

ISWS/BUL-60(33)/86

BULLETIN 60-33

STATE OF ILLINOIS

DEPARTMENT OF ENERGY AND NATURAL RESOURCES



*Public Ground-Water Supplies
in Livingston County*

by DOROTHY M. WOLLER, ROBERT D. OLSON, MICHAEL L. SARGENT,
and ELLIS W. SANDERSON

ILLINOIS STATE WATER SURVEY

CHAMPAIGN

1986

Funds derived from University of Illinois administered grants and contracts were used to produce this report.

PUBLIC GROUND-WATER SUPPLIES IN LIVINGSTON COUNTY

by Dorothy M. Woller, Robert D. Olson, Michael L. Sargent¹, and Ellis W. Sanderson

INTRODUCTION

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

This report includes separate descriptions for 13 ground-water supply systems furnishing water to 12 municipalities and 2 state institutions in Livingston County. These are preceded by brief summaries of the ground-water hydrology and geology of the county and the development of ground-water 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 Richard J. Schicht, Acting Chief of the Illinois State Water Survey. John W. Brother, Jr. supervised the preparation of the illustrations. The annual pumpage information was provided by James R. Kirk. The chemical analyses, unless otherwise stated, were made by personnel of the Water Survey Analytical Chemistry Laboratory Unit under the supervision of James C. Whitney. The analyses made by personnel of the Illinois Environmental Protection Agency were under the supervision of Roger Selburg. Ross D. Brower, Associate Geologist, Illinois State Geological Survey, 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.

GROUND-WATER GEOLOGY AND HYDROLOGY

The ground-water geology and hydrology of Livingston County are described generally in Illinois State Geological Survey Circular 248, "Groundwater Geology in East-Central Illinois," and Illinois State Water Survey Report of Investigation 62, "Groundwater Resources of the Buried Mahomet Bedrock Valley." The following brief discussion of geologic and hydrologic conditions in the county is taken largely from these publications. For a more detailed definition of the geology in this part of the state, the reader is referred to the State Geological Survey. More detailed information concerning the ground-water hydrology and water quality may be obtained from the Water Survey. The Surveys are located on the campus of the University of Illinois at Urbana-Champaign.

Unconsolidated deposits

Livingston County lies in the Till Plains Section, including both the Bloomington Ridged Plain and the Kankakee Plain of the Central Lowland physiographic province, and has been completely blanketed by glacial deposits (often referred to as drift or unconsolidated deposits). The area is characterized as a gently undulatory plain with low, broad morainic ridges or islands and glacial terraces with intervening wide stretches of relatively flat ground moraines and glacial lake beds that are typical of the Bloomington Ridged and Kankakee Plains. A very thin (less than 2 ft thick) mantle of loess overlies the glacial deposits in the eastern quarter of the county and gradually thickens to the west,

¹Illinois State Geological Survey

exceeding 4 ft in the southwest corner. A youthful, erosional drainage system currently dissects the unconsolidated deposits; some areas are poorly drained.

Glacial drift completely conceals the bedrock topography except where locally eroded along major stream valleys. Drift thickness ranges from 0 to over 300 ft, although it is generally 100 or more feet (figure 1). The thickest sections occur where drift fills the Danvers Bedrock Valley along the southwest edge of the county (figure 2). Thick sections of drift also fill the Kempton and Chatsworth Bedrock Valleys in the mideastern and southeastern parts of the county. Glacial deposits, composed mostly of till with numerous thin and discontinuous beds of sand and gravel, include those of Wisconsinan, Illinoian, and pre-Illinoian ages (figure 3). Wisconsinan deposits form the present-day land surface, whereas Illinoian and pre-Illinoian deposits are buried beneath Wisconsinan drift in the buried bedrock

valleys. All of these deposits are included in the Prairie Aquigroup.

The most favorable prospects for developing ground-water supplies from the unconsolidated deposits are generally in areas of thicker drift, usually situated along bedrock valleys where glacial meltwater deposited clean sand and gravel. Locally, such deposits provide the ground-water source for municipal supplies at Campus, Chatsworth, Cornell, Cullom, Dwight, Fairbury, Flanagan, Forrest, Saunemin, and Strawn.

The highest individual yields from sand and gravel wells in Livingston County are found at Dwight and Fairbury, where estimates made from tests conducted by the Illinois State Water Survey indicate that long-term well yields of 250 to 500 gpm can be obtained. Two wells at Dwight are reportedly pumped at rates greater than 600 gpm. Testing also indicates that sand and gravel wells at Chatsworth and Forrest may attain

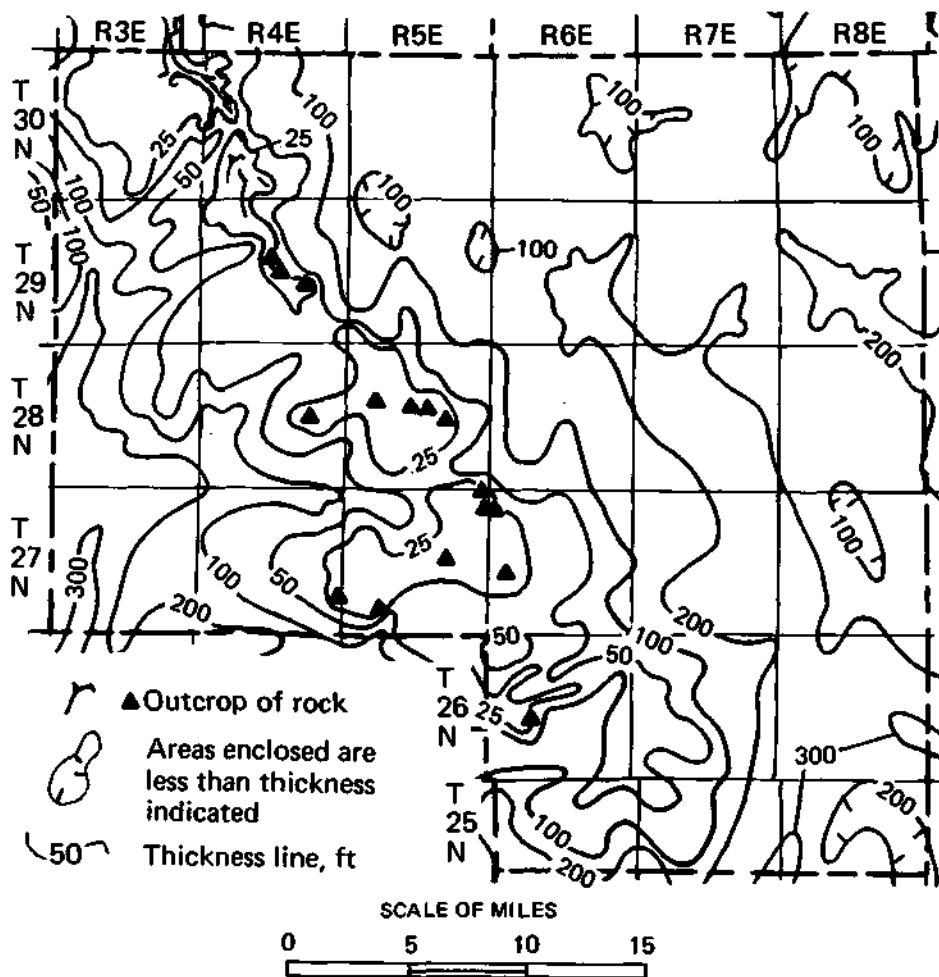


Figure 1. Map of thickness of glacial drift in Livingston County, Illinois (modified from Piskin and Bergstrom, 1975, ISGS Circular 416)

yields of 200 to 250 gpm. With the exception of the Chatsworth wells, which tap the deep, basal sands of the Chatsworth Bedrock Valley, the above high capacity wells tap shallower sand and gravel deposits in the Kempton and Chatsworth Bedrock Valleys (including their upper reaches or tributaries).

Well yields are highly variable and smaller at the communities of Saunemin, Campus, Cullom, and Flanagan, ranging from 5 to 130 gpm, even though some of their wells are located near the axes of the major bedrock valleys. The highly variable yields suggest that the sand and gravel deposits in these valleys are discontinuous and that their water-yielding properties vary.

The buried valleys remain unexplored in many areas outside the individual communities. Thick, continuous, water-bearing sand and gravel deposits are not always present in areas where the drift is thickest. An

exploratory program, which includes a review of well records, geophysical testing, and test drilling, will be necessary in most cases to locate and verify the presence of aquifer material capable of producing more than a domestic water supply.

Bedrock

Beneath the glacial deposits blanketing the county lies the Pennsylvanian System, assigned to the Upper Bedrock Aquigroup (figure 3) that is composed mostly of shale with a few, thin, water-yielding beds of sandstone and fractured limestone. Domestic and farm supplies are obtained from these upper Pennsylvanian formations at depths to about 200 ft, when a suitable ground-water supply is not available from the unconsolidated deposits. No municipal supply in the

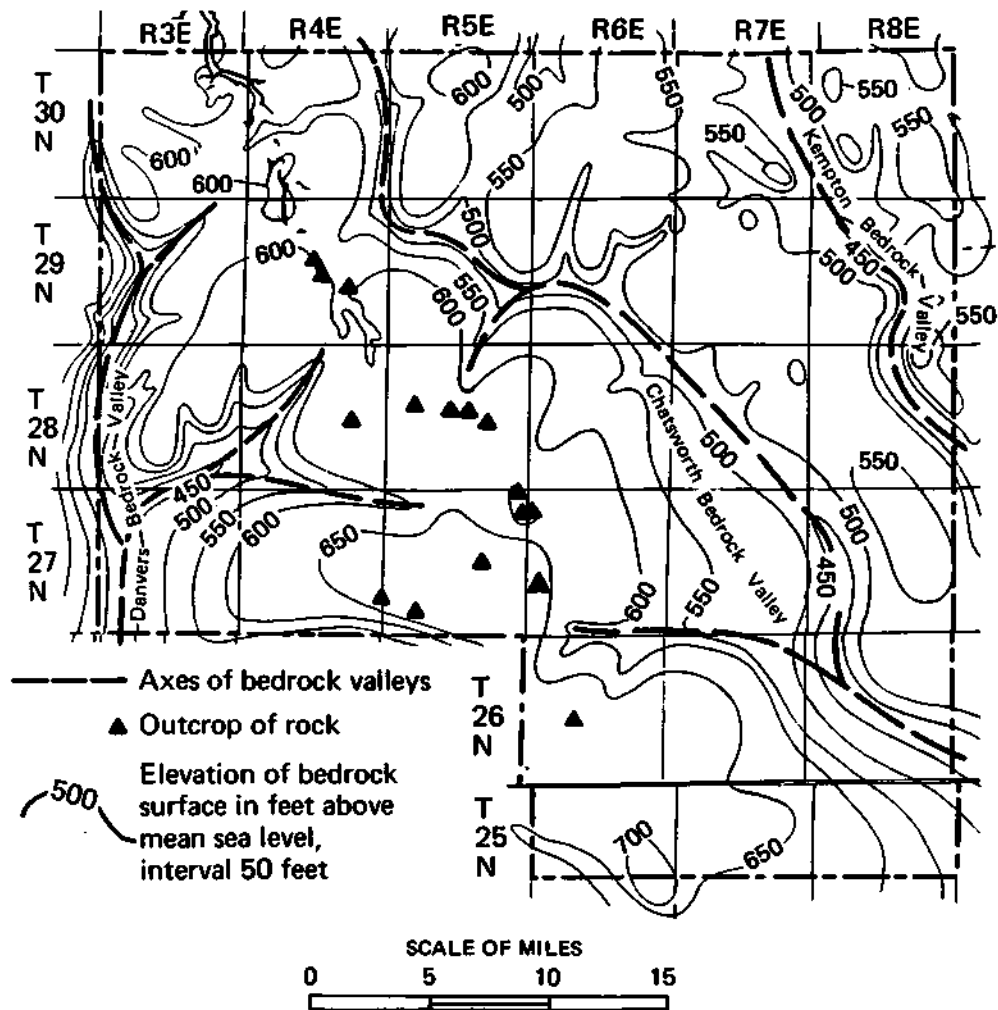


Figure 2. Map of topography of bedrock surface in Livingston County, Illinois (modified from Horberg, 1950, ISGS Bulletin 73, plate 1)

SYSTEM	SERIES	GROUP OR FORMATION	AQUIGROUP	LOG	THICKNESS (FT)	DESCRIPTION	
QUATERNARY	PLEISTOCENE		Prairie Aquigroup		0 - 310	Unconsolidated glacial deposits-pebbly clay (silt), silt, sand and gravel Alluvial silts and sands along streams	
PENNSYLVANIAN	MISSOURIAN	Bond and Modesto	Upper Bedrock Aquigroup		150 - 500	Shale, sandstone, clay, limestone, and coal	
	DES MOINESIAN	Spoon and Carbondale					
DEVONIAN	UPPER	New Albany	Mississippi Valley Aquigroup		0 - 200	Shale, gray to black, some green; generally fissile	
	MIDDLE	Cedar Valley			0 - 50	Limestone, pure, fine to coarse, coarsening upward, some beds argillaceous, fossiliferous at top	
Wapsipinicon							
SILURIAN	NIAGARAN	Racine			reef	0 - 550	Dolomite, very pure to argillaceous, silty, cherty; reefs in upper part
		Sugar Run					Dolomite, slightly argillaceous and silty
		Joliet					Dolomite, very pure to shaly and shale, dolomitic; white, light gray, green, pink, maroon
	ALEXANDRIAN	Kankakee				0 - 30	Dolomite, pure top 1' - 2', thin green shale partings, base glauconitic
		Elwood					Dolomite, slightly argillaceous, abundant layered white chert
		Wilhelmi					Dolomite, gray, argillaceous and becomes dolomitic shale at base
ORDOVICIAN	CINCINNATIAN	Maquoketa			Midwest Aquigroup		0 - 190	Shale, red to maroon, oolites Shale, silty, dolomitic, greenish gray, weak (upper unit) Dolomite and limestone, white, light gray, interbedded shale (middle unit) Shale, dolomitic, brown, gray (lower unit)
	CHAMPLAINIAN	Galena	350 - 450	Dolomite, and/or limestone, cherty (lower part) Dolomite, shale partings, speckled Dolomite and/or limestone, cherty, sandy at base			
		Platteville					
		Glenwood					
	CANADIAN	St. Peter	180 - 390	Sandstone, fine and coarse grained; little dolomite; shale at top Sandstone, fine to medium grained; locally cherty red shale at base			
		Shakopee	375 - 600	Dolomite, sandy, cherty (oolitic); sandstone			
		New Richmond		Sandstone interbedded with dolomite			
		Oneota		Dolomite, white to pink, coarse grained cherty (oolitic)			
	Gunter	Sandstone, medium-grained, slightly dolomitic					
	CAMBRIAN	CROIXAN	Eminence	250 - 380			Dolomite, light colored, sandy, thin sandstones
Potosi			Dolomite, fine-grained, gray to brown, drusy quartz				
Franconia			180 - 230	Dolomite, sandstone and shale, glauconitic, green to red, micaceous			
Ironton			200 - 230	Sandstone, fine to coarse grained, well sorted; upper part dolomitic			
Galesville							

Figure 3. Generalized column of rock stratigraphic units and aquigroups in Livingston County, Illinois

county currently uses the Upper Bedrock Aquigroup. A 200-ft-deep well which reportedly yielded 15 gpm was used by the village of Saunemin until about 1948, and an unsuccessful test well was drilled into the Pennsylvanian by the Dwight Correctional Center in 1935. Well yields from Pennsylvanian rocks are generally 10 gpm or less and some drilling attempts are reported as dry holes. The Pennsylvanian System is about 500 ft thick in the part of the county southwest of Fairbury, and thins to the north and east where it is less than 200 ft thick. This is important where units deeper than the Pennsylvanian are considered as potential sources of supply because, as the underlying units become more deeply buried, lower yields and poorer water quality are generally obtained.

Dolomite of the Mississippi Valley Aquigroup (Silurian System) (figure 3) immediately underlies the Pennsylvanian in most of Livingston County. The Silurian thins to the northeast and is absent in most of the northern part of the county. The bedrock units stand structurally higher in these areas, reflecting both the regional dip to the south and the LaSalle Anticlinal Belt, an upwarped feature lying beneath the trend of the Vermilion River. In the central and northeastern parts of the county many domestic and farm wells penetrate and use this dolomite as a source of water. In addition, a municipal supply well at the village of Emmington penetrates the Silurian at a depth of 390 to 550 ft and yields about 30 gpm. Two Silurian dolomite wells at Saunemin, which yielded 20 to 30 gpm each, have been abandoned or disconnected from the system. The Silurian had been left open, along with some deeper bedrock units, in several wells that are located at Chatsworth, Cullom, and Fairbury. All these wells are now abandoned. Water from the Mississippi Valley Aquigroup (Silurian dolomite) is highly mineralized and its mineralization increases toward the south as this dolomite becomes more deeply buried. Naturally-occurring Beta radioactivity and fluoride content have been reported to exceed the MAC (maximum allowable concentration) at some locations.

In the northwest corner of the county, dolomites of the Galena Group (part of the Midwest Aquigroup) (figure 3) immediately underlie Pennsylvanian rocks and yield water only in quantities sufficient for domestic and farm supplies. To the south and east, Maquoketa and then Silurian rock units successively overlain the Galena. The beveled tops of these units are overlain by Pennsylvanian rocks. This succession of units gradually becomes thicker to the south, burying the dolomites of the Galena and the underlying Platteville Group to greater and greater depths. In general,

the quantity and quality of water in the Galena and Platteville deteriorate as these dolomites become more deeply buried.

The St. Peter Sandstone, part of the Midwest Aquigroup (figure 3), is the most prolific and dependable of the bedrock aquifers capable of producing potable water in Livingston County. This sandstone unit, which underlies the Platteville Group, generally yields the highest percentage of water to wells which penetrate to this depth and are also left open to overlying units. The St. Peter ranges in depth from 450 ft in the northwestern corner of the county to 1400 ft near Fairbury. The thickness varies between 200 and 300 ft over most of the county. Thick local occurrences range up to nearly 400 ft. Water from the St. Peter contains total dissolved minerals that exceed 1000 mg/L and increase to over 2000 mg/L in the central and southern parts of the county. The water may contain natural radioactivity that exceeds the MAC and hydrogen sulfide that causes odor problems.

Below the St. Peter Sandstone the water quality deteriorates with increasing depth. For this reason, the underlying Prairie du Chien Group (basal Ordovician) and the Eminence-Potosi Dolomite of the Cambrian System have been the only units penetrated by wells intended for potable supplies. Water quality in the deeper Ironton-Galesville Sandstone, a prolific aquifer in northern Illinois, is thought to be unacceptable for municipal supplies, and the aquifer has not been penetrated by any of the deep wells.

