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1998-99 Annual Report



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**Low-Level Radioactive Waste
Management Office**

MISSION

The Low-Level Radioactive Waste Management Office (LLRWMO) was established in 1982 to carry out the responsibilities of the federal government for low-level radioactive waste management in Canada.

MANDATE

The mandate of the LLRWMO is to:

- resolve historic waste problems that are a federal responsibility;
- establish, as required, a user-pay service for the disposal of low-level radioactive waste produced on an ongoing basis; and
- address public information needs about low-level radioactive wastes.

The LLRWMO is operated by Atomic Energy of Canada Limited (AECL) through a cost-recovery agreement with Natural Resources Canada (NRCan), the federal department that provides the funding and establishes national policy for low-level radioactive waste management.

LOCATIONS

National Office

Low-Level Radioactive Waste
Management Office
1595 Telesat Court, Suite 700
Gloucester, Ontario
K1B 5R3
Tel: (613) 998-9442
Fax: (613) 952-0760
E-mail: llrwm@aecl.ca

Technical Services Office

Low-Level Radioactive Waste
Management Office
67 John Street, Suite 104
Port Hope, Ontario
L1A 2Z4
Tel: (905) 885-9488
Fax: (905) 885-7458
E-mail: llrwmoph@aecl.ca

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LETTER OF TRANSMITTAL

Mr. D. R. Whelan
Director General
Energy Resources Branch
Natural Resources Canada
580 Booth Street
Ottawa, Ontario
K1A 0E4

Dr. P. A. Brown
Director
Uranium and Radioactive
Waste Division
Natural Resources Canada
580 Booth Street
Ottawa, Ontario
K1A 0E4

Dr. C. J. Allan
General Manager
Systems Development
and Engineering
AECL
Chalk River Laboratories
Chalk River, Ontario
K0J 1J0

Sirs:

I have the honour to present to you the Annual Report of the Low-Level Radioactive Waste Management Office for the fiscal year ending March 31, 1999.

This report has been prepared in accordance with Section 5.2 of the memorandum of understanding between Energy, Mines and Resources Canada (now called Natural Resources Canada) and Atomic Energy of Canada Limited, for the operation of the Low-Level Radioactive Waste Management Office.

Sincerely,



R. L. Zelmer, P.Eng., RPP
Director

DIRECTOR'S MESSAGE

Work in 1998-99 centred on ongoing interim waste management programs and additional remediation at the main historic low-level radioactive waste sites in Canada. The year also saw promising developments toward the long-term objective of disposal of Canada's historic wastes.



As in past years, the LLRWMO continued to operate and maintain facilities and programs at the main historic waste sites in Surrey, Port Hope, Scarborough, Fort McMurray and the Northwest Territories. All interim storage sites were monitored and inspected regularly, and all Atomic Energy Control Board (AECB) licence requirements were met. Further remedial work was carried out at the Anvil Way site in Surrey, British Columbia, and at other sites. These ongoing activities continue to be of vital importance, since they demonstrate commitment to the protection of local communities and the environment until disposal of the waste takes place.

Although much of Canada's historic low-level radioactive waste is safely stored at interim storage facilities, it is the federal government's intention that this waste will be disposed of when suitable disposal sites become available. This year, progress has been made toward long-term solutions for historic waste in both Surrey, British Columbia, and the Port Hope area in Ontario. The Surrey Siting Task Force has recommended that a commercial disposal site in the U.S. state of Oregon be explored for the permanent disposal of waste at the Anvil Way site in Surrey. Assessment of the waste has demonstrated its suitability for disposal at this facility. Hope Township and the Town of Port Hope have each proposed a locally developed long-term solution for their own waste and the Municipality of Clarington is also developing a local solution for its waste.

Technical competence and innovation have always been necessary components of successful solutions. However, social aspects are also important. The LLRWMO's programs and projects can affect owners and tenants of contaminated sites, community residents, local workers and other stakeholders, and it is essential to address their needs and concerns. Addressing both technical and social aspects has helped us move forward with interim storage of historic wastes in the past and will be no less important in the development of long-term solutions.

