



POLLUTION PREVENTION Northwest

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PBTs & P2

Persistent bioaccumulative toxins ~ PBTs ~ have joined the acronymic lexicon of government and business, and are a hot topic in the Northwest right now. Many of these chemicals have been banned, some decades ago, yet they persist in the environment. Of the PBTs still entering the environment, many come from Northwest industries and citizens, either directly or as a by-product of their activities. Therefore, P2 has a key role to play as the Northwest tackles the issue of PBT reduction. This issue of *Pollution Prevention Northwest* explores PBTs, in the context of the healthcare sector, and P2: and that's preventative medicine at its best.

What Does P2 Have To Do with PBTs?

As the saying goes, an ounce of prevention is worth a pound of cure and the cure for eliminating PBTs that are already present in the environment isn't very clear.

For example, the agricultural pesticide DDT is a PBT; it was banned from use in the U.S. back in 1972, yet it is still detectable, even in places and people far away from its original use. The State of Alaska reports the increasing presence of PBTs in the state's air, water, wildlife and people, especially in the Arctic, far away from most PBT sources. (The report is available at <http://www.state.ak.us/local/akpages/ENV.CONSERV/deh/contaminants.htm>.)

OK, let's consider DDT a "cow out of the barn": there are

no more P2 opportunities for DDT in the U.S.. However, dioxin, benzo(a)pyrene, and mercury are all still being released and will persist for decades. Dozens of industries release these and other PBTs (see lists of industries and Priority PBTs next page), and P2 is both a timely and cost effective way to reduce their releases.



P2 also has an educational angle. Consumers may be unaware of products they purchase that use PBTs in the manufacturing process, or their activities that generate PBTs (e.g. mercury fever thermometers, hazardous lawn and garden products). Better understanding can help consum-

ers drive demand for PBT-free products.

Prevention is central to P2, and despite the fact that PBTs are a big issue, P2 has a clear and important role in reducing PBTs that are still being released. Read on for more information about what's happening in the Northwest and how the healthcare industry figures into the big picture.

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Industry Sectors That May Release PBTs

Many industry sectors and processes, as well as citizens, currently release PBTs into the environment. Sectors and processes include (but are not limited to):

- ◆ chlorine-bleached pulp & paper manufacturing
- ◆ cement manufacturing
- ◆ rubber manufacturing
- ◆ pharmaceuticals manufacturing
- ◆ chlorine manufacturing
- ◆ caustic soda (chlor alkali) manufacturing
- ◆ plastics manufacturing
- ◆ electronics manufacturing
- ◆ aluminum & steel manufacturing
- ◆ petroleum refining
- ◆ wood preserving/treating
- ◆ pest control
- ◆ mining & smelting operations
- ◆ shipyards
- ◆ metal fabrication & finishing
- ◆ incineration
- ◆ coal-fired power plants
- ◆ healthcare

Individuals also add PBTs to the environment through activities such as driving cars and trucks, burning wood and yard debris, and purchasing (and thereby creating a demand for) products that have PBTs, such as mercury fever thermometers, hazardous lawn and garden products, and types of treated lumber.

What's a PBT?

As the name suggests, PBTs (persistent bioaccumulative toxins) are especially long-lived toxic chemicals. They do not naturally break down in the environment and they build up in the food chain, accumulating in the tissues of fish, wildlife and humans. They can travel long distances in the environment and move from land to air to water. PBTs have been linked to serious human and ecological health problems. They also are known as POPs – persistent organic pollutants.

What's a "Priority PBT"?

Many chemicals meet the criteria of being persistent, bioaccumulative and toxic. EPA and others have attempted to prioritize lists of these chemicals to determine which are the most dangerous, and which should be addressed first.

At the national level, after a multi-year process, EPA determined a list of 12 Priority PBTs including:

- ◆ aldrin/dieldrin
- ◆ benzo(a)pyrene
- ◆ chlordane
- ◆ DDT, DDP, DDE
- ◆ hexachlorobenzene
- ◆ alkyl-lead
- ◆ mercury (and its components)
- ◆ mirex
- ◆ octachlorostyrene
- ◆ PCBs (polychlorinated biphenals)
- ◆ dioxins and furans
- ◆ toxaphene

These chemicals (or families of chemicals) are either used in manufacturing, were used in pest control (and are now banned), or are by-products of industrial processes.

