

## Puget Sound Toxics Control Strategy Revised 09/06/2006

**Outcome:** Toxic contamination in Puget Sound is reduced to levels that provide long-term support for the natural ecosystem, its component species, and human health and well-being.

**Strategies:**

1. Characterize pathways<sup>1</sup> of toxic<sup>2</sup> contamination to the Puget Sound ecosystem.
2. Evaluate their relative contribution and the feasibility of additional regulatory controls.
3. Develop, adapt and accelerate control strategies and actions by continually advancing and applying best practices to control ongoing releases.
4. Adapt and accelerate toxic contaminated site and sediment clean up efforts by periodic review of priorities, level of effort, and best practices.

**Background Recommended Approach:**

Pollutants, including toxins, easily reach water. They can directly reach surface water via aerial deposition and indirectly by run-off and overland flow following rainfall. Toxics can percolate through soils to groundwater. Many factors contribute to toxic loadings to Puget Sound:

- Urbanization, with its paved surfaces, industrial development, and higher vehicle traffic;
- Residential activities such as use of chemical in lawns and gardens, herbicides in parks and golf courses, and toxic cleaning compounds;
- Agricultural practices;
- Industrial and municipal wastewater discharges;
- Emissions to the air and subsequent deposition; and
- Abrasion of road surfaces and corrosion of metal alloys and other vehicle parts (e.g. brake linings).

**A. Pathway characterization and evaluation**

In order to reduce the amount of toxics reaching Puget Sound, more information is needed on how the toxics of greatest concern, their common pathway to Puget Sound, and how to control and clean them up. This paper recommends an initial two-phase approach to first estimate and then characterize the loadings and fate of toxic contaminants in Puget Sound and second, to implement better and more effective control strategies and accelerated cleanups.

**Phase I.** An initial (and immediate) effort will use regional expertise to develop a very general understanding of the major pathways for toxic contamination in Puget Sound and whether or not realistic potential exists to reduce loadings from those pathways by

- (1) identifying a "short list" of toxic contaminants of greatest concern (e.g., PCBs, PAHs, copper),
- (2) estimating loads of those contaminants by major pathways at appropriate geographic scales using information available from multiple sources<sup>3</sup>,

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<sup>1</sup> "Pathways" include air deposition, surface water, municipal and industrial wastewater, spills, groundwater discharges, etc.

<sup>2</sup> "Toxics" means PCBs, PAHs, copper, etc.

- (3) identifying the potential for significant reductions in loadings from major pathways, and
- (4) developing a simple mass budget model of toxic contaminants the Puget Sound ecosystem.

Specifically:

Phase I – initial loading assessment completed by mid-2007.

*Tasks:*

- Assemble and facilitate a toxics loadings and fate work group from Participant organizations outlined below.
- Identify toxic contaminants of greatest ecological and human health concern (see footnote 2).
- Using and extrapolating from existing information from Washington and other locations and sources, estimate loads of key contaminants from major pathways at appropriate geographic scales. (See footnote 1 and 3)
- By reviewing of current practices, available technologies, and trends in industrial and pollution control practices, evaluate the potential for reductions in loadings of toxic contaminants from major pathways.
- Develop a simple model of toxic contaminant loading, accumulation, and loss to describe the mass budget of toxic contaminants in Puget Sound.
- Prepare and report on conclusions of the toxic loading and fate work group with appropriate caveats on how the information should and should not be used given the level of uncertainty.
- Include specific recommendations on how to present the data to assure uncertainties are clear.

*Participants:* A contractor would be hired to form and facilitate an ad hoc toxic loadings work group and undertake the technical tasks to accomplish the work of Phase 1. The work group would be made up of representatives of the Washington Department of Ecology, other Puget Sound Partners, PSAT staff, and other interested individuals with technical expertise.

*Funding Estimate:* \$100,000 to \$150,000 (contract) for technical tasks and work group coordination. Project should start in the Fall, 2006.

**CAVEAT:** It is possible that not enough information exists to complete Phase 1. Should that be the case, the tasks listed above would be modified. After identifying the toxics of greatest concern, the tasks would include identifying the critical information needed to complete Phase 1 with recommendations on how to gather it. (See also *Uncertainties and Risks* at the end of this paper.)

**Phase 2.** Because Phase 1 of this proposal will result in a very general, high level understanding, additional work will be needed to better understand the levels and pathways of toxics entering Puget Sound.

*Tasks*

- Conduct studies to collect data on actual loadings from pathways and source contributions to pathways identified in Phase 1.
- Develop a quantitative model of the mass budget of toxic contaminants in Puget Sound.

