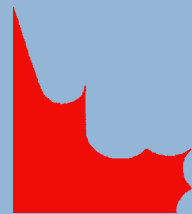


Liquid Assets — Monitoring Water Quality in Ontario



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Liquid Assets — Monitoring Water Quality in Ontario



December 2001

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Anne Mitchell
Executive Director
December 2001

1. Introduction

We want Ontario's children and grandchildren to inherit a province with clean air, land, and water.

Premier Mike Harris
February 7, 2001 News Release

Premier Harris' noble sentiment expressed last February raises a most serious question: how will we know if Ontario's air, land and water are clean? This question is the motivation for this study, particularly in light of the Executive Resource Group's January 2001 report to the Ontario government, *'Managing the Environment. A Review of Best Practices'*. ERG noted "...that the Ministry [of the Environment] has not been investing adequately in its monitoring program for the Great Lakes and associated watercourses... As well, MOE has not invested sufficiently in information portals to provide the private sector and the public with information on environmental quality compared to leading jurisdictions."¹ This study presents 'hard' information in support of this view.

We asked specific questions: Are the necessary environmental data being collected and evaluated? What is the state of the government's monitoring network? Are the results being communicated to the people of Ontario in a timely fashion? Are monitoring data used in any capacity, for example, to review the adequacy of current regulatory standards and develop improved standards? Is enforcement of current regulatory standards adequate? Is the provincial government capable of assessing the health of Ontario's aquatic environment?

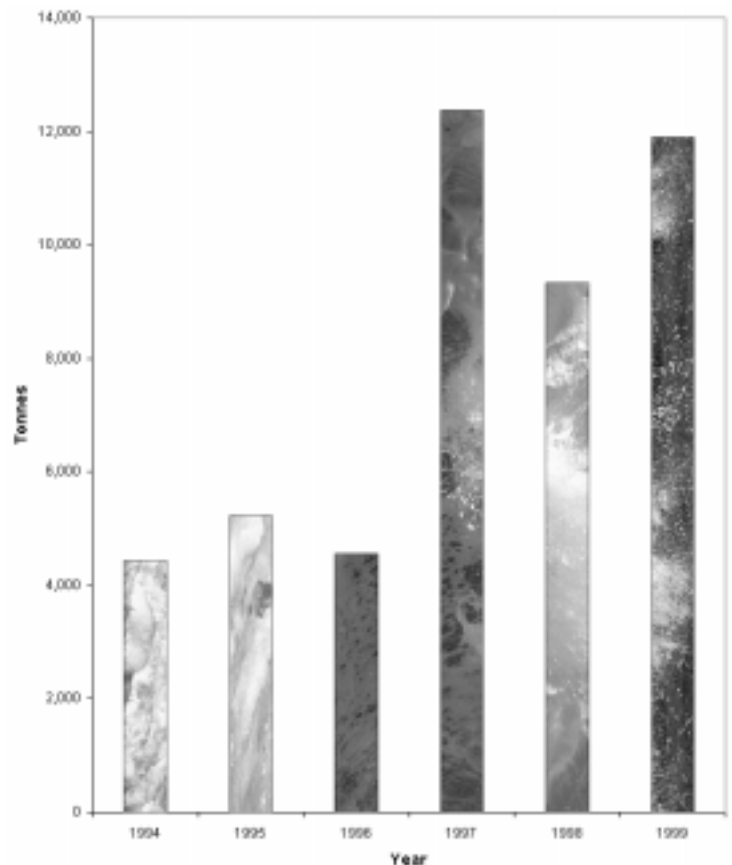
This brief study focuses on surface and ground waters but excludes drinking water because of the current Walkerton Inquiry into the *E.coli* contamination of the water supply in Walkerton, Ontario, and into the safety of Ontario's drinking water. This report is divided into sections dealing with pollution emissions, allocation of financial resources, enforcement, monitoring, reporting, ground waters and comparison to other jurisdictions. The primary focus is on the Ontario Ministry of the Environment (MOE) as the 'line' Ministry responsi-

ble for administering several relevant Acts. Several indicators are used to assess the capacity of the provincial government to monitor and evaluate the state of the environment and to enforce existing regulations.

