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Public Groundwater Supplies in Kane County

by DOROTHY M. WOLLER and ELLIS W. SANDERSON

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PUBLIC GROUNDWATER SUPPLIES IN KANE 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 Kane 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 34 public water supply systems furnishing water to 16 municipalities, 14 subdivisions, and 4 state institutions in Kane 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.

Acknowledgments. This report was prepared under the general direction of Dr. William C. Ackermann, Chief of the Illinois State Water Survey, and John B. Stall, Engineer Emeritus and former Head of Hydrology. Richard J. Schicht, Head of the Hydrology Section, reviewed the final manuscript. Special thanks are given to R. T. Sasman, Hydrologist, who checked all of the data and reviewed the manuscript. Mrs. J. L. Ivens and Mrs. P. A. Motherway edited the manuscript, Mrs. Marilyn Innes typed the camera-copy, William Motherway, Jr., supervised the preparation of the illustrations, and Karen L. Kunz assisted in the final preparation of the manuscript. The chemical analyses, unless otherwise stated, were made by personnel of the Water Survey Chemistry Section under the supervision of Laurel M. Henley. The analyses made by personnel of the Illinois Environmental Protection Agency were under the supervision of Ira M. Markwood. Thanks are due M. L. Sargent of the Illinois State Geological Survey who prepared the generalized column of rock stratigraphic units and aquifers and, with R. D. Brower, reviewed the geological information in the manuscript. Grateful acknowledgment also is given to consulting engineers, well drillers, water superintendents, and municipal officials who have provided valuable information used in this report.

Geology

The geology of Kane County is described in Illinois State Geological Survey Circular 198, *Groundwater Possibilities in Northeastern Illinois,* Circular 406, *Bedrock Aquifers of Northeastern Illinois,* Report of Investigation 218, *Cambrian and Ordovician Strata of Northeastern Illinois,* and in 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. For a more detailed definition of the geology in this portion of the state, the reader is referred to the State Geological Survey which is located on the University of Illinois campus, Urbana.

The glacial drift deposits in Kane County vary in thickness from less than 1 ft along the Fox River, where bedrock is exposed, to as much as 300 ft near the northwest corner. Sand and gravel deposits offering possibilities for the development of moderate to large quantities of water (100 to 500 gpm) from individual wells are present within the glacial drift in more than half of the county. Shallow outwash deposits of sand and gravel with potential for yielding municipal water supplies occur locally along the Fox River Valley and its tributaries.

Beneath the glacial deposits, the upper bedrock formations

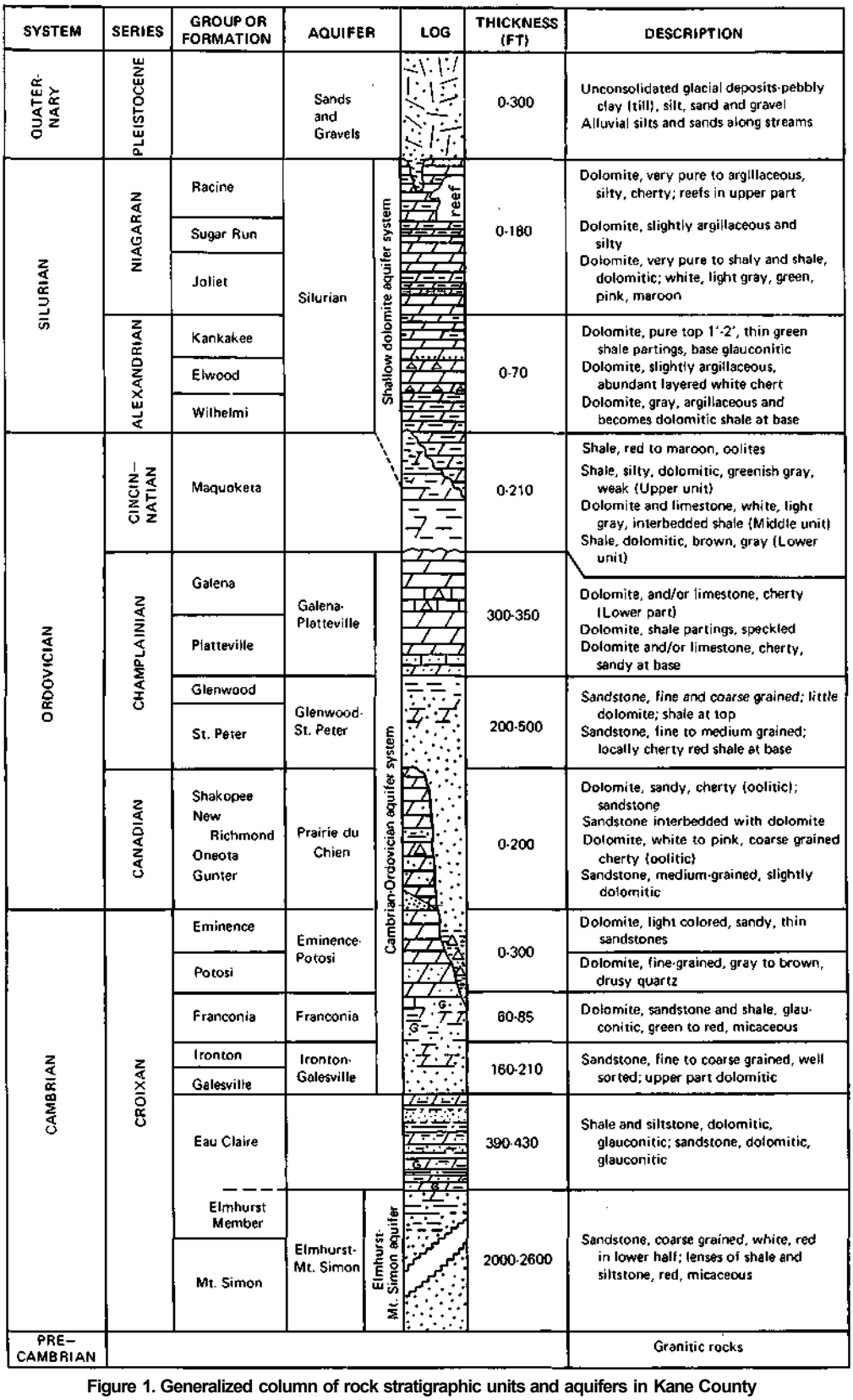

Figure 1. Generalized column of rock stratigraphic units and aquifers in Kane County

(Prepared by M. L. Sargent, Illinois State Geological Survey)

consist principally of dolomite (a limestone-like rock), shale, and sandstone which dip easterly at about 10 ft per mile. Rock formations underlying Kane County range in age from Silurian to Precambrian (see generalized stratigraphic sequence in figure 1).

The Silurian dolomite underlies the glacial drift along most of the eastern edge of the county and in two areas near Plato Center and Elburn in central Kane County (see figure 2). This unit is part of the geohydrologic system present throughout northeastern Illinois that is referred to as the shallow dolomite aquifer. These rocks are encountered near land surface in the Fox River Valley and are buried to a depth of about 200 ft near Plato Center and Elburn. They range in thickness from a featheredge to about 50 ft in areas in the eastern portion of the county. Where they have been completely removed by erosion, the underlying Maquoketa Group is exposed. 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. In some areas the Silurian rocks directly underlie permeable deposits of water-bearing sand and gravel. Under such geohydrologic conditions, formation of solution cracks and crevices and free exchange of water from the glacial drift to the bedrock is maximized, thereby enhancing the yield capability of the Silurian aquifer.

The Maquoketa Group (Ordovician age) underlies the glacial drift in most of Kane County and consists primarily of nonwater-bearing shales that separate the Silurian aquifer from deeper water-bearing units. These shales lie at depths from about 50 ft in areas in the southwestern part of the county to more than 250 ft in the north-central part of the county. The Maquoketa rocks range from about 150 to 200 ft in thickness. The Maquoketa Group generally is not considered as a source for large municipal 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 this group.

Below the Maquoketa Group is 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, Eminence-Potosi Dolomite, Franconia Formation, and Ironton-Galesville Sandstone.

Dolomite of the Galena-Platteville (Ordovician age) lies at depths of about 425 ft in the north-central area of the county to about 325 ft in the southeast area at Aurora. It is relatively uniform in thickness throughout the county ranging from about 300 to 350 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.

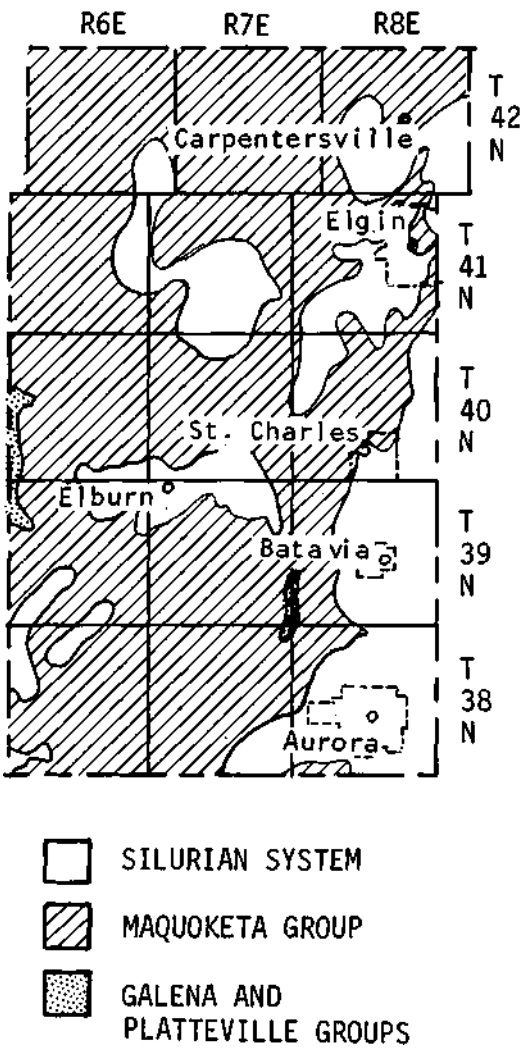

Figure 2. Areal geology of the bedrock surface
(Modified from Geologic Map of Illinois, Willman and others, 1967)

The Glenwood-St. Peter Sandstone (Ordovician age) lies below the Galena-Platteville. This sandstone aquifer is encountered at depths from about 750 ft in the north-central part of the county to approximately 650 ft near the southeast corner and ranges in thickness from about 200 ft at Elgin and Aurora to more than 400 ft in narrow bands in the central part of the county. 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 Eminence-Potosi Dolomite (Cambrian age) and the Franconia Formation (Cambrian age) which consist of interbedded sandstones, shales, and dolomites. These units are encountered at depths greater than about 1100 ft in the northeast to 800 ft in the southeast and have total thicknesses varying from about 125 to 400 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 formations produce about 35 percent of the total yield from the Cambrian-Ordovician aquifer system. Wells tapping only these formations 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 ft thick in Kane County and it lies at a depth of about 1200 ft throughout most of the county, but is about 1000 ft deep in the northeast and northwest areas and reaches a maximum of about 1325 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 are composed primarily of nonwater-bearing sandy dolomitic shales that separate the Cambrian-Ordovician aquifer system from deeper water-bearing units. 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, the deepest fresh water aquifer in northern Illinois. In Kane County this aquifer lies at depths ranging from about 1500 ft in the north to more than 1800 ft in the southeast and ranges in thickness from about 2000 ft in the northwest part to about 2600 ft in the southern 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 use.

Groundwater Development for Public Use

Groundwater is used as a source of public water supply at 16 municipalities, 14 subdivisions, and 4 state institutions in Kane County. The location of these supplies are shown in figure 3.

Sand and gravel deposits in the unconsolidated materials above bedrock are tapped by 16 public water systems in Kane County as a source of all or part of their water supply. There are presently 27 production and standby wells, ranging in depth from 18 to 186 ft, tapping only the sand and gravel deposits. Their reported yields range from 24 to 3150 gpm depending primarily upon the type of well and the permeability, thickness, and areal extent of the sand and gravel unit tapped by each well. Production from these wells for 1976 was estimated to be about 5,447,000 gpd.

The analyses of water from these wells show that the iron content ranges from 0.0 to 3.6 mg/l and the hardness from 228 to 576 mg/1. Hydrogen sulfide gas was also noted in water from 1 well. Treatment provided for these supplies is as follows: 13 chlorinate, 10 fluoridate, 2 soften, 5 treat for iron removal, 3 add polyphosphate to keep iron in solution, and 2 supplies provide no treatment.

The upper bedrock units in Kane County, the Silurian dolomite and the Maquoketa Group, are tapped by 13 public water systems as a source of all or a portion of their water supply. There are presently 20 production and standby wells finished only in these units. They range in depth from 147 to 514 ft and are pumped at rates of 25 to 400 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 1976 were estimated to be about 268,000 gpd.

Analyses of water from wells tapping only the upper bedrock units show that the iron content usually ranges from 0.0 to 2.3 mg/1, and the hardness from 140 to 540 mg/1. Hydrogen sulfide gas was also noted in water from 1 well. Treatment provided at the 13 supply systems is as follows: 7 chlorinate, 9 fluoridate, 1 treats for iron removal, 2 add polyphosphate to keep iron in solution, and 4 provide no treatment.

Wells tapping combinations of formations within the Cambrian-Ordovician aquifer system are used at 12 public water systems as a source of water supply. There are presently 41 production wells, ranging in depth from 355 to 1719 ft, finished within the Cambrian-Ordovician aquifer system (including Elburn Well No. 1 which is also open to the Silurian dolomite, and Hampshire Well Nos. 3, 4, and 5 which are also open to the Maquoketa Group; Hampshire Well No. 4 is also open to sand and gravel). These wells are pumped at rates of 68 to 2000 gpm. Production from these wells for 1976 was estimated to be about 18,089,000 gpd.

The analyses of water from these wells show the iron content usually ranges from 0.0 to 2.4 mg/1 and the hardness from 144 to 585 mg/1. The barium content of water from 12 wells ranges from 1.3 to 11.7 mg/1. Hydrogen sulfide gas was also noted in water from 3 wells. Water treatment for these supplies is as follows: 12 chlorinate, 4 add fluoride, 2 soften, 6 treat for iron removal, and 4 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 of this aquifer. In Kane County water levels have declined at an average rate of 10 ft per year for the period 1966 to 1971 and 9 ft per year for the period 1971 to 1975 (from State Water Survey Circular 125).

Wells tapping combinations of formations within the Cambrian-Ordovician aquifer system and the Elmhurst-Mt. Simon aquifer system are used at 6 public water systems as a source of supply. There are presently 16 production wells, ranging in depth from 1793 to 2292 ft, finished within the Elmhurst-Mt. Simon aquifer system. These wells are

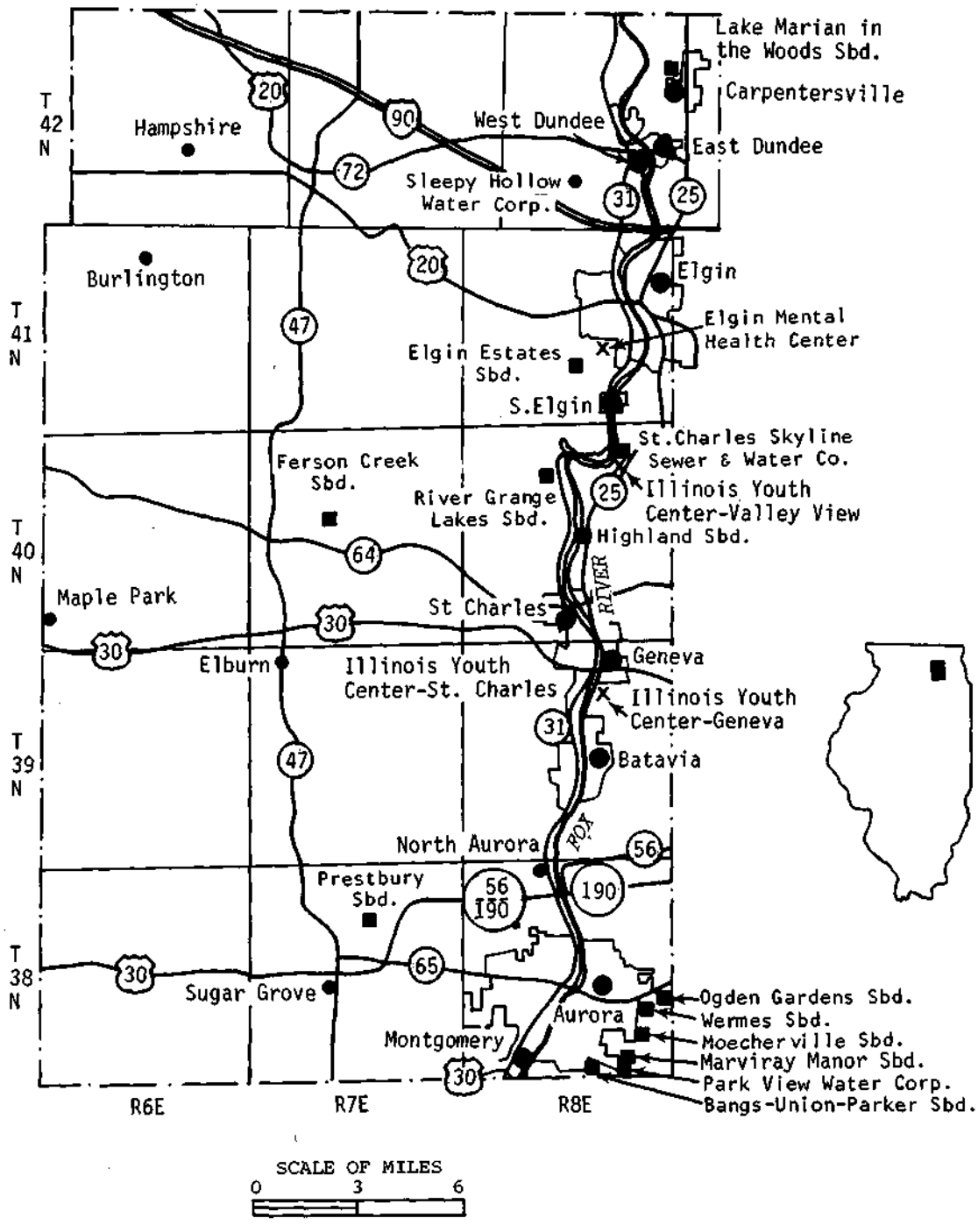

Figure 3. Location of public groundwater supply systems in Kane County

pumped at rates of 171 to 1600 gpm. Production from these wells for 1976 was estimated to be about 8,096,000 gpd.

The analyses of water from these wells show the iron content usually ranges from 0.0 to 1.6 mg/l, and the hardness from 200 to 552 mg/l. The chloride content of water from 1 well exceeds the recommended limit of 250 mg/1. The barium content of water from 6 wells ranges from 2.0 to 6.8 mg/l. Hydrogen sulfide gas was also noted in water from 1 well and methane gas in water from 1 well. Treatment of water for these supplies is as follows: 6 chlorinate, 1 fluoridates, 2 soften, 2 treat for iron removal, and 1 adds polyphosphate to keep iron in solution.

The Elmhurst-Mt. Simon aquifer system has not been extensively developed in Kane County and nonpumping water levels in this aquifer system may be about 50 ft higher than those in the overlying Cambrian-Ordovician aquifer system.

The total public water supply pumpage from the aquifers in Kane County for 1976 was about 31,900,000 gpd. Of this total approximately 17 percent was obtained from sand and gravel aquifers, 1 percent from the Silurian dolomite and Maquoketa Group, 57 percent from combinations of formations within the Cambrian-Ordovician aquifer system, and 25 percent from combinations within the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifer systems.

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	gallon(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/l	millequivalents per liter
mg/l	milligrams per liter
min	minute(s)
No.(s)	number(s)
OD	outside diameter
oz	ounce(s)
pc/l	picocuries per liter
qt	quart(s)
R	range
rpm	revolutions per minute
T	township
TDH	total dynamic head
Tr	trace

PUBLIC WATER SUPPLIES

AURORA

The city of Aurora (74,182) installed a public water supply in 1886. This city is in Kane County but one of the wells (No. 22) is located in DuPage County. Ten wells (Nos. 8, 15, 16, 17, 18, 19, 20, 21, 22, and 25) are in use and four wells (Nos. 11, 12, 12A, and 23) are available for emergency use. In 1949 there were 15,300 services, all metered; the estimated average and maximum daily pumpages were 4,420,000 and 7,200,000 gpd, respectively. In 1977 there were 22,000 services, all metered; the average and maximum daily pumpages were 9,202,386 and 13,800,000 gpd, respectively. The water is chlorinated and treated with polyphosphate to keep iron in solution.

Initially, water was obtained from a well and filter gallery excavated in a gravel formation located on an island in the Fox River on the north side of the city. This source of water supply was abandoned in 1902.

WELL NO. 1, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was constructed in 1892 to a depth of 1381 ft by the American Well Works Co., Aurora, and deepened in 1898 to a depth of 2235 ft by the J. P. Miller Artesian Well Co., Brookfield. This well was abandoned and sealed in 1928. The well was located on the bank of the Fox River on the north side of the city, approximately 790 ft S and 2505 ft W of the NE corner of Section 15, T38N, R8E. The land surface elevation at the well is approximately 640 ft.

The well apparently was cased with 8-in. pipe to a depth of 150 ft and when deepened in 1898, the hole was finished 6 in. in diameter at the bottom.

In 1894, this well reportedly flowed. In 1910, the production of this well was reported to be 550 gpm when pumping in combination with Well Nos. 2,3, and 4.

WELL NO. 2, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in 1893 to a depth of 2440 ft by the American Well Works Co., Aurora. This well was abandoned and sealed in 1928. The well was located about 310 ft northwest of Well No. 1, approximately 495 ft S and 2605 ft W of the NE corner of Section 15, T38N, R8E. The land surface elevation at the well is approximately 640 ft.

The well apparently was cased with 12-in. pipe to a depth of 160 ft, and the hole was finished 6 in. in diameter at the bottom.

In 1894, this well reportedly flowed. In 1910, the production of this well was reported to be 350 gpm when pumping in combination with Well Nos. 1, 3, and 4.

A partial analysis of a sample (Lab. No. 31010) made in August 1915, showed the water to have a hardness of 432 mg/l, total dissolved minerals of 1248 mg/l, and an iron content of 0.1 mg/1.

WELL NO. 3, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in 1893 to a depth of 2274 ft by the J. P. Miller Artesian Well Co., Brookfield. This well was abandoned and sealed in 1928. The well was located about 185 ft northwest of Well No. 1, approximately 640 ft S and 2615 ft W of the NE corner of Section 15, T38N, R8E. The land surface elevation at the well is approximately 635 ft.

An 8- or 10-in. diameter hole was drilled to a depth of 610 ft and finished 6 in. in diameter from 610 to 2274 ft. The well apparently was cased with 8- or 10-in. pipe to a depth of 150 ft.

In 1894, this well reportedly flowed. In 1910, the production of this well was reported to be 500 gpm when pumping in combination with Well Nos. 1, 2, and 4.

WELL NO. 4, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in 1895 to a depth of 2445 ft (backfilled to a depth of 2250 ft) by the J. P. Miller Artesian Well Co., Brookfield. This well was abandoned and sealed in 1928. The well was located about 85 ft west of Well No. 1, approximately 800 ft S and 2590 ft W of the NE corner of Section 15, T38N, R8E. The land surface elevation at the well is approximately 635 ft.

A correlated drillers log of Well No. 4 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Surface	10	10
SILURIAN SYSTEM		
Niagaran Series		
"Limestone"	95	105
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale	140	245
Galena-Platteville Groups		
"Limestone"	325	570
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone	195	765
ORDOVICIAN-CAMBRIAN SYSTEMS (Undifferentiated)		
"Shale"	135	900
"Sandstone"	190	1090
"Shale"	75	1165
CAMBRIAN SYSTEM		
Ironton-Galesville Sandstone		
Sandstone	185	1350
Eau Claire Formation		
Shale	190	1540
"Limestone"	25	1565
Shale	165	1730
Mt. Simon Sandstone		
Sandstone	715	2445

A 10-in. diameter hole was drilled to a depth of 76 ft, reduced to 8 in. between 76 and 1700 ft, and finished 6 in. in diameter from 1700 to 2445 ft. The well was cased with 10-in. pipe to a depth of 76 ft.

In 1910, the production of this well was reported to be 400 gpm when pumping in combination with Well Nos. 1, 2, and 3.

WELL NO. 5, open to the Cambrian-Ordovician and the

Elmhurst-Mt. Simon aquifers, was completed in 1910 to a depth of 2250 ft by Timmes and Beckwith. This well was abandoned in 1970 and has not been sealed. The well is located immediately east of the main pumping station on North Aurora Ave. about 145 ft southeast of Well No. 1, approximately 850 ft S and 2375 ft W of the NE corner of Section 15, T38N, R8E. The land surface elevation at the well is approximately 655 ft.

A correlated drillers log of Well No. 5 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Clay	2	2
SILURIAN SYSTEM		
"Limestone", white	123	125
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale	120	245
Galena-Platteville Groups		
"Limestone", blue	340	585
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, white	220	805
Shale, blue	25	830
Prairie du Chien Group		
Oneota Dolomite		
"Limestone", gray	100	930
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
"Limestone", gray	175	1105
Franconia Formation		
Shale and white sandstone	70	1175
Ironton-Galesville Sandstone		
Sandstone, white	190	1365
Eau Claire Formation		
"Limestone", blue	25	1390
Shale and "limestone"	160	1550
"Limestone", blue	180	1730
Mt. Simon Sandstone		
Sandstone	520	2250

A 22-in. diameter hole was drilled to a depth of 12 ft, reduced to 18 in. between 12 and 25 5 ft, reduced to 16 in. between 255 and 500 ft, reduced to 13 in. between 500 and 900 ft, reduced to 10 in. between 900 and 1500 ft, and finished 8 in. in diameter from 1500 to 2250 ft. The well is cased with 16-in. pipe from 1 ft above the floor of a 7-ft deep pit to a depth of 350 ft.

In December 1942, when the well reportedly produced 600 gpm, the pumping water level was about 320 ft below the pump base.

In July 1947, the well reportedly produced 575 gpm with an average drawdown of 153 ft from a nonpumping water level of 172 ft.

During the period of March 31-September 23, 1949, the nonpumping water levels ranged from 280 to 207 ft.

A mineral analysis of a sample (Lab. No. 95181) collected February 2, 1943, after pumping for 9 hr at 600 gpm, showed the water to have a hardness of 305 mg/l, total dissolved minerals of 562 mg/1, and an iron content of 0.1 mg/1.

WELL NO. 6, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in 1915 to a depth of 2185 ft (cleaned out to 2100 ft in 1952) by S. B. Geiger & Co., Chicago. This well has not been used since August 1972 because the sand remover could not remove all the sand. The well is located at the southeast corner of Talma and Binder Sts., approximately 180 ft N and 2540 ft W of the SE corner of Section 27, T38N, R8E. The land surface elevation at the well is approximately 670 ft.

An 18-in. diameter hole was drilled to a depth of 400 ft and finished 15 in. in diameter from 400 to 2185 ft. The well is cased with 18-in. pipe from above the floor of a 7-ft deep pit to a depth of 400 ft. After the well was cleaned in 1952, a 16-in. casing was pressure grouted inside the 18-in. pipe from above the pit floor to a depth of 400 ft.

In 1923, the well reportedly produced from 600 to 650 gpm with a drawdown of 220 ft from a nonpumping water level of 50 ft below the pump base.

In July 1947, after pumping at a rate of 500 gpm, the drawdown was 203 ft from a nonpumping water level of 70 ft below the pump base.

During the period of March 22-September 19, 1949, the nonpumping water levels ranged from 74 to 63 ft.

This well was logged by Schlumberger on January 26, 1952, and later shot with nitrogelatin at the following depths: 2060, 2000, 1950, 1900, 1850, 1420, 1370, 1320, 1280, 1270, 1220, and 1170 ft. The well was cleaned out to 2100 ft and a new casing installed.

On June 21, 1952, the well reportedly produced 950 gpm with a drawdown of 120 ft from a nonpumping water level of 207 ft below the pump base.

This well was rehabilitated in March 1968 but no report of the work accomplished is available.

A mineral analysis of a sample (Lab. No. 149497) collected April 28, 1959, after pumping at 700 gpm, showed the water to have a hardness of 258 mg/1, total dissolved minerals of 365 mg/1, and an iron content of 0.5 mg/1.

WELL NO. 7 (River St. well), presently open to the Cambrian-Ordovician aquifer, was completed in 1915 to a depth of 2262 ft (cleaned out in 1944 to 2221 ft and plugged in 1950 at 1420 ft) by S. B. Geiger & Co., Chicago. This well was abandoned and sealed in 1968. The well was located on South River St. near Sard Ave., approximately 2650 ft N and 25 30 ft W of the SE corner of Section 28, T38N, R8E. The land surface elevation at the well is approximately 630 ft.

The well was cased with 17-in. pipe from 0.7 ft above the floor of a well pit to a depth of 248 ft. When the well was cleaned in November 1944, a 14-in. casing was installed from 0.7 ft above the pit floor to a depth of 291 ft (cemented in) and two 12-in. liners were placed between the depths of 721 and 1198 ft and between 1395 and 1895 ft.

On October 25, 1924, the nonpumping water level was reported to be 50 ft below the pump base.

In November 1944, bridges at depths of 770 and 1200 ft were removed, and material below 1700 ft was cleaned out to a depth of 2221 ft.

On June 4-5, 1945, after 21.8 hr of pumping at 360 to 400 gpm, the drawdown was 145 ft from a nonpumping water level of 75 ft below the pump base.

In July 1947, the well reportedly produced 500 gpm with a drawdown of 155 ft from a nonpumping water level of 90 ft below the pump base.

During the period of March 22-September 19, 1949, the nonpumping water levels ranged from 114 to 105 ft.

A geologically interpreted summary log of Well No. 7 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES	6	6
SILURIAN SYSTEM		
Niagaran dolomite	84	90
Alexandrian dolomite	30	120
ORDOVICIAN SYSTEM		
Maquoketa Shale Group	119	239
Galena-Platteville Dolomite Groups	336	575
Ancell Group		
Glenwood-St. Peter Sandstone	176	751
No samples	254	1005
CAMBRIAN SYSTEM		
Potosi Dolomite	95	1100
Franconia Formation	108	1208
Ironton-Galesville Sandstone	152	1360
Eau Claire Formation	395	1755
Mt. Simon Sandstone	408	2163

A mineral analysis of a sample (Lab. No. 149492) collected April 28, 1959, after pumping at 390 gpm, showed the water to have a hardness of 393 mg/l, total dissolved minerals of 926 mg/l, and an iron content of 1.6 mg/1. The iron content in previous samples has been as low as 0.1 mg/1.

WELL NO. 8 (Stolps Island well), presently open to the Cambrian-Ordovician aquifer, was completed in 1916 to a depth of 2280 ft by S. B. Geiger & Co., Chicago. This well was plugged at 1500 ft in 1949, sounded at 1440 ft in May 1954, and reported to be 1380 ft deep in 1976. The well is located behind the site of the old city hall between Benton and Fox Sts., approximately 1300 ft N and 1000 ft E of the SW corner of Section 22, T38N, R8E. The land surface elevation at the well is approximately 630 ft.

A sample study log of Well No. 8 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Soil and glacial drift	18	18
SILURIAN SYSTEM		
Niagaran dolomite	142	160
ORDOVICIAN SYSTEM		
Maquoketa Shale Group	170	330
Galena-Platteville Dolomite Groups	280	610
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone	250	860
Conglomerate; shale and chert	50	910
Prairie du Chien Group		
Oneota Dolomite and dolomitic sandstone	100	1010
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	120	1130
Franconia Formation		
Shale and dolomite	100	1230
Ironton-Galesville Sandstone	190	1420
Eau Claire Formation		
Shale, dolomite, some sandstone	350	1770
Mt. Simon Sandstone	470	2240
No samples	40	2280

Originally, the well was cased with 18-in. OD pipe from 1.4 ft above the floor of a 10-ft deep pit to a depth of 400 ft, and the hole was finished 15 in. in diameter from 400 to 2280 ft. In May 1954, the hole was reamed out to 25 in. in diameter to 310 ft and 19 in. in diameter from 310 to 1000 ft. After the well was reamed out, it was recased with 26-in. OD drive pipe from 2.6 ft above the pumphouse basement floor to a depth of 25 ft and 20-in. OD pipe from 2.6 ft above the pumphouse basement floor to a depth of 310 ft (cemented in).

Upon completion, the well reportedly flowed.

On October 25, 1924, the nonpumping water level was reported to be 60 ft below the top of the casing.

Nonpumping water levels below the pump base have been reported as follows: 106 ft from September 1942 to January 1943; 112 ft on October 24, 1944, October 30, 1945, and February 5, 1946.

This well was rehabilitated in November 1949 by the Layne-Western Co., Aurora. The well was cleaned out and then plugged at about 1500 ft because of high chloride content. The well was shot with 50 qt of nitrogen-gel at the following levels: 1410, 1400, 1375, 1350, and 1324 ft. A broken casing and liner were also cleaned out of the well.

On January 19, 1950, after 4.2 hr of pumping at rates of 617 to 844 gpm, the drawdown was 143 ft from a nonpumping water level of 154 ft below land surface.

In March 1954, L. Cliff Neely, Batavia, cleaned out this well and a 20-ft length of 9-in. pipe was fished out. After reaming out the hole and recasing the well, a production test was conducted by L. Cliff Neely on July 19-20, 1954. After 24 hr of pumping at a rate of 810 gpm, the drawdown was 152 ft from a nonpumping water level of 166 ft below land surface.

This well was rebuilt in 1967 because of a fire in 1966. No details on the repair work are available.

In January 1973, the Layne-Western Co., Aurora, reported that the well produced 1176 gpm with a drawdown of 170 ft from a nonpumping water level of 456 ft.

On February 13, 1976, the Layne-Western Co. reported that the well produced 1235 gpm for 3.5 hr with a drawdown of 180 ft from a nonpumping water level of 451 ft.

The pumping equipment presently installed consists of a 350-hp Byron Jackson electric motor, a 12-in., 13-stage Byron Jackson submersible turbine pump set at 790 ft, rated at 1200 gpm at about 900 ft TDH, and has 790 ft of 8-in. column pipe. The well is equipped with 786 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B32393) of a sample collected February 17, 1976, after pumping for 83 hr at 1170 gpm,

showed the water to have a hardness of 263 nig/1, total dissolved minerals of 386 mg/l, and an iron content of 0.3 mg/l.

WELL NO. 9 (Wood St. well), open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in 1923 to a depth of 2285 ft (cleaned and sounded in 1943 at 2220 ft deep) by S. B. Geiger & Co., Chicago. This well was abandoned and sealed in 1967. The well was located at Wood St. and Indian Ave. extended, approximately 500 ft S and 1300 ft E of the NW corner of Section 23, T38N, R8E. The land surface elevation at the well is approximately 695 ft.

A correlated drillers log of Well No. 9 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Gravel and sand	32	32
SILURIAN SYSTEM		
"Limestone", gray	113	145
ORDOVICIAN SYSTEM		
Maquoketa Group		
"Slate", gray	70	215
Galena-Platteville Groups		
"Limestone"	375	590
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, white, fine	210	800
Slate, blue	5	805
Shale, white, cave	15	820
Prairie du Chien Group		
Oneota Dolomite		
"Limestone", blue, white	90	910
Gunter Sandstone		
Sandstone, white	15	925
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
"Limestone", gray	135	1060
Rock, pink, very hard	10	1070
"Limestone", gray	5	1075
Rock, pink, hard	25	1100
Franconia Formation		
Sandstone, dark gray	15	1115
"Slate", blue	45	1160
"Limestone", gray	8	1168
"Slate", blue	22	1190
Ironton-Galesville Sandstone		
Sandstone, white	10	1200
"Limestone", blue	180	1380
Eau Claire Formation		
"Slate", red	100	1480
"Limestone", hard, gray	75	1555
"Limestone", hard, blue	175	1730
"Flint", blue, hard	15	1745
Mt. Simon Sandstone		
Sandstone, red tinted	425	2170
Sandstone, white	90	2260

An 18-in. diameter hole was drilled to a depth of 325 ft, reduced to 17 in. between 325 and 861 ft, reduced to 16 in. between 861 and 1200 ft, and finished 14 in. in diameter from 1200 to 2285 ft. The well was cased with 18-in. OD pipe from above the pumphouse floor to a depth of 325 ft and a 16-in. OD liner from 795 ft to a depth of 865 ft. After cleaning in 1943, a 16-in. steel pipe was placed from above the pumphouse floor to a depth of 350.3 ft (cemented in to a depth of 150 ft) and a 10-in. ID steel liner was placed to a depth of 1755 ft and suspended by a connection with the 16-in pipe. Various portions of the liner were slotted to provide inlets from the water-bearing formations of potential importance.

In 1923, after 8 hr of pumping at 1400 gpm, the pumping water level was 167 ft below land surface.

On October 25, 1924, the nonpumping water level was reported to be 50 ft below land surface.

From December 28, 1942 to May 19, 1943, this well was rehabilitated by the Layne-Western Co., Aurora. The well was shot by the American Glycerine Co., Robinson, with 30 qt of nitroglycerin per shot at each of the following depths: 2185, 2135, 2085, 2035, 1984, 1935, 1885, and 1833 ft. The well was cleaned out and the bottom sounded at a depth of 2220 ft.

A production test was conducted on May 24-26, 1943, by representatives of the city, the Layne-Western Co., and the State Water Survey. After 26.7 hr of pumping at rates of 900 to 840 gpm, the drawdown was 81.0 ft from a nonpumping water level of 145.0 ft below the top of the casing. Pumping was continued for 4.8 hr at rates of 1305 to 1280 gpm with a drawdown of 122.0 ft. After an additional 12.4 hr of pumping at rates of 1370 to 1435 gpm, the drawdown was 143.5 ft. Pumping was continued for 4.1 hr at decreased rates of 1000 to 1015 gpm with a final drawdown of 101.0 ft. After pumping was stopped for 5.2 hr, the water level had recovered to 130.8 ft and after 15.8 hr, the water level was 124.5 ft (20.5 ft above the beginning nonpumping water level).

A water level recorder was installed by the State Water Survey from July 20, 1943 to November 23, 1943. Water levels below the top of the casing were: 116.5 ft on July 20, 119 ft on August 14 and September 3, and 118 ft on October 30.

On December 20, 1943, the well reportedly produced 1120 gpm for 30 min with a drawdown of 115 ft from a nonpumping water level of 118 ft below land surface. On the following day after 3.5 hr of pumping at 1120 gpm, the drawdown was 111 ft from a nonpumping water level of 122 ft below land surface.

During the period of March 29-September 21, 1949, the nonpumping water levels ranged from 165 to 178 ft.

A mineral analysis of a sample (Lab. No. 96231) collected May 26, 1943, after pumping for 24 hr at 1015 gpm, showed the water to have a hardness of 402 mg/1, total dissolved minerals of 924 mg/1, and an iron content of 1.8 mg/1. The iron content in previous samples has been as low as 0.4 mg/1.

WELL NO. 10, open to the Cambrian-Ordovician and the E Elmhurst-Mt. Simon aquifers, was completed in 1924 to a depth of 2299 ft by S. B. Geiger & Co., Chicago. This well has not been used since 1964 and has been disconnected from the system. The well is located on Russell and West Park Aves., approximately 650 ft S and 3200 ft W of the NE corner of Section 21, T38N, R8E. The land surface elevation at the well is approximately 680 ft.

A correlated drillers log of Well No. 10 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE AND RECENT SERIES		
Clay, yellow, and stone	25	25
SILURIAN SYSTEM		
"Limestone", gray	80	105
"Limestone", red	15	120
"Limestone", gray	50	170
ORDOVICIAN SYSTEM		
Maquoketa Shale Group		
Slate	165	335
Galena-Platteville Groups		
"Limestone", gray	280	615
Sand, white	10	625
"Limestone", very hard, brown	35	660
Ancell Group		
Glenwood-St. Peter Sandstone		
Sand, white	185	845
Cave	0.2	845.2
Shale, white	4.8	850
Prairie du Chien Group		
Oneota Dolomite		
"Limestone", gray; cave at 870 ft	35	885
Gunter Sandstone		
Sand, white	50	935
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
"Limestone", gray	25	960
"Limestone", gray, very hard	72	1032
Franconia Formation		
Mixed clay and "limestone"	8	1040
"Limestone", gray	160	1200
Sand, white	6	1206
"Limestone", blue, and sandstone	21	1227
Ironton-Galesville Sandstone		
Sandstone, mixed with "limestone"	38	1265
Sand, white	115	1380
Eau Claire Formation		
"Limestone"	25	1405
Shale	245	1650
"Limestone", hard	130	1780
Mt. Simon Sandstone		
Sand, white	70	1850
Slate	4	1854
Red tinted sand	266	2120
Sand, light brown	10	2130
Red tinted sand	80	2210
Sand, white	3	2213
Red rock, very hard	43	2256
Sand, white	43	2299

An 18-in. diameter hole was drilled to a depth of 400 ft, reduced to 17 in. between 400 and 935 ft, and finished 16 in. in diameter from 935 to 2299 ft. The well is cased with 18-in. OD pipe from above the floor of a 7-ft deep pit to a depth of 400 ft and 16-in. liner from 829 ft to a depth of 935 ft.

Nonpumping water levels below the pump base were reported as follows: 137 to 141 ft in August and September 1942; 131 to 133 ft in December 1942, January 1943, and February 1943; 142 to 146 ft between August and November 1943; 138 to 143 ft between December 1943 and May 1944; 153 to 160 ft between June and November 1944; 143 to 159 ft between December 1944 and March 1945; 161 ft in June, July, and November 1945; and 159 ft in December 1945 and February 1946.

During the period of March 27-August 29, 1949, the nonpumping water levels ranged from 169 to 180 ft.

The pumping equipment presently installed is a Byron Jackson turbine pump.

A mineral analysis of a sample (Lab. No. 95185) collected February 1, 1943, after pumping for 9 hr at 1050 gpm, showed the water to have a hardness of 388 mg/l, total dissolved minerals of 917 mg/l, and a trace of iron.

WELL NO. 11, presently open to the Cambrian-Ordovician aquifer, was completed in 1928 to a depth of 2250 ft (cleaned in 1941 to 2253 ft and filled to 1434 ft in 1971) by S. B. Geiger & Co., Chicago. This well could be used in case of an extreme emergency. The well is located at the Aurora Ave. pumping station about 325 ft southwest of Aurora Ave. and about 155 ft northwest of Well No. 1, approximately 665 ft S and 2595 ft W of the NE corner of Section 15, T38N, R8E. The land surface elevation at the well is approximately 635 ft.

A sample study log of Well No. 11 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Sandy silt	15	15
SILURIAN SYSTEM		
Alexandrian Series		
Kankakee Dolomite	40	55
Elwood Dolomite	20	75
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite	45	120
Shale	110	230
Galena-Platteville Dolomite Groups	335	565
Ancell Group		
Glenwood Dolomitic Sandstone	30	595
St. Peter Sandstone		
Sandstone, water bearing	145	740
Shale, chert, and sandstone	15	755
Prairie du Chien Group		
Oneota Dolomite	150	905
Gunter Sandstone, dolomitic	55	960
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	135	1095
Franconia Formation		
Shale and sandstone	65	1160
Dolomitic sandstone	35	1195
Ironton-Galesville Sandstone, water bearing	145	1340
Eau Claire Formation		
Shale and sandstone	170	1510
Dolomite	130	1640
Shale and dolomite	75	1715
Mt. Simon Sandstone, water bearing	535	2250

The well is cased with 18-in. OD pipe from 1 ft above the floor of a 6-ft deep pit to a depth of 405 ft, and the hole was finished 17 in. in diameter to a depth of 2250 ft. After cleaning the well in 1941, a 12-in. ID slotted liner was placed from 1370 ft to a depth of 1770 ft.

Nonpumping water levels below the pump base were reported to be 80 ft in 1929 and 130 ft in 1938.

After a decrease in production in 1941, this well was rehabilitated by the Layne-Western Co., Aurora. Caving conditions and bridging were found from 1350 to 1687 ft. The well was shot by the American Glycerine Co., Robinson,

with 250 qt of nitroglycerin at depths of 2159, 2077, 2030, 1950, 1894, 1848, and 1800 ft, and the well was cleaned out to a depth of 225 3 ft.

A production test was conducted by the State Water Survey on February 28-March 2, 1942. After 22 hr of pumping at rates decreasing from 1008 to 945 gpm, the drawdown was 99.0 ft from a nonpumping water level of 132.5 ft below the pump base. Pumping was continued for 24.2 hr at rates ranging from 1313 to 1263 gpm with a drawdown of 132.0 ft. After an additional 7 hr of pumping at rates ranging from 1398 to 1476 gpm, the final drawdown was 139.0 ft. Ten min after pumping was stopped, the water level had recovered to 156.5 ft. Well Nos. 5, 12, and 12A were operated alternately during portions of this test.

Nonpumping water levels below the pump base were reported as follows: 125 to 136 ft in December 1942; 125 to 148 ft in 1943; 133 ft on February 7, 1944; and 155 ft on August 27, 1944.

Nonpumping water levels were reported to be 166 ft on August 31, 1949, and 175 ft on September 23, 1949.

In May-July 1971, this well was backfilled with pea gravel from 1434 ft to a depth of 1610 ft. A cement plug was placed from 1610 to 1620 ft, and the remainder of the hole was filled with pea gravel. After filling and plugging, this well was shot with Bird well shots (2 per ft) between the depths of 1190 and 1340 ft.

On March 1, 1972, the Layne-Western Co. reported that the well produced 735 gpm for 2 hr with a drawdown of 83 ft from a nonpumping water level of 435 ft.

The pumping equipment presently installed is a Byron Jackson turbine pump set at 795 ft, and powered by a 200-hp Byron Jackson electric motor.

The following mineral analysis (Lab. No. 187923) is for a water sample from the well collected March 1, 1972, after 2 hr of pumping. The iron content in previous samples has been as low as 0.2 mg/l.

WELL NO. 11, LABORATORY NO. 187923

		mg/l	me/l			mg/l	me/l
Iron	Fe	2.1		Silica	SiO_2	8.3	
Manganese	Mn	0.07		Fluoride	F	1.4	0.07
Ammonium	NH_4	0.6	0.03	Boron	B	0.6	
Sodium	Na	379	16.49	Nitrate	NO_3	0.9	0.01
Potassium	K	20.2	0.52	Chloride	Cl	850	23.97
Calcium	Ca	186	9.28	Sulfate	SO_4	76.7	1.60
Magnesium	Mg	50.1	4.12	Alkalinity(as $CaCO_3$)		232	4.64
Strontium	Sr	4.24		Hardness (as $CaCO_3$)		670	13.40
Barium	Ba	<0.1		Total dissolved minerals		1734	
Copper	Cu	0.06					
Cadmium	Cd	0.00		Turbidity		16	
Chromium	Cr	0.00		Color		0	
Lead	Pb	<0.05		Odor		0	
Lithium	Li	0.14		pH(as rec'd)		7.3	
Nickel	Ni	<0.05		Temp. (reported)		61.0F	
Zinc	Zn	0.08					

WELL NO. 12, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in 1929 to a depth of 225 3 ft (cleaned to 2190 ft in November 1947) by William H. Cater, Chicago. This well could be used in case of an extreme emergency. The well is located east of the Aurora Ave. pumping station about 110 ft southeast of Well No. 1 and 25 ft northwest of Well No. 5, approximately 825 ft S and 2400 ft W of the NE corner of Section 15, T38N, R8E. The land surface elevation at the well is approximately 650 ft.

A correlated drillers log of Well No. 12 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	3	3
SILURIAN SYSTEM		
Niagaran Series		
"Limestone", white to cream	118	121
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale, gray to green	119	240
Galena-Platteville Groups		
Dolomite, buff to gray to blue	340	580
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, white, medium rounded grains	175	755
Shale, gray to green	35	790
ORDOVICIAN-CAMBRIAN SYSTEMS		
Oneota-Eminence-Potosi Dolomites		
Dolomite, gray to brown	305	1095
CAMBRIAN SYSTEM		
Franconia Formation		
Sandstone, gray to white with green shale	70	1165
Ironton-Galesville Sandstone		
Sandstone, white	180	1345
Eau Claire Formation		
"Limestone", gray	15	1360
Shale, gray	25	1385
Shale, and "limestone", brown	140	1525
Dolomite, brown to blue	105	1630
Dolomite, brown; shale, green	95	1725
Mt. Simon Sandstone		
Sandstone, white to pink	528	2253

A 24-in. diameter hole was drilled to a depth of 12 ft, reduced to 20 in. between 12 and 400 ft, and finished 17 in. in diameter from 400 to 225 3 ft. The well is cased with 22-in. OD pipe to a depth of 12 ft and 18-in. OD pipe from 2.4 ft above the floor of the well pit to a depth of 400 ft. In 1947, 14-in. slotted liners were placed between 761 and 839 ft and between 1300 and 1700 ft.

On March 15, 1930, the well reportedly produced 1307 gpm with a drawdown of 234 ft from a nonpumping water level of 100 ft below the pump base.

In the winter of 1942-43, after pumping at a rate of 1050 gpm, the drawdown was about 212 ft from a nonpumping water level of about 138 ft below the pump base.

In August 1947, when the pump was pulled, a bridge was found at a depth of about 1625 ft and a backfill of 32 ft at the bottom. In November 1947, the Layne-Western Co., Aurora, shot the well with 420 qt of nitroglycerin at the following depths: 2154, 2100, 1854, 1327, 1280, and 1228 ft. The well was then cleaned to a depth of 2190 ft.

A production test was conducted on March 9-10, 1948. After 24.9 hr of pumping at rates of 1175 to 1065 gpm, the

final drawdown was 135 ft from a nonpumping water level of 199 ft. Eleven min after pumping was stopped, the water level had recovered to 212 ft.

During the period of April 1-September 23, 1949, the nonpumping water levels ranged from 145 to 213 ft.

In March 1969, the well reportedly produced 910 gpm with with a drawdown of 90 ft from a nonpumping water level of 445 ft.

The pumping equipment presently installed consists of a 200-hp 1750 rpm Byron Jackson electric motor, a 12-in., 11-stage Byron Jackson submersible pump set at 720 ft, rated at 1000 gpm at about 660 ft head, and has 720 ft of 8-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003865) of a sample collected November 27, 1973, after pumping at 1350 gpm, showed the water to have a hardness of 345 mg/l, total dissolved minerals of 896 mg/l, and an iron content of 0.7 mg/l.

WELL NO. 12A, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in March 1936 to a depth of 2251 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located east of the Aurora Ave. pumping station about 700 ft east of Aurora Ave., approximately 200 ft S and 1800 ft W of the NE corner of Section 15, T38N, R8E. The land surface elevation at the well is approximately 670 ft.

A sample study log of Well No. 12A furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Silt, sand, and pebbles	10	10
Gravel, silty	5	15
SILURIAN SYSTEM		
Niagaran-Alexandrian dolomites	85	100
ORDOVICIAN SYSTEM		
Maquoketa shale, some limestone and dolomite	158	258
Galena-Platteville limestone and dolomite	332	590
Glenwood Sandstone, dolomitic	10	600
St. Peter Sandstone		
Sandstone	185	785
Sandstone, shale and chert	35	820
Oneota Dolomite and Gunter Sandstone	160	980
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	120	1100
Franconia Formation, sandstone and shale	90	1190
Ironton-Galesville Sandstone		
Sandstone, some dolomite	120	1310
Sandstone, incoherent	20	1330
Sandstone, dolomitic	35	1365
Eau Claire Formation, sandstone, siltstone, shale, and dolomite	365	1730
Mt. Simon Sandstone	521	2251

A 22-in. diameter hole was drilled to a depth of 455 ft, reduced to 17 in. between 455 and 1633 ft, and finished 15 in. in diameter from 1633 to 2251 ft. The well is cased with 22-in. pipe from 1.1 ft above the floor of an 8-ft deep pit to a depth of 31.7 ft, 18-in. pipe from 1.1 ft above the floor of an 8-ft deep pit to a depth of 455 ft, and two 16-in. liners were placed between 771 and 838.6 ft and between 1333 and 1633 ft.

A production test was conducted by the State Water Survey on September 24-25, 1936. After 4 hr of pumping at a rate of 1100 gpm, the drawdown was 98.0 ft from a nonpumping water level of 128.7 ft below the top of the casing. Pumping was continued for 21 hr at rates ranging from 1325 to 1300 gpm with a final drawdown of 132.5 ft. Well No. 11, about 920 ft southwest, was pumping for the first 22.7 hr of the test, and Well No. 12, about 250 ft southeast, was pumping for the last 6.8 hr of the test.

Nonpumping water levels during 1943 were reported to be 157 to 178 ft below the pump base. In 1944 they varied from 161 ft on January 18 to 188 ft on September 19. On February 25, 1946, the nonpumping water level was reported to be 166 ft below the pump base. During the period of April 2-September 24, 1949, the nonpumping water levels ranged from 172 to 194 ft.

The pumping equipment presently installed consists of a 250-hp Byron Jackson electric motor, a 12-in., 8-stage Byron Jackson submersible pump set at 675 ft, rated at 1200 gpm at about 640 ft head, and has 675 ft of 10-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 03720) is for a water sample from the well collected January 19, 1972, after 48 hr of pumping at about 450 gpm.

