

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

2005 Annual Report

Prepared for

Canadian Council of
Ministers of the Environment

by

Pollution Prevention
Environmental Stewardship Branch
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 (<http://www.ec.gc.ca/wmd-dgd/>). 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 (<http://www.ec.gc.ca/wmd-dgd/>). Pour plus d'information sur l'inventaire national, veuillez communiquer avec la:

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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 which is technically supported by Environment Canada for the Canadian Council of Ministers of the Environment (CCME). This report presents the status of the PCB inventory as of December 31, 2005.

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 2005 inventory report are given in the next section.

2. Inventory Highlights

2.1 National Inventory

As of December 2005, 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) (net weight, tonnes)
Transformers	5 395	1 933
Capacitors	1 254	427
Other equipment	40	29
Bulk storage	N/A	600
Total	6 689	2 989

Note: N/A means Non Applicable

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	1 335	163
Capacitors	N/A	N/A
Other equipment	71	20
Bulk storage	N/A	630
Total	1 406	813

Table 3: National Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	98 576
Fluorescent light ballasts	1 711
Drained equipment	814
Other wastes	1 615
Total	102 716

2.2 Federal Inventory

As of December 2005, 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) (net weight, tonnes)
Transformers	368	19
Capacitors	28	86
Other equipment	13	4
Bulk storage	N/A	36
Total	409	145

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	95	15
Capacitors	N/A	N/A
Other equipment	0	0
Bulk storage	N/A	2
Total	95	17

Table 6: Federal Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	135
Fluorescent light ballasts	495
Drained equipment	26
Other wastes	36
Total	692

2.3 Non-federal Inventory

As of December 2005, 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) (net weight, tonnes)
Transformers	5 028	1 914
Capacitors	1 227	318
Other equipment	27	26
Bulk storage	N/A	600
Total	6 282	2 858

Table 8: Non-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	1 240	148
Capacitors	N/A	N/A
Other equipment	71	20
Bulk storage	N/A	628
Total	1 311	796

Table 9: Non-federal Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	98 441
Fluorescent light ballasts	1 216
Drained equipment	788
Other wastes	1 579
Total	102 024

3. PCB Waste Storage Sites

As of December 2005, there were 1 615 PCB waste storage sites in Canada. Of these, 226 sites were federal and 1 389 were non-federal. The sites are divided into seven categories according to the quantities of wastes stored in them (i.e., from less than 100 kg to 10 000 tonnes or more) (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	11	10	13	3			44
	Tonnes	0.4	2.8	30.1	484.7	503.2			1 021.2
P.E.I.	Sites	2	1	1					4
	Tonnes	0.1	0.2	1.0					1.3
N.S.	Sites	5	10	12	8		1		36
	Tonnes	0.3	3.1	39.0	164.7		2 457.0		2 664.1
N.B.	Sites		5	7					12
	Tonnes		1.8	21.1					22.9
Que.	Sites	66	65	56	20	2			209
	Tonnes	2.4	23.5	231.4	555.3	561.8			1 374.4
Ont.	Sites	74	169	156	64	12	2	2	479
	Tonnes	2.7	70.8	522.3	1 768.6	3 518.8	12 877.5	76 017.8	94 778.5
Man.	Sites	10	51	34	3				98
	Tonnes	0.2	16.0	92.4	93.5				202.1
Sask.	Sites	26	93	40	3				162
	Tonnes	0.4	34.1	91.2	42.3				168.0
Alta.	Sites	17	9	4	5	1			36
	Tonnes	0.6	2.8	23.1	144.9	559.9			731.3
B.C.	Sites	114	199	144	47	7	1		512
	Tonnes	4.5	77.3	525.6	1 571.8	1 342.5	1 824.8		5 346.5
Yukon	Sites	11	4	2					17
	Tonnes	0.2	0.8	3.3					4.3
N.W.T.	Sites		2	3	1				6
	Tonnes		0.8	14.4	39.0				54.2
Total	Sites	332	619	469	164	25	4	2	1 615
	Tonnes	11.8	234.0	1 594.9	4 864.8	6 486.2	17 159.3	76 017.8	106 368.8

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	102.0				114.6
N.S.	Sites	1	1	3	1				6
	Tonnes	0.1	0.4	9.0	13.3				22.8
N.B.	Sites		1	1					2
	Tonnes		0.4	2.5					2.9
Que.	Sites	5	4	3	1	1			14
	Tonnes	0.1	1.9	8.4	53.8	141.6			205.8
Ont.	Sites	3	2	11	5	1			22
	Tonnes	0.0	0.5	33.5	119.2	153.0			306.2
Man.	Sites	1	7	2					10
	Tonnes	0.0	1.9	10.8					12.7
Sask.	Sites	12	65	26					103
	Tonnes	0.0	24.3	42.4					66.7
Alta.	Sites	1	3	1					5
	Tonnes	0.0	0.5	1.0					1.5
B.C.	Sites	25	10	9	5	1			50
	Tonnes	0.4	4.5	29.1	129	213.4			376.4
Yukon	Sites	3	1						4
	Tonnes	0.1	0.1						0.2
NWT & Nunavut	Sites		1	1	1				3
	Tonnes		0.2	6.8	39.0				46.0
Total	Sites	51	95	57	13	3	0	0	226
	Tonnes	0.7	35.4	155.4	456.3	508.0	0.0	0.0	1 155.8

