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MAJOR NEW STUDY REVEALS TOXIC CONTAMINATION OF THE NIAGARA RIVER

TESTS IDENTIFY PRESENCE OF CANCER-CAUSING CHEMICALS

INADEQUATE REGULATION OF TOXIC DISCHARGES, WATER PURIFICATION, AND MONITORING DETAILED

The New York Public Interest Research Center, Inc. (NYPIRC) today released a 260-page study detailing the sources, types, and hazardous health effects of toxic chemicals discharged into the Niagara River by some of the largest corporations in America. The three-year-long investigation, entitled The Ravaged River, found that:

- Extremely hazardous chemicals such as benzene, trichloroethylene, polychlorinated biphenyls (PCBs), phenol, carbon tetrachloride and phthalate esters are present in industrial wastewaters and municipal sewage treatment plant effluents discharged into the Niagara River. These contaminated discharges total more than 500 million gallons per day.

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- National and State Pollutant Discharge Elimination System (N/SPDES) permits issued to 77 industrial dischargers fail to control the dumping of toxic chemicals. Consequently, some of the largest chemical, steel, and manufacturing facilities in America discharge a complex spectrum of carcinogenic and otherwise toxic wastes into the Niagara River. These inadequately-regulated discharges total approximately 250 million gallons per day.

- More than 700 industries currently avoid direct regulation under the N/SPDES permit program by diverting their contaminated wastewater to municipal wastewater systems. All ten of the facilities reviewed in the study were found to be inappropriately designed or operated to treat toxic industrial wastes. As a result, chemical pollutants pass through these facilities and are discharged into the Niagara River. The effluents from the ten facilities total more than 260 million gallons per day. Ironically, treatment systems representing tens of millions of dollars invested in pollution control are major sources of pollution.

- Scores of landfills containing hundreds of millions of tons of highly concentrated hazardous waste are scattered throughout the Niagara River drainage basin. These inappropriately designed, constructed and maintained landfills are another significant source of toxic contamination.

- A dump located on the Hooker Chemicals and Plastics Corporation's Buffalo Avenue plant site is believed to be the source of toxic chemicals that have penetrated the City of Niagara Falls water treatment plant, which is situated adjacent to the chemical landfill.

- Past and present state and federal toxic substance monitoring programs failed to assess the full scope of pollution problems. Comprehensive testing for a wide variety of toxic pollutants in water supplies and fishlife is non-existent.

- Despite the investment of billions of dollars for a Pure Waters Program in New York State, little or no progress has been made, with respect to discharge of toxic substances, toward meeting the Clean Water Act's 1983 goal of "fishable, swimmable" water quality or the 1985 goal of "zero discharge" of toxic substances.

"The honeymoon is over as far as the Niagara's pollution protection programs go," said Donald K. Ross, executive director of NYPIRG. "Millions of tax dollars have been spent to clean up the Niagara, but you still can't eat the fish. Industry must pay for the damage its pollution has caused."

These findings are of critical importance because more than 380,000 people drink water from the Niagara River. Because currently practiced drinking water purification procedures in most cases do not adequately remove toxic contaminants, and because chlorination, once thought to ensure water purity, has itself been shown to produce carcinogens through interaction with water-borne organic chemicals the findings in this study raise very serious questions regarding the use of the Niagara River as a source of drinking water.

"As long as the Niagara River serves as a vast industrial sewer, drinking water quality will be jeopardized," said Walter L.T. Hang, NYPIRG staff scientist and a co-author of the report. "The failure to control toxic industrial discharges, manage hazardous wastes and safeguard drinking water quality is not limited to the Niagara Frontier," Hang noted. "It is a nationwide disaster. Nearly 30 billion dollars have been spent on national clean water programs, yet rivers and lakes are more contaminated with toxics than ever before."

NYPIRG called on local, state and Congressional elected representatives to conduct immediate hearings on the study's findings and to call for full disclosure of industrial dumping activities. Copies of the report were sent to Governor Carey, Commissioner Robert Flacke of the New York State Department of Environmental Conservation, the acting Regional Administrator of the U.S. Environmental Protection Agency, Commissioner David Axelrod of the New York State Department of Health, and Canadian environmental authorities. These officials were urged to give immediate attention to the problems identified in the study. Advanced drinking water filtration systems utilizing Granular Activated Carbon were recommended as a first step in safeguarding public health. In the long run, abatement of toxic discharges at their source was called for.

In undertaking this study, NYPIRG has continued its long involvement in environmental and consumer affairs. NYPIRG is a statewide not-for-profit nonpartisan research and advocacy organization with over 150,000 members. The Toxics Project was begun in 1976, specializing in comprehensive scientific investigations of pollution hazards. Its landmark studies of toxic contamination of the Hudson River, entitled Troubled Waters, and its study of Long Island groundwater contamination, Toxics on Tap, were both cited by the President's Council on Environmental Quality in its annual report. NYPIRG has also been awarded a certificate of merit appreciation by the Environmental Protection Agency for its toxic work.

Copies of this report are available from NYPIRG Publications, Room 1000, 5 Beekman Street, New York, NY, 10038, for $10.00 for individuals and non-profit organizations, $25.00 for government agencies and institutions and $50.00 for all others. Add $2.00 for postage and handling. Summaries of the report are free upon request, when accompanied by a stamped, self-addressed envelope.

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The Ravaged River

Toxic Chemicals in the Niagara River

SUMMARY

This report details the findings of a three year, independent investigation of toxic pollution in the Niagara River undertaken by the New York Public Interest Research Center, Inc. (NYPIRC). The study was designed to: 1) assess the adequacy of existing pollution control efforts; 2) determine the full extent of contamination in the river; 3) assess the pollution impact on the river, its surrounding environment, and the residents of that area; and 4) outline the steps necessary to cope with the river's pollution problems.

By studying the plight of the Niagara River, as it exemplifies pollution threats to essential waters nationwide, and by checking whether environmental mandates established a decade ago have been put into action, the strengths and weaknesses of the nation's attempts to cope with water pollution can be judged. The verdict is not reassuring. The critical elements of the Niagara River's protection program have been reviewed. Not a single one is adequate.

The National and State Pollutant Discharge Elimination System (N/SPDES) is the main line of defense against water pollution in America. A total of 77 facilities licensed jointly by the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (DEC) dump over 250 million gallons of wastewater into the Niagara each day. An in-depth permit review profiled the pollution potential of each facility, showing that many are known or suspected sources of toxic organic chemicals. Strict numerical standards curtailing the discharge of a broad range of oils, solvents, and other typical manufacturing residues are uniformly lacking. Instead, regulations are generally required only for traditional pollution concerns such as degradable and visible forms of pollution. Instead of rigorously limiting the discharge of toxic pollutants, the permit program sanctions it. The study concludes that N/SPDES-regulated discharges are a major source of chemical contamination.

Due to a loophole in the law, more than 700 industries escape the licensing mechanism of the N/SPDES altogether by discharging wastewaters through municipal treatment systems, instead of directly into the Niagara River. Each of the ten treatment facilities that was studied was either inappropriately designed to cope with industrial wastes or was operating improperly and, thus, could not provide comprehensive toxics removal. Strict pretreatment of wastewaters before release into collection systems was generally not required. As a result, the study found that treatment plants, representing hundreds of millions of tax dollars invested in pollution control, discharge between 260 and 310 million gallons of inadequately treated wastewater into the river per day, thus increasing substantially the Niagara's toxic burden.

Landfilled hazardous wastes constitute yet another inadequately controlled source of chemical pollution. A review of available information detailing the potential hazards associated with the more than 200 dumps located in Erie and Niagara counties reveals that highways, buildings, and water supply structures have been constructed on or adjacent to abandoned and active landfills. More than 50 dumps are proximate to the Niagara River. Contamination slips from these landfills and flows underground, where it is all but impossible to retrieve. Ultimately, the pollution drains into the Niagara River. Improperly disposed-of hazardous wastes are a potentially catastrophic threat to the environment and the public's health. Yet, the study concluded that neither government nor industry has determined the composition of wastes entombed in the majority of the sites, characterized the extent of pollution emanating from the sites, or undertaken remedial work to make the sites secure.

A critique of ongoing monitoring programs reveals that the full extent of toxic contamination in the Niagara River and its surrounding environment is a mystery to all. Broad spectrum analyses essential for identifying toxic chemicals in hazardous wastes, industrial wastewaters and drinking water have not been undertaken frequently enough. As a result, a limited and misleading understanding of contamination problems exists. If pollution is undetected, appropriate action obviously cannot be taken. A limited monitoring survey was undertaken in order to test the presumption that sources of contamination exist that simply have not been identified. A total of 73 samples were collected and analyzed using Ames Testing or gas chromatograph/mass spectrometry techniques. The presence of previously undetected contamination was verified by the test results.

More than 380,000 people drink water drawn from the contaminated Niagara River. Yet, this study reveals, none of the seven water supplies that tap the river are equipped to cope effectively with toxic chemicals. As a result, the public may be exposed to potentially hazardous pollutants in their water.

The city of Niagara Falls supply system was found to have the most severe pollution problems. The municipal treatment plant is located immediately adjacent to a massive Hooker Chemicals site and less than 200 yards away from a hazardous waste dump where more than 74,000 tons of chemical waste have been buried. Studies have indicated that contamination from this landfill has already infiltrated the plant's water intake system. Among the wastes known to be in the dump are 200 tons of trichlorophenol, a material contaminated with dioxin. Dioxin is extraordinarily toxic and is considered to be one of the deadliest chemicals known to science. In the event of a sudden break in the plant's antiquated intake lines, the facility is not designed to to keep the pollution out of the water supply system. An unprecedented health disaster could result.

The widespread toxic pollution that was identified in this study led to a preliminary assessment of the potential for environmentally-induced diseases in the study area. A review of available cancer statistics shows that presumptive evidence exists which indicates that toxic contamination in western New York's environment may already be taking a toll in human lives. Erie

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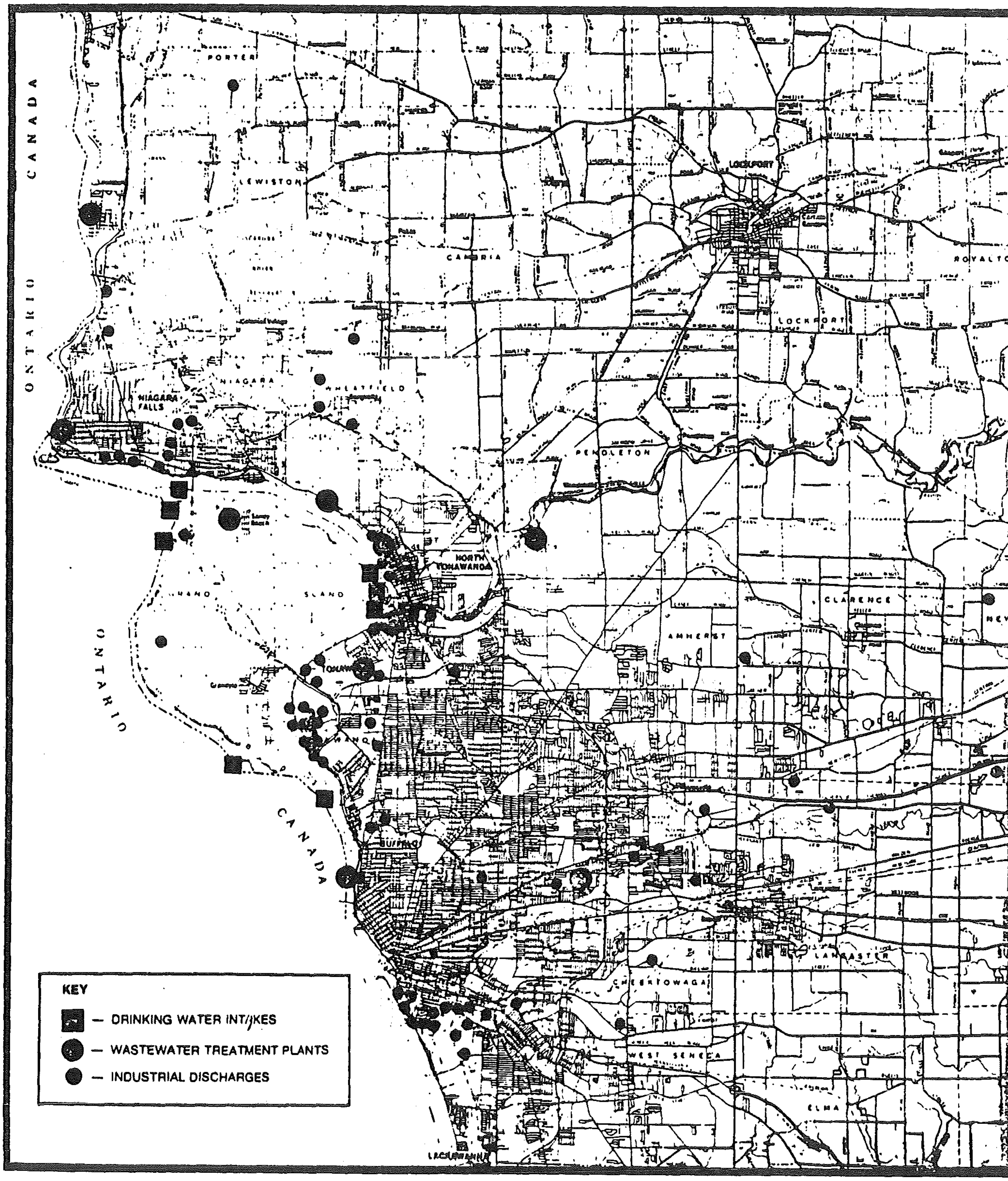
Present cancer mortality rates, however, primarily reflect the results of events and exposures to cancer-causing (carcinogenic) chemicals that could have occurred as long ago as 40 years. Cancer is a latent disease. As the environment becomes more heavily polluted with carcinogenic contaminants, the public's exposure to toxics also rises, resulting, in all likelihood, in a commensurate increase in health risks. The study concludes that in the years ahead, toxic pollution could pose a very serious threat to public health in the Niagara Frontier.

This study proves for the first time that the Niagara River's pollution problems are far more serious and numerous than was previously known. It also proves that existing environmental and public health programs are fundamentally unable to cope with the chemical pollution problems in the Niagara and its surrounding environment.

THE RAVAGED RIVER

Toxic Chemicals In The Niagara River



NYPIRG's *Toxic Chemicals Project* was established in 1976. Scientists trained in varied disciplines conduct independent investigations of toxic hazards in New York State. Technical reports, testimony and organizing are used to promote citizen understanding and action in the areas of public policy that affect environment and health.

The New York Public Interest Research Group, Inc. (NYPIRG) is a not-for-profit, non-partisan research and advocacy organization directed by New York State college students. NYPIRG is funded by students at member schools, contributions raised by a professional canvassing staff, and government and foundation grants. NYPIRG organizers, scientists, lawyers, researchers, administrators, graphic artists and printers work with students and other citizens in Albany, Binghamton, the Bronx, Brooklyn, Buffalo, Long Island, Manhattan, New Paltz, Queens, Staten Island, Syracuse and Utica, developing citizenship skills and shaping public policy. Consumer protection, energy policy, environmental preservation, government accountability, political reform and social justice are NYPIRG's principal areas of concern.

The NYPIRG *Citizens Alliance* is the community organizing project of the New York Public Interest Research Group, Inc. Its goals are to increase citizen power and improve the quality of life in New York State. The issues of highest importance to Citizens Alliance members are environmental quality, energy costs, neighborhood preservation, governmental reform and fair taxes.

For additional copies of this publication or for information on economical bulk rates write: NYPIRG Publications, 5 Beekman Street, New York, New York 10038 (212) 349-6460.

A Study by the Toxics Project
of the New York Public Interest Research Group, Inc.

THE RAVAGED RIVER

TOXIC CHEMICALS IN THE NIAGARA

Walter L. T. Hang
Joseph P. Salvo

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Acknowledgements

A report of this size and scope is never the effort of one or two individuals. Without the patience, skill and encouragement of many caring people, our study could not have been completed. The authors gratefully acknowledge the assistance of those individuals and the importance of their contributions.

We wish to thank representatives of many environmental and health agencies who shared vital information and provided technical assistance during the course of this study, including: the U.S. Environmental Protection Agency, the National Institute of Occupational Safety and Health, the National Cancer Institute, the New York State Department of Environmental Conservation, and the New York State Department of Health.

We also thank the local public officials and employees who participated in our surveys or were otherwise helpful.

For their assistance with sample collection and analyses, we acknowledge the efforts of Dr. Sweeney of the Great Lakes Laboratory, Mr. Sam Markello of Biosystems Research, the Energy Resources Company (ERCO), and Dr. Beverly Paigen and her colleagues at Roswell Park Memorial Institute. In particular, we honor Martha Braun, who was responsible for most of the Ames Testing jointly undertaken by NYPIRG and Dr. Paigen's laboratory, and who died unexpectedly and and tragically while this study was in progress.

Deep gratitude is expressed to the following past and present scientists of Roswell Park for their educational and inspirational support: Dr. William Munyon, Dr. Shie-Sheng Lin, and Dr. Robert G. Hughes.

NYPIRG's Toxics Project was originally started as a joint effort with the Environmental Defense Fund. We thank them for the guidance and assistance they have provided throughout the last five years.

Dr. Robert Harris and Dr. David Burmaster, formerly of the President's Council on Environmenal Quality, have been valuable allies at the highest level of authority. We are grateful for the help and encouragement they have given us.

This study could not have been completed without the help of exceptional student interns and volunteers. At Buffalo State College, we thank Harold Avery, Edward Bernel, Tom Novick, Connie La Porta, and faculty member Dr. George M. Land for their help and cooperation. At Syracuse University, we acknowledge Marc Chytilo, Bill Fee, Bob Fekete, Dan Kowalski, Jim Lan, Doug Schultz, Bill Schwartz, "Danny" Wallenhorst, and Rick Zanleuter. We also thank Dr. David Johnson of the SUNY Forestry School, the staff and students of the Community Internship Program and the Syracuse Local Board for their assistance, cooperation and support. Finally, we pay tribute to Gary Johnson, Eric Gent, and Ellen Spilka, good and caring Legislative interns who assisted the undertaking of this study. Our deepest appreciation goes to all of these people. Their commitment and contributions serve as a model of student achievement for environmental and political activists everywhere.

All the work of the Toxics Project received the enduring support of the NYPIRG State Board and Executive Committee. We acknowledge the leadership of: Christopher Aidun, Andrew R. Stevens, Thomas J. Novick, Susan Stamler and Lisa Schwartz.

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Much of the funding support for this study was raised by NYPIRG's own consummate canvassers. Credit for this noteworthy achievement belongs to: Marc Anderson, Paul Hill, Al Guilemette, Irene Grossberg, Pat Burns, Bonnie Martinez, Edmund Devitt Tobin, Gwen Pospisil, Janet Katowitz, MaryEllen Dour, Valerie Kent and all the field managers and individual canvassers. Funding was also supplied by the ARCA Foundation. We are grateful for their support. A special note of thanks goes to Molli Lampi and Bernard Melewski of the Environmental Planning Lobby for providing food, shelter, and a forum for thought during our period of endless commuting to Albany.

We also acknowledge the aid of Ira Rosen, Mike Wallace and the staff of 60 Minutes.

We pay special tribute to those who crafted this study by hand. It has been their triumph to assemble this report from endless hand-scrawled pages. Without their perseverance in the face of adversity, this report could never have been finished. We thank them now for what was often a bitter and nerve-wracking task. The typists: John Barker, Daniel Bucko, Mary Downey, Robin Farber, Abby Helfer, David Hyl, Lynn Russo, and Beth Silbergleit. The editors: Donald Ross, Irwin Fisch, and Anne Witte. The typesetters, printers and graphic artists: Elizabeth Kulas, Conrad Thomas, Larry Lee, Diane Sipprelle, Mark Schienberg, Martha Mixon and Ann Stevenson.

We say it again: more than any other person, Donald K. Ross, NYPIRG's director, has powered this study to fruition. He can generate more pure unrelenting pressure than anyone in the public interest movement, but without him, this report could not have been finished. Thanks again for everything, Chief.

Finally, we acknowledge those who provided the day-to-day encouragement and energy to carry this project through to the end. It has been three long years since this investigation began, but at last another passing thought has become something of enduring value. Thanks to Barbara Breen, Susan Shafer, and our loving parents.

Dedication

This report is dedicated to the organizations and individuals who have worked to preserve the beauty and environmental integrity of the Niagara River and Lake Ontario and to the future generations of Niagara Frontier residents, who will benefit from these irreplaceable natural resources. We wish to recognize the vanguard efforts of the Sierra Club, Operation Clean, Citizens Against Pollution, the Bloody Run Association, S.T.O.P. I.T., the Ecumenical Task Force, Project Pipewatch, the Great Lakes Laboratory, the Environmental Defense Fund, the League of Women Voters, the Oil, Chemical, and Atomic Workers Union, the Erie-Niagara County 208 group, Michael Brown and the Niagara Gazette, Paul MacClennan and the Buffalo Evening News, the International Joint Commission and the numerous sports and fishing groups in western New York.

We pay special tribute to Dr. Beverly Paigen and the Love Canal Homeowners' Association who, through the sheer strength of their convictions, courage, and sacrifice, alerted the world to the devastating potential of toxic chemical hazards.

THE RAVAGED RIVER

Introduction

Few rivers, if any, have the blessings or the troubles of the Niagara. This beautiful river, with its majestic waterfalls, attracts millions of visitors to Canada and the United States each year. Yet, it is a little known fact that the Niagara River is a sewer for one of the great industrialized corridors in the world. Ironically, the splendid Niagara River is one of the most chemically contaminated bodies of water in America.

Ever since industrialization took root in this country, it has flourished in the Niagara Frontier. With easy access to an abundance of water and cheap hydroelectric power, the region was transformed from a placid countryside to a giant manufacturing complex. Today, the relatively short corridor running alongside the Niagara River between New York's two Great Lakes, Erie and Ontario, is crowded with facilities owned by many of the nation's largest corporations, including: Dupont, Union Carbide, Allied Chemical, Hooker Chemical and Plastics, Olin, FMC, Ashland Oil, Mobil, Dunlop, Republic Steel, U.S. Steel, and General Motors.

These and other industries have polluted the Niagara Frontier almost beyond belief. Hundreds of millions of gallons of industrial wastewater are discharged directly into the Niagara River each day, much of it contaminated with the deadliest pollutants known to science. Millions of tons of hazardous waste have been landfilled in more than 200 dumps scattered throughout the area. These long forgotten residues were buried over the course of many decades. Now they jeopardize the future of Western New York. Together, hazardous wastes and industrial discharges constitute an uncontrolled and unprecedented threat to the natural integrity of the Niagara River, the quality of its surrounding environment, and the health and well being of the 380,000 people who drink water drawn from this polluted source.

The implications of this scenario are startling, yet the Niagara's troubles are merely a harbinger of the larger toxic contamination crisis that looms ahead. A myth is being perpetrated in this country that environmental problems have been solved or have ceased to exist. In terms of chemical pollution, this is far from the truth. In fact, the huge proportions of the problem are only now being discovered. As a heavily industrialized nation, America annually generates over 90 billion pounds of pollution. But all across the country industrial wastes are indiscriminately dumped into rivers, lakes, and groundwaters, precisely where widespread contamination is certain to result. During the 1970's, a decade of awakening environmental awareness, nearly 30 billion tax dollars were allocated by the federal government to clean up the nation's waters. But efforts to stem the rapid deterioration of water quality focused almost entirely on controlling degradable biological wastes, such as sewage. Consequently, little progress was made to halt the discharge of toxic chemicals. Biological wastes can upset a river's ecological balance, but nature can usually repair the damage if the dumping stops. Rivers heavily polluted with synthetic industrial wastes rarely recover. Today, many waterways which look cleaner than they have in decades are often more contaminated with toxics than ever before.

So long as America's environment serves as industry's dumping ground, toxic pollution of the nation's air, land and water resources will continue to intensify. The principal problem that must be overcome is neither technical, legal or economic. It is purely political. Since the early 1970's, environmentalists have worked to lay the foundation for sound pollution control programs, mainly through legal and research efforts. But without sustained grassroots support for tough initiatives, powerful special interest groups counterattacked to thwart the implementation of essential policies. Industry's strategy has been successful. Many of the nation's environmental laws are mostly promise and little substance and the national drive for a clean, safe environment has been stopped well short of its goals.

As America enters its second decade of widespread environmental awareness, a renewed commitment to fight pollution is needed. One way to bring this about is to chart the successes and failures of the nation's anti-pollution efforts for all to see. Then the public can learn what has been accomplished and decide what needs to be achieved in the future.

This report details the findings of a three year, independent investigation of toxic pollution in the Niagara River undertaken by the New York Public Interest Research Group, Inc. (NYPIRG). The study was designed to: 1) assess the adequacy of existing pollution control efforts; 2) determine the full extent of contamination in the river; 3) assess the pollution impact on the river, its surrounding environment, and the residents of that area; and 4) outline the steps necessary to cope with the river's pollution problems.

By studying the plight of the Niagara River, as it exemplifies pollution threats to essential waters nationwide, and by checking whether environmental mandates established a decade ago have been put into action, the strengths and weaknesses of the nation's attempts to cope with water pollution can be judged by this study. The verdict is not reassuring. The critical elements of the Niagara River's protection program have been reviewed. Not a single one is adequate.

The National Pollutant Discharge Elimination System (NPDES) is the main line of defense against water pollution in America. A total of 77 facilities licensed by the U.S. Environmental Protection Agency (EPA) dump over 250 million gallons of wastewater into the Niagara each day. An in-depth permit review profiled the pollution potential of each facility, showing that many are known or suspected sources of toxic organic chemicals. Strict numerical standards curtailing the discharge of a broad range of oils, solvents and other typical manufacturing residues are uniformly lacking. Instead, regulations are generally required only for traditional pollution concerns such as degradable and visible forms of pollution. Instead of rigorously limiting the discharge of toxic pollutants, the permit program sanctions it. The study concludes that NPDES regulated discharges are a major source of chemical contamination.

Due to a loophole in the law, more than 700 industries escape the licensing mechanism of the NPDES permit program altogether by discharging wastewaters through municipal treatment systems, instead of directly into the Niagara River. Each of the 10 treatment facilities that was studied was either inappropriately designed to cope with industrial wastes or was operating improperly and, thus, could not provide comprehensive toxics removal. Strict pretreatment of wastewaters before release into collection systems was generally not required. As a result, the study found that treatment plants, representing hundreds of millions of tax dollars invested in pollution control, discharge between 260 and 310 million gallons of inadequately treated wastewater into the river per day, thus increasing substantially the Niagara's toxic burden.

Landfilled hazardous wastes constitute yet another inadequately controlled source of chemical pollution. A review of available information detailing the potential hazards associated with the more than 200 dumps located in Erie and Niagara counties reveals that highways, buildings and water supply structures have been constructed on or adjacent to abandoned and active landfills. More than 50 dumps are proximate to the Niagara River, including the Hooker Chemical and Plastics Corporation's "S-Area" landfill which reportedly contains 74,000 tons of chemical waste and abuts the city of Niagara Falls water filtration plant property. Contamination slips from these landfills and flows underground, where it is all but impossible to retrieve. Ultimately, the pollution drains into the Niagara River. Improperly disposed of hazardous wastes are a potentially catastrophic threat to the environment and the public's health. Yet, the study concluded that neither government nor industry has determined the composition of wastes entombed in the majority of the sites, characterized the extent of pollution emanating from the sites, or undertaken remedial work to make the sites secure.

A critique of on-going monitoring programs reveals that the full extent of toxic contamination in the Niagara River and its surrounding environment is a mystery to all. Broad spectrum analyses essential for identifying toxic chemicals in hazardous wastes, industrial wastewaters and drinking water have not been undertaken frequently enough. As a result, a limited and misleading understanding of contamination problems exists. If pollution is undetected, appropriate action obviously cannot be taken. A limited monitoring survey was undertaken in order to test the presumption that sources of contamination exist which simply haven't been identified. A total of 73 samples were collected and analyzed using Ames Testing or gas chromatograph/mass spectrometry techniques. The presence of previously undetected contamination was verified by the test results.

The widespread toxic pollution that was identified in this study led to a preliminary assessment of the potential for environmentally induced diseases in the study area. A review of available cancer statistics shows that presumptive evidence exists which indicates that toxic contamination in Western New York's environment may already be taking a toll in human lives. Erie County's overall age-adjusted cancer mortality rates for white males and females and nonwhite males are each ranked in the top 10 percent of the national rate, according to a National Cancer Institute Study. Similarly, Niagara County's overall age-adjusted cancer mortality rates for white and nonwhite males are also ranked in the top 10 percent of the national rate. These high cancer death rates may be directly linked to toxic pollutants consumed in contaminated drinking water or absorbed via other routes of exposure; 60 to 90 percent of all human tumors are believed to be environmentally induced, according to the World Health Organization and the National Cancer Institute.

Present cancer mortality rates, however, primarily reflect the results of events and exposures to cancer-causing (carcinogenic) chemicals that could have occured as long ago as 40 years. Cancer is a latent disease. As the environment becomes more heavily polluted with carcinogenic contaminants, the public's exposure to toxics also rises, resulting, in all likelihood, in a commensurate increase in health risks. The study concluded that in the years agead, toxic pollution could pose a very serious threat to public health in the Niagara Frontier.

This study raises many questions that cannot be answered with certainty, but it proves for the first time that the Niagara River's pollution problems are far more serious and numerous than was previously known. It also proves that existing environmental and public health programs are fundamentally unable to cope with the chemical pollution problems in the Niagara and its surrounding environment.

Difficult problems are described in this report, but NYPIRG hopes that its study will spark a positive response, not one of resignation or despair. A clear choice lies ahead for the public. Unless toxic chemical discharges are curtailed, water quality in the Niagara River will continue to deteriorate. In the long run the damage could be irreversible. However, key changes in pollution control could result in dramatic improvements in the foreseeable future. Essential reforms, and the justifications for making them, are described in this report.

Until now relatively meager resources have been used to fight toxic pollution in New York. A handful of workers lacking adequate technical, legal, scientific and laboratory support cannot possibly regulate tens of thousands of industrial discharges, preserve the environment and protect public health. In the future it will be essential to greatly expand resource allocations to the state and federal puablic health and environmental protection programs.

Equally important is the necessity to develop a political solution to the national toxics dilemma. Rivers like the Niagara belong to the public, not to giant multi-national corporations. Yet industry has exploited America's waters without regard for environmental protection. Individuals concerned about the country's environmental future should fight to take away industry's freedom to lay waste to America's irreplacable rivers and lakes.

A unified citizen campaign can translate the recommendations of this study into public policy. Initially, citizens must become knowledgeable about the wide range of hazards industrial pollution poses to the environment and the public's health. Ultimately, citizens must organize themselves to challenge and overcome the the power of corporate polluters. Five main goals should be sought: 1) the control of chemical contamination through a crackdown on waste dumping; 2) the fundamental reorganization of public policies to improve the management and preservation of our nation's precious natural resources; 3) the protection of public health through a drastic reduction in exposures to toxic pollutants; 4) the utilization of corporate profits to repair the damage caused by illegally discharged wastes; and 5) the development of environmentally acceptable manufacturing and waste disposal systems.

Making these changes will be difficult, but the task is not impossible and the results do much more than protect the environment. By fighting for improvements, citizens become politically wise and empowered to make decisions for themselves. In the long run, this allows an informed public to collectively weaken the political advantages of special interest groups in order to make sure that America's land, air, and water resources are used to serve the needs of people, not the demands of profit-minded corporations.

The scientists, attorneys, organizers and members of NYPIRG are ready to join citizens to work for a clean, safe environment.

Walter Liong-Ting Hang.
Staff Scientist

Joseph P. Sabo
Staff Scientist

Donald K. Ross
Executive Director

CHAPTER I

BACKGROUND

This section provides background information on the issues central to this investigation.

The Niagara River

The Niagara is a singular river. Starting from the confluence of the Buffalo River and Lake Erie, the entire length of the Niagara serves as the United States/Canadian border. The Niagara flows from south to north linking Lake Erie to Lake Ontario. It travels 36 miles and generally measures less than a mile in width. At Grand Island the Niagara splits into east and 97 west branches which converge at the northern tip of the island, approximately four miles upstream from Niagara Falls. At the famous waterfalls, the river plummets 167 feet into the Niagara Gorge and continues northward to Lake Ontario. The mean flow rate of the Niagara is approximately 203,000 $feet^3$/second.[1]

The Niagara is Lake Ontario's largest tributary, contributing 83 percent of the total input to the lake. The combined flow of the other four major tributaries (the Genesee, Oswego, Black Rivers and the Trout River in Canada) is less than one-third of the Niagara's.[2] Consequently these tributaries have a lesser effect on water quality in Lake Ontario. Water from the Niagara spends an average of 15 years in Lake Ontario before flowing down the Saint Lawrence River to the Atlantic Ocean.[3]

Once in the lake, water from the Niagara moves in directions influenced by wind direction, temperature, river volume, and other factors associated with seasonal variation. Studies have indicated that the combination of these factors tends to orient the Niagara's plume close to Lake Ontario's southern shore, moving it steadily in an easterly direction.[4] In this way, toxic contamination originating from the Niagara River affects water quality along the southern shore of Lake Ontario.

At the turn of the century, the Niagara Frontier presented an attractive opportunity to prospective industries. The Erie Canal offered a major thoroughfare for goods. Cities like Buffalo and Niagara Falls harbored large pools of workers. The Niagara River offered cheap hydroelectric power and an ample water supply for large energy and water-intensive manufacturing operations. The combination made for prosperity.

Between 1890 and 1930, most of the major chemical, steel and manufacturing facilities were built, including the three Allied Chemical plants in Buffalo and Tonawanda, the oil refinery now operated by Ashland in Tonawanda, the Hooker Chemicals and Plastics plant in Niagara Falls, the two DuPont Chemical facilities in Tonawanda and Niagara Falls, the Carborundum facility in Niagara Falls, the General Motors plant in Tonawanda and the Bethlehem Steel facility in Buffalo. These industries transformed the region into an area heavily dependent on industrial manufacturing.

Similarly, industrial activity has transformed the Niagara River. As this study will document, the large number of heavy industries in the Niagara Frontier have burdened the river with unique toxic pollution problems.

Toxic Chemicals

The phrase "toxic chemicals" is typically used to describe members of a large class of potentially hazardous compounds known as synthetic organic chemicals. These materials are man-made, not naturally occurring, and are primarily composed of carbon and hydrogen. In recent decades, modern chemistry methods have produced tens of thousands of these compounds, mainly from petroleum. Today, over 30,000 organic chemicals are commercially manufactured.[5] Each year approximately 500 new compounds are discovered. By substituting synthetic chemicals for naturally-occurring materials, the chemical industry has brought about a manufacturing revolution. Since 1945, U.S. petrochemical production has skyrocketed by more than 2,000 percent.[6] In the last ten years alone, America's production of synthetic organic chemicals has more than doubled.[7] As a result, these materials now play an essential role in manufacturing and are used as oils, solvents, greases, detergents, intermediates and additives. Moreover, they are common ingredients in an endless variety of consumer products. Unfortunately, synthetic chemicals are also ubiquitous as pollutants.

Wastes from industrial processes are often composed of potentially toxic chemicals and their by-products. Each year, more than 334 million metric tons (wet) of industrial wastes are generated in America, with an annual growth rate of three percent. Yet, the U.S. Environmental Protection Agency estimates that up to 15 percent of this waste is hazardous and that more than 90 percent of it is dumped in unsafe ways each year.[8] Free in the environment, synthetic chemicals require an extremely long time to break down. While doing so, the pollutants disperse to cause widespread contamination of air, land, and water.

Many toxic chemicals are carcinogenic, mutagenic (cause mutations), teratogenic (cause birth defects) or otherwise toxic. Some cause all these toxic effects, even at very low concentrations. However, the toxic effects of most synthetic chemicals are not known for certain. The vast majority of the chemicals used in manufacturing, found in consumer products, or identified as environmental pollutants have never been tested adequately to determine their toxic qualities. As a result, the exact consequences of daily, inadvertent exposure to these contaminants is not known. There is, however, convincing scientific evidence to suppport the presumption that exposure to toxic chemicals will result in higher cancer rates in the near future.

Environmental Cancer

The scientific community generally agrees that the majority of human cancers are environmentally induced. Estimates by the World Health Organization (WHO) and the National Cancer Institute (NCI) concur that between 60 and 90 percent of all human cancers are environmental in origin, and that approximately 90 percent of all human cancers are chemical in origin.[9,10] These estimates have resulted from carefully conducted epidemiological investigations in the workplace, or in large diverse populations.

Cancer is actually a group of over 100 illnesses resulting from the uncontrolled growthn of cells. Normally the human body's billions of cells are specialized to accomplish exacting duties. The complex operation of organs and life processes are precisely regulated and harmonious with one another. When cancer develops, however, the effects are devastating. Cancerous cells disregard the body's internal system of operations controls. Growing at faster rates than normal, cancerous cells build up into tumors. These independent masses of cells invade, compress, and destroy surrounding tissues. Through the process of metastasis, cancerous cells spread throughout the bloodstream and lymph system to form new tumors elsewhere in the body. Ultimately, the body becomes so weakened that death occurs.

Since the turn of the century, the incidence rate of cancer has risen steadily and drastically. In 1900 cancer was the eighth leading cause of premature death. Today, only heart disease kills more people in America. Between 1930 and 1975, the age-adjusted national cancer rate jumped from 116.7 deaths per 100,000 people to 130.9 deaths per 100,000. This increased toll is far above the rise expected from either the increased longevity of Americans, the decline of other leading causes of death (such as infectious diseases), the population boom or other related factors.[11] At its present rate, cancer will afflict one out of every four citizens in the nation sometime during their lives. Approximately 54 million people alive at this time in the USA will someday get cancer. Two-thirds of those people will ultimately die from the disease.[12]

The vastness of these statistics fails to convey the agony and dread caused by cancer. More people die annually from it than all the Americans who died in combat during the entire Second World War.[13] So many have died from this disease that the cancer experience of drawn-out pain and suffering is close to universal in our country. There are few Americans who have not been touched in some way by cancer, their lives changed forever.

The economic costs of cancer are also devastating. The direct and indirect costs of cancer have been calculated to range from $15 billion to $25 billion a year.

Ironically, cancer is a largely preventable disease. Many sicknesses previously thought to arise spontaneously are now known to be caused by environmental pollution. This is especially true of cancer. Toxic substances, including carcinogens, are in the air we breathe, the food we eat, the consumer products we use and the water we drink. Exposure to these chemicals has significant deleterious effects on human health, most notably the incitement of tumors. Multiple exposures can exert additive, synergistic or antagonistic effects. Thus, as our environment grows increasingly contaminated, the cancer risks we bear rise accordingly.

The rise may be a direct consequence of increased exposure to toxic chemicals. It is evident that cancer's general increase is closely parallel to the deterioration of the nation's environment. A graph of industrial activities known to be major contributors of toxic pollution follows a concurrent rising trend of cancer mortality in Figure I.[14] Loose in the environment, synthetic pollutants may not break down for decades. Instead, they accumulate in "hot spots" or in the flesh of fish and wildlife. Human beings are similarly poisoned. Extremely carcinogenic or otherwise toxic compounds such as: polychlorinated biphenyls (PCBs) DDT, DDE, DDD, BHC (benzene hexachloride), aldrin/dieldrin, endrin, mirex, lindane, heptachlor, heptachlor epoxide, oxychlordane, hexachlorobenzene, transnonachlor, and dioxin have all been detected in American flesh.[15]

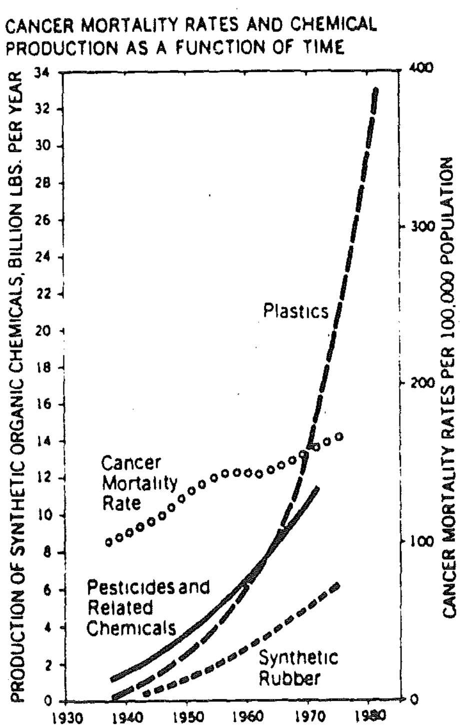


FIGURE I

Source: The Environmental Defense Fund and Robert H. Boyle, Malignant Neglect (New York: Alfred A. Kroff, 1979), pp 21. ("used with permission")

It is highly probable that so long as we expose ourselves to carcinogens in the environment, the rise in the cancer rate will continue unabated. Cancer is a latent disease. Once induced, its symptoms may not appear for as long as 40 years. Presently observed cancer rates are generally the results of exposures that occurred decades ago. These rising trends can logically be extrapolated to much higher rates in the future. Americans have yet to experience the full impact of massive dumping of toxic wastes. The worst effects of today's air, land and water pollution, therefore, will be felt in the years to come.

The future is already taking shape. The distribution of cancer death rates in America has been studied in depth and charted on maps. The result is a major geographical investigation of cancer in America, entitled, Atlas of Cancer Mortality for U.S. Counties: 1950-1969, published in 1975 by the Epidemiology Branch of the National Cancer Institute. This study mapped out the geographical variations in cancer mortality for white males and females nationwide. Mortality rates for 19 cancer sites were graphically represented according to individual counties or clusters of counties that comprised "state economic areas" (SEA). As the phrase implies, these minor regions are economically, sociologically and otherwise similar. Mortality rates for 16 additional prevalent cancers were graphically represented on a strictly county-by-county basis.[16] Later a similar study was performed for nonwhites, males and females. The nationwide maps for white males and females are presented in Figures 2 and 3,[17,18] respectively. Nonwhite patterns for males and females are presented in Figures 4 and 5,[19,20] respectively.

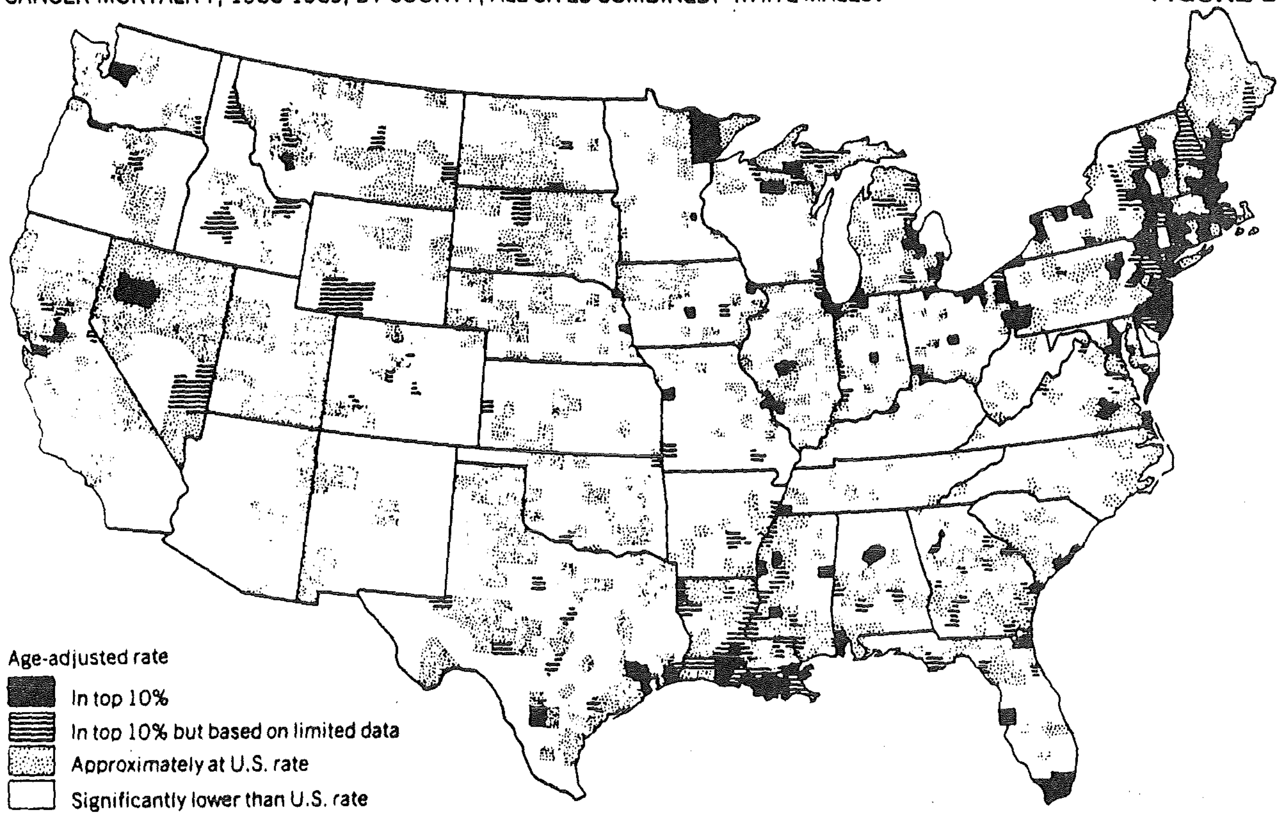
This study indicates that America's northeastern region has the greatest concentration of high cancer rates, with clusters of high cancer mortality located in the manufacturing centers of the Great Lakes, the southern petrochemical center of southern Louisiana and a variety of other locations throughout the country. New Jersey ranked number one overall for cancer mortality, with New York an extremely close second.[21,22]

As a heavily industrialized and populated state with intensely polluted areas, New York would be expected to have high cancer rates. In fact, each of New York's industrialized areas were found to have age-adjusted, overall cancer mortality rates for white males ranked in the top 10 percent of the nation's overall rate.

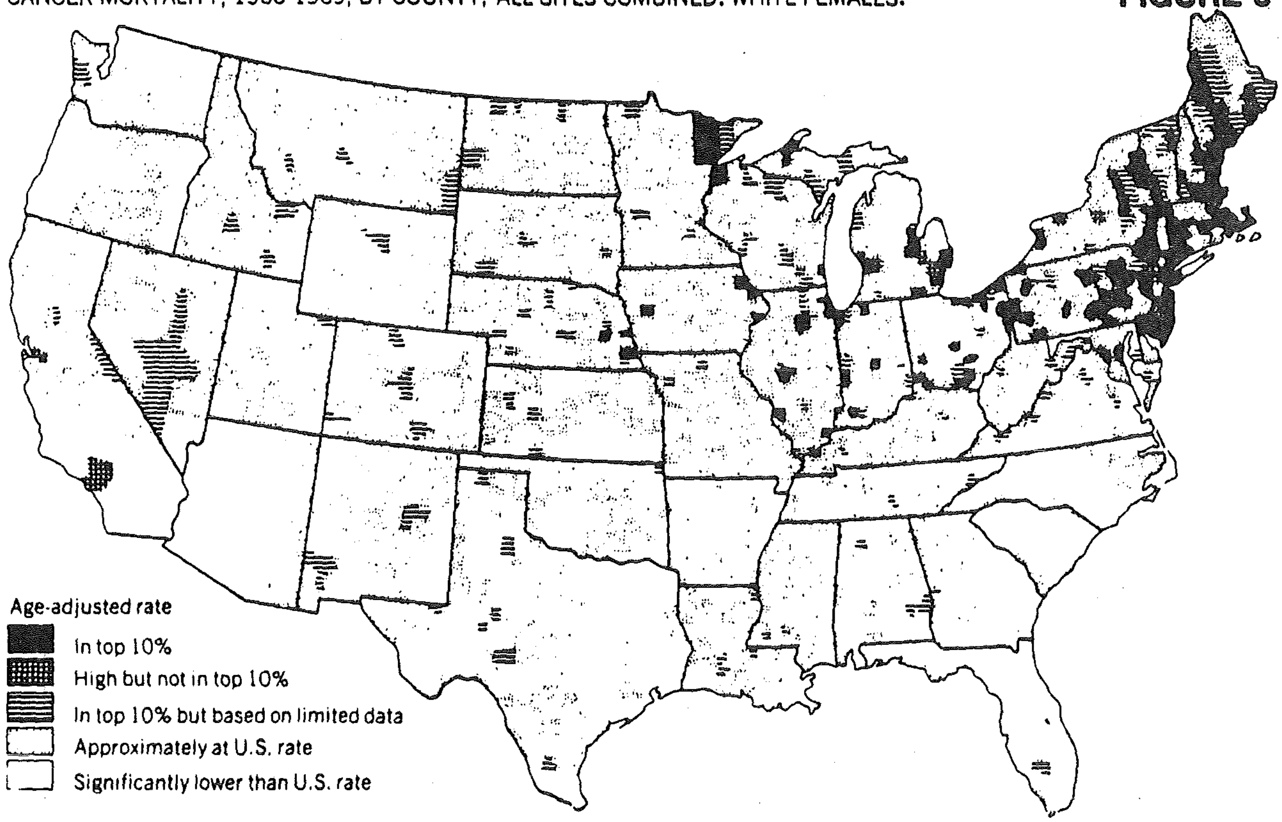
For a detailed review of cancer statistics and trends in Erie and Niagara Counties, refer to Chapter VIII.

A cancer cure is all but impossible in the foreseeable future. This is plainly evident by the fact that cancer's overall incidence rate is climbing, while its cure rate remains static. The overall five-year survival rate of cancer victims

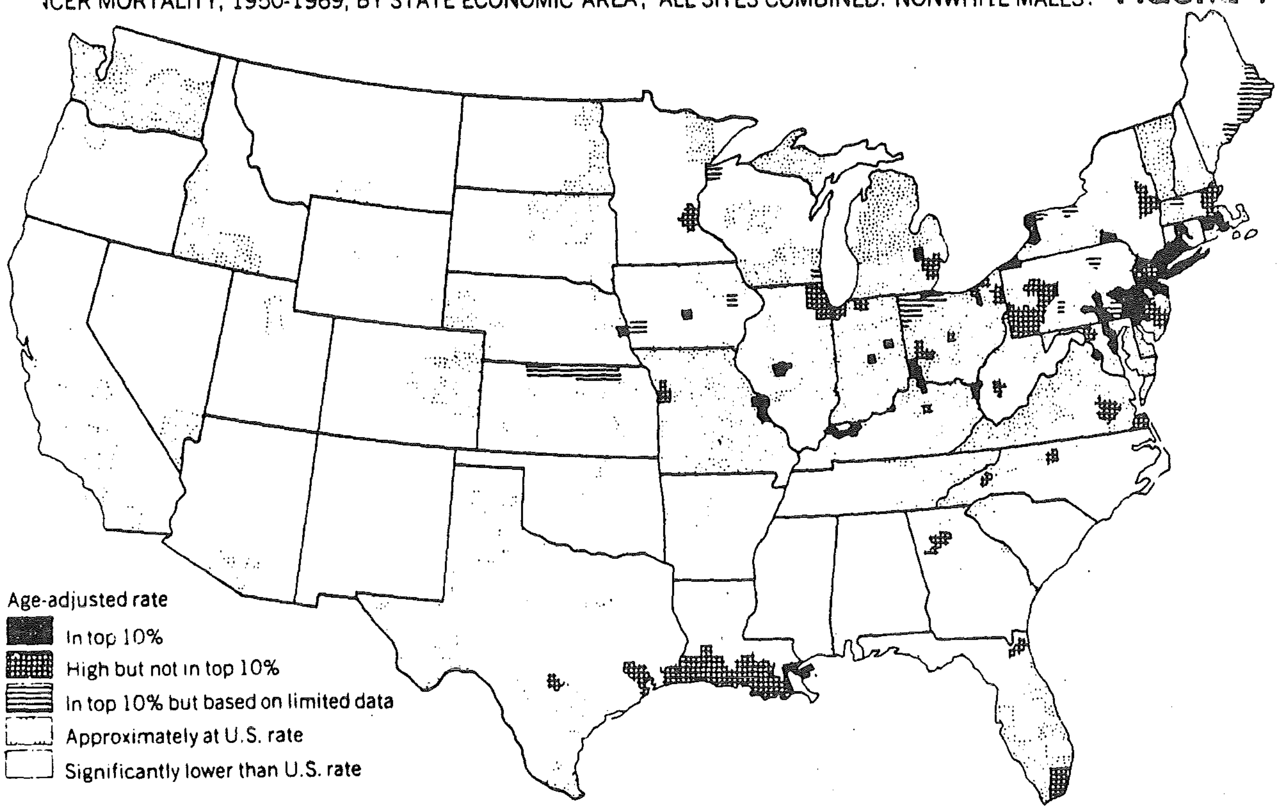
CANCER MORTALITY, 1950-1969, BY COUNTY, ALL SITES COMBINED. WHITE MALES. **FIGURE 2**



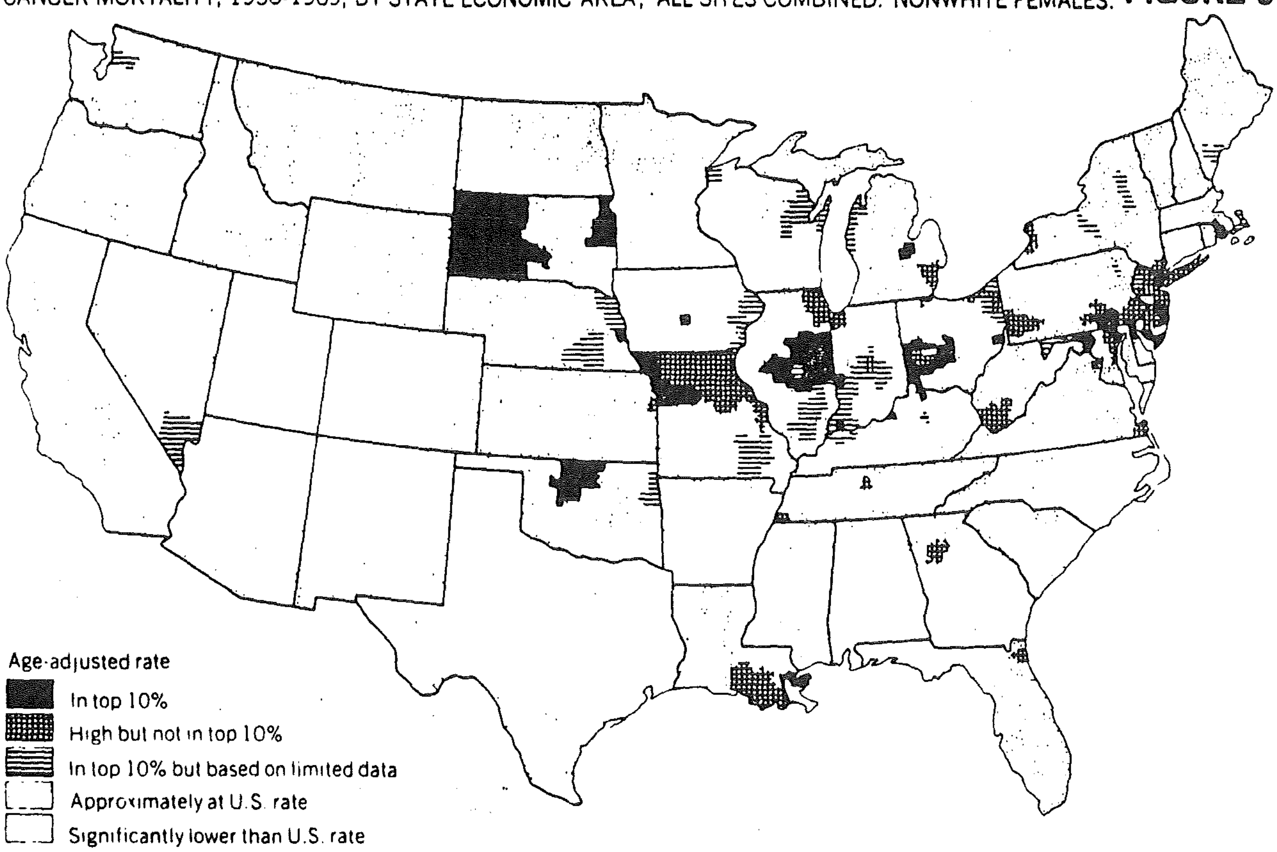
CANCER MORTALITY, 1950-1969, BY COUNTY, ALL SITES COMBINED. WHITE FEMALES. **FIGURE 3**



ICER MORTALITY, 1950-1969, BY STATE ECONOMIC AREA, ALL SITES COMBINED. NONWHITE MALES. **FIGURE 4**



CANCER MORTALITY, 1950-1969, BY STATE ECONOMIC AREA, ALL SITES COMBINED. NONWHITE FEMALES. **FIGURE 5**



Source:
The Environmental Defense Fund and Robert H. Boyle, Malignant Neglect (New York: Alfred A. Kroff, 1979). pp 12, 13, 16, 17.
National Institutes of Health (1975). Atlas of Cancer Mortality for U.S. Counties: 1950-1969, Department of Health, Education and Welfare, Washington, D.C. ("used with permission")

has remained virtually the same since 1950.[23] While tens of thousands more people now contract cancer than 30 years ago, their chances of survival have barely improved.

Toxics in Drinking Water

A large body of scientific evidence has associated ingestion of carcinogens and other toxic pollutants in drinking water with elevated cancer mortality. Yet, neither standards nor stringent protection programs have been established to safeguard the public from this preventable health hazard.

One of the earliest warnings was sounded in 1963 by Dr. Wilhelm Heuper, former head of the National Cancer Institute's Environmental Cancer Section, and an associate:

> The rapidly increasing pollution of many bodies of fresh and salt water with [such] carcinogenic agents and the inabilities of the presently used filtration equipment to remove adequately such contaminants from the drinking water supply has created conditions that may result in serious cancer hazards to the general population.[24]

In 1964 an expert committee on the prevention of cancer reporting to the World Health Organization (WHO) concluded that:

> Effective measures are needed to prevent the introduction of carcinogenic industrial wastes into the atmosphere and into public waters serving as sources of drinking water supply... Although at present no clear evidence exists that such carcinogenic industrial contaminants of the air and water have become an actual environmental cancer hazard to the general population, they should be viewed with serious concern, so as to forestall such complications in the future.[25]

During the 17 years since these ominous warnings were voiced, little or no action has been taken to heed their advice. Yet indications of widespread drinking water problems are more striking now than ever before.

A great deal of scientific evidence now shows that exposure to toxics in drinking water results in significantly increased cancer risks. Dr. Robert H. Harris, formerly of the Environmental Defense Fund (EDF) was the first investigator in America to substantiate that presumption. In 1974 Dr. Harris released the findings of a pioneering epidemiological study which showed a strong statistical link between toxics consumed in drinking water drawn from the Mississippi and increased cancer mortality rates in residents of New Orleans and eleven parishes.[26] Since Dr. Harris' first study, no less than 12 separate epidemiological investigations have confirmed his general findings. These and other epidemiological studies of toxic chemicals in drinking water are listed in Table I.[27] These studies were conducted by investigators independent of one another, in different geographical locations in the United States, using a variety of analytical techniques. Yet they consistently implicate consumption of water-borne carcinogens with excess cancer mortalities, primarily associated with tumors of the gastro-intestinal and urinary tract. Cancer sites which were associated positively in the studies are also listed. On the average the studies estimate the excess cancer rate due to consumption of trace carcinogens in water to be 20 percent or greater.

TABLE 1
EPIDEMIOLOGIC STUDIES OF CANCER AND DRINKING WATER QUALITY

Author P.=Published (Year of publ. or completion) Country/study identifier	Type of study Type of data (Geographical location)	Sample Sex Race	Sample Age	Water Variable	Cancer Outcome (C=control attempt. for extraneous variables in design or analysis)	Major Findings (Subgroups, ages)
Organics (Surrogate Exposure Data, i.e. Surface/Ground Water)						
Diehl P.(1953) Netherlands	Ecological Mortality (Municipalities)	M F All	>50	1)Water systems vs. no water systems	Total	+
				2)Water supply from river vs. other source	Total	+
Harris P.(1974) U.S.A.	Ecological Mortality (Louisiana parishes)	M W	All	% parish population drinking from Mississippi River water	Total Site Specific (C)	+ Urinary tract + G.I. tract + Liver, lung N.C.
De Rouen (1975) U.S.A.	Ecological Mortality (Southern Louisiana parishes)	M F All	All	Water furnished by Mississippi River (dichotomous)	Site specific	Bladder + Colon-rectum + Breast + Liver, corpus uteri - 10 sites N.C.
Buncher (1975) U.S.A.	Ecological Mortality (Ohio River counties)	M F W	All	Water furnished by Ohio River (dichotomous)	Total (C)	N.C.
Page P.(1976) U.S.A.	Ecological Mortality (Louisiana parishes)	M F All	All	% parish population drinking from Mississippi River water	Total Site specific (C)	+ (WM, NW) G.I. tract + Urinary tract + (WM, NWF) Breast, prostate N.C.

Author P.=Published (Year of publ. or completion) Country/study identifier	Type of study Type of data (Geographical location)	Sample Sex Race	Age	Water Variable	Cancer Outcome (C=control attempt. for extraneous variables in design or analysis)	Major Findings (Subgroups, ages)
Organics (Surrogate Exposure Data) Cont.						
Kuzma P.(1977) U.S.A.	Ecological Mortality (Ohio counties)	M F W	All	Ground/ surface water (dichotomous)	Total Site specific (C)	+ (M) Stomach + Bladder + (M) 6 other sites N.C.
Harris (1977a) U.S.A.	Ecological Mortality (Ohio counties)	M F W	All	% county population served by surface water	Total Site specific (C)	+ (M) Stomach + Bladder + (M) Esophagus, pancreas + (M) 5 other sites N.C.
Vasilenko P.(1975) U.S.A.	Ecological Mortality (New Jersey counties)	M W	All	Ratio of # houses served by water systems to # houses served by individual wells	Site specific (C)	Lung + Stomach + Urinary tract N.C.
Kruse (1977) U.S.A.	Retrospective cohort Incidence (Washington county)	M F W	>35	Chlorination (dichotomous)	Site specific (C)	Liver, kidney N.C.
Alavanja P.(1977) U.S.A.	Case control Mortality (New York State)	M F All	All	1)Ground/ surface water (dichotomous) 2)Chlorination (dichotomous)	Site specific Site specific (C)	G.I., Urinary tract N.C. G.I., Urinary tract +
Spivey (1977) U.S.A.	Ecological Mortality Incidence (Los Angeles county communities)	M F W	All	Chloroform content (low/ medium/high)	Site specific (C)	G.I. tract N.C. Urinary tract N.C. Liver, lung N.C.
Salg (1977) U.S.A.	Ecological Mortality (Ohio River basin counties)	M F All	All	1)% county population served by surface water 2)% county population served by pre-chlorinated water	Site specific Site specific (C)	Esophagus, rectum, larynx + Rectum + 16 other sites N.C. *1T
Carlson (1977) U.S.A.	Ecological Incidence (public water supplies Pittsburgh)	M F All	All	1)Types of surface water 2)Types of ground water 3)Water company 4)Raw water source	Total Total Total Total (C)	N.C. N.C. N.C. N.C.

Tuthill (1978) U.S.A.	Ecological Mortality (Communities Massachusetts)	M F All	All	10 water variables including chlorine dose, hardness, iron and nitrate content	Site specific (C)	19 sites invest., a number of + and - associations, + associations principally between nitrates and G.I. cancers
Rafferty (1978) U.S.A.	Ecological Mortality (North Carolina cities)	M F All	All	Ground water vs. surface water receiving upstream discharges	Total Site specific (C)	N.C. 10 sites invest., several + associations between G.I. cancers and surface water
Organics (Measured Exposure Data)						
McCabe (1975) U.S.A.	Ecological Mortality (Cities)	M F All	All	1)Chloroform level 2)T.T.H.M. level 3)T.O.C. level	Total Total Total	+ + N.C.
Cantor P.(1977) U.S.A.	Ecological Mortality (Urban counties)	M F W	All	Chloroform T.T.H.M. B.T.H.M.	Site specific (C)	Kidney + (M) Stomach + (F) Bladder + Non-Hodgkin's Lymphomas +(M)
Hogan P.(1979) U.S.A.	Ecological/ Statistical-Methodological Mortality (Counties)	M F W	All	Chloroform level	Total Site specific (C)	N.C. Colon + Rectum + Bladder + (F) 10 other sites N.C.

Notations For Table 10: Bladder= Urinary bladder *1T = 1-tailed statistical test
M = male W = white N.C. = not conclusive - = negative association
F = female NW = non-white + = positive association G.I. = gastrointestinal
T.T.H.M.=Total trihalomethane T.O.C.=Total organic carbon B.T.H.M. = Bromine containing trihalomethane

Source: SHY, C.M. and Stuba, M.S. (1979). "Epidemiologic Evidence for Human Cancer Risk Associated With Organics in Drinking Water Presented at the Third Conference on Water Chlorination: Environmental Impact and Health Effects, Colorado Springs, Colorado.

Although these studies, and epidemiological investigations in general, do not prove beyond a shadow of a doubt that contaminated water causes cancer in humans, they do provide strong evidence to support that presumption. Similarly no one can say that smoking cigarettes causes cancer. The causes of the disease are known only to be the intensely complex interactions of myriad factors such as genetic makeup, diet, exposure to toxics, and radiation-- all combined with the influence of random chance. One fact is certain, however. Any exposure to carcinogens, no matter how small or transitory, increases cancer risk. The ad hoc committee on the Evaluation of Low Levels of Environmental Chemical Carcinogens reporting to the Surgeon General in 1970 recommended that:

> No level of exposure to a chemical carcinogen should be considered toxicologically insignificant for man.... The principle of a zero tolerance for carcinogenic exposures should be retained in all areas of legislation

presently covered by it and should be extended as well... Any substance developed for use not primarily involving exposure to man but nevertheless resulting in such exposure, if found to be carcinogenic, should be either prevented from entering the environment or, if it already exists in the environment, progressively eliminated.[28]

In 1975 the National Organics Reconnaissance Survey (NORS) tested for the presence of six pollutants in the water supplies of 80 American cities. The compounds were bromochloromethane, bromoform, bromodichloromethane, chloroform, carbon tetrachloride, and 1,2 dichloroethane. Chloroform is carcinogenic. Several of the others are potentially carcinogenic. All were thought to be formed during the chlorination process used to disinfect water. When raw water is drawn into a purification plant, it contains naturally-occuring substances known as humic and fulvic acids; these are long chain fatty acid breakdown products of plant and animal matter decay. Upon shock chlorination, chlorine, iodine and bromine atoms attach to carbon fragments of the fatty acids through free radical halogenation. The result is production of a class of toxic compounds generally called trihalomethanes. These include the six previously mentioned chemicals.

The NORS results were the first evidence that diverse water supplies across the U.S. shared the problem of producing finished water laced with carcinogens. Chloroform was detected in each of the 80 supplies sampled; 1,2 dichloroethane and carbon tetrachloride appeared to originate from pollution sources and not the chlorination disinfection process and were discovered in the water supply of 26 cities and ten cities, respectively. Three cities were selected for more extensive analysis. A total of 129 organic compounds were identified in the water supplies of: New York, New York; Philadelphia, Pennsylvania; Cincinnatti, Ohio; Seattle, Washington; Miami, Florida; Terrebonne Parish, Louisiana; Tucson, Arizona; Grand Forks, North Dakota; Ottumwa, Iowa; and Lawrence, Massachusetts. The National Academy of Science has since determined that 22 of the 129 chemicals are suspected or known carcinogens.[29]

Although the Safe Drinking Water Act (SDWA) of 1974 empowers the EPA with far-reaching authority to regulate the levels of carcinogens in drinking water, the agency has failed to do its job adequately. SDWA directs EPA to set numerical limits for individual toxic compounds consumed in water. It also allows EPA to require sophisticated treatment processes at individual water purification plants. To date, EPA has done neither. In February 1978, EPA proposed to set a maximum contaminant level (MCL) for trihalomethanes (THMs) at 100 ug/l or parts per billion (ppb). At the same time, EPA proposed to require the installation of Granular Activated Carbon (GAC) filtration in communities of over 75,000 residents where synthetic organic chemical contamination was known to exist. Nearly two years later only the THM standard has begun to be put into effect.

Even if both the proposed EPA actions were instituted, adequate protection would still be lacking. The THM standard of 100 ppb could account for at least 200 excess cancer fatalities nationwide per year, according to EPA's own calculations. Furthermore, one study by the NCI predicts that consumption of two liters per day of contaminated water containing 100 ppb of chloroform for 50 years will result in a 30 percent excess of bladder cancer, and a four to six percent excess of colon/rectum tract cancer. [30]

Over 700 individual pollutants have been identified in public water supplies nationwide. [31] Yet it is estimated that 90 percent of all toxic chemicals consumed in drinking water remain unidentified. Fewer than 10 percent of the known drinking water contaminants have been tested adequately for toxic and carcinogenic effects. The National Cancer Institute lists 23 drinking water pollutants as caracinogens, 30 as mutagens, and 11 as promoting agents.[32] These facts indicate that health authorities responsible for the public's safety have been unable to cope with water-borne toxic chemical problems so far. As a result tens of millions of American consumers are unknowingly dosed with toxic chemicals in their drinking water on a daily basis.

<u>Regulatory Overview</u>

By enacting the Federal Water Pollution Control Act Amendments of 1972 (FWPCA), America began to strive for clean, safe water as never before. [33] Nearly 30 billion federal tax dollars have since been spent to implement the Act. Water pollution bureaucracies now exist in every state. Wastewater treatment plants have been built across the country. Yet, much of the letter and spirit of this law has never been implemented. After almost a decade of effort, it is fitting to consider the glaring discrepancy between existing water pollution control programs and the mandate that Congress originally provided. While it is obvious that the Congressional intent to regulate toxic discharges has not been successfully translated into action, it is equally obvious that the pollution management strategy embodied in the Act still remains remarkably sensible.

The Act set out as its objective "to restore and maintain the chemical, physical and biological integrity of the nation's water." [34] To achieve this objective, two national goals and four major policies were formulated.

The first goal established that "the discharge of pollutants into the navigable waters be eliminated by 1985." [35] The second goal established that "wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983. [36] The four national policies defined by the act were: 1. to provide federal financing for the construction of municipal sewage treatment plant; 2. to research and develop the technologies capable of eliminating pollutant discharges into the nation's waters; 3. to prohibit the discharge of toxic pollutants in toxic amounts; and 4. to provide for area-wide waste treatment planning in order to guarantee proper pollution control in each state.[37]

The Act's definition of "pollutant" is so inclusive that virtually everything dumped into water is controlled: "the term 'pollutant' means dredge spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water." [38]

The Act makes a clean break with past pollution control practices. Previously, individual states controlled pollution through an antiquated and ineffective system of "water quality standards" for each river or stream and its segments. For example, a particular section would be classified by its "best use": drinking water supply source, trout waters, or industrial discharge use. Waste allocations for individual dischargers, consistent with the standards, would then be applied to maintain that "best use" quality. Unfortunately, there were fundamental problems with this approach, not the least of which was its dependence on the precise ability to measure the effect of pollution on a body of water, something that is scientifically impossible at this time. Water quality standards often overloaded bodies of water with more pollutants than they were able to assimilate. Also, water quality management generally tended to focus on direct uses of water, such as drinking, recreation, or dumping. Consequently, protection of aquatic ecosystems was largely ignored. Finally, the system was cumbersome to use. Each new discharge altered the allowable discharges for all existing dischargers. Thus, individual standards constantly changed. Strict enforcement of standards was all but impossible.

In order to aviod the pitfalls of the "water quality standards" approach, the FWPCA embodied a a bold new strategy. For the first time pollution abatement was to occur at each discharge source. Effluent standards set by EPA based on the availability of technology and its cost provide uniform control measures nationwide. Enforcement of these standards became the task of the National Pollutant Discharge Elimination System (NPDES). Under this system the same categories of industries located anywhere in the country were supposed to attain the same quality of discharged waste waters. Discharges into relatively unpolluted streams must assure non-degradation of high water quality. Dischargers into already contaminated streams must help clean them up.

The FWPCA also provided a step-by-step overall plan to restore the nation's waters. The effluent standards, for municipal and industrial discharges, become progressively stricter in order to meet the 1983 "fishable swimmable" and 1985 "zero discharge" limitations. By July 1, 1977 industries were required to reach "best practicable" waste treatment (BPT) and municipalities were required to install secondary treatment processes. By July 1, 1983 industries would be obliged to institute "best available" waste treatment (BAT) while municipalities must install "best practicable" waste treatment.

The FWPCA required the U.S. Environmental Protection Agency (EPA) to establish specific effluent standards for toxic substances and pre-treatment regulations for industries that discharge through municipal sewage treatment plants. If adequate control were not provided by these standards, in any particular body of water, water quality standards might still be applied.

In addition, in conjunction with its monitoring provisions, the FWPCA provided that on a continuing basis effluent standards would be developed for newly-developed pollutants. Finally, the Act established area-wide waste treatment planning to guide and assist in the control of complex problems caused by combined point and non-point sources of pollution.

Within the overall scheme of the FWPCA is a special system of regulatory controls to guard against the release of toxic chemicals. Section 307(a) requires EPA to compile a list of toxic pollutants and to develop pre-treatment and effluent standards to limit their discharge. Instead of the industry-by-industry approach common to the FWPCA, section 307(a) requires a more stringent pollutant-by-pollutant review. Furthermore, if a toxic is regulated under the provisions of 307(a) tighter controls than under Section 304(b) may be required. Section 307(a) calls for nothing less than protection affording "an ample margin of saftey." There is little room allowed for consideration of factors other than a substance's toxic qualities and no authority such as in Section 304(b), which permits consideration of economic factors in setting BPT and BAT effluent standards.

Toxic pollutants are defined broadly as "those pollutants or combinations of pollutants, including disease-carrying agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the administrator, cause death, disease, behavior abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformation, in such organisms or their offspring."[39] The FWPCA provides guidelines for selecting toxics for regulation under section 307(a). The EPA administrator is instructed to "take into account the toxicity of the pollutant, its persistence, degrability, the unusual or potential presence of the affected organisms in any water, the importance of the affected organism and the nature and effect of the toxic pollutant on such organisms."

Despite this clear authority to halt toxic chemical discharges, EPA did next to nothing to implement an exacting toxics program. Between 1972 and 1976 EPA listed a mere nine substances as toxics: mercury, benzidine, polychlorinated biphenyls (PCBs), cadmium, cyanide, and four pesticides (endrin, toxiphene, DDT, and aldrin/dieldrin). However, even for these few toxics no effluent standards were promulgated.

Beginning in 1976, EPA began to place more emphasis on controlling toxic chemicals. In June of that year a settlement agreement was signed ending three years of litigation between EPA and several environmental groups. At issue was EPA's implementation of Section 307(a). The agreement provided that EPA would embark on a new plan to deal with toxics. EPA's first action consisted of bringing 129 priority toxic pollutants, discharged by 21 industrial categories, under control. EPA's strategy was to skirt the special provisions of Section 307(a) and regulate the pollutants using the Sections of the FWPCA which dealt with pollution in general. The 129 priority pollutants would be regulated by effluent, new source performance, and pre-treatment standards set according to BAT. These standards would be developed on a phased-in schedule beginning in September, 1979. When Congress amended the FWPCA in 1977 few significant changes were made in this general approach. The biggest difference was that FWPCA would have a new name: The Clean Water Act (CWA). Some of the deadlines were also delayed and several other levels of treatment were provided. Overall, in 1977 Congress affirmed its strong mandate to EPA to regulate toxics vigorously.

In New York the implementation of the CWA is the joint responsibility of the federal EPA and the State Department of Environmental Conservation (DEC). For example, the CWA specifically provides for the eventual state takeover of the National Pollutant Discharge Elimination System (NPDES). The terms that New York State and the EPA came to regarding this transfer of program authority are contained in a pact called the "State-EPA Agreement."

Despite all the new and amended laws, and program reorganizations and alterations, toxic chemical pollutants are regulated no more effectively today than in years past. In 1980 EPA proposed the first "Best Available Treatment" (BAT) discharge standards for the 129 priority pollutants found in wastestreams of several categories of industries. Though the consent decree specifically calls for EPA to set toxic chemical effluent guidelines, no numerical standards were proposed. Soon afterwards, the Reagan administration established a freeze on all new regulations. As a result, BAT standards for the majority of the 21 industry categories have not been promulgated. Nor have any of the proposed BAT standards been adopted.

No one knows when the mandates of the consent decree will actually be implemented. The Reagan administration has vowed to reduce the burden of regulation on industry and to subject all new regulations to cost/benefit analysis. In the meantime, new regulations have not been proposed. Consequently, New York State now has the responsibility to implement BAT, with or without the benefit of national standards set by EPA. This is a next to impossible task. On July 1, 1981, all SPDES permits were allowed to expire. Since then, the DEC has begun to renew tens of thousands of permits in order to meet the BAT deadline of July 1, 1984, approximately three years from this time. All permits are supposed to be renewed on a case by case basis, using Best Engineering Judgement to decide how to regulate individual discharges consistent with BAT. Until that is accomplished, the parameters required by the lapsed permits are still in effect. Many years may pass before BAT is effectively implemented. It may never happen. In the meantime, toxic chemical discharges will remain inadequately regulated and will continue to pollute the environment and threaten the health of New Yorkers.

CHAPTER II

METHODOLOGY

This investigation of toxic chemical pollution in the Niagara River was based on a modified version of a research model originally developed by NYPIRG and the Environmental Defense Fund to assess the water quality problems of the Hudson River. The model is composed of four interwoven sections: 1) a survey of licensed industrial dischargers regulated by the State Pollutant Discharge Elimination System (SPDES) permit program; 2) a survey of unlicensed industries that discharge through sewage collection systems, thereby escaping the permit program; 3) a review of environmental and health problems posed by past and present hazardous waste disposal practices; and 4) a limited monitoring effort to identify previously undetected sources of toxic contamination. Because of the Niagara River's unique problems, two additional sections have been included in the study. Since approximately 380,000 residents of the Niagara Frontier drink water drawn from the polluted Niagara, an investigation of possible long-term, water-borne health hazards to the public was undertaken. Since the Niagara Frontier is already characterized by alarmingly high cancer rates, a preliminary investigation was undertaken to determine whether environmental pollution or drinking water contamination may be the cause of the area's present health problems or whether they pose future hazards.

A description of the methodology used in each section of the study follows.

Chapter III -- <u>An Evaluation of Wastewaters Discharged into the Niagara River Regulated by the State Pollutant Discharge Elimination System.</u>

On December 18, 1980, a computer listing of all SPDES regulated dischargers in the Niagara River-Lake Erie Basin was obtained from the New York State Department of Environmental Conservation (DEC). From this master list, a total of 77 industries that discharge directly into the Niagara River and its major tributaries, including the Buffalo River and Buffalo Creek, was selected for study.

In-depth reviews of each individual discharger's permit file were performed at the Bureau of Industrial Programs and the SPDES Permit Division at the DEC headquarters in Albany and at the Region 9 office in Buffalo. Information was gathered to prepare profiles of each discharger relating to the following three concerns: 1) assessing the permit program's ability to control toxics adequately; 2) assessing the permit compliance record and the pollution potential of each facility's manufacturing processes; and 3) characterizing the quantity and quality of effluents dumped into the Niagara.

Information from four other sources was also incorporated into the profiles. First, a literature search generated lists of toxic organic chemicals that have previously been identified in the wastestreams of 23 Standard Industrial Classification (SIC) categories of manufacturers, including most of the 77 dischargers. Since the effluents of industries are rarely monitored for toxics, these lists are one of the best ways to index the pollutants that are likely to enter the Niagara through inadequately regulated discharges. The lists also indicate the relative biodegradability of the compounds and identify which ones have been detected in the U.S. drinking water supplies. These data help assess the pollution potential of each industry. The lists are contained in Appendix A.

The second source of information was a compilation of data generated during a large-scale monitoring program carried out by the U.S Environmental Protection Agency (EPA). Appendix B contains summaries of the 129 "priority pollutants" that were identified in the wastestreams of selected SIC categories of industries due to be regulated according to Best Available Treatment (BAT) standards by 1984. These data also provide an index of the pollutants likely to be present in effluents that have not been monitored for toxics.

The third source of information used to guage the pollution potential of individual dischargers was the DEC's Industrial Chemical Survey (ICS). Beginning in 1976, the ICS surveyed approximately 6,000 industries to learn the specific types and ammounts of potentially hazardous chemicals that they had used, stored, distributed or otherwise disposed of since January, 1971. The ICS is continuously in the process of being updated, so its data are outdated to some extent, but there is little evidence to prove that individual usage of the reported chemicals has changed dramatically. The ICS, therefore, still provides one of the best means to assess the pollution potential of individual dischargers. Appendix C contains ICS data for selected positive responders.

The fourth major source of information found in the discharge profiles is the toxicity data contained in Appendix D.

Literature research was another important source of data. Where gaps of information existed, environmental and health agency personnel were interviewed. To a limited extent, industry personnel also supplied information found in the profiles.

The completed profiles were analyzed to determine whether the mandates of the Clean Water Act had been translated into action by the SPDES program. The findings of that evaluation are presented.

Chapter IV- An Evaluation of Industries Discharging Into Municipal Wastewater Treatment Systems.

NYPIRG reviewed Section 303 River Basin Reports for the Niagara and its tributaries, the Erie-Niagara County reports, Dr. Beverly Paigen's Project Pipewatch report, and the master list of SPDES regulated dischargers used in Chapter III to identify municipal wastewater treatment plants in the Niagara drainage basin. With the help of the DEC's Bureau of Sewage Programs and personnel in the Region 9 office, 10 wastewater treatment facilities with industries on-line to their collection system were identified. In order to prepare profiles similar to those described in Chapter III, the SPDES permit files for each of these plants were reviewed in depth at the Permit Division located in the DEC headquarters in Albany and at the Region 9 office in Buffalo. Because these files contained little complete information on the industrial wastewater contributions to each facility, a phone survey was undertaken.

Answers to the following questions were sought:

1. Which industries are serviced by the facility?

2. What types of manufacturing processes are employed by those industries?

3. What pretreatment of industrial wstewaters is required, if any?

4. Has the treatment plant's effluent ever been analyzed comprehensively?

5. What type of treatment technology is employed by the treatment plant?

6. On the average, what volume of wastewater is treated per day?

7. What effluent parameters are monitored by the treatment facility in order to comply with its SPDES permit?

In addition to this information, the pollution potential of each treatment facility and its on-line industrial dischargers was assessed using the same four sources of information described in the methodology summary for Chapter III and contained in Appendices A, B, C, and D. A literature search was also undertaken to determine the toxics removal efficiency of the treatment methods employed by each municipal system. Finally, DEC and EPA personnel were interviewed to discover the progress of the pretreatment programs and other efforts being developed to cope with this problem.

Chapter V- Hazardous Waste Contamination in the Niagara Frontier

Beginning in 1978, an enormous amount of attention has been focussed on the problem of hazardous wastes in Western New York. Due to the unprecedented publicity generated by the Love Canal tragedy and due to pending litigation against the Hooker Chemical and Plastics Corporation and its parent company Occidental Petroleum, many hazardous waste studies have been undertaken. As a result, unlike most areas of New York State and the rest of the country, an inventory of active and abandoned landfill sites has been compiled. Through widespread use of the Freedom of Information Act, NYPIRG has reviewed virtually all of the major studies that have been completed, as well as several that are still in progress. Foremost among these are the Interagency Task Force on Hazardous Wastes report and the Hazardous Waste Disposal Sites in New York State, First Annual Report. In addition, NYPIRG interviewed the EPA and DEC personnel who undertook the studies or who are involved in the regulation of hazardous wastes. A detailed critique of the strengths and weaknesses of past and present research efforts and existing regulatory programs is presented.

Chapter VI- Monitoring of Selected Pollution Sites

In order to support the findings of the previous three chapters of this study, a total of 71 sediment samples were collected from areas identified to be polluted and were analyzed using the Ames Test. Two wastewater samples were also collected and subjected to integrated gas chromatograph/mass spectrometry analysis. A detailed description of the sampling and analytical protocals used in this monitoring effort is found in Chapter VI.

Chapter VII- An Evaluation of Niagara River Drinking Water Supplies and their Regulation

The quality of drinking water drawn from the Niagara River and supplied to approximately 380,000 residents of the Niagara Frontier was assessed through interviews with environmental and health authorities, mail and telephone surveys sent to a total of seven water supply system operators, and a review of studies detailing the operation of the individual treatment facilities and their contamination problems. Combined with the findings of a literature search of general drinking water quality problems and a summary and critique of existing state and national d rinking water regulations, an evaluation of drinking water protection programs as a whole was produced.

Chapter VIII- A Preliminary Analysis of Cancer Statistics and Trends in Erie and Niagara Counties.

Cancer statistics were compiled from the National Cancer Institute, the New York State Department of Health and other sources. These data were summarized and analyzed to determine which tumor sites were most prevalent and whether mortality rates over successive years demonstrated any obvious trends. The findings of this preliminary assessment were compared against statewide and nationwide statistics and trends for the same time period.

CHAPTER III

An Evaluation of Wastewater Discharges in Erie and Niagara Counties Regulated by the State Pollutant Discharge Elimination System (SPDES).

The restoration of the Niagara River's polluted waters depends on the strict control of toxic industrial discharges. Manufacturing wastewaters are often highly contaminated with a broad spectrum of synthetic organic chemicals such as spent oils, solvents, greases, plasticizers, and other process residues. When these contaminants are discharged into the Niagara, widespread and devastating contamination problems can develop in the fragile aquatic ecosystems in both the river and in Lake Ontario. Toxic pollutants sometimes require decades to break down when released into the environment. As the chemicals disperse, they bioconcentrate in the fatty tissues of fish and wildlife, and pass upward through the food chain. In the long run, this can cause the impairment of growth and reproductive capacity in a wide range of animal species. Toxic dumping also results in the bioaccumulation of carcinogenic and otherwise toxic residues in human flesh and mothers' milk, drinking water contamination on a vast scale and a general elevation of health risks in communities touched by the ever-spreading pollution.

This section represents the first attempt to judge the SPDES permit program's overall effectiveness in reversing the deterioration of water quality in the Niagara River. As the regulatory overview section of this report points out, the SPDES program is the heart of the water pollution control effort since it is the most important mechanism to carry out the mandates of the Clean Water Act. With few exceptions, no pollution discharges to surface or groundwaters are allowed unless they are regulated by a SPDES permit and are in full compliance with the permit's requirements.

In order to obtain an SPDES permit, each potential discharger in Erie and Niagara Counties makes an application to the New York State Department of Environmental Conservation (DEC) and fills out the form pictured in Figure 6. All the dischargers in these two counties are under the responsibility of DEC's Region 9 office. After the completed form is returned and the appropriate permit fee paid, a review process is initiated to assure that the proposed discharge will not violate national effluent limits or performance standards, or substantially impair anchorage and navigation. The review is conducted at local, state and federal levels of authority. On-site inspections, requests for additional data and the participation of other agencies and neighboring states may be involved. Eventually, proposed compliance schedules, effluent limits and monitoring requirements are set up. Notice of the preliminary decision to grant or deny the permit application follows. After 30 days, during which the public can comment or request hearings, the permit is finally granted or denied. SPDES permits are valid for a five year period, and are renewable.

FIGURE 6
STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) PERMIT APPLICATION FORM "C"

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

APPLICATION FORM "C" FOR A STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) PERMIT INDUSTRIAL OR MINING

1. APPLICANT DATA

APPLICATION TYPE: ☐ New ☐ Renewal ☐ Modification

IF RENEWAL OR MODIFICATION, GIVE PREVIOUS APPLICATION NO., EFFECTIVE DATE, EXPIRATION DATE: No. NY– | Effective Date | Expiration Date

OWNER'S NAME (Corporate, Partnership or Individual)

TYPE OF OWNERSHIP: ☐ Corporate ☐ Individual ☐ Partnership ☐ Public

OWNER'S MAILING ADDRESS (Street, City, State, Zip Code)

REFER ALL CORRESPONDENCE TO: (Name, Title and Address)

TELEPHONE NO. (Include Area Code)

FACILITY NAME

FACILITY LOCATION (Street or Road)

CITY, TOWN OR VILLAGE

COUNTY

GIVE EXPLICIT DIRECTIONS TO LOCATION, If Necessary

NATURE OF BUSINESS OR TYPE OF FACILITY

NO. OF EMPLOYEES

NO. OF SHIFTS

2. IF ALL YOUR WASTE IS DISCHARGED TO A PUBLICLY OWNED WASTE TREATMENT FACILITY AND/OR A LICENSED WASTE SCAVENGER AND TO THE BEST OF YOUR KNOWLEDGE YOU ARE NOT REQUIRED TO OBTAIN AN SPDES PERMIT, COMPLETE THIS SECTION ONLY, SIGN APPLICATION AND RETURN.

AND/OR

NAME AND ADDRESS OF MUNICIPALITY RESPONSIBLE FOR RECEIVING WASTE | NAME AND ADDRESS OF LICENSED WASTE SCAVENGER

3. PRODUCTION DATA (Use additional forms, if necessary)

PRINCIPAL TYPES OF PROCESSING DONE AT THIS FACILITY

PRINCIPAL PRODUCTS AND AMOUNTS PRODUCED PER TIME UNIT	RAW MATERIALS AND AMOUNTS CONSUMED PER TIME UNIT
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

4. DOES ANY OF YOUR DISCHARGES CONTAIN OR IS IT POSSIBLE FOR ANY DISCHARGE TO CONTAIN ONE OR MORE OF THE FOLLOWING SUBSTANCES ADDED AS A RESULT OF YOUR OPERATIONS, ACTIVITIES OR PROCESSES?

☐ Aluminum	☐ Arsenic	☐ Boron	☐ Chromium	☐ Flourides	☐ Lead	☐ Nickel	☐ Selenium	☐ Tin
☐ Ammonia	☐ Barium	☐ Cadmium	☐ Copper	☐ Gold	☐ Manganese	☐ Oil & Grease	☐ Silver	☐ Zinc
☐ Antimony	☐ Beryllium	☐ Chlorine	☐ Cyanide	☐ Iron	☐ Mercury	☐ Phenols	☐ Sulfides	

☐ Corrosion control chemicals (specify) ______

☐ Halogenated organics or halogenated hydrocarbons (e.g. chlorinated, flourinated or brominated) (specify) ______

☐ Herbicides or pesticides (specify) ______

☐ Radioactivity (specify) ______

☐ Slimicides, biocides or algaecides (specify) ______

☐ Substituted aromatics (e.g. derivatives of benzene, pyridene, biphenyl, napthalene, coal or petroleum tar, etc.) (specify) ______

☐ Surfactants (specify) ______

☐ None of the above

Specify the trade name and manufacturer of any chemicals used at this facility which are not listed above and whose specific constituents are not known to you. ______

Explanation of above: (Attach additional sheets, if necessary) ______

[illegible] (1/77)

SLUDGE DISPOSAL If sludge is created as a result of processing or treatment, what is ultimate disposal point?

DISCHARGE DATA (Continued) (See Instructions) ATTACH SKETCH SHOWING OUTFALL LOCATIONS

OUTFALL NO. ☐ Proposed ☐ Replacement ☐ Existing ☐ Expansion | TYPE OF WASTE | TYPE OF TREATMENT (If none, so state)

DESIGN FLOW Gal/Day | ACTUAL FLOW Gal/Day | FREQUENCY OF DISCHARGE ☐ Continuous ☐ Intermittent ☐ Batch | IS FLOW EQUALIZATION PROVIDED? ☐ Yes ☐ No If "Yes", describe in comments

PERIOD OF DISCHARGE ______ Months per year | ______ Days per week | ______ Hours per day

SURFACE DISCHARGE ☐ Yes ☐ No | If "Yes", Name of Receiving Waters | Classification | Waters Index No.

SUBSURFACE DISCHARGE ☐ Yes ☐ No | If "Yes", Name of nearest Surface Water | Distance Ft. | SOIL TYPE | Depth to Water Table

OUTFALL NO. ☐ Proposed ☐ Replacement ☐ Existing ☐ Expansion | TYPE OF WASTE | TYPE OF TREATMENT (If none, so state)

DESIGN FLOW Gal/Day | ACTUAL FLOW Gal/Day | FREQUENCY OF DISCHARGE ☐ Continuous ☐ Intermittent ☐ Batch | IS FLOW EQUALIZATION PROVIDED? ☐ Yes ☐ No If "Yes", describe in comments

PERIOD OF DISCHARGE ______ Months per year | ______ Days per week | ______ Hours per day

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SUBSURFACE DISCHARGE ☐ Yes ☐ No | If "Yes", Name of nearest Surface Water | Distance Ft. | SOIL TYPE | Depth to Water Table

OUTFALL NO. ☐ Proposed ☐ Replacement ☐ Existing ☐ Expansion | TYPE OF WASTE | TYPE OF TREATMENT (If none, so state)

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PERIOD OF DISCHARGE ______ Months per year | ______ Days per week | ______ Hours per day

SURFACE DISCHARGE ☐ Yes ☐ No | If "Yes", Name of Receiving Waters | Classification | Waters Index No.

