

**National Inventory
of
PCBs in Use and PCB Wastes in Storage
in Canada**

2002 Annual Report

Prepared for

Canadian Council of
Ministers of the Environment

by

Toxics Pollution Prevention Directorate
Environmental Protection Service
Environment Canada

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Foreword

The national PCB inventory is a compilation of PCB-containing items that are in use or in storage at various locations across Canada. The inventory changes continually as PCBs are taken out of service to be placed in storage or destroyed and as new PCB materials are reported. In addition, new storage sites may be established or existing sites consolidated or closed. As a result, differences between the information in this inventory and other PCB inventory information may arise from time to time. These differences should be discussed with the appropriate provincial or federal officials listed in Appendices A and B of this report.

This annual report and reports from previous years are available at Environment Canada's PCB website (www.ec.gc.ca/pcb/eng/inv_e.htm). For more information about the national inventory, please contact:

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Ce rapport annuel et ceux des années précédentes sont disponibles en français au site des BPC d'Environnement Canada (www.ec.gc.ca/pcb/fra/inv_f.htm). Pour plus d'information sur l'inventaire national, veuillez communiquer avec :

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1. Background

The *National Inventory of PCBs in Use and PCB Wastes in Storage in Canada* is an annual report summarizing information in the national PCB inventory database that Environment Canada maintains for the Canadian Council of Ministers of the Environment (CCME). This report presents the status of the PCB inventory as of December 31, 2002.

The first national inventory of Canadian PCBs, which was published by the CCME in 1988, provided data on PCB wastes in storage only. Subsequently, in order to improve the system for reporting on PCBs in Canada and to provide a comprehensive inventory, a national database system was established to include data on both PCBs in use and PCB wastes in storage.

The provision of information for the national database is a joint federal–provincial responsibility. Environment Canada supplies data on in-use PCB-containing equipment, federally regulated PCB wastes, and PCB wastes in Prince Edward Island, Saskatchewan, Yukon, the Northwest Territories, and Nunavut. The provincial governments of Newfoundland and Labrador, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Alberta, and British Columbia supply data on PCB wastes in storage in their respective jurisdictions.

Data for the report are obtained from several sources. Federal and provincial PCB waste storage regulations require PCB owners to report to government on the amounts of PCB wastes in storage. Data on the amounts of PCBs in use in electrical equipment come from two sources: voluntary reporting by PCB owners, and inspections of PCB equipment for compliance with the federal Chlorobiphenyls Regulations.

The present report gives data for five categories of PCBs, namely:

- in-use askarel,
- waste askarel,
- in-use PCB-contaminated mineral oil,
- waste PCB-contaminated mineral oil, and
- other PCB wastes.

The two askarel categories represent high-concentration PCB liquids. Askarels generally contain between 40% and 80% PCBs and were used in electrical transformers when insulating and fire-resistant liquids were required. Pure PCBs were also used in other types of electrical equipment, such as capacitors and fluorescent light ballasts.

The two mineral oil categories represent liquids containing low concentrations of PCBs. Mineral oil is also used as an insulating fluid in electrical transformers, and some of it

has become inadvertently contaminated with PCBs. Generally, the PCB concentration in mineral oil is less than 1000 mg/litre.

The final category, “other PCB wastes,” includes drained PCB transformers, capacitors contaminated with residual PCBs, fluorescent lamp ballasts containing PCB capacitors, and PCB-contaminated soil and other solids (e.g., wood and absorbents).

Most of the in-use and waste askarel and mineral oil in Canada is found in electrical equipment; however, liquid PCB wastes may also be stored in drums or other containers.

In reporting the inventory data, both gross and net weights are used. Net weight refers to the weight of the askarel or mineral oil itself, while gross weight is the total weight of the liquid and the electrical equipment in which it is contained. Other PCB wastes, such as soil, are reported only as gross weights. Both gross and net weights are included in the inventory because when PCB management options are being evaluated, PCB liquids, the various types of PCB equipment, and PCB-contaminated soil may each be managed differently. For example, the entire PCB capacitor may be destroyed, whereas PCB transformers may be cleaned to recycle metal and other components. If askarel is drained from a transformer, the transformer casing and internal components (e.g., wire, wood, and paper) may still represent a PCB waste and, as such, will form part of the PCB waste inventory.