The Galena and Platteville Dolomite Groups, St. Peter Sandstone, and other bedrock units of the Midwest Aquigroup (Cambrian-Ordovician System) (figure 3) have been penetrated and tapped by wells at Chatsworth, Cullom, the Dwight Correctional Center, Fairbury, and Odell. The wells at the Correctional Center and Odell are still in use. The remainder of these wells have been abandoned or disconnected from their systems. A yield of about 100 gpm can be expected from these combined bedrock units, although yields from 85 to 370 gpm have been reported. Total dissolved minerals exceed 1000 mg/L and generally increase downdip, to the south, as the units become more deeply buried. A recent study has shown that natural radioactivity is usually present in these waters, with sandstone units producing the most radioactive water. Remedial well construction measures, such as casing off the sandstone units, are not likely to reduce radioactivity without causing a significant reduction in yield. Poor water quality is presumed to be the major reason that a number of these multiple unit wells were abandoned and other water-supply sources sought.

Summary

Ground-water possibilities from sand and gravel aquifers are extremely variable in Livingston County. With the exception of areas along the Vermilion River where the glacial drift is thin, sand and gravel deposits capable of yielding small- to moderate-sized municipal supplies can usually be located through record review,

geophysical exploration, and test drilling. In the central and north parts of the county, small to moderate ground-water supplies can be obtained from the Silurian, Galena-Platteville, and St. Peter bedrock units when conditions are unfavorable in the drift. The quality of water in the bedrock is usually much poorer than that found in the drift and deteriorates with increasing depth and from north to south.

GROUND-WATER DEVELOPMENT FOR PUBLIC USE

Ground water is used as a source for 13 public water-supply systems serving Campus, Chatsworth, Cornell, Cullom, Dwight, the Dwight Correctional Center, Emmington, Fairbury, Flanagan, Forrest, Odell, Saunemin, Strawn, and the William W. Fox Developmental Center. The locations of these supplies are shown in figure 4.

Sand and gravel deposits in the unconsolidated materials of the Prairie Aquigroup are tapped as a source of water for Campus, Chatsworth, Cornell, Cullom, Dwight, Fairbury, Flanagan, Forrest, Saunemin, and Strawn. There are presently 29 production and standby wells, ranging in depth from 39 to 232 ft, tapping only sand and gravel deposits. Their reported pumping rates range from 30 to 650 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 1984 was estimated to be 1,395,200 gpd. Analyses of water from these wells show that iron content ranges from 0.1 to 8.98 mg/L, sodium from 0.9 to 310 mg/L, sulfates from 0.0 to 1270 mg/L, hardness from 80 to 1060 mg/L, and total dissolved minerals from 336 to 2048 mg/L. Hydrogen sulfide gas was also noted in water from 3 wells and methane gas in water from 1 well. Water for Campus, from Well Nos. 5 and 6 at Saunemin, and for Strawn is chlorinated and fluoridated. At Chatsworth and Forrest, the water is aerated, settled, chlorinated, fluoridated, and filtered. At Cornell, the water is chlorinated. Water from Well No. 2 at Cullom is filtered, treated with polyphosphate to sequester iron, fluoridated, and chlorinated; water from Well No. 3 is not treated. At Dwight, the water is fluoridated, chlorinated, and treated with polyphosphate to sequester iron. Water for Fairbury is aerated, coagulated with alum, softened with lime and soda ash, recarbonated, chlorinated, fluoridated, treated with polyphosphate to sequester iron, and filtered. At

Flanagan, the water is chlorinated, and water from Well Nos. 2 and 3 is also fluoridated.

The Mississippi Valley Aquigroup (dolomite of the Silurian System), immediately underlying the Upper Bedrock Aquigroup (Pennsylvanian System) in most of Livingston County, is the producing aquifer in 1 well at Emmington. This well is 550 ft deep and is reportedly pumped at about 30 gpm. The estimated production from this well was 7200 gpd in 1984. Analyses of water samples from this well indicate that iron content ranges from 0.0 to 0.7 mg/L, sodium from 973 to 1050 mg/L, fluoride from 4.0 to 5.0 mg/L, chlorides from 800 to 910 mg/L, hardness from 33 to 40 mg/L, and total dissolved minerals from 2421 to 2452 mg/L. Water for Emmington is chlorinated.

The upper part of the Midwest Aquigroup (dolomites of the Galena and Platteville Groups and St. Peter Sandstone) is tapped by 1 production well and 1 emergency well at the Dwight Correctional Center. These wells are 1203 ft deep (reported to be 1183 ft deep in 1969) and 1201 ft deep and are reportedly pumped at rates of about 150 to 200 gpm. Estimated production from these wells was 100,200 gpd in 1984. Analyses of water samples from these wells indicate that the iron content generally ranges from 0.1 to 0.9 mg/L, sodium from 260 to 572.2 mg/L, chlorides from 340 to 1110 mg/L, sulfates from 166.2 to 257.5 mg/L, hardness from 277 to 440 mg/L, and total dissolved minerals from 1170 to 2009 mg/L. Hydrogen sulfide gas was also noted in the water from these 2 wells. Water for the Dwight Correctional Center is aerated, chlorinated, settled, softened, and treated with caustic soda and sodium silicate.

Odell Well No. 3 penetrates the Midwest Aquigroup (Cambrian-Ordovician aquifer) through the Eminence-Potosi Dolomite except for the dolomites of the Galena and Platteville Groups. This well is 1940 ft deep and is reportedly pumped at about 225 gpm.

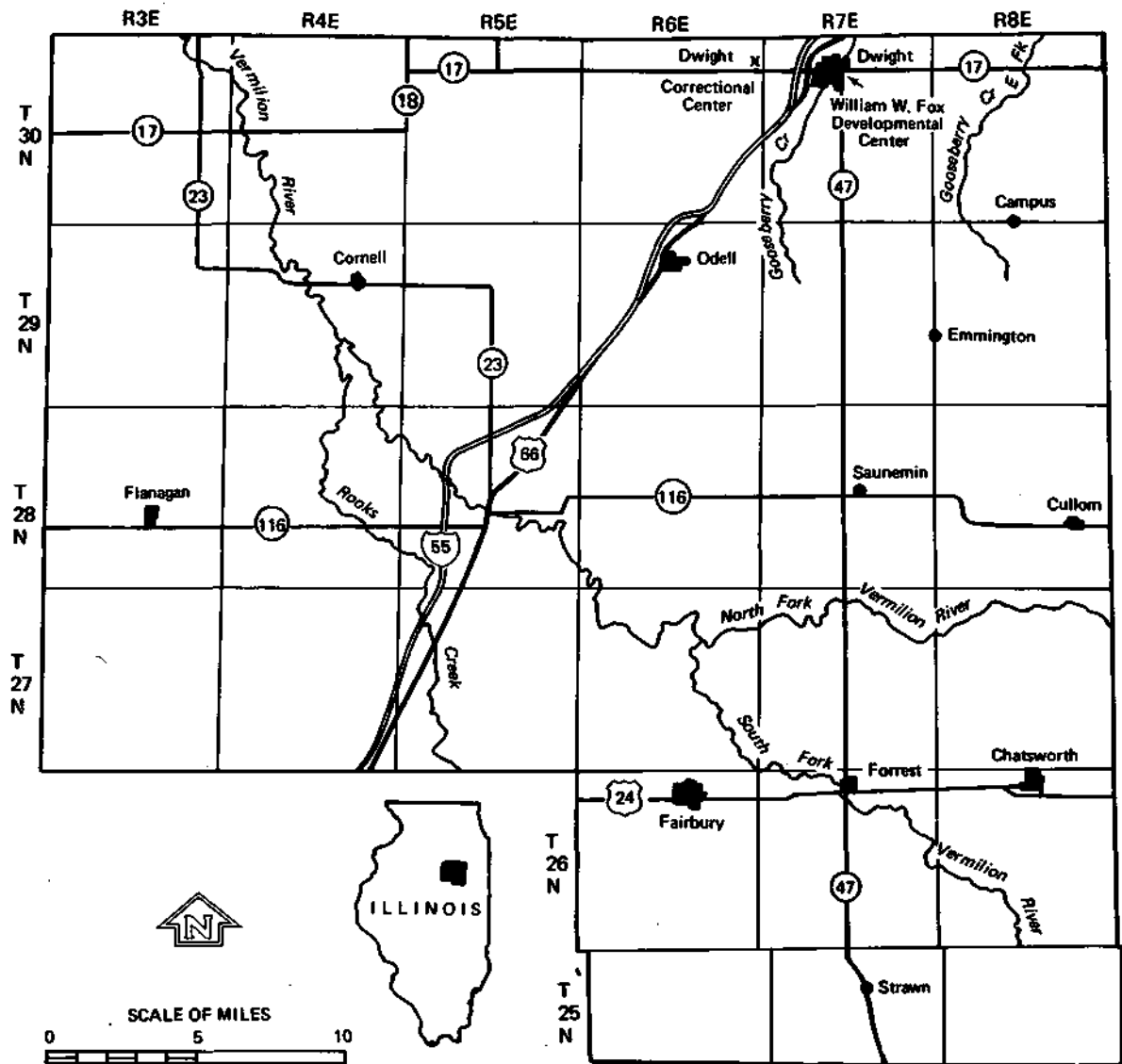


Figure 4. Location of public ground-water supplies in Livingston County

Estimated production from this well was 100,300 gpd in 1984. Analyses of water from this well indicate that the iron content ranges from 0.0 to 0.6 mg/L, sodium from 384 to 420 mg/L, chlorides from 490 to 570 mg/L, hardness from 203 to 284 mg/L, and total dissolved minerals from 1313 to 1450 mg/L. Hydrogen sulfide gas was also noted in the water from this well. Water for Odell is aerated to remove hydrogen sulfide and then chlorinated.

The total public water-supply pumpage from the aquifers in Livingston County for 1984 was about 1,602,900 gpd. Of this total approximately 87.1 percent (1,395,200 gpd) was obtained from sand and gravel aquifers of the Prairie Aquigroup, 0.4 percent (7200 gpd) from the Mississippi Valley Aquigroup (Silurian dolomite), and 12.5 percent (200,500 gpd) from combinations of formations in the Midwest Aquigroup (Cambrian-Ordovician aquifer).

FORMAT

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

At the beginning of each description the U. S. Census of population for 1980 is given for incorporated places. For unincorporated places, population is estimated by 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, as available, 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. Most of the limestones or dolomites reported by drillers yielding fresh water in Illinois are carbonate rocks, dolomitic in composition. When the bedrock aquifers tapped by a well are described, 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 well. 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
hp.....	.....horsepower
hr.....	.....hour(s)
HTH.....	.....high test hypochlorite
ID.....	.....inside diameter
in.....	.....inch(es)
Lab.....	.....laboratory
lb.....	.....pound(s)
me/L.....	.....milliequivalents per liter
mg/L.....	.....milligrams per liter
min.....	.....minute(s)
No.(s).....	.....number(s)
OD.....	.....outside diameter
pc/L.....	.....picocuries per liter
R.....	.....range
rpm.....	.....revolutions per minute
T.....	.....township
TDH.....	.....total dynamic head

CAMPUS

The village of Campus (224) installed a public water supply in 1896. One well (No. 2) is in use and another well (No. 1) is available for emergency use. In 1950 there were 55 services, none metered; the estimated average pumpage was 7500 gpd. In 1984 there were 76 services, none metered; the average and maximum pumpages were 18,600 and 29,000 gpd, respectively. The water from Well No. 2 is chlorinated and fluoridated.

Initially, a 2-in. diameter well was completed about 1896 to an unknown depth. This well, abandoned prior to February 1947, was located at the southeast corner of Center and Elm Sts.

WELL NO. 1 (formerly known as Well No. 2), finished in sand and gravel of the Prairie Aquigroup, was completed in 1910 to a depth of 130 ft. This well is available for emergency use. The well is located in the pumping station near the center of the village, approximately 870 ft N and 300 ft W of the SE corner of Section 33, T30N, R8E. The land surface elevation at the well is approximately 655 ft.

A 6-in. diameter hole was drilled to a depth of 130 ft. The well is cased with 6-in. pipe from about 1 ft above land surface and equipped with an unknown length of well screen.

Nonpumping water levels were reported to be 23 ft below land surface in July 1926, 35 ft in February 1951, and 39 ft on October 20, 1958.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 4HB6) rated at 125 gpm at about 80 ft TDH, and powered by a 7-hp electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B15110) of a sample collected September 26, 1972, after pumping for 30 min at 125 gpm, showed the water to have a hardness of 245 mg/L, total dissolved minerals of 668 mg/L, and an iron content of 0.64 mg/L.

WELL NO. 2 (formerly known as Well No. 3 or Wabash RR well), finished in sand and gravel of the Prairie Aquigroup, was completed in June 1925 to a depth of 163 ft (effective depth) by R. R. Hopper, Wellington. This well was purchased from the Wabash RR in 1954 and connected to the village system in 1955. The well is located on the west side of the village across the railroad tracks from the storage tank, approximately 725 ft N and 1200 ft W of the SE corner of Section 33, T30N, R8E. The land surface elevation at the well is approximately 652 ft.

WELL NO. 2, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Clay	31	31
Boulders	2	33
Clay	41	74
Boulders	3	77
Clay	18	95
Gumbo	25	120
Slate, clay and boulders	24	144
Sand and gravel	15	159
Gumbo	15	174

The well is cased with 24-in. pipe from above land surface to a depth of 125 ft and 18-in. pipe from land surface to a depth of 133 ft followed by 30 ft of 18-in. No. 6 (0.080 in.) Layne shutter screen.

In 1925, the nonpumping water level was reported to be 34 ft below the top of the casing.

On May 16, 1975, the well reportedly produced 100 gpm for 1 hr with a drawdown of 20 ft from a nonpumping water level of 42 ft below the top of the casing.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 500T4-MB6) set at 105 ft, rated at 100 gpm at about 115 ft TDH, and powered by a 15-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A12737) is for a water sample from the well collected January 25, 1976, after 30 min of pumping.

WELL NO. 2, LABORATORY NO. A12737

		<i>mg/L</i>	<i>me/L</i>			<i>mg/L</i>	<i>me/L</i>
Iron	Fe	0.40		Silica	SiO ₂	12	
Manganese	Mn	0.02		Fluoride	F	0.5	0.03
Ammonium	NH ₄	2.18	0.12	Boron	B	1.6	
Sodium	Na	135	5.87	Cyanide	CN	0.01	
Potassium	K	3.5	0.09	Nitrate	NO ₂	1.3	0.02
Calcium	Ca	46	2.30	Chloride	Cl	66	1.86
Magnesium	Mg	20	1.65	Sulfate	SO ₄	140	2.91
				Alkalinity (as CaCO ₃)		280	5.60
Arsenic	As	0.000		Hardness (as CaCO ₃)		198	3.96
Barium	Ba	0.2		Radioactivity			
Cadmium	Cd	0.00		Total dissolved mineral		560	
Chromium	Cr	0.00					
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		8.0	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha <i>pc/l</i>		0.4	
Selenium	Se	0.00		± deviation		1.4	
Silver	Ag	0.00		Beta <i>pc/l</i>		6.5	
Zinc	Zn	0.00		± deviation		2.3	

CHATSWORTH

The town of Chatsworth (1187) installed a public water supply in 1909. Four wells (Nos. 2, 3, 4, and 5) are in use. In 1950 there were 350 services, 92 percent metered. In 1985 there were 520 services, all metered; the average and maximum pumpages were 149,000 and 181,000 gpd, respectively. The water is aerated, settled, chlorinated, fluoridated, and filtered.

WELL NO. 1 was completed about 1909 to a depth of 1285 ft. This well was abandoned prior to December 1959. The water-yielding units in this well are the Mississippi Valley Aquigroup (dolomite of the Silurian System) and the Midwest Aquigroup (dolomites of the Galena and Platteville Groups, and St. Peter Sandstone). The well is located west of Fourth St. and south of Maple St., approximately 2600 ft S and 1230 ft E of the NW corner of Section 3, T26N, R8E. The land surface elevation at the well is approximately 733 ft.

WELL NO. 1, SAMPLE STUDY LOG (furnished by the State Geological Survey)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM		
Pleistocene Series		
Glacial drift	118	118
Gravel and sand	20	138
Glacial drift	82	220
PENNSYLVANIAN SYSTEM		
Siltstone, sandstone and coal measures	40	260
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite	355	615
ORDOVICIAN SYSTEM		
Cincinnatian Series		
Maquoketa Group		
Shale, some limestone	150	765
Champlainian Series		
Galena and Platteville Groups		
Limestones	445	1210
Ancell Group		
St. Peter Sandstone	75	1285

The well is cased with 12-in. pipe from the pump station floor to a depth of 270 ft. Below the casing, the hole was reported to be 8 and 6 in. in diameter to the bottom.

In May 1920, the nonpumping water level was reported to be 65 ft below land surface.

A production test was conducted by the State Water Survey on January 3, 1941. After 3.1 hr of pumping at rates of 82 to 80 gpm, the drawdown was 78 ft from a nonpumping water level of 77 ft below the pump base.

Twenty min after pumping was stopped, the water level had recovered to 86 ft.

A production test was conducted by the State Water Survey on February 17, 1941, after the pump was lowered from 160 to 230 ft. After 55 min of pumping at rates of 120 to 98 gpm, the drawdown was 154.5 ft from a nonpumping water level of 75.0 ft. Pumping was continued for 1.8 hr at rates of 94 to 96 gpm with a drawdown of 138.0 ft. After 1 additional hr of pumping at rates of 100 to 98 gpm, the final drawdown was 148.0 ft.

A mineral analysis of a sample (Lab. No. 115837) collected September 17, 1948, showed the water to have a hardness of 450 mg/L, total dissolved minerals of 676 mg/L, and an iron content of 0.6 mg/L.

In 1948, a test hole was constructed to a depth of 91 ft. The hole was located approximately 2500 ft N and 10 ft E of the SW corner of Section 35, T27N, R8E.

Prior to the construction of Well No. 2, four test holes were constructed in 1949 by Hayes & Sims, Champaign, to depths ranging from 60 to 78 ft. The first hole was located approximately 2500 ft S and 75 ft E of the NW corner of Section 3, T26N, R8E. Upon completion, the nonpumping water level was reported to be 22 ft. No information is available on the location of the last three test holes.

WELL NO. 2, finished in sand and gravel of the Prairie Aquigroup, was completed in May 1949 to a depth of 67 ft by Hayes & Sims, Champaign. The well is located on the south side of Maple St. between First St. and the Illinois Central RR tracks, approximately 2500 ft S and 170 ft E of the NW corner of Section 3, T26N, R8E. The land surface elevation at the well is approximately 732 ft.

WELL NO. 2, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil	1	1
Yellow clay	9	10
Blue clay	25	35
Dirty sand	9	44
Sand and gravel	10	54
Gravel	6	60
Sand and gravel	7	67

A 12-in. diameter hole was drilled to a depth of 67 ft. The well is cased with 12-in. pipe from about 1.5 ft above land surface to a depth of 57.1 ft followed by 9.9 ft (10.9 ft overall length) of 12-in. No. 40 slot Johnson Everdur screen.

