750 to 1200 gpm after this work.

The pumping equipment presently installed consists of a 400-hp 1769 rpm Ideal electric motor, a 14-in., 10-stage Peerless turbine pump (No. 110077) set at 750 ft, rated at 985 gpm, and has 750 ft of 10-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B15875) is for a water sample from the well collected October 2, 1978, after 24 hr of pumping at 700 gpm.

WELL NO. 4, LABORATORY NO. B1 5875

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.19		Silica	SiO_2	7.9	
Manganese	Mn	0.01		Fluoride	F	1.5	0.08
Ammonium	NH_4	0.9	0.05	Boron	B	0.7	
Sodium	Na	70	3.04	Cyanide	CN	0.00	
Potassium	K	14.1	0.36	Nitrate	NO3	0.0	0.00
Calcium	Ca	60	2.99	Chloride	Cl	29	0.82
Magnesium	Mg	19	1.56	Sulfate	SO_4	84	1.75
				Alkalinitv(asCaC03)		274	5.48
Arsenic	As	<0.001		Hardness(asCaC03)		233	4.66
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cd	0.01		minerals		443	
Copper	Cu	0.04					
Lead	Pb	0.005					
Mercury	Hg	<0.00002					
Nickel	Ni	0.0					
Selenium	Se	<0.001					
Silver	Ag	0.00					
Zinc	Zn	0.03		pH (as rec'd)		7.6	

WELL NO. 5, open to the Silurian dolomite, was completed in January 1973 to a depth of 330 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located north of Division St. east of Farrell Road, approximately 1395 ft N and 1195 ft E of the SW corner of Section 19, T36N, R11E. The land surface elevation at the well is approximately 712 ft.

A drillers log of Well No. 5 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	62	62
Lime	13	75
Lime with shale	65	140

Strata (continued)	*Thickness (ft)*	*Depth (ft)*
Lime	**145**	**285**
Lime with shale	5	**290**
Shale	**40**	**330**

A 30-in. diameter hole was drilled to a depth of 60.5 ft, reduced to 29 in. between 60.5 and 72 ft, and finished 25 in. in diameter from 72 to 330 ft. The well is cased with 30-in. drive pipe from land surface to a depth of 60.5 ft and 26-in. pipe from land surface to a depth of 72 ft (cemented in).

After the well was acidized with 5000 gal of treating acid, a production test was conducted by the driller on January 30-31, 1973. After 33.5 hr of pumping at rates ranging from 400 to 677 gpm, the maximum drawdown was 170 ft from a nonpumping water level of 73 ft below the top of the casing.

A second production test was conducted by the driller on February 20, 1973. After 8.8 hr of pumping at rates ranging from 1000 to 677 gpm, the maximum drawdown was 80 ft from a nonpumping water level of 73 ft below the top of the casing.

A third production test was conducted by the driller on February 21, 1973. After 4.1 hr of pumping at rates of 440 to 578 gpm, the final drawdown was 17 ft from a nonpumping water level of 73 ft below the top of the casing.

The pumping equipment presently installed consists of a 75-hp electric motor, a 12-in., 3-stage Peerless turbine pump rated at 900 gpm, and has 170 ft of 8-in. column pipe. A 10-ft section of 8-in. suction pipe is attached to the pump intake. The well is equipped with 170 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B43113) is for a water sample from the well collected April 29, 1976, after 4 hr of pumping at 650 gpm.

WELL NO. 5, LABORATORY NO. B43113

		mg/l	*me/l*			*mg/l*	*me/1*
Iron	Fe	0.0		Silica	SiO_2	11	
Manganese	Mn	0.01		Fluoride	F	0.3	0.02
Ammonium	NH4	0.09	0.00	Boron	B	0.3	
Sodium	Na	13	0.57	Cyanide	CN	0.00	
Potassium	K	2.1	0.05	Nitrate	NO3	6.6	0.11
Calcium	Ca	109	5.44	Chloride	Cl	6.9	0.19
Magnesium	Mg	62	5.10	Sulfate	SO4	200	4.16
				Alkalinity(as $CaCO_3$)		354	7.08
Arsenic	As	0.00		Hardness(as $CaCO_3$)		527	10.54
Barium	Ba	0.2					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		659	
Copper	Cu	0.06					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)	7.9		

LOCKPORT HEIGHTS SANITARY DISTRICT

Lockport Heights Sanitary District (est. 1057), located about 2 miles northeast of Lockport, installed a public water supply in 1953. Three wells are in use. In 1970 there were 243 services, none metered; the average pumpage was 38,000 gpd. In 1980 there were 308 services; the average pumpage was 80,150 gpd. The water is chlorinated and fluoridated; in addition, the water from Well No. 1 is filtered for iron removal.

WELL NO. 1, open to the Silurian dolomite, was completed in May 1953 to a depth of 220 ft by Dreher & Schorie, Joliet. The well is located at 13910 West 146th Place, approximately 3050 ft N and 175 ft E of the SW corner of Section 7, T36N, RUE. The land surface elevation at the well is approximately 720 ft.

A 6-in. diameter hole was drilled to a depth of 220 ft. The well is cased with 6-in. pipe from 1.5 ft above the pumphouse floor to a depth of 115 ft.

The pumping equipment presently installed is a Sta-Rite submersible pump set at 180 ft, rated at 100 gpm, and powered by a 15-hp electric motor.

WELL NO. 2, open to the Silurian dolomite, was completed in June 1955 to a depth of 265 ft by Dreher & Schorie, Joliet. The well is located on the east side of Park Road between 145th and 146th Place, approximately 3600 ft N and 1425 ft E of the SW corner of Section 7, T36N, RUE. The land surface elevation at the well is approximately 740 ft.

A 6-in. diameter hole was drilled to a depth of 265 ft. The well is cased with 6-in. pipe from 1.5 ft above the pumphouse floor to a depth of 135 ft.

The pumping equipment presently installed is a Sta-Rite submersible pump set at 200 ft, rated at 100 gpm, and powered by a 10-hp Sta-Rite electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42551) of a sample collected April 19, 1977, showed the water to have a hardness of 1004 mg/l, total dissolved minerals of 1300 mg/l, and an iron content of 1.1 mg/l.

WELL NO. 3, open to the Silurian dolomite, was completed in April 1966 to a depth of 297 ft by Dreher &

Schorie, Joliet. The well is located about 75 ft southwest of Park Road and 147th Place, approximately 2700 ft N and 1375 ft E of the SW corner of Section 7, T36N, R11E. The land surface elevation at the well is approximately 730 ft.

A 6-in. diameter hole was drilled to a depth of 297 ft. The well is cased with 6-in. pipe from 1.5 ft above land surface to a depth of 130 ft. The top of the well casing is equipped with a pitless adapter.

The pumping equipment presently installed is a Red Jacket submersible pump set at 220 ft, rated at 70 gpm, and powered by a 10-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42552) is for a water sample from the well collected April 19, 1977.

WELL NO. 3, LABORATORY NO. B42552

		mg/l	*me/l*			*mg/l*	*tne/l*
Iron	Fe	1.2		Silica	SiO_2	15	
Manganese	Mn	0.05		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.06	0.00	Boron	B	0.3	
Sodium	Na	22	0.96	Cyanide	CN	0.00	
Potassium	K	5.0	0.13	Nitrate	NO_3	0.0	0.00
Calcium	Ca	220	10.98	Chloride	Cl	7.5	0.21
Magnesium	Mg	100	8.23	Sulfate	SO_4	540	11.23
				Alkalinity(as$CaCO_3$)		465	9.30
Arsenic	As	0.00		Hardness(as$CaCO_3$)		1000	20.00
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		1280	
Copper	Cu	0.06					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.5		pH (as rec'd)		7.5	

LOCKPORT TOWNSHIP WATER SYSTEM

Lockport Township Water System (est. 2800), located between Lockport and Joliet, installed a public water supply in 1976. Finished water for this supply is obtained from Lockport for the north area and from Joliet for the south area. In 1978 there were 300 services, all metered, in the north area, and 500 services, all metered, in the south area; the estimated average consumption was 230,000 gpd.

MANHATTAN

The village of Manhattan (1530) installed a public water supply in 1900. Three wells (Nos. 2, 3, and 4) are in use. In 1953 there were 250 services, none metered; the estimated average pumpage was 50,000 gpd. In 1980 there were 579 services, all metered; the average pumpage was 154,432 gpd. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite, was completed in 1892 to a depth of 105 ft (measured in 1923 to be 98 ft deep). This well was abandoned in 1955 and sealed in 1970. The well was located about 240 ft southeast of First St. and 40 ft southwest of McClure Ave., approximately 1230 ft S and 1300 ft W of the NE corner of Section 20, T34N, R11E. The land surface elevation at the well is approximately 685 ft.

The well was cased with 6-in. pipe from the top of the pump station floor to a depth of about 30 ft.

In October 1923, the nonpumping water level was reported to be 20 ft below land surface.

In June 1949, while the pump was out of the well, the nonpumping water level was reported to be 40 ft. The pump had been delivering at a rate of 32 gpm and broke suction after 3 min of pumping.

A partial analysis of a sample (Lab. No. 94226) collected October 1, 1942, after pumping for 1 hr at 50 gpm, showed the water to have a hardness of 424 mg/l, total dissolved minerals of 518 mg/l, and an iron content of 0.3 mg/l.

WELL NO. 2, open to the Silurian dolomite, was completed in March 1939 to a depth of 156 ft by Dreher & Schorie, Joliet. The well is located on McClure St. between First and Gustafson Sts. by the elevated tank, approximately 1120 ft S and 1200 ft W of the NE corner of Section 20, T34N, R11E. The land surface elevation at the well is approximately 685 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	**35**	**35**
Limestone	**121**	**156**

An 8-in. diameter hole was drilled to a depth of 156 ft. The well is cased with 8-in. pipe from about 0.7 ft above the pumphouse floor to a depth of 35 ft.

Upon completion, the well reportedly produced 60 gpm for several hours with very little drawdown from a nonpumping water level of 28 ft below land surface.

In 1959, this well was acidized by the J. P. Miller Artesian Well Co., Brookfield. It was reported that the production rate was about 70 gpm before acidizing and about 150 gpm after treatment.

In May 1975, the nonpumping water level was reported to be 30 ft.

The pumping equipment presently installed is a Deming turbine pump set at 100 ft, rated at 150 gpm, and powered by a 10-hp U. S. electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 04215) of a sample collected February 22, 1972, after pumping for 1 hr at an estimated rate of 125 gpm, showed the water to have a hardness of 452 mg/1, total dissolved minerals of 500 mg/1, and an iron content of 0.0 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in October 1942 to a depth of 187 ft by Dreher & Schorie, Joliet. This well was leased from the Norfolk & Western RR for village use in 1955. The well is located on the east side of the RR right-of-way about one-half block west of Well No. 2, approximately 1125 ft S and 1400 ft W of the NE corner of Section 20, T34N, R11E. The land surface elevation at the well is approximately 685 ft

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	2	2
Tan clay	8	10
Tan sandy clay	8	18
Gray clay	20	38
Sand and gravel	2	40
Limestone	147	187

A 10-in. diameter hole was drilled to a depth of 170 ft and finished 6 in. in diameter from 170 to 187 ft. The well is cased with 10-in. black steel pipe from about 2 ft above the floor of a 6-ft deep pit to a depth of 41 ft.

Upon completion, the well reportedly produced 240 gpm for 10 hr with a drawdown of 35 ft from a nonpumping water level of 22 ft below the pump base.

In April 1948, after 5 min of pumping at a rate of 160 gpm, the drawdown was 8 ft from a nonpumping water level of 43 ft.

In 1964, this well was acidized by the J. P. Miller Artesian Well Co., Brookfield. It was reported that the production rate was about the same as before treatment.

In May 1975, the nonpumping water level was reported to be 35 ft.

The pumping equipment presently installed is a 7-in., 6-stage Peerless turbine pump set at 100 ft, rated at 150 gpm at about 109 ft TDH, and powered by a 7½-hp 1800 rpm U. S. electric motor (Serial No. 310623).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B10651) is for a water sample from the well collected August 28, 1978, after 3 hr of pumping at 100 gpm.

WELL NO. 3, LABORATORY NO. B10651

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.2		Silica	SiO_2	16	
Manganese	Mn	0.04		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.4	0.02	Boron	B	0.2	
Sodium	Na	30	1.30	Cyanide	CN	0.00	
Potassium	K	2.9	0.07	Nitrate	NO_3	0.4	0.01
Calcium	Ca	116	5.79	Chloride	Cl	8.0	0.23
Magnesium	Mg	51	4.20	Sulfate	SO_4	186	3.87
				Alkalinity(as $CaCO_3$)		355	7.10
Arsenic	As	0.00		Hardness(as $CaCO_3$)		500	10.00
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		661	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	<0.00002					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.4	

WELL NO. 4 (former sod farm well), open to the Silurian dolomite, was completed about 1945 to a depth of 115 ft (measured at 107 ft in 1963). This well was acquired from Charles Benck in August 1977. The well is located about 300 ft west of Eastern Ave. and 250 ft north of Prairie Ave., approximately 720 ft N and 300 ft W of the SE corner of Section 17, T34N, RUE. The land surface elevation at the well is approximately 682 ft.

A 10-in. diameter hole was drilled to a depth of 115 ft. The well is cased with 10-in. steel pipe from about 1 ft above land surface to an unknown depth.

In February 1964, this well was acidized with 1000 gal of treating acid by the J. P. Miller Artesian Well Co., Brookfield. On February 19, 1964, the driller reported that the well produced 290 gpm for 4.5 hr with a drawdown of 15 ft from a nonpumping water level of 17 ft.

The pumping equipment presently installed consists of a 20-hp electric motor, an 8-in., 13-stage American Well Works turbine pump set at 70 ft, rated at 290 gpm, and has 70 ft of 5-in. column pipe. The well is equipped with 70 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003041) is for

a water sample from the well collected January 17, 1979, after 1 hr of pumping at 275 gpm.

WELL NO. 4. LABORATORY NO. C003041

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.5		Silica	SiO_2	18	
Manganese	Mn	0.02		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.46	0.02	Boron	B	0.2	
Sodium	Na	18.5	0.80	Cyanide	CN	0.00	
Potassium	K	1.7	0.04	Nitrate	NO_3	0.0	0.00
Calcium	Ca	84	4.19	Chloride	Cl	2	0.06
Magnesium	Mg	40	3.29	Sulfate	SO_4	53	1.10
				Alkalinity (as $CaCO_3$)		376	7.52
Arsenic	As	0.005		Hardness(as $CaCO_3$)		377	7.54
Barium	Ba	<0.2					
Cadmium	Cd	<0.01		Total dissolved			
Chromium	Cr	<0.05		minerals		474	
Copper	Cu	0.02					
Lead	Pb	<0.01					
Mercury	Hg	0.0000					
Nickel	Ni	<0.2					
Zinc	Zn	0.04		pH (as rec'd)		8.3	

WELL NO. 5, open to the Silurian dolomite and the Maquoketa Group, was completed in July 1980 to a depth of 305 ft by the Wehling Well Works, Beecher. As of February 1981, this well was not in use. The well is located approximately 2250 ft N and 3050 ft W of the SE corner of Section 17, T34N, R11E. The land surface elevation at the well is approximately 685 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	25	25
Rock	2	27
Lime	178	205
Shale	100	305

The well is cased with 18-in. black steel pipe from about 1 ft above land surface to a depth of 13 ft and 12.8-in. black steel pipe from about 1 ft above land surface to a depth of 41 ft (cemented in). Below the casing, the hole was finished 11.8 in. in diameter.

Upon completion, the well reportedly produced 17 gpm with a drawdown of 185 ft from a nonpumping water level of 19 ft below land surface.

The permanent pumping equipment is not yet installed.

MINOOKA

The village of Minooka (768) installed a public water supply in 1886. One well (No. 3) is in use and another well (No. 4) is available for emergency use. This village also has a well in Will County, but the present water supply is from wells in Grundy County. In 1950 there were 95 services, all metered; the estimated average pumpage was 16,000 gpd. In 1979 there were 516 services, all metered; the average and maximum pumpages were 180,000 and 240,000 gpd, respectively. The water is aerated, chlorinated, filtered, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, finished in sandstone, was completed in 1886 to a depth of 2100 ft. This well was abandoned in 1906 and sealed in 1952. The well was located on the south side of Main St. about 50 ft north of the Chicago, Rock Island & Pacific RR tracks, approximately 2650 ft S and 2450 ft E of the NW corner of Section 1, T34N, R8E, Grundy County. The land surface elevation at the well is approximately 610 ft.

Information on the hole and casing records is not available.

The well reportedly flowed at a rate of 100 gpm upon completion, 32 gpm in December 1919, 4 gpm in 1938, and the flow stopped entirely in 1941.

Nonpumping water levels were reported to be 35 ft on September 1, 1942; 30 ft on May 1, 1943; 24 ft on June 11, 1944; 28 ft on October 15, 1944; 24.5 ft on April 3, 1945; and 57 ft in December 1950.

A mineral analysis of a sample (Lab. No. 31633) collected September 25, 1915, showed the water to have a hardness of 303 mg/l, total dissolved minerals of 1742 mg/l, and an iron content of 0.3 mg/l.

WELL NO. 2, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in April 1906 to a depth of 621 ft (reported to be 556 ft deep in 1948) by John Mathews, Joliet. This well was abandoned prior to December 1973. The well is located in a building at the base of the elevated tank, approximately 2400 ft S and 2600 ft E of the NW corner of Section 1, T34N, R8E', Grundy County. The land surface elevation at the well is approximately 612 ft.

A 12-in. diameter hole was drilled to a depth of 124 ft, reduced to 10 in. between 124 and 265 ft, reduced to 8 in. between 265 and 368 ft, and finished 6 in. in diameter from 368 to 621 ft. The well is cased with 12-in. pipe from about 1 ft above the village hall floor to a depth of 124 ft.

Nonpumping water levels were reported to be 60 ft below land surface in 1913, 75 ft below land surface in 1917, 78 ft in November 1919, and 84 ft in 1923.

On May 3, 1938, the well reportedly produced 70 gpm with a drawdown of 19 ft from a nonpumping water level of 92 ft.

Nonpumping water levels were reported to be 106 ft in April 1941, and 95 ft in July 1941.

In 1941, because ot a receding water level and decreased production, this well was shot between the depths of 497 and 594 ft with 150 qt of nitroglycerin and cleaned out by W. J. Neely, Batavia. Little improvement in well capacity was reported after this work.

In July 1943, after pumping at 45 gpm, the drawdown was 74 ft from a nonpumping water level of 106 ft.

On June 11, 1945, the nonpumping water level was reported to be 106 ft.

A production test was conducted by the State Water Survey on July 3, 1945. The well was pumped for 4.5 hr at rates of 54 to 47 gpm. Water level measurements could not be taken, however, the nonpumping water level was reported to be 110 ft.

Nonpumping water levels were reported to be 118 ft in June 1948, 170 ft below the pump base in October 1958, and 148 ft in December 1964.

A mineral analysis of a sample (Lab. No. 129785) collected September 2, 1952, showed the water to have a hardness of 243 mg/1, total dissolved minerals of 690 mg/1, and an iron content of 0.18 mg/1. Hydrogen sulfide was apparent when this sample was collected.

WELL NO. 3, open to the Eminence-Potosi Dolomite, Franconia Formation, and the Ironton-Galesville Sandstone, was completed in May 1965 to a depth of 1508 ft by the Wehling Well Works, Beecher. The well is located at 203 East Mondamon St., approximately 2700 ft N and 1900 ft W of the SE corner of Section 1, T34N, R8E, Grundy County. The land surface elevation at the well is approximately 610 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Drift (largely till)	93	93
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
Dolomite, light gray, gray, medium to coarsely crystalline	23	116
Scales Shale		
Shale, grayish brown to brown, brittle; little dolomite	69	185
Galena Group		
Dolomite, buff, fine to medium crystalline	235	420
Platteville Group		
Dolomite, calcitic, gray, very finely crystalline to sublithographic	35	455
Dolomite, calcitic, buff to grayish brown, very finely crystalline	91	546
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, buff, white, very fine to medium, partly silty; little sandy dolomite in upper part	179	725
Shale, red, gray; little red dolomite	15	740
Prairie du Chien Group		
Dolomite, light gray, fine; dolomite, light brown, medium to coarsely crystalline; little sandstone	220	960
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, white to light gray, partly sandy; dolomite, brownish gray, finely crystalline	245	1205
Franconia Formation		
Sandstone, gray, very fine to fine, glauconitic, partly very dolomitic; little dolomite and shale in lower part	124	1329
Ironton-Galesville Sandstone		
Sandstone, fine to coarse, dolomitic; little sandy dolomite	179	1508

A 21-in. diameter hole was drilled to a depth of 93 ft, reduced to 19 in. between 93 and 191 ft, reduced to 15.2 in. between 191 and 829 ft, and finished 12 in. in diameter from 829 to 1508 ft. The well is cased with 20-in. pipe from land surface to a depth of 93 ft, 16-in. pipe from land surface to a depth of 191 ft, and 12-in. pipe from land surface to a depth of 892 ft (cemented in).

Upon completion, this well was shot with 450 lb of prima cord between 1350 and 1500 ft.

A production test was conducted by the driller on May 19-20, 1965. After 23.8 hr of pumping at a rate of 520gpm, the final drawdown was 143 ft from a nonpumping water level of 223 ft below land surface.

On August 7, 1972, the nonpumping water level was reported to be 242 ft.

The pumping equipment presently installed is a Sumo submersible pump set at 546 ft, rated at 325 gpm, and powered by a 60-hp 1770 rpm General Electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B29577) is for a water sample from the well collected January 10, 1978, after 3 hr of pumping at 270 gpm.

WELL NO. 3, LABORATORY NO. B29577

		mg/l	*me/l*		*mg/l*	*me/l*
Iron	Fe	0.3	Silica	SiO_2	8.1	
Manganese	Mn	0.00	Fluoride	F	1.2	0.06
Ammonium	NH_4	1.0	0.06	Boron	B	0.8	
Sodium	Na	87.0	3.78	Cyanide	CN	0.00	
Potassium	K	16.1	0.41	Nitrate	NO_3	0.0	0.00
Calcium	Ca	57.0	2.84	Chloride	CI	81	2.28
Magnesium	Mg	22.0	1.81	Sulfate	SO_4	60	1.25
				Alkalinity(as$CaCO_3$)		264	5.28
Arsenic	As	0.00		Hardness(as$CaCO_3$)		243	4.86
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		490	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0001					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.8	

WELL NO. 4, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in August 1973 to a depth of 725 ft by the Wehling Well Works, Beecher. This well is available for emergency use. The well is located about 20 ft southwest of Well No. 3, approximately 2690 ft N and 1915 ft W of the SE corner of Section 1, T34N, R8E, Grundy County. The land surface elevation at the well is approximately 610 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Yellow clay	30	30
Blue clay with sand	64	94
Shale	89	183
Lime	18	201
Gray and brown lime	393	594
Sand	131	725

A 14-in. diameter hole was drilled to a depth of 10 ft, reduced to 12 in. between 10 and 200 ft, and finished 7.9 in. in diameter from 200 to 725 ft. The well is cased with 14-in. pipe from land surface to a depth of 10 ft, and 8-in. pipe from land surface to a depth of 200 ft (cemented in).

A production test was conducted by the driller on August 14, 1973. After 9.5 hr of pumping at rates ranging from 166 to 203 gpm, the final drawdown was 67 ft from a nonpumping water level of 223 ft below the top of the casing. Five min after pumping was stopped, the water level had recovered to 226 ft.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B15570) is for a water sample from the well collected October 13, 1976, after 6 hr of pumping at 140 gpm.