HIGHLIGHTS

Disposal

The Surrey Siting Task Force, established by the Minister of Natural Resources Canada to locate a disposal site for the waste in Surrey, British Columbia, has recommended that a commercial landfill disposal facility in the United States be considered for disposal of waste at the Anvil Way site in Surrey. Chemical and radiological assessment of the waste has demonstrated its suitability for disposal at this facility. In preparation for disposal, additional cleanup and consolidation of contaminated soil at the Anvil Way site has been carried out and the waste stored in the interim storage facility at the site.



The Chairman and Executive Director of the Surrey Siting Task Force discuss the permanent disposal of the Surrey waste.

Interim Management

During the year, the LLRWMO performed cleanup and interim remedial work at 10 locations in Ontario, British Columbia and the Northwest Territories. The LLRWMO continued to operate an AECB-licensed interim storage site in Port Hope, and maintained and monitored six sites in Port Hope, Scarborough, Surrey and Fort McMurray. A further nine sites in Port Hope were monitored or inspected regularly. These activities provide communities with an acceptable level of safety, security and environmental protection until permanent disposal sites are available.



A sealed sample of waste from Anvil Way, Surrey, is analyzed for radioactivity content.



Contaminated soil is shaped at the working area of the Temporary Storage Site in Port Hope.

Contaminated soil was removed from a site at Hay River, Northwest Territories, and the site was restored.



OPERATIONS REVIEW

The activities of the LLRWMO are carried out within three broad program areas:

- Historic Wastes Program;
- Ongoing Wastes Program; and
- Information Program.

HISTORIC WASTES PROGRAM

Historic wastes are low-level radioactive wastes for which the original owner can no longer be held responsible. The federal government has assumed responsibility for historic waste in Canada through the LLRWMO.

The focus of the Historic Wastes Program is to perform cleanup and interim remedial work at historic waste sites, and to construct and operate any necessary waste storage facilities to protect human health and the environment before the waste can be moved to permanent waste disposal facilities. All activities are carried out in accordance with the requirements of the AECB, the federal regulatory agency. Work during 1998-99 centred on Surrey and the Port Hope area.



The main historic low-level radioactive waste sites in Canada.

• Surrey, British Columbia

The Surrey Siting Task Force (SSTF) was established by the Minister of Natural Resources Canada to locate a disposal site for the Surrey waste. During 1998-99, the SSTF recommended that a landfill disposal facility in the United States be explored for permanent disposal of the waste at the Anvil Way site in Surrey. The waste consists of about 4,500 cubic metres of soil and slag contaminated with thorium. Radiological and chemical characterization of waste samples carried out by the LLRWMO in support of the SSTF's initiative confirmed that the waste met the requirements for disposal at the facility.

Field work identified the need for additional cleanup and consolidation of waste at the Anvil Way site before disposal; the first phase of this cleanup was completed during 1998-99. It consisted of removal of approximately 100 cubic metres of contaminated soil from beneath building columns and grade beams. To accommodate the additional material, the interim storage structure (bunker) built in 1985 was expanded. The remaining contaminated soil, known to underlie certain small areas of the site, will be removed with the waste in the bunker.

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Monitoring for residual contamination after removal of contaminated soil from beneath a building at the Anvil Way site in Surrey.



Completing the expansion of the storage bunker at the Anvil Way site in Surrey.

• Port Hope, Ontario

During 1998-99, the LLRWMO provided NRCan with technical data, information and communications support for community discussions on the long-term storage of waste and health concerns related to radioactive contamination. Staff participated in regular meetings in Hope Township, the Town of Port Hope and the Municipality of Clarington, as these three municipalities considered long-term waste management options within their communities. Hope Township and the Town of Port Hope each forwarded their findings to the federal government for consideration in future discussions. Technical support was also provided to the Port Hope Community Health Concerns Committee, a community group examining the health risks associated with industrial contamination in the town, including the presence of low-level radioactive waste.

The LLRWMO continued to operate an AECB-licensed interim storage site in Port Hope, which received waste from cleanups within the town, and to maintain and monitor three additional AECB-licensed sites. A further nine sites within the town are monitored or inspected regularly. The LLRWMO also continued to operate the Construction Monitoring Program and provided individual property status letters and radiological surveys in the town. The LLRWMO removed about 185 cubic metres of contaminated soil to the Temporary Storage Site.



Water runoff from the Temporary Storage Site in Port Hope is collected for analysis.