SUBSURFACE DISCHARGE ☐ Yes ☐ No | If "Yes", Name of nearest Surface Water | Distance Ft. | SOIL TYPE | Depth to Water Table

OUTFALL NO. ☐ Proposed ☐ Replacement ☐ Existing ☐ Expansion | TYPE OF WASTE | TYPE OF TREATMENT (If none, so state)

DESIGN FLOW Gal/Day | ACTUAL FLOW Gal/Day | FREQUENCY OF DISCHARGE ☐ Continuous ☐ Intermittent ☐ Batch | IS FLOW EQUALIZATION PROVIDED? ☐ Yes ☐ No If "Yes", describe in comments

PERIOD OF DISCHARGE ______ Months per year | ______ Days per week | ______ Hours per day

SURFACE DISCHARGE ☐ Yes ☐ No | If "Yes", Name of Receiving Water | Classification | Waters Index No.

SUBSURFACE DISCHARGE ☐ Yes ☐ No | If "Yes", Name of nearest Surface Water | Distance Ft. | SOIL TYPE | Depth to Water Table

COMMENTS

I hereby affirm under penalty of perjury that information provided on this form and any attached supplemental forms is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

APPLICANT'S SIGNATURE (See Instructions) | Date | Printed Name | Title

Often industries that seek to skirt the systematic controls of the SPDES permit program discharge their wastewaters into municipal sewage collection systems. These on-line contributors are not required by law to be regulated by SPDES permits. Industrial wastewaters, however, can create a host of operational problems for municipal treatment plants. On-line dischargers in Erie and Niagara Counties are discussed separately in the following section of this report.

In order to assess the pollution impact of industrial effluents dumped directly into the Niagara River, an in-depth review was made of 77 licensed industrial dischargers located in Erie and Niagara Counties. These facilities release more than 250 million gallons per day (MGD) of wastewater into the river. The purposes of this review were 1) to assess the effectivenessof the SPDES permit program in controlling toxic chemical discharges properly; 2) to profile the pollution potential of the most problematic industrial dischargers in terms of their manufacturing processes, the nature of their wastes, and their pollution control compliance records; and 3) to characterize the quantity and quality of the effluents dumped by the potentially most significant toxic dischargers.

One of the primary goals of the SPDES program is the stringent control of wastewaters contaminated with toxic organic chemicals. Yet not a single one of the 77 discharge permits reviewed in this study contained comprehensive standards capable of strictly controlling the release of the broad spectrum of toxic pollutants found in industrial wastewaters. The vast majority of the permits failed to set specific limitations for the discharge of any toxic chemical contaminants at all. Instead, the SPDES permits focussed on regulating conventional pollutants, such as sewage and other degradable forms of pollution, using gross pollution parameters that fail to control toxic chemicals adequately. Consequently, the SPDES program, the main line of defense against water pollution, sanctions the discharge of toxic contaminants instead of rigorously abating their release.

This section proves that the fundamental components of a sound toxic pollution control program do not exist at either the state or federal level. Legal, scientific, technical, laboratory and field investigation support services are woefully inadequate. As a result, pollution problems are developing at a rate that greatly exceeds the permit program's ability to identify them and cope with them. Inadequately controlled industrial discharges have already released massive amounts of toxic chemicals into the Niagara River over the course of past decades, and there can be no reasonable hope of properly curtailing wastewater discharges in the future unless fundamental reforms are made in the SPDES program.

Findings

The 77 industrial profiles presented in this section contain the results of the investigation described in the methodology section of this report. Every profile follows the same format. The heading contains the discharger's name, address and SPDES permit number. Where appropriate, the following information is also provided: 1) the industry's Standard Industrial Classification code and references to Appendices A and B, which identify the toxic pollutants that have been detected in the wastewaters of that SIC category; 2) whether the industry is an Industrial Chemical Survey positive responder, indicated by a reference to Appendix C, which contains individual response summaries; 3) whether the industry or its profile is contained in the Interagency Task Force (ITF) report; and 4) the number of people employed by the firm.

The body of the profile contains a description of the firm's manufacturing or business activities, the nature of the wastes it generates, the quality and quantity of its wastewater discharge, the adequacy of its SPDES permit's requirements, its permit compliance record and its environmental impact.

Table 2 lists the industries profiled in this section and indicates whether they are 1) positive ICS responders, 2) included in the Interagency Task Force Report on hazardous waste dumping; and 3) designated as principal or non-principal wastewater dischargers.

Figure 7 illustrates the locations of the 77 profiled industries.

TABLE 2
77 SPDES-REGULATED INDUSTRIAL DISCHARGERS IN ERIE AND NIAGARA COUNTIES

COMPANY	RESPONSE TO ICS	PROFILED IN TASK FORCE REPORT?	DESIGNATED "MAJOR" DISCHARGE
1. National Starch & Chemical, W. Seneca, N.Y.	NI	NI	N
2. Dresser Industries, Depew, N.Y.	Y	Y	Y
3. Buffalo Slag, Cheektowaga, N.Y.	N	NI	N
4. Worthington Compressors, Buffalo, N.Y.	Y	NI	N
5. Mobil Oil, Buffalo, N.Y.	Y	Y	Y
6. Allied Chemical, Buffalo, N.Y. (Lee St.)	Y	Y	Y
7. Republic Steel, Buffalo, N.Y.	Y	Y	Y
8. Buffalo Color, Buffalo, N.Y.	Y	Y	Y
9. Donner Hanna Coke, Buffalo, N.Y.	Y	Y	Y
10. Ramco Steel, Buffalo, N.Y.	N	Y	Y
11. Airco, Buffalo, N.Y.	Y	NI	N
12. U.S. Steel, Buffalo, N.Y.	NI	NI	N
13. Pacific Molasses, Buffalo, N.Y.	NI	NI	Y
14. International Multifoods, Buffalo, N.Y.	NI	NI	N
15. American Malting, Buffalo, N.Y.	Y	NI	N

16. Peavey Corporation, Buffalo, N.Y.	Y	NI	Y
17. Agway, Buffalo, N.Y.	NI	NI	N
18. Pillsbury, Buffalo, N.Y.	Y	NI	N
19. General Mills, Buffalo, N.Y.	NI	NI	N
20. Westinghouse Electric, Cheektowaga, N.Y.	Y	Y	Y
21. Calspan Corp., Buffalo, N.Y.	NI	NI	N
22. Arcata Graphics, Depew, N.Y.	Y	Y	N
23. Spencer Kellogg, Buffalo, N.Y.	Y	NI	N
24. American Optical, Cheektowaga, N.Y.	Y	Y	N
25. Markel Electric Products, Buffalo, N.Y.	NI	NI	N
26. Dayton Malleable (Pratt & Letchworth) Buffalo, N.Y.	N	Y	N
27. Curtiss Wright, Buffalo, N.Y.	NI	NI	N
28. F.M. Schaeffer, Buffalo, N.Y.	NI	NI	N
29. General Motors-Chevrolet, Tonawanda, N.Y.	Y	Y	Y
30. Dupont, Yerkes Plant, Tonawanda, N.Y.	Y	Y	Y
31. Niagara Mohawk, Tonawanda, N.Y.	Y	Y	Y
32. Polymer Applications, Tonawanda, N.Y.	Y	Y	N
33. Dunlop Tires, Tonawanda, N.Y.	Y	Y	N
34. FMC Corporation, Tonawanda, N.Y.	Y	Y	Y
35. Texaco (oil storage), Tonawanda, N.Y.	NI	NI	N
36. Ashland Oil (oil storage), Tonawanda, N.Y.	NI	NI	N
37. Sun Oil (oil storage), Tonawanda, N.Y.	NI	NI	N
38. Atlantic Richfield, Tonawanda, N.Y.	NI	NI	N
39. Allied Chemicals-Plastics, Tonawanda, N.Y.	Y	Y	Y
40. Tonawanda Coke, Tonawanda, N.Y.	Y	Y	Y
41. N.Y. Wire Mills, Tonawanda, N.Y.	Y	NI	N
42. Ashland-Canlake Truck Terminal, Tonawanda, N.Y.	NI	NI	N
43. Ashland Oil, Tonawanda, N.Y.	Y	Y	Y
44. River Road Oil Company (oil storage), Tonawanda, N.Y.	Y	NI	N
45. Spaulding Fiber, Tonawanda, N.Y.	Y	Y	Y
46. Hooker Chemical/Durez, N. Tonawanda, N.Y.	Y	Y	Y
47. Tonawanda Electric Steel, Tonawanda, N.Y.	Y	NI	N
48. Kopper's Inc., N. Tonawanda, N.Y.	N	NI	N
49. Hooker Chemical, Niagara Falls, N.Y.	Y	Y	Y
50. Olin Corporation, Niagara Falls, N.Y.	N	Y	Y
51. Dupont Co., Niagara Falls, N.Y.	Y	Y	Y
52. Union Carbide/ Linde, Niagara Falls, N.Y.	N	Y	Y
53. Union Carbide, Acheson Plant, Niagara Falls, N.Y.	Y	Y	N
54. Carborundum, Niagara Falls, N.Y.	Y	Y	Y
55. Great Lakes Carbon, Niagara Falls, N.Y.	Y	Y	N
56. Grief Brothers, Niagara Falls, N.Y.	Y	NI	N
57. Stauffer Chemical, Niagara Falls, N.Y.	NI	Y	Y
58. Grand Island Biological, Grand Island, N.Y.	Y	NI	N
59. Hooker Chemical, Grand Island, N.Y.	Y	Y	N
60. St. Regis Paper, Kenmore, N.Y.	Y	NI	N
61. Union Carbide/ Linde, Tonawanda, N.Y.	Y	Y	N
62. Bisonite, Tonawanda, N.Y.	Y	NI	N
63. National Gypsum, Clarence Center, N.Y.	NI	NI	N
64. Amax Metals, Clarence Center, N.Y.	Y	Y	N
65. Continental Can, Tonawanda, N.Y.	NI	NI	N
66. Exolon, Tonawanda, N.Y.	Y	NI	N
67. County Limestone, Akron, N.Y.	NI	NI	N
68. Lancaster Stone, Clarence, N.Y.	NI	NI	N
69. Houdaille Construction, Akron, N.Y.	NI	NI	N
70. Trimetal Industries, Cheektowaga, N.Y.	NI	NI	N
71. Columbus McKinnon, Tonawanda, N.Y.	Y	Y	N
72. Carborundum, Graphite, Sanborn, N.Y.	NI	Y	N
73. Carborundum, Coated Abrasives, Niagara Falls, N.Y.	Y	Y	N
74. Radatron, N. Tonawanda, N.Y.	NI	NI	N
75. Bell Aerospace, Wheatfield, N.Y.	Y	Y	N
76. Newco Waste Systems, Niagara Falls, N.Y.	NI	Y	N
77. SCA Waste Systems, Model City, N.Y.	Y	Y	Y

Key:

Y- positive response
N- negative response
NI- not included

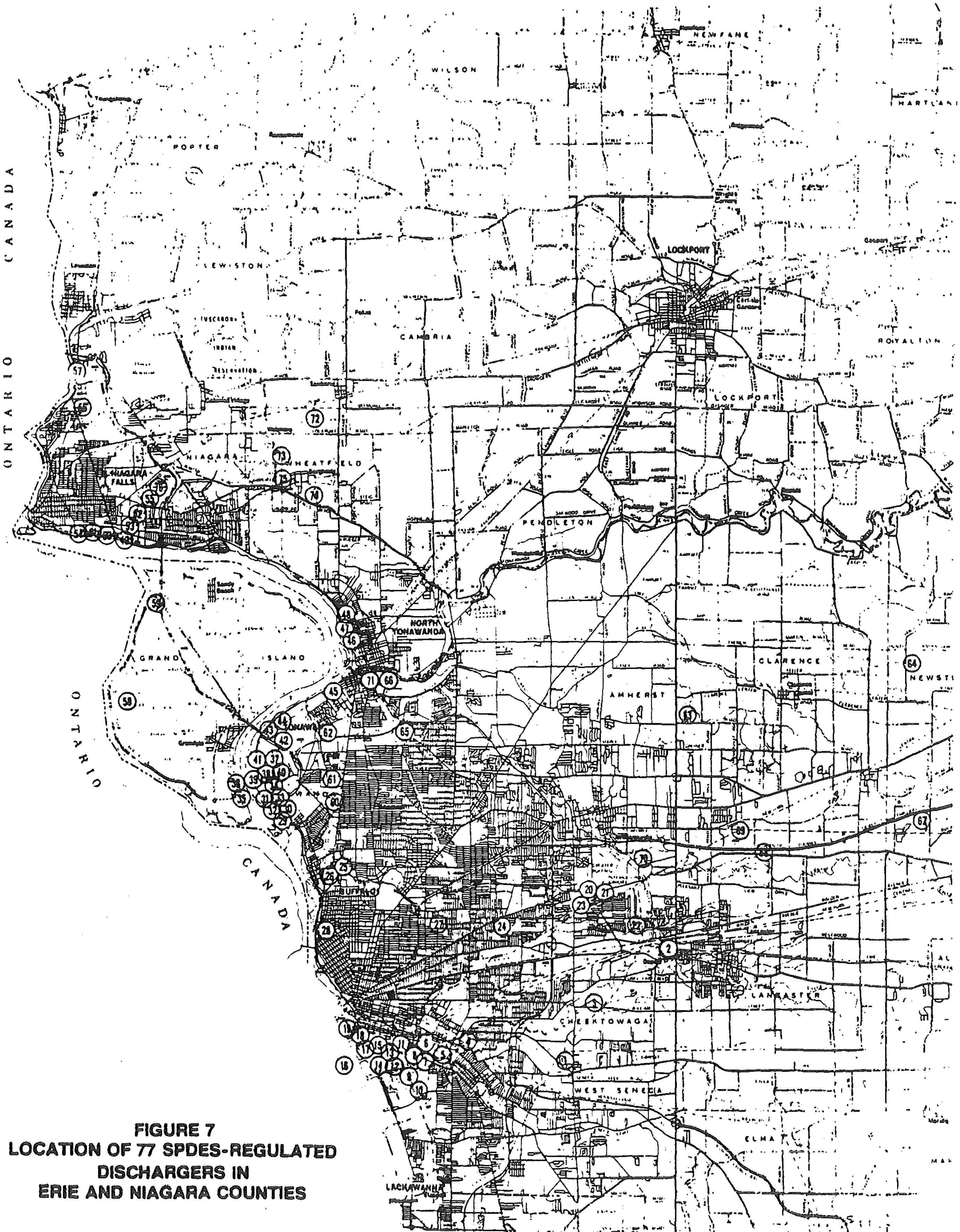


FIGURE 7
LOCATION OF 77 SPDES-REGULATED DISCHARGERS IN ERIE AND NIAGARA COUNTIES

Discharges to Buffalo Creek

1. National Starch and Chemical
   105 Empire Drive, West Seneca, N.Y.
   SPDES permit number: NY (000 2071)
   SIC code: 2891 - Refer to Appendices A and B
   ICS Response: negative
   eight employees

This firm manufactures approximately 5,400 pounds/day of converted starches for use as adhesives. Its 4,000 gallon/day nonprincipal discharge of cooling water is regulated for flow, conductivity and pH.

The pollution potential of this facility's effluent should be assessed. Although a variety of toxic pollutants have been identified in the wastewaters of industries in the SIC category 2849, this company's effluent has never been monitored for organic chemicals. Its SPDES permit fails to provide any toxic chemical limits whatsoever.

2. Dresser Industries
   2 Main Street, Depew, N.Y.
   SPDES permit number NY (0001996)
   SIC code: 3323 - Refer to Appendix B
   ICS response: positive
   Interagency Task Force Response (ITF): positive
   1,450 employees

This steel foundry operation manufactures more than 225 tons of large iron castings/day. Approximately 250 tons of steel scrap/day are heated in two electric arc furnaces. The molten metal is poured into sand molds formed with cereal and phenol formaldehyde based core resins. After the castings have cooled, the molds are broken apart by mechanical vibrating screens. The rough low alloy specialty castings of railroad undercarriages, couplings, and gears are then heat treated, finished and painted.

This plant's effluent discharge of approximately 90,000 gallons per day (GPD) is a designated source of toxic organic chemicals and heavy metals, and is reported to contain ammonia, arsenic, barium, cadmium, chromium, copper, cyanide, iron, lead, manganese, mercury, nickel, phenols, selenium, silver, oil, grease, phenols and formaldehyde.

This company's discharge was first identified as a source of toxics in 1977, when a DEC inspection discovered unauthorized releases of phenol, oil and grease. Yet its SPDES permit still fails to regulate toxic pollutants strictly. Only the following traditional effluent limitations are enforced: temperature (32.2 degrees Centigrade- maximum), flow (0.2 million gallons/day (MGD) average), oil and grease (25 pounds/day (PPD) average, cyanide

(4.3 PPD - average), and iron (2.0 PPD - average, 3.0 PPD maximum). These standards fail to provide comprehensive control of toxics.

This industry is scheduled to discharge its wastewaters on-line to a municipal collection system. This will present unique pollution problems that are discussed in detail in the following section of this report. In the meantime, however, the company is an inadequately regulated toxic discharger. The information contained in Appendix B indicates that a wide variety of toxic organic chemicals have been identified in the wastewaters of industries in the 332 SIC category. Yet this firm has not been required to monitor its discharge for those pollutants. Its full pollution potential should be assessed. Toxics found in its wastestream should be abated immediately.

3. Buffalo Slag Company/Cheektowaga Crushed Stone
   500 Como Park Boulevard Buffalo, N.Y.
   SPDES permit number: NY 000 2852
   SIC code: 3295
   ICS response: negative
   ITF Response: negative
   3,200 employees

This firm quarries, crushes and screens limestone rock and produces 3,400 tons of finished product/day. This process is dry and generates no wastewater. The facility's discharge is groundwater runoff from the company's property and is regulated only for pH (6.5 to 8.5), and suspended solids (25.0 mg/L - average, 50.0 mg/L - maximum). In 1976, an on-site inspection discovered an illegal discharge of sewage and reported that suspended solid limitations were exceeded during wet weather periods.

<u>Discharges to the Buffalo River</u>

4. Worthington Compressors
   45 Roberts Street Buffalo, N.Y.
   SPDES permit number: NY 0000 485
   SIC code: 3561
   ICS response: positive - refer to Appendix C
   ITF response: positive
   1,200 empoloyees

This firm manufactures water cooled air and gas compressors and diesel and dual fuel engines. Its process wastes are discharged into the Buffalo Sewer Authority (BSA) collection system. Its SPDES regulated non-contact cooling water discharge totals 164,000 GPD. This industry generates and discharges a variety of wastes. Regarding the plant's effluent, the BSA noted in 1971 that "excessive quantities of oily matter and solid material are entering these sewer facilities." The company's annealing operation produces oil quench discharges that can exit through floor drains. Other "lubricating oils and cleaning solvents" releases have been identified. The ITF reported that the company generated many wastes that could contaminate its wastestream: casting sands, slags, flyash, various binders, waste oils, crystalline "kolene" process salts, degreasers, and polyester sludge. In addition, residues of waste oil used to control dust on the plant site could be carried by stormwater runoff off-site or into the plant's discharges. According to the ITF, nearly 30 times as much trichloroethane is used in self-contained degreasing units than is reported to be hauled away. The rest of the material could be escaping into the environment.

In all likelihood, toxics are present in this facility's discharge, yet its SPDES permit only regulates temperature, pH, oil and grease. These traditional pollution limitations fail to provide comprehensive toxics control.

The full pollution potential of this industry's wastewaters should be determined. Toxics in its discharge should be abated immediately.

5. Mobil Oil
   635 Elk Street Buffalo, N.Y.
   SPDES permit number: NY 0000 264
   SIC code: 2911 and 2992 - Refer to Appendices A and B
   ICS response: positive - Refer to Appendix C
   ITF response: positive
   234 employees

This petroleum refinery has been in operation since 1892 and processes over 44 million barrels of crude oil per day. Processes including atmospheric and vacuum distillation, catalytic cracking and reforming and product treating and blending are used to produce 21.3 million barrels of motor gasoline/day, 10.3 million barrels of distillates/day, such as kerosene and distillate fuel oil, 8.5 million barrels of residuals/day, such as residual fuel oil and asphalt, and 3.6 million barrels/day of liquified petroleum gas and butane - butylene mixture.

The plant's effluent varies between 28 and 33 MGD. Since November 28, 1979, process wastewaters have been discharged to the BSA system. Other SPDES regulated wastewaters are designated as a principal discharge of toxic heavy metals and organics. These are still dumped into the Buffalo River and are reported to contain: ammonia, barium, chlorine, chromium, copper, cyanide, fluorides, iron, lead, manganese, oil, grease, sulfides, zinc, and phenols.

The refinery's discharge has been identified as a source of toxic contamination, yet its SPDES permit fails to regulate toxics strictly. Only the following limitations are in effect: temperature (90 degrees Fahrenheit - maximum), Chemical Oxygen Demand (COD) (2,800 PPD - average, 65,600 PPD - maximum), pH (6.0

to 9.0), oil and grease (80 PPD - average, 160 PPD - maximum), NH3 (149 PPD - average, 298 PPD - maximum), Total Organic Carbon (5.0 mg/L - maximum), chrome-hexavalent (0.07 PPD - average, 0.154 PPD - maximum), suspended solids (815 PPD - average, 1,630 PPD - maximum), Biochemical Oxygen Demand (BOD5) (400 PPD - average, 800 PPD - maximum), phenols (25.0 PPD - average, 50.0 PPD - maximum), chrome-total (4.4PPD - average, 8.8 PPD - maximum), and sulfides (20.0 PPD - average, 40.0 PPD - maximum). None of these limitations provide comprehensive toxics control. Moreover, during wet weather even less stringent standards are in effect to compensate for stormwater runoff.

This industry is an inadequately regulated source of chemical contamination. In all likelihood a variety of undetected types of pollution are present in the plant's discharges. Hazardous wastes listed in Mobil's response to the ITF include spent catalysts, tank sediments, bottoms, and scrapings, contaminated soil, and spent caustic sludges. These materials could contaminate the refinery's effluent. The facility's primary product, gasoline, characteristically contains a mixture of straight chained and branched alkanes an alkenes, substituted and unsubstituted aromatics, and a variety of other hydrocarbon compounds. Many of these chemicals are typically present in refinery wastestreams, especially those associated with the cooling and condensing of hydrocarbon streams. Appendices A, B, and C contain refinery effluent monitoring data and ICS information supplied by Mobil that prove that potentially toxic chemicals used in Mobil's petroleum refinery process are typically found in refinery wastestreams. Yet the facility's discharges to the BSA system or the Buffalo River have never been monitored for those pollutants. The refinery's full pollution potential should be assessed as soon as possible. Toxics discovered in its discharges should be abated immediately.

6. Allied Chemical Corporation
   35 Lee Street Buffalo, N.Y.
   SPDES permit number: NY 000 2160
   SIC code: 2818, 2819 - Refer to Appendix B
   ICS response: positive - Refer to Appendix B
   ITF response: positive
   136 employees

This facility has been in operation since 1930 and manufactures acids and other industrial inorganic chemicals. The following compounds are produced: sulfuric acid (112,000 tons/year), nitric acid (20,000 tons/year), oxalic and mixed acids (6,700 tons/year), ammonium thiosulfate (30,000 tons/year) and other assorted metallic nitrates (1,603 tons/year).

The plant disposes of its wastewater in three ways. Sanitary sewage is discharged to the BSA system. Non-contact cooking water averaging 12 MGD is discharged through four outfalls into the Buffalo River. Process wastewater is diverted to the nearby Buffalo Color treatment facility and is ultimately discharged to the Buffalo River.

The industry's SPDES-regulated discharges have been known to be contaminated with toxic pollutants since 1977. High-intensity monitoring detected trichlorotrifluoroethane being discharged at the rate of 0.06PPD, 1.08 PPD, and 0.22 PPD, over a three day period, respectively. Some of this contamination was traced to the plant's water source. Subsequently, testing for the 129 "priority pollutants" detected the presence of the following compounds:

1. discharge 001: bis(2-chloro ethyl) ether, 2,4 dichlorophenol, bis(2-ethyl hexyl) phthalate, di-n-octyl phthalate, and diethyl phthalate, all present at concentrations less than 10 ppb.

2. discharge 002: bis(2-ethyl hexyl) phthalate, di-n-butyl phthalate, and diethyl phthalate, all at concentrations less than 50 parts per trillion.

3. discharge 003: 2-nitrophenol, bis(2-ethyl hexyl) phthalate, and diethyl phthalate at concentrations less than 10 ppb and endosulfan at concentrations less than 50 ppt.

4. discharge 004: 2-nitrophenol, bis (2-ethyl hexyl) phthalate, di-n-butyl phthalate, diethyl phthalate, all at concentrations less than 10 ppb.

This facility is an inadequately regulated discharger. Despite the fact that toxic chemicals have been identified in its discharge, its SPDES permit does not curtail the release of these pollutant. For the four discharges: only the following sum limitations are in effect: pH (6.0 to 9.0), temperature (90 degrees F- maximum), COD (1,540 PPD maximum), oil and grease (150 PPD maximum), total Kjeldhal nitrogen(TKN)(6.0 PPD average, 12.0 PPD maximum), cadmium (2.6 PPD maximum), suspended solids (1,340 PPD maximum), BOD5 (260 PPD maximum), copper-total (5.0PPD maximum) and iron-total (99.0 PPD maximum). These standards fail to provide comprehensive toxics control. Numerical limits should be set to abate the toxic pollutants identified in this facility's discharge.

7. Republic Steel Corporation
   1175 Park Avenue Buffalo, N.Y.
   SPDES permit number: NY 000 1881
   SIC code: 3312 - Refer to Appendix B
   ICS response: positive - Refer to Appendix C
   ITF response: positive
   2,600 employees

This facility has been in operation since 1906 and produces, on an annual basis, 624,000 ingot tons of steel products using 776,000 tons of iron ore, 118,000 tons of limestone and 371,000 tons of coke.

The facility has four discharges in all. Discharge 01 contains wastewaters generated by the manufacture of 2,199 tons of steel bars/day. Operations that contribute to this effluent include bar mills, machine shops, steel chipping scarfing, barstraightening and pickling. Discharge 02 contains wastewaters generated by the manufacture of 2,502 tons of pig iron, 4,599 tons of steel and 3,933 tons of bloom and billets per day. The discharge consists of blast furnace gas cleaning water, basic oxygen furnace spark box wastewater and blooming mill wastewater. Discharge 03 contains wastewater generated by the manufacture of 2,340 tons of steel and steel billets/day and surface runoff. Indirect cooling water from the basic oxygen furnace melt shop and miscellaneous cooling water from the blooming mill area constitute this discharge. Discharge 04 contains cooling water generated by the power house, turbo blower condenser and turbo generator condenser operations that produce electric power wind for the blast furnaces.

This plant's manufacturing processes generate a total of between nine and ten MGD of wastewaters known to be polluted with the following: ammonia, cadmium, chromium, copper, cyanide, iron, lead, manganese, mercury, nickel, sulfides, zinc, phenols, oil and grease. The monitoring data presented in Appendix B indicates that scores of toxic organic chemicals could also be present in the facility's wastewaters.

Despite the fact that this industry is designated as a principal discharger of heavy metals and organic chemicals, its SPDES permit fails to provide comprehensive toxics control. Only the following limitations are in effect:

<u>outfall 01:</u> pH (6.0 to 9.0), oil and grease (482 PPD-average, 1,446 PPD maximum), temperature (summer: 92 degrees F average, 104 degrees F maximum, winter: 55 degrees F average, 61 degrees F maximum), suspended solids (1,064 PPDaverage, 3,192 PPD maximum).

<u>outfall 02:</u> pH (6.0 to 9.0), oil and grease (514 PPD average, 1,542 PPD maximum), NH3 (200 PPD average, 400 PPD maximum), free cyanide (20PPD average, 60 PPD maximum), soluble iron (184 PPD average, 552 PPD maximum), temperature (summer: 94 degrees F average, 104 degrees F maximum, winter: 56 degrees F average, 61 degrees F maximum), suspended solids (1,318 PPD average, 3,954 PPD maximum), phenols (17.4 PPD average, 52.2 PPD maximum), cyanide (39 PPD average, 117 PPD maximum).

<u>outfall 03:</u> pH (6.0 to 9.0), and temperature (summer: 80 degrees F average, 89 degrees F maximum, winter: 39 degrees F average, 51 degrees F maximum).

outfall 04: pH (6.0 to 9.0) and temperature (summer: 90 degrees F average, 98 degrees F maximum, winter: 54 degrees F average, 61 degrees F maximum).

Numerical standards for specific organic chemicals are totally lacking. This facility is an inadequately regulated toxic discharge. Its full pollution potential should be assessed. Toxic pollutants identified in its discharges should be abated immediately. In the past this company has exceeded allowable levels of free cyanide by nearly four-fold and total cyanide by two-fold.

8. Buffalo Color Corporation
340 Elk Street Buffalo, N.Y.
SPDES permit number: NY 000 2470
SIC code: 2818, 2841 - Refer to appendices A and B
ICS response: positive - Refer to Appendix C
ITF response: positive
525 employees

This facility operates 90 product lines and manufactures over 50 million pounds/year of various dyes, dye intermediates, alkyl anilines, resin chemicals and food colorings. The plant generates approximately 20 MGD of combined cooling and process wastewater. Its SPDES-regulated effluent to the Buffalo River is designated as a principal discharge of toxic organic chemicals. The facility is also an on-line discharger to the BSA collection system.

The company's wastestream has been known to be contaminated with toxic pollutants since 1977. In January, 1977, after repeated violations of its phenol discharge limitation, the firm analyzed its effluent for compounds that could give a false-positive phenol test. It was discovered that high phenol levels were evidently due to the presence of diethylaniline and dimethyl-analine. The company has since reported that o-dichlorobenzene and substituted aromatic compounds are also present in its wastestream. Ames testing analysis of bottom sediments collected by Dr. Beverly Paigen of Roswell Park Memorial Institute in an area adjacent to the plant's discharge to the Buffalo River provide solid evidence of the presence of mutagenic agents in the facility's wastestream. Other identified contaminants in the plant's effluent include ammonia, chromium, cyanide, iron, zinc, oil and grease.

Despite the certain knowledge that this plant is a source of toxic contamination, its SPDES permit fails to provide comprehensive control of chemical pollutants. Only the following sum limitations are in effect: oil and grease (10.0 mg/L maximum), NH_3 (125 PPD average, 250 PPD maximum), total organic carbon (750 PPD average, 1,500 PPD maximum), suspended solids (1,500 PPD average, 3,000 PPD maximum), BOD_5 (750 PPD average, 1,500 PPD maximum), and phenols (5.0 PPD average, 10.0 PPD maximum). Numerical standards for specific toxic pollutants are completely lacking.

This facility is an inadequately regulated source of toxic contamination. The monitoring data presented in appendices A and B indicate that a wide variety of toxic compounds could be present in the plant's wastestream. Information supplied by the company to the ITF indicates that millions of tons of hazardous waste have been generated by this facility since it began operation in 1930 as the National Aniline and Chemical Company, including: still bottoms, organic residues, spent oils and solvents, laboratory chemicals and off-specification products. Some of these wastes were disposed of on-site using incineration, open pit burning, recharge lagoons and deep well injection. Residues from these disposal operations could be contributing contamination to the facility's wastestream. This belief is substantiated by references in the company's permit file which indicate that "...recent contamination is believed to originate from site drainage and infiltration." Many of the chemicals that were produced at this plant are powerful carcinogens, notable the benzidine base dyes that were manufactured until 1976. All pollutants generated by the company's past and present production activities should be analyzed for this facility's discharges. Toxic compounds found to be present should be abated immediately.

This company has established a clear record of permit non-compliance and poor cooperation with water pollution control authorities. In a recent SPDES permit renewal application, the firm argued for less stringent regulations because: "the current owner is committed to a program of growth and expansion. Reduction or tightening of existing limits, which are presently quite confining, may inhibit this reversal and proposed expansion of economic activity."

In the future, this industry's toxic chemical discharges should be regulated as strictly as possible under the authority of the Clean Water Act.

9. Donner Hanna Coke Joint Venture
   Abby and Mystic Streets Buffalo, N.Y.
   SPDES permit number: NY 000 3310
   SIC code: 3312- Refer to Appendix B
   ICS response: positive - Refer to Appendix C
   ITF response: negative
   400 - 500 employees

This firm manufactures coke from coal for metallurgical purposes. Pyrolysis of coal produces two billion pounds/year of coke, 30 million gallons/year of liquid ammonia, and other "products of variable and changing composition from which others derive benzene, pyridene, naphthalene and other organics."

The plant generates approximately 15 MGD of combined non-contact cooling and process wastewater. Sanitary wastes are discharged to the BSA collection system. The SPDES-regulated effluent to the Buffalo River is designated as a principal discharge of toxic heavy metals and organic chemicals.

This facility is an inadequately regulated toxics discharger. Aromatic oils were reported in the plant's wastestream in 1976. Benzene and toluene were reported to contaminate the company's effluent in 1979. Yet the industry's SPDES permit fails to provide comprehensive control of chemical pollutant. Only the following effluent limitations are in effect: temperature (94 degrees F maximum, 90 degress summer maximum), pH (6.0 to 9.0), oil and grease (65.0 PPD average, 194.0 PPD maximum), NH3 (413.0 PPD average, 826.0 PPD maximum), suspended solids (220.0 PPD average, 650.0 maximum), BOD 5 (780.0 PPD-average, 1000.0 PPD maximum), phenols (8.0 PPD average, 16.0 maximum), cyanide (9.8 PPD average, 19.6 PPD maximum). Numerical standards for specific toxic compounds are totally lacking.

The full pollution potential of this facility should be assessed. In all likelihood, a wide variety of organic pollutants are present in its discharge. Appendix B contains monitoring data that identifies scores of toxic contaminants that are typically present in the wastestreams of SIC 3312 industries. Traditional pollution parameters do not restrict the discharge of these pollutants. The facility's wastestream should be monitored for the broad spectrum of pollutants that could be present. Strict limitations should be established for those that are present.

10. Ramco Steel, Incorporated
    110 Hopkins Street Buffalo, N.Y
    SPDES permit number: NY 0074977
    ICS response: negative
    ITF response: positive
    250 employees

This firms SPDES permit was deleted on March 7, 1980. The facility discharges its 50,000 gallons/day of wastewater to the BSA collection system. This company manufactures cold finished steel bars and coils. Wastewaters generated by the plant are contaminated with spent pickle liquor, rinse water, and waste lubricating oils. Prior to diverting its effluent to the BSA system, the facility had dumped wastewaters into the Buffalo River since 1929. These discharges were regulated only for traditional pollution concerns, not for toxic pollutants.

11. AIRCO Industrial Gases Division
101 Katherine Street Buffalo N.Y
SPDES permit number: NY 0085294
SIC codes: 493, 4925
ICS response: positive - Refer to Appendix C
ITF response: negative
40 employees

This firm manufactures industrial gases by air separation. The facility is reported to produce 500 tons/day of oxygen, 150 tons/day of nitrogen and 12 tons/day of argon. Approximately 40,000 gallons/day of primarily cooling water are discharged into the Buffalo River. An additional 700 gallons/day of sanitary waste is discharged into groundwaters. The plant's SPDES permit provides the following restrictions: Total phosphorus (10.0 mg/L average, 15 mg/L maximum), phenol (0.01 mg/L maximum), temperature (90 degrees F maximum), and pH (6.0 to 9.0). These traditional pollution standards fail to limit the discharge of toxic pollutants that could be present in the facility's wastestream. The industry's full pollution potential should be assessed immediately. Toxic chemicals identified in its wastestream should be abated. In particular, attention should be focussed on microbiocides reported to be used by the plant and known to contain toxic compounds such as 1,1,1-trichloroethane, dimethyl formamide, diethylene glycol, methylene bisthiocyanate, and isopropanol.

12. U.S. Steel Corporation
Katherine Street Buffalo, N.Y.
SPDES permit number: NY 0002194
SIC code: 3295
ICS response: negative
ITF response: negative

This facility ceased operation on July 20, 1979. Prior to shutting down, the plant produced agricultural grades of limestone by crushing and drying between 700 and 1,000 tons/day of limestone. The facility's 30,000 to 50,000 gallon/day discharge was only regulated for traditional pollution concerns, not for toxic chemicals.

13. Pacific Molasses Company
Katherine Street Buffalo, N.Y.
SPDES permit munber: NY 0001139
SIC code: 5099
ICS response: negative
ITF response: negative

This firm is a molasses distribution terminal. Molasses is received via railroad tank cars or barges, stored in tanks, and distributed. Boilers heat the molasses to facilitate its transfer. Water is added to the molasses to adjust it to "feed trade density." Approximately 3,640 gallons/day of sanitary waste and boiler blowdown are discharged to the Buffalo River. The plant has a history of molasses spills.

The facility's SPDES permit fails to provide comprehensive control of toxics. Only the following standards are in effect: pH (6.0 to 9.0) and temperature (160 degrees F average). The full pollution potential of this plant should be assessed immediately. Toxics detected in its effluent should be abated.

14. International Multifoods
    120 Childs Street Buffalo, N.Y.
    SPDES permit number: NY 000 1619
    SIC code: 2041
    ICS response: negative
    ITF response: negative
    300 employees

This firm processes 2.6 million pounds of wheat into 2.1 million pounds of flour/day. Until recently, approximately 36,000 gallons/day of combined cooling and sanitary wastewater was discharged into the Buffalo River. This wastestream was regulated only for traditional pollution concerns, not for toxic chemicals. Now the facility diverts its wastestream to the BSA collection system.

In the past, this company had violated its SPDES permit requirement in a variety of ways. On July 26, 1978 an EPA sampling team conducted an on-site inspection of the facility. Alleged violations included discharge of pollutants through an unauthorized outfall, failure to monitor discharges as required, and failure to provide effective secondary treatment of sanitary waste.

15. American Malting Incorporated
    100 Childs Street Buffalo, N.Y.
    SPDES permit number: NY 000 1945
    SIC code: 2083
    ICS response: positive - Refer to Appendix C
    ITF response: negative
    45 employees

This firm germinates 3,000,000 bushels of malt from 2,700,000 bushels of barley/year. The facility generates between 170,000 and 400,000 GPD of combined process and cooling water. The plant's effluent is designated as a non-principal discharge of toxic heavy metals to the Buffalo River.

This industry is scheduled to divert its wastestream to the BSA collection system shortly. In the meantime, it is an inadequately regulated discharger. The plant's effluent is known to be contaminated with heavy metals. However, the company has reported using a variety of toxic substances that could also be present in its wastewaters. Despite this potential, the facility's discharge has never been monitored for the spectrum of toxics that could be present. Only the following traditional pollution standards have been set: temperature (winter: 60 degrees F maximum, summer: 86 degrees F maximum), and pH (6.0 to 9.0). Numerical standards for specific toxic organic pollutants are completely lacking.

The full potential of this industry should be assessed. Toxic chemicals identified in its discharge should be abated immediately.

16. Peavey Corporation
    87 Childs Street Buffalo, N.Y.
    SPDES permit number: NY 0000 361
    SIC code: 2040
    ICS response: positive
    ITF response: negative
    180 employees

This company operates a grain milling plant that processes 32,000 bushels of wheat/day into 16,000 100 pound bags of flour/day that are distributed to wholesale bakeries. The facility generates between 170,000 and 400,000 GPD of wastewater. Until recently this effluent was discharged into the Buffalo River and regulated only for traditional pollution concerns, not for toxic chemicals. Now the wastestream is diverted to the BSA collection system.

In October, 1977, this company was discovered to have an illegal discharge of sanitary waste.

17. Agway, Incorporated
    33 Ganson Street Buffalo, NY
    SPDES permit number: NY 000 531
    SIC code: 204
    ICS response: negative
    ITF response: negative

This company manufactures between 1,000 and 1,500 tons/day of animal and poultry feed. Water is mixed with molasses, added to grain mixtures, then pelletized with steam. The plant's discharge of 35,000 gallons of cooling water is reported to be discharged to the Buffalo River and is regulated only for traditional pollution concerns, not for toxic chemicals. The full pollution potential of this facility should be assessed. Toxic pollutants identified in its effluent should be abated.

18. Pillsbury Company
250 Ganson Steet Buffalo, N.Y.
SPDES permit number: NY 000 1767
SIC code: 2041
ICS response: positive - Refer to Appendix C
ITF response: negative
150 employees

This firm processes 100,000,000 bushels of wheat/year and produces flour. Until recently, the facility discharged 15,000 GPD of sanitary waste and 8,000 GPD of process wastewater into the Blackwell Ship Canal. This effluent was regulated only for traditional pollution concerns, even though the company reported using toxic organic substances that could have infiltrated its wastestream. Now the plant diverts its discharge to the BSA collection system.

19. General Mills, Incorporated
54 South Michigan Avenue Buffalo, N.Y.
SPDES permit number: NY 0000 655
ICS response: negative
ITF response: negative
900 employees

This firm manufactures grain products, including breakfast cereals and "Bisquick." Production figures are confidential. Until recently, this facility discharged 102,000 GPD of combined cooking, sanitary and process wastewater into both the Buffalo River and the Ship Canal. This effluent was designated as a non-principal discharge of heavy metals and was regulated only for traditional pollution concerns, not for toxic chemicals. Now the wastestream is diverted to the BSA collection system.

Discharges to Scajaquada Creek

20. Westinghouse Electric Corporation
4454 Genesee Street Buffalo, N.Y.
SPDES permit number: NY 000 1210
SIC code: 3621, 3622
ICS response: negative
ITF response: positive
3,100 employees

This company manufactures 530 electric motors, 35 speed reducers and 52 electric controls per day, using processes including metal forming and joining, surface finishing, heat treating and electrical winding, insulating and testing. The facility's 1.03 MGD effluent of combined process and cooling wastewaters is designated as a principal discharge of toxic heavy metals and organics and is known to be contaminated with: aluminum, ammonia, barium, boron, cadmium, chlorine, chromium, copper, cyanide, fluorides, iron, lead, manganese, nickel, phenol, selenium, silver, sulfides, tin, zinc, oil, grease, methyl chloride, methylene chloride, freon, 1,1,1-

trichloroethane, BF3 furyl alcohol complex, toluene, xylene, ethylene glycol, mono butyl phenolic alkyl varnish, dyes and organic pigment.

This industry is known to be discharging toxic pollutants, yet its SPDES permit fails to provide comprehensive control of chemical contaminants. Only the following traditional pollution parameters are in effect: all outfalls 01,02,03 and 04: oil and grease (24.4 PPD average, 36.3 PPD maximum), soluble cadmium (0.13 PPD average, 0.26 PPD maximum), total cadmium (0.247 PPD average, 0.5 PPD maximum), chromium-hexavalent (0.07 PPD average, (.14 PPD maximum), soluble copper (0.26 PPD average, 0.52 PPD maximum), soluble iron (0.65 PPD average, 1.3 PPD maximum), total lead (0.025 PPD average, 0.05 PPD maximum), suspended solids (5.70 PPD average, 85.5 PPD maximum), BOD5 (29.2 PPD average, 45.0 PPD maximum), total zinc (0.39 PPD average, 0.76 PPD maximum), total chromium (0.65 PPD average, 1.3 PPD maximum), cyanide (0.152 PPD average, 0.3 PPD maximum), total copper (1.2 PPD average, 2.4 PPD maximum), total iron (0.913 PPD average, 1.8 PPD maximum) and oxidizable cyanide (0.13 PPD average, 0.26 PPD maximum).

These standards rigorously control the discharge of heavy metals and inorganic compounds, but organic chemicals are totally ignored. This facility is an inadequately regulated toxic discharger. Its full pollution potential should be assessed. In all likelihood the plant's wastestream is contaminated with a broad spectrum of toxics. Chemical contaminants identified in the company's discharge should be abated immediately. In the past, this facility exceeded allowable discharge levels of iron, zinc (by nearly three-fold) and lead (by nearly five-fold).

21. Calspan Corporation
    4455 Genesee Street Buffalo, N.Y.
    SPDES permit number: NY 000 2712
    SIC code: 7391
    ICS response: negative
    ITF response: negative
    850 employees

This facility is a research and development laboratory. Its 33,000 GPD of cooling water is designated as a non-principal discharge of heavy metals to Scajaquada Creek. Its sanitary waste is diverted to the Cheektowaga District Number Seven Collection System.

The company has reported using a variety of toxic chemicals in its cooling water and boiler systems. Yet its SPDES permit fails to provide comprehensive toxics control. Only the follwing standards are in effect: outfalls 01,02,03,and 04: pH (6.0 to 9.0), temperature (summer: 80 degrees F average, winter: 75 degrees F average), suspended solids (8.0 PPD average, 16.0 PPD maximum), total zinc (0.5 mg/L average, 1.0 mg/L maximum), and total chromium (1.0 mg/L maximum). Numerical standards for toxic chemicals are totally lacking.

This facility is an inadequately regulated discharger. Its full pollution potential should be assessed. Toxic pollutants detected in its wastestream should be abated.

22. Arcata Graphics
TC Industrial Park Depew, N.Y.
SPDES permit number: NY 0032140
SIC code: 2751, 4111
ICS response: positive - Refer to Appendix C
ITF response: negative
1500 employees

This company has been in business since 1878 and prints and binds 140,000 tons/year of books and magazines using letter press, offset, gravure printing and plate making processes. The facility's effluent of 2,800 GPD is known to be contaminated with toxic organic chemicals. Triplicate grab samples of the plant's 002 outfall on November 28, 1978 detected toluene at concentrations less than 6.5 parts per billion, xylene at concentrations less than 6.2 parts per billion and naphthalene at concentrations from 117.1 parts per billion to 141.8 parts per billion. All three of these chemical solvents were reported to be used by the facility in its ICS response. According to ITF report, approximately 48,000 gallons/year of waste solvents are removed from this plant. Plate room chemical wastes, however, are discharged to sewers.

This facility is an inadequately regulated discharger. The company's SPDES permit only regulates the effluent according to traditional pollution concerns such as temperature and suspended solids. Naphthalene, xylene and toluene are monitored, but the discharge of these toxic chemicals is not controlled. The full pollution potential of this plant should be assessed. Large-scale printing operations often use potentially toxic inks, solvents, lubricating oils, and blanket washes that can contaminate their wastestreams. The facility's effluent should be monitored for the broad spectrum of contaminants that could be present. Toxics found in the wastestream should be abated immediately.

23. Spencer Kellogg Research Center, Division of Textron, Incorporated
4201 Genesee Street Buffalo, N.Y.
SPDES permit number: NY 0000 388
SIC code: 2820, 2093 - Refer to Appendix B
ICS response: positive - Refer to Appendix C
ITF response: positive

This applied research facility manufactures 4,000 PPD of resinous polymers. Other operations at the plant include: new product development and research, pilot plants, and analytical and quality control research.

This facility discharges 32,000 GPD of cooling water which may contain hazardous wastes, according to a DEC memo in the company's permit file. The firm also uses more than 45,000 gallons/year and 40,000 pounds/year of 23 potentially toxic compounds that could be present in the plant's wastestream. Yet the industry's effluent has never been monitored for chemical contaminants, and its SPDES permit only regulates the discharge using traditional pollution parameters such as BOD, total suspended solids, settleable solids, pH, oil and grease. Numerical standards for toxic pollutants have not been set. The industry's full pollution potential should be assessed. Toxics identified in its wastestream should be abated immediately.

24. American Optical Corporation
Eggert and Sugar Roads Cheektowaga, N.Y.
SPDES permit number: NY 000 1058
SIC code: 3831
ICS response: positive - Refer to Appendix C
ITF response: positive
1,400 employees

This company's SPDES permit was deleted on January 10, 1980. Now the facility's 16,700 GPD of process and cooling waters are discharged on-line to the Cheektowaga Sewer District Number Five collection system. Prior to diverting its effluent to the municipal treatment plant, the company had discharged its wastewaters into Scajaquada Creek.

Over the years, the facility has manufactured many optical instruments, including microscopes, microtomes, opthalmic instruments, projectors, optical machinery, periscopes and sniperscopes. Since 1938, production of thes instruments is known to have generated large amounts of hazardous cutting oils, waste paints, thinners, lubricants, contaminated fuller's earth and many types of spent solvents. Residues of these materials may have been discharged in the plant's effluent. That possibility should be investigated thoroughly.

25. Markel Electric Products, Incorporated
601 Amherst Street Buffalo, N.Y.
SPDES permit number: NY 009 3564
SIC code: 3567
ICS response: negative
ITF response: negative
350 employees

This firm operates a sheet metal fabrication plant that manufactures portable, built-in and industrial electric heaters. The company's 30,000 GPD discharge to Scajaquada Creek may be inadequately regulated. Sheet metal fabrication typically involves the use of potentially toxic degreasing agents and solvents used in painting or other surface finishing processes. Yet this facility's SPDES permit only regulates flow, temperature and pH. The plant's wastestream has never been monitored for chemical contaminants. As a result, numerical standards for individual pollutants have not been set. The full pollution potential of this industry should be assessed. Toxics identified in its wastestream should be abated immediately.

26. Dayton Malleable, Pratt and Letchworth division
    189 Tonawanda Street Buffalo, N.Y.
    SPDES permit number: NY 00 31275
    SIc code: 3325, 3312, and 3493 - Refer to Appendix B
    ICS response: negative
    ITF response: positive
    550 employees

This company has been in operation since 1900 and produces railroad steel castings and forged steel. Its 220,000 GPD combined cooling and process wastewater discharge is designated as a non-principal discharger of toxic heavy metals to Scajaquada Creek . According to the monitoring data presented in Appendix B, wastewaters generated by industries in this firm's SIC category are known to be contaminated with scores of toxic organic chemicals. Yet this facility's effluent has never been monitored for those pollutants and its SPDES permit fails to protect against their discharge. Only the following limitations are in effect: outfall 01 (non contact cooling water): pH (6.5 to 8.5), suspended solids (30.0 mg/L average, 50 mg/L maximum) and total iron (2.0 mg/L average, 4.0 mg/L maximum); outfall 02 (non-contact cooling water): temperature (90 degrees F maximum) and pH (6.5 to 8.5); outfall 03: (non-contact cooling water and oil quench wastewater): temperature (90 degrees F maximum), pH (6.5 to 8.5), oil and grease (10.0 mg/L average, 15.0 mg/L maximum) and total iron (2.0 mg/L average, 4.0 mg/L maximum). Numerical standards for specific toxic pollutants are totally lacking This facility is an inadequately regulated toxic discharger. Its full pollution potential should be assessed. Toxic chemicals identified in its effluent should be abated imediately.

27. Curtiss Wright
    60 Grinder Street Buffalo, N.Y.
    SPDES permit number: NY
    SIC code: 3722
    ICS response: negative
    ITF response: negative
    225 employees

This company operates a metal extruding facility. Its discharge is not apparently continuous and is regulated only for traditional pollution concerns. Standards have reportedly been set for pH, total suspended solids, oil and grease. Monitoring is reportedly required for flow, temperature, total oxygen demand and "heavy metals suspected to be present." The plant's wastestream has not been monitored for the presence of toxic pollutants.

28. F.M. Schaeffer
    1314 Niagara Street Buffalo, N.Y.
    SIC code: 2082
    ICS response: negative
    ITF response: negative
    40 employees

This brewery is reported to discharge one MGD of combined process and cooling water into the Niagara River. Its effluent has never been monitored for toxic pollutants. Its SPDES permit only regulates the discharge using traditional pollution parameters for temperature, BOD, ammonia and sulfides. The facility's full pollution potential should be assessed immediately.

29. General Motors Corporation/Chevrolet Division
    Tonawanda, N.Y.
    SPDES permit number: 0000574
    SIC codes: 3714, 3462, 3321, - Refer to Appendix B
    ICS response: positive - Refer to Appendix C
    ITF response: positive

This facility is composed of three separate manufacturing operations: the forge plant, which produces automobile steering mechanism components, axles, drive gears, engine parts and brake and clutch pedals; the metal casting plant, which produces automotive gray iron castings; and the motor plant, which manufactures passenger and truck engines and parts, axles and assemblies. Approximately 6,660 engines, 2,650 tons of metal castings and 550 tons of metal forgings are produced daily.

These three facilities' combined effluent of 22 MGD is designated as a principal discharge of toxic heavy metals and organics. Yet, the company's SPDES permit fails to provide comprehensive toxics control. Only the following effluent limitations are in effect: temperature (90 degrees F maximum), pH (6.7 to 8.5), oil and grease (1130 PPD maximum), and phenols (12 PPD average, 24 PPD maximum). Numerical standards for specific toxic chemicals are completely lacking.

These facilities are inadequately regulated toxic dischargers. The monitoring data presented in Appendix B clearly indicates that manufacturing processes employed by industries in the SIC 332 category generate wastewaters contaminated with a wide variety of toxic organic chemicals. The information contained in Appendix C shows that many of the same compounds are known to be used in these three facilities. Yet, their wastewaters have never been monitored for those compounds. The company operates a physical-chemical treatment plant for removal of suspended solids, oil and grease, and a "polishing" facility to remove oil films. These treatment processes, however, are ineffective against toxics. The full pollution potential of these facilities should be assessed. Toxics identified in their effluents should be abated immediately.

30 E.I. Du Pont de NEMOURS and Company, Incorporated
Yerkes Plant Sheridan Drive Tonawanda, N.Y.
SPDES permit number: NY 000 1601
SIC code: 2821, 3079 - Refer to Appendices A and B
ICS response: positive - Refer to Appendix C
ITF response: positive
500 employees

This facility polymerizes polyvinyl fluoride and extrudes the polymer into films. The plant produces 13,000 PPD of polyvinyl fluoride (PVF) film, 15,000 to 18,000 PPD of polyolefin netting, 20,000 to 25,000 square feet/day of polymethylmethacrylate (PMMA) sheets and 400 to 500 PMMA bowls/day.

The facility discharges 2.5 MGD of cooling water and stormwater runoff into Niagara River. Past monitoring of this effluent identified the presence of methylene chloride at concentrations of two to four parts per billion. The company reports that nearly 350,000 pounds of this organic solvent are used at the plant each year. Despite the fact that toxic contamination is known to exist in the company's wastestream, its SPDES permit fails to limit the discharge of any specific organic chemicals. Only the following standards have been set: temperature (90 degrees F maximum), COD (330 PPD average, 660 PPD maximum), and pH (6.0 to 9.0). These limitations fail to provide comprehensive toxics control.

This facility is an inadequately regulated toxic discharger. The monitoring data presented in Appendices A and B show that a wide variety of organic chemical pollutants have been detected in the wastestreams of industries in the 2821 and 30 categories. Yet, this plant's wastewaters have never been monitored for those pollutants. The full pollution potential of this facility should be assessed. Toxics in its effluent should be abated immediately.

This company's process wastes are diverted to the Town of Tonawanda sewage treatment plant. Although the municipal wastewater system is not designed to cope with toxic organic chemicals, comprehensive pretreatment of the plant's wastewaters is not required. According to a letter from the town engineer, "The Yerkes plant has satisfied us that the 50,000 to 100,000 GPD discharge of process waste... has no pollutant incompatible with the wastewater treatment plant." Monitoring of the municipal treatment plant's discharge to the Niagara River should be undertaken to determine whether toxics in the Du Pont facility's wastestream are surviving the plant's secondary treatment processes.

31. Niagara Mohawk Power Corporation/C.R. Huntley Steam Station
River Road Tonawanda, N.Y.
SPDES permit number: NY 000 1023
SIC code: 4011 - Refer to Appendices A and B
ICS response: positive - Refer to Appendix C
ITF response: positive

This 875 megawatt coal-fired electric power generating facility has been in operation since 1916. Six power units, each consisting of a coal fired steam generator, a steam turbine-driven electrical generator, a steam condenser system and various auxiliary equipment systems, consume approximately 6,720 tons of bituminous coal/day and produce 12,234,033 kilowatt hours of electricity. At full operating capacity, this facility draws 835 MGD of cooling water from the Niagara River. The power plant's eight discharges are regulated for traditional pollution concerns. Only the following limitations have been set:

outfall 01: pH: (6.7 to 8.5), and suspended solids (44.0 PPD average;

outfall 02: pH (6.7 to 8.5);

outfall 03 and 04: temperatures (91 degrees F maximum with 13 degree difference allowed), pH (6.7 to 8.5), chlorine residual (0.3 mg/L), suspended solids (0.4 PPD average, 14 PPD maximum), and heat (3.83 billion British Thermal Units (BTU)/Hour);

outfall 05: heat, chlorine residual, and pH limitation same as for 03 and 04; temperature (92 degrees F maximum iwth 13 degrees difference allowed.

This facility is an inadequately regulated discharger. The monitoring data presented in appendices A and B show that many organic chemicals have been detected in coal-fired steam power generating plants' effluents. Yet this facility has never monitored its discharge for those pollutants. In its response to the ITF, the company reported the use of 9,125 gallons of PCBs in 63 transformers.

Leaks from these electrical devices could be the source of PCBs that are known to contaminate the plant's effluent.

In the past Niagara Mohawk has been known to dispose of waste PCBs in environmentally unacceptable ways. For example, in 1977 NYPIRG discovered that a fire fighter training school in Oswego, N.Y. was burning waste oils heavily contaminated with PCBs supplied by Niagara Mohawk in Syracuse. Monitoring data indicated that toxic PCB residues had contaminated portions of the school property and drained into a stream that flowed into Lake Ontario close to the water intake structures of the City of Syracuse. DEC authorities were well aware of the local contamination problems and the potential for widespread dispersal of air-borne PCBs, but took no action to halt the burning of the waste oils, Niagara Mohawk denied that PCBs were present in the oil burned by the school. Subsequent monitoring detected high concentrations of PCBs in the oils supplied by the company.

The power plant's effluent is also known to be contaminated with residues that are transported by a stream that drains the property of several nearby industries, notably Polymer Applications. The huge pile of coal on the power plant's property is another potential source of toxics that can leach into surface runoff. Hazardous waste landfills are possibly located on the plant's property. The Hooker Chemical Corporation reported to the ITF that massive amounts of phenol tar from its Durez facility were buried on the Huntley Power Station property.

In short, the full pollution potential of this plant is unknown, and should be determined as soon as possible. Toxics identified in the plant's discharges should be abated immediately.

32. Polymer Applications, Incorporated
3445 River Road Tonawanda, N.Y.
SPDES permit number: NY 00 84123
SIC code: 2851 - Refer to Appendices A and B
ICS response: positive - Refer to Appendix C
ITF response: positive
30 employees

This firm produces between 10,000 and 50,000 PPD of phenolic resins for plastics manufacture. Approximately 170,000 GPD of combined cooling, sanitary and process wastewaters are discharged through two outfalls into a ditch that connects with a slag pond on the adjacent Niagara Mohawk plant property. These discharges are regulated for traditional pollution concerns, not for toxic pollutants. Only the following limitations are in effect: temperature (70 degrees F maximum), flow (0.25 MGD average), pH (6.7 to 8.5), oil and grease (15.0mg/L maximum) and phenols (0.5 mg/L average and 10 mg/L maximum). These standards fail to provide comprehensive toxics control.

The monitoring data presented in Appendices A and B indicate that a broad spectrum of organic chemicals have been identified in the wastestreams of facilities in this company's SIC category. Yet this plant's wastestream has never been monitored for those toxic chemicals. Information in Appendix C shows that this industry handles over 7,000,000 pounds of phenol and formaldehyde each year. Information given to the ITF indicated that more than 125,000 gallons/year of a variety of waste solvents were disposed of in an underground storage tank until it was discovered to be leaking. The company has reported cleaning up the contamination, but residues may still be present. These materials could be finding their way into the plant discharges.

The full pollution potential of this facility should be assessed. Toxics identified in its discharges should be abated immediately. Rigorous enforcement of the firm's permit is necessary since the company has a long history of permit violations for phenol discharges. A July, 1975, DEC memo characterized the plant as a "sloppy operation" with "large amounts of phenol contamination in the rain runoff water, phenolic resins spilled on the ground." Though the matter was referred to the DEC's enforcement bureau, the case was never resolved. The industry also discharges process wastewaters which have not been pretreated properly to the Town of Tonawanda sewage treatment plant.

33. Dunlop Tire and Rubber Corporation
    Sheridan Drive Tonawanda, NY
    SPDES permit number: NY 010 1575
    SIC code: 3011 - Refer to Appendix B
    ICS response: positive - Refer to Appendix C
    ITF response: positive
    1,500 employees

This company manufactures tires and sporting goods. It produces 13,000 passenger and small truck tires/day, 2,000 large truck tires/day, 600 motorcycle tires/day, 3,500 PPD of golf balls and 6,600 PPD of tennis balls.

The plant generates approximately four MGD of process and cooling wastewaters which are released into the Niagara River. This effluent is designated as a non-principal discharger of toxic organic chemicals, yet the company's SPDES permit does not contain numerical limitations for any specific toxic pollutants. Only the following effluent standards are in effect: outfall one: flow (four MGD average), pH (6.7 to 8.5), oil and grease (10 mg/L average, 15 mg/L maximum), suspended solids (30 mg/L average, 50 mg/L maximum), and phenols (1.0 mg/L average, 2.0 mg/L maximum); outfall 03: pH (6.7 to 8.5). These traditional pollution parameters fail to provide comprehensive safeguards against the discharge of toxic chemicals.

This facility is an inadequately regulated toxic discharger. The monitoring data presented in Appendix B shows that many organic chemicals have been identified in the wastestreams of industries in this company's SIC category. Yet this plant's discharges have not been monitored for those pollutants. Other sources of chemical contamination may also be contributing wastes to the facility's effluent. Since 1921, hundreds of thousands of tons of hazardous waste have been disposed of on the plant property. These materials were not put into secure landfills. Instead they were buried in environmentally unacceptable ways and may now be infiltrating the plant's discharges. These wastes include a large number of oils, solvents, greases, scraps, scrapings, and sludges, contaminated with toxic chemicals.

The facility's full pollution potential should be assessed. Toxics present in its discharges should be abated immediately. This plant also contributes sanitary waste to the town of Tonawanda sewage treatment system. The impact of that practice should also be determined.

34. FMC Corporation
    37 Sawyer Avenue Tonawanda, N.Y.
    SPDES permit number: NY 0000 337
    SIC code: 2819 - Refer to Appendix B
    ICS response: positive - Refer to Appendix C
    ITF response: positive

This facility manufactures inorganic chemicals, including perborates, persulfates, calcium and zinc peroxides and peracetic acid. Its industrial processes of electrolysis, crystallization and drying generate 10 MGD of combined cooling and process wastewaters known to be contaminated with phenol acid phosphate, dipcolinic acid, phenol and chlorotoluene. The plant's effluent is designated as a principal discharge of toxic heavy metals. The facility's sanitary wastes are diverted to the Town of Tonawanda sewage treatment plant.

Despite the fact that toxic chemicals have been identified in this industry's wastestream, its SPDES permit does not contain any numerical standards for chemical contaminants. Only the following traditional pollution limitations are in effect: temperature (90 degrees F maximum), pH (6.0 to 9.0), NH3 (200 PPD average, 400 PPD maximum), total phosphorus (11.0 PPD average, 22 PPD maximum), total boron (640 PPD average, 1,600 PPD maximum), suspended solids (340 PPD average, 680 PPD maximum), and total zinc (6.6 PPS maximum). These standards fail to provide comprehensive control of toxic pollutants.

This facility is an inadequately regulated source of chemical contamination. The monitoring data presented in Appendix B indicates that many toxic pollutants have been identified in the wastestreams of facility's in this company's SIC category. Yet, its discharge has not been monitored for these compounds. Over the decades, tons of hazardous wastes were disposed of in at least four on-site pits. These toxic residues may be infiltrating the plant's discharges. The full pollution potential of this industry should be assessed. Toxics identified in its effluent should be abated.

35. Texaco, Incorporated Tonawanda Terminal
    River Road and James Street Tonawanda, N.Y.
    SPDES permit number: NY 00 21202
    SIC code: 5171
    ICS response: negative
    ITF response: negative

This facility is a petroleum products storage terminal. Its discharge consists of 6,000 GPD of treated stormwater runoff and 1,000 GPD of untreated stormwater runoff and is regulated for oil and grease. This facility is an inadequately regulated discharger. Its full potential should be assessed. Petroleum products handled at this facility are typically composed of a wide variety of organic chemicals including substituted, branched, cyclic, and aromatic hydrocarbons. Spillage that typically results during the handling of bulk amounts of petroleum could allow toxic pollutants to infiltrate the facility's discharges, yet the wastestream has never been monitored for organic chemicals. Toxic contaminants detected in the facility's effluent should be abated immediately.

36. Ashland Petroleum Company
3701 River Road Tonawanda, N.Y.
ICS response: negative
ITF response: negative

This is a petroleum storage facility that poses problems similar to those described in the previous profile. It, too, is regulated only for the discharge of oil and grease, not for toxics. Its pollution potential should be assessed. Chemical pollutants in its effluent should be abated.

37. Sunoil Buffalo Terminal
3755 River Road Tonawanda, N.Y.
SPDES permit number: NY 00 27103
SIC code: 5171
ICS response: negative
ITF response: negative
17 employees

This is another petroleum storage facility that poses problems similar to those described in the previous profiles. It also is regulated only for the discharge of oil and grease, not for toxic chemicals. This facility also blends lubricating oils. Its discharge averages 35,500 GPD. The full pollution potential of this plant should be assessed, and toxics present in its effluent should be abated immediately.

38. Atlantic Richfield
3733 River Road Tonawanda, N.Y.
SPDES permit number: NY 00 23621
SIC code: 5171
ICS response: negative
ITF response: negative
14 employees

This facility is another petroleum storage facility that poses problems similar to those described in the preceding three profiles. Its discharges consist of stormwater runoff and truck washings and averages approximately 1,000 to 5,000 GPD on an intermittent basis. The effluent is only regulated for oil and grease. The facility's full pollution potential should be assessed. Toxics present in its wastestream should be abated immediately.

39. Allied Chemical Corporation/Specialty Chemicals Division
    3821 River road Tonawanda, N.Y.
    SPDES permit number: NY 000 1481
    SIC code: 2821 - Refer to Appendices A and B
    ICS response: positive - Refer to Appendix C
    ITF response: positive
    66 employees

This facility manufactures various types of polyethylene utilizing polymerization and copolymerization processes. Its process wastewaters are diverted to the Town of Tonawanda sewage treatment plant. Its Five MGD discharge to the Niagara River consists of cooling water and stormwater runoff and is known to be contaminated with arsenic, chromium, nickel, copper, zinc, iron, oil, grease, substituted aromatic compounds originating from nearby coke and coal tar manufacturers, and trace quantities of trichloroethane originating from instrument cleaning.

Despite the fact that toxic pollutants are known to exist in this plant's discharge, its SPDES permit fails to provide comprehensive toxics control. Only the following limitations are in effect: temperature (85 degrees F maximum), COD (165 PPD average, 495 PPD maximum), pH (6.0 to 9.0) and suspended solids (5 mg/L maximum). Numerical standards for specific chemical contaminants are completely lacking.

This facility is an inadequately regulated discharger. Monitoring data presented in Appendices A and B indicate that many toxic chemicals are typically present in the wastestreams of industries in the 2821 SIC category. Yet this plant's wastestream has never been monitored for those pollutants. According to the company's response to the ITF, hundreds of tons of hazardous wastes lie buried beneath the plant property, including scrap polyethylene, chlorinated polyethylene, tars, waste solvents, oils and nitric acid. These pollutants were not disposed of in a secure manner and may be finding their way into the industry's discharges. The full pollution potential of this facility needs to be determined. Toxics in its effluent should be abated immediately. Process wastewaters should also be monitored for the presence of chemical pollutants and pretreated before being discharged to the municipal collection system.

40. Tonawanda Coke Corporation
3875 River Road Tonawanda, N.Y.
SPDES permit number: NY 000 2399
SIC code 3312 - Refer to Appendix B
ICS response: positive - Refer to Appendix C
ITF response: positive
200 employees

This firm produces 300,000 tons/year of foundry coke from 370,000 tons/year of coal using destructive distillation. Ammonia, tar and coke oven gas are generated as by-products. Approximately 3.25 MGD of combined process (13 percent) and non-contact cooling (79 percent) wastewaters are released into the Niagara River. This effluent is designated as a principal discharge of toxic heavy metals and organics. Some process wastes are also diverted to the Town of Tonawanda sewage treatment plant.

Despite the fact that this facility is a known discharger of toxic chemicals, its SPDES permit fails to provide comprehensive toxic controls. Only the following traditional pollution parameters are in effect: temperature (102 degrees F maximum), pH (6.0 to 9.0), oil and grease (70 PPD average, 210 PPD maximum), NH3 (254 PPD average, 762 PPD maximum), total phosphorus (59 PPD average, 177 PPD maximum), suspended solids (880 PPD average, 2,200 PPD maximum), BOD5 (1,342 PPD average, 2,350 PPD maximum), phenols (6.0 PPD average, 18.0 PPD maximum), cyanide (12 PPD average, 36 PPD maximum), and settleable solids (0.1 mg/L maximum). Numerical standards for specific toxic pollutants are totally lacking.

This facility is an inadequately regulated toxic discharger. The monitoring data presented in Apdendix B indicates that a broad spectrum of organic chemicals are typically present in the wastestreams of industries in the 3312 SIC category. Yet, this facility's effluent has never been monitored for those pollutants. The Allied Chemical Cemet Solvent Division plant has reported disposing of tons of hazardous wastes on the Tonawanda Coke Corporation's plant property. These residues may be infiltrating the facility's discharges. The full pollution potential of the industry's effluent should be assessed. Toxics identified in its wastestream should be abated immediately.

41. New York Wire Mills, Incorporated
3937 River Road Tonawanda, N.Y.
SPDES permit number: NY 00 83623
SIC code: 2481
ICS response: positive - Rever to Appendix C
ITF response: negative
274 employees

This firm manufactures between 200 and 500 tons/day of wire. Approximately 500 GPD of cooling water is discharged to the Niagara River. Sanitary wastes are diverted to the Town of

Tonawanda sewage treatment facility. Among the wastewaters generated at this plant are pickling solutions that may be contaminated with toxic pollutants. Despite the potential for chemical contaminants to be present in the industry's discharge, its SPDES permit fails to contain toxic limitations of any kind. Nor has its wastestream been monitored for organics. Only the following effluent standards are in effect: temperature (90 degrees F maximum), and pH (6.5 to 8.5). The full pollution potential for this facility should be assessed. Toxics identified in its discharge should be abated immediately.

42. Ashland CanLake Truck Terminal
740 Grand Island Boulevard Tonawanda, N.Y.
SPDES permit number: NY 00 73687
SIC code: 5171
ICS response: negative
ITF response: negataive

This facility is a petroleum products storage terminal with a capacity of 200,000 barrels of crude or fuel oil. Its discharges are intermittent releases of stormwater runoff that passes through an oil-water separator. Like the other petroleum storage operations discussed previously in this section, this facility is regulated for oil and grease, not for toxics. Its pollution potential should be assessed. Chemical contaminants in its discharges should be abated immediately.

43. Ashland Petroleum - Buffalo Refinery
4545 River Road Tonawanda, N.Y.
SPDES permit number: NY 000 1678
SIC code 2911 - Refer to Appendices A and B
ICS response: positive - Refer to Appendix C
ITF response: positive
300 employees

This refinery processes 62,000 barrels/day of crude oil and produces 31,000 barrels/day of gasoline, 16,000 barrels/day of fuel oils, 7,000 barrels/day of asphalt, and 3,000 barrels/day of aromatic petrochemicals. Its effluent of between 15 and 29 MGD of cooling water to the Niagara River is designated as a principal discharge of toxic heavy metals and organics. Process wastewaters are diverted to the Town of Tonawanda sewage treatment plant.

Despite the fact that toxic pollutants are known to be present in this facility's effluent, its SPDES permit fails to provide comprehensive toxic controls. Only the following traditional pollution parameters are in effect: outfall 01: temperature (115 degrees F maximum), pH (6.0 to 9.0), oil and grease (700 PPD average, 1,000 PPD maximum), NH3 (400 PPD average, 720 PPD maximum), total organic carbon (2,300 PPD average, 4,100 PPD maximum), hexavalent chrome (0.1 PPD average, 0.3PPD maximum), suspended solids (380 PPD average, 644 PPD maximum), BOD5 (3,800 PPD average, 6,840 PPD maximum), phenols (55 PPD maximum), total chrome (4.5 PPD maximum), and sulfides (150 PPD average, 270 PPD maximum). Numerical standards for specific toxic compounds are completely lacking.

This facility is an inadequately regulated toxic discharger. The monitoring data presented in Appendices A and B indicate that refinery wastewaters are typically contaminated with many toxic organic chemicals. Yet this facility's effluent has never been monitored for those pollutants. The full pollution potential of the facility should be assessed. Toxics detected in its discharges to the Niagara River and to the municipal system should be abated immediately.

This facility's permit requires rigorous enforcement. In the past, the company's compliance record has been poor. In May, 1975 the company was fined $600 for a permit violation. In 1977, EPA filed suit against the company for repeated violations of its phenol limitations. The company was subsequentlly fined $1,000 and placed on a compliance schedule for correcting the problem.

44. River Road Oil Company
    5335 River Road Tonawanda, N.Y.
    ICS response: negative
    ITF response: negative

This facility stores bulk petroleum and toluene. Wastewater discharges from the facility consist of stormwater runoff and are regulated for oil, grease and toluene. In addition to the previously-discussed problems associated with the storage of petroleum products, this facility is known to discharge toluene, a toxic organic chemical solvent. Yet its wastestream has not been monitored for the broad spectrum of toxics that may be present. The firm's SPDES permit requires limits on toluene discharges, but does not provide comprehensive toxics control. The facility's pollution potential remains unknown and should be determined. Toxic pollutants identified in its effluent should be abated immediately.

45. Spaulding Fiber Company/Industrial Plastics Division
    310 Wheeler Street Tonawanda, N.Y.
    SPDES permit number: NY 000 2364
    SIC code: 3567, 2631 - Refer to Appendix B
    ICS response: positive - Refer to Appendix C
    ITF response: positive
    1,142 employees

This firm manufactures vulcanized fiber for the production of specially treated papers. Vulcanization refers to the treatment of paper with zinc chloride. The facility includes a paper mill and a lamination plant. Its manufacturing processes include: condensation, polymerization, resin-carrier saturation, high pressure laminating and fabrication. A total of 25 tons/day of vulcanized fiber and between 20 to 25 tons/day of industrial laminates are produced.

The plant's effluent of four MGD of combined cooling and process wastewater is designated as a prinicpal discharge of toxic heavy metals. However, the company's SPDES permit fails to provide comprehensive toxics controls. Only the following standards are in effect:

outfalls 01 and 02: temperature (110 degrees F maximum), pH (6.0 to 9.0), soluble zinc (20 PPD average, 30 PPD maximum), total zinc (0.5 mg/L average, 1.0 mg/L maximum);

outfall 03: pH (6.0 to 9.0), soluble zinc (same for outfalls 01 and 02); all outfalls: suspended solids (24,900 PPD - sum average), BOD5 (2,400 PPD - sum average), and total zinc (1.5 mg/L sum average). Numerical standards for specific toxic pollutants are totally lacking.

This facility is an inadequately regulated toxic discharger. The monitoring data presented in Appendix B indicates that many toxic organic chemicals are typically present in the wastestreams of industries in the 3567 and 2631 SIC categories. Yet this company's effluent has not been monitored for those pollutants. The firm is known to have generated tons of hazardous waste contaminated with toxic solvents, such as phenol and formaldehyde. Some of this material is buried on-site and may be infiltrating the plant's wastewater discharge. That possibility has not been investigated thoroughly.

The full pollution potential of this facility should be assessed . Toxics identified in its effluent should be abated. The company is in the process of constructing a pretreatment facility and diverting its process wastes to the Town of Tonawanda sewage treatment system. Steps should be taken to assure that pretreatment provided by the firm is adequate to remove toxics that may be present. Between November 10, 1978 and January 30, 1979, this facility failed to discharge soluble zinc in compliance with its SPDES permit.

46. Hooker Chemical and Plastics Corporation/Durez Division
Walck Road North Tonawanda, N.Y.
SPDES permit number: NY 000 1198
SIC code: 2821 - Refer to Appendices A and B
ICS response: positive - Refer to Appendix C
ITF response: positive
500 employees

This facility manufactures phenolic resins, molding compounds and formaldehyde, hexamethylenetetramine, diallyl phthalate molding compound, alkyl molding compound and para-tertiary octyl-phenol. It is designated as a principal discharger of toxic heavy metals and organics into the Niagara River. The plant produces approximately 83,309 PPD of hexamine (formalin and ammonia,), 316,577 PPD of formalin and unspecified amounts of synthetic resins and molding compounds. Its manufacturing processes generate approximately 800,000 GPD of cooling water and 40,000 GPD of process wastewater, which are discharged into the Niagara River via a storm sewer system. According to a study performed by the Center for Bio-Organic studies dated October 24, 1979, the following substances were qualitatively identified:

trichloroethylene
monochlorobenzene
benzyl chloride
dichlorobenzene
trichlorobenzene
chlorophenol
benzene
toluene
acetophenone
phenol
methyl phenol
dimethyl phenol isomer
trimethyl phenol isomer
ethyl phenol
C3 phenol isomer
C4 phenol isomer
biphenyl
diphenylether
dimethyl phthalate
C5 phenol isomer
dibenzofuran
phenylphenol
phenoxyphenol isomer
diethylphthalate
C8 phenol isomer
Carboxylic acid
diallylphthalate
dibutylthanone
xanthone
phthalate

Despite the fact that this plant's wastewaters are known to be contaminated with highly toxic and carcinogenic chemicals, its SPDES permit fails to provide comprehensive toxics control. Only these effluent limitations are in effect:

outfalls 01 to 14: pH (6.0 to 9.0).

Four outfalls listed on the DEC's computer printouts as 21,22, 23, and 24 are regulated as follows: outfall 21: COD (4,000 PPD average, 8,000 maximum), TKN (550 PPD average, 1,100 PPD maximum), suspended solids (128 PPD average, 256 PPD maximum), BOD5 (2,000 PPD average and 4,000 PPD maximum) and phenols (35 PPD average); outfall 22: oil and grease (50 PPD maximum); outfall 23: benzene (2.9 PPD maximum), toluene (0.1 PPD maximum), trichlorobenzene (0.2 PPD maximum), monochlorobenzene (7.5 PPD maximum), and dichlorobenzene (6.0 PPD maximum); outfall 25: total zinc (2.5 PPD maximum).

This facility is an inadequately regulated toxic discharger. The information presented in Appendix C indicates that this plant handles more than 30 million pounds of potentially toxic organic chemicals. Spills and other accidental releases have allowed some of these compounds to infiltrate the company's wastewater discharges. In addition, the plant site is known to hold hundreds of tons of hazardous waste landfilled in at least 14 dumps. None of these is designed, constructed or maintained to be able to hold toxic chemicals securely. A confidential interoffice memorandum dated August 23, 1978 from J. Gburek at the Durez facility to A. Katonah at Hooker's main facility states," The phenol-bearing materials such as the resins and molding compounds represent leachate problems, but my primary concern is those wastes originating from our phenol plant that contain chlorinated benzenes. Burial sites on the plant premises have been identified through interviews with senior employees and it has been our experience that chlorinated benzenes are slowly leaching into plant wastewater systems." Finally, the monitoring data presented in Appendices A and B indicate that many organic chemicals are typically present in the wastestreams generated by industries such as this one in the 2821 SIC category. The general pollution parameters required by this facility's SPDES permit are not adequate safeguards against the discharge of these pollutants.

This plant's full pollution potential should be assessed. Its wastestream should be extensively monitored and numerical limitations should be set to abate the discharge of all toxics that are identified.

47. Tonawanda Electric Steel Casting Corporation
    200 River Road North Tonawanda, N.Y.
    SPDES permit number: NY 000 2747
    SIC code 3325 - Refer to Appendix B
    ICS response: positive - Refer to Appendix C
    ITF response: negative
    125 employees

This firm produces up to 100 tons/month of steel castings made from scrap. Molten metal is poured into sand molds in two batches/day. Process wastewaters are diverted to the City of North Tonawanda sewage treatment plant. Approximately 7,900 GPD of non-contact cooling water are discharged into the Niagara River.

The full pollution potential of this facility should be assessed. The monitoring data presented in Appendix B shows that industries in the 3325 SIC category generate wastewaters that are typically contaminated with toxic organic chemicals. Yet this company's effluent has never been monitored for those compounds. Its SPDES permit does not set limits on the discharge of any toxic pollutants. Only these standards are in effect: temperature (winter: 60 degrees F average, 70 degrees F maximum; summer: 84 degrees F average, 110 degrees F maximum), and pH (6.0

to 9.0). Steps should be taken to assure that the facility is not discharging toxics into the Niagara River or the municipal wastewater collection system.

48. Koppers, Incorporated/Organic Materials Division
940 River Road North Tonawanda, N.Y.
ICS response: negative
ITF response: negative
30 to 40 employees

On March 29, 1978 this facility diverted its wastestream to the City of North Tonawanda sewage treatment plant and its SPDEs permit was deleted. Prior to connecting with the municipal collection system the facility discharged 50,000 GPD into the Niagara. The firm produces 50 tons/day of finished roofing felt using 15 percent kraft, 60 percent reclaimed newspaper and 25 percent wood flour. A study should be undertaken to determine if the facility is discharging toxics into the municipal wastewater system. If so, the company should institute appropriate pretreatment measures.

49. Hooker Chemicals and Plastics Corporation/Specialty Chemicals Division
47th Street and Buffalo Avenue Niagara Falls, N.Y.
SPDES permit number: NY 000 3336
SIC code: 2812 - Refer to Appendix B
ICS response: positive - Refer to Appendix C
ITF response: positive

In August, 1978 the discovery of widespread health problems evidently related to toxic chemicals emanating from the Love Canal, an abandoned Hooker dump site, made the Hooker Chemicals and Plastics Corporation instantly infamous. Almost immediately, the company became the focus of extensive investigations designed to determine the full extent of its toxic dumping activities. Where little or no attention had previously been paid to either abandoned hazardous waste dumps or toxic chemical dischargers, Hooker's waste disposal activities soon became singularly clear.

Much attention was paid to Hooker's Buffalo Avenue facility. This huge mile-long facility has produced over 250 chemicals, many with numerous variations, since 1930. Its major products have been caustic soda, chlorine, chlorotoluenes, dechlorane (Mirex), halogenated organic chemicals, including parachlorobenzotrichloride (PCBTC) and parachlorobenzotrifluoride (PCBTF), and various sulphur and phosphorus compounds.

This facility is one of the largest identified toxic dischargers in the Niagara Frontier. Over the years it has generated hundreds of thousands of tons of hazardous wastes. Much of that material was disposed of in Hooker-owned dumps such as the Love Canal, and the Hyde Park and the 102nd Street landfills. However, more than 75,000 tons of chemical waste lies buried in a wide variety of areas on the plant property. Table 3 lists the compounds that are found in the S and N- area dump alone.

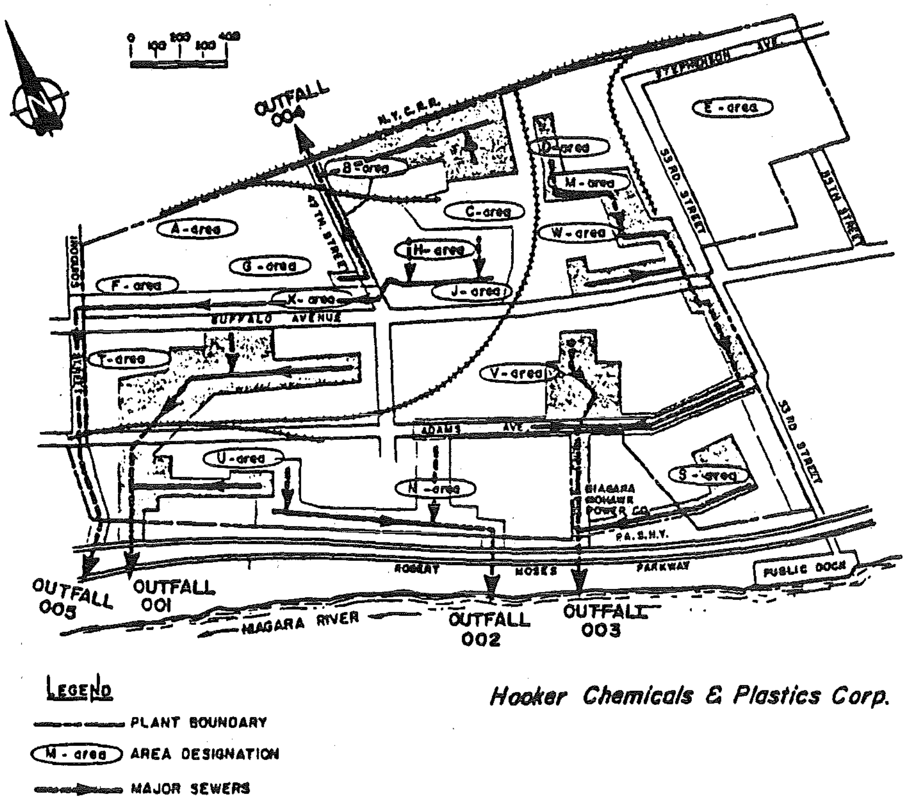
TABLE 3
HOOKER CHEMICAL S AND N-AREA WASTE INVENTORY

Type of Waste	Estimated Total Tonnage
Organic phosphates (24)	200 tons
Misc. acid chlorides (20)	400 tons
Phenol tars (23)	800 tons
Thionyl chloride (17)	4,200 tons
HET acid (18)	500 tons
Misc. chlorinations (19)	400 tons
DDM (15)	8,100 tons
TCP (16)	200 tons
Benzoyl chloride (7)	3,300 tons
LDS/MCT (9)	2,200 tons
Metal chlorides (11)	900 tons
C-56 (4)	17,400 tons
Chlorobenzenes (6)	18,900 tons
Benzyl chlorides (1)	1,600 tons
Thiodan (2)	700 tons
Sulfides (3)	4,200 tons
Misc. 10% of above	6,400 tons
Total	74,400 tons

These and other highly toxic residues were not disposed of in structures designed, constructed, or maintained to hold them securely. Instead they were buried in open dumps. Over the years the compounds leached out of the dumps. Now these toxic materials have been discovered to be migrating through groundwaters beneath the plant site and entering the company's vast network of cooling water discharge pipelines. As a result, tens of thousands of pounds of highly toxic chemicals flow annually from this facility into the Niagara River.

The Hooker plant diverts all of its process wastewater to the City of Niagara Falls wastewater treatment plant. Its cooling water system, however, discharges approximately 50 MGD directly into the Niagara River. Cooling water is also diverted to a Diversion Sewer along Buffalo Avenue. Figure 8 depicts the Hooker facility, its sewer system and its outfalls.

FIGURE 8
HOOKER BUFFALO AVENUE PLANT



On September 13th and 14th, 1978, the EPA conducted an inspection of the Hooker Buffalo Avenue plant and sampled its discharges for toxic chemicals. These were the results of that monitoring effort:

OUTFALL	PARAMETER	Concentration, ug/l
002	Trichloroethylene	124
	Toluene	97
003	Tetrachloroethylene	52
	Chloroform	52
	Chlorotoluene	95
	Bentachlorobenzene	67
	2-Butoxyethanol	2400
003 S	Dibromochloromethane	126
	Bromoform	180/150
	Ethyl Hexyl Phthalate	69
005	Chlorobenzene	170

These data are among the earliest indications that a broad spectrum of toxic pollutants were found in the facility's wastewater discharges.

Later that year Hooker initiated a "Chlorocarbon Source Investigation Program" as part of its SPDES permit renewal requirements. The findings of that investigation were released in a report that was submitted to the DEC in 1979. For the first time the waste load allocations of individual compounds in each outfall collection systems was determined. These data are presented in Table 4.

TABLE 4
HOOKER CHEMICAL BUFFALO AVENUE PLANT
SPDES HALOGENATED ORGANIC AND TOLUENE MONITORING RESULTS
July through December 1978

AVERAGE NET RESULTS IN LBS/DAY

Constituent	Area 3 001	N-Area 002	Area 4 003	47th Div 004	F-28 005	Total 001-005
Monochlorotoluene	5.0	21	3.6	3	36	69
Dichlorotoluene	0.56	0.15	0.16	0.55	1.9	3.3
Monochlorobenzotrifluoride	0.12	10	6.5	0.04	0.07	16.7
Dichlorobenzotrifluoride	0.04	0.37	0.28	0.06	0.09	0.84
Hexachlorocyclopentadiene	0.01	0	1.1	0.01	0.34	1.5
Hexachlorobutadiene	0.02	0	0.05	0.03	0.09	0.19
Endosulfan (Thiodan)	0	0.00	0.01	0.01	1.27	1.3
Dechlorane Plus	0.03	0.01	0.20	0	0.12	0.36
Dechlorane 602	0.00	0.00	0.04	0.00	0.24	0.28
Pentac	0.00	0.00	0.03	0.00	0.16	0.19
Chlorendic Acid	0.06	0.01	0.25	0.02	6.4	6.7
Monochlorobenzene	0.16	0.05	0.08	0.10	2.2	2.6
Dichlorobenzene	0.11	0.20	0.20	0.38	2.2	3.1
Trichlorobenzene	0.35	0.08	0.13	0.36	9.1	10
Tetrachlorobenzene	0.19	0.01	0.32	0.06	15	16
Trichloroethylene	7.8	0.75	0.60	0.59	0.09	9.8
Tetrachloroethylene	1.0	0	8.3	3.0	0.10	12
Hexachlorocyclohexane	0.06	0.94	0.07	0.05	1.3	2.4
TOTAL	16	34	22	8.3	77	157
Toluene	0.57	0.41	0.66	0.42	0.40	2.5

According to the report, "based on the source survey results, approximately 41 PPD or 26 percent of the total outfall loading appears to be related to current process sources with the remaining (74 percent) believed to be associated with non-point sources, such as infiltration of contaminated groundwater and the sewer system." The report indicated that "this belief is founded on the presence of several organic disposal sites on plant property... and also the fact that many compounds that are no longer produced at the Niagara Plant are detected in the outfalls."

The discovery that landfilled hazardous wastes had contaminated large areas of the overburden beneath the Hooker plant property led to the undertaking of a second, more extensive investigation. The findings of that probe were submitted to the DEC in a four-volume study entitled, "Report on Wastewater Outfall Sewers, September 22, 1980."

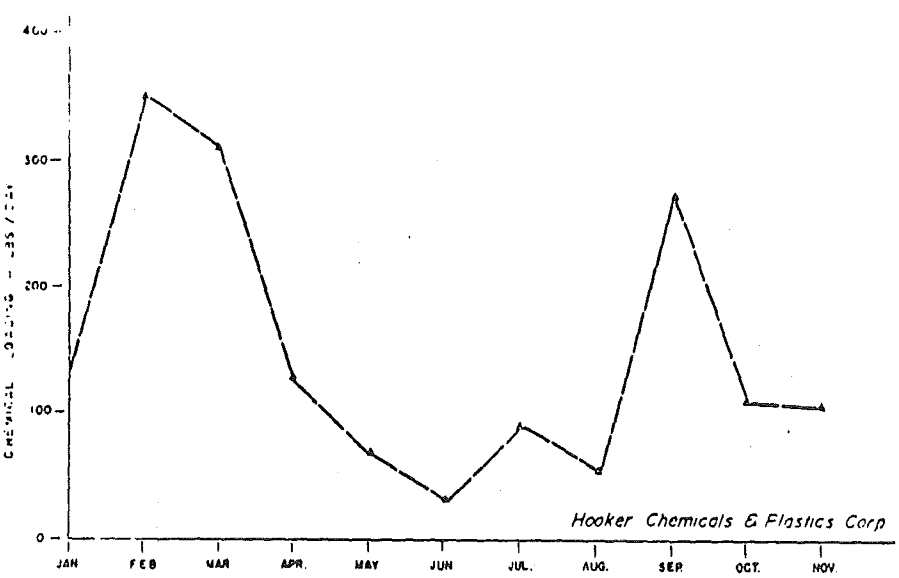
Table 5 outlines the waste loads of 11 compounds in each outfall during 1979.

TABLE 5
HOOKER CHEMICAL BUFFALO AVENUE PLANT
BASELINE CHEMICAL LOADING
1979 Average
(lbs./day)

CHEMICAL	OUTFALL 001	002	003	004	005
Trichloroethylene	12.55	0.65	1.37	0.22	0.21
Tetrachloroethylene	1.97	0.	6.17	1.22	0.11
Toluene	2.4	0.59	0.38	0.24	3.9
Chlorobenzotrifluorides	0.54	9.4	32.	0.09	0.35
Monochlorobenzene	0.51	0.03	0.16	0.05	1.9
Dichlorobenzene	0.26	0.05	0.53	0.56	2.9
Chlorotoluenes	19.86	9.6	2.9	1.56	20.3
Dichlorotoluenes	0.76	0.08	0.39	0.18	2.4
Trichlorobenzenes	0.78	0.03	0.24	0.11	4.56
Tetrachlorobenzenes	0.69	0.	2.26	0.	4.0
Hexachlorocyclopentadiene	0.	0.	2.38	0.	0.11
TOTAL lbs/day	40.32	20.43	48.78	4.23	40.74

Figure 9 charts the seasonal variation of waste discharges during 1979.

