City of Portland
and
Multnomah County

Toxics Reduction Strategy

A plan for minimizing use of toxic substances of concern in government operations by using the Precautionary Principle.

Document prepared by:
Multnomah County Sustainability Initiative
City of Portland's Office of Sustainable Development
Oregon Center for Environmental Health

April 25, 2006

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April 25, 2006

Dear Friends,

Preventing pollution has long been common practice at the City of Portland and Multnomah County. For decades, City bureaus and County departments have shown great innovation in reducing the use of hazardous substances. Despite these efforts, the continued presence of toxic pollutants in our environment is troubling. We are pleased, therefore, to introduce this Toxics Reduction Strategy, which seeks to build on existing City and County efforts and exercise leadership in choosing safer alternatives whenever non-toxic methods are effective, available and affordable.

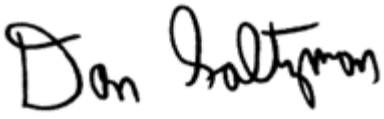
Certain environmental pollutants are well established as preventable risk factors in a number of chronic diseases, disabilities and premature deaths. Even here in our own community, low income and underserved populations are disproportionately exposed to toxic substances and pollution, and children bear greater risks of the potential resulting health affects. Further development and use of safer alternatives to hazardous substances and products in Oregon has the potential to spur business growth, create jobs, improve public health, lower the costs of health care and special education and protect the environment.

This Strategy outlines actions that will help to minimize the procurement, use and release of toxic substances in our government operations by using the framework of the Precautionary Principle as a guide. The Precautionary Principle, a fundamental aspect of environmental agreements throughout the world, offers the City and County a common-sense approach to preventing public health and environmental impacts wherever practical. By adopting this Toxics Reduction Strategy, the Portland City Council and the Multnomah County Board of Commissioners will establish a goal of replacing toxic substances, materials or products of concern with viable least-toxic alternatives by 2020. Achieving this goal will require continued action to build on existing efforts and collaboration at all levels and functions of our operations.

We wish to thank the City and County staff members and the individuals, organizations and professionals who provided valuable guidance on the development of this Strategy. This work would not be possible without their continued vision, expertise, innovation and dedication. Working together, we move closer to our vision of a sustainable healthy community and we lead by example, using government operations as a starting point for minimizing toxics in our community and protecting the health of our children.

Thank you for your interest in this vital issue.

Sincerely,



Dan Saltzman
City of Portland Commissioner

Maria Rojo de Steffey
Multnomah County Commissioner

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Executive Summary

Many products and materials used in government operations contain toxic substances of concern. For instance, lead is still found in electronics and paints, mercury can be found in cars and fluorescent light tubes and arsenic can be found in some treated wood. Exposures to persistent, bioaccumulative and toxic pollutants (PBTs) in water, air and soil have been linked to serious health impacts, including cancer, asthma, birth defects, developmental disabilities, autism, endometriosis, and infertility (EPA, 2006; Lockwood, 2000; Collaborative for Health and Environment, 2006). The Precautionary Principle is an emerging paradigm that suggests taking precautionary measures when an activity raises threats of serious or irreversible harm, even if some of the cause-and-effect relationships are not fully established (UN, 1992; Wingspread, 1998). Such a precautionary approach involves several key components: establishing goals, seeking out and evaluating alternatives, community right-to-know reporting, full cost accounting, and developing more participatory and transparent decision-making methods.

Using the Precautionary Principle as a framework, the Toxics Reduction Strategy (Strategy) builds on existing efforts to reduce the use of toxics in government operations. In almost every category of goods or services, there are alternatives that offer reduced threats to human and environmental health. Using a systematic and documented process, staff and others with relevant expertise actively seek out and evaluate the availability, effectiveness and affordability of alternatives. With guidance from the City Council and the County Board of Commissioners, a Steering Committee facilitates the implementation of the Strategy. The Strategy outlines an initial plan that will be refined and expanded in years to come by the Steering Committee, staff, the community and other key stakeholders.

The long-term vision of the Strategy is to promote a healthy community and environment by eliminating the governmental purchase, release and use of toxic substances that present potential negative health or environmental impacts. Specifically, the Strategy establishes the goal of using the Precautionary Principle as a framework for replacing toxic substances, materials or products of concern with viable least-toxic alternatives by 2020. These efforts will be guided by the following principles:

- Use products and substances that do not contain or generate persistent bioaccumulative and toxic chemicals, heavy metals of concern, or known, probable or suspected carcinogens, mutagens, teratogens, endocrine disrupters, organ toxics or respiratory irritants.
- Use effective and progressive integrated pest management strategies to minimize reliance on pesticides of concern and to ensure careful screening of products and their application to minimize adverse impacts.
- Effectively utilize procurement tools that support toxics reduction in the purchase of all goods and services.
- Implement best management practices that support toxics reduction and proper waste management in all operations.

The vision, goal and guiding principles outline the overarching intent of the Strategy to minimize the use of toxics at the City and County, and the specific action recommendations outline first steps. Recommendations include, but are not limited to:

- Establish a purchasing policy, product specifications and boilerplate procurement language to specifically support the reduction of toxics.
- Completion of a comprehensive chemical inventory and development of a chemical management system.
- Evaluate alternative cleaning products, disinfectant practices, laundering services, light tubes, electronics, industrial paints, wheel weights, fuels, medical supplies, office supplies and building materials.
- Implement best management practices that support toxics reduction and proper waste management, such as the recycling of heavy metals and electronic wastes, and a comprehensive idle reduction program.
- Review, modify and update the Strategy on a regular basis.

In addition to minimizing potential adverse impacts to community health and the environment, other potential benefits exist, including: lowered costs related to pollution control, regulatory compliance, liability and worker safety; economic development opportunities through creating new markets for local businesses to provide safer alternative products, services, and technologies; and improved safety for emergency response personnel, especially firefighters. These efforts will enhance the quality of life in Portland, a priority for citizens who want to feel comfortable catching fish from our rivers, breathing our air and eating locally-grown foods.

PART 1: Why a Toxics Reduction Strategy?

Introduction

While not every chemical, whether naturally derived or synthetically manufactured, has been linked to specific health risks to people and the environment, some of these chemicals are known to be persistent and bioaccumulative, meaning they do not break down readily and tend to accumulate in living organisms. These substances may contaminate the air, the land, our food and our water. Unfortunately, toxicological data only exist for about 7% of 85,000 registered chemicals, and tens of thousand of chemicals are not even registered (Goldman & Koduru, 2000). These factors make it difficult for us to know definitively which products or toxic contaminants threaten our health and environment.

> For the purposes of this Toxics Reduction Strategy, **"toxics"** is defined as environmental pollutants that cause negative health or environmental impacts. These environmental pollutants can be in the air, water and/or land or in the indoor environment. The City and County are not limiting the term "toxics" to chemicals listed on one or more statutes or regulations.
>
> *This definition is based on the wording used by the Environmental Protection Agency's CARE program.*

Through the emerging science of biomonitoring, the Centers for Disease Control and Prevention (CDC) has recently measured levels of 148 different metals, chemicals and their metabolites in humans, including mercury, pesticides and phthalates. According to the CDC, more research is needed to determine whether exposure levels reported are cause for health concerns (CDC, 2005). However, the presence of some of these persistent and bioaccumulative substances may have negative effects of which we are unaware. Recent studies have shown that some of these substances can impact the earliest stages of life, exposing developing fetuses to a combination of chemicals whose impacts are just beginning to be understood (Schettler, 2001). There is also great concern that exposure-related health outcomes are distributed unevenly across various sectors of society. One pivotal report, sponsored by The United Church of Christ Commission for Racial Justice, found race to be the single most important factor, more important than income, in the location of abandoned toxic waste sites (UCCCRJ, 1987).

The Pacific Northwest, known for its pristine environment and high quality of life, has its share of toxic pollutants. Consider the following:

- Fourteen air pollutants in Multnomah County exceed health-based benchmarks. Six of those pollutants are more than 10 times national health standards (Multnomah County Health Department, 2003).
- The Oregon rate for asthma, which can be triggered by air toxics among other exposures, is higher than the national average (Oregon Asthma Network, 2005).
- The Willamette River is contaminated with industrial and agricultural toxics, including mercury, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), chlorinated pesticides and dioxin. The section of the river in the heart of our city, the Portland Harbor, is listed for clean-up under the national Superfund program (Oregon DEQ, 2000; EPA, 2000).
- Certain fish species in 16 waterways in Oregon, including the Portland Harbor section of the Willamette River, contain mercury, PCBs and wood treating chemicals at levels harmful to health if consumed (Oregon Department of Human Services, 2004).
- Increasing body burdens (the level of bioaccumulation in humans) of toxic chemicals widely used as fire retardants have been found in human tissue and breast milk, including in women in the Pacific Northwest, and pose a potential public health threat to future generations (California Environmental Protection Agency, 2006; Northwest Environment Watch, 2004).
- Oregon women ranked eighth in the US for cancer incidence and mortality rate in 2001 and 2002, and Multnomah County had the third highest incidence rate in the state (545.9 per 100,000 people) (National Cancer Institute, 2001; Oregon State Cancer Registry, 2002; North American Association of Central Cancer Registries, 2005). It is important to note, however, that exposure to environmental pollutants is only one of a number of complex factors affecting cancer incidence and death rates.

