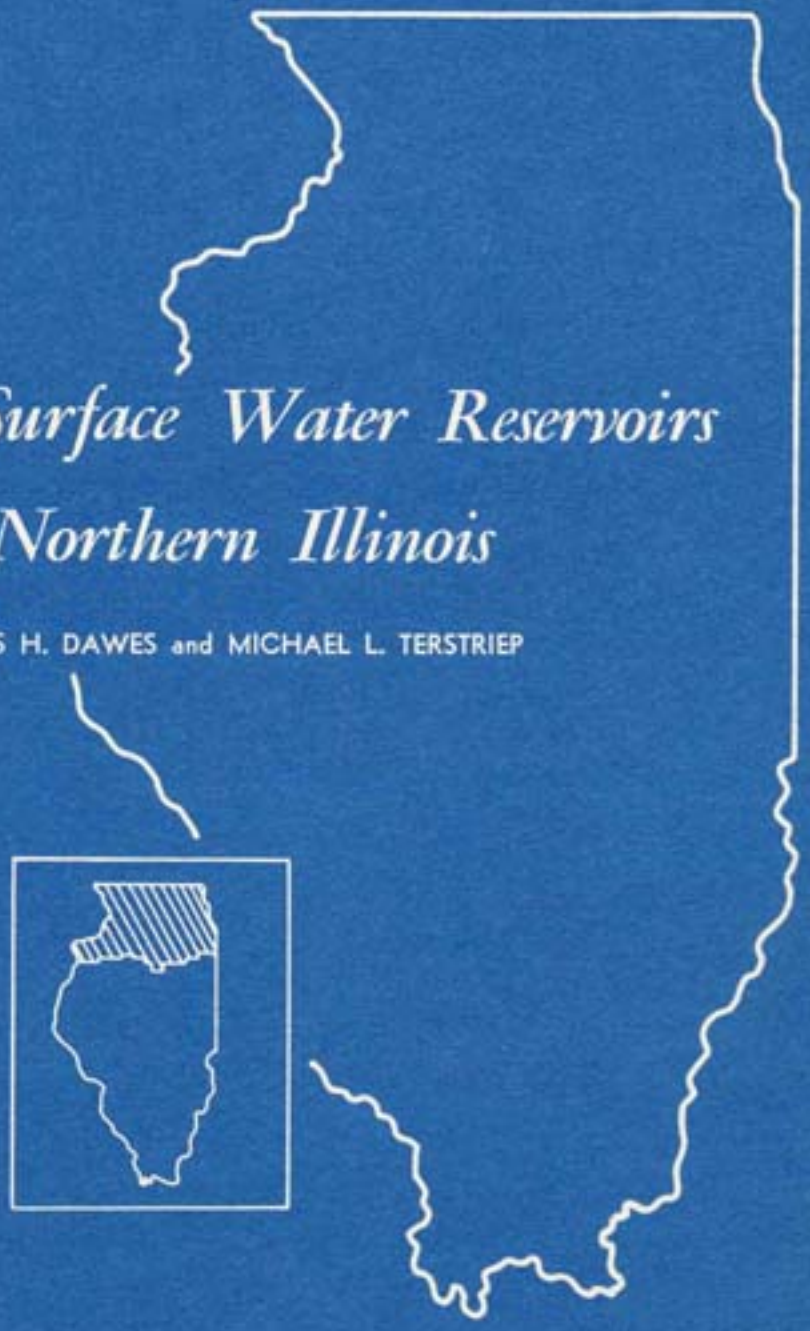
REPORT OF INVESTIGATION 58

STATE OF ILLINOIS

DEPARTMENT OF REGISTRATION AND EDUCATION

Potential Surface Water Reservoirs of Northern Illinois

by JULIUS H. DAWES and MICHAEL L. TERSTRIEP



ILLINOIS STATE WATER SURVEY

URBANA

1967

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FOREWORD

In many parts of Illinois, reservoir storage of water is an important means of increasing usable water supplies to enable community growth and development. Because of this significance for water resources of the future, the Illinois State Water Survey initiated a reconnaissance investigation to identify potential sites within the state where surface storage of water is physically feasible.

This report provides information on potential and existing reservoirs in 23 counties of northern Illinois. Publications containing similar data for 17 southern, 29 south-central, and 33 north-central counties have been published as Reports of Investigation 31, 54, and 56, respectively. The division of the state was based primarily on drainage systems.

These publications are intended to bring about greater understanding of surface water storage potential. It is hoped that the information will be of value in rural, urban, and regional planning for development of industry, agriculture, and recreation.

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Potential Surface Water Reservoirs of Northern Illinois

by Julius H. Dawes and Michael L. Terstriep

SUMMARY

The northern portion of Illinois comprises 23 counties having a total area of 13,720 square miles. The physical potential for development of surface water reservoirs is present in much of this area because the rainfall and resulting runoff is adequate and the topography is suitable for reservoir construction.

The counties included in the northern section are Boone, Bureau, Carroll, Cook, DeKalb, DuPage, Grundy, Henry, JoDaviess, Kane, Kendall, Lake, LaSalle, Lee, McHenry, Mercer, Ogle, Putnam, Eock Island, Stephenson, Whiteside, Will, and Winnebago.

Within these counties 115 potential surfaee water reservoir sites have been identified. Sites suitable for reservoir development are scarce in Boone, Cook, DeKalb, DuPage, Grundy, Kane, Kendall, Lake, Lee, and Whiteside Counties. Some of these counties have a limited number of sites because of the lack of topographic relief, and a few have geologic conditions that indicate leakage and stability problems or insufficient material for constructing earth dams.

Ground-water contribution to streamflow causes continuous flow in many of the streams on which potential reservoir sites have been located. The normal runoff out of the northern area from streams such as the Galena, Apple, Plum, Pecatonica, Eock, Green, Edwards, *Fox,* Vermilion, DuPage, and Mazon Eivers; Mill, Pope, West Bureau, Bureau, East Bureau, Hickory, and Thorn Creeks; and the Chicago Sanitary and Ship Canal is estimated at 9.21 billion gallons per day (bgd). Of this amount 3.88 bgd is diversion from Lake Michigan, and pumpage from Lake Michigan and wells for the greater Chicago area.

Eainfall in the area averages 34 inches per year, or 22.25 bgd. The normal runoff is estimated at 24 percent of the normal rainfall.

The northern area inventory consists of 115 sites which have 61,381 surface area acres, 1,017,917 acre-feet of storage, a combined drainage area of 2,493 square miles, and 1,518 miles of shoreline. Hydrologic data indicate that from these selected sites 459.6 million gallons of water would be available daily during a drought that could be expected once in 25 years.

INTRODUCTION

It has become increasingly apparent that water deficiencies can and do exist in the 23 northern Illinois counties. This region is bordered on the west by the Mississippi River, on the north by the Wisconsin state line, and on the east by Lake Michigan and the Indiana state line. Internally the area is drained by the Rock and Edwards Rivers, tributaries of the Mississippi River, and by the Fox and other tributaries of the Illinois River. There are several developments of surface water impoundments, exemplified by the Le-Aqua-Na, Pierce, Pox Chain-O-Lakes, Wolf, Loud Thunder, Johnson Sauk Trail, Wonder, Crystal, and Calumet Lakes.

There are 115 reservoir sites capable of development within the 23 counties. This section of the state supports a population of 7,137,306 or 70.8 percent of the state population, and extends over 13,720 square miles which represents 24.52 percent of the area of Illinois. Cook County has 1.70 percent of the state area but 50.88 percent of the state population.

Objectives and Scope

This report is primarily an inventory of potential reservoir sites, plus a partial list of presently developed sites of the 23 northern counties. These sites are potential reservoir areas insofar as they have 1) the physical characteristics necessary to impound water, 2) runoff from the watershed in sufficient quantities to provide storage for beneficial use plus anticipated losses, and 3) relative freedom from man-made or natural obstructions. Although a moderate potential for reservoir storage is present in the northern counties, the distribution over the area is poor.

A complete evaluation of the potential reservoir sites for water resource development involves far more than physical availability of sites such as considered here. It is important to consider water developments in relation to other natural resources, social and political environment, and the economy of a region. Cost of development

must be balanced by benefits. These are all critical factors that must be dealt with before a comprehensive report can be made. The surface water impoundment potential is dependent upon rainfall, topography, runoff, geology, and man's occupancy as determined from an analysis of physiographic and hydrographic data.

This inventory of potential reservoir sites was selected from a map study of U. S. Geological Survey quadrangles. Each site was then visited by an engineer and a geologist for a feasibility study. These studies were reconnaissance in nature, and only surficial site examinations using manual equipment could be conducted. Thus, these studies do not take the place of the individual, and far more detailed, engineering survey in establishing the feasibility of any particular project. Detailed economic studies were not made, but studies of relative land cost, favorable topography, and runoff indicate the general feasibility of the selected sites. Cost considerations are described by the terms high, moderately high, normal or moderate, moderately low, or low.

Prom these studies it can be said with assurance that the physical potential exists for water resource development through the storage of surface water. An attempt has been made to indicate the maximum yield based on the largest reservoir available at each of these sites. Since the basic site data were obtained from topographic maps, they may require modification in light of additional field investigations.

This report has two principal parts. Part 1 discusses the pertinent hydrologic elements including geology and climate. Part 2 includes the data on potential and existing reservoirs for each of the 23 counties.

Acknowledgments

This study has been completed by the authors under the guidance of H. P. Smith, Head of the Hydrology Section, and William C. Ackermann, Chief, Illinois State Water Survey. A number of Water Survey personnel have aided in the preparation of this report. John B. Stall, Engineer, provided the streamflow analysis and furnished counsel during the development of a computer program used in watershed yield analysis. W. J. Roberts, Engineer, made available previous reservoir studies and evaporation data. Wayne Neibel provided sedimentation data and assisted in the preparation of that section. The section on Climatological Elements was prepared by Stanley A. Changnon, Jr., Climatologist. William Motherway, Jr., Assistant Draftsman, and John W. Brother, Jr., Drafting Supervisor, prepared the illustrations.

Geologic investigations were conducted by Michael T. Lukert, graduate student of geology at Western Reserve University, Cleveland, Ohio. The geologic investigations were made under the direction of W. Calhoun Smith, Geologist, Illinois State Geological Survey.

The University of Illinois Digital Computer Laboratory's computer facilities, principally the IBM 7094 system, were used extensively in carrying out data processing for this report.

Part 1. Hydrology

Study Criteria and Procedures

The greatest potential surface water resource within the 23 northern counties lies in utilization of runoff of relatively small streams by creation of impoundments. Each of the 23 counties has been studied with respect to availability of potential reservoir sites as determined under the following criteria: 1) the surface area should be larger than 50 acres, 2) maximum depth at dam not less than 20 feet, 3) average mean depth not less than 7 feet, 4) time to fill not greater than or less than the lines depicted on the graph in figure 1 showing relationship of capacity to drainage area, 5) a maximum allowable storage loss of 2 percent per year by reason of sediment, 6) maximum dam length of 0.5 mile, and 7) a maximum dam height of 90 feet.

The procedure for conducting the inventory was as follows: 1) an initial inventory of potential reservoir sites was made from a topographic map study; 2) data obtained from the topographic maps were analyzed for conformance to the study criteria; 3) a field examination of each reservoir area was made by an engineer for determining its physical feasibility; and 4) a field examination of each dam site and reservoir area was made by a geologist for determining its geologic feasibility as to stability of dam construction, retention of water, and availability of construction material.

U. S. Geological Survey quadrangle sheets were used for the map study. A small percentage of the area is covered by 7.5 minute, 1:24,000 scale maps, and these were used where available; however, most of the work was done on the earlier 15 minute, 1:62,500 scale maps.

Personal judgment had to be relied upon throughout the map study. Required factors of consideration included length of dam, area of the lake, maximum depth, excessive shallow water, capacity of the lake and its relation to the watershed size, inundation of man-made obstructions, and possible future uses. Relative costs affecting feasibility were observed, although the economics involved in a complete evaluation was beyond the scope of this study. Whenever records were available, sites selected in previous studies and sites for which local interest had been shown were included in the inventory. In some cases many possible dam sites were available in

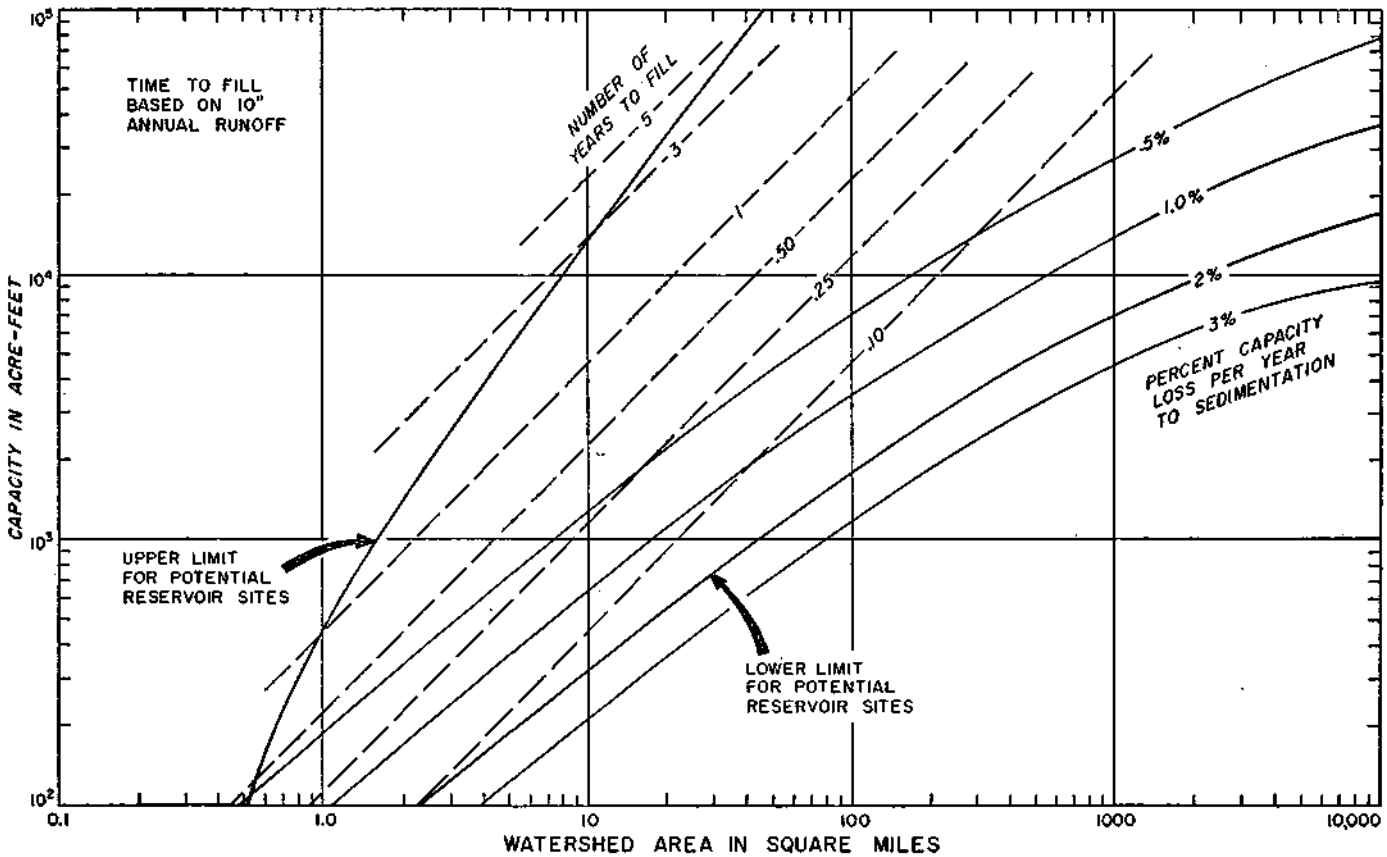


Figure 1. Capacity-watershed area criteria extracted from sedimentation curves

a relatively small area; in such cases, and as a matter of general practice, an attempt was made to select the best development for each particular watershed without the use of an excessively long or high dam. These limits of dam size are arbitrary and were imposed as the study proceeded since they seemed to meet the requirements of the topography.

The quadrangle maps were studied one at a time and then combined by counties for an additional search, and for tabulating the inventory. In general, the larger waterways were searched first and then the small tributaries. Smaller sites included in the inventory are generally located near centers of population as possible municipal water supply reservoirs. Since overlapping sites were not considered, one large site shown in the study might have been replaced by several smaller sites on tributaries. Obviously, because of the number of factors involved, no two individuals making a similar study would select identical reservoirs, but it is believed that the individual sites and the number of sites selected per county are representative of the area.

Data measured on the topographic maps were reservoir surface area, maximum depth, watershed area, length of shoreline, length of dam, and abutment slopes at the dam site. The contour interval of 10 or 20 feet used on the quadrangle maps was a severe limitation, especially on the selection of optimum spillway elevation. The capacity of a reservoir was computed as one-third times the maximum depth times the surface area. This formula gave results that were generally within 10 percent of the average-end-area method which involves planimetering the area inside each contour line below lake level.

The watershed-capacity relation is one of the more important factors used for the selection of potential sites. Figure 1 indicates the acceptable relations between watershed and reservoir capacity. The sedimentation curves were developed from actual sedimentation surveys on existing lakes in this area of the state. The upper limit is based on watershed/capacity ratios of existing reservoir sites that have demonstrated the proper balance between storage and runoff to insure satisfactory performance. The "years to fill" values were computed on the basis of 10 inches of runoff per year. There is a definite tendency for the potential sites to lie along the upper rather than the lower limit. In cases where one watershed is included within another, the sites were analyzed independently.

A program was prepared to compute net reservoir yield and volume of earthwork required. The method of determining reservoir yield is described elsewhere. Volume of earth was computed using a dam height of maximum depth plus 10 feet of freeboard; an upstream slope of 3 to 1; a downstream slope of 2.5 to 1; and a top width of 10 feet or twice the square root of dam height plus 3 feet, whichever is greater. The dam length was scaled at spillway elevation, and the abutment slopes were measured on the quadrangle sheets. In addition to the above computations, a 5-foot berm was added on both sides of the dam for each 30 feet of vertical height.

Field evaluation of each site by an engineer was primarily aimed at updating the maps for such features as homes, roads, or other man-made obstructions that might have been developed in the reservoir area. Since many of the existing maps are 30 to 40 years old, such a visit was imperative. The field evaluation also offered an opportunity to make a rough estimate of land use and project costs.

The field evaluations by a geologist, although surficial in nature, were extremely valuable in identifying those sites that have obvious geologic problems. These evaluations also made it possible to state with near certainty that a high percentage of the sites selected are geologically feasible. However, this evaluation in no way takes the place of a complete boring and testing program that should be undertaken early in the investigation stage of every reservoir development. The thorough program of borings and material testing may reveal unobserved problems and may be expected to provide information that can be used to resolve the geologic problems in some cases.

Climatological Elements

The climatic elements most closely related to water resources are precipitation, soil and air temperatures, and evapotranspiration. Precipitation, which is the major source of surface water, is the most important of these elements. For this reason, much of this discussion concerns precipitation conditions in northern Illinois.

The continental type of climate present in northern Illinois is characterized by warm to hot summers (June-August) and cool to cold winters (December-February). The strong latitudinal controls on the weather of this area often cause a north-to-south gradation in the areal distribution of most of the region's climatic elements. However, certain west-to-east gradients occur in seasonal precipitation patterns.[1] In general, 65 percent of the precipitation occurs in the warmer half-year (April-September), and the driest months occur during the winter.[2-5] Air temperatures have ranged from as low as —35 F to as high as 113 F, and the length of the growing season varies from 116 to 165 days. Portions of this area have a high frequency of all forms of severe weather including hailstorms and thunderstorms.

Lake Michigan has a minor effect on the climate of the land area located within a few miles of the lake shore. Prevailing winds in the area are from the southwest,[8] and consequently air modified over the lake frequently does not move across northeastern Illinois. However, the lake often tends to modify temperatures in the area immediately adjacent to it so that this area has fewer and

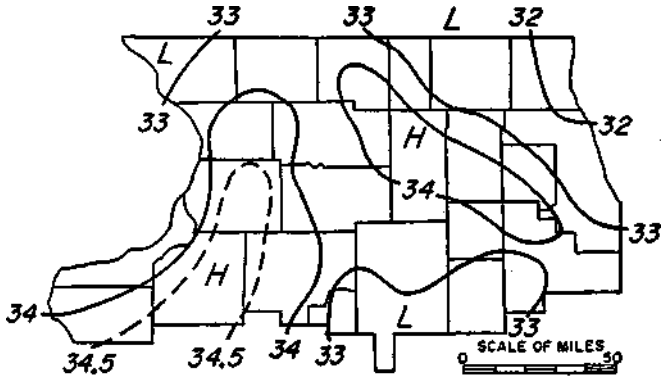


Figure 2. Average annual precipitation, in inches, 1900-1944

less severe extremes of temperature. Another lake effect relates to the occasional production of snowstorms along the inland periphery of the lake. The urban complex of Chicago and environs appears to affect precipitation by causing a slight increase in precipitation, particularly during the colder half-year.[7]

Precipitation

Annual and Seasonal. The distribution of the average annual precipitation in the northern area is shown in figure 2. The maximum regional difference is less than 2 inches, ranging from less than 32 inches in the northeast to 34.5 inches in the south.[8] The average precipitation for the area is 33.5 inches, and thunderstorms account for between 38 percent (eastern portion) and 45 percent (western portion) of the total precipitation.[1] The wettest years on record have produced as much as 55 inches of precipitation in the southern portion and between 42 and 50 inches elsewhere. Dry calendar years have resulted in annual totals of less than 18 inches in the western portion, and between 19 and 23 inches elsewhere in the area.

The distribution of precipitation in the colder half-year (October-March) shows a definite latitudinal pattern (figure 3). The area average for this half-year is 12.3 inches, and normally from 24 to 33 percent of the cold season precipitation is derived from snowfall.

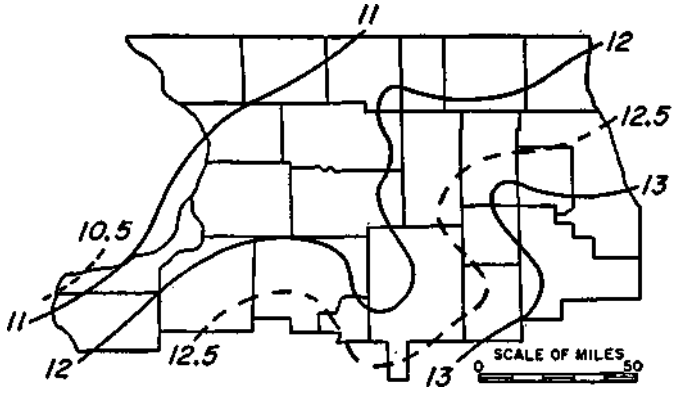


Figure 3. Average colder half-year precipitation, in inches, 1900-1944

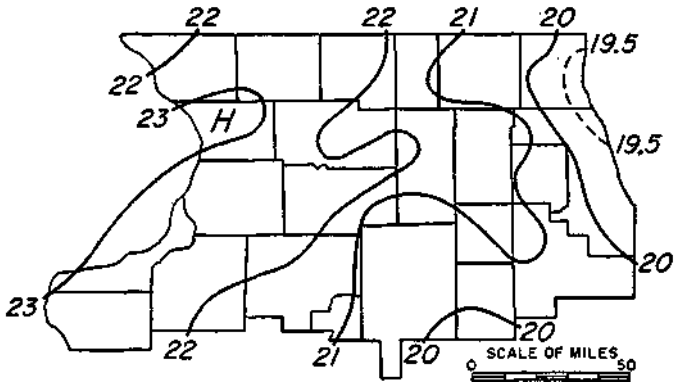


Figure 4. Average warmer half-year precipitation, in inches, 1900-1944

The average precipitation during the warmer half-year (April-September) is 22 inches. The distribution in the area (figure 4) varies from 20 inches in the southeast to 23 inches in the west, and largely accounts for the pattern of the annual precipitation.

Chiang[9] has shown that during the warm season, rain-producing cold fronts are more frequent in the western portion of northern Illinois than in any other portion of the northern area. The western portion also experiences more summer thunderstorms than the remaining portion of northern Illinois. Much of the warm season rainfall is derived from thunderstorms; more than 70 percent of the June, July, and August average rainfall amounts is from thunderstorms.[1]

Monthly. Throughout the entire area, the month with the lowest average precipitation is February, and either December or January ranks as the second driest month of the year. The month of maximum precipitation varies considerably. May has the highest average values in a small portion of the northwestern area including the southern portions of Henry, Bureau, and Putnam Counties. June average amounts are highest in most of the area northwest of a line from Moline to Rockford and in the area southeast of a line from Joliet to Waukegan. In the remaining portions, September values rank first. The wettest three consecutive months in an average year

Table 1. Average Number of Days with Varying Weather Conditions per Month

Months	Precipitation ≥ given amounts, inches			Minimum air temperatures ≤ 32F
	0.1	0.5	1.0	
Jan	4	1–	*	29
Feb	4	1–	*	26
Mar	6–	1+	*	21
Apr	6+	2–	1–	8
May	7+	3–	1	*
Jun	7	3	1	0
Jul	6–	2	1	0
Aug	6–	2	1	0
Sep	6–	3–	1+	*
Oct	5	2–	*	4
Nov	5–	1+	*	17
Dec	4	1	*	26
Annual	66	22	6	131

** Indicates an occasional occurrence in a month*

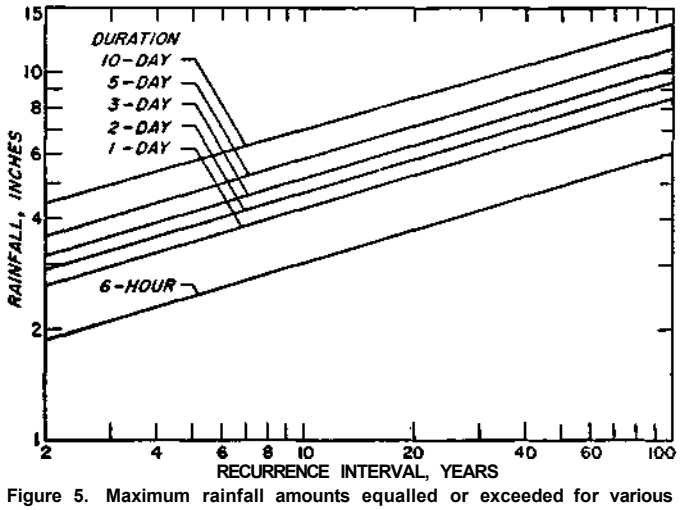


Figure 5. Maximum rainfall amounts equalled or exceeded for various recurrence intervals and durations at any point in the northern area

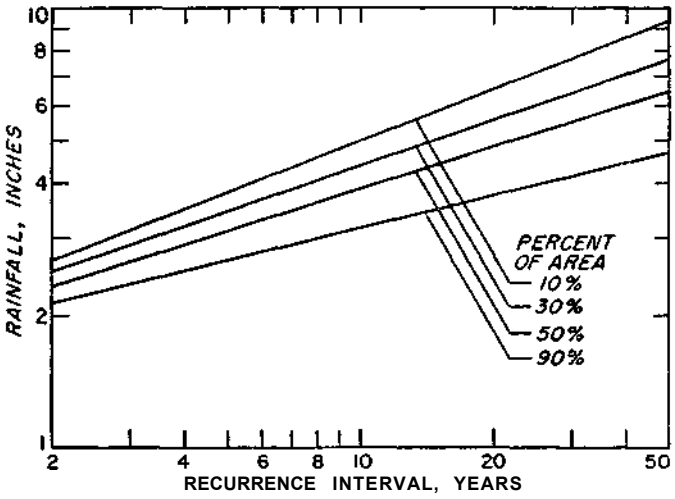
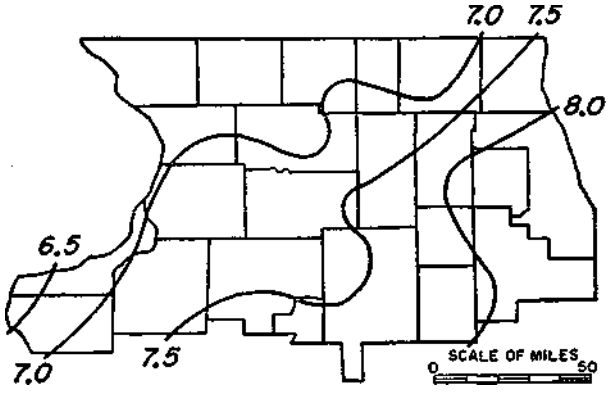


Figure 6. Areal frequency distribution of maximum 24-hour amounts equalled or exceeded at various recurrence intervals in the northern area

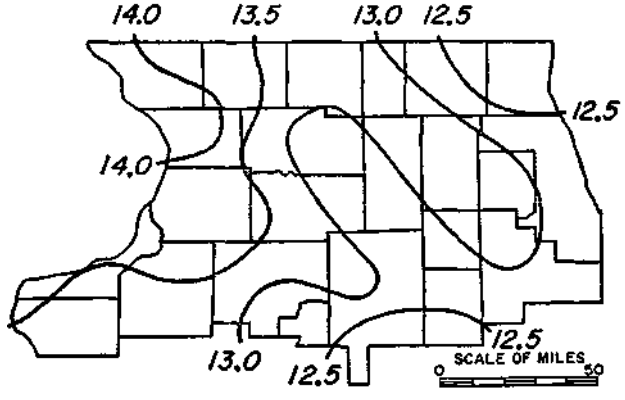
are May, June, and July. The driest three consecutive months are normally December, January, and February.

Daily Frequencies. Table 1 shows the average number of days per month with varying intensities of rainfall. These averages are generally representative for any point in northern Illinois, although slight regional variations do exist. Days with rain of 0.1 inch or more and days with 0.5 inch or more are most frequent in the spring and early summer and least frequent in the winter.

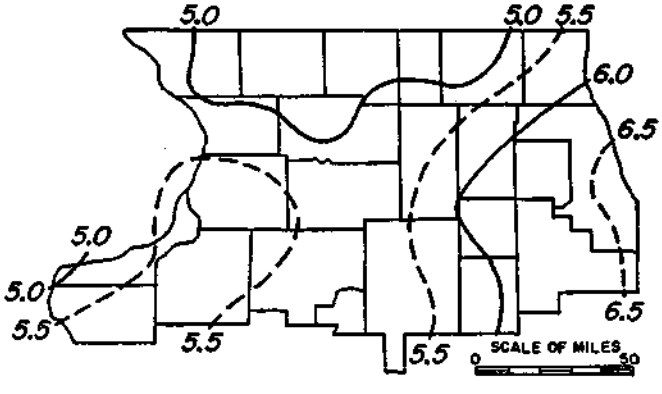
Short-Period Heavy Rainfall Frequencies. Figure 5 portrays the frequency of maximum precipitation



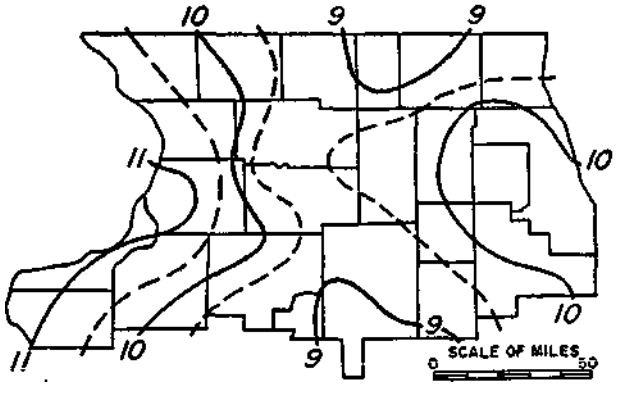
MINIMUM 6-MONTH PRECIPITATION
5-YEAR FREQUENCY
(COLDER HALF-YEAR)



MINIMUM 6-MONTH PRECIPITATION
5-YEAR FREQUENCY
(WARMER HALF-YEAR)

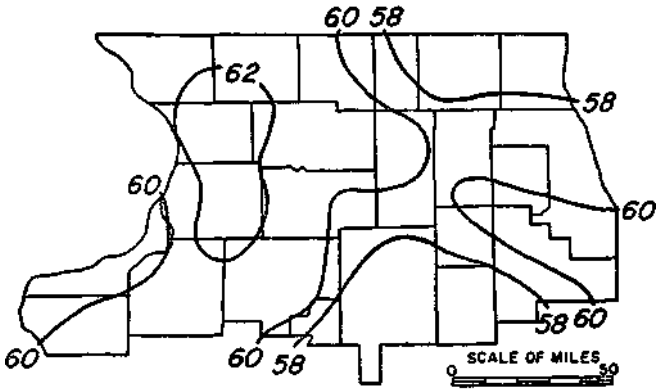


MINIMUM 6-MONTH PRECIPITATION
25-YEAR FREQUENCY
(COLDER HALF-YEAR)

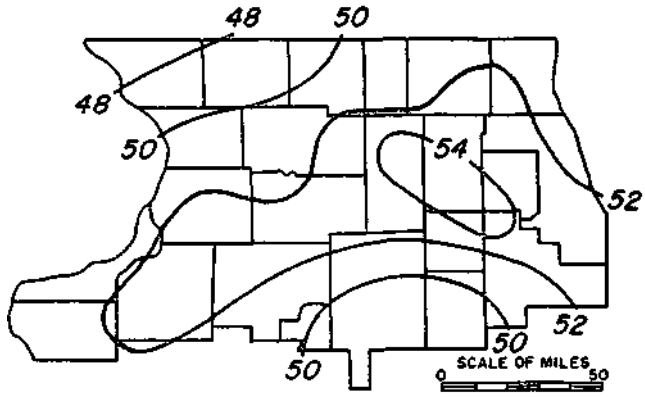


MINIMUM 6-MONTH PRECIPITATION
25-YEAR FREQUENCY
(WARMER HALF-YEAR)

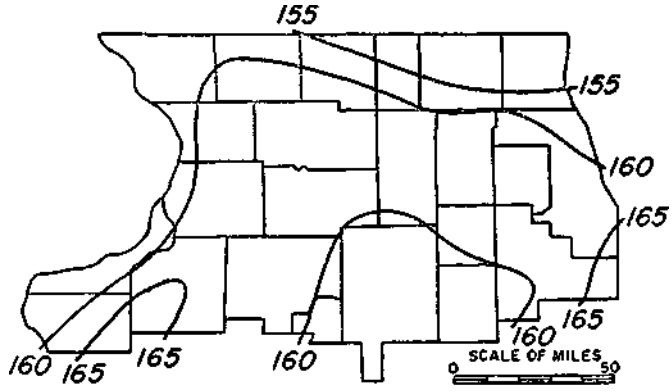
Figure 7. Minimum 6-month precipitation amounts, in inches, expected once every 5 and every 25 years, for colder and warmer half-years



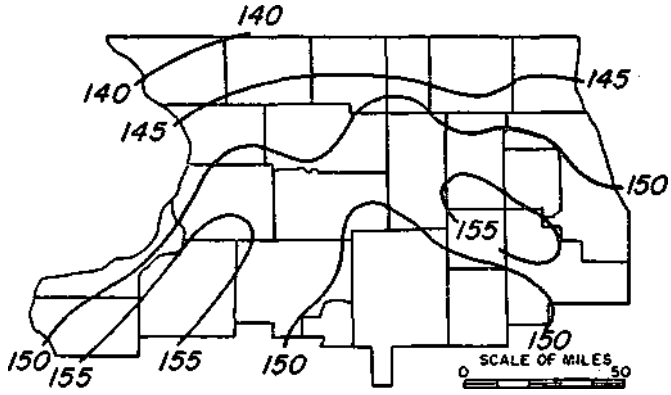
MINIMUM 24-MONTH PRECIPITATION,
5-YEAR FREQUENCY



MINIMUM 24-MONTH PRECIPITATION
25-YEAR FREQUENCY



MINIMUM 60-MONTH PRECIPITATION,
10-YEAR FREQUENCY



MINIMUM 60-MONTH PRECIPITATION
25-YEAR FREQUENCY

Figure 8. Minimum 24- and 60-month precipitation amounts, in inches, expected at varying recurrence intervals

amounts for varying durations at any point in the northern area.[10,11] The curves on figure 6 describe the areal extent of maximum 24-hour rainfall amounts.

Long-Term Dry Period Frequencies. One of the notable features of the precipitation climate of northern Illinois is the fact that this area has experienced less severe and fewer precipitation deficiencies than most areas of the state.[12] Many 3- to 12-month rainfall droughts in the northern portion have derived from extremely low precipitation in the winter months. However, northern Illinois has less variable winter precipitation than do other parts of Illinois, and droughts often are not as severe as in many other areas.

Frequency maps of low precipitation expected during 6- to 60-month periods are presented in figures 7 and 8. Because of the great difference in average seasonal precipitation (figures 3 and 4), two sets of 6-month minimum rainfall maps are shown for the 5-year and 25-year frequencies. More than 60 percent of all 6-month dry periods in the northern area occur during at least 4 of the 6 months of the colder half-year.[12] Figures 7 and 8 reveal that, in general, the lowest values in the area occur in the western and northern portions, and the highest values occur in the southeast.

Snowfall

The distribution of the average annual snowfall in the northern area is shown on figure 9. Snowfall is extremely variable from year to year, with observed annual values at points in the area ranging from 5 to 68 inches. More than 85 percent of the annual snowfall occurs in December, January, February, and March. November and April are normally the only other months when measurable snowfall occurs.

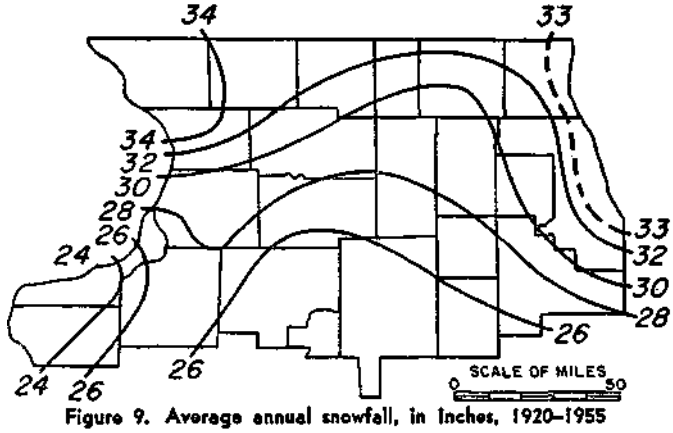


Figure 9. Average annual snowfall, in inches, 1920–1955

The western portion of the northern area has a relatively low frequency of days with freezing rain and sleet,[8] but the eastern portion of the area has a moderately high frequency of days with freezing rain and sleet. These forms of icing conditions occur on an average of 8 days a year in the western portions of the area, and on 9 or 10 days in the eastern portion. The average annual number of days with freezing rain account for 2 of these icing days in the west and 3 or 4 icing days in the eastern portion.

Cold Air and Soil Temperatures

Certain low air and soil temperatures affect water resources because the movement of water in lakes and ponds, across ground surfaces, and through the upper soil layers is affected by freezing conditions. Table 1 lists the average number of days per month with minimum temperatures of 32 F or lower.

Air temperatures below OF are infrequent and normally occur on about 10 days in the south and 13 to 18 days in the north. Some years have no days with 0 or lower temperatures. The first freezing temperature of the fall season normally occurs during the October 10-15 period, and the last freezing temperature in the spring normally occurs during the April 20-May 7 period.[8]

In the central portions of the area the soil temperature at a depth of 4 inches normally goes below 32 F on December 8 and rises above freezing on March 13, producing a 96-day period of frozen soil at this depth. Northern portions of the area normally have 112 days per year with below freezing soil temperatures at the 4-inch depth.

At the 12-inch depth, soil temperatures normally remain below the freezing level in the northern area from mid-January until late in March, producing 70- to 80-day periods of frozen soil at the 12-inch depth.

Geology

The many geologic considerations relative to the selection of feasible lake sites may be generalized into three categories: 1) composition of the bedrock; 2) composition of the unconsolidated material; and 3) thickness of unconsolidated material overlying the bedrock surface.

The land surface of northern Illinois was shaped by glacial ice and running water.[13] The great continental glaciers covered northern Illinois except for the area of northwestern Carroll County and most of JoDaviess County which stood as an island within the ice sheets and remains an unglaciated area of rugged topography carved by running water. The glaciers scraped the land surfaces over which they moved, picking up and transporting rock debris that was deposited as what is called drift to form an irregular surface blanket over the solid layered bedrock. Eunning water continues to modify these surfaces by cutting into the land and depositing sediments in valley bottoms.

The prominent ridges paralleling Lake Michigan in McHenry, Lake, Kane, Cook, DuPage, and Will Counties consist of mixed materials (clay, silt, sand, pebbles, and boulders) that were heaped along the front of a melting glacier. Wide flat areas that were once shallow glacial lakes exist in Cook and Grundy Counties. Some valleys in northeastern Illinois have broad sand and gravel flats created by large streams. The heterogeneous glacial deposits in the northeastern counties are several hundred feet thick at some locations.

The bedrock formations in northeastern Illinois consist of orderly layers of limestone, shale, and sandstone. These firm dense rocks were once loose sediments in shallow seas that were buried and hardened into solid rock. Later these rocks were tilted and now dip southeastward 10 to 15 feet per mile. In McHenry, Lake, Cook, DuPage, and Will Counties a limestone known as dolomite underlies the glacial drift, but to the west bands of older shale and sandstone lie directly beneath the drift.

The glacial deposits in central and western portions of northern Illinois are complex. In Bureau, LaSalle, DeKalb, and southeastern Lee Counties the low broad moraines, trending northeast, consist of thick accumulations of mixed clay, silt, sand, pebbles, and boulders that were piled at glacial margins. In Carroll, Ogle, Stephenson, Winnebago, and Boone Counties the rolling land surface is underlain by thinner much-eroded glacial deposits from an early ice advance. Beyond the ice front, sediment-laden meltwaters partially filled the valleys with outwash consisting of sorted sand, gravel, and finer material. Wind erosion of river flats caused large volumes of silt to be blown onto the uplands near the valleys to form loess. Loess, till, outwash, and the sediment from modern streams cover the bedrock surface in most of the central and western portions of northern Illinois. In these areas, the bedrock beneath the glacial deposits, and at the surface or beneath the loess in the unglaciated areas, consists of layers of limestone, dolomite, shale, and sandstone. These solid rocks also were once loose sediments in a sea and were buried and hardened; later, they were warped, folded, and in some cases fractured.

In general the geology of northern Illinois is not well suited to water storage structures. The bedrock may have fractures or porous material that could cause leakage from a reservoir, and much of the unconsolidated material over the bedrock and in stream valleys has continuous sand and gravel lenses that also could create serious leakage problems. Glacial till, a relatively impervious material suitable for constructing earthen dams, is not always available in sufficient quantities.

More detailed geology is presented in each county section of this report, and the observations of a geologist

at the dam site are presented in each site description. Pending verification by adequate borings and material testing, the sites are classified geologically as feasible, probably feasible, probably not feasible, and not feasible.

Streamflow and Water Yields

The major rivers in the northern 23-county area are: the Mississippi River, which provides the western border; the Rock, Green, and Edwards Rivers, which are tributaries to the Mississippi River and drain the internal area; and the Illinois River and its tributaries, which include the Fox, Kankakee, and Vermilion Rivers, draining the eastern third of the area.

The U. S. Geological Survey in its cooperative programs with the Illinois State Water Survey and other state, local, and federal agencies, collects long-term streamflow records to determine the performance of rivers and streams. The measurement of river discharge is usually expressed in cubic feet per second (cfs). It is sometimes converted to units of rate per unit of area, such as cubic feet per second per square mile of drainage area, or to inches of runoff per year. Inches of runoff is a term representing the depth to which a drainage area would be covered if all of the flow during a period of time (usually a year) were distributed uniformly on its surface. The term is convenient to use when comparing inches of rainfall with runoff. Figure 10 shows the location of 38 stream gaging stations used in this report. Information on each station is presented in table 2. The detailed streamflow data were obtained from the Surface Water Records of Illinois, published by the U. S. Geological Survey. Data for the water years 1951 through 1959 were obtained from the U. S. Geological Survey Water Supply Papers.

