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ILLINOIS STATE GEOLOGICAL SURVEY

REPORT - I (II)

EVALUATION OF RESERVOIR SITES IN NORTHEASTERN ILLINOIS FOR MULTIPURPOSE DEVELOPMENT POTENTIAL

by

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Evaluation of Reservoir Sites in Northeastern Illinois for Multipurpose Development Potential

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The Illinois State Water Survey has made a feasibility study of 38 reservoir sites in the eight county area of Northeastern Illinois. These sites were evaluated for surface water supply storage potential. After consideration of certain criteria (described below), 13 of these sites were deemed feasible. This report is concerned with a reappraisal of the balance of 24 sites which are located in the six county metropolitan area and which were found unfeasible for surface water supply storage purposes. The reappraisal of these sites has been primarily in terms of character of materials and the foundation conditions at each site.

The investigation made by the Illinois State Water Survey covered the eight northeastern counties of Illinois (Cook, DuPage, Grundy, Kane, Kendall, Lake, McHenry, and Will). An office study of topographic quadrangle maps indicated 38 possible reservoir sites of sufficient area to be used for water supply purposes. These 38 sites were evaluated as to feasibility. A field reconnaissance study was m ade of each possible reservoir site to determine feasibility. The feasibility criteria applied were:

1) Average depth must be greater than 5 feet

2) Surface area must be greater than 50 acres

3) Watershed yield must be great enough to fill the lake at least once each year

4) Soil and geologic conditions of the structure site and impoundment area must be such that the reservoir will hold water and the structure remain stable and that construction materials be locally available.

The average depth and surface area were determined from the U.S.G.S. topographic maps.

The water yield was determined from stream flow records of the U.S.Geological Survey.

The soil and geologic conditions were evaluated by field inspection of each site substantiated by geologic opinions furnished by the Illinois State Geological Survey.

Approximate cost estimates were made for each dam and impoundment by estimating the cost of land, land clearance, earth work, construction, relocations and contingencies. The latter items were estimated from cost records of 18 existing lakes in Illinois.

The above information has been extracted from the Supreme Court Testimony of W. C. Ackermann and an unpublished report by James Madden of the Illinois State Water Survey.

The following list indicates the locations of the surface water reservoir sites in the six county metropolitan area which were investigated and found unfeasible for water supply purposes. Also indicated for each site is the reason for rejection. (Site Q is an exception, and sites H,I,J, & K are special cases)

1) Cook County

A) Salt Creek Pond No. 13
East-central part of Sec. 29, T.41 N., R.11 E.
Reason for rejection - too shallow

B) North Creek
NW¼, Sec. 34, T.36 N., R.14 E.
Reason for rejection - too shallow

2) Kane County

C) Norton Creek
SE corner, Sec. 15, T.40 N., R.8 E.
Reason for rejection - unsuitable geology

D) Person Creek No. 2
NE corner, Sec. 19, T.40 N., R.8 E.
Reason for rejection - unsuitable geology

E) Person Creek No. 1
NE¼, SE¼, Sec. 20, T.40 N., R.8 E.
Reason for rejection - unsuitable geology

3) Lake County

F) Indian Creek
SE corner, Sec. 7, T.43 N., R.11 E.
Reason for rejection - too shallow

G) Buffalo Creek
SE¼, Sec. 31, T.43 N., R.11 E.
Reason for rejection - too shallow

Flood Control Retention Basins, DesPlaines River:

H) Wadsworth
South line, Sec. 27, T.46 N., R.11 E.

I) Gurnee
SW corner, Sec. 23, SE corner, Sec.22,
T. 45 N., R.11 E.

J) Libertyville
Northern part, Sec. 9, T. 44 N., R. 11E.

K) Half Day
Center, Sec. 10, T.43 N., R. 11 E.

4) Will County

L) Forked Creek
SW¼, Sec. 21, T. 33 N., R. 11 E.
Reason for rejection - too shallow

M) Jordan Creek
NE corner, Sec. 29, T. 33 N., R. 10 E.
Reason for rejection - too shallow

N) Long Run
NW¼, Sec. 1, T. 36 N., R. 10 E.
Reason for rejection - unsuitable geology

O) Pike Creek
NW¼, Sec. 35, T. 33 N., R. 14 E.
Reason for rejection - too shallow

P) Plum Creek
NE¼, Sec. 6, T. 34 N., R. 15 E.
Reason for rejection - too shallow

Q) Spring Creek
Sec. 33 T. 36 N., R. 11 E.
Reason for rejection - this site has been approved (site #29) for a smaller water supply reservoir.

5) DuPage County

R) West Branch DuPage River
NE¼, Sec. 14, T.38 N., R.9 E.
Reason for rejection - poor soil conditions - too shallow

S) West Branch DuPage River
SE¼, Sec. 27, T.39 N., R.9 E.
Reason for rejection - too shallow

T) (= U)
West Branch DuPage River
SW corner, Sec. 26, T. 40 N., R. 9 E.
Reason for rejection - poor soil conditions - too shallow

V) (= W)
West Branch DuPage River
Center, Sec. 12, T. 40 N., R. 9 E.
Reason for rejection - too shallow - pollution problems

X) East Branch DuPage River
SW¼, Sec. 25, T. 39 N., R. 10 E.
Reason for rejection - too shallow

Y) Tributary of East Branch DuPage River
Center, Sec. 36, T. 39 N., R. 10 E.
Reason for rejection - insufficient watershed yield

Z) Prentice Creek
SW¼, Sec. 14, NW¼, Sec. 23, T.38 N., R.10 E.
Reason for rejection - geologic conditions

The reasons for rejection are summarized below:

13 sites are too shallow
7 sites have unsuitable geology (two of these sites are also too shallow)
4 sites on the DesPlaines River are special cases
1 site has insufficient watershed yield
1 site has been approved for water supply purposes

Of the sites that are too shallow, two have in addition unsuitable geology, and another has, in addition, pollution problems.

Reappraisal:

The Northeast Illinois Metropolitan Area Planning Commission, as part of an overall project of water resources study, has requested the Illinois State Geological Survey to re-examine these sites in terms of potential multipurpose development.

The location of the sites is shown on Figure 1.

The criteria to be used in the evaluation of sites for multipurpose reservoir development have not been firmly established, and in the final analysis the approval of any site must be a function of the primary use or uses of the facility and the benefits which might accrue, together with the expenditures necessary to realize these benefits.

These uses include:

1. Retention of flood waters
2. Low flow augmentation
3. Effluent dilution
4. Recreation
5. Artificial ground water recharge
6. Open space, park land, wildlife, etc.
7. Water supply

The overall usefulness and functional value of multipurpose reservoirs must first be accepted as a valid assumption. In our area

deficient in parklands andopen space, subject, in places, to periodic flooding, polluted streams, sewage disposal problems, etc., this assumption needs no amplification and little justification.

The overall criteria to be considered are therefore:

1. The need for the facility
2. The general feasibility and desirability
3. The results of cost-benefit analyses
4. The role of multipurpose reservoirs in comprehensive river basin plans
5. The practicability of the facility in terms of engineering and geologic feasibility

Item 5 of the above list is the major consideration which has been applied in the following appraisals of the 24 sites.

Particular criteria which were examined were:

1. The cultural environment
2. The physical environment
3. The geologic environment
4. The engineering environment

Although a site may be unsuitable if it fails to meet any or all of these environmental criteria, no limits can be placed on these items and they can be studied therefore only in a general sense. If all the environmental considerations are, or appear to be, satisfied then the remaining factor is the foundation information which is necessary for design purposes and for the engineering of final stability and performance of the proposed structure. This information can be determined only by detailed on-site inspection together with a complete program of subsurface investigation. Consequently, any conclusion that is drawn from the following appraisals must be tentative and subject to modification in the light of new information.

Particular care and sound judgement must accompany any interpretation of the information presented. The information can be only as good as the source material - and in many cases the source of information cannot be considered too reliable. The paucity of existing subsurface information necessitated generous extrapolation which could be proved erroneous when the results of detailed site investigations become available.

It must be stressed that any engineering structure of any consequence requires its own particular subsurface investigation tailored to the specific project, and full approval for the development of multipurpose reservoirs cannot be given until the results of the detailed investigation become available.

The appraisals are intended only to provide a preliminary and generlaized picture of the overall site conditions.

The procedure followed in the site appraisals is outlined briefly below:

1. The location of each site was studied using topographic maps of the area. These included the 15' quadrangle maps where available, the 7½' quadrangle maps, and in some cases advance prints of revised 7½' quadrangles were used.

These maps were used to appraise the physical or topographic and the cultural environments.

2. The sites were located on a generalized map showing the glacial geology of northeastern Illinois (Ekblaw, Illinois State Geological Survey Cooperative Ground-Water Report 1) to obtain an appreciation of the overall geologic environment.

3. Those sites located in the area covered by the glacial geology maps of Chicago and vicinity (Bretz, ISGS Bull. 65) were located on these maps for geologic information.

4. All available geologic maps and reports, both published and unpublished, on file at the Illinois State Geological Survey were examined and any relative information was noted.

5. To provide additional information on the nature of the soil parent materials of the region, the sites were located on the soil association map of Northeastern Illinois (U. of I. Ag. Expt. Station Bull. 665, 1960) and the NIMAPC soil resource area map of northeastern Illinois. Useful information was also obtained from the detailed soil series map of Will County (U. of I. Ag.Expt. Station 1954).

6. Well logs in the vicinity of each site were obtained from the files of the Illinois State Geological Survey, and any useful or relevent information was recorded.

7. In some cases, useful information was obtained from field notes on file at the Illinois State Geological Survey.

8. In some cases, persons acquainted with a particular area were able to provide useful information.

9. Field inspection of the sites was not made, and it is emphasized at this point that the appraisals are the result of an office study and as such are subject to the limitations of an office study.

10. Reports of the Division of Waterways were, however, not examined.

Site A

Description:

Salt Creek Pond #13. Busse Woods
East-Central part of Section 29, T. 41 N., R. 11 E.
Cook County
Palatine 7½' Quad.
Barrington 15' Quad.

Given:

Length of dam 900'
Area of lake 480 acres
Capacity of lake — 4800 acre-feet at El. 690'
Watershed Area — 52 square miles
Watershed Yield — 8 inches annual runoff would fill lake four to six times per year

Remarks: Site proposed by Consoer, Townsend & Associates, (1959) as a flood control impoundment.
Land owned by Cook Co. Forest Preserve District.
Could provide a permanent 250 acre recreation lake.

Reason for rejection: "too shallow"

Reappraisal:

Bauer Engineering studied the project and submitted a report to the Forest Preserve District of Cook County recommending development of the Busse Woods reservoir on Salt Creek.