Background Information on PBTs

EPA's PBT Chemical Program

<http://www.epa.gov/pbt>

PPRC's Northwest Guide to PBTs

<http://www.pprc.org/pprc/pubs/topics/pbt.html>

Washington Toxics Coalition - PBT Information

<http://www.watoxics.org/tp.htm>

United Nations Environment Programme – POPs

<http://www.chem.unep.ch/pops>

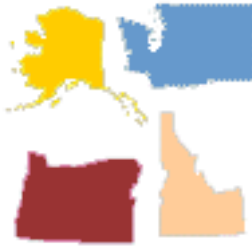
What's Happening in the Northwest?

PBT discussion and research is happening both nationally and internationally, however the Northwest has taken an especially proactive stance on the issue of PBTs.

In Oregon, a September 1999 Executive Order from the Governor charged the Department of Environmental Quality (DEQ) with the task of leading a statewide effort to identify and track PBTs, and eliminate PBT releases by 2020. This year the state legislature considered, but did not pass, a bill that would have sped up the process started with the Governor's Executive Order. DEQ has begun by adopting EPA's list of 12 Priority PBTs, and is determining which pose the greatest problems in Oregon.

A coalition of federal, state, and tribal governmental agencies in Alaska authored a report that documented the existence of these chemicals in the environment and human populations in the state. The authors recommend additional funding for monitoring activities, education, and an international effort to reduce PBTs worldwide.

Washington State's legislature recently authorized \$800,000 to begin implementing a PBT strategy during the next two years. This effort is considered to be a multi-year approach to eliminating PBTs from the state, and both the Departments of Ecology and Health are involved. The Department of Ecology has selected 9 chemicals (that also appear on EPA's list) as a current priority:



Banned Pesticides

Aldrin/Dieldrin
Chlordane
DDT (DDD & DDE)
Toxaphene

By-Products

Benzo(a)pyrene
Dioxins and Furans
PCBs

Other

Hexachlorobenzene
Mercury

Ecology is developing chemical-specific action plans, screening and prioritizing additional chemicals to determine their relative risk, and working to develop reduction strategies.

The Healthcare Industry & PBTs

Over the last few years the healthcare industry has become more aware of the role it plays in the world of P2. It's a logical connection, as the underlying oath of the healthcare professional is: "first do no harm."

As interest, knowledge and concern about PBTs has grown, the healthcare industry has been recognized as one of the industries that releases and contributes to the production of PBTs as part of their normal operations.

That's beginning to change

through the efforts of grassroots activists and organizations within and outside the healthcare system, such as:

MIRT

(Medical Industry Waste Prevention Round Table)

http://dnr.metrokc.gov/swd/bizprog/waste_pre/medical.htm

Healthcare Without Harm

<http://www.noharm.org>

Sustainable Hospitals Project

<http://www.sustainablehospitals.org>

More Information...

Oregon Executive Order 99-13 (Elimination of PBTs)

<http://www.governor.state.or.us/governor/legal/execorders/eo99-13.pdf>

Oregon DEQ Fact Sheet on Executive Order 99-13

<http://www.deq.state.or.us/wmc/hw/pbtfactsht.html>

Q&A about Washington's Proposed PBT Strategy

<http://www.ecy.wa.gov/programs/eap/pbt/pbtfaq.html>

Ecology's Proposed Strategy to Continually Reduce PBTs in Washington

<http://www.ecy.wa.gov/biblio/0003054.html>

News Article: "State Takes Steps Against Toxins"

http://seattlepi.nwsource.com/local/44619_toxics30.shtml

Contaminants In Alaska

<http://www.state.ak.us/local/akpages/ENV.CONSERV/deh/contaminants.htm>

News Article: International PBT/POP Treaty

<http://www.planetark.org/dailynewsstory.cfm?newsid=10920>

Hospitals For A Healthy Environment

<http://www.h2e-online.org>

PBTs are used in the healthcare sector in various ways. Facilities use products that contain PBTs, such as mercury fever thermometers. Healthcare laboratories use PBTs, albeit in small quantities, as part of their testing and analysis. Facilities release PBTs when medical waste is incinerated. These and other issues and solutions are discussed on the following pages.

