

The Challenge of Substances of Emerging Concern in the Great Lakes Basin: A review of chemicals policies and programs in Canada and the United States



A report prepared for the
International Joint Commission
Multi-Board Work Group on Chemicals of Emerging Concern in the Great
Lakes Basin

Prepared by
Canadian Environmental Law Association
and
Lowell Center for Sustainable Production

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Lowell Center for
Sustainable Production
UNIVERSITY OF MASSACHUSETTS

Contributors:

Canadian Environmental Law Association Project Team

Anne Wordsworth
Sarah Rang
Kaitlyn Mitchell
Fe de Leon

Lowell Center for Sustainable Production Project Team

Jessica Schifano
Joel Tickner
Aliza Gordon
Yve Torrie
Melissa Coffin

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Contact Information:

Lowell Center for Sustainable Production

University of Massachusetts Lowell
One University Ave., Kitson 208
Lowell, MA 01854
USA
Tel: 978-934-2980
Fax: 978-934-2025

Canadian Environmental Law Association

130 Spadina Ave., Suite 301
Toronto, Ontario
M5V 2L4
CANADA
Tel: 416-960-2284
Fax: 416-960-9392

www.cela.ca

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Preface

This report was commissioned by the International Joint Commission (IJC) Work Group on Chemicals of Emerging Concern in order to assess the ability of existing policy structures to identify, assess, control, and prevent exposures to chemicals of emerging concern in the Great Lakes. In conjunction with the Canadian Environmental Law Association and the Lowell Center for Sustainable Production, the Work Group defined the scope of policies and programs that were to be included in this analysis. Given time and limited funding for the analysis, this scope included only policies and programs that broadly address the inherent hazards and exposures to a particular substance or group of substances (including identification, testing, and prevention – also called “chemicals policy” or “chemicals management policy”) and excluded media-specific policies and programs (i.e., water, air, sediment) as well as those that address only the end-of-pipe management of emissions. Although the report is substantially dedicated to the analysis of a limited number of policies and programs, the companion inventory highlights over 50 Canadian policies (including regulations and statutes) and programs, and over 200 U.S. municipal, state, regional, and federal policies and programs. This inventory provides a robust high-level summary of the breadth and depth of existing policy structures in the U.S. and Canada. Due to the sheer number of these policies, the inventory does not include an analysis of the strengths, weaknesses, or adequacy of each one, but rather summarizes areas where policies do exist. We recognize that, given the wide range of policies and programs in the Great Lakes region, there may be some policies and programs that were not identified in our research.

Despite the report’s focus on preventive, upstream approaches to chemicals of emerging concern in the Great Lakes, we recognize that a multi-pronged approach is necessary in order to establish a long-term, sustainable solution to the problem of chemicals of emerging concern in the Great Lakes. This approach must not only embrace ideas of pollution prevention, toxics use reduction, alternatives assessment, substitution, and green chemistry, but must also include the use of pollution control mechanisms and wastewater treatment technologies. Ultimately, given the societal need for some chemicals of emerging concern (such as pharmaceuticals) and the limited availability of preventive options in many cases (for example, pharmaceutical degradation or green chemistry alternatives for critical industrial or agricultural processes) upstream approaches must be utilized in conjunction with effective proactive management policies and controls. However, the report’s focus on preventive, upstream approaches was undertaken for a number of important reasons:

- The mandate from the Work Group was to examine policies and programs that could advance the dialogue on chemicals management policy options in the Great Lakes, building on the preventive and precautionary GLWQA vision of virtual elimination;
- Current end-of-pipe management regulatory structures have been reasonably effective at controlling many types of industrial point source emissions; however,

- most of the chemicals of emerging concern are dispersive, non-point, product-based emissions that cannot be effectively controlled through regulatory structures that focus primarily on end of pipe controls from industrial sources;
- Although wastewater treatment technologies are an essential component to the effective management of chemicals of emerging concern in the Great Lakes, such facilities were not designed to degrade these contaminants (which may hurt biological treatment processes). Hence, currently existing technologies cannot eliminate the threats posed by these chemicals, they can only reduce them and possibly transfer them from a water problem to a land disposal problem (for example biosolids); and
 - Given our increasing knowledge of chemicals use, effects of low dose exposures, evidence of presence of such chemicals in the environment and the human body, and prevention options, an upstream approach serves to broaden current burdensome and slow, chemical-by-chemical risk-based approaches to chemicals management by highlighting the need to consider the inherent hazards of a substance while at the same time using information about use and exposure to rapidly prioritize a large number of chemicals of emerging concern for preventive actions.

