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Inventory of Great Lakes Monitoring and Surveillance Activities under the Great Lakes International Surveillance Plan (GLISP). 1986

Great Lakes Water Quality Board. Surveillance Work Group

1986 INVENTORY OF
GREAT LAKES MONITORING AND SURVEILLANCE ACTIVITIES
UNDER THE
GREAT LAKES INTERNATIONAL SURVEILLANCE PLAN (GLISP)

PREPARED BY THE
LAKE AND CONNECTING CHANNELS TASK FORCES
OF THE
SURVEILLANCE WORK GROUP
UNDER THE AUSPICES OF
THE GREAT LAKES WATER QUALITY BOARD

GREAT LAKES REGIONAL OFFICE
INTERNATIONAL JOINT COMMISSION
WINDSOR, ONTARIO
AUGUST, 1986

PREFACE

The following document includes the annual reports of the Surveillance Work Group (SWG) task forces for each of the lakes and connecting channels as required by the Great Lakes International Surveillance Plan (GLISP). The objective of these reports is to inventory the work conducted by agencies of the Parties for the preceding field year and the planned work for the upcoming field year; and to compare the activities with GLISP requirements.

It is intended that this will assist the SWG in assessing the performance of the Parties in meeting the Agreement requirements on surveillance and monitoring and permit reporting to the Parties through the IJC process.

This is the second of an ongoing series of such reports which will normally be published prior to the upcoming field season. In this report it will be noted that there is no inventory for the Upper Connecting Channels, this is a result of the separate effort through a binational study.

Inquiries concerning this document can be sent to Martin P. Bratzel, Jr., Secretary, Water Quality Board and John E. Gannon, Secretary, Surveillance Work Group to:

Great Lakes Regional Office
International Joint Commission
100 Ouellette Avenue, 8th Floor
Windsor, Ontario, Canada N9A 6T3
Telephone (519) 256-7821 (Canada)
or (313) 226-2170 (United States)

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1.0 LAKE SUPERIOR

1.1 INTRODUCTION

The Lake Superior Task Force has not as yet completed the development of a detailed annual surveillance plan. It was decided that the Task Force should first complete the 1983 Intensive Surveillance Report. Based on this examination, a scientifically defensible annual surveillance plan would then be prepared, which would represent the minimum program requirements that are both necessary and sufficient to fulfill the terms of the 1978 Great Lakes Water Quality Agreement.

At present, the Task Force is in the final stages of preparing the 1983 Intensive Surveillance Report. It is also attempting to simultaneously prepare portions of the Annual Surveillance Plan for Lake Superior.

In order to conform to the needs of the Surveillance Work Group, and to provide the Water Quality Board with a surveillance inventory, the Lake Superior Task Force will present a description of agency activities completed in 1985 and proposed for 1986. It is imperative that the Board realize that none of the agencies were obligated to adhere to any Plan in the intervening years; however, once a detailed annual surveillance plan has been approved by the Board, an accurate annual inventory of surveillance and monitoring activities will be provided by this Task Force.

1.2 1985 SURVEILLANCE AND MONITORING ACTIVITIES COMPLETED

Atmosphere

According to the Upper Lakes Reference Group Report of 1976, the atmosphere may represent a major source of many inorganic and possibly organic contaminants to Lake Superior. This has been further demonstrated by various research studies. It is, therefore, imperative that an adequate and reliable network for monitoring all contaminants of concern to the lake be established and maintained.

Seven United States sites provided weekly information on nutrients and some metals.

Four Canadian sites were monitored for conventional parameters on a monthly basis with one of the four stations sampled on a bi-weekly basis for organic contaminants.

Tributaries

Water

Four Ontario rivers were event monitored for total phosphorus and 10 Ontario rivers were sampled monthly for a variety of parameters.

Michigan took monthly samples from the Ontonagon River which were analyzed for a variety of conventional pollutants and metals.

Wisconsin event monitored the Bad and Nemadji Rivers, and Bois Brule and Montreal Rivers were sampled monthly.

Minnesota monitored the St. Louis River, Beaver and Whiteface Rivers monthly (except for November, December and February) for a variety of nutrients and conventional parameters.

Sediment

No work done.

Biota

Some measurements on resident adult fish by Wisconsin and Minnesota.

Point Sources

Water

All active point sources in Ontario were sampled in 1985.

Open Lake

Water

Based on a comparison of the 1973/1983 open lake water chemistry a single cruise was deemed appropriate in 1985. Samples were taken at 1 meter from 60 stations and analyzed for nutrients and conventional pollutants and for metals at 20 stations.

Sediments

No work done - research activity.

Biota

United States and Canadian collections (at one site only, Thunder Bay, ' analysis completed) of lake trout and rainbow smelt were made. No collections of benthos or plankton were made. Herring gull egg collections were made as usual.

Nearshore

Biota

Young-of-the-year spottail shiners were collected at four Ontario sites, two Wisconsin sites and one Michigan site.

Resident species and sportfish were collected at a number of sites by both Canadian and United States agencies.

Sediments

No work done.

Water

Ontario sampled the two water intakes at Thunder Bay and Terrance Bay.

Areas of Concern

Some additional work performed in the Kaministikwia River (Thunder Bay).

1.3 1986 SURVEILLANCE AND MONITORING ACTIVITIES PLANNED

Atmosphere

United States sites (equipped with bulk precipitation samplers) will provide information on nutrients and some metals.

Four Canadian sites will be monitored monthly for conventional parameters with one site to provide bi-weekly data on organic contaminants.

At present, the U.S. GLAD and Canadian networks are being reviewed with respect to parameters, sampler types and location. Both agencies are jointly participating in this review activity. Specific recommendations for the measurement and assessment of the atmospheric deposition to the Great Lakes will be made for parameter lists and the following types of input; wet deposition, dry deposition, particulate and vapour exchange. In addition, the interface between the United States and Canadian networks will be addressed through an agreement between U.S. EPA and Environment Canada. Moreover, the Water Quality Board, Science Advisory Board, and the Air Quality Board are sponsoring an Atmospheric Workshop this fall and the Surveillance Work Group has responsibility over a newly created Atmospheric Task Force. It would seem that the Lake & Connecting Channel Task Force can expect some major recommendations in the near future regarding atmospheric monitoring.

Tributaries

Water

Four Ontario rivers will be event monitored for total phosphorus and 10 rivers will be sampled monthly for a variety of parameters.

Michigan will sample the Ontonagon River monthly for a variety of conventional parameters and trace metals.

Minnesota will sample the St. Louis, Beaver and Whiteface Rivers monthly for a variety of nutrients and conventional parameters.

Sediments

No work anticipated.

Biota

Based on results from the U.S. EPA dioxin study, several potential sources will be investigated. As part of the ongoing fish monitoring program, lake trout and coho salmon fillets will be sampled and analyzed for PCBs and mercury. These samples will come from near Beaver Bay, Two Harbors, French River and Grand Marion. Whole fish will be analyzed for a variety of parameters from Burlington Bay (white sucker) and Knife River (brook trout).

Point Sources

Water

All active point sources in Ontario will be sampled by the Ministry of the Environment.

Open Lake

Water

One spring cruise planned to sample surface water at 72 stations for conventional parameters, 19 stations to be sampled for organochlorines, PCBs, chlorobenzene (66 litres), four stations to be sampled for alkyl lead and BAP.

Sediments

No work done - research activity.

Biota

United States and Canadian collection of lake trout and rainbow smelt will be collected in accordance with their existing protocol. Herring gull egg samples will be collected as specified. No collections of benthos or plankton anticipated.

Nearshore

YOY spottail shiners will be collected at four Ontario sites and one site in Michigan. No collections are anticipated by Wisconsin or Minnesota.

Sediments

No work anticipated.

Water

Ontario will sample two water intakes at Thunder and Terrace Bays.

No embayment surveys planned for 1986.

Areas of Concern

1. Thunder Bay/Kam River Delta will be surveyed for inorganic/organic contaminants.

2. Marathon-Peninsula Harbour water quality survey including in-situ fish toxicity and caged clams uptake study.

3. Nipigon Bay will have two water quality stations surveyed.

4. Jackfish Bay will have two water quality stations surveyed.

5. St. Louis Bay will be sampled for sources of dioxin to harbor fish.

APPENDIX 1
ACTIVITY SUMMARY 1985 - LAKE SUPERIOR

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
ATMOSPHERE	IWD-OR, U.S. EPA	Deferred until atmospheric plan is developed.	Weekly samples from 7 U.S. stations for nutrients and metals and monthly at 4 Cdn. sites for inorganics except biweekly samples for organics at one site.
TRIBUTARIES	ONT. MOE		Monthly samples from 10 rivers.
			Event monitoring from four rivers.
	MI. DNR		Monthly samples from one river.
	WISC. DNR		Monthly samples from two rivers.
			Event monitoring from two rivers.
	MINN. PCA		Monthly monitoring from three rivers.
POINT SOURCES	ONT. MOE		Eleven completed.
	MI. DNR		
	WISC. DNR		Five completed.
	MINN. PCA		One completed.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
OPEN LAKE			
1) Water	IWD-OR		One spring cruise at 60 stations for nutrients conventional and metals at 20 stations 1 m depth only.
2) Biota	DFO		One set of lake trout and smelt samples collected in Thunder Bay. Analysis for OCs, PCBs, trace metals, toxaphene, TCDD & a portion of samples analyzed for TCDF.
	U.S. EPA		One site collected for routine analysis of lake trout and smelt.
	CWS		Two sites were collected for routine analysis.
3) Research			Bulk water from Sault Ste. Marie for water quality assurance organics; sediment sampling for metals from Batchawana Bay.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
NEARSHORE			
1) Water	ONT. MOE MI DNR WISC DNR MINN. PCA		Ontario MOE sampled water intakes from Thunder Bay and Terrace Bay.
2) Shiners	ONT. MOE		Four sites collected in 1985.
	MI. DNR		One site collected in 1985.
	WISC. DNR		Two sites collected in 1985.
	MINN. PCA		No work carried out.
3) Fish	MI. DNR ONT. MOE		Resident species and sport fish sampled to varying degrees by responsible agencies.
	WISC. DNR		
	MINN. PCA		
4) Sediments	ONT. MOE		No work done.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
AREAS OF CONCERN			
1) Superior Harbor (St. Louis Bay)			
a) Point Sources	MINN. PCA		Remedial action plan submitted.
b) Water	MINN. PCA		No work done.
c) Sediment	MINN. PCA		No work done.
d) Fish	WISC. DNR		Wisc. DNR collected fish for U.S. EPA national dioxin program.
	MINN. PCA		
2) Thunder Bay			
a) Point Sources	ONT. MOE		
b) Water	ONT. MOE		Some work done in Kaministikwia River.
c) Sediment	ONT. MOE		No work done.
d) Phytoplankton	ONT. MOE		No work done.
e) Benthos; Macrophytes	ONT. MOE		No work done.
f) Fish	ONT. MOE		Done.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
AREAS OF CONCERN (Cont'd.)			
3) Nipigon Bay	ONT. MOE		No work done.
4) Jackfish Bay	ONT. MOE		No work done.
5) Marathon-Peninsula Harbour	ONT. MOE		No work done.

APPENDIX 2

PROJECTED ACTIVITY SUMMARY 1986 - LAKE SUPERIOR

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
ATMOSPHERE	IWD-OR, and U.S. EPA		Weekly samples from 3 U.S. stations for nutrients and metals. Monthly samples at 4 Cdn. stations for conventional and metals. One station biweekly for organics.
TRIBUTARIES	ONT. MOE		Six rivers sampled monthly and four rivers event sampled.
	MI. DNR		Monthly sampling at Ontonagon.
	WISC. DNR		
	MINN. PCA		Monthly sampling at St. Louis, Beaver and Whiteface River.
POINT SOURCES	ONT. MOE		
	MI. DNR		
	WISC. DNR		
	MINN. PCA		

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
OPEN LAKE			
1) Water	IWD-OR IWD		One spring cruise surface sample at 72 stations for conventional parameters. Nineteen stations to be sampled for OCs, PCBs, & CBs (66-litres), four stations for alkylated lead and BAP. No metals.
2) Biota (Fish)	DFO		Samples of lake trout and smelt from Thunder Bay and Sault Ste. Marie for routine and non-routine if sufficient samples are collected.
(Fish)	U.S. EPA		Samples from one site for routine analysis.
(Herring gulls)	CWS		Collections at routine sites for routine parameters plus an additional collection at Gull Island as per LSTF recommendations.
3) Research	NWRI		

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
NEARSHORE			
1) Water	ONT. MOE MI. DNR WISC. DNR MINN. PCA		No work planned.
2) Shiners	ONT. MOE		Four sites to be collected in 1986.
	MI. DNR		One site to be collected in 1986.
	WISC. DNR		
	MINN. PCA		No work planned.
3) Fish	MI. DNR		
	WISC. DNR		
	MINN. PCA		Samples of lake trout and chinook salmon to be collected by Minn. PCA for health advisory study.
4) Sediments	ONT. MOE		No work planned.

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
AREAS OF CONCERN			
1) Superior Harbor (St. Louis Bay)	Minn. PCA		Attempts to determine sources of dioxin will be initiated.
a) Water	MINN. PCA		
b) Sediment	MINN. PCA		
c) Fish	~~WISC. DNR~~ MINN. PCA		
2) Thunder Bay			
a) Point Sources	ONT. MOE		Planned.
b) Water	ONT. MOE		Embayment work planned in Kam River and Delta region only.
c) Sediment	ONT. MOE		No work planned.
d) Phytoplankton & Zooplankton	ONT. MOE		No work planned.
e) Benthos; Macrophytes	ONT. MOE		No work planned.
f) Fish	ONT. MOE		Planned.

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
AREAS OF CONCERN (Cont'd.)			
3) Nipigon Bay	ONT. MOE		Water quality to be surveyed at two stations.
4) Jackfish Bay	ONT. MOE		Water quality to be surveyed at two stations.
5) Marathon-Peninsula Harbour	ONT. MOE		Water quality for survey indicating in situ fish toxicity and caged clams uptake study.

2.0 LAKE MICHIGAN

2.1 1985 MONITORING ACTIVITIES IN SUPPORT OF THE PLAN

To permit ready comparison with the proposed plan, activities conducted in 1985 are discussed by operational component as they are presented in the Lake Michigan Task Force (LMTF) plan. Table 1A contains a summary of planned activities for 1985-86. Table 1B gives a brief summary of the level of achievement for 1985. Research activities conducted in addition to the plan activities are discussed in the operational components sections where they seem to fit.

Atmosphere

The state agencies, Wisconsin Department of Natural Resources (WDNR), Illinois Environmental Protection Agency (IEPA), Michigan Department of Natural Resources (MDNR), and the Great Lakes National Program Office (GLNPO), United States Environmental Protection Agency (USEPA) collected samples from eleven sites (Great Lakes Atmospheric Deposition Network) on a weekly basis. The samples are analyzed for nutrients and metals. The Lake Michigan Plan calls for a review of the network to determine its effectiveness for estimating loads and for identification of atmospheric contaminants. Network review was conducted in 1985.

1985 Research Activities Related to Atmospheric Deposition

In 1985 grants were issued for evaluations of sampler siting, (Tom J. Murphy, Principal Investigator (P.I.), DePaul University) and organic chemical samplers (Steve J. Eisenreich, P.I., University of Minnesota). Planning was begun to reduce the quantity of the conventional atmospheric network stations. An atmospheric workshop was held in November 1985, and recommendations for revising the Network to include organic constituents is expected to be initiated in the first quarter of 1986.

1986

A joint U.S. and Canadian resolution was signed requiring review of the U.S. Great Lakes Atmospheric Deposition (GLAD) Network and the Canadian Great Lakes Precipitation Network (GLPN) by atmospheric scientists. An atmospheric deposition task force has been convened by the IJC.

Specific recommendations regarding measurements and assessment of the atmospheric deposition processes to the Great Lakes will be compiled. Parameter lists for conventional pollutants, nutrients, organics, and trace metals will be made for wet deposition, and particle and vapor exchange. Siting and research needs will be addressed.

Implementation of plans revised in 1985 have begun. Changes to the networks recommended by the joint U.S. and Canadian atmospheric deposition

task force will be initiated in 1986. The number of GLAD conventional monitoring sites has been reduced to around 20 sites (from 37). For Lake Michigan there are 7 sites remaining (from 11).

Tributaries

Water

Tributary loadings for phosphorus are computed from flow measurements and monthly collections of grab samples at 21 of 26 scheduled tributaries. The tributary load for phosphorus is the single largest monitored load to the lake representing upwards of 50% or more of the total load. This annual source represents, however, less than 20% of the in-place phosphorus source burden in Lake Michigan.

In addition to phosphorus, the ions (Ca, Na, Cl, SO_4), nutrients (NO_2+NO_3, TKN, SiO_2), physical (pH, TSS, specific conductivity), a metal (Pb), and organic chemicals (PCB, TOC, synthetic hydrocarbons) are measured. Some of these constituents are measured less frequently than monthly, ranging from every six weeks to semiannually. Flow data are collected from 25 of 26 tributaries scheduled for sampling. High flow monitoring was conducted on the Grand and Père Marquette by MDNR.

