Washington Toxics Reduction Strategy:

Background Information on Toxics in Washington and Toxics Management Strategies

Prepared for the Washington Toxics Reduction Strategy Workgroup
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Introduction

The Department of Ecology has convened the Toxics Reduction Strategy Workgroup to examine alternative approaches to addressing toxics in Washington. Specifically, this group has been asked to:

- Examine existing approaches to identify and control human and environmental exposures to toxic chemicals.
- Identify areas where current approaches fall short.
- Identify areas where current rules and programs addressing toxic threats can be improved.
- Envision new approaches to reducing toxic pollution and exposures that offer improved environmental and human health protections, and make sense economically.

To assist the group with its initial deliberations, Ross Strategic and Ecology have prepared this memo that provides high-level overviews of the following topics:

1. What do we know—and not know—about toxic chemicals in Washington?
2. How do we currently address toxics in Washington, and what are examples of challenges with current approaches?
3. What approaches are other States and countries taking to address toxics?

This information is intended as a starting place, to spark thinking and discussion. It can provide a frame of reference from which to advance the conversation about options for Washington's toxics management strategies in the future.

Question 1: What Do We Know—And Not Know—About Toxics in Washington?

The Chemicals in Our Environment

Chemicals are everywhere in the modern world—yet we know little about the toxics in our environment and in ourselves, and how those chemicals may be affecting us. The American Chemical Society maintains a database of chemical substance information called the CAS Registry.[1] The CAS Registry contains more than 68 million unique organic and inorganic substances, and more than 63 million sequences, and more than 15,000 substances are added to the database each day. While many of those substances certainly would prove to not be harmful, some of them may cause harm. The sheer number of chemicals speaks to the challenge of understanding the chemical hazards in the environment.

Unlike nutrition labels, we generally do not have data on the toxics that are present in our environment—in the products we use at work and at home, and for transportation and leisure. ***Except in certain limited cases, manufacturers are not required to disclose the chemical ingredients products contain.*** We know in general that some chemicals, such as metals, the flame retardants polybrominated diphenyl ethers (PBDEs), and organic polymers used in plastics and coatings, are widely present in products. Washington's recently enacted Children's Safe Products Act will begin to change the data flows for children's products, as manufacturers of children's products were required to report on the chemicals in the State's List of Chemicals of High Concern to Children beginning in 2012.[2]

A lack of data about toxic chemicals plagues efforts to mitigate their presence and impacts on a national level, and this reality is true for Washington State as it is for the country as a whole. Under the federal Toxic Substances Control Act (TSCA), EPA's ability to gather data about new chemicals' toxicity is limited to a 90-day review window, and, unlike many other developed countries, TSCA does not require producers of new chemicals to provide any data about the chemical's health or environmental safety. Producers rarely submit such data, even in the case of chemicals that are widely produced in large volumes. TSCA also does not address several major classes or uses of chemicals, including pesticides, drugs, cosmetics, munitions, or foods and food additives.

- In 1998, EPA found that there was no publicly available data for 43 percent of approximately 3,000 high-volume chemicals. EPA had then conducted testing on fewer than 200 chemicals.[3]
- There are currently more than 84,000 chemical substances on EPA's TSCA Inventory, and in March 2012 EPA identified 83 of those chemicals (TSCA Work Plan chemicals) for further assessment over the next several years.[4]

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[1] The CAS registry and database counter are at: http://www.cas.org/.

[2] For more information: http://www.ecy.wa.gov/programs/swfa/cspa/

[3] Lowell Center for Sustainable Production, *Options for State Chemicals Policy Reform: A Resource Guide,* (University of Massachusetts, January 2008) p. 4. http://www.chemicalspolicy.org/downloads/OptionsforStateChemicalsPolicyReform.pdf

[4] For information about TSCA Work Plan chemicals, see www.epa.gov/oppt/existingchemicals/pubs/workplans.html.

So, what *do* we know about toxics in Washington? Some key information sources include:

- Toxic Release Inventory (TRI) emissions reports, which show toxics entering the environment from industrial facilities
- Puget Sound Toxic Loading study, which although focused in one geographic region of the state, provides an integrated look at toxic inputs from multiple sources (not just point sources)
- Washington's Environmental Information Management (EIM) system, which is a database of over 12.5 million environmental records, including air, surface water, groundwater, soil, sediment, and aquatic animals and plants[5]
- Human health exposure studies, which show the amounts of certain toxic substances that are appearing in our bodily fluids and tissues

Information from each of these sources is described further below.

Toxic Emissions in Washington

Toxic Release Inventory Data

We have good information about toxic emissions in Washington from point sources—and in particular, from the facilities that submit TRI emissions reports to EPA. These represent the industrial facilities with larger volumes of chemical releases (federal law establishes reporting thresholds for 650 TRI chemicals, with lower thresholds for persistent, bioaccumulative, and toxic [PBT] chemicals). TRI data alone do not indicate the risk associated with the releases (e.g., 1,000 pounds of chemical X may be a greater health or environmental risk than 10,000 pounds of chemical Y), or correlate with exposures to the chemicals. However, they provide a sense of the toxics entering in our environment from industrial sources.

