

from salts in the Coldwater Shale that were deposited from the salty seas which covered the area millions of years ago during Mississippian time.

General Suitability of the Water in the County

Most ground and surface water in the county is hard to very hard. Locally, iron is a problem in well water. Water from streams and lakes is mostly free of dissolved iron, and generally softer than well water. "Salty water" or chlorides occurs in water from a number of wells finished in the Coldwater Shale. Water from wells can be processed through softeners to reduce the hardness and iron content. Chlorides (salty water) however, cannot be removed economically with present-day methods.

Quality of Water from Wells

Hundreds of samples of water from wells were collected and analyzed in the field or in the laboratory. The areal distribution of these selected sites is shown in figure 28.

The results of the field analyses are included in table 3 (in appendix), and the results of laboratory analyses are in table 8 (in appendix).

The only significant problems with ground-water quality in the county at present are excessive hardness, iron, and some chlorides. Although sulfates are present, they generally are not a problem to most users.

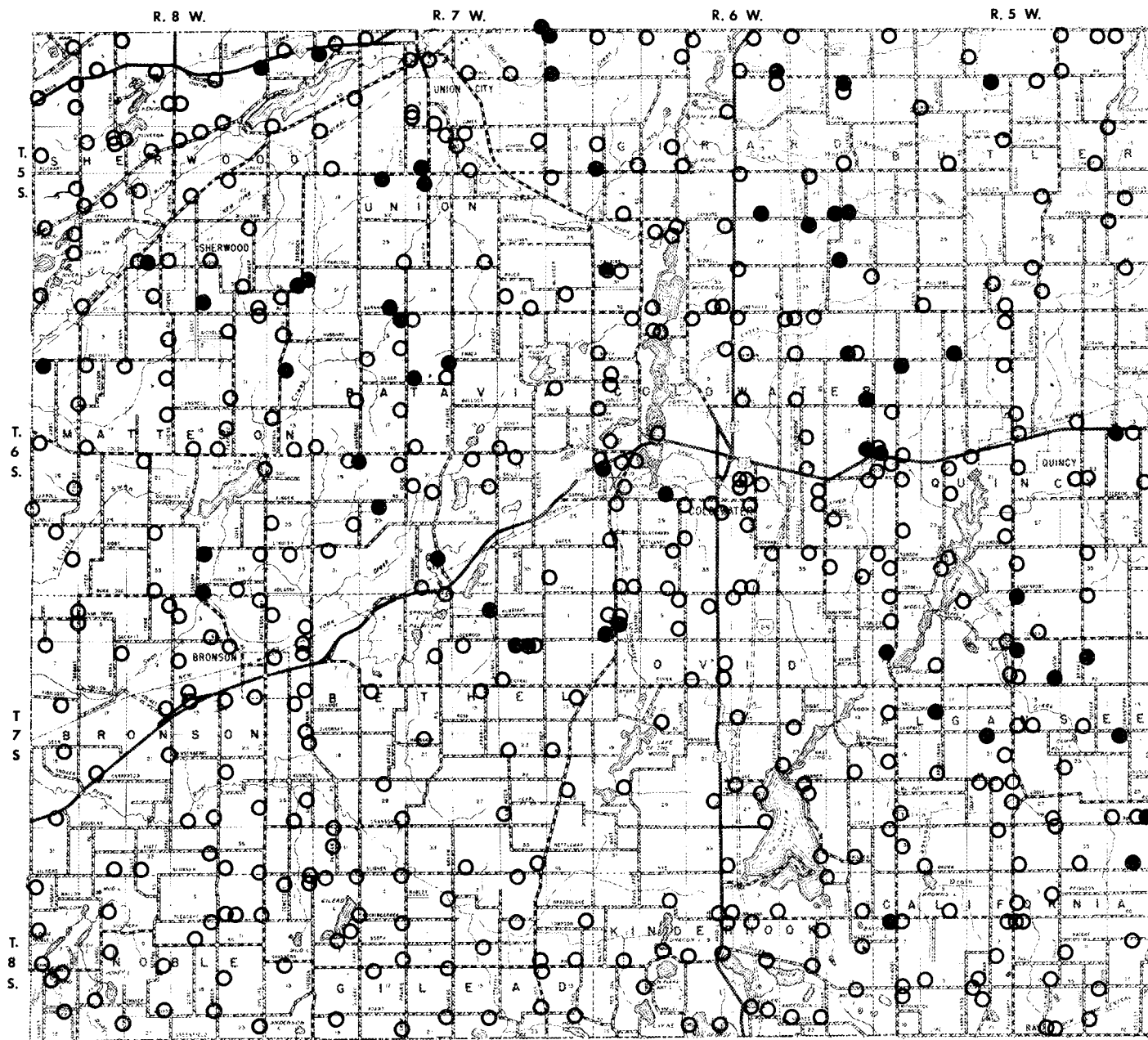


Figure 28. Selected wells sampled for water quality data.

The County Health Department encourages families with infants to submit samples of their well water for analysis to determine nitrate content, as concentrations in excess of 45 ppm can cause methemoglobinemia, a blood disorder, which can be fatal to infants. Fortunately, no cases of this high a concentration of nitrates have been reported to date.

The relation between specific conductance (Tables 3, 8, 9, 10) and the amount of dissolved mineral solids is

shown graphically in figure 29. This relation is useful in detecting changes in quality of water where monitoring is desirable. Further field or laboratory analyses can then be made to determine the minerals causing the change in conductance.

The variations in hardness, iron, and chloride in water from wells are generalized on maps (figs. 30-32) and discussed below.

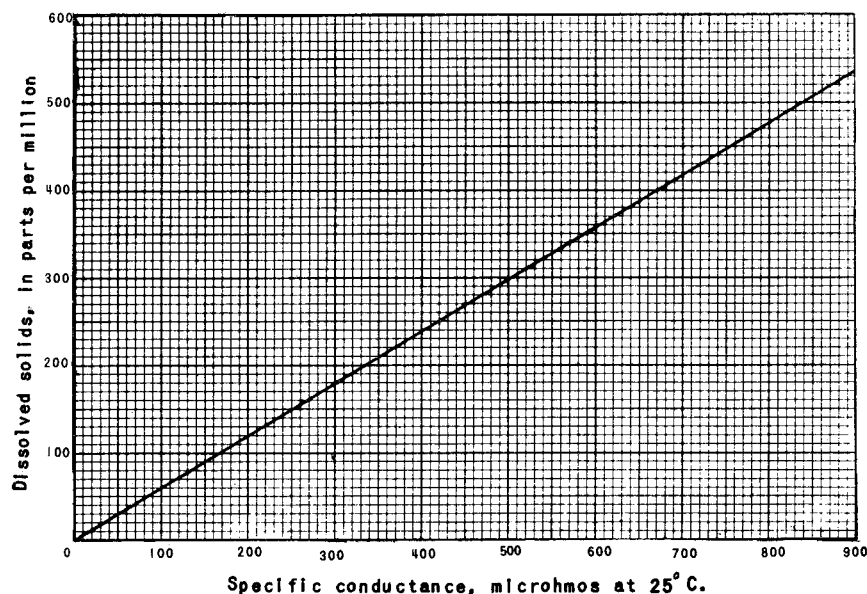


Figure 29. Relation of dissolved solids to specific conductance in wells and streams of Branch County.

Hardness in Water from Wells

The hardness of well waters sampled in the county ranged from as little as 33 parts per million (ppm) to as much as 1,200 ppm. The areal distribution of hardness in the county is shown in figure 30. Based on some 500 samples, well water averaged about 300 ppm (17 grains) hardness with most ranging from 200 to 400 ppm. The U. S. Geological Survey classified hardness, in terms of the amount of calcium carbonate or its equivalent that would be formed if the water were evaporated, as follows:

Parts per million	
0-60 -----	Soft
61-120 -----	Moderately hard
121-180 -----	Hard
More than 180 -----	Very hard

If a gallon of water containing 500 ppm hardness were boiled away, a residue of about 1/16 ounce of limy material would be left.

Hardness is a problem common to most ground water in the county. The harder water usually occurs in moraines and till; the softer water in Coldwater Shale. Softer water in the Coldwater may be the result of sodium ions in the shale replacing the calcium and magnesium ions to create a softer sodium bicarbonate water -- a reaction that is very similar to the one occurring in common domestic water softeners. However, the softer water found in the shale may contain objectionable amounts of chlorides.

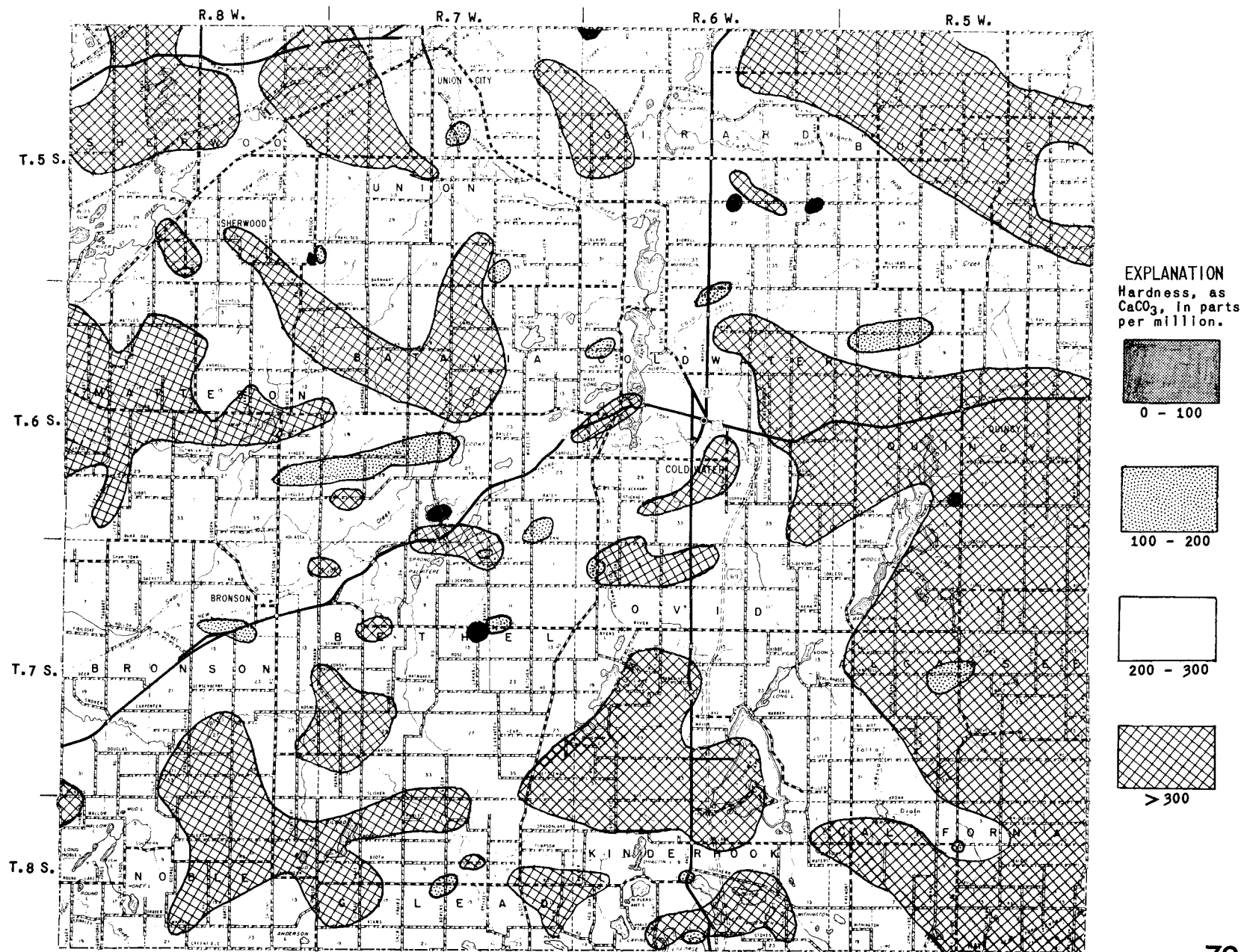


Figure 30. Distribution of hardness in ground water.

Iron in Water from Wells

Iron in excess of about 0.3 ppm is a problem with water from many wells in the county (fig. 31). Dissolved iron oxidizes upon exposure to air and results in reddish-brown sediments and stains.

Use of water softeners and iron removal equipment seems to be the most practical solution to problems of hardness and iron content. There is no apparent correlation of either hardness or iron content with depth of wells, so it may be futile to drill shallower or deeper wells in the hope of obtaining better water.

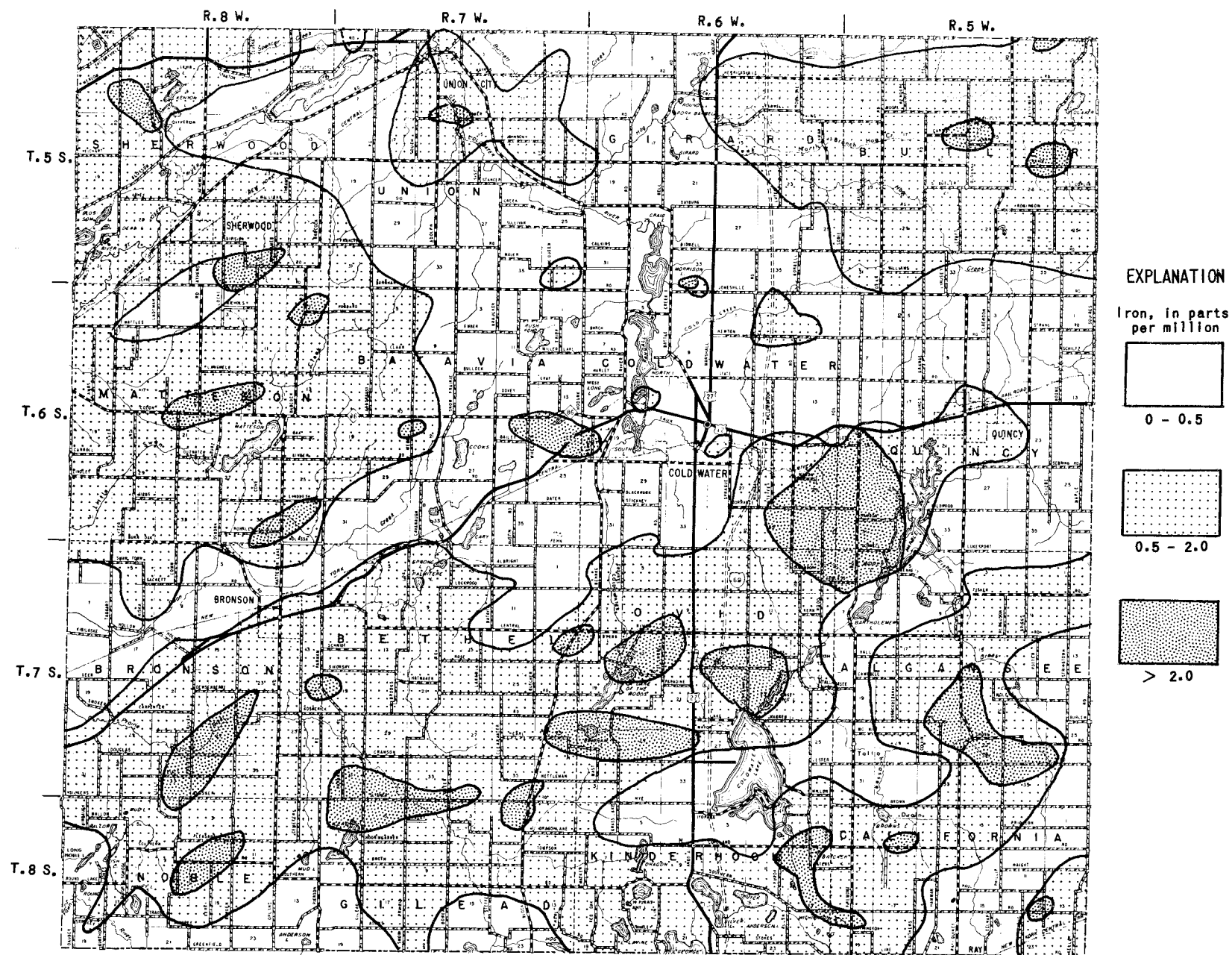


Figure 31. Distribution of iron in ground water.

Chlorides in Water from Wells

Water containing high chlorides usually is associated with the Coldwater Shale and problems of high chlorides or "salty water" are typical of areas where the Coldwater is near the land surface. Very few incidents of high chlorides were found in wells finished in glacial drift. The concentrations of chlorides in wells is shown on figure 32. The areas of high chlorides are generalized and further study is needed for accurate delineation. Where salty water is encountered in glacial drift wells, it may be the result of ground water infiltration from nearby bedrock highs. Normally, water from wells in glacial drift contain concentrations of chlorides varying from 5 to 15 parts per million. In a few cases, moderately high chlorides in shallow wells may be an indication of contamination from sewage disposal systems, industrial wastes, or possibly from oil field operations with improperly plugged wells.

As there is no inexpensive way to eliminate salt from water at present, wells should not be drilled to obtain water supplies from the Coldwater Shale in areas where the water in the shale is salty (see fig. 32). Properly constructed dug wells in the glacial drift overlying the shale would be one solution. Screening the well above the shale even though the well penetrated shale would perhaps in some cases introduce a freshwater head on top of the salty water, or dilute the salt content to reasonable proportions. The drinking water limits by the U. S. Public Health Service recommends not over 250 parts per million of chlorides in water. However, water for stock could probably exceed this limit. Persons who are on salt-free diets probably should import their drinking water from a more potable source.

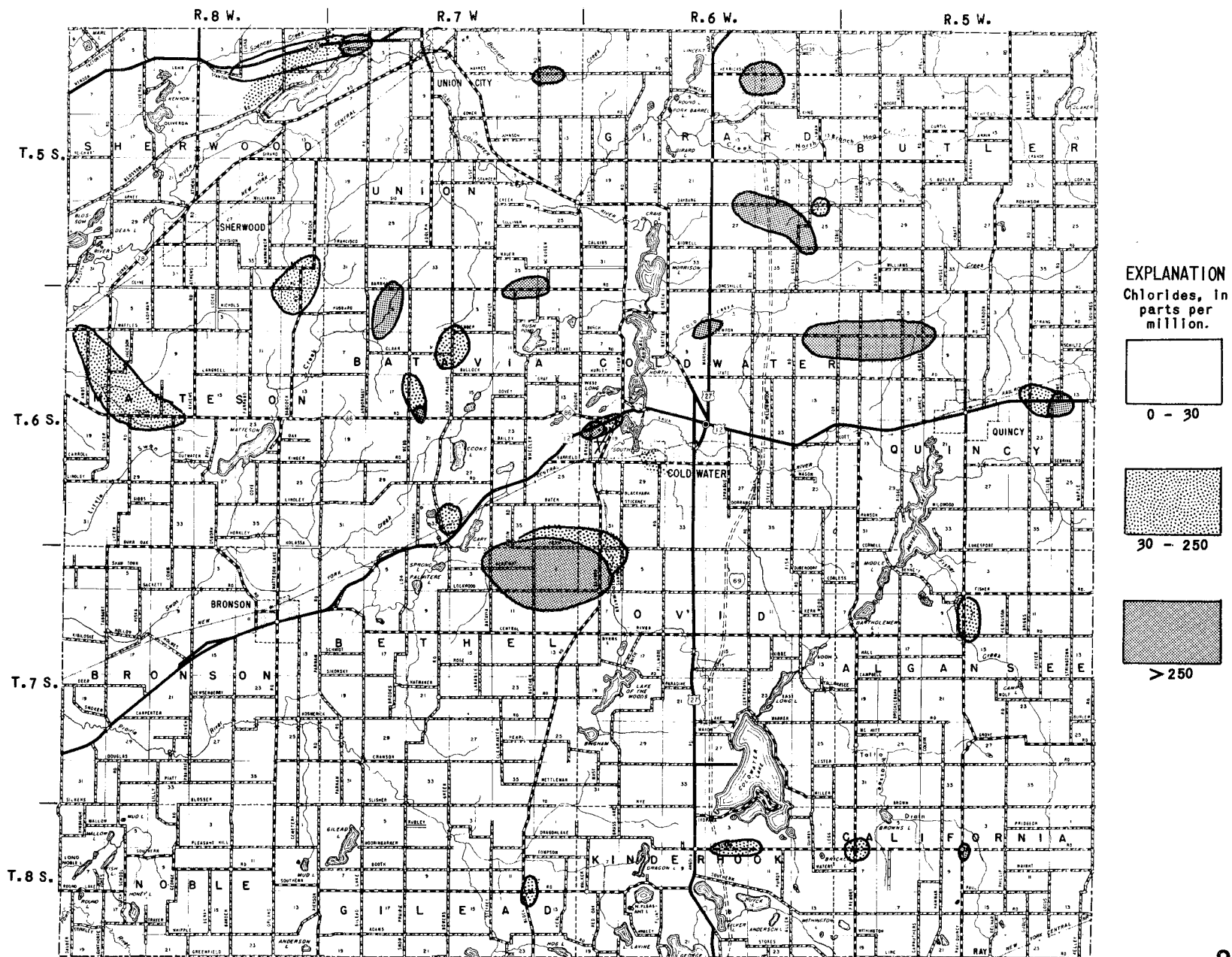


Figure 32. Distribution of chlorides in ground water.

Quality of Water from Streams

Water from streams in Branch County is generally softer than ground water, with virtually no iron and little chloride in solution (table 9, in appendix). The chemical quality of water from streams is summarized below.

Constituent or property	Maximum	Minimum	Median
Sulphate (SO_4)	194	52	84
Chloride (Cl)	36	1	10
Dissolved solids	565	240	336
Total hardness (as CaCO_3)	448	186	270
pH	8.4	6.6	7.7
(Results in parts per million except pH)			

The concentrations of hardness and chloride increase somewhat during periods of dry weather when the streams are fed almost entirely by ground-water seepage. During periods of heavy runoff from intense precipitation the stream water is less mineralized.

Large variations in quality may result from contaminants introduced to the streams by sewage, by runoff from swampy areas which increases sulfate content, and by introduction of industrial wastes. For example, a large increase in chlorides may be introduced into a stream by back washing and discharge in softening processes

by public or industrial plants. An example is the drain at the Coldwater State Home and Training School which empties into Cold Creek to the north. In another case, a large increase in sulfates in Swan Creek, Fisher Creek, and Tallahassee Drain occurred in the spring of 1965 when heavy precipitation flushed sulfate-laden materials from swamps into these streams.

What Can Be Done About Contamination of Streams by Sewage and Other Wastes?

Contamination of streams can best be detected by periodic sampling and analysis of the water. If contamination is found to exceed tolerable limits, the State Water Resources Commission should be informed.

Knowledge of the flow of streams is essential in the determination of the amount of wastes a stream can assimilate safely. If a stream is overloaded, additional waste treatment must be provided, another disposal site found, or the flow augmented by reservoirs.

The Quality of Water from Lakes

Water from lakes in Branch County ranged in hardness from as little as 24 ppm in Round Lake, a small land-locked lake in Noble Township, to as much as 430 ppm in Brown's Lake in California Township (table 10, in appendix). The low hardness in Round Lake is probably the result of the recharge to the lake being mostly direct precipitation whereas, Brown's Lake is actually a wide place in Tallahassee Drain, which also has about 430 ppm hardness.

Round Lake was also the only lake checked where the pH value was on the acid side. This is more or less typical of soft-water, land-locked lakes in other areas of Michigan.

Chlorides in lakes ranged from 3 to 25 ppm. The higher chlorides are probably the result of sewage effluent, as in the chain of lakes west and north of Coldwater.

The chemical quality of water from lakes is summarized below:

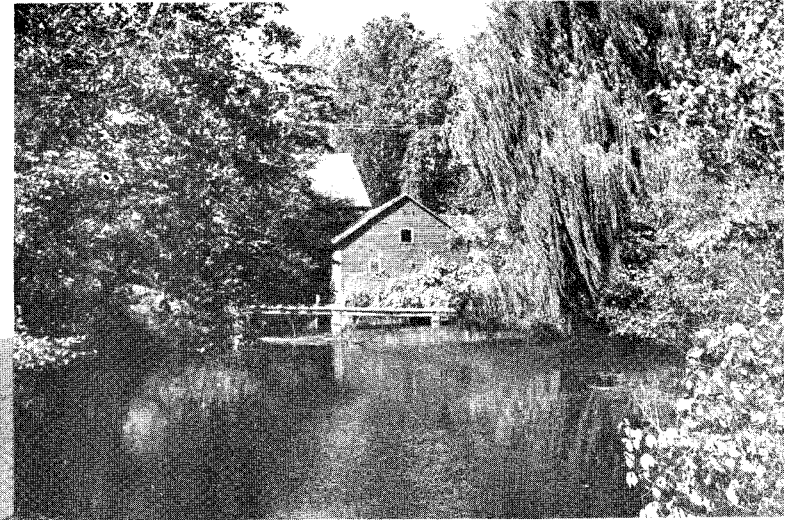
Constituent or property	Maximum	Minimum	Median
Chloride (Cl)	25	3	10
Dissolved solids	445	32	250
Total hardness (as CaCO ₃)	430	20	220
pH	9.8	6.1	7.8
(Results in parts per million, except pH)			

Thermoclines in Lakes

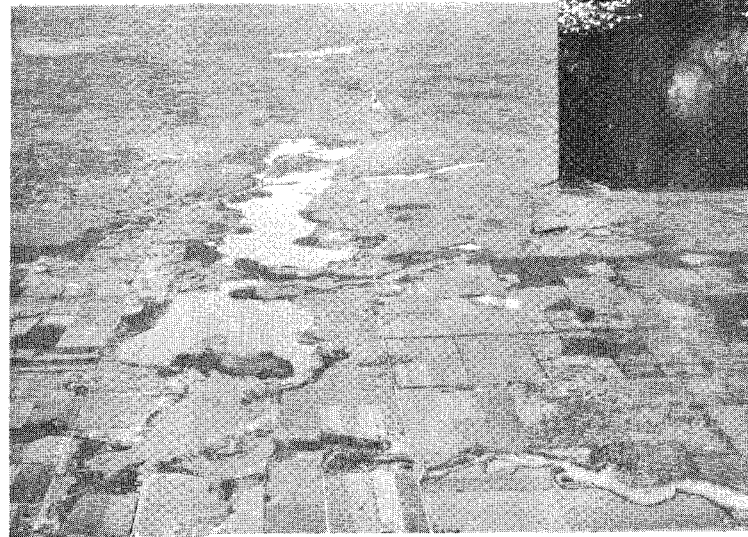
Depth, temperature, and dissolved oxygen were used to determine thermoclines in four of the county's deeper lakes -- Lakes George, North Pleasant, Coldwater, and Gilead (table 10). A thermocline is defined in Webster's dictionary as "a temperature gradient, especially one marking sharp change; also any of the layers of water exhibiting this". Seasonal changes in temperature cause physical and chemical changes in water. During the winter months, waters in lakes have no definite temperature stratification, but rather there is a gradation in temperature from about 32°F. near the surface to about 39°F. on the bottom. For a few weeks in the spring water temperatures are homogeneous and the water is mixed, distributing nutrients and flocculent bottom solids

from deeper waters -- this is popularly called the "spring turnover". As waters warm during the summer a stratification takes place -- the warmer waters rest over denser, colder water creating a thermal stratification and a thermocline. This layering exists throughout the summer and early fall (MacKenthun, 1964). Below the thermocline, the colder water is generally more mineralized, harder, nearer a neutral pH, and contains little or no dissolved oxygen. Above the thermocline, the water is usually of about the same quality and temperature as streams in the area and has abundant dissolved oxygen. For several weeks in the fall the water is mixed again -- this is the "fall turnover".

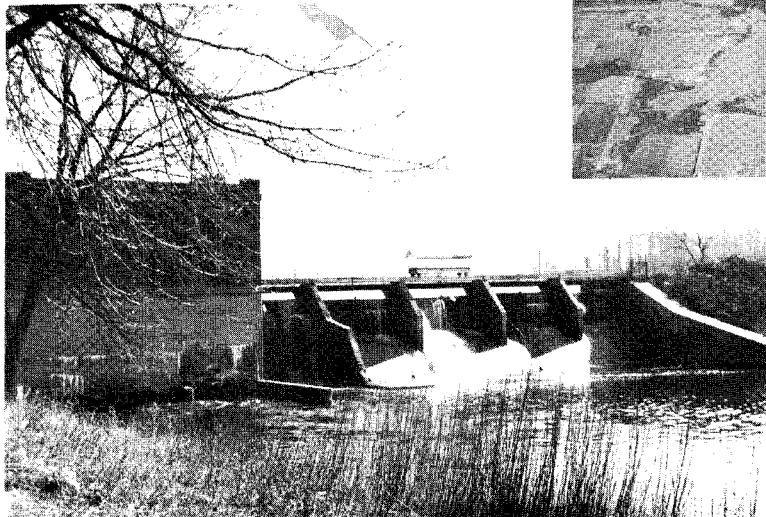
AMONG BRANCH COUNTY'S MOST IMPORTANT RESOURCES, THE ABUNDANT CLEAR LAKES AND STREAMS PROVIDE INVALUABLE ECONOMIC, RECREATIONAL, AND ESTHETIC ASSETS.



A TRADITIONAL USE OF WATER POWER in an operating sawmill on the Coldwater River below Hodunk.



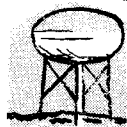
SEVERAL LAKE CHAINS CONNECT over 35 of the county's major lakes, yielding several thousand acres of water navigable to pleasure craft. the Coldwater River (foreground) flows out of such a chain west of the city of Coldwater with six lakes holding over 1,100 acres of water.



SEVERAL HUNDRED ACRES OF RECREATIONAL WATERS as well as electric power are provided by the Union City municipal hydro-electric dam on the St. Joseph River.

WATER USE

Almost all water used in Branch County is from wells. The total pumpage from wells for municipal and industrial supplies in 1965 was about 1.8 billion gallons. Some surface water is used for irrigation and for generation of electricity. A major non-consumptive use of water is for recreation at the numerous lakes.

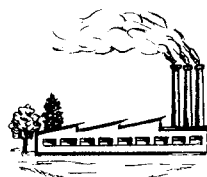


Municipal and Institutional Use

All municipal and institutional water supplies in the county are from wells in the glacial deposits. In 1965, about 1,651 million gallons was pumped for these supplies; of this about 854 million gallons went to industrial use. One village, Sherwood, has no municipal supply and water is obtained from individual wells in the glacial deposits. A summary of municipal and institutional water systems is given below; a more complete description of these systems is given in the appendix.

City, Village or Institution	Number of wells	Range in depths of wells (feet)	Range in depths to water (feet)	Range in pumpage of wells (gpm)	Total pumpage in 1965 (million gallons)
Bronson	3	60-97	7-15	675-810	319
Coldwater	4	121-132	9-17	1,200-2,850	984
Coldwater State School	3	50-59	18±	250-300	168
Quincy	2	65-102	8±	350-650	46
Union City	2	98-138	7-38	475-480	134

Peak demand days on municipal plants have an important bearing on the complete water system. However, these demands usually can be handled through increased storage facilities. For example, in 1965 Coldwater increased its storage from 300,000 gallons to a million gallons to insure that water would be available during periods of peak demands.



Industrial Use

Industry is the big user of water in the county, using about 1,009 million gallons in 1965. Most of the water was from municipal supplies; one industry during certain periods of the year uses as much as a million gallons a day from the municipal supply in Coldwater. Only about 155 million gallons of the industrial use was from private wells. Table 11 gives water use by industry. Most water used by industry is from wells except that some flour and feed-grinding mills, as at Hodunk, use surface water. In addition, surface water is used for industrial cooling in the municipal power plants at Coldwater and Union City.



Irrigation Use

In 1965 there were 16 irrigation systems in the county (personal communication, State Water Resources Commission). Only two used ground water to irrigate a total of about 11 acres. The remaining systems used streams, lakes, ponds, and ditches to irrigate about 600 acres. Crops irrigated were gladiolas, truck crops, strawberries, and corn. Water was also used to irrigate cemeteries and golf courses. The use of ground water is on the order of 2 million gallons a year while surface water use is about 140 million gallons a year. The location of irrigation systems and sources of supply are shown in figure 33.

Table II.--Major industrial uses of ground water in Branch County in 1965.

(Data collected the Michigan Water Resources Commission.)

