

TOXIC POLLUTANTS

I. Problem Statement

While certain persistent toxic substances (PTS) have been significantly reduced in the Great Lakes Basin Ecosystem over the past 30 years, they continue to be present at levels that pose threats to human and wildlife health and warrant fish consumption advisories in all five lakes. PTS releases from contaminated bottom sediments, various industrial processes, and non-point sources, loadings from atmospheric deposition and continuous cycling of PTS within the Great Lakes themselves, all contribute to this ongoing problem. More recently, researchers have documented the presence of additional chemicals of emerging concern that may also pose threats to the Great Lakes. Characteristics of these substances, such as sources, releases, fate, transport, persistence, bioaccumulation, and toxicity, must be better understood.

II. Goals and Milestones

To establish and maintain the chemical integrity of the Great Lakes Basin Ecosystem, as called for in the Great Lakes Water Quality Agreement, this Strategy sets forth the following goals:

Goal 1: Virtually eliminate the discharge of any or all persistent toxic substances (PTS) to the Great Lakes basin ecosystem;

Goal 2: Significantly reduce exposure to persistent toxic chemicals from historically contaminated sources through source remediation and exposure reduction;

Goal 3: Reduce environmental levels of toxic chemicals to the point that all restrictions on the consumption of Great Lakes fish can be lifted; and

Goal 4: Protect the health and integrity of wildlife populations and habitat from adverse chemical and biological effects associated with the release of PTS.

Interim Milestones, Goals 1-4:

- By 2008, collect 1M lbs waste pesticides per year;
- By 2010, 50 percent reduction in Basin-wide household garbage burning;
- By 2010, commence significant reductions in mercury emissions from coal-fired power plants;³⁰
- By 2015, full phase-outs of intentionally added mercury bearing products, as possible;³¹
- By 2025, full phase-out of all PCB equipment in the basin; and
- By 2025, significantly reduce PTS inputs from international sources.

Goal 5: Prevent the discharge of toxic substances in toxic amounts.

Interim Milestones, Goal 5:

- By 2008, include pollution prevention and energy efficiency (P2/E2) measures in federal and state rule making.

³⁰ The Clean Air Mercury Rule, promulgated under Section 111 of the Clean Air Act, requires a 21 percent reduction in mercury emissions, from 48 tons in 1999 to 38 tons in 2010. It is likely that 2010 reductions will be deeper than 21 percent, since the Clean Air Mercury Rule creates incentives for early reductions; EPA projects 35 percent reduction by 2010. Additionally, EPA projects deeper reductions in non-elemental mercury emissions, which cause most local and regional deposition. The rule requires additional reductions by 2018, when the mercury emissions cap will be reduced to 70 percent below the 1999 baseline, to 15 tons per year. The full 70 percent reduction will not occur until some time after 2018, because early reductions can be "banked" for later use. This rule provides flexibility for all states, including the Great Lakes States, to implement deeper cuts in mercury emissions. Some Great Lakes States have challenged EPA's clean air mercury rulemakings in federal court.

³¹ Examples include thermometers, thermostats, and manometers.

- By 2010, implement 200 P2/E2 projects for small to medium sized businesses in the Great Lakes States.

Goal 6: Protect the general public from toxic substances through effective outreach and education, including protective fish consumption advice throughout the Great Lakes Basin Ecosystem.

Interim Milestones, Goal 6:

- By 2007, commence basin-wide PTS public information campaign; and
- By 2009, adopt consistent Great Lakes basin fish consumption advisories.

Goal 7: Identify and fill the gaps in our scientific understanding that limit our ability to effectively manage the risks of toxic substances found in the Great Lakes.

Interim Milestones, Goal 7:

- By 2008, initiate a central Great Lakes PTS database.
- By 2010, a basin-wide surveillance program of chemicals of emerging concern at wastewater treatment plants will be established. At least 50 percent of the large in-basin WWTPs will participate in the program.³²
- By 2010, implement a Great Lakes human PTS biomonitoring program.³³
- By 2010, complete an intercomparison study of mercury and PCB models.

III. Recommendations

This Strategy seeks to comprehensively address PTS issues in the Great Lakes, to: 1) reduce and virtually eliminate sources of current priority pollutants; 2) prevent new chemical threats from entering the basin; 3) develop a sufficient knowledge base to address toxic chemicals in the Great Lakes environment; 4) protect public health and engage the public to do its part in reducing PTS sources; and 5) address international sources. The recommendations below are guided by a number of important principles. Historically, collaborative efforts within the Great Lakes basin to address PTS reduction have served as a model for statewide, national, and international efforts. These efforts provide a strong foundation for further endeavors. In particular, the principles, tenets and concepts embodied in the Great Lakes Binational Toxics Strategy (Binational Strategy) are incorporated here as the starting point for the Toxic Pollutant Strategy. This strategy also builds on the efforts of the Lakewide Management Plans (LaMPs) to help implement lake-specific high priority chemical reduction efforts and on recommendations from Remedial Action Plans to address beneficial uses impaired by PTS in Areas of Concern.

