

STATE OF ILLINOIS )  
 ) Original Do Not Remove  
COUNTY OF LAKE )

BEFORE THE POLLUTION CONTROL BOARD  
OF THE STATE OF ILLINOIS

PEOPLE OF THE STATE OF ILLINOIS )  
and the ILLINOIS ENVIRONMENTAL )  
PROTECTION AGENCY, )

Complainants, )

v. )

ROUND LAKE SANITARY DISTRICT, )  
an Illinois municipal corporation, )

Respondent. )

----- )  
ROUND LAKE SANITARY DISTRICT, an )  
Illinois municipal corporation, )

Petitioner, )

v. )

ILLINOIS ENVIRONMENTAL PROTECTION )  
AGENCY, )

Respondent. )

----- )  
and )

ROUND LAKE AREA CONCERNED LANDOWNERS, )  
CITIZENS AND DEVELOPERS ASSOCIATION, )  
Third Party Intervenor in the )  
consolidated causes. )

RECEIVED

DEC 19 1977

POLLUTION CONTROL BOARD

PCB 75-33 and 75-65

Consolidated

NOTICE

TO: Harvey M. Sheldon, Esq.  
One N. LaSalle Street  
Room 2300  
Chicago, Illinois 60602

Joseph Sikes, Esq.  
21 North Whitney  
Grays Lake, Illinois 60030

Jerome Foreman, Esq.  
188 West Randolph Street  
Room 2026  
Chicago, Illinois 60601

PLEASE TAKE NOTICE that I have today filed in the Office of the Clerk of the Pollution Control Board, a Stipulation and Proposal for Settlement, a copy of which is served upon you.

WILLIAM J. SCOTT  
Attorney General  
State of Illinois

By *Dennis R. Fields*  
DENNIS R. FIELDS  
Special Assistant Attorney General

DATED: December 19, 1977.

100 North LaSalle Street  
Room 1612  
Chicago, Illinois 60602  
312/346-0646

BEFORE THE  
POLLUTION CONTROL BOARD  
OF THE STATE OF ILLINOIS

*Presented by EA ...*  
*...*

NOV 21 1977

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and the ILLINOIS ENVIRONMENTAL  
PROTECTION AGENCY,

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STIPULATION AND PROPOSAL  
FOR SETTLEMENT

1. Respondent Round Lake Sanitary District (hereinafter  
the "District") is an Illinois Municipal Corporation duly

organized and incorporated in 1946. The District was organized, and exists pursuant to the Sanitary District Act (Ill.Rev. Stat., Chap. 42, Paragraph 298.00 et. seq. (1975)). The District owns and operates a sewage treatment plant located at Sunset and Hawthorne Drives, Village of Round Lake, Lake County, Illinois. Untreated waste water from the western Lake County communities of the Village of Round Lake, the Village of Round Lake Beach, the Village of Round Lake Heights, the Village of Round Lake Park and a portion of the Village of Hainesville are received by the District.

2. Each Village owns and operates a sanitary sewer system tributary to the District's interceptor sewers and sewage treatment plant. Specifically, each Village owns and operates the following sanitary sewer system, and as of September 1, 1974, contained the following population served by the District:

Village of Round Lake	11.8 miles	2,500
Village of Round Lake Beach	31 miles	10,100
Village of Round Lake Heights	3.8 miles	1,300
Village of Round Lake Park	10.7 miles	) 4,000
Village of Hainesville	1 mile	

3. The effluent from the District's sewage treatment plant discharges into a stream which, in turn, discharges into Long Lake. Both the stream and Long Lake are located within the Fox River Basin. The stream has, as its source, a Lake named "Round Lake".

4. The District's original sewage treatment plant was constructed in 1948, and consisted of secondary treatment

designed to serve 3,750 people. In 1961, the plant was expanded to serve an additional 12,600 people. The expansion of the plant increased the design capacity to 1.68 million gallons a day. That is the present capacity of the District's plant. Additionally, in 1960, two lagoons were added. In 1969, a third lagoon was added. In 1974, interceptor sewers were constructed by the District for the purpose of separating and metering the flows from each village within the District.

5. Exhibit No. 1, attached to this Stipulation, is a Flow Diagram of the District's sewage treatment plant as it exists today. The interceptor sewers carry the influent into the sewage treatment plant. Prior to the merging of the flows from the different interceptor sewers, the flows are metered. The combined flows then first pass through a by-pass chamber. The by-pass chamber is controlled by a leaping weir arrangement where the amount of flow coming to the plant dictates whether the influent will pass through the sewage treatment plant or be by-passed to the ponds. As shown in the flow diagram, the influent that passes through the physical plant then flows into the lagoon system prior to discharge to the stream. Any influent that is by-passed travels through the lagoon system, is mixed with the effluent from the physical plant and is then discharged to the stream.

All influent which can mechanically be pumped through the plant is sent through the physical plant for treatment. Only the remainder is by-passed to the lagoon system. By-passes

only occur during wet weather flows. If all of the pumps are working to capacity, they are capable of pumping waste water through the physical plant at a rate of approximately 3.5 million gallons a day. Records kept by the Round Lake Sanitary District show the following, during 1974, concerning precipitation, by-passing and flow through the physical plant:

<u>Month</u>	<u>Days of Precipitation</u>	<u>Days By-passing to Lagoon #1</u>	<u>Flow Rate - MGD (not including by-pass flow)</u>
Jan. '74	8	0	2.26
Feb. '74	8	22	2.02
Mar. '74	16	23	1.8
Apr. '74	13	15	1.92
May '74	16	23	2.18
June '74	12	25	2.53
July '74	6	13	2.09
Aug. '74	8	2	2.57
Sept. '74	8	0	2.34
Oct. '74	6	0	2.45
Nov. '74	13	0	2.36
Dec. '74	12	15	2.42

The average flow to the District sewage treatment plant, based upon the District's records, is approximately 2.3 million gallons a day. The actual flow through the treatment works has exceeded 1.68 million gallons a day repeatedly since 1961.

6. The District estimated its population, as of September 1, 1974, at 17,900. Additionally, waste water from industries, with a population equivalent of 300, brought the total estimated population serviced by the District, in 1974, to 18,200. Between 1970 and March 31, 1977, the Round Lake Sanitary District issued 2,412 permits for hookups to its treatment plant.

7. The District's physical sewage treatment plant cannot remove as high a percentage of BOD and suspended solids at a flow rate of 2.3 million gallons a day as it could at its designed flow rate of 1.68 million gallons per day. This is due primarily to a decreased retention time. The retention time continues to decrease when the plant is required to handle more than 2.3 million gallons a day. Because the effluent from the physical plant is passed through the lagoon system, the relationship between the quality of the final effluent and the increases in influent depends upon a number of variables. While the District has not conducted a study to determine this relationship, estimates by the District's engineers establish that a large increase (approximately one-half a million to a million gallons a day) would certainly cause a significant adverse change in the quality of effluent discharged to the stream.

8. Both the Agency and the Round Lake Sanitary District have conducted tests on effluent samples from the District's sewage treatment plant. Additionally, the Agency has conducted tests on samples taken both upstream and downstream of the Round Lake Sanitary District. A summary of the Agency's composite samples from the treatment plant's effluent, grab samples from the treatment plant's effluent and grab samples showing water quality upstream and downstream from the sewage treatment plant are as follows:





The District, on its variance Petition, reports its Average Daily Flow at 22mgd, BOD 10.15 mg/l, SS 12.07 /l and Total Phosphorus at 12.7 mg/l.

9. The United States Environmental Protection Agency, as part of a National Eutrophication Survey, conducted a study and prepared a report on Long Lake. The report was dated June, 1975. The report relates the water quality in Long Lake to waste sources discharging into Long Lake. A copy of the United States Environmental Protection Agency's report is attached and incorporated by reference herein.

Respondent and Intervenors note and agree with the conclusions in the U.S.E.P.A. report insofar as they indicate that "nitrogen is the limiting factor in Long Lake". Respondent and Intervenors take exception to the conclusory statements in the report indicating that phosphorus inputs in the Lake should be minimized, and the parties make no stipulation concerning these conclusions. The Respondent and Intervenors contend and would offer expert evidence at a hearing of this cause that in the presence of nitrogen of the volume indicated in the report, the temporary restriction of phosphorus loadings such as would result from a sewer connection ban over a three year period could not be calculated to reduce the rate of eutrophication now occurring in Long Lake. This Stipulation and Proposal for Settlement indicates that phosphorus discharges to Long Lake from the Round Lake Sanitary District will be eliminated by the construction of a regional sewage treatment plant, within little more than two years, as further set forth below.

10. On March 4, 1974, the District applied for an Agency operating permit. The Agency denied the permit request on April 8, 1974 because the District's monthly operating reports and Agency surveillance reports indicated that the plant was both hydraulically and organically overloaded, and because concentrations of several contaminants were in violation of effluent and water quality standards. Thereafter, the Agency has consistently denied construction permit applications for connections to the District's sewer system.

11. The area currently serviced by the District is in part the subject of a regional plan prepared by the Northeastern Illinois Planning Commission. The proposed area plan, which is entitled the "Northwest Regional Sewer Project", provides for the collection of sewage from all the villages presently being served by the District, as well as from other surrounding areas. Sewage will then be transported, by regional interceptors owned, operated and maintained by Lake County, to a regional plant to be constructed, owned and operated by the Village of Fox Lake.

The proposal to regionalize sewage collection and treatment in northwestern Lake County had its genesis in studies conducted by the Northeastern Illinois Planning Commission. This study established that the most serious water pollution problem in northeastern Illinois exists in the northwestern portion of Lake County, that the Chain of Lakes are seriously polluted, that eutrophication is occurring, and that present health hazards exist due to the existence

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of malfunctioning septic tank systems, some inadequacies of existing waste water treatment plants in the area, and intensive use of farm fertilizers reaching Long Lake through Squaw Creek, Eagle Creek and other streams. To abate this area-wide problem, the Commission recommended that sewage being treated in existing municipal plants be transported instead, by interceptor sewers, to a regional plant discharging into the Fox River. The Fox River has a higher dilution rate, and is better able, therefore, to assimilate treatment plant effluent than the shallow low flow lakes and streams.