Industry	Consumption (million gallons per year)	
	Municipal supply	Private wells
<u>City of Bronson</u>		
Bronson Laundromat	1.0	
Bronson Plating Company	57.5	
Bronson Reel Company	14.0	
Darling, L. A., Company	170.0	
Douglas Mfg. Company	3.4	134.8
Econowash	0.7	
<u>City of Coldwater</u>		
American Int. Alum.	330.0	
Branch County Jail	2.6	
Climax Molydenum Co. of Mich.	42.0	
Coldwater Brass Company	1.9	
Coldwater Livestock Auction	1.7	
Culligan Water Conditioning	8.9	
Federal-Mogul Service	10.5	
Kroger Egg Plant	2.1	
Maple Lawn Hospital	3.6	
Midwest Foundry Company	125.7	
Powered Metal Products, R. B. & W.	1.2	
Quality Spring Products	1.2	
Shaw, M. T. Inc.	1.0	
Speed-Queen Laundry	5.4	
Wash-King Laundry	2.8	
Wash-N-Dry	3.3	
Wayne Co-op Milk Products	12.3	
Woodward-Pollack Concrete	1.4	
<u>Village of Quincy</u>		
General Cable Company		20.5
<u>Village of Union City</u>		
Duo-Coach Corp.	38.6	
Schafer Mfg. Company	4.7	

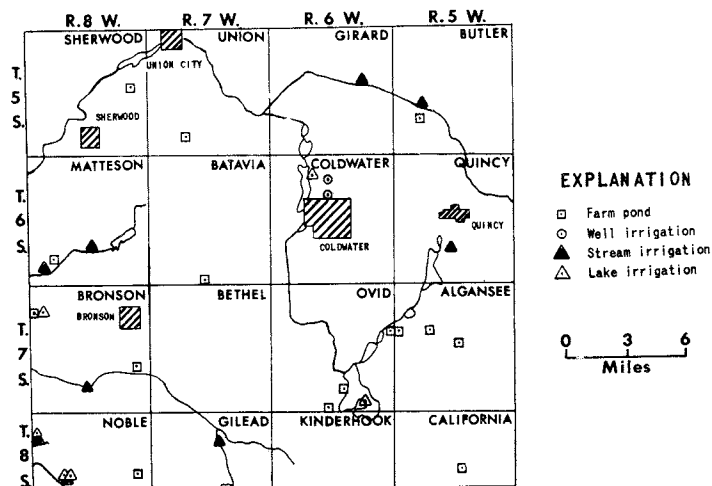


Figure 33. Irrigation and farm pond sites.

Livestock	Use per head (gpd)
Milk cows -----	20
Beef cattle -----	10
Horses and mules -	10
Hogs -----	3
Sheep -----	2
Chickens -----	.04

At the present rate of use, withdrawals of water for irrigation should not significantly affect other water supplies. However, increased use could adversely affect streamflow and lake levels, especially as demand is usually greatest when streams are at low flows and lake levels are low.

Stock Use

Water for stock often is obtained from streams and ponds, but a considerable amount also is derived from wells. The amount of water used by stock is quite large; the following tabulation gives the daily average use per head of livestock in most states ("Estimated Use of Water in the United States", 1961).

The number of livestock in Branch County in 1959 (U. S. Census, 1960) was as follows:

Cattle, cows, calves -----	29,900
Horses, mules -----	764
Hogs -----	40,204
Sheep and lambs -----	16,363
Chickens -----	156,411



On the basis of the above data, it is estimated that the amount of water used by livestock in 1959 was about $\frac{1}{2}$ million gallons a day or nearly 200 million gallons a year. In addition, large amounts of water from wells are used for clean-up purposes, such as for cleaning stables and milk houses.



Recreational Use



Recreational use of lakes and streams is a non-consumptive use, but it has great esthetic and economic value. Some indication of the economic value of lakes and streams is the large number of summer cottages, permanent lakeshore homes, sandy beaches, resorts, boat liveries, and public fishing sites, and the large number of fishing licenses sold. Summer residents and tourists from other areas flock to Branch County during the warmer months. Many of the lakes and streams are valuable for fishing, canoeing, boating, and water skiing. Winter sports, such as ice fishing, attract many sportsmen during the colder months. Some 20,000 fishing licenses were sold in the county in 1964, of which 13,000 were to non-residents. The State Conservation Department maintains nine public fishing sites.

The business generated by the lakes and streams forms a large part of the county's income. Although many of the larger lakes have substantial developments, there is still room for much future development on the numerous, smaller lakes. Detailed information on the recreation possibilities in the county is contained in a recent publication "Lake and Stream Guide, Branch County".

SUGGESTIONS FOR THE FUTURE

Solution of water problems requires an understanding of the hydrologic environment that controls the occurrence of water, along with records of the changes and trends in ground-water levels, lake levels, stream-flow, and water quality. This report describes the general water environment of the county, but the two years of study was not enough to determine all the probable ranges and trends in the hydrologic variables. To obtain meaningful information on these variables a longer period of recorded data is needed. Recording stations must be selected with care so that the information obtained will be truly representative of a problem area or condition. The study of the county just completed provides the information needed for the selection of these stations.

Ground Water

Observation wells should be established in areas where man-made influences, such as heavy pumping, affect water levels and also in areas away from man's influence where natural fluctuations of the water table occur. The natural fluctuations must be determined in order to evaluate those fluctuations caused by the works of man.

At least one observation well should be established in every community using ground water for municipal supply. This is desirable in order to determine the long-term effects of pumping the municipal wells. These observation wells should be located near the center of pumping, but should not be so close to a pumping well that the long-term fluctuations are masked by the large changes caused by turning the pumping well on and

off. Because large variations in water levels may occur in a short period of time, these observation wells should be equipped with continuous recording instruments.

Observation wells equipped with continuous recorders should also be established in areas wherever and whenever large quantities of ground water are pumped for irrigation or industrial use.

Finally, a small network of observation wells should be maintained in relatively unpumped areas to record the natural fluctuations in the water table. These should be selected to reflect conditions in each major topographic and geologic area. These wells could be measured monthly or equipped with continuous recorders for only such time as needed to determine the type of fluctuation pattern.

Streams

In order to expand the present knowledge of surface-water resources and to document future trends and occurrences, a continuing program of stream-gaging is recommended. The program should be comprised of stream-gaging stations and partial-record stations. The location and number of such stations would be dependent on the needs and desires of those concerned with development and management of the water resources.

Lakes

Records of fluctuations of lake levels in the county also should be obtained. Greatest fluctuations in levels generally occur in lakes having no surface outlets, so records should be obtained from such lakes. As a minimum sampling, records should be obtained from at least one lake in each political township of the county where lakes occur.

Quality of Water

At regular intervals water from representative wells, streams, and lakes should be checked with specific conductance meters for any changes in chemical quality and samples collected (when changes occur in conductance) for laboratory or field analysis to determine both short-term changes and long-term trends in quality of water. Dissolved oxygen and sediment load tests should be made on streams at regular intervals to determine the condition of the streams and preserve them for multiple use.

Using the Recorded Information

Of course, records of water levels, streamflow, and quality of waters must be interpreted to justify their collection. The old adage of "a stitch in time saves nine" is particularly applicable to water resources. It is far better to take preventive measures to guarantee the maintenance of water levels, streamflow, and the quality of the water than to try to rectify problems after they have become serious.

A monitoring program should be maintained and immediate steps should be taken, if practicable, to correct any serious lowering of ground-water levels and lake levels, large decreases in streamflow, or impairment of the quality of any of the waters of the county.

This report makes available most of the information known about the water resources of the county at this time. However, more data is constantly becoming available from drilling operations, water level and streamflow records, and quality determinations. This additional data should be summarized and interpreted in a continuous program of updating the report information. Informal progress reports should be prepared at regular

intervals of a year or so. At five-year intervals a more comprehensive progress report should be prepared. The people of Branch County and others interested in its water resources could then have available up-dated evaluations of the water resources.

One cannot foresee the time when water problems will not occur. It is difficult to provide for the solution of unknown future water problems. Technological advances may render solutions of some future problems easy. For example, extremely cheap power, as may occur by the fission of deuterium and tritium may facilitate processing of sewage waters into pure water, or allow the cheap desalination of heavily mineralized waters or eliminate the use of water for industrial and air conditioning uses. Weather control may solve problems caused by increased uses of irrigation.

As the cost of water rises, modern technology may find additional ways to conserve water for industrial, public, and domestic uses.

The use of dams to hold back water for low-flow supplementation during dry periods, and ponds to recharge water to the ground will undoubtedly be increased, as will the use of synthetic films to lower evaporation from open bodies of water. The use of plastic film to conserve moisture on truck gardens eliminates some irrigation, and is already practical in certain areas of the country.

In the final analysis, knowledge of our water environment should lead to the wisest use for all persons concerned, now and for future generations.

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Table 2.--Logs of selected wells.

Location: SW SW 15 denotes SW $\frac{1}{4}$ SW $\frac{1}{4}$ of section 15.Altitude: Land surface at well in feet above mean sea level
(estimated from topographic maps).

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>ALGANSEE TOWNSHIP</u>			NW NE 25 Brooks Homes, Inc., Lot 5 Altitude: 950			SE SW 30 County Road Commission Altitude: 930		
SW SW 15 G. Ewers Altitude: 1040			Surface soil, sandy	5	5	Surface loam, stoney	2	2
Surface	5	5	Gravel, dry	10	15	Gravel, very coarse, cobbly, dry	5	7
Clay, brown	15	20	Clay and gravel, mixed	7	22	Gravel, very coarse, cobbly, wet	20	27
Gravel, brown	2	22	Gravel	19	41	Gravel, fine, to sand coarse, silty, wet	10	37
Clay, grey	28	50	-----			Sand, coarse to fine, silty, wet	8	45
Sand, dirty, and gravel, fine	11	61	NW NE 25			Clay, brown, pebbly	5	50
Clay, brown	9	70	Brooks Homes, Inc., Lot 12			Clay, grey, soft, sandy	2	52
Hardpan, brown	6	76	Altitude: 950			Clay, brown, pebbly, wet	1	53
Clay, grey	4	80	Surface soil, sandy	5	5	Clay, brown, very hard, pebbly	3	56
Gravel, blue	8	88	Gravel, dry	10	15	-----		
-----			Gravel and clay, mixed	3	18	<u>BRONSON TOWNSHIP</u>		
NW NW 22 County Road Commission Altitude: 1045			Clay, grey	2	20	SE SE 1 Bronson City, #3 Altitude: 915		
Surface loam	2	2	Shale, grey	80	100	Fill	4	4
Sand, yellow, medium	1	3	-----			Topsoil	1	5
Clay, brown, and sand	9	12	SE NE 33			Clay, sandy	4	9
Clay, dry, blue	10	22	County Road Commission			Sand and gravel, wet	7	16
Clay, very hard, or shale	5	27	Altitude: 930			Clay, blue	17	33
-----			Sand and loam, dry, brown	2	2	Sand and gravel, wet	29	62
<u>BATAVIA TOWNSHIP</u>			Sand, coarse, brown, dry, cobbly	10	12	Clay	1	63
NE NE 5 County Road Commission Altitude: 925			Sand, coarse, to pea gravel, clayey	7	19	-----		
Surface loam	5	5	Clay, dry, sandy with shale pebbles	21	40	NE NE 4 D. Van Pelt Altitude: 920		
Clay, grey, wet	2	7	Shale	--	40+	Clay, yellow, limey, and gravel	10	10
Sand, wet, medium to coarse	15	22	-----			Clay, grey, limey, and gravel	40	50
Clay	1	23	<u>BETHEL TOWNSHIP</u>			Sand, limey, medium, light brown	2	52
Sand, very coarse, to gravel, fine	7	30	SE NE 26			Sand, grey and brown, and gravel, medium to coarse	4	56
Clay, grey	7	37	O. Bellard			-----		
Gravel, fine to stoney	6	43	Altitude: 1010					
Clay, grey	3	46	Sand and gravel	30	30			
Sand, grey, to sand and gravel	9	55	Clay, blue	15	45			
Shale, grey, hard	--	55+	Sand	6	51			
-----			Gravel	7	58			
			Clay	--	58+			

Table 2.--Logs of selected wells.--Continued

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>BRONSON TOWNSHIP (CONT'D)</u>						<u>CALIFORNIA TOWNSHIP</u>		
SW NW 12			NE NE 15			NW NE 6		
Bronson City, #1			R. Wotta			G. Cattell (former Calif.		
Altitude: 912			Altitude: 910			PS #2)		
Sand and gravel, orange-brown	4	4	Sand	28	28	Altitude: 1030		
Gravel, medium, sands unsorted	8	12	Clay	10	38	Clay	6	6
Sands, grey, and gravel	25	37	Sand and gravel, fine	22	60	Gravel, dry	12	18
Gravel, medium	20	57	Clay, blue	--	60+	Clay, soft, grey	8	26
Clay, brown, and sand	18	75	-----			Hardpan and boulders	4	30
Gravel and sands, unsorted	22	97				Clay, grey	6	36
-----			SW SW 15			Gravel, wet	1	37
SE NE 12			Ambassador Oil Co.			Clay, grey	15	52
County Road Commission			Altitude: 910			Hardpan and boulders	2	54
Altitude: 920			Sand and gravel	144	144	Clay, grey	4	58
Surface loam, brown	2	2	Mud, reddish brown, very soft	66	210	Gravel, wet	--	58+
Sand, medium, brown	8	10	Shale, gray, micaceous	450	660	-----		
Gravel, coarse, brown, dry	2	12	-----			SW NE 22		
Sand, coarse, and gravel, fine,			<u>BUTLER TOWNSHIP</u>			California P.S.		
pebbly, wet	28	40	SE SE 3			Altitude: 1085		
Gravel, medium, and sand, fine,			Butler P.S. #3			Clay and pebbles	9	9
wet, some cobbles	2	42	Altitude: 990			Clay, sand and pebbles	13	22
-----			Clay and sand, yellow	20	20	Gravel and clay	45	67
NE NE 14			Clay, sandy, grey	10	30	Clay and gravel	31	98
Bronson City, #1A			Clay, grey, muddy	35	65	Sand and gravel	13	111
Altitude: 912			Clay, brown	16	81	Sand, clay and pebbles	12	123
Topsoil	5	5	Shale, yellow	2	83	Sand and gravel	10	133
Sand, brown	10	15	Sandstone, grey and shale, sandy,			-----		
Sand, grey, clean	15	30	water bearing	21	104	<u>COLDWATER TOWNSHIP</u>		
Sand and clay balls	5	35	Shale, blue	2	106	NE SE 4		
Hardpan	15	50	-----			H. Laurell		
Sand, fine, silty	10	60				Altitude: 930		
Sand, coarse	14	74	SW 14			Surface	5	5
Sand, coarse, and gravel	6	80	L. Freeburn			Sand, fine	10	15
Sand, fine, muddy	1	81	Altitude: 1020			Gravel, coarse	15	30
Clay	8	89	Topsoil	5	5	Hardpan	4	34
-----			Clay, brown	20	25	Gravel, water bearing	3	37
			Clay, grey	58	83	-----		
			Shale	30	113			

Table 2.--Logs of selected wells.--Continued

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>COLDWATER TOWNSHIP (CONT'D)</u>								
SW NE 5 Coldwater Country Club Altitude: 940			SE SE 9 County Road Commission Altitude: 955			SE NW 21 Libby-McNeill Altitude: 960		
Topsoil	5	5	Loam, brown	2	2	Topsoil	8	8
Clay, brown and gravel	19	24	Gravel, brown and clay	2	4	Gravel, dry	12	20
Gravel, water bearing	9	33	Gravel, cobbly, brown	5	9	Gravel, clean, water bearing	41	61
Clay, grey	2	35	Gravel, coarse, brown and sand coarse	21	30	Shale, blue	4	65
Gravel, water bearing	31	66	Clay, brown, sandy	3	33	-----		
-----			Gravel, cobbly	1	34			
SW SW 6			Sand and gravel	4	38	NE SW 22		
County Road Commission			Clay, cobbly	12	50	Coldwater City		
Altitude: 931			Sand, coarse, silty, brown	18	68	Altitude: 970		
Sand, coarse, clayey, yellow	2	2	Clay, blue, pebbly	5	73			
Sand, coarse, grey, clayey	3	5	-----			Gravel, rusty	17	17
Sand, medium, silty, grey, wet	5	10	NW NW 19			Gravel, coarse	26	43
Sand, coarse, grey and gravel, pea, wet	8	18	Coldwater Township			Gravel, clay streak	4	47
Gravel and cobbles	1	19	Altitude: 950			Gravel, pebbly	7	54
Sand, coarse, grey and gravel, pea, wet	8	27	Gravel	37	37	Clay, yellow, pebbly	24	78
Sand, medium, grey and gravel, medium, wet	8	35	Clay, grey	10½	47½	Gravel, coarse, pebbly	53	131
Gravel and cobbles	4	39	Gravel, water bearing	9½	57	Gravel, fine, pebbly	2	133
Sand, coarse to fine, pebbly, wet	16	55	Clay, grey	--	57+	Shale	15	148
Sand, coarse to fine, wet	7	62	-----			Limestone	2	150
Silt, sandy, grey, very wet	10	72	NW NE 19			-----		
Silt, sandy, gravel layers, wet	5	77	Golip Plat			NW SE 22		
Sand, silty, grey, wet	20	97	Altitude: 950			Coldwater City		
Sand, coarse, silty, very wet	15	112	Surface	4	4	Altitude: 970		
Sand, coarse, grey, wet	10	122	Gravel and clay	11	15			
-----			Gravel	7	22	Sand and gravel, dirty	10	10
NW NE 7			Gravel and clay	6	28	Sand and gravel, coarse	25	35
County Road Commission			Hardpan	5½	33½	Sand and gravel, very coarse, cobbly	17	52
Altitude: 940			Clay, grey and gravel	2½	36	Clay, sandy to boulders	10	62
Sand, coarse, pebbly, brown, dry	19	19	Clay, grey	4	40	Sand, coarse to very coarse	15	77
Clay, blue, dry	1	20	Shale, blue	6	46	Sand and gravel, dirty	5	82
Sand, coarse	5	25	-----			Sand and gravel, clean	13	95
Clay, blue, dry	1	26	NW NE 19			Sand and gravel, cobbly	25	120
Gravel	3	29	Golip Plat			Sand and gravel, medium, boulders at 132'	14	134
Gravel, cobbly	1	30	Altitude: 950			Clay, soft shale	6	140
Clay, powder, blue, dry, shale pebbles	15	45	Surface and clay, red	5	5	-----		
Boulder, shale	½	45½	Clay, brown and gravel	8½	13½			
Clay, blue, very hard, dry, shale pebbles	1½	47	Gravel (water)	13½	27			
-----			Clay, grey	3	30			
			Clay, brown	8	38			
			Gravel and clay, mixed	3	41			
			Sand and gravel, (water)	8	49			
			Shale, blue	21	70			

Table 2.--Logs of selected wells.--Continued

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>COLDWATER TOWNSHIP (CONT'D)</u>			<u>GILEAD TOWNSHIP</u>			NW SW 14 Hartsock Altitude: 961		
SW SW 23 State Highway Department Altitude: 981			NW NE 5 County Road Commission Altitude: 950			Topsoil	$\frac{1}{2}$	$\frac{1}{2}$
Sand, gravelly, loamy, fine, brown	2	2	Sand, medium, yellow	7	7	Sand, medium, yellow	$1\frac{1}{2}$	2
Gravel, medium, sandy, brown	9	11	Sand, coarse, brown	15	22	Sand, medium, brown, trace of clay and gravel	3	5
Sand, medium and gravel, brown, wet	2	13	Clay	1	23	Sand and gravel, brown	13	18
Gravel, medium to coarse, sandy, grey, wet	59	72	Sand, coarse	4	27	Sand, coarse, grey, and gravel, medium	37	55
-----			-----			Clay, firm, grey, sandy	5	60
NE NE 26 J. Burke Altitude: 970			SW SW 6 County Road Commission Altitude: 960			-----		
No record	14	14	Gravel and sand, coarse	7	7	NE NE 22 State Highway Department Altitude: 950		
Sand and gravel	46	60	Sand, pebbly	8	15	Sand, brown to yellow	6	6
Cobbles	--	60+	Gravel, very coarse, pebbly	22	37	Gravel, coarse, sandy	21	27
-----			-----			Gravel, very coarse, cobbly	5	32
NE SW 27 D. Pope Altitude: 990			SW NE 7 County Road Commission Altitude: 975			-----		
Gravel	20	20	Sand, coarse, and gravel, cobbly	7	7	SE NW 23 Ratkowski Altitude: 962		
Hardpan, grey	10	30	Sand and gravel, coarse, pebbly	40	47	Loam, sandy	1	1
Gravel, water bearing	9	39	-----			Sand, gravelly, loam	$2\frac{1}{2}$	$3\frac{1}{2}$
-----			<u>GIRARD TOWNSHIP</u>			Gravel, sandy	$5\frac{1}{2}$	9
NE NW 30 L. Rohloff Altitude: 950			NW SW 10 M. Van Der Pool Altitude: 950			Sand, fine, pebbly, brown	3	12
Topsoil	5	5	Gravel, brown, and clay	15	15	Loam, sandy, brown	4	16
Clay, brown and gravel, mixed	20	25	Clay, grey	17	32	Shale, soft, blue	3	19
Sand, brown, water bearing	6	31	Gravel, hardpan	4	36	-----		
Clay, grey	4	35	Sand, brown, silty	24	60	SE SE 35 F. Hayes Altitude: 960		
-----			Gravel, grey, water bearing	10	70	Sand	15	15
			Shale	1	71	Clay	15	30
			-----			Sand and gravel	6	36
						Clay	34	70

Table 2.--Logs of selected wells.--Continued

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>KINDERHOOK TOWNSHIP</u>			Matteson P.S. #1.-Continued			NE SW 29 County Road Commission Altitude: 875		
NE SW 1 County Road Commission Altitude: 1020			Clay, sandy	8	18	Muck, black, and peat	2	2
			Sand, fine, wet	7	25	Sand, coarse, dark brown, wet	10	12
			Clay, sandy	5	30	Sand, coarse, silty, grey, wet	10	22
			Gravel, coarse, wet	6	36	Sand, coarse, grey and gravel, pea, wet	5	27
Clay, brown, pebbly	10	10	-----			Sand, coarse, grey, silty, very wet	25	52
Gravel, pea, clayey, wet	2	12				Sand, medium, silty, pebbly, very wet	5	57
Gravel, medium, and sand, coarse, silty, very wet	10	22	NW NE 14 County Road Commission Altitude: 880			Sand, coarse, silty, very wet	6	63
Sand, coarse, silty, very wet	8	30	Loam, stoney	2	2	Clay, grey, wet, sticky	9	72
Sand, coarse, and gravel, pea	7	37	Gravel, brown, sandy and clayey, dry	5	7	Silt, grey, very wet	4	76
Gravel, pea, wet and sand, coarse	10	47		5	12	Clay, grey, wet, sticky	1	77
Gravel, fine, brown and sand, coarse, pebbly, wet	8	55	Gravel, coarse and sand, wet	21	33	Silt, grey, very wet	3	80
Gravel, very coarse, cobbly, wet	3	58	Sand, coarse, silty, grey, wet	1	34	Clay, grey, sticky, wet	1	81
-----			Clay, grey	5	39	Silt, grey, very wet, sandy	12	93
SE SE 15 State Highway Department Altitude: 993			Sand, coarse, wet	15	54	Clay, grey	2	95
			Gravel, cobbly, wet	4	58	Clay, grey and silt, layered	7	102
			Clay, firm, wet	3	61	-----		
			Gravel, silty	--	61+	NW SW 29 McClure Oil Company Altitude: 866		
Peat, soft, fibrous	2	2	Shale			Clay and sand	18	18
Marl, soft	17½	19½	-----			Gravel	27	45
Sand, grey	4½	24				Clay, grey and sand	125	170
Clay, grey, firm, very sandy	4	28	NE NE 19 Matteson P.S. #2 Altitude: 880			Shale, grey	518	688
Sand, grey	4	32	Topsoil	5	5	-----		
-----			Sand, clayey	5	10	NE NE 35 County Road Commission Altitude: 940		
NW NW 23 G. Sellers Altitude: 1020			Sand, coarse and gravel, wet	2	12	Loam, yellow, clayey, dry	2	2
Clay	25	25	Sand, clayey, wet	3	15	Sand, pebbly, brown, dry	10	12
Gravel	3	28	Clay, sandy, yellow	5	20	Clay, pebbly, grey, dry	5	17
Clay, sand, gravel, layered	22	50	Clay, sandy	10	30	Clay, pebbly, grey, gravel streaks, wet	10	27
Clay, blue, gummy	50	100	Sand, coarse and gravel	6	36	Clay, pebbly, grey, silty	8	35
Gravel, pea	11	111	-----			Clay, pebbly, grey, hard	2	37
-----			NE SW 27 County Road Commission Altitude: 895			Clay, sandy, grey, soft	2	39
<u>MATTESON TOWNSHIP</u>			Loam	2	2	Clay, pebbly, grey, hard	8	47
SW SW 13 Matteson P.S. #1 Altitude: 900			Loam and gravel	3	5	Clay, soft, silty	5	52
			Sand, coarse, yellow and gravel	6	11	Clay, grey, tough, shale pebbles	3	55
Topsoil and clay	5	5	Gravel, pea, brown, pebbly, wet	23	34	Clay, grey, soft	3	58
Sand, coarse, wet	5	10	Clay, tough, blue	3	37	Clay, grey, very hard	--	58+
			-----			-----		

Table 2.--Logs of selected wells.--Continued

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>MATTESON TOWNSHIP (CONT'D)</u>			<u>OVID TOWNSHIP</u>			SE SE 6 County Road Commission Altitude: 960		
NE NE 35 Matteson P.S. #4 Altitude: 917			SW NW 1 E. Lippert Altitude: 990			Fill, gravel	6	6
Sand and clay, yellow	21	21	Sand and gravel	35	35	Sand, coarse, grey and gravel, fine, very wet	41	47
Sand and gravel, coarse	9	30	Clay, blue	12	47	Clay, blue, and sand, coarse, thin layers	6	53
Sand and clay, brown	1½	31½	Sand, fine	17	64	Clay, blue and boulders to clay, blue, very tough	4	57
Sand and clay, yellow	2½	34	Gravel, very coarse	4	68	-----		
Sand, fine to medium, yellow, and clay, yellow	1	35	-----			NE NE 11 County Road Commission Altitude: 1000		
Gravel, coarse	3	38	SW NE 1 M. Hineman Altitude: 1000			Muck, black	2	2
-----			-----			Peat, red	3	5
NW NE 36 C. Kaczynski Altitude: 940			Topsoil	5	5	Sand, fine, grey and silt, very wet	25	30
Topsoil	5	5	Sand, brown	9	14	Clay, grey, plastic	1	31
Clay, brown	31	36	Clay, grey	10	24	Sand, fine, grey and silt, very wet	18	49
Clay, grey	34	70	Clay, brown	37	61	Clay, grey, plastic	2	51
Gravel, brown	9	79	Gravel, water bearing	9	70	Sand, fine, grey and silt, very wet	12	63
-----			-----			Silt, grey to clay, grey, plastic	4	67
<u>NOBLE TOWNSHIP</u>			SE SE 3 Cranson Altitude: 1010			Sand, medium, grey, wet and thin clay layers	10	77
SW SW 7 County Road Commission Altitude: 910			Topsoil	1½	1½	-----		
Loam, brown	1	1	Loam, clayey, brown	8½	10	SW SW 13 V. Feasel Altitude: 990		
Sand and clay, brown	1	2	Loam, sandy, pebbly, brown	2	12	Fill	2	2
Sand, medium, brown, clayey, cobbly	5	7	Sand, gravelly	8	20	Peat	½	2½
Sand, medium, brown, pebbly	15	22	Sand, fine, yellow	1½	21½	Sand, fine	24½	27
-----			Sand, fine, pebbly, brown, wet	6½	28	Marl	60	87
NW NE 12 County Road Commission Altitude: 945			Sand, fine, pebbly, with silt and clay lenses	2	30	Sand, fine	10	97
Fill	3	3	-----			Marl	40	137
Marl	5	8	SE SW 6 County Road Commission Altitude: 1005			Gravel, coarse, black	5	142
Sand and gravel, pebbly, muddy	9	17	Clay, brown	2	2	-----		
-----			Clay, pebbly, yellow-brown	3	5			
			Clay, brown, dry	3	8			
			Clay, brown, wet	1	9			
			Clay, chalky, blue, very dry	9	18			
			Clay, blue, wet	½	18½			
			Clay, hard, blue, dry and shale pebbles	1½	20			

Table 2.--Logs of selected wells.--Continued

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>OVID TOWNSHIP (CONT'D)</u>			<u>QUINCY TOWNSHIP</u>			General Cable Company.-Continued		
SW NW 15 Armstrong Altitude: 991			SW NW 1 Worden Bros. Altitude: 1060			Sand, fine, silty	8	74
Sand, loamy, brown	1½	1½	Surface	5	5	Sand and gravel, dirty	6	80
Sand, gravelly	8	9½	Clay, soft, brown	45	50	Clay, sandy, gravelly	5	85
Gravel, sandy, wet	2½	12	Shale, blue	40	90	Sand, fine, silty	16	101
Gravel, wet	6½	18½	-----					
Clay, pebbly	1½	20				NE SE 14 K. Rehner Altitude: 1020		
-----			NE NW 2 T. Spencer Altitude: 1040			Topsoil	5	5
NW NE 26 M. Shupp Altitude: 990			Topsoil	5	5	Gravel	5	10
Surface	5	5	Hardpan, brown	20	25	Clay, brown	8	18
Clay, brown, stoney and gravel	16	21	Clay, grey	15	40	Shale	47	65
Sand, brown	3	24	Clay, brown and gravel	39	79	-----		
Clay, grey	41	65	Sand, brown, water bearing	8	87	NE SW 15 Quincy Village Altitude: 1010		
Gravel, grey	4	69	-----			Topsoil	5	5
Clay, grey	5	74	NW NE 5 C. Counterman Altitude: 1040			Gravel, coarse	15	20
Clay, brown and gravel	5	79	Clay, blue	12	12	Sand, fine	10	30
Gravel, brown, water bearing	7	86	Shale	6	18	Sand, very fine, silty	10	40
-----			Limestone and shale	42	60	Clay, grey	21	61
SE SE 27 E. Fellers Altitude: 990			-----			Sand, coarse and gravel, water bearing	8	69
Sand, grey and gravel	30	30	SW NW 14 General Cable Company Altitude: 1015			Sand, fine	9	78
Clay, blue	18	48	Clay, sandy	3	3	-----		
Sand, fine	7	55	Gravel, clean, sandy	28	31	SW SW 18 County Road Commission Altitude: 925		
Gravel, pea	4	59	Gravel, clayey, sandy	6	37	Loam, brown	2	2
-----			Sand and gravel, muddy	2	39	Clay, brown, pebbly	3	5
SW SE 35 V. Sayre Altitude: 990			Sand and gravel, brown	8½	47½	Clay, pebbly, sandy, brown	10	15
Gravel	21	21	Sand, brown	1½	49	Clay, grey-blue, wet	½	15½
Hardpan, grey	100	121	Sand and gravel, grey, clayey	3	52	Clay, pebbly, sticky, wet	3½	19
Sand, white, water bearing	10	131	Gravel, sandy	2	54	Clay, pebbly, grey, dry	7	26
-----			Sand and gravel, muddy, clayey	12	66	Clay, pebbly, grey, wet	4	30
						Gravel, coarse	1	31
						Clay, brown, hard	1	32
						Sand, fine, silty, brown, very wet	4	36
						Clay, pebbly, sandy, grey, very hard	9	45

Table 2.--Logs of selected wells.--Continued

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>QUINCY TOWNSHIP (CONT'D)</u>			<u>SW SE 31</u> C. Carpenter Altitude: 1010			<u>NW NW 33</u> County Road Commission Altitude: 880		
SW NW 22 Quincy Village Altitude: 1010			Surface	5	5	Sand, medium, brown	5	5
Clay, yellow	18	18	Clay, hard, brown and gravel	26	31	Clay, sandy, brown, wet	11½	16½
Hardpan	2	20	Clay, hard, grey and gravel	6	37	Clay, tough, blue	2½	19
Gravel, water bearing	19	39	Clay, brown and gravel	11	48	Refusal - boulder or shale	--	19+
Clay	1	40	Clay, hard, red-brown and gravel	8	56			
Sand, fine, dirty, wet	18	58	Gravel, brown	12	68			
Clay	1	59						
Sand, brown and gravel, wet	14	73						
Sand and gravel, grey, water bearing	27	100						
			<u>SHERWOOD TOWNSHIP</u>			<u>UNION TOWNSHIP</u>		
			SE SE 2 Indian Mission Altitude: 920			SW SW 4 Union City Village Altitude: 910		
NW NE 23 R. Milliman Altitude: 1040			Topsoil	5	5	Clay, brown	9	9
Hardpan, yellow	16	16	Clay, yellow	4	9	Gravel, dry	1	10
Clay and shale, blue	12	28	Clay, grey and sand	2	11	Clay, blue and gravel	55	65
Shale	3	31	Shale	34	45	Gravel, red	45	110
						Gravel, grey, water bearing	28	138
			SE SE 20 County Road Commission Altitude: 965			SE NW 4 Union City Village Altitude: 890		
SE SE 28 E. Bowerman Altitude: 1000			Loam, sandy	3	3	Topsoil	1	1
Topsoil	5	5	Clay, sandy, yellow, wet	7	10	Gravel, very coarse	28	29
Clay, brown and gravel	15	20	Sand, medium, wet	13	23	Sand, silty, fine	24	53
Hardpan, brown, gravelly	7	27	Clay, silty, very wet	2	25	Sand, coarse, clean	18½	71½
Clay, brown	7	34	Sand, coarse, wet	22	47	Clay, grey	32½	104
Clay, grey	7	41	Sand, very coarse, pebbly	5	52			
Shale, blue	32	73	Gravel, pea and sand, coarse	10	62			
			Sand, fine	32	94			
			Clay, tough, grey, sandy layers	10	104	NE SE 5 Union City Village Altitude: 880		
			Sand, medium	8	112	Sand and gravel	30	30
						Clay	12	42
SW NE 30 K. Kinsey Altitude: 990						Gravel	3	45
Surface	5	5	NW SE 28 County Road Commission Altitude: 880			Gravel and sand	30	75
Clay, soft, brown	7	12	Loam, brown	2	2	Gravel	23	98
Clay and gravel, hard, brown	5	17	Sand, medium, brown	10	12	Shale	--	98+
Gravel, brown	5	22	Sand, coarse, pebbly, brown	5	17			
Clay, brown	14	36	Sand and clay, grey, pebbly, wet	5	22			
Clay, grey	6	42	Clay, tough, blue	5	27			
Gravel, blue	12	54	Sand, fine, grey, wet	10	37			
			Sand, medium, grey, wet	5	42			

Table 2.--Logs of selected wells.--Continued

	Thick- ness (ft)	Depth (ft)		Thick- ness (ft)	Depth (ft)
<u>UNION TOWNSHIP (CONT'D)</u>					
NW SW 9 E. Eldred Altitude: 920			SW SE 14 County Road Commission Altitude: 970		
Topsoil	4	4	Loam and clay	2	2
Sand	3	7	Clay, sandy, pebbly, brown	13	15
Clay, red, cobbly	36	43	Clay, sandy, brown, wet	4	19
Sand	3	46	Clay, grey, wet, sandy to pebbly	11	30
Clay, red, cobbly	16	62	Clay, grey, tough	1	31
Gravel	2	64	Clay, grey, plastic	9	40
			Clay, tough, pebbly, grey	5	45
-----			-----		
SW SW 10 Branch Co. Road Commission Altitude: 900			SE NE 16 County Road Commission Altitude: 910		
Loam, brown	2	2	Clay, sandy, brown	7	7
Sand, brown, cobbles at 4'	2	4	Clay, cobbly, brown to pebbly, blue	5	12
Sand, coarse, brown	3	7	Clay, blue, dry	2½	14½
Gravel, coarse	3	10	Shale, limey	--	14½+
Gravel, medium, wet	2	12			
Gravel, very coarse, cobbly	10	22	-----		
Gravel, pea	5	27	NE NW 23 E. Daniels Altitude: 950		
Gravel, fine, clayey	5	32			
Sand, medium to coarse, grey	5	37			
Sand, medium to coarse, brown	18	55			
Clay, blue, hard, pebbly	2	57	Clay, blue and shale, soft, blue	45	45
Sand, medium	8	65	Shale, very hard	--	45+
Clay, blue	8	73			
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Table 3.--Records of selected wells.