FIGURE 9
MONTHLY TOTAL OUTFALL CHEMICAL LOADING 1979



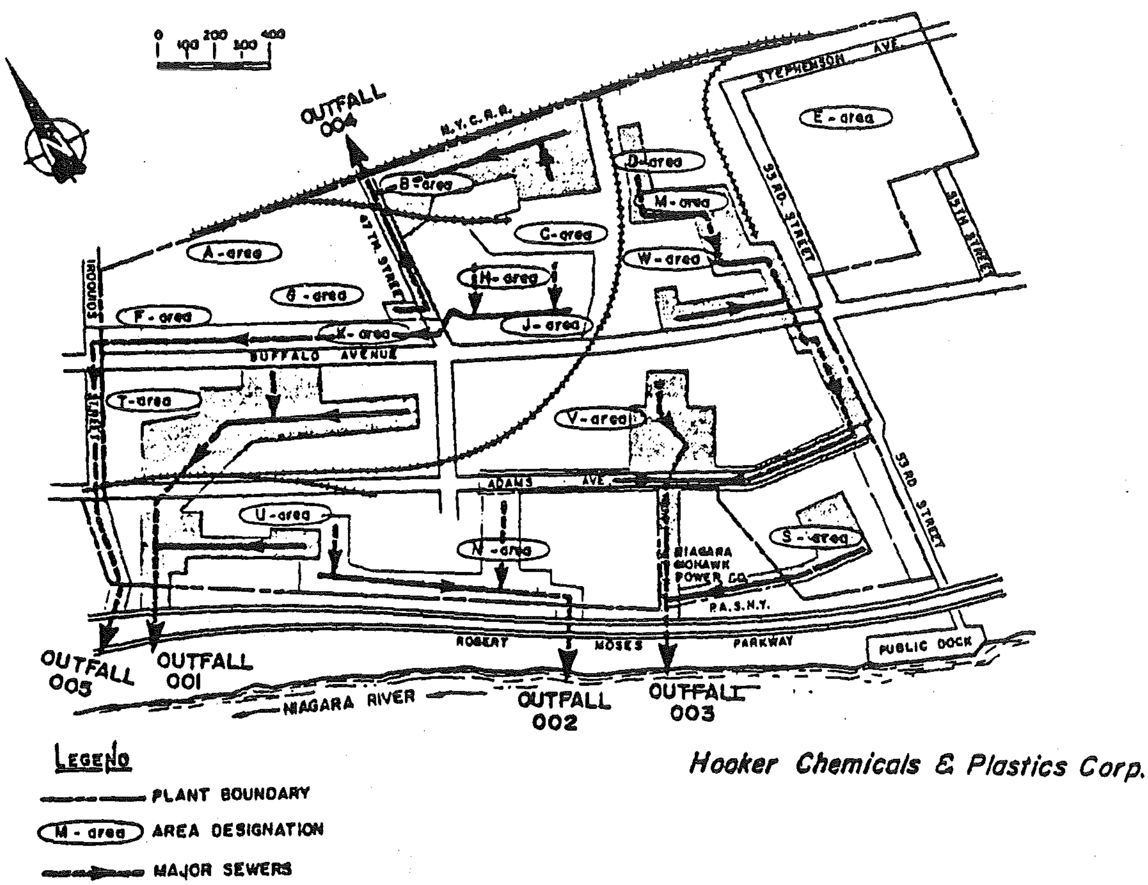
Despite the fact that a wide variety of toxic chemicals have been clearly identified in this facility's wastewater discharges, its SPDES permit fails to provide comprehensive toxic limitations. In fact, the permit does just the opposite by allowing the company to release a maximum of 284 PPD of unspecified halogenated organic chemicals. In addition, the following traditional pollution parameters are in effect: outfalls 001, 002, 003, 004 and 005: suspended solids (4,434 PPD average, 5,755 PPD maximum), COD (2,410 PPD average, 4,780 maximum), toluene (14 PPD maximum), Mirex (less than 0.001 mg/L in each discharge), temperature (90 degrees F maximum); outfall 001: pH (6.0 to 9.0) and mercury (0.15PPD average, 0.3 PPD maximum); outfall 002: pH (6.0 to 9.0); outfall 003: pH (6.0 to 9.5) and fluorides (176 PPD average and 350 PPD maximum); outfalls 004 and 005: pH (6.0 to 9.0).

This company's discharge permit exemplifies the limitations of the entire SPDES system. Large amounts of toxic chemicals are known to be present in the facility's effluent. Yet its SPDES permit neither requires comprehensive monitoring of the discharge nor sets strict standards to control the release of those or other toxic pollutants. The Hooker facility is known to have manufactured hundreds of different chemicals and generated hundreds of thousands of tons of hazardous waste. Yet, less than 20 compounds have been monitored for in the plant's wastewaters. As a result, the fate of the remaining contaminants is unknown. Though more than 75,000 tons of chemical waste are known to be buried in inappropriately designed, constructed and maintained dumpsites, no action has been required to make those disposal areas secure. Consequently, extremely deadly chemicals pour into the facility's severely deteriorated sewer system and, subsequently, into the Niagara River. This uncontrolled discharge, in effect, receives the blessings of the State and federal environmental authorities.

The full pollution potential of the Hooker facility should be determined as soon as possible. The company should analyze its wastewater discharges to the river and the City of Niagara Falls treatment plant for the full spectrum of toxic chemicals that might be present. Comprehensive analyses should be performed for every single one of the compounds Hooker has manufactured, handled or disposed of at its plant site. These analyses should be conducted using the most sophisticated technology available and monitoring should be conducted for as long as is necessary to develop an adequate data base. In particular, monitoring should focus on discovering whether trichlorophenol or dioxin are escaping into the Niagara or into groundwaters that migrate beyond the perimeter of the Hooker facility. Extensive groundwater monitoring should also be immediately undertaken to investigate whether chemical contamination is entering the Niagara River directly. Chemical pollutants are evidently migrating from the vicinity of the S-Area dump toward the City of Niagara Falls water filtration plant. The threat that Hooker's wastes pose to the quality of drinking water produced by the municipal treatment facility should be assessed. The impact of Hooker's wastes on the quality of groundwaters in the overburden and deep water aquifer system beneath the plant site should also be investigated. Hooker's own studies have pointed out the need to conduct more research on its facility's environmental impact. Close attention should be paid to the areas outlined in Figure 10.

Once the facility's numerous sources of toxic contamination have been identified in full, action should be taken to curtail all toxic discharges to the environment as a matter of urgent necessity. The company should be held strictly liable for the pollution problems it may have caused. If appropriate, legal action should be brought against the company for any violations of its SPDES permit.

FIGURE 10
HOOKER CHEMICAL NIAGARA PLANT AREAS FOR FURTHER STUDY



50. Olin Corporation/Niagara Works
Buffalo Avenue Niagara Falls, N.Y.
SPDES permit number: NY 000 1635
SIC code: 2812 - Refer to Appendix B
ICS response: negative
ITF response: positive
300 employees

This facility has been in operation since 1897 and manufactures the following inorganic chemicals: 255 tons/day of caustic soda, 250 tons/day of liquid chlorine, 57.5 tons/day of HTH ®, 5.25 tons/day of sodium methylate and 5.95 tons/day of sodium chloride.

Due to a contaminated well water supply, this facility is one of the largest identified toxic dischargers in the Niagara Frontier. The Olin manufacturing complex is made up of two plants, separated by a portion of the E.I Du Pont de Nemours company, that use water drawn from wells and from the Niagara River. The west plant is where wells are located that draw water from groundwater beneath the site. The east plant is where river water intakes and pumps are located. In winter, well water flows vary between 2,000 and 2,600 gallons/minute. In summer, the same flows vary between 2,600 and 3,600 gallons/minute. Well water is distributed to both plants. However, river water is normally used only at the east plant. Additional amounts of city water are also used at both plants.

In late 1978, the company discovered the presence of toxic organic chemicals in its well water supply. Subsequently, on June 12, 1980, simultaneous samples were collected from three non-contact cooling water discharges to the diversion sewer along Buffalo Avenue and from the two operating wells. The findings of those analyses have been reported in a report dated December 1, 1980, and entitled, "Monitoring Study Contaminated Well Water Supply." Those findings are summarized in Table 6.

TABLE 6
OLIN CORPORATION PRIORITY POLLUTANT ANALYSIS
June 12, 1980

(ppb)

COMPOUNDS	DETECTION LIMIT	NORTH WELL	SOUTH WELL	002 (1 CW)	004 (3 CW)	005 (4 CW)
Benzene µg/l	10	12	---	19	11	---
Carbon Tetrachloride µg/l	10	38	90	22	13	13
1,2,4-Trichlorobenzene µg/l	10	---	---	12	---	---
1,1,1-Trichloroethane µg/l	10	39	54	30	---	13
1,1,2,2-Tetrachloroethane µg/l	10	---	511	---	502	423
1,1,2-Trichloroethane µg/l	10	---	---	12	---	---
Chloroform µg/l	10	593	294	432	59	82
Trans-1,2-Dichloroethene µ	10	2006	1154	1906	375	519
Methylene Chloride µg/l	10	163	94	48	10	42
Trichlorofluoromethane µg/l	10	---	11	---	---	---
Tetrachloroethene µg/l	10	1931	875	2498	726	398
Trichloroethene µg/l	10	2446	1239	2553	1661	826
Bis(2-Ethyl Hexyl)phthalate µg/l	10	---	---	15	---	---
Vinyl Chloride µg/l	10	116	88	89	18	23
		7344	4410	7636	3375	2339
		5877 avg.				

North Well Flow - 2,830,000 gpd
South Well Flow - 2,181,600 gpd
Discharge 002 Flow - 2,480,000 gpd
Discharge 004 Flow - 2,440,000 gpd
Discharge 005 Flow - 1,330,000 gpd

ORGANIC CONTAMINANTS (pounds)

COMPOUNDS	NORTH WELL	SOUTH WELL	COMBINED WELLS	COMBINED DISCHARGES	DISCHARGE 002	DISCHARGE 004	DISCHARGE 005
Benzene	0.29	---	0.29	0.61	0.39	0.22	---
Carbon Tetrachloride	0.91	1.64	2.55	0.35	0.46	0.25	0.14
1,2,4-Trichlorobenzene	---	---	---	0.25	0.25	---	---
1,1,1-Trichloroethane	0.94	0.98	1.92	0.76	0.62	---	0.14
1,1,2,2-Tetrachloroethane	---	9.30	9.30	20.46	---	10.22	10.24
1,1,2-Trichloroethane	---	---	---	0.25	0.25	---	---
Chloroform	14.24	5.35	19.59	11.05	8.94	1.20	0.91
Trans-1,2-Dichloroethene	48.18	21.00	69.18	52.81	39.42	7.63	5.76
Methylene Chloride	3.92	1.71	5.63	1.66	0.99	0.20	0.47
Trichlorofluoromethane	---	0.20	0.20	---	---	---	---
Tetrachloroethene	46.38	15.92	62.30	70.85	51.67	14.77	4.41
Trichloroethene	58.75	22.54	81.29	95.76	52.80	33.80	9.16
Bis(2-ethyl hexyl)phthalate	---	---	---	0.31	0.31	---	---
Vinyl Chloride	2.79	1.60	4.39	2.47	1.84	0.37	0.26
	176.40	80.24	256.64	258.10	157.94	68.67	31.49

In all, these discharges release approximately 90,000 pounds of toxics/year into the Niagara River.

In the company's SPDES permit renewal application, the following compounds were identified in the facility's discharge: aluminum, cadmium, chlorine, chromium, copper, cyanide, fluorides, iron, lead, mercury, nickel, phenols, silver, sulfides, zinc, oil and grease. The following "priority pollutants" were reported to be, or could be, present in the plant discharge due to the contaminated water supply:

Methylene Chloride	Hexachloro-1,3-butadiene
Chloroform	Trichlorobenzene (2 isomers)
Carbon tetrachloride	Naphthalene
Trichloroethene	BHC (Hexachlorocyclohexane)
1,1,2-Trichloroethane	Dibutylphthalate
Dichlorobromomethane	Pyrene
Dibromochloromethane	Fluoranthene
Di-isooctylphthalate	1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane	Diethylphthalate
Monchlorobenzene	Phenathrene
Toluene	Dichlorobenzene
Tetrachloroethene	Phenol
Butanol	Mercury
Vinylidine Chloride	Chromium
Benzene	Copper
Bromoform	Lead
1,2-Dichloroethane	Nickel
Ethylbenzene	Silver
Hexachloroethane	Thallium

The following compounds were also reported to be, or could be, present in the plant's discharge:

1,2 Dichloroethene	Butylatedhydroxytoluene (BHT)
Acetone	Dioctyladipate
Tetrahydrofuran	Chlorocyclohexane
Dimethoxymethane	Trichloroethylbenzene
1,1,1,2-Tetrachloroethane	Chlorocyclohexane
1,1,2-Trichloro-1,2,2-Trifluoroethane	Cyclohexenone
Pentachlorobutene	Pentachlorobutadiene
a Decane	Chlorocyclohexanone
Tetrachlorobenzene	Cyclohexanedione
Bromochlorocyclohexane	Chlorocyclohexanol

Despite the fact that these toxic compounds have been identified in the company's discharges, its SPDES permit fails to provide comprehensive toxics control. Only these effluent limitations are in effect: outfalls 002, 004 and 005: mercury (0.1 PPD average, 0.2 PPD maximum), pH (6.0 to 9.0) and total suspended solids (920 PPD average, 2,000 PPD maximum); outfall 005: BOD5 (110 PPD average, 240 PPD maximum). Monitoring for these compounds is also required: total volatile organics, monochlorobenzene, dichlorobenzene, total phenolics, carbon tetrachloride, chloroform, methylene chloride, 1,1,2,2-tetrachloroethane, dichloroethenes, tetrachloroethene, and 1,1,2-trichloroethene. Numerical standards were not set to limit the release of individual organics.

The full pollution potential of this facility should be determined. Even though large numbers of toxic chemicals have been detected in this company's discharges to the diversion sewer, the source of these pollutants is unknown. According to the ITF report, Olin has manufactured many highly toxic chemicals over the years and disposed of large amounts of hazardous waste on-site. In particular, the plant's Buffalo Avenue parking lot was used from approximately 1947 to 1956 to dispose of about 175 tons of brine sludge contaminated with mercury. Another 275 tons of brine sludge contaminated with mercury were disposed of somewhere on the plant property between 1957 and 1960. Other toxic chemicals may also be buried on-site. Olin reported manufacturing hexachlorocyclohexane (C-66) until 1956, trichlorobenzene between 1952 and 1956, and trichloro-phenol between 1953 and 1957. Wastes produced by Olin are reported to include benzene hexachloride (BHC), trichlorobenzene, tetrachlorobenzene, pentachloronitrobenzene, and trichloroanisole

There are monitoring data to suport the conclusion that materials disposed of on the Olin plant site leached into Gill Creek, which flows through the plant property. In a letter dated October 11, 1979 Olin reported these monitoring results to the DEC:

		Total Hexachlorocyclohexane	Isomers
Sediment	under Adams Ave bridge	8,681 ppm	6,515 ppm alpha isomer 1,857 ppm beta isomer 309 ppm delta isomer
	Near Buffalo Ave	18.9 ppm	11 ppm alpha isomer 2.4 ppm beta isomer 5.9 ppm gamma isomer 0.6 ppm delta isomer
Bank	Upper West Bank	43.8 ppm	16.7 ppm alpha isomer 27.1 ppm beta isomer
	West bank near to Adams Avenue	464.4 ppm	356.3 ppm alpha isomer 60.7 ppm beta isomer 47.4 ppm delta isomer
Water	Buffalo Ave	0.7 ppb	predominately alpha, no gamma
	Middle	6.4 ppb	predominately alpha, no gamma
	Adams Ave	2.3 ppb	predominately alpha, estimated 0.07 ppm gamma

These materials may have been transported by a shallow aquifer system that flows beneath the Olin facility and discharges in Gill Creek.

Regarding chlorophenols that were detected in the groundwaters drawn from two Olin test wells, the company reported, "Olin manufactured tri-chlorophenol for a period of two years (1954-1956) with production operations in Building 97. We are apparently seeing material from that operation in these two wells."

Regarding other detected pollutants in sediment sample taken from the creek bank, Olin reported, "The coal tar priority pollutants in the creek bank sample are probably due to production operations on the site prior to Olin occupation. A series of manufacturers of abrasives and carbon electrodes occupied the area in years past. Both operations used coal tars in their production processes. These included:

Carbide Chemicals Corporation (Union Carbide Corp.)
Star Electrode Company
Star Electric Company
Norton Company
Ampere Chemical Company
Electro Lamp Company

In a letter from DEC to Olin, dated January 31, 1980, regarding BHC contamination in Gill Creek, it was noted "the lack of aquatic life in this stretch of the creek and high incidence of skeletal remains indicates the presence of compounds of high aquatic toxicity."

Last spring, Olin dredged the section of Gill Creek Adjacent to its facility. While this action removed large amounts of toxics that could have eventually flowed into the Niagara River, the site's pollution problems are by no means solved. Full disclosure of the company's manufacturing and hazardous waste disposal activities is essential. Olin is known to have disposed of toxic chemicals at the 102nd Street site and at other locations in the area, but the possibility that large amounts of waste are buried on its plant property should be investigated thoroughly. In particular, the whereabouts of dioxin-contaminated trichlorophenol wastes must be determined.

In addition, the company's discharge of toxics should be curtailed immediately. The release of such a large amount of chemical pollution is not consistent with either the letter or the spirit of the Clean Water Act. The plant's discharge to the municipal collection system should also be monitored for toxics. Rigorous enforcement is essential. In the past the company has falsified its discharge monitoring reports in order to cover-up violations of allowable mercury discharge levels.

51. E.I. Du Pont de Nemours/Chemical Dye and Pigment Department
Buffalo Avenue and Chemical Road Niagara Falls, N.Y.
SPDES permit number: NY 000 3328
SIC codes 2818, 2819 - Refer to Appendix B
ICS response: positive - Refer to Appendix C
ITF response: positive
878 employees

This facility manufactures inorganic and organic chemicals, including polymeric alcohols, sodium, chlorine, copper and zinc cyanides, vinyl acetate, methanol, acetic acid and a variety of other compounds. In the past this facility also produced bulk organic chemicals such as methylene chloride, chloroform, trichloroethylene, tetrachloroethane, and carbon tetrachloride.

Some of the facility's process wastewater is diverted to the City of Niagara Falls wastewater treatment plant. Approximately 15 MGD of combined cooling water, treated process wastes and stormwater runoff are discharged to Gill Creek and the Niagara River. Though the facility is known to handle large amounts of potentially toxic chemicals and is known to generate hazardous waste, its SPDES permit fails to provide comprehensive toxics control. Only these standards are in effect:

All outfalls: COD (7,000 PPD average, 10,500 PPD maximum) and suspended solids (1,500 same PPD average, 3,000 sum PPD maximum); outfall 01: temperature (90 degrees F maximum), pH (6.0 to 9.0), oil and grease (300 sum PPD average, 600 sum PPD maximum), total barium (100 PPD average, 200 PPD-maximum); outfall 04: temperature (90 degrees maximum), pH (6.0 to 9.0) and oil and grease (300 PPD average, 600 PPD maximum); outfall 11: Fluoride (250 PPD average); outfall 17: temperature (90 degrees F maximum) and pH (6.0 to 9.0). Numerical standards for specific toxic chemicals are totally lacking.

This facility's full pollution potential should be assessed. Its plant site is known to be peppered with hazardous waste dumps. An area next to Building 107 has been excavated to remove large amounts of toxic residues, including materials with high concentrations of PCBs, that were leaching into groundwaters entering Gill Creek. (This discovery led to the dredging of Gill Creek last year). Contamination from other dump sites may be contributing contamination to the plant's wastewater discharge. That potential should be thoroughly investigated. Toxics identified in the company's wastestream should be abated immediately.

This facility is known to have landfilled more than 93 tons of hazardous waste at its Necco Park dump site. In a letter from DEC to Du Pont, dated June 14, 1978, it was noted that well "7" contained concentrations of trichlorophenol measuring 15,000 ug/L. The company, however, had never reported to the ITF handling or manufacturing trichlorophenol. The presence of this potentially dioxin-contaminated material should be investigatied in Du Pont's plant site and in its wastewater discharges.

52. Union Carbide Corporation/Linde Division/Welding Flux Plant
Simmons Avenue and 47th Street Niagara Falls, N.Y.
SPDES permit number: 0000 060
SIC code: 2819, 3313 - Refer to Appendix B
ICS response: negative
ITF response: positive
120 employees

The Linde Division of Union Carbide owns and operates this facility on the property of Union Carbide's Metals Division, which was once a metals and plastics manufacturing operation. The present plant produces between 30 and 45 million pounds/year of sub-arc welding flux by melting various elemental oxides, such as tungsten, boron, nickel, manganese, chromium, aluminum, and vanadium oxides and ores, in an electric furnace.

This facility's effluent of more than 2.5 MGD of commercial process, cooling and treated furnace wastewaters is designated as a prinicpal discharge of toxic heavy metals and organics. It is known to be contaminated with: aluminum, fluoride, manganese, oil, grease and phenols. Yet, the company's SPDES permit fails to provide comprehensive toxics control. Only the following traditional pollution parameters are in effect:

outfall 01: temperature (90 degrees F maximum), pH (6.5 to 8.5), TKN (42 PPD average, 47 PPD maximum), total phosphorus (22 PPD average, 42 PPD maximum), fluoride (70 PPD average, 140 PPD maximum) and suspended solids (50 PPD average, 100 PPD maximum);

outfall 02: oil and grease (14.6 PPD average 22 PPD maximum). Numerical limitations for specific toxics are completely lacking.

This facility is an inadequately regulated toxic discharger. The monitoring data presented in Appendix B indicates that industries in the 281 SIC category typically generate wastewaters contaminated with many organic chemicals. Yet this facility's effluent has never been monitored for toxics. Its full pollution potential should be assessed. In particular, it should be determined whether hazardous wastes buried on-site are infiltrating the plant's discharges. Toxics identified in its wastestream should be abated immediately.

53. Union Carbide Carbon Products Division/Acheson Plant
Buffalo Avenue Niagara Falls, N.Y.
SPDES permit number: NY 0105325
SIC Code: 3471
ICS response: positive - Refer to Appendix C
ITF response: positive

This facility produces 2.5 million carbon electrodes/month from 2.67 million pounds of coke/year. The plant also manufactures specialty machined graphite, carbon liners, cathode blocks and electrodes for furnaces using processes such as milling, mixing, forming, baking, pitch impregnation, graphatizing and machining of carbon products.

The plant discharges approximately 1.1 MGD of non-contact cooling water into the Niagara River. Its process wastewaters are diverted to the City of Niagara Falls wastewater treatment plant. Although the potential exists for toxic contaminants to be present in the facility's effluent, it has never been monitored for organics. Similarly, the company's SPDES permit only contains traditional pollution parameters, including temperature and pH. Numerical standards for organic chemicals are totally lacking.

The facility's full pollution potential should be assessed. Toxics detected in its discharges to the Niagara River and to the municipal collection system should be abated immediately.

54. Carborundum Company
Buffalo Avenue Niagara Falls, N.Y.
SPDES permit number: NY 000 1376
SIC code 3291
ICS response: positive - Refer to Appendix C
ITF response: positive
1,500 employees

This facility consists of five separate divisions. The Electro Minerals Division produces abarasives, grains, powders and metallurgical silicon carbide bricks. The Insulation Division produces alumina-silica fibers, blankets, felts, papers, cloth, tape and rope. The Graphite Division produces silicon carbide, boron nitride powder and solids. The Bonded Abrasives Division produces wheels, sticks, stones, and filter media. The Research and Development Division conducts basic and applied research on carbon, carbides, nitrides, borides, and plastics and phenolic compounds used to bind abrasives. From 1959 to 1968 this division also conducted research on the development of uranium, plutonium and thorium carbides.

In all, this facility consumes 568,750 PPD of coke, aluminum oxide, silica sand, silicon carbide and sawdust and manufactures 521,850 PPD of abrasives. The plant discharges 4.2 MGD of cooling water into the Niagara River. Its process wastewaters are diverted to the City of Niagara Falls wastewater treatment plant. Despite the fact that this industry uses tens of millions of pounds of toxic chemicals whose residues could be present in the plant's wastestream, its SPDES permit does not provide comprehensive toxic safeguards. Only the following limitations are in effect: outfalls: 01,02,03,04: temperature (90 degrees F maximum), pH (6.7 to 8.5) and chlorine residual (0.5 mg/L minimum); outfall 01 and 02: suspended solids (30 mg/L average, 45 mg/L maximum), and settleable solids (0.3 ml/L maximum). Numerical standards for toxic chemicals are completely lacking. The full pollution potential of this facility should be assessed. Toxics identified in its discharges to the Niagara River and the municipal wastewater collection system should be abated immediately.

55. Great Lakes Carbon Corporation
5600 Pine Avenue Niagara Falls, N.Y.
SPDES permit number: NY 0000 906
SIC code: 3624
ICS response: positive - Refer to Appendix C
ITF response: positive
434 employees

This firm manufactures 150,000 PPD of carbon and graphite products from coal, petroleum coke and pitch binder. The facility discharges approximately 730,000 GPD of primarily cooling water into Pike Creek, which is a tributary of the Niagara River. Process wastewaters are diverted to the City of Niagara Falls wastewater treatment plant.

Though this industry is known to use more than 10 million pounds of carbon and petroleum derivative products which may contribute chemical contaminants to its wastestream, its SPDES permit fails to provide comprehensive toxics control. Only the following limitations are in effect: outfalls 01,02 and 03: suspended solids (100 mg/L maximum); outfall 01: suspended solids (12 PPD average, 24 PPD maximum). Numerical standards for specific toxic chemicals are totally lacking.

The full pollution potential of this industry should be determined. Toxics identified in the plant's wastestream should be abated immediately. The company has reported landfilling large amounts of carbon and petroleum compounds on-site. These residues may be contributing contamination to its discharges to Pike Creek and the municipal collection system. That possibility should be investigated thoroughly.

56. Greif Brothers Corporation Fabrication Plant
4901 Hyde Park Boulevard Lewiston, N.Y.
SPDES permit number: NY 000 3069
SIC code: 3491
ICS response: positive
ITF response: negative
87 employees

This firm manufactures 37,500 steel shipping containers/month from 834,000 pounds of rolled steel. The facility's process wastewaters are diverted to the Town of Lewiston sewage treatment plant. More than 43,000 GPD of primarily non-contact cooling water is discharged into Bloody Run, a small tribuary of the Niagara River that also drains the Hooker Chemicals Corporation's massive Hyde Park Landfill. This facility's discharge is known to be contaminated with toxic chemicals. In January, 1980, outfalls 02 and 03 were sampled. Concentrations of trichloroethylene ranged from less than 5 ug/L to 13,800 ug/L. Concentrations of xylene ranged from less than 5 ug/L to 589 ug/L. Both of these compounds were reported by the company to be used at the facility.

Despite the fact that toxic chemicals have been identified in this industry's wastestream, its SPDES permit fails to provide strict toxic safeguards. Only the following limitations are in effect:

outfall 01: (sanitary waste only) pH (6.0 to 9.0), BOD5 (30 mg/L average, 45 mg/L maximum), fecal coliform (200 MPN/100 ml average, 400 MPN/100 ml maximum), and temperature (90 degrees F maximum);

outfalls 02 and 03: suspended solids (20 mg/L maximum), total chromium (1.0 mg/L maximum), total zinc (1.0 mg/L maximum), temperature (90 degrees F maximum) and pH (6.0 to 9.0).

Numerical standards have not been set for specific toxic compounds.

This facility is an inadequately regulated toxic discharger. Its full pollution potential should be assessed. Two toxic pollutants have been identified in its wastestream, but several other organic solvents are also used at the plant. These, too, could find their way into the plant's discharges. That possibility should be investigated thoroughly. Toxics detected in the industry's wastestream should be abated immediately.

57. Stauffer Chemical Company
5717 Old Lewiston Road Niagara Falls, N.Y.
SPDES permit number: NY 000 1651
SIC code: 2812 - Refer to Appendix B
ICS response: negative
ITF response: positive
400 former employees

This facility ceased operation in 1978. Recently, however, the company requested and was granted a renewal of its SPDES permit. Prior to shutting down, this plant manufactured inorganic and organic chemicals including chlorine, caustic, silicon tetrachloride, titanium tetrachloride, carbon bisulfide, sulfur and a variety of other chlorinated metal compounds. The company's present permit allows a discharge of 10,000 GPD of stormwater runoff and requires the monitoring of carbon tetrachloride.

This facility is an inadequately regulated source of toxic contamination. This plant began operation in 1946. Over the years, hazardous wastes and potentially toxic raw materials were sure to be spilled onto the plant property. These residues may be transported by stormwater runoff into the plant discharges. An investigation of the facility's full pollution potential should be made. Toxics in its discharges should be abated.

Discharges on Grand Island

58. Grand Island Biological Company
3175 Staley Road Grand Island, N.Y.
SPDES permit number: NY 0000 400
SIC code: 2831, 2834 - Refer to Appendices A and B
ICS response: positive - Refer to Appendix C
ITF response: negative

This firm is involved in the filtering, formulation and packaging of 200 to 500 GPD of diagnostic medias, serums, and injectable drugs. The facility's wastestream consists of sanitary wastewater from the autoclaves, boiler water and laboratory wastes and is designated as a non-principal discharger of toxic heavy metals and organics. The company also reported that its discharge contained significant levels of hexone in a 1971 discharge permit application. Yet its SPDES permit fails to provide comprehensive toxic controls. Only these limitations are in effect:

outfall 01: temperature (80 degrees F maximum), pH 6.5 to 8.5), oil and grease (10 mg/L average, 15 mg/L maximum) chlorine residual (0.5 mg/L maximum), fecal coliform (100 MPN/100ml maximum), BOD5 and suspended solids (15 mg/L average, 30 mg/l maximum), and phenols (0.05 mg/L maximum);

outfall 02: suspended solids and BOD5 (30 mg/L average, 45mg/L maximum).

Numerical standards for specific toxic chemicals are totally lacking.

This facility is an inadequately regulated toxic discharger. The monitoring data presented in Appendices A and B indicate that industries in the 2834 SIC category typically generate wastewaters contaminated with organic chemicals. Yet this company's wastestream has never been monitored for those compounds. Its full pollution potential should be assessed. Toxics found in the facility's discharge should be abated.

Rigorous enforcement of the firm's SPDES permit is needed. In the past, the facility consistently exceeded allowable discharge levels of oil, grease and phenols.

59. Hooker Chemicals and Plastics Corporation
Long Road Grand Island, N.Y.
SPDES permit number: NY 000 1201
ICS response: positive - Refer to Appendix C
ITF responde: positive

This facility is engaged in research and development activities related to organic chemicals, particularly chlorinated compounds. Its discharge amounts to 70,000 GPD during winter months and 400,000 GPD during summer months when air conditioning units increase water usage. Approximately 50,000 GPD of process wastes are generated. These wastewaters are treated in an on-site facility and discharged into the Niagara River.

Despite the fact that this facility is known to handle large amounts of toxic chemicals and is known to generate hazardous wastes, its SPDES permit fails to provide stringent toxics control. Only the following limitations are in effect: BOD5 and suspended solids (20 PPD average, 40 PPD maximum), temperature (90 degrees maximum), chlorine residual (0.5 mg/L minimum), fecal coliform (200 MPN/100 ml average, 400 MPN/100 ml maximum), settleable solids (0.3 ml/L maximum) and pH (6.0 to 9.0). Numerical standards for individual organic chemicals are completely lacking.

The full pollution potential of this facility should be assessed. The ITF report indicates that a variety of toxic wastes are generated at the plant, including: miscellaneous acids, alkalis, organics, oxidizing agents, and pesticides. Yet the company's discharge has never been comprehensively monitored for organic pollutants. Between 1973 and 1975, alone, Hooker removed approximately 20 tons of waste from this facility. Residues of these materials may contaminate the company's discharge. That possibility should be investigated. Toxics present in the facility's wastestream should be abated immediately.

Discharges to Two Mile Creek

60. St. Regis Paper Company/Buffalo Corrugated Container Plant
1110 Military Road Buffalo, N.Y.
SPDES permit number: NY 000 2038
SIC code: 2653 - Refer to Appendices A and B
ICS response: positive - Refer to Appendix C
ITF response: negative
92 employees

This facility produces 60 tons/day of corrugated paper containers and boxes. Sanitary and process wastewaters are pretreated for color and metals removal and are discharged into the Town of Tonawanda wastewater collection system. Approximately 6,400 GPD of cooling water is discharged to Two Mile Creek.

The monitoring data presented in Appendices A and B indicate that industries in the 26 and 265 SIC category typically generate wastewaters contaminated with toxic pollutants. Yet this facility's wastestream has never been monitored for those compounds. Its SPDES permit only regulates temperature, not chemical contaminants.

The plant's full pollution potential should be assessed. Toxics identified in its discharges to Two Mile Creek and the municipal system should be abated immediately.

61. Union Carbide Corporation/Linde Division
East Park Drive and Woodward Avenue Tonawanda, N.Y.
SPDES permit number: NY 000 0281
SIC code: 3569
ICS response: positive - Refer to Appendix C
ITF response: positive
1,850 employees

This facility manufactures cryogenic hardware for the separation, storage, distribution and use of atmospheric gases. Approximately 1,030 tons/month of structural steel, alloy steel and aluminum are used to produce 60 standard cryogenic tanks/month, 1.2 scarfing machines/month and 1.4 air separation plants/month.

The plant's 330,000 GPD discharge of combined stormwater runoff, process wastes and boiler blowdown is known to contain heavy metals. Despite the fact that this facility is known to use large amounts of toxic chemicals and to generate hazardous wastes, its SPDES permit fails to provide comprehensive toxic controls. Only these limitations are in effect for outfalls 01 and 02 combined: temperature (90 degrees F maximum), oil and grease (15 mg/L maximum), iron and aluminum total (5.5 PPD sum maximum), and suspended solids (66 PPD sum maximum). Numerical standards for organic chemicals are completely lacking.

The full pollution potential of this facility should be determined. According to the ITF report, this plant generates over 40,000 gallons of hazardous waste/year including paint sludges, waste solvents and oils, heavy metal sludges, laboratory wastes, coal tar wastes and spent photographic solutions. Yet the company has not reported where these wastes were disposed of prior to 1966. They may be buried on-site. Liquid radioactive wastes are known to have been disposed of using deepwell injection. Fill materials added to the site to develop storage areas and parking lots are also thought to possibly be radioactive. A U.S. Energy Research and Development Agency (ERDA) radiation survey conducted several years ago detected radiation at the ground surface. This facility originally conducted uranium refining and manufacturing activities as part of the Manhattan Project.

62. Bisonite Company, Incorporated
2250 Military Road Tonawanda, N.Y.
SPDES permit number: NY 000 3123
SIC: 2851 and 2852 - Refer to Appendices A and B
ICS response: positive
ITF response: negative
50 employees

This firm manufactures paints, varnishes and resins. As of 1972, the company produced 2,000 GPD. The plant's process wastes are discharged into evaporation lagoons. The residues are carted away, and solvents are drummed and disposed of. Between 12,000 to 16,000 GPD of non-contact cooling water is discharged to Two Mile Creek.

This facility handles cpproximately 32,000 gallons/year of toluene and xylene. Both of these toxic compounds could find their way into the company's discharges through spills or other releases. The monitoring data presented in Appendices A and B indicate that industries in the 2851 SIC category typically generate wastewaters contaminated with a large variety of organic pollutants. Yet this industry's effluent has never been monitored for any of these compounds. Its SPDES permit fails to provide comprehensive toxic controls. Only these traditional pollution parameters are in effect: temperature (80 degrees F maximum), flow (16,000 GPD average), and pH (6.5 to 8.5). Numerical standards have not been set to limit the discharge of specific toxic chemicals.

The full pollution potential of this facility should be assessed. Toxics released into evaporation lagoons can either volatilize and cause air pollution, or leach and contaminate groundwaters. These possible pollution problems should be investigated. The facility's wastestream should be monitored thoroughly for toxics. Chemical contaminants that are detected should be abated immediately.

Discharges to Tonawanda Creek

63. National Gypsum Company
8600 Roll Road Clarence Center, N.Y.
SPDES permit number: NY 000 1091

On January 8, 1979 this company's SPDES permit was deleted. Prior to that time this facility manufactured gypsum board and plaster. Its effluent consisted primarily of mine dewatering and was discharged to Got Creek. It was only regulated for traditional pollution concerns. The following limitations were in effect: outfalls 01 and 02: pH (6.0 to 9.0), temperature (summer: 60 degrees F average, winter: 50 degrees F average) and suspended solids (204 PPD average). These standards did not adequately protect against the discharge of toxic chemicals known to contaminate the wastewater of industries in the 3275 SIC category.

64. Amax Specialty Metals
Clarence Center and Hake Roads Akron, N.Y.
SIC code: 3356
ICS response: positive - Refer to Appendix C
ITF response: positive

This facility ceased operation in June, 1978. Prior to that time, the plant had been in business since 1953 and had produced zirconium and hafnium alloys and products. Waste chemicals generated at the facility were disposed of in on-site lagoons between 1967 to 1978. In 1978, 5,670 tons of neutralized metal sludge were removed and carted to the SCA facility in Porter. Wastewaters generated at the plant were regulated for traditional pollution concerns and were discharged into Beaver Meadow Creek.

65. Continental Can Company/Fiber Drum Plant #81
2122 Colvin Boulevard Tonawanda, N.Y.
SPDES permit number: NY 000 1970
SIC code: 2655 - Refer to Appendices A and B
ICS response: negative
ITF response: negative
164 employees

This facility's SPDES permit was deleted on November 12, 1977, after its wastestream was diverted to the Town of Tonawanda sewage treatment plant. Prior to that time, the plant discharged 19,000 GPD of non-contact cooling water into Tonawanda Creek. This industry cuts Kraft paper to size and manufactures 8,000 fiber drums /day. The monitoring data presented in Appendices A and B indicate that toxic organic chemicals are typically present in the wastewaters generated by industries in the 265 SIC category. Yet this company's discharges have never been monitored for toxic pollutants. Its pollution impact on the municipal treatment system should be assessed.

66. Exolon Company
1000 East Niagara Street Tonawanda, N.Y.
SPDES permit number: NY 00 69001
SIC codes: 3291, 3443
ICS response: positive - Refer to Appendix C
ITF response: negative
200 employees

This facility manufactures artificial abrasive grains. Raw materials are crushed to specified sizes, roasted in kilns and screened. On an annual basis, the company produces 25,000 tons of aluminum oxide, 15,000 tons of silicon carbide, and 600 tons of zirconium oxide.

This facility discharges 310,000 GPD of non-contact cooling water and washwater into Tonawanda Creek. Even though the company is known to use potentially toxic chemicals, its SPDES permit fails to provide comprehensive toxics control. Only the following standards are in effect: outfalls 01 and 02: flow (0.1

MGD average), pH (6.5 to 8.5), temperature (summer: 90 degrees F maximum), suspended solids (50.0 PPD average, 75.0 PPD maximum) and settleable solids (0.1 ml/L maximum). Numerical standards for specific toxic pollutants are totally lacking.

The full pollution potential of this facility should be assessed. Toxics identified in its effluent should be abated immediately.

Discharges to Ellicott Creek

67. Line Stone Company, Incorporated
County Line Road Akron, N.Y.
SPDES permit number: NY 000 2941
SIC code: 1442
ICS response: negative
ITF response: negative

This quarry crushes 2000 tons/day of stone for highway use and discharges four MGD of groundwater from dewatering of the mine. This effluent is regulated only for traditional pollution concerns, not for toxics. The following limitations are in effect: temperature (winter: 3.0 degrees C average, 21 degrees C maximum, summer 7 degrees C average, 21 degrees C maximum), pH (6.5 to 8.5) and suspended solids (100 PPD average and 200 PPD maximum). The pollution potential of this facility should be assessed. Toxics detected in its discharge should be abated immediately.

68. Lancaster Stone Products Corporation
91 Barton Road Clarence N.Y.
SPDES permit number: NY 00 33065
SIC code: 3281
ICS response: negative
ITF response: negative

This limestone quarry discharges three MGD of groundwater from dewatering of the mine. This effluent is regulated only for traditional pollution concerns, not for toxics. Limitations have been set for suspended solids and flow. The full pollution potential of this facility should be assessed. Toxics in its effluent should be abated immediately.

69. Buffalo Crushed Stone, Incorporated
8615 Wehrle Drive Clarence, N.Y.
SPDES permit number: NY 000 1741
SIC code: 1429
ICS response: negative
ITF response: negative

This limestone quarry discharges two MGD of mining wastewater. Its SPDES permit only regulates the facility's effluent for traditional pollution concerns, not for toxics. The following limitations are in effect: pH (6.5 to 8.5), oil and grease (15 mg/L maximum) and suspended solids (25 mg/L average, 45 mg/L maximum) and settleable solids (0.1 ml/L maximum). The full pollution potential of this operation should be assessed. Toxics detected in its wastestream should be abated.

70. Tri-Metal Industries
199 Aero Drive Cheektowaga, N.Y.
SPDES permit number: NY 00 89486
ICS response: negative
ITF response: negative
54 employees

On September 12, 1980 this firm's SPDES permit was deleted because it had moved to North Tonawanda. Prior to that time the plant was involved in the etching and aluminum coating of metal products. Although the facility wastestream was designated as a non-principal discharge of toxic heavy metals and organics, its SPDES permit only regulated the release of traditional pollution concerns and metals.

71. Columbus McKinnon Corporation
1 Fremont Street Tonawanda, N.Y.
SPDES permit number: NY 00 68217
SIC code: 3536, 3496
ICS response: positive -Refer to Appendix C
ITF response: positive
900 employees

This firm manufactures 10,000,000 pounds/year of chains and 1,000,000 pounds/year of machine forgings. The facilit discharges approximately 73,000 GPD of combined process a cooling waters into Ellicott Creek. Even though this company ha reported using more than 100,000 pounds of potentially toxic raw materials and is known to generate hazardous wastes, its SPDES permit fails to provide comprehensive toxic controls. Only these limitations are in effect: outfall 01: flow (0.067 MGD average), pH (6.0 to 9.5), oil and grease (18.4 PPD average, 27.6 PPD maximum); outfall 02: flow (0.22 MGD average), pH (6.0 to 9.5) and oil and grease (5.7 PPD average and 8.5 PPD maximum). Numerical limitations for specific toxic chemicals have not been set.

The full pollution potential of this facility should be determined. According to the ITF, at least 27,000 gallons of water soluble cutting oils are buried on the plant's property. These residues may be infiltrating the company's wastestream. That possibility should be investigated. Toxics identified in the plant's discharges to Ellicott Creek or the Town of Tonawanda sewage treatment plant should be abated immediately.

Discharges to Bergholtz and Cayuga Creeks

72. Carborundum Company/Graphite Products Division
2050 Cory Drive Sanborn, N.Y.
SPDES permit number: NY 000 1988
SIC code: 2824 - Refer to Appendix B
ICS response: negative
ITF response: positive
100 employees

This facility produces specialty graphite, carbon, graphite tubes, rods, yarn and cloth, lighting carbons and metal graphite brushes. The company also operates a research and development division here which produces boron nitride fiber.

Despite the fact that this plant generates hazardous waste, its SPDES permit only regulates the 100,000 GPD discharge of combined cooling and process wastewaters for traditional pollution concerns. Only these limitations are in effect: flow (0.1 MGD average, 0.125 MGD maximum), pH (6.0 to 9.0), oil and grease (1.0 mg/L average, 15 mg/L maximum), NH3 (4.5 PPD maximum), TKN (5.5PPD maximum) and temperature (summer: 75 degrees F maximum and winter: 55 degrees maximum). According to the ITF, this facility generates 9,000 gallons/year of a mixture of 90 percent waste oil and 10 percent trichloroethylene. In 1977, this plant had 2,700 gallons of waste hydrochloric acid and formaldehyde picked up by CECOS.

The monitoring data presented in Appendix B indicates that industries in the 282 SIC category typically generate wastewaters contaminated with toxic chemicals. Yet this firm's discharges have never been monitored for those compounds. Its full pollution potential should be assessed. Toxics detected in its effluent should be abated immediately.

73. Carborundum Company/Coated Abrasives Division
Walmore Road Niagara Falls, N.Y.
SPDES permit number: NY 000 1716
ICS response: negative
ITF response: positive

This facility consists of two divisions: the Coated Abrasives and the High Performance Plastics Division. The Coated Abrasives Division produces coated abrasive rolls, disks, sheets, and belts by bonding mineral coatings to paper, cloth or fiber backings using animal glue adhesive and phenolic and urea resins. The High Performance Plastics Division produces 190,000 PPD of phenol-formaldehyde and urea formaldehyde resin adhesives, varnishes and cloth finishing mixes. Since 1973, this division has also manufactured high temperature polymers and copolymers.

Process wastes totalling 268,000 GPD are diverted to the City of Niagara Falls wastewater treatment plant. Cooling waters are discharged into a holding lagoon and then into Cayuga Creek.

Despite the fact that this facility is designated as a non-principal discharger of toxic organic chemicals and is known to generate hazardous wastes, its SPDES permit fails to provide comprehensive toxic controls. Only these limitations are in effect: all outfalls: suspended solids (13.5 sum PPD maximum) TKN (2.8 sum PPD maximum), BOD5 (6.8 sum PPD maximum) and phenols (1.4 PPD sum PPD average, 2.8 sum PPD maximum). Numerical standards for specific chemical pollutants have not been set.

This facility's full pollution potential should be assessed. According to the ITF, the plant generates 2,500 tons/year of wood, paper, rags, abrasive grain, solidified resins and 50,000 gallons/year of trichloroethylene bottoms, Therminol 66, sulphuric acid and acetic acid. Residues of these materials could be present in the company's discharge. Approximately 400 tons of wastes, including solidified and partially solidified resins, are known to have been disposed of on-site between 1968 and 1976. These materials could also be infiltrating the company's effluent. The composition of the facility's discharges to Cayuga Creek and the municipal collection system should be determined. Toxics discovered in the wastestream should be abated immediately.

Prior to diverting its process wastewaters to the City of Niagara Falls wastewater treatment plant, this facility exceeded allowable discharge levels for phenol and BOD on a number of occasions.

74. Radatron
    2424 Niagara Falls Boulevard North Tonawanda, N.Y.
    SPDES permit number: NY 00 31607
    ICS response: negative
    ITF response: negative
    60 employees

This firm produces 1,000 to 5,000 pieces/day of consumer electronic assemblies. The facility discharges 2,000 GPD of sanitary wastes, which are regulated for flow, BOD, fecal coliform , pH and chlorine residual. The plant's full pollution potential should be assessed. Its current SPDES permit only limits traditional pollution problems, not toxics.

75. Bell Aerospace
    Niagara Falls Boulevard Wheatfield, N.Y.
    SPDES permit number: 0000 469
    SIC codes: 1925, 3721, 3722
    ICS response: positive - Refer to Appendix C
    ITF response: positive
    1,500 employees

This facility designs, manufactures and tests missile and space vehicle components, aircraft parts, electronic navigational aids, high energy lasers, and military and space-borne communication, navigation and guidance systems.

This plant's 200,000 GPD of wastewater are designated a non-principal discharge of toxic heavy metals. However, the company is also known to use over 100,000 pounds/year of potentially toxic chemicals, notably degreasing agents. According to the ITF, a wide variety of hazardous wastes are known to have been generated at the plant, including: plating tank sludges, scrap adhesives, waste oils, degreasing solvents (including brush wash, methylethyl ketone, methylene chloride, isopropyl alchohol and freon), paint spray filters, lab chemicals, rocket fuels (including unsymmetrical dimethyl hydrazine and nitrosodimethylamine), thorium oxide, radium, transformer oils and sulfuric and nitric acids. Some of these wastes are known to be disposed of on-site. Residues of these materials could be present in the plant's wastestream.

Despite the potential for chemical contaminants in this facility's charge, its SPDES permit fails to provide comprehensive toxics control. Only these limitations are in effect:

outfall 01: temperature (winter: 50 degrees F average, 60 degrees maximum, summer: 70 degrees F averate, 80 degrees maximum), total chromium (1.0 mg/L maximum), hexavalent chromium (0.05 mg/L maximum), total zinc (0.3 mg/L maximum) pH (6.0 to 9.0) and suspended solids (81.0 PPD maximum);

outfall 02: temperature (winter: 50 degrees F average, 60 degrees F maximum, summer;70 degrees F average, 78 degrees F maximum); total chromium, hexavalent chromium, pH and total zinc are the same as for .01.

Numerical standards for specific toxic chemicals are totally lacking.

This facility's full pollution potential should be assessed. Toxics identified in its discharges to Cayuga Creek and the Niagara County Sewer District Number One system should be abated immediately.

76. Newco Waste Systems, Incorporated/Packard Road Site
Packard Road Niagara Falls, N.Y.
SPDES permit number: NY 00 94251
ITF response: positive

This facility is owned by CECOS International and operates a sanitary landfill on the CECOS site described in the hazardous waste section of this report.

Recently this facility's peripheral drainage system's discharge was found to be exceeding its allowable BOD5 levels authorized by the company's SPDES permit. Surface water quality standards for ammonia were also being exceeded. The facility's sanitary landfill was thought to be the primary source of contamination. As a result, DEC ordered that a leachate control system be installed around that disposal site. In the meantime, the peripheral drainage system's discharge to a drainage ditch has been diverted to the municipal collection system. After the leachate control system is installed, this discharge will be reactivated.

This facility is an inadequately regulated discharger whose full pollution potential should be determined. The information presented in Appendix C indicates that the CECOS facility receives hundreds of tons of hazardous waste each year. These materials could be infiltrating the NEWCO Waste System's discharges. Sampling data present in Chapter VI of this study provides evidence of mutagenic activity in the peripheral drainage system. The facility's wastewater should be extensively monitored for the broad spectrum of toxic chemicals that could be present. Strict numerical standards should be set to limit the compounds that are identified in the facility's discharges.

77. SCA Waste Systems
1550 Balmer Road Model City, N.Y.
SPDES permit number NY 00 72061
ICS response: positive - Refer to Appendix C
ITF response: positive
70 employees

This facility's site and waste disposal activities are described in chapter V.

The facility has four treatment systems that generate between 100,000 and 150,000 gallons/month of wastewater:

1. Wastewater Treatment System- Liquid wastes are mixed with lime. Contaminated water is directed to aeration tanks and facultative ponds and passed through a carbon adsorption system. Sludges are landfilled on site.

2. Blended fuels program- Waste oils, solvents and liquids are blended to the fuel specifications for prospective customers. Filtered solids are landfilled.

3. Distillation process- Bottom residues and waste solvents are flash distilled. Solids and residues are landfilled, water is decanted and sent to the Wastewater Treatment system.

4. Landfills-SCA maintains seven landfills, each having clay and plastic liners and leachate collection.

In the past these treatment systems have generated more wastewater than could be discharged into two seasonally flowing streams that flowed into Lake Ontario. Although the company was authorized to discharge treated wastewater into the Niagara River, it had no way to transport the wastes from the site to the river. As a result, millions of gallons of wastewater accumulated on-site.

Recently, construction of a pipeline to the river was completed and the company has begun to empty its lagoons of accumulated wastewaters. Facultative pond #3 has been drained dry. Wastewaters that were stored in the lagoon were discharged into Six Mile Swale or discharged to the Niagara River. These wastewaters are regulated by approximately 60 pollution parameters that limit metals, inorganic compounds, gross pollution levels and a small number of toxic organic chemicals. Eventually discharges to the intermittent streams will cease and all wastewater releases will flow to the Niagara River.

A large number of special conditions must be met before wastewaters are allowed to be discharged. Each lagoon must prequalify for drainage. Batch monitoring must be undertaken for general pollution parameters included in the company's SPDES permit. Bio monitoring for acute toxicity is also required. Gas chromatograph scans utilizing electron capture and flame ionization are also required. If previously undiscoverred individual peaks are discovered, then GC/MS analyses must be conducted to identify the compounds. A literature review must then be undertaken to determine the bioaccumulation and degradative qualities of the identified pollutants. If the discharge is authorized, continuous monitoring of flow and settleable solids is mandated. Only one MGD of wastewater may be released, and no wastewaters may be released between December 1st and April 1st, or until the spring ice break-up on the Niagara River, whichever is first. One hundred million gallons may be discharged the first year, and not more than 75 million gallons during each of the next three years. The facility's discharge must average less than 50 million gallons over that period.

While this facility is one of the most strictly controlled wastewater dischargers in the Niagara Frontier, its SPDES permit nevertheless fails to provide adequate limitations on the release of toxic chemicals. The data presented in Appendix C indicates that this waste disposal operation receives and disposes of more than 220 substances of toxic concern from all over the world. Yet, its wastestream has never been comprehensively monitored for those compounds and numerical discharge limitations have been set for only a very few chemicals. The vast majority of the chemical wastes which might be present in the facility's discharges are regulated by gross pollution parameters, such as Total Organic Carbon, Chemical Oxygen Demand and halogenated hydrocarbons, which cannot provide direct control of toxic discharges.

The full pollution potential of this facility's discharge should be determined before the company's authorized to discharge any more of its wastewaters into the Niagara River. In the past this facility has experienced a wide variety of operational problems that have resulted in spills and unauthorized discharges of toxic pollution. Moreover, the potential for human error and engineering problems related to the operation of the recently constructed pipeline to the Niagara River could result in massive releases of contamination. Before this facility is allowed to discharge more wastewater into the river, adequate measures must be instituted to prevent the release of toxics.

This profile concludes this chapter of the report. Refer to Chapter IX for a discussion of this section's conclusions and recommendations.

CHAPTER IV

An Evaluation of Industries in Erie and Niagara Counties Discharging into Municipal Wastewater Treatment Systems

The previous chapter examined the strengths and weaknesses of the permit program that regulates 77 industrial discharges to the Niagara River and its tributaries. More than 700 additional industries are able to escape this regulation altogether because a loophole in the law allows industries to contribute their wastewaters to municipal treatment systems without a national or state Pollutant Discharge Elimination System (N/SPDES) permit. Thus, "on-line" contributors skirt the effluent limitations and abatement schedules established by the N/SPDES permit program, and are able to discharge toxic pollution virtually without restriction.

Although the Clean Water Act (CWA) mandated the development of a comprehensive solution to the problem, that goal has not been reached so far. Under Section 307 of the Act, industries are required to "pretreat" their wastes to "prevent the discharge of any pollutant through treatment works which are publicly owned... [that] interferes with, passes through, or is otherwise incompatible with such works." This requires that all industries on-line to treatment systems be identified, the composition of their effluents determined, and pretreatment requirements set to provide comprehensive control of toxic pollutants found in their discharges. The Environmental Protection Agency (EPA) was originally charged with establishing pretreatment standards in 1972. In 1976, as a result of a consent decree ending three years of litigation regarding EPA's failure to implement Section 307 of the Act, EPA agreed to adopt strict pretreatment regulations for 129 "priority pollutants" discharged by 21 categories of industries. To date, not a single one of these standards has been implemented. In the absence of comprehensive numerical standards, on-line industrial wastewaters are almost completely unregulated. At best, limitations comparable to the traditional pollution parameters established by the N/SPDES permit program are imposed. These minimal safeguards are wholly inadequate.

In general, toxic organic chemical wastes that enter municipal sewage plants are neither broken down nor rendered harmless by the treatment process. Nearly all conventional sewage systems in America are designed solely to purify domestic and human wastes through bacterial degradation, which is ineffective against the wide range of synthetic pollutants found in industrial effluents. In fact, heavy metals and organic chemicals sometimes interfere with the treatment system by killing the bacteria that break down sewage. More often, however, these toxic pollutants pass through the facility and are ultimately discharged along with the treated effluent into the receiving body of water.

A study by the EPA has determined that sewage treatment works vary widely in removal efficiencies for different pollutants. Due to daily plant operations changes, treatment works have been found to fluctuate in their ability to remove chemical oxygen demand (COD), total organic carbon (TOC), and phenols, parameters that often indicate the presence of toxic chemicals. Trickling filter plants were found to remove an average of 64 percent of the COD and 50 percent of the phenols in the influent wastewaters, but in some plants COD removal was measured as low as 8 percent and phenol removal as low as zero. Activated sludge plants were found to remove an average of 73 percent of the COD and 69 percent of the phenol received, but removal rates went as low as 42 percent and zero, respectively, in some plants. Primary treatment facilities were found to remove less than 25 percent COD and 38 percent of incoming phenols.[1] These data clearly show that conventional sewage works are not capable of consistently removing the variety of toxic pollutants present in many industrial wastestreams.

Table 7 identifies the organic chemicals that have been identified in sewage treatment plant discharges.[2]

TABLE 7
ORGANIC COMPOUNDS IDENTIFIED IN SEWAGE TREATMENT PLANT EFFLUENTS

acetone
p-eminostibene
benzene hexachloride
3,4 benzofluoranthene
11,12 benzofluoranthene
benzoic acid
3,4 benzopyrene
p-tert-butylacetaphenone
butyl hexayecanoic acid
bytyloleate
bytylstearate
caprostanol
p-chlorobenzoic acid
3-chloro-4 hydroxy-benzoic acid
chloroform
4-chloro-3 methylphenol
2-chlorophenol
4-chlororesorcinol
5-chloroyracil
5-chlorouridine
8-chloroxanthine
cholesterol
coprostannol
coumarine
creatine
o-cresol
DDE
DDT
dibutyl formal
dibutylphthalate
1,4 dichlorobenzene
dieldrin
ethylbenzene
2-ethyl-1-hexanol
ethyl nyristate
ethyl stearate
fluoranthene
fructose
glucose
glutamic acid
glutamine
guanosine
hexachlorobenzene
hexachloroethane
indene
indeno(1,2-c,d)pyrene
inosine
methylene chloride
1-methylxanthe
myristic acid
r-octyl-Z-ethylbexy
palmitic acid
pentachlorophenyl
phenylalanine
phenylaniline
phthalic anhydride
serine
stearic acid
TDS
tetrachlorobiphenyl
tetrachloroethylene
theronine
toluene
trichlorobenzene
trichlorobiphenyl
1,1,2-trichloroethane
1,1,2-trichloroethylene
uracil
urea
valine
xanthine

In the Niagara basin, the inability of conventional sewage treatment systems to cope with toxics has been exacerbated by two additional factors. First, scores of industries are now discharging N/SPDES regulated non-contact cooling waters directly into the Niagara River. Highly contaminated and non-compatible process wastewaters, however, are diverted to municipal collection systems. Second, many local treatment facilities are far behind schedule in providing "secondary treatment" that was required by law in 1977. Consequently, these plants are only capable of providing "primary treatment," which offers minimal removal of toxic organic chemical pollutants.

Municipal sewage treatment plant discharges are regulated by the N/SPDES permit program. Like the direct discharge permits granted to industries, however, these permits do not require comprehensive control of toxic chemical pollutants. All the N/SPDES permits granted to municipal wastewater facilities in Erie and Niagara Counties follow the same general format. Effluent restrictions reflect concern for human and domestic wastes, not for industrial chemicals. Numerical standards routinely limit the discharge levels of: Biochemical Oxygen Demand (BOD), fecal coliforms (bacteria that reside in the human digestive tract), suspended solids, flow, pH, settleable solids, phosphorus and chlorine residual. These standards are grossly inadequate and fail to provide strict safeguards against the release of toxic polluants. Moreover, the application of these effluent standards does not vary to compensate for increased levels of industrial process wastewaters on-line to individual treatment systems.

Findings

In order to assess the environmental impact of wastewater treatment plant effluents discharged into the Niagara River, a total of ten facilities with on-line industrial contributors were selected for study according to the protocol described in the methodology section of this report. The toxic pollution potential of each treatment system was investigated and described in individual plant profiles. Refer to Appendices A and B for compilations of the synthetic organic chemicals and the 129 "priority pollutants" that have been identified in the effluents of selected standard industrial classification (SIC) categories that are on-line to the treatment facilities, respectively. Table 8 is a summary of Appendix B showing the number of "priority pollutants" that have been identified in the wastestreams of 32 industrial categories monitored by the EPA. This information clearly shows that many of the industrial wastewaters discharged into municipal treatment systems in the Niagara Frontier are typically contaminated with a spectrum of toxic pollutants. Refer to Appendix D for a description of the toxicity of some of the most prevalent pollutants.

Figure 11 illustrates the locations of the 10 wastewater treatment systems reviewed in this section.

TABLE 8
PRIORITY POLLUTANTS IDENTIFIED IN 32 STANDARD INDUSTRIAL CLASSIFICATION CATEGORIES

Industrial Category	Organics: Number of Samples Taken	Organics: Number of Priority Pollutant Compounds Present*	Metals: Number of Samples Taken	Metals: Number of Priority Pollutant Compounds Present*
Soaps and Detergents	20	11	20	10
Adhesives & Sealants	11	24	11	10
Leather Tanning	72	37	72	10
Textile Products	121	46	121	14
Gum & Wood Products	18	9	18	14
Pulp and Paper	44	24	44	14
Timber	261	44	261	13
Printing & Publishing	66	40	66	14
Paint and Ink	63	35	149	13
Pesticides	104	71	104	14
Pharmaceuticals	77	38	77	12
Organics & Plastics	557	106	557	14
Rubber	63	44	54	9
Coal Mining	94	19	94	12
Ore Mining	64	12	64	14
Paving and Roofing	8	0	8	7
Steam Electric Power Plants	82	29	82	9
Petroleum Refining	54	55	346	12
Iron and Steel	414	57	414	14
Foundries	54	46	54	14
Electroplating	18	17	18	9
Nonferrous Metals	146	41	146	14
Batteries	3	8	0	-
Coil Coating	12	17	12	6
Photographic	8	23	0	-
*Inorganic Chemicals	107	38	107	13
Electrical	2	17	2	14
Auto & Other Laundries	45	54	45	11
Phosphates	33	28	0	-
Plastics Processing	1	8	0	-
Explosives	16	2	16	8
Porcelain & Enameling	12	7	12	7

*This number represents the number of compounds (i.e chloroform, benzene, mercury) found, not the number of times each one was present.

Source: USEPA

Table 9 summarizes information on the size of each facility's effluent discharge, the amount of industrial wastewater contributed to the system, the number of industries and positive Industrial Chemical Survey (ICS) responders on-line to the system and the mode of treatment employed at each plant.

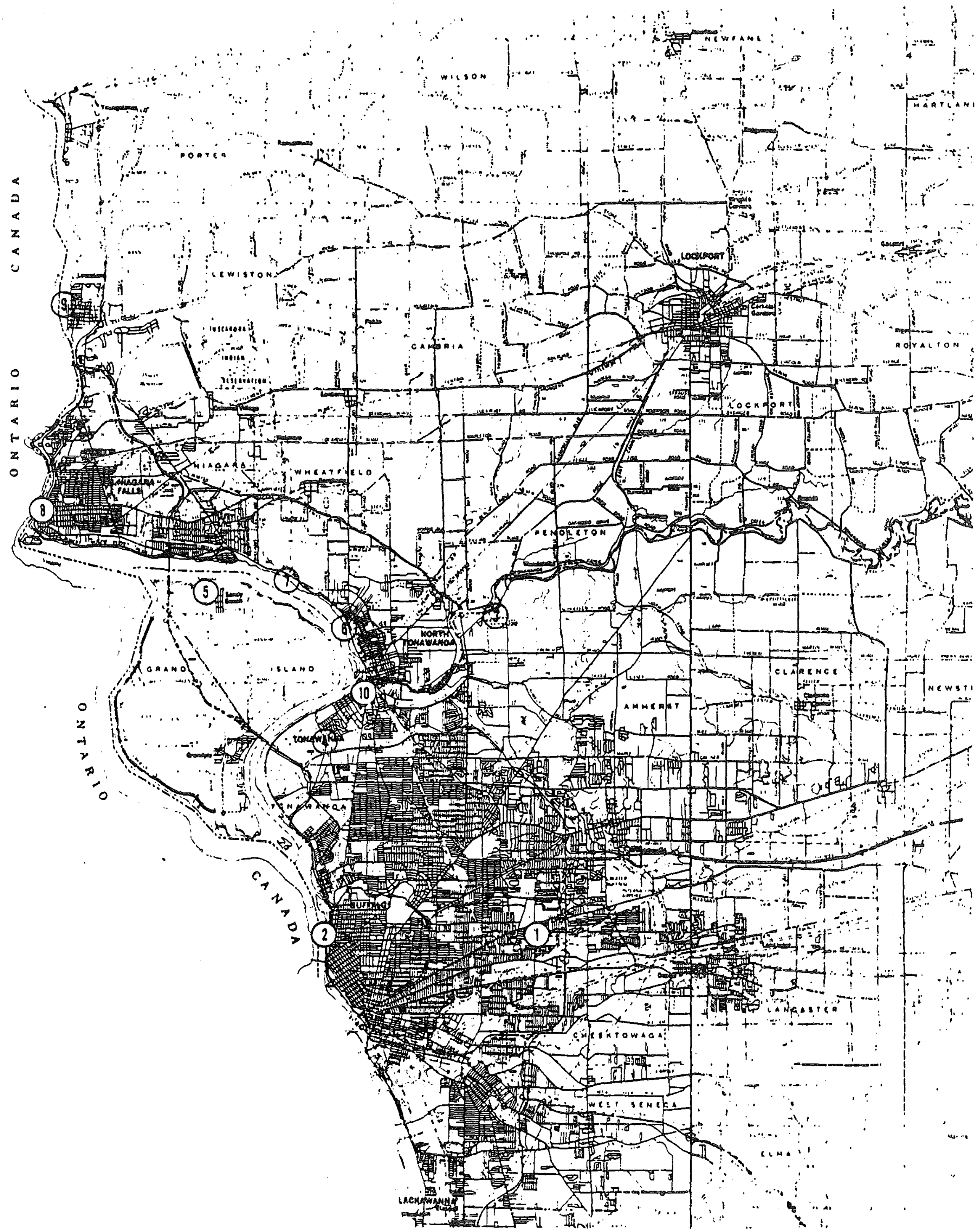


FIGURE 11
LOCATION OF MUNICIPAL WASTEWATER TREATMENT

TABLE 9
MUNICIPAL SEWAGE TREATMENT PLANTS WITH ON-LINE CONTRIBUTING INDUSTRIES

SEWAGE TREATMENT PLANT	DESIGN FLOW (MGD)	# OF ON-LINE INDUSTRIES	ACTUAL FLOW (MGD)	# OF ON-LINE INDUSTRIES WITH POSITIVE ICS	INDUSTRIAL FLOW (MGD)	INDUSTRIAL FLOW OF (+) ICS RESPONDENTS	EFFLUENT ANALYZER FOR TOXIC ORGANICS	CURRENT TREATMENT PROVIDED
1- CHEEKTOWAGA #5	7.5	25	9-10	9	1.35 [1]	1.35	No	1°, TF
2- BUFFALO SEWER AUTHORITY	180	420	150-190	38 [2]	21	7.90 [3]	No [11]	2°, AS [4], CL
3- AMHERST #16	24	1	17-20	1	Unavailable	Unavailable	No	2°, AS
4- TOWN OF TONAWANDA	30	22	15-16	17	Unavailable	Unavailable	No	1°, AS
5- CITY OF TONAWANDA	3.5	0 [5]	0 [5]	0 [5]	Unavailable	Unavailable	No	1°, CL
6- CITY OF NORTH TONAWANDA	14	11	8-9	5	1.6 [7]	.32 [8]	No	2°, CL
7- NIAGARA COUNTY SEWER DISTRICT #1	14.1	1	2	1	0.6	Unavailable	No	1°, AS, CL, PR
8- CITY OF NIAGARA FALLS	48	28 [9]	60-70	17	25-28	21.48	Yes	1°, CL
9- TOWN OF LEWISTON	2.75	1	1	1	0 [10]	0	No	1°, AS, PR
10- TOWN OF GRAND ISLAND #2	3.5	4	1.5	1	0 [10]	0	No	2°, AS, CL
Totals- # Plants= 10	327.25	513	265.25-311.25	90	-	-	-	-

Codes:
1° = primary treatment
AS = activated sludge
CL = chlorination
TF = trickling filter
PR = phosphate removal

Notes:
1 Flows were available only for the 9 major contributing industries into the system.
2 Figure does not include industries discharging to Scajaquada Creek, which is treated at the Bird Island facility.
3 Figure represents water use. Actual discharge would be less in most instances.
4 Bird Island currently providing 50-60 MGD of secondary treatment.
5 All discharges now to Town of Tonowanda Sewage Treatment Plant.
6 Current primary operation designed for 6 MGD. 14 MGD is capacity of new physical chemical addition to be completed Spring 1980.
7 Figure based on water use and includes commercial firms for a total of 71 industries.
8 Figure includes Hooker Durez sanitary wastes, but omits one plastic firm
9 Figure includes only major contributing industries on line
10 Wastes are sanitary wastes only
11 Influent has been monitored, but results are unavailable.

Profiles of each facility are presented below.

Cheektowaga Sewer District Number Five
SPDES permit number: NY 0032279
171 Central Boulevard Cheektowaga, N.Y.

This secondary treatment plant employs clarification, trickling filters and chlorination. Between nine and ten million gallons of combined sanitary and industrial wastewater enter the facility each day, even though the design capacity of the system is 7.5 million gallons per day. As a result, between 16 and 20 percent of the influent receives only primary treatment.

Twenty-five industries have been reported to be on-line to this treatment system. Table 10 lists the firms, the nature of their business, the amount of effluent they discharge to the collection system, and whether they have responded positively to the ICS and reported that they use, handle, manufacture or dispose of a variety of potentially toxic organic chemicals, including potentially carcinogenic solvents and polychlorinated biphenyls found in electrical devices.

TABLE 10
ON-LINE INDUSTRIES TO THE CHEEKTOWAGA #5 SEWAGE TREATMENT PLANT

INDUSTRY	PRODUCT LINE	FLOW (GPD)	ICS RESPONSE	NOTES
1- ABBOTT LABS 2400 Walden Ave Cheektowaga	Disposable hospital products	-	Positive 8000 gal/yr of Genesolve	MCI
2- AIRPORT INDUSTRIAL PARK 455 Cayuga Rd.	Industrial park	-	Not Included	-
3- AMERICAN OPTICAL CORP. Eggert & Sugar Rds	Precision optical equipment	383,000	Positive	see profile #24 MCI
4- AMERICAN PRECISION INDUSTRIES 2777 Walden Ave.	Heat exchanges and dust collectors	-	Not Included	-
5- ARCATA GRAPHICS TC Industrial Pk.	Printing & binding of books & magazines	520,000	Positive	MCI see profile #22
6- BIRDAIR STRUCTURES 2015 Walden Ave.	Air-supported structures	-	Positive xylene 9300 gal/yr toluene 9300 gal/yr adhesives 1400 gal/yr	MCI
7- BUFFALO AERONAUTICAL CORP Buffalo Airport		-	Not Included	-
8- BUFFALO AIRPORT Cayuga Rd.	Commercial airport	-	Not Included	-

INDUSTRY	PRODUCT LINE	FLOW (GPD)	ICS RESPONSE	NOTES
9- F.N. BURT 2345 Walden Ave.	Paperboard packaging	90,000	Positive toluene 4900 gal/yr trichloro-ethylene 50 gal/yr	MCI
10- CALSPAN CORP 4455 Genesee St.	Research & Development	110,000	Not Included, but list of water treatment chemicals	MCI see profile #22
11- CONAX CORP. 2300 Walden Ave.	Thermocouple manufacture	20,000	Not Included	-
12- DERRICK MANUFACTURE 590 Dulce Rd.	Manufacture of vibrating screen machinery	-	Not Included	-
13- EMIL VON DUNGEN INC. 83 Anderson Rd.	Steel manufacture	-	Not Included	-
14- ERNST STEEL 1746 Walden Ave.	Steel manufacture	-	Not Included	-
15- GIBRALTAR STEEL 2555 Walden Ave.	Steel stripmill	33,000	Not Included	-
16- HERALD VAULT COMPANY 1712 Dale Rd.	Vault manufacture	-	Not Included	-
17- KISTNER CONCRETE PRODUCTS 1800 Dale Rd.	Concrete & concrete products	-	Not Included	-
18- NATIONAL GYPSUM 2580 Walden Ave.	Warehouse	6,080	Not Included	-
19- NIAGARA TRANSFORMER	Power regulating, distribution & specialty transformers & parts		Positive: unknown quantities of PCB's, 5 additional compounds, totalling 6000 gal/yr of use	-
20- PLATECRAFT OF AMERICA 600 Duke Rd.	Copper, nickel, & chromium plating of plastic	60,000	Not Included	-
21- R.F. MOLD COMPANY 1850 Dale Rd.	Thermoplastic molding compounds	4,000	Not Included	-
22- ST. JOSEPH'S HOSPITAL 2605 Harlem Rd.	Hospital	-	Not Included	-
23- SCOTT AVIATION DIVISION OF A.T.O. 1735 Walden Ave.	Oxygen-generating equipment for commercial aircraft	-	Not Included	-
24- SPENCER KELLOGG 4201 Genesee St.	Resinous polymers (polyurethane)	-	Positive	MCI see profile #23
25- WESTINGHOUSE ELECTRICAL CORP. 4454 Genesee St.	Electric motors & motor controls	247,900	(Positive) Not Included but included in Task Force Report	MCI see profile #20

Refer to Appendices A, B and C for information regarding the compounds likely to be present in those industrial effluents. Refer to Appendix D for the toxic effects of these compounds.

Although this wastewater facility has a significant number of potential sources of toxic contamination on-line to its collection system, it does not have a strict pretreatment program. Analyses have not been undertaken to identify the toxic pollutants found in its industrial effluents or in the treatment plant's final discharge to Scajaquada Creek.[3]

The facility's SPDES permit also fails to provide adequate protection against the discharge of toxic chemicals. At present, the following maximum discharge standards are in effect: Biochemical Oxygen Demand (909mg/L), suspended solids (90mg/L) flow (6.0 million gallons per day (MGD)), fecal coliform (400MPN/100 ML), and settleable solids (0.3ML/L). Numerical standards for toxic pollutants are totally lacking.

Eventually this plant will be used as a stormwater retention and treatment facility and its discharge will be diverted to the Buffalo Sewer Authority's (BSA) Bird Island plant. In the meantime, however, this system may be an inadequately regulated source of toxic contamination. That possibility should be investigated immediately. Finally, the treatment plant's consistent inability to comply with its allowable effluent limit of 6.0 MGD should be corrected.

Buffalo Sewer Authority
SPDES permit number: NY 0028410
Bird Island, Buffalo, N.Y.

The Buffalo Sewer Authority (BSA) is the largest municipal wastewater treatment facility in the Niagara Frontier. Until recently, between 150 to 190 MGD of wastewater received primary treatment using screening, settling and chlorination at the BSA's antiquated facility and was discharged to the Black Rock Canal in the Niagara River. A new facility with secondary treatment capability has been constructed, but it has not yet been able to meet secondary treatment standards.

This massive system receives influent from six sources: sanitary and domestic wastewater, industrial wastewater, Scajaquada Creek, stormwater, groundwater infiltration and river inflow. Domestic and sanitary wastewaters are the largest contribution to the system, totalling approximately 100 MGD. The BSA services over 700,000 residents of the Buffalo area and receives wastewaters from the following collection systems: Erie County Sewer Districts One, Two, Three, Four and Five, West Seneca Sewer District 15, Cheektowaga Sewer District Three, Orchard Park, and the villages of Lancaster, Depew, and Alden. Cheektowaga Sewer District Five is also scheduled to connect with this system. Scajaquada Creek is enclosed at the Buffalo city line and its 20 MGD flows directly into the sewer system. Due to the high water table in parts of the system, groundwater infiltrates the collection system as well. Finally, seasonal fluctuations in Lake Erie and Niagara River levels periodically cause water levels to rise above overflow chambers and create a backflow into the system. On the average, approxicately 19 MGD of infiltration and inflow enter the system.

The BSA has established an industrial waste section to manage on-line industrial contributions to its system. In an effort to determine the nature, quantity and types of wastes discharged into the collection system, an Industrial Waste Survey was undertaken. A total of 1,140 on-line industries were identified, approximately 700 of which were judged to be of serious pollution concern. Eighty-five industries were found to contribute 84 percent of the 21 MGD of industrial wastewater discharged to the system each day. Further testing of these 85 influents for the presence of heavy metals, phenols, cyanide, and oil and grease showed that 57 were in violation of the City sewer use ordinance standards presented in Table 11.

TABLE 11
BUFFALO SEWER AUTHORITY DISCHARGE LIMITS

Parameter	Concentration (mg/l)
Chromium (total)	2.0
Chromium (trivalent)	1.0
Chromium (hexavalent)	0.1
Copper	0.4
Zinc	0.6
Nickel	1.0
Cadmium	0.2
Arsenic	0.1
Barium	1.0
Lead	0.1
Manganese	1.0
Silver	.05
Boron	1.0
Mercury	.01
Selenium	.05
Cyanide	0.8
Phenols	0.1
Oil and Grease	50.0

Among 420 on-line industries included in an industrial inventory undertaken by BSA, 72 firms were identified as dischargers of "organic" and toxic" wastes. Thirty eight of these firms, excluding the industries that discharge into Scajaquada Creek, also responded positively to the ICS and contributed a total of 7.09 MGD of wastewater to the system. Thirteen discharges were among those characterized by the BSA as "toxic" and "organic". Table 12 lists the 38 industries, their locations, the volume of their discharge and the characteristics of their effluents. These firms have reported that they use, handle, manufacture or dispose of millions of pounds of a wide variety of potentially toxic organic chemicals.

TABLE 12
INDUSTRIES WITH A POSITIVE INDUSTRIAL CHEMICAL SURVEY RESPONSE ON-LINE TO THE BUFFALO SEWER AUTHORITY SYSTEM

INDUSTRY	ADDRESS	WATER USE IN GPD	WASTEWATER CHARACTERISTICS
1- Gro Green Products	717 Elk St. Buffalo	3,680	Dry (no process)
2- Donner Hanna Coke	S. Park St. Buffalo	347,000	Toxic, Inorganic
3- Pratt & Lambert		99,921	Toxic, Organic
4- Osmose Wood Preserving	980 Ellicott St. Buffalo	9,963	Toxic, Organic
5- Republic Steel	P.O. Box 6 Buffalo	1,202,000	Toxic, Inorganic
6- Allied Chemical Industrial Chemicals	35 Lee St. Buffalo	351,000	Toxic, Organic
7- Allied Chemical Lab Specialties	20 Peabody St. Buffalo	1,500,000	Toxic, Organic
8- Bernel Foam Products	344 Vulcan St. Buffalo	10,732	Toxic, Organic
9- Mobil Oil	635 Elk St. Buffalo	819,613	Non-toxic, Organic

INDUSTRY	ADDRESS	WATER USE IN GPD	WASTEWATER CHARACTERISTICS
10- Bemis Co., Inc.	711 Northland Ave. Buffalo	7,600	Non-toxic, Organic
11- Bison Products	81 Dingen St. Buffalo	40,300	Non-toxic, Organic
12- Alum Casting	3753 Walden Ave Lancaster	731	Non-toxic, Inorganic
13- Westwood Pharmaceuticals	468 Dewitt St. Buffalo	128,046	Non-toxic, Organic
14- Truly Magic Products, Inc.	1740 Bailey Ave. Buffalo	38,672	Non-toxic, Organic
15- Atlas Plastics	2745 Seneca St. Buffalo	7,900	Toxic, Non-toxic Organic, Inorganic
16- Wagner Folding Box Corporation	P.O. Box 1028 Buffalo	2,915	Non-toxic, Inorganic
17- Elmer Bender & Son, Inc.	175 Lewis St. Buffalo	27,764	Non-toxic, Organic
18- General Motors Corp., Harrison Radiator Division	56 Clyde Ave Buffalo	361,400	Inorganic, Toxic, Organic
19- H.B. Fuller & Co.	155 Isabelle St. Buffalo	12,500	Toxic, Non-toxic Organic
20- S.A. Day Manufacturing Co., Inc.	1489 Niagara St. Buffalo	22,200	Toxic, Organic, Inorganic, Non-toxic
21- Buffalo Weaving & Belting Co.	260 Chandler St. Buffalo	147,838	Non-toxic, Organic
22- General Electric (Service Shop)	Buffalo	4,770	Dry
23- Ameron Protective Company	111 Colgate Ave. Buffalo	11,124	Toxic, Inorganic Organic, Non-toxic
24- Colad Company, Inc.	701 Seneca St. Buffalo	Unknown	Toxic, Organic Inorganic, Non-toxic
25- Flexo Transparent, Inc.	P.O. Box 128 Buffalo	16,400	Toxic, Organic
26- Chip Steak Co.	1181 Jefferson St. Buffalo	2,306	Dry
27- Anaconda American Brass Co.	P.O. Box 981 Buffalo	1,885,700	Toxic, Inorganic
28- Niagara Envelope	701 Seneca St. Buffalo	Unknown	Dry
29- Mentholatum Co.	1360 Niagara St. Buffalo	15,334	Non-toxic, Organic
30- Inmont Corp.	T.C. Industrial Park Depew	Unknown	Toxic, Inorganic, Organic, Non-toxic
31- Winfield Industries	33 Clarence Ave. Buffalo	4,553	Dry
32- Worthington Corp.	45 Roberts Ave. Buffalo	487,790	Inorganic, Toxic, Non-toxic
33- Royton Paper Products	1050 Niagara St. Buffalo	8,800	Organic, Non-toxic
34- Cathedral Envelope	980 Northampton St. Buffalo	7,691	Organic, Non-toxic
35- F.K. and Son	140 Detroit St. Buffalo	5,100	Non-toxic, Organic
36- Madison Wire Co., Inc.	P.O. Box 46 Buffalo	181,414	Toxic, Inorganic
37- Pohlman Foundry Co.	205 Baitz Ave. Buffalo	76,321	Non-toxic, Inorganic
38- Canada Dry Bottling Co. of Buffalo	144 Urban St. Buffalo	48,102	Non-toxic Inorganic

Refer to Appendices A, B, and C for information regarding the compounds likely to be present in these industries' effluents. Refer to Appendix D for toxicity information on these compounds.

The BSA has established its own version of the SPDES permit program to regulate industries on-line into its system. Most of the industries, however, have not been granted permits, and pretreatment requirements are limited to heavy metals. Only Buffalo Color Corporation has been required to monitor its effluent for synthetic organic chemicals.[4]

Evidence of the high levels of toxic pollution discharged by on-line industries is found in the treatment facility's sludge. Primary treatment is able to remove organic chemicals and heavy metals to a limited extent. As a result, sludge residues can become contaminated. The Bird Island facility's sludge has been analyzed and found to be unsuitable for composting because of high concentrations of heavy metals, and unable to be incinerated because of the potential for volatilization of mercury and other heavy metals and organics such as PCBs. County health authorities have required the sludge to be disposed of in secure landfill burial sites normally used to dispose of hazardous chemical waste.

The BSA system is a known source of toxic pollutants. Methylene chloride, a common organic chemical solvent used in large amounts by many industries on-line to the BSA system, has been identified in the treatment facility's discharge. Monitoring data also indicates that high levels of oil, grease, phenols and some organic chemicals are also discharged into the collection system. Primary treatment cannot be expected to provide effective removal of these pollutants.

Many industries on-line to the BSA system are known violators of the SPDES permit program. A review of the permits issued to industries that discharge process wastewaters to the municipal system and non-contact cooling water directly into the Niagara River showed that many industries have been cited for a variety of violations, including: discharging of permits through unlicensed outfalls, failure to monitor effluents properly, and failure to attain effluent limitations.

Despite the clear potential for high levels of toxic pollution in the BSA Bird Island facility discharge, its SPDES permit fails to provide strict control of toxic chemicals. At present the following contaminant levels are allowed: flow (180 MGD maximum), five day Biochemical Oxygen Demand (BOD5) (45,000 pounds/day minimum, 30 day average, and 67,500 pounds/day maximum, seven day average), suspended solids (45,000 pounds/day, minimum, 30 day average, and 67,500 pounds/day, maximum, seven day average), phosphorus (1.0 mg/L maximum), fecal coliform

(400MPN/100ML), settleable solids (0.3mL/L maximum), pH (6.0 to 9.0) and resudial chlorine (not less than 0.5 mg/L). Numerical standards for specific toxics are totally lacking.

Due to the large number of industries on-line to this facility and its inability to provide secondary treatment, this facility is an inadequately regulated source of toxic pollution, and perhaps is a major undetected source of chemical pollution. That potential should be investigated immediately, and a strict and comprehensive pretreatment program should be instituted as soon as possible.

Amherst Sewer District Number 16
SPDES permit number: NY 0025950
455 Tonawanda Creek Road Amherst, N.Y.

This secondary treatment facility utilizes activated sludge and tertiary treatment for phosphorus to process between 17 and 20 MGD of combined sanitary and industrial wastewater. This amount includes the effluent that was formerly discharged to the Amherst Sewer District Number One. The facility's discharge enters Tonawanda Creek.

Several commercial firms and at least one industry are on-line to this treatment system.[5] Garry Laboratories, a positive ICS responder, employs 27 people and manufactures waxes, cleaners, lubricants and transmission fluids for cars. From the information contained in Appendix A, it is clear that industries in the 2992 SIC category typically generate wastewaters that are contaminated with toxic chemicals. The information contained in Appendix C indicates that this firm also uses many additional substances of toxic concern. Although this industry is reported to discharge less than one percent of the wastewater facility's total influent, it could be a significant source of toxic contamination.

Despite that potential, the wastewater facility has not established a strict pretreatment system. Neither industrial contributions nor treated effluents are analyzed for organics.

In addition, the plant's SPDES permit fails to provide toxic pollution safeguards. At present, the following maximum discharge standards are in effect: flow (12MGD), settleable solids (0.8 MG/L) and chlorine residual (0.5mg/L). Numerical standards for toxic chemicals are totally lacking.

This facility is an inadequately regulated source of pollution. A full investigation of its toxic pollution potential should be undertaken as soon as possible.

Town of Tonawanda Sewage Treatment Plant
SPDES permit number: NY 0026395
779 Two Mile Creek Road Tonawanda, N.Y.

This secondary treatment facility is equipped with activated sludge technology and processes between 15 and 16 MGD of combined sanitary and industrial wastewater. It discharges directly into the Niagara River. [6]

There are 22 industries on-line to this municipal system, including four firms that previously contributed wastewater to the City of Tonawanda collection system. Table 13 identifies the 22 companies, the nature of their business, the type of wastewater each discharges to the system, whether they are ICS positive responders and whether they are profiled in the previous section of this report.

TABLE 13
ON-LINE INDUSTRIES
TO THE TOWN OF TONAWANDA SEWAGE TREATMENT PLANT

INDUSTRY	PRODUCT LINE	WASTEWATER TYPE	ICS RESPONSE	NOTES
1- ALLIED CHEMICAL Plastics Division	polyethylene, polyethylene pipe compound	sanitary & process	POSITIVE	see profile #39
2- ASHLAND OIL	crude oil refinery	sanitary & process	POSITIVE	see profile #43
3- BUFFALO BARREL CO.	barrel cleaning	process	NOT INCLUDED	-
4- CHEVROLET-General Motors	engines, axles, car manufacture	sanitary	POSITIVE	see profile #29
5- COCA COLA	bottling plant	bottle washings, sanitary & process	POSITIVE	96 lbs/yr of pyrethrins
6- COLUMBUS MC KINNON B	chain manufacture	sanitary	POSITIVE	see profile #71
7- CONTINENTAL CAN	fiber drums	process & sanitary	NOT INCLUDED	see profile #65
8- DUNLOP	tires & tubes	sanitary	POSITIVE	see profile #33
9- DUPONT-Yerkes Plant	Vexar® plastic netting Tedlar® polyvinylfluoride	sanitary & process	POSITIVE	see profile #30
10- CHEMICAL LEHMAN TANK LINES*	trucking firm, includes chemical shipments	truck washings	NOT INCLUDED	-
11- F.M.C.		sanitary	POSITIVE	see profile #34
12- LUCIDOL-Division of Pennwalt, Inc.	cosmetic chemicals, bleach for flour	process (includes organic acids & solids) & sanitary	POSITIVE	use 57,000 lbs/yr of benzoyl chloride 500 lbs/yr of herbicide
13- NATIONAL MANUFACTURING*	paint manufacture	non contact cooling sanitary	POSITIVE	use 60,000 lbs/yr unichlor 50-L-50
14- NIAGARA MOHAWK-Huntley Station	coal fired electrical generating plant	sanitary	POSITIVE	see profile #31
15- NEW YORK WIRE MILLS	wire	sanitary & process	POSITIVE	see profile #41
16- O-CEL-O	cellulose sponge manufacture (16,000 lbs/day)	sanitary & process (140,000 GPD)	NOT INCLUDED	use carbon disulfide, pigments, alkyldimethybenzyl ammonium chloride, polyhydroxy aliphatic compounds, glycerine & polyethylene glycol
17- POLYMER APPLICATIONS B	plastic resin manufacture	process & sanitary	POSITIVE	see profile #32

18- ST. REGIS PAPER	packaging materials	process	POSITIVE	see profile #60
19- SHANCO PLASTICS	resin manufacture (out of business)	process	POSITIVE	compounds unlisted in ICS printout
20- SPAULDING FIBER*	phenolic resins, vulcanized paper	process	POSITIVE	see profile #45
21- TONAWANDA COKE	industrial coke	sanitary & some process wastes	POSITIVE	see profile #40
22- UNION CARBIDE-Linde Division	industrial gas gas process equipment	sanitary	POSITIVE	see profile #61

* Denotes discharge to the City of Tonawanda Sewage Treatment Plant
A New Columbus McKinnon SPDES permit makes no mention of discharge to Town of Tonawanda Sewage Treatment Plant
B Polymer Applications was added to the town system although SPDES permit allows for direct discharge

In all likelihood, a majority of the industries on-line to this system discharge toxic chemicals. Approximately two thirds of the firms have diverted their contaminated process wastewaters to this municipal facility while continuing to discharge unpolluted non-contact cooling water to the Niagara River. This is a common method of escaping the tighter standards and abatement schedules established by the SPDES permit program. Appendices A and B indicate that a wide variety of toxic organic chemicals have been identified in the wastewaters of the SIC categories represented by these on-line firms. Appendix C shows that these manufacturers use, store, manufacture or dispose of a large number of toxic chemicals that could contaminate their effluents.

Despite the potential for toxics in the industrial wastewaters discharged into this municipal system, a stringent pretreatment program has not been instituted. Information in the treatment plant's SPDES permit file indicated that minimal pretreatment measures are required of some firms, but industries are not required to comprehensively monitor or curtail the broad spectrum of organic pollutants that could be present in their wastestreams.

The treatment plant's SPDES permit also fails to guard against the release of toxics. Only the following effluent limitations are in effect: flow (30 MGD-maximum) pH (6.0 to 9.0), phosphorus-total (1.0 mg/L-maximum), fecal coliform (200 MPN/100ml-average 400 MPN/100ml-maximum), suspended solids (7,500 pounds/day-average, 11,250 pounds/day-maximum), and settleable solids (0.1ml/l-maximum). Numerical standards for toxic organic chemicals are totally lacking.

This wastewater facility is an inadequately regulated source of pollution. Due to its location upstream from drinking water intakes, an investigation of its full pollution potential should be undertaken immediately. Chemical analyses should be performed to identify the toxic chemicals in its effluent and stringent standards should be imposed to curtail the discharge of those pollutants.

City of Tonawanda Sewage Treatment Plant
SPDES permit number: NY 0020371
200 Niagara Street Tonawanda, N.Y.

Prior to diverting its effluent to the Town of Tonawanda System on Janary 30, 1979, this primary facility used sedimentation and chlorination to process approximately 4.3 MGD of combined sanitary and industrial wastewaters. It consistently exceeded its 3.5 MGD design capacity during 1975, 1976, and 1977. Four industries known to use, manufacture, store or dispose of toxic chemicals were on-line to this system: Chemical/Lehman Tank Lines, Spaulding Fiber, National Manufacturing and Columbus McKinnon. These firms are now connected to the Town of Tonawanda collection system. [7]

A comprehensive pretreatment program was never instituted by the City of Tonawanda facility. Monitoring was never undertaken to identify the toxic pollutants found in its influent or in its effluent discharge to the Niagara River. The system may have been a major contributor of toxic pollution to the Niagara River. That possibility needs to be investigated.

City of North Tonawanda Sewage Treatment Plant
SPDES permit number: NY 0026280
830 River Road North Tonawanda, N.Y.

