Reducing Toxics in the Spokane River Watershed

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INTRODUCTION

This document is the Washington Department of Ecology's strategy, or "road map," for reducing and removing toxic contamination in water, water sediments and soil in the Spokane River watershed in Washington State. This is a "living" document, i.e., we will build on this road map, adding new initiatives, strategies and successes as the months pass. A communication plan is being developed, as well, that will be based on this strategy.

Toxic chemicals in our environment are a high priority for the Department of Ecology in the Spokane area. Toxic pollution is complicated, especially difficult to find and remove, and it's everywhere. It pollutes the Spokane River from the end of a pipe and from much more diffuse sources and leaves contaminated soils where the chemicals were used in the past. Residents, visitors, and living aquatic creatures can be exposed to the pollution. Ecology is working with the community to prevent the release of toxics into our environment, limit exposure, and clean up the worst spots along the river.

Our communities use and dispose of literally thousands of chemicals resulting from manufactured goods we use and consume, choices we make in our daily routines, and products available at stores around the state. Many of these chemicals end up in our aquatic systems, such as rivers, where they persist and travel up through the food chain, in some cases having ongoing impacts to humans and the environment.

Ecology is working with local citizens, businesses, city and county governments and environmental organizations to identify and reduce toxic pollution in the Spokane River. We are doing this work together with many community partners:

- City of Spokane and other municipalities such as Liberty Lake.
- Spokane County.
- Idaho's Department of Environmental Quality and the cities of Post Falls and Coeur d' Alene.
- U.S. Environmental Protection Agency.
- Private companies that discharge wastewater into the river.
- Local environmental advocacy groups such as the Sierra Club and the Lands Council.
- Coeur d'Alene Tribal government.
- Spokane Tribe of Indians.
- Spokane Regional Health District.
- Spokane Regional Clean Air, and others.

Not only are we coordinating with other agencies and organizations, but within Ecology's Eastern Regional Office our many different programs are working closely together as a team to address toxics. The programs include Water Quality, Toxics Cleanup, Water Resources, Shorelands and Environmental Assessment, and Hazardous Waste and Toxics Reduction.

As stated, toxic chemicals and metals are everywhere--in the air from other parts of the world, in our bodies, in the clothes we wear, the chair we sit in, and in our water. As much as we try to clean them up and prevent their release, the job is really one we all need to share. We all must

change the way we shop, change the products we use, take personal responsibility for the way we use chemicals when we have to use them. It's not just industries that pollute. It's you and me. Without each and every one of us committing to change our habits, we don't stand a chance against toxics.

DESCRIPTIONS OF TOXICS OF CONCERN IN SPOKANE

- **PCBs**
  Polychlorinated biphenyls (PCBs) are a family of human-made, chlorinated chemical compounds that were once used in a variety of applications including as insulating fluids for electric transformers and capacitors. They were also used in plasticizers, paint additives, adhesives, inks and carbonless (mimeograph) paper, lubricants, and as heat transfer and hydraulic fluids. Commercial production of PCBs was stopped in 1977 because of concerns about toxicity and persistence in the environment. They are a "PBT" -- they are persistent, bioaccumulative, and toxic. PCBs in food, particularly fish, are the main way that people are exposed. Low level exposure to PCBs can affect the immune system and exposure in the womb can cause learning deficits later in life.

- **PBDEs**
  Polybrominated diphenyl ethers (PBDEs) are a family of chemicals used as flame retardants in plastic and foam products such as electronic enclosures, wire insulation, adhesives, textile coatings, foam cushions, and carpet padding. Increasing concentrations of PBDEs in humans and wildlife worldwide continue to raise concerns about their health effects. The highest levels of PBDE in human tissue have been found in the U.S. and Canada (Ecology and DOH, 2006). The release of PBDEs from products in our homes is thought to be a key way that PBDEs get into our bodies. No definite information if available on health effects of PBDEs in people. Laboratory tests in animals suggest that high concentrations of PBDEs may cause neurobehavioral alterations and affect the immune system.

- **Dioxins/Furans**
  Dioxins and furans, or polychlorinated dibenzo-p-dioxins and -furans, are a family chemicals that are not produced intentionally but are byproducts of combustion (trash, wood and other fossil fuels), chlorine bleaching in paper production, and chemical and pesticide manufacturing. Agent Orange, used as a defoliant in the Vietnam War, contained dioxins (ATSDR 2006). People exposed to large amounts of dioxin can develop chloracne, which is a severe skin disease with acne-like lesions that occur mainly on the face and upper body. Changes in blood and urine that may indicate liver damage also are seen in people. Long-term exposure to dioxins is associated with increased risk of getting cancer.

