

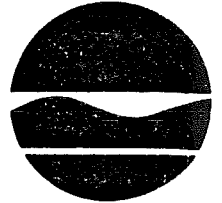
status report

The
Niagara
River
Toxics
Project

February 1983



New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233



Henry G. Willia
Commissioner

February 22, 1983

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Dear Niagara Frontier Resident:

Attached is a report issued by the American/Canadian Niagara River Toxics Committee (NRTC) describing the status of the Niagara River Toxics Project.

Its purpose is to bring you up-to-date on where the project stands today.

In order to discuss items in this status report and answer questions you might have about the project, two informal public informational meetings have been scheduled by the New York State Department of Environmental Conservation for Niagara and Erie Counties. They are:

Tuesday, March 8, 1983
7:30 - 10:30 p.m.
Williamsville Senior High School
5950 Main Street
Williamsville, New York

and

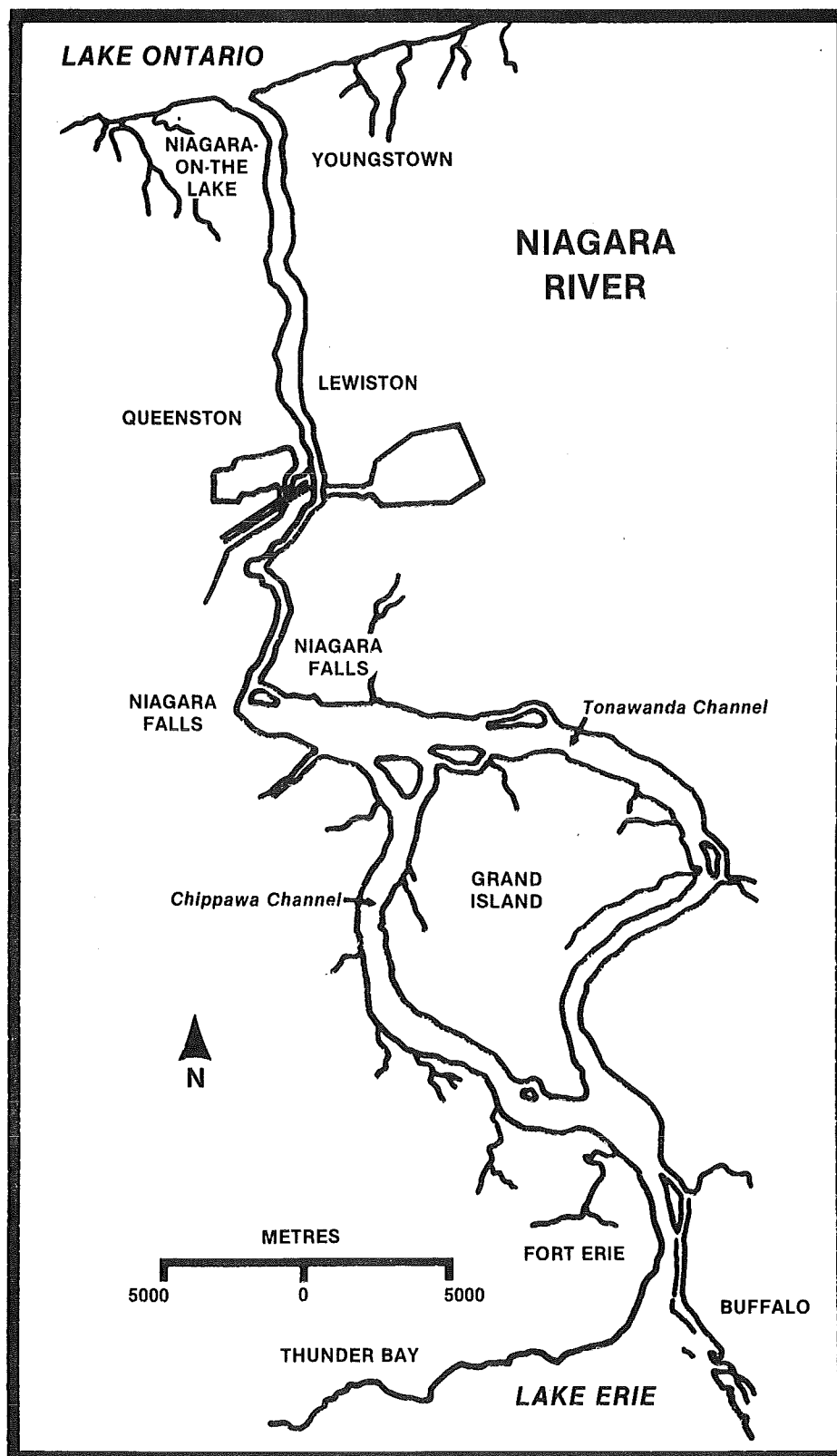
Wednesday, March 9, 1983
7:30 - 10:30 p.m.
Niagara County Office Building
Ceder and Third Streets
Niagara Falls, New York

At this time, the data collected by the project have not been analyzed and therefore the status report does not contain any description of results or findings. The Committee's final report is expected to be ready in December, 1983.

Sincerely,

John J. Spagnoli
Regional Director
Region 9, Buffalo

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status report

**The
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River
Toxics
Project**

February 1983



Issued by the Niagara River Toxics
Committee

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Environmental Conservation*

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SECTION 1

Introduction

In February 1981, a joint Canada/United States team of scientists and engineers began a comprehensive investigation of toxic chemicals in the Niagara River.

Though there have been investigations and reports on water quality in the river, leading to heightened public concern for improving health and environmental safeguards, no investigation until now has attempted a thorough and integrated study of the river.

This joint investigation will make recommendations as to what should be done to reduce or remove the contamination and to monitor the effectiveness of clean-up programs.

This Status Report describes the investigation by the joint Canada/United States team. It describes where the project stands as the investigators wrap up two years of information-gathering and begin nine months of examining the data and drawing up recommendations to be made to their respective governments.

The status report is presented in two sections. Section One is a description of the toxic contamination concerns in the river, the objectives of the study, the projects undertaken by the investigators and the likely form of the final report, due in December 1983.

Section Two is a summary and status, as of February 1983, of the 39 individual subprojects which make up the whole investigation.