This primary facility currently uses settling, filtration and chlorination to process between eight and nine MGD of combined sanitary and industrial wastewater. This flow exceeds the plant's design capacity by two to three MGD. During rainy periods, however, as much as 16 MGD of wastewater enters the collection system. All excess influent passes through the facility's clarifier system, is chlorinated and is discharged. This facility is scheduled to be upgraded soon to a physical-chemical treatment works that will utilize an activated carbon filtration system to treat industrial wastes. [8]

Eleven industries are on-line to this municipal system. Table 14 lists the firms, the nature of their business, the volume and type of wastewater they contribute, whether they are ICS positive responders and whether they are profiled in the previous section of this study. Approximately one half of the on-line industries are likely to discharge toxic chemicals. At least three firms have diverted their contaminated process waters to this facility while continuing to discharge SPDES regulated uncontaminated cooling waters to the Niagara River. Appendices A and B indicate that a wide variety spectrum of toxic pollutants have been identifed in the wastewaters of some of the SIC categories represented by these on-line firms. Appendix C shows that these manufacturers use, store, manufacture or dispose of a large number of toxic compounds that could also contaminate their effluents. Based on water usage, these companies are estimated to contribute approximately 20 percent of the system's influent.

TABLE 14
ON-LINE INDUSTRIES TO THE CITY OF NORTH TONAWANDA SEWAGE TREATMENT PLANT

INDUSTRY	PRODUCT	WASTEWATER FLOW (GPD)	WASTEWATER TYPE	ICS RESPONSE	NOTES
1- AN-COR PLASTICS	Plastics, fiberglass, reinforced plastic tanks, pipe systems.	-	Storm, sanitary and process	POSITIVE styrene, acetone, polyester resins, combined use of 220,000 lbs/yr	
2- BATTENFIELD OIL & GREASE	Carting firm & oil processing	22,000	truck washings sanitary	POSITIVE 4 compounds totalling 93,000 lbs/yr & 3,000,000 lbs/yr of asbestos	
3- BOOTH OIL	Recycle hydraulic cutting, road, & lubricating oils	28,000	sanitary & truck washings	NOT INCLUDED	31 employees
4- HOOKER DUREZ [1]	Phenolic resins and plastics	92,000	sanitary	POSITIVE	1300 employees see profile #46
5- KOPPERS, INC.	Felt	13,000	process, sanitary and cooling	NEGATIVE	see profile #48
6- NATIONAL GRINDING WHEEL	Grinding wheels	29,700	separated cooling water	NOT INCLUDED	400 employees
7- ROBLIN STEEL	Steel rolling mill, producing carbon & alloy steel bars, rods, & rolls	172,000	cooling & process & sanitary	POSITIVE 1320 gal/yr solvent 602 500 lbs/yr asbestos	
8- TONAWANDA ELECTRIC STEEL	Steel castings	37,000	process	POSITIVE	see profile #47 125 employees
9- TUBE MANIFOLD	Metal products, steel disposable cylinders, compressor mufflers	32,000	process	NOT INCLUDED	57 employees

10 & 11 are a carting firm and a metal shop, unnamed by the plant engineer

[1] Sanitary wastes from Hooker are currently on-line.

Despite the potential for toxics in the industrial wastestreams discharged to this system, a comprehensive pretreatment program has not been established. On a case-by-case basis, some industries have been required to pretreat their wastes. Booth Oil uses an oil-water separator to eliminate excess oil and grease from its discharge. The firm also monitors the oil and grease levels in its effluent. Koppers limits levels of BOD (200mg/L), COD (400 mg/L), and suspended solids (100mg/L) in its three MGD discharge. The standards listed in Table 15 are to be used to regulate on-line discharges. These measures, however, fail to provide adequate toxic pollutant safeguards. None of the imposed standards sets limitations for organic chemicals, and none of the on-line industries are required to monitor the levels of toxic contaminants found in their wastestream.

TABLE 15
PRETREATMENT STANDARDS
CITY OF NORTH TONAWANDA

PARAMETER	MAXIMUM EFFLUENT CONCENTRATION LIMIT (mg/l)
Cadmium	0.4
Chromium +6	0.2
Chromium (total)	4.0
Copper	0.8
Lead	0.2
Mercury	0.2
Nickel	4.0
Zinc	1.2
Arsenic	0.2
Available Chlorine	50.0
Cyanide	0.4
Complexed Cyanide	1.6
Selenium	0.2
Sulfur	6.0
Barium	4.0
Manganese	4.0
Gold	0.2
Silver	0.2
Flourides (to fresh water)	4.0
(to saline water)	36.0
Phenol	4.0

At the same time, the treatment plant's SPDES permit also fails to limit the discharge of toxic chemicals. Only the following effluent standards are in effect: pH (6.0 to 9.0), flow (14 MGD-maximum), phosphorus-total (1.0 mg/L), fecal coliform (200 MPN/100 ML average, 400 MPN/100 maximum), suspended solids (3,500 pounds/day-average, 5,250 pounds/day maximum), settleable solids (0.1 ML/L - maximum). Numerical standards for toxic pollutants are completely lacking.

This facility is an inadequately regulated source of pollution. Its discharge may be a major source of toxic contamination to the Niagara River. Since the plant's effluent is released upstream of drinking water intakes, the full pollution potential of the system should be assessed immediately. Analyses should be performed to identify the toxic chemical constituents of its discharge, and stringent limitations should then be imposed to curtail the release of those contaminants.

Niagara County Sewer District Number One
SPDES permit number: NY 0027979
2255 River Road Wheatfield, N.Y.

This secondary treatment plant processes two MGD of combined sanitary and industrial effluent using activated sludge, phosphate removal, polishing filters and chlorination. It discharges directly into the Niagara River.[9]

One industry is currently on-line to this facility, and several other firms are scheduled to connect to it. Bell Aerospace manufactures rocket and airplane components and accessories. It is an ICS positive responder and has reported using manufacturing, storing or disposing of a wide variety of toxic chemicals. Some of these may contaminate its wastestream. Continental Can and Carborundum Graphite and Special Fibers are each expected to begin contributing wastewaters to this system in the near future. Both are potential sources of toxic contaminants; Continental Can is an ICS positive responder. Despite the likelihood of toxics being present in the on-line discharges to its system, this facility has not instituted a comprehensive pretreatment program. Bell Aerospace's discharge is not considered to be a significant source of toxic chemicals even though its effluent has not been monitored and the firm is diverting its process wastewaters to the municipal collection system while continuing to discharge SPDES regulated cooling water to the Niagara River. Neither of the other two firms have been required to monitor their wastestreams for toxics or abate the discharge of chemical contaminants.

The treatment plant's SPDES permit also fails to reflect a concern for toxic chemicals. Only the following effluent limitations are in effect: flow (14.08 MGD), pH (6.0 to 9.0), phosphorus- total (1.0 mg/L average), fecal coliform (200 MPN/100ML average, 400 MPN/100 ML maximum), suspended solids

(3,250 pounds/day- average, 5,300 pounds/day maximum), BOD5 (3,250 pounds/day- average, 5,300 pounds/day- maximum), settleable solids (0.1 ML/L maximum). Numerical standards for toxic pollutants are totally lacking.

This facility is an inadequately regulated source of pollution. A comprehensive investigation of its pollution potential should be undertaken as soon as possible. Stringent standards should be imposed to curtail the discharge of toxic pollutants in its effluent.

Town of Lewiston Sewage Treatment Plant
SPDES permit number: NY 0027766
Fletcher Road and Fifth Street Lewiston, N.Y.

This tertiary treatment facility uses activated sludge filtration and phosphorus removal to process approximately one MGD of domestic and industrial sanitary wastewaters. It discharges directly into the Niagara River.[10]

Currently there are at least two on-line contributors to this system, and several other dischargers are scheduled to connect into the system shortly. Niagara University and Grief Brothers are both reported to be contributing only sanitary wastewaters but it is possible that toxic chemicals may be present in their effluents. Grief Brothers is an ICS positive responder and toxic organic chemical solvents have been identified in its SPDES regulated discharge. Refer to Appendix C and profile 56 in the previous section of this study for additional information on this firm. Niagara University's effluent could be contaminated with toxic chemicals from maintenance facilities or scientific laboratories. To date, neither on-line discharges has monitored its wastestream for toxic pollutants or pretreated its effluent to remove organic compounds that may be present.

There is evidence, however, that this treatment facility has discharged significant quantities of toxics into the Niagara River. In 1978 divers discovered that nearly one half of the two 54 inch outfall pipes were clogged with sediment. During January and February, 1979, the facility's discharge lines were by-passed and the material was removed. Chemical analyses of the accumulated sediment showed mercury concentrations of 8.6 parts per million (ppm) and 12.4 ppm, chromium, nickel, zinc and copper concentrations of 15 to 20 ppm, lindane concentrations of 0.14 ppm and 0.08 ppm, polychlorinated biphenyl (PCBS) concentrations of 2.6 and 2.1 ppm and trace levels of halogenated organics. These findings, however, were not confirmed by subsequent DEC test results.[11]

Despite the potential for chemical pollutants in this facility's discharge, its SPDES permit fails to provide stringent control of toxics. Only the following effluent limitations are in effect: flow (2.75 MGD- maximum), pH

(6.0 to 9.0), phosphorus total (1.0mg/L), fecal coliform (200MPN/ml- average, 400 MPN/ml maximum), suspended solids and BOD5 (688 pounds/.day- average, 1,032 pounds/day- maximum), and settleable solids (0.1 ml/L- maximum).

The treatment plant is an inadequately regulated source of pollution. A comprehensive investigation of its pollution potential should be undertaken as soon as possible. Toxic chemicals identified in its effluent should be rigidly controlled.

Town of Grand Island Sewage Treatment Plant
SPDES permit number: NY 0027693
2555 Baseline Road Grand Island, N.Y.

Until recently this treatment system was composed of three facilities. Plant number One, a primary treatment works, was abandoned and is now used as a stormwater retention facility. Plant number Four is a secondary treatment works scheduled to be phased out in the near future. Plant number Two is the main treatment facility. It uses secondary treatment technology to process approximately 12 MGD of combined domestic and industrial sanitary wastes, though stormwater overflows sometimes reach 6.0 MGD. The system discharges into the East Branch of the Niagara River.

Only treatment plant number Two has on-line industrial contributors. At least four industries are reported to discharge non-process wastewaters: Wer Plastics employs 300 people and manufactures automation equipment, DC drives and speed controls. Edwards Hi Vacuum employs 50 people and produces high vacuum equipment systems and components, freeze dryers, and tissue dryers. Mesmer's Dairy produces milk and milk products. Nuclear Radiation Development manufactures smoke detectors. With the exception of Nuclear Radiation Development, none of the firms responded positively to the ICS or have otherwise indicated that they use toxic chemicals. Nuclear Radiation Development is an ICS positive responder, which reported using 200 gallons per year of methyl ethyl ketone, a toxic organic chemical solvent. Prior to its discharge, the company's effluent is evaporated, condensed and filtered. This is the only on-line firm required to provide pretreatment of its wastestream.

The treatment facility's SPDES permit fails to reflect concern for toxic pollutants. Neither its influent or its effluent has been monitored for toxic chemicals. Only the following effluent limitations are in effect: flow (0.75 MGD maximum), pH (6.0 to 9.0), chlorine residual (0.5 mg/L minimum), and settleable solids (0.;8ml/L maximum).

This facility is an inadequately regulated source of pollution. Its full pollution potential should be investigated as soon as possible. Chemical analyses should be performed to determine if toxic pollutants contaminate its discharge, and stringent standards should be set to limit the discharge of all toxic chemicals.

City of Niagara Falls Wastewater Treatment Plant
SPDES permit number: NY 0026336
1200 Buffalo Avenue Niagara Falls, N.Y.

This physical/chemical wastewater treatment plant cost more than $60 million to build and is the largest public owned facility of its kind in the country. It is equipped with sophisticated treatment systems that process between 50 and 60 MGD of combined sanitary and heavily contaminated industrial wastewaters using screening, flocculation, sedimentation, and activated carbon filtration. Since the plant began operating in April 1977, however, it has been plagued with problems that have crippled critical elements of its treatment process. As a result, it has never performed properly and is now recognized as one of the largest dischargers of toxic chemicals into the Niagara River.

A total of 28 industries are on-line contributors to this facility, including several of the largest manufacturing concerns in the Niagara Frontier. Table 16 lists the on-line firms, the nature of their business, the volume and type of wastewater they contribute, whether they are ICS positive responders, whether they pretreat their waste discharges, and whether they are profiled in the previous section of this report. All but four of the 28 major contributing industries discharge some amount of process waste to this municipal collection system. Their combined effluents total more than 25 MGD of contaminated wastewaters and constitute more than 40 percent of the treatment system's influent. According to the Interagency Task Force report on hazardous waste dumping and the ICS, 17 of the on-line firms use, store, handle, or dispose of toxic organic chemicals. Refer to Appendices A, B, C, and D for details of the pollutants that have been identified in the wastestreams of selected SIC categories represented by these firms, their ICS responses and the toxicity of the identified compounds.

TABLE 16
ON-LINE INDUSTRIES
TO THE CITY OF NIAGARA FALLS SEWAGE TREATMENT PLANT

INDUSTRY	PRODUCT	WASTEWATER FLOW (GPD)	WASTEWATER TYPE	ICS RESPONSE	NOTES
1- AIRCO ALLOYS 3801 Highland Ave. (SKW Alloys)	100 TPD 50% ferrosilicon 60 TPD Ferrochrome silicon	7,500	Sanitary only	NOT INCLUDED	no pretreatment
2- AIRCO SPEER	Graphite electrodes graphite anodes	800,000	Process	NOT INCLUDED	
3- ALOX CORP 3943 Buffalo Ave	Rust preventatives corrosion inhibitors oil additives	100,000	Process	POSITIVE	pretreat for oil
4- BUROOX	cleaning & separating air 100 TPD liquid oxygen 60 TPD liquid nitrogen 4 TPD liquid argon	43,204	Process	POSITIVE 3200 lbs/yr freon 330 gals/yr trichloroethane	no pretreatment

5- CARBORUNDUM Buffalo Ave	521,850 lbs/day Abrasives	3,000,000	Process	POSITIVE see profile #54	use settling bay & clarifier to pretreat
6- CARBORUNDUM Globar Plant 3425 Hyde Park Blvd	Electric heating elements	56,000	Sanitary	NOT INCLUDED	
7- CARBORUNDUM Wheatfield Plant Walmore Rd.	Coated Abrasives 150,000 lbs/day sandpaper 19,000 lbs/day synthetic resins	268,000	Process	NOT INCLUDED but evidence of trichloroethylene use see profile #73	use settling tank to pretreat
8- E. I. DUPONT Buffalo Ave	Polymeric alcohol N-methyl pyrole Metal cyanides	2,150,000	Process	POSITIVE see profile #51	Pretreat for Ba, Destroy cyanide & hypochloride wastes
9- FRONTIER BRONZE 4870 Packard Rd.	4000 lbs/day bronze 2000 lbs/day aluminum	100,000	Cooling & sanitary	POSITIVE 200 gal/yr trichloroethane 100 gal/yr trichloroethylene	
10- FRONTIER CHEMICAL 4626 Royal Ave Niagara Falls	Industrial Waste Treatment Facility	100,000	Treated waste water	POSITIVE 8 compounds unknown quantities	Wastewater is first passed through a physical chemical treatment plant with carbon filters
11- GENERAL ABRASIVES 2000College Ave.	400,000 lbs/day refractory & abrasive grain	458,000	Process	NOT INCLUDED	No pretreatment of wastes
12- GOODYEAR TIRE & RUBBER 5408 Baker Ave.	Rubber chemivals 12 TPD Accelerators 30 TPD Antioxidants	800,000	Process	POSITIVE 13 compounds totalling 12.5 million lbs/yr of use, & 57,000,000 lbs/yr vinyl chloride	Have a "solids accumulation sump"
13-GREAT LAKES CARBON Pine Ave & 56th St	50,246 lbs/day carbon forms 45,100 lbs/day graphite forms	40,000	Process	POSITIVE 90 substances, over 500 million lbs/yr of use	No pretreatment see profile #55
14-HOOKER CHEMICAL Buffalo Ave & 47th	Organic & inorganic chemicals including 350,000 tons/yr chlorine 38,000 tons/yr halogenated toluene 418,000 tons/yr sodium & potassium hydroxide	6,400,000	Process	POSITIVE 90 substances over 500 million lbs/yr of use	neutralize decant, decompose & thermally destruct portions of the waste stream see profile #49
15-NATIONAL BISCUIT CO (NABISCO) 920 Erie Ave	Shredded wheat cereal & triscuits use 5,350 bushels of wheat/day	156,000	Sanitary, cooling & process	NOT INCLUDED	Use hydrasieve unit for coarse screening
16-NATIONAL LEAD (NL INDUSTRIES) 4511 Hyde Park Blvd	Ceramic, refractory, & dielectric materials 30,000 lbs/day silicates 20,000 lbs/day Barium titanates 60,000 lbs/day opacifiers	420,000	Process	POSITIVE 14,000 lbs/yr asbestos	neutralize for pH
17- NEWCO 4626 Royal Ave.	Disposal site for waste acid & alkali streams & various organics	160,000	Process	NOT INCLUDED but does file a Hazardous Waste Report each year	see profile #76 wastes extensively treated for metals & organics
18- NIACET CORP 400 47th St.	40,000 lbs/day anhydrous sodium acetate	380,000	Process	NOT INCLUDED	Neutralize wastes formerly Union Carbide Chemicals Division see profile #52
19- NITEC PAPER (CELLU PRODUCTS) 4001 Packard Rd.	200 TPD coated publications 116 TPD tissue paper	6,000,000	Process	POSITIVE	
20- OLIN CORP 2400 Buffalo Ave.	250 TPD chlorine 277 TPD caustic 115,000 lbs/day HTH 10,500 lbs/day sodium methylate 11,900 lbs/day sodium chlorite	550,000	Process	NEGATIVE but Hazardous Waste Report suggests some use of toxic compounds	see profile # 50 pretreat to precipitate mercury & reduce chlorine

21- PRESTOLITE BATTERY 3125 Highland Ave.	10,000 plastic containers/day 12,800 plastic covers/day 10,300 hard rubber containers 9,400 hard rubber covers/day	56,000	Process	NOT INCLUDED	use polypropylene & rubber compounds to make battery cases
22- PYRON CORP 5950 Packard Rd.	200,000 lbs/day iron powder	180,000	Non contact cooling & sanitary	NOT INCLUDED	
23- SOLVENT CHEMICAL (ICC INDUSTRIES)	benzene & chlorinated benzene	300,000	Chemical & process wastewater	POSITIVE 16,000,000 lbs/yr chlorinated benzene 8,500,000 lbs/yr benzene	
24- UNION CARBIDE Acheson Plant 1930 Buffalo Ave.	33 TPD graphite shapes	52,000	"domestic type wastes" process waste	POSITIVE	no pretreatment see profile #53
25- UNION CARBIDE National Plant 3625 Highland Ave.	86 TPD coal based carbon shapes 27 TPD coke based carbon shapes	1,240,000	Process	POSITIVE	no pretreatment
26- UNION CARBIDE Republic Plant 3501 Hyde Park Blvd.	34 TPD coal based carbon 21 TPD coke based carbon	388,000	Process	NOT INCLUDED	pretreat saw cooling water sludge
27- UNION CARBIDE Mining & Metals 4625 Royal Ave.	8,000 lbs/day ferroalloys	800,000	Process	NEGATIVE	no pretreatment see profile #52
28- VARCUM CORP (Reichold Chemical) 5000 Packard Rd.	phenolic resins	60,000	Process	POSITIVE use, store, or produce 32 compounds totalling 18 million lbs/yr	pretreat for phenols

Most of these industries are known to discharge large volumes of process wastewater polluted with toxic chemicals to the municipal collection system while continuing to discharge SPDES regulated cooling water to the Niagara River. However, a comprehenisve pretreatment program has not been instituted. Only 14 of the on-line industries are required to pretreat their waste discharges at all and not a single firm is providing adequate pretreatment for the broad spectrum of wastes found in its effluents. Detailed analyses have not been performed on the discharges to identify all the toxic compounds that are present, and strict numerical limitations have not been set to curtail the release of toxic compounds. In general, pretreatment requirements cope only with traditional pollution concerns such as visible oils and solids, not with synthetic organic chemical process wastes. These minimal protection measures are wholly inadequate.

Without a strict pretreatment program in effect, this wastewater facility has become a major discharger of toxics. With the exception of a few winter months in 1978, the plant has only been able to provide primary treatment of its influent. The heart of the system's treatment scheme is a series of 28 activated carbon contact beds. These were designed to remove the toxic organic chemicals that survived the plant's traditional physical/chemical treatment processes. But this critical element of the wastewater facility was in operation only a few months before the concrete bases and support structures were destroyed.[12] As a result, incoming wastewater receives incomplete traditional treatment, by-passes the activated carbon system designed to remove toxics, and is discharged into the Niagara River contaminated with high levels of organics.

Other problems have plagued the treatment plant as well. The facility has been uable to comply with its SPDES discharge permit in a number of ways. It has consistently exceeded its allowable average limit for COD by an average of ten thousand pounds per day for at least the last year: an average of 43,596 pounds/day are permitted; according to the plant's discharge monitoring reports, during the last year the average daily discharge has been 56,641 pounds over 30 days. During the last year, the plant has also exceeded its allowable limit of phosphorus.

In the past, non-compliance problems have been even worse. In February, 1979, the facility reported COD discharges of 55,876 pounds/day over 30 days and 80,564 pounds/day over seven days, averaging only 53.5 percent removal. During the same period, phenol discharges were reported to average 1,809 pounds/day over 30 days.

Due to operational problems, this plant has also discharged up to 12 MGD of raw, untreated wastewater into the Niagara River. Wastewater from the northern and downtown portions of Niagara Falls flows through old sewers to the site of the former municipal sewage treatment plant at the river's edge in the Niagara gorge below Ashland Avenue. From there, the wastewater is pumped up to the top of the gorge to a force main and gravity flow conduit to the new treatment works. Until December 1980, however, all three of the pumps in the Gorge Pumping Station were not in operation. As a result, untreated wastewaters that exceeded the pumping capacity of the station were diverted directly into the river. This is still a serious problem; even when all three pumps are at full operational capacity, all the wastewater entering the Gorge Pumping Station cannot be handled because the force main capacity is inadequate. In order to prevent street level flooding, a certain volume of wastewater must still be diverted to the Niagara River. In recent months this has amounted to over one MGD of dry weather flow. In the event of pump breakdowns and wet weather, the overflow increases dramatically.

These untreated discharges and the heavily contaminated treated wastewaters discharged by this facility were recognized as serious problems over three years ago. In an EPA report of a September, 1978 inspection of the Hooker Chemical facility, the inspectors noted that:

The whole point of this discussion is that for another year or so, all industrial waste discharged to the Niagara River from the City of Niagara Falls industries will receive primary settling and chlorination only through the waste treatment plant and no treatment if by-passed at the Gorge Pumping Station. Worst of all, all dissolved toxic or hazardous waste being discharged by industry to the Niagara Falls Sewer System will be discharged as is to the Niagara River. Niagara-on-the-Lake, a Canadian City, near the mouth of the Niagara River, takes its potable water from the Niagara River... If they become aware that Niagara Falls is again discharging industrial waste with little or no treatment to the river, there will be some objection on their part...

Another EPA memo, dated January 11, 1979, informed DEC of the results of a bioassay performed by EPA biologists. According to the memo, "the flow-through biological assay study on the Niagara Falls wastewater treatment plant effluent indicated that the effluent was acutely toxic to the fat head minnow, Pimphales promelas...," and that "the data indicated the Niagara Falls wastewater treatment plant would not be in compliance with the In-Stream Waste Limit... the toxicity of the waste is due to the organic compounds present in the effluent."

EPA is currently bringing suit against the city of Niagara Falls for its failure to operate the treatment works in compliance with its discharge permit.

Despite the awareness of toxic pollutants in the treatment facility's wastestream, its SPDES permit does not limit the discharge of organic chemicals. Only the following effluent standards are in effect: COD (43,596 pounds/day- average over seven days and 66,000 pounds/day-maximum over 30 days), pH (6.0 to 9.0), phosphorus- total (1.0 mg/L- maximum), fecal coliform (200 MPN/100 ml-average over seven days and 400 MPN/100 ml-maximum over 30 days), suspended solids (12,000 pounds/day-average over seven days and 18,000 pounds/day- maximum over 30 days) and phenols (81 pounds/day- average over seven days). Numerical standards for the broad range of pollutants found in the plant's discharge are completely lacking.

This facility's treated effluent was sampled by NYPIRG on July 17, 1981 and subjected to integrated gas chromatograph/mass spectrometry analysis for "priority pollutants." The presence of a total of 34 carcinogenic, teratogenic and otherwise toxic priority pollutants were discovered to be present at concentrations up to 75ug/L. These findings are discussed in Chapter VIII.

The Niagara Falls wastewater treatment works is an inadequately regulated, uncontrolled discharger of toxic chemicals. Due to the lack of a comprehensive pretreatment program and a fully operational treatment process, this facility is a major threat to the water quality of the Niagara River and Lake Ontario and to the drinking water supplies drawn from these bodies of water. A full-scale investigation of its toxic potential should be undertaken immediately. Since the facility's problems cannot be corrected for at least several years, stringent remedial measures should be instituted as soon as possible to curtail the discharge of toxics.

The Niagara Falls wastewater plant exemplifies the inability of conventional and improperly designed advanced treatment works to cope with highly contaminated industrial wastes. However, other aspects of the pollution threat that these facilities pose have been overlooked. Table 17 identifies the toxic compounds that may be formed during the biological phase of sewage treatment.[13] These concerns have been largely ignored. Existing regulatory programs have been consistently hampered by a startling inability to determine exactly what problems need to be solved. Municipalities have invested hundreds of millions of dollars in water pollution control, but the treatment systems that have been constructed were poorly planned, designed, built and operated. Consequently these facilities cannot function properly and have ironically become major sources of toxic contamination. Only a complete review of the Niagara Frontier's municipal wastewater treatment programs can determine how to correct the problems that have been detailed in this section.

TABLE 17
COMPOUNDS WHICH MAY BE FORMED DURING THE BIOLOGICAL PHASE OF SEWAGE TREATMENT

acetaldehyde	carbon disulfide	methyl ethyl ketone
acetic acid	o-creosol	methyl phenyl carbinol
acetone	2,4-dimethyl phenol	2-methyl propanal
acetophenone	2,6-dinitrotoluene	methyl stearate
(diethyl)atrazine	ethanol	pentanol
benzene	ethyl amine	propanol
borneol	methane	propylamine
isoborneol	methanol	1-terpineol
	3-methyl butanal	trimethyl-trioxo-hexahydro-triazene isomer

CHAPTER V

Hazardous Waste Contamination in the Niagara Frontier

Massive quantities of toxic industrial residues lie buried in scores of abandoned dumps scattered throughout the Niagara Frontier. Many of the landfills are already known to be sources of widespread contamination. Few, if any, are designed, constructed or maintained to hold their contents securely over the long run. As this section documents, the environmental and health threats posed by hazardous wastes have not been successfully managed by existing protection programs. As a result, landfilled hazardous wastes are a severe threat to the Niagara River and its surrounding environment.

The Love Canal

In 1978, the infamous Love Canal first alerted the nation to the dangers of hazardous waste dumps. There is no clearer example of the consequences of mishandled toxic chemicals. From 1942 to 1952 the Hooker Chemical and Plastics Company dumped an estimated 21,800 tons of manufacturing waste into the abandoned canal until it was completely filled. The wastes included an estimated 200 tons of trichlorophenol residue, a material contaminated with one of the deadliest substances known to science: dioxin (2,3,7,8, tetrachlorodibenzo-p-dioxin). Many of the chemicals that Hooker dumped into the canal were carcinogenic or otherwise toxic. But none matched dioxin's extraordinary toxicity. Dioxin is carcinogenic, mutagenic, embryolethal, teratogenic and bioaccumulates 8,000-fold in aquatic organisms. Between 125 and 145 pounds of this deadly compound were buried in the Love Canal. Nearly three decades after the site ceased to serve as an active Hooker dump, dioxin and more than 80 other pollutants were discovered migrating through groundwaters flowing from the landfill.

After breeching the basement foundations of nearby homes, the chemical wastes caused an epidemic of birth defects and other health hazards in the community surrounding the canal. The danger was so great that on August 2, 1978, former New York State Health commissioner Robert Whalen declared the Love Canal to be "an official emergency." Eventually over 240 families were evacuated from their homes. To this day, the Love Canal neighborhood remains uninhabited and largely deserted, a deadly legacy to future generations.

Since 1978, hundreds of dumps similar to the Love Canal have been identified in Western New York. In August 1978, Peter A. A. Berle, the New York State Commissioner of Environmental Conservation (DEC), created an Interagency Task Force to respond to the growing awareness of hazardous waste problems in Erie and Niagara Counties. The Task Force was composed of representatives of the DEC, the New York State Departmenbt of Health, (DOH) and the U.S. Environmental Protection Agency (EPA). Its purpose was to determine the source, nature and location of hazardous waste disposed of in the two counties and to recommend appropriate remedial, legal and legislative actions concerning such dumpsites.

On April 5, 1979, the Task Force released a report, entitled: Draft _Report on Hazardous Waste Disposal in Erie and Niagara Counties, New York._[1] A total of 215 waste disposal sites were identified and assigned a priority rating based on each dump's actual and potential environmental and public health impact. A total of 109 sites were located in Erie County. An additional 106 sites were located in Niagara County. A total of 78 waste disposal sites were identified and assigned a priority rating based on each dump's actual and potential environmental and public health impact. A total of 78 sites remained in active use. 126 were inactive. The status of 11 sites was unknown. In Niagara County, a total of 66 sites were owned by waste generators and an additional 36 sites were municipal, state or private waste disposal operations. Similarly, in Erie County, a total of 59 sites were owned by waste generators and 48 sites were municipal, state or private waste disposal operations. A total of six sites in both counties were owned by the federal government.

The priority ratings assigned by the Task Force have the following meanings:

Priority I: Waste disposal areas that have definitely received large quantities of hazardous waste; remedial action may be necessary; litigation to ensure that remedial action is taken should be considered.

Priority II: Waste disposal areas that may have received significant quantities of hazardous waste.

Priority III: Waste disposal areas that are unlikely to have received significant quantities of hazardous wastes or any industrial wastes at all.

Figure 12 illustrates where the sites are located.

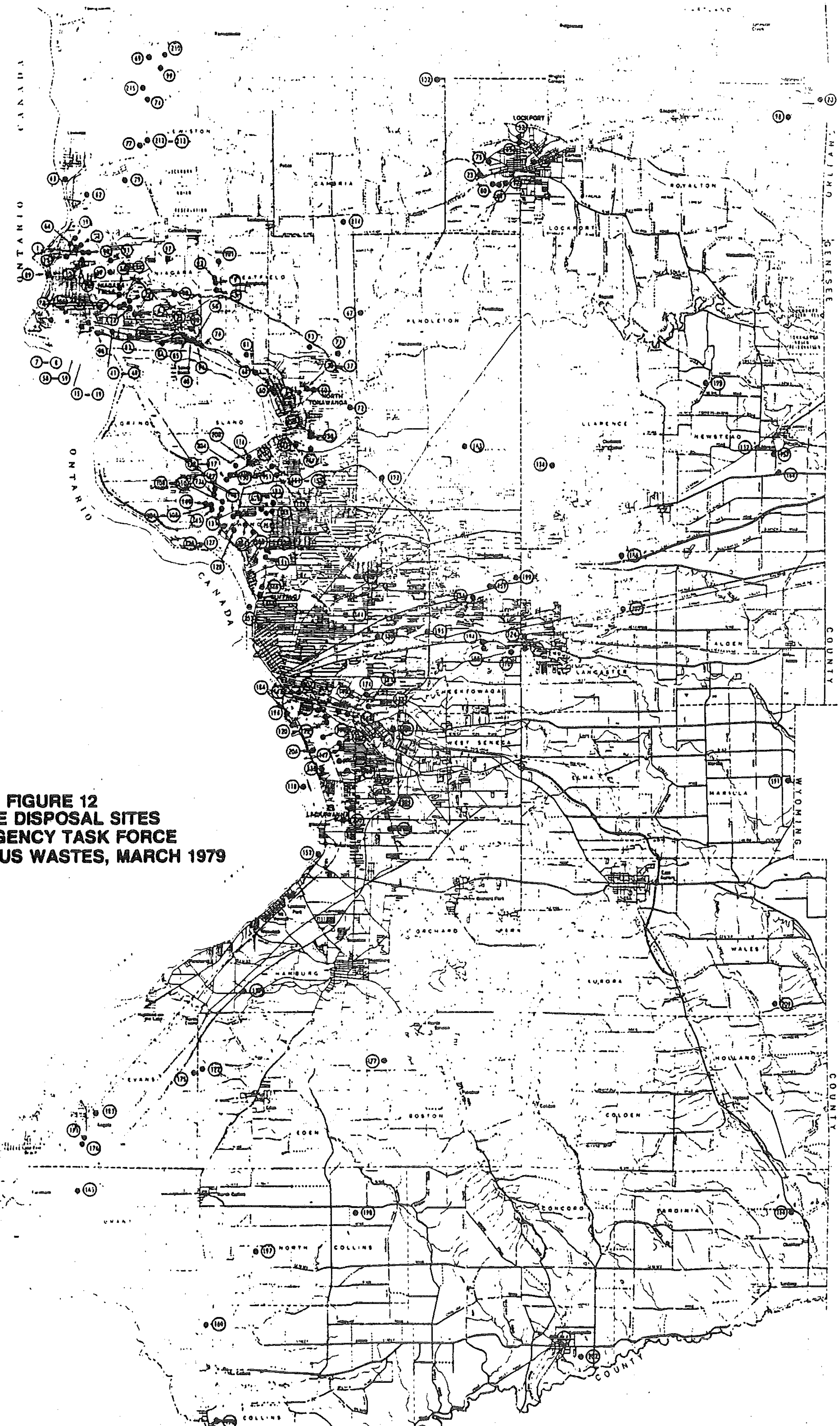


FIGURE 12
WASTE DISPOSAL SITES
INTERAGENCY TASK FORCE
ON HAZARDOUS WASTES, MARCH 1979

Table 18 contains a list of the sites and their assigned priority ratings.

TABLE 18
WASTE DISPOSAL SITE LOCATIONS AND PRIORITY RATINGS INTERAGENCY TASK FORCE

SITE NO.	PRIORITY	COUNTY	SITE NAME AND LOCATION
1	2	NIAG	AIRCO ALLOYS, WITMER ROAD, NIAGARA FALLS
2	2	NIAG	AIRCO SPEER CARBON-GRAPHITE, PACKARD ROAD, NIAGARA FALLS
3	2	NIAG	ALLIED CHEMICAL, RANSOMVILLE
4	2	NIAG	BASIC CARBON, CONNECTING ROAD, NIAGARA FALLS
5	2	NIAG	BELL AEROSPACE TEXTRON, ROUTE 62, NIAGARA FALLS
6	3	NIAG	BUFFALO PUMPS DIVISION, OLIVER ST., NORTH TONAWANDA
7	2	NIAG	CARBORUNDUM, BLDG. 89, BUFFALO AVE., NIAGARA FALLS
8	3	NIAG	CARBORUNDUM, BLDG. 82, BUFFALO AVE., NIAGARA FALLS
9	2	NIAG	CARBORUNDUM, WALMORE ROAD, WHEATFIELD
10	3	NIAG	CARBORUNDUM, GLOBAR PLANT, HYDE PARK BLVD., NIAGARA FALLS
11	3	NIAG	CHISHOLM-RYDER COMPANY, INC., COLLEGE AND HIGHLAND AVES., NIAGARA FALLS
12	3	NIAG	DIVERSIFIED MANUFACTURING, INC., OHIO ST., LOCKPORT
13	2	NIAG	DUSSAULT FOUNDARY, WASHBURN ST., LOCKPORT
14	1	NIAG	DUPONT, NECCO PARK, NIAGARA FALLS
15	1	NIAG	DUPONT, WEST YARD, NIAGARA FALLS
16	1	NIAG	DUPONT, BLDG. 301, NIAGARA FALLS
17	1	NIAG	DUPONT, BLDG. 117, NIAGARA FALLS
18	2	NIAG	DUPONT, S. BOUNDARY, NIAGARA FALLS
19	2	NIAG	DUPONT, W. OF HYDE PK. BLVD., NIAGARA FALLS
20	1	NIAG	FMC, NIAGARA ST., MIDDLEPORT
21	2	NIAG	FRONTIER BRONZE CORP., PACKARD ROAD, NIAGARA FALLS
22	2	NIAG	GREAT LAKES CARBON CORP., PINE AVE., NIAGARA FALLS
23	2	NIAG	HARRISON RADIATOR, UPPER MTN RD., LOCKPORT
24	1	NIAG	HOOKER DUREZ, PLANT SITE I, NORTH TONAWANDA
25	1	NIAG	HOOKER DUREZ, PLANT SITE II, NORTH TONAWANDA
26	1	NIAG	HOOKER DUREZ, PLANT SITE III, NORTH TONAWANDA
27	1	NIAG	HOOKER DUREZ, PLANT SITE IV, NORTH TONAWANDA
28	1	NIAG	HOOKER DUREZ, PLANT SITE V, NORTH TONAWANDA
29	1	NIAG	HOOKER DUREZ, PLANT SITE VI, NORTH TONAWANDA
30	1	NIAG	HOOKER DUREZ, PLANT SITE VII, NORTH TONAWANDA
31	1	NIAG	HOOKER DUREZ, PLANT SITE VIII, NORTH TONAWANDA
32	1	NIAG	HOOKER DUREZ, PLANT SITE IX, NORTH TONAWANDA
33	1	NIAG	HOOKER DUREZ, PLANT SITE X, NORTH TONAWANDA
34	1	NIAG	HOOKER DUREZ, PLANT SITE XI, NORTH TONAWANDA
35	1	NIAG	HOOKER DUREZ, PLANT SITE XII, NORTH TONAWANDA
36	1	NIAG	HOOKER DUREZ, PLANT SITE XIII, NORTH TONAWANDA
37	1	NIAG	HOOKER DUREZ, PLANT SITE XIV, NORTH TONAWANDA
38	1	NIAG	HOOKER NIAGARA FALLS, LOVE CANAL
39	1	NIAG	HOOKER NIAGARA FALLS, HYDE PARK SITE
40	1	NIAG	HOOKER NIAGARA FALLS, 102ND ST. SITE
41	1	NIAG	HOOKER NIAGARA FALLS, S AND N AREAS
42	1	NIAG	HOOKER NIAGARA FALLS, D AREA
43	1	NIAG	HOOKER NIAGARA FALLS, E AREA
44	1	NIAG	HOOKER NIAGARA FALLS, V 80 AREA
45	1	NIAG	HOOKER NIAGARA FALLS, V 56 AREA
46	2	NIAG	HOOKER NIAGARA FALLS, V 64 AREA
47	1	NIAG	HOOKER NIAGARA FALLS, U AREA
48	2	NIAG	HOOKER NIAGARA FALLS, W 107 AREA
49	1	NIAG	HOOKER NIAGARA FALLS, BLDGS. D 11 AND D 21
50	3	NIAG	NATIONAL GRINDING WHEEL, WALCK ROAD, NORTH TONAWANDA
51	1	NIAG	NL INDUSTRIES, HYDE PARK BLVD., NIAGARA FALLS
52	2	NIAG	NORTON LABORATORIES, MILL STREET, LOCKPORT
53	2	NIAG	NOURY CHEMICAL, BEHIND BLDG.20, ROUTE 78, BURT
54	2	NIAG	NOURY CHEMICAL, SLUDGE PIT BTWN BLDGS. 14 AND 19, RT. 78, BURT
55	2	NIAG	NOURY CHEMICAL, BEHIND BLDG. 20, RT. 78, BURT
56	1	NIAG	OLIN, 102ND STREET SITE, NIAGARA FALLS
57	2	NIAG	OLIN (SITE OF INDUST. WELDING CORP.), NIAGARA FALLS
58	2	NIAG	OLIN, PARKING LOT, BUFFALO AVENUE, NIAGARA FALLS
59	2	NIAG	OLIN, BUFFALO AVENUE, NIAGARA FALLS
60	2	NIAG	ROBLIN STEEL, EAST AVENUE, NORTH TONAWANDA
61	2	NIAG	SIMONDS STEEL, OHIO STREET, LOCKPORT
62	2	NIAG	STAUFFER CHEMICAL, UPPER MTN RD, LEWISTON
63	2	NIAG	STAUFFER CHEMICAL, ARTPARK, LEWISTON
64	3	NIAG	UNION CARBIDE CARBON PRODUCTS, HYDE PARK BLVD., NIAGARA FALLS
65	2	NIAG	VAN DE MARK CHEMICAL, NORTH TRANSIT ROAD, LOCKPORT
66	2	NIAG	VARCUM CHEMICAL, PACKARD ROAD, NIAGARA FALLS
67	1	NIAG	FRONTIER CHEMICAL, PENDLETON
68	2	NIAG	GRATWICK PARK, RIVER ROAD, NORTH TONAWANDA
69	3	NIAG	J. T. SALVAGE, BALMER ROAD, YOUNGSTOWN
70	3	NIAG	TOWN OF HARTLAND, RYAN ROAD, HARTLAND
71	2	NIAG	HARVEY NEWMAN, SHAWNEE ROAD, WHEATFIELD
72	2	NIAG	HOLIDAY PARK, WALCK ROAD, NORTH TONAWANDA
73	3	NIAG	LASALLE EXPRESSWAY, NIAGARA FALLS
74	2	NIAG	TOWN OF LEWISTON, HAROLD AND FLETCHER ROADS, LEWISTON
75	2	NIAG	CITY OF LOCKPORT, OAKHURST ROAD, LOCKPORT

76	[illegible]	NIAG	LYNCH PARK, WILLIAMS AND RIVER ROADS, WHEATFIELD
77	2	NIAG	MODERN DISPOSAL SERVICES, MODEL CITY ROAD, MODEL CITY
78	[illegible]	NIAG	NEWCO WASTE SYSTEMS, NIAGARA FALLS
79	3	NIAG	N. Y. S. POWER AUTHORITY, UPPER MTN. ROAD, LEWISTON
80	2	NIAG	NIAGARA CO. REFUSE DISPOSAL, RIDGEFIELD ST., LOCKPORT
81	1	NIAG	NIAGARA CO. REFUSE DISPOSAL, WITMER ROAD, WHEATFIELD
82	[illegible]	NIAG	ADAMS GENERATING PLANT, 13TH STREET, NIAGARA FALLS
83	3	NIAG	BUFFALO AVENUE, 52ND TO 60TH STREETS, NIAGARA FALLS
84	2	NIAG	CAYUGA ISLAND, NIAGARA FALLS
85	3	NIAG	GRIFFON PARK, NIAGARA FALLS
86	[illegible]	NIAG	HYDRAULIC CANAL, NIAGARA FALLS
87	3	NIAG	NEW ROAD, NIAGARA FALLS
88	[illegible]	NIAG	64TH STREET, NIAGARA FALLS
89	3	NIAG	WHIRLPOOL SITE, NIAGARA FALLS
90	3	NIAG	WITMER ROAD, NIAGARA FALLS
91	3	NIAG	TOWN OF NIAGARA, LOCKPORT ROAD
92	2	NIAG	NIAGARA FRONTIER TRANSPORTATION AUTHORITY, WHEATFIELD
93	2	NIAG	NASH ROAD SITE, WHEATFIELD
94	3	NIAG	NIAGARA RIVER SITE, RIVER ROAD, WHEATFIELD
95	3	NIAG	OLD CREEK BED, PORTER AND TUSCARORA ROADS, NIAGARA FALLS
96	2	NIAG	ROBERT MOSES PARKWAY, NIAGARA FALLS
97	2	NIAG	ROSS STEEL, PINE AVE, NIAGARA FALLS
98	3	NIAG	TOWN OF ROYALTON, GLESWOOD ROAD, ROYALTON
99	[illegible]	NIAG	SCA, PORTER
100	3	NIAG	SILBERGELD JUNK YARD, 14TH STREET, NIAGARA FALLS
101	3	NIAG	WALMORE ROAD, WHEATFIELD
102	2	NIAG	WILSON-CAMBRIA NEWFANE SITE, CHESTNUT STREET, WILSON
103	3	ERIE	R. P. ADAMS COMPANY, EAST PARK DRIVE, BUFFALO
104	2	ERIE	ALLIED CHEMICAL PLASTICS, RIVER ROAD, TONAWANDA
105	2	ERIE	ALLIED CHEMICAL PLASTICS, RIVER ROAD, TONAWANDA
106	2	ERIE	ALLIED CHEMICAL PLASTICS, RIVER ROAD, TONAWANDA
107	2	ERIE	ALLIED CHEMICAL, IND. CHEM. DIV., LEE STREET, BUFFALO
108	2	ERIE	ALLIED CHEMICAL, (TONAWANDA COKE), RIVER ROAD, TONAWANDA
109	2	ERIE	ALLIED CHEMICAL, (TONAWANDA COKE), RIVER ROAD, TONAWANDA
110	2	ERIE	ALLIED CHEMICAL, (TONAWANDA COKE), RIVER ROAD, TONAWANDA
111	2	ERIE	ALUMINUM MATCH PLATE, MILITARY ROAD, KENMORE
112	3	ERIE	AMAX SPECIALTY METALS, HAKE ROAD, AKRON
113	3	ERIE	THE ANACONDA COMPANY, MILITARY ROAD, BUFFALO
114	[illegible]	ERIE	ASHLAND PETROLEUM, RIVER ROAD, TONAWANDA
115	3	ERIE	ASHLAND PETROLEUM, RIVER ROAD, TONAWANDA
116	3	ERIE	ASHLAND PETROLEUM, RIVER ROAD, TONAWANDA
117	2	ERIE	ASHLAND PETROLEUM, RIVER RD., TONAWANDA
118	2	ERIE	BETHLEHEM STEEL, LACKAWANNA
119	[illegible]	ERIE	BISONITE, MILITARY ROAD, TONAWANDA
120	2	ERIE	BUFFALO COLOR CORP., SOUTH PARK AVENUE, BUFFALO
121	2	ERIE	BUFFALO COLOR CORP., PLANT D, SOUTH PARK AVENUE, BUFFALO
122	2	ERIE	BUFFALO COLOR CORP., SOUTH PARK AVENUE, BUFFALO
123	3	ERIE	COLUMBUS MCKINNON, FREMONT STREET, TONAWANDA
124	[illegible]	ERIE	DRESSER INDUSTRIES, TRANSIT ROAD, DEPEW
125	2	ERIE	DUNLOP TIRE AND RUBBER, SHERIDAN DRIVE, TONAWANDA
126	2	ERIE	DUNLOP TIRE AND RUBBER, SHERIDAN DRIVE, TONAWANDA
127	2	ERIE	DUNLOP TIRE AND RUBBER, SHERIDAN DRIVE, TONAWANDA
128	2	ERIE	DUPONT, RIVER RD. AND SHERIDAN DRIVE, TONAWANDA
129	2	ERIE	FENSI STEEL CORP., WALDEN AVENUE, CHEEKTOWAGA
130	2	ERIE	EXOLON CORPORATION, EAST NIAGARA STREET, TONAWANDA
131	2	ERIE	FMC, SAWYER STREET, TONAWANDA
132	3	ERIE	FEDDERS AUTOMOTIVE, TONAWANDA STREET, BUFFALO
133	[illegible]	ERIE	FERRO CORPORATION, WILLET ROAD, LACKAWANNA
134	2	ERIE	GOLD BOND DIV., ROLL ROAD, CLARENCE CENTER
135	2	ERIE	HANNA FURNACE, FUHRMANN BLVD., BUFFALO
136	2	ERIE	I. N. S. EQUIPMENT CORP., RIVER ROAD, TONAWANDA
137	3	ERIE	LUCIDOL DIV., MILITARY ROAD, TONAWANDA
138	3	ERIE	MACNAUGHTON BROOKS, BOLTON PLACE, BUFFALO
139	2	ERIE	MADISON WIRE, INDIAN CHURCH ROAD, BUFFALO
140	2	ERIE	MANZEL DIV., BABCOCK STREET, BUFFALO
141	2	ERIE	MOBIL OIL, ELK STREET, BUFFALO
142	3	ERIE	MOLLENBERG BETZ MACHINE, SCOTT STREET, BUFFALO
143	2	ERIE	O CEL O PRODUCTS, SAWYER AVENUE, TONAWANDA
144	2	ERIE	OTIS ELEVATOR, DUTTON AND NORTHLAND AVENUES, BUFFALO
145	2	ERIE	POLYMER APPLICATIONS, RIVER ROAD, TONAWANDA
146	2	ERIE	PRATT AND LETCHWORTH, TONAWNDA, BUFFALO
147	2	ERIE	RAMCO STEEL, HOPKINS STREET, BUFFALO
148	2	ERIE	REPUBLIC STEEL, MARILLA AND HOPKINS STREETS, BUFFALO
149	2	ERIE	ROBLIN STEEL, RIVER ROAD, TONAWANDA
150	2	ERIE	SHANCO PLASTICS, KENMORE AVENUE, TONAWANDA
151	2	ERIE	SHANCO PLASTICS, KENMORE AVENUE, TONAWANDA
152	[illegible]	ERIE	SNYDER TANK COMPANY, LAKE SHORE ROAD, BUFFALO
153	2	ERIE	SPAULDING FIBRE, WHEELER STREET, TONAWANDA
154	2	ERIE	SPAULDING FIBRE, WHEELER STREET, TONAWANDA
155	2	ERIE	SPAULDING FIBRE, WHEELER STREET, TONAWANDA
156	2	ERIE	SPENCER KELLOGG, GENESEE STREET, CHEEKTOWAGA
157	3	ERIE	STRIPPIT DIV., CLARENCE RD., AKRON
158	1	ERIE	UNION CARBIDE LINDE, EAST PARK DRIVE, TONAWANDA
159	[illegible]	ERIE	WESTINGHOUSE ELECTRIC, GENESEE ST., CHEEKTOWAGA
160	[illegible]	ERIE	J. H. WILLIAMS, VULCAN STREET, BUFFALO
161	[illegible]	ERIE	WINSMITH DIV., EATON STREET, SPRINGVILLE
162	2	ERIE	ALTIT, FILET STREET, BUFFALO
163	3	ERIE	TOWN OF AMHERST, HOPKINS ROAD
164	3	ERIE	BERNARD CORP, BUELL STREET, AKRON
165	3	ERIE	TOWN OF BRANT, NORTH COLLINS ROAD
166	2	ERIE	CHAFFEE LANDFILL, HAND ROAD, SARDINIA
167	[illegible]	ERIE	CHEMICAL LEAMAN TANK LINES, FILLMORE AVENUE, TONAWANDA
168	2	ERIE	CHEM TROL, LAKE ROAD, BLASDELL
169	3	ERIE	TOWN OF COLLINS, ROUTE 62, COLLINS
170	3	ERIE	VILLAGE OF DEPEW, BORDEN ROAD
171	[illegible]	ERIE	EN BALL, HOLLAND ROAD, EVANS
172	3	ERIE	EDEN SANITATION, TOWN LINE ROAD, EDEN
173	3	ERIE	EMPIRE WASTE, SKILLEN ROAD, BUFFALO
174	2	ERIE	ERIE LACKAWANNA RAILROAD, CLINTON STREET, BUFFALO
175	3	ERIE	TOWN OF EVANS, TOWN LINE ROAD
176	3	ERIE	TOWN OF EVANS, HOLLAND ROAD
177	3	ERIE	GEORGE SCHREIBER SITE, LEDDICK ROAD, BOSTON
178	3	ERIE	VILLAGE OF GOWANDA, CEMETERY HILL
179	3	ERIE	TOWN OF HAMBURG, LAKEVIEW ROAD
180	2	ERIE	HOPKINS STREET, BUFFALO
181	2	ERIE	HOUGHTON PARK, BUFFALO
182	[illegible]	ERIE	HUNTLEY POWER STATION, TONAWANDA

183	3	ERIE	JAMES FOX, GOWANDA ROAD, ANGOLA
184	3	ERIE	KELLY ISLAND, BUFFALO
185	2	ERIE	LACKAWANNA, ABBOT ROAD
186	2	ERIE	LANCASTER SANITARY LANDFILL, GUNNVILLE ROAD, LANCASTER
187	2	ERIE	LANCASTER RECLAMATION, PAVEMENT ROAD, LANCASTER
188	2	ERIE	LAND RECLAMATION, BROADWAY AND INDIAN ROAD, CHEEKTOWAGA
189	3	ERIE	LA SALLE RESERVOIR, EAST AURORA AND PARK RIDGE STREETS, BUFFALO
190	[illegible]	ERIE	LEHIGH VALLEY RAILROAD, TIFFT STREET, BUFFALO
191	3	ERIE	TOWN OF MARILLA, EASTWOOD ROAD, MARILLA
192	3	ERIE	MORRIS AND REIMAN WRECKING, RENSCH ROAD, AMHERST
193	3	ERIE	TOWN OF NEWSTEAD, SAND HILL ROAD
194	3	ERIE	N. Y. S. DEPT. OF TRANS., INDIAN RD., CHEEKTOWAGA
195	3	ERIE	N. Y. S. THRUWAY AUTHORITY, EXIT 52, CHEEKTOWAGA
196	2	ERIE	NIAGARA FRONTIER PORT AUTHORITY, FUHRMANN BLVD., BUFFALO
197	3	ERIE	TOWN OF NORTH COLLINS, KETCHUM ROAD
198	2	ERIE	FOX ROAD SITE, LANGFORD AND SHIRLEY ROADS, NORTH COLLINS
199	2	ERIE	FLOOD BROTHERS, AERO DRIVE, CHEEKTOWAGA
200	3	ERIE	FROCKNAL AND KATRA, ELECTRIC AVENUE, BLASDELL
201	2	ERIE	SEAWAY INDUSTRIAL PARK, RIVER ROAD, TONAWANDA
202	2	ERIE	VILLAGE OF SPRINGVILLE, MILL STREET
203	2	ERIE	SQUAW ISLAND, BUFFALO
204	3	ERIE	WILLIAM STRASSMAN PROPERTY, RIVER ROAD, TONAWANDA
205	2	ERIE	STOCKS POND, BROADWAY AND TRANSIT ROAD, DEPEW
206	2	ERIE	TIFFT FARM, BUFFALO
207	2	ERIE	CITY OF TONAWANDA, WALES AVENUE
208	3	ERIE	VETERANS PARK, NIAGARA STREET, TONAWANDA
209	3	ERIE	TOWN OF WALES, FISH HILL ROAD
210	2	NIAG	AIR FORCE PLANT 38, PORTER AND BALMER ROADS, PORTER
211	2	ERIE	AIR FORCE PLANT 40, KENMORE AVENUE, TONAWANDA
212	1	NIAG	AIR FORCE PLANT 68, LUTTS ROAD, MODEL CITY
213	2	NIAG	AIR FORCE PLANT 68, LUTTS ROAD, MODEL CITY
214	2	NIAG	LOCKPORT AIR FORCE BASE, LOCKPORT
215	1	NIAG	LAKE ONTARIO ORDINANCE WORKS, MODEL CITY IGLOO AREA, LEWISTON

Following the release of the Task Force report, two additional hazardous waste studies were undertaken jointly by the DEC and the DOH. Both attempted to identify hazardous waste disposal sites on a statewide basis. Toxic Substances in New York's Environment was released in 1979.2 A total of 520 dumps were identified and characterized as follows:

> "These sites contain an enormous variety of toxic materials found under a wide range of conditions. A few sites have been granted permits as controlled disposal areas for hazardous waste, but many are obsolete or abandoned sites where inappropriate soil and groundwater conditions allow the escape of toxic substances and materials lie open to direct contact by people and animals."

Hazardous Waste Disposal Sites in New York was released in 1980. It identified a total of 680 properties "where known or suspected hazardous waste disposal sites have been found."

In addition, the U.S. Environmental Protection Agency has compiled its own listing of 844 hazardous or potentially hazardous waste dumps in New York.3

These four studies generally rely on the same data base. Consequently, they are all incomplete in the same way. Not one of them provides a detailed analysis of the full extent of the hazardous waste problem in the Niagara Frontier.

First, the precise amounts and types of waste actually buried in individual dumps are not known for certain. According to the Task Force report:

> It should be stressed that much of the information on disposal sites is general and tentative. Some of the data on wastes is derived, not from specific company records, but from estimates of past activities and personal recollections. Moreover, even where detailed information is

available, it usually describes the quantities and types of waste placed in an area, and not necessarily the substances there now.

Similarly, the Hazardous Waste Disposal Sites in New York report states that actual dumping of hazardous wastes has been confirmed at only 40 percent of the identified sites. The exact boundaries of approximately 40 percent of the sites are also unknown. These limitations underscore the fact that, at best, the physical dimensions of the hazardous waste disposal problems in Western New York are poorly defined.

In addition, the potential and actual health and environmental hazards posed by each dump are uncertain. The Task Force report fails to detail exactly what problems have resulted from hazardous waste disposal at the 215 sites. Its main purpose was simply to locate dump sites. Consequently, comprehensive field investigations were not carried out. The make-up of each landfill was not determined. Test borings to locate plumes of pollution emanating from each dump were not undertaken. Similarly, the EPA's efforts were also limited to developing a list of dumps, not to investigate the problems they have caused. That task is only supposed to be addressed when site-specific studies are initiated at each dump. Neither timetables nor plans have been established for these studies. The two statewide hazardous waste studies attempted to assess health and environmental hazards, but both fail. According to the Hazardous Waste Disposal Site report, environmental assessments were based on generalities: "regarding the evaluation of possible environmental impacts from hazardous wastes found in dumpsites." Health hazard assessments were also based on meager amounts of detailed information. "Because of the scarcity of firm environmental and health data, most of the health assessments noted on the site reports are simply general statements of health concerns and records of involvement of the Department of Health at the site." Finally, the report describes the site evaluation process this way: "In most cases, the evaluations shown on the individual site report forms are preliminary, and based on extremely limited information about materials present, soil and water conditions at the site, apparent effects on biological systems or industrial practices."

This method of analysis produces Catch-22-like problems. Since very little research has been undertaken to discover precisely what kinds of health hazards result from low-level, environmental exposures to toxic pollutants emanating from dumps, statements of general health concerns are necessarily limited. Furthermore, the DOH has previously been engaged in a very small number of waste dump investigations involving human health hazards. As a result, there is very little information to report. Due to these fundamental flaws, virtually all of the identified hazardous waste dumpsites were characterized as "health hazard unknown" or "no apparent hazard."

Obviously this review process does not provide assurances that pollution hazards do not exist. It only fails to identify them. When an absence of analytical and field support services prevents authorities from identifying the specific problems associated with large numbers of dumps, evidence is not gathered to prove that dangers actually do exist. Thus, there is no obvious reason to secure the dumps and minimize the public's exposure to toxics leaking from them. The threat, in effect, is allowed to exist unabated.

It has been more than three years since hundreds of dumps were first identified in Western New York. Yet, a full-scale, systematic program has not been established to cope with the environmental and public health hazards threatening the Niagara River and its surrounding environment. Resource commitments to laboratory, legal, scientific, and technical assistance programs remain uniformly inadequate. Consequently, only a few sites have either been investigated or abated as sources of pollution. During the last three years, most of the state and federal government's research and legal efforts have focussed on the dumps owned by the Hooker Chemical and Plastics Company, notably the Love Canal. Yet, not one final settlement has been reached, and meanwhile, scores of other dumps have been left in the lurch. At their present rate of accomplishment, it will be several centuries, if ever, before all the sites are investigated thoroughly and made secure.

It is beyond dispute that existing environmental protection programs have been overwhelmed by the problem of abandoned hazardous waste dumps. Yet obsolete landfills are only part of a larger problem. During the last 50 or more years, industries were not required by law to dispose of wastes properly. As a result, it was common industrial practice to bury toxic wastes on-site or in nearby dumps. Few, if any, burial sites were designed, constructed or maintained to minimize the escape of pollution. Not until 1976 was the Resource Conservation and Recovery Act passed to govern the land disposal of wastes nationwide. This law was passed long after the national Clean Air and Clean Water Acts. Consequently its implementation has lagged behind most of the other environmental statutes passed in the 1970's.

New York State is one of the ten largest generators of hazardous waste in the nation. Based on the findings of a voluntary statewide survey conducted by the DEC between 1976 and 1978, 1,170 companies generate approximately 1.2 million tons of hazardous waste annually. Approximately 44 percent of these wastes were generated by 201 industries located in Erie and Niagara Counties. Erie County was the largest generator of hazardous waste in the state with 287,719 tons of hazardous waste generated annually, and a 23.3 percent share of the states total annual output of hazardous waste. Niagara County was the second largest generator with 261,292 tons of hazardous waste generated annually and a 21.1 percent share of the total annual output of hazardous waste. In comparison, the third largest generator of hazardous waste was Orange County, with 102,830 tons of wastes and an 8.3 percent share of the state's total output.[4]

Table 19 indicates the types and amounts of hazardous waste generated annually in Erie County

TABLE 19
HAZARDOUS WASTE GENERATION IN ERIE COUNTY

TYPE	DESCRIPTION	QUANTITY GALLONS	TONS
ERIE			
101	ACID SOLUTIONS-HEAVY METALS	66,760	0
103	ACID SOLUTIONS-OTHER METALS	2,710	0
105	OTHER ACID SOLUTIONS	4,065,440	0
106	SPENT ETCHANT	165,094	0
107	SPENT PICKLE LIQUOR	11,874,117	10,577
114	ALKALI SOLUTION-OTHER METALS	3,150	0
115	CYANIDE SOLUTION	3,970	0
115	OTHER ALKALINE SOLUTIONS	76,135	0
121	NON-SOLVENT INORGANIC LIQUID	2,420	0
122	INORGANIC LIQUID-HEAVY METAL	42,275	0
124	OTHER INORGANIC SOLIDS	0	5,909
301	HALOGEN SOLVENT-HEAVY METALS	1,935	0
303	OTHER HALOGENATED SOLVENTS	11,700	0
304	NON-HALOGENATED SOLVENTS	766,800	0
305	OTHER SOLVENT-HEAVY METAL	500	0
307	UNKNOWN SOLVENT	1,500	0
310	MIXTURE OF SOLVENTS	203,634	0
311	HALOGENATED ORGANIC LIQUIDS	55	0
314	OTHER ORGANIC LIQUIDS	254,615	0
315	OTHER ORGANIC SOLIDS	2,200	0
501	AMMONIUM THIOSULFATE SLUDGE	0	53
502	DEGREASING SLUDGE	140	0
503	DESCALING SLUDGE	14,950	0
504	DRAG-OUT SLUDGE	1,115,000	0
506	FILTER PRESS SLUDGE OR SOLID	0	7,305
508	HEAVY METAL SLUDGE	1,312,860	30
509	INK SOLIDS AND SLUDGES	5,720	1
511	METAL FINISHING SLUDGE	24,055	118
512	OIL SLUDGE	267,750	0
513	PAINT SOLIDS AND SLUDGES	40,013	25
515	PCB SOLID OR SLUDGE	57	0
520	SCRUBBER SLUDGE	87,715	200
521	TETRAETHYL LEAD SLUDGE	0	4
522	WASTEWATER TREATMENT SLUDGE	9,162,870	75,314
523	PHOSPHATE SLUDGE	98,000	0
525	API SEPARATOR SLUDGE	516,000	0
526	SULFUR SLUDGE	135,000	0
602	DUST COLLECTOR WASTE	0	10,910
603	BOILER WASH	500,000	0
607	CONTAMINATED CONTAINERS	0	12
610	CONTAMINATED PALLETS	60	0
611	CONTAMINATED SOIL	0	8,899
612	NON-EMULSIFIED WASTE OIL	6,195,955	0
613	EMULSIFIED OIL	1,204,090	0
617	FLY ASH	0	8,759
619	HALOGENATED STILL BOTTOMS	3,000	0
621	LAGOON BOTTOMS	0	101
622	LAGOON TOPS	110	0
623	LOW-LEVEL RADIOACTIVE WASTE	0	28
628	LAB CHEMICALS	13,805	10
629	NON-HALOGENATED STILL BOTTOM	10,550	0
630	NON-HALOGENATED TANK RESIDUE	3,950	1
631	OFF-SPEC CHEMICALS	42,000	52
633	OFF-SPEC PHARMACEUTICALS	491	5
635	MINERAL OIL	1,660	0
636	PHOTOGRAPHIC CHEMICAL WASTE	75,720	0
637	PHENOLIC RESIN WASTE	38,828	0
638	SPILL CLEAN-UP	14,090	10
641	SOLDER FLUX OR WAVE OIL	0	0
644	SPENT CATALYST	0	342
647	WASTE TAR	0	8
649	TEXTILE COATING SOLUTIONS	10,800	0
651	MIXED OILS	1,241,680	0
653	OTHER MIXED WASTE	524,074	1
655	LAB ANIMALS AND HUMAN BLOOD	15,000	0
662	OTHERS	0	8,748
TOTAL COUNTY		40,261,168	138,069

Table 20 indicates the types and amounts of hazardous waste generated annually in Niagara County.

TABLE 20
HAZARDOUS WASTE GENERATION IN NIAGARA COUNTY

TYPE	DESCRIPTION	QUANTITY GALLONS	TONS
NIAGARA			
101	ACID SOLUTIONS-HEAVY METALS	600,000	0
105	OTHER ACID SOLUTIONS	143,000	54,000
107	SPENT PICKLE LIQUOR	460,000	0
115	CYANIDE SOLUTION	3,000	0
116	OTHER ALKALINE SOLUTIONS	507,360	0
121	NON-SOLVENT INORGANIC LIQUID	7,050,000	2
122	INORGANIC LIQUID-HEAVY METAL	400	10
124	OTHER INORGANIC SOLIDS	0	1,664
125	INORGANIC GASES	0	375
303	OTHER HALOGENATED SOLVENTS	16,715	0
304	NON-HALOGENATED SOLVENTS	2,600	3
310	MIXTURE OF SOLVENTS	33,300	0
311	HALOGENATED ORGANIC LIQUIDS	3,695,050	507
314	OTHER ORGANIC LIQUIDS	4,318,310	90
315	ORGANIC LIQUID-HEAVY METAL	200	0
317	HALOGENATED ORGANIC SOLIDS	0	105
504	DRAG-OUT SLUDGE	33,000	0
505	FILTER PRESS SLUDGE OR SOLID	0	1,351
508	HEAVY METAL SLUDGE	4,500,000	2,002
509	INK SOLIDS AND SLUDGES	10,000	0
510	LIME SLUDGE	404,000	2,252
511	METAL FINISHING SLUDGE	0	56
513	PAINT SOLIDS AND SLUDGES	67,960	1
517	PHENOLIC SOLID OR SLUDGES	0	452
520	SCRUBBER SLUDGE	14,000	0
522	WASTEWATER TREATMENT SLUDGE	30,000	67,750
523	BRINE SLUDGE	506,894	32,500
529	SILICON TETRACHLORIDE SLUDGE	0	136
601	ASBESTOS	0	26
602	DUST COLLECTOR WASTE	0	3
607	CONTAMINATED EQUIPMENT	0	1,632
608	CONTAMINATED CLOTHES OR RAGS	0	3
609	CONTAMINATED CONTAINERS	0	126
611	CONTAMINATED SOIL	0	169
612	NON-EMULSIFIED WASTE OIL	224,400	0
613	EMULSIFIED OIL	1,865	0
619	HALOGENATED STILL BOTTOMS	27,500	0
621	LAGOON BOTTOMS	2,400	0
622	LAGOON TOPS	32,000	0
628	LAB CHEMICALS	2,565	0
629	NON-HALOGENATED STILL BOTTOM	660	234
630	NON-HALOGENATED TANK RESIDUE	0	455
631	OFF-SPEC CHEMICALS	990	10
632	OFF-SPEC PESTICIDES	0	103
637	PHENOLIC RESIN WASTE	0	100
638	SPILL CLEAN-UP	0	64
651	MIXED OILS	4,430	0
652	RETORT ASH	0	9
653	OTHER MIXED WASTE	70,250	27
658	POLYESTER RESIN	660	0
661	ALUMINUM OR TIN DROSS	0	265
TOTAL COUNTY		22,763,509	166,480

In New York State, the implementation of the Resource Conservation and Recovery Act (RCRA) is the joint responsibility of the EPA and the DEC. Under RCRA, EPA is charged with the responsibility to regulate "the treatment, storage, transportation and disposal of hazardous wastes which have adverse effects on health and the environment." Congress specifically instructed the EPA to identify and define hazardous wastes and prescribe standards for their proper labeling, handling, shipping and ultimate disposal, as well as to set standards for the proper operations of hazardous waste treatment, storage and disposal sites. When the New York State Legislature passed the Hazardous Waste Management Act in 1977 the DEC was authorized to administer RCRA in New York under the supervision of the EPA.

To date, however, a comprehensive hazardous waste regulatory system has not been established. Regulations required by many sections of RCRA are in the process of being proposed, promulgated or adopted. While, at the same time, other critical sections of the law have not been addressed at all. A definition of what constitutes a hazardous waste is available and storage facility, surface impoundments and incinerator operating standards are also in place. But land disposal regulations to upgrade existing facilities are not. Moreover, emergency interim land disposal criteria are vague and may be difficult to translate into action. Finally, both the EPA and the DEC are in the process of establishing a manifest system to track the transport and disposal of hazardous wastes through a "cradle to grave" record keeping system. Both systems differ, however, in fundamental ways. The federal system does not monitor the transport of wastes as strictly as the New York State system. It also provides a waiver for companies that generate less than 1,000 kilograms of waste per year.

However, even a full set of adopted regulations is no guarantee of success. Never before has the disposal of hazardous wastes been tightly controlled, and this study documents the formidable problems that air and water regulatory programs have encountered. Both of these programs were better funded and initiated years before RCRA even became law. Yet neither one has carried out its mandates. Gearing up the state and federal bureaurcracies to establish a sound hazardous waste disposal program will be a difficult, if not impossible, task. Merely processing the massive amounts of information presently being supplied by hazardous waste generators is time consuming. Without adequate levels of basic legal, technical, and analytical and clerical support services, the job becomes unrealistically tough.

Traditional solid waste programs focused on solid waste problems typically associated with sanitary landfills. These can pose serious environmental and health problems, but hazardous wastes encompass an entirely different realm of catastrophic pollution scenarios. Developing a program to address and cope with those problems will require time, experience, and great expense.

At this early stage of development, state and federal programs are susceptible to sabotage through campaigns to withhold waste generation and disposal information or to provide misleading information to the authorities. If industries unified to thwart the implementation of tough hazardous waste programs, there is little that the regulatory authorities would be able to do to stop them. Environmental agencies lack the resources to challenge large numbers of recalcitrant firms in court to force them to submit accurate and complete information on a timely basis. Information that is supplied cannot be properly verified.

Political and economic factors also jeopardize New York's hazardous waste programs. President Ronald Reagan's Draconian budget cuts will critically hamper EPA's efforts to develop programs and promulgate regulations required by RCRA. Without benefit of national standards and support from EPA, New York State will have dire problems implementing its own program, much of which is keyed to EPA's actions. Moreover, New York would have political difficulties establishing a comprehensive program while national efforts were delayed as a result of intensified efforts to revive America's flagging industrial base. Fiscally, New York lacks the revenue to support its present environmental program. Expansion would be out of the question.

Industrial generators of hazardous waste are not the only challenge facing the developing regulatory system. The Niagara Frontier is the home of two of the largest commercial hazardous waste disposal sites in the country, which pose serious potential environmental and public health problems. Since 1973, SCA Chemical Waste Services, Inc. has operated a 630 acre facility on a site that was formerly part of the federally owned Lake Ontario Ordinance works. It is located in the Town of Lewiston and Porter on Balmer Road, on a flat lowland site which is drained by two streams that drain into Lake Ontario: Twelve Mile Creek and Six Mile Swale. Hazardous wastes, reportedly received from at least 31 states, Canada, Puerto Rico, and Taiwan[5], have been disposed of at the site since 1972. The following materials are accepted for disposal:

- Solvents, both halogenated and non-halogenated
- Solvents, both halogenated and non-halogenated
- Acids, with and without heavy metals
- Aqueous waste including:
  - alkaline solutions with and without heavy metals
  - phenol contaminated water
  - PCB contaminated water
  - aqueous contaminated with heavy metals
  - brine solutions
  - aqueous solutions with organics
- Still and tank bottoms, paint sludges, heavy metal sludges, PCB solid waste, packaged lab chemicals contaminated soil and earth, solid organic waste
- Cyanide waste
- Organic liquids including oil and PCBs [6]

Chemical and Environmental Conservation Systems (CECOS) International, Inc., formerly Newco Waste Systems Incorporated, operates a 385 acre facility on a site that has been a waste disposal area since 1897, When it was used by the predecessor company of Union Carbide Corporation's Metals Division. Located in the Town of Niagara and the City of Niagara Falls, the site is bounded by Interstate 190 on the east and north, Packard Road and the Niagara Junction Railroad on the west, and the Great Lakes Carbon Company on the south. Lowlands that are considered federal flood hazard areas are located in the northeastern and central portions of the site. Pike's Creek also originates near the center of the site and flows south toward Pine Avenue. CECOS has operated the facility since 1976. The following materials are accepted for disposal:

Halogenated hydrocarbon residues
Halogenated still bottoms
PCB contaminated solids
Aromatic hydrocarbon residues
Halogenated organic residues
Pesticide residues
Tar residues
Substituted aromatic residues
Asbestos containing wastes
Laboratory chemical waste
Paint sludge
Solids containing cyanide
Organic residues and sludges
Oil sludges
Acid solutions containing heavy metals and oraganics
Waste ferric chloride
Alkaline solutions
Heavy metal sludges
Alkaline sludges
Acidic sludges
Oil/water waste
Wastewater treatment plant sludges
Inorganic wastes containing sulfur, nitrogen, etc.
Fly ash
Contaminated sand and soil
Spent activated carbon
Wastewaters contaminated with organics [7]

SCA recycles and separates liquid wastes through flash distillation and prepares specially blended mixtures for use as fuels. Liquid residues are treated on-site with lime in a centrifugal neutralizer and open-top reaction vessel. Contaminated wastewaters are aerated, passed through an activated icarbon adsorption system and discharged into the streams that flow across the site. A direct discharge line to the Niagara River has recently been approved by the DEC and is being used. This line will allow the facility to eliminate wastewaters that have collected because the volume of water in the local streams has been inadequate to provide acceptable dilution levels required by the DEC. Waste residues generated by the treatment system are deposited along with other solid hazardous wastes in a series of "secure landfill burial sites."

CECOS recycles waste lime, salvages scrap metal and metal from foundry sand, and operates an industrial fill area, a sanitary landfill and "secure landfill burial sites".

The "secure landfill burial sites" operated by both these firms are causes of serious concern. Contrary to their titles, they are not guaranteed to be secure. Both firms have excavated pits in the native clay soils and lined the pits with layers of compacted clay separated by an artificial liner. Solid hazardous wastes are buried in the pits and covered over with clay or other materials. Although each site is equipped with leachate collection systems designed to prevent the infiltration of chemically contaminated wastes into groundwaters underlying the landfills, the security of these waste disposal facilities is compromised by two main factors: 1) a limited understanding of the basic chemistry of synthetic organic compounds, and 2) an inability to design a structure capable of holding hazardous wastes securely for long periods of time. Compacted clay layers, for example, are the main means of retaining materials within the landfills. But even though clay is a dependable barrier against the migration of water, it is not as effective in retaining the broad spectrum of organic chemicals that make up wastes accepted for disposal by both of these firms. In fact, many low molecular weight solvents are capable of breeching the clay foundations of the landfills. In addition, although artificial plastic liners are also effective barriers to water, they can neither resist the attack of organic chemical solvents nor prevent their passage into subterranean groundwaters.

Maintaining the integrity of the plastic liner is a fundamental problem. In constructing the landfills, large sheets of thick liner are laid out and must be sealed together. If the seams are not perfect, however, leachate can eventually seep through the artificial barrier into the groundwaters below. Even if the landfill is successfully lined, the process of installing a layer of compacted clay on top of the plastic often tears holes in the fragile plastic material.

The leachate control systems in these types of landfills are also prone to failure. Once tons of waste are deposited in the landfill, it is difficult to repair clogged or otherwise faulty drainage systems. If these problems are not corrected, however, the clay lined pits can fill up with water from rain and other forms of precipitation. This problem has already occurred at CECOS.

Unless hazardous wastes are properly segregated during burial and kept separated, potentially disastrous chemical reactions can take place. Spontaneous combustion often takes place in sanitary landfills. Similar reactions in the presence of highly inflammable wastes could severely damage the structural integrity of the landfill, and widespread dispersal of toxic pollutants could result. Moreover, the likelihood of such an event is not necessarily reduced by the passage of time. Hazardous wastes composed of synthetic organic chemicals are exceedingly stable, and entombed in a cold, underground environment devoid of light and air, their breakdown would proceed at extremely slow rates. The combustible and reactive qualities of certain wastes could be retained for long periods of time.

It is this facet of hazardous waste disposal that underscores the flawed logic of burying chemical residues. The facilities operated by CECOS and SCA will continue to pose serious potential environmental and public health threats to the Niagara Frontier far into the future. Once the wastes are deposited on-site, they will remain there for periods up to thousands of years. Constant maintenance of the landfills will be required at all times. The design and construction problems outlined in this section will be exacerbated greatly by the day-to-day difficulties of operating the facility smoothly over the long run. In the past, both companies have experienced problems with the volatilization of wastes resulting in noxious odors, imiproper leachate control and, particularly in the case of SCA, accidental spills of hazardous material. Ultimately, even if these operational problems could be managed, these sites, like the Love Canal, could cause catastrophic pollution problems many decades after ceasing to serve as active disposal areas. In fact, the same potential exists for all landfilled hazardous wastes.

In reviewing the Niagara Frontier's hazardous waste dilemma, it is clear that neither the commercial, the industrial, nor the abandoned waste disposal sites have been designed, constructed or maintained to be able to provide secure long-term storage of chemical wastes. Existing regulatory efforts are not capable of addressing these problems due to a lack of field investigation personnel and legal, scientific, technical, analytical and clerical support. As a result, the threat of known sources of contamination in close proximity to the Niagara River, water supply facilities, and homes remains unabated. Meanwhile, massive amounts of hazardous waste stream into the area from all over the country to be buried in commercial disposal sites that pose potential public health and environmental problems on an unprecedented scale.

CHAPTER VI

Monitoring of Selected Pollution Sites

From the analysis outlined in the previous sections of this report, it is evident that systematic failures to control synthetic organic chemical discharges from industrial facilities, hazardous waste landfills and municipal wastewater treatment plants have resulted in the contamination of major portions of the Niagara River. Yet, even though hundreds of sources of toxic pollution have been clearly identified, few have ever been monitored for the chemical contaminants that they let loose into the environment. As a result, relatively little precise information has been gathered detailing the kinds and amounts of industrial pollutants that flow into the Niagara River.

In order to overcome this lack of monitoring data, a limited sampling and analysis effort was mounted to accomplish two goals: 1) to verify that toxic chemicals are actually being released from selected pollution sources that are reviewed in this study; and 2) to confirm the basic conclusion of this investigation that current water pollution control, hazardous waste management, drinking water protection and environmental monitoring programs are fundamentally unable to cope with toxic contamination problems in the Niagara River and its surrounding environment.

A total of 73 samples were collected from a wide range of locations and analyzed using either integrated gas chromatography/mass spectrometry (GC/MS) techniques or the Ames Test. Each portion of the monitoring program is described below.

GC/MS Analyses

On the morning of July 17, 1981 two sets of wastewater samples were collected for integrated GC/MS priority pollutant analyses.

The first set of samples was collected at the City of Niagara Falls wastewater treatment plant from the post-chlorination chamber just above the weir overflow to the facility's discharge line to the Tail Race Tunnel. The chamber was filled with greenish water flecked with floating solids, minute pieces of debris and white, yellow and brown foam. A stainless steel 1000 milliliter (ml) sample container used routinely by the wastewater treatment plant personnel was rinsed three times with reagent grade methylene chloride and then filled and emptied three times with wastewater. Two one-gallon prepared extractable organics analysis sample bottles were alternatively filled, one 1000 ml aliquot at a time. Both samples were collected by J.R. Westendorf, Chief Chemist of the City of Niagara Falls wastewater treatment plant, in the presence of Walter L. T. Hang, NYPIRG Staff Scientist, and Tony Lapino, NYPIRG Citizens Alliance organizer. One sample was collected for NYPIRG. The second sample was collected for the treatment plant authorities.

Next, four prepared metals analysis sample containers were filled, two containers at a time, from the same 1000 ml aliquot. Two samples were for NYPIRG. Two were for the treatment plant authorities.

Finally, four prepared volatile organics analysis sample containers were filled, all from the same 1000 ml aliquot. Again, the samples were split between NYPIRG and the wastewater treatment plant authorities.

After being collected, each sample was stored in ice. Sampling began at 10:11 AM and ended at 10:25 AM.

Less than one and a half hours later, the second set of samples was collected from a wall located on the northern edge of the Tail Race Tunnel outfall. A prepared sample container was dipped into the mixing zone of the discharge. The water was greenish with white foam. Walter Hang collected the samples in the presence of Tony Lapino and Patrolman Thomas V. Gilbert, Niagara Frontier State Park and Recreation Commission. All three sets of containers were immediately stored in ice. Sampling began at 11:30 AM and ended at 11:45 AM.

Both sets of samples were packed completed with ice and sent by Federal Express to the Energy Resources Company, Incorporated, in Cambridge, Massachusetts. Following guidelines and procedures established by the EPA, this EPA-authorized laboratory analyzed the two samples for priority pollutants.

Figure 13 is the GC scan of the Acid fraction of the Niagara Falls treatment plant's effluent.

FIGURE 13
ACID FRACTION GAS CHROMATOGRAPH SCAN
OF THE CITY OF NIAGARA FALLS WASTEWATER TREATMENT PLANT EFFLUENT
July 17, 1981

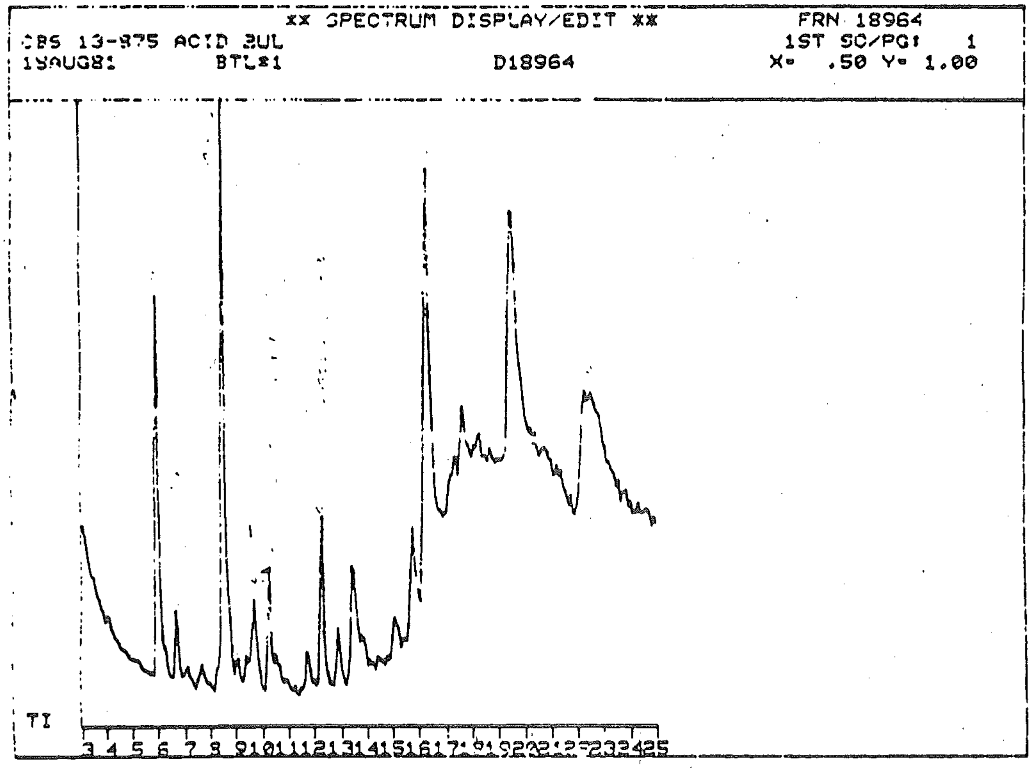


Figure 14 is the GC Scan of the Base/Neutral fraction of the Niagara Falls treatment plant's effluent.

FIGURE 14
BASE/NEUTRAL FRACTION GAS CHROMATOGRAPH SCAN
OF THE CITY OF NIAGARA FALLS WASTEWATER TREATMENT PLANT EFFLUENT
July 17, 1981

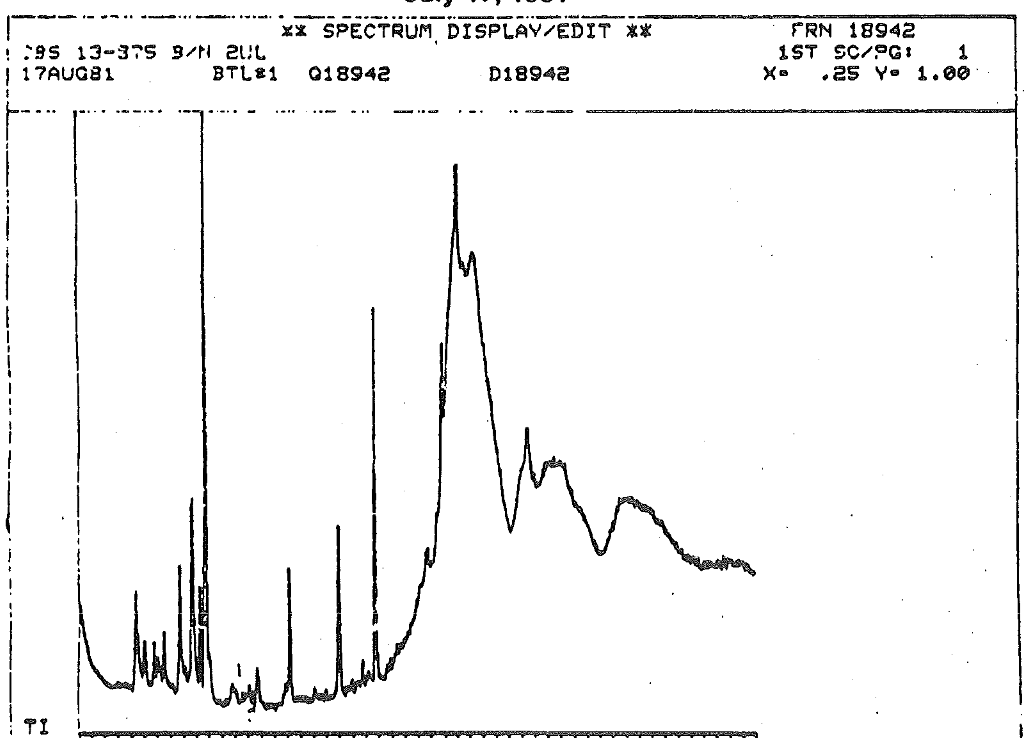


Figure 15 is the GC Scan of the Volatile fraction of the Niagara Falls treatment plant's effluent.

FIGURE 15
VOLATILE FRACTION GAS CHROMATOGRAPGH SCAN
OF THE CITY OF NIAGARA FALLS WASTEWATER TREATMENT PLANT EFFLUENT
July 17, 1981

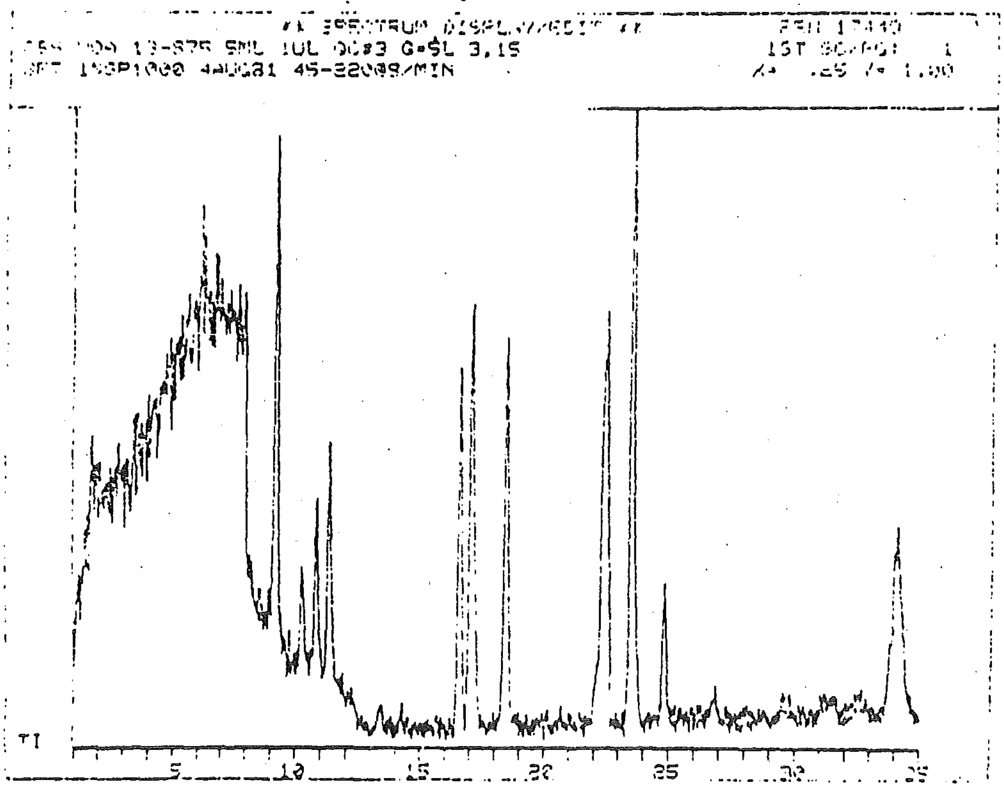


Figure 16 is the GC Scan of the Acid fraction of the Tail Race Tunnel discharge sample.

FIGURE 16
ACID FRACTION GAS CHROMATOGRAPH SCAN
OF THE TAIL RACE TUNNEL DISCHARGE
July 17, 1981

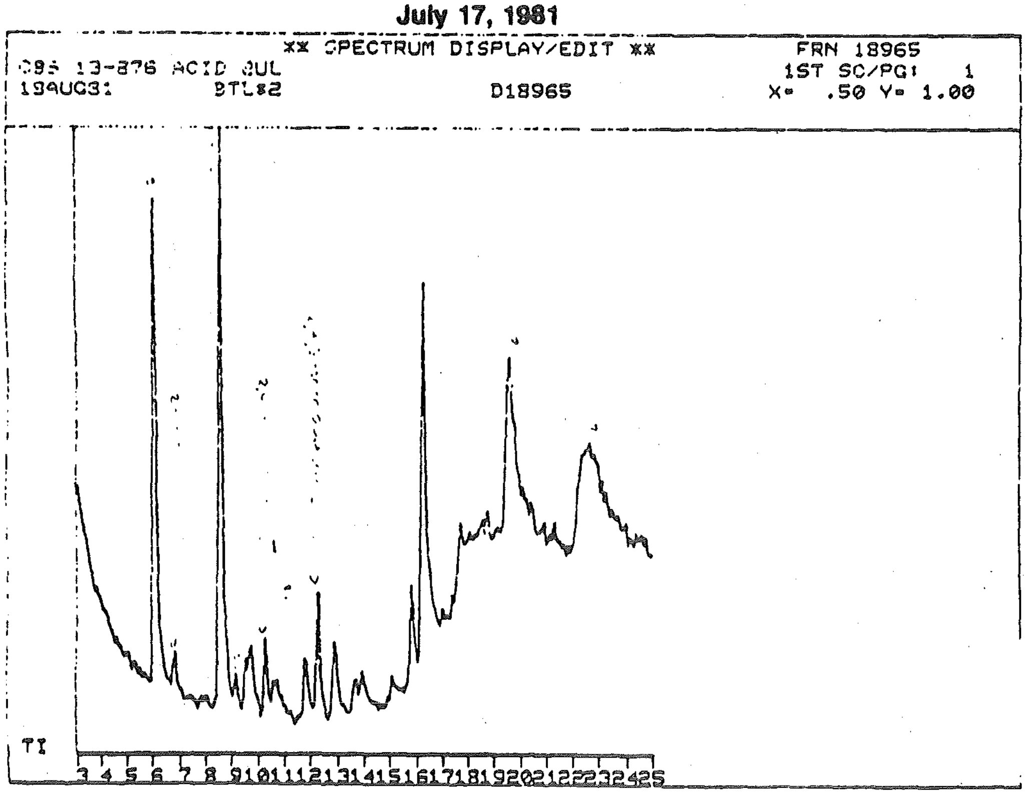


Figure 17 is the GC Scan of the Base/Neutral fraction of the Tail Race Tunnel discharge sample.