Motivated by new research on toxic chemicals and their potential impacts on public and environmental health, communities across the nation are taking a proactive approach, stating their preference for safer alternatives to toxic chemicals wherever possible. In the U.S. "pollution prevention" is being adopted as a standard best practice for protecting public health, the environment and the economy. For example, from 1990 to 1999, Massachusetts companies implementing pollution prevention reported a reduction in chemical waste by 57 percent, a reduction in the use of toxic chemicals by 40 percent and a reduction in chemical emissions by 80 percent. These companies reported saving $15 million as a result of these efforts. This figure does not include other benefits which are non-quantifiable, such as health, safety and environmental benefits, as well as other measures of well-being (Massey and Ackerman, 2002).

Historically, environmentally harmful activities have only been stopped after they have manifested extreme environmental degradation or exposed people to harm. In the cases of DDT, lead and asbestos, for instance, regulatory action took place only after disaster and disease occurred. The delay between first knowledge of harm and appropriate action to deal with it can be measured in a lower quality of life, numerous injuries and disabilities, tremendous costs for health care and remediation, and the loss of many human lives. The Precautionary Principle has emerged as one of the leading environmental health frameworks in shaping new policy. The Precautionary Principle is an example of a preventive and protective approach to identifying potentially harmful substances and evaluating safer alternatives to their use.

Precautionary Principle Approach to Decision Making:

Where there are reasonable grounds for concern, the precautionary approach to decision-making is meant to help reduce the threat of serious or irreversible harm by triggering a process to select the least potential threat. The essential elements of the Precautionary Principle approach to decision-making include:

1. Anticipatory Action: Anticipatory action prevents harm. Government, business, community groups and the public share this responsibility.

2. Right to Know: The community has a right to know complete and accurate information on potential human health and environmental impacts associated with the selection of products, services, operations or plans. The burden to supply this information lies with the proponent, not with the general public.

3. Alternatives Assessment: An obligation exists to examine a full range of alternatives and select the viable alternative with the least potential impact on human health and the environment, including the alternative of doing nothing.

4. Full Cost Accounting: When evaluating potential alternatives, there is a duty to consider all the reasonably foreseeable costs, including raw materials, manufacturing, transportation, use, cleanup, eventual disposal and health costs even if such costs are not reflected in the initial price. Short-and long-term benefits and time thresholds should be considered when making decisions.

5. Participatory Decision Process: Decisions applying the Precautionary Principle must be transparent, participatory and informed by the best available information.

From: San Francisco Precautionary Principle Ordinance, 2003.

Portland and Multnomah County have earned the reputation of being a "green" community through decades of work to support urban sustainability through energy efficiency, waste reduction and recycling, green building and urban habitat protection. However, more work needs to be done by local governments to reduce the community's exposure to substances that are potentially harmful to human health and our environment. This Toxics Reduction Strategy was developed as a way to integrate the Precautionary Principle into existing processes and create a plan of action to identify and use safer alternatives whenever they are available, effective, and affordable.

Background

In 2003 and 2004, the City, County and Oregon Center for Environmental Health, along with other partners including the Sustainable Development Commission and the national BE SAFE network, hosted workshops on environmental health and the Precautionary Principle. Based on the feedback from these workshops and other stakeholders, the Sustainable Development Commission and Oregon Center for Environmental Health developed a white paper to make the case for a toxics reduction strategy at the City and County (OCEH and SDC, 2004). Ultimately, a joint resolution was adopted in September of 2004 establishing a workgroup to develop a Toxics Reduction Strategy for City and County operations, using the Precautionary Principle as a framework (see Appendix B: 2004 Resolution to Develop Toxics Reduction Strategy).

Strategy Development

> Multnomah County's priority-based budget setting process has enabled the County to focus on the top priorities of the community. One of these five priorities points to a healthy environment, and states that as a resident "I want to have clean, healthy neighborhoods with a vibrant sense of community."

In early 2005, a Toxics Reduction Workgroup (Workgroup) was formed, comprised of representatives from the community, environmental advocacy groups, local government, business, academia, and City and County staff. This Workgroup held monthly meetings that were open to members of the community beginning in May of 2005. The Workgroup: identified toxics of most concern in the local environment based on prior assessments; interviewed several City and County bureau and department stakeholders; and documented current chemical inventory procedures and reviewed several best practices in toxics reduction (see Appendix D: Bibliography and Additional Resources). The best practice review focused on existing policies to reduce toxics that had been adopted and implemented locally as well as in other communities. This review provided the Workgroup with guidance on how best to organize the strategy, possible challenges in the application of toxics reduction and preliminary recommendations that are based on successful actions taken by other municipalities.

Based on published pollutant reduction lists by the Environmental Protection Agency, Oregon Department of Environmental Quality, Washington Department of Ecology, California Environmental Protection Agency, Oregon Environmental Council, as well as input from citizens, a Priority Chemicals of Concerns list was compiled as a starting framework to guide the strategy development process (see Appendix C: Table 1).

> The Sustainable City Principles, adopted by the City of Portland in 1994, include a goal to "Prevent additional pollution through planned, proactive measures rather than only corrective action. Enlist the community to focus on solutions rather than symptoms."

The Workgroup focused on gathering information on pollutants likely to be contained in chemicals and products used at the City and County and where opportunities for replacement or reduction could be readily identified. This information was compiled in a Preliminary Target List (see Appendix C: Table 2) which was used by the Workgroup to create the Strategy's initial set of recommendations. Over time, additional pollutants may be added as subsequent health data and alternative products become available.

The Workgroup also conducted staff interviews and surveys at selected bureau and department sites. Through this process the Workgroup gained a better understanding of some of the substances and products commonly used in local government operations. The survey included a cursory review of primary chemicals used by the bureau or department and questions to gather staff suggestions on how to reduce toxics while supporting smooth working operations.

Feedback from staff revealed that:

- Support exists among employees for a toxics reduction strategy and that several departments have been innovative in reducing toxics to date;

- Staff want to actively participate and retain decision-making authority in any process that involves adopting products or practices which impact their work environment or responsibilities;
- Alternative products need to be evaluated based on their availability, durability, performance, initial and long-term cost, overall impact and their potential to create additional indirect costs; and
- Centralized procurement tools, such as product specifications, evaluation criteria and procurement guidelines, can be utilized in implementing efforts to reduce the use and impacts of toxics.

The City and County both have agency-wide sustainability projects and policies underway that support toxics reduction. For example, the County's adopted Sustainability Principles state: "Take necessary precautions to prevent toxic pollution and waste through proactive measures." Other efforts, such as the joint Sustainable Procurement Strategy, the City's Sustainable Paper Use Policy and the County's Green Cleaning Policy support further actions to reduce toxics in government operations. Below you will find a few brief examples of some of the exciting work in this area being done at the City and County.

CITY SUCCESSES

Chemical Substitutions

A new protocol was developed by the City's Wastewater Treatment Plant to find a less toxic alternative to disinfect wastewater effluent. Sodium Hypochlorite 12%-15% (liquid bleach) was recently substituted for the use of liquid chlorine, eliminating an extremely hazardous human and environmental health threat and resulting in nearly $200,000 in annual savings from avoided safety and reporting requirements.

Minimal Pesticides in Parks

City Park's Integrated Pest Management Program has been hailed nationwide as a progressive model that addresses potential impacts and has reduced reliance on pesticides. Parks also worked with Salmon-Safe, Inc. to develop best practice third-party certification standards for urban restoration efforts and land management practices that help preserve habitat and waterways for salmonids. Portland Parks is currently the only park system in the country to receive the Salmon Safe designation.

Chemical Reductions

In an effort to reduce employee exposure to hazardous products, the City's Water Bureau conducted a complete review of chemicals, reduced their inventory by 29% and established a new chemical/product procurement process requiring a health and safety review before purchasing. Working together with the Bureau of Maintenance, an effective online Material Safety Data Sheet system was developed.

COUNTY SUCCESSES

Chemical Safety Reviews

As a way to evaluate the potential impact of chemical products and specify safe handling techniques for new products, a chemical review procedure was developed by the County to ensure employee safety when using chemical products in the workplace. This has been adopted as County Administrative Procedure RSK-21.

Green Cleaners

As a part of the Sustainable Procurement Strategy, general cleaning products used in facility maintenance at the County were reviewed for their human health and environmental impacts. As a result, a Green Cleaning Policy was adopted to phase-in sustainable cleaning products and the procurement of Green Seal certified products is underway.

Pollution Prevention in Fleet

County Fleet Maintenance shops have done significant work to incorporate Pollution Prevention into their daily operations, earning designations as a GREAT business from City of Gresham, and as an EcoLogical business by the region's Pollution Prevention Outreach Team.

Based on the Workgroup's initial findings of the pollutants of greatest concern in our region, identifying where government operations can have an impact and reviewing the efforts of peer government agencies, a collection of proposed actions have been compiled in the Recommendations section of the Strategy. These recommendations serve as an initial starting point for toxics reduction and will be evaluated and updated regularly to ensure continuous improvement.