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	9	7	11	3			37
	Tonnes	0.4	2.1	18.2	382.7	503.2			906.6
P.E.I.	Sites	2	1	1					4
	Tonnes	0.1	0.2	1.0					1.3
N.S.	Sites	4	9	9	7		1		30
	Tonnes	0.2	2.6	30.0	151.3		2 457.0		2 641.1
N.B.	Sites		4	6					10
	Tonnes		1.4	18.6					20.0
Que.	Sites	61	61	53	19	1			195
	Tonnes	2.3	21.6	223.0	501.6	420.2			1 168.7
Ont.	Sites	71	167	145	59	11	2	2	457
	Tonnes	2.7	70.3	488.8	1 649.4	3 365.8	12 877.5	76 017.8	94 472.3
Man.	Sites	9	44	32	3				88
	Tonnes	0.2	14.1	81.7	93.5				189.5
Sask.	Sites	14	28	14	3				59
	Tonnes	0.3	9.9	48.7	42.3				101.2
Alta.	Sites	16	6	3	5	1			31
	Tonnes	0.6	2.3	22.1	144.9	559.9			729.8
B.C.	Sites	89	189	135	42	6	1		462
	Tonnes	4.1	72.7	496.5	1 442.8	1 129.2	1 824.8		4 970.1
Yukon	Sites	8	3	2					13
	Tonnes	0.2	0.7	3.3					4.2
NWT & Nunavut	Sites		1	2					3
	Tonnes		0.5	7.7					8.2
Total	Sites	281	522	409	149	22	4	2	1 389
	Tonnes	11.1	198.4	1 439.6	4 408.5	5 978.3	17 159.3	76 017.8	105 213.0

Note: Totals may not add up due to rounding.

4. Summary of National PCB Inventory Data from 1990 to 2005

National PCB inventory data from 1990 to 2005 are summarized in Table 13a and Table 13b.

Table 13a: Summary of National PCB Inventory Data from 1990 to 1997

ITEMS IN USE	1990	1991	1992	1993	1994	1995	1996	1997
Askarels in use (net weight, tonnes)	14 450	13 256	12 488	11 505	12 245	10 781	9 732	9 447
CMO* in use (net weight, tonnes)	N/A	N/A	2 043	2 160	2 233	1 775	1 726	1 406
Total - In use (net weight, tonnes)	N/A	N/A	14 531	13 665	14 478	12 556	11 458	10 853
WASTE ITEMS (STORAGE)	1990	1991	1992	1993	1994	1995	1996	1997
Askarel waste (gross weight, tonnes)	11 461	14 543	15 665	15 247	14 710	17 294	13 187	17 706
CMO* waste (net weight, tonnes)	5 110	4 511	4 362	3 787	3 496	3 423	3 270	2 979
Other PCB waste (gross weight, tonnes)	113 640	122 876	123 258	107 991	115 300	120 735	118 432	106 567
Total - Wastes (tonnes)	130 211	141 930	143 285	127 025	133 506	141 452	134 889	127 252
Waste storage sites (number)	3 089	3 106	3 130	3 216	3 278	2 857	2 823	2 857

* Contaminated mineral oil.

Table 13b: Summary of National PCB Inventory Data from 1998 to 2005

ITEMS IN USE	1998	1999	2000	2001	2002	2003	2004	2005
Askarels in use (net weight, tonnes)	9 158	9 032	8 682	8 286	7 920	7 733	7 365	6 689
CMO* in use (net weight, tonnes)	1 929	1 915	1 808	1 752	1 727	1 717	1 667	1 406
Total - In use (net weight, tonnes)	11 087	10 947	10 490	10 038	9 647	9 450	9 032	8 095

WASTE ITEMS (STORAGE)	1998	1999	2000	2001	2002	2003	2004	2005
Askarel waste (gross weight, tonnes)	13 900	13 635	12 357	10 730	10 037	9 092	8 608	8 967
CMO* waste (net weight, tonnes)	2 442	2 474	1 786	1 721	1 450	1 264	884	813
Other PCB waste (gross weight, tonnes)	95 955	96 431	94 434	93 619	87 703	86 704	86 225	102 716
Total - Wastes (tonnes)	112 297	112 540	108 577	106 070	99 190	97 061	95 717	112 496

Waste storage sites (number)	2 301	2 288	2 090	2 006	1 861	1 718	1 681	1 615
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* Contaminated mineral oil.

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

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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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