2007 Chemicals in Washington State Summary Report

Tier Two – Emergency and Hazardous Chemical Inventory and Toxics Release Inventory Data

Washington State Emergency Response Commission

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2007 Chemicals in Washington State
Summary Report

Tier Two – Emergency and Hazardous Chemical Inventory

and Toxics Release Inventory Data

by
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Executive Summary

This report summarizes information about chemicals stored on site or released into the air, land, or water by certain Washington State businesses during 2007. The Emergency Planning and Community Right-to-Know Act (EPCRA) contains five sections dealing with various reporting requirements of businesses and responsibilities of state, tribal, and local governments. A facility may be subject to one or all EPCRA sections. This summary focuses on the two annual EPCRA reporting requirements: Tier Two – Emergency & Hazardous Chemical Inventory reporting (Section 312) and Toxics Release Inventory reporting (Section 313).

Use of Hazardous Chemical Inventory (Tier Two) and Toxics Release Inventory (TRI) Data

Tier Two data is used for emergency planning activities. Local Emergency Planning Committees (LEPCs) use the information for emergency preparedness, disaster and mitigation planning, and counter-terrorism planning. Local fire departments use the information for incident responses at or near reporting facilities.

The Department of Ecology (Ecology) uses TRI data as one of several environmental indicators for the state. The data serves as a valuable tool for measuring the progress and effectiveness of pollution prevention programs. It is used as an indicator for Beyond Waste, Ecology's long-range plan to reduce and eliminate solid and hazardous waste. It is also used to identify sources of toxic chemicals in Puget Sound as part of the effort to protect Puget Sound waters.

Statewide Summary of Tier Two – Emergency and Hazardous Chemical Inventory Reporting in Washington, 2007

Approximately 3,700 facilities in Washington State reported storage of one or more hazardous chemicals at or above reportable thresholds during 2007. Under EPCRA Section 312, Tier Two reporting requirements, the reportable threshold for hazardous substances was established at 10,000 pounds at any one time with much lower thresholds for extremely hazardous substances.

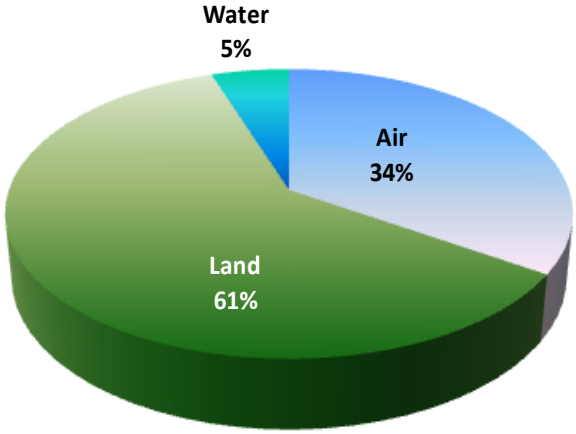
Federally designated Extremely Hazardous Substances (EHSs) have significantly lower thresholds for reporting due to their acute risk to employees, the public, and the environment. The top three reported EHSs were sulfuric acid, ammonia, and chlorine.

Top Three Substances Reported in Storage

HAZARDOUS	
Substance	Reports
Diesel fuel	1,273
Gasoline	729
Lube oil	643

EXTREMELY HAZARDOUS	
Substance	Reports
Sulfuric acid	1,137
Ammonia	520
Chlorine	204

Summary of TRI Reporting in Washington, 2007



In 2007, 322 Washington facilities submitted 1,099 TRI reports representing the use of 111 different chemicals or chemical groups. A total of 26,083,110 pounds of toxic chemicals were released to air, land, and water in Washington. With the reopening of the Pend Oreille Mine in 2004, land releases now have the greatest percentage of the total - 15,807,794 pounds or 61 percent. Air releases account for 34 percent (8,920,877 pounds) and 5 percent (1,354,439 pounds) were released to state waters. Prior to the reopening of the Pend Oreille Mine, air releases were the highest percentage of the total.

The highest chemical releases by weight were from zinc compounds (mostly from the Pend Oreille Mine), methanol (primarily from the pulp and paper industry), and lead (mostly from the Pend Oreille Mine and the U.S. Department of Energy's Hanford site). Lead compounds (persistent, bioaccumulative, and toxic) were reported by the greatest number of facilities — 79.

The top three persistent, bioaccumulative, and toxic (PBT) chemicals by weight of on-site releases were lead, lead compounds, and polycyclic aromatic compounds. If amounts of lead and lead compounds were added together, mercury compounds would be the third most-reported chemical by weight. Most of the releases for lead and lead compounds were to land, while the majority of releases for the other PBT chemicals were to air. By number of chemical reports, the top three reported chemicals were lead compounds (79), lead (69), and polycyclic aromatic compounds (40).

In 2007, the top 20 facilities reporting under the TRI released 23.3 million pounds of TRI chemicals during the year, 89 percent of the state's 26.1 million pound total. The Pend Oreille Mine facility reported the highest total on-site releases of 11.1 million pounds. Transalta Centralia Generation/Mining and U.S. Department of Energy's Hanford Site were the next highest, each reporting 2.1 million pounds of on-site releases.

The following report is a summary of the 2007 TRI data. A web report, with supporting data tables, is also available at *www.ecy.wa.gov/epcra/*.

Introduction

In December 1984, a deadly cloud of methyl isocyanate tragically killed thousands of people in Bhopal, India. In August 1985, another serious accidental chemical release also occurred in Institute, West Virginia. These and other events raised concerns about lack of planning and preparation in response to chemical accidents. It also led to public demand for information about toxic chemicals released 'beyond the fence line' of a facility, that could endanger surrounding communities.

As a result of these and other incidents, the Superfund Amendments and Reauthorization Act (SARA) was signed into federal law in 1986. Title III of SARA is commonly referred to as the Emergency Planning and Community Right-To-Know Act (EPCRA) or the Community Right-to-Know law. EPCRA facilitates emergency planning, helps to minimize the effects of potential chemical accidents, and provides the public with information about potentially dangerous chemicals in their communities. EPCRA empowers citizens, through information, to hold companies and local governments accountable in terms of how toxic chemicals are managed.

While EPCRA helps communities deal safely and effectively with hazardous chemicals, the law also includes a number of requirements for businesses and government. EPCRA's primary objective is to help improve emergency planning for hazardous chemicals at the local level by:

- Enhancing emergency response capabilities for chemical incidents.
- Expanding emergency planning for hazardous chemical incidents.
- Identifying storage, use, and release of hazardous chemicals in communities.
- Promoting communication between facilities that handle hazardous chemicals, the community, and local planners.

Chapter 118-40 Washington Administrative Code (WAC) was established in 1987 and adopted the Community Right-to-Know reporting thresholds and requirements in accordance with federal Public Law 99-499. The Governor appointed the Washington State Emergency Response Commission (SERC), which established Local Emergency Planning Committees (LEPCs) statewide.

In addition to being a member of the Washington SERC, the Washington State Department of Ecology (Ecology) is mandated to develop and implement the state EPCRA Program. Ecology receives reports, manages data, and distributes information on storage and releases of toxic chemicals under these regulations on behalf of the SERC. Ecology staff also track facility compliance and provide technical and regulatory guidance to businesses, local emergency planning committees, tribal nations, and the public.

This report summarizes information about chemicals stored on site or released into the air, land, and water by some Washington businesses. It focuses on the two annual EPCRA reporting requirements:

1. Tier Two - Emergency & Hazardous Chemical Inventory (Section 312) for 2007.
2. Toxics Release Inventory (Section 313) for 2005 through 2007.

Tier Two - Emergency and Hazardous Chemical Inventory

Facilities that must maintain a material safety data sheet (MSDS) for any hazardous chemical stored or used in the workplace are potentially covered under Community Right-to-Know laws. Under EPCRA Section 312, facilities are required to report inventories of substances or products that meet or exceed reporting thresholds. These reports are submitted to the SERC, Local Emergency Planning Committee, and local fire department. They must submit a Tier Two - Emergency and Hazardous Chemical Inventory report by March 1st of each year for the inventory of hazardous substances or chemicals stored on site during the previous calendar year.

What are Material Safety Data Sheets (MSDSs)?

MSDSs are detailed information sheets that provide data on health hazards and physical hazards of chemicals along with associated protective measures. More than 500,000 products have MSDSs, which are normally obtained from the chemical manufacturer.