Two earlier studies were made by Consoer, Townsend & Associates, and the Division of Waterways. Bauer's proposal for design and development differs from the earlier studies in that he includes design recommendations for multi-purpose development.

Dr. J. E. Hackett, in a letter to Dr. A. J. Zeizel, December 5, 1962, reported on the geologic conditions in the area included within sections 17, 18, 19, 20, 29, 30 of Twp. 41 N., R. 11 E., Cook Co. as they pertain to the occurrence of ground water aquifers in relation to the impoundment of Salt Creek by the construction of a dam - Dr. Hackett states as follows

"Salt Creek flows southward through the lowland bounded on either side by glacial morainic highlands; the Tinley moraine on the east and the Palatine moraine of the Valparaiso morainic system on the west. The intervening lowlands, below an elevation of about 700 feet M.S.L., are underlain by a thin cover of generally fine-textured

outwash ranging in composition from silty sand to silty clay. Locally, coarser-grained deposits of silty gravel occur within the outwash but are not extensive throughout the area. According to soil mapping of Cook County by the University of Illinois Agricultural Experiment Station, the subsoils in the lowland area range from moderately permeable silty clay loam to moderately slowly permeable silty clay.

The thickness of unconsolidated glacial drift is 100 to 125 feet, and lies directly on dolomite bedrock of Silurian age. The character and sequence of the glacial materials in this area are presented in the following generalized log based on foundation borings and water well logs in Sections 8 and 17, T. 41 N., R. 11 E.,:

Unit	Material	Thickness	Depth
1	Outwash: Clay, silty to sand, silty, clayey to gravel, silty, sandy	10 - 20	15 ±
2	Till: Clay, silty, sandy, gray, with pebbles	20 - 50	45 ±
3	Outwash: Interbedded silt, sand, & clay grading to gravel, sandy	20 - 40	75 ±
4	Till: Clay, silty, compressed to hardpan near top	15 - 25	95 ±
5	Outwash: Gravel, sandy, silty	10 - 30	115 ±
	Silurian - Dolomite		Below

Aquifer materials may occur in units 1, 3, or 5, of the above log. Unit 1 is surficial outwash that occurs within the drainage basin of Salt Creek at elevation of less than about 700 feet M.S.L. within the area of discussion. Coarse permeable deposits within this unit are not likely to be extensive, nor are they likely to be significant as sources of ground water.

Unit 3 is consistently reported in water wells and borings throughout this general area but is quite variable in composition. Locally, the unit consists entirely of fine-grained silt, and sand, or clay of relatively low permeability. At some places the entire unit consists of

permeable sand and gravel. Most generally the unit consists of fine-grained interbedded sand, silt, and clay at the top grading to coarser-grained sand and gravel in the basal portion. In areas where 15 feet or more of the unit is composed of sand and gravel, it can be considered as a significant aquifer.

Unit 5 immediately overlies the creviced dolomite of Silurian age that is widely used as an aquifer. The Silurian dolomite aquifer is estimated to be approximately 100 feet thick in this area. A rather complete hydrologic connection exists between this basal unit and the dolomite and they function essentially as one unit. Regional information suggests that the basal unit of sand and gravel outwash is not widespread to the west or north but increases in thickness in other directions to form a significant aquifer unit locally exceeding a thickness of 60 to 100 feet."

Dr. Hackett concluded that, "Artificial recharge by means of surface impoundment is of dubious value because of the presence of the relatively tight deposit of clayey till that overlies the sand and gravel aquifers ---"

Areal Geologic Environment

Salt Creek flows south and southeast along an intermorainal lowland area underlain primarily by till. The broad shallow valley is bounded on the east by the Arlington Heights member of the Valparaiso morainic system and by the Palatine Moraine in the west. Some gravels are found in the Palatine Moraine area.

An area of gravel in the intermorainal lowland is reported in SE Section 36, T. 41N., R. 10 E. i.e. three miles to the north of the site.

The valley of the eastward flowing tributary to Salt Creek across the north line of Section 30 and Section 29, T. 41 N., R. 11 E., contains extensive sand and gravel deposits, numerous abandoned gravel pits also are present. The valley train gravel deposits link up with the Salt Creek Valley alluvial deposits, but according to the mapping of Powers (1936) continus only a short distance downstream from the dam site, i.e. the proposed dam site is probably located in an area of sand and gravel, but relocation a short distance downstream might afford better foundation conditions with respect to leakage.

An adequate site investigation complete with borings is

required to determine the nature of the materials in the foundations, to evaluate the amount and rate of seepage through permeable sand and gravel deposits that are probably present, and to determine the advisability of relocating the structure. The soils and geologic information currently available is inadequate for design purposes.

Site B

Description:

North Creek
NW¼ Section 34, T. 36 N., R. 14 E.
Cook County
Calumet City 7½' Quad.

Given:

Length of dam: 700 feet
Area of lake: 160 acres
Capacity of lake: 480 acre-feet at El. 610' M.S.L.
Watershed area: Approximately 40 square miles
Remarks:
Field inspection of this site indicates that it could be developed into an excellent recreational lake. The Calumet Expressway which runs north and south at the extreme eastern edge of the proposed lake would not be affected, and Cottage Grove Avenue which crosses the central part of the lake appears to be sufficiently high so as not to require further raising if the lake were constructed. Five wood homes are located near the dam site and may have to be removed. This lake site seems so desirable that it may be wise to advise the Forest Preserve of the necessity of zoning the area to protect it for future development as a lake. The U.S. Geological Survey has gaging stations one mile above the head of the lake and immediately below the dam.

Yield of watershed: 9 inches annual runoff
40 square miles watershed
17.83 million gallons per square mile per inch
480 acre-feet = 156 million gallons

Ratio of runoff to lake capacity = $\frac{6419}{156} = 41$

Normal runoff would fill the lake 41 times per year
Minimum yield based on 3 inches of runoff indicates the lake would fill more than 13 times per year

Reason for rejection: "too shallow"

Reappraisal:

North Creek is a generally westward flowing tributary to Thorn Creek which flows generally north-east to join the Little Calumet River below the town of Thornton. In the northwest quarter of Section 34 the valley is fairly narrow with a generally flat bottom and is steep sided with valley walls some 15 feet high. According to the topographic map, a dam in the northwest ¼ of Section 34 would

be across Thorn Creek. As the location of one other site of the series currently under investigation was incorrectly reported, and as a dam at this location is not advisable as it would be located less than 600 yards east of the east wall of the southeast corner of Thornton Quarry, and as a dam at this location would back up the lower reaches of Thorn Creek and also the lower reaches of Butterfield Creek and Deer Creek-tributaries to Thorn Creek-and disrupt more existing facilities than indicated in the information given, it is concluded that the intended location is on North Creek in the southeast quarter of Section 34 and not the northwest quarter as stated. Therefore, the location of SE¼ Section 34, T. 36 N., R. 14 E. for the reservoir site will be assumed here. A dam at the original site would not be acceptable because of the high risk of greatly increasing the flow of water into the large quarries via the dolomite which occurs at shallow depths in this area. Elevations of surface ponds in the area are 600-610'. The bottom of the quarries is below elevation 560'. Water in the quarries in 1930-1932 (Bretz) stood at elevation 564 feet. The quarry area is kept dewatered by constant pumping.

If the original location is necessary for maximum development of the reservoir site, then extensive precautions would be required to monitor water levels and water movement between the reservoir and the quarry, and remedial or preferably preventative measures to reduce or eliminate the flow of water must be taken into consideration in design specifications and cost analyses.

In the SE¼ Section 34, immediately upstream from the junction of North Creek with Thorn Creek, the valley is fairly wide and flat bottomed with steep valley walls 15 feet in height. The stream gradient is very low (1½' per mile approximately), and construction of a dam with a spillway elevation of 610' M.S.L. would produce a long, narrow, fairly shallow lake some five miles in length and covering essentially the same area as shown flooded on the flood hazard map of Calumet City Quadrangle (Floods Near Chicago Heights, Illinois; U.S.G.S. 1960). Consequently a normal pool elevation of 610' M.S.L. would not be acceptable as very little additional temporary storage would be available for flood water retention. As the original proposal, based on a spillway elevation of 610' M.S.L. was rejected on the basis of the shallow depth of the resulting lake, then lowering of the spillway elevation to provide additional flood storage capacity would serve only to further reduce the normal average depth of the lake. Without extensive excavation to increase the capacity and depth of the lake, this valley is severely limited in its potential for development of a multipurpose reservoir.

The glacial geologic map in Coop. Report #1 shows that North Creek flows across a lake plain area which is bounded to the north and wouth by beach ridges. Bull. 665 soils map describes the lake plain area as underlain by sandy loams and sands. The NIMAPC soil resource area map shows that the valleys of this stream system occur in and along areas of gently rolling somewhat plastic timber soils (Unit 12). North Creek valley is bounded on the north by level loamy prairie soils, shallow to sand, and on the south by level, wet, somewhat plastic prairie soils (Unit 10).

The geologic map of Bretz shows that the stream flows across the flat plain of a glacial lake bottom (with or without lacustrine sediments), and that the valley is bounded to the north and south by beach ridges of sand and gravel associated with the Glenwood and Calumet shorelines of glacial Lake Chicago. Recent alluvial deposits are found in the valley bottom, and Silurian dolomite outcrops along the valley of Thorn Creek in Section 3, T. 35 N., R. 14 E., only a few hundred yards upstream the confluence of Thorn and North Creeks.

The glacial drift is thickest (65 feet ±) in the beach ridge areas where an average profile as determined from driller's logs is as follows:

20' ±	sand
40' ±	clay
5' ±	sand and gravel
Silurian dolomite	

In the glacial lake bottom area adjacent to the valley glacial drift is about 50 feet thick and the generalized succession is:

20' ±	yellow clay, probably till
20' ±	blue clay, probably till
10' ±	sand and gravel
Silurian dolomite	

The area is probably overlain by thin silty outwash in the upstream area and by thin sandy outwash downstream.

Conclusion:

No materials or foundation problem is evident as long as the possibility of greatly increasing the flow of water into the quarries west of Thornton is recognized and appropriate action taken. Full approval of any site in this area would be dependent on a subsurface investigation. A site in the SE¼ of Section 34 would permit a dam with a spillway elevation of several feet less than 610' but would result in a long, narrow, shallow body of water.

Site C

Description:

Norton Creek
SE corner Section 15, T. 40 N., R. 8 E.
Kane County
Geneva 15' Quad.
Geneva 7½ Quad.