1 – The Niagara River

The 37-mile Niagara River, with an average flow of 200,000 cubic feet per second, connects Lake Erie to Lake Ontario. Divided into the upper and lower reaches by Niagara Falls, it provides 83 percent of the

total tributary flow to Lake Ontario. For both Canada and the United States, it provides municipal and industrial water supplies, power generation, commerce, recreation and tourism.

As a source of municipal drinking water, it serves a combined Canada/United States population of more than 400,000 people. The City of Buffalo municipal water plant, which obtains water at the junction of Lake Erie and the Niagara River, services an additional 530,000 people. The river, in return, receives the treated waste from these same populations.

The proximity to a source of cheap electrical power and water for use in industrial processing has made the Niagara Frontier a highly industrialized area, particularly on the United States side. The Niagara River passes through a complex of steel, petrochemical and chemical manufacturing industries.

Social values which, two or three generations ago, led to decisions to develop the Niagara Frontier for the benefit of society—jobs, cheaper products, and chemicals such as pesticides—have changed to include concern for environmental degradation and potential impacts on human health. While these economic development decisions were felt to be the best ones possible for the present and future benefit of society at the time, they have proven to be the cause of environmental problems for the river and surrounding area.

2 – Pollution in the River

Earliest pollution concerns in the river included bacterial contamination, phenol problems, oil, excessive levels of iron, phosphorus, chloride and mercury, as well as general discoloration. Most of these contaminants have been reduced significantly over the last decade. Today, attention is focused on toxic substances in the Niagara River and in Lake Ontario

and their effects on human health and the ecosystem. In addition to direct municipal and industrial discharges to the river, major toxic waste disposal sites have been identified along the river corridor. Their impacts on the safety of drinking water drawn from the river have become a public concern. For those chemicals for which health standards exist, monitoring of these water supplies shows them to be within current United States and Canadian standards. The development of drinking water standards is an on-going process, since there are chemical compounds in the river presently being identified for which standards, as yet, have not been established.

The presence in the river of toxic chemicals is not new. The development of more sophisticated equipment and methodology from 1974 to the present has led to greater detection capability, enabling chemicals to be found at very small concentrations. These substances have probably been in the river for a number of years and, where long term data exist, they show a decline in most of these contaminants. Concern about toxic substances stems from long-term, low-level exposure. Unfortunately, given the present state of scientific knowledge, the ability to detect these compounds has outstripped our ability to identify direct adverse effects to human health and the environment.

Many members of the public feel that there has been a lack of government concern and action in solving the problems in the Niagara River. But, in fact, pollution in the Niagara River has been a major concern of governments since the early 1950's. The Niagara River has been the focus of numerous studies and reports by the International Joint Commission (IJC), and by individual federal, state and provincial agencies in both countries. These reports, as well as those by public interest groups, have caused heightened public awareness and sensitivity to Niagara River issues.

Millions of dollars have been, and are continuing to be, spent by government and industry in implementing clean-up programs, determining the effectiveness of river clean-up programs and identifying additional

contamination sources requiring action. Significant progress has already been made in alleviating many of the earlier problems, largely through the control of municipal and industrial waste discharges.

A continuing effort is now being directed at solving the more complex problems of toxic substance contamination in the Niagara River. In many cases, the scientific basis for understanding the environmental and human health significance of these chemical compounds does not exist and will have to be developed before appropriate actions can be taken. This is by no means an easy or inexpensive task.

In summary, toxic chemicals in the Niagara River are a major public issue in both countries. While much has been accomplished so far, it is a complex problem involving many, as yet, unanswered questions about chemical contamination of the Lake Ontario Basin. The task is to assess what is there, identify the sources, implement appropriate abatement strategies, and monitor the effectiveness of these strategies.

3—Niagara River Pollution—A Cause for International Concern

The governments of both countries recognize the international context within which pollution of the river must be considered. As part of the international boundary between Canada and the United States, the Niagara River comes under the umbrella of the Boundary Waters Treaty of 1909 and the Canada/United States Agreement on Great Lakes Water Quality, which was signed in 1972 and revised in 1978.

Article IV of the Boundary Waters Treaty states that 'boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other.' Signing of the Boundary Waters Treaty led to the formation of the International Joint Commission (IJC), a six-member

body with equal representation from Canada and the United States. The major task of the Commission is to try and solve common boundary water problems through deliberation and recommendations to the two governments.

The success of this international body in issuing effective, common impartial recommendations paved the way for the signing of the Great Lakes Water Quality Agreement of 1972, which was renewed and expanded in 1978.

The Commission's early focus on the Great Lakes problems centered on conventional pollutants such as bacteria, phenols and phosphorus. In recent years, toxic chemical pollution has become a major concern, so that the purpose of the agreement now is 'to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Ecosystem.' In response to this mandate two events occurred. In the United States, the Great Lakes National Program Office (GLNPO) was established within the United States Environmental Protection Agency (USEPA), to administer the part of the federal Clean Water Act referring to the Great Lakes. In Canada, the Canada-Ontario Agreement was signed which coordinated federal and provincial government efforts on pollution control in the Great Lakes.

Despite massive clean-up efforts and the expenditure of millions of dollars by both industry and government, the Niagara River is one of a number of areas in the Great Lakes and connecting waters which have continued to be designated as a 'Problem Area' or 'Area of Concern' by the IJC since 1974. This means that it is an area in which the specific water quality objectives of the 1972 and 1978 Great Lakes Water Quality Agreement are not being met. These objectives are designed to protect the most sensitive beneficial use of the water, including uses for drinking and for the protection of aquatic life.

4 – The Niagara River Toxics Committee

Because of the concern of governments and the public about toxic pollution in the Niagara River, and because of the common interests of restoring the health and vitality of the river, the environmental agencies of the two countries agreed to cooperate in a joint investigation of toxic chemicals entering the river. In February 1981 a Canada/United States Niagara River Toxics Committee (NRTC) was established to oversee and coordinate this program. The committee's membership consists of representatives from Environment Canada, the Ontario Ministry of the Environment, the U.S. Environmental Protection Agency, and New York State Department of Environmental Conservation.

Funding for the investigation is being provided by the four cooperating agencies.

The Committee is co-chaired by Environment Canada and the New York State Department of Environmental Conservation.