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<sup>3</sup> Information sources includes Washington Department of Ecology, NOAA Fisheries, King County, scientific literature, and common engineering assumptions associated with the types of facilities found in Puget Sound that contribute to the identified pathways.

- For contaminants identified in Phase 1, prepare a comprehensive description of pathways and sources, and estimate amounts of toxic contaminants entering Puget Sound.

*Participants:* Continue involvement and approach of ad hoc work group, including contractor support.

*Funding Estimate:* Minimum of \$1.2 million for 2007-09 biennium.

## **B. Continued and improved source control and cleanup**

Continue current efforts and develop, adapt and accelerate strategies and actions as suggested by improved understanding of toxics loadings and effects and new developments in pollution prevention, control and clean up practices. This approach includes four elements: enhance compliance in urban bays; review and improve control measures undertaken by regulated facilities, provide source control technical assistance to unregulated businesses as well as the general public, and clean up contaminated sites and sediments.

### **Compliance Inspections; Assistance and Enforcement:**

#### *Tasks*

- Expand targeted work in specific Puget Sound bays (e.g. Bellingham Bay, Liberty Bay, Budd Inlet) to work with local governments, businesses and citizens on controlling sources of contamination into stormwater, inspecting permittees and taking necessary actions to bring permittees into compliance as well as bring unpermitted sources under required permits.

*Participants:* WDOE

*Funding Estimate:* \$400,000 (annual)

### **Review and Improve Control Programs**

#### *Tasks*

- Review current CWA, CAA and RCRA permits for the Puget Sound area and generate a listing of toxics currently regulated under CWA, CAA and RCRA, and the minimum and maximum range of concentrations currently included in permits that discharge into or impact Puget Sound.
- Identify more protective permit limits for currently regulated chemicals of concern and high priority emerging chemicals. Investigate treatment technologies for all chemicals of concern.
- Incorporate recommended chemical of concern permitted levels and monitoring plans into NPDES, RCRA, Washington state solid waste and air quality permits, and TMDLs as appropriate.<sup>4</sup>

*Participants:* EPA, WDOE, local health departments, Puget Sound Clean Air Agency, permittees

*Funding Estimate:* \$300,000 - \$500,000

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<sup>4</sup> Some of this work is done by local health departments (solid waste) or the Puget Sound Clean Air Agency. Where appropriate, these entities will be brought into the upfront work on this project.

## Source control technical assistance to unregulated businesses

*Section under development*

### Cleanup of Contaminated Sites and Sediments

#### *Tasks*

- Assist with identification of source control priorities upstream of priority cleanup and restoration areas.
- Complete remedial actions at priority sediment cleanup sites.
- Contribute data from priority cleanup sites to comprehensive toxics database.

*Participants: EPA, WDOE*

*Funding Estimate: \$400,000 plus cleanup costs (annual)*

### **C. Monitoring and Assessment**

Develop a monitoring and assessment strategy that evaluates the effectiveness of the toxics source control strategy, addresses monitoring gaps in water, air and sediments and biota, and provides input for refining the toxics control strategy to reduce toxics in Puget Sound.

#### *Tasks*

- Continue and adapt ongoing status and trends monitoring programs and develop recommendations for additional types of status and trends monitoring and assessment.
- Develop an approach to assess the effectiveness of the toxics control actions and the overall strategy.
- Describe and communicate needs for investments in toxics monitoring and assessment and recommend changes or refinements to the toxics control strategy for Puget Sound based on assessment and monitoring results.

*Participants: Puget Sound Assessment and Monitoring Program (NOAA Fisheries, WDF&W, USF&W, PSAT, WDOE, EPA)*

*Funding Estimate: \$80,000 plus agency staff (annual)*

#### **Uncertainties and Risks:**

Products would not be available in time for use by the Puget Sound Partnership. This proposal assumes some successor group will develop and advance toxics reduction recommendations and further refine loading estimates.

Available data and expertise will expose a number of significant information gaps. These gaps may preclude developing estimates of loads by some pathways, but will identify areas of recommended focus for subsequent study.

The methodologies that are practical for estimating loadings in the initial project effort may yield results that are of dubious quality. Without further work evaluating the potential approaches, it is not possible to describe the tradeoffs between confidence, timeliness, and level of effort represented by this proposal.

Ongoing studies (e.g., atmospheric deposition in south Seattle) may address some aspects of this work and may aid in providing more accurate loading estimates. These studies should be coordinated with this effort.

Approaches for evaluating the level of toxics loading reductions possible for major sources is not clear. Information regarding potential pre-treatment and treatment options will need to be obtained.