A production test was conducted by the driller on May 17, 1949. After 6.1 hr of intermittent pumping at rates of 150 to 200 gpm, the drawdown was 11.0 ft from a nonpumping water level of 29.5 ft. Pumping was continued for 2.7 hr at rates of 100 to 325 gpm with a final drawdown of 19.5 ft. Ten min after pumping was stopped, the water level had recovered to 24.5 ft.

On October 7, 1949, the well reportedly produced 125 gpm for 1 hr with a drawdown of 7 ft from a non-pumping water level of 23 ft below the pump base.

On September 21, 1966, this well was treated with Calgon and a new pump was installed by the Sims Drilling Co., Savoy. The well then reportedly produced 120 gpm for 1.8 hr with a drawdown of 3.9 ft from a nonpumping water level of 33.0 ft below land surface.

The pumping equipment presently installed is a Jacuzzi submersible pump (Model No. 5S6J4-S, Serial No. WRG229) set at 49 ft, rated at 120 gpm at about 139 ft TDH, and powered by a 5-hp Franklin electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B26627) of a sample collected December 11, 1979, after pumping for 3 hr at 120 gpm, showed the water to have a hardness of 418 mg/L, total dissolved minerals of 556 mg/L, and an iron content of 2.22 mg/L.

Prior to the installation of Well No. 3, eight test holes were drilled in April and May 1958 to depths ranging from 120 to 266.2 ft by the Sims Drilling Co., Savoy. Seven of the holes were located in Section 3 and one hole was located in Section 4, T26N, R8E.

WELL NO. 3, finished in sand and gravel of the Prairie Aquigroup, was completed in May 1958 to a depth of 99.5 ft by the Sims Drilling Co., Savoy. The well is located at the northwest corner of Cherry and Third Sts., approximately 750 ft S and 650 ft E of the NW corner of Section 3, T26N, R8E. The land surface elevation at the well is approximately 720 ft.

A 12-in. diameter hole was drilled to a depth of 99.5 ft. The well is cased with 12-in. steel pipe from about 3 ft above land surface to a depth of 91.7 ft followed by 7.8 ft of 12-in. No. 35 slot Johnson Everdur screen. The top of the casing is equipped with a Monitor pit-less adapter.

A production test was conducted on June 6, 1958, by representatives of the driller, the State Water Survey, and Tracy Pitzen, Consulting Engineer. After 6.8 hr of pumping at rates ranging from 113 to 100 gpm, the drawdown was 26.0 ft from a nonpumping water level

of 42.0 ft below land surface. Pumping was continued for 2.2 hr at rates of 120 to 160 gpm with a final drawdown of 41.5 ft. Thirty min after pumping was stopped, the water level had recovered to 58.5 ft.

In 1970, this well was cleaned with acid by the Sims Drilling Co.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 8MB6, Serial No. MGZ-P295) set at 84 ft, rated at 100 gpm at about 100 ft TDH, and powered by a 10-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B007112) is for a water sample from the well collected August 24, 1982, after 2 hr of pumping at 100 gpm.

WELL NO. 3, LABORATORY NO. B007112

		mg/L	me/L		mg/L	me/L
Iron	Fe	1.1		Silica	SiO ₂	18
Manganese	Mn	0.026		Fluoride	F	OSS 0.03
Ammonium	NH ₄	1.9	0.10	Boron	B	1.28
Sodium	Na	57	2.48	Cyanide	CN	< 0.005
Potassium	K	3.3	0.08	Nitrate	NO ₂	9.7 0.16
Calcium	Ca	110	5.49	Chloride	Cl	1.7 0.08
Magnesium	Mg	44	3.62	Sulfate	SO ₄	220 4.58
Strontium	Sr	1.36		Alkalinity (as CaCO ₂)		343 6.86
Arsenic	As	<0.001		Hardness (as CaCO ₂)		46S 9.30
Barium	Ba	0.033		Total dissolved minerals		681
Beryllium	Be	<0.0005				
Cadmium	Cd	<0.003				
Chromium	Cr	< 0.005				
Cobalt	Co	<0.005				
Copper	Cu	0.004				
Lead	Pb	0.006				
Mercury	Hg	< 0.00005				
Nickel	Ni	<0.015				
Selenium	Se	< 0.001				
Silver	Ag	< 0.005				
Vanadium	V	< 0.004				
Zinc	Zn	<0.002		pH (as rec'd)		7.3

Prior to the installation of Well No. 4, thirty-four test holes were drilled in 1959 and 1960 to depths ranging from 125 to 239.5 ft by the Sims Drilling Co., Savoy. These holes were located in Section 3, T26N, R8E, and Sections 24, 25, 26, 32, 34, and 36, T27N, R8E.

WELL NO. 4, finished in sand and gravel of the Prairie Aquigroup, was completed in June 1960 to a depth of 232 ft by the Sims Drilling Co., Savoy. The well is located about 0.3 mile north of the town, approximately 1200 ft N and 1400 ft E of the SW corner of Section 34, T27N, R8E. The land surface elevation at the well is approximately 710 ft.

WELL NO. 4, DRILLERS LOG

Strata	Thickness (ft)	Depth (ft)
Top soil	1	1
Compact yellow clay	8	9
Soft blue clay	40	49
Slight sandy gravel, blue clay	16	65
Compact blue and gravelly clay	26	91
Loose dirt and gravelly clay, peat showing	9	100
Compact blue and gravelly clay	18	118
Dirty sand, clean streak water bearing	11	129
Slightly soft brown gravelly compact clay	76	205
Light clean gravel to coarse sand	27	232
Clay showing		

A 12-in. diameter hole was drilled to a depth of 232 ft. The well is cased with 12-in. ID steel pipe from about 1 ft above land surface to a depth of 206 ft and equipped with 27 ft (26 ft exposed) of 12-in. Johnson Everdur screen. The screened section from top to bottom consists of 7 ft of No. 20 slot, 5 ft of No. 40 slot, 10 ft of No. 20 slot, and 5 ft of No. 50 slot. The top of the casing is equipped with a Baker pitless adapter.

A production test was conducted on June 21, 1960, by representatives of the driller, the town, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 6 hr of pumping at a rate of 207 gpm, the drawdown was 73.55 ft from a nonpumping water level of 47.50 ft below land surface. One hr after pumping was stopped, the water level had recovered to 49.65 ft. On the basis of the production test data, it was estimated that this well should yield 200 gpm (288,000 gpd) on a long-term basis.

In 1970, this well was cleaned with acid by the Sims Drilling Co.

The pumping equipment presently installed is a Red Jacket submersible pump rated at 200 gpm, and powered by a 20-hp Franklin electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A4177) of a sample collected August 23, 1977, after pumping for 2 hr at 150 gpm, showed the water to have a hardness of 454 mg/L, total dissolved minerals of 680 mg/L, and an iron content of 2.1 mg/L.

WELL NO. 5, finished in sand and gravel of the Prairie Aquigroup, was completed in September 1960 to a depth of 223 ft by the Sims Drilling Co., Savoy. The well is located about 0.2 mile northeast of Well No. 4, approximately 2700 ft S and 1600 ft E of the NW corner of Section 34, T27N, R8E. The land surface elevation at the well is approximately 700 ft.

WELL NO. 6, DRILLERS LOG

Strata	Thickness (ft)	Depth (ft)
Top soil	1	1
Clay, yellow	8	9
Clay, blue, gravelly	32	41
Sand, dirty	16	57
Sand, cemented with clay	13	70
Sand, gravel with clay, hard	11	81
Clay, gravelly with boulders	18	99
Clay, gravelly, hard	5	104
Sand, gravelly, dirty	6	110
Sand, gravel, cemented	29	139
Sand, gravel, dirty, clay streaks	12	151
Sand and gravel, dirty	52	203
Sand, fine, dirty	5	208
Sand, medium to coarse with gravel, dirty	12	220
Sand, fine, dirty	3	223

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A4179) is for a water sample from the well collected August 23, 1977, after 2 hr of pumping at 155 gpm.

WELL NO. 5, LABORATORY NO. A4179

	mg/L	me/L		mg/L	me/L		
Iron	Fe	2.0	Silica	SiO ₂	14		
Manganese	Mn	0.00	Fluoride	F	0.4	0.02	
Ammonium	NH ₄	5.65	0.31	Boron	B	1.0	
Sodium	Na	59.0	2.57	Cyanide	CN	0.02	
Potassium	K	2.7	0.07	Nitrate	NO ₂	0.0	0.00
Calcium	Ca	100.0	4.99	Chloride	Cl	1	0.03
Magnesium	Mg	43.0	3.54	Sulfate	SO ₄	200	4.16
				Alkalinity (as CaCO ₂)		370	7.40
Arsenic	As	0.000					
Barium	Ba	0.0	Hardness (as CaCO ₂)		429	8.58	
Cadmium	Cd	0.00					
Chromium	Cr	0.00	Total dissolved				
Copper	Cu	0.00	minerals		670		
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0	pH (as rec'd)		8.1		

A 12-in. diameter hole was drilled to a depth of 223 ft. The well is cased with 12-in. steel pipe from about 4 ft above land surface to a depth of 203 ft and equipped with 21 ft (20 ft exposed) of 12-in. Johnson Everdur screen. The screened section from top to bottom consists of 5 ft of No. 12 slot, 4 ft of No. 20 slot, 5 ft of No. 30 slot, 4 ft of No. 20 slot, and 3 ft of No. 15 slot. The top of the casing is equipped with a Baker pitless adapter.

A production test using one observation well (No 4) was conducted on September 19, 1960, by representatives of the driller, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 4 hr of pumping at rates ranging from 185 to 210 gpm, the final drawdown was 16.55 ft from a nonpumping water level of 36.50 ft below land surface. One hr after pumping was stopped, the water level had recovered to 38.18 ft. On the basis of the production test data, it

was estimated that this well should yield 200 gpm (288,000 gpd) on a long-term basis.

In 1970, this well was cleaned with acid by the Sims Drilling Co.

The pumping equipment presently installed is a Jacuzzi submersible pump (Serial No. SVA027508) set at 105 ft, rated at 230 gpm at about 150 ft TDH, and powered by a 20-hp Jacuzzi electric motor.

CORNELL

The village of Cornell (603) installed a public water supply in 1953. Two wells are in use. In 1954 there were 100 services, all metered. In 1984 there were 247 services, all metered; the average pumpage was 82,400 gpd. The water is chlorinated.

WELL NO. 1, finished in sand and gravel of the Prairie Aquigroup, was completed in June 1953 to a depth of 99 ft by J. Bolliger & Sons, Fairbury. The well is located on Bradley St. between Fourth and Fifth Sts., approximately 700 ft N and 2200 ft E of the SW corner of Section 11, T29N, R4E. The land surface elevation at the well is approximately 632 ft.

WELL NO. 1, SUMMARY SAMPLE STUDY LOG (furnished by the State Geological Survey)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM		
Pleistocene Series		
Wisconsinan drift		
"Black soil"	2	2
Clay, mottled gray brown to yellow brown, oxidized, sandy	8	10
Clay, gray, uniform	12	22
Clay, gray, sandy	8	30
Till, brown, sandy, gravelly	36	66
Sand, medium to coarse, silty, poorly sorted	3	69
"Clay and sand mixed (soft)"	6	75
Till, brown, sandy, gravelly	15	90
Sand, medium to coarse, little gravel, clean	10	100
"Coarse sand, some finer and dirty"	2	102

An 8-in. diameter hole was drilled to a depth of 99 ft. The well is cased with 8-in. ID steel pipe from about 0.7 ft above land surface to a depth of 93 ft and equipped with 6.8 ft of 8-in. No. 80 slot Johnson Everdur screen.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C005891) is for a water sample from the well collected May 18, 1977, after 3 hr of pumping at 90 gpm.

WELL NO. 1, LABORATORY NO. C005891

	<i>mg/L</i>	<i>me/L</i>		<i>mg/L</i>	<i>me/L</i>
Iron	Fe	0.2	Silica	SiO ₂	18
Manganese	Mn	0.00	Fluoride	F	1.0 0.05
Ammonium	NH ₄	0.90	Boron	B	1.3
Sodium	Na	288	Cyanide	CN	0.00
Potassium	K	1.9	Nitrate	NO ₂	0.04 0.00
Calcium	Ca	32	Chloride	Cl	160 4.51
Magnesium	Mg	17	Sulfate	SO ₄	21 0.44
			Alkalinity (as CaCO ₂)	544	10.88
Arsenic	As	0.000			
Barium	Ba	0.3	Hardness (as CaCO ₂)	150	3.00
Cadmium	Cd	0.00			
Chromium	Cr	0.00	Total dissolved minerals	906	
Copper	Cu	0.00			
Lead	Pb	0.00			
Mercury	Hg	0.0000			
Nickel	Ni	0.0			
Selenium	Se	0.00			
Silver	Ag	0.00			
Zinc	Zn	0.02	pH (as rec'd)	8.7	

A production test using one observation well was conducted on July 7, 1953, by representatives of the driller, the village, the State Water Survey, and the Caldwell-Rhoads Co., Consulting Engineers. After 6 hr of pumping at rates ranging from 148 to 160 gpm, the drawdown was 14.6 ft from a nonpumping water level of 10.4 ft below the top of the casing. Pumping was continued for 54 min at rates ranging from 242 to 200 gpm with a final drawdown of 19.6 ft. Forty-four min after pumping was stopped, the water level had recovered to 12.4 ft.

In July 1977, the well reportedly produced 121.7 gpm for 1 hr with a drawdown of 47 ft from a nonpumping water level of 19 ft.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 6MB6, Serial No. KLP188) set at about 84 ft, rated at 100 gpm at about 150 ft TDH, and powered by a 7-1/2-hp Red Jacket electric motor (Serial No. 2MLE-997). The well is equipped with 84 ft of airline.

WELL NO. 2, finished in sand and gravel of the Prairie Aquigroup, was completed in September 1978 to a depth of 110 ft (105 ft effective depth) by the K & K Well Drilling Co., Mokena. The well is located west-northwest of Well No. 1, approximately 700 ft N and 1900 ft E of the SW corner of Section 11, T29N, R4E. The land surface elevation at the well is approximately 635 ft.

WELL NO. 2, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil	2	2
Clay (brownish yellow)	16	18
Clay with streaks of gravel	21	39
Gravel	5	44
Clay (gray)	1	45
Gravel	2	47
Clay with streaks of gravel	11	58
Clay (gray)	11	69
Gravel	3	72
Clay (gray)	11	83
Gravel (water bearing)	25	108
Fine sand, muddy	2	110

An 18-in. diameter hole was drilled to a depth of 20 ft and finished 10 in. in diameter from 20 to 110 ft. The well is cased with 8-in. black pipe from about 3 ft above land surface to a depth of 95 ft followed by 10 ft of 8-in. No. 70 slot Cook stainless steel screen. A 5-ft length of 8-in. pipe is attached to the bottom of the screen from 105 to 110 ft. The annulus between the bore hole and casing-screen assembly is filled with cement from 0 to 20 ft and with pea gravel from 20 to 110 ft. The top of the casing is equipped with a Williams pitless adapter extending about 2 ft above land surface.

A production test using one observation well (No. 1) was conducted on October 24, 1978, by representatives of the driller, the village, the State Water Survey, and Daily & Associates, Engineers. After 3 hr of pumping at a rate of 200 gpm, the final drawdown was 11.77 ft from a nonpumping water level of 16.69 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 17.54 ft. On the basis of the production test data, it was estimated that this well could be pumped safely at a rate of 150 gpm.

The pumping equipment presently installed is a Jacuzzi submersible pump (Model No. 75S6M3-T/F) set at 84 ft, rated at 140 gpm at about 160 ft TDH, and powered by a 7-1/2-hp Franklin electric motor.

A partial analysis of a sample (Lab. No. 209440) collected during the initial production test, after pumping for 2.5 hr at 200 gpm, showed the water to have a hardness of 172 mg/L, total dissolved minerals of 824 mg/L, and an iron content of 0.3 mg/L.

CULLOM

The village of Cullom (608) installed a public water supply in 1906. One well (No. 2) is in use and another well (No. 3) is available for emergency use. In 1949 there were 139 services, none metered; the estimated average pumpage was 35,000 gpd. In 1984 there were 270 services, none metered; the average and maximum pumpages were 73,600 and 108,000 gpd, respectively. The water from Well No. 2 is filtered, treated with polyphosphate to sequester iron, fluoridated, and chlorinated, and the water from Well No. 3 is not treated.

Initially, water was obtained from a well completed about 1906. The hole was drilled to a depth of 280 ft, but the well was finished in sand and gravel at a depth of 140 ft. The well was located near the center of the village on Washington St. and has been abandoned.

WELL NO. 1 was completed in 1914 to a depth of 1670 ft. This well was abandoned in 1947. The water-yielding units in this well are the Mississippi Valley Aquigroup (dolomite of the Silurian System) and the Midwest Aquigroup (dolomites of the Galena

and Platteville Groups, and St. Peter Sandstone). The well is located near the center of the village, approximately 650 ft N and 2200 ft W of the SE corner of Section 23, T28N, R8E. The land surface elevation at the well is approximately 685 ft.

WELL NO. 1, SAMPLE STUDY AND DRILLERS LOG
(furnished by the State Geological Survey)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM		
Pleistocene Series		
"Drift"	165	165
PENNSYLVANIAN SYSTEM		
"Blue shale and coal"	145	310
SILURIAN SYSTEM		
Niagan and Alexandrian Series		
"Limestones"	390	700
ORDOVICIAN SYSTEM		
Cincinnatian Series		
Maquoketa Group		
"Shale and limestone"	165	865
Champlainian Series		
Galena and Platteville Groups		
"Limestones"	415	1280
Ancell Group		
St. Peter Sandstone	190	1470
No record	200	1670

The well is cased with 10-in. pipe to a depth of 400 or 500 ft.

In 1916, the nonpumping water level was reported to be 70 ft below the top of the well.

A partial analysis of a sample (Lab. No. 110487) collected May 31, 1947, after pumping for 7 hr, showed the water to have a hardness of 122 mg/L, total dissolved minerals of 975 mg/L, and an iron content of 0.5 mg/L.

Prior to the construction of Well No. 2, a test well was constructed in February 1947 to a depth of 152.5 ft by Hayes & Sims, Champaign. The test well was located east of the east end of Jeffrey St., approximately 725 ft N and 560 ft W of the SE corner of Section 23, T28N, R8E. A 2-in. diameter hole was drilled to a depth of 152.5 ft. The test well was cased with 2-in. pipe with a 7.9-ft length of sandpoint at the bottom. Upon completion, the nonpumping water level was reported to be 32 ft below land surface.

WELL NO. 2, finished in sand and gravel of the Prairie Aquigroup, was completed in August 1947 to a depth of 152.5 ft by Hayes & Sims, Champaign. The well is located about 10 ft east of the test well near the intersection of Hickory and Washington Sts., approximately 725 ft N and 550 ft W of the SE corner of Section 23, T28N, R8E. The land surface elevation at the well is approximately 690 ft.