WELL NO. 4, LABORATORY NO. B1 5570

		mg/l	*me/l*			*mg/l*	*me/1*
Iron	Fe	0.0		Silica	SiO_2	7.3	
Manganese	Mn	0.00		Fluoride	F	0.8	0.04
Ammonium	NH_4	1.1	0.06	Boron	B	0.7	
Sodium	Na	84	3.65	Cyanide	CN	0.01	
Potassium	K	13.9	0.36	Nitrate	NO_3	0.0	0.00
Calcium	Ca	39	1.95	Chloride	Cl	37	1.04
Magnesium	Mg	23	1.89	Sulfate	SO_4	60	1.25
				Alkalinitv(as$CaCO_3$)		280	5.60
Arsenic	As	0.00		Hardness(as$CaCO_3$)		192	3.84
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		440	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.5	

The pumping equipment presently installed is a Red Jacket submersible pump set at 400 ft, operated at 140 gpm, and powered by a 25-hp Franklin electric motor.

A test well was constructed in December 1978 to a depth of 42 ft by the Wehling Well Works, Beecher. It was located approximately 3550 ft S and 1900 ft W of the NE corner of Section 7, T34N, R9E, Will County. A 5-in. diameter hole was drilled to a depth of 42 ft. The test well was cased with 1.2-in. galvanized pipe from about 1 ft above land surface to a depth of 40 ft.

WELL NO. 5, finished in sand and gravel, was completed in March 1980 to a depth of 41 ft by the Wehling Well Works, Beecher. As of February 1981, this well was not in use. The well is located northwest of the DuPage River about 350 ft south of San Carlos Road and 750 ft west of Jardine Drive west of the treatment plant, approximately 3550 ft S and 1900 ft W of the NE corner of Section 7, T34N, R9E, Will County. The land surface elevation at the well is approximately 5 30 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Sand and rocks	7	7
Clay	1	8
Overburden	33	41

A 30-in. diameter hole was drilled to a depth of 41 ft. The well is cased with 30-in. black steel pipe from about 2 ft above land surface to a depth of 40 ft.

A production test was conducted by the driller on May 15, 1980. After 4 hr of pumping at rates ranging from 420 to 313 gpm, the maximum drawdown was 19 ft from a nonpumping water level of 15 ft.

A second production test was conducted by the driller on May 19, 1980. After 3.2 hr of pumping at rates ranging from 320 to 340 gpm, the drawdown was 11 ft from a nonpumping water level of 13 ft below land surface. Pumping was continued for 30 min at a rate of 413 gpm with a final drawdown of 19 ft.

The permanent pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 213909) collected May 19, 1980, showed the water to have a hardness of 392 mg/l, total dissolved minerals of 430 mg/l, and an iron content of 0.7 mg/l.

MOKENA

The village of Mokena (1643) installed a public water supply in 1899. Two wells (Nos. 2 and 3) are in use. In 1966 there were 421 services, all metered; the average pumpage was 135,000 gpd. In 1979 there were 1050 services, all metered; the average and maximum pumpages were 245,000 and 375,000 gpd, respectively. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, finished in sand and gravel, was completed in 1891 to a depth of 139 ft. This well, installed under private ownership and acquired by the village in 1899, was abandoned in 1921 and sealed prior to September 1966. The well was located on Front St., approximately 2100 ft N and 2000 ft E of the SW corner of Section 8, T35N, R12E. The land surface elevation at the well is approximately 728 ft.

The well was cased with 4-in. pipe to a depth of 129 ft followed by 10 ft of screen.

In 1915, the nonpumping water level was reported to be 61 ft below land surface.

A mineral analysis of a sample (Lab. No. 30861) collected July 1, 1915, showed the water to have a hardness of 547 mg/1, total dissolved minerals of 620 mg/1, and an iron content of 0.6 mg/1.

WELL NO. 2 (Village Well No. 1), open to the Silurian dolomite, was completed in 1920 to a depth of 225 ft by John Matthews, Joliet. The well is located in the municipal building at 10940 Front St., approximately 1750 ft N and 1440 ft E of the SW corner of Section 8, T35N, R12E. The land surface elevation at the weli is approximately 725 ft.

The well is cased with 8-in. pipe from about 0.5 ft above the pumphouse floor to a depth of about 125 ft.

Upon completion, the nonpumping water level was reported to be 67 ft below land surface.

On September 29, 1922, after a 15.7-hr idle period, the well reportedly produced approximately 57 gpm for 3.3 hr with a drawdown of less than 2 ft from a nonpumping water level of 67 ft below the pumphouse floor.

A production test was conducted by the J. P. Miller Artesian Well Co., Brookfield, on June 11, 1952. After 1.4 hr of pumping at a rate of 475 gpm, the drawdown was 30.5 ft from a nonpumping water level of 65.0 ft.

The pumping equipment presently installed is an 8-stage vertical turbine pump set at about 120 ft, rated at 400 gpm at about 200 ft TDH, and powered by a 30-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B02159) is for a water sample from the well collected July 11, 1978, after 3 hr of pumping at 400 gpm.

WELL NO. 2, LABORATORY NO. B02159

		mg/1	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.6		Silica	SiO_2	18	
Manganese	Mn	0.00		Fluoride	F	0.5	0.03
Ammonium	NH_4	0.6	0.03	Boron	B	0.4	
Sodium	Na	22	0.96	Cyanide	CN	0.00	
Potassium	K	3.9	0.10	Nitrate	NO_3	0.0	0.00
Calcium	Ca	115	5.74	Chloride	Cl	2.6	0.07
Magnesium	Mg	69	5.68	Sulfate	SO_4	220	4.58
				Alkalinity (as $CaCO_3$)		381	7.62
Arsenic	As	0.02		Hardness (as $CaCO_3$)		574	11.48
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		693	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	<0.00002					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)	7.2		

WELL NO. 3 (Village Well No. 2), open to the Silurian dolomite, was completed in January 1966 to a depth of 417 ft by the Wehling Well Works, Beecher. The well is located at the west end of Bonnes St., approximately 150 ft N and 300 ft E of the SW corner of Section 8, T35N, R12E. The land surface elevation at the well is approximately 715 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	30	30
Mud and gravel	40	70
Sand and stone	15	85
Lime	329	414
Shale	3	417

A 15.2-in. diameter hole was drilled to a depth of 417 ft. The well is cased with 16-in. OD pipe from 2 ft above land surface to a depth of 91 ft.

A production test was conducted by the driller on January 25-26, 1966. After 20.8 hr of pumping at rates ranging from 2170 to 2400 gpm, the drawdown was 17 ft from a nonpumping water level of 52 ft below land surface.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 317136) set at 110 ft, rated at 685 gpm at about 200 ft head, and powered by a 35-hp 1800 rpm U. S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B48906) is for a water sample from the well collected May 6, 1980, after 1 hr of pumping at 800 gpm.

WELL NO. 3, LABORATORY NO. B48906

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.2		Silica	SiO_2	16	
Manganese	Mn	<0.005		Fluoride	F	0.44	0.02
Ammonium	NH_4	0.6	0.03	Boron	B	0.31	
Sodium	Na	23	1.00	Cyanide	CN	0.03	
Potassium	K	5.4	0.14	Nitrate	NO_3	<0.4	
Calcium	Ca	130	6.49	Chloride	Cl	7.6	0.21
Magnesium	Mg	71	5.84	Sulfate	SO_4	292	6.07
Strontium	Sr	1.2		Alkalinity($CaCO_3$)		372	7.44
Arsenic	As	0.008		Hardness(as$CaCO_3$)		610	12.20
Barium	Ba	0.02					
Beryllium	Be	<0.0001		Total dissolved			
Cadmium	Cd	<0.0005		minerals		788	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	<0.005					
Lead	Pb	<0.01					
Lithium	Li	0.17					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.005					
Selenium	Se	<0.0005					
Silver	Ag	<0.01					
Vanadium	V	<0.005					
Zinc	Zn	<0.005		pH (as rec'd)		6.8	

WELL NO. 4 (Village Well No. 3), open to the Silurian dolomite, was completed in July 1979 to a depth of 420 ft by the Wehling Well Works, Beecher. This well is not yet connected to the system. The well is located about 60 ft south of the center line of 191st St. just east of the pumphouse, approximately 60 ft S and 2400 ft W of the NE corner of Section 9, T35N, R12E. The land surface elevation at the well is approximately ,707 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	**2**	**2**
Clay	**20**	**22**
Drift	**64**	**86**
Lime	**327**	**413**
Shale	**7**	**420**

A 19-in. diameter hole was drilled to a depth of 92 ft and finished 15 in. in diameter from 92 to 420 ft. The well is cased with 16-in. black steel pipe from about 1 ft above land surface to a depth of 89 ft (cemented in).

A production test was conducted by the driller on August 10-11, 1979. After 24.3 hr of pumping at rates ranging from 935 to 1043 gpm, the drawdown was 18 ft from a nonpumping water level of 49 ft below land surface. Pumping was continued for 15 min at a rate of 1500 gpm with a final drawdown of 32 ft.

The pumping equipment presently installed is a 12-in., 3-stage Johnston vertical turbine pump (Serial No. DN21019) set at 100 ft, rated at 1000 gpm at about 225 ft TDH, and powered by a 75-hp 1760 rpm General Electric motor.

MONEE

The village of Monee (940) installed a public water supply in 1897. One well (No. 3) is in use and another well (No. 2) is available for emergency use. In 1949 there were 175 services, all metered; the estimated average and maximum pumpages were 30,000 and 45,000 gpd, respectively. In 1980 there were 430 services, all metered; the average and maximum pumpages were 80,000 and 160,000 gpd, respectively. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite, was completed in 1897 to a depth of 166 ft (measured in October 1946 at 157 ft deep). This well was abandoned in 1942 and sealed about 1964. The well was located about 80 ft east of Eastgate St. and 210 ft south of Main St., approximately 2030 ft N and 2510 ft E of the SW corner of Section 21, T34N, R13E. The land surface elevation at the well is approximately 805 ft.

A 6-in. diameter hole was drilled to a depth of 166 ft. The well was cased with 6-in. pipe from about 1 ft above the pump station floor to a depth of 90 ft.

Upon completion, the well reportedly produced 60 gpm for 3 days with very little drawdown.

Nonpumping water levels were reported to be 75 ft below land surface on June 29, 1915, and 70 ft below the pump base in 1935.

On October 4, 1946, the nonpumping water level was reported to be 73 ft below the pump base when Well No. 2 was idle. The water level was lowered about 2 ft when Well No. 2 was producing at 140 gpm.

A mineral analysis of a sample (Lab. No. 30842) collected June 29, 1915, showed the water to have a hardness of 713 mg/l, total dissolved minerals of 1035 mg/l, and an iron content of 8.0 mg/l.

WELL NO. 2, open to the Silurian dolomite, was constructed in 1913 to a depth of 169 ft by E. C. Sass, Monee, and deepened prior to 1945 to a reported depth of 519 ft (measured in 1949 at 491 ft deep). This well is available for emergency use. The well is located about 30 ft east of Well No. 1, approximately 2030 ft N and 2540 ft E of the SW

corner of Section 21, T34N, R13E. The land surface elevation at the well is approximately 805 ft.

A 10-in. diameter hole was drilled to a depth of 519 ft. The well is cased with 10-in. pipe from about 1.5 ft above the pump station floor to a depth of 120 ft.

On June 29, 1915, the nonpumping water level was reported to be 75 ft below land surface.

On October 4, 1946, the well reportedly produced 140 gpm for 1 hr with a drawdown of about 2 ft from a nonpumping water level of 73 ft below the pump base.

The pumping equipment presently installed is a Fairbanks-Morse Pomona turbine pump operated at 550 gpm, and powered by a 15-hp 1750 rpm General Electric motor.

A mineral analysis of a sample (Lab. No. 107911) collected October 8, 1946, after pumping for 1 hr at 128 gpm, showed the water to have a hardness of 614 mg/1, total dissolved minerals of 776 mg/1, and an iron content of 0.5 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in February 1960 to a depth of 494 ft by the Wehling Well Works, Beecher. The well is located just north of the village hall at Chestnut and Main Sts., approximately 2550 ft S and 700 ft E of the NW corner of Section 21, T34N, R13E. The land surface elevation at the well is approximately 800 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Soil	5	5
Till, yellowish-buff, oxidized	20	25
Till, partly gravelly, gray to buff, calcareous	50	75
Till, gravelly, gray, partly brownish-gray, calcareous	45	120
SILURIAN SYSTEM		
Niagaran Series		
Racine-Joliet Dolomite		
Dolomite, silty, slightly cherty, buff, gray, fine	30	150
Dolomite, very silty, white to light buff, fine	60	210
Dolomite, slightly silty, white, speckled	15	225
Dolomite, silty, partly calcareous, white to light gray	45	270
Dolomite, slightly silty, white	15	285
Dolomite, calcareous, light gray to buff	75	360
Dolomite, slightly calcareous, white, fine	60	420
Strata (continued)	*Thickness (ft)*	*Depth (ft)*
Alexandrian Series		
Kankakee Dolomite		
Dolomite, brown, fine	20	440
Elwood Dolomite		
Dolomite, very silty, gray, speckled	20	460
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
Dolomite, silty, buff, grayish-buff, fine	15	475
Scales Shale		
Shale, gray, black, weak	15	490

A 22-in. diameter hole was drilled to a depth of 134 ft and finished 19.2 in. in diameter from 134 to 494 ft. The well is cased with 20-in. pipe from about 0.4 ft above land surface to a depth of 134 ft.

A production test was conducted by the driller on February 2, 1960. After 12 hr of pumping at rates of 950 to 590 gpm, the final drawdown was 20 ft from a nonpumping water level of 80 ft.

The pumping equipment presently installed is a 10-in., 8-stage Johnston vertical turbine pump set at 200 ft, rated at 700 gpm, and powered by a 60-hp 1800 rpm U. S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B102122) is for a water sample from the well collected August 19, 1974.

WELL NO. 3, LABORATORY NO. B102122

		mg/l	*me/l*			*rng/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	14	
Manganese	Mn	0.0		Fluoride	F	0.8	0.04
Ammonium	NH_4	0.9	0.05	Boron	B	0.5	
Sodium	Na	35	1.52	Cyanide	CN	0.00	
Potassium	K	3.8	0.10	Nitrate	NO_3	0.6	0.01
Calcium	Ca	124		Chloride	Cl	1	0.03
Magnesium	Mg	38	3.13	Sulfate	SO_4	172	3.58
				Alkalinity(as$CaCO_3$)		350	7.00
Arsenic	As	0.00		Hardness(as$CaCO_3$)		466	9.32
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		666	
Copper	Cu	0.01					
Lead	Pb	0.00		pH (as rec'd)		7.5	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		0.7	
Selenium	Se	0.00		± deviation		2.1	
Silver	Ag	0.00		Beta *pc/l*		5.4	
Zinc	Zn	0.00		± deviation		2.7	

NEW LENOX

The village of New Lenox (2855) installed a public water supply in 1931. Three wells (Nos. 2, 3, and 5) are in use and another well (No. 4) is available for emergency use. In 1953 there were 200 services, 89 percent metered; the average pumpage was 20,000 gpd. In 1978 there were 1790 services, all metered; the average and maximum pumpages were 400,000 and 600,000 gpd, respectively. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution; in addition, the water from Well No. 3 is also aerated and filtered.

WELL NO. 1, open to the Silurian dolomite, was completed in 1931 to a depth of 320 ft (measured in 1947 to be 308 ft deep) by Henry Boysen, Jr., Libertyville. This well was abandoned about 1975. The well is located at 109 West Joliet Highway, approximately 2600 ft S and 270 ft W of the NE corner of Section 21, T35N, R11E. The land surface elevation at the well is approximately 703 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Till	58	58
Limestone (Niagaran)	167	225
Dolomite (Alexandrian)	25	250
Dolomite (Edgewood)	55	305
Shale	5	310
Dolomite	5	315
Shale	5	320

A 12-in. diameter hole was drilled to a depth of 320 ft. The well is cased with 12-in. pipe from about 1 ft above the pump station floor to a depth of 67 ft.

Upon completion, the well reportedly produced 60 gpm for 8 hr and the nonpumping water level was 41 ft below land surface.

Nonpumping water levels were reported to be 40.8 ft below the pump base in 1942; 42.8 ft on January 8, 1948; 53 ft after a 35-min idle period on November 22, 1948; and 51 ft on September 8, 1952.

A partial analysis of a sample (Lab. No. 136386) collected November 30, 1954, showed the water to have a hardness of 564 mg/1, total dissolved minerals of 607 mg/1, and an iron content of 2.4 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in January 1951 to a depth of 334 ft by the Milaeger Well & Pump Co., Brookfield, Wis. The well is located at the northwest corner of South Pine St. and West Michigan Road, approximately 983 ft N and 763 ft W of the SE corner of Section 21, T35N, R11E. The land surface elevation at the well is approximately 703 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Glacial drift	102	102
Niagara lime	232	334

A 16-in. diameter hole was drilled to a depth of 20 ft and finished 12 in. in diameter from 20 to 334 ft. The well is cased with 16-in. pipe from 1 ft above land surface to a depth of 20 ft and 12-in. pipe from 1 ft above land surface to a depth of 102 ft (cemented in from 0 to 20 ft).

A production test was conducted by the driller on January 27, 1951. After 5 hr of pumping at rates of 148 to 205 gpm, the drawdown was 48 ft from a nonpumping water level of 34 ft below land surface.

On November 23, 1955, the nonpumping water level was reported to be 41 ft.

On November 10, 1966, the well reportedly produced 330 gpm for 30 min with a drawdown of 17 ft from a nonpumping water level of 50 ft below land surface.

The pumping equipment presently installed consists of a 25-hp 1800 rpm U. S. electric motor (Serial No. 2802838), an 8-in., 7-stage Layne & Bowler turbine pump set at 100 ft, rated at 300 gpm at about 204 ft TDH, and has 100 ft of 5-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake. The well is equipped with 100 ft of airline.

A partial analysis of a sample (Lab. No. 170195) collected November 10, 1966, after pumping for 30 min at 330 gpm, showed the water to have a hardness of 746 mg/1, total dissolved minerals of 1125 mg/1, and an iron content of 0.9 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in April 1961 to a depth of 325 ft by the Layne-Western Co., Aurora. This well was purchased from the Illinois Municipal Water Co. about 1972. The well is located about 200 ft west of Well No. 2, approximately 957 ft N and 919 ft W of the SE corner of Section 21, T35N, R11E. The land surface elevation at the well is approximately 703 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	2	2
Yellow clay	8	10
Blue clay	32	42
Sand and gravel	5	47
Gray clay	13	60
Sandy gray clay	13	73
Sand and gravel	1	74
Broken limestone	11	85
Medium brown limestone	25	110
Medium gray limestone	65	175
Gray shale	6	181
Medium gray limestone	19	200
Gray limestone with shale streaks	5	205
Medium gray limestone	45	250
Medium gray creviced limestone	5	255
Medium gray limestone	15	270
Medium gray creviced limestone	10	280
Medium gray limestone	15	295
Medium gray limestone with shale streaks	5	300
Medium gray limestone	5	305
Hard gray limestone	18	323
Shale	2	325

A 16-in. diameter hole was drilled to a depth of 86.5 ft and finished 12 in. in diameter from 86.5 to 325 ft. The well is cased with 16-in. pipe from land surface to a depth of 18.8 ft and 12-in. pipe from land surface to a depth of 86.5 ft (cemented in).

A production test was conducted by the driller on April 24, 1961. After 3.8 hr of pumping at rates of 302 to 401 gpm, the drawdown was 79.0 ft from a nonpumping water level of 40.5 ft below land surface. Pumping was continued for 4.2 hr at a rate of 302 gpm with a final drawdown of 41.0 ft.

A production test was conducted by the Wehling Well Works, Beecher, on March 16, 1972. After 6.8 hr of pumping at rates of 240 to 300 gpm, the drawdown was 108 ft from a nonpumping water level of 57 ft below the top of the casing.

On March 25, 1976, the well reportedly produced 300 gpm with a drawdown of 56 ft from a nonpumping water level of 72 ft.

The pumping equipment presently installed is an 8-in., 6-stage Layne turbine pump with a Johnston pump head set at 140 ft, rated at 300 gpm at about 171 ft TDH, and powered by a 25-hp General Electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B29594) is for a water sample from the well collected January 26, 1976, after 24 hr of pumping at 230 gpm.

WELL NO. 3, LABORATORY NO. B29594

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.8		Silica	SiO_2	12	
Manganese	Mn	0.02		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.95	0.05	Boron	B	0.6	
Sodium	Na	44	1.91	Cyanide	CN	0.00	
Potassium	K	5.8	0.15	Nitrate	NO_3	0.04	0.00
Calcium	Ca	230	11.48	Chloride	Cl	2.0	0.06
Magnesium	Mg	62	5.10	Sulfate	SO_4	660	13.73
				Alkalinity(as $CaCO_3$)		272	5.44
Arsenic	As	0.00		Hardness(as $CaCO_3$)		829	16.58
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		1208	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		7.9	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		3.7	
Selenium	Se	0.00		± deviation		3.7	
Silver	Ag	0.00		Beta *pc/l*		17.2	
Zinc	Zn	0.0	±	deviation		4.3	

WELL NO. 4, open to the Silurian dolomite, was completed in February 1972 to a depth of 300 ft by the Wehling Well Works, Beecher. This well is available for emergency use. The well is located east of Cedar Road and south of Hickory Creek, approximately 985 ft N and 350 ft W of the SE corner of Section 16, T35N, R11E. The land surface elevation at the well is approximately 625 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	12	12
Lime	282	294
Shale	6	300

A 16-in. diameter hole was drilled to a depth of 12 ft, reduced to 13.4 in. between 12 and 57 ft, and finished 10 in. in diameter from 57 to 300 ft. The well is cased with 14-in. pipe from land surface to a depth of 12 ft and 10.8-in. pipe from land surface to a depth of 57 ft (cemented in).

A production test was conducted by the driller on February 18, 1972. After 11.8 hr of pumping at rates ranging from 102 to 156 gpm, the final drawdown was 242 ft from a nonpumping water level of 3 ft below the top of the casing. Fifteen min after pumping was stopped, the water level had recovered to 7 ft.

The pumping equipment presently installed is a Layne pump rated at 190 gpm, and powered by a 25-hp General Electric motor.

A partial analysis of asample(Lab. No. 187890) collected February 24, 1972, after pumping for 24 hr at 133 gpm, showed the water to have a hardness of 514 mg/l, total dissolved minerals of 665 mg/l, and an iron content of 1.1 mg/l.

WELL NO. 5 , open to the Silurian dolomite, was completed in September 1973 to a depth of 303 ft by the Wehling Well Works, Beecher. This well was purchased from the Laraway Utility Co. in April 1978. The well is located on the east side of Nelson Road about 1000 ft north of Laraway Road and 200 ft south of the intersection of Shagbark Road just east of the elevated tank, approximately 1000 ft N and 50 ft E of the SW corner of Section 28, T35N, R11E. The land surface elevation at the well is approximately 677 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	66	66
Lime	237	303

A 19.2-in. diameter hole was drilled to a depth of 68 ft and finished 15 in. in diameter from 68 to 303 ft. The well is cased with 20-in. black pipe from land surface to a depth of 19 ft and 16-in. black pipe from land surface to a depth of 68 ft (cemented in).

