NATIONAL INVENTORY
OF
PCBs IN USE AND PCB WASTES IN STORAGE
IN CANADA

1994 ANNUAL REPORT

PREPARED FOR THE CANADIAN COUNCIL OF MINISTERS OF ENVIRONMENT BY:

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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.

It may be noted that the method of presentation used in this report has been modified from that used in previous annual inventory reports. This has been done in order to focus on information which users indicate is of principal interest to them.

This report has been approved for distribution by the Canadian Council of Ministers of the Environment. Copies may be obtained from the Commercial Chemicals Evaluation Branch, Environmental Protection Service, Environment Canada, Ottawa, K1A 0H3.
Telephone: (819) 997-2314. Fax: (819) 953-4936.

Ce rapport est aussi disponible en francais sous le titre "Inventaire national des matieres utilisées contenant des BPC et des déchets contenant des BPC en entreposage au Canada, decembre 1994, Rapport sommaire", a l'adresse suivante: Direction d'évaluation des produits chimiques commerciaux, Direction générale de la protection de l'environnement, Environnement Canada, Ottawa, K1A 0H3.
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1. OVERVIEW

1.1 Background

The "National Inventory of PCBs In Use and PCB Wastes 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 31st, 1994, and includes information on the amounts of PCBs destroyed in Canada since 1988.

The first national inventory of Canadian PCBs, which was published by the CCME in 1988, only gave data on PCB wastes in storage. 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 data base 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 and the Northwest Territories. The provincial governments of Newfoundland, 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. Information on the amounts of PCBs destroyed was obtained from published reports on PCB destruction projects in Canada, and from the owners and operators of commercial PCB treatment and destruction systems.

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 ppm.

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 in the terms of net weight because transformers that contain this oil are often reused after being cleaned and retrofilled with clean oil. The gross weight of a mineral oil transformer 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 1994 inventory report are given below.

1.2 INVENTORY HIGHLIGHTS

1.2.1 National Inventory

As of December 1994, the national PCB inventory (Tables 1 - 3) included:

- 12 245 tonnes (net weight) of in-use askarel (excluding fluorescent lamp ballasts) of which 10 053 tonnes were in transformers, 2 024 tonnes in capacitors, and 168 tonnes in other equipment.
- 2 233 tonnes (net weight) of in-use PCB-contaminated mineral oil of which 2 153 tonnes is in transformers, and 80 tonnes is in other equipment.
- 14 710 tonnes (gross weight) of waste askarel and askarel-equipment consisting of 5 786 tonnes of transformers, 6 230 tonnes of capacitors, 2 538 tonnes in bulk storage, and 156 tonnes of other equipment.
- 3 496 tonnes (net weight) of waste PCB-contaminated mineral oil of which 464 tonnes were in transformers, 6 tonnes in other equipment, and 3 026 tonnes in bulk storage.

- 115 300 tonnes (gross weight) of other PCB wastes consisting of 104 553 tonnes of soil, 5 335 tonnes of fluorescent lamp ballasts, 1 651 tonnes of drained equipment, and 3 761 tonnes of other wastes.

1.2.2 Federal Inventory

As of December 1994 the federal inventory (Tables 1 - 3) included:

- 711 tonnes (net weight) of in-use askarel (excluding fluorescent lamp ballasts) of which 634 tonnes were in transformers, 41 tonnes in capacitors, and 36 tonnes in other miscellaneous equipment.
- 119 tonnes (net weight) of in-use PCB-contaminated mineral oil of which 117 tonnes were in transformers, and 2 tonnes in other equipment.
- 1 661 tonnes (gross weight) of waste askarel and askarel-containing equipment.
- 164 tonnes (net weight) of waste PCB-contaminated mineral oil.
- 3 851 tonnes (gross weight) of other PCB wastes.