Given:

Length of dam - 700 feet
Area of lake - 110 acres
Capacity of lake - 1100 acre-feet at El. 730'
Watershed area - 6.5 square miles
Remarks:
No important highway would be affected by construction of this lake. Two buildings would be within the flooded area.

Reason for rejection: "unsuitable geology"

Reappraisal:

Norton Creek is a westward flowing tributary of the Fox River which it joins some 2½ miles upstream from St. Charles. In the area under consideration it has a fairly deep, steep sided, v-shaped valley and has a gradient of 20 feet per mile (approximately).

Norton Creek occupies a valley which dissects the Minooka Moraine.

Although not shown on either the Bull. 665 soils map or the NIMAPC soil resource area map (both of which describe the area as one of loam till), the valley of Norton Creek apparently originated as a melt-water channel and is filled with outwash associated with the West Chicago moraine which is located some 4 miles east of the site. Norton Creek rises in the West Chicago outwash lying in front of (i.e. along the western margin) the West Chicago moraine. Sand and gravel greater than 15 feet in thickness occurs in Section 14 where it overlies fine sand of unknown thickness which grades laterally into silt (Anderson, 1962). The extent of these fine grained deposits is not known. Leighton and Powers (1928-30) reported several gravel pits in the SE part of Section 15 and the SW part of Section 14. Block (1960) shows that the valley of Norton Creek is underlain by valley-train outwash deposits at depths of 10 feet or less. The deposits form either a veneer on the floor of the valley or terraces along the valley.

Very little useful subsurface information is available for this area. Over a short distance the reported bedrock elevation varies from 486' to 700' above sea level, and is pro-

bably between 600-650' at the site. One boring in Section 14 reports 204' of drift overlying Maquoketa shale. The drift section consists of 70' of till overlying sand and gravel.

Preliminary indications are that at least 30-40 feet of highly permeable gravels may be encountered below the dam site. Such materials would require extensive treatment to provide satisfactory foundation conditions for a dam.

A preliminary site examination should be made to establish the nature of the materials below the valley bottom. The site could possibly be relocated depending on the realization of less adverse foundation conditions upstream from the original site, but it is probable that extensive foundation treatment would be required along any stretch of this valley.

Site D

Description:

Ferson Creek #2
NE corner Section 19, T. 40 N., R. 8 E.
Kane County
Geneva 15' Quad.
Geneva 7½ Quad.

Given:

Length of dam - 500 feet
Area of lake - 640 acres
Capacity of lake - 5100 acre-feet at El. 760'
Watershed area - 12 square miles
Remarks-
Two east-west township roads would be affected for a total distance of 3000 feet in the flooded area. Five buildings would require moving.

Reason for rejection - "unsuitable geology"

Reappraisal:

Site D is located only 1 mile upstream from site E. Attention is directed to the appraisal submitted for site E.

Ferson Creek flows south along the outwash zone situated in front of the Marseilles moraine. The site is just upstream from the point where the creek leaves its former valley to flow east across the moraine. The normal shape of the valley occupied by Ferson Creek (and the shape of the former valley which continues south across Section 31, T. 40 N., R. 8 E., and Sections 6 and 7, T. 39 N., R. 8 E.) is broad, fairly shallow and with gentle slopes. At the site the valley is narrow, fairly deep, steep-sided and v-shaped. The valley is constricted by the presence of kames on both sides. A large kame occupies the southern part of Section 18 and the northern half of Section 19 west of the river, and two smaller kames are located on the east side in the northwest corner of Section 20. The proposed dam would abut against kames at each end.

Kames are mounds or hills containing sand and gravel. The gravel content, texture and thickness of these ice-contact deposits vary greatly. They do not provide good end conditions for dams. The kames on each side of the valley, coupled with the outwash sand and gravel which probably underlies the valley in this section, preclude the construction of a dam at this site without extensive foundation treatment.

Attention is directed to the appraisal for site E about one mile downstream. If satisfactory foundation conditions are

Site E

Description:

Ferson Creek #1
NE¼, SE¼, Section 20, T. 40 N., R. 8 E.
Kane County
Geneva 15' Quad.
Geneva 7½' Quad.

Given:

Length of dam - 400 feet
Area of lake - 80 acres
Capacity of lake - 600 acre-feet at El. 730'
Watershed area - 15 square miles
Remarks -
No roads or buildings would be affected by building this lake.

Reason for rejection - "unsuitable geology"

Reappraisal:

Ferson Creek flows south and east to join the Fox River about 1 mile upstream from St. Charles. tter Creek, upstream from its confluence with Ferson Creek, and Ferson Creek downstream from this confluence follow a zone of outwash which is located in front of (i.e. along the western margin) the Marseilles moraine. The valley in the outwash area is rather broad and wide-bottomed. However, about ½ mile upstream from site E, the creek makes a sharp bend to flow east and breach the Marseilles moraine. Therefore, at the site the valley is narrow, deep, v-shaped and steep-sided. Downstream from the site the valley widens out considerably and the stream gradient is reduced.

Both the geologic and soils maps suggest that the outwash in front of the 'arseilles moraine is linked to the outwash and alluvium along the Fox River Valley via the breach through the Marseilles moraine. If this moraine was breached by Ferson Creek relatively recently then only a thin layer of granular deposits may be present below the valley bottom at site E. -f, however, the breach was made by glacial meltwaters, then the valley is probably underlain by considerable thicknesses of outwash sand and gravel.

Leighton and Powers (1928-30) reported a gravel pit near the proposed dam site, but according to Block (1960) this gravel pit is probably associated with a kame or esker rather than an extensive outwash deposit. Block does not indicate connection between the 'arseilles outwash and the Fox River outwash and alluvium.

Subsurface information at the site and below the valley is non-existant. Several borings in the adjacent-upland areas

penetrated up to 100 feet of till before encountering sand and gravel. Drift thicknesses of up to 170 feet are reported in this area, and the bedrock elevation at the site is probably between 600-650 feet which suggests a drift thickness of 50-100 feet at the site.

It is noted that the former valley of Ferson Creek continued essentially due south. The record of this former course is seen in the outwash-filled north-south depression located immediately west of the Marseilles moraine.

If site E is not underlain by thick deposits of highly permeable sand and gravel, and a dam at this location is feasible, then attention might be directed to an added benefit of a multipurpose reservoir at this location - namely the possibility of induced recharge to shallow aquifers west of St. Charles via the sand and gravel deposits filling the old valley of Ferson Creek in the western part of Section 29.

If a low saddle dam is constructed in the south-west part of Section 20 to afford closure at elevation 750', then a higher dam can be considered at site E to provide a much larger reservoir and obviate much of the need for a dam at site D only one mile upstream.

The site merits a preliminary foundation investigation to determine precisely the nature of the materials in the subsurface. The site is fairly attractive - but it is not unlikely that poor foundation conditions will be found.

Site F

Description:

Indian Creek
SE corner Section 7, T. 43 N., R. 11 E.
Lake County
Highwood 15' Quad. (out of print)
Wheeling 7½' Quad.

Given:

Length of dam: 3200 feet
Area of lake: 448 acres
Capacity of lake: 1490 acre-feet at El. 725'
Watershed area: 8.9 square miles
Remarks:
Note that this impoundment will be located on Indian Creek and will cover Mundelein Road for a distance of one mile. State Route 83 and State Route 59 would both be affected for a short distance by construction of this lake.

Reason for rejection: "too shallow"

Reappraisal:

Indian Creek is a short tributary of the DesPlaines River. It rises in an area of undifferentiated Valparaiso moraine and for a short distance flows essentially south to follow the outer margin of the Tinley moraine. The site is located a short distance upstream from where the creek turns sharply east to breach the Tinley moraine. At the site the valley is fairly broad and flat bottomed with some terrace development. The valley is fairly deep with moderately sloping walls.

Elevation 725 is not an acceptable pool height, as little or no closure is provided at the upstream end of the tributary heading in from the north from Section 31, T. 44 N., R. 11 E. Elevation 725' represents the maximum permissible elevation and may even exceed the allowable elevation. Some additional surveying would be required in Section 31, T.44 N., R. 11 E.

The surficial geology map of Bretz (1930-32) shows no outwash or alluvial deposit at the site, and suggests that no significant foundation problem should be encountered.

Bull. 665 soils map shows that the material in the general area is silty clay loam till, and the NIMAPC soil resource area map indicates that the area is one of gently rolling somewhat plastic prairie soils (Varna & Elliott).

Subsurface information is incomplete in this area. Up to

240' of drift is reported overlying limestone bedrock. The drift consists essentially of a thick layer of till (or tills) overlying a thin basal sand and gravel layer with or without intermediate sand and gravel zones. The bedrock elevation at the site is judged to be 525' 10, and the thickness of drift to be about 165 feet.

Except for the possibility of gravels, etc. occurring in the terrace-like areas, or as buried channel deposits, no foundation or materials problem is evident from the information currently available, but this information is considered insufficient. A dam appears feasible at this site, but full approval must be withhold until the results of a preliminary foundation investigation become available. If the valley of Indian Creek ever carried glacial meltwater, then it is highly likely that granular materials - perhaps in the form of buried channel deposits - may be encountered at depth below the site.

It is noted that, to provide any flood storage capacity, the normal operating level of a reservoir at this site should be not higher than 720'. This would result in a 17' depth of water at the dam, and a considerable area of the lake would be deeper than 10 feet. Highway relocation and modification costs are likely to be high. The possibiliby exists of constructing a smaller, shorter, lower dam across the narrow part of the valley, 3/4 mile downstream from site F where the stream breaches the Tinley moraine.

Although a smaller lake would result (El. 700), construction and relocation costs would probably be lower.

This section of Indian Creek merits a preliminary site inspection.

Site G

Description:

Buffalo Creek
SE¼, Section 31, T. 43 N., R. 11 E.
Lake County
Highwood 15' Quad. (out of print)
Wheeling 7½' Quad.

Given:

Length of dam: 500 feet
Area of lake: 160 acres
Capacity of lake: 800 acre-feet at El. 705'
Watershed area: 3.2 square miles
Remarks:
This impoundment is located on Buffalo Creek with two legs extending into Cook County. The lake is roughly square with an island in the center. Checker Road would have to be raised ten feet for a distance of 400 feet.

Reason for rejection: "too shallow"

Reappraisal:

With a pool elevation of 705' the depth of water at the dam would be approximately 17 feet and about half the lake would have a depth of greater than five feet.

The Glacial Geology map in Coop. Report #1 indicates that this site is located in the Tinley moraine where it is breached by Buffalo Creek and near the northern end of the Palatine moraine which is slightly over-ridden by the Tinley in the southwest corner of T. 43 N., R. 11 E.