The information required on the Tier Two – Emergency and Hazardous Chemical Inventory report includes:

- Facility identification.
- Chemical or product name.
- Physical and health hazards.
- Actual, maximum, and average inventory amounts.
- Description of storage conditions
- Location of chemicals on site.

Tier Two data is critical to the SERC and local agencies. The data is used to prepare for emergencies, disaster and counter-terrorism planning, and emergency responses to incidents at or near reporting facilities. It is also made available to the public. This data also helps the state better understand how and where the chemicals are used.

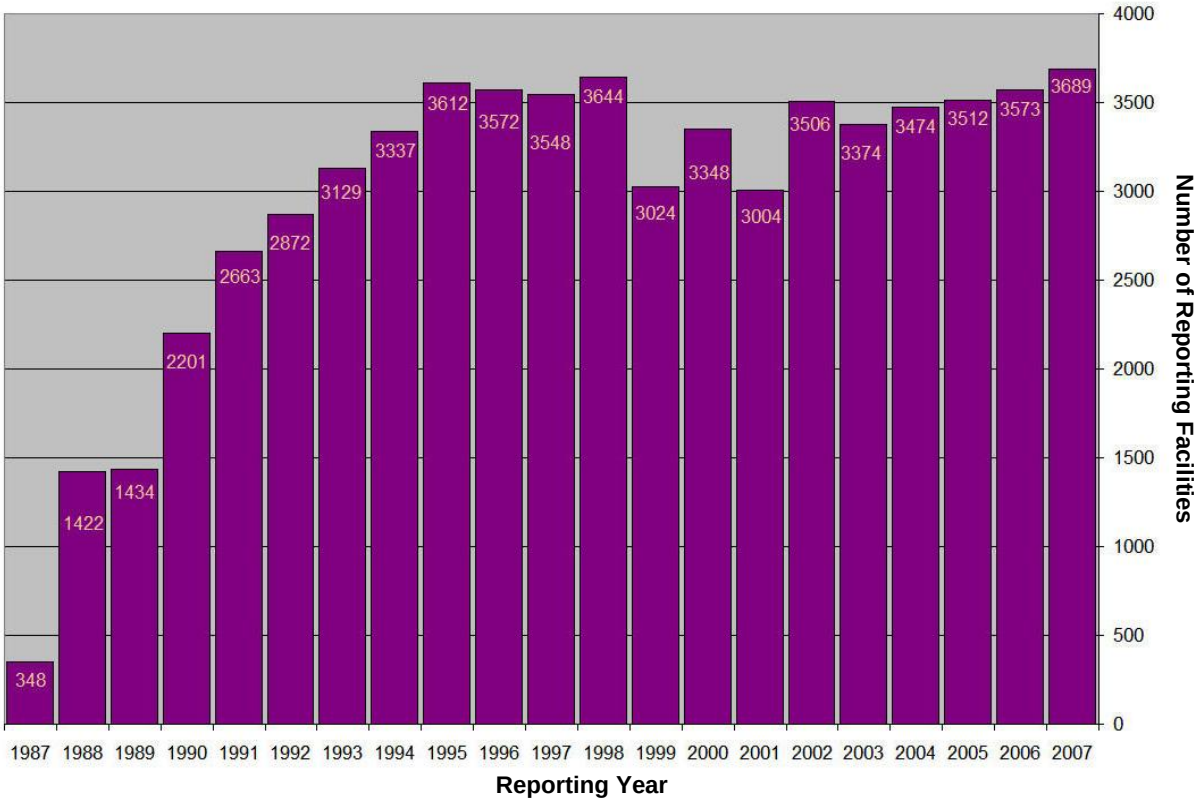
Statewide Summary of Chemical Inventory Reporting in 2007

Nearly 3,700 facilities in Washington reported storage of one or more hazardous chemicals at reportable thresholds during 2007. Under Tier Two reporting requirements, the reportable threshold for hazardous substances was established at 10,000 pounds stored at any one time, with much lower thresholds for extremely hazardous substances. Federally designated "Extremely Hazardous Substances" (EHSs) have significantly lower thresholds for reporting due to their acute risk to employees, the public, and the environment.

Tier Two Reporting Facilities

The number of facilities reporting Tier Two chemicals increased each year prior to 1998 due to increased outreach efforts, awareness of reporting requirements, and enforcement activities. In 1998, reporting requirements were changed for retail gas stations causing a significant decrease from this sector. Each year the number of reporting facilities changes because some businesses store smaller quantities and are no longer required to report, while other new businesses start reporting.

Figure 1. Historical Number of Facilities by Reporting Year



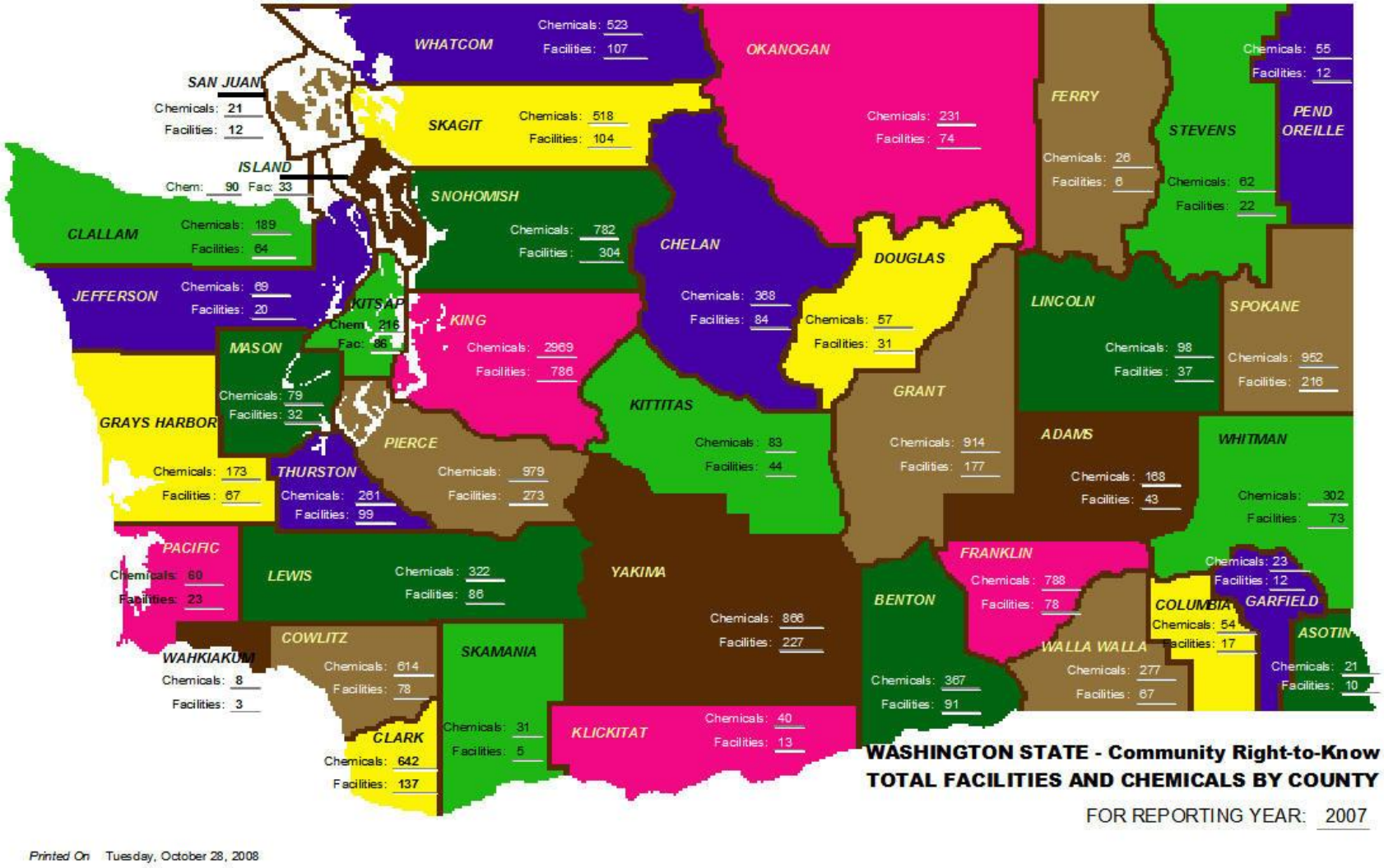
Nearly 3,700 Washington facilities stored hazardous substances during 2007. These facilities reported 14,304 substances in 32,487 storage locations at their business sites. More than 3,207 extremely hazardous substances were reported.