EXPLANATION: Water level--Reported or estimated to the nearest foot.
 Yield--Figures are as reported by drillers or owners; A, adequate; I, inadequate.
 Well use--A, abandoned; D, domestic; I, industrial, air conditioning; Ir, irrigation, spraying; M, municipal; O, observation; P, public; S, stock; T, test.
 Aquifer--GD, glacial drift; GR, gravel; Sd, sand; Sh, Coldwater Shale.
 Quality of water--Field analyses by U. S. Geological Survey, except as noted.
 Remarks--LOG, Log of formations is available; ANAL., see table 8 for ground-water analysis; MDH, analysis by Michigan Department of Health.

Location 1/4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhms @ 25° C)	Hardness (ppm as CaCO ₃)	Iron (ppm)	Chloride (ppm)	Date sampled	
ALGANSEE TOWNSHIP																				
SW SE 1	R. Downer	Self	1962	36	4	1,070	12	1962	50	---	D	.050	GD	---	---	---	---	---	---	
SW SE 1	W. Downer	Self	1946	63	6	1,070	18	5/46	17	---	D	None	Sh	45	---	---	---	---	---	
NW NE 2	Mrs. F. Gilbert	-----	-----	21	36	1,095	9.38	12/65	1	---	D	---	GD	---	830	500	0	15	12/65	
SW SE 2	Mrs. E. Marquart	W. Downer	1946	61	6	1,090	17	8/46	15	---	D	---	Sh	30	---	---	---	---	---	
NW NW 3	I. Diment	W. Downer	1931	75	4	1,050	-----	-----	1	---	D, S	None	Sh	---	570	300	0.1	5	12/65	
SW SE 3	Mrs. E. Etchey	W. Downer	1935	45	3	1,035	15	1936	1	---	D	---	GR	---	660	330	4	15	4/65	
SE NE 4	E. Long	W. Downer	1958	40	4	1,020	8	3/58	30	---	P	None	Sh	30	---	---	---	---	---	
NE NE 5	J. Miller	B. Yearling	1965	38	4	990	17	1965	A	---	D	---	GR	---	570	320	0	10	12/65	
NE NW 6	C. Peavey	-----	-----	180	4	1,005	21	-----	A	---	D	---	---	---	410	270	3.0	5	12/65	
NE SW 6	Mrs. D. Archer	-----	-----	60	---	1,000	-----	-----	A	---	D	---	---	---	520	270	3.0	10	2/65	
SE NW 7	D. Davis	W. Downer	1954	60	4	1,010	38	1954	I	---	D	---	GD	---	600	200	0	5	12/65	
NE SW 8	Mrs. C. Hever	-----	-----	20	2	1,030	-----	-----	A	---	D, S	---	GD	---	750	390	0.2	20	12/65	
SE NW 8	I. Walbridge	W. Downer	1961	40	4	1,015	11	1961	10	---	D	None	GD	---	700	360	0.1	10	3/65	
SE SE 9	G. Strang	Self	-----	21	1 1/2	1,020	16	1960	A	---	D	.010	GR	---	950	500	1.5	40	12/65	
SE SE 10	H. Preston	W. Downer	1944	82	6	1,065	18	1944	A	<1	D	None	Sh	40	625	300	1.5	5	4/65	
NW NW 10	N. Strong	W. Downer	1956	84	6	1,035	19	1956	9	---	D	None	Sh	45	700	120	0	50	4/65	
SE SE 10	H. Preston	W. Downer	1951	91	5	1,065	27	11/57	6	---	D	None	Sh	55	-----	-----	-----	-----	-----	
NE NE 10	Mrs. F. Ransom	W. Downer	1953	70	4	1,080	30	1953	14	---	D	None	Sh	25	-----	-----	-----	-----	-----	
SW SW 10	D. Kling	Self	1962	20	1 1/2	1,015	13	1962	A	---	D	---	GR	---	790	400	2.0	10	3/65	
SE SE 10	Ferguson School	W. Downer	1936	60	4	1,060	-----	-----	---	---	A	None	Sh	35	-----	-----	-----	-----	-----	
SW NE 11	L. Marquart	W. Downer	1944	75	6	1,090	14	1944	6	---	D	None	Sh	40	625	300	1.8	10	4/65	
NW SE 11	E. Hastings	W. Downer	1953	55	4	1,090	26	10/53	27	---	D	---	Sh	---	-----	-----	-----	-----	-----	
NW NE 12	L. Downer	W. Downer	1946	63	6	1,065	18	1946	26	---	D	None	Sh	43	-----	-----	-----	-----	-----	
SE NW 12	M. Risdorph	W. Downer	-----	44	4	1,080	11	1945	17	---	D	---	GR	---	-----	-----	-----	-----	-----	
SW SE 12	E. Algansee Church	W. Downer	1953	52	4	1,090	16	10/53	20	---	P	None	Sh	20	-----	-----	-----	-----	-----	
SE SE 14	C. Daniels	Self	-----	18	4	1,065	12	-----	A	---	D	---	GR	---	760	390	0	15	12/65	
SE SW 15	L. Ewers	W. Downer	1948	56	4	1,070	19	7/48	12	12	D	None	Sh	30	600	325	3.0	15	12/65	LOG
SW SW 15	L. & G. Ewers	W. Downer	1965	88	4	1,040	19	5/65	20	4	D	---	GR	---	510	255	2.5	5	12/65	
NW NE 16	C. Hildebrandt	W. Downer	1946	90	4	1,040	18	10/46	10	---	D	None	Sh	<55	-----	-----	-----	-----	-----	One dry hole
NE SW 17	C. Payne	-----	1955	76	---	1,045	-----	-----	A	---	D	---	---	---	590	325	4.0	10	12/65	
NE NE 17	P. Porter	W. Downer	1963	33	4	1,040	15	2/63	11	<1	---	---	GD	---	-----	-----	-----	-----	-----	
SE SW 19	T. Rhodes	W. Downer	1961	56	4	1,040	40	9/61	20	---	D	.030	GD	---	500	260	0.4	10	2/65	pH 7.6
SE SW 20	B. Boyd	Self	1961	35	2	1,040	15	1961	A	---	D	---	GR	---	630	340	1.2	10	12/65	
NE NW 21	S. Weiss	W. Downer	1959	114	4	1,035	12	11/59	4	<1	D, S	.012	GD	---	540	240	1.0	10	12/65	
NE SE 21	H. Bailey	B. Yearling	1965	59	4	1,040	12	1965	10	---	D	---	GD	---	680	375	3.5	15	12/65	
NW NW 22	Branch Co. Rd. Comm.	USGS	1964	27	4	1,045	11.20	10/64	---	---	T	---	GD	22	-----	-----	-----	-----	-----	LOG
SW SW 23	R. Craddock	-----	-----	70	4	1,085	-----	-----	A	---	D, S	---	---	---	700	395	1.0	20	12/65	
NE NW 24	D. Luxenburger	W. Downer	1942	62	4	1,100	18	11/42	12	2	D, S	None	Sh	35	560	325	0.1	5	12/65	
SW SE 25	M. Church	W. Downer	-----	60	---	1,075	8	-----	6	---	D, I	---	GR	---	590	255	0.3	10	10/65	

Table 3.--Records of selected wells.--Continued

Location 4 4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO ₃)	Iron (ppm)	Chloride (ppm)	Date sampled	
ALGANSEE TOWNSHIP (CONT'D)																				
SE SE 25	F. Galloway	-----	1952	60	4	1,095	-----	-----	A	---	D,S	None	Sh	---	660	340	0.2	10	10/65	Pumps fine sand
SW SW 25	M. Carpenter	-----	-----	40	1½	1,040	<25	-----	A	---	D	.010	Sd	---	675	290	2.0	20	10/65	
NW SW 27	Mrs. D. Safford	W. Downer	-----	40	1½	1,050	-----	-----	A	---	D	.010	GD	---	730	340	3.0	20	10/65	
NW NW 27	L. Wyncoop	W. Downer	1952	37	4	1,050	20	3/52	16	---	D	None	GD	---	700	340	3.0	15	10/65	
SE SE 27	O. Donbrock	Self	-----	28	2	1,050	<25	-----	A	---	D,S	---	GD	---	690	325	3.0	20	10/65	ANAL. pH 7.5
NW NE 28	A. Waligora	-----	-----	110	4	1,040	-----	-----	A	---	D,S	---	---	---	---	---	---	---	---	
NE NW 28	C. Stanfield	A. Knapp	1965	37	4	1,040	7	7/65	A	---	D,S	None	GR	---	540	290	2.5	5	12/65	
NW SE 30	F. Boetcher	Self	1963	32	1½	1,035	13	1963	A	---	D,I	.010	GD	---	415	220	0.3	10	2/65	
NW SE 31	C. Cook	-----	-----	25	2	1,030	-----	-----	A	---	D,S	.010	GD	---	530	275	0	5	2/65	Also one 80' well at barn Analysis by Culligan; pH 7.5
SW SE 32	R. Guisinger	-----	-----	29	1½	1,020	<25	-----	I	---	D,S	.010	GD	---	650	295	0	20	2/65	
NW NE 33	R. Girod	-----	-----	30	8	1,050	<25	-----	I	---	D	None	GD	---	920	410	0	60	12/65	
NE NE 34	L. Stukey	W. Downer	1955	60	4	1,050	<25	-----	A	---	D,S	---	GR	---	-----	330	3.8	---	2/64	
SE SW 35	W. Greenlees	W. Downer	----	20	1½	1,060	10	-----	A	---	D	.010	GD	---	590	310	1.0	5	2/65	
SW SW 35	A. Kurtman	W. Downer	1955	90	4	1,060	18	7/55	13	8	---	None	Sh	<60	-----	-----	-----	-----	-----	
SE SW 36	C. Kriser	W. Downer	----	80	4	1,080	<25	-----	A	---	D	None	Sh	30	-----	-----	-----	-----	-----	
BATAVIA TOWNSHIP																				
NW SE 2	C. Headly	A. Knapp	1965	65	4	950	10	10/65	--	---	---	None	Sh	20	-----	-----	-----	-----	-----	LOG Slotted pipe screen
SE SE 4	R. Gallop	B. Thompson	1963	100	4	975	6	1963	5	<1	D	None	Sh	20	-----	-----	-----	-----	-----	
NE SE 5	F. Lampman	W. Downer	1947	60	6	970	18	9/47	4	<1	D	None	Sh	---	-----	-----	-----	-----	-----	
NE NE 5	R. Tyler	A. Knapp	1958	100	4	950	-----	-----	--	---	D,S	---	Sh	---	520	290	0.5	15	7/65	
SE SE 5	C. Hawley	-----	-----	48	1½	980	-----	-----	--	---	D,S	---	GD	---	500	275	1.5	5	7/65	
SE SE 7	Woodford	Self	1964	32	4	945	15	1964	--	---	D	None	GR	---	800	450	0.5	40	7/65	
NE NE 9	B. G. Matthews	W. Downer	1953	150	4	980	-----	-----	--	---	D	---	Sh	---	815	390	0.4	50	5/65	
SE NE 9	B. A. Matthews	A. Knapp	-----	40	3	980	-----	-----	--	---	D	---	---	---	950	320	0	50	5/65	
NE NW 10	H. Pierce	A. Knapp	1965	75	4	980	11	11/65	--	---	D	None	Sh	30	-----	-----	-----	-----	-----	
NW SW 12	R. Tappendon	Self	----	21	1½	940	<25	10/64	--	---	D	.010	GR	---	540	250	0	5	10/64	
SE SE 13	C. Beulis	W. Downer	1955	93	4	950	22	2/55	21	4	D	---	GD	---	-----	-----	-----	-----	-----	
SW SW 14	R. Miller	E. Studemann	1960	40	5	940	-----	-----	--	---	D	---	GR	---	570	280	0	25	5/65	
SW SW 16	Scheber	A. Knapp	1965	65	4	940	7	9/65	--	2	---	None	Sh	15	-----	-----	-----	-----	-----	
SE SW 17	G. Watson	D. Showalter	----	90	4	950	4	-----	3	---	D	None	Sh	---	-----	-----	-----	-----	-----	
NE NE 19	Danbury	-----	1946	90	3	960	30	1965	--	---	D,S	None	Sh	30	730	85	0.7	15	7/65	
NW SE 21	V. Good	-----	----	<25	1½	930	-----	-----	--	---	D,S	.010	GD	---	400	185	0	10	5/65	
NE NW 22	R. Bloom	-----	----	25	1½	930	15	1965	--	---	D,S	.010	GD	---	1,050	305	0	200	5/65	
NW NE 23	L. Miller	D. Showalter	1946	130	4	970	-----	-----	--	---	A	None	Sh	30	-----	-----	-----	-----	-----	
NW NE 23	L. Miller	D. Showalter	----	32	8	950	16	1926	450	---	A,I	----	GD	35	-----	-----	-----	-----	-----	
SW NW 23	L. Barrows	A. Knapp	1965	82	4	940	35	6/25	--	---	D	.010	Sd	---	-----	-----	-----	-----	-----	
NW NE 23	K. Miller	E. Studemann	1940	25	4	950	20	1940	--	---	D,S	---	GR	27	675	205	2.5	75	5/65	LOG
SW SE 24	C. Peppiatt	B. Yearling	1965	35	4	950	23	6/65	10	<1	---	None	Sd, GR	---	-----	-----	-----	-----	-----	LOG

Table 3.--Records of selected wells.--Continued

Location ± ¼ sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well Altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
BRONSON TOWNSHIP																				
SW NW 1	F. Wesh	-----	----	89	4	930	-----	-----	A	---	D	----	--	----	460	220	0.7	10	4/65	ANAL; LOG
SW SE 1	City of Bronson #3	Layne-Northern	1960	62	30	915	8	11/60	1,000	32	M	.055	Sd, GR	----	-----	-----	-----	-----	-----	
SE SE 1	I. Parham	Self	----	16	1½	915	<25	1965	A	---	D,S	.010	GD	----	1,025	450	0.2	50	4/65	
NE NE 2	B. Reagan	-----	1958	96	3	925	-----	-----	A	---	D	----	--	----	440	240	0.7	10	4/65	LOG
SE SE 3	J. Norris	-----	----	36	1½	910	10	1955	A	---	D	.010	GD	----	440	230	-----	5	4/65	
SE SE 3	J. Bloom	W. Downer	1959	95	4	920	-----	-----	25	---	D	----	GD	----	-----	-----	-----	-----	-----	
NE NE 4	D. Littlejohn	-----	----	67	2	920	23	1965	A	---	D	----	--	----	560	260	0.3	5	4/65	LOG
NE NE 4	Bronson #3 School	E. Studeman	1940	56	4	920	23	11/40	15	---	P	.010	Sd	----	-----	-----	-----	-----	-----	
SE NE 6	V. Teff	-----	----	90	4	900	-----	-----	A	---	D,S	----	--	----	460	210	0.6	10	4/65	
NE NW 7	H. Cary	Self	----	20	1½	880	5	1965	A	---	D	.010	GD	----	495	200	0	5	4/65	ANAL; LOG
NE NE 8	E. Yesh	Reed	1960	70	2	900	15	1960	A	---	D	.010	Sd, GR	----	590	210	1.0	10	4/65	
SW SW 10	C. Dixon	-----	----	30	--	905	-----	-----	A	---	D	.010	GD	----	725	290	0.2	20	4/65	
NW NW 11	C. Barnes	Self	1957	30	1½	910	8	7/57	A	---	D	.010	GD	----	530	260	0.3	5	4/65	ANAL; LOG
SW NW 12	City of Bronson #1	Smith-Monroe	1936	97	12	915	15	7/58	700	17	M	.040	GR	----	-----	-----	-----	-----	-----	
SE NE 12	City of Bronson #4	Layne-Northern	1960	61	30	925	11.25	3/60	850	68	M	.030	Sd	----	-----	-----	-----	-----	-----	
SE NE 12	Branch Co. Rd. Comm.	USGS	1965	42	1½	915	13.12	9/65	--	---	O	.010	Sd, GR	----	-----	-----	-----	-----	-----	LOG
SE SE 13	W. Losinsky	-----	----	65	2	925	-----	-----	A	---	D,S	----	--	----	500	290	2.0	15	7/65	
NE NE 13	K. Cuyler	R. Colpetsyir	1965	26	1½	920	6.66	4/65	A	---	D	.010	GD	----	500	240	3.0	10	4/65	
NE NE 14	City of Bronson #2	-----	----	80	12	915	10	-----	1,050	42	A	.050	Sd	----	-----	-----	-----	-----	-----	LOG; ANAL. ANAL. ANAL. LOG
NW NW 14	B. Losinski	Self	1952	27	1½	910	<25	1965	A	---	D	.010	Sd	----	380	190	0.1	10	4/65	
NW NE 15	R. Witta	B. Yearling	1965	60	4	910	14	8/65	12	---	D	None	Sd	----	-----	-----	-----	-----	-----	
NE NW 15	M. Dicus	Self	1963	25	1½	910	15	5/63	A	---	D	.010	GD	----	410	190	0	5	4/65	pH 7.2
NE SE 16	L. Green	E. Studeman	-----	65	4	920	-----	-----	A	---	D,S	None	GR	----	580	-----	2.0	15	4/65	
NW NE 18	N. Holst	Self	----	20	1½	880	-----	1965	A	---	D	.010	GD	----	520	220	0	10	4/65	
SW NE 19	F. Minger	B. Lewis	1949	72	4	900	35	1965	A	---	D,S	----	GR	----	540	280	0	5	4/65	pH 7.0; ANAL. Gravel packed
SE SW 20	F. Rohloff	A. Wooster	1965	82	2	930	30	1965	9	---	D	----	GD	----	470	220	1.2	5	4/65	
SE NE 21	C. Warzniak	-----	----	25	1½	910	-----	-----	A	---	D,S	.010	GD	----	490	240	0	-----	4/65	
SW SW 23	V. Smoker	Self	----	21	1½	910	17	1965	A	---	D,S	.010	GD	----	580	290	2.0	5	4/65	pH 7.0; ANAL. Gravel packed
NE NE 24	A. Losinski	Self	----	31	1½	920	11	1/65	A	---	D	.010	GD	----	1,050	520	<4	10	4/65	
NE NW 25	W. S. Korski	W. Downer	1962	65	4	920	24.25	5/52	30	---	---	----	GD	----	-----	-----	-----	-----	-----	
SE NE 25	H. Harris	Self	----	20	1½	930	-----	-----	A	---	D,S	.010	Sd	----	600	290	0.6	5	4/65	pH 7.0; ANAL. Gravel packed
NE SE 26	T. Antosekiewicz	-----	----	80	4	920	-----	-----	A	---	D,S	----	--	----	575	260	0.7	10	4/65	
SW SW 27	K. Coler	Self	----	25	1½	910	-----	-----	A	---	D	.010	GD	----	810	360	<4	35	4/65	
SE SE 27	L. Keeslar	-----	1964	28	1½	915	-----	-----	A	---	D	.010	GD	----	625	270	0.3	5	4/65	pH 7.0; ANAL. Gravel packed
SE SW 30	B. Fager	-----	----	20	1½	900	-----	-----	A	---	D,S	.010	GD	----	500	260	0.6	5	4/65	
SE SE 32	O. Lilly	Self	----	22	1½	910	5	1965	A	---	D	.010	Sd	----	650	290	0	20	4/65	
SW SW 33	M. Lilly	Self	----	21	1½	900	-----	-----	A	---	D,S	.010	GD	----	1,000	490	3.5	5	4/65	pH 7.0; ANAL. Gravel packed
NE SE 34	W. Slisher	Harto Diebels	----	22	1½	910	-----	-----	A	---	D	.010	GD	----	550	290	0.2	-----	4/65	
SW SW 35	C. Rice	Self	1958	20	1½	910	-----	-----	A	---	D	.010	GD	----	600	300	4.0	-----	4/65	
SE SW 35	F. Slisher	C. Wendell	1964	19	1½	930	10	1964	12	---	D	.010	GD	----	-----	-----	-----	-----	-----	pH 7.0; ANAL. Gravel packed

Table 3.--Records of selected wells.--Continued

Location # # sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
BATAVIA TOWNSHIP (CONT'D)																				
NE NW 24	D. Shiery	B. Yearling	1965	85	4	950	22	4/65	10	1	---	None	GR	---	---	---	---	---	---	LOG
NW NE 25	Brooks Plat	W. Downer	1955	42	4	950	22	9/55	40	40	P	.025	GR	---	---	220	.05	3.0	1963	MDH ANAL; LOG
NW NE 25	Brooks Plat	W. Downer	1955	100	4	950	20	3/55	2	---	T	None	Sh	80	---	---	---	---	---	Reported salty; LOG
NW NE 25	Brooks Plat	W. Downer	1955	30	4	950	-----	-----	0	---	T	---	Sh	30	-----	-----	-----	-----	-----	Dry hole; LOG
NW NW 27	J. Pinke	A. Knapp	1956	96	6	940	10	12/56	10	---	D	None	Sh	30	1,850	120	0.6	500	7/65	pH 8.0; ANAL.
NE NW 31	F. Casey	-----	-----	67	4	940	-----	-----	---	---	D,S	---	---	---	510	360	1.1	5	7/65	ANAL.
SE NE 33	D. Herman	-----	-----	106	3	925	12	1962	---	---	D,S	---	Sh	---	1,500	190	0.3	500	5/65	
SE SE 33	L. McKee	-----	1962	34	4	925	<25	1965	---	---	P	---	GR	---	600	310	0.3	60	7/65	Supplies 20 trailers
SW SE 35	J. Szafronski	A. Knapp	1954	96	4	970	-----	-----	---	---	---	None	Sh	---	---	240	---	1,500	8/64	pH 7.8
NW SW 36	J. Szafronski	Self	----	13	28	980	5.52	7/65	---	---	I	---	GD	---	750	310	0	55	7/65	pH 7.4; dug well
BETHEL TOWNSHIP																				
NE NW 1	S. Walker	W. Downer	1960	54	6	1,000	8	6/60	5	---	---	None	Sh	20	-----	-----	-----	-----	-----	
SE NE 3	E. Butters	-----	----	20	1½	940	15	1965	I	---	---	.010	GD	20	1,050	375	0	60	4/65	
SE NE 3	E. Butters	A. Knapp	1963	201	6	940	-----	-----	I	---	D,S	None	Sh	---	4,000	185	0.2	1,200	4/65	
NW NW 6	S. Czajkowski	W. Downer	1961	52	5	910	26	9/61	21	---	P	.020	Sd	---	---	---	---	---	---	LOG
SE NE 7	J. Rifenburgh	W. Downer	-----	63	4	915	23	6/63	17	---	---	.016	GD	---	---	---	---	---	---	
SW NE 9	J. Wilkins	-----	----	35	2	930	-----	-----	---	---	D	---	GD	---	550	255	0.9	10	7/65	
NE NW 11	L. Green	Self	----	20	1½	960	<20	-----	---	---	D	.010	GD	---	540	290	0.4	15	7/65	pH 7.6
NE NW 11	L. Green	W. Downer	1941	100	4	965	14	10/42	5	<1	D,S	None	Sh	---	6,000	220	0.9	1,800	7/65	pH 8.0; ANAL.
NE NE 11	F. Renshaw	-----	----	14	---	975	7.30	7/65	---	---	D,S	None	GD	---	350	290	0	10	7/65	pH 7.2; dug well
SW NE 13	J. Cole	D. Showalter	1908	109	2	1,025	-----	-----	---	---	D	---	---	---	500	275	2.4	20	7/65	
NE NW 14	J. Ewers	-----	----	12	28	975	6.89	7/65	---	---	A	None	GD	---	980	395	0.3	75	7/65	pH 7.9; dug well
NE NE 15	D. Fowler	W. Downer	1964	96	6	955	13	2/64	30	---	---	None	Sh	---	---	---	---	---	---	
NE NW 17	B. Duncan	Self	1963	25	1½	930	15	4/63	---	---	D,S	.010	GR	---	840	380	---	30	4/65	
NE NW 21	N. Drust	A. Wooster	1962	30	1½	940	<25	-----	---	---	D	.010	GD	---	480	255	1.5	10	7/65	
SW SW 23	A. Caskey	-----	----	80	4	990	-----	-----	---	---	D,S	---	---	---	500	275	1.7	5	7/65	
SW NW 24	W. Knapp	Self	-----	28	1½	1,010	-----	-----	I	---	D	.010	Sd	---	460	255	0.4	10	7/65	
NE NW 25	Ellis	Kaiser	-----	120	4	1,010	-----	-----	---	---	D	---	---	---	510	275	4.0	5	7/65	
NE SW 26	K. Alleshouse	-----	----	70	4	980	-----	-----	I	---	D	---	---	---	470	255	1.5	15	7/65	
SE SE 29	D. Sauchuk	-----	----	30	1½	940	10	1955	---	---	D	.010	Sd	---	550	275	1.0	35	7/65	
NE NW 29	V. Ludwick	Self	-----	30	1½	935	-----	-----	---	---	D	.010	GD	---	720	275	0.4	20	7/65	
SE NW 31	O. Harbaugh	Self	-----	22	1½	945	20	-----	---	---	D	.010	GR	---	625	300	0	10	10/64	
NE NW 31	G. Jeffery	-----	----	50	1½	940	20	7/65	---	---	D	.010	GD	---	680	340	1.8	15	7/65	
SW SW 34	R. Wells	-----	----	26	1½	965	<25	-----	---	---	D	.010	GD	---	750	340	0.4	30	7/65	Reported deep
NW NW 34	K. Alleshouse	Greely	1955	---	4	965	-----	-----	---	---	D	---	GR	---	870	360	0.7	35	7/65	
SE SE 35	I. Lundsford	H. Fry	-----	70	4	980	18	7/65	---	---	D	---	---	---	750	430	2.4	25	7/65	ANAL.
SE SE 35	P. Brower	Self	-----	22	1½	980	16	9/63	---	---	D,S	.010	GR	---	650	300	0	5	10/64	

Table 3.--Records of selected wells.--Continued

Location ± ¼ sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO ₃)	Iron (ppm)	Chloride (ppm)	Date sampled	
BUTLER TOWNSHIP																				
NE NW 1	M. Wade	Brewer	1950	62	4	990	10	-----	A	---	D,S	----	S ₄ GR	---	480	210	1.2	5	9/64	pH 7.2
NE NE 2	M. Wade	Brewer	1950	60	12	985	8.44	8/64	500	500	Q,Ir	----	GR	---	-----	-----	-----	-----	-----	pH 7.0 LOG
NE NE 2	M. Wade	Brewer	1950	237	10	985	8.20	8/64	200	---	A,O	----	Sh	110	-----	-----	-----	-----	-----	
NW NW 2	H. Ray	W. Downer	1962	99	4	990	60	1962	A	---	D,S	----	GR	---	550	240	0.2	10	9/64	
SW SW 2	C. Belote	-----	1947	106	4	1,015	19	1941	A	---	D	----	--	---	660	310	0.5	5	9/64	
SE SE 3	Butler P.S. #3	W. Downer	1941	106	4	990	19	1941	--	---	D	None	Sh	83	-----	-----	-----	-----	-----	pH 7.0 pH 7.2
NW SW 4	J. Hackworth	-----	-----	28	4	980	≤25	-----	A	---	D	----	GD	---	740	350	5	5	10/64	
NE NW 6	E. Lindsey	Self	1963	20	1½	970	15	1963	I	---	D,S	.010	GR	---	725	310	0.3	20	10/64	
NW SW 8	C. Peet	-----	1958	75	4	1,010	25	-----	A	---	D,S	---	---	---	650	340	0.5	-----	9/64	
NE NE 9	H. Rice	Kleinfeldt	1956	130	4	1,000	-----	-----	A	---	D,S	None	Sh	---	675	230	1.5	25	10/64	pH 7.2
NW NE 10	R. Coriell	-----	-----	70	4	1,010	-----	-----	A	---	D,S	---	---	---	740	345	0.5	20	10/64	
NE NW 10	F. Frick	W. Downer	1948	70	4	1,020	16	3/48	27	---	---	None	Sh	50	-----	-----	-----	-----	-----	ANAL.
NW NW 13	C. Mc Ninch	-----	-----	40	--	995	≤25	-----	A	---	D,I	---	---	---	700	330	1.5	10	10/64	
SW SW 14	L. Freeburn	W. Downer	1965	113	6	-----	61	1/65	22	2	D	None	Sh	---	-----	-----	-----	-----	-----	
SE SE 14	A. Harley	Leonard	1964	29	5	1,005	9	1964	30	---	S	----	GR	---	600	290	6.0	5	10/64	
SE NE 16	R. Fish	Self	-----	15	--	990	≤15	-----	A	---	D,S	.010	GD	---	700	360	4	-----	10/64	ANAL.
SE SE 17	O. Griffin	W. Downer	1960	82	4	1,015	30	1960	A	---	D	----	--	---	570	260	1.2	0	10/64	
SE SW 17	L. Supinoski	W. Downer	1956	47	4	980	18	8/56	25	---	---	.020	GD	---	-----	-----	-----	-----	-----	
SE NE 17	L. Hulbert	W. Downer	1963	85	4	980	30	4/63	22	---	---	None	Sh	60	-----	-----	-----	-----	-----	
SW SE 18	R. Taylor	Self	1954	30	1½	975	16	-----	I	---	D,S	.010	GD	---	440	310	4.0	-----	9/64	ANAL.
NE SE 22	G. McCann	-----	-----	86	4	1,080	-----	-----	A	---	D	----	---	---	600	325	0.7	-----	10/64	
SW NW 22	H. Moore	W. Downer	1953	62	4	1,005	17	9/53	7	---	---	None	Sh	45	-----	-----	-----	-----	-----	
NW SE 22	L. Wiser	W. Downer	1955	60	4	1,020	7	3/55	27	---	---	None	Sh	35	-----	-----	-----	-----	-----	
NW NW 25	T. Shilling	B. Thompson	-----	82	4	1,020	30	-----	A	---	D,S	----	---	---	460	210	0.5	5	10/64	ANAL.
NW NE 28	O. Beagle	W. Downer	1948	89	4	1,000	18	7/48	7	≤1	---	None	Sh	45	-----	-----	-----	-----	-----	
SE SE 29	C. Lucke	W. Downer	1955	50	4	1,000	5	5/55	20	---	---	None	Sh	40	-----	-----	-----	-----	-----	
SW SE 30	E. Wells	B. Thompson	1956	96	4	1,030	8	1956	10	---	---	None	Sh	≤70	-----	-----	-----	-----	-----	
SW SW 32	R. Beemer	-----	-----	83	4	1,015	-----	-----	A	---	D,S	----	---	---	440	240	0.7	5	10/64	ANAL.
SE SE 33	C. Lampman	W. Downer	-----	34	4	995	-----	-----	A	---	D,S	----	---	---	550	280	1.5	5	10/64	
SW NW 33	W. Locke	W. Downer	1961	75	2	1,030	-----	-----	A	---	D,S	----	---	---	480	220	0	5	10/64	
NW SE 34	B. Hayes	-----	-----	30	1½	995	-----	-----	A	---	D,S	.010	GD	---	520	260	0	5	10/64	
NW NE 34	R. McDonald	-----	-----	80	4	1,020	-----	-----	A	---	D,S	----	---	---	500	260	0.7	5	10/64	ANAL.
SE SE 35	R. Denham	W. Downer	1956	96	4	980	8	1956	10	---	---	None	Sh	≤70	-----	-----	-----	-----	-----	
NE NW 36	A. Oxenham	W. Downer	1940	85	4	1,010	32	1940	A	---	D,S	----	GR	---	720	330	1.5	20	10/64	

