

Executive Summary

Senate Bill 737: Development of a Priority Persistent Pollutant (P³) List for Oregon



October 2009

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The Oregon Department of Environmental Quality (DEQ) Water Quality Program's mission is "to protect and improve Oregon's water quality." Many Oregonians are concerned about the health of Oregon's rivers and people who use them. There is a growing concern about persistent pollutants – those that come from a wide variety of sources but linger in the environment and have a documented effect on human health, wildlife and aquatic habitat. 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 throughout 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. To date, Oregon has not comprehensively evaluated which of these pollutants should be a priority for strategic action.

The 2007 Oregon Legislature directed DEQ to compile a prioritized list of persistent pollutants (the P³ List) to guide DEQ's pollution prevention efforts. Senate Bill 737 (SB 737) sets specific guidelines for DEQ to follow in compiling this list. The statute requires DEQ to present a list of priority persistent pollutants to the Legislature by June 1, 2009. An Interim Final Priority Persistent Pollutant List (P³L) was submitted to the Legislature at that time. Then from June to through July 2009, DEQ provided the public an opportunity to submit additional information on certain pollutants; information relevant to their behavior in sediment, overall persistence, degradation rates, toxicity to humans, bioaccumulation in fish or measurements in water, sediment, or fish tissue. DEQ evaluated all information received and released a Final P³L in October 2009.

By June 1, 2010, DEQ will submit a report to the Legislature identifying sources of pollutants on the list and opportunities to reduce their discharge to water. Oregon's 52 large municipal wastewater treatment plants (WWTPs) must also develop toxics reduction plans by July 2011 to reduce persistent pollutants occurring in their effluent at levels above "trigger levels" set by DEQ. Oregon's 52 largest WWTPs have funded this work for two years, and continue to be closely involved.

To create this list, DEQ convened a Science Workgroup of seven experts in the fields of fate and transport, hydrology, as well as in the field of human health, aquatic life, and wildlife toxicology. This group provided advice as DEQ assessed the toxicity, persistence and bioaccumulation characteristics of more than 2000 chemicals utilizing several U.S. Environmental Protection Agency (EPA) chemical property estimation models.

Because toxic pollutants cross social and political boundaries, DEQ coordinated extensively with other state and federal agencies, tribal nations, outside experts, stakeholders, interested parties and the general public. A comprehensive public outreach effort in March 2009 reached more than 200 individuals, with 55 individuals or

organizations submitting over 150 written comments. DEQ is committed to using a collaborative approach during every phase of the project, including consultation with interested parties through the project's completion.

DEQ's Final P³ List identified 118 toxic pollutants, divided into two categories, that persist in the environment or accumulate in animals. All of the pollutants on the list have potential to cause harm to human health or aquatic life if they get into the water and thereby have the potential to pose a threat to Oregon's waters. Some are known carcinogens, and others are believed to disrupt endocrine functions. The list includes both well-studied pollutants that people have worked to reduce for many years, and those for which little information exists.

Tier 1: 69 Persistent Pollutants

"Persistent pollutant" means a substance that is toxic and either persists in the environment or accumulates in the tissues of humans, fish, wildlife or plants (*SB 737, Section 2(4)*).

Pollutant	Uses / examples
PAHs	Combustion byproducts. Many of these have been identified as carcinogenic.
Halogenated flame retardants	Flame retardants such as PBDEs. Many of these have been banned in Europe since 2003.
Pesticides and herbicides	Used for agricultural, grounds-keeping and urban pest and weed control. Some of these are suspected of disrupting endocrine functions.
Pharmaceuticals and personal care product ingredients	Including synthetic hormones, an anti-psychotic, food additives and disinfectants. Some of these are suspected of disrupting endocrine functions.
Perfluorinated surfactants	Anti-stain coatings.
Metals	Arsenic, tributyltin, cadmium, lead, mercury, selenium. Some of these have been identified as carcinogenic.
Industrial chemicals	Including stabilizers for polymers and plasticizers.

Tier 2: 49 Legacy Persistent Pollutants

"Legacy" means a pollutant, the use of which has been banned or restricted for several years, that remains at detectable levels in sediment and tissue samples (*SB 737, Section 2(1)*).

Pollutant	Uses / examples
Pesticides and herbicides	Includes Chlordane, DDT, Dieldrin, Endrin, Heptachlor, and Mirex. Some of these have been identified as carcinogenic, and some are suspected of disrupting endocrine functions.
Polychlorinated Biphenyls (PCBs)	Used for cooling and insulating fluid for closed electrical systems. Some of these have been identified as carcinogenic.
Polychlorinated Naphthalenes (PCNs)	Used for insulating coatings for electrical wires, wood preservatives, as rubber and plastic additives; in very limited production since 1976.
Dioxins and furans	Occur as by-products in the manufacture of organochlorides, in the incineration of chlorine-containing substances such as PVC (Polyvinyl Chloride), and from natural sources such as volcanoes and forest fires. Some of these have been identified as carcinogenic.