- **Metals**
  - **Arsenic**--Arsenic exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts, redness and swelling. Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment. Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsenobetaine that is much less harmful.

- **Cadmium**— Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen (cadmium oxide), chlorine (cadmium chloride), or sulfur (cadmium sulfate, cadmium sulfide). Most cadmium used in the United States is extracted during the production of other metals like zinc, lead, and copper. Cadmium does not corrode easily and has many uses, including batteries, pigments, metal coatings, and plastics. Usually, the general population is exposed to cadmium when people breathe cigarette smoke or eat cadmium-contaminated foods. Cadmium damages the kidneys, lungs, and bones.

- **Lead**-- Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing. Children can be exposed to lead in indoor dust from deteriorating paint or by playing in contaminated soil. Exposure to lead can also happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Lead can damage the nervous system, kidneys, and reproductive system.

- **Zinc** is a naturally occurring element that is also pervasive in urban and industrial settings. Zinc is found everywhere there is galvanized metal -- from cyclone fences to gutters and metal roofs. Zinc is also found in tires, motor oils and in hydraulic fluids. Zinc from stormwater harms fish and other aquatic life. Zinc can bind to fish gills and cause suffocation. When zinc becomes dissolved in water, it is harmful even at relatively low concentrations to threatened and endangered salmon and aquatic life. Our exposure to large amounts of zinc can cause stomach cramps, anemia, and changes in cholesterol levels.

  Zinc compounds are widely used in industry to make paint, rubber, dyes, wood preservatives, and ointments. Some is released into the environment by natural processes, but most comes from human activities like mining, steel production, coal burning, and burning of waste. Depending on the type of soil, some zinc compounds can move into the groundwater and into lakes, streams, and rivers. Most of the zinc in soil stays bound to soil particles and does not dissolve in water. It builds up in fish and other organisms, but it does not build up in plants.

PROGRESS ALREADY MADE

Science

Ecology's Environmental Assessment Program (EAP) has conducted research over the years to tell us where problems exist. Much of our work is based on this scientific work. The program conducts monitoring on many Persistent Bioaccumulative Toxics (PBTs) and also is conducting studies on the river to identify sources and track trends.

Past studies:
In past years the Environmental Assessment Program has published studies on PCBs, flame retardants, dioxins/furans, pesticides and heavy metals in fish tissue and in the Spokane River's water. Following is a bibliography of toxic studies through mid-2009:

URL	Pub. No.	Title	Author
http://www.ecy.wa.gov/biblio/84e30.html	**84-e30**	PCBs in Fish Taken from the Spokane River	Joy, J.
http://www.ecy.wa.gov/biblio/9499.html	**94-99**	Cadmium, Copper, Mercury, Lead, and Zinc in the Spokane River: Comparisons with Water Quality Standards and Recommendations for Total Maximum Daily Loads	Pelletier, G.
http://www.ecy.wa.gov/biblio/94e05.html	**94-e05**	1994 Spokane River Survey - Fish Tissue and Sediment Sampling Plan.	Davis, D.
http://www.ecy.wa.gov/biblio/94e23.html	**94-e23**	Planar PCBs in Spokane River Fish. Memo to Carl Nuechterlein, ERO.	Johnson, A.
http://www.ecy.wa.gov/biblio/94e24.html	**94-e24**	Results of 1993 Screening Survey on PCBs and Metals in the Spokane River	Johnson, A., D. Serdar, and D. Davis
http://www.ecy.wa.gov/biblio/94e41.html	**94-e41**	PCB and Lead Results for 1994 Spokane River Fish Samples	Johnson, A.
http://www.ecy.wa.gov/biblio/95310.html	**95-310**	Department of Ecology 1993-94 Investigation of PCBs in the Spokane River	Toxic Investigation Section
http://www.ecy.wa.gov/biblio/95e19.html	**95-e19**	Bioassays of Spokane River Sediments (Final).	Batts, D. and A. Johnson
http://www.ecy.wa.gov/biblio/96331.html	**96-331**	Spokane River PCB Source Monitoring Follow-up Study November and December 1995	Golding, S.
http://www.ecy.wa.gov/biblio/96e05.html	**96-e05**	Particulate Matter and Polychlorinated Biphenyls in Spokane River, Washington. Article in Microscope, Vol 44:1 1-6, 1996.	Huntamer, D.
http://www.ecy.wa.gov/biblio/97e02.html	**97-e02**	Metal Concentrations in the Spokane River During Spring 1997. Memo to J. Manning and C. Nuechterlein, August 26, 1997.	Hopkins, B. and A. Johnson
http://www.ecy.wa.gov/biblio/97e04.html	**97-e04**	1996 Results on PCBs in Upper Spokane River Fish. Memo to C. Nuechterlein and D. Knight, Eastern Regional Office.	Johnson, A.