PART 2: Recommendations

The Toxics Reduction Strategy is intended to be a working example of the Precautionary Principle, adopting the notion that "An ounce of prevention is worth a pound of cure." More specifically, where threats of serious or irreversible damage to people or the environment exist, lack of full scientific certainty about cause and effect shall not be viewed as sufficient reason for the City or County to postpone cost-effective measures to prevent the degradation of the environment or to protect the health of its citizens. This perspective offers an approach to toxics reduction that can be used in conjunction with traditional risk assessment and risk management models.

Where there are reasonable grounds for concern, the precautionary approach to decision-making is meant to help reduce harm by triggering a process to seek alternatives that pose the least potential threat using the best information available. Gaps in scientific data uncovered by the examination of alternatives provide guideposts for future research, but should not prevent protective action from being taken by the City or County. As new scientific data become available, the City and County will review their decisions and make adjustments when warranted.

The intent of the Strategy is to provide the process framework for the City and County's efforts to reduce the use and impacts from toxic substances of concern by seeking viable least-toxic alternatives in a variety of opportunity areas. The Strategy outlines an initial plan that will be refined and expanded in years to come by the Steering Committee, City and County staff, and other key stakeholders. Staff from bureaus and departments with relevant responsibilities and expertise have the primary responsibility for investigating, evaluating and testing the viability of alternatives, and for making final recommendations for bureaus and departments to consider for implementation.

While utilizing the tenets of the Precautionary Principle, the long-term vision and goal (see below) of the Strategy are accomplished by:

- Assessing current practices and replicating those that exemplify best management practices in other bureaus and departments;
- Evaluating alternative products and practices through a transparent, participatory and informed process; and
- Preventing new toxic substances of concern from entering operations through the effective utilization of a variety of procurement and chemical management tools.

The guiding principles outlined below provide the context for these efforts and should not be construed as blanket bans or directives. It is understood that the toxicity of a product or substance is only one factor that enters into an assessment of its suitability for use. Other factors that will be considered include, but are not limited to, the impacts of a product or chemical's life cycle, costs, staffing, equipment warranties and capital investment requirements, as well as expected benefits such as savings, avoided costs, improved safety and reduced liability (see Part 3: Implementation).

In evaluating alternatives, a concerted effort will be made to utilize the hierarchy provided in the US EPA's *Pollution Prevention Act of 1990:*

- Pollution should be *prevented* or *reduced* at the source whenever feasible;
- Pollution that cannot be prevented should be *recycled* in an environmentally safe manner whenever feasible;
- Pollution that cannot be prevented or recycled should be *treated* in an environmentally safe manner whenever feasible; and
- Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

Long-term Vision

Promote a healthy community and environment by eliminating the governmental purchase, release and use of toxic substances that present potential negative health or environmental impacts.

Goal

By using the Precautionary Principle as a framework, replace toxic substances, materials or products of concern with viable least-toxic alternatives by 2020.

Guiding Principles

1. Use products and substances that do not contain or generate persistent bioaccumulative and toxic chemicals, heavy metals of concern, or known, probable or suspected carcinogens, mutagens, teratogens, endocrine disrupters, organ toxics or respiratory irritants.
2. Use effective and progressive integrated pest management strategies to minimize reliance on pesticides of concern and to ensure careful screening of products and their application to minimize adverse impacts.
3. Effectively utilize procurement tools that support toxics reduction in the purchase of all goods and services.
4. Implement best management practices that support toxics reduction and proper waste management in all operations.

Proposed Actions

The tables below provide specific preliminary actions designed to move the City and County toward achieving the Strategy's vision and goal. The Strategy, including the proposed actions, is a "living document" and will be reviewed, modified, and updated on a regular basis (see Part 3: Implementation). The recommendations outlined below provide initial steps that build on existing efforts and are not intended to serve as an exhaustive, all-inclusive list. In addition, the topical header statements (gray boxes) are meant to assist the reader in navigating the recommendations and to connect the proposed actions back to the guiding principles above. The language used for both the proposed actions and the topical header statements is intended to reflect the ideal outcome of each recommendation and should not be interpreted as a blanket directive or ban. Staff are responsible for evaluating the viability of the proposed actions and for making final recommendations for bureaus and departments to consider for implementation.

The action items are divided into Foundation Building & Ongoing, Short-term, and Mid-term actions with the general focus areas of:

- Procurement
- Use & Management
- Disposal & Recycling
- Performance Measurement
- Education & Outreach

These action items provide a road map and timeline for the initial toxics reduction efforts included in the Strategy. The timelines are meant to assist the City and County in building a comprehensive program that will effectively minimize toxics over time. The short-term actions are intended to build the foundation of the Strategy and ensure the completion of actions already underway. The mid-term actions are intended to identify more complex actions for the City and County to undertake. Throughout the implementation of the Strategy, the City and County will work to realize the Strategy's goal and inspire other local governments, businesses and the community to take action as well.

A preliminary effort has been made to identify the primary City bureau(s) and/or County department(s) that have expertise in the issue and/or whose work may be impacted by the proposed actions (italicized text following each proposed action item in the tables below). These bureaus and departments will be included on any workgroups created for the various proposed action items (see acronym legend at end of this section for clarification). In addition, staff are encouraged to invite additional co-workers, stakeholders and other persons with relevant expertise to join the groups to provide information and assistance that may add value to their work (see Part 3: Implementation for more details).

Foundation Building & Ongoing Actions

PROCUREMENT	FOUNDATION BUILDING ACTIONS 2006-2010

Purchases	**Develop and utilize purchasing tools to assist the City and County in achieving the vision and goal of the Toxics Reduction Strategy.**

1. In collaboration with bureaus, departments and qualified experts, develop a comprehensive list of chemicals, materials, substances and products to be banned from purchase by the City and County.
   - This list will include substances prohibited by legislation, as well as other toxic substances for which viable alternatives are available for specific applications.
   - This list will include the recently banned flame retardants pentabrominated diphenyl ether and octabrominated diphenyl ether.
   - Create a process for timely review to authorize exemptions for specific applications where no viable alternatives are available.
   - Provide training regarding the banned list to educate staff and external stakeholders involved in all types of public procurement, including small, intermediate and informal processes. Training should be incorporated into existing staff training opportunities (e.g. purchasing training) whenever possible.
   - Ensure this list is regularly reviewed, updated and communicated to staff.
   - Explore the ability to include penalties or consequences for non-compliance by vendors during the procurement process or contract term.

   STEERING COMMITTEE
   CITY: BOP, OSD
   COUNTY: CPCA, SUST

2. In collaboration with bureaus, departments and qualified experts, develop a comprehensive purchasing policy, standard specifications and procurement guidelines.
   - Assist with the development of specifications and/or guidelines regarding procuring the least toxic alternatives for materials, substances and products purchased through all types of public procurement, including small, intermediate and informal procurement.
   - In assessing economic feasibility, long-term public health and environmental considerations should be considered, as well as avoided costs, improved safety and reduced liability.
   - As part of the purchasing policy, work collaboratively with the "State Procurement Interagency Team" (created by Governor Kulongoski's sustainability Executive Order No. 06-02) to incorporate specifications for least toxic alternatives into future State solicitations.

   CITY: BOP, OSD
   COUNTY: CPCA, SUST

3. Develop boilerplate procurement language that places the burden of proof on a vendor to demonstrate that their product(s) are safe for human health and the environment.
   - Language should include requirements for the vendor to provide information sufficient to permit a reasonable evaluation of the potential human and environmental health impacts of the substances contained in the product(s) (such as full ingredient lists or third-party certification).
   - Language should give the City and County authority to make procurement decisions that, based on the Precautionary Principle, take anticipatory action to prevent harm to human health and the environment. This authority shall be in accordance with Oregon Public Contracting Code (ORS 279 A, B and C) and other relevant public procurement regulations.

CITY: BOP, OSD
COUNTY: CPCA, SUST

USE & MANAGEMENT FOUNDATION BUILDING ACTIONS 2006-2010

Inventory	**Conduct a City- and County-wide inventory to ensure the Strategy adequately addresses toxics substances of concern currently in use.**

4. Departments and bureaus will conduct an inventory of all chemicals, products and substances that are used by the City and County on an annual basis.
   - The inventory will include estimates of quantities or volumes used annually, as well as those that are stockpiled or no longer used, as applicable.
   - The workgroup will develop the inventory scope (e.g. what type of "products" or "substances," which bureaus or departments will participate, etc.) and a reporting template to capture all data in electronic form.
   - Using credible resources, expertise and publicly available lists, the Steering Committee will provide technical assistance in identifying and prioritizing toxics of concern that are found in the inventoried chemicals, products and substances.
   - Inventory will include materials that become medical, biological or hazardous wastes and will document waste treatment methods (e.g. incineration).
   - Bureau and department staff will ensure that a current MSDS (Material Safety Data Sheet) is on file for all applicable chemicals, products or substances identified in the inventory.

CITY: ALL
COUNTY: ALL

5. Based on the City- and County-wide baseline use inventory and associated toxics analysis (outlined above), the Steering Committee, in collaboration with stakeholder bureaus and departments, will:
   - Review and update the action items and banned list for purchases outlined in the Toxics Reduction Strategy accordingly.
   - Include the development of procurement specifications for persistent bioaccumulative and toxic (PBT) chemicals not already addressed in these initial recommendations as future action items.

