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

1992 ANNUAL REPORT

PREPARED FOR THE CANADIAN COUNCIL OF MINISTERS OF ENVIRONMENT BY:

HAZARDOUS WASTE MANAGEMENT BRANCH
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The National PCB Inventory comprises more than 170,000 PCB-containing items in use or in storage at more than 6,000 locations across the country. The inventory changes continually as PCBs are taken out of service and placed in storage or destroyed. New storage sites may be established, or existing sites consolidated or closed. Therefore discrepancies between the information in this inventory and other PCB inventory information may arise from time to time. These discrepancies should be discussed with the appropriate provincial or federal officials listed in Appendices A and B of this report.

This report has been approved for distribution by the Canadian Council of Ministers of the Environment. Copies may be obtained from the Hazardous Waste Management Branch, Environmental Protection Directorate, Environment Canada, Ottawa, K1A 0H3.
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Ce rapport est aussi disponible en français sous le titre "Inventaire national des matières utilisées contenant des BPC et des déchets contenant des BPC en entreposage au Canada, decembre 1992, Rapport sommaire", à l'adresse suivante: Direction de la gestion des déchets, Direction général de la protection de l'environnement, Environnement Canada, Ottawa, K1A 0H3. Téléphone: (819) 953-1712. Fax: (819) 953-0509.

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EXECUTIVE SUMMARY

This report to the Canadian Council of Ministers of Environment (CCME) on the National PCB Inventory provides an historical overview of and current status report on the PCB inventory. Progress in PCB destruction since 1988 is also reported.

The data on PCB wastes in this report were obtained through the reporting requirements of federal and provincial regulations governing the storage of PCBs. The data on in-use PCBs and on the destruction of waste PCBs were provided on a voluntary basis and obtained through inspections of PCBs in service.

Data are reported for five categories of PCB materials:

1. IN-USE ASKAREL:
   i.e. various types of equipment (transformers, capacitors, fluorescent lamp ballasts, and other equipment) that is in-use and contains high concentration PCB liquids — usually pure PCBs or Askarel (PCBs diluted to about 40 - 70% with chlorobenzenes).

2. IN-USE MINERAL OIL:
   i.e. PCB-contaminated mineral oil in transformers and other equipment that is in use, most often having a PCB concentration less than 500 ppm in the oil, and almost always less than 1000 ppm.

3. ASKAREL WASTE:
   i.e. Askarel and other high concentration PCB liquids in equipment (transformers, capacitors, and other equipment) that is no longer being used, and high concentration PCB liquids in bulk storage in other containers.

4. MINERAL OIL WASTE:
   i.e. waste PCB contaminated mineral oil in transformers and other equipment that is no longer being used, and waste PCB-contaminated mineral oil in other containers.

5. OTHER PCB WASTES:
   i.e. transformers, capacitors, and other types of equipment that formerly contained high concentration PCB liquids or PCB-contaminated mineral oil, and have been drained of these fluids; fluorescent lamp ballasts; PCB-contaminated soil; and other PCB-contaminated solids (e.g. wood, clothing, absorbents) and liquids (e.g. solvents).

This report summarizes these five categories of PCB materials in three sections:

(1) **National totals** represent aggregations of both federal and non-federal in-use and waste PCB materials.

(2) **Federal totals** represent aggregations of in-use and waste PCB materials owned, controlled or possessed by federal institutions (departments, agencies. boards, and corporations).

(3) **Non-federal totals** represent aggregations for in-use and waste PCB materials owned, controlled, or possessed by provincial and territorial governments, and by other public and private sector organizations.

The fourth section details progress in PCB destruction.

The amounts of PCBs are reported as either gross weight, which includes the weight of equipment and the liquid in it; or as net weight, which is the weight of the liquid alone; or both. Both gross and net weights are reported because, when PCB waste management options are being evaluated, PCB liquids and equipment may be handled in different ways.

NATIONAL TOTALS

As of December 1992 national totals included:

- 12,488 tonnes (net weight) of in-use askarel (excluding fluorescent lamp ballasts): 10,414 tonnes in transformers, 1,909 tonnes in capacitors, and 165 tonnes in other equipment. This distribution is shown in Figure N-1, page 1 and Table N-1, page 1 of the report. The total represents a decrease of 768 tonnes from 13,256 tonnes in December 1991.

- 2,120 tonnes (net weight) of in-use PCB-contaminated mineral oil: 2,043 tonnes in transformers, and 78 tonnes in other equipment. This distribution is shown in Figure N-4 and Table N-2, page 4 of the report. The total represents a decrease of 75 tonnes from 2,196 tonnes in December 1991.

- 15,665 tonnes (gross weight) of waste askarel and askarel-equipment: 5,693 tonnes of transformers, 7,618 tonnes of capacitors, 2,236 tonnes in bulk storage, and 117 tonnes of other equipment. This distribution is shown in Figure N-7 and Table N-4, page 7 of the report. The total represents an increase of 1,121 tonnes from 14,543 tonnes in December 1991.

- 4,362 tonnes (net weight) of waste PCB-contaminated mineral oil: 458 tonnes in transformers, and 3,903 tonnes in bulk storage. This distribution is shown in Table N-5, page 8 of the report. This total represents a decrease of 149 tonnes from 4,511 tonnes in December 1991.

- 123,258 tonnes (gross weight) of other PCB wastes: 101,141 tonnes of soil, 10,311 tonnes of fluorescent lamp ballasts, 2,540 tonnes of drained equipment, and 9,267 tonnes of other wastes. This distribution is shown in Table N-6, page 11 of the report. This total represents an increase of 383 tonnes from 122,876 tonnes in December 1991.

FEDERAL TOTALS

As of December 1992 the federal portion of the National totals included:

- 730 tonnes (net weight) of in-use askarel (excluding fluorescent lamp ballasts). The distribution of this figure is shown in Figure F-1, page 17 of the report. Of this total, 648 tonnes are in transformers, 45 tonnes in capacitors, and 37 tonnes are in other miscellaneous equipment. This total represents a decrease of 13 tonnes from 743 tonnes in December 1991.

- 127 tonnes (net weight) of in-use PCB-contaminated mineral oil was reported in Canada: 125 tonnes in transformers, and 2 tonnes in other equipment. The distribution of this figure is shown in Table F-2, page 20 of the report. This total represents a decrease of 28 tonnes from 155 tonnes in December 1991.

- 1,259 tonnes (gross weight) of waste askarel and askarel-equipment. The distribution of this figure is shown in Table F-4, page 23 of the report. This total represents an increase of 556 tonnes from 703 tonnes in December 1991.

- 120 tonnes (net weight) of waste PCB-contaminated mineral oil. The distribution of this figure is shown in Table F-5, page 24 of the report. This total represents an increase of 27 tonnes from 93 tonnes in December 1991.

- 3,598 tonnes (gross weight) of other PCB wastes. The distribution of this figure is shown in Table F-6, page 26 of the report. This total represents an increase of 830 tonnes from 2,768 tonnes in December 1991.

NON-FEDERAL TOTALS

As of December 1992 the non-federal portion of the National totals included:

- 11,758 tonnes (net weight) of in-use askarel (excluding fluorescent lamp ballasts). The distribution of this figure is shown in Figure NF-1, page 31 of the report. Of this total, 9,766 tonnes are in transformers, 1,864 tonnes in capacitors, and 128 tonnes are in other miscellaneous equipment. This total represents a decrease of 754 tonnes from 12,512 tonnes in December 1991.

- 1,993 tonnes (net weight) of in-use PCB-contaminated mineral oil was reported in Canada: 1,918 tonnes in transformers, and 75 tonnes in other equipment. The distribution of this figure is shown in Table NF-2, page 34 of the report. This total represents a decrease of 48 tonnes from 2,041 tonnes in December 1991.

- 14,406 tonnes (gross weight) of waste askarel and askarel-equipment. The distribution of this figure is shown in Table NF-4, page 38 of the report. This total represents an increase of 566 tonnes from 13,840 tonnes in December 1991.

- 4,242 tonnes (net weight) of waste PCB-contaminated mineral oil. The distribution of this figure is shown in Table NF-5, page 39 of the report. This total represents an increase of 3 tonnes since December 1991.

- 119,660 tonnes (gross weight) of other PCB wastes. The distribution of this figure is shown in Table NF-6, page 41 of the report. This total represents a decrease of 448 tonnes from the 120,108 tonnes reported in December 1991.

PROGRESS IN PCB DESTRUCTION

Between December 1991 and December 1992, 11,231 tonnes were destroyed by incineration at three sites: 8,614 tonnes at the Smithville, Ontario site (Ontario Ministry of Environment); 2,380 tonnes at the Alberta Special Waste Management Centre, Swan Hills, Alberta (Alberta Ministry of Environment); and 237 tonnes during the test of a PCB destruction system near Baie-Comeau, Québec.

Most of these PCB wastes destroyed were not in the inventory. At Smithville, the majority of PCB wastes were soils excavated and destroyed at the site.

Note:

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.

Summary Tables

	National	Federal	Non-Federal
Askarel in-use (net weight)	12,488	730	11,758
Mineral oil in-use (net weight)	2,120	127	1,993
Total in-use	14,608	857	13,751
Askarel waste (gross weight)	15,665	1,259	14,406
Mineral oil waste (net weight)	4,362	120	4,242
Other PCB wastes (gross weight)	123,258	3,598	119,660
Total wastes	143,285	4,977	138,308
Total PCB materials	157,893	5,834	152,059

	National	Federal	Non-Federal
Askarel in-use (net weight)	12,488	730	11,758
Askarel waste (gross weight)	15,665	1,259	14,406
Total askarel	28,153	1,989	26,164
Mineral oil in-use (net weight)	2,120	127	1,993
Mineral oil waste (net weight)	4,362	120	4,242
Total mineral oil	6,482	247	6,235
Other PCB wastes (gross weight)	123,258	3,598	119,660
Total PCB Materials	157,893	5,834	152,059

INTRODUCTION

BACKGROUND

In September 1988, the Canadian Council of Resource and Environment Ministers (now known as the Canadian Council of Ministers of Environment, CCME) published the first national inventory of Canadian PCB waste storage sites. The national inventory was a compilation of data from eleven federal and provincial jurisdictions.

To streamline reporting of this inventory, a national database system was established in 1988 to handle the data on PCBs in use and PCB wastes in storage.

The information contained in this report represents the fourth annual summary report of the national database. The compilation of the data in the national database is a joint federal-provincial responsibility. Environment Canada provides the data on in-use askarel equipment, federally-regulated PCB wastes, and PCB wastes in Prince Edward Island, Saskatchewan and the Yukon and Northwest Territories. The provincial governments of Newfoundland, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Alberta and British Columbia provide data concerning the PCB waste inventories for their respective provinces.

In 1980, the manufacturing of new PCB equipment and the refilling of existing PCB equipment was banned. Earlier increases in the in-use inventory have been attributed to gradual improvements in the inventory system, i.e., the inclusion of equipment that was already in service but not included in the previous inventories. Although some equipment did come out of service between 1984 and 1986, the inclusion of new items outweighed the quantities coming out of service. By 1987, however, the quantities coming out of service became greater than additions to the inventory; the quantity of askarel in use decreased slightly, to 18,570 tonnes. By 1991 the quantity had decreased to 13,255 tonnes, and in 1992, the downward trend continued to 12,123 tonnes (net weights).

SCOPE

This report to the Canadian Council of Ministers of Environment (CCME) on the National PCB Inventory provides a historical overview and current status report of the PCB inventory and recent progress in PCB destruction.

The data on PCB wastes in this report were obtained through the reporting requirements of federal and provincial regulations governing the storage and destruction of PCBs. The data on in-use PCBs and on the destruction of waste PCBs were supplied on a voluntary basis and obtained through inspections of PCBs in service.

Data are reported for five categories of PCB materials:

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   i.e. various types of equipment (transformers, capacitors, fluorescent lamp ballasts, and other equipment) that is in-use and contains high concentration PCB liquids — usually pure PCBs or Askarel (PCBs diluted to about 40 - 70% with chlorobenzines).

2. IN-USE MINERAL OIL:

i.e. PCB-contaminated mineral oil in transformers and other equipment that is in use, most often having a PCB concentration less than 500 ppm in the oil, and almost always less than 1000 ppm.

3. ASKAREL WASTE:

i.e. Askarel and high concentration PCB liquids in equipment (transformers, capacitors, and other equipment) that is no longer being used, and high concentration PCB liquids in other containers.

4. MINERAL OIL WASTE:

i.e. waste PCB contaminated mineral oil in transformers and other equipment that is no longer being used, and waste PCB-contaminated mineral oil in other containers.

5. OTHER PCB WASTES:

i.e. transformers, capacitors, and other types of equipment that formerly contained high concentration PCB liquids or PCB-contaminated mineral oil, and have been drained of these fluids; fluorescent lamp ballasts; PCB-contaminated soil; and other PCB-contaminated solids (e.g. wood, clothing, absorbents) and liquids (e.g. solvents).

This report summarizes these five categories of PCB materials in three sections:

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The fourth section details progress in PCB destruction, in which the amounts destroyed and the method of destruction are identified.

Because current data was not available, this report uses the 1991 data from Newfoundland. Preliminary indications are that there has been little change in this province's inventory status.

UNITS OF WEIGHT

There are two methods of reporting askarel wastes: by net weight (i.e., the quantity of askarel in equipment and in bulk storage containers), or by gross weight (i.e. the quantity of bulk stored askarel and askarel in equipment plus the weight of the equipment casings). The gross weight is important to know because small equipment, such as capacitors, is usually destroyed in its entirety. Similarly, after the askarel fluid is drained, the casings and internals of askarel transformers may still represent a PCB waste and, as such, form part of this PCB waste inventory. The gross weight of equipment is often unknown, but can be estimated from the fluid contents.

Gross weights may be estimated by multiplying the fluid capacity in litres by a factor of 4.5 or 6 depending on the type of equipment. These factors are derived as follows:

- Transformers and other large equipment. The average density of askarel is 1.5 kg/litre. The average weight ratio of transformer casing to askarel is 2:1. Therefore the factor is 3 x 1.5 = 4.5.

- Capacitors and other small equipment. The average weight ratio for capacitors is slightly higher than for transformers; the average used here is 3:1. Therefore the factor is 4 x 1.5 = 6.0.

- PCB-contaminated mineral oil is reported in net weight because the transformers that contain this oil are often reused after being cleaned and retro-filled with clean oil. The density of mineral oil is 0.9 kg/litre.

- Solid PCB wastes such as soil, debris, and sludge are reported in gross weight.

IN-USE ASKAREL

In December 1992, there were 12,488 tonnes (net weight) of in-use askarel in Canada: 10,414 tonnes (83.4%) in transformers; 1,909 tonnes (15.3%) in capacitors; and 165 tonnes (1.3%) in other miscellaneous electrical and mechanical equipment (Figure N-1). The amount of in-use askarel for 1992 represents a decrease of 768 tonnes from the 1991 inventory of 13,256 tonnes.

Quantities of in-use askarel in all types of equipment showed a noticeable decrease as the number of transformers, capacitors, and other askarel equipment came out of service. The quantity of askarel in in-use transformers decreased by 637 tonnes (6%) from 11,051 tonnes in December 1991 to 10,414 tonnes (net weight) in December 1992. That in capacitors decreased by 111 tonnes (6%) from 2,020 tonnes in December 1991 to 1,909 tonnes (net weight) in December 1992. In-use askarel in other equipment decreased by 20 tonnes (11%) from 185 tonnes in December 1991 to 165 tonnes (net weight) in December 1992.

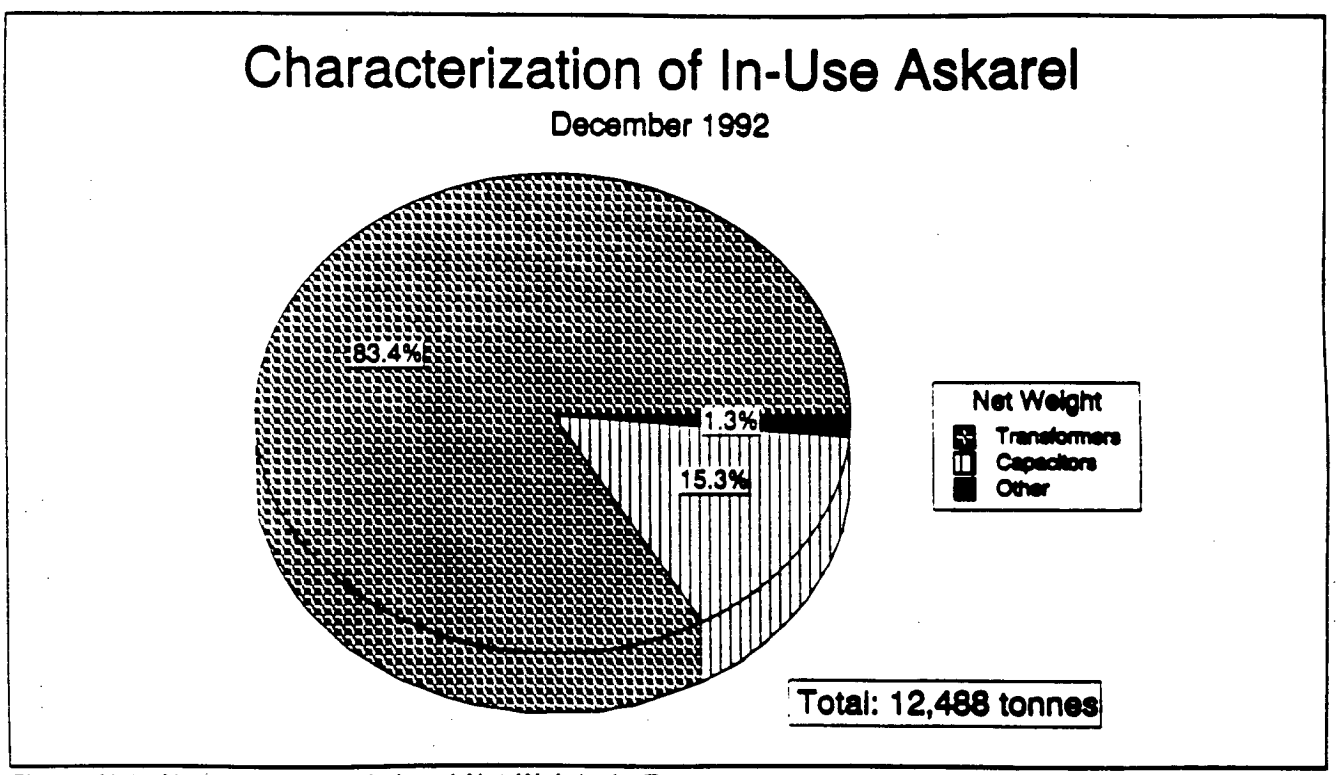

Figure N-1: National In-Use Askarel Net Weight in Tonnes

The trend in the total quantity of in-use askarel from 1984 to 1992 indicates a gradual increase from 1984 to 1986 (from 17,400 to 18,820 tonnes; Figure N-2 below). Since 1987, however, the trend indicates a gradual decrease in the national totals of in-use askarel (18,820 tonnes in 1986 to 12,488 tonnes December 1992).[1] Figure 3B indicates the changes noted in the net weights nationwide of in-use askarel.

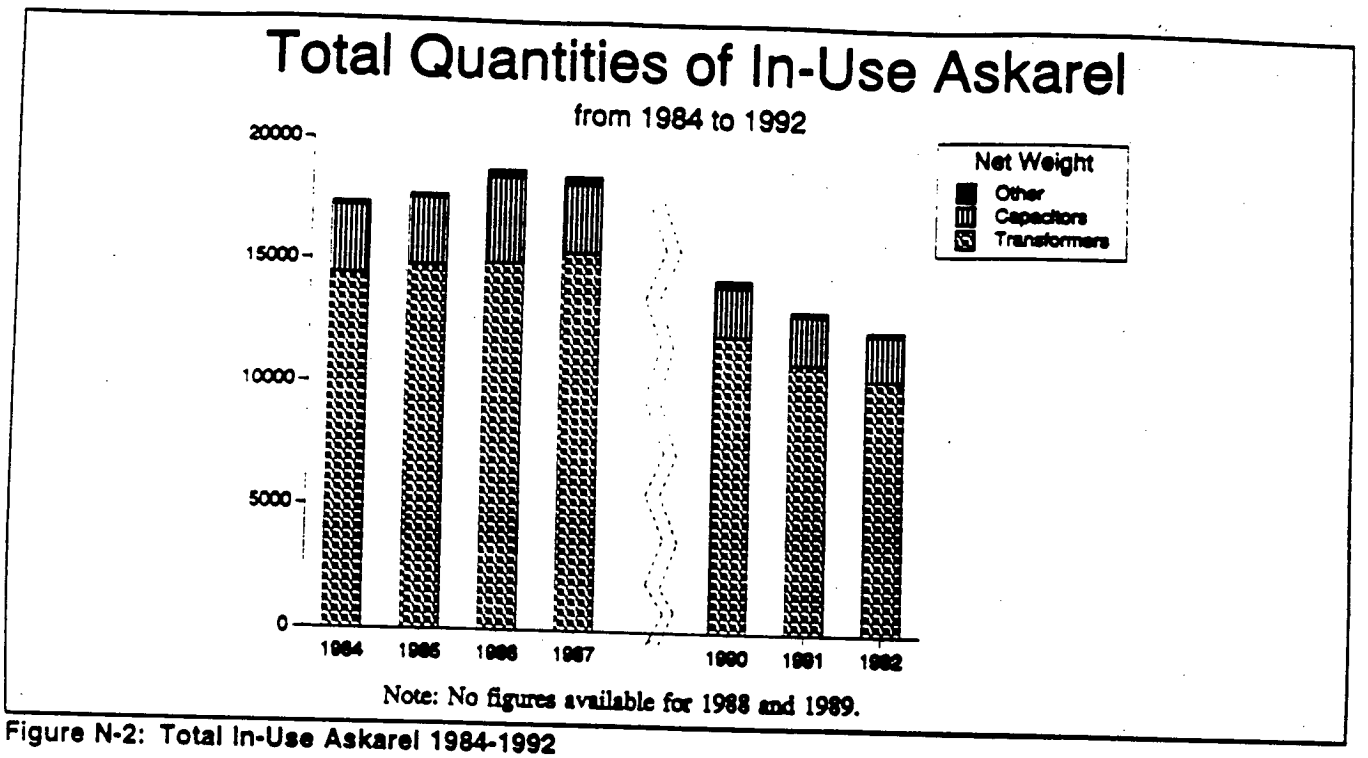

Figure N-2: Total In-Use Askarel 1984-1992

	1984	1985	1986	1987		1990	1991	1992
Transformers	14,430	14,850	14,960	15,380		12,110	11,051	10,414
Capacitors	2,810	2,790	3,560	2,860		2,070	2,020	1,909
Other	160	150	300	330		270	185	165
Total	17,400	17,790	18,820	18,570		14,450	13,256	12,488

Table N-1: Total In-Use Askarel 1984 - 1992

[1]Data for 1988 and 1989 were not available. It is assumed that the downward trend which began in 1987 continued in 1988 and 1989. This assumption is based on the fact that the trend continued in 1990 through 1992.