The Committee has three objectives:

1. Identify sources of toxic pollutants entering the Niagara River.
2. Recommend control programs where necessary.
3. Recommend long term water quality monitoring programs for the Niagara River that will allow evaluation of the effectiveness of control programs.

The first task of the committee was to develop a work plan for this joint investigation and a timetable for its completion. The committee has been coordinating the implementation of the work plan, and on completion of the studies, the committee will draft the final report with its recommendations to the four governments involved. The timetable for the committee's work follows.

5 – Timetable

February 1981: First Meeting of the Niagara River Toxics Committee (NRTC).

February 1981 - March 1983: Gather scientific data on water quality in the river and adjacent parts of Lakes Erie and Ontario, on the river sediments, on fish and plants in the river and at its source and mouth, on industrial and municipal discharges to the river, and on potential migration of chemicals from hazardous waste sites to the river.

February 1983: Release of Status Report on the activities of the NRTC.

April 1983: Target date for completion of data gathering for individual sub-projects.

April - December 1983: Analyses of the information, and drafting of the final report including the recommendations to the four governments involved.

December 1983: Completion of final report and its submission to sponsoring agencies for acceptance and action.

6 – Purpose of the NRTC Investigation

While many studies have been conducted in the past, there are still gaps in the data. For example, past ambient river monitoring has looked at only a few of the many toxic substances which have now been identified in the river as a result of improved analytical methods.

There has been little attempt in the past to coordinate Canadian and United States monitoring activities on the river. A total picture of the toxic contamination issue is lacking, particularly the relationship between contaminants in the river and the sources of these chemicals to the river.

The present coordinated investigation was designed to fill these gaps. It will provide more information on what chemicals are present in the river, how much there is of each chemical in the water, sediments, and fish, where they are coming from, and how each chemical gets to Lake Ontario. With this information, conclusions can be reached on how well present pollution abatement programs are protecting the water and fish, not only in the Niagara River, but also in Lake Ontario.

The results may lead to refinements in these programs, as well as the need for additional programs. Part of the Niagara River Toxics Project includes the design of long-term water quality monitoring to evaluate the effectiveness of these control programs.

In summary, by providing this perspective on the toxic substances contamination of the Niagara River, governments will be able to make more informed decisions about the river's environment.

7 – The Work Plan

I. Evaluation of Existing Data

Objective: Review information on toxics in relation to the Niagara River and prepare reports that will present our state of knowledge on toxics in the river and potential direct and indirect discharges.

The initial step is to summarize what is already known. This information is being used to direct the study requirements, avoid duplication of past efforts and augment study results.

II. Ambient River Monitoring

Objective: Assess the extent of toxic contamination in the Niagara River and locate areas in the Niagara River where significant inputs of toxic chemicals are occurring.

Ambient river monitoring is designed to look at the distributions of toxic substances in the river system, measure their concentrations in water, sediment, suspended sediment, fish and other biota. It includes sampling surveys in the Niagara River, and also in Buffalo Harbor, the Buffalo River, Frenchman's Creek, Scajaquada, Two Mile, Tonawanda and Cayuga Creeks, and the Welland River, and adjacent parts of Lakes Erie and Ontario. This part of the project contains twenty-eight sub-projects.

III. Point Source Monitoring

Objective: Determine specific sites of toxics input to the Niagara River from point sources and quantify these inputs.

These sub-projects are designed to test and evaluate the waste discharges to the river from industrial facilities and municipal treatment plants. Efforts are also underway to determine the presence and significance of toxic substances entering the river from urban run-off through storm sewer systems.

IV. Non-Point Source Monitoring

Objective: Determine specific sites of toxic inputs into the Niagara River from non-point sources (primarily landfills) and attempt to estimate these inputs.

These sub-projects investigate other toxic contributions to the river, primarily landfill sites. More than 150 sites are being investigated to determine what they contain and the extent of groundwater pollution, and whether this groundwater eventually enters the river.

V. Abatement Program Assessment

Objective: Develop specific recommendations for remedial and abatement programs to reduce toxic chemical inputs into the Niagara River.

Upon completion of the field work, and on the basis of the analysis and interpretation of the data collected under Sections II, III and IV, the committee will be able to make recommendations on the need to make modifications to existing control programs or, in some cases, the need for additional programs to reduce or remove toxic chemicals currently entering the river.

VI. Long-Term Monitoring

Objective: Design a long-term ambient monitoring program on the Niagara River that will allow the effectiveness of programs to control toxics to be evaluated.

The long-term monitoring program will be designed to evaluate the effectiveness of toxic control programs. Implementation of this monitoring program will ensure ongoing cooperation and coordination of Canadian and United States studies on the river.

VII. Final Report

Objective: Prepare a final report that will provide both specific recommendations on increasing the effectiveness of present controls over toxic chemicals entering the Niagara River and a proposed long-range monitoring plan to evaluate the effectiveness of control programs.

The date for submission of the Committee's final report to the four environmental agencies involved in the project is December 1983. A brief description of the proposed outline of this report is presented in the next section.

8—Outline of the Final Report

Beginning in April 1983, the Niagara River Toxics Committee will draft its final report on the Niagara River project. The report, as presently planned, will include the following chapters:

I. Introduction: Overview of the toxic substances issue, the role of the NRTC, overall project objectives and outline of the sub-projects.

II. Project Findings: This chapter represents the core of the report. It will integrate and interpret the results from all the sub-projects to lay a foundation for the committee's recommendations. Given the new and existing data, it will provide a current picture of the present state of toxic pollution in the river. Measurements taken on the river's water, sediments and fish, at point sources (at the end of discharge pipes) and non-point sources (e.g. leachate from hazardous waste sites) will be compared and integrated with existing historical information in order to describe a total picture of what is in the river. Comparisons between industrial, municipal, and hazardous waste site inputs will identify the significance of the various pollution sources. Specific emphasis will be placed on those chemicals for which there are existing water quality objectives, human health guidelines, and effluent criteria. Data limitations and deficiencies will also be discussed.

III. Review of Control Programs and Remedial Work: This chapter will discuss the legal basis for remedial programs in both Canada and the United States and the current status of these programs. These will include for example, the SPDES Permit System (United States) and Certificates of Approval (Canada) for municipal and industrial discharges and the United States and Canadian pretreatment programs.