The streamflow data have been used in two ways: first, for determining average streamflow conditions to estimate normal runoff at each of the potential sites; and second, for determining minimum yields for each site. Minimum yields were determined by a method developed during a study of low flows.[14]

In another study, the gross watershed yield was determined for 164 Illinois stream gaging records for selected recurrence intervals using a statistical analysis of monthly low flows for duration intervals by 1 month for the first 12 months and then by 2-month intervals for periods up to 60 months.[15] Mutually exclusive and independent low flow periods from these series were secured by avoiding overlapping of low flow periods. Plottings were made on log extreme value paper and a broken line was constructed through the plotted points.

For each particular reservoir site, the analyzed stream gage having watershed runoff characteristics most similar to those of the site was employed to determine gross yield. Gross yield was determined as the percent of

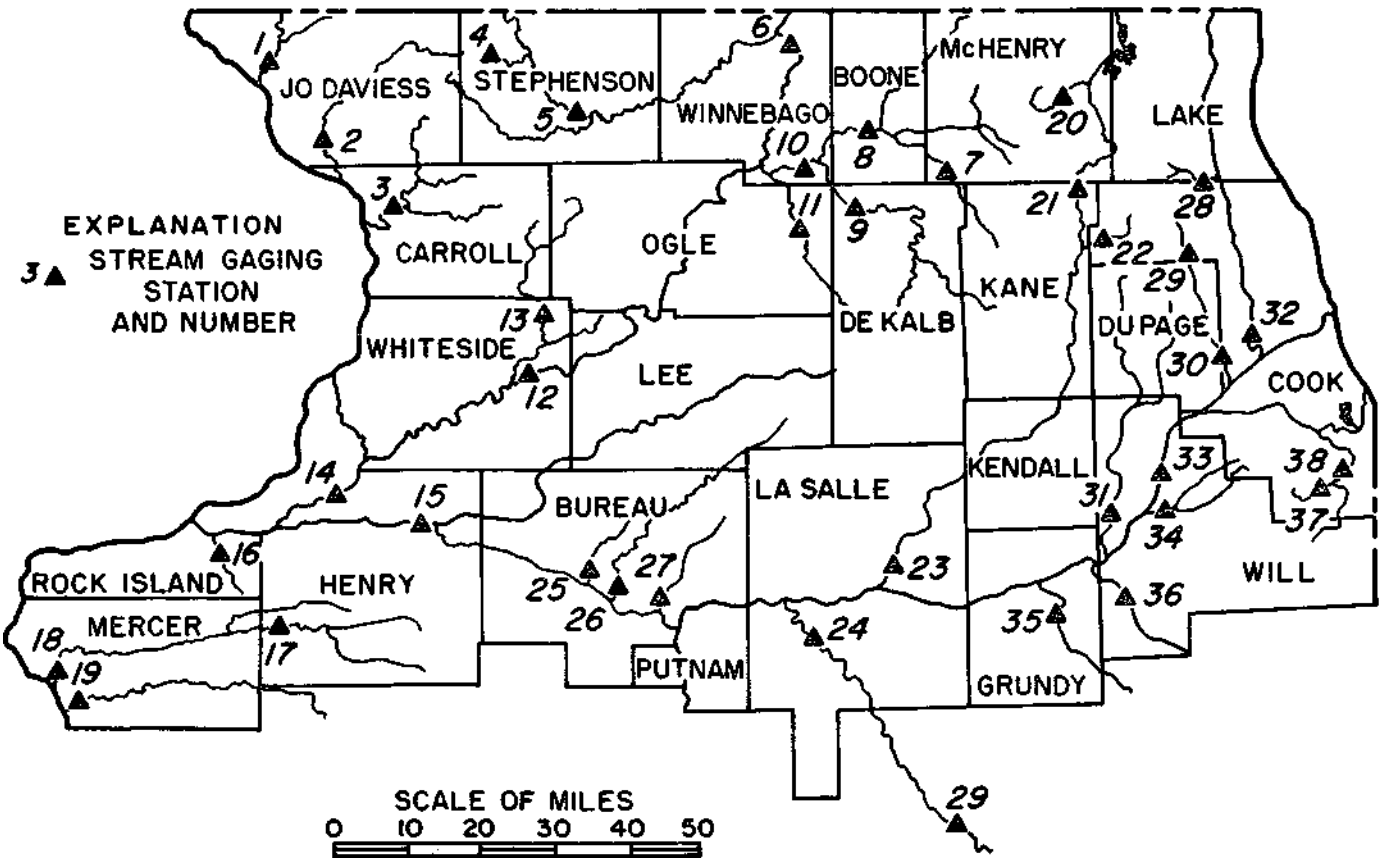


Figure 10. Stream gaging stations and numbers

Table 2. Summary of Discharge Records at Stream Gaging Stations

Map no.	Station and number	Location	Location remarks	Drainage area (sq mi)	Records available	Discharge (cfs)		
						Average	Maximum	Minimum
1	East Fork Galena River at Council Hill (5-4155)	W½ sec 31, T29N, R2E	Left bank at Council Hill 3 mi upstream from mouth	20.1	Sep 1939 to Sep 1963	12.7	16,600	0.3
2	Apple River near Hanover (5-4190)	NE¼ NW¼ sec 16, T26N, R2E	Right bank 0.3 mi SW of Hanover, 12 mi upstream from mouth	244	Oct 1934 to Sep 1963	162	12,000	4
3	Plum River below Carroll Creek near Savanna (5-4200)	NW¼ SW¼ sec 31, T25N, R4E	Left bank 3.5 mi NE of Savanna, 13 mi upstream from mouth	231	Oct 1940 to Sep 1963	138	11,600	8
4	Cedar Creek near Winslow (5-4350)	SE¼ NE¼ sec 32, T29N, R6E	Right bank, 3 mi SW of Winslow, 3 mi upstream from mouth	1.29	Mar 1951 to Sep 1963	0.456	120	0
5	Pecatonica River at Freeport (5-4355)	SE¼ sec 30, T27N, R8E	0.3 mi upstream from Stephenson St. Bridge, 5 mi upstream of Yellow Creek	1330	Sep 1914 to Sep 1963	889	18,400	225
6	Rock River at Rockton (5-4375)	SE¼ NW¼ sec 24, T46N, R1E	Left bank Ill. 2 in Rockton, ¾ mi downstream from Pecatonica River	6290	1903 to 1905 1914 to 1919 1939 to 1963	3,769	32,500	501
7	Coon Creek at Riley (5-4382.5)	SE¼ SW¼ sec 22, T43N, R5E	0.3 mi upstream from Interstate 90, 0.7 mi SW of Riley	82	Aug 1961 to Sep 1963	0	970	4.4
8	Kishwaukee River at Belvidere (5-4385)	SE¼ sec 27, T44N, R3E	1.25 mi downstream from State St. Bridge in Belvidere	525	Oct 1939 to Sep 1963	280	10,300	15
9	South Branch Kishwaukee River near Fairdale (5-4395)	Sec 16, 17, T42N, R3E	Left bank upstream highway bridge, 1.2 mi downstream from Owens Creek	386	Oct 1939 to Sep 1963	211	6,840	2.1
10	Kishwaukee River near Perryville (5-4400)	NE¼ sec 21, T43N, R2E	Left bank upstream Forest Preserve road bridge, 2 mi SW of Perryville	1090	Oct 1939 to Sep 1963	581	16,400	46
11	Killbuck Creek near Monroe Center (5-4405)	NW¼ SW¼ sec 19, T42N, R2E	800 ft downstream from Chicago, Milwaukee, St. Paul, and Pacific RR bridge	114	Oct 1939 to Sep 1963	58.2	6,100	2.0
12	Rock River at Como (5-4435)	NE¼ sec 25, T21N, R6E	Left bank 1 mi upstream from Como, 3 mi downstream from Rock Falls	8700	Oct 1914 to Sep 1963	5,082	51,000	498
13	Elkhorn Creek near Penrose (5-4440)	SW¼ SE¼ sec 9, T22N, R7E	50 ft upstream from highway bridge, 2 mi NW of Penrose	153	Oct 1939 to Sep 1963	83	5,980	2.2
14	Rock River near Joslin (5-4465)	NE¼ sec 18, T18N, R3E	Right bank Ill. 92, 1.75 mi E of Joslin	9520	Oct 1939 to Sep 1963	5,347	46,200	834
15	Green River near Geneseo (5-4475)	NE¼ SW¼ sec 4, T17N, R3E	Right bank Ill. 82, 1.4 mi upstream from Geneseo Creek	958	Mar 1936 to Sep 1963	538	8,900	27
16	Mill Creek at Milan (5-4480)	SW¼ SE¼ sec 24, T17N, R2W	Left bank of Knoxville Road Bridge, 1 mi SE of Milan	62.5	Jul 1941 to Sep 1963	39.4	8,980	0
17	Edwards River near Orion (5-4660)	NE¼ SE¼ sec 21, T15N, R1E	Left bank U.S. 150, 1.5 mi N of Opheim	163	Oct 1940 to Sep 1963	95.6	8,910	0.3
18	Edwards River near New Boston (5-4665)	Between sec 21, 28, T14N, R5W	Left bank Ill. 17, 1.5 mi NE of New Boston	434	Oct 1934 to Sep 1963	246	7,280	5.2
19	Pope Creek near Keithsburg (5-4670)	SE¼ sec 11, T13N, R5W	Center span of highway bridge, 2 mi NE of Keithsburg	171	Oct 1934 to Sep 1963	95.9	4,230	0.6
20	Boone Creek near McHenry (5-5490)	W½ sec 4, T44N, R8E	Left bank highway bridge, 2.5 mi SW of McHenry	15.3	Jul 1948 to Sep 1963	10.8	246	1.6
21	Fox River at Algonquin (5-5500)	NW¼ sec 34, T43N, R8E	Right bank Chicago St. Bridge at Algonquin	1364	Oct 1915 to Sep 1963	759	6,610	12
22	Poplar Creek at Elgin (5-5505)	SE¼ NW¼ sec 19, T41N, R9E	Right bank at Villa St. Bridge on U.S. 20 in Elgin	37	Aug 1951 to Sep 1963	17.7	512	0
23	Fox River at Dayton (5-5525)	SE¼ sec 29, T34N, R4E	Below plant of North Counties Hydro-Electric Co. at Dayton	2570	Nov 1914 to Sep 1963	1,493	47,100	1
24	Vermilion River at Lowell (5-5555)	NE¼ SE¼ sec 8, T32N, R2E	Bridge on Ill. 178, 0.2 mi N of Lowell	1230	May 1931 to Sep 1963	736	33,500	5
25	West Bureau Creek at Wyanet (5-5570)	NE¼ sec 21, T16N, R8E	Left bank U.S. 6 and 34, 0.5 mi E of Wyanet	83.3	Mar 1936 to Sep 1963	45.7	6,620	0
26	Bureau Creek at Princeton (5-5565)	SW¼ SE¼ sec 18, T16N, R9E	Right bank 500 ft downstream U.S. 6 and 34, 1.5 mi W of Princeton	186	Mar 1936 to Sep 1963	118	11,800	0
27	East Bureau Creek near Bureau (5-5575)	SW¼ SE¼ sec 30, T16N, R10E	Left bank at bridge, 3.5 mi N of Bureau	101	Mar 1936 to Sep 1963	48.3	6,200	0
28	Buffalo Creek near Wheeling (5-5285)	NE¼ NW¼ sec 4, T42N, R11E	Left bank at bridge, 2.5 mi W of Wheeling	19.4	Aug 1952 to Sep 1963	11.4	457	0
29	Salt Creek near Arlington Heights (5-5310)	N½ sec 17, T41N, R11E	Right bank at bridge on Ill. 58, 2.75 mi SE of Arlington Heights	32.5	Aug 1950 to Sep 1963	21.9	721	0
30	Salt Creek at Western Springs (5-5315)	Between sec 31, 32, T39N, R12E	Left bank bridge on Wolf Road in Cook County Forest Preserve	114	Oct 1945 to Sep 1963	85.7	1,920	0.4
31	DuPage River at Troy (5-5405)	SE¼ SW¼ sec 10, T35N, R9E	Left bank 400 ft upstream from U.S. 52	325	Oct 1940 to Sep 1963	216	12,000	0.2
32	DesPlaines River at Riverside (5-5325)	SW¼ SW¼ sec 36, T39N, R12E	Left bank 300 ft downstream from Barry Point Road Bridge in Riverside	635	Oct 1943 to Sep 1963	360	6,510	0
33	Chicago Sanitary and Ship Canal at Lockport (5-5370)	SW¼ sec 27, T36N, R10E	At upper end of 9 ft navigation channel in DesPlaines River at Lockport		Feb 1900 to Sep 1963	5,806	24,585	91
34	Hickory Creek at Joliet (5-5390)	SW¼ NE¼ sec 15, T35N, R10E	Right bank at Third Avenue in Joliet	107	Oct 1944 to Sep 1963	77	15,200	0.6
35	Mazon River near Coal City (5-5420)	SW¼ SW¼ sec 31, T33N, R8E	Right bank downstream Ill. 113	407	Oct 1939 to Sep 1963	292	17,600	0
36	Kankakee River near Wilmington (5-5275)	NW¼ sec 15, T33N, R9E	Right bank 0.4 mi downstream from Prairie Creek, 5 mi downstream from Wilmington	5250	Oct 1933 to Sep 1963	3,799	75,900	204
37	Butterfield Creek at Flossmoor (4-890)	NE¼ NW¼ sec 8, T35N, R14E	Left bank downstream Reigle Road Bridge at Homewood	234	May 1948 to Sep 1963	15.2	2,550	0
38	Thorn Creek at Thornton (4-905)	N½ sec 34, T36N, R14E	Right bank downstream of Ridge Road Bridge in Thornton	104	May 1948 to Sep 1963	89.0	4,700	4.4

mean flow a given reservoir could sustain for droughts of various recurrence intervals. Adjusting gross yield to net yield involves two factors: 1) losses due to seepage, and 2) losses due to evaporation. In addition to these factors, loss of capacity to sedimentation will lower the yield.

Since reservoirs with severe seepage losses are generally discovered by geological investigations and eliminated or given special treatment, seepage losses were considered to be negligible and were not considered in this report.

Evaporative losses do not normally amount to a large percentage of the gross yields; however, for shallow reservoirs evaporation losses can be severe. A method published by Stall[15] was used to evaluate evaporative losses. Evaporation and precipitation data were analyzed in the same manner as the low flow data. After developing a series of mutually exclusive and nonoverlapping evaporation events and minimum precipitation events for periods of 1 to 60 months duration, net evaporation tables were developed by subtracting minimum precipitation from maximum evaporation for events of equal duration and recurrence interval. Tables for representative locations give net lake evaporation in inches for durations from 1 to 60 months and for recurrence intervals from 2 to 50 years. Rockford evaporation data were used in this report.

Immediately upon closure of the dam, a surface water impoundment begins the process of trapping incoming water-borne sediments. The importance of sediment as a factor in determining the useful life of a water-supply reservoir has been recognized since the early 1930s. Prior to that time, selection of a reservoir site was based upon economic and engineering considerations such as distance between reservoir site and city, dam foundation conditions, watershed hydrology, evaporation losses, and predicted population and industrial growth trends. A prudent look to the future, with particular reference to water-supply reservoirs, should also include a provision for sediment storage volume.

The movement and deposition of sediment particles from watershed to reservoir involves the action of three different but related regimes of sediment movement. The first is the actual displacement of the soil particles by the bombing effect of individual raindrops striking the soil surface. The next step is the transportation of eroded material, and the third phenomenon is that of sediment deposition.

No attempt was made to relate sedimentation losses with reductions in water yield since expected sediment losses were usually less than 1 percent per year for all selected potential sites. Figure 1 shows the sedimentation curves developed from 82 sedimentation surveys by the Illinois State Water Survey.

Since the yield analysis assumes a full reservoir at the beginning of the critical period and an empty one

Table 3. Data on Public Surface Water Supplies

Municipality* by county	Population 1960	Date installed	Source**	Pumpage (1,000 gpd)
Cook				
Alsip	3,770		From Chicago	160
Bedford Park	737	1950	From Chicago	9,860
Berkeley	5,792	1914	Chicago via Hillside	125
Berwyn	54,224	1893	From Chicago	4,500
Blue Island	19,618	1883	From Chicago	1,000
Bridgeview	7,334	1966	From Chicago	100
Broadview	8,588	1919	From Chicago	1,644
Brookfield	20,429	1905	From Chicago	2,000
		1940		
Burnham	2,478	1918	From Chicago	180
Calumet City	25,000	1892	From Chicago	2,500
Calumet Park	8,448	1917	From Chicago	4,746
Chicago	3,550,404	1843	Lake Michigan	1,043,000
Cicero	69,130	1889	From Chicago	16,500
Dixmoor	3,076	1927	From Chicago	365
Dolton	18,746	1894	From Chicago	2,000
East Hazelcrest	1,457		From Chicago	100
Elmwood Park	23,866	1923	From Chicago	3,490
Evanston	79,283	1874	Lake Michigan	21,777
Evergreen Park	24,178	1926	From Chicago	2,000
Forest Park	14,452	1892	From Chicago	1,500
Forest View	1,042	1926	From Chicago	124
Franklin Park	18,322	1910	From Chicago	3,090
		1949		
Glencoe	10,472		Lake Michigan	3,013
Glenview	18,132	1916	From Wilmette	2,339
		1938		
Golf	409	1938	From Chicago	40
Harvey	29,071	1890	From Chicago	7,020
Harwood Heights	5,688		From Chicago	1,000
Hazel Crest	6,205	1928	From Chicago	456
Hillside	7,794	1953	From Chicago	994
Hodgkins	1,126	1963	From McCook	80
Hometown	7,479		From Chicago	55
Kenilworth	2,959	1890	Lake Michigan	457
LaGrange Park	13,793	1910	From Chicago	1,258
		1937		
Lansing	18,098	1921	From Hammond, Ind.	1,500
		1937		
Lincolnwood	11,744	1926	From Chicago	2,913
Markham	11,704	1928	From Chicago	708
Maywood	27,330	1895	From Chicago	2,500
		1945		
McCook	441	1948	From Chicago	4,500
Melrose Park	22,291	1898	From Chicago	5,560
Merrionette Park	2,354		From Chicago	111
Midlothian	6,605	1920	From Chicago	640
		1936		
Morton Grove	20,533	1914	From Chicago	3,544
Niles	20,393	1925	From Chicago	3,617
Norridge	14,087		From Chicago	1,028
Northbrook	11,635	1915	From Glencoe	1,250
Northfield	4,005	1930	From Winnetka	600
Northlake*	12,318	1940	From Melrose Park and Chicago-Northwestern RR	1,750
North Riverside	7,989	1927	From Chicago	1,000
Oak Lawn	27,471	1931	From Chicago	2,200
Oak Park	61,093	1901	From Chicago	5,500
Park Ridge	32,659	1890	From Chicago	5,000
Phoenix	4,203	1926	From Chicago	220
Posen	4,517	1927	From Chicago	300
Riverdale	12,008	1902	From Chicago	3,010
River Forest	12,695	1893	From Chicago	1,723
River Grove	8,464	1924	From Chicago	2,630
Robbins	7,511	1931	From Chicago	300
Rosemont	978		From Chicago	400
Schiller Park	5,687	1925	From Chicago	1,640
		1938		
Skokie	59,364	1911	From Chicago and Evanston	15,000
South Holland	10,412	1929	From Chicago	959
Stickney	6,239	1926	From Chicago	1,880
Stone Park	3,038	1941	From Chicago	130
		1953		
Summit	10,374	1902	From Chicago	1,500
Westchester	18,092	1927	From Chicago	3,620
Wilmette	28,268	1893	Lake Michigan	1,940
Winnetka	13,368	1893	Lake Michigan	3,060
Lake				
Bannockburn*	466	1925	From Deerfield	10
Deerfield	11,786	1914	From Highland Park	1,370
Highland Park	25,532	1893	Lake Michigan	5,580
Lake Bluff	3,494	1904	Lake Forest	200
Lake Forest	10,687	1891	Lake Michigan	2,140
North Chicago	20,517	1937	Lake Michigan	11,543
		1946		
Waukegan	55,719	1895	Lake Michigan	7,737
LaSalle				
Streator*	16,868	1886	(1) Vermilion River	3,923
Rock Island				
East Moline	16,732	1910	Mississippi River	3,500
Hampton	742		East Moline	30
Moline	42,705	1881	Mississippi River	5,659
Rock Island	51,863	1870	Mississippi River	7,300

** All supplies are municipally owned except those starred, which are privately owned.*
*** (1) impounding reservoir.*

at the end of it, an effective evaporative surface area of 65 percent of the normal lake area was used in the computations. Another phase of the yield analysis assumes that the reservoir is drawn down from full storage capacity to one-half of its storage capacity. For this computation an effective evaporative surface of 80 percent of the normal lake area was used. Gross yields reduced by the evaporative losses, and computed for recurrence intervals of 5, 10, 25, and 40 years, are reported as net yields in million gallons per day (mgd). Yield data, presented in the tables of potential reservoir sites in each county, are given for both full reservoir capacity and one-half reservoir capacity.

A knowledge of stream discharge is important to the hydraulic engineer in solving problems of water supply. For this purpose he may use the flow-duration curve which illustrates graphically the percentage of total period of record when discharge falls within selected rates. Procedure for developing a curve for a particular river is described by Mitchell,[16] who demonstrates how to construct curves that will compare one basin having a long and representative period of record with an adjacent basin having only a short-term record. Mitchell has prepared duration curves for several streams in the northern portion of Illinois including the East Fork Galena River at Council Hill, Apple River near Hanover, Elkhorn Creek near Penrose, Fox River at Algonquin, Bureau Creek at Princeton, Hickory Creek at Joliet, and Kishwaukee River at Belvidere.

Water resource development requires both basic data and data analysis that permit an evaluation of the adequacy of the water supply. The techniques employed should allow the planner to select an acceptable risk governing the adequacy of the water supply. The impounding reservoir stores water when runoff is above normal making water available when runoff is below normal. In developing the inventory of potential reservoir sites, the amount of reservoir capacity was dictated by availability of runoff and the physical characteristics of the reservoir site.

Municipal Surface Water Supplies

In the northern region 344 communities depend on wells, and 79 communities use surface water as a source of water supply. Three of the 79 surface water supplies are privately owned, and the others are municipally owned; 74 of the 79 supplies obtain the water from Lake Michigan. Surface water supplies are used by 67.8 percent of the region's population, which was 7,137,306 according to the 1960 census for the 23 counties. The pumpage for the 79 surface water supplies, which is used for both municipal and industrial purposes, amounted to 1.13 bgd in 1962, or approximately 233 gpd per person. Table 3 shows the distribution of surface water supplies in northern Illinois.

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Part 2. Potential Reservoir Sites

There are several potential sites in the 23-county area of northern Illinois that might be developed for water-supply reservoirs and/or other purposes. The hydrology of 115 potential sites has been studied, and data for each reservoir are presented in tabular form. Plate 1 *{in hack-cover pocket)* shows the surface water resources of northern Illinois.

In certain areas many similar potential sites exist; therefore, only data for typical examples have been included. The extent to which each would affect existing structures has been considered. The data presented are provisional and subject to revision when more detailed topographic, geologic, and engineering surveys are available.

On the following pages, the potential reservoir sites in the 23 northern counties are discussed in detail, by counties. Site possibilities in each county were numbered during the map study, and since the nonfeasible sites were eliminated, the numbers of sites described in this report are not consecutive. A map for each county shows the locations of potential sites, identified by site number. Many of the existing reservoirs also are shown on the county maps, but it was not possible to show the small ones. Available hydrologic data for both potential and existing sites are given in tables that accompany the descriptions for each county. Where data are missing in the tables, it has not been possible to obtain accurate information.

BOONE COUNTY

The major topographic feature of the bedrock surface in Boone County is the Troy Valley which crosses the county almost diagonally from northeast to southwest. Boone County was covered entirely by the Illinoian glaciation and in the south and east by the Wiseonsinan. Depth of the glacial drift varies from 3 or 4 feet in some areas to 400 feet or more over the Troy Valley. The drift is generally not tight enough to impede drainage. Shallow sand and gravel deposits are common in the lowlands north and east of Belvidere and extend east to the moraines in McHenry County. There is a possibility of encountering permeable beds at shallow depths in almost any part of the county. The Kishwaukee River and its tributaries drain all but the northwest corner of the county which drains directly to the Rock River.

Two potential sites were studied in Boone County, and the results of these studies follow.

Site 1. A potential dam site exists on South Kinnikinnick Creek 3 miles north and 2 miles west of Caledonia. This minor stream drains an area of rolling uplands having a relief of 30 to 40 feet. The reservoir area is almost entirely pasture. A two-lane blacktop road would have to be raised or relocated. Two farm residences are very near the proposed spillway level. Glacial drift, primarily till, covers the bedrock to a depth of 25 feet or less. The stream is entrenched 3 to 4 feet in a floodplain 100 to 150 feet wide that is covered with dark brownish gray fine silty alluvial sand. The abutments consist of 12 to 15 feet of light brown to brown sandy clay till over 15 to 20 feet of white thickly bedded fine-grained limestone that becomes more thinly bedded near the top. The alluvium is not suitable for borrow, but good quality till could be obtained from the nearby uplands. The site is considered probably feasible geologically, subject to verification by an adequate program of materials testing and test borings. Special attention should be given to the possibility of solution channels in the limestone although no sinks are present in the watershed. This site should make a fair reservoir at a moderately high project cost.

Site 2. A possible dam site exists on Mosquito Creek above the confluence of Beaver Creek about 3 miles north and 4 miles west of Belvidere. Mosquito Creek is a minor tributary of the Kishwaukee River that drains a portion of the White Rock moraine. Cover consists of fallow grassland and pasture. A one-lane blacktop road could be relocated below the structure which would provide an around-the-lake road system. One farm residence would have to be acquired but would not be inundated. The watershed uplands are covered with glacial drift, rolling to hilly, and have 40 to 60 feet of relief. The stream flows in a 4- to 5-foot notch in the floodplain which is 50 to 75 feet wide and 40 to 60 feet below the uplands. The floodplain is covered with dark brown silty alluvial sand and sandy silt. The valley walls are composed of brown sandy till. The abutments consist of brown sandy clay till in a gently to moderately sloping exposure. The site is considered probably feasible, subject to further investigation of the nature and extent of sand and gravel bodies in the valley walls and the nature and sequence of the subsurface materials in the abutments. Sufficient glacial till is available for the construction of an earth embankment. This is a fair site that should develop at a nearly normal project cost.

Potential Reservoirs in Boone County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (t,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	S. Kinnikinnick Creek SE ¼ 31-46N-3E (Belvidere Quad)	880	237	3,200	1,000	9.8	1.3	40	700	127	3	3.81	3.7	3.4	2.8	2.4	3.0	2.3	1.9	1.9
2	Mosquito Creek NW ¼ 8-44N-3E (Belvidere Quad)	830	112	1,200	400	4.6	1.7	33	800	146	3	1.79	1.7	1.4	1.2	1.1	1.2	1.0	0.9	0.8

Existing Reservoirs in Boone County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Boone County Cons. Council	SW ¼ 5-44N-3E (Belvidere Quad)		5	3,200	18	9	12.4	65	21.2	0.24	

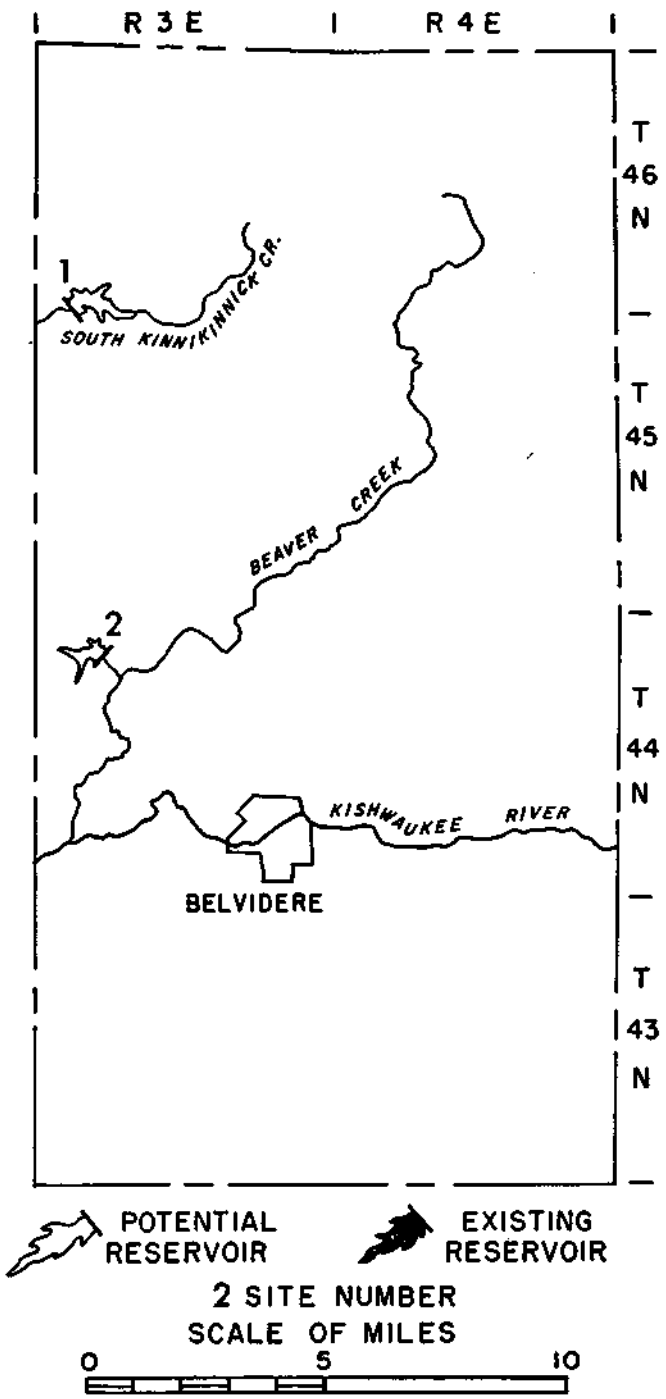
BUREAU COUNTY

Much of the bedrock surface in Bureau County is composed of tight shales of Pennsylvanian age. Striking topographic features of the bedrock surface are the ancient Mississippi, Rock, and Ticona Valleys which intersect in the vicinity of Princeton. These valleys, the Mississippi to the northwest, the Rock to the northeast, and the Ticona to the southeast, were filled with permeable material by several glaciations. This area of high permeability covers all but the southwest third of the county and a small area in the southeastern corner, and even in these areas sand and gravel beds may be encountered locally. The Wisconsinan was the last glacier to enter the county and has provided the greatest topographical variance with the Bloomington moraine in the western half of the county and the Cropsey moraine in the northeastern corner. There are three distinct drainage basins: the Spoon River in the southwest, the Green River in the northwest, and the Bureau Creek-Illinois River in the east and southeast.

Seven potential reservoir sites were analyzed in Bureau County, and the resulting data follow.

Site 1. A reservoir could be developed on a tributary of Masters Fork with the dam 1 mile north of Van Orin. This minor stream drains a portion of the Bloomington moraine. The reservoir area is open land under clean-tilled cultivation. A two-lane gravel road crossing the lower third of the reservoir area could be relocated below the structure, and a two-lane north-south blacktop road could be abandoned. No residences would be inundated, but improvement might require the acquisition of one farm residence and associated outbuildings. Some shallow waters can be expected in the upper reaches. The watershed uplands are gently rolling to rolling with relief of 20 to 40 feet. The surficial material is loess and glacial drift, primarily till. Logs of previous borings indicate that depth to bedrock is probably in excess of 400 feet. The stream is entrenched 6 to 8 feet in a floodplain 250 to 300 feet wide and 20 to 30 feet below the uplands. The abutments have gentle slopes and are composed of 5 feet of mottled brown and gray sandy silty clay till overlain by 2 feet of brown gravelly silty fine-to-coarse sand overlain by 4 feet of tan to light brown clayey silt known as loess. The valley walls are similar to the abutments. The valley floor is covered with dark brown silty alluvial sand. A plentiful supply of good quality till could be obtained in the nearby uplands. The site is probably feasible, subject to a complete program of materials testing. The till underlying the reservoir site is impervious but could contain local gravel lenses that could cause serious leakage problems. This site would make a fair small reservoir at a high project cost.

Site 2. A fairly large reservoir could be developed on Bureau Creek, a major stream that drains portions of the Bloomington and Cropsey moraines, with the dam located 3.75 miles west and 1.5 miles south of LaMoille. The reservoir area is predominantly open land in clean-tilled cultivation. The valley walls to the north are fairly steep and are covered with light brush and timber. Roads crossing the reservoir area could be abandoned in favor of an around-the-lake road system. No known residences would be inundated, but some local service utilities would have to be relocated. The watershed uplands are gently rolling to rolling with relief of 20 to 40 feet. The surficial materials are loess and glacial drift, primarily till. The depth to bedrock is probably in excess of 300 feet. The stream is entrenched 6 to 8 feet in a floodplain approximately 0.25 mile wide and



30 to 40 feet below the uplands. The floodplain is covered with dark gray silty alluvial sand. The abutments consist of 5 feet of tan to light brown silty sand, over 6 feet of stratified tan to light brown gravelly silty sand which grades to sandy gravel near the base, over 8 feet of grayish brown silty sandy clay till. Abundant borrow material of good quality glacial till could be obtained in the nearby uplands. The site must be considered probably not feasible because of the presence of loose porous sand and gravel in the abutments and the valley walls. Outwash probably underlies much of the dam site as indicated by sand and gravel pits near the area. The extent of this sand and gravel would have to be determined by future test borings.

Site 3. A dam site on West Bureau Creek 0.75 mile east and 0.5 mile north of Wyanet would create a reservoir 4 to 5 miles long and about 0.5 mile wide.

West Bureau Creek is a major tributary of Bureau Creek, and its headwaters drain a portion of the Bloomington moraine. Much of the floodplain is swamp and in brush and light timber. At least one farm residence and associated outbuildings would be inundated. Interstate Route 80 crosses the center of the reservoir area with low steel approximately 30 feet above the floodplain. Town and county roads crossing the reservoir area could be abandoned in favor of an around-the-lake road system already in existence. The watershed uplands are flat to gently rolling with relief of 10 to 20 feet. The surficial materials are till and sediments of a preglacial lake. Logs of previous borings indicate that the depth to bedrock is approximately 100 feet. The stream bed is entrenched 8 to 10 feet in a floodplain approximately 0.25 mile wide and 60 to 70 feet below the uplands. The floodplain is covered with dark brown silty fine-to-medium alluvial sand. The steep-sloped abutments consist of 6 feet of orangish brown silty fine-to-medium sand, over 5 feet of pinkish brown sandy clayey silt containing scattered pebbles, over 1 foot of tan silty fine sand, over 20 feet of gray to pinkish brown sandy silty clay till. Good quality till for borrow material could be obtained from the nearby uplands. The site is considered probably feasible. The till underlying the reservoir area and dam site is probably impervious, but might contain local gravel lenses which could cause serious leakage. Development of this site would be limited by the low steel on Interstate Route 80, and it probably would be a moderately high cost project.

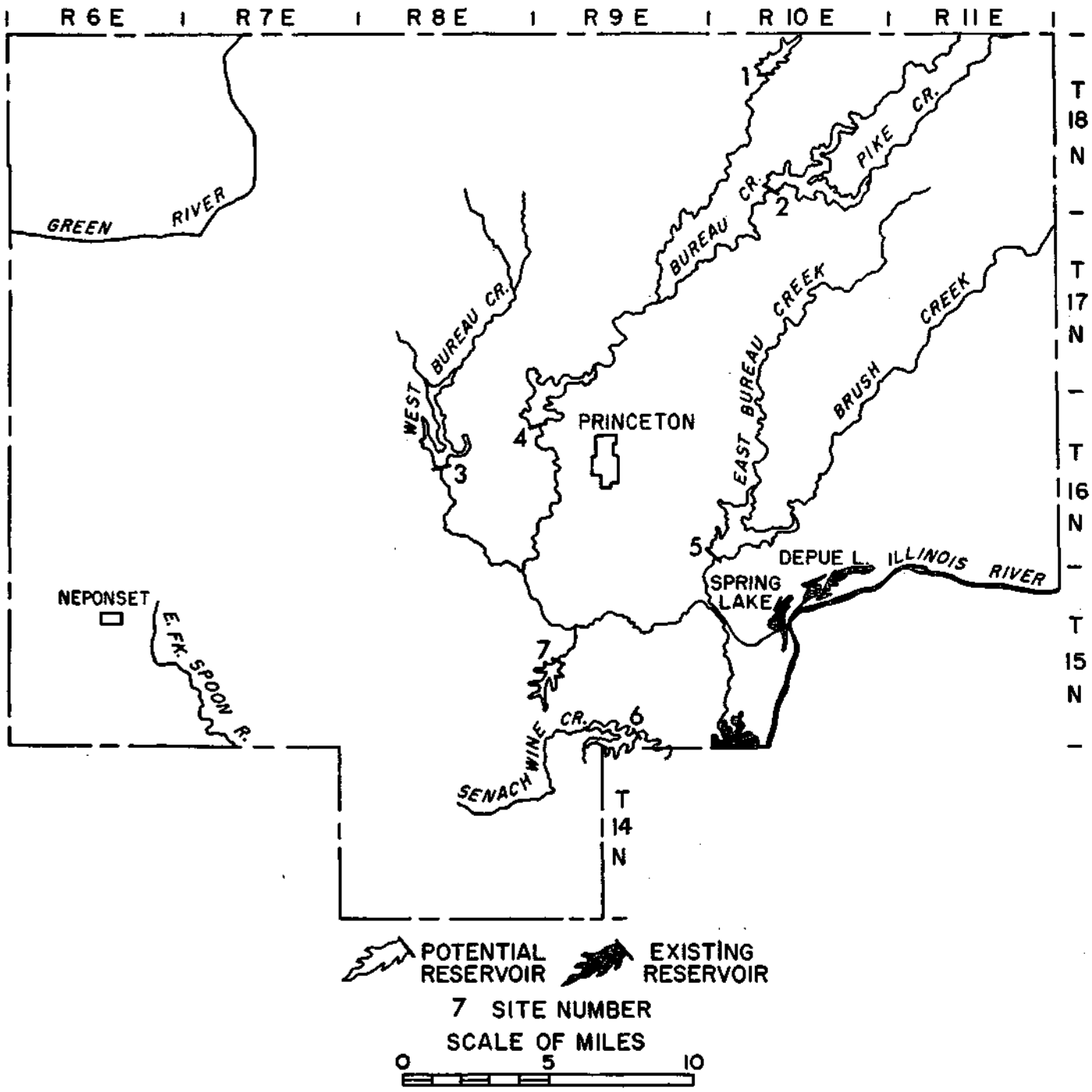
Site 4. A reservoir could be developed on Bureau

Potential Reservoirs in Bureau County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Trib. Masters Fork NE ¼ 8-18N-10E (Amboy Quad)	810	352	3,200	1,000	13.2	1.9	27	1,500	222	5	5.43	5.1	3.3	2.9	2.7	2.8	2.3	1.8	1.2
2	Bureau Creek NE ¼ 32-18N-10E (Amboy Quad)	750		12,370	4,020	98.0	3.6	35	1,000	204	22	40.32	23.3	18.6	15.5	14.1	12.2	10.0	7.6	7.2
3	West Bureau Creek SE ¼ 16-16N-8E (Buda Quad)	640	973	17,800	5,800	85.4	2.0	55	1,200	523	17	31.72	26.6	19.4	16.7	14.0	16.0	13.2	10.6	10.0
4	Bureau Creek NW ¼ 7-16N-9E (Buda Quad)	640	1,730	34,600	11,260	186.6	2.5	60	1,350	680	19	76.77	57.9	41.8	37.5	34.2	28.3	22.7	18.2	17.2
5	East Bureau Creek W ½ 31-16N-10E (Hennepin Quad)	580	1,600	50,500	16,420	85.7	0.5	95	2,400	2,652	18	28.40	26.8	26.8	26.8	26.8	26.4	24.5	19.8	19.2
6	Senachwine Creek SW ¼ 34-15N-9E (Lacon Quad)	640	627	11,900	3,900	21.7	0.8	57	1,000	457	16	8.68	8.5	7.7	6.8	6.4	7.9	5.2	4.2	4.1
7	Plow Hollow NE ¼ 19-15N-9E (Hennepin Quad)	620	288	6,700	2,200	7.5	0.5	70	900	549	15	3.00	2.8	2.8	2.8	2.8	2.7	2.4	2.1	2.0

Existing Reservoirs in Bureau County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
	E ½ 5-18N-9E (Amboy Quad)						6				
Spring Lake	4-9-16-15N-10E (Hennepin Quad)						262				
Depue Lake	35-36-16N-10E and 1-3-10-15N-10E (Hennepin Quad)						524				
	NE¼ 14-16N-7E (Buda Quad)						2.5				
	NE ¼ 19-16N-8E (Buda Quad)						10				
	NW ¼ 25-16N-7E (Buda Quad)						1.5				
Goose Lake	31-32-15N-10E (Lacon Quad)						462				
Rawson Lake							127				
Seatonville Community Lake							8				
Menno-Haven Lake							14	22.6	7.38		
Robinson Lake							6.9				



Creek by constructing a dam 2.5 miles west and 1 mile north of Princeton. The reservoir area is primarily open land under clean-tilled cultivation. The valley walls and coves are covered with light timber. Interstate Route 80 crosses Bureau Creek at the ideal dam site which necessitated moving the location upstream and increasing the embankment by about one-third. A two-lane blacktop highway across the lower third of the reservoir, which serves 12 residences, would be inundated. Illinois Route 26 across the upper third of the reservoir would have to be relocated, and at least two residences in this area would be inundated. These conditions would make land acquisition and relocations costly. The watershed uplands are flat to gently rolling with relief of 10 to 20 feet. The depth to bedrock is probably in excess of 300 feet as the region is underlain by the deep bedrock valley of the ancient Mississippi River which is filled with Sankoty sand and gravel over-

lain by glacial till. The till is probably impervious, but sand and gravel lenses may act as leakage channels to the buried valley. The stream is entrenched 4 to 6 feet in a floodplain approximately 0.25 mile wide and 70 to 80 feet below the uplands. The floodplain is covered with brown silty alluvial sand. The abutments consist of 3 feet of stratified and interbedded light brown to tan silty fine-to-medium sand and sandy silt, over 6 feet of stratified brown sandy fine-to-coarse gravel which is probably outwash, over 8 feet of reddish brown sandy clayey silty till. The upper material of the right abutment is brown gravelly silty sand that has been used as fill for embankments along Interstate Route 80. The site is probably not feasible because of high land acquisition costs, relocations, Interstate Route 80, and the presence of outwash in the sandy till of the abutments. Additional materials testing and test borings might indicate a feasible solution to the geologic problems. This site could result in a good reservoir but at a high project cost.

Site 5. A large reservoir could be developed on Bast Bureau Creek by constructing a dam 3.75 miles east and 3.5 miles south of Princeton. East Bureau Creek is a major tributary of Bureau Creek that drains a portion of the Cropsey and Bloomington moraines. The reservoir area is mostly open land under clean-tilled cultivation. The valley walls and coves are lightly covered with timber, and brush and light timber cover the stream banks. Two two-lane gravel roads cross the reservoir area in both north-south and east-west directions, serving 12 residences and Pilgrim Park. The park would be inundated. Twin telephone cables and local power lines cross the reservoir area and would have to be relocated. Land acquisition and relocation costs would be high. The stream is entrenched 4 to 6 feet in a 70- to 80-foot floodplain covered with brown sandy alluvial silt. The depth to bedrock is estimated at 150 to 200 feet, and the bedrock is probably overlain by Sankoty sand. The right abutment consists of 2 to 4 feet of loess over 8 feet of brown sandy stony clay till over 10 feet of grayish brown sandy clay till. The left abutment is not exposed but is probably similar in composition to the right abutment. Material in a gravel pit in the right abutment is probably outwash. The Sankoty sand probably underlies the valley bottom in the reservoir area. The lower portion of the valley walls consists of about 30 feet of stratified sand and gravel with most of the coarser sediments near the base. Much of the gravel is well cemented. These glaciofluvial sediments are overlain by about 4 feet of buff to tan, rudely laminated, sandy stony clayey silty till which is overlain by 2 to 4 feet of tan to buff clayey silt. Good quality till is available from the nearby uplands for construction of an earth dam. The site is considered probably not feasible subject to verification of possible leakage from the reservoir into the Sankoty sand.