Buffalo Creek heads south apparently between the Palatine and Tinley moraines, and then, where it is joined by the tributary from the southwest, turns abruptly east to breach the Tinley moraine. The valley at the site is narrow, fairly deep, steep sided and v-shaped, and the stream has a gradient of 20 feet per mile (approximately). Some three miles downstream from the site, where the creek flows onto the outwash plain associated with the DesPlaines River, the gradient is considerably less, and the creek has been extensively channelled and is termed the Wheeling Drainage Ditch.

Bull. 665 soils map indicates that the site is located in an area of loam till, and the NIMAPC soil resource area map describes the area as one of shallow soils overlying friable till. The soils of Vernon township have been mapped in great detail, but the maps are not yet available.

In the southeast corner of Elia Township (Sec. 36, T. 43N., R. 10 E.) the soils are developed in medium-textured glacial drift (till).

The surficial geology map of the Wheeling Quadrangle (Bretz 1930-32) indicates no sand or gravel deposit along the valley of Buffalo Creek in the vicinity of the proposed dam site.

No subsurface information is available near the site, but borings in the area indicate up to 200 feet of glacial drift overlying bedrock. The bedrock elevation at the site is probably between 500 and 550 feet above sea level. The thickness of drift below the site is probably between 140-190 feet, and probably consists of a thick deposit of relatively impermeable till (or tills) overlying a basal sand and gravel layer.

No foundation problem is evident at this time, and the site appears feasible for the development of a multi-purpose reservoir. However, a complete foundation investigation will be required before unqualified approval can be given. It is noted that some downstream flood control benefits might be derived from a dam at this location.

The topographic map of 1928 shows no settlement of the area which would be flooded. The area should be field checked to determine the current development in the area.

Sites H, I, J, K

Site H
Description:

South line of Section 27, T. 46 N., R. 11 E.
Wadsworth 7½' Quad.

Given:

Impoundment covering two square miles
Storage capacity: 3800 acre-feet at El. 670'
Average depth of 3 feet
80 percent of the area is presently swamp land

Site I
Description:

SW corner Section 23 and SE corner Section 22,
T. 45 N., R. 11 E.
One mile southwest of Gurnee
Libertyville 7½' Quad.

Given:

Area of lake: 1 square mile
Storage capacity: 3200 acre-feet at El. 660'

Site J
Description:

Northern part of Section 9, T. 44 N., R. 11 E.
Libertyville 7½' Quad.

Given:

Area of lake: 500 acres
Storage capacity: 2500 acre-feet at El. 658'

Site K
Description:

Center Section 10, T. 43 N., R. 11 E.
One mile north of Halfday
Wheeling 7½' Quad.

Given:

Area of lake: 300 acres
Storage capacity: 1500 acre-feet at El. 650'

Remarks: (Given by State Water Survey)
The valley of the DesPlaines River has several sites available for flood retention basins within Lake County.

The drainage area within Lake County varies from approx-

imately 200 square miles at Wadsworth to 300 square miles near the Halfday reservoir.

It is expected that sedimentation rates would be high in these reservoirs unless they were emptied after each storm. Since they would be shallow lakes, there could be no multiple use made of them even as conservation lakes without destroying their usefulness for flood control.

Reappraisal:

The Division of Waterways has a comprehensive plan for flood control and drainage development for the entire DesPlaines River Basin in Lake and Cook Counties. This plan consists of the construction and installation of a dual Reservoir and Channel Improvement system. This plan was not available for study at the time this appraisal was made.

In the information given above, it is stated that the sites along the DesPlaines River are unsuitable for multipurpose development because of the high siltation rate and the resulting need to empty the reservoirs after each flood. If this determination has already been made and if the determination is valid, then the reappraisal of these sites for multipurpose use is beyond the scope of a materials and foundations evaluation.

The primary concern with these sites appears to be a cost-benefit appraisal in terms of flood control, together with a consideration of operating procedures.

The DesPlaines River has a very low gradient and a wide flat-bottomed valley with extensive flood plains.

The glacial geology in Coop. Report #1, indicates that the river follows a glacial meltwater channel and carried valley train and outwash deposits associated with the outer Lake Border moraines.

Bull. 665 soils map and the NIMAPC soil resource area map indicate that the soils along the valley consist of mixed bottomland, terrace and bluffwash materials and wet bottomland soils.

The topographic maps show that numerous gravel pits are located along the valley of the DesPlaines River, and gravel deposits probably underlie the valley - particularly in areas of terrace development.

An unpublished Illinois State Geological Survey preliminary map of the sand and gravel resources of Lake County, Illinois

(Ekblaw and Schaefer, 1960) shows that sand and gravel deposits are extensive along the whole length of the Des Plaines River valley in Lake County. The lower lying sand and gravel deposits are thought to be generally thin (alluvium), and the adjacent flood plain areas are underlain by sheet-like deposits of sand and gravel (outwash) in some areas. In and adjacent to the DesPlaines River the sand and gravel deposits are said to rest on an uneven floor of glacial clay and therefore vary in thickness. Low hills and ridges along the river valley are bars built by glacial DesPlaines River and are likely to be made up of coarser sand and gravel than occurs in the flatter parts.

Bedrock elevations vary between 500-550', and the drift thickness as determined from driller's logs in as much as 228' in places, but below the valley of the DesPlaines River is probably within the range of 100-150 feet.

Very few bores are located in the river valley, and little reliable subsurface information is available at any of the four proposed dam sites. The maximum thickness of gravel along the valley reported in driller's logs is 41 feet in Section 23, T. 45 N., R. 11 E. The DesPlaines valley train north from Libertyville is a composite feature produced by meltwater from both the Park Ridge and Deerfield moraines. Mechanical analyses show no uniform down-valley changes in grain size or sorting, hence, it is concluded that material was contributed to the valley train at several points along the valley rather than a single upstream source. (Anderson, State Geological Survey, 1960 field notes).

Numerous gravel pits have been opened in the outwash gravels along the DesPlaines River generally to depths greater than 20 feet and ranging to depths of 40 to 50 feet. Test holes are reported to have encountered gravel to depths of 65 to 80 feet. The thickest deposits probably occur in the center of the valley (Anderson).

The dams (H,I,J, and K) have spillway elevations of 670', 660', 658', and 650' respectively. At these elevations the maximum depth of water at each site would be 10',6',10' and 13' respectively (H,I,J, andK)

Although up to 60 feet (or more) of permeable sand and gravel deposits probably underlie each site (overlying relatively impermeable till), the head differences involved are fairly low and foundation criteria need not be as rigorous as for a higher structure. Therefore, although the foundation materials are probably not particularly desirable, it

is thought that the construction of low dams across the river should not be a difficult engineering problem. However, the value of the impoundments in terms of multipurpose benefits is a function of the siltation rate and the necessity of releasing ponded waters after floods. Under such operating conditions the multipurpose benefits might be severely limited because of widely fluctuating pool elevations and lake areas. The evaluation of these sites for multipurpose use is beyond the scope of a foundations and materials appraisal.

Difficult but not unsurmountable foundation problems exist, and each site will require a complete foundation investigation.

Site L

Description:

Forked Creek
SW¼, Section 21, T. 33 N., R. 11 E.
Will County
Peotone 15' Quad.
Wilton Center 7½' Quad.

Given:

Length of dam: Two sections, 750' and 500'
Area of lake: 240 acres
Capacity of lake: 1200 acre-feet
Watershed area: 3¼ square miles
Remarks:
A part if Wilton cemetary would be along the shoreline of the lake. A short section of north-south township road on the east side of Section 21 would have to be elevated 10 feet.

Reason for rejection: "too shallow"

Reappraisal:

Bulletin 31 (1937) of the State Water Survey reported that a dam constructed across the valley of Forked Creek in the NW¼ of Section 31, T. 33 N., R. 10 E., with spillway at an elevation of 570 feet, would create a reservoir having a depth at the dam of 35 feet, a pool area of 930 acres, a storage of approximately 10,850 acre-feet, and a watershed area of 126.3 square miles. This site was listed under the chapter on Possible Reservoir Sites. This site is some 14 miles downstream from that presently under consideration.

Forked Creek flows southwest at a gradient of approximately 7' per mile in the vicinity of the proposed site. However, in this area the stream appears to have been channelled along some sections, presumably for agricultural drainage purposes. The stream has its source in an irregular morainic upland area some 14 miles to the NE. It has cut a shallow V-shaped valley across this morainic upland. The dam site is located near the outer edge of the moraine area and downstream the valley is less well defined and quite shallow where the stream flows across the lower lying and less irregular ground moraine and outwash area.

The glacial geologic map in Coop Report #1 shows that the site is located near the outer margin of the Marhattan moraine and that downstream from the site the creek crosses a narrow area of ground moraine before flowing onto lake plain sediments and then into an area of outwash associated with the Kankakee River.

Forked Creek joins the Kankakee River at the town of Wilmington, some 15 miles downstream from the dam site.

Bull. 665 soils map shows that the valley of Forked Creek is underlain by medium and moderately fine textured outwash (Unit 8) and that the surrounding morainic areas consist of silty clay loam till (Unit 4). The NIMAPC soil resource area map omits the outwash from the valley of Forked Creek and indicates that the whole area is one of gently rolling, somewhat plastic prairie soils (Varna and Elliott) (Unit 11).

The Soil Survey Map of Will County shows that the channel of Forked Creek contains organic bottom-land soils (Huntsville loam), and that on the north side of the creek for a short distance upstream is an area of Brenton and Proctor soil indicating a deposit of stratified silt and sandy outwash. Drummer soils occupy a considerable portion of the valley bottom upstream from the sandier area. The valley walls and surrounding upland areas carry soils all developed from silty clay loam till.

Subsurface information is rather incomplete, but driller's logs indicate some 40' of glacial drift overlying rock. The glacial drift consists of 30-35 feet of till overlying a rather widespread thin basal sand and gravel layer which is 1 to 9 feet thick in this area. The underlying rock is dolomite of Silurian age. Borings in the general region suggest that this dolomite is fairly thin (down to 20-25') and overlies Maquoketa shale of Ordovician age. Farther west the dolomite pinches out and the glacial drift directly overlies Maquoketa shale.

Because of the inadequate subsurface information a site investigation complete with borings is mandatory before full approval can be given, although the available data would indicate that no unsurmountable problem is likely to occur. The sandy outwash deposits immediately upstream from the dam site should be investigated, and their presence or absence in the immediate vicinity and below the proposed structure should be ascertained. Some possibility exists that direct hydrologic contact may exist between ponded waters and the thin Silurian dolomite via the thin basal sand and gravel layer, particularly in places where the drift (till) cover is thin.