The plan calls for the collection of herbicide residue data during the spring runoff from six tributaries (St. Joseph, Grand, Kalamazoo, Boardman, Fox, Kewaunee). No activity is reported for this component.

1986 Research Activities Related to Tributary Monitoring

U.S. EPA's GLNPO, in response to a request for same, has received grant proposals to review and summarize existing Great Lakes tributary high flow data, to evaluate phosphorus load estimation methods, and to make recommendations as to the optimal load estimation and tributary monitoring strategies needed to provide adequate load estimates to the lakes. It is anticipated that such a project will be funded in the spring of 1986, with Sarah Pavlovic of the GLNPO acting as project officer. The results of this review are expected to be useful in guiding future tributary monitoring strategies.

A workshop is being planned for summer 1986 through cooperation among Heidelberg College, GLNPO, IJC's Nonpoint Source Committee, and others, to address the topic of tributary monitoring for currently-used pesticides.

Fish

No work was done in 1985. Tributary adult indigenous fish are scheduled for collection every five years. Major collections were made 1980-82, and reports are completed or in press: (See Table 1A). No activity planned for 1986.

The young-of-the-year spottail shiner program was initiated at two sites in Michigan. This program's purpose is to identify annual trends in problem nearshore areas. Collections are proving to be extremely difficult because of

declining populations of spottail. For 1986, spottails will be collected at Menominee River, Fox River, Southern Green Bay, Sheboygan, Milwaukee Estuary, Waukegan Harbor, Grand Calumet, Indiana Harbor, and Kalamazoo River.

Sediments

No sediment analyses were performed in 1985. Extensive sediment collections and analyses were accomplished in 1981. The plan calls for additional sediment sampling in areas where problems are identified. Samples will be analyzed for the organic constituents that are identified by the fish contaminant monitoring program, and those metals in which concentrations are high in sediments (Bi, Cr, Mg, Hg, Cd, Zn, Pb, Cu, Co, Ni, Se, Sb, Sn) will be determined also.

Benthos

No known cohesive activity can be reported. The plan calls for systematic collections once every five years to look for polycyclic aromatic hydrocarbons (PAHs) and heavy metals. The purpose of the benthos collection is to assess benthic health through species enumeration, and to provide a base line on the degree of chemical contamination in benthos.

Point Sources

Water

Loading estimates for phosphorus to the lake are provided by all municipal and industrial sources via the permits issued by USEPA or authorized state agencies under the National Pollutant Discharge Elimination System (NPDES).

The plan calls for collation and assessment of NPDES monitoring results of conventional and some toxic pollutants in addition to phosphorus. The extent of the reporting of other substances will depend on each permit and the permittee's identification of other pollutants. All pollutants in the NPDES are stored in STORET (Storage and Retrieval System) with the majority of entries other than phosphorus being metals and phenols.

Open Lake

Water

GLNPO-USEPA conducted three open lake water surveys using the RV Simons in 1985. The samplings were accomplished in spring (April/May), summer (August), and in the late fall, after overturn, (November/December). The surveys included physical, biological (zoo/phytoplankton), chemical, and microbiological measurements.

1986

This open lake program is being carried out in 1986, with a spring (April/May) and summer (August) ship survey and two winter helicopter surveys (February/March 1987).

Primary Productivity

1985

In 1985 a grant was awarded to Art Brooks, P.I., University of Wisconsin to implement the water intake lake productivity assessment program at Chicago and Milwaukee. This program will be linked to the lake-wide primary productivity assessments derived from the open lake surveys program. Primary productivity assessment of open lake water samples has been added to the RV Simons program.

1986

Continuation of the primary productivity measurements at Chicago and Milwaukee is anticipated, provided that funding is available. The addition of a primary productivity laboratory to the RV Simons is scheduled for completion by April 1986. Collection of samples from the 11 open lake sites will be done during the ship surveys.

1985 Research Activities Relevant to Open Lake Surveillance

The Illinois portion of Lake Michigan is monitored under the terms of a cooperative agreement between Illinois Environmental Protection Agency and the City of Chicago. The City of Chicago's Water Purification Division regularly conducts water quality surveys and lake bed assessments to evaluate Lake Michigan water sources near Chicago. There are five separate surveys involving 41 nearshore stations (less than 3 miles from shore) and 39 offshore stations (between 3 to 17 miles from shore). The parameters measured for each site are: physical properties; nutrient, conservative ion, and asbestiform concentrations; selected microbiological forms; and plankton concentrations and species.

Parameters measured at water intakes include total metals, cyanide, and hardness. Of the Great Lakes Water Quality Agreement Annex 1 metals, only selenium is not measured in these surveys.

Monitoring for chlorinated hydrocarbons is done at one site, twice a year, for all Annex 1, Persistent Toxic Substances, except heptachlor/heptachlor epoxide, mirex, and phthalic acid esters.

Radiological monitoring of the area near the Zion Nuclear Power Plant is conducted by the Metropolitan Sanitary District (MSD) of Greater Chicago. Water, sediment, and plankton are sampled. The water samples are analyzed for alpha, beta, and gamma radioactivity. Artificial radio nuclides measured include Zn^{65}, Cs^{137}, Sr^{90}, and tritium. Ms. Lee Kristoff is the Principal Investigator for the MSD.

The MSD of Greater Chicago conducts annual monitoring of Lake Michigan water quality for fecal coliforms, standard plate counts, fats, oils and greases, total Kjeldahl nitrogen, ammonia nitrogen, and electrolytic conductivity. Dr. Salvador Sedita is the Principal Investigator for the MSD.

The radiological surveillance program at the Kewaunee Nuclear Power Plant is supervised by Thomas P. Meimz, P.I., Wisconsin Public Service Corporation

(WPSC). The program consists of monthly samples of air, terrestrial, and aquatic environments in which alpha and gross beta activity are measured in the total residue, dissolved solids, and suspended solids.

Milwaukee Metropolitan Sewerage District (MSD) annually conducts major water quality surveys to evaluate the impact of the sewage treatment plants on Lake Michigan water quality and the water quality of the three major rivers Milwaukee, Menomonee, and Kinnickinnic; and also Oak Creek. The parameters monitored include conventional ions, nutrients, microbiological indicators, zoo/phytoplankton, and the metals, including copper, chromium, cadmium, zinc, lead, and iron. Open lake sites within two miles of the western shores covering roughly 20 square miles are also sampled.

A Milwaukee harbor estuary comprehensive planning program is managed by the south Eastern Wisconsin Regional Planning Commission in conjunction with USEPA, MMSD, and USGS. The primary purpose of this program is to determine the nature and extent of pollution problems in the Milwaukee estuary including sources and effects, and to evaluate potential abatement strategies.

2.2 1986 RESEARCH ACTIVITIES

Mr. Gary Fahnenstiel, National Oceanic and Atmospheric Administration (NOAA), is developing a primary productivity program. A southern basin survey is planned using the RV Shenahan in April and August at Lake Michigan sites 18, 19, and 23 to measure primary production. Measurements at the Grand Haven station are planned every three weeks during ice-free season.

Biota

1985

Phytoplankton and zooplankton were collected at 11 stations during the GLNPO limnology program in 1985. In addition to the three open lake surveys, phytoplankton samples were collected in February 1985 by helicopter.

1986

This program will be continued in 1986 with ship collections from the two survey periods. Helicopter surveys will be done for the limnology program in February and March 1987. The 1986 program is part of the limnology program using the RV Simons.

1985 Research Activities Related to Biota

Wildlife contaminant monitoring program for a Forster's Tern population in lower Green Bay is being managed by Terry Amundson, P.I., WDNR. The purpose of this project is to investigate residue accumulations of pesticides, PCBs, and heavy metal contaminants.

A toxic monitoring program for the lower Fox River and lower Green Bay is being conducted by Jack Sullivan, P.I., WDNR. The study plan consists of an intensive sediment survey for trend analysis. A PCB monitoring study has been developed using clams as the indicator species.

The Wisconsin fish contaminants program is being conducted by Lee B. Liebenstein, P.I., WDNR. The primary parameters measured include PCBs, DDT, dieldrin, and chlordane.

The study of the role of microcontaminants in the reproductive failure of Forster's Tern colonies in Green Bay is being conducted by H. J. Harris, P.I., University of Wisconsin - Green Bay. One of the objectives of this study is to gather data which should assist in determining the need for a monitoring and research program related to dioxin and other toxic organic compounds in Green Bay. Another objective is to determine if the presence of PCBs and PCB-like compounds are causing problems in other species of birds in lower Green Bay using the Forster's Tern as the bell weather species.

Open Lake Fish

1985

Collection of lake trout and smelt by the U.S. Fish and Wildlife Service at Charlevoix was made. Trout were analyzed by U.S.EPA/Contractor for 10 samples of 5 fish composites for evaluation of organic contaminants. A report is being prepared by David DeVault, GLNPO.

Collections of fall run coho salmon were made by the eight Great Lakes states at Manistique River; St. Joseph, Plutte River; and Thompson Creek, Michigan; Trail Creek, Indiana; Kellogg Creek, Illinois; and Sheboygan River, Wisconsin. Analyses are being performed by the U.S. Food and Drug Administration laboratory in Minneapolis. A report is being prepared by David DeVault, GLNPO.

1986

These programs are being implemented in 1986 with open lake fish collected at Saugatuck. The 1986 work schedule is similar to the 1984 schedule. The fall run coho salmon program is planned to be similar to the 1985 program.

Sediments

1985

Sediment sampling in the four deposition basins of the lake was carried out by the University of Michigan's Great Lakes Research Division and by the University of Wisconsin's Milwaukee Great Lakes Studies Center.

1985 Research Activities Related to Sediments

A project to study the feasibility of constructing fishing reefs from flyash block is being conducted by T. A. Hanson, P.I., of WPSC.

Hydrodynamic and water quality modeling in lower Green Bay is being conducted by Kwang K. Lee, P.I., MSD of Green Bay. The objective of this study is to develop, calibrate, and verify hydrodynamic and biochemical mathematical models for use in simulating alternatives for the management of surface waters of the Fox River and lower Green Bay.

Nearshore

The Water Quality Board of the International Joint Commission (IJC) has identified 42 Areas of Concern (AOC), 30 of which are in the U.S. and 10 within the Lake Michigan basin.

The January 15, 1986 status for each Area of Concern by state follows:

Area of Concern	Products/Roles	Summary Dates
ILLINOIS		
Waukegan Harbor	Illinois EPA is securing a contract for a major implementation effort designed to address PCB contamination of the harbor. A very preliminary draft of a Remedial Action Plan (RAP) was completed by the Contractor. Illinois wishes to defer the preparation of more detailed versions of the RAP until the implementation effort is further along. GLNPO, the State, and the Contractor are considering some additional data gathering of key technical documents.	Preliminary draft RAP: complete Draft RAP: deferred Final RAP: deferred
INDIANA		
Grand Calumet River/Indiana Harbor Canal	GLNPO (through Contractor assistance) will prepare the RAP, in close coordination with the Indiana State Board of Health (ISBH). GLNPO will gather, collate, and analyze available data; identify additional data needs; and prepare draft and final RAPs. Project was initiated 10/15/85. Contractor is on schedule; initial draft as of 2/86.	DRAFT RAP: 2/86 Final RAP: 5/86
MICHIGAN		
Kalamazoo	GLNPO (through Contractor support) will assist Michigan in preparation of the RAP. This assistance will include assembly and review of baseline data; preparation of draft Areas of Concern chapters, description of existing conditions in the Areas of Concern; determination of additional data requirements; and formulation of schedule (and roles/ responsibilities of Michigan DNR and GLNPO) for completing the RAP. Project is expected to be initiated in July 1986.	Draft initial chapters of RAP: 8/86 Plan/ schedule completing RAP: 10/86 RAP completion: 12/86

Area of Concern	Products/Roles	Summary Dates
MICHIGAN, cont'd.		
Muskegon Lake	Recent studies have shown improved lake quality and no use impairment. As a result, Michigan placed Muskegon Lake in Category 6 (confirmation that uses have been restored and deletion as an Area of Concern in next WQB report). This remains to be documented to meet GLNPO concerns.	No RAP needed according to Michigan.
White Lake Montague	RAP nearing completion. Recent litigation has resulted in a court injunction requiring Hooker Chemical to cut off its discharge to the lake.	RAP completed 12/85
Manistique River	Invesitgations underway, but incomplete.	Target date for RAP: 12/31/86
WISCONSIN		
Sheboygan River	The WNDR will prepare the RAP. GLNPO (through Contractor assistance) will support the WDNR staff in the initial phases of RAP preparation. GLNPO will assist WDNR in its data gathering, data analysis, and in the determination of data base completeness and comprehensiveness relative to the needs of remedial action planning. WDNR and GLNPO in a planning meeting will then define the tasks necessary to complete the RAP, including the generation of new data; if necessary, a schedule for completing each task, and the parties responsible for completing each task.	Scoping Mtgs: 12/85 - 8/86 Data Synthesis Report: deferred Data Base Review Report: deferred
	WDNR in an initial meeting with the Contractor has requested that the project be deferred for seven months. This would result in a project starting up of 8/86.	Planning Mtg. Summary Report: deferred

Area of Concern	Products/Roles	Summary Dates
WISCONSIN, cont'd.		
Fox River/ Southern Green Bay	WDNR will prepare the RAP. GLNPO (through Contractor assistance) will provide technical guidance and staff support to WDNR in the identification and analysis of available information; identification of additional data requirements; and preparation of the work plan for completing the RAP. A multiagency planning seminar for the purpose identifying ecological performance criteria for Green Bay has already been held. The Contractor provided support in coordinating this seminar.	Ecological Criteria Seminar:10/85 Data Source Synthesis: 12/85 Planning Meeting: 2/86 Final RAP: 10/86
Milwaukee Estuary	GLNPO (through Contractor support) will assist in assembling existing information in RAP format and identifying any gaps. Existing information is very extensive.	Scoping Mtg.: unscheduled Draft RAP: unscheduled
Menominee River	The source of arsenic contaminated sediments is Ansul Corp. (Marinette, WI). Cleanup of Ansul Corp. waste disposal site has been initiated. This is a Wisconsin source and Wisconsin DNR's consent order with Ansul Corp. will address this matter. Accordingly, the RAP should be developed by Wisconsin.	No RAP scheduled

TABLE 1A.
APPENDIX - ACTIVITY SUMMARY 1985 - LAKE MICHIGAN - PAGE 1 OF 7

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
ATMOSPHERE	USEPA-GLNPO; Environment Canada.	PLANNING NETWORK Review of goals and objectives to measure atmospheric inputs to the lake.	Siting and organic sampler evaluation grants awarded.	W		
			Workshop held Nov. 1985.			
		Evaluation of the measurement methods available, models and limitations.	Organic Sampler Evaluation.	W	W	
	USEPA-GLNPO; Wisconsin DNR; Illinois EPA; Michigan DNR.	CURRENT NETWORK OPERATION Identify amounts of materials coming from the atmosphere and to evaluate the significance of these sources for each of them to the lake. In particular, those constituents identified in Annex 1 need to be measured.	GLAD Network: Wet precipitation from 11 sites weekly measurements of pH, conductivity, nutrients, inorganics.	Y	W	W
				60% Completed.		
			GLAD Network: Collection of bulk (wet and dry precipitation) on a monthly basis for nutrients, inorganic, metals and organic analyses was discontinued as of Sept 1, 1985.	Y	N	N
				For method development, collection discontinued in FY'85.		

Y = Complete
W = Work-In-Progress
N = Not Started

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
TRIBUTARY Water	Water Division EPA; USEPA-GLNPO; Wisconsin DNR; Indiana SPCB; Michigan DNR.	Quantification of chemical loads and determination of tributary health.	Monthly collection grab samples for TP analysis from 21 of 26 scheduled tributaries.	Y	W	N
		Plan specifically calls for TP, and herbicides.	Concentration data for nutrients [NO_2+NO_3) SiO_2, TKN] physical (Temp. spec. cond. pH. TSS).	W	W	W
		Flow data.		Data stored in STORET		
			Conservative ions (Ca, Na, Cl, SO_4, (including synthetic hydrocarbons) e.g. PCB, TOC, Herbicides (?).	Metals (Pb), Organics		
				N	N	N
			USGS collects flow data for 25 of 26 scheduled tributaries.	W	N	
				Data stored in STORET		
Fish-Nearshore	USEPA-GLNPO; State Agencies.	Adult indigenous fish collected a minimum of once every 5 years to detect emergent contaminants and to identify source areas of contaminants affecting the lake ecosystem.	No activity in 1985. Collections completed for first round 1980-1982.			Report on State of MI fish by R.Rossmann. D.DeVault: "Contaminants in Fish From Great Lakes Harbors and Tributary Mouths" 1980-81, EPA-905/3-84-003.
						Combined report of all Lake Michigan fish in progress by G.Lahvis and D.DeVault

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
Fish-Nearshore (cont'd.)	USEPA-GLNPO; State Agencies.	Spottail shiner program to determine trends in areas identified in program above.	Collection at 2 sites.	Y	W	N
TRIBUTARIES Sediments	USEPA-GLNPO.	Sample locations (tributary mouths, embayments, and harbors) where problems are identified. Parameters will include metals (from the complete chemical evaluation of tributary water) for organic contaminants identified via fish contaminant monitoring, (GC/MS scan).	None scheduled, collections done in 1981.	Data stored in STORET.		
Benthos	Cities?; MSD; Milwaukee.	Benthic organisms should be collected once every 5 years and analyzed for PAHs and heavy metals to determine the degree of contaminants and to provide supplemental information for possible public health.	Monitoring for benthic fauna plans at 8 sites in inner harbor, all priority pollutants.	Milwaukee MSD to conduct monitoring programs in near-shore areas of Milwaukee.		