The Lake County Department of Public Works and the Village of Fox Lake filed federal and state grant applications to obtain funds to construct a regional plant at the Village of Fox Lake and to construct the necessary regional interceptors. This grant application was approved as consistent with the Northeastern Illinois Planning Commission's plan. The Round Lake Sanitary District had its own grant application pending at the same time to expand its sewage treatment plant. The District's application was at first accepted, but then was denied by Complainant Agency because it was not consistent with the Commission's regional plan, despite its having been given higher priority for funding, prior to adoption of the Commission's regional plan.

12. If this case were tried, the District and Intervenors would contend and seek to prove that this change of construction grant priorities was arbitrary and capricious, or otherwise interfered with District's efforts to upgrade and expand its facilities. Complainants would contend that the above

actions on priorities were proper and reasonable. The proposed regional plant will have a design capacity of 6 million gallons per day, will provide tertiary treatment and will have phosphorus and ammonia nitrogen removal facilities. Phase 1 of the proposed regional project will service the area comprising the Round Lake Sanitary District, as well as the Village of Fox Lake, Fox Lake Sanitary District, and part of the newly formed Lakes Region Sanitary District. (Phase 2 and 3 will provide interceptors for other areas in the northwest section.) On June 13, 1974, the Agency certified the joint application of the Lake County Department of Public Works and the Village of Fox Lake. On June 3, 1975 and November 19, 1975, letters were sent the District and Round Lake Beach explaining the State's position concerning Grand Funds. Copies of these letters are attached hereto and incorporated herein.

13. Participation in the regional plan was on a voluntary basis. Following denial of the District's grant application by the State of Illinois, the District was faced with the practical choice of agreeing to become part of the regional plan or of upgrading its existing plan without the aid of federal funds. It was estimated that the upgrading of the District sewage treatment plant to meet effluent and water quality requirements would have cost approximately \$3,500,000.

14. The Round Lake Sanitary District and the five villages have been involved in negotiations with the County concerning transporting waste water to the Village of Fox

Lake plant since approximately 1970. Obstacles concerning entering into such a contract included disagreement over the terms of the contract and questions regarding the comparative costs of treatment at the Fox Lake plant and at an upgraded District plant.

15. The sewer systems owned, operated and maintained by each individual village are sanitary sewer systems. No storm water system discharge to the District's sewage treatment plant is intended. Flows to the Round Lake Sanitary District's treatment plant, in excess of those generated by hookups to the sanitary sewer system, get into the sewer system by inflow or infiltration.

The Round Lake Sanitary District estimated a population equivalent of 18,200 persons as of September 1, 1974. The Environmental Protection Agency's design standards use a figure of 100 gallons a day per person. That 100 gallons a day includes some normal amount of inflow and filtration. Any flow over 100 gallons a day per person would constitute excess inflow/infiltration. The District has made studies and would contend at the hearing that the actual average flow per person is only 65 G.P.D. within the District.

A history of correspondence and meetings involving the State of Illinois, the villages and the Round Lake Sanitary District dates back to the 1960's. This correspondence concerned the inflow/infiltration problem and the hydraulic overloading of the Round Lake Sanitary District's sewage treatment plant. The Lake County Department of Public Works has prepared a sewer system evaluation report-infiltration-

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inflow analysis of the sewer system owned by the five Villages within the District as part of its step I project. The evaluation report established the presence of substantial inflow and infiltration into the sewer system, generally analyzed the source of this inflow-infiltration and estimated certain costs in removing portions of the inflow and infiltration. The District and Intervenors do not concur with or admit to the conclusions thereof.

16. On January 23, 1975, the People of the State of Illinois filed a Complaint against the District charging that the sewage treated by the District exceeds the rated capacity of the sewage treatment plant, that discharges of phosphorus in the plant's effluent caused unnatural algal growth in Long Lake and that discharges of ammonia in the plant's effluent caused water quality violations in the stream. On February 14, 1975, the Round Lake Sanitary District filed a Petition for Variance with the Pollution Control Board. In that Petition, the District requested a variance from the Board's regulations limiting BOD to 4 milligrams per liter, limiting suspended solids to 5 milligrams per liter and limiting phosphorus to 1 milligram per liter. The two actions were consolidated on March 13, 1975. On March 21, 1975, the Agency filed its recommendation. The Agency recommended the Petition be granted for a period of six months with the Petitioner to request subsequent extensions or modifications. The Agency recommended that any variance be subject to the conditions that Petitioner install alum storage and feeding equipment and that no new sewer connections

be permitted during the term of the variance.

On March 24, 1975, the People of the State of Illinois and the Environmental Protection Agency filed an Amended Complaint against the District alleging violations of Rule 407(b) (1 milligram per liter of phosphorus), Rule 405(f) (4 milligrams per liter of BOD), Rule 203 and 402 (unnatural algal growth in Long Lake) and Rule 203(f) (ammonia water quality violation in stream). Additionally, Complainants asked for the imposition of a sewer ban. On April 22, 1975, the Round Lake Area Concerned Land Owners, Citizens and Developers Association filed a Motion to Intervene in the proceeding. Its Motion was granted.

On August 22, 1975, Plaintiffs filed a Second Amended Complaint. In its Second Amended Complaint, Complainants charged the District with causing water pollution, with causing an unnatural algal growth in Long Lake, and with causing a violation of water quality standards in the stream. Additionally, Complainants charged each village with a violation of Rule 602(b) (failing to eliminate excess infiltration and inflow).

On May 28, 1976, Complainants filed a Third Amended Complaint. This Third Amended Complaint charged the District with operating without a permit, with violating the BOD and suspended solid effluent limitations contained in Rule 404(f), with violating the phosphorus effluent limitation contained in Rule 407(b), with causing water quality violations for ammonia nitrogen in the stream, with causing water quality violations for phosphorus in Long Lake, with causing an unnatural algal growth in Long Lake, and with causing

water pollution in Long Lake. Additionally, Complainants charged each village with violating Rule 602(b), and with causing or threatening or allowing, based on their failure to reduce or eliminate excess inflow-infiltration into their sewers, BOD5 effluent and water quality violation with which the District was charged. On September 29, 1977, pursuant to Complainants' Motion, the Respondent Villages were dismissed, without prejudice, as parties from this case.

17. Extensive discovery has been undertaken. Considerable technical and other testimony and evidence exists and is in controversy on several issues.

18. On September 10, 1975, a Petition was filed in Round Lake Beach requiring an election to determine whether the Village of Round Lake Beach would enter into a contract with the County, thus becoming part of the regional treatment plan. Following the filing of that Petition, the Village of Round Lake Beach authorized financing consultants to prepare a rate comparison study of waste water treatment for the Village of Round Lake Beach. The purpose of that study was to compare the relative costs of upgrading the District's treatment plant and of becoming part of the Regional program. Their report was presented to the Village of Round Lake Beach in March, 1976. The results of that report were presented to the voters at various seminars. On May 1, 1976, the voters of the Village of Round Lake Beach chose, by a vote of 401 "Yes", 157 "No", and 20 spoiled ballots, to enter into an agreement with the County and become part of



the regional treatment plan. Following additional negotiations, the Village of Round Lake Beach, the Round Lake Sanitary District, and the other four above-named villages signed contracts with the County. These contracts were signed on March 11, 1977.

On August 9, 1977, the County Board ratified the sale of bonds to finance the first phase of the Northwest project.

19. In 1975, the Round Lake Sanitary District installed an alum feed system for the purpose of reducing phosphates in its effluent. The installation of the alum feeding system was intended as an interim measure pending either the diversion of its waste water to the Village of Fox Lake plant or the upgrading of the District's plant.

20. If this cause were to be heard by the Board, Respondents and Intervenors would seek to introduce testimony and evidence to the following purpose and effect:

- a. The phosphorus standards and BOD and suspended solid standards which the Complaint alleges the District should meet are not achievable on a regular and continuous basis, and their imposition on the District creates an arbitrary and unreasonable hardship, as established by the fact that the Complainant E.P.A. has suggested revision of these standards by the Board.
- b. Water supplies in the District are primarily from wells. There are test results indicating that the phosphorus in the natural waters of the area is about five times greater than the 1 ppm. limitation. Any interim compliance with present phosphorus limitations by the District is thus made a far greater hardship, if not an impossibility, for reasons over which the District has no control.

- c. No large single family residential developments are contemplated or known to be planned within the District; however, there are owners of single family lots who would be adversely affected and economically harmed if any ban on single-family residences were to be imposed. As real estate owners, such persons have by law regularly paid taxes to support the District, but have contributed no sewage to the treatment works. Virtually all lots remaining undeveloped in the District are small and could not support septic fields. Thus a sewer ban is arbitrary as to such owners, since they have done nothing to contribute to any problem of treatment. A connection ban would cause economic hardship to dozens of construction industry workers who have regularly helped build homes in the District.
- d. The Regional Treatment Plant is the best workable solution for the region, but it depends in part upon a healthy local economy for its revenue. Any sewer connection ban, even in an interim period, would tend to depress the local economy.
- e. A two or three year new sewer connection ban would cause no significant decrease in the eutrophication rate of Long Lake.
- f. The Northwest Regional Treatment Plant, insofar as it accepts and treats sewage from the Respondent District, should be operational by December 31, 1979.
- g. The Long Lake eutrophication problem is long standing. If called to testify, Mr. Ralph L. Evans of the Illinois State Water Survey would be shown to be a recognized expert on water quality. He is head of the Water Quality Section of the Survey, and is a registered professional engineer with a Masters Degree in Sanitary Engineering from Harvard University; and with some 17 years of field experience. He observed fish kills and algal blooms in Long Lake at least as early as 1954. He would testify that even the total diversion of Round Lake Sanitary District effluent to the regional plant at Fox Lake would have little immediate effect on water quality in Long Lake, because the Lake is so heavily nutrified. He would testify that Long Lake has a "bad bottom" where nutrients have accumulated over many, many years, and that it would take many years for the bottom to become stable again; probably

in excess of ten years would be required to show any effect of diversion, unless in-lake treatment were successful, and no noticeable change in condition of the Lake would be discernable during that ten year period.