Often the gross weight of electrical equipment is unknown. However, as was outlined in previous inventory reports, the gross weight of the equipment can be estimated if the volume of fluid in the equipment is known. For transformers and other large equipment containing askarel, the gross weight in kilograms is calculated by multiplying the fluid capacity in litres by a factor of 4.5. For askarel-containing capacitors, the comparable factor is 6. PCB-contaminated mineral oil is usually referred to in terms of net weight, because transformers that contain this oil are often reused after being cleaned and retrofilled with clean oil. The net weight of the oil can be calculated assuming a density of 0.9 kg/litre for mineral oil.

The principal components of this inventory report are the national inventory, the federal inventory, and the non-federal inventory. The national inventory represents all PCBs in Canada. The federal inventory includes only those PCBs owned or controlled by federal departments, boards, agencies, and Crown corporations. The non-federal inventory includes only those PCBs owned or controlled by provincial and territorial governments and the private sector. Some highlights from the 2002 inventory report are given in the next section.

2. Inventory Highlights

2.1 National Inventory

As of December 2002, the national inventory of PCBs in use and in storage was as shown in Tables 1–3.

Table 1: National Inventory of In-use and Waste Askarels

Item	In-use askarels (net weight, tonnes)	Waste askarels (storage) (gross weight, tonnes)
Transformers	6 531	7 115
Capacitors	1 345	2 078
Other equipment	44	92
Bulk storage	N/A	752
Total	7 920	10 037

Table 2: National Inventory of In-use and Waste Mineral Oil

Item	In-use mineral oil (net weight, tonnes)	Waste mineral oil (storage) (net weight, tonnes)
Transformers	1 651	237
Capacitors	N/A	N/A
Other equipment	76	22
Bulk storage	N/A	1 191
Total	1 727	1 450

Table 3: National Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	82 331
Fluorescent light ballasts	1 755
Drained equipment	1 598
Other wastes	2 019
Total	87 703

2.2 Federal Inventory

As of December 2002, the federal inventory of PCBs in use and in storage was as shown in Tables 4–6.

Table 4: Federal Inventory of In-use and Waste Askarels

Item	In-use askarels (net weight, tonnes)	Waste askarels (storage) (gross weight, tonnes)
Transformers	424	79

Capacitors	32	374
Other equipment	14	8
Bulk storage	N/A	22
Total	470	483

Table 5: Federal Inventory of In-use and Waste Mineral Oil

Item	In-use mineral oil (net weight, tonnes)	Waste mineral oil (storage) (net weight, tonnes)
Transformers	98	16
Capacitors	N/A	N/A
Other equipment	0	2
Bulk storage	N/A	2
Total	98	20

Table 6: Federal Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	144
Fluorescent light ballasts	330
Drained equipment	26
Other wastes	50
Total	550

2.3 Non-federal Inventory

As of December 2002, the non-federal inventory of PCBs in use and in storage was as shown in Tables 7–9.

Table 7: Non-federal Inventory of In-use and Waste Askarels

Item	In-use askarels (net weight, tonnes)	Waste askarels (storage) (gross weight, tonnes)
Transformers	6 107	7 036
Capacitors	1 313	1 704
Other equipment	30	84
Bulk storage	N/A	730
Total	7 450	9 554

Table 8: Non-federal Inventory of In-use and Waste Mineral Oil

Item	In-use mineral oil	Waste mineral oil (storage)
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	(net weight, tonnes)	(net weight, tonnes)
Transformers	1 553	221
Capacitors	N/A	N/A
Other equipment	76	20
Bulk storage	N/A	1 189
Total	1 629	1 430

Table 9: Non-federal Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	82 187
Fluorescent light ballasts	1 425
Drained equipment	1 572
Other wastes	1 969
Total	87 153

3. PCB Waste Storage Sites

As of December 2002, there were 1 861 PCB waste storage sites in Canada. Of these, 245 sites were federal and 1 616 were non-federal. The sites are divided into seven categories according to the quantities of wastes stored in them (i.e., from <100 kg to \geq 10 000 tonnes) (Tables 10–12).