WELL NO. 12A, LABORATORY NO. 03720

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	9	
Manganese	Mn	0.0		Fluoride	F	1.5	0.08
Ammonium	NH_4	0.6	0.03	Boron	B	0.3	
Sodium	Na	145	6.31	Nitrate	NO_3	0.0	
Potassium	K	14	0.36	Chloride	Cl	288	8.12
Calcium	Ca	85	4.24	Sulfate	SO_4	39	0.81
Magnesium	Mg	32.4	2.66	Alkalinity(as $CaCO_3$)		228	4.56
				Hardness (as $CaCO_3$)		340	
Barium	Ba	0.2		Total dissolved minerals		780	
Copper	Cu	0.0					
Cadmium	Cd	0.00					
Chromium	Cr	0.0		pH (as rec'd)		7.5	
Lead	Pb	0.01		Radioactivity			
Mercury	Hg	<0.0005		Alpha pc/l		6	
Nickel	Ni	0.0		± deviation		3	
Silver	Ag	0.0		Beta pc/l		27	
Zinc	Zn	0.0		± deviation		4	

WELL NO. 14 (former Phillips Park well), open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in June 1909 to a depth of 2460 ft. This well was abandoned and sealed in 1970. The well was located in Phillips Park about 0.2 mile in from the Route 30 entrance and about 340 ft east of the south end of Smith Blvd. and 90 ft northeast of the center of North Circle Drive, approximately 200 ft S and 2200 ft E of the NW corner of Section 35, T38N, R8E. The land surface elevation at the

well is approximately 705 ft.

A drillers log of Well No. 14 follows:

Strata	Thickness (ft)	Depth (ft)
Clay, sand, and gravel	131	131
Lime and shale	187	318
Limerock	337	655
Sandrock	295	950
Shale and red muck	15	965
Sandrock	15	980
Lime and shale	35	1015
Sandy lime	45	1060
Limerock	100	1160
Red rock	45	1205
Shale	90	1295
Sandrock	170	1465
Shale	377	1842
Sandrock	618	2460

The well was cased with 10-in. pipe from 2 ft above the floor of the well pit to a depth of 133.7 ft, a 6.2-in. liner from 934 ft to a depth of 1015 ft, and a 5-in. liner from 1715 ft to a depth of 2015 ft, and the hole was finished 5 in. in diameter to a depth of 2460 ft.

A mineral analysis of a sample (Lab. No. 95189) collected February 2, 1943, after pumping for 18 hr at 280 gpm, showed the water to have a hardness of 459 mg/l, total dissolved minerals of 551 mg/l, and an iron content of 0.2 mg/l.

WELL NO. 15, presently open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in March 1951 to a depth of 2150 ft (plugged to 1719 ft in January 1970) by the Layne-Western Co., Aurora. The well is located at Prairie and Hartford Sts., approximately 164 ft S and 700 ft W of the NE corner of Section 29, T38N, R8E. The land surface elevation at the well is approximately 670 ft.

A sample study log of Well No. 15 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Glacial drift	45	45
SILURIAN SYSTEM		
Niagaran and Alexandrian Dolomite Series	95	140
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale and dolomite	152	292
Galena Group		
Dolomite, yellowish brown to light gray, medium crystalline	243	535
Platteville Group		
Dolomite, yellowish gray to gray, fine crystalline	91	626
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, light gray, incoherent	266	892
Prairie du Chien Group		
Oneota Dolomite		
Dolomite, very light pinkish gray, medium crystalline	93	985
Gunter Sandstone		
Sandstone, dolomitic	25	1010
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, gray, glauconitic	148	1158
Franconia Formation		
Sandstone, shaly, greenish gray, glauconitic	92	1250
Ironton-Galesville Sandstone		
Sandstone, light gray, incoherent	180	1430
Eau Claire Formation		
Sandstone, shale, dolomite, interbedded	400	1830
Mt. Simon Sandstone	320	2150

A 30-in. diameter hole was drilled to a depth of 14 ft, reduced to 25 in. between 14 and 632 ft, reduced to 19 in. between 632 and 898 ft, reduced to 15 in. between 898 and 1420 ft, and finished 12 in. in diameter from 1420 to 2150 ft. The well is cased with 30-in. OD pipe from land surface to a depth of 14 ft, 26-in. OD drive pipe from 2 ft above the pumphouse floor to a depth of 49 ft, 20-in. OD pipe from 2 ft above the pumphouse floor to a depth of 632 ft (cemented in), 16-in. OD perforated liner from 818 ft to a depth of 898 ft, and 12-in. ID liner from 1420 ft to a depth of 1790 ft.

The well was shot with 750 qt of nitro at the following depths: 2160, 2085, 2035, 1985, 1930, 1880, 1850, 1400, 1375, 1350, 1325, 1300, and 1275 ft. After shooting, a production test was conducted on March 14-15, 1951, by representatives of the driller and the city. After 21.5 hr of pumping at a rate of 1115 gpm, the drawdown was 181 ft from a nonpumping water level of 155 ft below land surface.

In January 1970, this well was plugged at a depth of 1719 ft. No details of this work are available.

The pumping equipment presently installed consists of a 350-hp 1800 rpm Byron Jackson electric motor, a 12-in., 17-stage Byron Jackson submersible pump set at 783 ft, rated at 1000 gpm at about 990 ft head, and has 783 ft of 8-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003867) of a sample collected November 27, 1973, after pumping for 24 hr at 1100 gpm, showed the water to have a hardness of 247 mg/l, total dissolved minerals of 394 mg/l, and an iron content of 0.1 mg/l.

WELL NO. 16, open to the Cambrian-Ordovician (except for the Galena-Platteville dolomite) and the Elmhurst-Mt. Simon aquifers, was completed in 1952 to a depth of 2139 ft by the Layne-Western Co., Aurora. The well is located at Lafayette and Parker Aves. about 2 miles southeast of Well No. 15, approximately 1100 ft S and 600 ft E of the NW corner of Section 34, T38N, R8E. The land surface elevation at the well is approximately 650 ft.

A 26-in. diameter hole was drilled to a depth of 79 ft, reduced to 24 in. between 79 and 586 ft, reduced to 19 in. between 586 and 1734 ft, and finished 15 in. in diameter from 1734 to 2139 ft. The well is cased with 26-in. OD drive pipe from 2 ft above the pumphouse floor to a depth of 79 ft, 20-in. OD pipe from 2 ft above the pumphouse

floor to a depth of 586 ft (cemented in), and 16-in. OD perforated liner pipe from 1357 ft to a depth of 1734 ft.

The well was shot with blasting gel at the following depths: 1260, 1300, 1340, 1775, 1850, 1900, 1950, 2025, 2075, and 2125 ft. Before shooting the nonpumping water level was reported to be 187 ft below land surface and after shooting it was 210 ft.

On July 9-11, 1952, the well reportedly produced from 784 to 1078 gpm with a final drawdown of 145 ft from a nonpumping water level of 189 ft. Sand was then cleaned out of the well and on August 15-26, 1952, the well reportedly produced 1120 gpm with a drawdown of 170 ft from a nonpumping water level of 160 ft.

The pumping equipment presently installed consists of a 350-hp Byron Jackson electric motor, a 12-in., 15-stage Byron Jackson submersible pump set at 800 ft, rated at 1000 gpm at about 900 ft head, and has 800 ft of 8-in. column pipe.

A sample study log of **Well** No. 16 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Glacial drift		
Till, yellowish brown	20	20
Gravel, sandy, yellowish gray	60	80
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, light gray	25	105
Dolomite, cherty, yellowish gray; shale	95	200
Shale, dark yellowish gray	50	250
Galena Group		
Dolomite, pale yellowish gray	220	470
Platteville Group		
Dolomite, light gray to yellowish brown	108	578
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, silty, light gray	142	720
Shale, sandy, green	5	725
Prairie du Chien Group		
Shakopee Dolomite		
Dolomite, cherty, pale yellowish brown	10	735
New Richmond Sandstone		
Sandstone, silty, yellowish gray	35	770
Oneota Dolomite		
Dolomite, cherty, light yellowish gray	85	855
Dolomite, cherty, white; shale	35	890
Dolomite, cherty, sandy, yellowish gray	85	975
Gunter Sandstone		
Sandstone, light gray	7	982
CAMBRIAN SYSTEM		
Eminence Dolomite		
Dolomite, sandy, cherty, yellowish gray	58	1040
Potosi Dolomite		
Dolomite, pale grayish brown	75	1115
Franconia Formation		
Sandstone, light greenish gray	20	1135
Shale, sandy, greenish gray; sandstone	30	1165
Sandstone, grayish green; shale	35	1200
Ironton Sandstone		
Sandstone, yellowish gray	15	1215
Dolomite, sandy, pinkish gray	10	1225
Sandstone, yellowish gray	85	1310
Galesville Sandstone		
Sandstone, yellowish gray	35	1345
Eau Claire Formation		
Dolomite, sandy, brown; sandstone, gray	35	1380
Shale, sandy, green; sandstone, yellow	35	1415
Sandstone, yellow; siltstone; shale	180	1595
Strata (continued)	*Thickness (ft)*	*Depth (ft)*
Dolomite, sandy, yellowish gray; shale	150	1745
Mt. Simon Sandstone		
Sandstone, gray	10	1755
Sandstone, pink, incoherent	245	2000
No samples	139	2139

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C005198) is for a water sample from the well collected January 22, 1974, after 24 hr of pumping at 1100 gpm.

WELL NO. 16, LABORATORY NO. C005198

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.3		Silica	SiO_2	10	
Manganese	Mn	0.00		Fluoride	F	1.3	0.07
Ammonium	NH_4	1.2	0.07	Boron	B	0.5	
Sodium	Na	53	2.31	Nitrate	NO_3	0.2	0.00
Potassium	K	15	0.38	Chloride	Cl	51	1.44
Calcium	Ca	54	2.70	Sulfate	SO_4	25	0.52
Magnesium	Mg	18	1.48	Alkalinity(as $CaCO_3$)		260	5.20
Arsenic	As	0.00		Hardness (as $CaCO_3$)		209	4.18
Barium	Ba	0.0					
Copper	Cu	0.00		Total dissolved			
Cadmium	Cd	0.00		minerals		406	
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		8.0	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		7.7	
Silver	Ag	0.00		± deviation		2.8	
Cyanide	CN	0.00		Beta *pc/l*		26.8	
Zinc	Zn	0.03		± deviation		3.2	

WELL NO. 17, open to the Cambrian-Ordovician (except for the Galena-Platteville dolomite) and the Elmhurst-Mt. Simon aquifers, was completed in November 1958 to a depth of 2152 ft by the Layne-Western Co., Aurora. The well is located just north of the intersection of Highland and New Haven Aves., about 1.2 miles southwest of Well No. 5 and 1.2 miles northwest of Well No. 8, approximately 2100 ft N and 2350 ft W of the SE corner of Section 16, T38N, R8E. The land surface elevation at the well is approximately 695 ft.

A sample study log of Well No. 17 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Soil and glacial drift	38	38
SILURIAN SYSTEM		
Niagaran Series		
Dolomite, white	62	100
Alexandrian Series		
Dolomite, partly cherty, buff	80	180
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, very argillaceous, green, gray, fine, granular; and shale, sandy, dolomitic, becoming calcareous at base	135	315
Galena Group		
Dolomite, buff, fine to medium crystalline; cherty dolomite (540-660 ft)	245	560
Platteville Group		
Dolomite, buff, gray, fine to very fine	93	653
Ancell Group		

Strata (continued)	Thickness (ft)	Depth (ft)
Glenwood-St. Peter Sandstone		
Sandstone, white, medium, fine, incoherent	262	915
Prairie du Chien Group		
Oneota Dolomite		
Dolomite, cherty, pink, medium	85	1000
Gunter Sandstone		
Sandstone, slightly dolomitic, white, medium, fine, incoherent, little friable, dolomite, very sandy, white, fine to very fine, crystalline	35	1035
CAMBRIAN SYSTEM		
Eminence Dolomite		
Dolomite, sandy, glauconitic	65	1100
Potosi Dolomite		
Dolomite, clayey, reddish-buff	75	1175
Franconia Formation		
Sandstone, very glauconitic, dolomitic, greenish-gray, fine	75	1250
Ironton-Galesville Sandstone		
Sandstone, buff, medium to coarse, incoherent	178	1428
Eau Claire Formation		
Sandstone, dolomite, shale, interbedded	374	1802
Elmhurst Member		
Sandstone, gray, medium to very coarse, sooty	23	1825
Mt. Simon Sandstone		
Sandstone, gray, buff, medium to fine, some very coarse	327	2152

A 25-in. diameter hole was drilled to a depth of 660 ft, reduced to 19 in. between 660 and 962 ft, reduced to 15 in. between 962 and 1233 ft, reduced to 12 in. between 1233 and 1538 ft, reduced to 10 in. between 1538 and 1758 ft, and finished 8 in. in diameter from 1758 to 2152 ft. The well is cased with 26-in. steel drive pipe from land surface to a depth of 56.8 ft, 20-in. steel pipe from land surface to a depth of 660 ft (cemented in), 16-in. steel liner from 887 ft to a depth of 962 ft, 12-in. steel perforated liner from 1164.5 ft to a depth of 1233 ft, 10-in. steel liner from 1428 ft to a depth of 15 38 ft, and 8-in. steel liner from 1677 ft to a depth of 1758 ft.

After drilling, shots were placed as follows: 6 shots (150 lb each) between 2140 and 1880 ft, and 4 shots (150, 200, 250, and 200 lb) between 1350 and 1300 ft. After the well was shot and cleaned out, a production test was conducted by the driller on November 13-14, 1958. After 21 hr of pumping at rates of 662 to 1016 gpm, the final drawdown was 155 ft from a nonpumping water level of 274 ft below the top of the casing.

The pumping equipment presently installed consists of a 250-hp Byron Jackson electric motor, a 12-in., 14-stage Byron Jackson submersible turbine pump set at 840 ft, rated at 1000 gpm at about 750 ft head, and has 840 ft of 8-in. column pipe.

A mineral analysis of a sample (Lab. No. 173480) collected November 15, 1967, after pumping for 12 hr at 1000 gpm, showed the water to have a hardness of 230 mg/l, total dissolved minerals of 323 mg/l, and an iron content of 0.3 mg/l.

WELL NO. 18, presently open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in September 1961 to a depth of 2150 ft (plugged to 1486 ft in August 1974) by the Layne-Western Co., Aurora. The well is located southeast of Hillside and Collidge Aves., approximately 1850 ft N and 900 ft E of the SW corner of Section 24, T38N, R8E. The land surface elevation at the well is approximately 715 ft.

A sample study log of Well No. 18 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Glacial drift	119	119
SILURIAN SYSTEM		
Dolomite, cherty, silty, light gray	86	205
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale, gray	32	237
Dolomite, white, fine to medium	18	255
Shale, brownish-gray	65	320
Galena Group		
Dolomite, light buff, buff, medium	253	573
Platteville Group		
Dolomite, buffish-gray, finely crystalline	77	650
Ancell Group		
Glenwood-St. Peter Sandstone		
Sandstone, white, fine medium, incoherent	207	857
Prairie du Chien Group		
Oneota Dolomite		
Dolomite, pinkish-buff, medium crystalline	134	991
Gunter Sandstone		
Sandstone, white, fine to coarse grained	13	1004
CAMBRIAN SYSTEM		
Eminence Dolomite		
Dolomite, slightly sandy, buff	81	1085
Potosi Dolomite		
Dolomite, pinkish buff, finely crystalline	85	1170
Franconia Formation		
Sandstone, glauconitic, very fine to fine; little dolomite and shale	100	1270
Ironton-Galesville Sandstone		
Sandstone, white, medium to coarse	190	1460
Eau Claire Formation		
Sandstone, shale, and dolomite, interbedded	350	1810
Elmhurst Member		
Sandstone, white, medium to coarse, little fine, "sooty"; little dolomite	50	1860
Mt. Simon Sandstone		
Sandstone, pink, fine to very coarse, few granules, incoherent	290	2150

A 25-in. diameter hole was drilled to a depth of 656 ft, reduced to 19 in. between 656 and 943 ft, reduced to 16 in. between 943 and 1755 ft, and finished 12 in. in diameter from 1755 to 2150 ft. The well is cased with 26-in. drive pipe from 1.5 ft above the pump station floor to a depth of 123 ft, 20-in. pipe from 1.5 ft above the pump station floor to a depth of 656 ft (cemented in), 16-in. perforated liner from 856 ft to a depth of 943 ft (removed in 1977), and 12-in. perforated liner from 1439 ft to a depth of 1755 ft. In 1977, the well was reamed to 17 in. in diameter from 943 to 1439 ft. The 16-in. perforated liner was removed and an 18-in. solid liner was then placed from 650 ft to a depth of 943 ft.

After shooting with 575 qt of nitroglycerin, a production test was conducted by the driller on September 7-8, 1961. After 24.5 hr of pumping at rates of 931 to 1035 gpm, the final drawdown was 179 ft from a nonpumping water level of 324 ft below land surface.

In August 1974, the Layne-Western Co. filled the lower portion of this well with gravel and placed a cement plug at a depth of 1486 ft.

In 1977, this well was rehabilitated by the Layne-Western Co. The 16-in. perforated liner was removed, the well was reamed and cleaned out, and a new 18-in. solid liner was installed to case out the St. Peter Sandstone. The pump was then reinstalled at a lower setting. On August 31, 1977, the well reportedly produced 1150 gpm with a drawdown of 168 ft from a nonpumping water level of 578 ft below the top of the casing.

The pumping equipment presently installed consists of a 350-hp Byron Jackson electric motor, a 12-in., 12-stage Byron Jackson submersible turbine pump set at 904 ft, rated at 1200 gpm at about 800 ft head, and has 904 ft of 8-in. column pipe.

WELL NO. 19, presently open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in April 1962 to a depth of 2150 ft (plugged to 1424 ft in 1969) by the Layne-Western Co., Aurora. The well is located on Prairie St. at Palmer Ave., approximately 123 ft N and 2725 ft W of the SE corner of Section 19, T38N, R8E. The land surface elevation at the well is approximately 685 ft.

A drillers log of Well No. 19 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Yellow clay	7	7
Gravel and clay	11	18
Blue clay	12	30
Gravel and clay	10	40
Gravel	5	45
Gray lime	103	148
Red rock and shale	2	150
Gray lime	9	159
Lime and shale	66	225
Gray lime	10	235
Shale	60	295
Gray lime	31	326
Brown lime	13	339
Gray lime	52	391
Brown lime, hard	91	482
Gray lime, hard	80	562
Brown lime	58	620
Sandy lime	17	637
Sandstone	203	840
Red rock lime and shale	12	852
Sandy lime	18	870
Sandstone	15	885
Green shale	5	890
Lime	19	909
Red shale	1	910
Lime	9	919
Shale	1	920
Lime	10	930
Shale	3	933
Lime	262	1195
Green shale	5	1200
Sandy lime and shale	14	1214
Lime and green shale	27	1241
Sandy lime	24	1265
Sandstone	163	1428
Sandy lime	22	1450
Green shale	2	1452
Lime	6	1458
Shale	14	1472
Shale mixed with lime	348	1820
Sand, white	40	1860
Sand, pink	219	2079
Sand, pink with shale breaks	71	2150

A 25-in. diameter hole was drilled to a depth of 640 ft, reduced to 19.2 in. between 640 and 946 ft, reduced to 15.2 in. between 946 and 1759 ft, and finished 12 in. in diameter from 1759 to 2150 ft. The well is cased with 26-in. drive pipe from 0.8 ft above land surface to a depth of 55.5 ft, 20-in. pipe from 0.8 ft above land surface to a depth of 640 ft (cemented in), 16-in. liner from 840 ft to a depth of 946 ft, and 12-in. liner from 1427 ft to a depth of 1759 ft. The top of the casing is equipped with a pitless adapter.

After shooting with 1450 lb of solidified gelatin between 1290 and 1385 ft and 1860 and 2100 ft, a production test was conducted by the driller on April 30-May 1, 1962. After 22 hr of pumping at rates ranging from 857 to 979 gpm, the final drawdown was 179 ft from a nonpumping water level of 278 ft below land surface.

In May 1969, this well was rehabilitated by the Layne-Western Co., and was bridged to 1765 ft, backfilled with pea gravel to 1455 ft, and plugged with cement to 1424 ft. Before plugging the nonpumping water level was reported to be 279 ft and after plugging, the water level was reported to be 307 ft on May 27, 1969.

On July 21, 1969, the well reportedly produced 400 gpm with a drawdown of 270 ft from a nonpumping water level of 330 ft.

The pumping equipment presently installed consists of a 300-hp Byron Jackson electric motor, an 11-in., 17-stage Byron Jackson submersible turbine pump set at 800 ft, rated at 750 gpm at about 865 ft head, and has 800 ft of 8-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006206) of a sample collected June 14, 1977, after pumping for 30 hr at 694 gpm, showed the water to have a hardness of 261 mg/l, total dissolved minerals of 330 mg/l, and an iron content of 0.1 mg/l.

WELL NO. 20, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in March 1967 to a depth of 1400 ft by the Layne-Western Co., Aurora. The well is located northeast of Stephens-Adamson Manufacturing Co. on North Farnsworth Ave., approximately 1350 ft N and 1250 ft W of the SE corner of Section 1, T38N, R8E. The land surface elevation at the well is approximately 715 ft.

A drillers log of Well No. 20 follows:

Strata	Thickness (ft)	Depth (ft)
Yellow clay	5	5
Clay and gravel	15	20
Blue clay and gravel (boulders at 20-25 ft)	45	65
Gray lime, medium hard	10	75
Buff lime, medium hard	10	85
Gray lime, medium hard	95	180
Lime, second shale, gray, medium hard	80	260
Gray shale, medium hard	50	310
Hard gray lime	140	450
Hard brown lime	75	525
Hard gray lime	45	570
Hard brown lime	10	580
Hard gray lime	55	635
Hard white sandy lime	5	640
Hard white sandstone	20	660
Medium hard white sandstone	190	850
Hard white sandy lime	25	875
Hard white sandstone	18	893
Medium hard gray shale	2	895
Medium hard gray shaley lime	15	910
Hard gray limestone	15	925
Lime mixed with shale	5	930
Gray lime	15	945
Lime with shale streaks	10	955
Sandy lime	20	975
Hard gray lime	70	1045
Lime with red shale	10	1055
Hard gray lime	70	1125
Lime with shale streaks	20	1145
Sandy lime with shale streaks	45	1190
Hard gray lime	20	1210
Sandy lime	25	1235
Sandstone	145	1380
Hard lime	20	1400

A 26-in. diameter hole was drilled to a depth of 67 ft, reduced to 25 in. between 67 and 675 ft, reduced to 21 in. between 675 and 977 ft, and finished 17.2 in. in diameter from 977 to 1400 ft. The well is cased with 26-in. pipe from land surface to a depth of 67 ft, 22-in. pipe from land surface to a depth of 641 ft (cemented in), and 18-in. slotted liner from 877.5 ft to a depth of 977 ft. The top of the casing is equipped with a pitless adapter.

This well was shot with 100 percent nitro-gel as follows: 50 lb at 1355 ft, 50 lb at 1325 ft, 100 lb at 1300 ft, 100 lb at 1275 ft, and 100 lb at 1250 ft. After shooting, a production test was conducted by the driller on March 31-April 1, 1967. After 24 hr of pumping at rates ranging from 713 to 1059 gpm, the final drawdown was 79 ft from a nonpumping water level of 430 ft below the top of the casing. Twenty min after pumping was stopped, the water level had recovered to 451 ft.

The pumping equipment presently installed consists of a 350-hp Byron Jackson electric motor, a 12-in., 11-stage Byron Jackson submersible pump set at 750 ft, rated at 1200 gpm at about 750 ft head, and has 750 ft of 8-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006207) of a sample collected June 14, 1977, after pumping continuously at 885 gpm, showed the water to have a hardness of 260 mg/l, total dissolved minerals of 348 mg/l, and an iron content of 0.3 mg/l.

PIONEER PARK WELL NO. 101, finished in sand and gravel, was completed in December 1970 to a depth of 116 ft by the Layne-Western Co., Aurora. This well has not been in use since it was completed. The well is located in Pioneer Park west of the city about 150 ft south of West Galena Blvd., appproximately 150 ft S and 1850 ft E of the NW corner of Section 24, T38N, R7E. The land surface elevation at the well is approximately 672 ft.

A drillers log of Pioneer Park Well No. 101 follows:

Strata	Thickness (ft)	Depth (ft)
Black sandy clay and medium to large gravel	4	4
Brown silty clay	3	7
Fine to medium sand and gravel	24	31
Fine sand	3	34
Hard gray silty sandy clay, gravel embedded boulders	40.5	74.5
Fine to medium sand and gravel	9	83.5
Fine to medium sand, some gravel	29.5	113
Medium to coarse gravel	4.5	117.5
Broken lime		

A 42-in. diameter hole was drilled to a depth of 116 ft. The well is cased with 12-in. pipe from 2.8 ft above land surface to a depth of 86 ft followed by 30 ft of 12-in. No. 6 (0.080 in.) Layne stainless steel shutter screen. The annulus between the bore hole and casing-screen assembly is filled with ready mix cement from 0 to 20 ft, with pit run gravel from 20 to 35 ft, with pit run gravel and bentonite from 35 to 45 ft, with pit run gravel from 45 to 50 ft, and with No. 3 Muscatine sand from 50 to 116 ft.

A production test using three observation wells was conducted by the driller on December 28-29, 1970. After 24 hr of pumping at rates ranging from 798 to 818 gpm, the final drawdown was 62.3 ft from a nonpumping water level of 2.0 ft below land surface. One hr after pumping was stopped, the water level had recovered to 13.3 ft. On the basis of the production test data, the State Water Survey estimated that this well would yield 700 gpm (1,008,000 gpd) on a long-term basis.

On February 10, 1972, the well reportedly produced 810 gpm for 48 hr with a drawdown of 67 ft from a nonpumping water level of 5 ft below land surface.

The pumping equipment presently installed consists of a 60-hp General Electric Holloshaft motor, a 10-in., 7-stage Byron Jackson turbine pump set at 78 ft, rated at 700 gpm at about 283 ft TDH, and has 78 ft of 8-in. column pipe.

A partial analysis of a sample (Lab. No. 187889) collected February 12, 1972, after pumping for 48 hr at 810 gpm, showed the water to have a hardness of 338 mg/l, total dissolved minerals of 365 mg/l, and an iron content of 1.0 mg/l. Hydrogen sulfide was apparent when a previous sample was collected.

Five test holes were constructed in January and February 1971 by the Layne-Western Co., Aurora, to depths ranging from 60 to 132 ft. The holes were located in Sections 2 and 31, T38N, R7E, Kane County, and in Sections 1 and 11, T37N, R6E, and Section 6, T37N, R7E, Kendall County.

WELL NO. 21, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in June 1972 to a depth of 1447 ft by the Henry Boysen Co., Libertyville. The well is located adjacent to Pioneer Park Well No. 101, approximately 135 ft S and 1823 ft E of the NW corner of Section 24, T38N, R7E. The land surface elevation at the well is approximately 670 ft.

A drillers log of Well No. 21 follows:

Strata	Thickness (ft)	Depth (ft)
Sand, gravel	34	34
Clay, boulders	38	72
Gravel, sandy	21	93
Heaving sand	14	107
Sand, gravel	10	117
Limestone	42	159
Limestone, shale	92	251
Brown and gray shale	54	305
Brown lime - chert	242	547
Galena-Platteville lime	97	644
Sand	16	660
Sand, white	159	819
Sand, pink to white	28	847
Conglomerate, red shale	47	894
Sand, mucky	18	912
Red shale, dolomite (caving)	12	924
Limestone	83	1007
Sand	10	1017
Limestone, little shale	153	1170
Sandy shale and lime shells	92	1262
Sand, squeeze rock, dirty	104	1366
Sand	20	1386
Green shale	1	1387
Sand, white, fine	40	1427
Shale and limestone	20	1447

A 25-in. diameter hole was drilled to a depth of 660 ft, reduced to 21 in. between 660 and 947 ft, and finished 17 in. in diameter from 947 to 1447 ft. The well is cased with 26-in. drive pipe from land surface to a depth of 123 ft, 22-in. pipe from land surface to a depth of 656 ft (cemented in), and 18-in. pipe from 843 ft to a depth of 947 ft. The top of the casing is equipped with a pitless adapter.

A production test was conducted by the driller on June 29, 1972. After 6.7 hr of pumping at rates of 508 to 1190 gpm, the maximum drawdown was 320 ft from a nonpumping water level of 292 ft below the top of the casing.

A second production test was conducted by the driller on July 5-6, 1972. After 24 hr of pumping at rates ranging from 599 to 1280 gpm, the maximum drawdown was 325 ft from a nonpumping water level of 343 ft below the top of the casing.

The pumping equipment presently installed consists of a 350-hp Byron Jackson electric motor, a 12-in., 12-stage Byron Jackson submersible turbine pump set at 790 ft, rated at 1200 gpm at about 825 ft TDH, and has 790 ft of 10-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006208) of a sample collected June 14, 1977, after pumping for 5 hr at 867 gpm, showed the water to have a hardness of 244 mg/l, total dissolved minerals of 344 mg/l, and an iron content of 0.2 mg/l.

Ten test holes were constructed in July, August, and September 1972 by the Layne-Western Co., Aurora, to depths ranging from 63 to 155 ft. The holes were located in Sections 5, 11, 26, 27, 28, 29, and 31, T38N, R7E, and Section 32, T39N, R7E.

WELL NO. 22, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in October 1973 to a depth of 1420 ft by the Layne-Western Co., Aurora. The well is located west of the E. J. & E. RR between U. S. Highway 34 and Aurora Ave., approximately 1415 ft S and 2815 ft W of the NE corner of Section 29, T38N, R9E, DuPage County. The land surface elevation at the well is approximately 684 ft.

A drillers log of Well No. 22 follows:

Strata	Thickness (ft)	Depth (ft)
Surface	5	5
Coarse gravel and boulders	10	15
Blue clay and gravel	35	50
Fine clean gravel	19	69
Hard gray limestone	46	115
Hard gray limestone with shale breaks	10	125
Medium red limestone with shale breaks	10	135
Medium grey limestone and shale	70	205
Medium to hard gray limestone	10	215
Medium gray limestone and shale	20	235
Medium gray shale	25	260
Medium gray limestone and shale	20	280
Hard brown limestone	35	315
Hard gray limestone	85	400
Medium gray limestone	10	410
Hard gray limestone	45	455
Hard brown limestone	10	465
Hard gray limestone	70	535
Medium gray limestone	25	560
Hard dark gray limestone	45	605
Hard brown limestone	10	615
Hard gray limestone	9	624
Hard white sandstone	36	660
Medium to hard white sandstone	10	670
Medium white sandstone	70	740
Medium to hard white sandstone	20	760
Hard dark gray sandstone	10	770
Hard gray limestone with shale seams	10	780
Medium white sandstone	21	801
Hard gray limestone	34	835
Medium gray limestone	95	930
Hard pink limestone with streaks of red dolomite	5	935
Hard gray limestone	20	955
Pink sandy dolomite with streaks of green shale	10	965
Hard gray limestone	20	985
Hard gray limestone and dolomite	60	1045
Medium gray limestone	40	1085
Hard gray limestone	5	1090
Hard gray dolomite	15	1105
Hard pink dolomite	5	1110
Hard red dolomite	30	1140
Hard gray limestone with seams of gray-green shale	5	1145
Medium gray sandy limestone and shale	65	1210
Hard dark gray limestone	30	1240
Hard white sandy dolomite	5	1245
Hard white sandstone with streaks of dolomite	30	1275
Medium to hard white sandstone	10	1285
Hard white sandstone with streaks of dolomite	5	1290
Medium white sandstone with streaks of dolomite	15	1305
Medium to soft white sandstone	10	1315
Medium to hard white sandstone	15	1330
Medium white sandstone	30	1360

Strata (continued)	Thickness (ft)	Depth (ft)
Hard white sandy dolomite	15	1375
Hard gray sandy limestone	5	1380
Medium to soft white sandstone	20	1400
Hard dark gray shale and limestone	5	1405
Hard gray limestone	15	1420

A 26-in. diameter hole was drilled to a depth of 73 ft, reduced to 25 in. between 73 and 636 ft, reduced to 21 in. between 636 and 1109 ft, and finished 17 in. in diameter from 1109 to 1420 ft. The well is cased with 25-in. pipe from land surface to a depth of 73 ft, and 22-in. pipe from land surface to a depth of 636 ft (cemented in). The top of the casing is equipped with a pitless adapter.

A production test was conducted by the driller on October 24-25, 1973. After 24 hr of pumping at rates ranging from 600 to 1134 gpm, the final drawdown was 236 ft from a nonpumping water level of 515 ft below the top of the casing. After pumping was stopped for 1.5 hr, the water level had recovered to 535 ft.

The pumping equipment presently installed consists of a 350-hp Byron Jackson electric motor, a 14-in., 10-stage Byron Jackson submersible turbine pump set at 900 ft, rated at 1300 gpm at about 830 ft TDH, and has 900 ft of 10-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006209) of a sample collected June 14, 1977, after pumping continuously at 1050 gpm, showed the water to have a hardness of 253 mg/l, total dissolved minerals of 378 mg/l, and an iron content of 0.2 mg/l.

WELL NO. 23, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in May 1973 to a depth of 1420 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located at Jericho and Barnes Roads, approximately 1000 ft N and 2500 ft E of the SW corner of Section 25, T38N, R7E. The land surface elevation at the well is approximately 670 ft.

A drillers log of Well No. 23 follows:

Strata	Thickness (ft)	Depth (ft)
Coarse gravel	15	15
Sand, gravel, some blue clay, compact	10	25
Medium coarse gravel - clean	15	40
Compact gravel	10	50
Gravel - clean	5	55
Hard gray lime	70	125
Hard gray lime with shale seams	10	135
Hard gray lime	10	145
Hard dark gray lime	5	150
Hard gray lime	25	175
Medium dark gray lime and shale	50	225
Medium dark gray shale	5	230
Medium brown shale	5	235
Medium gray shale	50	285
Hard brown lime	5	290
Hard gray lime	115	405
Hard brown lime	45	450
Hard gray lime	20	470
Hard gray lime, white squeeze shale	5	475

Strata (continued)	Thickness (ft)	Depth (ft)
Hard gray lime	25	500
Hard dark gray lime	60	560
Hard gray lime	30	590
Hard dark gray lime	10	600
Hard brown lime	15	615
Hard white sandy lime	5	620
Hard white sandstone	55	675
Medium white sandstone	55	730
Medium to soft white sandstone	5	735
Medium white sandstone	75	810
Medium to hard pink sandstone	5	815
Hard pink sandstone	5	820
Hard white sandstone	5	825
Hard red sandy shale	5	830
Hard red sandy lime	15	845
Hard red sandy lime shale	5	850
Hard pink sandstone	5	855
Medium pink sandstone, shale seams	15	870
Medium red rock and shale	5	875
Hard gray lime	30	905
Hard gray small shale break	5	910
Hard gray lime hole caving	5	915
Hard gray lime	55	970
Hard gray lime small shale break	5	975
Hard gray lime	5	980
Hard white sandy chert and shale	5	985
Hard white sandy chert	5	990
Hard gray lime	35	1025
Hard gray sandy lime	5	1030
Hard gray lime	25	1055
Hard gray lime and dolomite	40	1095
Hard brown dolomite	30	1125
Hard pink dolomite	5	1130
Hard red dolomite	10	1140
Hard gray sandy dolomite	15	1155
Hard gray dolomite	10	1165
Hard gray sandy dolomite and green shale	15	1180
Hard gray lime	5	1185
Hard dark gray sandy dolomite	5	1190
Hard white sandy dolomite	10	1200
Hard sandy dolomite streaks green shale	5	1205
Hard white sandy dolomite shale seams	30	1235
Hard dark gray dolomite	15	1250
Hard white sandstone	5	1255
Hard pink sandy dolomite	25	1280
Hard white sandstone and dolomite	5	1285
Hard white sandstone	25	1310
Medium to hard white sandstone	10	1320
Hard white sandstone dolomite	15	1335
Hard pink sandstone	20	1355
Hard white sandstone	45	1400
Hard dark gray sandy lime, some shale	20	1420

A 26-in. diameter hole was drilled to a depth of 55 ft, reduced to 25 in. between 55 and 631 ft, reduced to 21 in. between 631 and 931 ft, and finished 17 in. in diameter from 931 to 1420 ft. The well is cased with 26-in. pipe from land surface to a depth of 55 ft, 22-in. pipe from land surface to a depth of 631 ft (cemented in), and 18-in slotted pipe from 805 ft to a depth of 931 ft. The top of the casing is equipped with a pitless adapter.

This well was shot by Birdwell Division from 1205 to 1400 ft with 390 Thor shots (4 3/8 in.). After shooting, a production test was conducted by the driller on May 9, 1973. After 11.5 hr of pumping at rates ranging from 933 to 617 gpm, the maximum drawdown was 327 ft from a nonpumping water level of 390 ft below the top of the casing. Two hr after pumping was stopped, the water level had recovered to 470 ft.

A second production test was conducted by the driller on

May 21-22, 1973. After 25.5 hr of pumping at rates ranging from 633 to 1364 gpm, the final drawdown was 254 ft from a nonpumping water level of 395 ft below the top of the casing.

A third production test was conducted by the driller on May 31, 1973. After 5.5 hr of pumping at rates ranging from 825 to 1356 gpm, the final drawdown was 214 ft from a nonpumping water level of 395 ft below the top of the casing.

The pumping equipment presently installed consists of a 350-hp Byron Jackson electric motor, a 12-in., 11-stage Byron Jackson submersible turbine pump set at 808 ft, rated at 1050 gpm at about 800 ft TDH, and has 808 ft of 8-in. column pipe.

A partial analysis of a sample (Lab. No. 102094) collected May 22, 1973, after pumping for 25.5 hr at 1334 gpm, showed the water to have a hardness of 258 mg/l, total dissolved minerals of 351 mg/l, and an iron content of 0.3 mg/l.

WELL NO. 24 — the site for this well has been selected, but construction has not been initiated.

WELL NO. 25, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was constructed in August 1974 to a depth of 925 ft and deepened in October 1974 to a depth of 1460 ft by the Layne-Western Co., Aurora. The well is located north of Indian Trail Road and east of Randall Road, approximately 2472 ft S and 1926 ft W of the NE corner of Section 8, T38N, R8E. The land surface elevation at the well is approximately 695 ft.

A drillers log of Well No. 25 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	20	20
Blue clay and coarse gravel	10	30
Blue clay and boulders	15	45
Fine clean gravel	7	52
Hard gray limestone	58	110
Medium gray limestone and shale	5	115
Medium gray shale	20	135
Hard gray limestone	65	200
Hard gray limestone with shale seams	15	215
Medium gray shale with lime shells	75	290
Medium gray shale	45	335
Hard gray limestone	165	500
Hard brown limestone	120	620
Hard gray limestone	10	630
Hard brown limestone	20	650
Hard gray sandy limestone	10	660
Hard buff sandstone	5	665
Hard white sandstone	20	685
Medium white sandstone	50	735
Medium to hard white sandstone	15	750
Hard white sandstone	10	760
Hard white sandy dolomite and shale	5	765
Hard white sandstone	10	775
Medium white sandstone	10	785
Hard white sandstone	20	805
Medium white sandstone	5	810
Hard white sandstone	60	870
Medium white sandstone	5	875
Hard white sandstone	5	880
Hard pink sandstone	5	885
Medium pink sandstone	5	890
Medium white sandstone	10	900
Hard white sandstone	15	915
Hard pink sandstone	5	920
Hard limestone and gray shale	5	925
Hard red sandy limestone and shale	5	930
Hard red sandy shale	5	935
Hard red sandstone	10	945
Hard pink sandstone	5	950
Hard pink limestone and chert	15	965
Hard gray limestone with shale seams	10	975
Hard gray limestone, crevice at 981 and 1021 ft	45	1020
Hard gray chert and dolomite	5	1025
Hard gray sandy dolomite	10	1035
Hard gray limestone and shale seams	5	1040
Hard white sandy dolomite	5	1045
Hard gray dolomite with shale seams	5	1050
Hard gray limestone and dolomite, crevice at 1063 ft	15	1065
Hard white sandy dolomite	5	1070
Hard gray sandstone, crevice at 1077 ft	20	1090
Hard gray limestone and dolomite	70	1160
Hard brown limestone and dolomite	15	1175
Hard gray limestone and dolomite, crevice at 1182 ft	20	1195
Hard limestone with green shale seams	5	1200
Hard dark gray limestone and dolomite	5	1205
Hard dark gray sandy dolomite and shale	35	1240
Hard white sandy dolomite	35	1275
Hard white sandstone	10	1285
Hard white sandstone and dolomite	15	1300
Hard white sandstone	5	1305
Hard white sandstone with streaks of red dolomite	10	1315
Hard white sandstone	20	1335
Medium to hard white sandstone	10	1345
Hard white sandstone and red dolomite	5	1350
Hard white sandstone and dolomite	20	1370
Medium to hard white sandstone	30	1400
Medium to soft white sandstone	5	1405
Soft white sandstone	30	1435
Medium white sandstone	5	1440
Hard dark gray limestone	5	1445
Hard dark gray limestone and shale	15	1460

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006210) is for a water sample from the well collected June 14, 1977, after 14 hr of pumping at 1340 gpm.

WELL NO. 25, LABORATORY NO. C006210

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.1		Silica	SiO_2	6	
Manganese	Mn	0.00		Fluoride	F	1.2	0.06
Ammonium	NH_4	0.67	0.04	Boron	B	0.6	
Sodium	Na	34	1.48	Nitrate	NO_3	0.57	0.01
Potassium	K	14.4	0.37	Chloride	Cl	10	0.28
Calcium	Ca	58	2.89	Sulfate	SO_4	49	1.02
Magnesium	Mg	25	2.06	Alkalinity(as $CaCO_3$)		280	5.60
Arsenic	As	0.000					
Barium	Ba	0.1		Hardness (as $CaCO_3$)		248	4.96
Copper	Cu	0.00					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		376	
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.02		pH (as rec'd)		8.6	

A 26-in. diameter hole was drilled to a depth of 53 ft, reduced to 25 in. between 53 and 668 ft, and finished 21 in.

in diameter from 668 to 1460 ft. The well is cased with 26-in. pipe from land surface to a depth of 53 ft and 22-in. pipe from land surface to a depth of 667 ft (cemented in). The top of the casing is equipped with a pitless adapter.

Before deepening, a production test was conducted by the driller on August 15, 1974. After 2.9 hr of pumping at rates ranging from 145 to 448 gpm, the drawdown was 211 ft from a nonpumping water level of 393 ft. Fifty min after pumping was stopped, the water level had recovered to 415 ft.

After deepening, a production test was conducted by the driller on October 21-22, 1974. After 21.2 hr of pumping at rates ranging from 863 to 1585 gpm, the drawdown was 157 ft from a nonpumping water level of 448 ft below the top of the casing.

A production test was conducted by the driller on October 28, 1974. After 1 hr of pumping at a rate of 1560 gpm, the drawdown was 53 ft from a nonpumping water level of 468 ft below the top of the casing. Pumping was continued for 1 hr at a rate of 1845 gpm with a drawdown of 88 ft. After an additional 7 hr of pumping at rates ranging from 2000 to 1905 gpm, the final drawdown was 163 ft. Fifteen min after pumping was stopped, the water level had recovered to 594 ft.

The pumping equipment presently installed consists of a 400-hp Byron Jackson electric motor, a 13-in., 9-stage Byron Jackson submersible turbine pump set at 850 ft, rated at 1400 gpm at about 775 ft TDH, and has 850 ft of 10-in. column pipe.

BANGS-UNION-PARKER SUBDIVISION

Bangs-Union-Parker Subdivision (est. 23), located just south of the Aurora city limits, installed a public water supply in 1951. The water system is owned and operated by the Bangs-Union Water Supply. One well is in use. In 1953 there were 11 services, none metered. In 1975 there were 11 services, none metered; the average and maximum daily pumpages were 2000 and 3000 gpd, respectively. The water is chlorinated.

WELL NO. 1, open to the Maquoketa Group, was constructed in 1951 to a depth of 173 ft by R. Chitty, Oswego, and deepened in November 1970 to a reported depth of 260 ft by the K & K Well Drilling Co., Mokena. The well is located in the rear of 1117 South Union St., approximately 1200 ft S and 800 ft W of the NE corner of Section 34, T38N, R8E. The land surface elevation at the well is approximately 665 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
No record	160	160
Rock	98	258
Shale	2	260

The well is cased with 6-in. pipe from above the roof of a 5-ft deep pit to a depth of 94 ft and 4-in. pipe from 94 ft to a depth of 130 ft, and the hole was finished 4 in. in diameter to a depth of 260 ft. The top of the casing is equipped with a pitless adapter.

In 1951 before deepening, the nonpumping water level was reported to be 18 ft.

The pumping equipment presently installed is a Barnes submersible pump powered by a 1-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A15093) is for a water sample from the well collected March 2, 1976, after 30 min of pumping at 33 gpm.

WELL NO. 1, LABORATORY NO. A15093

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.25		Silica	SiO_2	12	
Manganese	Mn	0.05		Fluoride	F	1.2	0.06
Ammonium	NH_4	0.70	0.04	Boron	B	1.0	
Sodium	Na	89	3.87	Nitrate	NO_3	0.0	0.00
Potassium	K	6.0	0.15	Chloride	Cl	15	0.42
Calcium	Ca	55	2.74	Sulfate	SO_4	130	2.70
Magnesium	Mg	34	2.80	Alkalinity (as $CaCO_3$)		344	6.88
				Hardness (as $CaCO_3$)		279	5.58
Arsenic	As	0.000		Total dissolved minerals		550	
Barium	Ba	0.0					
Copper	Cu	0.04					
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.6	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha pc/l		0.4	
Silver	Ag	0.00		± deviation		1.5	
Cyanide	CN	0.02		Beta pc/l		8.7	
Zinc	Zn	0.0		± deviation		2.4	

BATAVIA

The city of Batavia (8994) installed a public water supply in 1894. Three wells (Nos. 2, 3, and 4) are in use. This supply is cross connected with the city of Geneva and Geneva is also connected to the city of St. Charles. In 1949 there were 1737 services, all metered; the average daily pumpage was 550,000 gpd. In 1977 there were 3324 services, all metered; the average and maximum daily pumpages were 1,586,682 and 2,380,000 gpd, respectively. The water is chlorinated.

WELL NO. 1, open to the Silurian dolomite (lower part) and the Cambrian-Ordovician aquifer, was completed in 1895 to a depth of 1279 ft by the J. P. Miller Artesian Well Co., Brookfield. This well was abandoned and sealed in 1948. The well was located about 255 ft south of Wilson St. and 78 ft east of Island Ave., approximately 2000 ft S and 1700 ft W of the NE corner of Section 22, T39N, R8E. The land surface elevation at the well is approximately 665 ft.

The bore hole was reported to be 10 in., 8 in., and 4 in. in diameter with the length of each bore hole diameter unknown. The well was cased with 10-in. ID pipe to a depth of 40 ft and 6-in. liner pipe from 800 ft to a depth of 860 ft.

The well flowed upon completion.

In 1911, the pumping water levels below the top of the casing varied from 16 ft for the winter, spring, and fall months to 40 ft during the longer summer pumping periods. The production averaged 800 gpm in 1911 and 600 gpm in 1918 and 1945.

WELL NO. 2, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was constructed in 1915 to a depth of 2000 ft and deepened in 1945 to a reported depth of 2200 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located just east of the main pumping station, approximately 2050 ft S and 1680 ft W of the NE corner of Section 22, T39N, R8E. The land surface elevation at the well is approximately 667 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	6	6
Niagaran limestone	74	80
Maquoketa shale	50	130
Shale	90	220
Galena-Platteville	300	520
St. Peter sandstone	330	850
Sandstone	55	905
Dolomite, white pink	105	1010
Dolomite	90	1100
Galesville Sandstone	170	1270
Eau Claire Formation	390	1660
Mt. Simon Sandstone	340	2000
No record	15	2015
Sand, pink	20	2035
Sand, red	30	2065
Sand, pink	30	2095
No record	15	2110
Sand	20	2130
Sand, red	20	2150
Sand	20	2170
No record	5	2175
Sand, red	25	2200

After initial construction, it was reported in 1918 that the well produced 1143 gpm with a drawdown of 34 ft from a nonpumping water level of 6 ft.

In 1924, after pumping at a rate of 1143 gpm, the drawdown was 43 ft from a nonpumping water level of 40 ft.

Before rehabilitation in 1945, the well reportedly produced about 600 gpm with a drawdown of 19 ft from a nonpumping water level of 113 ft.

This well was rehabilitated by the J. P. Miller Artesian Well Co., during May to December 1945. Before work was started, the well was sounded and found filled to a depth of 1547 ft. After the old casing and liner were removed, the well was reamed to a larger diameter, drilled 200 ft deeper, and recased.

A 28-in. diameter hole was drilled to a depth of 50 ft, reduced to 24 in. between 50 and 234 ft, reduced to 19.2 in. between 234 and 940 ft, reduced to 15.2 in. between 940 and 1670 ft, and finished 12 in. in diameter from 1670 to 2200 ft. The well is cased with 26-in. OD pipe from land surface to a depth of 50 ft (cemented in), 20-in. pipe from land surface to a depth of 233 ft (cemented in), and a 16-in. liner from 790 ft to a depth of 940 ft. A 12-in. liner from 1260 ft to a depth of 1670 ft also was installed, but removed before the well was shot in October 1945.

After rehabilitation, a 24-hr production test was conducted on October 2-3, 1945, by representatives of the city, the driller, and the State Water Survey. The discharge was irregular during periods of the test and varied from 615 to 365 gpm. Well No. 3 was operated intermittently during the test. After breaking suction several times a constant rate of 475 gpm was established with a drawdown of 81 ft from a nonpumping water level of 126 ft when Well No. 3 was not in operation.

After this test the 12-in. liner between 1260 and 1670 ft was removed and the well was shot at depths of 1250, 1239, 1229, and 1224 ft. During this cleanout operation, a bridge was found at a depth of 1290 ft and no sand had fallen below that depth.

After shooting the well, a production test was conducted by the State Water Survey on November 30-December 1, 1945. After 24 hr of pumping at rates of 755 to 1430 gpm, the final drawdown was 81.5 ft from a nonpumping water level of 128.5 ft below the top of the casing. Well No. 3 was operated intermittently during the test.

On August 13, 1947, after a 4-hr idle period, the well reportedly produced 1350 gpm for 0.8 hr with a drawdown of 53 ft from a nonpumping water level of 145 ft below the pump base.

In January 1948, the nonpumping water level was reported to be 128 ft below the pump base.

In July 1948, after 2 hr of pumping at 1600 gpm, the pumping water level was 191 ft below the pump base.

Nonpumping water levels were reported to be 200 ft in January 1952 and 343 ft in July 1975.

The pumping equipment presently installed is a Byron Jackson submersible pump set at 503 ft, rated at 1300 gpm at about 350 ft head, and powered by a 200-hp electric motor. The well is equipped with 503 ft of airline.

A mineral analysis of a sample (Lab. No. 199252) collected July 17, 1975, after pumping for 45 min at 1050 gpm, showed the water to have a hardness of 234 mg/l, total dissolved minerals of 373 mg/l, and an iron content of 0.2 mg/l.

WELL NO. 3, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in March 1941 to a depth of 2200 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located about 500 ft south of the main pumping station, approximately 2350 ft S and 1735 ft W of the NE corner of Section 22, T39N, R8E. The land surface elevation at the well is approximately 667 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Soil	1	1
SILURIAN SYSTEM		
Niagaran-Alexandrian Dolomite Series	69	70
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite	100	170
Shale	40	210
Galena-Platteville Dolomite Groups	314	524
Ancell Group		
Glenwood Sandstone, dolomitic	13	537
St. Peter Sandstone		
Sandstone	303	840
Shale	2	842
Prairie du Chien Group		
Oneota Dolomite, chert and some sandstone	78	920
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite, some shale at 945 ft	100	1020
Franconia Formation, some shale	85	1105
Ironton-Galesville Sandstone		
Sandstone, dolomitic	95	1200
Sandstone, incoherent, dolomitic from 1230 to 1250 ft	70	1270
Eau Claire Formation, shale, sandstone, siltstone, and dolomite	392	1662
Mt. Simon Sandstone	538	2200

A 24-in. diameter hole was drilled to a depth of 41.8 ft, reduced to 19.2 in. between 41.8 and 925 ft, reduced to 15.2 in. between 925 and 1606 ft, and finished 12.2 in. in diameter from 1606 to 2200 ft. The well is cased with 20-in. OD steel pipe from 1.8 ft above land surface to a depth of 41.8 ft (cemented in), 16-in. OD wrought iron pipe from land surface to a depth of 273.8 ft, 16-in. OD wrought iron liner from 765 ft to a depth of 866 ft, 13-in. OD wrought iron liner from 824 ft to a depth of 925 ft, and 13-in. OD wrought iron liner from 1250 ft to a depth of 1606 ft. The annulus between the 20-in. and 16-in. casings is filled with bentonite. About 1967, it was reported that portions of the well casing-liners were removed and new casings installed. Details of this work are not available.