Table 1. Top Three Substances Reported in Storage

HAZARDOUS	
Substance	Reports
Diesel fuel	1,273
Gasoline	729
Lube oil	643

EXTREMELY HAZARDOUS	
Substance	Reports
Sulfuric acid	1,137
Ammonia	520
Chlorine	204

Figure 2. Facilities and Chemicals by County



Tier Two Reporting Requirements

Any facility in Washington that stores over a certain amount (reporting threshold) of a hazardous chemical must report this annually to the Washington State Emergency Response Commission (SERC), the Local Emergency Planning Committee (LEPC), and the local fire department. Under EPCRA Section 312, the facility must submit a Tier Two - Emergency and Hazardous Chemical Inventory report by March 1st. The Tier Two report contains information on hazardous substances or extremely hazardous substances present in amounts at or above the chemical threshold level at any time during the previous calendar year.

Reporting thresholds for hazardous substances are 10,000 pounds or more at any one time. The thresholds for extremely hazardous substances vary, depending on the chemical.

Tier Two data includes the number of facilities storing extremely hazardous substances (EHSs). The 350 chemical compounds classified as EHSs are designated by the Environmental Protection Agency (EPA).

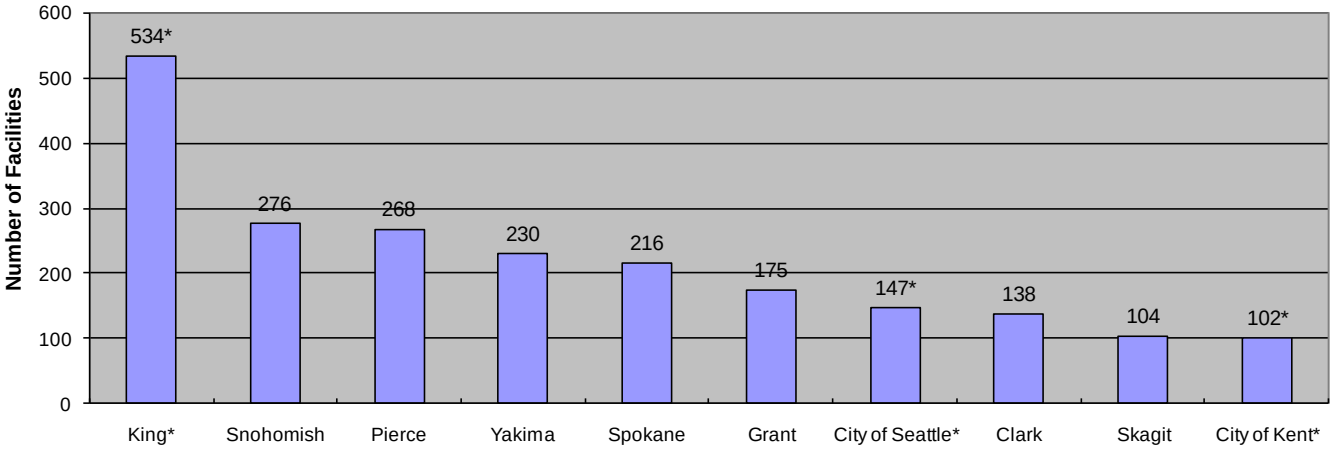
Ecology staff enters the information into a tracking system to share with the public, LEPCs, fire departments, and other government agencies.

Local Emergency Planning Committees

LEPCs are made up of representatives from emergency management, local government officials, law enforcement, health professionals, environmental and citizen groups, industry and other interested parties. Each LEPC looks for ways to prevent chemical accidents. It is also responsible for developing a local emergency plan for its district and for the collection of information submitted by industry, which is made available to the public.

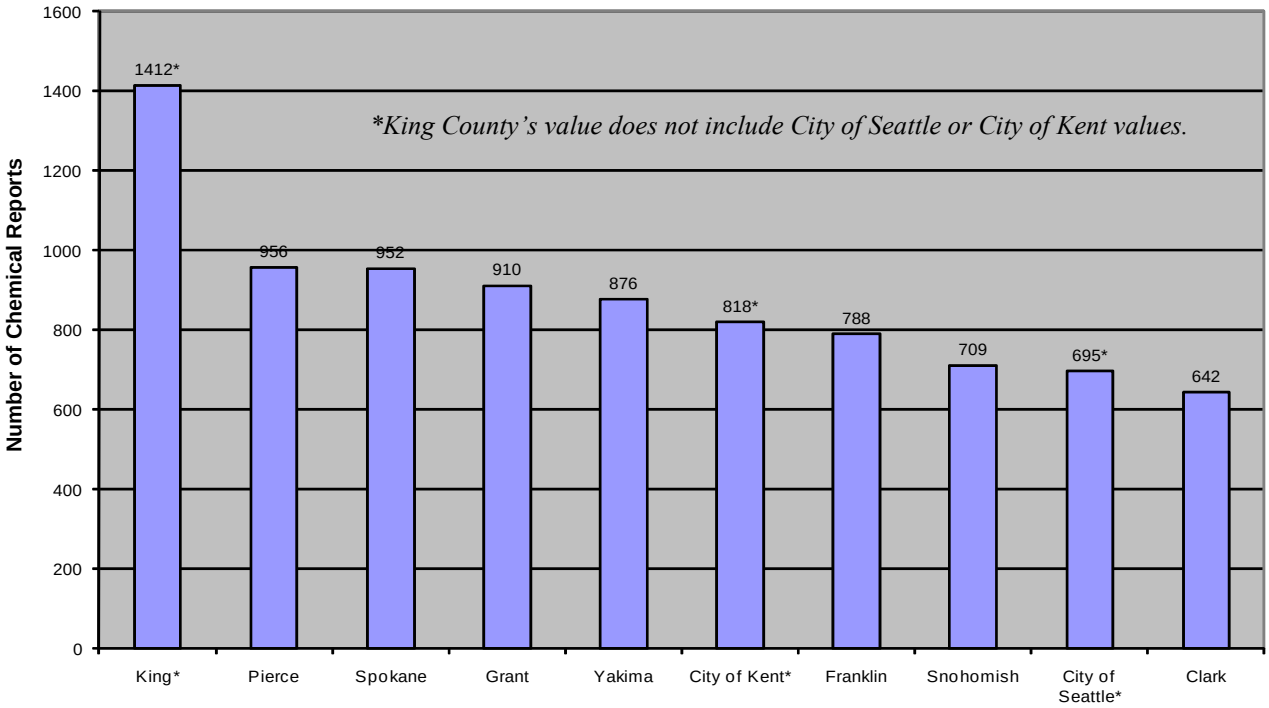
The SERC currently oversees 43 LEPCs. Most share the same jurisdictional area as counties. Some communities serve as their own LEPC. Figure 3 displays the ten LEPCs having the most facilities within their jurisdiction that filed Tier Two reports in 2007. Figure 4 is similar, but shows the top ten LEPCs in terms of the total number of chemicals reported as stored on site. A list of all the LEPCs and their numbers of reporting facilities and chemicals reported can be found in Appendix A on page 21. A current LEPC list is available at *www.ecy.wa.gov/epcra/lepclist.html*.

Figure 3. Top Ten LEPCs with the Most Reporting Facilities



**King county's value does not include City of Seattle or City of Kent values.*

Figure 4. Top Ten LEPCs by Chemicals Stored On Site



Most Frequently Reported Hazardous Substances and Extremely Hazardous Substances

The ten most frequently reported hazardous substances are displayed in Figure 5 below. Figure 6 displays the ten most frequently reported EHSs. EHSs present a higher risk to the public and the environment and therefore have much lower reporting thresholds. The value of making information on these chemicals available becomes apparent when one thinks of the risks faced by employees, emergency responders, and others in close proximity.