STEERING COMMITTEE

PERF. MEASUREMENT FOUNDATION BUILDING ACTIONS 2011-2015

Strategy Review	**Conduct comprehensive review of progress toward achieving the goal of replacing toxic substances, materials or products of concern with viable least-toxic alternatives by 2020.**

6. Create evaluation workgroup with stakeholders from the City, County and community to review and update the Strategy and incorporate any remaining actions required to achieve the goal.

STEERING COMMITTEE

EDUCATION & OUTREACH — ONGOING ACTIONS

7. Coordinate staff training on the Strategy and toxics reduction techniques including use of the Precautionary Principle.
   - As needed, facilitate staff access to guidance from professionals with specific and relevant expertise, including other City and County staff and external parties.
   - Develop a mechanism for sharing information and programs across bureaus and departments.

   STEERING COMMITTEE

8. Develop a comprehensive outreach and education program for local governments in the Portland Metro region, businesses and the community about pollution prevention techniques and using the Precautionary Principle framework for reducing and eliminating toxics.

   CITY: OSD
   COUNTY: SUST

Short-term Actions: 2006 through 2010

PROCUREMENT — SHORT-TERM ACTIONS 2006-2010

Cleaners	**Seek to use industrial and commercial cleaning chemicals and products that do not contain potentially harmful substances.**

9. Using the County's recent cleaning products procurement and Green Cleaning Policy as a guide, the City will establish guidelines for the purchase and use of non-toxic cleaning products, including the products used by janitorial contractors.

   CITY: BGS, Parks, BOP, Fire
   COUNTY: N/A

10. Seek effective, least-toxic alternatives to disinfectants containing toxic substances or presenting other human health hazards.
    - Limit the purchase and use of hazardous disinfectants to only those applications where absolutely necessary (e.g. where aggressive contamination outbreaks are possible).
    - Use of hazardous disinfectants is to be done only by workers trained in the use of the particular disinfectant(s).

    CITY: BGS, Parks, BOP, Fire
    COUNTY: SUST, Stores, MCSO, Health, Risk

11. Ensure all uniform laundering services contracted by the City and County use non-toxic cleaning products and processes.
    - All uniform supply and laundering service contractors have, and are in compliance with, required water discharge and pre-treatment permits.
    - Any contracts or pricing agreements secured or negotiated by the City or County require PERC-free (perchloroethylene) dry cleaning processes.
    - Encourage staff to use PERC-free dry cleaning options for personal uniform laundering (e.g. public safety officers).

    CITY: PS, BOP
    COUNTY: CPCA, MCSO, Health, FM

Dioxin	**Seek to use products and materials that do not create dioxins during their manufacture, use or disposal.**

12. Per adopted policies on paper use, ensure all white copy/printer paper purchased and used for City and County business is "Process Chlorine Free" (PCF) and encourage the purchase of non-chlorine bleached envelopes, file folders, paper towels and toilet paper. Encourage external parties purchasing paper or ordering print jobs from the City or County to specify similar non-chlorine bleached products as applicable.

CITY: ALL, BOP, P&D
COUNTY: Stores

13. Promote the purchase of PVC-free office supplies by City and County staff.

CITY: ALL, BOP
COUNTY: CPCA, Stores

14. Inventory all PVC medical devices and gloves currently in use by County health clinics and public safety. Identify where alternatives exist, and develop and implement a phase out plan.

CITY: PS, Fire
COUNTY: Health, MCSO, SUST

Mercury	**Seek to use products that do not contain mercury including medical products, lab chemicals, dental products, consumer products (such as switches, thermostats, gauges and barometers) and vehicles.**

15. Specify low-mercury lamps for all fluorescent lighting, to be recycled at the end of use.

CITY: BGS, Parks, Fire, BOP, OSD, Water, PDOT
COUNTY: FM

16. As called for under the Oregon Mercury Reduction Act of 2001, beginning in 2006:
    - All new thermostats installed are mercury free.
    - Ensure manufacturer adheres to requirement of mercury-free switches in new vehicle and equipment purchases.

CITY: BGS, Parks, Fleet, Fire
COUNTY: FM, CPCA, Fleet

USE & MANAGEMENT SHORT-TERM ACTIONS 2006-2010

Heavy Metals	**Seek to use products that do not contain heavy metals of concern and ensure the responsible capture and recycling for those that are currently in use.**

17. Inventory and label equipment and devices that contain mercury.
    - Include thermostats, as required by Oregon Mercury Reduction Act of 2001.
    - Develop and implement a plan to remove and/or replace with mercury-free alternatives, including switches in vehicles, traffic light signals and other equipment.

CITY: BGS, Parks, Fleet, Fire, PDOT
COUNTY: FM, Fleet

18. As the market allows, purchase and use non-toxic industrial paints, including paints used on roads, bridges and other metal structures.

CITY: PDOT, Water
COUNTY: DCM, Fleet, Bridges, FM

19. Replace lead wheel weights on City and County fleet vehicles with viable non-toxic alternatives.

CITY: Fleet
COUNTY: Fleet

20. Increase purchase of renewable electricity for County operations, especially for electricity from sources that contribute toxic pollution to the environment, such as mercury.

CITY: N/A
COUNTY: SUST, FM

Vehicle Emissions	**Minimize particulate matter, and other emissions of concern, from City and County vehicles and equipment.**

21. Develop goals and an implementation plan to significantly increase the use of alternative fuels such as biodiesel in vehicles, as well as off-road equipment.

CITY: Fleet, large user bureaus.
COUNTY: Fleet

22. Install retrofit emission control technologies on vehicles and equipment.
    - Seek any additional financial resources as needed (i.e. grant funding).

CITY: Fleet, large user bureaus, OSD
COUNTY: Fleet, SUST

23. Implement comprehensive emission reduction programs.
    - To help achieve additional resource conservation and global warming goals, the programs should include gasoline-powered vehicles and equipment, in addition to diesel vehicles.
    - Implement a comprehensive idle reduction program that includes vendors and contractors servicing the City or the County.
    - Develop strategies to improve vehicle utilization, including right-sizing, efficient travel (e.g. consolidated maintenance routes, carpooling, etc.) and fuel efficiency guidelines.

CITY: Fleet, Water, BES, PDOT, Parks, PS
COUNTY: Fleet, Transportation, Animal Control, FM, MCSO

DISPOSAL & RECYCLING — SHORT-TERM ACTIONS 2006-2010

Heavy Metals	**Ensure best management practices are implemented for the proper management, recycling and disposal of products containing heavy metals.**

24. Recycle all mercury-containing fluorescent light tubes and non-alkaline batteries through reputable sources that can ensure heavy metals are captured.

CITY: BGS, Parks, Fleet, Fire, Water
COUNTY: FM

25. Ensure best management practices are implemented for products or materials (typically wood and metal) that contain, or have been treated or coated with materials containing heavy metals of concern; including arsenic, lead and hexavalent chromium.

CITY: BGS, Parks, Water, BES, PDOT
COUNTY: FM

26. Install mercury amalgam separators at County dental clinics and ensure proper disposal of collected mercury.

CITY: N/A
COUNTY: Health

27. Ensure best management practices are implemented for the responsible reuse, recycling and disposal of electronic wastes, including computers, monitors, peripherals, phones, printers, copiers, etc.

CITY: BTS, P&D
COUNTY: IT, Central Stores

Mid-term Actions: 2011 through 2015

PROCUREMENT	MID-TERM ACTIONS 2011-2015

PVC, Dioxins and Heavy Metals	**Seek to use products that do not contain, release or produce polyvinyl chloride (PVC), heavy metals of concern or dioxins.**

28. Identify additional opportunities to establish procurement specifications and evaluation criteria that support the use of, when feasible, PVC-free flooring, piping (including storm pipe and landscaping pipe), building materials and finishes, electronics, office and medical supplies.
    - When appropriate, consider products meeting applicable third-party certifications and/or standards (e.g. Green Seal, California's Specification Section 01350, etc.).

CITY: BOP, BGS, BTS, Fire, PDOT
COUNTY: CPCA, FM, Stores

29. As the market allows, develop specifications for the purchase of electronics, paints and plastic products that do not contain heavy metals of concern, including lead, mercury, cadmium, chromium or arsenic.

CITY: BOP, BTS, PDOT
COUNTY: CPCA, IT, FREDS, Bridges, Stores

30. Develop electronic product vendor "take back" specifications for the next round(s) of City and County procurement contracts.
    - Include in procurement contracts for new computers, monitors, peripherals, phones, printers and copiers.
    - Specify least-toxic components and casings.
    - Ensure responsible recycling and disposal of all components by selected "take back" vendors.

CITY: BTS, BOP
COUNTY: CPCA, IT, Stores

31. Continue to research all types of products for their contribution to the creation or release of heavy metals or dioxins during the manufacture, generation or disposal of such products, including electricity generated from the combustion of fossil fuels.

CITY: BOP, OSD
COUNTY: CPCA, SUST

Flame Retardants	**Identify any emerging alternatives for office furniture, carpets, electronics, equipment and products that are free of all toxic flame retardants.**

32. Establish procurement specifications and evaluation criteria that support the use of products that do not contain the flame retardant decabromodiphenyl ether (DecaBDE) (if not already banned in the State of Oregon during this timeframe).