2. Ontario Pollutant Discharges 1994-1999

Why do we need a monitoring system? Why do we need to continually measure pollution concentrations throughout the environment? Reports on pollutant releases to surface waters from direct discharges, spills and leaks in Ontario (PollutionWatch Scorecard: www.scorecard.org/pollutionwatch/npri) show that the total amount of pollutants released more than doubled between 1994 and 1999 (Figure 1). While some of the increase may be due to more stringent reporting requirements, there is certainly no evidence

Figure 1. Pollutant Discharges to Ontario Surface Waters



that we can relax our vigil, in fact, quite the opposite. Moreover, the pollutants reported to NPRI do not include human and animal fecal waste or pesticides in agricultural runoff. The quantities and the trend in pollutants released to Ontario's waterways means that we must have an effective pollution monitoring system in place to determine their concentrations and track their movement and impacts.

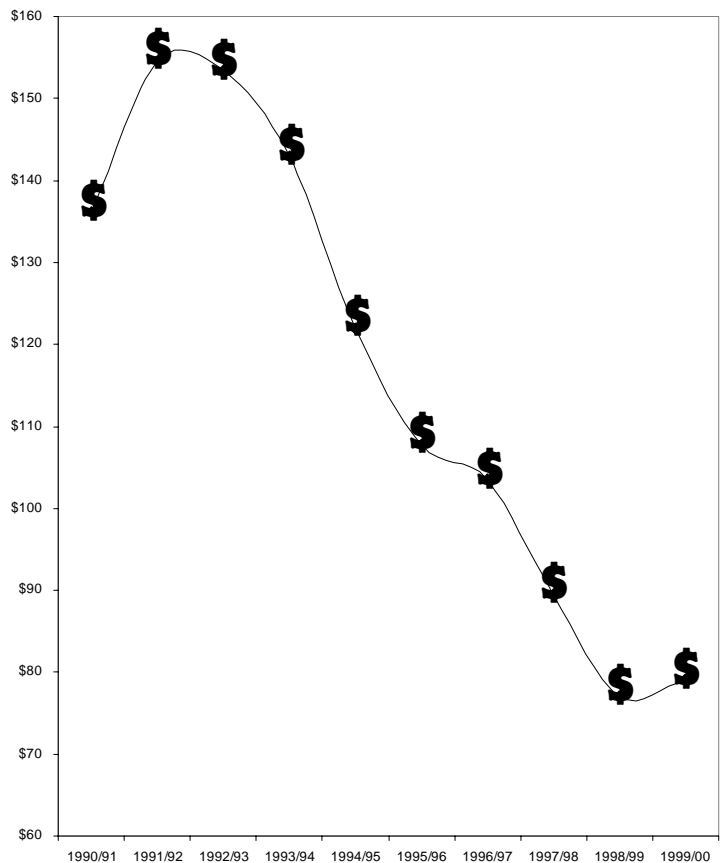
3. Trends in MOE Financial Resources

The discharge of MOE's primary responsibilities requires professional and technical personnel, as well as support staff. The amount of money allocated to 'Salaries and Wages' is a good measure of staffing levels as long as salaries do not change appreciably as was the case through most of the 1990's. Ministry financial data show a decline in staffing resources allocated to MOE (Figure 2²) over the 10 year period 1990/91-1999/00. The decline was due primarily to layoffs in 1995/96 and attrition before then (some salaries were moved to the Clean Water Agency in 1993 and reported separately). The trend in Salaries and Wages is in keeping with this government's generally parsimonious attitude towards the public sector. Note that while the decline in funding began at least 5 years before the election of the provincial Progressive Conservatives in 1995, it continued to erode into their second term of office which began in 1999. The amount of funding allocated to Salaries and Wages dropped 27% between 1995/96 and 1999/00 indicating a large drop in the number of professional and technical staff.