Figure 5. Top Ten Most Frequently Reported Hazardous Substances, 2007

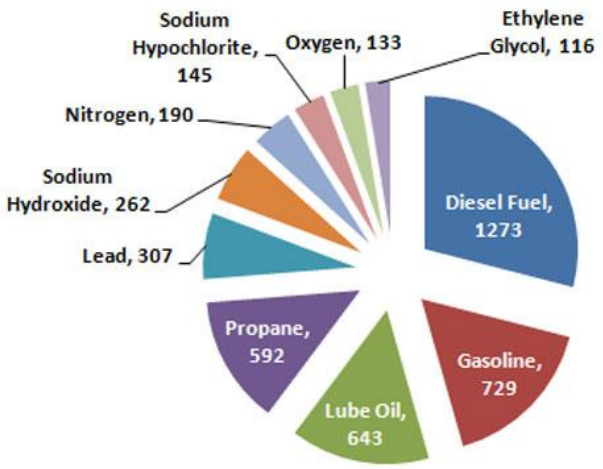
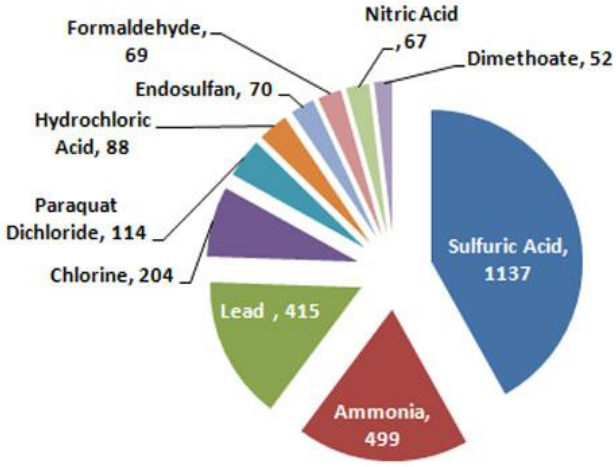


Figure 6. Top Ten Most Frequently Reported Extremely Hazardous Substances, 2007



The Toxics Release Inventory

EPCRA Section 313, the Toxics Release Inventory (TRI), identifies facilities, and chemicals manufactured and used at those facilities. It also tracks accidental and routine releases of those chemicals to air, land, and water. Facilities required to report under TRI are manufacturing companies in specific industrial sectors and seven other industries: metal mining, coal mining, electric utilities, commercial hazardous waste treatment, petroleum bulk terminals, chemical wholesalers, and solvent recovery services.

Nationally, the TRI collects chemical information from more than 23,000 facilities that manufacture, process, or otherwise use over 650 chemicals. In 2007, 322 Washington facilities submitted 1,099 TRI reports representing the use of 111 different chemicals or chemical groups. In addition to release information, TRI collects information about how waste is managed through disposal, treatment, recycling, or energy recovery.

The U.S. Environmental Protection Agency (EPA) compiles TRI data each year and makes it available through several data access tools, including TRI Explorer (*www.epa.gov/triexplorer/*), TRI.NET (*www.epa.gov/tri/tridotnet/index.html*), and Envirofacts (*www.epa.gov/enviro/*). Information available through these systems includes national, state, county level, and facility-specific TRI data. There are other organizations that also make the data available to the public through their own data access tools. For example, OMB[1] Watch provides data through its tool "RTKNet" (*www.rtknet.org/*), and the U.S. National Library of Medicine provides a searchable database of TRI information through "TOXNET" (*http://toxnet.nlm.nih.gov/*).

Who must report under the Toxics Release Inventory?

Under EPCRA Section 313, a facility must complete a TRI report, if ***all three*** of these criteria are met:

1. It is in a covered industry category as determined by its North American Industry Classification System (NAICS) code, or prior to 2007, its Standard Industry Classification (SIC) code; ***and***
2. It has ten or more full-time employees (or the equivalent of 20,000 employee hours per year); ***and***
3. It manufactures, imports, processes, or otherwise uses any of the EPCRA Section 313 chemicals in amounts greater than established threshold quantities of these chemicals. (At present, more than 650 chemicals and chemical categories are covered.)

If these criteria are met during a calendar year, the facility must file an annual report by July 1 of the following year to the EPA or tribal government, and to the state in which the facility is located. In Washington State, these reports are sent to the TRI coordinator at Ecology.

Toxics Release Inventory Reporting Thresholds

Each chemical reportable under the TRI is assigned a reportable threshold amount. The reporting thresholds for persistent bioaccumulative and toxic (PBT) chemicals are lower than the thresholds for non-PBT chemicals, and separate thresholds apply, depending on how each listed chemical is used.

[1] U.S. Office of Management and Budget

The reporting threshold for PBT chemicals is 100 pounds per year. For a small subset of PBT chemicals that are highly persistent, bioaccumulative, and toxic the reporting threshold is ten pounds per year. For dioxins and dioxin-like compounds, there is a separate reporting threshold of 0.1 **gram** per year.

For non-PBT chemicals that are "manufactured" or "processed" at the facility, the threshold is 25,000 pounds. Non-PBT chemicals that are "otherwise used" are reportable at 10,000 pounds. "Otherwise used" means it is not purposely integrated into a product distributed for business. This includes chemicals that are disposed, stabilized, or treated for destruction.

What are PBTs?

PBTs are persistent, bioaccumulative, and highly toxic pollutants. These long-lasting substances can build up in the food chain to levels that are harmful to human and ecosystem health.

PBTs are associated with a range of adverse health effects, including nervous system damage, reproductive and developmental problems, cancer, and genetic impacts, such as birth defects.

There are 16 PBT chemicals and 4 PBT chemical compound categories subject to reporting under TRI.

Toxics Release Inventory Reporting Thresholds for PBT Chemicals

By federal rule, PBT chemicals have lower thresholds for reporting under the TRI. The thresholds for chemical use are:

- One hundred pounds for persistent and bioaccumulative chemicals like polycyclic aromatic compounds, lead, and lead compounds.
- Ten pounds for highly persistent and highly bioaccumulative chemicals like mercury and mercury compounds.
- One tenth of a gram for dioxins and dioxin-like compounds.

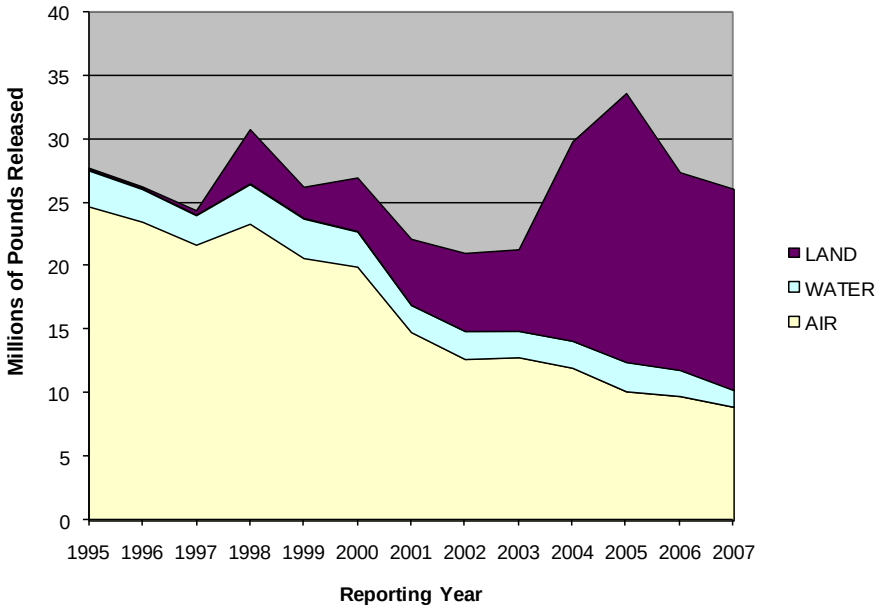
Relatively small releases of PBT chemicals can pose human and environmental health threats, so releases of these chemicals are of special concern. PBT chemicals are not only toxic, but also remain in the environment for long periods of time, are not readily destroyed, and tend to build up or accumulate in body tissue of living things. They also increase in concentration as these chemicals move up the food chain. PBTs can easily move through air, water, and land and are widely distributed throughout the environment.

Exposure to PBTs has been linked to a wide range of toxic effects in fish, wildlife, and humans, including nervous system damage, reproductive and developmental problems, cancer, and genetic impacts, such as birth defects.

Key Trends in Toxics Release Inventory in Washington

With a few notable exceptions, TRI releases, especially to air and water, have been decreasing in Washington State for more than a decade. Large increases in on-site releases to land occurred in 1998, when seven new industry sectors were added to the TRI reporting universe (by federal rule change), and again in 2004 when the reopening of the Pend Oreille Mine added millions of 'new' pounds to the data annually. However, those newly reported releases (mostly from mine tailings into regulated, lined, holding basins) have also been decreasing since 2005.