The chapter will also describe present remedial programs for existing chemical waste disposal sites and the status of these programs.

IV. Strategies for Control: This chapter will consider possible alternative or new strategies for improving controls on the basis of the results from this program, the adequacy of present control programs and predicted future loadings. Discussion of these strategies will also attempt to outline possible legal and technical

feasibilities, costs, timetables, and health and environmental benefits.

V. Long-Range Monitoring: This chapter will present a long-range monitoring program designed to assess the effectiveness of any changes or additions made to present pollution abatement programs as well as continually updating the information on toxic substances pollution in the river. Implementation of this program will ensure a coordinated approach between the two countries in addressing this issue.

VI. Recommendations: These will be made by the committee to the four environmental agencies involved. The recommendations will be made on an overall control strategy and on specific steps which should be taken where needed to improve the effectiveness of toxic chemical controls.

GLOSSARY

Glossary of Agencies and Other Terms Used in Sub-project Status Reports

USEPA	United States Environmental Protection Agency	EPA Region II	U.S. Environmental Protection Agency Region II Offices in New York City
NEIC	National Enforcement Investigations Center, USEPA, Denver, Colorado	IWD/OR	Inland Waters Directorate/Ontario Region, Environment Canada
GLNPO	Great Lakes National Program Office, located at USEPA Region V Offices, Chicago, Illinois	IJC	International Joint Commission
NYS DEC	New York State Department of Environmental Conservation	IAGLR	International Association for Great Lakes Research
NYS DOH	New York State Department of Health	SPDES Permit	State Pollution Discharge Elimination System Permit (New York State)
EPA ERL	USEPA, Environmental Research Laboratory, Duluth, Minnesota	EPS	Environmental Protection Service, Ontario Region, Environment Canada
NRTC	Niagara River Toxics Committee	NWRI	National Water Research Institute, Environment Canada
MOE	Ontario Ministry of the Environment		
WRB	Water Resources Branch, Ontario MOE		

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SECTION 2

I—Evaluation of Existing Data

Sub-project No. 1

Title—Literature Review and Evaluation

Project Leader—James Vincent

Agency—USEPA-NEIC, Denver with support from Great Lakes Laboratory

Objective—Review information on toxics in relation to the Niagara River and prepare reports that will present our state of knowledge on toxics in the river and potential direct and indirect discharges.

Tasks—A multi-media review of the literature and agency files on toxic chemicals in the Niagara Frontier and their effect on the Niagara River has been conducted.

Status—Published reports—Overview of Environmental Pollution in the Niagara Frontier, New York, March 1982, by EPA-NEIC.

II - Ambient River Monitoring

Sub-project No. 1

Title—Buffalo Harbor and Niagara River Sediment Survey

Project Leader—Cliff Risley

Agency—EPA Region V (GLNPO)

Objective—To determine the quality of the bottom sediments in the upper Niagara River and its main tributaries

Tasks—Sampled 58 sites in early May 1981 and 11 during September 1981. Each sample was subject to a GC/MS scan and significant peaks identified. Samples were taken from Buffalo Harbor to Niagara Falls, NY

Status—The draft report is currently undergoing EPA's peer review process. The laboratory data have been made available to the NRTC.

Sub-project No. 2

Title—Ambient Feasibility Study

Project Leader—Dr. Edward Kuzia

Agency—NYS DEC

Objective—To develop a monitoring procedure employing freshwater clams (*Elliptio complanatus*) and polypropylene substrates to identify entry points of contaminants to the Niagara River.

Tasks—A study site was selected on the east shore of the Tonawanda Channel downstream from Tonawanda Creek at Petit Flume, a storm sewer outlet which contains treated wastes from Hooker Durez. Caged clams and polypropylene substrates were deployed in the flume and about 100 yards upstream and downstream on July 17, 1981. Sample recovery was completed August 12, 1982. Results were analyzed to determine if there are statistically significant differences between upstream and downstream sites.

Status—This project has been completed. Neither clams nor substrates demonstrated any significant accumulation of contaminants. Therefore, no further work on this project is contemplated.

Sub-project No. 3

Title—Polycyclic Aromatic Hydrocarbon (PAH) Trackdown

Project Leader—Dr. Edward Kuzia

Agency—NYS DEC/EPA Region V (GLNPO). Major contract to Health Research, Inc., Roswell Park Memorial Institute, Buffalo, NY. Dr. John Black, Principal Investigator.

Objective—To identify sources of PAH input to the Niagara River basin in the vicinity of Buffalo, New York using artificial substrates (oil absorbent polypropylene mats), sediments, and biota.

Tasks—A study has been underway since October 1980 placing polypropylene substrates at various locations along the Niagara River principally close to potential industries that may be handling toxic organics. Approximately 40 sites have been sampled, the organics extracted and tested. They were scanned by high pressure liquid chromatography. Preliminary testing identified a number of areas contributing PAH to the Niagara River. During the second stage of this program, sampling several of these high loading areas was carried out to specifically identify the type, amount and entry point of polycyclic aromatics.

Status—Analyses have been completed. A final report is in preparation.

Sub-project No. 4

Title—Nearshore Ambient Trackdown

Project Leader—Dr. Edward Kuzia

Agency—NYS DEC

Objective—By fish sampling near the shore of the Niagara River to identify sources of toxic chemical entry to the river.

Tasks—Young of year spottail shiners were collected at approximately 25 locations in the Niagara River basin. Fish are being analyzed for selected contaminants.

Status—Young-of-year spottail shiners have been collected at approximately 25 locations. A contract is being prepared between NYSDEC and Hazelton-Raltech Inc. for contaminant analyses of these fish.

Sub-project No. 5

Title—Fish Studies

Project Leader—Dr. Ron Sloan

Agency—NYS DEC

Objective—To determine on an on-going basis the contaminant levels of fish in the Niagara River.

Tasks—As part of a statewide program fish are collected at several locations on the Niagara River on a cyclic 3-year schedule. Analyses are carried out on filets for metals and chlorinated organics.

Status—Report on 1979 data summary sheets available.

Report on 1981 data - results not yet available for Lewiston, Strawberry Island & Fort Niagara Locations.

No collections in 1982.

