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

2000 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, 2000.

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 2000 inventory report are given in the next section.

2. Inventory Highlights

2.1 National Inventory

As of December 2000, 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	7 267	8 070
Capacitors	1 365	3 149
Other equipment	50	99
Bulk storage	N/A	1 039
Total	8 682	12 357

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	1 731	259
Capacitors	N/A	N/A
Other equipment	77	21
Bulk storage	N/A	1 506
Total	1 808	1 786

Table 3: National Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	87 843
Fluorescent light ballasts	1 915
Drained equipment	2 062
Other wastes	2 614
Total	94 434

2.2 Federal Inventory

As of December 2000, 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	465	120
Capacitors	34	441

Other equipment	14	9
Bulk storage	N/A	65
Total	513	635

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	133	11
Capacitors	N/A	N/A
Other equipment	0	2
Bulk storage	N/A	11
Total	133	24

Table 6: Federal Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	145
Fluorescent light ballasts	403
Drained equipment	39
Other wastes	103
Total	690

2.3 Non-federal Inventory

As of December 2000, 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	6 802	7 950
Capacitors	1 331	2 708
Other equipment	36	90
Bulk storage	N/A	974
Total	8 169	11 722

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	1 598	248
Capacitors	N/A	N/A
Other equipment	77	19
Bulk storage	N/A	1 495
Total	1 675	1 762

Table 9: Non-federal Inventory of Other Stored Wastes

Item	Other stored wastes (gross weight, tonnes)
Soil	87 843
Fluorescent light ballasts	1 915
Drained equipment	2 062
Other wastes	2 614
Total	94 434

3. PCB Waste Storage Sites

As of December 2000, there were 2 090 PCB waste storage sites in Canada. Of these, 272 sites were federal and 1 818 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 ≥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	11	14	14	20	3			62
	Tonnes	0.5	4.2	41.2	675.6	503.2			1 224.7
P.E.I.	Sites	1	3			1			5
	Tonnes	0.0	1.0			127.8			128.8
N.S.	Sites	6	15	12	9		1		43
	Tonnes	0.2	4.8	38.3	201.0		2 457.0		2 701.3
N.B.	Sites		3	9					12
	Tonnes		1.2	37.2					38.4
Que.	Sites	105	119	107	47	6			384
	Tonnes	3.9	46.0	468.6	1 397.1	1 939.9			3 855.5
Ont.	Sites	106	229	225	106	16	2	1	685
	Tonnes	4.2	94.0	855.8	2 706.7	4 792.0	12 877.5	64 000.0	85 330.2
Man.	Sites	9	57	33	8	2			109
	Tonnes	0.2	20.8	105.4	280.8	473.2			880.4
Sask.	Sites	30	94	40	3				167
	Tonnes	0.5	34.9	91.2	42.3				168.9
Alta.	Sites	22	26	11	14	5			78
	Tonnes	0.7	10.8	33.7	576.0	2 672.1			3 293.3
B.C.	Sites	118	199	144	46	8	2		517
	Tonnes	4.6	77.5	526.8	1 557.4	1 540.2	7 176.8		10 883.3
Yukon	Sites	13	5	2					20
	Tonnes	0.3	1.2	4.9					6.4
N.W.T.	Sites		2	5	1				8
	Tonnes		1.0	26.2	39.0				66.2
Total	Sites	421	766	602	254	41	5	1	2 090
	Tonnes	15.1	297.4	2 229.3	7 475.9	12 048.4	22 511.3	64 000.0	108 577.4

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	1	2	3	3				9
	Tonnes	0.0	0.7	12.6	105.9				119.2
P.E.I.	Sites								0
	Tonnes								0.0
N.S.	Sites	1	4	2	1				8
	Tonnes	0.0	1.5	4.1	23.8				29.4
N.B.	Sites			1					1
	Tonnes			5.9					5.9
Que.	Sites	6	6	5	6				23
	Tonnes	0.1	3.0	28.2	170.3				201.6
Ont.	Sites	8	17	14	6	2			47
	Tonnes	0.2	7.1	39.0	160.9	302.4			509.6
Man.	Sites	1	8	5					14
	Tonnes	0.0	4.4	14.5					18.9
Sask.	Sites	12	65	26					103
	Tonnes	0.0	24.3	42.4					66.7
Alta.	Sites	1	4	3					8
	Tonnes	0.0	2.6	5.0					7.6
B.C.	Sites	26	11	9	4	1			51
	Tonnes	0.4	5.2	31.1	90.6	213.4			340.7
Yukon	Sites	3	1						4
	Tonnes	0.1	0.1						0.2
N.W.T.	Sites		1	2	1				4
	Tonnes		0.2	9.8	39.0				49.0
Total	Sites	59	119	70	21	3	0	0	272
	Tonnes	0.8	49.1	192.6	590.5	515.8	0.0	0.0	1 348.8

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	10	12	11	17	3			53
	Tonnes	0.5	3.5	28.5	569.7	503.2			1 105.4
P.E.I.	Sites	1	3			1			5
	Tonnes	0.0	1.0			127.8			128.8
N.S.	Sites	5	11	10	8		1		35
	Tonnes	0.2	3.2	34.1	177.1		2 457.0		2 671.6
N.B.	Sites		3	8					11
	Tonnes		1.2	31.3					32.5
Que.	Sites	99	113	102	41	6			361
	Tonnes	3.8	42.9	440.4	1 226.8	1 939.9			3 653.8
Ont.	Sites	98	212	211	100	14	2	1	638
	Tonnes	4.0	86.9	816.9	2 545.8	4 489.6	12 877.5	64 000.0	84 820.7
Man.	Sites	8	49	28	8	2			95
	Tonnes	0.2	16.4	90.8	280.8	473.2			861.4
Sask.	Sites	18	29	14	3				64
	Tonnes	0.5	10.6	48.7	42.3				102.1
Alta.	Sites	21	22	8	14	5			70
	Tonnes	0.7	8.2	28.6	576.0	2 672.1			3 285.6
B.C.	Sites	92	188	135	42	7	2		466
	Tonnes	4.2	72.3	495.7	1 466.8	1 326.8	7 176.8		10 542.6
Yukon	Sites	10	4	2					16
	Tonnes	0.2	1.1	4.9					6.2
N.W.T.	Sites		1	3					4
	Tonnes		0.8	16.4					17.2
Total	Sites	362	647	532	233	38	5	1	1 818
	Tonnes	14.3	248.1	2 036.3	6 885.3	11 532.6	22 511.3	64 000.0	107 227.9

Note: Totals may not add up due to rounding.

4. Summary of National PCB Inventory Data from 1990 to 2000

National PCB inventory data from 1990 to 2000 are summarized in Table 13.

Table 13: Summary of National PCB Inventory Data from 1990 to 2000

ITEMS IN USE	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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
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
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**

WASTE ITEMS (STORAGE)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
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
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
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
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**

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

* 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

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