In 2010, the most recent year for which we have TRI data, 307 Washington facilities reported on the use of 107 different chemicals or chemical groups through TRI (see Table 1 for the top 10 TRI releases). Key statistics about Washington TRI releases include:

- ***In 2010, 18.4 million pounds of toxic chemicals were released to the air, water, or land at Washington facilities*** and another 1.98 million pounds were disposed or released off-site.[6]
- Forty seven percent of the on-site releases were to air, 45 percent were to land, and 8 percent of the releases were to water.[7]
- ***Lead and lead compounds, polychlorinated biphenyls*** (PCBs, all of which were disposed off-site in 2010), ***polycyclic aromatic compounds, and mercury compounds were the most prominent PBTs released by industry*** according to the TRI reports (see Table 2).

[5] For more information about the Washington Department of Ecology's EIM, see http://www.ecy.wa.gov/eim/index.htm.
[6] U.S. EPA, Toxics Release Inventory, *2010 State Fact Sheet: Washington,* 2010 data update as of March 2012, available at http://iaspub.epa.gov/triexplorer/tri_statefactsheet.statefactsheet.
[7] Calculated based on U.S. EPA, TRI 2010 State Fact Sheet for Washington.

Table 1: Top 10 TRI Releases in Washington by Chemical Volume, 2010

Chemical	Facilities Reporting	PBT?	Carcinogen?	On-Site Disposal or Releases (Pounds)	On- and Off-Site Disposal or Releases (Pounds)
Lead	62	Y	Y	4,309,016	4,373,934
Methanol	30	N	N	3,047,857	3,050,978
Barium Compounds	9	N	N	2,793,635	2,918,733
Hydrochloric Acid (Acid Aerosols)	15	N	N	1,060,487	1,060,487
Nitrate Compounds	46	N	N	1,058,562	1,122,293
Ammonia	31	N	N	812,043	910,567
Carbonyl Sulfide	6	N	N	787,790	787,790
Manganese Compounds	18	N	N	707,630	929,751
Copper Compounds	17	N	N	469,693	602,483
Styrene	23	N	Y	396,227	406,067

Source: U.S. EPA, *TRI Explorer,* 2010 data update as of March 2012, downloaded August 2012, www.epa.gov/tri/.

Table 2: PBT Chemical Releases in Washington by Chemical, 2010

Chemical	Facilities Reporting	On-Site Disposal or Releases (Pounds)*	On- and Off-Site Disposal or Releases (Pounds)*
Lead	62	4,309,016	4,373,934
Lead Compounds	72	146,384	185,917
Polychlorinated Biphenyls (PCBs)	4	0	61,400
Polycyclic Aromatic Compounds	30	3,413	38,330
Mercury Compounds	18	643	717
Benzo(g,h,i)perylene	22	521	565
Mercury	6	12	40
Tetrabromobisphenol A	3	0	12
Dioxin and Dioxin-like Compounds	23	61 grams	373 grams
Total		**4,459,988**	**4,660,917**

*Releases for dioxin and dioxin-like compounds are reported in grams rather than pounds.

Source: U.S. EPA, *TRI Explorer,* 2010 data update as of March 2012, downloaded August 2012, www.epa.gov/tri/.

TRI does not capture all toxic releases. The TRI reports information on emissions from manufacturing, but not other potential toxic emissions sources, including: other businesses; vehicles; sources for the majority of pesticides, volatile organic compounds, and agricultural fertilizers; wood smoke; consumer products; personal care products; and pharmaceuticals.

Puget Sound Toxic Loading

The quantity, sources, and pathways of toxic chemicals in Puget Sound have been studied since 2006, thanks to a collaborative effort between the Department of Ecology, Puget Sound Partnership, and other state and federal agencies, to investigate toxics loading toward the goal of preserving the Sound.[8] The toxic loading study provides a picture of the toxics entering our environment through multiple pathways—both from point sources such as industrial facilities and wastewater treatment plants, and from non-point sources including vehicles, developed areas, and agricultural areas. The results of this study provide an integrated understanding of a variety of media and sources. The loading study focused on 17 toxic chemicals, including metals, pesticides, PBTs, and others; it did not include pharmaceuticals.[9]

The study found that the vast majority of toxic chemicals in Puget Sound come from non-point sources through surface water runoff. This makes it difficult to trace the origin of most toxics that reach the Sound; however, the study did reveal several sources of some chemicals, including:

- **Copper, cadmium, zinc, and phthalates,** from roofing materials
- **Copper** from pesticide and fertilizer use in urban areas, brake pads in vehicles, roofing materials, and boat paint
- **Polycyclic aromatic hydrocarbons (PAHs)** from wood smoke, creosote-treated wood, and vehicle exhaust
- **Petroleum-related compounds** from minor fuel and oil spills, and drips and leaks from personal vehicles

Washington State has already taken action to address some of these sources, for example, through recent laws limiting the metal content of brake pads. Overall, the loading study indicated that the primary pathway to Puget Sound is polluted surface water runoff, or stormwater. Other pathways include direct air deposition (where chemicals fall directly into the water; this is the most common pathway for PBDEs and some PAHs), and wastewater treatment plants (for PDBEs).[10] Although the study focused on Puget Sound, it gives an indication of the types of toxic substances and pathways that may be present in other areas of the state.