URL	Pub. No.	Title	Author
http://www.ecy.wa.gov/biblio/98329.html	**98-329**	Cadmium, Lead, and Zinc in the Spokane River Recommendations for TMDL and Waste Load Allocations	Pelletier, G.
http://www.ecy.wa.gov/biblio/99330.html	**99-330**	Metals Concentrations in Spokane River Sediments Collected with USGS in 1998	Johnson, A.
http://www.ecy.wa.gov/biblio/0003017.html	**00-03-017**	Results from Analyzing Metals in 1999 Spokane River Fish and Crayfish Samples	Johnson, A.
http://www.ecy.wa.gov/biblio/0003021.html	**00-03-021**	Reconnaissance Survey on Metals, Semivolatiles, and PCBs in Sediment Deposits Behind Upriver Dam, Spokane River	Johnson, A.
http://www.ecy.wa.gov/biblio/0003026.html	**00-03-026**	Data Appendix: Reconnaissance Survey on Metals, Semivolatiles, and PCBs in Sediment Deposits Behind Upriver Dam, Spokane River	Johnson, A.
http://www.ecy.wa.gov/biblio/0003040.html	**00-03-040**	Results from Analyzing PCBs in 1999 Spokane River Fish and Crayfish Samples	Johnson, A.
http://www.ecy.wa.gov/biblio/0103015.html	**01-03-015**	An Ecological Hazard Assessment for PCBs in the Spokane River	Johnson, A.
http://www.ecy.wa.gov/biblio/0103016.html	**01-03-016**	Spokane River PCB and Source Survey, August 2000	Golding, S.
http://www.ecy.wa.gov/biblio/0103019.html	**01-03-019**	Chemical Analysis and Toxicity Testing of Spokane River Sediments Collected in October 2000	Johnson, A. and D. Norton
http://www.ecy.wa.gov/biblio/0203049.html	**02-03-049**	Analysis of Fish Tissue from Long Lake (Spokane River) for PCBs and Selected Metals	Jack, R. and M. Roose
http://www.ecy.wa.gov/biblio/0603024.html	**06-03-024**	Spokane River PCBs Total Maximum Daily Load Study (DRAFT report)	Serdar, D., K. Kinney, and P. Hallinan
http://www.ecy.wa.gov/biblio/0603025.html	**06-03-025**	PCBs, PBDEs, and Selected Metals in Spokane River Fish, 2005	Serdar, D. and A. Johnson
http://www.ecy.wa.gov/biblio/0703055.html	**07-03-055**	Spokane River PCB TMDL Stormwater Loading Analysis: Final Technical Report	Parsons and Terragraphics Inc.
http://www.ecy.wa.gov/biblio/0903013.html	**09-03-013**	Washington State Toxics Monitoring Program: Trend Monitoring for Chlorinated Pesticides, PCBs, and PBDEs in Washington Rivers and Lakes, 2007	Sandvik, P.
http://www.ecy.wa.gov/biblio/0903010.html	**09-03-010**	PBDE and Dioxin/Furans in Spokane Stormwater	Lubliner, B.
http://www.ecy.wa.gov/biblio/0903020.html	**09--03-020**	PBT Trend Monitoring: Lead in Suspended Particulate Matter, 2008	Meredith, C. and C. Furl
http://www.ecy.wa.gov/biblio/0903108.html	**09-03-108**	Quality Assurance Project Plan: PBDE Flame Retardants in Spokane River Fish Tissues and Osprey Eggs	Furl, C., C. Meredith, and M. Friese

Governor's and Ecology's statewide efforts to reduce toxics

Studying the problem to understand where toxic pollution is and where it is coming from is one of a many-pronged approach to reduce toxics in our environment. The state also has taken concrete, statewide action to target certain pollutants and certain geographic areas. Here are some examples:

- More state resources have been invested to restore the Spokane River than any other freshwater area in the state of Washington.

- Washington state successfully locked in the first-ever ban on the persistent, bioaccumulative (builds up in tissues) flame-retardant, Deca-BDE, that gets into the food chain and into human mothers' milk.

- The Department of Ecology has developed three Chemical Action Plans (CAP) so far, and more will be developed. These are part of Ecology's Toxics Initiative. See the regulation here: http://www.ecy.wa.gov/pubs/wac173333.pdf .