DEQ is building its body of knowledge on many of these pollutants and is also evaluating existing data to confirm the presence of P³ pollutants in sediment, water, or fish tissue and/or data or information indicating whether the presence of the pollutant is likely in Oregon waters.

DEQ acknowledges that many persistent pollutants are not currently regulated under the traditional environmental regulations and are not covered under state or federal environmental standards or limits. DEQ will consult with knowledgeable parties to document existing opportunities for pollution prevention and to also identify new approaches that may reduce the discharge of P³ pollutants into Oregon's waters. DEQ will also incorporate this effort into the agency's efforts to develop a cross-media strategy addressing toxics reduction.

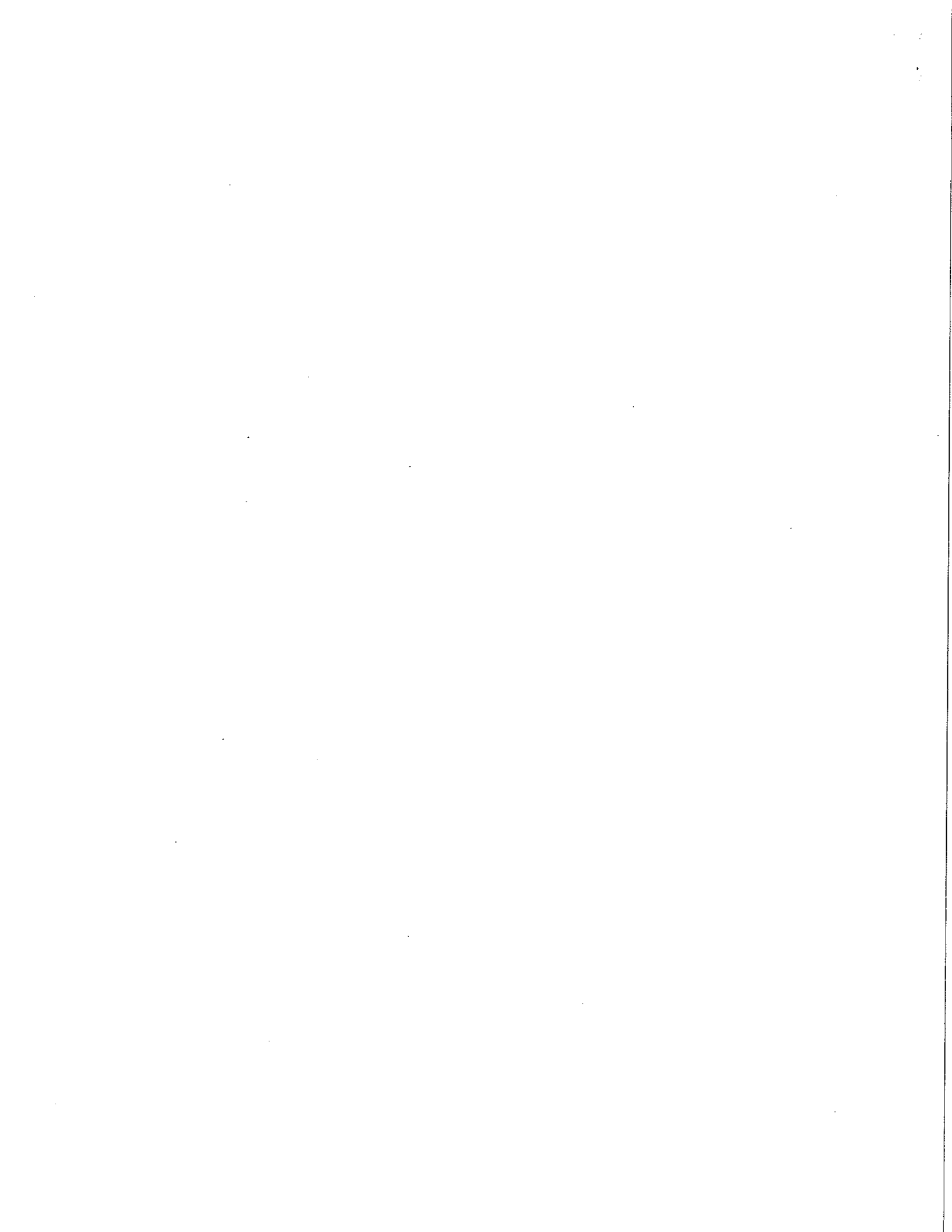


Table 1. PRIORITY PERSISTENT POLLUTANT LIST (FINAL)