FIGURE 17
BASE/NEUTRAL FRACTION GAS CHROMATOGRAPH SCAN OF THE TAIL RACE TUNNEL DISCHARGE
July 17, 1981

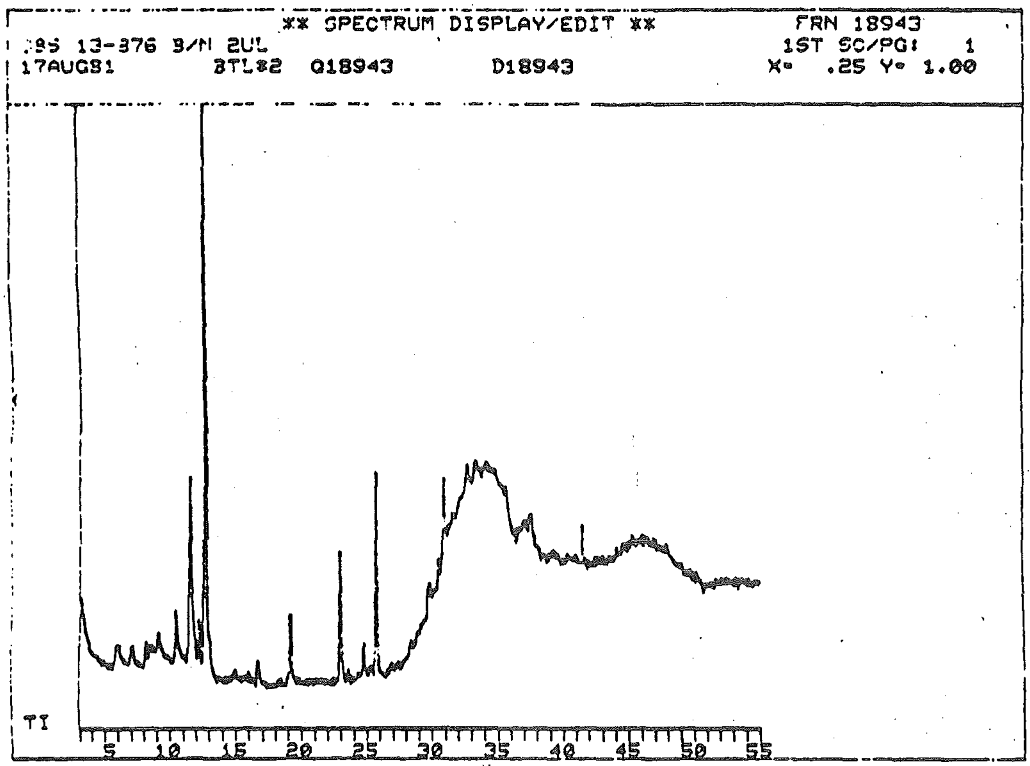


Figure 18 is the GC Scan of the Volatile fraction of the Tail Race Tunnel discharge sample.

FIGURE 18
VOLATILE FRACTION GAS CHROMATOGRAPH SCAN OF THE TAIL RACE TUNNEL DISCHARGE
July 17, 1981

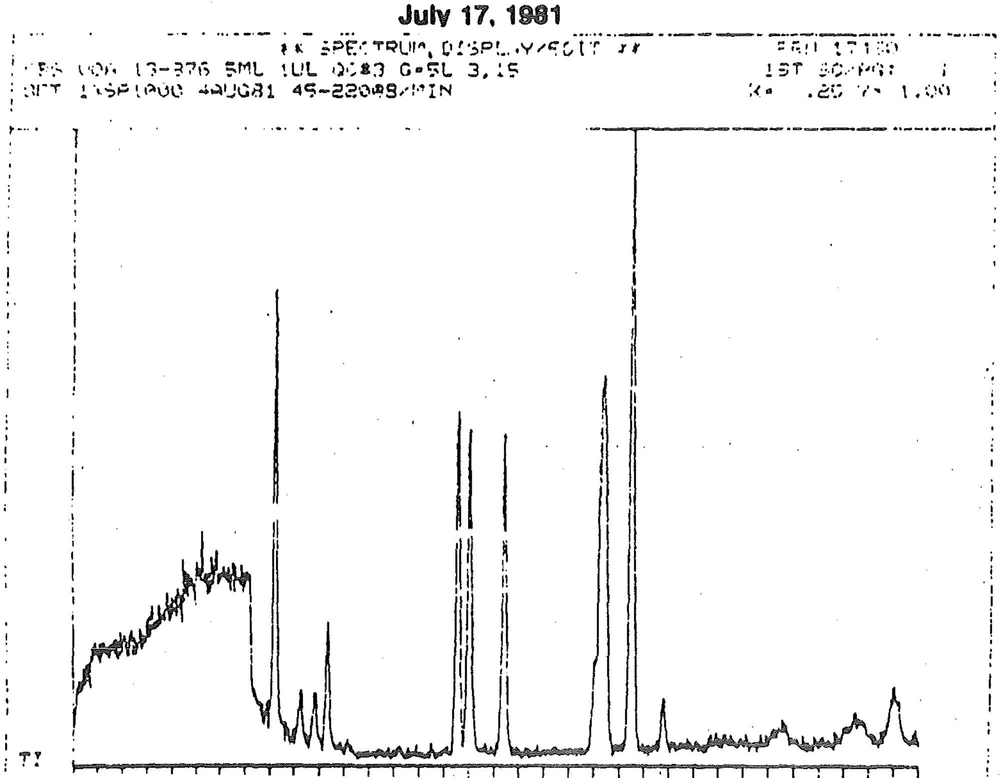


Table 21 lists the analytical results of the Niagara Falls treatment plant's effluent sample.

TABLE 21
PRIORITY POLLUTANTS DETECTED IN CITY OF NIAGARA FALLS WASTEWATER TREATMENT PLANT EFFLUENT, July 17, 1981

	ACID COMPOUNDS	ug/l
21A	2,4,6-trichlorophenol	13
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	*
31A	2,4-dichlorophenol	12
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	46

	BASE/NEUTRAL COMPOUNDS	ug/l
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	11
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	13
26B	1,3-dichlorobenzene	*
27B	1,4-dichlorobenzene	*
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	*
40B	4-chlorophenyl phenyl ether	ND
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	*
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	*
67B	butyl benzyl phthalate	*
68B	di-n-butyl phthalate	*
69B	di-n-octyl phthalate	ND
70B	diethyl phthalate	*
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene /chrysene	*
73B	benzo(a)pyrene	*
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	*
76B	chrysene	See 72B
77B	acenaphthylene	ND
78B	anthracene /phenanthrene	*
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	See 78B
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	*
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

	VOLATILES	ug/l
2V	acrolein	ND
3V	acrylonitrile	ND
4V	benzene	27
6V	carbon tetrachloride	*
7V	chlorobenzene	*
10V	1,2-dichloroethane	ND
11V	1,1,1,-trichloroethane	*
13V	1,1-dichloroethane	ND
14V	1,1,2-trichloroethane	ND
15V	1,1,2,2-tetrachloroethane	11
16V	chloroethane	ND
17V	bis(chloromethyl)ether	ND
19V	2-chloroethylvinyl ether	ND
23V	chloroform	62
29V	1,1-dichloroethylene	ND
30V	1,2-trans-dichloroethylene	75
32V	1,2-dichloropropane	ND
33V	1,3-dichloropropylene	ND
38V	ethylbenzene	ND
44V	methylene chloride	49
45V	methyl chloride	ND
46V	methyl bromide	ND
47V	bromoform	ND
48V	dichlorobromomethane	*
49V	trichlorofluoromethane	ND

	PESTICIDES	μg/l
89P	aldrin	ND
90P	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT	ND
93P	4,4'-DDE	ND
94P	4,4'-DDD	ND
95P	α -endosulfan	ND
96P	β -endosulfan	ND
97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	α -BHC	ND
103P	β -BHC	ND
104P	γ -BHC	ND
105P	δ -BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	*
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

50V	dichlorodifluoromethane	ND
51V	chlorodibromomethane	ND
85V	tetrachloroethylene	36
86V	toluene	*
87V	trichloroethylene	70
88V	vinyl chloride	ND
	xylenes	12

ND = none detected
NA = not applicable
* = 1-9 μg/l (for pesticides 0.1-1.0ug/l)
Reported by:
Checked by:

As	Be	Cd	Cr	Cu	Ni	Pb	Sb	Se	Tl	Zn	Ag	Hg
<5	<0.5	<0.5	5	29	7	<5	<2	6	<2	23	<0.5	0.28
<5	<0.5	<0.5	6	28	7	<5	<2	<5	<2	23	<0.5	0.2[illegible]

All data are in concentration units of ppb unless stated otherwise.

SURROGATE RECOVERIES

ACID	% Recovery	BASE NEUTRAL COMPOUNDS	% Recovery	VOLATILES	% Recovery
d_6-phenol	27%	d_8-naphthalene	64%	d_6-benzene	80%
2-fluorophenol	40%	d_5-pyridine	NA	d_8-toluene	91%
pentafluorophenol	53%	d_5-nitrobenzene	69%		
		fluoroaniline	39%		
		fluoronaphthalene	58%		

Table 22 lists the analytical results of the Tail Race Tunnel discharge sample.

TABLE 22
PRIORITY POLLUTANTS DETECTED IN TAIL RACE TUNNEL DISCHARGE, July 19, 1981

	ACID COMPOUNDS	μg/l
21A	2,4,6-trichlorophenol	*
22A	p-chloro-m-cresol	ND
24A	2-chlorophenol	*
31A	2,4-dichlorophenol	*
34A	2,4-dimethylphenol	ND
57A	2-nitrophenol	ND
58A	4-nitrophenol	ND
59A	2,4-dinitrophenol	ND
60A	4,6-dinitro-o-cresol	ND
64A	pentachlorophenol	ND
65A	phenol	24

	BASE/NEUTRAL COMPOUNDS	μg/l
1B	acenaphthene	ND
5B	benzidine	ND
8B	1,2,4-trichlorobenzene	*
9B	hexachlorobenzene	ND
12B	hexachloroethane	ND
18B	bis(2-chloroethyl)ether	ND
20B	2-chloronaphthalene	ND
25B	1,2-dichlorobenzene	*
26B	1,3-dichlorobenzene	ND
27B	1,4-dichlorobenzene	*
28B	3,3-dichlorobenzidine	ND
35B	2,4-dinitrotoluene	ND
36B	2,6-dinitrotoluene	ND
37B	1,2-diphenylhydrazine	ND
39B	fluoranthene	ND
40B	4-chlorophenyl phenyl ether	ND

	BASE NEUTRAL COMPOUNDS	μg/l
41B	4-bromophenyl phenyl ether	ND
42B	bis(2-chloroisopropyl)ether	ND
43B	bis(2-chloroethoxy)methane	ND
52B	hexachlorobutadiene	ND
53B	hexachlorocyclopentadiene	ND
54B	isophorone	ND
55B	naphthalene	*
56B	nitrobenzene	ND
61B	N-nitrosodimethylamine	ND
62B	N-nitrosodiphenylamine	ND
63B	N-nitrosodi-n-propylamine	ND
66B	bis(2-ethylhexyl)phthalate	*
67B	butyl benzyl phthalate	*
68B	di-n-butyl phthalate	*
69B	di-n-octyl phthalate	ND
70B	diethyl phthalate	ND
71B	dimethyl phthalate	ND
72B	benzo(a)anthracene	ND
73B	benzo(a)pyrene	ND
74B	3,4-benzofluoranthene	ND
75B	benzo(k)fluoranthene	ND
76B	chrysene	ND
77B	acenaphthylene	ND
78B	anthracene	ND
79B	benzo(ghi)perylene	ND
80B	fluorene	ND
81B	phenanthrene	ND
82B	dibenzo(a,h)anthracene	ND
83B	indeno(1,2,3-cd)pyrene	ND
84B	pyrene	ND
129B	2,3,7,8-tetrachlorodibenzo-p-dioxin	ND

	VOLATILES	μg/l
2V	acrolein	ND
3V	acrylonitrile	ND
4V	benzene	*
6V	carbon tetrachloride	*
7V	chlorobenzene	11
10V	1,2-dichloroethane	ND
11V	1,1,1,-trichloroethane	*
13V	1,1-dichloroethane	ND

	PESTICIDES	μg/l
89P	aldrin	ND
90P	dieldrin	ND
91P	chlordane	ND
92P	4,4'-DDT	ND
93P	4,4'-DDE	ND
94P	4,4'-DDD	ND
95P	α-endosulfan	ND
96P	β-endosulfan	ND

14V	1,1,2-trichloroethane	ND
15V	1,1,2,2-tetrachloroethane	22
16V	chloroethane	ND
17V	bis(chloromethyl)ether	ND
19V	2-chloroethylvinyl ether	ND
23V	chloroform	46
29V	1,1-dichloroethylene	ND
30V	1,2-trans-dichloroethylene	36
32V	1,2-dichloropropane	ND
33V	1,3-dichloropropylene	ND
38V	ethylbenzene	ND
44V	methylene chloride	33
45V	methyl chloride	ND
46V	methyl bromide	ND
47V	bromoform	ND
48V	dichlorobromomethane	*
49V	trichlorofluoromethane	ND
50V	dichlorodifluoromethane	ND
51V	chlorodibromomethane	ND
85V	tetrachloroethylene	62
86V	toluene	*
87V	trichloroethylene	92
88V	vinyl chloride	ND
	xylenes	*

97P	endosulfan sulfate	ND
98P	endrin	ND
99P	endrin aldehyde	ND
100P	heptachlor	ND
101P	heptachlor epoxide	ND
102P	α -BHC	ND
103P	β -BHC	ND
104P	γ -BHC	ND
105P	δ -BHC	ND
106P	PCB-1242	ND
107P	PCB-1254	ND
108P	PCB-1221	ND
109P	PCB-1232	ND
110P	PCB-1248	1.2
111P	PCB-1260	ND
112P	PCB-1016	ND
113P	toxaphene	ND

ND = none detected
NA = not applicable
* = 1-9 $\mu g/l$ (for pesticides 0.1-1.0ug/l)
Reported by: C. Rodgers
Checked by:

As	Be	Cd	Cr	Cu	Ni	Pb	Sb	Se	Tl	Zn	Ag	Hg
<5	<0.5	<0.5	<4	19	<5	<5	<2	<5	<2	150	0.7	0.28
<5	<0.5	<0.5	<4	18	<5	<5	<2	<5	<2	150	<0.5	0.28

All data are in concentration units of ppb unless stated otherwise.

SURROGATE RECOVERIES

ACID	% Recovery	BASE NEUTRAL COMPOUNDS	% Recovery	VOLATILES	% Recovery
d_6-phenol	29%	d_8-naphthalene	73%	d_6-benzene	78%
2-fluorophenol	44%	d_5-pyridine	101%	d_8-toluene	111%
pentafluorophenol	41%	d_5-nitrobenzene	86%		
		fluoroaniline	59%		
		fluoronaphthalene	69%		

The results of these analyses indicate that a variety of toxic chemicals are present in the treated effluent discharge of the City of Niagara Falls wastewater treatment plant and the Tail Race Tunnel discharge into the Niagara River. The treatment plant's effluent was found to contain 34 organic chemicals. The Tail Race Tunnel discharge was found to contain 25 organic chemicals. Both samples were also found to contain a variety of metals.

The treatment plant contributes approximately one half of the flow discharged into the Niagara River through the Tail Race Tunnel. The two sets of analyses bear out this relationship in several ways . Most of the compounds present in the treatment plant's effluent were also detected at lower concentrations in the tunnel's discharge. This could be the result of dilution or other factors. For example, many compounds, such as chloroform and 1,2-trans-dichloroethylene, that are capable of being removed through aeration, were present in the tunnel discharge at lower concentrations than in the treatment plant's effluent. Compounds that were the exception to this observation, such as trichloroethylene and tetrachloroethylene, are known to be used in large amounts by industries that discharge cooling water into the diversion sewer that feeds into the Tail Race Tunnel. At least one firm, Olin Chemical, is known to discharge toxic organic chemicals into the diversion sewer. Other previously-undetected discharges of toxics may also exist. This could explain the increase in pollutant concentrations in the tunnel discharge.

Compounds that were present at uniformly low concentrations in both samples included a variety of phthalate acid esters. These non-volatile compounds would not tend to volitilize. Moreover, they have not been reported to be present in cooling water discharges to the diversion sewer. However, since phthalate acid esters originate from a large number of sources, they are typically detected in trace amounts. This might explain why dilution did not lower their concentrations in the treatment plant effluent below detection limits in the tunnel discharge.

Finally, most of the compounds detected in either sample are known to be used by industries on-line to the City of Niagara Falls wastewater system or by facilities that utilize the diversion sewer. In fact, the vast majority of the compounds are typically used in amounts of millions of pounds each year by the same firms. As detailed in the previous sections of this report, many of the detected priority pollutants are also known to contaminate wastewater discharges released into the Niagara River and hazardous wastes buried in landfills in Western New York. While individual sources of the detected pollutants remain unknown, there can be little doubt that toxic chemicals detected in these two samples originate from industrial operations.

Ames Testing

Due to the high cost of conducting integrated GC/MS analyses, NYPIRG, with the assistance of Dr. Beverly Paigen of the Roswell Park Memorial Institute, utilized the Ames Test to monitor suspected pollution sites pinpointed during this investigation. Originally developed by Dr. Bruce Ames at the University of California at Berkeley, the Ames Test makes use of mutant strains of Salmonella bacteria to indicate mutagenicity. For certain classes of chemicals, Ames Test results have been closely correlated with results of animal studies testing for the carcinogenic effects of various chemicals. Since the Ames Test is a rapid, low-cost method of detecting the presence of mutagenic agents, major chemical and pharmaceutical manufacturers have begun using the test to screen new products for their cancer-causing potential.[1]

Due to two drawbacks, the Ames Test is best utilized to identify areas that warrant more comprehensive investigation. First, because it can never identify the mutagenic agent, it is non-specific. Second, the Ames Test is insensitive to certain potentially carcinogenic chlorinated organic chemicals.[2] Since many of the potentially toxic chemicals used, produced or disposed of in the Niagara Frontier belong to this class of compounds, their presence may escape detection by the Ames Test. Thus, a negative Ames Test does not necessarily prove that a sample is toxics-free.

<u>Procedure</u>

The Niagara River is a fast moving river and its strong scouring action can carry material a considerable distance before allowing it to settle out as sediment. To counter this, NYPIRG sampled close to shore where the current is weaker and deposition of sediment is greater. The sediment samples taken from the river were obtained using a Ponar dredge, which usually collected sediment from the top 4 to 8 inches of the river bottom. Because the sediment was homogenized by the dredge, and because deposition rates vary along the length of the river, it is difficult to determine when the mutagenic agents were first introduced into the river. This limitation pertains primarily to samples collected in the Niagara River itself and does not pose a problem for samples collected from wastewater treatment plants, drinking water treatment plants, or in the slower moving tributaries.

A total of 53 sediment samples were drawn by NYPIRG on November 8th and 9th, 1978. Thirty-three of the fifty-three sediment samples were collected from a 19-foot boat owned and operated by Sam Markello of Bio Systems Research. These samples were collected in 5-gallon plastic tubs, using a Ponar dredge, and were immediately transferred to one-pint containers provided by Dr. Paigen's laboratory. The remaining twenty sediment samples were collected by hand in the one-pint containers from various locations around Erie and Niagara County. They were transported and analyzed with the samples taken from the boat.

An additional 18 samples were drawn between December 8, 1978, and February 9th, 1979, from wastewater treatment plant sludge and drinking water treatment plant backwash. These samples were collected using one-pint containers. All 71 samples were analyzed using the same procedure.

Samples were placed in cold storage and allowed to stand. The liquid was decanted, and the sediment was allowed to settle. The samples were transferred to the laboratory where a portion of the sediment was dried in a vacuum dessicator at room temperature and the remainder frozen. The dried sediment was weighed, and a sample, usually 60 grams, was ground to a fine powder using mortar and pestle. The powder was then extracted in a Soxhlet apparatus with methanol. It should be noted that mutagenic compounds capable of evaporation may have escaped during this phase of the procedure.

Extracted samples were flash evaporated to approximately 20 ml and dried completely in a shaker bath at room temperature with a vacuum. The drying time varied from two to twenty-four hours.

The residue was weighed, redissolved with 5 ml of warm dimethylsulfoxide, sterilized by filtration through a millipore filter, and refrigerated until testing.

Samples were tested for mutagenic activity at several dilutions using Salmonella typhimurium strains TA-98 and TA-100, according to the methods described by McCann and Ames.[3] Duplicate plates were done for each test. Metabolic activation was provided by liver homogenates prepared from rats induced with Arochlor. Only those samples which yielded at least twice the number of revertants as the control plates with no extract added were considered "positive" by this test. This eliminated any marginal results.

When a sample appeared to give a positive result, it was retested at four or five concentrations to obtain a linear dose response. A sample that appeared negative was retested at a higher concentration. Therefore each sample was tested at least twice.

Results

A listing of the 71 samples obtained by NYPIRG, their location, and the results of each Ames test is provided in Table 23. Sample locations are listed on the map provided in Figure 19. A key to the sampling locations on the map is provided in Table 24.

TABLE 23
AMES TESTING SAMPLING PROGRAM RESULTS

SAMPLE	LOCATION	DEPTH	DISTANCE FROM SHORE	COMMENTS	TA 98 RESULTS	TA 100 RESULTS
181	Mouth, Two Mile Creek	9'	10'	Black sludge	+	-
182	Discharge pipe, near Amoco Oil	11'	11'	Black sludge	+	+
183	Between Ashland discharge & Amoco	4'	15'	Black sludge	+	+
184	Between Ashland discharge & Amoco	4'	30'	Silty	+	+
185	Adjacent to pilings, near Ashland Oil	18'	20'	Silt/sludge	+	+
186	Between S. Grand Island Bridge & pilings	6'	30'	Liquid-like	+	+
187	Stream, 20 ft. downstream, G.I. bridge	5'	30'		+	-
188	Upstream of marina, upstream of S. Grand Island bridge	4'	20'		+	+
189	Small stream, upstream Tonqwanda Coke discharge	6'	15'		+	+
190	Marathon Oil Terminal	23'	4'		+	-
191	Discharge pipe near Semet Solvay	8'	12'		-	-
192	Lagoon next to Allied Plastic discharge	6'	30'		-	-
193	Upstream Placid Harbor, near "cable crossing" sign	5'	30'		-	-
194	Strom sewer	5'	10-15'		-	-
195	Niagara Mohawk slag pond discharge	8'	30'		-	-
196	Upstream Niagara Mohawk slag pond	14'	30-40'		-	-
197	Series of 4 adjecent pipes, near Dupont and GMC	5'	40'	Murky, organic film of surface	+	-
198	Downstream previous sample	6'	30'		-	-
199	Pipe next to GMC	7'	15'		+	-
200	In the north end of Black Rock Canal	27'	-		+	-
201	Downstream previous sample	27'	20'		+	T

202	Mouth of Buffalo River	15'	30'		+	+
203	Near entrance to Black Rock Canal	29'	50'		+	-
204	Further in entrance to Black Rock Canal	10'	5'		+	-
205	Spaulding Fiber discharge	10'	10'	Murky, black discharge	+	-
206	Downstream of Spaulding Fiber	10'	100' from pipe		+	-
207						
208	Mouth of Tonawanda Creek	18'	4'	Black sludge	+	-
209	Further in Tonawanda Creek	11'	20'	Black sludge	+	-
210	Mouth of Ellicott Creek--on Erie Canal	17'	45'	Black suspension	+	-
211	Near mouth of Spicer Creek, Grand Island	11'	75'	Black sludge	-	-
212	Near City of Lockport water intake	15'	Channel	Sandy	-	+
213	Northern tip of Tonawanda Island near pipe	21'	20'	Brown, cement-like	T	+
214	200 yds. downstream City of N. Tonawanda STP	17'	45'	Very mild activity	+	+
215						
216						
217	Two Mile Creek, by bridge	1'	-	Black sludge	-	-
218	Two Mile Creek, behind STP	1'	-	Grey-green	-	-
219	Two Mile Creek, at the mouth	1'	-	Black sludge	+	-
220	Spaulding Fiber discharge	-	-	Suspended material discharge	-	-
221	Spaulding Fiber	-	-	Red material around pipe	-	-
223	Ditch beside Durez plant, N. Tonawanda	-	-	Dark green Sludge, oil film present	-	-
224	Shoreline, 102 landfill	-	-	Black	-	-
225						
226	Gill Creek, upstream of bridge	2'	-	Black sludge	-	-
227	Creek by Maislin Trucking, off River Road	1'	-		-	-
228	Creek near Northland Wire & Supply	1'	-	Creek was orange in color	+	-
229	Same as above (Allied discharge)	1'	-		+	+
230	Streambed next to FMC	-	-		+	+
231	Stream adjacent to Polymer Applications	½'	-	Orange sediment	-	-
232	Ditch adjacent to Dunlop Tire	-	-	Black sludge	-	-
233	Runoff ditch, Hooker Hyde Park landfill	-	-	Strong chemical odor	+	-
234	Ditch adjacent to Niagara University	-	-	Oily film present	-	T
235	Ditch surrounding Newco landfill	-	-	Ditch was yellow gray	+	-
236	Duplicate of 235				+	-
237	Black Gill Creek, off 97 St. & Greenwald	-	-	-	+	-
238	Black Gill Creek, off Colvin	-	-	-	-	-
239	Buffalo Sewer Authority--digested sludge cake	-	-	Chemically treated	+	T
240	Buffalo Sewer Authority--secondary sludge	-	-	-	-	-
241	Buffalo Sewer Authority--primary sludge	-	-	-	-	-
250	Buffalo Sewer Authority--primary sludge	-	-	-	-	-
251	Grand Island Water Filtration Plant backwash				+	-
260	City of Tonowanda STP--primary sludge	-	-		-	-
261	City of Tonowanda STP--digested primary sludge	-	-		-	-
264	Town of Tonowanda STP--activated sludge	-	-		+	T
265	Town of Tonowanda STP--activated zinpro	-	-		-	-
266	City of N. Tonowanda Water Filter Plant	-	-		-	-
267	Same as above				-	-
268	Same as above				-	-
269	Same as above				-	-
270	City of N. Tonowanda STP--digested primary sludge	-	-		-	-
271	City of N. Tonowanda STP--raw sludge	-	-		-	-
272	Amherst S.D. #16 STP--primary sludge	-	-		-	-
274	City of Niagara Falls STP--primary sludge				+	-
275	City of Niagara Falls STP--dewatered sludge				+	-

KEY: T Toxic to bacteria at lowest concentration tested-Thus mutagenicity cannot be tested.
\+ Mutagenic agents detected
\- Mutagenic agents not detected
STP Sewage Treatment Plant

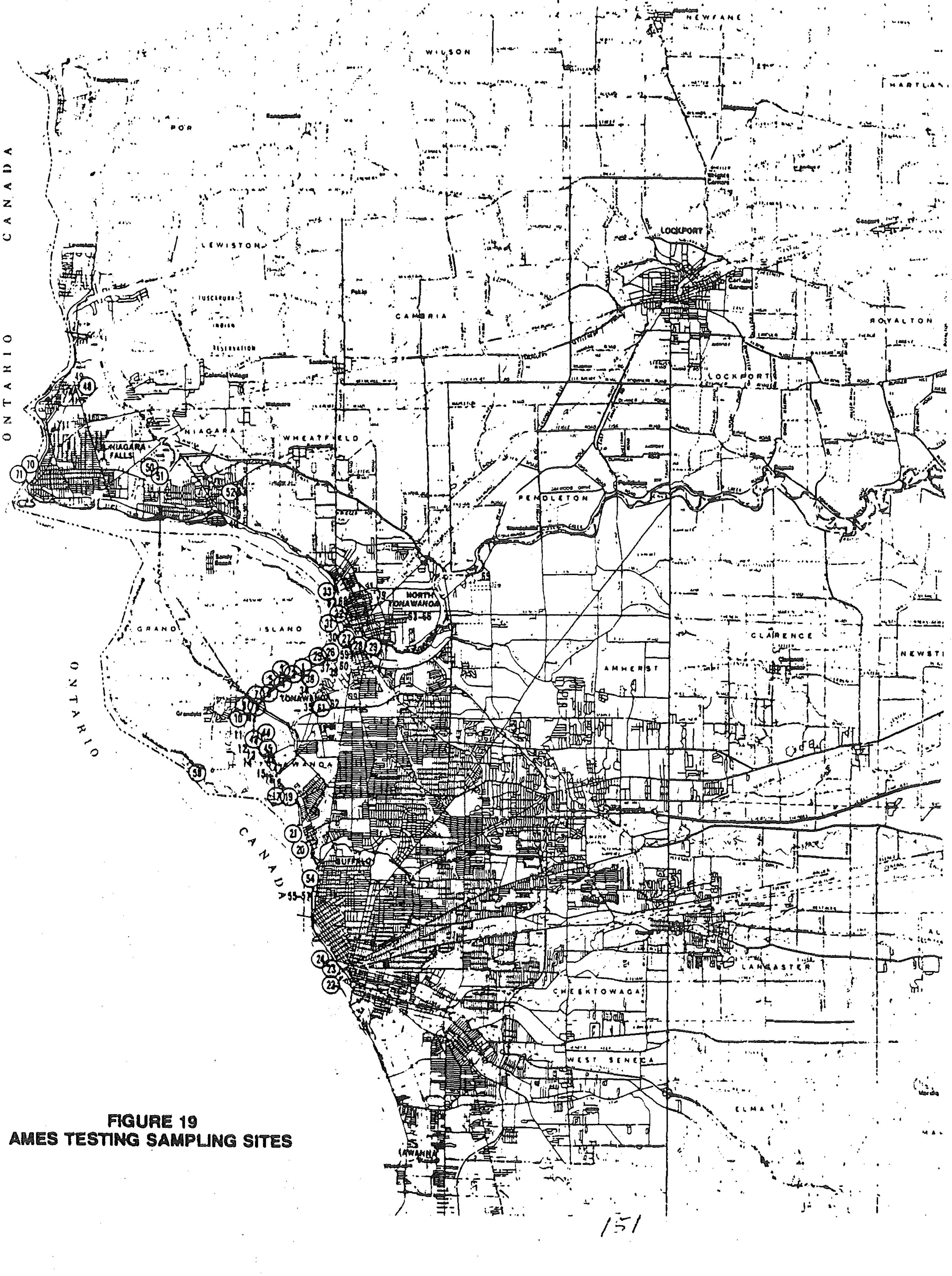


FIGURE 19
AMES TESTING SAMPLING SITES

TABLE 24
KEY TO SAMPLING LOCATIONS DEPICTED IN FIGURE 19

MAP NUMBER	CORRESPONDING SAMPLE NUMBER	TEST RESULTS	MAP NUMBER	CORRESPONDING SAMPLE NUMBER	TEST RESULTS
1	181	+	37	220	-
2	182	+	38	221	-
3	183	+	39	223	-
4	184	+	40	224	-
5	185	+	41	226	-
6	186	+	42	227	-
7	187	+	43	228	+
8	188	+	44	229	+
9	189	+	45	230	+
10	190	+	46	231	-
11	191	-	47	232	-
12	192	-	48	233	+
13	193	-	49	234	-
14	194	-	50	235	+
15	195	-	51	236	+
16	196	-	52	237	+
17	197	+	53	238	-
18	198	-	54	239	+
19	199	+	55	240	-
20	200	+	56	241	-
21	201	+	57	250	-
22	202	+	58	251	+
23	203	+	59	260	-
24	204	+	60	261	-
25	205	+	61	264	+
26	206	+	62	265	-
27	207	+	63	266	-
28	209	+	64	267	-
29	210	+	65	268	-
30	211	-	66	269	-
31	212	+	67	270	-
32	213	+	68	271	-
33	214	+	69	272	-
34	217	-	70	274	+
35	218	-	71	275	+
36	219	+			

\+ denotes presence of mutagenic agents
\- no mutagenic agents found to be present

Table 23 shows the sample number, the location the sample was obtained from, and the results of Ames Testing using the two strains of <u>Salmonella</u>, TA-98 and TA-100. Samples were tested in two strains of bacteria because these strains detect different types of mutagens. Many mutagenic chemicals are not mutagenic in the chemical form found in the environment, but become mutagenic when acted upon by enzymes in the body during metabolism. Consequently, the testing scheme included the addition of an animal liver extract during culturing to provide the types of activating enzymes normally found in the human body.

Positive samples were tested at 4 or 5 concentrations and the results were plotted on graph paper. The linear portion of the dose response curve was determined, and this number was used to compute the number of revertant colonies generated/gram of dried sample. These figures are included in Table 25 for all samples that tested positive with either the TA-98 or TA-100 strains of <u>Salmonella</u>.

TABLE 25
NUMBER OF REVERTANT COLONIES GENERATED PER GRAM OF DRIED SAMPLE FOR ALL POSITIVE AMES TEST RESULTS

NIAGARA RIVER

Sample #	TA98 rev/gram dry	TA100 rev/gram dry
181	720	
182	600	1,520
183	546	2,267
184	680	2,547
185	813	1,280
186	960	2,000
187	1,333	
189	667	2,533
190	613	
197	1,013	
199	813	
200	1,146	
201	1,173	toxic
202	1,000	1,466
203	880	
204	1,066	
205	813	
206	520	
208	1,240	
209	813	
210	707	
212		920
213	toxic	763
214	107	773
219	1,360	
228	1,600	
229	4,827	8,160
230	1,360	positive
233	115	
235	1,120	
236	1,280	
237	273	
239	4,507	toxic
251	1,840	
263	2,080	toxic
274	560	
275	1,786	
188	positive	positive

A total of 71 samples were tested by this procedure. Thirty-eight samples (54 percent) tested positive in either one strain or the other, indicating that mutagenic agents were present in a majority of the samples. One sample obtained from the backwash of a drinking water plant tested positive. These results show that mutagenic, and potentially carcinogenic, materials are present in the Niagara River, its sediments, sewage treatment plants, and possibly even drinking water treatment plants. Because of the high use of chlorinated compounds in the river basin, and the inability of the Ames test to detect many of these types of compounds, the problem may be even more severe than the test results indicate.

The two samples with the highest number of revertants generated/gram of dry sample were samples 229 and 239. Sample 239 was obtained from an orange-colored stream that runs next to the Northland Wire and Supply in Tonawanda. This stream appears to be the discharge from the Allied Chemicals Plastic Division plant on River Road, which manufactures polyethylene wax, pipe compound, and cleaning compound. The company acknowledged use of toxic and potentially toxic compounds at the plant, including toluene, tetrachlorethylene and xylene. The company also noted that its discharge may include runoff from Tonawanda Coke's nearby coke and coal tar manufacturing operation as well.

Sample 239 was obtained from the Buffalo Sewer Authority Bird Island sewage treatment plant. The sample represents chemically-treated digested sludge cake. The Buffalo Sewer Authority plant receives wastewater from more than 620 industries, 85 of which contribute 84 percent of the total industrial flow. Of these 620 industries, 72 were listed by the Buffalo Sewer Authority as contributing wastes that are toxic and organic in nature to the plant. Another 38 companies acknowledged use of potentially toxic chemicals in their response to the Industrial Chemical Survey. It is important to note that secondary and primary sludge samples also taken from the plant (samples 240, 241, and 250) did <u>not</u> yield positive results for the Ames Test. This suggests that chemical treatment of the plant's sludge may be responsible for the mutagenic agents present in sample 239.

Two drinking water treatment plants were tested by sampling the filter backwash. The sample obtained from the Grand Island Water Treatment plant (sample 251), tested positive, indicating the presence of mutagenic agents in the filter media. Samples obtained from the City of North Tonawanda Water Treatment Plant (samples 266, 267, and 269) all proved negative.

A total of six sewage plants with on-line industries were sampled. The sludge samples collected from three of the plants (50 percent) were positive for mutagenic activity. The three plants were the Buffalo Sewer Authority facility, the City of Niagara Falls Sewage Treatment Plant, and the Town of Tonawanda Sewage Treatment Plant. NYPIRG sampled both activated sludge and activated zinpro from the Town of Tonawanda facility. Only the activated sludge sample gave a positive Ames test result. Both the primary sludge and dewatered sludge samples from the City of Niagara Falls plant gave a positive Ames test result. These three facilities are characterized by large numbers of on-line contributing industries, many of which use and discharge potentially toxic chemicals. Four hundred and seventy of the 712 industries identified on-line to the 10 sewage treatment plants included in this study are on-line to these three plants, 72 of which use, store, or produce toxic and potentially toxic chemicals.

By contrast, the three sewage treatment plants that gave negative Ames test results all have relatively few industries on-line to their systems. The three plants include the City of Tonawanda facility, which now has its flow diverted to the Town of Tonawanda treatment plant; the City of North Tonawanda facility, which has 11 on-line industries; and the Amherst #16 facility, which has one on-line industry.

A total of 33 samples were drawn from the Niagara River itself and 20 samples collected by hand at various locations in Erie and Niagara Counties. Twenty-five of the thirty-three samples taken from the river sediment (76 percent) tested positive with the Ames Test. One sediment sample taken approximately 20 yards upstream of water intake for the City of Lockport drinking water intake tested positive, indicating the presence of mutagenic agents. NYPIRG did not sample the Lockport drinking water plant backwash.

Samples taken from just below the South Grand Island bridge downstream to the mouth of Ellicott Creek all indicated the presence of mutagenic agents. The discharges from Ashland Petroleum, Hooker Durez, Spaulding Fiber, the City of Tonawanda Sewage Treatment Plant, and industries which discharge to Ellicott and Tonawanda Creeks all enter the river in this region. While two sediment samples taken from the river near the Spaulding Fiber discharge tested positive (samples 205 and 206), two samples scraped from the inside of the company's discharge pipe paradoxically tested negative (samples 220 and 221). Sediment samples drawn from the river between the Tonawanda coke discharge (sample 191) and the Niagara Mohawk plant (sample 196) all tested negative. Samples taken from the Dupont Chemical and General Motors discharges upstream to the exit of Black Rock Canal and Scajaquada Creek all tested positive. NYPIRG was unable to obtain any samples off of Bird Island because of the strong currents and severe scouring action in the river at that point. Three samples taken at the mouth of the Buffalo River and the entrance to the Black Rock Canal all tested positive for mutagenic agents.

A total of eight of the 20 samples (40 percent) collected by hand at various locations tested positive. Among the more important were two samples collected from the drainage ditch around the CECOS facility in Niagara Falls, which discharges to a city storm sewer. Water in the ditch was yellow-grey. Both samples indicated the presence of mutagenic agents in the ditch. This facility is one of two licensed hazardous waste disposal sites in Western New York, and accepts large quantities of toxic chemicals at the site.

Positive results were also found for samples taken in a stream adjacent to the FMC Corporation in Tonawanda, the runoff ditch from the Hooker Hyde Park landfill, in Black Creek, just north of the Love Canal, and at the mouth of Two Mile Creek in Tonawanda.

Mutagenic agents were found to be present in over half of the samples taken, in river sediment, sewage treatment plant sludge, landfill leachate, drinking water filter plants, and wastewater discharge streams. The large number of locations and the variety of sites sampled provide evidence that state and federal programs designed to prevent the release of toxic pollution and to safeguard public water supplies are seriously inadequate. These sampling results support this study's conclusion that regulatory loopholes systematically allow toxic contamination to enter the environment and the Niagara River, where public health and drinking water quality may be jeopardized.

CHAPTER VII

An Evaluation of Niagara River Drinking Water Supplies and Their Regulation

From the information presented in the previous sections of this report, it is obvious that discharges of toxics into the Niagara are inadequately controlled. As a result, the river is heavily polluted with industrial and municipal wastes. This section outlines the hazards associated with drinking water drawn from the Niagara. First, the regulations that govern the quality of drinking water in New York State are described and critiqued. Then the findings of the literature search and the results of interviews with water authorities, and the mail and telephone surveys, described in the methodology section, are presented.

Drinking Water Regulation

Drinking water quality in western New York, as in the rest of the state, is regulated under the authority of the U.S. Environmental Protection Agency (EPA) and the New York State Department of Health (DOH). The EPA is responsible for implementing the National Safe Water Drinking Act, but in New York, EPA has granted primary authority for carrying out the program to DOH. Municipal and other local water supply authorities are required to regulate drinking water quality according to standards adopted by DOH. These must be at least as stringent as standards established by the federal government. If it chooses, however, DOH can set even more stringent standards. To date, it has not exercised this option.

Chapter I of Title 10 of the New York State Official Compilation of Codes, Rules and Regulations contains the State Sanitary Code. Part 5 of Chapter I deals specifically with "Drinking Water Supplies" and contains detailed requirements for maintaining pure and safe drinking water from every potential source. Rules to protect sources of water supply, set quality standards, govern the planning, siting, and treatment of water supply sources, determine maximum contaminant levels of toxic substances and set the frequency of sampling and analysis programs are outlined in this section. Radiation protection measures are also spelled out.

Under subpart 5.1, community water systems and non-community water systems are required to regulate the compounds and quality parameters outlined in Table 26. A community water system is a water supply system serving at least five service connections used by year-round residents or at least 25 year-round residents. A non-community water system is a public water system that is not a community system.

A review of the compounds with promulgated maximum contaminant levels (MCLS) indicates that an extremely limited number of pollutants found in drinking water are regulated strictly. Four organic pesticides and two organic herbicides from among the nearly 700 organic contaminants previously identified in drinking water have MCLS. The presence of toxic chemical oils, solvents, plasticizers and other industrial manufacturing residues in drinking water are not regulated specifically in New York State or, for that matter, anywhere else in America at this time.

Microbiological MCLS are controlled more strictly by a variety of regulatory options. Coliform bacteria are only allowed to be present in drinking water in minute concentrations. A maximum of four coliform bacteria per 100 milliliters are permitted in finished drinking water. Other provisions limit coliform bacteria by the maximum percent of contaminated portions analyzed per month. Frequency of community water system sampling is calculated on a sliding scale according to the size of the population served. For example, systems serving populations up to 1,000 people must be sampled a minimum of once per month. Populations of 4,690,001 or more require a minimum of 500 samples per month. Non-community water systems are sampled quarterly. Samples are always required to be collected at distribution points. When chlorine disinfectant is employed, a chlorine residual determination must be made at the time the sample is collected.

Subpart 5-1.12 requires water suppliers to report immediately to the State any violations of MCLS, any deleterious changes in raw water quality, changes in watershed or aquifer character which may affect water quality or any combination of these conditions. Modifications in water treatment and sampling are then required on a stop-gap basis. Within 30 days the findings of an investigation to determine the cause, extent and nature of the problem conditions. Modifications in water

TABLE 26
COMMUNITY WATER SYSTEMS: MAXIMUM CONTAMINANT LEVELS

Inorganic chemical	*Maximum contaminant level (milligrams per liter)*
Arsenic (As)	0.05
Barium (Ba)	1.
Cadmium (Cd)	0.010
Chromium (Cr)	0.05
Fluoride (F)	****
Lead (Pb)	0.05
Mercury (Hg)	0.002
Nitrate (as N)	10.
Selenium (Se)	0.01
Silver (Ag)	0.05

**** Where the annual average of the maximum daily air temperatures for the location of the community water system is the following, the maximum contaminant levels for fluoride are:

Temperature		Maximum contaminant level (milligrams per liter)
53.8 to 58.3 (°F)	12.1 to 14.6 (°C)	2.2
58.4 to 63.8 (°F)	14.7 to 17.6 (°C)	2.0

Inorganic chemical	Maximum contaminant level (milligrams per liter)
Chloride (Cl)	250.0
Copper (Cu)	1.0
Corrosivity	non-corrosive[2]
Iron (Fe)	0.3[3]
Manganese	0.3[3]
Sodium (Na)	no designated limits[4]
Sulfate (SO_4)	250.0
Zinc (Zn)	5.0

Physical characteristic	Units
Color	15
Odor	3

---

[2] Corrosivity shall be determined by calcium carbonate saturation or other method acceptable to the commissioner. A water other than noncorrosive may be allowed by the State based on justification submitted by the supplier of water. Such justification shall include but may not be limited to:

(a) Data concerning increases in metal concentrations of point of use water as compared to source water metal content;

(b) Distribution water quality characteristics such as calcium hardness, alkalinity, total dissolved solids, and pH;

(c) Documentation of the lack of complaints or potential adverse effects; and

(d) A report summarizing, for at least a period of one year, the above.

[3] If iron and manganese are both present, the total concentration of both substances should not exceed 0.5 milligram per liter. Higher levels of iron may be allowed by the State when justified by the supplier of water.

[4] Water containing more than 20 milligrams per liter of sodium should not be used for drinking by those on severely restricted sodium diets. Water containing more than 270 milligrams per liter of sodium should not be used for drinking by those on moderately restricted sodium diets.

Organic chemical	Maximum contaminant le (milligrams per liter)
(1) *Chlorinated hydrocarbons:*	
Endrin (1,2,3,4,10,hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo, endo-5,8 - dimethano naphthalene	0.0002
Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer)	0.004
Methoxychlor (1,1,1-Trichloro-2,2 - bis p-methoxyphenyl ethane)	0.1
Toxaphene ($C_{10} H_{10} Cl_8$ - Technical chlorinated camphene, 67-69 percent chlorine)	0.005
(2) *Chlorophenoxys:*	
2,4-D (2,4-Dichlorophenoxyacetic acid)	0.1
2,4,5-TP Silvex (2,4,5-Trichloro phenoxypropionic acid)	0.01

treatment and sampling are then required on a stop-gap basis. Within 30 days the findings of an investigation to determine the cause, extent and nature of the problem must be submitted in writing to the State. Infractions of MCLS may trigger a comprehensive investigation of water quality deterioration. An investigation may also be initiated by the intrusion of substances for which no MCLS have been set, such as organic pollutants of toxic concern. Whenever MCLS for organic chemicals are violated, state, consumer and public notification is required.

Other subparts regulate the many facets of drinking water treatment and distribution such as: approved laboratory procedures for compliance sampling and analysis, approved record keeping systems, procedures for changes in water treatment, waivers of regulations, public notification procedures to grant variances from MCLS and treatment techniques, water well construction standards and protection of underground and surface water supply sources.

Chapter III of Title 10 is entitled "Public Water Supplies." Subchapter A addresses the various types of water suppliers county by county, for example: institutions, district municipalities, and companies. Localities are listed separately; sometimes even suppliers are named.

Part 170, Subchapter C of Chapter III-Title 10 is titled "Public Water Supplies." In conjunction with Part 5 and Parts 100-158 (watershed rules and regulations) this part protects present and future water supply sources from contamination. The revised version of Part 170 regulates raw water quality. Since early 1978 this part has been under revision. Eventually raw water quality standards will approach drinking water standards. The revised regulations are expected to allow higher MCLS for some inorganic pollutants and coliform bacteria. Chlorinated hydrocarbon pesticides are expected to be more tightly restricted. However, both the old and proposed new versions contain a non-numerical, general standard for "toxic wastes, oil, deleterious substances, heated liquids, colored or other wastes." None of these are allowed, alone or in combination with other substances or wastes, in sufficient amounts or at such temperatures as to make the waters unsafe or unsuitable as a source of water supply. Under this authority, health officials are able to place individual numerical limits on whatever substances they consider to be toxic. Despite this, the revised Part 170 contains a Permissive Use clause (Section 170.7): "Where the maximum quality level for any contaminant in the Part is exceeded, the State Commissioner of Health may, on the submission of a written application by the supplier of water and subject to appropriate conditions, permit use of the source of water supply."

Under the authority granted by Part 170, New York State Department of Health developed "Interim Guidelines" to provide toxic chemical limits in response to the identification of toxic pollutants in Long Island water supplies in early 1977. Vinyl chloride and other known carcinogens are limited to ten micrograms per liter (ug/l). All other toxic synthetic organic chemicals are limited to 50 ug/l. The total concentration of toxic pollutants is limited to 100 ug/l.

The decision-making logic applied in formulating New York State's interim guidelines for toxic drinking water pollutants is fundamentally incorrect. Calculating the risk of consuming trace amounts of toxics in drinking water is fraught with problems. Existing techniques only allow predictive risk calculations to be made for carcinogenic compounds. However, a wide variety of harmful health effects potentially could result from imbibing water-borne contaminants. Among these are mutagenic hazards, teratogenic effects, central nervous system disorders, polyneuropathy, blood system disruptions and liver atrophy. Moreover, the exposure to toxics in drinking water is only one route of exposure to thousands of potentially carcinogenic or otherwise toxic substances that are ubiquitous in the environment. Toxics consumed in water interact with other pollutants humans are exposed to. The result can be additive, synergistic or antagonistic effects. At present there is no way to assess these cumulative effects accurately. Thus, it is next to impossible to set drinking water standards that successfully weigh the toxic effects of these myriad interactions. Furthermore, any amount of a carcinogen, no matter how small, consumed in drinking water increases cancer risk. Given these limitations, the setting of the interim guidelines is basically an intellectual exercise in risk assessment. The suspiciously round figures of 10ug/l for carcinogens, 50ug/l for any single organic compound and a composite total of 100ug/l do little to safeguard public health adequately.

Findings

The results of NYPIRG's survey of water supplies are presented in Table 27. Seven systems draw a combined total of approximately 103 MGD from the Niagara River. This water is consumed by approximately 380,000 people. Figure 20 shows that, in the Niagara basin, the seven drinking water intakes are interspersed among the 77 direct industrial discharges, the 10 municipal wastewater treatment plant discharges, and the hazardous waste landfills proximate to the river that are reviewed in this study. While these inadequately controlled discharges of toxics are certain to affect water quality in the river, effective measures have not been taken to safeguard the quality of drinking water suplied to the residents of this area.

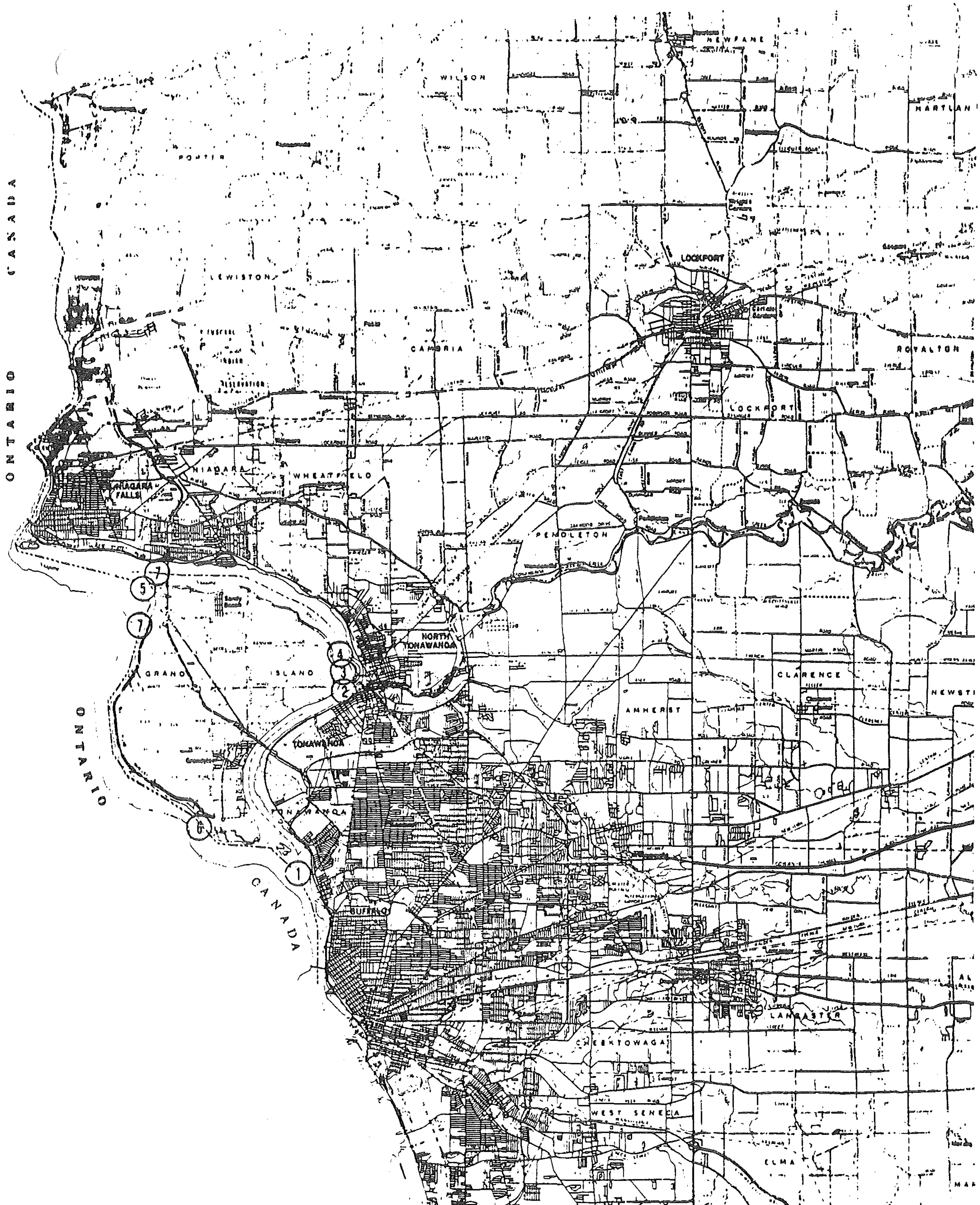


FIGURE 20
LOCATION OF DRINKING WATER INTAKES IN THE NIAGARA RIVER

TABLE 27
DRINKING WATER SUPPLY SYSTEMS IN NIAGARA RIVER BASIN

NAME & LOCATION OF SYSTEM	# OF PEOPLE SERVICED	DISTRIBUTION	SEDIMENTATION & COAGULATION	FILTRATION	CHLORINATION	OPERATING AT FULL CAPACITY?	DAILY OUTPUT (MGD)	CONDUCTING MONITORING FOR ORGANICS
1. TOWN OF TONAWANDA	110,000	SAME, plus 1.79 MGD sold to the Village of Kenmore	Aluminum Sulfate	R.G.S. Anthrafilt, gravel, and Leopold clay tiles	Yes	70%	17.0	No
2. CITY OF TONAWANDA	21,898	SAME	Alum, Aid 18	R.G.S. stone, gravel	Yes	No	5.7	No
3. CITY OF NORTH TONAWANDA	38,500	SAME	Rapid Mixing	R.G.S. Anthrafilt, sand, gravel	Yes	No	7.5	No
4. CITY OF LOCKPORT	26,000	SAME	Alum	R.G.S. Anthracite, gravel	Yes	80%	10.0	No
5. TOWN OF GRAND ISLAND	18,000	SAME	Alum	R.G.S.	Yes	Yes	1.2 purchase additional 1MGD from Niagara County Water District Daily	No
6. NIAGARA COUNTY WATER DISTRICT	80,000	SAME (sell to Grand Island)	Alum	R.G.S. Anthracite	Yes	Yes	12.0	No
7. CITY OF NIAGARA FALLS	86,000	SAME	Alum	R.G.S. Anthracity	Yes	No	50.0	Yes
Totals= 7 systems	380,398		7/7	R.G.S. 7/7	7/7		103.4 MGD	1/7

R.G.S.= Rapid Gravity Sand Filtration

All of the water supply systems employ water purification technology and treatment methods that are fundamentally unable to provide comprehensive removal of trace toxic organic chemical pollutants present in the raw water or produced during the water treatment process. None employ Granular Activated Carbon (GAC) or other treatment systems that are effective against toxics. Traditional water purification techniques utilizing sedimentation, rapid filtration through sand, anthracite, gravel, stone, or similar materials, combined with chlorination disinfection, fail to remove the broad spectrum of toxic pollutants likely to be present in raw water drawn from the Niagara. [1]

In fact, the chlorination method of disinfection used by all of the surveyed systems poses a further threat to water quality. Naturally-occuring organic compounds present in raw water due to plant and animal matter breakdown, such as fulvic and humic acids, can become chlorinated during chlorine disinfection. A class of potentially hazardous compounds known as trihalomethanes (THMs) are produced, often in relatively high concentrations compared to ambient levels of industrial pollutants. [2] THMs include a variety of potentially carcinogenic compounds, such as chloroform and bromoform.

While treatment techniques, such as the addition of powdered activated carbon, can improve the removal of trihalomethanes, only the addition of comprehensive treatment systems, for example, one using GAC, provide cost-efficient, fully effective removal of the pollutants.

In response to the nationwide concern focused in THMs, the DOH conducted a THM monitoring program between 1978 and 1979. Table 28 contains data for the supply systems in the Niagara Frontier.

TABLE 28
SUMMARY OF TRIHALOMETHANE SAMPLING DATA

	WATER SYSTEM	FLOW	CONCENTRATION TRICHLORO-ETHANE (ppb)	CONCENTRATION CARBON TETRA-CHLORIDE (ppb)	CONCENTRATION BROMODICHLORO-METHANE (ppb)	CONCENTRATION CHLOROFORM (ppb)	CONCENTRATION TRICHLORO-ETHYLENE (ppb)	CONCENTRATION TETRACHLORO ETHYLENE (ppb)	CONCENTRATION BROMOFORM (ppb)	CONCENTRATION DIBROMO CHLOROETHANE (ppb)	FREE CHLORINE (ppm)	CHLORINE CONTACT TIME (HRS)	TOTAL THM's EXCLUDING (ppb)	TOTAL THM's INCLUDING (ppb)
1.	CITY OF TONAWANDA	8.0	< 5	< 5	16	46	< 5	< 2	< 5	6	.83	3	68	< 90
2.	TOWN OF TONAWANDA	24.0	< 5	< 5	15	36	< 5	< 2	< 5	6	.58	2	57	< 79
3.	GRAND ISLAND	1.25	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 2	.6	1	0	< 31
4.	CITY OF NORTH TONAWANDA	12.0	< 5	< 5	20	46	< 5	< 2	< 5	7	.78		73	< 95
5.	CITY OF NIAGARA FALLS	61.0	< 5	< 5	21	43	< 5	< 2	< 5	8	.8	2.5	72	< 94
6.	CITY OF LOCKPORT	12.0	< 5	< 5	13	38	< 5	< 2	< 5	6	.81	7	57	< 79
7.	NIAGARA COUNTY WATER DISTRICT	12.0	< 5	< 5	18	42	< 5	< 2	< 5	7	.7	7	67	< 89
8.	CITY OF BUFFALO (water source: Lake Erie)	110	< 5	< 5	11	16	< 5	< 2	< 5	6	.55	3	33	< 55
9.	TOWN OF HAMBURG (water source: Lake Erie)	2.0	< 5	< 5	14	24	< 5	< 2	< 5	7	.8	6	45	< 67

Source: New York State Department of Health

* All samples obtained 7/21/78

Among these, the two supplies with the highest THM concentrations were the city of North Tonawanda and the City of Niagara Falls, respectively. Although the THM concentration in these communities did not exceed the 100 parts per billion MCL set by the EPA, they approach the allowable limit.

With the exception of the Town of Grand Island supply system, the THM concentrations in all of the supplies drawn from the Niagara River were very similar. The Grand Island system probably had no detectable THMs in its supply bcause of the relatively short chlorine contact time it employs. The other surveyed systems provided much longer chlorine contact time, two hours on the average.

Data on the THM concentrations in the water supplies of the City of Buffalo and the Town of Hamburg are presented for comparison. Both of these communities draw their water from Lake Erie. These data indicate that communities drawing water from the Niagara River have uniformly higher concentrations of THMs than those using Lake Erie as a source of water supply.

However, these data are not comprehensive. THM concentrations typically vary throughout the year and throughout each community's water conveyance system. The DOH study needs to be expanded in order to account for seasonal variations and increases in THM concentrations found only in the far reaches of the distribution system, resulting from extended chlorine contact time. The scope of the study also needs to be expanded significantly.

Table 29 lists compounds that may be produced during chlorination of drinking water.[3] Obviously many more compounds may be formed than have been monitored for to date. This inadequacy should be corrected in future studies.

TABLE 29
COMPOUNDS WHICH MAY BE FORMED BY CHLORINATION

acetylene dichloride (6)
bromobenzene (20)
bromochlorobenzene (21)
bromodichloromethane (22)
bromoform (23)
bromoform butanol (24)
bromophenyl phenyl ether (25)
butyl bromide (27)
1,2-bis-chloroethoxy ethane (34)
b-chloroethyl methyl ether (35)
chloroform (36)
chlorohydroxy benzophenone (37)
bis-chloroisopropyl ether (38)
chloromethyl ether (39)
chloromethyl ethyl ether (40)
m-chloronitrobenzene (41)
3-chloropyridine (42)
dibromobenzene (47)
dibromochloromethane (48)
dibromodichloroethane (49)
1,4-dichlorobenzene (52)
dichlorodifluoroethane (53)
1,2-dichloroethane (54)
dichloroethyl ether (55)
hexachloro-1,3-butadiene (88)
hexachloroethane (90)
methyl chloride (108)
methylene chloride (117)
octyl chloride (124)
pentachlorobiphenyl (125)
1,1,3,3-tetrachloroacetone (136)
tetrachlorobiphenyl (137)
tetrachloroethane (138)
tetrachloroethylene (139)
trichlorobenzene (143)
trichlorobiphenyl (144)
1,1,2-trichloroethane (145)
1,1,2-trichloroethylene (146)
trichlorofluoromethane (147)
2,4,6-trichlorophenol (148)

Table 30 lists compounds that can be formed by chlorination of certain precursor compounds.[4] Raw water drawn from the polluted Niagara may be contaminated with a wide variety of industrial chemical residues. Many of these are easily attacked during free radical halogenation, including aldehydes, ethers, unsaturated alkanes and ketones.[5] Phenol and benzene, both widely identified in the environment, are especially susceptible.[6] Future studies should investigate this concern.

TABLE 30
STARTING COMPOUNDS AND POSSIBLE RESULTANT CHLORINATION PRODUCTS

Starting Compound	Chlorinated Product
phenol	ortho and para-chlorophenol 2,4-dichlorophenol 2,6-dichlorophenol 2,4,6-trichlorophenol (148) non-aromatic oxidation products
m-cresol	2-chloro-3 -methylphenol 4-chloro-3-methylphenol 6-chloro-3-methylphenol 2,4-dichloro-3-methylphenol 2,6-dichloro-3-methylphenol 4,6-dichloro-3-methylphenol 2,4,6-trichloro-3-methylphenol non-aromatic oxidation products
hydroquinone	para-benzoquinone non-aromatic oxidation products
aniline	ortho and para-chloroaniline 2,4 and 2,6-dichloroaniline 2,4,6-trichloroaniline non-aromatic oxidation products
dimethylamine	n-chloro-dimethylamine oxidation products

Toxic Pollutants

Data detailing the presence of toxic organic chemicals in the raw and treated drinking water of six of the surveyed supply systems does not exist. With the exception of the City of Niagara Falls, none of the water systems that utilize the Niagara River as a source of supply have investigated what levels, if any, of toxic pollutants are present in their waste.

This lack of data is reprehensible. For example, the Buffalo Sewer Authority (BSA) discharges over 180 million gallons of inadequately treated wastewater each day less than two miles upstream of the water intake for the Town of Tonawanda supply system. This massive discharge contains effluents from over 600 industries on-line to the BSA system. Yet the impact it has on the local water supply is unknown. Unless water supplies are monitored for toxics, there is no way to identify the contamination. Without knowledge of the extent of toxic problems, it is impossible to take corrective action.

City of Niagara Falls Water Supply System

The City of Niagara Falls water supply is the only system in the Niagara Frontier that has been monitored for a broad spectrum of toxics. Extremely serious chemical contamination has been discovered. The supply system is threatened by pollutants in the groundwaters surrounding the treatment facility, as well as in the river. A detailed description and analysis of the predicament follows.

The City's treatment plant, located at 53rd Street and Buffalo Avenue, was originally constructed in 1914. Since then, it has been expanded several times. The original plant, known as 1B, contained a total of 16 one million gallon per day (MGD) capacity rapid sand filters. Raw water was drawn from an intake located in the east branch of the Niagara River and pumped to the plant by a single pump station. By 1935, eight additional two MGD capacity sand filters were installed. In addition, a new river intake tunnel, connected to a vertical shoreshaft, was constructed. The shoreshaft was connected to the Old Pump Station via a 54" underground steel line. In times of heavy pumping, the raw water supply was supplemented using a shore pump installed in the shaft serving a 20" cast iron line. In 1943, a four million gallon finished water reservoir was added. By approximately 1953, an entirely new filtration plant, designated 1A, was constructed. It was equipped with eight four MGD capacity gravity-fed, rapid flow sand filtration units, four underground sedimentation basins, a chemical pretreatment building and four flocculation basins. At the same time, a new pump station and water intake structure were completed. The intake has six 10'x7' openings in the downstream faces of its hexagonal shape. Water is drawn into the intake and conveyed via a ten foot vertical shaft which extends to a 6'x6 1/2" horizontal tunnel 30' below the river bottom. The tunnel runs 3,381 feet to an old intake and then continues 2,170' as a 5'5 1/2" tunnel until it connects to the shoreshaft. The eight foot wide shoreshaft delivers raw water to the Pump Station forebay via a 115' 66" cast steel pipe. The Pump Station is equipped with four low service pumps with a combined capacity of 90 MGD. They deliver raw water via two 36" lines to the chemical pretreatment building's A and B chemical contact channel. The water flows by gravity into the flocculation basins. There, the water remains for approximately 2.5 hours before passing through the rapid sand filters augmented with 6" of anthracite. After chlorination, the combined effluents of the A and B plants flow through a 2 million gallon clear well and enter the Pump Station. Six high service pumps with a combined 115 MGD capacity deliver the water to the distribution system at 90 pounds per square inch pressure. [7]

Little has changed since the plant went into operation. The basic treatment system is the same, with only a few significant changes. The raw water is shock chlorinated after it is pumped from the river, then alum and cationic polymer are added to facilitate flocculation. Powdered activated carbon is added to adsorb organic chemicals. The treated water then passes through one stage flocculation, sedimentation and rapid sand filtration. Finally, the water is post chlorinated, fluoridated, and supplied to consumers. [8]

One major change that has been made in recent years is that the facility no longer draws Niagara River water from a single intake. Beginning on December 18, 1979, an emergency 48" intake line was used to draw water from the East Channel of the river. At present, approximately 40 MGD of the total 50 MGD of water supplied to the city's customers is drawn through this line. The remaining 10 MGD is drawn from the Emerald Channel through the main intake system. [9]

Chemical contamination necessitated the switch in primary water intakes. The water filtration facility lies approximately 200 yards east of the Hooker Chemicals and Plastics Corporation's S-Area disposal site. [10] The dump is only one of many landfills on the mammoth Hooker plant's property, which is located immediately adjacent to the water filtration plant. [11] This dump is of particular concern. First, it is situated on reclaimed land. Until approximately 1924, the site is known to have been under water. Sometime between 1938 and 1947, however, construction debris, such as stone, dirt, cinders, slag, and carborundum abrasives were used to fill in the area. In 1947, Hooker acquired the land and used it as a disposal area until 1975, though the major dumping of waste occured prior to 1961. Table 31 lists the types and ammounts of wastes reported by Hooker to be buried in the S-Area and in the adjacent N-Area. [12]

TABLE 31
HOOKER CHEMICALS "S" AND "N-AREA" WASTE INVENTORY

Waste Category	Physical State	Total Estimated Quantity - Tons	Container
Org. Phosphates	L, S	200	D, B
Misc. Acid Chlorides	L, S	400	D, B
Phenol Tars	L	800	B
Thionyl Chloride	L	4,200	D
HET Acid	L, S	500	D, B
Misc. Chlorinations	L, S	400	D, B
DDM	L, S	8,100	D
TCP	L, S	200	D
Benzoyl Chloride	L, S	3,300	D, B
LDS/MCT	L, S	2,200	D, B
Metal Chlorides	S	900	D
C-56	L, S	17,400	D, B
Chlorobenzenes	L, S	18,900	D, B
Benzyl Chlorides	L, S	1,600	D, B
Thiodan	L, S	700	D, B
Sulfides	S	4,200	D
Misc. 10% of above		6,400	
	TOTAL	74,400	

L = liquid
S = solid

D = drummed
B = in bulk

Many of the wastes are potentially carcinogenic, or otherwise extremely toxic, notably the chlorobenzenes and C-56 (hexachlorocyclopentadiene). But the TCP, or trichlorophenol, is the most problematic waste material of all. TCP is a chemical intermediate used in the manufacture of broad leaf herbicides such as 2,4,5-T (2,4,5-Trichlorophenoxyacetic acid), and hexachlorophene, a compound previously used in medicinal soaps. The TCP made by Hooker is known to be contaminated with dioxin, arguably one of the deadliest compounds known to exist.[13] Dioxin is carcinogenic, mutagenic, embryolethal, teratogenic and bioaccumulates 8,000-fold in aquatic organisms.

The method Hooker employed to produce TCP inadvertently produced trace amounts of dioxin as a chemical process by-product. By multiplying the concentration of dioxin estimated to be present per unit amount of TCP by the total of 200 tons of TCP reported to be in the S-Area, between 125 and 145 pounds of dioxin are estimated to be buried in the landfill.[14] Due to the extraordinary toxicity of dioxin, this amount is calculated to be capable of killing several million people or causing massive environmental pollution if released on a widespread scale.[15]

The S-Area is by no means a secure landfill. In several respects, it is precisely the opposite. Due to its location on reclaimed land, its underlying support structure is porous and incapable of preventing the escape of toxic wastes. At present, the water table is reported to be located approximately four feet below grade, but fluctuating water levels in the Niagara are calculated to cause groundwater levels to vary by several feet per day.[16] Consequently, chemical wastes may actually be in direct contact with groundwaters at certain times. This condition would facilitate the leaching of waste residues.

Moreover, hazardous wastes were disposed of in a fashion that maximizes the potential for groundwater infiltration. Liquid wastes were reported to be emptied from trailers directly into parallel trenches dug 15 to 18 feet deep in the landfill. Drummed wastes were punctured and the contents emptied into the trenches, followed by the drums themselves. After the trenches were filled up, twin fluoride waste treatment lagoons were constructed atop the dump.[17] The penetration of liquids from these lagoons may provide a transport mechanism for carrying the chemical wastes into the groundwater system. As described in the Hooker profile in Chapter III, wastes from the S-area are reported to be contaminating the overburden and infiltrating a network of underground discharge lines that provide a conduit to the Niagara River.[18] The wastes may be migrating along several other paths as well.

There are two separate aquifer systems beneath the S-Area.[19] One is a shallow southward flowing groundwater system that normally discharges into the Niagara. The second is a deep water aquifer system that eventually discharges into the Niagara gorge. S-Area wastes may be entering both systems. Residues in the overburden may not be able to pass through the barrier provided by the embankment and underlying structure of the Robert Moses Parkway, which was constructed in the early 1960's. Instead, the contaminated groundwaters may be forced to flow in an easterly direction parallel to the river, toward the water treatment plant.[20] Contaminated groundwaters may have penetrated the deepwater system as well, for much of the waste in the S-Area is acidic and capable of dissolving the dolomite bedrock beneath the landfill.[21]

On August 22, 1978, an underwater inspection performed by Allen Marine Salvage of the raw water intake system and the forebays of the Pump Station discovered the presence of liquid chemical residues.[22] In the number one forebay, a black, tar-like material was present in pools and on top of the gravel, sand and debris that had accumulated in the forebay. Samples of the material were immediately collected and sent to the Hooker Chemical and Plastics Research and Development Laboratory for analysis. On August 25, 1978, the test results were submitted to the City of Niagara Falls authorities. Those findings are presented in Table 32. The identified contaminants closely coincide with materials reported to be buried in the S-Area.[23]

TABLE 32
HOOKER GC ANALYSIS OF SEDIMENT REMOVED FROM #1 FOREBAY OF PUMP STATION, AUGUST 22, 1978 AND GRAB SAMPLES OF FINISHED AND RAW WATER TAKEN AUGUST 23, 1978 FROM FILTER PLANT IA AND PUMP STATION FOREBAY, RESPECTFULLY

Compound	Finished Water µg/l ppm	Raw Water µg/l ppb	Sediment % Composition
trichloroethylene	<0.4	<0.4	
toluene	<0.1	<0.1	
tetrachloroethylene	<0.4	<0.4	
monochlorobenzene	<0.1	<0.1	
monochlorobenzotrifluoride	<0.2	<0.2	
monochlorotoluene	<0.1	<0.1	
dichlorobenzotrifluoride	1.9 (1)	<0.2	
dichlorobenzene	0.2	0.07	
dichlorotoluene	<0.3	<0.3	
trichlorobenzene	1.5	1.1	9.3
hexachlorobutadiene(C-46)	0.13	0.14	2.9
tetrachlorobenzene	1.7	1.6	29.4
hexachlorocyclopentadiene(C-56)	0.31	0.26	8.0
Mirex	<0.2	<0.2	0.15
Mecury	<0.1	<0.1	

(1) Interference present and/or retention time shift.

Source: City of Niagara Falls

On August 27, 1978, 24 hour composite water samples were collected by Carborundum Analytical Laboratories' personnel from the Emerald Channel water intake, the Pump Station number one forebay, and a clearwell containing combined post-chlorinated effluents from the A and B treatment plants. Analyses performed for the 129 "priority pollutants" show that the levels of organics present in the raw and finished water, with the exception of THMs, did not exceed 3ug/l.[24]

On August 28, 1978 a sediment sample was collected and analyzed for volatile organics and methylene soluble materials. The results of that analysis are presented in Table 33.[25] These findings also coincide with wastes known to be buried in the S-Area.

TABLE 33

SEDIMENT GRAB SAMPLES TAKEN BETWEEN TRAVELLING SCREENS AND STATIONARY BARS OF #1 FOREBAY PUMP STATION, AUGUST 28, 1978

I. Methylene Chloride Solubilized Material

Compound	Concentration mg/l
1,3-dichlorobenzene &	
1,4-dichlorobenzene	790
1,2-dichlorobenzene	1,800
hexachloroethane	15,000
hexachlorobutadiene	66,000
1,2,4-trichlorobenzene	120,000
h.xachlorocyclopentadiene	100,000
h.xachlorobenzene	30,000
c.lorotoluenes	265
dichlorotolue.es	460
tetrachlorobenzenes	13,800

II. Volctile Organic Compounds

Compound	Concentration ug/l
benzene	0.37
carbon tetrachloride	300.0
chlorobenzene	230.0
1,1,1-trichloroethane	1.7
chloroform	0.75
1,1-dichloroethylene	0.061
thylbenzne	0.15
ethylene chloride	0.84
etrachloroethylene	25,000.0
.oluene	0.39
.richloroethylene	33.0
(1)	

(1) Volatile compnunds not listed were reported N/D.

Source: City of Niagara Falls

Subsequent underwater inspections discovered the presence of more contamination and a major new source of contamination. As described previously, prior to the construction of the present pump station, raw water was supplied to the Old Pump Station via a 54" steel pipe, supplemented by a 20" cast iron line. In 1970, an underwater investigation, also performed by Allen Marine Salvage had identified the presence of contamination in the forebays and in the shoreshaft. No attempt, however, was made to remove the material. Instead, a concrete plug was poured into the abandoned 54" line approximately 14 feet from its entrance to the shoreshaft. On September 1, 1978, a 6" gap at the top of the plug was discovered during an underwater inspection. The entrance into the abandoned line contained a large amount of collected sediment extending from the gap. Organic chemical contamination was present in this material. Additional sediment was discovered on the floor of the shoreshaft, as well as five feet into the main water intake tunnel, and between 5' to 6" depth in the raw water chemical pretreatment channels.[26]

Beginning August 28, 1978 and ending October 6, 1978 remedial actions were carried out using vacuum trucks equipped with suction hoses to remove the chemically saturated sediments in the treatment facility. Approximately 34 tons of material was removed. Approximately 15,000 gallons of contaminated liquid material was also removed, chemically processed in a holding lagoon and disposed of somewhere in Ohio. Approximately 138, 55-gallon drums of contaminated solid materials were removed and disposed of in the secure landfill facility operated by CECOS International in Niagara Falls. The total cost of these remedial efforts was reported to be $290,000.[27]

Between April 9 and 29, 1979, a spring clean-up was conducted at the treatment facility. More contamination was discovered in the system and another major source of contamination was located. In each case the contamination was composed of the same compounds that were originally found in the Pump Station forebay during August, 1978. At the intersection of the main water intake tunnel and the shoreshaft, sediment had accumulated to a depth of 2'5", extending approximately 25' into the tunnel. When this material was removed, a hole was discovered in the floor of the shoreshaft. When the debris in the hole was removed, it was clear that the integrity of the bottom of the shoreshaft had been breeched. At a depth of 2'6" below floor elevation, river bottom-like mud was found. Table 34 lists the compounds that were identified in the sediment. On April 25, 1979 the hole was capped with concrete.[28]

TABLE 34
ANALYSIS OF "SUMP HOLE" SEDIMENT

Compound	ug/g (dry) (ppm)
Lindane	9.16
hexachlorobutadiene	0.07
hexachlorocyclopentadiene	0.18
octoachlorocyclopentene	1.97
hexachlorobenzene	0.20
1,2-dichlorobenzene	22.0
1,4-dichlorobenzene	114.0
1,2,4-trichlorobenzene	108.0
1,2,3-trichlorobenzene	8.48
1,3,5-trichlorobenzene	18.0
1,2,3,4-tetrachlorobenzene	44.5
1,2,4,5-tetrachlorobenzene	2.28
1,2,3,5-tetrachlorobenzene	< 0.01
Mirex	0.28

Source: City of Niagara Falls

Table 35 indicates that the highest concentrations for 11 compounds identified in the treatment plant's finished water were measured in March and April of 1979.

TABLE 35
ORGANIC COMPOUNDS IDENTIFIED IN CITY OF NIAGARA FALLS FINISHED DRINKING WATER

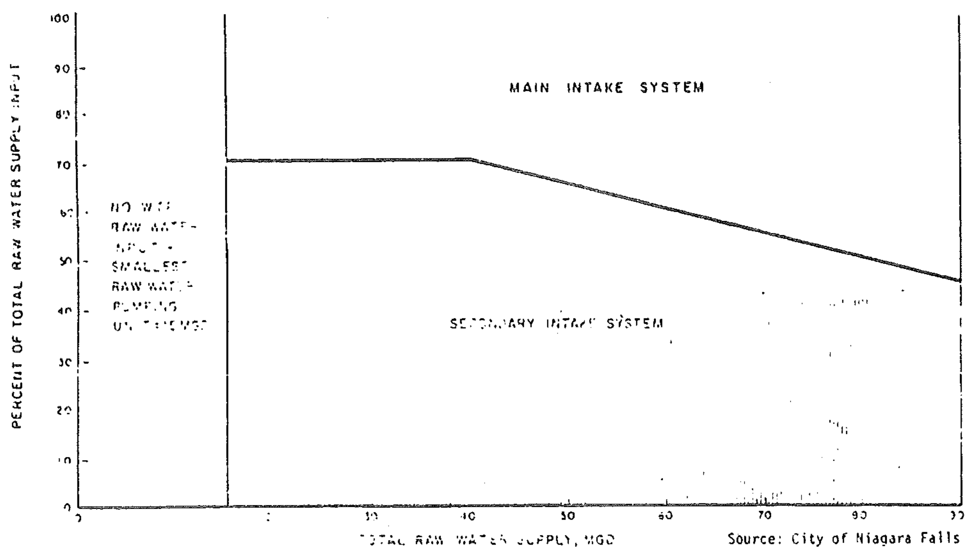
COMPOUND	HIGHEST CONCENTRATION DETECTED (ppb)	DATE	SOURCE
Trichloroethylene	5.40	9/15/78	Carborundum
Toluene	.36	8/25/78	Carborundum
Tetrachloroethylene	2.70	8/27/78	Carborundum
Monochlorobenzene	.13	11/1/78	Carborundum
Monochlorobenzotrifluoride	.10	8/23/78	Carborundum
Monochlorotoluene	.27	9/5/78	Carborundum
Dichlorobenzotrifluoride	1.0	10/11/78	Carborundum
Dichlorobenzenes	.36	3/19/79	Carborundum
Dichlorotoluenes	.30	9/15/78	Carborundum
Trichlorobenzenes	1.9	3/19/79	Carborundum
Hexachlorocyclopentadiene (C5,6)	.65	4/12/79	Carborundum
Hexachlorobutadiene	.70	4/12/79	Carborundum
Tetrachlorobenzenes	6.54	4/18/79	EPA
Mirex	.10	4/12/79	Carborundum
Lindane	1.9, 1.66	4/11/79, 4/18/79	Recra
Benzene	.89	8/27/78	Carborundum
Carbon Tetrachloride	.43	8/27/78	Carborundum
1,1,1 Trichloroethane	1.1	11/1/78	Carborundum
Chloroform	43.0	7/21/78	NYSDOH
1,1 Dichloroethylene	.26	8/27/78	Carborundum
Ethylbenzene	.025	8/27/78	Carborundum
Methylene Chloride	.80	11/1/78	Carborundum
Bromoform	.37	8/27/78	Carborundum
Dichlorobromomethane	55.0	8/27/78	Carborundum
Chlorodibromomethane	22.0	8/27/78	Carborundum
2,4,5 Trichlorophenol	.072	April/79	Niagara Gazette, EPA
Hexachlorobenzenes	.57	4/11/79	Recra Research Inc.
Octachlorocylopentene	.51	4/18/79	Recra Research
Hexachlorocyclobutene	.20	4/11/79	Recra Research
bis (2-ethylhexyl) phthalate	< .58	8/27/78	Carborundum
butyl Benzyl Phthalate	< .30	8/27/78	Carborundum
Phenol	25.0	8/27/78	Carborundum
Endrin	< 0.1	8/27/78	Carborundum
Methoxychlor	< 1.0	8/27/78	Carborundum
2,4 D	< 2.5	8/27/78	Carborundum
2,4,5 TP	< 0.5	8/27/78	Carborundum
Toxaphene	< 5.0	8/27/78	Carborundum
Kepone	< 1.0	8/27/78	Carborundum

Since the discovery of the hole in the floor of the shoreshaft, several other sources of contamination have been discovered. 2 inch diameter "weep holes" have been identified every 20 feet in the main intake tunnel.[29] These holes connect the top of the tunnel floor to the bottom of the 6" gravel fill. Under static conditions the pressure gradient in the tunnel is greater than the bedrock gradient. Due to changes in surface water levels in the Niagara and rates of pumping, however, the bedrock gradient could become higher than the pressure gradient in the tunnel, especially in the near-shore area. This would result in chemical wastes infiltrating into the intake line. Water levels in the river regularly fluctuate due to heavy intake pumping for power generation purposes. The filtration plant's water intake rate fluctuates in response to system demand.

There are at least two other breeches in the intake system's structural integrity. The first two joints in the 66" raw water intake line from the shoreshaft to the forebay were found to be separated 1" and 1 1/2", respectively.[30] There are also structural faults in the intake system.

Beginning on December 18, 1979, the 48" secondary intake line was reactivated and began to supply most of the water system's raw water directly into the forebays of the Pump Station. Figure 21 illustrates the total percentage of water supplied by this intake line. Under maximum water surface differential conditions this intake is able to supply approximately 40 MGD. The remaining 19 to 29 percent of the raw water needs of the system is supplied by the main water intake tunnel, which is partially blocked by an isolation steel slide gate.[31]

FIGURE 21
PERCENTAGE OF TOTAL RAW WATER INPUT
SUPPLIED BY SECONDARY INTAKE SYSTEM, CITY OF NIAGARA FALLS



The switch in water intakes fails, however, to by-pass the two main sources of toxic pollution: the contamination in the overburden and in the bedrock. There is evidence that wastes in the S-Area have migrated along the gravel base of the abandoned 54" water intake line toward the shoreshaft. Groundwater monitoring data from well "CW-2A" shows elevated levels of chlorobenzene compounds are present in the overburden.[32] The sediments removed from the shoreshaft in April, 1979 contained approximately 35 percent chlorobenzene compounds. In the area of the shoreshaft, a cross connection between the underlying water layer and the overlying water bearing zone probably exists, due to structural fractures in the bedrock, caused by construction of the shoreshaft, and due to the thin layer of relatively impermeable clay-till that separates the two layers. The monitoring well "SS-1" located 12' north of the northwest corner of the shoreshaft identified the presence of a contaminated aquifer at a depth of 56 feet.[33] The bottom of the shoreshaft is 69 feet from the top of grade. The close proximity of the pollution to the base of the shoreshaft indicates that contamination in the aquifer may have infiltrated the intake system through the hole in the floor of the shoreshaft.

Recently, monitoring of groundwater conditions on property immediately east of the water treatment plant has discovered the presence of C-46 and several isomers of tri and tetra chlorobenzene.[34] The source of these materials is unknown.

NYPIRG has learned that the treatment facility has been contaminated with toxics since at least 1969. A memo dated October 14, 1969 from then Deputy Director of Water, John Sparacio, to the Niagara Falls City manager, Donald J. O'Hara, noted that a "heavy plastic-like liquid" had been found in the treatment plant's shoreshaft. The memo stated that "the investigation and analysis of the substance leaves Hooker Chemical very much suspect... it is quite possible that Hooker's waste has leached into our line then our intake." This early awareness led to the installation of the concrete plug in the abandoned 54" water intake line, but not to other actions that could have solved the plant's pollution problems.

Though the contamination troubles of this treatment facility are unique, they exemplify the overall weaknesses of the existing system of water quality safeguards. The problem is Catch-22-like. Strict toxic chemical regulations have not been established. Consequently, the drinking water bureaucracy tends to only focus on existing standards that reflect greater concern for 19th Century health hazards associated with bacterial contamination. As a result, toxic chemical threats are given short shrift. Limited monitoring facilities are mainly utilized to test for identified problems, not for undetected toxic hazards. Thus, contamination may escape discovery for long periods. Because the need to upgrade antiquated treatment systems is not readily apparent, little improvement in the monitoring or removal of toxics occurs. The entire process maintains the status quo.

Obviously, a host of reforms are urgently needed. They are discussed in the conclusions and recommendations section of this report.

CHAPTER VIII

A Preliminary Analysis of Cancer Statistics and Trends in Erie and Niagara Counties

This section compiles and analyzes cancer mortality and morbidity statistics for Erie and Niagara Counties to determine if significant cancer trends exist.

The rates of cancer mortality in Erie and Niagara Counties by individual organ sites and all sites combined, according to U.S. Cancer Mortality by County: 1950-1969, are detailed in Table 36. Death certificate information was used to calculate various average annual age-adjusted mortality rates per 100,000 people based on counties of usual residence. The rates were determined according to tumor sites, sex, and race, using the total U.S. population of 1960 as the standard for the 19 year period of review. Rates were calculated both for the 50 states and the 48 contiguous states. Nonwhite and white population figures were taken from census data for the years 1950, 1960, and 1970. Rates during the intervening years were calculated using linear interpolation of the same data. Each tumor site is identified by name and by the Sixth Revision of the International Classification of Diseases (ICD) code number. These data formed the data base of the Cancer Atlas described in the background section of this report. The individual county mortality rates for each tumor sites are compared with the same data for New York State and the nation as a whole. Column one lists the number of deaths. Column two lists the age-adjusted rates. Column three indicates which decile each local rate was in, compared with nationwide rates. Data for ICD sites 190-204 are based on State Economic Areas (SEA), not on single counties.