  A CAP is a comprehensive plan to identify, characterize and evaluate all uses and releases of a specific PBT (persistent bioaccumulative toxic chemical), a group of PBTs or metals of concern. A CAP is a plan, not legislation or a rule. It recommends actions to protect human health and the environment. Some of the recommendations may lead to new legislation or rules. These would go through the normal legislative or rulemaking process.

  Go to this web site to see Chemical Action Plans for lead, mercury and PBDEs (flame retardants): http://www.ecy.wa.gov/programs/swfa/pbt/ .

- More detail on the state's overall toxics strategy can be found at: http://www.ecy.wa.gov/toxics/ecologyefforts.htm .

Progress has been made and we have seen results.

Before outlining Ecology's strategy for toxic chemicals in the Spokane River watershed, you will see here summaries of on-the-ground cleanup work that has already been accomplished.

Cleaning up toxic metals from Idaho's Mining District

Some toxic metals come from Idaho's historic mining district, and major work has been done on the federal and state level to clean it up. In fact, Ecology conducted three cleanup operations and the EPA conducted one. The total amount of contaminated material excavated from these areas included more than 3,000 tons. More than 6,000 tons of clean capping materials were placed over some contaminated areas to prevent people from coming into contact with the toxic metals.

Contaminants from historic mining practices in Idaho's Coeur d'Alene Basin washed downstream and settled in soil and sediment along certain beaches of the Spokane River. These contaminants, known as heavy metals, include lead, arsenic, zinc, and cadmium. The U.S. Environmental Protection Agency (EPA) conducted studies of mining contaminants in the Coeur d'Alene Basin and began a wide-spread cleanup known as the Coeur d'Alene Basin Superfund cleanup. As a result of the studies, and additional testing by Ecology, nine shoreline areas in Washington State were identified for cleanup.

Cleanup of Heavy Metals in Spokane River beaches that are now complete:

- 2006 – Starr Road (EPA and Ecology)
- 2007 – Island Complex (Ecology)
- 2007 – Murray Road (Ecology)
- 2008 – Harvard Road (Ecology)

See the Spokane River basin section under Toxics Cleanup Activities on Ecology's website for links to details about each of the metals cleanup projects. This link will take you directly there: http://www.ecy.wa.gov/geographic/spokane/spokane_river_basin.htm

Cleaning up PCB contamination

Ecology tested PCBs in a variety of fish species from the river between 1994 and 2005. Those studies indicate the situation is improving. PCB concentrations have declined some in the last 15 years. Meanwhile, some on-the-ground cleanup activities have been focused on PCBs. Here are examples:

- **2006–Upriver Dam PCB Sediment Site** (Avista Development, Inc., and Ecology) The dam is located along Upriver Drive east of Havana Street. The project begins directly behind the dam and stretches east for nearly one-half mile. Under Ecology's direction, contractors for Avista Development, Inc. placed a three-layered cover called an engineered cap over the contaminated sediments on the river bottom. The cap is made of coal, sand, and gravel and is intended to isolate PCBs and keep contaminants from moving.

- **2007–Donkey Island** This project is east of the dam in wetlands and backwater channels found on the north bank of the river. Ecology provided oversight as contractors removed PCB-contaminated soil and restored the area with clean sand. Areas disturbed during PCB removal were replanted in the spring of 2007.

- **2007–Kaiser Trentwood – West Discharge Ravine** Cleanup was completed in October 2007 at a portion of the Kaiser Trentwood site known as the West Discharge Ravine. The West Discharge Ravine was used as a wastewater conveyance from 1942 until about 1973 when wastewater treatment facilities were upgraded. PCBs and petroleum product in soil were removed in an accelerated process to protect human health and eliminate potential impacts to the river. Over 1,700 tons of PCB and petroleum-contaminated soil were removed from the West Ravine, which included an

estimated 250 pounds of PCBs. The area was backfilled with clean soil, graded, and hydro-seeded. Native plants were re-established.

Other projects have been undertaken to reduce PCBs in the environment

The following are examples of projects in the Spokane area that are not necessarily adjacent to the river. However, the contamination could very well affect the river by coming into contact with groundwater or by having these contaminants washed into the river by stormwater. Many other actions also have been taken that are not listed here. These may include formal cleanups of other, smaller contaminated sites; cleaning up old, contaminated landfills and more.

- **Kaiser Aluminum Fabricated products, LLC**. Ecology's Toxics Cleanup Program is working with Kaiser to address PCBs, petroleum and metals contamination at the Kaiser Trentwood site near the river. Kaiser is currently conducting a Remedial Investigation and Feasibility Study at the site. The purpose of the Remedial Investigation is to gather more information to determine the nature and extent of contamination that may be in soil and groundwater. The Feasibility Study will evaluate cleanup options. Several interim actions, including the West Ravine listed above, have been taken at the site to clean up contamination. See this link for details:
  http://www.ecy.wa.gov/programs/tcp/sites/Kaiser_trentwood/kaiser_tw_hp.html

  In addition, Ecology's Hazardous Waste and Toxics Reduction Program continues to work with Kaiser to make sure dangerous waste produced from the cleanup activities and from current facility operations is managed appropriately.