Site 6. Senachwine Creek, a minor stream that drains a portion of the Normal moraine, has a potential dam site 4 miles west and 3 miles south of Bureau. About half of the floodplain area is open land in pasture; the other half and the south valley wall are covered with brush and light timber. There are no known residences or buildings in the reservoir area. The dam site is readily accessible, but gravel roads paralleling the reservoir would have to be raised. The watershed uplands are gently rolling with relief of 20 to 30 feet. The surficial material is loess and glacial drift, primarily till. The stream is entrenched 6 to 8 feet in a floodplain 300 to 400 feet wide and 40 to 50 feet below the uplands. The floodplain is composed of dark grayish brown silty alluvial sand. The right abutment is composed of 10 feet of brown silty clay over brown sandy silty clay containing yellow sandstone pebbles, probably till. Sankoty sand and gravel probably underlies the reservoir area but is overlain by till containing local lenses of gravel and sand. The till is probably impervious, but the gravel and sand lenses could act as leakage channels if located directly beneath the reservoir. The site is considered probably feasible, subject to an adequate program of test borings and materials testing.

Site 7. A potential dam site exists on Plow Hollow, a minor tributary of Bureau Creek that drains a portion of the Normal moraine, about 1 mile south and 0.5 mile east of Tiskilwa. The entire reservoir area is covered with brush and light timber. The valley walls are lightly timbered. There are no residences nor other obstructions in the reservoir area. A two-lane blacktop road crosses the stream below the dam site and would provide easy access to the area. A levee has been constructed to create a by-pass pond below the dam site for use as a sewage lagoon for hog refuse. The watershed uplands are flat to very gently rolling with relief of 10 to 20 feet. The surficial material is glacial drift, primarily till. The stream is entrenched 2 to 3 feet in a floodplain 300 to 400 feet wide and 70 to 80 feet below the uplands. The stream bed is sandy gravel, and the floodplain is covered with brown silty clayey fine-to-medium sand. The abutments at the dam site and the reservoir valley walls consist of reddish brown sandy clayey silty till. The till becomes more gray and more clayey with depth. The site is considered probably feasible, subject to an adequate program of materials testing and test borings. Good quality till would be available in the uplands. The till underlying the reservoir and dam site area is probably impervious, but contains local lenses of sand and gravel that could cause serious leakage. This site should make a good small reservoir at a near normal project cost.

CARROLL COUNTY

Carroll County contains both glaciated and unglaciated areas. The northwestern corner is part of the unglaciated area of the Upper Mississippi Valley that was surrounded by ice sheets during the glacial period. The rugged topography was shaped by running water. The glaciated uplands south and east of Mt. Carroll contain complex thin glacial deposits that are made up of unsorted rock debris known as till. Sediment laden meltwaters partially filled the valleys with outwash material consisting of sorted sand, gravel, and finer material. Thick permeable sand and gravel deposits occur in the Mississippi Valley and may be present in the valley of Johnson Creek south and east of Mt. Carroll. Large volumes of silt from the river flats were carried by the wind and deposited on the uplands bordering the valleys. This fine wind-blown material is known as loess. Loess, till, outwash, and the sediment of modern streams cover the bedrock surface in the glaciated portion of Carroll County. In the unglaciated area, the bedrock beneath the loess consists of layers of limestone, dolomite, shale, and sandstone that have been warped. The drainage of Carroll County is to the south and west to the Mississippi River via the Plum River, Johnson and Rock Creeks, and their respective tributaries.

The results of studies on five potential reservoir sites in Carroll County follow.

Site 1. A potential reservoir site exists on Camp Creek with the dam located about 3 miles northeast of Savanna. Camp Creek is a major stream draining an area of loess-covered early Paleozoic sediments. The uplands are hilly with relief of 80 to 100 feet. The depth to bedrock is about 10 feet or less in most places according to exposures along the valley walls. The reservoir area is open land, cultivated or in pasture, except for the coves and valley walls which are covered with light timber. About 12 farm residences and associated outbuildings along with local service utilities would be inundated. Several roads would have to be abandoned in favor of an around-the-lake road system. Borrow material for an earth dam is scarce, and it probably would be necessary to use some other kind of construction material. The stream is entrenched 8 to 10 feet in a floodplain 0.25 mile wide and 60 to 70 feet below the uplands. The floodplain alluvium consists of light brown silty sand. The abutments are primarily composed of gray to buff thin-bedded sandy dolomite containing some chert layers and many crevices. The dolomite is mantled by light brown sandy loess. A small solution depression exists on top of the left abutment with a deep crevice underneath. The reservoir area and dam site are considered probably not feasible geologically because of the solution features and numerous crevices in the dolomite which would probably permit leakage. An adequate program of test borings and materials testing would be required to determine the feasibility of this site. The site would create a large and beautiful reservoir but at a moderately high project cost.

Site 2. A potential dam site exists on East Plum River 4.5 miles north of the city of Mt. Carroll. The East Plum River drains an area of loess- and drift-covered dolomite. The watershed uplands are hilly with 50 to 70 feet of relief. The reservoir area is open land under clean-tilled cultivation or in meadow and pasture. The valley walls and coves have some light timber. Thirteen farm residences, associated outbuildings, and local utilities would be inundated. At least six residences would require new access roads. A two-lane blacktop county highway traverses two-thirds of the reservoir area and would have to be abandoned. Land acquisition and relocations of roads and utilities would be expensive. The depth to bedrock is probably 20 feet or less. The stream is entrenched 10 to 12 feet in a floodplain approximately 0.25 mile wide and 40 to 50 feet below the uplands. The shallow floodplain alluvium consists of brown sandy silt. The valley walls are composed of tan to buff rugged dolomite mantled with loess. Both abutments are covered with vegetation on light brown sandy loess. Borrow material suitable for the construction of an earth dam was not observed in the area. The floodplain alluvium is not suitable for borrow. The site is considered probably feasible, subject to verification by a program of materials testing and test borings. This site would make a fairly large reservoir but at a high project cost.

Site 3. A potential dam site exists on the East Pork of East Plum River about 2 miles west and 6 miles north of Lanark. The East Fork of East Plum River is a minor stream that drains an area of loess-covered Ordovician dolomite. The watershed uplands are hilly with 40 to 60 feet of relief. Depth to bedrock is probably less than 20 feet. The reservoir area is open land, half under cultivation and half in pasture. At least five farm residences, associated outbuildings, and local service utilities would be inundated. A two-lane gravel highway in the lower half of the reservoir area would have to be abandoned. The stream flows in a 6-foot notch in a flood plain 700 to 800 feet wide that lies 40 to 50 feet below the uplands. The alluvium exposed in the stream channel consists of 2 feet of brown to dark brown sandy silt underlain by 2 feet of brown to greenish gray clayey silty sand underlain by 2 feet of clayey sandy medium-to-coarse gravel. The abutments are composed of tan

to buff rugged sandy dolomite mantled with light brown sandy loess. Sufficient suitable borrow material is not available in the area to construct an earth dam. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing especially to determine the nature and sequence of the subsurface materials. This site should make a good reservoir at a near normal project cost.

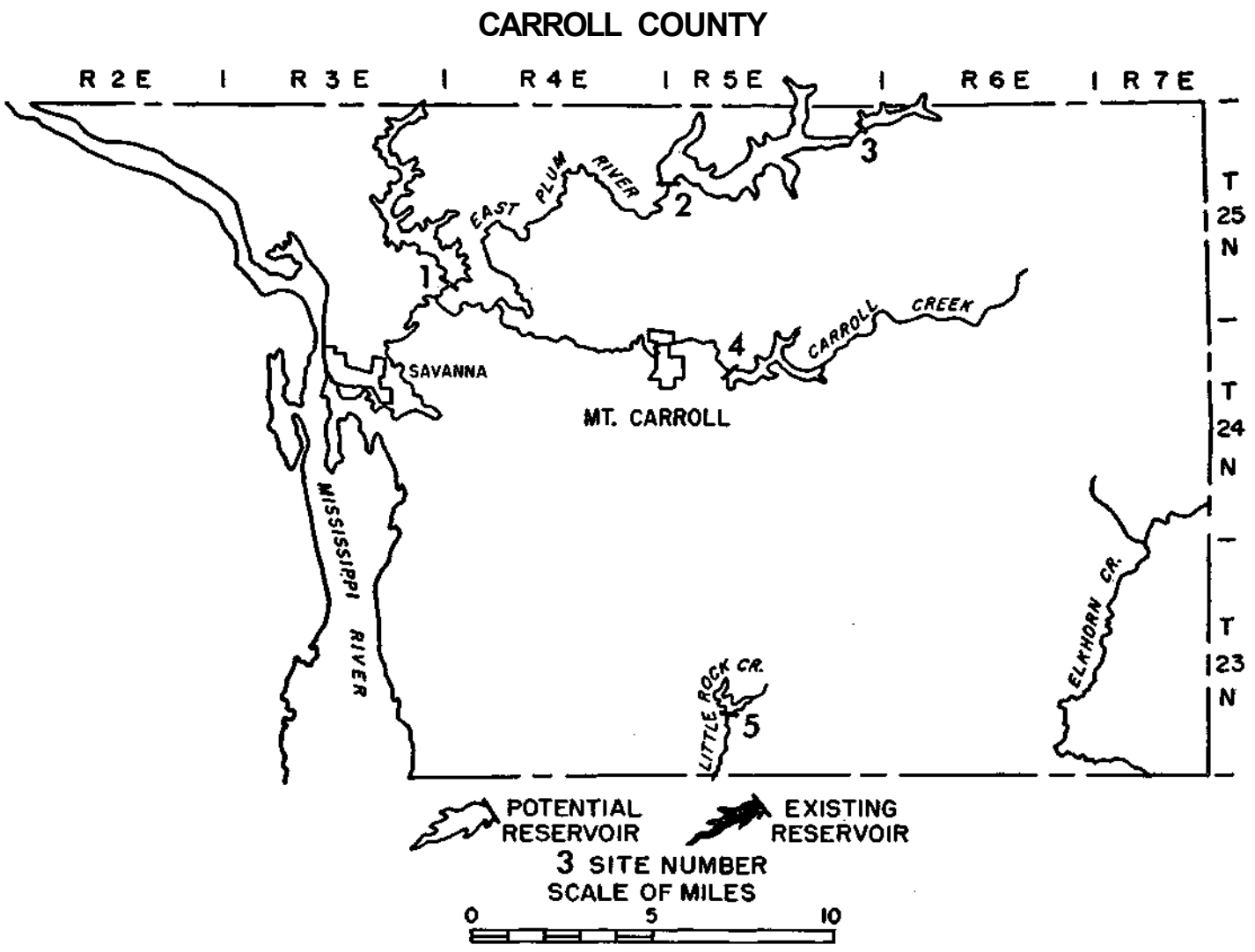
Site 4. A dam site on Carroll Creek is located 1.75 miles east and 0.25 mile south of Mt. Carroll. Carroll Creek is a major stream in the central part of the county that drains an area of loess- and drift-covered Ordovician dolomite. The watershed has rolling uplands with a relief of 30 to 40 feet. The reservoir area is open land, partially under clean-tilled cultivation but mostly in meadow and pasture. Two farm residences and associated outbuildings would be inundated. Approximately 1 mile of U. S. Eoute 52 and Illinois Eoute 64 would be inundated in two places. Low steel on the Chicago, Milwaukee, St. Paul, and Pacific Railroad appears to be safe, but the embankments would have to be strengthened. The storage capacity is less than desirable for a drainage area of this size and should be increased if not prohibited by relocations. Shallow water would be a problem in the tributary headwaters. The stream is entrenched 3 to 4 feet in a floodplain approximately 100 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of dark brown sandy clayey silt. The moderate to steep abutment slopes are composed principally of tan to buff rugged dolomite belonging to the Galena formation, overlain by tan to light brown sandy loess of variable thickness. No suitable borrow material was observed in the immediate

Potential Reservoirs in Carroll County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Camp Creek SW ¼ 30-25N-4E (Savanna Quad)	680	2,138	57,000	18,600	35.1	0.3	80	1,600	1,334	43	16.25	14.7	14.7	14.7	14.7	14.3	14.3	13.9	11.7
2	East Plum River NE ¼ 13-25N-4E (Mt. Carroll Quad)	700	2,310	50,100	16,300	57.0	0.6	65	1,550	908	32	26.33	24.8	24.8	24.3	21.2	24.8	24.1	16.3	13.3
3	E. Fk., East Plum River SW ¼ 1-25N-5E (Mt. Carroll Quad)	780	454	10,900	3,550	9.0	0.4	72	1,300	857	10	4.17	3.9	3.9	3.9	5.9	3.8	3.8	2.9	2.4
4	Carroll Creek NE ¼ 8-24N-5E (Mt. Carroll Quad)	780	627	6,300	2,100	40.2	3.3	30	300	50	14	18.61	12.7	9.8	6.5	5.8	7.8	7.1	4.4	3.7
5	Little Rock Creek NE ¼ 29-23N-5E (Morrison Quad)	760	180	2,100	684	5.7	1.1	35	800	165	3	2.15	2.1	1.9	1.7	1.6	2.0	1.5	1.3	1.3

Existing Reservoirs in Carroll County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Lundy Lake	NE ¼ 12-25N-2E (Savanna Quad)					4	10				
Horseshoe Lake	Ctr. 7-25N-3E (Savanna Quad)					4	10				
Spring Lake	14-15-22-23-26-27-35-24N-3E (Savanna Quad)						3,550				Upper Mississippi R. Wildlife and Fish Refuge
Timber Lake	SE ¼ 20-24N-5E (Mt. Carroll Quad)	Donald Mackay	0.30	190	22	16	11	30	9.8	1.87	
Bashaws Lake	SW ¼ 18-24N-4E (Savanna Quad)	Henry Bashaw					35				
Cooleys Lake	NW ¼ 19-24N-4E (Savanna Quad)	Axel Larson					7				



vicinity of the dam site. It is possible that sufficient brown sandy clayey silty till is present in the valley walls for construction of an earth dam. The site is considered probably feasible, pending an adequate program of test borings and materials testing to determine the nature and extent of the sand and gravel in the valley walls and the possibility of solution channels in the dolomite. This site would make a fair reservoir at a moderately high project cost.

Site 5. A small reservoir could be created on Little Rock Creek by constructing a dam 9 miles west and 0.5 mile south of Milledgeville. Little Rock Creek is a minor stream that drains an area of loess- and till-covered Ordovician dolomite. The watershed uplands are rolling with relief of 20 to 40 feet. The reservoir area is open land under clean-tilled cultivation or in meadow and pasture. Two residences and associated outbuildings and a two-lane gravel road would be inundated. The road could be abandoned. The stream is entrenched 5 feet in a floodplain approximately 200 to 250 feet wide and 20 to 30 feet below the uplands. The floodplain alluvium consists of dark brown silty sand. The gently sloping abutments and valley walls are composed of dolomite capped by till and loess. A section exposed in a quarry about 0.25 mile northwest of the dam site consists of 3 feet of brown sandy loess overlying 4 feet of brown sandy clayey silty till overlying 12 feet of tan to buff thin-bedded dolomite containing layers of chert. Some till suitable for borrow may be obtained from the uplands and the valley walls, but insufficient quantities of till might prohibit the construction of an earth dam. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing especially to investigate the possible presence of solution channels in the dolomite. This site should result in a good small reservoir at a near normal project cost.

COOK COUNTY

The bedrock immediately below the glacial drift in Cook County is a resistant dolomite of the Silurian system. Beneath the silts and clays of the Chicago Lake Plain the dolomite is only slightly creviced or tight in a belt 3 to 7 miles to the west of Lake Michigan. In the upland areas of the northwestern, south-central, and southern portions of the county, the glacial drift is as much as 200 feet deep and may contain water-yielding deposits of sand and fine-to-coarse gravel up to 100 feet thick. In central Cook County and along the Des Plaines Eiver, the glacial drift is thin, and sand and gravel deposits are correspondingly thin or absent. In north-central Cook County, bedrock formations have been severely broken and displaced or faulted. Uncommonly great thicknesses of shale are encountered in the Des Plaines faulted area, where dolomite formations may be thin or absent. Underlying the dolomite and shale is a deeply buried sandstone, a reliable source of municipal and industrial water supply. The northern half of the county is drained to the south by the Chicago and Des Plaines Eivers. The southern half drains westward through the Calumet Sag Channel into the Des Plaines River.

In Cook County the topography is not well suited to the construction of reservoirs, and shallow bedrock having solution channels may be a problem. Sufficient quantities of silty clayey till suitable for impervious borrow material are available through most of the county. Two potential reservoir sites were studied, and the data for these are presented here.

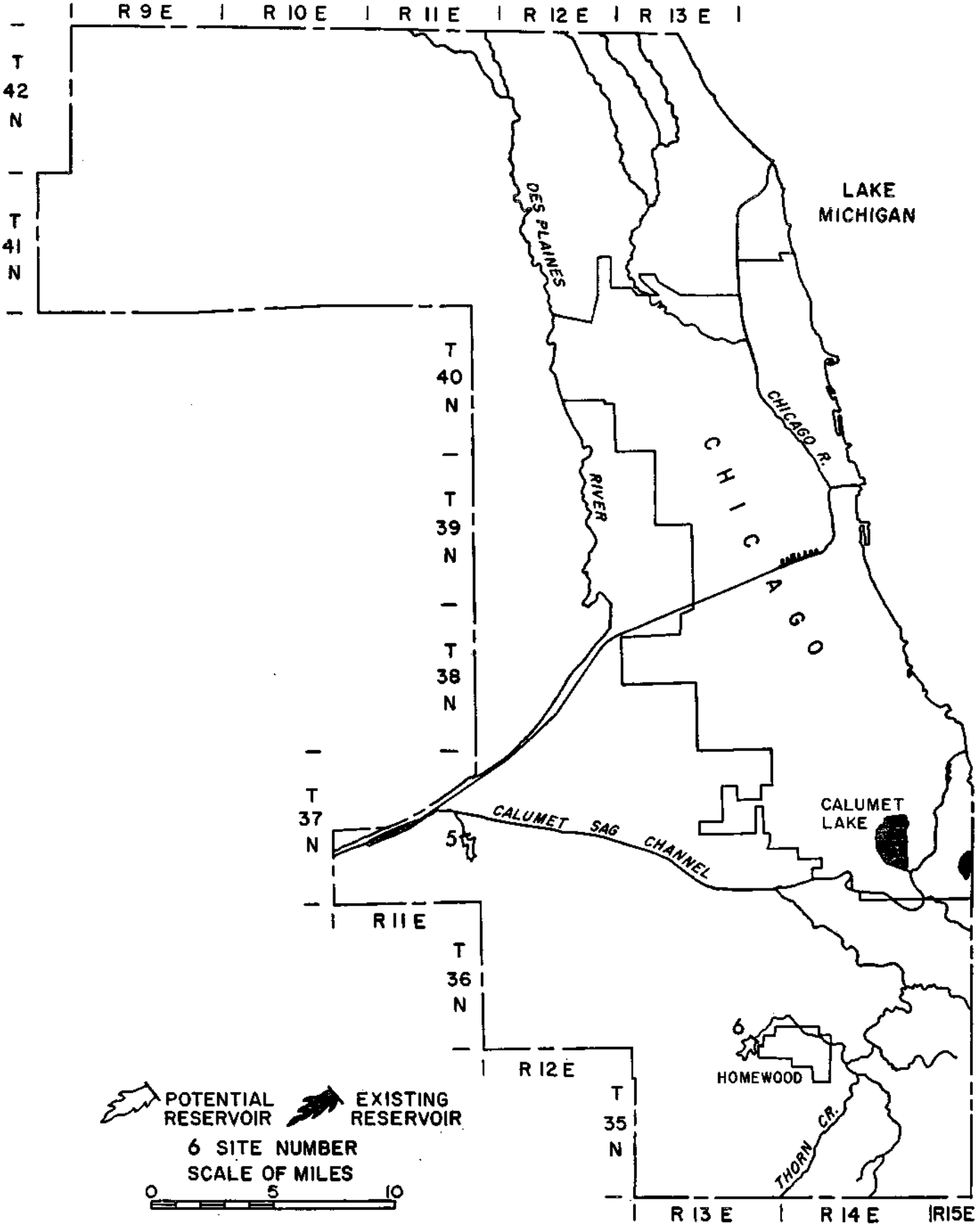
Site 5. A small reservoir could be created by constructing a dam 3.75 miles east and 0.75 mile north of Lemont on an unnamed tributary to the Calumet Sag Channel just above its confluence with the Chicago Sanitary and Ship Canal. No roads, residences, nor other obstructions would be involved. Cover in the reservoir area consists of brushy pasture. At this site the water level could be raised 5 feet if an additional small saddle dam were constructed, and this would almost double the indicated storage capacity. The watershed lies just west of the Cook County Palos Hills Forest Preserve and drains a part of the Valparaiso moraine which has many local depressions occupied by lakes, swamps, and marshes. Relief in the area ranges from 70 to 135 feet. Niagaran dolomitic rock is exposed downstream from the dam site. The stream flows in a notch 3 to 6 feet wide and 2 to 3 feet deep in a floodplain 100 to 150 feet wide. The abutments have moderately steep slopes rising 25 to 30 feet and are underlain by stony sandy clayey till containing boulders up to 4 feet in diameter. The valley walls consist of similar material which is probably suitable as an impervious borrow. The shallow bedrock surface may be irregular, and solution channels may be present in the dolomite. This site is probably feasible, subject to verification by an adequate program of test borings and materials testing. This site should result in a good small reservoir at a moderate project cost.

Site 6. An intermittent creek draining a part of the Tinley moraine has a potential dam site 1.5 miles west of Homewood that would create a small reservoir. The project would be southwest of the lake plain area of the former Lake Chicago. The reservoir area is half in pasture and half under cultivation, and there is timber along the creek. Two or three houses along 183rd Street would be inundated, and the two-lane concrete street would have to be raised. Relief in the area ranges from 20 to 55 feet, and logs of previous borings show 70 to 75 feet of unconsolidated glacial material over the limestone or dolomitic bedrock. The creek flows in a notch 1 to 5 feet deep and 4 to 6 feet wide in a floodplain that ranges from 100 to 700 feet wide and is composed of black silty clay alluvium. The right abutment at the dam site has a steep slope, and the left abutment has a moderate slope. Both abutments rise some 25 feet and are underlain by silty and clayey till containing very small amounts of sand and a few small pebbles and cobbles. A small saddle dam would be required on the eastern valley wall. Sufficient quantities of silty clayey till for borrow are available in the adjacent uplands. The site is considered feasible, subject to verification by an adequate program of test borings and materials testing. Land costs and relocations would make this a moderately high cost project.

Potential Reservoirs in Cook County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (r,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
5	Trib. Calumet Sag Channel NE ¼ NW ¼ 24-37N-13E (Sag Bridge Quad)	670	72	480	156	1.9	2.1	20	500	52	1.5	0.92	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2
6	Unnamed Tributary NE ¼ SE ¼ 35-36N-13E (Harvey Quad)	670	100	667	217	1.7	1.3	20	500	52	2	0.81	0.8	0.7	0.6	0.6	0.6	0.4	0.4	0.4

COOK COUNTY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Existing Reservoirs in Cook County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Baker Lake	SW ¼ 6-42N-10E (Barrington Quad)						130				
Lake Melissa	NE ¼ 3-42N-9E (Barrington Quad)										
Dana Lake	NE ¼ 3-42N-9E (Barrington Quad)										
Twin Lake	SE ¼ NW ¼ 3-42N-9E (Barrington Quad)										
Twin Lake	SW ¼ NW ¼ 3-42N-9E (Barrington Quad)										
Lacey Lake	NE ¼ 4-42N-9E (Barrington Quad)										
Mirror Lake	NW ¼ 4-42N-9E (Barrington Quad)										
Spring Lake	SE ¼ NW ¼ 5-42N-9E (Barrington Quad)						32				
Mud Lake	NW ¼ NW ¼ 5-42N-9E (Barrington Quad)										
Goose Lake	NE ¼ NE ¼ 9-42N-9E (Barrington Quad)						65				
Stephanie Lake	NE ¼ NE ¼ 11-42N-9E (Barrington Quad)										
Hawthorn Lake	SW ¼ SE ¼ 2-42N-9E NW ¼ NE ¼ 11-42N-9E (Barrington Quad)						28.5				
Hawley Lake	NW ¼ 11-42N-9E (Barrington Quad)						65				
Keen Lake	Ctr. 11-42N-9E (Barrington Quad)						48				
Heather Lake	SE ¼ 11-42N-9E (Barrington Quad)						5				
Crabtree Lake	SE ¼ 15-42N-9E (Streamwood Quad)										
Beverly Lake	S ½ 30-42N-9E (Streamwood Quad)						14		9		
Arlington Park Race Track	NE ¼ 25-42N-10E (Palatine Quad)						5				
Skokie Lagoons	1-42-13-42N-12E 18-19-42N-13E (Park Ridge Quad)						266				
Shagbark Lake	SW ¼ 21-41N-12E (Arlington Heights Quad)						8				
Humboldt Park	NW ¼ 1-39N-13E (Chicago Loop Quad)						20				
Garfield Park	S ½ 11-39N-13E (Chicago Loop Quad)						14				
Douglas Park	N ½ 24-39N-13E (Englewood Quad)						25				
McKinley Park	SW ¼ 31-39N-14E (Englewood Quad)						7				
Sherman Park	SW ¼ 8-38N-14E (Englewood Quad)						12				
Marquette Park	SE ¼ 23-38N-13E SW ¼ 24-38N-13E (Englewood Quad)						44				
Washington Park	Ctr. 15-38N-14E (Jackson Park Quad)						22				
Chicago Zoological Park	NW ¼ 35-39N-12E (Berwyn Quad)										
Belly Deep Slough	W ½ 10-37N-12E (Palos Park Quad)						15				
Wheaton Camp Lake	SW ¼ 9-37N-12E (Palos Park Quad)	Argonne Forest Preserve					6	31	10		
Orland Lake	4-36N-12E (Palos Park Quad)	Orland Wildlife Refuge									
Maple Lake	NW ¼ 8-37N-12E (Sag Bridge Quad)						58				
Lamont	NE ¼ 21-37N-11E (Sag Bridge Quad)						16.2	61	20		
Silver Lake	E ½ SW ¼ 11-36N-12E (Tinley Park Quad)	Silver Lake Country Club									
Calumet Lake	13-14-22-23-25-27-37N-14E (Lake Calumet Quad)										
Wolf Lake	20-29-32-37N-15E (Lake Calumet Quad)										
Lake Victory	SE ¼ NW ¼ 10-36N-14E (Lake Calumet Quad)						20.2	61	20		
Merrionette Park	SW ¼ SE ¼ 23-37N-13E (Blue Island Quad)										

Existing Reservoirs in Cook County (Concluded)

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Sauk Trail Lake	SW ¼ 29, SE ¼ 30-35N-14E (Steger Quad)		6	3,840			40				
Goose Lake	Ctr. NE ¼ 19-37N-11E (Romeoville Quad)		6	3,840							
Sunset Lake	SE ¼ 32-36N-14E (Harvey Quad)										
Walton Lake	SE ¼ 32-36N-14E (Harvey Quad)										
Lansing	NE ¼ 5-36N-15E (Calumet City Quad)						23.3	76	25		
Bryn Mawr	SE ¼ 34-41N-13E (Evanston Quad)	Bryn Mawr Country Club									
South Deering	SW ¼ 20-37N-15E (Lake Calumet Quad)						11.6	21	7		
Dolton	N ½ 2-36N-14E (Lake Calumet Quad)						16	46	15		Brick yard clay hole
Alsip	NE ¼ 28-37N-13E (Blue Island Quad)						15	46	15		

DE KALB COUNTY

One of the features of the bedrock surface in DeKalb County is the Troy Valley which runs from north to south along the western half of the county. The Sandwich Fault Zone crosses the southwest, and sandstones of equal age are 400 feet closer to the surface south of the fault than north of it. The Illinoian and Wisconsinan glaciations have covered these bedrock features with drift that generally exceeds 150 feet in depth over the southern half of the county decreasing slightly to the north. Two ridges of the Bloomington moraine divide the county into three sections from north to south. The southern branch of the Kishwaukee Eiver drains the central portion of the county and breaks through the outer ridge to drain the northern portion. The southern portion is drained by several small tributaries of the Fox Eiver. Soils throughout most of the county were not formed directly from the glacial drift but from a 3- to 6-foot layer of wind-blown material known as loess.

The results of one feasibility study in DeKalb County follow.

Site 1. The general lack of lake sites in this part of the state makes the potential reservoir site on Indian Creek 0.75 mile north of Shabbona especially attractive. Indian Creek is a major stream in this area that drains a portion of the Cropsey-Bloomington moraine. The watershed has rolling uplands with relief of 60 to 80 feet. The reservoir area is highly developed for agriculture. Three small farm units and one gravel road would be inundated. The existing roads would form an around-the-lake road system. The valley walls and coves have considerable timber and would be excellent for park development. The stream is entrenched in a broad notch 4 to 6 feet deep in a floodplain approximately 0.25 mile wide. The alluvium varies from light to dark brown and is covered with silt and sand. The abutments are composed of brown sandy stony clay till over stratified sand and gravel which is probably glacial outwash. The glaciofluvial sediments are at least 10 feet thick where exposed, and their extent is not known. It is possible that this glaciofluvial material is only a local deposit and that the overlying till is thick enough to prevent leakage. A sufficient quantity of good till for construction of an earth dam could be obtained from the nearby uplands. An adequate program of test borings and materials testing would be necessary to determine the feasibility of this site.

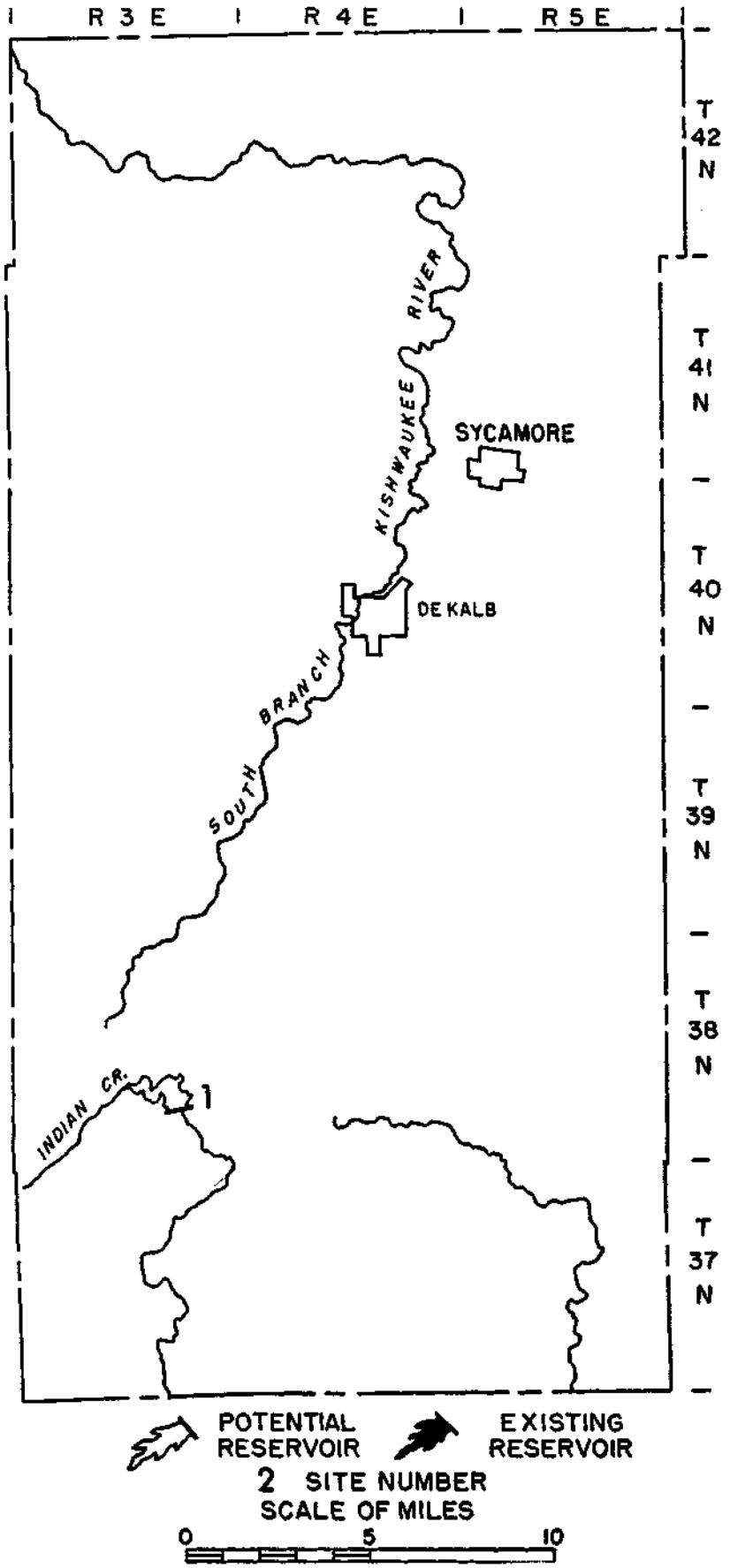
Potential Reservoirs in DeKalb County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Indian Creek N ½ 26-38N-3E (Earlville Quad)	850	493	7,700	2,500	18.6	0.6	47	1,900	630	7	4.14	3.8	3.8	3.4	3.2	3.8	2.9	2.4	2.2

Existing Reservoirs in DeKalb County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
]	NE ¼ 22-40N-4E (DeKalb Quad)	Northern Ill. University				3	6				DeKalb SCS Office

DE KALB COUNTY



DU PAGE COUNTY

The bedrock surface in DuPage County is a resistant dolomite of the Silurian system. The bedrock has a north-south crest (Niagara Cuesta) with an elevation ranging from about 900 feet in McHenry County to 650 feet at its lowest points in southern DuPage County and a slope eastward of about 15 feet per mile. The bedrock is overlain by thick glacial drift containing water-yielding sand and gravel deposits. The topography of the bedrock is unrelated to present surface topography that drains to the south by the East and West Branches of the DuPage River and Salt Creek. Sufficient quantities of suitable till are available for constructing earth embankments.

The topography in DuPage County is not conducive to good reservoir sites. Although some outwash may include permeable sand and gravel, and the shallow bedrock surface may be irregular and have solution channels, feasible sites may be found. The results of two feasibility studies follow.

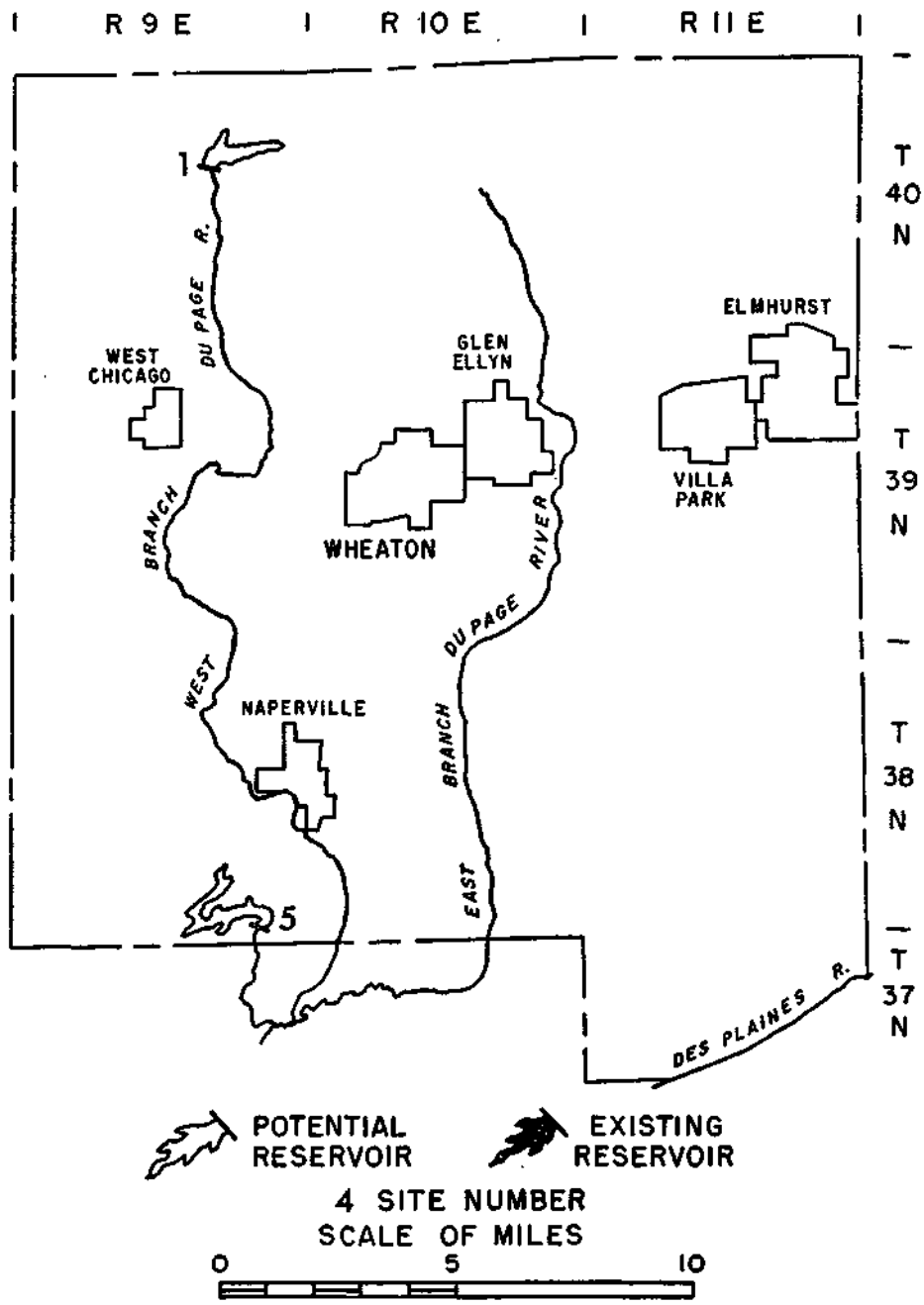
Site 1. A reservoir could be created by constructing a dam across the West Branch DuPage River 5 miles north and 1 mile east of West Chicago. The stream drains a part of the West Chicago moraine which lies about 2 miles west of the dam site. The gently rolling topography has relief of 30 to 80 feet. Most of the reservoir area is under cultivation, but the low areas are in pasture and swamp. Several township roads would be inundated and a cemetery would have to be protected, but other relocations would be minimal. The stream at the dam site is 10 to 12 feet wide and flows in a notch 4 to 6 feet deep in a floodplain about 650

Potential Reservoirs in DuPage County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity 5 Yr	10 Yr	25 Yr	40 Yr	Half capacity 5 Yr	10 Yr	25 Yr	40 Yr
1	W Br. DuPage River SE ¼ SE ¼ 10-40N-9E (West Chicago Quad)	765	850	8,500	2,770	19.2	0.9	30	1,600	278	8	6.58	6.1	6.0	5.2	5.2	5.1	3.9	2.6	2.4
5	Spring Brook NE ¼ SW¼ 36-38N-9E (Normantown Quad)	680	415	3,570	1,163	9.3	1.2	26	1,000	138	7	3.88	3.6	3.6	3.0	2.8	2.6	2.3	1.7	1.4

Existing Reservoirs in DuPage County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Mt. Emblem Cemetery	SE ¼ NE ¼ 25-40N-11E (Elmhurst Quad)						16.7				
Medinah Country Club Lake	12-13-40N-10E (Lombard Quad)						37.8				
Lake Ellyn	SW ¼ NE ¼ 11-39N-10E (Lombard Quad)						11				
North Side Park	8-9-39N-10E (Lombard Quad)						9.9				
Pratts Wayne Wood Lake #1	E ½ 7-40N-9E (Lombard Quad)						16.2				
Pratts Wayne Wood Lake #2	SW ¼ NE ¼ 7-40N-9E (Lombard Quad)						5.8				
Mallard Lake	SE ¼ 7-40N-10E (West Chicago Quad)						37				
Mallard Borrow Pit	N ½ SE ¼ 7-40N-10E (West Chicago Quad)						6				
Mays Lakes	NE ¼ 34, NW ¼ 35-39N-11E (Hinsdale Quad)						17.4				Three lakes
Johnson Slough	NE ¼ 14-38N-11E (Hinsdale Quad)						20.4	76	15		
Ruth Lake	SE ¼ 14-38N-11E (Hinsdale Quad)						14.6	31	10		
Rotts Lakes	N ½ 15-38N-10E (Wheaton Quad)										Three lakes
Herricks Lake	SW ¼ NW ¼ 30-31-39N-10E (Naperville Quad)						19.1				
Roy C. Blackwell Lake	NW ¼ 31-39N-10E (Naperville Quad)						6.8				
	SE ¼ 36-38N-10E (Romeoville Quad)						13.5				



feet wide. Logs of previous borings indicate that 90 to 150 feet of unconsolidated material, mostly glacial, overlies the limestone bedrock. Materials in fields and road cuts suggest that stony sandy clayey till underlies the abutments and valley walls. A sufficient quantity of till suitable as borrow would be available in the uplands. This site is considered probably feasible, subject to verification by an adequate testing program. The unconsolidated material may contain sand and gravel deposits suitable for development as a ground-water recharge aquifer. Considerable shallow water would occur in the upper reaches. The site should develop at a moderately high project cost.

Site 5. A dam across Spring Brook about 0.25 mile north of the DuPage-Will county line would create a small winding reservoir. Spring Brook enters the Du-Page River below the confluence of the East and "West Branches and drains gently rolling topography. The reservoir area is nearly all in row crops. Relocations would involve three farm units, a two-lane blacktop road, and two gravel roads. The stream is 6 to 8 feet

wide and flows in a notch 2 to 3 feet deep in a floodplain about 300 feet wide at the dam site. An exposure in the floodplain reveals black sandy silty clayey alluvium with a few boulders. Logs of previous borings indicate that a relatively thin cover of drift, 24 to 70 feet thick, overlies the limestone bedrock. It is unlikely that bedrock would be encountered at the level of the proposed emergency spillway. The valley walls slope moderately in the reservoir area but are steep at the dam site, and surficial material suggests that they are underlain with stony till in both areas. A sufficient quantity of till that is probably suitable as borrow would be available in the uplands. The site is considered probably feasible, subject to verification by an adequate testing program to investigate the possibilities of permeable sand and gravel within the area or of solution channels in the irregular bedrock surface. This site would result in a high project cost.

GRUNDY COUNTY

The glacial drift over the bedrock in Grundy County is thin on the uplands north and south of the Illinois River and contains only small, scattered, shallow deposits of sand and gravel. North, northeast, and east of Morris the bedrock is dolomite at 75 feet and deeper. West and northwest of Morris, St. Peter sandstone occurs below 150 feet. South of the Illinois River, relatively tight Pennsylvanian rocks underlie the glacial drift. Sufficient quantities of sandy clayey till, probably suitable as borrow, are available in the uplands. The extent of permeable gravel deposits below reservoirs and dam sites should be determined by test borings. Preglacial drainage in Grundy County was to the south, but present drainage is to the west and southwest via the Illinois River. The area north of the river drains to the south; the area south of the river drains to the north. Most of this area is part of the lake plain of glacial Lake Wauponsee and is not conducive to good reservoir sites. Several strip mine lakes exist in T34N, R7W, and T33N, R8W. Results of studies of two potential reservoir sites in Grundy County follow.