Sub-project No. 6

Title—Macroinvertebrate Survey

Project Leader—Dr. Karl Simpson

Agency—NYS DEC/NYS DOH

Objective—To evaluate the relative biological health of the Niagara River through the collection and study of macroinvertebrate samples.

Tasks—Artificial substrate samples are placed every few miles and retrieved after 5 weeks residence time. This repeated three times during the summer (June-October, 1982). The results will be compared with those obtained from a similar survey in 1976.

Status—Collected samples in July, August and September from 9 stations from upstream of the Peace Bridge to Youngstown (mouth). Samples are now being sorted and analyzed.

Sub-project No. 7

Title—Lake Erie and Lake Ontario Water Sampling

Project Leader—Nelson Thomas

Agency—EPA ERL - Duluth

Objective—To investigate the quality of the water as it enters the Niagara River and as the river enters Lake Ontario.

Tasks—A 99-liter sample was taken at the lower end of the Niagara River, the far eastern end of Lake Erie and the far western end of Lake Ontario.

Status—Sampling and analysis have been completed and a report issued to the NRTC.

Sub-project No. 8

Title—Sediment Testing in Buffalo River & Harbor

Project Leader—R. Leonard

Agency—U.S. Corps of Engineers, Buffalo

Objective—To determine chemical quality of the sediments in the Buffalo Harbor navigation channel.

Tasks—Thirteen sites were sampled during May 1981. Samples extracted and analyzed for metals, chlorinated organics, and nutrients.

Status—Sampling and analysis for the Buffalo River have been completed and a report was issued to the NRTC.

Sampling of the Times Beach area of the Buffalo Harbor has been completed, the analyses are underway, and a report is expected in early 1983.

Sub-project No. 9

Title—Water Quality Surveillance Network Sampling

Project Leader—Mr. Frank Estabrooks

Agency—NYS DEC

Objective—To establish a toxics surveillance program within the WQSN; evaluate the extent of toxic contaminants; determine longterm trends; identify problem areas and substances.

Tasks—The following areas in the Niagara River Basin were sampled for toxics testing in July and September of 1981. They are:

1. Niagara River at Buffalo-Broderick Park Dock, Squaw Island Site 01-004.
2. Niagara River at mouth-Fort Niagara Site 01-0001
3. Niagara River at Town of Tonawanda (Inside W.T.P.) Site 01-0007
4. Niagara River at Town of Tonawanda (W.T.P. dock) Site 01-008
5. Buffalo River at Buffalo (Ohio St. Lift Bridge) Site 01-0006
6. Tonawanda Creek at City of Tonawanda (River Rd. Bridge) Site 01-0200

Status—Samples were tested for the priority pollutants for Phase 1 of this overall program. After evaluation of the data and coordination with other groups working on toxics, a Phase II program was developed to center principally on site-specific evaluations (1982)

Phase I has been completed. This phase was concerned with developing sampling methodologies and training personnel.

Phase II has been completed and the first annual report is being prepared.

Sub-project No. 10

Title—Lake Erie Input to Niagara River

Project Leader—Italo Carcich/Patricia Longabucco

Agency—NYS DEC

Objective—Estimate the toxics loading to the Niagara River from Lake Erie independent of the Buffalo River.

Tasks—Suspended sediments were collected bi-weekly and under high turbidity conditions by a continuous centrifuge installed at the Buffalo Water Treatment Plant (BWTP). In addition, Lake Erie water samples were collected from the BWTP and composited over the interval of centrifuge operation.

Analyses were performed for selected pollutants and the results compared with similar analyses performed on samples obtained at Niagara-on-the-Lake by MOE.

An additional investigation was conducted to assess the appropriateness of using the BWTP as a representative sampling point for Lake Erie.

Status—A total of 18 suspended sediment and 13 water samples were collected from Lake Erie at the Buffalo Water Treatment Plant (BWTP) station. Three samples were collected during high wind conditions over the lake. All samples were analyzed for priority pollutant metals and organics.

A split sample exchange system was initiated between the US and Canada. Four sediment splits have thus far been exchanged for analytical result comparisons.

A study to assess the suitability of using the BWTP intake as a sampling station was undertaken in June 1982. Results from the study show no significant water quality differences between the sampling site and nearshore areas. This confirms the selection of the intake crib as an appropriate station for monitoring Lake Erie toxic inputs to the Niagara River.

In order to determine the nature and variability of bottom sediments and water in eastern Lake Erie, a number of samples were collected in various locations. These were analyzed for priority pollutants as well as total organic carbon and particle size for the sediments.

Sub-project No. 11

Title—Buffalo River Toxics Loading

Project Leaders—Italo Carcich/Patricia Longabucco

Agency—NYS DEC

Objective—Determine the annual export of toxics by the Buffalo River to the Niagara River.

Tasks—Depth-integrated water samples were collected at the Michigan Avenue bridge during low-flow, base-flow and high-flow conditions. Special efforts were made to collect samples during fall and spring run-off events, when, experience has shown, much of the annual loading of pollutants occurs.

Status—Water samples have been collected from the Buffalo River Michigan Avenue station under several flow conditions. Since June 1982, one base-flow and six low-flow samples were collected and analyzed for priority pollutant metals and organics. Coverage of two fall rainstorm events with peak flows of approximately 4000 cfs and 8000 cfs, respectively, resulted in the collection of 24 samples through the duration of the events. Chemical analysis of these samples has not been completed.

Sub-project No. 12

Title—Open Lake (Erie) Dredge Spoil Site Sampling

Project Leader—R. Hemmett

Agency—EPA Region II

Objective—To determine if contaminated dredge spoils still exist at the former Open Lake dredge spoil site.

Tasks—Twenty samples were collected using a ponar dredge in the vicinity of the dredge spoil site. The samples were analyzed for the EPA priority pollutants and the data were evaluated with reference to any possible influence on the Niagara River.

Status—16 Samples taken, data have been analyzed and the report is being prepared.

Sub-project No. 13

Title—Scajaquada Creek Sediment Sampling

Project Leader—R. Speed

Agency—NYS DEC Region 9

Objective—To determine if there are any significant toxic constituents in sediments of Scajaquada Creek that may eventually find their way to the Niagara River.

