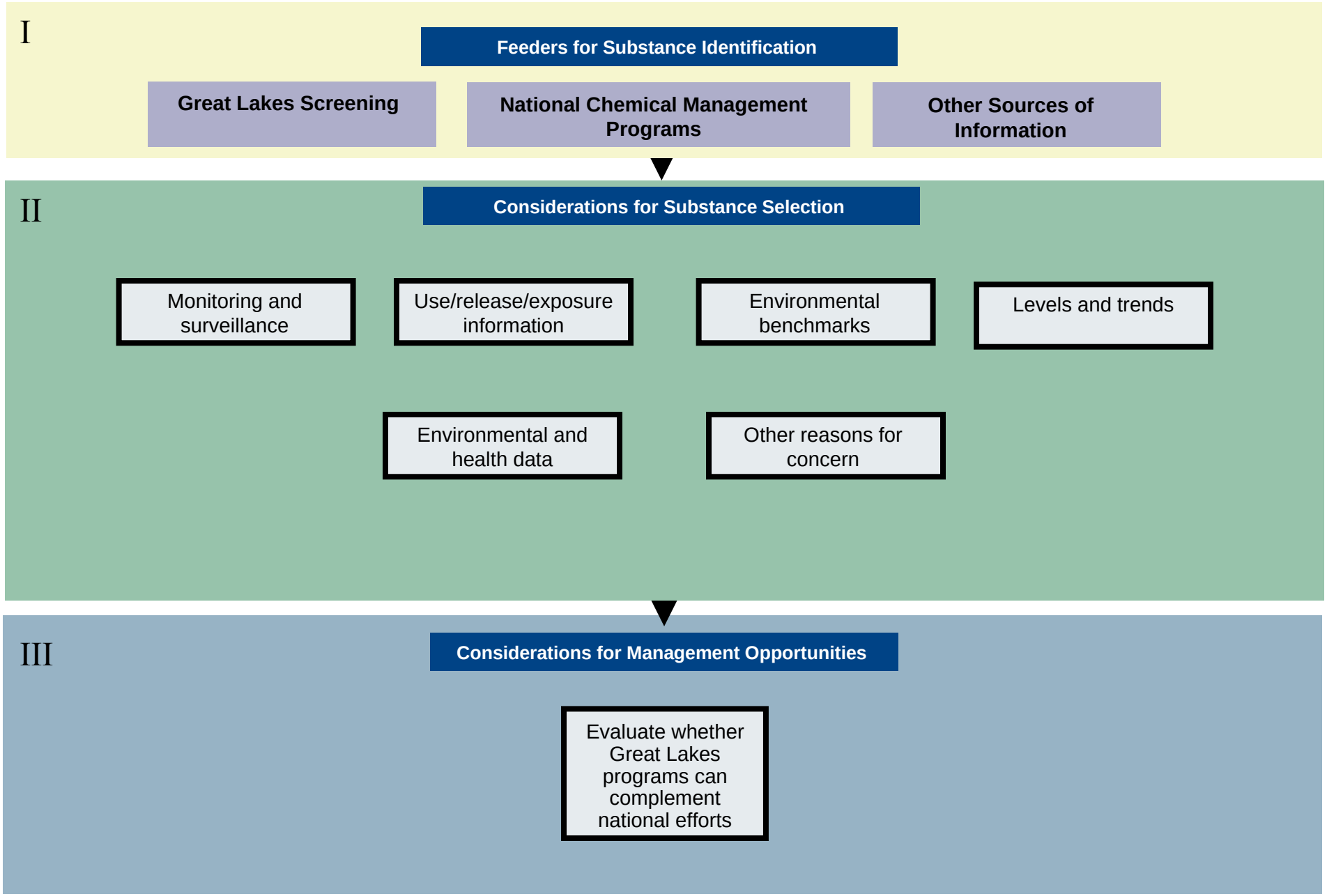
Review of General Framework for Identifying Substances to be Addressed in the Great Lakes Basin

Great Lakes Binational Toxics Strategy (GLBTS) Meeting
Chicago, September 24, 2008

Objectives of the presentation

- Provide a review of the draft Framework to date
- Provide a closer look at what the boxes of the Framework mean
- Explore the Framework by providing an example.
  - The example is Nonylphenol and its Ethoxylate (NPE), selected for its data-richness
  - The example of NPE is used in this presentation only to illustrate the definition of each box of the Framework and has not currently been selected as a substance for management in the GLB.
- Provide a platform for discussion on the Framework this afternoon. We would like your input to establish a path forward for the Framework

Overview of: General Framework for Identifying Substances to be Addressed in the Great Lakes Basin



I

Feeders for Substance Identification

- Substances which feed into the Framework may be identified through various mechanisms, primarily identified in three broad categories:

Great Lakes Screening

• A project that draws upon the national programs of both countries to provide a list of substances targeted for monitoring, based on selected physical-chemical properties, available analytical methods, as well as use, release and exposure information.