1.2.3 Non-federal Inventory

As of December 1994 the non-federal inventory (Tables 1 - 3) included:

- 11 533 tonnes (net weight) of in-use askarel (excluding fluorescent lamp ballasts) of which 9 418 tonnes were in transformers, 1 983 tonnes in capacitors, and 132 tonnes in other miscellaneous equipment.
- 2 114 tonnes (net weight) of in-use PCB-contaminated mineral oil of which 2 038 tonnes were in transformers, and 76 tonnes in other equipment
- 13 049 tonnes (gross weight) of waste askarel and askarel-equipment
- 3 332 tonnes (net weight) of waste PCB-contaminated mineral oil.
- 111 449 tonnes (gross weight) of other PCB wastes.

1.3 PCB WASTE STORAGE SITES

As of December 1994, there were 3 279 PCB waste storage sites in Canada. Of these, 482 sites were federal and 2 797 were non-federal. The quantities of waste stored in these sites are divided into seven groups; ranging from sites containing less than 1 000 kg to sites containing greater than 10 000 tonnes (Tables 4 -6).

An analysis of the distribution of waste among these storage sites indicates that almost half of the waste (64 000 tonnes) was stored at one site and that 28% of the waste (37 851 tonnes) was stored at eight sites containing between 1 000 and 10 000 tonnes.

Detailed information on waste storage sites under provincial or territorial jurisdictions 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.

1.4 PCB WASTE DESTRUCTION

In 1994, the Alberta Special Waste Treatment Centre (ASWTC), near Swan Hills, Alberta operates the only incinerator in Canada that was licensed to destroy PCBs. During 1994, 6698 tonnes of PCB waste were destroyed. In addition, a transformer decontamination furnace system operated at the ASWTC, and 647 drained askarel transformers were treated during the year to destroy residual PCBs.

The only other commercial PCB waste destruction activity in Canada in 1994 was the chemical destruction of low level PCBs in mineral oil.

TABLE 1 IN-USE ASKAREL AND MINERAL OIL (DECEMBER 1994)

Item	Askarel (net weight, tonnes)			Mineral Oil (net weight, tonnes)		
	National	Federal	Non-federal	National	Federal	Non-federal
Transformers	10053	634	9418	2153	117	2038
Capacitors	2024	41	1983	0	0	0
Other equipment	168	36	132	80	2	76
Total	12245	711	11533	2233	119	2114

TABLE 2 WASTE ASKAREL AND MINERAL OIL (DECEMBER 1994)

Item	Askarel (gross weight, tonnes)			Mineral Oil (net weight, tonnes)		
	National	Federal	Non-federal	National	Federal	Non-federal
Transformers	5786	419	5367	464	67	396.6
Capacitors	6230	956	5274	0	0	0
Bulk storage	2538	159	2379	3026	91	1
Other equipment	156	127	29	6	6	2934
Total	14710	1661	13049	3496	164	3332

TABLE 3 OTHER PCB WASTES (DECEMBER 1994)

Item	Waste (gross weight, tonnes)		
	National	Federal	Non-federal
Soil	104553	2355	102198
Flourescent light ballasts	5335	746	4589
Drained equipment	1651	207	1444
Other wastes	3761	543	3218
Total	115300	3851	111449

TABLE 4 PCB STORAGE SITES (National)