Figure 7. Washington State TRI On-site Releases by Media, 1995-2007



The trends for TRI releases are partly related to economic factors. For example, cost per pound to manage and properly dispose of toxic waste is going up. Higher waste management costs provide greater incentives to generate less toxic waste and use less toxic materials in the first place.

Other factors contributing to the downward trend in Washington TRI releases include:

- Fewer businesses filing TRI reports each year.
- State required Pollution Prevention (P2) Plans. P2 planning has fostered significant reductions in waste and toxic chemicals used. Washington TRI facilities must submit and annually update these P2 Plans*.
- More businesses understand that the costs and liability for using toxic chemicals are increasing, as are associated cleanup costs.

*TRI data is one indicator used in Ecology's Beyond Waste Progress Report to track progress towards reducing wastes and toxics. The Progress Report is available online at *www.ecy.wa.gov/beyondwaste/bwprog_front.html*. Information about state required P2 plans can be found online at *www.ecy.wa.gov/programs/hwtr/P2/p3.html*.

On-site Releases to Air, Land, and Water

On-site disposal or other releases include emissions to the air, discharges to bodies of water, disposal at the facility to land, and disposal in underground injection wells. Disposal or other releases are reported to TRI by media type, either air, land, or water.

In 2007, 322 Washington facilities submitted 1,099 TRI reports representing the use of 111 different chemicals or chemical groups. A total of 26,083,110 pounds of toxic chemicals were released to air, land, and water in 2007. With the reopening of the Pend Oreille Mine in 2004, land releases now have the greatest percentage of the total - 15,807,794 pounds or 61 percent. Air releases accounted for 34 percent (8,920,877 pounds) and 5 percent (1,354,439 pounds) was released to state waters. Prior to the reopening of the Pend Oreille Mine, air releases were the highest percentage of the total.

Toxics Release Inventory releases have generally decreased over time. However, in 2007 there was a slight increase in the release of dioxins and dioxin-like compounds when compared to 2006. See Figure 9, page 11.

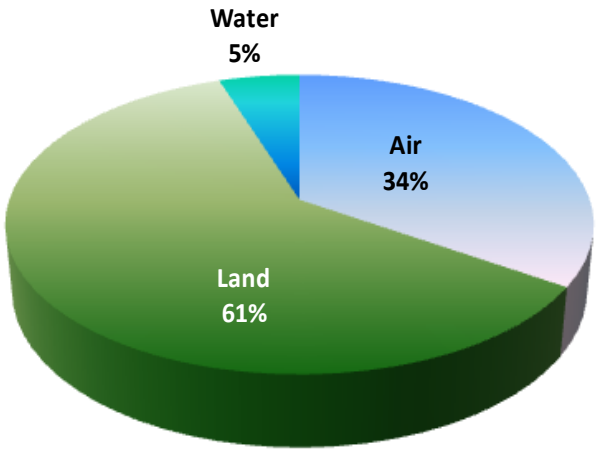


Figure 8. Washington State TRI On-site Releases by Media, 2007 (in pounds)

Releases to air are classified as either 'fugitive' or 'stack' releases. Fugitive releases, or 'non-point' source emissions, include evaporative losses, leaks, and releases from building ventilation systems. Stack, or 'point source' emissions, come from known points such as stacks, confined vents, ducts, pipes, or other confined air streams. Stack releases also include air releases from air pollution control equipment and storage tank emissions.

Releases to water are discharges to streams, rivers, lakes, oceans, and other bodies of water. These include process outfalls such as pipes and open trenches, releases from on-site wastewater treatment systems, and the contribution from stormwater runoff. Discharges to a publicly-owned treatment works (community wastewater treatment plants) or other off-site wastewater treatment facility are not counted here under water releases, but rather as transfers.

There are several types of **land releases** reported under TRI - underground injection (not allowed in Washington State), disposal to landfills, land treatment, surface impoundment, and disposal methods not covered by the above categories. Land treatment involves disposal of waste containing TRI-listed chemicals applied onto or incorporated into soil. Surface impoundments are natural topographic depressions, manmade excavations, or diked areas designed to hold an accumulation of liquid wastes or wastes containing free liquids. Surface impoundments include holding, settling, storage and elevation pits, ponds, and lagoons.

More about Releases to Washington Waters

A total of 1,354,439 pounds of chemicals were reported as released to Washington's waters in 2007. This is a decrease of more than 700,000 pounds from 2006. Out of the 44 chemicals or chemical compounds released to water, the top three alone – nitrate compounds, methanol, and manganese compounds – account for 87 percent of releases.

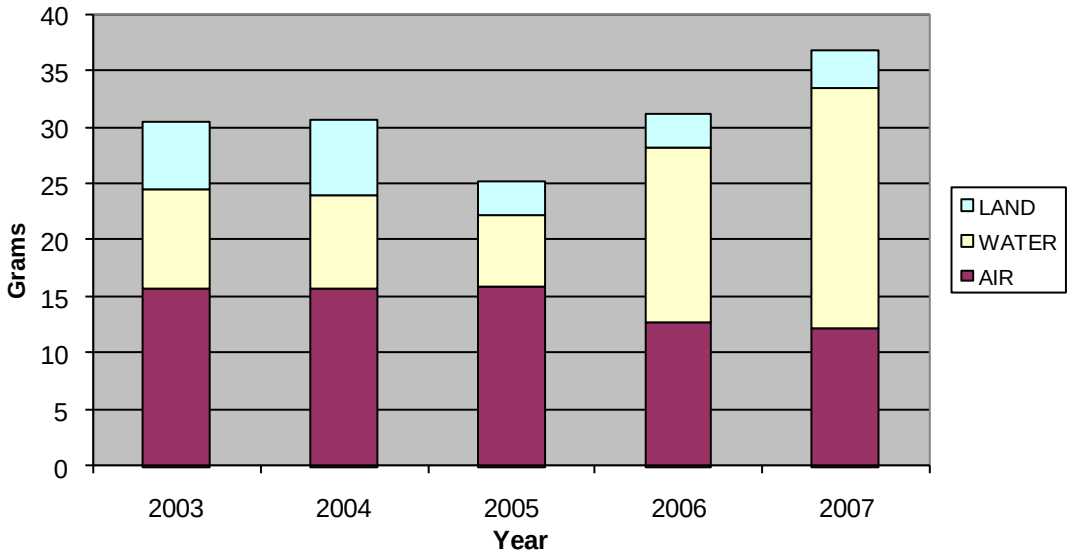
The Columbia River received the most chemical discharges by weight (539,968 pounds, or 40 percent), followed by Commencement Bay (Tacoma) (231,795 pounds, 17 percent), and Pend Oreille River (178,675 pounds, 13 percent). Out of Washington's 39 counties, 17 reported water releases under TRI. Cowlitz County had the highest volume of releases (247,624 pounds, 18 percent) followed by Pierce (231,850 pounds, 17 percent) and Benton counties (219,179 pounds, 16 percent).

For dioxins and dioxin-like compounds, which are PBT chemicals, 21.3 grams were released to Washington waters in 2007. This is a 38 percent increase over the previous year. Kimberly Clark Worldwide (Everett) reported nearly half of Washington's dioxin total, with 10.3 grams. As a result, Everett Harbor received the highest volume of dioxin discharges, followed by the Columbia River (7.9 grams, 37 percent) and Fidalgo Bay (1.9 grams, 9 percent).

Releases of Dioxins and Dioxin-like Compounds

Facilities report dioxin and dioxin-like compounds in smaller quantities (grams instead of pounds) because these compounds are very toxic. There are 454 grams in one pound. There was a 17 percent increase in the amount of dioxin and dioxin-like compounds released in 2007 compared to the previous year. This increase appears to be largely due to increases in water releases at two facilities. Boise Cascade in Wallula, Walla Walla County released 5.5 and 5.9 grams of dioxin or dioxin-like compounds to water in 2007 and 2006 respectively, compared to 0.083 grams in 2005. Kimberly-Clark Worldwide in Everett, Snohomish County released 10.29 grams of dioxin or dioxin-like compounds to water in 2007, compared to 2.52 and 1.33 grams in 2006 and 2005 respectively.

Figure 9. Washington State TRI Dioxin Releases, 2003-2007 (in grams)



In 2006, nearly half of dioxin releases were to water (49.3 percent). Air releases were the next largest contribution (40.9 percent), and land releases accounted for 9.8 percent of on-site releases. In 2007, a slightly higher proportion of releases were to water (57.8 percent), followed by air (33.4 percent) and land (8.8 percent).