- h. That Daniel J. Goodwin, head of the Planning and Standards Section of the Water Pollution Control Division of Respondent EPA would, if called, testify that the EPA is unable to grant a so-called "Pfeffer exemption" pursuant to Rule 404 of the Water Pollution Regulations respecting Long Lake because the Streeter Phelps equation which is used in the formula is inapplicable to a nutrient rich lake such as Long Lake. He would also testify that only very expensive technical analysis, taking over a year to complete at a cost of at least \$10,000.00 could hope to develop data sufficient to permit a person, such as Respondent District, to show it qualifies for an exemption.
- i. The District would further seek to show that the sewer plant of the Village of Lake Villa is a major contributor to pollution of Long Lake, and that there are other important sources of nutrients.
- j. The District has installed water metering devices at its sanitary sewage intakes, at a cost to the District of \$ , to assure that villages within its boundaries are surcharged for any overload attributable to excess infiltration and inflow.

#### TERMS OF SETTLEMENT

21. As a result of numerous discussions, and based on the foregoing Stipulation, the parties hereto propose, agree, and further stipulate that the interest of the public and the parties hereto will be best served by the resolution of this enforcement proceeding without further litigation and under the terms and conditions provided herein. Actual trial of the issues in controversy would take several weeks and would not, in the judgment of the parties, result in any clearer statement of the issues than contained herein. In accordance with the

procedure for settlement prescribed by the Board's procedural rules, the parties offer this Stipulation of Facts and Proposal for Settlement in lieu of a full hearing.

The parties hereby stipulate and agree that a settlement of the above entitled enforcement proceeding shall be set forth below. This proposed settlement is expressly conditioned upon, and effective only, with approval thereof in all respects by the Illinois Pollution Control Board. The parties further stipulate that all statements contained herein, including but not limited to all statements of fact, shall be null, void and of no effect in the event that the Board fails to approve the following terms of settlement in all respects.

22. The People of the State of Illinois and the Illinois Environmental Protection Agency believe that diversion of the District's waste water flow to the upgraded Village of Fox Lake's sewage treatment plant is the most reasonable method by which the District and the villages could comply with the Board's Regulations and the Act. The Complainants also believe that a date of December 31, 1979, is a reasonable period by which diversion of the flows to the Village of Fox Lake plant should be achieved. Respondent herein agrees to honor the terms of the provisions of its contract with Lake County.

23. During the time period until December 31, 1979, the District will continue to treat waste water from the five villages and to discharge effluent into the stream and into Long Lake. However, the Round Lake Sanitary District

agrees to and accepts the following terms and conditions of settlement:

The District is granted a variance to operate its treatment works until December 31, 1979, or such earlier time as the interceptor to the Regional Treatment Plant at Fox Lake may become operational and be able to receive sewage at its contemplated load for treatment by the Regional Plant. The terms of this variance are:

a) The District shall utilize optimum plant operational practices during the period of the variance. If Complainants believe that optimal practices are not being utilized at anytime, they shall specify their belief to the District in writing, setting forth the practice objected to, the suggested optimum practice, and the reasons for the objection and suggestion. The suggestion shall become effective within 30 days and shall be binding upon the District unless, within 30 days of receipt of the suggestion, the District formally seeks relief therefrom from the Board. Suggestions shall extend only to operating practices, and not to capital equipment or expenses.

b) There shall be a limit on the number and kind of new sewer connections within the District. No more than one hundred thirty (130) new single family residences shall be given permits to be connected to sanitary sewers contributory to the District treatment works in each calendar year 1978 and 1979.

Any person or contractor desiring a permit for connection of a single family residence, on applications made after December 31, 1977, shall certify that if granted a permit the applicant will engage in a prompt and continuous course of construction, weather permitting, delays for strikes or other causes beyond the control of the applicant excepted. Applicants must be lot owners or authorized representatives of lot owners. The Board of Trustees of the District shall accumulate all permit applications filed between January 1 and February 28 of a calendar year, and shall issue permits for all good faith applications made by February 28, or up to 100 permits, whichever shall be the smaller number. If more than one hundred applications exist, the Board of Trustees of the District shall allocate permits fairly among applicants so that no contractor or other

person obtains an unfair market share. Of the first one hundred permits issued in a calendar year, 25 permits shall be the maximum issued to any applicant. The board shall issue the first group of permits by March 15 of the calendar year. On applications made after February 28 of a calendar year, the Board shall issue the unused portion of the first one hundred, plus thirty more, at a rate of not more than 15 a month. The total number of permits issued on applications in a calendar year shall not exceed 130. If 130 have not been issued by June 30 of a year, the Board may issue the remainder in total on a first come, first served basis.

If within sixty days of issuance of a permit, weather and strikes or other excuses by reasons beyond an applicant's control excepted, an applicant has not caused construction to be commenced and the house to be under roof, the permit may be revoked by the District on five business days' notice posted at the permitted site and mailed to the applicant. If the reason for revocation is not cured, or satisfactory excuse is not established to the reasonable satisfaction of the Board of Trustees, the permit shall be forthwith revoked, provided there is another good faith applicant willing and able to obtain a permit at that time. Risk of loss arising from revocation is to be borne solely by the permit holder. The issuance or allocation of permits shall not depend on the geographical location of proposed homes within the District.

For purposes of this subparagraph: a) "Good Faith" application means an application showing that the construction of the proposed dwelling will meet applicable District construction rules and regulations, and containing a sworn certificate that the applicant will begin construction, weather permitting, and will finish the construction in good faith. Final determination of excuses and good faith shall rest with the Board of Trustees of the District. b) "Applicant" means an individual, person, company, corporation, joint venture, or partnership, making an application. If any such person or entity making an application is part of a single affiliated group that is in business together with respect to building, buying, or selling

homes in the District, applications by such applicant and affiliated persons shall be considered as if from the same single applicant. c) "Single Family Residence" means a free standing permanent house designed for use by a single family, and does not include a mobile home, town home or apartment.

Any person who believes that his inability to obtain a permit has created an arbitrary or unreasonable hardship, or that the denial or revocation thereof has been arbitrary or unreasonable, may apply for a variance from the Pollution Control Board, pursuant to the Rules of the Board.

c) The District shall continue to utilize its alum feed treatment facilities, provided that sludge produced thereby can continue to be economically hauled to a solid waste disposal facility.

d) No connections to District treatment works of multi-family residential or of commercial structures or of other structures not expressly permitted to be connected under the terms hereof shall be made without a permit from the Agency, or, alternatively, a specific variance from this Board, during the term of the variance.

e) The District shall continue to meter flows from the individual villages it serves, and shall surcharge the villages for excess flows.

24. If the diversion of waste water from the District to the Village of Fox Lake is not completed by December 31, 1979, Respondents and Intervenors may seek an extension of the program contained herein by applying for a variance from the Pollution Control Board. Further, if the Village of Fox Lake or Lake County fails to proceed with construction of the sewage treatment plant or the interceptor sewers, or necessary funds are not available to construct the treatment

plant or the interceptor sewers or the regional project is abandoned for any reason, the terms and conditions of this settlement will become null and void; under such circumstances, Pollution Control Board Regulations shall be deemed effective, and Complainants will be in no way barred from seeking alternative methods of compliance, but Respondent and Intervenors shall not be bound or controlled by the stipulations in this Settlement Proposal.

25. Under the circumstances, the parties agree that the imposition of a penalty is not warranted in this case, the District having duly sought construction funds, having added alum treatment as recommended by the Agency, and a regional plan having been agreed to. The People of the State of Illinois and the Agency recommend that no penalty be imposed, and Respondent is not bound to accept any terms of settlement if a penalty is imposed.

26. This Stipulation and Proposal for Settlement is submitted to the Board for approval as one integral package. All admissions and statements made herein are for purposes of this case and settlement only, and are null and void if the settlement agreed to by the parties is not approved in all its respects by the Board without change or modification of any kind. The parties express to the Board appreciation



for its due concern for resolution of the important questions involved in this case, the resolution of which has involved the work of many persons, public agencies and concerned citizens; the parties submit this Proposal as being in the common interest of carefully planned resolution of the issue of sewage treatment disposal in northwest Lake County.

Respectfully Submitted  
and Agreed To:

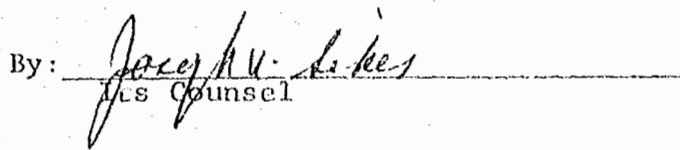
PEOPLE OF THE STATE OF ILLINOIS  
ex rel William J. Scott,  
Attorney General

By:   
Assistant Attorney General

ENVIRONMENTAL PROTECTION AGENCY

By:   
Authorized Representative

ROUND LAKE SANITARY DISTRICT

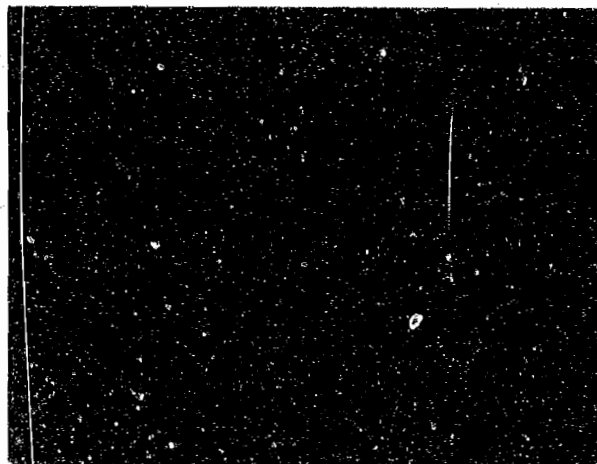
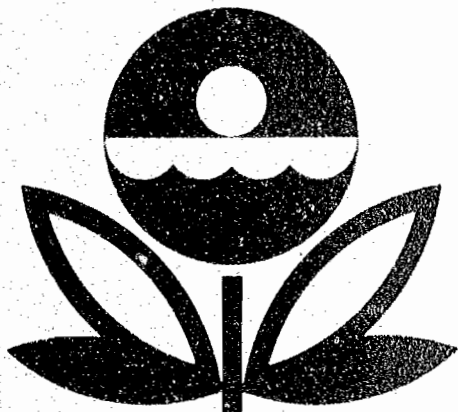
By:   
Its Counsel

ROUND LAKE AREA CONCERNED LANDOWNERS  
CITIZENS AND DEVELOPERS ASSOCIATION

By:   
Its Counsel

November 21, 1977

U.S. ENVIRONMENTAL PROTECTION AGENCY  
NATIONAL EUTROPHICATION SURVEY  
WORKING PAPER SERIES



CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON  
and  
ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA

People v. RLSN 10/15 75-33 : 75-65  
Exhibit No 2

REPORT  
ON  
LONG LAKE  
LAKE COUNTY  
ILLINOIS  
EPA REGION V  
WORKING PAPER No. 309

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
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## F O R E W O R D

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

### OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

### ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

- a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.
- b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.
- c. With such a transformation, an assessment of the potential for eutrophication control can be made.

### LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

#### ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Illinois Environmental Protection Agency for professional involvement and to the Illinois National Guard for conducting the tributary sampling phase of the Survey.

Dr. Richard H. Briceland, Director of the Illinois Environmental Protection Agency; and Ronald M. Barganz, State Survey Coordinator, and John J. Forneris, Manager of Region III, Field Operations Section of the Division of Water Pollution Control, provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

Major General Harold R. Patton, the Adjutant General of Illinois, and Project Officer Colonel Daniel L. Fane, who directed the volunteer efforts of the Illinois National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

## NATIONAL EUTROPHICATION SURVEY

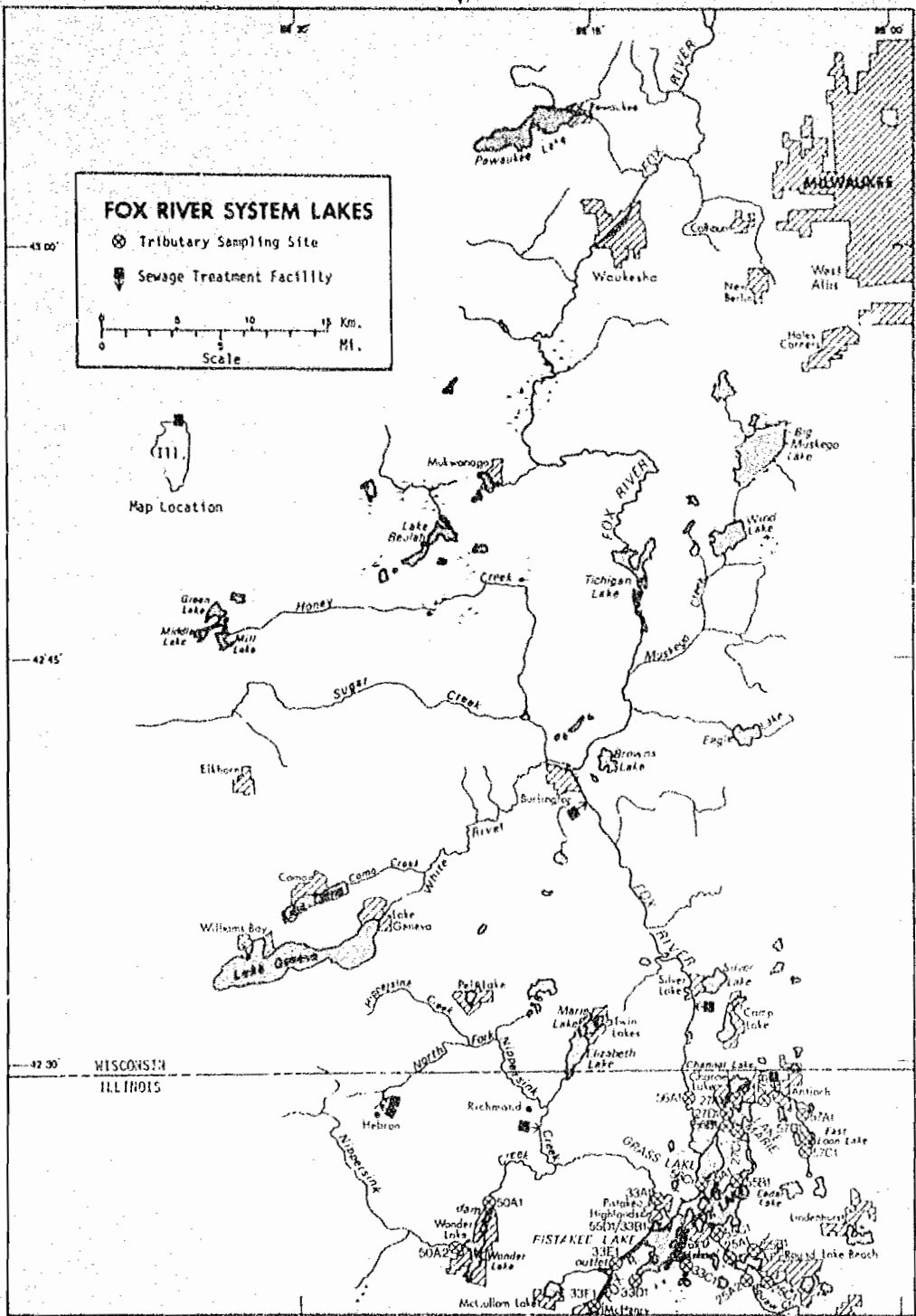
## STUDY LAKES

STATE OF ILLINOIS

<u>LAKE NAME</u>	<u>COUNTY</u>
Baldwin	Randolph
Bloomington	McLean
Carlyle	Bond, Clinton, Fayette
Cedar	Lake
Charleston	Coles
Coffeen	Montgomery
Crab Orchard	Jackson, Williamson
Decatur	Macon
DePue	Bureau
East Loon	Lake
Fox	Lake
Grass	Lake
Highland Silver	Madison
Holiday	LaSalle
Horseshoe	Madison
Long	Lake
Lou Yaeger	Montgomery
Marie	Lake
Old Ben Mine	Franklin
Pistakee	Lake, McHenry
Raccoon	Marion
Rend	Franklin, Jefferson
Sangchris	Christian
Shelbyville	Moultrie, Shelby
Slocum	Lake
Springfield	Sangamon
Storey	Knox
Vandalia	Fayette
Vermilion	Vermilion
Wee Ma Tuk	Fulton
Wonder	McHenry

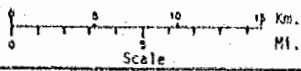






**FOX RIVER SYSTEM LAKES**

- ⊗ Tributary Sampling Site
- ⊠ Sewage Treatment Facility



43 00'

42 45'

42 30' WISCONSIN ILLINOIS

LONG LAKE  
STORET NO. 1725

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Long Lake is eutrophic. It ranked 29th when the 31 Illinois lakes sampled in 1973 were compared using a combination of six parameters\*. Twenty-eight of the lakes had less median total phosphorus, 29 had less median dissolved phosphorus, 17 had less median inorganic nitrogen, 21 had less mean chlorophyll a, and 18 had greater mean Secchi disc transparency.

Survey limnologists noted surface concentrations of blue-green algae in August, 1973.

B. Rate-Limiting Nutrient:

The algal assay results indicate that Long Lake was limited by nitrogen at the time the sample was taken (05/09/73). The lake data indicate nitrogen limitation in August and October as well.

C. Nutrient Controllability:

1. Point sources--The phosphorus contribution of known point sources accounted for 87.3% of the total load reaching Long Lake during the sampling year. The major portion of the

\* See Appendix A.

load, 81.5%, was contributed by the Round Lake Sanitary District wastewater treatment plant. The remainder came from the Village of Lake Villa, Fremont School, Camp Hickory, and industrial wastewater treatment facilities.

The present loading rate of 23.66 g/m<sup>2</sup>/yr is nearly 29 times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic rate (see page 13). For this reason, all phosphorus inputs to the lake should be minimized to the greatest practicable extent. Complete removal of phosphorus from the listed point source loads would reduce the loading rate to 3.03 g/m<sup>2</sup>/yr and should at least slow the present rate of eutrophication now occurring. The relatively short mean hydraulic retention time of 32 days would facilitate water quality improvement once phosphorus controls are initiated.

2. Non-point sources--The phosphorus contribution of non-point sources amounted to 12.7% of the total load to the lake. Squaw Creek contributed 6.6%, Eagle Creek contributed 2.5%, and Unnamed Creek C-1 contributed 2.3% of this total. Ungaged tributaries were estimated to have contributed 11.6%.

## II. LAKE AND DRAINAGE BASIN CHARACTERISTICS<sup>†</sup>

### A. Lake Morphometry<sup>††</sup>:

1. Surface area: 1.03 kilometers<sup>2</sup>.
2. Mean depth: 1.6 meters.
3. Maximum depth: >4.9 meters.
4. Volume:  $1.648 \times 10^6$  m<sup>3</sup>.
5. Mean hydraulic retention time: 32 days.

### B. Tributary and Outlet: (See Appendix C for flow data)

#### 1. Tributaries -

<u>Name</u>	<u>Drainage area (km<sup>2</sup>)*</u>	<u>Mean flow (m<sup>3</sup>/sec)*</u>
Squaw Creek	64.1	0.4
Eagle Creek	11.3	0.1
Unnamed Creek C-1	15.3	0.1
Minor tributaries & immediate drainage -	<u>8.0</u>	<u>&lt;0.1</u>
Totals	98.7	0.6

#### 2. Outlet -

Squaw Creek	99.7**	0.6
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### C. Precipitation\*\*\*:

1. Year of sampling: 112.2 centimeters.
2. Mean annual: 83.3 centimeters.

<sup>†</sup> Table of metric conversions--Appendix B.

<sup>††</sup> Forneris, 1973.

\* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".

\*\* Includes area of lake.

\*\*\* See Working Paper No. 175.

### III. LAKE WATER QUALITY SUMMARY

Long Lake was sampled three times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two stations on the lake and from a number of depths at each station (see map, page v). During each visit, a single depth-integrated (4.6 m or near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 4.9 meters at station 1 and 4.3 meters at station 2.