Province		<100 kg	100 kg - 1 tonne	1 - 10 tonnes	10 - 100 tonnes	100 - 1000 tonnes	1000 - 10,000 tonnes	>10,000 tonnes	Total Sites Total tonnes
NFLD	Sites	6	15	8	9	1	0	0	39
	Tonnes	0.2	7.6	30.4	372.9	113.9	0	0	525.0
PEI	Sites	2	6	5	1	0	0	0	14
	Tonnes	0.1	1.5	17.1	28.2	0	0	0	47.0
NS	Sites	10	36	30	14	3	1	0	94
	Tonnes	0.3	17.2	98.6	406	486.4	2 204	0	3 213
NB	Sites	5	24	25	18	2	0	0	74
	Tonnes	0.2	10.8	101.7	688.4	267.6	0	0	1 068.7
QUE	Sites	148	187	169	81	6	0	0	591
	Tonnes	5.9	75.1	727.1	2 484.4	1 859.9	0.0	0.0	5 152.4
ONT	Sites	102	606	564	227	33	4	1	1 537
	Tonnes	3.0	261.0	2 011.4	6 585.0	8 425	26 042	64 000.0	107 327
MAN	Sites	10	76	36	11	2	0	0	135
	Tonnes	0.3	28.3	128.5	326.7	664.7	0.0	0.0	1 149
SASK	Sites	19	120	28	12	1	0	0	180
	Tonnes	0.7	54.5	55.2	511.8	117.4	0.0	0.0	740.0
ALTA	Sites	2	9	9	4	2	0	0	26
	Tonnes	0.0	2.7	42.4	190.9	705.9	0.0	0.0	942.0
BC	Sites	129	220	140	52	7	3	0	551
	Tonnes	5.3	84.8	540.6	1 434.7	1 536.3	9 605	0.0	13 207
YUK	Sites	13	6	3	0	1	0	0	23
	Tonnes	0.3	1.5	12.0	0.0	173.8	0.0	0.0	187.6
NWT	Sites	3	2	7	3	0	0	0	15
	Tonnes	0.2	0.8	32.3	88.5	0.0	0.0	0.0	122.0
TOTAL	Sites	449	1 307	1 024	432	58	8	1	3 279
	Tonnes	16.5	545.7	3 797.3	13 117.5	14 3509	37 851	64 000.0	133 680

TABLE 5 PCB STORAGE SITES (Federal)

Province		<100 kg	100 kg - 1 tonne	1 - 10 tonnes	10 - 100 tonnes	100 - 1000 tonnes	1000 - 10,000 tonnes	>10,000 tonnes	Total Sites Total tonnes
NFLD	Sites	3	13	4	1	0	0	0	21
	Tonnes	0.1	6.8	19.8	82.3	13.9	0.0	0.0	122.9
PEI	Sites	0	3	3	0	0	0	0	6
	Tonnes	0.0	0.7	5.4	0.0	0.0	0.0	0.0	6.1
NS	Sites	2	11	10	6	0	1	0	30
	Tonnes	0.0	7.0	27.2	224.7	0.0	2 204.0	0.0	2 462.9
NB	Sites	1	10	7	4	0	0	0	22
	Tonnes	0.1	4.5	30.1	100.6	0.0	0.0	0.0	135.3
QUE	Sites	12	40	17	13	2	0	0	84
	Tonnes	0.3	18.3	104.1	349.3	490.5	0.0	0.0	962.5
ONT	Sites	7	41	34	24	3	0	0	109
	Tonnes	0.3	18.6	145.7	527.9	415.2	0.0	0.0	1 107.7
MAN	Sites	1	12	4	1	0	0	0	18
	Tonnes	0.0	4.6	15.7	19.2	0.0	0.0	0.0	39.5
SASK	Sites	4	82	17	1	0	0	0	104
	Tonnes	0.1	38.2	29.8	77.9	0.0	0.0	0.0	146.0
ALTA	Sites	1	6	2	1	0	0	0	10
	Tonnes	0.0	2.2	6.3	17.9	0.0	0.0	0.0	26.4
BC	Sites	30	10	15	7	2	0	0	64
	Tonnes	0.6	4.4	64.4	258.1	313.3	0.0	0.0	640.8
YUK	Sites	4	1	1	0	0	0	0	6
	Tonnes	0.1	0.1	5.0	0.0	0.0	0.0	0.0	5.2
NWT	Sites	2	1	3	1	1	0	0	8
	Tonnes	0.1	0.2	12.7	20.6	0.0	0.0	0.0	33.6
TOTAL	Sites	67	230	117	59	8	1	0	482
	Tonnes	1.7	125.4	466.4	1 678.5	1 232.9	2 204.0	0.0	5 689