Environmental Information Management (EIM) System

Another information source for toxics in Washington is the Department of Ecology's EIM System. The EIM database contains over 12.5 million environmental records on air, groundwater, stream habitat, soil, sediment, aquatic animals, and plants. It is a searchable database available to the public at www.ecy.wa.gov/eim. Data on toxics in the database are collected for a variety of purposes and are not routinely summarized, but the database can be searched by study, chemical, location, groundwater well, parameter, or other fields.

[8] For more information about the Puget Sound toxic loading study, see http://www.ecy.wa.gov/programs/wq/pstoxics.

[9] The list of chemicals studied included: arsenic, cadmium, copper, lead, mercury, and zinc; polycyclic aromatic hydrocarbons (PAHs); flame retardants such as PBDEs; phthalates; petroleum-based contaminants; PCBs and DDT; triclopyr, a pesticide commonly used in urban areas; and nonylphenol, a compound often found when commercial detergents breakdown.

[10] Herrera Environmental Consultants, Inc. *Control of Toxic Chemicals in Puget Sound: Phase 3 Data and Load Estimates.* April 2011. http://www.ecy.wa.gov/puget_sound/reports.html

Human Health Exposures to Toxics

The most comprehensive study of human exposure to toxics in the environment in the U.S. is the CDC's *National Report on Human Exposure to Environmental Chemicals*, which has reported the levels of chemicals in people's blood and urine since 1999.[11] The list of chemicals tracked in these ongoing biomonitoring studies has increased over time, with 212 chemicals reported in the most recent National Report in 2009 and data for an additional 34 chemicals presented in updated tables in 2012.[12] ***Overall, the exposure studies show that many industrial chemicals are widely present in our bodies. However, for most substances included in the CDC's report (with notable exceptions, such as blood lead levels), more research is needed to determine whether the exposure levels indicate a health concern.***

Highlights of findings from the fourth national exposure report include:[13]

- The report showed progress at reducing exposure to **lead,** a known health risk. From 1976-90, 88.2 percent of children studied had elevated blood lead levels (above 10 micrograms per deciliter), but only 1.4 percent of children had elevated blood lead levels in 1999-2004.
- **Bisphenol A (BPA),** a component of epoxy resins and polycarbons that may have reproductive toxicity, was found in over 90 percent of the sampled population.
- Most Americans have methyl *tert*-butyl ether **(MTBE)** in their blood according to the CDC.[14] MTBE was added to gasoline to boost octane and reduce carbon monoxide emissions; many health studies of MTBE have been inconclusive, although high doses can irritate skin and eyes.
- One type of **PBDE,** BDE-47, was found in the blood of nearly all survey participants. PBDEs are fire retardants that accumulate in the environment and fatty tissue. In animal studies, PBDEs have shown effects on the thyroid, liver, and brain development.
- All survey participants had detectable levels of **perchlorate** in their urine; perchlorate is both naturally occurring and used to manufacture explosives. While large doses of perchlorate are known to harm thyroid function, little is known about the health risks of low exposure levels.
- Most participants had measurable levels of the perfluorinated chemical**, perfluororooctanoic acid (PFOA)**, which aids in manufacturing non-stick coatings for cookware and is used to synthesize other chemicals. In animal testing, large doses of PFOA have affected reproduction, development, and the liver. Perfluorinated compounds tend to be highly persistent.

Washington is one of three states (along with California and New York) that received a federal grant from CDC in 2009 to conduct a laboratory biomonitoring program. (The CDC exposure studies do not have sufficient sample size to allow differentiation by state.) The Washington State Department of

[11] The National Report on Human Exposure to Environmental Chemicals is available at http://www.cdc.gov/exposurereport.

[12] The chemicals studied include environmental tobacco smoke, pesticides/herbicides/insecticides, dioxin-like compounds, metals, PAHs, parabens, perfluorochemicals, phthalates, PBDEs, PCBs, phytoestrogens, volatile organic compounds, halogenated solvents, and others.

[13] Findings in this section from: Centers for Disease Control and Prevention*, Fourth Report on Human Exposure to Environmental Chemicals, 2009*, (Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, http://www.cdc.gov/exposurereport/) pp. 1-7.

[14] CDC*, Fourth Report on Human Exposure to Environmental Chemicals, 2009*, http://www.cdc.gov/exposurereport/, pp. 489-90.

Health is measuring chemicals in the blood, urine, and other tissues of Washington residents, for both average risk and high-risk populations, through the **Washington Environmental Biomonitoring Survey (WEBS) project**.[15] The goals of the project include comparing the Washington biomonitoring data to national exposure levels, and using the information to reduce exposures. In the first two years, the Department tested urine samples and drinking water for the following substances:

- Arsenic (including testing in areas with high naturally occurring arsenic in drinking water)
- Pyrethroid and organophosphate pesticide metabolites
- Other metals

The testing results from years 1-2 are expected in 2012. In years 3-5 of the grant (September 2011-August 2014), the Department plans to survey other environmental chemicals and collect other types of samples (e.g., blood and hair). An Advisory Committee provides guidance on the project.