A production test was conducted on April 2-3, 1941. After 5 hr of pumping at rates of 1260 to 1210 gpm, the drawdown was 102.0 ft from a nonpumping water level of 90.5 ft. Pumping was continued for an additional 19 hr at rates of 1100 to 800 gpm with a final drawdown of 69 ft.

On October 3, 1945, the well reportedly produced 1060 gpm for 30 min with a drawdown of 65 ft from a nonpumping water level of 127 ft.

On August 13, 1947, after 45 min of pumping at a rate of 1250 gpm, the drawdown was 53 ft from a nonpumping water level of 135 ft below the pump base.

On July 9, 1948, the nonpumping water level was reported to be 124 ft below the pump base.

A production test was conducted by the Layne-Western Co., Aurora, on May 22, 1974. After 2.3 hr of pumping at rates of 760 to 869 gpm, the drawdown was 170 ft from a nonpumping water level of 250 ft. Pumping was continued for 4.5 hr with a final drawdown of 180 ft.

In July 1975, the nonpumping water level was reported to be 250 ft.

The pumping equipment presently installed is an Aurora turbine pump rated at 1000 gpm, and powered by a 150-hp 1750 rpm Westinghouse electric motor (No. 1S17N3905).

The following mineral analysis (Lab. No. 199253) is for a water sample from the well collected July 17, 1975, after 12 hr of pumping at 1000 gpm.

WELL NO. 3, LABORATORY NO. 199253

		mg/l	*me/l*			*mg/l*	*me/l*
Iron (total)	Fe	0.3		Silica	SiO_2	8.7	
Manganese	Mn	0.00		Fluoride	F	1.3	
Ammonium	NH_4	0.3	0.02	Boron	B	0.2	
Sodium	Na	64.0	2.78	Nitrate	NO_3	0.0	0.00
Potassium	K	11.2	0.29	Chloride	Cl	100	2.82
Calcium	Ca	63.2	3.15	Sulfate	SO_4	30.0	0.62
Magnesium	Mg	24.0	1.97	Alkalinity (as $CaCO_3$)		232	4.64
Strontium	Sr	1.24	0.03				
				Hardness (as $CaCO_3$)		256	5.12
Barium	Ba	<0.1					
Copper	Cu	0.00		Total dissolved minerals		459	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	<0.05					
Lithium	Li	0.05		Turbidity		1	
Nickel	Ni	<0.05		Color		0	
Zinc	Zn	0.00		Odor		0	

WELL NO. 4, open to the Cambrian-Ordovician aquifer, was completed in March 1953 to a depth of 1357 ft (cleaned out to 1310 ft in 1976) by L. Cliff Neely, Batavia. The well is located on the eastern side of the Fox River at 434 East Wilson St., approximately 1650 ft S and 425 ft E of the NW corner of Section 23, T39N, R8E. The land surface elevation

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at the well is approximately 721 ft.

A 26-in. diameter hole was drilled to a depth of 60 ft, reduced to 25 in. between 60 and 270 ft, reduced to 19.2 in. between 270 and 955 ft, and finished 16 in. in diameter from 955 to 1357 ft. The well is cased with 26-in. pipe from land surface to a depth of 60 ft, 19-in. pipe from land surface to a depth of 270 ft (cemented in), and a 16-in. liner from 840 ft to a depth of 955 ft (cemented in).

A production test was conducted by the driller on April 20, 1953. After 9 hr of pumping at a rate of 552 gpm, the drawdown was 110 ft from a nonpumping water level of 210 ft below land surface.

After the well was shot with 300 qt of nitroglycerin between depths of 1227 and 1321 ft, a production test was conducted on May 27-28, 1953, by representatives of the driller, the State Water Survey, and Wells Engineering Co. After 23.7 hr of pumping at rates ranging from 500 to 674 gpm, the drawdown was 53.0 ft from a nonpumping water level of 240.0 ft below the top of the casing. Fifty-two min after pumping was stopped, the water level had recovered to 246.5 ft.

In September 1958, the well reportedly produced 600 gpm for 24 hr with a drawdown of 20 ft from a nonpumping water level of 250 ft below the pump base.

In January 1976, this well was cleaned out by the Layne-Western Co., Aurora, to a depth of 1310 ft. A production test was conducted by the Layne-Western Co. on January 6, 1976. After 2.5 hr of pumping at rates of 887 to 1200 gpm, the drawdown was 79 ft from a nonpumping water level of 431 ft below land surface.

The pumping equipment presently installed consists of a 200-hp 1750 rpm Byron Jackson electric motor, a 12-in., 10-stage Byron Jackson submersible pump rated at 1100 gpm at about 620 ft TDH, and has 603 ft of 8-in. column pipe.

The following mineral analysis (Lab. No. 199254) is for a water sample from the well collected July 17, 1975, after 45 min of pumping at 1000 gpm.

WELL NO. 4, LABORATORY NO. 199254

		mg/l	me/l			mg/l	me/l
Iron (total)	Fe	0.1		Silica	SiO_2	6.7	
Manganese	Mn	0.00		Fluoride	F	1.1	
Ammonium	NH_4	0.0	0.00	Boron	B	0.5	
Sodium	Na	32.3	1.41	Nitrate	NO_3	1.9	0.03
Potassium	K	14.8	0.38	Chloride	Cl	6	0.17
Calcium	Ca	59.6	2.97	Sulfate	SO_4	38.9	0.81
Magnesium	Mg	25.7	2.11	Alkalinity (as $CaCO_3$)		284	5.68
Strontium	Sr	2.6	0.06				
Barium	Ba	<0.1					
Copper	Cu	0.00		Hardness (as $CaCO_3$)		254	5.08
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved minerals		352	
Lead	Pb	<0.05					
Lithium	Li	0.04		Turbidity	0		
Nickel	Ni	<0.05		Color	0		
Zinc	Zn	0.02		Odor	0		

BURLINGTON

The Village of Burlington (456) installed a public water supply in 1943. One well (No. 2) is in use and another well (No. 1) is available for emergency use. In 1951 there were 84 services, all metered. In 1974 there were 167 services, 99 percent metered; the average and maximum daily pumpages were 73,530 and 110,000 gpd, respectively. The water is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution; the water from Well No. 1 is untreated.

WELL NO. 1, finished in sand and gravel was completed in July 1941 to a depth of 108.3 ft by Hayes & Sims, Champaign. This well is available for emergency use. The well is located in the rear of the main pumping station next to the firehouse on South St., approximately 1100 ft S and 100 ft W of the NE corner of Section 9, T41N, R6E. The land surface elevation at the well is approximately 925 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Top soil	2	2
Yellow clay	13	15
Red clay	10	25
Clay with gravel showing	63	88
Gravel and sand with some clay showing	20	108

A 6-in. diameter hole was drilled to a depth of 108.3 ft. The well is cased with 6-in. pipe from 1.7 ft above land surface to a depth of about 95.3 ft and equipped with 14.7 ft of No. 35 slot Johnson Armco iron screen.

A production test was conducted by the State Water Survey on July 7, 1941. After 3.4 hr of intermittent pumping at rates ranging from 24 to 43 gpm, the drawdown was 5 ft from a nonpumping water level of 3 3 ft below land surface. Five min after pumping was stopped, the water level had recovered to 34 ft.

The pumping equipment presently installed consists of a 2-hp 1740 rpm General Electric motor, a 6-in., 4-stage Aurora turbine pump (No. 12504) rated at 50 gpm at about 57 ft head, and has 50 ft of 4-in. column pipe. A 10-ft section of 4-in. suction pipe is attached to the pump intake. The well is equipped with 50 ft of airline.

A mineral analysis of a sample (Lab. No. 111400) collected August 6, 1947, after pumping for 15 min at 50 gpm, showed the water to have a hardness of 338 mg/l, total dissolved minerals of 385 mg/l, and an iron content of 3.1 mg/l.

WELL NO. 2, open to the Cambrian-Ordovician aquifer, was completed in January 1960 to a depth of 1105 ft by L. Cliff Neely, Batavia. The well is located behind the main pumping station, approximately 1050 ft S and 40 ft W of the NE corner of Section 9, T41N, R6E. The land surface elevation at the well is approximately 922 ft.

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

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Till, buff to dark brown, slightly sandy, and gravelly	70	70
Sand, slightly gravelly, silty, fine to coarse	25	95
Gravel, slightly sandy, granule to coarse, little clay (till?)	60	155
Till, gray to grayish buff	10	165
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale, dolomitic, gray to buff, brittle to weak; little dolomite	20	185
Dolomite, slightly silty, white, buff, brown and gray, fine to medium, little coarse; little shale and siltstone	105	290
Shale, dolomitic, buff to dark gray, weak to tough; little dolomite	20	310
Galena Group		
Dolomite, buff to white, little gray, fine to medium, crystalline, slightly cherty at base	170	480
Dolomite, slightly cherty, buff, gray to white, speckled red and black, fine to medium	65	545
Platteville Group		
Dolomite, slightly calcareous toward base, silty, buff, white to gray, mottled, fine to medium, crystalline	95	640
Ancell Group		
Glenwood Formation		
Sandstone, dolomitic, white, fine to very coarse, some granules	15	655
Dolomite, sandy, greenish white to white, fine, crystalline, compact, little porous; shale, sandy, green, brittle to tough	40	695
Sandstone, white, fine to coarse, incoherent	20	715
St. Peter Sandstone		
Sandstone, white, fine to medium incoherent, little chert at base	265	980
Siltstone, little slightly glauconitic, red, white, tough; sandstone and shale	125	1105

A 12-in. diameter hole was drilled to a depth of 343.8 ft and finished 10 in. in diameter from 343.8 to 1105 ft. The well is equipped with a Well King pitless adapter from 1 ft above land surface and cased with 12-in. pipe to a depth of 186 ft and 10-in. pipe from land surface to a depth of 343.8 ft (cemented in).

A production test was conducted by the driller on January 27-28, 1960. After 25.3 hr of pumping at rates ranging from 71 to 280 gpm, the final drawdown was 42 ft from a non-pumping water level of 273 ft below land surface. Seventeen min after pumping was stopped, the water level had recovered to 278 ft.

On October 11, 1960, the well reportedly produced 230 gpm for 2 hr with a drawdown of 36 ft from a non-pumping water level of 269 ft below the pump base.

The pumping equipment presently installed is an 8-in., 15-stage Layne submersible pump set at 450 ft, rated at 230 gpm at about 360 ft head, and powered by a 40-hp U. S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B32682) is for a water sample from the well collected February 17, 1976, after 30 min of pumping at 185 gpm.

WELL NO. 2, LABORATORY NO. B32682

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.2		Silica	SiO_2	7	
Manganese	Mn	0.00		Fluoride	F	0.6	0.03
Ammonium	NH_4	0.5	0.03	Boron	B	0.2	
Sodium	Na	9.0	0.39	Nitrate	NO_3	0.3	0.01
Potassium	K	6.6	0.17	Chloride	Cl	1.5	0.04
Calcium	Ca	64	3.19	Sulfate	SO_4	0.0	0.00
Magnesium	Mg	30	2.47	Alkalinity(as $CaCO_3$)		312	6.24
Arsenic	As	0.00		Hardness (as $CaCO_3$)		283	5.66
Berium	Ba	2.3					
Copper	Cu	0.00		Total dissolved minerals		304	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)	7.9		
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*	14.5		
Silver	Ag	0.00		± deviation	3.0		
Cyanide	CN	0.00		Beta *pc/l*	17.7		
Zinc	Zn	0.0		± deviation	2.2		

CARPENTERSVILLE

The village of Carpentersville (24,059) installed a public water supply in 1914. Three wells (Nos. 3, 5, and 6) are in use. In 1950 there were 430 services, all metered; the estimated average daily pumpage was 96,000 gpd. In 1978 there were 6881 services, all metered; the average and maximum daily pumpages in 1977 were 2,755,422 and 4,100,000 gpd, respectively. The water is aerated, filtered, chlorinated, softened, and fluoridated.

Initially, water was obtained from a 20-ft diameter dug well, finished in sand and gravel. It was constructed in 1914 to a depth of 17 ft and deepened to a reported depth of 23 ft in 1920. This well has not been used since April 1967.

The well was located about 210 ft south of Cleveland Ave. and 25 ft west of Grove St., approximately 900 ft S and 2400 ft W of the NE corner of Section 22, T42N, R8E. The well was curbed with an 8-in. thick concrete wall from about 1.3 ft above land surface to the original depth of 17 ft. Information on the wall below 17 ft is not available. A 6-in. overflow pipe was laid from a point 6 ft below land surface to a branch of the Fox River. In 1915, the well was reported to have a productive capacity of 250 gpm with a maximum drawdown to within 4 ft of the bottom. On June 28, 1923, the water level was drawn down to a depth of 9.4 ft below the top of the well by pumping for 33 min and the pump was stopped. The rate of inflow was 141 gpm when the water level was 9.1 ft below the top and decreased to 43 gpm when the water level was 7.0 ft. On August 4, 1947, the well flowed to waste at an estimated rate of 75 gpm.

A partial analysis of a sample (Lab. No. 111397) collected August 2, 1947, from the end of the overflow pipe, showed the water to have a hardness of 542 mg/l, total dissolved minerals of 599 mg/l, and an iron content of 0.2 mg/l.

Prior to the construction of Well No. 1, two test holes, located in the NE corner of Section 22, T42N, R8E, were constructed in 1940 by the Dundee Engineering Co. to depths of 500+ and 745 ft, respectively.

WELL NO. 1, open to the Cambrian-Ordovician aquifer, was completed in May 1941 to a depth of 1140 ft (measured at 1127 ft in October 1953) by Ray Feuerborn, Batavia. This well was disconnected from the sytem and capped in 1969. The well is located in the old treatment plant on Grove St., approximately 730 ft S and 2400 ft W of the NE corner of Section 22, T42N, R8E. The land surface elevation at the well is approximately 728 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	33	33
Limestone	183	216
Sandstone	347	563
No record	45	608
Limestone	17	625
Sandstone	130	755
Limestone	13	768
Sandstone	10	778
Shale	1	779
Sandstone	9	788
Limestone	175	963
Sandstone	161	1124
Limestone	16	1140

The well is cased with 18-in. pipe from land surface to a depth of 40 ft, 12-in. pipe from land surface to a depth of 255 ft, and a 10-in. liner from 749 ft to a depth of 789 ft. The annular space of both pipes is reported to be cement grouted.

A production test was conducted by the State Water Survey on May 8, 1941. After 4 hr of pumping at a rate of 275 gpm, the drawdown was 144 ft from a nonpumping water level of 107 ft below the top of the casing. The pumping rate was then reduced to 150 gpm, and after 3 hr of pumping, the final drawdown was 62 ft.

On June 10, 1953, the well reportedly produced 100 gpm with a drawdown of 110 ft from a nonpumping water level of 165 ft.

After pump repairs in August 1953, the well reportedly produced 173 gpm with a drawdown of 178 ft from a nonpumping water level of 168 ft.

On November 29, 1953, this well was shot with 180 7-oz shots between 1070 and 980 ft. On November 30, 1953, 2000 gal of HCl were introduced at the 800-ft level and 1000 gal of HCl at the 600-ft level. On December 2, 1953, after 3 hr of pumping at rates ranging from 266 to 275 gpm, the drawdown was 55 ft from a nonpumping water level of 165 ft below the pump base.

On May 14, 1954, the well reportedly produced 316 gpm with a drawdown of 42 ft from a nonpumping water level of 180 ft below land surface.

On July 18, 1959, after 2 hr of pumping at 335 gpm, the drawdown was 73 ft from a nonpumping water level of 235 ft below the pump base.

A mineral analysis of a sample (Lab. No. 111396) collected August 2, 1947, after pumping for 7 hr at 150 gpm, showed the water to have a hardness of 213 mg/l, total dissolved minerals of 309 mg/l, and a trace of iron.

WELL NO. 2 (former Meadowdale Subdivision Well No. 1), open to the Silurian dolomite, was completed in March 1954 to a depth of 247 ft (measured at 200 ft) by Sherman Holman, Elgin. This well has not been used since 1966 and is capped. The well is located on Tee Lane of Unit No. 2, approximately 1450 ft N and 1600 ft E of the SW corner of Section 13, T42N, R8E. The land surface elevation at the well is approximately 885 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil	8	8
Red clay	6	14
Sand and gravel	98	112
Blue clay	20	132
Sand and gravel	60	192
Shale	10	202
Sand and gravel	8	210
Limestone and sand	37	247

The well is cased with 12-in. pipe from 0.7 ft above the pumphouse floor to a depth of 210 ft.

Upon completion, the driller reported that the well produced 125 gpm for 18 hr with a drawdown of 20 ft from a nonpumping water level of 145 ft below the pump base.

The pumping equipment presently installed consists of a 30-hp 1800 rpm U. S. electric motor (No. 2478545), an 8-in., 10-stage Layne turbine pump (No. 34307) set at 170 ft, rated at 350 gpm at about 292 ft TDH, and has 170 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 170 ft of airline.

A group of 45 well points (former Meadowdale Subdivision Well No. 2), finished in sand and gravel, were jetted in in 1954 to depths of approximately 18 ft deep by the Meadowdale Corp. The well points were abandoned in May 1958. The well points were located in the Meadowdale Subdivision on the east side of the Fox River, in Section 15, T42N, R8E. The land surface elevation at the well points is approximately 740 ft.

The well points were spaced 15 ft apart, 1.5 in. in diameter, in groups of 15, and each set of 15 was connected to a 4-in. suction line.

WELL NO. 3 (former Meadowdale Subdivision Well No. 3), finished in sand and gravel, was completed in October 1955 to a depth of 72 ft by the Layne-Western Co., Aurora. The well is located on the south side of Lake Marian Road about 300 ft east of Williams Road, approximately 1500 ft S and 400 ft W of the NE corner of Section 15, T42N, R8E. The land surface elevation at the well is approximately 790 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil	**1**	**1**
Sand and gravel	**3**	**4**
Clay	**28**	**32**
Medium coarse sand	**18**	**50**
Coarse gravel and boulders	**22**	**72**
Clay	**4**	**76**

A 34-in. diameter hole was drilled to a depth of 72 ft. The well is cased with 16-in. pipe from 0.4 ft above the pumphouse floor to a depth of 52 ft followed by 20 ft of 16-in. No. 5 (0.105 in.) Layne shutter screen. The annulus between the bore hole and the casing-screen assembly is filled with clay from 0 to 20 ft and with gravel from 20 to 72 ft.

A production test was conducted by the driller on October 18, 1955. After 8 hr of pumping at a rate of 1223 gpm, the drawdown was 21 ft from a nonpumping water level of 18 ft below the pump base.

In 1963, this well was treated with 700 gal of acid by the Layne-Western Co. After acidizing, the well reportedly produced 1045 gpm with a drawdown of 11 ft from a nonpumping water level of 19 ft.

The pumping equipment presently installed is a Layne turbine pump (No. 47528) set at 50 ft, rated at 1000 gpm at about 325 ft TDH, and powered by a 100-hp 1800 rpm U. S. electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B36634) of a sample collected March 9, 1977, after pumping for 1 hr at 700 gpm, showed the water to have a hardness of 431 mg/l, total dissolved minerals of 455 mg/l, and an iron content of 1.5 mg/l.

WELL NO. 4 (former Meadowdale Subdivision Well No. 4), finished in sand and gravel, was completed in February 1957 to a depth of 177 ft by the Layne-Western Co., Aurora. This well is disconnected from the system but rehabilitation work is planned. The well is located on the southwest corner of Lake Marian Road and Meadowdale Drive, approximately 1450 ft S and 1400 ft W of the NE corner of Section 14, T42N, R8E. The land surface elevation at the well is approximately 860 ft.

A summary sample study log of Well No. 4 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Till, yellowish brown, gravelly	**27**	**27**
Gravel, granule to pebble size; sand coarse to very coarse	**22**	**49**
Silt, light chocolate brown; granule gravel	**5**	**54**
Sand, medium to coarse; some yellow silt and granule gravel	**6**	**60**
Silt, light chocolate brown, platy	**43**	**103**
Sand, coarse to medium; granule gravel	**17**	**120**
Till, yellowish brown, silty; granule gravel	**5**	**125**
Gravel, granule to pebble; some medium to very coarse sand	**24**	**149**
Till, yellowish brown	**3**	**152**
Gravel, granule to pebble; sand	**13**	**165**
Sand, medium to very coarse; subangular, much chert and dolomite	**5**	**170**
Sand, fine to medium; some gravel and silt	**5**	**175**
Sandstone, quartzitic (boulder?) at		**175**

A 34-in. diameter hole was drilled to a depth of 177 ft. The well is cased with 18-in. steel pipe from 1 ft above the pumphouse floor to a depth of 157 ft followed by 20 ft of 16-in. No. 5 (0.105 in.) Layne Armco iron shutter screen. The annulus between the bore hole and casing-screen assembly is filled with clay from 0 to 137 ft and with 15 cubic yards of pea gravel from 137 to 177 ft.

A production test was conducted by the driller on Februar 19, 1957. After 8 hr of pumping at rates ranging from 1218 to 1110 gpm, the drawdown was 11 ft from a nonpumping water level of 80 ft.

On April 23, 1958, the well reportedly produced 1800 gpm with a drawdown of 17 ft from a nonpumping water level of 84 ft below the pump base.

In April 1970, before acidizing, the well reportedly produced 450 gpm with a drawdown of 47 ft from a nonpumping water level of 93 ft. After this well was acidized with 1000 gal of 15 percent HC1 in May 1970 by the Layne-Western Co., the well reportedly produced 2100 gpm with a drawdown of 42 ft from a nonpumping water level of 90 ft.

This well was acidized again in June 1971 by the Layne-Western Co., with 1000 gal of 15 percent HC1. After pumping at 1200 gpm, the drawdown was 47 ft from a nonpumping water level of 93 ft.

On January 10, 1973, the nonpumping water level was reported to be 82 ft.

The pumping equipment presently installed consists of a

150-hp 1775 rpm General Electric motor (Model No. C5662, No. PD6637530), a 14-in., 3-stage Layne turbine pump (No. 36704) set at 140 ft, rated at 2000 gpm at about 230 ft head, and has 140 ft of 10-in. column pipe. A 10-ft section of 10-in. suction pipe is attached to the pump intake. The well is equipped with 140 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 01936) of a sample collected September 28, 1971, after pumping for 2 hr at 1250 gpm, showed the water to have a hardness of 412 mg/l, total dissolved minerals of 477 mg/l, and an iron content of 0.9 mg/l.

WELL NO. 5, finished in sand and gravel, was completed in June 1966 to a depth of 183 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located on the northeast corner of Austin Ave. and Sacramento Drive, approximately 4900 ft N and 900 ft W of the SE corner of Section 14, T42N, R8E. The land surface elevation at the well is approximately 875 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay and boulders	25	25
Sand, gravel, and boulders	45	70
Clay and gravel	60	130
Sand and gravel	53	183

A 42-in. diameter hole was drilled to a depth of 183 ft. The well is cased with 20-in. OD pipe from 0.9 ft above the building floor to a depth of 153 ft followed by 30 ft of 20-in. No. 120 slot Johnson stainless steel screen. The annulus between the bore hole and the casing-screen assembly is filled with bentonite from 0 to 36 ft and with gravel from 36 to 183 ft.

A production test was conducted by the driller on June 9, 1966. After 8.5 hr of pumping at rates from 840 to 2650 gpm, the final drawdown was 16.5 ft from a nonpumping water level of 104.0 ft below land surface.

A production test using one observation well was conducted by the village on July 18, 1972. The well reportedly produced from 2800 to 2200 gpm for 17.3 hr with a final drawdown of 8 ft from a nonpumping water level of 118 ft.

A production test using one observation well was conducted by the State Water Survey on January 10, 1973. After 4 hr of pumping at an average rate of 3016 gpm, the drawdown was 10.5 ft from a nonpumping water level of 112.5 ft.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 315441) set at 140 ft, rated at 2500 gpm at about 200 ft head, and powered by a 200-hp 1770 rpm General Electric motor (Model No. 5K6285XC599A, DBJ413148).

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B36635) of a sample collected March 9, 1977, after pumping for 1.5 hr at 2700 gpm, showed the water to have a hardness of 423 mg/l, total dissolved minerals of 417 mg/l, and an iron content of 1.5 mg/l.

WELL NO. 6, finished in sand and gravel, was completed in April 1973 to a depth of 179 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located about 300 ft east of the filtration plant, approximately 850 ft S and 1100 ft W of the NE corner of Section 14, T42N, R8E. The land surface elevation at the well is approximately 880 ft.

A drillers log of Well No. 6 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Brown clay and boulders	5	5
Brown clay with gravel	13	18
Fine gravel	14	32
Sand	3	35
Sand and gravel	5	40
Medium gravel	10	50
Medium gravel and boulders	5	55
Medium gravel	5	60
Coarse gravel and boulders	5	65
Coarse gravel	5	70
Fine gravel and sand	5	75
Gray sandy clay	5	80
Gray clay	40	120
Gray clay, sandy	10	130
Fine to medium gravel	10	140
Medium gravel	5	145
Medium to coarse gravel	5	150
Gravel and boulders	11	161
Gravel	5	166
Gravel and boulders	5	171
Gravel	10	181
Hard coarse sand	14	195
Limestone	20	215

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B36637) is for a water sample from the well collected March 9, 1977, after 30 min of pumping at 2500 gpm.

WELL NO. 6, LABORATORY NO. B36637

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.4		Silica	SiO_2	19	
Manganese	Mn	0.05		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.09	0.00	Boron	B	0.9	
Sodium	Na	4	0.17	Nitrate	NO_3	0.0	0.00
Potassium	K	1.6	0.04	Chloride	Cl	15	0.42
Calcium	Ca	85	4.24	Sulfate	SO_4	67	1.39
Magnesium	Mg	48	3.95	Alkalinity (as $CaCO_3$)		332	6.64
Arsenic	As	0.00					
Barium	Ba	0.2					
Copper	Cu	0.01		Hardness (as $CaCO_3$)		430	8.60
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved minerals		461	
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.5	

A 42-in. diameter hole was drilled to a depth of 181.5 ft. The well is cased with 20-in. pipe from land surface to a depth of 149 ft followed by 30 ft of 20 in. No. 120 slot

Johnson stainless steel screen. The annulus between the bore hole and casing-screen assembly is filled with cement grout from 0 to 20 ft, with impervious clay from 20 to 110 ft, and with No. 2 Northern gravel from 110 to 181.5 ft.

A production test was conducted by the driller on April 17, 1973. After 4 hr of pumping at an average rate of 3150 gpm, the final drawdown was 13 ft from a nonpumping water level of 104 ft below land surface.

After the permanent pump installation, a production test was conducted by the driller on August 9, 1974. After 4.4 hr of pumping at rates of 2900 to 2500 gpm, the final drawdown was 14 ft from a nonpumping water level of 107 ft below land surface.

The pumping equipment presently installed is a 2-stage Peerless turbine pump rated at 2500 gpm at about 192 ft TDH, and powered by a 200-hp 1775 rpm Westinghouse electric motor.

EAST DUNDEE

The village of East Dundee (2920) installed a public water supply in 1915. One well (No. 3) and the spring supply are in use and another well (No. 2) is available for emergency use. In 1951 there were 365 services, all metered; the estimated average daily pumpage was 130,000 gpd. In 1974 there were 850 services, all metered; the average and maximum daily pumpages were 342,500 and 510,000 gpd, respectively. The water is chlorinated and fluoridated.

Initially, water was obtained from a 9-ft diameter dug well installed in 1902 to a depth of 25 ft. This well was abandoned and filled in 1931. The well was located about 25 ft south of Barrington Ave. and 40 ft west of Third St., approximately 1950 ft N and 300 ft E of the SW corner of Section 23, T42N, R8E. On June 27, 1923, the well reportedly produced at an average inflow rate of 48 gpm.

A SPRING SUPPLY, finished in sand and gravel, was constructed in 1915. The spring is located up the hill from the main pumping station on Barrington Ave., approximately 2100 to 2200 ft N and 1260 to 1700 ft E of the SW corner of Section 23, T42N, R8E. The land surface elevation at the well is approximately 790 ft.

Originally, 400 to 500 ft of vitrified sewer pipe was laid with open joints at a depth of nearly 20 ft. In February 1956, the spring consisted of 230 ft of 8-in. bell and spigot open joint tile laid about 18 to 20 ft deep. In 1959, it was reported that the 8-in. bell and spigot tile had been replaced with 8-in. cast iron pipe with water tight joints. Spring water is obtained only from the spring which is reported to be 18 ft deep, constructed of reinforced concrete which has the upper portion water tight and the lower portion porous so that water can enter.

On July 6, 1915, the spring reportedly flowed at a rate of 78 gpm and in 1965 the flow was reported to be 72 gpm.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B118588) is for a water sample from the spring collected December 18, 1974.

SPRING SUPPLY, LABORATORY NO. B118588

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	19	
Manganese	Mn	0.0		Fluoride	F	0.7	0.04
Ammonium	NH_4	0.0	0.00	Boron	B	0.1	
Sodium	Na	25	1.09	Nitrate	NO_3	8.4	0.14
Potassium	K	2.2	0.06	Chloride	Cl	48	1.35
Calcium	Ca	78	3.89	Sulfate	SO_4	58	1.21
Magnesium	Mg	38	3.13	Alkalinity (as $CaCO_3$)		267	5.34
Arsenic	As	0.00		Hardness (as $CaCO_3$)		351	7.02
Barium	Ba	0.0					
Copper	Cu	0.00		Total dissolved minerals		430	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)	7.6		
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*	1.2		
Silver	Ag	0.00		± deviation	1.6		
Cyanide	CN	0.00		Beta *pc/l*	2.5		
Zinc	Zn	0.0		± deviation	1.8		

WELL NO. 1, open to the Silurian dolomite, was completed in 1931 to a depth of 130 ft. This well was abandoned about 1969 when the motor became inoperable and was sealed about 1974. The well was located near the collecting reservoir on Barrington Ave., approximately 2100 ft N and 1200 ft E of the SW corner of Section 23, T42N, R8E. The land surface elevation at the well is approximately 780 ft.

A 6-in. diameter hole was drilled to a depth of 130 ft. The well was cased with 6-in. pipe to a depth of 100 ft.

On August 4, 1947, after a 42-hr idle period, the well reportedly produced 125 gpm for 30 min with a drawdown of 30.0 ft from a nonpumping water level of 51.5 ft below the pump base.

On August 28, 1958, the nonpumping water level was reported to be 52 ft below the top of the casing.

A mineral analysis of a sample (Lab. No. 111398) collected August 4, 1947, after pumping for 30 min at 125 gpm,

showed the water to have a hardness of 372 mg/l, total dissolved minerals of 414 mg/l, and an iron content of 1.6 mg/l.

Prior to the construction of Well No. 2, a test hole was constructed to a depth of 70 ft in the SW quarter of Section 23, T42N, R8E.

WELL NO. 2, finished in sand and gravel, was completed in December 1958 to a depth of 68.8 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located in the main pumping station at 408 Barrington Ave., approximately 2100 ft N and 1250 ft E of the SW corner of Section 23, T42N, R8E. The land surface elevation at the well is approximately 785 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil, sand, fill, and yellow clay	5	5
Soft blue grey clay and boulders	39	44
Very coarse sand and gravel, boulders	17	61
Fine to coarse sand and gravel	8	69
Gray clay and boulders	3	72

A 38-in. diameter hole was drilled to a depth of 72 ft. The well is cased with 12-in. standard pipe from 0.6 ft above the pump station floor to a depth of 5 3.8 ft followed by 15 ft of 12-in. No. 6 (0.080 in.) Layne stainless steel shutter screen. The annulus between the bore hole and casing-screen assembly is filled with cement from 0 to 15 ft, with sand fill from 15 to 41 ft, and with gravel from 41 to 72 ft.

A production test was conducted by the driller on December 6, 1958. After 6 hr of pumping at a rate of 759 gpm, the drawdown was 9 ft from a nonpumping water level of 37 ft below the top of the casing.

In January 1961, the nonpumping water level was reported to be 52 ft.

The pumping equipment presently installed is a Layne turbine pump (Serial No. 39794) set at 65 ft, rated at 400 gpm at about 72 ft head, and powered by a 10-hp 1800 rpm U. S. electric motor (Serial No. 2795381). The well is equipped with 65 ft of airline.

A partial analysis of a sample (Lab. No. 148533) collected during the initial production test, after pumping for 6 hr at 759 gpm, showed the water to have a hardness of 387 mg/l, total dissolved minerals of 387 mg/l, and an iron content of 0.1 mg/l.

Prior to the construction of Well No. 3, a test hole was constructed in November 1968 to a depth of 128 ft by the Layne-Western Co., Aurora. It was located in the NW quarter of Section 23, T42N, R8E.

WELL NO. 3, finished in sand and gravel, was completed in April 1969 to a depth of 128 ft by the Layne-Western Co., Aurora. The well is located at the top of Barrington Ave. hill, approximately 2600 ft S and 1800 ft E of the NW corner of Section 23, T42N, R8E. The land surface elevation at the well is approximately 830 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Brown clay	6	6
Dirty sand and gravel and boulders	4	10
Gravel and boulders	32	42
Gravel and clay	4	46
Gray clay	8	54
Gravel and clay	11	65
Gray clay, hard	13	78
Medium coarse sand, trace of gravel, some fine gravel	10	88
Clay and sand and gravel	8	96
Coarse sand and gravel, few boulders, few clay balls	5	101
Coarse sand and gravel and clay	10	111
Coarse sand and gravel	14	125
Medium to coarse sand and boulders	3	128
Brown, peat, and black shale	2	130

A 38-in. diameter hole was drilled to a depth of 128 ft. The well is cased with 16-in. steel pipe from 2 ft above land surface to a depth of 108 ft followed by 20 ft of 16-in. No. 6 (0.080 in.) Layne stainless steel shutter screen. The annulus between the bore hole and casing-screen assembly is filled with Redi-Mix cement from 0 to 15 ft, with pit run sand from 15 to 88 ft, and with 22 yards of No. 3 Muscatine gravel from 88 to 128 ft.

A production test was conducted by the driller on April 2, 1969. After 8 hr of pumping at rates of 1043 to 1033 gpm, the final drawdown was 32.6 ft from a nonpumping water level of 61.2 ft below the top of the casing.

The pumping equipment presently installed is a Byron Jackson turbine pump set at 110 ft, rated at 1000 gpm at about 251 ft head, and powered by a 100-hp General Electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B118636) is for a water sample from the well collected December 18, 1974, after 1 hr of pumping at 900 gpm.

WELL NO. 3, LABORATORY NO. B118636

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.6		Silica	SiO_2	19	
Manganese	Mn	0.1		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.8	0.04	Boron	B	0.1	
Sodium	Na	10.5	0.46	Nitrate	NO_3	1.8	0.03
Potassium	K	2.1	0.05	Chloride	Cl	27	0.76
Calcium	Ca	80	3.99	Sulfate	SO_4	58	1.21
Magnesium	Mg	45	3.70	Alkalinity (as $CaCO_3$)		325	6.50
Arsenic	As	0.00		Hardness (as $CaCO_3$)		384	7.68
Barium	Ba	0.2					
Copper	Cu	0.02		Total dissolved minerals		441	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0003		pH (as rec'd)		7.8	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		1.0	
Silver	Ag	0.01		± deviation		1.7	
Cyanide	CN	0.00		Beta *pc/l*		0.9	
Zinc	Zn	0.2		± deviation		1.7	

ELBURN

The village of Elburn (1122) installed a public water supply in 1900. Three wells are in use. This supply is cross connected with the Elburn Packing Co. wells. In 1951 there were approximately 250 services, almost all were metered. In 1975 there were 400 services, all metered; the average and maximum daily pumpages were 140,132 and 210,000 gpd, respectively. The water is aerated, chlorinated, settled, and filtered.

WELL NO. 1, open to the Silurian dolomite and the Cambrian-Ordovician aquifer, was completed in 1900 to a depth of 1350 ft (measured in October 1952 to be 1308 ft deep) by Carl Phildot, St. Charles. This well was out of service from 1937 to 1953. The well is located in the old waterworks building on the west side of North First St., approximately 1450 ft S and 275 ft E of the NW corner of Section 5, T39N, R7E. The land surface elevation at the well is approximately 850 ft.

A 10-in. diameter hole was drilled to a depth of 148 ft, reduced to 8 in. between 148 and 376 ft, and finished 6 in. in diameter from 376 to 1350 ft. The well is cased with 10-in. pipe from the pumphouse floor to a depth of 148 ft.

On May 3, 1928, the nonpumping water level was reported to be about 75 ft below the pump base.

On October 22, 1952, the well reportedly produced 68 gpm for 4 hr with a drawdown of 20 ft from a nonpumping water level of 232 ft.

In 1973, the nonpumping water level was reported to be 345 ft below the pump base.

The pumping equipment presently installed is a 10-stage Sumo submersible pump set at 400 ft, rated at 100 gpm at about 450 ft TDH, and powered by a 15-hp Sumo electric motor. The well is equipped with 400 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 01433) is for a water sample from the well collected September 13, 1971, after 1 hr of pumping at 100 gpm.

WELL NO. 1, LABORATORY NO. 01433

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.05	0.00	Silica	SiO_2	7.0	
Manganese	Mn	0.0		Fluoride	F	0.8	0.04
Ammonium	NH_4	0.7	0.04	Nitrate	NO_3	0	
Sodium	Na	23	1.00	Chloride	Cl	5	0.14
Potassium	K	9.3	0.24	Sulfate	SO_4	5	0.10
Calcium	Ca	62.4	3.11	Alkalinity (as $CaCO_3$)		294	5.88
Magnesium	Mg	23	1.89	Hardness (as $CaCO_3$)		252	
Barium	Ba	1.0		Total dissolved minerals		340	
Copper	Cu	0.0					
Cadmium	Cd	0.00					
Chromium	Cr	0.0		pH (as rec'd)		7.3	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha *pc/l*		11	
Nickel	Ni	0.0		± deviation		2	
Silver	Ag	0.0		Beta *pc/l*		33	
Zinc	Zn	0.0		± deviation		4	

WELL NO. 2, finished in sand and gravel, was completed in 1937 to a depth of 153 ft by M. L. Reichart, Batavia. The well is located on the west side of North First St. south of North St., approximately 1400 ft S and 250 ft E of the NW corner of Section 5, T39N, R7E. The land surface elevation at the well is approximately 850 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	152	152
Limestone	1	153

An 8-in. diameter hole was drilled to a depth of 153 ft. The well is cased with 8-in. pipe from land surface to a depth of 142 ft followed by 11 ft of 8-in. No. 8 slot Clayton Mark brass screen.

A production test was conducted by the State Water Survey on March 22-23, 1937. After 9 hr of pumping at a rate of 75 gpm, the drawdown was 65 ft from a nonpumping water level of 85 ft below land surface. During the next 15 hr of this test, pumping was gradually decreased to 40 gpm and continued at this rate with a constant drawdown of 65 ft.

On August 7, 1947, the nonpumping water level was reported to be 102.5 ft below the pump base after a 30-min idle period.

In 1973, the nonpumping water level was reported to be 142 ft below the pump base.

The pumping equipment presently installed consists of a 7 ½-hp U. S. electric motor, an 8-in., 5-stage American Well Works turbine pump (No. 60567) rated at 100 gpm at about 145 ft head, and has 140 ft of 5-in. column pipe. A 7.5-ft section of 5-in. suction pipe is attached to the pump intake. The well is equipped with 148.5 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 01434) is for a water sample from the well collected September 13, 1971, after 1 hr of pumping at 100 gpm.

WELL NO. 2, LABORATORY NO. 01434

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.5	0.02	Silica	SiO_2	18	
Manganese	Mn	0.0		Fluoride	F	0.6	0.03
Ammonium	NH_4	3.1	0.17	Nitrate	NO_3	0	
Sodium	Na	35	1.52	Chloride	Cl	2.0	0.06
Potassium	K	1.3	0.03	Sulfate	SO_4	12	0.25
Calcium	Ca	57.5	2.87	Alkalinity (as $CaCO_3$)		320	6.40
Magnesium	Mg	30	2.47	Hardness (as $CaCO_3$)		260	
Barium	Ba	0.0		Total dissolved minerals		350	
Copper	Cu	0.0					
Cadmium	Cd	0.00					
Chromium	Cr	0.0		pH (as rec'd)		7.4	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha *pc/l*		1	
Nickel	Ni	0.0		± deviation		1	
Silver	Ag	0.0		Beta *pc/l*		0	
Zinc	Zn	0.0		± deviation		2	

WELL NO. 3, open to the Cambrian-Ordovician aquifer, was completed in July 1971 to a depth of 1393 ft by the Wehling Well Works, Beecher. The well is located east of Highway 47 on the north side of the village, approximately 1295 ft N and 380 ft E of the SW corner of Section 32, T40N, R7E. The land surface elevation at the well is approximately 900 ft.

A 15.2-in. diameter hole was drilled to a depth of 352 ft and finished 12 in. in diameter from 352 to 1393 ft. The well is cased with 16-in. drive pipe from land surface to a depth of 208 ft and 12-in. pipe from land surface to a depth of 352 ft (cemented in).

A production test was conducted by the driller on July 28-29, 1971. After 23.8 hr of pumping at varying rates of 290 to 550 gpm, the final drawdown was 133 ft from a non-pumping water level of 362 ft below the top of the casing. Five hr after pumping was stopped, the water level had recovered to 376 ft.

The pumping equipment presently installed consists of a 40-hp Byron Jackson electric motor, a 7-in., 23-stage Byron Jackson submersible pump set at 510 ft, rated at 200 gpm at about 550 ft TDH, and has 510 ft of 4-in. column pipe. The well is equipped with 510 ft of airline.

A partial analysis of a sample (Lab. No. 186387) collected during the initial production test, showed the water to have a hardness of 246 mg/l, total dissolved minerals of 311 mg/l, and an iron content of 1.7 mg/l. The iron content is probably not representative of the water in this well because of initial pumping conditions.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Gravel and sand	30	30
Mud	160	190
Gravel, broken rock	10	200
Lime	6	206
Lime and shale	119	325
Shale	15	340
Lime	350	690
Sand	56	746
Sand, shale and red rock	14	760
Sand	14	774
Sand and shale	56	830
Sand	145	975
Red rock and sand	6	981
Sand	14	995
Red rock and green shale	10	1005
Sand	59	1064
Lime	111	1175
Sandy shale	10	1185
Lime	20	1205
Lime and green shale	9	1214
Sand	179	1393

ELGIN

The city of Elgin (55,691) installed a public water supply in 1887. Thirteen wells (Slade Ave. Well Nos. 1-6, Lavoie Ave. well, St. Charles St. Well No. 3, and Well Nos, 1A, 2A, 3A, 4A, and 5A) are in use and three other wells (Slade Ave. Shallow well, North State St. well, and Crighton Ave. well) are available for emergency use. This supply is also cross connected with the Elgin Mental Health Center (State Hospital) wells. In 1949 there were 9900 services; the average daily pumpage was 2,967,000 gpd. In 1974 there were 15,202 services, all metered; the average and maximum daily pumpages were 7,187,914 and 10,700,000 gpd, respectively. Water at the Slade Ave. and West Side plants is aerated, lime-soda softened, prechlorinated, fluoridated, and post chlorinated. Water at the St. Charles St. plant is aerated, zeolite softened, fluoridated, and chlorinated.

Initially, water was obtained from the Fox River with the pumping station and filtration plant located between the east bank of the Fox River and the Chicago and Northwestern RR, about 1000 ft north of Slade Ave. Because of adverse public opinion in obtaining water from this source, a groundwater supply consisting of the first four Slade Ave. wells was initiated in 1904. The supply from these wells and other wells subsequently drilled was not always adequate for the city demands, so the filtered river water supply was maintained to supplement the well supply until about 1920.

A description of the wells serving the Slade Ave, Treatment Plant follows:

SLADE AVE. WELL NO. 1, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in 1901 to a depth of 2000 ft (rehabilitated in 1960 to a depth of 1945 ft) by Frank M. Gray, Milwaukee, Wis. The well is located at the southwest corner of the pumping station, approximately 775 ft S and 725 ft W of the NE corner of Section 11, T41N, R8E. The land surface elevation at the well is approximately 725 ft.

A drillers log of Slade Ave. Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	38	38
Limestone	27	65
Shale	50	115
Limestone, dark	70	185
Limestone, light	140	325
Limestone, brown	75	400
Limestone, mixed with shale	85	485
Limestone	75	560
St. Peter Sandstone, dark	80	640
St. Peter Sandstone, white	62	702
Limestone, lower magnesium	48	750
Limestone, lower some hard	100	850
Limestone hard, some shale	30	880

Strata (continued)	*Thickness (ft)*	*Depth (ft)*
Sandstone, light pink	70	950
Pink limestone hard	100	1050
Sandstone	250	1300
Hard limestone	50	1350
Sandstone, dark	80	1430
Sandy limestone	150	1580
Sandstone	65	1645
"Potsdam" sandstone	155	1800
"Potsdam" reddish	80	1880
"Potsdam" mixed limestone	120	2000

Originally, a 12-in. diameter hole was reported to be drilled to a depth of 122 ft, reduced to 10 in. between 122 and 800 ft, and finished 8 in. in diameter from 800 to 2000 ft. In 1943, a sounding revealed an 11.5-in. hole to 404 ft, an unknown length of 10-in. **liner** at a depth of 800 ft, and an 8-in. diameter hole to the bottom. After rehabilitation in 1960 by S. B. Geiger & Co., Chicago, the hole was reported to be 20 in. in diameter to a depth of 125 ft, 16 in. in diameter from 125 to 800 ft, and 6 in. in diameter from 800 to 1945 ft. The well was then recased with 20-in. pipe from land surface to a depth of 125 ft and 16-in. pipe from land surface to a depth of 160 ft (cemented in).

In March 1917, a 25-lb weight was lowered in this well to a depth of 1159 ft, indicating bridging or filling of the well since construction.

In 1931, after a few years of infrequent use, the Varner Well and Pump Co., Dubuque, Iowa, cleaned out the well to a depth of 1850 ft and shot at depths of 1525, 1450, 1200, and 1100 ft. An airlift was installed and weir box measurements showed a production of 360 gpm with a drawdown of 36 ft from a nonpumping water level of 87 ft below land surface.

In 1933, the well reportedly produced 847 gpm for 48 hr with a drawdown of 73 ft from a nonpumping water level of 94 ft below the top of the well.

In 1943, S. B. Geiger & Co., Chicago, reportedly shot this well with a 500-lb charge of 100 percent blasting gelatin between the depths of 1120 and 1160 ft. Approximately 30 cubic yards of sand were removed from the well.

A production test was conducted by the State Water Survey on March 21-22, 1946. After 20.5 hr of pumping at rates ranging from 520 to 685 gpm, the final drawdown was 93 ft from a nonpumping water level of 147 ft below the pump base. Thirty-four min after pumping was stopped, the water level had recovered to 170 ft. During this test, Slade Ave. Well Nos. 2 and 3 were pumping intermittently.

In April 1946, the well was cleaned out by the Layne-Western Co., Aurora, to a depth of 1945 ft. Bridges were encountered at depths of 1145 and 1560 ft and were removed.

On April 23, 1947, after 5 hr of pumping at a rate of 1124 gpm, the pumping water level was below the 302-ft airline. On April 24 and May 2, 1947, the nonpumping water level was reported to be 157 ft below the pump base.

On June 27, 1948, the well reportedly produced 1076 gpm for 18 hr with a drawdown of 147 ft from a nonpumping water level of 160 ft below the pump base. '

In 1956, this well was cleaned out to a depth of 1935 ft. A bridge was found at a depth of 1145 ft.

From June 3, 1956 to April 21, 1957, nonpumping water levels ranged from 240 to 295 ft.

The pumping equipment presently installed consists of a 200-hp KSB electric motor, a Layne & Bowler submersible pump set at 600 ft, rated at about 1000 gpm, and has 600 ft of 6-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C008783) of a sample collected June 14, 1974, after pumping for 16 hr at 984 gpm, showed the water to have a hardness of 241 mg/l, total dissolved minerals of 330 mg/l, a barium content of 6.8 mg/l, and an iron content of 0.0 mg/l.

SLADE AVE. WELL NO. 2, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was constructed in 1904 to a depth of 1300 ft by Frank M. Gray, Milwaukee, Wis., deepened in 1924 to a depth of 1950 ft by Coney and Coon, Elgin, and cleaned and deepened in January 1946 to a depth of 1965 ft (rehabilitated in 1959 to a depth of 1935 ft) by the Layne-Western Co., Aurora. The well is located on the west side of the treatment plant about 205.4 ft northeast of Slade Ave. Well No. 1, approximately 640 ft S and 575 ft W of the NE corner of Section 11, T41N, R8E. The land surface elevation at the well is approximately 720 ft.

In March 1917, a 25-lb weight was lowered in this well to a depth of 1272 ft indicating bridging or filling of the well since construction. After the production had decreased, the well was cleaned out in 1924 and the well deepened to 1950 ft.

After deepening in 1924, the hole was reported to be 12 in. in diameter to a depth of 122 ft, 10 in. between 122 and 800 ft, and finished 8 in. in diameter from 800 to 1950 ft. In 1946, when the well was cleaned and deepened to a depth of 1965 ft, the following was reported: 12-in. diameter hole to a depth of 695.3 ft, reduced to 10 in. between 695.3 and 861.7 ft, and finished 8 in. in diameter from 861.7 to 1965 ft. A 6-in. slotted liner was placed from 1117 ft to a depth of 1264 ft. At this time a leak was reported in an upper 12-in. casing at a depth of 128 ft. After rehabilitation in 1959 by S. B. Geiger & Co., Chicago, the hole was reported to be 20 in. in diameter to a depth of 125 ft, 16 in. in diameter from 125 to 800 ft, and 6 in. in diameter from 800 to 1935 ft. The well was then recased with 20-in. pipe from land surface to a depth of 125 ft and 16-in. pipe from land surface to a depth of 160 ft (cemented in).

In 1933, the well reportedly produced 446 gpm for 48 hr with a drawdown of 58 ft from a nonpumping water level of 86 ft below the top of the well.

In 1941, S. B. Geiger & Co., Chicago, reportedly shot

this well at depths of 1375 and 1800 ft.

This well was rehabilitated by the Layne-Western Co., Aurora, from January to March 1946. It was found filled below 1221 ft with a hard blue sandy shale which was drilled and bailed out and the hole cleaned to a depth of 1965 ft. Following this rehabilitation work, a production test was conducted on March 12-13, 1946, by representatives of the city and the State Water Survey. After pumping for 22.9 hr at rates ranging from 550 to 465 gpm, the final drawdown was 113 ft from a nonpumping water level of 13 3 ft below the pump base. Ten min after pumping was stopped, the water level had recovered to 168 ft. During this test, Slade Ave. Well Nos. 1 and 3 were pumping intermittently.

On June 19, 1960, the well reportedly produced 790 gpm with a drawdown of 60 ft from a nonpumping water level of 328 ft below the pump base.

On July 4, 1971, the nonpumping water level was reported to be 440 ft.

The pumping equipment presently installed consists of a 200-hp Byron Jackson electric motor, a 12-in., 9-stage Byron Jackson submersible pump set at 600 ft, rated at 1000 gpm at about 550 ft TDH, and has 600 ft of 10-in. column pipe.

The following mineral analysis (Lab. No. 186198) is for a water sample from the well collected July 13, 1971, after 24 hr of pumping. Methane gas was reported in a previous sample.

SLADE AVE. WELL NO. 2, LABORATORY NO. 186198

		mg/l	me/l			mg/l	me/l
Iron (total)	Fe	0.1		Silica	SiO_2	6.8	
Manganese	Mn	0.04		Fluoride	F	0.7	
Ammonium	NH_4	0.5	0.03	Boron	B	0.2	
Sodium	Na	28.4	1.24	Nitrate	NO_3	0.0	0.00
Potassium	K	9.1	0.23	Chloride	Cl	15	0.42
Calcium	Ca	63.2	3.15	Sulfate	SO_4	14.0	0.29
Magnesium	Mg	25.4	2.09	Alkalinity (as $CaCO_3$)		300	6.00
Strontium	Sr	2.83	0.06	Hardness (as $CaCO_3$)		262	5.24
Barium	Ba	3.1					
Copper	Cu	0.21	0.01	Total dissolved minerals		368	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	<0.05		Turbidity		3	
Lithium	Li	0.01		Color		0	
Nickel	Ni	<0.05		Odor		0	
Zinc	Zn	0.20	0.01	Temp. (reported)		56.5F	

SLADE AVE. WELL NO. 3, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was constructed in 1904 to a depth of 1300 ft by Frank M. Gray, Milwaukee, Wis., and deepened in 1924 to a depth of 1960 ft (rehabilitated in 1960 to a depth of 1793 ft) by Coney and Coon, Elgin. The well is located about 300 ft north of the treatment plant about 333.6 ft northeast of Slade Ave. Well No. 1, approximately 600 ft S and 440 ft W of the NE corner of Section 11, T41N, R8E. The land surface elevation at the well is approximately 720 ft.

In March 1917, a 25-lb weight was lowered in this well to a depth of 1178 ft indicating bridging or filling of the well since construction. After the production had decreased, the well was cleaned out in 1924 and the well deepened to 1960 ft.