A production test was conducted by the driller on September 18, 1973. After 6.8 hr of pumping at rates ranging from 370 to 300 gpm, the drawdown was 135 ft from a nonpumping water level of 22 ft. After surging for about 2 hr, pumping was continued for 6.2 hr at rates ranging from 257 to 268 gpm with a final drawdown of 82 ft.

The pumping equipment presently installed is a Johnston pump rated at 285 gpm, and powered by a 25-hp U. S. electric motor.

The following mineral analysis (Lab. No. 207951) is for a water sample from the well collected in April 1978.

WELL NO. 5, LABORATORY NO. 207951

		mg/l	*me/l*			*mg/l*	*me/l*
Iron(total)	Fe	0.8		Silica	SiO_2	13.1	
Manganese	Mn	0.00		Fluoride	F	0.3	
Ammonium	NH_4	1.1	0.06	Boron	B	0.5	
Sodium	Na	47.3	2.06	Nitrate	NO_3	0.4	0.01
Potassium	K	9.3	0.24	Chloride	Cl	2	0.06
Calcium	Ca	256	12.77	Sulfate	SO_4	834.3	17.35
Magnesium	Mg	84.3	6.93	Alkalinity(as $CaCO_3$)		240	4.80
Strontium	Sr	2.42	0.06				
				Hardness(as $CaCO_3$)		985	19.70
Barium	Ba	<0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		1435	
Copper	Cu	0.01					
Lead	Pb	<0.05					
Lithium	Li	0.04		Turbidity		4	
Nickel	Ni	<0.05		Color		0	
Zinc	Zn	0.06		Odor		0	

OAK VALLEY SUBDIVISION

Oak Valley Subdivision (est. 515), located about 5.2 miles east of Lockport, installed a public water supply in 1978. The water system is owned and operated by the Chickasaw Hills Utility Co., Inc. One well is in use. In 1980 there were 147 services, all metered; the estimated average and maximum pumpages were 85,000 and 150,000 gpd, respectively. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite, was completed in July 1977 to a depth of 300 ft by the Shaver Well Drilling Co., Lombard. The well is located on the west side of Oak Valley Trail, approximately 1500 ft S and 1200 ft W of the NE corner of Section 23, T36N, R11E. The land surface elevation at the well is approximately 746 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Overburden	155	155
Limestone white	10	165
Limestone gray	135	300

A 12-in. diameter hole was drilled to a depth of 155 ft and finished 11.9 in. in diameter from 155 to 300 ft. The well is cased with 12.8-in. OD pipe from about 2 ft above land surface to a depth of 155 ft.

Upon completion, the well reportedly produced 859 gpm for 8 hr with a drawdown of 55 ft from a nonpumping water level of 88 ft below land surface.

The pumping equipment presently installed is an Aurora vertical turbine pump set at 206 ft, operated at about 800 gpm, and powered by a 60-hp General Electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B23354) is for a water sample from the well collected November 11, 1980, after 2 hr of pumping at 720 gpm.

WELL NO. 1, LABORATORY NO. B23354

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.61		Silica	SiO_2	19	
Manganese	Mn	0.02		Fluoride	F	0.29	0.02
Ammonium	NH_4	0.9	0.05	Boron	B	0.33	
Sodium	Na	26	1.13	Cyanide	CN	0.01	
Potassium	K	3.0	0.08	Nitrate	NO_3	<0.4	
Calcium	Ca	154	7.68	Chloride	Cl	4.4	0.12
Magnesium	Mg	72	5.93	Sulfate	SO_4	370	7.70
Strontium	Sr	1.65		Alkalinity(as $CaCO_3$)		331	6.62
Arsenic	As	0.006		Hardness(as $CaCO_3$)		686	13.72
Barium	Ba	0.02					
Beryllium	Be	<0.0005		Total dissolved			
Cadmium	Cd	<0.005		minerals		876	
Chromium	Cr	0.010					
Cobalt	Co	<0.005					
Copper	Cu	<0.005					
Lead	Pb	<0.005					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.005					
Selenium	Se	<0.001					
Silver	Ag	<0.005					
Vanadium	V	<0.005					
Zinc	Zn	0.009		pH (as rec'd)		6.6	

OAKVIEW AVENUE WATERWORKS, INC.

Oakview Avenue Waterworks, Inc. (est. 350), located about 1 mile southeast of Joliet, installed a public water supply in 1947. One well (No. 3) is in use. In 1950 there were 107 services. In 1980 there were 99 services, none metered; the average pumpage was 20,246 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1933 to a depth of 110 ft. This well was abandoned and sealed prior to 1970. The well was located at 1421 Washington St., approximately 800 ft S and 800 ft W of the NE corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 600 ft.

The well was cased with 4-in. pipe from land surface to a depth of 72 ft.

In July 1953, the nonpumping water level was reported to be 37 ft.

WELL NO. 2, open to the Silurian dolomite, was completed in 1941 to a depth of 200 ft by Mr. Kramer. This well was abandoned and sealed about 1950. The well was located at 304 Hebbard St., approximately 1750 ft S and 500 ft W of the NE comer of Section 14, T35N, R10E. The land surface elevation at the well is approximately 625 ft.

The well was cased with 4.5-in. pipe from land surface to a depth of 18 ft.

WELL NO. 3, open to the Silurian dolomite, was completed in 1946 to a depth of 257 ft by Jack Hinton, Lockport. The well is located at 412 Oakview Ave., approximately 2600 ft S and 1150 ft W of the NE corner of Section 14, T35N, R10E. The land surface elevation at the well is approximately 635 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	**14**	**14**
Dolomite	**243**	**257**

The well is cased with 6-in. galvanized iron pipe from about 0.8 ft above the pumphouse floor to a depth of 31 ft (cemented in).

The pumping equipment presently installed is a 5-hp 1800 rpm U. S. electric motor (Serial No. 529355), a 9-stage Peerless turbine pump (No. 34160) set at 150 ft, rated at 60 gpm, and has 150 ft of 3-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B51368) is for a water sample from the well collected May 19, 1980, after 2 hr of pumping at 50 gpm.

WELL NO. 3, LABORATORY NO. B51368

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.06		Silica	SiO_2	12	
Manganese	Mn	<0.005		Fluoride	F	0.15	0.01
Ammonium	NH_4	<0.1		Boron	B	0.14	
Sodium	Na	36	1.57	Cyanide	CN	<0.005	
Potassium	K	2.8	0.07	Nitrate	NO_3	15.9	0.26
Calcium	Ca	123	6.14	Chloride	Cl	97	2.74
Magnesium	Mg	61	5.02	Sulfate	SO_4	i11	2.31
Strontium	Sr	0.116		Alkalinity(as $CaCO_3$)		356	7.12
Arsenic	As	<0.001		Hardness(as $CaCO_3$)		550	11.00
Barium	Ba	0.05					
Beryllium	Be	<0.005		Total dissolved			
Cadmium	Cd	<0.001		minerals		694	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	0.006					
Lead	Pb	<0.01					
Lithium	Li	0.14					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.005					
Selenium	Se	<0.0005					
Silver	Ag	<0.005					
Vanadium	V	<0.002					
Zinc	Zn	0.012		pH (as rec'd)		7.0	

PARK FOREST SOUTH UTILITY CO.

The Park Forest South Utility Co. (1748) installed a public water supply in 1961. This supply also furnishes water to the Governor's State University. Four wells (Nos. 1-3 and 6) are in use. In 1962 there were 150 services, all metered; the average pumpage was 63,000 gpd. In 1981 there were 1390 services, all metered; the average pumpage was 1,000,594 gpd. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution; in addition, water from Well Nos. 1 and 2 is ion-exchange softened.

WELL NO. 1, open to the Silurian dolomite, was completed in July 1961 to a depth of 480 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located at 546 Irving Place, approximately 2070 ft S and 1730 ft W of the NE corner of Section 13, T34N, R13E. The land surface elevation at the well is approximately 773 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Gray shale and boulders	91	91
Lime gray	24	115
Lime broken brown	30	145
Lime gray	139	284
Sandy lime	49	333
Gray hard	66	399
Light gray lime	57	456
Gray lime soft	19	475
Gray shale	5	480

A 20-in. diameter hole was drilled to a depth of 116.6 ft and finished 15.2 in. in diameter from 116.6 to 480 ft. The well is cased with 20-in. pipe from about 1.5 ft above the pump station floor to a depth of 97 ft and 16-in. pipe from about 1.5 ft above the pump station floor to a depth of 116.6 ft (cemented in).

On July 28, 1961, the well reportedly produced 312 gpm with a drawdown of 172 ft from a nonpumping water level of 78 ft.

After treating with 6000 gal of acid, the driller reported that in a test on August 3, 1961, the well produced 660 gpm with a drawdown of 157 ft from a nonpumping water level of 78 ft.

The pumping equipment presently installed consists of a 10-in., 16-stage Peerless turbine pump set at 260 ft, rated at 600 gpm at about 480 ft TDH, and has 260 ft of 8-in. column pipe. A 40-ft section of 6-in. suction pipe is attached to the pump intake. Power is furnished by an Ideal electric polyphase induction motor which has two windings producing 44 and 100 hp at 1177 and 1768 rpm.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B48061) of a sample collected May 23, 1977, showed the water to have a hardness of 392 mg/1, total dissolved minerals of 420 mg/1, and an iron content of 0.3 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in June 1969 to a depth of 499 ft by the Wehling Well Works, Beecher. The well is located on Hickok Ave. at the end of Burnham Drive, approximately 1800 ft S and 1450 ft E of the NW corner of Section 13, T34N, R13E. The land surface elevation at the well is approximately 775 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Soil and clay	18	18
Drift	41	59
Gravel	13	72
Lime and gravel	14	86
Sand and gravel	24	110
Silty lime	15	125
Muddy shale	15	140
Lime	356	496
Shale	3	499

A 20-in. diameter hole was drilled to a depth of 158 ft and finished 15.2 in. in diameter from 158 to 499 ft. The well is cased with 20-in. galvanized pipe from land surface to a depth of 143 ft and 16-in. pipe from about 0.6 ft above the wellhouse floor to a depth of 158 ft (cemented in).

A production test was conducted by the driller on June 10-11, 1969. After 19 hr of pumping at a rate of 1000 gpm, the drawdown was 47 ft from a nonpumping water level of 78 ft.

A second production test was conducted by the driller on February 9, 1970. After 8 hr of pumping at rates ranging from 1260 to 1663 gpm, the maximum drawdown was 238 ft from a nonpumping water level of 79 ft.

The pumping equipment presently installed is a Johnston vertical turbine pump rated at 1000 gpm, and powered by a 150-hp General Electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C001877) is for a water sample from the well collected November 7, 1979, after pumping at 1000 gpm.

WELL NO. 2, LABORATORY NO. C001877

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.6		Silica	SiO_2	16	
Manganese	Mn	<0.01		Fluoride	F	0.27	0.01
Ammonium	NH4	0.4	0.02	Boron	B	0.1	
Sodium	Na	12	0.52	Cyanide	CN	0.00	
Potassium	K	2.0	0.05	Nitrate	NO_3	9.7	0.16
Calcium	Ca	88	4.39	Chloride	Cl	2	0.06
Magnesium	Mg	44	3.62	Sulfate	SO_4	31	0.64
				Alkalinity(as $CaCO_3$)		396	7.92
Arsenic	As	0.007		Hardness(as $CaCO_3$)		401	8.02
Barium	Ba	0.3					
Cadmium	Cd	<0.004		Total dissolved			
Chromium	Cr	<0.01		minerals		474	
Copper	Cu	<0.01					
Lead	Pb	<0.01					
Mercury	Hg	< 0.00005					
Nickel	Ni	<0.1					
Selenium	Se	< 0.001					
Silver	Ag	<0.01					
Zinc	Zn	<0.01		pH (as rec'd)		8.3	

WELL NO. 3, open to the Silurian dolomite, was completed in September 1970 to a depth of 457 ft by the Wehling Well Works, Beecher. The well is located on the east side of Central Ave. about 800 ft south of Bond St., approximately 2500 ft N and 250 ft E of the SW corner of Section 16, T34N, R13E. The land surface elevation at the well is approximately 779 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	20	20
Gravel	10	30
Mud	60	90
Sand	32	122
Lime	283	405

Strata (continued)	Thickness (ft)	Depth (ft)
Shale	3	408
Lime	42	450
Shale	7	457

A 20-in. diameter hole was drilled to a depth of 126 ft, reduced to 19 in. between 126 and 136 ft, and finished 15.2 in. in diameter from 136 to 457 ft. The well is cased with 20-in. pipe from land surface to a depth of 126 ft and 16-in. pipe from land surface to a depth of 136 ft (cemented in).

A production test was conducted by the driller on September 2-3, 1970. After 24.2 hr of pumping at rates ranging from 970 to 1440 gpm, the maximum drawdown was 254 ft from a nonpumping water level of 65 ft below the top of the casing.

The pumping equipment presently installed is a Johnston vertical turbine pump set at about 300 ft, rated at 1000 gpm, and powered by a 150-hp General Electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B48063) of a sample collected May 23, 1977, after pumping for 931 hr at 1000 gpm, showed the water to have a hardness of 613 mg/1, total dissolved minerals of 871 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 4, open to the Silurian dolomite, was completed in August 1970 to a depth of 489 ft by the Wehling Well Works, Beecher. As of November 1979, this well was not in use. The well is located on the east side of Governors Highway (U. S. Highway 54) about 500 ft north of Stunkel Road, approximately 570 ft N and 1830 ft E of the SW corner of Section 3, T34N, R13E. The land surface elevation at the well is approximately 778 ft.

A drillers log of Well No. 4 follows:

Strata	Thickness (ft)	Depth (ft)
Drift and clay	136	136
Lime	301	437
Shale	2	439
Lime	48	487
Shale	2	489

A 20-in. diameter hole was drilled to a depth of 145 ft, reduced to 19 in. between 145 and 155 ft, and finished 15.2 in-, in diameter from 155 to 489 ft. The well is cased with 20-in. pipe from land surface to a depth of 145 ft and 16-in. pipe from land surface to a depth of 155 ft (cemented in).

A production test was conducted by the driller on August 14-15, 1970. After 24 hr of pumping at rates ranging from 760 to 1263 gpm, the maximum drawdown was 272 ft from a nonpumping water level of 83 ft below the top of the casing.

The permanent pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 184063) collected September 21, 1970, showed the water to have a hardness of 574 mg/1, total dissolved minerals of 807 mg/1, and an iron content of 1.5 mg/1.

WELL NO. 5, open to the Silurian dolomite, was completed in November 1970 to a depth of 524 ft by the Wehling Well Works, Beecher. As of November 1979, this well was not in use. The well is located on the east side of Steger-Monee Road about 0.5 mile south of Exchange St., approximately 20 ft S and 1270 ft E of the NW corner of Section 14, T34N, R13E. The land surface elevation at the well is approximately 790 ft.

A drillers log of Well No. 5 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	90	90
Gravel and sand	30	120
Mud and sand	10	130
Gravel	6	136
Lime	381	517
Lime with shale	7	524

A 20-in. diameter hole was drilled to a depth of 137 ft, reduced to 19 in. between 137 and 147 ft, and finished 15.2 in. in diameter from 147 to 524 ft. The well is cased with 20-in. pipe from land surface to a depth of 137 ft and 16-in. pipe from land surface to a depth of 147 ft (cemented in).

A production test was conducted by the driller on November 11-12,1970. After 24 hr of pumping at rates ranging from 1000 to 1500 gpm, the maximum drawdown was 53 ft from a nonpumping water level of 85 ft below the top of the casing.

The permanent pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 184688) collected November 22, 1970, showed the water to have a hardness of 516 mg/1, total dissolved minerals of 657 mg/1, and an iron content of 2.0 mg/1.

WELL NO. 6, open to the Silurian dolomite, was completed in June 1971 to a depth of 460 ft by the Wehling Well Works, Beecher. The well is located on the west side of Hamilton Ave. about 600 ft south of Bond St., approximately 2650 ft N and 2630 ft E of the SW corner of Section 17, T34N, R13E. The land surface elevation at the well is approximately 785 ft.

A drillers log of Well No. 6 follows:

Strata	Thickness (ft)	Depth (ft)
Soil and clay	10	10
Clay	25	35
Drift	77	112
Gravel	13	125
Sand	5	130
Gravel	5	135
Lime	24	159
Lime and shale	38	197
Lime	258	455
Red rock	5	460

A 20-in. diameter hole was drilled to a depth of 159 ft and finished 15.2 in. in diameter from 159 to 460 ft. The well is cased with 20-in. pipe from land surface to a depth of 146 ft and 16-in. pipe from land surface to a depth of 159 ft (cemented in).

A production test was conducted by the driller on June 23-24, 1971. After 24.1 hr of pumping at rates ranging from 580 to 850 gpm, the maximum drawdown was 147 ft from a nonpumping water level of 75 ft below the top of the casing.

The pumping equipment presently installed is a Johnston vertical turbine pump set at 200 ft, rated at 600 gpm, and powered by a 75-hp U. S. Holloshaft electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B109406) is for a water sample from the well collected March 19, 1974, after 45 min of pumping at 600 gpm.

WELL NO. 6, LABORATORY NO. B109406

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.0		Silica	SiO_2	11	
Manganese	Mn	0.02		Fluoride	F	0.6	0.03
Ammonium	NH_4	0.6	0.03	Boron	B	0.9	
Sodium	Na	30	1.30	Cyanide	CN	0.00	
Potasssium	K	6.3	0.16	Nitrate	NO_3	0.4	0.01
Calcium	Ca	138	6.89	Chloride	Cl	1	0.03
Magnesium	Mg	45	3.70	Sulfate	SO_4	296	6.16
				Alkalinity(as$CaCO_3$)		272	5.44
Arsenic	As	0.00		Hardness(as$CaCO_3$)		531	10.62
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		764	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		7.5	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc//		2.7	
Selenium	Se	0.00		± deviation		2.9	
Silver	Ag	0.00'		Beta pc//		6.1	
Zinc-	Zn	0.02		± deviation		2.8	

WELL NO. 7, open to the Silurian dolomite, was completed in February 1972 to a depth of 488 ft by the Wehling Well Works, Beecher. This well is used only for the golf course and is not connected to the public water supply. The well is located northwest of the intersection of Western Ave. and Landan Road, approximately 780 ft S and 270 ft W of the NE corner of Section 13, T34N, R13E. The land surface elevation at the well is approximately 765 ft.

A drillers log of Well No. 7 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	10	10
Clay and sand	17	27
Clay and gravel	33	60
Lime and.broken soft	32	92
Lime	393	485
Shale	3	488

A 20-in. diameter hole was drilled to a depth of 95 ft, reduced to 19 in. between 95 and 107 ft, and finished 15.2 in. in diameter from 107 to 488 ft. The well is cased with 20-in. pipe from land surface to a depth of 95 ft and 16-in. pipe from land surface to a depth of 107 ft (cemented in).

A production test was conducted by the driller on February 2-3, 1972. After 24.2 hr of pumping at rates ranging from 833 to 600 gpm, the maximum drawdown was 210 ft from a nonpumping water level of 65 ft.

The pumping equipment presently installed is a Johnston turbine pump set at 250 ft, rated at 700 gpm, and powered by a 75-hp General Electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B48060) of a sample collected May 23, 1977, after pumping for 913 hr at 700 gpm, showed the water to have a hardness of 431 mg/l, total dissolved minerals of 457 mg/l, and an iron content of 0.5 mg/l.

PARK ROAD WATER ASSOCIATION

Park Road Water Association (est. 95), located about 1 mile southeast of Joliet, installed a public water supply in 1930. One well is in use. In 1979 there were 27 services, none metered; the average pumpage in 1980 was 4761 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1930 to a depth of 300 ft by R. J. Barr. The well is located at Washington St. and Park Road, approximately 800 ft S and 2100 ft E of the NW corner of Section 13, T35N, R10E. The land surface elevation at the well is approximately 615 ft.

An 8-in. diameter hole was drilled to a depth of 300 ft. The well is cased with 6-in. pipe from about 0.5 ft above land surface to an unknown depth.

The pumping equipment presently installed is a Red Jacket submersible pump set at 110 ft, rated at about 20 gpm, and powered by a l½-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B44652) is for a water sample from the well collected April 25, 1978, after 1300 hr of pumping at 21 gpm.

WELL NO. 1, LABORATORY NO. B44652

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.1		Silica	SiO_2	12	
Manganese	Mn	0.02		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.0	0.00	Boron	B	0.1	
Sodium	Na	13	0.57	Cyanide	CN	0.00	
Potassium	K	2.2	0.06	Nitrate	NO_3	5.3	0.08
Calcium	Ca	111	5.54	Chloride	Cl	45	1.27
Magnesium	Mg	60	4.94	Sulfate	SO_4	178	3.70
				Alkalinity(as $CaCO_3$)		304	6.08
Arsenic	As	0.00		Hardness(as $CaCO_3$)		516	10.32
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		639	
Copper	Cu	0.01					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.4	

PEOTONE

The village of Peotone (2345) installed a public water supply in 1895. Two wells (Nos. 3 and 4) are in use and another well (No. 1) is available for emergency use. In 1953 there were 500 services, all metered; the estimated average pumpage was 50,000 to 75,000 gpd. In 1980 there were 825 services, all metered; the average pumpage was 232,909 gpd. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

Initially, water was obtained from a 10-in. diameter well 100 ft deep at the local electric light plant. In 1903, the plant was sold and the village developed another water supply.

WELL NO. 1, open to the Silurian dolomite, was completed in 1904 to a depth of 135 ft by Martin & Kaler, Manteno. This well is available for emergency use. The well is located in the rear of the. village hall on Third St. between Main St. and Corning Ave., approximately 2450 ft S and 1130 ft W of the NE corner of Section 24, T33N, R12E. The land surface elevation at the well is approximately 715 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil, gravel, and clay	**60**	**60**
Limestone	**75**	**135**

The well is cased with 10-in. pipe from about 2 ft above the pump station floor to a depth of 60 ft.

Nonpumping water levels were reported to be 25 ft below land surface in 1913, 22 ft below the pump base in 1923, and 28 ft on February 25, 1974.

The pumping equipment presently installed is a turbine pump operated at 350 gpm.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41259) of a sample collected April 11, 1977, after pumping for 2 hr at 350 gpm, showed the water to have a hardness of 472 mg/l, total dissolved minerals of 642 mg/l, and an iron content of 0.4 mg/l.

WELL NO. 2, open to the Silurian dolomite, was completed in 1930 to a depth of 135 ft by J. O. Heflin, Joliet. This well was abandoned prior to 1979. The well is located about 45 ft west of Third St. and 45 ft northwest of Well No. 1, approximately 2410 ft S and 1150 ft W of the NE corner of Section 24, T33N, R12E. The land surface elevation at the well is approximately 715 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil and clay	**60**	**60**
Limestone	**75**	**135**

The well is cased with 10-in. pipe from about 1.5 ft above the pump station floor to a depth of 60 ft.

In 1934, the nonpumping water level was reported to be 22 ft below land surface.

On February 25, 1974, the well reportedly produced about 250 gpm with a drawdown of 34 ft from a nonpumping water level of 21 ft.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41255) of a sample collected April 11, 1977, after pumping for 2.5 hr at 350 gpm, showed the water to have a hardness of 467 mg/1, total dissolved minerals of 632 mg/1, and an iron content of 0.4 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in February 1970 to a depth of 300 ft by the Wehling Well Works, Beecher. The well is located on Rathje St., approximately 2371 ft N and 73 ft E of the SW corner of Section 24, T33N, R12E. The land surface elevation at the well is approximately 715 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	45	45
Mud, sand, and gravel	32	77
Lime	223	300

A 16-in. diameter hole was drilled to a depth of 81.5 ft and finished 15 in. in diameter from 81.5 to 300 ft. The well is cased with 16-in. pipe from land surface to a depth of 81.5 ft.