Tasks—Seven points were sampled

Status—All data received. Report is in preparation

Sub-project No. 14

Title—Two Mile Creek Sediment Sampling

Project Leader—R. Speed

Agency—NYS DEC Region 9

Objective—To determine if there are any significant toxic constituents in Two Mile Creek that may find their way into the Niagara River.

Tasks—Eight points were sampled

Status—All data received. Report is in preparation.

Sub-project No. 15

Title—Cayuga Creek Dioxin Trackdown

Project Leader—Dr. Edward Kuzia

Agency—NYS DEC

Objective—To identify areas where dioxin enters into the Cayuga Creek drainage.

Tasks—Fish and sediment samples were collected at approximately 11 locations in the Cayuga Creek drainage. Samples were analyzed for dioxin.

Status—Fish and sediment sample collections have been completed. A biological assay is being developed to screen the samples for dioxin.

NOTE:

Skip between Sub-project 1 through Sub-project 15 and Sub-project 21 through 33 is intentional.

Sub-project No. 21

Title—Survey of Contaminants at Niagara-on-the-Lake

Project Leader—K.W. Kuntz

Agency—Inland Waters Directorate/Ontario Region

Objective—To determine short-term frequency variations in PCBs and chlorobenzenes in suspended sediments and to more accurately define occurrences and variations of other, as yet, unanalyzed for organic compounds.

Tasks—Suspended sediment samples were collected continuously for a 10-day period in November 1980. Routine analysis (i.e., PCB and OCs - (organochlorines), chlorobenzenes and trace metals)

Status—Data have been received from the laboratory and data interpretation is underway.

Sub-project No. 22

Title—Niagara River - Suspended Sediments

Project Leader—K.W. Kuntz

Agency—Inland Waters Directorate/Ontario Region

Objective—To quantify loadings of PCBs and chlorobenzenes to Lake Ontario via the Niagara River, to identify new and developing problems, to identify violations of International Joint Commission (IJC) specific objectives for water quality and to establish a sediment sample bank for future analysis of unforeseen problems.

Tasks—Suspended sediment samples were collected bi-weekly at Niagara-on-the-Lake. Bi-weekly samples were analyzed for PCBs, OCs, chlorobenzenes, phthalates, and PAHs. For identification of new and developing problems, spottail shiners were collected at several locations.

Status—Sampling completed in August 1982. Analyses underway.

Sub-project No. 23

Title—Toxic Contaminants Sources Survey

Project Leader—K.W. Kuntz

Agency—Inland Waters Directorate/Ontario Region

Objective—To more accurately define sources and violations to IJC specific water quality objectives in the Niagara River.

Tasks—Large volume water samples and suspended sediment samples were collected on three surveys (May, July, November of 1981) in both Upper and Lower Niagara River at five locations. Bottom sediment samples were collected at 16 locations in May 1981. They were analyzed for: PCBs, OCs, PAHs, chlorobenzenes, phthalates, trace metals (on sediments), dioxins, GC-MS scan for new compounds.

Status—Draft report on bottom sediments portion has been submitted to NRTC.

Sub-project No. 24

Title—Niagara-on-the-Lake - Daily Water Monitoring

Project Leader—K.W. Kuntz

Agency—Inland Waters Directorate/Ontario Region

Objective—To establish long-term water quality records for trend evaluation and to provide annual material loads from the Niagara River into Lake Ontario

Tasks—This is the sixth year of a continuing project. Daily water samples were collected by an automatic sampler at Niagara-on-the-Lake. Samples were returned to Burlington weekly for analysis. These were analyzed for: Daily - pH, conductivity, TKN, NO₃, TP; Weekly - Major ions, Total metals, As, Se, Hg

Status—1980 Yearly loading reported in June 1982. Trend analysis reported in IAGLR 1982.

Sub-project No. 25

Title—Lower Niagara River Water Quality Survey

Project Leader—Peter Kauss

Agency—Ontario Ministry of the Environment

Objective—To monitor water quality in the lower Niagara River

Task—Four cruises at 5 stations in the lower Niagara River were conducted on May 4, June 22, August 3, September 14, 1982. Each cruise consisted of 3 consecutive sampling days. Water samples were collected at 1.5 m and analyzed for the following parameters:

Total coliform
Fecal coliform
Fecal Strep.
Pseudomonas aeruginosa
Heterotrophs

Note that GC/MS (Priority Organics) and additional heavy metals analyses (Ba, Co, Ag, Se) performed on 1982 samples.

Status—All four 1982 surveys completed. Report being prepared.

Sub-project No. 26

Title—Upper Niagara River Water Quality Survey

Project Leader—Peter Kauss

Agency—Ontario Ministry of the Environment

Objective—To monitor water quality in the Upper Niagara River

Tasks—Similar to the lower river monitoring at 16 stations in the Upper Niagara River

Status—Same as for II-25

Sub-project No. 27

Title—Lower Niagara River Sediment Survey

Project Leader—Peter Kauss

Agency—Ontario Ministry of the Environment

Objective—To determine the extent of heavy metals and pesticides contamination of lower Niagara River sediments

Tasks—Surface sediment samples were collected during the period June 22—July 6, 1981 in seven areas (three on the Canadian and four on the U.S. side of the river) along 34 transects at water depths of 1, 2 and 5 m. Analyses include:

Group 1 PCBs/pesticides scan and organic extractables

Group 2 Hg, As, Al, Cd, Cu, Fe, Pb, Ni, Zn, Cr, TP, TKN, total C, TOC, loss on ignition and particle size

Group 3 2,3,7,8 - tetrachlorodibenzo-p-dioxin

Status—Data on 1981 survey provided to Ambient Monitoring Sub-Committee

Sub-project No. 28

Title— Freshwater Clam Study

Project Leader—Peter Kauss

Agency—Ontario Ministry of the Environment

Objective—To determine the inputs of trace contaminants during specified periods at various locations in the Niagara River and near the mouths of the Grand River, Twelve Mile Creek and the Welland Canal.

Tasks—Freshwater clams (collected from Balsam Lake in Ontario) were placed in various locations in the Niagara River in cages for a three-week period between August 18—September 8, 1981. Studies at Niagara-on-the-Lake were continuous on a three-day rotational basis from June 1 to October 5. Part of the collections from Balsam Lake were kept as controls. During collection and retrieval, measurements of current direction and speed at the surface (0.5 m depth) and bottom were made at each station along with vertical profiles of dissolved oxygen, temperature, pH

and conductivity. Clams were shucked after collection on site and the tissue shipped on ice back to the laboratory for analyses (metals and organics).