• Scarborough, Ontario (Malvern Remedial Project)

The LLRWMO continued to maintain and monitor the Passmore Avenue storage site. Environmental monitoring included measurement of radiation levels at the site boundary, and testing for specific radioactive and chemical contaminants in the air and groundwater. A monitoring committee was established to review the environmental status of the Passmore Avenue site until disposal of the waste takes place. The annual monitoring report was sent to the City of Scarborough and to the Malvern community library. The results show that the site is not adversely affecting the local environment.

• Fort McMurray, Alberta and the Northern Transportation Route, Northwest Territories

Fort McMurray

Mildly contaminated soils from cleanups at several sites are held in a storage area at the Beaconhill Landfill site in Fort McMurray. Monitoring of the storage area continued to show no adverse effects on the environment from this waste. During the year, a site in Fort McMurray (formerly owned by the Northern Transportation Company Limited), which was previously cleaned up by the LLRWMO, was restored and developed by the new owner for retail use.

Northern Transportation Route

The current focus for the northern transportation route (from Great Bear Lake to Fort McMurray) is on performing surveys or remedial work necessary to accommodate local land uses.

During the year, the LLRWMO conducted work at two locations. In Fort Smith, radiation protection support was provided for the demolition of a local warehouse that was contaminated with uranium and considered a fire hazard. At Hay River, on Great Slave Lake, about 5 cubic metres of uranium-contaminated soil were removed from a site on the Dene Reserve. The Hay River work was carried out on behalf of Indian and Northern Affairs Canada, to accommodate plans to convert the area into parkland.

• Other Historic Waste Activities

Small-Scale Cleanups

In addition to remedial work at the major historic waste sites, described above, the LLRWMO also undertakes cleanup of smaller sites. During the year, the LLRWMO performed a cleanup at a site in Mono Mills, Ontario, and provided radiological support for the cleanup of a property in Mississauga (the Arsenal Lands) owned by the Toronto Regional Conservation Authority. Radium contamination was removed from a private residence in Goderich, Ontario, and

Low-Level Radioactive Waste Management Office

miscellaneous radium dials were picked up, at the request of the AECB. The LLRWMO also began remedial work to mitigate radon gas at a property in Elliot Lake, Ontario, which was contaminated with uranium mining waste under the crawl space.

Development Work

The LLRWMO completed its development work on environmental restoration methods, as part of a project coordinated by the International Atomic Energy Agency (IAEA) in Vienna. The IAEA is preparing a technical report summarizing the results of the participating organizations.

LLRWMO Storage Facility

Packaged waste from small-scale cleanups and small amounts of AECB-licensable materials from some of the major sites are routinely transferred to the LLRWMO storage facility located at the Chalk River Laboratories of Atomic Energy of Canada Limited (AECL). The storage facility consists of two buildings, one constructed in 1984 and the second in 1990. During 1998-99, about 8 cubic metres of material in drums were shipped to the storage facility, resulting in a total inventory of 592 cubic metres (about 70% of the storage capacity).



Exterior View



Interior View

One of the LLRWMO's storage buildings used to store low-level radioactive waste at AECL's Chalk River Laboratories.

ONGOING WASTES PROGRAM

Ongoing wastes are low-level radioactive wastes, for which the producer can be held responsible. Examples of producers include electrical utilities, research organizations, and fuel manufacturers.

Technical advice continued to be provided to NRCAN on the latest national and international developments related to the management of low-level radioactive waste and on the requirements for disposal facilities in Canada.

Low-Level Radioactive Waste Management Office

A new initiative was undertaken in 1998-99 to prepare a report on the inventory of all types of radioactive waste. The objectives of the report are to provide a comprehensive national overview for government reference and planning, and to provide a general reference for others with an interest in radioactive waste management in Canada. Previous inventory reports prepared by the LLRWMO were limited to low-level radioactive waste; the new report will include three types of radioactive waste: nuclear fuel waste, low-level radioactive waste, and uranium mine and mill tailings.

INFORMATION PROGRAM

The focus of the Information Program is to provide general information about low-level radioactive waste management and to carry out communications activities in support of specific historic waste projects. The National Office in Gloucester, near Ottawa, provides daily access for phone, mail and personal inquiries. In addition, a web site is being designed as part of an initiative to broaden the sources of information for the public and other stakeholders.