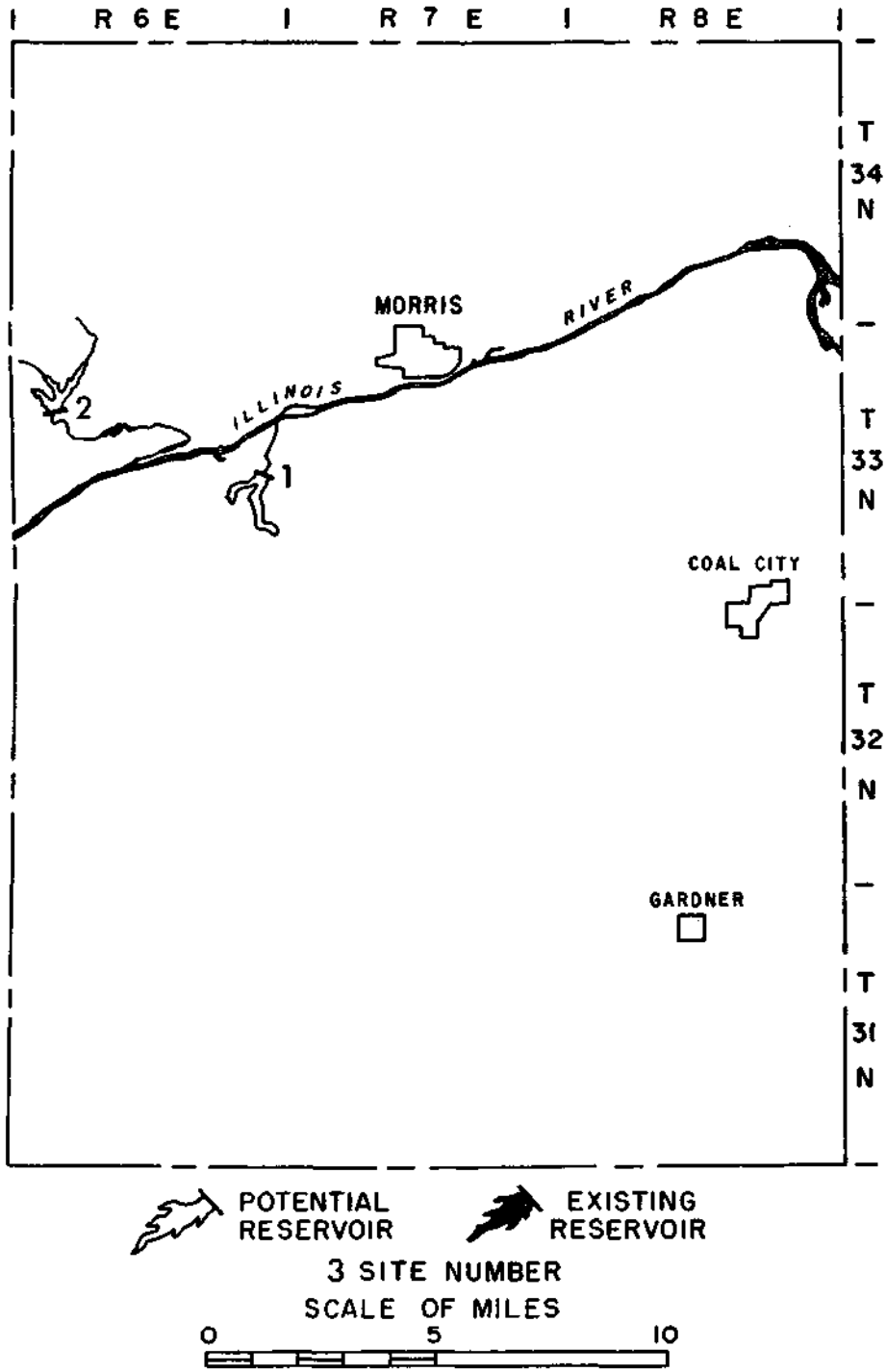
Site 1. A reservoir could be created on Bills Run, a tributary of the Illinois River, by constructing a dam 3.5 miles west and 2.5 miles south of Morris. The reservoir area is in pasture with some brush and timber. No roads, residences, obstructions, or utilities would be involved. Topographically this is an ideal site, but at the indicated elevation the storage provided would be low. Consideration should be given to raising the spillway elevation which probably would require a saddle dam on the north valley wall. Relief in the area ranges from 75 to 150 feet. Logs of previous borings indicate 70 to 120 feet of unconsolidated material over the sandstone and limestone bedrock. The intermittent stream flows in a notch 6 to 12 feet deep and 25 to 30 feet wide in a floodplain about 350 feet wide underlain by interbedded sand, silty sand, and gravel. The steep-sloped abutments are heavily wooded, and consist of sandy clayey to sandy gravelly till. Downstream 700 feet from the right abutment is a pit that exposes 40 to 50 feet of loose medium-grained sand overlain by 1 foot of gravelly sandy till. Sufficient quantities of suitable borrow material would be available in the sandy clayey till uplands. The site is considered probably feasible, but investigation should be made of the extent of permeable gravels beneath the floodplain and the possibility of sand extending upstream and under the right abutment. This site should result in a moderate project cost.

Site 2. A reservoir could be created on Long Point and Stanton Creeks, tributaries of the Illinois River, by constructing a dam 7 miles east and 0.5 mile north of Marseilles. The reservoir area is in pasture and scattered timber. One residence and two gravel roads would be inundated; the north-south road through the center of the area could be abandoned, the other raised. The watershed is on the western border of the very flat lake plain of glacial Lake Wauponsee, but the reservoir site occupies a morainal area that has gently rolling topog-

Potential Reservoirs in Grundy County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Bills Run NW ¼ NE ¼ 24-33N-6E (Morris Quad)	550	100	1,330	433	13.7	7.8	40	550	151	3	9.24	2.6	2.1	1.8	1.7	1.4	1.1	0.8	0.7
2	Long Point Creek SE Cor. 7-33N-6E (Marseilles Quad)	580	210	3,500	1,140	9.0	1.9	50	1,100	375	6	6.07	4.9	3.9	2.7	2.6	2.8	2.1	1.8	1.6

GRUNDY COUNTY



raphy with relief of 60 to 100 feet. Subsurface information indicates that 50 to 65 feet of material overlies the Pennsylvanian shale bedrock. The creek is 3 to 6 feet wide and flows in a notch 3 to 5 feet deep and 20 to 25 feet wide in a floodplain 300 feet wide. Sandy silty alluvium, 2 to 3 feet thick, overlies an undetermined thickness of coarse sandy and gravelly material. Both abutments have steep slopes and consist of stony sandy clayey till in which are pockets of sandy gravelly material and boulders 2 to 3 feet in diameter. The valley walls are underlain with similar till. Sufficient quantities of sandy clayey till that is probably suitable as borrow would be available in the uplands. This site is considered feasible, subject to verification of the extent of permeable gravel deposits below the dam site. This site should develop at a moderate project cost.

HENRY COUNTY

Henry County can be divided both topographically and geologically into a northern and a southern section. Slightly over half of the county lies in the southern portion which contains all of the uplands. The bedrock surface in this area is composed of Pennsylvanian shales with thin sandstone, limestone, and coal seams. This material is overlain by Illinoian glacial drift which is generally free from continuous deep beds of highly permeable materials. Loessial deposits up to 40 feet in depth are common along the northern edge of the southern portion. The northern portion is identified with the Rock-Green River lowlands. The bedrock surface is generally Silurian dolomite and contains two major topographic features, the Green River Valley and the Princeton Valley which was a former course of the Mississippi River. This area is overlain by deposits of highly permeable sands and gravels that thicken toward the northern edge of the county. The Green River provides drainage for the northern two-thirds of Henry County. The Edwards River drains most of the remainder of the county except the southwest corner which is drained by tributaries of the Spoon River.

The results of 13 feasibility studies in Henry County are presented here.

Site 1. A reservoir could be created on a small tributary of Green River by constructing a dam about 2 miles north and 0.25 mile east of Colona. The stream drains an area of loess-covered Pennsylvanian sediments. The rolling watershed uplands have a relief of 30 to 40 feet and a depth to bedrock of probably less than 25 feet. The reservoir bottomland is mostly open land in clean-tilled crops and pasture. The valley walls and coves are lightly wooded, and there is brush along the stream banks. The two-lane oiled roads crossing the upper third of the reservoir could be raised or abandoned. A more serious problem would be Interstate Route 80 in the lower third of the reservoir area, which crosses the valley on a 60- to 80-foot embankment with twin 18-foot corrugated metal pipe conduits. The stream flows in a 4- to 6-foot notch in a floodplain 100 to 150 feet wide and 30 to 40 feet below the uplands. The floodplain is covered with dark brown sandy alluvial silt with some brown silty sand at the base of the stream channel. The valley walls are composed of loess-capped shale and have moderate to steep slopes. Both abutments at the dam site have steep slopes and are composed of 3 feet of dark gray soft thinly laminated shale with small ironstone concretions, overlain by 2 feet of mottled gray and brown soft weathered shale, overlain by 7 feet of dark gray thinly bedded sandy shale, overlain by 5 feet of mottled gray and brown soft weathered shale, overlain by 1 foot of coal, overlain by 3 feet of dark gray soft thinly laminated shale, overlain by 1 foot of coal, overlain by 5 feet of mottled gray and brown soft weathered shale, and topped with 4 feet of tan to light brown sandy clayey silt. Materials suitable for use in a rolled earth embankment are not available in the area. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing which should include investigation of the shales for possible borrow material. This site should make a fair small reservoir but at a moderately high project cost.

Site 3. A reservoir could be created on Geneseo Creek by the construction of a dam 2 miles south and 1.5 miles west of Geneseo. Geneseo Creek is a tributary of the Green River that drains an area of loess-covered Pennsylvanian sediments. Long narrow dendritic drainage to the north typifies the watershed. The stream flows in an 8- to 10-foot notch in a floodplain 200 to 300 feet wide and 50 to 70 feet below the uplands. The reservoir area is open land under clean-tilled cultivation. One farm residence and associated outbuildings would be inundated. Two north-south roads, one a two-lane oiled road and the other a two-lane blacktop, would have to be raised or abandoned. Illinois Route 82 and an east-west oiled road would have to be raised slightly. The floodplain is covered with dark brown sandy alluvial silt. The valley walls are gently to moderately sloping, and the upper portions are composed of tan to light brown sandy clayey silt known as loess. The abutments at the dam site have gentle slopes and are composed of a soil developed in loess. Whether sufficient and suitable borrow material is available in the immediate vicinity is not known. The site is considered geologically feasible, subject to verification by test borings and materials testing especially to determine the nature and sequence of the subsurface materials. There would be considerable shallow water in the upper reaches of the reservoir. This site would make only a fair reservoir at a moderately high project cost.

Site 5. A reservoir could be created on Spring Creek by constructing a dam 4 miles east and 3 miles north of Cambridge. Spring Creek is a major tributary of the Green River that drains an area of loess-covered bedrock hills. Depth to bedrock is probably about 50 feet. The reservoir area is open land except for brush on the stream banks. The entire reservoir area has been artificially drained and is under intense clean-tilled cultivation. At least one residence and associated outbuildings would be inundated. Roads crossing the reservoir could be abandoned, but new access roads would

have to be built. Several township roads and a two-lane blacktop county road would have to be raised. The stream flows in a 10- to 12-foot notch in a floodplain 200 to 300 feet wide and 60 to 70 feet below the uplands. The floodplain is partially covered with brown silty fine alluvial sand. The remainder of the floodplain and the valley walls are covered with tan to light brown clayey silt. The abutments at the dam site are gently sloping, and are covered with tan to light brown clayey silt known as loess. Greenish gray clayey silt is exposed near the base of the stream channel. Suitable borrow is not available in the immediate vicinity of the dam site. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing especially to determine the nature and sequence of the subsurface materials. A great deal of shallow water would occur in the upper reaches. Because of excessive land costs this site would result in a moderately high to high project cost.

Site 6. A potential reservoir site exists on "Walker Creek with the dam site 4 miles north and 4 miles west of Kewanee. The creek is a tributary of Mud Creek that drains an area of loess-covered bedrock hills. The watershed uplands are rolling to hilly, and depth to bedrock is probably less than 50 feet. The reservoir area is open land, except for brush along the stream banks, and about 60 percent is clean tilled and the rest pasture. One farm residence and associated outbuildings would be inundated. One two-lane oiled road crossing the area could be abandoned, and another relocated. The stream flows in a 12- to 15-foot notch in a floodplain 500 to 600 feet wide and 60 to 70 feet below the uplands. The floodplain is covered with brown sandy alluvial silt. The gently to moderately sloping valley walls are composed of tan loess over brown silty clay. Sandstone underlies part of the reservoir area. The abutments at the dam site have gentle to moderate slopes and consist of 6 feet of dark brown to brown silty clay overlain by 2 feet of brown sandy silt overlain by 8 to 10 feet of tan to light brown clay silt known as loess. The floodplain alluvium probably would not be suitable for borrow. Adequate quantities of material suitable for constructing an earth embankment may not be available close to the dam site. The site is considered probably feasible, subject to verification by test borings and materials testing to determine the nature and sequence of subsurface materials and to locate an adequate supply of suitable borrow. Drainage from the city of Kewanee should be investigated. This site should develop a fair reservoir at a moderately high project cost.

Site 7. A small reservoir could be created on a minor tributary of Mud Creek with the dam site 2 miles north and 0.5 mile east of Kewanee. The stream drains an area of loess- and drift-mantled bedrock of Pennsylvanian age. The watershed uplands are rolling to hilly, and depth to bedrock is probably less than 30 feet. The reservoir area is clean tilled on the bottoms and lightly timbered on the valley walls. No residences nor obstructions would be involved. Shore approaches would be steep and access to the site would be poor. The stream flows in a 10- to 12-foot notch in a narrow floodplain consisting of brownish gray sandy alluvial silt. The moderately sloping valley walls consist of light brown sandy clayey till. Exposure of the right abutment indicates that both abutments at the dam site are composed of light brown to buff silty clayey till which contains many brown sandstone fragments. The abutments have moderate to gentle slopes. Brown silty clay is exposed near the base of the stream channel. Sufficient quantities of till suitable for borrow probably could be obtained from the nearby uplands. The site is considered probably feasible, subject to test borings and materials testing to determine the extent and degree of permeability of the Pennsylvanian sandstone which may be present beneath the till. This site should develop a good small reservoir at a low project cost.

Site 8. A deep many-fingered reservoir could be created on Mud Creek, a major tributary of the Green River, with the dam 3.5 miles northeast of Kewanee. Mud Creek drains an area of loess- and drift-mantled bedrock of Pennsylvanian age. The watershed uplands are rolling to hilly and are underlain by Shelbyville drift. Exposures along the stream and logs of previous borings indicate that depth to bedrock is less than 25 feet. The reservoir area is open land in clean-tilled cultivation. Three residences and associated outbuildings would have to be acquired. Two power lines, one on steel towers and the other on wood poles, cross the reservoir area in a north-south direction and would have to be raised. The stream flows in a 12- to 15-foot notch in a floodplain 500 to 600 feet wide and covered with brown sandy alluvial silt. The valley walls have moderate slopes and are composed of sandstone covered by till. The abutments at the dam site are composed of 6 feet of orangish brown soft thinly bedded sandstone overlain by 8 to 10 feet of tan to light brown silty sandy clay till. Sufficient quantities of till suitable for borrow could be obtained from the uplands near the dam site. The site is considered probably feasible, subject to test borings and materials testing to determine the extent and permeability of Pennsylvanian sandstone beds and underlying sands and gravels. This site should develop at a near normal project cost.

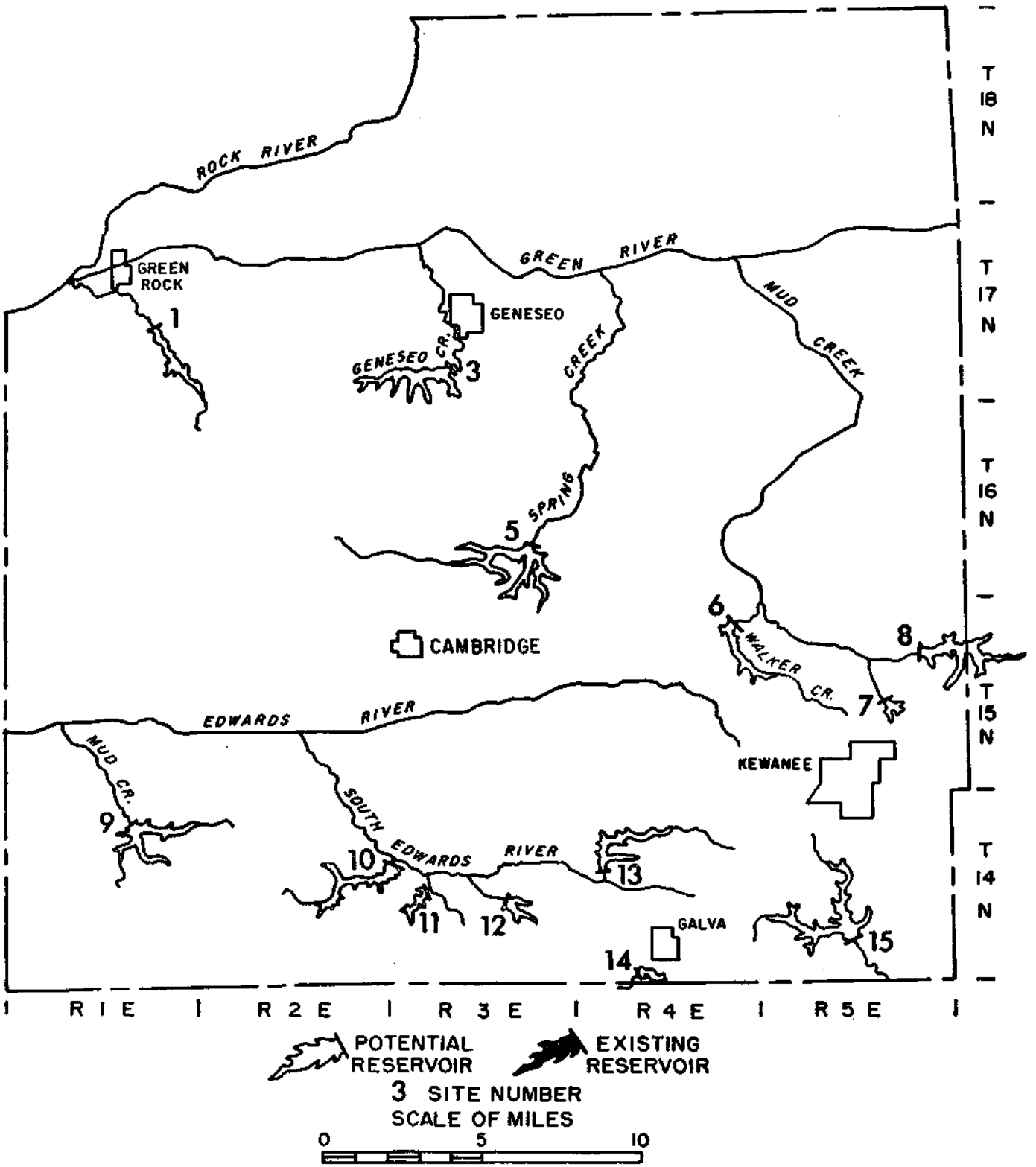
Site 9. An excellent reservoir site from a topographic standpoint exists on Mud Creek with the dam site located 2 miles north and 1 mile east of Alpha. This Mud

Creek is a tributary of the Edwards River, a major stream in the southwestern part of the county draining an area of loess-covered till. The watershed uplands are gently rolling, and depth to bedrock is probably less than 100 feet. The reservoir area is half pasture and half cultivated lands. Two secondary roads across the site could be abandoned. There are no residences nor other obstructions in the reservoir area, but an abandoned coal mine shaft exists near the center of section 11. The stream flows in a 10- to 12-foot notch in a floodplain 200 to 300 feet wide and covered with dark brown silty alluvial sand. The moderately sloping valley walls are composed of till capped by loess. The left abutment at the dam site consists primarily of mottled gray and brown sandy clay till capped by tan to light brown sandy clayey silt known as loess. Only loess is exposed in the right abutment but composition is probably similar to that of the left abutment. Both abutments have gentle slopes. Sufficient quantities of till suitable for borrow can be obtained from the valley walls. The site is considered probably feasible, subject to verification by test borings and materials testing especially to determine the nature and extent of any mined-out areas in the vicinity of the reservoir. This site should develop at a moderately low project cost.

Site 10. A reservoir could be created by constructing a dam across Dugout Creek about 5 miles west of Bishop Hill. Dugout Creek, a tributary of South Edwards River, is a minor stream that drains an area of loess-covered till. The watershed uplands are flat to gently rolling. The depth to bedrock is probably less than 50 feet. The entire reservoir area is open land under clean-tilled cultivation, except for brush along the stream bank. There are no known residences in the reservoir area. Several two-lane oiled roads could be abandoned, relocated, or raised without excessive cost. Considerable shallow water would occur in the upper reaches, especially in the south fork. The stream flows in an 8- to 10-foot notch in a floodplain 500 to 600 feet wide and covered with dark brown sandy alluvial silt. The valley walls have moderate slopes and are composed of till overlain with 4 to 6 feet of tan to light brown sandy clayey silt. The left abutment at the dam site is composed of mottled brown and gray sandy clay till which contains lenses of reddish brown clayey sand and is capped by loess. The right abutment is covered with vegetation but is probably similar in composition to the left abutment. Both abutments are gently to moderately sloping. Sufficient quantities of till suitable for borrow can be obtained from the valley walls. The

Potential Reservoirs in Henry County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity 5 Yr	10 Yr	25 Yr	40 Yr	Half capacity 5 Yr	10 Yr	25 Yr	40 Yr
1	Trib. Green River NE ¼ 23-17N-1E (Orion Quad)	660	321	7,000	2,300	8.6	0.5	65	800	400	11	2.92	2.6	2.3	1.9	1.8	2.3	1.7	1.6	1.4
3	Geneseo Creek SE ¼ 29-17N-3E (Geneseo Quad)	660	640	6,400	2,100	20.2	1.4	30	700	113	22	7.85	7.6	5.9	5.1	4.8	5.5	4.1	3.3	3.0
5	Spring Creek NW ¼ 26-16N-3E (Geneseo Quad)	680	1,178	11,800	3,800	27.0	1.0	30	1,100	189	27	10.49	10.0	8.9	8.2	7.6	8.6	6.3	5.0	5.0
6	Walker Creek SE ¼ 2-15N-4E (Annawan Quad)	690	416	4,200	1,200	14.6	1.5	30	1,000	167	12	5.67	5.5	4.2	3.5	3.4	3.8	2.8	2.3	2.0
7	Trib. Mud Creek NW ¼ 22-15N-5E (Annawan Quad)	740	64	500	200	1.5	1.3	25	350	47	4	0.58	0.5	0.5	0.4	0.3	0.5	0.3	0.2	0.2
8	Mud Creek SE ¼ 11-15N-5E (Annawan Quad)	740	442	4,400	1,400	11.1	1.1	30	900	152	17	4.31	4.1	3.5	3.1	3.0	3.2	2.5	1.9	1.8
9	Mud Creek SW ¼ 2-14N-1E (Woodhull Quad)	730	423	4,900	1,600	15.1	1.3	35	1,000	211	16	5.87	5.7	4.6	3.9	3.7	4.2	3.1	2.5	2.3
10	Dugout Creek NW ¼ 18-14N-3E (Galva Quad)	740	740	9,870	3,210	15.6	0.7	40	1,200	313	15	6.06	5.8	5.7	5.4	5.2	5.6	4.2	3.5	3.4
11	Trib. S. Edwards River NW ¼ 20-14N-3E (Galva Quad)	750	134	1,300	400	2.6	0.9	30	800	136	4	1.01	0.9	0.9	0.8	0.8	0.9	0.7	0.5	0.5
12	Trib. S. Edwards River E ½ 22-14N-3E (Galva Quad)	760	160	1,100	400	5.1	2.0	20	800	84	6	1.98	1.7	1.2	1.0	1.0	0.9	0.8	0.6	0.6
13	Goose Creek SW ¼ 17-14N-4E (Galva Quad)	780	672	7,800	2,500	10.8	0.6	35	1,000	211	16	4.20	3.7	3.7	3.7	3.7	3.6	3.1	2.9	2.6
14	Mud Run SW ¼ 33-14N-4E (Galva Quad)	800	64	400	100	2.2	2.4	20	700	73	3	0.85	0.7	0.5	0.4	0.3	0.4	0.3	0.2	0.2
15	Indian Creek S ½ 21-14N-5E (Kewanee Quad)	780	1,222	20,400	6,600	17.5	0.4	50	1,700	627	35	6.80	5.9	5.9	5.9	5.9	5.7	5.7	5.6	5.4



site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing to determine the nature and extent of the sand lenses in the abutments. This site would make a fair reservoir but at a moderately high project cost.

Site 11. A small reservoir could be created on a minor tributary of South Edwards River by constructing a dam 7.5 miles west and 2 miles north of Galva. The stream drains an area of loess- and till-covered Pennsylvanian sediments. Depth to bedrock is probably less

Existing Reservoirs in Henry County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Shadow Lake	17-18N-3E (Erie Quad)										
Andover Club Lake	8-17-15N-2E (Orion Quad)	Andover Lake Club	0.23	150		8	5	22	6	1.79	
Crescent Lake Club of Alpha	S ½ 15-14N-1E (Woodhull Quad)	Crescent Lake Club	1.56	1,000		25	30	240	55	2.87	
Johnson Sauk Trail Lake	SE ¼ 35-16N-5E (Annawan Quad)	State Cons. Dept.				31	64				
Geneseo Fish Hatchery Ponds	SW ¼ 10-17N-3E (Geneseo Quad)	Bester Bros.					6				Strip mines
40 & 8 Club Lake	S ½ SE ¼ 32-17N-5E (Annawan Quad)						40				
Atkinson Sportsmen's Club	N ½ NE ¼ 1-16N-4E (Annawan Quad)						47				

than 50 feet. The reservoir area is partially in pasture or idle but has a few cultivated fields in the bottomland. There are no known residences nor obstructions, but one road would have to be raised slightly. The stream is entrenched 6 to 8 feet in a floodplain 200 to 300 feet wide and 50 to 60 feet below the uplands. The floodplain is covered with dark brown sandy clayey alluvial silt. The valley walls have gentle to moderate slopes and consist of loess-covered till. The left abutment at the dam site is composed of mottled gray and brown sandy clay till capped with tan to light brown sandy clayey silt of variable thickness. The right abutment is covered but is probably similar to the left one. Sufficient quantities of till suitable for borrow would be available in the uplands near the dam site. The site is considered feasible, subject to verification by an adequate program of test borings and materials testing. The site should develop at a near normal project cost.

Site 12. A small reservoir could be created on a minor tributary of South Edwards Eiver by the construction of a dam 1 mile south and 1 mile west of Bishop Hill. The stream drains an area of loess- and till-covered Pennsylvanian sediments. The watershed uplands are rolling and have a relief of 30 to 40 feet. Depth to bedrock is probably less than 50 feet. The reservoir area is open land, except for a fringe of brush along the channel, and is 60 to 70 percent clean-tilled cultivation and the rest pasture. Three farm residences would need new access roads. Two two-lane oiled roads, one east-west and one north-south, would have to be abandoned. The stream flows in a 4- to 6-foot notch in a floodplain 500 to 600 feet wide and 40 to 50 feet below the uplands. The floodplain is covered with dark brown sandy clayey alluvial silt. The upper portions of the valley walls are composed of tan to light brown sandy clayey silt of variable thickness over tan to light brown sandy clayey silty till, the base of which is not exposed. Loess covers the gently sloping abutments at the dam site and probably overlies till. Sufficient quantities of till suitable for borrow could be obtained in the valley walls near the dam site. The site is considered feasible, subject to verification by test borings and materials testing to determine the nature and sequence of subsurface deposits. Land acquisition would probably be high because of intensive use. This should result in a small reservoir at a moderately high project cost.

Site 13. A potential reservoir site exists on Goose Creek with the dam site 2 miles west and 2.5 miles north of Galva. Goose Creek is a major tributary of the South Edwards River that drains an area of loess-covered Pennsylvanian sediments. The watershed uplands are gently rolling, and depth to bedrock is probably 50 feet or less. The reservoir area is primarily open land under clean-tilled cultivation but lacks normal productivity because of imperfectly drained soils and low soil fertility. Several oiled and dirt roads could be abandoned, but others would have to be raised slightly. Several access roads would have to be provided, but no residences would be inundated. The stream flows in an 8- to 10-foot notch in a floodplain 200 to 300 feet wide and about 50 feet below the uplands. The floodplain is covered with dark grayish brown silty fine alluvial sand. The gently to moderately sloping valley walls are covered with loess which probably overlies till. The abutments at the dam site are composed primarily of reddish brown sandy clay till overlain by tan to light brown clayey sandy silt known as loess. The loess varies in thickness but is at least 1 foot thick in most places. Sufficient quantities of till suitable for borrow may not be present in the immediate vicinity of the dam site. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing. This site could be developed into a fair reservoir at a near normal project cost.

Site 14. A small reservoir could be created on Mud Run about 1 mile southwest of Galva. Mud Run is a minor stream that drains an area of loess-covered Pennsylvanian sediments. The watershed uplands are rolling and have a relief of 30 to 40 feet. Depth to bedrock is probably less than 50 feet. The reservoir area is primarily open land under clean-tilled cultivation, with brush restricted to the stream banks. Illinois Route 78 would limit the extent of the development. No buildings nor obstructions occur in the reservoir area. The stream flows in a 5- to 7-foot notch in a floodplain approximately 300 to 400 feet wide. The abutments and the valley walls have gentle slopes. The abutments are composed of rusty brown very sandy clay till (base not exposed), overlain by 6 to 8 feet of tan to light brown sandy clayey silt known as loess. The till in the area may provide suitable borrow for an earth embankment, but may not be present in sufficient quantities. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing. The upper reaches of the reservoir would have some shallow water. The site should develop at a moderately high project cost.

Site 15. A reservoir could be created on Indian Creek 5 miles south of Kewanee. Indian Creek is a major tributary of the Spoon River and drains an area of loess-covered Pennsylvanian sediments. The watershed uplands are gently rolling to rolling. The surficial materials are loess, soft sandstone, and shale. The depth to bedrock is less than 25 feet, according to exposures in road cuts and stream valleys. The reservoir area is open land under clean-tilled cultivation except for brush and scattered trees along the stream channel. At least one farm residence would require a new access road, and several township roads would have to be abandoned. U. S. Route 34 and Illinois Route 78 might have to be raised at one location. The stream flows in a 6- to 8-foot notch in a floodplain 200 to 250 feet wide and 40 to 60 feet below the uplands. The floodplain is covered with dark brown silty clayey alluvial sand. The valley walls have gentle to moderate slopes, and are composed of loess and sandstone containing some soft thinly laminated sandy shale. The abutments at the dam site are composed of 8 to 10 feet of tan to light brown fine-to-medium soft thinly bedded sandstone (base not exposed), overlain by 3 feet of grayish brown sandy clay till, overlain by 6 to 7 feet of tan to light brown sandy clayey silt known as loess. There is some till suitable for borrow near the dam site, but the quantity may not be sufficient. The site is considered probably feasible, subject to verification by test borings and materials testing to determine the nature and sequence of the subsurface materials and the permeability of the sandstone. This site should make a good reservoir at a near normal project cost.

JO DAVIESS COUNTY

Most of JoDaviess County lies in the unglaciated area of the Upper Mississippi Valley where the topography is rugged and the bedrock is widely exposed. This area stood as an island surrounded by ice sheets during the great glacial epoch. Ice-laid deposits are absent, and the rugged topography has been carved by running water. Most students of the driftless area have recognized remnants of either one or two peneplains. Two prominent upland surfaces are present. The upper one has been termed the Dodgeville peneplain, represented by the tops of isolated mounds or ridges capped by Silurian dolomite. The lower and more extensively developed surface is the Lancaster peneplain, which lies about 150 feet below the Dodgeville plain. The Lancaster plain coincides closely with the tops of the Galena dolomite and slopes southward from 900 to 1000 feet above sea level. Maquoketa shale is exposed in the present valley system. Thick permeable sand and gravel deposits occur in the Mississippi Valley. Lower portions of tributary valleys contain considerable fine-grained materials which were deposited during glacial high water stages of the Mississippi River. The drainage is primarily to the southwest through tributaries to the Mississippi River such as the Galena and Apple Rivers and Smallpox and Rush Creeks.

Seven potential reservoir sites were studied in JoDaviess County, and the results of these studies follow.

Site 2. A reservoir could be created on Smallpox Creek, a tributary of the Mississippi River, by constructing a dam 3 miles east and 2 miles south of Galena. The watershed is about 7 miles long and 3 miles wide and has hilly uplands with considerable relief. The reservoir area is primarily open land under clean-tilled cultivation or in pasture. At least four farm residences with associated outbuildings and their access roads would be inundated. Depth to bedrock is probably less than 10 feet in most places, according to exposures in the valley walls. Of three surficial bedrock units, the Niagaran dolomite crops out only at the tops of the higher mounds and ridges in the area, the Maquoketa shale forms gentle slopes between the Niagaran and the Galena dolomites, and the Galena dolomite crops out in the lower portions of the valley walls. The steeply sloping left abutment at the dam site is composed of tan to gray thick-bedded Galena dolomite,

in which some solution features and jointing are present. The stream flows in a 6- to 8-foot notch in a floodplain 500 to 600 feet wide and 50 to 60 feet below the uplands. Borrow material for an earth dam was not observed in the area, and it might be necessary to consider some other construction material. The floodplain alluvium probably would not be suitable for borrow. The site is considered probably feasible, but special attention should be given to the possible presence of solution channels in the dolomite. Because of land acquisition and construction costs, this site would develop at a moderately high project cost.

Site 3. A small reservoir could be created in a steep gorge on a small tributary of the East Fork of the Galena River. The dam site would be about 6 miles east and 3.25 miles north of Galena. The reservoir area is not easily accessible, and is covered with light timber and brush. There are no residences nor obstructions in the reservoir area except a utility power line on timber poles that crosses the upper end. The watershed uplands are hilly and have considerable relief. The depth to bedrock is probably less than 10 feet according to exposures in the valley walls. The stream meanders in a 4- to 6-foot notch in a floodplain 100 to 150 feet wide and 40 to 50 feet below the uplands. The abutments at the dam site slope moderately to the uplands and are covered with vegetation. Some tan to buff rugged sandy thick-bedded crystalline dolomite of the Galena formation is exposed and forms the abutments. The floodplain alluvium probably is not suitable for borrow, and suitable borrow material for an earth dam was not observed near the dam site. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing to investigate the possible presence of solution channels in the dolomite. This should make a good small reservoir at a near normal project cost.

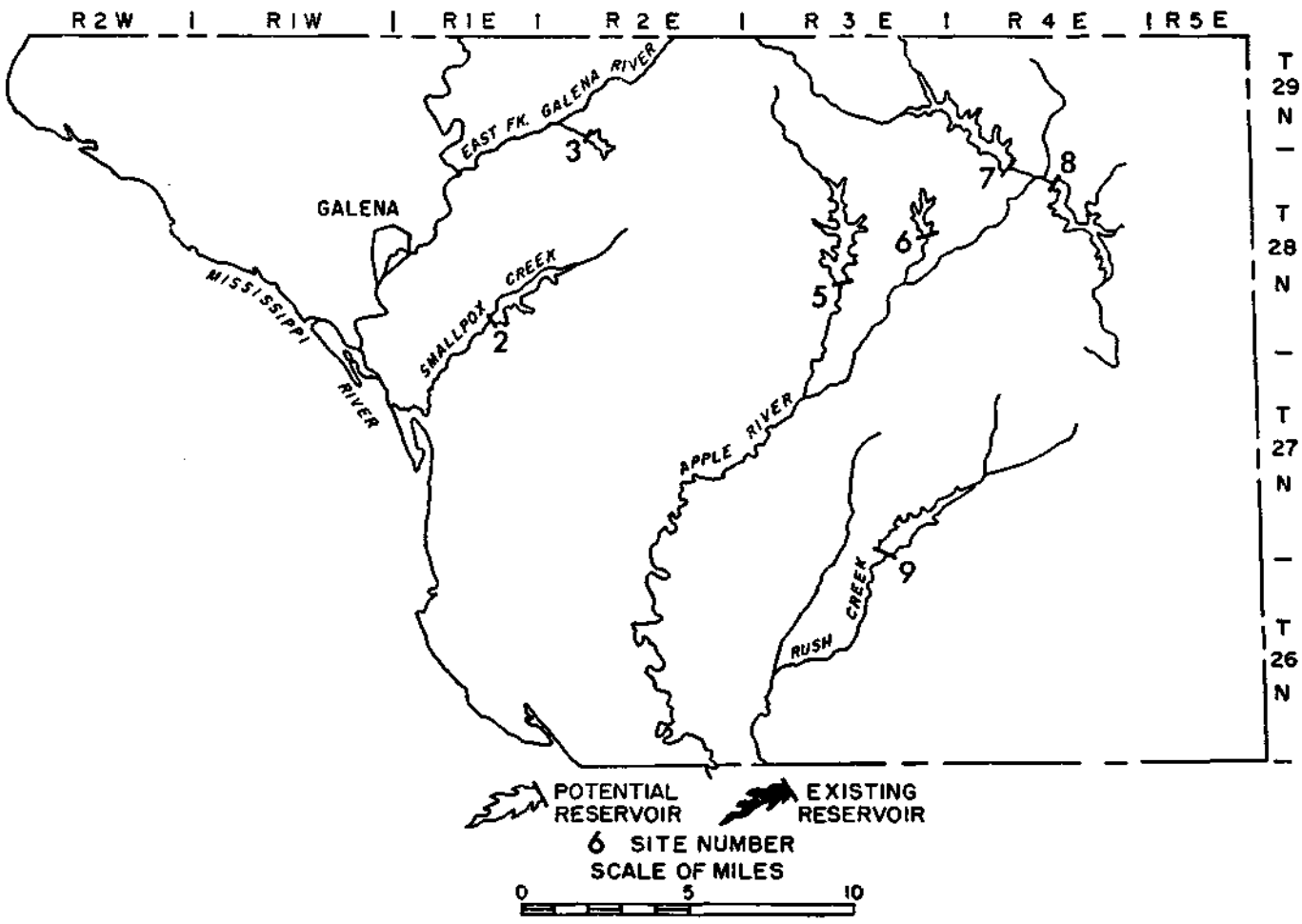
Potential Reservoirs in JoDaviess County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals							
													Full capacity				Half capacity			
													5 Yr	10 Yr	25 Yr	40 Yr	5 Yr	10 Yr	25 Yr	40 Yr
2	Smallpox Creek N ½ 35-28N-1E (Galena Quad)	720	662	17,700	5,800	20.6	0.5	80	750	568	24	8.71	8.3	8.3	8.3	8.3	8.2	8.2	7.4	6.0
3	Trib. E. Fk. Galena River SE ¼ 32-29N-2E (Galena Quad)	900	100	2,000	650	2.2	0.5	60	500	208	2	0.93	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.6
5	Hells Branch SE ¼ 21-28N-3E (Elizabeth Quad)	800	810	26,400	8,600	17.1	0.3	98	1,100	1,020	22	7.03	6.3	6.3	6.3	6.3	6.1	6.1	6.1	6.1
6	Coon Creek NW ¼ 13-28N-3E (Elizabeth Quad)	820	154	1,500	500	6.3	1.9	30	700	120	7	2.59	2.5	2.0	1.7	1.5	1.8	1.5	1.2	1.0
7	Apple River E ½ 5-28N-4E (Elizabeth Quad)	900	704	21,100	6,900	14.6	0.3	90	1,100	981	18	6.01	5.4	5.4	5.4	5.4	5.2	5.2	5.2	5.2
8	S. Fk. Apple River NW ¼ 10-28N-4E (Elizabeth Quad)	860	589	9,800	3,200	28.0	1.3	50	850	319	18	11.52	11.3	10.8	8.7	7.9	9.8	7.8	6.6	5.4
9	Rush Creek SE ¼ 34-27N-3E (Elizabeth Quad)	720	877	18,400	6,000	25.2	0.6	63	1,600	862	16	10.37	9.6	9.6	9.6	9.6	9.4	9.4	7.8	7.2

Existing Reservoirs in JoDaviess County

Reservoir name	Legal description	Owner	Watershed area		Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity			Remarks and data source
			(sq mi)	(acres)				(ac-ft)	(mg)	(in)	
Wise Lake	21-28-27N-1E (Galena Quad)						40				
Yonkers Lake	28-33-27N-1E (Galena Quad)						45				
Lake Lakoma							17				
Frentress Lake							92				
Switzer Lake							35				
Stone Lake							19				
Tuppys Lake							13				
Long Lake							16				
Kehaugh Slough							109				
Fish Trap Lake							285				
Spratts Lake							55				

JO DAVIESS COUNTY



Site 5. A reservoir could be created on Hells Branch by constructing a dam 3 miles east and 6 miles north of Elizabeth. Hells Branch, a tributary of the Apple Eiver, drains an area of loess-mantled early Paleozoic sediments. The uplands are hilly, and the depth to bedrock is less than 10 feet. Niagaran dolomite crops out at the tops of the higher mounds and ridges in the area. Gentle slopes are formed on the Maquoketa shale below the Niagaran dolomite and above the Galena dolomite which crops out in the lower portions of the valley walls. The reservoir area is primarily open land under clean-tilled cultivation or in pasture. At least three residences and associated outbuildings would be inundated. Two east-west gravel highways would have to be abandoned. The stream flows in a 4-foot notch in a floodplain 500 to 600 feet wide and 50 to 60 feet below the uplands. The alluvium on the floodplain is estimated at 6 to 8 feet deep and consists of brown silty fine sand with stringers of gravel. Loess-mantled Galena dolomite crops out almost continuously along the moderately sloping valley walls. The left abutment at the dam site is a nearly vertical bluff primarily composed of tan to buff thick-bedded rugged Galena dolomite, which is capped by light reddish brown sandy loess. The moderately sloping right abutment, which is covered with vegetation, consists of similar material. Suitable borrow of reddish brown sandy clay is exposed below the loess in the uplands near the dam site, but the thickness and extent of this material would have to be determined. The floodplain alluvium is not suitable for borrow. The site is considered feasible, but special attention should be given to possible solution channels in the dolomite. This should make a good reservoir at a moderately high project cost.

Site 6. A small reservoir could be created on Coon Creek, a minor tributary of the Apple River, by constructing a dam 6 miles south and 1 mile west of the village of Apple River. The stream drains an area of loess-mantled early Paleozoic sediments including the Niagaran dolomite, the Maquoketa shale, and the Galena dolomite. The rolling uplands have considerable relief, and the depth to bedrock is less than 10 feet according to exposures in the valley walls. The entire

reservoir area is in brush and timber. No known residences, utilities, or road relocations would be involved in this development. Access to the area is poor but could be developed easily. The stream flows in a 4-foot notch in a floodplain 200 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of brown sandy silt. In some places the stream bed is formed in the Galena dolomite. The valley walls are composed primarily of dolomite and have moderate to steep slopes. The abutments at the dam site are composed of tan to buff thick-bedded rugged Galena dolomite capped by loess. The right abutment slopes steeply, but the left abutment has a moderate slope. Material suitable for construction of an earth dam was not observed in the area but may be found in the uplands. The floodplain alluvium is probably not suitable for borrow. The site is considered probably feasible, but special attention should be given to solution channels in the dolomite. This site should result in a good small reservoir at a moderately low project cost.

Site 7. A reservoir could be created on Apple River by constructing a dam 1.5 miles east and 3.5 miles south of the village of Apple River. The Apple River is a major stream draining an area of loess-mantled early Paleozoic sediments, including the Niagaran dolomite, the Maquoketa shale, and the Galena dolomite. The hilly uplands have considerable relief, and the depth to bedrock is less than 10 feet. The reservoir area is primarily used for pasture. Light timber and brush cover most of the valley walls. At least two farm residences and associated outbuildings would be inundated. The north-south highways crossing the reservoir area would have to be abandoned in favor of an around-the-lake road system. The stream flows in a 5-foot notch in a floodplain approximately 250 feet wide and 50 to 60 feet below the uplands. The floodplain alluvium consists of 3 feet of dark brown silty sand over 2 feet of coarse sandy gravel, the base of which is not exposed. The valley walls have moderate to steep slopes and are composed of tan to buff dolomite capped by loess. The abutments at the dam site are steeply sloping to vertical bluffs and are composed of tan to buff thick-bedded rugged sandy Galena dolomite which is mantled with light reddish brown sandy loess. Suitable borrow of reddish brown sandy clay is exposed below the loess at a few places in the nearby uplands, but the thickness and extent of this material would have to be investigated to determine whether enough clay is present for the project. The site is considered probably feasible, subject to verification of possible solution channels in the dolomite. The site should make a good deep reservoir at a moderately high project cost.