A production test was conducted by the driller on April 4, 1970. After 6.2 hr of pumping at rates ranging from 1385 to 1026 gpm, the final drawdown was 10 ft from a nonpumping water level of 30 ft below the top of the casing.

On February 25, 1974, the nonpumping water level was reported to be 33 ft.

The pumping equipment presently installed is a Johnston vertical turbine pump set at 100 ft, rated at 700 gpm, and powered by a 75-hp Westinghouse electric motor. The well is equipped with 100 ft of airline.

The following mineral analysis (Lab. No. 207182) is for a water sample from the well collected January 17, 1978.

WELL NO. 3, LABORATORY NO. 207182

		mg/l	*me/l*			*mg/l*	*me/l*
Iron(total)	Fe	0.2		Silica	SiO_2	8.9	
Manganese	Mn	0.00		Fluoride	F	0.4	
Ammonium	NH_4	1.4	0.08	Boron	B	1.2	
Sodium	Na	52.6	2.29	Nitrate	NO_3	0.2	0.00
Potassium	K	11.7	0.30	Chloride	Cl	5	0.14
Calcium	Ca	195.2	9.74	Sulfate	SO_4	622.0	12.94
Magnesium	Mg	77.3	6.36	Alkalinity(as$CaCO_3$)		274	5.48
Strontium	Sr	2.11	0.05				
				Hardness(as$CaCO_3$)		805	16.10
Barium	Ba	<0.1					
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved			
Copper	Cu	0.00		minerals		1163	
Lead	Pb	<0.05					
Lithium	Li	0.05					
Nickel	Ni	<0.05		Turbidity		2	
Silver	Ag	0.00		Color		0	
Zinc	Zn	0.01		Odor		0	

WELL NO. 4, open to the Silurian dolomite, was completed in July 1977 to a depth of 300 ft by the Wehling Well Works, Beecher. The well is located north of East Lincoln St. and west of the north end of Washington St., approximately 775 ft S and 1210 ft W of the NE corner of Section 24, T33N, R12E. The land surface elevation at the well is approximately 714 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Mud	20	20
Gravel and mud	10	30
Mud	29	59
Broken rock	14	73
Lime	227	300

A 15-in. diameter hole was drilled to a depth of 300 ft. The well is cased with 16-in. black pipe from land surface to a depth of 72 ft.

A production test was conducted by the driller on July 22-23, 1977. After 24 hr of pumping at rates ranging from 670 to 1450 gpm, the final drawdown was 159 ft from a nonpumping water level of 38 ft below the top of the casing.

A second production test was conducted by the driller on July 25, 1977. After 4 hr of pumping at rates ranging from 1413 to 983 gpm, the maximum drawdown was 156 ft from a nonpumping water level of 38 ft below the top of the casing.

The pumping equipment presently installed is a Johnston submersible pump set at 200 ft, rated at 750 gpm, and powered by a 75-hp U. S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B048979) is for a water sample from the well collected April 8, 1981, after 2 hr of pumping.

WELL NO. 4, LABORATORY NO. B048979

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.147		Silica	SiO_2	8.9	
Manganese	Mn	0.006		Fluoride	F	0.47	0.02
Ammonium	NH_4	0.4	0.02	Boron	B	0.99	
Sodium	Na	50	2.18	Cyanide	CN	<0.005	
Potassium	K	9.2	0.24	Nitrate	NO_3	<0.4	
Calcium	Ca	135	6.74	Chloride	Cl	3.8	0.11
Magnesium	Mg	61.2	5.04	Sulfate	SO_4	391	8.13
Strontium	Sr	1.20		Alkalinity(as$CaCO_3$)		316	6.32
Arsenic	As	0.001		Hardness(as$CaCO_3$)		588	11.76
Barium	Ba	0.021					
Beryllium	Be	<0.0005		Total dissolved			
Cadmium	Cd	<0.003		minerals		888	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	0.008					
Lead	Pb	<0.005					
Mercury	Hg	0.00008					
Nickel	Ni	0.023					
Selenium	Se	<0.0005					
Silver	Ag	<0.005					
Vanadium	V	<0.004					
Zinc	Zn	0.010		pH (as rec'd)		7.4	

PLAINFIELD

The village of Plainfield (2928) installed a public water supply in 1898. Two wells (Nos. 3 and 4) are in use. In 1961 there were 800 services; the average and maximum pumpages were 260,000 and 380,000 gpd, respectively. In 1980 there were about 1200 services, all metered; the average pumpage was 612,663 gpd. The water is chlorinated.

Water was initially obtained from a well constructed in 1898 to a depth of 104 ft by Feldott Bros., Batavia, and deepened in 1915 to a depth of 638 ft by S. H. Gray. This well was seldom used after deepening because of turbid water and was abandoned and sealed in 1929. The well was located about 50 ft south of Lockport St. and 85 ft west of Des Plaines St., approximately 90 ft S and 900 ft W of the NE corner of Section 16, T36N, R9E. The well was cased with 9-in. pipe to a depth of 20 ft and the hole was finished 6 in. in diameter to 104 ft. After deepening and rehabilitation, the well was cased with 10-in. pipe to a depth of 44 ft and an 8-in. liner pipe was placed between the depths of 135 and 273 ft.

A second well was completed in 1915 to a depth of 1380 ft. This well was abandoned in 1929 and then used as an observation well by the State Water Survey. The well is located about 150 ft north of the initial well, approximately 100 ft N and 900 ft W of the SE corner of Section 9, T36N, R9E. The well is cased with 12-in. pipe from land surface to a depth of 60 ft and liner pipe was placed between the depths of 150 and 300 ft, and the hole was finished 8 in. in diameter to the bottom. In 1917, the nonpumping water level was reported to be 55 ft below land surface.

WELL NO. 1, open to the Silurian dolomite, was completed in July 1929 to a depth of 195 ft by the Layne-Western Co., Aurora. This well was abandoned in 1972. The well is located about 0.7 mile north of Lockport St. and about 400 ft west of Illinois Route 59, approximately 1250 ft S and 400 ft W of the NE corner of Section 9, T36N, R9E. The land surface elevation at the well is approximately 612 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay and gravel	25.5	25.5
Broken limestone	2	27.5
Niagaran limestone	167.5	195
Maquoketa shale below		

A 33-in. diameter hole was drilled to a depth of 30 ft, reduced to 32 in. between 30 and 40 ft, and finished 15 in. in diameter from 40 to 195 ft. The well is cased with 26-in. OD steel pipe from about 0.1 ft above the pump foundation block to a depth of 26.5 ft and 16-in. OD genuine wrought iron pipe from about 0.1 ft above the pump foundation block to a depth of 40 ft (cemented in).

A production test was conducted by the driller on July 7, 1929. After 6 hr of pumping at a rate of 150 gpm, the drawdown was 32.8 ft from a nonpumping water level of 11.8 ft below land surface. Pumping was continued for 1.5 hr at a rate of 180 gpm with a drawdown of 55.8 ft. Pumping was continued for 30 min at a rate of 200 gpm with a drawdown of 61.3 ft. Pumping was continued for 45 min at a rate of 150 gpm with a drawdown of 40.3 ft. After an additional 1.8 hr of pumping at a rate of 112 gpm, the final drawdown was 28.8 ft.

On August 3, 1929, the nonpumping water level was reported to be 12.1 ft below land surface.

On November 12, 1929, after 10 hr of pumping at rates of 160 to 200 gpm, the drawdown was 101.5 ft from a nonpumping water level of 15.0 ft. Well Nos. 1 and 2 were producing at a combined rate of 379 to 303 gpm during this test.

In 1953, this well was acidized but most of the acid escaped through an adjacent observation well which had not been capped. Some acid also was found in Well No. 2 and the water system.

In August 1957, the nonpumping water level was reported to be 22 ft.

A mineral analysis of a sample (Lab. No. 107951) collected October 14, 1946, after pumping for 15 min at 125 gpm, showed the water to have a hardness of 363 mg/1, total dissolved minerals of 455 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in August 1929 to a depth of 201 ft by the Layne-Western Co., Aurora. This well was abandoned in 1972. The well is located about 400 ft west of Well No. 1, approximately 1250 ft S and 800 ft W of the NE corner of Section 9, T36N, R9E. The land surface elevation at the well is approximately 612 ft.

A correlated drillers log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Clay and gravel	27	27
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Limestone, broken	2	29
Limestone	172	201
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale	below	201

A 26-in. diameter hole was drilled to a depth of 29 ft, reduced to 24 in. between 29 and 48.7 ft, and finished 15 in. in diameter from 48.7 to 201 ft. The well is cased with 26-in. OD drive pipe from about 0.1 ft above the pump

foundation block to a depth of 29 ft and 16-in. OD pipe from about 0.1 ft above the pump foundation block to a depth of 48.7 ft (cemented in).

Upon completion, the well reportedly produced from 208 to 196 gpm for 4 hr with a drawdown of 61.5 ft from a nonpumping water level of 10.3 ft below land surface.

On November 12, 1929, after 10 hr of pumping, the drawdown was 97 ft from a nonpumping water level of 17 ft below the pump base. Well Nos. 1 and 2 were producing at a combined rate of 379 to 303 gpm during this test.

Nonpumping water levels were reported to be 50 ft in October 1951 and 58 ft in August 1957.

A mineral analysis of a sample (Lab. No. 107952) collected October 14, 1946, after pumping for 15 min at 125 gpm, showed the water to have a hardness of 335 mg/1, total dissolved minerals of 448 mg/1, and an iron content of 0.3 mg/1.

WELL NO. 3, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in January 1956 to a depth of 1481 ft by the Layne-Western Co., Aurora. The well is located at 1112 Mills St. under the elevated tank, approximately 2400 ft N and 750 ft E of the SW corner of Section 10, T36N, R9E. The land surface elevation at the well is approximately 612 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Soil	5	5
Till and gravel, silty, gray to buff	24	29
SILURIAN SYSTEM		
Niagaran Series		
Joliet Dolomite		
Brandon Bridge Member		
Limestone, buff, gray, pink, red	21	50
Alexandrian Series		
Kankakee Dolomite		
Limestone, buff to gray, silty at top	35	85
Limestone, gray, buff, little glauconite	10	95
Elwood Dolomite		
Dolomite, cherty, silty, gray to buff	30	125
Wilhelmi Formation		
Dolomite, silty, gray to buff	20	145
Limestone, dolomitic, white to buff	5	150
Dolomite, very argillaceous, gray	8	158
ORDOVICIAN SYSTEM		
Maquoketa Group		
Brainard Shale		
Shale, green to gray, weak to brittle	27	185
Ft. Atkinson Limestone		
Limestone, gray to buff; shale at base	18	203
Scales Shale		
Shale, gray, silty; limestone stringers	76	279
Galena Group		
Limestone, dolomitic, buff	86	365
No sample	5	370
Limestone, dolomitic, buff	55	425
No sample	5	430
Limestone, dolomitic, buff	30	460
Limestone, dolomitic, gray, buff, red	7	467
Limestone, dolomitic, cherty, gray, buff	13	480
Platteville Group		
Limestone, dolomitic, buff to gray	70	550
Dolomite, calcareous, buff to gray	15	565
Limestone, dolomitic, gray to buff	25	590
Dolomite, calcareous, gray to buff	37	627
Ancell Group		
Glenwood Formation		
Sandstone, dolomitic, shaley, white, buff	68	695
St. Peter Sandstone		
Sandstone, silty, white to light gray, rounded, very fine to coarse; shale at base, sandy, buff, tough	190	885
Prairie du Chien Group		
Shakopee Dolomite		
Dolomite, cherty (oolitic), white, buff	20	905
New Richmond Sandstone		
Sandstone, white; dolomite, white, cherty	21	926
Shale, green, brown	9	935
Oneota Dolomite		
Dolomite, cherty, white, buff	17	952
Shale, silty, red, gray	15	967
Dolomite, cherty, pink; shale	23	990
Gunter Sandstone		
Sandstone, white	10	1000
CAMBRIAN SYSTEM		
Eminence Dolomite		
Dolomite, sandy, cherty, buff to gray	40	1040
Potosi Dolomite		
Dolomite, gray, pink, buff	154	1194
Franconia Formation		
Dolomite, glauconitic, sandy, buff, gray	26	1220
Shale, glauconitic, silty, gray, green	25	1245
Sandstone, glauconitic, gray, green	50	1295
Ironton Sandstone		
Sandstone, gray; dolomite, pink, sandy	20	1315
Sandstone, gray, silty, dolomitic	65	1380
Sandstone, silty, white to buff	25	1405
Galesville Sandstone		
Sandstone, white to gray, fine to coarse	25	1430
Sandstone, medium to coarse, white, gray	35	1465
Sandstone, dolomitic, white to gray	15	1480

A 26-in. diameter hole was drilled to a depth of 35 ft, reduced to 22 in. between 35 and 620 ft, reduced to 17.2 in. between 620 and 990 ft, and finished 15.2 in. in diameter from 990 to 1481 ft. The well is cased with 26-in. drive pipe from about 0.8 ft above the pumphouse floor to a depth of 35 ft, 18-in. OD pipe from about 0.8 ft above the

pumphouse floor to a depth of 620 ft (cemented in), and 16-in. liner pipe from 887 ft to a depth of 990 ft.

Before shooting, a production test was conducted on January 19, 1956, by representatives of the driller, the village, the State Water Survey, and Walter Deuchler Associates, Consulting Engineers. After 4.2 hr of pumping at rates ranging from 310 to 190 gpm, the final drawdown was 110 ft from a nonpumping water level of 280 ft. Thirty-two min after pumping was stopped, the water level had recovered to 289 ft.

After the well was shot with 5 shots (600 lb total) of 100 percent solidified gelatin between the depths of 1320 and 1450 ft, a production test was conducted on January 30-31, 1956, by representatives of the driller, the village, the State Water Survey, and Walter Deuchler Associates, Consulting Engineers. After 5.5 hr of pumping at rates ranging from 195 to 305 gpm, the drawdown was 53 ft from a nonpumping water level of 277 ft below the pump base. Pumping was continued at rates ranging from 439 to 465 gpm for 15.5 hr with a drawdown of 78 ft. After an additional 3 hr of pumping at rates ranging from 644 to 608 gpm, the final drawdown was 100 ft. The water level recovered to 307 ft after pumping had been stopped for 1.2 hr.

In August 1957, the nonpumping water level was reported to be 312 ft.

In April 1958, the well reportedly produced 650 gpm for 5 min with a drawdown of 51 ft from a nqnpumping water level of 314 ft.

On March 31, 1971, the well reportedly produced 600 gpm for 1 hr with a drawdown of 58 ft from a nonpumping water level of 450 ft.

On October 9, 1975, the nonpumping water level was reported to be 498 ft below land surface.

The pumping equipment presently installed consists of a 200-hp 1800 rpm U.S. electric motor, a 10-in., 15-stage Layne vertical turbine pump (No. 33996) set at 650 ft, rated at 600 gpm at about 768 ft TDH, and has 650 ft of 8-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake. The well is equipped with 650 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40191) of a sample collected March 27, 1978, after pumping for 1 hr at about 650 gpm, showed the water to have a hardness of 213 mg/l, total dissolved minerals of 369 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 4, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in December 1964 to a depth of 1443 ft by the Layne-Western Co., Aurora. The well is located along the Elgin, Joliet & Eastern RR tracks at 143rd St. east of Van Dyke Road, approximately 125 ft N and 2100 ft W of the SE corner of Section 4, T36N, R9E. The land surface elevation at the well is approximately 620 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Surface	5	5
Yellow clay	5	10
Blue clay and gravel	16	26
Gray limestone	109	135
Medium gray limestone and shale	15	150
Medium gray limestone	10	160
Medium gray lime with shale streaks	50	210
Medium dark gray limestone	15	225
Medium gray shale	43	268
Medium brown limestone	27	295
Medium gray limestone	120	415
Light brown limestone	50	465
Gray limestone	105	570
Brown limestone	35	605
Hard gray sandy limestone	5	610
Hard white sandstone	20	630
Medium white sandstone	20	650
Soft white sandstone	45	695
Hard white sandy limestone	25	720
Medium white sandstone	30	750
Limestone and shale	45	795
Hard gray limestone	10	805
Hard gray limestone and shale	10	815
Medium gray limestone	33	848
Gray shale	1	849
Hard gray limestone	21	870
Hard buff limestone	6	876
Green shale	1	877
Gray limestone	138	1015
Hard buff limestone	25	1040
Hard gray limestone	90	1130
Medium white sandy limestone	20	1150
Hard dark gray limestone	23	1173
Hard buff limestone	7	1180
Gray limestone	20	1200
Hard gray sandy limestone	10	1210
Medium gray sandy shale	10	1220
Medium dark gray sandy limestone	70	1290
Hard white sandy limestone	30	1320
Hard white sandstone	20	1340
Medium white sandstone	20	1360
Hard white sandstone	10	1370
Hard white sandy limestone	15	1385
Medium white sandstone	5	1390
Soft white sandstone	33	1423
Hard sandy limestone	6	1429
Hard brown limestone	14	1443

A 26-in. diameter hole was drilled to a depth of 29.5 ft, reduced to 25 in. between 29.5 and 619 ft, reduced to 19 in. between 619 and 887 ft, and finished 17 in. in diameter from 887 to 1443 ft. The well is cased with 26-in. pipe from 1 ft above land surface to a depth of 29.5 ft, 20-in. pipe from 1 ft above land surface to a depth of 619 ft (cemented in), and 18-in. liner pipe from 732 ft to a depth of 887 ft.

The well was shot with nitroglycerin at 4 locations as follows: 40 qt from 1392.5 to 1420 ft, 50 qt from 1360 to 1385 ft, 50 qt from 1328 to 1353.5 ft, and 60 qt from 1278 to 1302 ft.

A production test was conducted by the driller on December 3, 1964. After 5.6 hr of pumping at rates ranging

from 445 to 643 gpm, the final drawdown was 125 ft from a nonpumping water level of 339 ft below land surface.

A second production test was conducted by the driller on December 4, 1964. After 8.8 hr of pumping at rates ranging from 540 to 944 gpm, the final drawdown was 147 ft from a nonpumping water level of 339 ft below land surface.

A third production test was conducted by the driller on December 22, 1964. The well produced at rates of 540 to 1018 gpm for 12 hr with a final drawdown of 149 ft from a nonpumping water level of 344 ft below land surface. One hr after pumping was stopped, the water level had recovered to 360 ft.

On October 8, 1975, the nonpumping water level was reported to be 545 ft below land surface.

The pumping equipment presently installed is a 10-in., 12-stage Layne submersible pump set at 716 ft, rated at 800 gpm at about 460 ft head, and powered by a 200-hp 1750 rpm Byron Jackson electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B47374) is for a water sample from the well collected April 28, 1980, after 2 hr of pumping at 650 gpm.

WELL NO. 4. LABORATORY NO. B47374

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.21		Silica	SiO_2	7.3	
Manganese	Mn	<0.005		Fluoride	F	1.27	0.07
Ammonium	NH_4	0.9	0.05	Boron	B	0.63	
Sodium	Na	71	3.09	Cyanide	CN	<0.005	
Potassium	K	16.9	0.43	Nitrate	NO_3	<0.4	
Calcium	Ca	49	2.44	Chloride	Cl	25	0.70
Magnesium	Mg	15	1.23	Sulfate	SO_4	48	1.00
Strontium	Sr	2.4		Alkalinity(as$CaCO_3$)		281	5.62
Arsenic	As	<0.0005		Hardness(as$CaCO_3$)		180	3.60
Barium	Ba	0.07					
Beryllium	Be	<0.0001		Total dissolved			
Cadmium	Cd	<0.0005		minerals		407	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	<0.005					
Lead	Pb	<0.005					
Lithium	Li	0.05					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.0O5					
Selenium	Se	<0.0005					
Silver	Ag	<0.01					
Vanadium	V	<0.005					
Zinc	Zn	0.01		pH (as rec'd)		7.2	

PRESTON UTILITY CO.

Preston Utility Co. (est. 1925), located about 1 mile southeast of Joliet, installed a public water supply in 1954. One well is in use. This supply is also cross connected with the city of Joliet. In 1969 there were 441 services, all metered; the estimated average pumpage was 100,000 gpd. In 1980 there were 476 services, all metered; the average pumpage was 172,926 gpd. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

Prior to the installation of Well No. 1, water was obtained from the city of Joliet.

WELL NO. 1, open to the Silurian dolomite, was completed in April 1960 to a depth of 248 ft by the Layne-Western Co., Aurora. The well is located at South Chicago St. and Zarley Boulevard, approximately 319 ft S and 306 ft E of the NW corner of Section 27, T35N, R10E. The land surface elevation at the well is approximately 632 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil and clay	10	10
Gravelly clay	20	30
Sand and gravel	13	43
Gravelly clay	12	55
Gray limestone	75	130
Gray and brown limestone	25	155
Gray limestone	90	245
Gray shale	3	248

A 15.2-in. diameter hole was drilled to a depth of 248 ft. The well is cased with 16-in. pipe from 1.2 ft above the pumphouse floor to a depth of 56 ft.

A production test was conducted by the driller on April 13, 1960. After 8 hr of pumping at rates ranging from 430 to 267 gpm, the maximum drawdown was 165 ft from a nonpumping water level of 50 ft below land surface. Ten min after pumping was stopped, the water level had recovered to 73 ft.

On November 10, 1966, the well reportedly produced 325 gpm for 30 min with a drawdown of 74 ft from a nonpumping water level of 60 ft below the pump base.

On December 11, 1970, the well reportedly produced 320 gpm for 30 min with a drawdown of 71 ft from a nonpumping water level of 91 ft.

The pumping equipment presently installed consists of a 40-hp 1800 rpm Westinghouse electric motor, a 6-in., 12-stage Layne turbine pump (Serial No. 41830) set at 220 ft, rated at 300 gpm at about 331 ft head, and has 220 ft of 6-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake. The well is equipped with 220 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No, B33468) is for a water sample from the well collected January 30, 1980, after 30 min of pumping at 250 gpm.

WELL NO. 1, LABORATORY NO. B33468

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.43		Silica	SiO_2	15	
Manganese	Mn	0.01		Fluoride	F	0.22	0.01
Ammonium	NH_4	0.4	0.02	Boron	B	0.21	
Sodium	Na	25	1.09	Cyanide	CN	0.01	
Potassium	K	4.9	0.12	Nitrate	NO_3	<0.4	
Calcium	Ca	114	5.69	Chloride	Cl	22	0.62
Magnesium	Mg	56	4.61	Sulfate	SO_4	175	3.64
Strontium	Sr	0.737		Alkalinity(as$CaCO_3$)		374	7.48
Arsenic	As	0.002		Hardness(as$CaCO_3$)		515	10.30
Barium	Ba	0.04					
Beryllium	Be	<0.001		Total dissolved			
Cadmium	Cd	<0.0005		minerals		641	
Chromium	Cr	0.01					
Cobalt	Co	<0.005					
Copper	Cu	0.006					
Lead	Pb	0.02					
Lithium	Li	0.09					
Mercury	Hg	<0.00005					
Nickel	Ni	0.008					
Selenium	Se	<0.001					
Silver	Ag	<0.005					
Zinc	Zn	0.005		pH (as rec'd)		7.5	

PRESTWICK UTILITY CO.