CITY: BOP, OSD
COUNTY: CPCA, SUST

Vendor Practices	**Use the government's purchasing power to influence the marketplace and encourage toxics reduction by those providing products and services to the City and County.**

33. Establish procurement specifications and evaluation criteria that encourage vendors and contractors to utilize alternative fuels and/or emission control technologies that significantly reduce particulate matter and other air emissions of concern.
    - Evaluate opportunities to encourage the use of alternative fuels and/or emission control technologies for garbage haulers and taxi cabs.
    - Seek to require contractors to use, at a minimum, ultra-low sulfur diesel in off-road equipment.
    - Develop a method for tracking progress and monitoring results.

    CITY: BOP, OSD, BES, Water
    COUNTY: CPCA, Fleet, Roads

34. Establish procurement specifications and evaluation criteria that encourage vendors to provide non-toxic products and services, as well as practice toxics reduction strategies in their internal business operations, including the use of alternative fuels and renewable power.

    CITY: BOP, OSD
    COUNTY: CPCA, SUST

USE & MANAGEMENT — MID-TERM ACTIONS 2011-2015

Chemical Management	**Develop and implement a jurisdiction specific City- and County-wide chemical management program for all chemicals and products containing chemicals.**

35. Ensure the chemical management program addresses best practices for chemical procurement, delivery/distribution, inventorying, use (including chemical substitution research), collection, monitoring/reporting, training, treatment and disposal.
    - Explore a variety of management approaches, including the model of contracting for Chemical Management Services.
    - Utilize a support tool database, such as Zero Waste Alliance's Chemical Assessment and Ranking System (CARS), in conjunction with information on how chemical products are used, to assess and rank chemicals and to set goals for substitution or elimination. The database will include publicly available and well-documented information on the potential chemical hazards related to human health and safety, ecological health and ecosystem-wide impacts.
    - Evaluate and update comprehensive list of chemicals, materials, substances and products that are banned from purchase or use by the City and County. Ensure this list is regularly reviewed, updated and communicated to staff.
    - Establish a jurisdiction specific electronic or online Material Safety Data Sheet (MSDS) database for all bureaus and departments.
    - Establish an effective method for managing inventory data, including annual use quantities and the differentiation between historical and current chemical use.
    - Establish a plan to safely recycle or dispose of obsolete chemicals and products in storage.

    CITY: OSD, Risk, Water, BES, PDOT, Fleet, P&D, Parks
    COUNTY: SUST, Risk, FM

Pesticides	**Adopt successful and certified integrated pest management (IPM) approaches that seek to reduce reliance on pesticides of concern.**

36. Develop an implementation plan to expand progressive IPM practices to all property owned, operated or maintained by the City or County.
    - Include outdoor areas such as right-of-ways and indoor pest control.
    - Facilitate the City- and County-wide adoption of model management programs, as applicable. Consider those of Portland Parks and Recreation (including Salmon Safe certification), the Bureau of Environmental Services, and other jurisdictions such as the City of Bainbridge Island (WA) and the City of San Francisco.
    - Incorporate strategies and best management practices for land-use planning, landscape and park design, revegetation and invasive species removal.
    - When applicable, strive for qualified and sufficiently comprehensive third-party review that confirms the implementation of best practices.

    CITY: Parks, BES, PDOT, Water, BGS
    COUNTY: FM, Roads

37. Continue identification of opportunities to reduce pesticide usage by Vector Control services provided by County to the maximum extent practicable, providing a balance with other community health needs.
    - Include land use, statutes and other guidelines as apart of the review criteria.
    - Include integrated pest management practices and use ORS 634.650 for guidance.

    CITY: N/A
    COUNTY: Vector

Heavy Metals	**Seek to use products that are not treated or coated with heavy metals of concern or other toxic substances.**

38. Continue and expand existing efforts to use alternatives to materials treated or coated with heavy metals of concern or other toxic substances, including wood and metal used for outdoor structures.

    CITY: Parks, PDOT, Water
    COUNTY: FM, Roads

Facility Maintenance	**Seek to use facility maintenance products and practices the help to achieve the Toxics Reduction Strategy vision and goal.**

39. Implement best management practices for maintenance and improvements done in office and other applicable space that is leased from a third-party for use by the City and County, including tenant improvements, building materials and finishes, and janitorial cleaning services.

    CITY: BGS, OSD
    COUNTY: FM

40. Continue efforts to minimize chlorine use, while meeting health standards, and explore chlorine-free alternatives for the management of public swimming pools.

    CITY: Parks
    COUNTY: EnvHlth

Legend for bureau and department acronyms:

CITY		COUNTY	
ALL	All Bureaus	ALL	All Departments
BES	Bureau of Environmental Services	Bridges	Bridge Section
BGS	Bureau of General Services	CPCA	Central Procurement and Contracts Administration
BoP	Bureau of Purchases	DCM	Department of County Management
BTS	Bureau of Technology Services	EnvHlth	Environmental Health Division
Fire	Fire Bureau	Fleet	Fleet section
Fleet	City Fleets	FREDS	Fleet, Records, Electronic, & Distribution Services
N/A	Not Applicable	Health	Health Department
OSD	Office of Sustainable Development	MCSO	Multnomah County Sheriff's Office
Parks	Parks & Recreation	N/A	Not Applicable
P&D	Printing and Distribution	Risk	Risk Management
PDOT	Office of Transportation	Roads	Land Use and Transportation Division
PS	Public Safety	Stores	Central Stores, Material Management
Risk	Risk Management	SUST	Sustainability Initiative, Department of County Management
Water	Water Bureau	Vector	Vector Control, Environmental Health Div.

PART 3: Implementation

Steering Committee

A Toxics Reduction Steering Committee will facilitate and coordinate the evaluation and implementation of the proposed actions identified in the Strategy. The Steering Committee is made up of key City and County staff who have relevant expertise and responsibilities, as well as external community partners who can add value to these efforts through their knowledge, experience or resources. The Steering Committee will be convened by the City's Office of Sustainable Development and the County's Sustainability Initiative, in consultation with the leadership of affected bureaus and departments. The Steering Committee will seek feedback and guidance from additional parties with specific and relevant expertise in such areas as medicine, community health, toxicology, regulations, ecology, operations and purchasing. The Steering Committee will focus on the following key roles:

- Identify and promote current City and County programs that utilize best management practices to reduce the use of toxic substances of concern in their operations.
- Provide technical assistance and support to staff evaluating proposed actions and alternatives.
- Facilitate access to guidance from professionals with specific and relevant expertise.
- Coordinate staff training on toxics reduction techniques, including use of the Precautionary Principle.
- Prioritize and refine proposed actions to create a manageable work plan.
- Ensure recommendations strive to achieve the Strategy's goal to the maximum extent feasible, and adequately evaluate the direct and indirect costs, performance, safety and other considerations.
- Facilitate communication and collaboration among bureaus and departments in the implementation of the Strategy.
- Provide annual progress updates to City Council and the County Board.
- Identify opportunities to promote successes and solicit feedback from members of the community.
- In collaboration with affected bureaus and departments, ensure continuous improvement by reviewing and updating the Strategy as needed, and at least once every three years.

Implementation Process

While the Strategy's vision, goal and guiding principles outline the overarching intent of efforts to minimize the use of toxics at the City and County, the specific implementation process will be established by the Steering Committee. In partnership with bureaus and departments, sustainability program staff will facilitate the development of an implementation process that serves as a blueprint for implementing the proposed actions outlined in the Recommendations section of the Strategy. This implementation process is expected to include mechanisms to ensure the following key actions:

- Define proposed scope of the specific project(s).
- Identify internal and external stakeholders.
- Describe current practices.
- Research best management practices and identify potential alternatives.
- Evaluate feasible alternatives (see Alternatives Assessment & Impacts Analysis discussion below).
- Seek feedback and input from potentially affected parties and other stakeholders.
- Recommend viable alternatives (if any).
- Seek necessary approvals, as needed.
- Develop and carry out implementation plan.
- Measure and report on progress or results.

Several implementation process models have been put forward. One, based on the joint City/County Sustainable Procurement Strategy, involves the creation of action specific interagency taskforces to share resources, achieve economies of scale and facilitate the coordination of efforts between bureaus and departments. A second option would establish clear goals, while allowing individual bureaus or departments to develop their own

implementation plans. In addition, as part of the development of the Strategy, the Workgroup has developed a variety of draft guides and reporting templates to assist staff in these efforts. These materials provide a starting point for further discussion as the implementation process is finalized by the Steering Committee, in partnership with staff from affected bureaus and departments.

The implementation process should assist staff in the development of alternative policy, product or equipment recommendations (which may include continuing to use existing products and practices because viable alternatives do not exist). Instead of asking "What level of harm is acceptable?", staff are encouraged to ask questions like "How much contamination can be avoided?", "What are the alternatives to this product or activity, and are they safer?" and "Is this activity even necessary?". In general, the implementation process is expected to address the following key elements, each of which is elaborated on below:

- Staff workgroups;
- Alternatives assessment and impact analysis;
- Stakeholder review and input;
- Alternative product or practice testing;
- Implementation decisions; and
- Reporting.