Site 8. A potential dam site exists on the South Fork of Apple River 4 miles south and 3 miles east of the village of Apple River. The stream drains an area of loess- and drift-mantled early Paleozoic sediments including the Niagaran dolomite, the Maquoketa shale, and the Galena dolomite. The uplands are rolling to hilly with considerable relief, and some mounds rise 200 feet above the general level of the uplands. The depth to bedrock is probably less than 10 feet. The Niagaran dolomite crops out only at the tops of the higher mounds and ridges in the area. Gentle slopes are formed on the Maquoketa shale between the Niagaran and Galena dolomites. The Galena dolomite crops out in the lower portions of the valley walls. The reservoir area is under clean-tilled cultivation or in pasture. Light timber covers the valley walls in the lower reaches. A two-lane gravel road crossing the upper third of the reservoir could be raised, and all other roads would have to be abandoned. At least four residences and associated outbuildings would have to be acquired. The stream flows in a 4-foot notch in a floodplain approximately 500 feet wide and 40 to 50 feet below the uplands. The floodplain alluvium consists of brown sandy silt. The valley walls slope moderately to the uplands and are composed of Galena dolomite capped by brown to light reddish brown clayey sandy loess. The abutments at the dam site are composed primarily of tan to buff thick-bedded rugged sandy Galena dolomite which is capped by tan to light brown sandy loess. The left abutment is a vertical bluff; the right abutment has a moderate slope. Suitable borrow for an earth dam was not observed in the area, but usable till might be available east of the dam site although the quantity is not known. The site is considered feasible, subject to verification to determine the possible presence of solution channels in the dolomite. This should make a good medium-sized reservoir at a moderately high project cost.

Site 9. A reservoir could be developed on Rush Creek by constructing a dam 6.75 miles west and 4.5 miles south of Stockton. Rush Creek is a major stream in central JoDaviess County that drains an area of loess-mantled early Paleozoic sediments. The hilly uplands have considerable relief, and logs of previous borings indicate that depth to bedrock is probably 15 feet or less. The reservoir area is primarily open land under clean-tilled cultivation or in pasture, although light woods cover some of the valley walls. Six residences and associated outbuildings and a two-lane gravel highway would be inundated. The stream is entrenched 6 to 8 feet in a floodplain approximately 0.25 mile wide and 50 to 60 feet below the uplands. The floodplain alluvium consists of brown silty fine sand. The valley walls consist of tan to buff sandy rugged Galena dolomite. The abutments at the dam site are covered with vegetation, but are probably underlain by Galena dolo-

mite. Light brown sandy loess is exposed in the gently sloping right abutment. The site is considered probably feasible, subject to a complete program of test borings and materials testing to determine the nature and sequence of the subsurface materials and the possibility of solution channels in the dolomite. Suitable borrow material was not observed in the area of the dam site so that it might be necessary to consider another type of dam. This site could make a good reservoir at a moderately high to high project cost.

KANE COUNTY

Bedrock is exposed or very close to the surface in the Fox River Valley south of Elgin in the eastern portion of Kane County. East of the Fox River the bedrock surface is dolomite which is well creviced and a dependable source of ground water. West of the river the bedrock surface is shale and dolomite of the Maquoketa formation. Most of Kane County is covered by a thick glacial drift in which sand and gravel deposits are common. Along the Marengo Ridge, and to the east, the drift is at least 200 feet thick and widespread. The preglacial drainage was to the south. However, the northwestern portion of the county now drains northwest and west, and the remainder drains south via the Fox River, which bears no relation to the preglacial drainage. Dam sites are not plentiful in Kane County because of the lack of relief and geologic conditions. The sand and gravel of the glacial material can be so permeable as to allow serious leakage from a reservoir. Glacial till suitable for impervious borrow is usually available in sufficient quantities. The results of two feasibility studies follow.

Site 1. A small reservoir could be created on an unnamed tributary of the Fox River by constructing a dam 1 mile west and 1 mile south of Algonquin. No roads nor residences would be involved. The reservoir area is primarily in pasture and some timber. The relief in the area is about 100 feet. Logs of previous borings indicate approximately 200 feet of unconsolidated glacial material over the limestone bedrock. The stream flows in a notch 2 to 4 feet wide and 2 to 3 feet deep, and does not have a definite floodplain. The moderately steep valley walls rise to a height of about 70. feet. The abutments and the valley walls are underlain by stony clayey till. A sufficient quantity of till suitable for borrow is available in the adjacent uplands. A small farm pond located below the dam site shows no evidence of leakage or siltation. The site appears to be feasible, subject to verification by an adequate program of test borings and materials testing. This site should develop at a moderate project cost.

Site 3. A reservoir could be created on Mill Creek, a tributary of the Fox River, by constructing a dam about 1 mile southwest of Batavia, above Mooseheart Lake. Mill Creek drains part of the gently rolling Marseilles moraine which is underlain by till. The reservoir area is primarily in pasture and some row crops but very little timber. Two farm units, several expensive new homes, two two-lane blacktop roads, three gravel roads, and several service utilities would be inundated. A new north-south blacktop road would have to be relocated to the east, possibly over or below the proposed dam. Logs of previous borings indicate that between 110 and 150 feet of unconsolidated material, mostly glacial, overlies limestone bedrock. The creek flows in a notch 10 to 15 feet wide and 4 to 6 feet deep in a floodplain about 350 feet wide. Both abutments have moderate slopes rising some 40 feet. The right abutment is underlain with till, but the left abutment appears to be underlain by coarse sand and gravel. The floodplain at the dam site is marshy. The moderately sloping valley walls are underlain by till. Sufficient quantities of till suitable for borrow are available in the adjacent uplands. The site is considered probably not feasible, subject to verification with special attention to the gravel in the left abutment that could allow serious leakage. Land acquisition and relocations would make this a high cost project.

Potential Reservoirs in Kane County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Trib. Fox River NE ¼ NW ¼ 4-42N-8E (Crystal Lake Quad)	870	43	774	252	1.2	0.8	54	1,500	552	1.5	0.56	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
3	Mill Creek NE Cor. 29-39N-8E (Aurora North Quad)	705	585	4,680	1,520	26.5	2.2	24	800	102	9	9.09	6.8	5.2	3.9	3.5	3.0	2.4	2.2	1.5

Existing Reservoirs in Kane County

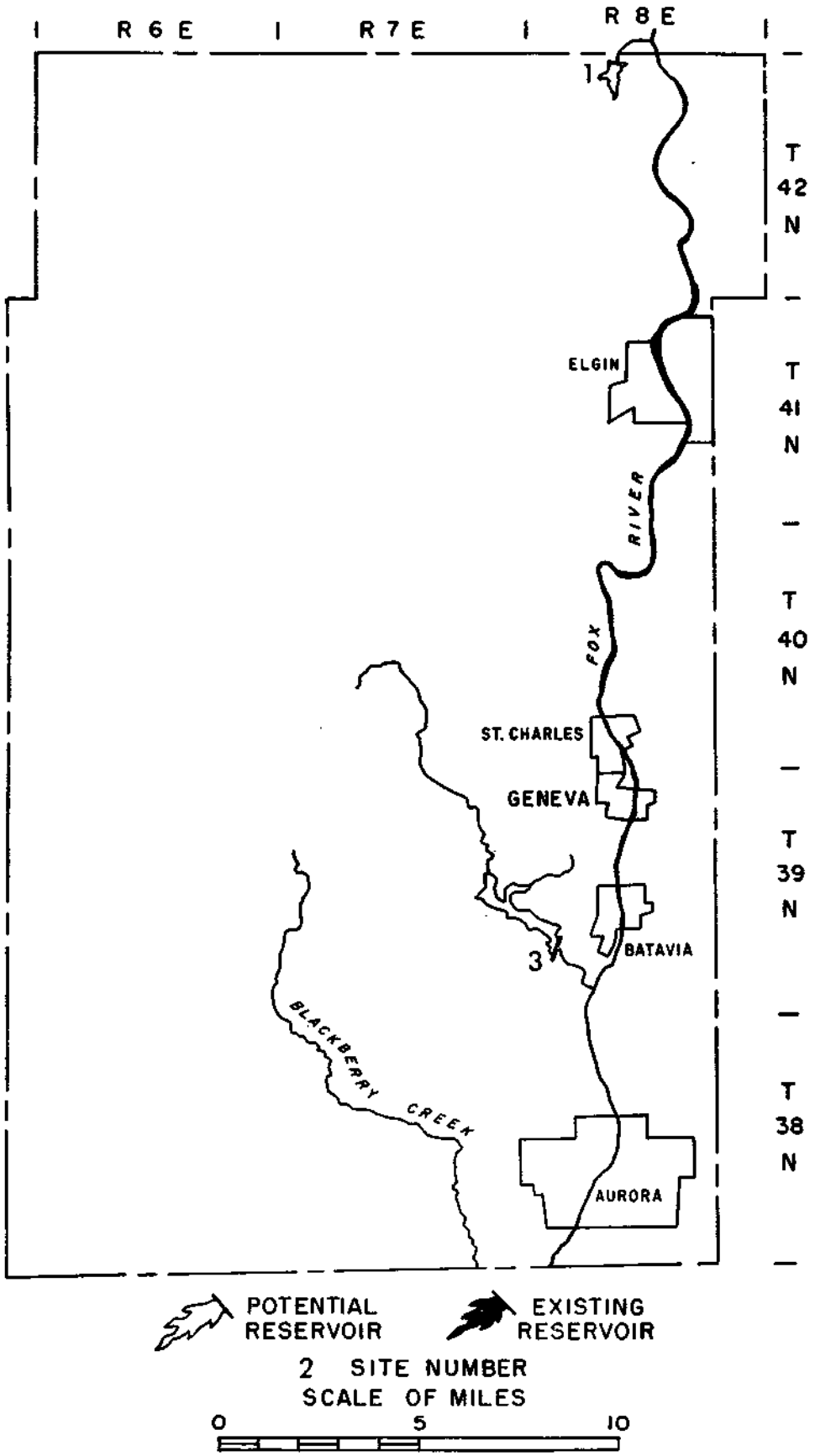
Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Lake Mastodan	26-35-38N-8E (Aurora South Quad)						14.3				Near Aurora
Lake Marian	34-42N-8E (Elgin Quad)						11.6				Near Dundee
Lake Campton	14-15-40N-7E (Geneva Quad)						30.6				Near St. Charles
Mooseheart Lake	28-39N-8E (Aurora North Quad)						19				
Aurora Hunt and Fish							12.2				Near Montgomery
Quarry Lake	SW Cor. 36-41N-8E (Geneva Quad)						6.6				Near Elgin
McNabb Lake	(Elgin Quad)						6				Near Dundee
Lucky 50 Club Lakes	29-38N-8E (Geneva Quad)						41.8				Four lakes near Aurora
St. Charles Boys School Lake	NW ¼ 31-40N-8E (Geneva Quad)						5.6				
	20-42N-8E (Geneva Quad)						10				New subdivision

KENDALL COUNTY

The character of the bedrock underlying Kendall County varies markedly. In most areas north and east of Yorkville and east of Plattville, shale beds 125 to 300 feet thick occur below the glacial drift, and are underlain by dolomite. South of Newark and west of Lisbon, sandstone occurs directly below the drift. Elsewhere in the county, dolomite lies below the glacial drift and is fractured with open cracks and crevices. Surface drainage is to the southwest via the Pox River, but bears little relationship to the preglacial drainage system. The gentle topography of the till plain does not lend itself to the development of reservoirs, and available sites may be subject to leakage through underlying permeable sand and gravel deposits. Sufficient quantities of sandy clayey till, which is probably suitable as impervious borrow material, are usually available in the uplands. The results of two feasibility studies in Kendall County follow.

Site 2. A reservoir site exists on Little Rock Creek, a tributary of the Fox River, with the dam 2 miles south and 1 mile west of Piano, and 1 mile south and 4 miles east of Sandwich. A very small dam was built at this location about 1905. Little Rock Creek drains a part of a till plain between two moraines. The till plain has gently rolling topography, into which the creek has cut a valley 60 to 70 feet deep. Below the existing dam the creek flows in a notch about 10 feet wide and 6 feet deep in a floodplain approximately 500 feet wide. The reservoir area is in poor grade timber and is bounded by moderately steep to very steep slopes. A gravel township road crossing the reservoir site east of Sandwich could be abandoned. The Chicago, Burlington, and Quincy Railroad fill would have to be stabilized or raised, and U. S. Route 34 would have to be raised. Several new homes would be close to the shoreline and might require new access roads. Logs of previons borings in the area show 63 to 156 feet of unconsolidated glacial material over limestone, shale, and sandstone bedrock. Both abutments have very steep slopes rising 60 feet to the uplands. The left abutment is underlain by sandy clayey till which has zones of gravelly ma-

KANE COUNTY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terial. The base of the right abutment is underlain by gravelly material, and the upper slope appears to be underlain by sandy clayey till. Sufficient quantities of sandy clayey till suitable for borrow would be available in the adjacent uplands. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing. This site should develop at a moderately high project cost.

Site 4. A small reservoir could be created on an intermittent tributary of the Fox River by constructing a dam 1.5 miles east of Yorkville. The watershed is gently rolling, and the reservoir area is heavily wooded. No residences nor roads would be involved. Access to the area would be by Illinois Route 71 about 0.5 mile to the south. Logs of previous borings indicate 53 to 85 feet of unconsolidated glacial material over shale and limestone bedrock. The right abutment has moderately steep slopes rising 60 feet to the uplands. Approximately 20 feet above the bottom of the valley there is a terrace-like bench on the right abutment. The surface of this bench and the slope below it are very marshy, and are underlain by black wet organically rich sandy clayey material. Sandy clayey till underlies the valley slopes above the bench. The till and marshy material have a sharp contact at the upper or inner edge of the bench. Sufficient quantities of till suitable as borrow would be available in the adjacent uplands. Because both abutments have ground water discharge areas where considerable seepage occurs, the valley walls are considered unsuitable for abutment foundations. This site is considered probably not feasible pending a complete program of test borings and materials testing.

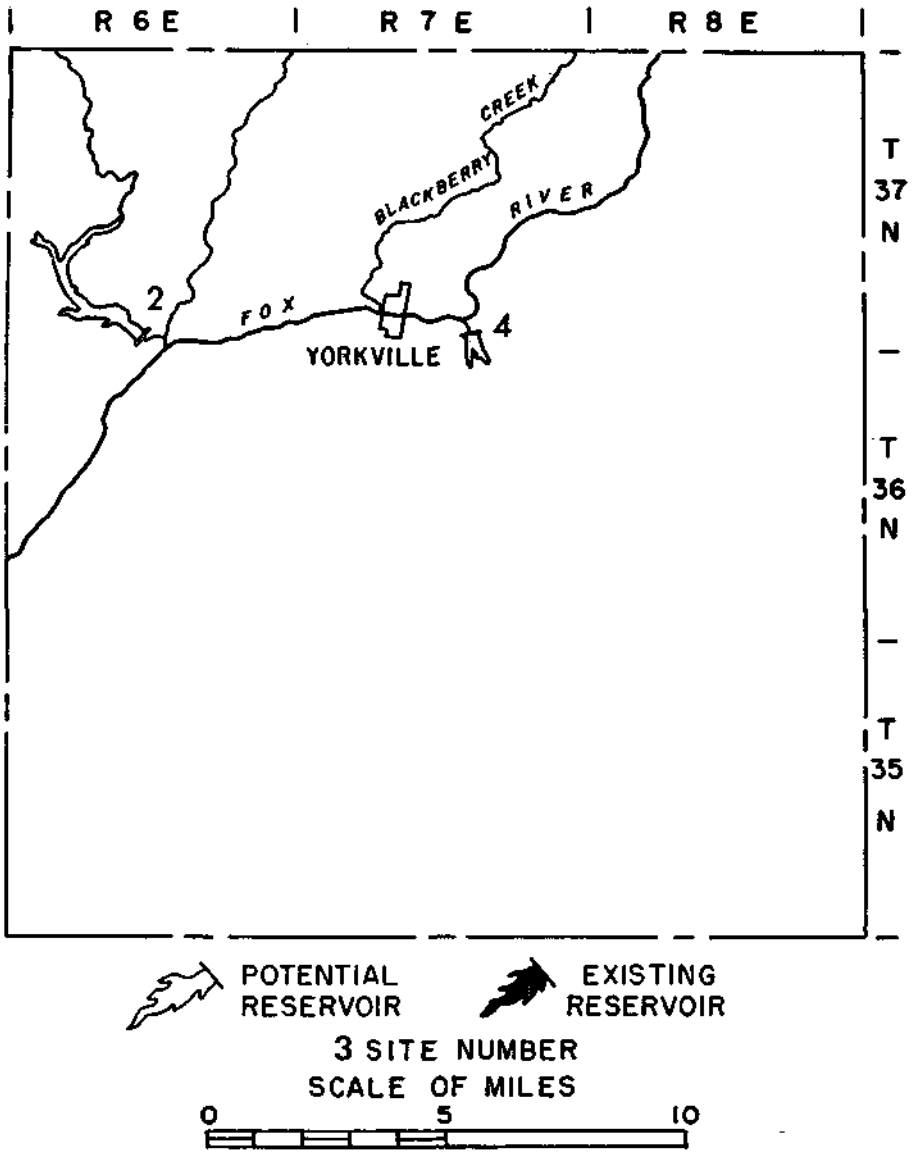
Potential Reservoirs in Kendall County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity 5 Yr	10 Yr	25 Yr	40 Yr	Half capacity 5 Yr	10 Yr	25 Yr	40 Yr
2	Little Rock Creek Ctr. SE ¼ 33-37N-6E (Sandwich Quad)	630	345	5,750	1,740	34.0	2.0	50	1,000	474	7	14.18	12.6	10.4	8.6	8.1	8.4	7.6	6.2	5.6
4	Trib. Fox River Ctr. 34-37N-7E (Yorkville Quad)	635	50	915	298	1.8	0.9	55	600	232	1.5	0.71	0.7	0.7	0.6	0.6	0.6	0.5	0.4	0.4

Existing Reservoirs in Kendall County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Lake Plano	W ½ SW ¼ 24-37N-6E (Sandwich Quad)						10				
	SE ¼ 33-37N-6E (Sandwich Quad)						25				

KENDALL COUNTY



LAKE COUNTY

The bedrock underlying Lake County is dolomite of the Silurian system that has a regional eastward dip averaging about 15 feet per mile. The bedrock is overlain with glacial drift, primarily till, that reaches a depth of over 200 feet in the western portion of the county. Prominent ridges, called moraines, parallel Lake Michigan and are composed of glacial till which consists of mixed clay, silt, sand, pebbles, and boulders that were deposited along the front of a melting glacier. The eastern third of Lake County drains to Lake Michigan and the Chicago River; the middle third of the county drains south via the Des Plaines River; and the western third drains south through the Fox River. The glacial till is probably suitable material for use as impervious borrow.

Although natural lakes abound in the northwestern portion of Lake County, potential reservoir sites are limited because of the gently rolling topography. The results of three feasibility studies follow.

Site 2. A small reservoir could be created on a tributary of the Des Plaines River by constructing a dam 4 miles north of Libertyville. The stream drains a part of the backslope of the Tinley moraine. The topography is gently rolling, and relief ranges from 60 to 100 feet. The reservoir area is mostly in pasture but elevated portions are cultivated. No residences would

be involved in the development, but two township roads would have to be raised. The stream flows in a notch 6 to 8 feet wide and 3 to 4 feet deep in a floodplain about 300 to 400 feet wide. The floodplain is underlain by sandy clayey silty alluvium with occasional large boulders. The moderately sloping valley walls and the steeply sloping abutments are underlain with till. Logs of previous borings in the area indicate that about 200 feet of glacial material, primarily till, overlies the limestone bedrock. The site is considered feasible, subject to verification. Sufficient quantities of till suitable for use as borrow would be available in the adjacent uplands. This site should develop at a normal project cost.

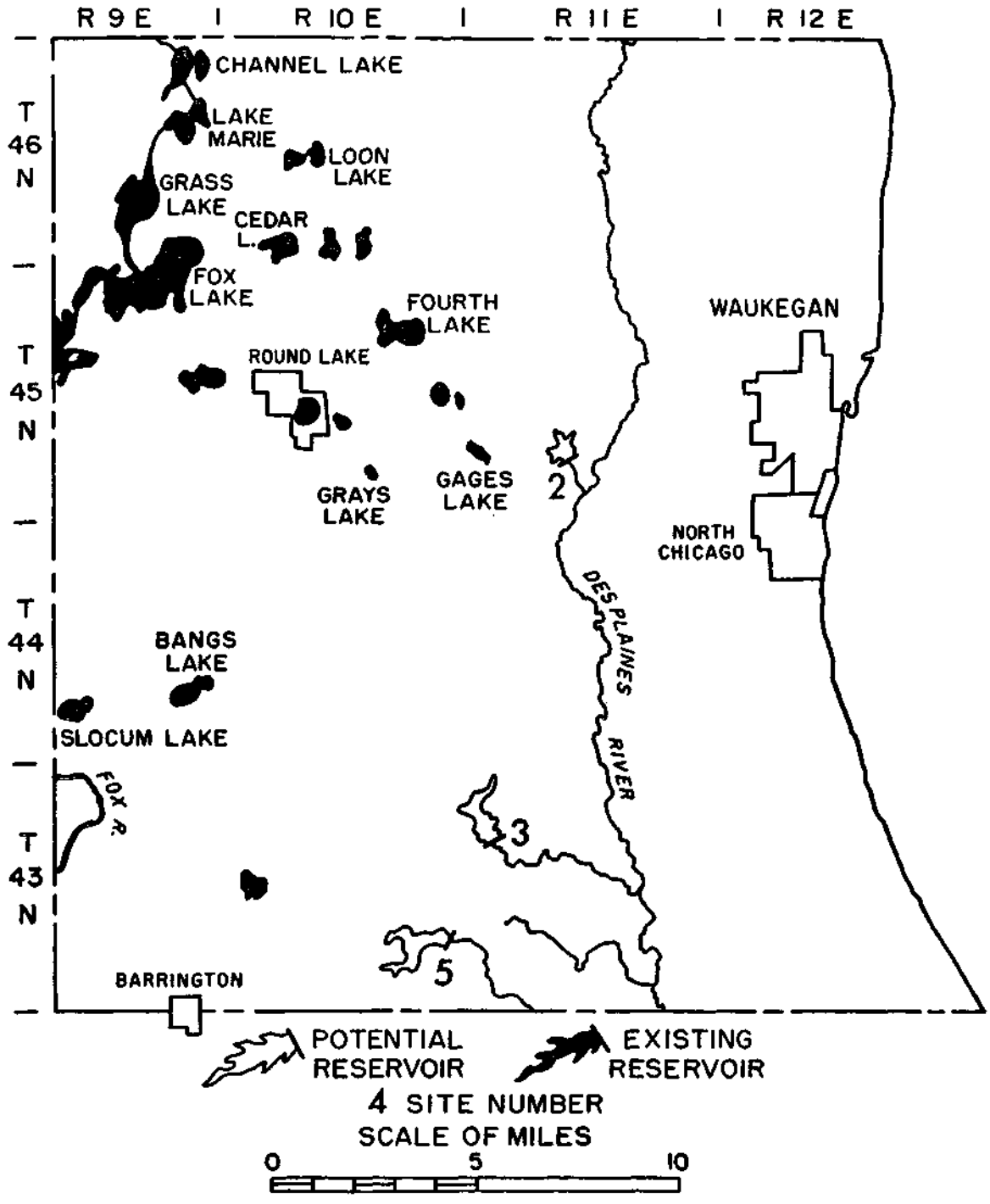
Site 3. A reservoir could be developed on Indian Creek, a tributary of the Des Plaines River, by constructing a dam about 2.5 miles south of Mundelein. The gently rolling topography in this area has relief ranging from 35 to 55 feet. Indian Creek flows in a channel 8 to 10 feet wide and 4 to 5 feet deep in a floodplain approximately 1400 feet wide. The reservoir area contains parts of a golf course, horse farm, research farm, and about a mile of Illinois Route 83. U. S. Route 45 crosses the northeastern end of the area but would not be affected. Logs of previous borings in the area indicate that 160 to 235 feet of unconsolidated material, largely glacial, overlies the limestone bedrock. Several small water-filled gravel pits exist in the floodplain about 3 miles north of the dam site, and a peat and muck area is present about 0.5 mile north. The valley walls and the abutments at the dam site have gentle slopes, and the scattered cobbles and boulders in adjacent fields suggest that the abutments are underlain by till. Sufficient quantities of till suitable for an impervious embankment could be obtained from the adjacent uplands. The site is considered probably feasible geologically, subject to a complete program of testing and borings. The site would result in a high project cost because of expensive relocations and land acquisition costs.

Site 5. A small reservoir could be developed on Buffalo Creek, a tributary of the Des Plaines River, by constructing a dam about 5 miles south of Mundelein. The creek drains a gently rolling area underlain by the Valparaiso ground moraine. Most of the reservoir area is swampy, and a portion has been subdivided but not developed. Several residences, access roads, and utilities would be inundated and require relocation. Buffalo Creek flows in a notch 3 to 4 feet deep and 6 to 10 feet wide in a floodplain about 200 feet wide. Relief in the area ranges from 40 to 80 feet. Logs of previous borings indicate limestone bedrock is overlain by 170 to 190 feet of unconsolidated material, mostly of glacial origin. The valley walls and the abutments at the dam site appear to be underlain by silty clayey till that contains little coarse material. Sufficient quantities of clayey till suitable for impervious borrow material could be obtained in the adjacent uplands. The site is considered feasible, subject to verification by a complete program of test borings and materials testing. This site should result in a small reservoir with a long shoreline, but at a high project cost.

Potential Reservoirs in Lake County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity 5 Yr	10 Yr	25 Yr	40 Yr	Half capacity 5 Yr	10 Yr	25 Yr	40 Yr
2	Trib. Des Plaines River W ½ SE ¼ 28-45N-11E (Libertyville Quad)	710	165	1,870	609	3.7	0.9	34	1,200	240	3.5	1.46	1.4	1.3	0.9	0.8	1.0	0.7	0.5	0.5
3	Indian Creek SE ¼ 7-43N-11E (Wheeling Quad)	720	470	4,385	1,430	18.6	1.8	28	2,050	334	6	7.23	5.5	3.8	3.4	3.0	2.6	1.8	1.7	1.2
5	Buffalo Creek S ½ NE ¼ 25-43N-10E (Lake Zurich Quad)	745	560	5,970	1,945	7.4	0.5	32	500	93	7	2.88	2.5	2.4	2.3	2.3	2.4	1.7	1.5	1.4

LAKE COUNTY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GAGES LAKE
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Existing Reservoirs in Lake County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Gages Lake	NW ¼ 30-45N-11E (Grays Lake Quad)	Public					140				
Butlers Lake	SE ¼ 17-44N-11E (Waukegan Quad)	Public					65				
Deer Lake	NW ¼ 11-46N-10E (Grays Lake Quad)	Club					42				
Cross Lake	SE ¼ 5-46N-10E (Grays Lake Quad)	Public					86				
Silver Lake	N ½ 16-46N-10E (Grays Lake Quad)	Public					41				
Lake Catherine	N ½ 12-46N-9E (Grays Lake Quad)	Public					145				
Channel Lake	11-12-46N-9E (Grays Lake Quad)	Public					320				
Lake Marie	13-14-24-46N-9E (Grays Lake Quad)	Public					455				
Huntley Lake	NE ¼ 23-46N-10E (Grays Lake Quad)	Association					25				
West Loon Lake	20-21-46N-10E (Grays Lake Quad)	Public					164				
East Loon Lake (Antioch Lake)	21-46N-10E (Grays Lake Quad)	Association					166				
Buff Lake	N ½ 24-46N-9E (Grays Lake Quad)	Public					65				
Grass Lake	14-15-22-23-26-27-34-35-46N-9E (Grays Lake Quad)	Public					1,360				
Dunns Lake	33-46N-9E (Grays Lake Quad)	Public					60				
Petite Lake	S ½ 25-46N-9E (Grays Lake Quad)	Public					155				
Cedar Lake	32-33-46N-10E (Grays Lake Quad)	Public					320				
Deep Lake	33-46N-10E (Grays Lake Quad)	Public					200				
Crooked Lake	34-46N-10E (Grays Lake Quad)	Public					130				
Hastings Lake	NW ¼ 35-10E (Grays Lake Quad)	YMCA					65				
Sand Lake	2-3-45N-10E (Grays Lake Quad)	Public					115				
Slough Lake	SE ¼ 3-45N-10E (Grays Lake Quad)	Private					30				
Fourth Lake	10-12-45N-10E (Grays Lake Quad)	Public					440				
Fox Lake	35-36-46N-9E, 1-5-10-12-45N-9E (Grays Lake Quad)	Public					1,670				
Pistakee Lake	9-16-45N-9E (Grays Lake Quad)	Public					1,550				
Redhead Lake	SE ¼ 16-45N-9E (Grays Lake Quad)	Public					45				
Ducks Lake	SW ¼ 14-45N-9E (Grays Lake Quad)	Public					65				
Long Lake	13-24-45N-9E 8-45N-10E (Grays Lake Quad)	Public					335				
Big Hollow Brandenburg Lake	SE ¼ 21-45N-9E (Grays Lake Quad)	Association					51				
Wooster Lake	Ctr. 23-45N-9E (Grays Lake Quad)	Public					95				
Mud Lake	SE ¼ 24-45N-9E (Grays Lake Quad)	Private					14				
Round Lake	W ½ 21-45N-10E (Grays Lake Quad)	Public					215				
Taylor Lake	21-22-45N-10E (Grays Lake Quad)	Public					110				
Third Lake	13-24-45N-10E (Grays Lake Quad)	Public					157				
Druce Lake	24-45N-10E 19-45N-11E (Grays Lake Quad)	Public					80				
Grays Lake	27-34-45N-10E (Grays Lake Quad)	Public					65				
Cranberry Lake	NE ¼ 28-45N-10E (Grays Lake Quad)	Private					17				
Fish Lake	W ½ 35-45N-9E (Grays Lake Quad)	Public					85				
Sullivan Lake	28-33-45N-9E (Grays Lake Quad)	Club					45				
Slocum Lake	S ½ 28-44N-9E (Grays Lake Quad)	Public					225				

Existing Reservoirs in Lake County (Concluded)

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Bangs Lake	24-26-44N-9E (Grays Lake Quad)	Public					297				
Davis Lake	E ½ 29-44N-10E (Grays Lake Quad)	Private					12				
Schreiber Lake	SE ¼ 29-44N-10E (Grays Lake Quad)	Private					8				
Diamond Lake	36-44N-10E (Grays Lake Quad)	Public					120				
Grassy Lake	NE ¼ 14-43N-9E (Barrington Quad)	Association					50				
Honey Lake	S ½ 13-43N-9E (Barrington Quad)	Association					50				
Lake Zurich	17-20-43N-10E (Barrington Quad)	Public					228				
Tower Lake	2-43N-9E (Barrington Quad)	Association					70				
Timber Lake	1-43N-9E (Barrington Quad)	Association					31				
Lake Barrington	11-43N-9E (Barrington Quad)	Association									
Sylvan Lake	SE ¼ 34-44N-10E (Lake Zurich Quad)	Association					30				
Countryside Lake	W ½ 35-44N-10E (Lake Zurich Quad)	Association					200				
Echo Lake	NE ¼ 17-43N-10E (Lake Zurich Quad)	Association					25				
Forest Lake	S ½ 10-43N-10E (Lake Zurich Quad)	Association					60				
Lake Germaine	Ctr. 10-43N-10E (Lake Zurich Quad)										
Lake Forest Academy	SW ¼ 36-44N-11E (Wheeling Quad)						22				
Nippersink Lake	3-4-45N-9E (Grays Lake Quad)						450				
Indian Lake	11-43N-9E (Barrington Quad)						85				

LA SALLE COUNTY

Bedrock valleys in LaSalle County include the ancient Ticona across the southern half and the lower Rock Valley along the northwestern corner. The LaSalle Anticline which crosses the western half of the county does not create surface variations except in the Illinois River Valley where the amount of overflow land is sharply reduced to the east of the anticline and sandstone is exposed in several locations. Another feature of the bedrock formation is the Sandwich Fault Zone which passes very close to the northeastern corner of the county. Sand and gravel beds are found almost everywhere in LaSalle County except along the Illinois River bluffs. The deep sands and gravels that occur throughout the buried Ticona Valley and in the northwestern corner of the county are generally overlain by 100 feet of glacial till. Loessial deposits occur throughout the county with depths ranging from 2 to 10 feet. The entire county lies within the Illinois River Basin, and the Fox River to the north and the Vermilion River to the south are the major tributaries.

Nine potential reservoir sites were studied in LaSalle County, and the results of these studies follow.

Site 1. A small reservoir could be developed on a tributary of Vermilion Creek about 3 miles east of Mendota. One gravel road across the dam site would provide excellent construction access and could be relocated downstream. U. S. Route 34 touches the upper end of the site. Cover in the lake area consists of half pasture and half row crops, with scattered trees along the creek. The floodplain is covered with brown sandy clayey silt, but the abutments appear to be till. Geologic conditions indicate that the site is feasible. Sufficient quantities of till for the earth fill would be available in the nearby uplands. This site should develop at a moderate project cost.

Site 2. A fairly large reservoir could be developed on Somonauk Creek with the dam site about 4 miles south and 3 miles west of Sandwich. The water surface would extend north to U. S. Route 34. Two gravel roads crossing the site could be abandoned and a new road constructed over or downstream from the structure. At least six residences would be inundated. The wider portions of the potential lake bed are cultivated, the

narrows are in pasture and scattered timber, and the valley walls are in timber. The watershed is generally rolling, well drained, and in clean-tilled cultivation. The valley walls are composed of a brown silty sandy stony clay till that would probably be suitable for the earth fill. The site is classified as probably feasible geologically, but the extent of silty sand lenses in the valley walls is not known.

Site 3. A small reservoir site exists on Mission Creek about 2 miles southeast of Sheridan. No roads nor residences would be involved in this development. Cover in the lake area is pasture and scattered timber. The watershed is gently rolling and under cultivation. Although this site is good topographically, the geologic conditions are not favorable. St. Peter sandstone overlain by till probably occurs throughout most of the proposed lake area. An extensive program of test borings would be required to determine if the till blanket would prevent leakage, and permeability of the sandstone also would have to be determined. If the site should prove feasible geologically, it would make an excellent small reservoir at a low project cost.

Site 4. A potential reservoir site exists on Buck Creek near Wedron. The watershed is very gently rolling and under cultivation. At least four fairly new residences and two township roads would be inundated. Some shaping would probably be required in the upper reaches to control shallow water areas. Porous St. Peter

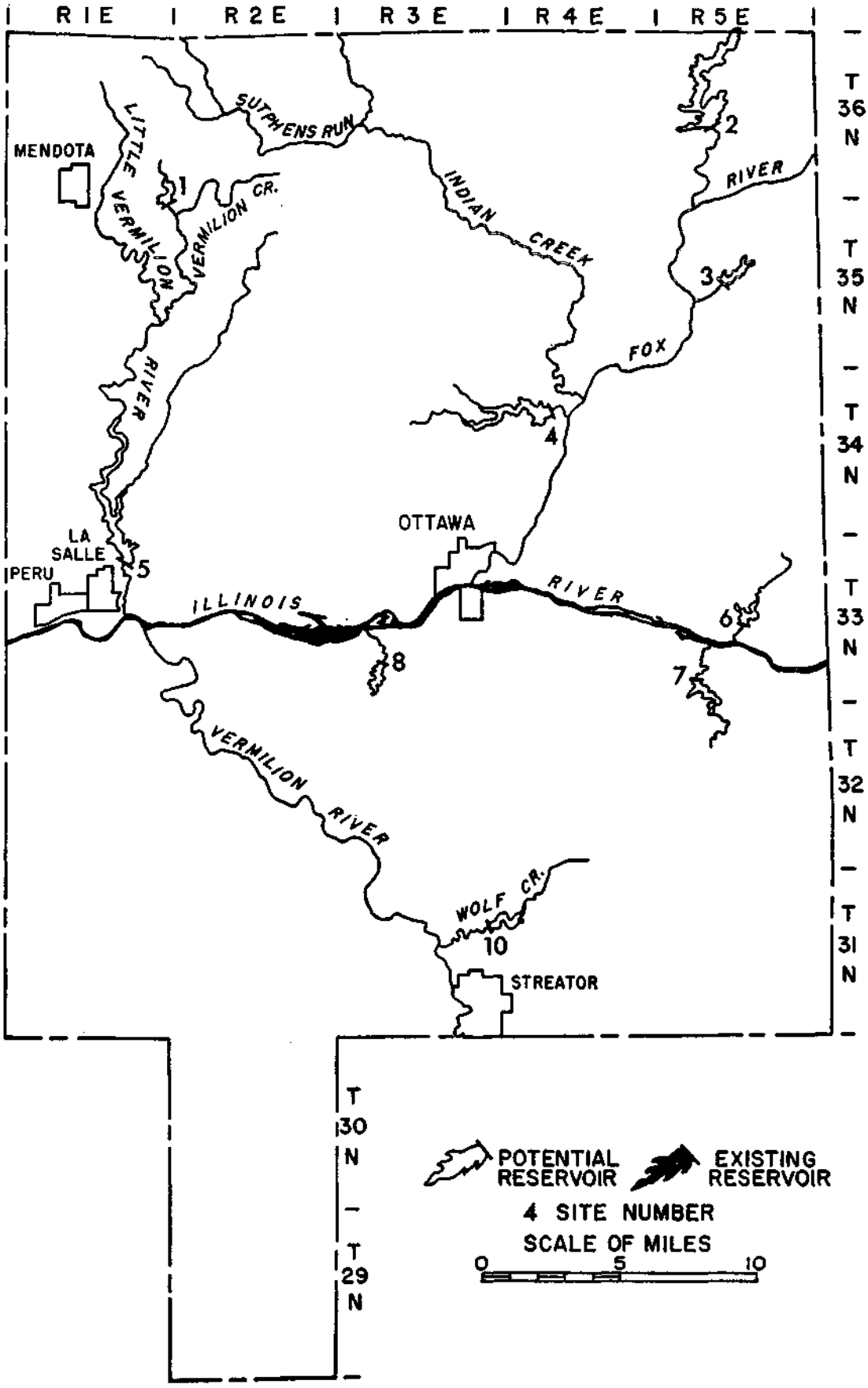
Potential Reservoirs in LaSalle County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Trib. Vermilion Creek SE ¼ 36-36N-1E (Mendota Quad)	690	173	1,400	500	4.7	0.8	25	1,300	178	6	1.05	1.0	0.9	0.7	0.6	0.7	0.5	0.4	0.3
2	Somonauk Creek NW ¼ 21-36N-5E (Sandwich Quad)	640	992	17,500	5,700	72.4	1.0	53	950	368	35	16.13	15.8	12.6	10.7	10.0	11.0	7.6	6.2	5.6
3	Mission Creek S ½ 16-35N-5E (Sandwich Quad)	610	192	8,260	2,690	9.9	0.3	43	700	196	7	2.21	2.2	2.2	2.2	2.2	2.1	2.1	1.7	1.6
4	Buck Creek SE ¼ 8-34N-4E (Ottawa Quad)	600	454	11,500	3,700	37.9	0.8	76	700	447	15	8.45	8.3	7.5	6.1	5.9	6.7	4.6	3.9	3.6
5	Little Vermilion River NW ¼ 11-33N-1E (LaSalle Quad)	590	698	20,900	6,800	123.0	1.5	90	700	587	38	27.41	24.1	16.6	14.3	13.4	14.7	10.4	8.3	7.7
6	North Kickapoo Creek NE ¼ 21-33N-5E (Marseilles Quad)	560	128	2,100	700	7.2	0.8	50	700	232	6	1.60	1.6	1.4	1.1	1.0	1.2	0.8	0.7	0.6
7	South Kickapoo Creek NW ¼ 32-33N-5E (Marseilles Quad)	600	218	4,200	1,400	8.6	1.5	58	900	415	7	5.80	5.7	4.7	3.0	2.8	3.5	2.5	2.1	1.9
8	Trib. Illinois River Ctr. 29-33N-3E (Ottawa Quad)	580	105	2,450	798	5.2	1.0	70	650	387	5	1.96	1.9	1.7	1.5	1.3	1.5	1.2	1.0	0.9
10	Wolf Creek NE ¼ 13-31N-3E (Streator Quad)	620	166	1,700	600	15.0	3.7	30	800	136	7	5.66	2.8	2.4	1.9	1.5	1.3	1.1	0.9	0.9

Existing Reservoirs in LaSalle County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Lake Mendota	SE ¼ 29-36N-1E (Mendota Quad)	Mendota (C)	2.36	1510		15	18				Recreation
Two By-Pass Ponds	SE ¼ 27-36N-1E (Mendota Quad)	California Packing Co.				5	27				Sediment basins
Sheridan Rod & Gun Club	W ½ 5-35N-5E (Sandwich Quad)	Sheridan Rod & Gun Club				30	22				Old gravel pit
Two Ponds	E ½ 15-33N-3E (Ottawa Quad)	Libbey, Owens, Ford				12	24				Silting basins
Huse Lake	21-22-33N-1E (LaSalle Quad)	Gus Engelhaupt				5	19				Leased for ducks
Matthiessen Park Lake	W ½ 29-33N-2E (LaSalle Quad)	Deer Park Land Trust	1.23	790		30	8				Private club
Ottawa Silica Co. Quarries	S ½ 18-33N-3E (Ottawa Quad)	Ottawa Silica Co.				16	113				Recreation
Marquette Lakes Fishing Club	N ½ 22-23-33N-1E (LaSalle Quad)	Marquette Cement Co.				20	12				Recreation
Seneca Rod & Gun Club	S ½ 26-33N-5E (Marseilles Quad)	Rivers Industries				30	9				Recreation

LA SALLE COUNTY



sandstone underlies the area and is exposed in the abutments. Leakage through this formation would probably be excessive. The site is considered probably not feasible geologically, subject to verification by a complete program of test borings. If the borings prove the site to be feasible, it should develop at a moderately high project cost.

Site 5. A large potential reservoir site exists on the Little Vermilion River. The water surface would extend about 1 mile north of LaSalle and 1 mile south of Troy Grove. Although topographically feasible, geologic conditions at this site are unfavorable because of the existence of porous sandstone in the valley walls and possibly under the proposed lake bed. Leakage through this formation would probably make this an unfeasible site, but test borings would be required before a final decision could be made. The Interstate Route 80 crossing and shallow water problems in the upper reaches also would require further study. The proximity of the site to population centers should justify consideration despite these problems.

Site 6. A small reservoir could be developed on North Kickapoo Creek about 2 miles east of Marseilles. No roads would be involved, and only one residence would be inundated. Cover in the site area consists of brush and timber. The watershed, which is sloping and would drain quickly, is mostly in pasture, and timbered uplands near the proposed lake would provide excellent park and camping areas. Although the site is classified as probably feasible geologically, test borings would be required to determine the nature and extent of shale and sandstone which underlie the silty till material in this area and make up the lower 20 feet of the abutments. The silty till common to the uplands occurs in sufficient quantity for an earth fill. This site should develop at a low project cost.

Site 7. A reservoir could be developed on South Kickapoo Creek 2 miles south and 1 mile east of Marseilles. Cover in the lake area consists of pasture with scattered timber on the downstream half, and timber on the remaining portion. No roads nor residences would be involved. Access to the lake area proper is poor although there are blacktop roads nearby. About a fourth of the watershed is flat cultivated uplands and the rest fairly fast draining slopes. The abutments are basically a stony clay till that is both suitable and adequate for an earth fill. Clayey silt of variable thickness overlies the till. The site is considered probably feasible geologically, the only major question being the extent of gravel beds at the base of the stream channel. This site should develop at a moderate project cost.

Site 8. A small deep lake could be developed on a tributary of the Illinois River about 3 miles south and 3 miles west of Ottawa. Access to the area is provided by a blacktop road which passes within 0.5 mile of the proposed lake. Proximity of the site to Starved Rock State Park makes this a desirable location. No roads nor residences would be inundated. The land in the lake area is idle although extensive clearing would be required. The abutments and valley walls are composed of St. Peter sandstone overlain by shales that are overlain by clayey silts. The clayey silt material is probably suitable for the earth fill and occurs in sufficient quantity on the uplands. Geologically, the site is classified as probably feasible. A program of test borings would be required to determine the nature and thickness of cover over the porous sandstone at the dam site and in the reservoir area. This site should develop at a low project cost.

Site 10. A potential reservoir site exists on "Wolf Creek about 2 miles north of Streator near the abandoned Illinois Traction crossing. A two-lane gravel road crossing the site could be abandoned or relocated over the structure. One other dirt road along the southern edge of the site could be improved. No residences would be inundated by the development, but one is close to the proposed shoreline. The watershed is circular, its extremities sloping to rather flat uplands which are under clean-tilled cultivation. Most of the lake area is in pasture. The abutments and valley walls consist of glacial till, but a 3-foot lens of brown sandy fine-to-medium gravel is exposed high on the left abutment. Test borings would be required to search for other gravel deposits and to determine the depth of alluvium in the floodplain. The site is considered probably feasible geologically. This site should develop at a moderate project cost.