Overall, human health exposure studies indicate that many toxic chemicals are widely present in our bodies; however, we only have data for a portion of the toxic chemicals in our environment, much of it has been examined only recently, and we are only beginning to collect data at the state level.

Conclusion

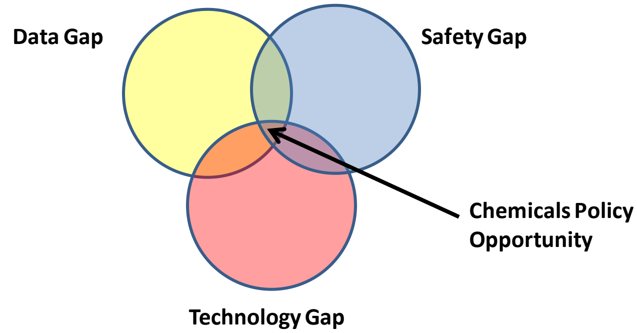
While a considerable amount of information has been gathered about toxic chemicals in Washington State, data gaps remain in the areas of assessing new chemical hazards, understanding the toxics present in products, and human health exposure. Although not unique to Washington State, these data gaps highlight some of the challenges of developing an effective chemicals policy. Researchers at the California Policy Research Center characterized the current U.S. chemical management system as having three related gaps:[16]

- *Data Gap*: Very little is known about health effects, exposures, and uses about a large percentage of chemicals that are used in the marketplace. Even large companies can have difficulty identifying hazardous chemicals in their supply chains if chemical producers have not provided data on how toxic these chemicals are to human health and the environment.
- *Safety Gap*: Lacking sufficient information to designate certain chemicals as toxic substances, and prioritize those that pose a high risk, it is difficult for companies, federal agencies, or state government agencies to take measures to protect people's safety from high-risk substances.
- *Technology Gap*: The failure of current policy to disincentivize the use of toxic chemicals results in a lack of any catalyst for chemical producers to research safer alternatives and green chemistry options.

[15] For more information about the WEBS project, see http://www.doh.wa.gov/DataandStatisticalReports/EnvironmentalHealth/Biomonitoring.aspx.

[16] Wilson, Michael P., Daniel A. Chia and Bryan C. Ehlers. *Green Chemistry in California: A Framework for Leadership in Chemicals Policy Innovation.* California Policy Research Center, University of California. 2006. http://coeh.berkeley.edu/FINALgreenchemistryrpt.pdf

Figure 1: Three Critical Gaps in U.S. Chemicals Policy



Adapted from: Minnesota Pollution Control Agency, *Options to Reduce and Phase-out Priority Chemicals in Children's Products and Promote Green Chemistry,* Report to the Legislature, December 2010.

The data we have shows toxic releases for many chemicals from some sources in Washington, and we know that many toxic chemicals are present in the general U.S. population. There are many more chemicals in our environment than those for which we have a good understanding of health impacts, exposures and risks, and the list of chemicals is constantly increasing. More complete data on toxics in the U.S., and in Washington, would contain information on health and other hazards, potential and actual releases, exposures, uses, supply chain flows, and lifecycle management. Currently, such data are lacking. Even the data we have omit information about potentially hazardous classes of chemicals or chemical applications; these gaps include pharmaceuticals, pesticides, cosmetics, and food products.

Question 2: How Do We Currently Address Toxics in Washington, and What Are Challenges of Current Approaches?

This section describes the range of prevention, management, and cleanup programs in Washington that address toxic chemical exposures, and provides a short summary of the types of challenges remaining for toxics management in the state.

Current Approaches to Toxics in Washington

Ecology has a three-pronged approach to reducing toxics: cleanup; management; and prevention.

Cleanup Programs

We have cleanup programs to address legacy releases of contaminants. Ecology's Toxics Cleanup Program has cleaned up about 5,300 out of a little more than 11,000 identified cleanup sites since the enactment of the Model Toxics Control Act in 1989. About 300 new sites are identified every year and TCP estimates that over the next 10 years almost $2 billion in funding is needed to clean up publicly owned sites. Ecology is also responsible for cleaning up impaired water bodies through preparation and implementation of total maximum daily loads (TMDLs). There are 1,767 water bodies identified as impaired due to toxic chemicals for either water or sediment quality and about 32 percent are being addressed by TMDLs.

Management Programs

Major programs to manage or control the releases of toxic chemicals into the environment are generally focused on permitting programs, technical assistance efforts, best management practices and education/outreach activities. Key permits include: NPDES permits to control point source discharges to surface waters; general permits to control contamination in stormwater from a variety of sources such as boatyards, construction sites, sand and gravel operations, industrial facilities and municipalities; air quality permits to limit emissions from industrial operations and agricultural burning; and permits to control releases from facilities that treat, store or dispose of hazardous wastes.

Many Ecology Programs also provide technical assistance to help businesses comply with permit requirements. Best Management Practices and other guidance documents are developed for this same purpose as are some education and outreach activities.

Prevention Programs

Cleanup and management programs are essential to reducing toxic threats but they are costly. Prevention efforts must also be expanded and improved if we ever to get in front of these issues. Below is a short summary of a number of key efforts underway in Washington to reduce toxic threats by preventing the use or release of toxic chemicals.