These proportions contrast with 2005 where the largest contribution was from air (62.9 percent) followed by water (25.2 percent) and land (11.9 percent). In Washington State, the majority of dioxin releases come from the pulp and paper industries, or from petroleum refineries.

Toxics Release Inventory by Industry

Mining and manufacturing were responsible for 21 million pounds, or 82 percent, of on-site releases in the state. The next largest contributors were Public Administration (2.3 million pounds, 9 percent) and Utilities (2.2 million pounds, 8 percent). In Washington, facilities classified under Public Administration include military installations, Superfund clean-up sites managed by EPA, and the U.S. Department of Energy's Hanford Site.

Table 2. Washington State TRI On-site Releases Ranked by Industry Sector, 2007

2-Digit NAICS*	2007 NAICS* Category (facility count)	Total Pounds Released On Site
21	Mining (1)	11,103,313
31-33	Manufacturing (285)	10,373,909
92	Public Administration (9)	2,344,168
22	Utilities (4)	2,215,397
42	Wholesale Trade (11)	28,319
56	Administrative and Support, Waste Management and Remediation Services (8)	10,013
48-49	Transportation and Warehousing (1)	1,605

** North American Industry Classification System*

Top Ten Toxics Release Inventory by County

Of Washington's 39 counties, 29 had facilities that reported under the Toxics Release Inventory (TRI). King County had the greatest number of facilities with 75, but was ranked eighth in total volume of releases. Not surprisingly, Pend Oreille County had the greatest volume of releases, largely due to the activities of the Pend Oreille Mine. (All but 178,358 pounds reported released in 2007 in Pend Oreille County were from the Pend Oreille Mine.)

Table 3. Washington State TRI Releases by County, 2007

County	No. Facilities	Pounds Released to Air	Pounds Released to Water	Pounds Released to Land	Total Pounds Released On Site
Pend Oreille	2	3,197	178,675	11,099,799	11,281,671
Benton	10	94,579	219,179	2,208,603	2,522,360
Lewis	9	100,171	119,489	2,021,532	2,241,192
Cowlitz	14	1,704,694	247,624	0	1,952,319
Pierce	34	1,203,878	231,850	129,124	1,564,852
Whatcom	20	952,985	85,643	822	1,039,450
Walla Walla	4	562,667	64,843	161,993	789,503
King	75	742,602	344	776	743,722
Jefferson	1	444,175	54,184	70,983	569,342
Snohomish	27	473,244	62,600	0	535,843

Top Ten Toxics Release Inventory by Chemical

TRI provides information about the type and amount of chemicals that are released to air, land, and water. In the 2007 reporting year, 322 facilities in Washington submitted 1,099 reports representing the release of 111 chemicals or chemical groups, a slight decrease from the previous year.

The highest chemical releases by weight in 2007 and 2006 were from zinc compounds (mostly from the Pend Oreille Mine), methanol (primarily from the pulp and paper industry), and lead (mostly from the Pend Oreille Mine and the U.S. Department of Energy's Hanford site). Lead compounds (persistent, bioaccumulative, and toxic) were reported by the greatest number of facilities — 79 in 2007, and 75 in 2006.

Table 4. Washington State TRI Ranked by Total On-site Releases, 2007

Chemical	No. of Reports	Pounds Released to Air	Pounds Released to Water	Pounds Released to Land	Total Pounds Released On Site for 2007
Zinc Compounds	19	15,149	32,876	9,403,851	9,451,876
Methanol	34	2,432,699	181,845	660	2,615,204
Lead	69	987	958	2,310,587	2,312,532
Lead Compounds	79	3,424	2,264	1,624,340	1,630,028
Barium Compounds	8	1,552	9,474	1,602,378	1,613,404
Hydrochloric Acid	17	1,012,597	0	0	1,012,597
Nitrate Compounds	44	4,385	838,223	102,777	945,385
Styrene	25	848,905	45	3	848,953
Ammonia	35	775,072	54,337	807	830,215
Carbonyl Sulfide	6	744,826	0	0	744,826

PBT Releases in Washington

In 2007, the top three persistent, bioaccumulative, and toxic (PBT) chemicals by weight of on-site releases were lead, lead compounds, and polycyclic aromatic compounds. If amounts of lead and lead compounds are added together, mercury compounds would be the third most-reported chemical by weight. Most of the releases for lead and lead compounds were to land, while the majority of releases for the other PBT chemicals were to air. By number of chemical reports, the top three reported chemicals were lead compounds (79), lead (69), and polycyclic aromatic compounds (40).

Table 5. Washington State TRI Releases of PBT Chemicals, 2007

Chemical	No. of Reports	Pounds Released to Air	Pounds Released to Water	Pounds Released to Land	Total Pounds Released On Site
Lead	69	987	958	2,310,587	2,312,532
Lead Compounds	79	3,424	2,264	1,624,340	1,630,028
Polycyclic Aromatic Compounds	40	11,164	61	436	11,661
Mercury Compounds	19	631	13	77	721
Benzo(g,h,i)perylene	26	666	5	23	693
Mercury	6	2	0	0	2
Hexachlorobenzene	2	0	0	0	0
Polychlorinated Biphenyls	4	0	0	0	0
Tetrabromobisphenol A	2	0	0	0	0

For comparison, in 2006, the top three PBT chemicals were lead and lead compounds (if combined), polycyclic aromatic compounds, and benzo(g,h,i)perylene. By number of chemical reports, the top three reported chemicals for 2006 were lead compounds (75), lead (67), and polycyclic aromatic compounds (42). These values demonstrate that TRI data regarding releases of PBTs are relatively stable from year to year.

Top Reporting Facilities Ranked by Greatest Volume of Total Releases

In 2007, the top 20 facilities reporting under the TRI released 23.3 million pounds of TRI chemicals during the year, 89 percent of the state's 26.1 million pound total. The Pend Oreille Mine reported the highest total on-site releases of 11.1 million pounds. Transalta Centralia Generation/Mining and U.S. Department of Energy's Hanford Site were the next highest, each reporting 2.1 million pounds of on-site releases.

Table 6. Washington State Top TRI On-site Releases by Facility, 2007

Facility Name	City	County	No. of Chemicals Reported	Total Pounds Released On Site
Pend Oreille Mine	Metaline Falls	Pend Oreille	9	11,103,313
Transalta Centralia Generation/Mining	Centralia	Lewis	17	2,189,830
U.S. Department of Energy's Hanford Site	Richland	Benton	2	2,154,287
Weyerhaeuser Company	Longview	Cowlitz	24	1,413,389
Simpson Tacoma Kraft Company LLC	Tacoma	Pierce	21	1,124,728
Boise Cascade LLC	Wallula	Walla Walla	16	744,903
Port Townsend Paper Corp	Port Townsend	Jefferson	12	569,342
Alcoa Wenatchee Works	Malaga	Chelan	5	507,331
Longview Fibre Paper & Packaging Inc.	Longview	Cowlitz	15	481,055
Georgia-Pacific Consumer Products LLC-Camas	Camas	Clark	17	436,580
Intalco Aluminum Corp.	Ferndale	Whatcom	9	419,740
Tesoro Refining & Marketing Co.	Anacortes	Skagit	31	362,286
Kimberly-Clark Worldwide	Everett	Snohomish	12	280,771
Rexam Beverage Can Co.	Kent	King	5	267,830
Ball Metal Beverage Container Corp	Kent	King	5	240,098
Lasco Bathware Inc.	Yelm	Thurston	1	231,200
Crown Beverage Packaging	Olympia	Thurston	4	209,532
BP Cherry Point Refinery	Blaine	Whatcom	28	195,563
Sandvik Special Metals LLC	Kennewick	Benton	3	192,170
Ponderay Newsprint Co.	Usk	Pend Oreille	3	178,358
Total			**239**	**23,302,305**

For number of chemical reports submitted by each facility, ConocoPhillips Ferndale Refinery and Shell Oil -Puget Sound Refinery each reported 33. The next highest facility, Tesoro Refining and Marketing Company, reported 31 chemicals.