After deepening in 1924, the hole was reported to be 12 in. in diameter to a depth of 122 ft, 10 in. between 122 and 800 ft, and finished 8 in. in diameter from 800 to 1960 ft. The well was reported to be cased with 12-in. pipe to at least 115 ft. After rehabilitation in 1961 by S. B. Geiger & Co., Chicago, the hole was reported to be 20 in. in diameter to a depth of 145 ft, 15.2 in. in diameter from 145 to 800 ft, and 8 in. in diameter from 800 to 1793 ft. The well was then recased with 20-in. pipe from land surface to a depth of 145 ft and 16-in. pipe from land surface to a depth of 160 ft (cemented in).

In 1934, the well reportedly produced 893 gpm for 1 hr with a drawdown of 65 ft from a nonpumping water level of 93 ft below land surface.

In May 1947, after a new pump was installed, a 24-hr production test was conducted while pumping at a rate of 1146 gpm. Considerable sand was discharged which cleared up during the test. Subsequent operations showed periodical discharges of sand which could only be cleared up by continuous periods of operation. On May 12, 1947, the nonpumping water level was reported to be 155 ft below the pump base after a 12-hr idle period.

On June 27, 1948, the well reportedly produced 1053 gpm for 18 hr with a drawdown of 75 ft from a nonpumping water level of 170 ft below the pump base.

From May 6, 1956 to April 21, 1957, nonpumping water levels ranged from 260 to 305 ft.

On June 19, 1960, the nonpumping water level was reported to be 320 ft below the pump base.

After this well was rehabilitated in 1960-1961, a production test using three observation wells was conducted by S. B. Geiger & Co. on February 28-March 1, 1961, After 20.5 hr of pumping at a rate of 1375 gpm, the drawdown was 79 ft from a nonpumping water level of 352 ft.

The pumping equipment presently installed is a Byron Jackson submersible pump set at 600 ft, rated at 900 gpm, and powered by a 150-hp Byron Jackson electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B19910) of a sample collected November 15, 1976, after pumping for 2 hr at 909 gpm, showed the water to have a hardness of 263 mg/l, total dissolved minerals of 304 mg/l, a barium content of 4.4 mg/l, and an iron content of 0.1 mg/l.

SLADE AVE. WELL NO. 4, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was constructed in 1904 to a depth of 1300 ft by Frank M. Gray, Milwaukee, Wis., and deepened in 1924 to a depth of 1880 ft (rehabilitated in 1954 to a depth of 1898 ft) by Coney and Coon, Elgin. The

well is located about 600 ft north of the treatment plant about 501.4 ft northeast of Slade Ave. Well No. 1, approximately 525 ft S and 290 ft W of the NE corner of Section 11, T41N, R8E. The land surface elevation at the well is approximately 720 ft.

In March 1917, a 25-lb weight was lowered in this well to a depth of 589 ft indicating bridging or filling of the well since construction. After production decreased, the well was cleaned out in 1924 and was deepened to 1880 ft.

After deepening in 1924, the hole was reported to be 12 in. in diameter to a depth of 122 ft, 10 in. between 122 and 800 ft, and finished 8 in. in diameter from 800 to 1880 ft. In May 1942 the hole diameter was checked and reported to be 12 in. in diameter to a depth of 591 ft, reduced to 10 in. between 591 and 860 ft, and finished 8 in. in diameter from 860 to 1880 ft. A 12-in. diameter casing was reported to be from land surface to a depth of 300 ft. After rehabilitation in October 1954, the hole was reported to be 20 in. in diameter from 275 W 501 ft, 15 in. in diameter from 501 to 792 ft, and 8 in. in diameter from 792 to 1898 ft. The well is cased with 30-in. drive pipe from land surface to a depth of 46 ft, 25-in. pipe from land surface to a depth of 146 ft (cemented in), and 20-in. pipe from land surface to a depth of 275 ft (cemented in). In October 1972, the Layne-Western Co., Aurora, installed a 15-in. liner from 622 ft to a depth of 823 ft.

In 1934, the well reportedly produced 857 gpm for 6 hr with a drawdown of 51 ft from a nonpumping water level of 104 ft below land surface.

In May 1942, S. B. Geiger & Co., Chicago, checked this well for hole sizes and depth. A bridge was found in the well at a depth of 590 ft which was removed.

In May 1947, a 24-hr production test was conducted after a new pump was installed. After pumping at a rate of 1146 gpm, the drawdown was 92 ft from a nonpumping water level of 156 ft below the pump base. A difficulty of pumping sand with a lowered turbine setting was experienced and the water would clear up only after long periods of continuous pumping.

This well was rehabilitated in October 1954 by L. Cliff Neely, Batavia. The well reportedly produced 1077 gpm with a drawdown of 87 ft from a nonpumping water level of 250 ft below land surface.

On January 24, 1957, the well reportedly produced 1000 gpm for 18 hr with a drawdown of 60 ft from a nonpumping water level of 265 ft.

From May 6, 1956 to April 21, 1957, nonpumping water levels ranged from 250 to 310 ft.

In May 1959, the well reportedly produced 915 gpm for 3.5 hr with a drawdown of 110 ft from a nonpumping water level of 280 ft.

On June 19, 1960, after pumping at a rate of 1038 gpm, the drawdown was 52 ft from a nonpumping water level of 318 ft below the pump base.

The pumping equipment presently installed consists of a 200-hp Byron Jackson electric motor, a 12-in., 10-stage Byron Jackson submersible pump set at 600 ft, rated at 1000 gpm at about 600 ft TDH, and has 600 ft of 8-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B20295) of a sample collected November 15, 1976, after pumping for 4 hr at 1230 gpm, showed the water to have a hardness of 256 mg/l, total dissolved minerals of 317 mg/l, a barium content of 3.1 mg/l, and an iron content of 0.0 mg/l.

SLADE AVE. SHALLOW WELL, finished in sand and gravel, was dug in 1914 to a depth of 19 ft, and deepened in 1934 as a drilled well to a depth of 53.5 ft (reported to be 52.9 ft deep in 1970). This well is available for emergency use. The well is located about 110 ft southwest of the pumping station, approximately 850 ft S and 700 ft W of the NE corner of Section 11, T41N, R8E. The land surface elevation at the well is approximately 725 ft.

The diameter of the dug portion of the well is not recorded and it was lined with concrete. The drilled part was cased with 12-in. pipe followed by a 12-in. diameter screen. In May 1970, after rehabilitation, the well was cased with 10-in. pipe from land surface to a depth of 42.9 ft followed by 10 ft of 10-in. No. 5 (0.105 in.) Layne stainless steel shutter screen.

In 1916, the nonpumping water level was reported to be 28 ft and the well produced about 600,000 gpd. When the nearby 6-in. wells were placed in use in 1921, the water level was drawn to the bottom of the dug portion of the well.

On September 28, 1946, the well reportedly produced 200 gpm with a drawdown of 10 to 12 ft from a nonpumping water level of 12 ft below the pump base after an idle period of a month.

This well was rehabilitated in 1970 by the Layne-Western Co., Aurora, and the depth was reported to be 52.9 ft. A new casing, screen, and pump were installed. On May 26, 1970, after the well was acidized with 500 gal of HC1, the Layne-Western Co. reported that the well produced 289 gpm with a drawdown of 25.3 ft from a nonpumping water level of 9.7 ft.

The pumping equipment presently installed is an Aurora turbine pump set at 47 ft, rated at 200 gpm, and powered by a 7½-hp U.S. electric motor.

A mineral analysis of a sample (Lab. No. 115123) collected June 28, 1948, after pumping for 6 hr at 200 gpm, showed the water to have a hardness of 332 mg/l, total dissolved minerals of 386 mg/l, and an iron content of 0.5 mg/l.

Three 6-in. diameter wells, finished in sand and gravel, were drilled about 1921 to depths of about 37 ft, and spaced 22 ft apart, the nearest well being about 45 ft from the Slade Ave. Shallow Well. Their combined production was reported to be 500,000 gpd in December 1921. Only one of the pumps was operated continuously at a rate of 350 gpm in January 1925, because little additional water could be obtained by the operation of additional pumps. By August 1931, continuous

operation of a single well in the group produced 250,000 gpd. These wells were abandoned in 1932.

SLADE AVE. WELL NO. 5, open to the Cambrian-Ordovician aquifer, was completed in September 1949 to a depth of 1225 ft by the Layne-Western Co., Aurora. The well is located southwest of the pumping station about 600 ft southwest of Slade Ave. Well No. 1, approximately 1175 ft S and 1175 ft W of the NE corner of Section 11, T41N, R8E. The land surface elevation at the well is approximately 725 ft.

A drillers log of Slade Ave. Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Yellow clay	5	5
Sand and gravel	30	35
Limestone	25	60
Shale	50	110
Limestone	120	230
Limestone and shale	45	275
Limestone	305	580
Sandstone	170	750
Broken limestone	220	970
Sandstone and shale	65	1035
Sandstone	180	1215
Shale	10	1225

A 30-in. diameter hole was drilled to a depth of 129 ft and finished 20 in. in diameter from 129 to 1225 ft. The well is cased with 30-in. OD drive pipe from land surface to a depth of 65 ft and 22-in. OD pipe from land surface to a depth of 129 ft (cemented in).

A production test was conducted by the driller on September 22-23, 1949. After 20.4 hr of pumping at rates ranging from 1340 to 1001 gpm, the drawdown was 210 ft from a nonpumping water level of 100 ft below the pump base. Pumping was continued for 5.6 hr at rates ranging from 805 to 200 gpm with a final drawdown of 149 ft.

During the period of November 5-December 31, 1950, the nonpumping water levels ranged from 210 to 240 ft.

During the period of May 6, 1956 to April 21, 1957, the nonpumping water levels ranged from 250 to 310 ft.

On May 6, 1959, the well reportedly produced 1202 gpm for 3 hr with a drawdown of 88 ft from a nonpumping water level of 300 ft.

On June 19, 1960, the well reportedly produced 1202 gpm with a drawdown of 75 ft from a nonpumping water level of 307 ft below the pump base.

The pumping equipment presently installed is a 12-in., 9-stage Byron Jackson submersible pump set at 600 ft, rated at 1000 gpm, and powered by a 200-hp Byron Jackson electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B20294) of a sample collected November 15, 1976, after pumping for 28 hr at 1018 gpm, showed the water to have a hardness of 266 mg/l, total dissolved minerals of 347 mg/l, a barium content of 5.4 mg/l, and an iron content of 0.0 mg/l.

SLADE AVE. WELL NO. 6, open to the Cambrian-Ordovician aquifer, was completed in March 1958 to a depth of 1300 ft by L. Cliff Neely, Batavia. The well is located about 650 ft southwest of Slade Ave. Well No. 5 and 1250 ft southwest of Slade Ave. Well No. 1, approximately 1750 ft S and 1500 ft W of the NE corner of Section 11, T41N, R8E. The land surface elevation at the well is approximately 725 ft.

A drillers log of Slade Ave. Well No. 6 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Gravel	30	30
Gravel and sand	20	50
Lime	13	63
Sandy shale	7	70
Shale	45	115
Lime	45	160
Shale	21	181
Lime	53	234
Shale	36	270
Lime	323	593
Sand	47	640
Lime	10	650
Sand	98	748
Gypsum white	2	750
Sand	19	769
Lime	11	780
White gypsum	5	785
Lime	32	817
Shale	3	820
Sandy lime	5	825
Lime	75	900
Gypsum	8	908
Lime	2	910
Dolomite	10	920
Lime	10	930
Red rock and shale	10	940
Lime	25	965
Red sandy shale	11	976
Red rock and lime shells	21	997
Shale	36	1033
Sandy lime	21	1054
Sand	121	1175
Lime	6	1181
Sand	34	1215
Black lime	5	1220
Shale	80	1300

A 26-in. diameter hole was drilled to a depth of 296 ft and finished 19 in. in diameter from 296 to 1300 ft. The well is cased with 26-in. drive pipe from land surface to a depth of 54 ft and 20-in. pipe from land surface to a depth of 293.5 ft (cemented in).

Upon completion, the well reportedly produced 1503 gpm with a drawdown of 37 ft from a nonpumping water level of 407 ft below the pump base.

The pumping equipment presently installed is a 14-in., 7-stage Byron Jackson submersible pump set at 600 ft, rated at 1500 gpm at about 500 ft TDH, and powered by a 250-hp Byron Jackson electric motor.

A partial analysis of a sample (Lab. No. 146283) collected April 1, 1958, showed the water to have a hardness of 252 mg/l, total dissolved minerals of 326 mg/l, and an iron content of 0.2 mg/l.

A description of the wells serving the St. Charles St.

Treatment Plant follows:

ST. CHARLES ST. WELL NO. 1, finished in sand and gravel, was completed in 1921 to a depth of 100 ft by the Kelly Well Co., Grand Island, Neb. This well was abandoned about 1933. The well was located in the southern part of the city on the west side of St. Charles St. between Dixon and Elgin Aves., approximately 700 ft N and 1500 ft W of the SE corner of Section 24, T41N, R8E. The land surface elevation at the well is approximately 718 ft.

A drillers log of St. Charles St. Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay, gravel, and boulders	13	13
Gravel and clay	17	30
Clay	10	40
Clay, few boulders, and fine sand	23	63
Fine sand	1	64
Clay and gravel	13	77
Coarse sand	11	88
Gravel and boulders	9	97
Boulders	4	101

The well was cased with 24-in. OD by 18-in. ID concrete pipe from within a pit that was 11 ft deep to a depth of 78 ft. A perforated concrete screen of the same size extended from 78 to 100 ft and a concrete plug extended to 101 ft.

Upon completion, the well reportedly produced 1080 gpm for 7 hr each day for 4 days with a maximum drawdown of 24 ft from a nonpumping water level at the top of the casing.

The production rate of the well gradually decreased to 860 gpm in 1925, 685 gpm in June 1928, and 133 gpm in August 1931. No recession in the nonpumping water level had occurred during the 10-year operation of the well and the diminished capacity was attributed to a blocking of the water passages in the concrete screen or the gravel surrounding it.

About October 1931, after the well was surged for 3 days and considerable sand was removed, a test was made showing an increase in production of 250 gpm. Surging was continued but after another day nothing but pea-sized gravel was removed and upon testing the production decreased to the presurging capacity of 100 gpm.

A mineral analysis of a sample (Lab. No. 53092) collected January 13, 1925, showed the water to have a hardness of 269 mg/l, total dissolved minerals of 377 mg/l, and an iron content of 1.2 mg/l.

An attempt to construct a sand and gravel well at the following Lavoie Ave. well site to a depth of 85 ft failed to produce a sufficient quantity of water.

LAVOIE AVE. WELL, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was constructed in September 1931 to a depth of 677.5 ft (electrically logged in 1943 to a depth of 654 ft) by the W. L. Thome Co., Des Plaines, and deepened in 1945 to a depth of 1978 ft by S. B. Geiger & Co., Chicago. The well is located in the southeastern part of the city on the east side of Lavoie Ave. between Hammond and Elgin Aves., approximately 200 ft N and 270 ft W of the SE corner of Section 24, T41N, R8E. The land surface elevation at the well is approximately 710 ft.

A sample study log of the Lavoie Ave. Well furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
"Clay"	4	4
"Sand"	26	30
Gravel, clean	55	85
ORDOVICIAN SYSTEM		
Maquoketa shale and dolomite	190	275
Galena-Platteville dolomites	335	610
Glenwood Formation		
"Sandstone, hard"	55	665
"Sandstone and shale"	12.5	677.5
St. Peter Sandstone		
Sandstone	122.5	800
Conglomerate of sandstone, shale, and chert	38	838
Oneota Dolomite, some shale and sandstone	40	878
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	102	980
Franconia Formation, shale, some sandstone and dolomite	75	1055
Ironton-Galesville Sandstone		
Sandstone, some dolomite	85	1140
Sandstone, incoherent	65	1205
Sandstone and dolomite	20	1225
Eau Claire shale, sandstone, and dolomite	425	1650
Mt. Simon Sandstone	328	1978

When the well was deepened in 1945, a 30-in. diameter hole was drilled to a depth of 87.3 ft, reduced to 15 in. between 87.3 and 867 ft, reduced to 12 in. between 867 and 1070 ft, reduced to 10 in. between 1070 and 1414 ft, and finished 8 in. in diameter from 1414 to 1978 ft. The well is cased with 30-in. OD pipe from land surface to a depth of 8 ft, 24-in. pipe from land surface to a depth of 40 ft, 16-in. OD pipe from 6 ft above the floor of a well pit to a depth of 87.3 ft, 12-in. pipe from 805 ft to a depth of 867 ft, 10-in. pipe from 966 ft to a depth of 1070 ft, and 8-in. pipe from 1230 ft to a depth of 1414 ft. In 1948, the Layne-Western Co., Aurora, removed the 12-in. liner and replaced it with a slotted liner.

When the well was completed to a depth of 677.5 ft, a production test was conducted on September 24, 1931. After 18 hr of pumping at rates of 690 to 700 gpm, the drawdown was 181 ft from a nonpumping water level of 7 ft below land surface.

On November 22, 1943, the nonpumping water level was reported to be 20 ft below land surface.

On December 31, 1945, after deepening, the nonpumping water level was reported to be 75 ft below the pump base.

In August 1946, the well reportedly produced about 1000 gpm with a drawdown of 212 ft from a nonpumping water level of 73 ft below the pump base.

On March 1, 1947, after a 6-hr idle period, the nonpumping

water level was reported to be 60 ft.

In 1949, the Layne-Western Co., Aurora, rehabilitated and shot this well as follows: 300 qt nitro from 1135 to 1180 ft, 200 qt nitro from 1094 to 1130 ft, and 200 qt nitro from 745 to 790 ft. In a following test, the well reportedly produced 791 gpm for 30 hr with a drawdown of 192 ft from a nonpumping water level of 67 ft below land surface.

The pumping equipment presently installed consists of a 150-hp U. S. electric motor, an 11-in., 9-stage Byron Jackson turbine pump set at 550 ft, rated at 900 gpm at about 540 ft TDH, and has 550 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 550 ft of airline.

A partial analysis of a sample (Lab. No. 149546) collected May 6, 1959, showed the water to have a hardness of 272 mg/l, total dissolved minerals of 439 mg/l, and an iron content of 0.1 mg/l.

ST. CHARLES ST. WELL NO. 2, finished in sand and gravel, was completed in October 1933 to a depth of 105 ft by the Kelly Well Co., Grand Island, Neb. This well is not in use. The well is located about 35 ft northeast of St. Charles St. Well No. 1, approximately 725 ft N and 1475 ft W of the SE corner of Section 24, T41N, R8E. The land surface elevation at the well is approximately 718 ft.

The well is cased with 16-in. ID concrete pipe and perforated concrete screen to a depth of 105 ft.

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

In 1944, weekly observations of the nonpumping water level indicated levels of 24 to 25 ft below the pump base.

Nonpumping water levels were reported to be 16 ft on November 16, 1946; 13.5 ft on January 30, 1947; and 15.6 ft on February 26, 1947.

The pumping equipment presently installed consists of a 40-hp U. S. electric motor, a 12-in., 4-stage American Well Works turbine pump (Head No. 58076, Bowl Assembly No. 57434) rated at 450 gpm at about 237 ft head, and has 70.4 ft of 8-in. column pipe. A 12-ft section of 8-in. suction pipe is attached to the pump intake. The well is equipped with 85 ft of airline.

A mineral analysis of a sample (Lab. No. 115158) collected June 30, 1948, showed the water to have a hardness of 552 mg/l, total dissolved minerals of 652 mg/l, and an iron content of 4.4 mg/l.

ST. CHARLES ST. WELL NO. 3, open to the Cambrian-Ordovician aquifer, was completed in November 1953 to a depth of 1255 ft by L. Cliff Neely, Batavia. The well is located just north of the treatment plant near the rear of the building about 50 ft west of St. Charles St. Well No. 2, approximately 725 ft N and 1525 ft W of the SE corner of Section 24, T41N, R8E. The land surface elevation at the well is approximately 718 ft.

A sample study log of St. Charles St. Well No. 3 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
No sample	110	110
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, brownish gray	131	241
Shale, dolomitic, silty, grayish brown	34	275
Galena-Platteville Groups (poor samples)		
Dolomite, pale grayish brown, fine to medium, slightly pyritic	335	610
Ancell Group		
Glenwood-St. Peter Sandstone (poor samples)		
Sandstone, light gray, fine to medium, incoherent	218	828
Chert, yellow, pink, orange, white, chalky; and shale, greenish gray	42	870
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, sandy, pale pinkish buff, very fine; sandstone, fine to coarse, incoherent; little shale, green, red, partly slightly glauconitic, geode quartz	125	995
Franconia Formation		
Shale, dolomitic, silty, red, weak; sandstone, dolomitic, silty, greenish gray, fine, glauconitic	60	1055
Ironton-Galesville Sandstone		
Sandstone, gray, fine to very coarse, rounded, incoherent	170	1225
Eau Claire Formation		
Dolomite, silty, sandy, pale yellowish gray, pink, very fine; sandstone, light gray, fine to medium, incoherent; shale, silty, sandy, dolomitic, greenish gray, weak	30	1255

A 25-in. diameter hole was drilled to a depth of 315 ft, reduced to 20 in. between 315 and 1040 ft, and finished 15.2 in. in diameter from 1040 to 1255 ft. The well is cased with 26-in. drive pipe from land surface to a depth of about 130 ft and 20-in. OD pipe from land surface to a depth of 315 ft (pressure grouted with 375 bags of cement).

In November 1953, six charges of nitroglycerin were exploded as follows: 420 qt at 1225 ft, 100 qt at 858 ft, 120 qt at 807 ft, 100 qt at 747 ft, 100 qt at 646 ft, and 100 qt at 596 ft. By February 2, 1954, about 300 cubic yards of sandstone had been removed since the shooting in the previous November.

A production test was conducted on March 12, 1954, by representatives of the driller and the city. After 48 hr of pumping at a rate of 1438 gpm, the drawdown was 188 ft from a nonpumping water level of 192 ft.

On May 30, 1960, the well reportedly produced 1100 gpm with a drawdown of 100 ft from a nonpumping water level of 285 ft below the pump base.

On August 18, 1975, the Layne-Western Co., Aurora, reported that the well produced 600 gpm with a drawdown of 75 ft from a nonpumping water level of 400 ft.

The pumping equipment presently installed consists of a 150-hp U. S. electric motor, a 10-in., 17-stage Aurora turbine pump (No. 77565) set at 600 ft, rated at 1000 gpm at about 390 ft TDH, and has 600 ft of 8-in. column pipe. The well is equipped with 600 ft of airline.

The following mineral analysis (Lab. No. 186199) is for a water sample from the well collected July 13, 1971, after 24 hr of pumping.

ST. CHARLES ST. WELL NO.3, LABORATORY NO. 186199

		mg/l	me/l			mg/l	me/l
Iron (total)	Fe	0.2		Silica	SiO_2	8.4	
Manganese	Mn	0.11		Fluoride	F	0.7	
Ammonium	NH_4	0.5	0.03	Boron	B	0.2	
Sodium	Na	23.7	1.03	Nitrate	NO_3	0.0	0.00
Potassium	K	10.7	0.27	Chloride	Cl	4	0.11
Calcium	Ca	63.2	3.15	Sulfate	SO_4	7.0	0.15
Magnesium	Mg	24.9	2.05	Alkalinity(as $CaCO_3$)		308	6.16
Strontium	Sr	3.18	0.07	Hardness (as $CaCO_3$)		260	5.20
Barium	Ba	7.4					
Copper	Cu	0.10		Total dissolved minerals		342	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	<0.05		Turbidity		1	
Lithium	Li	0.01		Color		0	
Nickel	Ni	<0.05		Odor		H_2S (at well)	
Zinc	Zn	0.26	0.01	Temp. (reported)		56.5F	

A description of the wells serving the West Side Treatment Plant follows:

WELL NO. 1A, open to the Cambrian-Ordovician aquifer, was completed in June 1963 to a depth of 1305 ft (cleaned out to 1268 ft) by the Layne-Western Co., Aurora. The well is located about 600 ft west of the West Side Treatment Plant near the southwest corner of the south lagoon, approximately 1865 ft N and 2590 ft W of the SE corner of Section 16, T41N, R8E. The land surface elevation at the well is approximately 840 ft.

A drillers log of Well No. 1A follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Surface	5	5
Sand	10	15
Sand and gravel	10	25
Blue clay and gravel	45	70
Soft white sand	5	75
Blue clay and gravel	45	120
Soft gray sand	12	132
Hard gray limestone	13	145
Medium gray shale and limestone	50	195
Medium gray shale	11	206
Dark gray limestone	29	235
Dark gray limestone and shale	40	275
Gray limestone	45	320
Medium gray shale	31	351
Gray limestone	14	365
Medium brown limestone	10	375
Medium gray limestone	293	668
Medium white sandstone	7	675
Soft white sandstone	25	700
Medium gray sandstone	15	715
Hard gray sandstone	5	720
Gray sandy limestone	20	740
Soft white sandstone	55	795
Sandstone and green shale breaks	13	808
Medium white sandstone	17	825
Soft white sandstone	35	860
Medium white sandstone	20	880
Hard white sandstone	8	888
Hard brown sandy limestone	2	890
Limestone and shale	15	905
Red sandy shale	5	910
Medium white sandstone	14	924
Green shale	1	925
Limestone red and gray	10	935
Hard limestone	115	1050
Red sandy limestone, hard	5	1055
Sandy limestone and shale	25	1080
Sandy limestone	30	1110
Hard gray limestone	10	1120
Hard sandstone	10	1130
Hard white sandy limestone	10	1140
Hard white sandstone	15	1155
Hard white sandstone and lime shells	10	1165
Hard white sandstone	30	1195
Medium white sandstone	30	1225
Soft white sandstone	35	1260
Sandy red limestone	5	1265
Gray limestone	20	1285
Medium gray sandy limestone	5	1290
Hard gray sandstone and limestone	5	1295
Hard gray limestone and shale	10	1305

A 26-in. diameter hole was drilled to a depth of 135 ft, reduced to 25.2 in. between 135 and 366 ft, reduced to 21.2 in. between 366 and 956 ft, and finished 17.2 in. in diameter from 956 to 1305 ft. The well is cased with 26-in. pipe from land surface to a depth of 135 ft, 22-in. pipe from land surface to a depth of 366 ft (cemented in), and 18-in. liner from 869 to 956 ft. The top of the casing is equipped with a pitless adapter.

A production test was conducted by the driller on July 1-2, 1963. After 24 hr of pumping at rates ranging from 589 to 755 gpm, the final drawdown was 177 ft from a non-pumping water level of 371 ft below land surface.

After shooting with eight 50-qt shots of liquid glycerin at 1245 to 1258 ft, 1225 to 1238 ft, 1209 to 1218 ft, 1200 to 1209 ft, 1169 to 1178 ft, 1160 to 1169 ft, 1139 to 1148 ft, and 1130 to 1139 ft, the well was cleaned out to 1268 ft. A production test was then conducted by the driller on July 31, 1963. After 16 hr of pumping at rates ranging from 650 to 1401 gpm, the final drawdown was 145 ft from a non-pumping water level of 374 ft below land surface.

The pumping equipment presently installed is a Layne & Bowler submersible turbine pump set at 760 ft, rated at 1500 gpm, and powered by a 300-hp General Electric motor.

A partial analysis of a sample (Lab. No. 160585) collected during the initial production test, after pumping for 24 hr at 735 gpm, showed the water to have a hardness of 244 mg/l, total dissolved minerals of 342 mg/l, and an iron content of 0.2 mg/l.

WELL NO. 2A, open to the Cambrian-Ordovician aquifer, was completed in February 1964 to a depth of 1353 ft by the Layne-Western Co., Aurora. The well is located 75 ft west of the elevated tank at the West Side Treatment Plant, approximately 2100 ft N and 2040 ft W of the SE corner of Section 16, T41N, R8E. The land surface elevation at the well is approximately 860 ft.

A drillers log of Well No. 2A follows:

Strata	Thickness (ft)	Depth (ft)
Soft yellow sand	25	25
Soft yellow sandy clay	40	65
Soft blue clay and sand	10	75
Blue clay, sand and gravel	50	125
Blue clay and gravel	32	157
Medium gray limestone	13	170
Medium gray limestone and shale	55	225
Medium dark gray limestone	110	335
Hard dark gray limestone	8	343
Medium blue shale	12	355
Medium gray shale	20	375
Hard gray limestone	10	385
Medium gray limestone	195	580
Hard gray limestone	25	605
Medium dark gray limestone	90	695
Medium white sandstone	10	705
Soft white sandstone	40	745
Hard gray sandy limestone	5	750
Hard gray limestone	10	760
Soft white sandstone	105	865
Medium white sandstone	35	900
Soft white sandstone	15	915
Hard white sandy limestone	5	920
Medium limestone with shale breaks	5	925
Medium gray sandy limestone	5	930
Hard gray limestone	5	935
Hard shale	5	940
Medium red sandy shale	5	945
Medium sand, red and green shale breaks	10	955
Hard sandy limestone	5	960
Hard gray limestone	55	1015
Hard buff limestone	30	1045
Hard gray limestone	15	1060
Hard sandy limestone	40	1100
Medium sandy limestone	20	1120
Hard gray sandy limestone	10	1130
Hard gray limestone	5	1135
Hard white sandy limestone	20	1155
Medium white sandstone	40	1195
Medium white sandy limestone	10	1205
Hard white sandstone	35	1240
Medium white sandstone	5	1245
Hard white sandstone	5	1250
Medium white sandstone	10	1260
Hard white sandstone	5	1265
Medium white sandstone	38	1303
Hard gray sandy limestone and shale	12	1315
Hard, dark, gray sandy shale	5	1320
Hard dark gray limestone	15	1335
Hard dark gray limestone and shale	18	1353

A 25-in. diameter hole was drilled to a depth of 390 ft, reduced to 21.2 in. between 390 and 975 ft, and finished 17.2 in. in diameter from 975 to 1353 ft. The well is cased with 26-in. drive pipe from land surface to a depth of 161 ft, 22-in. pipe from land surface to a depth of 390 ft (cemented in), and 18-in. liner from 901 ft to a depth of 975 ft.

After the well was shot with four 50-qt shots of liquid glycerin at 1260 to 1294 ft, 1230 to 1250 ft, 1205 to 1225 ft, and 1165 to 1199 ft, a production test was conducted by the driller on February 17-20, 1964. After 2 hr of pumping at rates of 698 to 799 gpm, the drawdown was 79 ft from a nonpumping water level of 396 ft below land surface. Pumping was continued for 1.5 hr at a rate of 956 gpm with a drawdown of 96 ft. Pumping was continued for 4 hr at rates of 1104 to 1094 gpm with a drawdown of 112 ft. After an additional 64.5 hr of pumping at rates ranging from 1200 to 1416 gpm, the final drawdown was 136 ft. Ten min after pumping was stopped, the water level had recovered to 420 ft.

The pumping equipment presently installed is a Layne & Bowler submersible pump set at 761 ft, rated at 1500 gpm, and powered by a 300-hp General Electric motor.

A mineral analysis of a sample (Lab. No. 186200) collected July 13, 1971, after pumping for 24 hr, showed the water to have a hardness of 244 mg/l, total dissolved minerals of 319 mg/l, a barium content of 2.0 mg/l, and a trace of iron. Hydrogen sulfide also was apparent when this sample was collected.

WELL NO. 3A, open to the Cambrian-Ordovician aquifer, was completed in August 1967 to a depth of 1378 ft by the Layne-Western Co., Aurora. The well is located in the northwest corner of the school yard north of the treatment plant, approximately 2565 ft N and 2590 ft W of the SE corner of Section 16, T41N, R8E. The land surface elevation at the well is approximately 860 ft.

A drillers log of Well No. 3A follows:

Strata	Thickness (ft)	Depth (ft)
No record	60	60
Soft gray clay	5	65
Brown clay and gravel	80	145
Medium gray broken limestone	5	150
Brown sand and gravel	5	155
Limestone, sand and gravel	3	158
Hard gray limestone	12	170
Green shale with sand streaks	5	175
Green shale with limestone streaks	55	230
Hard dark gray limestone	110	340
Limestone with green shale streaks	5	345
Gray shale	5	350
Gray shale, with limestone streaks	27	377
Hard gray limestone	28	405
Medium gray limestone	160	565
Hard gray limestone	60	625
Medium gray limestone with hard streaks	15	640
Sandy broken limestone	20	660
Medium gray limestone	38	698
Medium white sandstone	17	715
Soft white sandstone	20	735
Medium white sandstone	15	750
Hard gray limestone	5	755
Medium gray limestone	5	760
Soft white sandstone	50	810
Medium hard white sandstone	15	825
Medium white sandstone	85	910
Medium sandy limestone	10	920
Hard sandy limestone	5	925
Hard gray shale	5	930
Shale and limestone streaks	6	936
Medium blue shale	4	940
Medium brown sandstone	15	955
Hard brown limestone	5	960
Hard sandy limestone	5	965
Medium hard sandstone	5	970
Hard gray limestone	5	975
Hard brown limestone	95	1070
Dark brown sandy limestone and red shale streaks	15	1085
Medium red sandy limestone	25	1110
Sandy blue limestone, shale and mud	10	1120
Medium gray sandstone	10	1130
Gray shale	5	1135
Hard red limestone	5	1140

Strata (continued)	Thickness (ft)	Depth (ft)
Hard sandy limestone	10	1150
Hard gray sandy limestone	23	1173
Medium white sandstone	52	1225
Hard white sandstone	10	1235
Medium white sandstone	40	1275
Soft white sandstone	30	1305
Medium white sandstone	10	1315
Hard white sandstone	10	1325
Green shale	5	1330
Very hard limestone and chert	10	1340
Limestone and chert with streaks of green shale	5	1345
Gray limestone and shale	33	1378

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B20292) is for a water sample from the well collected November 15, 1976, after 1 hr of pumping at 1160 gpm.

WELL NO. 3A, LABORATORY NO. B20292

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.0		Silica	SiO_2	8.2	
Manganese	Mn	0.00		Fluoride	F	0.7	0.04
Ammonium	NH_4	0.5	0.03	Boron	B	0.2	
Sodium	Na	37	1.61	Nitrate	NO_3	0.0	0.00
Potassium	K	9.9	0.25	Chloride	Cl	40	1.13
Calcium	Ca	64	3.19	Sulfate	SO_4	0.0	0.00
Magnesium	Mg	25	2.06	Alkalinity (as $CaCO_3$)		296	5.92
Arsenic	As	0.00		Hardness (as $CaCO_3$)		262	5.24
Barium	Ba	10.1					
Copper	Cu	0.01					
Cadmium	Cd	0.00		Total dissolved minerals		353	
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0002					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.4	

A 25.2-in. diameter hole was drilled to a depth of 390 ft and finished 21.2 in. in diameter from 390 to 1378 ft. The well is cased with 26-in. steel drive pipe from land surface to a depth of 159.2 ft and 22-in. steel pipe from land surface to a depth of 390.3 ft (cemented in).

A production test was conducted by the driller on August 15, 1967. After 2.5 hr of pumping at rates of 394 to 334 gpm, the drawdown was 130 ft from a nonpumping water level of 435 ft. On August 16, 1967, the well was tested again for 6.7 hr at rates of 366 to 330 gpm with a drawdown of 125 ft from a nonpumping water level of 445 ft.

The well was shot with 100 qt of nitroglycerin as follows: 20 qt at 1190 ft, 20 qt at 1230 ft, 20 qt at 1265 ft, 20 qt at 1290 ft, and 20 qt at 1315 ft. After shooting, a production test was conducted by the driller on August 29-30, 1967. After 23 hr of pumping at rates ranging from 600 to 863 gpm, the final drawdown was 136 ft from a nonpumping water level of 435 ft below the top of the casing.

A production test was conducted by the driller on September 13, 1967. After 12.5 hr of pumping at rates ranging from 1084 to 1012 gpm, the drawdown was 158 ft from a nonpumping water level of 445 ft. Two hr after pumping was stopped, the water level had recovered to 480 ft.

The pumping equipment presently installed consists of a 300-hp General Electric motor, a 14-in., 10-stage Layne & Bowler submersible pump set at 716 ft, rated at about 1500 gpm, and has 716 ft of 10-in. column pipe. The well is equipped with 716 ft of airline.

WELL NO. 4A, open to the Cambrian-Ordovician aquifer, was completed in May 1972 to a depth of 1345 ft by the Layne-Western Co., Aurora. The well is located just east of the West Side Treatment Plant, approximately 2000 ft N and 1000 ft W of the SE corner of Section 16, T41N, R8E. The land surface elevation at the well is approximately 835 ft.

A drillers log of Well No. 4A follows:

Strata	Thickness (ft)	Depth (ft)
Black top soil	2	2
Sandy yellow clay	8	10
Yellow sandy gravel	35	45
Gray clay	10	55
Sandy clay and boulders	20	75
Clay	25	100
Gravel	20	120
Hard gray limestone	25	145
Hard limestone with shale streaks	35	180
Shale	15	195
Hard limestone	25	220
Limestone with shale streaks	25	245
Shale	30	275
Limestone and shale	35	310
Sticky shale	30	340
Hard brown limestone	95	435
Hard gray limestone	230	665
Hard gray sandy limestone	5	670
Hard white sandstone	30	700
Medium white sandstone	15	715
Hard white sandstone	5	720
Hard gray limestone	15	735
Hard gray sandstone	55	790
Medium white sandstone	15	805
Hard white sandstone	10	815
Medium white sandstone	10	825
Hard white sandstone	65	890
Hard sandy limestone	10	900
Hard gray limestone	5	905
Gray sandy limestone with red shale streaks, hard	15	920
Medium sand and shale streaks	5	925
Hard pink limestone	45	970
Hard gray limestone	70	1040
Hard sandy gray limestone	10	1050
Medium red limestone	15	1065
Medium red sandy limestone	30	1095
Hard gray sandy limestone	45	1140
Medium gray sandstone	55	1195
Medium white sandstone	95	1290
Hard sandy limestone and shale	10	1300
Hard gray shale	45	1345

A 25-in. diameter hole was drilled to a depth of 359 ft and finished 21.2 in. in diameter from 359 to 1345 ft. The well is cased with 26-in. pipe from land surface to a depth of 128 ft and 22-in. pipe from land surface to a depth of 359 ft (cemented in).

A production test was conducted by the driller on May 16-17, 1972. After 26.4 hr of intermittent pumping at rates ranging

from 1104 to 1506 gpm, the final drawdown was 220 ft from a nonpumping water level of 448 ft below land surface.

The pumping equipment presently installed consists of a 300-hp Byron Jackson electric motor, a 12-in., 11-stage Byron Jackson submersible pump set at 800 ft, rated at 1200 gpm at at about 790 ft TDH, and has 800 ft of 10-in. column pipe.

A partial analysis of a sample (Lab. No. 188649) collected during the initial production test, after pumping for 27 hr at 1143 gpm, showed the water to have a hardness of 254 mg/l, total dissolved minerals of 332 mg/l, a barium content of 7.2 mg/l, and a trace of iron.

WELL NO. 5A, open to the Cambrian-Ordovician aquifer, was completed in February 1977 to a depth of 1310 ft by the Layne-Western Co., Aurora. The well is located on Edgewood St. at Foothill St., approximately 1650 ft N and 1300 ft E of the SW corner of Section 16, T41N, R8E. The land surface elevation at the well is approximately 822 ft.

A drillers log of Well No. 5 A follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Peat - top soil	3	3
Sandy clay some gravel	108	111
Gray limestone	59	170
Dark gray limestone	20	190
Dark gray limestone (shaley)	65	255
Dark gray limestone	72	327
Brown limestone	138	465
Light brown and gray limestone	130	595
Limestone - dolomite (cherty)	70	665
Limestone - dolomite (shaley)	15	680
Sandstone trace of shale	225	905
Sandstone trace of limestone	20	925
Red and brown sandstone	13	938
Sandy limestone brown and gray	32	970
Hard limestone	55	1025
Shaley limestone	25	1050
Red shale trace of green shale	15	1065
Limestone shale	10	1075
Limestone - trace of blue-green shale	20	1095
Brown sandy limestone hard lumps	35	1130
Pink sandstone	5	1135
White sandstone	55	1190
Hard sandstone, white	10	1200
Sandy dolomite trace of shale	5	1205
White and red sandstone with trace of white shale	40	1245
Brown and red sandy dolomite and shale	30	1275
Gray limestone trace of shale	35	1310

A 28-in. diameter hole was drilled to a depth of 120 ft, reduced to 25.2 in. between 120 and 371 ft, reduced to 21.2 in. between 371 and 1095 ft, and finished 17.2 in. in diameter from 1095 to 1310 ft. The well is cased with 26-in. pipe from land surface to a depth of 119 ft, 22-in. pipe from land surface to a depth of 370 ft (cemented in), and an 18-in. liner from 1014 ft to a depth of 1095 ft. The top of the well casing is equipped with a Baker Monitor pitless adapter.

Upon completion, this well was shot with 5 charges of 20 qt of 100 percent nitrogel per each shot as follows: 1230 to 1240 ft, 1210 to 1220 ft, 1185 to 1195 ft, 1165 to 1175 ft, and 1145 to 1155 ft.

A production test was conducted by the driller on April 18-19, 1977. After 3.8 hr of pumping at a rate of 600 gpm, the drawdown was 120 ft from a nonpumping water level of 425 ft. Pumping was continued for 6 hr at rates of 713 to 933 gpm with a drawdown of 170 ft. Pumping was continued for 6.5 hr at rates ranging from 1059 to 1064 gpm with a drawdown of 183 ft. Pumping was continued for 2.8 hr at a rate of 600 gpm with a drawdown of 128 ft. After a 5.1-hr idle period, pumping was continued for 3 hr at rates ranging from 728 to 1379 gpm with a maximum drawdown of 210 ft. Thirty-five min after pumping was stopped, the water level had recovered to 475 ft.

A second production test was conducted by the driller on May 5-6, 1977. After 3 hr of pumping at rates ranging from 1059 to 1379 gpm, the drawdown was 160 ft from a nonpumping water level of 455 ft. Pumping was continued for 15.8 hr at rates of 1610 to 1651 gpm with a final drawdown of 205 ft. The water level recovered to 474 ft after pumping had been stopped for 6.1 hr.

The pumping equipment presently installed consists of a 450-hp Byron Jackson electric motor, a 13-in., 10-stage Byron Jackson submersible pump set at 848 ft, rated at 1400 gpm at about 830 ft TDH, and has 848 ft of 10-in. column pipe.

Other wells located throughout the city are listed as follows:

ERIE ST. WELL, finished in sand and gravel, was completed to a depth of about 40 ft. This well was abandoned in 1931. The well was located at the northwest corner of Clifton Ave. and Erie St., approximately 100 ft N and 2000 ft W of the SE corner of Section 15, T41N, R8E. The land surface elevation at the well is approximately 825 ft.

Details on the casing and screen are not available.

A mineral analysis of a sample (Lab. No. 68116) collected December 3, 1930, showed the water to have a hardness of 472 mg/l, total dissolved minerals of 585 mg/l, and an iron content of 0.4 mg/l.

NORTH STATE ST. WELL, finished in sand and gravel, was completed in 1926 to a depth of 43 ft and deepened in 1928 to a reported depth of 48 ft by the Kelly Well Co., Grand Island, Neb. This well is available for emergency use. The well is located on the northwest corner of State and Washington Sts., approximately 1950 ft S and 1850 ft W of the NE corner of Section 14, T41N, R8E. The land surface elevation at the well is approximately 730 ft.

A partial drillers log of North State St. Well follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	5	5
Gravel	29	34
No record	14	48

The well is cased with 25-in. ID concrete pipe from 18 ft below land surface within a pit to an unknown depth followed by a perforated concrete screen.

On May 30, 1928, after a 12-hr idle period, the nonpumping water level was reported to be 15.7 ft below the floor level of the pit.

In 1934, the well reportedly produced 84 gpm for 20 min with a drawdown of 1.4 ft from a nonpumping water level of 25.0 ft below land surface.

In 1946, after pumping at a rate of 215 gpm, the drawdown was 5.5 ft from a nonpumping water level of 12.5 ft below the pump base or 28.5 ft below land surface.

In 1948, the well reportedly produced 215 gpm for 12 hr with a drawdown of 5 ft from a nonpumping water level of 15 ft below the pump base.

The pumping equipment presently installed is an 8-in., 6-stage Byron Jackson turbine pump set at 21 ft, operated at about 235 gpm, and powered by a 25-hp Westinghouse electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C004347) is for a water sample from the well collected December 11, 1973, after 24 hr of pumping at 300 gpm.

NORTH STATE ST. WELL, LABORATORY NO. C004347

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	18	
Manganese	Mn	0.00		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.23	0.01	Boron	B	0.4	
Sodium	Na	37	1.61	Nitrate	NO_3	11.9	0.19
Potassium	K	3.9	0.10	Chloride	Cl	75	2.12
Calcium	Ca	102	5.09	Sulfate	SO_4	98	2.04
Magnesium	Mg	48	3.95	Alkalinity(as $CaCO_3$)		344	6.88
Arsenic	As	0.00		Hardness (as $CaCO_3$)		452	9.04
Barium	Ba	0.0					
Copper	Cu	0.01		Total dissolved			
Cadmium	Cd	0.00		minerals		606	
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.6	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		0.5	
Silver	Ag	0.00		± deviation		1.6	
Cyanide	CN	0.00		Beta *pc/l*		4.6	
Zinc	Zn	0.01		± deviation		2.5	

CRIGHTON AVE. WELL, finished in sand and gravel, was completed in 1928 to a depth of 53 ft (reported in 1933 to be 48.6 ft deep) by the Kelly Well Co., Grand Island, Neb. This well is available for emergency use. The well is located on the west side of Crighton Ave. between West Chicago St. and Pennsylvania Ave., approximately 2050 ft N and 1230 ft E of the SW corner of Section 14, T41N, R8E. The land surface elevation at the well is approximately 795 ft.

The well is cased with 25-in. ID concrete pipe from above the floor of a 6-ft deep pit to an unknown depth followed by a perforated concrete screen.

In January 1933, the well reportedly produced 203 gpm with a drawdown of 23 ft from a nonpumping water level of 19 ft below the top of the well.

On June 30, 1948, the well reportedly produced 200 gpm for 12 hr with a drawdown of 10 ft from a nonpumping water level of 8 ft below the pump base.

The pumping equipment presently installed consists of a 15-hp U. S. electric motor, an 8-in., 6-stage American Well Works turbine pump (No. 55175) set at 40 ft, rated at 200 gpm at about 152 ft TDH, and has 40 ft of 6-in. column pipe. A 7-ft section of 5-in. suction pipe is attached to the pump intake.

A mineral analysis of a sample (Lab. No. 115154) collected June 30, 1948, after pumping for 12 hr at 200 gpm, showed the water to have a hardness of 576 mg/l, total dissolved minerals of 628 mg/l, and an iron content of 0.1 mg/l.

LAUREL ST. WELL, finished in sand and gravel was completed in 1928 to a depth of 53 ft by the Kelly Well Co., Grand Island, Neb. This well was abandoned in 1931. The well was located at the east end of Laurel St. at the southwest intersection of Illinois Ave., approximately 1300 ft N and 700 ft W of the SE corner of Section 13, T41N, R8E. The land surface elevation at the well is approximately 740 ft.

A drillers log of Laurel St. Well follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil	4	4
Sand	2	6
Gravel	47	53
Blue clay		

The well was cased with 25-in. ID concrete pipe from 1 ft below land surface to a depth of about 18 ft. A perforated concrete screen of the same size extends from about 18 to 53 ft.

Upon completion, the nonpumping water level was reported to be 2.8 ft below the top of the casing.

A mineral analysis of a sample (Lab. No. 67202) collected August 13, 1930, showed the water to have a hardness of 531 mg/l, total dissolved minerals of 638 mg/l, and an iron content of 0 mg/l.

To alleviate a water shortage, in the summer of 1931 a group of four shallow wells owned by the Borden Milk Co. were purchased by the city. These wells, finished in sand and gravel, were located about 30 ft east of the Fox River about 375 to 450 ft south of the center of Kimball St., approximately 1330 ft S and 1450 ft W of the NE corner of Section 14, T41N, R8E. Three of these wells were 6 in. in diameter and 46 ft deep, and one was 12 in. in diameter and 36 ft deep. These wells were abandoned in 1934 and sealed in 1942.

SHULER ST. WELL, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in 1931 to a depth of 1940 ft by the Varner Well and Pump Co., Dubuque, Iowa. This well is not in service and has been capped. The well is located near the southwest corner of Shuler St. and Commonwealth Ave., approximately 850 ft N and 250 ft E of the SW corner of Section 14, T41N, R8E. The land surface elevation at the well is approximately 821 ft.

A sample study log of Shuler St. Well furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Glacial drift	104	104
SILURIAN SYSTEM		
Alexandrian Series		
Dolomite, light gray to buff, medium	36	140
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, buff and light green, argillaceous; shale, green, dolomitic	170	310
Shale, dark brown and dark greenish gray	30	340
Galena Group		
Dolomite, light gray, medium, slightly cherty	200	540
Platteville Group		
Dolomite, slightly cherty, buff to gray, fine to very fine	120	660
Ancell Group		
Glenwood Formation		
Dolomite, sandy, buff to gray; sandstone, partly dolomitic, fine to medium, buff, partly incoherent	100	760
St. Peter Sandstone		
Sandstone, white to buff, fine to medium, incoherent; shale, dolomitic, sandy, green at base	190	950
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, gray to light buff, fine to medium, very glauconitic in lower part	100	1050
Franconia Formation		
Sandstone, very glauconitic, pink; shale, glauconitic, sandy, green	50	1100
Ironton-Galesville Sandstone		
Sandstone, fine to coarse, white, incoherent	200	1300
Eau Claire Formation		
Shale, dolomitic, greenish-gray; siltstone, dolomitic, glauconitic, light gray-buff, greenish; shale, greenish gray, firm; all interbedded; siltstone, very dolomitic, gray-buff	380	1680
Mt. Simon Sandstone		
Sandstone, light buff, fine to coarse, incoherent	260	1940

A 22-in. diameter hole was drilled to a depth of 106.3 ft, reduced to 20 in. between 106.3 and 210 ft, reduced to 17 in. between 210 and 955 ft, reduced to 15 in. between 955 and 1463 ft, and finished 12 in. in diameter from 1463 to 1940 ft. The well is cased with 22-in. pipe from land surface to a depth of 106.3 ft, 18-in. OD pipe from land surface to a depth of 210 ft, 16-in. OD liner from 890 ft to a depth of 955 ft, and 12-in. liner from 1280 ft to a depth of 1463 ft.

During drilling at a depth of 1852 ft, a 26-hr production test was conducted. After 5 hr of pumping at rates of 850 to 900 gpm, the drawdown was 197 ft from a nonpumping water level of 93 ft below land surface. The water level did not return to its prior level of 93 ft but remained at 180 ft while drilling was continued to the 1940 ft depth.

Upon completion, the well reportedly produced 760 gpm for 8 hr with a drawdown of 158 ft from a nonpumping water level of 180 ft below land surface.

The production of the well dropped to 460 gpm in 1933 and the pump was removed for inspection. It was found in good condition and replaced but the production continued to diminish until in September 1944 the pump broke suction at the end of 5 min operation. The pump was removed and a water level recorder installed in the well on March 12, 1946. The distance to water on that date was 110.1 ft below the top of the casing and in November 1946 the depth of water was 109.0 ft.

A mineral analysis of a sample (Lab. No. 69718) collected October 2, 1931, showed the water to have a hardness of 242 mg/l, total dissolved minerals of 395 mg/l, and an iron content of 0.2 mg/l.

Two test holes, located in Sections 1 and 2, T41N, R8E, were drilled in January and February 1961" by the Layne-Western Co., Aurora, to depths of 33 and 31 ft deep.

In search for sand and gravel deposits, the Layne-Western Co. drilled five test holes in 1971, ranging in depth from 90 to 154 ft. The test holes were located in Sections 7, 19, and 20, T41N, R9E, Cook County.

ELGIN ESTATES SUBDIVISION (ROLLINS SEWER & WATER CO.)

Elgin Estates Subdivision (Rollins Sewer & Water Co.) (est. 250), located 1 mile southwest of Elgin, installed a public water supply in 1959. The water system is operated by the Midwest Utility Co. One well is in use. In 1963 there were 32 services, all metered; the estimated average daily pumpage was 5300 gpd. In 1974 there were 71 services, all metered; the average and maximum daily pumpages were 20,000 and 40,000 gpd, respectively. The water is chlorinated, fluoridated, and filtered.