Table 3.--Records of selected wells.--Continued

Location 1/4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks	
															Specific conductance (Micromhos @ 25° C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled		
CALIFORNIA TOWNSHIP																					
NW SW 2	D. Pridgeon	W. Downer	1950	39	4	1,070	18	4/50	15	---	---	None	GD	---	---	---	---	---	---	---	
SW NW 2	G. Pridgeon	W. Downer	1942	85	4	1,075	18	10/42	8	---	D,S	None	Sh	48	---	---	---	---	---	---	
SW SW 3	M. Miller	B. Thompson	1964	31	4	1,050	12	10/64	15	---	D	---	Sd, GR	---	500	295	0.8	<5	3/65	pH 7.5	
SW SE 5	H. Billman	Self	----	15	1 1/2	1,045	-----	----	---	---	---	---	---	---	---	---	---	---	---	---	
SW SW 5	E. Withington	D. Showalter	1933	65	4	1,035	7	9/33	---	---	---	None	Sh	54	---	---	---	---	---	---	
NW NE 6	G. Cattlee	W. Downer	1940	58	4	1,030	18.57	9/64	15	---	O	None	GR	---	---	---	---	---	---	LOG	
NE NW 7	H. Copeland	-----	----	80	2	1,040	-----	----	A	---	D	---	---	---	825	345	1.0	65	3/65	LOG	
NW NE 7	J. Easterday	Self	----	35	1 1/2	1,040	<25	1963	A	---	D	.010	---	---	750	345	1.0	50	3/65	pH 7.1	
NE NE 9	Bretz General Store	J. Decker	----	74	2	1,065	3	-----	A	---	D	---	---	---	500	260	1.0	5	3/65	---	
SW SE 9	J. Vance	Self	1952	20	1 1/2	1,060	<20	1952	A	---	D,S	.010	GD	---	570	310	0	10	12/65	---	
NW NW 10	E. Cope	-----	----	138	---	1,065	-----	----	A	---	D	---	---	---	1,600	50	0.1	400	3/65	2 houses use	
SW SW 11	R. Wise	B. Thompson	1964	66	4	1,065	20	10/64	15	---	P	None	Sh	50	450	240	0.7	5	3/65	pH 7.8	
NW SE 12	L. Kestner	Tucker	1957	65	2	1,090	> 25	1957	A	---	D,S	---	---	---	600	310	0	16	3/65	---	
NE SE 14	M. Loucks	-----	----	50	---	1,090	-----	----	A	---	D,S	---	---	---	785	395	2.0	15	3/65	---	
SW NE 14	E. Miller	-----	----	170	4	1,100	50	1964	A	---	D,S	---	---	---	650	310	4.0	5	12/65	---	
SE NE 15	H. Miller	W. Downer	1946	84	4	1,100	57	7/46	10	---	---	None	GD	---	---	---	---	---	---	---	
NE SW 16	Schoolhouse	Self	----	25	1 1/2	1,085	20	-----	A	---	D	---	---	---	780	380	0	20	12/65	---	
SE SW 16	E. Hamman	-----	----	51	4	1,070	46	2/34	---	---	---	---	GR	---	---	---	---	---	---	LOG	
			----	26	1 1/2	1,070	5	-----	A	---	D,S	.010	Sd, GR	---	---	---	---	---	---	---	
NW SW 16	L. Hamman	-----	----	60	4	1,065	<18	-----	A	---	S	---	---	---	930	380	0	35	12/65	---	
NW SW 16	L. Hamman	-----	----	17	1 1/2	1,065	13	-----	A	---	D	.010	---	---	500	260	0.8	5	12/65	---	
SW NW 17	Mrs. C. Hartman	A. Allen	----	70	---	1,060	-----	----	A	---	D	---	---	---	600	310	0	10	12/65	---	
NW SE 18	M. Green	Hutchins	----	160	4	1,050	80	-----	A	---	D, S	---	---	---	460	205	1.0	10	12/65	pH 7.8; ANAL.	
NE SE 18	C. Wilhite	W. Surfus	1961	80	4	1,050	-----	----	A	---	D	---	GR	---	540	290	2.5	5	3/65	---	
SW NE 22	Schoolhouse	D. Showalter	1934	133	4	1,080	46	2/34	---	---	---	---	GR	---	---	---	---	---	---	LOG	
SW NE 22	J. Penner	Allen & Crain	1965	92	4	1,080	39	3/65	---	---	P	.018	GR	---	---	---	---	---	---	LOG	
SW NE 22	P. Stewart	E. Carlin	1964	102	2	1,090	<25	1964	A	---	D	---	GD	---	650	255	1.0	5	12/65	---	
SW NE 22	J. Binkley	R. Akers	1959	42	2	1,080	<25	1965	A	---	D	---	GD	---	640	360	0	15	3/65	pH 7.0	
SW NE 23	S. Kincaid	-----	----	160	2	1,100	-----	----	I	---	D	---	---	---	600	290	1.5	----	12/65	---	
COLDWATER TOWNSHIP																					
NE SE 1	R. Greenmyer	W. Downer	1963	75	6	1,020	41	3/63	20	---	---	---	GD	---	---	---	---	---	---	---	
SW SE 1	A. Pechulis	W. Downer	----	120	4	1,020	-----	----	I	---	D,S	None	Sh	---	2,400	250	2.0	550	10/65	---	
SW SE 1	A. Pechulis	W. Downer	----	60	4	1,020	-----	----	A	---	D,S	---	---	---	700	280	0.2	15	10/65	---	
NW NW 1	C. Chatfield	W. Downer	1961	60	4	970	5	10/61	9	<1	---	None	Sh	29	---	---	---	---	---	---	
NW NW 1	G. Pifer	-----	1962	47	4	970	10	6/62	11	---	---	None	Sh	26	---	---	---	---	---	---	
NW SE 1	F. Garrett	W. Downer	1947	84	5	980	18	8/47	8	<1	---	---	Sh	23	---	---	---	---	---	---	
NW SW 2	E. Williams	W. Downer	1949	76	4	1,010	31	5/49	10	1	---	---	GD	---	---	---	---	---	---	---	
NW NW 2	L. Paul	-----	----	80	4	990	-----	----	A	---	D, I	---	---	---	600	270	0	-----	9/64	---	
SE SW 2	A. Semmelroth	W. Downer	1957	60	6	990	33	9/57	16	2	D,S	.030	GD	---	850	400	1.5	35	11/65	---	
NE NE 2	F. Lenon	A. Knapp	1954	68	4	975	12	11/64	A	---	D,S	---	---	---	875	430	-----	30	11/64	---	
NE NW 2	G. Martin	-----	----	83	6	975	20	-----	A	---	D,S	---	---	---	520	250	1.0	-----	7/64	---	

Table 3.--Records of selected wells.--Continued

Location 1/4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO ₃)	Iron (ppm)	Chloride (ppm)	Date sampled	
COLDWATER TOWNSHIP (CONT'D)																				
SE SW 3	H. Murphy	D. Showalter	----	70	4	970	5	-----	A	---	D,S	None	Sh	14	710	345	0.1	20	10/65	LOG 12 trailers pH 7.2 20' screen
NW NW 3	C. Bible	-----	1947	100	6	980	Δ25	-----	I	---	P	None	Sh	12	700	140	0	10	10/64	
NE NW 3	J. Lewis, Jr.	W. Downer	1964	90	6	990	36	11/64	11	Δ1	---	None	Sh	47	-----	-----	-----	-----	-----	
NE SW 4	H. Stukey	W. Downer	1960	62	4	940	22	5/60	20	---	---	.016	GD	---	-----	-----	-----	-----	-----	
NW NW 4	T. Victor	Self	1962	18	1 1/2	940	Δ18	1962	A	---	D	.010	GD	---	550	260	0	15	10/64	
NE SE 4	H. Laurell	W. Downer	1965	37	4	940	18	8/65	7	Δ1	D	.012	SD	---	-----	-----	-----	-----	-----	
SE SW 5	Lakecrest Mobile Ct.	A. Knapp	1962	87	4	935	10	1962	55	---	P	---	SD	---	430	200	4.0	5	10/65	
SW SW 5	R. Raddick	Self	-----	32	1 1/2	940	12	-----	A	---	D	.010	GD	---	610	240	4.0	10	10/65	
SW NE 5	Coldwater C. Club	W. Downer	1965	66	8	940	16	8/65	350	17	P,I	.030	GR	---	-----	-----	-----	-----	-----	
SE SE 5	Wine Miller Mfg. Co.	W. Downer	1960	39	10	940	6	5/60	620	89	I	---	GD	---	-----	-----	-----	-----	-----	
SE SE 6	D. Baxter	D. Mott	1964	27	1 1/2	930	20	1964	---	---	---	.010	GD	---	-----	-----	-----	-----	-----	
SW SW 6	J. Musselman	-----	-----	26	1 1/2	845	Δ25	-----	---	---	D	.010	GD	---	650	275	0	60	10/65	
NE NE 6	W. Brown	Self	1938	28	1 1/2	940	Δ25	-----	A	---	D,S	.010	GD	---	550	275	0.1	110	10/65	
SE NW 7	T. Rumens	D. Showalter	-----	100	4	950	-----	-----	A	---	D	None	---	---	570	100	0	10	10/65	
NE SW 7	L. Fraser	-----	-----	28	1 1/2	950	Δ25	-----	A	---	D	.010	GD	---	875	120	0	150	10/65	
NW SW 7	Coldwater P.S. #2	-----	-----	108	4	960	34	-----	11	Δ1	P	None	Sh	---	-----	-----	-----	-----	-----	
SE NE 7	G. Gruner	-----	-----	106	4	965	-----	-----	---	---	D	None	Sh	---	-----	-----	-----	-----	-----	
NE NE 9	Maple Lawn Hospital	-----	-----	135	6	980	10.10	8/64	---	---	A,O	---	Sh	---	-----	-----	-----	-----	-----	
NE SE 9	I. Hoff	A. Knapp	1956	55	4	970	-----	-----	105	---	Ir	---	GD	---	650	310	-----	5	9/64	
NW SW 9	L. Legg	A. Knapp	1958	132	4	940	7	6/58	---	---	---	---	---	---	900	430	2.6	45	10/65	
SE SW 9	R. Shook	W. Downer	1954	34	4	950	23	12/54	15	---	---	---	GD	---	-----	-----	-----	-----	-----	
SE NE 9	J. Downey	A. Knapp	1955	45	6	970	Δ25	1955	A	---	Ir	---	---	---	-----	-----	-----	-----	-----	
SE SE 10	K. Gannon	W. Downer	1963	65	6	980	15	11/63	10	---	---	---	Sh	---	1,050	120	0.4	200	10/65	
SE SW 11	C. Beckwith	-----	1940	96	4	1,010	Δ25	-----	A	---	D,S	---	---	---	750	420	1.5	20	-----	
SE SE 12	M. Semmelroth	D. Showalter	1938	60	4	1,040	Δ25	1938	A	---	D,S	None	Sh	---	-----	-----	-----	-----	-----	
SW SW 12	J. Mitchell	W. Downer	1958	87	6	1,030	-----	-----	7	---	---	None	Sh	25	-----	-----	-----	-----	-----	
SE SW 12	E. Norton	W. Downer	1944	84	5	1,030	16	12/44	5	---	---	None	Sh	22	-----	-----	-----	-----	-----	
SE SE 13	Marsh	B. Thompson	1964	157	4	1,020	50	1964	10	---	D	None	Sh	70	1,050	120	0.4	260	10/65	
NE SE 14	R. Link	-----	-----	85	4	1,030	17	1962	A	---	D,S	---	---	---	750	420	1.5	20	9/64	
SE SE 14	L. Ormes	W. Downer	1957	40	6	1,010	6	9/57	25	---	---	None	Sh	21	-----	-----	-----	-----	-----	
SW SW 14	H. Coombs	W. Downer	1949	51	4	1,015	20	7/49	10	Δ1	---	---	CD	---	-----	-----	-----	-----	-----	
SE SE 16	R. Olmstead	-----	-----	80	4	963	-----	-----	---	---	Ir	---	GD	---	-----	175	0	8.7	6/60	
SW SW 17	Coachlite Motel	D. Mott	-----	24	4	950	15	-----	A	---	P	---	GD	---	-----	-----	-----	-----	-----	
NE NW 18	R. Young	D. Showalter	1923	65	4	950	28	1963	A	---	P	---	---	---	480	240	0.1	-----	10/65	
SE SW 18	Yorrington	Self	1960	23	2	940	Δ23	1964	A	---	D	.010	SD	---	-----	-----	-----	-----	-----	
SW NW 19	G. Griest	A. Knapp	1960	53	4	950	-----	-----	A	---	D	---	GR	---	660	275	0.1	15	4/64	
NW NW 19	Coldwater Twp.	W. Downer	1964	56	6	950	29.29	7/64	117	6	T,O	.040	GR	---	625	290	0.1	16	4/64	
SW SE 19	L & S Products	A. Knapp	1953	35	4	950	Δ25	1953	---	---	P,I	---	GD	---	650	340	0.8	15	4/65	
SW NW 19	W. Gruner	D. Showalter	1926	100	4	950	40	1964	8	---	A	None	Sh	36	550	240	0.2	10	3/64	
NE NE 19	C. Herman	-----	-----	42	1 1/2	950	27	1961	A	---	D,I	.010	GR	---	8,700	470	4.0	4,200	3/64	
NE NW 19	K. Penner	W. Downer	1954	30	4	950	6	1954	15	5	D	.012	GR	---	700	290	0.1	30	3/64	
NW NE 19	Golip Plat	W. Downer	1960	32	6	950	19	6/60	30	4	T	.030	GR	---	-----	300	0.3	14	6/60	
NE NE 19	Mack's Airport Inn	A. Knapp	1964	64	---	950	19	9/64	55	---	P	---	GR	---	-----	-----	-----	-----	-----	
SW SE 20	J. Cangialosi	A. Knapp	1960	108	6	980	-----	-----	A	---	D	None	Sh	---	2,900	105	0.1	800	10/65	

Table 3.--Records of selected wells.--Continued

Location ± ± sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
COLDWATER TOWNSHIP (CONT'D)																				
SE SW 20	L. Fisher	A. Knapp	1965	25	4	960	10	8/65	--	---	D	----	Sd, GR	---	---	---	---	---	---	
NE NE 21	So. Mich. Nat'l Bank	W. Downer	1955	49	4	970	18	4/55	50	8	I	.020	GD	---	---	---	---	---	---	6' screen
NE SW 21	Quality Spring Prod.	W. Downer	1956	46	6	960	21	6/56	50	20	I	.100	GD	---	---	---	---	---	---	15' screen
SW SE 21	Pepsi Cola Co.	A. Knapp	1958	26	4	960	17	5/58	--	---	I	----	GD	---	---	---	---	---	---	
NE NE 21	Davis Company	W. Downer	1963	41	4	970	18	6/63	50	--	I	.050	GD	---	---	---	---	---	---	
SW NE 21	Grant Hotel	C. Wright	1932	1,290	8	960	-----	-----	--	---	A	None	Ls	115	-----	29173	11.5	75240	-----	Culligan ANAL; LOG
SE NE 21	Coldwater Dairy	-----	1932	142	6	970	-----	-----	--	---	I	----	GR	---	---	---	---	---	---	
NE SW 22	City of Coldwater	Harmon-Ness	1931	132	28	970	17	10/61	1200	235	M	.250	Sd, GR	135	-----	---	---	---	---	LOG; ANAL.
NE SW 22	City of Coldwater	Dunbar	1947	121	20	970	12	12/47	2250	150	M	.180	Sd, GR	---	---	---	---	---	---	LOG; ANAL.
NE SW 22	City of Coldwater	Dunbar	1956	125	20	970	11	5/56	2250	150	M	.155	Sd, GR	---	---	---	---	---	---	LOG; ANAL.
NW SW 22	City of Coldwater	Dunbar	1964	131	34	970	9	7/64	2850	190	M	.250	Sd, GR	---	---	---	---	---	---	LOG; ANAL.
SE NE 22	Anderson Dairy	W. Downer	1950	53	6	970	11	10/50	125	125	I	.125	Sd, GR	---	---	---	---	---	---	10' screen
SE NW 23	Carl's Refinery	A. Knapp	1940	40	4	980	-----	-----	A	---	P	----	Sd, GR	---	600	---	---	---	---	
SW NE 23	Restwell Motel	A. Knapp	1957	52	4	980	30	1957	A	---	P	----	GR	---	650	310	0	10	9/64	pH 7.0
SE NE 23	Little King Motel	W. Downer	1952	37	4	990	14	5/52	50	---	P	.010	GD	---	---	---	---	---	---	
SE SE 23	J. Kzepka	C. Batterson	1965	28	1½	975	13	5/65	A	---	D	----	GD	---	620	290	1.0	15	10/65	
NE SE 24	G. Pohl	-----	----	18	1½	980	<18	-----	A	---	D,S	.008	GD	---	950	390	0	30	10/65	
SW NW 24	W. Post	W. Downer	-----	93	6	1,000	43	-----	16	4	---	.010	GD	---	---	---	---	---	---	
SW SW 24	G. Abbott	D. Mott	1963	19	1½	980	12	1963	--	---	---	----	GD	---	---	---	---	---	---	
SE SE 26	G. Wheeler	W. Downer	1964	134	4	1,020	60	2/64	20	---	---	.010	GD	---	---	---	---	---	---	
NE NE 26	L. Bickford	Self	1965	30	1½	970	16	4/65	A	---	D	None	GD	---	550	240	1.0	15	10/65	
NE NE 26	J. Burke	B. Yearling	1965	60	4	970	7	10/65	35	---	D	.010	GR	---	---	---	---	---	---	LOG
SW SW 27	G. Schlubatis	A. Knapp	1963	36	4	1,030	-----	-----	A	---	Ir	.010	Sd, GR	---	710	345	0	5	10/65	
NE NW 27	D. Dospoy	A. Knapp	----	28	2	970	<25	1965	A	---	D	----	GD	---	610	290	0.1	10	10/65	
NE SW 27	D. Pope	A. Wooster	1965	39	2	980	20	8/65	15	---	D	.012	GD	---	---	---	---	---	---	LOG
NE SW 27	R. Bates	W. Downer	1963	41	4	980	22	10/63	20	---	D	.030	GD	---	---	---	---	---	---	
SE NE 28	G. Schlubatis	W. Downer	1957	36	5	1,010	20	10/57	12	---	D	----	GD	---	---	---	---	---	---	
NW SW 28	C. Rendering Co.	W. Downer	1956	31	8	990	17	5/56	--	---	I	*	GD	---	---	---	---	---	---	*.060-.100, 7'
NW SW 28	C. Rendering Co.	W. Downer	1955	130	14	990	8	1/55	2	---	I	None	Sh	---	---	---	---	---	---	Dry hole
NW NE 28	S. Side Trailer Park	W. Downer	----	35	6	965	12	-----	60	60	P	.050	GR	---	560	250	0	10	10/65	Gravel stoney
NE NE 29	R. Thomas	-----	1913	12	96	985	1	10/65	A	---	D,S	None	Sd	---	625	295	0.3	10	10/65	
SE SE 29	J. Widener	D. Showalter	----	100	4	1,020	-----	-----	I	---	D,S	None	Sh	---	620	260	0	15	10/65	
NE NW 29	M. Maunder	*	1880	*	*	940	*	-----	A	---	D	----	---	---	540	255	0.3	10	10/65	*Cased spring
NE NW 30	R. Gifford	-----	----	38	1½	955	30	1951	A	---	D	.010	Sd	---	450	205	0	10	4/65	pH 7.5
SE SW 30	M. Snyder	Self	----	27	1½	960	<25	1965	A	---	D	.010	GD	---	470	205	0	15	10/65	
NE NW 30	L. Roloff	W. Downer	1965	35	6	955	<26	10/65	17	3	D	.020	GR	<80	-----	---	---	---	---	LOG

Table 3.--Records of selected wells.--Continued

Location 1/4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO ₃)	Iron (ppm)	Chloride (ppm)	Date sampled	
COLDWATER TOWNSHIP (CONT'D)																				
NW NW 30	P. Barone	W. Downer	1963	36	6	960	28	11/63	4	---	D	----	GR	---	-----	-----	-----	-----	-----	Also dry hole
SW SE 31	A. Teachout	Self	1964	15	1½	970	9	6/64	A	---	D	.010	GR	---	800	325	0	115	10/65	
NE NE 32	Countryside Court	E. Studeman	1960	38	4	1,020	8	1960	A	---	P	----	SD ₄	---	710	345	0	25	10/65	
NE NE 32	L. Lampman	Self	----	22	2	1,020	<22	----	I	---	D	.010	--	---	900	390	0	35	10/65	pH 7.1; 20 trailers pH 7.1
NE SE 32	B. Good	W. Downer	1950	85	4	1,030	21	8/56	7	---	---	None	Sh	30	-----	-----	-----	-----	-----	
NE SE 33	J. Cochrane	A. Knapp	1958	95	4	1,020	15	4/58	---	---	---	None	Sh	35	-----	-----	-----	-----	-----	
SE SW 34	J. Lothamer	-----	1944	85	4	1,040	65	-----	A	---	D,S	-----	---	---	575	290	0.7	10	10/64	
SW SW 34	N. Boldridge	-----	-----	80	4	1,040	-----	-----	A	---	D,S	-----	---	---	540	225	0.2	5	10/64	
NE SE 34	E. Zirkle	W. Downer	1958	128	4	1,000	36	6/58	25	---	---	---	GD	---	-----	-----	-----	-----	-----	
SE SE 34	D. Shovey	W. Downer	1961	57	4	1,000	18	4/61	30	---	---	---	GD	---	-----	-----	-----	-----	-----	
NW NE 35	L. Butcher	A. Wooster	1949	128	2	1,030	53	12/49	A	---	D	-----	---	---	600	280	4.0	10	10/65	
NE SE 35	B. Pohl	W. Downer	1964	124	4	1,020	50	3/64	12	---	---	.030	GD	---	-----	-----	-----	-----	-----	
NW SW 35	V. Connin	W. Downer	1964	154	4	1,025	70	4/64	12	---	---	.020	GD	---	-----	-----	-----	-----	-----	
NW NW 35	A. Ianka	W. Downer	1954	107	4	985	29	9/54	20	---	---	---	GD	---	-----	275	0.6	-----	9/56	MDH
NE NE 35	R. Holmes	W. Downer	1962	137	4	1,020	55	12/62	15	7	---	.050	GD	---	-----	-----	-----	-----	-----	
SW NW 36	A. Nichols	-----	-----	200	6	1,030	-----	-----	---	---	D,S	-----	---	---	610	320	> 4	5	10/65	
SE SE 36	E. Clark	W. Downer	1963	43	4	990	24	6/63	30	---	---	.030	GD	---	-----	-----	-----	-----	-----	
NW NW 36	L. Otis	W. Downer	1955	118	4	980	40	10/55	18	---	---	---	GD	---	-----	-----	-----	-----	-----	
GILEAD TOWNSHIP																				
NE NW 2	A. Markley	-----	1929	116	2	990	20	1950	A	---	D	-----	GR	---	480	240	5	5	8/65	LOG
SE SE 4	C. Beck	Self	-----	10	1½	950	4.80	8/65	1	---	A	.010	GD	---	-----	-----	-----	-----	-----	
NE NE 5	J. Rubley	-----	-----	30	2	945	<25	-----	A	---	A	.010	GD	---	550	310	0.1	5	8/65	
NW NE 5	Branch Co. Rd. Comm.	USGS	1964	27	1½	950	13.24	11/64	---	---	C	.010	SD	---	-----	-----	-----	-----	-----	LOG
SW SW 6	Branch Co. Rd. Comm.	USGS	1964	37	1½	963	23.09	10/64	---	---	O	.010	GR	---	-----	-----	-----	-----	-----	
NE NE 6	H. Bucklin	-----	1936	28	1½	968.8	26.36	9/64	---	---	O	---	GD	---	-----	-----	-----	-----	-----	LOG
NE SE 6	O. Martin	-----	-----	28	1½	955	18.56	8/64	---	---	O	---	GD	---	-----	-----	-----	-----	-----	
SW SE 6	D. Coy	Dieble	-----	28	1½	970	16	1959	A	---	D	.010	SD	---	420	210	1.0	5	10/65	
SE SE 6	M. Weddle	Self	-----	30	1½	970	-----	-----	A	---	D	.010	GD	---	590	310	0.5	15	7/65	LOG
SE NW 7	M. Fair	D. Corey	1957	68	2	975	-----	-----	A	---	D,S	---	GD	---	650	340	0.3	15	7/65	
SW NE 7	Branch Co. Rd. Comm.	USGS	1964	47	1½	975	30.75	11/64	---	---	O	.010	SD ₄	---	-----	-----	-----	-----	-----	
SE SE 7	Branch Co. Rd. Comm.	USGS	1964	34	1½	950	10.05	11/64	---	---	O	.010	GR	---	-----	-----	-----	-----	-----	LOG
SW NW 7	Branch Co. Rd. Comm.	USGS	1964	36	1½	950	23.90	11/64	---	---	O	.010	SD ₄	---	-----	-----	-----	-----	-----	
SE SE 8	H. Lutz	A. Wooster	----	86	4	1,002	-----	-----	A	---	D	----	--	---	490	240	0.7	15	7/65	LOG
NE SE 10	W. Bidwell	-----	-----	30	1½	960	-----	-----	A	---	D,S	.010	GD	---	650	310	1.4	10	8/65	
NE SE 10	J. Ripley	-----	1964	19	1½	960	12.55	9/64	A	---	A,O	.010	GD	---	-----	-----	-----	-----	-----	
SE SE 11	M. Rubley	R. Davis	1964	35	2	980	-----	-----	A	---	B	---	GD	---	1,050	445	0.4	140	7/65	ANAL.
NE NW 11	P. Foster	A. Wooster	1957	80	2	990	-----	-----	A	---	D,S	---	GD	---	320	255	1.0	20	8/65	
NE NE 12	C. Hilton	Self	1950	29	1½	975	-----	-----	A	---	D	.010	GD	---	460	255	0.5	10	8/65	

Table 3.--Records of selected wells.--Continued

Location ± ± sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks	
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO ₃)	Iron (ppm)	Chloride (ppm)	Date sampled		
GILEAD TOWNSHIP (CONT'D)																					
SW SE 12	B. Rubley	D. Corey	----	20	1½	975	> 20	1965	A	---	D	----	GD	---	600	330	0.3	20	7/65		
NE NE 14	A. Sanders		----	75	2	970	-----	----	----	A	---	D	----	GD	----	520	255	4.7	5	7/65	
SE SE 14	N. Albright		----	25	1½	975	Δ 25	----	----	A	---	D	.010	GD	---	800	430	0.4	10	8/65	
NE NE 16	T. Mart	Self	----	20	1½	990	8	----	A	---	D	.010	Sd	---	520	190	0.8	30	7/65		
NW NW 17	L. Cranson	R. Davis	1964	60	2	985	-----	----	A	---	D	----	Sd	---	590	310	1.4	5	7/65		
NE NW 19	W. Barrows	-----	1955	60	2	1,010	-----	----	A	---	D, S	----	GD	---	600	330	0	15	8/65		
SE SE 20	I. Fair	R. Davis	1964	131	4	990	-----	----	A	---	D	----	GD	---	500	280	1.8	5	8/65		
NE NE 20	C. Haenni	B. Thompson	1963	86	4	1,010	30	1963	15	---	None	GR	----	----	----	----	----	----	----		
NE NE 21	H. Brown	Self	----	50	1½	990	-----	----	A	---	D	.010	GD	---	600	310	0.3	20	8/65		
NE NE 22	J. Neihardt	Self	----	30	1½	980	25	1963	A	---	D	.010	GD	---	850	450	0.3	20	8/65		
NW NE 24	W. Goetz	-----	----	56	2	980	-----	----	A	---	D	----	GD	---	520	280	1.6	5	8/65		
GIRARD TOWNSHIP																					
NW NW 2	C. Wagoner	-----	1952	80	2	980	-----	----	A	---	D	----	--	----	720	360	0.1	5	9/64		
SW SW 3	E. Kowalski	A. Knapp	1962	90	4	960	30	11/64	A	---	D, S	----	Sd	----	480	240	-----	5	11/64		
SE SE 3	H. Thornton	T. Brewer	1948	210	6	980	-----	----	--	---	D, S	None	Sh	190	6,500	1,150	2.5	1,300	11/64	pH 7.8; ANAL.	
NW NW 5	A. Smith	-----	----	125	3	975	-----	----	A	---	D	----	--	----	400	260	0.1	5	10/64		
NE SE 5	V. Eberts	C. Kleinfeldt	----	22	2	960	< 22	11/64	I	---	D, S	----	--	----	610	275	-----	10	11/64		
NW NW 6	M. Dennis	-----	----	135	4	955	-----	----	--	---	D	----	--	----	575	60	0.4	15	10/64	pH 7.5; ANAL.	
SE SE 9	C. Lehman	-----	1952	72	4	950	14	1952	15	---	D	----	--	----	----	----	----	----	----	ANAL.	
NW SW 10	M. Vanderpool	W. Downer	1964	68	6	950	18	12/64	15	< 1	D	.030	GR	70	----	----	----	----	----	LOG	
NE NE 10	C. Doolittle	-----	----	60	2	980	30	11/64	A	---	S	----	--	----	700	325	0	5	11/64		
NE NW 12	M. Gallop	-----	1904	120	4	985	60	1954	A	---	D, S	----	--	----	600	160	0.5	15	11/64	pH 7.8; ANAL.	
SE SW 13	H. Simons	Self	----	22	1½	970	6	1965	A	---	D, S	.010	GR	----	600	260	1.2	10	9/64	pH 7.0	
SW SW 15	R. Lenning	W. Downer	1963	44	4	950	24	10/63	20	---	D	.018	GD	----	----	----	----	----	----		
SE SE 17	G. Havens	Self	----	28	2	945	< 25	1965	A	---	D, S	.010	GD	----	530	290	0.6	10	11/64	pH 7.5	
SW NE 17	C. King	Mitchell Plumbing	----	20	2	940	< 20	1965	A	---	D, S	.010	Sd	----	----	----	----	----	----		
SW NW 18	A. Weaver	Self	1940	26	36	965	13	11/64	A	---	D	None	GR	----	570	275	0	-----	11/64	pH 7.2	
SW SW 18	G. Van Kampen	D. Showalter	1920	90	4	968	12	1965	A	---	D, S	None	Sh	----	1,450	690	0	95	11/64	Dug well	
SW SE 19	W. Kimble	Self	----	18	1½	935	< 18	1964	A	---	D, S	.010	GD	----	660	325	1.5	10	11/64	pH 7.1	
NW NW 22	F. Morrison	Self	----	20	1½	950	< 20	1964	A	---	D	.010	GD	----	690	290	0	25	11/64		
NW NW 22	I. Stahl	Self	----	32	3	960	25	11/65	A	---	D	.010	GR	----	650	325	0	10	11/64		
NE NE 22	Branch Co. Rd. Comm.	USGS	1964	27	1½	950	16.20	10/64	--	---	0	.010	GR	----	600	260	0.1	10	9/64		
SW SE 22	D. AcMoody	A. Knapp	1964	135	4	980	14	4/64	I	---	D, S	None	Sh	33	2,000	120	0	250	11/64		
NW NE 23	H. Lozer	A. Knapp	----	25	4	995	16	9/64	A	---	D	----	GD	----	520	245	1.0	-----	9/64	pH 6.8	
SW SW 24	R. Maggart	W. Downer	1953	70	4	985	15	11/64	A	---	D	None	--	----	650	270	-----	5	9/64		
SE SW 24	J. Stahowiak	W. Downer	1953	90	4	975	10	1/53	4	---	D, S	None	Sh	30	1,100	15	0	85	11/64	ANAL.	
SE SW 24	J. Stahowiak	D. Showalter	1931	70	4	975	10	2/31	I	---	S	None	Sh	30	2,400	270	0	450	11/64	ANAL.	
SE NE 25	F. Taylor	W. Downer	1964	80	6	1,000	26	12/64	9	---	---	None	Sh	35	----	----	----	----	----		
NW NW 25	F. Wixon	W. Downer	1941	88	4	975	6	5/41	--	---	---	None	Sh	40	----	----	----	----	----		
SW SW 25	B. Brown	B. Thompson	1961	190	4	1,010	6	6/61	6	---	D	None	Sh	----	1,900	120	0	250	11/64		
NW NE 26	D. Robson	A. Knapp	1954	105	4	980	5	1954	4	---	D, S	None	Sh	12	8,000	310	-----	2,150	11/64		
NE NE 27	C. AcMoody	A. Knapp	1965	80	4	980	7	8/65	--	---	---	None	Sh	40	----	----	----	----	----	LOG	