Pollution prevention

Under the Pollution Prevention Act of 1990, certain businesses that use hazardous products or generate dangerous waste are required to prepare Pollution Prevention (P2) plans for voluntarily reducing their hazardous substance use and dangerous waste generation. Businesses that generate more than 2,640 pounds of hazardous waste or are required to report as part of the national Toxic Release Inventory must submit plans.

Toxic Metals Prevention project

The Toxic Metals Prevention Project is a joint effort between the Department of Ecology and Washington's larger businesses that participate in Pollution Prevention (P2) Planning. The project's goal is to identify safer alternatives to toxic metals. Though several metals are toxic, this effort will first focus on mercury, lead, and cadmium.

Local Source Control

The Local Source Control Partnership is a key component of the Urban Waters Initiative to restore the significant urban waters in Washington State. Local Source Control Specialists confer with business owners and managers over hazardous and dangerous wastes, stormwater, solid waste, and spill prevention – making every effort to assist those businesses that are not properly managing their waste.

Wood stove emission reductions

Ecology issues grants to help communities reduce toxic wood smoke pollution during the winter heating season by helping residents replace older, more polluting wood heating devices with newer, less-polluting home heating devices.

Diesel emission reductions

Ecology issues grants to reduce toxic diesel emissions in situations where concentrations of diesel exhaust from engines can cause adverse health impacts to citizens. These include engine exhaust retrofits, idle-reduction technologies, re-powers to alternative fuels, as well as dockside and truck stop electrification. In addition to reducing direct emissions that impact public health, many of these strategies help entities reduce fuel use and save money.

Preventing future non-attainment

Ecology and local air agencies are working actively to address nonattainment in the Tacoma-Pierce County area through the Tacoma-Pierce County Clean Air Task Force. The Task Force recommended enhanced enforcement of burn bans, requiring removal of uncertified wood stoves and inserts, and reducing pollution from non-wood smoke sources.

Spill prevention

Ecology's Spill Prevention, Preparedness & Response Program focuses on prevention of oil spills to Washington waters and land, as well as planning for an effective response to oil and hazardous substance spills whenever they occur.

PBT Program

Persistent, bioaccumulative toxics (PBTs) are a distinct group of chemicals that threaten the health of people and the environment. The focus of our work on PBTs is preparing and implementing Chemical Action Plans (CAPs). A CAP is a plan, not legislation or a rule. It recommends actions to protect human health and the environment. CAPs are generally well-regarded among stakeholders for their comprehensive approach but implementation of recommendations requires additional funding not currently in Ecology's base budget.

Children's Safe Product Act
The Children's Safe Product Act is designed to collect information that will help government and the public better understand the presence of chemicals in children's products. It requires manufacturers of children's products to report if their products contain certain chemicals. All the chemicals on the list are toxic and have either been found in children's products or have been documented to be present in human tissue (blood, breast milk, etc.) The rule applies to companies that make children's products like toys, cosmetics, jewelry and baby products.

Chemical bans
Ecology is implementing a variety of chemical-specific bans that apply to particular products, including laws that limit:

- Mercury in thermometers, manometers, thermostats, and automotive switches
- Polybrominated diphenyl ether (PBDE) flame retardants
- Lead wheel weights
- Coal tar sealants
- Bisphenol A in baby bottles and cups
- Copper in brake pads and boat paint

Alternatives assessment guidance
Ecology is working with seven other member states of the Interstate Chemicals Clearinghouse to create an alternatives assessment guidance document. The purpose of the effort is to help businesses, particularly small and medium sized organizations, reduce their use of toxics and avoid regrettable substitutes by conducting alternatives assessments.

Washington Waters educational efforts
About one-third of Washington's waters are too polluted to meet state water quality standards. More than 60 percent of water pollution comes from things like cars leaking oil, fertilizers and pesticides from farms and gardens, failing septic tanks, pet waste and fuel spills from recreational boaters. All these small, dispersed sources add up to a big pollution problem. Educational efforts such as Washington Waters are designed to encourage individuals to change their behavior to prevent these sources of toxic chemicals to the environment.

Types of Toxics Management Challenges Washington State Faces
While Washington State has made significant progress in reducing toxics in our environment and in the products we use, there remain challenges with our current approaches. The State's cleanup, management, and prevention programs were all developed to address specific elements of toxics management and to prevent, or mitigate, specific outcomes such as discharges of toxics to the environment in air or wastewater. These programs have been mostly successful at reducing toxic exposures and releases to the environment in the areas they are designed to address. Yet problems and significant challenges remain.

The list below describes some examples of the types of challenges that the State often faces when confronting the task of reducing the threat of toxics to humans and the environment.

Challenges Facing Washington

- Prevention is the smartest, cheapest, and healthiest approach, but it is the least developed, the least comprehensive, and it is faced with significantly less investment than our investment in cleanup and management activities.
- There is a major disconnect between those with the responsibility to address toxic pollutants and those who can address the sources of toxics through design and other choices.
- The burden of proof necessary to take preventative action is too high and too costly, and it is frequently only met too late—after serious releases or exposures occur.
- There are inadequate or non-existent tools to address distributed/non-point sources.
- Many “chemicals of concern” or potential chemicals of concern fall outside of current regulatory tools.
- The inability to prevent sources threatens recontamination of cleanup sites.
- Unlike other major environmental laws, there is no cost/benefit mechanism in the Clean Water Act.
- This deficient system for managing toxic chemicals results in high transaction costs for government, businesses, and the public

Question 3: What Approaches Are Other States and Countries Taking to Address Toxics?