TABLE 6 PCB STORAGE SITES (Non Federal)

Province		<100 kg	100 kg - 1 tonne	1 - 10 tonnes	10 - 100 tonnes	100 - 1000 tonnes	1000 - 10,000 tonnes	>10,000 tonnes	Total Sites Total tonnes
NFLD	Sites	3	2	4	8	1	0	0	18
	Tonnes	0.1	0.8	10.6	290.7	113.9	0.0	0.0	416.1
PEI	Sites	2	3	2	1	0	0	0	8
	Tonnes	0.1	0.8	11.7	28.2	0.0	0.0	0.0	40.8
NS	Sites	8	25	20	8	3	0	0	64
	Tonnes	0.3	10.2	71.4	181.3	486.4	0.0	0.0	749.6
NB	Sites	4	14	18	14	2	0	0	52
	Tonnes	0.1	6.3	71.6	587.8	267.6	0.0	0.0	933.4
QUE	Sites	136	147	152	68	4	0	0	507
	Tonnes	5.5	56.8	623.0	2 135.2	1 369.3	0.0	0.0	4 189.8
ONT	Sites	95	565	530	203	30	4	1	1 428
	Tonnes	2.7	242.3	1 865.7	6 057.1	8 009.6	26 042.4	64 000.0	106 219.8
MAN	Sites	9	64	32	10	2	0	0	117
	Tonnes	0.3	23.7	122.8	307.5	664.7	0.0	0.0	1 119
SASK	Sites	15	38	11	11	1	0	0	76
	Tonnes	0.6	16.3	25.4	433.9	117.4	0.0	0.0	593.6
ALTA	Sites	1	3	7	3	2	0	0	16
	Tonnes	0.0	0.5	36.1	173.0	705.9	0.0	0.0	915.5
BC	Sites	99	210	125	45	5	3	0	487
	Tonnes	4.6	80.4	476.2	1 176.6	1 223	9 604.8	0.0	12 565.6
YUK	Sites	9	5	2	0	0	0	0	16
	Tonnes	0.2	1.4	7.0	0.0	0.0	0.0	0.0	8.6
NWT	Sites	1	1	4	2	0	0	0	8
	Tonnes	0.1	0.5	19.6	67.9	0.0	0.0	0.0	88.1
TOTAL	Sites	382	1 077	907	373	50	7	1	2 797
	Tonnes	14.6	440.0	3 340.9	11 439.2	12 957.8	35 647.2	64 000	127 840

TABLE 7 SUMMARY OF PCB INVENTORY DATA (1984 to 1994)

ITEM	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Askarel in use (net weight tonnes)	17 400	17 790	18 820	18 570	n/a	n/a	14 450	13 256	12 488	11 505	12 245
CMO in use (tonnes net weight)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2 043	2 160	2 233
Total PCB wastes (tonnes gross weight)	n/a	n/a	n/a	n/a	n/a	n/a	130 240	141 930	143 284	127 025	133 680
Askarel waste (tonnes gross weight)	n/a	n/a	n/a	n/a	n/a	n/a	11,461	14,543	15,665	15 247	14 710
Askarel waste (tonnes net waste)	n/a	n/a	n/a	n/a	n/a	n/a	5 410	5 669	6 078	6 266	6 077
CMO waste (tonnes net weight)	n/a	n/a	n/a	n/a	n/a	n/a	5 110	4 511	4 362	3 787	3 496
Other PCB waste (tonnes gross weight)	n/a	n/a	n/a	n/a	n/a	n/a	113 640	122 876	123 258	107 991	115 300
Waste storage sites	n/a	n/a	n/a	n/a	n/a	n/a	3 089	3 106	3 130	3 216	3278
Destruction (tonnes)	n/a	n/a	n/a	n/a	8 119	10 512	13 809	20822	17 632	7 507	6 698

n/a means information not available

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 Territory, and Northwest Territories contact the Environment Canada regional office in that province or territory.

APPENDIX B

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