Status—Analyses of 1981 tissue samples from 14 sites now complete for total PCBs and organochlorine pesticides. No analyses are planned for metals.

Sub-project No. 29

Title—Cladophora Surveys

Project Leader—Mike Jackson

Agency—Ontario Ministry of the Environment

Objective—To monitor uptake of heavy metals by Cladophora at several sites in the Niagara River to determine accumulation rates and identify possible sources.

Tasks—Collection of Cladophora quantities from 18 sites in the Niagara River and Lake Erie during June, July and August 1982 were analyzed for heavy metals.

Status—1982 collections sampled as proposed at 20 sites and presently being analyzed for total PCBs and heavy metals.

Sub-project No. 30

Title—Fish Studies—Toxic Contaminants

Project Leader—Karl Suns

Agency—Ontario Ministry of the Environment

Objective—To determine concentrations and trends of contaminants in Young-of-the-Year Spottail Shiners and possibly give an indication of input sources

Tasks—Collection of Young-of-the-Year Spottail Shiners at several locations in the Niagara River. Analyses include PCBs, mirex, Hg, chlordane, OCs, pesticides, HCB, BHC and styrenes and 2,3,7,8-TCDD.

Status—1982 collections completed as proposed at 23 sites and spottail shiner samples are presently being analyzed for total PCBs, organochlorine pesticides, chlorophenols, chlorobenzenes, mercury. Selected samples also to be analyzed for 2,3,7,8-TCDD.

Sub-project No. 31

Title—Trends in Contaminants in Herring Gulls

Project Leader—C. Weseloh

Agency—Canadian Wildlife Service

Objective—To determine the concentrations of persistent contaminants and their temporal trends as well as trends in reproductive success in Great Lakes herring gulls

Tasks—Collecting samples of eggs and other tissues and analysis of contaminant levels and measurement of reproductive success in a herring gull colony resident on an island in the Niagara River just downstream of Niagara Falls. Chemical analyses include a variety of organic compounds including pesticides, mirex, PCBs, and dioxins. This project is part of the ongoing wildlife contaminants program in the Great Lakes which has been operational since 1975.

Status—Samples for 1982 were collected on schedule. Laboratory analyses has just been completed, a quality assurance report and data interpretation are in progress.

Sub-project No. 32

Title—Drinking Water Monitoring

Project Leader—Ray Stewart

Agency—Ontario Ministry of the Environment

Objective—To determine the concentrations of organics in drinking water

Tasks—Collected samples of raw river water on approximately monthly basis near Fort Erie and at Niagara Falls (Ontario), St. Catharines, and Niagara-on-the-Lake water treatment plants (raw and treated water). Samples analyzed for PCBs, organochlorine pesticides and volatile organics (aromatic and halogenated aliphatics) and dioxin.

Status—Program continuing as planned, with samples taken on an approximately twice-monthly basis at Fort Erie (Bertie Bay), Niagara Falls, Niagara-on-the-Lake and St. Catharines. Niagara-on-the-Lake WTP phased out in July, 1982

Sub-project No. 33

Title—Sport Fish Testing—Angler Advisory Program

Project Leader—Allan Johnson



Agency—Ontario Ministry of the Environment

Objective—To determine the levels of contaminants in game fish using statistically valid sample sizes which allow regression analysis for length vs contaminant concentration and the publication of consumption advice to anglers.

Tasks—Annual collection of sport fish from Upper and Lower Niagara Rivers and near river mouth areas of Lake Ontario. Analyses for mercury, PCB, mirex, DDT, HCB, lindane, chlordane, heptachlor, aldrin, 2,3,7,8-TCDD (dioxin) and chlorostyrene. Assessment of results of analyses in regard to suitability of human consumption and, if possible, trends from previous years. Publication of significance of results in "Guide to Eating Ontario Sport Fish - Great Lakes". Part of Ontario-wide sport fish testing program.

Status—1982 sampling program completed. 1981 collections reported in 1982 "Guide" released in April 1982. Results also reported to IJC and NRTC.

III-Point Source Monitoring

Sub-project No. 1

Title—The Effluent Water Quality of Major Industrial and Municipal Treatment Plants

Project Leader—John Ciancia

Agency—EPA Region II

Objectives—To determine and assess the effluent water quality of 10 industrial and municipal plants along the Niagara River with special emphasis on toxics.

Tasks—Samples were taken during May 1981 from Bethlehem Steel, Republic Steel, Donner Hanna, North Tonawanda Wastewater Treatment Plant, Hooker Durez, Niagara County Sewer District No. 1 - Wastewater Treatment Plant, Buffalo Sewer Authority and Town of Tonawanda Wastewater Treatment Plant. For each of the above, the analysis included the priority pollutants and the SPDES parameters. Grab samples of Buffalo Color and CECOS were taken for checking the priority pollutants only.

Status—Samples taken and analyzed, and report written. Report given to the NRTC.

Sub-project No. 2

Title—The Effluent Water Quality of Major Industrial Plants

Project Leader—R. Speed

Agency—NYS DEC Region 9

Objective—To determine and assess the effluent water quality of nine industrial plants along the Niagara River with special emphasis on toxics.

Tasks—Samples were taken (Fall 1981) at nine major dischargers. These samples have been analyzed for the parameters included under the SPDES permits, the priority pollutants and any other special potential toxic chemicals deemed possible in the effluent.

Status—All data received. Reports are in preparation.

Sub-project No. 3

Title—Bioassay of Major Industrial and Municipal Treatment Plant Effluents

Project Leader—Gary Neuderfer

Agency—NYS DEC Avon

Objective—To determine and assess via 48 hour static bioassay the acute fish toxicity of municipal and industrial effluents.

Task—Forty-eight-hour static bioassay were run on effluent samples from 19 industries and municipal treatment plants tested under sub-projects 1 and 2. Two bioassays, one with *Daphnia* and one with fat head minnows, were run on each sample.

Status—All results are being incorporated into individual Point Source Monitoring Reports for industrial and municipal facilities, Sub-project Nos. 2, 4 and 5.