The management of toxic chemicals in the United States is conducted at the federal level under the Toxic Substances Control Act (TSCA), passed in 1976; however, many states are responding to deficiencies in TSCA and choosing to approach toxics in different ways. Many states began addressing toxics through policies that restrict single chemicals or specific chemical uses, such as laws banning BPA in children's products, but there is a trend toward more integrated, holistic approaches that address multiple chemicals and/or sources. New solutions that include diverse stakeholders and explore options like product stewardship and green chemistry are showing promise in several states.

In this section, we present highlights of several states' and international efforts to manage and reduce toxic chemicals. Although the states we've selected have more comprehensive policy approaches to addressing toxic chemicals, we've chosen to highlight particular notable aspects of each state's approach rather than describing the full range of toxics management policies.

For more information about the range of policy approaches that states have used to address toxics, see the Table of State Toxics Policy Approaches in Appendix A. Appendix B also contains a list of resources.

Example State Approaches

California

California is a leader among U.S. states in its comprehensive approach to assessment and management of toxic chemicals. Some key elements of California's approach to toxics include:

- **Right-To-Know Provisions and Chemical Restrictions Under Proposition 65:** In 1986, California enacted the Safe Drinking Water and Toxic Enforcement Act (commonly known as Proposition 65), which **prohibits discharges of chemicals** known to the state to cause cancer, birth defects, or other reproductive harm when those discharges could affect water or drinking water. Businesses are required to **label products** containing chemicals identified in the list of more than 700 chemicals prepared by the California EPA. The Act established an enforcement fund for implementation and administration, which is funded in part by civil and criminal penalties.

- **Proposed Safer Consumer Products Regulation:** In summer 2012, California DTSC proposed a new regulation that would **require manufacturers to seek alternative ingredients** in widely used products when products use one or more of 185 "chemicals of concern."[17] The regulation addresses a broader range of products than legislation in other states, which focus on particular product types such as children's products. The comment period will conclude in October 2012.

- **Biomonitoring:** Established in 2006, the California Environmental Contaminant Biomonitoring Program was the first state-level biomonitoring program. The Program monitors the presence and

[17] For more information about the proposed regulation, see http://www.dtsc.ca.gov/SCPRegulations.cfm.

concentration of chemicals (metals and organic pollutants) in residents' blood and urine, and expects to have data available to share with the public every two years, beginning in 2012.

Maine

Maine's **2008 Kid Safe Products Act** authorized the state to designate a list of priority toxic chemicals, termed **Chemicals of High Concern (CHCs)**. The burden to gather data and identify substances as toxic rests on the government. Maine promotes the **free dissemination of information** on toxic substances by publishing the list of manufacturer-reported chemicals in products on a publicly accessible website.[18] The list contains approximately 1700 chemicals.

Maine's toxic chemicals policy authorizes the state to take the following actions to reduce the presence of toxics in the state:

- **Ban sale or distribution** of children's products containing PCs
- Require manufacturers to conduct **safer alternatives** analyses
- Require that safer alternatives be used when they are available
- Require that a **stakeholder group** be convened to provide recommendations regarding implementation of safer alternatives when they are identified

Minnesota

Minnesota's **Toxic Free Kids Act** requires the state to create and maintain a list of **chemicals of high concern** in children's products and a **list of priority chemicals**. The Minnesota Pollution Control Agency (MPCA) provides recommendations to the state legislature on addressing priority chemicals in children's products, moving to safer alternatives, and incentives for product design involving green chemistry.[19]

Minnesota state agencies and businesses sponsored two phases of **stakeholder dialog on chemical regulation and policy.** The non-profit Environmental Initiative facilitated the stakeholder processes from 2010 to May 2012.[20] Phase 1 of the project focused on refining the issues and opportunities, as well as identifying policy alternatives to consider for Minnesota. Phase 2 of the project focused on providing options for improving state chemicals policy in three areas: [21]

(1) a research project to evaluate alternative risk assessment methodologies;
(2) improved use of science in chemical management decision-making (e.g., with an advisory body); and
(3) promotion of innovation and economic development through green chemistry.

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[18] Information on Maine's Chemicals of Concern list is available at http://www.maine.gov/dep/safechem/concern/index.html

[19] The report to the legislature, with recommendations, is available at http://www.pca.state.mn.us/index.php/view-document.html?gid=15319.

[20] Reports from the project are available at http://environmental-initiative.org/projects/minnesota-chemical-regulation-a-policy.

[21] For more information: http://www.environmental-initiative.org/images/files/chemreg/ph2finalreport_web.pdf

Oregon

Oregon's toxics reduction strategy focuses on addressing highest-priority toxic chemicals, reducing toxics at their source, partnering with other agencies and organizations, and measuring the effectiveness of implementation. The State's **focus list of priority chemicals** identifies 51 chemicals and chemical classes of concern, and details 25 actions to assess and reduce toxics in the state. The final version of the strategy is projected to be completed in fall 2012.