TABLE 36
ERIE AND NIAGARA COUNTY CANCER MORTALITY RATES BY SITE, SEX, AND RACE: 1950-1969

	MALE					FEMALE				
	WHITE			NONWHITE		WHITE			NONWHITE	
	#	rate	decile	#	rate	#	rate	decile	#	rate
ICD #140 Site: Lip										
Erie	27	.3	30th	1	.1	4	0	50th	1	.1
Niagara	4	.2	10th	-	-	-	-		-	-
NYS	361	.25		8	0.1	39	0.2		3	.02
USA	4752	.33		80	.06	525	.03		57	.04
ICD #142 Site: Salivary Glands										
Erie	45	.5	60th	6	1.2	30	.3	70th	2	.7
Niagara	8	.4	40th			2	.1	10th	-	-
NYS	672	.44		49	.52	4[illegible]2	.22		18	.17
USA	6450	.44		497	.34	3945	.22		317	.19
ICD #146 Site: Nasopharynx										
Erie	43	.5	80th	4	.9	14	.1	50th	-	-
Niagara	11	.5	80th	-		2	.1	50th	-	-
NYS	692	.43		163	1.45	262	.15		22	.15
USA	5759	.38		924	.58	1988	.12		259	.15

	MALE WHITE #	MALE WHITE rate	MALE WHITE decile	MALE NONWHITE #	MALE NONWHITE rate	FEMALE WHITE #	FEMALE WHITE rate	FEMALE WHITE decile	FEMALE NONWHITE #	FEMALE NONWHITE rate

ICD #141,143, 144, 145, 148 Site: Tongue, floor of mouth, other unspecified mouth, oral mesopharynx, pharynx, unspecified

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	633	6.8	90th	32	5.9	117	1.1	50th	11	2.3
Niagara	101	5.2	80th	-	-	19	0.8	20th	-	-
NYS	8289	5.29	-	813	7.55	2096	1.13		197	1.54
USA	62505	4.21		6575	4.44	18325	1.05		2139	1.30

ICD #150 Site: Esophogus

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	616	6.7	90th	70	14.4	113	1.0	60th	18	3.4
Niagara	107	5.5	90th	3	6.3	27	1.2	80th	1	1.3
NYS	8442	5.44		1736	17.80	2622	1.39		408	3.24
USA	60819	4.10		13875	9.44	18214	1.03		3575	2.17

ICD #151 Site: Stomach

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	1699	18.8	80th	109	25.2	1054	9.5	80th	39	9.3
Niagara	324	16.7	70th	4	9.4	163	7.3	50th	2	6.6
NYS	28441	18.52		2475	27.43	18450	9.78		1480	12.69
USA	222524	15.22		33606	24.03	137254	7.70		16725	10.69

ICD #157 Site: Pancreas

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	969	10.5	70th	59	13.0	680	6.1	60th	38	9.1
Niagara	173	8.7	40th	3	4.6	118	5.3	50th	3	11.1
NYS	16487	10.58		1065	11.33	12623	6.70		839	7.43
USA	142333	9.63		14416	10.17	102899	5.83		9650	6.17

ICD #160 Site: Nose, nasal cavities, middle ear, and accessory sinuses

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	48	.5	70th	1	.4	22	.2	40th	1	.2
Niagara	8	.4	40th	-	-	10	.4	90th	1	3.2
NYS	626	.41		60	.61	414	.22		48	.37
USA	6299	0.43		886	.60	4055	.23		403	.25

ICD #161 Site: Larynx

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	387	4.2	90th	15	3.1	33	.3	70th	1	.2
Niagara	71	3.5	90th	-	-	3	.1	20th	-	-
NYS	5397	3.41		407	4.06	580	.31		69	.52
USA	37954	2.54		3898	2.67	4141	.24		607	.37

ICD #153 Site: Large intestine except rectum

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	1849	20.5	90th	62	14.4	1864	16.8	70th	76	18.6
Niagara	340	17.5	80th	2	7.8	379	17.1	70th	5	14.1
NYS	33088	21.66	80th	1413	16.18	36798	19.55		1784	16.02
USA	241910	16.54		16758	12.07	287645	16.25		19876	12.69

ICD #154 Site: Rectum

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	1079	12.0	90th	44	11.8	706	6.4	90th	22	4.5
Niagara	197	10.1	90th	3	10.4	126	5.7	80th	1	3.2
NYS	17657	11.48		775	8.93	12692	6.75		673	5.84
USA	112232	7.65		7967	5.68	85170	4.82		7110	4.46

ICD #155 Site: Biliary passages and liver

	#	rate	decile	#	rate	#	rate	decile	#	rate
Erie	530	5.8	70th	43	9.6	648	5.9	60th	17	3.4
Niagara	105	5.3	60th	4	8.5	130	5.9	60th	-	-
NYS	8536	5.51		839	8.47	10538	5.60		519	4.60
USA	76070	5.16		10021	6.91	94229	5.34		7261	4.59

	MALE					FEMALE				
	WHITE			NONWHITE		WHITE			NONWHITE	
	#	rate	decile	#	rate	#	rate	decile	#	rate
ICD #162, 163 Site: Trachea, bronchus and lung (1° and/or 2°)										
Erie	4531	47.8	90th	300	61.5	631	5.8	60th	42	8.1
Niagara	922	45.5	90th	24	51.3	145	6.6	70th	1	3.2
NYS	70029	43.77		4812	48.01	13377	7.20		916	7.43
USA	571226	37.98		53910	36.67	108326	6.29		10222	6.27
ICD #170 Site: Breast										
Erie	30	.3	70th	2	.4	3535	32.3	90th	132	26.1
Niagara	7	.3	70th	-	-	619	27.9	80th	8	15.9
NYS	572	.37		42	.46	57924	31.53		3360	25.53
USA	4131	.28		527	.37	436618	25.51		36926	22.1
ICD #171 Site: Cervix Uteri										
Erie						828	7.6	50th	119	20.9
Niagara						190	8.5	60th	8	17.5
NYS						12050	6.64		2516	18.19
USA						131240	7.79		32329	18.92
ICD #172, 173, 174 Sites: Corpus uteri, other parts uterus, inc. chorionepithelioma and unspecified parts										
Erie						770	7.0	60th	51	10.6
Niagara						158	7.2	70th	6	17.5
NYS						11404	6.09		972	8.21
USA						106455	6.13		18267	11.3
ICD #175 Site: Ovary, fallopian tube and broad ligament										
Erie						1098	10.1	80th	49	10.0
Niagara						225	10.2	80th	2	6.8
NYS						18348	10.00		997	7.74
USA						145957	8.57		10696	6.37
ICD #177 Site: Prostate										
Erie	1491	17.8	50th	100	28.5					
Niagara	282	15.6	30th	9	29.1					
NYS	24287	16.8		1981	27.33					
USA	252763	17.84		35397	27.39					
ICD #178 Site: Testis										
Erie	99	1.0	80th	1	0.1					
Niagara	24	1.1	80th	-	-					
NYS	1276	0.84		30	0.22					
USA	12918	0.83		504	0.30					
ICD #180 Site: Kidney										
Erie	438	4.6	80th	21	4.2	239	2.2	60th	14	2.6
Niagara	79	4.0	60th	1	4.1	43	2.0	50th	2	1.8
NYS	6793	4.31		343	3.37	3992	2.2		219	1.73
USA	57780	3.86		4072	2.67	34204	1.99		2429	1.42
ICD #181 Site: Baldder and Urinary Organs										
Erie	874	9.9	90th	19	3.9	333	3.0	80th	23	5.2
Niagara	155	8.2	80th			64	2.9	80th	1	2.4
NYS	13012	8.64		538	6.43	5201	2.73		408	3.61
USA	98304	6.78		7001	5.05	43095	2.39		4758	3.05
ICD #191 Site: Skin (malignant melanoma)										
Erie	122	1.3	30th	3	.6	92	.9	20th	-	-
Niagara	20	0.9	10th	-	-	18	.8	10th	-	-
NYS	2379	1.52		31	.33	1796	1.01		46	0.41
USA	23417	1.55		564	.39	18865	1.11		492	0.30

	MALE					FEMALE				
	WHITE			NONWHITE		WHITE			NONWHITE	
	#	rate	decile	#	rate	#	rate	decile	#	rate
ICD #192 Site: Eye										
Erie	21	.2	40th	-	-	20	.2	50th	-	-
Niagara	4	.2	40th	-	-	6	.3	80th	1	4.2
NYS	340	.22		12	.10	334	.19		11	.09
USA	3453	.23		200	.11	3291	.19		196	.10
ICD #193 Site: Brain and other parts of nervous system										
Erie	429	4.4	50th	16	2.2	307	3.0	60th	11	1.3
Niagara	72	3.3	30th	3	3.2	57	2.6	50th	2	1.9
NYS	7229	4.59		375	2.83	5028	2.98		339	2.19
USA	67751	4.42		4154	2.34	47192	2.91		3022	1.54
ICD #194 Site: Thyroid										
Erie	60	.6	80th	4	.9	96	.9	80th	5	1.0
Niagara	10	.5	70th	-	-	13	.6	40th	-	-
NYS	868	.55		45	.45	1573	.84		86	.72
USA	6436	.43		523	.36	12032	.69		1121	.70
ICD #195 Site: Other endocrine glands										
Erie	38	.4	70th	1	.1	20	.2	60th	2	.2
Niagara	15	.7	90th	-	-	4	.2	60th	-	-
NYS	530	.34		35	.27	366	.22		28	.18
USA	4765	.31		388	.23	3191	.20		275	.15
ICD #196 Site: Bone, including jaw bone										
Erie	105	1.1	20th	6	1.0	61	.6	10th	5	.8
Niagara	30	1.5	70th	-	-	12	.5	40th	-	-
NYS	2063	1.35		124	1.17	1512	.87		102	.72
USA	20368	1.35		1984	1.23	14403	.85		1537	.88
ICD #197 Site: Connective tissue										
Erie	72	.8	80th	3	..4	69	.7	90th	3	.5
Niagara	16	.8	80th	-	-	13	.6	80th	-	-
NYS	1153	.75		75	.66	939	.53		66	.49
USA	9775	.65		948	.59	8009	.48		884	.50
ICD #201 Site: Hodgkin's Disease										
Erie	282	3.0	90th	14	2.1	193	1.8	90th	17	1.1
Niagara	36	1.7	10th	-	-	.34	1.5	80th	2	4.6
NYS	4033	2.59		232	1.88	2763	1.59		154	1.01
USA	35279	2.29		2762	1.65	22340	1.32		1439	.78
ICD #200, 202,205 Site: Reticulosarcoma lymphosarcoma, other forms of lymphoma and mycosis fungoides										
Erie	467	5.0	60th	20	3.8	319	2.9	60th	13	3.2
Niagara	114	5.6	80th	6	12.9	93	4.2	90th	2	2.0
NYS	8515	5.46		442	3.88	6642	3.66		328	2.46
USA	73475	4.89		5277	3.38	55658	3.25		3283	1.91
ICD #203 Site: Multiple neyclonia (plasmocytoma)										
Erie	176	1.9	70th	19	3.9	131	1.2	50th	7	1.5
Niagara	37	1.8	60th	-	-	30	1.4	70th	2	5.6
NYS	2899	1.84		318	3.35	2509	1.34		278	2.35
USA	26267	1.76		3873	2.7	21460	1.24		2942	1.83

ICD #204 Leukemia and aleukemia

Erie	825	9.1	60th	45	9.2	598	5.8	50th	25	3.6
Niagara	177	8.8	50th	4	9.1	124	5.7	50th	1	3.8
NYS	13282	8.9		682	5.93	10205	5.98		539	3.95
USA	130703	8.81		9327	5.77	95959	5.74		6983	3.88

ICD #147, 152, 158, 159, 164, 165, 176, 179, 198, 199
(all ICD's not previously listed)

Erie	883	9.6	40th	66	13.6	900	8.1	30th	58	11.7
Niagara	166	8.4	20th	10	25.3	165	7.5	20th	5	13.9
NYS	18373	11.84		1374	16.59	18691	10.01		1500	12.63
USA	186259	12.64		24432	17.19	173690	9.89		21284	13.51

ICD #140 - 205 All malignant neoplasms

Erie	18959	207.0	90th	1087	237.0	15598	142.3	90th	797	161.2
Niagara	3635	184.2	90th	76	182.1	3008	135.8	80th	57	143.5
NYS	307997	199.24		21572	227.69	273316	148.01		18920	152.80
USA	2572035	174.04		264108	184.28	2253282	130.1		228561	139.18

Source: Mason, I.J. and McKay, F.W. (1973). U.S. Cancer Mortality by County, 1950-1969. DHEW publication (NIH) 74-615, Washington, D.C.

Total resident deaths from malignant neoplasms in Erie and Niagara Counties and New York State from 1970 to 1980 are presented in Table 37.

Table 37: Deaths by Malignant Neoplasms by County 1970-1980

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Erie	2,183	2,175	2,051	2,225	2,166	2,112	2,282	2,310	2,228	2,259	2,327
Niagara	398	422	406	414	492	454	465	483	510	498	479
New York State	35,764	35,883	35,551	35,926	35,675	35,822	36,671	36,849	36,618	36,526	37,489

Rates of resident deaths from malignant neoplasms in Erie and Niagara Counties and New York State from 1970 to 1980 are presented in Table 38.

Table 38: Death Rates for Malignant Neoplasms by County 1970-1980*

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Erie	196.5	194.5	182.6	199.5	198.2	194.7	212.1	216.5	214.4	212.9	220.4
Niagara	168.4	178.1	171.4	175.7	208.1	192.0	197.2	265.4	213.7	208.0	199.3
New York State	195.4	194.8	192.3	195.8	197.1	198.2	202.8	205.8	205.6	204.8	208.9

*per 100,000 residents

Total cancer deaths in Erie and Niagara Counties by site are presented in Table 39.

Table39 Cancer Deaths in Erie and Niagara Counties by Site

	Total Deaths ICD 140-208	Buccal Cavity and pharynx 140-149	Digestive Organs and Peritoneum 150-159	Respiratory System 160-165	Breast 174-175
Erie	2,327	46	710	630	188
Niagara	479	9	142	125	54

	Genital Organs 179-187	Urinary Organs 188-189	Other and unspecified sites 170-173 190-199	Lymphatic and Hematopoietic tissues 200-208
Erie	212	100	228	213
Niagara	50	13	43	43

Total cancer deaths in New York State by age group and site are presented in Table 40.

TABLE 40
TOTAL CANCER DEATHS IN NEW YOUR STATE BY AGE, GROUP AND SITE

(EXCLUSIVE OF FETAL DEATHS)

AGE IN YEARS

CAUSE OF DEATH (INTERNATIONAL LIST NUMBERS, SIXTH REVISION, ICD)	SEX	TOTAL DEATHS	UNDER 1	1	2	3	4	TOTAL UNDER 5	5 TO 9	10 TO 14	15 TO 19	20 TO 24
MALIGNANT NEOPLASMS, INCLUDING NEOPLASMS OF LYMPHATIC AND HEMATOPOIETIC TISSUES (140-205)	M	19,375	1	6	6	7	4	24	42	33	52	91
	F	18,114	4	4	4	4	5	21	13	21	22	59
OF BUCCAL CAVITY AND PHARYNX (140-148)	M	546										
	F	267										
OF DIGESTIVE ORGANS AND PERITONEUM (150-159)	M	5,760									1	5
	F	5,436			1			1			4	3
STOMACH (151)	M	587										1
	F	671										
INTESTINE, EXCEPT RECTUM (152,153)	M	2,240										1
	F	2,331									1	1
RECTUM (154)	M	517										
	F	464										
BILIARY PASSAGES AND LIVER (155,156)	M	470									1	1
	F	542			1			1			3	2
PANCREAS (157)	M	1,025										2
	F	994										
OTHER AND UNSPECIFIED DIGESTIVE ORGANS (150,158,159)	M	666										
	F	577										
OF RESPIRATORY SYSTEM (160-165)	M	6,353			1		1	2			1	2
	F	2,680								1		1
LARYNX (161)	M	299										
	F	75										
BRONCHUS AND LUNG (162.2-162.9)	M	5,949			1			1			1	1
	F	2,550										

AGE IN YEARS

25 TO 29	30 TO 34	35 TO 39	40 TO 44	45 TO 49	50 TO 54	55 TO 59	60 TO 64	65 TO 69	70 TO 74	75 TO 79	80 TO 84	85 TO 89	90 TO 94	95 TO 99	100 AND OVER	NOT STATED
1,910	2,056	2,162	2,796	4,256	7,165	10,587	14,178	18,197	21,402	23,280	23,843	18,961	10,137	2,956	519	26
1,424	1,641	1,366	1,749	2,650	4,538	6,504	8,523	10,652	11,606	11,757	10,269	7,165	3,330	819	134	16
486	415	796	1,047	1,606	2,767	4,033	5,655	7,545	9,596	11,623	13,574	11,776	6,807	2,138	385	10
1	[illegible]	[illegible]	5	11	16	16	16	10	14	19	9	10		1		
[illegible]	[illegible]	[illegible]	6	4	4	3	3	11	11	7	7	6	2			
	[illegible]	[illegible]	5	11	14	7	13	10	13	17	5	10				
1	2	1	6	3	4	2	2	10	5	4	6	4	1			
1																
[illegible]	1	2	4	3	2	4	4	1	5	1	1	2				
1	2	2	2		2	3	2	1	6	1		2	1			
			1		1		1	2	1	1	1	2				
									1	1		1				
1	1	1	13	28	71	114	136	177	161	139	103	58	15	5		
	1	2	7	22	40	69	97	155	171	163	137	90	31	8	1	
	1	[illegible]	14	21	46	98	93	116	93	65	68	37	13			
	1	[illegible]	3	8	16	30	47	55	64	51	52	29	15	3	1	
6	9	31	95	220	663	771	979	1,120	1,106	797	671	216	57	6	1	
2	5	26	57	104	249	324	377	443	617	313	195	100	19	10		
		2	1	13	19	45	51	48	53	27	22	7	6	1		
		1	1	6	9	12	10	6	12	7	5	6				
4	7	32	83	205	440	770	916	1,064	1,566	763	444	204	50	3	1	
1	4	11	54	97	239	305	382	432	600	296	185	93	35	9		

AGE IN YEARS

CAUSE OF DEATH (INTERNATIONAL LIST NUMBERS, NINTH REVISION, ICD)	SEX	TOTAL DEATHS	UNDER 1	1	2	3	4	TOTAL UNDER 5	5 TO 9	10 TO 14	15 TO 19	20 TO 24
OTHER PARTS OF RESPIRATORY SYSTEM (160,162.0,163-165)	M	65					1	1				1
	F	55								1		1
OF BONE, CONNECTIVE TISSUE, SKIN AND BREAST (170-175)	M	501		2				2	2	3	6	13
	F	1,054					1	1	2	5	1	7
BONE, CONNECTIVE TISSUE AND SKIN (170-173)	M	476		2				2	2	3	6	13
	F	179					1	1	2	5	3	7
BREAST (174-175)	M	30										
	F	1,675										
OF GENITOURINARY ORGANS (179-189)	M	2,981		1		1		2	1	1	6	13
	F	2,729	1					1	1	1	2	7
CERVIX UTERI (180)	M											
	F	419	1					1				2
OVARY, FALLOPIAN TUBE AND BROAD LIGAMENT (183)	M											
	F	1,050								1	1	5
PROSTATE (185)	M	1,627										
OTHER AND UNSPECIFIED GENITAL ORGANS (179,181,182,184,186,187)	M	71										
	F	666								1	5	11
KIDNEY (189.0,189.1)	M	387		1		1		2	1		1	2
	F	250							1		1	
BLADDER AND OTHER URINARY ORGANS (188,189.2-189.9)	M	696										
	F	324										
OTHER AND UNSPECIFIED SITES (190-199)	M	1,512		2	5	6	1	12	14	7	6	19
	F	1,384	2	4	2	4	2	14	6	6	3	15
OF LYMPHATIC AND HEMATOPOIETIC TISSUES (200-208)	M	1,697	1	1		2	2	6	25	22	12	41
	F	1,584	1		1		2	4	6	10	10	26
LEUKEMIA AND ALEUKEMIA (204-208)	M	741	1	1		2	2	6	22	20	18	22
	F	620	1		1		1	3	5	4	8	14

AGE IN YEARS

25 TO 29	30 TO 34	35 TO 39	40 TO 44	45 TO 49	50 TO 54	55 TO 59	60 TO 64	65 TO 69	70 TO 74	75 TO 79	80 TO 84	85 TO 89	90 TO 94	95 TO 99	100 AND OVER	NOT STATED
		1		7	18	19	67	105	129	130	111	61	25	7		
		1	2	8	11	13	12	61	39	52	60	40	20	5		
17	21	26	21	69	113	153	204	223	224	166	130	58	23	5	1	
6	20	17	20	47	73	102	175	185	209	187	160	95	39	8	1	
41	37	42	45	53	109	160	181	222	219	211	147	71	26	7		
31	24	27	30	49	83	132	168	199	222	218	169	123	47	6		
	1	2	1	2	4	6	12	6	9	7	1	1	1			
1	1	1	2	1	2	7	7	5	5	10	5	1	2	1		
[illegible]	12	14	17	29	49	69	62	57	64	39	33	29	6	3		
[illegible]	42	94	154	211	329	512	510	523	427	442	333	203	23	18	1	
[illegible]	19	14	15	28	47	48	55	55	59	35	24	28	5	3		
[illegible]	13	12	11	18	29	32	11	42	37	50	37	26	8	2	1	
			2	1	2	1	7	2	5	4	4	1	1			
14	32	81	143	193	360	490	477	481	452	293	297	177	75	16	2	
13	5	7	12	53	70	142	244	402	499	567	496	321	125	25		
13	19	32	67	113	195	260	379	363	396	352	271	135	59	15		1
7	12	18	38	31	44	52	44	47	47	44	25	24	6	2		
[illegible]	5	11	23	54	105	109	157	139	155	135	87	43	15	3		
			1	5	24	52	117	221	316	399	346	239	89	18		
[illegible]	5	5	4	3	3	1	1	3	3	4	6	2	2			
[illegible]	1	2	9	16	28	57	107	102	113	64	74	57	17	5		
2		1	7	18	25	52	55	73	71	34	33	19	9			
	1		2	7	9	29	46	32	37	11	25	21	3			1

These data indicate that New York State's overall cancer mortality rate has risen steadily during recent decades to become one of the highest in the nation. Compared with the rest of the state, mortality rates in western New York have been generally high, especially in Erie County, where cancer rates have been consistently ranked among the highest in the state and the nation. For white males, Erie and Niagara Counties' cancer mortality rates have both been ranked in the 90th decile of the nation's rate for the following sites: esophogus, trachus, bronchus and lung, rectum, larynx, and all malignant neoplasms combined. In addition, Erie County's cancer mortality rates for white males have also been ranked in the 90th decile of the national rate for the following sites: tongue, floor of mouth, other unspecified mouth, oral mesopharynx, pharynx, unspecified, large intestine except rectum, bladder and urinary organs, and Hodgkin's disease. Similarly, in Niagara County, cancer mortality rates for white males have also been ranked in the 90th decile of the national rate for other endocrine glands.

For white females, Erie County's cancer mortality rates have been ranked in the 90th decile of the national rate for the following sites: breast, connective tissue, Hodgkin's Disease, and all malignant neoplasms. Similarly, in Niagara County, cancer mortality rates for white females have been ranked in the 90th decile of the national rate for reticulosarcoma, lymphosarcoma, other forms of lymphoma and mycosis fungoides.

Refer to the conclusions and recommendations section of this study for a discussion of the potential influence of toxic pollution on these cancer rates.

CHAPTER IX

Summary, Conclusions and Recommendations

This study is the first comprehensive examination of the problems of toxic organic chemical pollution in the Niagara River basin. NYPIRG investigated direct industrial discharges, municipal sewage treatment plants with on-line industries and hazardous waste landfills located in the basin to identify the types of compounds being introduced directly and indirectly into the river. Investigators also investigated public water supply systems that use the river as a drinking water source. Finally, a limited sampling program was conducted to define areas in the river where toxic chemical pollution is prominent. The study concludes that a wide range of toxic organic compounds are being introduced into the river on a daily basis and that current state and federal regulatory programs designed to reduce pollution and protect public health are not effectively curtailing toxic chemical pollution. As a result, the water supply systems of over 380,000 residents in Erie and Niagara Counties may be jeopardized by increasingly high levels of toxic chemical pollution in the river. The locations of the 77 industrial dischargers, ten wastewater treatment plants and 7 drinking water intakes reviewed in this study are illustrated in Figure 22.

Chapter III

An Evaluation of Wastewaters Discharged into the Niagara River Regulated by the State Pollution Discharge Elimination System

This section of the report reviews the wastewater discharges of 77 industries located in the Niagara River basin. Using a variety of sources, NYPIRG gathered information on the products, raw materials, manufacturing processes and toxic chemicals used and wastewater generated by these industries. Information on toxic and potentially toxic chemicals typically present in wastewater discharges for a number of industrial categories was compiled. This information was compared to the wastewater discharge permits issued by the New York State Department of Environmental Conservation (DEC) to discover whether current permits adequately regulate toxic chemicals known to be or suspected of being present in the industrial wastewaters.

This study found that the current permit system inadequately regulates the broad spectrum of toxic organic chemicals discharged by industry. Despite indications that more than 65 percent of the 77 industries use, store, or manufacture some quantity of synthetic organic chemicals, less than 5 percent of them had discharge permits with numerical limits that restrict specific synthetic organic chemicals. The vast majority of the industries surveyed are only regulated for traditional pollution parameters, such as oil and grease, suspended solids, chemical

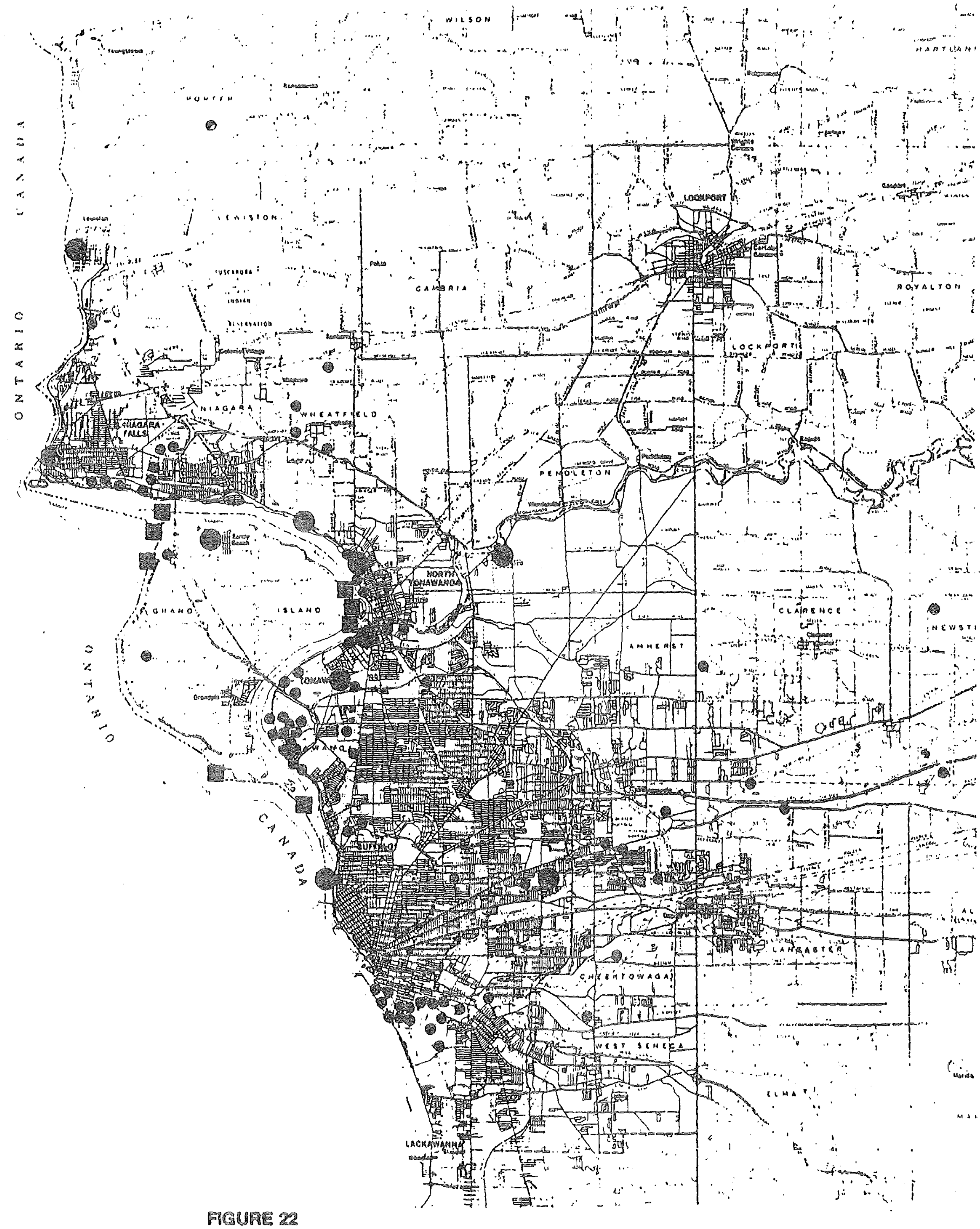


FIGURE 22
LOCATION OF THE 77 INDUSTRIAL DISCHARGERS, TEN WASTEWATER TREATMENT PLANTS AND SEVEN DRINKING WATER INTAKES REVIEWED IN THIS STUDY

oxygen demand, and biological oxygen demand. These regulations fail to effectively curtail the discharge of toxic substances. The Hooker Chemical and Plastics Corporation in Niagara Falls, for instance, is apparently discharging 157 lbs/day of untreated chemical leachate into the Niagara River, purportedly in compliance with the company's discharge permit. It should be noted that this is one of the few permits that even attempts to regulate toxic organic chemicals.

The report also documents that virtually all of the 77 discharge permits were issued in the absence of any data identifying the specific components of the industry's wastestream . Consequently, DEC is forced to rely on information submitted by the industries as to what compounds are likely to be present in their discharge or what chemicals are in use at their plants. Since the permits only regulate compounds suspected of being present in the discharge, many synthetic organic compounds escape regulation entirely.

Moreover, the information supplied by industry on toxic chemical use is neither verified nor cross-checked. NYPIRG learned, for instance, that there is no program to inspect or monitor industries that indicate in DEC's Industrial Chemical Survey that they do <u>not</u> use, store, or manufacture toxic or potentially toxic compounds. Similarly, NYPIRG found that a program begun in 1978 to inspect the 84 largest users of toxic and potentially toxic compounds in New York State has yet to complete over 50 percent of those inspections almost three years later. In Region 9, which includes the Niagara River basin, only a handful of the 175 industries that have indicated they use, store, or produce toxic chemicals have been inspected.

Because of severe staff restrictions, DEC relies heavily on self-monitoring data submitted by industrial dischargers to determine whether an industry is in compliance with its permit. Since DEC cannot adequately handle all self-monitoring data that is submitted, it divides industries into "major" and "minor" categories and enters data on major dischargers into a computer for analysis and follow-up. NYPIRG's own survey of the designated major dischargers included in this study revealed that up to 28 percent fail to comply with the terms of their current permits. More important, approximately 16 percent of the industries that use, store, or produce toxic and potentially toxic compounds are currently classified as minor dischargers and consequently are not as closely scrutinized or monitored.

RECOMMENDATIONS

While inadequate staffing, funding, and federal support are important factors in New York State's failure to effectively regulate toxic chemical discharges, there are a number of actions that can be taken to improve the present situation. They include the following:

1) A comprehensive state and federal review of the N/SPDES permit program's ability to control toxic synthetic organic pollutants should be undertaken immediately by EPA and DEC. A full report of this investigation should be made to the President, the U.S. Congress, and the New York State Legislature. This review should be used to improve the existing program in order to provide more stringent toxic waste controls.

2) All N/SPDES-permitted dischargers should be required to analyze their wastestreams for the presence of the 129 "priority pollutants" designated by EPA. This action is authorized under Section 308 of the CWA. Monitoring data for the "priority pollutants" should be submitted as part of the process of permit application and renewal; this information should provide the basis for regulatory priority setting.

3) Monitoring data generated by recommendation #2 should be used to set strict regulations for the discharge of toxic synthetic organic compounds. Due to the long delays in proposing and promulgating "priority pollutant" Best Available Treatment (BAT) Standards, EPA and DEC should take action to provide strict intermediate pollution controls.

4) The high rate of non-compliance in the permit program must be brought under control immediately. Laboratory analysis capability, legal support services, on-site inspections and enforcement services need to be drastically expanded. Increased fines and criminal penalties for pollution violations and rigorous follow-up should be provided.

5) Existing laboratory facilities need to be expanded several-fold and equipped with sophisticated gas chromatograph/mass spectrograph full scan testing technology. Otherwise, drinking water and industrial discharge monitoring data cannot be compiled or verified.

6) The Industrial Chemicals Survey (ICS) should be expanded and made a part of the SPDES permit application and renewal process. ICS data should be used to set appropriate SPDES permit regulations. DEC should re-establish a separate interdisciplinary inspection program to follow-up the findings of Industrial Chemical Survey. This program would assess the potential for air, soil, and water contamination from facilities using, storing, or manufacturing toxic and potentially toxic compounds.

7) The New York State Legislature should conduct its own investigation of the current inability of DEC to regulate toxic chemical discharges. This investigation should identify priority problem areas in the department and submit recommendations to the Governor, the Legislature, and DEC to improve current pollution control efforts. Based on these findings, the Legislature should fund an expansion of DEC's toxic chemical monitoring program. Compounds on the list of priority

pollutants should be monitored for in industrial and municipal treatment plant effluents. Fish and wildlife sampling programs should be similarly expanded.

8) The principal/non-principal discharger categories need to be revised. All industries identified as using, storing, manufacturing or generating toxic synthetic organic chemicals or wastes should be designated as principal dischargers. Self-monitoring should be required and computerized for instant retrieval.

9) Record-keeping in the SPDES permit program should be made reliable and open for quick retrieval. The vast multi-level program cannot function properly when data is unavailable, inconsistent, or outdated.

Chapter IV
An Evaluation of Industries Discharging into Municipal Wastewater Treatment Systems

As described in Chapter III, industrial discharges regulated by the N/SPDES permit program are not adequately controlled. In addition, hundreds of industries discharge wastewaters without even holding a SPDES permit. A loophole allows dischargers to release their effluents into municipal sewage treatment systems without requiring them to obtain a SPDES permit. In this way, on-line polluters are able to skirt the discharge standards and abatement schedules established by the SPDES permit program. Since sewage plants are generally unable to treat toxic chemical wastes, industrial discharges simply pass through municipal facilities into the environment. Pretreatment requirements, which are capable of managing this problem, are required by law, but to date these standards have not been implemented. In this way, the failure to limit on-line toxic discharges parallels the inadequate control of direct wastewater discharges; that is, protection has been mandated by law, but little or no action has actually been taken.

NYPIRG found that there has been a growing trend in western New York for industries to send their wastewater to municipally-operated facilities. NYPIRG surveyed 10 municipal sewage treatment plants with on-line industries discharging to the Niagara River and identified more than 700 industries on-line to these municipal treatment plants. Since these industries are not monitored or regulated by any state pollution discharge permit and are not required to submit monitoring data to DEC, they are totally unregulated for toxic and potentially toxic chemicals in their discharges. The municipal treatment plants are not designed to adequately treat and remove these compounds from industrial wastewaters. As a result, these facilities serve as a major conduit for a broad spectrum of synthetic organic compounds to the Niagara River.

NYPIRG found that approximately 20 percent of the industries that are on-line to municipal treatment plants have indicated some use, storage, or production of toxic and potentially toxic organic chemicals. If the huge Buffalo Sewer Authority System is eliminated from the analysis, the study shows that more than 55 percent of the industries that are on-line to the remaining 9 sewage treatment plants use, store, or produce toxic and potentially toxic compounds. In addition, at least 7 of the treatment plants chlorinate their effluent - a process which results in the formation of a number of additional toxic and potentially toxic organic compounds.

Most surprisingly of all, NYPIRG found that much of the estimated 265 to 310 million gallons/day (MGD) of wastewater being discharged by these facilities receive only primary treatment despite the large number of on-line industries. The inadequacy of the current regulatory program to control this important source of toxic chemical pollution is most graphically illustrated by the City of Niagara Falls Sewage Treatment plant. This plant has 28 major contributing industries which account for 54-60% of the wastewater received at the plant. The 60 MGD of wastewater entering the plant receives only primary treatment. Improperly regulated industrial wastewater discharges have caused the plant to discharge more than 40 tons/day of chemical oxygen demand to the river at times. NYPIRG monitored this facility's effluent and identified the presence of 34 priority pollutants. The plant's wastewater has been characterized by EPA as extremely toxic as a result of synthetic organic compounds present in the treated waste. This situation may continue unchanged for years to come.

State efforts to alleviate this problem by requiring on-line industries to pretreat their wastes are only at the beginning stages. NYPIRG found, for instance, that the state DEC does not even have an accurate list of what industries are on-line to what sewage treatment plants in the state. Pretreatment requirements, where they exist, are administered by individual municipalities, with no state overview. The pretreatment requirements imposed in individual industries vary tremendously in scope and depth and do not mandate pretreatment for specific synthetic organic compounds, except in rare instances. Thus, tying into a municipal sewage treatment facility provides a major loophole for industries to avoid toxic chemical regulation.

RECOMMENDATIONS

To help control toxic chemical polluton in the Niagara River originating from municipal treatment plants, NYPIRG recommends the following:

1) A separately funded, staffed, and administered pretreatment program should be created by the Department of Environmental Conservation (DEC) to identify all on-line dischargers in the Niagara Frontier and in the state as a whole.

This program should be directed to develop a pretreatment system to control on-line dischargers through modification of SPDES permits issued to municipal treatment facilities. Municipalities would thus be required to monitor and to regulate incoming on-line discharges, as well as their own effluents.

2) All on-line industries should be required to sample their wastestreams comprehensively for the presence of the 129 "priority pollutants." This action should be mandated by authority of Section 308 of the CWA, and should be implemented through the application and renewal process of the SPDES permit program for municipal facilities. The data should be used to develop appropriate pretreatment strategies for each contributing industry.

3) Wastewater discharge permits issued to municipal sewage treatment plants should be modified to include restrictions for toxic and potentially toxic organic chemicals being introduced into the plant. The discharger permits would then reflect the difference between treatment plants with on-line industries and those without. This would cause the municipality to mandate pretreatment of incoming wastewater to meet the terms of the plant's own discharge permit.

4) Action should be taken to manage properly the disposal of contaminated sewage sludge. While removal of toxic chemicals in traditional secondary sewage treatment processes is inefficient, sludges nevertheless become contaminated with toxic residues. When these sludges are inappropriately disposed of, pollution problems result.

Chapter V

Hazardous Waste Contamination in the Niagara Frontier

This chapter addresses the problem of landfilled wastes. Hundreds of industries in the Niagara Frontier generate more than 300,000 tons of hazardous wastes annually. Massive amounts of these wastes and hundreds of tons of garbage per year have been buried in local landfills. Yet none of the landfills are structured to prevent the leaching of toxic wastes into groundwaters.

Recent disasters such as the Love Canal demonstrate how toxic chemicals can slowly infiltrate an area and threaten the health of its residents. Hundreds of industries representing a wide variety of manufacturing concerns have dumped toxic wastes in equally damaging ways. In the years ahead, widespread contamination is certain to result from this environmentally unacceptable open dumping practice.

At present, no comprehensive program controls the land disposal of hazardous wastes. Like the SPDES permit program reviewed in this study, hazardous waste management programs are, for the most part, mostly promise and little substance. For example, there is no way to know which companies have landfilled wastes where and in what amounts. No groundwater monitoring has been identified exactly where toxic chemical groundwater contamination has occurred. No studies have adequately determined whether water supplies or public health have been threatened by hazardous waste dumps in western New York. Only the fact that the Niagara Frontier's environment is jeopardized by hazardous wastes is known for sure.

In short, hazardous wastes, which are pollution in its most toxic and concentrated form, have not been disposed of in any well-planned manner. They have been dumped into local sanitary landfills, buried on the property of industries that generate the waste and scattered across the countryside. In the years to come, as these wastes spread into the environment, drinking water supplies will be ruined, public health will be threatened and contamination will become increasingly unmanageable. Emergency action must be taken now to cope with the Niagara Frontier's hazardous waste dilemma.

RECOMMENDATIONS

1) DEC should follow up the Interagency Task Force Report with a sampling program to determine the contents of landfills situated along the Niagara River and its tributaries, especially those located upstream of public drinking water intakes.

2) DEC should conduct a study to determine the relative contribution of toxic and potentially toxic chemicals from the 50 hazardous waste sites located adjacent to or having access to the Niagara River and its tributaries. Based on those results, DEC should establish priorities and mandate a remedial program for each site found to be leaching into the Niagara River.

3) A hazardous waste manifest system should be established to manage the transport and disposal of hazardous waste. Like many other components of the national pollution control program, EPA will eventually establish this system as required by federal law. But in the meantime, states are left in limbo as to how to manage their problems. New York should not delay in implementing its own program. The Legislature has already cleared the way for the state to develop and impelment a comprehensive hazardous waste program, in conjunction with proposed EPA plans.

4) New York should establish a "superfund" to assist in containing and cleaning up hazardous waste dumps and spills. A system should be established to collect fees from industries that generate hazardous waste, based on the amount of waste produced per year. The fund should establish a comprehensive system of joint, several and strict liability that would require that polluters pay for the environmental damage their wastes cause. The fund would collect the industry-based fees and recover the costs of clean up under the strict system of liability. In

addition to cleaning up hazardous waste problems, the superfund monies would be used to aid victims of chemical disasters by funding limited medical services, emergency evacuations, emergency water supplies and other similar disaster assistance.

5) New York State should establish criminal penalties for corporate officials who knowingly dump toxic wastes or employ illegal "midnight dumpers" to empty toxic and hazardous waste into municipal landfills and other unsecured areas.

6) New York should investigate the development of engineered hazardous waste storage facilities in remote, sparsely populated areas in its upstate areas. Until thermal destruction technology has been fully proven as a safe and effective means of disposing of hazardous wastes, it should not be employed in the state. Nor should unreliable burial systems be depended on at this time. Techniques to store wastes temporarily until effective disposal systems can be developed should be a top priority.

7) A comprehensive program to regulate industrial waste haulers should be established. Existing programs are seriously inadequate for the task of monitoring the actions of small operations that are often known to dump their waste loads illegally.

8) Mandatory deposit legislation should be passed by the New York State Legislature as a first step in reducing the huge volume of wastes generated each year. This would decrease the expansion of landfills and reduce the groundwater pollution potential of the sites.

9) Source separation programs should be implemented to encourage intensive recycling of domestic and industrial wastes. At present, little or no effort is made to re-use tons of glass, metal, paper and recoverable oils and solvents that otherwise go into local dumps.

10) A public education campaign should be developed to inform Niagara Frontier residents of the dangers associated with hazardous waste dumps. This action should be undertaken as part of the overall efforts recommended in this study to involve citizens in environmental and health public policy decision-making at all levels of government.

Chapter VI
Monitoring of Selected Pollution Sites

From previous sections it is clear that existing monitoring programs are just as inadequate as the pollution control efforts. A two-fold problem blocks a positive, in-depth response to the environmental and health problems described in this study: 1) many contamination sites have polluted surface and groundwaters with toxic chemicals, but due to inadequate monitoring, the pollution has not been detected; and 2) even when toxic pollution problems are identified, pollution control programs are largely incapable of coping with them. None of the toxic hazards detailed in this report have been comprehensively monitored. Without concrete information that they are a threat to environmental quality, water supplies or public health, little action will be taken to clean them up.

The last section of the report contains the results of a limited sampling program conducted by NYPIRG with the assistance of Dr. Beverly Paigen at the Roswell Park Memorial Institute in Buffalo. Two samples collected from the City of Niagara Falls wastewater treatment plant and the Tail Race Tunnel were analyzed using gas chromatograph/mass spectograph techniques. A total of 34 and 25 priority pollutants were detected in each sample, respectively. Using Ames testing, NYPIRG and Dr. Paigen tested a total of 71 samples from a number of locations for the presence of mutagenic compounds. Thirty-eight samples (54 percent of the total) came back positive, indicating the presence of mutagenic, and hence potentially carcinogenic materials. Positive test results were found for samples taken from the river sediment, sewage treatment plant sludge, tributaries, industrial wastewater discharge streams, landfill leachate, and in one instance, from the backwash of the Town of Grand Island drinking water filter plant.

RECOMMENDATIONS

The data, while not identifying the precise sources of toxic chemicals, clearly indicates that toxic chemicals are being introduced into the Niagara River by direct and indirect discharges and by leachate from landfills that are not being properly controlled or regulated by current regulatory programs. These compounds may already pose a direct threat to public water supplies.

1) The State Health Department should identify mutagenic chemicals present at the Town of Grand Island water treatment plant, and should at the same time perform analyses for the presence of toxic organic chemicals at the other six drinking water treatment plants in the basin.

2) DEC should perform more detailed sampling and analyses at locations where toxic chemicals and mutagenic agents were identified, to characterize fully what toxic chemicals are present and to identify the sources of these compounds. This should be done especially for samples with demonstrated mutagenic activity taken adjacent to industrial dischargers and municipal sewage treatment plant sludges, so that additional restrictions may be added to a wastewater discharge permit to control the discharge of these dangerous compounds.

3) Both the State Health Department and DEC should begin an extensive monitoring program utilizing the Ames test to identify other toxic chemical problem areas in Erie and Niagara Counties. This type of sampling and testing could provide a relatively inexpensive first-round test for the presence of toxic chemicals in wastewater discharges, drinking water supplies, landfill leachate, and sewage treatment plant wastes.

Chapter VII

An Evaluation of Niagara River Drinking Water Supplies and their Regulation

This section of the report examines the drinking water supply systems that draw from the Niagara River. Located amid the 77 direct dischargers, 10 municipal sewage treatment plants, and 50 hazardous waste landfills are water intakes servicing 380,000 residents of Erie and Niagara Counties. NYPIRG conducted a survey of seven water supply systems, and found that none of the seven treatment plants use treatment techniques or technologies capable of removing a wide range of synthetic organic compounds from drinking water supplies. This situation is most severe in the City of Niagara Falls where synthetic organic compounds, including known and suspected cancer-causing agents, have been identified in the city's finished water supply. A memo found by NYPIRG indicates this problem has been present in the city's water supply since at least 1969.

Current state and federal drinking water standards, with few exceptions, do not adequately safeguard public water supplies from the threat posed by these compounds. All but one of the seven water supply systems were found to have detectable quantities of a class of compounds known as trihalomethanes in finished water supplies. Although none of the systems exceeded federal limits, three systems were found to have trihalomethanes present at concentrations within 10 parts per billion (ppb) of the 100 ppb Federal Maximum Contaminant Level. Six of the seven systems had never been adequately monitored for a wide range of synthetic organic chemicals.

Recommendations

1) Sophisticated water treatment systems utilizing granular activated carbon (GAC) should be installed immediately to safeguard the public's health. This action should be carried out by the state and federal authority granted by the Safe Drinking Water Act (SDWA). GAC has been used successfully for decades to purify water in industries such as food processing, bottling, and pharmaceutical manufacturing. Wherever pure water is absolutely necessary, GAC is employed, since it is extremely effective for the removal of a wide spectrum of organic chemical pollutants found in raw water.

GAC is generally made of coal. High temperatures, steam and the absence of oxygen combine to generate granules of super-porous carbon. The resulting GAC has a tremendously high surface area by weight: on the order of 2,000 cubic meters/gram (1.0 gram $\approx$ 1/28 ounce. A mere handful of GAC has the surface area of roughly one acre. Hydrophobic organic molecules, including chlorination by-products, preferentially cling to GAC surfaces and are "adsorbed." As increasing amounts of pollutants are retained by the GAC, its removal efficiency drops. But GAC can be regenerated through the same general process used to produce the material with near 100 percent effectiveness.

Toxic synthetic organic contaminants (such as PCBs and other exotic industrial pollutants used originally as oils, solvents, greases and plasticizers), as well as chemical intermediates used in the production of plastics, dyes, drugs, and chemicals, and pesticides of toxic concern, like DDT, would all be removed thoroughly by GAC.

In addition, GAC would be effective in removing most of the pollutants that are likely to be found in water supplies in the future. Only low molecular weight compounds, like chloroform, are poorly adsorbed onto GAC. However, these compounds can be removed using methods that are compatible with GAC filtration systems, such as aeration.

In Europe, GAC has been used to remove toxic synthetic chemicals from drinking water for over 20 years. Since the beginning of the Industrial Revolution, Europe has used its rivers as industrial sewers. European rivers, such as the Rhine, have been heavily contaminated for decades longer than most American bodies of water. Consequently, European nations have been forced to deal with toxic pollutants in drinking water for much longer than the U.S. In all, about 20 European communities have installed GAC to safeguard the quality of water drawn from polluted sources. In every instance, GAC systems have been shown to be effective and marginal in extra costs. For example, the city of Dusseldorf, West Germany, installed GAC systems in three plants serving over a million people, at no increased cost to the consumers.

GAC water treatment is of maximum benefit and cost efficiency when it is installed in large multi-community supply systems. The capital investment of the filtration system, GAC regeneration furnaces and retrofitting of an existing water plant is expensive. But when the costs are spread out over the largest possible number of people, the financial burden to each individual, family or community becomes increasingly manageable. Due to the economies of scale, the greater the volume of GAC-treated water produced per day, the lower the cost per gallon.

2) The State Health Department should immediately conduct a composite sampling program for the 129 priority pollutants in the seven public water supply systems drawing from the Niagara River.

3) The State Health Department engineers should assist the seven public water supply systems in changing the point of chlorination at the water treatment plant to generate lower quantities of trihalomethanes in finished water supplies.

4) The EPA and the New York State Department of health (DOH) should immediately set maximum contaminant levels (MCLs) for all the toxic pollutants found in water supplies, based on a one in a million risk level.

5) The New York State Legislature and the U.S. Congress should hold hearings to determine why toxic pollutant control mandates in the Safe Drinking Water Act have not been carried out. Local, state and federal authorities should stand accountable for the total lack of comprehensive drinking water standards for toxic chemicals.

6) A citizen oversight committee with wide representation of environmental and community groups should be established to make recommendations on the issue of toxic chemicals in drinking water in western New York.

7) A concerted effort should be made to develop a regional approach to water quality planning. At present, drinking water quality programs are institutionally separate from water pollution control programs. As a result, critical public policy gaps have developed which impair the best management of water resources. A review of existing water quality programs should be undertaken to assess their failure to cope with toxic chemical concerns. New management plans should then be formulated and implemented to correct the present shortcomings.

Chapter VIII

A Preliminary Analysis of Cancer Statistics and Trends in Erie and Niagara Counties

This section reviews cancer mortality rates and trends in Erie and Niagara Counties. For certain types of cancer, both counties have exceptionally high mortality rates. According to a National Cancer Institute Study, for white males, Erie and Niagara Counties' cancer mortality rates have both been ranked in the 90th decile of the nation's rate for the following sites: esophogus, trachus, bronchus and lung, rectum, larynx, and all malignant neoplasms combined. In addition, Erie County's cancer mortality rates for white males have also been ranked in the 90th decile of the national rate for the following sites: tongue, floor of mouth, other unspecified mouth, oral mesopharynx, pharynx, unspecified, large intestine except rectum, bladder and urinary organs, and Hodgkin's disease. Similarly, in Niagara County, cancer mortality rates for white males have also been ranked in the 90th decile of the national rate for other endocrine glands.

For white females, Erie County's cancer mortality rates have been ranked in the 90th decile of the national rate for the following sites: breast, connective tissue, Hodgkin's Disease, and all malignant neoplasms. Similarly, in Niagara County, cancer mortality rates for white females have been ranked in the 90th decile of the national rate for reticulosarcoma, lymphosarcoma, other forms of lymphoma and mycosis fungoides.

Existing studies, however, do not reveal clear trends. Only the study performed by the National Cancer Institute has compared age-adjusted cancer rates in Erie and Niagara Counties to New York State and national rates. These limited data show that New York's overall cancer mortality rate was ranked second in the nation during the period 1950 to 1969. In Erie County, overall cancer rates for males greatly exceed both the state and national rates. Moreover, nonwhite males had higher overall cancer rates than white males. In Niagara County, overall white male cancer rates exceeded the national rate, but not the state rate. For nonwhite males, overall cancer rates were below both the state and national rates. These patterns may be related to occupational factors. Overall female cancer mortality rates in both Erie and Niagara Counties were significantly lower than male rates for most cancers. Even though these rates were higher than the national rate, only nonwhite rates exceeded the state rate.

Cancer statistics compiled by New York State are not age-adjusted. Consequently, it is not known whether recent cancer trends are due to the influence of changing age patterns in western New York, or other factors, such as increased toxics exposure. Non-age-adjusted mortality rates have generally been on the rise in both counties and in New York State as a whole.

In 1970, Erie County's overall cancer mortality rate nearly matched the state rate. By 1980, however, it had exceeded the state rate significantly. In 1970, Niagara County's overall cancer mortality rate was signficantly less than the state rate. During three of the last four years (1977, 1978, and 1979), it has exceeded the state rate.

While these data are suggestive, existing studies do not provide an adequate data base to assess the role of toxic chemicals in inducing high cancer mortality rates. For example, cancers typically associated with toxic chemicals consumed in drinking water, such as tumors in the gastro-intestinal and urinary tract, tend to be prominent. However, carefully controlled studies have not been undertaken to determine whether water quality is a significant influence on cancer rates. Similarly, studies capable of discovering the influence of air quality, occupational exposures to toxics and chemical wastes escaping from landfills have not been undertaken. Until well-designed epidemiological studies have been completed, it will be difficult, if not impossible, to determine the impact of toxic chemical pollution on public health in the Niagara Frontier.

Recommendations:

1) A series of epidemiological studies should be carried out to assess the public health implications of toxic chemical exposures associated with western New York's air, drinking water, occupational settings and environment. These studies should address the realm of health hazards that could develop, including, but not limited to, cancer, birth defects, and general health disorders.

Epilogue

A myth is being perpetrated in this state that toxic chemical pollution is under control. In fact, little could be further from the truth. New York's agencies and the nation as a whole are in no way prepared for the oncoming environmental crisis. As this study shows, toxic chemical discharges from industries, dumps and wastewater treatment plants are beyond the control of our existing health and environmental management programs. Unless fundamental reforms are implemented, the situation will only worsen in the years ahead as hundreds of tons of raw wastes are released into the air, land and water.

As this report details, industries have ravaged the famed Niagara River. Now the damage must be repaired. A total effort must be made to respond to the findings of this study. Each day that uncontrolled industrial wastewaters pour into the Niagara River, the contamination grows more severe. As the quality of the environment deteriorates, public health will be jeopardized. The costs of strengthening pollution control systems will surely be high, but the costs of treating ever-increasing numbers of cancer victims and purifying contaminated water supplies will be even greater.

By undertaking this study, NYPIRG has taken an important first step to assure that meaningful actions are taken to control further contamination of the Niagara River. It is the hope of all those who have prepared this report that its findings and recommendations will be seriously reviewed and considered by appropriate local, state and federal officials.

REFERENCES
CHAPTER I

1. Bruce, J.P. and Rodgers, G.K. (1962). Water Balance of the Great Lakes System. Proc. Symp. Great Lakes Basin, Chicago, Illinois, 1959- H.J. Ancus, Editor, Amer. Assoc. Advan. Sci., Washington, D.C., Publication No. 71 pp 41-69.

2. Ibid.

3. Allen, E.R. (1977). Lake Ontario Atlas: Chemistry. Sea Great Institute, Albany, N.Y.

4. U.S. Environmental Protection Agency (1976). An Investigation of the Nearshore Region of Lake Ontario, IFYGL. Ecological Research Series Report 600/3-76-115.

5. Environmental Defense Fund and Robert H. Bogle (1979). Malignant Neglect. Alfred A. Knopf, New York, New York.

6. Ibid.

7. Ibid.

8. U.S. Environmental Protection Agency. EPA Journal. February, 1979. pp. 12.

9. World Health Organization (1964). Prevention of Cancer Technical Report Series 276. Geneva.

10. Danham, L. J. and Bailar, J.C. (1968). World Maps of Cancer Mortality Rates and Frequency Ratios. Journal of National Cancer Institute, 41: 155-204.

11. Epstein, Samuel S. (1979). "The Politics of Cancer" Anchor Press/Doubleday, Garden City, New York.

12. Environmental Defense Fund and Robert H. Boyle (1979), op. cit.

13. Ibid.

14. Ibid.

15. Ibid.

16. National Institutes of Health (1975). "Atlas of Cancer Mortality for U.S. Counties: 1950-1969." Department of Health, Education and Welfare, Washington, DC.

17. Environmental Defense Fund and Robert H. Boyle (1979), op. cit.

18. Ibid.

19. Ibid.

20. Ibid.

21. Epstein, S.S. (1979), op. cit.

22. Ibid.

23. Ibid.

24. (per, W.C. and Payne, W.W. "Carcinogenic Effects of Adsorbates of Raw and Finished Water Supplies." American Journal of Clinical Pathology, 39, 475-81

25. World Health Organization (1964), op. cit.

26. Harris, R. (1974) "The Implications of Cancer-Causing Substances in Mississippi River Water." Report by the Environmental Defense Fund, Washington, D.C.

27. Shy, C.N. and Struba, M.S. (1979). "Epidemiologic Evidence for Human Cancer Risk Associated With Organics in Drinking Water." Presented at the Third Conference on Water Chlorination: Environmental Impact and Health Effects, Colorado Springs, Colorado.

28. "Evaluation of Environmental Carcinogens," Report to the Surgeon General, U.S. Public Health Service, Ad Hoc Committee on the Evaluation of Low Levels of Environmental Carcinogens, April 22, 1970.

29. U.S. Environmental Protection Agency (1975). "Preliminary Assessment of Suspected Carcinogens in Drinking Water." Presented at Hearings on Drinking Waster of the U.S. Environmental Protection Agency, Washington, D.C.

30. Cantor, K. (1979) Epidemiology Branch, National Cancer Institute. Personal communication. 1979.

31. Melton, Robert (1979). "Organic Compounds Identified in U.S. Drinking Water". Office of Health and Ecological Effects, U.S. Environmental Protection Agency. Personal Communication. 1979.

32. U.S. Environmental Protection Agency (1975), op. cit.

33. Federal Water Pollution Control Act of 1972, Public Law 92-500, 101-517, 86. Stat. 816. 33 U.S.C. § § 1251-1376(Supp. V 1975).

34. Section 101(a), 33 U.S.C. §§ 1251(a) (Supp. V 1975).

35. Section 101 (a)(1), 33 U.S.C. §1251(a)(1)(Supp. V 1975).

36. Section 101 (a)(2), 33 U.S.C. §1251(a)(2)(Supp. V. 1975).

37. Section 101(a)(3)--(6) 33(U.S.C.§1251 (9)(3)-(6)(Supp. V 1975).

38. Section 502 (6), 33 U.S.C. §1362(6) (Supp. V 1975).

39. Section 502(13), 33 U.S.C. § 1362(13)(Supp. V 1975).

REFERENCES
CHAPTER IV

1. USEPA. (1977). Federal Guidelines: State and Local Pretreatment Programs. EPA Report MCD-43, p. F-8

2. Versar. (1975). Identification of Organic Compounds in Effluents from Indsutrial Sources. EPA Report EPA-560/3 - 75- 002.

3. Pugh, W. (1979). Town of Cheektowaga, Engineering Department. Personal Communication.

4. Menno, D. (1979). Buffalo Sewer Authority, Industrial Waste Section. Personal Communication. December 1979.

5. Smith, D. (1979). Town of Amherst, Engineering Department. Personal Communication. December 1979.

6. Steves (1979). Town of Tonawanda, Sewage Treatment Plant. Personal Communication. December 1979.

7. Husky. (1979). City of Tonawanda, Engineering Department. Personal Communication. December 1979

8. Franklin, G. (1979). City of North Tonawanda, Engineering Department. Personal Communication. December 1979.

9. Nerone, F. (1979). Niagara County Sewer district #1 Treatment Plant. Personal Communication. December, 1979.

10. Bedell, G. (1980). Town of Lewiston, Engineering Department. Personal Communication. January 1980.

11. NYS DEC (1980). Bureau of Hazardous Waste. Personal Communication. February 1980.

12. Matthews, R. (1981). City of Niagara Falls, Department of Utilities. Personal Communication. July 1981.

13. Versar, Inc. (1975), op.cit.

REFERENCES
CHAPTER V

1. Interagency Task Force on Hazardous Waste, 1979. Draft Report on Hazardous Waste Disposal in Erie and Niagara Counties, New York.

2. Toxic Substances in New York's Environment, an Interim Report. New York Department of Environmental Conservation and New York State Department of Health. 1979.

3. Environmental Protection Agency Hazard System. July, 1981.

4. Ianotti, J., et al. (1979) "An Inventory of Industrial Hazardous Waste Generation in New York State." Division of Solid Waste Management, New York State Department of Environmental Conservation, Albany, NY.

5. Rosen, Ira, Producer, 60 Minutes, CBS News. 1981. Personal Communication.

6. Interagency Task Force on Hazardous Waste.. 1979. Op.cit.

7. Ibid.

REFERENCES
CHAPTER VI

1) Lubow, A. (1977). Bruce Ames Escalates the War on Cancer. New Times. September, 1977.

2) McCann, J. and Ames, B.N. (1976). Detection of Carcinogens as Mutagens, in the Salmonella/Microsome Test: Assay of 300 Chemicals. Proceedings of the National Academy of Sciences, 73, 950-954.

3) McCann, J., Ames, B.N. and Yamansaki, E. (1975). Methods for Detecting Carcinogens and Mutagens with the Salmonella/Mammalian-Microsome Mutagenicity Test. Mutation Research 31 (1975) 347-364.

REFERENCES
CHAPTER VII

1. Harris, R. and Brecher, E.M. (1974) Is the Water Safe to Drink? Consumer Reports, Washington D.C.

2. U.S. EPA (1975). Preliminary Assessment of Suspected Carcinogens in Drinking Water-Interim Report to Congress Office of Toxic Substances, Washington, D.C.

3. U.S. EPA (1975) Identification of Organic Compounds in Effluents from Industrial Sources. Office of Toxic Substances, Washington, D.C.

4. Ibid.

5. Ibid.

6. Ibid.

7. Matthews, R.R., Carr, C.W., Stanish, S.N. (1979). City of Niagara Falls Water Treatment Plant, The Investigatory Team, July 17, 1979. Department of Utilities, Niagara Falls, N.Y.

8. Ibid.

9. Niagara Falls, New York Water Treatment Plant Investigatory Team (1980). Progress Report Number 4. Department of Utilities, Niagara Falls, N.Y.

10. Interagency Task Force on Hazardous Wastes (1979). Draft Report on Hazardous Waste Disposal in Erie and Niagara Counties, N.Y. Albany, N.Y.

11. Hooker Chemicals and Plastics Corporation (1980). Niagara Plant Comprehensive Water Management Study. Niagara Falls, N.Y.

12. Interagency Task Force on Hazardous Waste (1979), op.cit.

13. Axelrod, David (1978). The New Yorker Personal Communication New York, N.Y. 1978.

] Ibid.

15. Whiteside, Thomas (1978).The New Yorker Personal Communication. New York, N.Y. 1978.

16. Interagency Task Force on Hazardous Waste (1979), op.cit.

17. Ibid.

18. Hooker Chemicals and Plastics Corporation (1980), op.cit.

19. Sarkees, A. (1981) New York State Department of Environmental Conservation, Sanitary Engineer. Personal Communication. 1981.

20. Interagency Task Force on Hazardous Waste (1979), op.cit.

21. Ibid.

22. Matthews, R.R., Carr, C.W., Stanish, S.N. (1979), op.cit.

23. Ibid.

24. Ibid.

25. Ibid.

26. Ibid.

27. Stanish, S.N. (1978). Preliminary Engineering Report on Removal of Sediment from Niagara Falls Water Treatment Plant, August-- November 1978. Department of Utilities, Niagara Falls, N.Y.

28. Matthews, R.R., Carr, C.W., Stanish, S.N. (1979), op.cit.

29. Ibid.

30. Ibid.

31. Niagara Falls, New York Water Treatment Plant Investigatory Team (1980), op.cit.

32. Matthews, R.R., Carr, C.W., Stanish, S.N. (1979), op.cit.

33. Ibid.

34. Greene, Robert M. (1981). Letter from Phillips, Lytle, Hitchcock, Blaine, and Huber, Attorneys at Law, to John C. McMahon, Regional Engineer, New York State Department of Environmental Conservation. Buffalo, N.Y.

GLOSSARY

1) Activated Carbon	A drinking water filter medium formed from carbon that is highly effective in removing synthetic organic chemicals from water. Activated carbon has been successfully employed for water purification by food processing and beverage manufacturing industries for decades.
2) Ames Test	A test developed by Dr. Bruce Ames of the University of California which detects the presence of mutation causing compounds using a specially developed strain of *Salmonella* bacteria.
3) BOD	Biochemical Oxygen Demand A measure of the amount of oxygen consumed during the biological degradation of organic matter in water. This, with Total Suspended Solids, is a common measure of pollution. The higher the BOD, the greater the pollution.
4) Carcinogen	A compound that is capable of inducing tumors. A cancer-causing agent.
5) COD	Chemical Oxygen Demand A measure of the amount of oxygen required to oxidize organic and inorganic compounds in water. The COD test, like the BOD test, is used to determine the amount of pollution in an effluent.
6) DEC	Department of Environmental Conservation New York State's environmental agency. The DEC is responsible for water pollution, air pollution and hazardous waste control programs in the State.
7) DOH	Department of Health New York State's public health agency. The DOH is responsible for the regulation of drinking water supplies in the state.
8) EPA	Environmental Protection Agency. The Federal environmental agency. The EPA has the responsibility for implementing and administering nation-wide programs to control water pollution, air pollution, hazardous waste disposal and to safeguard the integrity of the nation's drinking water supplies. Although EPA has delegated most of the responsibility to the DEC and DOH, in New York, it maintains overall responsibility for those programs and oversees their progress.
9) ICD number	International Classification of Disease number. A series of numbers describing cancer tumor sites in the human body.
10) ICS	Industrial Chemical Survey A statewide survey of approximately 6000 industries conducted by the DEC between 1976 and 1978 to determine the types and quantities of toxic chemicals used, stored or manufactured at those facilities. The survey is an on-going project of the DEC.
11) MCL	Maximum Contaminant Level The maximum amount of a pollutant permissable in a drinking water supply, as established by the EPA.

12) MGD — Million Gallons per Day
A measure of flow, often included in wastewater discharge reports and permits.

13) mutagen — A compound capable of inducing mutations. Mutagenicity or the ability to create mutagens in genetic material is strongly correlated with carcinogenicity, or the ability to induce tumors in test animals.

14) NORS — National Organic Reconnaisance Study
A 1975 EPA study of drinking water supplies from 80 U.S. cities. EPA tested for the presence of six synthetic organic chemicals.

15) NPDES — National Pollutant Discharge Elimination System
A national wastewater discharge permit program mandated by the Federal Water Pollution Control Amendments of 1972. Under this law, all direct dischargers must obtain a NPDES permit from EPA in order to discharge wastes.

16) NYSDEC — see "DEC"

17) PCBs — Polychlorinated Biphenyls
A class of highly toxic compounds found primarily in transformers and capacitors.

18) pH — A measure of the acidity or alkalinity of a solution. The pH scale from 0 to 14 with 7 representing a neutral solution, 0 representing the most acidic and 14, the most alkaline.

19) ppb — parts per billion
A unit of concentration. One ppb is roughly equal to one microgram per liter (ug/l)

20) ppm — part per million
A unit of concentration. One ppm is roughly equal to one milligram per liter (mg/l)

21) primary treatment — A type of treatment provided by sewage treatment plants for incoming wastewater. Primary treatment usually consists of adding a coagulant and allowing the wastewater to settle.

22) secondary treatment — A type of treatment provided by sewage treatment plants in conjunction with primary treatment. Secondary treatment involves special bacteria in the decomposition of wastewater. By law, secondary treatment plants must provide 85% removal of BOD and suspended solids.

23) SPDES — State Pollutant Discharge Elimination System
A state-run permit program to control wastewater dischargers. The NPDES program was delegated by EPA to New York State, where it is now run by DEC under the name of the "SPDES" program. See "NPDES."

24) STP — Sewage Treatment Plant

25) THMs	Trihaolmethanes A class of compounds including chloroform that are formed during the chlorination of drinking water. Decaying organic matter in the raw water supply react with chlorine to form these chemicals, some of which are known and suspected carcinogens.
26) TKN	Total Kjeldhal Nitrogen A measure of the amount of nitrogen containing waste present. This is a commonly employed indicator of nitrogen pollution.
27) TSS	Total Suspended Solids A measure of the amount of solid particles present in a given wastewater discharge. Suspended solids and BOD are the two principal conventional measures of water pollution.
28) USEPA	See "EPA"

APPENDIX A

Organic Compounds In Effluents From Industrial Point Sources Categorized By Standard Industrial Classification (SIC)[1]

The compilation of data in this appendix provides a qualitative characterization of industrial wastewaters according to Standard Industrial Classification (SIC) codes. Compounds previously identified in the wastestream of various SIC categories are listed along with information detailing each chemical's 1) toxicity, 2) biodegradability and 3) known presence in U.S. public water supplies. Each compound's biodegradability was characterized according to the following categories:

Category	Biodegradability	Persistence in Unadapted Soil	Success of Biological Treatment of Point Source	Typical chemical
(1)	Easily degraded	1-3 weeks	Susceptible to normal waste treatment.	Acetic acid
(2)	Degraded without much difficulty	1-3 months	Susceptible to normal waste treatment	Benzoic acid
(3)	Difficult to degrade	3 months to one one year	Prolonged treatment needed.	e-caprolactam
(4)	Very difficult to degrade	1-2 years	Leakage possible even with prolonged treatment.	Chlorobenzene
(5)	Refractory	More than 2 years	Cannot be treated biologically.	Hexachloro-benzene

1. Identification of Organic Compounds in Effluents From Industrial Sources, PB-241 641, Prepared for the Environmental Protection Agency by Versar Incorporated, April, 1975

Organic Compounds In Effluents From Industrial Point Sources Categorized By Standard Industrial Classification (SIC)

SIC CODE	SIC TITLE
0721	Crop Planting, Cultivating and Protection
999	Pesticide Manufacturers or Distributors or Packagers
2879	Pesticides and Agricultural Chemicals, N.E.C.

Organic Compound	Suspected Carcinogen[2]	Identified in U.S. Drinking Water[3]	Biodegradability (Persistence)
triphenyl phosphate		X	5
2,4,6-trichlorophenol	X	X	5
trichlorobenzene		X (isomer)	5
tetrachloroethane	X	X (1,1,1,2)	5
phthalic anhydride	X	X	3
phenyl benzoate		X	3
pentachlorophenol	X	X	5
hexachloro-1,3-butadiene	X	X	5
dimethyl naphthalene, 1,3-		X (isomers)	3
xylene		X (isomers)	3
tetrachlorobiphenyl		X (isomers)	5
camphor		X	4
carbon disulfide	X	X	3

carbon tetrachloride	X	X	5
chlordane	X	X	5
chlorobenzene		X	4
dichloroethyl ether	X	X	4
chloroform		X	5
o-cresol		X	3
DDE	X	X	5
DDT	X	X	5
dibromochloromethane			5
1,4-dichlorobenzene	X		5
aldrin	X	X	5
1,2-dichloroethane	X	X	3
naphthalene	X	X	3
methyl naphthalene		X (isomers)	3
methyl chloride	X	X	4
methyl benzoate		X	2
acenaphthylene		X	4
benzene	X	X	3
bromoform	X	X	5
2-hydroxyadiponitrile		X	4
dibutyl phthalate		X	5
trichlorobiphenyl		X (isomers)	5
pentachlorobiphenyl		X (isomers)	5
dieldrin	X	X	5
2,4-dimethyl phenol	X	X	3
4,6-dinitro-2-aminophenol		X	5
endrin	X	X	5
o-ethyltoluene		X	3
heptachlor epoxide		X	5
1,2,3,4,5,7,7-heptachloronorbornene		X	5
hexachlorobenzene	X	X	5
hexachlorocyclohexane	X	X	5
hexachloroethane	X	X	5
propylamine		X	2
atrazine	X	X	4
(diethyl) atrazine		X	4

2. Suspected Carcinogens, A Subfile of the Registry of Toxic Effects of Chemical Substances; U.S. Department of Health, Education and Welfare, Public Health Service; Center for Disease Control, National Institute for Occupational Safety and Health, 1976

3. Organic Compounds Identified in U.S. Drinking Water, Health Effects Research Laboratory, Office of Health and Ecological Effects, U.S. Environmental Protection Agency, 1979

SIC CODE
2221

SIC TITLE
Broad Woven Fabric Mills, Man-made Fiber and Silk

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
e-caprolactam	X	X	3
2,4,6-trichlorophenol	X	X	5
trichloroethylene, 1,1,2-	X	X	4
trichlorobenzene		X	5
tetrachloroethylene	X	X	4
propylbenzene			3
propylamine		X	2
propanol	X	X	1
methyl benzoate		X	2
dibutyl phthalate		X	5
tetradecane		X	2
2-hydroxyadiponitrile		X	4
2-methyl propanal		X	2
borneol		X	4
dichloroethyl ether	X	X	4
bis-chloroisopropyl ether	X	X	5

diethyl phthalate		X	5
methyl naphthalene		X	3
cis-2-methyl-4-ethyl dioxolane			4
trans-2-methy-4-ethyl dioxolane			4
dieldrin	X	X	5
trichlorobiphenyl		X	5
tetrachlorobiphenyl		X	5
pentachlorobiphenyl		X	5
tridecane		X	2
ethylene dichloride	X	X	
vinyl benzene	X	X	3
chloroform		X	5
acetophenone		X	2
chlorobenzene	*X	X	4
dichlorobenzene	X(isomers)	X(isomers)	5
toluene	X	X	3
ethylbenzene	X	X	3
naphthalene	X	X	3
n-dodecane		X	3

Toxic Pollutants Judged to be Most Significant in Textile Mill Wastewaters 4

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
acrylonitrile	X		
benzene	X	X	3
1,2,4-trichlorobenzene		X	
2,4,6-trichlorophenol	X	X	5
parachlorometacresol			
chloroform		X	
1,4-dichlorobenzene	X	X	
ethyl benzene	X	X	
trichlorofluoromethane	X	X	
naphthalene		X	
N-nitrosodi-n-propylamine	*X		
pentachlorophenol	X	X	
phenol			
bis(2-ethylhexyl) phthalate			
tetrachloroethylene	X	X	
toluene	X	X	
trichloroethylene	X	X	
antimony	X(compounds)		
arsenic	X		
cadmium	X		
chromium	X		
copper	X (compounds)		
cyanide			
lead	X (compounds)		
nickel	X		
selenium	X (compounds)		
silver	X		
zinc	X (compounds)		
mercury	X		
(mono) chlorobenzene		X	
2-chlorophenol	X		
1,2-dichloropropane	X (isomer)	X	
methylene chloride	X	X	4
di-n-butyl phthalate			
dimethyl phthalate		X	
diethyl phthalate		X	
N-nitrosodiphenylamine	X		

4 Development Document for Effluent Limitations Guidelines and Standards for the Textile Mills Point Source Category - Proposed EPA 440/1-79/022b, October, 1979

*N-nitroso-dipropylamine

SIC CODE 2611 and 2621

SIC TITLE Paper Mills, Except Building Paper Mills, Pulp Mills

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
n-tridecane		X	2
tetradecane		X	2
pentadecane		X	2
octadecane		X	2
2-methylpropanal		X	2
carbon disulfide	X	X	3
n-docosane		X	2
eicosane		X	2
behenic acid, methyl ester of		X	3
borneol		X	4
camphor		X	4
dimethyl sulfoxide		X	4
methyl palmitate		X	3
methyl stearate	X	X	3
hexachloroethane	X	X	5
n-dodecane		X	3
guaiacol			4
hexadecane		X	2
limonene		X	3
1-terpineol	X (isomers)	X (isomer)	3
n-undecane		X	2
acetone	X	X	1
methylene chloride	X	X	4
propanol	X	X	1
diethyl phthalate		X	5
methyl benzoate		X	2
chloroform		X	5
acetic acid		X	1
dihexyl phthalate		X	5
di(2-ethyl hexyl) phthalate		X	5
methyl ester of lignoceric acid		X	3
methyl ethyl ketone	X	X	1
methanol		X	2

SIC CODE 265

SIC TITLE Paperboard Containers and Boxes

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
acetaldehyde		X	1
acetone	X	X	1
methyl ethyl ketone	X	X	1
methylene chloride	X	X	4
o-cresol		X	3
propanol	X	X	1
diethyl pnthalate		X	5

SIC CODE 2821

SIC TITLE Plastics Materials, Synthtic Resins and Nonvulcanizable Elastomers

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
xylene		X	3
vinyl benzene	X	X	3
triphenyl phosphate	X	X	3
1,1,2-trichloroethylene	X	X	4
propylbenzene		X	3
propanol	X	X	1
propylamine		X	2
phthalic anhydride	X	X	3
phenyl benzoate		X	3
pentanol		X	1
2-methyl propanal		X	2
methyl benzoate		X	2
methanol		X	2

SIC CODE
2821

SIC TITLE
Plastics Materials, Synthetic Resins and Nonvulcanizable Elastomers (con't.)

limonene		X	3
isopropyl benzene		X	3
decane		X	3
n-undecane		X	2
dichloroethyl ether		X	4
hexadecane		X	2
methyl naphthalene		X	3
octadecane		X	2
di-t-butyl-p-benzoquinone		X	4
cis-2-ethyl-4-methyl-1, 3-dixolane		X	4
trans-2-ethyl-4-methyl-1,3-dioxolane		X	4
methyl chloride	X	X	4
acenaphthylene		X	4
acetaldehyde		X	1
acetic acid		X	1
dibromobenzene		X	5
camphor		X	4
e-caprolactam	X	X	3
o-cresol	X	X	3
dibutyl phthalate		X	5
ethyl benzene	X	X	3
methylene chloride	X	X	4
diethyl phthalate		X	5
di(2-ethyl hexyl) phthalate		X	5
dihexyl phthalate		X	5
di-isobutyl phthalate		X	5
2,4-dimethyl phenol		X	3
acetone	X	X	1
acetophenone		X	2
benzene sulfonic acid		X	3
benzoic acid		X	2
benzyl butyl phthalate		X	5
carbon disulfide	X	X	3
hexachloro-1,3-butadiene	X	X	5
bromodichloromethane	X	X	5
bromobenzene		X	4
2-hydroxyadiponitrile		X	4
naphthalene	X	X	3
pentachlorophenol	X	X	5
1-terpineol	X(isomers)	X(isomer)	3
trichlorobenzene		X	5
trichlorophenol, 2,4,6-	X	X	5
thiomethylbenzothiazole		X	5
dimethyl phthalate		X	5
2,6-dinitrotoluene	X	X	4
dioctyl adipate		X	3
dipropyl phthalate		X	5
ethanol	X	X	1
ethyl amine		X	2
methyl ethyl ketone	X	X	1
hexachloroethane	X	X	5
trichlorobiphenyl		X	5
tetrachlorobiphenyl		X	5
pentachlorobiphenyl		X	5

SIC CODE
2822

SIC TITLE
Synthetic Rubber (Vulcanizable Elastomers)

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
vinyl benzene	X	X	3
n-tridecane		X	2
1,1,2-trichloroethane	X	X	5
tetradecane		X	2
tetrachloroethylene	X	X	4
tetrachloroethane	X (1,1,2,2)	X	5
propylamine		X	2

pentadecane		X	2
octadecane		X	2
nitrobenzene	X	X	4
2-methylpropanal		X	2
methyl chloride	X	X	4
isopropyl benzene		X	3
hexadecane		X	2
pentachlorophenol	X	X	5
pentanol		X	1
acetaldehyde		X	1
acetic acid		X	1
acetophenone		X	2
acetylene dichloride		X	3
benzene	X	X	3
benzothiazole		X	5
carbon disulfide	X	X	3
carbon tetrachloride	X	X	5
hexachloro-1,3-butadiene	X	X	5
n-docosane		X	2
eicosane		X	2
ethanol	X	X	1
hexachloroethane	X	X	5
isophorone	X	X	4
methyl naphthalene		X	3
o-cresol		X	3

SIC CODE 2834 — SIC TITLE Pharmaceutical Preparations

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
propylamine		X	2
phthalic anhydride	X	X	3
2-methylpropanal		X	2
3-methyl butanal		X	2
methanol		X	2
acetic acid		X	1
acetone	X	X	1
acetophenone		X	2
benzene	X	X	3
benzoic acid		X	2
bromofrom	X	X	5
camphor		X	4
chloroform	X	X	5
3-chloropyridine		X	4
o-cresol		X	3
2,4-diemthyl sulfoxide		X	4
ethanol	X	X	1
o-ethyltoluene		X	3
guaiacol			4
hexachlorocyclohexane	X (isomers)	X	5
hexachloroethane	X	X	5
nitrobenzene	X	X	4
dimethyl sulfoxide		X	4
methylene chloride	X	X	4

SIC CODE 2841 — SIC TITLE Soaps and Other Detergents, Except Specialty Cleaners

1-terpineol	X (isomers)	X (alpha)	3
borneol		X	4
methylene chloride	X	X	4
naphthalene	X	X	3
benzene	X	X	3

SIC CODE 2852 — SIC TITLE Paints, Varnishes, Lacquers, Enamels and Allied Products

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
trichlorobiphenyl		X	5
tetrachloroethylene	X	X	4

tetrachlorobiphenyl		X	5
propylamine		X	2
propanol	X (n)	X	1
pentachlorobiphenyl		X	5
methyl stearate		X	3
indene		X	4
acetone	X	X	1
benzothiazole		X	5
acetylene dichloride		X	3
benzene	X	X	3
borneol		X	4
methyl ethyl ketone (butanone)	X	X	1
camphor		X	4
bis-chloroisopropyl ether		X	5
dimethyl sulfoxide		X	4
2-ethyl-n-hexane		X	3
trichlorofluormethane	X	X	5
pentachlorophenol	X	X	5

SIC CODE 2869 — SIC TITLE Miscellaneous Industrial Organic Chemicals

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
2,6-dinitrotoluene	X (isomers)	X	4
cis-2-methyl-4-ethyl dioxolane			4
trans-2-methyl-4-ethyl dioxolane			4
vinylbenzene	X	X	3
1,1,2-trichloroethylene	X (isomers)	X	4
1,1,2-trichloroethane	X	X	5
trichlorobenzene		X	5
toluene	X	X	3
tetrachloroethylene	X	X	4
tetrachloroethane	X (1,1,2,2)	X (1,1,1,2)	5
phthalic anhydride	X	X	3
pentanol		X	1
pentane		X	3
nitroanisole			4
nitrobenzene	X	X	4
methane		X	3
acetaldehyde		X	1
isopropyl benzene		X	3
isoborneol		X	4
hexachlorobenzene	X	X	5
ethylbenzene	X	X	3
n-dodecane		X	3
di-isobutyl carbinol		X	2
1,2-dichloroethane	X	X	3
dichloroethyl ether	X	X	4
butylbromide		X	3
methyl ethyl ketone	X	X	1
borneol		X	4
behenic acid, methyl ester of		X	3
benzene	X	X	3
benzene sulfonic acid		X	3
benzoic acid		X	2
bromochlorobenzene		X	5
acetone	X	X	1
acetic acid		X	1

SIC CODE 2851 — SIC TITLE Paint Formulating[5]

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
aldrin	X	X	5
dieldrin	X	X	5
4,4-DDD	X (p,p-)		
4,4-DDE	X (p,p-)	X	5
endrin aldehyde			
phenol	X	X	
2,4-dichlorophenol	X	X	
2,4-dimethylphenol	X	X	
2,4,6-trichlorophenol	X	X	
2,4-dinitrophenol	X		

SIC CODE 2851 | SIC TITLE Paint Formulating (con't.)

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
4,6-dinitro-o-cresol	X (dinitrocresol)		
pentachlorophenol (PCP)	X	X	
total phenols		X	
bromoform	X	X	5
carbon tetrachloride	X	X	5
chloroform	X	X	5
chlorodibromomethane		X	
dichlorobromomethane	X		
methylene chloride		X	4
1,1-dichloroethane	X	X	
1,2-dichloroethane	X	X	
1,1,1-trichloroethane	X	X	
1,1,2-trichloroethane	X	X	
1,1,2,2-tetrachloroethane	X		
chloroethane		X	
benzene	X	X	3
toluene	X	X	3
ethyl benzene	X	X	3
1,2-dichloropropane	X	X	
1,3-dichloropropylene			
1,1-dichloroethylene	X	X	
1,2-trans-dichloroethylene	X	X	
trichloroethylene	X	X	4
tetrachloroethylene	X	X	4
acrolein	X	X	
chlorobenzene	*X	X	4
acenaphthene	X		
anthracene	X		
3,4-benzofluoranthene	X		
11,12-benzofluoranthene	**X		
benzo (a) pyrene	X	***X	

*chlorinated benzene
**11,12, benzo (k) fluoranthene
***benzopyrene

fluoranthene	X	X	
naphthalene	X	X	3
phenanthrene	X	X	
1,2-dichlorobenzene	X	X	
1,2,4-trichlorobenzene		X	
hexachlorobenzene	X	X	5
di (2-ethylhexyl) phthalate		X	
butyl benzyl phthalate		X	
di-n-butyl phthalate		X	
diethyl phthalate		X	
dimethyl phthalate		X	
di (2-chloroethyl) ether	X	*X	
di (2-chloroethyoxy) methane			
4-chlorophenyl phenyl ether	**X		
nitrobenzene	X	X	4
3,3-dichlorobenzidine	X		
1,2 diphenylhydrazine	X (1,1)	X	
2-chloronaphthalene	***X		
isophorone	X	X	4
asbestos	X		
chromium	X		
copper	X (compounds)		
cyanide			
lead	X (compounds)		
mercury	X		
nickel	X		
zinc			

*dichloroethyl ether
**chlorophenyl phenyl ether
***chlorinated napthalene

[5] Development Document for Effluent Limitations Guidelines and Standards for the Paint Formulating Point Source Category, Proposed; EPA - 440/1-79/049-b December 1979

SIC CODE 2891 — SIC TITLE Adhesives and Sealants

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
trichlorobiphenyl		X	5
tetrachlorobiphenyl		X	5
propanol	X	X	1
pentachlorobiphenyl		X	5

SIC CODE 2892 — SIC TITLE Explosives

toluene	X	X	3
nitrobenzene	X	X	4
benzene	X	X	3
dihexyl phthalate		X	5
di-butyl phthalate		X	5
camphor		X	4
2,6-dinitrotoluene	X	X	4
hexachloroethane	X	X	5
di(2-ethyl hexyl) phthalate		X	5

SIC CODE 2899 — SIC TITLE Chemicals and Chemical Preparations

trichlorobiphenyl		X	5
tetrachlorobiphenyl		X	5
pentachlorobiphenyl		X	5
bromodichloromethane	X	X	5
bromoform	X	X	5
carbon tetrachloride	X	X	5
chloroform	X	X	5
dibromochlcromethane			5
dibromodichloroethane		X	5
hexachloroethane	X	X	5
methanol		X	2

SIC CODE 2893 — SIC TITLE Ink Formulating[6]

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradabili (Persistence)
dieldrin	X	X	5
BHC (hexachlorocyclohexane)	X (isomers)	X	
c-BCH		X	
phenol	X	X	
2,4-dichlorophenol	X	X	
2,4-dimethylphenol	X	X	
2,4,6-trichlorophenol	X	X	
4,6-dinitro-o-cresol	*X		
pentachlorophenol (PCP)	X	X	
total phenols			
carbon tetrachloride	X	X	5
chloroform	X	X	5
dichlorobromomethane			
methyl chloride	X	X	4
methylene chloride	X	X	4
trichlorofluoromethane	X	X	5
1,1-dichloroethane	X	X	
1,2-dichloroethane	X	X	
1,1,1-trichloroethane	X	X	
1,1,2-trichloroethane	X	X	
1,1,2,2-tetrachloroethane	X		
benzene	X	X	3
toluene	X	X	3
ethylbenzene	X	X	3
1,1-dichlcropropane	X		
1,1-dichloroethylene	X	X	
trichloroethylene	X	X	4
tetrachloroethylene	X	X	4
chlorobenzeneacenaphthene			

acenapthene	X		
acenaphthylene		X	4
anthracene	X	X	
1,2-benzanthracene			
3,4-benzofluoranthene	X		
chrysene	X		
fluorene		X	
fluoranthene	X	X	
naphthalene	X	X	3
phenanthrene	X	X	
pyrene	X	X	
1,2-dichlorobenzene	X	X	
1,2,4-trichlorobenzene		X	
di (2-ethylhexyl) phthalate		X	
butyl benzyl phthalate		X	
di-n-butyl phthalate			
di-n-octyl phthalate			
diethyl phthalate		X	
dimethyl phthalate		X	
di (2-chloroisopropyl) ether	X		
di (2-chloroethoxy) methane			
4-chlorophenyl phenyl ether			
N-nitrosodiphenylamine	X		
2,4-dinitrotoluene	X		
2,6-dinitrotoluene	X	X	
3,3-dichlorobenzidine	X		
1,2-diphenylhydrazine	X (1,1)	X	
isophorone	X	X	4
antimony	X (compounds)		
chromium	X		
zinc			
copper	X (compounds)		
lead	X (compounds)		

*dinitro-cresol

6 Development Document for Effluent Limitations Guidelines and Standards for the Ink Formulating Point Source Category, Proposed; EPA-440/1-79/090-b; December 1979

SIC CODE 2911

SIC TITLE Petroleum Refining

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
acenaphthylene		X	4
benzene	X	X	3
benzene sulfonic acid		X	3
benzopyrene	X (isomers)	X	5
butylbenzene		X	3
carbon disulfide	X	X	3
o-cresol		X	3
decane		X	3
1,3-dimethyl naphthalene		X	3
acetophenone		X	2
o-ethyl toluene		X	3
methylindene		X	4
vinyl benzene	X	X	3
napththalene	X	X	3
nonane		X	3
octadecane		X	2
octane		X	3
pentadecane		X	2
n-docosane		X	2
n-dodecane		X	3
eicosane		X	2
ethyl benzene	X	X	3
2-ethyl-n-hexane		X	3
hexadecane		X	2

indene		X	4
isodecane		X	3
1-isopropenyl-4-isopropylbenzene		X	4
isopropyl benzene (cumene)		X	3
methane		X	3
methyl napthalene		X	3
2,4-dimethyl phenol	X (isomers)	X	3
1-terpineol	X (isomers)	X (alpha)	3
pentane		X	3
propylbenzene		X	3
tetradecane		X	2
toluene	X	X	3
n-tridecane		X	2
n-undecane		X	2
xylene		X	3
bromobenzene		X	4
triphenyl phosphate		X	5
methyl phenyl carbinol		X	3
methyl biphenyl		X	4
di (2-ethyl hexyl) phthalate		X	5
dioctyl phthalate		X	
pentanol		X	1

SIC CODE 2992 — SIC TITLE Lubricating Oils and Greases

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
limonene		X	3
2-methyl propanal		X	2
trichlorobiphenyl		X	5
tetrachlorobiphenyl		X	5
pentachlorobiphenyl		X	5
methyl stearate	X	X	3
naphthalene	X	X	3
methyl ethyl ketone	X	X	1

SIC CODE 3275 — SIC TITLE Gypsum Products

acetone	X	X	1
methylene chloride	X	X	4
propanol	X	X	1

SIC CODE 3679 — SIC TITLE Electronic Components, N.E.C.

vinyl benzene	X	X	3
trichlorobiphenyl		X	5
trichlorobenzene		X	5
tetrachlorobiphenyl		X	5
DDT	X	X	5
pentachlorobiphenyl		X	5
carbon disulfide	X	X	3
chloroform	X	X	5
DDE	X	X	5

SIC CODE 3861 — SIC TITLE Photographic Equipment and Supplies

acetic acid		X	1
benzene	X	X	3
dimethyl phthalate		X	5
methylene chloride	X	X	4

SIC CODE 3999 — SIC TITLE Manufacturing Industries, N.E.C.