- **City Parcel Site**. Ecology's Toxics Cleanup Program is conducting PCB cleanup at the City Parcel site located at 708 N. Cook St. in Spokane. Contractors removed asbestos in June 2009. They are currently (July 2009) removing PCB-contaminated soil. See this link for details:
  http://www.ecy.wa.gov/programs/tcp/sites/city_parcel/city_parcel_hp.html

- **General Electric**. Ecology worked with GE to clean up PCBs at a site located at 4323 E. Mission St. in Spokane. Long-term monitoring is being conducted to determine the effectiveness of the cleanup. See this link for details:
  http://www.ecy.wa.gov/programs/tcp/sites/genlElecSpo/genElecSpo_hp.htm

- **Aluminum Recycling Trentwood**. Ecology is negotiating with Union Pacific Railroad to conduct a Remedial Investigation and Feasibility Study at the Aluminum Recycling Trentwood site located near the river at 4323 N. Sullivan Rd. in the Spokane Valley. See this link for details:
  http://www.ecy.wa.gov/programs/tcp/sites/alumRecyTrent/alumRecyTrent_hp.html

- **Kendall Yards (River Front Properties)** *More Than 200,000 Tons of Contaminated Soil Removed.* In less than one year, the owners of River Front Properties finished cleaning up several contaminants in soil at the site. The cleanup was conducted in compliance with the U.S. Environmental Protection Agency's (EPA) Brownfields

Initiative and Ecology's Voluntary Cleanup Program. Ecology worked alongside other parties including the owners, River Front Properties, LLC and their consultants, the Washington Department of Commerce, the EPA, and the city of Spokane.

The site was placed on Ecology's Hazardous Sites List because of contamination from previous land uses primarily related to the railroad industry. Union Pacific operated a locomotive repair and servicing complex from 1914 to 1955 at the site. Other uses included a plating operation, storage facilities and operation of several county facilities. Contaminants in soil included petroleum product, metals, and materials known as carcinogenic polyaromatic hydrocarbons.

STRATEGY FOR CURRENT AND FUTURE WORK—ECOLOGY'S "ROAD MAP"

Many initiatives are underway or soon to be underway to continue and "beef up" Ecology's efforts to reduce the toxic chemicals in our environment. Our road map includes keeping up-to-date with the science and learning where the toxics are coming from, writing new permits for industrial and municipal dischargers, and more on-the-ground cleanup work on the beaches where toxic metals have landed from Idaho's mining district.

Science

Future studies:

- Ecology's Environmental Assessment Program (EAP) is studying and will issue a report in 2009 on how much flame retardant (PBDEs) is showing up in Osprey and Fish (http://www.ecy.wa.gov/biblio/0903108.html). Sampling was completed in June 2009.
- Organic Trends Monitoring- Since 2008 we have had one station on the Spokane River at Nine Mile Dam. EAP has analyzed for PCBs and PBDEs. Beginning in the fall of 2009 we will have three stations (Stateline, Mission Park, and Nine Mile).
- Lead Monitoring- We have monitored lead associated with sediment particles at Stateline and Nine Mile Dam since 2008. Additional metals (Arsenic, Cadmium, and Zinc) will be added starting in fall of 2009.
- The program will continue to monitor for PCBs, metals, and PBDEs at Stateline, Mission Park and at the Nine-Mile Dam in the Spokane River.
- Studies will continue on pharmaceuticals and personal care products in our water. *(See page 15.)*

Urban Waters Initiative

The **Urban Waters Initiative** has been implemented to address Spokane River contaminants as well as toxic problem areas in the Spokane River basin. The project is comprised of a team of ecology scientists, technical staff, and specialists from the Spokane Regional Health District. They are sampling water and visiting businesses along the river to identify sources of toxic chemicals that affect the river. Ecology will work with these sources to eliminate further impacts to the river. Go to: http://www.ecy.wa.gov/urbanwaters/index.html for more information.

Major accomplishments of the Urban Waters Project since November 2007 include:

1. Completion of a background sampling study in Liberty Lake that isolated contaminant concentrations from residential and industry with no known sources. The analysis and report will be completed in 2009.
2. Finishing the source tracing and elimination strategy for the rest of the Spokane watershed starting in the city of Spokane.
3. Beginning source tracing through inspection and sampling within smaller watersheds within the city of Spokane and the city's sanitary sewer system.