Effective and meaningful PTS reductions require both regulatory and non-regulatory approaches. Existing regulatory programs, particularly federal and state permitting and enforcement, must be adequately funded and implemented. Non-regulatory approaches can sometimes achieve results efficiently and are encouraged to the maximum extent practicable. New regulatory approaches must also be considered where necessary. Finally, significant amounts of PTS from both international and regional sources are deposited to the Great Lakes. Five key recommendations are presented below³⁴:

1) Reduce and virtually eliminate the principal sources of mercury, PCBs, dioxins and furans, pesticides and other toxic substances that threaten the Great Lakes basin ecosystem, through coordinated intergovernmental strategies.

- **Mercury³⁵: Coal fired electric utilities constitute the largest remaining domestic source of mercury emissions. Utility sources must implement control measures to reduce these emissions. Mercury is still**

³² Examples may include pharmaceuticals, personal care products, and endocrine-disrupting chemicals.

³³ To be based on the PTS monitoring component of CDC's National Health and Nutrition Survey (NHANES)

³⁴ Note that there is a matrix of all recommendations of the PBT Team included in the appendix.

³⁵ See appendix for information on mercury, PCBs, dioxins and furans.

used in numerous products basin-wide. A basin-wide mercury product stewardship strategy should be developed to complete phase-outs of mercury uses, as practicable.

- **PCBs: Consistent with the Stockholm Convention on Persistent Organic Pollutants, PCB-containing electrical equipment should be decommissioned and properly disposed.**
- **Dioxins and Furans: Uncontrolled burning of household garbage constitutes the largest known source of dioxins and furans to the Great Lakes. Where deficiencies exist in any Great Lakes Basin communities either in the infrastructure to support garbage collection or enforcement to stop illegal burning, these should be addressed.**
- **Cancelled Pesticides: State, tribal, and local waste pesticide collection efforts are very effective in reducing stockpiled sources of cancelled pesticides to the Great Lakes, but these programs are inconsistently supported. Each State should implement a robust and ongoing waste pesticide collection program.**

Rationale: Principal sources of priority pollutants continue to threaten the health of the Great Lakes and drive fish consumption advisories, and should therefore be systematically reduced and virtually eliminated:³⁶

Implementation: The Great Lakes Binational Strategy³⁷ in a coordinating role, LaMP chemical committees, EPA, State environment and agriculture agencies; municipalities, and industry.

Cost³⁸: \$10M/yr - Burn Barrel Initiatives (all new), \$3.4M/yr - Clean Sweeps (\$2.0M/yr new).

2) Prevent new toxic chemicals from entering the Great Lakes basin: Target production, use and sound disposal of toxic chemicals across the Great Lakes basin through strategic deployment of pollution prevention and waste minimization programs.

- **To provide easier access and broaden dissemination of these programs to small and medium sized businesses, States should “bundle” technical assistance services, such as compliance assistance, pollution prevention (p2) audits, and energy efficiency (E2) audits, in “one-stop-shop” programs. Tax incentives and low interest loans should be utilized to promote investments in energy efficiency upgrades and pollution prevention projects.³⁹**
- **Federal and state agencies should ensure that traditional regulatory programs, including enforcement, provide incentives to conduct pollution prevention and energy efficiency projects.**

Rationale: Preventing new toxic substances from entering into the Great Lakes is as important to protecting ecosystem health as addressing current priority pollutants. U.S. EPA controls new PTSs from entering commerce under TSCA and FIFRA, using chemical screening methods. U.S. EPA’s many pollution prevention and waste minimization programs are described online at www.epa.gov/p2⁴⁰. These programs should be aggressively

³⁶ A comprehensive list of priority pollutants, sources and reduction activities may be found in the 2004 Great Lakes Binational Toxics Strategy Annual Report.

³⁷ The Binational Strategy engages a forum of Stakeholders from government, Industry and NGOs from the US and Canada that regularly gather to collaborate on toxics reduction projects, with a focus on priority pollutants such as mercury and PCBs.

³⁸ Costs are presented as current plus new (new funding in parenthesis). Costs are fully itemized in appendix A.

³⁹ EPA should award assistance for states and other eligible entities to authorize or enhance low-interest revolving loan funds that can be coupled with technical assistance efforts to assist in the implementation of P2 and E2 measures for both private and public sector facilities

⁴⁰ EPA’s Sustainable Futures program promotes a number of innovative non-regulatory pollution prevention (P2) programs including the The PBT Profiler and Design for the Environment (DfE) which help industry screen out potential toxic substances and design safe non-toxic products, and the The Green Suppliers Network (GSN) and Environmentally Preferable Purchasing which promote PTS-free alternatives in production and purchasing. The Resource Conservation Challenge promotes a number of innovative waste minimization programs such as The Plug-In To eCycling Program, Product Stewardship Partnerships and The WasteWise Partnership Program .

marketed and made available to Great Lakes businesses, their suppliers and customers through technical assistance providers⁴¹.