Table 3.--Records of selected wells.--Continued

Location 1/4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Micromhos @ 25° C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
GIRARD TOWNSHIP (CONT'D)																				
NE NE 28	B. Earley	Self	1964	24	1 1/2	940	7	7/64	A	---	D	.010	GD	30	520	240	0	15	11/64	LOG Gravel pack
NE NE 29	M. Hebner	Self	1963	33	1 1/2	940	7	1956	A	---	D	.010	GD	---	540	270	0.2	5	11/64	
NE NW 31	C. Gruner	A. Knapp	1964	75	4	980	10	7/64	I	---	D	None	Sh	30	480	220	0.1	5	11/64	
NW NE 31	C. Gruner	Self	1962	25	1 1/2	940	< 25	1964	I	---	D	.010	GD	---	750	360	0	10	11/64	
SE SE 32	G. Musser	-----	-----	18	2	927	< 18	1964	A	---	D	.010	GD	---	480	225	0	5	10/64	LOG Gravel pack
NE NE 32	L. Green	A. Knapp	1965	35	4	940	7	4/65	10	---	P	.012	GR	---	-----	-----	-----	-----	-----	
SW NE 32	R. Archbold	W. Downer	1955	65	4	930	21	10/55	25	---	D	-----	GD	---	-----	-----	-----	-----	-----	
SE SE 33	H. Dove	-----	-----	100	4	985	-----	-----	A	---	D	None	Sh	---	460	225	0.7	5	10/64	
SW SE 33	H. Dove	A. Knapp	1934	60	4	985	12	1965	A	---	D	None	Sh	20	725	330	3.5	10	10/64	LOG
NW NW 34	G. Hawver	A. Knapp	1932	63	4	980	8	1932	A	---	D, S	-----	---	---	710	320	0.2	15	11/64	
NW NE 34	A. Waller	A. Wooster	1965	22	3	940	13	8/65	10	---	D	.012	GR	26	-----	-----	-----	-----	-----	
SE SE 35	F. Hayes	B. Yearling	1965	70	4	960	10	10/65	5	2.5	D	None	GD	---	-----	-----	-----	-----	-----	
NW SW 35	G. Billsborrow	W. Downer	1952	65	6	1,005	10	5/52	8.5	< 1	---	None	Sh	20	-----	-----	-----	-----	-----	Gravel packed
SE NE 36	R. Maxon	B. Thompson	1961	40	4	980	6	7/61	15	---	D, S	-----	GR	---	580	260	0.5	10	11/64	
NW NW 36	H. Hatmaker	W. Downer	1952	85	4	1,010	12	6/52	3.5	< 0.1	---	None	Sh	---	-----	-----	-----	-----	-----	
KINDERHOOK TOWNSHIP																				
NE NE 2	Nichols Resort	-----	-----	25	1 1/2	1,000	< 25	-----	---	---	P	.010	GD	---	530	240	1.2	5	4/65	pH 7.7 pH 7.0
NE SE 3	D. Pridgeon	W. Downer	1959	43	4	1,070	< 25	-----	A	---	D, S	-----	GD	---	560	290	1.0	5	3/65	
SE SE 3	O. Barnes	A. Allen	1964	20	1 1/2	1,005	10	1964	---	---	D	.010	GD	---	800	350	0	30	10/64	
SW SE 4	F. Crabill	Self	-----	26	1 1/2	1,003	16	-----	A	---	D	.010	---	---	610	290	0	30	10/64	
SE SE 4	L. Hodge	Self	1952	21	1 1/2	1,005	12	1952	A	---	D	.010	GR	---	560	345	0	5	10/64	pH 7.2 pH 7.1
NE SW 5	E. Preston	Self	-----	15	1 1/2	980	< 15	-----	I	---	D	.010	GD	---	540	310	0.1	15	8/65	
NE NE 6	R. McCullough	-----	-----	17	1 1/2	985	4.80	8/64	---	---	O	.010	---	---	-----	-----	-----	-----	-----	
SE SW 7	T. Hand	Self	1950	20	1 1/2	990	10	-----	A	---	D	.010	GD	---	660	340	0.7	25	8/65	
SE SW 8	F. Welch	Easterday	1957	39	2	1,000	-----	-----	A	---	D	-----	---	---	480	240	1.2	10	8/65	LOG
NE NE 9	F. Baker	W. Downer	1944	29	4	1,000	14	1944	7	1 1/2	D	-----	GR	---	540	275	1.3	5	9/65	
NE NE 9	C. Corwin	Self	1950	22	1 1/2	1,003	12	-----	A	---	D	.010	GR	---	540	260	1.2	5	10/64	
SW SW 9	L. Flint	R. Davis	1955	95	2	1,025	-----	-----	A	---	D	-----	---	---	600	220	1.7	10	8/65	
SW SE 9	Mich. St. Hwy.	Self	1935	86	4	1,000	-----	-----	---	---	P	-----	---	---	-----	-----	-----	-----	-----	ANAL. ANAL.
SE SE 9	L. Fochtman	Self	1953	35	2	1,000	18	-----	A	---	P	-----	GD	---	-----	-----	-----	-----	-----	
NE NW 10	D. Corwin	Self	1962	22	1 1/2	1,008	15	-----	A	---	D, S	.010	GD	---	860	350	-----	30	10/64	
SW SE 10	D. Michael	R. Davis	-----	40	2	1,020	19	-----	A	---	D	-----	GD	---	700	360	0.6	20	8/65	
NE NE 11	J. Straw	-----	-----	43	2	1,020	-----	-----	A	---	D	-----	GD	---	540	275	3.3	15	8/65	Have 4 wells
NE SE 12	I. Harshman	C. Hutchins	-----	65	2	1,050	-----	-----	A	---	D	-----	---	---	600	275	0.4	15	8/65	
NW SE 13	Mrs. Beck	R. Davis	1963	107	2	1,035	-----	-----	A	---	D	-----	---	---	560	290	2.7	10	8/65	
NW NE 14	L. Taylor	A. Allen	1955	80	2	1,050	-----	-----	A	---	D	-----	GR	---	660	340	0.6	5	8/65	
NE SW 15	H. Keith	-----	1945	30	1 1/2	1,010	17	-----	A	---	D	.010	GD	---	620	325	1.9	35	8/65	LOG; Test hole
SW SE 15	Mich. St. Hwy.	Self	1965	32	---	993	-----	-----	---	---	---	---	---	---	-----	-----	-----	-----	-----	
SW NW 17	C. Pierucki	-----	1964	100	2	1,010	-----	-----	A	---	D	-----	---	---	560	255	1.2	15	8/65	
NE NE 20	P. Kaelner	R. Akers	1959	48	4	1,000	-----	-----	---	---	P	-----	---	---	950	430	0.2	25	8/65	
SW NE 21	Mrs. Wing	A. Knapp	1925	25	4	990	< 25	-----	A	---	P	-----	GD	---	380	154	0.6	10	8/65	
SW NE 21	E. Scott	-----	-----	311	4	990	9	-----	6	---	---	.020	GD	---	-----	-----	-----	-----	-----	
NW NW 22	G. Lewis	F. Furch	----	43	2	1,010	31	1965	---	---	D	-----	GD	---	-----	-----	-----	-----	-----	

Table 3.--Records of selected wells.--Continued

Location ± ± sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Micromhos @ 25° C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
KINDERHOOK TOWNSHIP (CONT'D)																				
NW NE 22	H. Sellers	H. Keith	----	60	2	1,045	55	-----	A	---	D,S	.010	GR	---	900	400	0	25	3/65	
NW NW 23	G. Sellers	R. Davis	1963	111	2	1,020	27	1963	A	---	D,S	.010	GR	---	460	240	----	5	3/65	
NE NE 23	A. Allen	Self	1944	47	2	1,040	30	1944	17	---	D	.018	GR	---	710	360	0.4	5	5/65	
MATTESSON TOWNSHIP																				
SE NW 1	J. Parks	W. Griner	1926	60	2	920	16	-----	A	---	D	----	GR	---	670	480	2.6	30	6/65	
SW NW 2	M. Johnson	-----	1945	50	3	905	25	-----	A	---	D,S	----	---	---	460	290	1.3	10	6/65	
SE SE 7	C. Whitmore	-----	1900	40	30	905	<25	1965	A	---	D	----	GD	---	800	410	0.6	35	7/65	pH 7.1
NW NW 7	O. Ambs	E. Studeman	1932	25	7	890	<25	1966	I	---	D	None	GR	---	620	395	1.2	55	6/65	Gravel pack
NE NE 8	R. Thrans	F. Herringer	1964	35	2	900	<25	1964	I	---	D,S	----	GD	---	560	430	0.4	10	7/65	Gravel pack
SE NE 9	L. Van Vorst	F. Herringer	1965	51	4	910	<20	1964	A	---	D,S	----	GR	---	-----	-----	-----	-----	-----	
SE NE 9	L. Van Vorst	Reed	1960	48	2	910	20	1964	I	---	D,S	----	Sd	---	509	340	1.2	10	6/65	Pump f. sand
NE NW 12	W. Michaels	W. Downer	1960	80	4	940	42	4/60	16	---	D,S	.016	GD	---	590	410	1.8	20	6/65	
SW SE 13	A. Goebel	W. Crosby	1962	38	2	920	-----	-----	A	---	D	----	GR	---	480	340	0.2	15	7/65	
SW SW 13	Matterson #1 School	E. Studeman	1940	35	2	900	8	11/40	10	---	A	.010	GR	---	-----	-----	-----	-----	-----	LOG
NW SW 14	A. Moss	D. Cray	1960	58	2	910	20	1960	A	---	D	----	GD	---	780	530	0.4	30	6/65	
SE SW 15	E. Stoll	-----	----	60	2	925	-----	-----	A	---	D,S	----	GD	---	400	275	2.0	5	6/65	
NE NE 16	L. Russell	-----	1948	114	4	940	-----	-----	A	---	D	----	---	---	470	290	0.7	10	6/65	
NW SW 18	R. Rowland	Self	1945	30	1½	880	<25	1945	A	---	D,S	.010	GD	---	630	445	2.4	10	6/65	Has 4 wells
NE NE 19	Matterson #1 School	E. Studeman	1940	36	2	880	11	1940	--	---	A	.010	Sd, GR	---	-----	-----	-----	-----	-----	LOG
NE NW 21	M. Keckler	-----	1951	56	4	910	-----	-----	A	---	D	----	---	---	950	580	3.9	60	6/65	pH 7.0
NW NE 21	J. Kruska	W. Downer	----	40	4	910	27	-----	13	---	D	None	GD	---	-----	-----	-----	-----	-----	
SE NE 23	L. Werner	-----	----	43	2	905	-----	-----	A	---	D	----	---	---	600	410	0.7	25	7/65	
NE SE 23	C. Wendell	Self	1960	37	2	900	10	1960	25	---	D	.007	GR	---	-----	-----	-----	-----	-----	
SE SW 25	E. Swift	W. Downer	1955	95	4	930	32	1955	--	---	D	None	GD	---	-----	-----	-----	-----	-----	
SW NW 25	A. Kline	-----	1964	28	1½	960	<25	1964	A	---	D	----	Sd	---	260	140	0.5	5	7/65	
SE NE 25	F. Casey	-----	----	90	4	950	-----	-----	A	---	D,S	----	---	---	570	275	1.7	45	7/65	
SE NW 27	H. Herman	-----	----	29	2	895	9.63	9/64	--	---	---	----	GD	---	-----	-----	-----	-----	-----	
NW SE 28	C. Ross	Self	1930	15	1½	895	<15	-----	A	---	D	.010	Sd	---	400	255	0.4	10	7/65	Has 2 wells
NE NE 30	Eldridge	E. Studeman	----	60	--	895	-----	-----	A	---	D,S	----	---	---	410	310	1.6	5	7/65	
SE NE 31	K. Robins	Self	----	25	1½	875	<25	-----	A	---	D,S	.010	GD	---	700	465	0.8	15	7/65	Has 6 wells
SW SW 32	M. Brawker	-----	----	20	1½	885	<20	-----	A	---	D,S	.010	GD	---	675	310	0	40	4/65	
SW SE 33	D. Van Pelt	-----	1960	110	--	920	-----	-----	A	---	D	----	---	---	420	290	1.1	10	7/65	
SW SE 34	S. Horkey	Reed	----	70	--	920	-----	-----	A	---	D	----	---	---	480	290	0.8	15	7/65	
NW NE 34	L. Kolassa	Reed	1963	100	4	920	-----	-----	A	---	D	----	---	---	390	240	0.7	15	7/65	
NE SW 34	S. Malovey	-----	----	34	18	910	-----	-----	--	---	A	None	GD	---	-----	-----	-----	-----	-----	
NE SE 35	G. Hollister	-----	1957	20	1½	912	<20	1957	A	---	A	.010	GD	---	600	275	0	25	4/65	
NE SE 35	G. Roeser	-----	1886	50	2	910	<25	-----	A	---	D	----	---	---	410	275	2.5	15	7/65	
NE NE 35	Matterson School #4	E. Studeman	1940	38	4	917	11	1940	7	1	P	None	Sd, GR	---	570	280	1.5	5	4/65	
NW NE 36	C. Kaczynski	W. Downer	1965	79	4	940	39	1965	20	---	A	----	GR	---	600	290	2.5	10	4/65	LOG

Table 3.--Records of selected wells.--Continued

Location 1/4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhos @ 25° C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
NOBLE TOWNSHIP																				
NE NE 1	M. Keller	Self	----	25	1½	955	<25	7/65	A	---	D	.010	Sd	---	520	290	0.4	10	7/65	ANAL.
NE NW 1	D. Markley	Self	1962	21	1½	940	19	1963	A	---	D	.010	GR	---	420	210	0.5	5	8/65	
NE NE 1	M. Keller	Self	----	11	1½	940	5.22	7/65	A	---	S,O	.010	GD	---	580	275	0.5	15	7/65	
SW SW 2	E. Smith	Self	1965	20	1½	925	10	8/65	A	---	D	.010	GR	---	800	375	3.6	20	8/65	
SW SE 5	T. Arver	-----	----	25	1½	910	13	8/65	A	---	D,S	.010	GR	---	460	220	0.8	10	8/65	
SW NW 6	W. Mayer	Self	1962	25	1½	900	<25	1962	A	---	D	.010	GD	---	880	430	0.6	15	5/65	
NW NE 6	A. Jasper	Lilly	----	28	---	900	17	1965	A	---	D	---	GD	---	600	310	2.5	5	8/65	
NW NW 7	J. Cary	-----	----	20	1½	900	<25	1965	A	---	D	.010	GD	---	775	----	0.2	15	8/65	
NW SE 8	L. Mallow	-----	----	25	1½	915	<25	1965	A	---	D	.010	GR	---	580	260	0.6	15	8/65	
SE SE 9	M. Frohriep	A. Wooster	1955	56	2	920	13	1965	A	---	D	---	GD	---	590	280	3.5	5	8/65	
SW NW 10	H. Ward	W. Downer	1959	49	4	930	24	1/59	A	---	D	---	GR	---	800	430	3.5	20	8/65	2 dry holes
NE NE 10	Pleasant Hills Church	A. Wooster	1964	57	2	925	-----	-----	A	---	D,S	---	GR	---	520	280	1.8	5	8/65	
NE NW 13	G. Calhoun	-----	1920	20	1½	960	15	1965	A	---	D	.010	GR	---	550	290	0.2	10	8/65	pH 7.4
NW NW 14	V. Mackey	A. Wooster	1964	37	4	945	-----	-----	A	---	D	.010	GD	---	700	340	0.9	15	8/65	
SE SE 15	F. Pippenger	Self	----	25	1½	940	<25	1965	A	---	D	---	GR	---	380	190	0	10	8/65	
SE SE 16	O. Metzger	Self	1952	15	1½	925	9	1965	A	---	D	.010	GD	---	560	310	0.6	15	8/65	
NE SW 17	A. Botzner	Self	----	30	1½	910	-----	-----	A	---	D	.010	GD	---	480	240	0	10	5/65	
SE SW 17	Traver School	-----	----	38	1½	917	15.99	9/64	---	---	A,O	.010	GD	---	----	220	----	----	----	
SW SE 18	C. Bowdish	-----	----	44	2	910	-----	-----	A	---	D,S	---	GD	---	450	----	1.5	5	5/65	
NE NE 20	A. Schutz	Self	1940	25	1½	920	20	1965	A	---	D	.010	GD	---	600	290	0.3	15	8/65	
NE NE 23	M. Penix	-----	----	35	2	950	-----	-----	A	---	D	---	GD	---	520	260	0.3	10	8/65	
OVID TOWNSHIP																				
SW NW 1	E. Lippert	B. Yearling	1965	68	4	990	22	5/65	10	<1	D	None	GR	---	-----	-----	-----	-----	-----	LOG
SW NE 1	M. Heineman	W. Downer	1965	70	4	990	22	6/65	20	4	D	.030	GR	---	-----	-----	-----	-----	-----	LOG
NW NE 3	M. Shupp	W. Downer	1953	58	4	1,048	38	1/53	16	---	D	None	GR	---	875	420	3.5	25	10/64	pH 7.0
NW NW 3	N. Baldridge	-----	----	32	36	1,025	20.8	3/65	---	---	A	None	GD	---	-----	-----	-----	-----	-----	Dug well
NW NW 3	N. Baldridge	D. Showalter	----	60	6	1,025	-----	-----	A	---	D,S	---	---	---	860	410	0.7	25	10/64	pH 7.1
SW SE 4	J. Woods	A. Wooster	----	45	2	975	18	-----	A	---	D	---	---	---	1,080	515	3.0	40	10/64	pH 7.3
SW SE 4	J. Woods	Self	----	16	1½	975	<16	-----	A	---	D	.010	GD	---	850	430	0.2	85	10/64	pH 7.3
SW NW 4	R. Aronson	W. Downer	1963	100	4	1,010	4	3/63	A	---	D	None	Sh	70	-----	-----	-----	-----	-----	-----
NE NE 5	A. Rathbun	A. Knapp	1953	95	4	1,030	-----	-----	A	---	D	---	---	---	500	240	0.3	5	5/65	-----
NE NE 5	A. Rathbun	-----	----	26	---	1,030	16.84	5/65	---	---	A	None	GD	---	-----	-----	-----	-----	-----	-----
SE SE 5	V. Fillmore	D. Showalter	1915	85	3	1,030	12	1962	A	---	D,S	None	---	---	600	325	----	10	5/65	-----
NW SE 6	H. Munger	A. Knapp	1950	---	4	980	<25	-----	A	---	D	None	Sh	---	4,800	190	2.0	1,550	7/65	ANAL; pH 7.9
NW SE 6	H. Munger	-----	1952	35	4	980	<25	-----	I	---	D	---	GD	---	620	290	0.9	30	7/65	ANAL; pH 7.1
NE NW 6	Mrs. D. Bunker	D. Showalter	1934	95	4	970	12	11/34	---	---	D	None	Sh	40	-----	-----	-----	-----	-----	-----
SE SW 6	R. Kosmerick	A. Knapp	1957	140	2	1,010	<25	1957	I	---	D	None	Sh	---	7,000	240	0.4	2600	7/65	pH 7.9
NW NE 7	M. Cranson	B. Thompson	1963	100	4	1,000	>25	1963	A	---	D	None	Sh	80	-----	-----	-----	-----	-----	-----
SE SE 8	D. Roberts	W. Downer	1964	115	6	975	18	7/64	A	---	---	None	Sh	72	-----	-----	-----	-----	-----	Rept. salty
SE SE 8	L. McCurley	W. Downer	1945	78	4	980	34	7/45	15	---	D	None	GD	---	-----	-----	-----	-----	-----	-----
SW SE 9	K. McCullough	-----	1905	75	4	1,000	<25	-----	A	---	D	---	---	---	520	250	0.7	5	5/65	-----
SW SW 9	M. Russell	Self	----	16	1½	980	8	-----	A	---	D,S	.010	GD	---	520	290	0	15	5/65	Has 4 wells
NE SE 9	H. Brenerman	-----	----	80	4	1,020	>25	-----	A	---	D,S	---	---	---	500	245	0.8	3	3/65	Springs in vic.

Table 3.--Records of selected wells.--Continued

Location ± 4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmios @ 25° C.)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
OVID TOWNSHIP (CONT'D)																				
SE SE 10	J. Kasperski	W. Downer	1956	78	4	1,000	16	4/56	20	---	---	---	GD	---	---	---	---	---	---	Gravel pack
SW SW 11	J. Downer	W. Downer	1957	73	4	1,000	23	12/57	20	---	---	---	GD	---	---	---	---	---	---	Gravel pack
SW SE 11	D. Nearpass	B. Thompson	1951	40	4	1,010	20	1951	15	---	---	---	GR	---	---	---	---	---	---	Gravel pack
NE SW 12	E. Ovid Parsonage	W. Downer	1949	70	4	1,005	35	9/49	12	6	D	---	GD	---	---	---	---	---	---	Slotted pipe
NW NE 13	Dove	B. Thompson	1963	100	4	1,025	30	1963	15	1	---	None	Sh	80	---	---	---	---	---	---
SW SW 13	V. Feasel	----	1958	142	--	990	<25	1958	---	---	---	---	GR	---	---	---	---	---	---	LOG
NW SW 15	W. Otis	A. Knapp	1963	35	4	987	<25	1963	A	---	D	---	GD	---	560	290	2	<5	3/65	---
SE SE 16	F. Bascom & Son	A. Knapp	1964	69	4	980	17	1/64	--	---	---	---	Sd	---	---	---	---	---	---	---
NW SE 16	C. Newman	D. Showalter	1932	59	4	985	11	4/32	--	---	---	None	Sh	11	---	---	---	---	---	LOG
SE SW 17	I. Lane	----	----	23	1½	970	<23	----	A	---	P	.010	GD	---	820	515	1.7	15	8/65	---
NE NW 17	Mrs. G. Burns	B. Yearling	1966	63	4	970	8	1/66	11	1	---	None	GR	---	---	---	---	---	---	LOG
SW SW 18	M. Fenner	W. Downer	1949	104	4	1,015	50	2/49	12	<1	---	---	GD	---	---	---	---	---	---	---
SW NE 21	Scheidler Bros.	B. Thompson	1963	68	4	985	30	1963	20	---	---	.025	GR	---	---	---	---	---	---	---
SW NE 21	E. Scheidler	----	1963	60	4	985	13	1963	---	---	---	---	GD	---	570	310	1.0	5	12/65	---
SE SW 24	O. Bennett	Self	----	20	1½	1,000	14	----	A	---	D, S	.010	GD	---	520	280	1.5	5	10/64	---
SW SW 24	O. Maxon	----	----	19	1½	1,010	8.75	8/64	---	---	O	.010	GD	---	---	---	---	---	---	---
NE NE 26	M. Shupp	W. Downer	1965	86	4	990	14	7/65	18	2	---	.030	GR	---	---	---	---	---	---	LOG
NE NW 26	L. O. Clark	----	1965	66	4	990	----	----	A	---	P	---	GD	---	560	240	1.5	15	5/65	---
NW NW 27	R. Unterkircher	Self	----	30	1½	980	<25	----	A	---	D	.010	GD	---	490	240	0	10	5/65	---
SW NE 28	P. McCullough	Self	1960	20	1½	990	7	1960	A	---	D, I	.010	Sd	---	---	---	---	---	---	---
NE NE 30	A. Norton	Self	----	30	1½	970	<25	----	A	---	D	.010	GD	---	520	260	4.0	5	12/65	Has 2 wells
SE SE 33	O. Scheidler	Self	----	25	1½	995	<25	----	A	---	D, S	.010	GD	---	650	310	4.7	40	8/65	Several wells
NE SE 35	W. Treat	W. Downer	1959	64	4	990	2	1/59	16	---	D	---	GD	---	600	295	0	10	12/65	---
NE NW 35	J. Wibell	W. Downer	1962	110	4	1,000	15	9/62	15	---	---	.030	GD	---	---	---	---	---	---	---
NE SE 35	E. Schwengel	A. Knapp	1958	56	--	990	flow	3/58	---	---	---	---	GD	---	---	---	---	---	---	---
SW NW 36	C. Bussing	A. Knapp	1962	70	4	1,012	12	1962	<25	---	D, S	----	--	---	540	260	1.2	5	10/64	---
QUINCY TOWNSHIP																				
SW NE 1	Worden Brothers	W. Downer	1965	90	6	1,060	----	----	16	---	---	None	Sh	45	---	---	---	---	---	LOG
NE SE 1	R. Strang	W. Downer	1951	54	4	1,060	17	4/51	20	1	---	*	GD	---	---	---	---	---	---	*Slotted pipe
SE NW 1	G. Brown	W. Downer	1960	110	4	1,060	30	10/60	12	---	---	None	Sh	75	---	---	---	---	---	---
NW NW 2	H. Ray	W. Downer	1962	99	4	990	60	1962	A	---	D, S	---	GD	---	550	240	0.2	10	9/64	pH 7
NE NW 2	T. Spencer	W. Downer	1965	87	4	1,040	33	1/65	15	---	---	.014	Sd	---	---	---	---	---	---	LOG
NW NE 2	Worden Brothers	W. Downer	1944	104	4	1,030	16	1/44	5	---	---	None	Sh	40	---	---	---	---	---	---
SE NW 2	R. Worden	W. Downer	1942	78	4	1,020	40	5/42	20	20	---	---	GD	---	---	---	---	---	---	---
SE SW 3	R. Jeffers	Rose	1965	68	2	1,030	28	3/65	8	---	D	.010	Sd	---	---	---	---	---	---	---
SW SW 3	E. Dobson	W. Downer	1950	73	4	1,050	50	2/50	15	2	---	*	GR	---	---	---	---	---	---	LOG
NW NW 4	H. Rushlow	W. Downer	1954	28	4	1,030	9	1954	10	---	---	---	GD	---	---	---	---	---	---	*Gravel packed
NW NW 4	H. Rushlow	W. Downer	1955	32	4	1,030	20	1955	15	---	---	---	GD	---	---	---	---	---	---	---
NW NW 4	G. Monrhard	W. Downer	1953	110	4	1,020	----	----	3	---	---	None	Sh	76	---	---	---	---	---	---
NE SE 5	E. Sprout	W. Downer	1961	75	6	1,015	21	1961	17	---	---	None	Sh	26	---	---	---	---	---	---

Table 3.--Records of selected wells.--Continued

Location 1/4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhm-cm @ 25°C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
QUINCY TOWNSHIP (CONT'D)																				
SE SE 5	L. Baird	W. Downer	1965	99	6	1,020	14	1965	--	---	D	None	Sh	20	----	----	----	----	----	
NW NE 6	R. Anthony	W. Downer	1963	90	6	990	12	1963	2	----	---	None	Sh	40	----	----	----	----	----	
SE SW 6	H. Sawdy	W. Downer	1950	62	6	1,025	6	1950	1 1/2	----	---	None	Sh	20	----	----	----	----	----	
SE SE 6	J. Siler	W. Downer	1944	101	6	1,030	16	1944	4 3/4	----	---	None	Sh	40	----	----	----	----	----	
SE NW 7	B. Friend	A. Knapp	1963	80	4	1,030	14	1963	--	----	---	None	Sh	30	----	----	----	----	----	
NW NE 7	P. Merkle	W. Downer	1963	100	6	1,040	12	1963	A	----	D	None	Sh	30	2,950	116	0.2	720	10/64	ANAL.
NW NE 8	R. Phelps	W. Downer	1946	115	6	1,020	30	1946	4	1/1	---	None	Sh	30	----	----	----	----	----	
NE SW 8	O. Siler	W. Downer	1955	40	6	1,030	10	1955	41	----	---	None	Sh	20	----	----	----	----	----	
NW NW 9	Quincy Grange	W. Downer	1948	63	5	1,040	14	1948	3	1/1	---	None	Sh	20	----	----	----	----	----	
NE NE 9	H & B Van Orthwick	-----	1940	50	4	1,030	20	-----	A	----	D, S	---	---	---	470	205	0	5	10/64	pH 7.2
SW NE 10	E. Jahr	W. Downer	1953	142	4	-----	40	1953	20	2	---	---	GD	---	-----	-----	-----	-----	-----	
NE NW 11	F. Marquart	W. Downer	1941	74	4	-----	17	1941	10	----	---	None	Sh	30	-----	-----	-----	-----	-----	
SE NW 11	M. Marsh	W. Downer	1960	46	4	-----	5	1960	40	----	---	.014	GD	---	-----	-----	-----	-----	-----	
SE NW 12	S. Friend	W. Downer	1948	80	4	-----	15	1948	4	1/1	---	None	Sh	40	-----	-----	-----	-----	-----	
NE SW 13	L. Sanderson	W. Downer	1930	65	4	-----	40	-----	A	----	D	---	Sh	---	2,900	60	0	900	1/65	pH 8.1
NE SE 13	L. Sanderson	Self	-----	22	1 1/2	-----	<20	1965	A	----	D, S	.010	GD	---	760	340	0	15	1/65	pH 7.1
NE NW 14	W. Hard	A. Knapp	1965	27	4	-----	10	1965	---	----	D	---	GR	---	-----	-----	-----	-----	-----	
SE NW 14	General Cable Co.	Layne-Northern	1959	28	26	-----	7	1959	164	55	P, I	.080	Sd	---	850	270	0	100	1/65	pH 7.5; LOG
NW SW 14	A. Strother	W. Downer	1965	48	4	-----	14	1965	7	----	---	---	---	---	-----	-----	-----	-----	-----	LOG
NE SE 14	K. Rehner	W. Downer	1965	65	6	-----	4	1965	---	----	---	None	Sh	34	-----	-----	-----	-----	-----	LOG
SW NW 15	Quincy Village	W. Downer	1941	65	10	1,015	16	7/41	650	65	M	-----	Sd, GR	---	-----	-----	-----	-----	-----	ANAL.; LOG
NE NE 15	Quincy Village	W. Downer	1955	78	6	1,010	14	9/55	--	----	T	-----	Sd, GR	---	-----	-----	-----	-----	-----	LOG
NW NW 15	F. Sackett	W. Downer	1964	50	4	1,025	22	1964	30	----	D	-----	Sh	40	840	410	0.6	15	10/64	pH 7.3
SE SE 17	D. Main	W. Downer	1950	31	4	1,020	8	1950	17	2	---	---	GD	---	-----	-----	-----	-----	-----	*Gravel packed
SW SW 18	E. Hemker	-----	-----	70	4	1,030	-----	-----	A	----	D, S	---	---	---	700	325	0.2	20	4/65	
NW NW 19	R. Fogle	-----	1957	65	4	1,000	-----	-----	--	----	P	---	---	---	1,250	120	-----	250	4/65	pH 7.0
NE NW 19	H. King	Self	-----	14	1 1/2	990	9.5	-----	A	----	D	.010	GR	---	925	430	> 4	25	11/65	pH 7.0
SE NW 19	V. Weaver	-----	-----	37	1 1/2	1,010	30	-----	I	----	D	---	---	---	860	345	-----	150	4/65	
NW NE 19	W. Brewer	W. Downer	1964	50	4	-----	10	1964	25	----	---	None	Sh	20	-----	-----	-----	-----	-----	
SW NE 19	K. Zeck	-----	-----	25	1 1/2	1,000	<25	-----	A	----	---	.010	GD	---	580	376	0	10	11/62	pH 8.0
NW SE 19	R. King	A. Knapp	1963	31	4	1,000	21	1963	--	----	D	-----	GD	---	600	291	3.1	5	12/63	pH 7.5
SE NW 20	F. Lusk	W. Downer	1955	63	4	1,030	47	1955	20	----	---	*	GD	---	-----	-----	-----	-----	-----	*Gravel packed
NW NW 20	L. Baker	W. Downer	1951	55	4	-----	34	1951	20	3	---	*	GD	---	-----	-----	-----	-----	-----	*Gravel packed
NE NE 20	J. Brickey	W. Downer	1955	74	4	1,020	37	1955	17	17	---	---	GD	---	-----	-----	-----	-----	-----	
SW NE 20	R. Milyae	-----	-----	27	1 1/2	1,005	-----	-----	A	----	D	---	---	---	740	310	1.0	25	4/65	
SW SE 20	U. Hedrick	Self	-----	18	1 1/2	990	<18	-----	--	----	D	.010	GD	---	620	330	1.0	5	11/64	pH 7.0
NW NW 21	H. Sellon	W. Downer	1949	45	4	1,020	32	1949	16	----	D	*	GD	---	790	330	0	40	1/65	*Gravel packed
SE NW 21	T. Johnson	W. Downer	1965	41	4	-----	7	1965	---	----	---	---	---	---	-----	-----	-----	-----	-----	LOG
NE SE 21	M. Lobdell	W. Downer	1954	39	4	1,010	16	1954	16	----	---	*	GD	---	-----	-----	-----	-----	-----	*Gravel packed
SW NW 22	Quincy Products Co.	W. Downer	1958	42	8	1,010	12	1958	242	----	I	---	GD	---	600	290	2.5	5	1/65	
NW SW 22	Quincy Village	W. Downer	1960	102	10	1,010	8	12/60	857	24	M	*	GR	---	-----	-----	-----	-----	-----	*.030-.070; LOG; ANAL.
NE SW 23	W. Horn	W. Downer	1958	55	4	1,015	14	1958	33	----	D, S	.030	GD	---	750	375	1.5	10	10/65	pH 7.0