CASRN	Chemical Name	Total PBT Score
TIER 1 - PERSISTENT POLLUTANTS		
Pesticides & Herbicides		
82657-04-3	Bifenthrin	4
2921-88-2	Chlorpyrifos (Lorsban, Dursban)	5
52918-63-5	Deltamethrin [decamethrin]	4
333-41-5	Diazinon	3
115-32-2	Dicofol	6
1031-07-8	Endosulfan sulfate	3
66230-04-4	Esfenvalerate	5
13356-08-6	Fenbutatin-oxide	4
120068-37-3	Fipronil	4
91465-08-6	Lambda-cyhalothrin	4
330-55-2	Linuron	2 ^(a)
88671-89-0	Myclobutanil	2 ^(b)
42874-03-3	Oxyfluorfen	4
40487-42-1	Pendimethalin	3
67747-09-5	Prochloraz	4
1582-09-8	Trifluralin	4
Consumer-Related Products		
57-88-5	Cholesterol	4
360-68-9	Coprostanol	4
541-02-6	Cyclopentasiloxane, decamethyl- [D5]	4
556-67-2	Cyclotetrasiloxane, octamethyl- [D4]	3
56-53-1	Diethylstilbestrol	3
1222-05-5	Galaxolide [HHCB]	5
70-30-4	Hexachlorophene	4
15323-35-0	Musk indane	3
81-14-1	Musk ketone	3
145-39-1	Musk tibetene	3
81-15-2	Musk xylene	4
2062-78-4	Pimozide	4
80214-83-1	Roxithromycin	3
83-45-4	Sitostanol, beta- [Stigmastanol]	4
83-46-5	Sitosterol, beta-	4
92-94-4	Terphenyl, p-	4
3380-34-5	Triclosan [2,4,4'-trichloro-2'-hydroxydiphenyl ether]	5
Halogenated Flame Retardants		
25637-99-4	Hexabromocyclodecane [HBCD]	5
5436-43-1	PBDE-047 [2,2',4,4'-Tetrabromodiphenyl ether]	5

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CASRN	Chemical Name	Total PBT Score
60348-60-9	PBDE-099 [2,2',4,4',5-Pentabromodiphenyl ether]	6
189084-64-8	PBDE-100 [2,2',4,4',6-Pentabromodiphenyl ether]	--- ^(c)
68631-49-2	PBDE-153 [2,2',4,4',5,5'-hexabromodiphenyl ether]	--- ^(c)
1163-19-5	PBDE-209 [decabromodiphenyl ether]	4
79-94-7	Tetrabromobisphenol A [TBBPA]	4
Industrial Chemicals		
98-07-7	Benzotrichloride [trichloromethylbenzene]	3
29082-74-4	Octachlorostyrene	5
1825-21-4	Pentachloroanisole [2,3,4,5,6-Pentachloroanisole]	3
732-26-3	Tris-(1,1-dimethylethyl)phenol, 2,4,6- [Alkofen B]	6
Polycyclic Aromatic Hydrocarbons (PAH)		
120-12-7	Anthracene	3
56-55-3	Benz(a)anthracene	3
50-32-8	Benzo(a)pyrene	4
205-99-2	Benzo(b)fluoranthene	4
191-24-2	Benzo(g,h,i)perylene	4
207-08-9	Benzo(k)fluoranthene	4
218-01-9	Chrysene [benzo(a)phenanthrene]	4
53-70-3	Dibenz(a,h)anthracene	4
206-44-0	Fluoranthene [Benzo(j,k)fluorene]	3
193-39-5	Indeno(1,2,3-cd)pyrene	4
832-69-9	Methylphenanthrene, 1-	3
2381-21-7	Methylpyrene, 1-	3
85-01-8	Phenanthrene	3
129-00-0	Pyrene	3
Inorganic & Organic Metals		
7440-38-2	Arsenic Compounds [dissolved]	--- ^(d)
7440-43-9	Cadmium Compounds [dissolved]	--- ^(d)
7439-92-1	Lead Compounds [dissolved]	--- ^(d)
22967-92-6	Methylmercury	4
7782-49-2	Selenium Compounds [total]	--- ^(d)
Perfluorinated Surfactants		
434-90-2	Decafluorobiphenyl	5
375-85-9	Perfluoroheptanoic acid [PFHpA]	3
375-95-1	Perfluorononanoic acid [PFNA]	5
754-91-6	Perfluorooctane sulfonamide [PFOSA]	5
1763-23-1	Perfluorooctane sulfonic acid [PFOS]	5
335-67-1	Perfluorooctanoic acid [PFOA]	4