Staff Workgroups

When appropriate, the Steering Committee convenes staff from the various City bureaus and County departments that are the relevant users of a particular product, chemical or practice. These workgroups are encouraged to invite additional staff and other persons with expertise in the field to join the groups to provide information and assistance that may add value to their work. Not all recommended actions will require the creation of such a workgroup. Bureau and department supervisors are expected to support the Strategy by providing staff sufficient time, as a part of their regular job duties, to meaningfully participate in the implementation of the Strategy.

Each workgroup develops a work plan including major milestones, roles and responsibilities, additional internal and/or external stakeholder identification, best management practices, proposed performance benchmark(s), staff training needs, education plans and timelines.

Alternatives Assessment and Impact Analysis

Utilize alternatives assessment as a part of process for making recommendations for the purchase of alternative products or chemicals, the implementation of best management practices, or the installation and use of new technologies. As available information allows, weigh the relative benefits and costs of the various alternatives, known as full-cost accounting. The alternatives assessment and impact analysis should consider the following (as applicable):

- Contains persistent, bioaccumulative and toxic (PBTs) pollutants?
- Contains carcinogen, mutagen or teratogen?
- Contains endocrine disrupter?
- Contains heavy metals of concern?
- Presents a high health hazard? (flammable, poisonous, caustic, etc.)
- Contributes to global warming?
- Depletes the ozone layer?
- Performance considerations?
- Availability?
- Manufacturer location?
- Direct cost considerations? (e.g. product price)
- Indirect cost considerations? (e.g. labor, disposal, training)
- Potential savings or avoided costs?
- Bureau/Department concerns or impacts? (e.g. equipment warranties)
- Waste disposal or recycling issues?
- Health or safety issues minimized or created?
- Reduced liability?
- Regulatory issues or requirements?
- Other relevant factors.

In partnership with key City and County staff and individuals with relevant expertise, the Steering Committee will develop guidelines, tools, training and other materials to assist staff in doing such an analysis in a consistent and meaningful way.

Stakeholder Review and Input
Staff are responsible for seeking and considering input from potentially affected parties, both internal and external, on their proposed recommendations for policy, procedure, product or equipment changes.

Alternative Product or Practice Testing
If prudent, staff should coordinate the testing of proposed changes in chemicals, products or practices they are looking to recommend. This testing may be done as a part of the development of the workgroup's final recommendations, or it may be done as part of the implementation process after the recommendations have been approved by affected bureaus and departments.

Implementation Decisions
Staff are responsible for evaluating the viability of the proposed actions and alternatives, and for making final recommendations for bureaus and departments to consider for implementation. In some instances, a recommended alternative product or process might work for certain bureaus or departments, but not for others.

Reporting
Using the progress reports and updates from staff working on the proposed actions, the Steering Committee will provide an annual update to the Council and Board on the City and County's overall progress.

Staffing Resources and Impacts

Both the City and County face significant budget constraints and reduced staffing resources. It is understood that additional City and County resources are unlikely and that use of existing government resources is required to support this Strategy. Every effort will be made to work within existing staff resources and staff time commitments. If effective utilization of existing resources does not cover the staffing costs for the actions identified in the Strategy, staff will jointly work to seek funding from outside sources.

Joint staffing from the County's Sustainability Initiative and the City's Office of Sustainable Development will support the key Strategy efforts. In addition, staff from other bureaus and departments who are relevant users of a particular product, chemical or practice will participate in implementing the proposed actions. The amount of time that is required of bureau and department staff will depend on the complexity and the scale of the action.

Staff will set their own work and meeting schedules and will be given the flexibility to adjust their individual time commitments based on other workload priorities. It is expected that bureaus and departments will assign staff as needed and that employees will assume these duties as part of their daily work. These efforts can be done in concert with routine operations of staff and a good faith effort made not to duplicate the efforts of others.

Appendices

Appendix A: Definitions

Appendix B: 2004 Resolution to Develop Toxics Reduction Strategy

Appendix C: Priority Chemical and Preliminary Target Lists

Appendix D: Bibliography and Resources

Appendix A: Definitions

The following terms are defined for the purpose of this Toxics Reduction Strategy. These definitions are not all encompassing, but are useful "working definitions."

- **Carcinogen:** Carcinogens are defined as those chemicals listed as known, probable, or possible human carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), the U.S. Environmental Protection Agency, the Occupational Health and Safety Administration, or California Proposition 65.
- **Chemical:** For the purpose of this Toxics Reduction Strategy, chemical refers to human-made or synthetic compounds that are used, released or found in products.
- **Endocrine disrupters:** Endocrine disruptors are chemicals that interfere with the normal function of hormones and the way hormones control growth, metabolism and body functions.
- **PBTs:** Persistent, bioaccumulative and toxic pollutants (PBTs) are highly toxic, long-lasting substances that can build up in the food chain to levels that are harmful to human and ecosystem health. They are associated with a range of adverse human health effects, including effects on the nervous system, reproductive and developmental problems, cancer and genetic impacts.
- **Pesticide:** A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest. This definition includes insecticides, herbicides, fungicides, rodenticides, and antimicrobials as well as plant growth regulators, defoliants and desiccants. All pesticides that are legal for sale are registered with the US EPA. *This definition is based on the national pesticide law, the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).*
- **Phthalates:** A class of widely used industrial compounds known technically as dialkyl or alkyl aryl esters of 1,2-benzenenedicarboxylic acid. Phthalates can be found in many consumer goods, including products made of flexible polyvinyl chloride plastic (PVC), cosmetics and other personal care goods, pesticides, building materials, lubricants, adhesives and film, among other items.
- **Pollutant:** Any substance introduced into the environment, whether natural or man-made, that causes concern because it has, or could have, adverse impacts on human or ecological health.
- **Pollution Prevention (P2):** Source reduction and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources, or protection of natural resources by conservation.
- **Respiratory Irritant:** Any substance including particles, vapors, gases, fumes or mist which can cause inflammation or other adverse reactions in the respiratory system (lungs, nose, mouth, larynx and trachea).
- **Sustainability:** Meeting the needs of the present without compromising the ability of future generations to meet their needs.
- **Teratogen:** A substance that interrupts or alters the normal development of a fetus, with results that are evident at birth.
- **Toxics:** For the purposes of this Toxics Reduction Strategy, "toxics" is defined as environmental pollutants that cause negative health or environmental impacts. These environmental pollutants can be in the air, water and/or land or in the indoor environment. The City and County are not limiting the term toxics to chemicals listed to one or more statutes or regulations. *This definition is based on the wording used by the Environmental Protection Agency's CARE program*.

Appendix B: 2004 Resolution to Develop Toxics Reduction Strategy

The following resolution was adopted jointly by both the City of Portland and Multnomah County in September of 2004, directing the development this Toxics Reduction Strategy. While the text shown below is the County's resolution, the City adopted an almost identical version concurrently.

RESOLUTION NO. 04-140

Recognizing National Pollution Prevention Week and Directing Development of a Toxics Reduction Strategy Jointly with the City of Portland Using the Precautionary Principle

The Multnomah County Board of Commissioners Finds:

a. On April 20, 2004, the Sustainable Development Commission of Portland and Multnomah County (SDC) and the Oregon Center for Environmental Health sponsored the *Precautionary Principle Workshop: A New Approach for Protecting Human Health and the Environment*, about toxic pollution prevention.

b. The Precautionary Principle is an effective policy framework for decision-making to prevent harm to human health and the environment, and states that "Where threats of serious or irreversible harm to people or nature exist, anticipatory action will be taken to prevent damages to human and environmental health, even when full scientific certainty about cause and effect is not available, with the intent of safeguarding the quality of life for current and future generations."

c. The attached SDC report, *Precautionary Approaches for Health and the Environment*, finds that every Multnomah County resident has an equal right to a safe and healthy environment; but considerable evidence suggests this right is compromised, including the following:

- An estimated 700 contaminants are present and accumulate within the human body, many of them toxics that have known health risks.
- Cancer, asthma, birth defects, developmental disabilities, autism, endometriosis, and infertility are becoming increasingly common and are linked to toxic exposures from the environment.
- Children suffer disproportionately from environmental health risks and toxic pollution.
- Low income and politically marginalized communities are disproportionately exposed to toxic substances and pollution.

d. Toxic substances have a profound negative impact on the indoor and outdoor environment, as shown by SDC report findings that:

- A section of the lower Willamette River is listed as a Superfund site, designating it as one of the most polluted rivers in the country. River sediment is polluted with unsafe levels of toxics, including mercury, PCBs, dioxins, DDT, as well as pesticides and herbicides.
- Fish from the Willamette and Columbia Rivers are contaminated with toxic pollutants at high levels resulting in consumption advisories from the Oregon Department of Health and Human Services.
- Fourteen air toxics in Multnomah County exceed health-based benchmarks, with six pollutants more than ten times national health standards.

e. Several regional governments have taken precautionary approaches to reduce toxic pollution, including the City of San Francisco, City of Oakland, City of Seattle, and the State of Washington.

f. The Oregon Department of Environmental Quality has been directed to develop a plan to eliminate persistent bioaccumulative toxics in Oregon by 2020, and local governments in Oregon are encouraged to participate.

g. Multnomah County has made progress in the area of toxics use reduction by including green building strategies, initiation of a pollution prevention program, eco-certification of fleet shops, and promoting best practices for pollution prevention through a water quality program.

h. The County has adopted that support pollution prevention, including the Local Action Plan on Global Warming (Resolution 01-052), Sustainable Procurement Strategy (Resolution 02-058), and Sustainability Principles (Resolution 04-019) The Sustainability Principles state that Multnomah County will "Take necessary precautions to prevent toxic pollution and waste through proactive measures."

i. Preventing toxic pollution is economically sustainable; and as indicated in the SDC report:

- Toxic substances have negative impacts at all stages of the product life cycle, including manufacture, use, and disposal.
- Pollution prevention lowers business costs related to pollution control, liability, and worker safety.
- Quality of life, a key reason businesses locate in the Portland Metropolitan area, is associated with social, economic and environmental indicators.
- Costs to society for diseases related to toxic substances such as loss of wages, increased expense for special education and medical treatment can be reduced.
- A Toxics Reduction Strategy would initiate economic development by creating new opportunities for local business to provide safer alternative products, processes, and technologies.

j. Multnomah County considers prevention of toxic pollution a high priority for action to reduce risk to public and environmental health, and intends by this resolution to encourage the reduction of use of toxic substances through pollution prevention and by utilizing the precautionary principle.