4. The Spokane Regional Health District has conducted nearly 150 business visits in areas of concern in a little over a year.

(Also see page 18, under "Businesses.")

Spokane River Toxics Water Quality Improvement Plan

The state has several tools for limiting toxic water pollution. One tool is to develop and implement a water quality improvement plan. A DRAFT plan (or total maximum daily load/ TMDL) was written in June 2006 for PCBs but was not completed because of the need for more data. The Draft TMDL still contains valuable information such as a review of previous studies, a discussion of PCB concentrations from the Idaho border to the mouth of the river from 2003 through 2004, and general actions various organizations can take to reduce PCBs.

Ecology is considering more comprehensive methods and tools to reduce toxic pollution. One tool may be to develop a TMDL or other plan for all the toxics that are a problem in the Spokane River area, rather than for a single contaminant such as PCBs. Either approach will include reducing polluted runoff – or stormwater – which may be a leading pathway for toxic chemicals to enter the river. Traditional water cleanup plans alone cannot clean up the river – we also need this stormwater strategy. *(See page 15.)*

Wastewater Permitting

Four wastewater treatment plants discharge to the Spokane River: Inland Empire Paper Company, Kaiser (Trentwood), the city of Liberty Lake, and the city of Spokane. Wastewater permits place limits on the quantity of toxics and other contaminants that may be discharged to the river without violating state or federal water quality standards. Permits also set other conditions, including monitoring and reporting requirements, spill prevention planning, and other activities to protect water quality of the river.

Dischargers to the Spokane River are required to have a wastewater permit before they are allowed to discharge. The permits are required by the federal government and are called National Pollutant Discharge Elimination System (NPDES) permits.

The permits are based on water quality improvement plans or "total maximum daily load" reports (TMDLs). Those reports say how much of a pollutant a wastewater treatment plant can discharge without violating water quality standards.

New permits will be issued to these plants after the Spokane River Dissolved Oxygen Water Quality Improvement Plan is approved by the U.S. EPA later in 2009 or early 2010. The new permits also will include monitoring requirements for toxics such as metals, PCBs, mercury, PBDE (flame retardants), dioxins, and furans. The monitoring will tell us what current levels of toxics are being discharged and help to identify next steps for better treatment and operations.

On-the-ground cleanup work

In addition to the cleanup projects already accomplished (*see pages 8-11*), more projects are planned for the future. These projects are designed to address heavy metals from Idaho's Silver Valley mining district. They each will be completed as Ecology secures adequate funding:

- 2009 – Barker Road South (This project is designed to restrict access to contaminated areas.)
- 2009-- Flora Road
- Barker Road North
- Islands Lagoon
- Myrtle Point

We plan to place a cap over the impacted sediments at each of the sites, minimizing disturbance of existing vegetation and enhancing public access pathways.

Ecology's statewide efforts to reduce toxics

Again, as stated on *page 8*, the state of Washington has taken concrete, statewide action to target certain pollutants and certain geographic areas. Some of those efforts have recently begun and will carry forward for many years. These activities are considered important pieces in the Spokane River Toxics Strategy or "road map."

Managing Stormwater

The state of Washington has passed strict laws to address toxic-laden stormwater. Many changes are taking place in populated communities such as Spokane where stormwater is the leading pollution threat. For details on this, go to this link: http://www.ecy.wa.gov/programs/wq/stormwater/index.html .

Stormwater – or polluted runoff -- is what results when it rains hard or during a fast snow melt. The water carries pollution on the land into downstream waters. Stormwater is a leading contributor to pollution problems in the Spokane River.

Stormwater permits are Ecology's key tool to prevent polluted runoff. Many communities are just now beginning to take the steps necessary to comply. Through this permit system, Ecology regulates stormwater discharges at industrial sites, one-acre and larger construction sites, sand and gravel sites, municipalities, and at state-owned highways and facilities managed by the Washington Department of Transportation. However, permits alone will not clean up our stormwater. For "only rain down the drain," we are now educating people to raise their awareness about how they can help. People at home and at their jobs are the key to healthy, clean waters.

Washington Waters—Ours to Protect

In Washington, we have dramatically reduced pollution from industrial facilities like manufacturing plants and sewage treatment plants. While our state isn't letting up on industrial pollution, we're now putting new emphasis on equipping Washington residents – all of us – to help protect our state's imperiled waters. People usually want to do the right thing, but they often do not know what that is. With Washington's growth and the issues we face in restoring our urban waters, this topic has never been more relevant. See our ***Washington Waters – Ours to Protect*** website for additional information: **www.ecy.wa.gov/washington_waters/**. Public education materials are available to adapt to local jurisdictions to help local governments get started.