Table 3.--Records of selected wells.--Continued

Location 1/4 1/4 sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks	
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO ₃)	Iron (ppm)	Chloride (ppm)	Date sampled		
QUINCY TOWNSHIP (CONT'D)																					
NW SE 23	W. Reichhart	Self	----	20	1½	1,015	10	-----	--	---	D,S	.010	GD	---	720	345	0	10	1/65	pH 7.1	
NE NE 24	J. Pocazy	W. Downer	1949	61	6	1,025	39	1949	17	3	---	---	GD	---	---	---	---	---	---	---	
NE SE 24	W. Knirk	W. Downer	1961	36	4	-----	26	1961	25	---	---	.050	GD	---	---	---	---	---	---	---	
SE SE 24	B. Knirk	-----	----	60	4	1,040	22	-----	---	---	D,S	---	GD	---	900	400	---	25	1/65	pH 7.0	
SE NE 25	M. Klepack	W. Downer	1948	170	6	1,060	21	1948	16	<1	---	None	Sh	---	---	---	---	---	---	---	
SE SW 25	R. Macey	-----	----	55	4	1,033	13	1951	---	---	---	---	GD	---	---	---	---	---	---	---	
NW SE 25	E. Hutchins	D. Showalter	1931	65	--	1,070	26.5	1931	---	---	---	None	Sh	40	---	---	---	---	---	---	
SE SW 27	E. Bowerman	W. Downer	1957	80	6	1,035	12	1957	7.5	---	---	None	Sh	45	---	---	---	---	---	---	
NE SE 28	J. Williams	Self	1960	20	1½	1,000	<20	-----	A	---	D	.010	GD	---	540	310	0.4	10	1/65	pH 7.2	
SW SW 28	V. Kennedy	W. Downer	1965	82	4	1,000	3	1965	---	---	---	.003	GR	---	---	---	---	---	---	LOG	
NE SE 28	S. Midkiff	W. Downer	1965	27	4	1,000	19	1965	---	---	D	None	GR	---	---	---	---	---	---	LOG	
SE SE 28	E. Bowerman	W. Downer	1965	73	4	1,005	15	1965	A	---	D,S	None	Sh	40	850	30	0	110	12/65	LOG	
SE SE 29	H. Fredrikson	B. Yearling	1965	42	4	990	12	1965	8	---	---	None	GR	---	---	---	---	---	---	LOG	
NW SE 29	Mrs. Russell	B. Yearling	1966	63	4	990	12	1966	11	1	D	---	GR	---	---	---	---	---	---	---	
SW NE 30	K. Kinsey	W. Downer	1965	54	4	995	16	1965	---	---	D	.030	GR	---	---	---	---	---	---	LOG	
NE SE 30	M. Loose	W. Downer	1961	52	4	1,000	25	1961	22	---	D,S	---	GR	---	650	310	> 4	10	11/64	---	
SE NW 31	E. Loose	D. Showalter	1942	68	4	1,005	28	1963	A	---	D,S	---	---	---	640	---	4	10	11/64	---	
SW NE 31	C. Carpenter	W. Downer	1965	68	4	-----	22	1965	---	---	D	.050	GR	---	---	---	---	---	---	LOG	
NW NW 32	G. Hawkins	W. Downer	1964	27	4	990	14	1964	50	---	D	.050	GD	---	---	---	---	---	---	---	
SE NW 32	F. Riley	-----	----	43	1½	995	-----	-----	---	---	D	---	---	---	---	---	> 5	35	11/64	---	
NW NE 32	R. Finkey	-----	----	35	--	990	-----	-----	---	---	D	---	---	---	580	275	3	10	11/64	---	
NW NE 32	L. Peterson	D. Mott	1963	24	2	990	14	1963	---	---	D	.040	GD	---	---	---	---	---	---	---	
SE NE 33	R. Matz	W. Downer	1950	90	4	1,030	30	1950	9	---	D	None	Sh	70	---	---	---	---	---	---	
NE SE 33	H. Philson	W. Downer	1954	80	4	1,050	20	1954	10	---	D	None	Sh	60	---	---	---	---	---	---	
NW NW 34	W. Jenkins	W. Downer	1959	35	4	1,030	8	1959	30	---	D	*	GD	---	---	---	---	---	---	---	
SW NW 34	G. Goodwin	-----	----	1953	35	1½	1,040	<25	---	I	---	D	---	GD	---	960	430	0.1	20	10/65	*Gravel packed pH 7.1; ANAL.
NE NW 35	H. Bowerman	W. Downer	1955	51	4	1,030	12	1955	42	---	D	None	Sh	30	---	---	---	---	---	---	
SE NW 35	E. Bowerman	W. Downer	1947	86	5	1,060	21	1947	20	7	D	---	Sh	45	---	---	---	---	---	---	
NW NE 35	M. Rawson	W. Downer	1964	90	6	1,060	20	1964	12	---	D,S	None	Sh	50	560	270	0.2	5	10/65	pH 8.0	
SW SW 35	A. Morency	W. Downer	1942	106	4	1,080	16	1942	5	<1	---	None	Sh	40	---	---	---	---	---	---	
SW SW 35	A. Morency	W. Downer	1942	96	4	1,080	12	1942	4	---	---	None	Sh	40	---	---	---	---	---	---	
SHERWOOD TOWNSHIP																					
SE NW 1	A. Harrison	Self	1964	20	1½	900	17	-----	A	---	D,S	.010	GD	---	750	360	0.4	40	8/65	---	
NE SE 2	L. Kijac	Fleshman	-----	75	2	895	-----	-----	---	---	D	---	---	---	1,350	350	0.6	115	8/65	---	
SE SE 2	Indian Mission Camp	W. Downer	1965	45	6	925	11	7/65	40	3	P	None	Sh	18	---	---	---	---	---	LOG	
SE SE 3	N. Klein	Self	-----	20	1½	890	<20	-----	A	---	D	.010	GD	---	680	255	0.8	55	8/65	---	
NW SW 4	W. Raviler	-----	----	80	--	880	-----	-----	A	---	D	---	---	---	640	275	0.8	10	6/65	---	
NW SW 4	P. Spencer	-----	----	18	1½	870	8	-----	A	---	D,P	.010	GD	---	690	430	0.8	75	6/65	---	
NE NE 5	A. Case	-----	----	26	1½	884	<25	-----	I	---	D,S	.010	GD	---	500	310	0.5	10	6/65	---	
SE SW 5	Idyl Wyle Acres	-----	----	40	3	880	-----	-----	A	---	D,S	---	---	---	590	375	0.4	15	6/65	---	
SE NE 6	D. Belson	-----	----	1963	45	--	880	-----	A	---	D	---	---	---	510	375	1.5	10	6/65	---	
SW NW 7	B. Cline	Self	1940	21	1½	880	<21	-----	A	---	D	.010	GD	---	470	240	0.7	20	6/65	---	
NE SE 7	W. Carr	B. Lewis	1947	110	2	900	-----	-----	A	---	D,S	---	GD	---	460	290	3.6	5	6/65	---	

Table 3.--Records of selected wells.--Continued

Location ± ± sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO3)	Iron (ppm)	Chloride (ppm)	Date sampled	
SHERWOOD TOWNSHIP (CONT'D)																				
NE SE 9	E. Stanton	-----	----	75	--	885	-----	----	A	---	D,S	----	--	----	600	395	1.0	70	6/65	pH 7.0
NW SW 10	E. Stanton	-----	----	68	2	885	-----	----	A	---	D,S	----	--	----	420	310	0.6	10	6/65	
SW SW 11	C. Mallow	E. Studeman	1955	51	4	890	-----	----	A	---	D,S	----	--	----	450	290	0.2	5	6/65	
NW NW 13	E. Heaton	Self	-----	47	2	890	-----	----	--	---	D	----	--	----	860	400	0	10	11/64	Has 2 wells
NW NE 15	F. Smittey	-----	1953	80	2	890	-----	----	A	---	D,S	----	--	----	530	360	0.5	10	6/65	
NE SW 16	G. Harvey	-----	1935	85	2	885	-----	----	A	---	D	----	--	----	530	360	0.4	10	6/65	
SW NW 17	C. McDonald	Crosby & Heaton	1961	60	2	890	-----	----	A	---	D	----	--	----	390	205	0.2	<10	6/65	pH 7.2
NE NE 17	D. Garus	Self	1964	33	2	880	-----	----	A	---	D	.010	GD	----	450	325	2.4	5	6/65	
NE NE 17	J. Taylor	Self	1964	27	1½	885	20	8/64	A	---	D	.010	GD	----	390	240	0.5	----	6/65	
NE NE 17	J. Taylor	-----	1956	60	2	880	-----	----	A	---	D	----	--	----	480	310	3.8	5	6/65	ANAL.
NE NE 17	P. Thurston	W. Downer	1963	55	4	870	20	1/63	--	---	D	.020	GD	----	-----	-----	-----	-----	-----	
NW SW 18	S. Markus	Self	-----	37	--	890	14	----	A	---	D,S	.010	GD	----	580	310	1.6	25	6/65	
SE NE 19	P. Gaylord	-----	----	80	2	900	-----	----	--	---	D	----	--	----	480	340	0.4	10	6/65	Has 2 wells
SW SW 20	L. Blackman	Self	1964	25	1½	875	17	1964	A	---	D	.010	GR	----	410	275	0.4	5	6/65	
NW SW 22	F. Pequisnot	Self	1964	31	1½	890	25	1964	A	---	D,S	.010	---	----	450	290	0.5	10	6/65	
NW NW 23	L. Rocho	Self	1945	40	1½	890	-----	----	I	---	D	----	GD	----	430	255	0.4	< 5	6/65	Has 2 wells
NE NE 25	J. Gawlak	A. Knapp	1958	80	--	920	15	1958	--	---	---	----	Sh	40	-----	-----	-----	-----	-----	
NW NE 26	R. Blair	A. Wooster	1960	65	2	920	<25	----	A	---	D,S	----	--	----	500	290	1.4	----	6/65	
SE SE 27	V. Claar	Crosby-Heaton	1955	60	2	900	<25	----	A	---	D,S	----	--	----	550	325	0.5	30	6/65	LOG
NW SE 28	Branch Co. Rd. Comm.	USGS	1965	42	1½	880	18.45	9/65	--	---	O	.010	Sd	----	-----	-----	-----	-----	-----	
SE SW 28	R. Leatherbury	E. Wood	-----	96	3	880	4	1953	A	---	D	----	--	----	590	340	1.6	30	6/65	
SE SE 28	M. Howell	Self	-----	30	1½	880	25	1964	I	---	D	.010	GD	----	520	275	0.6	20	6/65	Temp. 50.05°F
NE NW 30	L. Rote	Self	-----	27	1½	875	17	----	A	---	D,S	.010	Sd	----	410	220	0.6	10	6/65	
SE NE 30	E. Blackman	Self	-----	20	1½	840	3	----	A	---	D	.010	GD	----	450	240	0.6	10	6/65	
SW SE 30	G. Siebert	Mathis	1958	35	1½	845	0	----	A	---	D	----	Sd	----	370	220	2.2	10	6/65	6/65
NW SW 31	W. Smith	Self	1925	42	1½	860	23.80	1965	12	---	D,S	.010	Sd	----	450	220	0.6	15	6/65	
SW SW 32	J. Thornton	Heaton & Crosby	1958	44	--	875	<25	----	--	---	D	----	--	----	490	250	1.1	10	6/65	
SE NE 33	Union City Schools	W. Downer	1959	70	6	910	43	1959	30	6	P	.016	GD	70	-----	-----	-----	-----	-----	6/65
SW SE 34	F. Meyer	Self	1947	85	2	915	20	----	A	---	D,S	----	Sh	----	470	290	2.4	5	6/65	
SW NE 35	A. Hollister	Crosby & Heaton	1957	60	2	920	-----	----	I	---	D,S	----	--	----	620	360	3.7	20	6/65	
NW SW 35	G. Adams	W. Downer	1963	41	4	-----	25	1963	10	---	---	.006	GD	----	-----	-----	-----	-----	-----	6/65
SE SE 35	B. Robbins	Crosby & Heaton	1962	50	4	910	-----	----	I	---	D,S	----	Sd	----	-----	-----	-----	-----	-----	
SE SE 35	B. Robbins	-----	-----	30	2	910	-----	----	I	---	D,S	----	Sd	----	780	500	0.6	40	6/65	
NW NE 36	A. Jones & Son	-----	1912	72	3	930	37	1963	A	---	D,S	----	Sh	----	590	170	1.1	25	10/65	Comp. Anal. Temp. 52.8°F. pH 7.4; ANAL. pH 7.4
SW NE 36	A. Jones	Heaton & Crosby	1949	101	3	925	36	----	A	---	D,S	----	Sh	38	710	85	1.1	50	6/65	
NE SW 36	Mrs. E. Jones	Self	----	25	1½	910	<25	----	A	---	D	.010	GD	----	570	290	0.5	50	6/65	
UNION TOWNSHIP																				
NW NW 1	A. Hagerman	R. Katz	----	107	4	950	13	8/64	10	---	D	None	Sh	40	570	220	0.2	25	5/65	ANAL.
SW SW 1	A. Pifer	E. Heaton	1960	100	4	925	-----	----	A	---	D	None	Sh	----	5,000	500	1.0	1,900	5/65	
SW SW 2	H. Olds	-----	----	96	4	920	-----	----	A	---	D	----	--	----	460	220	0.4	15	5/65	
SE SW 3	H. Mattson	-----	----	80	4	920	-----	----	A	---	D	----	--	----	480	240	1.0	5	5/65	LOG; ANAL. LOG
SW SW 4	Union City Village	B. Thompson	1955	138	12	910	38	----	480	10	M	.020	GR	----	-----	-----	-----	-----	-----	
SE NW 4	Union City Village	W. Downer	1964	104	6	840	1.25	10/64	115	3	T	.012	Sd	----	590	240	25	1.2	11/64	

Table 3.--Records of selected wells.--Continued

Location # & sec.	Owner	Driller	Year drilled	Well depth (feet)	Diameter (inches)	Well altitude (feet above M.S.L.)	Water level (feet)	Date measured	Yield (gpm)	Specific capacity (gpm/ft)	Well use	Screen opening (inches)	Aquifer	Bedrock depth (feet)	Chemical quality of water					Remarks
															Specific conductance (Microhmhos @ 25° C)	Hardness (ppm as CaCO ₃)	Iron (ppm)	Chloride (ppm)	Date sampled	
UNION TOWNSHIP (CONT'D)																				
NE NE 4	L. Kate	W. Downer	1962	45	4	900	28	9/62	13	2	D	.030	GD	---	---	---	---	---		
SW NW 5	F. Lux	D. Showalter	1931	74	4	900	36	1/31	---	---	---	---	GR	---	---	---	---	---	LOG	
NE SE 5	Union City Village	B. Thompson	1956	99	10	880	7.5	1960	600	20	M	.080	GR	98	---	---	---	---	LOG; ANAL.	
NE NW 6	M. Ogden	Self	----	27	1½	900	20	1965	A	---	D, S	.010	GD	---	810	370	1.8	25	pH 7.0; ANAL.	
SE NE 7	L. Gaw	E. Heaton	1963	68	2	905	45	7/63	---	---	D, S	----	GR	---	750	360	0	10	11/64	
NW SW 9	E. Eldred	Knapp	1965	66	4	920	33	4/65	A	----	D	----	GR	70	500	220	1.0	20	5/65	LOG
NW SW 9	E. Eldred	-----	-----	18	30	920	16.40	11/64	I	----	S, O	*	GD	----	700	260	0	15	5/65	
SW NE 10	H. Olds	W. Downer	1953	59	4	920	34	10/53	17	----	D	.010	GD	----	----	----	----	----	----	
SW SE 10	F. Wertz	-----	-----	38	2	920	<25	1965	A	----	D	----	----	----	290	120	0.7	5	5/65	
NW NW 12	Union P.S. #9	E. Studeman	1940	65	4	930	5	12/41	5	----	A	None	Sh	35	----	----	----	----	----	
SE NE 14	E. Gray	-----	-----	60	4	950	-----	-----	A	----	D, S	----	----	----	580	290	1.0	10	5/65	
SE SE 14	C. Strang	W. Downer	1962	100	4	970	43	1/62	20	----	----	*	GD	----	----	----	----	----	----	*Gravel packed
SE SW 15	L. Marten	-----	-----	33	30	930	<25	1965	A	----	D	*	GD	70	600	290	0	20	5/65	*Dug well
NW NW 15	M. Kozakowech	W. Downer	1964	62	4	920	31	6/64	20	----	D	.030	GD	----	530	250	2.0	15	5/65	
SE SW 16	J. Jones	A. Knapp	1957	106	4	950	17	10/57	7	----	D	None	Sh	20	575	250	1.0	5	5/65	
NE NE 16	H. Miller	-----	-----	90	4	930	-----	-----	A	----	D	----	----	----	600	270	0.7	5	5/65	
NW NW 18	J. Bronson	-----	-----	40	30	910	30	4/64	A	----	D	*	GD	----	950	470	0	20	5/65	*Dug well
NW NW 19	A. Seiple	W. Downer	1953	87	4	930	28	10/53	6	----	----	None	Sh	60	-----	-----	-----	-----	-----	
NE SE 19	E. Kongker	W. Downer	1955	90	4	930	15	9/55	6	1	----	None	Sh	35	-----	-----	-----	-----	-----	
NE NW 20	G. Matthews	D. Showalter	-----	64	4	930	12	1965	A	----	D, S	-----	----	----	600	310	0.6	5	11/64	
NE NW 21	H. Knapp	W. Crosby	1947	75	4	935	15	1947	--	----	D	None	Sh	20	680	345	1.0	20	5/65	
NE NW 23	E. Daniels	B. Yearling	1965	45	4	950	22	5/65	12	1	----	None	GD	45	-----	-----	-----	-----	-----	LOG
NW SW 26	W. Elase	-----	-----	90	4	960	-----	-----	A	----	D	-----	----	----	540	250	1.0	10	5/65	
SE SE 29	C. Brown	-----	-----	120	4	980	90	1963	A	----	D, S	-----	----	----	650	255	0	10	5/65	
NE NE 30	D. Haynes	W. Downer	1954	67	4	990	40	2/54	5	----	----	.014	Sd	----	-----	-----	-----	-----	-----	
SW SE 32	G. Wagner	W. Downer	1953	59	4	930	19	6/53	20	----	D	None	Sh	30	-----	205	0.3	1,600	5/65	
NE SE 33	W. Warner	W. Downer	1954	90	4	970	18	9/54	12	----	----	None	Sh	30	-----	-----	-----	-----	-----	
NW NE 33	J. Rosseel	W. Downer	1955	83	6	930	12	6/55	6	----	----	None	Sh	45	-----	-----	-----	-----	-----	
SW SW 34	M. Barnhart	Knapp	1958	100	4	980	11	8/58	3	----	----	None	Sh	34	-----	-----	-----	-----	-----	
NW SW 35	C. Brauker	Knapp	1934	108	4	970	-----	-----	A	----	D, S	-----	----	----	420	190	0	5	11/64	
NE SW 36	R. Brown	Knapp	1964	94	4	965	48	8/64	A	----	D	-----	GR	----	660	350	1.5	10	11/64	
NE SW 36	R. Brown	-----	-----	37	--	965	-----	-----	--	----	----	-----	GR	----	1,300	690	5.0	35	11/64	

Table 4.--Drainage areas of streams.

Station number	Stream and location	Drainage area (Square miles)
St. Joseph River:		
963.9	Tekonsha Creek at Dean Rd., W $\frac{1}{2}$ sec.5, T.5 S., R.5 W.-----	10.8
	Tekonsha Creek at mouth, NE $\frac{1}{4}$ sec.34, T.4 S., R.6 W.-----	21.8
964.1	Burnett Creek at Haynes Rd., SW $\frac{1}{4}$ sec.2, T.5 S., R.7 W.-----	7.53
	Fisher Creek at Copeland Rd., SW $\frac{1}{4}$ sec.1, T.8 S., R.5 W.-----	1.27
964.15	Fisher Creek at Grove Rd., E $\frac{1}{2}$ sec.26, T.7 S., R.5 W.-----	4.77
	Fisher Creek at Campbell Rd., SW $\frac{1}{4}$ sec.14, T.7 S., R.5 W.-----	8.22
964.2	Fisher Creek at Fisher Rd., SE $\frac{1}{4}$ sec.4, T.7 S., R.5 W.-----	16.8
	Fisher Creek above Marble Lake, NW $\frac{1}{4}$ sec.4, T.7 S., R.6 W.-----	18.8
964.24	Tallahassee Drain at Ray-Quincy Rd., NW $\frac{1}{4}$ sec.3, T.8 S., R.5 W.-----	6.47
964.27	Tallahassee Drain at Brown Rd., SW $\frac{1}{4}$ sec.32, T.7 S., R.5 W.-----	13.4
	Tallahassee Drain at Warren Rd., NE $\frac{1}{4}$ sec.25, T.7 S., R.6 W.-----	20.4
964.3	Tallahassee Drain at Tallahassee Rd., NE $\frac{1}{4}$ sec.24, T.7 S., R.6 W.-----	22.7
	Tallahassee Drain at mouth, SW $\frac{1}{4}$ sec.13, T.7 S., R.6 W.-----	23.1
	Coldwater Lake at outlet, NE $\frac{1}{4}$ sec.27, T.7 S., R.6 W.-----	82.5
964.4	Coldwater River at Lake Rd., NW $\frac{1}{4}$ sec.27, T.7 S., R.6 W.-----	82.8
964.5	Coldwater River at Fillmore Rd., SW $\frac{1}{4}$ sec.9, T.7 S., R.6 W.-----	88.8
	Coldwater River above Lake of the Woods outlet, SW $\frac{1}{4}$ sec.8, T.7 S., R.6 W.-----	89.6
	Lake of the Woods at outlet, SE $\frac{1}{4}$ sec.18, T.7 S., R.6 W.-----	14.4
964.55	Byers Lake outlet at Central Rd., SW $\frac{1}{4}$ sec.8, T.7 S., R.6 W.-----	15.1
964.6	Coldwater River at Garfield Rd., NE $\frac{1}{4}$ sec.30, T.6 S., R.6 W.-----	114
964.8	Sauk River at Ridge Rd., N $\frac{1}{2}$ sec.29, T.6 S., R.5 W.-----	0
965	Sauk River at Jay St., NW $\frac{1}{4}$ sec.21, T.6 S., R.6 W.-----	16.3
	Coldwater River at State Highway 12, SW $\frac{1}{4}$ sec.17, T.6 S., R.6 W.-----	134
965.1	Cold Creek at Michigan Rd., W $\frac{1}{2}$ sec.2, T.6 S., R.6 W.-----	14.4
	Cold Creek at Battle Creek Rd., W $\frac{1}{2}$ sec.9, T.6 S., R.6 W.-----	18.9
	Cold Creek at mouth, SE $\frac{1}{4}$ sec.8, T.6 S., R.6 W.-----	19.8
	Coldwater River at Randall Lake outlet, SE $\frac{1}{4}$ sec.5, T.6 S., R.6 W.-----	158
	Coldwater River above Hog Creek, NE $\frac{1}{4}$ sec.25, T.5 S., R.7 W.-----	173
965.15	Hog Creek at State Highway 12, SE $\frac{1}{4}$ sec.13, T.6 S., R.5 W.-----	48.7
965.2	Hog Creek at Boone Rd., SW $\frac{1}{4}$ sec.12, T.6 S., R.5 W.-----	54.6
	Bowen Creek at mouth, SW $\frac{1}{4}$ sec.35, T.5 S., R.5 W.-----	6.91
	Hog Creek at Bowen Creek, SW $\frac{1}{4}$ sec.35, T.5 S., R.5 W.-----	64.3
965.25	Hog Creek at Claendon Rd., E $\frac{1}{2}$ sec.34, T.5 S., R.5 W.-----	65.1
	Bagley Creek at mouth, NE $\frac{1}{4}$ sec.33, T.5 S., R.5 W.-----	8.67
	Hog Creek at Bagley Creek, NE $\frac{1}{4}$ sec.33, T.5 S., R.5 W.-----	74.4

Table 4.--Drainage areas of streams.(Continued)

Station number	Stream and location	Drainage area (Square miles)
965.3	Hog Creek at Bidwell Rd., NE $\frac{1}{4}$ sec.33, T.5 S., R.5 W.-----	74.7
965.4	Hog Creek at Girard Rd., NE $\frac{1}{4}$ sec.23, T.5 S., R.6 W.-----	87.2
965.7	Hog Creek at U. S. Highway 27, SW $\frac{1}{4}$ sec.15, T.5 S., R.6 W.-----	89.8
965.75	North Branch Hog Creek at Lyman Rd., S $\frac{1}{2}$ sec.13, T.5 S., R.6 W.-----	6.34
	North Branch Hog Creek at mouth, NE $\frac{1}{4}$ sec.16, T.5 S., R.6 W.-----	11.7
	Hog Creek at North Branch Hog Creek, NE $\frac{1}{4}$ sec.16, T.5 S., R.6 W.-----	102
965.8	Hog Creek at Bell Rd., NE $\frac{1}{4}$ sec.17, T.5 S., R.6 W.-----	106
965.85	Hog Creek at River Rd., SE $\frac{1}{4}$ sec.18, T.5 S., R.6 W.-----	108
965.9	Hog Creek at Cady Rd., NE $\frac{1}{4}$ sec.19, T.5 S., R.6 W.-----	110
	Hog Creek at mouth, NE $\frac{1}{4}$ sec.25, T.5 S., R.7 W.-----	111
	Coldwater River at Hog Creek, NE $\frac{1}{4}$ sec.25, T.5 S., R.7 W.-----	284
966	Coldwater River at Girard Rd., NE $\frac{1}{4}$ sec.22, T.5 S., R.7 W.-----	293
966.2	Coldwater River tributary at Girard Rd., NE $\frac{1}{4}$ sec.21, T.5 S., R.7 W.-----	1.90
	Coldwater River at Gower Rd., SW $\frac{1}{4}$ sec.10, T.5 S., R.7 W.-----	296
	Coldwater River at mouth, SW $\frac{1}{4}$ sec.4, T.5 S., R.7 W.-----	300
	St. Joseph River at Coldwater River, SW $\frac{1}{4}$ sec.4, T.4 S., R.7 W.-----	528
966.4	St. Joseph River tributary at Thrums Rd., NE $\frac{1}{4}$ sec.14, T.5 S., R.8 W.-----	9.69
966.6	Spencer Creek at Blossom Rd., NW $\frac{1}{4}$ sec.1, T.5 S., R.8 W.-----	4.02
966.8	Spencer Creek at Michigan Highway 60, SW $\frac{1}{4}$ sec.3, T.5 S., R.8 W.-----	5.83
967	Spencer Creek at Blossom Rd., SW $\frac{1}{4}$ sec.16, T.5 S., R.8 W.-----	10.2
	Spencer Creek at mouth, SE $\frac{1}{4}$ sec.21, T.5 S., R.8 W.-----	10.9
	St. Joseph River at Spencer Creek, SE $\frac{1}{4}$ sec.21, T.5 S., R.8 W.-----	562
	St. Joseph River, SW $\frac{1}{4}$ sec.6, T.6 S., R.8 W.-----	575
967.1	St. Joseph River tributary at Ambs Rd., NE $\frac{1}{4}$ sec.18, T.6 S., R.8 W.-----	9.34
	St. Joseph River tributary at mouth, SE $\frac{1}{4}$ sec.1, T.6 S., R.9 W.-----	12.2
967.2	Swan Creek at Lindley Rd., SW $\frac{1}{4}$ sec.28, T.6 S., R.7 W.-----	8.01
967.4	Swan Creek tributary at U. S. Highway 12, NW $\frac{1}{4}$ sec.5, T.7 S., R.7 W.-----	33.2
	Swan Creek tributary at mouth, SE $\frac{1}{4}$ sec.31, T.6 S., R.7 W.-----	34.9
967.45	Swan Creek at Parnam Rd., NW $\frac{1}{4}$ sec.6, T.7 S., R.7 W.-----	45.9
967.5	Swan Creek at Matteson Lake Rd., NW $\frac{1}{4}$ sec.36, T.6 S., R.8 W.-----	51.2
	Swan Creek at Burr Oak Rd., NE $\frac{1}{4}$ sec.3, T.7 S., R.8 W.-----	55.5
967.6	Swan Creek at Prairie River Rd., NE $\frac{1}{4}$ sec.9, T.7 S., R.8 W.-----	57.4
	Swan Creek at South Burr Oak Rd., NW $\frac{1}{4}$ sec.12, T.7 S., R.9 W.-----	67.8
967.7	Little Swan Cr. at Langwell Rd., NE $\frac{1}{4}$ sec.13, T.6 S., R.8 W.-----	8.94
	Little Swan Cr. at outlet of Matteson Lake, NW $\frac{1}{4}$ sec.27, T.6 S., R.8 W.-----	18.2
967.8	Little Swan Cr. at Comm Rd., S $\frac{1}{2}$ sec.21, T.6 S., R.8 W.-----	19.4

Table 4.--Drainage areas of streams.(Continued)

Station number	Stream and location	Drainage area (Square miles)
967.9	Little Swan Cr. at Lyter Rd., N $\frac{1}{2}$ sec.29, T.6 S., R.8 W.-----	20.2
	Little Swan Cr. at mouth, SE $\frac{1}{4}$ sec.22, T.6 S., R.9 W.-----	31.6
975.1	Prairie River at Block Rd., NE $\frac{1}{4}$ sec.11, T.8 S., R.7 W.-----	8.15
975.22	Lake Pleasant outlet at Booth Rd., S $\frac{1}{2}$ sec.10, T.8 S., R.7 W.-----	9.63
975.25	Prairie River at Bowers Rd., SE $\frac{1}{4}$ sec.4, T.8 S., R.7 W.-----	27.3
975.26	Prairie River at Parnam Rd., E $\frac{1}{2}$ sec.30, T.7 S., R.7 W.-----	31.9
975.27	Prairie River tributary at Cranson Rd., NE $\frac{1}{4}$ sec.36, T.7 S., R.8 W.-----	6.15
975.28	Prairie River at Orland Rd., NW $\frac{1}{4}$ sec.25, T.7 S., R.8 W.-----	42.5
975.29	Prairie River at Prairie River Rd., SW $\frac{1}{4}$ sec.27, T.7 S., R.8 W.-----	46.2
975.3	Prairie River at St. Joseph Rd., SW $\frac{1}{4}$ sec.19, T.7 S., R.8 W.-----	63.3
	Fawn River:	
	Himebaugh Drain at mouth, SW $\frac{1}{4}$ sec.13, T.8 S., R.9 W.-----	13.4

Table 5.--Base flow measurements of streams (cubic feet per second).

Station Number	Stream	Drainage area (sq. mi.)	1963	1964											1965					
			7-11	2-6	4-15	4-16	6-2	6-3	7-13	7-28	7-29	9-14	10-26	10-27	2-18	*4-26	7-27	7-28	10-19	10-28
964.1	Burnett Creek	7.53									0.02		0							
964.15	Fisher Creek	4.77								0.71			.57							
964.2	Fisher Creek	16.8		1.44	5.19		2.56		1.78		1.17	0.92	1.53		10.6	29.1		1.78		4.96
964.24	Tallahassee Drain	6.47								.22				0.18						
964.27	Tallahassee Drain	13.4								.74				.81						
964.3	Tallahassee Drain	22.7								1.70				1.68						
964.4	Coldwater River	82.8		8.84	3.60			0.02		.32		.06		.10	37.5	75.6		.42		1.31
964.5	Coldwater River	88.8								.28				.29						
964.55	Byers Lake outlet	15.1							1.84	0			.005							
964.6	Coldwater River	114		13.2		21.1	4.62		5.18		1.96	.65	.78		71.8	164	2.79			26.6
964.8	Sauk River	0			14.2		.61		1.90		1.09	.38	.25		52.6	88.7	8.10			8.94
965	Sauk River	16.3				12.3		3.03	1.35		.50	.33	.28		45.4	127	7.09			10.5
965.1	Cold Creek	14.4							.24		.08		.10			25.6				
965.15	Hog Creek	48.7							2.38		1.13		2.38							
965.2	Hog Creek	54.6							2.93		1.27			2.19						
965.25	Hog Creek	65.1							4.37		.80			2.44						
965.3	Hog Creek	74.7		7.79	39.6		9.34				.83	.74	2.75		66.7	125	14.3			35.6
965.4	Hog Creek	87.2							3.61	0			1.56							
965.7	Hog Creek	89.8	1.27	4.86	44.3		9.23			.08		0	0		90.0	145	13.5			40.0
965.75	N. Br. Hog Creek	6.34							1.10	.72			.29							
965.8	Hog Creek	106								2.16				2.04						
965.85	Hog Creek	108								1.90				2.18						
965.9	Hog Creek	110								3.47				3.13		163				
966.2	Coldwater R. trib.	1.90									.02		.006							
966.4	St. Joseph R. trib.	9.69								.13			.12							
966.6	Spencer Creek	4.02							.26		.06		.02							
966.8	Spencer Creek	5.83							.58	.19			.14							
967	Spencer Creek	10.2							.89	0			.62							
967.1	St. Joseph R. trib.	9.34							0	0			0							

Table 5.--Base flow measurements of streams (cubic feet per second).--Continued

Station Number	Stream	Drainage area (sq. mi.)	1963												1964						1965					
			7-11	2-6	4-15	4-16	6-2	6-3	7-13	7-28	7-29	9-14	10-26	10-27	2-18	*4-26	7-27	7-28	10-19	10-28						
967.2	Swan Creek	8.01		.94		2.35	1.99		1.35	1.01		.32	.38		5.35	18.6		1.90		2.33						
967.4	Swan Creek trib.	33.2		4.59		11.3	4.96		4.90	2.32		2.10	2.60		24.7	85.6		5.36		16.0						
967.45	Swan Creek	45.9							6.16	3.10			3.68													
967.5	Swan Creek	51.2							5.54		2.85		3.37													
967.6	Swan Creek	57.4				21.1	8.54		7.42		3.38	1.68		3.89	51.2	123		9.31	12.0							
967.7	Little Swan Creek	8.94							.40	.16				0												
967.8	Little Swan Creek	19.4				6.29	4.42				.61	.57	.56		22.9	34.7		1.65	1.83							
967.9	Little Swan Creek	20.2								2.78				1.81												
975.1	Prairie River	8.15								.29			.18													
975.22	Lake Pleasant outlet	9.63								1.20			1.02													
975.25	Prairie River	27.3								3.06				2.51												
975.26	Prairie River	31.9								4.85				5.54												
975.27	Prairie River trib.	6.15									.01			0												
975.28	Prairie River	42.5	6.28	8.46		17.6		9.73			5.30	4.34		5.24	33.2	88.6		6.93	12.7							
975.29	Prairie River	46.2									6.01			4.98												
975.3	Prairie River	63.3									9.78			8.34												

* Flows measured on this date include surface runoff.