WELL NO. 1, open to the Silurian dolomite and the Maquoketa Group, was completed in July 1960 to a depth of 300 ft by the Layne-Western Co., Aurora. The well is located on the north side of Bowes Road midway between Randall Road and McLean Blvd., approximately 2450 ft S and 660 ft W of the NE corner of Section 28, T41N, R8E. The land surface elevation at the well is approximately 805 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Top soil	5	5
Gray clay	25	30
Sandy gray clay	20	50
Sand and gravel	25	75

Strata (continued)	Thickness (ft)	Depth (ft)
Black clay	10	85
Medium gray limestone	43	128
Gray limestone and shale	7	135
Brown medium limestone and shale	10	145
Gray shale	10	155
Gray limestone and shale	26	181
Medium limestone	24	205
Limestone with shale streaks	40	245
Gray shale	5	250
Limestone and shale	5	255
Gray limestone	35	290
Shale and limestone	3	293
Shale	7	300

A 20-in. diameter hole was drilled to a depth of 20 ft, reduced to 12.8 in. between 20 and 87 ft, and finished 12 in. in diameter from 87 to 300 ft. The well is cased with 20-in. steel pipe from land surface to a depth of 20 ft and 12-in. steel pipe from 1 ft above the pump station floor to a depth of 87 ft. The annular opening between the two casings is cement grouted from 0 to 20 ft.

Upon completion, the well reportedly produced 310 gpm for 12 hr with a drawdown of 15 ft from a nonpumping water level of 17 ft.

The pumping equipment presently installed is a Layne & Bowler turbine pump (Type RKHC, Serial No. 42542) set at 40 ft, rated at 300 gpm at about 262 ft head, and powered by a 30-hp 1460 rpm A. O. Smith electric motor (Model No. P326UX4A4-02, Serial No. 2J60).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A13811) is for a water sample from the well collected February 12, 1976, after 30 min of pumping at 350 gpm.

WELL NO. 1, LABORATORY NO. A13811

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.85		Silica	SiO_2	21	
Manganese	Mn	0.10		Fluoride	F	0.4	0.02
Ammonium	NH_4	1.86	0.10	Boron	B	0.0	
Sodium	Na	8.0	0.35	Nitrate	NO_3	0.4	0.01
Potassium	K	1.0	0.03	Chloride	Cl	15	0.42
Calcium	Ca	89	4.44	Sulfate	SO_4	80	1.66
Magnesium	Mg	45	3.70	Alkalinity (as $CaCO_3$)		346	6.92
Arsenic	As	0.000		Hardness (as $CaCO_3$)		409	8.18
Barium	Ba	0.0					
Copper	Cu	0.05		Total dissolved minerals		470	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.6	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha pc/l		0.0	
Silver	Ag	0.00		± deviation		1.1	
Cyanide	CN	0.01		Beta pc/l		2.6	
Zinc	Zn	0.0		± deviation		1.8	

ELGIN MENTAL HEALTH CENTER (STATE HOSPITAL)

The Elgin Mental Health Center (State Hospital) (est. 2500), located on the south edge of Elgin, installed a public water supply in 1912. Two wells are in use. This supply is cross connected with the city of Elgin. In 1950 with a population of approximately 7200, the estimated average daily pumpage was 1,000,000 gpd. In 1974 with a population of approximately 2500, the average and maximum daily pumpages were 430,000 and 650,000 gpd, respectively. The water is chlorinated.

Water was initially obtained from two 20-ft deep dug wells, each 22 ft in diameter. The wells were located 40 and 110 ft from the edge of the Fox River. These wells were abandoned and sealed between 1950 and 1952.

WELL NO. 1, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in September 1932 to a depth of 2000 ft (measured at 1987 ft in March 1951) by the Gray-Milaeger Drilling Co., Milwaukee, Wis. The well is located at 750 South State St. in a room of the tin shop in the power plant area, approximately 1275 ft N and 1775 ft W of the SE corner of Section 23, T41N, R8E. The land surface elevation at the well is approximately 750 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Gravel fill	3	3
Soil, black and clay	5	8
Gravel, coarse, dry	2	10
Sand, hard; stonelike, dry	2	12
Gravel, coarse, dry	6	18
Gravel, fine; water	20	38
Sand, muddy and gravel	15	53
Quicksand, gray	5	58
Shale, gray, muddy	2	60
Limestone, gray; broken	4	64
Limestone, gray	10	74
Limestone, yellow, hard	6	80
Limestone, gray	10	90
Limestone, gray and pink shale	5	95
Shale, bluish gray, muddy	50	145
Limestone, gray, shaley	100	245
Shale, muddy and lime shells	35	280
Limestone, light gray	20	300
Limestone, hard, yellow	45	345
Limestone, yellow; not so hard	20	365
Limestone, light gray	125	490
Limestone, yellow, very hard	25	515
Limestone, light gray, blue spots	15	530
Limestone, light brown, blue spots	70	600
Limestone, light gray	4	604
Sandstone, light gray	6	610

Strata (continued)	Thickness (ft)	Depth (ft)
Sandstone, white; fine	5	615
Sandstone, light gray	5	620
Sandstone, white; fine	20	640
Sandstone, white, coarse	10	650
Sandstone, green shale	10	660
Sand, gray and limestone	20	680
Sandstone, white; yellow tint	170	850
Sandstone, white; medium fine to coarse	40	890
Sand, white; lime shells	10	900
Shale, gray and green, muddy	10	910
Sandstone, white	15	925
Shale, sandy, green	10	935
Limestone, light brown	40	975
Lime, light brown, sandy; pink tint	10	985
Lime, brown; red marl, shale	25	1010
Lime, sandy; pink marl	5	1015
Sandstone, pink marl	5	1020
Sandstone, light gray; green shale	20	1040
Sandstone, gray, green shale	20	1060
Sand and lime; pink, green shale	10	1070
Sand and lime, white to buff	20	1090
Sandstone, white to gray	35	1125
Sandstone, hard, lime shells	15	1140
Sandstone, fine, white, yellow	30	1170
Sandstone, white	25	1195
Sandstone, white, pink tint	25	1220
Sandstone, light gray, hard	10	1230
Sand, gray, white lime shells	10	1240
Lime, sandy, dark gray	10	1250
Shale, bluish gray; lime shells	2	1252
Shale, dark gray, tough, limestone, gray	13	1265
Limestone, gray and brown, shale streaks	10	1275
Limestone, gray and brown, shale	45	1320
Shale, reddish brown; lime shells	20	1340
Limestone, reddish brown; shale	20	1360
Shale, gray, red, green; lime shells	10	1370
Limestone, gray and shale	5	1375
Sandstone, gray, greenish, hard, sharp	10	1385
Sandstone, hard, fine, white, dolomitic	35	1420
Sand, gray, and limestone	10	1430
Dolomite, dark gray, sandy	10	1440
Sandstone, gray, hard, fine	10	1450
Dolomite, gray, very little sand	80	1530
Lime, gray and yellow, green shale	5	1535
Sandstone, gray and green, green shale	10	1545
Dolomite, gray	20	1565
Dolomite, gray, shale	10	1575
Dolomite, gray and shale	40	1615
Dolomite, gray, buff	5	1620
Sandstone, gray; dolomitic	15	1635
Sandstone, light buff	45	1680
Sandstone, pink marl	290	1970
Sandstone; blue and gray shale	30	2000

A 20-in. diameter hole was drilled to a depth of 300 ft, reduced to 17 in. between 300 and 1060 ft, and finished 15 in. in diameter from 1060 to 2000 ft. The well is cased with 20-in. OD drive pipe from 0.7 ft above the pumphouse floor to a depth of 64 ft, 18-in. OD welded pipe from the pumphouse floor to a depth of 300 ft, and a 16-in. OD liner from 816 ft to a depth of 1060 ft.

A production test was conducted by the hospital in October 1932. After 48 hr of pumping at an average rate of 1365 gpm, the drawdown was 90 ft from a nonpumping water level of 45 ft below land surface.

On February 26, 1945, the well reportedly produced 800 gpm for 20 hr with a drawdown of 115 ft from a nonpumping water level of 50 ft below land surface.

On November 29, 1951, the well reportedly produced 770 gpm for 2 hr with a drawdown of 155 ft from a nonpumping water level of 53 ft.

A production test was conducted on May 27-28, 1953, by representatives of the Layne-Western Co., Aurora, the hospital, and the State Water Survey. After 18.6 hr of pumping at rates ranging from 976 to 1051 gpm, the final drawdown was 250.5 ft from a nonpumping water level of 67.0 ft. Thirty-eight min after pumping was stopped, the water level had recovered to 94.0 ft.

After a new pump was installed, a production test was conducted on July 19, 1954, by representatives of the Layne-Western Co. and the State Water Survey. After 1.4 hr of pumping at 1100 gpm, the drawdown was 268.2 ft from a nonpumping water level of 48.6 ft below the top of the casing. Forty-nine min after pumping was stopped, full recovery was observed.

A production test was conducted on September 7, 1954, to check on the performance characteristics of the new pump and on the problem of air appearing in the water pumped from the well. After 2.4 hr of pumping at rates ranging from 1240 to 975 gpm, the final drawdown was 274 ft from a nonpumping water level of 46 ft.

The pumping equipment presently installed consists of a 200-hp 1800 rpm U. S. electric motor (Serial No. 982727), a 12-in., 9-stage Layne turbine pump (No. 27761) rated at 1000 gpm at about 555 ft TDH, and has 550 ft of 10-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A15005) is for a water sample from the well collected March 1, 1976, after 50 min of pumping at 900 gpm.

WELL NO. 1, LABORATORY NO. A15005

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.1		Silica	SiO_2	14	
Manganese	Mn	0.05		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.39	0.02	Boron	B	0.3	
Sodium	Na	30	1.30	Nitrate	NO_3	7.9	0.13
Potassium	K	2.5	0.06	Chloride	Cl	57	1.61
Calcium	Ca	98	4.89	Sulfate	SO_4	160	3.33
Magnesium	Mg	54	4.44	Alkalinity (as $CaCO_3$)		304	6.08
Arsenic	As	0.000		Hardness (as $CaCO_3$)		465	9.30
Barium	Ba	0.0					
Copper	Cu	0.05		Total dissolved			
Cadmium	Cd	0.00		minerals		670	
Chromium	Cr	0.05					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.3	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha pc/l		0.2	
Silver	Ag	0.00		± deviation		1.8	
Cyanide	CN	0.01		Beta pc/l		4.9	
Zinc	Zn	0.0		± deviation		2.3	

WELL NO. 2, open to the Ironton-Galesville Sandstone of the Cambrian-Ordovician aquifer and the Elmhurst-Mt. Simon aquifer, was constructed in July 1947 to a depth of 1290 ft, and deepened in June 1951 to a reported depth of 2000 ft by the Layne-Western Co., Aurora. The well is located

in a brick building about 1 block west of the main hospital elevated tank, approximately 925 ft N and 1750 ft E of the SW corner of Section 23, T41N, R8E. The land surface elevation at the well is approximately 755 ft.

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

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Silt, sandy, brownish red, gravelly at base	15	15
Gravel, granular, silty	10	25
Sand and gravel, silty	40	65
SILURIAN SYSTEM		
Niagaran Series		
Dolomite, light buff to light yellow	18	83
Alexandrian Series		
Dolomite, white to light buff, fine to medium; dolomite, pale green, very fine at base	52	135
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale, greenish gray, weak; dolomite, light green to gray, fine to coarse	55	190
Dolomite, light gray to brown; shale, brown, tough	140	330
Galena Group		
Dolomite, light gray to light buff, fine to medium, crystalline	225	555
Platteville Group		
Dolomite, light greenish gray to buff, brown, very fine to coarse	60	615
Ancell Group		
Glenwood Formation		
Sandstone, light gray, white, fine to medium, incoherent	73	688
St. Peter Sandstone		
Sandstone, yellowish gray, fine to coarse, incoherent	152	840
Chert, white; shale light gray to light brown, green, weak	30	870
Sandstone, white, fine to coarse, incoherent	5	875
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, light pinkish buff and grayish green, fine to medium	125	1000
Franconia Formation		
Sandstone, white, light pink, buff to green, very fine to medium; incoherent; little shale, light gray; little dolomite, pink	105	1105
Ironton-Galesville Sandstone		
Sandstone, white, fine to coarse, incoherent	155	1260
Eau Claire Formation		
Sandstone, buff, very fine to medium; shale, light green to grayish brown, weak, brittle; dolomite, sandy	30	1290
Shale, greenish pink, weak; sandstone yellowish orange, grayish green, fine to coarse, incoherent to compact	150	1440
Dolomite, gray, yellowish gray, fine to coarse; shale, green, weak	230	1670
Mt. Simon Sandstone		
Sandstone, silty, yellowish orange pink, very fine to very coarse, rounded to angular, incoherent	330	2000

A 30-in. diameter hole was drilled to a depth of 74 ft, reduced to 24 in. between 74 and 440 ft, reduced to 19 in. between 440 and 940 ft, reduced to 15.2 in. between 940 and 1290 ft, and finished 10 in. in diameter from 1290 to 2000 ft. The well is cased with 30-in. OD drive pipe from 1 ft above the pumphouse floor to a depth of 74 ft and 20-in. pipe from land surface to a depth of 436 ft (cemented in). Originally a 16-in. OD slotted liner was installed from 840 ft to a depth of 940 ft. In 1950 the 16-in. liner was removed and a 16-in. OD casing was installed from land surface to a depth of 688 ft (cemented in) and a 12-in. perforated liner was set from 839 ft to a depth of 958 ft. During deepening in 1951, the 12-in. perforated liner was removed and a 10-in. liner was installed from 667 ft to a depth of 1010 ft (cemented in).

A production test was conducted on July 30-31, 1947, by representatives of the driller, the State Water Survey, the hospital, and the Division of Architecture & Engineering. After 24.3 hr of pumping at rates of 550 to 1100 gpm, the final drawdown was 51.0 ft from a nonpumping water level of 191.0 ft below the top of the casing. The water level recovered to 212.5 ft after pumping was stopped for 3.2 hr. During this test, Well No. 1 was pumping continuously.

Before rehabilitation, a production test was conducted on November 14, 1949, by representatives of the driller, the State Water Survey, and the hospital. The well reportedly produced 720 to 1050 gpm for 2.5 hr with a drawdown of 28 ft from a nonpumping water level of 202 ft below the top of the airline.

This well was rehabilitated by the Layne-Western Co. for the purpose of sealing off certain water-bearing formations which were causing a high hydrogen sulfide content in the water. After installing a new casing and liner, a production test was conducted on February 13-14, 1950, by representatives of the driller, the State Water Survey, and the hospital. The well reportedly produced 650 to 1100 gpm for 22 hr with a drawdown of 131 ft from a nonpumping water level of 195 ft below the pump base. Forty-five min after pumping was stopped, the water level had recovered to 222 ft.

On June 12, 1950, with a deeper pump setting, a production test was conducted by representatives of the driller, the State Water Survey, and the hospital. After 2.9 hr of pumping at rates of 1250 to 1220 gpm, the drawdown was 125 ft from a nonpumping water level of 207 ft below the pumphouse floor.

After the well was deepened to 2000 ft, a production test was conducted on July 9, 1951, by representatives of the driller, the State Water Survey, and the hospital. After 3.8 hr of pumping at rates ranging from 435 to 660 gpm, the drawdown was 259 ft from a nonpumping water level of 198 ft below the pumphouse floor. When rates of pumping were over 600 gpm, the pump would break suction.

This well was shot on August 29, 1951, with 100 qt of nitroglycerin at the following levels: 1184 to 1245 ft, 1715 to 1730 ft, and 1750 to 1765 ft. The well was then cleaned out to 2000 ft. A production test was conducted August 31-September 1, 1951, by representatives of the driller, the State Water Survey, and the hospital. After 11.8 hr of pumping at rates of 1009 to 1295 gpm, the drawdown was 193 ft from a nonpumping water level of 225 ft.

After lowering the pump in 1964, the well reportedly produced 1100 gpm with a drawdown of 141 ft from a nonpumping water level of 314 ft.

The pumping equipment presently installed consists of a 250-hp 1800 rpm U. S. electric motor, a 10-stage Layne turbine pump (Serial No. 46278) rated at 1000 gpm, and has 550 ft of column pipe. A 10-ft section of 10-in. suction pipe is attached to the pump intake. The well is equipped with 550 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A15004) is for a water sample from the well collected March 1, 1976, after 40 min of pumping at 900 gpm.

WELL NO. 2, LABORATORY NO. A15004

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.3		Silica	SiO_2	8	
Manganese	Mn	0.05		Fluoride	F	1.4	0.07
Ammonium	NH_4	0.71	0.04	Boron	B	0.3	
Sodium	Na	11	0.48	Nitrate	NO_3	1.3	0.02
Potassium	K	9.5	0.24	Chloride	Cl	12	0.34
Calcium	Ca	54	2.70	Sulfate	SO_4	20	0.42
Magnesium	Mg	19	1.56	Alkalinity (as $CaCO_3$)		224	4.48
Arsenic	As	0.000		Hardness (as $CaCO_3$)		215	4.30
Barium	Ba	0.2					
Copper	Cu	0.05		Total dissolved minerals		280	
Cadmium	Cd	0.00					
Chromium	Cr	0.05					
Lead	Pb	0.00					
Mercury	Hg	0.0014		pH (as rec'd)		7.3	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		11.3	
Silver	Ag	0.00		± deviation		2.4	
Cyanide	CN	0.01		Beta *pc/l*		16.2	
Zinc	Zn	0.0		± deviation		1.9	

FERSON CREEK SUBDIVISION

Ferson Creek Subdivision (est. 318), located 1.5 miles east of Lily Lake, installed a public water supply in 1972. The water system is owned and operated by the Ferson Creek Utilities, Inc. One well (No. 2) is in use. In 1976 there were 91 services, all metered; the average and maximum daily pumpages were 26,275 and 40,000 gpd, respectively. The water is chlorinated and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Cambrian-Ordovician aquifer, was completed in August 1969 to a depth of 1409 ft by the Layne-Western Co., Aurora. This well was disconnected in September 1975. The well is located about 75 ft south of Paddock Lane, approximately 2590 ft S and 1620 ft E of the NW corner of Section 16, T40N, R7E. The land surface elevation at the well is approximately 955 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Brown clay	5	5
Brown clay, trace of sand	7	12
Buff clay, with gravel embedded	241	253
White shale, trace of green	8	261
Shale with streaks of hard limestone	22	283
Hard gray limestone	23	306
Hard gray limestone with streaks of shale	5	311
Broken limestone	2	313
Shale with streaks of limestone (hard)	66	379
Light brown limestone	9	388
Soft gray shale	9	397
Hard brown limestone	254	651
St. Peter sandstone	369	1020
Red shale, water turned red	18	1038
Hard gray shale and hard sandy limestone	195	1233
Sandstone and green shale	80	1313
Galesville sandstone	87	1400
Hard shale	9	1409

A 17.5-in. diameter hole was drilled to a depth of 261 ft, reduced to 13.2 in. between 261 and 402 ft, and finished 10 in. in diameter from 402 to 1409 ft. The well is cased with 14-in. pipe from 3 ft above land surface to a depth of 261 ft and 10-in. pipe from 3 ft above land surface to a depth of 402 ft (cemented in).

A production test was conducted by the driller on August 15-16, 1969. After 24 hr of pumping at rates ranging from 383 to 430 gpm, the final drawdown was 72 ft from a nonpumping water level of 417 ft below land surface.

The pumping equipment presently installed is a Reda submersible pump set at 505 ft, rated at 180 gpm at about 500 ft TDH, and powered by a 40-hp Reda electric motor. The well is equipped with 505 ft of airline.

The following mineral analysis (Lab. No. 195211) is for a water sample from the well collected April 5, 1974.

WELL NO. 1, LABORATORY NO. 195211

		mg/l	me/l			mg/l	me/l
Iron (total)	Fe	Tr		Silica	SiO_2	6.7	
Manganese	Mn	0.04		Flouride	F	0.8	
Ammonium	NH_4	0.5	0.03	Boron	B	0.3	
Sodium	Na	41.0	1.78	Nitrate	NO_3	0.3	Tr
Potassium	K	10.5	0.27	Chloride	Cl	2	0.06
Calcium	Ca	49.6	2.48	Sulfate	SO_4	5.1	0.11
Magnesium	Mg	21.4	1.76	Alkalinity (as $CaCO_3$)		300	6.00
Strontium	Sr	2.25	0.05	Hardness (as $CaCO_3$)		212	4.24
Barium	Ba	<7.8					
Copper	Cu	0.00		Total dissolved minerals		325	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	<0.05					
Lithium	Li	0.01		Turbidity		0	
Nickel	Ni	<0.05		Color		0	
Zinc	Zn	0.00		Odor		H_2S	

Prior to the construction of Well No. 2, a test well was completed in September 1974 to a depth of 176 ft by the K & K Well Drilling Co., Mokena. The test well was located

approximately 1 ?00 ft N and 2200 ft W of the SE corner of Section 16, T40N, R7E.

WELL NO. 2, finished in sand and gravel, was completed in February 1975 to a depth of 186 ft by the K & K Well Drilling Co., Mokena. The well is located on Hidden Springs Drive, approximately 1820 ft N and 2150 ft W of the SE corner of Section 16, T40N, R7E. The land surface elevation at the well is approximately 850 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Overburden to gravel	186	186

An 8-in. diameter hole was drilled to a depth of 186 ft. The well is cased with 8-in. black pipe from land surface to a depth of 166 ft followed by 20 ft of 8-in. No. 20 slot stainless steel screen. The top of the casing is equipped with a pitless adapter.

Upon completion, the well reportedly produced 285 gpm for 24 hr with a drawdown of 98 ft from a nonpumping water level of 69 ft below land surface.

The pumping equipment presently installed is a Barnes submersible pump set at 168 ft, rated at 285 gpm, and powered by a 25-hp Barnes electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. C008798) is for a water sample from the well collected May 12, 1975, after pumping at 240 gpm.

WELL NO. 2, LABORATORY NO. C008798

		mg/l	me/l			mg/l	me/l
Iron	Fe	1.3		Silica	SiO_2	21.0	
Manganese	Mn	0.02		Fluoride	F	0.8	0.04
Ammonium	NH_4	0.62	0.03	Boron	B	0.3	
Sodium	Na	32	1.39	Nitrate	NO_3	0.4	0.01
Potassium	K	1.7	0.04	Chloride	Cl	3	0.08
Calcium	Ca	60	2.99	Sulfate	SO_4	4	0.08
Magnesium	Mg	29	2.39	Alkalinity (as $CaCO_3$)		348	6.96
Arsenic	As	0.000		Hardness (as $CaCO_3$)		271	5.42
Barium	Ba	0.2					
Copper	Cu	0.00		Total dissolved minerals		398	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		8.2	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha pc/l		2.0	
Silver	Ag	0.00		± deviation		1.3	
Cyanide	CN	0.00		Beta pc/l		3.2	
Zinc	Zn	0.80		± deviation		1.7	

GENEVA

The city of Geneva (9115) installed a public water supply in 1896. Four wells (Nos. 2, 3, 5, and 6) are in use. This supply is also cross connected with the cities of Batavia and St. Charles. In 1949 there were 1500 services, all metered; the average and maximum daily pumpages were 800,000 and 1,000,000 gpd, respectively. In 1974 there were 3038 services, all metered; the average and maximum daily pumpages were 1,756,468 and 2,600,000 gpd, respectively. The water is chlorinated and the water from Well Nos. 2 and 3 is also aerated.

WELL NO. 1, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in 1896 to a depth of 850 ft (reported in May 1928 to be 843 ft deep). This well was abandoned prior to 1948 and sealed prior to 1970. The well was located in the main pumping station about 45 ft south of State St. and 45 ft east of River St., approximately 1170 ft N and 590 ft W of the SE corner of Section 3, T39N, R8E. The land surface elevation at the well is approximately 679 ft.

The well was cased with 12-in. pipe to a depth of 8 ft, and the hole was finished 8 in. in diameter from 105 ft to the bottom. In May 1928, a 10-in. pipe was installed to a depth of 105 ft.

In 1922, the well reportedly produced 234 gpm with a drawdown of 21 ft from a nonpumping water level of 29 ft below land surface.

On August 14, 1947, the nonpumping water level was reported to be 1?? ft below the pump base when Well No. 2 was idle.

A mineral analysis of a sample (Lab. No. 38886) collected January 30, 1918, showed the water to have a hardness of 237 mg/l, total dissolved minerals of 415 mg/l, and an iron content of 0.0 mg/l.

WELL NO. 2, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was constructed in 1924 to a depth of 1156 ft by the W. L. Thorne Co., Des Plaines, and deepened in 1928 to a reported depth of 2217 ft (cleaned out in 1962 to 2172 ft) by the J. P. Miller Artesian Well Co., Brookfield. The well is located behind the city hall about 150 ft south of the main pumping station, approximately 1000 ft N and 500 ft W of the SE corner of Section 3, T39N, R8E. The land surface elevation at the well is 677.89 ft.

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

Strata	Thickness (ft)	Depth (ft)
No sample	4	4
SILURIAN SYSTEM		
"Rock", dolomite, buff, and light gray, crystalline, gray, cherty in lower part	136	140
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, argillaceous, brown; shale, dolomitic, gray	45	185
Shale, dolomitic, brown, with dolomite concretions	35	220
Galena Group		
Dolomite, buff	180	400
Platteville Group		
Dolomite, light buff, compact, fine to extra fine	130	530
Ancell Group		
St. Peter Sandstone		
Sandstone, light gray to buff, very fine to medium incoherent	300	830
Shale, sandy, red with white streaks	10	840
Conglomerate of sand, medium, and white chert pebbles	10	850
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, cherty, pink, light gray and white, geodic quartz, glauconitic	150	1000
Franconia Formation		
Shale, red and green; sandstone, red, fine; dolomite, gray, glauconitic	60	1060
Ironton-Galesville Sandstone		
Sandstone, white, fine to coarse, slightly dolomitic	160	1220
Eau Claire Formation		
Sandstone, dolomitic, grayish buff, very fine; shale, dolomitic, gray, glauconitic, green; dolomite, sandy, glauconitic, gray, all interbedded	410	1630
Mt. Simon Sandstone		
Sandstone, yellowish gray to pink to red, very fine to very coarse	587	2217

After the well was deepened in 1928, the hole was reported to be 12 in. in diameter to a depth of 1156 ft and 10 in. in diameter from 1156 to 2217 ft. In 1950 the hole was enlarged to 19 in. to a depth of 352 ft and in 1962 the hole was reamed out to 15 in. in diameter from 352 to 665 ft. The well was originally cased with 12-in. pipe to a depth of 224 ft. In April 1950, the 12-in. casing was removed and a 20-in. diameter surface pipe was placed from land surface to a depth of 6 ft and a 16-in. OD pipe was set from land surface to a depth of 352 ft (cemented in).

Upon completion, the well reportedly produced 300 gpm with a drawdown of 40 ft from a nonpumping water level of 60 ft below land surface.

In April 1925, the nonpumping water level was reported to be 62 ft below the top of the casing.

On March 4, 1926, after pumping at a rate of 171 gpm, the drawdown was 142 ft from a nonpumping water level of 66 ft.

After deepening in 1928, the well reportedly produced 525 gpm with a drawdown of 78 ft from a nonpumping water level of 50 ft below the top of the casing.

On November 10, 1937, the well reportedly produced 800 gpm with a drawdown of 109 ft from a nonpumping water level of 66 ft below land surface.

In January 1944, after pumping at a rate of 900 gpm, the average drawdown was 100 ft from a nonpumping water level of 96 ft below the pump base.

On August 14, 1947, after an idle period of 1 month, the nonpumping water level was reported to be 122 ft below the pump base.

On November 10, 1959, the nonpumping water level was reported to be 192 ft.

In 1962, the well was found bridged at 1562 ft. The hole was reamed from 352 to 665 ft, cleaned to 2172 ft, and then a caliper log was run. After this rehabilitation work, the well reportedly produced from 1067 to 1100 gpm for 3 hr with a drawdown of 235 ft from a nonpumping water level of 212 ft. Pumping was continued for an additional 7 hr at 857 gpm with a final drawdown of 183 ft.

In November 1970, the nonpumping water level was reported to be 284 ft.

In January 1971, the well reportedly produced 750 gpm with a drawdown of 190 ft from a nonpumping water level of 285 ft.

The pumping equipment presently installed consists of a 125-hp Byron Jackson electric motor, an 11-in., 10-stage Byron Jackson submersible pump set at 530 ft, rated at 700 gpm at about 570 ft TDH, and has 530 ft of 8-in. column pipe. The well is equipped with 5 30 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003862) of a sample collected November 26, 1973, after pumping for 3 hr at 750 gpm, showed the water to have a hardness of 223 mg/l, total dissolved minerals of 386 mg/l, and an iron content of 0.1 mg/l.

WELL NO. 3, presently open to the Cambrian-Ordovician aquifer, was constructed in March 1930 to a depth of 985 ft by William H. Cater, Chicago, and deepened in 1941 to a reported depth of 2300 ft (measured at 1241.4 ft in 1951) by the Gray Well Co., Chicago. The well is located in the northwest part of the city near the elevated tank at Logan and Center Sts., approximately 1000 ft S and 400 ft E of the NW corner of Section 3, T39N, R8E. The land surface elevation at the well is 758.6 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Glacial drift	60	60
SILURIAN SYSTEM		
Niagaran and Alexandrian dolomites	150	210
ORDOVICIAN SYSTEM		
Maquoketa Group, shale and dolomite	95	305
Galena-Platteville Dolomite Groups	335	640
Ancell Group		
Glenwood Formation, dolomitic sandstone	45	685
St. Peter Sandstone		
Sandstone, incoherent	402	1087
Conglomerate, sandstone	23	1110
CAMBRIAN SYSTEM		
Franconia Formation, dolomite, sandstone and shale	50	1160

Strata (continued)	Thickness (ft)	Depth (ft)
Ironton Sandstone, partly dolomitic	70	1230
Galesville Sandstone	95	1325
Eau Claire Formation, shale, sandstone and dolomite	390	1715
Mt. Simon Sandstone	585	2300

A 19-in. diameter hole was drilled to a depth of 978 ft. When the well was deepened in 1941, a 15-in. diameter hole was drilled from 978 to 1715 ft and finished 12 in. in diameter from 1715 to 2300 ft. Initially, the well was cased with 20-in. OD wrought iron pipe from land surface to a depth of 65 ft. In March 1931, a 16-in. OD liner was installed from 200 ft to to a depth of 300 ft. Between June and September 1940, the 16-in. liner was removed and a 16-in. OD pipe was installed from land surface to a depth of 320 ft. After deepening this well, a 10-in. liner was set from 1576 ft to a depth of 1715 ft. In 1946 the 16-in. casing was removed and replaced with 16-in. OD casing from land surface to a depth of 338.6 ft (cemented in) and a 16-in. OD perforated liner was set on drive shoes (top and bottom) from 810 ft to a depth of 995 ft. This liner had approximately 40 ft of 1-ft by ¼-in. slots cut with a torch in 4 rows equally spaced around the pipe but staggered in the vertical direction.

On March 13-16, 1930, after pumping at rates of 400, 500, and 620 gpm, the drawdowns were 176.2, 211.2, and 256.2 ft from a nonpumping water level of 48.8 ft below land surface.

On November 20, 1930, the well reportedly produced 500 gpm with a drawdown of 224 ft from a nonpumping water level of 62 ft below the pump base.

On December 3, 1937, the nonpumping water level was reported to be 127 ft.

On March 12, 1940, the well reportedly produced 300 gpm with a drawdown of 103 ft from a nonpumping water level of 135 ft.

Between June and September 1940, the Gray Well Co. removed the 16-in. liner and shot the well with 250 lb of 80 percent blasting gelatin at a depth of 975 ft and with 175 lb at 969 ft. After the second shot a measurement showed a bridge at 960 ft. Ten charges varying from 100 to 250 lb were exploded between 820 and 960 ft. A new 16-in. casing was installed and about 80 cubic yards of sand was removed from the shot zone. After this work was completed a production test was conducted on September 21-23, 1940. After 56 hr of pumping at rates of 250 to 500 gpm, the drawdown was 234 ft from a nonpumping water level of 92 ft below the pump base. Pumping was continued for an additional 3 hr at a rate of 525 gpm with a final drawdown of 250 ft. Since the shooting and developing did not succeed in restoring the well to a greater capacity, the well was drilled to a greater depth,

After the well was deepened in 1941, a production test was conducted on December 22-23, 1941. After 4 hr of pumping at a rate of 1150 gpm, the drawdown was 213 ft from a nonpumping water level of 87 ft below the pump base. Pumping was continued for an additional 40 hr at a rate of 1120 gpm with a final drawdown of 225 ft. Considerable sand was pumped during the first part of the test and the well did not clear up until after 32 hr of pumping. On removal of the test pump, the well was found filled to 933 ft. Approximately 100 cubic yards of sand was bailed from January 12 to May 5, 1942, and at that time the well had been cleaned out to a depth of 1301 ft.

On May 12-13, 1942, the well reportedly produced 500 gpm for 36 hr with a drawdown of 200 ft from a nonpumping water level of 92 ft below the pump base.

On September 17, 1942, after an idle period of 12.5 hr, the well reportedly produced 480 gpm for 6.5 hr with a drawdown of 179 ft from a nonpumping water level of 141 ft below land surface.

In April 1944, holes were found in the 16-in. casing and the well bridged at a depth of 972 ft.

In March 1946, S. B. Geiger & Co., Chicago, started rehabilitating the well. On March 25, 1946, the nonpumping water level was 135 ft and the hole bridged at 970 ft below the pumphouse floor. The 16-in. casing was removed and the hole cleaned to a depth of 1410 ft. A 16-in. liner was temporarily set between depths of 741 and 1003 ft and 1400 lbs of 100 percent blasting gelatin was exploded at 6 levels between 1235 and 1335 ft. The shooting backfilled the hole to 1300 ft and the hole was cleaned out to 2300 ft. A new 16-in. casing at land surface and a 16-in. perforated liner were installed.

After rehabilitation, a production test was conducted on September 5-6, 1946, by representatives of the city, S. B. Geiger & Co., and the State Water Survey. After 20.8 hr of pumping at rates ranging from 755 to 1255 gpm, the final drawdown was 105 ft from a nonpumping water level of 204 ft below the top of the casing. One hr after pumping was stopped, the water level had recovered to 228 ft. When the test pump was removed, the hole was found bridged at a depth of 1278 ft and was then cleaned out to 1540 ft where hard material was encountered. Drilling was stopped at 1576 ft on October 27, 1946.

On July 28, 1947, after a 36-hr idle period, the nonpumping water level was reported to be 212 ft below the pump base.

On October 30, 1951, the well was measured at 1241.4 ft deep and the nonpumping water level was reported to be 234.2 ft.

On June 16, 1954, the well reportedly produced 550 gpm with a drawdown of 54 ft from a nonpumping water level of 256 ft.

The pumping equipment presently installed is a Byron Jackson submersible pump set at 525 ft, rated at 500 gpm at about 524 ft head, and powered by a 125-hp Byron Jackson electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003809) of a sample collected November 26, 1973, after pumping for 9 hr at 400 gpm, showed

the water to have a hardness of 244 mg/l, total dissolved minerals of 334 mg/l, and an iron content of 0.1 mg/l.

WELL NO. 4, presently open to the Ironton-Galesville Sandstone of the Cambrian-Ordovician aquifer and the Elmhurst-Mt. Simon aquifer, was completed in June 1944 to a depth of 2267 ft by the S. B. Geiger & Co., Chicago. This well has not been used since 1973 and rehabilitation is scheduled for 1977. The well is located in the rear of the city hall near First and James Sts., approximately 1150 ft N and 1250 ft W of the SE corner of Section 3, T39N, R8E. The land surface elevation at the well is 719.14 ft.

A sample study log of Well No. 4 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Silt and sand	5	5
Gravel, clean	29	34
SILURIAN SYSTEM		
Niagaran-Alexandrian dolomites	71	105
ORDOVICIAN SYSTEM		
Maquoketa Group, dolomite and shale	135	240
Galena-Platteville Dolomite Groups	340	580
Ancell Group		
Glenwood Formation, sandstone and dolomite	5	585
St. Peter Sandstone		
Sandstone, some shale	338	923
Conglomerate of sandstone, chert, shale, and dolomite	169	1092
CAMBRIAN SYSTEM		
Franconia Formation, sandstone, dolomite, and shale	30	1122
Ironton-Galesville Sandstone		
Sandstone, partly dolomitic, some shale	161	1283
Eau Claire Formation, shale, dolomite, sandstone, and limestone, interbedded	392	1675
Mt. Simon Sandstone	592	2267

A 24-in. diameter hole was drilled to a depth of 55.3 ft, reduced to 22 in. between 55.3 and 275 ft, reduced to 19.2 in. between 275 and 1116 ft, reduced to 16 in. between 1116 and 1687 ft, and finished 12 in. in diameter from 1687 to 2267 ft. The well is cased with 24-in. OD pipe from land surface to a depth of 55.3 ft, 20-in. pipe from land surface to a depth of 275 ft (sealed with bentonite), 16-in. liner from 949 ft to a depth of 1116 ft, and 12-in. liner from 1485 ft to a depth of 1687 ft. In 1964 a 16-in. pipe was installed from land surface to a depth of 934 ft, 10-in. pipe from 934 ft to a depth of 944 ft, and 12-in. ID pipe from 944 ft to a depth of 1125 ft. The annular opening between the casing, liners, and bore hole is filled with cement.

A production test was conducted on June 26-27, 1944. After 24.3 hr of pumping at rates of 1050 to 985 gpm, the drawdown was 172.0 ft from a nonpumping water level of 138.0 ft below the top of the casing. Forty-five min after pumping was stopped, the water level had recovered to 168.0 ft. During the test Well No. 2, 765 ft southeast, was pumping intermittently.

On July 18, 1945, the well reportedly produced 950 gpm for 5 hr with a drawdown of 172 ft from a nonpumping water level of 130 ft below the pumphouse floor.

On July 30, 1947, the nonpumping water level was reported to be 137 ft.

In January 1954, Dowell, Inc. removed the pump and shot the well in the Ironton-Galesville Sandstone using the directional method. The well was then acidized with 2000 gal of 28 percent HCl and the pump was replaced. On March 19, 1954, the well reportedly produced 940 gpm for 28 hr with a drawdown of 135 ft from a nonpumping water level of 205 ft.

In 1964 the well was reamed and shot with about 8 charges of 50 lb nitroglycerin from 1150 to 1275 ft and the new casing was installed.

Between 1968 and 1970 because of reduced production, the well was shot twice with prima cord. The well delivered 650 gpm when returned to service.

In 1970, the nonpumping water level was reported to be 360 ft.

The pumping equipment presently installed consists of a 150-hp U.S. electric motor, a 12-in., 10-stage Aurora turbine pump (No. 24624) set at 520 ft, rated at 700 gpm, and has 520 ft of column pipe. A 30-ft section of 10-in. suction pipe is attached to the pump intake. The well is equipped with 520 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C003805) of a sample collected November 26, 1973, after pumping for 1 hr at 300 gpm, showed the water to have a hardness of 216 mg/l, total dissolved minerals of 318 mg/l, and an iron content of 0.5 mg/l.

WELL NO. 5, open to the Cambrian-Ordovician and the Elmhurst-Mt. Simon aquifers, was completed in February 1957 to a depth of 2292 ft by L. Cliff Neely, Batavia. The well is located near East Side Drive on Dodson St., approximately 1690 ft N and 2390 ft W of the SE corner of Section 2, T39N, R8E. The land surface elevation at the well is approximately 753 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Glacial drift	64	64
Lime	187	251
Maquoketa shale	39	290
Lime	110	400
Sandy lime	22	422
Broken conglomerate	16	438
Lime	8	446
Shale and lime	25	471
Lime	97	568
Shale	2	570
Lime	49	619
Sand	266	885
Red rock	4	889
Lime	10	899
Sand	25	924
Lime	182	1106
Shale	22	1128
Sand	3	1131
Shale	2	1133
Sand	12	1145

Strata (continued)	Thickness (ft)	Depth (ft)
Shale	22	1167
Sand	175	1342
Shale	5	1347
Sandy shale	11	1358
Sand	6	1364
Shale	83	1447
Red shale	26	1473
Shale	34	1507
Sandy lime	8	1515
Sand hard	24	1539
Sandy lime	32	1571
Sand	11	1582
Lime	62	1644
Shale	21	1665
Lime	14	1679
Lime and shale	11	1690
Sand	10	1700
Lime	9	1709
Shale	6	1715
Lime	10	1725
Sandy lime	9	1734
Sand	11	1745
Brown sand	34	1779
Sand	87	1866
Lime	19	1885
Sand	38	1923
Red shale	7	1930
Sand	12	1942
Sand and shale	20	1962
Sand	16	1978
Red shale	14	1992
Red sand and shale	58	2050
Sand, white	148	2198
Red shale	7	2205
Sand	87	2292

A 26-in. diameter hole was drilled to a depth of 64 ft, reduced to 25 in. between 64 and 302 ft, reduced to 19 in. between 302 and 1135 ft, reduced to 15.2 in. between 1135 and 1555 ft, and finished 12 in. in diameter from 1555 to 2292 ft. The well is cased with 26-in. pipe from 2 ft above land surface to a depth of 64 ft, 20-in. pipe from 2 ft above land surface to a depth of 302 ft (cemented in), 18-in. liner from 397 ft to a depth of 500 ft (cemented in), 16-in. liner from 875 ft to a depth of 1135 ft, and 12-in. liner from 1335 ft to a depth of 1555 ft.

A production test was conducted on March 1-2, 1957, by representatives of the driller, the city, the State Water Survey, and Baxter and Woodman, Engineers. After 23.2 hr of pumping at rates of 1012 to 1078 gpm, the drawdown was 150 ft from a nonpumping water level of 234 ft below land surface. Pumping was continued at a rate of 1280 gpm for 1 hr with a final drawdown of 169 ft. Twenty-three min after pumping was stopped, the water level had recovered to 283 ft.

On May 23, 1958, the nonpumping water level was reported to be 247.3 ft below the top of the casing.

On September 10, 1971, the well reportedly produced 900 gpm with a drawdown of 70 ft from a nonpumping water level of 400 ft.

The pumping equipment presently installed consists of a 200-hp 1750 rpm Byron Jackson electric motor, a 12-in., 9-stage Byron Jackson submersible pump (No. 341806) set at 510 ft, rated at 1000 gpm at about 486 ft TDH, and has 510 ft of 8-in. column pipe. The well is equipped with 510 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 03723) is for a water sample from the well collected January 18, 1972, after 1.5 hr of pumping at 875 gpm.

WELL NO. 5, LABORATORY NO. 03723

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.0		Silica	SiO_2	7.5	
Manganese	Mn	0.0		Fluoride	F	1.6	0.08
Ammonium	NH_4	0.5	0.03	Boron	B	0.35	
Sodium	Na	34.4	1.50	Nitrate	NO_3	0.0	
Potassium	K	11.3	0.29	Chloride	Cl	35	0.99
Calcium	Ca	53	2.64	Sulfate	SO_4	24	0.50
Magnesium	Mg	22	1.81	Alkalinity (as $CaCO_3$)		236	4.72
Barium	Ba	0.0		Hardness (as $CaCO_3$)		220	
Copper	Cu	0.0		Total dissolved minerals		335	
Cadmium	Cd	0.00		pH (as rec;d)		7.2	
Chromium	Cr	0.0		Radioactivity			
Lead	Pb	0.01		Alpha pc/l		6	
Mercury	Hg	<0.0005		± deviation		2	
Nickel	Ni	0.0		Beta pc/l		14	
Silver	Ag	0.0		± deviation		2	
Zinc	Zn	0.0					

WELL NO. 6, open to the Ironton-Galesville Sandstone of the Cambrian-Ordovician aquifer, was completed in June 1964 to a depth of 1350 ft by the Milaeger Well and Pump Co., Brookfield, Wis. The well is located east of Randall Road south of South St., approximately 80 ft S and 150 ft E of the NW corner of Section 9, T39N, R8E. The land surface elevation at the well is approximately 755 ft.

A drillers log of Well No. 6 follows:

Strata	Thickness (ft)	Depth (ft)
Glacial drift	100	100
Limestone	467	567
Brown lime	39	606
Sand, white	394	1000
Lime	17	1017
Lime, with shale streaks	84	1101
Red sand	3	1104
Sandy lime	46	1150
Sand	120	1270
Lime, sandy	63	1333
Lime, shale streaks	17	1350

A 26-in. diameter hole was drilled to a depth of 90 ft, reduced to 25 in. between 90 and 500 ft, reduced to 24 in. between 500 and 1140 ft, and finished 19 in. in diameter from 1140 to 1350 ft. The well is cased with 26-in. pipe from 1 ft above land surface to a depth of 90 ft and 20-in. pipe from 1 ft above land surface to a depth of 1140 ft (cemented in). The top of the well casing is equipped with a pitless adapter.

After the well was shot with eight 50-lb shots of 80 percent nitro at 12-ft intervals, a production test was conducted

on June 23, 1964, by representatives of the driller and the Wells Engineering Co. After 14.5 hr of pumping at rates ranging from 270 to 979 gpm, the drawdown was 166 ft from a nonpumping water level of 306 ft below land surface.

The pumping equipment presently installed is a Byron Jackson submersible pump set at 640 ft, rated at 1000 gpm, and powered by a 250-hp Byron Jackson electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 03725) is for a water sample from the well collected January 18, 1972, after 1.5 hr of pumping at 900 gpm.

WELL NO. 6, LABORATORY NO. 03725

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.0		Silica	SiO_2	7.5	
Manganese	Mn	0.0		Fluoride	F	0.8	0.04
Ammonium	NH_4	0.7	0.04	Boron	B	0.25	
Sodium	Na	13	0.57	Nitrate	NO_3	0.0	
Potassium	K	10.4	0.27	Chloride	Cl	3.8	0.11
Calcium	Ca	59	2.94	Sulfate	SO_4	9	0.19
Magnesium	Mg	26	2.14	Alkalinity(as $CaCO_3$)		284	5.68
Barium	Ba	0.5		Hardness (as $CaCO_3$)		256	
Copper	Cu	0.0		Total dissolved minerals		304	
Cadmium	Cd	0.00		pH (as rec'd)		7.0	
Chromium	Cr	0.0		Radioactivity			
Lead	Pb	0.00		Alpha *pc/l*		6	
Mercury	Hg	<0.0005		± deviation		2	
Nickel	Ni	0.0		Beta *pc/l*		17	
Silver	Ag	0.0		± deviation		3	
Zinc	Zn	0.0					

HAMPSHIRE

The village of Hampshire (1611) installed a public water supply in 1902. One well (No. 5) is in use and two wells (Nos. 3 and 4) are available for emergency use. In 1951 there were 280 services, 90 percent metered; the estimated average daily pumpage was 45,000 gpd. In 1974 there were 550 services, all metered; the average and maximum daily pumpages were 200,000 and 300,000 gpd, respectively. The water from Well No. 5 is chlorinated, fluoridated, and treated with polyphosphate to keep iron in solution; the water from Well Nos. 3 and 4 is untreated.

WELL NO. 1, finished in sand and gravel, was completed in 1902 to a depth of 72 ft. This well was abandoned and capped in 1952. The well is located about 60 ft west of State St. and 60 ft south of Jefferson St., approximately 650 ft N and 100 ft W of the SE corner of Section 21, T42N, R6E. The land surface elevation at the well is approximately 900 ft.

The well is cased with 6-in. pipe.

In April 1922, the nonpumping water level was reported to be 35 ft below the pump base.

A mineral analysis of a sample (Lab. No. 47403) collected April 20, 1922, showed the water to have a hardness of 343 mg/l, total dissolved minerals of 388 mg/l, and an iron content of 0.1 mg/l.

WELL NO. 2, open to the Maquoketa Group and the Galena-Platteville dolomite, was completed in 1924 to a depth of 1180 ft (later plugged to 400 ft) by P. E. Millis, Byron. This well was abandoned and capped in 1952. The well is located southwest of Well No. 1, approximately 600 ft N and 200 ft W of the SE corner of Section 21, T42N, R6E. The land surface elevation at the well is approximately 900 ft.

A correlated drillers log of Well No. 2 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Clay	60	60
Gravel	10	70
Clay	106	176
ORDOVICIAN SYSTEM		
Maquoketa Group		
Lime rock	64	240
Shale, dark	40	280
Galena-Platteville Groups		
Lime rock	330	610
Ancell Group		
St. Peter Sandstone	210	820
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Lime rock	50	870
Franconia Formation		
Red marl	20	890
Lime rock	80	970
Eau Claire Formation		
Sand Potsdam	210	1180

A 10-in. diameter hole was drilled to a depth of 178 ft and finished 8 in. in diameter from 178 to 1180 ft. The well is cased with 10-in. pipe to a depth of 178 ft. This well was plugged to a depth of 400 ft and shot at a depth of about 300 ft.

Upon completion, the well reportedly produced 120 gpm for 6 hr and the nonpumping water level was 42 ft below land surface.

On May 18, 1938, after the well was plugged, the nonpumping water level was reported to be 25 ft below the pump base.

On August 6, 1947, after 15 min of pumping at a rate of 125 gpm, the drawdown was 4.5 ft from a nonpumping water level of 45.5 ft below the pump base.

A mineral analysis of a sample (Lab. No. 111401) collected August 6, 1947, after pumping for 15 min at 125 gpm, showed the water to have a hardness of 176 mg/l, total dissolved minerals of 302 mg/l, and an iron content of 0.4 mg/l. Hydrogen

sulfide also was apparent when this sample was collected.

WELL NO. 3 (purchased from Interrieden Canning Co. about 1950), open to the Maquoketa Group and the Galena-Platteville dolomite, was completed in July 1943 to a depth of 514 ft by Neely and Schimelpfenig, Batavia. This well is available for emergency use. The well is located in the northeast portion of the village within the Playskool Toy factory building, approximately 1500 ft N and 1850 ft E of the SW corner of Section 22, T42N, R6E. The land surface elevation at the well is approximately 905 ft.

An 8-in. diameter hole was drilled to a depth of 275 ft and finished 6 in. in diameter from 275 to 514 ft. The well is cased with 8-in. pipe from 2.2 ft above a concrete floor to a depth of 275 ft and a 6-in. liner is placed between the depths of 375 and 455 ft.

Upon completion of the well, after 3.4 hr of pumping at a rate of 400 gpm, the drawdown was 25 ft from a nonpumping water level of 35 ft below the pump base.

On December 2, 1958, the well reportedly produced at capacity with a drawdown of 27.7 ft from a nonpumping water level of 60.7 ft below the pump base.

The pumping equipment presently installed consists of a 30-hp 3450 rpm Franklin electric motor, a 6-stage Deming submersible pump (Serial No. 8694) set at 200 ft, rated at 240 gpm at about 363 ft head, and has 200 ft of 4-in. column pipe.

A mineral analysis of a sample (Lab. No. 148811) collected December 2, 1958, showed the water to have a hardness of 250 mg/l, total dissolved minerals of 315 mg/l, and an iron content of 0.6 mg/l.

WELL NO. 4 (purchased from Interrieden Canning Co. about 1950), open to sand and gravel, the Maquoketa Group, and the Galena-Platteville dolomite, was completed in March 1943 to a depth of 355 ft by Neely and Schimelpfenig, Batavia. This well is available for emergency use. The well is located about 350 ft west of Well No. 3, approximately 1500 ft N and 1500 ft E of the SW corner of Section 22, T42N, R6E. The land surface elevation at the well is approximately 905 ft.

A sample study log of Well No. 4 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
No sample	5	5
Gravel, sandy, silty at base	20	25
Glacial till, gravel, sand, and silt	55	80
Sand, coarse	5	85
Soil	5	90
Sand and gravel	20	110
Glacial till, sand, and silt	80	190
Granular gravel	10	200
ORDOVICIAN SYSTEM		
Maquoketa Group, shale, some dolomite	100	300
Galena Dolomite Group	55	355

A 10-in. diameter hole was drilled to a depth of 200 ft and finished 8 in. in diameter from 200 to 355 ft. The well is cased with 10-in. pipe from 1 ft above land surface to a depth of 190 ft followed by 10 ft of 8-in. No. 40 slot Johnson Armco iron screen.

On May 22, 1943, the nonpumping water level was reported to be 35 ft below the top of the casing.

The pumping equipment presently installed consists of a 10-hp Westinghouse electric motor, a 6-in., 8-stage Pomona turbine pump (No. SC1685) set at 120 ft, rated at 100 gpm at about 250 ft TDH, and has 120 ft of 4.5-in. column pipe.

WELL NO. 5, open to the Maquoketa Group, the Galena-Platteville dolomite, and the Glenwood-St. Peter Sandstone, was constructed in March 1968 to a depth of 690 ft and deepened in January 1971 to a reported depth of 818 ft (measured at 804 ft in February 1973) by the Wehling Well Works, Beecher. The well is located in a field south of the Chicago, Milwaukee, St. Paul, & Pacific RR between Rinn St. and Jefferson Ave. 1 block west of Prairie St., approximately 840 ft N and 2100 ft W of the SE corner of Section 21, T42N, R6E. The land surface elevation at the well is approximately 878 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Soil and clay	5	5
Sand	15	20
Sand and gravel	15	35
Gravel	25	60
Drift and gravel	95	155
Lime	70	225
Shale	35	260
Lime	330	590
Sand	215	805
Lime	13	818

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B008449) is for a water sample from the well collected March 4, 1972, after pumping at 300 gpm.