4. Enforcing Environmental Laws

Even if properly designed, policies are only effective if violations of environmental laws and regulations are minimal. Enforcement is traditionally used to encourage compliance. The provincial government usually

Figure 2. MOE Salaries & Wages (Millions)



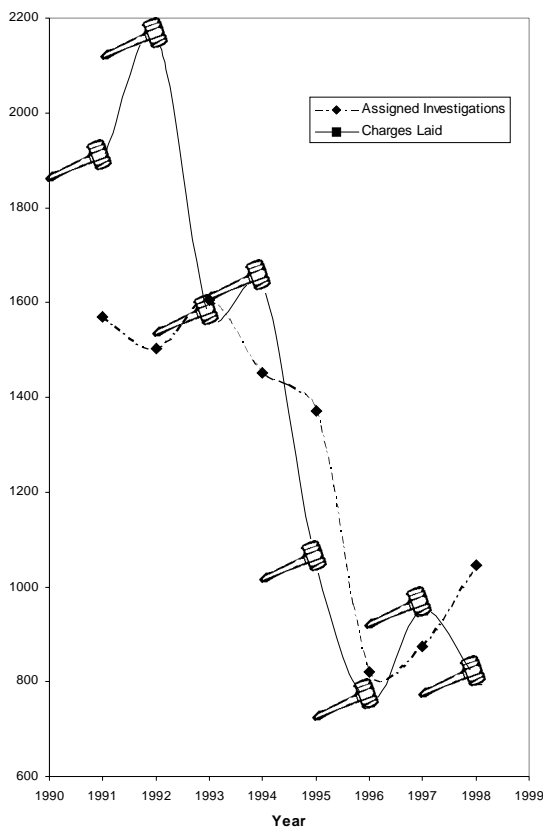
learns of violations of its statutes and regulations through complaints and inspections, and not the monitoring network. Once informed of a violation, the government may begin an investigation, after which it may lay charges and begin a prosecution or it may negotiate with the offender to change its practices. The MOE investigations and charges summary involves all of its statutes and regulations, not just water-related offenses, and as such is a general indicator of the government's overall capacity and willingness to enforce its environmental laws. A decline in these categories may reflect the government's lack of resources and inability to pursue violators.

Figure 3³ shows the number of investigations assigned and charges laid annually 1991 through 1998. The number of assigned investigations was relatively constant between 1991 and 1995, averaging 1500 but declined to an average of 914 investigations between

1996 and 1998 (a 39% decline). The trend in charges laid was similar, averaging 1662 between 1991 and 1995, and 838 between 1996 and 1998 (a 50% decline). 'Salaries and Wages' and 'Assigned Investigations' for 1991 to 1998 are highly correlated with both declining significantly during this period. The average amount of funding allocated to Salaries and Wages in 1994/95 and 1995/96 (Figure 2) was \$114.9 million, declining to an average of \$90 million in 1996/97 - 1998/99, a drop of 22%.

It is likely that the decline in staff under the present government contributed to the erosion of enforcement activity, which can only jeopardize environmental health. In response to criticisms, the government announced on May 2, 2001 the formation of an 'Environmental SWAT Team' to enhance inspection and enforcement activities. This may reverse the enforcement trend of recent years, however, there is some concern that too many trivial cases are being pursued in order to bolster the government's prosecution record.