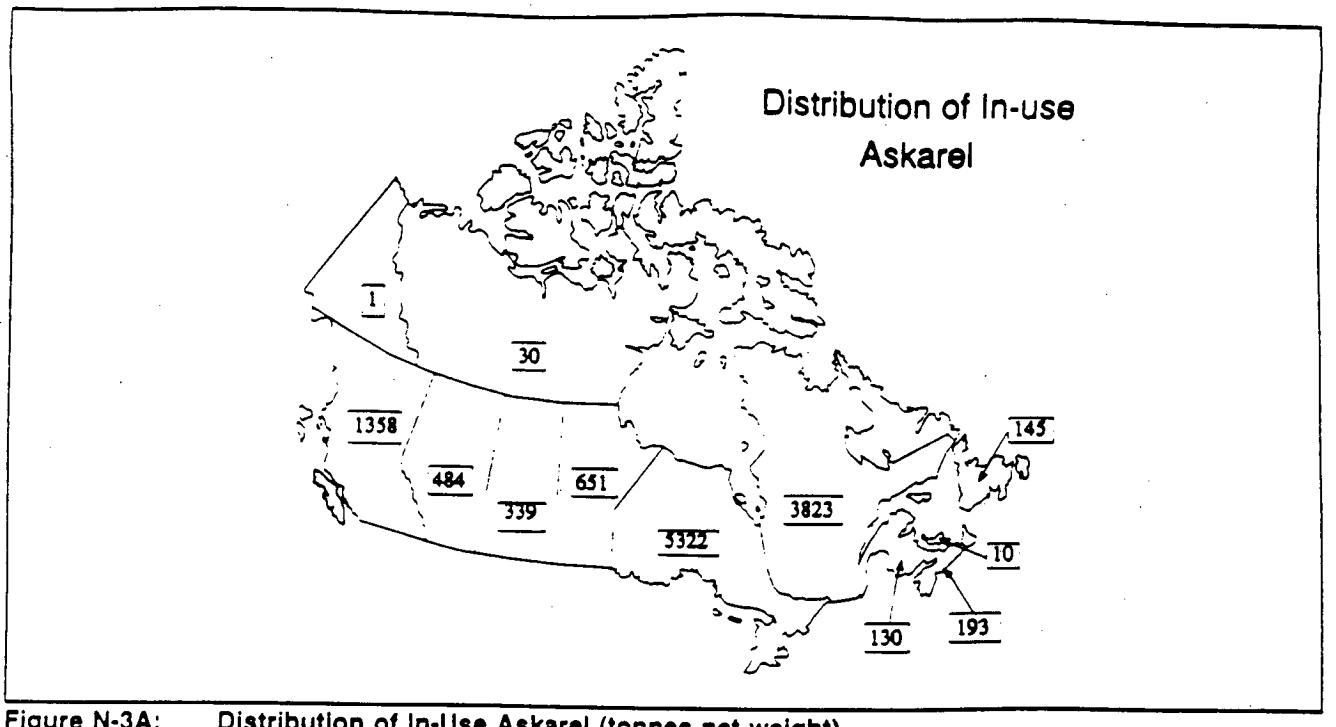

Figure N-3A: Distribution of In-Use Askarel (tonnes net weight)

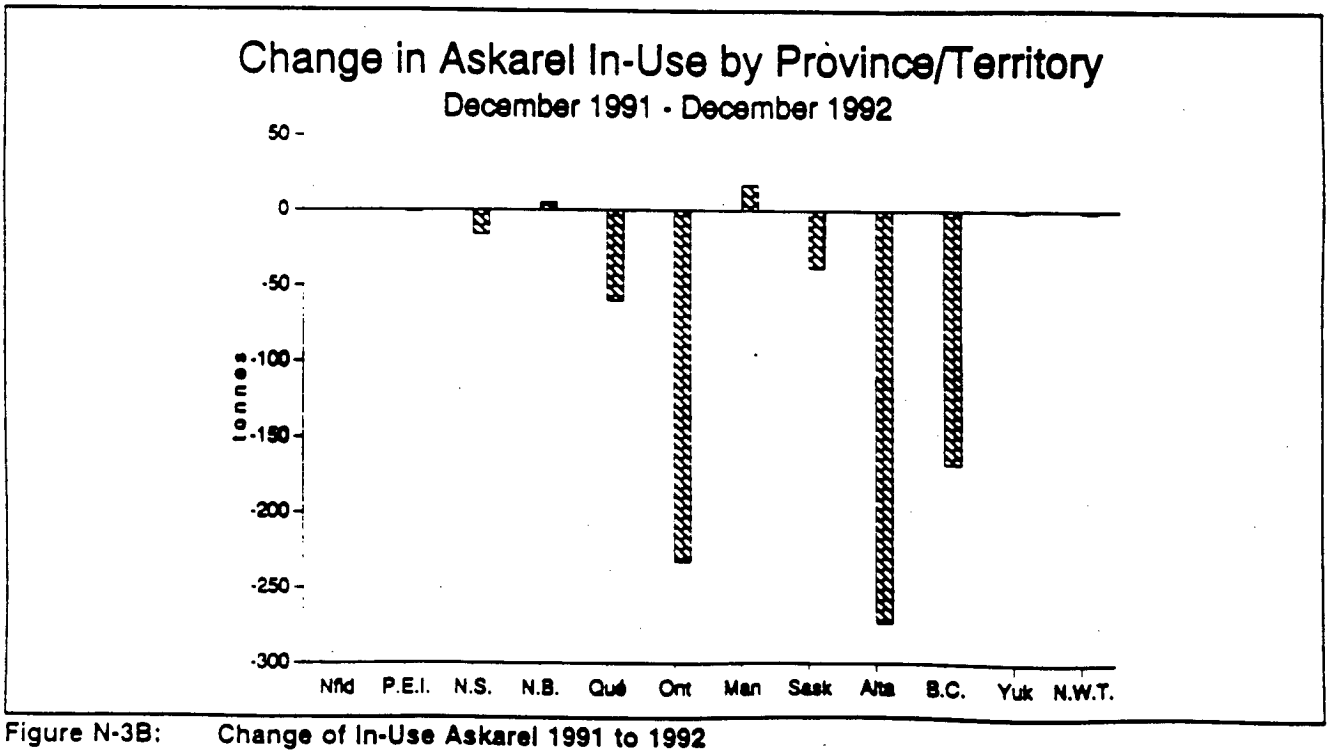

Figure N-3B: Change of In-Use Askarel 1991 to 1992

IN-USE MINERAL OIL

This annual report marks the first time that figures for in-use PCB-contaminated mineral oil in the inventory are reported. In-use mineral oil reports indicate that the majority of the contaminated mineral oil is contained in transformers 2,043 tonnes (96%), while the remainder (78 tonnes, 4%) is contained in other equipment. Distribution of in-use mineral oil is detailed in Figure N-4 and Table N-2 below.

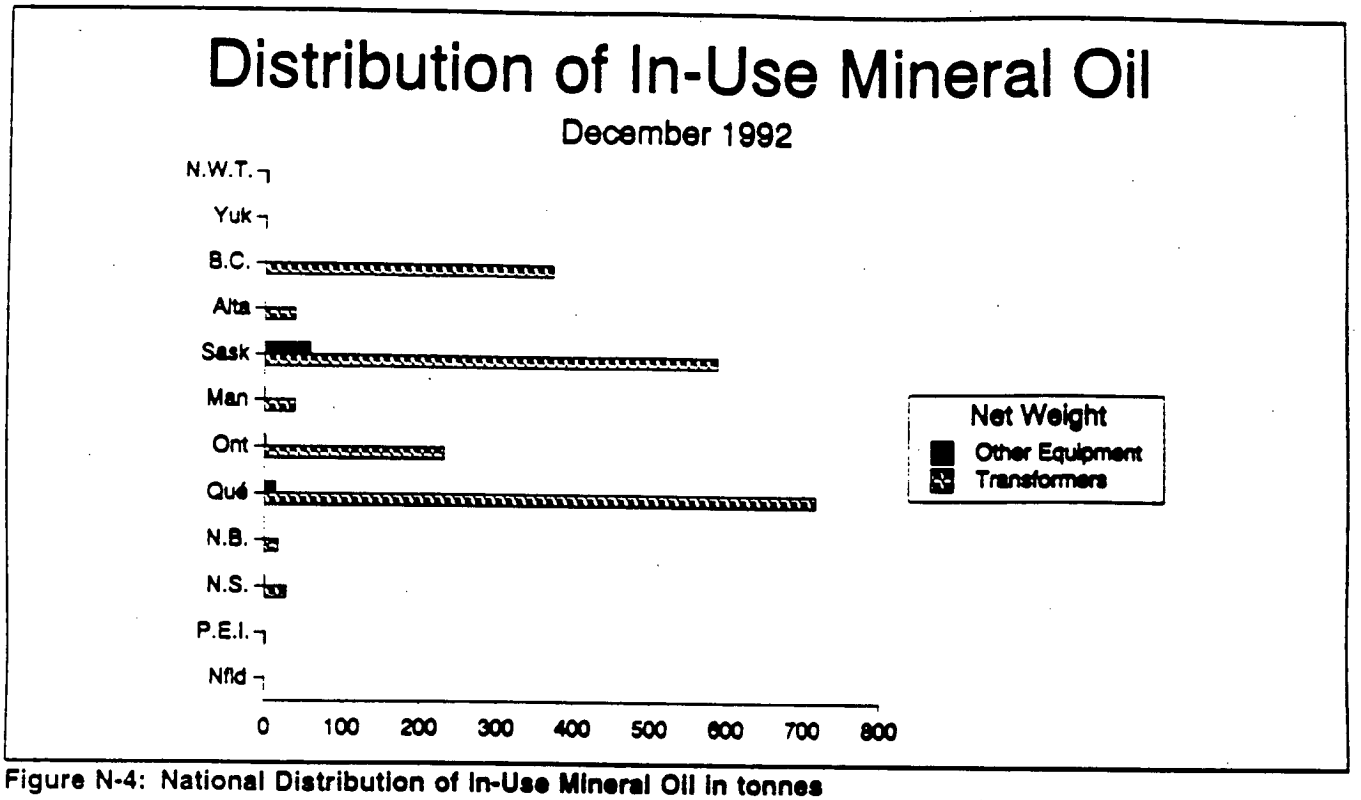

Figure N-4: National Distribution of In-Use Mineral Oil in tonnes

	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld	Total
Trans-formers	3	1	373	39	588	40	233	717	18	29	2	1	2,043
Other equip.	0	0	0	0	59	1	2	15	0	1	0	0	78
Total	3	1	373	39	647	41	235	732	18	30	2	1	2,121

Table N-2: National Distribution of In-Use Mineral Oil (tonnes net weight)

TOTAL PCB WASTES

In December 1992 there were 143,285 tonnes of PCB wastes in Canada. 15,665 tonnes (10.9%) of these wastes are bulk askarel and askarel-containing equipment, 10,311 tonnes (7.2%) are fluorescent lamp ballasts, 4,362 tonnes (3.0%) are PCB-contaminated mineral oil, 2,540 tonnes (1.8%) are drained askarel equipment, 101,141 tonnes (70.6%) are PCB-contaminated soils, and 9,267 tonnes (6.5%) are miscellaneous PCB-contaminated wastes. (Figure N-5).

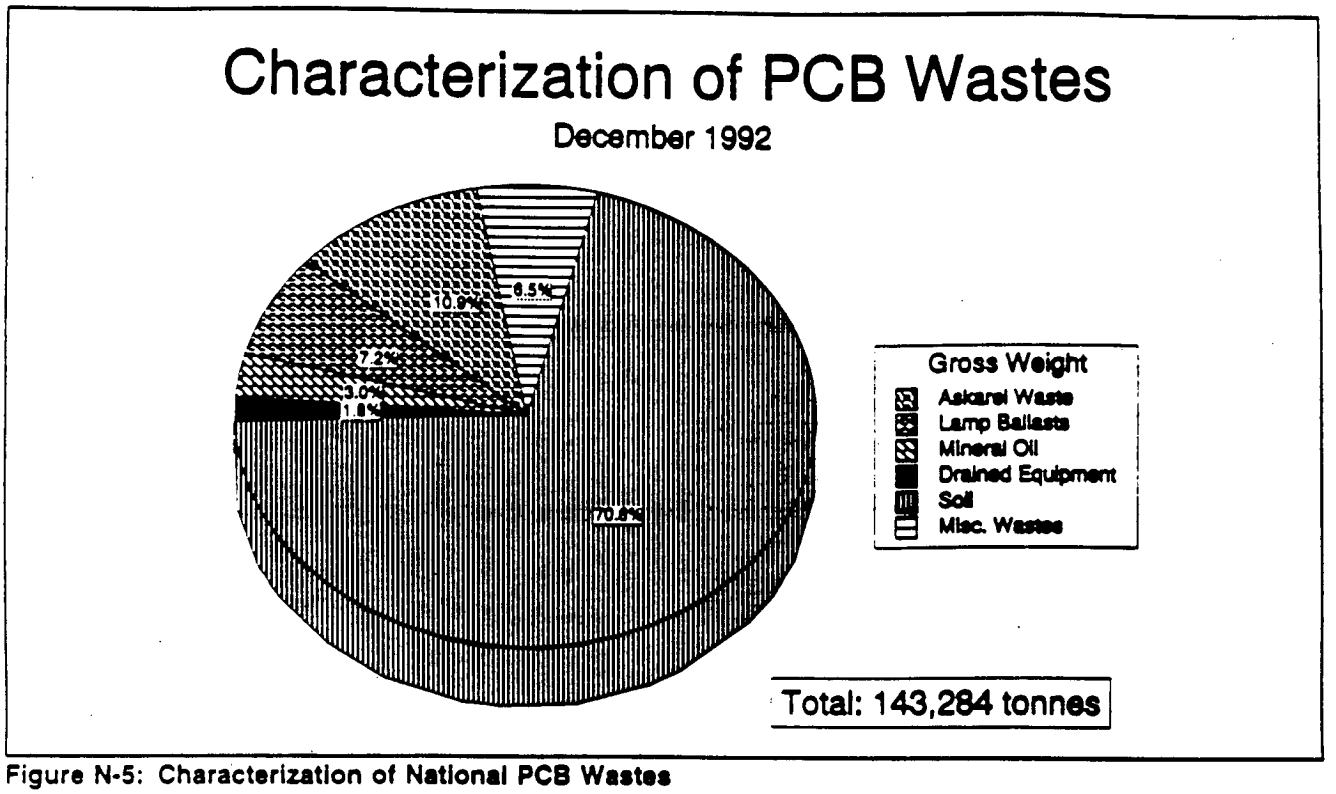

Figure N-5: Characterization of National PCB Wastes

The total quantity of PCB wastes reported at the end of December 1992 increased by 1,355 tonnes over the 141,930 tonnes reported in December 1991. This increase has three main components:

(1) The gross weight of bulk askarel and askarel-containing equipment increased by 1,121 tonnes (7.7%) as more equipment came out of service.

(2) The gross weight of fluorescent lamp ballasts increased by 3,100 tonnes (43%) to 10,311 tonnes.

(3) The gross weight of contaminated soils decreased by 2,813 tonnes (3%) to 101,141 tonnes.

BY NET WEIGHT

In December 1992, there were approximately 6,078 tonnes of waste askarel in storage. The majority of this is in bulk storage (2,236 tonnes, 37%). Transformers contain (1,898 tonnes, 31%). Another 1,907 tonnes (32%) is in capacitors, and a further 37 tonnes (less than 1%) is in miscellaneous other types of electrical and mechanical equipment.

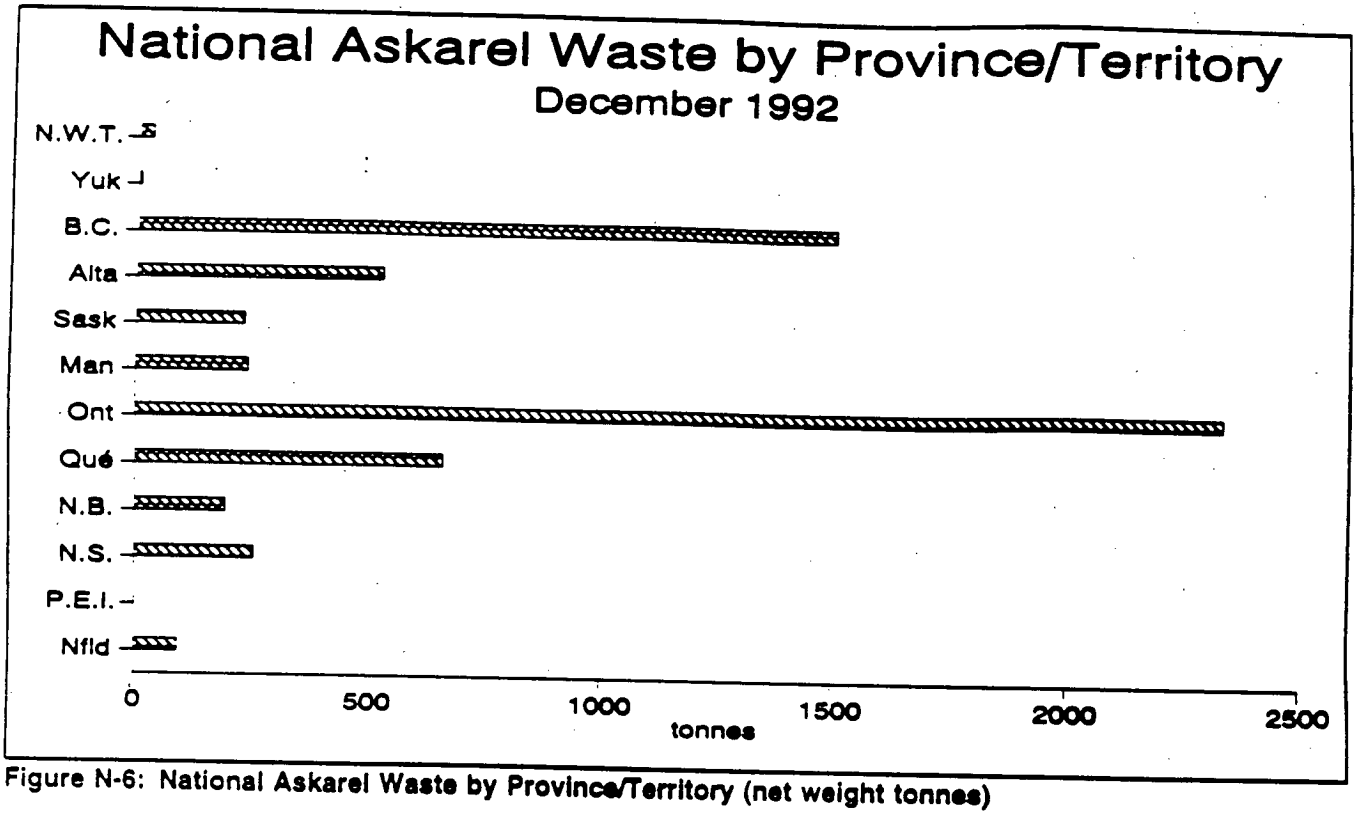

Figure N-6: National Askarel Waste by Province/Territory (net weight tonnes)

Net weight	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld
Inventory	29	5	1,054	527	232	241	2,333	658	195	256	1	94
Change from December 1991	-22	0	237	205	21	126	158	-378	1	66	-4	0

Table N-3: Askarel Waste by Province/Territory (net weight tonnes)

BY GROSS WEIGHT

There were 15,665 tonnes of askarel and askarel equipment stored for disposal. Transformers and capacitors constitute the majority, 5,693 tonnes (36.3%) and 7,618 tonnes (48.6%) respectively. 2,236 tonnes (14.3%) are in bulk storage and 117 tonnes (0.7%) are classified as other askarel wastes. The gross weight of askarel in storage increased by 1,121 tonnes from December 1991.