National Chemical Management Programs

Including:
- Canada's Chemicals Management Plan (CMP)
- US' Chemicals Assessment and Management Program (ChAMP)

Other Sources of Information

Including:
- stakeholder nomination
- provincial/state programs
- international fora
- academic studies.

I

Feeders for Substance Identification

Example: Nonylphenol and its Ethoxylate (NPE)

Great Lakes Screening

- NPEs are not involved in the Great Lakes Screening Project

National Chemical Management Programs

Canada

- 'CEPA toxic' under CEPA, 1999, added to CEPA 1999 Schedule 1- List of Toxic Substances in 2002

United States

- High Production Volume (HPV) Chemicals

Other Sources of Information

European Union

- European Union Directive restricts the marketing and use in Europe of products and product formulations that contain more than 0.1% of NPE (as of January 2005)

OSPAR (The Convention for the Protection of the Marine Environment of the North-East Atlantic)

- NPE is on the OSPAR List of Chemicals for Priority Action (2007)

II

Considerations for Substance Selection

- the Framework provides categories of considerations to facilitate the evaluation of potential threat to the Great Lakes Basin (GLB):

Monitoring and surveillance

Use/release/exposure information

Environmental benchmarks

Levels and trends

Environmental and health data

Other reasons for concern

II

Considerations for Substance Selection (continued)

Monitoring and surveillance

- Is the substance is present in the GLB?
- These data include:
  - measurements in water, air, sediment, soil, or biomonitoring
  - In certain cases where this information is not available, source/use/release/exposure information may be considered as a surrogate

Example: Nonylphenol and its Ethoxylate (NPE)

- Numerous monitoring and surveillance data demonstrates the presence of NPEs in the GLB. For example:
  - USEPA & GLNPO are participating in numerous collaborative sampling efforts to assess the presence of APEs in the region
  - Beenie *et al.* 1997, reports concentrations in surface water (<0.020 to 10 µg/L) & sediments (<0.015 to 38 µg/g d.w.)
  - Environment Canada & Health Canada 2001, reports concentrations in Canadian freshwater, effluent and sludge from Canadian sewage treatment plants, surface waters & sediments
  - International Joint Commission, 2006 Reports concentrations in Great Lakes species; sediments & water

II

Considerations for Substance Selection (continued)

Source/Use/Release/Exposure Information

- Source, use, release, and exposure data may support monitoring and levels/trends data
- Precautionary assessment in cases where the effects of a substance could be significant by the time it is measured
- Includes indications of persistence based on continuous discharge to GLB and/or intensive use properties

Example: Nonylphenol and its Ethoxylate (NPE)

Source/Use

- NPE used in many sectors including:
  - textile processing, pulp and paper processing, paints, resins and protective coatings, oil and gas recovery, steel manufacturing, pest control products, cleaning products, degreasers and detergents, cosmetics, paints*
- NPE available for use in Canada: 23 800 tonnes (1995), 19 000 (1996)*
- NPE production in United States: ~104 300 tonnes (in 1998), demand increasing ~2 % annually

Release

- The major route for the release of NPEs through discharge of effluents (i.e. municipal, textile)

Exposure:

- found in: fresh water, sediment, fish and beluga whale tissue, textile mill effluents, pulp and paper mill effluents, MWWTP influents, effluents and sludges, and soil to which municipal sludges had been applied (in Canada)

**Canada has taken risk management actions to restrict use*

II

Considerations for Substance Selection (continued)

Environmental Benchmarks

- Substances detected in the Great Lakes in levels that exceed environmental benchmarks may be important candidates for management consideration
- Environmental benchmarks include: water quality criteria, fish tissue concentrations, human health based standards

Example: Nonylphenol and its Ethoxylate (NPE)

Canada

- Canadian Environmental Quality Guidelines for Nonylphenol and its Ethoxylates

Environmental Media	Media Type	Guideline Type	Guideline Value *
Water	Freshwater Marine	Full Interim	1.0 $\mu g \cdot L^{-1}$ 0.7 $\mu g \cdot L^{-1}$
Sediment **	Freshwater Marine	Provisional Interim Provisional Interim	1.4 $mg \cdot kg^{-1}$ 1.0 $mg \cdot kg^{-1}$