Figure 3. MOE Annual Enforcement Data



5. Water Quality and Biomonitoring Programs

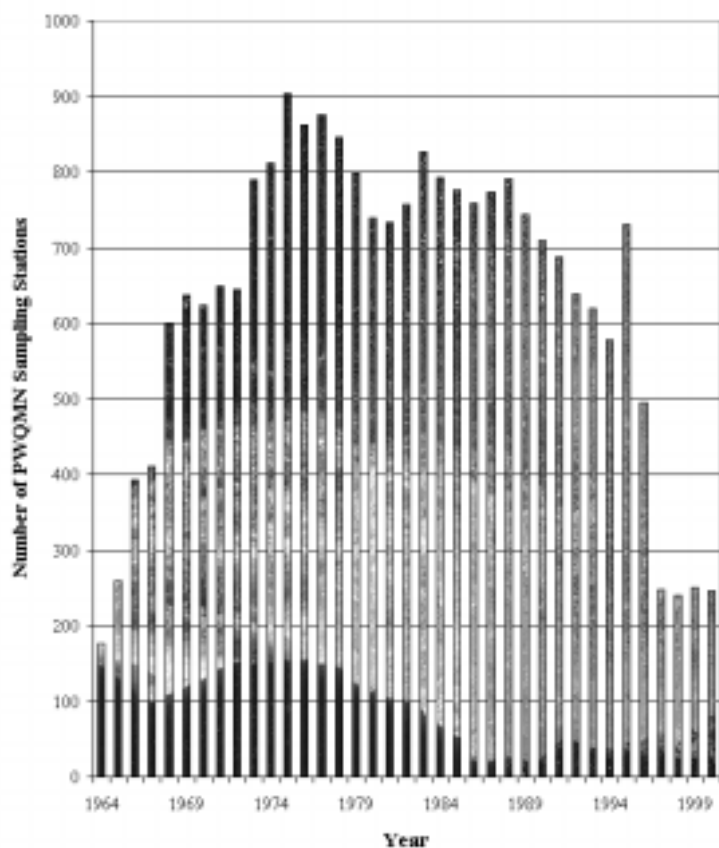
Monitoring programs are the Ministry's 'eyes and ears' on the natural world around us. Without them, it would be difficult, if not impossible to know whether the state of our surface waters is improving or worsening. Consequently, the Ministry would not know if policies and regulations need improvement. To be effective, a monitoring system must have several components – an adequate number of sampling sites, sufficient number of visits to each site, adequate number and type of measurements, rigorous data analysis, thorough interpretation of results, and rapid internal reporting to be followed by public reporting. Without these components, the state of Ontario's surface waters is essentially unknown.

Modern aquatic monitoring programs can include several complementary approaches: chemical measurements of water, sediments and local flora and fauna, census of aquatic species present, and responses of standard laboratory test organisms such as the fathead minnow to polluted waters.

Provincial Water Quality Monitoring Network

In 1964, the first year of the provincial water quality monitoring network (PWQMN) program, there were 177 active stations where water samples were routinely collected for chemical analyses. The number of stations gradually increased, reaching a maximum in 1975 of 903 stations with the majority of stations sampled up to 8-10 times per year. This level remained relatively constant throughout the 1980s. Gradual cutbacks in the number of stations beginning in 1989 were followed by a drastic reduction in the number of sampling sites from 730 sites in 1995 to about 240 in 2000 (Figure 4⁴). About 40% of the active sampling sites are located in five major watersheds in southern Ontario – the Thames, Grand, Credit, Trent-Severn and Rideau watersheds. In total, over 2000 sites have been monitored at least once during the 40-year span of testing but almost 90% of them have been discontinued.

Figure 4



The number of active sites is not the only indicator of government activity on the monitoring front. How many times a year is each site visited? What is measured? The PWQMN sites are currently monitored by MOE and the Conservation Authorities (CA). The active sites are sampled approximately 8 times per year by MOE or CA staff and analyzed primarily by MOE Laboratory Services Branch for “standard” water quality indicators such as pH, turbidity, conductivity, nutrients, metals, major ions, alkalinity, and suspended solids. Prior to 1996 they were also sampled for several kinds of bacteria. Results of the water analyses are archived in a centralized computer database.