MERCURY

Mercury is a heavy metal that is toxic to the nervous system as well as to other important tissues and organs of living beings. It is the stuff that made the hatter mad. It is also one of the 12 priority PBTs identified by the EPA and it is on both Oregon and Washington's lists.

There are many forms of mercury, but the most dangerous is the organic form, methylmercury. This is formed by small organisms in oceans, freshwater ponds and lakes from inorganic mercury and elemental mercury that gets into the water.

The healthcare industry has been a source of this mercury, through its use in laboratories, mercury-containing batteries, and fever thermometers. Mercury-containing instruments and laboratory chemicals can, due to improper disposal, contaminate wastewater that leaves medical facilities. Dental mercury — from amalgams — is another important source.

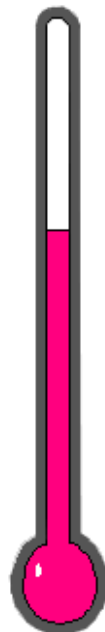
On a related note, cleanup of mercury spills is expensive and disruptive in a healthcare setting. A case study of a spill, and its related costs, is available in PPRC's healthcare industry topical report at <http://www.pprc.org/pprc/pubs/topics/healthcare.html#mercalt>.

Mercury also is released from healthcare incinerators. Hospitals, medical clinics, and labs have commonly used incinerators to rid biological waste of pathogens and to reduce the amounts of waste being sent to landfills. Mercury is released when debris containing the chemical, which could include anything from thermometers to antiseptics to CAT scan paper, is combusted at high temperatures. A 1997 report from the National Wildlife Federation estimated that over 30% of mercury emitted to the atmosphere from combustion point sources came from medical incinerators (more information on the next page).

Eventually, thanks to the natural cycle of things, mercury ends up in the fish we consume. (And, unlike most PBTs, it accumulates in the muscle of the fish and less in the fat, so it can't be trimmed away.) Now, mercury advisories from agencies that oversee our food supplies are commonplace. Mercury is especially dangerous to fetuses and infants, and pregnant women are always targeted in these advisories.

There are substitutes for mercury that are effective and economical, and many agencies, organizations and health care facilities are deciding to eliminate mercury use for good. For example, back in 1999, Legacy Health Systems in Portland, Ore. was the first hospital in Oregon to create an organizational policy to eliminate mercury. Northwest governments also have stepped in: this summer Oregon passed a state law to prohibit the sale of fever thermometers with mercury, and to phase out or ban other sources including thermostats, and automotive light switches that use mercury. Nationwide, many pharmacies have phased out the sale of mercury thermometers.

Check out the sidebar for technical discussion of mercury, fact sheets, and mercury resources available for the industry.



Mercury and Healthcare Industry Resources

ATSDR Public Health Statement on Mercury

<http://www.atsdr.cdc.gov/ToxProfiles/phs8916.html>

EPA Mercury Fact Sheet

<http://www.epa.gov/mercury/>

A simplified fact sheet on mercury from Minnesota

<http://www.wlssd.duluth.mn.us/mercury.htm>

Toxicological Effects of Methylmercury

<http://www.nap.edu/books/0309071402/html/>

EPA's "Mercury Use Reduction and Waste Prevention in Medical Facilities" site

<http://www.epa.gov/seahome/mercury/src/title.htm>

Mercury P2 in Healthcare

<http://www.nwf.org/greatlakes/resources/mercury.html>

Mercury Policy Project

<http://www.mercurypolicy.org>

Healthcare Without Harm's site on Mercury

<http://www.noharm.org/hcwh/issues/mercury.html>

Mercury Alternatives in Healthcare Products

<http://www.deq.state.mi.us/pub/ead/p2sect/mercury/healthpr.doc>

Protecting By Degrees: What Hospitals Can Do To Reduce Mercury Pollution

http://www.noharm.org/library/docs/Protecting_by_Degrees_2.pdf

Topic Hub: Mercury - Dental

<http://www.newmoa.org/Newmoa/htdocs/prevention/topichub/>

Topic Hub: Mercury - Thermometers

<http://www.newmoa.org/Newmoa/htdocs/prevention/topichub/>

POLYVINYL CHLORIDE (PVC)