United States

- U.S. Water Quality Criteria for Nonylphenol in Fresh and Marine Water

Environmental Media	Media Type	Guideline Value
Water	Fresh water	- A four day average of 6.6µg/L not exceeded more than once every three years - A one hour average of 28µg/L not exceeded more than once every three years
	Marine water	- A four day average of 1.7µg/L not exceeded more than once every three years - A one hour average of 7.0µg/L not exceeded more than once every three years

II

Considerations for Substance Selection (continued)

Levels and Trends

- Current levels of a substance in the GLB compared with available environmental benchmarks to assess whether potential health or environmental concerns exist
- Trends may be assessed to determine changes in environmental levels of the substance over time

Example: Nonylphenol and its Ethoxylate (NPE)

- Monitoring data includes: Beenie *et al.* 1997, reports concentrations in surface water (<0.020 to 10 µg/L)

- The highest range of NPE surface water concentrations exceeds both the Canadian freshwater guideline value of 1.0 µg/L and the United States fresh water four day average criteria of 6.6 µg/L

II

Considerations for Substance Selection (continued)

Environmental and Health Data

- Additional avenue for assessing potential impact on the GLB.
- Data may range from conclusions of toxicity through the national programs to reasonable worst-case scenario estimates of intake by human populations that indicate concern

Example: Nonylphenol and its Ethoxylate (NPE)

- ‘CEPA toxic’ based on CEPA 1999 64(a)&(b)
- not considered a priority for investigation of options to reduce public exposure through control of sources that are addressed under CEPA 1999 64(c)

II

Considerations for Substance Selection (continued)

Other Reasons for Concern

- Opportunity to assess specific characteristics of a substance that may make it a potential threat to the GLB
- Incorporates ‘precautionary approach’
- Includes:
  - indications of endocrine disrupting properties, acute adverse effects, and the concern that manufacturing/importation of the substance may increase in the future

Example: Nonylphenol and its Ethoxylate (NPE)

- Evidence from scientific journals suggests NPEs have endocrine disrupting properties

‘Considerations for Substance Selection’ Outcomes

Stream 1 and Stream 2 Substances

Substances analyzed under the Framework may fall into one of two streams, based on data availability

- ***Stream 1:*** Substances for which sufficient data exist to evaluate the questions posed under section II, ‘Consideration for substance selection’. Stream 1 substances would be assessed for management opportunities prior to those that fall into Stream 2
- ***Stream 2:*** Substances with insufficient information to evaluate under selection II fall into Stream 2

For Stream 1 substances, Framework determinations include:

  - Data suggest that a substance is not currently a cause for concern in the GLB.
  - Data may suggest that a substance poses a threat to the GLB, with management activities already proposed. The GLBTS may rely on existing efforts or recommend complementary measures
  - Data may suggest that a substance poses a threat to the GLB, with no existing management programs, and management actions may be recommended for the GLB

III

Considerations for Management Opportunities

- summarize existing program actions to address the substance
- assess opportunities to complement existing programs
- The following questions may be posed to determine whether management actions in the GLB are warranted and where reduction opportunities lie:
  - What is the present management status (regulatory and voluntary)?
  - Is current management sufficient and is further action necessary?

Example: Nonylphenol and its Ethoxylate (NPE)

Canada

- The risk management objective for NPE-containing products: achieve 50% reduction by 2007 and a 95% reduction of NPEs by 2010 in soap and cleaning products, processing aids used in textile wet processing and pulp and paper processing aids
- There are 2 Pollution Prevention (P2) Planning notices under CEPA developed to manage risks associated with NPEs (effective December 04, 2004):
  - Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Nonylphenol and its Ethoxylates Contained in Products
  - Notice Requiring the Preparation and Implementation of Pollution Prevention Plans in Respect of Nonylphenol and its Ethoxylates Used in the Wet Processing Textile Industry and Effluents From Textile Mills that Use Wet Processing

US

- US EPA's Design for the Environment Program partnered with cleaning product manufacturers and others in the design of products with a more positive health and environmental profile, Safer Detergents Stewardship Initiative SDSI, a high-level recognition program for companies who switch completely to safer surfactants

Next Steps for Framework

- Receive input from stakeholders
- Revise Framework and include ‘companion document’ describing Framework
- Distribute revised Framework with companion piece to stakeholders in the fall
- Provide final draft by December meetings