Strong possibility exists that this dam site is located within the area influenced by a northwest-southeast trending fault zone. It is likely that the bedrock will be

found to be fairly well fractured and might be faulted and jointed more than usual. The condition of the bedrock should be determined both at the dam site and at places upstream within the reservoir area.

A fairly large though rather shallow reservoir appears feasible at this location but a satisfactory and thorough foundation investigation must precede any design and construction activity.

Site M

Description:

Jordan Creek
NE corner, Section 29, T. 33 N., R. 10 E.
Will County
Wilmington 15' Quad.
Symerton 7½' Quad.

Given:

Length of dam: 1000 feet
Area of lake: 130 acres
Capacity of lake: 390 acre-feet
Watershed area: 13.6 square miles
Remarks:
Drainage from Joliet Arsenal would enter this lake. An east-west township road at north line of Section 28 would be close to the spillway crest elevation at 3 points.

Reason for rejection: "too shallow"

Reappraisal:

Jordan Creek flows southwest to join Forked Creek about one half mile upstream from the town of Wilmington. In the vicinity of the proposed reservoir the stream is flowing in a more westerly direction with a gradient of approximately 11 feet per mile. The stream has its source near the outer margin of a morainic upland some six miles to the northeast, and the dam is located in an area of lower lying irregular morainic topography through which the creek has cut a shallow v-shaped valley. With a spillway elevation of 600' M.S.L. the depth of water would be approximately 17 feet at the dam, and a fairly large part of the reservoir would have a depth of greater than five feet.

The glacial geology map in Coop Report #1 indicates that the dam site is located in or near a small isolated moraine area (Minooka) which is situated in an area of lake plain sediments.

The geologic map of Fisher (Wilmington Quad., 1922-23, unpublished) shows that the dam site overlies Kankakee dolomite of Silurian Age near the border of the Niagaran dolomite (Silurian) which underlies the drainage basin upstream from the site. Fisher indicates that both Silurian and Ordovician strata are exposed in the valley floor (or walls) in the southwest corner of Section 29.

Field notes on file at the Geological Survey record that limestone outcrops along the road in the east-central part

of Section 31, and that a small limestone quarry is located west of the road in the NE part of Section 31. The limestone is overlain by 2 feet of gravel. The limestone is thin bedded, well crystallized and mainly "massive". Jointing is prominent but not regular. The joints are mainly vertical and trend S. 60° E.

Bull. 665 (Ag. Expt. Station) shows that the area is one of silty clay loam till (Unit 4) with mixed bottomland, terrace and bluff wash materials in the valley of Jordan Creek downstream from the site.

The NIMAPC soil resource area map shows that level wet somewhat plastic prairie soils (Martinton and Ashkum) predominate in the area, with level silty soils, shallow to bedrock (Plattville and Richey) occurring along Jordan Creek downstream from the site.

The Soil Survey map of Will County indicates that a broad area of Drummer silty clay loam occupies the valley bottom of Jordan Creek. On the south side of the valley and extending about one mile upstream is an area of Brenton silt-loam which might indicate a deposit of medium-fine textured sandy parent material in the form of a terrace deposit. A narrow strip of this soil is mapped at the dam site and extending a short distance downstream. The valley of Jordan Creek in its upper reaches supports Ashkum silty clay loam, small areas of Symerton silt-loam occur along the valley walls, and the adjacent uplands support Elliott silt-loam, all of which develop from silty clay loam till parent material (Unit 4). Thin soil over limestone is mapped in the valley of Jordan Creek downstream from the southwest quarter of Section 29.

Subsurface information is rather inadequate in this area. In the vicinity of the reservoir, driller's logs indicate varying thicknesses of glacial drift overlying "limestone" (dolomite) bedrock. The drift is from 15 feet to 60 feet thick perhaps averaging 20 to 30 feet. The drift consists primarily of till with a basal sand and gravel layer 1 to 6 feet in thickness reported in some places.

The site is located near the wedge edge of the Silurian dolomite, and the bedrock consists of 50 to 100 feet of dolomite overlying shale (Maquoketa, Ordovician).

In view of the rather thin drift cover in this area there is a strong possibility that ready hydrologic continuity may exist between ponded water and the underlying dolomitic bedrock, particularly on the south side of the valley where sandier soils are located and a partial terrace has developed.

Apart from the possibility of excessive leakage through the underlying rock, the site appears feasible for multipurpose development. A thorough investigation of the drift and the depth and condition of the bedrock should precede any detailed design work or construction activity.

Site N

Description:

Long Run
NW¼, Section 1, T. 36 N., R. 10 E.
Will County
Joliet 15' Quad.
Romeoville 7½' Quad.

Given:

Length of dam: 800'
Area of lake: 60 acres
Capacity of lake: 300 acre-feet at El. 630 M.S.L.
Watershed area: 3.2 square miles
Remarks:

Field inspection of this site indicated that it is bordered by a golf course on the north and farmland on the south. The upper part of the watershed is relatively steep land.

The lake would be located on upland one mile east of the DesPlaines River, the Chicago Sanitary and Ship Canal and several refineries use the canal water at the present time. If industries build the lake up Long Run, the water would have to be conveyed downhill approximately one mile to the refineries. It would appear that this lake would be an asset in the area and especially to the Big Run Golf Club immediately north of the proposed lake.

Reason for original rejection: "unsuitable geology"

Reappraisal:

Long Run flows generally westward until it reaches the valley of the DesPlaines River where it swings south to parallel the river before flowing into the Illinois and Michigan Canal near Lockport. Long Run has its source in an upland area of irregular morainic topography at an elevation of about 700 feet.

The reservoir site is located on the east side of the DesPlaines River Valley where the creek breaches the valley wall. At this location the stream gradient is steeper (12' per mile, approx.) than it is farther upstream (4'/mile approx.).

The valley of Long Run Creek is fairly deep. The valley walls rise steeply from the rather wide and fairly flat terraced valley bottom to a height of 70' on the north and west side and to 50' on the south and east. The southern slopes are less well defined than the slopes on the north side, and a prominant wide terrace 20-25' above the valley floor in-

terrupts the slope. The smaller terrace on the north side is closer to river level.

The glacial geology map in Coop Report #1 shows that this site is located close to the outer margin of undifferentiated Valparaiso moraine.

The geologic map of the Joliet Quadrangle (Fisher Bull. 51, 1925) indicates that a substantial outwash deposit is located along the south side of the creek both upstream and downstream from the dam site. The terraces along the valley floor are probably composed of this outwash material.

Niagaran dolomite underlies the wide valley occupied by the DesPlaines River. Numerous gravel pits are noted along the east-edge of the DesPlaines valley, and several gravel pits are indicated upstream from the dam site along the valley of Long Run. Bull. 665 soil map shows bottomland deposits in the valley of Long Run, and silty clay loam till constituting the surrounding moraine.

The NIMAPC soil resource area map shows only that the area supports steep, somewhat plastic timber soils (Morley and Chatsworth). The Soil Survey map of Will County indicates that extensive deposits of gravel and sand occur on the south side of the creek both upstream and downstream from the dam site. Sands and gravels predominate in the wide terrace south of the creek and underly a large area in the center of Section 1. The granular materials are probably stream deposits although some ice contact stratified drift is probably represented by kame terrace deposits at the lower elevations. North of the creek, the Soil Survey map indicates soils developed on silty clay loam till parent material.

Driller's logs provide only sparse subsurface information in this area, and no boring is located near the dam site. The average drift thickness in the upland areas is between 90-110' and is comprised of 40-50 feet of clay (till) overlying a basal sand and gravel layer 40-50 feet in thickness. The drift thickness below the valley bottom is probably only 15-20 feet at the dam site. Some two miles upstream, a boring penetrated 25 feet of sand and gravel in the valley floor without reaching bedrock.

Bretz (ISGS Bull. 65, 1955) describes the type section of the pre-Valparaiso Lemont drift along the south edge of the DesPlaines River valley some two miles north-east of the dam site. The Lemont drift is described as an irregular association of gravel, sand and silt with overlying and/or intercalated till. The till is silty, has a laminated structure, is well charged with stones and shows no lime enrichment. The maximum thickness of the Lemont drift is 60'

It seems likely that the basal sand and gravel below the till of the upland areas adjacent to the dam site is the Lemont drift which is probably of fairly widespread occurrence.

Summary:

The gravelly nature of the Lemont drift underlying the Valparaiso till, coupled with the extensive terrace gravels, outwash and sandy alluvium at the dam site limit the practicality of developing a multipurpose reservoir at this location.

Design specifications to eliminate or reduce seepage both below and around the structure might prove that the cost of construction would be prohibitive.

A detailed site investigation would be required before approval could be given to any proposal to develop a structure at this location.

An alternative exists if the location of the proposed dam was shifted one half mile upstream to the NE part of Section 1. A Spillway elevation of 650' would result in a much larger facility, but would adversely affect recent settlement (as shown on the advance print of the 7½' Romeoville Quad.) and would require fairly extensive road relocation. This alternative site offers better foundation conditions- but full approval would be dependent on a complete site investigation. The alternative merits a preliminary cost-benefit analysis.

Site 0

Description:

Pike Creek
NW¼, Section 35, T. 33 N., R. 14 E.
Will County. 3 miles SE of Beecher
Beecher East 7½' Quad.

Given:

Length of dam: 700'
Area of lake: 51 acres
Capacity of lake: 153 acre-feet at El. 700'
Watershed area: 212 square miles
Remarks:
One east-west township road would have to be elevated at two points for a total distance of 500'

Reason for original rejection: "too shallow"

Reappraisal:

Pike Creek heads south southwest (parallel to other creeks 2-3 miles apart) in an upland area of irregular morainic topography. The upland area reaches elevations of just greater than 760'. The stream gradient in the area under consideration is 17.5' per mile (approximately). Downstream from the proposed dam site the stream has been artificially channelled - presumably for agricultural drainage requirements.

The creek has cut a shallow v-shaped valley. Construction of a dam would considerably reduce the erosive activities of this stream and also reduce the amount of sediment carried into the channelled area downstream.

Rejection of this site on the basis of the shallow depth of the resulting pond is difficult to understand if an average depth of 5 feet is the minimum depth requirement. Examination of the topographic map indicates that at pool elevation of 700' the depth of water at the dam would be a little over 20' and that a considerable area of the lake would have a depth of greater than 10'.

The glacial geologic map Coop Report #1 shows that the site is located in an area of undifferentiated Valparaiso moraine near its outer border where it over-rides the Manhattan moraine.

Bull. 665 shows that the soil of the general area is classified as Type 4 - silty clay loam till.