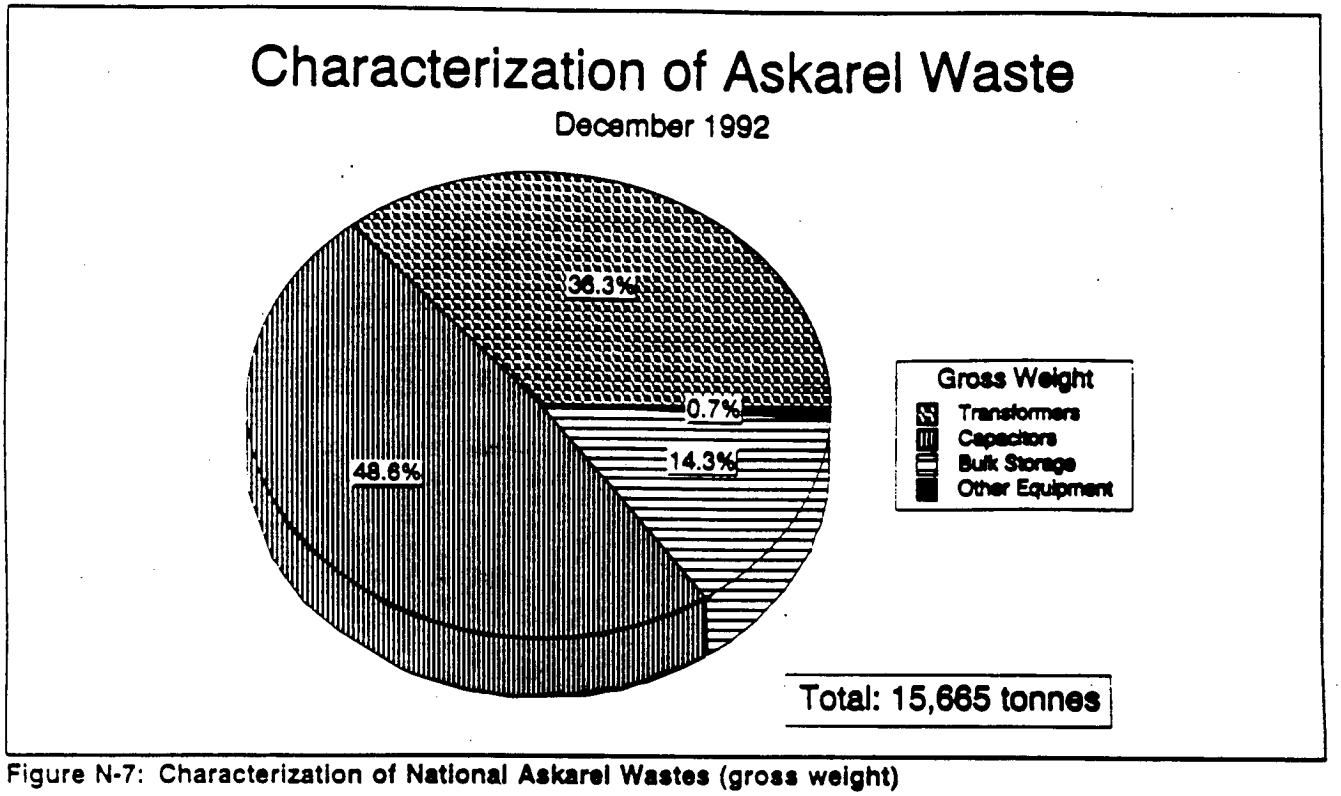

Figure N-7: Characterization of National Askarel Wastes (gross weight)

Item	Inventory	Percent
Transformers	5,693 tonnes	36.3%
Capacitors	7,618 tonnes	48.6%
Bulk storage	2,236 tonnes	14.3%
Other equipment	117 tonnes	0.7%
Total	15,665 tonnes	100%

Table N-4: Characterization of Askarel Waste

MINERAL OIL WASTE

In December 1992 there were 4,362 tonnes of waste PCB-contaminated mineral oil in storage. 3,903 tonnes (90%) are in bulk storage awaiting treatment. Over the past year, the inventory of contaminated mineral oil decreased by 149 tonnes from 4,511 tonnes to 4,362 tonnes.

Note:

PCB-contaminated mineral oil often goes directly from in-use equipment to a treatment facility without being stored and included in inventory.

	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld	Total
Transformers	0	0	59	39	1	9	251	78	6	14	1	0	459
Bulk storage	35	0	359	46	12	16	3187	113	36	35	0	65	3904
Total	35	0	418	85	13	25	3438	191	39	49	1	65	4,362

Table N-5: National PCB-Contaminated Mineral Oil Waste (net weight tonnes)

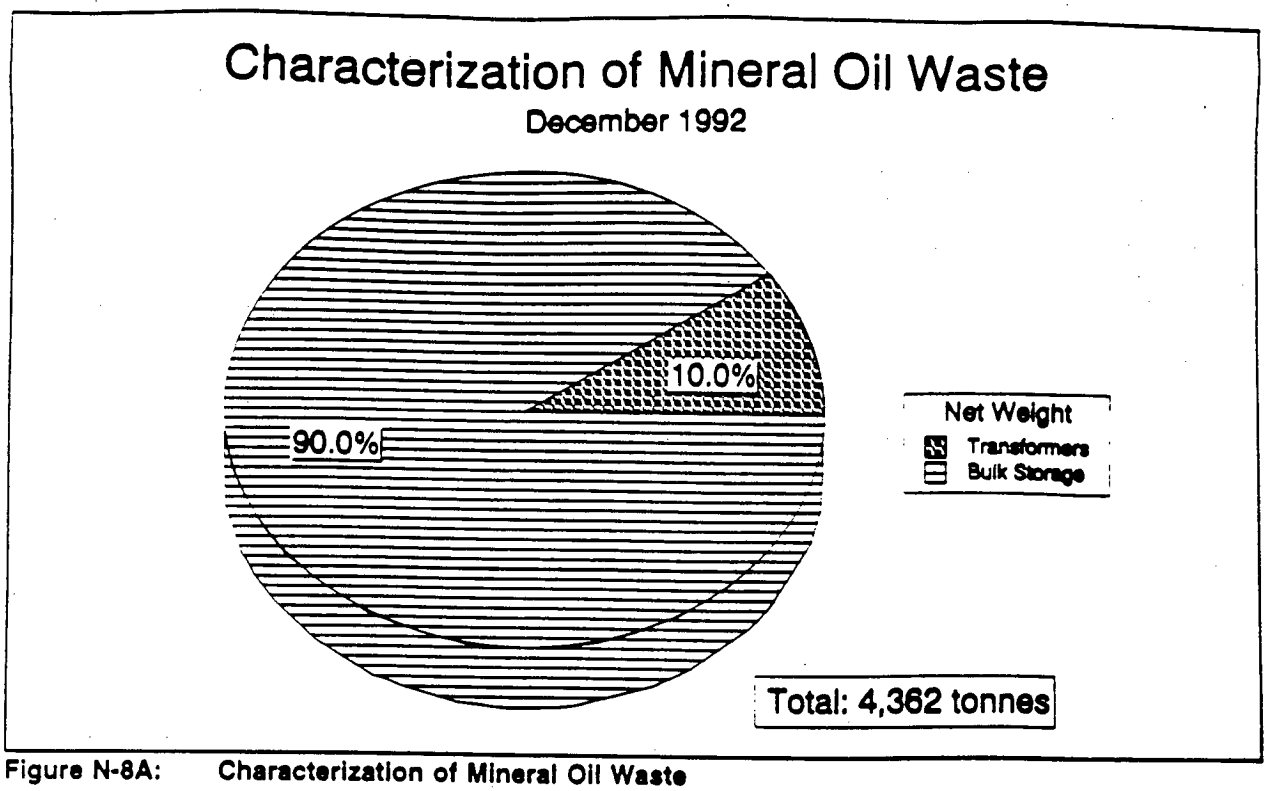

Figure N-8A: Characterization of Mineral Oil Waste

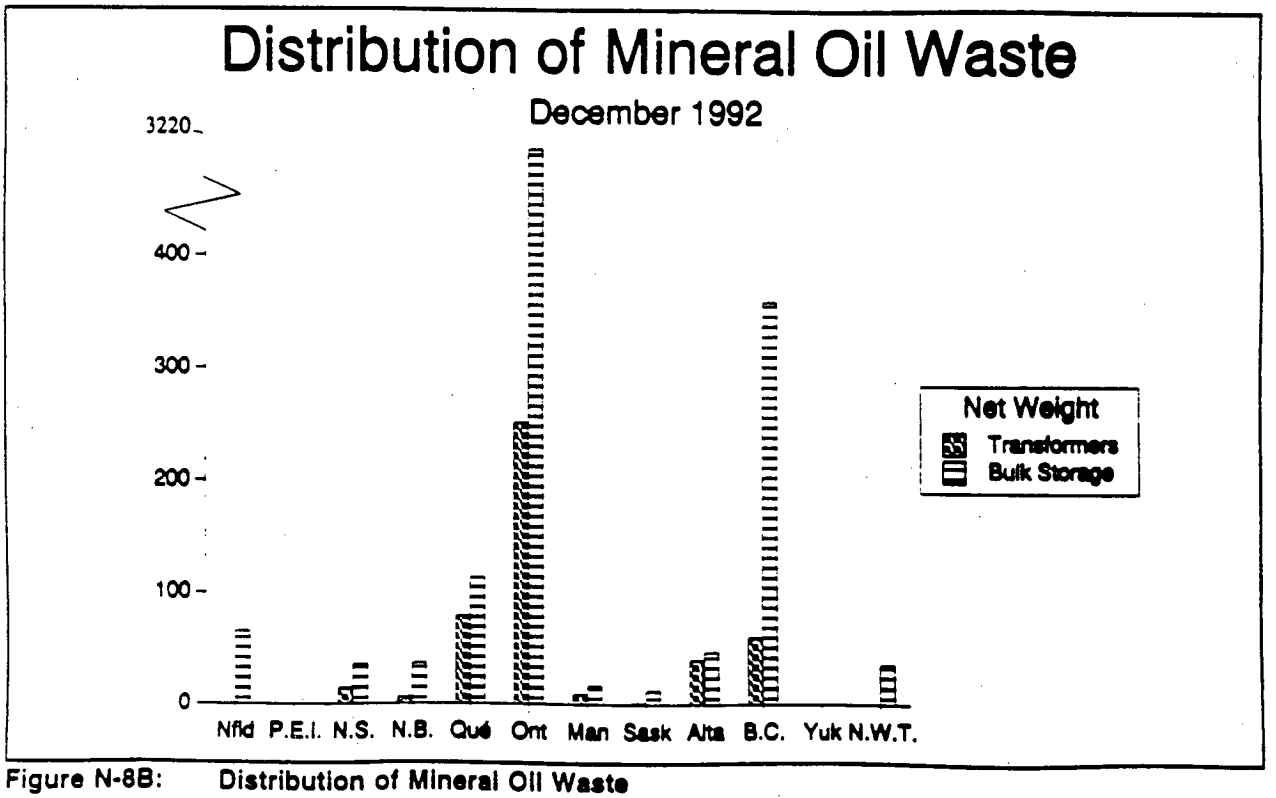

Figure N-8B: Distribution of Mineral Oil Waste

OTHER PCB WASTES

In addition to askarel stored in bulk containers and askarel-containing equipment, there are a variety of PCB-contaminated wastes in storage. These wastes represent the majority of total PCB wastes, 86% (123,258 tonnes). As illustrated in Figure N-9 and Table N-6 on page 11, this category includes such materials as:

- soil (101,141 tonnes, 82%)
- PCB-containing fluorescent lamp ballasts (10,311 tonnes, 8%)
- drained transformers and other equipment (2,540 tonnes, 2%)
- miscellaneous wastes, such as absorbents and clothing used in spill clean-up, and other debris (9,267 tonnes, 8%).

The total quantity of other PCB-contaminated wastes increased by 382 tonnes from the 122,876 tonnes reported at the end of December 1991.

The main factor in the increase in the quantity of PCB-contaminated wastes in the inventory was the increase in the quantity of fluorescent lamp ballasts by 3,100 tonnes. This increase in the quantity of fluorescent lamp ballasts in storage reflects both the continued phasing-out of these items from buildings across the country, as well as improvements in the inventory.

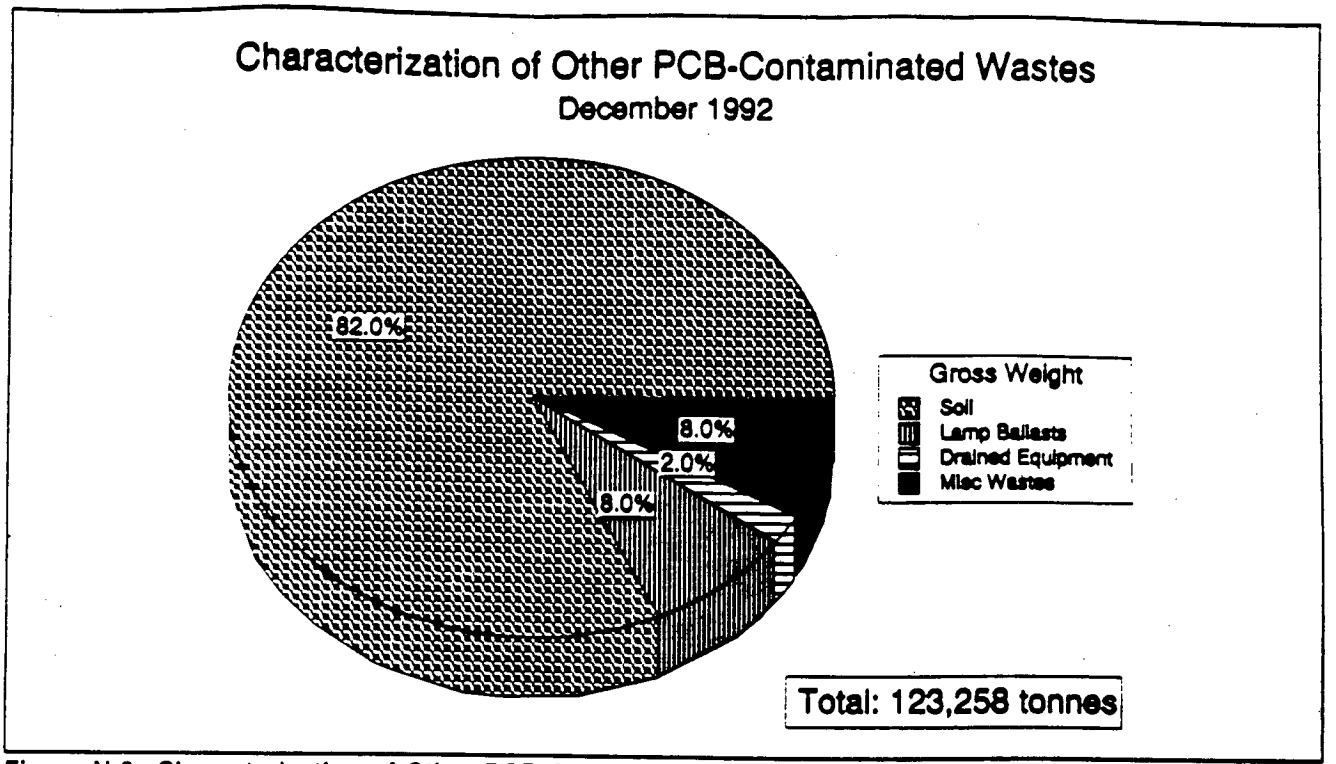

Figure N-9: Characterization of Other PCB-Contaminated Wastes

Item	Inventory	Percent
Soil	101,141 tonnes	82%
Fluorescent lamp Ballasts	10,311 tonnes	8%
Drained Equipment	2,540 tonnes	2%
Misc Wastes	9,267 tonnes	8%
Total	123,258 tonnes	100%

Table N-6: Other PCB-Contaminated Wastes (tonnes gross weight)

PCB WASTE STORAGE SITES

In December 1992, there were 3,130 PCB waste storage sites in Canada, an increase of 465 sites over the 3,106 sites identified in December 1991.

The total number of federally-owned PCB waste storage sites nationwide decreased by 97 sites from 593 in December 1991 to 496 in December 1992.

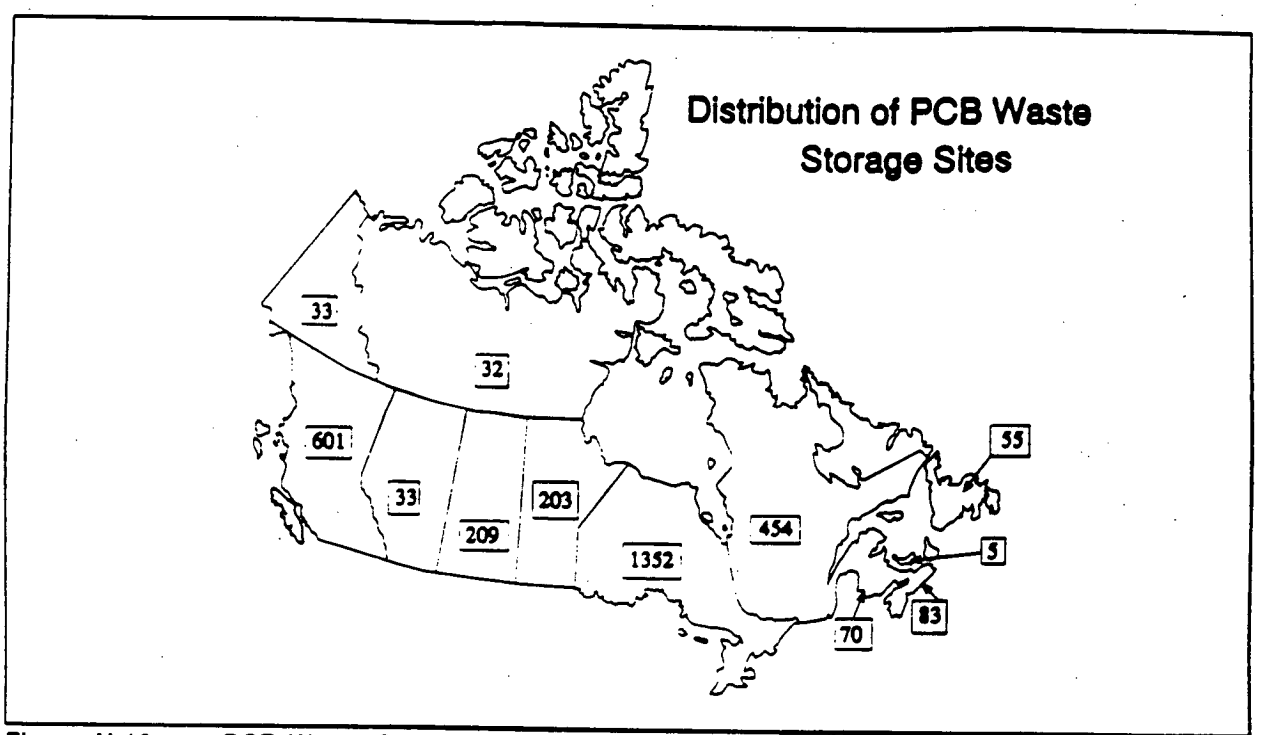

Figure N-10: **PCB Waste Storage Sites December 1992**

An analysis of PCB waste storage sites by the quantity of PCB wastes stored is presented in Figure N-11 and Table N-7. The sites are divided into the following categories:

- less than 100 kg
- 100 kg to 1 tonne
- 1 to 10 tonnes
- 10 to 100 tonnes
- 100 to 1,000 tonnes
- 1,000 to 10,000 tonnes
- greater than 10,000 tonnes