The well is cased with 8-in. ID steel pipe from about 0.95 ft above land surface to a depth of 142.5 ft followed by 10 ft of 8-in. Johnson Everdur screen. The screened section consists of 5 ft of No. 40 slot followed by 5 ft of No. 60 slot.

A production test was conducted on August 29, 1947, by representatives of the driller, the State Water Survey, and the Miller Engineering Service. After 5 hr of pumping at rates of 94 to 118 gpm, the drawdown was 18.5 ft from a nonpumping water level of 33.0 ft below land surface. Nine min after pumping was stopped, the water level had recovered to 34.7 ft.

In 1983, the well screen was reportedly cleaned by Kingsley-Weburg Well Drilling, Inc., Elliott.

A production test was conducted on February 26, 1985, by representatives of Kingsley-Weburg Well Drilling, Inc., the village, the State Water Survey, and Vegrzyn, Sarver and Associates, Consulting Engineers. After 1.7 hr of pumping at a rate of 105 gpm, the final drawdown was 44.46 ft from a nonpumping water level of 43.20 ft below land surface. Twenty-five min after pumping was stopped, the water level had recovered to 43.80 ft. On the basis of the production test data, the well appeared capable of sustaining a safe yield of 105 gpm (151,200 gpd) on a long-term basis.

The pumping equipment presently installed is a Red Jacket submersible pump rated at 130 gpm at about 240 ft TDH, and powered by a 7-1/2-hp Franklin electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B105901) is for a water sample from the well collected December 4, 1973, after 45 min of pumping at 85 gpm. Hydrogen sulfide was apparent when a previous sample was collected.

WELL NO. 2, LABORATORY NO. B105901

		<i>mg/L</i>	<i>me/L</i>		<i>mg/L</i>	<i>me/L</i>
Iron	Fe	3.0		Silica	SiO ₂	18
Manganese	Mn	0.14		Fluoride	F	0.7 0.04
Ammonium	NH ₄	2.6	0.14	Boron	B	1.9
Sodium	Na	170	7.40	Nitrate	NO ₂	0.0 0.00
Potassium	K	3.7	0.10	Chloride	Cl	13 0.37
Calcium	Ca	201	10.03	Sulfate	SO ₄	1000 20.80
Magnesium	Mg	73	6.01	Alkalinity (as CaCO ₂)		116 2.32
Arsenic	As	0.00		Hardness (as CaCO ₂)		806 16.12
Barium	Ba	0.2		Total dissolved minerals		1665
Cadmium	Cd	0.00				
Chromium	Cr	0.00				
Copper	Cu	0.00				
Lead	Pb	0.00		pH (as rec'd)		7.7
Mercury	Hg	0.0000		Radioactivity		
Nickel	Ni	0.0		Alpha <i>pc/l</i>		0.0
Selenium	Se	0.00		± deviation		0.0
Silver	Ag	0.00		Beta <i>pc/l</i>		4.9
Zinc	Zn	0.01		± deviation		3.0

WELL NO. 3, finished in sand and gravel of the Prairie Aquigroup, was completed in September 1961 to a depth of 145 ft by J. Bolliger & Sons, Fairbury. This well is available for emergency use. The well is located about 30 ft from the elevated tank, approximately 700 ft N and 2200 ft W of the SE corner of Section 23, T28N, R8E. The land surface elevation at the well is approximately 685 ft.

WELL NO. 3, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Black soil	1.5	1.5
Yellow soil	10.5	12
Gray soil	78	90
Hardpan, tough and some boulders	40	130
Coarse sand and gravel, dirty	10	140
Water, sand and gravel	4	144

An 8-in. diameter hole was drilled to a depth of 145 ft. The well is cased with 8-in. steel pipe from about 0.65 ft above land surface to a reported depth of 139 ft followed by 6 ft (6.8 ft overall length) of 8-in. No. 40 slot Johnson Everdur screen. The top of the casing is equipped with a pitless adapter.

A production test was conducted on September 14, 1961, by representatives of the driller, the village, and the State Water Survey. After 4 hr of pumping at rates

ranging from 147 to 153 gpm, the final drawdown was 23.91 ft from a nonpumping water level of 34.50 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 37.01 ft. On the basis of the production test data, it was estimated that this well should yield 100 gpm (144,000 gpd) on a long-term basis.

A production test using one observation well (No. 2) was conducted on February 26, 1985, by representatives of Kingsley-Weburg Well Drilling, Inc., Elliott, the village, the State Water Survey, and Vegrzyn, Sarver and Associates, Consulting Engineers. After 1.7 hr of pumping at a rate of 120 gpm, the final drawdown was 15.25 ft from a nonpumping water level of 35.60 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 36.27 ft. On the basis of the production test data, it was recommended that the withdrawal rate from this well should not exceed 100 gpm (144,000 gpd).

The pumping equipment presently installed is a Red Jacket submersible pump rated at 130 gpm at about 175 ft TDH, and powered by a 7-1/2-hp Red Jacket electric motor.

A partial analysis of a sample (Lab. No. 220727) collected February 26, 1985, after pumping for 2.7 hr at rates of 121 to 120 gpm, showed the water to have a hardness of 1054 mg/L, total dissolved minerals of 2048 mg/L, and an iron content of 4.08 mg/L.

DWIGHT

The village of Dwight (4146) installed a public water supply in 1891. Five wells (Nos. 1, 4, 5, 6, and 7) are in use. This supply also furnishes water to the William W. Fox Developmental Center. In 1950 there were 850 services, 50 percent metered; the estimated average pumpage was 160,000 gpd. In 1986 there were 1500 services, all metered (including William W. Fox Developmental Center); the average and maximum pumpages in 1985 were 466,000 and 554,000 gpd, respectively. The water is treated with polyphosphate to sequester iron, fluoridated, and chlorinated.

WELL NO. 1, finished in sand and gravel of the Prairie Aquigroup, was constructed in 1891 to a depth of 136 ft (reported to be 128 ft deep in 1924) by J.

Eyer, Dwight, and deepened in 1930 to a reported depth of 140 ft. The well is located in the west side of the pumping station at the northwest corner of Franklin and Chippewa Sts., approximately 700 ft S and 1650 ft W of the NE corner of Section 9, T30N, R7E. The land surface elevation at the well is approximately 635 ft.

Originally, an 8-in. diameter hole was drilled to a depth of 136 ft. The well was originally cased with 8-in. pipe from land surface to a depth of 126 ft and equipped with 8 ft of 8-in. No. 10 slot Cook screen. In 1923, because of holes in the 8-in. pipe, J. Eyer enlarged the well to 10 in. in diameter and installed a 10-in. pipe from about 1.3 ft above the pump station

floor to a depth of 118 ft and equipped it with 11 ft of 10-in. No. 10 slot Cook screen. After deepening in 1930, the hole was reported to be 10 in. in diameter from 0 to 140 ft. The well was then cased with 10-in. pipe from the pumphouse floor to a depth of 120 ft and equipped with 11 ft of 10-in. No. 10 slot Cook screen.

In 1923, the nonpumping water level was reported to be 35 ft (Nos. 2 and 3 operating).

On May 20, 1947, the well reportedly produced 375 gpm for 15 min with a drawdown of 53 ft from a nonpumping water level of 32 ft below the top of the casing. During the first 11 min, Well No. 4 was operating at a rate of 450 gpm.

In May 1973, this well was acidized by the J. P. Miller Artesian Well Co., Brookfield.

The pumping equipment presently installed consists of a 15-hp, 1800 rpm U. S. electric motor and a 7.5-in., 5-stage Deming turbine pump (No. DC15082) set at 100 ft, rated at 375 gpm at about 100 ft head, and equipped with 100 ft of 6-in. column pipe. A 10-ft section of 5-in. suction pipe is attached to the pump intake. The well is equipped with 100 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B031575) of a sample collected January 5, 1982, after pumping for 30 min at 200 gpm, showed the water to have a hardness of 494 mg/L, total dissolved minerals of 1070 mg/L, and an iron content of 2.60 mg/L.

WELL NO. 2, finished in sand and gravel of the Prairie Aquigroup, was completed in 1906 to a depth of 136 ft. This well was abandoned and sealed in 1930. The well was located about 25 ft northeast of Well No. 1, approximately 683 ft S and 1633 ft W of the NE corner of Section 9, T30N, R7E. The land surface elevation at the well is approximately 635 ft.

An 8-in. diameter hole was drilled to a depth of 136 ft. The well was cased with 8-in. pipe from land surface to a depth of about 126 ft and equipped with 12 ft of 8-in. No. 24 slot Johnson screen.

A mineral analysis of a sample (Lab. No. 51271) collected April 16, 1924, showed the water to have a hardness of 599 mg/L, total dissolved minerals of 1272 mg/L, and an iron content of 3.6 mg/L.

WELL NO. 3, finished in sand and gravel of the Prairie Aquigroup, was completed in 1908 to a depth of 136 ft. This well was abandoned prior to 1938 and sealed in 1976. The well was located about 50 ft east of Well No. 1 in the east side of the pumping station, approximately 700 ft S and 1600 ft W of the NE corner of Section 9, T30N, R7E. The land surface elevation at the well is approximately 635 ft.

The well was cased with 6-in. pipe from land surface to a depth of 126 ft and equipped with 8 ft of Cook screen.

A partial analysis of a sample (Lab. No. 144488) collected August 26, 1957, showed the water to have a hardness of 480 mg/L, total dissolved minerals of 901 mg/L, and an iron content of 1.9 mg/L.

WELL NO. 4, finished in sand and gravel of the Prairie Aquigroup, was completed in 1930 to a depth of 140 ft by J. Bolliger & Sons, Fairbury. The well is located about 50 ft north of Well No. 1 at the north side of the pumping station, approximately 650 ft S and 1650 ft W of the NE corner of Section 9, T30N, R7E. The land surface elevation at the well is approximately 635 ft.

The well is cased with 12-in. pipe from about 0.3 ft above the pump station floor to an unknown depth. Well screen information is not recorded.

On July 30, 1930, the well reportedly produced 250 gpm with a drawdown of 4 ft from a nonpumping water level of 126 ft below the pumphouse floor.

In May 1973, this well was acidized by the J. P. Miller Artesian Well Co., Brookfield.

The pumping equipment presently installed consists of a 20-hp, 1800 rpm U. S. electric motor (No. 123739) and a 9.5-in., 4-stage Deming turbine pump (No. DC14947) set at 100 ft, rated at 450 gpm at about 100 ft head, and equipped with 100 ft of 6-in. column pipe. A 10-ft section of suction pipe is attached to the pump intake.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B24159) of a sample collected November 27, 1979, after pumping for 1 hr at 267 gpm, showed the water to have a hardness of 544 mg/L, total dissolved minerals of 1152 mg/L, and an iron content of 2.78 mg/L.

WELL NO. 5, finished in sand and gravel of the Prairie Aquigroup, was completed in March 1946 to a depth of 142 ft (reported to be 140 ft in 1976) by John Bolliger, Fairbury. The well is located about 6 ft east of Well No. 3, approximately 700 ft S and 1594 ft W of the NE corner of Section 9, T30N, R7E. The land surface elevation at the well is approximately 635 ft.

The well is cased with 10-in. pipe from about 1 ft above the pump station floor to a depth of about 134 ft followed by 8 ft of 10-in. brass screen.

Upon completion, the nonpumping water level was reported to be 35 ft below land surface.

A production test was conducted by the J. P. Miller Artesian Well Co., Brookfield, on May 8, 1975. After

1.8 hr of pumping at rates of 270 to 280 gpm, the drawdown was 22 ft from a nonpumping water level of 48 ft.

In August 1976, this well was acidized with 2000 gal of treating acid by the J. P. Miller Artesian Well Co. A production test was then conducted on August 13, 1976. After 1.2 hr of pumping at a rate of 365 gpm, the drawdown was 23 ft from a nonpumping water level of 54 ft.

This well was reported to be acidized on May 23, 1979.

The pumping equipment presently installed is a combination Deming and Peerless turbine pump set at 100 ft, rated at 365 gpm, and powered by a 20-hp, 1750 rpm U. S. electric motor. The well is equipped with 100 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B27549) of a sample collected December 18, 1979, after pumping for 1 hr, showed the water to have a hardness of 568 mg/L, total dissolved minerals of 1154 mg/L, and an iron content of 1.10 mg/L.

Five test holes were constructed in November 1970 by the J. P. Miller Artesian Well Co., Brookfield, to depths ranging from 122 to 160 ft. The holes were located in Sections 4, 8, 9, and 11, T30N, R7E.

WELL NO. 6, finished in sand and gravel of the Prairie Aquigroup, was completed in April 1971 to a depth of 132 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located on Chippewa St. southwest of the elevated tank, approximately 860 ft S and 2100 ft W of the NE corner of Section 9, T30N, R7E. The land surface elevation at the well is approximately 635 ft.

WELL NO. 6, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil and yellow clay	10	10
Yellow gravel	9	19
Blue clay	95	114
Fine sand (some water)	1	115
Gravel, fine to medium (water bearing)	17	132
Shale	1	133

A 42-in. diameter hole was drilled to a depth of 132 ft. The well is cased with 12-in. steel pipe from about 1 ft above land surface to a depth of 117 ft followed by 15 ft of 12-in. No. 65 slot Johnson stainless steel screen. The annulus between the bore hole and casing-screen assembly is filled with cement from 0 to 20 ft, with sand and bentonite from 20 to 85 ft, and with No. 1 Muscatine gravel from 85 to 132 ft.

A production test was conducted on April 28, 1971, by representatives of the driller, the village, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 3 hr of pumping at a rate of 500 gpm, the final drawdown was 29.82 ft from a nonpumping water level of 54.60 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 57.35 ft. On the basis of the production test data, it was estimated that this well should yield 500 gpm (720,000 gpd) on a long-term basis.

In March 1978, this well was acidized by the J. P. Miller Artesian Well Co., and it was reportedly acidized again in 1984.

The pumping equipment presently installed is a Peerless turbine pump (Serial No. 224820) set at 110 ft, rated at 650 gpm at about 196 ft TDH, and powered by a 40-hp, 1765 rpm U. S. electric motor (Model No. R-8887-00-271-D, Serial No. R204558). The well is equipped with 110 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B24160) is for a water sample from the well collected November 27, 1979, after 1 hr of pumping at 315 gpm.

WELL NO. 6, LABORATORY NO. B24160

	<i>mg/L</i>	<i>me/L</i>		<i>mg/L</i>	<i>me/L</i>
Iron	Fe	0.782	Silica	SiO ₂	8.8
Manganese	Mn	0.055	Fluoride	F	0.64 0.03
Ammonium	NH ₄	5.3	Boron	B	1.2
Sodium	Na	180	Cyanide	CN	< 0.005
Potassium	K	3.5	Nitrate	NO ₂	< 0.4
Calcium	Ca	47	Chloride	Cl	111 3.13
Magnesium	Mg	24	Sulfate	SO ₄	111 2.31
Strontium	Sr	0.69	Alkalinity (as CaCO ₂)		367 7.34
Arsenic	As	0.002	Hardness (as CaCO ₂)		215 4.30
Barium	Ba	0.12			
Cadmium	Cd	< 0.001	Total dissolved		
Chromium	Cr	< 0.005	minerals		717
Cobalt	Co	< 0.005			
Copper	Cu	< 0.005			
Lead	Pb	0.01			
Mercury	Hg	< 0.00005			
Nickel	Ni	< 0.005			
Selenium	Se	< 0.001			
Silver	Ag	< 0.005			
Zinc	Zn	< 0.005	pH (as rec'd)		8.0

Three test holes were constructed in April 1979 by the Layne-Western Co., Aurora, to depths of 165, 166, and 165 ft, respectively. The first test hole was located approximately 1300 ft S and 2297 ft E of the NW corner of Section 9; the second hole was located approximately 1550 ft S and 990 ft E of the NW corner of Section 9; and the third hole was located approximately 460 ft S and 165 ft W of the NE corner of Section 8, T30N, R7E.

WELL NO. 7, finished in sand and gravel of the Prairie Aquigroup, was completed in June 1980 to a depth of 147 ft by Albrecht Well Drilling, Inc., Ohio. The well is located at the corner of Washington and South Sts. at the site of Test Hole No. 1-79, approximately 1300 ft S and 2297 ft E of the NW corner of Section 9, T30N, R7E. The land surface elevation at the well is approximately 640 ft.

TEST HOLE NO. 1-79, DRILLERS LOG
(site of Well No. 7)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Black top soil and wood	3	3
Brown clayey silt	3	6
Brown silty clay	3	9
Brownish gray silty clay	9	18
Sand	2	20
Gray silty clay with an occasional sand and gravel seam	44	64
Sand and gravel	2	66
Gray silty clay, some sand and gravel seams	28	94
Gray sandy silty clay, some gravel	10	104
Gray sandy silty clay with sand and gravel layers	6	110
Gray very sandy silty clay with sand and gravel seams	4	114
Gray silty clay	5	119
Gray fine sand to small gravel, some coarser intermixed	19	138
Gray fine sand to coarse gravel	8	146
Fine to coarse sand with silty seams	13	159
Gray fine sand to coarse sand with gravel and boulder	4	163
Blue gray shale	2	165

A 38-in. diameter hole was drilled to a depth of 147 ft. The well is cased with 12-in. ID steel pipe from about 1 ft above the pumphouse floor to a depth of 127 ft followed by 20 ft of 14-in. No. 80 slot Johnson stainless steel screen. The annulus between the bore hole and casing-screen assembly is filled with concrete from 1 to 15 ft, with torpedo sand from 15 to 82 ft, and with No. 3 Muscatine gravel from 82 to 147 ft.

A production test was conducted on June 24, 1980, by representatives of the driller, the village, the State

Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 3 hr of pumping at rates ranging from 640 to 580 gpm, the final observed drawdown was 13.22 ft from a nonpumping water level of 62.26 ft below land surface. Thirty-one min after pumping was stopped, the water level had recovered to 62.80 ft. On the basis of the production test data, it was estimated that this well should yield 500 gpm (720,000 gpd) on a long-term basis. Well Nos. 1, 4, and 5 were operating during the test for the first 1.7 hr.

The pumping equipment presently installed is a Goulds turbine pump set at 120 ft, rated at 500 gpm at about 250 ft TDH, and powered by a 50-hp, 1765 rpm U. S. electric motor (No. R-6232-05-078).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B032876) is for a water sample from the well collected March 1, 1984, after 6 hr of pumping at 500 gpm.