Table 7. Washington State Top TRI Facilities by Number of Chemicals Reported, 2007

Facility Name	No. of Chemicals	City	County	Total Pounds Released On Site
ConocoPhillips Ferndale Refinery	33	Ferndale	Whatcom	138,912
Shell Oil Products US - Puget Sound Refinery	33	Anacortes	Skagit	117,849
Tesoro Refining and Marketing Company	31	Anacortes	Skagit	362,286
BP Cherry Point Refinery	28	Blaine	Whatcom	195,563
Weyerhaeuser Company	24	Longview	Cowlitz	1,413,389
Emerald Services Inc.	22	Tacoma	Pierce	9,977
Simpson Tacoma Kraft Company LLC	21	Tacoma	Pierce	1,124,728
Transalta Centralia Generation/Mining	17	Centralia	Lewis	2,189,830
Georgia-Pacific Consumer Products LLC	17	Camas	Clark	436,580
Boise Cascade LLC	16	Wallula	Walla Walla	744,903
Atlas Castings & Technology	16	Tacoma	Pierce	3,590
Longview Fibre Paper and Packaging Inc.	15	Longview	Cowlitz	481,055
US Oil and Refining Company	15	Tacoma	Pierce	111,409
Tidewater Terminal Co Snake River Terminal	14	Pasco	Franklin	7,231
Burlington Environmental Inc.	14	Tacoma	Pierce	0
Boeing Commercial Airplane Group - Everett	13	Everett	Snohomish	91,252
Port Townsend Paper Corp.	12	Pt Townsend	Jefferson	569,342
Kimberly-Clark Worldwide	12	Everett	Snohomish	280,771
Steelscape	12	Kalama	Cowlitz	17,561
BP West Coast Products Co. - Seattle Terminal	12	Seattle	King	3,519

As shown by the data above, the facilities that release the greatest amounts of toxic chemicals are not necessarily the ones with the highest number of reportable toxic chemicals. Pend Oreille Mine, the facility with by far the largest reported on-site releases, reported only nine chemicals. On the other hand, ConocoPhillips and Shell Oil-Puget Sound Refinery reported the greatest number of chemicals used, but did not show up on the list of Top TRI On-site Releases by Facility for 2007.

Releases of Carcinogens

A total of 3,819,916 pounds of chemicals identified as carcinogens were released in 2007[2]. This number is 1.7 million pounds higher than in 2006, but about equal to the amount reported in 2005. Lead ranked highest in terms of releases by weight, followed by styrene and acetaldehyde. This differs from 2006 where styrene ranked first for weight, followed by acetaldehyde and formaldehyde. The increase in releases of carcinogens for 2007 is due, in large part, to the releases of lead from the U.S. Department of Energy's Hanford site. This facility reported 2.1 million pounds of lead released in 2007, compared to slightly less than 1 million pounds of lead compounds for 2006.

In 2007, lead was reported by the greatest number of facilities (69), followed by polycyclic aromatic compounds (40), and benzo(g,h,i)perylene (26). This is similar to 2006 with 67, 42, and 27 respectively.

2. TRI classifies chemicals as carcinogens if they are possible, probable, or known human carcinogens according to the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

Table 8. Washington State TRI Releases of Chemicals Identified as Carcinogens, 2007

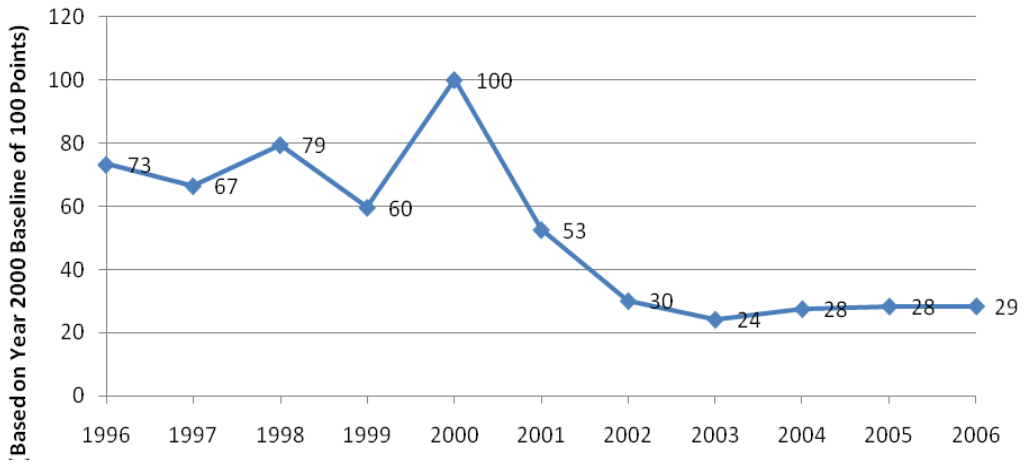
Chemical	No. of Facilities	Total Pounds of On-site Releases
Lead	69	2,312,532
Styrene	25	848,953
Acetaldehyde	8	322,721
Formaldehyde	12	160,024
Chloroform	2	38,970
Benzene	15	37,616
Trichloroethylene	3	31,910
Dichloromethane	3	21,465
Cobalt Compounds	4	15,289
Polycyclic Aromatic Compounds	40	11,661
Tetrachloroethylene	5	7,574
Chromium	21	3,724
Di(2-ethylehexyl) Phthalate	3	3,055
Nickel	17	1,720
Benzo(g,h,i)perylene	26	693
Toluene Diisocyanate (Mixed Isomers)	3	600
1,3-Butadiene	4	491
1,2-Dichloroethane	1	314
N,N-Dimethylformamide	1	256
1,3-Dichloropropylene	1	212
Trans-1,3-Dichloropropene	1	98
Acrylamide	1	21
Pentachlorophenol	5	17
Creosote	1	0
Hexachlorobenzene	2	0
Polychlorinated Biphenyls	4	0
Tetrabromobisphenol A	2	0
Grand Total	**279**	**3,819,916**

Risk-Screening of Environmental Indicators – A way to identify priorities

EPA developed the Risk Screening Environmental Indicators (RSEI) computer program to prioritize toxic releases that might be of public health concern. RSEI incorporates a number of components of risk assessment including the amount of chemical released, the fate and transport of the chemical, the route and extent of human exposure to the chemical, the number of people affected, and the toxicity of the chemical. The computer model takes the pounds of chemicals emitted to the environment, analyzes their toxicity and risk to humans, and ranks its potential risk relative to other TRI releases. RSEI scores can be used for trend analysis and as a tool to target follow-up activities. The RSEI program can be downloaded from EPA's website: *www.epa.gov/oppt/rsei/index.html*.

The most recent year of TRI data available for RSEI modeling is 2006. To compare TRI facilities in RSEI, the year 2000 was used as a baseline. The RSEI scores for Washington show that risk from toxic chemicals has decreased since 2000 and has leveled out in the most recent years. The spike in 2000 can be attributed to lower reporting thresholds for a number of persistent, bioaccumulative, and toxic chemicals. Although reported TRI releases have decreased between 2005 and 2006 by nearly 6 million pounds, according to RSEI modeling the risk for this lesser amount of releases is slightly higher. There are several possible explanations for this. First, although total pounds of chemicals released to the environment may have decreased, relatively small releases may lead to high-risk scores in RSEI if the toxicity weight is particularly high or if the estimated exposed population is large. RSEI also assigns a greater risk score for chemicals released to air or water (rather than to land) since it is more likely that people will be exposed to these types of releases.

Figure 10. Toxic Release Risks from Manufacturers in Washington State, 1996-2006



On a facility level, Kimberly-Clark Worldwide (Everett) ranked highest in terms of RSEI risk scores.

Table 9. Top Ten TRI Facilities Ranked by RSEI Score, 2006

Facility ID (TRIFID)	Facility Name	Pounds	Score
98201SCTTP2600F	Kimberly-Clark Worldwide	408,013	23,562
98108RLMJR8531E	Jorgensen Forge Corp	349,507	8,960
98073GNNDS18700	Genie Industries South Campus	609,015	4,533
98421SMPSN801PO	Simpson Tacoma Kraft Co LLC	1,166,503	3,220
98272GLCRB17341	Glacier Bay Catamarans	76,298	3,006
98666VNCVR1200W	Vancouver Iron & Steel Inc.	250	2,693
98221SHLLLWESTM	Tesoro Refining & Marketing Co	424,976	2,583
98073GNNDS18340	Genie Industries Main Campus	85,057	2,520
98409TLSFN3021S	Atlas Castings & Technology	70,687	2,447
98314SDDSN1400F	U.S. Navy PSNS & IMF - Bremerton	404,171	1,921

By chemical, manganese and manganese compounds had the highest values for risk-related scores by chemical, followed by mercury and mercury compounds, and lead and lead compounds.