The lake sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR LONG LAKE  
STORET CODE 1725

PARAMETER	1ST SAMPLING ( 5/ 9/73)			2ND SAMPLING ( 8/ 7/73)			3RD SAMPLING (10/16/73)		
	2 SITES			2 SITES			2 SITES		
	RANGE	MEAN	MEDIAN	RANGE	MEAN	MEDIAN	RANGE	MEAN	MEDIAN
TEMP (C)	13.4 - 14.3	13.9	13.9	24.5 - 26.2	25.3	25.2	17.1 - 17.6	17.3	17.3
DISS OXY (MG/L)	6.8 - 9.4	8.4	8.2	6.2 - 10.0	6.1	8.2	6.8 - 9.0	8.0	8.2
CNDCTVY (MCROMO)	570. - 640.	587.	575.	614. - 624.	620.	620.	579. - 583.	581.	580.
PH (STAND UNITS)	8.1 - 8.8	8.3	8.1	8.6 - 9.0	8.9	8.9	8.5 - 8.6	8.5	8.5
TOT ALK (MG/L)	195. - 203.	199.	200.	203. - 284.	266.	276.	210. - 232.	222.	228.
TOT P (MG/L)	0.204 - 0.376	0.240	0.215	0.652 - 0.924	0.750	0.725	0.744 - 0.828	0.785	0.764
GRTHO P (MG/L)	0.116 - 0.129	0.122	0.122	0.392 - 0.494	0.434	0.421	0.441 - 0.474	0.454	0.450
NO2+NO3 (MG/L)	1.010 - 1.060	1.032	1.025	0.060 - 0.120	0.092	0.085	0.720 - 0.750	0.734	0.730
AMMONIA (MG/L)	0.160 - 0.220	0.180	0.179	0.080 - 0.250	0.142	0.105	0.440 - 0.660	0.560	0.590
KJEL N (MG/L)	0.900 - 1.200	1.017	0.950	1.800 - 2.800	2.217	2.100	2.200 - 2.900	2.640	2.700
INORG N (MG/L)	1.180 - 1.240	1.212	1.210	0.160 - 0.370	0.233	0.205	1.190 - 1.400	1.300	1.320
TOTAL N (MG/L)	1.910 - 2.250	2.049	1.995	1.860 - 2.920	2.308	2.205	2.950 - 3.640	3.374	3.430
CHLRPYL A (UG/L)	44.2 - 44.9	44.5	44.5	29.8 - 54.5	42.2	42.2	50.7 - 61.8	61.2	61.2
SECCHI (METERS)	0.5 - 0.5	0.5	0.5	0.3 - 0.3	0.5	0.5	0.3 - 0.3	0.3	0.3

## B. Biological characteristics:

## 1. Phytoplankton (incomplete at this time) -

<u>Sampling Date</u>	<u>Dominant Genera</u>	<u>Algal units per ml</u>
05/09/73	1. <u>Stephanodiscus sp.</u>	1,091
	2. <u>Cryptomonas sp.</u>	436
	3. <u>Melosira sp.</u>	236
	4. <u>Pediastrum sp.</u>	18
	5. <u>Synedra sp.</u>	18
	Other genera	1
	Total	1,800
08/07/73	1. <u>Microcystis sp.</u>	1,205
	2. <u>Aphanizomenon sp.</u>	585
	3. <u>Stephanodiscus sp.</u>	344
	4. <u>Cryptomonas sp.</u>	155
	5. Blue-green filaments	103
	Other genera	225
	Total	2,617
10/16/73	1. <u>Stephanodiscus sp.</u>	1,355
	2. <u>Aphanizomenon sp.</u>	214
	3. Flagellates	186
	4. Blue-green filaments	128
	5. <u>Cryptomonas sp.</u>	106
	Other genera	453
	Total	2,442

2. Chlorophyll a -

<u>Sampling Date</u>	<u>Station Number</u>	<u>Chlorophyll a (µg/l)</u>
05/09/73	01	44.2
	02	44.9
08/07/73	01	29.8
	02	54.6
10/16/73	01	60.7
	02	61.8

## C. Limiting Nutrient Study:

## 1. Autoclaved, filtered, and nutrient spiked -

<u>Spike (mg/l)</u>	<u>Ortho P Conc. (mg/l)</u>	<u>Inorganic N Conc. (mg/l)</u>	<u>Maximum yield (mg/l-dry wt.)</u>
Control	0.085	1.220	30.6
0.050 P	0.135	1.220	29.7
0.050 P + 1.0 N	0.135	2.220	41.7
1.0 N	0.085	2.220	39.6

## 2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Long Lake was high at the time the assay sample was collected. Also, a significant increase in yield when only nitrogen was added indicates that this lake was limited by nitrogen at that time. Note the lack of response when only orthophosphorus was added.

The lake data indicate Long Lake was limited by nitrogen at the other sampling times as well. The mean inorganic nitrogen/orthophosphorus ratios were less than 1/1 in August and 3/1 in October.



#### IV. NUTRIENT LOADINGS (See Appendix E for data)

For the determination of nutrient loadings, the Illinois National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff month of March when two samples were collected. Sampling was begun in June, 1973, and was completed in May, 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Illinois District Office of the U.S. Geological Survey for most of the tributary sites nearest the lake. However, flow estimates for Squaw and Eagle creeks were not included. Flow rates for these tributaries were determined by multiplying the runoff coefficient used by U.S.G.S., in  $\text{m}^3/\text{sec}/\text{km}^2$ , by the corresponding drainage areas of each creek planimetered by the Survey geographer.

In this report, nutrient loads for sampled tributaries were calculated using mean annual concentrations and mean annual flows. Nutrient loads shown are those measured minus point-source loads, if any. However, the nutrient loads measured at the Round Lake Sanitary District wastewater treatment facility exceeded the loads measured in Unnamed Creek C-1 and the background load for this stream and the unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the means of the nutrient loads, in  $\text{kg}/\text{km}^2/\text{yr}$ , at station A-1 of nearby Lake Pistakee

(see map, page vi) and multiplying the means by the C-1 and ZZ areas in km<sup>2</sup>.

The operators of the Village of Lake Villa, Round Lake Sanitary District, Travenol Labs, Inc., and Heppner Mfg. Company wastewater treatment plants provided monthly effluent samples and corresponding flow data. However, Camp Hickory and Fremont School did not participate in the sampling program. Nutrient loads for these sources were estimated at 1.134 kg P and 3.401 kg N/capita/year, and flows were estimated at 0.3785 m<sup>3</sup>/capita/day.

A. Waste Sources:

1. Known municipal -

<u>Name</u>	<u>Pop. Served</u>	<u>Treatment</u>	<u>Mean Flow (m<sup>3</sup>/d)</u>	<u>Receiving Water</u>
Village of Lake Villa*	1,200	stab. pond	378.5	Eagle Creek
Round Lake San. Dist.*	16,300	trickling filter	8,396.7	Unnamed Stream (C-1)
Camp Hickory**	140	Imhoff	53.0	ditch to Squaw Creek
Fremont Sch.**	500	act. sludge	189.2	drainage tile from Fremont Center/Squaw Creek

\* Treatment plant questionnaires.

\*\* Anonymous, 1972.

## 2. Known Industrial -

<u>Name</u>	<u>Product</u>	<u>Treatment</u>	<u>Mean Flow (m<sup>3</sup>/d)</u>	<u>Receiving Water</u>
Heppner Mfg.*	radio speakers	trickling filter	16.4	Squaw Creek
Travenol Labs, Inc.*	medical & bio. products	act. sludge + pond**	1,100.9	Unnamed trib. to Squaw Creek

\* Treatment plant questionnaires.

\*\* Effluent is pumped from the pond to a 3.5-acre evaporation field planted in rice grass. Effluent that does not evaporate runs back along the surface to the pond. The evaporation field has the capacity to evaporate 29 inches per year and is used at full capacity. Local rainfall is 33" per year. The pond spills into Squaw Creek only during overflow from storm runoff which goes into Lake Lure. The latter essentially is a 300-acre swamp one mile above Long Lake.

## B. Annual Total Phosphorus Loading - Average Year:

## 1. Inputs -

<u>Source</u>	<u>kg P/ yr</u>	<u>% of total</u>
a. Tributaries (non-point load) -		
Squaw Creek	1,610	6.6
Eagle Creek	615	2.5
Unnamed Creek C-1	565	2.3
b. Minor tributaries & immediate drainage (non-point load) -	295	1.2
c. Known municipal STP's -		
Round Lake San. District	19,860	81.5
Village of Lake Villa	600	2.5
Fremont School	565	2.3
Camp Hickory	160	0.7
d. Septic tanks* -	60	0.2
e. Known industrial -		
Travenol Labs, Inc.	?	-
Heppner Mfg.	20	0.1
f. Direct precipitation** -	<u>20</u>	<u>0.1</u>
Total	24,370	100.0

## 2. Outputs -

Lake outlet - Squaw Creek 9,195

## 3. Net annual P accumulation - 15,175 kg.

\* Estimate based on 205 lakeshore dwellings; see Working Paper No. 175.

\*\* See Working Paper No. 175.

## C. Annual Total Nitrogen Loading - Average Year:

## 1. Inputs -

<u>Source</u>	<u>kg N/ yr</u>	<u>% of total</u>
a. Tributaries (non-point load) -		
Squaw Creek	41,710	35.3
Eagle Creek	6,000	5.1
Unnamed Creek C-1	10,315	8.7
b. Minor tributaries & immediate drainage (non-point load) -	5,395	4.6
c. Known municipal STP's -		
Round Lake San. District	48,050	40.6
Village of Lake Villa	1,300	1.1
Fremont School	1,700	1.4
Camp Hickory	475	0.4
d. Septic tanks* -	2,185	1.9
e. Known industrial -		
Travenol Labs, Inc.	?	-
Heppner Mfg.	15	<0.1
f. Direct precipitation** -	<u>1,110</u>	<u>0.9</u>
Total	118,255	100.0

## 2. Outputs -

Lake outlet - Squaw Creek                      64,845

## 3. Net annual N accumulation - 53,410 kg.

\* Estimate based on 205 lakeshore dwellings; see Working Paper No. 175.  
 \*\* See Working Paper No. 175.

## D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

<u>Tributary</u>	<u>kg P/km<sup>2</sup>/yr</u>	<u>kg N/km<sup>2</sup>/yr</u>
Squaw Creek	25	651
Eagle Creek	54	531
Unnamed Creek C-1	37	674

## E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" rate is the rate at which the receiving water would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	<u>Total Phosphorus</u>		<u>Total Nitrogen</u>	
	<u>Total</u>	<u>Accumulated</u>	<u>Total</u>	<u>Accumulated</u>
grams/m <sup>2</sup> /yr	23.60	14.73	114.8	63.0

Vollenweider loading rates for phosphorus (g/m<sup>2</sup>/yr) based on mean depth and mean hydraulic retention time of Long Lake:

"Dangerous" (eutrophic rate)	0.82
"Permissible" (oligotrophic rate)	0.41

## V. LITERATURE REVIEWED

Anonymous, 1972. Wastewater treatment works data book. IL Env. Prot. Agency, Springfield.