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
POINT SOURCES	USEPA-Water Div.; State Agencies.	Quantify loadings in accordance with Annex 3, permits issued under NPDES and monitored via self monitoring reports primarily for phosphorus.	States provide data for principal discharges to IJC municipal/industrial data base for phosphorus loads.	Y	Y	W
				Data stored by IJC point source coordinator in the municipal/ industrial point source data base.		
OPEN LAKE Water	USEPA-GLNPO.	Program to provide basic limnological data and evaluation of water quality trends.	Spring (2) ice out surveys-summer (3) stratified surveys "late fall"-2 surveys during overturn. Winter 2 surveys during isothermal period for physical, biological, chemical, and micro-biological parameters at 20 sites.	Y	Y	N
	Chicago; Milwaukee.	Program to collect chemical and bio-logical data at the Chicago and Milwaukee water filtration plants on a daily basis.	City run programs in place.	Y	Y	N
				Data stored in STORET or city maintained data bases. Chicago and IEPA provides annual reports for Chicago's monitoring programs.		

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
OPEN LAKE Water (cont'd)	USEPA-GLNPO; University(ies)	Program to check water intake sites as representative of open lake sites and to use long-term biological change in primary production at water intake to assess the structure and function of the primary producers.	Grants awarded to conduct programs at Milwaukee and Chicago intakes.	W	W	N
	USEPA-GLNPO; Contractor.	Predictive model verification (WASP) as part of a surveillance research management cycle.	No activity planned.	N	N	N
		Monitoring for contaminants to check compliance with general and specific objectives.	No activity in 1985 outside of basic limnology program. Trace metals done in 1981. Organics limited to PCBs by Grosse Ile Laboratory in 1980.	Y	Y	N Trace metal study with report on Trace Metals by R.Rossmann "Trace Metals Concentrations in the Offshore Waters of L.Erie and Michigan" Special report No. 108 of the GL Res. Division.
Biota		Collection of phyto and zooplankton to support predictive models and to provide structure of lake biota via identification of species.	Part of limnology program implemented during spring, summer, fall overturn, and winter.	Y	N	N Phytoplankton and zooplankton schedule to complete March 1986.

WASP = Water Assessment Simulation Program

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
OPEN LAKE Fish	USEPA-GLNPO; USFWS.	Open lake fish monitoring of lake trout and smelt.	Collection of Charlevoix of lake trout/smelt.	Y	W	N
	USEPA-GLNPO; State Agencies; USFDA.	Evaluation of hazard toxic substances in game fish consumed by public.	Collection of fall run coho salmon at Manistique River, and Thompson Creek, MI; St. Joseph, Grand, Platte River, and Sheboygan, WI; Trail Creek, IN; and Kellogg Creek, IL.	Y	W Report in progress as part of entire Great Lakes Basin Report.	N
Sediments	USEPA-GLNPO; Grantees.	Determination of in place loads in depositional areas on on a 5 to 10 year cycle. Last surveys in 1983-1985.	Some activity by Universities to collect sediments from depositional zones.	N?	N?	N?

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
Nearshore	USEPA; State Agencies. [WDNR, GBMSD, UWM UWGB - Green Bay] [MMSD-Milwaukee Estuary]	Development of Remedial Action Plans. Monitoring in Green Bay for eutrophication phytoplankton, ammonia and dissolved oxygen.	Two RAPs considered complete - White Lake - Montague and Waukegan Harbor. Waukegan Harbor has a draft RAP which is considered complete until implementation efforts to address the PCB contamination is further along. Muskegon Lake is considered complete by the Michigan DNR. Documentation of this is requested by GLNPO.			
SPECIAL STUDIES	USFWS; Environment Canada.	Herring Gulls to be monitored for bird population health and toxic contaminants.	Status unknown.			

WDNR = Wisconsin Dept. of Natural Resources
GBMSD = Green Bay Metropolitan Sanitary District
UWM = University of Wisconsin Milwaukee
UMGB = University of Wisconsin Green Bay
MMSD = Milwaukee Metropolitan Sanitary District
USFWS = United States Fish and Wildlife Services

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
ATMOSPHERE	USEPA-GLNPO; Environment Canada.	PLANNING & IMPLEMENTATION OF NETWORK Review of goals and objectives to measure atmospheric inputs to the lake. Evaluation of the measurement methods available, models and limitations.	Conventional Network size to be reduced from 11 to 7.			
	USEPA-GLNPO; Wisconsin DNR; Michigan DNR.	CURRENT NETWORK OPERATION Identify amounts of materials coming from the atmosphere and to evaluate the significance of these sources for each of them to the lake. In particular, those constituents identified in Annex 1 need to be measured.	GLAD Network: Wet precipitation from 7 sites weekly measurements of pH, conductance, nutrients, inorganics.	W	W	N

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
TRIBUTARIES Water	Water Division EPA; USEPA-GLNPO; Wisconsin DNR; Indiana SPCB; Michigan DNR.	Quantification of chemical loads and determination of tributary health.	Monthly collection of grab samples for TP analysis from 21 of 26 scheduled tributaries.	W	W	N
			Annual Phosphorus Loading Report by IJC not completed.			
		Plan specifically calls for TP, and herbicides.	Concentration data for nutrients [NO_2+NO_3, SiO_2, TKN] physical (temperature, specific conductance, pH, TSS).	W	W	W
		Flow data.		Data stored in STORET.		
	IJC Non Point Sources Work Group; USEPA-GLNPO; Heidelberg College.	Pesticide Monitoring Workshop.	Workshop to determine tributary monitoring for pesticides and toxic substances Summer 1986.			
			Conservative ions (Ca, Na, Cl, SO_4), metals (Pb). Organics (including synthetic) hydrocarbons, e.g. PCB, TOC, herbicides(?).	N	N	N
			USGS collects flow data for 25 of 26 scheduled tributaries.	W	N	
				Data stored in STORET.		

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
	USEPA-GLNPO.	Review of tributary loading data base and techniques for high flow sampling to determine optimum effort.	Request for proposals issued and proposals received.			
Fish-Nearshore	USEPA-GLNPO; State Agencies.	Adult indigenous fish collected a minimum of once every five years to detect emergent contaminants and to identify source areas of contaminants affecting the lake ecosystem.	No activity in 1985. Collections completed for first round 1980-1982.			Report on State of MI fish by R.Rossmann. D.DeVault: Contaminants in Fish From Great Lakes Harbors and Tributary Mouths 1980-81, EPA-905/3-84-003. Combined report of all Lake Michigan fish in progress by G.Lahvis and D.DeVault.
	USEPA-GLNPO; State Agencies.	Spottail shiner program to determine trends in areas identified in program above.	Collections planned Sheboygan, Waukegan, Grand Calumet River, Menominee, Fox River/ Southern Green Bay, Milwaukee Estuary and Kalamazoo.			

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
TRIBUTARIES Sediments	USEPA-GLNPO.	Sample locations (tributary mouths, embayments, and harbors) where problems are identified. Parameters will include metals (from the complete chemical evaluation of tributary water) for organic contaminants identified via fish contaminant monitoring, (GC/MS scan).	None scheduled. Collections last done in 1981.	Data to be stored in STORET.		
Benthos	Cities?; MSD; Milwaukee.	Benthic organisms should be collected once every 5 years and analyzed for PAHs and heavy metals to determine the degree of contaminants and to provide supplemental information for possible public health.				
POINT SOURCES	USEPA-Water Div.; State Agencies.	Quantify loadings in accordance with Annex 3, permits issued under NPDES and monitored via self-monitoring reports primarily for phosphorus.	States provide data for principal discharges to IJC municipal/industrial data base for phosphorus loads.	W Data stored by IJC point source coordinator in the municipal/ industrial point source data base.	W	N

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
OPEN LAKE Water	USEPA-GLNPO.	Program to provide basic limnological data and evaluation of water quality trends.	Spring (2) ice out surveys-summer (2) stratified surveys; 2 helicopter (Feb.-Mar./87) surveys during isothermal period for physical, biological chemical, and primary productivity, and microbiological parameters at 20 sites.			
	Chicago; Milwaukee.	Program to collect chemical and biological data at the Chicago and Milwaukee water filtration plants on a daily basis.	City run programs in place.			Data stored in STORET or city maintained data bases. Chicago and IEPA provides annual reports for Chicago's monitoring programs.
	USEPA-GLNPO; University(ies).	Program to check water intake sites as representative of open lake sites and to use long-term biological change in primary production at water intake to assess the structure and function of the primary producers.	Continuation of grant for primary production at Chicago and Milwaukee intakes.			

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
OPEN LAKE Water	USEPA-GLNPO; Contractor.	Predictive model verification (WASP) as part of a surveillance research management cycle.	No activity planned.			
		Monitoring for contaminants to check compliance with general and specific objectives.	No activity outside of basic limnology program. Trace metals done in 1981. Organics limited to PCBs by Grosse Ile in 1980.	Trace metal study with report on Trace Metals by R.Rossmann "Trace Metals Concentrations in the Offshore Waters of L.Erie and Michigan Special report No. 108 of the G.L. Res. Division.		
Biota		Collection of phyto and zooplankton to support predictive models and to provide structure of lake biota via identification of species.	Part of limnology program implemented during spring, summer, and winter.	W	N	N
				Phytoplankton and zooplankton schedule to complete March 1988.		

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
OPEN LAKE Fish	USEPA-GLNPO; USFWS.	Open lake fish monitoring of lake trout smelt.	Collection off Saugatuck of lake trout/smelt.			Report available through 1982. Contact D.DeVault, GLNPO.
	USEPA-GLNPO; State Agencies; USFDA.	Evaluation of hazard toxic substances in game fish consumed by public.	Collection of fall run coho salmon at Manistique River, and Thompson Creek, MI; St. Joseph, Grand, Platte River, and Sheboygan, WI; Trail Creek, IN; Kellogg Creek, IL.			Report available through 1984. Contact D.DeVault, GLNPO.
Sediments	USEPA-GLNPO; Grantees.	Determination of in-place loads in depositional areas on a 5 to 10 year cycle. Last surveys in 1983-1985.				

Operational Component	Responsible Jurisdiction	Planned Activity	Activity Completed	Sampling Y/W/N	Analysis Y/W/N	Report Y/W/N
Nearshore	USEPA; State Agencies.	Development of Remedial Action Plans.	By the end of 1986 activity in 4 Areas of Concern should result in development of remedial action plan (Fox River/ Southern Green Bay, Manistique River, Kalamazoo, Grand Calumet River, Indiana Harbor Canal). Activities in the following areas may not result in a complete RAP by the end of 1986; Sheboygan River, Milwaukee Estuary, Menominee River.			

Table 1B
Level of Achievement for 1985
In Relation to Lake Michigan Surveillance Plan

		FREQUENCY	SITES	PARAMETERS
Atmosphere -	wet only	✓?	✓?	-
	planned revision	✓	N/A	N/A
Tributary -	water	-	-	-
Indigenous	fish	✓	✓	✓
	spottails	-	-	-?
	sediment	✓	✓	✓
	benthos	ND	ND	ND
	point sources	✓?	-	-
Open Lake -	water	✓	✓	-
	water intakes	-	-	-
	model evaluation	ND	ND	ND
	biota	✓	✓	✓
	fish-trout	✓	✓	✓
	fish-coho	✓	✓	✓
	sediments	✓?	✓?	✓?
Nearshore				
AOCS[1]		-	-	-

[1]Remedial Action Plans when completed will be incorporated into the Plan.

- Done, but did not meet Plan requirements.
✓ Met all Plan requirements.
+ Exceeded Plan requirements.
ND Not done.

Table 1B
Level of Achievement for 1986
In Relation to Lake Michigan Surveillance Plan

		FREQUENCY	SITES	PARAMETERS
Atmosphere -	wet only	✓?	✓?	-
	planned revision	✓?	N/A	N/A
Tributary -	water	-	-	-
Indigenous	fish	✓	✓	✓
	spottails (if any can be caught)	✓	✓	✓?
	sediment	✓	✓	✓
	benthos	ND	ND	ND
	point sources	✓?	-	-
Open Lake -	water	✓	✓	-
	water intakes	✓	✓	-
	model evaluation	ND	ND	ND
	biota	✓	✓	✓
	fish-trout	✓	✓	✓
	fish-coho	✓	✓	✓
	sediments	✓?	✓?	✓?
Nearshore				
AOCS[1]		-	-	-

- To be done, but will not meet Plan requirements.
✓ Will meet all Plan requirements.
+ Will exceed Plan requirements.
ND Will not be done.
* Not defined in Plan but other work done.

3.0 LAKE HURON

SUMMARY

In this second Inventory, for 1985/86, compared with 1984/85, some progress has been made in meeting Plan requirements. Noteworthy are the continued efforts to develop a comprehensive atmospheric monitoring network and the initiation of a second open lake cruise as required by the Plan. However, a number of further actions are required. In descending order of priority, they are:

1. Point Sources. The lack of data being collected on the 65 major point sources to Lake Huron is lamentable and it is vital that this be corrected. Little assessment of impact to the lake is possible without this information.

2. Nearshore. While work is being undertaken in the nearshore, this needs to be coordinated and comprehensive with specific objectives as outlined in the Plan. The response of the agencies to the Plan will be tracked by the Task Force.

3. Areas of Concern. Saginaw Bay is still the most important Area of Concern in Lake Huron and considerable remedial work has been undertaken. Yet no effort has been expended since 1980 to assess the effectiveness of these remedial actions.

4. Open Lake. While the water chemistry component of the open lake surveys is being fully implemented, neither phytoplankton community structure, sediment or benthic portions of the Plan are being followed.

3.1 INTRODUCTION

This is the second annual inventory of the Lake Huron Task Force which documents completed activities for 1985 and planned activities for 1986 as they relate to the Great Lakes International Surveillance Plan (GLISP). As such, this document will identify components currently being conducted but more importantly allow the WQB to identify how much work is still required to initiate GLISP which is the minimum required work to identify the state of Lake Huron as recommended by the IJC.

3.2 1985 MONITORING ACTIVITIES

The activities conducted in 1985 are discussed by operational component and summarized in Appendix 1.

Atmospheric

Nine stations were sampled by Environment Canada and U.S. EPA. In addition to conventional parameters metals were also analyzed in 1985, as

called for in the Plan and at one site contaminants were also analyzed, as required by the Plan.

Tributaries - water

Sampling was completed as required by the Plan for all Canadian tributaries. On the United States side, only tributaries of the Saginaw River and to Saginaw Bay were sampled. Four other tributaries as required by the Plan were not sampled viz AuSable, Thunder Bay, Cheboygan and Pine (Mackinac Co.) Rivers. Details are not currently available on whether the parameters analyzed were as required by GLISP.

Tributaries - sediments

Bottom and suspended sediments were sampled on all Canadian tributaries as required by the Plan. No sediment analyses were conducted on United States tributaries.

Tributaries - biota

U.S. EPA and Michigan DNR collected coho salmon from two tributaries, the AuSable and Tawas Rivers, for contaminant analysis.

Point Sources

Little work has been reported on point sources. An industrial point source survey was planned for Eldorado; this was not conducted. However, data are available on the Bruce Nuclear discharge from Ontario Hydro. Apparently other surveys were carried out on point sources.

Nearshore

Some work was carried out to examine metal uptake on periphyton in Georgian Bay, no other components of the Cladophora program were undertaken. No work was conducted on clams. Shiners were sampled at three locations for contaminants and fish collections taken for tumor examination at one site. In addition, the index fishing program and sport fish contaminant program were carried out.

Open Lake

Environment Canada conducted both spring and summer cruises as required by the Plan and in addition, EPA-GLNPO conducted three open lake surveys. However, to date no steps have been taken to implement some of the biological components of the open lake plan, particularly the phytoplankton and benthic invertebrate community structure and no sampling of open lake sediments has yet been initiated. The open lake fish contaminant portion of the Plan is being conducted by EPA and Canada DFO. In addition, some sampling of Pontoporeia for contaminants analysis has been undertaken.