WELL NO. 5, LABORATORY NO. B008449

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.1	0.00	Silica	SiO_2	13.0	
Manganese	Mn	0.1	0.00	Fluoride	F	0.6	0.03
Ammonium	NH_4	0.12	0.01	Boron	B	0.18	
Sodium	Na	14.4	0.63	Nitrate	NO_3	2.2	0.04
Potassium	K	5.0	0.13	Chloride	Cl	6.0	0.17
Calcium	Ca	60.8	3.03	Sulfate	SO_4	13	0.28
Magnesium	Mg	32.5	2.67	Alkalinity(as $CaCO_3$)		292	5.84
				Hardness (as $CaCO_3$)		272	
Barium	Ba	0.1		Total dissolved minerals		335	
Copper	Cu	0.0					
Cadmium	Cd	0.00		pH (as rec'd)	7.4		
Chromium	Cr	0.0		Radioactivity			
Lead	Pb	0.00		Alpha pc/l	1		
Mercury	Hg	<0.0005		± deviation	1		
Nickel	Ni	0.0		Beta pc/l	3		
Zinc	Zn	0.0		± deviation	1		

A 12-in. diameter hole was drilled to a depth of 155 ft, reduced to 11.2 in. between 155 and 365 ft, and finished 10 in. in diameter from 365 to 818 ft. The well is cased with 12-in. pipe from 2 ft above the pump station floor to a depth of 155 ft and 10-in. pipe from 204 ft to a depth of 365 ft.

A production test was conducted by the driller on March 25-26, 1968. After 15.5 hr of pumping at a rate of 280 gpm, the drawdown was 255 ft from a nonpumping water level of 125 ft below the top of the casing. The water level recovered to 205 ft after pumping had been stopped for 1.1 hr.

Before the well was deepened in January 1971, the driller shot the well with 300 ft of prima cord.

In February 1973, the Layne-Western Co., Aurora, measured the well at 804 ft. The well produced 335 gpm with a drawdown of 205 ft from a nonpumping water level of 177 ft.

The pumping equipment presently installed consists of a 60-hp 1770 rpm Byron Jackson electric motor, an 8-in., 19-stage Byron Jackson submersible turbine pump set at 570 ft, rated at 275 gpm, and has 570 ft of 5-in. column pipe. The well is equipped with 570 ft of airline.

HIGHLAND SUBDIVISION

Highland Subdivision (est. 67), located 2 miles north of St. Charles, installed a public water supply in 1926. The water system is owned and operated by the Highland Subdivision Property Owners Association. One well is in use. In 1975 there were 19 services, none metered; the average and maximum daily pumpages were 4020 and 6000 gpd, respectively. The water is not treated.

From 1926 to 1951, water was obtained from a privately owned well located in the SW quarter of the SE quarter of Section 15, T40N, R8E.

WELL NO. 1, open to the Maquoketa Group, was completed in 1951 to a depth of 152 ft by the W. J. Neely Well & Pump Co., Batavia. The well is located on the lot west of 35W385 Lambert Drive, approximately 650 ft N and 2075 ft W of the SE corner of Section 15, T40N, R8E. The land surface elevation at the well is approximately 700 ft.

The well is cased with 8-in. pipe from about 1.7 ft above the floor of a 6-ft deep pit to an unknown depth.

Upon completion of the well, the nonpumping water level was reported to be 17 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 125 ft and powered by a 3-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A16674) is for a water sample from the well collected March 23, 1976.

WELL NO. 1, LABORATORY NO. A16674

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0	Sili	Silica	SiO_2	15	
Manganese	Mn	0.02		Fluoride	F	0.1	0.00
Ammonium	NH_4	0.0	0.00	Boron	B	0.0	
Sodium	Na	64	2.78	Nitrate	NO_3	8.8	0.14
Potassium	K	2.0	0.05	Chloride	Cl	10	0.28
Calcium	Ca	48	2.40	Sulfate	SO_4	60	1.25
Magnesium	Mg	25	2.06	Alkalinity(as $CaCO_3$)		266	5.32
Arsenic	As	0.000		Hardness (as $CaCO_3$)		222	4.44
Barium	Ba	0.0					
Copper	Cu	0.00		Total dissolved			
Cadmium	Cd	0.00		minerals		420	
Chromium	Cr	0.02					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.9	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		2.3	
Silver	Ag	0.00		± deviation		1.6	
Cyanide	CN	0.00		Beta *pc/l*		2.2	
Zinc	Zn	0.1		± deviation		1.6	

ILLINOIS YOUTH CENTER - GENEVA

Illinois Youth Center - Geneva, formerly known as the Illinois State Training School for Girls (est. 350), located 0.2 mile south of Geneva, installed a public water supply in 1926. One well (No. 4) is in use. In 1952 with a population of 450, the average daily pumpages were 150,000 gpd (summer) and 110,000 gpd (winter). In 1974, with a population of 350, the average and maximum daily pumpages were 48,709 and 72,000 gpd, respectively. The water from Well No. 4 is chlorinated and the hot water is softened.

WELL NO. 1 (old North Well), open to the Silurian dolomite and the Maquoketa Group, was completed in 1903 to a depth of 278 ft. This well was abandoned and filled with concrete prior to 1954. The well was located in the power house, approximately 2140 ft S and 1050 ft E of the NW corner of Section 11, T39N, R8E. The land surface elevation at the well is approximately 720 ft.

The well was cased with 8-in. pipe from 3 ft below land surface to a depth of 135 ft.

On November 30, 1939, the nonpumping water level was reported to be 21 ft below land surface.

A mineral analysis of a sample (Lab. No. 86874) made in December 1939, showed the water to have a hardness of 508 mg/l, total dissolved minerals of 587 mg/l, and an iron content of 0.7 mg/l.

WELL NO. 2 (old South Well), open to the Silurian dolomite and the Maquoketa Group, was completed about 1906 to a depth of 225 ft. This well was abandoned prior to 1958 and filled with concrete prior to 1964. The well was located in the power house 10 ft south of Well No. 1, approximately 2150 ft S and 1050 ft E of the NW corner of Section 11, T39N, R8E. The land surface elevation at the well is approximately 722 ft.

The well was cased with 8-in. pipe from 3 ft above the basement floor of the power house to an unknown depth.

WELL NO. 3, open to the Silurian dolomite and the Maquoketa Group, was completed in March 1953 to a depth of 265 ft (reported in 1956 to be 256.8 ft deep) by the Layne-Western Co., Aurora. This well is not in use. The well is located in a pumphouse about 30 ft east of the elevated tank, approximately 2190 ft S and 1080 ft E of the NW corner of Section 11, T39N, R8E. 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, clay, sand and gravel	70	70
Limestone	155	225
Lime mixed with shale	25	250
Shale	15	265

A 10-in. diameter hole was drilled to a depth of 265 ft. The well is cased with 10-in. steel pipe from 2 ft above the pumphouse floor to a depth of 73 ft.

A production test was conducted by the driller on March 28-30, 1953. After 40.8 hr of pumping at rates ranging from 200 to 188 gpm, the final drawdown was 20 ft from a nonpumping water level of 66 ft. During this test, Well No. 2 was pumping intermittently.

On December 20, 1957, the well reportedly produced 175 gpm with a drawdown of 22 ft from a nonpumping water level of 61 ft.

The pumping equipment presently installed is a Layne & Bowler vertical turbine pump (No. 34892) set at 120 ft, rated at 180 gpm at about 142 ft head, and powered by a 10-hp General Electric motor. The well is equipped with 120 ft of airline.

A mineral analysis of a sample (Lab. No. 145323) collected December 20, 1957, showed the water to have a hardness of 514 mg/l, total dissolved minerals of 675 mg/l, and an iron content of 0.3 mg/l.

WELL NO. 4, open to the Cambrian-Ordovician (except for the Galena-Platteville dolomite) and the Elmhurst-Mt. Simon aquifers, was completed in September 1958 to a depth of 1330 ft and deepened in October 1958 to a reported depth of 2001 ft by L. Cliff Neely, Batavia. The well is located about 6 ft south of the pumphouse which is about 100 yards south of the elevated tank, approximately 2390 ft S and 1070 ft E of the NW corner of Section 11, T39N, R8E. The land surface elevation at the well is approximately 725 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay and gravel	24	24
Gravel and lime shells	21	45
Sand and gravel	11	56
Lime	53	109
Brown lime	5	114
Lime	26	140
Gypsum	25	165
Lime and gypsum	20	185
Lime	40	225
Shale	35	260
Gray shale	15	275
Brown lime	4	279
Shale	10	289
Lime	90	379
Shale	5	384
Lime	6	390
Gypsum	6	396
Lime	6	402
Lime and shale	15	417
Shale	4	421
Lime and gypsum	34	455
Lime	23	478
Gypsum and lime	17	495
Lime	62	557
Hard lime	13	570
Lime	17	587
Sand	17	604
Hard sand	11	615
Soft sand	8	623
Sand	32	655
Sand, hard	25	680
Sand	96	776
Fine sand	22	798
Sand	77	875
Sand hard	27	902
Sand	24	926
Red rock	2	928
Lime	5	933
Sand, lime, and red rock	7	940
Red rock	7	947
Lime	8	955
Chert	8	963
Red rock	15	978
Brown lime	3	981
Lime	59	1040
Shale green	3	1043
Sand	10	1053
Gypsum and lime	17	1070
Shale	9	1079
Green sandy shale	28	1107
Shale green	9	1116
Lime	9	1125
Hard sand	7	1132
Sandy lime	11	1143
Lime	7	1150
Sand	5	1155
Lime	6	1161
Sand	20	1181
Soft sand	24	1205
Hard sandy lime	3	1208
Lime	17	1225
Sand	18	1243

Strata (continued)	Thickness (ft)	Depth (ft)
Sand hard	24	1267
Sand and lime shells	21	1288
Hard sand and lime	15	1303
Lime	12	1315
Shale	27	1342
Shale shells	11	1353
Shale	40	1393
Lime	4	1397
Shale and lime shells	22	1419
Shale and shells	27	1446
Lime	7	1453
Shale	17	1470
Soft sand	6	1476
Sand	57	1533
Hard sand	14	1547
Sand	3	1550
Lime	16	1566
Shale	10	1576
Shale and shells	12	1588
Shale and lime	12	1600
Shale	26	1626
Shale and lime	14	1640
Shale	15	1655
Lime	4	1659
Shale	45	1704
Sand	26	1730
Sand red	17	1747
Sand	19	1766
Sand red	21	1787
Sand	83	1870
Shale	6	1876
Red rock and sand	46	1922
Sand	79	2001

A 25-in. diameter hole was drilled to a depth of 68 ft, reduced to 20 in. between 68 and 602 ft, reduced to 16 in. between 602 and 1001 ft, reduced to 12 in. between 1001 and 1717 ft, and finished 10 in. in diameter from 1717 to 2001 ft. The well is cased with 26-in. drive pipe from land surface to a depth of 68 ft, 16-in. pipe from land surface to a depth of 602 ft (cemented in), and a 12-in. liner from 936.5 ft to a depth of 1025 ft.

At a depth of 1330 ft, a production test was conducted on September 10-11, 1958, by representatives of the driller, the Illinois Youth Center, and the State Water Survey. After 24 hr of pumping at rates ranging from 508 to 394 gpm, the final drawdown was 170 ft from a nonpumping water level of 250 ft below the pump base. The water level recovered to 273 ft after pumping was stopped for 1.6 hr.

At a final depth of 2001 ft, a production test was conducted on October 16-17, 1958, by representatives of the driller, the Illinois Youth Center, and the State Water Survey. The well reportedly produced from 760 to 408 gpm for 24.2 hr with a drawdown of 120 ft from a nonpumping water level of 245 ft below land surface. Three min after pumping was stopped, the water level had recovered to 278 ft.

On January 25, 1960, the nonpumping water level was reported to be 389 ft below land surface.

Monthly measurements of the nonpumping water level during the period January 1962 to January 1978 ranged from about 335 to 399 ft below land surface.

The pumping equipment presently installed consists of a 75-hp 1760 rpm General Electric motor (No. TPJ517001), a 10-in., 10-stage Jacuzzi submersible turbine pump (No. WKC128437) set at 455 ft, rated at 400 gpm at about 500 ft head, and has 455 ft of 6-in. column pipe. The well is equipped with 450 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 04287) is for a water sample from the well collected February 28, 1972, after 1 hr of pumping at 410 gpm.

WELL NO. 4, LABORATORY NO. 04287

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.1	0.00	Silica	SiO_2	7.5	
Manganese	Mn	0.0	0.0	Fluoride	F	1.4	0.07
Ammonium	NH_4	0.8	0.04	Boron	B	0.5	
Sodium	Na	28	1.22	Nitrate	NO_3	0.0	0
Potassium	K	12.0	0.31	Chloride	Cl	10.0	0.28
Calcium	Ca	53	2.64	Sulfate	SO_4	21	0.44
Magnesium	Mg	20.5	1.68	Alkalinity(as $CaCO_3$)		248	4.96
				Hardness (as $CaCO_3$)		220	
Barium	Ba	0.0		Total dissolved minerals		376	
Copper	Cu	0.0					
Cadmium	Cd	0.00					
Chromium	Cr	0.0		pH (as rec'd)		7.5	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha pc/l		2	
Nickel	Ni	0.0		± deviation		1	
Silver	Ag	0.0		Beta pc/l		12	
Zinc	Zn	0.10		± deviation		2	

ILLINOIS YOUTH CENTER - ST. CHARLES

Illinois Youth Center - St. Charles, formerly known as the Illinois State Training School for Boys (est. 360), located 2 miles west of Geneva, installed a public water supply in 1926. Two wells (Nos. 4 and 5) are in use. In 1952, with a population of approximately 750, the average daily pumpages were 300,000 gpd during the summer and 220,000 gpd during the winter. In 1974, with the current population of 360, the average and maximum daily pumpages were 262,368 and 390,000 gpd, respectively. The water is chlorinated and aerated; water discharged to the hot water system is softened but not chlorinated.

WELL NO. 1 (Old South Well), finished in sand and gravel, was an old dug well. This well was abandoned and filled with gravel and dirt in 1954. The well was located on the south side of the power house in the NW quarter of Section 31, T40N, R8E.

WELL NO. 2 (North Well), presently open to the Maquoketa

Group, the Galena-Platteville dolomite, the Glenwood-St. Peter Sandstone, and the Franconia Formation, was completed in December 1907 to a depth of 1108 ft (reported in 1939 to be 1030 ft deep and sounded in 1952 at 734 ft deep) by the J. P. Miller Artesian Well Co., Brookfield. This well was abandoned and filled about 1956. The well was located about 20 ft north of the power house, approximately 1400 ft S and 400 ft E of the NW corner of Section 31, T40N, R8E. The land surface elevation at the well is approximately 785 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Sand and gravel	136	136
Limestone	140	276
Shale	15	291
Limestone	55	346
Shale	10	356
Limestone	30	386
Limestone and shale	20	406
Limestone	230	636
Sandstone, St. Peter	380	1016
Shale, red	5	1021
Shale, red, and limestone	27	1048
Sandstone	40	1088
Shale	20	1108

An 8-in. diameter hole was drilled to a depth of 275 ft, reduced to 6.2 in. between 275 and 1027 ft, and finished 5 in. in diameter from 1027 to 1108 ft. The well was cased with 8-in. pipe from land surface to a depth of 135 ft and a 5-in. liner from 985 ft to a depth of 1027 ft. In 1949, a new sleeve was placed around part of the casing to stop a leak that had developed.

In 1939, the nonpumping water level was reported to be 62 ft below land surface.

In June 1952, the nonpumping water level was reported to be 59 ft. While pumping at 220 gpm, water was produced for 1 min and air for 1 min. When pumping at 120 gpm, with 40-50 ft of water depth above the bowls, there was some air but water flowed at a steady rate. The maximum rate of pumping was reported to be 150 gpm "with a heavy drawdown."

A mineral analysis of a sample (Lab. No. 86833) made in December 1939, showed the water to have a hardness of 396 mg/l, total dissolved minerals of 431 mg/l, and an iron content of 0.5 mg/l.

WELL NO. 3 (South Well), open to the Cambrian-Ordovician aquifer, was completed about 1907 to a depth of 1500 ft. This well was abandoned and capped prior to 1970. The well is located on the south side of the power house, approximately 1550 ft S and 400 ft E of the NW corner of Section 31, T40N, R8E. The land surface elevation at the well is approximately 788 ft.

The well is cased with 12-in. pipe to a depth of 200 ft.

In 1939 the nonpumping water level was reported to be 47.5 ft.

WELL NO. 4 (formerly known as Well No. 3), open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in May 1955 to a depth of 1322 ft by the Layne-Western Co., Aurora. The well is located about one block north of the power house and 150 ft north of the Vocational Building, approximately 378 ft S and 3800 ft W of the NE corner of Section 31, T40N, R8E. The land surface elevation at the well is approximately 755 ft.

A sample study summary log of Well No. 4 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
No sample	5	5
Till, sandy, yellowish brown	25	30
Sand and gravel, buff	20	50
Sand, buff	25	75
No sample	10	85
Till and gravel	20	105
Sand and gravel, calcareous, clean	45	150
SILURIAN SYSTEM		
Elwood Dolomite		
Dolomite, cherty, silty, fine to medium	25	175
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, silty, fine, little shale, gray	40	215
Shale, slightly dolomitic, gray to buff	65	280
Galena Group		
Dolomite, very fine to fine, buff	215	495
Platteville Group		
Dolomite, slightly silty, trace chert	122	617
Ancell Group		
Glenwood Formation		
Dolomite, sandy, fine to medium	4	621
Sandstone, fine to coarse, subrounded, incoherent, shaly at base	64	685
St. Peter Sandstone		
Sandstone, silty, near middle fine to coarse, subrounded, incoherent, chert near base	300	985
Shale, red, conglomerate near base	50	1035
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, fine	10	1045
Franconia Formation		
Sandstone, dolomitic, very fine to medium, dolomite at top	73	1118
Ironton-Galesville Sandstone		
Sandstone, dolomitic, fine to coarse, subrounded, incoherent	198	1316
Eau Claire Formation		
Shale, silty, greenish gray	6	1322

A 16 in. diameter hole was drilled to a depth of 155 ft, reduced to 15.5 in. between 155 and 630 ft, reduced to 12 in. between 630 and 1065 ft, and finished 10 in. in diameter from 1065 to 1322 ft. The well is cased with 16-in. OD pipe from 1 ft above land surface to a depth of 155 ft, 12-in. OD pipe from 1 ft above land surface to a depth of 630 ft, and a 10-in. ID liner from 928 ft to a depth of 1065 ft. The annulus between the 16-in. and 12-in. casings was grouted with cement.

A production test was conducted on May 18-19, 1955, by representatives of the driller and the **State** Water Survey. After

24 hr of pumping at rates ranging from 167 to 369 gpm, the final drawdown was 110.2 ft from a nonpumping water level of 233.3 ft below land surface.

A second production test was conducted by the State Water Survey on June 27, 1955, after the well was shot with 300 qt of liquid explosive between the depths of 1310 and 1160 ft and cleaned out. After 7.3 hr of pumping at rates ranging from 300 to 472 gpm, the final drawdown was 50 ft from a nonpumping water level of 238 ft below the top of the casing. Forty min after pumping was stopped, the water level had recovered to 251 ft.

On June 14, 1957, the nonpumping water level was reported to be 270 ft.

On September 11, 1957, the well reportedly produced 330 gpm for 15 min with a drawdown of 28 ft from a nonpumping water level of 248 ft.

On January 12, 1972, after pumping at 350± gpm, the drawdown was 22 ft from a nonpumping water level of 370 ft.

The pumping equipment presently installed consists of a 75-hp 1800 rpm U. S. electric motor (Serial No. 1040048), a 10-in., 9-stage Layne turbine pump (No. 33557) set at 420 ft, rated at 600 gpm, and has 420 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 420 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A107145) of a sample collected November 28, 1973, after pumping for 45 min at 280 gpm, showed the water to have a hardness of 240 mg/l, total dissolved minerals of 324 mg/l, and an iron content of 0.00 mg/l.

WELL NO. 5, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in December 1969 to a depth of 1292 ft by the Layne-Western Co., Aurora. The well is located about 350 ft southeast of the collecting reservoir just east of Roosevelt Cottage, approximately 1600 ft S and 740 ft E of the NW corner of Section 31, T40N, R8E. The land surface elevation at the well is approximately 763 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black top soil	2	2
Yellow sandy clay	8	10
Gravel	7	17
Brown gritty shale	18	35
Brown mud and gravel	45	80
Gravel	20	100
Brown soft sand	20	120
Brown and yellow, medium lime	5	125
Lime with green shale streaks	25	150
Gray shale and lime shells	20	170
Soft gray shale	5	175
Soft shale and lime shells	30	205
Soft brown shale	20	225
Soft gray shale and shells	15	240
Medium hard gray lime	5	245
Medium gray shale	8	253
Hard gray limestone	42	295
Medium hard gray limestone	20	315
Medium hard brown limestone	100	415
Hard brown limestone	50	465
Hard gray limestone	45	510
Hard brown limestone	15	525
Hard gray limestone	30	555
Hard brown limestone	30	585
Hard white sandstone	40	625
Soft white sandstone	30	655
Green shale	5	660
Medium hard white sandstone	250	910
Medium brown sandstone	25	935
Hard brown sandy limestone	15	950
Sticky red rock	13	963
Hard sandy limestone	12	975
Medium hard sandstone	10	985
Hard sand and red rock	20	1005
Sandstone, lime, and red rock conglomerate	19	1024
Limestone	1	1025
Red rock with sand	10	1035
Hard sand and red rock	5	1040
Sand and some shale	10	1050
Hard gray sandstone	5	1055
Green shale and red rock	5	1060
Green shale	10	1070
Hard gray sandy limestone	15	1085
Medium lime and shale	15	1100
Hard brown sandstone	15	1115
Hard white sandstone	20	1135
Medium hard sandstone	40	1175
Medium soft sandstone	10	1185
Soft white sandstone	70	1255
Medium white sandstone	20	1275
Gray sandy shale	5	1280
Shale	12	1292

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 04157) is for a water sample from the well collected February 16, 1972, after 30 min of pumping at 650 gpm.

WELL NO. 5, LABORATORY NO. 04157

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	6.5	
Manganese	Mn	0.0		Fluoride	F	0.9	0.05
Ammonium	NH_4	0.8	0.04	Boron	B	0.4	
Sodium	Na	18	0.78	Nitrate	NO_3	0.0	
Potassium	K	9	0.23	Chloride	Cl	4	0.11
Calcium	Ca	61	3.04	Sulfate	SO_4	8	0.17
Magnesium	Mg	25	2.06	Alkalinity (as $CaCO_3$)		288	
				Hardness (as $CaCO_3$)		252	
Barium	Ba	0.2		Total dissolved minerals		320	
Copper	Cu	0.0					
Cadmium	Cd	0.00		pH (as rec'd)		7.5	
Chromium	Cr	0.0		Radioactivity			
Lead	Pb	0.00		Alpha *pc/l*		6	
Mercury	Hg	<0.0005		± deviation		2	
Nickel	Ni	0.0		Beta *pc/l*		7	
Silver	Ag	0.0		± deviation		2	
Zinc	Zn	0.0					

A 16-in. diameter hole was drilled to a depth of 124 ft, reduced to 15.2 in. between 124 and 593 ft, reduced to 12 in. between 593 and 1088 ft, and finished 10 in. in diameter from 1088 to 1292 ft. The well is cased with 16-in. pipe from 2.2 ft above land surface to a depth of 124 ft, 12-in. pipe from 2.2 ft above land surface to a depth of 593 ft (cemented in), and a 10-in. liner from 947.6 ft to a

depth of 1088 ft.

A production test was conducted by the driller on December 22, 1969. After 9.6 hr of pumping at rates ranging from 495 to 548 gpm, the final drawdown was 83 ft from a nonpumping water level of 343 ft below land surface. Two hr after pumping was stopped, the water level had recovered to 335 ft.

A second production test was conducted by the driller on August 14, 1970. The well reportedly produced from 700 to 690 gpm for 1 hr with a final drawdown of **118** ft from a nonpumping water level of 318 ft below the top of the casing.

On January 12, 1972, the nonpumping water level was reported to be 341 ft.

The pumping equipment presently installed is a 12-in., 11-stage Layne vertical centrifugal turbine pump (Serial No. 62760) set at 500 ft, rated at 600 gpm at about 565 ft TDH, and powered by a 125-hp 1770 rpm U: S. Holloshaft electric motor (Serial No. HCJ1426823). The well is equipped with 500 ft of airline.

ILLINOIS YOUTH CENTER - VALLEY VIEW

Illinois Youth Center - Valley View (est. 280), located within the village of Valley View, installed a public water supply in 1969. Finished water for this supply is obtained from the St. Charles Skyline Sewer & Water Co. (Valley View).

LAKE MARIAN IN THE WOODS SUBDIVISION

Lake Marian in the Woods Subdivision (est. 648), located 1 mile north of Carpentersville, installed a public water supply in 1953. The water system is owned and operated by the Lake Marian Water Corporation. Two wells (Nos. 1 and 2) are in use and another well (No. 3) is available for emergency use. In 1961 there were 90 services, none metered. In 1974 there were 150 services, all metered; the average and maximum daily pumpages were 23,090 and 36,000 gpd, respectively. The water from Well No. 1 is fluoridated and the water from Well Nos. 2 and 3 is untreated.

WELL NO. 1, open to the Maquoketa Group, was completed in August 1953 to a depth of 208 ft by the Mitchell Well Drilling Co, Prospect Heights. The well is located between Sunset and Skyline Drives, approximately 400 ft S and 2200 ft E of the NW corner of Section 14, T42N, R8E. The land surface elevation at the well is approximately 873 ft.

A 6-in. diameter hole was drilled to a depth of 208 ft. The well is cased with 6-in. black pipe from 0.2 ft above the pumphouse floor to a depth of 180 ft.

Upon completion, the well reportedly produced 25 gpm for 5 hr with little drawdown from a nonpumping water level of 90 ft.

A production test was conducted by the State Water Survey on July 30, 1962. The nonpumping water level was 101.8 ft below land surface. After 11 min of pumping at a rate of 44 gpm, the pump broke suction and the discharge dropped off to 36 gpm. The discharge was still dropping when the pump was shut down 6 min later.

The pumping equipment presently installed is a Reda submersible pump set at 158 ft, and powered by a 5-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C000180) of a sample collected July 15, 1977, showed the water to have a hardness of 383 mg/l, total dissolved minerals of 428 mg/l, and an iron content of 1.2 mg/l.

WELL NO. 2, open to the Maquoketa Group, was completed in December 1953 to a depth of 251 ft by the Mitchell Well Drilling Co., Prospect Heights, The well is located south of Kings Road just west of Deerpath Lane, approximately 2900 ft S and 1850 ft E of the NW corner of Section 11, T42N, R8E. The land surface elevation at the well is approximately **840** ft.

A 6-in. diameter hole was drilled to a depth of 251 ft. The well is cased with 6-in. black pipe from 1.2 ft above the pumphouse floor to a depth of 202 ft.

Upon completion, the well reportedly produced 25 gpm for 8 hr with a drawdown of 6 ft from a nonpumping water level of 105 ft.

A production test was conducted by the State Water Survey on July 30, 1962. **After 1** hr of pumping at a rate of 25 gpm, the drawdown was 19.1 ft from a nonpumping water level of 77.9 ft below land surface.

The pumping equipment presently installed is a submersible

pump powered by a 5-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C000182) is for a water sample from the well collected July 15, 1977.

WELL NO. 2, LABORATORY NO. C000182

		mg/l	me/l			mg/l	me/l
Iron	Fe	1.4		Silica	SiO_2	17	
Manganese	Mn	0.02		Fluoride	F	0.5	0.03
Ammonium	NH_4	0.23	0.01	Boron	B	0.2	
Sodium	Na	4	0.17	Nitrate	NO_3	0.04	0.00
Potassium	K	1.9	0.05	Chloride	Cl	5	0.14
Calcium	Ca	73	3.64	Sulfate	SO_4	48	1.00
Magnesium	Mg	42	3.46	Alkalinity(as $CaCO_3$)		328	6.56
Arsenic	As	0.000					
Barium	Ba	0.0					
Copper	Cu	0.00		Hardness (as $CaCO_3$)		357	7.14
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved			
Lead	Pb	0.00		minerals		400	
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.01		pH (as rec'd)		8.3	

WELL NO. 3, finished in sand and gravel, was completed in November 1963 to a depth of 75 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located east of Park Ave. just south of Memory Lane, approximately 1050 ft S and 1250 ft E of the NW corner of Section 14, T42N, R8E. The land surface elevation at the well is approximately 800 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Fill, few stones	5	5
Coarse sand and gravel	6	11
Strata (continued)		
Pinkish clay, few sand streaks	9	20
Pinkish clay	13	33
Pinkish clay and sand streaks	11	44
Medium sand	14	58
Coarse sand and gravel, few boulders	22	80

A 16-in. diameter hole was drilled to a depth of 15 ft and finished 6 in. in diameter from 15 to 75 ft. The well is equipped with a pitless adapter from 1 ft above land surface to a depth of 4 ft and cased with 6-in. pipe to a depth of 65 ft (cemented in from 0 to 15 ft) followed by 10 ft of 6-in. No. 20 slot Layne Keystone stainless steel screen.

A production test was conducted on November 22, 1963, by representatives of the driller, the Lake Marian Water Corporation, the State Water Survey, and R. H. Anderson, Consulting Engineer. After 2 hr of pumping at a rate of 28.2 gpm, the drawdown was 1.40 ft from a nonpumping water level of 27.50 ft below land surface. Fifty min after pumping was stopped, the water level had recovered to 27.54 ft.

On December 11, 1963, after the permanent pump had been installed, the well reportedly produced from 83 to 89 gpm for 1 hr with a drawdown of 11.50 ft from a nonpumping water level of 27.50 ft below land surface. The water level recovered to 28.00 ft after the pump was stopped for 10 min.

The pumping equipment presently installed is a 12-stage Red Jacket submersible pump (Model No. 500K1-12E) set at 70 ft, rated at 50 gpm, and powered by a 5-hp Red Jacket electric motor.

A partial analysis of a sample (Lab. No. 161697) collected during the initial production test, after pumping for 2 hr at 28.2 gpm, showed the water to have a hardness of 472 mg/l, total dissolved minerals of 556 mg/l, and an iron content of 1.4 mg/l.

MAPLE PARK

The village of Maple Park (660) installed a public water supply in 1894. One well (No. 3) is in use and another well (No. 2) is available for emergency use. In 1950 there were 130 services, all metered; the estimated average daily pumpage was 18,000 gpd. In 1977 there were 190 services, all metered; the estimated average and maximum daily pumpages in 1976 were 41,644 and 62,500 gpd, respectively. The water is fluoridated and chlorinated.

WELL NO. 1, open to the Galena-Platteville dolomite, was completed in 1894 to a depth of 300 ft. This well was abandoned in 1946 and filled in 1956. The well was located about 20 ft south of Main St. and 215 ft east of Liberty St., approximately 700 ft S and 1400 ft E of the NW corner of Section 31, T40N, R6E. The land surface elevation at the well is approximately 865 ft.

The well was cased with 6-in. pipe to an unknown depth.

About 1920 the nonpumping water level was reported to be 127 ft below the pump base.

In 1939 this well was cleaned out by Harry Prentice, DeKalb, and was found to be bridged at a point 75 ft above the bottom. When the bridge was removed there was no change in the nonpumping water level of 155 ft below the pump base, but an increase in production was reported.

A mineral analysis of a sample (Lab. No. 31118) collected

July 31, 1915, showed the water to have a hardness of 241 mg/l, total dissolved minerals of 324 mg/l, and an iron content of 0.1 mg/l.

WELL NO. 2, finished in sand and gravel, was completed in September 1946 to a depth of 134 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located next to the village hall on Main St., approximately 450 ft S and 950 ft E of the NW corner of Section 31, T40N, R6E. The land surface elevation at the well is approximately 865 ft.

A correlated drillers log of a test hole at the site of Well No. 2 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Top soil	2	2
Yellow clay	12	14
Brown sand	4	18
Sand and clay	47	65
Sand, fine clean, and loose	5	70
Sand and clay	12	82
Sand	103	185
Sand, cemented, clay boulders	8	193
ORDOVICIAN SYSTEM		
Maquoketa Group		
Rock, bottom of test hole	at	193

The well is cased with 10-in. pipe from 0.5 ft above the pumphouse floor to a depth of 117 ft and equipped with 20 ft (17 ft exposed) of 8-in. No. 10 slot Keystone screen. The top 3 ft of the screen was lead seal, the next 15 ft slotted, and the bottom 2 ft was blank.

A production test was conducted by Mr. Clifford Ashley, engineer, on October 1, 1946. After 3.5 hr of pumping at a rate of 132 gpm, the drawdown was 85 ft from a nonpumping water level of 19 ft below the pump base. Three min after pumping was stopped, full recovery was observed.

In 1961, after the well had been acidized by H. I. Stone & Sons, DeKalb, the well reportedly produced 120 gpm for 2 hr with a drawdown of 44 ft from a nonpumping water level of 19 ft.

The pumping equipment presently installed is a Red Jacket submersible pump rated at 100 gpm, and powered by a 10-hp electric motor.

A partial analysis of a sample (Lab. No. 146284) collected April 8, 1958, showed the water to have a hardness of 324 mg/l, total dissolved minerals of 350 mg/l, and an iron content of 2.3 mg/l.

WELL NO. 3, finished in sand and gravel, was completed in April 1971 to a depth of 182 ft (effective depth) by the Layne-Western Co., Aurora. The well is located at the southeast corner of the intersection of Pearl and Charles Sts., approximately 400 ft N and 1300 ft E of the SW corner of Section 30, T40N, R6E. The land surface elevation at the well is approximately 862 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Clay	14	14
Sand and gravel	8	22
Gravelly clay	14	36
Gravel and sand	6	42
Clay	35	77
Sand and gravel	31	108
Clay	4	112
Sand and gravel	70	182
Brown shale	3	185

An 18-in. diameter hole was drilled to a depth of 188 ft. The well is cased with 10-in. steel pipe from 2 ft above land surface to a depth of 150.2 ft, screened with 10-in. No. 35 slot Johnson stainless steel from 150.2 to 152.2 ft, cased with 10-in. steel pipe from 152.2 to 160.7 ft, screened with 10-in. No. 35 slot Johnson stainless steel from 160.7 to 170.7 ft, cased with 10-in. steel pipe from 170.7 to 177 ft, screened with 10-in. No. 35 slot Johnson stainless steel from 177 to 182 ft, and cased with 10-in. steel pipe from 182 to 185 ft. The annulus between the hole and casing-screen assembly is filled with cement from 0 to 135 ft and with No. 1 Muscatine gravel from 135 to 188 ft.

A production test was conducted by the driller on May 10, 1971. After 7 hr of pumping at a rate of 80 gpm, the final drawdown was 105.1 ft from a nonpumping water level of 17.8 ft below land surface.

The pumping equipment presently installed consists of a 10-hp 1750 rpm U.S. electric motor, an 8-in., 8-stage Layne turbine pump (No. 70929) set at 157 ft, rated at 80 gpm at about 250 ft TDH, and has 157 ft of 4-in. column pipe. A 10-ft section of 4-in. suction pipe is attached to the pump intake. The well is equipped with 157 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B2164) is for a water sample from the well collected July 12, 1972, after 122 hr of pumping at 75 gpm.

WELL NO. 3, LABORATORY NO. B2164

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.20	0.01	Silica	SiO_2	18.4	
Manganese	Mn	0.01		Fluoride	F	0.5	0.03
Ammonium	NH_4	0.5	0.03	Boron	B	0.25	
Sodium	Na	22.7	0.99	Nitrate	NO_3	0.0	
Potassium	K	2.6	0.07	Chloride	Cl	1	0.03
Calcium	Ca	44.6	2.23	Sulfate	SO_4	0	
Magnesium	Mg	28.5	2.34	Alkalinity(as $CaCO_3$)		274	5.48
Arsenic	As	0.00		Hardness (as $CaCO_3$)		228	
Barium	Ba	0.1					
Copper	Cu	0.00		Total dissolved minerals		296	
Cadmium	Cd	0.00					
Chromium	Cr	0.0					
Lead	Pb	0.00		pH (as rec'd)		7.6	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha pc/l		0.0	
Selenium	Se	0.00		± deviation		1.4	
Silver	Ag	0.00		Beta pc/l		0.3	
Zinc	Zn	0.0		± deviation		0.8	

MARVIRAY MANOR SUBDIVISION

Marviray Manor Subdivision (est. 385), located just southeast of the Aurora city limits, installed a public water supply in 1946. The water system is owned and operated by the Marviray Waterworks, Inc. One well is in use. In 1953 there were 72 services, all metered. In 1977 there were 110 services, all metered; the estimated average and maximum daily pumpages were 19,700 and 29,500 gpd, respectively. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite and the Maquoketa Group, was completed in October 1946 to a depth of 300 ft by Neely and Schimelpfenig, Batavia. The well is located at the southwest corner of Montgomery Road and Howell Place at 781 Montgomery Road, approximately 2600 ft N and 700 ft E of the SW corner of Section 35, T38N, R8E. The land surface elevation at the well is approximately 683 ft.

A correlated drillers log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Drift	50	50
SILURIAN AND ORDOVICIAN SYSTEMS (Undifferentiated)		
"Limestone", some shale breaks	175	225
Maquoketa Group		
Shale, 5 ft lime break	70	295
Galena Group		
"Limestone"	5	300

A 10-in. diameter hole was drilled to a depth of 300 ft. The well is cased with 10-in. ID pipe from 2.5 ft above the pumphouse floor to a depth of 58.5 ft.

A production test was conducted on October 16, 1946, by representatives of the driller, the subdivision, and the State Water Survey. After 5 hr of pumping at a rate of 50 gpm, the drawdown was 5 ft from a nonpumping water level of 27 ft below the top of the casing.

Nonpumping water levels were reported to be 27 ft on January 14, 1969; 25 ft in April 1975; 32 ft in August and September 1975; 28 ft in April 1976; and 35 ft in August 1976.

The pumping equipment presently installed is a Layne & Bowler turbine pump set at 125 ft, rated at 100 gpm at about 175 ft head, and powered by a 7½-hp U.S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A15635) is for a water sample from the well collected March 9, 1976, after 45 min of pumping at 100 gpm.

WELL NO. 1, LABORATORY NO. A15635

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.7		Silica	SiO_2	18	
Manganese	Mn	0.07		Fluoride	F	0.6	0.03
Ammonium	NH_4	0.47	0.03	Boron	B	0.5	
Sodium	Na	34	1.48	Nitrate	NO_3	2.6	0.04
Potassium	K	5.0	0.13	Chloride	Cl	15	0.42
Calcium	Ca	91	4.54	Sulfate	SO_4	152	3.16
Magnesium	Mg	52	4.28	Alkalinity (as $CaCO_3$)		350	7.00
Arsenic	As	0.000		Hardness (as $CaCO_3$)		442	8.84
Barium	Ba	0.0					
Copper	Cu	0.03		Total dissolved minerals		590	
Cadmium	Cd	0.00					
Chromium	Cr	0.02					
Lead	Pb	0.00					
Mercury	Hg	0.0003		pH (as rec'd)	7.4		
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha pc/l	5.1		
Silver	Ag	0.00		± deviation	2.7		
Cyanide	CN	0.01		Beta pc/l	8.0		
Zinc	Zn	0.0		± deviation	2.4		

MOECHERVILLE SUBDIVISION

Moecherville Subdivision (est. 1120), located at the southeast edge of Aurora, installed a public water supply in 1942. The water system is owned and operated by the Subdivision Water Trust No. 1. Three wells are in use. In 1953 there were 322 services, all metered. In 1976 there were 320 services, none metered; the average and maximum daily pumpages were 72,800 and 108,000 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 August 1942 to a depth of 147 ft. The well is located near the intersection of Fifth St. and Farnsworth Ave., approximately 575 ft S and 125 ft W of the NE corner of Section 26, T38N, R8E. The land surface elevation at the well is approximately 710 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	3	3
Yellow clay	27	30
Gray clay	60	90
Gravel and sand	17	107
Gray limestone	5	112
White limestone	35	147

A 6-in. diameter hole was drilled to a depth of 147 ft. The well is cased with 6-in. galvanized wrought steel pipe from 0.7 ft above the pumphouse floor to a depth of 107 ft.

The well was treated with acid on May 28, 1956. The results were not recorded.

On May 31, 1956, and April 22,1970, the nonpumping water level was reported to be 50 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 5-hp Red Jacket electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42016) of a sample collected April 21, 1976, after pumping for 2 hr at 70 gpm, showed the water to have a hardness of 441 mg/l, total dissolved minerals of 581 mg/l, and an iron content of 1.6 mg/l.

WELL NO. 2, open to the Silurian dolomite, was completed in September 1946 to a depth of 180 ft by Ray Feuerborn, Batavia. The well is located just northeast of the intersection of Sumner and Ziegler Sts., approximately 575 ft S and 850 ft W of the NE corner of Section 26, T38N, R8E. The land surface elevation at the well is approximately 710 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	114	114
Limestone	66	180
Shale		

A 6-in. diameter hole was drilled to a depth of 180 ft. The well is cased with 6-in. wrought steel pipe from 1.7 ft above the pumphouse floor to a depth of 114 ft.

The well was acidized in August 1955 but the results were not recorded.

On April 22, 1970, the nonpumping water level was reported to be 50 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 140 ft, rated at 90 gpm, and powered by a 5-hp Red Jacket electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42010) of a sample collected April 21, 1976, after pumping for 1 hr at 70 gpm, showed the water to have a hardness of 464 mg/l, total dissolved minerals of 613 mg/l, and an iron content of 1.7 mg/l.

WELL NO. 3, open to the Silurian dolomite, was completed in July 1950 to a depth of 196 ft by Ray Feuerborn, Batavia. The well is located at the northeast corner of the intersection of Louck and Ziegler Sts., approximately 575 ft S and 1200 ft W of the NE corner of Section 26, T38N, R8E. The land surface elevation at the well is approximately 712 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	114	114
Limestone	82	196
Shale		

A 6-in. diameter hole was drilled to a depth of 196 ft. The well is cased with 6-in. wrought steel pipe from 1 ft above the pumphouse floor to a depth of 114 ft.

On April 22, 1970, the nonpumping water level was reported to be 50 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 130 ft, rated at 90 gpm, and powered by a 5-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B42017) is for a water sample from the well collected April 21, 1976, after 1 hr of pumping at 70 gpm.

WELL NO. 3, LABORATORY NO. B42017

		mg/l	me/l			mg/l	me/l
Iron	Fe	1.1		Silica	SiO_2	15	
Manganese	Mn	0.01		Fluoride	F	0.8	0.04
Ammonium	NH_4	0.44	0.02	Boron	B	0.5	
Sodium	Na	27	1.17	Nitrate	NO_3	0.0	0.00
Potassium	K	2.5	0.06	Chloride	Cl	2.9	0.08
Calcium	Ca	66	3.29	Sulfate	SO_4	69	1.44
Magnesium	Mg	42	3.46	Alkalinity (as $CaCO_3$)		325	6.50
Arsenic	As	0.00		Hardness (as $CaCO_3$)		337	6.74
Barium	Ba	0.1					
Copper	Cu	0.00		Total dissolved minerals		463	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.4	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha pc/l		1.6	
Silver	Ag	0.00		± deviation		1.3	
Cyanide	CN	0.00		Beta pc/l		3.4	
Zinc	Zn	0.0		± deviation		1.5	

MONTGOMERY

The village of Montgomery (3278) installed a public water supply in 1928. Five wells (Nos. 3, 4, 6, 7, and 8) are in use and two wells (Nos. 1 and 2) are available for emergency use. This supply is also cross connected with the Western Electric Co. In 1951 there were 200 services, all metered. In 1976 there were 3176 services, including Boulder Hill, Parkview Estates, and Blackberry Heights Subdivisions; the average and maximum daily pumpages in 1972 were 1,594,524 and 1,885,400 gpd, respectively. The village water is chlorinated. The water from Parkview Estates (Well No. 5) and Blackberry Heights Subdivisions (Well Nos. 6 and 7) is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite and the Maquoketa Group, was completed in 1928 to a depth of 175 ft by B. L. Palmer & Sons, Aurora. This well is available for emergency use, however, it has not been used since 1962. The well is located in the old main pumping station at Clay and Railroad Sts., approximately 1850 ft N and 1450 ft W of the SE corner of Section 32, T38N, R8E. The land surface elevation at the well is approximately 642 ft.

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

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
"Loam top soil"	4	4
"Gravel"	28	32
SILURIAN SYSTEM		
Elwood Dolomite		
Dolomite, cherty, light gray	23	55
ORDOVICIAN SYSTEM		
Maquoketa Group		
Shale, dolomitic, light gray	55	110
Dolomite, gray, brown	20	130
Shale, dolomitic, brown; dolomite, brown	45	175

A 10-in. diameter hole was drilled to a depth of 85 ft and finished 8 in. in diameter from 85 to 175 ft. The well is cased with 10-in. pipe from land surface to a depth of 34 ft and 8-in. pipe from land surface to a depth of 85 ft (perforated between 40 and 45 ft).

Upon completion, the well reportedly produced 100 gpm for 6 hr with a drawdown of less than 5 ft.

On May 8, 1928, after pumping at a rate of 100 gpm, the drawdown was 10 ft from a nonpumping water level of 24 ft below the floor.

On August 8, 1947, after a 4-hr idle period, the well reportedly produced 100 gpm for 5 hr with a drawdown of 10 ft from a nonpumping water level of 54 ft.

In July 1957, the nonpumping water level was reported to be 71 ft.

The pumping equipment presently installed consists of a 10-hp 1800 rpm U.S. electric motor (Serial No. 503657), a 6-in., 17-stage Aurora turbine pump (No. 28303) set at 90 ft, rated at 100 gpm at about 220 ft head, and has 90 ft of 4-in. column pipe. A 10-ft section of 4-in. suction pipe is attached to the pump intake. The well is equipped with 90 ft of airline.

A partial analysis of a sample (Lab. No. 123076) collected September 22, 1950, showed the water to have a hardness of 217 mg/l, total dissolved minerals of 509 mg/l, and a trace of iron. Hydrogen sulfide was apparent when a previous sample was collected from this well.

In January 1946 the village leased a 125-ft deep well for 3 years from Hinckley and Schmitt. The well was located at the northwest corner of Mill and Pearl Sts., approximately 2550 ft N and 550 ft W of the SE corner of Section 32, T38N, R8E. The land surface elevation at the well is approximately 630 ft. The well was cased with 4-in. pipe from within a 4-ft deep pit. In February 1946, the nonpumping water level was reported to be 7 ft below land surface.

A mineral analysis of a sample from the leased well (Lab. No. 111418) collected August 8, 1947, after pumping for 15 min at an estimated rate of 70 gpm, showed the water to have a hardness of 466 mg/l, total dissolved minerals of 577 mg/l, and an iron content of 0.0 mg/l.

WELL NO. 2, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in August 1949 to a depth of 718 ft by the Layne-Western Co. Aurora. This well is available for emergency use. The well is located in the old main pumping station just south of Well No. 1, approximately 1825 ft N and 1460 ft W of the SE corner of Section 32, T38N, R8E. The land surface elevation at the well is approximately 642 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Surface	5	5
Sand and blue clay	5	10
Sand and gravel (limestone at 25 ft)	15	25
Broken lime soft	30	55
Green shale and lime, brown, medium	5	60
Green shale and red shale	5	65
Gray lime, broken, medium	5	70
Lime shale medium	5	75
Lime, gray medium	10	85
Lime, blue medium	5	90
Gray lime medium	15	105
Brown lime broken, medium	5	110
Brown lime broken, hard	10	120
Lime, dark gray, medium, shale streaks	5	125
Lime, gray medium	20	145
Shale blue medium	5	150
Shale blue medium, lime streaks	5	155
Shale blue medium	25	180
Shale medium, gray sticky	5	185
Shale blue medium	10	195
Shale, lime at 200 ft, medium	5	200
Brown lime hard	10	210
Lime, light gray medium	15	225
Lime, gray medium	55	280
Dark gray lime medium	20	300
Lime, gray medium	35	335
Brown lime medium	30	365
Gray lime hard	5	370
Brown lime medium	75	445
Lime, gray medium	15	460
Lime, gray hard	10	470
Lime, dark brown hard	15	485
Lime, gray hard	15	500
Lime, brown hard	15	515
Lime, dark brown medium	5	520
Lime, brown medium	5	525
Brown lime hard	15	540
Lime, gray hard (sand at 546 ft)	5	545
Sand, white hard	20	565
Sand, coarse hard medium	5	570
Sand, fine medium	5	575
Sand, fine white soft	25	600
Sand, white fine medium	5	605
Sand, hard	5	610
Sand, white fine hard	10	620
Sand, white fine soft	5	625
Sand, white soft	5	630
Sand, white fine soft	20	650
Sand, white hard	5	655
Sand, white medium	5	660
Sand, streaky soft	15	675
White sand hard	15	690
Sandy shale, blue soft (shale at 694 ft)	5	695
Sand, bluish soft	5	700
Sand, bluish medium	5	705
Sand and shale, red and green medium	5	710
Sand and cavings medium	8	718

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A107166) is for a water sample from the well collected November 29, 1973, after 2.5 hr of pumping at 500 gpm.

WELL NO. 2, LABORATORY NO. A107166

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.50		Silica	SiO_2	11.0	
Manganese	Mn	0.07		Fluoride	F	0.7	0.04
Ammonium	NH_4	0.45	0.02	Boron	B	0.8	
Sodium	Na	85	3.70	Nitrate	NO_3	0.0	0.00
Potassium	K	10	0.26	Chloride	Cl	34	0.96
Calcium	Ca	92	4.59	Sulfate	SO_4	227	4.72
Magnesium	Mg	52	4.28	Alkalinity(as $CaCO_3$)		352	7.04
Arsenic	As	0.00		Hardness (as $CaCO_3$)		444	8.88
Barium	Ba	0.0					
Copper	Cu	0.00		Total dissolved			
Cadmium	Cd	0.00		minerals		746	
Chromium	Cr	0.00					
Lead	Pb	0.02					
Mercury	Hg	0.0000		pH (as rec'd)		7.5	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		3.6	
Silver	Ag	0.00		± deviation		2.5	
Cyanide	CN	0.000		Beta *pc/l*		11.2	
Zinc	Zn	0.00		± deviation		3.0	

The well is cased with 20-in. OD pipe from land surface to a depth of 39.5 ft, 18-in. OD pipe from land surface to a depth of 80 ft, and 14-in. pipe from land surface to a depth of 221 ft (lower 21 ft cemented in place). The hole was finished 13.2 in. in diameter from 221 to 718 ft.

Upon completion, the well reportedly produced 335 gpm with a drawdown of 207.0 ft from a nonpumping water level of 32.5 ft below the top of the casing.

The pumping equipment presently installed is a Byron Jackson submersible pump set at 300 ft, rated at 500 gpm at about 450 ft head, and powered by a 100-hp 1750 rpm Byron Jackson electric motor (No. 700023).

WELL NO. 3, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in November 1957 to a depth of 1336 ft (reported to be 1312 ft deep in 1971 and 1281 ft deep in 1974) by the Layne-Western Co., Aurora. The well is located near First and Second Aves., approximately 1350 ft N and 750 ft E of the SW corner of Section 33, T38N, R8E. The land surface elevation at the well is approximately 633 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Till, slightly gravelly, slightly sandy, buff	5	5
Gravel, sandy, yellowish buff, clean	30	35
SILURIAN SYSTEM		
Elwood Dolomite		
Dolomite, white to light gray, fine to medium, crystalline	10	45
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, light gray, reddish brown, fine to medium; shale, pinkish, purple, weak	95	140
Shale, brown, light greenish gray at base, weak to brittle; little dolomite, brown	55	195
Galena Group		
Dolomite, buff to grayish buff, fine to very fine, crystalline; limestone, light buff to buff, extra fine to fine; crystalline	160	355
Dolomite, light buff to gray, very fine to fine, crystalline	25	380
Platteville Group		
Dolomite, light gray to grayish buff, very fine, crystalline	150	530
Ancell Group		
Glenwood Formation		
Sandstone, light gray, very fine to coarse, incoherent	80	610
St. Peter Sandstone		
Sandstone, light gray to white, fine to medium, incoherent to friable	165	775
Prairie du Chien Group		
Oneota Dolomite		
Dolomite, white to light gray, very fine to medium, crystalline; sandstone, white to light gray, fine to coarse, incoherent	160	935
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite		
Dolomite, buff, very fine, crystalline	138	1073
Franconia Formation		
Sandstone, light greenish-gray to gray, very fine to fine, incoherent; shale, green, weak; dolomite, light buff, fine to medium	92	1165
Ironton-Galesville Sandstone		
Sandstone, white to light, gray, fine to coarse, rounded, incoherent	100	1265
Sandstone, slightly silty, light gray, very fine to fine, rounded, frosted, incoherent	70	1335
"Limestone"	1	1336

A 26-in. diameter hole was drilled to a depth of 46 ft, reduced to 25 in. between 46 and 539 ft, reduced to 19.2 in. between 539 and 870 ft, and finished 15.2 in. in diameter from 870 to 13 36 ft. The well is cased with 26-in. pipe from 0.5 ft above the pump station floor to a depth of 36 ft, 20-in. pipe from 0.5 ft above the pump station floor to a depth of 539 ft (cemented in), and a 16-in. liner from 740 ft to a depth of 870 ft.