Forneris, John J., 1973. Personal communication (lake morphometry). IL Env. Prot. Agency, Springfield.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS



## LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS OXYGEN P
1703	LAKE BLOOMINGTON	0.050	5.730	464.667	26.200	14.800	0.020
1706	LAKE CARLYLE	0.084	1.270	477.889	17.367	11.000	0.032
1708	LAKE CHARLESTON	0.160	4.680	490.667	12.000	8.400	0.085
1711	COFFEE LAKE	0.032	0.260	456.222	7.700	14.900	0.012
1712	CRAN ORCHARD LAKE	0.082	0.200	482.222	59.867	13.800	0.013
1714	LAKE DECATUR	0.129	3.750	479.571	43.600	14.500	0.062
1725	LONG LAKE	0.704	1.190	482.667	49.333	8.800	0.398
1726	LAKE LOU YAEGER	0.186	1.600	489.583	10.662	11.400	0.076
1727	LAKE MARIE	0.098	0.370	467.667	39.533	14.700	0.057
1733	PISTAKEE LAKE	0.203	0.370	485.667	75.867	7.000	0.062
1735	REND LAKE	0.071	0.210	471.500	23.533	12.700	0.012
1739	LAKE SHELBYVILLE	0.062	3.290	461.333	17.161	14.800	0.014
1740	SILVER LAKE (HIGHLAND)	0.226	0.970	489.500	5.822	14.800	0.057
1742	LAKE SPRINGFIELD	0.109	3.265	483.385	13.013	10.800	0.059
1748	VERMILION LAKE	0.109	4.695	481.500	31.159	14.200	0.050
1750	WONDER LAKE	0.426	0.890	486.000	98.533	7.800	0.132
1751	LAKE STORY	0.072	2.510	454.333	17.250	14.800	0.021
1752	DEPUE LAKE	0.438	4.050	490.000	58.833	7.600	0.276
1753	LAKE SANGCHIS	0.050	1.970	475.417	14.292	14.500	0.009
1754	LAKE HOLIDAY	0.167	3.135	485.167	51.217	7.200	0.046
1755	FOX LAKE	0.214	0.375	486.167	63.850	8.800	0.083
1756	GRASS LAKE	0.301	0.820	481.000	83.500	5.900	0.393
1757	EAST LOON LAKE	0.076	0.120	450.000	22.300	14.900	0.014
1758	SLOCUM LAKE	0.865	0.200	487.333	221.100	5.800	0.362
1759	CEDAR LAKE	0.029	0.170	400.333	4.767	12.800	0.013
1761	LAKE WEMATUK	0.069	1.770	466.333	7.967	14.500	0.031
1762	RACCOON LAKE	0.106	0.310	484.333	19.217	13.800	0.020
1763	BALDWIN LAKE	0.044	0.140	461.167	11.333	13.700	0.007

## LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P
1764	LAKE VANDALIA	0.116	0.480	478.111	11.278	14.800	0.023
1765	OLD BEN MINE RESERVOIR	0.930	0.205	478.333	31.433	11.200	0.575
1766	HORSESHOE LAKE	0.127	0.705	482.833	182.250	6.800	0.018

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
1703	LAKE BLOOMINGTON	88 ( 26)	0 ( 0)	80 ( 24)	47 ( 14)	13 ( 2)	68 ( 20)	296
1706	LAKE CARLYLE	63 ( 19)	40 ( 12)	63 ( 19)	63 ( 19)	63 ( 19)	53 ( 16)	345
1708	LAKE CHARLESTON	37 ( 11)	7 ( 2)	0 ( 0)	77 ( 23)	77 ( 23)	27 ( 8)	225
1711	COFFEEN LAKE	97 ( 29)	77 ( 23)	93 ( 28)	93 ( 28)	2 ( 0)	92 ( 27)	454
1712	CRAB ORCHARD LAKE	67 ( 20)	90 ( 27)	43 ( 13)	20 ( 6)	42 ( 12)	85 ( 25)	347
1714	LAKE DECATUR	40 ( 12)	13 ( 4)	53 ( 16)	33 ( 10)	30 ( 8)	32 ( 9)	201
1725	LONG LAKE	7 ( 2)	43 ( 13)	40 ( 12)	30 ( 9)	72 ( 21)	3 ( 1)	195
1726	LAKE LOU YAEGER	30 ( 9)	37 ( 11)	7 ( 2)	87 ( 26)	57 ( 17)	23 ( 7)	241
1727	LAKE MARIE	60 ( 18)	68 ( 20)	73 ( 22)	37 ( 11)	23 ( 7)	42 ( 12)	303
1733	PISTAKEE LAKE	27 ( 8)	68 ( 20)	23 ( 7)	13 ( 4)	90 ( 27)	32 ( 9)	253
1735	REND LAKE	77 ( 23)	80 ( 24)	70 ( 21)	50 ( 15)	53 ( 16)	92 ( 27)	422
1739	LAKE SHELBYVILLE	93 ( 28)	17 ( 5)	83 ( 25)	70 ( 21)	13 ( 2)	73 ( 22)	339
1740	SILVER LAKE (HIGHLAND)	20 ( 6)	47 ( 14)	10 ( 3)	97 ( 29)	13 ( 2)	42 ( 12)	224
1742	LAKE SPRINGFIELD	53 ( 16)	20 ( 6)	33 ( 10)	73 ( 22)	67 ( 20)	37 ( 11)	283
1748	VERMILION LAKE	59 ( 18)	3 ( 1)	47 ( 14)	43 ( 13)	37 ( 11)	47 ( 14)	227
1750	WONDER LAKE	13 ( 4)	50 ( 15)	20 ( 6)	7 ( 2)	80 ( 24)	13 ( 4)	103
1751	LAKE STORY	73 ( 22)	27 ( 8)	90 ( 27)	67 ( 20)	13 ( 2)	63 ( 19)	333
1752	DEPUE LAKE	10 ( 3)	10 ( 3)	3 ( 1)	23 ( 7)	83 ( 25)	10 ( 3)	109
1753	LAKE SANGCHRIS	88 ( 26)	30 ( 9)	67 ( 20)	57 ( 17)	30 ( 8)	97 ( 29)	369
1754	LAKE HOLIDAY	33 ( 10)	23 ( 7)	27 ( 8)	27 ( 8)	87 ( 26)	50 ( 15)	247
1755	FOX LAKE	23 ( 7)	63 ( 19)	17 ( 5)	17 ( 5)	72 ( 21)	20 ( 6)	212
1756	GRASS LAKE	17 ( 5)	53 ( 16)	50 ( 15)	10 ( 3)	97 ( 29)	17 ( 5)	244
1757	EAST LOON LAKE	70 ( 21)	100 ( 30)	97 ( 29)	53 ( 16)	2 ( 0)	77 ( 23)	349
1758	SLOCUM LAKE	3 ( 1)	87 ( 26)	13 ( 4)	0 ( 0)	100 ( 30)	7 ( 2)	210
1759	CEDAR LAKE	100 ( 30)	93 ( 28)	100 ( 30)	100 ( 30)	50 ( 15)	85 ( 25)	528
1761	LAKE WEMATUK	80 ( 24)	33 ( 10)	77 ( 23)	40 ( 12)	30 ( 8)	57 ( 17)	367
1762	RACCOON LAKE	57 ( 17)	73 ( 22)	30 ( 9)	60 ( 18)	42 ( 12)	68 ( 20)	330
1763	BALDWIN LAKE	93 ( 28)	97 ( 29)	87 ( 26)	80 ( 24)	47 ( 14)	100 ( 30)	504

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P	INDEX NO
1764	LAKE VANDALIA	47 ( 14)	60 ( 18)	60 ( 18)	83 ( 25)	13 ( 2)	60 ( 18)	323
1765	OLD BEN MINE RESERVOIR	0 ( 0)	83 ( 25)	57 ( 17)	40 ( 12)	60 ( 18)	0 ( 0)	240
1766	HORSESHOE LAKE	43 ( 13)	57 ( 17)	37 ( 11)	3 ( 1)	93 ( 28)	80 ( 24)	313

## LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	1759	CEDAR LAKE	528
2	1763	BALDWIN LAKE	504
3	1711	COFFEEN LAKE	454
4	1735	REND LAKE	422
5	1757	EAST LOON LAKE	399
6	1753	LAKE SANGCHRIS	369
7	1761	LAKE WEMATUK	367
8	1712	CRAB ORCHARD LAKE	347
9	1706	LAKE CARLYLE	345
10	1739	LAKE SHELBYVILLE	339
11	1751	LAKE STORY	333
12	1762	RACCOON LAKE	330
13	1764	LAKE VANDALIA	323
14	1766	HORSESHOE LAKE	313
15	1727	LAKE MARIE	303
16	1703	LAKE BLOOMINGTON	296
17	1742	LAKE SPRINGFIELD	283
18	1733	PISTAKEE LAKE	253
19	1754	LAKE HOLIDAY	247
20	1756	GRASS LAKE	244
21	1726	LAKE LOU YAEGER	241
22	1765	OLD BEN MINE RESERVOIR	240
23	1749	SILVER LAKE (HIGHLAND)	229
24	1748	VERMILION LAKE	227
25	1768	LAKE CHARLESTON	225
26	1755	FOX LAKE	212
27	1758	SLOCUM LAKE	210
28	1714	LAKE DECATUR	201

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
29	1725	LONG LAKE	195
30	1750	WONDER LAKE	183
31	1752	DEPUE LAKE	139

APPENDIX B

CONVERSIONS FACTORS

## CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x  $8.107 \times 10^{-4}$  = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile



APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR ILLINOIS

10/23/75

LAKE CODE 1725 LONG LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 99.7

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS)										MEAN		
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT		NOV	DEC
1725A1	99.7	0.65	0.98	1.21	1.24	0.98	0.82	0.49	0.26	0.18	0.19	0.27	0.34	0.63
1725C1	21.0	0.13	0.21	0.25	0.26	0.20	0.17	0.10	0.05	0.03	0.04	0.06	0.07	0.13
1725ZZ	79.3	0.52	0.77	0.95	0.99	0.78	0.65	0.39	0.20	0.14	0.16	0.23	0.28	0.50