The soil resource map of NIMAPC further describes the soils as gently rolling somewhat plastic timber soils (Morley and Blount) (Area 12) developed on silty clay loam textured till, i.e. moderately heavy textured till, and lacustrine sediments. The material classifies as C.L. to C.H. and A-6 to A-7-6.

Reliable subsurface information is not available for this area. Driller's logs indicate from 75 to 125' of glacial d drift overlying as much as 600' of Silurian dolomite. One sample study from Section 16, T. 33 N., R. 14 E., (village of Beecher) shows the following succession:

75'	sandy and gravelly till
15'	silty fine sand
20'	gravelly till
10'	sandy gravel
	dolomite

The same general succession can be expected at the dam site some 2½ miles to the southeast.

With adequate site and foundation investigation and with proper compaction of the embankment materials available in the vicinity, there appears to be no major physical factor that might jeopardize the success of the proposed reservoir project.

Site P

Description:

Plum Creek
NE¼, Section 6, T. 34 N., R. 15 E.
Will County
Dyer 7½ Quad.
Crete 15' Quad.

Given:

Length of dam: 500 feet
Area of lake: 200 acres
Capacity of lake: 600 acre-feet at El. 660' M.S.L.
Watershed area: 19 square miles
Remarks:
One township road in the west part of Section 7 would have to be raised for a distance of 500'
Reason for rejection: "too shallow"

Reappraisal:

Plum Creek flows north-eastwards in the north-east corner of Will County. It heads in a morainic area of irregular topography at an elevation of 730' (approx.). It flows across this morainic topography in a v-shaped valley which is in places, fairly narrow and steepsided and in others is vairly wide with gently sloping walls, as at the proposed site. The stream has low gradient (5' per mile approx.) and construction of a dam with a spillway elevation of 660' would result in a narrow ribbon of shallow water some four miles long. The depth of water at the dam would be almost 20 feet, but the area of lake having a depth of greater than 10 feet would be quite small and the area of water deeper than five feet would not be much greater.

The glacial geology map in Coop Report #1 shows that the valley is located in an area of undifferentiated Valparaiso moraine.

Bull. 665 soils map shows that the parent material in this region is silty clay loam till. NIMAPC soils map shows that the region is one of gently rolling, somewhat plastic timber soils. The Soil Survey map shows that Huntsville loam, bottom soil, occurs in the valley bottom over most of the length of the stream, and that the adjacent uplands support soils developed on silty clay loam till.

Driller's logs indicate drift thicknesses of up to 148 feet in this region, with a thickness (estimated) of 120 feet at the proposed site. The subsurface geology is not well documented, but a generalized section is as follows:

30 - 60 feet	clay (till)
10 - 15 feet	fine sand
10 - 40 feet	sand and gravel
15 - 30 feet	blue clay (till?) (not always present)
5 - 10 feet	basal sand and gravel (not always present)
Below -	dolomite

No foundation or materials problem is indicated at this site.

If a very long, narrow, shallow lake is desired then no materials or foundation limitation is evident.

Site Q

Description:

Spring Creek
Section 33, T. 36 N., R. 11 E.
Will County
Mokena 7½' Quad.

Given:

Length of dam: 2200 feet
Area of lake: 418 acres
Capacity of lake: 3110 acre-feet or
1040 mill. gal. at El. 675' M.S.L.
Watershed area: 16.9 square miles
Total cost: $439,000 - $142 per acre-feet
Inflow: 8.3 MG x 365 = 3030 MG
Reservoir fills three times per year
Remarks:
This site appears to be very desirable. Relocation expenses should be reasonable. Construction access is good.
Reason for original rejection:
This site has not been rejected. The dimensions given above indicate that this is an alternative and larger structure than that already "approved" as site #29 at the same location. Site #29 has the following specifications:

Site #29

Location: SW¼ Section 33, T. 36 N., R. 11 E.
Length of dam: 1200 feet
Area of lake: 80 acres
Capacity of lake: 260 acre-feet at El. 660' M.S.L.
Watershed area: 16.9 square miles
Remarks:
This would be a small lake which would not flood any buildings or roads. A larger lake could be constructed by building a dam 2200 feet in length in essentially the same location. This would create a lake covering 407 acres with a capacity of 6500 acre-feet. Spillway crest elevation would be 700 feet M.S.L. Parts of Messenger Woodland would be flooded and approximately one mile of township road would have to be relocated. No important highway or building is located within the lake site.

The alternative larger structure will be considered here, but the appraisal for Site #29 will be reported first:

Preliminary Report on Geologic Conditions at proposed dam site on Spring Creek, By G. E. Hdblaw. 1961.

Geologic Situation

"At the proposed dam site the valley of Spring Creek is v-shaped, with a relatively narrow bottom and moderately sloping walls 35' high on the southeast and 70' high on the northwest side. Terraces at elevations respectively slightly above and slightly below 675 feet above mean sea level occur along the northwest side of the valley immediately upstream and along the southeast side of the valley immediately downstream from the dam site. A small terrace also slightly below 675' above mean sea level occurs along the northwest side of the valley at the dam site.

The valley walls consist of two strata of glacial drift. The lower stratum, which has been designated the Lemont drift, is a stony drift consisting to a large extent and associated with extensive local deposits of silt, sand and gravel. It seemingly comprises the terraces noted along the valley and presumably underlies the valley bottom. The upper stratum along the valley walls is a more clayey till, the Valparaiso till".

Opinion

"Although the presence of glacial drift both in the valley walls and in the valley bottom seemingly make this a feasible dam site, the fact that the lower part is the stony, gravelly, sandy, silty Lemont drift, which may be so permeable that it would allow excessive leakage both around the ends and under the dam, making it necessary to withhold final judgement until an adequate program of test borings reveal the character of the Lemont drift."

Reappraisal:

The proposed dam site is located on Spring Creek some 6.8 miles upstream from its confluence with Hickory Creek. The two streams meet within the City of Joliet. The site is located some 8.8 miles upstream from the confluence of Spring Creek with the DesPlaines River at Brandon Locks.

At the dam site the stream has a gradient of 12.5' per mile (approx.), but a short distance upstream the stream gradient is considerably less (5' per mile, approx.).

The glacial geology map of Coop Report #1 shows that this area is entirely within the undifferentiated Valparaiso moraine.

Bull. 665 (AG. Expt. Station) soils map indicates that mixed

bottomland, terrace and bluff wash materials (Unit 9) occur in the valley of Spring Creek, and that the surrounding area supports soils developed from silty clay loam till (Unit 4).

The surficial geology map of Mokena Quadrangle (Chicago Areal Geologic Maps, Map #17, Bretz, Bull. 65, ISGS) indicates that the valley floor of Spring Creek is underlain by recent alluvium consisting of silt, sand and gravel deposited by the present stream, and that the surrounding area is the irregular upland of the Valparaiso moraine. Bretz indicates a small kame deposit of poorly sorted sand and gravel. This kame forms the hill on the valley flank on the east edge of Section 33 and is crossed by the road just south of Spring Creek.

The geologic map of the Joliet Quadrangle (Fisher, 1921) shows that Silurian dolomite outcrops 2½ miles downstream in the western part of Section 6, T. 35 N., R. 11 E.

The NIMAPC soil resource area map shows that this site is located in an area of gently rolling, somewhat plastic timber soils (Morley and Blount) (Unit 12). The Soil Survey Map of Will County indicates that Drummer silty clay loam Occupies the valley bottom. In places along and within the valley are small isolated areas of Proctor silt-loam indicating deposits of medium-fine textured granular materials. Two such pockets of granular material occur at and below the proposed dam site. A fairly large sand bar is located in the north part of Section 34 along the south side of the creek. The alluvial deposits along the valley require proper identification. The soils map indicates that the soils of the valley walls and adjacent upland areas are those having silty clay loam till parent material (Unit 4).

The bedrock topography map (Coop Report #1) shows that Spring Creek follows the trend of a buried bedrock valley. This explains the varying thickness of drift in this area. In the vicinity of the dam site the drift thickness is as great as 172', and 2 miles upstream drift thicknesses of up to 200' are reported. Away from the buried valley, the drift thickness is considerably less (down to 29', average 60-80').

The bedrock elevation at the site is judged to be 525-530' M.S.L. i.e. some 115-130' below the valley bottom. A State Geological Survey test hole in Section 27, T. 36 N., R.11 E, revealed the following generalized succession:

43	feet	Valparaiso till
4	"	coarse sand
9	"	fine gravel
2	"	coarse sand
11	"	gravel, very silty, till-like
8	"	sand
25	"	sand with till and wood inclusions
18	"	till
1	"	coarse sand
7	"	till, silty
12	"	sand and silt
4	"	sandy gravel
7	"	sand and silt
19	"	Silurian dolomite, finely crystalline

T.D. 156 feet

Horberg suspected that the material between the Valparaiso till and the Silurian dolomite may be Lemont drift. The top of this granular section is at El. 637' M.S.L. ( ), which would place it at a depth of 16' below the elevation of the bottom of the valley at the dam site. However, two borings in Section 32 indicate that the top of the gravelly section is at El. 660' M.S.L. which if extrapolated means that 7' of granular material should be exposed in the lower part of the valley slopes at the dam site. The borings in Section 32 are located fairly high on the valley wall forming the north side of the valley. They revealed:

25'	gravelly till	5'	gravelly till
95'	gravel	45'	fine gravel
5'	sand and gravel	40'	coarse sand
6'	gravel	5'	sand and gravel
20'	till	15'	sandy gravel

Sand pockets are present in the valley bottom at the dam site according to the Soil Survey map, and extensive deposits of granular material (Lemont drift) are known to occur below the Valparaiso till which blankets this area.

Borings located off the line of the buried bedrock valley do not consistently report sand and gravel below the Valparaiso till. In several places the till directly overlies dolomite bedrock. Therefore much of the sand and gravel reported below the till in this area might well be restricted to the bedrock channel.

In any event, the location and extent of these sands and gravels must be determined and their physical properties evalu-

ated with respect to permeability and seepage problems likely to arise. A thorough site investigation, complete with borings is indicated so that variations in materials, etc., can be properly incorporated in preliminary designs. Some geophysical exploration might afford useful information on the subsurface materials.

The site appears excellent for the development of a multi-purpose reservoir. The site lends itself to stage construction, and the structure could be enlarged when and if desired. Depending on shoreline and upstream settlement, a spillway elevation of 685' M.S.L. would not be out of the question.

The site merits early attention.

Site R

Description:

West Branch DuPage River
NE¼, Section 14, T. 38 N., R. 9 E.
DuPage County
Wheaton 15' Quad.
Naperville 7½' Quad.