Information on low-level radioactive waste management is routinely available from the Port Hope Technical Services Office (shown above) and the National Office in Gloucester, near Ottawa.

The Technical Services Office in Port Hope provides daily access for general inquiries in the Port Hope area. During the year, it responded to some 50 general inquiries for information from residents, as well as to many specific inquiries related to the Construction Monitoring Program and the status of radiological contamination of individual properties.

ADMINISTRATIVE MANAGEMENT AND SUPPORT SERVICES

AECL operates the LLRWMO through a memorandum of understanding with NRCan, the federal department that provides funding and establishes national policy on radioactive waste management. Administratively, the LLRWMO operates as a division of Systems Development and Engineering. It functions as a project management organization with a small staff complement, as follows.

LLRWMO Staff List (March 31, 1999)

National Office (Gloucester, near Ottawa)

Director	R. L. (Bob) Zelmer ¹
Administrative Assistant	L. D. (Lorraine) Delaney
Administrative Assistant	T. A. (Teena) Valentonis
Office Assistant	M. I. (Monique) Rhéaume
Financial Analyst ²	S. E. (Sylvie) Beauchamp
Manager, Field Services	B. A. (Barry) McCallum
Scientific Specialist	C. H. (Chris) Clement
Technical Program Manager, Special Projects	P. L. (Pab) De
Technical Program Manager, Engineering and Operations	Vacant
Technical Specialist	R. C. (Bob) Barker

Technical Services Office (Port Hope)

Technical Supervisor	M. J. (Mark) Gardiner
Administrative Assistant ³	S. A. (Sharon) Pickering
Technical Analyst	D. M. (Dale) Huffman
Technical Analyst	E. P. (Ted) Rowden
Technical Analyst	S. L. (Susanne) Ledgard

¹ Appointed January 01, 1999

² Attached from AECL Finance

³ Part-time

The LLRWMO continued to participate in AECL programs on health, safety, environment and quality assurance, and to demonstrate compliance with current AECL requirements and current professional practice. Activities were carried out in full compliance with the requirements of the three AECB licences issued for sites in Port Hope and an additional licence for projects and activities carried out at other sites in Canada.

FINANCIAL REVIEW

GENERAL

NRCan transfers funds to AECL through a cost-recovery agreement (memorandum of understanding) for the operation of the LLRWMO. The major planning document is the annual LLRWMO Business Plan, submitted to NRCan for approval prior to the start of each fiscal year. The Business Plan identifies how NRCan priorities can be accommodated within the available funding. Adjustments to priorities during the year are accomplished through joint quarterly progress reviews by the LLRWMO and staff of the Uranium and Radioactive Waste Division of NRCan.

The accounts and financial control system of the LLRWMO are in conformance with AECL's financial policies and control. They provide assurance that reliable and accurate financial information is available on a timely basis. The financial statements in this annual report present the costs of operation of the LLRWMO as of March 31, 1999.

FINANCIAL SUMMARIES

In this section, summaries of expenditures are given as follows:

- expenditures for NRCan funding;
- total LLRWMO expenditures; and
- five-year comparison of expenditures for NRCan and Treasury Board funding.

Expenditures for NRCan Funding

Activities in 1998-99 were grouped under the three major programs of the LLRWMO:

- Historic Wastes;
- Ongoing Wastes; and
- Information.

These categories correspond to the three distinct areas within the mandate of the LLRWMO adopted in reporting progress in the Operations Review section of this annual report. General overhead costs that cannot be directly attributed to one of the three programs are reported under Administrative Management and Support Services.

The financial summary for funding received from NRCan in 1998-99 is shown in Table 1 and graphically in Figure 1.

Low-Level Radioactive Waste Management Office

Table 1: Financial Summary for NRCan Funding for 1998-99 (\$ million)

Program Area	Business Plan	Actual Expenditure
1. Historic Wastes Program		
- Surrey	0.560	0.643
- Port Hope	0.381	0.308
- Scarborough (Malvern Remedial Project)	0.017	0.003
- Fort McMurray and Northern Transportation Route	0.122	0.161
- Other Historic Waste Activities	0.202	0.129
Subtotal: Historic Wastes program	1.282	1.244
2. Ongoing Wastes Program	0.237	0.208
3. Information Program	0.066	0.077
4. Administrative Management and Support Services	0.415	0.445
Approved NRCan Funding	2.000	1.974

The budget approved by NRCan was \$2.0 million. An additional project-specific budget of \$1.0 million for the disposal of Surrey waste was allocated but was not required as disposal did not occur. The approved year-end budget remained at \$2.0 million. Project expenditures were generally in line with original estimates.