Areas of Concern

1. Saginaw Bay - Extensive tributary monitoring on both the Saginaw River and other tributaries was conducted by EPA/MDNR. However, no work except open lake cruises on spottail shiners was conducted on Saginaw Bay.

2. Penetang-Midland - Biweekly sampling for nutrients and major ions

3. Collingwood - shiners for contaminants

4. Spanish River - shiners for contaminants

3.3 PLANNED 1986 MONITORING ACTIVITIES

Atmospheric

Metals will be sampled at all sites and contaminants at one site, the number of sites, however, is being reduced to seven. There is, however, a considerable momentum in the basin towards developing a comprehensive basin-wide compatible deposition monitoring network. The Parties are to be applauded for this effort.

Point Sources

Although considerable strides are being made toward developing accurate contaminant loadings from the atmosphere, unfortunately the same cannot be said regarding point sources. In 1985, apparently little work was conducted by the Parties on point sources to Lake Huron. The Plan identifies 36 municipal and 31 industrial point sources. In 1985, only one of these was sampled. In 1986 information indicates that only four municipal and five industrial point sources will be surveyed. This does not include compliance monitoring but rather information required to estimate contaminant loads. This is in an area that is of the highest priority.

Tributaries

Good progress is being made on the tributary component of the Plan. All Ontario tributaries are to be monitored as required by the Plan, except for biota. In Michigan, all Saginaw Bay tributaries are to be monitored, work is necessary on the four remaining tributaries required by the Plan.

Nearshore

The nearshore program does not meet Plan requirements. Work is planned on three intakes for water and phytoplankton, some shiner, coho salmon and fish work is being undertaken. Additional work is being conducted on the benthos in the nearshore by Canada DFO and in drinking water and some bathing beaches by Ontario MOE. None of this work reflects an integrated program to assess nearshore impacts, more work is required on intakes and Cladophora for assessing eutrophication and contaminant impacts.

Open Lake

The water chemistry portion of the Plan is to be fully implemented by Environment Canada. No plans are in place to undertake the sediment or phytoplankton portions. Open lake fish and herring gulls are being sampled to assess impacts from contaminants.

Areas of Concern

Remedial Action Plans are under development for each of the Areas of Concern. However, the lack of data collection in Saginaw Bay remains a major concern.

TABLE 1A

LEVEL OF ACHIEVEMENT
IN RELATION TO PROPOSED PLAN (DEC. 1986) FOR PREVIOUS YEAR (1985)

		FREQUENCY	SITES	PARAMETERS
Atmosphere	- precipitation	✓	✓	-
	- air	no sampling defined in Plan		
Tributaries	- water	-	-	-
	- sediment	-	-	-
	- biota	-	-	-
Point Sources	- water	-	-	-
Open Lake	- water	✓	✓	-
	- sediment	ND	ND	ND
	- biota - structure	-	-	-
	- contaminants	-	-	✓
	- fish production	✓	✓	-
Nearshore	- biota - algae	-	-	-
	- clams	ND	ND	ND
	- shiners	✓	-	-
Areas of Concern				
Saginaw Bay & River				
	tributaries/point sources	✓	✓	✓
	water - bay	-	✓	-
	sediment - bay	ND	ND	ND
	biota - bay	-	-	-
Penetang/Midland				
	water	✓	✓	✓
	sediment	ND	ND	ND
	biota	ND	ND	ND
Spanish River				
	water	ND	ND	ND
	sediment	ND	ND	ND
	biota	-	-	-
Collingwood				
	water	ND	ND	ND
	sediment	ND	ND	ND
	biota	-	-	-

\- Done, but did not meet Plan requirements.
✓ Met all Plan requirements.
ND Not done.
* Not defined in Plan but other work done.

TABLE 1B

LEVEL OF ACHIEVEMENT
IN RELATION TO PROPOSED PLAN (198_) FOR NEXT YEAR (1986)

	FREQUENCY	SITES	PARAMETERS	
Atmosphere - precipitation	✓	-	-	
- air	no sampling defined in Plan			
Tributaries - water	-	-	-	
- sediment	-	-	-	
- biota	-	-	-	
Point Sources - water	-	-	-	
Open Lake - water	✓	✓	✓	
- sediment	ND	ND	ND	
- biota - structure	-	-	-	
- contaminants	-	-	✓	
- fish production	✓	✓	✓	
Nearshore - biota - algae	ND	ND	ND	
- clams	ND	ND	ND	
- shiners	✓	-	-	
- benthos	*	*	*	
Areas of Concern				
Saginaw Bay & River				
tributaries/point sources	✓	✓	✓	
water - bay	-	✓	-	
sediment - bay	ND	ND	ND	
biota - bay	ND	ND	ND	
Penetang/Midland				
water	✓	✓	✓	
sediment	ND	ND	ND	
biota	-	-	-	
Spanish River				
water	ND	ND	ND	
sediment	ND	ND	ND	
biota	ND	ND	ND	
Collingwood				
water	ND	ND	ND	RAP
sediment	ND	ND	ND	being
biota	ND	ND	ND	developed

- Done, but did not meet Plan requirements.
✓ Met all Plan requirements.
ND Not done.
* Not defined in Plan but other work done.

ACTIVITY SUMMARY 1985 - LAKE HURON

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
ATMOSPHERE	Env. Can.	Four stations for major ions/ metals; two stations for contaminants. Samples taken monthly (except contaminants in winter).	Four stations for conventionals and metals (monthly sampling). One station for contaminants (biweekly)-even in winter.
	EPA	Six stations for metals/nutrients ("wet only").	Five stations sampled.
TRIBUTARIES - water	MDNR	Saginaw R.	Joint project, both the Saginaw R. & three tributaries - Rifle, AuGres & Pigeon were sampled monthly. MDNR also sampled the Kawkawlin & Pine R.
	EPA	Saginaw R. high flow/nutrient study.	
- biota	MDNR/EPA	AuSable R., Tawas R., coho salmon to be sampled.	Done as planned.
- water	Ont. MOE	All tributaries as required in Plan.	All done as planned.
- sediments	Ont. MOE	Bottom and suspended at all tributaries.	All done as planned.
POINT SOURCES (including CSOs)	Ont. MOE	Only one point source, Eldorado (Blind River)	Not done. Note Ontario Hydro conducted self-monitoring at Bruce Nuclear.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
NEARSHORE			
1) Algae	DFO	Examination of effects of metals on aquatic communities in nearshore of Georgian Bay. Adenylate energy charge used as a health indicator.	Samples collected and algal productivity determined.
2) Clams			
3) Shiners	Ont. MOE	Collected at three locations for contaminants.	Samples collected and partly analyzed (note at Collingwood results inconclusive due to small sample size.)
	MNDR	Saginaw River, Saginaw Bay.	Samples collected.
4) Fish	DFO	Fish collections from Mclennans Ck. for examination of tumors. Examination of effects of metals, on walleye in nearshore Georgian Bay.	Fish analyzed for tumors and skeletal anomalies. Samples were collected and results were summarized.
	OMNR	Index fishing at three sites.	Nearshore index fishing completed.
		Larval fish sampling at one site to estimate yearclass strength.	Larval fish sampling completed.
	ONT. MOE	Sport fish.	Program carried out as planned.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
NEARSHORE			
5) Sediments			
6) Zooplankton	DFO	Weekly zooplankton collections from five sites and correlation of abundance with fish production.	Zooplankton samples collected and habitat enumeration completed, larval fishing completed.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
OPEN LAKE			
1) Water	Env. Canada	Spring and summer cruises of sampling stations in Plan for major ions, nutrients, and metals. Planned installation of Sarnia intake sampling station.	Spring and summer cruises, sampling 91 stations, completed. Collected samples for trace metals at 24 stations. Sarnia intake initiated.
	EPA	Three open lake surveys, two winter surveys chemistry, i.e. nutrients, major ions.	Three open lake surveys conducted.
2) Sediments	Env. Canada	No work planned.	No work done.
3) Biota	EPA/U.S. FWS EPA-GLNPO	Lake trout/smelt to be sampled from Bayport and analyzed for contaminants, open lake phyto-plankton and zooplankton.	Sampling completed.
	DFO	Lake trout from North Channel, splake and smelt from S. Georgian Bay, walleye/smelt from French River for contaminants analyses.	Sampling complete, data will be available in 1986 (September).
		Sculpins at sites for fin ray asymmetry, (Meaford, Blind River).	Sampling complete for -Georgian Bay - North Channel.
		Pontoporeia from Goderich, Southampton, North Channel, for contaminants analysis.	Sampling completed at all sites, data available in 1986 (September).

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
OPEN LAKE			
	CWS	Herring gull eggs and population parameters at four sites.	Completed as planned.
	OMNR	Commercial fisheries assessed at 25 assessment areas.	Commercial sampling completed.
		Index fishing at three sites.	Index fishing completed.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
AREAS OF CONCERN			
1) Saginaw R.	MDNR	Shiners to be sampled and analyzed for contaminants.	Sampling completed.
	EPA/MDNR	River sampled for water chemistry during high flow.	Completed, including other tributaries (see tribs).
2) Saginaw Bay			
a) Water		No work planned, yet to be scheduled.	
b) Sediment		No work planned, yet to be scheduled.	
c) Fish	MDNR	Shiners to be sampled at two stations and analyzed for contaminants.	Sampling completed.
d) Intakes		Daily odour monitoring.	Sampling completed.
3) Penetang-Midland Sturgeon Bay			
a) Water	Ont. MOE	Biweekly from May-September at 17 stations for nutrient and major ions.	Carried out, in addition some water exchange work conducted, eight current meters to measure flow in Severn Sound area and Georgian Bay.
b) Sediment		No work planned, yet to be scheduled.	

ACTIVITY SUMMARY 1986 - LAKE HURON

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY
ATMOSPHERE	Env. Can.	Four sites monitored for conventionals and trace metals monthly. One site monitoring for contaminants biweekly.
	EPA	Three stations for metals/nutrients (wet only).
TRIBUTARIES - water	MDNR	Saginaw River. Four Saginaw Bay tributaries (Kawkawlin, Rifle, AuGres, Pigeon). Monthly monitoring for all parameters except F, five metals.
	EPA	Saginaw Bay nutrient study.
	MDNR	Monthly tributary mouth and urban area sampling for conventionals and metals in Saginaw River & Saginaw Bay tribs, vis Kawkawlin, Rifle, AuGres and Pigeon.
	MOE	As required in Plan.
- sediments	MOE	Bottom and suspended in all tribs for metals, nutrients and trace contaminants.
POINT SOURCES (including CSOs)	MDNR	Will send proposed point source studies on the Saginaw River basin for 1986.
		Kelsey Hayes, Marlette WWTP, Hercules, Sandusky WWTP, Peck WWTP Lagoon, Yale Rubber, Frankenmuth WWTP, GMC Bay City.
	MOE	Bruce Nuclear (more info being obtained).

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY
NEARSHORE		
1) Algae	MOE	Intake program (three intakes Goderich, Grand Bend, Sarnia) weekly samples for phytoplankton, chlorophyll, nutrients and major ions.
2) Clams	DFO	Effects of heavy metal pollution in natural phytoplankton communities, determined by production and adenylate energy charge estimates.
3) Shiners	MDNR	50 young-of-the-year spottail shiner collections at Saginaw Bay near Port Austin, Bay Port and Saginaw River mouth.
	MOE	Young-of-the-year spottails from five sites in Georgian Bay and four sites in Lake Huron (one on U.S. shore) for organochlorines and metals.
4) Fish	MDNR	Coho salmon collections at the mouth of the Tawas River. Fish contaminant work will be performed by newly created fish contaminant program staff in selected areas of Lake Huron-Saginaw Bay area. The locations are to be determined and will be forwarded to T. Reynoldson.
	MOE	Sport fish for three sites in Lake Huron, one site in Georgian Bay for Hg and organics (pesticides and some dioxins.
5) Sediments	DFO	Effects of heavy metal pollution on fish and fish populations from five sites.
6) Zooplankton	DFO	Weekly collections of zooplankton at five sites on Lake Huron to determine the abundance and distribution of zooplankton and their relationship with larval fish production.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY
NEARSHORE		
	OMNR	Larval fish survey at one site on Lake Huron to determine first estimates of yearclass strength. Index fishing at three sites to determine changes in population parameters and model Lake Huron fish communities.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY
OPEN LAKE		
1) Water	EPA-GLNPO	Spring and summer survey. Ten sites per run. Two runs per survey.
	GLNPO/U of M	Evaluation of 1980 Port Huron water intake data. Chemistry nutrients and metals.
	Env. Can.	One spring and one summer cruise, sampling 91 stations for nutrients, conventionals. Twenty-five stations to be sampled (66L) for oc's, PCBs, CBs; five stations for alkyl lead, benzo-a-pyrene. No metals. Sarnia intake sampling station to be completed and sampling to begin in mid-summer for conventionals, metals, and organics biweekly.
2) Sediments	Env. Can.	None planned.
3) Biota	DFO	Monitoring contaminant levels in lake trout and smelt from Point Edward. Analysis will include oc's, PCBs, and metals. Ten per cent of the sample will be analyzed for toxaphene and TCDD/TCDF.
		Smelt and sculpins from four sites will be analyzed for fin ray asymmetry, collagen, hydroxyproline, and vertebrae strength.
	OMNR	Analysis of commercial fisheries to determine the composition, abundance, and distribution of Lake Huron fish stocks from the 25 commercial fisheries assessment areas.
		Index fishing at three sites to determine changes in population parameters and model Lake Huron fish communities.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY
OPEN LAKE		
	EPA-GLNPO	Spring and summer survey. Primary productivity studies. Species identification for zooplankton and phytoplankton.
		Lake trout/smelt off Alpena and coho fillets from Tawas R. analyzed for PCB, pesticides.
	CWS	Herring gull eggs and population parameters at four sites.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY
AREAS OF CONCERN	MDNR	Development of RAP in the Saginaw Bay and River in 1987. Nothing for 1986.
	MOE	Penetang Bay, etc. Water biweekly May-Sept. 17 sites major ions/nutrients. Phytoplankton biweekly May-Sept. 17 sites species & chloro. Collingwood As per remedial action plan. Spanish R. No field work RAP in prep.

4.0 LAKE ERIE

4.1 INTRODUCTION

The Surveillance Work Group and the Lake Erie Task Force have recently completed a major revision of the Great Lakes International Surveillance Plan for Lake Erie. It is the intent of the Lake Erie Task Force to provide the Water Quality Board, through the Surveillance Work Group, a periodic state of the lake report similar to the IJC report published in 1985. Additionally, the Task Force will provide input on a biennial basis for the Surveillance Work Group Appendix B. These reports will attempt to provide an interpretation of the quality of the ecosystem and identify either improving or deteriorating trends in any of the sampled components proposed in the Lake Erie Surveillance and Monitoring Plan. Annually, the Task Force will provide the Water Quality Board with a progress report including the identification of portions of the Plan that were either completed or not completed along with future projections for Plan implementation. The present inventory provides an indication of what components of the Plan were conducted in 1985 (Table 1A) and attempts to identify those components that were not in place in 1986 (Table 1B). It is hoped that this information will be of value to agencies that will be cooperating in the monitoring and surveillance of the Great Lakes.

Atmosphere

1985

The Great Lakes Atmospheric Deposition (GLAD) Network, operated by GLNPO, included eight sampling stations in the Lake Erie Basin. Weekly samples of wet precipitation were collected and analyzed for 18 conventional parameters plus heavy metals. No analyses were made for organic contaminants. The Canadian Atmospheric Network operated by IWD-DOE included two sampling stations in the Lake Erie Basin. Wet deposition collections are analyzed for conventional and heavy metals at both stations and for organics at one station.

A review of the GLAD Network with the objective of incorporating appropriate technology for the analysis of organic constituents was initiated. The grantee began a comparative study of several organic samplers, and an analysis of siting locations. A workshop was convened in the autumn of 1985 to discuss the reorganization of the GLAD Network. A report is expected in 1986.

1986

The GLAD network will be reduced to four stations in 1986. All other program components will remain unchanged.

Tributaries

1985

Loading

The Raisin, Maumee, Sandusky and Cuyahoga Rivers were enhanced monitored for all proposed parameters including bioavailable phosphorus fractions and pesticides at the recommended frequency. The Grand River, Ontario was enhanced sampled for all parameters except pesticides/herbicides. The Huron and Grand Rivers, Ohio were not enhanced sampled.

Water Quality

Monthly sampling occurred at two Michigan rivers, 12 Ohio rivers, one New York river and seven Ontario rivers for a variety of parameters. All of the recommended rivers were sampled but not in accordance with the proposed protocol. Fish were collected and analyzed for a variety of parameters at several rivers in Ohio, Pennsylvania, New York, and Ontario under the auspices of that jurisdictional human health programs. No sediments were taken.