Test load information for the Grand River watershed was reviewed for this study⁵. Of the 41 PWQMN stations sampled at least once between 1991 and 2001, organic contaminants were sampled at only one sta-

tion near Lake Erie. While this provides information on contaminant loading to Lake Erie, it doesn’t provide any information on the sources because a positive test at the mouth of the river doesn’t indicate where a contaminant entered the river. The seriousness of the problem is recognized by the provincial government because it publishes annual warnings advising anglers to limit sport fish consumption at many locations along the Grand River and its tributaries. Clearly, aquatic contamination is widespread in the Grand River watershed. Analyzing game fish is an excellent method for detecting contaminants that bioaccumulate, however, water quality may be also impaired by toxic contaminants that do not bioaccumulate and therefore will not show up in sport fish. In summary, it appears there is no systematic chemical monitoring of organic contaminants in the Grand River watershed and this is probably the case for other inland waters in Ontario.

Biomonitoring Programs

Provincial staff collect between 4000 and 6000 fish each year from approximately 1700 locations in Ontario’s inland waters and the Great Lakes and send them to the MOE laboratory in Toronto. The fish are analyzed for a short list of substances that bioaccumulate, including mercury, PCBs, mirex, DDT and dioxins. The results are used to develop the tables in the ‘Guide to Eating Ontario Sport’ published every year, which give consumption advice for each species tested at each location. This advice is based on health protection guidelines developed by Health Canada. The Sport Fish Contaminant Monitoring Program is the largest testing and advisory program of its kind in North America.

Exposure of test organisms to industrial effluents has been used for many years in Ontario to assay the quality of the effluents, for example, in the MISA (Municipal/Industrial Strategy for Abatement) program. However, only one MISA monitoring report appears to have been released to the public in the last decade.

There are no biomonitoring programs in southern Ontario's inland waters aside from the sport fish program and monitoring of algae and zooplankton (these are mostly small crustaceans) in Lake Simcoe and selected lakes in central Ontario.

6. Information Management and Public Reporting

While the government continues to collect surface water data on a reduced scale, what does it do with it? Are the data reviewed, analyzed and interpreted to create scientific information in a timely fashion? Is the scientific information used to inform policy discussions? Is the public informed in a timely fashion?

There appear to have been few visible efforts in recent years to report on the general environmental state of Ontario's inland waters (the Great Lakes are not considered to be inland waters). The province discontinued publication of annual PWQMN data reports around 1990. Although almost 40% of the active PWQMN sites are located in just five watersheds in southern Ontario, we could find only two reports on the MOE website (www.ene.gov.on.ca/envision/techdocs/index.htm) containing information on these watersheds. One was a 1994 report on Rice and Sturgeon Lakes. The second was a technical report on Lake Ontario released in 1997 that presented data up to 1994 on several types of nutrients, metals and organic contaminants collected at the mouths of Lake Ontario tributaries. In addition, no reports of water effluent monitoring data under the MISA (Municipal/Industrial Strategy for Abatement) program have been released since 1993. The only biomonitoring report listed on the website is the narrowly focused annual 'Guide to Eating Ontario Sport' which does little more than advise which fish to avoid eating.

To view PWQMN data, the public must file a request with MOE using the Freedom of Information process and the PWQMN program must be specifically mentioned. The data would most likely be provided in raw form, and the agency requesting the data would be responsible for analysis. The cost of obtaining all PWQMN data for the last 10 years through an FOI request would probably exceed several thousand dollars.

Some Conservation Authorities are filling the gap left by the province and have issued or are about to release 'State of the Watershed' reports. This is a positive step that has been taken even though the province has greatly reduced funding to Conservation Authorities.

Another positive step is the creation of the Water Resources Information Program by the Ministry of Natural Resources. This program is intended to provide a common platform for sharing water resource information across government. It is in a very early stage. However, WRIP is intended to share information: it will not correct the gaps in MOE's monitoring programs nor will it create useful information out of MOE's raw data. Data is not information until it has been analyzed and interpreted.