Implementation: U.S. EPA, State technical assistance providers, Manufacturing Extension Partnerships, City environmental departments.

Cost: \$16M/yr (\$15.12M/yr new), \$50M tax incentives/fund capitalization (all new).

3) Institute a comprehensive Great Lakes research, surveillance and forecasting capability to help identify, manage, and regulate⁴² chemical threats to the Great Lakes basin ecosystem. A Great Lakes basin-wide coordinated program that incorporates and augments current efforts should be created to better characterize links between PTS sources and exposure. The multi-party program should preferably be housed within an existing program or organization and call upon the combined resources of federal agencies, States, academia, the private sector, and our Canadian neighbors. To be successful, the effort should include:

- **Screening/long term monitoring of PTS sources and concentrations in environmental media, including humans and wildlife. Current monitoring programs should be enhanced and coordinated per the recommendations of recent program and peer reviews of existing networks;**
- **Research on chemical properties, exposure, and long term effects;⁴³**
- **Modeling, including evaluation and enhancement of current models, to better predict environmental impacts of reduction actions at various geographic scales, and to examine exposure scenarios; and**
- **Information management, an easily-accessible, central Great Lakes PTS database for monitoring data, emissions and releases information, and research results, including a clearinghouse for toxicity data used to develop GLI criteria.**

Rationale: To manage and assess regulatory and voluntary PTS programs, Great Lakes lawmakers, program managers, and stakeholders need accurate information. This requires a coordinated system which monitors PTS sources and environmental conditions, tracks reduction actions, projects future trends in exposure and effects, and uses this information for decision-making. For many PTS, past and existing monitoring and research have given us a good understanding of sources, transport, and exposure pathways. However, in order to make cost-effective decisions, improved understanding of relative contributions of different sources to human exposure is also needed. For example, local sources may have a greater effect on exposure in a community than in the basin as a whole.

Implementation: The Great Lakes Binational Toxics Strategy, federal agencies, States, academia.

Cost: \$5-10M/yr (\$300K/yr current/balance new).

4) Protect human health through consistent and easily accessible basin-wide messages on fish consumption and toxic reduction methods and choices .

- **With regard to PTS exposure, the Great Lakes Sport Fish Advisory Task Force should create consistent advice on fish and wildlife consumption to citizens in the Great Lakes Basin, especially to sensitive populations, and to health care professionals, in multiple languages. Current state advisory programs should be fully funded and implemented to adequately protect the entire basin.**
- **To help the public do its part to reduce the use and release of PTS, a basin-wide public education and outreach campaign that focuses on habits of individuals, households, the workplace, and schools, should be**

⁴¹ Providers include the Department of Commerce Manufacturing Extension Partnerships, State P2 technical assistance providers, and municipal environmental officials.

⁴² Regulations include development support for TMDL, criteria, and water quality standards and permit issuance.

⁴³ Expert program reviews of current regulatory and monitoring programs have defined some research needs.

developed in coordination with existing messages and stakeholder groups.^{44,45} Take back programs and household hazardous waste collection programs should be promoted as well.

Rationale: A consistent set of messages from federal, state, tribal and local health and environment agencies is needed to protect the public from health effects of PTS exposure, and to provide the public with information about lifestyle choices which will help reduce PTS uses and releases to the Great Lakes.

Implementation: Great Lakes Sport Fish Advisory Task Force, National Sea Grant Program, state and tribal departments of public health, environment and natural resources, the GL Human Health Network, U.S. EPA, and FDA.

Cost: \$15.9M/yr (\$11.7M/yr new).

5) Support efforts to reduce continental and global sources of PTS to the Great Lakes basin.

- **As a leader in management of toxic chemicals, the United States should ratify the Stockholm Convention on Persistent Organic Pollutants.**
- **The United States should also support international PTS management and monitoring programs, in coordination with the Commission for Environmental Cooperation (CEC) and the United Nations Environment Programme (UNEP), and support capacity building and technology transfer programs, such as those administered by EPA's Office of International Activities.**
- **In particular, federal support should be provided to efforts to reduce international sources of mercury, including funding and technical support for UNEP's mercury efforts.**

Rationale: Significant amounts of PTS come to the Great Lakes through air deposition from sources well beyond the U.S. border. International toxics reduction and monitoring programs are therefore essential to the protection of the Great Lakes.

Implementers: Congress, Federal Agencies, the Great Lakes Binational Strategy in a coordinating role.

Cost: \$7.725M/yr (\$6M/yr new).

⁴⁴ This would include high priority outreach topics such as backyard trash burning, mercury use reduction, energy conservation, personal care product use reduction, (non-toxic household cleaners, and reduction in household pesticide use.

⁴⁵ This outreach message should be conveyed through existing communication channels including lake stakeholder forums, human health networks, newsletters, conferences and other existing delivery mechanisms. A consistent outreach message could be included in the biennial LaMP reports and/or the annual public-friendly lake brochures.