E-Cycle Washington (E-Waste)

Working with manufacturers, retailers, collectors, transporters, processors, and local governments, Ecology has been able to launch E-cycle Washington. Households, small businesses, schools and school districts, small governments, special purpose districts, and charities have a free, convenient and environmentally responsible recycling program for computers, monitors, laptops, and televisions. Many electronics, especially TVs and computers, contain toxic materials such as PBDEs, lead, cadmium and mercury. Reusing and recycling electronics will keep these toxic materials out of our incinerator, and also recovers valuable resources. The electronic equipment this program collects will be taken apart and separated into materials such as glass, plastic, metal and chemicals. See the law here: http://www.ecy.wa.gov/biblio/0707042.html

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products (PPCPs) are an emerging environmental and human health issue. Pharmaceuticals and personal care products refer to any product used by individuals for personal health or cosmetic reasons. These include any substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease.

PPCPs are used daily by virtually every human, and so are now found throughout our environment. They enter the environment as they pass through the human body or when unwanted PPCPs are disposed in the trash or down the drain. Other significant sources include use for livestock, aquaculture, pets, and agriculture. This also includes products used to enhance the growth or health of livestock. Personal care products contain many different chemicals, and data varies greatly about human health and environmental effects.

PPCPs are present at low concentrations in lakes and streams, groundwater, soils, sediments, marine waters, and drinking water. Researchers monitoring the environment find PPCPs at higher levels where domestic wastewater is discharged.

The human health effects resulting from daily exposure to low concentrations of PPCPs are unclear. Some documented impacts to wildlife from PPCPs in the environment include feminization in fish, bioaccumulation in earthworms, and the near extinction of the vulture population in India. These direct effects to wildlife raise concerns about the impact to other species.

Conventional wastewater treatment systems do not do a good job of removing PPCPs from their discharge. Some advanced wastewater treatment processes do exist that are more effective in removing these contaminants; however, these treatment processes are less commonly used. No single treatment process will completely remove all PPCPs from wastewater.

Prevention strategies, such as pharmaceutical take-back programs are excellent tools, but they will only address a fraction of the issue. Pharmaceuticals are a necessary medical tool for many people, and personal care products are used pervasively worldwide by almost everyone. This source of contamination cannot be eliminated; it must be managed. A combination of prevention strategies combined with advanced wastewater treatment could reduce the amount of PPCPs in the environment.

You can find consumer information about Washington's drug take back program at: http://www.medicinereturn.com/ .

Hazardous Waste and Toxic Reduction Program's Inspections and Technical Assistance

In 2005, the Department of Ecology reached a 1990 legislative goal of reducing hazardous waste in the state by 50 percent. Even with that achievement, concerns about toxic chemicals in the environment continue to grow because toxic chemicals are embedded in the products we buy and use every day – from household cleaners to yard products to durable goods. The risk from toxic

chemicals doesn't begin with just a leaking drum at an industrial site. It also begins when we buy and use products that contain toxic chemicals.

Ecology's *Beyond Waste Plan* sets a direction for waste management in Washington State over the next 30 years and lists specific recommendations. It sets the framework for the Hazardous Waste and Toxics Reductions Program's work plan. See the Beyond Waste Plan at: http://www.ecy.wa.gov/beyondwaste/ .

The Hazardous Waste and Toxics Reduction Program conducts inspections of businesses and industrial facilities to make sure that hazardous (toxic) waste is being stored properly, labeled properly and disposed correctly to avoid polluting our soil and water. The program not only regulates toxic waste management, but also works with businesses and industries to eliminate hazardous materials from being generated in the first place.

Moving "beyond waste" will help us protect the environment, human health, and our state's economic development. Moving beyond waste to re-use and reduce materials use, especially toxic materials, will take many years.

Ecology's Spill Response Program's Spill Prevention and Cleanup

Every year, more than 20 billion gallons of oil and hazardous chemicals are transported through Washington by rail, road, pipelines, barges and ships. Accidents, equipment failure, and human error can all lead to unintended and potentially disastrous consequences. Oil and chemical spills can kill fish, birds and wildlife, foul drinking water sources, contaminate beaches and soils, and close public access areas. All spills, whether on land or water, can threaten public health and safety as well as our environment – ultimately damage the state's economy and quality of life.