Prestwick Utility Co. (est. 807), located about 3 miles east of Frankfort, installed a public water supply in 1965. The water system is owned and operated by Utilities, Inc. One well (No. 1) is in use and another well (No. 2) is available for emergency use. In 1975 there were 163 services, all metered; the average pumpage in 1973 was 77,775 gpd. In 1980 there were 394 services, all metered; the average pumpage was 184,725 gpd. The water is chlorinated and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Silurian dolomite, was completed in August 1965 to a depth of 370 ft by John Tyler, Frankfort. The well is located about 50 ft northwest of the elevated tank, approximately 185 ft S and 1890 ft E of the NW corner of Section 25, T35N, R12E, Will County. The land surface elevation at the well is approximately 710 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	64	64
Limestone	300	364
Shale	10	374

The well is cased with 10-in. galvanized pipe from about 1.5 ft above the wellhouse floor to a depth of 70 ft. The top of the well casing is equipped with a Tubbs pitless adapter.

Upon completion, the well reportedly produced 500 gpm for 3 hr with a drawdown of 140 ft from a nonpumping water level of 30 ft below land surface.

The pumping equipment presently installed is a Jacuzzi submersible pump set at 150 ft, rated at 600 gpm, and powered by a 70-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42018) is for a water sample from the well collected April 21, 1976, after 30 min of pumping at 300 gpm.

WELL NO. 1, LABORATORY NO. B42018

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.3		Silica	SiO_2	14	
Manganese	Mn	0.07		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.04	0.00	Boron	B	0.3	
Sodium	Na	20	0.87	Cyanide	CN	0.00	
Potassium	K	2.9	0.07	Nitrate	NO_3	0.0	0.00
Calcium	Ca	140	6.99	Chloride	Cl	34	0.96
Magnesium	Mg	76	6.26	Sulfate	SO_4	310	6.45
				Alkalinity(as$CaCO_3$)		334	6.68
Arsenic	As	0.00		Hardness(as$CaCO_3$)		662	13.24
Barium	Ba	0.2					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		876	
Copper	Cu	0.01					
Lead	Pb	0.00		pH (as rec'd)		7.2	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc//		5.0	
Selenium	Se	0.00		± deviation		3.5	
Silver	Ag	0.00		Beta pc//		5.5	
Zinc	Zn	0.0		± deviation		1.9	

WELL NO. 2, open to the Silurian dolomite, was completed about 1970 to a depth of about 370 ft. This well is available for emergency use. The well is located about 100 ft west of Harlem Ave. and 0.2 mile south of the Penn Central RR, approximately 900 ft S and 100 ft W of the NE corner of Section 25, T35N, R12E, Will County. The land surface elevation at the well is approximately 700 ft.

The well is cased with 10-in. pipe from about 1.2 ft above the wellhouse floor to an unknown depth.

The pumping equipment presently installed is a submersible pump rated at 175 gpm, and powered by a 20-hp electric motor.

WELL NO. 3, open to the Silurian dolomite, was constructed in May 1981 to a depth of 435 ft and deepened in June 1981 to a reported depth of 500 ft by the Henry Boysen Co., Libertyville. This well is not yet in use. The well is located approximately 2460 ft N and 1105 ft W of the SE corner of Section 30, T35N, R13E, Cook County. The land surface elevation at the well is approximately 725 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift grade	57	57
Limestone	357	414
Shale	56	470
Limestone	20	490
Shale	10	500

The well is cased with 12-in. pipe to a depth of 61 ft.

The pumping equipment is not yet installed.

A partial analysis of a sample (Lab. No. 215682) collected June 5, 1981, showed the water to have a hardness of 554 mg/1, total dissolved minerals of 693 mg/1, and an iron content of 0.1 mg/1.

RIDGEWOOD SUBDIVISION

Ridgewood Subdivision (est. 315), located just east of Joliet, installed a public water supply in 1927. The water system is owned and operated by the Ridgewood Water Association. One well is in use. In 1956 there were 80 services, plus 1 school, none metered; the estimated average pumpage was 10,000 to 15,000 gpd. In 1980 there were 90 services, none metered; the estimated average pumpage was 45,000 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was constructed in April 1927 to a depth of 277 ft by Mr. Bersey, and deepened in June 1930 to a reported depth of 375 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located about 150 ft east of 1114 Ridgewood St., approximately 2300 ft S and 2800 ft W of the NE corner of Section 11, T35N, R10E. The land surface elevation at the well is approximately 640 ft.

An 8-in. diameter hole was drilled to a depth of 92 ft and finished 6 in. in diameter from 92 to 375 ft. The well is cased with 8-in. pipe from about 0.7 ft above the floor of a 5-ft deep pit to a depth of 35 ft and 6-in. pipe from about 0.8 ft above the floor of a 5-ft deep pit to a depth of 92 ft.

On April 20, 1936, when pumping at capacity, the drawdown was 15 ft from a nonpumping water level of 128 ft below the pump base.

The pumping equipment presently installed consists of a 10-hp U. S. electric motor, a 6-in., 22-stage Peerless turbine pump (No. 6440) set at 150 ft, rated at 80 gpm at about 276 ft TDH, and has 150 ft of 4-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 04721) is for a water sample from the well collected March 27, 1971.

WELL NO. 1, LABORATORY NO. 04721

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0	0.00	Silica	SiO_2	12	
Manganese	Mn	0.0	0.00	Fluoride	F	0.2	0.01
Ammonium	NH_4	0.0	0.00	Boron	B	0.4	
Sodium	Na	20.5	0.89	Nitrate	NO_3	4.8	0.08
Potassium	K	4.3	0.11	Chloride	Cl	29	0.82
Calcium	Ca	158	7.88	Sulfate	SO_4	431	8.96
Magnesium	Mg	100	8.22	Alkalinity(as $CaCO_3$)		352	7.04
				Hardness(as $CaCO_3$)		800	
Barium	Ba	0.0		Total dissolved			
Cadmium	Cd	0.00		minerals		918	
Chromium	Cr	0.0					
Copper	Cu	0.0		pH (as rec'd)	6.9		
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha *pc/l*	0		
Nickel	Ni	0.0		± deviation	2		
Silver	Ag	0.0		Beta *pc/l*	2		
Zinc	Zn	0.05		± deviation	3		

ROCKDALE

The village of Rockdale (2085) installed a public water supply in 1915. One well (No. 2) is in use. This supply is also cross connected with the city of Joliet and the Universal Glass Co. In 1949 the average pumpage was 217,000 gpd. In 1980 there were 450 services, all metered; the average pumpage from Well No. 2 in 1979 was 377,000 gpd. An additional 274,000 gpd was purchased from Joliet. The water is chlorinated.

WELL NO. 1, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in 1914 to a depth of 660 ft by the Ohio Drilling Co., Massillon, Ohio. This well was abandoned and sealed in 1944. The well is located at the northwest corner of Otis and Midland Aves., approximately 750 ft S and 1240 ft E of the NW corner of Section 20, T35N, R10E. The land surface elevation at the well is approximately 555 ft.

A sample study and drillers log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	5	5
SILURIAN AND ORDOVICIAN SYSTEMS		
Niagaran and Alexandrian Series, and Maquoketa Group		
Dolomite and shale	245	250
ORDOVICIAN SYSTEM		
Galena and Platteville Groups		
Dolomites	335	585
Ancell Group		
Glenwood Formation		
Dolomite, sandy	10	595
St. Peter Sandstone		
Sandstone, water bearing	65	660

The well is cased with 10-in. pipe to a depth of about 265 ft.

Nonpumping water levels were reported to be 25 ft below land surface in September 1915, and 50 ft on July 13,. 1938.

A partial analysis of a sample (Lab. No. 100703) collected July 14, 1944, showed the water to have a hardness of 453 mg/1, total dissolved minerals of 562 mg/1, and an iron content of 0.3 mg/1.

In 1944, the pump in Well No. 1 would break suction after a few minutes of operation and the village water supply was supplemented through a cross connection with the Universal Glass Co. well.

In December 1944, cement moved through a fissure and plugged Well No. 1 when Well No. 2 (about 50 ft away) was being cemented. Water was then obtained from the Universal Glass Co. well until Well No. 2 was placed in operation.

WELL NO. 2, open to the Cambrian-Ordovician aquifer below the middle of the Oneota Dolomite, was completed in February 1945 to a depth of 1586 ft (reported to be 1575 ft deep in 1954) by the J. P. Miller Artesian Well Co., Brookfield. The well is located next to the elevated tank at Otis and Midland Aves., approximately 700 ft S and 1250 ft E of the NW corner of Section 20, T35N, R10E. The land surface elevation at the well is approximately 556 ft.

A sample study log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
"Surface"	10	10
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite	83	93
Dolomite, shaly, shale at base	55	148
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite and shale	108	256
Galena and Platteville Groups		
Dolomite, some limestone	347	603
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, incoherent	148	751
Prairie du Chien Group		
Shakopee Dolomite		
Dolomite, thin shale and sandstone beds	39	790
New Richmond Sandstone		
Dolomite and sandstone	15	805
ORDOVICIAN AND CAMBRIAN SYSTEMS		
Oneota and Eminence Dolomites		
Dolomite, some sandstone, thin shale beds	275	1080
CAMBRIAN SYSTEM		
Potosi Dolomite	154	1234
Franconia Formation		
Dolomite, some shale, sandstone	116	1350
Ironton-Galesville Sandstone		
Sandstone, thin dolomite beds	120	1470
Sandstone, incoherent	63	1533
Eau Claire Formation		
Dolomite, sandstone, and shale	53	1586

A 19.2-in. diameter hole was drilled to a depth of 431 ft and finished 13 in. in diameter from 431 to 1586 ft. The well is cased with 20-in. drive pipe from land surface to a depth of 19 ft and 14-in. ID pipe from 1.2 ft above the pumphouse floor to a depth of 431 ft (cemented in). In 1973, the Layne-Western Co., Aurora, installed a 12-in. casing from land surface to a depth of 900 ft.

A production test was conducted on March 1, 1945, by representatives of the driller and the State Water Survey. After 7 hr of pumping at rates of 170 to 118 gpm, the drawdown was 33 ft from a nonpumping water level of 286 ft below the pump base. Eight min after pumping was stopped, the water level had recovered to 289 ft.

On March 6, 1945, the well was shot with 300 lb of gelatin between the depths of 1501 and 1515 ft. After a con-

siderable amount of sand was bailed out and the well cleaned, the nonpumping water level was reported to be 283 ft below the top of the casing.

A second production test was conducted on March 23-24, 1945, by representatives of the driller and the State Water Survey. After 2.5 hr of pumping at a rate of 300 gpm, the drawdown was 38 ft from a nonpumping water level of 284 ft below the pump base. Pumping was continued for 1.9 hr at a rate of 400 gpm with a drawdown of 50 ft. After an additional 12.1 hr of pumping at rates ranging from 500 to 540 gpm, the final drawdown was 74 ft. The water level recovered to 290 ft after the pump had been turned off 2.9 hr.

On October 7, 1946, after a 6-hr idle period, the well reportedly produced 267 gpm for 4.2 hr with a drawdown of 26 ft from a nonpumping water level of 293 ft below the pump base.

Nonpumping water levels were reported to be 350 ft in October 1949, 368 ft in November 1954, and 586 ft in April 1971.

The pumping equipment presently installed consists of a 200-hp 1800 rpm U. S. electric motor (Serial No. 1269243), a 10-in., 17-stage Peerless turbine pump (Serial No. 108542) set at 800 ft, rated at 600 gpm at about 871 ft TDH, and has 800 ft of 8-in. column pipe. The well is equipped with 800 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A16730) is for a water sample from the well collected March 24, 1976, after 2 hr of pumping at 492 gpm.

WELL NO. 2, LABORATORY NO. A16730

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.1		Silica	SiO_2	8	
Manganese	Mn	0.04		Fluoride	F	1.8	0.10
Ammonium	NH_4	1.09	0.06	Boron	B	1.0	
Sodium	Na	94	4.09	Cyanide	CN	0.00	
Potassium	K	15	0.38	Nitrate	NO_3	0.0	0.00
Calcium	Ca	56	2.79	Chloride	Cl	30	0.85
Magnesium	Mg	19	1.56	Sulfate	SO_4	120	2.50
				Alkalinrty(as$CaCO_3$)		266	5.32
Arsenic	As	0.000		Hardness(as$CaCO_3$)		216	4.32
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.03		minerals		470	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		7.6	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc//		40.4	
Selenium	Se	0.00		± deviation		6.0	
Silver	Ag	0.00		Beta pc//		48.1	
Zinc	Zn	0.0		± deviation		4.2	

ROMEOVILLE

The village of Romeoville (12,674) installed a public water supply in 1958. Four wells (Nos. 1, 2, 4, and 5) are in use and another well (No. 3) is available for emergency use. The village purchased the Hampton Park Subdivision wells (now village Well Nos. 3 and 4) from the Alexander Utilities Co. in December 1972. In 1966 there were 1920 services, all metered; the average pumpage was 710,000 gpd. In 1980 there were 4005 services, all metered; the average pumpage was 1,423,458 gpd. The water is chlorinated.

WELL NO. 1, open to the Silurian dolomite, was completed in August 1958 to a depth of 160 ft by the Red Duck Drilling Co., Elmwood Park. The well is located on Norman Town Road about 30 ft east of the main pumping station, approximately 100 ft S and 500 ft W of the NE corner of Section 33, T37N, R10E. The land surface elevation at the well is approximately 640 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	5	5
Gravel	10	15
Gravel, clay, boulders	27	42
Lime, white	23	65
Lime, brown, crevices at 85 ft (very hard below 100 ft)	65	130
Lime, white	26	156
Red shale	1	157
Blue shale	3	160

A 12-in. diameter hole was drilled to a depth of 160 ft. The well is cased with 12-in. pipe from 2 ft above land surface to a depth of 42 ft.

Upon completion, the nonpumping water level was reported to be 20 ft. The well was pumped for 24 hr at a rate of 400 gpm.

On September 5, 1979, the nonpumping water level was reported to be 31 ft.

The pumping equipment presently installed consists of a 20-hp Sumo electric motor, a Fairbanks-Morse submersible pump set at 147 ft, rated at 350 gpm at about 160 ft TDH, and has 147 ft of 5-in. column pipe. The well is equipped with 147 ft of airline.

The following mineral analysis (Lab. No. 211877) is for a water sample from the well collected September 5, 1979, after 6 hr of pumping at 350 gpm.

WELL NO. 1, LABORATORY NO. 211877

		mg/l	*me/l*			*mg/l*	*me/l*
Iron(total)	Fe	<0.04		Silica	SiO_2	14.7	
Manganese	Mn	0.00		Fluoride	F	0.2	
Ammonium	NH_4	0.0	0.00	Boron	B	0.1	
Sodium	Na	17.8	0.77	Nitrate	NO_3	9.5	0.15
Potassium	K	2.0	0.05	Chloride	Cl	42	1.18
Calcium	Ca	109	5.43	Sulfate	SO_4	117	2.43
Magnesium	Mg	49.7	4.09	Alkalinity(as $CaCO_3$)		322	6.44
Strontium	Sr	0.13	0.00				
				Hardness(as $CaCO_3$)		476	9.52
Barium	Ba	<0.05					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		577	
Copper	Cu	0.01					
Lead	Pb	0.01					
Lithium	Li	0.01		Turbidity		1	
Nickel	Ni	0.01		Color		0	
Silver	Ag	0.00		Odor		0	
Zinc	Zn	0.00		Temp, (reported)		54F	

WELL NO. 2, open to the Cambrian-Ordovician aquifer except for the Kress Member of the Glenwood-St. Peter Sandstone, was completed in April 1959 to a depth of 1520 ft by James W. Bilskey, Westmont. The well is located on Norman Town Road inside the main pumping station about 50 ft west of Well No. 1, approximately 100 ft S and 550 ft W of the NE corner of Section 33, T37N, R10E. The land surface elevation at the well is approximately 640 ft.

A correlated drillers log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Drift	44	44
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Limestone	113	157
ORDOVICIAN SYSTEM		
Maquoketa Group		
Neda Formation		
Red shale	21	178
Brainard Shale		
Blue shale	75	253
Brown shale	7	260
Ft. Atkinson Limestone		
Shalylime	18	278
Scales Shale		
Brown shale	90	368
Galena and Platteville Groups		
Second limestone	330	698
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone	270	968
Kress Member		
Shale	3	971
Lime	4	975
Shale	11	986
Red shale	11	997
Blue shale	11	1008
CAMBRIAN SYSTEM		
Eminence Dolomite		
Sandy lime	8	1016
White lime	42	1058
Gray shale	36	1094
Potosi Dolomite		
White lime	159	1253
Franconia Formation		
Shale	5	1258
Lime	4	1262
Shale	6	1268
Lime	32	1300
Sandstone	2	1302
Sandy shale	32	1334
Hard white limestone	13	1347
Ironton-Galesville Sandstone		
Sandstone	145	1492
Eau Claire Formation		
Sandy lime	8	1500
Sandstone	15	1515
Blue shale	5	1520

The well is cased with 20-in. pipe from land surface to a depth of 44 ft, 16-in. pipe from about 0.8 ft above the pumphouse floor to a depth of 378 ft (cemented in), and 12.5-in. liner pipe from 967 ft to a depth of 1100 ft. Below the casing, the hole is 8 in. in diameter to the bottom.

Upon completion, the well was reportedly pumped at rates of 600 to 1034 gpm for 8 hr with a drawdown of 140 ft from a nonpumping water level of 420 ft.

A production test was conducted by the Alexander Construction Co. on June 30, 1959. After 5.2 hr of pumping at a rate of 1350 gpm, the drawdown was 121 ft from a nonpumping water level of 415 ft below the top of the casing.

In February 1969, the well reportedly produced 1100 gpm with a drawdown of 69 ft from a nonpumping water level of 5 37 ft.

The pumping equipment presently installed is a 12-in., 11-stage Layne & Bowler submersible turbine pump set at 700 ft, rated at 750 gpm at about 759 ft TDH, and powered by a 200-hp General Electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C004032) of a sample collected May 30, 1978, after pumping for 2 hr at 650 gpm, showed the water to have a hardness of 200 mg/l, total dissolved minerals of 370 mg/l, and an iron content of 0.1 mg/l.

WELL NO. 3 (formerly Hampton Park Subdivision well), open to the Silurian dolomite, was completed in October 1964 to a depth of 160 ft by the Layne-Western Co., Aurora. This well is available for emergency use and also supplies water for filling a lake used for swimming and fish-

ing. The well is located on Lake Shirley Drive near Lake Shirley, approximately 2500 ft N and 1875 ft E of the SW corner of Section 33, T37N, R10E. The land surface elevation at the well is approximately 618 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Clay fill	12	12
Top soil	5	17
Sand and gravel	1	18
Hard brown limestone	42	60
Medium brown limestone (crevices 70 to 80 ft)	60	120
Soft brown limestone	10	130
Soft light brown limestone	25	155
Medium limestone with shale streaks	5	160

A 16-in. diameter hole was drilled to a depth of 20.6 ft and finished 15.2 in. in diameter from 20.6 to 160 ft. The well is cased with 16-in. pipe from about 0.4 ft above the pumphouse floor to a depth of 20.6 ft.

A production test was conducted by the driller on October 6, 1964. After 8.1 hr of pumping at rates ranging from 1001 to 1604 gpm, the final drawdown was 5 ft from a nonpumping water level of 17 ft below land surface. Two min after pumping was stopped, full recovery was observed.

On September 5, 1979, the nonpumping water level was reported to be 19 ft.

The pumping equipment presently installed is a Layne & Bowler submersible turbine pump set at 40 ft, rated at 1000 gpm at about 315 ft head, and powered by a 100-hp 1800 rpm U. S. electric motor.

A partial analysis of a sample (Lab. No. 211878) collected September 5, 1979, after pumping for 10 min, showed the water to have a hardness of 430 mg/1, total dissolved minerals of 503 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 4 (formerly Hampton Park Subdivision well), open to the Cambrian-Ordovician aquifer, was completed in October 1964 to a depth of 1524 ft by the Layne-Western Co., Aurora. The well is located on Fairfax St. near Macon St., approximately 1250 ft S and 1850 ft E of the NW corner of Section 4, T36N, R10E. The land surface elevation at the well is approximately 670 ft.

A drillers log of Well No. 4 follows:

Strata	Thickness (ft)	Depth (ft)
Black dirt	2	2
Yellow clay and rocks	8	10
Brown clay and rocks	45	55
Hard brown limestone	15	70
Hard gray limestone	40	110
Medium gray shale and lime streaks	5	115
Hard gray limestone	55	170
Medium gray sandy limestone	20	190
Hard gray sandy limestone	30	220
Gray limestone and shale	25	245
Hard gray limestone	15	260
Gray shale and limestone streaks	5	265
Medium gray limestone	15	280
Medium gray shale	5	285
Shale and limestone streaks	75	360
Hard brown limestone	45	405
Medium brown limestone	135	540
Sandy limestone	5	545
Medium brown limestone	90	635
Medium gray limestone	35	670
Medium brown limestone	25	695
Medium gray sandstone	184	879
Blue shale	11	890
Sandy limestone with shale streaks	18	908
Blue shale	7	915
Shale and limestone streaks	45	960
Medium gray limestone	70	1030
Medium sandstone	15	1045
Brown limestone	15	1060
Sandy shale	8	1068
Medium gray-red-green limestone	7	1075
Medium brown limestone	15	1090
Hard brown limestone	55	1145
Hard gray limestone	15	1160
Hard brown limestone	20	1180
Hard gray limestone	48	1228
Hard brown limestone	12	1240
Medium gray limestone with shale streaks	20	1260
Medium sandstone and green shale	15	1275
Medium sandstone and shale streaks	25	1300
Blue shale	20	1320
Dark gray sandy limestone	20	1340
Medium gray sandstone	10	1350
Medium to hard gray sandstone	35	1385
Hard gray sandstone	15	1400
White medium to soft sandstone	40	1440
White, medium to hard sandstone	10	1450
White, soft sandstone	45	1495
White medium sandstone	15	1510
Hard brown limestone	14	1524

A 26-in. diameter hole was drilled to a depth of 57 ft, reduced to 25.2 in. between 57 and 368 ft, reduced to 19.2 in. between 368 and 960 ft, and finished 15.2 in. in diameter from 960 to 1524 ft. The well is cased with 26-in. pipe from land surface to a depth of 57 ft, 20-in. pipe from above land surface to a depth of 368 ft (cemented in), and 16-in. liner pipe from 849 ft to a depth of 960 ft.

Before shooting, a production test was conducted by the driller on October 13, 1964. After 2 hr of pumping at rates of 170 to 175 gpm, the drawdown was 124 ft from a nonpumping water level of 482 ft below land surface.

This well was shot with 100 percent solidified gelatin as follows: 150 lb at 1475 to 1495 ft, 150 lb at 1450 to 1470 ft, 180 lb at 1421 to 1440 ft, 180 lb at 1440 to 1419 ft, and 210 lb at 1347 to 1375 ft.

After shooting, a production test was conducted by the driller on November 27, 1964. After 12 hr of pumping at rates ranging from 1104 to 1311 gpm, the final drawdown was 144 ft from a nonpumping water level of 507 ft below land surface.

In February 1969, the nonpumping water level was reported to be 55 3 ft.

On September 30, 1975, the well reportedly produced 1100 gpm for 30 min with a drawdown of 58 ft from a nonpumping water level of 663 ft.

The pumping equipment presently installed is a Byron Jackson submersible turbine pump set at 811 ft, rated at 1200 gpm at about 920 ft head, and powered by a 400-hp Byron Jackson electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C002676) is for a water sample from the well collected September 23, 1974, after pumping at 1350 gpm.