WELL NO. 7, LABORATORY NO. B032876

	<i>mg/L</i>	<i>me/L</i>		<i>mg/L</i>	<i>me/L</i>	
Iron	Fe	0.49	Silica	SiO ₂	7.5	
Manganese	Mn	0.028	Fluoride	F	0.72	
Ammonium	NH ₄	3.9	Boron	B	1.47	
Sodium	Na	207	Cyanide	CN	< 0.005	
Potassium	K	4.9	Nitrate	NO ₂	< 0.4	
Calcium	Ca	35	Chloride	Cl	185	5.22
Magnesium	Mg	23	Sulfate	SO ₄	20	0.42
Strontium	Sr	0.76	Alkalinity (as CaCO ₂)		382	7.64
Aluminum	Al	< 0.05	Hardness (as CaCO ₂)		185	3.70
Arsenic	As	0.008				
Barium	Ba	0.270	0.00 Total dissolved			
Beryllium	Be	< 0.0005	minerals		715	
Cadmium	Cd	< 0.003				
Chromium	Cr	< 0.005				
Cobalt	Co	< 0.005				
Copper	Cu	< 0.005				
Lead	Pb	< 0.005				
Mercury	Hg	< 0.00010				
Nickel	Ni	< 0.005				
Selenium	Se	< 0.001				
Silver	Ag	< 0.005				
Vanadium	V	< 0.005				
Zinc	Zn	< 0.005	pH (as rec'd)		8.4	

DWIGHT CORRECTIONAL CENTER

Dwight Correctional Center (est. 500), formerly known as State Reformatory for Women, located about 2 miles west of Dwight, installed a public water supply in 1930. One well (No. 2) is in use and another well (No. 1) is available for emergency use. In 1953 the estimated average pumpage was 32,000 gpd. In 1983 there were 23 buildings serviced, none metered; the average pumpage was 100,200 gpd. The water is aerated, chlorinated, settled, softened, and treated with caustic soda and sodium silicate.

WELL NO. 1 was completed in 1930 to a depth of 1203 ft (reported to be 1183 ft deep in March 1969). This well is available for emergency use. The water-yielding units in this well are the Midwest Aquigroup (dolomites of the Galena and Platteville Groups and St. Peter Sandstone). The well is located on the institution grounds on Illinois Route 17, approximately 600 ft N and 1000 ft W of the SE corner of Section 1, T30N, R6E. The land surface elevation at the well is approximately 645 ft.

WELL NO. 1, SAMPLE STUDY LOG

(furnished by the State Geological Survey)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM		
Pleistocene Series		
Loam, black	5	5
Loam, brown	15	20
Clay, blue	104	124
PENNSYLVANIAN SYSTEM		
Des Moinesian Series		
Shale, brown	36	160
Shale, blue, micaceous, some dolomite	10	170
Shale, green to blue to black	40	210
Shale, blue with peat	5	215
Shale, brown to gray	50	265
Shale, brown and green	30	295
Shale, blue with coal	5	300
ORDOVICIAN SYSTEM		
Cincinnatian Series		
Maquoketa Group		
Shale, gray to green to brown, black slate, some dolomite	40	340
Dolomite, gray to green with large number of fossil shells	80	420
Dolomite with green shale and black slate	50	470
Champlainian Series		
Galena and Platteville Groups		
Dolomite, tan to buff	265	735
Dolomite, dark gray	40	775
Dolomite, tan to buff to gray	80	855
Ancestral Group		
St. Peter Sandstone		
Sandstone, white, medium rounded grains	348	1203

A 16-in. diameter hole was drilled to a depth of 125 ft, reduced to 12 in. between 125 and 342 ft, and finished 10 in. in diameter from 342 to 1203 ft. The well is cased with 16-in. pipe to an unknown depth, 12-in. pipe from land surface to a depth of 125 ft, and 10-in. pipe from land surface to a depth of 342 ft.

Nonpumping water levels were reported to be 110 ft in 1932, and 100 to 110 ft below land surface in 1946.

In July 1959, the well reportedly produced 128 gpm for 10 min with a drawdown of 113 ft from a non-pumping water level of 187 ft below the pump base.

In February 1965, this well was acidized by the Layne-Western Co., Aurora.

After shooting with Primacord, a production test was conducted by the Layne-Western Co. on March 13, 1969. After 45 min of pumping at a rate of 152 gpm, the drawdown was 116 ft from a nonpumping water level of 151 ft.

In November 1976, this well was shot with 85 gram directional shots at 1-ft intervals from 870 to 1170 ft by the Layne-Western Co. A production test was then conducted by the Layne-Western Co. on November 19, 1976. After 6 hr of pumping at rates ranging from 100 to 146 gpm, the final drawdown was 121 ft from a non-pumping water level of 157 ft. Thirty min after pumping was stopped, the water level had recovered to 187 ft.

The pumping equipment presently installed consists of a 15-hp General Electric motor and an 8-in., 10-stage Layne turbine pump (Serial No. 50711) set at 335 ft, rated at 150 gpm, and equipped with 335 ft of 4-in. column pipe. The well is equipped with 335 ft of air-line.

A partial analysis of a sample (Lab. No. 174375) collected April 9, 1968, after pumping for 15 min, showed the water to have a hardness of 440 mg/L, total dissolved minerals of 2009 mg/L, and an iron content of 0.3 mg/L. Hydrogen sulfide was apparent when previous samples were collected.

A test well, open to the Upper Bedrock Aquigroup (a sandstone in the Pennsylvanian System), was completed in August 1935 to a depth of 210 ft by Joseph Eyer, Dwight. The well was located in the SE quarter of Section 1, T30N, R6E.

TEST WELL, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Blue clay	102	102
Dirty gravel	2	104
Clay	39	143
Fine grained sandstone	17	160
Shale	50	210

The test well was cased with 6-in. pipe to a depth of 144 ft.

A production test was conducted on the test well by the State Water Survey on August 7, 1935. After 8 min of pumping at a rate of 12.2 gpm, the water level was lowered to the bottom of the suction pipe at 186 ft from a nonpumping water level of 32 ft below land surface. After an additional 4.4 hr of pumping at rates of 9.9 to 8 gpm, the water level was at the bottom of the suction pipe.

WELL NO. 2 was completed in September 1948 to a depth of 1201 ft by the Milaeger Well & Pump Co., Brookfield, Wis. The water-yielding units in this well are the Midwest Aquigroup (dolomites of the Galena and Platteville Groups, and St. Peter Sandstone). The well is located just north of the overhead storage tank, approximately 450 ft N and 100 ft W of the SE corner of Section 1, T30N, R6E. The land surface elevation at the well is approximately 648 ft.

WELL NO. 2, SAMPLE STUDY LOG
(furnished by the State Geological Survey)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM		
Pleistocene Series		
Till; soil at top	65	65
Sand and gravel	10	75
Till	25	100
Gravel	10	110
PENNSYLVANIAN SYSTEM		
Des Moines Series		
Sandstone, silty	105	215
Shale; thin beds siltstone, limestone, coal	148	363
ORDOVICIAN SYSTEM		
Cincinnatian Series		
Maquoketa Group		
Limestone, cherty	47	410
Dolomite	10	420
Limestone, argillaceous; little shale	15	435
Shale; limestone	45	480
Champlainian Series		
Galena Group		
Limestone, cherty at base	180	670
Platteville Group		
Limestone and dolomite, cherty	190	860
Ancell Group		
St. Peter Sandstone		
Sandstone, incoherent	341	1201

A 21-in. diameter hole was drilled to a depth of 402 ft, reduced to 15 in. between 402 and 507 ft, and finished 10 in. in diameter from 507 to 1201 ft. The well is cased with 21-in. drive pipe from land surface to a depth of 124 ft, 12-in. pipe from about 2 ft above land surface to a depth of 140 ft (cemented in), 10-in. pipe from 140 ft to a depth of 510 ft (cemented in to 507 ft), and a 15-in. liner from 256 ft to a depth of 420 ft.

A production test was conducted on September 22-23, 1948, by representatives of the driller and the State Water Survey. After 24.1 hr of pumping at rates ranging from 85 to 170 gpm, the final drawdown was 146 ft from a nonpumping water level of 148 ft below land surface. One hr after pumping was stopped, the water level had recovered to 161 ft.

In February 1965, the nonpumping water level was reported to be 168 ft.

In 1974, the well reportedly produced 140 gpm with a drawdown of 92 ft from a nonpumping water level of 177 ft.

The pumping equipment presently installed consists of a 20-hp General Electric motor and an 8-in., 15-stage Fairbanks Morse Pomona pump rated at 160 gpm, and equipped with 300 ft of 6-in. column pipe. A 10-ft section of 6-in. suction pipe is attached to the pump intake.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. C006276) is for a water sample from the well collected June 20, 1977, after 3 hr of pumping at 120 gpm. Hydrogen sulfide was apparent when previous samples were collected.

WELL NO. 2, LABORATORY NO. C006276

		<i>mg/L</i>	<i>me/L</i>			<i>mg/L</i>	<i>me/L</i>
Iron	Fc	0.3		Silica	SiO ₂	8	
Manganese	Mn	0.01		Fluoride	F	1.5	0.08
Ammonium	NH ₄	2.0	0.11	Boron	B	1.0	
Sodium	Na	320	13.92	Cyanide	CN	0.00	
Potassium	K	16.9	0.43	Nitrate	NO ₂	2.64	0.04
Calcium	Ca	74	3.69	Chloride	Cl	370	10.43
Magnesium	Mg	34	2.80	Sulfate	SO ₄	215	4.47
				Alkalinity (as CaCO ₂)		288	5.76
Arsenic	As	0.000					
Barium	Ba	0.0		Hardness (as CaCO ₂)		325	6.50
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved			
Copper	Cu	0.00		minerals		1200	
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.02		pH (as rec'd)		8.3	

EMMINGTON

The village of Emmington (119) installed a public water supply in 1973. One well is in use. In 1984 there were 65 services, all metered; the average pumpage was 7200 gpd. The water is chlorinated.

WELL NO. 1, open to the Mississippi Valley Aquifer (dolomite of the Silurian System), was completed in July 1971 to a depth of 550 ft by J. Bolliger & Sons, Fairbury. The well is located on the west edge of the village, approximately 1760 ft N and 545 ft W of the SE corner of Section 24, T29N, R7E. The land surface elevation at the well is approximately 710 ft.

WELL NO. 1, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil and yellow clay	5	5
Yellow clay	5	10
Gray clay	165	175
Gray shale	63	238
Gray shale mixed with coal	2	240
Gray shale	32	272
Black shale	3	275
Gray shale	25	300
Light brown sandstone	28	328
Coal	4	332
Gray shale	48	380
Dark gray shale	10	390
Light gray limestone (some water)	143	533
Dark gray limestone (some water)	11	544
Red shale mixed with limestone (some water)	2	546
Light gray limestone (water bearing)	4	550

An 8-in. diameter hole was drilled to a depth of 550 ft. The well is cased with 8-in. pipe from about 2 ft above land surface to a depth of 396 ft. The top of the casing is equipped with a pitless adapter.

A production test was conducted on July 9, 1971, by representatives of the driller, the State Water Survey, and Daily & Associates, Engineers. After 3 hr of

pumping at rates ranging from 30 to 32.2 gpm, the drawdown was 70.0 ft from a nonpumping water level of 197.1 ft below land surface. Two min after pumping was stopped, full recovery was observed. On the basis of the production test data, it was estimated that this well should yield 30 gpm (43,200 gpd) on a long-term basis.

The pumping equipment presently installed consists of a 10-hp Red Jacket electric motor and a 4-in. Red Jacket submersible pump set at 396 ft, rated at 30 gpm at about 560 ft TDH, and equipped with 396 ft of 4-in. column pipe.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B26584) is for a water sample from the well collected December 30, 1976, after 1.5 hr of pumping.

WELL NO. 1, LABORATORY NO. B26584

		<i>mg/L</i>	<i>me/L</i>			<i>mg/L</i>	<i>me/L</i>
Iron	Fe	0.0		Silica	SiO ₂	8.0	
Manganese	Mn	0.0		Fluoride	F	4.0	0.21
Ammonium	NH ₄	1.2	0.07	Boron	B	2.1	
Sodium	Na	1000	43.50	Cyanide	CN	0.00	
Potassium	K	7.2	0.18	Nitrate	NO ₂	0.0	0.00
Calcium	Ca	8	0.40	Chloride	Cl	880	24.82
Magnesium	Mg	4	0.33	Sulfate	SO ₄	97	2.02
				Alkalinity (as CaCO ₂)		880	17.60
Arsenic	As	0.00					
Barium	Ba	0.0		Hardness (as CaCO ₂)		36	0.72
Cadmium	Cd	0.00					
Chromium	Cr	0.00		Total dissolved minerals		2440	
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.01					
Zinc	Zn	0.0		pH (as rec'd)		8.3	

FAIRBURY

The city of Fairbury (3544) installed a public water supply in 1936. Two wells (Nos. 4 and 5) are in use and three wells (Nos. 1, 2, and 3) are available for emergency use. In 1950 there were 800 services, 90 percent metered; the estimated average pumpage in 1949 was 200,000 gpd. In 1984 there were 1478 services, all metered; the average pumpage was 409,600 gpd. The water is aerated, coagulated with alum, softened with lime and soda ash, recarbonated, chlorinated, fluori-

dated, treated with polyphosphate to sequester iron, and filtered.

OLD WELL NO. 1 was completed in 1892 to a depth of 2002 ft by the J. P. Miller Artesian Well Co., Brookfield. This well was abandoned in January 1936. The water-yielding units in this well are the Mississippi Valley Aquifer (dolomite of the Silurian System) and the Midwest Aquifer (Cambrian-Ordovician

aquifer) except for the Ironton-Galesville Sandstone. The well is located about 110 ft north of Locust St. and 40 ft west of First St., approximately 1090 ft N and 2600 ft E of the SW corner of Section 3, T26N, R6E. The land surface elevation at the well is approximately 685 ft.

The well is cased with 8-in. iron pipe to a depth of about 394 ft and 60 ft of 6-in. liner is placed at about 1500 ft.

Nonpumping water levels were reported to be 60 ft in 1896, and 80 ft in 1914.

In 1918, the nonpumping water level was reported to be 87 ft. After the well was pumped at 120 gpm for 5 min, the pump broke suction.

In 1922, the nonpumping water level was reported to be 122 ft.

A mineral analysis of a sample (Lab. No. 74746) collected June 23, 1934, showed the water to have a hardness of 194 mg/L, total dissolved minerals of 1160 mg/L, and a trace of iron.

OLD WELL NO. 2 was completed in 1917 to a depth of 2172 ft by the Cambridge Drilling Co. This well was abandoned in January 1936. The water-yielding units in this well are the Mississippi Valley Aquigroup (dolomite of the Silurian System) and the Midwest Aquigroup (Cambrian-Ordovician aquifer) except for the Ironton-Galesville Sandstone. The well is located about 35 ft south of Old Well No. 1, approximately 1055 ft N and 2600 ft E of the SW corner of Section 3, T26N, R6E. The land surface elevation at the well is approximately 685 ft.

OLD WELL NO. 2, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Gravel (water at 30 and 130 ft)	130	130
Material not given	40	170
Coal	5	175
Fire clay and slate	175	350
Limestone (little water at 500 ft)	170	520
Sand (water at 525 ft)	5	525
Limestone	135	660
Hard limestone	115	775
Shale	80	855
Limestone	5	860
Slate and shale	40	900
Limestone	25	925
Shale	25	950
Limestone	400	1350
St. Peter sandstone (hard)	253	1603
Break of shale	9	1612
Hard limestone and small streaks of hard sand	388	2000
Hard limestone	100	2100
Hard limestone and small veins of hard sand	72	2172

A 19-in. diameter hole was drilled to a depth of 402 ft, reduced to 12 in. between 402 and 920 ft, reduced to 10 in. between 920 and 1115 ft, and finished 8 in. in diameter from 1115 to 2172 ft. The well is cased with 18-in. OD pipe from land surface to a depth of about 41 ft, 14-in. OD pipe from land surface to a depth of 400 ft, 10-in. liner from 725 ft to a depth of 920 ft, and an 8-in. liner from 1568 ft to a depth of 1615 ft.

In 1918, the nonpumping water level was reported to be 109 ft below land surface. After the well was pumped at rates of 125 to 75 gpm for 24 hr, the water level was lowered below the pump cylinder which was at a depth of 300 ft.

In April 1928, the nonpumping water level was reported to be 236 ft below the pumphouse floor (Well Nos. 1 and 3 operating).

A mineral analysis of a sample (Lab. No. 51385) collected in August 1924, showed the water to have a hardness of 104 mg/L, total dissolved minerals of 1940 mg/L, and an iron content of 0.2 mg/L.

OLD WELL NO. 3 was completed in November 1926 to a depth of 1586 ft by Ira French, Fairbury. This well was abandoned in January 1936. The water-yielding units in this well are the Mississippi Valley Aquigroup (dolomite of the Silurian System) and the Midwest Aquigroup (dolomites of the Galena and Platteville Groups and St. Peter Sandstone). The well is located about 17 ft south and 75 ft west of Old Well No. 2, approximately 1038 ft N and 2525 ft E of the SW corner of Section 3, T26N, R6E. The land surface elevation at the well is approximately 685 ft.

OLD WELL NO. 3, SAMPLE STUDY LOG
(furnished by the State Geological Survey)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM		
Pleistocene Series		
No record	36	36
PENNSYLVANIAN SYSTEM		
Missourian and Des Moines Series		
Shale, and sandstone, thin beds of coal, limestone and siltstone	329	365
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite, partly shaley	155	520
Dolomite and limestone	230	750
Sandstone and limestone, siltstone at base	50	800
ORDOVICIAN SYSTEM		
Cincinnati Series		
Maquoketa Group		
Shale and limestone	140	940
Champlainian Series		
Galena and Platteville Groups		
Limestone, and few thin shale beds	390	1330
Ancell Group		
Glenwood Formation		
Sandstone, calcareous at top, shaley at base	70	1400
St. Peter Sandstone		
Sandstone	170	1570
Conglomerate of chert, shale and sandstone	16	1586

A 10-in. diameter hole was drilled to a depth of 381.2 ft, reduced to 8 in. between 381.2 and 1215 ft, and finished 6 in. in diameter from 1215 to 1586 ft. The well is cased with 10-in. pipe from land surface to a depth of 42 ft, 8-in. pipe from land surface to a depth of 381.2 ft, and a 6-in. liner from 745 ft to a depth of 955 ft.

Upon completion, this well was shot with 300 lb of 100 percent gelatin and exploded with dynamite. During this shooting, the 8-in. casing was cracked and the packer at the lower end was loosened. The 8-in. casing was then replaced.

A mineral analysis of a sample (Lab. No. 74747) collected June 23, 1934, showed the water to have a hardness of 124 mg/L, total dissolved minerals of 1781 mg/L, and an iron content of 0.0 mg/L.

A test well was constructed in July 1933 to a depth of 36 ft by Ira French, Fairbury. The test well was located on lot 6, block 20, on the south side of Locust St. between Sixth and Seventh Sts., approximately 1030 ft N and 300 ft W of the SE corner of Section 3, T26N, R6E. The test well was drilled 8 in. in diameter to a depth of 36 ft. It was cased with 8-in. drive pipe from about 2.5 ft above land surface to a depth of 29 ft. Upon completion, after 190 hr of pumping at a rate of 150 gpm, the water level was below the top of the pump from a nonpumping water level of 5 ft below land surface. Ten min after pumping was stopped, the water level raised 1 ft.