LEE COUNTY

The bedrock surface of Lee County has several ancient valleys, the largest being the lower Rock Valley in the southeastern corner. This valley was filled with highly permeable material at depths of 200 to 300 feet by the Illinoian and possibly older glaciations. The Wisconsinan, the most recent glaciation, nearly covered the southeastern half of the county, where its effects can be seen in the outer and inner ridges of the Bloomington moraine. Shallow sand and gravel deposits are common in the southwestern part of the county and northeast along the Green River, roughly concentric with the outer ridge of the Bloomington moraine. Glacial drift is about 100 feet thicker in the Wisconsinan glacial area than in the Illinoian to the northwest. The Illinoian drift is only 3 or 4 feet thick in a small area north of the Rock River. Most drainage is provided by the Rock River in the northwestern portion of the county, the Green River in the central portion, and Bureau Creek in the southeast. Much of the Green River Basin is low lying and artificially drained. The results of two feasibility studies in Lee County follow.

Site 1. A potential reservoir site exists on Franklin Creek with the dam about 4 miles northwest of Franklin Grove in a very narrow portion of an otherwise broad valley. The watershed exhibits very gently rolling uplands about 100 feet higher than the creek bed. The valley is wide with long moderately steep slopes and a rolling irregular floodplain. Franklin Grove lies within the watershed and is probably introducing some degree of pollution into the stream. Cover in the lake area appears to be about half pasture and half row crops, and there is some timber on the creek banks and steeper valley walls. One township road could be abandoned or placed over the structure and another relocated upstream. One residence would have to be acquired. The bedrock is covered by an irregular blanket of glacial till overlain by loess. Geologic conditions at the site are poor with permeable, poorly cemented, cross-bedded sandstone forming the abutments and probably the foundation. Some jointing is present and the rock is thinly bedded near the top. Sufficient quantities of suitable borrow may not be available in the immediate vicinity of the dam site although it should be found within a few miles. A final determination of feasibility would have to be based on pressure tests of the sandstone and test borings to determine the nature of the foundation and to locate a source of borrow. This site should develop at a moderately high project cost.

Site 2. A small site could be developed on Fourmile Grove Creek 4.5 miles south and 2 miles east of Compton. The stream is bordered by moderately steep valley walls and rolling uplands of the Cropsey moraine. No roads nor residences would be involved. Bedrock is about 100 feet deep and should not be encountered. Glacial till forms the abutments and foundation, although it is obscured on the uplands by loess and in the valley bottom by clayey silt and terrace remnants. Good quality till for the earth fill should be readily available from the nearby uplands. Although some sand and gravel outwash deposits are possible in this area, a preliminary report indicates that geologic conditions are favorable. This site should result in a good small reservoir at a low project cost.

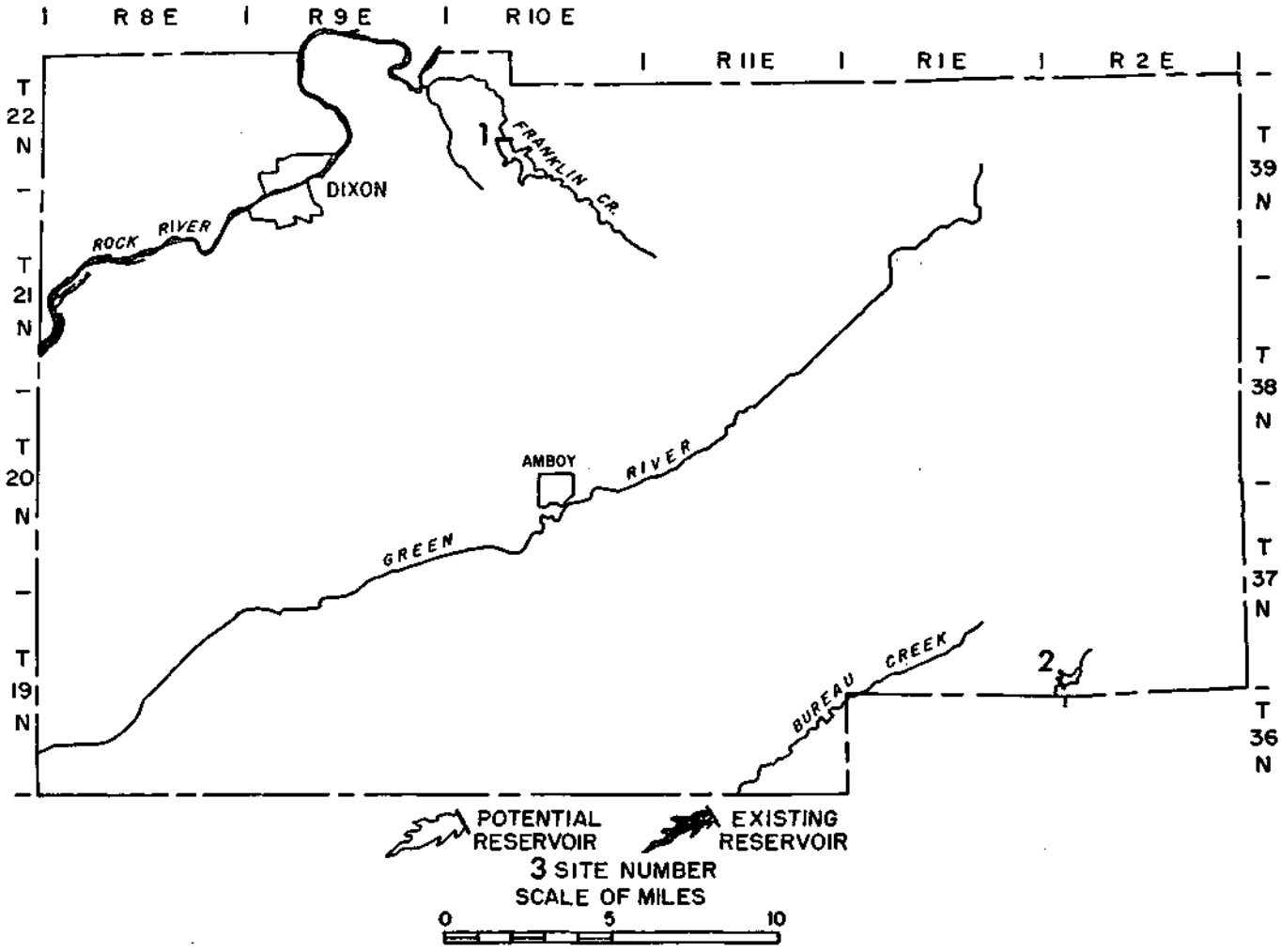
Potential Reservoirs in Lee County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Franklin Creek SE ¼ 20-22N-10E (Dixon Quad)	720	691	10,800	3,500	32.1	1.3	47	1,000	329	12	12.29	12.3	9.7	8.0	8.0	8.8	6.8	5.0	4.7
2	Fourmile Grove Creek SW ¼ 3-37N-2E (Mendota Quad)	850	85	935	304	2.5	1.2	33	600	105	2	0.54	0.6	0.4	0.4	0.3	0.3	0.2	0.2	0.1

Existing Reservoirs in Lee County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Leake Lake	17-20-20N-11E (Amboy Quad)		0.56	360		6	20	60	19.5	2.0	Dugout
McCracken Pond	S½ 12-20N-10E (Amboy Quad)		0.03	20		4	5				Dugout
Lyon Lakes	NE ¼ 31-20N-11E (Amboy Quad)		0.09	60			6	24	7.8	4.9	Three ponds
Powers Pit	E ½ 30-20N-10E (Amboy Quad)						15				Gravel pit
Meyers Pit	SE ¼ 25-20N-9E (Amboy Quad)						12				Gravel pit
Armstrong Gun Club	SE ¼ 10-19N-10E (Amboy Quad)		0.08	50		12	18	72	23.5	16.8	
Schermerhorn Lake	NW ¼ 13-20N-11E (Mendota Quad)		0.06	40		8	8				
Choan Lake	SW ¼ 13-20N-11E (Mendota Quad)		0.06	40			5				
Thier Pond	NE ¼ 35-20N-11E (Mendota Quad)		0.16	100		10	9	48	15.6	5.6	
Knitsch Pond	NW ¼ 2-37N-2E (Earlville Quad)		0.03	20		7	7				
Big Lake							22				
Amboy Spts. Club							8				
Island Slough							30				
Nelson Spts. Club						15	18.4				Gravel pit
Pine Lake Club							46				

LEE COUNTY



MC HENRY COUNTY

The bedrock underlying McHenry County is a limestone-like rock called dolomite. The overlying glacial drift varies from 50 feet in the southwestern corner of the county to over 175 feet in the eastern portion. Shale beds are found below the drift along the western edge of the county. The maximum local bedrock relief is in the northwestern corner where the difference in elevation is about 370 feet within 7 miles. There is little relation between the underlying strata and the surface drainage which is to the south via the Fox Eiver in the eastern half of the county and to the west via the Kishwaukee River in the western half. Till suitable for relatively impervious borrow material can usually be obtained from the uplands. The feasibility of a reservoir site in McHenry County depends upon the amount of leakage through porous sand and gravel in the alluvium or in terraced areas along valley walls, and an adequate program of test borings and materials testing is required.

Five potential reservoir sites were studied in McHenry County, and the results of these studies follow.

Site 2. A large reservoir could be developed by the construction of a dam across Nippersink Creek about 2 miles west of Hebron. The watershed uplands have relief of 50 to 75 feet and drain a part of the backslope of the West Chicago moraine. The creek valley becomes very broad and flat upstream from the dam site. The reservoir area is extensively tiled and under cultivation. Several township roads would be inundated. Logs of previous borings indicate glacial deposits range from 200 to 335 feet thick. The stream flows in a bed about 5 feet deep and 6 to 8 feet wide in a floodplain about 300 feet wide. At the dam site about 3 feet of black clayey silt overlies coarse sandy gravel of undetermined thickness. Moderate to steep sloping abutments are composed of clayey sandy gravelly till containing some large boulders. The reservoir area is composed of sand,

gravel, clayey sand, and peaty material. The northern and southern valley walls have moderate to steep slopes and are composed of till similar to that found at the dam site. The eastern side of the valley wall is a flat terrace-like area rising slightly above elevation 950 feet. Gravel deposits exist north and east of the terrace area, and if these extend through the terrace, they could provide an avenue for leakage from the reservoir. There is a sufficient quantity of till in the uplands to construct the dam and necessary saddle dams. The site is considered probably not feasible geologically because of possible leakage through porous sand and gravel in the alluvium and the terraced area. Land acquisition and construction costs would make this a high cost project.

Site 3. A reservoir site could be developed by constructing a dam across a narrow tributary on the south side of Nippersink Creek about 4 miles northwest of Fox Lake. A two-lane blacktop road and one farm residence would be inundated. Relocations would be minor. The cover in the reservoir area is generally pasture with a few patches of light timber. The abutments have moderately steep to steep slopes. A gravel pit in the left abutment shows interbedded sands, gravels, and tills typical of kame terrace deposits. A gravel pit exists in the reservoir area about 0.75 mile upstream from the dam site. Sufficient quantities of till suitable for borrow material would be available in the uplands. The site is considered not feasible because of the possibility of serious leakage through the permeable sand and gravel both in the vicinity of the dam site and in the reservoir area.

Site 4. A small reservoir could be created by constructing a dam across a tributary of the Fox River that drains a part of the rolling upland east of the West Chicago moraine. The dam site is about 0.5 mile west of Johnsburg. The reservoir area is about half marshy pasture but has some row crop development at the higher elevations. Only one frame residence on the right abutment would be involved. Logs of previous borings indicate approximately 200 feet of unconsolidated materials over dolomite bedrock. The geology of the valley and the dam site are similar. A kame, 0.25 mile north of the dam site, is exposed in a pit and shows large quantities of fine-to-medium well-sorted sand and smaller quantities of coarse gravel. The extent of the sand and gravel deposit was not determined. The kame is surrounded and overlain by till which appears to underlie the valley walls. Sufficient quantities of sandy clayey till suitable for borrow could be obtained from the adjacent uplands. The dam site is probably feasible geologically, subject to verification by test borings and materials testing. The site should develop at a moderate project cost.

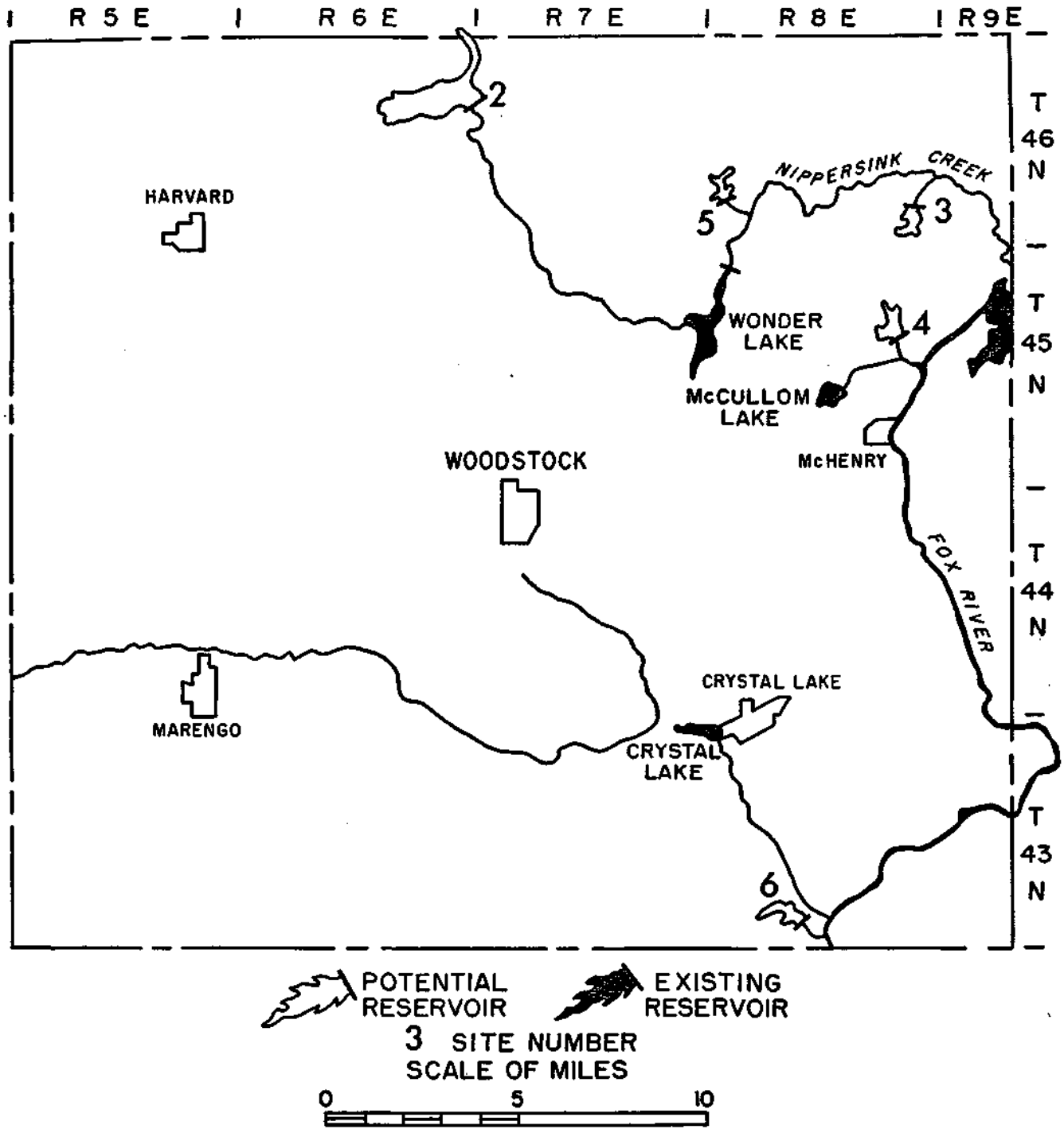
Site 5. A small tributary of Nippersink Creek has a potential dam site about 2 miles north of Wonder Lake. Cover in the reservoir area consists of pasture and scattered areas of light timber. A two-lane gravel road would be inundated and would have to be relocated around the northern shore to provide access to several residences. The stream is 3 to 5 feet wide and flows in a notch 2 to 5 feet deep in a floodplain approximately 200 feet wide. The valley floor is covered by 2 to 3 feet of black sandy silty clay which overlies a coarse gravelly material. The slopes of the valley walls become progressively more gentle toward the uplands, and are probably composed of till. A small gravel pit is located in a kame terrace approximately 500 feet downstream from the left abutment. The site is considered probably not feasible because serious leakage is likely to occur through the permeable sand and gravels in the proposed project area. A sufficient quantity of till for borrow could be obtained from the nearby uplands. If proven feasible, this site would develop at a moderately high project cost.

Site 6. A small reservoir could be created by constructing a dam on a short tributary of the Fox River

Potential Reservoirs in McHenry County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
2	Nippersink Creek SW ¼ NW ¼ 18-46N-7E (McHenry Quad)	95	1,280	8,960	2,919	21.6	1.2	21	700	79	9.0	10.00	9.3	9.8	8.8	8.5	9.0	8.2	7.3	7.3
3	Trib. Nippersink Creek Ctr. S ½ 25-8E (Fox Lake Quad)	850	52	691	225	1.1	0.8	40	550	134	1.5	0.51	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4
4	Trib. Fox River SE ¼ NE ¼ 14-45N-8E (Richmond Quad)	780	125	1,412	460	4.4	1.6	34	1,250	262	2.5	2.04	2.0	2.0	1.8	1.7	1.9	1.6	1.5	1.4
5	Trib. Nippersink Creek NW ¼ SE ¼ 30-46N-8E (Richmond Quad)	850	67	1,072	349	2.5	1.2	48	800	255	2.5	1.16	1.1	1.1	1.0	1.0	1.1	1.0	0.9	0.9
6	Trib. Fox River SW ¼ NE ¼ 33-43N-8E (Crystal Lake Quad)	830	75	1,620	528	1.5	0.5	65	650	321	2.0	0.69	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

MC HENRY COUNTY



about a 0.5 mile west of Algonquin. The upstream half of the reservoir area consists of pasture near the stream and row crops on the valley walls, and the lower half is in light timber. There are no residences nor obstructions, and only one two-lane blacktop road would have to be raised. The stream flows in a narrow notch 3 to 4 feet deep in a floodplain less than 100 feet wide at the dam site. The black clayey sandy alluvium probably is relatively limited. Logs of previous borings indicate that approximately 200 feet of unconsolidated material overlies the limestone bedrock. The valley walls rise steeply some 100 feet and are probably underlain by stony till. Gravel crops out along the upland rim of the reservoir area north of the left abutment. Sufficient quantities of sandy clayey stony till probably suitable for borow. would be available in the uplands west and south of the dam site. The site is probably feasible geologically, subject to verification especially to determine the presence and extent of permeable Algonquin gravels in the vicinity of the left abutment. This site should develop at a moderate project cost.

Existing Reservoirs in McHenry County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Spring Grove	NE Cor. 25-46N-9E (Grays Lake Quad)										
Pistakee Lake	8-17-45N-9E (Grays Lake Quad)										
Lily Lake	S ½ 32-45N-9E (Grays Lake Quad)						47.8				
Defiance Lake	SE ¼ 6-44N-9E (Grays Lake Quad)						150				
Griswold Lake	17-18-44N-9E (Grays Lake Quad)						40				
South Twin Lake	2-3-46N-8E (McHenry Quad)						730				
Wonder Lake	6-7-12-13-18-24-45N-7E, 8E (McHenry Quad)						245				
McCullom Lake	22-45N-8E (McHenry Quad)										
Lily Lake	W ½ 24-44N-7E (McHenry Quad)										
Silver Lake	NE Cor. 2-43N-8E (Elgin Quad)						39				
Crystal Lake	1-43N-7E (Elgin Quad)						228				
Lake-of-the-Hills	20-29-43N-8E (Elgin Quad)						52				
Bard Lakes	11-43N-7E (Elgin Quad)						67				Three lakes
May-B-Lake	NE ¼ NW ¼ 19-46N-9E	D. Joslyn	0.57	365	17	15	5.3	32	10.4	1.05	SCS planned
Colleen-Cafe Lake	SW ¼ NE ¼ 5-43N-7E (Elgin Quad)	N. Hurley	0.22	80	12	10	10	43	14.0	3.66	SCS planned
Bull-Valley Lake	NW ¼ 1-44N-7E (McHenry Quad)						52				
Parkers Lake	S ½ 23-44N-8E (McHenry Quad)						75				Data from aerial photo
Griebel Lake	SE ¼ 14-43N-5E (Genoa Quad)						21				Data from aerial photo
Lockwood Lake	NW ¼ 31-43N-6E (Genoa Quad)						5				Data from aerial photo

MERCER COUNTY

Bedrock in the eastern half of Mercer County is primarily Pennsylvanian shale. Mississippian limestones are prevalent in the Mississippi River Valley and major tributary valleys. Early glaciations approaching from the northwest probably covered Mercer County, but the Illinoian was the most recent and approached from the northeast. Drift deposited by the Illinoian and earlier glaciations exceeds 200 feet in some upland areas. Scattered and discontinuous sand and gravel deposits occur throughout most of the uplands. The western portion of the uplands is covered with up to 40 feet of loess. By contrast, sand and gravel deposits in the lowlands occur continuously and to considerable depths. Drainage from the county is generally west via Henderson, Pope, Copperas, and Eliza Creeks, and the Edwards River. The results of nine feasibility studies in Mercer County are presented here.

Site 1. A reservoir could be created on Eliza Creek by constructing a dam 8 miles west and 2 miles north of Millersburg. Eliza Creek is a major tributary of the Edwards River that drains an area of loess- and till-eovered bedrock. The watershed uplands are gently rolling and have relief of 20 to 30 feet. No residences would be involved. Cover in the reservoir area consists mostly of pasture with scattered timber. One two-lane gravel road across the site would have to be relocated over or below the structure, and two gravel roads in the upper reaches could be raised. The stream flows in a 6- to 8-foot notch in a floodplain 400 to 500 feet wide and 40 to 50 feet below the uplands. The floodplain alluvium consists of dark brownish gray silty fine-to-medium sand. The valley walls are composed of brown sandy clayey silt which grades downward to mottled gray and brown silty fine sand. The abutments slope steeply to the uplands. The lower 10 to 15 feet of the left abutment is composed of orangish brown silty fine-to-medium sand which is capped by tan sandy silt known as loess. The right abutment is covered with vegetation but is probably similar to the left abutment. The site is considered probably feasible, subject to a program of materials testing to determine the nature and extent of the sand in the abutments and valley walls. The floodplain alluvium is not suitable for borrow, and because of the scarcity of good borrow material, some type of dam other than a rolled earth embankment might be more practicable. This is an excellent site topographically, and should develop at a moderate project cost.

Site 2. A reservoir could be created on Camp Creek by constructing a dam about 2 miles west of Millersburg. Camp Creek is a major tributary of the Edwards River that drains an area of loess-covered Pennsylvanian sediments. The gently rolling uplands have a relief of 20 to 30 feet, and the depth to bedrock is approximately 20 feet. Most of the reservoir area is under cultivation with pasture and scattered timber on the valley walls. At least four residences would have to be acquired and a new road system developed, and seven secondary roads would be inundated. The stream flows in a 6- to 8-foot notch in a floodplain 500 to 600 feet wide and 40 to 50 feet below the uplands. The floodplain alluvium consists of dark brownish gray silty fine sand. The valley walls are composed of loess-mantled Pennsylvanian sediments. An exposed road cut shows 1 foot of coal (base not exposed), overlain by 8 feet of gray to dark gray soft thinly laminated shale that is well weathered near the top overlain by 4 feet of buff fine-to-medium thinly bedded sandstone. The abutments at the dam site are moderately sloping. The lower 15 feet of the left abutment is composed of mottled blue, gray, and brown soft thinly laminated shaly siltstone capped by light reddish brown sandy clayey silt known as loess. Loess is exposed on the right abutment where vegetation is sparse or absent. Suitable borrow material is not available in the dam site area. The site is considered probably feasible, subject to adequate testing to determine the possibility of leakage through the sandstone in the valley walls. There are two abandoned mine tipples about 1.5 miles east northeast of the dam site and near the reservoir area, and the extent of mining operations would have to be determined. This site should develop a good many-fingered reservoir at a moderately high project cost.

Site 4. A potential reservoir site exists on a minor tributary of Donohue Run with the dam site located 1.5 miles east and 1 mile north of Viola. The stream drains an area of loess- and till-covered Pennsylvanian sediments. The watershed has gently rolling uplands with relief of 20 to 30 feet. Depth to bedrock is probably less than 50 feet. The entire reservoir area is in pasture. No residences nor obstructions would be involved. The stream is entrenched 4 to 5 feet in a floodplain 100 to 150 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of dark brown sandy clayey silt. The reservoir walls slope moderately to the uplands and are composed of till and loess. The right abutment is composed of tan to light brown sandy clay till capped by light brown sandy silt known as loess. Only the loess is exposed in the left abutment. Both abutments have gentle slopes and are covered with vegetation. A sufficient quantity of till suitable for borrow could be obtained from the nearby uplands and valley walls. The site is considered prob-

ably feasible, subject to verification by an adequate program of test borings and materials testing. This should make a good small reservoir at a moderate project cost.

Site 5. A potential reservoir site exists on a small tributary of Parker Run 2 miles north and 1 mile west of Windsor. This stream drains an area in which the surficial materials are loess and till. The reservoir area cover is mainly pasture and a few small areas of timber and cultivated land. A one-lane gravel road crossing the reservoir area would have to be raised or abandoned. No residences nor other obstructions would be involved. The watershed uplands are very gently rolling. Depth to bedrock is less than 25 feet. The stream is entrenched 6 to 8 feet in a floodplain 200 to 300 feet wide and 30 to 40 feet below the uplands. The abutments are composed of mottled brown and gray sandy clay till capped by tan to brown sandy clayey silt. The floodplain is covered with dark brown sandy clayey alluvial silt. The valley walls have moderate slopes and are composed of soft weathered shale overlain by till. Sufficient quantities of till suitable for borrow could be obtained from the valley walls and the uplands. The site is considered probably feasible, subject to test borings and materials testing. This development should result in a long narrow reservoir at a moderate project cost.

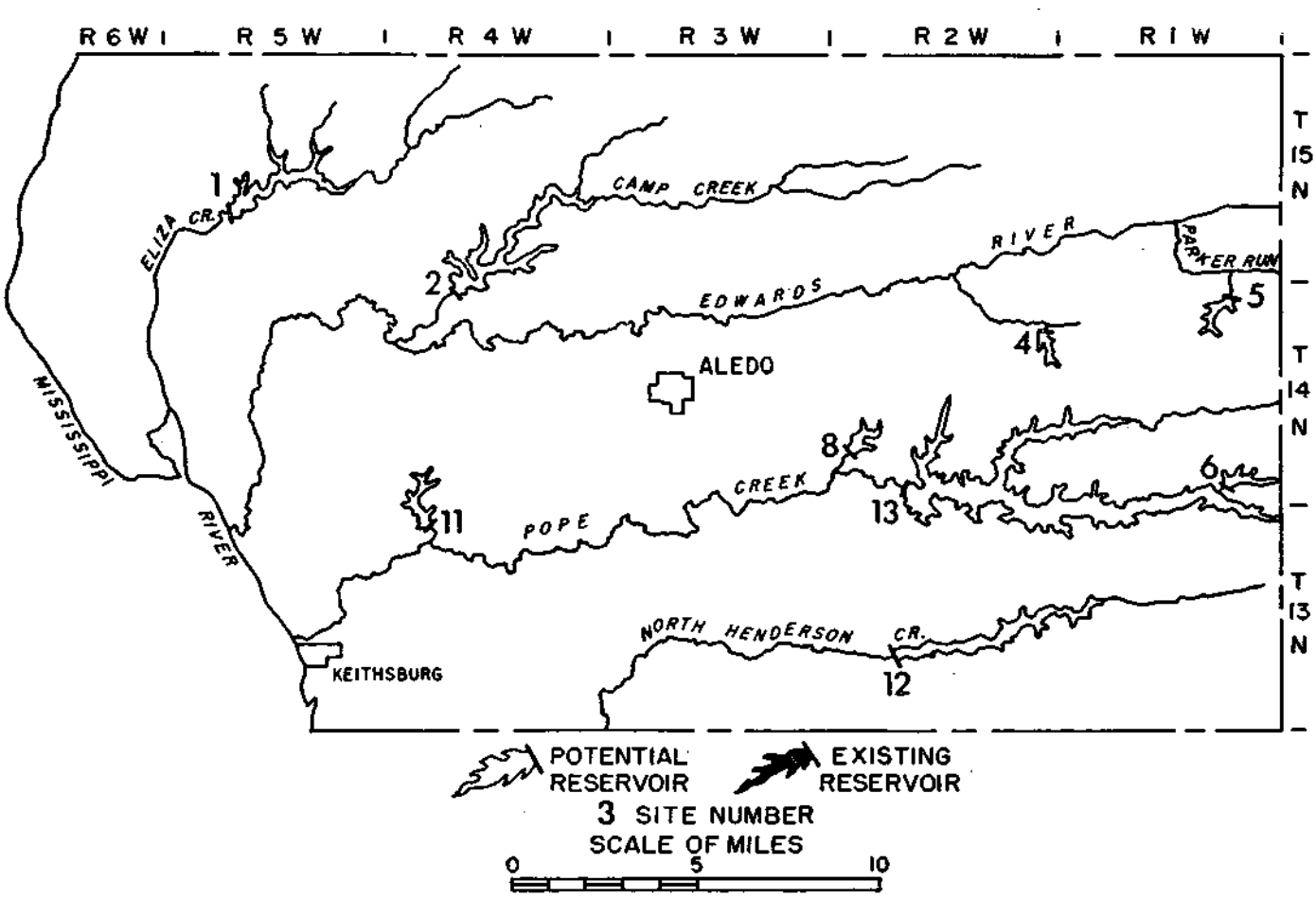
Site 6. A reservoir could be developed on a minor tributary of Pope Creek by constructing a dam 3 miles south and 1 mile west of Windsor. The watershed up-

Potential Reservoirs in Mercer County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity: 5 Yr	10 Yr	25 Yr	40 Yr	Half capacity: 5 Yr	10 Yr	25 Yr	40 Yr
1	Eliza Creek NE ¼ 29-15N-5W (Edgington Quad)	620	804	16,100	5,200	31.6	0.8	60	900	425	24	11.92	11.7	11.5	9.7	9.4	11.6	8.4	7.5	6.7
2	Camp Creek NE ¼ 5-14N-4W (Keithsburg Quad)	660	2,496	49,900	16,300	54.0	0.5	60	1,100	517	48	20.36	17.3	17.3	17.3	17.3	19.2	18.5	15.6	15.3
4	Trib. Donohue Run N ½ 12-14N-2W (Alexis Quad)	720	90	1,200	400	2.4	0.9	40	800	193	4	0.93	0.9	0.9	0.8	0.7	0.9	0.6	0.5	0.4
5	Trib. Parker Run NE ¼ 2-14N-1W (Woodhull Quad)	720	141	1,700	554	4.2	1.1	37	450	99	7	1.63	1.6	1.4	1.2	1.1	1.3	0.9	0.8	0.7
6	Trib. Pope Creek NW ¼ 35-14N-1W (Woodhull Quad)	730	173	2,000	652	4.6	0.9	35	600	123	6	1.68	1.6	1.5	1.3	1.2	1.6	1.0	0.9	0.8
8	Dugout Run SW ¼ 30-14N-2W (Alexis Quad)	680	115	1,500	500	4.7	1.3	39	650	156	7	1.72	1.7	1.4	1.2	1.1	1.3	0.9	0.8	0.7
11	Trib. Pope Creek SW ¼ 5-13N-4W (Keithsburg Quad)	620	145	2,420	788	3.7	1.0	50	600	198	8	14.00	13.9	11.7	10.5	9.8	11.7	7.8	6.2	6.0
12	North Henderson Creek SE ¼ 20-13N-2W (Alexis Quad)	680	1,158	15,800	5,100	35.8	0.9	41	1,000	263	25	13.09	12.8	11.8	10.4	10.0	12.7	8.4	7.6	6.8
13	Pope Creek SE ¼ 32-14N-2W (Alexis Quad)	710	5,000	116,700	38,000	92.5	0.3	70	1,900	1,205	140	33.83	30.2	30.2	30.2	30.2	29.3	29.3	29.3	29.2

Existing Reservoirs in Mercer County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Lake Mathersville	E ½ 28-15N-2W (Milan Quad)	Mathersville (V)	0.33	210			12.2				
Lake Nelson	NW ¼ 15-15N-4W (Edgington Quad)	Samuel T. Nelson					7.5				
Glancey Lake	SE ¼ 1-15N-6W (Muscatine Quad)										
Swan Lake	34-15N-6W 3-14N-6W (Muscatine Quad)	Public					122.2				
	SE ¼ 24-14N-4W (Aledo West Quad)	Lloyd McCaw	100				14				
Eliza Lake							417.7				Near New Boston
Swede Lake		Public					94				
Boston Bay	30-74N-1W (Toolesboro Quad)	Public					362				
Keithsburg Nat'l Wildlife Refuge Lake							275				U.S. Corps of Engineers



lands are flat to very gently rolling. The reservoir area is in pasture and scattered timber. A one-lane gravel road crossing the area could be abandoned. There are no residences nor other obstructions. The stream flows in a 4- to 6-foot notch in a floodplain 200 to 300 feet wide and 40 to 50 feet below the uplands. The floodplain is covered with dark brown to dark grayish brown clayey alluvial silt. The valley walls are moderately sloping and are composed of till and loess. The moderately sloping abutments are composed of tan to brown sandy clay till capped by tan to brown very sandy silt. Sufficient quantities of till for borrow would be available in the nearby uplands. Because of the Hazel Dell coal mine workings that extend under the upper portion of the proposed reservoir, this site must be considered probably not feasible.

Site 8. A potential reservoir site exists on Dugout Run, a tributary of Pope Creek, with the dam site located 2 miles south and 4 miles west of Viola. The stream drains an area of surficial loess and till underlain by Pennsylvanian sediments. The watershed uplands are hilly with relief of 60 to 80 feet. The reservoir area is primarily pasture. Only one gravel road crosses the area and it could be relocated over or below the structure. The stream is entrenched 6 to 8 feet in a floodplain 300 to 400 feet wide and 60 to 80 feet below the uplands. The floodplain alluvium consists of dark grayish brown silty clayey sand. The moderately sloping reservoir walls are composed of light brown sandy clay till that becomes mottled gray and light brown with depth. The till is capped with light brown sandy clayey silt. Both abutments are covered with vegetation, but are probably similar in composition to the valley walls. Till suitable for borrow could be obtained in sufficient quantities from the uplands and valley walls. The site is considered probably feasible, subject to test borings and materials testing especially to determine the nature and extent of subsurface materials and the extent of the mined-out area 1.5 miles northeast of the dam site. This site should develop a fair reservoir at a moderate project cost.

Site 11. A reservoir could be created on a minor tributary of Pope Creek by constructing a dam 3 miles east and 3.5 miles north of Keithsburg. The watershed

uplands are gently rolling with a relief of 20 to 30 feet. The surficial materials are loess and glacial drift, primarily till. The reservoir area is mostly pasture with scattered timber. There are no developments in the area, and land acquisition costs should be low. The stream flows in a 4- to 6-foot notch in a floodplain 250 to 300 feet wide and 40 to 50 feet below the uplands. The floodplain alluvium consists of grayish brown silty sand. The moderately sloping valley walls are covered with vegetation, but till and loess are exposed in a few places. The right abutment is composed of mottled gray and brown very sandy clay till and loessial soil, and the upper portion is covered with vegetation. Mottled gray and light brown sandy clayey silt is exposed near the base of the left abutment, and is probably underlain with glacial till. A sufficient quantity of till suitable for borrow could be obtained from the valley walls and the uplands. The site is considered probably feasible, subject to a program of adequate test borings and materials testing with special attention to the nature and sequence of the subsurface materials. This site should develop a long narrow reservoir at a moderately low project cost.

Site 12. A reservoir could be created on North Henderson Creek by constructing a dam 4 miles west and 2 miles north of Alexis. The creek is a major stream in southern Mercer County that drains an area of loess- and till-eovered Pennsylvanian sediments. The watershed uplands are flat to very gently rolling with a relief of 10 to 20 feet. The reservoir area is half pasture and half cultivated land. The valley walls are covered with light timber. No residences would be involved. U. S. Route 67 would have to be raised some 30 feet for approximately 0.5 mile. At least three secondary north-south roads that cross the reservoir area could be abandoned in favor of an around-the-lake road system. The stream flows in a 5- to 6-foot notch in a floodplain 400 to 500 feet wide and 20 to 30 feet below the uplands. The floodplain alluvium consists of dark brown sandy clayey silt. The valley walls are light brown sandy clay till capped by loess, and have gentle to moderate slopes. Although the abutments are similar in composition to the valley walls, a small outcrop on the left abutment consists of tan to light brown silty sand containing many sandstone pebbles, and light brown sandy clayey silt is present in the right abutment. A sufficient quantity of till suitable for borrow could be obtained from the nearby uplands and the valley walls. The site is considered probably feasible, subject to a complete program of test borings and materials testing with special attention to the nature and sequence of the subsurface materials. An abandoned mine tipple just east of the dam site indicates that mining has been done in the area and that the extent and location of mined-out areas should be determined. This site should develop a fair reservoir at a moderately high project cost.

Site 13. A large reservoir could be created on Pope Creek by constructing a dam 2 miles west and 3 miles south of Viola. This reservoir would back water up to U. S. Route 150 about 3 miles south of Alpha. Pope Creek is a major stream in central Mercer County draining an area of loess- and drift-covered Pennsylvanian sediments. The watershed uplands are very gently to gently rolling with a relief of 10 to 30 feet. The surficial materials are loess and glacial drift, primarily till. Depth to bedrock is probably less than 25 feet. The lake bed area is about half pasture and half cultivated land, but there is some timber on the valley walls and in a narrow strip along the creek. At least two residences and associated outbuildings would be inundated. Inundation of approximately 0.75 mile of U. S. Route 67 and some 10 secondary roads would cause local traffic relocations, but these should not be difficult nor too expensive. The stream is entrenched 6 to 8 feet in a floodplain approximately 300 to 400 feet wide and 40 to 50 feet below the uplands. The floodplain alluvium consists of grayish brown silty sand. The valley walls are composed primarily of loess and till, but some sandstone is exposed in the lower portions. The right abutment consists of some 10 feet of rusty brown thinly bedded silty sandstone with parting along bedding planes, overlain by 3 feet of mottled brown and white soft fine- to medium-grained sandstone, overlain by 3 to 4 feet of light brown very clayey sandy till, overlain by 12 feet of light brown clayey sandy silt, overlain by at least 10 feet of railroad fill. The left abutment is covered with vegetation but is probably similar in composition to the right abutment. A sufficient quantity of till suitable for borrow probably could be obtained from the nearby uplands and from the valley walls near the dam site. The site is considered probably feasible, subject to an adequate testing program with special attention to possible leakage through the sandstone and to the extent of abandoned mines under the dam site. This should make a good large reservoir at a moderate project cost.

OGLE COUNTY

The bedrock surface of Ogle County contains the impressions of several ancient valleys, the largest of these being the Upper Rock Valley along the eastern edge. The entire county was covered by the Illinoian glaciation, and later the Wisconsinan reached into the southeastern corner. The drift averages about 4 feet in depth on the uplands and up to 400 feet over the bedrock valleys. Winds have deposited a layer of loess over most of Ogle County. This silt-like deposit varies from 20 inches in depth in the eastern part of the county to 6 or 7 feet in the west. The shallow deposits of loess and drift account for the rock outcrops along the Eock River and its tributaries. Sand and gravel deposits are common at great depth along the eastern edge of the county and occur near the surface along the Rock River bottoms. The Rock River and its tributaries carry all surface runoff from the county.

Eleven potential reservoir sites were studied in Ogle County, and the results of these studies follow.

Site 1. A small potential reservoir site exists on an unnamed tributary of the Leaf River about 3.5 miles southeast of Porreston. No roads nor residences would be involved. The watershed consists of rolling uplands which slope gradually into the broad moderately steep walled valley. Access to the site via township roads from State Routes 26 and 72 is very good. The abutments are composed of tan to buff Galena dolomite overlain by a variable thickness of sandy clay glacial till. The till would be suitable for construction of an earth dam, but does not occur in sufficient quantity in the immediate vicinity of the dam. The depth of the silty fine-to-medium sand seen in the floodplain alluvium was not determined, but it is probably underlain at shallow depths by bedrock similar to that in the abutments. Although the site is probably feasible geologically, future borings would be required to investigate the foundation conditions, to examine the dolomite for solution channels, and to locate a source of borrow. Land costs for the agriculturally developed lake area would be offset by low site preparation costs since very little timber clearing would be required. This site should develop at a low project cost.

Site 2. A large potential reservoir site exists on Mud Creek with the dam 1 mile west of Lightsville. This creek is a major stream in north-central Ogle County and drains an area of loess and till that is underlain by Ordovician sediments. The uplands are gently rolling with a relief of 20 to 30 feet. The abutments slope gently to the uplands and are covered with vegetation. Depth to bedrock is probably less than 10 feet. The bedrock where exposed is a buff-colored Galena dolomite, but it is generally obscured by gravelly sandy clay till on the abutments and by sandy silt in the floodplain. Nine farm units and five township roads would be inundated. Cover in the lake area is about equally divided between pasture and row crops with timber restricted to the creek banks and valley walls. In addition to the high cost of agriculturally developed bottomlands, the earth fill would be quite long for a lake of this size. A complete program of test borings and materials testing would be required to determine the nature and sequence of subsurface materials, to examine the dolomite for solution channels, and to locate a suitable source of borrow. This site would develop at a high project cost and would not have been considered economical a few years ago. However, as the need for water increases, sites such as this are becoming more desirable.

Site 3. A small lake could be developed on the East Pork of Mill Creek with the dam about 4 miles north of Byron. Township roads come within 0.25 mile of any part of the proposed lake. No roads nor residences would be involved. The reservoir area is half timber and half pasture. Timbered areas would be available on the nearby uplands for residential or recreational development. This area is believed to be underlain at shallow depths by dolomite that is overlain by glacial till or loess except for a few places on the valley walls. Brown sandy loess is present in the lower right abutment. The alluvial overlay in the floodplain is composed of sandy silt. Although a preliminary examination indicates that the site is probably feasible geologically, a complete program of materials testing and test borings would be required to study the nature and sequence of bedrock, the possible existence of solution channels, and a source of suitable borrow for the earth dam. This site should develop at a low project cost.

Site 4. A reservoir could be created on a minor tributary of the Rock River by constructing a dam 5.5 miles west and 4 miles south of Rockford. The stream drains a gently rolling upland area of loess and till covering Ordovician dolomite. The area has a relief of 20 to 30 feet. Depth to bedrock is probably less than 10 feet according to exposures in the valley walls. The reservoir area is not obstructed by roads or residences, but there is evidence of a recent survey in the bottoms and development is probably not far away. The cover consists of pasture with scattered timber in the area nearest the dam and heavier timber in the upper reaches. The stream is entrenched 4 to 6 feet in a floodplain approximately 0.25 mile wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of 1 foot of

gray silty fine-to-medium sand over 2 feet of sandy fine-to-coarse gravel. The tailing piles near a small dam at the proposed dam site indicate that the abutments are probably underlain by tan to buff rugged crystalline dolomite belonging to the Galena formation. It is very doubtful that a sufficient quantity of till or other suitable borrow material is available for the construction of an earth dam. The floodplain alluvium probably is not suitable borrow. The site is considered probably feasible, but adequate test borings and materials testing should be undertaken especially to determine whether the dolomite contains solution channels. This site should result in a good small reservoir at a moderate project cost.