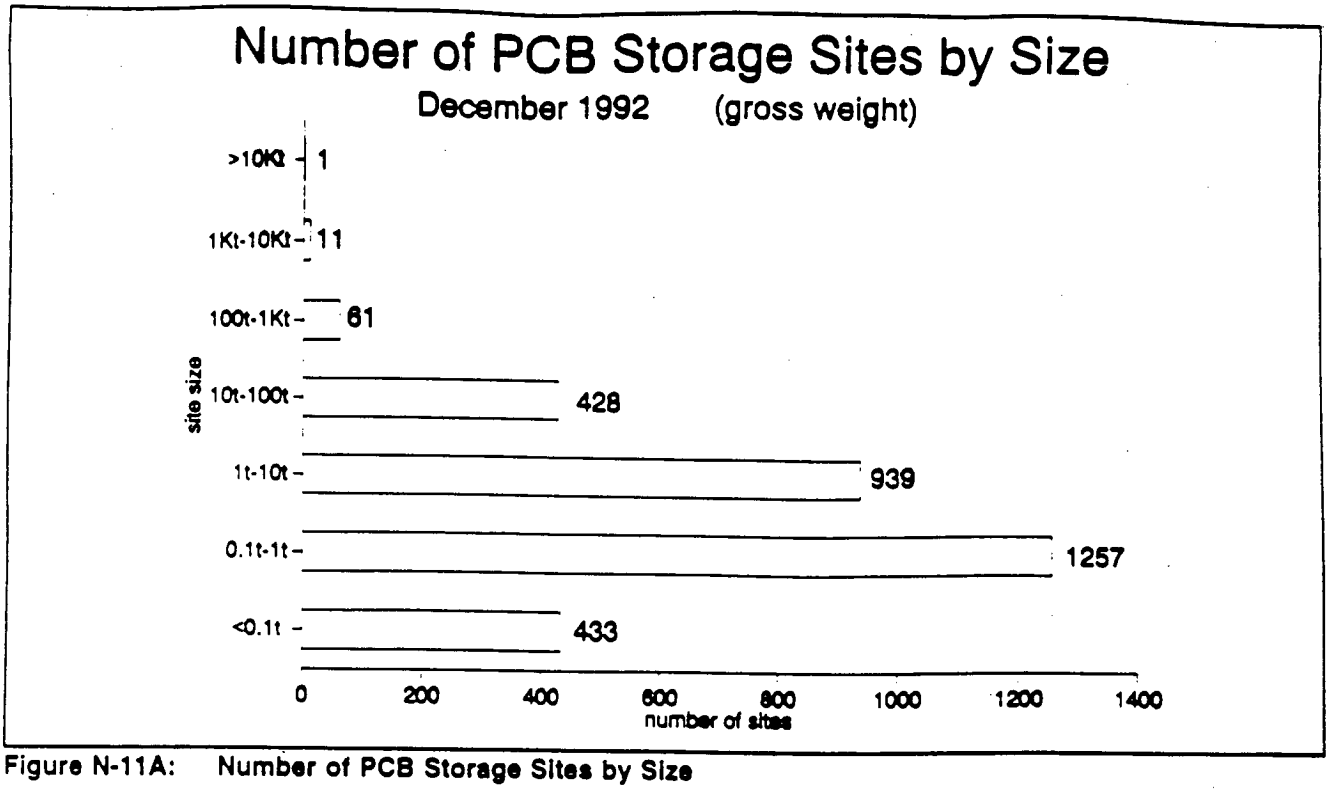

Figure N-11A: Number of PCB Storage Sites by Size

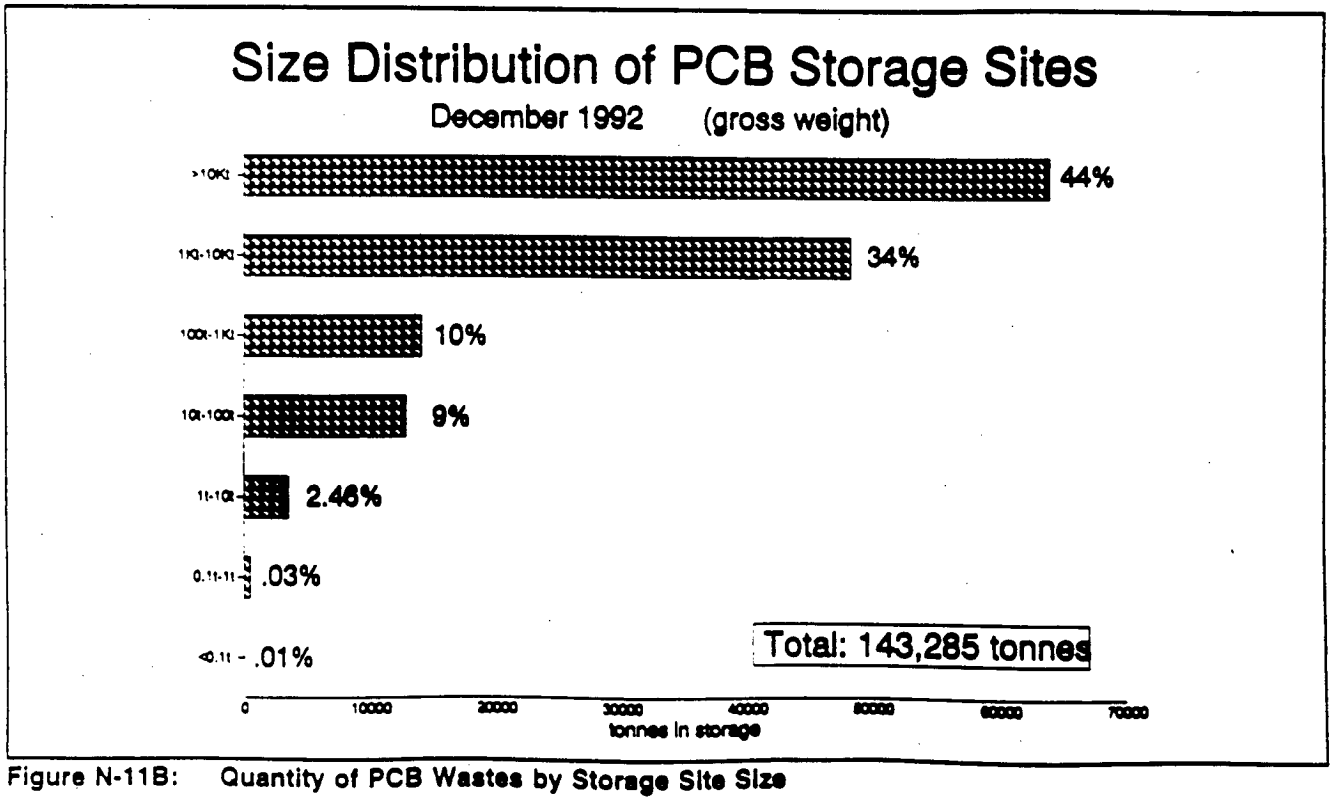

Figure N-11B: Quantity of PCB Wastes by Storage Site Size

64,000 tonnes (45%) of the total PCB wastes are stored in the largest PCB storage site in Canada.

48,413 tonnes (34%) of the PCB wastes are stored at the 11 sites containing between 1,000 and 10,000 tonnes each.

14,036 tonnes (10%) are stored at the 61 sites containing between 100 and 1,000 tonnes.

Cumulatively, 126,449 tonnes (88%) of all PCB wastes in Canada are stored at 73 (2%) of the 3,130 storage sites.

At the lower end of the waste-storage-site scale, the 428 sites containing between 10 and 100 tonnes of PCB wastes each, account for 9% (12,815 tonnes) of the total PCB wastes.

The 939 sites containing between one and ten tonnes each, contain only 3% (3,510 tonnes) of the total wastes.

The 1,257 sites containing between 100 kilograms and 1 tonne store only 0.3% (495 tonnes) of the total wastes.

And finally, the 433 sites containing less than 100 kg each account for a negligible proportion (16 tonnes) of the total quantity of PCB wastes.

This analysis indicates an uneven distribution of PCB waste storage sites nationwide (Figure N-10) and that a relatively small number of sites store the majority of the PCB wastes in Canada (Figures N-11A, N-11B, and Table N-7).

NATIONAL PCB WASTE STORAGE SITES
BY PROVINCE/TERRITORY AND SITE SIZE CLASS

December 1992

PROVINCE/ TERRITORY		<100 kg	100 kg - 1 tonne	1-10 tonnes	10-100 tonnes	100-1,000 tonnes	1,000 - 10,000 tonnes	> 10,000 tonnes	Total Sites / Total Tonnes
NFLD	No. of Sites	8	23	10	12	2	0	0	55
	Tonnes	0.6	[illegible]	42.0	379.2	257.9	0.0	0.0	688.7
PEI	No. of Sites	0	4	1	0	0	0	0	5
	Tonnes	0.0	2.1	4.5	0.0	0.0	0.0	[illegible]	6.6
NS	No. of Sites	12	33	23	11	3	1	0	83
	Tonnes	0.4	16.5	77.6	317.8	436.7	2,204.0	0.0	3,051.0
NB	No. of Sites	9	22	22	16	1	0	0	70
	Tonnes	0.5	7.4	86.7	630.6	165.5	0.0	0.0	890.7
QUE	No. of Sites	110	164	122	56	2	0	0	454
	Tonnes	[illegible]	58.7	513.8	1,678.3	1,136.0	0.0	0.0	3,379.0
ONT	No. of Sites	100	519	480	215	31	6	1	1,352
	Tonnes	[illegible]	213.6	1,828.5	6,292.3	7,603.5	[illegible]	[illegible]	[illegible]
MAN	No. of Sites	23	104	52	20	4	0	0	203
	Tonnes	0.8	38.9	151.3	538.8	768.8	0.0	0.0	[illegible]
SASK	No. of Sites	20	119	40	27	3	0	0	209
	Tonnes	0.7	53.8	117.8	935.5	426.1	0.0	[illegible]	1,528.9
ALTA	No. of Sites	3	13	6	8	1	2	0	33
	Tonnes	0.1	5.5	22.8	207.8	113.9	[illegible]	0.0	4,055.6
B.C.	No. of Sites	129	240	163	55	12	2	0	601
	Tonnes	5.1	86.7	586.2	1,511.4	2,442.9	[illegible]	0.0	12,412.3
YUK	No. of Sites	12	14	7	0	0	0	0	33
	Tonnes	[illegible]	[illegible]	28.6	0.0	0.0	0.0	0.0	29.1
NWT	No. of Sites	7	2	13	8	2	0	0	32
	Tonnes	[illegible]	[illegible]	59.1	326.0	702.6	[illegible]	0.0	1,088.7
National Totals	No. of Sites	433	1,257	939	428	61	11	1	3,310
	Tonnes	16.3	496.8	3,510.1	12,816.7	16,038.7	[illegible]	[illegible]	[illegible]

Table N-7: National PCB Waste Storage Sites by Province/Territory and Site Size

IN-USE ASKAREL

In December 1992, there were 730 tonnes (net weight) of in-use askarel in the federal inventory: 648 tonnes (89%) in transformers; 45 tonnes (6%) in capacitors; and 37 tonnes (5%) in other miscellaneous electrical and mechanical equipment (Figure F-1). The amount of in-use askarel for 1992 represents a decrease of 13 tonnes (2%) from the 1991 inventory of 743 tonnes.

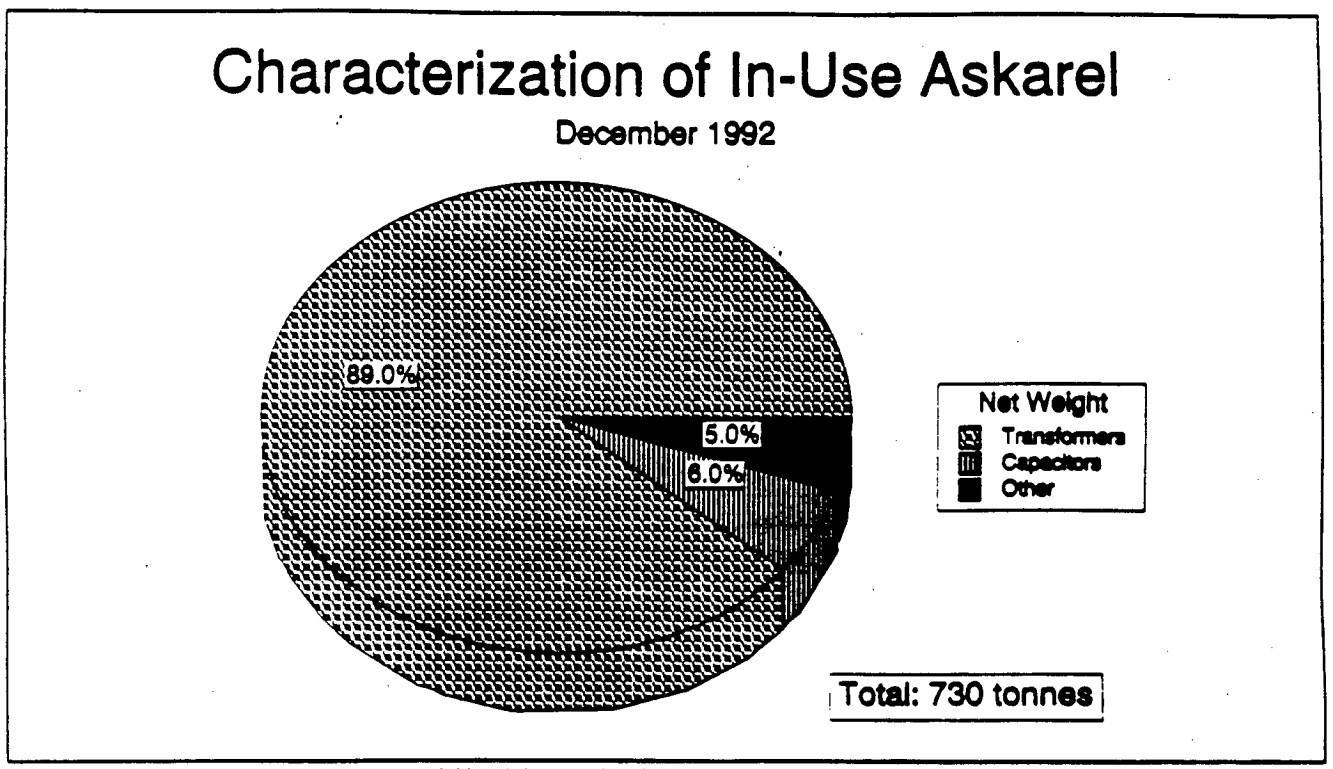

Figure F-1: **Federal In-Use Askarel Net Weight in Tonnes**

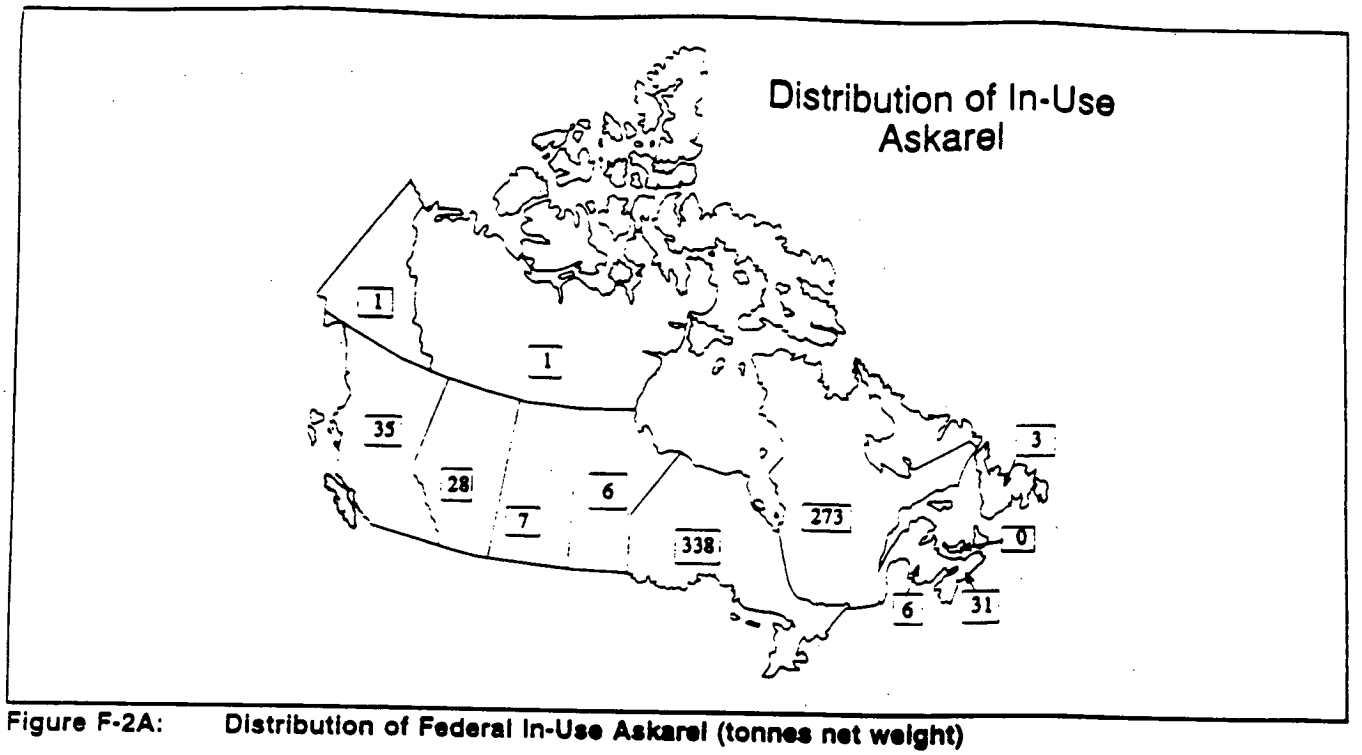

Figure F-2A: **Distribution of Federal In-Use Askarel (tonnes net weight)**

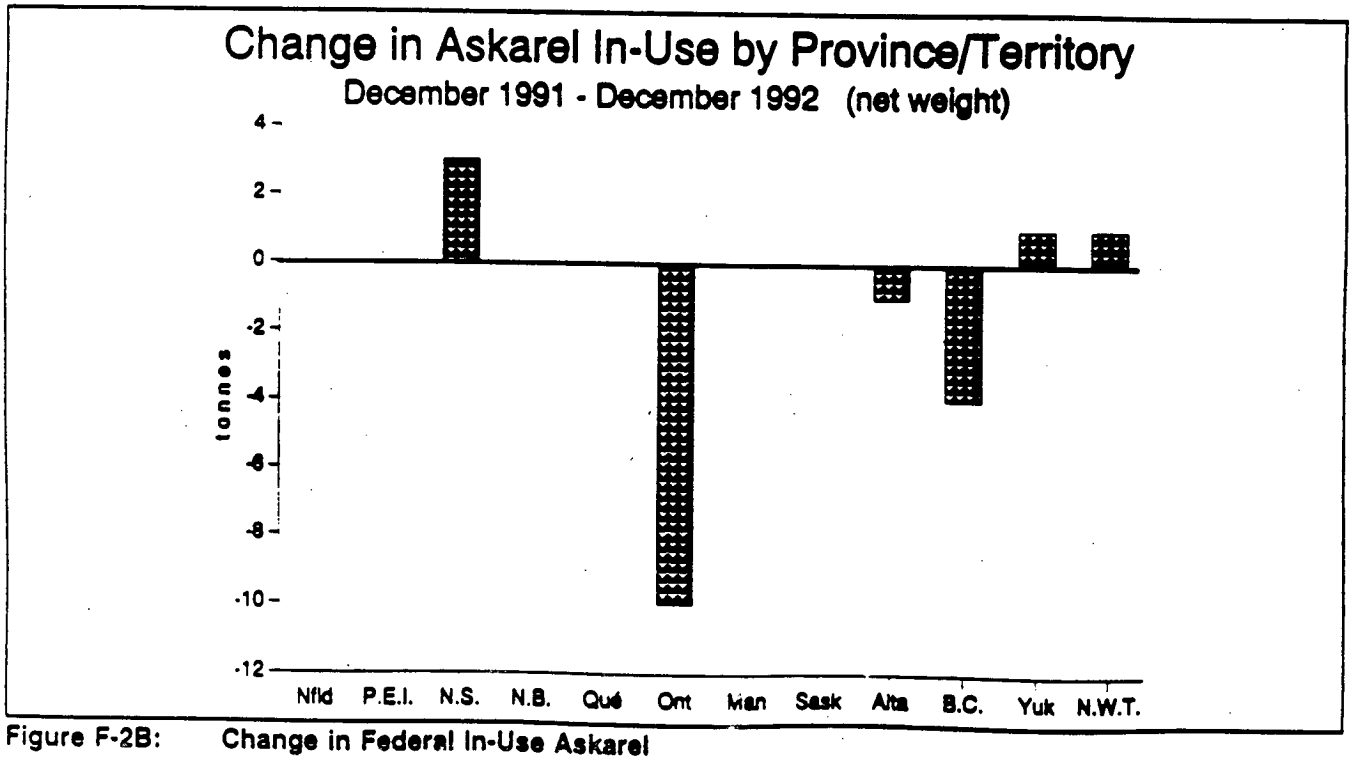

Figure F-2B: **Change in Federal In-Use Askarel**

Federal In-use Askarel (Tonnes of Askarel - Net Weight)			
Province	**1992**	**1991**	**CHANGE**
Nfld.	3	3	0
P.E.I.	0	0	0
N.S.	31	31	0
N.B.	6	6	0
Que.	273	273	0
Ont.	338	338	0
Man.	6	6	0
Sask.	7	7	0
Alta.	28	28	0
B.C.	35	35	0
Yuk.	1	1	
N.W.T.	1	1	

Table F-1: Federal In-use Askarel

The majority of the federal PCB-contaminated mineral oil is contained in transformers 125 tonnes (98%), while the remainder is contained in other equipment. The distribution of federal PCB-contaminated mineral oil is shown in Figure F-3 and Table F-2 below.