A second test well was constructed in 1933 to a depth of 33 ft by Ira French, Fairbury. The test well was located about 0.5 mile south of the city on the north side of Indian Creek in the NE quarter of Section 10, T26N, R6E.

WELL NO. 1, finished in sand and gravel of the Prairie Aquigroup, was completed in 1935 to a depth of 39 ft by J. Bolliger & Sons, Fairbury. This well is available for emergency use. The well is located south of the water plant on the east side of South First St., approximately 2400 ft N and 2595 ft W of the SE corner of Section 10, T26N, R6E. The land surface elevation at the well is approximately 675 ft.

A 12-in. diameter hole was drilled to a depth of 39 ft. The well is cased with 12-in. pipe from about 1 ft above the floor of a 6-ft deep pit to a depth of 24 ft followed by 15 ft of 12-in. Johnson screen. The screened section from top to bottom consists of 1 ft of No. 40 slot, 1 ft of No. 60 slot, 1 ft of No. 100 slot, and 12 ft of No. 125 slot. The top of the casing is equipped with a Whitewater pitless adapter extending about 3 ft above the pumphouse floor.

A production test was conducted by the State Water Survey on May 21, 1935. After pumping at a rate of 200 gpm, the drawdown was 3.65 ft from a nonpumping water level of 5.50 ft below land surface. Pumping was continued at a rate of 300 gpm with a drawdown of 5.90 ft. After additional pumping at a rate of 360 gpm, the drawdown was 7.50 ft.

In 1944, this well was treated with 600 lb of acid. The well was reportedly restored to its original specific capacity.

On April 25, 1946, the well reportedly produced about 300 gpm for 3 hr with a pumping water level of 11.7 ft. After pumping was stopped, the water level recovered to 4.9 ft.

In 1950, this well was treated with Calgon.

The pumping equipment presently installed is a Flygt-Sumo submersible pump set at 21.6 ft below the pit floor, rated at 200 gpm at about 55 ft head, and powered by a 5-hp, 3500 rpm Sumo electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B23474) of a sample collected November 26, 1979, after pumping for 24 hr at about 130 gpm, showed the water to have a hardness of 356 mg/L, total dissolved minerals of 399 mg/L, and an iron content of 0.49 mg/L.

WELL NO. 2, finished in sand and gravel of the Prairie Aquigroup, was completed in June 1935 to a depth of 40 ft by J. Bolliger & Sons, Fairbury. This well is available for emergency use. The well is located about 100 ft north of Well No. 1, approximately 2500 ft N and 2595 ft W of the SE corner of Section 10, T26N, R6E. The land surface elevation at the well is approximately 675 ft.

WELL NO. 2, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil	3	3
Coarse brown gravel	7	10
Gray sand	5	15
Gray gravel	2	17
Blue sand	4	21
Blue gravel	6	27
Blue sand	3	30
Blue gravel (coarse)	5	35
Blue gravel (fine)	3	38
Blue gravel (coarse)	2	40
Blue clay below		

A 12-in. diameter hole was drilled to a depth of 40 ft. The well is cased with 12-in. pipe from about 1 ft above the bottom of a 6-ft deep pit to a depth of 25 ft followed by 15 ft of 12-in. Cook screen. The screened section consists of 6 ft of No. 40 slot followed by 9 ft of

No. 125 slot. The top of the casing is equipped with a Whitewater pitless adapter extending about 3 ft above the pumphouse floor.

A production test was conducted by the State Water Survey on June 25, 1935. After pumping at a rate of 200 gpm, the drawdown was 10.05 ft from a nonpumping water level of 6.00 ft below land surface. Pumping was continued at a rate of 300 gpm with a drawdown of 15.40 ft. After additional pumping at a rate of 330 gpm, the drawdown was 17.80 ft.

A production test was conducted by the State Water Survey on April 25, 1946. After 20 min of pumping at a rate of 160 gpm, the drawdown was 14.1 ft from a nonpumping water level of 6.7 ft below the top of the casing.

On April 26, 1946, this well was treated with a total of 8 carboys (1000 lb) of muriatic acid. The well then reportedly produced 195 gpm with a drawdown of 11.6 ft after 20 min (a specific capacity increase of about 50 percent).

The pumping equipment presently installed is a Flygt-Sumo submersible pump set at 23.6 ft below the pit floor, rated at 200. gpm at about 55 ft head, and powered by a 5-hp, 3500 rpm Sumo electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B23471) of a sample collected November 26, 1979, after pumping for 24 hr at 120 gpm, showed the water to have a hardness of 359 mg/L, total dissolved minerals of 426 mg/L, and an iron content of 0.23 mg/L.

WELL NO. 3, finished in sand and gravel of the Prairie Aquigroup, was completed in June 1960 to a depth of 57 ft by Loren K. French, Fairbury. This well is available for emergency use. The well is located on the northeast corner of the water plant grounds, approximately 2890 ft N and 2330 ft W of the SE corner of Section 10, T26N, R6E. The land surface elevation at the well is approximately 675 ft.

WELL NO. 3, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil	2	2
Sandy clay	6	8
Sand - medium fine	10	18
Sand and gravel, medium to coarse	20	38
Gravel - coarse	19	57

A 16-in. diameter hole was drilled to a depth of 57 ft. The well is cased with 16-in. pipe from about 2.2 ft above land surface to a depth of 37 ft followed by 20 ft of 16-in. No. 80 slot Cook Everdur screen.

A production test was conducted on June 7, 1960, by representatives of the driller, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 7.7 hr of pumping at a rate of 500 gpm, the drawdown was 13.62 ft from a nonpumping water level of 10.50 ft below land surface. One hr after pumping was stopped, the water level had recovered to 11.14 ft. On the basis of the production test data, it was estimated that this well should yield 500 gpm (720,000 gpd) on a long-term basis if there is no interference from nearby wells.

In July 1977, fine sand was being pumped from the well. The well pump was pulled and about 4 ft of sand was found in the bottom of the well. The sand was removed and the well was redeveloped by surging and bailing for 8 hr.

In 1981, this well was acidized. The well was not improved and sand enters the well during pumping.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 2PB6) set at 45 ft, rated at 200 gpm, and powered by a 10-hp Red Jacket electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B23472) of a sample collected November 26, 1979, after pumping for 24 hr at 100 gpm, showed the water to have a hardness of 406 mg/L, total dissolved minerals of 474 mg/L, and an iron content of 0.72 mg/L.

A test well was constructed in 1976 to a depth of 54 ft by Loren K. French, Fairbury. The test well was located about 25 ft north and 300 ft east of Well No. 3, approximately 2875 ft N and 1950 ft W of the SE corner of Section 10, T26N, R6E.

WELL NO. 4, finished in sand and gravel of the Prairie Aquigroup, was completed in December 1976 to a depth of 52 ft by the J. P. Miller Artesian Well Co., Brookfield. The well is located about 330 ft east and 35 ft north of Well No. 3, approximately 2925 ft N and 2000 ft W of the SE corner of Section 10, T26N, R6E. The land surface elevation at the well is approximately 675 ft.

WELL NO. 4, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil	4	4
Brown, silty clay	6	10
Medium - coarse gravel and some sand	14.5	24.5
Fine - medium gravel	10.5	35
Sand and fine - medium gravel	5	40
Medium gravel	13	53
Gray clay		

A 30-in. diameter hole was drilled to a depth of 52 ft. The well is equipped with a Whitewater pitless adapter from about 7 ft above land surface to a depth of 4 ft and cased with 12-in. pipe from about 4 ft below land surface to a depth of 42 ft followed by 10 ft of 12-in. No. 93 slot Johnson screen. The annulus between the bore hole and casing-screen assembly is filled with earth backfill from 0 to 5 ft, with concrete from 5 to 15 ft, and with gravel from 15 to 52 ft. An earth berm surrounds the well.

A production test was conducted on December 7, 1976, by representatives of the driller, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 3 hr of pumping at rates ranging from 300 to 365 gpm, the final drawdown was 2.26 ft from a nonpumping water level of 14.20 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 14.63 ft. On the basis of the production test data, it was estimated that this well should yield 350 gpm (504,000 gpd) on a long-term basis.

The pumping equipment presently installed is a 7-in. Layne submersible pump set at 38 ft, rated at 350 gpm at about 108 ft TDH, and powered by a 15-hp, 1775 rpm Pleuger electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B34070) is for a water sample from the well collected February 20, 1979, after 48 hr of pumping at 350 gpm.

WELL NO. 4, LABORATORY NO. B34070

		mg/L	me/L		mg/L	me/L
Iron	Fe	0.72		Silica	SiO ₂	8.3
Manganese	Mn	0.62		Fluoride	F	0.3 0.02
Ammonium	NH ₄	<0.1		Boron	B	0.1
Sodium	Na	9	0.39	Cyanide	CN	< 0.005
Potassium	K	1.6	0.04	Nitrate	NO ₂	<0.4
Calcium	Ca	104	5.19	Chloride	Cl	19 0.54
Magnesium	Mg	43	3.54	Sulfate	SO ₄	146 3.04
				Alkalinity (as CaCO ₂)		268 5.36
Arsenic	As	0.003		Hardness (as CaCO ₂)		439 8.78
Barium	Ba	0.1		Total dissolved minerals		514
Cadmium	Cd	0.001				
Chromium	Cr	<0.005				
Copper	Cu	<0.005				
Lead	Pb	0.013				
Mercury	Hg	< 0.00001				
Nickel	Ni	<0.05				
Selenium	Se	< 0.001				
Silver	Ag	< 0.005				
Zinc	Zn	0.01		pH (as rec'd)		7.4

Test Hole No. 1-82 was constructed in 1982 to a depth of 60 ft by the Eaton Well Drilling Company, Tolono. It was located in the NE quarter of Section 10, T26N, R6E.

WELL NO. 5, finished in sand and gravel of the Prairie Aquigroup, was completed in August 1982 to a depth of 48 ft by Albrecht Well Drilling, Inc., Ohio. The well is located about 260 ft south-southeast of Well No. 3, approximately 2650 ft N and 2200 ft W of the SE corner of Section 10, T26N, R6E. The land surface elevation at the well is approximately 680 ft.

WELL NO. 5, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil	1	1
Clay	6	7
Gravel	41	48

A 30-in. diameter hole was drilled to a depth of 48 ft. The well is cased with 12-in. steel pipe from land surface to a depth of 36 ft followed by 12 ft of 12-in. No. 80 slot screen. The annulus between the bore hole and casing-screen assembly is filled with concrete and with No. 3 Muscatine gravel. The top of the casing is equipped with a pitless adapter.

A production test using one observation well (No. 1) was conducted on August 24, 1982, by representatives of the driller, the city, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 3 hr of pumping at rates ranging from 380 to 339 gpm, the final drawdown was 8.39 ft from a nonpumping water level of 9.85 ft below land surface. Twenty-nine min after pumping was stopped, the water level had recovered to 10.47 ft. On the basis of the production test data, the well appeared capable of sustaining a yield of 350 gpm.

The pumping equipment presently installed is a Goulds submersible pump set at 34 ft, rated at 350 gpm at about 75 ft TDH, and powered by a 10-hp Franklin electric motor.

A partial analysis of a sample (Lab. No. 217605) collected during the initial production test, after pumping for 2.3 hr at rates of 380 to 339 gpm, showed the water to have a hardness of 370 mg/L, total dissolved minerals of 426 mg/L, and an iron content of 0.2 mg/L.

FLANAGAN

The village of Flanagan (978) installed a public water supply in 1892. Two wells (Nos. 2 and 3) are in use and another well (No. 4) is available for emergency use. In 1950 there were 245 services, all metered; the estimated average pumpage was 54,000 gpd. In 1984 there were 432 services, all metered; the average pumpage was 82,300 gpd. The water is chlorinated: in addition, the water from Well Nos. 2 and 3 is fluoridated.

WELL NO. 1, finished in sand and gravel of the Prairie Aquigroup, was completed in 1892 to a depth of 170 ft. This well was abandoned prior to 1947 and sealed in 1956. The well was located approximately 2065 ft N and 1850 ft W of the SE corner of Section 22, T28N, R3E. The land surface elevation at the well is approximately 675 ft.

A 6-in. diameter hole was drilled to a depth of 170 ft. The well was cased with 6-in. iron pipe from about 1 ft above land surface to a depth of 164 ft followed by 6 ft of 6-in. screen.

Upon completion, the well reportedly flowed with a nonpumping water level of 11 ft above land surface.

In 1924, this well was capped when not in use to prevent water flowing to waste and drawing water from other wells.

A mineral analysis of a sample (Lab. No. 67048) collected July 30, 1930, showed the water to have a hardness of 96 mg/L, total dissolved minerals of 632 mg/L, and an iron content of 0.6 mg/L.

A well, finished in sand and gravel, was completed prior to 1913 to a depth of about 170 ft. This well, located near Well No. 1, was abandoned prior to 1947. The well was cased with 6-in. pipe to a depth of 164 ft followed by 6 ft of 6-in. screen. In 1930, it was reported that this well and Well No. 1 were interconnected and the wells flowed at a minimum of 1 gpm when they were not being pumped.

WELL NO. 2, finished in sand and gravel of the Prairie Aquigroup, was completed in May 1944 to a depth of 168 ft by Mike Ebert, Washington. The well is located in the village garage and fire station just east of the corner of South and Main Sts. about 40 ft west and 25 ft south of Well No. 1, approximately 2040 ft N and 1890 ft W of the SE corner of Section 22, T28N, R3E. The land surface elevation at the well is approximately 675 ft.

A 6-in. diameter hole was drilled to a depth of 168 ft. The well is cased with 6-in. cast iron pipe from

about 1 ft above the building floor to a depth of 163 ft followed by 5 ft of 6-in. screen.

Upon completion, the driller reported that the pumping rate was 100 gpm and the free flow was estimated to be about 20 gpm.

In December 1954, this well was treated with HTH.

In July and November 1976, this well was treated with "Nu-Well" with good results. The nonpumping water level was reported to be 25 ft below land surface.

In 1980, the nonpumping water level was reported to be 27 ft below the top of the casing.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 8MB-6) set at 147 ft, rated at 100 gpm at about 250 ft TDH, and powered by a 10-hp, 3450 rpm Red Jacket electric motor. The well is equipped with 147 ft of airline.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A3381) of a sample collected August 15, 1977, after pumping for 12 hr at 62 gpm, showed the water to have a hardness of 99 mg/L, total dissolved minerals of 630 mg/L, and an iron content of 0.2 mg/L.

WELL NO. 3, finished in sand and gravel of the Prairie Aquigroup, was completed in July 1972 to a depth of 164 ft by the M. Ebert Co., Washington. The well is located in the village park on South St., approximately 2030 ft N and 1290 ft W of the SE corner of Section 22, T28N, R3E. The land surface elevation at the well is approximately 675 ft.

WELL NO. 3, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Black top soil	3	3
Yellow and gray clay mixture	11	14
Gray clay, trace of sand and gravel	71	85
Green clay, trace of sand and gravel	7	92
Light brown sandy clay	8	100
Gray clay, trace of sand and gravel	39	139
Fine medium sand, trace of gravel	3	142
Gray clay, some sand and gravel (water bearing)	11.5	153.5
All grades of sand; trace of gravel (water bearing)	3	156.5
All grades of sand and gravel (water bearing)	7.5	164
Sandy clay below		

A 6-in. diameter hole was drilled to a depth of 164 ft. The well is cased with 6-in. black steel pipe from about 2.5 ft above land surface to a depth of 154.4 ft

followed by 9.6 ft (8 ft exposed) of 6-in. Cook red brass screen. The screened section consists of 2 ft of No. 30 slot followed by 6 ft of No. 50 slot.

A production test was conducted on July 13, 1972, by representatives of the driller, the village, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 3 hr of pumping at rates of 55 to 50 gpm, the final drawdown was 6.78 ft from a nonpumping water level of 10.57 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 11.23 ft. On the basis of the production test data, it was estimated that this well should yield 70 gpm (100,800 gpd) on a long-term basis.

The pumping equipment presently installed is a 4-stage Red Jacket submersible pump (Model No. 500T4-4MA6) set at 147 ft, rated at 85 gpm, and powered by a 5-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. A3382) is for a water sample from the well collected August 15, 1977, after 12 hr of pumping at 60 gpm. Hydrogen sulfide was apparent when a previous sample was collected.

WELL NO. 3, LABORATORY NO. A3382

		mg/L	me/L			mg/L	me/L
Iron	Fe	0.3		Silica	SiO ₂	14	
Manganese	Mn	0.00		Fluoride	F	0.6	0.03
Ammonium	NH ₄	3.08	0.17	Boron	B	0.5	
Sodium	Na	195.0	8.48	Cyanide	CN	0.02	
Potassium	K	2.0	0.05	Nitrate	NO ₂	0.0	0.00
Calcium	Ca	19.5	0.97	Chloride	Cl	12	0.34
Magnesium	Mg	12.0	0.99	Sulfate	SO ₄	120	2.50
				Alkalinity (as CaCO ₂)		385	7.70
Arsenic	As	0.002		Hardness (as CaCO ₂)		98	1.96
Barium	Ba	0.3		Total dissolved minerals		630	
Cadmium	Cd	0.00					
Chromium	Cr	0.03					
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0001					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		8.3	

WELL NO. 4, finished in sand and gravel of the Prairie Aquigroup, was completed in June 1977 to a depth of 173.5 ft by the M. Ebert Co., Washington. This well is available for emergency use. The well is

located at the corner of Edwards and Main Sts. about 50 ft north of the Illinois Central RR tracks, approximately 2595 ft S and 1940 ft W of the NE corner of Section 22, T28N, R3E. The land surface elevation at the well is approximately 675 ft.

WELL NO. 4, DRILLERS LOG

Strata	Thickness (ft)	Depth (ft)
Top soil	15	15
Yellow clay	13.5	15
Gray clay (traces of sand and gravel)	13	28
Soft yellow clay	16	44
Gray clay (traces of sand and gravel)	29	73
Yellowish green clay	4	77
Gray clay (traces of sand and gravel)	38	115
Soft gray clay - some sand and pea gravel	6	121
Gray clay (traces of sand and gravel)	42	163
Gravel and sand	2	165
Clay, sand and gravel	1	166
Dirty sand and gravel, mostly sand (not to shale)	7.5	173.5

A 6-in. diameter hole was drilled to a depth of 173.5 ft. The well is cased with 6-in. black steel pipe from about 1.2 ft above land surface to a depth of 167.5 ft followed by 6 ft of 6-in. Johnson stainless steel screen. The screened section consists of 3 ft of No. 16 slot followed by 3 ft of No. 12 slot. The top of the casing is equipped with a Baker pitless adapter.