After the well was shot with 600 lb of gelatin (150-lb per shot) at depths of 1310, 1280, 1250, and 1230 ft, a production test was conducted by the driller on November 4-5, 1957. After 23.8 hr of pumping at rates ranging from 990 to 1043 gpm, the final drawdown was 120 ft from a nonpumping water level of 252 ft below land surface.

On July 30, 1958, the well reportedly produced 1150 gpm for 15 min with a drawdown of 63 ft from a nonpumping water level of 250 ft below the top of the casing.

After the Galesville Sandstone was shot with bazooka charges by the Layne-Western Co. in April 1971, the well reportedly produced 810 gpm with a drawdown of 98 ft from a nonpumping water level of 440 ft.

A production test was conducted by the Layne-Western Co. on August 13, 1974, after the installation of new pump bowls. After 5 hr of pumping at rates of 744 to 681 gpm, the drawdown was 132 ft from a nonpumping water level of 480 ft below the top of the casing. Twenty-five min after pumping was stopped, the water level had recovered to 553 ft.

The pumping equipment presently installed consists of a 200-hp 1750 rpm Byron Jackson electric motor, a 12-in., 10-stage Byron Jackson submersible turbine pump set at 715 ft, rated at 1000 gpm at about 650 ft TDH, and has 715 ft of 8-in. column pipe.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A107167) of a sample collected November 29, 1973, after pumping for 24 hr at 460 gpm, showed the water to have a hardness of 234 mg/l, total dissolved minerals of 400 mg/l, and an iron content of 0.15 mg/l.

WELL NO. 4, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in January 1958 to a depth of 1353 ft (in 1969 the hole filled in to 133 3 ft depth and in June 1973 the well was sounded at 1331 ft deep) by the Layne-Western Co., Aurora. The well is located across Knell Road from the All Steel Equipment Co, approximately 1475 ft S and 2115 ft W of the NE corner of Section 32, T38N, R8E. The land surface elevation at the well is approximately 642 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	2	2
Clay with small stones	13	15
Sand and gravel	4	19
Creviced limestone	6	25
Medium limestone	130	155
Limestone and shale	5	160
Gray shale	5	165
Limestone and shale	15	180
Shale	30	210
Hard limestone	65	275
Medium limestone	45	320
Hard limestone	228	548
Hard sandstone	62	610
Medium sandstone	10	620
Hard sandstone	10	630
Medium sandstone	85	715
Hard sandstone	5	720
Medium sandstone	35	755
Soft red sandstone	20	775
Medium red sandstone	25	800
Medium to hard sandstone and limestone	25	825
Hard shale and limestone	5	830
Medium limestone	65	895
Medium sandstone	5	900
Medium limestone	30	930
Medium limestone and trace of shale	5	935
Medium limestone	120	1055
Hard brown limestone	30	1085
Medium brown limestone	15	1100
Hard gray limestone	5	1105
Hard blue shale	5	1110
Medium limestone	35	1145
Hard limestone	40	1185
Medium limestone	10	1195
Hard limestone	10	1205
Hard sandstone and limestone	9	1214
Medium sandstone	16	1230
Hard sandstone	5	1235
Medium sandstone	45	1280
Soft sandstone	20	1300
Hard sandstone	5	1305
Soft sandstone	5	1310
Hard sandstone	10	1320
Medium sandstone	28	1348
Limestone	5	1353

A 26-in. diameter hole was drilled to a depth of 24 ft, reduced to 25 in. between 24 and 552 ft, and finished 19 in. in diameter from 552 to 1353 ft. The well is cased with 26-in. pipe from 1.5 ft above the pumphouse floor to a depth of 24 ft and 20-in. pipe from 1.5 ft above the pumphouse floor to a depth of 552 ft (cemented in).

After the well was shot with four 150-lb charges of 100 percent gelatin at depths of 1330, 1305, 1285, and 1250 ft, a production test was conducted by the driller on January 24, 1958. After 16 hr of pumping at rates of 1461 to 1326 gpm, the final drawdown was 142 ft from a nonpumping water level of 250 ft below the top of the casing.

In November 1971, the well reportedly produced 960 gpm with a drawdown of 129 ft from a nonpumping water level of 437 ft.

In June 1973, the nonpumping water level was reported to be 475 ft.

The pumping equipment presently installed is a 12-stage Byron Jackson submersible pump set at 684 ft, rated at 1000 gpm at about 650 ft head, and powered by a 200-hp 1750 rpm Byron Jackson electric motor (Serial No. 363277).

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 03748) of a sample collected January 21, 1972, after pumping for 26 hr at 900 gpm, showed the water to have a hardness of 248 mg/l, total dissolved minerals of 370 mg/l, and an iron content of 0.0 mg/l.

WELL NO. 5, open to the Silurian dolomite and the Maquoketa Group, was completed in July 1962 to a depth of 186 ft by A. R. Touvell, Aurora. This well is not in use. The well is located south of Park Drive near the railroad tracks in Parkview Estates Subdivision, approximately 1300 ft N and 1350 ft E of the SW corner of Section 35, T38N, R8E. The land surface elevation at the well is approximately 665 ft.

A drillers log of Well No. 5 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	2	2
Yellow clay	6	8
Clay and black soil	8	16
Gravel	2	18
Hardpan and gravel	2	20
Red, white, and gray lime	23	43
Limestone	72	115
Red shale	5	120
Blue gray shale	66	186

An 8-in. diameter hole was drilled to a depth of 186 ft. The well is cased with 8-in. wrought steel pipe from 1.5 ft above the pumphouse floor to a depth of 23 ft.

Upon completion, the well reportedly produced 200 gpm for 5 hr with a drawdown of 8 ft from a nonpumping water level of 7 ft.

In 1972 the nonpumping water level was reported to be 15 ft.

The pumping equipment presently installed consists of a 15-hp Franklin electric motor, a Red Jacket submersible pump (Serial No. HVAP500) rated at 350 gpm, and has 45 ft of 4-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 03746) is for a water sample from the well collected January 21, 1972, after 5 min of pumping at 250 gpm. The iron content has been greater on previous samples.

WELL NO. 5, LABORATORY NO. 03746

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.0		Silica	SiO_2	18	
Manganese	Mn	0.0		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.3	0.02	Boron	B	0.8	
Sodium	Na	10	0.44	Nitrate	NO_3	0.0	
Potassium	K	1.2	0.03	Chloride	Cl	16	0.45
Calcium	Ca	96	4.79	Sulfate	SO_4	131	2.72
Magnesium	Mg	50	4.11	Alkalinity (as $CaCO_3$)		304	6.08
				Hardness (as $CaCO_3$)		452	
Barium	Ba	0.0					
Copper	Cu	0.0		Total dissolved minerals		557	
Cadmium	Cd	0.00					
Chromium	Cr	0.0		pH (as rec'd)		7.5	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha *pc/l*		0	
Nickel	Ni	0.0		± deviation		1	
Silver	Ag	0.0		Beta *pc/l*		1	
Zinc	Zn	0.0		± deviation		1	

WELL NO. 6 (formerly Blackberry Heights Subdivision Well No. 1), open to the Silurian dolomite and the Maquoketa Group, was completed in May 1959 to a depth of 160 ft by the Layne-Western Co., Aurora. The well is located at the corner of Keven Drive and Brentwood Ave. north of Route 30, approximately 600 ft N and 1100 ft E of the SW corner of Section 31, T38N, R8E. The land surface elevation at the well is approximately 665 ft.

A drillers log of Well No. 6 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	5	5
Sand and gravel	54	59
Limestone	16	75
Limestone and shale	27	102
Limestone and shale breaks	43	145
Limestone	10	155
Shale	5	160

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B25339) is for a water sample from the well collected December 23, 1975, after 30 min of pumping at 200 gpm. The iron content has been as low as 0.3 mg/l on previous analyses.

WELL NO. 6, LABORATORY NO. B25339

		mg/l	me/l			mg/l	me/l
Iron	Fe	7.3		Silica	SiO_2	16	
Manganese	Mn	0.56		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.44	0.02	Boron	B	0.1	
Sodium	Na	24	1.04	Nitrate	NO_3	0.09	0.00
Potassium	K	2.2	0.06	Chloride	Cl	29	0.82
Calcium	Ca	94	4.69	Sulfate	SO_4	110	2.29
Magnesium	Mg	47	3.87	Alkalinity (as $CaCO_3$)		324	6.48
Arsenic	As	0.00		Hardness (as $CaCO_3$)		428	8.56
Barium	Ba	0.1					
Copper	Cu	0.02		Total dissolved minerals		484	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.4	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		3.1	
Silver	Ag	0.00		± deviation		3.5	
Cyanide	CN	0.00		Beta *pc/l*		4.8	
Zinc	Zn	0.0		± deviation		2.0	

A 10-m. diameter hole was drilled to a depth of 160 ft. The well is cased with 10-in. standard steel pipe from 0.8 ft above the pumphouse floor to a depth of 59 ft.

A production test was conducted by the driller on May 23, 1959. After 5.5 hr of pumping at a rate of 200 gpm, the drawdown was 9 ft from a nonpumping water level of 36 ft below land surface.

In May 1961, the well reportedly produced 201 gpm for 5 hr with a drawdown of 4 ft from a nonpumping water level of 36 ft below land surface.

The pumping equipment presently installed consists of a 10-hp 1800 rpm Westinghouse electric motor, an 8-in., 4-stage Layne vertical turbine pump (Serial No. 40287) set at 80 ft, rated at 250 gpm at about 100 ft TDH, and has 80 ft of 5-in. column pipe. A 10-ft section of 4-in. suction pipe is attached to the pump intake.

WELL NO. 7 (formerly Blackberry Heights Subdivision Well No. 2), finished in sand and gravel, was completed in June 1960 to a depth of 46 ft by the Layne-Western Co., Aurora. The well is located about 20 ft north of Well No. 1, approximately 620 ft N and 1100 ft E of the SW corner of Section 31, T38N, R8E. The land surface elevation at the well is approximately 665 ft.

A drillers log of Well No. 7 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	1	1
Brown clay	4	5
Medium coarse sand and gravel	15	20
Coarse sand and boulders	12	32
Coarse sand and boulders, some clay	8	40
Coarse sand and gravel	6	46

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C000864) is for a water sample from the well collected August 16, 1976, after 2 hr of pumping at 100 gpm.

WELL NO. 7, LABORATORY NO. C000864

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.0		Silica	SiO_2	12	
Manganese	Mn	0.04		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.12	0.01	Boron	B	0.2	
Sodium	Na	14	0.61	Nitrate	NO_3	6.2	0.10
Potassium	K	5.6	0.14	Chloride	Cl	35	0.99
Calcium	Ca	105	5.24	Sulfate	SO_4	96	2.00
Magnesium	Mg	45	3.70	Alkalinity (as $CaCO_3$)		336	6.72
Arsenic	As	0.000					
Barium	Ba	0.3		Hardness (as $CaCO_3$)		470	9.40
Copper	Cu	0.03					
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved minerals		526	
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.18		pH (as rec'd)		8.0	

A 30-in. diameter hole was drilled to a depth of 46 ft. The well is cased with 10-in. steel pipe from 0.8 ft above the pumphouse floor to a depth of 31 ft followed by 15 ft of 10-in. No. 6 (0.080 in.) Armco iron shutter screen. The annulus between the bore hole and screen is gravel packed.

On July 12, 1960, the well reportedly produced 230 gpm for 8 hr with a drawdown of 12 ft from a nonpumping water level of 15 ft.

The pumping equipment presently installed consists of a 5-hp 1750 rpm Westinghouse electric motor, an 8-in., 1-stage Layne vertical turbine pump (Serial No. 41669) set at 30 ft, rated at 200 gpm at about 27 ft TDH, and has 30 ft of 4-in. column pipe. A 10-ft section of 4-in. suction pipe is attached to the pump intake.

WELL NO. 8, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in July 1975 to a depth of 1378 ft by the Layne-Western Co., Aurora. The well is located at the southwest corner of the intersection of Waubansia Ave. and Pearl St., approximately 1250 ft N and 1350 ft E of the SW corner of Section 34, T38N, R8E. The land surface elevation at the well is approximately 668 ft.

A drillers log of Well No. 8 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt and clay	5	5
Gravel	5	10
Blue clay and boulders	15	25
Medium brown limestone	20	45
Medium to hard, gray, dark gray, red limestone	220	265
Hard brown limestone	30	295
Hard gray limestone	80	375
Hard brown limestone	40	415
Hard gray limestone	25	440
Hard brown limestone	25	465
Hard gray limestone	110	575
Medium to hard white sandstone	100	675
Hard gray limestone, shale seams	50	725
Medium white sandstone	25	750
Hard gray sandy lime and shale seams	25	775
Hard dark gray limestone	140	915
Hard white sandy limestone	65	980
Hard gray limestone	55	1035
Hard red limestone	15	1050
Hard gray limestone	5	1055
Hard red limestone	60	1115
Hard to medium, dark gray limestone, shales	75	1190
Hard to medium white sandy limestone	60	1250
Hard to medium white sandstone	25	1275
Medium to soft white sandstone	15	1290
Hard white sandstone	20	1310
Medium white sandstone	20	1330
Soft white sandstone	20	1350
Hard white sandy limestone	10	1360
Hard gray limestone and shale seams	18	1378

A 26-in. diameter hole was drilled to a depth of 42 ft, reduced to 25 in. between 42 and 574 ft, and finished 21 in. in diameter from 574 to 1378 ft. The well is cased with 26-in. OD drive pipe from 1 ft above land surface to a depth of 42 ft and 22-in. OD pipe from 1 ft above land surface to a depth of 574 ft (cemented in). The top of the casing is equipped with a pitless adapter.

A production test was conducted by the driller on June 9, 1975. After 2.6 hr of pumping at 650 gpm, the drawdown was 193 ft from a nonpumping water level of 475 ft below the top of the casing. Pumping was continued for 3.5 hr at rates ranging from 1114 to 812 gpm with a final drawdown of 250 ft.

After the well was shot with 200 qt (50 qt per shot) of 100 percent nitrogel at 1220 to 1245 ft, 1250 to 1275 ft, 1275 to 1300 ft, and 1310 to 1335 ft, a production test was conducted by the driller on July 14-15, 1975. After 25.2 hr of pumping at rates of 851 to 1153 gpm, the final drawdown was 112 ft from a nonpumping water level of 510 ft below the top of the casing. Fifteen min after pumping was stopped, the water level had recovered to 535 ft.

The pumping equipment presently installed consists of a 350-hp Byron Jackson electric motor, a 13-in., 10-stage Byron Jackson submersible turbine pump set at 750 ft, rated at 1160 gpm at about 770 ft TDH, and has 750 ft of 10-in. column pipe. The well is equipped with 750 ft of airline.

The following mineral analysis (Lab. No. 199202) is for a water sample from the well collected July 15, 1975, after 9 hr of pumping at 1153 gpm.

WELL NO. 8, LABORATORY NO. 199202

		mg/l	*me/l*			*mg/l*	*me/l*
Iron (total)	Fe	Tr		Silica	SiO_2	7.2	
Manganese	Mn	0.00		Fluoride	F	1.0	
Ammonium	NH_4	0.9	0.05	Boron	B	0.4	
Sodium	Na	32.0	1.39	Nitrate	NO_3	0.0	0.00
Potassium	K	15.2	0.39	Chloride	Cl	10	0.28
Calcium	Ca	60.8	3.03	Sulfate	SO_4	40.9	0.85
Magnesium	Mg	22.5	1.85	Alkalinity (as $CaCO_3$)		278	5.56
Strontium	Sr	2.28	0.05				
				Hardness (as $CaCO_3$)		244	4.88
Barium	Ba	<0.1					
Copper	Cu	0.00		Total dissolved minerals		353	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	<0.05					
Lithium	Li	0.02		Turbidity		Tr	
Nickel	Ni	<0.05		Color		0	
Zinc	Zn	0.08		Odor		0	

NORTH AURORA

The village of North Aurora (4833) installed a public water supply in 1929. Three wells (Nos. 2-4) are in use. In 1950 there were 140 services, all metered; the average and maximum daily pumpages were 35,000 and 45,000 gpd, respectively. In 1974 there were about 1235 services, all metered; the average and maximum daily pumpages were 750,000 and 1,000,000 gpd, respectively. The water is chlorinated.

Water for the village was obtained from three wells owned by the Exposition Grounds prior to the installation of Well No. 1. Water from two of the wells, each reported to be 190 ft deep, was mainly used at the Exposition Grounds. The third well, 865 ft deep, was used to furnish water to North Aurora. This well was located approximately 750 ft N and 2600 ft E of the NW corner of Section 4, T38N, R8E.

WELL NO. 1, open to the Galena-Platteville dolomite and the Glenwood-St. Peter Sandstone, was completed in September 1938 to a depth of 807 ft by S. B. Geiger & Co., Chicago. This well was abandoned in 1964 and sealed in 1975. The well was located about 55 ft south of State St. and 135 ft east of Stone Ave., approximately 1350 ft S and 350 ft E of the NW corner of Section 3, T38N, R8E. The land surface elevation at the well is approximately 700 ft.

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

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
"Dry sand"	37	37
SILURIAN SYSTEM		
Niagaran-Alexandrian Series		
"Lime"	5	42
"Shale"	6	48
Dolomite	46	94
ORDOVICIAN SYSTEM		
Maquoketa Group, dolomite and shale	146	240
Galena-Platteville Groups, limestone and dolomite	336	576
Ancell Group		
Glenwood-St. Peter Sandstone	231	807

A 12-in. diameter hole was drilled to a depth of 300 ft and finished 10 in. in diameter from 300 to 807 ft. The well was cased with 12-in. drive pipe from land surface to a depth of 49 ft and 10-in. pipe from land surface to a depth of 300 ft. In 1949, the 10-in. pipe was extended to a depth of 360 ft.

A production test was conducted on September 6-7, 1938, by representatives of the State Water Survey and Walter E. Deuchler Associates, Inc., Consulting Engineers. After 9.6 hr of pumping intermittently at rates of 124 to 121 gpm, the drawdown was 83 ft from a nonpumping water level of 143 ft below the pump base. The pumping rate was gradually decreased to 106 gpm during the next 10 hr and the final drawdown was reported to be 77 ft.

On August 12, 1947, after an idle period of 12 hr, the well reportedly produced 100 gpm for 1.2 hr with a drawdown of 65 ft from a nonpumping water level of 181 ft.

On August 8, 1953, before acid treatment, the well reportedly produced 30 gpm with a drawdown of 55 ft from a nonpumping water level of 228 ft below the pump base. On August 12, 1953, after acidizing, when pumping at a rate of 125 gpm, the drawdown was 67 ft from a nonpumping water level of 228 ft below the pump base.

A partial analysis of a sample (Lab. No. 111525) collected August 12, 1947, after pumping for 1.2 hr at 100 gpm, showed the water to have a hardness of 253 mg/l, total dissolved minerals of 367 mg/l, and an iron content of 0.2 mg/l.

WELL NO. 2, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in March 1955 to a depth of 1272 ft by the Layne-Western Co., Aurora. The well is located behind the Village Library in the business district, approximately 1625 ft S and 600 ft W of the NE corner of Section 4, T38N, R8E. The land surface elevation at the well is approximately 640 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	5	5
Sand and gravel	12	17
Limestone	23	40
Broken lime	20	60
Shale	20	80
Broken lime	5	85
Blue shale	65	150
Brown shale	5	155
Blue shale	25	180
Lime - gray at 182 ft	5	185
Brown lime	30	215
Gray lime	10	225
Gray lime, hard	5	230
Gray lime	150	380
Brown lime, hard	30	410
Gray lime, hard	25	435
Brown lime, hard	20	455
Gray lime, hard	25	480
Brown lime, hard	20	500
Gray lime, hard	20	520
St. Peter at 521 ft	5	525
Sand, hard	15	540
Sand, soft	5	545
Sand, white - hard	25	570
Sand, white, medium	5	575
Crevice 579 - 582 ft	5	580
Sand, white, medium	25	605
Sand, white, hard	70	675
Sand, white, medium	77	752
Shale, blue	3	755
Sand, medium	5	760
Sand, shale at 764 ft	5	765
Lime, gray, hard	5	770
Sandy lime, shale breaks, hard	5	775
Shale at 778 ft	5	780
Sand, hard	10	790
Sandy lime, hard	10	800
Lime brown - shale breaks, hard	5	805
Lime, gray, hard	5	810
Lime, white - hard (shale breaks at 824 ft)	15	825
Lime, gray - hard (1 ft shale at 846 ft) - hole caving at 855 ft	30	855
Sandy lime, white, hard	5	860

Strata (continued)	Thickness (ft)	Depth (ft)
Lime gray hard - shale streaks	115	975
Lime brown, hard	55	1030
Shale breaks	5	1035
Shale	5	1040
Sandy shale	5	1045
Sand medium	5	1050
White sandy lime	5	1055
Sandy shale	10	1065
Sandy lime, white, hard	5	1070
Sand, white, hard	10	1080
Sandy shale	5	1085
Sandy lime, hard	20	1105
Gray lime, hard	5	1110
Sandy lime, gray, hard	5	1115
Sandy lime, white, hard	5	1120
Sandy lime, hard	20	1140
Sand, white, hard	25	1165
Sand, white, medium	20	1185
Sandy lime, hard	25	1210
Sand, white, medium	10	1220
Sand, white, hard	20	1240
Sand, white, medium	5	1245
Sand, white, soft	15	1260
Sand, white, hard	5	1265
Lime, gray, hard	5	1270

A 25.2-in. diameter hole was drilled to a depth of 530 ft and finished 17.2 in. in diameter from 530 to 1272 ft. The well is cased with 24-in. OD steel conductor pipe from land surface to a depth of 18 ft and 18-in. OD pipe from 3 ft above the pumphouse floor to a depth of 530 ft (cemented in).

A production test was conducted on March 31-April 1, 1955, by representatives of the driller, the State Water Survey, and Walter E. Deuchler Associates, Inc., Consulting Engineers. After 23.9 hr of pumping at rates ranging from 530 to 480 gpm, the drawdown was 152.8 ft from a nonpumping water level of 176.2 ft below the top of the casing. The water level recovered to 187.7 ft after pumping had been stopped for 1.5 hr.

On June 19, 1957, the nonpumping water level was reported to be 214 ft.

The pumping equipment presently installed is a 9-stage Byron Jackson submersible pump set at 498 ft, rated at 450 gpm at about 520 ft TDH, and powered by a 100-hp Byron Jackson electric motor. The well is equipped with 498 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B32677) of a sample collected February 18, 1976, after pumping for 1 hr at 320 gpm, showed the water to have a hardness of 244 mg/l, total dissolved minerals of 359 mg/l, and an iron content of 0.3 mg/l.

WELL NO. 3, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in June 1960 to a depth of 1305 ft by L. Cliff Neely, Batavia. The well is located on the north side of Oak St. between Lincolnway and Monroe Sts., approximately 880 ft S and 1650 ft W of the NE corner of Section 4, T38N, R8E. The land surface elevation at the well is approximately 675 ft.

A 26-in. diameter hole was drilled to a depth of 603 ft and finished 19.2 in. in diameter from 603 to 1305 ft. The well is cased with 26-in. pipe from land surface to a depth of 18 ft and 20-in. pipe from land surface to a depth of 603 ft (cemented in). The top of the casing is equipped with a 24-in. diameter pitless adapter.

A production test was conducted by Walter E. Deuchler Associates, Inc., Consulting Engineers, on June 22, 1960. After 8 hr of pumping at rates ranging from 768 to 609 gpm, the final drawdown was 98.5 ft from a nonpumping water level of 289.0 ft below the top of the casing. Fifteen min after pumping was stopped, full recovery was observed.

A second production test was conducted by Walter E. Deuchler Associates, Inc., Consulting Engineers, on July 18, 1960, after the well was shot with a total of 200 qt of nitroglycerin at the following 4 levels (50 qt each): 1261 to 1271 ft, 1240 to 1250 ft, 1203 to 1213 ft, and 1174 to 1184 ft. The well reportedly produced at rates ranging from 990 to 1280 gpm for 8.1 hr with a final drawdown of 143 ft from a nonpumping water level of 275 ft. Nine min after pumping was stopped, the water level had recovered to 287 ft.

On October 25, 1961, the nonpumping water level was reported to be 300 ft.

The pumping equipment presently installed consists of a 200-hp 1750 rpm Byron Jackson electric motor, a 12-in., 7-stage Byron Jackson submersible pump set at 450 ft, rated at 1000 gpm at about 560 ft head, and has 450 ft of 8-in. column pipe. The well is equipped with 450 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B32678) of a sample collected February 18, 1976, after pumping for 3 hr at 725 gpm, showed the water to have a hardness of 244 mg/l, total dissolved minerals of 368 mg/l, and an iron content of 0.2 mg/l.

WELL NO. 4, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in June 1968 to a depth of 1325 ft by the Layne-Western Co., Aurora. The well is located on Princeton Drive, approximately 2400 ft N and 50 ft E of the SW corner of Section 4, T38N, R8E. The land surface elevation at the well is approximately 689 ft.

A drillers log of Well No. 4 follows:

Strata	Thickness (ft)	Depth (ft)
Surface	5	5
Yellow clay, gravel, and boulders	10	15
Medium brown limestone	5	20
Medium gray limestone	55	75
Medium gray broken limestone	15	90
Medium gray shale	5	95
Medium gray shale and limestone	65	160
Medium gray shale	45	205
Hard gray limestone	185	390
Medium gray limestone	40	430
Hard gray limestone	35	465
Hard brown limestone	60	525
Hard brown limestone with shale streaks	5	530
Hard gray limestone	15	545
Hard white sandstone	25	570
Soft white sandstone	45	615
Medium white sandstone	15	630
Medium to soft white sandstone	10	640

Strata (continued)	Thickness (ft)	Depth (ft)
Medium white sandstone	15	655
Soft white sandstone	25	680
Medium white sandstone	35	715
Hard white sandstone	10	725
Medium white sandstone	40	765
Hard white sandy limestone	10	775
Hard white sandstone	5	780
Medium to hard white sandstone	25	805
Hard red sandy limestone and shale	25	830
Hard gray sandy limestone	5	835
Hard gray limestone	5	840
Hard red limestone with shale breaks	10	850
Hard red limestone	10	860
Hard buff sandy limestone	5	865
Hard gray limestone (3 ft crevice between 945 and 950 ft)	120	985
Hard white dolomite	10	995
Hard brown dolomite	65	1060
Medium gray limestone with shale breaks	20	1080
Medium dark gray sandy shale	40	1120
Medium sandy limestone with shale breaks	15	1135
Hard gray limestone	5	1140
Hard white sandy dolomite	5	1145
Hard buff sandy dolomite	5	1150
Hard white sandstone	35	1185
Medium white sandstone	5	1190
Soft white sandstone	20	1210
Medium to soft white sandstone	15	1225
Soft white sandstone	80	1305
Hard dark gray sandy limestone	10	1315
Hard dark gray limestone	10	1325

A 26-in. diameter hole was drilled to a depth of 31 ft, reduced to 25 in. between 31 and 552 ft, reduced to 19 in. between 552 and 871 ft, and finished 17 in. in diameter from 871 to 1325 ft. The well is cased with 26-in. steel pipe from 1 ft above land surface to a depth of 31 ft, 20-in. steel pipe from 1 ft above land surface to a depth of 551 ft (cemented in), and an 18-in. liner from 785 ft to a depth of 871 ft.

A production test was conducted by the driller on June 28, 1968. After 8 hr of pumping at rates of 617 to 1416 gpm, the final drawdown was reported to be only 18 ft from a nonpumping water level of 370 ft below land surface.

The pumping equipment presently installed is a 12-in., 8-stage Byron Jackson submersible pump set at 490 ft, rated at 1200 gpm at about 530 ft TDH, and powered by a 250-hp 1750 rpm Byron Jackson electric motor. The well is equipped with 490 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B32676) is for a water sample from the well collected February 18, 1976, after 1 hr of pumping at 1050 gpm.

WELL NO. 4, LABORATORY NO. B32676

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.2		Silica	SiO_2	7	
Manganese	Mn	0.00		Fluoride	F	1.2	0.06
Ammonium	NH_4	0.8	0.04	Boron	B	0.6	
Sodium	Na	30	1.30	Nitrate	NO_3	0.1	0.00
Potassium	K	13	0.33	Chloride	Cl	5.8	0.16
Calcium	Ca	55	2.74	Sulfate	SO_4	30	0.62
Magnesium	Mg	23	1.89	Alkalinity (as $CaCO_3$)		286	5.72
Arsenic	As	0.00		Hardness (as $CaCO_3$)		232	4.64
Barium	Ba	0.1					
Copper	Cu	0.05		Total dissolved minerals		348	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.9	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		25.2	
Silver	Ag	0.00		± deviation		3.9	
Cyanide	CN	0.00		Beta *pc/l*		30.3	
Zinc	Zn	0.0		± deviation		2.8	

OGDEN GARDENS SUBDIVISION

Ogden Gardens Subdivision (est. 400), located just east of the Aurora city limits, installed a public water supply in 1927. The water system is owned and operated by the Ogden Gardens Community Water Trust. Three wells are in use. In 1953 there were 93 services, none metered. In 1974 there were 114 services, none metered; the average and maximum daily pumpages were 24,000 and 36,000 gpd, respectively. The water is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed in October 1927 to a depth of 185 ft by A. W. Morey, Aurora. The well is located near the intersection of Ogden and Oakview Aves. at 222 Oakview Ave., approximately 3500 ft S and 3200 ft W of the NE corner of Section 24, T38N, R8E. The land surface elevation at the well is approximately 715 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	96	96
Niagaran limestone	89	185

A 6-in. diameter hole was drilled to a depth of 185 ft. The well is cased with 6-in. pipe from 1.5 ft above the concrete floor of an 8-ft deep pit to a depth of 96 ft.

On April 21, 1970, the nonpumping water level was reported to be 55 ft.

On February 19, 1972, the well reportedly produced 30 gpm with a drawdown of 2.3 ft from a nonpumping water level of 63.0 ft.

The pumping equipment presently installed is a Redco Red Jacket submersible pump set at 100 ft, rated at 40 gpm, and powered by a 2-hp Redco electric motor.

A mineral analysis made by the Illinois Environmental

Protection Agency (Lab. No. A14652) of a sample collected February 24, 1976, after pumping for 30 min, showed the water to have a hardness of 270 mg/l, total dissolved minerals of 340 mg/l, and an iron content of 0.6 mg/l.

WELL NO. 2, open to the Silurian dolomite, was completed in 1952 to a depth of 176 ft by R. Chitty, Oswego. The well is located at 288 Oakview Ave. about 2 blocks north of Well No. 1, approximately 2450 ft S and 3050 ft W of the NE corner of Section 24, T38N, R8E. The land surface elevation at the well is approximately 715 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Drift	136	136
Niagaran limestone	40	176

A 6-in. diameter hole was drilled to a depth of 176 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 136 ft.

On April 21, 1970, the nonpumping water level was reported to be 55 ft.

On February 19, 1972, the well reportedly produced 36 gpm with a drawdown of 4 ft from a nonpumping water level of 56 ft.

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

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A14653) of a sample collected February 24, 1976, showed the water to have a hardness of 270 mg/l, total dissolved minerals of 340 mg/l, and an iron content of 0.6 mg/l.

WELL NO. 3, open to the Silurian dolomite, was completed in March 1969 to a depth of 185 ft by N. H. Geltz, Aurora. The well is located in the rear of 311 Eastern Ave., approximately 2500 ft S and 2550 ft W of the NE corner of Section 24, T38N, R8E. The land surface elevation at the well is approximately 711 ft.

A drillers log of Well No. 3 follows:

Strata	Thickness (ft)	Depth (ft)
Fill, clay and rocks	5	5
Peat	12	17
Blue clay, sandy	50	67
Coarse sand, dirty	11	78
Blue clay	10	88
Sand and gravel, dirty	14	102
Fine sand	13	115
Fine sand with gravel	16	131
Broken limestone	3	134
Brown limestone medium	13	147
Blue and green limestone and shale medium	38	185

A 6-in. diameter hole was drilled to a depth of 185 ft. The well is cased with 6-in. black wrought steel pipe from 1.5 ft above the pumphouse floor to a depth of 134.3 ft.

Upon completion, the well reportedly produced 40 gpm for 4 hr with a drawdown of 5 ft from a nonpumping water level of 54 ft below land surface.

On February 19, 1972, the well reportedly produced 28 gpm with a drawdown of 0.2 ft from a nonpumping water level of 58.8 ft.

The pumping equipment presently installed is a Red Jacket submersible pump set at 100 ft, rated at 40 gpm, and powered by a 1 ½-hp 3500 rpm Redco electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A14655) is for a water sample from the well collected February 24, 1976, after 30 min of pumping.

WELL NO. 3, LABORATORY NO. A14655

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.9		Silica	SiO_2	13	
Manganese	Mn	0.02		Fluoride	F	0.8	0.04
Ammonium	NH_4	0.77	0.04	Boron	B	0.5	
Sodium	Na	28	1.22	Nitrate	NO_3	0.9	0.01
Potassium	K	2.5	0.06	Chloride	Cl	2	0.06
Calcium	Ca	55	2.74	Sulfate	SO_4	58	1.21
Magnesium	Mg	32	2.63	Alkalinity (as $CaCO_3$)		272	5.44
Arsenic	As	0.001		Hardness (as $CaCO_3$)		270	5.40
Barium	Ba	0.0					
Copper	Cu	0.00		Total dissolved minerals		340	
Cadmium	Cd	0.00					
Chromium	Cr	0.05					
Lead	Pb	0.00					
Mercury	Hg	0.0007		pH (as rec'd)		7.6	
Nickel	Ni	0.1		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		1.3	
Silver	Ag	0.00		± deviation		1.2	
Cyanide	CN	0.01		Beta *pc/l*		3.8	
Zinc	Zn	0.0		± deviation		1.4	

PARK VIEW WATER CORPORATION

Park View Water Corporation (est. 170), located on the southeast edge of Aurora, installed a public water supply in 1947. The water system is leased from Anthony Howaniec and operated by the Park View Water Corporation. One well is in use. In 1955 there were 47 services, none metered. In 1975 there were 47 services, none metered; the estimated average and maximum daily pumpages were 10,200 and 15,000 gpd, respectively. The water is fluoridated.

WELL NO. 1, open to the Silurian dolomite and the Maquoketa Group, was completed in 1947 to a depth of about 250 ft by Ray Feuerborn, Batavia. The well is located about 0.2 mile east of Highway 30 and 300 ft west of the Outdoor Theatre, approximately 900 ft S and 1000 ft W of the NE corner of Section 35, T38N, R8E. The land surface elevation at the well is approximately 710 ft.

An 8-in. diameter hole was drilled to a depth of about 250 ft. The well is cased with 8-in. pipe from 1.5 ft above the pumphouse floor to a depth of 139 ft.

In March 1973, the nonpumping water level was reported to be 55 ft.

The pumping equipment presently installed is a Jacuzzi submersible pump set at 84 ft, rated at 80 gpm, and powered by a 3-hp Franklin electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A15100) is for a water sample from the well collected in March 1976.

WELL NO. 1, LABORATORY NO. A15100

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	1.4		Silica	SiO_2	17	
Manganese	Mn	0.10		Fluoride	F	0.7	0.04
Ammonium	NH_4	0.45	0.02	Boron	B	0.2	
Sodium	Na	12	0.52	Nitrate	NO_3	0.0	0.00
Potassium	K	1.5	0.04	Chloride	Cl	3.0	0.08
Calcium	Ca	73	3.64	Sulfate	SO_4	49	1.02
Magnesium	Mg	41	3.37	Alkalinity (as $CaCO_3$)		332	6.64
Arsenic	As	0.000		Hardness (as $CaCO_3$)		350	7.00
Barium	Ba	0.2					
Copper	Cu	0.05		Total dissolved			
Cadmium	Cd	0.00		minerals		390	
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.4	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		0.0	
Silver	Ag	0.00		± deviation		0.0	
Cyanide	CN	0.00		Beta *pc/l*		3.4	
Zinc	Zn	0.1		± deviation		1.6	

PRESTBURY SUBDIVISION

Prestbury Subdivision (est. 350), located 5 miles west of Aurora, installed a public water supply in 1968. The water sytem is owned and operated by the Prestbury Utility Co. One well (No. 1) is in use and another well (No. 2) is available for emergency use. In 1977 there were 131 services, all metered; the average and maximum daily pumpages in 1976 were 34,457 and 52,000 gpd, respectively. The water is chlorinated; in addition, the water from Well No. 1 is fluoridated and treated with polyphosphate to keep iron in solution.

WELL NO. 1, open to the Maquoketa Group, was completed in September 1967 to a depth of 200 ft by the Layne-Western Co., Aurora. The well is located across the road from the office at 15 Winthrop New Road, approximately 1275 ft N and 930 ft W of the SE corner of Section 10, T38N, R7E. The land surface elevation at the well is approximately 685 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black soil	4	4
Sand, gravel and boulders with clay streaks	27	31
Pink clay	17	48
Broken limestone	2	50
Limestone	85	135
Limestone with shale streaks	65	200

A 12-in. diameter hole was drilled to a depth of 51 ft and finished 7.6 in. in diameter from 51 to 200 ft. The well is cased with 8-in. pipe from 1.5 ft above the pumphouse floor to a depth of 51 ft. The annulus between the casing and bore hole is filled with drill cuttings.

A production test was conducted by the driller on September 25, 1967. After 6 hr of pumping at a rate of 221 gpm, the drawdown was 5.4 ft from a nonpumping water level of 7.7 ft below land surface.

The pumping equipment presently installed is a Layne & Bowler turbine pump (Model No. 58118) set at 30 ft, rated at 500 gpm at about 160 ft head, and powered by a 30-hp 1750 rpm U. S. Holloshaft electric motor (Model No. R-1774-01-170, Serial No. R2019114).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B46038) is for a water sample from the well collected May 18, 1976.

WELL NO. 1, LABORATORY NO. B46038

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.2		Silica	SiO_2	18	
Manganese	Mn	0.05		Fluoride	F	0.3	0.02
Ammonium	NH_4	0.50	0.03	Boron	B	0.0	
Sodium	Na	7.8	0.34	Nitrate	NO_3	0.0	0.00
Potassium	K	1.3	0.03	Chloride	Cl	11	0.31
Calcium	Ca	110	5.49	Sulfate	SO_4	120	2.50
Magnesium	Mg	49	4.03	Alkalinity (as $CaCO_3$)		362	7.24
Arsenic	As	0.00					
Barium	Ba	0.1		Hardness (as $CaCO_3$)		476	9.52
Copper	Cu	0.06					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		558	
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.6	

WELL NO. 2, open to the Maquoketa Group, was completed in May 1973 to a depth of 181.5 ft by the Layne-Western Co., Aurora. This well is available for emergency use. The well is located on the northwest corner of the golf course parking lot, approximately 570 ft S and 1100 ft W of the NE corner of Section 15, T38N, R7E. The land surface elevation at the well is approximately 675 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Clay	3	3
Sandy clay with sand and gravel	3	6
Sand and gravel	3	9
Gray sandy clay	5	14
Sand and gravel with boulders	46	60
Sandy clay with sand and gravel	14	74
Light grey broken limestone	21	95
Gray limestone	21	116
Broken limestone and green shale	9	125
Soft green limestone and shale	3	128
Soft brown limestone and shale	10	138
Green shale and limestone	12	150
Gray shale and limestone	22	172
Limestone	3	175
Brown shale	6.5	181.5

A 12-in. diameter hole was drilled to a depth of 80 ft and finished 7.9 in. in diameter from 80 to 181.5 ft. The well is cased with 8-in. ID steel pipe from 1 ft above land surface to a depth of 80 ft (cemented in). The well casing was shot with a Birdwell perforating gun from 60 to 70 ft with 6 shots per foot.

A production test was conducted by the driller on May 22, 1973. After 8 hr of pumping at rates ranging from 192 to 257 gpm, the final drawdown was 13 ft from a nonpumping water level of 2 ft below land surface.

The pumping equipment presently installed is an 8 in., 5-stage Layne & Bowler turbine pump set at 30 ft, rated at 200 gpm at about 160 ft head, and powered by a 15-hp 1750 rpm U.S. vertical Holloshaft electric motor.

A partial analysis of a sample (Lab. No. 192092) collected during the initial production test, showed the water to have a hardness of 482 mg/l, total dissolved minerals of 572 mg/l, and an iron content of 2.3 mg/l.

RIVER GRANGE LAKES SUBDIVISION

River Grange Lakes Subdivision (est. 50), located 1 mile west of Valley View, installed a public water supply in 1963. The water system is owned and operated by the Valley Water Co. One well is in use. In 1976 there were 15 services, none metered; the average daily pumpage was 6000 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Silurian dolomite and the Maquoketa Group, was completed in 1963 to a depth of 180 ft by the Shaver Well Drilling Co., Downers Grove. The well is located approximately 1800 ft N and 350 ft W of the SE corner of Section 9, T40N, R8E. The land surface elevation at the well is approximately 775 ft.

An 8-in. diameter hole was drilled to a depth of 180 ft. The well is cased with 8-in. pipe from above land surface to a depth of 84 ft.

Upon completion, the well reportedly produced 350 gpm for 8 hr and the nonpumping water level was 30 ft below the top of the casing.

The pumping equipment presently installed is a Fairbanks-Morse submersible pump set at 100 ft, rated at 100 gpm at about 40 ft TDH, and powered by a 10-hp electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A15190) is for a water sample from the well collected in March 1976.

WELL NO. 1, LABORATORY NO. A15190

		mg/l	me/l			mg/l	me/l
Iron	Fe	1.35		Silica	SiO_2	17	
Manganese	Mn	0.12		Fluoride	F	0.7	0.04
Ammonium	NH_4	0.51	0.03	Boron	B	0.1	
Sodium	Na	12	0.52	Nitrate	NO_3	0.4	0.01
Potassium	K	1.5	0.04	Chloride	Cl	3	0.08
Calcium	Ca	71	3.54	Sulfate	SO_4	34	0.71
Magnesium	Mg	44	3.62	Alkalinity (as $CaCO_3$)		332	6.64
Arsenic	As	0.002		Hardness (as $CaCO_3$)		359	7.18
Barium	Ba	0.0					
Copper	Cu	0.02		Total dissolved			
Cadmium	Cd	0.00		minerals		380	
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		7.7	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		1.8	
Silver	Ag	0.00		± deviation		1.5	
Cyanide	CN	0.01		Beta *pc/l*		5.0	
Zinc	Zn	0.0		± deviation		1.6	

SLEEPY HOLLOW WATER CORPORATION

Sleepy Hollow Water Corporation (est. 1499) installed a public water supply in 1959. One well (No. 1) is in use and another well (No. 2) is available for emergency use. In 1961 there were 40 services, all metered. In 1976 there were 340 services, all metered including 102 apartment units, motel, and 2 swimming pools; the average and maximum daily pumpages were 136,945 and 205,000 gpd, respectively. The water from Well No. 1 is chlorinated and fluoridated.

WELL NO. 1, finished in sand and gravel, was completed in 1959 to a depth of 34 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located on Willow Lane at the foot of a small hill, approximately 1500 ft S and 1450 ft E of the NW corner of Section 28, T42N, R8E. The land surface elevation at the well is approximately 747 ft.

A drillers log of Well No. 1 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black soil	3	3
Gray clay	5	8
Sand	3.5	11.5
Gravel	3.5	15
Boulders	1	16
Clay and boulders	12	28
Gravel and boulders	6	34

A 33-in. diameter hole was drilled to a depth of 34 ft. The well is cased with 33-in. pipe from land surface to a depth of 28 ft and 20-in. pipe from 1 ft above the pumphouse floor to a depth of 29 ft and equipped with 6 ft of 20-in. No. 80 slot Johnson stainless steel screen. The top of the well casing is equipped with a pitless adapter.

On October 27, 1959, the test pump broke suction after pumping at 280 gpm for 17 min with a drawdown of 13.4 ft from a nonpumping water level of 0.2 ft. After an additional 2.3 hr of pumping at 200 gpm, the drawdown was 13.3 ft. Twenty-one min after pumping was stopped, the water level had recovered to 4.5 ft.

After the well was treated with phosphate on October 29, 1959, the well reportedly produced 405 gpm for 3 hr with a drawdown of 7.8 ft from a nonpumping water level of 3.0 ft.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 133532) set at 25 ft, rated at 500 gpm at about 140 ft TDH, and powered by a 25-hp 1800 rpm U.S. electric motor (Serial No. 2926015).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B43873) is for a water sample from the well collected April 25, 1977.

WELL NO. 1, LABORATORY NO. B43873

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.3		Silica	SiO_2	16	
Manganese	Mn	0.12		Fluoride	F	0.4	0.02
Ammonium	NH_4	1.5	0.08	Boron	B	0.2	
Sodium	Na	31	1.35	Nitrate	NO_3	0.4	0.01
Potassium	K	1.6	0.04	Chloride	Cl	82	2.31
Calcium	Ca	116	5.79	Sulfate	SO_4	65	1.35
Magnesium	Mg	50	4.12	Alkalinity(as $CaCO_3$)		380	7.60
Arsenic	As	0.00		Hardness (as $CaCO_3$)		510	10.20
Barium	Ba	0.2					
Copper	Cu	0.00		Total dissolved			
Cadmium	Cd	0.00		minerals		561	
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.3	

WELL NO. 2, finished in sand and gravel, was completed in 1962 to a depth of 44 ft by Stanley Bros., West Chicago. This well is available for emergency use. The well is located at the west end of Willow Lane near the swimming club about 50 ft west of Well No. 1, approximately 1500 ft S and 1400 ft E of the NW corner of Section 28, T42N, R8E. The land surface elevation at the well is approximately 747 ft.

The well is cased with 8-in. pipe and equipped with 5 ft of No. 3 (0.155 in.) shutter screen. The top of the casing is equipped with a pitless adapter.

The pumping equipment presently installed is a Red Jacket submersible pump rated at 200 gpm, and powered by a 10-hp 3450 rpm Red Jacket electric motor.

A partial analysis of a sample (Lab. No. 174809) collected May 1, 1968, after pumping at 225 gpm, showed the water to have a hardness of 468 mg/l, total dissolved minerals of 519 mg/l, and an iron content of 1.8 mg/l. Hydrogen sulfide also was apparent when this sample was collected.

SOUTH ELGIN

The village of South Elgin (4289) installed a public water supply in 1939. Two wells (Nos. 3 and 4) are in use and another well (No. 2) is available for emergency use. In 1950 there were 250 services, 70 percent metered; the average daily pumpage was 65,000 gpd. In 1977 there were 1350 services, all metered; the average and maximum daily pumpages in 1976 were 363,565 and 545,000 gpd, respectively. The water from Well Nos. 3 and 4 is chlorinated and fluoridated; in addition the water from Well No. 3 is aerated. The water from Well No. 2 is chlorinated as needed.

WELL NO. 1, open to the Cambrian-Ordovician aquifer, was constructed in 1929 to a depth of 685 ft and deepened in April 1938 to a depth of 1255 ft by the W. L. Thorne Co., Des Plaines, and deepened in 1952 to a final depth of 1400 ft. When the well was first drilled it was not equipped for pumping until the water distribution system was laid in 1938. This well was abandoned about 1969 and sealed in 1972. The well was located on the west side of the river about 70 ft west of Collins St. and 200 ft north of Prairie St., approximately 1200 ft S and 330 ft E of the NW corner of Section 35, T41N, R8E. The land surface elevation at the well is approximately 755 ft.

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

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES		
Soil	5	5
Sand	25	30
Glacial till	10	40
Gravel, clean	15	55
SILURIAN SYSTEM		
Alexandrian dolomite	40	95
ORDOVICIAN SYSTEM		
Maquoketa Group, shale and dolomite	170	265
Galena-Platteville Dolomite Groups	350	615
Ancell Group		
Glenwood Formation, some dolomite	70	685
St. Peter Sandstone		
Sandstone	175	860
Sandstone and shale	49	909
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite, some sandstone	93	1002
Franconia Formation, shale and dolomite	83	1085
Ironton-Galesville Sandstone	165	1250
No record	150	1400

A 12-in. diameter hole was drilled to a depth of 265 ft, reduced to 10 in. between 265 and 650 ft, reduced to 8 in. between 650 and 685 ft, and finished 6 in. in diameter from 685 to 1400 ft. The well was cased with 12-in. wrought iron pipe from 1 ft above the pumphouse floor to a depth of 59 ft, 10-in. wrought iron pipe from 49.5 ft to a depth of 265 ft, 8-in. pipe from 589.5 ft to a depth of 650 ft, and 6-in. pipe from 626.5 ft to a depth of 685 ft.

After deepening to 1255 ft, a production test was conducted by the State Water Survey on April 14, 1938. After 10 hr of pumping at rates ranging from 322 to 203 gpm, the final drawdown was 40 ft from a nonpumping water level of 142 ft below the top of the casing.

A second production test was conducted by the State Water Survey on September 29-30, 1938. After 18.7 hr of pumping at rates of 207 to 200 gpm, the drawdown was 34.5 ft from a nonpumping water level of 143.5 ft below the top of the casing. Pumping was continued at a reduced rate of 100 gpm for an additional 5.3 hr with a final drawdown of 19.0 ft. Ten min after pumping was stopped, the water level had recovered to 150.0 ft.

In 1946 the nonpumping water level was reported to be 179 ft below the pump base.

On August 14, 1947, the well reportedly produced 100 gpm for 0.5 hr with a pumping water level of 198 ft.

On February 20, 1959, at a depth of 1400 ft, the well reportedly produced 175 gpm for 20 min with a drawdown of 30 ft from a nonpumping water level of 260 ft below the pump base.

A mineral analysis of a sample when the well was 1250 ft deep (Lab. No. 111558) collected August 14, 1947, after pumping for 0.5 hr at 100 gpm, showed the water to have a hardness of 274 mg/l, total dissolved minerals of 343 mg/l, and an iron content of 0.7 mg/l.

WELL NO. 2, finished in sand and gravel, was completed in August 1951 to an effective depth of 117 ft by Ed O'Brien, Elgin. This well is available for emergency use. The well is located in the southeast part of town on Spring St. east of Fulton St., approximately 600 ft N and 1600 ft W of the SE corner of Section 35, T41N, R8E. The land surface elevation at the well is approximately 730 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black dirt	1	1
Till, brown	2	3
Gravel, yellow, coarse	18	21
Clay, tan, mostly medium	85	106
Sand, gray, medium to coarse, "live"	16	122
Sand, gray, cemented	2	124
Sand, gray, hard, "dead"	4	128

A 12-in. diameter hole was drilled to a depth of 121 ft. The well is cased with 12-in. pipe from 1.2 ft above the pumphouse floor to a depth of 107 ft followed by 10 ft of 12-in. No. 12 Cater shutter screen. A 4-ft length of blank pipe with drive shoe is placed below the screen.

A production test was conducted on April 14, 1952, by representatives of the driller, the State Water Survey, and Victor Kasser, City Engineer. After 3.1 hr of pumping at rates ranging from 271 to 257 gpm, the drawdown was 33.2 ft from a nonpumping water level of 28.8 ft below land surface. Two min after pumping was stopped, the water level had recovered to 30.5 ft.

In January 1959, the nonpumping water level was reported to be 37 ft.

The pumping equipment presently installed consists of a 20-hp 1800 rpm U. S. electric motor, an 8-in., 11-stage Aurora turbine pump (No. 60909) set at 90 ft, rated at 200 gpm at about 260 ft TDH, and has 90 ft of 5-in. column pipe. The well is equipped with 90 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006667) of a sample collected March 26, 1974, after pumping for 1.5 hr at 200 gpm, showed the water to have a hardness of 328 mg/l, total dissolved minerals of 412 mg/l, and an iron content of 1.4 mg/l.

WELL NO. 3, finished in sand and gravel, was completed in April 1962 to a depth of 112 ft by the Layne-Western Co., Aurora. The well is located at the corner of Gilbert and Lucille Sts., approximately 1400 ft N and 1450 ft W of the SE corner of Section 35, T41N, R8E. The land surface elevation at the well is approximately 735 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black sandy soil	1	1
Brown clay	2	3
Gray clay and stone	2	5
Coarse sand and gravel	4	9
Pinkish gray clay	36	45
Pinkish gray clay with few sand streaks	7	52
Pinkish gray clay	18	70
Pinkish gray clay, few stones	24	94
Pinkish gray clay, trace of sand	2	96
Medium blue sand, trace of fine sand	2	98
Medium coarse sand, some gravel, trace fine sand, lots of limestone ledges and boulders	4	102
Coarse sand and gravel, lots of limestone ledges and boulders	10	112
Limestone below		

A 14-in. diameter hole was drilled to a depth of 112 ft. The well is cased with 12-in. pipe from 5 ft above land surface to a depth of 102 ft followed by 10 ft of 12-in. No. 6 (0.080 in.) Layne bronze shutter screen. The annulus between the bore hole and casing-screen assembly is filled with puddled clay from 0 to 92 ft and with gravel from 92 to 112 ft.

A production test was conducted by the driller on April 5, 1962. After 6.2 hr of pumping at rates ranging from 448 to 524 gpm, the final drawdown was 36.5 ft from a nonpumping water level of 38.0 ft below land surface.