WELL NO. 4, LABORATORY NO. C002676

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.1		Silica	SiO_2	8.5	
Manganese	Mn	0.00		Fluoride	F	1.5	0.08
Ammonium	NH_4	0.87	0.05	Boron	B	0.8	
Sodium	Na	49	2.13	Cyanide	CN	0.00	
Potassium	K	14.6	0.37	Nitrate	NO_3	0.8	0.01
Calcium	Ca	56	2.79	Chloride	Cl	18	0.51
Magnesium	Mg	17	1.40	Sulfate	SO_4	46	0.96
				Alkalinity(as $CaCO_3$)		278	5.56
Arsenic	As	O.OOO		Hardness(as $CaCO_3$)		210	4.20
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		384	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		7.8	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		26.6	
Selenium	Se	0.00		± deviation		4.6	
Silver	Ag	0.00		Beta *pc/l*		32.3	
Zinc	Zn	0.00		± deviation		3.3	

WELL NO. 5, open to the Silurian dolomite, was completed in May 1976 to a depth of 250 ft by the Wehling Well Works, Beecher. The well is located about 0.2 mile west of Illinois Route 53 near the elevated tank, approximately 1150 ft N and 1220 ft W of the SE corner of Section 22, T37N, R10E. The land surface elevation at the well is approximately 710 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	2	2
Yellow clay	18	20
Blue silt with gravel	10	30
Yellow clay with gravel streaks	5	35
Broken lime with gravel	10	45
Yellow lime broken	10	55
White and yellow lime, hard	7	62
Strata (continued)	*Thickness (ft)*	*Depth (ft)*
Blue, white and yellow lime	73	135
White, tan and gray lime	45	180
White and gray lime	45	225
Red and gray shale	10	235
Gray sandy shale	15	250

An 18-in. diameter hole was drilled to a depth of 61 ft and finished 15 in. in diameter from 61 to 250 ft. The well is cased with 16-in. black steel pipe from land surface to a depth of 61.5 ft (cemented in).

Before acidizing, a production test was conducted by the driller on May 20, 1976. After 1 hr of pumping at rates ranging from 173 to 100 gpm, the drawdown was 137 ft from a nonpumping water level of 89 ft. The well was then acidized with 4500 gal of HC1 and developed by pumping and surging on May 21, 24, and 25.

A production test was conducted by the driller on May 27, 1976. After 16 hr of pumping at rates ranging from 420 to 530 gpm, the maximum drawdown was 21 ft from a nonpumping water level of 86 ft. Ten min after pumping was stopped, the water level had recovered to 90 ft.

The pumping equipment presently installed is a Johnston submersible pump set at 150 ft, operated at 420 gpm, and powered by a 40-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003072) is for a water sample from the well collected January 29, 1979, after 2.5 hr of pumping at 350 gpm.

WELL NO. 5, LABORATORY NO. C003072

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	15	
Manganese	Mn	0.00		Fluoride	F	0.1	0.00
Ammonium	NH_4	0.00	0.00	Boron	B	0.1	
Sodium	Na	8	0.35	Cyanide	CN	0.00	
Potassium	K	1.5	0.04	Nitrate	NO_3	4.31	0.07
Calcium	Ca	98	4.89	Chloride	Cl	26	0.73
Magnesium	Mg	52	4.28	Sulfate	SO_4	126	2.62
				Alkalinity(as $CaCO_3$)		300	6.00
Arsenic	As	0.000		Hardness(as $CaCO_3$)		458	9.16
Barium	Ba	<0.2					
Cadmium	Cd	<0.01		Total dissolved			
Chromium	Cr	<0.05		minerals		536	
Copper	Cu	<0.02					
Lead	Pb	<0.01					
Mercury	Hg	0.0000					
Nickel	Ni	<0.2					
Selenium	Se	0.00					
Silver	Ag	<0.02					
Zinc	Zn	0.03		pH (as rec'd)		7.4	

SHAWNITA TERRACE WATER ASSOCIATION

Shawnita Terrace Water Association (est. 147), located about 1 mile east of Joliet, installed a public water supply in 1929. One well is in use. In 1978 there were 42 services, none metered; the estimated average and maximum pumpages were 12,000 and 14,000 gpd, respectively. The water is fluoridated and chlorinated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1929 to a depth of 183 ft by Mr. Mathews. The well is located at 324 Mohawk St., approximately 2120 ft N and 545 ft E of the SW corner of Section 12, T36N, R10E. The land surface elevation at the well is approximately 635 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	50	50
Limestone	133	183

The well is cased with 6-in. galvanized pipe from about 1.5 ft above the floor of an 8-ft deep pit to a depth of 51 ft.

In 1937, the nonpumping water level was reported to be 70 ft below land surface.

The pumping equipment presently installed is a Red Jacket submersible pump set at 105 ft, rated at 28 gpm, and powered by a 3-hp 3450 rpm Franklin electric motor (Model No. 2821022100).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 04699) is for a water sample from the well collected March 28, 1972, after 45 min of pumping at about 26 gpm.

WELL NO. 1, LABORATORY NO. 04699

		mg/l	*me/l*			*mg/l*	*nte/l*
Iron	Fe	0.1	0.00	Silica	SiO_2	14	
Manganese	Mn	0.0	0.00	Fluoride	F	0.8	0.04
Ammonium	NH_4	0.0	0.00	Boron	B	0.25	
Sodium	Na	19	0.83	Nitrate	NO_3	0.0	0.00
Potassium	K	3.0	0.08	Chloride	Cl	12	0.34
Calcium	Ca	240	11.98	Sulfate	SO_4	775	16.12
Magnesium	Mg	155	12.74	Alkalinity(as$CaCO_3$)		428	8.48
				Hardness(as$CaCO_3$)		1210	24.20
Barium	Ba	0.0					
				Total dissolved			
Cadmium	Cd	0.00		minerals		1530	
Chromium	Cr	0.0					
Copper	Cu	0.05		pH (as rec'd)		6.9	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha *pc/l*		2	
Nickel	Ni	0.0		± deviation		3	
Silver	Ag	0.0		*Beta pc/l*		0	
Zinc	Zn	0:0		± deviation		3	

SHOREWOOD (BROOK FOREST SUBDIVISION)

Shorewood (Brook Forest Subdivision) (est. 3150), located about 0.5 mile north of Shorewood, installed a public water supply in 1968. The water system is owned and operated by the Will County Water Co. Two wells (Nos. 1 and 3) are in use. In 1970 there were 100 services, all metered. In 1980 there were 900 services, all metered; the average pumpage was 282,876 gpd. The water is chlorinated.

WELL NO. 1, open to the Cambrian-Ordovician aquifer, was completed in January 1968 to a depth of 1499 ft by L. Cliff Neeley, Batavia. The well is located at 318 Park Shore Drive about 20 ft northwest of the pumphouse, approximately 1500 ft N and 1400 ft W of the SE corner of Section 9, T35N, R9E. The land surface elevation at the well is approximately 605 ft.

A correlated drillers log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
"Yellow clay"	18	18
"Gray mud"	18	36
"Gravel"	6	42
SILURIAN SYSTEM		
"Gray lime"	60	102
"Broken lime"	20	122
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone		
"Shale and lime shells"	28	150
Scales Shale		
"Shale"	68	218
Galena Group		
"Lime"	212	430
Platteville Group		
"Lime"	110	540
Ancell Group		
Glenwood Formation		
"Sandstone"	45	585
"Lime"	7	592
St. Peter Sandstone		
"St. Peter sandrock"	173	765
Prairie du Chien Group		
Shakopee Dolomite		
"Lime and pink rock"	19	784
"Lime, blue shale (broken formation)"	17	801
"White sand, broken lime and shale"	3	804

Strata (continued)	*Thickness (ft)*	*Depth (ft)*
"Broken formation, lime and shale"	2	806
"Lime hole caving (lime hard)"	12	818
"Lime and chert"	9	827
"Lime"	13	840
Oneota Dolomite		
"Lime"	25	865
"Sandy lime, white"	10	875
"Lime, white and gritty"	40	915
"Lime and chert (gray and pink)"	13	928
"Lime, gray"	14	942
"Sand, white"	3	945
"Lime and chert, pink and gray"	30	975
"Lime, sharp, all colors"	9	984
"Lime, white"	10	994
CAMBRIAN SYSTEM		
Eminence Dolomite		
"Lime, chert, hard, all colors"	6	1000
"Green shale"	3	1003
"Lime, gray and white"	11	1014
"Lime, gray"	11	1025
"Shale"	2	1027
Potosi Dolomite		
"Lime"	28	1055
"Shale"	2	1057
"Lime"	22	1079
"Lime, gray, hard"	39	1118
"Lime, little shale"	17	1135
"Lime and green shale"	23	1158
"Lime, light brown"	9	1167
Franconia Formation		
"Lime, gray and sharp"	15	1182
"Sandy"	8	1190
"Lime shells and shale (dark gray)"	38	1228
"Lime sandy and shale"	16	1244
"Brown lime"	21	1265
"Gray lime"	13	1278
Ironton Sandstone		
"Lime and sand"	63	1341
"Sand, white"	20	1361
"Sand, white and shelly"	27	1388
Galesville Sandstone		
"Sand"	10	1398
"Lime, hard, light tan"	14	1412
"Sand, soft, white"	6	1418
"Sand, hard"	14	1432
"Sand, white"	22	1454
"Sand, firm"	22	1476
Eau Claire Formation		
"Shale"	23	1499

A 15-in. diameter hole was drilled to a depth of 224 ft, reduced to 12 in. between 224 and 852 ft, and finished 10 in. in diameter from 852 to 1499 ft. The well is cased with 15-in. pipe from 1.5 ft above land surface to a depth of 42 ft, 12-in. pipe from 1.5 ft above land surface to a depth of 224 ft (cemented in), and a 10-in. liner from 773 ft to a depth of 852 ft.

A production test was conducted by the driller on January 19, 1968. After 12 hr of pumping at rates ranging from 261 to 305 gpm, the drawdown was 175 ft from a nonpumping water level of 285 ft below land surface. On May 21, 1971, the nonpumping water level was reported to be 385 ft.

The pumping equipment presently installed is an 8-in., 24-stage Layne & Bowler turbine pump set at 850 ft, rated at 300 gpm at about 702 ft TDH, and powered by a 100-hp 1800 rpm U. S. electric motor. A 10-ft section of 6-in. suction pipe is attached to the pump intake.

The following mineral analysis (Lab. No. 207629) is for a water sample from the well collected March 6, 1978, after 15 min of pumping.

WELL NO. 1, LABORATORY NO. 207629

		mg/l	*me/l*			*mg/l*	*me/l*
Iron(total)	Fe	0.1		Silica	SiO_2	8.1	
Manganese	Mn	0.00		Fluoride	F	1.3	
Ammonium	NH_4	1.0	0.06	Boron	B	0.6	
Sodium	Na	62.8	2.73	Nitrate	NO_3	0.3	0.00
Potassium	K	15.3	0.39	Chloride	Cl	23	0.65
Calcium	Ca	54.0	2.69	Sulfate	SO_4	54.3	1.13
Magnesium	Mg	17.7	1.46	Alkalinity (as $CaCO_3$)		274	5.48
Strontium	Sr	2.46	0.06				
				Hardness(as $CaCO_3$)		207	4.15
Barium	Ba	<0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		385	
Copper	Cu	0.00					
Lead	Pb	<0.05		Turbidity		1	
Lithium	Li	0.03		Color		0	
Nickel	Ni	<0.05		Odor		0	
Zinc	Zn	0.00		Temp (reported)		59F	

WELL NO. 2, open to the Silurian dolomite, was completed in June 1973 to a depth of 151 ft by the Layne-Western Co., Aurora. This well is no longer used due to high sulfur content. The well is located about 600 ft west of Illinois Route 59 and about 1200 ft north of Black Road, approximately 2590 ft N and 1250 ft W of the SE corner of Section 4, T35N, R9E. The land surface elevation at the well is approximately 616 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	4	4
Brown sandy clay	10	14
Gray clay	21	35
Broken limestone with clay and gravel	2	37
Broken limestone	5	42
Light gray limestone	7	49
Broken limestone and shale	12	61
Light gray limestone	80	141
Dark gray shale	10	151

A 15-in. diameter hole was drilled to a depth of 38 ft, reduced to 12 in. between 38 and 48 ft, and finished 8 in. in diameter from 48 to 151 ft. The well is cased with 12-in. pipe from land surface to a depth of 38 ft and 8-in. pipe from 2 ft above land surface to a depth of 48 ft (cemented in).

A production test was conducted by the driller on June 4, 1973. After pumping intermittently for 7.6 hr at rates ranging from 60 to 68 gpm, the final drawdown was 95 ft

from a nonpumping water level of 23 ft below land surface. Five min after pumping was stopped, full recovery was observed.

The pumping equipment presently installed is a Red Jacket submersible pump set at 137 ft, rated at 60 gpm, and powered by a 5-hp electric motor.

A mineral analysis of a sample (Lab. No. 208910) collected July 28, 1978, after pumping for several hours, showed the water to have a hardness of 280 mg/1, total dissolved minerals of 416 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 3, open to the Silurian dolomite and the Maquoketa Group, was completed in March 1978 to a depth of 202 ft by the Layne-Western Co., Aurora. The well is located on the west side of Route 59 and south of Theodore Road, approximately 303 ft S and 1072 ft W of the NE corner of Section 4, T35N, R9E. The land surface elevation at the well is approximately 616 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	49	49
Broken lime	3	52
Gray lime	103	155
Lime and shale	35	190
Gray shale	12	202

A 20-in. diameter hole was drilled to a depth of 49 ft and finished 12 in. in diameter from 49 to 202 ft. The well is cased with 12-in. pipe from about 1.5 ft above the wellhouse floor to a depth of 57 ft. The annulus between the bore hole and casing is filled with cement grout from 0 to 28 ft and with cuttings and bentonite fill from 28 to 49 ft.

Upon completion, this well was acidized with 1000 gal of 15 percent treating acid.

A production test was conducted by the driller on March 14, 1978. After 7.5 hr of pumping at rates ranging from 225 to 357 gpm, the maximum drawdown was 87 ft from a nonpumping water level of 29 ft below land surface.

A second production test was conducted by the driller on March 20, 1978. After 3.7 hr of pumping at rates ranging from 304 to 354 gpm, the maximum drawdown was 50 ft from a nonpumping water level of 28 ft below land surface.

A third production test was conducted by the driller on March 21, 1978. After 5.3 hr of pumping at rates ranging from 305 to 425 gpm, the maximum drawdown was 104 ft from a nonpumping water level of 28 ft below land surface. Twenty-three min after pumping was stopped, the water level had recovered to 29 ft. Pumping was then continued for 1.3 hr at rates ranging from 278 to 354 gpm with a final drawdown of 55 ft.

On February 19, 1979, the well reportedly produced 230 gpm for 4 hr with a drawdown of 25 ft from a nonpumping water level of 29 ft below land surface.

The pumping equipment presently installed is a turbine pump set at 150 ft, rated at 260 gpm, and powered by a 30-hp Emerson electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B049971) is for a water sample from the well collected April 13, 1981, after 2 hr of pumping.

WELL NO. 3, LABORATORY NO. B049971

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.199		Silica	SiO_2	12	
Manganese	Mn	<0.005		Fluoride	F	0.71	0.04
Ammonium	NH_4	0.6	0.03	Boron	B	0.18	
Sodium	Na	52	2.26	Cyanide	CN	<0.005	
Potassium	K	3.6	0.09	Nitrate	NO_3	<0.4	
Calcium	Ca	50	2.50	Chloride	Cl	20	0.56
Magnesium	Mg	32.5	2.67	Sulfate	SO_4	67	1.39
Strontium	Sr	0.89		Alkalinity(as$CaCO_3$)		275	5.50
Arsenic	As	<0.001		Hardness(as$CaCO_3$)		260	5.20
Barium	Ba	0.063					
Beryllium	Be	<0.0005		Total dissolved			
Cadmium	Cd	0.003		minerals		414	
Chromium	Cr	<0.005					
Cobalt	Co	<0.005					
Copper	Cu	0.003					
Lead	Pb	<0.005					
Mercury	Hg	<0.0001					
Nickel	Ni	0.007					
Selenium	Se	<0.0005					
Silver	Ag	<0.005					
Vanadium	V	<0.004					
Zinc	Zn	0.004		pH (as rec'd)		7.5	

SHOREWOOD (OAKWOOD MANOR SUBDIVISION)

Shorewood (Oakwood Manor Subdivision) (est. 120), located on the southwest edge of Shorewood, installed a public water supply in 1962. The water system is owned and operated by the Will County Water Co. One well is in use. In 1963 there were 14 services, all metered; the average pumpage was 1700 gpd. In 1980 there were 34 services, all metered; the average pumpage was 19,726 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, the Maquoketa Group, and the Galena dolomite, was completed in July 1962 to a depth of 302 ft by Dreher & Schorie, Joliet. The well is located in the pumphouse at 218 Oakwood Drive in the Oakwood Manor Subdivision, approximately 2750 ft S and 900 ft W of the NE corner of Section 16, T35N, R9E. The land surface elevation at the well is approximately 575 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Black top soil	2	2
Gravel and clay	3	5
Sand and gravel	8	13
Limestone	42	55
Blue clay	17	72
Limestone	230	302

An 8-in. diameter hole was drilled to a depth of 72 ft and finished 6 in. in diameter from 72 to 302 ft. The well is cased with 8-in. pipe from about 1.5 ft above the pumphouse floor to a depth of 32 ft and 6-in. liner pipe from 52 ft to a depth of 72 ft.

On January 11, 1963, the nonpumping water level was reported to be 30 ft.

The pumping equipment presently installed is a Sta-Rite submersible pump set at 110 ft, rated at 50 gpm, and powered by a 5-hp Sta-Rite electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B29592) is for a water sample from the well collected January 26, 1976, after 30 min of pumping at 60 gpm.

WELL NO. 1, LABORATORY NO. B29592

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.7		Silica	SiO_2	10	
Manganese	Mn	0.00		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.21	0.01	Boron	B	0.5	
Sodium	Na	67	2.91	Cyanide	CN	0.00	
Potassium	K	4.6	0.12	Nitrate	NO_3	1.32	0.02
Calcium	Ca	93	4.64	Chloride	Cl	130	3.67
Magnesium	Mg	52	4.28	Sulfate	SO_4	93	1.93
				Alkalihity(as$CaCO_3$)		314	6.28
Arsenic	As	0.00		Hardness(as$CaCO_3$)		446	8.92
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		689	
Copper	Cu	0.05					
Lead	Pb	0.00		pH (as rec'd)		8.0	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha *pc/l*		3.9	
Selenium	Se	0.00		± deviation		2.8	
Silver	Ag	0.00		Beta *pc/l*		8.7	
Zinc	Zn	0.0		± deviation		2.9	

STATEVILLE CORRECTIONAL CENTER

Stateville Correctional Center (est. 2950), located about 1 mile north of Joliet on the west side of the Des Plaines River, installed a public water supply in 1920. Four wells (Nos. 3, 4, 5, and 6) are in use. In 1952 the estimated average and maximum pumpages were 650,000 and 1,000,000 gpd, respectively. In 1980 the average pumpage was 868,065 gpd. The water is chlorinated.

WELL NO. 1 (Center Well), open to the Cambrian-Ordovician aquifer, was constructed in 1913 to a depth of 1095 ft by W. H. Gray & Co., and deepened in February 1941 to a reported depth of 1599 ft by the J. P. Miller Artesian Well Co., Brookfield. This well has not been used since 1965. The well is located within the prison walls about 300 ft east of the center of the west wall, approximately 965 ft S and 1565 ft E of the NW corner of Section 28, T36N, R10E. The land surface elevation at the well is approximately 646 ft.

A correlated and sample study log of Well No. 1 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	65	65
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomites, water bearing	315	380
Strata (continued)		
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale and dolomite	110	490
Galena and Platteville Groups		
Dolomite	340	830
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	124	954
Shale, caving	10	964
ORDOVICIAN AND CAMBRIAN SYSTEMS		
Oneota-Eminence Dolomite		
Dolomite and sandy dolomite	131	1095
CAMBRIAN SYSTEM		
Potosi Dolomite	180	1275
Franconia Formation		
Dolomite and sandstone	118	1393
Ironton-Galesville Sandstone	157	1550
Eau Claire Formation		
Dolomite and shale	50	1600

The original hole and casing records are unknown. About 1930, a screen was placed at the base of the glacial drift by Joseph A. Mesiroff, Milwaukee, Wis. This was installed and gravel packed by the use of small pilot holes in order to admit water from the glacial drift. During deepening in 1941, the screen and old casing were removed and the Ironton-Galesville Sandstone was shot with three charges as follows: 150 lb at 1552 ft, 105 lb at 1537 ft, and 150 lb at 1520 ft. The well was then cased with 10-in. pipe from land surface to a depth of 426 ft and 8-in. pipe from 1060 ft to a depth of 1102 ft.

In 1923, the nonpumping water level was reported to be 40 ft below land surface.

A production test was conducted by the State Water Survey on February 19, 1941. After 4.4 hr of pumping at rates of 267 to 215 gpm, the final drawdown was 42.0 ft from a nonpumping water level of 290.0 ft. Fifteen min after pumping was stopped, the water level had recovered to 301.5 ft.

In January 1947 and in May 1948, the nonpumping water level was reported to be 451 ft.

The pumping equipment presently installed consists of a 60-hp 1750 rpm General Electric motor (Serial No. 4B6519396), an 8-in., 21-stage Pomona turbine pump (No. SW 1775) set at 570 ft, rated at 350 gpm, and has 570 ft of 5-in. column pipe. A 30-ft section of 5-in. suction pipe is attached to the pump intake.

A partial analysis of a sample (Lab. No. 106175) collected April 13, 1946, after pumping for several days, showed the water to have a hardness of 398 mg/1, total dissolved minerals of 518 mg/1, and an iron content of 0.4mg/l.

WELL NO. 2 (South Well), open to the Cambrian-Ordovician aquifer, was completed in January 1921 to a depth of 1577 ft (reported to be 1553 ft deep in 1947) by the J. P. Miller Artesian Well Co., Brookfield. This well has not been used since July 1966. The well is located in the southwest corner of the prison yard about 300 ft from the west and south walls, approximately 1500 ft S and 1565 ft E of the NW corner of Section 28, T36N, R10E. The land surface elevation at the well is approximately 643 ft.

A correlated drillers log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	49	49
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomites, water bearing	206	255
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale and dolomite	110	365
Galena and Platteville Groups		
Dolomite	335	700
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	130	830
Shale, sandy near middle	45	875
Prairie du Chien Group		
Oneota Dolomite	180	1055
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, partly sandy	245	1300
Franconia Formation		
Dolomite and shale	130	1430
Ironton-Galesville Sandstone		
Sandstone, part dolomitic	126	1556
Eau Claire Formation		
Dolomite	21	1577

A 16-in. diameter hole was drilled to a depth of 178.5 ft, reduced to 12 in. between 178.5 and 370 ft, reduced to 10 in. between 370 and 933 ft, and finished 8 in. in diameter from 933 to 1577 ft. The well is cased with 16-in. OD drive pipe from land surface to a depth of 70 ft, 12-in. pipe from land surface to a depth of 178.5 ft, 10-in. liner pipe from 232 ft to a depth of 370 ft, and an 8-in. liner pipe from 883 ft to a depth of 933 ft. In 1947, a 10-in. pipe was installed from land surface to a depth of 415.9 ft (cemented in) in addition to the original 16-in. casing and 8-in. liner.