Table 10. Top Ten TRI Chemicals Ranked by RSEI Score, 2006

Chemical	Pounds	Score
Manganese and manganese compounds	2,328,694	23,451
Mercury and mercury compounds	2,084	14,709
Lead and lead compounds	5,661,953	11,149
Chromium and chromium compounds	613,482	6,498
Sulfuric acid	611,628	6,426
Glycol ethers	534,169	3,774
Diisocyanates	12,955	3,041
Nickel and nickel compounds	280,458	2,643
Polycyclic aromatic compounds	44,889	2,338
Hydrochloric acid	1,106,464	1,898

How are the Toxics Release Inventory Data Used?

TRI data are valuable because they are of high interest to - and are easily accessible by - the public, fulfilling a key goal for the community's right-to-know. The public can use TRI data to better understand the potential risks from chemical releases to their communities. States and communities, working with business operations, can use the information from the TRI and other reports collected under EPCRA to improve chemicals' safety and protect the environment.

Businesses are aware that these data are public records and are available to, among others, the news media. This transparency may spur companies to focus on their chemical management practices. When TRI data are used with demographic data, the results can help government agencies and the public identify potential environmental justice concerns. The TRI is one of the primary databases used in environmental justice research. Specifically, TRI data are often used in proximity-based studies examining the location of industrial facilities in relation to community demographics. Using TRI data, national and regional studies (including a Washington State study) have demonstrated a pattern of low-income communities and people of color disproportionately living near industrial facilities. Residents living near TRI facilities, along with academic researchers, environmental organizations, health and social welfare groups, and other interested parties, rely on the TRI data to provide information about a community's potential exposure to toxic chemicals released by local industrial facilities. TRI data have helped communities better understand potential environmental and health concerns from industrial sources and to investigate cumulative impacts.

The data also serve as a rough indicator of environmental progress over time. Federal, state, and local governments have used TRI to set priorities, measure progress, and target areas of special and immediate concern. For example, TRI data are used to measure pollution trends from specific industrial sectors, and it provides an annual gauge of whether industrial pollution is going up or down.

For chemicals of particular concern, such as mercury, dioxins, and other persistent bioaccumulative toxics, the TRI is an especially important source data for environmental releases of these substances.

Data Limitations of the Toxics Release Inventory

TRI data cannot be used alone to determine risk. TRI data does not tell to what degree the public is exposed to listed chemicals. Exposure to a chemical depends on many factors, including the type of environmental medium (air, water, or land) into which a chemical is either disposed of or otherwise released.

TRI chemicals also vary widely in toxicity. High volume releases of less toxic chemicals may seem to be more of a serious problem than lower volume releases of highly toxic chemicals. Just the opposite might be true. Dioxins are a good example of a chemical that is highly toxic in small amounts.

TRI does not represent all toxic releases. It only covers those generally associated with manufacturing. Emissions from vehicles, from other types of businesses, and many other sources are not captured by the TRI. For example, sources for the majority of releases of pesticides, volatile organic compounds, and fertilizer chemicals common in agricultural use are not included.

Since TRI information is collected for releases that occur over a calendar year, there is no way to know what occurred in "real time." Releases (and thus potential exposures) may have occurred throughout the year, or as one-time events. Further, since reports for each calendar year are due on July 1 of the following year, the information is dated even before it is submitted.

Also, while many facilities base their TRI data on actual measurements, other methods may be legally used to estimate releases. The use of different measurement techniques makes data accuracy and comparing data between facilities more difficult.

In spite of its limitations, TRI remains one of the most comprehensive environmental data resources available since it does not focus on a single medium (air, land, or water). It is arguably the most widely cited and tracked environmental indicator now used by the public, the news media, environmental interests, and regulators.

How Has the Toxics Release Inventory Changed Over Time?

The TRI program has grown significantly since its inception in 1987. EPA has also issued rules to roughly double the number of chemicals included in the TRI to approximately 650. In 1994, federal facilities were added to the list of facilities required to report under TRI. In 1998, seven new industry sectors were added to expand coverage beyond the original covered industries. More recently, reporting thresholds for persistent, bioaccumulative, and toxic (PBT) chemicals were lowered to better track those with potential for serious harm even in small amounts.

In 1990, Congress passed the Pollution Prevention Act (PPA). Among its requirements was a mandate to expand TRI to include additional information on toxic chemicals in waste and on source reduction methods. Beginning in 1991, facilities were required to report quantities of TRI chemicals treated on site, recycled, and burned for energy recovery. The TRI program is a powerful tool that provides information on how facilities handle their chemicals and overall progress in reducing releases.

Beginning with the 2007 reporting year, industries that report under TRI must identify themselves under the more detailed six-digit North American Industry Classification System (NAICS) rather than the previous 3-digit Standard Industry Classification (SIC) codes.

These codes are used throughout the federal government to classify economic activity by industry. The switch from a four-digit SIC to a six-digit NAICS code did not affect the number of facilities required to report under TRI. It does allow for a greater degree of precision and flexibility when grouping activities by industry. NAICS codes are reviewed every five years for potential revisions so that the classification system can keep pace with the changing economy.

For the 2007 reporting year, the 2002 NAICS codes were used. Beginning with the 2008 reporting year, TRI facilities must report using 2007 NAICS codes. More information about the NAICS codes used for TRI reporting can be found on EPA's website: *www.epa.gov/tri/lawsandregs/naic/index.htm*.

TRI will continue to change over time as new chemicals of concern are identified and additional industry sectors are added to the TRI reporting universe.

Burden Reduction Rule of 2006 and Omnibus Appropriations Act of 2009

There are two main reporting forms for TRI. Form R provides details about releases and other waste management activities while Form A provides only the name of the chemical and certain facility identification information.

In 2006, a Burden Reduction Rule was passed that increased the number of facilities eligible to report on Form A. For the first time, PBT chemicals (except dioxins and dioxin-like compounds) could be filed on Form A, and the threshold for total pounds of releases was raised from 500 to 5,000 pounds. This meant that more facilities could report using Form A, and details of these releases and other waste management activities was not provided to EPA, the states, or to communities.

In recognition of the importance of TRI data, the Omnibus Appropriations Act amended the regulations in early 2009, returning reporting thresholds to their previous lower limit. The requirements of this Act were in effect for the 2008 reporting year.

For more information

This publication is available on Ecology's website at *www.ecy.wa.gov/biblio/0904020.html*. The information is also available as a web report, including supporting data tables, at *www.ecy.wa.gov/epcra*.

Appendix A

2007 Tier Two Reporting By LEPC

LEPC	Number of Reporting Facilities	Number of Chemicals Reported	Number of EHS Reporting Facilities	Number of EHS Chemicals Reported
Adams	43	168	28	192
Asotin	10	21	3	9
Benton	91	367	65	298
Chelan	84	368	66	413
City of Kent	102	818	51	134
City of Seattle	147	695	98	130
Clallam	64	189	30	92
Clark	138	642	76	346
Columbia	17	54	11	46
Cowlitz	78	614	46	224
Douglas	31	57	24	73
Ferry	6	26	1	5
Fort Lewis	3	19	0	0
Franklin	78	788	51	578
Garfield	12	23	6	28
Grant	175	910	77	685
Grays Harbor	67	173	33	114
Island	33	90	10	24
Jefferson	20	69	8	25
King	534	1412	210	317
Kitsap	86	216	44	130
Kittitas	44	83	28	71
Klickitat	13	40	15	32
Lewis	86	322	37	177
Lincoln	37	98	27	119
Mason	32	79	9	26
Okanogan	74	231	49	252
Pacific	23	60	13	42
Pend Oreille	12	55	6	20
Pierce	268	956	134	169
San Juan	12	21	3	9
Skagit	10 4	518	51	260
Skamania	5	31	6	9
Snohomish	276	709	98	130
Snohomish (SW)	29	75	8	10
Spokane	216	952	126	556
Stevens	22	62	11	39
Thurston	99	261	43	124

LEPC	Number of Reporting Facilities	Number of Chemicals Reported	Number of EHS Reporting Facilities	Number of EHS Chemicals Reported
Wahkiakum	3	8	3	11
Walla Walla	67	277	39	244
Whatcom	107	523	53	97
Whitman	73	302	46	93
Yakima	230	876	196	342