1986

Loading

The Grand (Ontario), Raisin, Maumee, Sandusky, and Cuyahoga will be enhanced monitored for all proposed conventional parameters and pesticides except no pesticides measured on the Grand River (Ontario). There are no plans to event monitor the Huron and Grand Rivers (Ohio).

Water Quality

Plans to sample the 12 proposed rivers is not in accordance with the proposed protocol.

Point Sources

1985

Under the NPDES program all permitted dischargers reported to the appropriate United States jurisdiction monthly, quarterly, and yearly concentrations and loadings of permit specific parameters. All STPs larger than 1 MGD were monitored for compliance with the 1 µg/L TP requirement. Did not meet plan requirements.

1986

Under the NPDES program all permitted dischargers will report to the appropriate United States jurisdiction monthly, quarterly, and yearly concentrations and loadings of permit specific parameters. All STPs larger than 1 MGD will be monitored for compliance with the 1 µg/L TP requirement. Will not meet plan requirements.

Open Lake

Water

1985

GLNPO and CLEAR conducted general limnological surveys of the open waters of Lake Erie in 1985. Stations sampled included three in the western basin in addition to the central basin, and eastern basin collections. All of the conventional parameters specified in the Lake Erie Plan were measured. In addition, samples for phytoplankton and zooplankton community structure were obtained.

Crews aboard the R/V Simons (U.S. EPA), CSS Limnos (EC), and R/V Hydra (OSU) participated in a intercomparison program of sampling water from the same station on Lake Erie on the same day, exchanging water samples, and analyzing all samples for selected water quality parameters. Results will be reported in 1986.

1986

GLNPO will fund the surveillance of Lake Erie for all stations, parameters, and frequency called for in the Plan. GLNPO will also continue its Open Lake Surveillance Program with cruises during April, August and November to the stations specified in the Plan, plus three additional ones in the western basin. All parameters as specified in the Plan except TSS, POC, and PON will be done. Samples for phytoplankton and zooplankton community structure will also be obtained.

Fish Contaminants

1985

Walleye and smelt were collected off Erie, PA (eastern basin) by the U.S. Fish and Wildlife Service. The samples were analyzed by U.S. EPA as whole fish, five-fish composite samples. Coho salmon were collected (1980-present) during the fall run from Detroit, Chagrin, Huron, and Trout Run tributaries. The fillets were analyzed by FDA, Minneapolis for over 30 organochlorine pesticides and PCBs. Samples have been analyzed for fish collected through 1984.

Walleye and smelt were collected from near Middle Island (western basin) and Port Dover (eastern basin) in 1985. The samples were analyzed as single aged, whole fish. Analysis of pesticides, exotic organics, and metals are made by the Ontario Ministry of Agriculture and Food, Department of Fisheries and Oceans and National Water Quality Laboratories, respectively. As a special program, coho are collected by DFO from the western basin and coho and lake trout are collected from the eastern basin.

1986

Walleye and smelt will be collected from near South Bass Island (western basin) by the U.S. FWS and near Port Dover and Middle Island by the Ontario Ministry of Natural Resources. Analysis will be performed by the labs

identified in the preceding section. Coho and lake trout will be collected from the sample areas as described in the preceding section.

Herring Gulls

1985

All samples were collected and analyzed in accordance with the proposed protocol.

1986

All samples will be collected and analyzed in accordance with the proposed protocol.

Nearshore

Water Intakes

1985

OMOE performed collections and analysis from five water intakes in accordance with the plan proposal. U.S. intakes were sampled but not in accordance with plan proposed. No work done on pilot study.

1986

OMOE expects to continue sampling in accordance with the plan. U.S. intakes will probably not be sampled in accordance with the plan; implementation of the pilot study is under review.

Spottail Shiners

1985

OMOE collected fish from five sites according to the proposed schedule. Michigan collected specimens from Monroe State Park which is near the Raisin River. No other collections were made.

1986

OMOE plans collections at eight sites which exceeds the plan proposal. Collections are anticipated at Raisin, Maumee, Cuyahoga, and Ashtabula Rivers.

Areas of Concern

1985

A report from the Raisin River (Michigan) intensive study by EPA-LLRS was initiated. The final report is expected in 1986. Final water quality report was completed for the Black River (Ohio). Ohio EPA began working on remedial action plans for the Black and Cuyahoga Rivers. Field studies in the Cuyahoga continued.

1986

Remedial action plans for the Ashtabula, Raisin, Black, Cuyahoga Rivers, and Wheatley Harbour are expected. Field work expected in the Maumee River.

TABLE 1A

LAKE ERIE LEVEL OF ACHIEVEMENT
IN RELATION TO PROPOSED PLAN FOR PREVIOUS YEAR (1985)

	FREQUENCY	SITES	PARAMETERS
Atmosphere - water (precipitation)	*	*	*
- air	*	*	*
Tributaries - loading	✓	–	–
- water	–	–	–
- sediment	ND	ND	ND
- biota	–	–	ND
Point Sources - water	*	*	*
Open Lake - water	✓	+	–
- sediment	–	–	–
- biota - structure	*	*	*
- contaminants	✓	✓	–
- fish production	*	*	*
Nearshore - water intakes			
a) conventional	–	–	–
b) contaminants	ND	ND	ND
c) plankton	–	–	–
- Cladophora	ND	ND	ND
- shiners	–	–	–
Areas of Concern			
Raisin River - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND
Maumee - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND
Black River - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND
Cuyhoga River - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND

Table 1A - cont'd.

	FREQUENCY	SITES	PARAMETERS
Ashtabula River - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND
Wheatley Harbour - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND

\- Done, but did not meet Plan requirements.
✓ Met all Plan requirements.
\+ Exceeded Plan requirements.
ND Not done.
* Not defined in Plan but other work done.

TABLE 1B

LAKE ERIE LEVEL OF COMMITMENT
IN RELATION TO PROPOSED PLAN FOR PREVIOUS YEAR (1985)

	FREQUENCY	SITES	PARAMETERS
Atmosphere - water	*	*	*
- air	*	*	*
Tributaries - loading	✓	-	-
- water	-	-	-
- sediment	ND	ND	ND
- biota	-	-	ND
Point Sources - water	*	*	*
Open Lake - water	+	+	+
- sediment	✓	✓	✓
- biota - structure	*	*	*
- contaminants	-	-	-
- fish production	*	*	*
Nearshore - water intakes			
a) conventional	-	-	-
b) contaminants	ND	ND	ND
c) plankton	-	-	-
- Cladophora	ND	ND	ND
- shiners	-	-	-
Areas of Concern			
Raisin River - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND
Maumee - water	-	-	-
- sediment	ND	ND	ND
- biota	ND	ND	ND
Black River - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND
Cuyhoga River - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND

Table 1B - cont'd.

	FREQUENCY	SITES	PARAMETERS
Ashtabula River - water	ND	ND	ND
- sediment	ND	ND	ND
- biota	ND	ND	ND
Wheatley Harbour - water	ND	ND	ND
- sediment	-	-	-
- biota	ND	ND	ND

\- Expected, but will not meet Plan requirements.
✓ Will meet all Plan requirements.
\+ Will exceed Plan requirements.
ND Expected or will not be done.
* Not defined in Plan but some work expected.

APPENDIX 1
ACTIVITY SUMMARY 1985 - LAKE ERIE

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
ATMOSPHERE	U.S. EPA-GLNPO IWD-DOE	Continue present GLAD and GLP network; review goals and objectives; evaluate collection methods; review siting locations; evaluate models; redesign and implement new network, including organics.	Existing network included (GLAD) collections in Ohio at Oregon (Toledo), Lorain, Fairport Harbor, Conneaut, and South Bass Island and in PA at Erie and in NY at Silver Creek and Grand Is. by GLNPO, and in Ontario (GLP) by IWD at Pelee Pt. and Long Point. U.S. analyses for nutrients and metals (no organics) from weekly wet precipitation collectors. GLNPO funded study and list of collector designs and equipment selection for sampling organics. GLNPO sponsored workshop for redesigning GLAD network to emphasize organic constituents in precipitation. Canadian analyses for organics from one solvent sampler and one resin sampler collected at two to four weeks intervals in water for nutrients, major ions, and metals from two wet samplers collected monthly.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
TRIBUTARIES LOADING water only	Ont. MOE	Grand River enhanced.	
	Mich. DNR	Raisin River enhanced.	
	Ohio EPA	Maumee River enhanced. Sandusky River enhanced. Huron River enhanced. Cuyahoga River enhanced. Grand River enhanced.	Enhanced activity completed for all recommended rivers, except Huron and Grand Rivers, Ohio. U.S. rivers measured for pesticides.
	Penn. DER	N/A	
	NY DEC	N/A	
WATER QUALITY -multiple parameters water, sediment & fish		Collection of monthly water samples, biannual sediment samples and annual fish samples at river mouth for conventional and contaminant analyses.	
	Mich. DNR	Huron River.	Enhanced high flow for nutrients and suspended sediments, no fish or sediments.
	Ohio EPA	Ottawa River. Portage River. Sandusky Bay. Huron River. Vermilion River. Rocky River. Chagrin River. Grand River. Conneaut River.	Excluding the Ottawa River, all Ohio rivers were sampled monthly for all water quality parameters, however, the stations were located upstream of the recommended sampling site. No sediments were taken. Fish samples were collected

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
			at the Portage, Vermilion, and Ottawa Rivers for priority pollutant scans.
	Penn. DER	N/A	
	NY DEC	N/A	
	Ont. MOE	Kettle Creek. Nanticoke. Grand River.	Monthly collections made (or attempted) at these and five additional rivers. No sediments or fish taken.
POINT SOURCES -Conventional Parameters	All jurisdictions	Evaluate procedures for TP analysis, QA, reporting and loading estimates along with standard errors for all point direct point sources and estimate TP loading from direct bypass systems.	Point source inventory of discharges maintained. Monthly reports of top 40 STPs for P and most major industrial effluents entered into point source data base in STORET. Ontario data entered into STORET (or nearly so).
Contaminants	All jurisdictions	Process inventory and effluent characterization of industrial point sources to calculate relative toxic contribution, verify permit compliance, analyze direct STP and bypass effluents and sludge for nine contaminants.	The majority of the planned activities remained incomplete.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
OPEN LAKE			
1) Water	U.S. EPA-GLNPO	Eight central basin cruises at 10 stations and five eastern basin cruises at four stations for selected conventional physical/chemical parameters along vertical profile.	All collections made with some additional parameters and stations sampled including phyto- and zooplankton community structure. Western basin sampled three times at three stations at reduced parameters. Intercomparisons studied completed between R.V.s Hydra, Limnos and Simons report expected in 1986.
2) Sediments	NOAA or NWRI	Cores in August from one station in western basin and central basin every five years and one station in eastern basin every three years for selected radionuclides. Major elements, organics and metals, nutrients, zoobenthos plus integrating trap annually.	Sediment samples taken by NWRI in western basin and central basin. Sediment traps deployed/recovered.
3) Contaminants in Biota a)Fish	U.S. EPA-GLNPO GLFRB-DFO	Annual September collections of walleye and smelt at two stations/country for selected list of organics & metals.	Canadian sites complete with additional central and eastern basin sites collected for coho and lake trout; U.S. collecting sites on alternate year basis with additional sites collected for coho.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
b)Herring Gulls	Cdn. WS	Collect gull eggs from two locations and analyze for select organics and organo-metals.	All sites done.
4) Physics	NOAA or NWRI	No sampling defined in Plan.	No work done.
NEARSHORE			
1) Water Intakes		Collect water samples weekly for selected conventional parameters and phyto-zooplankton. Monthly for metals and biannual for organics.	
	Ont. MOE	Dunnville, Elgin, Blenheim, Roseville and Union intakes.	Analysis done at five sites (Roseville added) for all parameters and frequency including phytoplankton. Eastern basin nearshore transects completed.
	Mich. DNR	Monroe intake.	One intake monitored daily for bacteria and conventional parameters by the city of Monroe. No monitoring for listed parameters.
	Ohio EPA	Oregon, Sandusky, Crown, Mentor, Ashtabula intakes.	Monthly sampling at five sites, not all parameters measured.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
	Penn. DER	Erie intake.	One intake monitored quarterly. Not all parameters measured.
	NY DEC	Dunkirk and Buffalo intakes.	
2) Spottail Shiners	All jurisdictions	August collections of YOYs for selected organics and metals on variable schedule at 15 locations.	
	Ont. MOE	Thunder Bay, Grand River, Port Stanley, Nanticoke Creek, Centre Creek, Wheatley Harbour, Point Pelee and Big Creek.	Collections made at five sites, not all parameters measured.
	Mich. DNR	Monroe Harbor	Collections made at Sterling State Park and Lake Erie State Park.
	Ohio EPA	Toledo Harbor, Camp Perry/Crane Creek (lakeshore), Lorain Harbor, Cleveland Harbor, Ashtabula Harbor.	No collections made.
	Penn. DER	Presque Ile (lakeshore)	No collections made.
	NY DEC	Dunkirk (lakeshore)	No collections made.
AREAS OF CONCERN		See Areas of Concern Workshop recommendations.	GLNPO funded contractor to provide assistance in developing AoC remedial action plans. Major workshop held at Burlington, Ontario, results expected in 1986.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
	U.S. EPA-LLRS Mich. DNR	Raisin River.	Intensive field survey results analyzed; report expected 1986.
	U.S. EPA-GLNPO Ohio EPA	Maumee River.	No work done.
	U.S. EPA-GLNPO Ohio EPA	Black River.	Final comprehensive water quality report completed for Black River.
	U.S. EPA-GLNPO Ohio EPA	Cuyahoga River.	Field studies initiated.
	U.S. EPA-GLNPO Ohio EPA	Ashtabula.	No work done.
	DOE-EPS Ont. MOE	Wheatley Harbour.	No work done.
HUMAN HEALTH 1) Beaches	All jurisdictions	Inventory current standards, sampling methodologies and test organisms. Review data analysis procedures and reporting methods.	Multiple agency testing for select parameters.
2) Nearshore Resident Fish Species	All jurisdictions	Inventory current standards, sampling methodologies and test organisms. Review data analysis procedures and reporting methods.	Multiple agency testing for select parameters.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
3) Drinking Water	All jurisdictions	Inventory current standards, sampling methodologies and test organisms. Review data analysis procedures and reporting methods.	Multiple agency testing for select parameters.
RESEARCH ACTIVITIES/ SPECIAL STUDIES			
Open Lake Water			
1) Western Basin Data analysis	U.S. EPA-GLNPO	Evaluate historical water quality data from western basin to develop spatial and temporal sampling design.	Binational evaluation of water quality data base initiated, completion expected in 1986.
2) Sediment Resuspension	NWRI-DOE	Calculate influence of sediment resuspension on open lake total P and contaminant concentrations.	Phosphorus bioavailability studied on cores for central basin.
3) Sediment Oxygen Demand	NWRI-DOE	Calculate rates of sediment O_2 demand for process and trend evaluation.	O_2 dynamics of the east and central basin meso- and hypolimnion studied by NWRI.
4) Metals	U.S. EPA-GLNPO	Evaluate procedures for metal analysis and perform three seasonal collections at one station in central basin and eastern basin.	No work completed.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
Nearshore			
5) Embayment Studies	DOC-NOAA DOE-NWRI	Extent and significance of pollutant processing within embayments, river mouth and nearshore zone.	Five sediment traps and current meters were installed to measure transport of phosphorus out of Sandusky Bay. Four research cruises were conducted by NWRI to study fluxes of nutrients and metals out of bottom sediments using *in situ* dialysis samplers. NWRI studied immediate bioavailability of phosphorus in Grand River, Ont. sediments by 32^P techniques.
6) Tributary Load Model		Assess direct loading from tributary mouth actually delivered to lake.	No work done.
7) Connecting Channels Loading		Devise appropriate methodologies for estimating nutrient and contaminant loadings to Lake Erie from the Detroit River.	No work done.
8) *Cladophora*		Evaluate distribution and abundance of *Cladophora* in nearshore area.	No work done.

APPENDIX 1 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	COMPLETED SAMPLING ANALYSIS REPORT
		Evaluate utility of *Cladophora* as indicator of metal/organic contaminant trends.	No work done.
9) Areas of Concern		Assess status of data base for developing RAP.	See nearshore section.