Through the years, Ecology has responded to thousands of spills, accidents, fires, explosions and other incidents to protect public health, reduce environmental damages, and shield sensitive natural, cultural and economic resources. For example, if a truck crashes releasing fuel or other hazardous cargo into the river or over a shallow part of the aquifer, Ecology's Spokane spills team is called to the scene to analyze the emergency. Ecology's role is to make sure the spiller takes immediate steps to clean up the spill and prevent it from entering surface and underground water sources. If the oil or hazardous material is already in the water, Ecology makes sure those responsible are using techniques to contain the spill so it can be cleaned up as close to the site as possible.

Ecology works hard to make sure hazardous, toxic substances do not pollute the Spokane River or our aquifer. The mission of the Spill Prevention, Preparedness, and Response Program is to protect Washington's environment, public health, and safety through a comprehensive spill prevention, preparedness, and response program. The program focuses on preventing oil spills to state waters and land – as well as planning effective responses to oil and hazardous material spills whenever they occur.

Connecting people with tools

Connecting the public, small businesses, schools, and local governments with resources to prevent toxic chemical pollution.

Residents

- 1-800-RECYCLE-- Connects residents and businesses with a comprehensive database to locate safe disposal options for household chemicals, electronics, yard debris, and many other recyclables. Disposing these items properly keeps potentially toxic chemicals from entering our air and water. https://fortress.wa.gov/ecy/recycle/ .

- Toxic Free Tips-- This statewide program encourages the safe use and disposal of hazardous household products, and the use of safer alternatives. http://www.ecy.wa.gov/toxicfreetips/ .

Businesses

- TREE program-- Technical Resources for Engineering Efficiency (TREE) is a free, non-regulatory, confidential technical assistance program that can reduce water and energy use and promote proper hazardous waste disposal and waste treatment. Since 1998, TREE has teamed with over 30 Washington businesses to re-design production processes. If these businesses implemented TREE recommendations for dangerous waste each year, these wastes would be reduced by 235,000 pounds.

  Ecology offers free technical assistance to reduce water use, energy use, and solid waste generation. The focus is on achieving payback periods specified by the company while reducing waste, i.e., the new equipment or operating technique will pay for itself in so many years. Since 1998, Ecology has worked with 30 select Washington businesses to reduce their environmental footprint and make them "greener." See: http://www.ecy.wa.gov/programs/hwtr/TREE/

- Lean and Environment program—The Washington State Department of Ecology's (Ecology) Hazardous Waste and Toxics Reduction Program and Washington Manufacturing Services worked together to provide low-cost "lean" manufacturing assistance. "Lean and Environment" is a program developed by the U.S. EPA. Three pilot projects were conducted and more will follow. One pilot project was Columbia Paint & Coatings (Columbia Paint), a manufacturer of residential, architectural, and industrial paint and coatings in Spokane. Through this program, Columbia Paint cut its hazardous materials and waste by 17,600 pounds.
  See http://www.ecy.wa.gov/pubs/0704033.pdf for more information. Ecology has grant funding to defray costs of future projects and is actively looking for interested companies.

- Hazardous waste education and resources-- Ecology's Hazardous Waste and Toxic Reduction Program provides technical assistance and resources for businesses that generate dangerous waste. These resources include workshops and training materials that can be found online at: http://198.238.211.77:8004/programs/hwtr/business.html

- Urban waters/local source control technical assistance-- Local source control specialists from the Spokane Regional Health District are working with businesses to identify and prevent pollution from reaching the river through sediment, storm drains, and combined sewers. Specialists visit businesses and work through a checklist of best management practices. Recommendations for improvements are made where needed and follow-ups may also be made to monitor progress and answer additional questions. The local source control specialists work alongside Ecology's Urban Waters investigators as they search for sources of toxic pollution along the river. See this website for details: http://www.ecy.wa.gov/urbanwaters/index.html

Working with Educators

- Ecology is planning to conduct teacher training on the *Hazards on the Homefront*—a teacher's guide that integrates state and local information relevant to everyday activities at school and home, and in students' communities. This curriculum teaches about the connection between human health and our air, land, and water. See: http://www.ecy.wa.gov/hazardsonthehomefront/index.html

Citizen Groups

- Public Participation Grants provide funding to not-for-profit public interest organizations and citizen groups. These grants encourage public involvement in monitoring the cleanup of contaminated sites and pollution prevention through waste reduction and elimination.
  Many past recipients of these grants have addressed toxics in the Spokane River.
  http://www.ecy.wa.gov/programs/swfa/grants/ppg.html

- Staff members at Ecology will make themselves available, as time permits, to speak on topics addressed in this strategy. The Spokane River Forum, http://www.spokaneriver.net/ may conduct workshops in 2009 and 2010 regarding the toxic pollution challenge. Ecology staff plans to participate in these workshops and other community events as much as possible as a community dialog is a high priority for us.