Sub-project No. 4

Title—Effluent Water Quality of Additional Industrial and Municipal Plants

Project Leader—R. Speed

Agency—NYS DEC Region 9

Objective—To determine and assess the effluent water quality of additional (see Sub-project No. 2) industrial and municipal effluents.

Tasks—Sampling and analysis will be done on: 29 industries (66 samples) discharging to the Niagara River or its tributaries; 25 industries (36 samples) discharging to the Niagara Falls Wastewater Treatment Plant; 40 storm sewer outfalls; and 8 municipal treatment plants (6 samples) including sludge from each.

Status—All data received. Report is in preparation.

Sub-project No. 5

Title—The Water Quality of Additional Point Sources

Project Leader—R. Speed

Agency—NYS DEC Region 9

Objective—To determine and assess the effluent water quality of additional (see Sub-projects No. 2 and 4) industrial and municipal effluents

Tasks—Water samples have been taken at six major dischargers. One sludge sample has been collected. Will be analyzed for priority pollutants.

Status—Samples all collected. Awaiting some data.

NOTE:

Skip between Sub-project 1 through Sub-project 5 and Sub-projects 11 and 12 is intentional.

Sub-project No. 11

Title—MOE Toxic Point-Source Survey

Project Leader—Ray Stewart

Agency—Ministry of the Environment, Ontario

Objective—Identify Canadian point-sources and establish loading of toxic substances entering the Niagara River.

Tasks—Preliminary Point-Source Survey (MOE)

The West-Central Region, Ontario Ministry of the Environment (MOE), conducted a point-source survey in January-February 1981. This survey was a preliminary screening of point-source inputs to the Niagara River. Eleven industries, three sewage treatment plants and two stormwater by-passes were sampled (a total of twenty outfalls). Each outfall was grabsampled three times (morning, noon and afternoon) over a one-day period to obtain three-part composite samples for organics, inorganics, heavy metals and pesticide analyses.

Sample analyses were completed in June. Analytical results were reviewed by MOE and EPS staff. Based on this review, it was decided that EPS will undertake an intensive point-source sampling program in 1981 to further characterize and quantify the significant point-source effluent inputs to the Niagara River.

Status—The point-source survey was repeated by the Ontario Ministry of the Environment's Niagara River Improvements Team during October–December 1982. This survey encompassed eleven industries, three sewage treatment plants, four combined sewers and six tributaries to the Niagara River. Each outfall was composite sampled for organics, inorganics, heavy metals and pesticides.

Sample analysis is presently in progress and results are expected for this sampling set by March 1983.

Phase I completed and reported May 27, 1982 to the NRTC.

Phase II sampling and analysis in progress.

Sub-project No. 12

Title—Intensive Toxic Point Source Survey

Project Leader—Tom Tseng

Agency—Environmental Protection Service/Ontario Region

Objective—To further characterize and quantify the significant point source effluent input to the Niagara River

Tasks—Staff of EPS - Ontario Region and MOE West Central Region reviewed industry dossiers and analytical results from the MOE preliminary survey, conducted site visits and decided that the following point-sources in the Niagara area would be studied:

Municipal

Niagara Falls (Stamford) STP
Welland STP
Fort Erie STP, and
4 municipal sewers

Each of the influents and final effluents (after chlorination) from the three STP's and the four sewers were monitored for three days, 8 to 24 hours composite sampling.

Industrial

Atlas Steel
BF Goodrich
Cyanamid
Stelco Welland Tube Works, and
Canadian Dry Chemicals Ltd., Durez Division, Fort Erie

A total of eight outfalls were sampled. Each outfall was monitored for three days, 8 to 24 hours composite sampling.

All samples were analyzed for inorganics, organics, heavy metals, pesticides and the EPA 129 Priority Pollutants. In addition, a list of 'Non-priority Pollutants found in the Niagara River' were to be used by lab personnel in their search for organic parameters. This was undertaken by EPS laboratories in Ottawa. NYS DEC has been asked to analyze three samples for quality assurance purposes. Ninety-six hour static fish bioassays were conducted on four industrial discharges in 1981.

Status—Field work completed. Samples at labs. Report writing to begin in January, 1983.

Pesticides fraction now being analyzed—results in March, 1983.

Purgeable and acid fraction data have been made available to the NRTC.

IV—Non-Point Source Monitoring

Sub-project No. 1

Title—Landfill Investigation

Project Leader—V. Saulys

Agency—EPA Region V (GLNPO)

Objective—To assess the potential for leachate migration from landfills to the Niagara River and determine the chemical nature of such migration.

Tasks—One hundred and fifty-eight disposal sites within three miles of the Niagara River were evaluated. Evaluation was conducted by the U.S. Geological Survey under the direction of NYS Department of Environmental Conservation, Region 9 Office, Buffalo. Funding was provided by EPA Great Lakes National Program Office.

Status—Site investigations at 76 landfills have been essentially completed. Some re-sampling will be necessary at a few sites. The review of outside contractor studies on 82 additional sites has been completed and reports are being drafted.

Sampling at the U.S. Corps of Engineers dredge disposal site has been completed and analyses are now in process.

NOTE:

Skip between Sub-project 1 and Sub-projects 11 and 12 is intentional.

Sub-project No. 11

Title—Urban Areas Draining to the Niagara River

Project Leader—J. Marsalek

Agency—NWRI and MOE, WRB

Objective—To determine the presence, annual loading, and significance of persistent toxic substances from urban areas draining to the Niagara River from Ontario.

Tasks—Manual sampling program, augmented by composite samplers with continuous stage recorders for flow estimates for the following locations:

Fort Erie Residential
Niagara Falls Residential and Industrial
Welland Residential and Industrial

Status—1982 sampling completed and analyses underway.

Sub-project No. 12

Title—Landfill Investigation

Project Leader—Peter Crabtree

Agency—Ontario Ministry of the Environment

Objective—To assess the potential for and the nature of leachate migration from landfills to the Niagara River.

Tasks—Nineteen landfill sites within one mile of the Niagara River or tributaries draining to the Niagara River, will be evaluated.

Status—Sampling completed. Samples in labs. Results late February, 1983. Report to be written.

For further information about this project, contact any one of the NRTC members listed below:

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