APPENDIX 2
ACTIVITY SUMMARY 1986 - LAKE ERIE

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY		ANTICIPATED SAMPLING ANALYSIS REPORT
ATMOSPHERE	U.S. EPA/GLNPO IWD/DOE	Continue present GLAD and GLP network; review goals and objectives; evaluate collection methods; review siting locations; evaluate models; redesign and implement new network, including organics.		GLNPO will operate four stations (South Bass, Fairport, Erie, Grand Island) for nutrients and metals (no organics) from wet precipitation collectors. GLNPO will continue to fund study and test collector designs and equipment selection for organic sampling. Report for redesigning GLAD network expected. IWD will operate two stations as in the past.
TRIBUTARIES Loading	Ont. MOE	Grand River	Enhanced	Sampling will be done for nutrients, not for pesticides.
	Mich. DNR	Raisin River	Enhanced	Sampling will be done for all parameters.
	Ohio EPA	Maumee River	Enhanced	Sampling will be done for all recommended rivers, and parameters except Huron and Grand Rivers, Ohio. Sampling is performed by Heidelberg College Water Quality Laboratory under contract to GLNPO.
		Sandusky River	Enhanced	
		Huron River	Enhanced	
		Cuyahoga River	Enhanced	
		Grand River	Enhanced	
	Penn. DER	N/A		

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ANTICIPATED SAMPLING ANALYSIS REPORT
	NY DEC	N/A	
WATER QUALITY -multiple parameters water, sediments & fish		Collection of monthly water samples, biannual sediment samples and annual fish samples at river mouth for conventional and contaminant analyses.	
	Mich. DNR	Huron River.	Monthly for conventional parameters.
	Ohio EPA	Ottawa River. Portage River. Sandusky River. Huron River. Vermilion River. Rocky River. Chagrin River. Grand River. Conneaut River.	No sampling on Ottawa River expected. Sampling on other rivers expected. No sediments or fish from Sandusky, Huron and Rocky Rivers.
	Penn. DER	N/A	
	NY DEC	N/A	
	Ont. MOE	Kettle Creek. Nanticoke. Grand River.	Sampling expected for the three listed rivers, plus Big Otter, Cunard, Catfish, Big Creek and Lynn River. No sediments or fish expected.

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ANTICIPATED SAMPLING ANALYSIS REPORT
POINT SOURCES -Conventional Parameters	All jurisdictions	Evaluate procedures for TP analysis, QA, reporting and loading estimates along with standard errors for all point direct point sources and estimate TP loading from direct bypass systems.	No work expected.
Contaminants	All jurisdictions	Process inventory and effluent characterization of industrial point sources to calculate relative contribution and verify permit compliance and analyze direct STP and bypass effluents and sludge for nine contaminants.	Status quo.
OPEN LAKE			
1) Water	U.S. EPA-GLNPO	Eight central basin cruises at 10 stations and five eastern basin cruises at four stations for selected conventional physical/chemical parameters along vertical profile.	GLNPO will fund Ohio State Univ. to fully implement surveillance program as recommended. Western basin will be sampled at five stations in two surveys. Primary production parameters to be measured. Report on intercomparison study expected to be issued.

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ANTICIPATED SAMPLING ANALYSIS REPORT
2) Sediments	NOAA or NWRI	Cores in August from one station in western basin and central basin every five years and one station in eastern basin every three years for selected radionuclides. Major elements, organics and metals, nutrients, zoobenthos plus integrating trap annually.	Winter traps in central basin deployed in 1985 will be collected. Summer traps will be deployed in all three basins according to Plan.
3) Contaminants in Biota a)Fish	U.S. EPA-GLNPO GLFRB-DFO	Annual September collections of walleye and smelt at two stations/country for selected list of organics & metals.	Canadian sites will be completed with additional central and eastern basin sites collected for coho and lake trout; U.S. collecting sites on alternate year basis with additional sites collected for coho.
b)Herring Gulls	Cdn. WS	Collect gull eggs from two locations and analyze for select organics and organometals.	All sites will be sampled.
4) Physics	NOAA or NWRI	No sampling defined in Plan.	One current meter to be located with sediment traps.
NEARSHORE			
1) Water Intakes		Collect water samples weekly for selected conventional parameters and phyto-zooplankton. Monthly for metals and biannual for organics.	GLNPO anticipating funds to inventory three Ohio intakes for suitability as monitoring sites (subject to available funding).

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ANTICIPATED SAMPLING ANALYSIS REPORT
	Ont. MOE	Dunnville, Elgin, Blenheim, and Union intakes.	Analysis will be done at five sites (Roseville added) for all parameters and frequency including phyto-plankton.
	Mich. DNR	Monroe intake.	Intake will be monitored daily for bacteria and conventional parameters by the city of Monroe. No monitoring for listed parameters.
	Ohio EPA	Oregon, Sandusky, Crown, Mentor, Ashtabula intakes.	Monthly sampling at five intakes expected; not all parameters measured, and no organics.
	Penn. DER	Erie intake.	One intake will be monitored quarterly. Not all parameters measured.
	NY DEC	Dunkirk and Buffalo intakes.	
2) Spottail Shiners	All jurisdictions	August collections of YOYs for selected organics and metals on variable schedule at 15 locations.	
	Ont. MOE	Thunder Bay, Grand River, Port Stanley, Nanticoke Creek, Centre Creek, Wheatley Harbour, Point Pelee and Big Creek.	Collections will be made at all eight sites, not all parameters will be measured.

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ANTICIPATED SAMPLING ANALYSIS REPORT
	Mich. DNR	Monroe Harbor	Collections anticipated at Sterling State Park and Raisin River (Monroe Harbor).
	Ohio EPA	Toledo Harbor, Camp Perry/Crane Creek (lakeshore), Lorain Harbor, Cleveland Harbor, Ashtabula Harbor.	Collections anticipated at Maumee, Cuyhoga and Ashtabula Rivers.
	Penn. DER	Presque Ile (lakeshore)	No collections anticipated.
	NY DEC	Dunkirk (lakeshore)	No collections anticipated.
AREAS OF CONCERN		See Areas of Concern Workshop recommendations.	U.S. EPA Region V contemplating a harbor sediment sampling for PAHs; harbor and tributary mouth adult fish scans summary. Report from 1980/84 collection expected.
	U.S. EPA-LLRS Mich. DNR	Raisin River.	Data analysis and synthesis completed. Report expected.
	U.S. EPA-GLNPO Ohio EPA	Maumee River.	Field work tentatively scheduled.
	U.S. EPA-GLNPO Ohio EPA	Black River.	Remedial action plan expected.

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ANTICIPATED SAMPLING ANALYSIS REPORT
	U.S. EPA-GLNPO Ohio EPA	Cuyahoga River.	No work expected.
	U.S. EPA-GLNPO Ohio EPA	Ashtabula.	Remedial action plan expected.
	DOE-EPS Ont. MOE	Wheatley Harbour.	In-place pollutants program scheduled. EPS is scheduled to sample surficial sediments, water quality and benthos.
HUMAN HEALTH			
1) Beaches	All jurisdictions	Inventory current standards, sampling methodologies and test organisms. Review data analysis procedures and reporting methods.	Multiple agency testing for select parameters.
2) Nearshore Resident Fish Species	All jurisdictions	Inventory current standards, sampling methodologies and test organisms. Review data analysis procedures and reporting methods.	Multiple agency testing for select parameters.
3) Drinking Water	All jurisdictions	Inventory current standards, sampling methodologies and test organisms. Review data analysis procedures and reporting methods.	Multiple agency testing for select parameters.

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ANTICIPATED SAMPLING ANALYSIS REPORT
RESEARCH ACTIVITIES/ SPECIAL STUDIES			
Open Lake Water			
1) Western Basin Data analysis	U.S. EPA-GLNPO	Evaluate historical water quality data from western basin to develop spatial and temporal sampling design.	Evaluation of western basin data continued; preliminary report expected.
2) Sediment Resuspension	NWRI-DOE	Calculate influence of sediment resuspension on open lake total P.V. concentrations and contaminant.	
3) Sediment Oxygen Demand	NWRI-DOE	Calculate rates of sediment O_2 demand for process and trend evaluation.	
4) Metals	U.S. EPA-GLNPO	Evaluate procedures for metal analysis and perform three seasonal collections at one station in central basin and eastern basin.	
Nearshore			
5) Embayment Studies	DOC-NOAA Ohio Sea Grant DOE-NWRI	Extent and significance of pollutant processing within embayments, river mouth and nearshore zone.	NWRI to continue Sandusky Bay and Grand River, Ont. studies.

APPENDIX 2 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ANTICIPATED SAMPLING ANALYSIS REPORT
6) Tributary Load Model		Assess direct loading from tributary mouth actually delivered to lake.	No work anticipated.
7) Connecting Channels Loading		Devise appropriate methodologies for estimating nutrient and contaminant loadings to Lake Erie from the Detroit River.	NWRI will study sediment movement between Lake Huron and Lake Erie to characterize contaminant differences in the connecting channels.
8) Cladophora		Evaluate distribution and abundance of Cladophora in nearshore area.	No work anticipated.
		Evaluate utility of Cladophora as indicator of metal/organic contaminant trends.	No work anticipated.
9) Areas of Concern		Assess status of data base for developing RAP.	RAP evaluation expected for all six A of C.

5.0 NIAGARA RIVER

5.1 ANNUAL INVENTORY REPORT

This annual inventory describes the extent to which the Niagara River Surveillance Plan was implemented during 1985 and the extent to which implementation is expected during 1986. This report does not present any data but, rather, serves as a tracking mechanism for the implementation of this component of the Great Lakes International Surveillance Plan (GLISP). This report also allows the Niagara & St. Lawrence Rivers Task Force to establish what data are, or will be available for inclusion in a detailed status report describing the ecosystem quality of the river, in conformance with the requirements of the 1978 Great Lakes Water Quality Agreement.

Table 1 summarizes the level of achievement in relation to GLISP for 1985, and Table 2 summarizes the anticipated level of achievement for 1986. Table 3 summarizes surveillance and monitoring activities for 1985, and Table 4 summarizes anticipated activities for 1986. The tables indicate that, during 1985, several components of the Niagara River Surveillance Plan were either not undertaken or not undertaken to the extent called for in the Plan. The anticipated level of activity for 1986 will be similar to that for 1985. Those activities that will be conducted generally will not fully meet the requirements as conceived in the Plan. However, this may change to some extent, in response to discussions which will be held among the jurisdictions regarding the implementation of this Plan. More likely, however, these discussions will result in changes for the 1987 field year.

TABLE 1

LEVEL OF ACHIEVEMENT
IN RELATION TO SURVEILLANCE PLAN FOR 1985

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
INPUTS			
3. Municipal & Industrial	*	*	*
4. Storm Water Discharges & Combined Sewer Overflows	*	*	*
5. Tributaries:			
- Sediment and Water	-	-	-
6. Groundwater	-	-	-
IMPACTS			
8. Chemical Constituents in Water:			
- NOTL/FE	✓	✓	✓
- Survey Ranges	ND	ND	ND
- Intakes	ND	ND	ND
9. Chemical Constituents in Sediment:			
- Suspended Sediment	✓	✓	✓
- Power Co. Reserviors	ND	ND	ND
- Navigation Channel-Cdn.	ND	ND	ND
- Dredging - U.S.	-	-	-
- Niagara River Bar	ND	ND	ND
10. Chemical Constituents in Fish			
11. Chemical Constituents in Other Aquatic Biota	✓	✓	✓
- Cladophora	*	*	*
13. Acute Toxicity	✓	✓	✓
14. Bacteria & Pathogenic Organisms	-	-	-

-	Done, but did not meet Plan requirements.
✓	Met all Plan requirements.
+	Exceeded Plan requirements.
ND	Not done.
*	Not defined in Plan but other work done.
NS	Not scheduled.

TABLE 1 - cont'd.

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
IMPACTS - cont'd.			
15. Aesthetics:			
- *Cladophora* Overflights	ND	ND	ND
- Other Items	ND	ND	ND
16. Physical Habitat	ND	ND	ND
17. Biological Community Welfare			
SITE-SPECIFIC STUDIES			
18. Buffalo River	✓	✓	✓

TABLE 2

ANTICIPATED LEVEL OF ACHIEVEMENT
IN RELATION TO SURVEILLANCE PLAN FOR 1986

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
INPUTS			
3. Municipal & Industrial	*	*	*
4. Storm Water Discharges & Combined Sewer Overflows	*	*	*
5. Tributaries	-	-	-
6. Groundwater	-	-	-
IMPACTS			
8. Chemical Constituents in Water:			
- NOTL/FE	+	+	+
- Survey Ranges	ND	ND	ND
- Intakes	ND	ND	ND
9. Chemical Constituents in Sediment:			
- Suspended Sediment	+	+	+
- Power Co. Reserviors	-	-	-
- Dredging - U.S.	-	-	-
- Niagara River Bar	NS		
10. Chemical Constituents in Fish:			
- Spottails	✓	✓	✓
- Sport Fish	NS		
- Fish Pathology	?	?	?
11. Chemical Constituents in Other Aquatic Biota:			
- Cladophora	?	?	?
- Clams	ND	ND	ND
13. Acute Toxicity:			
- Bioassay	-	-	-
14. Bacteria & Pathogenic Organisms	✓	✓	-

- To be done, but will not meet Plan requirements.
✓ Will meet all Plan requirements.
+ Will exceed Plan requirements.
ND Will not be done.
* Not defined in Plan but other work will be done.
NS Not scheduled.

TABLE 2 - cont'd.

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
IMPACTS - cont'd.			
15. Aesthetics	*	*	*
16. Physical Habitat	ND	ND	ND
17. Biological Community Welfare	ND	ND	ND
SITE-SPECIFIC STUDIES			
18. Buffalo River	✓	✓	✓

TABLE 3
ACTIVITY SUMMARY, 1985 - NIAGARA RIVER

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
INPUTS						
3. Municipal & Industrial	Ont. MOE	Design & implement sampling program	Not completed	Not completed	Not completed	
4. Storm Water Discharges & Combined Sewer Overflows	Ont. MOE	Assemble & review available literature, data & models	Not completed	Not completed	Not completed	
5. Tributaries - Sediment		Annual sampling of 12 tributaries for NRTC Group I chemicals	Completed	Not completed		
- Welland River	Ont. MOE	Collect water, sediment & biota samples	Not completed	Not completed	Not completed	
6. Groundwater						
IMPACTS						
8. Chemical Constituents in Water: - NOTL/FE	Canada DOE	Daily sampling for physicals & nutrients; weekly sampling for trace metals & major ions; bi-weekly sampling	Completed	Mostly completed		Report written on early part of year's data. Draft report written on trends during

TABLE 3 - cont'd

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
		for organics				1976-83 period. NRTC parameters analyzed for; draft report written on data up to Oct. 1985.
- Survey Ranges	Canada DOE	Monthly samples May-Nov. & one winter survey (total eight) at 39 stations for physicals, major ions, nutrients, bacteria, trace metals & organics	Not completed			
- Intakes		Three intakes to be sampled 6-10 times/year for nutrients, physicals, organics, volatiles, metals, major ions & bacteria				
9. Chemical Constituents in Sediment:						
- Suspended Sediment	Canada DOE	Bi-weekly collection. Analysis for NRTC parameters	Completed	Mostly completed		Draft report written on data to Oct. 1985.

TABLE 3 - cont'd

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
- Power Company Reservoirs		Three core samples in each of two reservoirs for NRTC Group I chemicals	Not completed	Not completed		
- Navigation Channels		Sampling in four channels for NRTC Group I chemicals	Not completed	Not completed		
- Niagara River Bar		Core sampling at 16 stations for NRTC Group I chemicals	Not completed	Not completed		
10. Chemical Constituents in Fish						
11. Chemical Constituents in Other Aquatic Biota	Ont. MOE	Collect Cladophora samples at selected sites. Place caged clams in same area as fish collections & Cladophora programs	Completed	Spring 1986	1986	
13. Acute Toxicity						

TABLE 3 - cont'd

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
14. Bacteria & Pathogenic Organisms	County health depts. NY DOH Ontario MOH	Classical beach monitoring	Summer 1985	Summer 1985		Only fecal & total coliform. No international data base currently exists.
15. Aesthetics - Cladophora Overflights	?	None				Experimental.
- Shore Spills	U.S. EPA U.S. DOT EGC	Two spills - Buffalo River (1985.06.21) & Tonawanda Channel (1985.05.16)			On file	Spills reported but not confirmed.
16. Physical Habitat	New York DEC Ont. MNR Canada DOE U.S. EPA U.S. FWS	Map habitats	Not started			
17. Biological Community Welfare						

TABLE 3 - cont'd

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
SITE-SPECIFIC STUDIES						
18. Buffalo River	U.S. Army COE	Dredge Buffalo Harbor.	Summer 1985	-	-	
		Continue Times Beach testing.	Summer 1985	Fall 1985	Winter 1985	
		Test Buffalo Harbor sediment.	Complete	Underway		

[a]Completed, not completed, anticipated completion date.

TABLE 4 - cont'd

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
- Survey Ranges	Canada DOE	Monthly samples May-Nov. & one winter survey (total eight) at 39 stations for physicals, major ions, nutrients, bacteria, trace metals & organics				
- Intakes		Three intakes to be sampled 6-10 times/ year for nutrients, physicals, organics, volatiles, metals, major ions & bacteria				
9. Chemical Constituents in Sediment:						
- Suspended Sediment	Canada DOE	Weekly collection. Analysis for NRTC parameters				
- Power Company Reservoirs		Three core samples in each of two reservoirs for NRTC Group I chemicals				One shot.