Organic Compound	Suspected Carcinogen	Identified in U.S. Drinking Water	Biodegradability (Persistence)
n-tridecane		X	2
tetradecane		X	2
pentadecane		X	2
hexadecane		X	2
n-docosane		X	2
eicosane		X	2
octadecane		X	2
n-dodecane		X	3

APPENDIX B

Priority Pollutants Identified in Wastestreams of Facilities in Selected Standard Industrial Classification (SIC) Categories

In order to implement the consent decree that required the Environmental Protection Agency to regulate 129 priority pollutants using Best Available Treatment (BAT) technology, a large-scale program was initiated. The following lists have been compiled from the results of that program and summarize which priority pollutants have been identified in the industrial wastestreams of the following Standard Industrial Classification (SIC) categories:

10	282	2893	3431
111	2834	2911	347
121	2841	2951	
22	2851	2952	3691
23	286	31	3692
24	2861	331	3996
26	2879	332	4911
272	2891	336	721
281	2892	333	

Source: Schaeffer, R., EPA Effluent Guidelines Division. Written Communication. August, 1978

*2,4-dimethylphenol	pyrene	di-n-butyl phthalate
*2,6-dinitrotoluene	tetachloroethylene	
*1,2-diphenylhydrazine	toluene	
ethylbenzene	trichloroethylene	

* Found in 2 or less samples

TIMBER INDUSTRIES

SIC 24

Total Number of Samples Taken: 261

Priority Pollutants Identified

acenaphthene	bis(2-ethylhexyl)phthalate	antimony
benzene	*di-n-butylphthalate	arsenic
*1,2-dichloroethane	1,2-benzanthracene	beryllium
*1,1,1-trichloroethane	benzo(a)pyrene	cadmium
*1,1,2-trichloroethane	3,4-benzofluoranthene	chromium
2,4,6-trichlorophenol	11,12-benzofluoranthene	copper
chloroform	chrysene	lead
2-chlorophenol	acenaphthylene	mercury
1,1-dichloroethylene	anthracene	nickel
2,4-dimethylphenol	fluorene	silver
ethylbenzene	phenanthrene	thallium
fluoranthene	1,2,5,6-dibenzanthracene	zinc
methylene chloride	indeno (1,2,3-cd)pyrene	selenium
*dichlorobromomethane	pyrene	
trichlorofluoromethane	toluene	
naphthalene	*aldrin	
2-nitrophenol	*chlordane	
4-nitrophenol	*neptachlor	
4,6-dinitro-o-cresol	alpha BHC (hexachlorocyclohexane)	
pentachlorophenol	beta BHC	
phenol	*PCB 1242	
2,4-dichlorophenol	*1,12-benzoperylene	

* Found in 2 or less samples

PULP AND PAPER INDUSTRIES

SIC 26

Total Number of Samples Taken: 44

Priority Pollutants Identified

*acrolein	phenol	beryllium
*acrylonitrile	bis(2-ethylhexyl) phthatate	cadmium
*benzene	*di-n-octyl phthalate	chromium
*carbon tetrachloride	di-n-butylphthalate	copper
1,1,1-trichloroethane	diethyl phthalate	cyanide
*2,4,6-trichlorophenol	*dimethyl phthalate	lead
chloroform	*anthracene	mercury
2,4-dichlorophenol	*1,2,5,6-dibenzanthracene	nickel
*2,4-dimethylphenol	tetrachloroethylene	selenium
*ethylbenzene	toluene	silver
methylene chloride	*PCB-1254	zinc
*isophorone	antimony	thallium
*naphthalene	arsenic	

* Found in 2 or less samples

EPA SAMPLING PROGRAM

RESULTS FOR 129 PRIORITY

POLLUTANTS IN WASTEWATER EFFLUENTS

ORE MINING INDUSTRIES
SIC CODE 10

TOTAL NUMBER OF SAMPLES TAKEN: 64

PRIORITY POLLUTANTS IDENTIFIED

carbon tetrachloride
1,2-trans-dichloroethylene*
2,4-dimethylphenol*
ethylbenzene*
methyl chloride
phenol
bis (2-ethyl hexyl) Phthalate
butyl benzyl phthalate
di-n-butyl phthalate
diethyl phthalate
dimethyl phthalate*
toluene
antimony
arsenic
beryllium
cadmium
chromium
copper
cyanide
lead
mercury
nickel
selenium
silver
thallium
zinc

* Found in 2 or less samples

COAL MINING INDUSTRIES
SIC 111 AND 121

TOTAL NUMBER OF SAMPLES TAKEN: 94

PRIORITY POLLUTANTS IDENTIFIED

acrolein
acrylonitrile
benzene
chlorobenzene*
1,2-dichloroethane
1,1,1-trichloroethane
1,1,2,2-tetrachloroethane
chloroform
1,2-trans-dichloroethylene
2,6-dinitrotoluene*
ethylbenzene
methylene chloride
trichlorofluoromethane
bis-(2 ethyl hexyl) phthalate
di-n-octyl phthalate
dimethyl phthalate*
1,12-benzoperylene*
phenanthrene*
toluene
antimony
arsenic
beryllium
cadmium
chromium
copper
lead
mercury*
nickel
selenium
thallium
zinc

* Found in 2 or less samples

TEXTILE PRODUCTS INDUSTRIES

SIC 22, 23

Total Number of Samples Taken: 121

Priority Pollutants Identified

acenaphthene
*acrylonitrile
benzene
chlorobenzene
1,2,4-trichlorobenzene
hexachlorobenzene
*1,2-dichloroethane
1,1,1-trichloroethane
1,1-dichloroethane
2,4,6-trichlorophenol
*parachlorometa cresol
2-chlorophenol
1,2-dichlorobenzene
1,4-dichlorobenzene
*1,1-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane
methylene chloride
*methyl chloride
*dichlorobromomethane
trichlorofluoromethane
naphthalene
*2-nitrophenol
4-nitrophenol
N-nitrosodiphenylamine
*N-nitrosodi-n-propylamine
phenol
bis(2-ethyl hexyl)phthalate
diethylphthalate
dimethylphthalate
*3,4-benzofluoranthene
*11, 12-benzofluoranthene
*acenaphthylene
*1,12-benzoperylene
*vinyl chloride
antimony
arsenic
beryllium
cadmium
chromium
copper
cyanide
lead
mercury
selenium
silver
thallium
zinc
pentachlorophenol
nickel
chloroform

PRINTING & PUBLISHING INDUSTRIES

SIC 272

Total Number of Samples Taken: 66

Priority Pollutants Identified

*acenaphthene
benzene
*benzidine
*carbon tetrachloride
*1,2-dichloroethane
1,1,1-trichloroethane
1,1-dichloroethane
*1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
*bis(2-chloroethyl) ether
chloroform
1,2-dichlorobenzene
1,4-dichlorobenzene
1,1-dichloroethylene
1,2-trans-dichloroethylene
*1,2-dichlornpropylene
ethylbenzene
methylene chloride
*bromoform
dichlorobromomethane
*trichlorofluoromethane
*dichlorodifluoromethane
chlorodibromomethane
naphthalene
pentachlorophenol
phenol
bis(2-ethylhexyl)phthalate
butyl benzyl phthalate
di-n-butyl phthalate
diethyl phthalate
*fluorene
*phenanthrene
tetrachloroethylene
toluene
trichloroethylene
*aldrin
betaendosulfan
*alpha BHC (hexachlorocyclohexane)
beta BHC
*lindane
antimony
arsenic
beryllium
cadmium
chromium
copper
cyanide
lead
mercury
nickel
selenium
silver
thallium
zinc

* Found in 2 or less samples

INORGANIC CHEMICAL INDUSTRIES

SIC 281

TOTAL NUMBER OF SAMPLES TAKEN: 107

PRIORITY POLLUTANTS IDENTIFIED

benzene
chlorobenzene
1,1,1-trichloroethane
hexachloroethane*
1,1,2,2-tetrachloroethane
chloroform
1,2-dichlorobenzene*
1,4 -dichlorobenzene*
1,2-trans-dichloroethylene*
1,2-dichloropropane
1,2-dichloropropylene*
2,4-dimethylphenol*
2,6-dinitrotoluene*
ethylbenzene
bis(2-chloroisopropyl)ether*
methylene chloride
dichlorobromomethane
trichlorofluoromethane*
chlorodibromomethane
naphthalene
nitrobenzene
2-nitrophenol*
4-nitrophenol
2,4-dinitrophenol
N-nitrosodi-n-propylamine*
pentachlorophenol
phenol
bis(2-ethylhexyl)phthalate
butylbenzyl phthalate*
di-n -butyl phthalate
di-n-octyl phthalate
diethyl phthalate
dimethyl phthalate*
benzo-(a)-pyrene*
pyrene*
tetrachloroethylene
toluene
trichloroethylene
arsenic
beryllium*
cadmium
chromium
copper
cyanide
lead
mercury
nickel
selenium
silver
thallium
zinc

* found in 2 or less samples

ORGANICS & PLASTICS MANUFACTURERS

SIC 282, 286

Total Number of Samples Taken: 557

Priority Pollutants Identified

acenaphthene
acrolein
acrylonitrile
benzene
chloroform
2-chlorophenol
1,2-dichlorobenzene
1,3-dichlorobenzene
bromoform
dichlorobromomethane
trichlorfluoromethane
dichlorodifluoromethane

*benzidine
carbon tetrachloride
chlorobenzene
1,2,4-trichlorobenzene
hexachloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
chloroethane
* bis (chloromethyl) ether
bis (2-chloroethyl) ether
2-chloroethyl vinyl ether
2-chloronaphthalene
2,4,6-trichlorophenol
parachlorometacresol
bis (2-ethylhexyl) phthalate
endrin aldehyde
di-n-octyl phthalate
diethyl phthalate
dimethyl phthalate
1,2-benzanthracene
benzo(a)pyrene
3,4-benzofluoranthene
11,12-benzofluoranthene
chrysene
acenaphthylene
anthracene
1,12-benzoperylene
fluorene
phenanthrene
indo (1,2,3-cd) pyrene
pyrene
tetrachloroethylene
toluene
trichloroethylene
vinyl chloride

1,4-dichlorobenzene
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane
1,2-dichloropropylene
2,4-dimethylphenol
1,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
ethylbenzene
fluoranthene
*4-chlorophenylphenyl ether
bis (2-chloroisopropyl) ether
bis (2-chloroethosy) methane
methylene chloride
methyl chloride
*methyl bromide
*endrin
di-n-butylphthalate
*heptachlorepoxide
alpha-BHC (BHC=hexachlorocyclohexane)
beta-BHC
lindane
*delta-BHC
PCB-1242
PCB-1254
PCB-1221
PCB-1232
PCB-1248
PCB-1260
PCB-1016
antimony
arsenic
beryllium
cadmium

chlorodibromomethane
hexachlorobutadiene
isophorone
hexachlorocyclopentadiene
naphthalene
nitrobenzene
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dinitro-o-cresol
N-nitrosodimethylamine
phenol
pentachlorophenol
N-nitrosodiphenylamine
butylbenzylphthalate
*heptachlor
cyanide
aldrin
lead
*dieldrin
chromium
copper
cyanide
mercury
4,4'-DDT
*4,4'-DDD
selenium
alpha-endosulfan
silver
*beta-endosulfan
thallium
endosulfan sulfate
zinc
nickel

* Found in 2 or less samples

PHARMACEUTICAL MANUFACTURERS

SIC 2834

Total Number of Samples Taken: 77

<u>Priority Pollutants Identified</u>

*acenaphthene
benzene
carbon tetrachloride
chlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
*1,1-dichloroethane
*bis(2-chloroethyl) ether
*2,4,6-trichlorophenol
chloroform
2-chlorophenol
*1,2-dichlorobenzene
*1,4-dichlorobenzene
1,1-dichloroethylene
*1,2-trans-dichloroethylene
*1,2-dichloropropylene
*2,4-dimethyl phenol

*1,2-diphenyl hydrazine
ethylbenzene
methylene chloride
*dichlorobromomethane
lead
selenium
silver
1,1,2-trichloroethane
trichlorofluoromethane
*chlorodibromomethane
*isophorone
*naphthalene
nitrobenzene
2-nitrophenol
4-nitrophenol
*N-nitrosodiphenylamine
phenol

bis(2-ethylhexyl)phthalate
di-n-butyl phthalate
diethyl phthalate
tetrachloroethylene
toluene
trichloroethylene
*antimony
*beryllium
cadmium
chromium
copper
cyanide
nickel
thallium
zinc
*pentachlorophenol

* Found in 2 or less samples

SOAP & DETERGENTS INDUSTRIES
SIC 2841

Total Number of Samples Taken: 20

Priority Pollutants Identified

* acenaphthene	* diethyl phthalate	chromiom
* benzene	* dimethyl phthalate	copper
* ethylbenzene	* acenaphthylene	lead
methylene chloride	* toluene	nickel
* pentachlorophenol	antimony	silver
phenol	arsenic	thallium
bis (2-ethylhexyl) phthalate	cadmium	zinc

* Found in 2 or less samples

GUM & WOOD PRODUCTS INDUSTRIES

SIC 2861

Total Number of Samples Taken: 18

Priority Pollutants Identified

benzene	*delta-BHC (hexachlorocyclohexane)	lead
*1,1,2,2-tetrachloroethane	antimony	mercury
chloroform	arsenic	nickel
ethylbenzene	beryllium	selenium
methylene chloride	cadmium	silver
phenol	chromium	thallium
bis(2-ethyl hexyl) phthalate	copper	zinc
toluene	*cyanide	

* Found in 2 or less samples

PESTICIDE MANUFACTURERS
SIC 2879

Total Number of Samples Taken: 104

Priority Pollutants Identified

*acenaphthene	*1,4-dichlorobenzene	butyl benzyl phthalate
*acrylonitrile	1,1-dichloroethylene	di-n-butyl phthalate
benzene	1,2-trans-dichloroethylene	*diethyl phthatlate
carbon tetrachloride	*2,4-dichlorophenol	*dimethyl phthalate
chlorobenzene	2,4-dimethylphenol	*acenaphthylene
*1,2,4-trichlorobenzene	2,6-dinitrotoluene	*anthracene
*hexachlorobenzene	ethylbenzene	*1,12 benzoperylene
1,2-dichlorobenzene	bis (2-chloroisopropyl) ether	*fluorene
1,2-dichloroethane	*bis (2-chloroethosy) methane	*phenanthrene
1,1,1-trichloroethane	methylene chloride	*pyrene
hexachloroethane	*bromoform	tetrachloroethylene
*1,1-dichloroethane	*dichlorobromomethane	*aldrin
*chlornethane	*isophorone	trichloroethylene
bis (2-chloroethyl) ether	naphthalene	*dieldrin
*2-chloronaphthalene	*nitrobenzene	*chlordane
2,4,6-trichlorophenol	2-nitrophenol	*4,4"-DDE
parachlorometa cresol	4-nitrophenol	*beta-endosulfan
chloroform	*2,4-dinitrophenol	*endosulfan sulfate
2-chlorophenol	*pentachlorophenol	endrin
*1,2-dichlorobenzene	phenol	*endrin aldehyde
*1,3-dichlorobenzene	bis (2-ethylhexyl) phthalate	heptachlor
1,1,2,2-tetrachloroethane	*trichlorofluoromethane	toluene
*alpha BHC (BHC=hexachlorocyclohexane)		nickel
*beta BHC	beryllium	selenium
*gamma BHC (lindane)	cadmium	silver
*delta BHC	chromium	thallium
toxaphene	copper	zinc
antimony	cyanide	*1,1,2-trichloroethane
arsenic	lead	
	*mercury	

* Found in 2 or less samples

ADHESIVES & SEALANTS MANUFACTURERS

SIC 2891

Number of Samples Taken: 11

Priority Pollutants Identified

* acrolein	* ethyl benzene	trichloroethylene
* acrylonitrile	* fluoroanthene	antimony
* benzene	* methylene chloride	* arsenic
carbon tetrachloride	* dichlorobromomethane	chromium
* 1,1,1-trichloroethane	* naphthalene	copper
* 1,1,2-trichloroethane	pentachlorophenol	lead
* 2,4,6-trichlorophenol	phenol	mercury
chloroform	* bis (2-ethylheryl) phthalate	nickel
* 1,3-dichlorobenzene	butyl benzyl phthalate	* selenium
1,1-dichloroethylene	* di-n-butyl phthalate	* silver
* 1,2-trans-dichloroethylene	* tolvene	zinc
* 2,4-dimethylphenol		

* Found in two or less samples

EXPLOSIVES MANUFACTURERS SIC 2892

TOTAL NUMBER OF SAMPLES TAKEN: 16

PRIORITY POLLUTANTS IDENTIFIED

isophorone*	copper*	silver*
phenol*	cyanide	thallium*
cadmium	nickel*	zinc
chromium*		

* found in 2 or less samples

PAINT & INK INDUSTRIES

SIC 2851, 2893

Total Number of Samples Taken: 63 for Organics
149 for Metals

Priority Pollutants Identified

benzene	*4-chlorophenyl phenylether	*diethyl phtnalate
carbon tetrachloride	*bis(2-chloroisopropyl) ether	*anthracene
*chlorobenzene	methylene chloride	tetrachloroethylene
*hexachlorobenzene	*bromoform	toluene
1,2-dichloroethane	dichlorobromomethane	trichloroethylene
1,1,1-trichloroethane	chlorodibromomethane	*antimony
*1,1-dichloroethane	nickel	arsenic
1,1,2-trichloroethane	thallium	beryllium
*1,1,2,2-tetrachloroethane	*isophorone	cadmium
chloroform	naphthalene	chromium
1,1-dichloroethylene	nitrobenzene	copper
1,2-trans-dichloroethylene	pentachlorophenol	cyanide
1,2-dichloropropane	phenol	lead
*1,2-dichloropropylene	bis(2-ethylhexyl) phthalate	mercury
*1,2-diphenylhydrazine	di-n-butyl phthalate	silver
ethylbenzene	*di-n-octyl phthalate	zinc

* Found in 2 or less samples

PETROLEUM REFINERIES

SIC CODE 2911

TOTAL NUMBER OF SAMPLES TAKEN: 54 for organics, 346 for metals

PRIORITY POLLUTANTS IDENTIFIED

acenaphthene	bromoform	pyrene
acrylonitrile*	dichlorobromomethane	tetrachloroethylene
benzene	trichlorofluoromethane*	toluene
carbon tetrachloride	chlorodibromomethane	trichloroethylene
chlorobenzene	isophorone*	aldrin*
1,2-dichloroethane	naphthalene	4,4-DDE*
1,1,1-trichloroethane	2-nitrophenol*	beta-endosulfan*
1,1-dichloroethane*	4-nitrophenol	delta benzene hexachloride*
1,1,2-trichloroethane	2,4-dinitrophenol	PCB-1242*
1,1,2,2-tetrachloroethane	4,6 dinitro-o-cresol*	PCB-1016*

2-chloronaphthalene*
parachlorometa cresol
chloroform
2-chlorophenol*
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol*
2,4-dimethyl phenol
ethylbenzene
fluoranthene
methylene chloride
methyl chloride*
pentachlorophenol*
phenol
bis(2-ethylhexyl)phthalate
di-n-butyl phthalate
diethyl phthalate*
dimethyl phthalate*
1,2-benzanthracene
benzo (a) pyrene*
chrysene
acenaphthylene*
anthracene
fluorene
phenanthrene
antimony
arsenic
cadmium
chromium
copper
cyanide
lead
nickel
selenium
silver*
thallium*
zinc

* Found in 2 or less samples

PAVING AND ROOFING INDUSTRIES
SIC CODES 2951, 2952, 3996

TOTAL NUMBER OF SAMPLES TAKEN: 8

PRIORITY POLLUTANTS IDENTIFIED

cadmium*
chromium
copper
lead*
nickel
selenium
zinc

* Found in 2 or less samples

RUBBER INDUSTRIES
SIC CODE 30

TOTAL NUMBER OF SAMPLES TAKEN: 63 for organics, 54 for metals

PRIORITY POLLUTANTS IDENTIFIED

acrylonitrile*
benzene
1,2-dichloroethane*
1,1,1-trichloroethane
hexachloroethane*
2-chloronaphthalene*
parachlorometa cresol*
chloroform
2-chlorophenol*
1,2-trans-dichloroethylene*
2,4-dimethyl phenol*
1,4-dinitrotoluene*
2,6-dinitrotoluene*
1,2-diphenylhydrazine*
ethylbenzene
fluoranthene*
4-bromophenyl phenyl ether*
bis (2-chloroethosy) methane*
methyl chloride
isophorone*
naphthalene
2-nitrophenol*
4,6-dinitro-o-cresol*
N-nitrosodiphenylamine
pentachlorophenol
phenol
bis(2-ethyl hexyl) phthalate
butyl benzyl phthalate*
di-n-butyl phthalate*
diethyl pnthalate*
dimethyl phthalate
1,2-benzanthracene*
benzo(a) pyrene*
3,4 benzofluoranthene*
11,12 benzofluoranthene*
chrysene*
anthracene*
1,12-benzoperylene
fluorene
phenanthrene
1,2,5,6-dibenzanthracene*
indeno (1,2,3-cd) pyrene*
pyrene*
toluene
cadmium
chromium
copper
cyanide*
lead
nickel
selenium
silver*
zinc

* Found in 2 or less samples

LEATHER TANNING INDUSTRIES SIC 31

Total Number of Samples Taken: 72

Priority Pollutants Identified

*acenaphthene
*benzene
*benzidine
carbon tetrachloride
chlorobenzene
naphthalene
*nitrobenzene
1,2 dichloroethane
1,1,1-trichloroethane
*1,1-dichloroethane
*1,1,2,2-tetrachloroethane
2-chloronaphthalene
2,4,6- trichlorophenol
chloroform
1,2-dichlorobenzene
*1,3-dichlorobenzene
1,4-dichlorobenzene
1,2- trans-dichloroethylene
2,4- dichlorophenol
*1,2-diphenyl hydrazine
cyanide
*mercury
nickel
zinc
ethylbenzene
*fluoranthene
*bis(2-chloroisopropyl) ether
methylene chloride
*dichlorobromomethane
copper
lead
pentachlorophenol
phenol
bis(2-ethylhexyl) phthalate
*di-n-butyl phthalate
*dimethyl phthalate
*acenaphthalene
anthracene
phenanthrene
tetrachloroethylene
toluene
*trichloroethylene
*chlordane
antimony
chromium
*selenium
*silver

* Found in 2 or less samples

IRON AND STEEL INDUSTRIES
SIC 331
TOTAL NUMBER OF SAMPLES TAKEN: 44

PRIORITY POLLUTANTS IDENTIFIED

acenaphthene
acrylonitrile
benzene
benzidine*
carbon tetrachloride
hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane *
1,1,2-trichloroethane*
1,1,2,2,-tetrachloroethane
2-chloronaphthalene
2,4,6-trichlorophenOl
parachlorometacresol
chloroform
2-chlorophenol*
1,2-dichlorcbenzene*
1,3-dichlorobenzene*
1,4-dichlorobenzene
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
2,4-dimethylphenol
2,6-dinitrotolvene*
1,2-diphenyl hydrazine*
ethylbenzene
fluoranthene
dichlorobromomethane*
isophorone
naphthalene
2-nitrophenol
4-nitrophenol*
2,4-dinitrophenol
4,6-dinitro-o-cresol
pentachlorophenol
phenol
bis(2-ethylhexyl)phthalate
butyl benzyl phthalate
di-n-butyl phthalate
di-n-octyl phthalate
diethylphthalate
dimethylphthalate
1,2-benzanthracene
benzo-(a)-pyrene
3,4-benzofluoranthene
11,12-benzofluoranthene
chrysene
acenaphthylene
anthracene
1,12-benzoperylene
fluorene
phenanthrene
1,2,5,6-dibenzanthracene
indeno(1,2,3-cd)pyrene
pyrene
tetrachloroethylene*
toluene
trichloroethylene
antimony
arsenic
beryllium
cadium
chromium
copper
cyanide
lead
mercury
nickel
selenium
silver
thallium
zinc

* found in 2 or less samples.

FOUNDRIES SIC CODES 332 and 336
TOTAL NO. OF SAMPLES TAKEN: 54

PRIORITY POLLUTANTS IDENTIFIED

acenaphthene
benzene
1,2,4--trichlorobenzene
1,1,1-trichloroethane
1,1,2-trichloroethane*
2-chloronaphthalene*
2,4, -trichlorophenol
parachlorometa cresol*
chloroform
2-chlorophenol
1,3-dichlorobenzene*
1,2-trans-dichloroethylene*
2,4-dimethylphenol
2,4 - dichlorophenol
1,4-dinitrotoluene
2,6-dinitrotoluene
ethylbenzene*
fluoranthene
methylene chloride*
bromoform*
dichlorobromomethane*
isophorone*
naphthalene
nitrobenzene
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dinitro-o-cresol
pentachlorophenol
phenol
bis(2-ethylhexyl)phthalate
butyl benzyl phthalate.
di-n-butyl-phthalate
di-n-butyl-phthalate
di-n-octyl-phthalate*
diethylphthalate
dimethylphthalate
benzo(a)pyrene*
chrysene
acenaphthylene
anthracene
fluorene
phenanthrene
pyrene
tetrachloroethylene
toluene*
trichloroethylene
antimony
arsenic
beryllium
cadmium
chromium
copper
cyanide
lead
mercury
nickel
selenium
silver
thallium
zinc

* found in 2 or less samples.

NON FERROUS METAL INDUSTRIES SIC333
TOTAL NO. OF SAMPLES TAKEN:

PRIORITY POLLUTANTS IDENTIFIED

acenaphthene
benzene
1,2,4-trichlorobenzene
hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
1,1,22-tetrachloroethane
2-chloronaphthalene*
chloroform
1,3-dichlorobenzene*
1,4-dichlorobenzene*
1,1-dichloroethylene
ethylbenzene
fluoranthene
methylene chloride
bromoform *
chlorodibromomethane*
isophorone
naphthalene
nitrobenzene*
bis(2-ethyl hexyl)phthalate
butyl benzyl phthalate
di-n-butyl phthalate
di-n-octyl phthalate*
diethyl phthalate
dimethyl phthalate
chrysene
acenaphthylene
anthracene
fluorene
phenanthrene
pyrene
tetrachloroethylene
toluene
trichloroethylene
chlordane*
alphaendosulfan*
endrin*
betabenzenehexachloride*
PCB 1254
PCB 1248
antimony
arsenic
beryllium
cadmium
chromium
copper
cyanide
lead
mercury
nickel
selenium
silver
thallium
zinc

* found in 2 or less samples

PORCELAIN AND ENAMELING INDUSTRIES SIC 3431

TOTAL NUMBER OF SAMPLES TAKEN: 12

PRIORITY POLLUTANTS IDENTIFIED+

chloroform*
bromoform*
chlorodibromomethane*
bis(2-ethyl hexyl)phthalate*
di-n-octyl phthalate*
toluene*
PCB-1232*
beryllium*
cadmium
chromium
copper
lead
nickel
zinc

ELECTROPLATING INDUSTRIES

SIC CODE 347
TOTAL NO. OF SAMPLES TAKEN: 18 for organics 16 for metals

PRIORITY POLLUTANTS IDENTIFIED

1,1,1-trichloroethane
chloroform
1,1-dichloroethylene*
ethylbenzene*
methylene chloride*
methyl chloride*
dichlorodifluoromethane*
naphthalene*
naphthalene*
phenol*
bis(2 ethylhexyl)phthalate
di-n-butylphthalate*
diethyl phthalate*
anthracene*
phenanthrene*
tetrachloroethylene*
toluene
trichloroethylene
cadmium
chromium
copper
cyanide
lead
mercury
nickel
silver
zinc

* found in 2 or less samples

BATTERY MANUFACTURERS

SIC CODES 3691,3692
TOTAL NO. OF SAMPLES TAKEN: 3 for organics 0 for metals

PRIORITY POLLUTANTS IDENTIFIED

1,1,1-trichloroethane
chloroform
methylene chloride
bis(2-ethylhexyl)phthalate
butylbenzyl phthalate
di-n-octyl phthalate
anthracene
phenanthrene

STEAM ELECTRIC POWER PLANTS
SIC CODE 4911

TOTAL NUMBER OF SAMPLES TAKEN: 82

PRIORITY POLLUTANTS IDENTIFIED

benzene
1,2-dichloroethane
1,1,1-trichloroethane
2-chloronaphthalene*
2,4,6-trichlorophenol*
chloroform
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol*
ethylbenzene
methylene chloride
bromoform
dichlorobromomethane
trichlorofluoromethane
chlorodibromomethane
pentachlorophenol
phenol
bis (2-ethylhexyl) phthalate
butyl benzyl phthalate*
di-n-butyl phthalate
di-n-octyl phthalate
diethyl phthalate
1,2-benzanthracene*
tetrachloroethylene
toluene
trichloroethylene
beryllium
cadmium
chromium
copper
lead
mercury*
nickel
silver
zinc

* Found in 2 or less samples

AUTO AND OTHER LAUNDRIES

SIC COD 721
TOTAL NUMBER OF SAMPLES TAKEN: 45

PRIORITY POLLUTANTS IDENTIFIED

acenaphthene
acrolein*
acrylonitrile*
benzene
carbon tetrachloride*
chlorobenzene
hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
hexachloroethane*
1,1,2-trichloroethane*
1,1,2,2,-tetrachloroethane*
parachlorometacresol*
chloroform
2-chlorophenol*
1,2-dichlorobenzene
1,4-dichlorobenzene
1,1-dichloroethylene
1,1-transdichloroethylene
2,4-dichlorophenol*
1,2-dichloropropane*
2,6-dinitrotoluene*
ethylbenzene
fluoranthene
bis(2-chloroisopropyl)ether
methylene chloride
bromoform
dichlorobromomethane
trichlorofluoromethane
chlorodibromomethane
isophorone
naphthalane
nitrobenzene*
N-nitrosodiphenylamine*
pentachlorophenol*
phenol*
bis(2-ethylhexyl)phthalate
butylbenzyl phthalate
di-n-butyl phthalate*
di-n-octyl phthalate*
diethyl phthalate
chrysene
acenaphthylene
anthracene
fluorene*
phenanthrene
pyrene
tetrachloroethylene
toluene
trichloroethylene
dieldrin*
4-4'-DDT*
alpha-endosulfan*
betaBHC(benzenehexa-chlori
antimony
arsenic
cadmium
chromium
copper
lead
mercury*
nickel
selenium*
silver
zinc

* found in 2 or less samples

APPENDIX C

New York State Industrial Chemical Survey Positive Responders Reviewed in This Study

Company Name	ICS Code	SIC Code
Abbott Laboratories	77044	3079
Airco Industrial Cases	77890	4925
Allied Chemical Corp.	66272	2818
Allied Chemical Corp.	66273	3312
Allied Chemical Corp.	77350	2818
Allied Chemical Corp.	77353	2818
Alum Casting Co.	77046	3361
Amax Specialty Metals Corp.	77556	3356
American Optical Corp.	66178	3831
Ameron Protective Coating Div.	77375	2899
Anaconda Co.	77407	3351
Arcata Graphics	66444	2751
Ashland Petroleum Co.	66093	2911
Atlas Plastics Inc.	77167	3079
Bell Aerospace Textron	77297	3721
Bernel Foam Products Co. Inc.	66285	2821
Birdair Structures Inc.	77690	3079
Bison Products Co. Inc.	77034	2013
Bisonite Company Inc.	77756	2851
Buffalo Weaving & Belting Co.	77345	2241
Canada Dry Bottling Co.	88047	2086
Cathedral Envelope Co. Inc.	88008	2751
Chem-Trol Pollution Services Inc.	66287	9990
Chevrolet Tonawanda Forge	66491	3462
Chevrolet Tonawanda Metal Casting	66490	3321
Chevrolet Tonawanda Motor Plant	66199	3714
Chip Steak Co.	77397	2010
Coca-Cola Bottling Co.	66123	2086
Colad Inc.	77377	2610
Columbus McKinnon Corp.	66447	3536
Donner-Hanna Coke Corp.	66087	3312
Dunlop Tire & Rubber Corp.	77732	3011
E. I. Dupont De Nemours & Co.	66134	2821
Elmer Bender & Son Inc.	77244	2011
F. K. & Son Inc.	88016	2010
F. N. Burt Company Inc.	77162	2651
Flexo Transparent Inc.	77384	2643
F. M. C. Corp.	66202	2819
Garry Laboratories Inc.	77695	2842
General Electric Co.	77355	7629
Gro Green Products	66043	9990
H. B. Fuller Co.	77324	2890
Harrison Radiator	77300	3714
Inmont Corp.	77573	2892
Lucidol-Div. of Pennwalt	77296	3821
Madison Wire Co. Inc.	88032	3315
Metholatum Co. Inc.	77599	2830
Mobil Oil Corp.	66431	2911
National Manufacturing Corp.	77735	2851
New York Wire Mills Corp.	77842	3481
Newco Chemical Waste Systems	66439	9999
Niagara Envelope Co. Inc.	77525	2642
Niagara Mohawk Power Corp.	77857	4911
Niagara Transformer Corp.	66334	3612
Nuclear Radiation Developments Corp.	77150	2810
Osmose Wood Preserving Co.	66179	2850
Peavey Co.	66468	2041
Pohlman Foundry Company Inc.	88037	3321
Polymer Applications Inc.	66368	2851
Pratt & Lambert Inc.	66166	2851
Republic Steel Corp.	66218	3312
Royton Paper Products	77676	2610
S. A. Day Mfg. Co. Inc.	77333	3291
Shanco Plastics & Chemicals Inc.	77586	2821
Spaulding Fibre Co. Inc.	66215	2823
Spencer Kellogg Div. of Textron Inc.	66259	2820
St. Regis Paper Co.	77661	2653
Truly Magic Products Inc.	77066	2842
Union Carbide Corp.	66361	3471
Union Carbide Corp.	77614	3443
Wagner Folding Box Corp.	77179	2651
Westinghouse Electric Corp.	77806	3621
Westbound Pharmaceuticals Inc.	77061	2834
Winfield Industries Inc.	77620	2821
Worthington Compressors Inc.	77621	3561

Key to Use Code Abbreviations

BAS - blended and used as solvents
CLN - cleaning and degreasing
CLO - anything used in a closed system (for example transformer oil, refrigerants), and chemicals treated and disposed of in landfills
CON - confidential
COT - coatings (glue, paint, ink, grease or oil)
NLU - no longer used
PES - pesticides (herbicides, slimicides, insecticides and rodenticides)
PKG - chemicals that are packaged and/or distributed
PRO - produced manufactured or reclaimed chemicals and by-products
RAD - chemicals used in research and development, and chemicals used in laboratories
REA - reacted, used up or changed, as in a chemical reaction
UNK - unknown

Source: New York State Department of Environmental Conservation

ICS NO.: 77000 ABBOTT LABORATORIES
****
/0 WALDEN AVE. BUFFALO NY 14225

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
GENESOLVE D (HALOGENATED C1 OR C2?)	A99	A99000-00-0	8,000	200	GALLONS	CLN

ICS NO.: 77890 AIRCO INDUSTRIAL GASES (BUFFALO FACILITY)
****
101 KATHERINE ST BUFFALO NY 14210

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
AMERPLEX	T99	T99000-00-0	1,500	1,800	POUNDS	PES
ADTYCT H	T99	T99000-00-0	500	675	POUNDS	PES
DREWCUR	T99	T99000-00-0	2,700	1,800	POUNDS	PES
DREWGARD 180	T99	T99000-00-0	6,000	1,500	POUNDS	PES
BIOSPERSE 201	T99	T99000-00-0	500	1,150	POUNDS	PES
BIOSPERSE 210	T99	T99000-00-0	550	1,100	POUNDS	PES
BIOSPERSE 204	T99	T99000-00-0	450	520	POUNDS	PES

ICS NO.: 66272 ALLIED CHEMICAL CORP (BUFFALO CHEMICAL PLT)
****
35 LEE ST. BUFFALO NY 14210

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
GENETRON 113	A05	000076-13-1	2,650	5,260	POUNDS	CLN
ASBESTOS	G01	001332-21-4	850	1,200	POUNDS	CLO
UROX 22-3(P-CHLOROPHENOL)DIMETHYLUREATRICHLOROACETATE	C99	C99000-00-0	25	22	POUNDS	NLU
PETROLEUM TAR	E02	E02000-00-0	200	250	POUNDS	COT
CHELANT C 1-2	T99	T99000-00-0	1,850	2,460	POUNDS	REA
CHELANT C-60	T99	T99000-00-0	5,250	1,744	POUNDS	REA
NEUTRAMEEN NAS	T99	T99000-00-0	5,350	2,425	POUNDS	REA
CORROGEN	T99	T99000-00-0	2,575	2,060	POUNDS	REA
K-GEL	T99	T99000-00-0	4,500	0	POUNDS	NLU
REMOX	T99	T99000-00-0	1,375	0	POUNDS	NLU
AMERTROL	T99	T99000-00-0	7,750	0	POUNDS	NLU
AMERZINE 35	T99	T99000-00-0	2,250	0	POUNDS	NLU
DREWPLEX 905	T99	T99000-00-0	4,750	0	POUNDS	NLU

ICS NO.: 66273 ALLIED CHEMICAL CORP (SEMET SOLVAY DIV) (BUFFALO PLANT)
****
3875 RIVER RD. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
BENZENE	D01	000071-43-2	133,333	11,000	GALLONS	PRO
1,1,1-TRICHLOROETHANE	A07	000071-55-6	750	50	GALLONS	CLN
TOLUENE	D02	000108-88-3	133,333	11,000	GALLONS	PRO
XYLENE	D03	001330-20-7	133,333	11,000	GALLONS	PRO
COAL TAR	E01	008007-45-2	1,870,000	1,359,000	GALLONS	PRO
TAR ACIDS	E99	E99000-00-0	10,000	UNKNOWN	GALLONS	PRO

ICS NO.: 77350 ALLIED CHEMICAL CORP (SPECIALTY CHEM DIV) (BUFFALO RESEARCH LAB)
****
20 PEABODY ST. BUFFALO NY 14210

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
CARBON TETRACHLORIDE	A04	000056-23-5	9,200	18	POUNDS	HAS
ANILINE	F06	000062-53-3	200	0	POUNDS	NLU
CHLOROFORM	A03	000067-66-3	111	15	POUNDS	HAS
BENZENE	D01	000071-43-2	12	250	POUNDS	HAS
1,1,1-TRICHLOROETHANE	A07	000071-55-6	1,700	2,500	POUNDS	REA
ETHYL BROMIDE	A08	000074-96-4	80	0	POUNDS	REA
ETHYL CHLORIDE	A08	000075-00-3	120	0	POUNDS	REA
METHYLENE CHLORIDE	A02	000075-09-2	137,000	1,270	POUNDS	REA
DIFLUOROMETHANE	A05	000075-10-5	5,500	50	POUNDS	PRO
1,1-DIFLUOROETHANE	A05	000075-37-6	33	10	POUNDS	REA
DICHLOROFLUOROMETHANE	A05	000075-43-4	54	2,015	POUNDS	PRO
PHOSGENE	B01	000075-44-5	135	0	POUNDS	REA
CHLORODIFLUOROMETHANE	A05	000075-45-6	113	100	POUNDS	REA
BROMOTRIFLUOROMETHANE	A05	000075-63-8	16	75	POUNDS	REA
1,1-DIFLUORO-1-CHLOROETHANE	A05	000075-68-3	0	25	POUNDS	REA
TRICHLOROFLUOROMETHANE	A05	000075-69-4	5,408	1,525	POUNDS	PRO
DICHLORODIFLUOROMETHANE	A05	000075-71-8	3,268	300	POUNDS	PRO
1,1,1-TRIFLUOROCHLOROETHANE	A05	000075-88-7	75	25	POUNDS	REA
TRIFLUOROETHANOL (ASS 2,2,2 ISOMER?)	B99	000075-89-8	9	30	POUNDS	REA
PENTACHLOROETHANE	A08	000076-01-7	335	90	POUNDS	REA
TRIFLUOROACETIC ACID	B99	000076-05-1	10	40	POUNDS	REA
1,1,1,2-TETRACHLORO-2,2-DIFLUOROETHANE	A05	000076-11-9	0	195	POUNDS	REA
1,1,2-TRICHLOROTRIFLUOROETHANE	A05	000076-13-1	5,137	2,250	POUNDS	REA
1,2-DICHLOROTETRAFLUOROETHANE	A05	000076-14-2	1,430	125	POUNDS	REA
CHLOROPENTAFLUOROETHANE	A05	000076-15-3	40	50	POUNDS	REA
PERFLUOROETHANE	A05	000076-16-4	60	50	POUNDS	REA
TRICHLOROETHYLENE	A12	000079-01-6	2,134	800	POUNDS	REA
ALLYL CHLORIDE	A15	000107-05-1	18,300	0	POUNDS	NLU
MALEIC ANHYDRIDE	G10	000108-31-6	14	25	POUNDS	REA
TOLUENE	D02	000108-88-3	2,750	265	POUNDS	HAS
CHLOROBENZENE	A16	000108-90-7	500	0	POUNDS	HAS
PERCHLOROETHYLENE	A13	000127-18-4	4,000	500	POUNDS	REA
1,1,1-TRIFLUORO-2,2-DICHLOROETHANE	A05	000306-83-2	2,236	3,030	POUNDS	REA
ISOCROTYL CHLORIDE	A99	000513-37-1	25	0	POUNDS	REA
METHALLYL CHLORIDE	A99	000563-47-3	150	100	POUNDS	NLU

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
8- AMINO QUINOLINE	F99	000578-66-5	1,050	0	POUNDS	NLU
CHLOROFLUOROMETHANE	A05	000593-70-4	63,000	24,000	POUNDS	PRO
XYLENE	D03	001330-20-7	10	54	POUNDS	BAS
N-CF(CF3)2-1,1,2,2-4H-DODECAFLUORODCTYL METHACRYLATE	B99	015166-00-4	40	40	POUNDS	NLU
1,4 BIS(PERFLUOROISOPROPOXY)PERFLUOROBUTANE	B99	023228-90-2	225	225	POUNDS	NLU
TOLUENE DIISOCYANATE	F10	026471-62-5	30	2	POUNDS	REA
1,1,2-TRICHLORODIFLUOROETHANE (ISOMER?)	A05	A05000-00-0	183	0	POUNDS	REA
1-CHLORO-1,2,2,2-TETRAFLUOROETHANE	A05	A05000-00-0	2,100	350	POUNDS	PRO
DICHLOROBENZENE	A18	A18000-00-0	3,500	585	POUNDS	NLU
GENESOLV C	A99	A99000-00-0	0	28	POUNDS	BAS
TRICHLOROHEPTAFLUOROBUTANE	A99	A99000-00-0	0	14	POUNDS	REA
CHLOROISOBUTANES, MIXED	A99	A99000-00-0	670	3,900	POUNDS	PRO
TRIFLUOROETHYL TRIFLUOROACETATE	B99	B99000-00-0	16	105	POUNDS	REA
1-(PERFLUOROISOPROXY)PERFLUOROHEXANE	B99	B99000-00-0	25	25	POUNDS	NLU
PERFLUOROISOPROPOXY ETHYL IODIDE	B99	B99000-00-0	790	790	POUNDS	NLU
PERFLUOROISOPROPOXY BUTYL IODIDE	B99	B99000-00-0	280	280	POUNDS	NLU
6-PERFLUOROISOPROPOXY HEXYL IODIDE	B99	B99000-00-0	137	137	POUNDS	NLU
8-PERFLUOROISOPROPOXY OCTYL IODIDE	B99	B99000-00-0	230	230	POUNDS	NLU
1,1,2,2-TETRAHYDRODODECAFLUORODCTYL-O-CF(CF3)2 ETHER	B99	B99000-00-0	200	200	POUNDS	NLU
NAGOR GREENISH BLUE	F24	F24000-00-0	85	0	POUNDS	NLU
NAGOR BLUE B DIMER	F24	F24000-00-0	17	0	POUNDS	NLU
PLASTO PINK YPP	F24	F24000-00-0	100	0	POUNDS	NLU
VARIOUS EPOXIDES	G12	G12000-00-0	4	20	POUNDS	REA
POLYMERIC ISOCYANATE	F99	F99000-00-0	85	0	POUNDS	NLU

ICS NO.: 77353 ALLIED CHEMICAL CORP (SPECIALTY CHEM DIV) (TONAWANDA PLANT)
****
3821 RIVER RD. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TRICHLOROETHANE	A07	000071-55-6	18	55	GALLONS	CLN
R-22	A05	000075-45-6	UNKNOWN	UNKNOWN	UNKNOWN	CLO
TRICHLOROETHYLENE	A12	000079-01-6	2,200	0	GALLONS	NLU
TOLUENE	D02	000108-88-3	UNKNOWN	UNKNOWN	GALLONS	BAS
TETRACHLOROETHYLENE	A13	000127-18-4	1,760	110	GALLONS	CLN
UROX22	C99	000140-41-0	575	0	POUNDS	PES
XYLENE	D03	001330-20-7	UNKNOWN	UNKNOWN	GALLONS	BAS
ASBESTOS	G01	001332-21-4	UNKNOWN	UNKNOWN	UNKNOWN	NLU
WEEDMIX	C99	C99000-00-0	500	0	POUNDS	PES
NOBRUSH P239	C99	C99000-00-0	1,467	500	POUNDS	PES

ICS NO.: 77046 ALUM CASTING CO.
****
3753 WALDEN AVE. LANCASTER NY 14086

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
ALUMINUM INGOT	H99	007429-90-5	80,000	UNKNOWN	POUNDS	PRO

ICS NO.: 77556 AMAX SPECIALTY METALS CORP.
****
CLARENCE CENTER & NE AKRON NY 14001

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
1,1,1-TRICHLOROETHANE	A07	000071-55-6	0	55	GALLONS	NLU
TRICHLOROETHYLENE	A12	000079-01-6	600	55	GALLONS	CLN

ICS NO.: 66178 AMERICAN OPTICAL CORP, SCIENTIFIC INSTRUMENT DIV.
****
EGGERT & SUGAR RDS. BUFFALO NY 14215

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
ACETONE	K01	000067-64-1	2,179	338	GALLONS	CLN
CHLOROFORM	A03	000067-66-3	15	0	GALLONS	CLN
1,1,1-TRICHLOROETHANE	A07	000071-55-6	8,000	1,715	GALLONS	CLN
METHYLENE CHLORIDE	A02	000075-09-2	5,045	165	GALLONS	CLN
TRICHLOROETHYLENE	A12	000079-01-6	500	385	GALLONS	CLN
TOLUENE	D02	000108-88-3	270	70	GALLONS	BAS
XYLENE	D03	001330-20-7	3,190	400	GALLONS	BAS
TOLUENE DIISOCYANATE	F10	026471-62-5	20	5	POUNDS	BAS
PINE TAR PITCH	E04	0X8011-48-1	1,804	372	POUNDS	BAS
FREON/GENATRON	A05	A05000-00-0	605	30	GALLONS	CLN
POLYCHLORINATED BIPHENYL	A21	A21000-00-0	12	4	POUNDS	BAS
DYES AND ORGANIC PIGMENTS	F24	F24000-00-0	1	1	POUNDS	BAS
EPOXIDES	G12	G12000-00-0	40	10	POUNDS	BAS
NAPHTHA	G25	G25000-00-0	54	72	GALLONS	CLN
PAINT THINNERS AND REDUCERS	G26	G26000-00-0	342	420	GALLONS	BAS

ICS NO.: 77375 AMERON PROTECTIVE COATING DIV.
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111 COLGATE AVE. BUFFALO NY 14220

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
ANILINE	F06	000062-53-3	8,000	2,400	POUNDS	BAS
ISOPHORONE	G04	000078-59-1	30	60	POUNDS	BAS
TOLUENE	D02	000108-88-3	240,000	105,000	POUNDS	BAS
PHENOL	F01	000108-95-2	50	300	POUNDS	BAS
CATECHOL	F02	000120-80-9	3,000	600	POUNDS	BAS
XYLENE	D03	001330-20-7	750,000	67,000	POUNDS	BAS
ASBESTOS	G01	001332-21-4	20,000	6,000	POUNDS	BAS
ABC-3 CUT BACK ASPHALT	F03	008052-42-4	15,000	350	POUNDS	BAS

ASPHALT 180 - 200	E03	008052-42-4	31,000	9,700 POUNDS	BAS
PIONEER COMPO. ASPHALT	E03	008052-42-4	4,300	1,500 POUNDS	BAS
COAL TAR	E01	0X8007-45-2	75,000	57,000 POUNDS	BAS
UNICLOR 70AX CHLORINATED PARAFFIN	A99	0X8029-39-8	37,000	6,700 POUNDS	BAS
CHLOROWAX 40 CHLORINATED PARAFFIN	A99	0X8029-39-8	16,000	2,900 POUNDS	BAS
HALO WAX 1006 CHLORINATED NAPHTHALENE	A22	A22000-00-0	900	130 POUNDS	BAS
DYES & ORGANIC PIGMENTS	F24	F24000-00-0	7,000	1,600 POUNDS	BAS
METHYLENEDIANILINE (ISOMERS)	F99	F99000-00-0	75,000	5,200 POUNDS	BAS
METHYLENEDIANILINE & M-PHENYLENEDIANILINE	F99	F99000-00-0	16,000	1,600 POUNDS	BAS
EPOXIDES	G12	G12000-00-0	500,000	110,000 POUNDS	BAS

ICS NO.: 77407 ANACONDA CO.(BRASS DIV.)
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P.O. BOX 981 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
1,1,1-TRICHLOROETHANE	A07	000071-55-6	525	238	GALLONS	BAS
ASBESTOS	G01	001332-21-4	31,046	3,720	POUNDS	CLO
KEROSENE	G25	008008-20-6	3,925	207	GALLONS	COT
STODDARD	G25	008052-41-3	1,163	224	GALLONS	COT
CASTER OIL #1	G16	0X8001-79-4	360	107	GALLONS	COT
NEATSFOOT OIL	G16	0X8002-64-0	1	1	GALLONS	COT
LARD OIL	G16	0X8016-28-2	79,080	4,750	GALLONS	COT
ALCOHOL	J99	J99000-00-0	84	39	GALLONS	COT
COPPER SHIELD #860	T99	T99000-00-0	430	133	GALLONS	COT
COPPER SHIELD #870	T99	T99000-00-0	55	110	GALLONS	COT
COPPERSKIN #705	T99	T99000-00-0	23,731	1,536	GALLONS	COT
MAGNU DRAK #30	T99	T99000-00-0	4	1	GALLONS	COT
DWEPL #90	T99	T99000-00-0	577	215	GALLONS	BAS
TUNEX #60	T99	T99000-00-0	1,201	385	GALLONS	COT
MOBILMET #308	T99	T99000-00-0	248	165	GALLONS	COT
AN#1	T99	T99000-00-0	2,935	496	GALLONS	COT
#735	T99	T99000-00-0	3,677	111	GALLONS	COT
COPPERSKIN #502-A	T99	T99000-00-0	20	21	GALLONS	COT
LUBRICOOLANT #930	T99	T99000-00-0	67	33	GALLONS	COT
WHEELMATE #203	T99	T99000-00-0	798	165	GALLONS	COT
LUBEWELL 3-298	T99	T99000-00-0	88	55	GALLONS	COT
MOBILGEAR #634	T99	T99000-00-0	2,984	564	GALLONS	COT
MOBIL DTE26	T99	T99000-00-0	370	163	GALLONS	COT
MOBILGEAR #630	T99	T99000-00-0	26,261	3,276	GALLONS	COT
MOBILMIST #32	T99	T99000-00-0	642	220	GALLONS	COT
MOBILGEAR #632	T99	T99000-00-0	5,200	400	GALLONS	COT
VOCO #1	T99	T99000-00-0	340	38	GALLONS	COT
DELVAC #1120	T99	T99000-00-0	133	90	GALLONS	COT
DELVAC #1140	T99	T99000-00-0	22	54	GALLONS	COT
SUPER #600W	T99	T99000-00-0	178	97	GALLONS	COT
RANDO F	T99	T99000-00-0	990	337	GALLONS	COT
MOBIL DTE MEDIUM	T99	T99000-00-0	33,814	1,714	GALLONS	COT
MOBIL DTE #25	T99	T99000-00-0	1,740	402	GALLONS	COT
VACTRA HEAVY MEDIUM	T99	T99000-00-0	10,930	2,476	GALLONS	COT
VACTRA #2	T99	T99000-00-0	410	70	GALLONS	COT
VELOCITE #3	T99	T99000-00-0	9	1	GALLONS	COT
VELOCITE DTE #105	T99	T99000-00-0	143	118	GALLONS	COT
VELOCITE DTE #33	T99	T99000-00-0	230	230	GALLONS	COT
VELOCITE DTE #BB	T99	T99000-00-0	404	80	GALLONS	COT
VACULINE #348	T99	T99000-00-0	4,237	1,045	GALLONS	COT
VACULINE DTE 797	T99	T99000-00-0	28	61	GALLONS	COT
TECTYLE #5114	T99	T99000-00-0	143	110	GALLONS	COT
ETNA #03	T99	T99000-00-0	523	165	GALLONS	COT
LUBRICANT #886396	T99	T99000-00-0	168	36	POUNDS	COT
LUBRICANT #J-448	T99	T99000-00-0	2	3	POUNDS	COT
WEMCO C	T99	T99000-00-0	0	165	GALLONS	COT
BRAKE FLUID	T99	T99000-00-0	55	21	GALLONS	COT
HOUGH TO SAFE #419R	T99	T99000-00-0	7,799	721	GALLONS	COT
SPRA SOLVO (AEROSOL)	T99	T99000-00-0	232	22	POUNDS	COT
PENETRATING OIL (LIQUID)	T99	T99000-00-0	4	5	GALLONS	COT
RIDGED OIL	T99	T99000-00-0	12	8	GALLONS	COT
LUBE #74440	T99	T99000-00-0	3	2	POUNDS	COT
FLO-SCOPE	T99	T99000-00-0	8	4	POUNDS	COT
FRICTION PROOFING	T99	T99000-00-0	65	46	POUNDS	BAS
GREASE SUPREME #1	T99	T99000-00-0	283	350	POUNDS	BAS
MOBIL LUBE #EP-140	T99	T99000-00-0	261	51	POUNDS	BAS
MOBIL #880	T99	T99000-00-0	400	400	POUNDS	BAS
MOBIL BRT-10	T99	T99000-00-0	1,075	400	POUNDS	COT
MOBILPLEX #47	T99	T99000-00-0	6,470	1,130	POUNDS	COT
ANDOX BM-275	T99	T99000-00-0	187	460	POUNDS	COT
TAC-E	T99	T99000-00-0	460	440	POUNDS	COT
FISKE #25	T99	T99000-00-0	4,207	363	POUNDS	COT
ISOPROPLY 171	T99	T99000-00-0	248	109	GALLONS	COT
LIQUALIN DEGREASER	T99	T99000-00-0	1,118	605	POUNDS	CLN
NAVY #42	T99	T99000-00-0	325	82	GALLONS	CLN
BROCHLORE #5	T99	T99000-00-0	84	73	GALLONS	COT
RUST BAN	T99	T99000-00-0	91	0	GALLONS	COT
U-CON #LB-385	T99	T99000-00-0	1,569	216	GALLONS	COT
LUSOL	T99	T99000-00-0	4,493	979	GALLONS	COT
VANISHING OIL	T99	T99000-00-0	9,170	660	GALLONS	CLN
H.D. SOLUABLE	T99	T99000-00-0	92	20	GALLONS	COT
SOLUABLE #2736	T99	T99000-00-0	10,616	18	GALLONS	COT
SOLUABLE #98A	T99	T99000-00-0	1,823	432	GALLONS	COT
COPPERSKIN #410C	T99	T99000-00-0	2,129	1,224	POUNDS	COT

ICS NO.: 66444 ARCATA GRAPHICS

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
NAPTHALENE	D05	000091-20-3	16,335	440	GALLONS	UNK
TOLUENE	D02	000108-88-3	66,960	1,920	GALLONS	UNK
XYLENE	D03	001330-20-7	8,910	240	GALLONS	UNK
LACTOL SPIRITS	G25	G25000-00-0	200,475	5,400	GALLONS	UNK

ICS NO.: 66093 ASHLAND PETROLEUM CO.

4545 RIVER ROAD TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
BENZENE	D01	000071-43-2	918,666	918,666	GALLONS	PRO
TOLUENE	D02	000108-88-3	286,251	286,251	GALLONS	PRO
XYLENE	D03	001330-20-7	384,594	384,594	GALLONS	PRO
AL 1978	C99	C99000-00-0	1,549	1,485	GALLONS	PES
NA-5 ADDITIVE	C99	C99000-00-0	279	220	GALLONS	PES
5380 ADDITIVE	T99	T99000-00-0	8,770	1,629	GALLONS	BAS
169 ADDITIVE	T99	T99000-00-0	1,430	605	GALLONS	BAS
547-D ADDITIVE	T99	T99000-00-0	1,320	1,595	GALLONS	BAS

ICS NO.: 77167 ATLAS PLASTICS INC.

2745 SENECA ST. BUFFALO NY 14072

SUBSTANCES OF CONCERN USED.	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
STYRENE MONOMER WITH POLYEST FLAM	D07	000100-42-5	10,000	1,000	POUNDS	BAS

ICS NO.: 77297 BELL AEROSPACE TEXTRON

NIAGARA FALLS BLVD. WHEATFIELD NY 14226

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
UNSYMETRICAL DIMETHYL HYDRAZINE	G09	000057-14-7	11,640	1,340	POUNDS	NLU
UNSYMETRICAL DIMETHYL HYDRAZINE	G09	000057-14-7	0	2,150	POUNDS	NLU
NITROSODIMETHYLAMINE	G08	000062-75-9	1,210	0	GALLONS	NLU
1,1,1-TRICHLOROETHANE, O-T-620 TYL	A07	000071-55-6	0	0	UNKNOWN	NLU
METHYLENE CHLORIDE	A02	000075-09-2	136	431	GALLONS	CLN
TRICHLOROETHYLENE OT 634A MLT 7003	A12	000079-01-6	100,000	UNKNOWN	POUNDS	CLN
XYLENE, GRADE A TPX-9168	D03	001330-20-7	3	0	GALLONS	PRO
FREON/GENETRON	A05	A05000-00-0	5,300	2,500	GALLONS	CLN
R-11 SHIELD TITE ROOF PRESERVATIVE	T99	T99000-00-0	UNKNOWN	1,000	GALLONS	COT
FORMULA 151	T99	T99000-00-0	800	220	GALLONS	BAS
FORMULA 241	T99	T99000-00-0	200	110	GALLONS	BAS
FORMULA 44	T99	T99000-00-0	240	110	POUNDS	BAS
FORMULA 122	T99	T99000-00-0	240	110	POUNDS	BAS
JCC SLUDGE SOLVENT	T99	T99000-00-0	450	165	POUNDS	BAS

ICS NO.: 66285 HERBEL FOAM PRODUCTS CO. INC.

344 VULCAN ST. BUFFALO NY 14207

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
1,1,1-TRICHLOROETHANE	A07	000071-55-6	3,000	100	GALLONS	CLN
METHYLENE CHLORIDE	A02	000075-09-2	45,000	9,000	POUNDS	REA
FREON 11	A05	000075-69-4	25,000	3,000	POUNDS	REA
TRIS(DICHLOROPROPYL)PHOSPHATE (ASS. 2,3 ISOMER?)	B99	000078-43-3	600,000	40,000	POUNDS	REA
MEK SOLVENT FOR ADHESIVE	K02	000078-93-3	UNKNOWN	UNKNOWN	UNKNOWN	PRO
METHYLENE BIS(2-CHLOROANILINE)40% ACTIVE	B12	000101-14-4	0	0	UNKNOWN	NLU
METHYLENE BIS(2-CHLOROANILINE)10% ACTIVE	B12	000101-14-4	0	400	UNKNOWN	NLU
TOLUENE SOLVENT FOR ADHESIVE	D02	000108-88-3	UNKNOWN	UNKNOWN	UNKNOWN	PRO
TOLUENE DIISOCYANATE	F10	026471-62-5	3,500,000	100,000	POUNDS	PRO
TETRA KIS(2-CHLOROETHYL)ETHYLENE DIPHOSPHATE	B99	033125-86-9	20,000	4,800	POUNDS	REA
CHLORINATED SOLVENT FOR ADHESIVE	A99	A99000-00-0	UNKNOWN	UNKNOWN	UNKNOWN	PRO
ORGANIC PIGMENTS	F24	F24000-00-0	3,000	900	POUNDS	BAS
ADHESIVE CHLORINATED SOLVENT	G17	G17000-00-0	40,000	1,000	GALLONS	PRO
ADHESIVE TOLUENE SOLVENT	G17	G17000-00-0	27,500	550	GALLONS	PRO
ADHESIVE TOLUENE MEK NAPHTHA BLEND	G17	G17000-00-0	3,000	100	GALLONS	PRO
NAPHTHA SOLVENT FOR ADHESIVE	G25	G25000-00-0	UNKNOWN	UNKNOWN	UNKNOWN	PRO

ICS NO.: 77690 BIRDAIR STRUCTURES INC.

2015 WALDEN AVE. BUFFALO NY 14225

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TOLUENE	D02	000108-88-3	9,185	250	GALLONS	BAS
XYLENE	D03	001330-20-7	110	40	GALLONS	BAS
BOSTIK 1205 ADHESIVE	G17	G17000-00-0	1,275	450	UNKNOWN	UNK
DUPONT 5149 ADHESIVE	G17	G17000-00-0	250	300	UNKNOWN	UNK

ICS NO.: 77034 BISON PRODUCTS CO., INC.

81 DINGEN ST. BUFFALO NY 14206

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
FREON	A05	A05000-00-0	100	125	POUNDS	CLO

TCS NO.: 77756 HISUNITE COMPANY INC.

50 MILITARY RD. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TOLUENE	D02	000108-88-3	16,000	500	GALLONS	BAS
XYLENE	D03	001330-20-7	16,000	500	GALLONS	BAS

TCS NO.: 77345 BUFFALO WEAVING & BELTING CO.

260 CHANDLER ST. BUFFALO NY 14207

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TRICHLOROETHYLENE	A12	000079-01-6	1,200	640	POUNDS	BAS
TOLUENE	D02	000108-88-3	4,620	400	POUNDS	BAS
ASBESTOS	G01	001332-21-4	27,936	6,858	POUNDS	COT
PINE TAR	E04	0X8011-48-1	780	180	POUNDS	COT

TCS NO.: 86097 CANADA DRY BOTTLING CO. OF BUFFALO, N.Y.INC.

144 URBAN ST. BUFFALO NY 14211

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
LEAD CAUSTIC SODA NAOH	H04	001310-73-2	7,500	2,500	POUNDS	CLN

TCS NO.: 88008 CATHEDRAL ENVELOPE CO. INC.

980 NORTHAMPTON ST. BUFFALO NY 14211

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
7180	T99	T99000-00-0	165	110	GALLONS	CLN

TCS NO.: 46287 CHEM-TROL POLLUTION SERVICES INC.

1520 BALMER RD. MODEL CITY NY 14017

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG. ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
DDT	C03	000050-29-3	104,200	UNKNOWN	POUNDS	CLO
PIPERONYL BUTOXIDE	C99	000051-03-6	1	UNKNOWN	POUNDS	CLO
NICOTINE	C99	000054-11-5	100	UNKNOWN	POUNDS	CLO
BAYTEX	C99	000055-38-9	50	UNKNOWN	POUNDS	CLO
CARBON TETRACHLORIDE	A04	000056-23-5	308,081	241,401	POUNDS	BAS
PARATHION	C09	000056-38-2	158	UNKNOWN	POUNDS	CLO
STRYCHNINE	C99	000057-24-9	100	UNKNOWN	POUNDS	CLO
CHLORDANE	C02	000057-74-9	5,462	UNKNOWN	POUNDS	CLO
LINDANE	C26	000058-89-9	13,300	UNKNOWN	POUNDS	CLO
DIELDRIN	C01	000060-57-1	5,400	UNKNOWN	POUNDS	CLO
AMITROLE	C99	000061-82-5	100	UNKNOWN	POUNDS	CLO
PMA	C99	000062-38-4	1,100	UNKNOWN	POUNDS	CLO
ANILINE	F06	000062-53-3	1,519	UNKNOWN	POUNDS	BAS
2,2-DICHLOROVINYL DIMETHYL PHOSPHATE	C99	000062-73-7	1,554	UNKNOWN	POUNDS	CLO
SEVIN	C11	000063-25-2	13,996	UNKNOWN	POUNDS	CLO
CARBARYL	C15	000063-25-2	108	UNKNOWN	POUNDS	CLO
CYCLOHEXIMIDE	C99	000066-81-9	16	UNKNOWN	POUNDS	CLO
CHLOROFORM	A03	000067-66-3	72,462	12,991	POUNDS	BAS
HEXACHLOROETHANE	A08	000067-72-1	83,540	UNKNOWN	POUNDS	BAS
BENZENE	D01	000071-43-2	25,123	20,912	POUNDS	BAS
1,1,1-TRICHLOROETHANE	A07	000071-55-6	674,771	35,557	POUNDS	PRO
ENDRIN	C05	000072-20-8	1,000	UNKNOWN	POUNDS	CLO
METHOXYCHLOR	C08	000072-43-5	700	UNKNOWN	POUNDS	CLO
METHYLENE BROMIDE	A06	000074-95-3	100,500	UNKNOWN	POUNDS	PRO
BROMOCHLOROMETHANE	A06	000074-97-5	666,000	326,925	POUNDS	PRO
METHYLENE CHLORIDE	A02	000075-09-2	2,992,831	505,573	POUNDS	PRO
CHLOROPICRIN	B18	000076-06-2	66	UNKNOWN	POUNDS	CLO
FREON TF	A05	000076-13-1	84,183	46,200	POUNDS	PRO
HEPTACHLOR	C06	000076-44-8	300	UNKNOWN	POUNDS	CLO
HEXACHLOROCYCLOPENTADIENE	A11	000077-47-4	473,355	700	POUNDS	CLO
1,1,2-TRICHLOROETHANE	A08	000079-00-5	92,270	121,057	POUNDS	BAS
TRICHLOROETHYLENE	A12	000079-01-6	838,904	257,252	POUNDS	PRO
ROTENONE	C25	000083-79-4	301	UNKNOWN	POUNDS	CLO
PHTHALIC ANHYDRIDE	F10	000085-44-9	191	UNKNOWN	POUNDS	CLO
FRUIT TONE	C99	000086-87-3	550	UNKNOWN	POUNDS	CLO
HEXACHLOROBUTADIENE	A16	000087-68-3	82,169	UNKNOWN	POUNDS	BAS
PENTACHLOROPHENOL	B07	000087-86-5	157,170	UNKNOWN	POUNDS	CLO
3-NITRO-4-AMINOTOLUENE	F99	000089-62-3	2,000	UNKNOWN	POUNDS	CLO
BIPHENYL	D04	000092-52-4	32,760	UNKNOWN	POUNDS	BAS
METHYL BENZOATE	F99	000093-58-3	28,980	UNKNOWN	POUNDS	CLO
SILVEX	C16	000093-72-1	100	UNKNOWN	POUNDS	CLO
MCPA	C99	000094-74-6	1,500	UNKNOWN	POUNDS	CLO
2,4-D	C99	000094-75-7	2,300	UNKNOWN	POUNDS	CLO
KANSEL (3% 2,4-D & 0.5% DICAMBA)	C99	000094-75-7	600	UNKNOWN	POUNDS	CLO
ORTHOCHLOROTOLUENE	A19	000095-49-8	UNKNOWN	21,206	POUNDS	BAS
DIBROMOCHLOROPROPANE (ASS. 1,2,3 ISOMER)	A50	000096-12-8	675	UNKNOWN	POUNDS	CLO
BENZOTRICHLORIDE	A19	000098-07-7	600	UNKNOWN	POUNDS	CLO
BENZOTRIFLUORIDE	A20	000098-08-8	17,800	UNKNOWN	POUNDS	CLO
ARSANILIC ACID	H05	000098-50-0	29,985	UNKNOWN	POUNDS	CLO
P-CHLOROBENZOTRIFLUORIDE	A99	000098-56-6	1,813,050	UNKNOWN	POUNDS	CLO
BENZOYL CHLORIDE	B05	000098-88-4	37,120	UNKNOWN	POUNDS	CLO
NITROBENZENE	F04	000098-95-3	2,773	UNKNOWN	POUNDS	BAS
METHYL P-TOLUATE	F99	000099-75-2	86,819	UNKNOWN	POUNDS	CLO
TEREPHTHALIC ACID	F13	000100-21-0	337,065	UNKNOWN	POUNDS	CLO

BENZYL BROMIDE	A99	000100-39-0	1,938	UNKNOWN POUNDS	CLO
BENZYL CHLORIDE	A99	000100-44-7	UNKNOWN	2,187 POUNDS	BAS
BENZALDEHYDE	K06	000100-52-7	45	UNKNOWN POUNDS	BAS
UNICEL N.D.	C99	000101-25-7	500	UNKNOWN POUNDS	CLO
MONOETHYLANILINE (ABB. N-ISOMER?)	F99	000103-69-5	12,642	UNKNOWN POUNDS	BAS
LAURYL PYRIDINIUM CHLORIDE	B99	000104-74-5	1,307	UNKNOWN POUNDS	CLO
EPICHLOROHYDRIN	B23	000106-89-8	2,120	UNKNOWN POUNDS	PRO
ETHYLENE DICHLORIDE	A08	000107-06-2	122,567	152,017 POUNDS	PRO
MALEIC ANHYDRIDE	G10	000108-31-6	191	UNKNOWN POUNDS	BAS
TOLUENE	D02	000108-88-3	1,049,941	1,278,309 POUNDS	BAS
MONOCHLOROBENZENE	A10	000108-90-7	230,035	12,821 POUNDS	PRO
PHENOLS	F01	000108-95-2	128,358	UNKNOWN POUNDS	BAS
PYRIDINES	F25	000110-86-1	1,535	UNKNOWN POUNDS	BAS
LAURYL CHLORIDE	A99	000112-52-7	1,307	UNKNOWN POUNDS	BAS
BAYGON	C29	000114-26-1	100	UNKNOWN POUNDS	CLO
METACID	B09	000115-28-6	54,915	UNKNOWN POUNDS	CLO
THIODAN	C08	000115-29-7	24,968	UNKNOWN POUNDS	CLO
THEBAINE	C99	000115-37-7	100	UNKNOWN POUNDS	CLO
DICHLONE	C24	000117-80-6	2,269	UNKNOWN POUNDS	CLO
DI OCTYL PHTHALATE	F15	000117-84-0	6,225	UNKNOWN POUNDS	CLO
HEXACHLOROBENZENE	A10	000118-74-1	UNKNOWN	233 POUNDS	BAS
TRIBROMOPHENOL (ABB. 2,4,6 ISOMER?)	B99	000118-79-6	51,610	UNKNOWN POUNDS	CLO
DIMETHYL TEREPHTHALATE	F15	000120-61-6	UNKNOWN	UNKNOWN POUNDS	CLO
PYRETHRINS	C99	000121-29-9	1	UNKNOWN POUNDS	CLO
DIMETHYL ANILINE (ABB. N,N ISOMER?)	F99	000121-69-7	11,203	UNKNOWN POUNDS	PRO
MALATHION	C07	000121-75-5	1,697	UNKNOWN POUNDS	CLO
HYDROQUINONES	F02	000123-31-9	1	UNKNOWN POUNDS	BAS
PERCHLOROETHYLENE	A13	000127-18-4	393,029	75,482 POUNDS	PRO
SODIUM ARSANILATE	H05	000127-85-5	679	UNKNOWN POUNDS	CLO
DIMETHYLPHTHALATE	F15	000131-11-3	229,000	UNKNOWN POUNDS	CLO
FOLPET	C23	000133-07-3	1,692	UNKNOWN POUNDS	CLO
ALPHA-NAPHTHYLAMINE	F21	000134-32-7	270	UNKNOWN POUNDS	CLO
THIRAM	C99	000137-26-8	21,659	UNKNOWN POUNDS	CLO
ANILINE HCL	B24	000142-04-1	2,431	UNKNOWN POUNDS	CLO
SODIUM CYANIDE	H01	000143-33-9	16,317	UNKNOWN POUNDS	CLO
TELVAR	C99	000150-68-5	100	UNKNOWN POUNDS	CLO
DIAZINON	C13	000333-41-5	840	UNKNOWN POUNDS	CLO
VALIUM	B99	000439-14-5	893	20,039 POUNDS	BAS
AZOXYBENZENE	C99	000495-48-7	17,472	UNKNOWN POUNDS	CLO
BIS(CHLOROMETHYL)ETHER	B03	000542-88-1	1	UNKNOWN POUNDS	BAS
ETHION	C99	000563-12-2	11,830	UNKNOWN POUNDS	CLO
HEXACHLOROCYCLOHEXANE	A24	000608-73-1	55,460	UNKNOWN POUNDS	CLO
ISOPHTHALONITRILE	F99	000626-17-5	5,971	UNKNOWN PIUNDS	CLO
TRIMETHYLHYDROQUINONE	F99	000700-13-0	17,600	29,277 POUNDS	BAS
OCTACHLOROCYCLOPENTENE	A99	000706-78-5	9,770	UNKNOWN POUNDS	BAS
BETASAN	C99	000741-58-2	50	UNKNOWN POUNDS	CLO
TRITHION	C99	000786-19-6	100	UNKNOWN POUNDS	CLO
N-METHYL PYRROLIDONE	F99	000872-50-4	10,626	UNKNOWN POUNDS	BAS
XYLIDINES	F99	001300-73-8	6,579	UNKNOWN POUNDS	BAS
XYLENE	D03	001330-20-7	653,929	418,609 POUNDS	PRO
ASBESTOS	G01	001332-21-4	865,000	UNKNOWN POUNDS	CLO
DICHLORODIPHENYL SULFONE MONOMER & ISOMERS	B99	001333-14-0	2,360	UNKNOWN POUNDS	CLO
CARBOFURANS	C21	001563-66-2	2,487	UNKNOWN POUNDS	CLO
METHYL HYDROGEN TEREPHTHALATE	F15	001679-64-7	227,577	UNKNOWN POUNDS	CLO
DACONIL	C99	001897-45-6	4,479	UNKNOWN POUNDS	CLO
MECOPEX	C99	001929-86-8	100	UNKNOWN POUNDS	CLO
OMITE	C99	002312-35-8	1,418	UNKNOWN POUNDS	CLO
DECHLORANE PERCHLOROPENTACYCLODECANE	A23	002385-85-5	683,075	UNKNOWN POUNDS	CLO
BARIUM PHENATE	F99	002678-41-3	3,312	UNKNOWN POUNDS	CLO
TANDEX	C20	004849-32-5	1,353	UNKNOWN POUNDS	CLO
AQUATHOL	C99	006385-68-0	250	UNKNOWN POUNDS	CLO
ZINC DUST	M13	007440-66-6	2,100	UNKNOWN POUNDS	CLO
ARSENATE OF LEAD	H02	007645-25-2	4,665	UNKNOWN POUNDS	CLO
AMMONIUM SULFAMATE	H01	007773-06-0	600	UNKNOWN POUNDS	CLO
ATRATOL	H01	007775-09-9	3,200	UNKNOWN POUNDS	CLO
SODIUM ARSENITE	H02	007784-46-5	510	UNKNOWN POUNDS	CLO
TOXAPHENE	C10	008001-35-2	520	UNKNOWN POUNDS	CLO
NIGROSINE DYE	F24	008005-03-6	40,546	UNKNOWN POUNDS	CLO
POLYVINYL CHLORIDE SOLIDS	P01	009002-86-2	20,000	UNKNOWN POUNDS	CLO
VINYLCHLOROACETATE STILLBOTTOMS(POLYVINYL(CL-CH3CO2) @	F99	009003-22-9	32,000	UNKNOWN POUNDS	CLO
POLYRAM	C17	009006-42-2	20,240	UNKNOWN POUNDS	CLO
SODIUM TEREPHTHALATE	F15	010027-33-5	UNKNOWN	90,515 POUNDS	CLO
TRICHLOROBENZENE	A10	012002-48-1	43,000	UNKNOWN POUNDS	BAS
ZINEB DUST	C17	012122-67-7	3,400	UNKNOWN POUNDS	CLO
1-CHLORO-3,3-DIMETHYL-2-BUTANONE	B99	013547-70-1	900	UNKNOWN POUNDS	CLO
FENAZAFLOR	C99	014255-88-0	410	UNKNOWN POUNDS	CLO
POLYETHYLENE TEREPHTHALATE DIMER	P99	025038-59-9	12,120	UNKNOWN POUNDS	CLO
TETRACHLOROETHANE	A08	025322-20-7	407,162	34,598 POUNDS	BAS
TOLUENE DI-ISOCYANATE REACTED	F10	026471-62-5	5,474	UNKNOWN POUNDS	REA
TOLUIDINE	F07	026915-12-8	45	UNKNOWN POUNDS	PRO
OCTYL PHENOL	F99	027193-28-8	360	UNKNOWN POUNDS	CLO
VACOR RODENTICIDE	C99	053558-25-1	65	UNKNOWN POUNDS	CLO
CHLORINATED PROPANES	A10	A14000-00-0	1,853,900	UNKNOWN POUNDS	BAS
DICHLOROBENZENE	A10	A10000-00-0	1,046,197	69,197 POUNDS	PRO
TETRACHLOROBENZENE	A10	A10000-00-0	17,085	UNKNOWN POUNDS	CLO
MONO & DICHLOROTOLUENE	A19	A19000-00-0	40,497	UNKNOWN POUNDS	BAS
TRICHLOROTOLUENE	A19	A19000-00-0	13	UNKNOWN POUNDS	BAS
DICHLOROBENZOTRICHLORIDE	A19	A19000-00-0	209,457	UNKNOWN POUNDS	CLO
POLYCHLORINATED BIPHENYL	A21	A21000-00-0	2,946,838	47 POUNDS	CLO
POLYBROMOBIPHENYL	A25	A25000-00-0	5,010	UNKNOWN POUNDS	CLO
BROMINATE XYLENE	A99	A99000-00-0	20,748	UNKNOWN POUNDS	BAS
BROMINATED RESIDUES	A99	A99000-00-0	2,113	UNKNOWN POUNDS	CLO
BROMOCYCLODECANE	A99	A99000-00-0	246,425	UNKNOWN POUNDS	CLO
CHLORINATED XYLENES	A99	A99000-00-0	111,446	UNKNOWN POUNDS	BAS
POLYCHLOROPENTANE	A99	A99000-00-0	34,920	UNKNOWN POUNDS	BAS
RESIDUES, CHLORINATED	A99	A99000-00-0	1,062,516	UNKNOWN POUNDS	CLO
BENZOTRIFLUORIDE RESIDUES	A99	A99000-00-0	48,930	UNKNOWN POUNDS	CLO

.OROBENZOTRIFLUORIDE	A99	A99000-00-0	42,600	UNKNOWN	POUNDS	CLO
~~IOPHENOL~~	B07	B07000-00-0	100	UNKNOWN	POUNDS	CLO
A...OBENZOYL TRIFLUORIDE	B99	B99000-00-0	171,345	UNKNOWN	POUNDS	CLO
~~BROMINATED DIOLS~~	B99	B99000-00-0	45	UNKNOWN	POUNDS	CLO
CHLORINATED RESIDUE	B99	B99000-00-0	329,244	UNKNOWN	POUNDS	CLO
~~BUTADIENE CHLORINATED SULFONE~~	B99	B99000-00-0	75,600	UNKNOWN	POUNDS	CLO
O & P-CHLOROBENZALDEHYDE	B99	B99000-00-0	4,529	36,063	POUNDS	BAS
~~DINITROBENZYLTRIFLUORIDE~~	B99	B99000-00-0	1,800	UNKNOWN	POUNDS	CLO
AGRIDUST	C99	C99000-00-0	250	UNKNOWN	POUNDS	CLO
~~AMBAM OXIDATION PRODUCTS~~	C99	C99000-00-0	29,286	UNKNOWN	POUNDS	CLO
ASTER X	C99	C99000-00-0	100	UNKNOWN	POUNDS	CLO
~~BEDRIN~~	C99	C99000-00-0	600	UNKNOWN	POUNDS	CLO
CRAB GRASS KILLER	C99	C99000-00-0	1,500	UNKNOWN	POUNDS	CLO
~~DACAMO X (COMPOUND GIVEN)~~	C99	C99000-00-0	1,625	UNKNOWN	POUNDS	CLO
DIMETHYL PHOSPHATE 3-HYDROXY-N-METHYL-CIS-CROTONAMIDE	C99	C99000-00-0	25	UNKNOWN	POUNDS	CLO
~~SUBSTITUTED CYCLOPROPANE(COMPD. GIVEN~~	C99	C99000-00-0	129	UNKNOWN	POUNDS	CLO
EXTHERM	C99	C99000-00-0	1,000	UNKNOWN	POUNDS	CLO
~~FLY DEAD~~	C99	C99000-00-0	3,950	UNKNOWN	POUNDS	CLO
GLOYODEX	C99	C99000-00-0	1,500	UNKNOWN	POUNDS	CLO
~~HAZE~~	C99	C99000-00-0	600	UNKNOWN	POUNDS	CLO
ISOOCTYL	C99	C99000-00-0	250	UNKNOWN	POUNDS	CLO
~~KROMANED~~	C99	C99000-00-0	400	UNKNOWN	POUNDS	CLO
MECORAR	C99	C99000-00-0	100	UNKNOWN	POUNDS	CLO
~~METAL SALTS - PESTICIDES~~	C99	C99000-00-0	7,400	UNKNOWN	POUNDS	CLO
4-METHYL-2-IMINO-1,3-DITHIOLANE HCL	C99	C99000-00-0	643	UNKNOWN	POUNDS	CLO
~~METHYL PENTADIENE (ISOMER?)~~	C99	C99000-00-0	100	UNKNOWN	POUNDS	CLO
METHYL PENTANAMIDE (ISOMER?)	C99	C99000-00-0	250	UNKNOWN	POUNDS	CLO
~~MICOPAX~~	C99	C99000-00-0	100	UNKNOWN	POUNDS	CLO
PHYSTOPP	C99	C99000-00-0	100	UNKNOWN	POUNDS	CLO
~~SILVACON~~	C99	C99000-00-0	8,150	UNKNOWN	POUNDS	CLO
SPORKILL	C99	C99000-00-0	1,200	UNKNOWN	POUNDS	CLO
~~TAB DUST~~	C99	C99000-00-0	200	UNKNOWN	POUNDS	CLO
TENDRION	C99	C99000-00-0	1,500	UNKNOWN	POUNDS	CLO
~~THIABAN~~	C99	C99000-00-0	900	UNKNOWN	POUNDS	CLO
THIOPHOSPHATE ESTERS	C99	C99000-00-0	140,400	UNKNOWN	POUNDS	CLO
~~THIAZOLE (ISOMER?)~~	C99	C99000-00-0	350	UNKNOWN	POUNDS	CLO
TURF EDGE	C99	C99000-00-0	100	UNKNOWN	POUNDS	CLO
BIOCIDE 2H9	C99	C99000-00-0	500	UNKNOWN	POUNDS	CLO
~~ORGANIC TARS~~	E99	E99000-00-0	1,020	UNKNOWN	POUNDS	CLO
RESIDUES, NON-CHLORINATED	E99	E99000-00-0	1,040,183	UNKNOWN	POUNDS	CLO
PAINT SLUDGE	E99	E99000-00-0	1,649,566	UNKNOWN	POUNDS	CLO
OIL SLUDGE	E99	E99000-00-0	35,172	UNKNOWN	POUNDS	CLO
ISOPHTHALOYL TAR	E99	E99000-00-0	226,175	UNKNOWN	POUNDS	CLO
TEREPHTHALOYL TAR	E99	E99000-00-0	226,175	UNKNOWN	POUNDS	CLO
~~DIHYDROXYETHYLENE TEREPHTHALATE~~	F15	F15000-00-0	18,192	UNKNOWN	POUNDS	CLO
PHENYL TEREPHTHALATE ESTERS	F15	F15000-00-0	500	UNKNOWN	POUNDS	CLO
ORGANIC PIGMENT	F24	F24000-00-0	784,566	UNKNOWN	POUNDS	CLO
PRINTERS INK	F24	F24000-00-0	7,888	UNKNOWN	POUNDS	BAS
DYE WASTE	F24	F24000-00-0	3,191	UNKNOWN	POUNDS	CLO
DINITROBUTYLPHENOL (ISOMER?)	F99	F99000-00-0	2,727	UNKNOWN	POUNDS	CLO
~~METHYL FORMYL BENZOATE~~	F99	F99000-00-0	560,456	UNKNOWN	POUNDS	CLO
EPOXY	G12	G12000-00-0	3,255	UNKNOWN	POUNDS	CLO
ISOCHROMATE (?)	H02	H02000-00-0	100	UNKNOWN	POUNDS	CLO
THALLIUM GRAIN	H02	H02000-00-0	100	UNKNOWN	POUNDS	CLO
TURF FUNGICIDE CD, CA, CU, ZN CHROMATE COMPLEX	H02	H02000-00-0	2,700	UNKNOWN	POUNDS	CLO
ZINC AMMONIUM CARBAMATE	H02	H02000-00-0	90,128	UNKNOWN	POUNDS	CLO
~~MERCURY COMPOUNDS~~	H05	H05000-00-0	528	UNKNOWN	POUNDS	CLO
CADMIUM ZINC BENZOATE	H05	H05000-00-0	3,312	UNKNOWN	POUNDS	CLO
POLYMER STILL BOTTOM SLUDGE	P99	P99000-00-0	330,413	UNKNOWN	POUNDS	CLO
CRESOL FORMALDEHYDE RESIN	P99	P99000-00-0	462	UNKNOWN	POUNDS	CLO
~~PHENOLIC RESIN~~	P99	P99000-00-0	4,306	UNKNOWN	POUNDS	CLO
TINUVINE (INERT DYE CARRIER)	T99	T99000-00-0	9,000	UNKNOWN	POUNDS	CLO
~~CHROMATE CONVERSION~~	T99	T99000-00-0	3,780	UNKNOWN	POUNDS	BAS
CONDERITE	T99	T99000-00-0	7,560	UNKNOWN	POUNDS	CLO
~~TURCO CLEANER~~	T99	T99000-00-0	5,508	UNKNOWN	POUNDS	BAS
ETHONE ENDSTRIP TL 105	T99	T99000-00-0	8,372	UNKNOWN	POUNDS	BAS
~~OAKITE C-25 CHROMAKOTE~~	T99	T99000-00-0	2,100	UNKNOWN	POUNDS	BAS
OAKITE STRIPPER	T99	T99000-00-0	850	UNKNOWN	POUNDS	BAS
~~OAKITE SUPER RUST STRIPPER~~	T99	T99000-00-0	178	UNKNOWN	POUNDS	BAS
TRIDITE 14-2	T99	T99000-00-0	UNKNOWN	UNKNOWN	UNKNOWN	BAS

ICS NO.: 66491 CHEVROLET TONAWANDA FORGE (RIVER RD PLT)(DIV G.M.C.)
****
PO BOX 21 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
PUTIL (10% DIMETHYL BENZYL AMMONIUM CHLORIDE)	C99	001875-92-9	600	50	GALLONS	CLN
~~TCC CLENAER (FREON)~~	A05	A05000-00-0	240	67	POUNDS	CLN
ASKAREL (PCB)	A21	A21000-00-0	0	40,808	GALLONS	CLO
HYPOID GEAR LUB	B99	B99000-00-0	15,000	275	GALLONS	COT
SLUG-A-BUG (#400)	C99	C99000-00-0	120	0	POUNDS	PES
MOBILMET 308	G15	G15000-00-0	8,250	3,300	GALLONS	COT

ICS NO.: 66490 CHEVROLET TONAWANDA METAL CASTING (IRENE ST PLT)(DIV G.M.C.)
****
PO BOX 21 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
ASBESTOS (BRAKE & CLUTCH FACING)	G01	001332-21-4	2,500	25,000	POUNDS	REA
FREON	A05	A05000-00-0	810	22	POUNDS	CLO
~~ARDCLORS~~	A21	A21000-00-0	0	16,937	GALLONS	CLO
HAMCO	E03	E02000-00-0	250	25	POUNDS	REA
NOCOL	E03	E02000-00-0	9,500,000	810,000	POUNDS	REA
BUFFALO SOLVENT VIOLET DYE	F24	F24000-00-0	1,000	500	POUNDS	COT

BUFFALO SOLVENT GREEN DYE	F24	F24000-00-0	1,250	750	POUNDS	COT
ESCO THINNER	G26	G26000-00-0	200	20	GALLONS	BAS
SPOTCHECK DEVELOPER	T99	T99000-00-0	5	28	GALLONS	COT
RIP	T99	T99000-00-0	100	275	GALLONS	CLN
HYSOL TH65	T99	T99000-00-0	0	0	UNKNOWN	NLU

ICS NO.: 66199 CHEVROLET TONAWANDA MOTOR PLANT-GMC DIV.
****
P.O. BOX 21 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
CHLOROTHENE G	A07	000071-55-6	28,512	1,080	GALLONS	NLU
SPOTCHECK DEVELOPER (CHLOROTHENE)	A07	000071-55-6	9,000	570	POUNDS	NLU
TRICHLOROETHANE	A07	000071-55-6	200	55	GALLONS	CLN
WONDER STRIPPER (METHYLENE CHLORIDE)	A02	000075-09-2	576	68	GALLONS	NLU
FREON 22	A05	000075-45-6	360	270	POUNDS	NLU
FREON 12	A05	000075-71-8	240	105	POUNDS	NLU
TRICHLOROETHYLENE	A12	000079-01-6	UNKNOWN	UNKNOWN	UNKNOWN	NLU
MOBIL TRAC E(15% TRICHLOROETHYLENE)	A12	000079-01-6	UNKNOWN	UNKNOWN	UNKNOWN	NLU
CIMKOOL "00" (TRIS(HYDROXYMETHYL)NITROMETHANE)	C99	000126-11-4	1,460	400	POUNDS	NLU
BANK-ROLA (PERCHLOROETHYLENE)	A13	000127-18-4	15	5	GALLONS	NLU
XYLENE	D03	001330-20-7	600	50	GALLONS	NLU
BRAKE AND CLUTCH FACING	G01	001332-21-4	1,200	12,000	POUNDS	COT
ASBESTOS GASKETS	G01	001332-21-4	100,000	1,500	POUNDS	NLU
ICC CLEANER (FREON)	A05	A05000-00-0	280	200	POUNDS	NLU
FREON	A05	A05000-00-0	175	270	POUNDS	CLU
ASKAREL (PCB)	A21	A21000-00-0	0	6,462	GALLONS	CLO
MACCO 5100 (CHLORINATED PETROLEUM)	A99	A99000-00-0	3,000	1,049	GALLONS	COT
MACCO 469F (CHLORINATED PETROLEUM)	A99	A99000-00-0	1,600	825	GALLONS	COT
MACCO 710WS (CHLORINATED PETROLEUM)	A99	A99000-00-0	100	55	GALLONS	COT
MOBILMET 308 (CHLORINATED WAX)	B99	B99000-00-0	8,250	1,100	GALLONS	NLU
HYPOID GEAR LUBRICANT(CHLORINATED WAX)	B99	B99000-00-0	15,000	5,000	GALLONS	NLU
MONTGOMERY PA8001 (CHLORINATED WAX)	B99	B99000-00-0	15,000	220	POUNDS	COT
WAYLUBE D	B99	B99000-00-0	400	230	GALLONS	COT
SANIKLEEN (10% DIMETHYLBENZYL AMMONIUM CHLORIDE)	C32	C32000-00-0	300	46	GALLONS	NLU
TOTE (10% DIMETHYLBENZYL AMMONIUM CHLORIDE)	C32	C32000-00-0	600	110	GALLONS	NLU
#000 SLUG-A-BUG	C99	C99000-00-0	120	0	POUNDS	NLU
RAECO	D02	D02000-00-0	20	0	GALLONS	NLU
NASCO	D02	D02000-00-0	100	37	GALLONS	BAS
DUPONT T3871	D03	D03000-00-0	2	0	GALLONS	NLU
BRUNING DRU-TECH II	D03	D03000-00-0	24	0	GALLONS	NLU
PARKS	D03	D03000-00-0	90	55	GALLONS	BAS
KLEAN-STRIP	D99	D99000-00-0	15	7	GALLONS	BAS
OPEN GEAR LUBRICANT (1% TRICHLOROETHYLENE)	G16	G16000-00-0	2,000	249	POUNDS	COT
LOCTITE 277 (1% ANILINE)	P99	P99000-00-0	750	50	GALLONS	NLU

ICS NO.: 77397 CHIP STEAK CO.
****
1191 JEFFERSON BUFFALO NY 14206

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
FREON 12	A05	000075-71-8	UNKNOWN	20	POUNDS	CLU

ICS NO.: 66125 COCA-COLA BOTTLING CO. OF BUFFALO, INC.
****
200 MILENS RD. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
PYRETHRINS 1673 CASES 16 OZ. CANS? ASS. 24 CANS/CASE	C99	000121-29-9	96	4	POUNDS	PES

ICS NO.: 77377 CULAD INC.
****
701 SENECA ST. BUFFALO NY 14210

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
ISOPROPANOL ANHYDROUS	J01	000067-63-0	600	100	GALLONS	BAS
TOLUENE	D02	000108-88-3	1,980	220	GALLONS	CLN
NAPTHOL SPIRITS	F99	001321-67-1	1,300	220	GALLONS	CLN
WATER BASE ADHESIVE K-10185	G17	G17000-00-0	600	200	GALLONS	COT
WATER BASE ADHESIVE K-10245	G17	G17000-00-0	600	200	GALLONS	COT
SOLVENT ADHESIVE P&S 9745	T99	T99000-00-0	22,000	1,650	GALLONS	BAS

ICS NO.: 66447 COLUMBUS MCKINNON CORP
****
1 FREMONT ST TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
ACETYLENE	G99	000074-86-2	26,580	5,760	CU. FT.	REA
PROPANE	G99	000074-98-6	76,864	2,480	GALLONS	REA
PERCHLOROETHYLENE	A13	000127-18-4	990	110	GALLONS	CLN
BORAX	H01	001303-96-4	7,600	5,900	POUNDS	UNK
CAUSTIC SODA	H04	001310-73-2	1,600	4,000	POUNDS	REA
HYDROGEN	H03	001333-74-0	156,000	6,240	CU. FT.	COT
ALUMINUM OXIDE	H02	001344-28-1	50,000	4,409	POUNDS	CLN
ARGON	G99	007440-37-1	40,590	1,650	CU. FT.	REA
SULFURIC ACID	H04	007664-93-9	13,083	3,050	GALLONS	CLN
POTASSIUM PERMANGANATE	H02	007722-64-7	1,870	500	POUNDS	CLN
OXYGEN	G99	007782-44-7	119,072	8,296	CU. FT.	REA
MINERAL SPIRITS	G25	008032-32-4	2,500	348	GALLONS	CLN

MACHINE PAINT	F24	F24000-00-0	113	17	GALLONS	COT
QUENCH OIL #510	G16	G16000-00-0	330	55	GALLONS	CLO
~~QUENCH OIL #522~~	~~G16~~	~~G16000-00-0~~	~~25~~	~~275~~	~~GALLONS~~	~~COT~~
BASE ANTISEPT OIL	G16	G16000-00-0	103	32	GALLONS	COT
VACTRA #B	G16	G16000-00-0	25	80	GALLONS	COT
DTE #24 OIL	G16	G16000-00-0	234	213	GALLONS	COT
DTE #25 OIL	G16	G16000-00-0	27	15	GALLONS	COT
10-30 MOTOR OIL	G16	G16000-00-0	116	44	GALLONS	COT
~~DTE #26 OIL~~	~~G16~~	~~G16000-00-0~~	~~1,180~~	~~374~~	~~GALLONS~~	~~COT~~
VACTRA HEAVY MEDIUM OIL	G16	G16000-00-0	862	200	GALLONS	COT
MOBILGEAR #629	G16	G16000-00-0	12,634	542	POUNDS	COT
MOBIL OIL #350	G16	G16000-00-0	43	50	GALLONS	CLN
RUSTPROOFING OIL #564	G16	G16000-00-0	216	95	GALLONS	COT
MOBILMET #406	G16	G16000-00-0	308	89	GALLONS	COT
~~TE LIGHT OIL~~	~~G16~~	~~G16000-00-0~~	~~69~~	~~29~~	~~GALLONS~~	~~COT~~
#6 BUNKER-C-OIL	G16	G16000-00-0	106,000	14,000	GALLONS	REA
THINSOL ST-55 LACQUER THINNER	G26	G26000-00-0	637	367	GALLONS	BAS
GRANALUBE #21	T99	T99000-00-0	2,400	1,800	POUNDS	COT
FIXADINE #15	T99	T99000-00-0	3,750	10,800	POUNDS	CLN
GRANADRAW #2	T99	T99000-00-0	1,870	330	GALLONS	COT
~~FOAMRITE SK-400~~	~~T99~~	~~T99000-00-0~~	~~165~~	~~220~~	~~GALLONS~~	~~REA~~
INHIBITRITE	T99	T99000-00-0	55	550	GALLONS	REA
DRY DRAW #15	T99	T99000-00-0	2,700	55	POUNDS	UNK
KLEANRITE	T99	T99000-00-0	700	2,870	POUNDS	REA
BURNISHING COMPOUND #321	T99	T99000-00-0	11,050	1,950	POUNDS	COT
ALKALINE CLEANER INDUSTRIAL #6	T99	T99000-00-0	52,000	4,400	POUNDS	CLN
~~GRANADINE #20~~	~~T99~~	~~T99000-00-0~~	~~55~~	~~55~~	~~GALLONS~~	~~COT~~
ANTI-RUST	T99	T99000-00-0	165	55	GALLONS	CLO
BLACK ASPHALTUM	T99	T99000-00-0	200	330	GALLONS	CLO
AEROSOL SPRAY PAINT	T99	T99000-00-0	740	346	POUNDS	COT
LACQUER	T99	T99000-00-0	925	265	GALLONS	COT
~~MOBIL COOLANT C-250~~	~~T99~~	~~T99000-00-0~~	~~459~~	~~92~~	~~GALLONS~~	~~COT~~
MOBILMET #27	T99	T99000-00-0	10	15	GALLONS	COT
MOBIL VACTRA #4	T99	T99000-00-0	13	5	GALLONS	COT
GRAPHITE OIL	T99	T99000-00-0	15	55	GALLONS	COT
MOBILPLEX EP-1	T99	T99000-00-0	134	70	POUNDS	CLN
TRIM-SOL	T99	T99000-00-0	628	70	GALLONS	CLO
~~5-2 CIMCOOL~~	~~T99~~	~~T99000-00-0~~	~~396~~	~~104~~	~~GALLONS~~	~~CLO~~
BUTTERCUT CUTTING COMPOUND	T99	T99000-00-0	18	20	GALLONS	CLO
HOCUT COOLANT	T99	T99000-00-0	14	102	GALLONS	CLO
#237 HOCUT	T99	T99000-00-0	160	109	GALLONS	COT
CHOICE-CUT COOLANT	T99	T99000-00-0	40	0	GALLONS	COT
NEUTRAL SALTS H	T99	T99000-00-0	1,800	1,600	POUNDS	CLO
QUICK TEMPER #275	T99	T99000-00-0	600	2,800	POUNDS	CLO
WYANDOTTE R-2	T99	T99000-00-0	1,000	290	POUNDS	COT
FUEL-N-RICH	T99	T99000-00-0	55	45	GALLONS	CLO
ISOCAL	T99	T99000-00-0	500	10	POUNDS	REA
SALT BUTTONS	T99	T99000-00-0	10,000	17,200	POUNDS	CLO
ISOMINE	T99	T99000-00-0	60	60	POUNDS	CLO
~~MOLD ALLOY 900~~	~~T99~~	~~T99000-00-0~~	~~75~~	~~1~~	~~GALLONS~~	~~CLO~~
MOLYKOTE 2	T99	T99000-00-0	22	7	POUNDS	COT
ANTI-SEIZE LUBE	T99	T99000-00-0	70	30	POUNDS	COT
PLASTILUBE	T99	T99000-00-0	70	70	POUNDS	COT
QUICK LITE COKE	T99	T99000-00-0	500	300	POUNDS	REA
LC-3 GAS	T99	T99000-00-0	72,500	11,600	CU. FT.	REA
~~T-9 GAS~~	~~T99~~	~~T99000-00-0~~	~~1,400~~	~~200~~	~~POUNDS~~	~~REA~~
C-25 GAS	T99	T99000-00-0	379	758	CU. FT.	REA
COMPOUND AA	T99	T99000-00-0	50	175	POUNDS	COT