Site 5. A good reservoir could be created on Fivemile Creek, a tributary of Elkhorn Creek, by constructing a dam 4.5 miles south and 3.5 miles west of Forreston. Fivemile Creek is a minor stream that drains an area of loess and till underlain by Ordovician sedi-

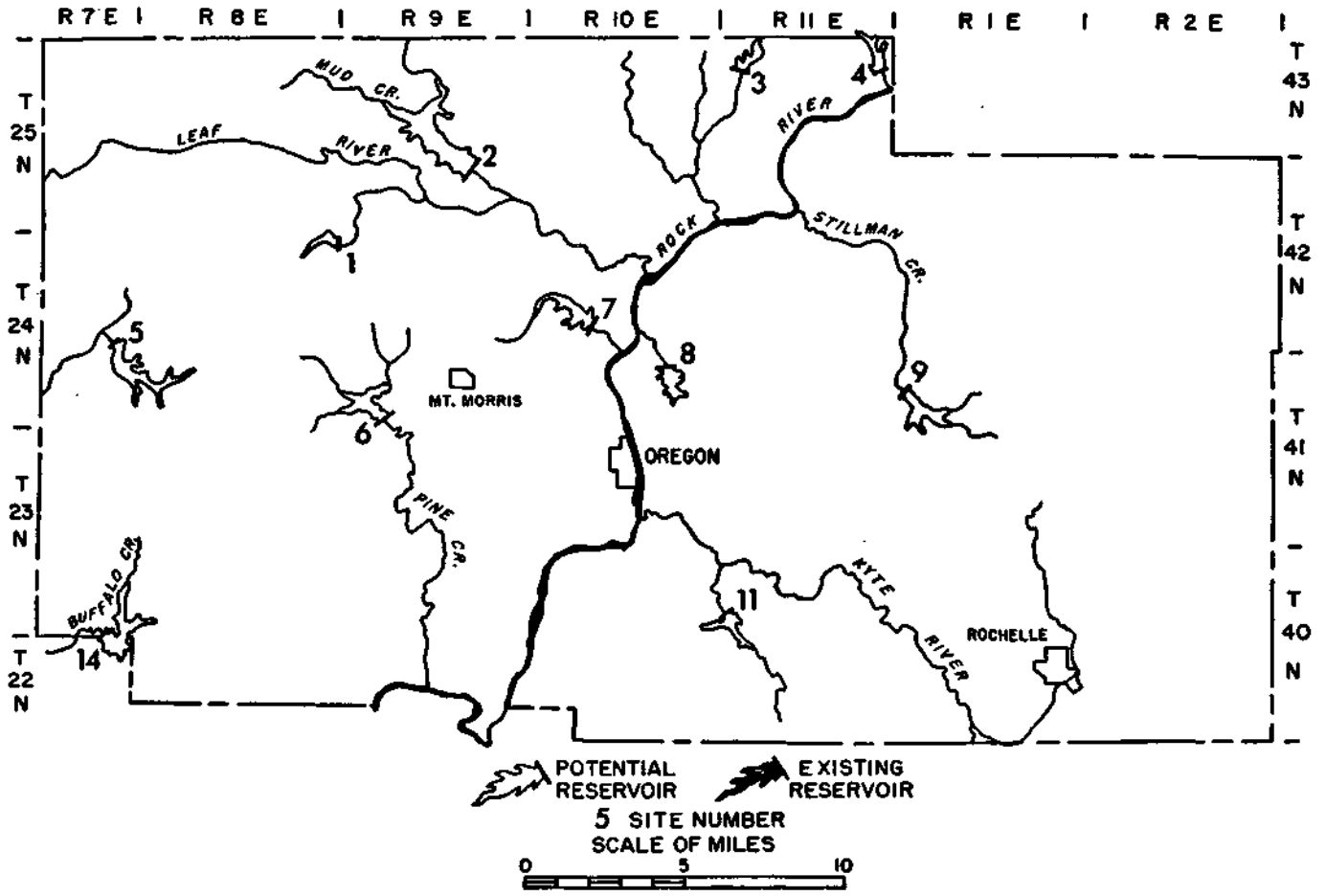
Potential Reservoirs in Ogle County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity: 5 Yr	10 Yr	25 Yr	40 Yr	Half capacity: 5 Yr	10 Yr	25 Yr	40 Yr
1	Trib. Leaf River NE ¼ 1-24N-8E (Forreston Quad)	840	160	1,600	500	7.7	2.0	30	1,200	202	4	2.90	2.9	2.3	1.9	1.7	2.1	1.8	1.4	1.3
2	Mud Creek NW ¼ 26-25N-9E (Oregon Quad)	760	1,158	20,100	6,500	28.0	0.6	52	2,300	959	15	10.56	9.9	9.9	9.9	9.9	9.8	9.8	8.0	7.3
3	E. Fk. Mill Creek NE ¼ 7-25N-11E (Oregon Quad)	780	141	1,900	600	7.4	1.6	40	1,000	264	4	2.79	2.8	2.4	1.9	1.8	2.3	1.8	1.5	1.4
4	Trib. Rock River SE ¼ 2-25N-11E (Kings Quad)	760	173	3,500	1,100	6.2		60	1,700	792	6	2.34	2.3	2.3	2.3	2.3	2.3	2.0	1.7	1.5
5	Fivemile Creek NW ¼ 24-24N-7E (Forreston Quad)	810	454	6,000	1,955	13.6	1.0	40	600	148	11	5.28	5.0	5.0	4.3	3.9	5.1	4.1	3.0	2.9
6	Pine Creek SE ¼ 32-24N-9E (Oregon Quad)	800	263	3,200	1,000	33.1	4.4	36	400	79	9	12.48	7.9	7.6	6.6	6.4	6.8	5.9	5.3	5.1
7	Silver Creek NW ¼ 21-24N-10E (Oregon Quad)	740	339	5,700	1,900	10.6	0.8	50	800	262	10	4.00	3.8	3.8	3.4	3.3	3.9	3.4	2.9	2.5
8	Spring Creek NW ¼ 26-24N-10E (Oregon Quad)	740	160	2,200	700	5.0	0.9	40	900	222	5	1.91	1.9	1.7	1.4	1.3	1.7	1.2	0.9	0.8
9	Stillman Creek NW ¼ 7-23N-1E (Kings Quad)	800	307	4,100	1,300	11.0	1.2	40	650	170	11	4.21	4.2	3.5	2.9	2.8	3.2	2.4	1.8	1.7
11	Trib. Kyte River SE ¼ 30-23N-11E (Dixon Quad)	730	211	2,100	700	19.5	4.0	30	600	98	8	7.47	4.1	3.5	2.5	2.4	2.5	2.3	1.7	1.5
14	Buffalo Creek SW ¼ 36-23N-7E (Sterling Quad)	750	557	7,400	2,400	28.4	1.7	40	600	140	15	11.03	10.9	9.4	7.6	6.8	7.9	6.7	5.4	5.3

Existing Reservoirs in Ogle County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Forreston Gravel Pit	N ½ 20-25N-8E (Forreston Quad)	ICRR				20	15				
	SW ¼ SW ¼ 15-25N-8E (Forreston Quad)						10				Gravel pit
	NW ¼ 18-42N-2E (Kings Quad)										
	N ½ 35-40N-1E (Wheaton Quad)	Rochelle (C)					27				Septic basins
	NW ¼ 8-23N-10E (Dixon Quad)	C B & Q RR				15	10				
Lost Nation Country Club	W ½ 9-22N-10E (Dixon Quad)	Country Club	13	8,320	13	12	38				
Mt. Morris Fishing Club							10.5				
Illinois Central Sportsman							10				
	SW ¼ SW ¼ 15-25N-8E (Forreston Quad)						10				
Lake Louisa	NE ¼ 29-25N-11E						44				

OGLE COUNTY



ments. The watershed uplands are gently rolling with a relief of 20 to 30 feet. The reservoir area has been developed agriculturally but the major portion is in pasture. One farm residence and Illinois Route 64 would be inundated. The stream is entrenched in a 4- to 6-foot notch in a floodplain approximately 150 to 200 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of dark brown silty sand. Tan to light brown sandy loess is present in the valley walls overlying brown sandy clayey silty till. The depth to bedrock was not determined but is probably less than 25 feet. The abutments are moderately sloping and are heavily covered with vegetation. No outcrops are visible in the abutments, but the sediments present are probably similar to those of the valley walls. The floodplain alluvium is not suitable for borrow. Till suitable for borrow material is present in the vicinity of the dam site but probably not in sufficient quantity for an earth dam. The site is considered probably feasible, subject to verification. The site should make a good reservoir but at a moderately high project cost.

Site 6. A small shallow reservoir could be created on Pine Creek by constructing a dam 2.5 miles west and 1 mile south of Mt. Morris. Pine Creek is a major stream in western Ogle County that drains an area of loess and till underlain by Ordovician sediments. The watershed uplands are gently rolling with a relief of 20 to 30 feet. The depth to bedrock is probably less than 10 feet. The reservoir area is in fairly high productivity crop land, but no roads, residences, nor utilities would be inundated. The stream is entrenched 5 to 6 feet in a floodplain approximately 100 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of dark brown silty fine sand. Bedrock is composed of tan to buff cherty dolomite belonging to the Galena formation. The upper portion of the dolomite is thin bedded and fractured; the lower portion is more massive and jointed. Both abutments are nearly vertical bluffs. The floodplain alluvium probably would not be suitable fill material. A sufficient quantity of suitable borrow material was not observed near the dam site but might be obtained in the uplands. The site is considered probably feasible, subject to verification particularly to examine the dolomite for solution channels which could cause leakage. This site should result in a small reservoir at a moderate project cost.

Site 7. A small reservoir could be created on Silver Creek, a tributary of the Rock River, by constructing a dam 4 miles east and 1.5 miles north of Mt. Morris. The reservoir area is open land, about three-quarters in pasture. Two gravel roads would have to be raised slightly. No residences, obstructions, nor utilities would be involved in the development. The stream is entrenched 2 to 3 feet in a floodplain approximately 200 to 250 feet wide and 40 to 50 feet below the uplands. The floodplain alluvium consists of dark brown silty sand. The moderately sloping abutments at the dam site are composed of buff fine-grained rugged medium-bedded dolomite. The valley walls are also composed of buff dolomite overlain by light brown silty clayey fine sand. The floodplain alluvium is not suitable for borrow, and sufficient quantities of suitable borrow material were not observed near the dam site. The site is considered probably feasible, subject to verification particularly to determine the presence and extent of solution channels in the dolomite. This site should develop a good small reservoir at a moderate project cost.

Site 8. A potential reservoir site could be developed on Spring Creek, a minor tributary of the Rock River, by constructing an earth dam 3 miles north and 1 mile east of Oregon. The stream drains an area of loess- and till-covered bedrock. The watershed uplands are rolling to hilly with a relief of 40 to 60 feet. Depth to bedrock is probably less than 20 feet. The reservoir area is developed agriculturally with about two-thirds row crops and one-third pasture. No residences would be inundated, but a one-lane gravel road that crosses the center of the reservoir site would have to be relocated below the structure. The stream is entrenched 4 to 6 feet in a floodplain approximately 0.25 mile wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of brown sandy clayey silt. The valley walls are composed of buff sandy dolomite capped by a thin layer of loess. The valley walls are moderately to gently sloping. Both abutments slope gently to the uplands and are covered with soil and vegetation. A buff fine-grained rugged sandy fairly thick bedded dolomite crops out in the stream channel. Borrow material in sufficient quantities was not observed near the dam site, nor is the floodplain alluvium suitable for borrow. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing especially to determine the presence and extent of solution cavities in the dolomite. This site should develop a good small reservoir at a moderate project cost.

Site 9. A good reservoir could be developed on Stillman Creek by constructing a dam 4.25 miles south and 0.75 mile east of the village of Stillman Valley. Stillman Creek is a major stream of northeastern Ogle County and drains an area of loess and sandy till which covers dolomite. The watershed uplands are gently rolling with a relief of 10 to 20 feet. Depth to bedrock generally is less than 10 feet. The downstream third of the reservoir area is in timber, and the remainder is in pasture. No residences would be involved, but a two-lane oiled road that crosses the reservoir area would have to be abandoned. Several areas on the reservoir shore are timbered, and a rock quarry is being worked in the right abutment. The stream flows in a 4-foot notch in a floodplain approximately 100 to 150 feet wide and 20 to 30 feet below the uplands. The right abutment is a vertical bluff while the left abutment is gently sloping. The abutments consist of rugged crystalline thick-bedded jointed dolomite with partings and solution channels along the bedding planes, overlain by 1 to 2 feet of brown sandy clay till. The alluvium consists of dark gray sandy clayey silt. The valley walls are composed of till-capped dolomite and have gentle to steep slopes. A sufficient quantity of till suitable for borrow may not be available in the vicinity of the dam site. The site is considered probably feasible, subject to verification with special attention to the possibility of solution channels in the dolomite which could permit leakage. The site should result in an excellent multifingered reservoir at a moderate project cost.

Site 11. A dam site exists on a small tributary of the Kyte River 5.5 miles north and 0.75 mile west of Franklin Grove. The stream drains an area of dolomite and sandstone covered in some places by a thin mantle of glacial drift. One farm unit would be inundated and one gravel road would have to be raised. The reservoir area is all open land, about half in row crops and half pasture. Bedrock is near the surface and crops out in many localities. The stream is entrenched 4 to 5 feet in a floodplain 250 to 300 feet wide and 30 to 40 feet below the uplands. Tan to light brown silty clayey sand is exposed in the right abutment. The left abutment is composed primarily of tan to light brown loose fine-to-medium sand containing angular pebbles and cobbles of buff sandy dolomite. The sand, which may be a weathering product of the dolomite, is capped by 2 to 3 feet of light reddish brown sandy clay. The floodplain alluvium consists of brownish gray silty alluvial sand. The valley walls are covered at most places, but exposures show sand and sandy dolomite similar to that in the abutments. Sufficient quantities of suitable borrow material were not observed near the dam site, nor is the floodplain alluvium suitable. The site is considered probably not feasible because of sand observed in the abutments and in the valley walls, along with the possibility of leakage through the St. Peter sandstone

which underlies much of the area. If proven feasible, this site should develop at a moderately high project cost.

Site 14. A reservoir could he created by constructing a dam on Buffalo Creek 3.5 miles west and 4 miles south of Polo. Buffalo Creek, a tributary of Elkhorn Creek, drains an area of loess and till which covers Ordovician dolomite. The watershed uplands are very gently rolling with a relief of 10 to 20 feet. Depth to bedrock is probably less than 10 feet. The reservoir area is primarily under clean-tilled cultivation and in pasture. Light timber covers the valley walls and the stream banks. At least three farm residences and associated outbuildings would be inundated. Some fringe roads would have to be raised where they would cross fingers of the reservoir area. Considerable shallow water would occur in the upper reservoir reaches. The stream flows in a 4-foot notch in a floodplain approximately 100 feet wide and 20 to 30 feet below the uplands. The floodplain alluvium consists of dark brown silty sand. The valley walls are composed of dolomite overlain by loess and till. The gently sloping right abutment and the steeply sloping left abutment are composed of tan to buff thick-bedded Galena dolomite, overlain by loess and brown sandy gravelly clay till of variable thickness. Till suitable for borrow is present at the dam site but probably not in sufficient quantity. The floodplain alluvium is not suited for borrow. The site is considered probably feasible, subject to verification with particular attention given to the possible presence of solution channels which could cause leakage. This site should result in a fair reservoir at a moderately high project cost.

PUTNAM COUNTY

The bedrock surface in Putnam County is primarily shale of Pennsylvanian age. The ancient Mississippi Valley lying north to south through the county and the Ticona Valley along the northern edge are major topographic features of the bedrock surface. These valleys were later filled with highly pervious glacial materials such as the Sankoty sand which extends in some places from the surface to a depth of several hundred feet. In most locations, however, the sand and gravel deposits are covered by a less pervious material known as till which is overlain by a uniform small grain material know as loess. The loess was picked up from the Illinois River bottoms by wind and deposited on the uplands where depths range from 3 to 10 feet. Drainage throughout the county is by small tributaries flowing directly into the Illinois River. The results of five feasibility studies in Putnam County follow.

Site 1. A potential reservoir site exists on Crow Creek, a direct tributary of the Illinois River. Crow Creek drains the southwestern portion of Putnam County and a part of the Normal moraine. The uplands are gently rolling with a relief of 20 to 30 feet. The abutments slope moderately to the uplands. The floodplain is approximately 0.25 mile wide and lies 50 to 60 feet below the uplands. The stream is entrenched in a channel 4 to 6 feet deep. Most of the reservoir area is under agricultural development, but there is considerable timber on the valley walls. Three farm units would be inundated, and at least two gravel roads would have to be raised or relocated. The surficial soil has been developed from loess which rests on glacial drift, primarily till. The dam site is situated over the ancient Mississippi River Valley which is filled with Sankoty sand to about elevation 520 feet. Depth to bedrock at the dam site is probably greater than 125 feet. Both abutments consist of silty sandy clayey till with layers, lenses, and pockets of sand and gravel. The floodplain alluvium consisting of grayish brown sandy silt may possibly rest on the Sankoty sand. The presence of the Sankoty sand beneath the valley bottom at the dam site and in at least part of the reservoir area indicates the probability of a serious leakage problem. Geologically this site must be considered probably not feasible, subject to verification by an adequate program of test borings and materials testing. Suitable borrow material probably could be obtained from the till on the uplands and in the valley walls. This site would result in a moderately high project cost.

Site 2. A potential reservoir site exists on Senachwine Creek, which is the principal stream in the northwest part of Putnam County draining a portion of the Normal moraine. Two farm residences and associated outbuildings would be inundated as well as several gravel roads. The reservoir area is predominantly open land under clean-tilled cultivation. The valley walls are fairly steep and lightly covered with woods. The stream is entrenched 5 to 6 feet in a floodplain 0.25 mile wide that lies 70 to 80 feet below the uplands. The floodplain alluvium consists of brown sandy silt and brownish gray gravelly silty sand. The depth to bedrock at the dam site is probably about 150 feet. The dam site is situated over the ancient Mississippi River Valley, and the top of the Sankoty sand probably is very near the surface. Under these conditions, leakage from the reservoir probably would be a serious problem, and the site must be considered probably not feasible, subject to a

program of materials testing. If proven feasible, this site should make a good deep many-fingered reservoir at a moderate project cost.

Site 3. A potential reservoir site exists on Clear Creek, a direct tributary of the Illinois River. Clear Creek is the principal stream in southern Putnam County east of the Illinois River and drains a portion of the Cropsey moraine. Most of the reservoir area is in high productivity row crops. A one-lane gravel road the length of the reservoir area, as well as four farm residences and associated outbuildings, would have to be abandoned. The uplands are gently rolling with a relief of 20 to 30 feet. The floodplain at the dam site is about 0.5 mile wide and lies 80 to 90 feet below the uplands. The dam site is situated over the ancient Mississippi River Valley, and the contact of the Sankoty sand with the overlying materials may be near or above floodplain level. Because of the possibility of serious leakage, this site is considered probably not feasible, subject to a program of materials testing. The surficial soil has been developed from loess which rests on glacial drift, primarily till. The till is believed to be impervious, but the possibility exists that some of the lenses and layers of sand and gravel may be continuous for a considerable distance. This is a good site topographically, and if proven feasible geologically, should develop at a moderately high project cost.

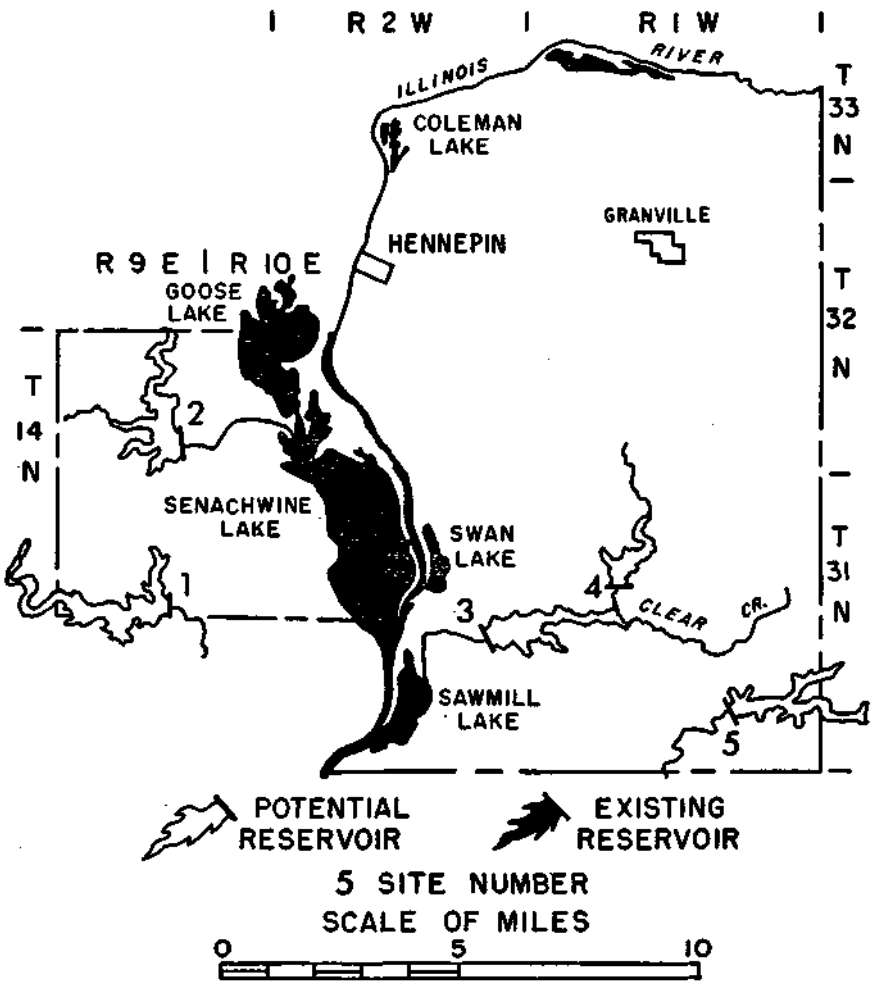
Site 4. A second potential reservoir site exists on Clear Creek to the east of *site 3*. The reservoir area is in timber. A gravel road crossing the upper end of the site could be raised or relocated, and no other obstructions were observed. The uplands are very gently rolling with a local relief of 10 to 20 feet. The surficial soil has been developed from loess which rests on glacial drift. The floodplain is about 0.25 mile wide and lies 50 to 60 feet below the uplands. The dam site is situated over the east side of the ancient Mississippi River Valley, and the Sankoty sand is probably present beneath the glacial till which has some intercalated lenses and layers of sand and gravel. For the most part the

Potential Reservoirs in Putnam County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity: 5 Yr	10 Yr	25 Yr	40 Yr	Half capacity: 5 Yr	10 Yr	25 Yr	40 Yr
1	Crow Creek SW ¼ 36-14N-9E (Lacon Quad)	600	1,100	25,700	8,400	53.9	0.9	70	1,600	1,020	33	21.56	21.4	18.6	16.5	15.5	19.1	12.5	9.8	9.7
2	Senachwine Creek E ½ 13-14N-9E (Lacon Quad)	540	570	16,200	5,300	35.0	1.0	85	1,600	1,406	28	14.00	13.9	11.7	10.5	9.9	11.8	7.8	6.2	6.0
3	Clear Creek NW ¼ 24-31N-2W (Lacon Quad)	560	698	18,600	6,100	35.4	0.8	80	2,050	1,736	17	13.35	13.2	12.7	11.2	10.2	11.3	8.7	7.2	6.4
4	Clear Creek SE ¼ 17-31N-1W (Wenona Quad)	640	358	8,400	2,700	12.2	0.6	70	1,000	582	12	4.60	4.4	4.4	4.2	3.9	4.4	3.5	2.9	2.5
5	Little Sandy Creek SW ¼ 26-31N-1W (Wenona Quad)	640	576	6,700	2,200	28.6	1.8	35	700	142	22	10.79	8.7	6.8	5.6	4.9	5.3	4.4	3.5	2.8

Existing Reservoirs in Putnam County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Turner Lake	19-20-21-33N-1W (LaSalle and Hennepin Quads)						465				Backwater from Illinois River
Coleman Lake	27-34-33N-2W (Hennepin Quad)						140				Backwater from Illinois River
Goose Lake	31-32-15N-10E 4-5-6-7-8-16-17-14N-10E (Lacon Quad)						2,360				Backwater from Illinois River
Senachwine Lake	15-16-20-21-22-23-26-28-33-35-14N-10E (Lacon Quad)	State of Illinois					3,324				Backwater from Illinois River
Swan Lake	2-3-10-11-14-31N-2W (Lacon Quad)						285				Backwater from Illinois River
Sawmill Lake	22-26-27-33-34-31N-2W (Lacon Quad)						630				Backwater from Illinois River
Balestri Lake	(Wenona Quad)	Club	1.8	1,080	30	22	15				



layers of till are impervious, but the thickness of till over the Sankoty sand would have to be determined. The dam site is probably not feasible, subject to verification by an adequate program of test borings and materials testing. This is an excellent site topographically, and if proven feasible geologically, could result in a good reservoir at a moderate project cost.

Site 5. Little Sandy Creek, a tributary of Sandy Creek draining a part of the Cropsey moraine, has a potential dam site 0.5 mile north of Magnolia. The reservoir area is mostly under cultivation with timber along the creek banks. No residences would be inundated, but access roads and town and county highways would have to be raised or relocated. The uplands are very gently rolling with a local relief of 10 to 20 feet. The floodplain is 300 to 400 feet wide and lies 20 to 30 feet below the uplands. The stream is entrenched in a notch 3 to 5 feet deep in the alluvium. The surficial soil has been developed from loess which rests on a thin layer of sandy outwash. Bedrock probably lies about 150 feet below the valley bottom at the dam site. The site is situated over the ancient Mississippi River Valley, but Sankoty sand may not be present at this location. In the upper reaches of Little Sandy Creek the tills for the most part are impervious, but the deposits of sand and gravel are porous and may be continuous. The abutments consist of mottled gray and brown sandy clay till which grades upward into about 4 feet of brown sandy pebbly silty till. The presence of a sufficient thickness of impervious till between the base of the dam and the top of the Sankoty sand, if it is present, would prevent serious leakage. The dam site is considerd probably feasible, subject to materials testing. This site should make a good reservoir at a moderately high project cost.

ROCK ISLAND COUNTY

The bedrock surface in Rock Island County consists of limestone over two-thirds of the county, nearest the river, and shale over the remainder. Extensive beds of highly permeable materials are not generally present in the county. The Green River Valley in the southeastern portion of the county is the most prominent feature of the bedrock surface. Except for a small portion in the northeast, the present Mississippi River Valley is quite recent geologically. The greatest alluvial plains exist in the Rock River Valley. The Illinoian glaciation covered the entire county, and drift varies in depth from 25 feet along the Rock River bluffs to 150 feet near the Mercer County line. Later, loess was deposited along the Mississippi bluffs varying from 40 feet deep along the Rock River bluffs to about 15 feet at the Mercer County line. Practically all of the county is drained by the Mississippi and Rock Rivers. There are two secondary streams, Copperas and Mill Creeks, in the southern part of the county.

Eight potential reservoir sites were studied in Rock Island County, and the results of these studies are presented here.

Site 1. A fairly large reservoir could be developed on Copperas Creek with the dam 1.5 miles south of Illinois City. The watershed has a well-developed deeply

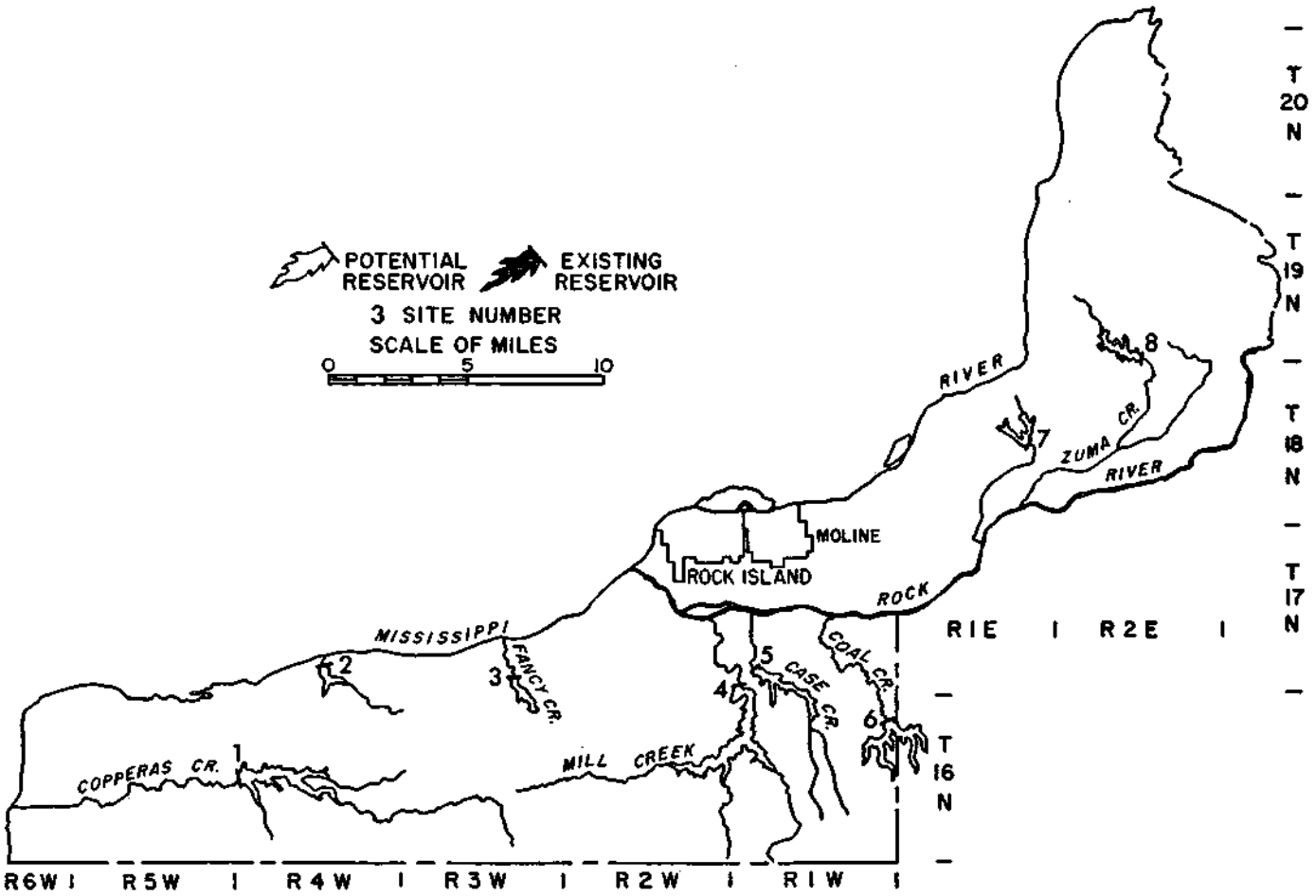
Potential Reservoirs in Rock Island County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Copperas Creek SW ¼ 18-16N-4W (Edgington Quad)	660	1,037	15,500	5,100	46.6	1.2	45	1,700	540	31	16.51	16.3	12.8	10.7	9.3	10.5	8.6	6.5	6.2
2	Big Branch (Loud Thunder, under construction) SW ¼ 27-17N-4W (Edgington Quad)	620	172	3,700	1,200	7.4	0.8	65	800	437	7	2.62	2.6	2.5	2.0	1.8	2.3	1.8	1.4	1.2
3	Fancy Creek NW ¼ 35-17N-3W (Milan Quad)	660	154	2,300	750	4.9	0.8	45	700	199	5	1.74	1.7	1.6	1.3	1.2	1.4	1.1	0.8	0.7
4	Mill Creek W ½ 31-17N-1W (Milan Quad)	650	1,320	21,600	7,000	60.4	1.1	49	1,200	448	36	21.40	21.1	17.2	14.1	12.5	14.2	11.8	8.9	8.5
5	Case Creek NE ¼ 31-17N-1W (Milan Quad)	660	365	7,300	2,400	13.9	0.8	60	900	410	16	4.92	4.8	4.5	3.7	3.4	4.3	3.3	2.7	2.4
6	Coal Creek SE ¼ 1-16N-1W (Orion Quad)	700	486	6,500	2,100	15.2	0.9	40	800	217	23	5.38	5.2	4.4	3.7	3.3	4.1	3.4	2.4	2.1
7	Trib. Rock River SW ¼ 13-18N-1E (Port Byron Quad)	630	70	750	244	3.0	1.6	32	250	45	4	1.06	0.9	0.7	0.6	0.5	0.6	0.5	0.4	0.3
8	Zuma Creek S ½ 34-19N 2E (Port Byron Quad)	650	174	2,200	720	4.0	0.7	38	400	88	10	1.42	1.4	1.3	1.1	1.0	1.3	1.0	0.8	0.7

Existing Reservoirs in Rock Island County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Joslin Slough	13-18N-2E 18-18N-3E (Erie Quad)	James Landuyt Lee Hanna	0.7	448			68				
Jones Lake	26-35-16N-6W (Muscatine Quad)	Paul Furnas	4.0	2,560			9				
Clear Lake	35-36-16N-6W (Muscatine Quad)	Daniel Kunts Dorthea Rounds	4.0	2,560			14				
Snooks Pond	21-22-17N-2W (Milan Quad)	Moline Consumer Co.	0.5	320			9				
Greenwood Slough	SE ¼ 13-17N-1W (Orion Quad)	Dr. Arp	.3	200			39.3				
Coaltown Slough	SE ¼ 13-17N-1W (Orion Quad)	Dr. Arp	.5	290			11				
Bowles Slough	18-17N-1E (Orion Quad)	Deere & Co.	2.0	1,265			30.5				
Lake George	SW ¼ 27-17N-4W (Montpelier Quad)	Ill. Dept. of Cons.	7.4	4,740	73	60	167	3,700	1,204	9.37	
Hidden Lake	SE ¼ 4-16N-3W (Milan Quad)	Betty Figg	.523	335	21.1	15.1	5.83	24.9	8.1	0.90	

ROCK ISLAND COUNTY



entrenched dendritic drainage pattern. The steep wooded valley walls border a wide flat floodplain most of which is under cultivation. A two-lane blacktop near the upper reaches could be raised in two places, and a road 2 miles downstream could be relocated. A one-lane gravel road crossing the site in two locations could be abandoned, but two dwellings on this road would have to be acquired. Some improvement would probably be necessary on a power line crossing. Access to the lake is provided by township roads from Illinois Route 92 about 1.5 miles north of the site. A surficial geologic investigation and logs of previous borings indicate that Pennsylvanian bedrock is overlain by about 60 feet of unconsolidated material, primarily till. An exposed section on the left abutment shows 3 feet of loess over 2 feet of fine-to-medium sand over sandy clay till, the base of which is not exposed. The right abutment is covered with loess, but is believed to be about the same composition as the left. The depth of the alluvium was not determined, but the surface material is a sandy clayey silt. Although no serious problems are anticipated, test borings would be required to determine the feasibility of the site and should include an investigation of the sand deposits seen on the left abutment. An adequate quantity of till suitable for borrow material probably could be obtained from the nearby uplands and valley walls. This site should develop at a moderately high project cost.

Site 2. This site on Big Branch, in the Loud Thunder Forest Preserve, is presently under construction.

Site 3. A small reservoir could be developed on Fancy Creek with the dam 1 mile southeast of Andalusia. This creek is a minor stream in the western part of the county that drains an area of loess and drift covering Pennsylvanian sediments. The uplands are very gently rolling with a relief of 10 to 20 feet. According to exposures along the valley walls, bedrock is near the surface, probably less than 20 feet in most places. Cover in the lake area is generally pasture with scattered timber. Although township roads closely surround the lake, only one would have to be raised. An exposure in the lower portion of the right abutment shows 3 feet of loess over 4 feet of sandy clay till over 1 foot of clayey sand over calcareous soft thinly

laminated fine-grained sandstone. The left abutment is covered with loess but is probably similar to the right. Alluvium in the floodplain consists of tan sandy clay. A program of test borings would be required to determine feasibility, but no problems are anticipated. Sufficient quantities of borrow should be available from the nearby till deposits. This would make a good small lake at low project cost.

Site 4. A large reservoir site exists on Mill Creek with the dam 3 miles southeast of Milan in a rapidly developing area. Mill Creek is a major stream in the central portion of the county and drains an area of loess and till covering Pennsylvanian bedrock. The bottoms are under general cultivation and contain two farm units and three new frame dwellings. A natural gas pipe line station is very close to the proposed water level and might require protection. The existing road system would be very good with one or two relocations. The uplands are gently rolling with a relief of 10 to 20 feet. The depth to bedrock is probably less than 20 feet according to exposures along the valley walls. The left abutment is loess covered, but an exposure in the nearly vertical right abutment shows 6 feet of loess over 2 feet of sand and gravel over 7 feet of interbedded fine sand and sandy silt over 2 feet of coarse sand and gravel over 1 foot of soft clay over 1 foot of gravel with layers of clay over 6 feet of soft shale, the bottom of which was not exposed. Test borings would be required to determine the extent of sand and silt deposits in the abutments and to locate a suitable source of borrow. The floodplain alluvium is silty fine-to-medium sand and would not be acceptable for borrow. This site should develop an excellent reservoir at a moderately high project cost.

Site 5. Case Creek provides an excellent potential reservoir site in an area of rapid development. Case Creek is one of the major streams of central Eock Island County, and it drains an area of loess and till covering Pennsylvanian sediments. No residences would be involved. A two-lane blacktop road would have to be raised slightly in two locations, and with this improvement, the lake would be very well serviced by existing roads. Cover in the lake area is primarily pasture. The uplands are flat to gently rolling with a relief of 10 to 20 feet, but they slope abruptly into a steep-walled dendritic drainage pattern. Depth to bedrock is probably less than 25 feet according to exposures along the valley walls. The right abutment shows about 4 feet of loess over at least 8 feet of soft silty shale, and the left-abutment is expected to be similar. An exposure upstream shows 6 feet of loess over 10 feet of sandy clay till over 2 feet of silt, sand, and sandy gravel over 1.5 feet of coal over 3 feet of soft underclay. Adequate borrow should be available from till deposits in the nearby uplands and valley walls. Several small creeks in the area have been successfully dammed indicating the general impermeability of local formations. Test borings would be required to determine the nature and extent of sand in the valley walls, and a mined-out area near the head of the reservoir should be studied for possible problems. This site would make a good reservoir at a moderate project cost.

Site 6. A potential dam site exists on Coal Creek about 2 miles southeast of Coal Valley, and is one of several possible sites on the stream. Development of this site would inundate four gravel roads and one residence. A site further downstream would reduce the number of man-made obstructions involved. The uplands in this area are very gently rolling and slope uniformly into a well-developed dendritic pattern of moderately steep walled valleys. Excellent access to the area is provided by U. S. Route 150 about 1 mile northeast of the site. Although logs of previous borings and a surficial examination did not uncover any serious geologic problems, future borings would be required before final determination of feasibility. The abutments and valley walls consist of 3 to 4 feet of loess over at least 15 feet of tan to light brown sandy silty clay till. Depth to Pennsylvanian bedrock is approximately 50 feet. Although the depth of the alluvium was not determined, it is not expected to be excessive, and the alluvium probably consists of silts and sands. A sufficient quantity of till suitable for borrow could be obtained from the valley walls and nearby uplands.

Site 7. A small potential reservoir site exists on a northern tributary of the Rock River with the dam about 2.5 miles southeast of Rapids City. One north-south gravel road across the site could be abandoned or relocated. Existing township roads and Illinois Routes 2 and 92 would provide good access. The watershed, which limits the size of this site, exhibits gently rolling uplands that slope uniformly into the moderately steep walled V-shaped valleys. Depth to bedrock is generally less than 25 feet. An exposed section of the right abutment shows 4 feet of loess over 4 feet of vegetation-covered soil over 2 feet of fine- to medium-grained thick-bedded sandstone over 9 feet of sandy shaly siltstone, the base of which was not exposed. The creek flows in a 6- to 9-foot notch of silty sand, but this is over thick-bedded sandstone. A source of borrow was not apparent in the vicinity of the dam. Although this site is classified as probably feasible geologically, a program of test borings and materials testing would be required to test the sandstone for leakage and to locate a suitable source of borrow.

Site 8. A good small reservoir could be developed about 5 miles southwest of Hillsdale on Zuma Creek. This creek, a minor tributary of the Rock River, drains an area of loess and drift covering Pennsylvanian sediments. Land use in the lake bed consists of about half pasture and half row crops with timber along the creek banks and steeper valley walls. A two-lane blacktop road would probably have to be relocated, but no residences would be involved. The uplands are gently rolling with a relief of 20 to 30 feet, and they slope gradually into the wide bowl-shaped valley. Bedrock is about 50 feet below the upland surface. Composition of the abutments and valley walls is obscured by vegetation. The floodplain alluvium consists of brown silty clayey sand to an undetermined depth. The lack of surface exposures makes a complete program of test borings and materials testing necessary before any determination of feasibility is made. Such a program would determine the nature, sequence, and extent of subsurface materials, and the possible presence of suitable borrow materials. This site should develop at a moderate project cost.

STEPHENSON COUNTY

The surface topography of Stephenson County is fairly young. An older landscape, carved in the bedrock before the glaciers advanced into the area, is present beneath the thin mantle of glacial deposits. The bedrock consists of layers of limestone, dolomite, shale, and sandstone. Present day surface valleys coincide with older valleys in the bedrock except in areas of very thick glacial deposits. The Pecatonica Valley east of Freeport contains considerable water-bearing sands and gravels. Thinner but continuous sand and gravel deposits are present along Yellow Creek and in a bedrock valley southwest of Freeport. Nearly all of Stephenson County drains southeasterly via the Pecatonica River and its tributaries to the Rock River. The results of five feasibility studies in Stephenson County are presented here.

Site 1. A small tributary of Waddams Creek in northwestern Stephenson County has a potential dam site 1.25 miles east of Lena. The watershed uplands are Ordovician bedrock hills which are covered with approximately 20 feet of loess and till and have between 30 and 40 feet of relief. The reservoir area is in pasture, and light woods cover both valley walls. The stream banks are covered with brush. A two-lane blacktop road crossing the upper third of the reservoir area would have to be raised. No residences would be involved, but at least one new access road would be required. The stream meanders in a 5-foot notch in a floodplain approximately 350 to 400 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium is dark brown slightly sandy silt. The valley walls are composed of reddish brown sandy clay till underlain by Galena dolomite and overlain by loess. The abutments are moderately sloping, and are composed primarily of tan to buff thin-bedded sandy rugged Galena dolomite, capped by tan to light brown sandy loess. Good borrow in sufficient quantities could be obtained from the till along the valley walls and in the nearby uplands. The site is considered probably feasible, subject to verification with special attention to the possible presence of solution channels in the dolomite which could permit leakage. This should make a good small reservoir at a moderately low project cost.

Site 2. A reservoir could be created on Cedar Creek, a major stream in north-central Stephenson County, by constructing a dam 0.5 mile northeast of Cedarville. The watershed uplands are Ordovician bedrock hills covered with approximately 10 feet of loess and till. Relief in the area is from 30 to 40 feet. The reservoir area is open land under clean-tilled cultivation or in pasture. At least three residences and associated outbuildings would be inundated. A two-lane gravel highway would have to be abandoned and another road raised. Access to several residences would have to be provided. The stream bed is entrenched in a 6-foot notch in a floodplain approximately 75 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of brown to dark brown clayey sandy silt. The gently sloping valley walls are covered with vegetation in most places and are composed of Galena dolomite overlain by clayey till overlain by sandy loess. The steeply sloping abutments are composed largely of tan to buff thinly bedded cherty rugged Galena dolomite, overlain by at least 1 foot of reddish brown sandy clay till, overlain by tan to light brown sandy loess. The floodplain alluvium is not suitable for borrow but sufficient quantities of till could be obtained from the valley walls and the nearby uplands. The site is considered probably feasible, subject to verification with special attention to discontinuities in the dolomite and possible serious leakage problems. This site should develop a fair reservoir at a moderately high to high project cost.

Site 4. A good small reservoir could be created on Rock Run, a tributary of Pecatonica River, by constructing a dam 1.5 miles west and 0.25 mile north of Davis. The watershed uplands are Ordovieian bedrock hills covered with approximately 10 feet of loess and till. Relief in the area is between 30 and 40 feet. Cover

in the reservoir area is about half row crops and half pasture. Three or four old residences would have to be acquired on the left abutment, along with two farm units in the body of the reservoir and one just below the dam site. A two-lane blacktop road and a two-lane gravel road would have to be abandoned. Two other roads could be raised, and a road built over the top of the structure. The stream is entrenched 4 feet in a floodplain approximately 200 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of brown silty clayey sand. The steeply sloping abutments are composed largely of tan to buff thinly bedded sandy rugged Galena dolomite, overlain by 2 to 3 feet of brown sandy clay till, overlain by loess. The reservoir valley walls slope gently to the uplands and are composed of Galena dolomite, till, and loess. A sufficient quantity of till suitable for borrow material probably could be obtained from the valley walls and the nearby uplands. The floodplain alluvium is not suitable borrow. The site is considered probably feasible, subject to verification with special attention to possible solution channels in the dolomite which could permit serious leakage. Land and property acquisition would be costly making this a moderately high cost project.