Given:

Length of dam: 1500 feet
Area of lake: 915 acres (Consoer, Townsend Report, 1150 acres with a recreational pool of 129 acres).
Capacity of lake: 4574 acre-feet at El. 690'
Remarks:
Construction of this lake would require the raising of the east-west tollway for a distance of 5000 feet Route 34 near the southern end of the lake would also have to be raised for a distance of 1300 feet.

Reason for rejection: "too shallow, poor soil conditions"

Reappraisal:

The site location is unfavorable. A new sewage disposal plant (the North Side) is located immediately south of Route 34 on the east bank of the river, and closure at elevation 690' would require construction of a saddle dam to bridge the depression in the north-east corner of Section 14, and also in the south-central part of Section 2. Relocation expenses and the cost of modification of existing structures may make this project economically unfeasible. Considerable reduction of costs would be made if the dam location is moved a short distance upstream of Route 34.

The West Branch of the DuPage River flows generally southeastward with a gradient of 4 feet per mile (approx.) in the area under consideration. The dam site is located about 1½ miles NW of Naperville. The valley is rather shallow with gently sloping walls.

Two low stall dams are located across the river. One of these is in the NE¼ of Section 10 about 1 mile upstream, and the second is about 3½ miles upstream in Section 35, T.39 N, R. 9 E.

The town of Warrenville contributes a considerable amount of detergent (and probably sewage effluent) to the river.

Numerous houses in the north-west quarter of Section 2 would be inundated by water standing at El. 690'. McDowell

Grove in the NW¼ of Section 11 is a small park area which would also be flooded out.

The site is located in an area of outwash and valley train deposits, situated along the front of the West Chicago moraine which forms the high ground east of the river. West of the river is a ground moraine area which is generally lower lying than the moraine area east of the river. The DuPage River in this area parallels the margin of the West Chicago moraine, and follows the zone of outwash and valley train deposits. Islands or inliers of till are found within the outwash. A dam located upstream from Route 34 could tie in to the large till "island" which is bounded approximately by the 690' contour in Section 11.

The small tributary in the NE corner of Section 14 exposes gravel deposits, and gravel is exposed in pits along the west side of River Road in Section 10. The northeast part of Section 11, most of Sections 2 and 12, and the western part of Section 1 are underlain by outwash sand and gravel deposits.

Investigation of the foundation conditions at the site of the secondary saddle dam would be required in addition to the foundation investigation for the main structure. Water from a lake standing at elevation 690' could easily by-pass the dam by taking a path through the granular materials, particularly below the lower ground in the NE¼ of Section 11.

Bull. 665 soils map shows that the upland area east of the river is a silty clay loam till, while the lower ground west of the river is one of loam till. Medium and moderately fine-textured outwash is shown along the river valley. The NIMAPC soil resource area map shows the same distribution of parent materials. However, neither of these soils maps shows the full extent of the outwash sands and gravels and valley train deposits present in this area.

Subsurface information available from borings is generally deficient in this area. Niagaran dolomite occurs at elevation 640-650'. The valley of the DuPage River is filled with up to 50' of sand and gravel, and glacial outwash sands and gravels are exposed in several places along the valley.

Because of high relocation costs coupled with highly permeable subsurface materials this site cannot be approved for development of a multipurpose reservoir.

Site S

Description:

West Branch DuPage River
SE¼ Section 27, T. 39 N., R. 9E.
DuPage County
Wheaton 15' Quad.
Naperville 7½' Quad.

Given:

Length of dam: 500 feet
Area of lake: 75 feet
Capacity of lake: 225 acre-feet at El. 700'
Watershed area: 62.7 square miles
Remarks:
One east-west country road in the southern part of Section 22 would have to be raised over the proposed lake

Reason for rejection: "too shallow"

Reappraisal:

The DuPage River in this area has a low gradient and a rather shallow valley. The valley is broad, with gently sloping walls - particularly on the east side. Because of recent settlement, elevation 700' would have to represent maximum pool height under flood conditions. Normal operating level would therefore be somewhat less than 700', resulting in a rather shallow body of water - with a 5' maximum depth.

This site is similar to site R in that it also is located in the outwash and valley train deposits marginal to the West Chicago moraine which forms the high ground east of the river. West of the river is a lower lying area of ground moraine. Poor foundation conditions are likely to be encountered because of the extensive sand and gravel deposits filling the valley of the DuPage River.

The dam site is poorly located with respect to foundation conditions. An old channel of the DuPage River trends due south from the site across Section 34 to join the present valley in the NW corner of Section 2, T. 38 N., R. 9 E. This old channel is probably filled with up to 75' of sand and gravel. The site is located at the upstream end of this old channel, and the dam should be relocated at least 300 yards upstream to avoid the old channel.

A complete foundation investigation would be required before

a dam in this vicinity could be approved, and preliminary indications are that this section of the valley does not lend itself to multipurpose reservoir development; although a low stall dam with free overflow and no flood storage capacity might be considered an improvement of the river in terms of scenic attraction.

Site T,U

Site T

Description:

West Branch DuPage River
2 miles north of West Chicago
DuPage County
SW corner Section 26, T. 40 N., R. 9 E.
Wheaton 15' Quad.
West Chicago 7½ Quad.

Given:

Length of dam: 800 feet
Area of lake: 400 acres
Capacity of lake: 2400 acre-feet at El. 740'
Watershed area: 27.4 square miles
Remarks:
800 feet of highway west of Wayne Center would have to be raised. A township road at the extreme northern edge of the lake would have to be raised for a distance of 300 feet.

Reason for rejection: "poor soil conditions-too shallow"

Site U

Description:

West Branch DuPage River
SW corner Section 26, T. 40 N., R. 9 E.
DuPage County
Wheaton 15' Quad.
West Chicago 7½' Quad.

Given:

Length of dam: 800 feet
Area of lake: 320 acres
Capacity of lake: 1600 acre-feet at El. 740'
Watershed area: 27.4 square miles
Remarks:
1000 feet of highway west of Wayne Center would have to be raised an average of 10 feet. A gravel pit and service road in northwest part of Section 23 would be close to the shore of the lake. The Illinois Central Railroad tracks at Granger would require raising 6 feet.

Yield of watershed: 8 inches annual runoff
27.4 square miles watershed
17.38 million gal per inch per sq. mile
1600 acre-feet = 521 million gallons

Ratio of runoff to lake capacity:

$$\frac{3809.7}{521} = 7.3$$

Normal runoff would fill the lake 7.3 times per year.

Reappraisal:

Sites T and U are considered hereas the same.

This site is located in the upstream section of the DuPage River. The valley is better defined in this area than farther downstream. At the site the valley is about 35' deep with moderately sloping valley walls. The stream gradient is fairly low (approx. 4' per mile).

Recent development in the southwest quarter of Section 26 precludes consideration of the original site, and a dam would have to be relocated upstream to about the mid-line of Section 26. A golf course is located west of the river upstream from the original site, and a field inspection should be made to determine the optimum location for a dam.

The glacial geologic map in Coop Report #1 shows no outwash along this section of the DuPage Valley, but both Bull. 665 and the NIMAPC soils map indicate that medium and moderately fine-grained outwash is present along the valley, and that silty clay loam till underlies the areas adjacent to the valley.

The valley is bounded to the east by the Wheaton moraine and to the west by the West Chicago moraine. Dr. Zeizel (U. of I. unpublished Ph.D. thesis) shows that the valley contains valley train materials consisting chiefly of outwash with alluvial cover. A gravel pit is located on the west side of the river in Section 23.

Very little subsurface information is available in this area. Dolomite bedrock is found at elevation 650-670' (approx.). Drift thickness in the areas adjacent to the valley varies between 80-142', and the thickness of drift below the valley bottom is probably 55-75'. The drift below the valley probably consists to a great extent of outwash and valley train sand and gravel, but no positive information is currently available.

This stretch of the river appears to be better suited for potential development of a multipurpose reservoir than the areas downstream, and as such should be accorded a preliminary foundation investigation to determine the existing subsurface conditions. The investigation should be of the al-

ternative site upstream from the developed areas, i.e. the west-central part of Section 26 rather than the southwest corner. Somewhat unfavorable but not unsurmountable conditions should be anticipated.

A preliminary cost-benefit study and reservation measures should be made as soon as possible if the site is not to be lost to further land development.

Sites V and W

Site V

Description:

West Branch DuPage River
Center of Section 12, T. 40 N., R. 9 E.
DuPage County
Wheaton 15' Quad.
West Chicago 7½' Quad.

Given:

Length of dam: 800 feet
Area of lake: 370 acres
Capacity of lake: 1100 acre-feet at El. 770'
Watershed area: 9.2 square miles
Remarks:
A north-south road in the eastern part of Section 12 would be flooded for a distance of 1200 feet. Two swampy areas in the upper part of the lake would be inundated to depths probably less than 5 feet.

Reason for rejection: "too shallow - pollution problems"

Site W

Description:

As above

Given:

Length of dam: 750 feet
Area of lake: 350 acres
Capacity of lake: 1400 acre-feet
Watershed area: 13.9 square miles
Remarks:
is part of surface water storage reservoir proposed for Section 10 and 11.

Reappraisal:

Sites V and W are the same.

Elevation 770' is the same as that proposed for a surface water supply reservoir located about 1½ miles downstream, and the consideration of this site therefore is unnecessary if the water supply reservoir is approved.

Elevation 770' is not an acceptable pool height for either structure, as very shallow water would be ponded and backed up into the low swampy area which stretches across the community of Keeneyville. If a lower elevation is selected,

there exists the possibility of excavating the swamp area in Keeneyville (c.f. Bensenville). It is noted that several houses are at and below elevation 770'.

It is recommended that this site (V & W) be abandoned in favor of a structure already proposed for the SW corner of Section 11 and SE corner of Section 10, and that elevation 760' should be selected for normal pool operating level, and that this facility be developed as a multipurpose rather than a surface water storage reservoir.

The existing soil add geologic information auggests that outwash and valley train materials found in the West Branch of the DuPage River extend upstream to about the site of the proposed surface water storage reservoir, i.e. up to the NW corner of Section 14. Upstream from this area the valley is cut in glacial till - silty clay loam till - which should afford good foundation conditions.

No subsurface information is currently available, and an adequate exploration program would be required before full approval could be fiven to any structure along this valley. Elevation of the bedrock surface is around 660' in this area, which means that up to 80 feet of drift may be encountered below the valley bottom.

Site X

Description:

East Branch of DuPage River
SW¼, Section 25, T. 39N., R. 10 E.
DuPage County
Wheaton 15' Quad
Wheaton 7½' Quad.