A more controversial material is polyvinyl chloride. This soft plastic is used in many medical supplies and pieces of equipment including intravenous bags, oxygen tents, tubing and office supplies. The manufacture and incineration of PVC forms dioxins (due to its high chlorine content).

Dioxins are not deliberately manufactured; they are formed as a by-product of certain industrial processes that use or burn chlorine. Dioxins as a class include over 70 different forms and although some are more toxic than others, they have been demonstrated to be carcinogenic in animals. Human epidemiologic studies suggest risks of cancer, but experts disagree on the extent of that risk. Nevertheless, there are concerns for this reason and because dioxins also are known to be endocrine disruptors, chemicals that can disturb the fine balance in hormone control in living organisms, including those hormones that are associated with sexual development and function especially during development *in utero*. Dioxin is on the Priority PBT lists from EPA, DEQ and Ecology.

P2 solutions include changing incineration practices, finding ways to safely reuse PVC products, and using PVC-free products.

More information on PVC and Dioxin

Health Care Without Harm

<http://www.noharm.org/hcwh/issues/pvc.html>

Sustainable Hospitals Alternative Products Database

http://www.sustainablehospitals.org/cgi-bin/DB_Index.cgi

Maine Hospitals Pledge to Reduce PVC Plastic

<http://www.noharm.org/library/docs/>

[Maine Hospitals Set Pollution Prevention Prece.htm](#)

Alternative Viewpoint

Discussion of the issues from the perspective of a medical products supplier

<http://www.baxter.com/investors/citizenship/environmental/issues/pvc.html>

Revised Regulations for Medical Waste Incinerators (EPA)

EPA estimates that new technologies and operations will allow incinerators reduce dioxin releases by up to 95%, as well as other PBTs

<http://www.epa.gov/epaoswer/other/medical/mwfaqs.htm>

MEDICAL WASTE INCINERATION

The burning of medical waste is an environmental and human health problem, as it releases both dioxin and mercury to the atmosphere.

Experts currently believe that more waste is disposed of through incineration than necessary, and that other waste prevention methods could help reduce the generation of medical waste.



“...According to the US Centers for Disease Control, 2% or less of a typical hospital’s waste stream — pathological waste — must be incinerated to protect public health and safety. However, hospitals

routinely burn 75 to 100% of their waste. The unnecessary burning of polyvinyl chloride plastic, paper, batteries, discarded equipment and other noninfectious materials leads to emissions of dioxins and mercury as well as furans, arsenic, lead, cadmium, and the generation of toxic ash. The US EPA has identified medical waste incinerators as a leading source of both dioxin and mercury pollution of our environment and our food supply.”

— The World Federation of Public Health Associations, May 1999, (http://www.apha.org/wfpha/health_without_harm.htm)

Guidelines are available to help facilities burn waste as cleanly as possible and to reduce the formation of dioxins during the burning process.

The P2 solution, however, is to reduce the amount of waste burned, or better yet, generated in the first place. Reuse of as many items as possible — a concept which goes directly against the traditions of the healthcare world for the past several decades — also can help reduce PBT emissions from the incineration process. The next section highlights a Northwest company that aims to give the idea of reuse a shot in the arm.

REUSABLE "SINGLE-USE" SUPPLIES

Single-use medical items have posed a problem that has plagued healthcare conservationists for a long time. Many of these items are designated as single-use simply because they were easier to replace than to reuse.