Table 8.--Chemical analyses of water from wells.

Chemical analyses are in parts per million, except pH.
Specific conductance is in micromhos at 25 C.

Use: D, domestic; S, stock; M, municipal; P, public; T, test; I, industrial.
Analyst: USGS, U. S. Geological Survey; MDH, Mich. Dept. of Health; LN, Layne-Northern.
Drilling Co.; CTE, Commercial Testing and Engineering; HL, Hall Laboratories;
Cull, Culligan Water Conditioning, Inc.; DTL, Detroit Testing Laboratory.

e) estimated

Location 1/4 1/4 sec.	Owner and Owners well number	Depth (ft)	Diameter (in)	Use	Date Sampled (Mo & Yr)	Analyst	Silica	Iron	Calcium	Magnesium	Sodium	Potassium	Bicarbonate	Sulfate	Chloride	Nitrate	Fluoride	Dissolved solids	Hardness as CaCO ₃		Specific Conductance	pH
																			Calcium magnesium	Non- carbonate		
ALGANSEE TOWNSHIP																						
NW NE 28	A. Waligora	110	4	D,S	1-64	Cull	20	3.5	178	116	(58)		287	44	21	0.0	---	----	294	----	----	7.7
SW SW 34	Dennis Higbee	36	1 1/4	D	10-65	USGS	---	0.88	----	---	-----	---	398	104	14	0.0	---	----	452	126	786	7.3
BATAVIA TOWNSHIP																						
NW NW 29	John Pinke	100	6	D	10-65	USGS	8.5	0.27	15	8.1	532	6.0	655	58	460	2.8	1.0	1,400	71	0	2,430	7.8
NE NW 31	Fred Casey	67	4	D,S	10-65	USGS	---	0.21	-----	---	-----	---	292	40	4.0	0.1	---	----	288	48	503	7.8
BETHEL TOWNSHIP																						
SE NE 3	Edwin Butters	201	6	D,S	-----	USGS	---	---	---	---	-----	---	394	22	980	3.1	---	----	190	0	3,570	7.8
NE NW 11	Lester Green	100	4	D,S	10-65	USGS	7.6	0.38	39	25	1,190	9.6	520	35	1,700	0.10	0.5	3,200	201	0	5,790	7.6
SE SE 35	Isaac Lunsford	70	4	D	10-65	USGS	---	4.5	----	---	-----	---	300	74	18	----	---	----	342	96	615	7.8
BRONSON TOWNSHIP																						
SE SE 1	City of Bronson	60	6	T	5-60	LN	---	0.1	----	---	-----	---	---	80	5.0	----	---	----	255	----	----	7.5
SE SE 1	City of Bronson #3	62	26	M	2-62	MDH	9	0.3	70	17	3.5	0.5	252	45	2.0	----	0	284	252	----	490	7.6
SE NE 12	City of Bronson #4	60	30	M	2-62	MDH	8	0.1	78	19	2.3	0.5	264	46	7	7.0	0	320	275	----	510	7.5
SE NE 12	City of Bronson	60	6	T	4-57	LN	---	0.1	----	---	-----	---	---	----	14	----	---	----	222	----	----	7.9
SE NE 12	City of Bronson	107	6	T	4-57	LN	---	2.2	----	---	-----	---	---	----	12	----	---	----	273	----	----	7.6
SE NE 12	City of Bronson	63	8	T	5-59	LN	---	0.4	----	---	-----	---	---	----	4.0	----	---	----	256	----	----	7.3
SE NE 12	City of Bronson	62	2	T	3-60	LN	---	0.5	----	---	-----	---	---	----	5.0	----	---	----	260	----	----	7.6
SW NW 12	City of Bronson #1	97	12	M	6-59	MDH	12	1.2	73	16	4.1	0.7	270	28	5	0	0.0	306	250	----	500	7.6
NE NE 14	City of Bronson #2	80	12	M	6-59	MDH	15	3.7	65	24	5.5	0.7	294	27	4	0	0.0	306	260	----	500	7.5
NW NW 14	Bernard Losinski	27	1 1/4	D	10-65	USGS	---	---	----	---	-----	---	170	25	8.0	30	---	----	204	----	394	7.7
NE NE 24	Alby Losinski	31	1 1/4	D	10-65	USGS	8.9	8.8	216	56	2.0	0.4	332	441	10	0.5	---	942	770	498	1,170	7.1

Table 8.--Chemical analyses of water from wells. (Continued)

Location Location 1/4 1/4 sec.	Owner and Owners well number	Depth (ft)	Diameter (in)	Use	Date Sampled (Mo & Yr)	Analyst	Silica	Iron	Calcium	Magnesium	Sodium	Potassium	Bicarbonate	Sulfate	Chloride	Nitrate	Fluoride	Dissolved solids	Hardness as CaCO ₃		Specific conductance	pH
																			Calcium magnesium	Non- carbonate		
BUTLER TOWNSHIP																						
SE SE 14	Gordon Van Kempen	29	5	S	10-65	USGS	---	2.1	----	---	----	---	306	73	4.0	0.1	---	----	332	80	620	7.4
SE SE 17	Otha Griffen	82	4	D	10-65	USGS	---	3.6	----	---	----	---	346	25	1.0	0.0	---	----	310	26	545	7.5
CALIFORNIA TOWNSHIP																						
NW SE 18	Marvin Green	160	4	D	10-65	USGS	---	----	----	---	----	---	390	13	145	1.0	---	----	86	0	1,090	7.8
COLDWATER TOWNSHIP																						
SE NW 7	Ted Rumens	190	4	D	10-65	USGS	---	----	----	---	----	---	315	14	8.0	0.7	---	302	102	0	513	8.2
NE SW 7	Larry Fraser	28	1 1/4	D	10-65	USGS	---	----	----	---	----	---	312	19	112	0.4	---	461	122	0	855	7.8
SW SW 10	Coldwater State Home #1	55	10	P,S	5-60	MDH	11	0.0	78	22	25	1.4	278	40	12	25	---	374	285	----	630	7.5
SW SW 10	Coldwater State Home #2	59	12	P,S	5-60	MDH	10	0.0	78	22	7.3	1.4	266	43	11	25	---	336	285	----	570	7.5
SW NE 14	Rod Link	85	4	D	10-65	USGS	---	0.79	----	---	----	---	430	28	20	0.1	---	----	404	51	712	7.3
NE NW 15	Coldwater State Home #3	150	12	P,S	5-60	MDH	10	0.0	66	18	5.0	1.0	240	30	8	15	---	284	240	----	500	7.7
NE SW 22	City of Coldwater #3	132	28	M	4-55	MDH	10	1.1	80	23	(7.8)	---	310	47	5	0	---	344	295	----	590	7.4
NE SW 22	City of Coldwater #3	132	28	M	12-63	MDH	14	1.4	82	23	8.3	0.8	320	44	8	0	---	358	300	----	570	7.4
NE SW 22	City of Coldwater #3	132	28	M	5-61	MDH	11	0.9	82	23	6.5	0.8	290	60	10	1.0	0.2	354	300	----	560	7.6
NE SW 22	City of Coldwater #4	121	20	M	8-49	DTL	3.5	1.0	24	2.4	133	---	300	19	29	0.1	---	390	----	----	----	7.6
NE SW 22	City of Coldwater #4	121	20	M	4-55	MDH	3	1.5	76	24	(9.1)	---	334	25	7	0	---	326	290	----	590	7.5
NE SW 22	City of Coldwater #4	121	20	M	5-61	MDH	17	1.6	80	22	6.5	0.6	345	25	4	0	---	338	290	----	550	7.6
NE SW 22	City of Coldwater #4	121	20	M	12-63	MDH	14	1.6	84	23	8.7	0.8	325	43	7	0	---	356	305	----	580	7.5
NE SW 22	City of Coldwater #5	125	20	M	12-63	MDH	13	1.2	92	24	7.6	1.3	296	81	9	0	---	400	330	----	605	7.4
NE SW 22	City of Coldwater TW #5	88	18	T	1-56	CTE	14	----	82	12	----	---	230	25	9	----	---	344	260	----	----	7.5
NE SW 22	City of Coldwater #5	125	20	M	1-57	MDH	10	1.5	44	16	8.0	0	192	20	5	0	---	254	175	----	475	7.8
NE SW 22	City of Coldwater #5	125	20	M	5-61	MDH	10	1.3	82	23	7.5	0.6	340	33	5	0	---	344	300	----	550	7.5
NW SE 22	City of Coldwater TW #6	35	18	T	1-56	CTE	15	----	87	18	----	---	234	70	7	0	---	340	200	----	----	7.5
NW SE 22	City of Coldwater #6	131	34- 18	M	7-64	MDH	15	0.3	84	24	7.0	0.6	324	40	7	0	---	358	310	----	560	7.7
NE SW 32	M. Nivison	21	1 1/4	D	2-56	MDH	7	0.0	88	15	5.0	1.0	307	30	3.0	0.0	---	330	280	----	640	7.7

Table 8.--Chemical analyses of water from wells. (Continued)

Location ¼ ¼ sec	Owner and Owners well number	Depth (ft)	Diameter (in)	Use	Date Sampled (Mo & Yr)	Analyst	Silica	Iron	Calcium	Magnesium	Sodium	Potassium	Bicarbonate	Sulfate	Chloride	Nitrate	Fluoride	Dissolved solids	Hardness as CaCO ₃		Specific conductance	pH
																			Calcium magnesium	Non- carbonate		
GILEAD TOWNSHIP																						
SE SE 11	Merle Rubley	35	2	D	10-65	USGS	14	0.17	109	43	38	4.1	350	94	90	36	---	626	449	162	1,000	7.9
NE NE 14	Archie Sanders	75	2	D	10-65	USGS	---	3.7	---	---	---	---	340	2.0	3.0	2.5	---	---	280	1	491	8.1
GIRARD TOWNSHIP																						
SE SE 3	Harry Thornton	20	36	D	11-64	USGS	---	---	---	---	---	---	393	33	6.0	16	---	---	362	40	676	7.1
SE SE 3	Harry Thornton	210	6	D	11-64	USGS	---	---	---	---	---	---	92	1,510	1,450	---	---	---	1,200	1,120	6,760	7.2
NW NW 6	Milton Dennis	135	4	D	10-64	USGS	---	---	---	---	---	---	336	12	13	0.7	---	---	70	0	576	7.9
SE SE 9	C. Lehman	72	4	D	5-64	USGS	---	---	69	19	3.2	0.8	286	21	3.0	---	---	278	250	16	470	7.0
NE NW 12	Marlin Gallop	120	4	D	10-65	USGS	---	0.58	---	---	---	---	370	4.4	14	1.2	---	---	208	0	601	8.2
SE SW 24	John Stahowiak	90	4	D	10-65	USGS	---	0.3	---	---	---	---	545	8.0	220	1.4	---	---	33	0	1,500	7.9
SE SW 24	John Stahowiak	70	4	S	10-65	USGS	15	0.29	1.05	40	14	6.0	414	82	38	0.2	---	518	427	88	831	7.8
KINDERHOOK TOWNSHIP																						
SE SE 9	Mich. State Hwy. Dept.	86	4	P	10-65	USGS	---	0.34	---	---	---	---	246	1.6	6.0	1.1	---	---	134	0	388	8.2
SE SE 9	L & M Fochtman	35	2	P	10-65	USGS	---	1.3	---	---	---	---	262	26	12	2.3	---	---	246	32	455	7.5
MATTESON TOWNSHIP																						
NW SW 14	Albert Moss	58	2	D	10-65	USGS	12	0.1	73	24	2.0	0.1	270	38	5.0	19	---	314	281	60	513	7.5
SW NW 25	Andrew Kline	28	1¼	D	10-65	USGS	9.5	.15	30	11	1.0	0.0	88	33	4.0	12	---	151	120	48	266	7.4
NOBLE TOWNSHIP																						
SW SW 2	Emmit Smith	15	1¼	D	10-65	USGS	---	2.8	---	---	4.2	---	376	170	12	0.2	---	---	508	200	846	7.3
SE SE 15	Fred Pippinger	25	1¼	D	10-65	USGS	---	---	---	---	---	---	198	18	4.0	24	---	---	209	47	452	8.2
OVID TOWNSHIP																						
NW SE 6	Harold Munger	±35	4	D	10-65	USGS	---	0.42	---	---	---	---	316	54	24	2.9	---	---	338	78	637	7.5
NW SE 6	Harold Munger	e)100	4	D	10-65	USGS	7.6	1.7	47	25	938	9.6	425	42	1,400	---	0.4	2,640	220	0	4,800	7.6

Table 8.--Chemical analyses of water from wells. (Continued)

Location 1/4 1/4 sec.	Owner and Owners well number	Depth (ft)	Diameter (in)	Use	Date Sampled (Mo & Yr)	Analyst	Silica	Iron	Calcium	Magnesium	Sodium	Potassium	Bicarbonate	Sulfate	Chloride	Nitrate	Fluoride	Dissolved solids	Hardness as CaCO ₃		Specific conductance	pH
																			Calcium magnesium	Non- carbonate		
QUINCY TOWNSHIP																						
NW NE 7	Paul Merkle	100	6	D	10-65	USGS	---	0.17	---	---	---	---	565	16	720	1.5	---	---	116	0	2,950	8.1
SE NW 14	General Cable Corp.	31	26	I	7-59	LN	---	0.7	---	---	---	---	300	---	8	---	---	---	307	7	---	7.6
NW SW 15	Village of Quincy #1	35	14	M	6-59	MDH	11	0.1	112	29	9.2	2.4	365	63	19	30	---	482	400	---	780	7.4
NW SW 15	Village of Quincy #2	65	10	M	6-59	MDH	17	1.4	86	24	7.4	0.7	350	26	9	0	---	336	315	---	600	7.5
NW SW 22	Village of Quincy #3	102	10	M	2-62	MDH	13	1.3	84	22	5.8	0.8	320	43	5	0	---	398	300	---	590	7.5
SW NW 34	George Goodwin	30- 40	1 1/4	D	10-65	USGS	---	---	---	---	---	---	518	95	20	42	---	---	556	131	992	7.3
SHERWOOD TOWNSHIP																						
NE NE 17	James Taylor	60	2	D	10-65	USGS	---	3.4	---	---	---	---	344	1.2	0	3.2	---	---	274	0	506	8.3
SW NE 36	Arthur Jones	101	3	D,S	10-65	USGS	---	0.7	---	---	---	---	446	18	46	1.0	---	---	88	0	830	7.7
UNION TOWNSHIP																						
SW SW 1	A. O. Pifer	100	4	D	10-65	USGS	---	1.2	---	---	---	---	250	4.0	1,850	---	---	---	688	483	5,770	7.4
SW SW 4	Village of Union City #2	138	10	M	6-59	MDH	10	1.2	81	21	2.8	0.7	290	47	3	7.5	---	324	290	---	580	7.4
SW SW 4	Village of Union City #2	138	10	M	3-62	HL	---	1.4	82	17	---	---	289	---	4	---	---	---	274	---	---	7.5
NE SE 5	Village of Union City #1	98	10	M	6-59	MDH	12	2.0	86	21	2.8	0.8	300	52	2	0	---	350	300	---	590	7.5
NE SE 5	Village of Union City #1	98	10	M	3-62	HL	---	2.3	92	19	---	---	313	---	6	---	---	---	306	---	---	7.5
SW NW 6	Milo Ogden	73	6	D	10-65	USGS	---	---	---	---	---	---	335	4.0	290	0.6	---	---	114	0	1,430	7.8

ADDENDA (to Table 9)

Locations of stream water-quality sites not identified or located in table 4 or on location map (figure 20) are shown below:

Table 9.--C

Analyses made by U. S. Geological Survey. Deter

Station number	Date	Temperature (°F)	Silica	Iron	Manganese	Calcium	Mg	Na
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963.9	7-28-64	74	--	--	--	--	--	--
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964.13	4-15-64	54	--	--	--	--	--	--
964.15	7-28-64	65	--	--	--	--	--	--
964.17	7-28-64	84	--	--	--	--	--	--
964.2	4-15-64	--	--	--	--	101	26	6.3
	7-13-64	64	12	0.14	0.13	89	30	7.4
	7-29-64	72	--	.21	.04	--	--	--
	10-26-64	54	--	.13	--	--	--	--
	4-26-65	45	5.7	.28	.06	88	19	5.8

- 964.13 Fisher Creek at Copeland Rd.,
SW $\frac{1}{2}$ sec. 1, T.8 S., R.5 W.
- 964.17 Fisher Creek at Campbell Rd.,
SW $\frac{1}{2}$ sec.14, T.7 S., R.5 W.
- 964.9 Sauk River at Lott Rd.,
SE $\frac{1}{2}$ sec.24, T.6 S., R.6 W.
- 965.12 Cold (Mud) Creek at Battle Creek Rd.,
W $\frac{1}{2}$ sec.9, T.6 S., R.6 W.
- 966.3 Coldwater River at Gower Rd.,
SW $\frac{1}{2}$ sec.10, T.5 S., R.7 W.
- 967.05 St. Joseph River
SW $\frac{1}{2}$ sec.6, T.6 S., R.8 W.

--	242	99	10	--	--	--	--	--	306	107	593	7.5	--
964.2	245	140	14	--	--	--	469	--	359	158	683	6.8	--
	298	94	12	0.6	1.5	--	414	--	346	102	649	8.0	17
	199	88	12	.3	1.4	0.04	--	--	256	92	501	8.1	--
	300	99	12	--	1.4	--	--	--	360	114	680	7.8	--
	214	115	10	.2	7.4	--	359	--	298	122	566	7.6	40

Tallahassee Drain

964.24	4-15-64	56	--	--	--	--	--	--	246	194	10	--	--	--	565	84	427	225	775	8.2	28
964.27	4-15-64	55	--	--	--	--	--	--	252	180	10	--	--	--	537	88	424	217	762	8.1	18
964.3	4-15-64	58	--	--	--	--	--	--	1/138	180	8.0	--	--	--	433	77	324	204	618	8.3	10
	7-28-64	77	--	--	--	--	--	--	226	126	8.0	--	--	--	--	--	322	137	601	8.1	--

Coldwater River

964.4	4-15-64	--	--	--	--	52	21	4.7	1.7	184	65	9.0	--	--	--	266	--	216	65	427	7.0	--
	7-28-64	86	--	.21	.00	--	--	--	--	156	52	6.0	.3	1.2	.79	--	--	186	58	375	7.5	--
	10-27-64	55	--	.29	--	--	--	--	--	192	57	8.0	--	.4	--	--	--	218	60	427	7.6	--
	4-26-65	46	--	.43	.02	--	--	--	--	164	76	6.0	--	2.3	--	--	--	226	92	438	7.3	5
964.6	4-16-64	--	--	--	--	76	24	5.3	1.4	197	120	1.0	--	--	--	367	--	288	127	553	6.8	--
	7-29-64	72	--	.22	.12	--	--	--	--	220	86	8.0	.2	1.5	.09	--	--	275	94	523	7.6	--
	10-26-64	55	--	.18	--	--	--	--	--	1/228	74	11	--	1.3	--	--	--	268	74	511	8.3	--
	4-26-65	46	--	.16	.05	--	--	--	--	2/170	101	7.0	--	5.2	--	--	--	270	125	502	8.4	20

Sauk River

964.8	4-15-64	--	--	--	--	56	21	8.0	2.0	202	66	11	--	--	--	285	--	226	60	463	7.0	--
	7-29-64	78	--	--	--	--	--	--	--	149	73	10	.2	1.0	.12	--	--	204	82	420	7.7	--
	10-26-64	55	--	.48	--	--	--	--	--	187	76	12	--	1.7	--	--	--	232	79	462	8.1	--
	4-26-65	47	--	.15	.02	--	--	--	--	184	84	10	--	2.9	--	--	--	248	97	487	7.2	8
964.9	7-29-64	74	--	--	--	--	--	--	--	206	126	12	--	--	--	--	--	300	131	581	8.1	--
965	4-16-64	--	--	--	--	77	25	7.7	1.6	229	106	11	--	--	--	375	--	295	108	579	6.9	--

1/ Also contains 4 ppm CO₃

2/ Also contains 6 ppm CO₃

Table 9.--Chemical analyses of water from streams. (continued)

Station number	Date	Temperature (°F)	Silica	Iron	Manganese	Calcium	Magnesium	Sodium	Potassium	Bicarbonate	Sulfate	Chloride	Fluoride	Nitrate	Phosphate	Dissolved solids	Loss on ignition	Hardness as CaCO ₃		Specific conductance	pH	Color
																		Calcium magnesium	Non-carbonate			
Sauk River																						
965	7-13-64	--	7.5	.37	.08	81	27	10	1.3	248	103	20	.5	.6	--	382	--	313	110	622	7.9	7
	7-29-64	59	13	.11	.19	51	27	47	2.6	154	67	104	.5	1.6	--	390	--	238	112	706	8.0	2
	10-26-64	53	--	.06	--	--	--	--	--	328	61	27	--	1.0	--	--	--	351	82	675	7.6	--
	4-26-65	46	4.0	.28	.06	79	22	8.6	1.8	206	116	11	.1	1.8	--	355	--	288	119	558	7.9	18
Cold Creek																						
965.1	7-29-64	71	--	--	--	--	--	140	--	356	46	305	--	--	--	--	--	472	180	1,560	7.4	--
	4-15-64	62	--	--	--	--	--	--	--	244	174	28	--	--	--	537	81	402	202	778	8.1	10
	7-13-64	--	--	--	--	--	--	95	--	230	80	228	--	--	--	--	--	392	203	1,220	7.5	--
965.12	4-15-64	64	--	--	--	--	--	--	--	218	142	40	--	--	--	476	71	350	171	719	8.1	12
	7-29-64	65	--	--	--	--	--	--	--	299	47	38	--	--	--	--	--	322	76	668	7.3	--
Hog Creek																						
965.3	4-15-64	--	--	--	--	72	23	5.0	1.4	234	79	10	--	--	--	336	--	274	82	519	6.6	--
	7-28-64	84	--	--	--	--	--	--	--	240	60	10	.3	2.2	.34	--	--	262	65	503	7.8	--
	10-26-64	55	--	.20	--	--	--	--	--	300	68	10	--	.5	--	--	--	318	72	589	8.0	--
	4-26-65	45	--	.18	.05	--	--	--	--	210	74	8.0	--	1.7	--	310	--	262	90	494	7.5	25
965.7	4-15-64	--	--	--	--	75	22	5.7	1.4	234	83	10	--	--	--	340	--	278	86	534	6.9	--
	7-28-64	81	--	.60	.84	--	--	--	--	2/232	62	10	.2	2.1	.30	--	--	270	70	501	8.3	--
	4-26-65	46	--	.16	.07	--	--	--	--	212	78	10	--	1.6	--	315	--	268	94	503	7.3	20
965.9	7-28-64	81	14	.15	.07	64	26	4.7	1.2	243	61	8.0	.5	1.2	.20	308	--	267	68	500	8.2	12
	10-27-64	55	--	.26	--	--	--	--	--	284	61	9.0	--	.7	--	--	--	296	63	553	7.9	--
	4-26-65	46	2.5	.19	.06	59	29	5.5	1.4	218	84	6.4	.1	1.2	--	322	--	266	88	518	7.7	35
Coldwater River																						
966	7-28-64	79	8.2	.18	.12	44	22	11	1.8	164	65	18	.5	1.1	.53	256	--	201	66	445	7.5	17
	10-27-64	53	--	.15	--	--	--	--	--	207	63	20	--	1.6	--	--	--	236	66	497	7.5	--
	4-26-65	47	4.2	.13	.06	71	18	8.0	1.7	195	82	12	.1	1.8	--	310	--	251	91	503	7.5	18
966.3	7-28-64	79	--	--	--	--	--	--	--	175	64	18	--	--	--	--	--	214	70	458	7.6	--
St. Joseph River																						
967.05	7-28-64	85	--	--	--	--	--	--	--	198	52	14	--	--	--	--	--	220	58	452	7.7	--
Swan Creek																						
967.2	4-16-64	--	--	--	--	80	21	5.3	0.9	235	90	11	--	--	--	353	--	286	94	550	6.9	--
	7-28-64	74	--	0.42	.04	--	--	--	--	226	62	10	.1	.9	.06	--	--	260	74	495	7.8	--
	10-26-64	50	--	.17	--	--	--	--	--	236	65	11	--	.7	--	--	--	262	68	508	7.9	--
	4-26-65	47	--	.72	.12	--	--	--	--	194	154	6.0	--	.22	--	443	--	350	191	643	7.2	27

Table 9.--Chemical analyses of water from streams. (continued)

Station number	Date	Temperature (°F)	Silica	Iron	Manganese	Calcium	Magnesium	Sodium	Potassium	Bicarbonate	Sulfate	Chloride	Fluoride	Nitrate	Phosphate	Dissolved solids	Loss on ignition	Hardness as CaCO ₃		Specific conductance	pH	Color
																		Calcium magnesium	Non-carbonate			
Swan Creek Tributary																						
967.4	4-16-64	--	--	--	--	80	23	5.7	1.4	250	90	10	--	--	--	362	--	294	89	569	6.8	--
	7-28-64	84	--	--	--	--	--	--	--	192	63	8.0	--	--	--	--	--	224	66	447	7.7	--
	10-26-64	54	--	.13	--	--	--	--	--	220	67	9.5	--	1.2	--	--	--	248	68	489	7.8	--
	4-26-65	46	--	.21	.07	--	--	--	--	186	80	7.0	--	4.9	--	306	--	250	98	478	7.2	27
Swan Creek																						
967.6	4-16-64	--	--	--	--	80	22	9.0	1.6	232	98	15	--	--	--	381	--	290	100	579	6.9	--
	7-13-64	66	10	.15	.10	59	23	12	1.1	196	73	18	.5	4.0	--	310	--	242	81	501	7.6	22
	7-29-64	78	12	.14	.11	48	16	22	3.3	166	56	28	.5	6.7	--	280	--	186	50	480	7.2	22
	10-27-64	49	--	.24	--	--	--	--	--	228	72	36	--	4.0	--	--	--	265	78	596	7.4	--
	4-27-65	45	4.2	.18	.06	76	17	6.5	1.6	184	99	9.5	.1	2.8	--	315	--	260	109	502	7.5	40
Little Swan Creek																						
967.8	4-16-64	--	--	--	--	53	19	5.3	1.4	180	64	9.0	--	--	--	272	--	210	62	424	6.8	--
	7-29-64	59	--	.37	.09	--	--	--	--	224	59	6.0	.2	.2	.06	--	--	246	62	471	7.9	--
	10-26-64	55	--	.28	--	--	--	--	--	204	64	7.0	--	.4	--	--	--	230	63	446	8.0	--
	4-26-65	47	--	.14	.06	--	--	--	--	172	94	7.0	--	.8	--	302	--	250	109	477	7.2	10
Prairie River																						
975.25	7-28-64	80	--	--	--	--	--	--	--	286	123	6.0	--	--	--	--	--	360	125	653	8.0	--
975.28	4-16-64	--	--	--	--	105	28	5.0	1.1	288	136	8.0	--	--	--	467	--	377	141	689	7.1	--
	7-29-64	71	--	.54	.07	--	--	--	--	286	102	6.0	.2	5.0	.05	--	--	343	108	634	7.8	--
	10-27-64	52	--	.19	--	--	--	--	--	298	98	8.0	--	6.7	--	--	--	348	104	642	7.9	--
	4-26-65	47	--	.39	.06	--	--	4.7	--	3/190	170	6.0	--	12	--	472	--	376	200	677	8.4	37
975.3	7-29-64	73	12	.37	.07	86	26	4.5	.9	274	88	6.0	.5	2.6	.17	373	--	322	97	595	7.8	12
	10-27-64	48	--	.27	--	--	--	--	--	298	92	6.0	--	3.0	--	--	--	340	96	626	7.9	--
	4-26-65	45	8.8	.25	.03	114	26	5.5	.9	231	172	7.0	.2	14	.36	488	--	392	202	706	7.7	30

3/ Also contains 10 ppm CO₃

Table 10.--Chemical analyses of water from lakes.

All analyses made by U. S. Geological Survey in the field, except laboratory analyses for samples collected September, 1965.
 Determinations in parts per million, except pH; specific conductance is in microhms at 25°C.