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 99.7  
 SUM OF SUB-DRAINAGE AREAS = 100.2

TOTAL FLOW IN = 7.62  
 TOTAL FLOW OUT = 7.63

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW	
1725A1	6	73	2.01	3	2.29					
	7	73	0.74	7	2.04					
	8	73	0.31	4	0.24					
	9	73	0.11	8	0.04					
	10	73	0.20	13	0.71					
	11	73	0.93	3	1.05					
	12	73	2.15	2	0.65					
	1	74	2.27	5	0.62					
	2	74	1.47	3	1.64	23	2.12			
	3	74	1.53	9	1.98	16	1.59			
	4	74	1.59	7	1.36					
	5	74	2.12	18	3.96					
	1725C1	6	73	0.42	3	0.48				
		7	73	0.15	7	0.42				
		8	73	0.06	4	0.85				
9		73	0.02	8	0.01					
10		73	0.04	13	0.13					
11		73	0.18	3	0.20					
12		73	0.42	2	0.13					
1		74	0.45	5	0.13					
2		74	0.45	3	0.51	23	0.65			
3		74	0.45	9	0.59	16	0.45			
4		74	0.45	7	0.40					
5		74	0.65	18	1.19					
1725ZZ	6	73	1.59	3	1.81					
	7	73	0.57	7	1.61					
	8	73	0.25	4	0.19					
	9	73	0.09	8	0.03					
	10	73	0.17	13	0.57					
	11	73	0.76	3	0.85					
	12	73	1.73	2	0.51					
	1	74	1.81	5	0.51					
	2	74	1.02	3	1.13	23	1.47			
	4	74	1.13	7	0.96					
5	74	1.47	18	2.78						

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 75/10/23

172501  
42 22 33.0 088 00 10.0  
LONG LAKE  
17097 ILLINOIS

11EPALES  
3

2111202  
0020 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DTS CRTHO MG/L P
73/05/09	11 50	0000	13.8		18	598	8.20	196	0.190	1.200	1.050	0.122
	11 50	0004	13.8	8.4		570	8.10	195	0.160	1.000	1.060	0.116
	11 50	0016	13.4	6.8		640	8.80	197	0.220	1.200	1.020	0.129
73/08/07	14 45	0000	25.2		30	617	8.90	203	0.100	1.800	0.060	0.444
	14 45	0005	25.2	8.0		618	8.90	280	0.100	1.900	0.080	0.482
	14 45	0011	24.5	6.2		514	8.60	284	0.210	1.900	0.090	0.499
73/10/16	12 25	0000	17.6		12	580						
	12 25	0005	17.6	7.6		580	8.50	210	0.590	2.700	0.730	0.441
	12 25	0012	17.6	6.8		580	8.50	210	0.590	2.700	0.730	0.441

DATE FROM TO	TIME OF DAY	DEPTH FEET	00655 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/09	11 50	0000	0.214	44.2
	11 50	0004	0.204	
	11 50	0016	0.376	
73/08/07	14 45	0000	0.670	29.8
	14 45	0005	0.704	
	14 45	0011	0.652	
73/10/16	12 25	0000		60.7
	12 25	0005	0.828	
	12 25	0012	0.828	

STORET RETRIEVAL DATE 75/10/23

172502  
42 22 37.0 088 07 10.0  
LONG LAKE  
17097 ILLINOIS

11EPALES  
3 2111202  
0018 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER YEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00610 NH3-N TOTAL MG/L	00625 TGT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00571 PHOS-DIS ORTHO MG/L P
73/05/09	12 15	0000	14.3		20	580	8.30	202	0.170	0.900	1.020	0.124
	12 15	0004	14.2	9.2		570	8.10	202	0.170	0.900	1.010	0.121
	12 15	0014	14.1	9.4		570	8.10	203	0.170	0.900	1.030	0.122
73/08/07	15 00	0000	26.2		12	623	9.00	270	0.080	2.600	0.080	0.398
	15 00	0005	26.0	10.0		622	9.00	272	0.110	2.800	0.120	0.396
	15 00	0014	25.0	8.4		624	8.90	284	0.250	2.300	0.120	0.392
73/10/16	12 05	0000	17.1		12	583	8.60	230	0.440	2.200	0.750	0.474
	12 05	0005	17.1	9.0		581	8.50	232	0.550	2.700	0.720	0.450
	12 05	0011	17.1	8.8		579		228	0.660	2.900	0.740	0.464

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/09	12 15	0000	0.216	44.9
	12 15	0004	0.208	
	12 15	0014	0.221	
73/08/07	15 00	0000	0.924	54.6
	15 00	0005	0.746	
	15 00	0014	0.804	
73/10/16	12 05	0000	0.762	61.8
	12 05	0005	0.764	
	12 05	0011	0.744	

APPENDIX E

TRIBUTARY and WASTEWATER  
TREATMENT PLANT DATA

STORET RETRIEVAL DATE 75/10/23

1725A1  
42 22 40.0 088 08 22.0  
SQUAW CREEK  
17115 7.5 FOX LAKE  
O/LONG LAKE  
WILSON RD BRDG AT SW EDGE OF INGLESIDE  
11EPALES 2111204  
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-OIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	11 30		0.910	3.300	0.105	0.168	0.220
73/07/07	09 25		0.370	2.800	0.044	0.310	0.430
73/08/04	09 55		0.310	2.700	0.032	0.560	0.680
73/09/08	12 30		0.260	1.600	0.054	0.700	0.855
73/10/13	09 40		0.680	2.500	0.520	0.510	0.660
73/11/03	10 10		0.710	2.100	0.470	0.490	0.700
73/12/02	10 00		0.890	2.000	0.370	0.490	0.610
74/01/05	13 20		2.100	1.600	0.400	0.360	0.400
74/02/03	11 00		2.400	1.400	0.260	0.165	0.250
74/03/09	10 25		1.600	1.500	0.330	0.210	0.345
74/03/16	09 35		1.500	5.200	0.735	0.345	0.460
74/04/07	11 45		1.600	1.700	0.490	0.290	0.400
74/05/18	08 00		1.120	1.700	0.170	0.171	0.300

STORET RETRIEVAL DATE 75/10/23

1725A2  
42 22 00.0 088 07 37.0  
SQUAW CREEK  
17 7.5 WAUCONDA  
O/LONG LAKE  
ST RT 134 BRDG AT S EDGE OF LONG LAKE  
11EPALES 2111204  
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	11 15		0.920	3.300	0.130	0.064	0.240
73/07/07	09 15		0.550	4.000	0.350	0.105	0.270
73/08/04	09 45		0.118	4.400	0.075	0.093	0.290
73/09/08	12 20		0.300	2.600	0.147	0.140	0.310
73/10/13	09 30		0.820	2.100	0.150	0.066	0.195
73/11/03	10 05		1.580	1.700	0.132	0.052	0.200
73/12/02	09 45		1.700	1.300	0.072	0.026	0.065
74/01/05	13 55		2.200	0.900	0.200	0.028	0.055
74/02/03	11 45		3.300	1.200	0.080	0.035	0.095
74/03/09	10 15		1.920	1.300	0.070	0.040	0.190
74/03/16	09 30		1.200	1.100	0.090	0.030	0.080
74/04/07	11 25		1.600	1.200	0.075	0.035	0.155
74/05/18	07 45		2.100	1.825	0.070	0.050	0.255



STORET RETRIEVAL DATE 75/10/23

172581  
42 23 00.0 088 07 22.0  
EAGLE CREEK  
17 7.5 ANTIOCH  
O/LONG LAKE  
ROLLINS RD BRDG NW EDGE ROUND LK BEACH  
11EPALES 2111204  
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	11 45		0.154	1.280	0.072	0.500	0.590
73/07/07	09 30		0.210	4.200	0.105	0.730	1.050
73/08/04	10 05		0.021	4.400	0.105	0.500	0.620
73/09/08	12 40		0.015	2.200	0.024	0.860	1.100
73/10/13	09 45		0.160	1.730	0.088	0.189	0.280
73/11/03	10 20		0.300	1.350	0.071	0.075	0.250
73/12/02	10 15		0.660	1.400	0.050	0.096	0.145
74/01/05	13 05		0.630	1.700	0.780	0.100	0.175
74/02/03	10 30		1.700	0.900	0.160	0.110	0.150
74/03/09	10 40		0.460	0.900	0.030	0.075	0.155
74/03/16	09 45		0.250	2.100	0.113	0.050	0.095
74/04/07	11 55		0.245	1.300	0.075	0.080	0.130
74/05/18	08 20		0.490	1.300	0.065	0.127	0.270

STORET RETRIEVAL DATE 75/10/23

1725C1  
42 21 55.0 088 06 40.0  
UNNAMED STREAM  
17 7.5 GRAYS LAKE  
0/LONG LAKE  
GRUB HILL RD BRDG SW EDGE ROUND LK BEACH  
11EPALES 2111204  
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	11 00		0.610	5.500	1.900	1.020	1.350
73/07/07	09 05		0.580	17.800	13.200	6.600	7.100
73/08/04	09 30		0.220	22.000	17.000	4.100	10.500
73/09/08	12 10			19.000	15.200		9.000
73/10/13	09 20		0.460	7.800	3.600	2.000	2.630
73/11/03	09 50		0.500	11.500	8.200	3.900	4.720
73/12/02	09 30		0.440	4.800	1.920	1.500	1.720
74/01/05	14 20		0.810	5.500	2.520	1.200	1.800
74/02/03	12 10		1.700	2.400	0.550	0.350	0.580
74/03/09	10 00		0.970	3.400	0.760	0.490	0.900
74/03/16	09 20		0.740	4.600	1.650	0.970	1.200
74/04/07	11 00		0.680	5.000	2.200	1.200	1.800
74/05/18	07 00		0.770	2.600	0.680	0.375	0.660