Table 1. PRIORITY PERSISTENT POLLUTANT LIST (FINAL)

CASRN	Chemical Name	Total PBT Score
TIER 2 - LEGACY PERSISTENT POLLUTANTS		
Pesticides & Herbicides		
5103-71-9	Chlordane, cis-	6
5103-74-2	Chlordane, trans-	6
143-50-0	Chlordecone [Kepone]	4
72-54-8	DDD, 4,4'-	5
72-55-9	DDE, 4,4'-	6
50-29-3	DDT, 4,4'-	6
60-57-1	Dieldrin	6
88-85-7	Dinoseb	3
72-20-8	Endrin	6
76-44-8	Heptachlor	6
1024-57-3	Heptachlor epoxide	5
118-74-1	Hexachlorobenzene [HCB]	5
319-84-6	Hexachlorocyclohexane, alpha-	4
319-85-7	Hexachlorocyclohexane, beta-	4
58-89-9	Hexachlorocyclohexane, gamma- [Lindane]	5
465-73-6	Isodrin	5
2385-85-5	Mirex	6
5103-73-1	Nonachlor, cis-	6
39765-80-5	Nonachlor, trans-	6
27304-13-8	Oxychlordane, single isomer	6
608-93-5	Pentachlorobenzene	5
82-68-8	Pentachloronitrobenzene	3
95-95-4	Trichlorophenol, 2,4,5-	3
88-06-2	Trichlorophenol, 2,4,6-	3
Polychlorinated Naphthalenes (PCN)		
32241-08-0	Heptachloronaphthalene	6
1335-87-1	Hexachloronaphthalene	6
1321-64-8	Pentachloronaphthalene	6
1335-88-2	Tetrachloronaphthalene	4
1321-65-9	Trichloronaphthalene	3
Dioxins / Furans		
1746-01-6	Dioxins / furans (as 2,3,7,8-TCDD TEQ)	6
Polychlorinated Biphenyls (PCB)		
7012-37-5	PCB-028 [2,4,4'-trichlorobiphenyl]	4
35693-99-3	PCB-052 [2,2',5,5'-tetrachlorobiphenyl]	6
32598-13-3	PCB-077 [3,3',4,4'-tetrachlorobiphenyl]	5
70362-50-4	PCB-081 (3,4,4',5-tetrachlorobiphenyl)	6

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CASRN	Chemical Name	Total PBT Score
37680-73-2	PCB-101 [2,2',4,5,5'-pentachlorobiphenyl]	6
32598-14-4	PCB-105 [2,3,3',4,4'-pentachlorobiphenyl]	6
74472-37-0	PCB-114 [2,3,4,4',5-pentachlorobiphenyl]	6
31508-00-6	PCB-118 [2,3',4,4',5-pentachlorobiphenyl]	6
65510-44-3	PCB-123 [2',3,4,4',5-pentachlorobiphenyl]	6
57465-28-8	PCB-126 [3,3',4,4',5-pentachlorobiphenyl]	6
35065-28-2	PCB-138 [2,2',3,4,4',5'-hexachlorobiphenyl]	6
35065-27-1	PCB-153 [2,2',4,4',5,5'-hexachlorobiphenyl]	5
38380-08-4	PCB-156 [2,3,3',4,4',5-hexachlorobiphenyl]	5
69782-90-7	PCB-157 [2,3,3',4,4',5'-hexachlorobiphenyl]	5
52663-72-6	PCB-167 [2,3',4,4',5,5'-hexachlorobiphenyl]	5
32774-16-6	PCB-169 [3,3',4,4',5,5'-hexachlorobiphenyl]	6
35065-29-3	PCB-180 [2,2',3,4,4',5,5'-heptachlorobiphenyl]	5
39635-31-9	PCB-189 [2,3,3',4,4',5,5'-heptachlorobiphenyl]	5
Inorganic & Organic Metals		
56-35-9	Bis (tributyltin) oxide [TBTO, hexabutyldistannoxane]	--- ^(d)

NOTES

- (a) Persistent and of concern for human toxicity (RfD < 0.003 mg/kg/d; developmental toxin).
- (b) Persistent and of concern for human toxicity (RfD < 0.003 mg/kg/d).
- (c) Physicochemical property data limited; added based on a deliberative process separate from PBT modeling.
- (d) Metals included based on a deliberative process separate from PBT modeling.