Total LLRWMO Expenditures

In addition to NRCan funding, the LLRWMO also received money from other sources on a cost-recovery basis. This money amounted to \$0.113 million from the following sources:

- \$0.042 million from the Government of Ontario under a cost-sharing agreement between the governments of Ontario and Canada for the Malvern Remedial Project;
- \$0.020 million from Indian and Northern Affairs Canada for work at Hay River;
- \$0.030 million from the Toronto Regional Conservation Authority for support work during a cleanup in Mississauga, Ontario; and

Low-Level Radioactive Waste Management Office

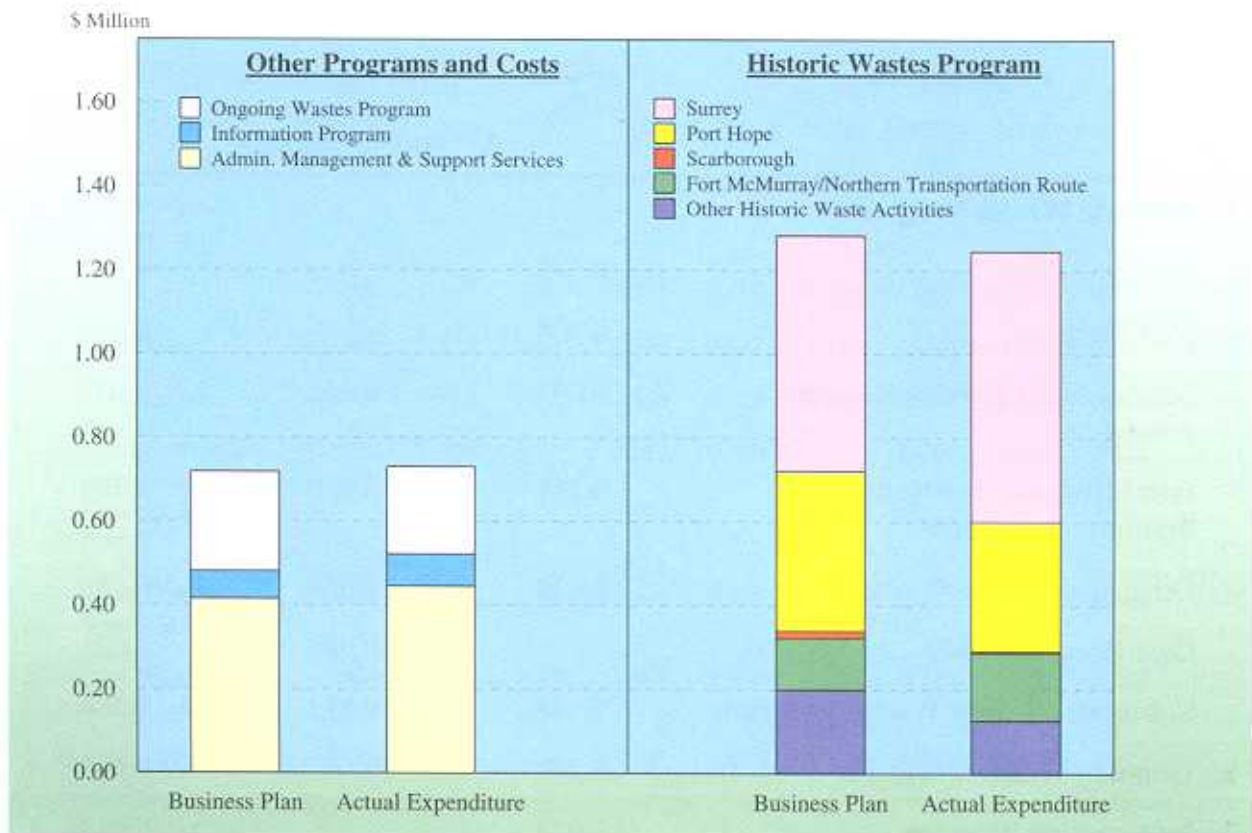


Figure 1: Financial Summary for NRCAN Funding for 1998-99

- \$0.021 million for other cost-recovery work.