Concentrations in parts per million, except pH, specific conductance is in micromhos at 25°C.															
Name	Date collected	Depth taken (ft)	Temperature °F	Bicarbonate	Sulfate	Chloride	Nitrate	Phosphate	Hardness		Specific conductance	pH	Dissolved oxygen		Remarks
									As calcium carbonate	Non-carbonate			ppm	% saturation	
ALGANSEE TOWNSHIP															
Bartholemew	6-23-65	--	--	---	----	10	---	----	360	---	480	7.5	---	----	Collected at shore from most NE of 3 ponds
Beckwith	6-22-65	--	--	---	----	10	---	----	220	---	330	8.0	---	----	
Camp	6-22-65	--	--	---	----	25	---	----	410	---	570	7.5	---	----	
Hanchet	6-22-65	--	--	---	----	10	---	----	250	---	340	8.8	---	----	
Hanchet	9-21-65	--	74	177	90	4	1.8	0.14	265	120	470	7.3	---	----	
Marble	11- 5-64	--	--	---	----	10	---	----	200	---	440	8.0	---	----	
Middle	6-22-65	--	--	---	----	10	---	----	340	---	480	7.2	---	----	
BATAVIA TOWNSHIP															
Cary	3-16-65	--	--	---	----	5	---	----	130	---	290	7.4	---	----	Collected near center of lake
Cooks	6-23-65	--	--	---	----	10	---	----	360	---	225	9.5	---	----	
Cooks	9-20-65	--	76	100	103	9	.5	.03	200	118	399	7.3	---	----	
Lime	6-23-65	--	--	---	----	25	---	----	250	---	390	9.8	---	----	
Lime	9-20-65	--	76	183	81	12	1.1	.57	237	87	492	7.4	---	----	Collected near center of lower end of lake
BETHEL TOWNSHIP															
Palmitere	7-19-65	--	--	---	----	20	---	----	130	---	300	9.2	---	----	Collected near center of lake. Maximum lake depth is 22 feet.
Palmitere	9-22-65	15	64	192	47	12	.7	.14	217	60	424	7.3	---	----	
Sprong	6-23-65	--	--	---	----	15	---	----	270	---	390	7.5	---	----	
BUTLER TOWNSHIP															
Quaker	6-22-65	--	--	---	----	15	---	----	370	---	480	8.0	---	----	
CALIFORNIA TOWNSHIP															
Browns	6-22-65	--	--	---	----	15	---	----	430	---	590	7.3	---	----	
Withington	6-22-65	--	--	---	----	15	---	----	320	---	560	7.8	---	----	

Table 10.--Chemical analyses of water from lakes. (continued)

Name	Date collected	Depth taken (ft.)	Temperature °F	Bicarbonate	Sulfate	Chloride	Nitrate	Phosphate	Hardness		Specific conductance	pH	Dissolved oxygen		Remarks
									As calcium carbonate	Non- carbonate			ppm	% satura- tion	
COLDWATER TOWNSHIP															
Little Long	4- 7-64	--	--	---	-----	20	---	----	170	---	405	7.8	---	-----	Collected near center of lake. Maximum lake depth is 12 feet.
Morrison	10- 7-64	--	--	---	-----	5	---	----	130	---	290	7.4	---	-----	
North	6-23-65	--	--	---	-----	15	---	----	370	---	500	8.2	---	-----	
Randall	10- 2-64	--	--	---	-----	20	---	----	220	---	540	8.5	---	-----	
South	7-21-65	--	--	---	-----	25	---	----	220	---	480	8.3	---	-----	
West Long	4- 7-64	--	--	---	-----	5	---	----	150	---	330	7.5	---	-----	
West Long	6-23-65	--	--	---	-----	10	---	----	270	---	410	9.3	---	-----	
West Long	9-20-65	--	66	148	50	18	.4	.11	185	64	384	7.5	---	-----	
GILEAD TOWNSHIP															
Gilead	10-22-64	--	--	---	-----	5	---	----	140	---	280	7.5	---	-----	Collected near center of lake. Evolved H ₂ S when acidified.
Gilead	9-21-65	10	71	128	22	4	.1	.12	130	25	250	7.8	9.6	103	
Gilead	9-21-65	35	60	252	25	6	3.0	.19	252	45	450	7.3	.0	0.0	
Hog	6-22-65	--	--	---	-----	15	---	----	270	---	350	8.5	---	-----	
Pleasant	6-22-65	--	--	---	-----	20	---	----	220	---	320	8.2	---	-----	
Redwater	6-22-65	--	--	---	-----	15	---	----	210	---	310	7.8	---	-----	
GIRARD TOWNSHIP															
Fox	11-13-64	--	--	---	-----	5	---	----	260	---	470	7.5	---	-----	
Girard	11- 5-64	--	--	---	-----	10	---	----	200	---	410	8.0	---	-----	
Morrison	10- 7-64	--	--	---	-----	20	---	----	190	---	450	8.5	---	-----	
Round	11-13-64	--	--	---	-----	5	---	----	210	---	390	8.0	---	-----	
Vincent	10-10-64	--	--	---	-----	10	---	----	180	---	370	8.0	---	-----	

Table 10.--Chemical analyses of water from lakes. (continued)

Name	Date collected	Depth taken (ft)	Temperature of	Bicarbonate	Sulfate	Chloride	Nitrate	Phosphate	Hardness		Specific conductance	pH	Dissolved oxygen		Remarks	
									As calcium carbonate	Non-carbonate			ppm	% saturation		
KINDERHOOK TOWNSHIP																
Coldwater	6-23-65	--	--	---	-----	10	---	----	290	---	390	8.6	---	-----	Collected near center of upper N portion of lake. Collected near center of upper N portion of lake Collected near center of lake. Collected near center of lake.	
Dragon	6-22-65	--	--	---	-----	15	---	----	240	---	350	8.3	---	-----		
George	6-22-65	--	--	---	-----	15	---	----	220	---	290	9.0	---	-----		
George	9-22-65	10	70	178	34	10	.8	.05	190	44	356	7.8	8.2	90		
George	9-22-65	50	48	155	34	8	.3	.06	166	39	325	7.7	.8	7		
Huyck	6-22-65	--	--	---	-----	10	---	----	250	---	360	7.8	---	-----		
Lavine	6-22-65	--	--	---	-----	5	---	----	180	---	310	8.0	---	-----		
North Pleasant	11- 4-64	--	--	---	-----	5	---	----	120	---	240	8.0	---	-----		
North Pleasant	9-22-65	10	75	114	22	5	.2	.02	119	26	234	7.6	7.8	89		
North Pleasant	9-22-65	50	49	124	20	4	.6	.07	125	24	248	7.2	2.2	18		
Silver	6-22-65	--	--	---	-----	15	---	----	240	---	330	8.2	---	-----		
Silver	7- 5-65	--	--	---	-----	15	---	----	190	---	360	8.2	---	-----		
MATTESON TOWNSHIP																
Matteson	6-23-65	--	--	---	-----	15	---	----	270	---	390	7.5	---	-----		
NOBLE TOWNSHIP																
Anderson	8- 4-65	--	--	---	-----	10	---	----	220	---	450	8.0	---	-----	Collected from boat dock near shore. Conductance check around shoreline indicated no changes.	
Fish	8- 3-65	--	--	---	-----	10	---	----	220	---	400	7.9	---	-----		
Honey	10-22-64	--	--	---	-----	5	---	----	150	---	320	7.5	---	-----		
Long Noble	10-22-64	--	--	---	-----	5	---	----	150	---	320	8.0	---	-----		
Long Noble	8- 3-65	--	--	---	-----	15	---	----	240	---	540	8.0	---	-----		
Mallow	8- 4-65	--	--	---	-----	10	---	----	310	---	600	8.0	---	-----		
Round	8- 4-65	--	--	---	-----	5	---	----	20	---	50	7.0	---	-----		
Round	9-21-65	--	75	15	8.0	3	1.2	.08	24	12	60	6.1	---	-----		
142																

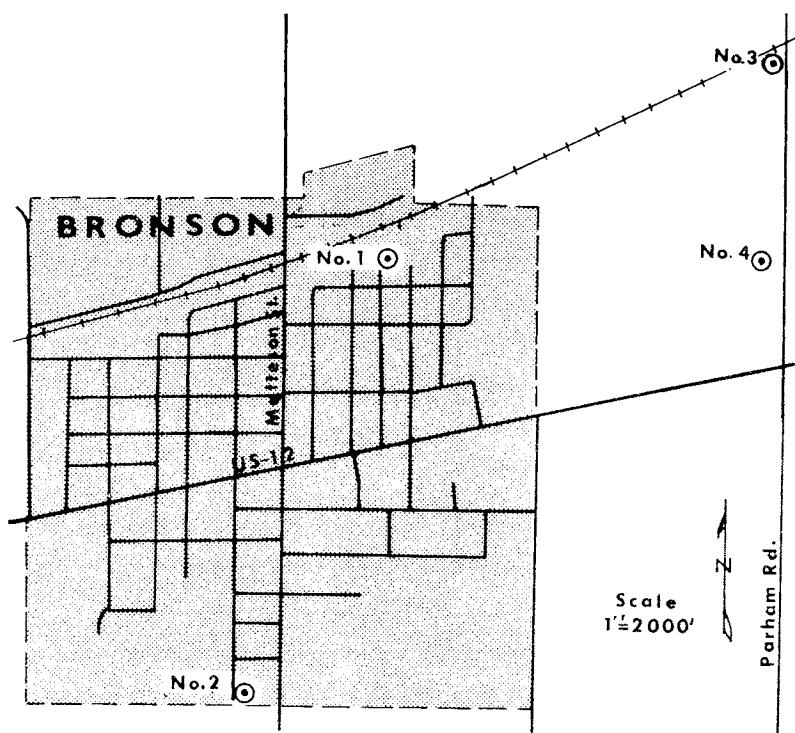
Table 10.--Chemical analyses of water from lakes. (continued)

Name	Date collected	Depth taken (ft)	Temperature °F	Bicarbonate	Sulfate	Chloride	Nitrate	Phosphate	Hardness		Specific conductance	pH	Dissolved oxygen		Remarks
									As calcium carbonate	Non-carbonate			ppm	% saturation	
OVID TOWNSHIP															
Bingham	9-22-65	--	76	182	206	10	1.0	.21	384	235	696	7.9	---	----	Collected off boat dock at NW end of lake
Coldwater	9-21-65	5	72	158	74	8	0.9	.06	220	91	419	8.0	8.6	98	Collected 300 yards off shore from public fishing site.
Coldwater	9-21-65	50	53	158	75	8	0.8	.29	218	88	420	7.7	8.5	78	Collected 300 yards off shore from public fishing site.
Lake of the Woods	6-22-65	--	--	---	-----	15	---	---	360	---	490	8.1	---	----	
Little Rose	6-23-65	--	--	---	-----	10	---	---	320	---	480	8.1	---	----	
QUINCY TOWNSHIP															
Marble	11-24-64	--	--	---	-----	10	---	---	200	---	440	8.0	---	----	
SHERWOOD TOWNSHIP															
Blossom	6-16-65	--	--	---	-----	5	---	---	190	---	335	7.8	---	----	
Dean	6-16-65	--	--	---	-----	10	---	---	150	---	280	8.0	---	----	
Goodrich	6-23-65	--	--	---	-----	10	---	---	220	---	320	7.1	---	----	
Kenyon	6-25-65	--	--	---	-----	15	---	---	310	---	440	8.0	---	----	
Lehr	6-25-65	--	--	---	-----	15	---	---	320	---	500	7.9	---	----	
Lutherberry	6-25-65	--	--	---	-----	5	---	---	190	---	300	7.7	---	----	
Marl	6-29-65	--	--	---	-----	10	---	---	250	---	400	7.8	---	----	
Oliverda	6-25-65	--	--	---	-----	15	---	---	270	---	420	8.0	---	----	
River	6-23-65	--	--	---	-----	15	---	---	290	---	400	7.2	---	----	
UNION TOWNSHIP															
Union	10-30-64	--	--	---	-----	10	---	---	240	---	---	7	---	----	

Description of Municipal and Institutional Supplies

City of Bronson

Present water supply.--The city has three wells finished in sand and gravel. No. 1 (formerly No. 2), was installed in 1936, is at Washington Avenue and Railroad Street, and is used only on a standby basis.



Location of the municipal wells.

The well is 97 feet deep, 12 inches in diameter, and has 18 feet of 40 slot screen from 79-97 feet. In 1950 its static water level was reported as 10 feet below ground surface and as 15 feet in 1958. This well is equipped with a 50 HP turbine pump.

No. 3 was installed in May, 1960, and is located 100 feet west of Parham Road and 50 feet south of New York Central Railroad. It is 62 feet deep, 26 inches in diameter, gravel wall type, and has 15 feet of 12-inch diameter No. 7 shutter-type screen. In 1960 its static water level was reported as 7 feet below ground level. Well is equipped with 50 HP turbine pump.

No. 4 was installed in March, 1960, and is located about 200 feet west of Parham Road and 750 feet south of New York Central Railroad. It is 60 feet deep, 30 inches in diameter, gravel wall type, and has 15 feet of 12-inch diameter, No. 8 shutter-type screen. In 1960 its static water level was reported as 10½ feet below ground level. Well is equipped with a 50 HP turbine pump.

Pumpage in gpm.--No. 1, 700; No. 3, 675; No. 4, 810.

Test yield in gpm.--No. 1, 700; No. 3, 1,000; No. 4, 855.

Specific capacity of wells in gpm per foot of drawdown.--No. 1, 17½; No. 3, 32; No. 4, 68.

Pumpage in 1965.--319 million gallons.

Maximum day.--1.75 million gallons.

Storage facilities.--200,000 gallons elevated.

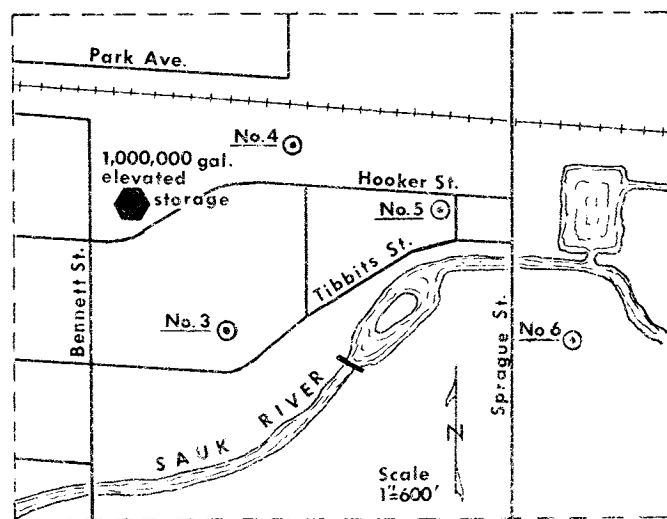
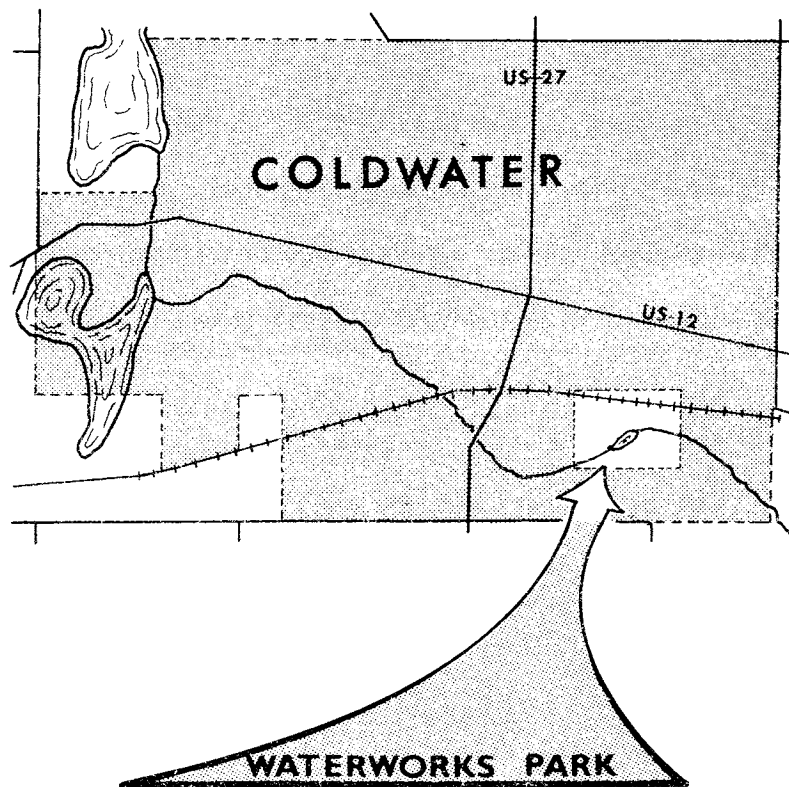
Quality of water.--Hardness, 245-275 ppm; Iron, 0.1-1.2 ppm.

Treatment.--None.

Population served.--2,267.

Per capita use.--386 gallons per day (includes large industrial use, see table 11).

Past history of water works.--Municipal supply system was originally installed in May 1911. Early records show that in September 1942 six driven wells 50 feet deep and 6 inches in diameter were being pumped by suction, in addition to present No. 1 well (Washington Avenue). In 1955 the Walker Street well located just south of Park Street was installed to a depth of 80 feet and 12 inches in diameter. It had a reported specific capacity of about 40 gpm with a test yield of 1,050 gpm. It had 18 feet of screen, the top 13 feet was 50 slot and bottom 5 feet 20 slot. Owing to contamination from chromium wastes it was later abandoned and was plugged in 1964. This well was No. 3 well, but was later designated as No. 2.



Location of the municipal well field.

City of Coldwater

Present water supply.--The city has four wells finished

in gravel. No. 3 well, located about 250 feet east and 100 feet north of intersection of Bennett and Tibbits Streets, was installed in 1930 and pump set in 1931. This well was rebuilt in 1961. It is now 132 feet deep, 28 inches in diameter, and has 62 feet of 18-inch diameter, 250 slot screen; 10 feet at 42-52 and 50 feet at 82-132 feet. In 1961, the static water level was reported as 17 feet below ground surface. This well is equipped with a 100 HP turbine pump. No. 4 well, located about 650 feet east and 700 feet north of intersection of Bennett and Tibbits Streets, was installed in 1947, pump set in 1948 and was put in service in 1949. It is 121 feet deep, 20 inches in diameter, and has 30 feet of 180 slot screen set at 87½-117½ feet. In 1947 the static water

level was reported as 12 feet below ground surface. This well is equipped with a 75 HP turbine pump. No. 5 well is located about 1,070 feet east and 460 feet north of intersection of Bennett and Tibbits Streets. It is 125 feet deep, 42 inches in diameter, and has 50 feet of 20-inch diameter, No. 3 shutter screen with gravel pack walls. It was installed in 1956. In 1956, the static water level was reported as 11 feet below ground surface. This well is equipped with 125 HP turbine pump. No. 6 well is located about 550 feet south and 200 feet east of intersection of New York Central Railroad and Sprague Street. It was installed in 1964 and put in service in 1965. It is 131 feet deep, 34 to 18 inches in diameter, and has 50 feet of 18-inch 250 slot screen with gravel packed walls. In 1964 the static water level was reported as 9 feet below ground surface. It is equipped with a 200 HP turbine pump.

Pumpage in gpm.--No. 3, 1,200; No. 4, 1,400; No. 5, 2,250; No. 6, 2,850.

Test yield in gpm.--No. 3, 5,000; No. 4, 3,400; No. 5, 4,500; No. 6, 3,800.

Specific capacity of wells in gpm per foot of drawdown.--No. 3, 235; No. 4, 160; No. 5, 150; No. 6, 190.

Pumpage in 1965.--984 million gallons.

Maximum day.--5.38 million gallons.

Storage facilities.--300,000 and 1,000,000 gallons elevated (1965).

Quality of water.--Hardness, 175-310 ppm; Iron, 0.3-1.5 ppm.

Treatment.--Chlorination, calgon and phosphate for iron treatment.

Population served.--estimated (1965) 9,000.

Per capita use.--300 gallons per day (includes large industrial use, see table 11).

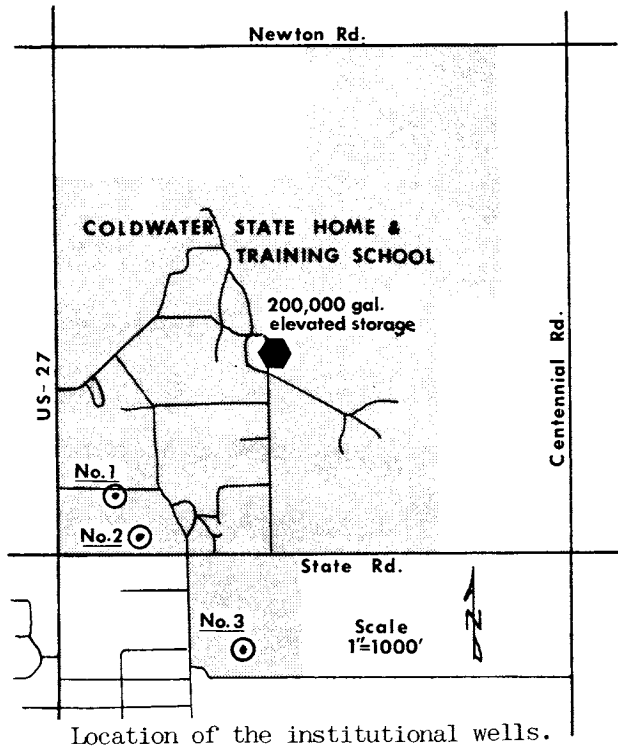
Past history of water works.--Original supply was started in 1890 when about eight 6-inch tubular wells were driven to depth of 30 to 40 feet and equipped with brass strainers. Pumps consisted of two 1½ million gallon per day capacity steam pumps, of 80 HP each. These wells reportedly failed in 10-15 years.

In 1898, No. 1 dug well was installed, followed by No. 2 dug well in 1910. These dug wells were 30 feet in diameter and 38 feet deep and were also pumped by steam pumps. About 1918 three 10-inch diameter, 104 foot deep tubular wells were installed in No. 2 dug well to tap the lower strata of gravel separated by clay layers from the upper strata. About 1924 a 300,000 gallon elevated storage tank was installed.

In 1929 the land in the present well field area was acquired by the city and was named Water Works Park. It has a multiple use in that it is used for the protection of the city water supply and as a recreation park.

All these older wells have now been replaced by the modern wells Nos. 3, 4, 5, and 6.

Coldwater State Home and Training School



Present water supply.--The institution has three wells finished in sand and gravel. All three are equipped with 20 HP turbine pumps. No. 2 well is located about 850 feet east and 150 feet north of the intersection of U. S. 27 and State Road, in section 10 of Coldwater Township, and was installed in 1942. It is reported to be 59 feet deep, 12 inches in diameter, and has 12 feet of 8-inch diameter 125 slot screen. In 1942 the static water level was 18 feet below ground surface. No. 1 well is located 600 feet east and 600 feet north of the intersection of U. S. 27 and State Roads at the site of test well 4, and was installed in 1945. It is reported to be 55 feet deep, 12 inches in diameter,

and has 12 feet of 8-inch, 125 slot screen. No. 3 well is located about 1,000 feet south and 1,900 feet east of intersection of U. S. 27 and State Road in section 15 and was installed in 1953. It is reported to be 50 feet deep, 12 inches in diameter, and has 12 feet of 8-inch, 125 slot screen.

Pumpage of wells in gpm.--No. 1, 300; No. 2, 250; No. 3, 250.

Test yield in gpm.--No. 2, 500; No. 3, 300.

Specific capacity of wells in gpm per foot of drawdown.--No. 2, 125.

Pumpage in 1965.--168 million gallons.

Storage facilities.--200,000 gallons elevated.

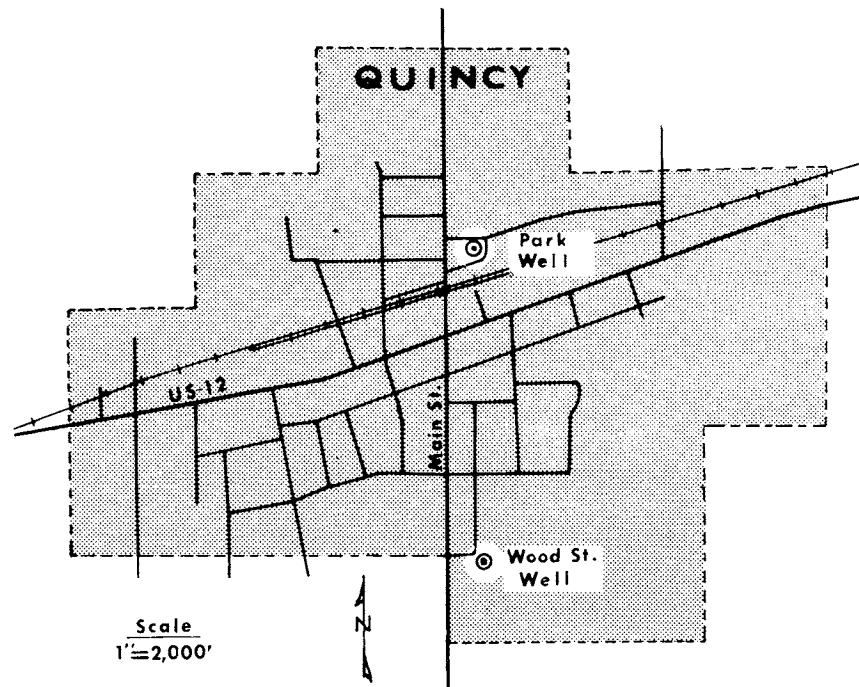
Quality of water.--Hardness, 240-285; Iron, None.

Treatment.--Fluoridation.

Population served.--1,000.

Per capita use.--460 gallons per day (large use by back washing at softening plant, laundry facilities, and irrigation of grounds).

Past history of water works.--Prior to 1917 a dug well 30 feet deep reportedly was located near center of section 10, Coldwater Township, and supplied water for the institution. A 10-inch test well was drilled into this dug well in 1917 to a depth of 150 into shale from 105 to 150 feet, but it was abandoned as a "dry" hole.



Location of the municipal wells.

Village of Quincy

Present water supply.--The village has

two wells finished in sand and gravel. One well is located in the City Park at East Park and Jackson Streets and was installed in 1941. It is reported as 65 feet deep, 10 inches in diameter. It is equipped with a 15 HP turbine pump. A second well, located at Wood Street and Glenn Avenue, was installed in 1960.

It is 102 feet deep, 10 inches in diameter, and has 20 feet of screen, 10 feet of 50 slot, 5 feet of 30, and 5 feet of 70 slot. In 1960 the static water level was 8 feet below ground surface. It is equipped with a 40 HP turbine.

Pumpage of wells in gpm.--350 at Park well and 650 at Wood Street.

Specific capacity of wells in gpm per foot of drawdown.--Wood Street well, 25.

Pumpage in 1965.--46 million gallons.

Storage facilities.--60,000 gallons elevated.

Quality of water.--Hardness, 300-315 ppm; Iron, 1.3-1.4 ppm.

Treatment.--None.

Population served.--1,600.

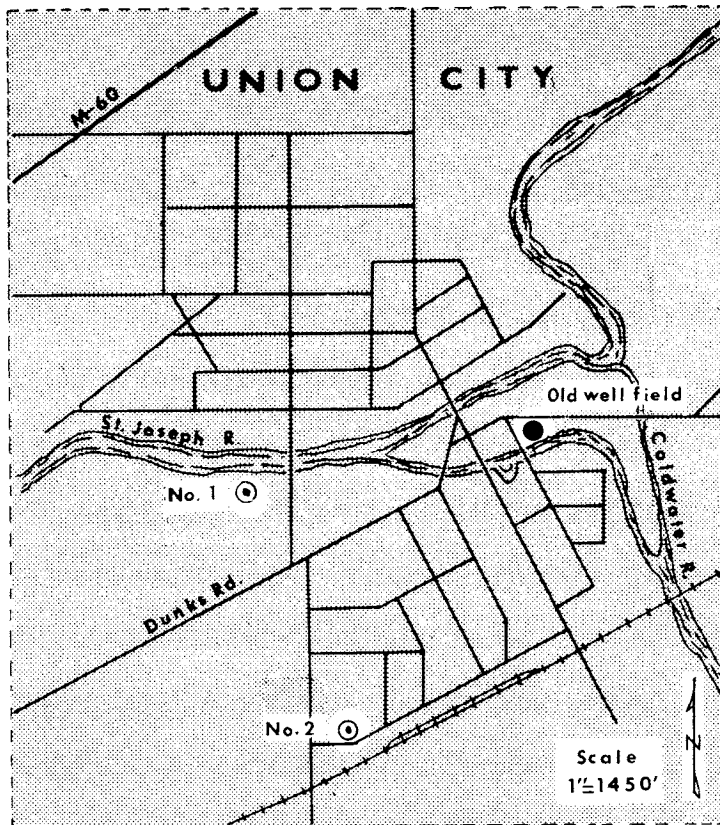
Per capita use.--79 gallons per day.

Past history of water works.--Original supply was begun in 1894, and consisted of four wells 36 feet deep, 6 inches in diameter, finished in gravel and pumped by suction lift.

In 1920 a well 38 feet deep, 10 inches in diameter, was installed. In 1924 a Kelly well 36 feet deep, and 18 inches in diameter was sunk. It had concrete casing and 13 feet of gravel-packed screen. Both wells were pumped with centrifugal pumps at about 200 gallons per minute.

All these wells have now (1965) been abandoned.

Village of Union City



Location of the municipal wells.

Present water supply.--The village has two wells finished in sand and gravel. Well No. 1, located at the High School Athletic Field, about 600 feet west of South Street and 300 feet south of the St. Joseph River, was installed in 1956. It is 98 feet deep, 10 inches in diameter, and has 15 feet of 80 slot screen. In 1956 and in 1960 the static water level was reported as $6\frac{1}{2}$ feet below ground surface. Well No. 1 is equipped with 40 HP turbine pump. Well No. 2, located 200 feet east of South Street and 200 feet north of Railroad Street, was installed in 1955. It is 138 feet deep, 12 inches in diameter, and has 21 feet of 10-inch diameter screen, slot sizes of 20, 25,

and 30. In 1955 the static water level was reported as 38 feet below ground surface. It is equipped with a 40 HP turbine pump.

Pumpage of wells in gpm.--No. 1, 475; No. 2, 480.

Test yield in gpm.--No. 1, 480; No. 2, 600.

Specific capacity of wells in gpm per foot of drawdown.--No. 1, 21; No. 2, 10.

Pumpage in 1965.--134 million gallons.

Storage facilities.--75,000 gallons.

Quality of water.--Hardness, 290-372 ppm; Iron, 1.2-3.0 ppm.

Treatment.--None.

Population served.--1,669.

Per capita use.--220 gallons per day (includes large industrial use, see table 11).

Past history of water works.--The municipal water supply was installed in 1894. No record of the early wells was found except that in 1910 7 new wells were drilled making a total of 15 wells about 28 feet deep and 6 inches in diameter. These wells were finished in sand and gravel and pumped by two steam pumps.

In April 1924 a Kelly well with a 42-inch diameter concrete casing was sunk to a depth of 47 feet. It had a gravel filter and was screened to tap sand and gravel in the bottom 30 feet. The water level was reported as 8 feet below ground surface. It was test pumped at 600 gpm at a drawdown of 8 feet giving a specific capacity of 75 gpm per foot of drawdown. At this time an elevated tank of 75,000 gallons served the population of 1,400. About 1942 an 8" well, depth unknown, was drilled near the Kelly well and was equipped with a Turbine pump. All these wells have since been abandoned (1965).

Relation Between Diameter and Length of Screen and Yield of Wells

Assuming identical construction of a well, increasing only the diameter of a well does not increase the yield proportionally. Figure 38 gives a comparison of diameter versus yield. For example, increasing the well diameter from 12 to 24 inches increases the amount of water entering a well only about 10 percent. However, reduced friction loss in the larger casing can result in substantially higher yield.

Because most water wells in the county are finished in the glacial drift the majority are equipped with well screens and cased from land surface to the screen.

The screen permits water to enter the well easily through closely-spaced openings. As the screen determines the efficiency of the well to produce water, the size of the screen opening must be selected carefully. The opening should preferably allow about $\frac{2}{3}$ of the finer materials around the screen to pass through when the well is developed. This then retains the coarser $\frac{1}{3}$ around the screen. If the water-bearing formation consists of various strata of different sizes of sands and gravels, several gradations of screens may need to be installed at the various depths. If artificial gravel packing is used, slot openings should be determined by the gravel size used. Openings to retain $\frac{3}{4}$ to $\frac{9}{10}$ of the gravel pack should be used. Thus, only a little of the gravel particles will be pumped out when the well is developed by pumping.

The length of screen is determined by the thickness of the water-bearing materials penetrated. Screening half the aquifer will result in a well yield about $\frac{2}{3}$ that of a well screened throughout the full thickness of a homogeneous aquifer, and screening $\frac{3}{4}$ of the aquifer will produce about $\frac{5}{6}$ of the available yield. Where the aquifer material varies, the screen should be set in the coarsest strata.

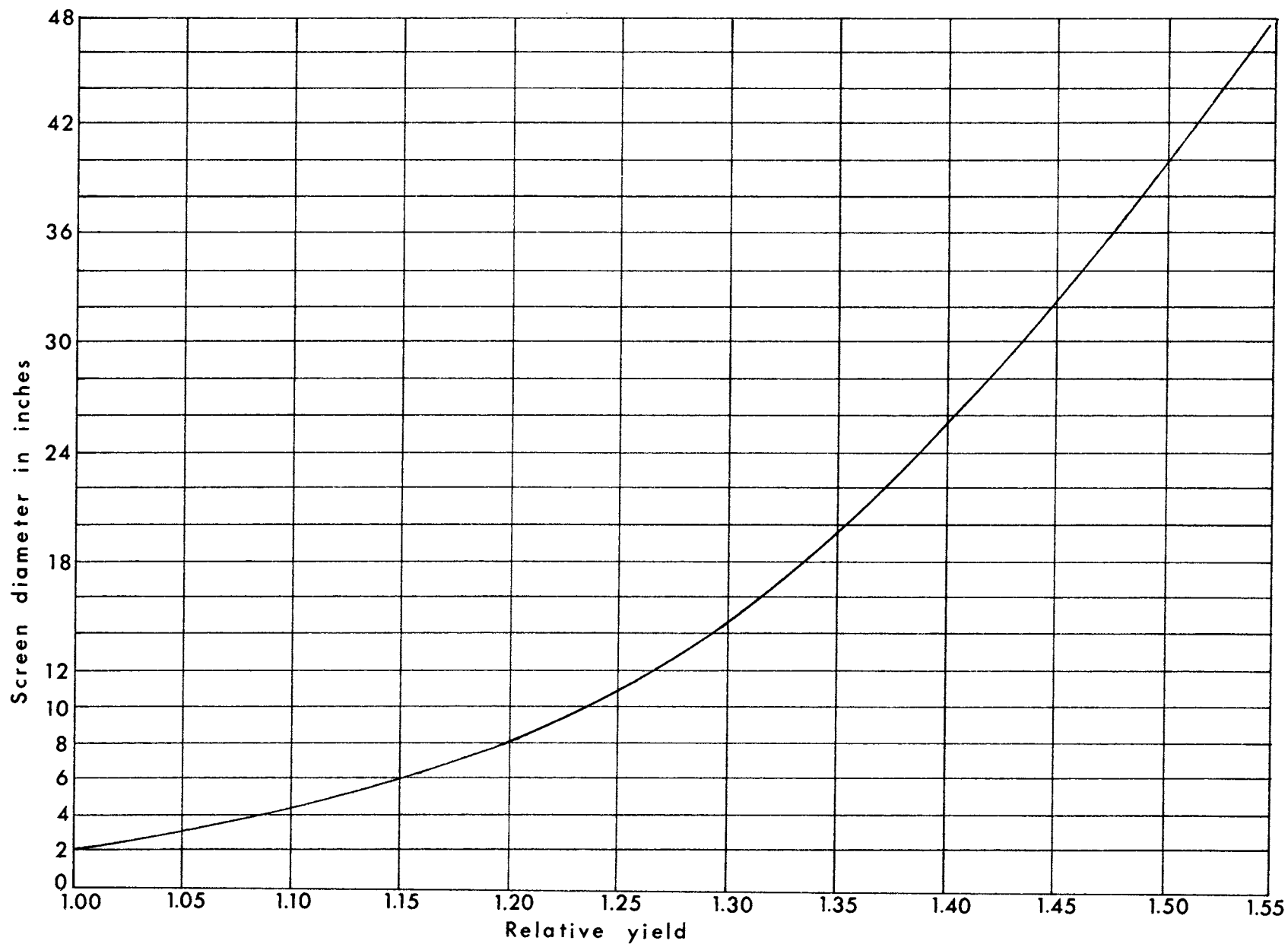


Figure 34. Relation between diameter and yield in wells.

This relation holds true for wells having the same depth, same size screen opening, and finished in the same formation. For example, the relative yield of a 12-inch and a 24-inch diameter well is only an advantage of about 10 percent in the larger well. However, reduced friction loss in the larger casing can result in a substantially higher yield.

The diameter of the screen is usually the same as the well casing. Providing room for the pumping equipment is usually the determining factor in the size of the well casing. However, large-diameter screens may have to be used if the water-bearing formation is thin. If a thick aquifer is available, the yield will be increased more by increased screen length than by increased diameter.

Various types of screens are used. Most screens are described as slotted, gauze, or shutter. The relative sizes of the openings in these screens are described in table 12.

Table 12.--Relative Sizes of Openings in Well Screens

<u>Slot number</u>	<u>Gauze number</u>	<u>Opening size in inches</u>
5	100	0.005
6	90	.006
8	70	.008
10	60	.010
12	50	.012
18	40	.018
25	30	.025
35	20	.035
50	12	.050
100	1/10 inch	.100
250	1/4 inch	.250

Width of shutter openings

No. 1	0.205 inches	5	0.105 inches
2	.180	6	.080
3	.155	7	.055
4	.130	8	.030

The opening size, in inches, of the well screens is included in the table of wells in this appendix.