Given:

Length of dam: 2500 feet
Area of lake: 960 acres
Capacity of lake: 4800 acre-feet
Watershed area: 28.1 square miles
Remarks:

Glen Ellyn Sewage Disposal Plant would be submerged. Housing developments in the flood plain area would have to be evacuated. Several Glen Ellyn streets would be on the edge of the proposed flooded area. Roosevelt Road would have to be raised for 2000 feet of its distance across the lake. Route 53 would also have to be raised for a similar distance. The Glen Oak Country Club would be partially flooded. Some raising of railroad tracks in the northern part of the flooded area would be required.

Reason for rejection: "too shallow"

Reappraisal:

Construction of a dam with the above dimensions is now virtually impossible at this site because of the extensive housing developments which would be located in the flooded area.

The maximum pool elevation now available is 680' which is 10' lower than the originally proposed spillway elevation. Elevation 680' would bring the water's edge very close to 20 houses of a new subdivision, would back up the river into the artificially channelled section a distance of 2½ miles upstream to produce a very narrow and shallow ribbon of water of questionable utility, would engulf the Glen Ellyn Sewage Disposal Plant resulting in the need for drastic modification of the sewage disposal system, and would produce only a shallow body of water. The water at maximum flood elevation would have a maximum depth at the dam of only 9 feet, and the average depth of water under normal operating conditions would be considerably less.

Soil information indicates that the wide shallow valley is underlain by medium and moderately fine-textured outwash, and the geologic information indicates that the valley is underlain by valley train materials - chiefly outwash with alluvial cover.

Subsurface information below the valley bottom is inadequate for the formulation of any positive statement about the subsurface conditions or materials, but preliminary indications are that this site is unsuitable for the location of a dam. It is not unlikely that up to 40' of moderately permeable granular materials (outwash) directly overlie dolomitic bedrock, and the cost of reducing or eliminating leakage when added to the high relocation costs would probably not make this structure economically feasible. If cost analysis results are favorable, then a test boring program should be made to determine the actual foundation conditions. It is noted that extensive housing developments downstream from the site may derive flood control benefits.

In the inspection of the site for this evaluation it was noted that the Glen Ellyn Sewage Disposal Plant does not appear to be well situated with respect to possible ground water pollution.

Site Y

Description:

Unnamed tributary to East Branch DuPage River
Center Section 36, T. 39 N., R. 10 E.
DuPage County
Wheaton 15' Quad.
Wheaton 7½' Quad.

Given:

Length of dam: 1100 feet
Area of lake: 990 acres
Capacity of lake: 4900 acre-feet at El. 700'
Watershed area: 5 square miles
Remarks:
Two secondary roads would be affected. One of these is probably part of a subdivision Lacey Road which cuts north-south through the lake would require raising for a distance of 1500'

Reason for rejection: "insufficient watershed yield"

Reappraisal:

The criteria used by the State Water Survey in the appraisal of sites for water supply reservoirs include the requirement that the watershed runoff or yield must be sufficient to fill the reservoir at least once yearly.

The watershed yield requirement for multipurpose reservoirs has not been clearly stated, but is judged to be somewhat less critical than for a water supply reservoir.

The advance print of the Wheaton 7½' Quadrangle shows that considerably more facilities would be affected than previously reported. The East-West Tollway crosses the area which would be covered by the lake. The section of Tollway affected would be more than one half mile in length, and several secondary roads having a total combined length of more than one mile would require modification. At least one access road would be submerged, and a small number of new homes and homesites would be adversely affected.

For these reasons and the fact that even though the watershed yield might be less critical than for water supply reservoirs, the lake would itself impound a major part of the watershed (and would be subject to extensive evaporation because of the large area of shallow water produced, especial-

ly in the upstream area), a reservoir at this site cannot be highly recommended.

The low stream gradient and wide shallow valley are factors which do not make utilization of this tributary an attractive proposition.

If considerable excavation of material from below the water table is considered, then it is possible that the valley upstream from the Tollway might be developed as a water table lake.

The creek flows through the gently rolling topography of the western margin or front of the Valparaiso moraine.

Bull. 665 soils map shows that the parent materials in this area is silty clay loam till, and the NIMAPC soil resource area map indicates an area of gently rolling somewhat plastic soils (Varna-Elliott, and Morley-Blount).

The drift thickness in the creek area varies from 80-130'. Dolomite bedrock occurs at about elevation 640' ± 10.

A generalized section consists of:

18-28'	yellow clay (till)
22-55'	blue clay (till)
0-33'	sand
10-48'	gravel
Below	ddlomite

Borings in the valley bottom would undoubtedly reveal alluvial deposits including some outwash sand and silt, which might be up to 15' in thickness, overlying the glacial till.

No subsurface information is available in the vicinity of the proposed site in the center of Section 36, nor in the area which would be excavated in Section 31 and Section 32, T. 39 N., R. 11 E., if the alternative scheme of a water table pond is developed. No major foundation or materials problem is evident but approval of any structure would depend upon the results of an adequate test boring program.

The problems at this site - calculation of minimum watershed yield to meet the requirements of a multipurpose reservoir, and the adverse effect of a lake on existing facilities- are beyond the scope of this appraisal.

Site Z

Description:

Prentice Creek Tributary of East Branch DuPage River
SW¼ Section 14, NW¼ Section 23, T. 38 N.,R. 10 E.
DuPage County
Wheaton 15' Quad.
Wheaton 7½' Quad.

Given:

Length of dam: 1700 feet
Area of lake: 160 acres
Capacity of lake: 1600 acre-feet at El. 700' M.S.L.
Watershed area: 3.4 square miles
Remarks:
Hobson Road would require raising an average of 10 feet for a distance of 500 feet. A study of the topographic map shows no other roads or dwellings that would interfere with the building of this lake. A short section of 63rd Street may have to be elevated.

Reason for rejection: "unsuitable geology"

Reappraisal:

Since the time that this site was evaluated for surface water storage potential, considerable land development has occurred, and a pool elevation of 700' would engulf part of a new subdivision in the south-central part of Section 14. Other parts of this area might have been developed since the survey for the advance print of the Wheaton 7½' Quadrangle was made. As far as can be determined from the advance topographic map, elevation 685' now represents the maximum permissable pool elevation without encountering excessive relocation costs. This limitation considerably reduces the area, depth and capacity of a lake at this site.

Prentice Creek and its small tributaries rise in an area of hummocky moraine topography in the region south of Downers Grove. The main stream heads westward at an average gradient of 25 feet per mile (approx.) to join the East Branch of the DuPage River. The creek flows only intermittently, but has eroded a fairly wide v-shaped valley.

The glacial geology map in Coop Report #1 shows that the creek flows across the western edge of the Valparaiso moraine and on to the outwash plain (valley train) associated with the DuPage River.

Dr. Zeizel (U. of I. Ph.D thesis) shows the same geologic environment, and in addition indicates that the glacial drift in this area is a silty clay loam till with some thin loess cover, and has moderately slow permeability.

Bull. 665 (Ag. Expt. Station) soils map shows that the area is one of silty clay loam till. The NIMAPC soil resource area map shows that the valley is cut in an area of gently rolling somewhat plastic soil - Varna and Elliott series in the upstream area and Morley and Blount series in the downstream area.

The drift thickness in the area varies from about 45' along the eastern wall of the East Branch of DuPage River to 118' in the upstream part of Prentice Creek. The drift thickness increases markedly towards the east - probably due mainly to the influence of constructional morainic topography in the area of higher ground rather than to major variation in bedrock surface.

A generalized section in the vicinity of the dam site is as follows:

0-5'	topsoil
10-18'	yellow clay (till)
25-73'	blue clay (till)
9-33'	gravel
0-13'	sand
180-234'	dolomite
	shale

Some sand (up to 15') may occur overlying the gravel, but sand, if present, usually is found below the basal gravel.

The basal gravel layer is fairly widespread in the area, but tends to be thicker closer to the DuPage River and thins, with corresponding increase in thickness of the till section, towards the east, i.e. towards the headwater region of Prentice Creek.

The till has a silty clay texture and should provide satisfactory foundation conditions , if present, in the subsurface at the dam site. However, it is very probably that Prentice Creek has eroded down through the upper till section to expose the basal gravel at the proposed dam site. If this is the case, then measures to reduce or prevent leakage from the reservoir would have to be taken into consideration, or alternatively the site of the dam could be moved upstream some 500 yards or more into an area where impermeable till does underlie the valley floor. In view of the recent housing development in the area, this alternative would be the only solution if a spillway elevation of 700' is to be maintained.

Apart from the exposure of granular materials underlying the valley floor in the downstream area, no major foundation

or materials problem is evident.

Full approval of the site must be withheld until adequate exploratory boring at the site together with pressure testing of the basal gravels has been completed. Preliminary steps to reserve the land lying below elevation 700' upstream from the alternative site (east from the point where the valley bottom is at elevation 675' approx.) might be desirable, but only when the boring results become available. Any preliminary cost analysis for the structure should include the expense of grouting and/or an upstream drainage blanket.

NORTHEASTERN ILLINOIS METROPOLITAN AREA

CONTROL BASE MAP

Prepared By

NORTHEASTERN ILLINOIS
METROPOLITAN AREA
PLANNING COMMISSION

SCALE IN MILES

THOUSAND FEET

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

SECTION NUMBERING SYSTEM FOR TOWNSHIPS

RESERVOIR SITES

○ = ~~24~~ sites ~~to be~~ appraised for multipurpose reservoir development.

◉ = appraisal completed & submitted to ~~&~~ J.H.

◎ = sites previously approved for surface water supply. Not under consideration here.

R. B. Ellwood
1 May 1963.

Illinois State Geological Survey
by R. B. Ellwood ~~June~~, 1963

THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH AN URBAN PLANNING GRANT FROM THE HOUSING AND HOME FINANCE AGENCY UNDER THE PROVISIONS OF SECTION 701 OF THE HOUSING ACT OF 1954 AS AMENDED.

APRIL 1960

NORTHEASTERN ILLINOIS METROPOLITAN AREA

CONTROL BASE MAP

Prepared By

NORTHEASTERN ILLINOIS METROPOLITAN AREA PLANNING COMMISSION

SCALE IN MILES

THOUSAND FEET

RESERVOIR SITES

ILLINOIS STATE GEOLOGICAL SURVEY

BY R.B. ELLWOOD JUNE 1963

● SITES APPRAISED FOR MULTI-PURPOSE RESERVOIR DEVELOPMENT

◎ SITES PREVIOUSLY APPROVED FOR SURFACE WATER SUPPLY. NOT UNDER CONSIDERATION HERE

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

SECTION NUMBERING SYSTEM FOR TOWNSHIPS

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APRIL 1960