

1992/93 ANNUAL REPORT



**LOW-LEVEL
RADIOACTIVE WASTE
MANAGEMENT OFFICE**

THE 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 (LLRW) management in Canada.

Mandate

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

The Low-Level Radioactive Waste Management Office is operated by Atomic Energy of Canada Limited (AECL) through a cost recovery agreement with Energy, Mines and Resources Canada (EMR), the federal department which provides the funding and establishes national policy for LLRW management.

Locations

NATIONAL OFFICE

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Dear 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, 1993.

This report has been prepared in accordance with the Memorandum of Understanding between Energy, Mines and Resources Canada and Atomic Energy of Canada Limited for the operation of the Low-Level Radioactive Waste Management Office.

Sincerely,



Robert W. Pollock
Director

1992/93 HIGHLIGHTS

Northern Transportation Route/Fort McMurray: Expenditure \$927K

Uranium ore from mines in the Northwest Territories was shipped south from the 1930s to the 1950s resulting in contaminated soil from spills at transfer points along the route. In Fort McMurray, Alberta, the initial phase of the cleanup program resulted in the removal of some 4000 cubic meters of contaminated soil to on-site interim storage in the fall of 1992.



Port Hope, Ontario: Expenditure \$878K



Characterization of leachate contaminated by historic wastes at the Port Hope landfill is one of the studies being undertaken to complete planning of the remaining remedial work at Port Hope sites. Throughout the town, the Construction Monitoring Program resulted in 118 properties being checked prior to excavation, to ensure that any contaminated soils are cleaned up prior to construction.

Surrey, B.C.: Expenditure \$462K

Testing at an interim storage site confirmed that the contaminated soils do not qualify as either special or radioactive wastes. This will assist the Surrey Siting Task Force in locating a permanent site.



Scarborough, Ontario: Expenditure \$303K



A community workshop was one of the public consultation activities used by the Public Liaison Committee to ensure that the Malvern Remedial Project, a joint Canada/Ontario initiative to complete cleanup of radium-contaminated soils in Scarborough, responds to concerns of local residents.

Small Scale Sites: Expenditure \$308K

In addition to remedial work at major historic waste sites, the LLRWMO carries out cleanups at individual properties contaminated by activities which took place during the early years of the radium and uranium industry. The use of contaminated lumber at this house was extensive. The most cost-effective option was to replace the entire house.



Ongoing Wastes: Expenditure \$293K

The first annual inventory report was published with information from the LLRWMO national database on the generation rates and accumulated inventory of LLRW in Canada. Studies were also completed on several topical areas, including decommissioning wastes, long-lived wastes, and mixed radioactive and hazardous wastes.

Inventory of
Low-Level
Radioactive Waste
in Canada

Annual Report
1991

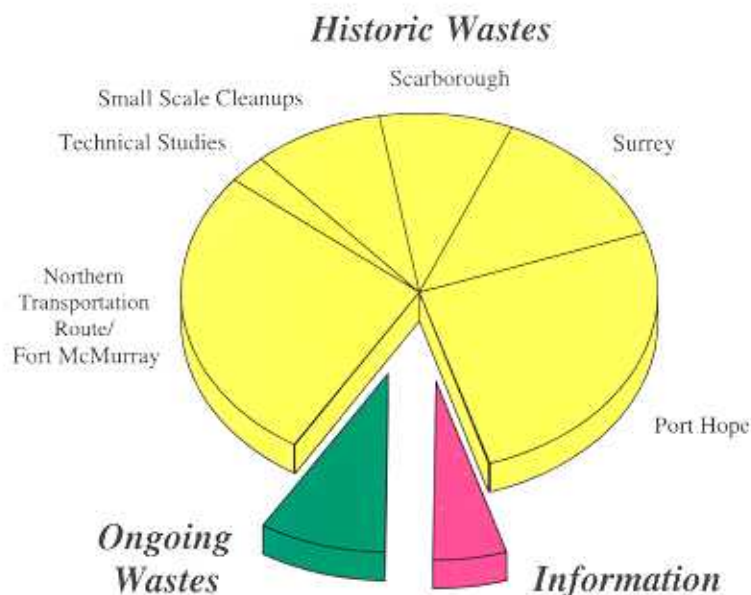


Information Programs: Expenditure \$168K



Public information and other communications activities were an integral part of the major remedial action projects already in progress at Port Hope, Ontario, and initiated at Fort McMurray, Alberta, and Scarborough, Ontario, in 1993.

Total 1992/93 LLRWMO Funding, from EMR



This figure shows the allocation of LLRWMO funding from Energy, Mines & Resources Canada in 1992/93. Total project costs, including cost recovery from other sources, are detailed in the financial review section. All costs shown are fully overheaded, that is, all staff and support services costs have been allocated to their respective projects.

DIRECTOR'S MESSAGE

Ten years ago, on October 26, 1982, Energy Minister Jean Chrétien announced that Cabinet had approved establishment of a new office to carry out the federal government's responsibilities for low-level radioactive waste management in Canada. After ten years it is appropriate to look back at what has been achieved, and to look ahead at what is yet to be done.



Historic wastes represent an inherited responsibility. Progress is being made, by independent Siting Task Forces, on establishing sites for permanent disposal. However, it will be some years before any are in operation. The immediate priority at historic waste sites is thus to determine whether interim work is required.