The Multnomah County Board of Commissioners Resolves:

1. The Board, in honor of National Pollution Prevention Week, recognizes the work that has been done to date by Multnomah County and the City of Portland to support reduction and elimination of public and environmental exposures to toxic pollutants.

2. The County, under the leadership of Commissioner Maria Rojo de Steffey, will participate in a workgroup to create a Toxics Reduction Strategy for government operations using the precautionary principle. The workgroup will include delegates from the City of Portland, Multnomah County, SDC and the community. The Sustainability Division of the Department of Business and Community Services will work with the workgroup, SDC, appropriate County departments, and the City of Portland to support this effort.

3. This Toxics Reduction Strategy should identify short-term and long-range goals for toxics reduction in government operations, actions to support those goals and be completed within one year of adoption of this resolution.

Appendix C: Priority Chemical and Preliminary Target Lists

The following Priority Chemical and Preliminary Target Lists are primarily comprised of pollutants listed on existing, published source lists prioritized by international, national and state government agencies, other municipalities and non-government groups. Table 1: Priority Chemicals of Concern is a working compendium of toxic chemicals identified by the Strategy Workgroup. This list is intended to be a resource for staff implementing the Strategy and requires further investigation on potential use and presence, if any, in City and County operations. Table 2: Preliminary Target List are pollutants identified by the Workgroup likely to be contained in chemicals and products used at the City and County and where opportunities for replacement or reduction could be readily identified and used. This list was used by the Workgroup to create the Strategy's initial set of recommendations.

The primary focus of the Strategy's toxics reduction efforts is in consumable products. Many of the toxic chemicals in these lists are constituents within products used (or potentially used) by City and County operations. Toxic chemicals may also be found in durable goods and may pose a risk to human and/or environmental health. For example, polybrominated diphenyl ethers (PBDE) are flame retardants used in furniture and other durable goods. They are bioaccumulative chemicals found throughout the environment, including the human body.

Some consumables may also produce by-products that are more toxic than the original chemical. For example, diesel fuel used in heavy machinery and vehicles produces exhaust that is harmful to human health. In identifying diesel as a chemical of concern, we may be able to incorporate new technologies and alternative fuels that will reduce or eliminate diesel exhaust.

These lists are intended to identify initial opportunities for toxics reduction where the City and County can have a positive impact. They are not intended to represent a list of banned substances. In addition, source list references have been provided as a resource to be used by the City and County to identify future opportunities to replace toxic substances, materials and products of concern with viable least-toxic alternatives. Over time, additional chemicals and/or source lists may be added as further information becomes available.

Table 1. Priority Chemicals of Concern - See next page for sources.

A working compendium of toxic chemicals identified by the Toxics Reduction Strategy (TRS) Workgroup, based on pollutants listed on existing, published source lists prioritized by international, national and state government agencies, other municipalities and non-government groups. This list is intended to be a resource for workgroups implementing this Strategy and requires further investigation on potential use and presence, if any, in City and County operations.

CHEMICALS

Pesticides
2,4,Dichlorophenoxyacetic acid (2,4, D) [5]
Organochlorines
- Endosulfan [3]
- Dicofol [3]
- Lindane [11]
- Methoxychlor [3,13]
- Pentachlorophenol [9,11]
- Heptachlor and Heptachlor epoxide [3,8,11]

Organophosphates
- Chlorpyrifos [5]
- Malathion [5]
- Parathion [5]

Pendimethalin [3]
Pentachlorobenzene/ pentachloronitrobenzene (PCNB) [3,4,14]
Tetrachlorobenzene, [2,3,5,6]
Trifluralin [3,14]

Solvents
Trichloroethylene (TCE) [5,11,12]
Trichloroethane (TCA) [5]
Benzene [6,11,12,13]
Hexachlorobenzene [1,2,3,8,11]
Hexachlorobutadiene [3]
Perchloroethylene [5,10]

Metals
Arsenic [7,11,12,13]
Cadmium [3,4,11,12,13,14]
Chromium (Hexavalent VI) [5, 11,12,13]
Lead [1,2,3,4,5,6,7,11,12,14]
Mercury [1,2,3,4,5,6,7,11,12,14]

Other Endocrine disruptors [7,9,10]
Nonylphenol/4-nonylphenol (branched) [3]
Bisphenol-A [6, 9]

Brominated flame retardants (BFR) [5,6,7]
Octabrominated diphenyl ether (OctaBDE)
Decabromodiphenyl ether (DecaBDE)
Pentabromodiphenyl ether (PBDE)
Tetrabromobisphenol A [3]

Volatile organic chemicals (VOCs) [7]

Irritants
Acrolein [6,12,13]

Polyaromatic Hydrocarbons (PAHs) [3,4,10,13]
Benzo(a)pyrene [1,2,11]

Dioxins and Furans [1,2,3,4,5,6,7,8,9,11,12,13,14]

Naphthalenes [3,11,14]

Perfluoroctane sulfonates (PFOS) [3,7,11]

Phthalate esters [3,5,6,7,11]
Di(2-ethylhexyl)phthalate (DEHP)
Di-isodecyl phthalate (DIDP)
Di-n-hexyl phthalate (DnHP)

Formaldehyde [5,6,11,12,13]

Vinyl chloride [7,11,12]

Chlorine [12,13]

Styrene [9]
and Octachlorostyrene [1,2]

Contaminant Source Mixtures
Particulate Matter (PM) [7]
Diesel fuel exhaust [6,7,9,10,11,12,13]

Legacy Chemicals*
Aldrin/dieldrin [1,2,3,11]
Chlordane [1,2,3,11]
Chlordecone (Kepone) [3,11]
DDT, DDD, DDEl [1,2,3,11]
PCBs [1,2,3,4,8,11,12,14]
Endrin [8,11]
Mirex [1,2,8,11]
Toxaphene [1,2,3,8]

* Most uses of the Legacy Chemicals have been banned in the United States. However, these chemicals are bioaccumulative and do not break down easily in our environment. Future actions on the Legacy Chemicals will likely be focused on ensuring no stockpiles exist at City and County facilities and the proper management of contaminated sites.

Priority Chemical of Concern Source Lists:

These source lists are subject to change with the availability of additional resources. Therefore, this list shall be reviewed regularly to determine whether new resources should be used.

1. Environmental Protection Agency (EPA), *First 12 Priority PBT's "Dirty Dozen"*, retrieved July, 2005, from http://www.epa.gov/pbt/pubs/accomp99.htm .

2. Oregon Department of Environmental Quality, *P2 for Persistent, Bioaccumulative Toxic Pollutants (PBT's)*, retrieved July, 2005 from http://www.deq.state.or.us/nwr/epoc/ch2.htm .

3. WA Department of Ecology, *Persistent Bioaccumulative Toxins* (PBT List Section), retrieved Sept., 2005 from http://www.ecy.wa.gov/laws-rules/wac173333/p0407_cont_a.pdf .

4. Dieckhoner, T., City of Seattle, *PBT Reduction Strategy: Progress Report to City Council*, retrieved Sept., 2005 from http://www.ci.seattle.wa.us/environment/Documents/PBTStrategy3-07-03.pdf .

5. Tolman, S.,The Commonwealth of Massachusetts, *An Act for A Healthy Massachusetts: Safer Alternatives to Toxic Chemicals*, retrieved July, 2005 from http://www.mass.gov/legis/bills/senate/st00/st00553.htm .

6. Oregon Environmental Council, *Children at Risk: How Toxic Chemicals Threaten Oregon's Children and What We Can Do About It*, retrieved Oct., 2005 from www.oeconline.org/kidshealth/childrenatrisk.

7. Toxic Reduction Strategy Workgroup recommendations September 2005 until January 2006.

8. United Nations Environment Program (UNEP), *Stockholm Convention Persistent Organic Pollutants*, retrieved Jan. 2006 from http://www.pops.int/documents/guidance/beg_guide.pdf .

9. Community stakeholder input - Chemicals/products and practices suggested by local citizens.

10. Oregon Partnership for Cancer Control (2005), Oregon Comprehensive Cancer Plan, retrieved July, 2005, http://www.oregon.gov/DHS/ph/cancer/docs/cancerplan/cplan05.pdf .