Detailed information on waste storage sites under provincial or territorial jurisdiction can be obtained from the provincial or territorial environment offices listed in Appendix A. Information on specific sites owned or operated by the federal government can be obtained from the Environment Canada regional or district offices listed in Appendix B.

Table 10: PCB Storage Sites (National)

Province		< 100 kg	100 kg to < 1 tonne	1 to <10 tonnes	10 to <100 tonnes	100 to <1000 tonnes	1000 to <10 000 tonnes	≥10 000 tonnes	Total sites Total tonnes
Nfld.	Sites	7	12	10	13	3			45
	Tonnes	0.4	3.4	30.1	475.2	503.2			1 012.3
P.E.I.	Sites	1	3			1			5
	Tonnes	0.0	1.0			125.6			126.6
N.S.	Sites	7	14	13	10		1		45
	Tonnes	0.3	4.3	40.1	200.6		2 457.0		2 702.3
N.B.	Sites		4	9					13
	Tonnes		2.2	33.1					35.3
Que.	Sites	101	109	89	41	4			344
	Tonnes	3.8	42.2	378.4	1 247.7	1 407.1			3 079.2
Ont.	Sites	88	188	186	81	13	2	1	559
	Tonnes	3.5	74.5	722.4	2 056.2	4 367.7	12 877.5	64 000.0	84 101.8
Man.	Sites	10	51	32	3	1			97
	Tonnes	0.3	17.8	113.1	104.0	338.7			573.9
Sask.	Sites	26	93	40	3				162
	Tonnes	0.4	34.1	91.2	42.3				168.0
Alta.	Sites	18	15	9	12	2			56
	Tonnes	0.7	4.9	35.6	459.8	1 529.1			2 030.1
B.C.	Sites	114	199	143	46	7	1		510
	Tonnes	4.5	77.7	522.7	1 527.0	1 342.5	1 824.8		5 299.2
Yukon	Sites	11	4	3					18
	Tonnes	0.2	0.8	6.0					7.0
N.W.T.	Sites		3	3	1				7
	Tonnes		1.2	14.4	39.0				54.6
Total	Sites	383	695	537	210	31	4	1	1 861
	Tonnes	14.1	264.1	1 987.1	6 151.8	9 613.9	17 159.3	64 000.0	99 190.3

Note: Totals may not add up due to rounding.

Table 11: PCB Storage Sites (Federal)

Province		< 100 kg	100 kg to < 1 tonne	1 to <10 tonnes	10 to <100 tonnes	100 to <1000 tonnes	1000 to <10 000 tonnes	≥10 000 tonnes	Total sites Total tonnes
Nfld.	Sites		2	3	2				7
	Tonnes		0.7	11.9	92.4				105.0
P.E.I.	Sites								0
	Tonnes								0.0
N.S.	Sites	2	3	3	1				9
	Tonnes	0.1	1.1	6.0	10.7				17.9
N.B.	Sites			2					2
	Tonnes			7.9					7.9
Que.	Sites	5	7	4	5				21
	Tonnes	0.1	4.4	18.7	181.7				204.9
Ont.	Sites	5	6	12	2	1			26
	Tonnes	0.1	1.6	42.2	72.8	124.3			241.0
Man.	Sites	1	6	5					12
	Tonnes	0.0	2.1	17.4					19.5
Sask.	Sites	12	65	26					103
	Tonnes	0.0	24.3	42.4					66.7
Alta.	Sites	2	4	2					8
	Tonnes	0.1	1.5	3.5					5.1
B.C.	Sites	25	11	9	4	1			50
	Tonnes	0.4	5.2	29.1	90.6	213.4			338.7
Yukon	Sites	3	1						4
	Tonnes	0.1	0.1						0.2
N.W.T.	Sites		1	1	1				3
	Tonnes		0.2	6.8	39.0				46.0
Total	Sites	55	106	67	15	2	0	0	245
	Tonnes	0.9	41.2	185.9	487.2	337.7	0.0	0.0	1 052.9

Note: Totals may not add up due to rounding.