Acknowledgement

The Lowell Center for Sustainable Production and the Canadian Environmental Law Association want to thank and acknowledge the work of the members of the IJC Work Group on Chemicals of Emerging Concern for their focus and dedication to addressing a very complex scientific and policy problem confronting the Great Lakes Basin. The members of the IJC Work Group have provided substantial insight and recommendations on the draft reports. While the report may not have been able to address every issue and question raised in a comprehensive manner, the input and comments received by the authors of the report from IJC Work Group members were valuable to the production of the report. The quality of the final report was significantly improved with this level of contribution. The conclusions expressed in this report, while influenced by the Work Group, are ultimately the responsibility of the Canadian Environmental Law Association and the Lowell Center for Sustainable Production. This analysis builds on several decades of experience working with government, industry and non-profit sectors in Canada, the U.S., and internationally on chemicals assessment and management policies and practices.

Executive Summary

For many decades, the Great Lakes Basin has been a significant repository of both direct and indirect sources of pollutants. The health and ecosystem impacts from these pollutants are well documented. Over the past two decades, targeted actions to control many industrial, municipal, and agricultural sources of contaminants have occurred, resulting in significant improvements in Great Lakes water quality. While industrial releases of pollutants continue to be a threat to the quality of the Great Lakes ecosystem, now there are new threats of pollutants that are emerging.

Scientists are beginning to recognize new, previously unaddressed chemicals in the Great Lakes – so called “chemicals of emerging concern.” These chemicals are coming from products, resulting in multiple, dispersive, and non-point sources. This change from reducing emissions from industrial *processes* to reducing emissions from the use and disposal of *products* poses new challenges for the protection of the Great Lakes. While the exact pathways of many of these chemicals of emerging concern, be it from long range transport, rain, waste water, or house dust, are not always well understood, often the original source is a particular product type – a pharmaceutical, a pesticide, a cosmetic, a consumer item (for example, a sunscreen, a couch, a plastic toy, etc.). An intentional and focused consideration of the sources of these chemicals and their control is necessary in efforts to ensure the quality of the Great Lakes ecosystem is protected.

The Canadian Environmental Law Association (CELA) and the Lowell Center for Sustainable Production have been asked by the International Joint Commission’s (IJC) Multi-Board Work Group on Chemicals of Emerging Concern in the Great Lakes to identify and analyze national, state/provincial, and regional policies and programs that address the identification, assessment, control, and prevention of the range of chemicals of emerging concern. As part of the project, the two organizations prepared inventories of the relevant programs and policies for Canada and the United States (U.S.) currently enacted in both countries. These inventories along with the results of this analysis and database of scientific studies on chemicals of emerging concern will serve to inform recommendations made by the Work Group to the IJC Commissioners. The analysis builds on several decades of combined experience in chemicals assessment and policy in Canada, the U.S., and internationally.

For the purposes of this report, we use the term “chemicals of emerging concern” to include:

- 1) Chemicals identified in the chemicals of emerging concern report developed for the International Joint Commission;
- 2) Chemicals which are persistent or bioaccumulative or toxic according to criteria outlined in the *Great Lakes Water Quality Agreement*;

3) Chemicals that may or may not have been detected in the Great Lakes Basin, but which are included in the categories of chemicals of emerging concern, such as veterinary drugs; and

4) Those chemicals that have been shown to occur widely in the environment and also identified as being a potential environmental or public health risk.

While these chemicals may not pose a high risk at this point in time, they do raise concerns about long term exposures and impacts.

CELA and the Lowell Center for Sustainable Production conducted their analysis based on the prevention-oriented foundations established through the *Great Lakes Water Quality Agreement*, which the governments of Canada and U.S. have committed to implement through bi-national efforts. This vision has been further elucidated and broadened through reports and statements of the International Joint Commission and national pollution prevention policies, which state that prevention through source reduction should be the first priority for managing waste and emissions. Building on the ultimate goal of prevention yet highlighting the pragmatic need for a multi-pronged approach to pollution prevention and control of chemicals of emerging concern in the Great Lakes Basin, our analysis focuses on the following questions:

1. To what degree do existing policies and programs facilitate rapid identification and assessment, prioritization, decision-making, and prevention for a broad range of chemical types before they become chemicals of concern?
2. What are the specific challenges of addressing chemicals of emerging concern in the region?
3. What policies and approaches are required to address chemicals of emerging concern in the Great Lakes Basin?

Different categories of substances are regulated in both the U.S. and Canada under different policy regimes and administrative agencies. Furthermore, there are differences in the federal and regional policy structures for regulating chemicals in Canada and the U.S. In Canada, the management and control of chemical substances is primarily regulated at the federal level, with provincial programs that focus primarily on end of pipe measures. In the U.S., both the federal and state governments have implemented significant programs to regulate chemicals and pesticides. As such, the report consists of the following four main sections:

1. An overview of the History of Efforts for Addressing Persistent Chemicals of Concern in the Great Lakes;
2. A review and analysis of Canadian policies and programs relating to the various categories of chemicals of emerging concern. This review and analysis focuses solely on federal level policies in Canada, with an emphasis of the Canadian Chemicals Management Plan (CMP);

3. A review and analysis of U.S. policies and programs relating to the various categories of chemicals of emerging concern. This review and analysis focuses on both federal and Great Lakes state policies relating to such chemicals; and
4. General observations on the challenges and gaps that constrain the ability to take national and regional action to prevent chemicals of emerging concern from entering the Great Lakes Basin and a roadmap for next steps.