- **Public Involvement:** Oregon's toxics reduction strategy encompasses a series of recommended potential toxics reduction actions, which were developed in conjunction with public workshops to generate toxics reduction ideas for potential inclusion in the strategy. The workshops included representatives from industry, local and state government, community and environmental organizations, EPA, tribes, and agricultural and forestry interests. Additionally, a Toxics Stakeholder Group, and sub-groups including a Water Quality Human Health Toxics Standards Rulemaking sub-group, contributed ideas for strategic actions.
- In 2010, the **Oregon Green Chemistry Advisory Group** issued the report, "Advancing Green Chemistry in Oregon," which provided recommendations on increasing awareness, education, research, and resources to support green chemistry. [22]

Example International Approaches

Canada

Canada has had a risk-based chemical management system in place since 1994. Environment Canada and Health Canada jointly manage Canada's Chemicals Management Plan. The objectives are "virtual elimination" from the environment of persistent, bioaccumulative toxic substances that result predominantly from human activity (known as track 1 chemicals), and life cycle management of other toxic substances of concern (known as track 2 chemicals). Key elements of the Plan include:

- **Notification and Risk Assessments of "New" Chemicals:** Before importing or use, substances new to Canada must be reported to the government so they can be screened for health and environmental risks and control measures can be identified where needed (or substances banned). Canada assesses approximately 500 new chemicals per year.
- **Prioritization of "Existing" Chemicals:** The Canadian government classified about 4,300 chemicals that needed health and/or environmental risk assessment into high, medium, or low priority for action, and is focusing attention on the highest priorities.
- **"Challenges" to Take Immediate Action on Chemicals of High Concern:** For 200 high-priority chemicals, industry and other stakeholders are required to provide information to the government on the use and management best practices for the chemicals. The government then conducts risk assessments and, if needed, develops risk management approaches.

[22] For more information, see: http://www.deq.state.or.us/toxics/

- **Regulatory Activities to Address Specific Issues:** For groups of chemicals or sectors (e.g., petroleum sector; chemicals in food, drugs, and cosmetics; pesticides; etc.), the government is also developing or reevaluating its chemical management approaches.
- **Monitoring and Research:** Canada monitors chemicals in both humans and the environment through the Canadian Health Measures Survey, the Maternal Infant Research on Environmental Chemicals, and observations of sensitive species as part of an ecological monitoring program.
- **Public Participation:** A Chemicals Management Plan Stakeholder Advisory Council offers advice and input from industry, NGOs, labor, and aboriginal groups on implementation, and a Chemical Substances website (www.chemicalsubstanceschimiques.gc.ca) provides info on activities.

Europe

Registration, Evaluation, Authorisation, and Restriction of Chemical Substances (REACH) is an integrated regulation passed and adopted by the European Union (E.U.) in 2007. REACH applies to all chemicals in the E.U., including those used in industrial processes and household goods.

Under REACH, the **burden of data gathering is placed on chemical producers**. Chemical producers and importers must identify and manage the risks of each chemical substance that they manufacture and/or market in the E.U. For a chemical substance to be sold in products or used in industrial processes in the E.U., the following steps must be completed:

- Companies **register** all chemical substances that they manufacture or import at a volume greater than one metric ton, with the European Chemicals Agency (ECHA), collaborating with other chemical producers who register the same substance.
- ECHA **evaluates** individual registrations and approves them in compliance with REACH.
- EU Member States evaluate selected substances to identify and highlight concerns for human health and the environment.
- ECHA **assesses** whether a substance's risks can be managed.
- A chemical may be **approved** for use and sale; this approval may be subject to specific use or prior authorization restrictions.[23]

REACH prescribes the following measures to restrict or reduce toxic substances in the E.U.:

- After chemical producers submit substances for approval under REACH, ECHA has the authority to **ban or restrict** the use of substances whose risks are deemed unmanageable.
- Chemicals that the ECHA names as **"Substances of Very High Concern"** (SVHC) require special authorization to be sold within the E.U.
- Manufacturers and importers of SVHCs must research the existence of **safer alternative substances**.

As of September 2012, there were 84 substances and categories of substances on the SVHC list.

[23] For more information, see: http://ec.europa.eu/enterprise/sectors/chemicals/reach/index_en.htm

Conclusion: State and International Toxics Programs

An array of policy options exists for states and countries to manage and reduce toxic chemicals and mitigate their threat to human health and the environment. The selected states and countries presented here show a variety of approaches, including restrictions on chemical manufacturers, stakeholder group processes, green chemistry initiatives, priority chemical lists, and alternatives assessments. While many states have approached toxics management by restricting single chemicals through bans or use restrictions, there is an increasing trend toward integrated approaches.

Appendix A: Table of State Toxic Chemicals Policy Approaches

State agencies have used a variety of approaches for understanding and managing exposures to toxic chemicals. The Center for Sustainable Production at the University of Massachusetts Lowell has inventoried these approaches and categorized them according to 13 types of chemical policies. The following table, which is adapted from a Lowell Center publication, presents the 13 types of state approaches to toxic chemicals policy along with their definitions and selected examples.