TABLE 4 - cont'd

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
- Navigation Channels		Sampling in four channels for NRTC Group I chemicals				
	U.S. Army COE	Dredge Black Rock Canal	Summer 1986			
- Niagara River Bar		Core sampling at 16 stations for NRTC Group I chemicals				
10. Chemical Constituents in Fish						
11. Chemical Constituents in Other Aquatic Biota						
13. Acute Toxicity						
14. Bacteria & Pathogenic Organisms	County health depts. NY DOH Ontario MOH	Classical beach monitoring	Summer 1986	Summer 1986		Only fecal & total coliform
15. Aesthetics - Cladophora Over-flights	?	Not planned				

TABLE 4 - cont'd

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
- Other Items	?	Produce & circulate experimental questionnaire for user comment	Summer 1986	Fall 1986	Winter 1986	Experimental only
16. Physical Habitat	New York DEC Ont. MNR Canada DOE U.S. EPA U.S. FWS	Map habitats	Not started			
17. Biological Community Welfare						
SITE-SPECIFIC STUDIES						
18. Buffalo River	U.S. Army COE	Dredge Buffalo Harbor.	Summer 1986			
		Continue Times Beach ecological studies.	Spring & summer 1986	Fall 1986	Winter 1986	
	U.S. EPA NY DEC	Collection & analysis of spottail shiners from 25 sites for contaminant trend monitoring				

[a]Completed, not completed, anticipated completion date.

6.0 LAKE ONTARIO

6.1 ANNUAL INVENTORY REPORT

This annual inventory describes the extent to which the Lake Ontario Surveillance Plan was implemented during 1985 and the extent to which implementation is expected during 1986. This report does not present any data but, rather, serves as a tracking mechanism for the implementation of this component of the Great Lakes International Surveillance Plan (GLISP). This report also allows the Lake Ontario Task Force to establish what data are, or will be available for inclusion in a detailed status report describing the ecosystem quality of the lake, in conformance with the requirements of the 1978 Great Lakes Water Quality Agreement.

Table 1 summarizes the level of achievement in relation to GLISP for 1985, and Table 2 summarizes the anticipated level of achievement for 1986. Table 3 summarizes surveillance and monitoring activities for 1985, and Table 4 summarizes anticipated activities for 1986. The tables indicate that, during 1985, several components of the Lake Ontario Surveillance Plan were either not undertaken or not undertaken to the extent called for in the Plan. The anticipated level of activity for 1986 will be similar to that for 1985. Those activities that will be conducted generally will not fully meet the requirements as conceived in the Plan. However, this may change to some extent, in response to discussions which will be held among the jurisdictions regarding the implementation of this Plan. More likely, however, these discussions will result in changes for the 1987 field year.

TABLE 1

LEVEL OF ACHIEVEMENT
IN RELATION TO SURVEILLANCE PLAN FOR 1985

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
INPUTS			
2. Point Sources			
- U.S.	-	-	-
- Canadian	✓	✓	-
3. Tributaries			
- U.S.	-	-	-
- Canadian	-	✓	-
4. Atmospheric	-	-	-
IMPACTS - OPEN LAKE			
5.1 Chemical Constituents in Water	-	✓	✓
5.2 Chemical Constituents in Sediment	-	-	-
5.3 Chemical Constituents in Fish - Aquatic Ecosystem Perspective	✓	✓	✓
5.4 Chemical Constituents in Fish - Human Health Perspective	-	-	-
5.5 Chemical Constituents in Other Aquatic Biota	✓	✓	✓
5.6 Chemical Constituents in Avian Populations	-	-	-
5.7 Acute Toxicity	ND	ND	ND
5.8 Fish Pathology & Sublethal Effects	-	-	-

\- Done, but did not meet Plan requirements.
✓ Met all Plan requirements.
\+ Exceeded Plan requirements.
ND Not done.
* Not defined in Plan but other work done.
NS Not scheduled.

Table 1 - cont'd.

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
IMPACTS - NEARSHORE			
6.1 Chemical Constituents in Water			
- U.S.	ND	ND	ND
- Canadian	-	-	-
6.2 Bacteria & Pathogenic Organisms	-	-	-
6.3 Aesthetics			
- Cladophora Overflights	-	-	-
- Other Items	ND	ND	ND
IMPACTS - AREAS OF CONCERN			
7.2 Hamilton Harbour			
- Canada DFO	*		
- Ontario MOE	ND	ND	ND
7.3 Toronto Waterfront	-	-	-
7.4 Port Hope			
- Water	-	✓	-
- Sediment	✓	+	✓
7.5 Bay of Quinte	-	-	-
7.6 Oswego River & Harbor	ND	ND	ND
7.7 Rochester Embayment	ND	ND	ND
7.8 Eighteen Mile Creek	*	*	*
7.9 Other Areas - Ontario	NS		
ECOSYSTEM SURVEILLANCE			
8.1 Physical Habitat			
- U.S.	ND	ND	ND
8.2 Structure of Biotic Community	-	-	-

TABLE 2

ANTICIPATED LEVEL OF ACHIEVEMENT
IN RELATION TO SURVEILLANCE PLAN FOR 1986

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
INPUTS			
2. Point Sources:			
- U.S.	-	-	-
- Canadian	✓	✓	-
3. Tributaries:			
- U.S.	-	-	-
- Canadian	-	✓	-
4. Atmospheric	-	-	-
IMPACTS - OPEN LAKE			
5.1 Chemical Constituents in Water:			
- U.S.	*	*	*
- Canadian	✓	✓	✓
5.2 Chemical Constituents in Sediment	-	-	-
5.3 Chemical Constituents in Fish - Aquatic Ecosystem Perspective:			
- Canadian	✓	✓	✓
- U.S.	a	a	a
5.4 Chemical Constituents in Fish - Human Health Perspective:			
- New York	ND	ND	ND
- Ontario	-	-	-
5.5 Chemical Constituents in Other Aquatic Biota	✓	✓	✓
5.6 Chemical Constituents in Avian Populations	-	-	-

-	To be done, but will not meet Plan requirements.
✓	Will meet all Plan requirements.
+	Will exceed Plan requirements.
ND	Will not be done.
*	Not defined in Plan but other work will be done.
a	Cannot project at present.
b	See Table 4.
NS	Not scheduled.

Table 2 - cont'd.

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
IMPACTS - OPEN LAKE - cont'd.			
5.7 Acute Toxicity: - U.S. FWS - NYDEC - Ontario MOE - U.S. EPA	-	-	-
5.8 Fish Pathology & Sublethal Effects[b]	✓	✓	✓
IMPACTS - NEARSHORE			
6.1 Chemical Constituents in Water - U.S. - Canadian	ND -	ND -	ND -
6.2 Bacteria & Pathogenic Organisms: - New York & Ontario	-	-	-
6.3 Aesthetics	-	-	-
IMPACTS - AREAS OF CONCERN			
7.2 Hamilton Harbour: - Ontario MOE - Canada DFO	ND *	ND	ND
7.3 Toronto Waterfront	*	*	*
7.4 Port Hope	-	✓	-
7.5 Bay of Quinte	-	-	-
7.6 Oswego River & Harbor	ND	ND	ND
7.7 Rochester Embayment	ND	ND	ND
7.8 Eighteen Mile Creek	ND	ND	ND
7.9 Other Areas - Ontario	✓	✓	✓
ECOSYSTEM SURVEILLANCE			
8.1 Physical Habitat	-	-	-
8.2 Structure of Biotic Community	✓	✓	✓

TABLE 3
ACTIVITY SUMMARY, 1985 - LAKE ONTARIO

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
INPUTS						
2. Point Sources	NY DEC	Permit compliance monitoring	Completed	Completed	Completed	
	Ont. MOE Locality	COA compliance monitoring	Completed	Completed	Completed	
3. Tributaries	U.S. EPA (Grantee)	High flow sampling at three tributaries for sediment & nutrients	Completed	Completed	Anticipated May 1986	
	NY DEC	Toxics & conventional monitoring	Completed	Completed	Anticipated March 1986	
	Ont. MOE	Enhanced tributary monitoring plus routine monitoring	Completed	Completed		
4. Atmospheric	U.S. EPA	Weekly sampling of wet deposition at four sites for pH, conductivity, nutrients & inorganics	In progress as planned	In progress	Anticipated 1987	
		Monthly sampling of wet deposition at one site for nutrients, inorganics, metals & organics	Discontinued 1985	Not done		

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
INPUTS - cont'd.						
	Canada DOE	Monthly wet samples at five stations for conventional parameters & trace metals; one station for trace organics	Five sites monthly		None	Completed.
IMPACTS - OPEN LAKE						
5.1 Chemical Constituents in Water	U.S. EPA	One cruise (Aug. 1985), 10 stations. Nutrients, chemical & physical parameters	Completed	Completed		
	U.S. EPA (Grantee)	20 stations - trace metals study	Completed	In progress. Anticipated Mar. 1986	Draft anticipated May 1986; final anticipated June 1987	
	Canada DOE	Five cruises, 97 stations. Nutrients on all five; metals at 20 stations, one cruise. Organics at 20 stations, one cruise; at three stations monthly for eight months	Completed		In 1986	

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - OPEN LAKE - cont'd.						
5.2 Chemical Constituents in Sediment - Dredging & dredged material testing	U.S. Army COE Canada DPW Ontario MOE	Dredging - Oak Orchard Creek & Wilson Harbor				
	Canada DOE	Three sediment trap stations across lake	Twice yearly (spring & fall)	Phosphorus		
5.3 Chemical Constituents in Fish - Aquatic Ecosystem Perspective	U.S. EPA	Collection of open lake fish (lake trout, smelt) for contaminant analysis	Completed. Hamlin Station	In progress	Report on trends anticipated 1985	
	U.S. EPA	Fall coho run sampled at Salmon River for contaminants	Completed	In progress		Yearly since 1980.
	NY DEC	Nearshore monitoring with spottail shiners at four sites	Completed	March 1986	May 1986	
	NY DEC	Long-term trend project-lake trout, alewife & rainbow smelt sampled	Completed	June 1986	Aug. 1986	Analysis of whole fish.
	Canada DFO	Three sites, two species/site, 50 fish/species	Completed	1986.06.30	1986.09.30	Analysis of whole fish.

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - OPEN LAKE - cont'd.						
5.4 Chemical Constituents in Fish - Human Health Perspective	NY DEC	Long-term trend project-rainbow & brown trout & coho sampled	Completed	June 1986	Aug. 1986	Analysis of standard fillets
5.5 Chemical Constituents in Other Aquatic Biota	Canada DFO	Five sites - benthic invertebrates	Completed	1986.06.30	1986.09.30	
5.6 Chemical Constituents in Avian Populations						
5.7 Acute Toxicity						
5.8 Fish Pathology & Sublethal Effects	Canada DFO	One site - tumor monitoring	Completed	1986.05.30	1986.09.30	Also bone composition.
		Six sites - fin ray asymmetry	1985.11.30	1986.05.30	1986.06.30	
IMPACTS - NEARSHORE						
6.1 Chemical Constituents in Water	NY DEC	Water intake monitoring	Not done			
	Ont. MOE	Water intake monitoring	Completed	Completed	Completed	
6.2 Bacteria & Pathogenic Organisms	County health depts. NY DOH Ontario MOH	Monitor 92 beaches	Summer 1985	Summer 1985		Only total & fecal coliform. No organized data base presently exists.

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - NEARSHORE - cont'd.						
6.3 Aesthetics						
- Cladophora	U.S. EPA	Overflights for portions of Lake Ontario	Summer 1985	Fall 1985	Winter 1985	Experimental only. Project completed.
- Spills	U.S. Coast Guard	Three shore-based spills	Year round			U.S. information only.
	Cdn. Coast Guard	One vessel spill				
	U.S. EPA					
	U.S. DOT					
IMPACTS - AREAS OF CONCERN						
7.2 Hamilton Harbour	Canada DFO	Fish community assessment	Complete	1985.11.30	1986.04.30	
		Effects of dredging on fish	Complete-1985.11.30	1985.11.30	1986.04.30	
	Ont. MOE	Problem area assessment	Completed	Completed	Completed	
7.3 Toronto Waterfront	Ont. MOE	Problem areas assessment	Completed	Completed	Completed	
7.4 Port Hope	Canada DOE	Sediment & benthos assessment	Completed	Completed	Completed	
	Ontario MOE	Currents & dispersion; water chemistry	Completed	Completed	Indefinite	

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - AREAS OF CONCERN - cont'd.						
7.5 Bay of Quinte						
7.6 Oswego River & Harbor	NY DEC	No activities planned				
7.7 Rochester Embayment - Sediment	U.S. Army COE	Dredging & dredged material testing- physical, chemical & bioassay	Summer 1985	Fall 1985	Winter 1985	On schedule.
	NY DEC	No activities planned				
7.8 Eighteen Mile Creek - Sediment	U.S. Army COE	Dredging - Olcott Harbor				
	NY DEC	No activities planned				
ECOSYSTEM SURVEILLANCE						
8.1 Physical Habitat	NY DEC Ont. MNR Canada DOE U.S. FWS	Mapping of habitat	Ongoing	Ongoing	Mar. 1986	NY Coastal Zone Management inventory of important areas.
8.2 Structure of Biotic Community	Canada DFO	Bioindex: two sites weekly - April 1 - Oct. 30	Completed	1986.03.30	1986.09.30	
	U.S. FWS	Annual assessment	Ongoing	Ongoing	Mar. 1986	
	Ont. MNR	One lakewide cruise, six index stations	Ongoing	Ongoing		
	NY DEC					

[a]Completed, not completed, anticipated completion date.

TABLE 4
ACTIVITY SUMMARY, 1986 - LAKE ONTARIO

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
INPUTS						
2. Point Sources	Ont. MOE	Compliance monitoring; in-depth assessment at Toronto Main STP	To be done	To be done	To be done	MISA initiative.
	NY DEC					
3. Tributaries	U.S. EPA (Grantee)	High flow sampling at three tributaries for sediment & nutrients				
	Ont. MOE NY DEC	Enhanced tributary monitoring	To be done	To be done	To be done	NY -Oswego River only.
4. Atmospheric	NY DEC U.S. EPA	Weekly sampling of wet deposition at two sites for pH, conductivity, nutrients & inorganics				
	Canada DOE U.S. EPA	Monthly samples (bulk & wet) at five Cdn.& four U.S. stations for conventional parameters & trace metals.				

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - OPEN LAKE						
5.1 Chemical Constituents in Water	U.S. EPA	Two cruises, spring & summer, 8 stations. Nutrients, chemical & physical parameters				
	Canada DOE	Two spring & three summer cruises, 96 stations: nutrients, chemical & physical parameters. One spring cruise, 23 stations for PCB/OC. One spring cruise, 21 stations for trace metals.				
5.2 Chemical Constituents in Sediment	U.S. EPA Canada DOE					
5.3 Chemical Constituents in Fish - Aquatic Ecosystem Perspective	U.S. EPA	Collection of open lake fish for contaminant & trend analysis. Oswego Station.				
	Canada DFO	Three sites, two species/site, 50 fish per species.				

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - OPEN LAKE - cont'd.						
5.4 Chemical Constituents in Fish - Human Health Perspective	U.S. EPA	Collection of fall-run coho fillets for contaminant & trend monitoring at Salmon River.				
5.5 Chemical Constituents in Other Aquatic Biota						
5.6 Chemical Constituents in Avian Populations						
5.7 Acute Toxicity						
5.8 Fish Pathology & Sublethal Effects	Canada DFO Ont. MNR U.S. EPA U.S. FWS NY DEC	Detailed planning for nearshore fish tumor survey. DFO-fin ray asymmetry of forage fish.	1987-areas of concern & other areas; approx. 100 fish/site. May also include some offshore fish, i.e. lake trout.	Tumor identification, chemical body burden & other cause identification by research agencies.		Agency funding to be confirmed.

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - NEARSHORE						
6.1 Chemical Constituents in Water	NY DEC Ont. MOE	Water intake monitoring-limited parameters, selected sites only	To be done	To be done	To be done	
6.2 Bacteria & Pathogenic Organisms	County health depts. NY DOH Ontario MOH	Monitor 92 beaches	Summer 1986	Summer 1986		Only total & fecal coliform. May do some *E. coli* on experimental basis if time & money found. No organized data base exists.
6.3 Aesthetics	U.S. EPA (?)	Possible reconfirmation of data	Summer 1986	Fall 1986	Winter 1986	Experimental; only if funds can be found.
IMPACTS - AREAS OF CONCERN						
7.2 Hamilton Harbour	Ont. MOE	Development of Remedial Action Plan				

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - AREAS OF CONCERN - cont'd.						
7.3 Toronto Waterfront	Ont. MOE	Main Toronto STP study: (1) toxic fate modelling (water, sediment, biota) & plume tracking, bioavailability, biotoxicity studies; (2) sediment transport assessment	(1) Summer 1986 (2) Summer 1986	Summer 1987 Spring 1987	Oct. 1988	MISA - 1986-88.
7.4 Port Hope	Ont. MOE	Water monitoring for gross α & β, U & Ra	Four times within spring/fall period			
7.5 Bay of Quinte	Ont. MOE & MNR	(1) Inputs-total P analysis at 6 STP outfalls.	Monthly			
		(2) Physical & chemical limnology - T, DO, chlorophyll a, total P, SRP, total N & Si at 3 mid-bay locations	Bi-weekly, May-Oct.			
		(3) Phytoplankton - 3 mid-bay locations	Bi-weekly, May-Oct.			