Our analyses of Canadian and U.S. policies have identified policy gaps and a disjointed, chemical-by-chemical reactive approach that significantly restricts the ability of government to rapidly identify, characterize, and control or prevent the introduction of a broad range of chemicals of emerging concern into the Great Lakes Basin.

In Part 4 of the report, some of the key policy gaps have been identified. They include:

1. The lack of an integrated system for the proactive management of chemicals of emerging concern, in particular prevention, that spans chemical types, sources (whether industrial sources or product based), and jurisdictional boundaries. Despite the dispersive and product-based nature of such chemicals, current policies do not sufficiently address elimination through redesigning products or processes to eliminate hazards in the first place.
2. A slow and cumbersome chemical-by-chemical testing and risk assessment approach to chemicals of emerging concern. Current approaches to chemical testing, assessment, and management have tended to focus on assessing the risks posed by single chemicals within chemical types and classes. Such processes are costly and inevitably result in decisions not being made until uncertainties are reduced, which in some cases can take years. The availability of safer chemical, non-chemical alternatives, prevention, or other proactive management options that would significantly reduce or prevent emissions of such chemicals is rarely considered in decision-making processes. Finally, chemicals that span different classes and mechanisms of toxicity pose large challenges for regulatory authorities to manage and to accurately and comprehensively characterize their risks.
3. Diminishing attention to toxics prevention efforts in the Great Lakes Basin and limited coordination between government authorities in this area.
4. Significant reliance on voluntary measures and use of chemical by chemical risk assessment and risk management processes to control releases of chemicals to the environment. This means that efforts to control or prevent releases have not kept up with the number of chemicals that are being identified or detected as chemicals of emerging concern in the Great Lakes Basin.

The risks posed by chemicals of emerging concern in the Great Lakes Basin can likely be reduced to some degree through enhanced control measures, such as improved industrial process controls and waste water treatment. However, given that most of the chemicals identified as chemicals of emerging concern are product based, and result in non-point emissions such that traditional pollution controls measures on industrial processes may not be applicable. Thus, many of the significant new strides in pollution prevention for

product based emissions may be made through greater controls on products, the promotion of safer alternatives, and a broader vision of pollution prevention – in essence green chemistry and substitution. Nonetheless, a comprehensive approach to prevention of chemicals of emerging concern will include processes for rapid characterization of hazards and exposures, prevention, and controls (for example in the workplace or wastewater treatment). *Given the product-based sources of the emissions of most of the identified chemicals of emerging concern in the Great Lakes, our analysis has focused primarily on policies that address chemical products, rather than industrial chemical emissions.* Clearly, some media specific laws can regulate emissions of chemicals from products, such as air quality regulations for formaldehyde or restrictions on disposal of products containing toxic materials (e.g., mercury) and are important supplements to product regulations. However, controls on chemicals in products are may not be adequate to address hazards that occur throughout product lifecycles.

The *Great Lakes Water Quality Agreement*, subsequent reports by the IJC, and national and regional policies, such as the 1990 U.S. Pollution Prevention Act, have set prevention as the top priority for addressing chemical hazards. The region's preventive approach paralleled similar efforts being undertaken in the several Scandinavian countries. However, while progress has stalled in the Great Lakes Basin, it did not in other jurisdictions. Today, there is a renewed commitment to the prevention of chemicals of concern. Numerous drivers are changing the way governments and industry think about chemicals in everyday products. Regulations such as the European Union's *Registration, Evaluation, and Authorization of Chemicals* (REACH) legislation are affecting a cultural shift in industrial chemicals management by requiring data on chemical toxicity and uses, requiring preventive action for classes of chemicals, and shifting the burden of proof to industry to demonstrate safety for high concern chemicals. Stakeholders in several U.S. states and Canadian provinces, including Great Lakes states of Michigan, Minnesota, and New York and the province of Ontario, are engaged in discussions to develop comprehensive toxics reduction policies for industrial chemicals. We outline an integrated, prevention-oriented roadmap (Part 4) for improved management of chemicals of emerging concern in the Great Lakes that can serve to elevate Great Lakes leadership in chemicals policy, including:

- Processes for rapidly identifying, screening, and prioritizing chemicals of emerging concern, including uses, potential exposures, and toxicity.
- Publication of a Great Lakes list of chemicals of concern to inform regulatory-making processes, markets, research and innovation, and educational activities that support proactive management with a focus on prevention, and end of life responsibility measures.
- Development of action plans for high priority chemicals of emerging concern considering possible measures, including prevention and substitution options, which would lead towards safer chemicals and products throughout their lifecycles.
- Establishment of a bi-national safer alternatives initiative, which would aim to provide tools, technical support, and incentives for research, development, and application of alternatives, such as green chemistry, and establish a process to

This roadmap would build on existing legal and administrative structures in the U.S. and Canada and require new collaborations and infrastructure at the Basin level.