The total LLRWMO expenditures (\$2.087 million) for 1998-99 are shown in Table 2. The total includes funding from NRCAN (\$1.974 million shown in Table 1) and costs recovered from the other sources listed above.

Low-Level Radioactive Waste Management Office

Table 2: Total LLRWMO Expenditures for 1998-99 (\$ million)

Program Area	NRCAN Funding	Cost Recovered from Non-NRCAN Sources	Total Expenditure
1. Historic Wastes Program			
- Surrey	0.643		0.643
- Port Hope	0.308		0.308
- Scarborough (Malvern Remedial Project)	0.003	0.042	0.045
- Fort McMurray and Northern Transportation Route	0.161	0.020	0.181
- Other Historic Waste Activities	0.129	0.030	0.159
- Cost-Recovery Work		0.021	0.021
Subtotal: Historic Wastes Program	1.244	0.113	1.357
2. Ongoing Wastes Program	0.208		0.208
3. Information Program	0.077		0.077
4. Administrative Management and Support Services	0.445		0.445
TOTAL	1.974	0.113	2.087

Five-Year Comparison of Expenditures for NRCAN and Treasury Board Funding

Treasury Board approval for five-year funding ended in 1994-95; since 1995-96, NRCAN has approved LLRWMO budgets. The comparison of actual expenditures against planned funding levels for NRCAN and Treasury Board funding for the last five years (1994-95 to 1998-99) is shown in Table 3 and graphically in Figure 2.

Low-Level Radioactive Waste Management Office

Table 3: LLRWMO Five-Year Financial Summary for NRCan and Treasury Board Funding (\$ million)

Program Area	1994-95		1995-96		1996-97		1997-98		1998-99	
	Planned*	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
1. Historic Wastes Program										
- Surrey	0.000	0.197	0.365	0.301	0.260	0.426	1.800 [†]	0.669	0.560	0.643
- Port Hope	0.000	0.372	0.425	0.470	0.331	0.326	0.330	0.315	0.381	0.308
- Scarborough	1.300	0.986	2.125	2.544	0.219	0.211	0.030	0.035	0.017	0.003
- Fort McMurray and Northern Transportation Route	0.000	0.433	0.245	0.252	0.160	0.092	0.060	0.094	0.122	0.161
- Other Historic Waste Activities	0.250	0.695	0.170	0.101	0.120	0.150	0.135	0.137	0.202	0.129
Subtotal: Historic Wastes Program	1.550	2.683	3.330	3.668	1.090	1.205	2.355	1.250	1.282	1.244
2. Ongoing Wastes Program	0.400	0.143	0.110	0.122	0.090	0.165	0.143	0.205	0.237	0.208
3. Information Program	0.000	0.139	0.090	0.100	0.060	0.044	0.040	0.032	0.066	0.077
4. Administrative Management and Support Services	0.916	0.699	0.470	0.429	0.460	0.397	0.462	0.421	0.415	0.445
Total Original Treasury Board/ NRCan Approval*	2.866	3.664	4.000	4.319	1.700	1.811	3.000	1.908	2.000	1.974
Subsequent Gov't-Wide Cost-Reduction Program	(0.200)									
Subtotal: Initial Budget	2.666		4.000		1.700		3.000	1.908	2.000	1.974
Additional NRCan Funding	0.995		0.300		0.100		(1.000) [†]			
TOTAL	3.661	3.664	4.300	4.319	1.800	1.811	2.000	1.908	2.000	1.974

* Treasury Board approval for five-year funding ended in 1994-95. Since 1995-96, NRCan has approved LLRWMO budgets.

† A project-specific budget of \$1.0 million for the disposal of Surrey waste was allocated but was not required as disposal did not occur.