Now "ClearMedical" in Bellevue, Wash. has an answer. By taking up where hospitals feared to tread, "Clear" is able to provide a service that permits reuse of some articles up to seven times, saving thousands of dollars for the facility and reducing the waste flow at the same time. According to Ric Radford, Chief Scientific Officer of ClearMedical:



Clear estimates that a significant portion of the medical waste stream is made up of so called 'single use devices'. Our financial evaluation of the opportunity for savings through reprocessing and reuse may range between \$500,000 to \$1,000,000 each year for a hospital of 200-400 beds. Our economists think the total landfill contribution from hospital 'single use devices' may exceed \$5 billion annually. Having these funds redirected to patient care activities is part of our ultimate mission. The variety of plastics (PVC, etc.) will certainly have environmental impacts as they are in some cases incinerated (less now) and or buried.

This innovative technology may be a significant aid to large-scale healthcare reduction of both solid waste and PBTs. For more information about the technology, visit <http://www.clearmedical.com>.

IN CONCLUSION

PBTs have migrated their way to international focus, and P2 provides an important tool to help reduce PBT releases, while also helping industries improve their operations and save money. This newsletter has discussed some of the PBT issues that apply to the healthcare sector, some of the P2 opportunities, and included links to numerous other resources to help find additional information and solutions.

Northwest technical assistance providers will certainly learn more about PBTs as state legislation and policymaking moves forward, and P2 is an appropriate tool for the healthcare industry, as well as many other sectors, to help address concerns about PBTs. And it makes perfect sense as our first-rate medical facilities are pillars of the community and are dedicated to the prevention of disease and improving public health. ■

Did you know?

How many medical waste incinerators exist in the US (1999 data)?

- a. 500
- b. 1200
- c. 2400

What reduction does EPA predict for the total number of future medical waste incinerators?

- a. 10% - 15%
- b. 35% - 45%
- c. 50% - 80%

(answers next page)

ATTENTION: SOAPBOX OPPORTUNITY!

P2 & National Security

PPRC is considering writing an article about pollution prevention and security after September 11 for the next issue of this newsletter.



Do you know of a business or agency that has changed its practices or purchasing decisions in the name of national security? Do you feel more or less committed to your job? What types of activities will serve to make us safer, from both a P2 and environmental perspective?

If you have a story to tell or would like to contribute your views, please contact Crispin at cstutzman@pprc.org or at 206-352-2050.

News Digest

Northwest Environmental Conference & Tradeshow

Come to this event for a low-cost environmental management training and a plethora of useful sessions. The conference features four tracks: a basic information “bootcamp” to help businesses operate within compliance guidelines, a “leadership and management” track addressing ideas for operating “beyond compliance”, roundtable sessions on hot environmental topics, and advanced technical sessions.

The conference and tradeshow will run from November 27 - 28, 2001 in Portland, Oregon. For more information, visit <http://www.nwec.org>.

Green Chemistry Video Tape

A videotape from a July 2001 Green Chemistry workshop is available and includes presentations on Green Chemistry: Background and Drivers, Basics for Business, and Examples from the Agricultural, Polymer, Pulp & Paper and Textile Industries.

Speakers include: Dr. Paul Anastas (formerly Branch Chief of the Industrial Chemicals Branch, EPA and currently with the White House Office of Science and Technology Policy), Dr. John Warner (formerly of Polaroid Corporation and currently chair of the Chemistry Department at University of Massachusetts-Boston), and Dr. Mary Kirchhoff (Assistant Director of the Green Chemistry Institute of the American Chemical Society).

This 110 minute videotape is available through the Zero Waste Alliance and the International Sustainable Development Foundation for \$30. For more information or to order a copy, please contact Zero Waste Alliance at <http://www.zerowaste.org>, e-mail rmarquardt@zerowaste.org or call 503-279-9383.

Healthcare Green Purchasing Tool

This tool targets the reduction of PBTs from healthcare facilities, particularly mercury and toxic halogenated compounds. It helps hospitals create preferred vendor programs by evaluating vendor environmental performance, scoring vendors, and being able to compare different vendors. Find the tool at <http://www.ahrmm.org/HCEPT>.

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PPRC Topic Hubs

As part of a nationwide project with the Pollution Prevention Resource Exchange (P2Rx), PPRC has developed six topic hubs, each with quality information and links on a specific industry sector or other P2 topic. You'll find enough description to put the information in context (background, operations, reasons to adopt P2 practices, P2 opportunities) and the best links for each topic described and categorized by section.