11. State of California, Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Safe Drinking Water and Toxic Enforcement Act of 1986 (Prop 65), *Chemicals known to the State to cause cancer or reproductive toxicity, February 3, 2006*, retrieved March 2006 from http://www.oehha.ca.gov/prop65/prop65_list/files/P65single20306.pdf .

12. Oregon Department of Environmental Quality, Oregon Air Toxics Program, Notice of Proposed Rule Making, *Ambient Benchmarks for 49 air toxics*, retrieved March, 2006 http://www.deq.state.or.us/news/publicnotices/uploaded/060207_5621_05-AQ-002_Benchmarks.pdf .

13. State of California, Environmental Protection Agency, Office of Environmental Health Hazard Assessment, *All chronic reference exposure levels adopted by OEHHA as of February 2005*, retrieved March, 2006 from http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html .

14. Environmental Protection Agency (EPA), National Partnership for Environmental Priorities, *31 Priority Chemicals*, retrieved March, 2006 from *http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm*.

Table 2. Preliminary Target List

Pollutants identified by the Workgroup likely to be contained in chemicals and products used at the City and County and where opportunities for replacement or reduction could be readily identified. This list was used by the Workgroup to create the Strategy's initial set of recommendations.

Chemical	Environmental & Health Considerations (all from http://www.osha.gov unless indicated)	Potential Sources
Arsenic	Replaces phosphate in cell functions. Carcinogen, reproductive and circulatory problems.	Treated wood, playgrounds.
Brominated Flame Retardants including PentaBDE, OctaBDE and DecaBDE	Persistent, bioaccumulative toxic., possible developmental neurotoxicity (http://www.ec.gc.ca/) (http://www.ehponline.org/members/2003/6559/6559.html)	Flame retardants in electronics, furniture, textiles.
Cadmium	Carcinogen, kidney damage, possible reproductive effects.	Batteries, industrial batteries-servers, emergency backup, substations, computer monitors, autobody refinishing.
Chromium (Hexavalent VI)	Heavy metal, carcinogen.	Chromates used as pigments for photography, in pyrotechnics, dyes, paints, inks, and plastics. They can also be used for stainless steel production, textile dyes, wood preservation, leather tanning, and as anti-corrosion coatings.
Diesel Exhaust	Exhaust contains air pollutants that exacerbate asthma, emphysema, allergies, potential carcinogen.	Fleet, construction, generators, coal fired plants
Dioxins/Furans	Endocrine disruptors, reproductive effects, carcinogen, persistent, bioaccumulative. (www.cfsan.fda.gov).	Dioxins are unintentionally formed during a variety of industrial processes that include chlorinated substances. Medical and hazardous waste incineration, backyard burning, biomass combustion, diesel exhaust, pesticide manufacturing, paper production, oil, PCB production, water and electrical system piping and conduit.
Lead	Heavy metal, Stored in bone, travels across placenta. Linked to wide range of health effects including cancer, brain damage, muscle weakness, sterility (www.epa.gov)	Batteries, lead paint on water tanks, bridges, dams and parts. Lead joint compound - Water Department. Cathode ray tube – computers and televisions.
Mercury	Heavy metal, neurotoxin, leads to brain, lung, kidney damage.	Dental amalgam, thermostats in buildings, car trunk switches, medical devices, fluorescent lamps, batteries, coal-fired plants emissions
Perchloroethylene	Skin, liver, and kidney damage, and possibly cancer. The inhalation of the chemical has been shown to cause numerous health effects such as dizziness, loss of coordination, memory loss, and blistering of skin.	Dry-cleaning chemical
Pesticides with serious acute, chronic, or sub-lethal impacts to human health and environment, including EPA Toxicity Category I and Category II	Multiple problems depending on chemical: possible carcinogens, endocrine disruptors, neurotoxins, many are persistent, bioaccumulative.	Golf courses, parks, anti-microbial disinfectants (correctional facilities, health clinics), landscape maintenance, interior pest management
Vinyl Chloride	Vinyl chloride (VC) is manufactured exclusively for polymerization into polyvinyl chloride (PVC), a plastic which across its life cycle - from manufacture to use to disposal - PVC relies upon and creates chemicals that are potentially hazardous to humans and the environment, including mercury, lead, dioxin, cancer-causing vinyl chloride monomer (VCM) and phthalates. http://www.ehponline.org http://www.besafenet.com	PVC Medical devices (can also contain phthalates), plastic products (office supplies, electronics, furniture, carpets, etc), building materials

Appendix D: Bibliography and Resources

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Additional Resources for Further Information:

PRECAUTIONARY PRINCIPLE

"The Precautionary Principle in Action: A Handbook"
www.sehn.org/rtfdocs/handbook-rtf.rtf

"Putting Precaution into Practice: Implementing the Precautionary Principle" www.sehn.org/pppractc.html

San Francisco Department of the Environment:
www.sfenvironment.com/aboutus/innovative/pp/

Seattle Precautionary Principle Working Group white paper: www.iceh.org/pdfs/CHE-WA/PrecautionaryPrinciple/PPWhitePaper.pdf

The Louisville Charter for Safer Chemicals
www.louisvillecharter.org/

REPORTS

"Precautionary Approaches for Health and the Environment: Making the Case for a Toxic Reduction Strategy and Portland and Multnomah County":
http://www.oregon-health.org/precaution_resources.html

"The Toxic Gap," Oregon Environmental Council:
www.orcouncil.org/reports/toxic%20gap%20report.PDF

The Environmental Health of Multnomah County", Multnomah County Health Department:
www.mchealth.org/enviroreport/

Chemicals of Concern in King County
www.govlink.org/hazwaste/publications/COC_Report.pdf

CDC National Report on Human Exposure to Environmental Chemicals
www.cdc.gov/exposurereport/

"Body Burden- The Pollution in Newborns"
www.ewg.org/reports/bodyburden2/

ECONOMICS AND TOXICS REDUCTION

"Prospering With Precaution," Tufts University:
http://ase.tufts.edu/gdae/policy_research/PrecautionReport02.htm

"Pricing the Priceless: Cost Benefit Analysis of Environmental Protection:"
www.healthytomorrow.org/pdf/priceless.pdf

PBT REDUCTION STRATEGIES/RESOURCES

Oregon Department of Environmental Quality Toxics Reduction Strategy:
www.deq.state.or.us/news/ToxicStrategyEQCFinal.pdf

Washington State Department of Ecology Proposal Strategy to Continually Reduce Persistent, Bioaccumulative Toxins (PBT's) in Washington State:
www.ecy.wa.gov/pubs/0003054.pdf

City of Seattle PBT Reduction Strategy
http://seattle.gov/environment/Documents/PBTStrategy3-07-03.pdf

New Hampshire Dioxin Reduction Strategy
www.des.state.nh.us/ARD/Dioxin/strategy.pdf

Oregon Department of Environmental Quality- Mercury Reduction Strategy
www.deq.state.or.us/wmc/factsheets/mercuryreductionstrategyfs.pdf

Washington State Mercury Action Plan
www.ecy.wa.gov/biblio/0203016.html

Detailed Study of Non-Mercury Alternatives as an Environmental Attribute
www.mercurypolicy.org/new/documents/NonMercuryAlternativesUSMilitary0206.pdf

PESTICIDE RESOURCES

Salmon-Safe High Risk Pesticide List
www.salmonsafe.org/urban/salmonsafe-urban54.pdf page 23

EPA List of Chemicals Evaluated for Carcinogenic Potential
www.epa.gov/pesticides/carlist/

San Francisco Reduced-Risk Pesticide List
www.sfenvironment.com/aboutus/innovative/ipm/pest_list05/index.htm

EPA 25b Minimum Risk Pesticides
www.epa.gov/oppbppd1/biopesticides/regtools/25b_list.htm

Pesticide Action Network Database
www.pesticideinfo.org/Index.html.

Oregon State University – National Pesticide Information Center
http://npic.orst.edu/tech.htm

Pesticide Free Parks
www.pesticide.org/portland/PFPhome.html

Northwest Coalition to the Alternatives to Pesticides
www.pesticide.org/

PURCHASING POLICIES/RESOURCES

Portland / Multnomah County Sustainable Procurement Strategy
www.co.multnomah.or.us/dbcs/sustainability/

City of Seattle's PBT Purchasing Resolution
www.healthybuilding.net/pdf/municipal_purchasing/Seattle_pbt_res_02.pdf

Green Purchasing in King County
www.govpro.com/Newsletters/Images/1005King.pdf

City of Olympia's Pesticide and PBT Purchasing Resolution
www.watoxics.org/content/pdf/OLY_Res_FINAL.pdf

City of San Francisco Less Toxic Purchasing
www.sfenvironment.com/aboutus/innovative/epp/index.htm

Electronic Product Environmental Assessment Tool
www.epeat.net/

Inform Purchasing for Pollution Prevention
www.informinc.org/p3_00.php

Green Seal Certified Products
www.gtreenseal.org/certproducts.htm

USEFUL WEBSITES

Science and Environmental Health Network website:
www.ci.sf.ca.us/sfenvironment/index.htm

Oregon Center for Environmental Health:
www.oregon-health.org

Multnomah County Sustainability Initiative
www.co.multnomah.or.us/dbcs/sustainability/