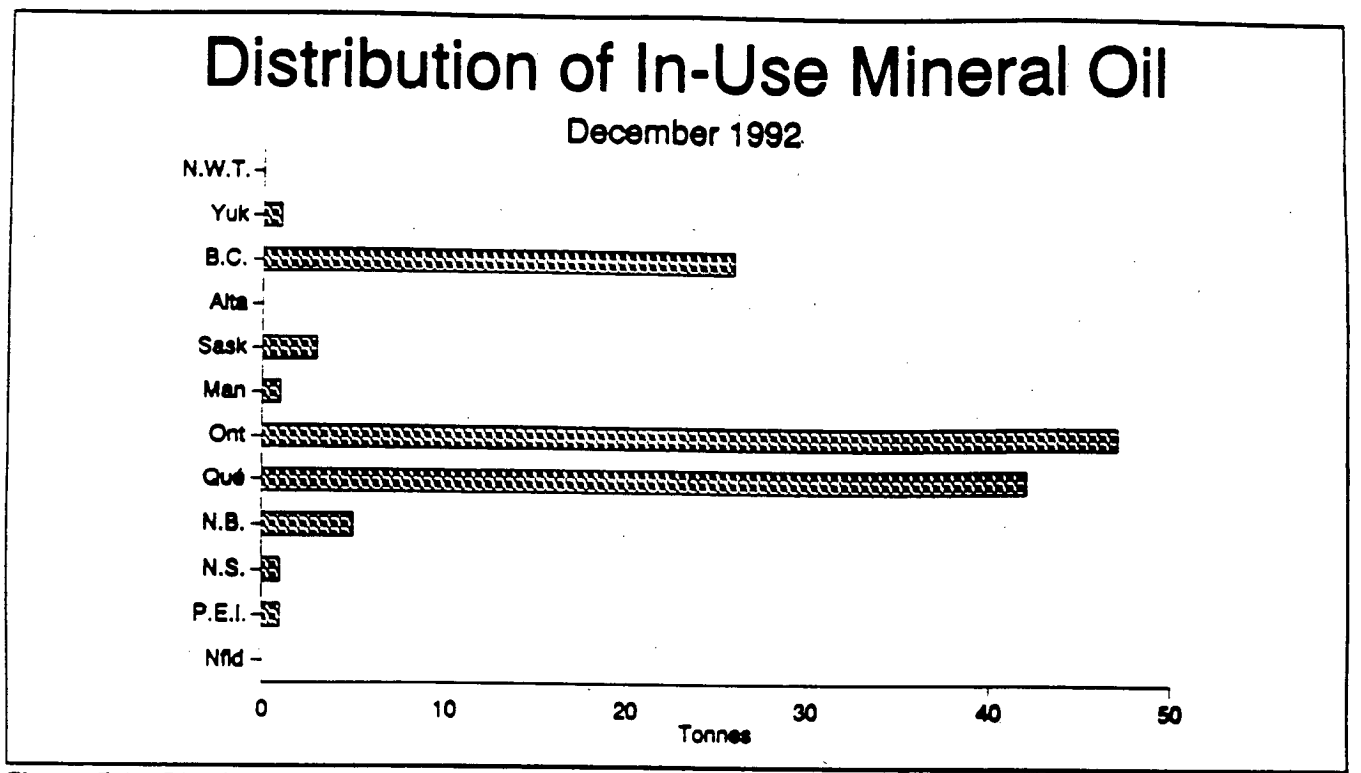

Figure F-3: Distribution of Federal In-Use Mineral Oil in tonnes

	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld	Total
Trans-formers	0	1	26	0	3	1	45	42	5	1	1	0	125
Other equip.	0	0	0	0	0	0	2	0	0	0	0	0	2
Total	0	4	44	0	3	1	46	42	5	1	1	0	127

Table F-2: Federal Distribution of In-Use Mineral Oil

TOTAL PCB WASTES

In December 1992 there were 4,977 tonnes (gross weight) of federally-owned PCB wastes in Canada. 1,259 tonnes (25%) of these wastes are bulk askarel and askarel-containing equipment, 1,012 tonnes (20%) are fluorescent lamp ballasts, 120 tonnes (2%) are PCB-contaminated mineral oil, 132 tonnes (3%) are drained askarel equipment, 2,333 tonnes (47%) are PCB-contaminated soils, and 122 tonnes (3%) are miscellaneous PCB-contaminated wastes. (Figure F-4)

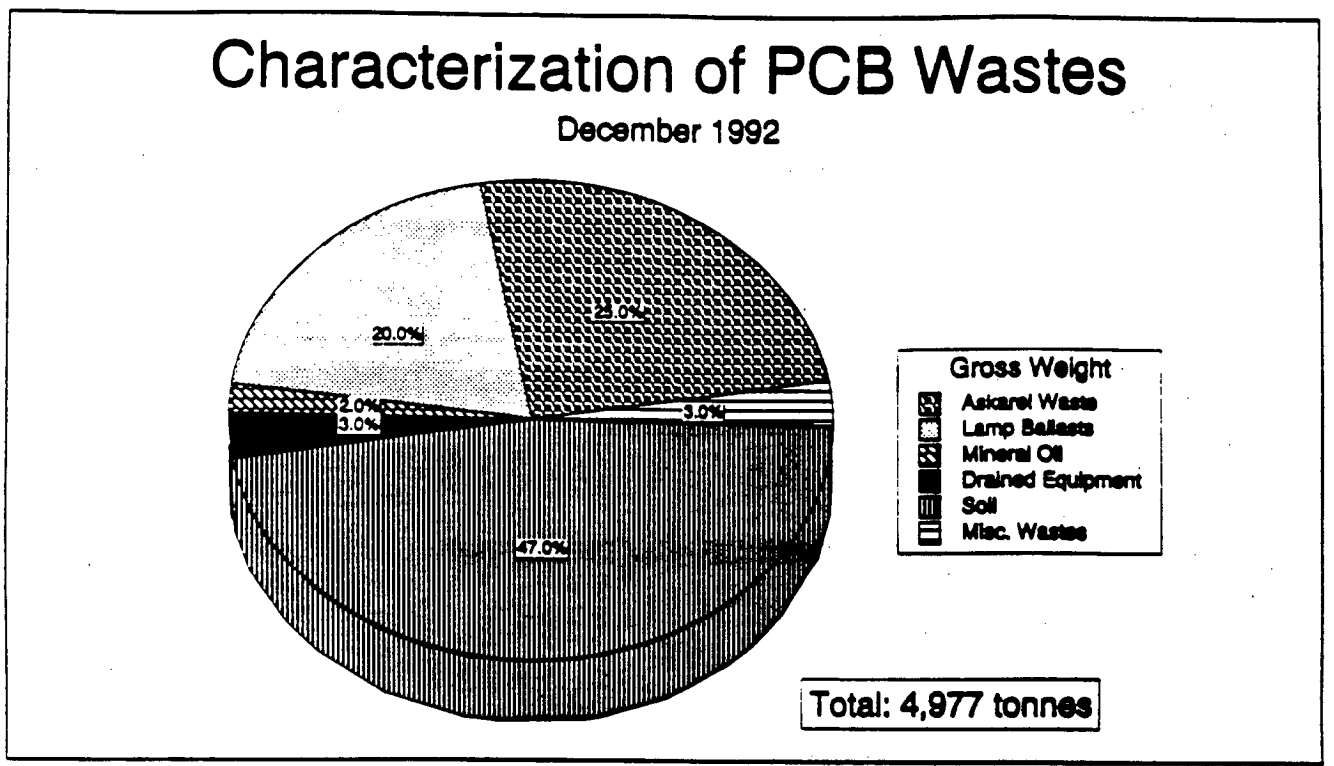

Figure F-4: Characterization of Federal PCB Waste

The total quantity of federal PCB wastes reported at the end of December 1992 increased by 40% (1,413 tonnes) since December 1991. This increase has three main components:

(1) The quantity of fluorescent lamp ballasts in storage increased by 722 tonnes) from 290 tonnes in December 1991 to 1,012 tonnes in December 1992 as more fluorescent lamp ballasts were identified or removed from service;

(2) The quantity of drained equipment doubled to 132 tonnes from December 1991 as more askarel-containing equipment was removed from service; and

(3) The quantity of bulk askarel and askarel-containing equipment increased by 556 tonnes from 703 tonnes in December 1991 to 1,259 tonnes in December 1992 as more equipment came out of service.

BY NET WEIGHT

In December 1992, there were approximately 409 tonnes of waste askarel in federally-regulated storage sites (Figure 5A): 163 tonnes (40%) in capacitors; 152 tonnes (37%) is in transformers; 64 tonnes (16%) is in bulk storage; and 30 tonnes (7%) is in miscellaneous other types of electrical and mechanical equipment. (Figure F-5, Table F-3)

The net weight of federal askarel waste in storage increased by 156 tonnes (62%) from 253 tonnes in December 1991 to 409 tonnes in December 1992. The most significant increase occurred in the capacitor category with a 201% increase from 54 tonnes in 1991 to 163 tonnes in 1962. The quantity of transformers increased by 31% (36 tonnes) from 116 tonnes in December 1991 to 152 tonnes in December 1992 as more transformers came out of service.

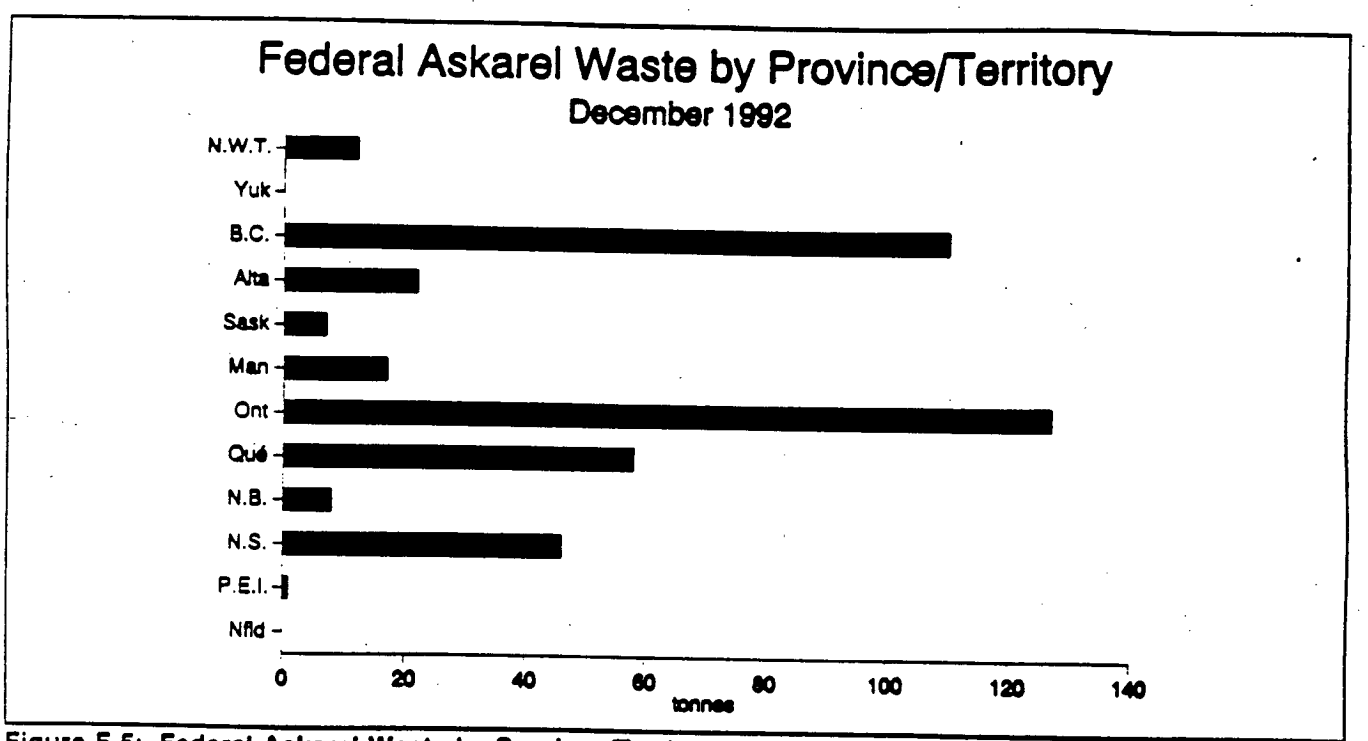

Figure F-5: **Federal Askarel Waste by Province/Territory (net weight tonnes)**

Net weight	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld
Inventory	12	0	110	22	7	17	127	58	8	46	1	1
Change from December 1991	-27	0	87	6	3	4	75	0	1	8	0	0

Table F-3: **Federal Askarel Waste by Province/Territory (net weight tonnes)**

BY GROSS WEIGHT

Viewed from a gross weight perspective, there were 1,259 tonnes of askarel and askarel equipment in storage for disposal. Transformers and capacitors comprise the majority, 456 tonnes (36%) and 643 tonnes (51%) respectively. 96 tonnes (8%) are classified as other askarel wastes, and bulk storage comprises 64 tonnes (5%). The gross weight of askarel in storage increased by 556 tonnes (80%) between December 1991 and December 1992.

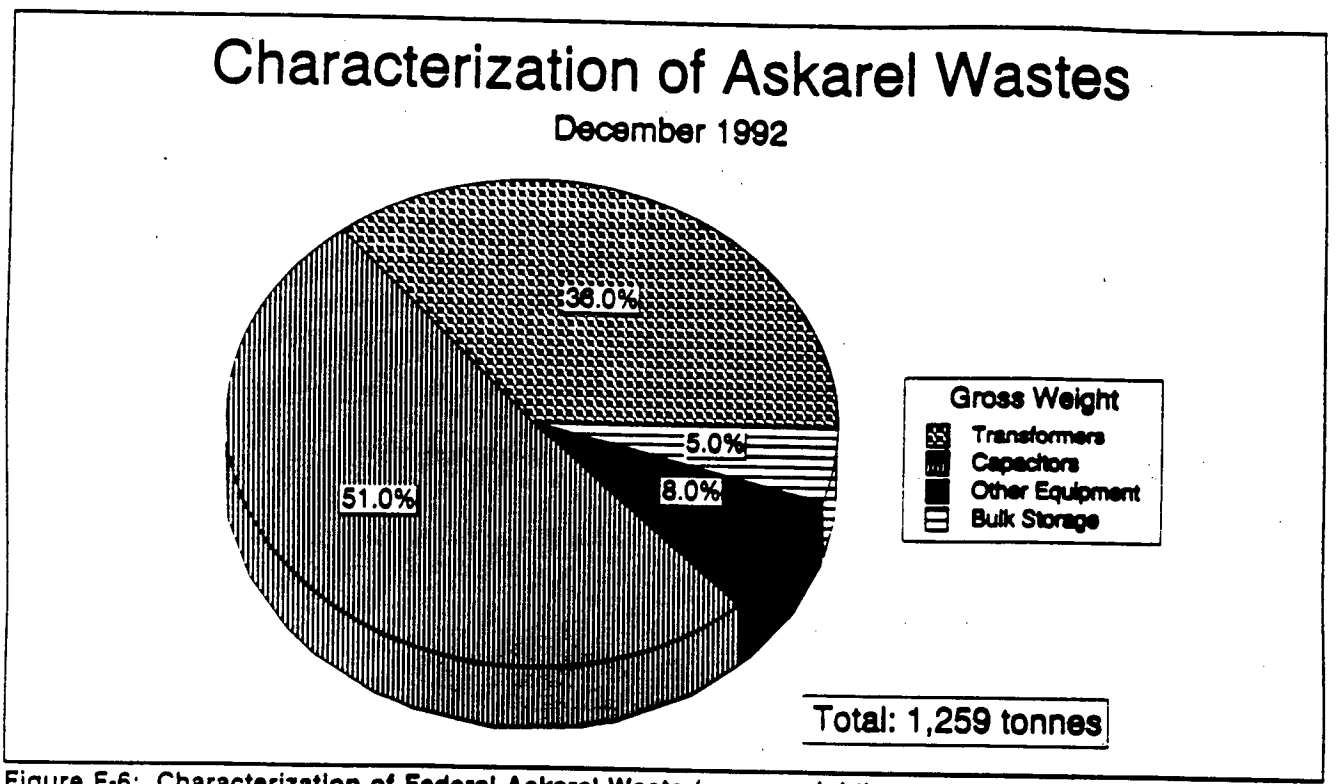

Figure F-6: Characterization of Federal Askarel Waste (gross weight)

Item	Inventory	Percent
Transformers	456 tonnes	36%
Capacitors	643 tonnes	51%
Other Equipment	96 tonnes	8%
Bulk Storage	64 tonnes	5%
Total	1,259 tonnes	100.0%

Table F-4: Characterization of Askarel Waste

MINERAL OIL WASTE

In December 1992 there were approximately 120 tonnes (net weight) of federally-owned PCB-contaminated mineral oil in storage.

Compared to 1991, the inventory of mineral oil waste increased by 27 tonnes from 93 tonnes to 120 tonnes.

Note:

PCB-contaminated mineral oil often goes directly from in-use equipment to a treatment facility without being stored and included in inventory.

	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld	Total
Transformers	0	0	16	0	0	0	21	10	2	1	0	0	50
Bulk storage	0	0	10	1	0	0	46	10	0	3	0	0	70
Total	0	0	26	1	0	0	67	20	2	4	0	0	120

Table F-5: Federal PCB-Contaminated Mineral Oil Waste (net weight tonnes)

OTHER PCB WASTES

In addition to askarel stored in bulk containers and askarel-containing equipment, there are a variety of PCB-contaminated wastes in storage. These wastes represent the majority of total PCB wastes, 3,598 tonnes (72%). As illustrated in Figure F-7 on page 26, this classification includes such materials as:

- soil (2,333 tonnes, 65%)
- PCB-containing fluorescent lamp ballasts (1,012 tonnes, 28%)
- drained transformers and other equipment (132 tonnes, 4%).
- miscellaneous wastes, such as absorbents and clothing used in spill clean-up, and other debris (122 tonnes, 3%)

The total quantity of other PCB-contaminated wastes increased by 830 tonnes from the 2,768 tonnes reported at the end of December 1991.

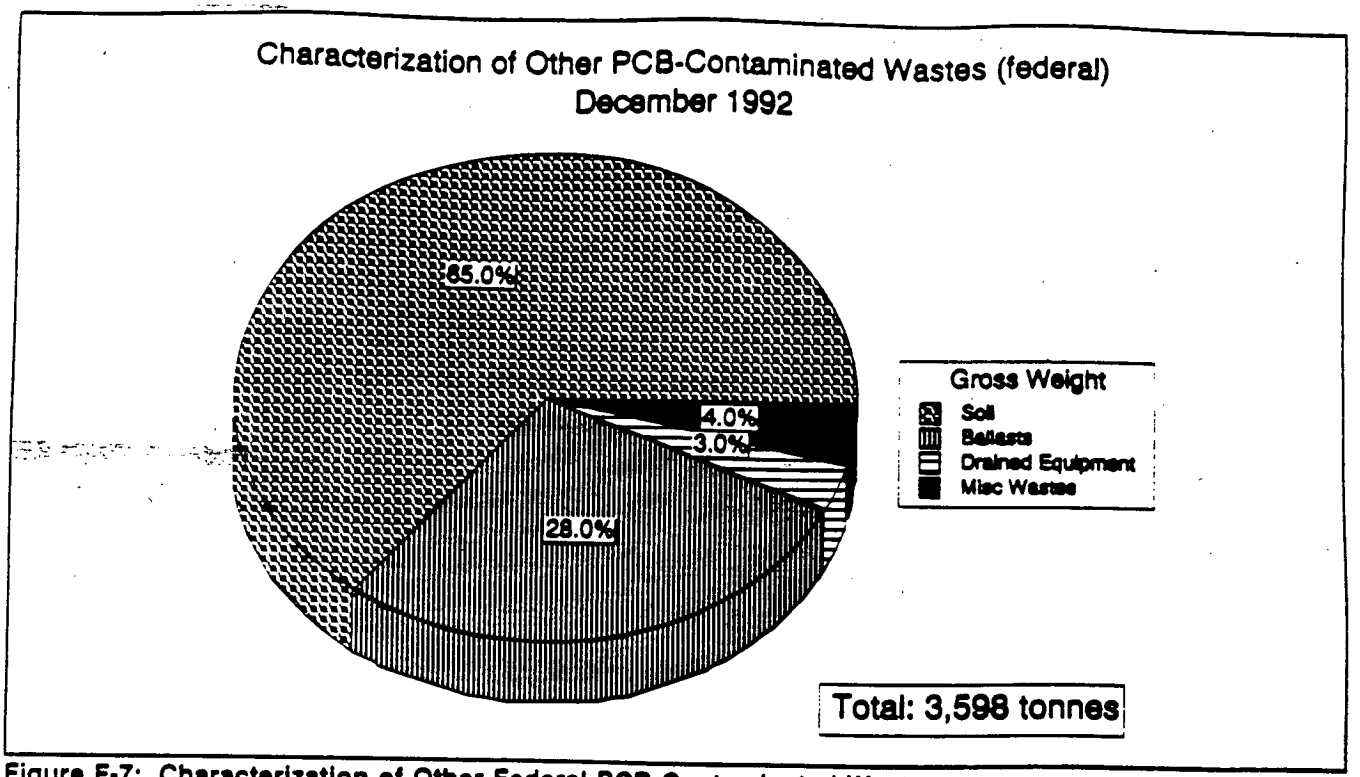

Figure F-7: Characterization of Other Federal PCB-Contaminated Wastes

Item	Inventory	Percent
Soil	2,333 tonnes	65%
Fluorescent lamp ballasts	1,012 tonnes	28%
Drained Equipment	132 tonnes	4%
Misc Wastes	122 tonnes	3%
Total	3,598 tonnes	100%

Table F-6: Other Federal PCB-Contaminated Wastes

PCB WASTE STORAGE SITES

In December 1992, there were 496 federally-owned PCB waste storage sites in Canada, a decrease of 97 sites since December 1991.