PPRC has developed hubs for **Aerospace, Fiberglass Fabrication, Metal Finishing, Paint and Coating Manufacturing & Ship Building and Repair**. Find these at <http://www.pprc.org/hubs>.

PPRC has co-developed a hub on **Metal Fabrication & Machining** with NEWMOA. Find this hub at <http://www.newmoa.org/Newmoa/hdocs/prevention/topichub> (click on Metal Fabrication).

Even More Topic Hubs

Hubs have also been developed for many other sectors and topics including: Mercury, Autobody, Electric Utilities, Green Procurement, Household Hazardous Waste, Oil and Gas, Lean Manufacturing, Lithographic Printing, P2, Managing Community Growth, and Regulatory Integration. These have been developed by PPRC's P2Rx partners. Link to these hubs from <http://www.p2rx.org>.

Have A Very P2 Holiday

The Holiday Season is fast approaching. Americans throw away 25% more trash between Thanksgiving and New Year's than any other time of year! Check out these links to keep your garbage can empty and to simplify your holiday season while still having fun.

<http://www.newdream.org/holiday/home.html> & <http://www.use-less-stuff.com/ULSDAY/42ways.html>

Answers: if you picked C. for both questions, you're right!
More information about medical waste incinerators:
<http://www.epa.gov/epaoswer/other/medical/mwfaqs.htm>

Meet Our Staff

Eun-Sook Goidel Green Purchasing Program Manager

A stream of consciousness from Eun-Sook...

Okay, so I'll share a few things about myself.

First, I'm a list maker. I make lists for everything. A list of things to do. A list of things not to do. A list of people to call. A list for the groceries, though my daughter is much more reliable about remembering what's on the list than I am about remembering to take the list. My lists are never "neat" though, with arrows pointing this way and that; boxes around some things; loops around other things. Last minute remembered details in the margins, written side-ways or upside down as I run out of space...

Another thing: I don't much like to talk about myself so I've put this off till the last minute. What should I say and how should I say it? Make a list!!*

→ *Favorite time of the year:* the very end of winter/beginning of spring when the trees are just starting to show signs of budding

→ *Favorite weekend activity:* a walk on the beach with family to look for neat rocks. Each rock comes with a story of a place and a time...

→ *Favorite place on the globe:* South Island, New Zealand

→ *Favorite foods:* chocolate, sushi, noodles, plums... okay, fried chicken

→ *Favorite way to unwind:* cook



esgoidel@pprc.org

PPRC welcomes Eun-Sook as our newest staff member! She brings extensive green purchasing expertise, and she will be working on several exciting projects in 2002. Stay tuned, or contact her for more information!

→ *Favorite TV show:* Julia Child Cooks at Home (or something like that, it's been a while since I've watched PG rated television. I could tell you the various episodes of Dragon Tales or Arthur, though!)

And, yes, you're beginning to see a pattern here – my love of food! My husband likes to say that I have an encyclopedia memory of food and food places.

→ *Where I've worked:* U.S. Environmental Protection Agency (for the past 12 years on pollution prevention issues; 8 years of which has been on Environmentally Preferable Purchasing)

→ *Why stick with EPP after 8 years?:* I'm not finished!! I've just begun to really understand the organizational and individual behaviors, attitudes and belief-systems that drive purchasing decisions. Each new experience has brought an additional set of challenges and lessons to help figure out the EPP puzzle. Do you want to join in?

→ *What motivates me:* A desire to better integrate what I do at work with what I do at home. Apart from myself, I'm accountable to my three-year old daughter whose expectations and observations are difficult to top! It's not easy to explain to her why I didn't do the right thing!

* My ideal way to have done this list would have been to hand-write it with many offshoots and tangents with lots of arrows, boxes around some things, loops around other things, etc...



PPRC

Practical solutions for big environmental issues

PPRC, a non-profit organization, is the Northwest's leading source of high quality, unbiased environmental solutions information. Through a collaborative approach, we focus on solutions that integrate resource efficiency and environmental health into business, government, and communities.

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