Nonpumping water levels were reported to be 55 ft in 1921, 81.7 ft in September 1941, 88 ft in October 1941, 70 ft in November 1941, and 62 ft on January 13, 1942.

In May 1947, this well was shot with 200 lb of nitrogel and 18 sticks of dynamite between the depths of 1528 and 1548 ft by the J. P. Miller Artesian Well Co. The nonpumping water level was lowered considerably for 2 or 3 days after shooting and then rose to 164 ft below land surface. On May 15, 1947, the nonpumping water level was reported to be 80 ft. The well was shot again by the J. P. Miller Artesian Well Co. in June 1947 with 250 lb of gel between the depths of 1506 and 1526 ft. An estimated amount of 18 to 20 truck loads of sand was removed. A new 10-in. casing was then installed and three weeks after the second shooting, the nonpumping water level was reported to be 433 to 436 ft and the well was reported to be 1553 ft deep.

On September 18, 1947, the well reportedly produced 260 gpm with a drawdown of 30 ft from a nonpumping water level of 445 ft.

In March 1949, the nonpumping water level was reported to be 454 to 456 ft.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 05620) set at 605 ft, rated at 400 gpm, and powered by a 125-hp 1800 rpm U. S. electric motor (Serial No. 908042).

A partial analysis of a sample (Lab. No. 105923) collected March 23, 1946, after pumping for several days, showed the water to have a hardness of 606 mg/1, total dissolved minerals of 658 mg/1, and an iron content of 1.1 mg/1.

WELL NO. 3 (North Well), open to the Cambrian-Ordovician aquifer, was completed in September 1926 to a depth of 1527 ft by the Gray Well Drilling Co., Milwaukee, Wis. The well is located near the northwest corner of the prison yard about 300 ft east of the west wall and 450 ft south of the north wall, approximately 445 ft S and 1565 ft E of the NW corner of Section 28, T36N, R10E. The land surface elevation at the well is approximately 643 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	60	60

Strata (continued)	*Thickness (ft)*	*Depth (ft)*
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite, white, water bearing	120	180
Alexandrian Series		
Elwood Dolomite		
Dolomite, white chert	40	220
Wilhelmi Formation		
Dolomite gray	30	250
OFSDOVICIAN SYSTEM		
Maquoketa Group		
Brainard Shale	15	265
Ft. Atkinson Limestone		
Dolomite, shaly	25	290
Scales Shale	75	365
Galena Group		
Dolomite	225	590
Platteville Group		
Dolomite	100	690
Ancell Group		
Glenwood Formation		
Sandstone, dolomitic	10	700
St. Peter Sandstone		
Sandstone, water bearing	130	830
Sandy shale and chert, caving	45	875
Prairie du Chien Group		
Oneota Dolomite	155	1030
CAMBRIAN SYSTEM		
Eminence Dolomite		
Dolomite, sandy	70	1100
Potosi Dolomite	160	1260
Franconia Formation		
Sandstone and shale	120	1380
Ironton Sandstone		
Sandstone, fine to coarse, dolomitic	60	1440
Galesville Sandstone		
Sandstone, v bearing	87	1527

Originally, a 15-in. diameter hole was drilled to a depth of 305 ft, reduced to 12 in. between 305 and 400 ft, reduced to 10 in. between 400 and 1400 ft, and finished 8 in. in diameter from 1400 to 1527 ft. The well was reported to be cased with 16-in. OD drive pipe from land surface to a depth of 73 ft, 10-in. pipe from 260 ft to a depth of 400 ft, and 8-in. pipe from 776 ft to a depth of 1400 ft. After drilling, the well was shot in the Ironton-Galesville Sandstone. After rehabilitation in 1942, the hole was reported to be 15 in. in diameter to a depth of 305 ft, 12 in. from 305 to 402 ft, 10-in. from 402 to 884 ft, and 8 in. from 884 to 1527 ft. The casing was reported to be 16-in. pipe from land surface to a depth of 73 ft, 12-in. pipe from land surface to a depth of 305 ft, 10-in. pipe from 282 ft to a depth of 402 ft, and an 8-in. liner from 789 ft to a depth of 884 ft.

In 1941, the nonpumping water level was reported to be 312.8 ft below land surface.

In March 1942, during rehabilitation, this well was shot by the J. P. Miller Artesian Well Co., Brookfield, with three 150-lb charges at depths of 1515, 1497, and 1475 ft. A total of slightly less than 5 cubic yards of sand was removed, the greatest amount of which was loosened after the first shot at 1515 ft.

A production test was conducted by the State Water Survey on April 7, 1942. After 8.2 hr of pumping at rates of 134 to 308 gpm, the final drawdown was 64.5 ft from a nonpumping water level of 327.0 ft below land surface. Fifteen min after pumping was stopped, the water level had recovered to 344.0 ft. During this test, Well No. 1 was pumping continuously.

On April 20, 1944, the nonpumping water level was reported to be 367 ft below land surface after an idle period of 3 days.

On March 11, 1949, the nonpumping water level was reported to be 439 ft.

On March 6, 1972, the J. P. Miller Artesian Well Co. reported that the well produced 230 gpm with a drawdown of 82 ft from a nonpumping water level of 610 ft.

The pumping equipment presently installed consists of a 150-hp U. S. electric motor, a Peerless turbine pump set at 840 ft, operated at 160 gpm, and has 840 ft of 6-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B41266) of a sample collected in April 1977, showed the water to have a hardness of 209 mg/1, total dissolved minerals of 411 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 4 (Outside Well), open to the Cambrian-Ordovician aquifer, was completed in 1937 to a depth of 2007 ft (filled to 1566 ft in 1948 and reported to be 1537 ft deep in May 1975) by the W. L. Thorne Co., Des Plaines. The well is located about 50 ft outside the south wall near the southwest corner of the prison walls, approximately 1760 ft S and 1565 ft E of the NW corner of Section 28, T36N, R10E. The land surface elevation at the well is approximately 640 ft.

A sample study log of Well No. 4 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene series		
Glacial drift	65	65
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomites, water bearing	180	245
ORDOVICIAN SYSTEM		
Maquoketa Group		
Brainard Shale	15	260
Ft. Atkinson Limestone	20	280
Scales Shale	80	360
Galena and Platteville Groups		
Dolomites	340	700
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, water bearing	127	827
Prairie du Chien Group		
Shakopee Dolomite		
Dolomite, shaly	53	880
Oneota Dolomite	175	1055
CAMBRIAN SYSTEM		
Eminence Dolomite		
Dolomite and sandstone	32	1087

Strata (continued)	Thickness (ft)	Depth (ft)
Potosi Dolomite	173	1260
Franconia Formation		
Shale, dolomite, and sandstone	135	1395
Ironton-Galesville Sandstone	175	1570
Eau Claire Formation		
Dolomite, shale, and sandstone	395	1S65
Mt. Simon Sandstone		
Sandstone, water bearing	42	2007

A 20-in. diameter hole was drilled to a depth of 433 ft, reduced to 18 in. between 433 and 896 ft, reduced to 16 in. between 896 and 1431 ft, reduced to 12 in. between 1431 and 1910 ft, and finished 10 in. in diameter from 1910 to 2007 ft. Originally, the well was cased with 12-in. pipe from land surface to a depth of 1432.5 ft and 10-in. pipe from 1590 ft to a depth of 1910 ft. During the rehabilitation work in 1948, the old casing was removed except for the 10-in. liner and new casings were installed consisting of 20-in. pipe from land surface to a depth of 60 ft and 16-in. pipe from land surface to a depth of 433 ft (cemented in). After rehabilitation in 1975, the hole was 21 in. in diameter to a depth of 433 ft, 18 in. from 433 to 896 ft, 16 in. from 896 to 1431 ft, and 12 in. from 1431 to 1537 ft. The well is now cased with 20-in. pipe from land surface to a depth of 60 ft, 16-in. pipe from land surface to a depth of 433 ft (cemented in), and 12-in. liner pipe from 1313 ft to a depth of 1431 ft (cemented in).

A production test was conducted by the State Water Survey on April 27, 1937. After 4.5 hr of pumping at rates ranging from 230 to 250 gpm, the drawdown was more than 304 ft from a nonpumping water level of 70 ft below land surface.

In 1941, the nonpumping water level was reported to be 140 ft.

Between December 1947 and March 1948, this well was shot by the J. P. Miller Artesian Well Co., Brookfield, with three charges (2300 lb of nitrogel) at depths of 1565, 1548, and 1518 ft. There was very little sand from the first two shots but several truck loads from the third shot. The well was cleaned out to 2005 ft, backfilled with gravel and a concrete bridge was placed at 1566 ft, and recased except for the 10-in. liner below 1590 ft.

A short production test was conducted on November 10, 1948, by representatives of the J. P. Miller Artesian Well Co., the State Water Survey, and Illinois State Penitentiary employees. After 1.8 hr of pumping at rates of 700 to 625 gpm, the drawdown was 62 ft from a nonpumping water level of 460 ft.

On November 7, 1952, the well reportedly produced 630 gpm for 3.8 hr with a drawdown of 96.3 ft from a nonpumping water level of 467.7 ft. Thirty min after pumping was stopped, the water level had recovered to 475.0 ft.

A production test was conducted by the J. P. Miller Artesian Well Co. on May 29, 1975. After 5.6 hr of pumping at rates of 690 to 890 gpm, the drawdown was 80 ft from a nonpumping water level of 685 ft below the top of the casing. Thirty-two min after pumping was stopped, the water level had recovered to 708 ft.

The pumping equipment presently installed consists of a 300-hp 1769 rpm Ideal electric motor, an 11.5-in., 13-stage Peerless turbine pump set at 830 ft, rated at 890 gpm at about 846 ft TDH, and has 830 ft of 8-in. column pipe. A 20-ft section of 8-in. suction pipe is attached to the pump intake. The well is equipped with 830 ft of airline.

A partial analysis of a sample (Lab. No. 117549) collected March 11, 1949, when the well was 2007 ft deep, after pumping for 24 hr, showed the water to have a hardness of 248 mg/1, total dissolved minerals of 477 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 5 (Honor Farm Well), open to the Cambrian-Ordovician aquifer, was completed in February 1951 to a depth of 1653 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located about 0.5 mile west of the prison walls on the Honor Farm in the vicinity of the farm buildings, approximately 1100 ft S and 1250 ft W of the NE corner of Section 29, T36N, R10E. The land surface elevation at the well is approximately 645 ft.

A sample study log of Well No. 5 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
QUATERNARY SYSTEM		
Pleistocene Series		
Drift	64	64
SILURIAN SYSTEM		
Niagaran Series	106	170
Alexandrian Series		
Kankakee Dolomite	45	215
Elwood Dolomite	40	255
ORDOVICIAN SYSTEM		
Maquoketa Group		
Brainard Shale	15	270
Ft. Atkinson Limestone	45	315
Scales Shale	60	375
Galena Group		
Dolomite	225	600
Platteville Group		
Dolomite	117	717
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, some dolomitic and silty	123	840
Shale, dolomitic, sandy	30	870
Prairie du Chien Group		
Shakopee Dolomite	90	960
Oneota Dolomite	165	1125
Gunter Sandstone	19	1144
CAMBRIAN SYSTEM		
Eminence Dolomite	61	1205
Potosi Dolomite	120	1325
Franconia Formation		
Dolomite, shale, and sand	85	1410
Ironton-Galesville Sandstone	176	1586
Eau Claire Formation		
Dolomite and shale	67	1653

A 23-in. diameter hole was drilled to a depth of 450 ft, reduced to 15 in. between 450 and 1350 ft, and finished 12 in. in diameter from 1350 to 1653 ft. The well is cased with 23-in. pipe from land surface to a depth of 64.5 ft and 16-in. pipe from land surface to a depth of 450 ft (cemented in).

Before shooting, a production test was conducted on March 6, 1951, by representatives of the driller, the State Water Survey, and the Division of Architecture and Engineering. After 2.5 hr of intermittent pumping at rates ranging from 265 to 75 gpm, the maximum drawdown was 123 ft from a nonpumping water level of 426 ft.

The well was shot as follows: 750 lb nitrogel and 20 lb of primer between 1572 and 1590 ft, 750 lb of gel and 18 lb of primer between 1547 and 1565 ft, 750 lb of gel and 8 lb of primer between 1535 and 1551 ft, 610 lb of gel and 8 lb of primer between 1521 and 1537 ft, and 400 lb of gel and 9 lb of primer between 1501 and 1515 ft.

After shooting a production test was conducted by the driller on August 21-22, 1951. After 16.9 hr of pumping at rates ranging from 310 to 445 gpm, the maximum drawdown was 73 ft from a nonpumping water level of 452 ft below land surface.

In September 1958, the well reportedly produced 550 gpm for 3 hr with a drawdown of 78 ft from a nonpumping water level of 478 ft below the top of the pump base.

On November 3-5, 1974, the well reportedly produced 680 gpm for 52 hr with a drawdown of 91 ft from a nonpumping water level of 670 ft.

In March 1980, considerable sand was bailed out during pump repairs.

The pumping equipment presently installed consists of a 250-hp 1760 rpm Ideal electric motor, an 11.5-in., 15-stage Peerless turbine pump set at 800 ft, rated at 680 gpm at about 761 ft TDH, and has 800 ft of 8-in. column pipe. A 10-ft section of 8-in. suction pipe is attached to the pump intake. The well is equipped with 800 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B40202) of a sample collected March 28, 1978, after pumping at 700 gpm, showed the water to have a hardness of 186 mg/1, total dissolved minerals of 503 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 6, open to the Cambrian-Ordovician aquifer, was completed in November 1965 to a depth of 1611 ft by the Wehling Well Works, Beecher. The well is located about 600 ft north of the northeast corner of the prison walls, approximately 293 ft N and 1980 ft W of the SE corner of Section 21, T36N, R10E. The land surface elevation at the well is approximately 642 ft.

A sample study summary log of Well No. 6 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	58	58
SILURIAN SYSTEM		
Niagaran Series		
Dolomites	122	180
Alexandrian Series		
Dolomites	83	263
ORDOVICIAN SYSTEM		
Maquoketa Group		
Brainard Shale	12	275
Ft. Atkinson Limestone		
Dolomite	30	305
Scales Shale	78	383
Galena Group		
Dolomites	192	575
Platteville Group		
Dolomites	145	720
Ancell Group		
Glenwood-St. Peter Sandstone	133	853
Prairie du Chien Group		
Shakopee Dolomite	56	909
Oneota Dolomite	181	1090
CAMBRIAN SYSTEM		
Eminence Dolomite		
Dolomite, sandy; and sandstone	65	1155
Potosi Dolomite		
Dolomite, slightly glauconitic	132	1287
Franconia Formation		
Sandstone and siltstone, dolomitic and glauconitic	113	1400
Ironton Sandstone		
Sandstone, fine to coarse, dolomitic, hard	90	1490
Galesville Sandstone		
Sandstone, mostly medium and incoherent	72	1562
Eau Claire Formation		
Dolomite and shale	49	1611

A 20-in. diameter hole was drilled to a depth of 60 ft, reduced to 19.2 in. between 60 and 450 ft, reduced to 15.2 in. between 450 and 950 ft, and finished 12.2 in. in diameter from 950 to 1611 ft. The well is cased with 20-in. drive pipe from land surface to a depth of 60 ft, 16-in. pipe from land surface to a depth of 446 ft (cemented in), and 13.4-in. pipe from 681 ft to a depth of 950 ft.

On November 20, 1965, this well was shot with 1860 lb of 100 percent solidified nitroglycerin between 1462 and 1569 ft.

A production test was conducted on February 24-25, 1966, by representatives of the driller and Crawford, Murphy & Tilly, Inc., Consulting Engineers. After 7 hr of pumping at rates of 500 to 275 gpm, the drawdown was 112 ft from a nonpumping water level of 573 ft below land surface. After 45 min of recovery, pumping was continued at rates ranging from 200 to 375 gpm for 8 hr with a drawdown of 112 ft. After an additional 8.2 hr of pumping at rates ranging from 268 to 283 gpm, the final drawdown was 101 ft.

A production test was conducted on April 8, 1966. The well reportedly produced 370 to 520 gpm for 12.9 hr with

a drawdown of 140 ft from a nonpumping water level of 555 ft below land surface.

On December 19, 1974, the well reportedly produced 610 gpm with a drawdown of 146 ft from a nonpumping water level of 584 ft.

The pumping equipment presently installed consists of a 250-hp 1770 rpm U. S. electric motor, a 16-stage Johnston turbine pump set at 900 ft, rated at 610 gpm at about 985 ft TDH, and has 900 ft of 8-in. column pipe. A 20-ft section of 8-in. suction pipe is attached to the pump intake. The well is equipped with 900 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B09749) is for a water sample from the well collected August 19, 1980, after 3 hr of pumping at 630 gpm. Hydrogen sulfide was apparent when a previous sample was collected.

WELL NO. 6, LABORATORY NO. B09749

		mg/l	*me/l*			*mg/1*	*me/l*
Iron	Fe	0.11		Silica	SiO_2	7.5	
Manganese	Mn	<0.005		Fluoride	F	1.30	0.07
Ammonium	NH_4	0.9	0.05	Boron	F	0.65	
Sodium	Na	58	2.52	Cyanide	CN	<0.005	
Potassium	K	14.0	0.36	Nitrate	NO_3	<0.4	
Calcium	Ca	59	2.94	Chloride	Cl	22	0.62
Magnesium	Mg	18	1.48	Sulfate	SO_4	77	1.60
Strontium	Sr	2.78		Alkalinity(as$CaCO_3$)		268	5.36
Arsenic	As	<0.001		Hardness(as$CaCO_3$)		226	4.52
Barium	Ba	0.04					
Beryllium	Be	<0.0005		Total dissolved			
Cadmium	Cd	<0.005		minerals		430	
Chromium	Cr	<0.01					
Cobalt	Co	<0.005					
Copper	Cu	<0.005					
Lead	Pb	<0.005					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.005					
Selenium	Se	<0.001					
Silver	Ag	<0.005					
Vanadium	V	<0.005					
Zinc	Zn	<0.005		pH (as rec'd)		7.5	

STEGER

The village of Steger (8104) installed a public water supply in 1910. This village also extends into Cook County and one of the wells (No. 3) is located there. Three wells are in use. This supply is also cross connected with the village of South Chicago Heights. In 1949 there were 1000 services, 80 percent metered; the estimated average pumpage was 400,000 gpd. In 1980 there were 2400 services, all metered; the average pumpage was 890,952 gpd. The water is chlorinated; in addition, the water from Well No. 3 is fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1910 to a depth of 318 ft. The well is located on the southeast corner of Halsted Boulevard and 34th St., approximately 200 ft S and 1550 ft W of the NE corner of Section 5, T34N, R14E, Will County. The land surface elevation at the well is approximately 712 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	94	94
Dolomite	224	318

A 12-in. diameter hole was drilled to a depth of 318 ft. The well is cased with 12-in. pipe from about 1.7 ft above the pump station floor to a depth of 147 ft.

In April 1926, the nonpumping water level was reported to be 35 ft below the pump base.

In 1945, after 2 hr of pumping at a rate of 350 gpm, the drawdown was 4 ft from a nonpumping water level of 43 ft below the pump base.

In 1949, the nonpumping water level was reported to be 48 ft.

The pumping equipment presently installed consists of a 20-hp U. S. electric motor, an American Well Works turbine pump (Shop No. 68597) set at 80 ft, rated at 300 gpm at about 192 ft head, and has 80 ft of 6-in. column pipe. A 20-ft section of suction pipe is attached to the pump intake.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C000382) of a sample collected July 26, 1977, after pumping for 2 hr at 380 gpm, showed the water to have a hardness of 478 mg/1, total dissolved minerals of 578 mg/1, and an iron content of 0.2 mg/1.

WELL NO. 2, open to the Silurian dolomite, was completed in July 1935 to a depth of 325 ft by Thomas Kramer & Sons, Harvey. The well is located about 30 ft south of Well No. 1, approximately 230 ft S and 1550 ft W of the NE corner of Section 5, T34N, R14E, Will County. The land surface elevation at the well is approximately 712 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Yellow clay	10	10
Gray clay	20	30
Gray clay, some gravel	45	75
Sand, clay, and gravel	5	80
Gray clay	5	85
Gray clay and first lime at 89 ft	5	90
Gray lime, hard	15	105
Gray lime	20	125
Gray lime, medium soft	30	155
Gray lime, harder	10	165
Gray lime, medium soft	35	200
Shaley first break	5	205
Gray shaley lime	5	210
Gray lime, cavey	5	215

Strata (continued)	Thickness (ft)	Depth (ft)
Soft gray lime	10	225
Medium hard lime	5	230
Medium hard gray lime	5	235
Gray lime, medium soft	25	260
Gray lime, soft	5	265
Gray lime, hard	5	270
Gray lime, medium soft	20	290
Gray lime, soft	35	325

A 12-in. diameter hole was drilled to a depth of 325 ft. The well is cased with 12-in. pipe from 1.9 ft above the pump station floor to a depth of 110 ft.

Upon completion, the well reportedly produced 400 gpm for 24 hr with very little drawdown from a nonpumping water level of 33.6 ft below the top of the casing.

On April 2, 1942, after a 30-min idle period, the well reportedly produced at an estimated rate of 400 gpm for 1 hr with a drawdown of 1.5 ft from a nonpumping water level of 31.0 ft below the pump base.

In 1946, after 8 hr of pumping at a rate of 300 gpm, the drawdown was 3 ft from a nonpumping water level of 38 ft.

Nonpumping water levels were reported to be 48 ft in 1949, and 76 ft on February 15, 1973.

The pumping equipment presently installed is a Pomona turbine pump set at 110 ft, rated at 700 gpm, and powered by a 50-hp General Electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C000381) of a sample collected July 26, 1977, after pumping for 2 hr at 680 gpm, showed the water to have a hardness of 476 mg/1, total dissolved minerals of 552 mg/1, and an iron content of 0.4 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in March 1963 to a depth of 377.5 ft by L. Cliff Neely, Batavia. The well is located on the south side of 31st St. east of the Chicago & Eastern Illinois RR tracks, approximately 1900 ft N and 430 ft E of the SW corner of Section 33, T35N, R14E, Cook County. The land surface elevation at the well is approximately 708 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Clay	10	10
Yellow clay	10	20
Light shale	21	41
Gravel	2	43
Shale and gravel	33.5	76.5
Limestone	30.5	107
Sandy limestone	6	113
Limestone	35	148
Blue-green limestone	'10	158
Limestone and shale	12	170
Shale and shells	17	187
Limestone	190.5	377.5

A 15.2-in. diameter hole was drilled to a depth of 377.5 ft. The well is cased with 16-in. wrought iron pipe to a depth of 80 ft.

A production test was conducted by the driller on March 20-21, 1963. After 11.5 hr of surging and intermittent pumping at rates of 791 to 533 gpm, the drawdown was 140 ft from a nonpumping water level of 63 ft below land surface. After a 30-min idle period, pumping was continued for 8.7 hr at a rate of 533 gpm with a drawdown of 40 ft. Pumping was continued at a rate of 458 gpm for 50 min with a drawdown of 20 ft. Pumping was increased to 618 gpm for 1.8 hr with a drawdown of 60 ft.

On September 21, 1967, the well reportedly produced 500 gpm for about 8 hr with a drawdown of 16 ft from a nonpumping water level of 68 ft below land surface.