Table 12: PCB Storage Sites (Non-federal)

Province		< 100 kg	100 kg to < 1 tonne	1 to <10 tonnes	10 to <100 tonnes	100 to <1000 tonnes	1000 to <10 000 tonnes	≥10 000 tonnes	Total sites Total tonnes
Nfld.	Sites	7	10	7	11	3			38
	Tonnes	0.4	2.7	18.2	382.7	503.2			907.2
P.E.I.	Sites	1	3			1			5
	Tonnes	0.0	1.0			125.6			126.6
N.S.	Sites	5	11	10	9		1		36
	Tonnes	0.2	3.2	34.1	189.9		2 457.0		2 684.4
N.B.	Sites		4	7					11
	Tonnes		2.2	25.2					27.4
Que.	Sites	96	102	85	36	4			323
	Tonnes	3.7	37.8	359.7	1 066.0	1 407.1			2 874.3
Ont.	Sites	83	182	174	79	12	2	1	533
	Tonnes	3.4	73.0	680.2	1 983.4	4 243.4	12 877.5	64 000.0	83 860.9
Man.	Sites	9	45	27	3	1			85
	Tonnes	0.3	15.7	95.7	104.0	338.7			554.4
Sask.	Sites	14	28	14	3				59
	Tonnes	0.3	9.9	48.7	42.3				101.2
Alta.	Sites	16	11	7	12	2			48
	Tonnes	0.6	3.3	32.0	459.7	1 529.1			2 024.7
B.C.	Sites	89	188	134	42	6	1		460
	Tonnes	4.1	72.5	493.6	1 436.5	1 129.2	1 824.8		4 960.7
Yukon	Sites	8	3	3					14
	Tonnes	0.2	0.7	6.0					6.9
N.W.T.	Sites		2	2					4
	Tonnes		1.0	7.7					8.7
Total	Sites	328	589	470	195	29	4	1	1 616
	Tonnes	13.2	223.0	1 801.1	5 664.5	9 276.3	17 159.3	64 000.0	98 137.4

Note: Totals may not add up due to rounding.

4. Summary of National PCB Inventory Data from 1990 to 2002

National PCB inventory data from 1990 to 2002 are summarized in Table 13.

Table 13: Summary of National PCB Inventory Data from 1990 to 2002

ITEMS IN USE	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Askarels in use (net weight, tonnes)	14 450	13 256	12 488	11 505	12 245	10 781	9 732	9 447	9 158	9 032	8 682	8 286	7 920
CMO* in use (net weight, tonnes)	N/A	N/A	2 043	2 160	2 233	1 775	1 726	1 899	1 929	1 915	1 808	1 752	1 727
Total - In use (net weight, tonnes)	N/A	N/A	14 531	13 665	14 478	12 556	11 458	11 346	11 087	10 947	10 490	10 038	9 647

WASTE ITEMS (STORAGE)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Askarel waste (gross weight, tonnes)	11 461	14 543	15 665	15 247	14 710	17 294	13 187	17 706	13 900	13 635	12 357	10 730	10 037
CMO* waste (net weight, tonnes)	5 110	4 511	4 362	3 787	3 496	3 423	3 270	2 979	2 442	2 474	1 786	1 721	1 450
Other PCB waste (gross weight, tonnes)	113 640	122 876	123 258	107 991	115 300	120 735	118 432	106 567	95 955	96 431	94 434	93 619	87 703
Total - Wastes (tonnes)	130 211	141 930	143 285	127 025	133 506	141 452	134 889	127 252	112 297	112 540	108 577	106 070	99 190

Waste storage sites (number)	3 089	3 106	3 130	3 216	3 278	2 857	2 823	2 857	2 301	2 288	2 090	2 006	1 861
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* Contaminated mineral oil.

Appendix A: Provincial/Territorial Contacts for Information on PCB Inventories

Newfoundland and Labrador

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Note: To obtain information on PCB inventories for Prince Edward Island, Yukon, the Northwest Territories, and Nunavut, contact the Environment Canada regional office in that province or territory (see Appendix B).

Appendix B: Federal Contacts for Information on the PCB Inventories

Newfoundland

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