STORET RETRIEVAL DATE 75/10/23

17258A IP17258A P001200  
 42 24 36.0 088 05 09.0  
 VILLAGE OF LAKE VILLA  
 17115 7.5 ANTIOCH  
 T/LONG LAKE  
 EAGLE CREEK  
 11EPALES  
 4  
 2141204  
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/07/16	13 30		1.000	8.800	0.230	2.900	3.800	0.100	0.100
	14 30		0.340	8.300	0.100	2.800	3.700	0.100	0.100
73/08/23	11 00								
CP(T)-			0.570	10.000	0.280	2.480	2.700	0.090	0.100
73/08/23	15 35								
73/09/20	11 05								
CP(T)-			0.850	5.300	0.240	3.150	3.800	0.100	0.100
73/09/20	16 00								
73/10/15	10 00								
CP(T)-			1.060	14.000	0.130	4.100	7.400	0.100	0.100
73/10/15	15 00								
73/11/29	08 00								
CP(T)-			0.340	12.000	0.270	5.900	7.300	0.120	0.100
73/11/29	15 30								
74/02/27	08 00		0.760	6.700	0.084	2.700	3.225	0.110	0.100
74/03/30	08 00								
CP(T)-			0.080	6.300	0.050K	1.850	4.200	0.090	0.100
74/03/30	16 30								
74/04/28	09 00								
CP(T)-			0.440	7.500	0.130	1.480	2.600	0.110	0.100
74/04/28	15 30								

K VALUE KNOWN TO BE  
 LESS THAN INDICATED

STORET RETRIEVAL DATE 75/10/23

1725CA                      TF1725CA                      P016300  
42 22 05.0 088 05 59.0  
ROUND LAKE SANITARY DISTRICT  
17                      7.5 GRAYSLAKE  
T/LONG LAKE  
UNNAMED  
11EPALES                      2141204  
4                                      0000 FEET      DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS URTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/09/10	10 00		0.950	22.000	7.250	3.400	10.000	1.900	1.800
73/10/24	09 30		0.600	16.000	0.440	5.000	6.400	2.200	2.000
73/11/15	08 30		0.960	18.000	3.990	6.500	7.400	2.400	2.200
73/12/12	10 15		1.400	9.400	0.110	2.520	3.900	3.000	2.500
74/01/21	15 00		0.080	16.000	4.200	5.520	7.700	6.000	3.500
74/03/08	10 00		1.200	6.600	0.050K	1.700	2.600	2.500	2.000
74/05/15	13 45		0.720	13.000	1.150	3.900	5.600	3.000	1.600
74/05/22	11 00		1.000	7.700	0.130	1.950	3.300	3.000	2.000
74/06/21	10 30		0.600	13.000	0.370	3.800	5.100	2.400	2.000
74/07/25	09 00		0.040	21.000	6.800	8.000	9.500	2.500	2.500
74/11/13	10 00		0.160	27.000	11.000	9.250	10.500	2.300	2.300

K VALUE KNOWN TO BE  
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/10/23

1725CB AS1725CB P001500\*  
 42 21 11.0 088 05 35.0  
 TRAVENOL LABS INC. (ROUND LAKE)  
 17 7.5 GRAY'S LAKE  
 T/LONG LAKE  
 UNNAMED / SQUAW CREEK  
 11EPALES 2141204  
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/09/29	11 00		0.390	1.300	0.500	1.400	1.500	0.534	0.402
73/11/02	08 30		0.140	4.900	0.190	2.000	2.250	0.240	0.133
73/12/03	10 30		0.390	4.500	0.096	1.680	2.000	0.255	0.264
74/01/02	11 30		0.240	5.800	0.040K	2.400	2.800	0.248	0.255
74/02/05	11 00		0.120	3.800	0.100	2.310	2.600	0.271	0.280
74/03/04	10 30		0.120	3.300	0.050K	1.650	2.100	0.253	0.236
74/04/04	11 30		0.640	2.600	0.480	1.650	1.950	0.281	0.287
74/06/05	11 00		0.080	3.200	0.050K	1.550	1.550	0.352	0.364
74/07/09	11 15		0.120	4.000	0.057	1.600	1.650	0.288	0.288
74/08/05	09 30		0.120	2.600	0.058	8.600	8.700	0.310	0.320
74/09/09	09 15		0.120	2.200	0.050K	4.250	4.800	0.360	0.370

K VALUE KNOWN TO BE  
 LESS THAN INDICATED

STORET RETRIEVAL DATE 75/10/23

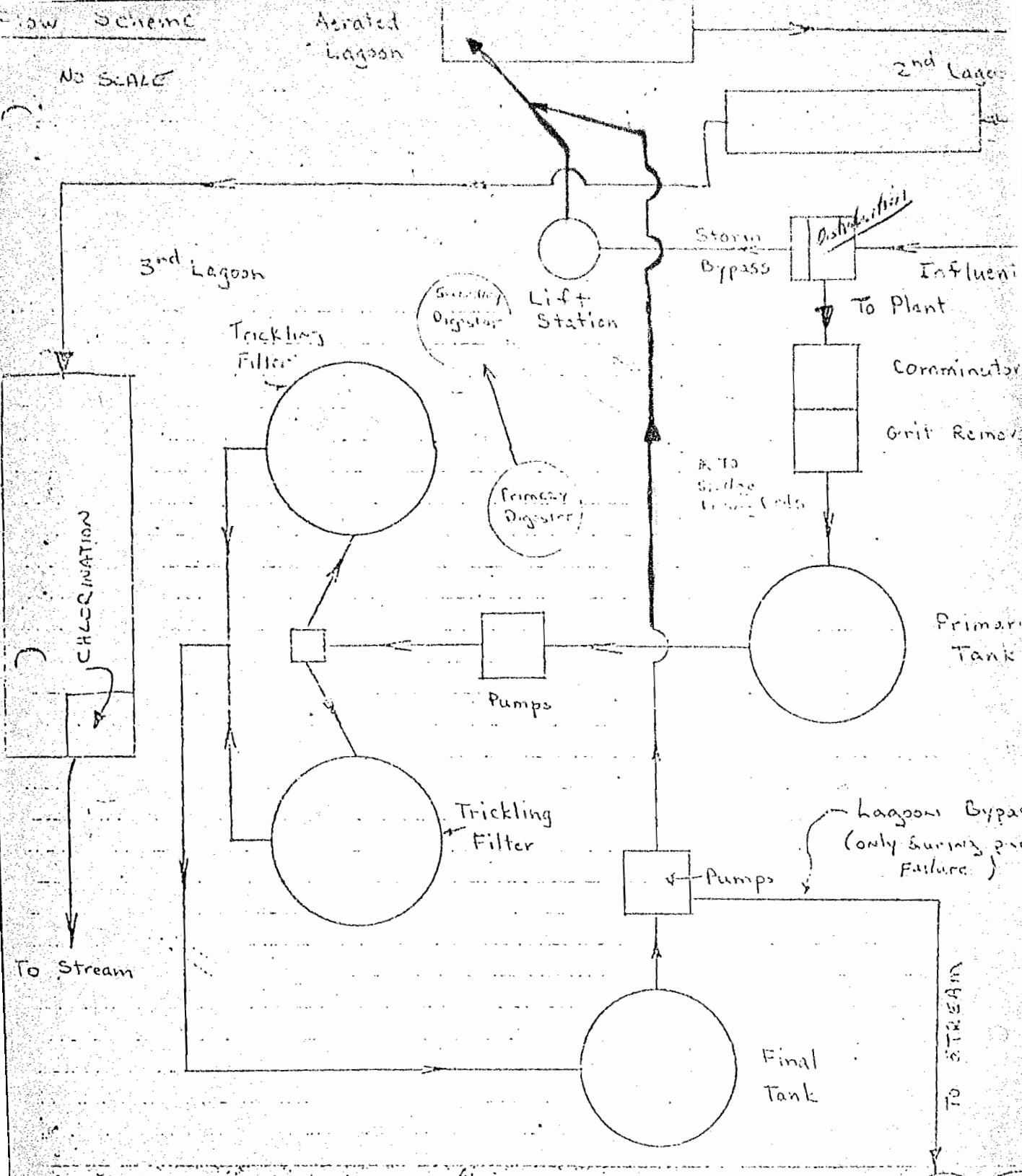
17250A SF1725DA P000035\*  
 42 20 18.0 088 05 16.0  
 HEPPNER MFG CO. ROUND LAKE  
 17 7.5 GRAYSVILLE  
 T/LONG LAKE  
 DITCH/SQUAW CREEK  
 11EPALES 2141204  
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/09/28	07	00	1.150	0.500	0.490	1.000	2.000	0.005	0.004
73/11/08	09	00	1.800	0.500K	0.028	1.890	3.750	0.005	0.004
73/12/17	08	30	0.580	2.950	0.074	1.890	3.150	0.004	0.005
74/01/09	08	30	0.640	0.500K	0.040K	1.480	2.100	0.005	0.005
74/02/04	07	30	0.760	9.000	0.040K	2.880	3.900	0.004	0.005
74/04/12	08	30	0.560	2.700	0.050K	6.400	7.900	0.004	0.005
	13	15	0.440	1.000K	0.050K	3.400	3.780	0.004	0.005
74/05/09	10	30	0.400	3.100	0.094	5.500	6.600	0.004	0.004
74/06/16	08	30	0.800	2.200	0.260	4.700	5.300	0.003	0.004
74/07/23	08	30	0.200	1.000K	0.050K	0.220	0.473	0.004	0.004
74/08/20	08	30	3.100	0.600	0.050K	3.100	3.530	0.004	0.004
74/09/09	09	00	0.400	1.000K	0.240	0.200	0.280	0.005	0.004

K VALUE KNOWN TO BE  
 LESS THAN INDICATED

Flow Scheme

NO SCALE



- People v. RLSD PCB 7533 UNPAVED CREEK, sometimes referred to as RAINBOW LAKE CREEK  
 Exhibit No. 1 75-65 OR N. BRANCH OF SAGE CREEK

PROOF OF SERVICE

I, Carolyn D. Buckner, having been sworn and under oath do state that I have this 19th day of December, 1977 served the foregoing Notice and Stipulation and Proposal for Settlement upon the persons to whom said Notice is directed by posting same in envelopes addressed to said persons, and depositing with the U.S. Postal Service at 160 North LaSalle Street, Chicago, Illinois 60301.

Carolyn D. Buckner

Subscribed and sworn to  
before me this 19th day  
of December, 1977.

Mary G. Dykstra  
Notary Public