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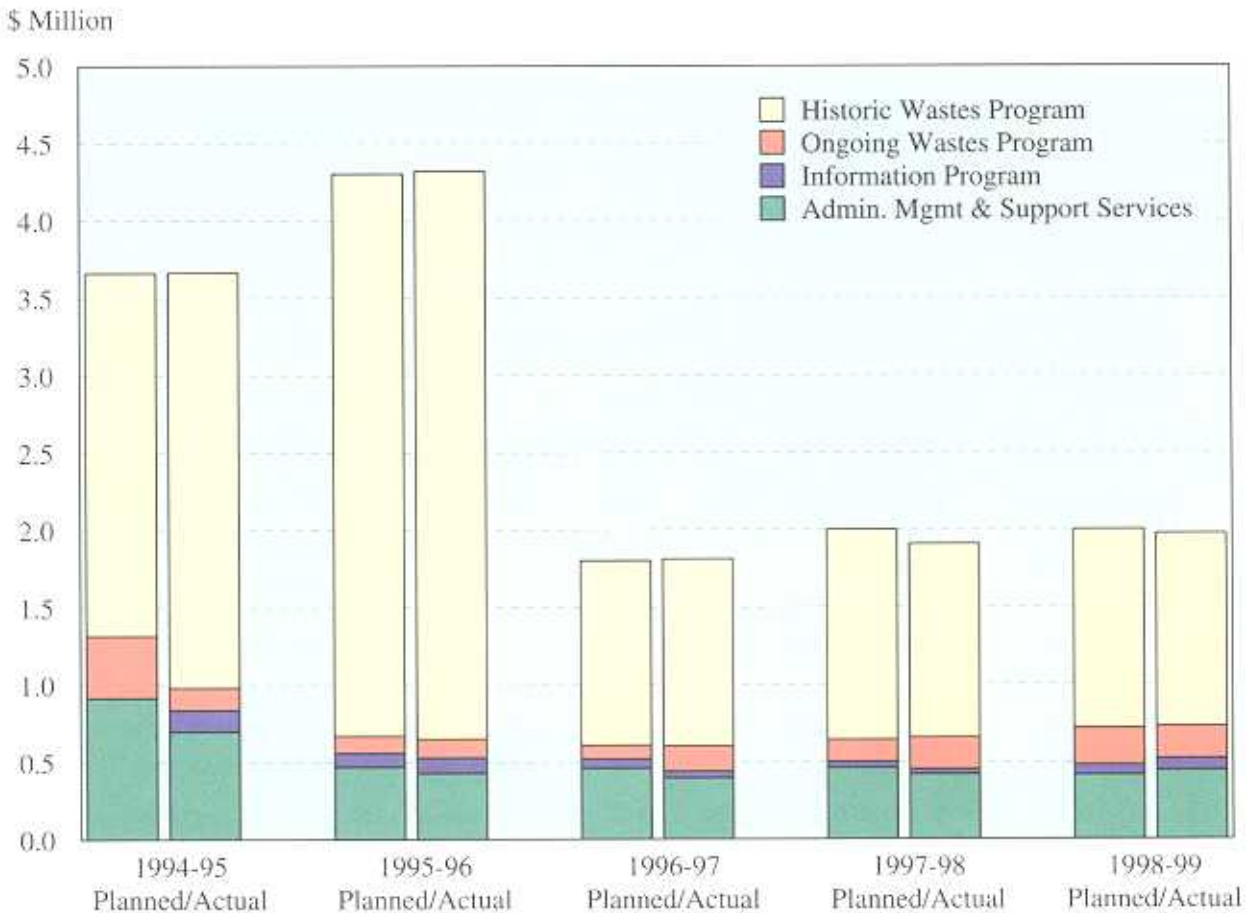


Figure 2: LLRWMO Actual Expenditures Versus Approved Funding from 1994-95 to 1998-99

Beginning in 1995-96, National Office staff time that could be reasonably attributed to specific projects was directly charged against those projects, instead of being charged to the LLRWMO overhead account (Administrative Management and Support Services). This adjustment provided a more accurate picture of both project and overhead costs. In addition, costs to meet commitments arising from AECB licences, legal agreements and other mandatory needs were charged directly to the appropriate historic waste projects.

Since 1995-96, a base budget of \$2.0 million has been allocated to the LLRWMO. A significant fraction of the base budget is required for maintaining a minimum level of effort in existing programs, to assure safety, and to meet regulatory and legal requirements. Consequently, there has been an increasing reliance on supplementary funding, even for relatively small remediation and cleanup activities.