ICS NO.: 66997 ~~DONNER-HANNA COKE CORP.~~
****
BOX A-SOUTH PARK STA BUFFALO NY 14420

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TOLUENE (84,000/10,000 TOTAL GIVEN FOR 002 AND 003?)	D02	000108-88-3	42,000	5,000	GALLONS	BAS
PHENOL	F01	000108-95-2	547,500	547,500	POUNDS	PRO
~~XYLENE (84,000/10,000 TOTAL GIVEN FOR 002 AND 003?)~~	~~D03~~	~~001330-20-7~~	~~42,000~~	~~5,000~~	~~GALLONS~~	~~BAS~~
COAL TAR	E01	0X8007-45-2	10,000,000	1,000,000	GALLONS	PRO
~~LIGHT OIL (AROMATIC CRUDE)~~	~~D12~~	~~D12000-00-0~~	~~4,500,000~~	~~100,000~~	~~GALLONS~~	~~PRO~~

ICS NO.: 77732 DUNLOP TIRE & RUBBER CORP.
****
P.O. BOX 1109 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
RESORCINOL	F02	000108-46-3	180,500	17,900	POUNDS	COT
TOLUENE	D02	000108-88-3	135,000	1,500	POUNDS	BAS
~~XYLENE~~	~~D03~~	~~001330-20-7~~	~~66~~	~~0~~	~~POUNDS~~	~~BAS~~
FREON	A05	A05000-00-0	50	150	POUNDS	CLO

ICS NO.: 66154 E.I. DUPONT OF NEMOURS & CO (YERKES PLT)
****
SHERIDAN DRIVE, STAT BUFFALO NY 14207

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
VINYL FLUORIDE	A09	000075-02-5	2,500,000	65,000	POUNDS	REA
METHYLENE CHLORIDE	A02	000075-09-2	240,000	75,000	POUNDS	CLN
MONASTRAL BLUE	F24	000147-14-8	500	600	POUNDS	BAS
MONASTRAL GREEN	F24	001328-53-6	200	550	POUNDS	BAS

ICS NO.: 77294 ELMER HENDER & SON INC.
****
175 LEWIS ST. BUFFALO NY 14206

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
FREON	A05	A05000-00-0	10	0	POUNDS	CLO
DYES	F24	F24000-00-0	2	5	GALLONS	BAS

ICS NO.: 86016 F.K. & SON INC.
****
140 DETROIT ST. BUFFALO NY 14206

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
C99	T99	T99000-00-0	100	50	GALLONS	CLN

ICS NO.: 77162 F.N. BURT COMPANY INC.(BUFFALO PLT.)
****
2345 WALDEN AVE. BUFFALO NY 14225

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TRICHLOROETHYLENE	A12	000079-01-6	50	60	GALLONS	CLN
TOLUENE	D02	000108-88-3	4,900	750	GALLONS	BAS

ICS NO.: 77384 FLEXO TRANSPARENT INC.
****
P.O. BOX 128 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
METHYLENE CHLORIDE	A02	000075-09-2	55	10	GALLONS	CLN
TRICHLOROETHYLENE	A12	000079-01-6	40	10	GALLONS	CLN
TOLUENE	D02	000108-88-3	60	10	GALLONS	CLN
DYES & ORGANIC PIGMENTS	F24	F24000-00-0	15,000	3,000	POUNDS	BAS

ICS NO.: 86202 FMC CORP.(INDUSTRIAL CHEMICAL DIV.)
****
34 SAWYER AVE. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
1,1,1-TRICHLOROETHANE	A07	000071-55-6	110	165	GALLONS	CLN
PHENOL	F01	000108-95-2	348	275	GALLONS	BAS
DIPICOLINIC ACID	F99	000499-83-2	1,620	990	POUNDS	PRO
CHLOROTOLUENE (ISOMER?)	A19	A19000-00-0	55	55	GALLONS	BAS
POLYCHLORINATED BIPHENYL	A21	A21000-00-0	UNKNOWN	180	GALLONS	CLO
LUTIDINE (ISOMER?)	F99	F99000-00-0	3,847	7,145	POUNDS	REA

ICS NO.: 77695 GARRY LABORATORIES INC.
****
260 CREEKSIDE DR. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
METHANOL	J99	000067-56-1	67,273	5,788	GALLONS	BAS
ISOPROPANOL	J01	000067-63-0	37,237	2,883	GALLONS	BAS
MORPHOLINE	G99	000110-91-8	8,481	421	POUNDS	BAS
GLYCOLETHER (BUTYLCELLOSOLVE)	J99	000111-76-2	362	419	POUNDS	BAS
OLEIC ACID	L99	000112-80-1	14,471	1,600	POUNDS	BAS
XYLENE	D03	001330-20-7	3,519	220	GALLONS	REA
ASBESTOS 7 RO 5	G01	001332-21-4	545	300	POUNDS	BAS
ASBESTOS 7 TF-1	G01	001332-21-4	1,914	700	POUNDS	BAS
PINE OIL #317	E04	008002-09-3	132	0	POUNDS	BAS
KEROSENE	G25	008008-20-6	1,622	165	GALLONS	BAS
MINERAL SPIRITS	G25	008032-32-4	37,004	7,209	GALLONS	BAS
ODORLESS MINERAL SPIRITS	G25	008032-32-4	150	55	GALLONS	BAS
CORAY 50	D12	012000-00-0	430	0	GALLONS	BAS
ISOPAR K	G25	G25000-00-0	781	165	GALLONS	REA
ISOPAR L	G25	G25000-00-0	853	385	GALLONS	REA
467 SOLVENT	T99	T99000-00-0	467	165	GALLONS	BAS

ICS NO.: 77355 GENERAL ELECTRIC CO. (SERVICE SHOP)
****
BUFFALO NY 14203

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
G.E. PAINT 880 ETHANOL 40%	J99	000064-17-5	5	1	GALLONS	COT
1,1,1-TRICHLOROETHANE	A07	000071-55-6	550	135	GALLONS	BAS
XYLENE	D03	001330-20-7	330	80	GALLONS	BAS
GE 1500 THINNER 60% XYLENE	D03	001330-20-7	132	33	GALLONS	BAS
GOLPHS COAT-48% XYLENE	D03	001330-20-7	288	72	POUNDS	COT
G.E. PAINT 1201 XYLENE 35%	D03	001330-20-7	4	1	GALLONS	COT
G.E. PAINT 8012 XYLENE 20%	D03	001330-20-7	1	1	GALLONS	COT
KEROSINE	G25	008008-20-6	110	25	GALLONS	BAS
MINERAL SPIRITS	G25	008032-32-4	110	25	GALLONS	BAS
G.E. PAINT 1201 5% VMP NAPHTHA	G25	008032-32-4	1	1	GALLONS	COT
MISC. G.E.	D99	D99000-00-0	224	60	GALLONS	COT
NAPTHA	G25	G25000-00-0	550	135	GALLONS	BAS
G.E. 1500 THINNER - 40% NAPHTHA	G25	G25000-00-0	88	22	GALLONS	BAS
G.E. PAINT 8012 5% NAPHTHA	G25	G25000-00-0	1	1	GALLONS	COT

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
[illegible] N ENAMEL	G99	G99000-00-0	900	150	POUNDS	COT
G.[illegible] INT 1201 60% INERT	G99	G99000-00-0	8	1	GALLONS	COT
G.E. PAINT 880 60% INERT	G99	G99000-00-0	9	1	GALLONS	COT
G.E. PAINT 8012 75% INERT	G99	G99000-00-0	5	1	GALLONS	COT
DOLPHS EMUL - VARNISH 52% UNKNOWN COMPONENTS	T99	T99000-00-0	312	78	POUNDS	COT

ICS NO.: 66043 GRO GREEN PRODUCTS, INC.
****
777 ELK ST. BUFFALO NY 14210

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
UREA	G24	000057-13-6	1,000,000	20,000	POUNDS	BAS
SILVEX	C16	000093-72-1	500	500	GALLONS	PES
2,4-D	C99	000094-75-7	30,000	30,000	POUNDS	PES
DALAPON	C99	001861-40-1	2,000	1,800	POUNDS	PES
DICAMBA	C99	001918-00-9	6,000	0	POUNDS	NLU
DURSBAN	C30	002921-88-2	875	385	GALLONS	PES
POTASSIUM CHLORIDE	H01	007447-40-7	200,000	16,000	POUNDS	BAS
DIAMMONIUM PHOSPHATE	H01	007783-28-0	100,000	60,000	POUNDS	BAS
MILORGANITE	G24	008049-99-6	1,400,000	40,000	POUNDS	BAS

ICS NO.: 77324 H.B. FULLER CO.
****
155 ISABELLE ST. BUFFALO NY 14207

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
1,1,1-TRICHLOROETHANE	A07	000071-55-6	10,000	1,000	GALLONS	BAS

ICS NO.: 77300 HARRISON RADIATOR (DIV G.M.C.) (PLANT #1)
****
WASHBURN & WALNUT ST LOCKPORT NY 14094

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
METHYLENE CHLORIDE	A02	000075-09-2	500	46	GALLONS	HAS
TRICHLOROETHYLENE	A12	000079-01-6	16,000	2,100	GALLONS	CLN
TOLUENE-MIXED PAINT	D02	000108-88-3	11,678	459	GALLONS	COT
TETRACHLOROETHYLENE	A13	000127-18-4	680	42	GALLONS	HAS
XYLENE-MIXED PAINT	D03	001330-20-7	1,794	71	GALLONS	COT
COMBINED AROMATICS	D99	D99000-00-0	250	21	GALLONS	HAS

ICS NO.: 77573 INMONT CORP.
****
T.C. INDUSTRIAL PARK DEPEW NY 14043

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
DYES AND ORGANIC PIGMENTS	F28	F28000-00-0	250,000	50,000	POUNDS	BAS

ICS NO.: 77296 LUCIDOL-DIV. OF PENNWALT
****
1740 MILITARY RD. BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
BENZOYL CHLORIDE	B05	000098-88-4	57,000	3,200	POUNDS	REA
NEVER GREEN P-200	C99	C99000-00-0	500	0	POUNDS	PES
PHTHALATE ESTERS	F15	F15000-00-0	5,600	59,000	POUNDS	BAS

ICS NO.: 88032 [illegible] CO. INC.
****
P.O. BOX 46, SOUTH P BUFFALO NY 14220

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
US D 401	T99	T99000-00-0	20	50	GALLONS	CLN

ICS NO.: 77599 MENTHOLATUM CO. INC.
****
1360 NIAGARA ST. BUFFALO NY 14213

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TETRACHLOROETHYLENE	A13	000127-18-4	6,500	400	GALLONS	HAS

ICS NO.: 66031 MOBIL OIL CORP. (BUFFALO REFINERY)
****
[illegible] ELK ST. BUFFALO NY 14210

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
1,1,1-TRICHLOROETHANE	A07	000071-55-6	430	220	GALLONS	REA
SODIUM HYDROXIDE	H04	001310-73-2	4,000,000	21,000	POUNDS	REA
ANHYDROUS AMMONIA	H04	007664-41-7	1,200	10,000	POUNDS	REA
SULFURIC ACID	H04	007664-93-9	112,000	3,000	POUNDS	REA
CHLORINE GAS	H03	007782-50-5	4,000	2,000	POUNDS	REA
PETROLEUM TAR	E02	E02000-00-0	51,000,000	4,500,000	GALLONS	PRO
DYE & ORGANIC PIGMENTS	F20	F20000-00-0	2,000	2,000	POUNDS	BAS
TETRA METHYL ETHYL LEAD	H05	H05000-00-0	2,000,000	49,000	POUNDS	BAS

ICS NO.: 77735 NATIONAL MANUFACTURING CORP.
****
153 FILL AVE. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TOLUENE	D02	000108-88-3	400	55	GALLONS	HAS
XYLENE	D03	001330-20-7	6,000	200	GALLONS	HAS
HI-FLASH NAPHTHA	D12	008030-30-6	200	20	GALLONS	HAS
UNICHLOR 50-L-50	A99	A99000-00-0	60,000	10,000	POUNDS	HAS

ICS NO.: 77842 NEW YORK WIRE MILLS CORP
****
3959 RIVER ROAD TONAWANDA (T) NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
LEAD	M07	007439-92-1	UNKNOWN	UNKNOWN	UNKNOWN	UNK
ZINC	M13	007440-66-6	UNKNOWN	UNKNOWN	UNKNOWN	UNK

ICS NO.: 66459 NEWCO CHEMICAL WASTE SYSTEMS INC.
****
N.56TH ST. NIAGARA FALLS NY 14304

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
BENZOIC ACID RESIDUES	F12	000065-85-0	71,853	UNKNOWN	POUNDS	CLO
METHANOL RESIDUES	J99	000067-56-1	290	UNKNOWN	POUNDS	CLO
ACETONE RESIDUES	K01	000067-64-1	1,705	UNKNOWN	POUNDS	CLO
BENZENE RESIDUES	D01	000071-43-2	516	UNKNOWN	POUNDS	CLO
VINYL CHLORIDE RESIDUES	A10	000075-01-4	25,911	UNKNOWN	POUNDS	CLO
METHYLENE CHLORIDE RESIDUES	A02	000075-09-2	895	UNKNOWN	POUNDS	CLO
HEXACHLOROCYCLOPENTADIENE RESIDUES	A17	000077-47-4	110,345	UNKNOWN	POUNDS	CLO
SULFOLENE RESIDUES	G99	000077-79-2	551	UNKNOWN	POUNDS	CLO
MEK RESIDUES	K02	000078-93-3	3,195	UNKNOWN	POUNDS	CLO
TRICHLOROETHYLENE RESIDUES	A12	000079-01-6	2,341	UNKNOWN	POUNDS	CLO
PHTHALIC ACID RESIDUES	F13	000088-99-3	13,977	UNKNOWN	POUNDS	CLO
NAPHTHALENE RESIDUES	D05	000091-20-3	4,080	UNKNOWN	POUNDS	CLO
BIPHENYL RESIDUES	D04	000092-52-4	2,068	UNKNOWN	POUNDS	CLO
BENZOTRIFLUORIDE RESIDUES	A20	000098-08-8	3,840	UNKNOWN	POUNDS	CLO
BENZOYL CHLORIDE RESIDUES	B05	000098-88-4	1,238,496	UNKNOWN	POUNDS	CLO
DIPHENYL OXIDE RESIDUES	F99	000101-84-8	6,309	UNKNOWN	POUNDS	CLO
DIPHENYLDIIMIDE RESIDUES	F99	000103-33-3	2,295	UNKNOWN	POUNDS	CLO
PHENYLISOCYANATE RESIDUES	F99	000103-72-0	39,242	UNKNOWN	POUNDS	CLO
LAURYPHIDINIUM CHLORIDE RESIDUES	F99	000104-74-5	10,244	UNKNOWN	POUNDS	CLO
PENTOL RESIDUES	J99	000105-29-3	15,012	UNKNOWN	POUNDS	CLO
ACRYLONITRILE RESIDUES	G03	000107-13-1	2,570	UNKNOWN	POUNDS	CLO
MIBK RESIDUES	K04	000108-10-1	319	UNKNOWN	POUNDS	CLO
SUCCINIC ANHYDRIDE BOTTOMS	G99	000108-30-5	17,571	UNKNOWN	POUNDS	CLO
MALEIC ANHYDRIDE RESIDUES	G10	000108-31-6	33,334	UNKNOWN	POUNDS	CLO
RESORCINOL RESIDUES	F02	000108-46-3	11,087	UNKNOWN	POUNDS	CLO
TOLUENE RESIDUES	D02	000108-88-3	119,165	UNKNOWN	POUNDS	CLO
PHENOL RESIDUES	F01	000108-95-2	902,194	UNKNOWN	POUNDS	CLO
TETRAHYDROFURAN RESIDUES	G99	000109-99-9	113	UNKNOWN	POUNDS	CLO
HEXANE RESIDUES	G25	000110-54-3	182	UNKNOWN	POUNDS	CLO
PYRIDINE RESIDUES	F25	000110-86-1	30,173	UNKNOWN	POUNDS	CLO
OCTYLCHLORIDE RESIDUES	A99	000111-85-3	826	UNKNOWN	POUNDS	CLO
DODECANE RESIDUES	G25	000112-40-3	1,487	UNKNOWN	POUNDS	CLO
LAURYL CHLORIDE RESIDUES	A99	000112-52-7	7,342	UNKNOWN	POUNDS	CLO
CHLORENDIC ACID RESIDUES	B09	000115-28-6	20,366	UNKNOWN	POUNDS	CLO
HYDROQUINONE RESIDUES	F02	000123-31-9	20,114	UNKNOWN	POUNDS	CLO
ADIPIC ACID RESIDUES	L99	000124-04-9	22,784	UNKNOWN	POUNDS	CLO
HEXAMETHYLENE DIAMINE RESIDUES	G99	000124-09-4	3,924	UNKNOWN	POUNDS	CLO
SULFOLANE RESIDUES	G99	000126-33-0	1,790	UNKNOWN	POUNDS	CLO
TETRACHLOROETHYLENE RESIDUES	A13	000127-18-4	23,511	UNKNOWN	POUNDS	CLO
MONOETHANOLAMINE RESIDUES	G99	000141-43-5	71,654	UNKNOWN	POUNDS	CLO
MERCAPTOBENZOTHIOZOLE RESIDUES	F99	000149-30-4	4,489	UNKNOWN	POUNDS	CLO
BENZOFURAN RESIDUES	F99	000271-89-6	40,523	UNKNOWN	POUNDS	CLO
DIETHYL PHOSPHORIC ACID RESIDUES	L98	000598-02-7	23,044	UNKNOWN	POUNDS	CLO
SULFENE DISTILLATION RESIDUES	F99	000917-73-7	45,439	UNKNOWN	POUNDS	CLO
CRESOL RESIDUES	F01	001319-77-3	52,464	UNKNOWN	POUNDS	CLO
XYLENE RESIDUES	D03	001330-20-7	3,047	UNKNOWN	POUNDS	CLO
ASBESTOS CONTAMINATED SOLIDS	G01	001332-21-4	763,083	UNKNOWN	POUNDS	CLO
DECHLORANE RESIDUES	A23	002385-85-5	242,404	UNKNOWN	POUNDS	CLO
POLYVINYL ALCOHOL RESIDUES	P99	009002-89-5	17,420	UNKNOWN	POUNDS	CLO
POLYMERIZED SYYRENE RESIDUES	P02	009003-53-6	4,406	UNKNOWN	POUNDS	CLO
CELLUCOSE ACETATE RESIDUES	G99	009004-35-7	2,476	UNKNOWN	POUNDS	CLO
BUTYLENE RESIDUES	G99	025167-67-3	18,637	UNKNOWN	POUNDS	CLO
TOLUENEDIAMINE RESIDUES	F99	025376-45-8	23,693	UNKNOWN	POUNDS	CLO
TOLUENE DIISOCYANATE RESIDUES	F10	026471-62-5	67,509	UNKNOWN	POUNDS	CLO
HALOMETHANES RESIDUES	A06	A06000-00-0	2,662	UNKNOWN	POUNDS	CLO
HALOETHANES RESIDUES	A08	A08000-00-0	597	UNKNOWN	POUNDS	CLO
CHLORINATED BENZENE RESIDUES	A18	A18000-00-0	335,539	UNKNOWN	POUNDS	CLO
CHLORINATED TOLUENE RESIDUES	A19	A19000-00-0	25,965	UNKNOWN	POUNDS	CLO
PCB CONTAMINATED SOLIDS	A21	A21000-00-0	13,562	UNKNOWN	CU. FT.	CLO
CHLORINATED BENZOTRIFLUORIDE RESIDUES	A99	A99000-00-0	2,431,469	UNKNOWN	POUNDS	CLO
HALOGENATED HYDROCARBON WASTE	A99	A99000-00-0	64,448	UNKNOWN	POUNDS	CLO
CHLORINATED PHENOL RESIDUES	B07	B07000-00-0	39	UNKNOWN	POUNDS	CLO
HET DIOL RESIDUES	B99	B99000-00-0	30,509	UNKNOWN	POUNDS	CLO
SOLIDS CONTAMINED WITH HALOGENATED ORGANICS	B99	B99000-00-0	1,296	UNKNOWN	CU. FT.	CLO
BROMINATED POLYESTER RESINS RESIDUES	B99	B99000-00-0	10,282	UNKNOWN	POUNDS	CLO
HEXACHLORODISILOXANE RESIDUES	B99	B99000-00-0	110,160	UNKNOWN	POUNDS	CLO
DINITROBENZOTRIFLUORIDE RESIDUES	B99	B99000-00-0	12,598	UNKNOWN	POUNDS	CLO
SULFONATED BENZOTRIFLUORIDE RESIDUES	B99	B99000-00-0	6,112	UNKNOWN	POUNDS	CLO
METHYL CHLOROBENZOATE RESIDUES	B99	B99000-00-0	717,792	UNKNOWN	POUNDS	CLO
CHLOROBENZOIC ACID RESIDUES	B99	B99000-00-0	190,813	UNKNOWN	POUNDS	CLO

PE(;DE CONTAMINATED SOLIDS	C99	C99000-00-0	202	UNKNOWN	UNKNOWN	CLO
CA. .ATE PESTICIDES	C99	C99000-00-0	236	UNKNOWN	UNKNOWN	CLO
~~PACKAGED PESTICIDE RESIDUES~~	C99	C99000-00-0	8	UNKNOWN	UNKNOWN	CLO
PETROLEUM TAR RESIDUES	E02	E02000-00-0	1,301	UNKNOWN	POUNDS	CLO
HALOGENATED AROMATIC TAR RESIDUES	E99	E99000-00-0	1,900	UNKNOWN	POUNDS	CLO
PHOTO PROCESS TAR RESIDUES	E99	E99000-00-0	215,060	UNKNOWN	POUNDS	CLO
NITROPHENOL RESIDUES	F03	F03000-00-0	18,558	UNKNOWN	POUNDS	CLO
NITROBENZENE RESIDUES	F04	F04000-00-0	60,000	UNKNOWN	POUNDS	CLO
DYE RESIDUES	F20	F20000-00-0	50,637	UNKNOWN	POUNDS	CLO
PHENYLENEDIAMINE RESIDUES	F99	F99000-00-0	1,003	UNKNOWN	POUNDS	CLO
EPOXIDE RESIDUES	G12	G12000-00-0	479	UNKNOWN	POUNDS	CLO
NAPTHA RESIDUES	G25	G25000-00-0	26,647	UNKNOWN	POUNDS	CLO
PACKAGED LABORATORY CHEMICAL WASTES	G99	G99000-00-0	1,475	UNKNOWN	UNKNOWN	CLO
MERCAPTAN RESIDUES	G99	G99000-00-0	19,891	UNKNOWN	POUNDS	CLO
POLYESTER RESIDUES	G99	G99000-00-0	110,068	UNKNOWN	POUNDS	CLO
LATEX WASTE	G99	G99000-00-0	47,782	UNKNOWN	POUNDS	CLO
GLYCOL RESIDUES	J02	J02000-00-0	36,006	UNKNOWN	POUNDS	CLO
BUTENE DIOL RESIDUES	J02	J02000-00-0	879	UNKNOWN	POUNDS	CLO
FATTY ACID RESIDUES	L99	L99000-00-0	146,704	UNKNOWN	POUNDS	CLO
STEARYLACID PHOSPHATE RESIDUES	L99	L99000-00-0	29,376	UNKNOWN	POUNDS	CLO
ACRYLIC SOLIDS RESIDUES	P99	P99000-00-0	97,801	UNKNOWN	POUNDS	CLO
POLYMER WASTE	P99	P99000-00-0	195,925	UNKNOWN	POUNDS	CLO
TERPENE RESIN RESIDUES	P99	P99000-00-0	294	UNKNOWN	POUNDS	CLO
WASTE OIL SLUDGES(OIL-WATER WASTES)	S01	S01000-00-0	7,934,560	UNKNOWN	POUNDS	CLO
PAINT SLUDGE	S99	S99000-00-0	801,477	UNKNOWN	POUNDS	CLO
ANGLAMOL 35 RESIDUES	T99	T99000-00-0	97,497	UNKNOWN	POUNDS	CLO

ICS NO.: 77525 NIAGARA ENVELOPE CO. INC.
****
701 SENECA ST. BUFFALO NY 14210

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
~~DYES AND ORGANIC PIGMENTS~~	F20	F20000-00-0	1,000	100	GALLONS	COT

ICS NO.: 77857 NIAGARA MOHAWK POWER CORP (C.R. HUNTLEY STEAM STATION)
****
RIVER RD TONAWANDA NY 14207

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
HYDRAZINE	G22	000302-01-2	95	110	GALLONS	REA
LIME	H04	001310-73-2	34,000	200	POUNDS	REA
~~CAUSTIC SODA~~	~~H04~~	~~001310-73-2~~	~~124,500~~	~~37,000~~	~~POUNDS~~	~~REA~~
SULFURIC ACID	H04	007664-93-9	19,300	10,500	POUNDS	REA
CHLORINE	H03	007782-50-5	180,000	24,000	POUNDS	REA
ALUM	H01	010043-01-3	5,709	1,000	POUNDS	REA
PHOSPHATE (MONO, DI, TRI)	H02	H02000-00-0	200	50	POUNDS	REA

ICS NO.: 66334 NIAGARA TRANSFORMER CORP.
****
1747 WALDEN AVE., P.O. BUFFALO NY 14225

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TOLUENE	D02	000108-88-3	660	55	GALLONS	BAS
POLYCHLORINATED BIPHENYL	A21	A21000-00-0	UNKNOWN	6,100	GALLONS	NLU
~~MINERAL SPIRITS 66 NAPHTHENES 43.78% AROMATICS 5.96%~~	~~D99~~	~~D99000-00-0~~	~~3,000~~	~~75~~	~~GALLONS~~	~~BAS~~
MINERAL SPIRITS 66 PARAFFINS-50.26%	G25	G25000-00-0	3,000	75	GALLONS	BAS
SS-25 SOLVENT DEGREASER	T99	T99000-00-0	70	10	GALLONS	BAS

ICS NO.: 77150 NUCLEAR RADIATION DEVELOPMENTS CORP.
****
2937 ALT BLVD. GRAND ISLAND NY 14072

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
METHYL ETHYL KETONE	K02	000078-93-3	200	10	GALLONS	CLN

ICS NO.: 66179 OSMOSE WOOD PRESERVING CO. OF AMERICA INC.
****
980 ELLICOTT ST. BUFFALO NY 14209

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
2,4-DINITROPHENOL	F03	000051-28-5	50,000	2,000	POUNDS	BAS
CHLORDANE	C02	000057-74-9	4,600	1,200	POUNDS	PKG
CHLOROPICRIN	B18	000076-06-2	1,000	150	POUNDS	BAS
~~ASBESTOS~~	~~G01~~	~~001332-21-4~~	~~25,000~~	~~2,000~~	~~POUNDS~~	~~BAS~~
CHLORINATED BENZENE	A18	A18000-00-0	20,000	12,000	POUNDS	BAS
CHLORINATED PHENOL	B07	B07000-00-0	80,000	14,000	POUNDS	BAS
ALDRIN/DIELDRIN	C01	C01000-00-0	0	0	UNKNOWN	NLU
DITHIOCARBAMATES	C17	C17000-00-0	8,000	1,200	POUNDS	PKG

ICS NO.: 66468 PEAVEY CO
****
87 CHILDS ST BUFFALO NY 14203

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
PIPERONYL BUTOXIDE	C99	000051-03-6	5	22	GALLONS	PES
CARBON TETRACHLORIDE	A04	000056-23-5	252	522	GALLONS	PES
METHYL BROMIDE	A06	000074-83-9	12,000	170	POUNDS	PES

~~PYRETHRINS~~	~~C99~~	~~000121-29-9~~	~~1~~	~~3~~	~~GALLONS~~	~~PES~~
MALATHION	C07	000121-75-5	26	99	GALLONS	PES
NITROPHENYL UREA	F99	000556-10-5	1	1	POUNDS	PES
CALCIUM CYANIDE	C99	000592-01-8	3	2	POUNDS	PES
ATRAZENE	C99	001912-24-9	46	38	POUNDS	PES
ALUMINUM PHOSPHIDE	C99	020859-73-8	332	114	POUNDS	PES
~~DICHLOROETHYLENE~~	~~A11~~	~~025323-30-2~~	~~10~~	~~1~~	~~GALLONS~~	~~PES~~
DIBROMOETHYLENE	A99	025429-23-6	177	6	GALLONS	PES
AMINO PYRIDINE	F99	F99000-00-0	1	1	POUNDS	PES

ICS NO.: 88037 POHLMAN FOUNDRY COMPANY INC.
****
205 WAITZ AVE. BUFFALO NY 14206

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
CHEM-REZ 480 BINDER	T99	T99000-00-0	10,810	1,150	GALLONS	REA
CHEM-REZ 2006 CATALYST	T99	T99000-00-0	3,610	500	GALLONS	REA

ICS NO.: 66368 POLYMER APPLICATIONS INC.
****
3445 RIVER RD. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
FORMALDEHYDE	K03	000050-00-0	3,500,000	85,000	POUNDS	REA
PHENOL	F01	000108-95-2	4,000,000	84,000	POUNDS	REA

ICS NO.: 66166 PRATT & LAMBERT INC.
****
P.O. BOX 22 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
METHYLENE CHLORIDE	A02	000075-09-2	151,860	28,497	POUNDS	BAS
ISOPHORONE	G04	000078-59-1	8,925	627	POUNDS	BAS
PHTHALIC ANHYDRIDE	F14	000085-44-9	1,756,500	89,861	POUNDS	REA
STYRENE	D07	000100-42-5	4,100	0	POUNDS	REA
MALEIC ANHYDRIDE	G10	000108-31-6	50,000	4,524	POUNDS	REA
~~TOLUENE~~	~~D02~~	~~000108-88-3~~	~~232,898~~	~~39,479~~	~~POUNDS~~	~~BAS~~
ISOPHTHALIC ACID	F13	000121-91-5	8,250	2,250	POUNDS	REA
HYDROQUINONE	F02	000123-31-9	300	32	POUNDS	BAS
FOLPET	C23	000133-07-3	26,700	238	POUNDS	BAS
ETHYLENEIMINE	G08	000151-56-4	179	0	POUNDS	REA
XYLENE	D03	001330-20-7	1,160,976	80,748	POUNDS	BAS
~~TOLUENE DIISOCYANATE~~	~~F10~~	~~026471-62-5~~	~~70,000~~	~~4,233~~	~~POUNDS~~	~~REA~~
COAL TAR	E01	0X8007-45-2	21,700	0	POUNDS	BAS
HALOGENATED HYDROCARBONS	A99	A99000-00-0	28,250	2,980	POUNDS	BAS
PESTICIDES	C99	C99000-00-0	14,670	1,280	POUNDS	BAS
BENZOIC ACID AND BENZOATE SALTS	F12	F12000-00-0	500	982	POUNDS	REA
PHTHALATE ESTERS	F15	F15000-00-0	2,910	1,207	POUNDS	BAS
~~DYES AND ORGANIC PIGMENTS~~	~~F24~~	~~F24000-00-0~~	~~92,948~~	~~14,913~~	~~POUNDS~~	~~BAS~~

ICS NO.: 60218 REPUBLIC STEEL CORP (BUFFALO PLT)
****
P.O. BOX 6 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
PYORAUL 135	A21	A21000-00-0	0	0	UNKNOWN	NLU
~~PYORAUL 150A~~	~~A21~~	~~A21000-00-0~~	~~0~~	~~0~~	~~UNKNOWN~~	~~NLU~~
PYRANOL	A21	A21000-00-0	0	2,200	GALLONS	CLO
~~INTEREEN~~	~~A21~~	~~A21000-00-0~~	~~0~~	~~7,700~~	~~GALLONS~~	~~CLO~~
CL HOPEXTOL	A21	A21000-00-0	0	430	GALLONS	CLO

ICS NO.: 77676 ROYTON PAPER PRODUCTS
****
1050 NIAGARA ST. BUFFALO NY 14213

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TOLUENE	D02	000108-88-3	2,600	110	GALLONS	BAS

ICS NO.: 77533 S.A. DAY MFG. CO. INC.
****
1489 NIAGARA ST. BUFFALO NY 14213

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
STEARIC ACID	L99	000057-11-4	5,200	1,150	POUNDS	BAS
UREA	G24	000057-13-6	3,200	0	POUNDS	BAS
~~TRICHLOROETHYLENE~~	~~A12~~	~~000079-01-6~~	~~23,456~~	~~0~~	~~GALLONS~~	~~NLU~~
N-BUTYL CELLOSOLVE	J99	000111-76-2	30,540	4,940	POUNDS	BAS
MONOETHANOLAMINE	G99	000141-43-5	25,947	1,395	POUNDS	BAS
SODIUM CYANIDE	H01	000143-33-9	157,440	22,200	POUNDS	PKG
POTASSIUM CYANIDE	H01	000151-50-8	8,280	1,300	POUNDS	PKG
NICKEL ACETATE	H02	000373-02-4	35	0	POUNDS	PKG
~~SODA ASH~~	~~H01~~	~~000497-19-8~~	~~5,500~~	~~1,250~~	~~POUNDS~~	~~PKG~~
BARIUM CARBONATE	H01	000513-77-9	400	100	POUNDS	PKG
COPPER CYANIDE	H06	000544-92-3	10,220	1,800	POUNDS	PKG
ZINC CYANIDE	H02	000557-21-1	6,400	1,100	POUNDS	PKG
CADMIUM OXIDE	H04	001306-19-0	29	0	POUNDS	PKG
POTASSIUM HYDROXIDE	H04	001310-58-3	28,100	1,800	POUNDS	PKG
SODIUM HYDROXIDE	H04	001310-73-2	26,800	1,500	POUNDS	PKG

ZINC OXIDE	M13	001314-13-2	106	25	POUNDS	BAS
AMMONIUM BIFLUORIDE	H01	001341-49-7	100	0	POUNDS	PKG
SODIUM SILICATE	H01	001344-09-8	3,100	0	POUNDS	PKG
NICKEL CARBONATE	H02	003333-67-3	288	75	POUNDS	PKG
AMMONIUM NITRATE	H01	006484-52-2	1,936	0	POUNDS	PKG
ACTIVATED CARBON	H03	007440-44-0	828	0	POUNDS	PKG
ZINC DUST	M13	007440-66-6	240	0	POUNDS	PKG
MAGNESIUM SULFATE	H01	007487-88-9	60	0	POUNDS	PKG
STANNOUS SULFATE	H02	007488-55-3	3,100	500	POUNDS	PKG
HYFLU SUPERCEL FILTER MEDIA	H01	007631-86-9	35	0	POUNDS	PKG
SODIUM BISULFITE	H01	007631-90-5	1,280	0	POUNDS	PKG
ZINC CHLORIDE	H02	007646-85-7	1,059,317	11,830	POUNDS	BAS
MURIATIC ACID	H04	007647-01-0	106,956	18,000	POUNDS	BAS
PHOSPHORIC ACID	H04	007664-38-2	920	0	POUNDS	PKG
HYDRO FLUORIC ACID	H04	007664-39-3	159	0	POUNDS	PKG
SULFURIC ACID	H04	007664-93-9	12,550	0	POUNDS	PKG
SODIUM FLUORIDE	H01	007681-49-4	8	0	POUNDS	PKG
NITRIC ACID	H04	007697-37-2	6,608	0	POUNDS	PKG
NICKEL CHLORIDE	H02	007718-54-9	800	0	POUNDS	PKG
STANNOUS CHLORIDE	H02	007772-99-8	19,580	5,400	POUNDS	BAS
POTASSIUM BICHROMATE	H02	007778-50-9	120	0	POUNDS	PKG
NICKEL SULFATE	M09	007786-81-4	5,140	900	POUNDS	PKG
HYDROBROMIC ACID	H04	010035-10-6	16,625	13,750	POUNDS	BAS
SODIUM BICROMATE	H05	010588-01-9	1,360	0	POUNDS	PKG
BORIC ACID	H04	011113-50-1	580	0	POUNDS	PKG
CHROMIC ACID	H04	011115-74-5	4,280	600	POUNDS	PKG
ECONO CHROME S (A CHROMIC ACID COMPD. WITH CATALYST))	H02	011115-74-5	1,380	0	POUNDS	PKG
ECONO CHROME 300	H02	011115-74-5	2,040	0	POUNDS	PKG
ECONO CHROME 40	H02	011115-74-5	80	0	POUNDS	PKG
SODIUM STANNATE	H02	012058-66-1	1,420	600	POUNDS	PKG
AMMONIUM BROMIDE	H01	012124-97-9	49	225	POUNDS	BAS
AMMONIUM CHLORIDE	H01	012125-02-9	386,000	84,400	POUNDS	BAS
POTASSIUM STANNATE	H02	012142-33-5	2,000	0	POUNDS	PKG
LEAD FLUOBORATE	H02	013814-96-5	1,232	0	POUNDS	PKG
TIN FLUOBORATE	H02	013814-97-8	205	0	POUNDS	PKG
POTASSIUM CYANIDE COPPER DOUBLE SALTS	H02	014263-73-1	520	600	POUNDS	PKG
FLUOBORIC ACID	H04	016872-11-0	231	0	POUNDS	PKG
COPPER FLUOBORATE	H02	038465-60-0	99	0	POUNDS	PKG
NITROBENZENE SULFONIC ACID (ISOMER))	F99	F99000-00-0	24,890	1,625	POUNDS	PKG
PETROLEUM GREASE	G25	G25000-00-0	1,200	900	POUNDS	BAS
POLYSULFIDE	H01	H01000-00-0	1,720	800	POUNDS	PKG
SODIUM CYANIDE COPPER DOUBLE SALTS	H02	H02000-00-0	3,340	600	POUNDS	PKG
MAXAMP (CONC. ALKALI))	H04	H04000-00-0	22,400	19,200	POUNDS	PKG
MILETCH (CONC. ALKALI))	H04	H04000-00-0	5,865	0	POUNDS	PKG
NUVAT (CONC. ALKALI))	H04	H04000-00-0	79,920	13,600	POUNDS	PKG
FRANKLIN SOAP	T99	T99000-00-0	638	330	GALLONS	BAS
SWIFT CO. SOLAR N.P.	T99	T99000-00-0	11,441	2,400	POUNDS	BAS
BLACK CHROME	T99	T99000-00-0	41,660	7,300	POUNDS	PKG
ELECTROPLATING BRIGHTENERS ELCHEM 1396	T99	T99000-00-0	340	0	POUNDS	NLU
ELCHEM 1442	T99	T99000-00-0	296	0	POUNDS	NLU
ELCHEM AA 500	T99	T99000-00-0	1,416	860	POUNDS	PKG
ELCHEM AA 510	T99	T99000-00-0	1,360	400	POUNDS	PKG
ELCHEM 770	T99	T99000-00-0	4	12	GALLONS	PKG
DUOZINC 100	T99	T99000-00-0	17,420	1,100	POUNDS	PKG
DUOZINC 101	T99	T99000-00-0	33,650	0	POUNDS	PKG
CHROMATES 1410	H02	T99000-00-0	684	960	POUNDS	PKG
CHROMATE 1408	H02	T99000-00-0	110	0	GALLONS	PKG
DUOZINC 102	T99	T99000-00-0	750	0	POUNDS	PKG
DUOZINC 121	T99	T99000-00-0	10	0	POUNDS	PKG
KASTONE	T99	T99000-00-0	9,500	0	POUNDS	PKG
DUROBRITE 309	T99	T99000-00-0	30	0	POUNDS	PKG
ECONOCHROME AC	H02	T99000-00-0	40	0	POUNDS	PKG
AA62	T99	T99000-00-0	60	0	POUNDS	PKG
AA8K	T99	T99000-00-0	2,344	180	POUNDS	PKG
AA66	T99	T99000-00-0	1,944	1,143	POUNDS	PKG
AA310	T99	T99000-00-0	45	0	POUNDS	PKG
A & E CLEANER	T99	T99000-00-0	21,520	6,400	POUNDS	PKG
AEROWASH	T99	T99000-00-0	297	55	GALLONS	PKG
ALDET	T99	T99000-00-0	1,120	200	POUNDS	PKG
ALTREX	T99	T99000-00-0	48,740	8,750	POUNDS	PKG
AMPLER	T99	T99000-00-0	4,880	1,200	POUNDS	PKG
B.N. CLEANER	T99	T99000-00-0	4,080	2,000	POUNDS	PKG
BUFSOL	T99	T99000-00-0	2,380	1,428	POUNDS	PKG
EMLON	T99	T99000-00-0	146	734	POUNDS	PKG
ERACE	T99	T99000-00-0	80	400	POUNDS	PKG
EXPRAY	T99	T99000-00-0	1,000	300	POUNDS	PKG
FLOTE	T99	T99000-00-0	650	0	POUNDS	PKG
F.S. CLEANER	T99	T99000-00-0	5,760	800	POUNDS	PKG
GRIME-GO	T99	T99000-00-0	1,419	1,419	POUNDS	PKG
INDUSTRIAL 3	T99	T99000-00-0	222,900	9,000	POUNDS	PKG
INDUSTRIAL 6	T99	T99000-00-0	50,640	2,000	POUNDS	PKG
L-61	T99	T99000-00-0	110	550	GALLONS	PKG
LOCKOTE F.E.	T99	T99000-00-0	420	0	GALLONS	PKG
LORRINSE	T99	T99000-00-0	3	0	GALLONS	PKG
M.P.ACID	T99	T99000-00-0	750	0	POUNDS	PKG
MERSOSTRIP	T99	T99000-00-0	10,240	0	POUNDS	PKG
NORDALL	T99	T99000-00-0	4,444	880	GALLONS	PKG
PERFECTION	T99	T99000-00-0	31,280	7,200	POUNDS	PKG
PHOSIT	T99	T99000-00-0	62	30	GALLONS	PKG
PONDAX	T99	T99000-00-0	510	0	POUNDS	PKG
POREEN	T99	T99000-00-0	372	142	POUNDS	PKG
PORENAC	T99	T99000-00-0	960	0	POUNDS	PKG
PRE-FOS	T99	T99000-00-0	70	0	POUNDS	PKG
R-2	T99	T99000-00-0	7,560	600	POUNDS	PKG
RELLAD	T99	T99000-00-0	2,730	2,925	POUNDS	PKG
SPECIAL H	T99	T99000-00-0	80	400	POUNDS	PKG

ULC	T99	T99000-00-0	8	0	GALLONS	PKG
#468	T99	T99000-00-0	74	50	GALLONS	PKG
P-1075	T99	T99000-00-0	11	0	GALLONS	PKG
#2487	T99	T99000-00-0	2,040	1,700	POUNDS	PKG
PD-5587	T99	T99000-00-0	70	0	POUNDS	PKG
F-5561	T99	T99000-00-0	750	0	POUNDS	PKG
PD-5685-0	T99	T99000-00-0	48	120	POUNDS	PKG
PD-5687-1	T99	T99000-00-0	22	0	GALLONS	PKG
HC-753 COLD PATCH BLACK	T99	T99000-00-0	5	0	GALLONS	NLU
C-1445 PRIMER	T99	T99000-00-0	75	0	GALLONS	NLU
C-1449 PRIMER REDUCER	T99	T99000-00-0	343	0	GALLONS	NLU
C-1452 WHITE PRIMER	T99	T99000-00-0	1	0	GALLONS	NLU
E-1003 MICROSOL	T99	T99000-00-0	205	0	GALLONS	NLU
XL-8 AIR DRY BLACK	T99	T99000-00-0	3	0	GALLONS	NLU
XL-8 AIR DRY GREEN	T99	T99000-00-0	1	0	GALLONS	NLU
XL-8 REDUCER	T99	T99000-00-0	1	0	GALLONS	NLU
ESBEC 1001	T99	T99000-00-0	2,080	0	POUNDS	PKG
ESBEC 1100G	T99	T99000-00-0	120	0	POUNDS	PKG
ESBEC 1203	T99	T99000-00-0	850	0	POUNDS	PKG
ESBEC 1025	T99	T99000-00-0	66	102	GALLONS	PKG
ESBEC 1210	T99	T99000-00-0	50	0	POUNDS	PKG
ESBEC 1615	T99	T99000-00-0	913	0	POUNDS	PKG
ESBEC 619	T99	T99000-00-0	30	0	POUNDS	PKG
TINTAC L	T99	T99000-00-0	13	5	GALLONS	PKG
TINTAC C	T99	T99000-00-0	1	5	GALLONS	PKG
TINTAC 17A	T99	T99000-00-0	40	0	POUNDS	PKG
TINTAC 18	T99	T99000-00-0	1,280	0	POUNDS	PKG
TINTAC 27	T99	T99000-00-0	7,040	0	POUNDS	PKG
TINTAC 30PH	T99	T99000-00-0	840	0	POUNDS	PKG
TINTAC 40	T99	T99000-00-0	90	0	POUNDS	PKG
TINTAC 182	T99	T99000-00-0	360	0	POUNDS	PKG
G-PEX	T99	T99000-00-0	6	0	GALLONS	PKG
G-PEX KENTIN-G-ON	T99	T99000-00-0	33	0	GALLONS	PKG
G-PEX 170	T99	T99000-00-0	2,660	0	POUNDS	PKG
G-PEX HPC	T99	T99000-00-0	144	0	GALLONS	PKG
ST-5	T99	T99000-00-0	30	0	GALLONS	PKG
28	T99	T99000-00-0	120	0	POUNDS	PKG
TALLOW	G99	X61789-97-7	1,639	165	GALLONS	HAS

ICS NO.: 77586 SHANCO PLASTICS & CHEMICALS INC.
****
2716 KENMORE AVE. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
PHTHALIC ANHYDRIDE	F14	000085-44-9	46,925	6,995	POUNDS	REA
P-TERT BUTYL PHENOL	F99	000098-54-4	UNKNOWN	2,250	POUNDS	REA
MALEIC ANHYDRIDE	G10	000108-31-6	77,564	8,329	POUNDS	REA
PHENOL	F01	000108-95-2	75,980	20,075	POUNDS	REA
OCTYLPHENOL	F99	027193-28-8	UNKNOWN	3,750	POUNDS	REA
BISPHENOL ANHYDRIDE 171	F99	F99000-00-0	UNKNOWN	1,555	POUNDS	REA

ICS NO.: 66215 SPAULDING FIBRE CO. INC.
****
310 WHEELER ST. TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
ANILINE	F08	000062-53-3	156,000	29,000	POUNDS	REA
TOLUENE	D02	000108-88-3	74,000	6,000	GALLONS	REA
PHENOL	F01	000108-95-2	6,702,000	950,000	POUNDS	REA
ASBESTOS	G01	001332-21-4	445,000	82,500	POUNDS	COT
PHTHALATE ESTERS	F15	F15000-00-0	299,000	40,000	POUNDS	REA
DYES	F24	F24000-00-0	72,000	11,000	POUNDS	REA
EPOXIDES	G12	G12000-00-0	93,000	29,000	POUNDS	REA

ICS NO.: 66259 SPENCER KELLOGG DIV. OF TEXTRON INC.
****
4201 GENESEE ST. CHEEKTOWAGA NY 14225

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
BIS(TRI-N-BUTYLTIN)OXIDE	C99	000056-35-9	1	4	POUNDS	REA
BENZOIC ACID	F12	000065-85-0	4,000	580	POUNDS	REA
4,4'-ISOPROPYLIDENEDIPHENOL	F99	000080-05-7	6,000	1,190	POUNDS	REA
PHTHALIC ANHYDRIDE	F14	000085-44-9	2,000	249	POUNDS	REA
4,4'-BUTYLIDENE BIS(6-TERT-BUTYL-M-CRESOL)	F99	000085-60-9	5,000	960	POUNDS	HAS
ETHYLBENZENE	D06	000100-41-4	1,000	180	GALLONS	HAS
DIPHENYLMETHANE DIISOCYANATE (ASS. P,P' ISOMER?)	F99	000101-68-8	3,000	2,240	POUNDS	REA
P,P'-METHYLENE DIANILINE	F27	000101-77-9	500	295	POUNDS	HAS
ACRYLONITRILE	G03	000107-13-1	0	5	GALLONS	REA
MALEIC ANHYDRIDE	G10	000108-31-6	1,000	455	POUNDS	REA
TOLUENE	D02	000108-88-3	15,000	400	GALLONS	HAS
DIOCTYL PHTHALATE	F15	000117-84-0	22	535	POUNDS	HAS
ISOPHTHALIC ACID	F13	000121-91-5	20,000	4,500	POUNDS	REA
2,6-BIS(1,1-DIMETHYLETHYL)-4-METHYLPHENOL	F99	000128-37-0	1,000	190	POUNDS	HAS
COPPER PHTHALOCYANINE BLUE	F24	000147-14-8	10	23	POUNDS	HAS
TRIMELLITIC ANHYDRIDE	F99	000552-30-7	2,500	410	POUNDS	REA
DIBUTYLTINDICHLORIDE	H05	000683-18-1	50	55	POUNDS	NLU
XYLENE	D03	001330-20-7	20,000	1,200	GALLONS	HAS
DIPHENYL DECYL PHOSPHITE	F99	003287-06-7	250	160	POUNDS	HAS
DODECYLGUANIDINE HYDROCHLORIDE	C99	013590-97-1	1	11	POUNDS	REA
DICHLOROETHYLENE	A11	025323-30-2	2,000	126	POUNDS	HAS
TOLUENE DIISOCYANATE	F10	026471-62-5	12,000	2,245	GALLONS	REA
AROMATIC HYDROCARBON MIXTURE	D99	D99000-00-0	500	70	GALLONS	HAS
ALIZARIN GREEN	F24	F24000-00-0	0	6	POUNDS	NLU

ICS NO.: 77661 ST. REGIS PAPER CO.
****
1110 MILITARY RD. BUFFALO NY 14217

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
TRICHLORETHANE	A07	000071-55-6	320	30	GALLONS	CLN
XYLENE	D03	001330-20-7	20	4	GALLONS	BAS
PRINTING INKS	F24	F24000-00-0	27,000	6,000	POUNDS	COT
SPRAY ON ADHESIVE	G17	G17000-00-0	30,000	2,000	POUNDS	COT

ICS NO.: 77066 TRULY MAGIC PRODUCTS, INC.
****
1740 BAILEY AVE. BUFFALO NY 14211

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
MEK	K02	000078-93-3	1,650	220	GALLONS	BAS
TOLUENE	D02	000108-88-3	1,320	220	GALLONS	BAS

ICS NO.: 66361 UNION CARBIDE CORP (CARBON PRODUCTS DIV)
****
3625 HIGHLAND AVE. NIAGARA FALLS NY 14302

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
DOWICIDE "A" 20% SOLUTION	B07	000136-32-3	860	100	GALLONS	BAS
COAL TAR	E01	0X8007-45-2	144,000	36,000	GALLONS	BAS
PETROLEUM TAR	E02	E02000-00-0	32,000,000	2,000,000	POUNDS	BAS

ICS NO.: 77614 UNION CARBIDE CORP (LINDE DIV) (TONAWANDA PLT)
****
EAST PARK DRIVE & WO TONAWANDA NY 14150

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
1,1,1-TRICHLORETHANE	A07	000071-55-6	10,000	700	GALLONS	CLN
NAPHTHALENE	D05	000091-20-3	110	55	GALLONS	BAS
TOLUENE	D02	000108-88-3	110	55	GALLONS	BAS
XYLENE	D03	001330-20-7	600	250	GALLONS	BAS
UCON/FREON/GENATRON	A05	A05000-00-0	800	200	POUNDS	CLO
LACQUER THINNER 330-145	G26	G26000-00-0	700	110	GALLONS	BAS

ICS NO.: 77179 WAGNER FOLDING BOX CORP.
****
P.O. BOX 1028 BUFFALO NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
SOLVOSOL 5	T99	T99000-00-0	220	55	GALLONS	BAS
SOLVENT 100	T99	T99000-00-0	220	55	GALLONS	BAS
ROSOS-G-77-V-COMB	T99	T99000-00-0	180	30	GALLONS	BAS

ICS NO.: 77806 WESTINGHOUSE ELECTRIC CORP (MOTOR & CONTROL DIVISION PLT)
****
4454 GENESEE ST CHEEKTOWAGA NY 14240

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
1,1,1-TRICHLOROETHANE	A07	000071-55-6	14,684	3,880	GALLONS	CLN
METHYL CHLORIDE	A01	000074-87-3	55	55	GALLONS	CLN
METHYLENE CHLORIDE	A02	000075-09-2	1,485	330	GALLONS	BAS
TRICHLOROETHYLENE	A12	000079-01-6	0	0	GALLONS	NLU
TOLUENE	D02	000108-88-3	16,273	741	GALLONS	BAS
XYLENE	D03	001330-20-7	14,092	5,557	GALLONS	BAS
ASBESTOS	G01	001332-21-4	4,590	1,835	POUNDS	CLO
FREON	A05	A05000-00-0	9,290	1,165	POUNDS	CLO
DYES AND ORGANIC PIGMENTS	F24	F24000-00-0	10	6	GALLONS	COT
AROMATIC ANHYRIDE	F99	F99000-00-0	0	0	GALLONS	NLU
PHENOLIC ALKYD VARNISH	F99	F99000-00-0	28,036	5,594	GALLONS	COT
EPOXIDES	G12	G12000-00-0	282,558	13,342	POUNDS	COT
METHYLENE GLYCOL MONOBUTYL	J02	J02000-00-0	330	55	GALLONS	COT
FURFURYL ALCOHOL COMPLEX	J99	J99000-00-0	12,000	294	POUNDS	REA
NONATHANE (R)	T99	T99000-00-0	550	55	GALLONS	UNK
CALGON SL70	T99	T99000-00-0	110	55	GALLONS	PES
CALGON 209	T99	T99000-00-0	10	2	GALLONS	PES
CALGON 212	T99	T99000-00-0	10	2	GALLONS	PES
AROMATIC 100	T99	T99000-00-0	5,500	495	GALLONS	BAS

ICS NO.: 77061 WESTWOOD PHARMACEUTICALS INC.
****
468 DEWITT ST. BUFFALO NY 14213

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
COAL TAR	E01	0X8007-45-2	13,200	3,960	POUNDS	BAS
DYES & ORGANIC PIGMENTS	F24	F24000-00-0	2,660	787	POUNDS	BAS

ICS NO.: 77620 WINFIELD INDUSTRIES INC
****
33 CLARENCE AVE. BUFFALO NY 14215

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
METHYLENE CHLORIDE	A02	000075-09-2	26,000	6,200	POUNDS	CLN
TRICHLORETHYLENE	A12	000079-01-6	9,900	660	POUNDS	CLN
TOLUENE	D02	000108-88-3	450	20	POUNDS	BAS
CHLORINATED ANILINE	B12	B12000-00-0	26,000	1,540	POUNDS	REA
METHYLENE DIANILINE (ISOMER?)	F99	F99000-00-0	400	42	POUNDS	REA

ICS NO.: 77621 WORTHINGTON COMPRESSORS INC.
****
45 ROBERTS AVE. BUFFALO NY 14206

SUBSTANCES OF CONCERN USED	CODE	CAS NO.	AVG.ANNUAL USE	AMOUNT ON HAND	UNITS	USECODE
FREON 22	A05	000075-45-6	625	200	POUNDS	CLO
ASBESTOS	G01	001332-21-4	200	40	POUNDS	CLO
COAL TAR	E01	008007-45-2	110	0	GALLONS	COT
MINERAL SPIRITS	G25	008032-32-4	2,750	440	GALLONS	BAS
TRICHLORETHANE	A08	025323-89-1	1,640	220	GALLONS	CLN
TAR (PITCH)	E99	E99000-00-0	2,000	110	GALLONS	COT
NAPHTHA	G25	G25000-00-0	385	55	GALLONS	BAS

APPENDIX D

Toxicity of Selected Compounds Identified in this Study

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Benzene	C_6H_6	71-43-2[f]	TLm 96: 100-10 ppm	Skin-rabbit		15 mg	24H open	Mild Irritation	
				Eye-rabbit		88 mg		Moderate Irritation	
				Oral-human	TDLo:	130 mg/kg		Central Nervous System	TLV (air): Cl 25 ppm
				Oral-human	LDLo:	50 mg/kg			OSHA std (air): TWA 10 ppm; Cl 25 ppm; Pk 50ppm/10M/8H
				Inhalation-human	LClo:	20,000 ppm	5M		
				Inhalation-human	TClo:	210 ppm		Blood	
				Inhalation-man	TCLo:	2,100 mg/m³	4YI	Carcinogenic	
				Oral-rat	LD50:	3,800 mg/kg			
				Inhalation-rat	LC50:	10,000 ppm	7H		NIOSH recm std (air): Cl 1 ppm/60M
				Intraperitoneal-rat	LDLo:	1,150 mg/kg			
				Oral-mouse	LD50:	4,700 mg/kg			
				Oral-mouse	TDLo:	1 mg/kg		Mutagenic	
				Intravenous-rabbit	LDLo:	88 mg/kg			
				Inhalation-mouse	LC50:	9,980 ppm			
				Skin-mouse	TDLo:	1,200 gm/kg	49WI	Neoplastic	
				Intraperitoneal-mouse	LD50:	468 mg/kg			
				Subcutaneous-mouse	TDLo:	2,700 mg/kg	13D (Preg.)	Teratogenic	
				Oral-dog	LDLo:	2,000 mg/kg			
				Inhalation-dog	LClo:	146,000 mg/m³			
				Inhalation-cat	LClo:	170,000 mg/m³			
				Intraperitoneal-guinea pig	LDlo:	527 mg/kg			
				Subcutaneous-frog	LDLo:	1,400 mg/kg			
				Inhalation-mammal	LClo:	20,000 ppm	5M		
Benzene, Chloro-	C_6H_5Cl	108-90-7[f]	TLm 96:100-1ppm	Oral-rat	LD50:	2,910 mg/kg			TLV (air): 75 ppm
				Subcutaneous-rat	LDLo:	7,000 mg/kg			OSHA std (air): TWA 75 ppm
				Oral-rabbit	LD50:	2,830 mg/kg			
				Intraperitoneal-rat	LDLo:	7,400 mg/kg			
				Intraperitoneal-guinea pig	LDL[illegible]:	4,100 mg/kg			
				Inhalation-mouse	LClo:	15 gm/m³			

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data: Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Benzene, 1,2-dichloro-	$C_6H_4Cl_2$	95-50-1[f]		Oral-human	LDLo:	500 mg/kg			TLV (air): 50 ppm
				Oral-rat	LD50:	500 mg/kg			
				Inhalation-rat	LCLo:	821 ppm	7H		OSHA std (air): CI 50 ppm
				Intraperitoneal-rat	LD50:	840 mg/kg			
				Intravenous-mouse	LDLo:	400 mg/kg			
				Oral-rabbit	LD50:	500 mg/kg			
				Intravenous-rabbit	LDLo:	250 mg/kg			
				Oral-guinea pig	LDLo:	2,000 mg/kg			
				Inhalation-guinea pig	LCLo:	800 ppm	24H		
				Eye-rabbit		100 mg	30 sec.	Mild Irritation	
Benzene, 1,4-dichloro-	$C_6H_4Cl_2$	106-46-7[f]		Oral-human	LDLo:	500 mg/kg			TLV (air): 75 ppm
				Oral-human	TDLo:	300 mg/kg		Systemic	OSHA std (air): TWA 75 ppm
				Eye-human		80 ppm		Irritation	
				Oral-rat	LD50:	500 mg/kg			
				Intraperitoneal-rat	LD50:	2,562 mg/kg			
				Oral-mouse	LD50:	2,950 mg/kg			
				Subcutaneous-mouse	LD50:	5,145 mg/kg			
				Oral-guinea pig	LDLo:	2,800 mg/kg			
Benzene, Ethyl-	C_8H_{10}	100-41-4[f]	TLm 96:100-10 ppm	Inhalation-human	TCLo:	100 ppm	8H	Irritant	TLV (air): 100 ppm
				Oral-rat	LD50:	3,500 mg/kg			
				Inhalation-rat	LCLo:	4,000 ppm	4H		OSHA std (air):
				Skin-rabbit	LD50:	5,000 mg/kg			TWA 100 ppm (skin)
				Inhalation-guinea pig	LCLo:	10,000 ppm			
				Skin-rabbit		15 mg	24H open	Mild Irritation	
				Eye-rabbit		100 mg		Irritation	
Benzene, 1,2,4-trichloro-	$C_6H_3Cl_3$	120-82-1[f]	TLm 96: 10-1 ppm	Oral-rat	LD50:	756 mg/kg			TLV (air): 5 ppm
				Oral-mouse	LD50:	766 mg/kg			
				Intraperitoneal-mouse	LDLo:	500 mg/kg			
1,3-Butadiene, Hexachloro-	C_4Cl_6	87-68-3[f]		Oral-rat	LD50:	90 mg/kg			
				Oral-rat	TDLo:	15 gm/kg	2YC	Carcinogenic	
				Intraperitoneal-rat	TDLo:	175 mg/kg			
				Oral-mouse	LD50:	110 mg/kg			
				Inhalation-mouse	LCLo:	235 ppm	4H		
				Intraperitoneal-mouse	LD50:	76 mg/kg			
				Oral-guinea pig	LD50:	90 mg/kg			
				Unreported-mammal	LD50:	200 mg/kg			

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Carbon Tetrachloride	CCl_4	56-23-5[f]	TLM 96: 100-10 ppm	Skin-rabbit		4 mg	Mild Irritation		TLV (air): 10 ppm (skin) OSHA std (air): TWA 10 ppm; CL 25; pk 200/5M/4H NIOSH recm std (air): CL 2ppm/60M
				Eye-rabbit		2,200 ug	30 sec	Mild Irritation	
				Eye-rabbit		500 mg	24H	Severe Irritation	
				Skin-Guinea pig		800 mg	24H	Moderate Irritation	
				Oral-human	LDLo:	43 mg/kg			
				Oral-woman		1,800 mg/kg		Systemic	
				Inhalation-human	TCLo:	20 ppm		Central Nervous System	
				Oral-woman	TDLO:	1,800 mg/kg		Pulmonary System	
				Oral-man	TDLO:	1,700 mg/kg		Central Nervous System	
				Inhalation-human	LCLo:	1,000 ppm			
				Inhalation-human	TCLO:	317 ppm	30M	Gastrointestinal Tract	
				Oral-rat	LD50:	2,800 mg/kg			
				Inhalation-rat	LCLo:	4,000 ppm	4H		
				Inhalation-rat	TCLO:	300 ppm	6-15D (Preg)	Teratogenic	
				Skin-rat	LD50:	5,070 mg/kg			
				Intraperitoneal-rat	LD50:	1,500 mg/kg			
				Subcutaneous-rat	TDLo:	133 gm/kg	25WI	Neoplastic	
				Oral-mouse	LD50:	12,800 mg/kg			
				Oral-mouse	TDLo:	4,800 mg/kg	68WI	Carcinogenic	
				Inhalation-mouse	LC50:	9,526 ppm	8H		
				Intraperitoneal-mouse	LD50:	4,675 mg/kg			
				Subcutaneous-mouse	LDLo:	12 gm/kg			
				Oral-dog	LDLo:	1,000 mg/kg			
				Intraperitoneal-dog	LD50:	1,500 mg/kg			
				Intravenous-dog	LDLo:	125 mg/kg			
				Inhalation-cat	LClo:	38,110 ppm	2H		

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data: Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Carbon Tetrachloride (cont'd)				Subcutaneous-cat	LDLo:	300 mg/kg			
				Oral-rabbit	LD50:	6,380 mg/kg			
				Intraperitoneal-rabbit	LDLo:	478 mg/kg			
				Subcutaneous-rabbit	LDLo:	3,000 mg/kg			
				Intravenous-rabbit	LD50:	5,840 mg/kg			
				Inhalation-guinea-pig	LCLo:	20,000 ppm	2H		
				Oral-hamster	TDLo:	3,680 mg/kg	30WI	Carcinogenic	
				Inhalation-frog	LCLo:	58,000 mg/m3			
				Inhalation-mammal	LCLo:	50,000 ppm	5M		
Chloroform (Trichloromethane)	$CHCl_3$	67-66-3[f]	TLm 96: 100-10 ppm	Oral-human	LDLo:	140 mg/kg			TLV (air): 25 ppm
				Inhalation-human	TCLo:	1,000 mg/m^3	1Y	Systemic	
				Inhalation-human	TCLo:	5,000 mg/m^3	7M	Central Nervous System	OSHA std (air): TWA 50 ppm
				Oral-rat	LD50:	800 mg/kg			
				Oral-rat	TDLo:	70 gm/kg	78WI	Neoplastic	NIOSH recm std (air): Cl 2 ppm/60M
				Inhalation-rat	LCLo:	8,000 ppm	4H		
				Inhalation-rat	TCLo:	100 ppm	7H/6-15D (Preg)	Teratogenic	
				Oral-mouse	LD50:	1,120 mg/kg			
				Oral-mouse	TDLo:	18 gm/kg	120DI	Carcinogenic	
				Inhalation-mouse	LC50:	28 gm/m^3			
				Intraperitoneal-mouse	LD50:	1,671 mg/kg			
				Subcutaneous-mouse	LD50:	704 mg/kg			
				Oral-dog	LDLo:	1,000 mg/kg			
				Inhalation-dog	LC50:	100 gm/m^3			
				Intraperitoneal-dog	LD50:	1,000 mg/kg			
				Intravenous-dog	LDLo:	75 mg/kg			
				Inhalation-cat	LCLo:	35,000 mg/m^3	4H		
				Oral-rabbit	LDLo:	500 mg/kg			
				Inhalation-rabbit	LC50:	59 gm/m^3			
				Subcutaneous-rabbit	LDLo:	3,000 mg/kg			
				Inhalation-guinea pig	LCLo:	20,000 ppm	2H		
				Inhalation-frog	LCLo:	6,000 mg/m^3			
				Inhalation-mammal	LCLo:	25,000 ppm	5M		
				Skin-rabbit		10 mg	24H open	Mild Irritation	
				Eye-rabbit		148 mg		Irritation	

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data: Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Cyclohexane, 1,2,3,4,5,6-Hexachloro-, alpha-isomer	$C_6H_6Cl_6$	319-84-6[f]		Oral-rat	LD50:	177 mg/kg			
				Oral-rat	TDLo:	17 gm/kg	48WC	Carcinogenic	
				Oral-mouse	TDLo:	8,350 mg/kg	24WC	Carcinogenic	
				Oral-mouse	TDLo:	16 gm/kg	24WC	Carcinogenic	
Cyclohexane, 1,2,3,4,5,6-Hexachloro-, beta-isomer	$C_6H_6Cl_6$	319-85-7[f]		Oral-rat	LD50:	6,000 mg/kg			
				Oral-mouse	TDLo:	29 gm/kg	2YC	Carcinogenic	
Cyclohexane, 1,2,3,4,5, 6-Hexachloro-, delta-isomer	$C_6H_6Cl_6$	319-86-8[f]		Oral-rat	LD50:	1,000 mg/kg			
Cyclohexane, 1,2,3,4,5,6-Hexachloro-, gamma-isomer (Lindane)	$C_6H_6Cl_6$	58-89-9[f]	TLm 96: under 1 ppm	Oral-child	LDLo:	180 mg/kg			TLV (air): 0.5 mg/m³
				Oral-child	TDLo:	111 mg/kg		Systemic	
				Oral-rat	LD50:	76 mg/kg			
				Skin-rat	LD50:	500 mg/kg			OSHA std (air):
				Intraperitoneal-rat	LDLo:	35 mg/kg			TWA 500 µg/m³
				Oral-mouse	LD50:	86 mg/kg			(skin)
				Oral-mouse	TDLo:	29 gm/kg	52WC	Carcinogenic	
				Intraperitoneal-mouse	LDLo:	75 mg/kg			
				Oral-dog	LD50:	40 mg/kg			
				Intravenous-dog	LDLo:	8 mg/kg			
				Oral-rabbit	LD50:	60 mg/kg			
				Skin-rabbit	LD50:	50 mg/kg			
				Intravenous-rabbit	LDLo:	4,500 ug/kg			
				Oral-guinea pig	LD50:	127 mg/kg			
				Oral-hamster	LD50:	360 mg/kg			
				Oral-bird, wild	LDLo:	100 mg/kg			
				Intramuscular-bird, wild	LDLo:	26 mg/kg			
Ethane, 1,2-Dichloro- (Ethylene Dichloride)	$C_2H_4Cl_2$	107-06-2[f]	TLm 96: 1,000-100 ppm	Inhalation-human	TCLo:	4,000 ppm	H	Central Nervous System	TLV (air): 50 ppm
				Oral-human	TDLo:	428 mg/kg		Gastro-intestinal tract	OSHA std (air): TWA 50 ppm; Cl 100; PK 200/5M/3H
				Oral-man	LDLo:	810 mg/kg			
				Oral-human	LDLo:	500 mg/kg			
				Oral-rat	LD50:	12 µg/kg			

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data: Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Ethane, 1,2-Dichloro- (cont'd)				Inhalation-rat	LCLo:	1,000 ppm	4H		
				Intraperitoneal-rat	LD50:	74 μg/kg			
				Subcutaneous-rat	LDLo:	500 mg/kg			
				Oral-mouse	LDLo:	600 mg/kg			NIOSH recm std (air):
				Inhalation-mouse	LCLo:	5,000 mg/m^3	2H		TWA 1 ppm;
				Intraperitoneal-mouse	LD50:	40 μg/kg			CI 2 ppm/15M
				Subcutaneous-mouse	LDLo:	380 mg/kg			
				Oral-dog	LDLo:	2,000 mg/kg			
				Intravenous-dog	LDLo:	175 mg/kg			
				Oral-rabbit	LD50:	860 mg/kg			
				Inhalation-rabbit	LCLo:	3,000 ppm	7H		
				Subcutaneous-rabbit	LDLo:	1,200 mg/kg			
				Inhalation-pig	LCLo:	3,000 ppm	7H		
				Inhalation-guinea pig	LCLo:	1,500 ppm	7H		
				Intraperitoneal-guinea pig	LDLo:	600 mg/kg			
				Skin-rabbit		625 mg	open	Mild Irritation	
				Eye-rabbit		63 mg		Severe Irritation	
				Oral-rat	TDLo:	26 gm/kg	78WI	Carcinogenic	
				Oral-mouse	TDLo:	81 gm/kg	78WI	Carcinogenic	
Ethane, Hexachloro-	C_2Cl_6	67-72-1[f]		Oral-human	LDLo:	50 mg/kg			TLV (air): 1 ppm (skin)
				Oral-rat	LD50:	6,000 mg/kg			
				Intraperitoneal-mouse	LD50:	4,500 mg/kg			
				Intravenous-dog	LDLo:	325 mg/kg			OSHA std (air):
				Subcutaneous-rabbit	LDLo:	4,000 mg/kg			1 ppm (skin)
Ethane, 1,1,2,2-tetrachloro-	$C_2H_2Cl_4$	79-34-5[f]		Oral-human	TLDO:	30 mg/kg		Central Nervous System	OSHA std (air): TWA 5 ppm (skin)
				Oral-human	LDLo:	50 mg/kg			
				Inhalation-human	TCLo:	1,000 mg/m^3	30M	Central Nervous System	NIOSH recm std (air): TWA 1 ppm
				Inhalation-rat	LCLo:	1,000 ppm	4H		
				Oral-mouse	TDLo:	58 gm/kg	56WC	Carcinogenic	
				Inhalation-mouse	LCLo:	9,000 mg/m^3	40M		
				Intraperitoneal-mouse	LDLo:	30 mg/kg			
				Oral-dog	LDLo:	300 mg/kg			
				Intravenous-dog	LDLo:	50 mg/kg			
				Inhalation-cat	LCLo:	19,000 mg/m^3	45M		
				Subcutaneous-rabbit	LDLo:	500 mg/kg			

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data: Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Ethane, 1,1,2-Trichloro-	$C_2H_3Cl_3$	79-00-5[f]	TLm: 96: 100-10 ppm	Oral-[illegible]	LDLo:	50 mg/kg			OSHA std (air): TWA 10 ppm (skin)
				Oral-rat	LD50:	1,140 mg/kg			
				Inhalation-rat	LCLo:	500 ppm	8H		TLV (air): 10 ppm (skin)
				Intraperitoneal-mouse	LD50:	994 mg/kg			
				Subcutaneous-mouse	LD50:	227 mg/kg			
				Oral-dog	LDLo:	500 mg/kg			
				Intraperitoneal-dog	LDLo:	450 mg/kg			
				Intraveneous-dog	LDLo:	95 mg/kg			
				Subcutaneous-rabbit	LDLo:	500 mg/kg			
				Skin-rabbit		500 mg	open	Mild Irritation	
				Skin-guinea pig		1,440 mg	15M	Irritation	
				Inhalation-cat	LCLo:	13,100 mg/m^3	4.5H		
Ethene, 1,1-dichloro- (1,1-Dichloroethylene)	$C_2H_2Cl_2$	75-35-4[f]	TLm 96: 1,000-100 ppm	Inhalation-human	TCLo:	25 ppm		Systemic	TLV (air): 10 ppm
				Oral-rat	LD50:	200 mg/kg			
				Inhalation-rat	LCLo:	10,000 ppm	24H		
				Inhalation-rat	TCLo:	55 ppm	6H/52WI	Neoplastic	NIOSH recm std (air): TWA 1 ppm; CI 5ppm/15M
				Inhalation-rat	TCLo:	55 ppm	6H/1YI	Equivocal Tumorigenic Agent	
				Oral-dog	LDLo:	5,750 mg/kg			
				Intravenous-dog	LDLo:	225 mg/kg			
				Subcutaneous-rabbit	LDLo:	3,700 mg/kg			
				Inhalation-mouse	LC50:	98 ppm	22H		
				Inhalation-mouse	TCLo:	55 ppm	6H/1YI	Equivocal Tumorigenic Agent	
Ethylene, Chloro- (Vinyl Chloride)	C_2H_3Cl	75-01-4[f]	TLm 96: over 1,000 ppm	Inhalation-man	TCLo:	500 ppm	4YI	Carcinogenic	TLV (air): 200 ppm
				Oral-rat	LD50:	500 mg/kg			
				Oral-rat	TDLo:	11 gm/kg	136WI	Carcinogenic	OSHA std (air): TWA 1 ppm; CI 5 ppm/15M
				Inhalation-rat	TCLo:	250 ppm	4H/130WI	Carcinogenic	
				Inhalation-rat	TCLo:	6,000 ppm	4H/12-13D (Preg)	Carcinogenic	
				Inhalation-mouse	TCLo:	250 ppm	35 WI	Carcinogenic	NIOSH recm std (air): TWA 1 ppm; CI 5 ppm/15M
				Inhalation-hamster	TCLo:	500 ppm	4H/30W-I	Carcinogenic	
				Inhalation-rat	TCLo:	6,000 ppm	4H/12-18D (Preg)	Neoplastic	
				Inhalation-rat	TCLo:	250 ppm	39WI	Carcinogenic	
				Inhalation-mouse	TCLo:	50 ppm	6H/12WI	Carcinogenic	
				Oral-rat	TDLo:	34 gm/kg	136WI	Carcinogenic	

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data: Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Ethylene, 1,2-Dichloro-(E)-	$C_2H_2Cl_2$	156-60-5[f]		Inhalation-human	TCLo:	4,800 mg/m^3	10M	Central Nervous System	
				Inhalation-mouse	LCLo:	75,000 mg/m^3	2H		
				Inhalation-cat	LCLo:	43,000 mg/m^3	6H		
Ethylene, Tetra-chloro- (Tetra-chloroethene)	C_2Cl_4	127-18-4[f]	TLm 96: 100-10 ppm	Inhalation-human	TCLo:	200 ppm		Systemic	OSHA std (air):
				Oral-human	LDLo:	500 mg/kg			TWA 100 ppm;
				Inhalation-man	TCLo:	280 ppm	2H	Eye	CI 200;
				Inhalation-man	TCLo:	600 ppm	10H	Central Nervous System	PK 300/5M/3H
									NIOSH recm std (air):
				Inhalation-rat	LCLo:	4,000 ppm	4H		TWA 50 ppm;
				Oral mouse	LD50:	8,850 mg/kg			CI 100 ppm/15M
				Inhalation-mouse	LCLo:	23,000 mg/m^3	2H		
				Intraperitoneal-mouse	LD50:	5,671 mg/kg			
				Oral-dog	LDLo:	4,000 mg/kg			
				Intraperitoneal-dog	LD50:	2,100 mg/kg			
				Intravenous-dog	LDLo:	85 mg/kg			
				Oral-cat	LDLo:	4,000 mg/kg			
				Oral-rabbit	LDLo:	5,000 mg/kg			
				Subcutaneous-rabbit	LDLo:	2,200 mg/kg			
				Oral-mouse	TDLo:	86 gm/kg	41WC	Carcinogenic	
Ethylene, Trichloro- (Trichloroethene)	C_2HCl_3	79-01-6[f]	TLm 96: 1,000-100 ppm	Oral-human	LDLo:	50 mg/kg			TLV (air): 100 ppm
				Inhalation-human	TCLo:	6,900 mg/m^3	10M	Central Nervous System	OSHA std (air): TWA 100 ppm; CI 200;
				Inhalation-human	TCLo:	160 ppm	83M	Central Nervous System	PK 300/5M/2H
				Inhalation-man	TCLo:	110 ppm	8H	Irritant	NIOSH recm std (air):
				Oral-rat	LD50:	4,920 mg/kg			TWA 100 ppm;
				Inhalation-rat	LCLo:	8,000 ppm	4H		CI 150 ppm/10M
				Oral-mouse	TDLo:	135 gm/kg	27WI	Carcinogenic	
				Inhalation-mouse	LCLO:	3,000 ppm	2H		
				Intravenous-mouse	LD50:	34 mg/kg			
				Oral-dog	LDLo:	5,860 mg/kg			
				Intraperitoneal-dog	LD50:	1,900 mg/kg			
				Intravenous-dog	LDLo:	150 mg/kg			
				Subcutaneous-rabbit	LDLo:	1,800 mg/kg			
				Oral-cat	LDLo:	5,864 mg/kg			

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data					Exposure Limits[e]
				Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	
Ethylene, Trichloro- (Trichloroethene) (cont'd)				Skin-rabbit		500 mg	24H	Severe Irritation	
				Eye-rabbit		20 mg	24H	Severe Irritation	
				Oral-human	LDLo:	7 gm/kg			
				Inhalation-human	TDLo:	812 mg/kg		Systemic	
				Inhalation-man	LCLo:	2,900 ppm			
				Intraperitoneal-mouse	LD50:	3,000 mg/kg			
				Subcutaneous-dog	LDLo:	150 mg/kg			
				Oral-rabbit	LDLo:	7,330 mg/kg			
Methane, Chloro- (Methyl Chloride)	CH_3Cl	74-87-3[f]	Tlm 96: over 1,000 ppm	Inhalation-rat	LC50:	152,000 mg/m^3	30H		TLV (air): 100 ppm
				Inhalation-mouse	LC50:	3,146 ppm	7H		
				Inhalation-dog	LCLo:	15,000 ppm	7H		OSHA std (air): TWA 100 ppm Cl 200; PK 300/5M/3H
				Inhalation-cat	LCLo:	128,700 mg/m^3	4H		
				Inhalation-guinea pig	LCLo:	20,000 ppm	2H		
Methane, Dichloro- (Methylene Chloride)	CH_2Cl_2	75-09-2[f]	Tlm 96: 1,000-100 ppm	Inhalation-human	TCLo:	500 ppm	1YI	Central Nervous System	TLV (air): 200 ppm
				Oral-human	LDLo:	500 mg/kg			OSHA std (air): TWA 500 ppm; Cl 1,000; PK 2,000/5M/2H
				Inhalation-human	TCLo:	500 ppm	8H	Blood	
				Oral-rat	LD50:	167 mg/kg			
				Inhalation-rat	LC50:	88,000 mg/m^3	30M		NIOSH recm std (air). TWA 75 ppm; PK 500 ppm/15M
				Inhalation-mouse	LC50:	14,400 ppm	7H		
				Intraperitoneal-mouse	LD50:	1,500 mg/kg			
				Subcutaneous-mouse	LD50:	6,460 mg/kg			
				Oral-dog	LDLo:	3,000 mg/kg			
				Inhalation-dog	LCLo:	20,000 ppm	7H		
				Intraperitoneal-dog	LDLo:	950 mg/kg			
				Subcutaneous-dog	LDLo:	2,700 mg/kg			
				Intravenous-dog	LDLo:	200 mg/kg			
				Inhalation-cat	LCLo:	43,400 mg/m^3	4 5H		
				Oral-rabbit	LDLo:	1,900 mg/kg			
				Subcutaneous-rabbit	LDLo:	2,700 mg/kg			
				Inhalation-guinea pig	LCLo:	5,000 ppm	2H		
Methane, Trichlorofluoro-	CCl_3F	75-69-4[f]		Inhalation-rat	LCLo:	10 ppm	20M		TLV (air): 1000 ppm
				Intraperitoneal-mouse	LD50:	1,743 mg/kg			OSHA std (air): TWA 1,000 ppm

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data: Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	Exposure Limits[e]
Phenol	C_6H_6O	108-95-2[f]	TLm 96: 100-10 ppm	Skin-rabbit		500 mg	24H	Severe Irritation	TLV (air): 5 ppm (skin)
				Skin-rabbit		535 mg	open	Severe Irritation	
				Eye-rabbit		5 mg		Severe Irritation	OSHA std (air): TWA 5 ppm (skin)
				Oral-human	LDLo:	140 mg/kg			
				Oral-rat	LD50:	414 mg/kg			
				Skin-rat	LD50:	669 mg/kg			
				Intraperitoneal-rat	LD50:	250 mg/kg			NIOSH recm std (air): TWA 20 mg/m³; CI 60 mg/m³/15M
				Subcutaneous-rat	LDLo:	650 mg/kg			
				Oral-mouse	LD50:	300 mg/kg			
				Skin-mouse	TDLo:	4,000 mg/kg	20WI	Carcinogenic	
				Intraperitoneal-mouse	LD50:	360 mg/kg			
				Subcutaneous-mouse	LD50:	344 mg/kg			
				Intravenous-mouse	LD50:	112 mg/kg			
				Oral-dog	LDLo:	500 mg/kg			
				Parenteral-dog	LDLo:	2,000 mg/kg			
				Oral-cat	LDLo:	80 mg/kg			
				Subcutaneous-cat	LDLo:	80 mg/kg			
				Parenteral-cat	LDLo:	500 mg/kg			
				Oral-rabbit	LDLo:	420 mg/kg			
				Skin-rabbit	LD50:	850 mg/kg			
				Intraperitoneal-rabbit	LDLo:	620 mg/kg			
				Subcutaneous-rabbit	LDLo:	620 mg/kg			
				Intravenous-rabbit	LDLo:	180 mg/kg			
				Parenteral-rabbit	LDLo:	300 mg/kg			
				Intraperitoneal-guinea pig	LDLo:	300 mg/kg			
				Subcutaneous-guinea pig	LDLo:	450 mg/kg			
				Subcutaneous-frog	LDLo:	75 mg/kg			
				Parenteral-frog	LDLo:	290 mg/kg			
				Subcutaneous-frog	LDLo:	790 mg/kg			
Phenol, o-Chloro-	C_6H_5ClO	95-57-8[f]		Oral-rat	LD50:	670 mg/kg			
				Intraperitoneal-rat	LD50:	230 mg/kg			
				Subcutaneous-rat	LD50:	950 mg/kg			
				Oral-mouse	LD50:	670 mg/kg			
				Skin-mouse	TDLo:	4,800 mg/kg	12WI	Neoplastic	
				Subcutaneous-rabbit	LDLo:	950 mg/kg			
				Intravenous-rabbit	LDLo:	120 mg/kg			
				Subcutaneous-guinea pig	LDLo:	800 mg/kg			
				Subcutaneous-frog	LDLo:	400 mg/kg			
				Oral-mammal	LD50:	440 mg/kg			

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data						Exposure Limits[e]
				Route of Entry	Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	
Phenol, 2-,4-Dichloro-	$C_6H_4Cl_2O$	120-83-2[f]		Oral	rat	LDLo:	580 mg/kg			
				Intraperitoneal	rat	LD50:	430 mg/kg			
				Subcutaneous	rat	LD50:	1,730 mg/kg			
				Oral	mouse	LD50:	1,600 mg/kg			
				Skin	mouse	TDLo:	312 mg/kg	39WI	Carcinogenic	
Phenol, Pentachloro-	C_6HCl_5O	87-86-5[f]		Skin	rabbit		10 mg	24H open	Mild Irritation	TLV (air): 0.5 mg/m³ (skin)
				Oral	human	LDLo:	29 mg/kg			
				Oral	man	TDLo:	196 mg/kg		Central Nervous System	OSHA std (air): TWA 500 µg/m³
				Oral	rat	TDLo:	60 mg/kg	9D (Preg)	Teratogenic	
				Oral	rat	LD50:	50 mg/kg			
				Inhalation	rat	LD50:	11,700 ug/kg			
				Skin	rat	LD50:	105 mg/kg			
				Intraperitoneal	rat	LD50:	56 mg/kg			
				Subcutaneous	rat	LD50:	100 mg/kg			
				Subcutaneous	mouse	TDLo:	46 mg/kg		Neoplastic	
				Subcutaneous	dog	LDLo:	135 mg/kg			
				Oral	rabbit	LDLo:	70 mg/kg			
				Skin	rabbit	LDLo:	40 mg/kg			
				Intraperitoneal	rabbit	LDLo:	135 mg/kg			
				Subcutaneous	rabbit	LDLo:	70 mg/kg			
Phthalic Acid, Bis (2-Ethylhexyl) Ester	$C_{24}H_{38}O_4$	117-81-7[f]		Eye	rabbit		500 mg		Irritation	OSHA std (air): TWA 5 mg/m³
				Oral	man	TDLo:	143 mg/kg		Gastro-intestinal Tract	
				Oral	rat	LD50:	31 gm/kg			
				Intraperitoneal	rat	LD50:	30,700 mg/kg			
				Intraperitoneal	rat	TDLo:	30 gm/kg	5-15D (Preg)	Tetratogenic	
				Intravenous	rat	LDLo:	300 mg/kg			
				Oral	mouse	LD50:	30 gm/kg			
				Oral	mouse	TDLo:	7,500 mg/kg	8D (Preg)	Teratogenic	
				Intraperitoneal	mouse	LD50:	14 gm/kg			
				Oral	rabbit	LD50:	34 gm/kg			
				Skin	rabbit	LD50:	25 gm/kg			
				Skin	guinea pig	LD50:	10 gm/kg			

Compound Name	Molecular Formula	Chemical Abstracts Service No.	Aquatic Toxicity[a]	Other Toxicity Data					Exposure Limits[e]
				Route of Entry - Species	Type of Dose[b]	Dose	Duration[c]	Effects[d]	
Phthalic Acid, Dibutyl Ester	$C_{16}H_{22}O_4$	84-74-2[f]	TLM 96: 1000-100 ppm	Oral-human	LDLo:	5,000 mg/kg			TLV (air): 5 mg/m³
				Oral-human	TDLo:	140 mg/kg		Eye	
				Oral-mouse	LD50:	12,000 mg/kg			OSHA std (air): TWA 5 mg/m³
				Intraperitoneal-rat	LD50:	3,050 mg/kg			
				Intraperitoneal-rat	TDLo:	874 mg/kg	5-15D (Preg)	Teratogenic	
Phthalic Acid, Diethyl Ester	$C_{12}H_{14}O_4$	84-66-2[f]		Eye-rabbit		112 mg		Irritation	TLV (air): 5 mg/m³
				Oral-human	LDLo:	500 mg/kg			
				Inhalation-human	TCLo:	1,000 mg/m³		Irritant	
				Intraperitonal-rat	LD50:	5,058 mg/kg			
				Intraperitoneal-rat	TDLo:	1,232 mg/kg	5-15D (Preg)	Teratogenic	
				Intraperitoneal-mouse	LD50:	2,749 mg/kg			
				Oral-rabbit	LDLo:	1,000 mg/kg			
				Intravenous-rabbit	LDLo:	100 mg/kg			
				Subcutaneous-guinea pig	LDLo:	3,000 mg/kg			
Toluene	C_7H_8	108-88-3[f]	TLm 96: 100-10 ppm	Eye-human		300 ppm		Irritation	TLV (air): 100 ppm (skin)
				Oral-human	LDLo:	50 mg/kg			
				Inhalation-human	TCLo:	200 ppm		Central Nervous System Psychotropic	OSHA std (air): TWA 200 ppm CL 300; PK 500/10M
				Inhalation-man	TCLo:	100 ppm			
				Oral-rat	LD50:	5,000 mg/kg			
				Inhalation-rat	LCLo:	4,000 ppm	4H		NIOSH recm std (air): TWA 100 ppm; CL 200 ppm/10M
				Intraperitoneal-rat	LDLo:	800 mg/kg			
				Inhalation-mouse	LC50:	5,320 ppm	8H		
				Skin-rabbit	LD50:	14 gm/kg			
				Skin-rabbit		435 mg		Mild Irritation	
				Eye-rabbit		870 µg		Mild Irritation	
				Subcutaneous-frog	LDLo:	920 mg/kg			
2,4-Xylenol (2,4-Dimethylphenol)	$C_8H_{10}O$	105-67-9[f]		Oral-rat	LD50:	3,200 mg/kg			
				Skin-rat	LD50:	1,040 mg/kg			
				Oral-mouse	LD50:	809 mg/kg			
				Skin-mouse	TDLo:	5,600 mg/kg	20WI	Carcinogenic	

a Aquatic Toxicity: TLm 96: 96-hour static or continuous flow standard protocol, in parts per million (ppm)

b Other Toxicity Data:

LD50	-	lethal dose 50% kill
LCLo	-	lowest published lethal concentration
LC50	-	lethal concentration 50% kill
LDLo	-	lowest published lethal dose
TDLo	-	lowest published toxic dose
TCLo	-	lowest published toxic concentration
TD	-	toxic dose

c Duration:

M	-	minute;
H	-	hour
D	-	day
W	-	week
Y	-	year
C	-	continuous
I	-	intermittent

d Exposure Limits:

NR	-	not reported
NIOSH	-	National Institute for Occupational Safety and Health
OSHA	-	Occupational Safety and Health Act of 1970
TWA	-	time-weighted average concentration
TLV	-	threshold limit value
Cl	-	ceiling
Pk	-	peak concentration

e Blood - Blood effects; effect on all blood elements, electrolytes, pH, protein, oxygen carrying or releasing capacity.
Carcinogenic - Carcinogenic effects; producing cancer, a cellular tumor the nature of which is fatal, or is associated with the formation of secondary tumors (metastasis).
Central Nervous System - Includes effects such as headaches, tremor, drowsiness, convulsions, hypnosis, anesthesia.
Eye - Irritation, diplopia, cataracts, eye ground, blindness by affecting the eye or the optic nerve.
Gastrointestinal - diarrhea, constipation, ulceration.
Irritant - Any irritant effect on the skin, eye or mucous membrane.
Mutagenic - Transmissible changes produced in the offspring.
Neoplastic - The production of tumors not clearly defined as carcinogenic.
Psychotropic - Exerting an effect upon the mind.
Pulmonary - Effects on respiration and respiratory pathology.
Systemic - Effects on the metabolic and excretory function of the liver or kidneys.
Teratogenic - Nontransmissible changes produced in the offspring.

f This chemical has been selected for priority attention as point source water effluent discharge toxic pollutant (NRDC vs Train consent decree)

Source: Stang, William J. (1979). "Pollutant Analyses Hooker Chemicals and Plastics Corporation Waste Disposal Sites Niagra Falls, New York." Environmental Protection Agency Office of Enforcement, National Enforcement Investigations Center, Denver, Colorado.