Site 5. A potential dam site exists on Bock Run, a tributary of the Pecatonica River, 2.25 miles south and 0.75 mile west of Davis. Rock Run is a major stream that drains an uplands area of Ordovician bedrock hills covered with approximately 10 feet of till and loess. Relief in the area is between 30 and 40 feet. The reservoir area is primarily in clean-tilled crops. The valley walls are covered with light timber and brush. A two-lane gravel road would be inundated, and shallow water would occur in the upper reaches of the lake. The stream flows in a 6-foot notch in a floodplain approximately 250 to 300 feet wide and 20 to 30 feet below the uplands. The floodplain alluvium consists of brown silty fine-to-medium sand. The abutments are composed of tan to buff thinly bedded sandy rugged Galena dolomite, overlain by 2 to 3 feet of light brown sandy silty till. The right abutment has a gentle slope, and the left abutment has a moderately gentle slope. The valley walls are composed of Galena dolomite overlain by 2 feet of brown sandy clay till overlain by 2 feet of tan to light brown sandy loess. Several springs issue from the Galena dolomite along the valley walls indicating the possibility of solution channels. A sufficient quantity of good till suitable for borrow probably could be obtained from the valley walls and the nearby uplands. The site is considered feasible, subject to verification with special attention to the possibility of solution channels in the dolomite. This site should develop a fair reservoir at a moderately low project cost.

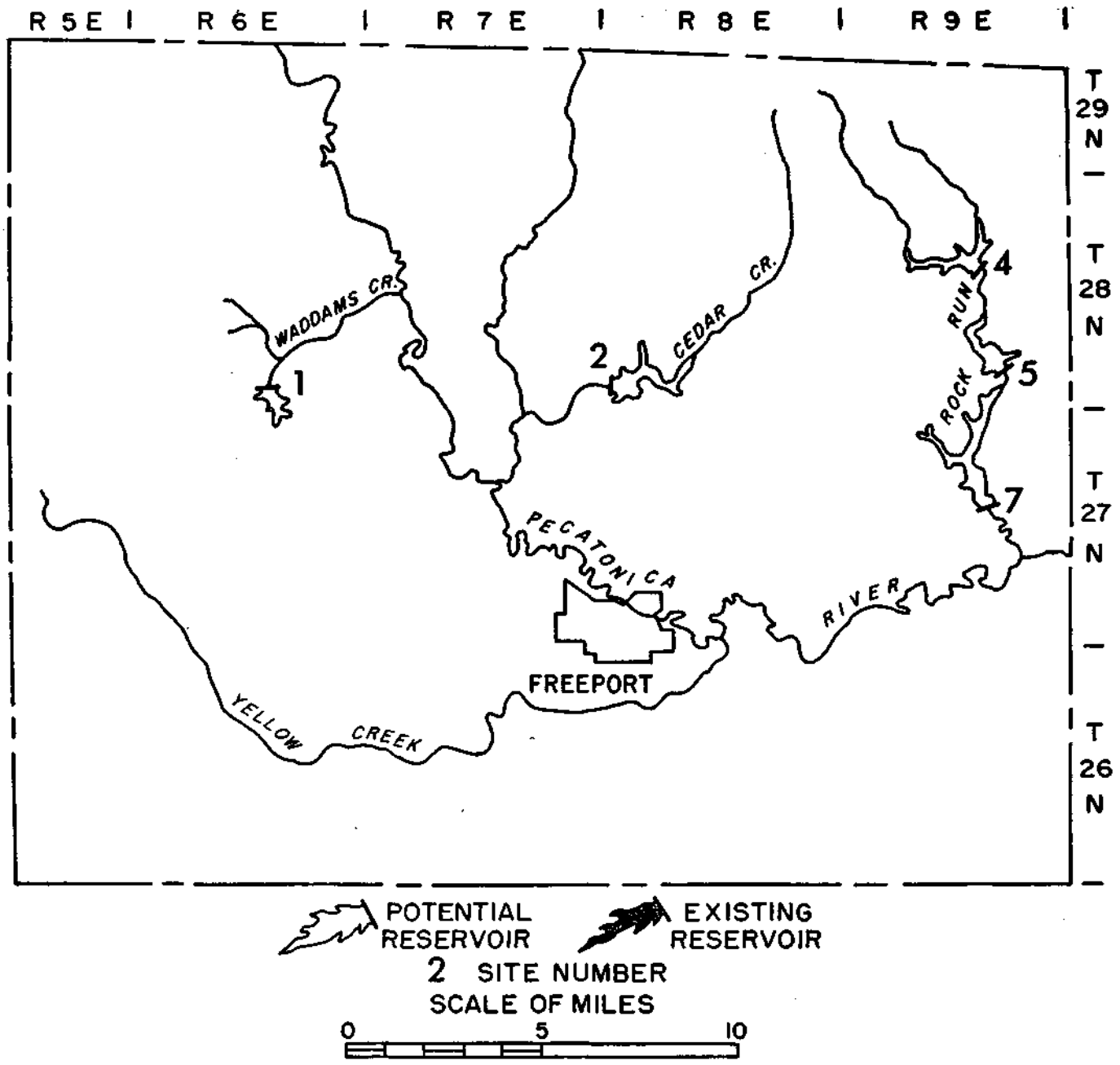
Site 7. A reservoir could be created on Rock Run by constructing a dam 4 miles west and 2.25 miles north of Pecatonica. The watershed uplands are Ordovician bedrock hills covered with approximately 10 feet of till and loess. The relief is between 30 and 40 feet. The reservoir area is under intense clean-tilled cultivation and pasture. At least five farm residences and associated outbuildings would be inundated. One two-lane

Potential Reservoirs in Stephenson County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Trib. Waddams Creek Ctr. 34-28N-6E (Lena Quad)	840	102	1,400	500	2.7	0.9	42	700	194	4	1.14	1.1	0.9	0.8	0.7	1.1	0.9	0.8	0.7
2	Cedar Creek Ctr. 31-28N-8E (Freeport Quad)	820	640	6,400	2,100	27.4	2.0	30	250	43	13	11.59	11.5	11.3	9.6	8.1	8.9	7.6	6.3	6.0
4	Rock Run SE ¼ 15-28N-9E (Pecatonica Quad)	860	538	5,380	1,750	22.7	2.0	30	400	42	12	9.60	9.5	8.0	6.6	5.8	7.5	6.3	5.3	5.0
5	Rock Run SW ¼ 26-28N-9E (Pecatonica Quad)	810	448	5,200	1,700	31.0	2.8	35	700	142	9	13.11	11.9	9.7	8.3	7.5	8.9	7.8	6.9	6.3
7	Rock Run NE ¼ 15-27N-9E (Pecatonica Quad)	780	1,427	19,000	6,200	49.7	1.2	40	2,050	530	17	21.01	20.7	20.0	17.0	14.6	19.7	15.8	13.1	12.1

Existing Reservoirs in Stephenson County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Le-Aqua-Na Lake	SW ¼ NW ¼ 16-21-28N-6E (Lena Quad)	State of Illinois	3.9	2,500	35	28	47	557	182	2.67	
Ducks Misery	NE ¼ 15-27N-7E (Freeport Quad)	Dale Fair & others				6	20	120	39.2		Oxbow
Lost Lake	NE ¼ 5-27N-9E (Pecatonica Quad)	Russian Church				6	30				



blacktop and two two-lane gravel east-west highways would have to be abandoned and a number of access roads provided. The stream is entrenched 10 to 12 feet in a floodplain approximately 0.5 mile wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of brown sandy silt. The abutments have gentle slopes which are covered with vegetation in most places so that light reddish brown sandy loess is the only sediment exposed. The abutment composition is probably similar to that of a quarry exposure about a mile northwest of the dam site which consists of 4 feet of blue-gray cherty thickly bedded crystalline dolomite (base not exposed), overlain by 5 feet of tan to buff thickly bedded rugged cherty crystalline dolomite, overlain by 15 feet of tan to buff thinly bedded sandstone with some jointing, overlain by 4 feet of tan to light brown sandy loess. No suitable borrow material for an earth dam was observed in the area. The floodplain alluvium is not suitable for borrow. The practicability of using material other than an earth fill should be studied. The site is considered probably feasible, subject to verification by test borings especially to determine the subsurface materials at the dam site and the possibility of solution channels that could permit leakage.

WHITESIDE COUNTY

Whiteside County has been subjected to vigorous glacial and stream action. The preglacial course of the Mississippi River south of Fulton was southeasterly across "Whiteside County. This old course of the Mississippi was blocked by an advance of the Wisconsinan glacier which filled the valley with permeable materials and forced the river into its present course. The bedrock surface consists of limestone which crops out in the northwestern part of the county and is generally underlain by dolomite and shale. The southern half of the county has moderately thick glacial deposits, which have filled bedrock valleys with sand and gravel. Loess varies in depth from about 150 feet in the west to 5 feet in the east. Soils of the county were formed from loess, except along the Mississippi River and Meredosia Slough and south of the Rock River where sand dunes have formed from the heavier alluvial material. Deep deposits of peat are not uncommon in the lowlands of Whiteside County. The Rock River drains most of the county to the Mississippi. Dredged ditches drain the swamp and terrace areas north and south of the Rock River and in the vicinity of Erie. Meredosia Slough, which forms the boundary between Rock Island and Whiteside Counties, serves as a cut-off between the Mississippi and Rock Rivers during flood flows.

The results of studies made for three potential reservoir sites in Whiteside County follow.

Site 1. A reservoir could be created on Otter Creek by constructing a dam 4.75 miles east and 2.5 miles north of Fulton. Otter Creek drains an area of loess-mantled Ordovician bedrock. The rolling uplands have a relief of 30 to 40 feet, and the depth to bedrock is less than 20 feet. The reservoir area is primarily open land under cultivation of moderate productivity. Ten residences and associated outbuildings, and a major township road, would be inundated. The stream meanders in a broad notch 3 feet deep in a floodplain about 0.5 mile wide and 40 to 50 feet below the uplands. The floodplain alluvium consists of brown silty fine-to-medium sand. The depth of alluvium is not known but might be very deep this close to the Mississippi River. The composition of the valley walls is dolomite that crops out continuously along the north side of the valley but is covered by sand and loess on the south. The right abutment is a vertical bluff composed almost entirely of Galena dolomite that is tan to buff, cherty, rugged, medium- to thin-bedded, fossiliferous, and jointed. The moderately sloping left abutment is covered with tan to light reddish brown silty fine sand. Material suitable for borrow is not available in the vicinity of the dam site, and the location of suitable borrow would have to be determined. Geologically, the site is considered probably feasible, subject to materials testing with particular attention to the occurrence of sand in the left abutment. This site would result in a high project cost.

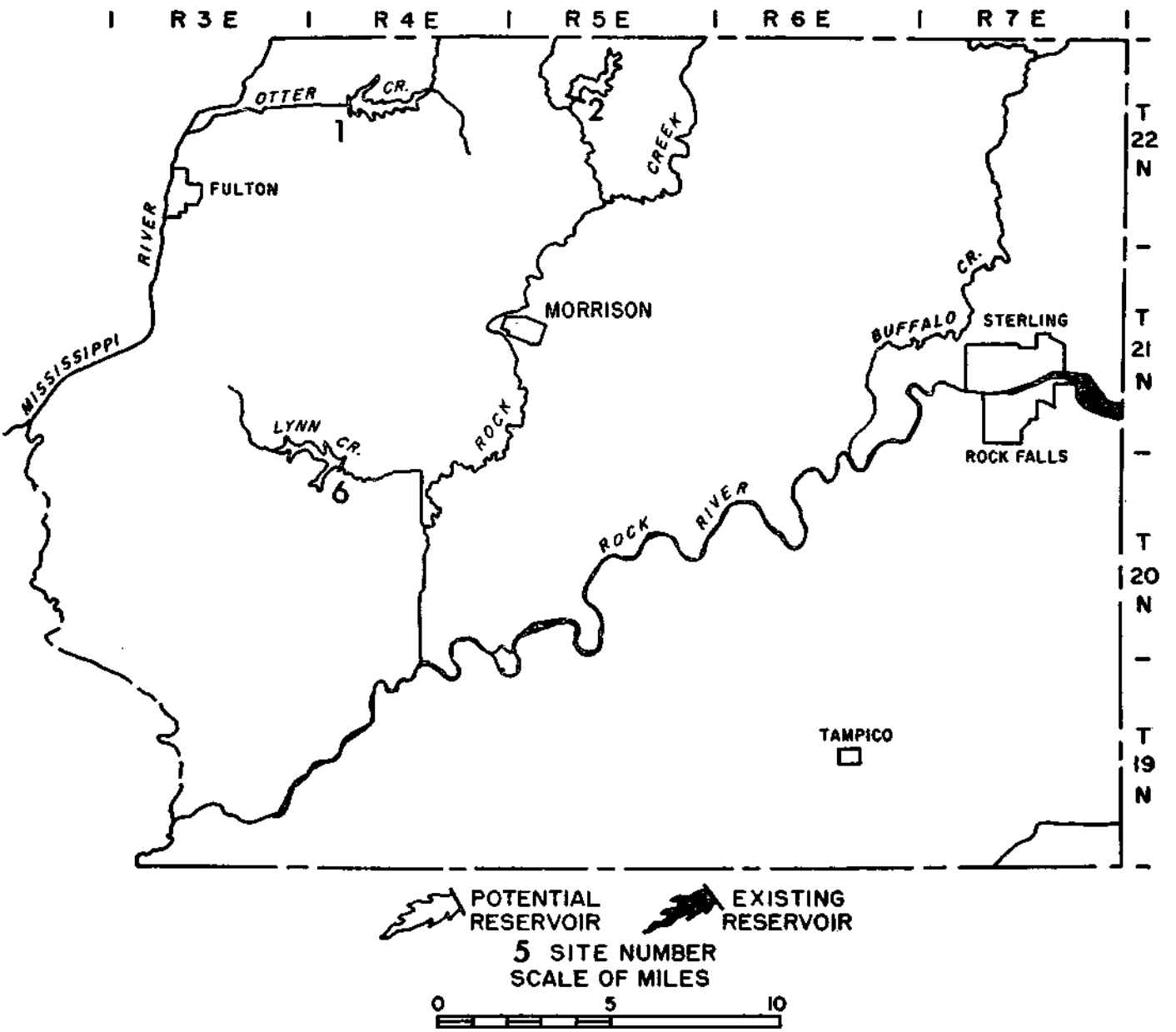
Site 2. A potential dam site is located 6.75 miles north and 1.5 miles east of Morrison on a tributary of

Potential Reservoirs in Whiteside County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals: Full capacity 5 Yr	Full capacity 10 Yr	Full capacity 25 Yr	Full capacity 40 Yr	Half capacity 5 Yr	Half capacity 10 Yr	Half capacity 25 Yr	Half capacity 40 Yr
1	Otter Creek NW ¼ 17-22N-4E (Clinton Quad)	640	500	5,800	1,900	22.2	1.6	35	1,600	360	15	8.40	8.2	8.2	8.2	8.2	6.6	5.5	4.7	4.4
2	Trib. Little Rock Creek SE ¼ 8-22N-5E (Morrison Quad)	720	314	5,800	1,900	5.7	0.4	55	1,000	416	9	2.15	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.8
6	Lynn Creek NW ¼ 5-20N-4E (Clinton Quad)	670	422	4,200	1,400	8.0	0.8	30	550	91	10	3.02	2.7	2.7	2.6	2.3	2.7	2.3	2.1	1.9

Existing Reservoirs in Whiteside County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Lake Erie	32-20N-4E 5-6-19N-4E (Erie Quad)	Erie Boat Club					15				
Hadaway Slough	19-20-19N-4E (Erie Quad)										
Goose Lake	SW ¼ 25-20N-7E (Walnut Quad)										
Cattail Slough	21-22-27-22N-3E (Walnut Quad)					6	120				



Little Rock Creek. The gently rolling uplands have relief of 20 to 30 feet and a depth to bedrock of probably less than 25 feet in most places. The reservoir area is about half open land under clean-tilled cultivation and half brush and light timber. A quarry in the west abutment and a two-lane gravel road that crosses the upper third of the reservoir area would be inundated. No residences nor utilities would be inundated. The stream meanders in a 4- to 6-foot notch in a floodplain 250 to 300 feet wide and 20 to 30 feet below the uplands. Orangish brown sandy thin-bedded dolomite is exposed in the base of the stream channel. The floodplain alluvium consists of brown silty fine sand. The moderately sloping valley walls of the reservoir area are mostly covered with vegetation. The abutments slope moderately to the uplands and probably are underlain by dolomite covered by tan to light brown sandy silt. Material suitable for borrow was not observed in the vicinity of the dam site. The floodplain alluvium is not suitable for borrow. The site is considered probably feasible, subject to verification by test borings and materials testing to determine the nature and sequence of subsurface materials, the possibility of solution channels, and the location of suitable borrow. This site should result in a good small reservoir at a moderate project cost.

6. A long, narrow, many-fingered reservoir could be created on Lynn Creek by constructing a dam 7.75 miles east and 2.5 miles south of Albany. Lynn Creek is a significant drainage course for the loess plains in the southwestern portion of the county. The watershed has rolling uplands with a relief of 30 to 40 feet. No residences would be inundated, but at least one would require new access. A gravel road crossing the site would have to be abandoned. The reservoir area is primarily open land, with about a third in row crops and the rest in pasture. The stream meanders in an 8- to 10-foot notch in a floodplain about 200 to 250 feet wide and 20 to 30 feet below the uplands. The floodplain alluvium consists of dark brown to gray sandy clayey silt. The valley walls have gentle to moderate slopes that are covered with vegetation. Both abutments show light brown to brown sandy clayey silt known as loess, but are mostly covered with vegetation. The floodplain alluvium is not suitable for borrow, and there are no exposures to indicate the presence of a sufficient quantity of suitable borrow near the dam site. The site is considered probably feasible, subject to materials testing with special attention to determining the nature and sequence of the subsurface materials and the extent of sand in the abutments. This should make a good reservoir at a moderate project cost.

WILL COUNTY

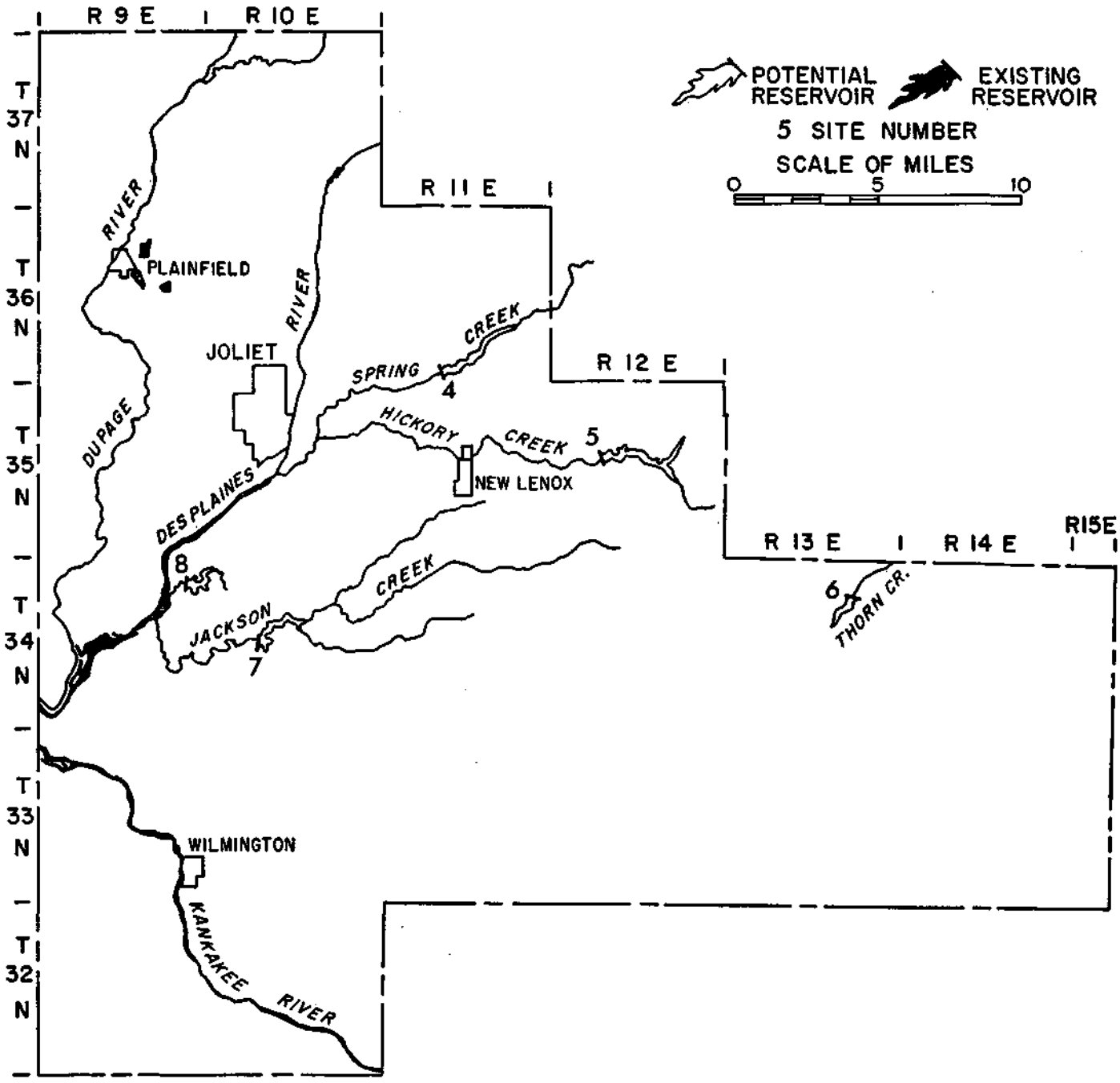
The bedrock surface in Will County is divided by the Sandwich Fault Zone which lies from northeast to southwest a few miles south of Joliet. North of this division the bedrock consists of dolomite which is overlain by moderately heavy drift. South of the fault zone the bedrock surface is more complex and includes Maquoketa shale and sandstone in addition to the dolomite. Although the major bedrock features are discernible beneath the drift in the western third of the county, sufficient till to serve as borrow for earth dam construction is generally available. Leakage may be a problem because of the abundant permeable sand and gravel deposits beneath the floodplains and the possibility of solution channels in the fractured bedrock. These conditions must be explored by an adequate program of test borings and materials testing. Five potential reservoir sites were studied in Will County, and the results of these studies follow.

Site 4. A good reservoir could be created by constructing a dam on Spring Creek about 2.5 miles northwest of New Lenox. The creek drains the gently rolling Valparaiso moraine east of Joliet. Spring Creek carried large quantities of outwash material during glacial times, and as a result extensive sand and gravel deposits underlie the valley. Relief in the area ranges from 50 to 100 feet. Most of the reservoir area is in pasture or row crops with small patches of timber. A two-lane blacktop road crossing the upper reaches would have to be raised. Several residences and some farm buildings would have to be acquired for shoreline control. At least two water wells for the city of Joliet would be affected by the present site location, but the well at the base of the right abutment could be avoided by shifting the axis of the dam upstream. Logs of previous borings in the area indicate that 78 to 131 feet of unconsolidated glacial material overlies the Niagaran dolomite bedrock. Both abutments have moderate slopes and are underlain by stony sandy clayey till. A test well at the foot of the right abutment indicates 110 feet of sand and gravel overlying dolomite bedrock. Spring Creek flows in a notch 4 to 6 feet deep and 8 to 10 feet wide in a floodplain 1400 feet wide. Sufficient quantities of till suitable for borrow material would be

Potential Reservoirs in Will County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals							
													Full capacity				Half capacity			
													5 Yr	10 Yr	25 Yr	40 Yr	5 Yr	10 Yr	25 Yr	40 Yr
4	Spring Creek NW ¼ S-35N-11E (Mokena Quad)	665	420	4,900	1,596	13.7	1.5	35	2,000	474	4	6.73	6.2	5.5	4.8	4.6	3.8	3.3	2.8	2.6
5	Hickory Creek SW ¼ SE ¼ 13-35N-11E (Mokena Quad)	685	580	5,025	1,636	40.0	4.4	26	1,150	158	9	19.66	12.1	11.2	10.0	9.9	7.9	6.6	6.4	6.1
6	Thorn Creek Ctr. N ½ 11-34N-13E (Steger Quad)	745	52	606	197	3.0	2.6	35	500	106	2	1.42	1.1	0.9	0.9	0.9	0.7	0.6	0.5	0.5
7	Jackson Creek SW ¼ SE ¼ 17-34N-10E (Elwood Quad)	610	255	2,040	665	44.7	12.0	24	650	82	6	21.97	8.4	7.2	6.8	6.8	5.6	5.2	4.4	4.4
8	Cedar Creek SW ¼ SW¼ 1-34N-9E (Channahon Quad)	580	145	2,115	690	13.1	3.4	44	1,000	270	3	6.44	4.6	4.2	3.7	3.5	3.1	2.7	2.6	2.5

WILL COUNTY



available in the adjacent uplands. The site is considered probably not feasible, unless an adequate program of test borings and materials testing shows that permeable sand and gravel deposits would not cause serious leakage from the reservoir. If serious leakage from the reservoir would occur, the project might be re-evaluated for artificial ground-water recharge since the abutment conditions are geologically suitable.

Site 5. A reservoir could be developed on Hickory Creek by constructing a dam 1 mile southeast of Mokena. Hickory Creek drains a part of the Valparaiso moraine. The watershed is mostly gently rolling open farmland but contains several subdivisions. About half of the reservoir site is in timber and the rest in pasture and row crops. A two-lane blacktop road, a high line, and at least one high pressure pipe line cross the reservoir area. No residences would be inundated, but a convent and an adjoining farm would probably require protection. The creek flows in a notch 30 to 50 feet wide and 3 to 8 feet deep in a floodplain 400 to 1100 feet wide that is underlain by sandy silty clayey alluvium and

Existing Reservoirs in Will County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
	NE ¼ SE ¼ 35-36N-11E (Mokena Quad)	S. Studnicki	.06	40	18	14	5.4				Farm pond
	NE ¼ NE ¼ 29-36N-9E (Plainfield Quad)	F. Bushnell	2.66	1,700	18	13	10				Farm pond
Rock Lake	W ½ 26-37N-10E (Romeoville Quad)										
Lake Renwick	15-36N-9E (Plainfield Quad)										
Deer Lake	NW ¼ 10-34N-14E (Dyers Quad)						25				
Monee Reservoir	W ½ 32-34N-13E (Frankfort Quad)						40				
Kemery Lake	SE ¼ 5-33N-10E (Symerton Quad)						20				

gravel. Logs of previous borings in the area indicate that from 88 to 115 feet of unconsolidated glacial material overlies the Niagaran dolomite bedrock. There are some scattered gravel deposits, representing small kames and eskers, along the creek, but these are believed to be local and do not appear to present any serious leakage problems. The right abutment is on a small heavily-wooded promontory which has steep slopes and is underlain by stony sandy clayey till. The left abutment, which has moderate slopes rising about 45 feet, is underlain by till and scattered pockets of coarse gravel. Sufficient quantities of impervious sandy clayey till for borrow would be available in the adjacent uplands. The site is considered geologically feasible, subject to verification by an adequate program of test borings and materials testing. This site would probably result in a moderately high cost project because of land acquisition and relocation costs.

Site 6. A very good small reservoir could be created on Thorn Creek by constructing a dam 1.5 miles southwest of Park Forest. Thorn Creek is an intermittent stream draining a part of the Valparaiso moraine which has a rolling topography and a relief of 40 to 70 feet. The creek flows in a notch 2 to 4 feet deep and 4 to 6 feet wide in a floodplain 150 to 200 feet wide that is underlain by sandy clay alluvium. The entire reservoir area is in timber with some new plantings. A gravel road on the right abutment would have to be relocated, but a gravel road crossing the center of the reservoir area could be abandoned. Only one residence would be inundated. Because of residential development downstream from the dam, this site would have to be classified as a high hazard structure. Logs of previous borings in the area show 84 to 130 feet of unconsolidated glacial material overlying the Niagaran dolomite bedrock. The left abutment has steep slopes rising about 50 feet and is underlain by sandy clayey till. The right abutment has moderate slopes and is also underlain by sandy clayey till. Similar till underlies most of the reservoir area. Sufficient quantities of borrow would be available in the uplands. The site is considered geologically feasible, subject to verification by an adequate program of test borings and materials testing. This site should develop at a moderate project cost.

Site 7. A relatively shallow reservoir could be created on Jackson Creek by constructing a dam 100 feet upstream from the Gulf, Mobile, and Ohio Railroad Bridge, 1 mile northeast of Elwood. Jackson Creek lies at the edge of the area formerly occupied by glacial Lake Wauponsee. The flat lake plain lies to the north while the southern drainage comes from a slightly rolling morainal topography. The reservoir area is about a third in timber and the rest in cropland and pasture. Several buildings constructed within the last two years would be inundated. A gravel road crossing the center of the reservoir area could be abandoned, and the new alternate U. S. Route 66 would have to be protected. Relief in the area ranges from 35 to 85 feet. Logs from previous borings indicate that between 37 and 65 feet of unconsolidated glacial material overlies the Niagaran dolomite bedrock which crops out within the reservoir area in the NW 1/4 of section 21. The creek flows in a notch 20 to 30 feet wide and 2 to 4 feet deep in a floodplain 500 to 700 feet wide. The valley walls have gentle to moderately steep slopes underlain with clayey till. The right abutment at the dam site has moderately steep slopes rising 30 feet to the upland, and the left abutment has very gentle to gentle slopes rising to the same height. Both abutments are underlain by stony sandy clayey till. Sufficient quantities of till would be available in the area adjacent to the dam site to construct an impervious embankment. Geologically, the site is considered probably feasible even though the surface of the shallow bedrock is probably irregular and solution channels may be present which would cause leakage. Sedimentation would be

a problem at this site. Development of this site would result in a moderately high project eost because of the expensive acquisitions, relocations, and protections.

Site 8. A reservoir could be created on Cedar Creek, a tributary of the Des Plaines River, by constructing a dam 3.5 miles east and 2 miles north of Channahon. Cedar Creek drains a part of the gently rolling plain formerly occupied by glacial Lake Wauponsee. The relief in the area ranges from 60 to 100 feet, and the land cover is mostly cultivated farm crops. The reservoir area is in pasture but has some timber on the valley walls near the dam site. Three residences and a one-lane gravel road crossing the center of the reservoir would be inundated. The valley walls are underlain by sandy clayey till. The creek bed in the lower part of the reservoir area is cut into the dolomite bedrock which is thin bedded with beds ranging in thickness from 1 to 3 inches. The bedrock surface map indicates that bedrock is not likely to be encountered at the level of the proposed emergency spillway. The thin alluvium along the creek is sandy and gravelly. A suitable impervious borrow material of sandy clayey till occurs in the adjacent uplands in sufficient quantities to build an embankment. No evidence of solution channels nor cavities was observed in the shallow bedrock, and the jointing appeared to be relatively tight. The site is considered feasible, subject to verification by an adequate program of test borings and materials testing.

WINNEBAGO COUNTY

The topography of Winnebago County varies from extremely rolling in the northwestern portion to gently rolling in the southeast. The depth of the glacial drift varies widely throughout the county. Bedrock, which may consist of sandstone, dolomite, or shale, is exposed in many places but east of the Rock River is over 300 feet deep. Pre-Illinoian glaciations covered portions of the county with thin drift which was in turn buried by Illinoian materials. Meltwaters from the Wisconsinan glaciation carried immense amounts of graded material into the Rock River Valley. The deposition of clay and silt in the Pecatonica Valley was caused by ponding during the Wisconsinan period. Winnebago County is entirely within the Rock River Basin and is drained by two large tributaries, the Kishwaukee in the southeast and the Pecatonica in the northwest. The results of studies for five potential reservoir sites in Winnebago County follow.

Site 1. A reservoir could be developed on North Branch Otter Creek by constructing a dam 2.5 miles west and 2.75 miles north of Durand. North Branch Otter Creek is a major stream in northwestern Winnebago County that drains an area of loess-covered bedrock hills. The watershed uplands have a relief of 30 to 40 feet and a depth to bedrock of less than 10 feet in most places, according to exposures along the valley walls and logs of previous borings. The reservoir area consists almost entirely of open land in pasture. One farm residence and a one-lane oiled road would have to be abandoned. The stream is entrenched 4 feet in a floodplain approximately 800 to 1000 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of brown sandy silt. The valley walls are composed of Galena dolomite overlain by loess. Several springs issue from the dolomite along the reservoir walls. The right abutment is composed of tan to buff sandy rugged thinly bedded Galena dolomite, which is overlain by light brown sandy loess. Only loess is exposed in the left abutment, but dolomite probably underlies the loess. The alluvium is not suitable for borrow, nor was any suitable material observed in the vicinity of the dam site. The site is considered feasible, subject to verification by testing with special attention to the possibility of solution channels in the dolomite. Two small stock ponds have been successfully built in the downstream area. This site would probably develop at a moderately high project cost.

Site 2. A reservoir could be created on North Kinnikinnick Creek by constructing a dam 2 miles northeast of Roscoe and 6.5 miles southeast of South Beloit. This minor stream in the northeastern portion of the county drains an area of till-covered bedrock hills which have a relief of 30 to 40 feet. The reservoir area is mostly in pasture and some row crops. Excellent timbered uplands could be developed for recreational purposes. Two gravel roads would have to be raised slightly, and one farm residence would have to be acquired. Active subdivision development in the dam site area could make this site impracticable in the future. The stream flows in a 3-foot notch in a floodplain 50 to 75 feet wide and 50 to 60 feet below the uplands. The floodplain is covered with gray to dark gray silty alluvial sand. The valley walls are composed of till-mantled limestone and dolomite. The abutments are composed of 10 to 15 feet of gray medium-bedded crystalline limestone and dolomite with some jointing and open bedding planes. Small solution pits are present in the outcrops. The carbonate rocks are overlain by brown sandy clay till of variable thickness. The abutments have moderate to steep slopes and are vertical at many places where

carbonates crop out. Till from the nearby uplands would be suitable borrow material but may not be present in sufficient quantities. The site is considered feasible, subject to verification by testing with special attention to the possibility of solution openings in the carbonate rocks.

Site 3. A small reservoir could be created by constructing a dam on a minor tributary of South Kinnikinnick Creek 2 miles east of Eoscoe. The creek drains an area of loess- and till-mantled bedrock hills having 40 to 50 feet of relief. The depth to bedrock is less than 10 feet in most places. The lower half of the reservoir area is timber and the upper half is in pasture. No roads nor residences would be involved. The stream flows in a 3-foot notch in a floodplain approximately 25 feet wide and 40 to 50 feet below the uplands. Dolomite crops out in the stream channel. The floodplain alluvium consists of brown silty sand. The valley walls slope steeply to the uplands, and are composed largely of dolomite overlain at some places by tan gravelly silty sand till. The abutments have steep to vertical slopes and are composed entirely of tan to buff thinly bedded sandy rugged Galena dolomite. Some brown sandy loess is present near the top of the abutments. The floodplain alluvium is not suitable for borrow, and no suitable material for construction of an earth dam was observed near the dam site. A rock-fill or some other type of dam might be considered. The site is considered feasible, subject to verification by testing with special attention to possible solution channels in the dolomite. This reservoir should develop at a moderate project cost.

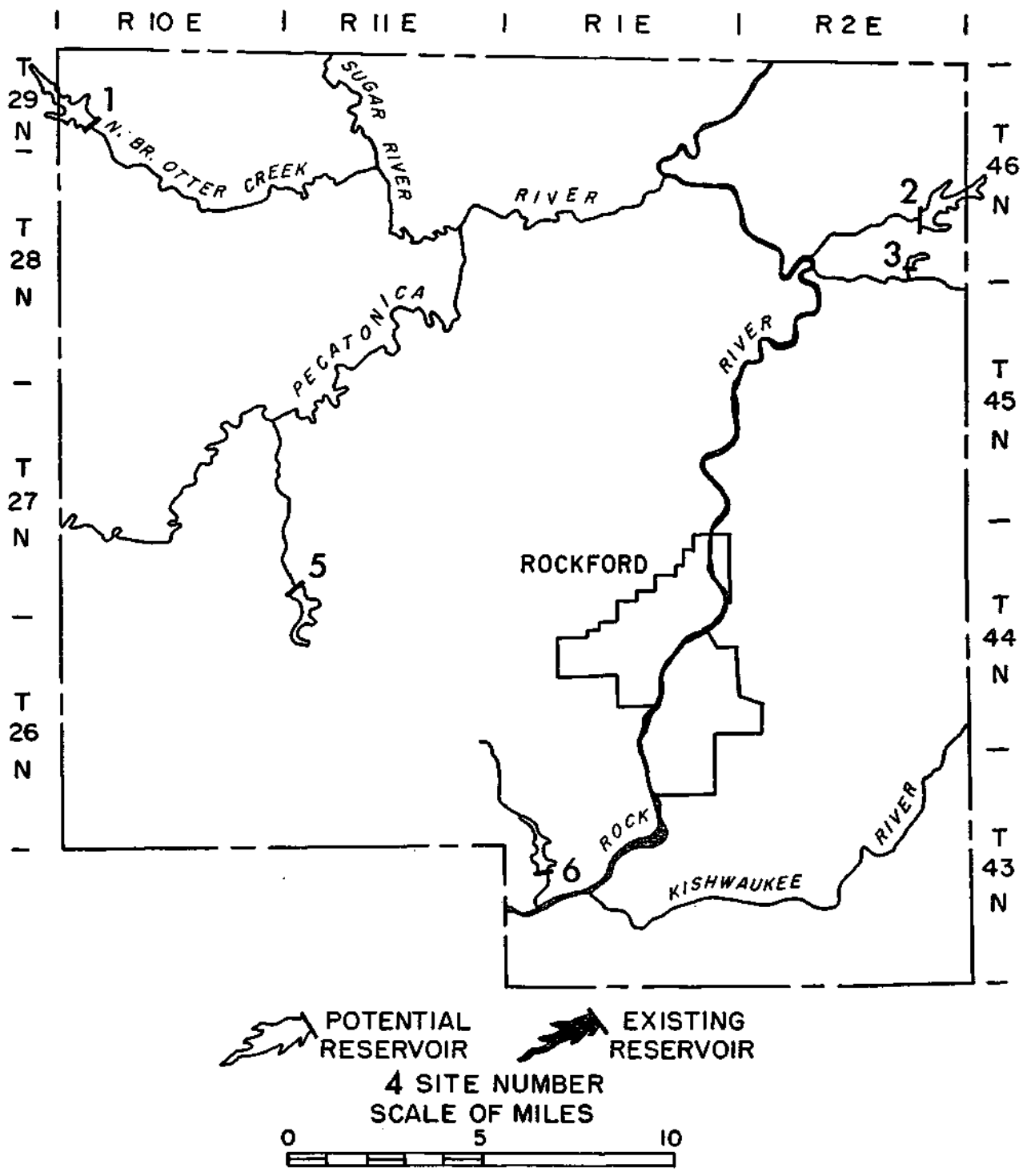
Site 5. A potential reservoir site exists on Coolidge Creek with the dam site 4 miles east and 1 mile south of Pecatonica. Coolidge Creek, a minor stream in west-central Winnebago County, drains an area of till-covered Ordovician dolomite hills which have a relief of 30 to 40 feet. Cover in the reservoir area consists of pasture in the bottomland and row crops on the slopes. A one-lane gravel road across the site could be raised. No residences would be involved. The stream meanders in a 5- to 6-foot notch in a floodplain approximately 0.25 mile wide and 20 to 30 feet below the uplands. The floodplain alluvium consists of brown sandy silt. The gently sloping valley walls are covered mostly with vegetation but have reddish brown sandy clay till exposed near the top. The abutments have gentle slopes and are covered with vegetation. The depth to bedrock is probably less than 25 feet. The floodplain alluvium is not suitable for borrow, but a sufficient quantity of suitable till could probably be obtained from the valley walls or the nearby uplands. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing especially

Potential Reservoirs in Winnebago County

Site	Waterway location	Spillway elevation (ft)	Pool area (acres)	Storage (ac-ft)	Storage (mg)	Watershed (sq mi)	Times filled per year	Depth at dam (ft)	Length of dam (ft)	Earth fill (1,000 cu yd)	Shoreline (mi)	Mean annual runoff (mgd)	Net yield (mgd) for given recurrence intervals — Full capacity 5 Yr	10 Yr	25 Yr	40 Yr	Half capacity 5 Yr	10 Yr	25 Yr	40 Yr
1	N. Br. Otter Creek NE ¼ 31-29N-10E (Pecatonica Quad)	830	326	4,300	1,400	8.2	0.9	40	1,600	389	9	3.47	3.2	3.2	3.1	2.8	3.3	3.0	2.4	2.1
2	N. Kinnikinnick Creek E ½ 26-46N-2E (Belvidere Quad)	840	486	8,100	2,600	15.3	0.8	50	900	298	8	5.94	5.6	5.6	4.9	4.6	5.7	4.5	3.8	3.4
3	Trib. S. Br. Kinnik. Creek Ctr. 35-46N-2E (Belvidere Quad)	840	83	1,100	400	3.6	1.4	50	700	232	2	1.40	1.4	1.2	1.0	0.9	1.1	0.8	0.7	0.7
5	Coolidge Creek NW ¼ 31-27N-11E (Pecatonica Quad)	800	262	2,200	700	8.3	1.8	25	1,300	179	10	3.51	3.4	3.1	2.5	2.2	2.8	2.4	1.9	1.8
6	Trib. Rock River NW ¼ 20-26N-1E (Kings Quad)	740	237	3,200	1,000	7.7	1.0	40	700	176	5	2.99	2.9	2.8	2.3	2.1	2.6	2.0	1.7	1.6

Existing Reservoirs in Winnebago County

Reservoir name	Legal description	Owner	Watershed area (sq mi)	Watershed area (acres)	Height of dam (ft)	Depth of water at dam (ft)	Pool area (acres)	Storage capacity (ac-ft)	Storage capacity (mg)	Storage capacity (in)	Remarks and data source
Pierce Lake	26-27-45N-2E (Belvidere Quad)	State of Illinois				25	162				Rock Cut State Park
Levings Lake	28-29-44N-1E (Rockford Quad)	Rockford (C)					28.9				Near Pecatonica
Four Lakes Forest Preserve	9-27N-11E (Pecatonica Quad)	Winnebago Co. Forest Preserve Dis.					19.2				
Zuagg Lake	5-44N-1E (Rockford Quad)	Ben Zuagg	3	2,000			20				Wood subdivision



to determine the nature and sequence of the subsurface materials. Though somewhat shallow water would occur, this site should make a fairly good reservoir at a moderate project cost.

Site 6. A potential reservoir site exists on a small tributary of the Rock River with the dam site 3 miles west of Camp Grant. This minor stream in south-central Winnebago County drains an area of till-covered Ordovician dolomite hills which have a relief of 30 to 40 feet. Depth to bedrock is probably less than 50 feet. The cover in the reservoir area is equally divided between row crops and pasture. A one-lane blacktop road near the dam site could be placed over the structure, and two

residences in this area would have to be acquired. One mile upstream, a one-lane gravel road could he raised slightly, and at least one and probably two residences would have to be acquired. The stream meanders in a 4-foot notch in a floodplain 300 to 400 feet wide and 30 to 40 feet below the uplands. The floodplain alluvium consists of brown sandy silt. The valley walls slope gently to the uplands and are largely covered with vegetation, although brown very sandy clay till is exposed in some places. The abutments are only slightly steeper than the valley walls, and probably are similar in character. A sufficient quantity of till, which may or may not be suitable borrow, probably could be obtained from the valley walls and the nearby uplands. The floodplain alluvium is not suitable for borrow. The site is considered probably feasible, subject to verification by an adequate program of test borings and materials testing especially to determine the nature and sequence of the subsurface materials. Since the area is developing residentially, this site could result in a moderately high project cost.