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - AREAS OF CONCERN - cont'd.						
		(4) Zooplankton - identify & count at two locations	Bi-weekly, May-Oct.			
		(5) Benthos - not planned				
		(6) Macrophytes - done in 1985; not scheduled for 1986				
		(7) Fish-length, weight, sex, maturity, age, species composition at three locations	Monthly, May-Sept.			
		(8) Contaminants - not planned				
7.6 Oswego River & Harbor	NY DEC	No activities planned				
7.7 Rochester Embayment - Dredging	U.S. Army COE	Dredge harbor				
	NY DEC	No activities planned				
7.8 Eighteen Mile Creek	NY DEC	No activities planned				

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - AREAS OF CONCERN - cont'd.						
7.9 Other Areas: - St. Catharines (12-Mile Creek/ Welland Canal Area)	Ont. MOE	Bacteriological & chemical assessment & physical modelling	Summer 1986	Fall 1986	March 1987	
ECOSYSTEM SURVEILLANCE						
8.1 Physical Habitat	NY DEC Ont. MNR Canada DOE U.S. FWS	Mapping of area		Ongoing		Effort related to specific projects funded by other agencies.
8.2 Structure of Biotic Community	U.S. FWS	Annual stock assessment	Open water season, 1986	Fall 1986	Mar. 1987	
	Ont. MNR	One lakewide cruise, six index stations				
	Canada DFO	Bioindex, as per 1985				
	NY DEC U.S. EPA	Two cruises, spring & summer, 8 stations. Zooplankton & phytoplankton				

[a]Completed, not completed, anticipated completion date.

7.0 ST. LAWRENCE RIVER

7.1 ANNUAL INVENTORY REPORT

This annual inventory describes the extent to which the St. Lawrence River Surveillance Plan was implemented during 1985 and the extent to which implementation is expected during 1986. This report does not present any data but, rather, serves as a tracking mechanism for the implementation of this component of the Great Lakes International Surveillance Plan (GLISP). This report also allows the Niagara & St. Lawrence Rivers Task Force to establish what data are, or will be available for inclusion in a detailed status report describing the ecosystem quality of the river, in conformance with the requirements of the 1978 Great Lakes Water Quality Agreement.

Table 1 summarizes the level of achievement in relation to GLISP for 1985, and Table 2 summarizes the anticipated level of achievement for 1986. Table 3 summarizes surveillance and monitoring activities for 1985, and Table 4 summarizes anticipated activities for 1986. The tables indicate that, during 1985, several components of the St. Lawrence River Surveillance Plan were either not undertaken or not undertaken to the extent called for in the Plan. The anticipated level of activity for 1986 will be similar to that for 1985. Those activities that will be conducted generally will not fully meet the requirements as conceived in the Plan. However, this may change to some extent, in response to discussions which will be held among the jurisdictions regarding the implementation of this Plan. More likely, however, these discussions will result in changes for the 1987 field year.

TABLE 1

LEVEL OF ACHIEVEMENT
IN RELATION TO SURVEILLANCE PLAN FOR 1985

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
INPUTS			
4. Municipal & Industrial:			
- U.S.	-	-	-
- Canadian	*	*	*
5. Storm Water Discharges & Combined Sewer Overflows:			
- Model Development	ND	ND	ND
6. Tributaries:			
- U.S.	ND	ND	ND
- Canadian	-	-	-
9. Shipping & Navigational Maintenance Activities	NA	NA	NA
IMPACTS			
10. Chemical Constituents in Water:			
- Wolfe Island	✓	✓	✓
- In-Channel	ND	ND	ND
- Water Intakes	ND	ND	ND
11. Chemical Constituents in Sediment:			
- Analysis of dredged material	-	-	-
12. Chemical Constituents in Fish	-	-	-
13. Chemical Constituents in Other Aquatic Biota	ND	ND	ND
15. Bacteria & Pathogenic Organisms:			
- Cdn: bathing beaches & water intakes	-	-	-
- U.S.	-	-	-

\- Done, but did not meet Plan requirements.
✓ Met all Plan requirements.
\+ Exceeded Plan requirements.
ND Not done.
* Not defined in Plan but other work done.
NS Not scheduled.
NA Not applicable.

Table 1 - cont'd.

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
IMPACTS - cont'd.			
16. Aesthetics:			
- Cladophora overflights	ND	ND	ND
- Other items	ND	ND	ND
17. Physical Habitat	ND	ND	ND
18. Biological Community Welfare:			
- Index netting	-	-	-
- Seining	ND	ND	ND
- Invertebrate sampling	ND	ND	ND
- Zooplankton & phytoplankton sampling - U.S.	ND	ND	ND
- Cdn.	ND	ND	ND
- Fish pathology	ND	ND	ND
- Macrophyte sampling - U.S.	ND	ND	ND
- Cdn.	ND	ND	ND
- Creel census	ND	ND	ND
- Fish food habits	ND	ND	ND
AREAS OF CONCERN & SITE-SPECIFIC STUDIES			
20. Cornwall-Massena	-	-	-
21. Lac St-Francois	ND	ND	ND
22. Maitland	ND	ND	ND
23. Ogdensburg	ND	ND	ND

TABLE 2

ANTICIPATED LEVEL OF ACHIEVEMENT
IN RELATION TO SURVEILLANCE PLAN FOR 1986

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
INPUTS			
4. Municipal & Industrial:			
- Ontario	✓	✓	✓
- New York	-	-	-
5. Storm Water Discharges & Combined Sewer Overflows:			
- Model Development	ND	ND	ND
6. Tributaries:			
- Ontario and New York	-	-	-
9. Shipping & Navigational Maintenance Activities	No planned activities		
IMPACTS			
10. Chemical Constituents in Water:			
- Wolfe Island	✓	✓	✓
- In-Channel	ND	ND	ND
- Water Intakes:			
- United States	ND	ND	ND
- Canada	-	-	-
11. Chemical Constituents in Sediment	ND	ND	ND
12. Chemical Constituents in Fish	-	-	-
13. Chemical Constituents in Other Aquatic Biota	ND	ND	ND
15. Bacteria & Pathogenic Organisms:			
- Bathing beaches & water intakes (U.S. & Cdn.)	-	-	-
16. Aesthetics	-	-	-

\- To be done, but will not meet Plan requirements.
✓ Will meet all Plan requirements.
\+ Will exceed Plan requirements.
ND Will not be done.
* Not defined in Plan but other work will be done.
NS Not scheduled.

Table 2 - cont'd.

OPERATIONAL COMPONENT	FREQUENCY	SITES	PARAMETERS
IMPACTS - cont'd.			
17. Physical Habitat	ND	ND	ND
18. Biological Community Welfare:			
- Index netting	-	-	-
- Seining	ND	ND	ND
- Invertebrate sampling	ND	ND	ND
- Zooplankton & phytoplankton sampling	ND	ND	ND
- Fish pathology	ND	ND	ND
- Macrophyte sampling	ND	ND	ND
- Creel census	-	-	-
- Fish food habits	ND	ND	ND
AREAS OF CONCERN & SITE-SPECIFIC STUDIES			
20. Cornwall-Massena:			
- Cornwall	+	+	+
- Massena	-	-	-
21. Lac St-Francois	ND	ND	ND
22. Maitland	NS	NS	NS
23. Ogdensburg	ND	ND	ND

TABLE 3
ACTIVITY SUMMARY, 1985 - ST. LAWRENCE RIVER

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
INPUTS						
4. Municipal & Industrial	New York DEC	Plant-specific program	Underway	Underway	Underway	Plant-specific per discharge permit
	Ontario MOE	Sample significant discharges, establish sampling frequency & eliminate from further monitoring those discharges where further consideration not needed	Spring 1987			
5. Storm Water Discharges & Combined Sewer Overflows	NY DEC Ontario MOE	No planned activity Assemble & review available literature, data & models; devise sampling program for significant discharge events; sample selected discharges	Spring 1987			
6. Tributaries	NY DEC	Limited toxics sampling	Underway	Underway	Expected 1986	Limited information
	Ontario MOE	Monitor major tributaries; enhanced monitoring during discharge events	Spring 1986			

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
INPUTS - cont'd.						
9. Shipping & Navigational Maintenance Activities: - Vessel Spills	U.S. Coast Guard Cdn. Coast Guard	Unplanned - nine reported spills	Year round-as needed	Year round -as needed	Continuous & year end	No formal data base yet for U.S. & Canada
IMPACTS						
10. Chemical Constituents in Water: - Wolfe Island	Canada DOE	Daily samples for physicals & nutrients; weekly for trace metals & major ions; monthly for organics in water and suspended sediment	Completed	Mostly completed		Draft reports: Organics - 1982-84 data. Nutrient Accuracy - 1984 data. Suspended Sediment - 1982-84 data.
- In-Channel	Canada DOE	82 stations sampled monthly May-Nov. & one winter survey (eight total)	Not completed			
- Intakes	Ontario MOE	6-10 times/year at 17 public water intakes for nutrients, physicals, organics, volatiles, metals, bacteria & major ions				

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
11. Chemical Constituents in Sediment:						
- Dredged Material Testing	U.S. Army COE	Monitor sediments from Massena to Alexandria Bay	Summer 1985	Fall 1985	Winter 1985	On schedule
- Sediment Survey	Canada DOE	Three grab samples at each of 50 stations, with 10 sites for core samples: trace metals, organics, particle size, TC, TN, core dating	Not completed			Draft report prepared on 1975 sampling conducted in river
12. Chemical Constituents in Fish	New York DEC U.S. FWS Ontario MOE Ontario MNR Canada DFO	DEC - sampling at Maitland; analyses for Hg, Pb, PCB/OC, pesticides. MNR - sampling at Maitland; analyses for same parameters. Sampling for sport fish guidelines.	Completed	Not yet completed		
13. Chemical Constituents in Other Aquatic Biota		Not done				

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
15. Bacteria & Pathogenic Organisms:						
- Bathing Beaches	County health depts. NY DOH Ontario MOH Ontario MOE	Two samples/beach, minimum five/month, July 1-Aug. 31	Summer 1985	Summer 1985		Only fecal & total coliform data collected.
- Public Water Intakes	Ontario MOE NY DOH	17 intakes, once/week, year round; raw & finished water	Ongoing	Ongoing		Some supplies may not be sampled at frequency indicated
16. Aesthetics:						
- Cladophora Over-flights	?	Monitor zones of Cladophora growth & wash-up				Not planned until at least 1987 & only if experimental work proves that large scale survey is feasible.
17. Physical Habitat	New York DEC Ontario MNR Canada DOE U.S. EPA U.S. FWS	Map Canadian section of river	Not started			U.S. area mapped

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
18. Biological Community Welfare:						
- Index netting	Ontario MNR NY DEC	160 sites plus 40 in Lac St-Francois	47 sites sampled in Lac St-Laurent	Not completed	1986.06.01	Ontario MNR study
			32 sites sampled in 1000 Islands area.	Not completed	1985.12.31	NY DEC study
- Seining	Ontario MNR Ontario MOE NY DEC	100 sites Spottail shiner program	None Completed	Completed	Available	
- Invertebrate Sampling	Canada DOE	75 sites	<70 stations	Completed	Not yet available	
	U.S. FWS	21 sites	21 sites sampled at 3-week intervals	Underway	Due May 1986	Special U.S. Army COE study
- Zooplankton & Phytoplankton Sampling	Canada DOE	6 sites	None			
- Fish Pathology	Canada DOE	420 samples	None			
- Macrophyte Sampling	Ontario MOE NY DEC U.S. FWS		None			

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
- Creel Census	Ontario MNR NY DEC	5,000 interviews	None			
- Fish Food Habits	Ontario MNR NY DEC		Yellow perch food study completed in Lac St-Francois	Completed	1986.05.01	
AREAS OF CONCERN & SITE-SPECIFIC STUDIES						
20. Cornwall-Massena	NY DEC	Sediment, water & biota samples	Limited	Underway	-	Part of the G.M. cleanup study
	Ontario MOE	1. Document intakes, outfalls & water movement patterns. 2. Monitor SWD, CSO, point sources, tributaries, beaches, intakes, fish, other aquatic biota & atmospheric deposition. 3. Monitor spatial variation of contaminants in water, sediment & biota.	Completed	Not completed	Not completed	

TABLE 3 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
AREAS OF CONCERN & SITE-SPECIFIC STUDIES - cont'd.						
21. Lac St-Francois	Canada DOE	1. Water sampling 6x/yr, 8 stations for nutrients, heavy metals & PCB/OC.	Completed	Not completed	Not completed	Part of overall St. Lawrence R. water quality network.
		2. Publish sediment report.	-	-	Completed	
		3. Interpret adult fish data.	-	-	Not completed	Interpretation at standstill - lack of resources.
		4. Publish spottail shiner project report.	-	-	Winter 1986	
22. Maitland	Ontario MOE	1. Document intakes, outfalls & water movement patterns.	Not completed	Not completed	Not completed	
		2. Monitor point sources, water intakes, fish & other biota.				

TABLE 4
ACTIVITY SUMMARY, 1986 - ST. LAWRENCE RIVER

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
INPUTS						
4. Municipal & Industrial	New York DEC Ontario MOE	Routine sampling	Routine	Routine	Plant-specific	Ongoing program per permit requirements
5. Storm Water Discharges & Combined Sewer Overflows	NY DEC Ontario MOE	Literature evaluation	None			
6. Tributaries	NY DEC Ontario MOE	Current routine sampling plus intensive pilot program on one tributary to establish future program	Routine plus pilot program	Routine plus pilot program	None	
9. Shipping & Navigational Maintenance Activities:	U.S. Coast Guard Cdn. Coast Guard	Not planned	Year round-as needed	Year round -as needed		
IMPACTS						
10. Chemical Constituents in Water: - Wolfe Island	Canada DOE	Daily samples for physicals & nutrients; weekly for trace metals & major ions; monthly for organics, chloro-	Routine throughout 1986			

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
		phyll a, POC & PN; monthly for organics in suspended sediment				
- In-Channel	Canada DOE	82 stations sampled monthly May-Nov. & one winter survey (eight total)				
11. Chemical Constituents in Sediment		Nothing planned				
12. Chemical Constituents in Fish	New York DEC Ontario MNR & MOE	Nothing planned Sampling for sport fish guidelines - Lake St. Francis.				
13. Chemical Constituents in Other Aquatic Biota		Nothing planned				
15. Bacteria & Pathogenic Organisms	County health depts. NY DOH Ontario MOH	Monitor bathing beaches	Summer 1986	Summer 1986		Only fecal & total coliform. No international data base established.

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
16. Aesthetics:						
- Cladophora Over-flights	?	None planned				
- Other Items	?	Possible experimental aesthetics question-naire to be developed				
17. Physical Habitat	New York DEC Ontario MNR Canada DOE U.S. EPA U.S. FWS	Map Canadian section of river	None			Needed to complete mapping of river
18. Biological Community Welfare:						
- Index netting	Ontario MNR NY DEC	160 sites plus 40 in Lac St-Francois			1986.12.31	Lac St-Francois-Ontario MNR study-40 sites 1000 Islands area - NY DEC study
- Seining	Ontario MNR Ontario MOE NY DEC	100 sites	None			
- Invertebrate Sampling	Canada DOE	75 sites	none			

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
IMPACTS - cont'd.						
- Zooplankton & Phytoplankton Sampling	Canada DOE	6 sites	None			
- Fish Pathology	Canada DOE	420 samples	None			
- Macrophyte Sampling	Ontario MOE NY DEC U.S. FWS		None			
- Creel Census	Ontario MNR NY DEC	5,000 interviews	None			
- Fish Food Habits	Ontario MNR NY DEC		Not done			
AREAS OF CONCERN & SITE-SPECIFIC STUDIES						
20. Cornwall-Massena	NY DEC Ontario MOE	None	Limited			Part of G.M. cleanup activities

TABLE 4 - cont'd.

OPERATIONAL COMPONENT	RESPONSIBLE JURISDICTION	PLANNED ACTIVITY	ACTIVITY STATUS[a] SAMPLING	ANALYSIS	REPORT	REMARKS
AREAS OF CONCERN & SITE-SPECIFIC STUDIES - cont'd.						
21. Lac St-Francois	Canada DOE	1. Sample water, 9 sites, 6x/yr for physical, nutrients, HM, Hg & PCB. 2. Interpret adult fish data				Trend analysis of Hg & PCB
22. Maitland						
23. Ogdensburg	New York DEC	None	None			Future project

[a]Completed, not completed, anticipated completion date.