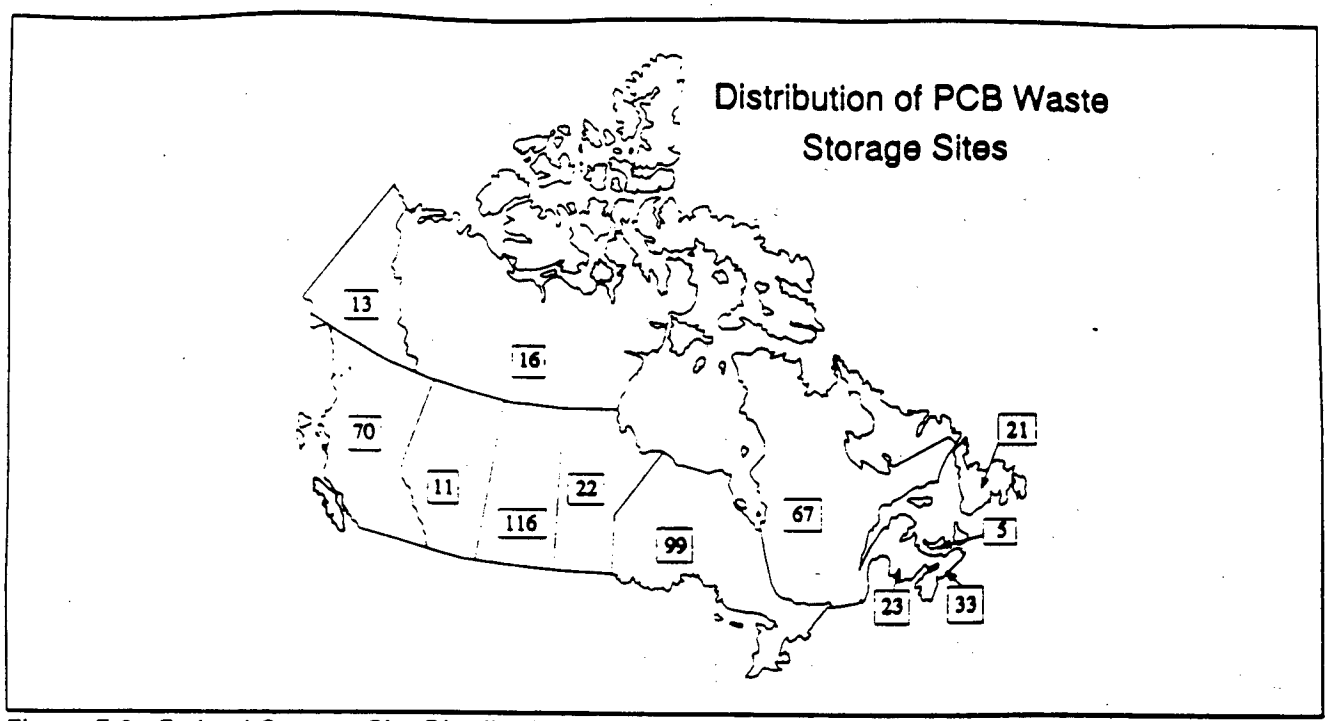

Figure F-8: Federal Storage Site Distribution

An analysis of federally-owned PCB waste storage sites by the quantity of PCB wastes stored is presented in Figure 3B and Table F-7. The sites are divided into the following categories:

- less than 100 kg
- 100 kg to 1 tonne
- 1 to 10 tonnes
- 10 to 100 tonnes
- 100 to 1,000 tonnes
- 1,000 to 10,000 tonnes
- greater than 10,000 tonnes

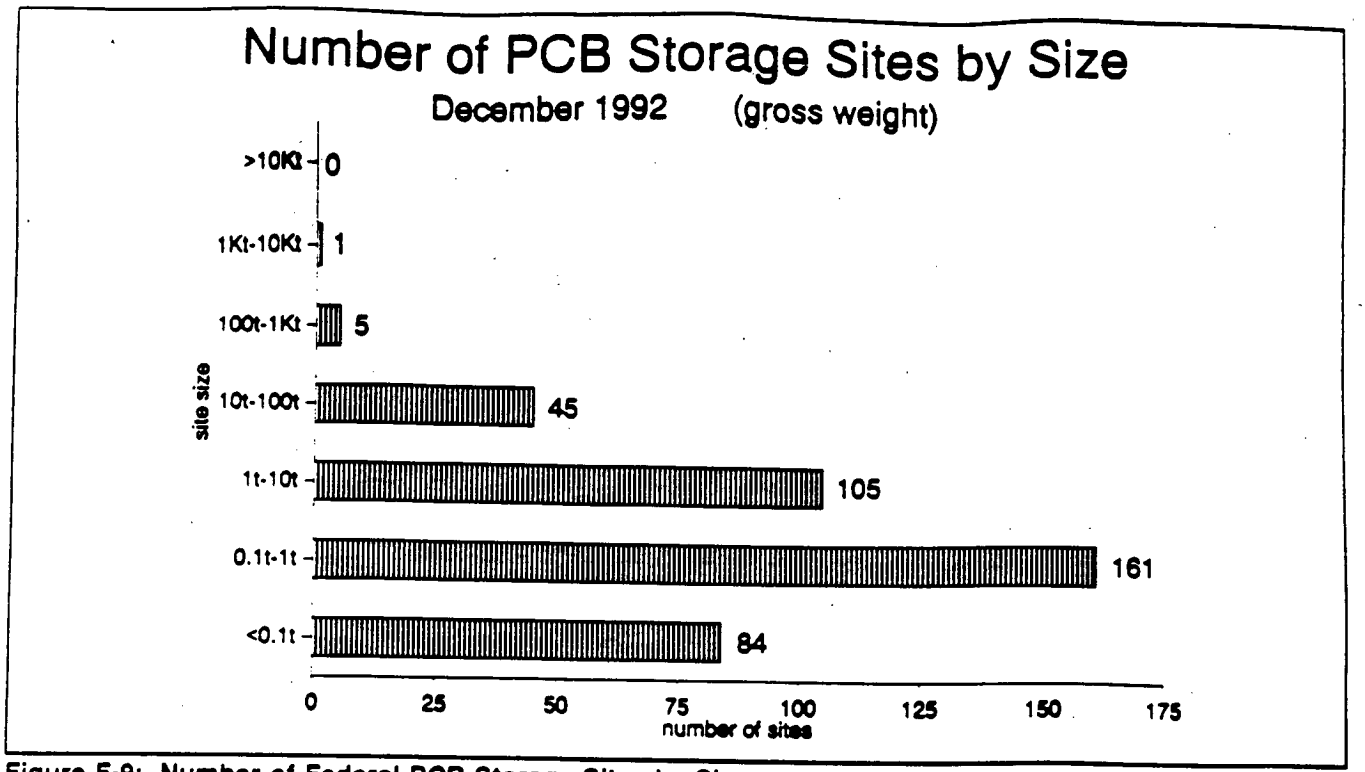

Figure F-9: Number of Federal PCB Storage Sites by Size

2,204 tonnes (44%) of the federal PCB wastes are stored at the single large (> 10,000 tonnes) site in Nova Scotia. 1,369 tonnes (28%) are stored at the 47 sites containing between 10 and 100 tonnes. Cumulatively, 4,402 tonnes (88%) of all federal PCB wastes in Canada are stored at 53 of the 503 federal storage sites.

At the lower end of the waste-storage-site scale, the 237 sites containing between 100 kg and 1 tonne of PCB wastes each, account for only 2% (97 tonnes) of the total federal PCB wastes. The 124 sites containing between one and ten tonnes each, contain only 10% (476 tonnes) of the total PCB wastes.

This analysis indicates an uneven distribution of federal PCB waste storage sites and that a relatively small number of sites (53) store the majority of the PCB wastes in Canada (see Figure F-9).

Although the number of federal PCB waste storage sites decreased, the total amount of PCB waste in storage increased by 1,413 tonnes from 3,564 to 4,977 tonnes. This increase represents a 40% increase since December 1991.

FEDERAL PCB WASTE STORAGE SITES
BY PROVINCE/TERRITORY AND SITE SIZE CLASS

December 1992

PROVINCE/ TERRITORY		< 100 kg	100 kg - 1 tonne	1 - 10 tonnes	10 - 100 tonnes	100-1,000 tonnes	1,000 - 10,000 tonnes	> 10,000 tonnes	Total Sites / Total Tonnes
NFLD	No. of Sites	4	13	2	2	0	0	0	21
	Tonnes	0.1	5.5	7.7	101.6	0.0	0.0	0.0	114.9
PEI	No. of Sites	0	4	1	0	0	0	0	5
	Tonnes	0.0	2.1	4.5	0.0	0.0	0.0	0.0	6.6
NS	No. of Sites	6	15	7	4	0	1	0	33
	Tonnes	0.2	6.7	22.5	154.8	0.0	2,204.0	0.0	2,388.2
NB	No. of Sites	4	9	9	1	0	0	0	23
	Tonnes	0.2	3.7	28.5	14.5	0.0	0.0	0.0	46.9
QUE	No. of Sites	5	37	17	8	0	0	0	67
	Tonnes	0.3	10.9	78.7	144.9	[illegible]	[illegible]	[illegible]	[illegible]
ONT	No. of Sites	15	35	41	7	1	0	0	99
	Tonnes	0.7	15.7	184.0	226.0	168.5	0.0	[illegible]	[illegible]
MAN	No. of Sites	3	11	3	5	1	0	0	22
	Tonnes	0.1	4.2	13.3	67.2	[illegible]	[illegible]	[illegible]	[illegible]
SASK	No. of Sites	4	84	24	3	1	0	0	116
	Tonnes	0.1	38.4	39.5	89.0	196.6	[illegible]	[illegible]	[illegible]
ALTA	No. of Sites	0	7	2	2	0	0	0	11
	Tonnes	0.0	2.7	2.7	68.7	0.0	[illegible]	[illegible]	78.1
BC	No. of Sites	33	12	13	10	2	0	0	70
	Tonnes	8.6	8.8	48.8	301.5	313.8	0.0	[illegible]	668.2
YUK	No. of Sites	4	8	1	0	0	0	0	13
	Tonnes	[illegible]	3.5	1.6	0.0	0.0	0.0	[illegible]	6.0
NWT	No. of Sites	4	2	4	5	1	0	0	16
	Tonnes	0.1	1.5	18.2	198.6	150.5	0.0	[illegible]	[illegible]
FEDERAL TOTALS	No. of Sites	82	237	124	47	5	1	0	496
	Tonnes	2.5	97.2	476.0	1,367.8	[illegible]	[illegible]	[illegible]	[illegible]

Table F-7: Federal PCB Waste Storage Sites

IN-USE ASKAREL

In December 1992, there were 11,758 tonnes (net weight) of in-use askarel in the non-federal inventory: 9,766 tonnes (83%) in transformers; 1,864 tonnes (16%) in capacitors; and 128 tonnes (1.0%) in other miscellaneous electrical and mechanical equipment (Figure NF-1). The amount of in-use askarel for 1992 represents an decrease of 754 tonnes (6%) from the 1991 inventory of 12,512 tonnes.

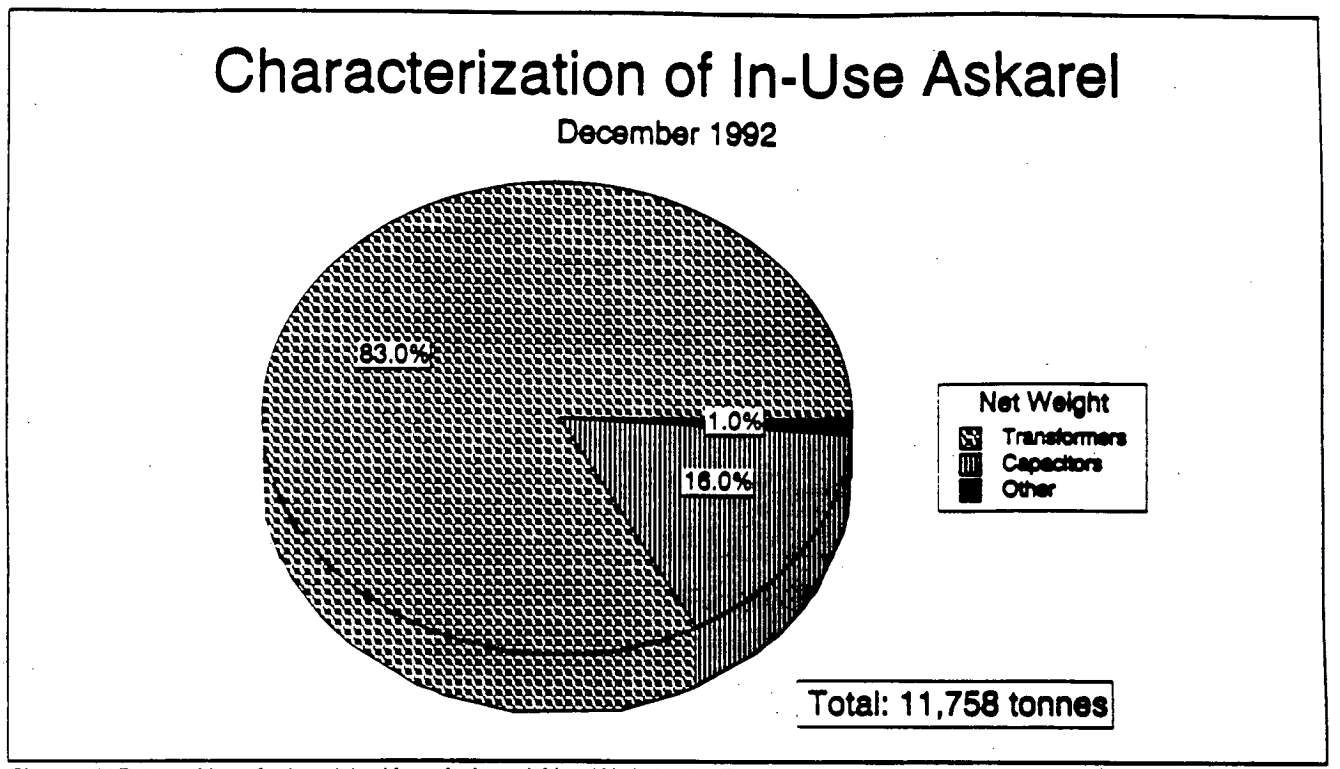

Figure NF-1: Non-federal In-Use Askarel Net Weight in Tonnes

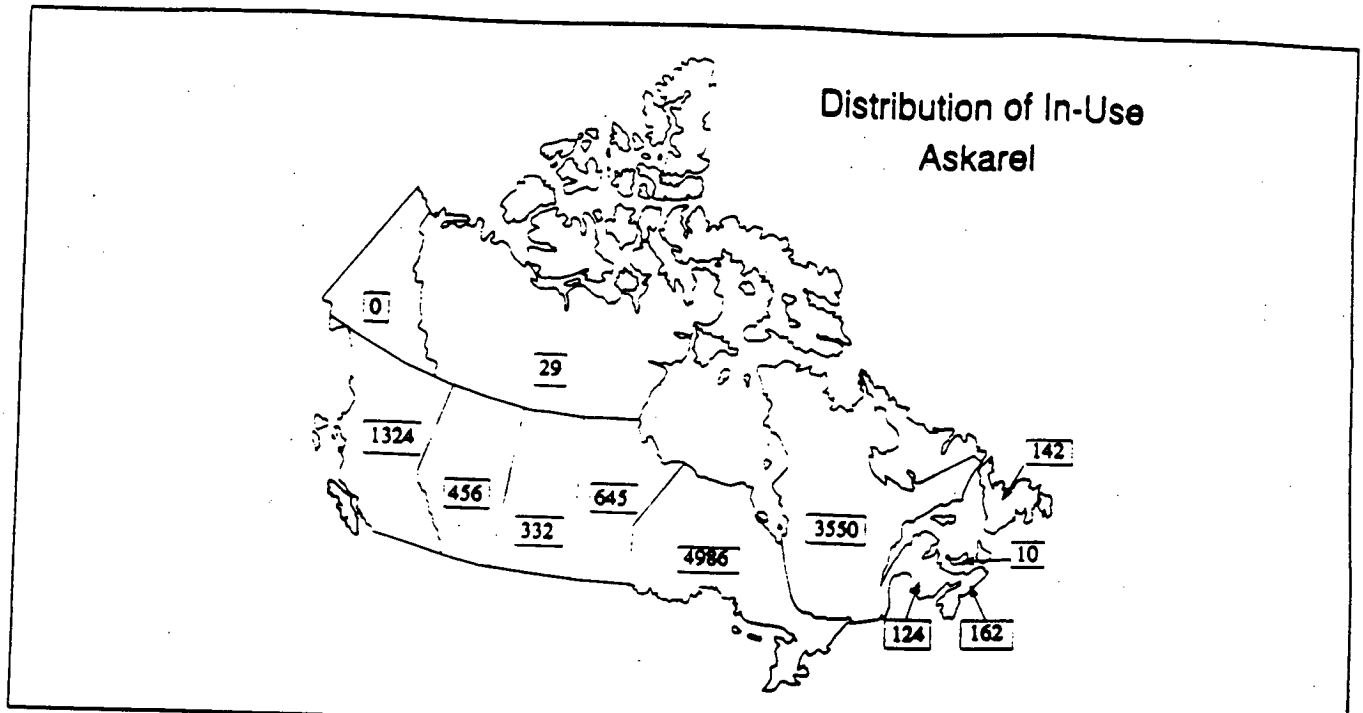

Figure NF-2A: Distribution of Non-federal In-Use Askarel (tonnes net weight)

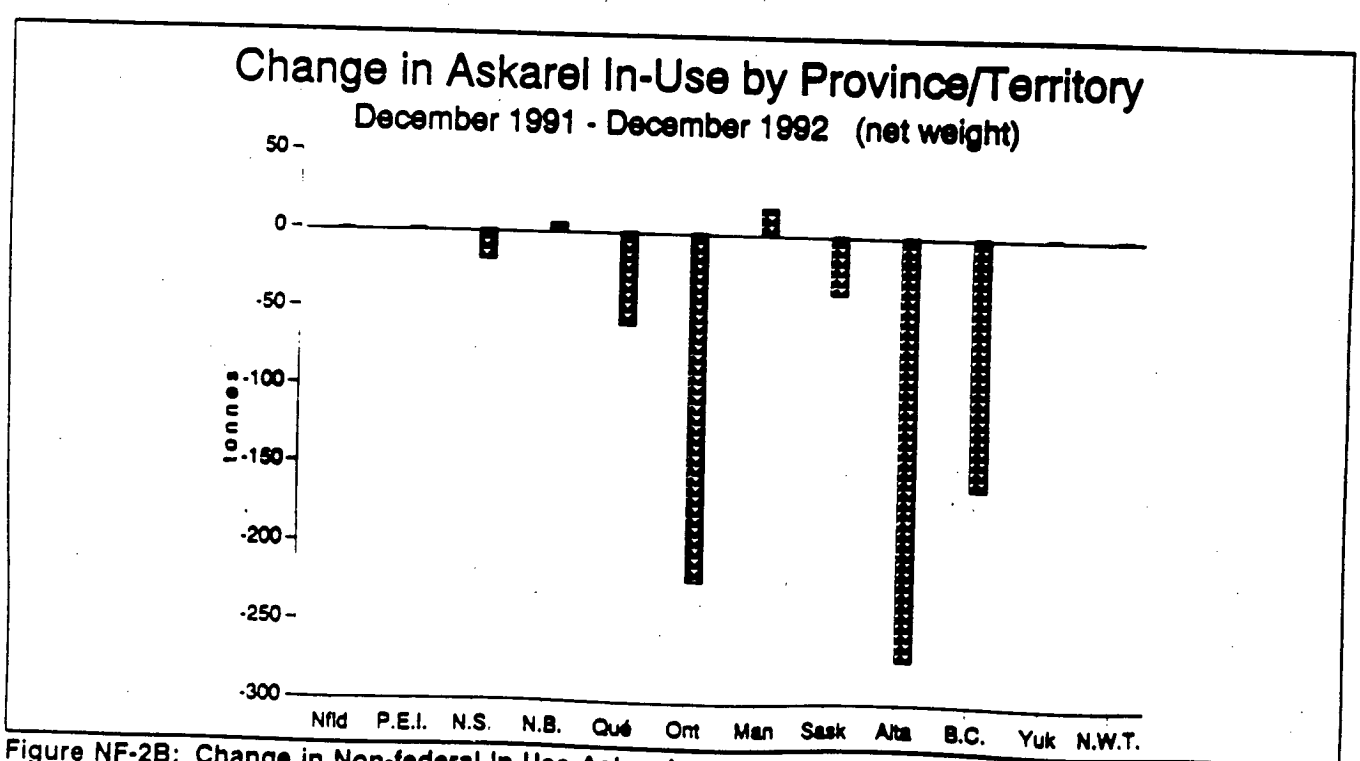

Figure NF-2B: Change in Non-federal In-Use Askarel

Non-federal In-use Askarel (Tonnes of Askarel - Net Weight)			
Province/ Territory	1992	1991	CHANGE
Nfld.	142	142	0
P.E.I.	10	11	-1
N.S.	162	181	-19
N.B.	124	119	5
Que.	3,550	3,610	-60
Ont.	4,986	5,207	-221
Man.	645	628	17
Sask.	332	370	-38
Alta.	456	728	-272
B.C.	1,324	1,487	-163
Yuk.	0	0	0
N.W.T.	29	29	0

Table NF-1: Non-federal In-use Askarel

The majority (1,918 tonnes, 96%) of the non-federal PCB-contaminated mineral oil is contained in transformers while the remainder is contained in other equipment. The distribution of non-federal PCB-contaminated mineral oil is shown in Figure NF-3 and Table NF-2 below.