The pumping equipment presently installed is a Johnston turbine pump set at 175 ft, rated at 550 gpm at about 220 ft head, and powered by a 40-hp 1800 rpm U. S. electric motor. The well is equipped with 175 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B23948) is for a water sample from the well collected November 26, 1979, after pumping at 550 gpm.

WELL NO. 3, LABORATORY NO. B23948

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.51		Silica	SiO_2	13	
Manganese	Mn	0.007		Fluoride	F	0.77	0.04
Ammonium	NH_4	<0.1		Boron	B	0.5	
Sodium	Na	14	0.61	Cyanide	CN	<0.005	
Potassium	K	5.9	0.15	Nitrate	NO_3	<0.4	
Calcium	Ca	117	5.84	Chloride	Cl	7.6	0.21
Magnesium	Mg	60	4.94	Sulfate	SO_4	178	3.70
Strontium	Sr	1.07		Alkalinity (as $CaCO_3$)		367	7.34
Arsenic	As	<0.001		Hardness (as $CaCO_3$)		546	10.92
Barium	Ba	0.04					
Cadmium	Cd	0.001		Total dissolved			
Chromium	Cr	<0.005		minerals		620	
Cobalt	Co	<0.005					
Copper	Cu	0.011					
Lead	Pb	0.01					
Mercury	Hg	<0.00005					
Nickel	Ni	<0.005					
Selenium	Se	<0.001					
Silver	Ag	<0.005					
Zinc	Zn	<0.005		pH (as rec'd)		7.2	

SUNNYLAND SUBDIVISION

Sunnyland Subdivision (est. 350), located about 4 miles southeast of Plainfield, installed a public water supply in 1945. The water system is owned and operated by the Sunnyland Improvement Association. Two wells (Nos. 2 and 3) are in use. In 1954 there were 82 services, all metered; the estimated average pumpage was 12,000 to 15,000 gpd. In 1980 there were 95 services, all metered; the average pumpage was 14,969 gpd. The water is hypochlorinated, fluoridated, and treated with polyphosphate to keep iron in solution.

WELL NO. 1 (also known as No. 2 by the subdivision), open to the Silurian dolomite, was completed in November 1945 to a depth of 132 ft by Dreher & Schorie, Joliet. This well was abandoned prior to 1970 and sealed prior to 1973. The well was located north of Flower St. and west of Gaylord Road at 2411 Flower St., approximately 1530 ft N and 730 ft W of the SE corner of Section 25, T36N, R9E. The land surface elevation at the well is approximately 617 ft.

A 5-in. diameter hole was drilled to a depth of 132 ft. The well was cased with 5-in. pipe from about 0.3 ft above the pumphouse floor to a depth of 60 ft.

Nonpumping water levels were reported to be 15 ft in 1950 and 20 ft in 1958.

A partial analysis of a sample (Lab. No. 147643) collected September 9, 1958, showed the water to have a hardness of 392 mg/1, total dissolved minerals of 430 mg/1, and an iron content of 1.2 mg/1.

WELL NO. 2 (also known as No. 1 by the subdivision), open to the Silurian dolomite, was completed in April 1946 to a depth of 124 ft by Dreher & Schorie, Joliet. The well is located at 2419 Flower St., approximately 1500 ft N and 460 ft W of the SE corner of Section 25, T36N, R9E. The land surface elevation at the well is approximately 618 ft.

A 6-in. diameter hole was drilled to a depth of 124 ft. The well is cased with 6-in. pipe from 1.5 ft above land surface to a depth of 40 ft.

Nonpumping water levels have been reported as follows: 15 ft in 1950, 20 ft below land surface in 1958, and 24 ft in 1972.

The pumping equipment presently installed consists of a 3-hp Reda electric motor, a Reda submersible pump (Model No. 453001) set at 60 ft, rated at 30 gpm, and has 60 ft of 2-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42328) of a sample collected April 18, 1977, after pumping for 30 min, showed the water to have a hardness of 466 mg/1, total dissolved minerals of 617 mg/1, and an iron content of 1.7 mg/1.

WELL NO. 3, open to the Silurian dolomite, was completed in October 1970 to a depth of 150 ft by the Lockport Well & Pump Co., Joliet. The well is located at 2411 Flower St. about 25 ft south of Well No. 2, approximately 1475 ft N and 460 ft W of the SE corner of Section 25, T36N, R9E. The land surface elevation at the well is approximately 618 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Surface	1	1
Clay	24	25
Gravel	13	38
Lime	42	80
Lime shale	70	150

An 8-in. diameter hole was drilled to a depth of 150 ft. The well is cased with 8-in. pipe from land surface to a depth of 40 ft. The top of the casing is equipped with a pitless adapter.

Upon completion, the well reportedly produced 40 gpm for 6 hr with a drawdown of 10 ft from a nonpumping water level of 35 ft below land surface.

The pumping equipment presently installed is a Red Jacket submersible pump set at 60 ft, rated at 40 gpm, and powered by a 3-hp Franklin electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42327) is for a water sample from the well collected April 18, 1977, after 30 min of pumping at 40 gpm.

WELL NO. 3, LABORATORY NO. B42327

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.3		Silica	SiO_2	13	
Manganese	Mn	0.05		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.23	0.01	Boron	B	0.1	
Sodium	Na	30	1.30	Cyanide	CN	0.00	
Botassium	K	2.1	0.05	Nitrate	NO_3	0.0	0.00
Calcium	Ca	115	5.74	Chloride	Cl	70	1.97
Magnesium	Mg	54	4.44	Sulfate	SO_4	150	3.12
				Alkalinity(as $CaCO_3$)		308	6.16
Arsenic	As	0.00		Hardness(as $CaCO_3$)		525	10.50
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		654	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.00005					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.5	

SUNSET TRAILS APARTMENTS

Sunset Trails Apartments (est. 280), located about 0.5 mile east of New Lenox, installed a public water supply in 1966. The water system is owned and operated by the Sunset Trails Water Co. One well is in use. In 1981 there were 80 services, all metered; the estimated average pumpage was 25,000 gpd. The water is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed in February 1962 to a depth of 300 ft by the Lockport Well & Pump Co., Joliet. The well is located about 300 ft south of Route 30 and 50 ft west of Cooper Road, approximately 220 ft S and 2200 ft E of the NW corner of Section 22, T35N, R11E. The land surface elevation at the well is approximately 675 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	3	3
Yellow clay	12	15
Gray clay	20	35
Blue clay with gravel	8	43
White lime	55	98
Brown lime	75	173
Blue lime	112	285
Lime and shale	10	295
Brown shale	5	300

A 12-in. diameter hole was drilled to a depth of 300 ft. The well is cased with 12-in. pipe from about 5 ft above the wellhouse floor to a depth of 43 ft.

On March 11, 1962, after 4 hr of pumping at a rate of 97+ gpm, the drawdown was 10.5 ft from a nonpumping water level of 38.0 ft below land surface.

On December 3, 1971, the nonpumping water level was reported to be 50 ft.

The pumping equipment presently installed consists of two Sta-Rite submersible pumps set at 90 and 110 ft, each rated at 48 gpm, and powered by two 3-hp Sta-Rite electric motors.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C005448) is for a water sample from the well collected January 21, 1975, after 15 min of pumping at 50 gpm.

WELL NO. 1, LABORATORY NO. C005448

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.7		Silica	SiO_2	16.0	
Manganese	Mn	0.00		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.37	0.02	Boron	B	0.3	
Sodium	Na	19	0.83	Cyanide	CN	0.00	
Potassium	K	3.3	0.08	Nitrate	NO_3	0.5	0.01
Calcium	Ca	134	6.69	Chloride	Cl	37	1.04
Magnesium	Mg	48	3.95	Sulfate	SO_4	125	2.60
				Alkalinitv(as$CaCO_3$)		382	7.64
Arsenic	As	0.006		Hardness(as$CaCO_3$)		533	10.66
Barium	Ba	0.2					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		562	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		7.7	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc//		1.4	
Selenium	Se	0.00		± deviation		1.9	
Silver	Ag	0.00		Beta pc//		6.6	
Zinc	Zn	0.09		± deviation		2.6	

UTILITIES, UNLIMITED

Utilities, Unlimited (est. 115), formerly known as Calumet Gardens Subdivision, located about 2 miles southeast of Crete, installed a public water supply in 1969. The water system is owned by Richard Breitbarth and operated by Utilities, Inc. One well is in use. In 1981 there were 33 services, all metered; the estimated average pumpage was 9200 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in June 1969 to a depth of 300 ft by the Wehling Well Works, Beecher. The well is located about 100 ft north of Lovella St. extended and 1253 ft west of Cottage Grove Road, approximately 1575 ft S and 1253 ft W of the NE corner of Section 22, T34N, R14E. The land surface elevation at the well is approximately 710 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	**58**	**58**
Lime	**242**	**300**

An 8-in. diameter hole was drilled to a depth of 300 ft. The well is cased with 8-in. pipe from about 1.5 ft above the pumphouse floor to a depth of 62 ft.

A production test was conducted by the driller on June 12, 1969. After 9 hr of pumping at rates of 190 to 275 gpm, the drawdown was 140 ft from a nonpumping water level of 15 ft.

The pumping equipment presently installed is a Johnston turbine pump set at 150 ft, rated at 200 gpm at about 250 ft TDH, and powered by a 20-hp 1750 rpm U. S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B03011) is for a water sample from the well collected July 12, 1978, after 5 min of pumping.

WELL NO. 1, LABORATORY NO. B03011

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.5		Silica	SiO_2	11	
Manganese	Mn	0.01		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.3	0.02	Boron	B	0.3	
Sodium	Na	9	0.30	Cyanide	CN	0.00	
Potassium	K	3.3	0.08	Nitrate	NO_3	0.0	0.00
Calcium	Ca	102	5.09	Chloride	Cl	3.2	0.09
Magnesium	Mg	45	3.70	Sulfate	SO_4	110	2.29
				Alkalinity(as$CaCO_3$)		333	6.66
Arsenic	As	0.00		Hardness(as$CaCO_3$)		436	8.72
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		488	
Copper	Cu	0.02					
Lead	Pb	0.00					
Mercury	Hg	<0.00002					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.2	

WILLOW BROOK UTILITY CO.

Willow Brook Utility Co. (est. 602), located about 4 miles east of Crete, installed a public water supply in 1972. The water system is owned and operated by the Kankakee Water Co. One well (No. 1) is in use and another well (No. 2) is available for emergency use. In 1980 there were 251 services, all metered; the average pumpage was 121,974 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite, was completed in November 1971 to a depth of 500 ft by the Wehling Well Works, Beecher. The well is located on the south side of Burrville Road about 0.5 mile east of Klemme Road, approximately 1170 ft S and 40 ft W of the NE corner of Section 18, T34N, R15E. The land surface elevation at the well is approximately 700 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	112	112
Rock	388	500

A 10-in. diameter hole was drilled to a depth of 500 ft. The well is cased with 10-in. galvanized pipe from about 1.5 ft above the wellhouse floor to a depth of 114 ft.

A production test was conducted by the driller on November 23, 1971. After 7.8 hr of pumping at rates of 640 to 300 gpm, the maximum drawdown was 119 ft from a nonpumping water level of 36 ft below land surface. Fifteen min after pumping was stopped, the water level had recovered to 55 ft.

The pumping equipment presently installed consists of a 50-hp U. S. Holloshaft electric motor, an 8-in., 12-stage Johnston turbine pump set at 200 ft, rated at 500 gpm at about 265 ft TDH, and has 200 ft of 6-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B29588) is for a water sample from the well collected January 27, 1976, after 1 hr of pumping at 350 gpm.

WELL NO. 1, LABORATORY NO. B29588

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.6		Silica	SiO_2	16	
Manganese	Mn	0.00		Fluoride	F	0.6	0.03
Ammonium	NH_4	0.84	0.05	Boron	B	0.6	
Sodium	Na	49	2.13	Cyanide	CN	0.00	
Potassium	K	3.4	0.09	Nitrate	NO_3	0.22	0.00
Calcium	Ca	68	3.39	Chloride	Cl	3.3	0.09
Magnesium	Mg	38	3.13	Sulfate	SO_4	79	1.64
				Alkalinity(as$CaCO_3$)		356	7.12
Arsenic	As	0.00		Hardness(as$CaCO_3$)		326	6.52
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		487	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		7.9	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc//		3.0	
Selenium	Se	0.00		± deviation		2.0	
Silver	Ag	0.00		Beta pc//		4.7	
Zinc	Zn	0.00		± deviation		1.7	

WELL NO. 2, open to the Silurian dolomite, was completed in November 1971 to a depth of 570 ft by the Wehling Well Works, Beecher. This well is available for emergency use. The well is located east of Klemme Road about 0.8 mile north of Burrville Road, approximately 1050 ft N and 2350 ft W of the SE corner of Section 7, T34N, R15E. The land surface elevation at the well is approximately 700 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	125	125
Rock	445	570

A 10-in. diameter hole was drilled to a depth of 570 ft. The well is cased with 10-in. galvanized pipe from about 0.5 ft above the wellhouse floor to a depth of 127 ft.

A production test was conducted by the driller on December 1, 1971. After 2 hr of pumping at rates of 460 to 226 gpm, the drawdown was 153 ft from a nonpumping water level of 44 ft below land surface. Pumping was continued for 3 hr at rates of 200 to 196 gpm with a drawdown of 138 ft. Pumping was continued for 1.2 hr at a rate of approximately 75 gpm with a drawdown of *69* ft. After an additional 1.5 hr of pumping at increased rates of 150 to 200 gpm, the final drawdown was 112 ft. Fifteen min after pumping was stopped, the water level had recovered to 93 ft.

The pumping equipment presently installed consists of a 30-hp U. S. Holloshaft electric motor, an 8-in., 9-stage Johnston turbine pump set at 250 ft, rated at 200 gpm at about 295 ft TDH, and has 250 ft of 6-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C004868) is for a water sample from the well collected April 1, 1977, after 1 hr of pumping.

WELL NO. 2, LABORATORY NO. C004868

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.8		Silica	SiO_2	12	
Manganese	Mn	0.00		Fluoride	F	0.5	0.03
Ammonium	NH_4	3.5	0.19	Boron	B	1.1	
Sodium	Na	0.00	0.00	Cyanide	CN	0.00	
Potassium	K	7.8	0.20	Nitrate	NO_3	1.14	0.02
Calcium	Ca	160	7.98	Chloride	Cl	8	0.23
Magnesium	Mg	67	5.51	Sulfate	SO_4	344	7.16
				Alkalinitv(as$CaCO_3$)		350	7.00
Arsenic	As	0.000		Hardness(as$CaCO_3$)		680	13.60
Barium	Ba	0.0					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		868	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.04		pH (as rec'd)		8.4	

WILMINGTON

The city of Wilmington (4335) installed a public water supply in 1892. Two wells (Nos. 2 and 3) are in use and another well (No. 1) is available for emergency use. In 1949 there were 900 services, 66 percent metered; the average pumpage was 270,000 gpd. In 1980 there were 1740 services, all metered; the average pumpage was 5 36,224 gpd. The water is chlorinated and treated with polyphosphate to keep iron in solution.

Initially, water was pumped directly from the Kankakee River for sprinkling and fire protection use. Private wells furnished all residential and business demands until 1918 when the first well was drilled for the city. The waterworks plant at the river was then abandoned.

WELL NO. 1, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in 1917 to a depth of 710 ft by J. W. Hensley & Co., Indianapolis, Ind. This well is available for emergency use. The well is located about 104 ft south of Jackson St. and 90 ft west of Main St. in a pumphouse in the rear of the city hall, approximately 1025 ft N and 1300 ft E of the SW corner of Section 25, T33N, R9E. The land surface elevation at the well is approximately 545 ft.

A sample study log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	15	15
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone	80	95
Scales Shale		
Shale with some limestone	45	140
Galena and Platteville Groups		
Limestone and dolomite	365	505
Ancell Group		
Glenwood Formation		
Dolomitic sandstone	20	525
St. Peter Sandstone		
Sandstone, water bearing	165	690
Prairie du Chien Group		
Shakopee Dolomite	20	710

The well is cased with 12-in. pipe from 2 ft above the pump station floor to a depth of 21 ft (cemented in) and 10-in. pipe from 21 ft to a depth of 210 ft. Below the casing, the hole was finished 10 in. in diameter to the bottom.

Upon completion, the nonpumping water level was reported to be 17 ft below land surface.

A production test was conducted on March 5-6, 1943, by representatives of the Stannard Power & Equipment Co., the city, the State Water Survey, and the Federal Works Agency. After 24.1 hr of pumping at rates ranging from 264 to 315 gpm, the maximum drawdown was 124 ft from a nonpumping water level of 118 ft below the pump base. The water level recovered to 122 ft after pumping had been stopped for 2.1 hr. During the test, Well No. 2 was operating intermittently.

In July 1952, Jack Hinton, Lockport, shot the well between the depths of 600 and 704 ft with 171 lb of nitrogel and 20 lb of 60 percent dynamite for primer and cleaned out the well to its original depth. On September 21, 1952, the well reportedly produced from 308 to 302 gpm for 1.4 hr with a drawdown of 80 ft from a nonpumping water level of 144 ft. During this test, Well No. 2 was pumping continuously.

The pumping equipment presently installed consists of a 40-hp General Electric motor, an 8-in., 21-stage Pomona turbine pump set at 300 ft, rated at 250 gpm, and has 300 ft of 6-in. column pipe. A 30-ft section of 6-in. suction pipe is attached to the pump intake. The well is equipped with 300 ft of airline.

A partial analysis of a sample (Lab. No. 97798) collected October 18, 1943, showed the water to have a hardness of 407 mg/1, total dissolved minerals of 1100 mg/1, and an iron content of 0.0 mg/1.

WELL NO. 2, open to the Cambrian-Ordovician aquifer, was completed in 1936 to a depth of 1566 ft (measured in October 1954 at 1536 ft deep) by C. W. Varner, Dubuque, Iowa. The well is located about 175 ft north and 75 ft east of Well No. 1, approximately 1200 ft N and 1375 ft E of the SW corner of Section 25, T33N, R9E. The land surface elevation at the well is approximately 546 ft.

A sample study log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
QUATERNARY SYSTEM		
Pleistocene Series		
"Soil, clay and soft lime shells"	9	9
"Sand and gravel"	11	20
ORDOVICIAN SYSTEM		
Maquoketa Group		
Ft. Atkinson Limestone	70	90
Scales Shale		
Shale, some limestone	57	147
Galena and Platteville Groups		
Limestone and dolomite	365	512
Ancell Group		
Glenwood Formation		
Sandstone, partly dolomitic	13	525
St. Peter Sandstone		
Sandstone, incoherent	150	675
Sandstone, shale, chert	7	682
Strata (continued)	*Thickness (ft)*	*Depth (ft)*
Prairie du Chien Group		
Shakopee Dolomite		
Dolomite, thin shale bed at top	73	755
New Richmond Sandstone		
Sandstone and dolomite	13	768
Oneota Dolomite		
Dolomite, thin beds of sandstone	277	1045
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	218	1263
Franconia Formation		
Sandstone, dolomite, thin beds of shale	137	1400
Ironton-Galesville Sandstone		
Sandstone and dolomite	100	1500
Sandstone, incoherent	35	1535
Sandstone, partly dolomitic	31	1566

A 12.5-in. diameter hole was drilled to a depth of 218 ft and finished 10 in. in diameter from 218 to 1566 ft. The well is cased with 12.5-in. drive pipe from 0.5 ft above the pump station floor to a depth of 23.2 ft and 10-in. pipe from 0.5 ft above the pump station floor to a depth of 218 ft.

Upon completion, the well reportedly produced 485 gpm with a drawdown of 6.5 ft from a nonpumping water level of 59.0 ft below the top of the casing.

In 1940, the nonpumping water level was reported to be 67 ft below the pump base.

A production test was conducted in November 1942, by representatives of the J. P. Miller Artesian Well Co., Brookfield, the city, the Federal Works Agency, and E. T. Mulford, Consulting Engineer. After 24 hr of pumping at rates ranging from 725 to 815 gpm, the drawdown was 16.5 ft from a nonpumping water level of 124.0 ft below the pump base. During this test, Well No. 1 was pumping intermittently.

In November 1954, the well reportedly produced 640 gpm with a drawdown of 23 ft from a nonpumping water level of 154 ft.

Nonpumping water levels were reported to be 124 ft in October 1955 and 319 ft on October 6, 1975.

The pumping equipment presently installed is a Johnston turbine pump set at 300 ft, rated at 750 gpm, and powered by a 125-hp 1800 rpm U. S. electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C001978) of a sample collected November 14, 1977, after pumping for 30 min at 760 gpm, showed the water to have a hardness of 424 mg/1, total dissolved minerals of 1168 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 3, open to the Cambrian-Ordovician aquifer, was completed in November 1964 to a depth of 1578 ft by the Wehling Well Works, Beecher. The well is located in the city park on South Island east of South Park St., approximately 240 ft S and 1125 ft E of the NW corner of Section 36, T33N, R9E. The land surface elevation at the well is approximately 530 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	15	15
Lime	35	50
Shale and lime	114	164
Lime	336	500
Sand	163	663
Lime and shale	43	706
Lime and sand	59	765
Lime	401	1166
Sand and lime	43	1209
Lime	23	1232
Sandy lime	41	1273
Sandy shale and lime	76	1349
Shale	40	1389
Sandy lime	19	1408
Lime	52	1460
Sandy lime	42	1502
Sand	55	1557
Gray lime	7	1564
Shale and lime	14	1578

A 20-in. diameter hole was drilled to a depth of 14 ft, reduced to 19 in. between 14 and 174 ft, reduced to 16 in. between 174 and 765 ft, and finished 12 in. in diameter from 765 to 1578 ft. The well is cased with 20-in. pipe from 0.8 ft above the pumphouse floor to a depth of 14 ft and 16-in. pipe from 0.8 ft above the pumphouse floor to a depth of 174 ft (cemented in).

A production test was conducted by the driller on December 3-4, 1964. After 24 hr of pumping at a rate of 1200 gpm, the final drawdown was 298 ft from anonpumping water level of 169 ft below land surface.

On October 6, 1975, the nonpumping water level was reported to be 300 ft.

The pumping equipment presently installed consists of a 150-hp 1800 rpm U. S. electric motor, a 14-in., 7-stage Johnston vertical turbine pump set at 410 ft, rated at 750 gpm at about 550 ft head, and has 410 ft of 8-in. column pipe. The well is equipped with 410 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B18488) is for a water sample from the well collected October 29, 1975, after 4 hr of pumping.

WELL NO. 3, LABORATORY NO. B18488

		mg/l	*me/l*		*mg/l*	*me/l*
Iron	Fe	0.1	Silica	SiO_2	8	
Manganese	Mn	0.00	Fluoride	F	1.2	0.06
Ammonium	NH_4	1.4 0.08	Boron	B	1.0	
Sodium	Na	280 12.18	Nitrate	NO_3	0.0	0.00
Potassium	K	21 0.54	Chloride	Cl	273	7.70
Calcium	Ca	104 5.19	Sulfate	SO_4	406	8.44
Magnesium	Mg	41 3.37	Alkalinity(as$CaCO_3$)		288	5.76
Arsenic	As	0.01	Hardness(as$CaCO_3$)		428	8.56
Barium	Ba	0.0				
Cadmium	Cd	0.00	Total dissolved			
Chromium	Cr	0.00	minerals		1268	
Copper	Cu	0.01				
Lead	Pb	0.00				
Mercury	Hg	0.0000				
Nickel	Ni	0.0				
Selenium	Se	0.00				
Silver	Ag	0.00				
Zinc	Zn	0.0	pH (as rec'd)		7.6	