The pumping equipment presently installed is a Byron Jackson turbine pump (Serial No. 700096) set at 100 ft, rated at 500 gpm at about 200 ft head, and powered by a 40-hp 1800 rpm U. S. electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B17800) of a sample collected October 29, 1976, after pumping for 1 hr at 333 gpm, showed the water to have a hardness of 314 mg/l, total dissolved minerals of 369 mg/l, and an iron content of 2.0 mg/l.

WELL NO. 4, finished in sand and gravel, was completed in October 1973 to a depth of 109 ft by the Layne-Western Co., Aurora. The well is located east of Martin St. and 60 ft south of Division St. extended, approximately 600 ft S and 650 ft W of the NE corner of Section 34, T41N, R8E. The land surface elevation at the well is approximately 762 ft.

A drillers log of Well No. 4 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Black sandy top soil	1	1
Brown sandy clay	1	2
Sand and gravel	2.5	4.5
Brown sandy clay	7.5	12
Gray sandy clay with gravel embedded	30	42
Fine sand to coarse gravel with boulders	15	57
Fine to coarse sand and some small gravel	7	64
Fine sand to coarse gravel	7	71
Pink sandy clay with gravel embedded	2.5	73.5
Gray medium sand to coarse gravel	35.5	109
Limestone below		

A 30-in. diameter hole was drilled to a depth of 109 ft. The well is cased with 24-in. pipe from 2 ft above land surface to a depth of 68 ft and 12-in. pipe from 2 ft above land surface to a depth of 84 ft followed by 25 ft of 12-in. No. 5 (0.105 in.) Layne stainless steel shutter screen. The annulus between the bore hole and 24-in. casing is filled with cement from 0 to 50 ft and the annulus between the 24- and 12-in. casings and between the bore hole and 12-in. casing-screen assembly is filled with Muscatine gravel from 0 to 109 ft.

A production test was conducted by the driller on October 22, 1973. After 7.2 hr of pumping at rates from 690 to 876 gpm, the final drawdown was 4.5 ft from a nonpumping water level of 66.0 ft below land surface. One min after pumping was stopped, full recovery was observed.

The pumping equipment presently installed is a Layne & Bowler turbine pump (No. 81812) set at 80 ft, rated at 800 gpm, and powered by a 60-hp 1770 rpm U. S. electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B50649) is for a water sample from the well collected June 14, 1977, after 1.5 hr of pumping at 490 gpm.

WELL NO. 4, LABORATORY NO. B50649

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	14	
Manganese	Mn	0.01		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.00	0.00	Boron	B	0.1	
Sodium	Na	6	0.26	Nitrate	NO_3	2.2	0.04
Potassium	K	1.3	0.03	Chloride	Cl	12	0.34
Calcium	Ca	85	4.24	Sulfate	SO_4	79	1.64
Magnesium	Mg	42	3.46	Alkalinity (as $CaCO_3$)		314	6.28
Arsenic	As	0.00					
Barium	Ba	0.1		Hardness (as $CaCO_3$)		419	8.38
Copper	Cu	0.00					
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved			
Lead	Pb	0.00		minerals		418	
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.5	

ST. CHARLES

The city of St. Charles (12,945) installed a public water supply in 1907. Five wells (Nos. 3, 4, 5, 6, and 7) are in use. This supply is cross connected with the Howell Co. well and the city of Geneva, and Geneva is also connected to the city of Batavia. In 1950 there were 1600 services, all metered; the estimated average daily pumpage was 580,000 gpd. In 1974 there were 4446 services, all metered; in 1973 the average and maximum daily pumpages were 2,388,211 and 2,800,000 gpd, respectively. The water from Well Nos. 3, 4, and 6 is chlorinated, treated with polyphosphate to keep iron in solution, and aerated. The water from Well No. 7 is aerated for iron removal, filtered, settled, chlorinated, and treated with polyphosphate.

WELL NO. 1, open to the Maquoketa Group and the Galena-Platteville dolomite, was completed in 1907 to a depth of 352 ft. This well was seldom used after 1919 and was abandoned, filled with puddled clay, capped, and sealed with concrete in 1936. The well was located about 5 ft north of the south line of Cedar Ave. and 15 ft west of First Ave. North, approximately 500 ft N and 2100 ft E of the SW corner of Section 27, T40N, R8E. The land surface elevation at the well is approximately 695 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Limestone	80	80
Blue shale	12	92
Limestone	260	352

A 10-in. diameter hole was drilled to a depth of 28 ft and finished 8 in. in diameter from 28 to 352 ft. The well was cased with 8-in. galvanized pipe to a depth of 80 ft.

In August 1914, a production of 120 gpm was reported when pumping with a plunger pump and the nonpumping water level was reported to be 6 to 8 ft from the top of the well.

A mineral analysis of a sample (Lab. No. 28354) collected August 6, 1914, showed the water to have a hardness of 400 mg/l, total dissolved minerals of 548 mg/l, and an iron content of 0.8 mg/l.

WELL NO. 2, open to the Silurian dolomite, the Maquoketa Group, the Galena-Platteville dolomite, and the Glenwood-St. Peter Sandstone, was completed in 1911 to a depth of 850 ft. This well was originally used for emergencies and was seldom operated between 1937 and 1941. The well was abandoned in 1941 and sealed in 1962. The well was located at the southwest corner of Fourth Ave. and Pearl St. about 100 ft north of the Chicago Great Western RR, approximately 1450 ft N and 2300 ft E of the SW corner of Section 27, T40N, R8E. The land surface elevation at the well is approximately 748 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Gravel and clay	42	42
Lime and shale rock	608	650
St. Peter sandstone	200	850

The well was cased with 10-in. pipe to a depth of 42 ft, and the hole was finished 8 in. in diameter to the bottom.

Upon completion, the well reportedly produced 160 gpm with a drawdown of 80 ft from a nonpumping water level of 25 ft below land surface.

This well was seldom used after 1919 until the W. L. Thome Co., Des Plaines, repaired it in 1931. After repairing, the nonpumping water level was 55 ft below land surface and the well reportedly produced 395 gpm with the drawdown below the 250-ft airline and the pump discharged air. Pumping was reduced to 350 gpm and the drawdown was 156 ft but the pump still discharged air. By 1941 when use of the well was discontinued, the productive capacity had decreased to 100 gpm.

A mineral analysis of a sample (Lab. No. 28355) collected August 6, 1914, showed the water to have a hardness of 287 mg/l, total dissolved minerals of 375 mg/l, and an iron content of 0.4 mg/l.

• WELL NO. 3, presently open to the Cambrian'Ordovician aquifer except for the Galena-Platteville dolomite, was constructed in February 1919 to a depth of 2198 ft by F. M. Gray, Jr., Chicago, and rebuilt between December 1953 and May 1955 to a depth of 2195 ft by the J. P. Miller Artesian Well Co., Brookfield. This well was plugged back to 1191.4 ft in May 1971 by the Layne-Western Co., Aurora. The well is located on the east bank of the Fox River about 25 ft south of Cedar St. and 100 ft west of First Ave. near the city hall, approximately 450 ft N and 2000 ft E of the SW corner of Section 27, T40N, R8E. The land surface elevation at the well is approximately 690 ft.

A sample study log of Well No. 3 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Clay	5	5
SILURIAN SYSTEM		
Dolomite, water bearing	60	65
ORDOVICIAN SYSTEM		
Maquoketa Group, shale and dolomite, in part water bearing	175	240
Galena-Platteville Dolomite Groups	320	560
Ancell Group		
Glenwood-St. Peter Sandstone, water bearing	320	880
CAMBRIAN SYSTEM		
Eminence-Potosi Dolomite	140	1020
Franconia Formation	80	1100

Strata (continued)	Thickness (ft)	Depth (ft)
Ironton-Galesville Sandstone, water bearing	130	1230
Eau Claire Formation, sandstone and shale	410	1640
Mt. Simon Sandstone, water bearing	560	2200

Originally, a 20-in. diameter hole was drilled to a depth of 200 ft, reduced to 15 in. between 200 and 475 ft, reduced to 12 in. between 475 and 489 ft, reduced to 10 in. between 489 and 865 ft, and finished 8 in. in diameter from 865 to 2198 ft. The old casing consisted of 20-in. OD drive pipe from land surface to a depth of 10 ft, 12-in. pipe from land surface to a depth of 243 ft, 10-in. pipe from 243 ft to a depth of 489 ft, and 8-in. liner from 830 ft to a depth of 930 ft. In December 1953 the J. P. Miller Artesian Well Co., removed the old casings and reamed the hole to 19.2 in. in diameter from land surface to a depth of 670 ft, 17 in. in diameter from 670 to 750 ft, 15.2 in. in diameter from 750 to 935 ft, and 10 in. in diameter from 935 to 2195 ft. By April 1955, the well was recased with 16-in. pipe from 0.2 ft above the pump station floor to a depth of 670 ft (cemented in) and 12-in. liner from 820 ft to a depth of 935 ft.

Upon completion in 1919, after a 48-hr idle period, the well reportedly produced 555 gpm with a water level below the 104-ft airline from a nonpumping water level of 14 ft below the pump base.

In 1946, when pumping at 600 gpm, water levels were below a 200-ft airline. At this time, unsuccessful attempts were made to raise the pump so additional column pipe could be added. The well was continued in service until February 1947 when the pump stopped. About 2000 gal of 28 percent HCl were required to free the pump column from the 12-in. casing before the pump could be pulled for repairs.

A production test was conducted on March 9, 1947, by representatives of the city and the State Water Survey. After 3 hr of pumping at rates ranging from 560 to 545 gpm, the drawdown was 47.0 ft from a nonpumping water level of 127.0 ft below the pump base. Pumping was decreased to 495 gpm for 2.5 hr with a final drawdown of 43.5 ft. Thirty-seven min after pumping was stopped, the water level had recovered to 134.0 ft. During this test, Well No. 4 was pumping intermittently.

In September and October 1952, the nonpumping water level was reported to be 148 ft below the pump base.

After rehabilitation was completed in 1955, the nonpumping water level was reported to be 167 ft below land surface.

A production test was conducted by the driller on May 3-4, 1955. After 24.4 hr of pumping at rates ranging from 913 to 1125 gpm, the final drawdown was 143 ft from a nonpumping water level of 177 ft below the pump base. The water level recovered to 200 ft after pumping was stopped 1.1 hr.

In May 1971, the Layne-Western Co. plugged this well to 1191.4 ft.

This well was acidized by the Layne-Western Co. in October 1971 with 2000 gal of treating acid. After acidizing, the well reportedly produced 852 gpm with a drawdown of 228 ft from a nonpumping water level of 376 ft.

The pumping equipment presently installed consists of a 200-hp General Electric motor, a 12-in., 9-stage Layne submersible pump (No. 65298) set at 661 ft, rated at 1000 gpm at about 660 ft head, and has 661.3 ft of 8-in. column pipe. The well is equipped with 661 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B43427) is for a water sample from the well collected April 25, 1977, after 1 hr of pumping at 850 gpm.

WELL NO. 3, LABORATORY NO. B43427

		mg/l	me/l			mg/l	me/l
Iron	Fe	0.2		Silica	SiO_2	6.7	
Manganese	Mn	0.00		Fluoride	F	0.8	0.04
Ammonium	NH_4	0.72	0.04	Boron	B	0.3	
Sodium	Na	22	0.96	Nitrate	NO_3	0.0	0.00
Potassium	K	12.1	0.31	Chloride	Cl	11	0.31
Calcium	Ca	61	3.04	Sulfate	SO_4	7	0.15
Magnesium	Mg	24	1.98	Alkalinity(as $CaCO_3$)		297	5.94
Arsenic	As	0.00					
Barium	Ba	1.8		Hardness (as $CaCO_3$)		259	5.18
Copper	Cu	0.00					
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved minerals		344	
Lead	Pb	0.00					
Mercury	Hg	0.0002					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Cyanide	CN	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.5	

WELL NO. 4, presently open to the Cambrian-Ordovician aquifer, was completed in October 1936 to a depth of 2200 ft by the Varner Well and Pump Co., Dubuque, Iowa. This well was cleaned out in May 1952 to 2190 ft and then in November 1970 the well was plugged at 1647 ft by the Layne-Western Co., Aurora. The well is located on the east bank of the Fox River about 100 ft north of State St. and 210 ft west of Cedar Ave., approximately 950 ft N and 1900 ft E of the SW corner of Section 27, T40N, R8E. The land surface elevation at the well is approximately 686 ft.

A sample study log of Well No. 4 furnished by the State Geological Survey follows:

Strata	Thickness (ft)	Depth (ft)
SILURIAN SYSTEM		
Niagaran-Alexandrian dolomites	65	65
ORDOVICIAN SYSTEM		
Maquoketa Group, shale and dolomite	155	220
Galena-Platteville Dolomite Groups	345	565
Ancell Group		
Glenwood Formation, sandstone and dolomite	65	630
St. Peter Sandstone		
Sandstone	300	930
Conglomerate of sandstone, chert, shale, and dolomite	100	1030
CAMBRIAN SYSTEM		
Franconia Formation, sandstone and dolomite.		

Strata	Thickness (ft)	Depth (ft)
some shale	55	1085
Ironton-Galesville Sandstone		
Sandstone, partly dolomitic	60	1145
Sandstone, incoherent	65	1210
Sandstone, partly dolomitic	45	1255
Eau Claire Formation, shale and dolomite, some sandstone	390	1645
Mt. Simon Sandstone	555	2200

A 24-in. diameter hole was drilled to a depth of 55 ft, reduced to 22 in. between 55 and 400 ft, reduced to 15 in. between 400 and 1046 ft, and finished 12 in. in diameter from 1046 to 2200 ft. The well is cased with 24-in. pipe from 0.7 ft above a concrete floor to a depth of 10 ft, 15.5-in. pipe from land surface to a depth of 400 ft (cemented in from 10 to 400 ft), and a 12-in. liner from 917.5 ft to a depth of 1046 ft.

Upon completion, after the well was shot at depths of 2160, 2100, and 1980 ft, the well reportedly produced 1000 gpm with a drawdown of 145 ft from a nonpumping water level of 90 ft below the top of the casing.

In December 1950, C. W. Varner, Dubuque, Iowa, removed the pump to rework the well and repair the pump. By March 1951, the well had been shot at three depths: 400 lb at 2130 ft, 700 lb at 2070 ft, and 350 lb at 2020 ft. Very little sand was bailed out so additional charges were set off as follows: 400 lb at 2130 ft, 400 lb at 2020 ft, 400 lb at 1940 ft, and 350 lb at 1380 ft.

In March 1952, the production fell off so the well was measured and found to be 1833 ft deep with a nonpumping water level of 151 ft below land surface. In May 1952, the well was cleaned out to a depth of 2190 ft and the pump bowls, shaft, and pump bearings were replaced. On May 31, 1952, the well reportedly produced at a maximum rate of 1146 gpm with a drawdown of 95 ft from a nonpumping water level of 145 ft below the pump base.

The pumping equipment presently installed is a 9-stage Byron Jackson submersible pump (Serial No. 691-C-0182) set at 545 ft, rated at 1000 gpm at about 480 ft head, and powered by a 150-hp 1760 rpm Byron Jackson electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A107106) of a sample collected November 27, 1973, after pumping for 2 hr at 670 gpm, showed the water to have a hardness of 234 mg/l, total dissolved minerals of 320 mg/l, and an iron content of 0.15 mg/l.

WELL NO. 5, presently open to the Cambrian-Ordovician aquifer, was completed in December 1947 to a depth of 2226 ft (measured in April 1964 at 1856 ft deep, measured in January 1976 at 1846 ft deep, and backfilled to 1713 ft in January 1976) by the Varner Well and Pump Co., Dubuque, Iowa. The well is located about 80 ft northwest of the intersection of Third and Bowman Sts., approximately 2050 ft S and 1500 ft E of the NW corner of Section 34, T40N, R8E. The land surface elevation at the well is approximately 760 ft

A drillers log of Well No. 5 follows:

Strata	Thickness (ft)	Depth (ft)
Clay and gravel	35	35
Sand and gravel	15	50
Sticky clay	5	55
Clay, gravel, some limerock	11	66
Brown limestone	11	77
White and brown lime	12	89
Gray lime	57	146
Rock and shale	29	175
White rock	20	195
Rock and shale	12	207
Gray shale	88	295
Brown rock	15	310
Gray limerock	319	629
Lime and sandstone	6	635
Sand and sandstone	52	687
Limerock and shale	10	697
White and gray sandstone	298	995
Rock and red shale	10	1005
Red sand and shale	30	1035
Red shale	10	1045
Hard, coarse, red and yellow rock	9	1054
Rock and shale	9	1063
Limerock	15	1078
Red shale and limerock	2	1080
Red shale and rock	19	1099
Green shale	8	1107
Dark gray shale, tough	1	1108
Red sandy shale	12	1120
Red-gray shale and dolomite	39	1159
Red sand and dolomite	44	1203
Red sand	9	1212
Pink sand, dolomite, and silt	42	1254
Buff sand	10	1264
White sand	25	1289
Pink sand, shale streaks	10	1299
White sand	10	1309
White dolomite	15	1324
Dolomite, black streaks, hard	5	1329
Blue-gray dolomite, hard	5	1334
Blue-gray shale, gray hard lime	12	1346
Gray shale	17	1363
Gray-blue shale	26	1389
Blue-gray shale and gray lime	11	1400
Gray shale	34	1434
Gray shale and lime	58	1492
Gray shale and dolomite	10	1502
Blue-gray sandy lime	10	1512
Gray, dolomite, silty	25	1537
Gray dolomite, some shale	42	1579
Blue-gray lime, shale streaks	13	1592
Gray lime	33	1625
Gray lime, shale streaks	10	1635
Gray-blue shale, lime streaks	11	1646
Gray lime	8	1654
Gray lime and dolomite	10	1664
Gray dolomite, shale streaks	86	1750
Fine pink sand; shale	10	1760
Red sand, streaks of clay	48	1808
Red sand	61	1869
Brown sand	11	1880
Red sand	24	1904
Red sand; red shale streaks	203	2107
Brownish sand; decided change in formation, fine and tight	29	2136
Red sand	30	2166
Pink, brown and red sand	60	2226

A 30-in. diameter hole was drilled to a depth of 295 ft, reduced to 24 in. between 295 and 315 ft, reduced to 23.5 in. between 315 and 1232 ft, and finished 20 in. in diameter from 1232 to 2226 ft. The well is cased with 30-in. pipe from 1 ft above the concrete floor to a depth of 68.3 ft and

24-in. pipe from land surface to a depth of 296 ft (cemented in).

Upon completion, the nonpumping water level was reported to be 191 ft below the top of the casing. The well was shot with 4 charges of 400 lb each at depths of 2020, 1855, 1280, and 1235 ft.

A production test was conducted on May 20, 1950, before the well was connected to the system. Much sand was pumped for the first 30 hr with less during the last 9 hr. During pumping at 1200 gpm, the drawdown was 30 ft from a nonpumping water level of 250 ft below the pump base.

Nonpumping water levels were reported to be 240 ft below the pump base in November 1952 and 335 ft in April 1964.

A production test was conducted by the M. P. Schneller & Assoc, Inc., Aurora, on July 3, 1964. After 3.8 hr of pumping at rates ranging from 850 to 960 gpm, the final drawdown was 44 ft from a nonpumping water level of 346 ft below the pump base.

On December 1, 1967, the nonpumping water level was reported to be 378 ft below land surface.

After the well was backfilled to a depth of 1713 ft, a production test was conducted by the Layne-Western Co., Aurora, on March 17, 1976. After 7.5 hr of intermittent pumping at rates ranging from 1089 to 1045 gpm, the final drawdown was 50 ft from a nonpumping water level of 452 ft.

The pumping equipment presently installed consists of a 200-hp Byron Jackson electric motor, a 12-in., 9-stage Byron Jackson submersible pump (No. 328548) set at 650 ft, and has 650 ft of 10-in. column pipe. The well is equipped with 650 ft of airline.

A partial analysis of a sample (Lab. No. 201358) collected March 17, 1976, after pumping for 7 hr at 1045 gpm, showed the water to have a hardness of 276 mg/l, total dissolved minerals of 377 mg/l, and an iron content of 0.7 mg/l.

WELL NO. 6, presently open to the Cambrian-Ordovician aquifer, was completed in October 1955 to a depth of 2249 ft (plugged to 1502 ft in 1974) by L. Cliff Neely, Batavia. The well is located about 60 ft southeast of the intersection of Fourth and Moody Sts., approximately 1900 ft S and 1400 ft E of the NW corner of Section 34, T40N, R8E. The land surface elevation at the well is approximately 766 ft.

A sample study log of Well No. 6 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Samples not studied	115	115
SILURIAN SYSTEM		
Dolomite, light grayish-buff, fine	5	120
ORDOVICIAN SYSTEM		
Maquoketa Group		
Dolomite, silty, partly argillaceous, light greenish-gray to brownish-gray, very fine	100	220
Shale, silty, dolomitic, gray to brown, weak; little dolomite, as above	72	292
Galena Group		
Dolomite, buff to grayish-buff, fine to medium, some dark gray pyritic specks	198	490
Platteville Group		
Nachusa Formation		
Dolomite, light gray to light brownish-gray, some gray mottling, fine crystalline	55	545
Grand Detour Formation		
Dolomite, light brownish-gray, dark gray mottled, very fine, dense	15	560
Mifflin Formation		
Dolomite, silty, light brownish-gray, very fine to fine, few orange specks	45	605
Pecatonica Dolomite		
Dolomite, light grayish-brown, partly silty, slightly sandy, fine, crystalline	30	635
Ancell Group		
Glenwood Formation		
Sandstone , partly dolomitic, fine to medium, friable	80	715
St. Peter Sandstone		
Sandstone, white, fine to medium, rounded, friable	295	1010
Kress Member		
Shale, silty, sandy, green, weak, cherty, pink, yellow, partly oolitic	82	1092
CAMBRIAN SYSTEM		
Franconia Formation		
Sandstone, silty, partly dolomitic, red, light gray at base, friable to firm, glauconitic; shale, red, light blue, weak	62	1154
Ironton-Galesville Sandstone		
Sandstone, slightly dolomitic, pale pinkish-gray, medium, friable, moderately sorted	181	1335
Eau Claire Formation		
Sandstone, dolomite, siltstone, shale interbedded	385	1720
Elmhurst Sandstone Member		
Sandstone, light gray, fine, friable, pyritic, sooty	5	1725
Mt. Simon Sandstone		
Sandstone, white, pale yellow, pink, medium to coarse, friable, poorly sorted, maximum grain size 1.8 mm	515	2240

A 26-in. diameter hole was drilled to a depth of 79 ft, reduced to 24 in. between 79 and 334 ft, reduced to 19 in. between 334 and 1172 ft, and finished 15.2 in. in diameter from 1172 to 2249 ft. The well is cased with 26-in. drive pipe from 0.7 ft above a concrete floor in a well pit to a depth of 79 ft, 20-in. pipe from land surface to a depth of 334 ft (cemented in), and a 16-in. liner from 1021 ft to a depth of 1172 ft. The well was shot with 800 qt of liquid nitro at a depth of 1925 ft.

Upon completion, the nonpumping water level was reported to be 243 ft below land surface.

A production test was conducted on October 17, 1955, by representatives of the driller, the State Water Survey, and Caldwell-Rhoads Co., Consulting Engineers. After 8 hr of pumping at rates of 1120 to 1300 gpm, the final drawdown was 118.0 ft from a nonpumping water level of 240.0 ft below the pump base. Thirty min after pumping was stopped, the water level had recovered to 270.0 ft.

On April 24, 1958, the nonpumping water level was reported to be 272.5 ft below the pump base.

A production test was conducted by the Layne-Western Co., Aurora, on July 9-10, 1974. After 20 hr of pumping

at a rate of 567 gpm, the drawdown was 282 ft from a nonpumping water level of 350 ft. The Layne-Western Co. plugged the well back to a depth of 1502 ft because of high chloride water from the Mt. Simon Formation. The well was then shot with two 110-grain shots per ft at 1330 to 1225 ft and one 110-grain shot per ft at 1225 to 1150 ft. On July 23, 1974, after 6.5 hr of pumping at rates ranging from 654 to 805 gpm, the drawdown was 113 ft from a nonpumping water level of 400 ft below the top of the pit.

In September 1975, the Layne-Western Co. pulled the pump, cleaned out the well from 1277 to 1502 ft, and rebuilt the bowls which had been severely worn by sand pumping. After this work, production tests were conducted by the Layne-Western Co. On October 8, 1975, after 5 hr of pumping at rates of 805 to 831 gpm, the drawdown was 55 ft from a nonpumping water level of 420 ft. On October 9, 1975, the well produced at rates ranging from 857 to 752 gpm for 7.8 hr with a drawdown of 55 ft from a nonpumping water level of 420 ft. On October 10, 1975, after 4.2 hr of pumping at rates of 851 to 838 gpm, the drawdown was 55 ft from a nonpumping water level of 420 ft.

The pumping equipment presently installed consists of a 150-hp Byron Jackson electric motor, a 10-in., 16-stage Byron Jackson submersible pump (No. 328548) set at 650 ft, rated at 1000 gpm at about 510 ft TDH, and has 650 ft of 8-in. column pipe.

The following mineral analysis (Lab. No. 200023) is for a water sample from the well collected October 9, 1975, after 7.5 hr of pumping at 838 gpm.

WELL NO. 6, LABORATORY NO. 200023

		mg/l	*me/l*			*mg/l*	*me/l*
Iron (total)	Fe	0.1		Silica	SiO_2	7.8	
Manganese	Mn	0.01		Fluoride	F	1.0	
Ammonium	NH_4	0.5	0.03	Boron	B	0.4	
Sodium	Na	31.7	1.38	Nitrate	NO_3	1.1	0.02
Potassium	K	14.5	0.37	Chloride	Cl	29	0.82
Calcium	Ca	64.0	3.19	Sulfate	SO_4	19.3	0.40
Magnesium	Mg	22.5	1.85	Alkalinity (as $CaCO_3$)		292	5.84
Strontium	Sr	2.6	0.06				
				Hardness (as $CaCO_3$)		252	5.04
Barium	Ba	<0.7					
Copper	Cu	0.02		Total dissolved			
Cadmium	Cd	0.00		minerals		367	
Chromium	Cr	0.00					
Lead	Pb	<0.05					
Lithium	Li	0.03		Turbidity		0	
Nickel	Ni	<0.05		Color		0	
Zinc	Zn	0.01		Odor		0	

A 6-in. test well was constructed in July 1962 to a depth of 126 ft by the J. P. Miller Artesian Well Co., Brookfield. The test well was located approximately 600 ft N and 35 ft E of the SW corner of Section 28, T40N, R8E. The test well reportedly produced 150 gpm for 24 hr with a drawdown of 4 ft from a nonpumping water level of 5 3 ft.

WELL NO. 7, finished in sand and gravel, was completed in November 1963 to a depth of 173 ft by the J. P. Miller Artesian Well Co., Brookfield. This well was not in regular use until 1973 when an iron removal plant was constructed. The well is located on the east side of Randall Road about 1 block north of Main St. (Route 64), approximately 600 ft N and 50 ft E of the SW corner of Section 28, T40N, R8E. 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, sand and gravel	90	90
Sand	28	118
Sand and gravel	15	133
Gravel and clay	7	140
Sand and gravel	35	175

A 42-in. diameter hole was drilled to a depth of 173 ft. The well is cased with 20-in. steel pipe from 2 ft above land surface to a depth of 118 ft, screened with 20-in. No. 90 slot Johnson stainless steel screen from 118 ft to a depth of 133 ft, cased with 18-in. pipe from 133 ft to a depth of 148 ft, and screened with 20-in. No. 90 slot Johnson screen from 148 ft to a depth of 173 ft. The annulus between the bore hole and casing-screen assembly is filled with impervious fill from 0 to 66 ft and with Silica gravel from 66 to 173 ft.

A production test was conducted by the driller on November 19-20, 1963. After 19.8 hr of pumping at rates of 1005 to 2156 gpm, the drawdown was 10 ft from a nonpumping water level of 59 ft below land surface. Pumping was continued for an additional 4.5 hr at a rate of 1005 gpm with a final drawdown of 3 ft.

The pumping equipment presently installed is a 2-stage Byron Jackson submersible pump set at 100 ft, rated at 2000 gpm at about 105 ft TDH, and powered by a 75-hp 1800 rpm Byron Jackson electric motor (Serial No. 10-1454-4-1RB).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C007460) is for a water sample from the well collected March 31, 1975, after 1.5 hr of pumping at 1200 gpm.

WELL NO. 7, LABORATORY NO. C007460

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	2.1		Silica	SiO_2	18.0	
Manganese	Mn	0.03		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.32	0.02	Boron	B	0.1	
Sodium	Na	6	0.26	Nitrate	NO_3	0.5	0.01
Potassium	K	1.1	0.03	Chloride	Cl	14	0.40
Calcium	Ca	84	4.19	Sulfate	SO_4	99	2.06
Magnesium	Mg	45	3.70	Alkalinity (as $CaCO_3$)		292	5.84
Arsenic	As	0.000		Hardness (as $CaCO_3$)		398	7.96
Barium	Ba	0.2					
Copper	Cu	0.00		Total dissolved			
Cadmium	Cd	0.00		minerals		404	
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		8.3	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		0.5	
Silver	Ag	0.00		± deviation		1.4	
Cyanide	CN	0.00		Beta *pc/l*		3.3	
Zinc	Zn	0.00		± deviation		2.0	

Five test holes were constructed in September and October 1977 by the Layne-Western Co., Aurora, to depths ranging from 71 to 280 ft. These holes were located in the northeast and northwest quarters of Section 22, the southeast quarter of Section 25, and the southwest quarter of Section 28, T40N, R8E.

A test well (No. 6-77) was constructed in December 1977 to a depth of 120 ft by the Layne-Western Co., Aurora. It was located approximately 2070 ft S and 720 ft E of the NW corner of Section 22, T40N, R8E. A 15-in. diameter hole was drilled to a depth of 120 ft. The test well was cased with 10-in. pipe from land surface to a depth of 100 ft followed by 20 ft of 8-in. Layne shutter screen. Upon completion, the test well reportedly produced 1012 gpm for 25 hr with a drawdown of 36.0 ft from a nonpumping water level of 4.5 ft below land surface.

ST. CHARLES SKYLINE SEWER & WATER CO. (VALLEY VIEW)

St. Charles Skyline Sewer & Water Co. (Valley View) (est. 500), located within the village of Valley View, installed a public water supply in 1958. Two wells are in use. In 1965 there were 92 services, all metered; the average daily pumpage was 25,000 gpd. In 1974 there were 151 services plus the Illinois Youth Center (Valley View), all metered; the average and maximum daily pumpages were 55,000 and 70,000 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 August 1958 to a depth of 131 ft by the Layne-Western Co., Aurora. The well is located at the northeast corner of Clyde Parkway and Skyline Drive, approximately 1150 ft N and 1200 ft E of the SW corner of Section 11, T40N, R8E. The land surface elevation at the well is approximately 787 ft.

A drillers log of Well No. 1 follows:

Strata	Thickness (ft)	Depth (ft)
Top soil	1	1
Yellow sand	2	3
Clay	9	12
Sandy clay	15	27
Fine sand	3	30
Clay	13	43
Sand and coarse gravel	2	45
Soft clay, sand streaks	22	67
Fine sand	3	70
Coarse sand	19	89
Fine sand and coarse gravel	9	98
Fine sand and coarse gravel with boulders	13	111
Loose fine sand and coarse gravel	22	133
Gravel and shale	6	139

An 18-in. diameter hole was drilled to a depth of 139 ft. The well is cased with 10-in. standard pipe from 2 ft above the pumphouse floor to a depth of 111 ft followed by 20 ft of 10-in. No. 6 (0.080 in.) Layne stainless steel shutter screen. The annulus between the bore hole and casing-screen assembly is filled with clay from 0 to 70 ft and with 5 yards of gravel from 70 ft to the bottom.

Upon completion, the well reportedly produced 250 gpm for 8 hr with a drawdown of 9.0 ft from a nonpumping water level of 100.5 ft below land surface.

On February 21, 1972, the well reportedly produced 250 gpm with a drawdown of 9 ft from a nonpumping water level of 103 ft.

The pumping equipment presently installed consists of a 10-hp 1800 rpm U.S. electric motor (No. 2582069), an 8-in., 4-stage Layne turbine pump (No. 39506) set at 120 ft, rated at 250 gpm at about 110 ft head, and has 120 ft of 5-in. column pipe. The well is equipped with 120 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006384) of a sample collected February 19, 1976, after pumping for 45 min at 250 gpm, showed the water to have a hardness of 373 mg/1, total dissolved minerals of 428 mg/1, and an iron content of 1.6 mg/1.

WELL NO. 2, finished in sand and gravel, was completed in June 1969 to a depth of 135 ft by the Layne-Western Co., Aurora. The well is located at the northeast corner of Clyde Parkway and Skyline Drive, approximately 1165 ft N and 1080 ft E of the SW corner of Section 11, T40N, R8E. The land surface elevation at the well is approximately 787 ft.

A drillers log of Well No. 2 follows:

Strata	Thickness (ft)	Depth (ft)
Top soil (brown)	1	1
Sandy clay	2	3
Brown and gray clay	9	12
Gray clay	15	27
Fine gray sand, trace of gravel	3	30
Gray clay	13	43
Gray sand	2	45
Pinkish clay, soft few sand streaks	36	81
Coarse sand and gravel, some fine gray shale	54	135
Gray shale	2	137

An 18-in. diameter hole was drilled to a depth of 137 ft. The well is cased with 10-in. pipe from 2 ft above the pumphouse floor to a depth of 115 ft followed by 20 ft of 10-in. No. 6 (0.080 in.) Layne shutter screen. The annulus between the bore hole and casing-screen assembly is filled with concrete from 0 to 20 ft, with pit run from 20 to 50 ft, and with 5 yards

of No. 3 Muscatine gravel from 50 to 137 ft.

A production test was conducted by the driller on June 9, 1969. After 8 hr of pumping at rates ranging from 375 to 340 gpm, the final drawdown was 16 ft from a nonpumping water level of 104 ft below the top of the casing.

On February 21, 1972, the well reportedly produced 250 gpm with a drawdown of 9 ft from a nonpumping water level of 105 ft.

The pumping equipment presently installed is a Layne vertical turbine centrifugal pump (Serial No. 61917) set at 123.7 ft, rated at 250 gpm at about 111 ft TDH, and powered by a 10-hp 1750 rpm General Electric motor (Model No. 5K6227XHIA, Serial No. CEJ319379).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006382) is for a water sample from the well collected February 19, 1976, after 45 min of pumping at 250 gpm.

WELL NO. 2, LABORATORY NO. C006382

		mg/l	me/l			mg/l	me/l
Iron	Fe	1.5		Silica	SiO_2	16.5	
Manganese	Mn	0.05		Fluoride	F	0.4	0.02
Ammonium	NH_4	0.75	0.04	Boron	B	0.1	
Sodium	Na	5	0.22	Nitrate	NO_3	0.4	0.01
Potassium	K	1.5	0.04	Chloride	Cl	4	0.11
Calcium	Ca	77	3.84	Sulfate	SO_4	65	1.35
Magnesium	Mg	45	3.70	Alkalinity(as $CaCO_3$)		336	6.72
Arsenic	As	0.000		Hardness (as $CaCO_3$)		380	7.60
Barium	Ba	0.1					
Copper	Cu	0.00		Total dissolved minerals		418	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		8.3	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha pc/l		0.6	
Silver	Ag	0.00		± deviation		1.2	
Cyanide	CN	0.00		Beta pc/l		4.5	
Zinc	Zn	0.00		±deviation		1.7	

SUGAR GROVE

The village of Sugar Grove (1230) installed a public water supply in 1957. One well (No. 2) is in use and another well (No. 3) is available for emergency use. In 1951 there were 60 services, all metered. In 1974 there were 330 services, all metered; the estimated average and maximum daily pumpages were 84,500 and 126,000 gpd, respectively. The water is chlorinated and fluoridated.

Prior to the installation of a public water supply, a private water supply was installed about 1890. A 3-in. diameter well, finished in sand and gravel, was completed in 1890 to a depth of 90 ft. The well was located about 57 ft north of the Chicago, Burlington & Quincy RR and 108 ft west of Main St., approximately 2550 ft S and 2400 ft E of the NW corner of Section 21, T38N, R7E. The land surface elevation at the well is approximately 727 ft. This well was in service until 1905 when it was abandoned because of sand clogging of the pump.

Another well, finished in dolomite, was completed in 1905 to a depth of 230 ft by B. L. Palmer & Sons, Aurora. The well was located approximately 2500 ft N and 2350 ft E of the SW corner of Section 21, T38N, R7E. The well was cased with 4-in. iron pipe from above the bottom of a 6-ft deep pit to a depth of 200 ft. This well has been abandoned and sealed.

A mineral analysis of a sample (Lab. No. 111526) collected August 11, 1947, after pumping for 6 hr at 8 gpm, showed the water to have a hardness of 120 mg/l, total dissolved minerals of 371 mg/l, and an iron content of 0.4 mg/l.

Prior to the construction of Well No. 1, Test Hole No. 1 was drilled in March 1948 to a depth of 104 ft by Hayes & Sims, Champaign.

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

Strata	Thickness (ft)	Depth (ft)
PLEISTOCENE SERIES		
Till, buff, very silty	5	5
Sand, fine to coarse, brown, very dirty	10	15
Gravel, granule, iron stained, oxidized	5	20
Sand, fine to coarse, of limestone, dolomite and chert, mostly clean	35	55
Sand, fine to medium, partly clean	5	60
Sand, very fine to medium, buff, mostly clean	20	80
Gravel, up to ¼ in. mostly clean, some silica sand	20	100
Gravel, up to ¼ in. clean, no sand	4	104

WELL NO. 1 (formerly known as Well No. 3), finished in sand and gravel, was completed in April 1948 to a depth of 104 ft by Hayes & Sims, Champaign. This well was abandoned and sealed prior to 1961. The well was located about 12 ft south of Test Hole No. 1 in the rear of the firehouse, approximately 2426 ft S and 2500 ft W of the NE corner of Section 21, T38N, R7E. The land surface elevation at the well is approximately 727 ft.

A 10-in. diameter hole was drilled to a depth of 40 ft and finished 8 in. in diameter from 40 to 104 ft. The well was cased with 10-ih. pipe from land surface to a depth of 41.6 ft and 8-in. pipe from land surface to a depth of 91.7 ft and equipped with 15 ft (12.3 ft exposed) of 8-in. No. 30 slot Johnson Everdur screen.

A production test was conducted on April 28, 1948, by representatives of the driller, the village, the State Water Survey, and the Consulting Engineer. After 4.7 hr of pumping at rates of 90 to 106 gpm, the final drawdown was 5.8 ft

from a nonpumping water level of 49.6 ft below the top of the casing. One min after pumping was stopped, full recovery was observed.

On March 9, 1960, the well reportedly produced 100 gpm for 5 min with a drawdown of 30 ft from a nonpumping water level of 40 ft below the pump base.

A mineral analysis of a sample (Lab. No. 151911) collected March 9, 1960, after pumping for 5 min at 100± gpm, showed the water to have a hardness of 429 mg/l, total dissolved minerals of 503 mg/l, and an iron content of 0.2 mg/l.

WELL NO. 2, finished in sand and gravel, was completed in June 1961 to a depth of 107 ft by the Layne-Western Co., Aurora. The well is located in an alley bordering the Chicago, Burlington & Quincy RR between Main and Grove Sts., approximately 2600 ft S and 2275 ft E of the NW corner of Section 21, T38N, R7E. The land surface elevation at the well is approximately 727 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Top soil	2	2
Yellow sandy clay and boulders	8	10
Coarse sand, gravel, and boulders	62	72
Gray to yellow fine sand	9	81
Coarse fine - coarse sand, some small gravel	10	91
Coarse sand, gravel, and boulders	24	115
Blue clay and boulders	4	119

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B32392) is for a water sample from the well collected February 17, 1976, after 1 hr of pumping at 500 gpm.

WELL NO. 2, LABORATORY NO. B32392

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	14	
Manganese	Mn	0.05		Fluoride	F	0.2	0.01
Ammonium	NH_4	0.1	0.01	Boron	B	0.2	
Sodium	Na	30	1.30	Nitrate	NO_3	5.5	0.09
Potassium	K	3.0	0.08	Chloride	Cl	87	2.45
Calcium	Ca	113	5.64	Sulfate	SO_4	120	2.50
Magnesium	Mg	60	4.94	Alkalinity (as $CaCO_3$)		346	6.92
Arsenic	As	0.00		Hardness (as $CaCO_3$)		528	10.56
Barium	Ba	0.1					
Copper	Cu	0.00		Total dissolved minerals		642	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		8.1	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		4.1	
Silver	Ag	0.00		± deviation		2.6	
Cyanide	CN	0.00		Beta *pc/l*		5.3	
Zinc	Zn	0.0		± deviation		2.6	

A 36-in. diameter hole was drilled to a depth of 107 ft. The well is cased with 12-in. pipe from 2 ft above the pumphouse floor to a depth of 87 ft followed by 20 ft of 12-in. No. 6 (0.080 in.) Layne stainless steel shutter screen. The annulus between the bore hole and casing-screen assembly is filled with sand and bentonite mixed from 0 to 44 ft and with gravel from 44 to 107 ft.

A production test was conducted by the driller on June 19, 1961. After 5.6 hr of pumping at a rate of 517 gpm, the drawdown was 6.5 ft from a nonpumping water level of 50.5 ft. Pumping was continued at a rate of 703 gpm for 4 hr with a drawdown of 9.0 ft. After an additional 6 hr of pumping at a rate of 855 gpm, the final drawdown was 11.5 ft. Fourteen min after pumping was stopped, the water level had recovered to 52.5 ft.

The pumping equipment presently installed is a Layne & Bowler turbine pump set at 80 ft rated at 500 gpm, and powered by a 50-hp U. S. electric motor.

WELL NO. 3, finished in sand and gravel, was completed in February 1961 to a depth of 110 ft by the J. P. Miller Artesian Well Co., Brookfield. This well is available for emergency use. The well is located about 12 ft north of Well No. 2, approximately 2588 ft S and 2275 ft E of the NW corner of Section 21, T38N, R7E. The land surface elevation at the well is approximately 727 ft.

A drillers log of Well No. 3 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Clay	10	10
Gravel	100	110

An 11-in. diameter hole was drilled to a depth of 110 ft. The well is cased with 6-in. steel pipe from 1.5 ft above the pumphouse floor to a depth of 90 ft followed by 20 ft of 6-in. No. 60 slot Howco stainless steel screen. The annulus between the bore hole and casing-screen assembly is filled with sand and bentonite from 0 to 45 ft and with gravel from 45 to 90 ft.

Upon completion, the well reportedly produced 220 gpm for 12 hr with a drawdown of 5 ft from a nonpumping water level of 50 ft below the top of the casing.

The pumping equipment presently installed is a Byron Jackson submersible pump rated at 75 gpm at about 180 ft head, and powered by a 7 ½-hp 1750 rpm Byron Jackson electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 04192) of a sample collected February 16, 1972, after pumping for 2 hr, showed the water to have a hardness of 500 mg/l, total dissolved minerals of 620 mg/l, and an iron content of 0.1 mg/l. The iron content has been greater on previous samples.

WERMES SUBDIVISION

Wermes Subdivision (est. 160), located on the southeast edge of Aurora, installed a public water supply in 1946. The water system is owned and operated by the Community Water Corporation. One well (No. 2) is in use and another well (No. 1) is available for emergency use. In 1972 there were 50 services, none metered; the average daily pumpage was 10,000 gpd. The water is not treated.

WELL NO. 1, open to the Silurian dolomite, was completed in 1923 to a depth of 216 ft. This well is available for emergency use. The well is located at 1428 Second Ave., approximately 800 ft S and 400 ft E of the NW corner of Section 25, T38N, R8E. The land surface elevation at the well is approximately 720 ft.

A 4-in. diameter hole was drilled to a depth of 216 ft. The well is cased with 4-in. pipe from 0.7 ft above the floor of a 7-ft deep pit to a depth of 155 ft.

The pumping equipment presently installed is an F. E. Myers piston pump set at 66 ft, rated at 10 gpm, and powered by a 3-hp 1750 rpm Westinghouse electric motor.

WELL NO. 2, open to the Silurian dolomite, was completed in September 1956 to a depth of 25 3 ft by the Wehling Well Works, Beecher. The well is located at 1428 Second Ave., approximately 825 ft S and 400 ft E of the NW corner of Section 25, T38N, R8E. The land surface elevation at the well is approximately 720 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Drift	150	150
Lime	103	253

An 8-in. diameter hole was drilled to a depth of 253 ft. The well is cased with 8-in. pipe from 1.3 ft above the pumphouse floor to a depth of 250 ft.

The pumping equipment presently installed is a Reda submersible pump set at 147 ft, rated at 45 gpm, and powered by a 3-hp Reda electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C001110) is for a water sample from the well collected August 7, 1974, after 30 min of pumping at 55 gpm.

WELL NO. 2, LABORATORY NO. C001110

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.4		Silica	SiO_2	7.0	
Manganese	Mn	0.00		Fluoride	F	1.4	0.07
Ammonium	NH_4	0.64	0.04	Boron	B	1.3	
Sodium	Na	126	5.48	Nitrate	NO_3	0.3	0.00
Potassium	K	6.3	0.16	Chloride	Cl	4	0.11
Calcium	Ca	30	1.50	Sulfate	SO_4	108	2.25
Magnesium	Mg	16	1.32	Alkalinity (as $CaCO_3$)		320	6.40
Arsenic	As	0.000		Hardness (as $CaCO_3$)		141	2.82
Barium	Ba	0.1					
Copper	Cu	0.01		Total dissolved			
Cadmium	Cd	0.00		minerals		540	
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0002		pH (as rec'd)		8.2	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		1.9	
Silver	Ag	0.00		± deviation		1.8	
Cyanide	CN	0.00		Beta *pc/l*		8.6	
Zinc	Zn	0.00		± deviation		2.9	

WEST DUNDEE

The village of West Dundee (3295) installed a public water supply in 1905. One well (No. 1) is in use and another well (No. 2) is available for emergency use. In 1951 there were 630 services, all metered; the average daily pumpage was 233,000 gpd. In 1972 there were 925 services, all metered; the average daily pumpage was 399,358 gpd. The water from both wells is chlorinated and fluoridated; Well No. 1 water is also force draft aerated.

A SPRING SUPPLY, finished in sand and gravel, was constructed in 1895. This source of supply was abandoned prior to 1969. The springs were located northeast of the intersection of Routes 63 and 72, approximately 1000 ft N and 2000 ft E of the SW corner of Section 23, T42N, R8E. The land surface elevation at the springs is approximately 780 ft.

Originally, 400 ft of 12-in. tile was laid with open joints at depths of 12 to 15 ft below land surface starting about 50 ft east of Route 63 and continuing east and then following the slope of 'East Hill' to the north. By 1922, because of an inadequate yield, 400 ft of additional tile was laid at depths of 4 to 8 ft following the east right-of-way of Route 63. Both tile lines discharged into a manhole, and then pumped through a pipe to the concrete reservoir. An overflow pipe was provided at the manhole. The water flowed by gravity from the reservoir through a 10-in. pipe to the pumping station located on the west bank of the Fox River about 200 ft south of Route 72. On August 18-19, 1947, the average rate of flow from the springs to the reservoir was estimated to be 370 gpm.

A mineral analysis of a sample (Lab. No. 111399) collected August 4, 1947, showed the water to have a hardness of 342 mg/l, total dissolved minerals of 387 mg/l, and a trace of iron.

WELL NO. 1, open to the Cambrian-Ordovician aquifer except for the Galena-Platteville dolomite, was completed in June 1957 to a depth of 1239 ft by the Milaeger Well and Pump Co., Brookfield, Wis. The well is located about 10 ft west of the pumping station on Dunning Ave. at Second St., approximately 2900 ft N and 200 ft W of the SE corner of Section 27, T42N, R8E. The land surface elevation at the well is approximately 725 ft.

A correlated drillers log of Well No. 1 furnished by the State Geological Survey follows:

Strata	*Thickness (ft)*	*Depth (ft)*
PLEISTOCENE SERIES	49	49
SILURIAN SYSTEM	16	65
ORDOVICIAN SYSTEM		
Maquoketa Group	210	275
Galena-Platteville Groups	313	588
Ancell Group		
St. Peter Sandstone	227	815
CAMBRIAN SYSTEM		
Franconia Formation	205	1020
Ironton-Galesville Sandstone	170	1190
Eau Claire Formation	50	1240

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B32680) is for a water sample from the well collected February 17, 1976, after 30 min of pumping at 1100 gpm. Hydrogen sulfide was also present when this sample was collected.

WELL NO. 1, LABORATORY NO. B32680

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.1		Silica	SiO_2	8	
Manganese	Mn	0.01		Fluoride	F	0.6	0.03
Ammonium	NH_4	0.7	0.04	Boron	B	0.2	
Sodium	Na	18	0.78	Nitrate	NO_3	0.0	0.00
Potassium	K	9.6	0.25	Chloride	Cl	2.3	0.06
Calcium	Ca	59	2.94	Sulfate	SO_4	2	0.04
Magnesium	Mg	23	1.89	Alkalinity(as $CaCO_3$)		291	5.82
Arsenic	As	0.00		Hardness (as $CaCO_3$)		242	4.84
Barium	Ba	6.5					
Copper	Cu	0.01		Total dissolved minerals		329	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000		pH (as rec'd)		8.0	
Nickel	Ni	0.0		Radioactivity			
Selenium	Se	0.00		Alpha *pc/l*		15.6	
Silver	Ag	0.00		± deviation		3.2	
Cyanide	CN	0.00		Beta *pc/l*		25.9	
Zinc	Zn	0.0		± deviation		2.5	

A 24-in. diameter hole was drilled to a depth of 39 ft, reduced to 23 in. between 39 and 596 ft, and finished 15.2 in. in diameter from 596 to 1239 ft. The well is cased with 24-in. OD pipe from 1.7 ft above land surface to a depth of 39 ft and 16-in. pipe from 1.7 ft above land surface to a depth of 596 ft (cemented in). The top of the casing is equipped with a pitless adapter.

Upon completion, the well reportedly produced 948 gpm for 24 hr with a drawdown of 57 ft from a nonpumping water level of 216 ft.

A production test was conducted by the J. P. Miller Artesian Well Co., Brookfield, on September 24-25, 1970. After 23.7 hr of pumping at rates of 880 to 775 gpm, the final drawdown was 54 ft from a nonpumping water level of 354 ft below the top of the casing. Fifty-four min after pumping was stopped, the water level had recovered to 380 ft.

On May 9, 1972, the well reportedly produced 1200 gpm for 5 min with a drawdown of 3 3 ft from a nonpumping water level of 405 ft.

The pumping equipment presently installed consists of a 150-hp 1750 rpm electric motor, a 12-in., 6-stage Byron Jackson submersible turbine pump (No. 346602) set at 520 ft, rated at 1000 gpm, and has 520 ft of 8-in. column pipe. The well is equipped with 520 ft of airline.

WELL NO. 2, finished in sand and gravel, was completed in February 1969 to a depth of 87 ft by the J. P. Miller Artesian Well Co., Brookfield. This well is available for emergency use. The well is located in Tower Park at Fourth and Main Sts., approximately 1000 ft N and 1200 ft W of the SE corner of Section 22, T42N, R8E. The land surface elevation at the well is approximately 760 ft.

A drillers log of Well No. 2 follows:

Strata	*Thickness (ft)*	*Depth (ft)*
Sand and gravel	87	87

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. 03918) is for a water sample form the well collected February 3, 1972, after 30 min of pumping at 600 gpm.

WELL NO. 2, LABORATORY NO. 03918

		mg/l	*me/l*			*mg/l*	*me/l*
Iron	Fe	0.0		Silica	SiO_2	13	
Manganese	Mn	0.0		Fluoride	F	0.5	0.03
Ammonium	NH_4	0.1	0.01	Boron	B	0.05	
Sodium	Na	15	0.65	Nitrate	NO_3	9.2	0.15
Potassium	K	3.4	0.09	Chloride	Cl	25	0.70
Calcium	Ca	94	4.69	Sulfate	SO_4	102	2.12
Magnesium	Mg	46	3.78	Alkalinity(as $CaCO_3$)		304	6.08
				Hardness (as $CaCO_3$)		416	
Barium	Ba	0.0		Total dissolved minerals		486	
Copper	Cu	0.0					
Cadmium	Cd	0.00					
Chromium	Cr	0.0		pH (as rec'd)		7.6	
Lead	Pb	0.00		Radioactivity			
Mercury	Hg	<0.0005		Alpha *pc/l*		0	
Nickel	Ni	0.0		± deviation		1	
Silver	Ag	0.0		Beta *pc/l*		1	
Zinc	Zn	0.0		± deviation		1	

A 10-in. diameter hole was drilled to a depth of 87 ft. The well is cased with 10-in. steel pipe from 2 ft above land surface to a depth of 67 ft followed by 20 ft of 10-in. No. 80 slot Johnson stainless steel screen.

Upon completion, the driller reported that the well produced 495 gpm for 20 hr with a drawdown of 10 ft from a nonpumping water level of 51 ft below land surface.

The pumping equipment presently installed is a Peerless turbine pump set at 70 ft, rated at 500 gpm at about 190 ft head, and powered by a 40-hp U. S. electric motor.

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