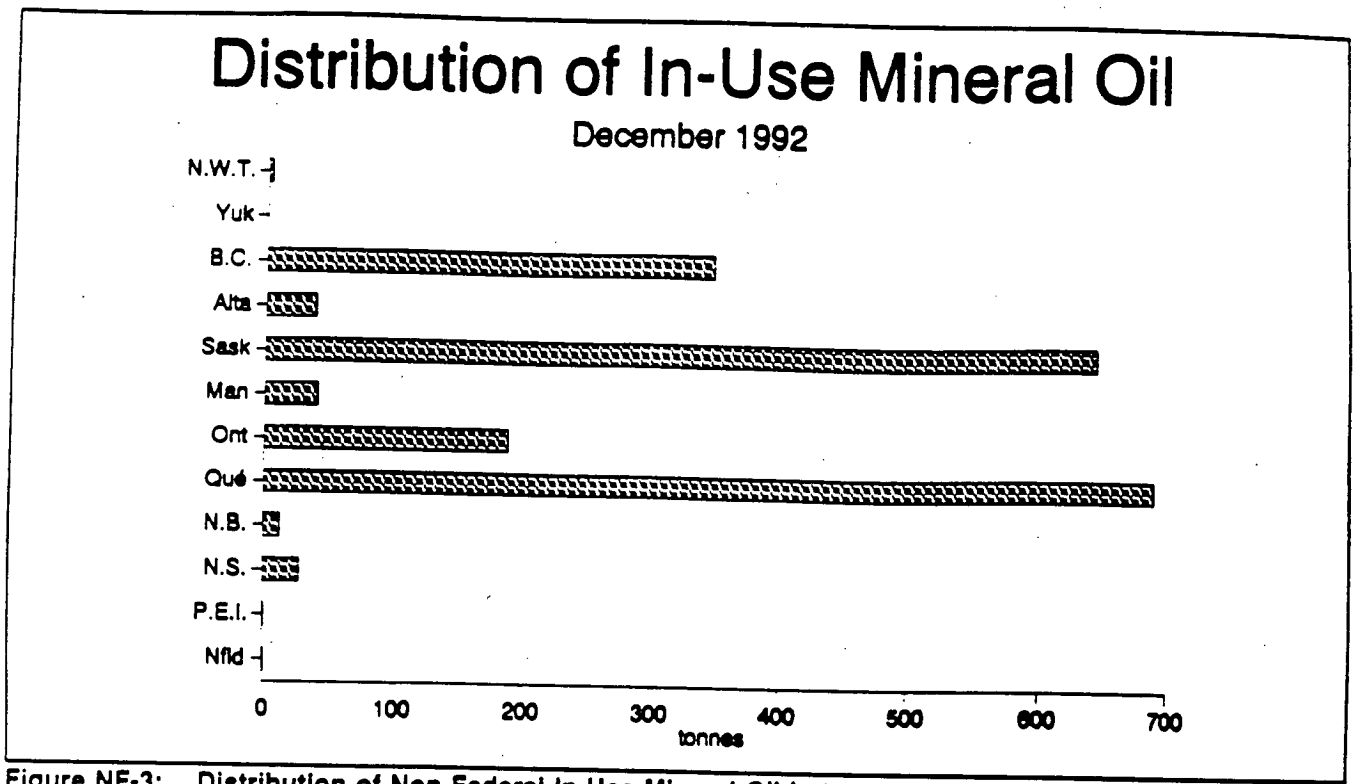

Figure NF-3: Distribution of Non-Federal In-Use Mineral Oil in tonnes

	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld	Total
Trans-formers	2.5	0	347	39	585	40	188	674	13	28	1	1	1,918
Other equip.	0	0	0	0	58	1	0	15	0	0	0	0	75
Total	2.5	0	347	39	643	41	188	689	13	28	1	1	1,993

Table NF-2: Distribution of Non-federal In-Use Mineral Oil in tonnes

TOTAL PCB WASTES

In December 1992 there were 138,308 tonnes (gross weight) of provincially-regulated PCB wastes in Canada. 14,404 tonnes (10%) of these wastes are askarel waste: 9,299 tonnes (7%) are fluorescent lamp ballasts, 4,242 tonnes (3%) are PCB-contaminated mineral oil, 2,408 tonnes (2%) are drained askarel equipment, 98,808 tonnes (71%) are PCB-contaminated soils, and 9,145 tonnes (7%) are miscellaneous PCB-contaminated wastes. (Fig NF-4)

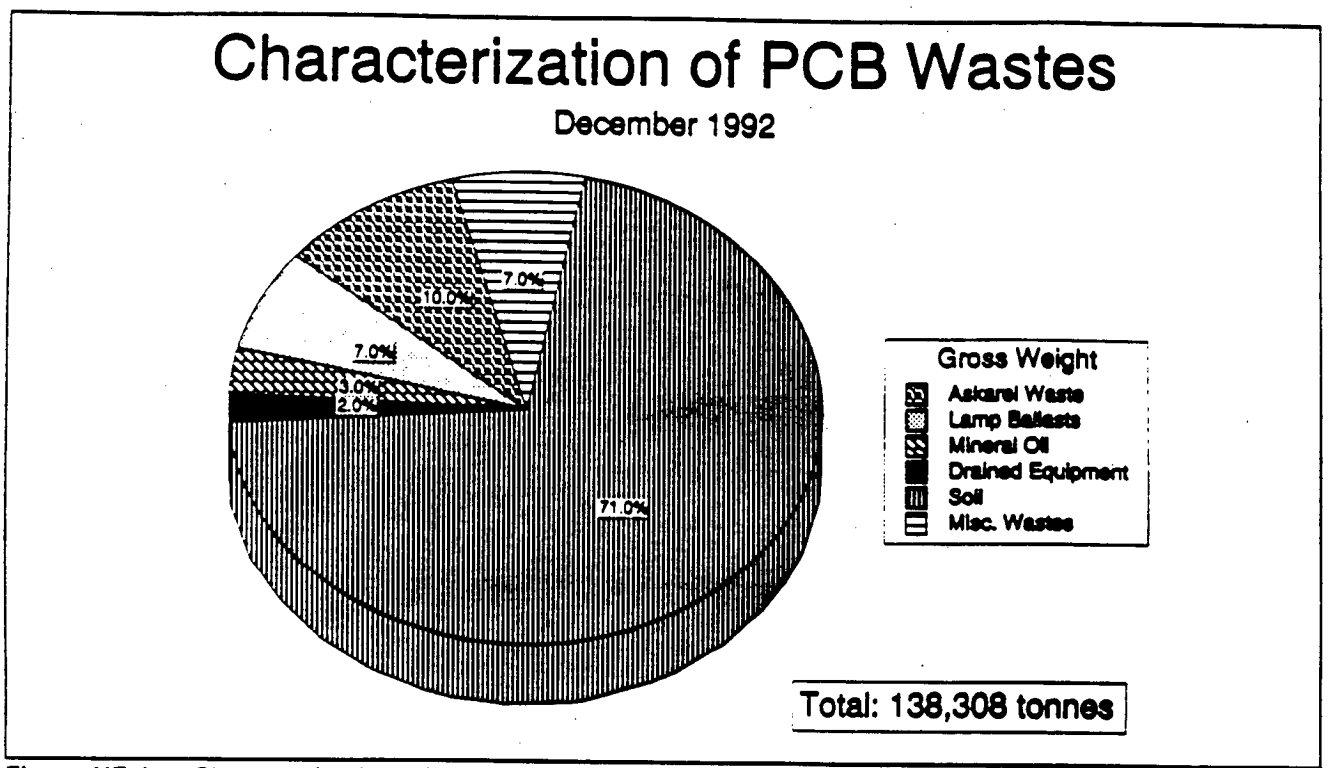

Figure NF-4: Characterization of Non-federal PCB Waste

The total quantity of non-federal PCB wastes reported at the end of December 1992 increased by 15% (18,200 tonnes) since December 1991. This increase has three main components:

(1) The quantity of askarel equipment increased by 4% (566 tonnes) from 13,840 tonnes in December 1991 to 14,404 tonnes in December 1992 as more askarel equipment was removed from service;

(2) The quantity of fluorescent lamp ballasts increased by 34% (2,378 tonnes) from 6,921 tonnes in December 1991 to 9,299 tonnes in December 1992; and

(3) The quantity of miscellaneous wastes increased by 11% (898 tonnes) from 8,247 tonnes in December 1991 to 9,145 tonnes in December 1992 as more miscellaneous wastes were identified in the inventory.

BY NET WEIGHT

In December 1992, there were approximately 5,669 tonnes of waste askarel in provincially-regulated storage sites. 1,746 tonnes (31%) is in transformers; 1,744 tonnes (31%) is in capacitors; 2,172 tonnes (38%) is in bulk storage; and 7 tonnes (0.1%) is in miscellaneous other types of electrical and mechanical equipment.

The net weight of non-federal waste askarel in storage increased by 253 tonnes (5%) from 5,416 tonnes in December 1991 to 5,669 tonnes in December 1992.

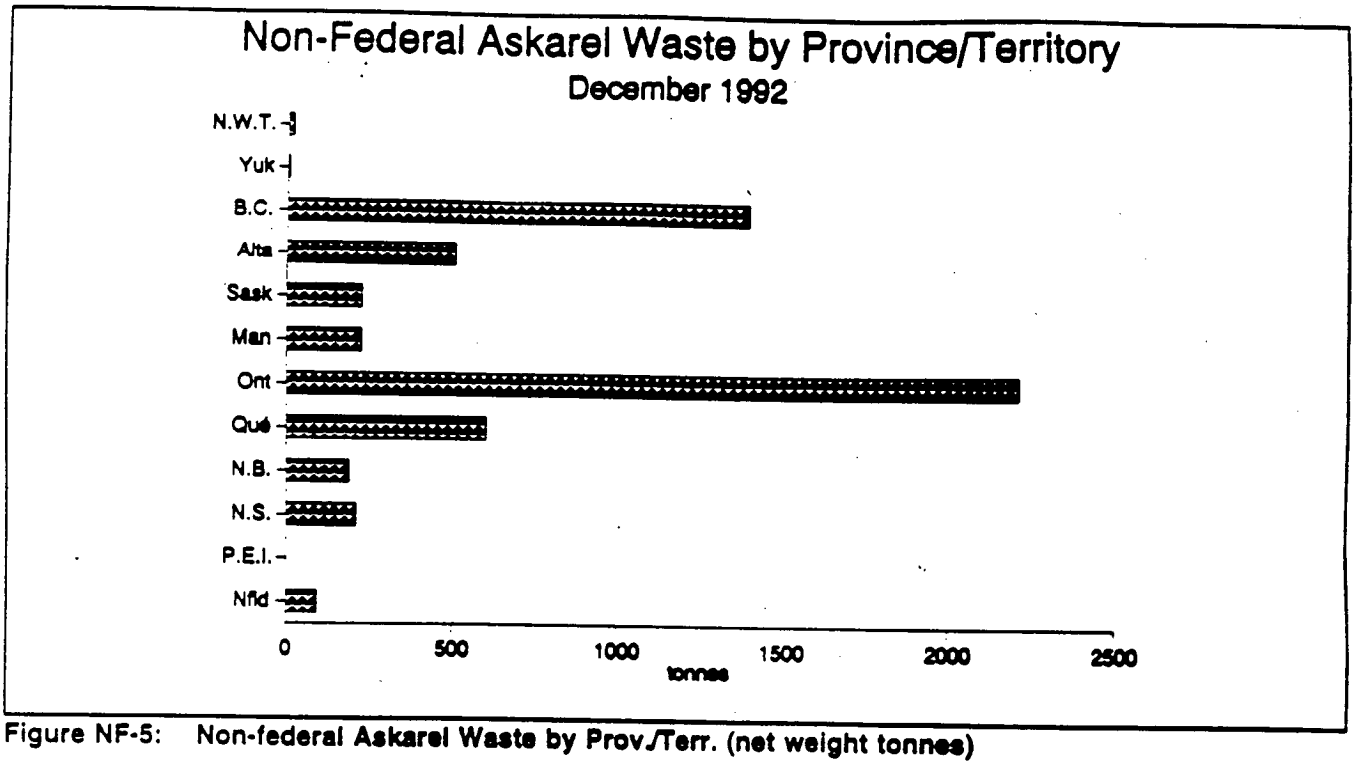

Figure NF-5: Non-federal Askarel Waste by Prov./Terr. (net weight tonnes)

Net weight	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	Nfld
Inventory	17	5	1394	505	225	224	2206	600	188	210	0	94
Change from December 1991	5	0	150	199	18	122	83	-378	0	58	-4	0

Table NF-3: Non-federal Askarel Waste by Province/Territory (net weight tonnes)

The increase in net weight of askarel wastes in provincially-regulated storage sites has two main components:

(1) The quantity of capacitors increased by 17% (251 tonnes) from 1,495 tonnes in December 1991 to 1,746 tonnes in December 1992 as more capacitors came out of service; and

(2) The quantity of bulk storage increased by 11% (220 tonnes) from 1,952 tonnes in December 1991 to 2,172 tonnes in December 1992 as more askarel came out of service.

BY GROSS WEIGHT

Viewed from a gross weight perspective, there were 14,404 tonnes of askarel and askarel equipment in storage for disposal. Transformers and capacitors comprise the majority: 5,238 and 6,975 tonnes (36% and 48%) respectively. 21 tonnes (0.1%) are classified as other askarel wastes, and bulk storage comprises 2,172 tonnes (15%). The gross weight of askarel in storage increased by 566 tonnes (4%) between December 1991 and December 1992.

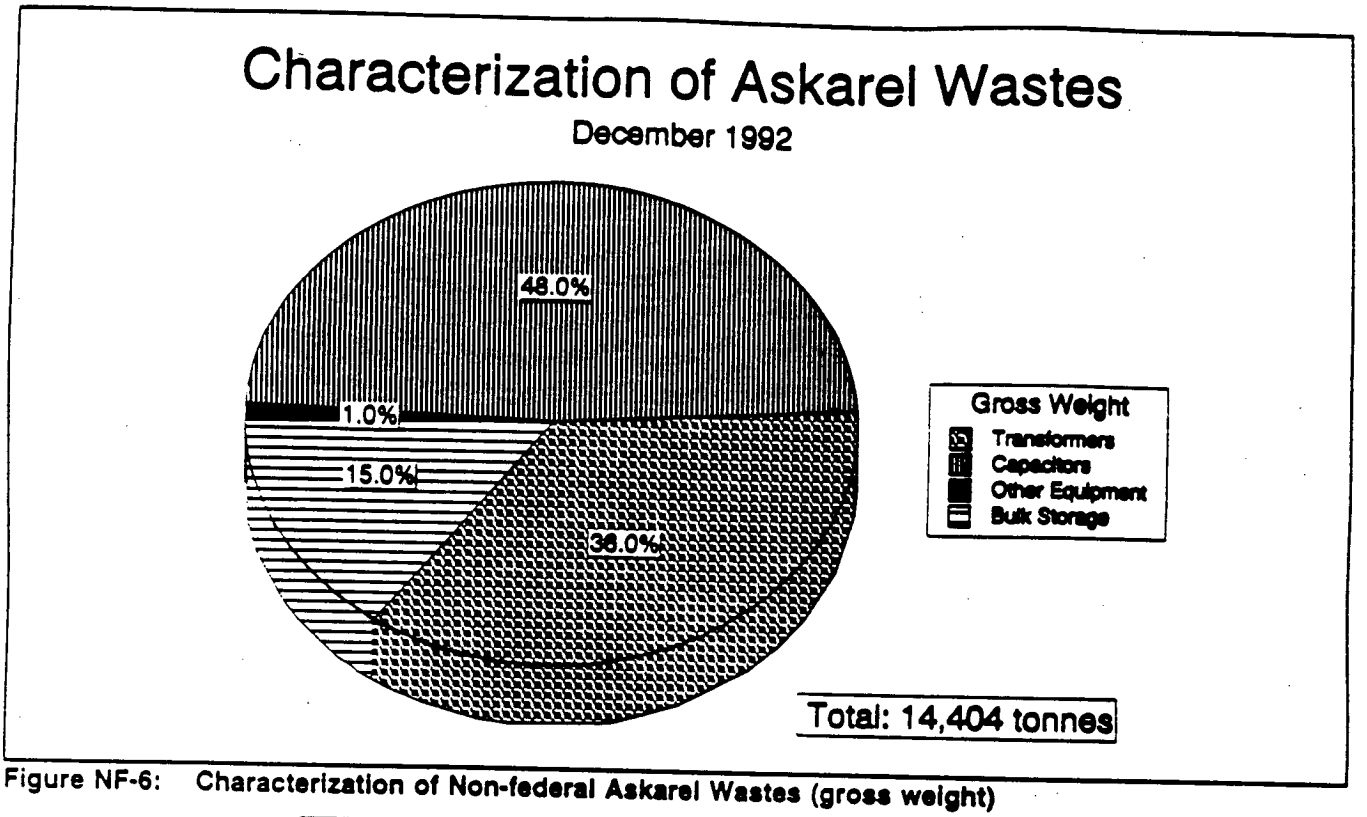

Figure NF-6: Characterization of Non-federal Askarel Wastes (gross weight)

Item	Inventory	Percent
Transformers	5,238 tonnes	36%
Capacitors	6,975 tonnes	48%
Other Equipment	21 tonnes	0.1%
Bulk Storage	2,172 tonnes	15%
Total	14,404 tonnes	100.0%

Table NF-4: Characterization of Non-federal Askarel Waste

MINERAL OIL WASTE

In December 1992 there were approximately 4,242 tonnes (net weight) of non-federal PCB-contaminated mineral oil in storage.

Compared to 1991, the inventory of contaminated mineral oil decreased slightly from 4,425 tonnes to 4,242 tonnes.

Note:

PCB-contaminated mineral oil often goes directly from in-use equipment to a treatment facility without being stored and included in inventory.

	NWT	Yuk	BC	Alta	Sask	Man	Ont	Que	NB	NS	PEI	NfLd	Total
Transformers	0	0	44	39	1	9	230	68	5	12	0	0	408
Bulk storage	35	0	349	45	12	16	3140	103	36	32	0	65	3834
Total	35	0	393	84	13	25	3370	171	41	44	0	65	4242

Table NF-5: Non-federal PCB-Contaminated Mineral Oil Waste (net weight tonnes)

OTHER PCB WASTES

In addition to askarel stored in bulk containers and askarel-containing equipment, there are a variety of other PCB-contaminated wastes in storage. These wastes represent the majority of total PCB wastes, 119,660 tonnes (87%) of the total PCB wastes at the end of December 1992. As illustrated in Figure NF-7, page 41, "Other PCB-contaminated Wastes" include such materials as:

- soil (98,808 tonnes, 82%)
- PCB-containing fluorescent lamp ballasts (9,299 tonnes, 8%)
- drained transformers and other equipment (2,408 tonnes, 2%).
- miscellaneous wastes, such as absorbents and clothing used in spill clean-up, and other debris (9,145 tonnes, 8%)

The total quantity of other PCB-contaminated wastes decreased by 448 tonnes from the 120,108 tonnes reported at the end of December 1991.

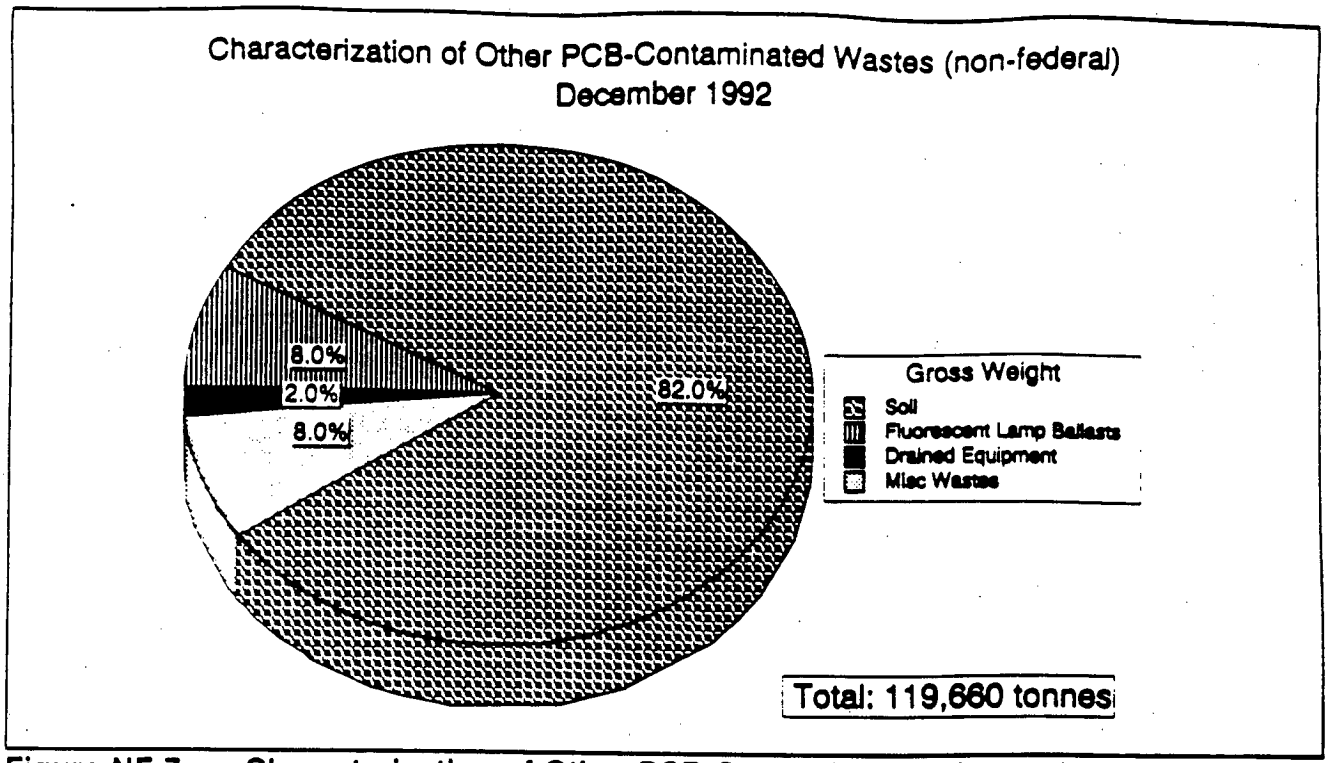

Figure NF-7: Characterisation of Other PCB-Contaminated Wastes (non-federal)

Item	Inventory	Percent
Soil	98,808 tonnes	82%
Fluorescent lamp ballasts	9,299 tonnes	8%
Drained Equipment	2,408 tonnes	2%
Misc Wastes	9,145 tonnes	8%
Total	119,660 tonnes	100%

Table NF-6: Other Non-federal PCB-Contaminated Wastes

PCB WASTE STORAGE SITES

In December 1992, there were 2,634 non-federal PCB waste storage sites in Canada. An additional 586 storage sites have been identified since December 1991.