7. Groundwaters

Until this year, the only program that monitored groundwater quality was the Drinking Water Surveillance Program which periodically samples 44 municipal waterworks of the 399 waterworks that receive their supply from groundwater. Recently, MOE and twenty-four Conservation Authorities announced the start of the Provincial Groundwater Monitoring Network. This six year sampling program will include approximately 400 wells by 2003. MOE will fund laboratory analyses only in the first year, leaving the CA's to fund it after that.

8. Comparing Ontario to Other Jurisdictions

While the Ontario government has greatly reduced its chemical monitoring program and provincial reporting has been virtually non-existent for most of the last decade, it might be argued by some that the program as it exists today is good enough. The public has no way of knowing if this argument is valid, of course, because the scientific information with which to evaluate the monitoring program is not available except at great cost through a freedom of information request. Substantial expertise is also needed to analyze the data.

If Ontario's approach is adequate, then other jurisdictions might be taking a similar approach and not needlessly spending money. We reviewed water quality monitoring and reporting programs in nearby Ohio just across Lake Erie from Ontario because it has similar geography, population and state of industrialization. A report by Beak International to the Ontario government, *'Environmental Monitoring: Leading Jurisdictions'* (listed on the MOE website) identified Ohio as a 'Best Practice Jurisdiction'.

The US Clean Water Act requires states to assess progress in achieving the Objectives of the Act. Ohio routinely conducts biological and water quality surveys and produces comprehensive reports called "Water Resource Inventory"⁶ every four years. The Inventories and accompanying appendices and fact sheets are forthcoming about the extent and sources of impairment. These, and other current reports are available from the Ohio Environmental Protection Agency website (www.epa.state.oh.us/dsw) which also describes numerous biological and water quality programs. It is clear that Ontario's reporting pales in comparison and it is likely that Ontario's monitoring of inland waters does so as well.

9. Conclusions

Assessing the quality of Ontario's inland waters does not appear to have been a high priority for the Ontario government during the last decade. The Ministry of the Environment has seen large reductions in its professional staff and surface water quality monitoring program and no longer reports to the public on the state of the aquatic environment in inland waters. The water quality monitoring data are not accessible to the public without a Freedom of Information request. Some Conservation Authorities have attempted to fill the analysis and reporting vacuum caused by the MOE contraction and have released several State of the Watershed reports. In spite of this, the Ontario government is probably not in a position to determine whether current policies, statutes, regulations and water quality guidelines are adequately protecting environmental health. Since environmental health is synonymous with public health, this is cause for concern.

Appendix

For a copy of the Report Appendix, please see our website at www.cielap.org/liquidassets.html or contact our office by phone (416) 923-3529 or e-mail, cielap@cielap.org.

Endnotes

- ¹ Executive Resource Group (2001) Managing the Environment. A Review of Best Practices, [document online] (Government publication released on February 07, 2001 [cited on October 13, 2001]); available from Ministry of the Environment website <http://www.ene.gov.on.ca/envision/ergreport/index.htm>
- ² Ontario Ministry of Treasury, Economics and Internal Governmental Affairs. Public Accounts, for years 1990-91; 1991-92; 1992-93; 1993-94; 1994-95; 1995-96; 1996-97; 1997-98; 1998-99; and 1999-2000. Ministry of the Environment.
- ³ Ontario Ministry of the Environment Head Office. Annual Enforcement Summary: Calendar Years 1991-1998. Internal document. Faxed to CIELAP on January 12, 2000.
- ⁴ Internal document sent by Ministry of the Environment in February 2001. Available at CIELAP.
- ⁵ Ministry of the Environment. Data from the Provincial Water Quality Monitoring Network through FOI on 48 sites on the Grand River. Diskettes available at CIELAP's office.
- ⁶ Ohio Environmental Protection Agency (2000) Water Resource Inventory, [document online] (reports for years 2000, 1998, 1996, 1994 are available on the Internet [cited on October 13, 2001]); available from the Ohio EPA website http://www.epa.state.oh.us/dsw/document_index/305b.html



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