A production test was conducted on June 30, 1977, by representatives of the driller, the village, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 3 hr of pumping at rates ranging from 60 to 45 gpm, the final drawdown was 10.07 ft from a nonpumping water level of 32.03 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 37.54 ft.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 500T4-5LB6, Serial No. HME-851) set at 156 ft, rated at 85 gpm at about 132 ft TDH, and powered by a 5-hp Red Jacket electric motor (Model No. 50074, Serial No. 4DNM). The well is equipped with 153 ft of airline.

A partial analysis of a sample (Lab. No. 205457) collected during the initial production test, after pumping for 3 hr at rates of 60 to 45 gpm, showed the water to have a hardness of 80 mg/L, total dissolved minerals of 543 mg/L, and an iron content of 0.3 mg/L.

FORREST

The village of Forrest (1246) installed a public water supply in 1895. Three wells are in use. In 1949 there were 274 services, 60 percent metered; the estimated average pumpage was 100,000 gpd. In 1984 there were 455 services, all metered; the average pumpage was 137,000 gpd. The water is aerated, settled, chlorinated, fluoridated, and filtered.

Initially, water was obtained from a dug well constructed about 1895 to an unknown depth. This well, located near the center of the village, was abandoned about 1901.

In 1901, two coal shafts were leased by the village. They were constructed about 1900 to depths of 80 ft each. This source of supply was abandoned about 1935. The shafts (30 ft apart) were located on the south side of the Toledo, Peoria & Western RR near the southwest corner of the village and about 75 ft from the South Fork of the Vermilion River, approximately 1200 ft N and 1200 ft W of the SE corner of Section 4, T26N, R7E. The upper part of the shafts were about 7 ft by 14 ft and cased with heavy lumber. Nonpumping water levels were reported to be 8 ft below land surface in 1916, and 6 to 8 ft in 1922. In 1930, the depth of the shafts was reported to be 48 or 49 ft below the top of the concrete curb and the non-pumping water level was 35 or 36 ft.

In 1932, at least 12 test holes were drilled by the Layne-North Central Co., Chicago. The test holes were located about 1.5 miles south of the village.

WELL NO. 1, finished in sand and gravel of the Prairie Aquigroup, was completed in March 1935 to a depth of 114 ft by the Layne-North Central Co., Chicago. This well is alternated weekly with Well No. 2. The well is located about 0.5 mile south of the village near the Vermilion River, approximately 2610 ft S and 1500 ft E of the NW corner of Section 10, T26N, R7E. The land surface elevation at the well is approximately 675 ft.

The well is cased with 30-in. outer pipe from about 6 ft above land surface to a depth of 99 ft and 18-in. inner pipe from about 6 ft above land surface to a depth of 99 ft and equipped with 25 ft of 18-in. (3/16-in. slots) Layne screen. A gravel wall surrounds the screen.

A production test was conducted by the State Water Survey on April 8, 1935. After 2.5 hr of pumping at a rate of 245 gpm, the drawdown was 13.2 ft from a non-pumping water level of 27.3 ft below land surface.

A second production test was conducted by the State Water Survey on May 27, 1935. After pumping at a rate of 143 gpm, the drawdown was 8.2 ft from a non-pumping water level of 36.5 ft below the pump base. Pumping was continued at a rate of 200 gpm with a drawdown of 13.5 ft. After additional pumping at a rate of 250 gpm, the final drawdown was 17.0 ft.

The pumping equipment presently installed consists of a 20-hp, 1800 rpm General Electric motor (Model No. 1F754, Serial No. 4828654) and an 8-in., 7-stage Layne turbine pump (No. 7184) set at 99 ft, rated at 250 gpm at about 195 ft TDH, and equipped with 99 ft of 6-in. column pipe. A 6-in. section of 6-in. suction pipe is attached to the pump intake. The well is equipped with 99 ft of airline.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B48062) is for a water sample from the well collected May 25, 1977, after 24 hr of pumping. Hydrogen sulfide and methane gas were apparent when previous samples were collected.

WELL NO. 1, LABORATORY NO. B48062

		mg/L	me/L			mg/L	me/L
Iron	Fe	2.7		Silica	SiO ₂	16	
Manganese	Mn	0.04		Fluoride	F	0.5	0.03
Ammonium	NH ₄	4.9	0.27	Boron	B	0.4	
Sodium	Na	45	1.96	Cyanide	CN	0.00	
Potassium	K	1.9	0.05	Nitrate	NO ₂	0.0	0.00
Calcium	Ca	78	3.89	Chloride	Cl	5.8	0.16
Magnesium	Mg	39	3.21	Sulfate	SO ₄	3	0.06
				Alkalinity (as CaCO ₂)		456	9.12
Arsenic	As	0.00		Hardness (as CaCO ₂)		365	7.30
Barium	Ba	0.3		Total dissolved minerals		481	
Cadmium	Cd	0.00					
Chromium	Cr	0.00					
Copper	Cu	0.00					
Lead	Pb	0.00					
Mercury	Hg	0.0000					
Nickel	Ni	0.0					
Selenium	Se	0.00					
Silver	Ag	0.00					
Zinc	Zn	0.0		pH (as rec'd)		7.4	

WELL NO. 2, finished in sand and gravel of the Prairie Aquigroup, was completed in September 1926 to a depth of 106 ft (101 ft effective depth) by the Layne-Bowler Co., Chicago. This well was purchased from the Wabash RR about 1959 and connected to the system in 1961. This well is alternated weekly with Well No. 1. The well is located about 0.5 mile south of the village and 15 ft east of the Wabash RR tracks, approximately 2600 ft S and 2600 ft W of the NE

corner of Section 10, T26N, R7E. The land surface elevation at the well is approximately 680 ft.

WELL NO. 2, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Yellow clay	8	8
Blue clay	7	15
Sand and gravel	4	19
Clay and gravel	11	30
Gumbo	5	35
Clay - gravel	6	41
Hardpan	11	52
Clay and sand	30	82
Sand and gravel	19	101
Clay	17	118

The well is cased with 30-in. outer pipe from land surface to a depth of about 77 ft and 18-in. inner pipe from about 4 ft above land surface to a depth of 81 ft followed by 20 ft of 18-in. Layne screen. A 5-ft length of 18-in. pipe extends below the screen from 101 to 106 ft. A gravel wall surrounds the screen.

In 1961, this well was reconditioned by the Layne-Western Co., Aurora.

In 1969, the nonpumping water level was reported to be 39 ft.

In 1970, this well was acidized by the Layne-Western Co. The well then reportedly produced 189 gpm with a drawdown of 28 ft from a nonpumping water level of 42 ft.

The pumping equipment presently installed is a 12-in., 6-stage Layne & Bowler turbine pump rated at 245 gpm, and powered by a 20-hp, 1200 rpm U. S. electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B144384) of a sample collected June 18, 1975, after pumping for 24 hr, showed the water to have a hardness of 373 mg/L, total dissolved minerals of 542 mg/L, and an iron content of 3.8 mg/L.

WELL NO. 3, finished in sand and gravel of the Prairie Aquigroup, was completed in February 1929 to a depth of 104.5 ft by the Judy Air-Made Well Co., Kansas City, Mo. This well was purchased from the Wabash RR about 1959 and connected to the system in

1961. The well is located about 200 ft east of Well No. 2, approximately 2600 ft S and 2400 ft W of the NE corner of Section 10, T26N, R7E. The land surface elevation at the well is approximately 690 ft.

WELL NO. 3, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Clay	18	18
Coarse sand	2	20
Gravel and hardpan	20	40
Hardpan and boulders	20	60
Blue clay	8	68
Silt and soft clay	8	76
Blue clay	6	82
Fine water sand	19	101
Blue clay	3.5	104.5

The well is cased with 30-in. outer pipe from the pumphouse floor to a depth of about 81 ft and 12-in. inner pipe from about 1.5 ft above land surface to a depth of 84.5 ft followed by 20 ft of 18-in. Layne screen. A gravel wall surrounds the screen.

In 1961, this well was reconditioned by the Layne-Western Co., Aurora.

A production test was conducted on September 21, 1984, by representatives of the village, the Swanson Well & Pump Service, Gibson City, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 3 hr of pumping at rates of 245 to 250 gpm, the final drawdown was 23.93 ft from a nonpumping water level of 44.15 ft below land surface. Thirty min after pumping was stopped, the water level had recovered to 46.81 ft. On the basis of the production test data, it was estimated that this well should yield 200 gpm (288,000 gpd) on a long-term basis.

The pumping equipment presently installed is a Red Jacket submersible pump (Model No. 1506R4-3PB6) set at 84 ft, rated at 225 gpm, and powered by a 15-hp electric motor.

A partial analysis of a sample (Lab. No. 220336) collected September 21, 1984, after pumping for 2.8 hr, showed the water to have a hardness of 375 mg/L, total dissolved minerals of 549 mg/L, and an iron content of 3.66 mg/L.

ODELL

The village of Odell (1083) installed a public water supply in 1898. One well (No. 3) is in use. In 1950 there were 300 services, 43 percent metered; the estimated average pumpage was 40,000 gpd. In 1984 there were 410 services, all metered; the average pumpage was 100,300 gpd. The water is aerated to remove hydrogen sulfide and chlorinated.

WELL NO. 1, open to the middle part of the Midwest Aquigroup (St. Peter Sandstone), was completed in 1898 to a depth of 1298 ft by the Ohio Drilling Co., Massillon, Ohio. This well was abandoned about 1950. The well is located at the intersection of Front and Elk Sts., approximately 1520 ft S and 970 ft E of the NW corner of Section 10, T29N, R6E. The land surface elevation at the well is approximately 720 ft.

WELL NO. 1, SAMPLE STUDY LOG

(furnished by the State Geological Survey)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM		
Pleistocene Series		
No record	168	168
PENNSYLVANIAN SYSTEM		
Missourian and Des Moinesian Series		
Shale, some limestone and thin sandstone beds	222	390
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Limestones	60	450
ORDOVICIAN SYSTEM		
Cincinnatian Series		
Maquoketa Group		
Shale and limestone	170	620
Galena and Platteville Groups		
Limestone	380	1000
Ancell Group		
St. Peter Sandstone	298	1298

The well is cased with 6-in. cast iron pipe from about 0.5 ft above the pump station floor to a depth of 1000 ft. Below the casing, the hole was finished 4 in. in diameter to the bottom.

Nonpumping water levels were reported to be 185 ft below land surface in 1914, and 250 ft in August 1923.

WELL NO. 2, open to the middle part of the Midwest Aquigroup (St. Peter Sandstone), was completed in March 1912 to a depth of 1360 ft (reported to be 1341 ft deep in November 1945) by the J. P. Miller Artesian Well Co., Brookfield. This well was abandoned prior to 1952 and sealed about 1904. The well

was located about 10 ft north of Well No. 1, approximately 1510 ft S and 970 ft E of the NW corner of Section 10, T29N, R6E. The land surface elevation at the well is approximately 720 ft.

WELL NO. 2, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Blue clay	168	168
Limestone	27	195
Shale	10	205
Coal	2	207
Shale (vein of coal at 275 ft)	68	275
Shale	95	370
Limestone	65	435
Sandy shale	64	499
Limestone	75	574
Shale	29	603
Hard limestone	263	866
Shale	4	870
Limestone	130	1000
Sandstone	360	1360

A 12-in. diameter hole was drilled to a depth of 410 ft, reduced to 10 in. between 410 and 1145 ft, and finished 8 in. in diameter from 1145 to 1360 ft. The well was cased with 12-in. pipe from about 3.2 ft above the pump station floor to a depth of 168 ft, 10-in. pipe from 164 ft to a depth of 410 ft, 8-in. pipe from 400 ft to a depth of 1110 ft, and 8.2-in. pipe from 1110 ft to a depth of 1145 ft.

Nonpumping water levels were reported to be 180 ft in 1937, and 209 ft below land surface in November 1945.

A mineral analysis of a sample (Lab. No. 110310) collected May 14, 1947, after pumping for 3 hr, showed the water to have a hardness of 149 mg/L, total dissolved minerals of 2389 mg/L, and an iron content of 0.4 mg/L. Hydrogen sulfide was apparent when previous samples were collected.

WELL NO. 3 was completed in May 1951 to a depth of 1940 ft by the Layne-Western Co., Aurora. The water-yielding unit in this well is the Midwest Aquigroup (Cambrian-Ordovician aquifer) down through the Eminence-Potosi Dolomite except for dolomites of the Galena and Platteville Groups. The well is located about 500 ft south of the water treatment plant on Front St., approximately 2000 ft S and 650 ft E of the NW corner of Section 10, T29N, R6E. The land surface elevation at the well is approximately 710 ft.

WELL NO. 3, SAMPLE STUDY LOG
(furnished by the State Geological Survey)

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>	<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM			Shakopee Dolomite		
Pleistocene Series			Dolomite, partly sandy, partly cherty, pale yellowish brown, fine to coarse	75	1515
Glacial drift			New Richmond Sandstone		
Till, grayish, brownish, olive gray; many samples mixed and/or missing	65	65	Sandstone, yellowish gray, fine to coarse	35	1550
Sand and gravel, silty, clayey	10	75	Oneota Dolomite		
Till, grayish brown to olive gray; clay; many samples mixed and/or missing	130	205	Chert; shale, gray, black, green, weak	15	1565
PENNSYLVANIAN SYSTEM			Dolomite, cherty, yellowish gray, fine to coarse; little shale, green, gray	80	1645
Missourian and Des Moinesian Series			Sandstone, white, fine to coarse; dolomite	5	1650
Shale, light gray, weak; little coal; no samples 245 to 250 ft, 290 to 295 ft	100	305	Dolomite, sandy, pale gray, fine to coarse	60	1710
Shale, silty, gray, weak; no sample 325 to 330 ft	55	360	Dolomite, yellowish gray, fine to medium	90	1800
SILURIAN SYSTEM			CAMBRIAN SYSTEM		
Niagaran and Alexandrian Series			Croixan Series		
Dolomite, white to gray, fine; calcite	30	390	Eminence-Potosi Dolomite		
Dolomite, grayish to brownish; limestone	35	425	Dolomite, pale yellowish brown, fine to medium; quartz; no samples 1880 to 1910 ft, 1915 to 1920 ft, and 1925 to 1930 ft	135	1935
ORDOVICIAN SYSTEM					
Cincinnatian Series					
Maquoketa Group					
Shale, light grayish green, weak	65	490			
Limestone, impure, brownish, fine to medium	70	560			
Shale, grayish to greenish, weak	35	595			
Champlainian Series					
Galena Group					
Limestone, yellowish brown, fine; few shaley surfaces	75	670			
Limestone, grayish to brownish, fine to coarse; dolomite; no sample 750 to 755 ft	90	760			
Dolomite, fine to coarse; limestone, fine	45	805			
Platteville Group					
Limestone, partly cherty, yellowish brown, lithographic to very fine; dolomite partly cherty, brownish, fine to coarse	170	975			
Ancell Group					
Glenwood Shale					
Shale, grayish, weak; limestone, fine	15	990			
St. Peter Sandstone					
Sandstone, partly silty, yellowish gray, very fine to medium, incoherent	80	1070			
Sandstone, as above, with silty streaks	100	1170			
Sandstone, fine to coarse, incoherent	70	1240			
Sandstone, very silty, fine to coarse, incoherent	95	1335			
Sandstone, yellowish gray to pink, loose	45	1380			
Conglomerate; sandstone; dolomite; shale	5	1385			
Shale, grayish to greenish, weak; dolomite	55	1440			
Canadian Series					
Prairie du Chien Group					

A 25-in. diameter hole was drilled to a depth of 14 ft, reduced to 17.2 in. between 14 and 172 ft, reduced to 15 in. between 172 and 1064 ft, reduced to 10 in. between 1064 and 1434 ft, and finished 8 in. in diameter from 1434 to 1940 ft. The well is cased with 25-in. pipe from 2 ft above land surface to a depth of 14 ft, 18-in. OD pipe from 3 ft above land surface to a depth of 172 ft, 10-in. steel pipe from about 0.2 ft above the wellhouse floor to a depth of 1064 ft (cemented in), and an 8-in. liner from 1372 ft to a depth of 1434 ft.

During drilling, when the well was at a depth of 1360 ft, a production test was conducted on March 21-22, 1951, by representatives of the driller, the village, the State Water Survey, and Warren & Van Praag, Consulting Engineers. After 23.4 hr of pumping at rates of 20 to 17 gpm, the drawdown was about 135 ft from a nonpumping water level of 215 ft.

A production test was conducted on May 1-2, 1951, by representatives of the driller, the village, the State Water Survey, and Warren & Van Praag. After 15.2 hr of pumping at rates ranging from 214 to 228 gpm, the drawdown was 8.0 ft from a nonpumping water level of 193.0 ft. Five min after pumping was stopped, the water level had recovered to 193.5 ft.

In October 1958, the well reportedly produced 370 gpm with a drawdown of 13 ft from a nonpumping water level of 192 ft below the pump base.

A production test was conducted by the driller on April 13, 1978. After 45 min of pumping at rates ranging from 230 to 190 gpm, the final drawdown was 8.5 ft from a nonpumping water level of 222.2 ft below the top of the casing.

In 1983, this well was shock chlorinated.

The pumping equipment presently installed is a Red Jacket submersible pump set at 296 ft, rated at 240 gpm, and powered by a 25-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B141779) is for a water sample from the well collected June 2, 1975, after 3 hr of pumping. Hydrogen sulfide was apparent when previous samples were collected.

WELL NO. 3, LABORATORY NO. B141779

		mg/L	me/L			mg/L	me/L
Iron	Fe	0.0		Silica	SiO ₂	11	
Manganese	Mn	0.0		Fluoride	F	1.8	0.10
Ammonium	NH ₄	1.2	0.07	Boron	B	1.1	
Sodium	Na	395	17.18	Cyanide	CN	0.00	
Potassium	K	17	0.44	Nitrate	NO ₂	0.39	0.01
Calcium	Ca	61	3.04	Chloride	Cl	52S	14.80
Magnesium	Mg	26	2.14	Sulfate	SO ₄	135	2.81
				Alkalinity (as CaCO ₂)		288	5.76
Arsenic	As	0.00		Hardness (as CaCO ₂)		259	5.18
Barium	Ba	0.1					
Cadmium	Cd	0.00		Total dissolved			
Chromium	Cr	0.00		minerals		1350	
Copper	Cu	0.00					
Lead	Pb	0.00		pH (as rec'd)		8.1	
Mercury	Hg	0.0000		Radioactivity			
Nickel	Ni	0.0		Alpha <i>pe/l</i>		24.2	
Selenium	Se	0.00		± deviation		7.8	
Silver	Ag	0.000		Beta <i>pe/l</i>		30.0	
Zinc	Zn	0.0		± deviation		5.7	

SAUNEMIN

The village of Saunemin (463) installed a public water supply in 1926. One well (No. 5) is in use and another well (No. 6) is available for emergency use. In 1950 there were 75 services, 96 percent metered; the estimated average pumpage was 12,000 gpd. In 1984 there were 190 services, 97 percent metered; the average pumpage was 29,500 gpd. The water is chlorinated and fluoridated.