State Toxic Chemicals Policy Approaches

Policy Category	**Definition**	**Examples**
Toxics Use Reduction/Pollution Prevention	Multi-pollutant, multi-media strategies that focus on reducing pollution at the source.	Massachusetts Toxics Use Reduction Act (TURA); Oregon Toxics Use Reduction and Hazardous Waste Reduction Act; New Jersey Pollution Prevention Act
Single Chemical Restrictions	Policies that ban or severely restrict the use of specific chemicals.	Washington PBDE ban; Maine PBDE ban; Rhode Island Mercury Reduction and Education Act
Multiple Chemical Polices	Policies that regulate groups of chemicals	Washington Persistent Toxic Chemicals rule; Executive Orders to reduce PBTs (Washington, Oregon)
Regulation of Product Categories	Policies that regulate categories of consumer products	California Safe Cosmetics Act; Connecticut Toxics in Packaging Law
Biomonitoring	Policies that support assessment and monitoring of human biological specimens to track the levels of human exposure to toxics.	California Environmental Contaminant and Biomonitoring Program
Data Collection	Policies that encourage the gathering and dissemination of information about toxics or use of toxics in processes.	California Chemical Testing Methods; Maine Act to Protect Children's Health and the Environment from Toxic Chemicals in Toys and Children's Products
Right-to-Know	Policies that require or encourage the provision of information or disclosures about exposures and health risks associated with chemicals to the general public.	California Safe Drinking Water and Toxic Enforcement Act

Policy Category	Definition	Examples
Prioritization	Policies that establish a framework for assessing and prioritizing chemicals.	Maine Act to Protect Children's Health and the Environment from Toxic Chemicals in Toys and Children's Products
Alternatives Assessment	Policies that encourage research to support or establish requirements to replace the use of toxic chemicals with the use of alternatives that have been evaluated for safety (i.e. substitution).	Massachusetts Toxic Use Reduction Act
Green Chemistry/Design for the Environment	Policies that encourage the redesign of chemicals, products, and processes from the outset to reduce or eliminate the use and generation of hazardous substances	Michigan Green Chemistry Executive Directive; California Green Chemistry Initiative
Product Stewardship	Policies that establish an environmental management strategy for minimizing a product's environmental impact throughout all stages of a product's life cycle.	Oregon Producer Responsibility System for the Management of Obsolete Electronics
Environmentally Preferable Purchasing	Policies that require or encourage the purchase of products that contain fewer toxic chemicals, contain recycled content, are energy efficient, or other environmentally preferable criteria	California State Agency Environmentally Preferable Purchasing; Vermont Clean State Program
Precautionary Principle	Policies that define and develop approaches for applying the precautionary principle in practice for chemicals.	Hawaii Precautionary Resolutions

Source: Adapted from: Lowell Center for Sustainable Production, *State Leadership in Formulating and Reforming Chemicals Policy: Actions Taken and Lessons Learned,* July 2009.

Appendix B: Resources

Resources on Toxics Exposures and Toxics in the Environment

Centers for Disease Control and Prevention, *Fourth Report on Human Exposure to Environmental Chemicals, 2009*, http://www.cdc.gov/exposurereport/

Herrera Environmental Consultants, Inc. *Control of Toxic Chemicals in Puget Sound: Phase 3 Data and Load Estimates.* April 2011. http://www.ecy.wa.gov/puget_sound/reports.html

U.S. EPA, Toxics Release Inventory, *2010 State Fact Sheet: Washington,* 2010 data update as of March 2012, http://iaspub.epa.gov/triexplorer/tri_statefactsheet.statefactsheet

Washington Environmental Biomonitoring Survey: http://www.doh.wa.gov/DataandStatisticalReports/EnvironmentalHealth/Biomonitoring.aspx

Washington State Environmental Information Management System, www.ecy.wa.gov/eim

Resources on State Toxic Chemical Programs

Lowell Center for Sustainable Production, *Options for State Chemicals Policy Reform: A Resource Guide,* (University of Massachusetts, January 2008) Available at: http://www.chemicalspolicy.org/downloads/OptionsforStateChemicalsPolicyReform.pdf

Lowell Center for Sustainable Production, *State Leadership in Formulating and Reforming Chemicals Policy: Actions Taken and Lessons Learned*, (University of Massachusetts, July 2009) http://www.chemicalspolicy.org/downloads/StateLeadership.pdf

California Biomonitoring Program: http://www.cdph.ca.gov/programs/Biomonitoring/Pages/default.aspx

Maine Chemicals of Concern: http://www.maine.gov/dep/safechem/concern/index.html

Minnesota Pollution Control Agency report to the legislature on phasing out priority chemicals and green chemistry: http://www.pca.state.mn.us/index.php/view-document.html?gid=15319

Oregon Toxics Reduction Program: http://www.deq.state.or.us/toxics/

Washington Department of Ecology Reducing Toxics Threats Initiative: http://www.ecy.wa.gov/toxics/

Canada Chemical Substances website: www.chemicalsubstanceschimiques.gc.ca

Europe REACH: http://ec.europa.eu/enterprise/sectors/chemicals/reach/index_en.htm