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Sustainable Production
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The Challenge of Emerging Substances of 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

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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 “emerging contaminants or chemicals of 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 “emerging” contaminants, 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 is necessary in efforts to ensure the quality of the Great Lakes ecosystem is protected. By moving upstream and considering toxicity and physical properties of chemicals at the chemical and product design stage and making changes in product and process design to employ less toxic and less bioavailable substances, the accumulation of these chemicals in the Great Lakes Basin may be preventable.

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 identification, assessment, and prevention of the range of emerging chemicals of 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.) relevant to being undertaken in both countries. These inventories along with the results of this analysis and database of scientific studies on emerging chemicals of concern will serve to inform recommendations made by the Work Group to the IJC Commissioners.

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

- 1) Chemicals identified in an emerging chemicals of 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 emerging chemicals of 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 binational efforts. Building on a vision that a prevention approach to address toxic substances is the most effective 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 adoption of safer alternatives for a broad range of chemical types before they become chemicals of concern?
2. What are the specific challenges of addressing emerging chemicals of concern in the region?
3. What policies and approaches are required to address emerging chemicals 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., states 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 Great Lakes vision of prevention;
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 emerging chemicals of concern from entering the Great Lakes Basin and recommendations 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 prevent the introduction of a broad range of emerging chemicals of concern into the Great Lakes Basin. The Great Lakes community is not alone in taking an approach to emerging chemicals of concern that focuses on artificial legal and jurisdictional approaches to addressing individual media and product types rather than moving upstream to focus on reducing the inherent toxicity of substances and advancing safer alternatives based on the principles of green chemistry.

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

1. The lack of an integrated system for the prevention of emerging chemicals of concern 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 emerging chemicals of 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 or non-chemical alternatives 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.

While the Great Lakes can always benefit from improved controls on industrial processes and improved water treatment systems, most of the significant new strides will 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 emerging chemicals of concern will include processes for rapid characterization of hazards and exposures prevention and controls (for example in the workplace or wastewater treatment).

The *Great Lakes Water Quality Agreement* and subsequent reports by the IJC set the stage for a visionary, prevention-oriented approach to the management of chemicals of concern in the Great Lakes Basin. The region's 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 Minnesota and New York and the province of Ontario, are engaged in discussions to develop comprehensive toxics reduction policies for industrial chemicals. The IJC Commissioners can demonstrate Great Lakes leadership in chemicals policy by advancing an integrated, prevention-based strategy for emerging chemicals of concern.

Based on the findings of our report, we propose the following recommendations to the Multi-Board Work Group on Chemicals of Emerging Concern in the Great Lakes (See Part 4 of the Report).

Establish a Binational Strategy on Emerging Chemicals of Concern based on precaution and prevention.

Recommendation 1

The IJC should urge the Parties to establish an intergovernmental taskforce on emerging chemicals of concern to develop a binational strategy for such chemicals that spans jurisdictional boundaries and focuses on approaches to ensure redesign of such chemicals toward safer alternatives. The taskforce would establish processes and authorities to implement the actions described below.

Establish a Great Lakes rapid identification and screening process for chemicals of concern.

Recommendation 2

Building on existing national programs of Canada and the U.S. as well as the GLWQA List and reviewing data from other jurisdictions for identification and screening substances of concern, the IJC should seek to establish a Great Lakes screening process for emerging chemicals of concern. The IJC process should use the criteria established under the GLWQA for persistence, bioaccumulation and/or toxicity, which would include carcinogenicity, reproductive and developmental toxicity, neurodevelopmentality, genotoxicity, respiratory toxicity, skin sensitization, and endocrine disruption to capture substances of concern in the Great Lakes. Given the unique vulnerability of the Basin's ecosystems, determination of chemicals of concern should be based on the most conservative criteria adopted internationally.

Recommendation 3

Similarly, the IJC or other Great Lakes binational agency should apply an identification and screening process to chemicals used in drugs, other pharmaceutical products and nanomaterials that effectively characterizes their uses, possible exposures, and fate in the environment.

Publish a Great Lakes List of Chemicals of Concern.

Recommendation 4

Building on the work of government scientists, Muir and Howard, and those of the national programs, substances should be identified and ranked as to their potential to become a chemical of concern in the Great Lakes Basin as high, medium, or low concern.¹ Substances with inadequate data needed for making such a categorization should be automatically considered as high concern. The results of this process should be widely publicized as a Great Lakes List of Chemicals of Concern. This list would be a tool to inform regulatory-, market-, research and innovation, and educational activities that support implementation of safer alternatives. A timeframe of two years to complete this process should be required.

Action plans should be developed and implemented for chemicals identified under the Great Lakes List of Chemicals of Concern to achieve the goals outlined under the GLWQA, particularly prevention and application of safer alternatives.

Recommendation 5

The IJC should recommend that Parties commit to the development and implementation of mandatory action plans to substitute or prohibit chemicals of high concern listed in the Great Lakes List of Chemicals of Concern as well as develop action plans to reduce and ultimately substitute with substances of medium and low concern.

All action plans should include time-limited mandatory processes and programs that achieve pollution prevention through substitution with safer, technologically feasible alternatives, product redesign, and mandatory restrictions where necessary. Such action plans should prioritize high concern chemicals for preventive actions. Action plans should also consider end of life take-back considerations for products containing chemicals of concern. Given the variety and number of such chemicals, action plans should be developed in as expedient a manner as possible.

¹ See Philip Howard, William Meylan and Derek Muir, "Screening Chemicals in Commerce to Identify Possible Persistent and Bioaccumulative Chemicals: New Results and Future Work," (Presented at Great Lakes Binational Toxics Strategy Meeting, Chicago, IL, 2008).

Recommendation 6

To support these action plans, the IJC should urge the Parties to establish a binational safer alternatives initiative to be coordinated by a Great Lakes agency. This initiative 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 assess safety of alternatives to ensure benefits to the Great Lakes environment, health and economy.

Establish a Public Database and Clearinghouse of Information on Chemicals of Concern for the Great Lakes Basin.

Recommendation 7

The IJC should recommend to the Parties, the development of a publicly accessible database that records the uses of high and medium concern substances in the Great Lakes Basin modeled after the Interstate Mercury Education and Reduction Clearinghouse. Such a database can provide government agencies and the public a vital source of information to track flows of emerging chemicals of concern in the Great Lakes Basin. This database would supplement existing pollutant inventories in Canada and in the United States, which apply to chemicals in medium to large scale manufacturing.

Ensure greater accountability by producers, users, vendors, importers, and disposers of chemicals, drugs, and nanomaterials in the Great Lakes Basin.

Recommendation 9

The IJC should urge the Parties to strengthen accountability mechanisms for those industries producing, using, selling, importing or disposing of chemicals, pharmaceuticals, pesticides, and nanomaterials, which are introduced into the Great Lakes Basin market. This may include improvements to monitoring regimes to ensure the effectiveness of action plans developed on chemicals identified under the Great Lakes
| List of Chemicals of Concern.