WELL NO. 1, open to the Mississippi Valley Aquifer (dolomite of the Silurian System), was completed in July 1926 to a depth of 584 ft by Robert H. Kersey, South Bend, Ind. This well was disconnected from the system in 1976 and sealed in 1983. The well was located at the northeast corner of the village adjacent to the elevated tank on Park St., approximately 1700 ft N and 1840 ft W of the SE corner of Section 15, T28N, R7E. The land surface elevation at the well is approximately 692 ft.

WELL NO. 1, SAMPLE STUDY LOG

(furnished by the State Geological Survey)

Strata	Thickness (ft)	Depth (ft)
QUATERNARY SYSTEM		
Pleistocene Series		
"Clay, yellow"	205	205
PENNSYLVANIAN SYSTEM		
Missourian and Des Moinesian Series		
Shale, thin beds of limestone, sandstone, siltstone, and coal	180	385

Strata	Thickness (ft)	Depth (ft)
SILURIAN SYSTEM		
Niagaran and Alexandrian Series		
Dolomite, shaly	70	455
Dolomite	86	541
Dolomite, shaly, some shale	43	584

A 10-in. diameter hole was drilled to a depth of 400 ft and finished 8 in. in diameter from 400 to 584 ft. The well was cased with 10-in. pipe from 2 ft above land surface to a depth of 253 ft and 8-in. pipe from about 253 ft to a depth of 400 ft.

A production test was conducted on July 26, 1926, by representatives of the driller, the State Water Survey, and Taylor and Woltman, Consulting Engineers. After 3 hr of pumping at rates of 28 to 19 gpm, the pumping water level was 282.5 ft. Thirteen hr after pumping was stopped, the water level had recovered to 118.0 ft.

On August 7, 1945, the nonpumping water level was reported to be 145 ft below the pump base.

In October 1947, this well was acidized by the Halliburton Co., Flora. The production capability was increased to 20 gpm.

About 1967, this well was acidized.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B16601) is for a water sample from the well collected October 2, 1972, after 1 hr of pumping at 14 gpm.

WELL NO. 1, LABORATORY NO. B10601

		my/l	me/L		mg/L	me/L
Iron	Fe	1.41	0.05	Silica	SiO ₂	7.0
Manganese	Mn	0.00	0.00	Fluoride	F	5.0 0.26
Ammonium	NH ₄	1.2	0.07	Boron	B	2.05
Sodium	Na	1000.0	43.5	Nitrate	NO ₂	0.00 0.00
Potassium	K	10.5	0.27	Chloride	Cl	1050.0 29.61
Calcium	Ca	11.0	0.55	Sulfate	SO ₄	98.0 2.04
Magnesium	Mg	6.5	0.54	Alkalinity (as CaCO ₂)		622.0 12.44
Arsenic	As	0.00		Hardness (as CaCO ₂)	54	1.08
Barium	Ba	0.0		Total dissolved minerals		2608
Cadmium	Cd	0.00		pH (as rec'd)	8.4	
Chromium	Cr	0.00		Radioactivity		
Copper	Cu	0.01		Alpha <i>pe/l</i>	12.1	
Lead	Pb	0.00		± deviation	9.1	
Mercury	Hg	0.0000		Beta <i>pe/l</i>	28.4	
Nickel	Ni	0.0		± deviation	9.1	
Selenium	Se	0.00				
Silver	Ag	0.0				
Zinc	Zn	0.10				

WELL NO. 2, open to the Upper Bedrock Aquigroup (sandstone of the Pennsylvanian System), was completed in April 1945 to a depth of 198 ft by Ira French, Fairbury. This well was abandoned in 1948 and has been plugged. The well was located at the east end of Center St. about 3 blocks south of Well No. 1, approximately 390 ft N and 1600 ft W of the SE corner of Section 15, T28N, R7E. The land surface elevation at the well is approximately 688 ft.

WELL NO. 2, DRILLERS LOG

Strata	Thickness (ft)	Depth (ft)
Drift	178	178
Sandstone	20	198

An 8-in. diameter hole was drilled to a depth of 198 ft. The well was cased with 8-in. pipe from land surface to a depth of 178 ft.

Upon completion, the nonpumping water level was reported to be 20 ft below land surface. When pumping at 15 gpm or less, a steady flow was produced, but when exceeding 15 gpm the pump broke suction.

A mineral analysis of a sample (Lab. No. 110182) collected May 5, 1947, after pumping for 24 hr, showed the water to have a hardness of 98 mg/L, total dissolved minerals of 474 mg/L, and an iron content of 1.2 mg/L.

WELL NO. 3, open to the Mississippi Valley Aquigroup (dolomite of the Silurian System), was completed in October 1958 to a depth of 589 ft by the Layne-Western Co., Aurora. This well was abandoned in 1969 and sealed in 1983. The well was located about 20 ft east of Well No. 1, approximately 1700 ft N and

1820 ft W of the SE corner of Section 15, T28N, R7E. The land surface elevation at the well is approximately 692 ft.

WELL NO. 3, DRILLERS LOG

Strata	Thickness (ft)	Depth (ft)
Top soil	1.5	1.5
Yellow-brown clay	1.5	3
Brownish-gray clay	6	9
Blue gray clay	22	31
Sandy blue gray clay, gravel embedded	4	35
Soft blue gray clay	8	43
Loose fine to coarse sand	1.5	44.5
Hard gray clay	2	46.5
Sand to fine gravel (streaks of clay)	2	48.5
Loose fine sand to fine gravel	3	51.5
Gray clay	1	52.5
Loose fine sand to medium gravel	1	53.5
Soft gray clay	4.5	58
Loose fine sand	1	59
Sandy clay	19	78
Dirty fine sand to fine gravel, tight, streaks of clay	3	81
Loose fine sand to fine gravel (fairly clean)	2.5	83.5
Dirty fine sand to fine gravel, tight, streaks of clay	3.5	87
Hard sandy gray clay, gravel embedded	19	106
Hard gray clay, gravel embedded	7	113
Soft silty clay	4	117
Hard gray clay, occasional large stones	8.5	125.5
Loose fine to coarse sand	1	126.5
Extra hard gray clay, boulder 134 to 135 ft	11.5	138
Fine to coarse sand	1	139
Hard gray clay	0.5	139.5
Loose fine sand to medium coarse gravel	3.5	143
Soft gray brown clay, occasional sand and gravel embedded	48	191
Very soft green and red clay, thin streaks of gravel	6	197
Soft light blue shale	6	203
Soft light blue shale, streaks of lime and coal	37	240
Soft black shale, streaks of coal	21	261
Hard red shale	5	266
Fairly hard multicolor, red shale, some coal	9	275
Soft green shale	23	298
Hard blue gray shale, thin streaks of lime	29	327
Soft coal	9	336
Coal shale and sandstone	3	339
Sandstone and chert	6	345
Chert and sandstone	13	358
Gray shale, thin streaks of sand and lime	12	370
Very soft light gray shale or soapstone	13	383
Green shaly limestone, hard	7	390
Limestone	197	587
Shale	2	589

A 12-in. diameter hole was drilled to a depth of 200 ft, reduced to 10 in. between 200 and 390 ft, and finished 8 in. in diameter from 390 to 589 ft. The well was cased with 8-in. pipe from 1.5 ft above land surface to a depth of 390 ft.

In October 1961, this well was acidized by the Layne-Western Co.

A partial analysis of a sample (Lab. No. 148064) collected in November 1958, after pumping for 8 hr at 30 gpm, showed the water to have a hardness of 48 mg/L, total dissolved minerals of 2573 mg/L, and an iron content of 0.7 mg/L.

WELL NO. 4, finished in sand and gravel of the Prairie Aquigroup, was completed in October 1963 to a depth of 39.2 ft by Clarence Immke, Saunemin. This well was disconnected from the system prior to 1982 and sealed in 1983. The well was located at the intersection of Routes 47 and 116 west of the village, approximately 375 ft S and 205 ft E of the NW corner of Section 22, T28N, R7E. The land surface elevation at the well is approximately 675 ft.

WELL NO. 4, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Yellow clay	5	5
Dark clay	5	10
Yellow mixed with blue clay	5	15
Blue clay	5	20
Blue clay mixed with gravel	5	25
Gravel (no water)	5	30
Water-bearing sand and gravel (fairly fine water-bearing sand at about 35 ft)	5	35
Sand and gravel	5	40

A 6-in. diameter hole was drilled to a depth of 39.2 ft. The well was cased with 6-in. pipe from 3 ft above land surface to a depth of 27.2 ft followed by 12 ft of 6-in. No. 25 slot Johnson screen. The top of the casing was equipped with a pitless adapter.

A production test using one observation well was conducted on October 22, 1963, by representatives of the village, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 2.6 hr of pumping at a rate of 28 gpm, the drawdown was 11.86 ft from a nonpumping water level of 9.15 ft below land surface. One hr after pumping was stopped, the water level had recovered to 17.62 ft. On the basis of the production test data, it was estimated that this well should yield about 5 gpm (7200 gpd) on a long-term basis.

A partial analysis of a sample (Lab. No. 161462) collected during the initial production test, after pumping for 2.5 hr at 28 gpm, showed the water to have a hardness of 392 mg/L, total dissolved minerals of 498 mg/L, and an iron content of 1.8 mg/L.

WELL NO. 5, finished in sand and gravel of the Prairie Aquigroup, was completed in November 1964 to a depth of 183 ft by Clarence Immke, Saunemin. The

well is located about 0.2 mile northwest of the village, approximately 2250 ft N and 1550 ft E of the SW corner of Section 15, T28N, R7E. The land surface elevation at the well is approximately 680 ft.

WELL NO. 5, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
No record	90	90
Clay, hard, mixed with small and medium-sized gravel	81	171
Sand, coarse sand and gravel (water bearing)	12	183
Hard clay	2	185

A 5-in. diameter hole was drilled to a depth of 183 ft. The well is cased with 5-in. pipe from 2.6 ft above land surface to a depth of 171 ft followed by 12 ft of 5-in. No. 25 slot Johnson brass screen. The top of the casing is equipped with a pitless adapter.

A production test was conducted on October 10, 1969, by representatives of the village, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 2 hr of pumping at rates of 23 to 24 gpm, the drawdown was 7.65 ft from a nonpumping water level of 34.33 ft below land surface. Fourteen min after pumping was stopped, full recovery was observed. On the basis of the production test data, it was estimated that this well should yield 35 gpm (50,400 gpd) on a long-term basis.

In August 1976, this well was acidized by Ira French, Fairbury. A slight improvement in the yield was reported.

The pumping equipment presently installed is a Goulds submersible pump set at 160 ft, rated at 30 gpm, and powered by a 2-hp Franklin electric motor.

A mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B47776) of a sample collected May 24, 1977, after pumping for 24 hr at 23 gpm, showed the water to have a hardness of 247 mg/L, total dissolved minerals of 586 mg/L, and an iron content of 1.39 mg/L.

WELL NO. 6, finished in sand and gravel of the Prairie Aquigroup, was completed in July 1977 to a depth of 184 ft by Loren K. French, Fairbury. This well is available for emergency use. The well is located at the northwest corner of the village about 700 ft west of the Wabash RR tracks, approximately 2250 ft N and 1650 ft E of the SW corner of Section 15, T28N, R7E. The land surface elevation at the well is approximately 680 ft.

WELL NO. 6, DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
Top soil	3	3
Yellow clay	12	15
Blue clay	30	45
Blue sandy clay	15	60
Blue clay	40	100
Sandy clay with gravel streaks	10	110
Blue clay	20	130
Sandy clay	5	135
Hard blue clay	30	165
Sandy clay	5	170
Fine sand	1	171
Medium to coarse sandy gravel	6	177
Sand with clay	1	178
Medium sand and gravel	6	184
Clay	1	185

An 8-in. diameter hole was drilled to a depth of 185 ft. The well is cased with 8-in. pipe from 2.2 ft above land surface to a depth of 171 ft followed by 13 ft of 8-in. Johnson stainless steel screen. The screened section from top to bottom consists of 6 ft of No. 50 slot, 2 ft of blank pipe, and 5 ft of No. 50 slot. A 6-ft length of 6-in. ID pipe with lead packer at the top extends from the top of the screen into the casing. The top of the casing is equipped with a Baker pitless adapter.

A production test was conducted on July 26, 1977, by representatives of the driller, the village, the State Water Survey, and Farnsworth & Wylie, Consulting Engineers. After 3 hr of pumping at a rate of 40 gpm, the drawdown was 4.03 ft from a nonpumping water level of 36.03 ft below land surface. Thirty min after

pumping was stopped, the water level had recovered to 36.35 ft. On the basis of the production test data, it was estimated that this well would yield 115 gpm (165,600 gpd) on a long-term basis.

The pumping equipment presently installed is a Red Jacket submersible pump set at 100 ft, rated at 40 gpm at about 195 ft TDH, and powered by a 3-hp Red Jacket electric motor.

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B16271) is for a water sample from the well collected October 10, 1979, after 5 hr of pumping at 45 gpm.

WELL NO. 8, LABORATORY NO. B18271

		<i>mg/L</i>		<i>me/L</i>	<i>mg/L</i>	<i>me/L</i>
Iron	Fe	1.72	Silica	SiO ₂	15	
Manganese	Mn	0.022	Fluoride	F	0.67	0.04
Ammonium	NH ₄	7.1	Boron	B	0.4	
Sodium	Na	105	Cyanide	CN	< 0.005	
Potassium	K	2.6	Nitrate	NO ₂	< 0.4	
Calcium	Ca	55	Chloride	Cl	12	0.34
Magnesium	Mg	27	Sulfate	SO ₄	88	1.83
Strontium	Sr	0.66	Alkalinity (as CaCO ₂)		404	8.08
Arsenic	As	0.008	Hardness (as CaCO ₂)		248	4.96
Barium	Ba	0.3				
Cadmium	Cd	< 0.0005	Total dissolved			
Chromium	Cr	< 0.005	minerals		555	
Cobalt	Co	0.015				
Copper	Cu	0.012				
Lead	Pb	0.01				
Mercury	Hg	< 0.00005				
Nickel	Ni	0.015				
Selenium	Se	< 0.001				
Silver	Ag	< 0.005				
Zinc	Zn	0.019	pH (as rec'd)	7.5		

STRAWN

The village of Strawn (143) installed a public water supply in 1911. One well is in use. In 1949 there were 56 services, none metered. In 1984 there were 58 services, none metered; the average pumpage was 14,600 gpd. The water is chlorinated and fluoridated.

The first well was completed in 1895 to a depth of 40 ft. This well was abandoned in 1909. The well was located in the village hall on the north side of Herman St. An 8-ft diameter hole was dug to a depth of 40 ft.

A second well was completed in 1909 to a depth of 45 ft by Mel Cook. This well, located on the west side of the park near the center of the village, was aban-

doned prior to 1938. A 6-in. diameter hole was drilled to a depth of 45 ft. The well was cased with 6-in. pipe to a depth of 40 ft followed by 5 ft of 6-in. screen. The screened section consisted of 1/4-in. holes spaced 1/2 in. center to center. In 1915, the nonpumping water level was reported to be 20 ft below land surface.

WELL NO. 1, finished in sand and gravel of the Prairie Aquigroup, was completed in May 1933 to a depth of 60 ft by John Bolliger, Fairbury. The well is located adjacent to the elevated tank within the village hall, approximately 2150 ft N and 2200 ft E of the SW corner of Section 3, T25N, R7E. The land surface elevation at the well is approximately 770 ft.

The well is cased with 6-in. pipe from about 2 ft above the pumphouse floor and reportedly equipped with 5 ft of 6-in. screen having 1/4-in. holes.

In 1947, the nonpumping water level was reported to be 15 to 20 ft below land surface.

The pumping equipment presently installed is a Peerless turbine pump set at about 50 ft, rated at 50 gpm, and powered by a 5-hp 3600 rpm U. S. electric motor (Serial No. 2455594).

The following mineral analysis made by the Illinois Environmental Protection Agency (Lab. No. B21648) is for a water sample from the well collected November 13, 1979, after pumping at 50 gpm.

WELL NO. 1, LABORATORY NO. B21848

		mg/L	me/L		mg/L	me/L
Iron	Fe	1.67		Silica	SiO ₂	12
Manganese	Mn	0.070		Fluoride	F	0.25 0.01
Ammonium	NH ₄	0.2	0.01	Boron	B	0.3
Sodium	Na	19	0.83	Cyanide	CN	< 0.005
Potassium	K	2.2	0.06	Nitrate	NO ₂	< 0.4
Calcium	Ca	85	4.24	Chloride	Cl	16 0.45
Magnesium	Mg	39	3.21	Sulfate	SO ₄	91 1.89
Strontium	Sr	0.57		Alkalinity (as CaCO ₂)		290 5.80
Arsenic	As	0.002		Hardness (as CaCO ₂)		367 7.34
Barium	Ba	0.08		Total dissolved minerals		439
Cadmium	Cd	0.001				
Chromium	Cr	< 0.005				
Cobalt	Co	< 0.005				
Copper	Cu	< 0.005				
Lead	Pb	0.01				
Mercury	Hg	< 0.00005				
Nickel	Ni	< 0.005				
Selenium	Se	< 0.001				
Silver	Ag	< 0.005				
Zinc	Zn	0.057				
				pH (as rec'd)		7.5

WILLIAM W. FOX DEVELOPMENTAL CENTER

William W. Fox Developmental Center (est. 500), located in the center of Dwight, installed a public water supply in 1912. Water for this supply is obtained from the village of Dwight. In 1969, with a population of 580, the estimated average pumpage was 20,000 gpd. In 1983, with a population of 500, the average pumpage was 30,000 gpd. The water is aerated, chlorinated, settled, filtered, softened, and treated for corrosion control. The water is fluoridated by the village of Dwight.

Prior to receiving water from the village of Dwight, water was obtained from a well completed in 1912 to a depth of 1077 ft. This well was abandoned and sealed in 1961. The well was located in the pump room of Building No. 3, about 265 ft south of Mazon Ave. and 140 ft east of Prairie Ave., approximately 265 ft S and 2200 ft W of the NE corner of Section 9, T30N, R7E.

CORRELATED DRILLERS LOG

<i>Strata</i>	<i>Thickness (ft)</i>	<i>Depth (ft)</i>
QUATERNARY SYSTEM		
Pleistocene Series		
Gravel, clay and sand	157	157
PENNSYLVANIAN SYSTEM		
Des Moinesian Series		
Shale	44	201
Limestone	3	204
Shale	36	240
Coal and shale (Coal No. 2)	10	250
Shale	45	295
ORDOVICIAN SYSTEM		
Cincinnatian Series		
Maquoketa Group		
Limestone	53	348
Shale	61	409
Champlainian Series		
Galena and Platteville Groups		
Limestone	386	795
Ansell Group		
St. Peter Sandstone		
Sandstone	251	1046
Shale	9	1055
Canadian Series		
Prairie du Chien Group		
Limestone	22	1077