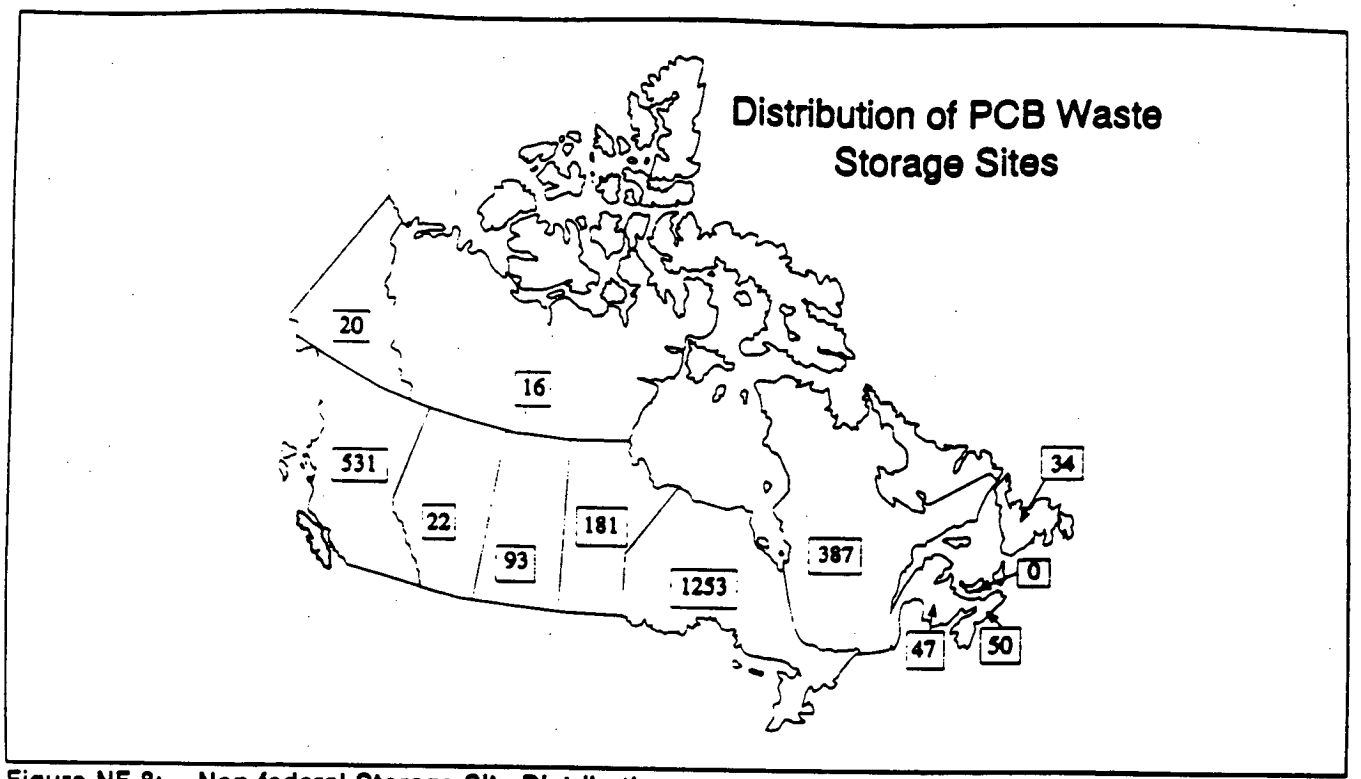

Figure NF-8: Non-federal Storage Site Distribution

An analysis of non-federal PCB waste storage sites by the quantity of PCB wastes stored are presented in Figure NF-9, page 43, and Table NF-7, page 44. The sites are divided into the following categories:

- less than 100 kg
- 100 kg to 1 tonne
- 1 to 10 tonnes
- 10 to 100 tonnes
- 100 to 1,000 tonnes
- 1,000 to 10,000 tonnes
- greater than 10,000 tonnes

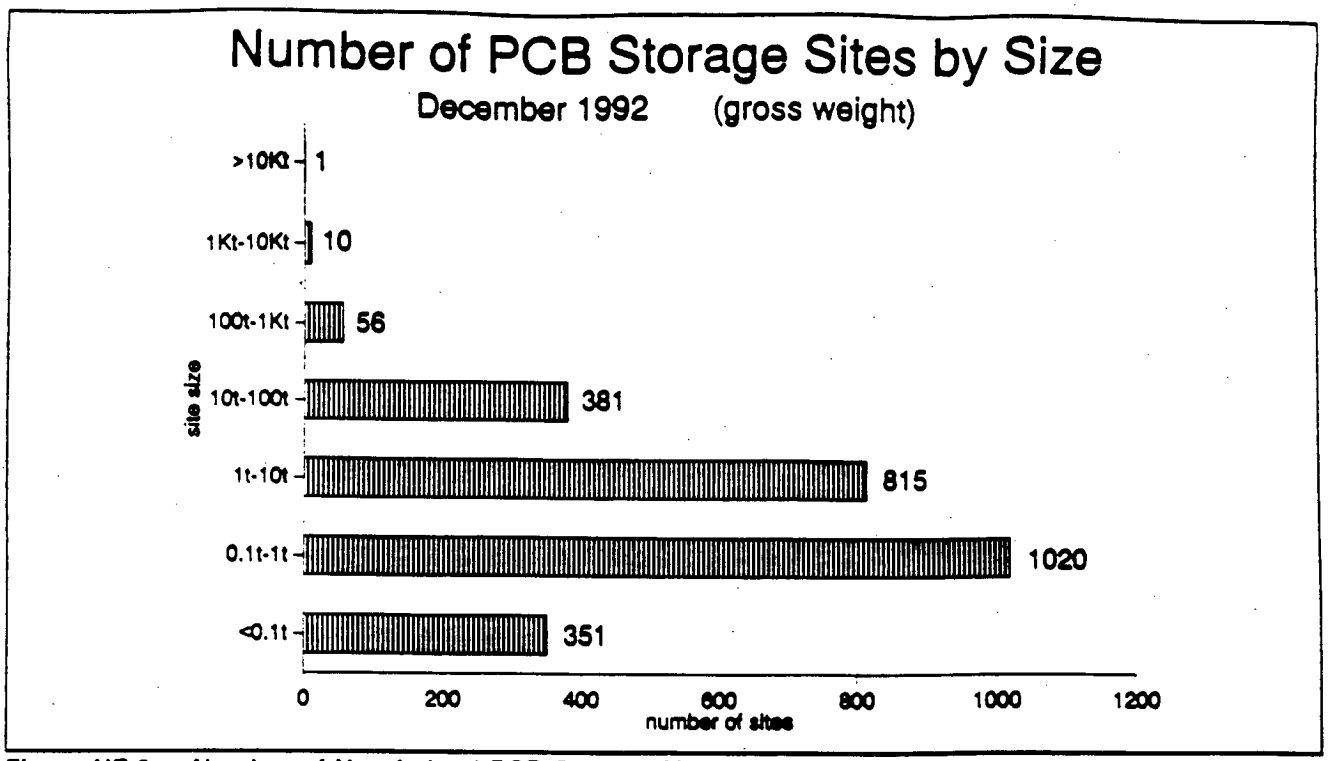

Figure NF-9: Number of Non-federal PCB Storage Sites by Size

Forty-six percent (64,000 tonnes) of the non-federal PCB wastes are stored at the Potterburg Creek site in Ontario. Close to 33% (46,209 tonnes) are stored at the 10 sites containing between 1,000 and 10,000 tonnes. Cumulatively, 110,209 tonnes (80%) of all non-federal PCB wastes in Canada are stored at 11 of the 2,634 non-federal storage facilities.

At the lower end of the waste-storage-site scale, the 1,020 sites containing between 100 kg and 1 tonne of PCB wastes each, account for less than 0.2% (397 tonnes) of the total non-federal PCB wastes. The 815 sites containing between one and ten tonnes each, contain only 2% (3,034 tonnes) of the total PCB wastes.

This analysis indicates an uneven distribution of PCB waste storage sites and that a relatively small number of sites (11) store the majority of non-federal PCB wastes in Canada (see Table NF-7, page 44).

NON-FEDERAL PCB WASTE STORAGE SITES
BY PROVINCE/TERRITORY AND SITE SIZE CLASS

December 1992

PROVINCE/ TERRITORY		<100 kg	100 kg - 1 tonne	1-10 tonnes	10-100 tonnes	100-1,000 tonnes	1,000 - 10,000 tonnes	> 10,000 tonnes	Total Sites / Total Tonnes
NFLD	No. of Sites	4	10	8	10	2	0	0	34
	Tonnes	0.2	3.7	34.4	277.6	257.9	0.0	0.0	573.9
PEI	No. of Sites	0	0	0	0	0	0	0	0
	Tonnes	0.0	0.0	0.0	0.0	[illegible]	[illegible]	[illegible]	0.0
NS	No. of Sites	6	18	16	7	3	0	0	50
	Tonnes	0.2	[illegible]	55.1	143.0	436.7	[illegible]	[illegible]	662.8
NB	No. of Sites	5	13	13	15	1	0	0	47
	Tonnes	0.2	3.7	58.2	618.1	[illegible]	[illegible]	[illegible]	843.7
QUE	No. of Sites	105	127	105	48	2	0	0	387
	Tonnes	[illegible]	48.8	433.2	1,533.4	[illegible]	[illegible]	[illegible]	[illegible]
ONT	No. of Sites	85	484	439	208	30	6	1	1 253
	Tonnes	2.4	137.9	1,646.5	6,066.2	7,434.8	[illegible]	[illegible]	[illegible]
MAN	No. of Sites	20	93	49	15	4	0	0	181
	Tonnes	[illegible]	[illegible]	138.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SASK	No. of Sites	16	35	16	24	2	0	0	93
	Tonnes	0.6	15.6	93.4	844.5	[illegible]	[illegible]	[illegible]	[illegible]
ALTA	No. of Sites	3	6	4	6	1	2	0	22
	Tonnes	0.1	[illegible]	[illegible]	139.1	[illegible]	[illegible]	[illegible]	[illegible]
BC	No. of Sites	96	228	150	45	10	2	0	531
	Tonnes	4.5	[illegible]	[illegible]	1,209.8	2,129.6	[illegible]	[illegible]	[illegible]
YUK	No. of Sites	8	6	6	0	0	0	0	20
	Tonnes	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]	[illegible]	[illegible]
NWT	No. of Sites	3	0	9	3	1	0	0	16
	Tonnes	[illegible]	[illegible]	42.0	126.5	551.6	[illegible]	[illegible]	[illegible]
NON-FEDERAL TOTALS	No. of Sites	351	1,020	815	381	56	10	1	2,634
	Tonnes	13.9	397.4	3,034.4	11,446.8	13,266.[illegible]	[illegible]	[illegible]	[illegible]

Table NF-7: Non-federal PCB Waste Storage Sites

PROGRESS IN PCB DESTRUCTION SINCE 1988

In Canada, there are two approved methods available for the destruction of PCB wastes, thermal destruction (high temperature incineration), and chemical destruction (decontamination). Decontamination is a chemical process applicable to mineral oil containing low concentrations of PCBs. High concentration PCB wastes are more effectively destroyed using high temperature incineration. Some PCBs were exported for destruction. However, on August 15, 1990, the federal Minister of Environment banned the export of PCBs. Before the PCB export ban, PCB wastes were sent to two incineration facilities in Europe: Tredi in France, and Rechem in Wales.

Since 1988, the quantity of wastes destroyed annually has continually increased. 8,119 tonnes were destroyed in 1988, 10,512 tonnes in 1989, 13,809 tonnes in 1990, 20,822 tonnes in 1991, and 17,632 tonnes were destroyed in 1992. (Figure D-1 below).

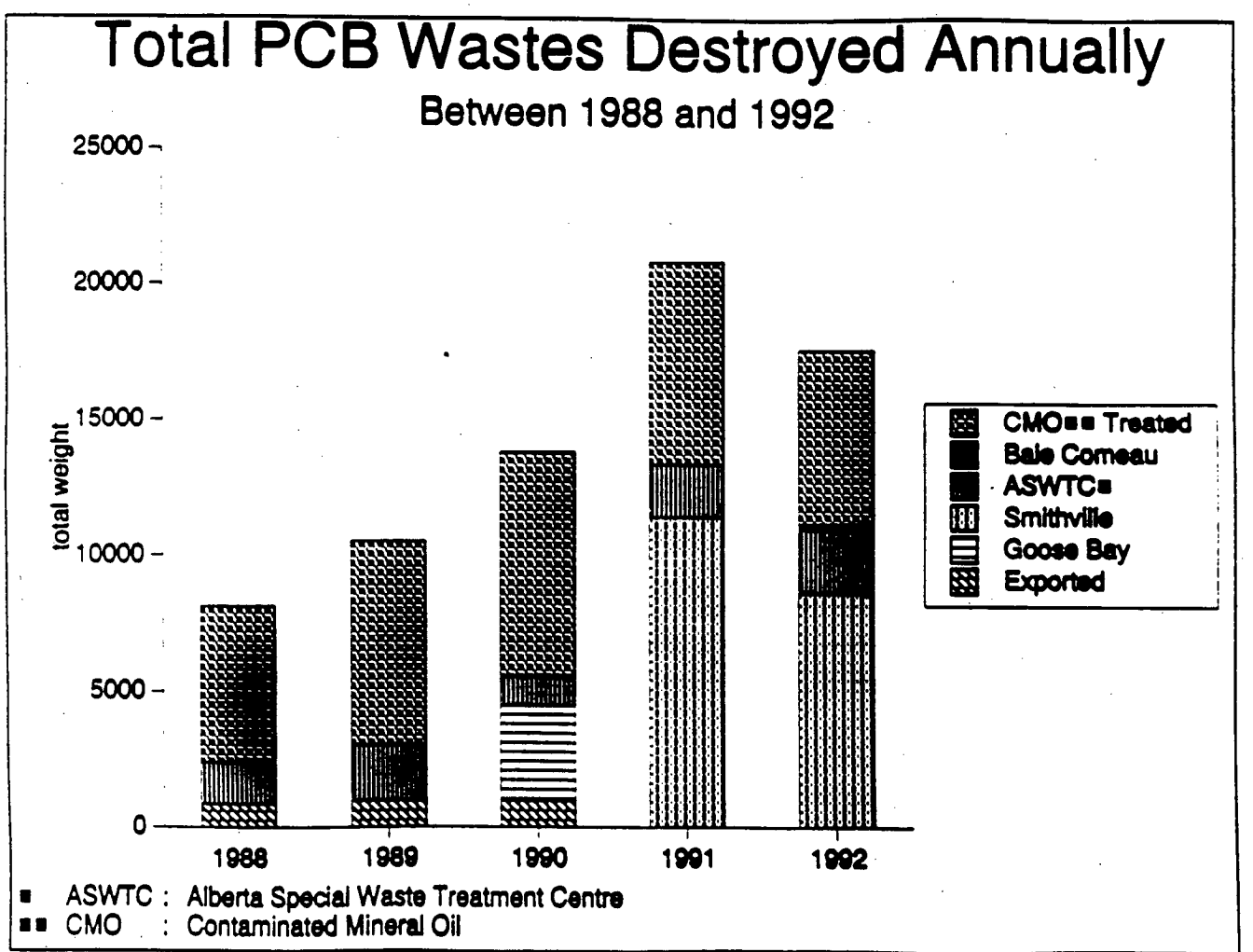

Figure D-1: PCB Destruction since 1988

INCINERATION OF PCB WASTES

Incineration of PCB wastes in Canada to date has occurred at four sites: The first is the only permanent incineration facility in Canada licensed to destroy PCBs, the Alberta Special Waste Treatment Centre, near Swan Hills, Alberta, where 9,040 tonnes of PCB wastes have been incinerated since the facility opened in 1988. In five years, 4,882 tonnes of PCB liquids (mostly askarel) have been destroyed, as well as 148 tonnes of fluorescent lamp ballasts and capacitors, and 4,010 tonnes of miscellaneous PCB-contaminated solids (Figure D-2 below).

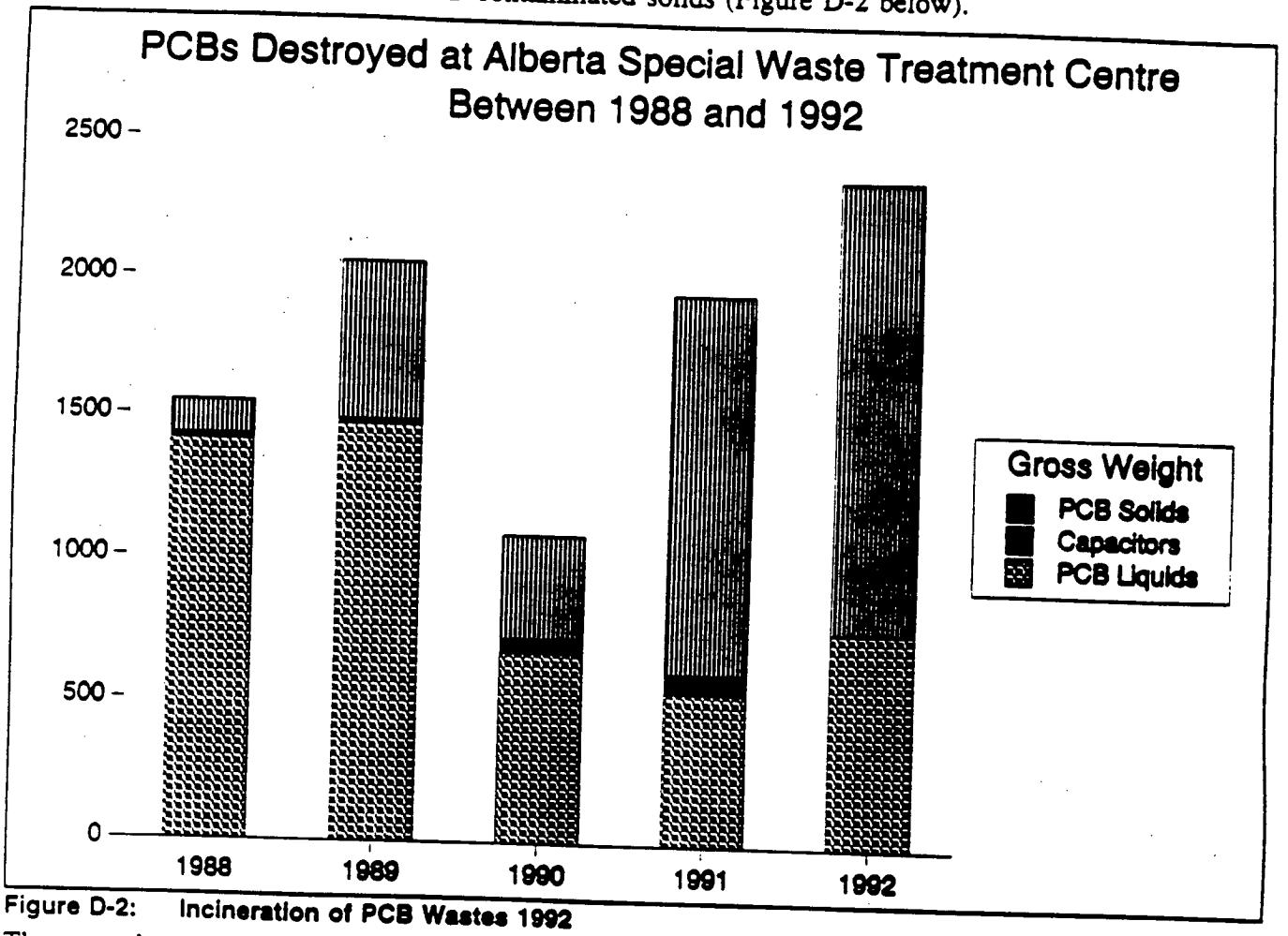

Figure D-2: Incineration of PCB Wastes 1992

The second was a temporary incineration project at the Department of National Defence Base at Goose Bay, Labrador, using a transportable incinerator, where 3,500 tonnes of wastes were destroyed between January and July 1990.

The third is another temporary project, which is being managed by the Ontario Ministry of Environment, at Smithville, Ontario where 11,400 tonnes of PCB wastes (10,300 tonnes of PCB-contaminated soil, 800 tonnes of other PCB-contaminated solids, 290 tonnes of askarel and other liquids, and 10 tonnes of capacitors) have been destroyed.

The fourth was at a test site near Baie Comeau, Québec where 196 tonnes of soil, 9 tonnes of askarel, and 13 tonnes of PCB-contaminated mineral oil were destroyed in 1992.

CHEMICAL TREATMENT OF PCB-CONTAMINATED MINERAL OIL

The treatment of low-level PCB-contaminated oil has been practised in Canada since 1983. Between 1983 and 1987, 5,888 tonnes (6.5 million litres) were treated (CCREM, 1987). Between 1988 and 1991, a further 28,800 tonnes (over 32 million litres) were treated, and in 1992 6,400 tonnes were treated. This brings the total amount treated to 41,188 tonnes.

Assuming an average contamination level of between 100 ppm and 200 ppm, the total quantity of PCBs destroyed would have been in the order of 4 to 8 tonnes.

It has been estimated that there are another 36,000 tonnes of PCB-contaminated oil still in service in Canada. Given this, it would appear that approximately 50 percent of the PCB-contaminated oil in Canada had been eliminated by December 1991.

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Canadian Council of Resource and Environment Ministers, PCB Action Plan; Final Report. (October 1987).

Environment Canada, National Inventory of Concentrated PCB (Askarel) Fluids (1985 Summary Update). Ottawa, Ontario. Report EPS 5/HA/4 (May 1986).

Environment Canada, National Inventory of Fluids Containing Polychlorinated Biphenyls (PCBs). Ottawa, Ontario. Report EPS 5/HA/1 (April 1985).

APPENDIX A

PROVINCIAL/TERRITORIAL CONTACTS FOR INFORMATION ON PCB INVENTORIES

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Note: To obtain information on inventories for Prince Edward Island, Yukon, and Northwest Territories, contact the Environment Canada Office in that province or territory.

APPENDIX B

FEDERAL CONTACTS FOR INFORMATION ON THE PCB INVENTORIES

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