For sites (primarily buildings) where waste volumes are small, cleanups are carried out and the wastes transferred to warehouse storage buildings operated for the LLRWMO by AECL's Chalk River Laboratories. Over 20 of these projects have been carried out in Quebec, Ontario, Alberta and British Columbia. For sites with large waste volumes, an alternate approach is required. Initially, efforts were made to establish temporary storage sites at new locations. These proved unsuccessful because of opposition from residents near proposed sites. The approach now is to develop engineered containment at, or near, sites where the wastes are found. Experience has shown that this approach, combined with an effective public consultation program, can result in good interim solutions that protect public health and remedy environmental contamination problems. Major projects have been carried out at Port Hope, Ontario, and Surrey, British Columbia, and are now underway at Fort McMurray, Alberta, and Scarborough, Ontario.

With respect to LLRW produced on an ongoing basis, the fundamental principle is that the waste producer is responsible for its long-term management. The LLRWMO role is thus to determine long-term requirements for LLRW management from a national perspective, to provide analysis and advice to EMR, and - through cooperation with EMR, regulatory agencies and waste producers - to pursue a framework that will result in the development of the necessary facilities. The LLRWMO has carried out an assessment of national requirements, established a national database used to produce an annual inventory report, and completed a number of topical studies.

The statement made on the date of our tenth anniversary provides perhaps the best summary. *"Our cumulative experience has resulted in a forward-going initiative now in progress for every major historic waste site, and for all related generic issues. This is a major achievement that should lead to the eventual resolution of complex technical and social issues associated with historic wastes, and to the opportunity to move forward in Canada towards the development of disposal facilities for LLRW being produced today and in the future."*

OPERATIONS REVIEW

The activities of the Office are generally carried out within three broad program areas, namely:

- Historic Wastes Program
- Ongoing Wastes Program
- Information Program

HISTORIC WASTES PROGRAM

Historic wastes are low-level radioactive wastes for which the original owner can no longer be held responsible and which are managed in a manner no longer considered acceptable. If they are wastes for which the federal government accepts responsibility, their management comes within the mandate of the LLRWMO. Historic wastes are located at several sites across Canada.

The goal of this program is to perform cleanup and interim remedial work at historic waste sites in order to protect human health and the environment, prior to the availability of permanent disposal facilities for these wastes. In this connection, close liaison was maintained with, and necessary technical advice was provided to, the independent Siting Task Forces appointed by the Minister of EMR to locate facilities for the long-term management of historic wastes.

Activities and achievements during 1992/93 in the specific historic wastes projects are detailed below.

Northern Transportation Route/Fort McMurray, Alberta



In August of 1992, uranium-contaminated soil and building materials were discovered at an unused warehouse site in Fort McMurray, Alberta. The discovery occurred during an investigation of the 2200 kilometre water transportation network that was used, from the 1930s through the 1950s, to transport uranium ore from the Port Radium mine, at Great Bear Lake in the Northwest Territories, to Waterways (now Fort McMurray), Alberta for rail shipment to Port Hope. Subsequent investigations have found contaminated soil at three additional properties in Fort McMurray that were once part of the original site, at a second barge-to-rail transfer site and along an unused rail line between the two sites. The volume of uranium-contaminated soil in Fort McMurray is currently estimated at 23,000 cubic metres (m³).

In addition to the material found at Fort McMurray, uranium-contaminated soil was also discovered at two major cargo transfer points at rapids along the water transportation network and on a private property near a point where cargo transfers normally took place on the water. The transfer points are at the series of rapids on the Slave River between Fort Fitzgerald, Alberta and Fort Smith, NWT, and the St. Charles rapids on the Great Bear River. At Fort Norman, where the

Great Bear River flows into the MacKenzie River, and where transfers of cargo normally took place on the water, uranium-contaminated soil was found on an occupied private property. A cleanup with a temporary stockpiling of material on vacant land was conducted at this location. Investigations of the Northern Transportation Network will continue in 1993.

In Fort McMurray, plans were already in place for the warehouse property to be sold, the old warehouse removed, and the site redeveloped. To avoid a delay in this schedule, approximately 4000 m³ of contaminated soil was excavated during October and November, and placed in the warehouse for interim storage. Further work, including the removal of the warehouse, is planned at the site beginning in April of 1993.

Issues to be resolved before the cleanup program at Fort McMurray can be completed include the establishment of cleanup criteria and finding a site for the disposal of the waste. In December, a working group, consisting of representatives from the LLRWMO and their environmental and engineering consultant, the City of Fort McMurray, Improvement District 18 (the adjacent mainly rural area), and the Fort McMurray and District Health Unit as the regulatory agency, was organized to resolve these issues.

Cleanup criteria were established, partially on the basis of criteria published by the Canadian Council of Ministers of the Environment (CCME), and partially through a risk assessment to set criteria for elements not covered by CCME. A work plan was developed based on segregating the relatively small volume of material (a few hundred cubic metres) with a uranium concentration of 500 parts per million (PPM) or higher, and requiring a licence from the Atomic Energy Control Board (AECB), from the estimated 23,000 m³ of mildly contaminated soil. The licensable material will be removed from the community, either for storage in a warehouse operated for the LLRWMO at the Chalk River Laboratories of AECL and ultimate disposal as waste, or for processing at a uranium mill. The mildly contaminated soil has been classified by the province of Alberta as industrial waste and will be disposed of in a separate cell at the local landfill. This work will take place in 1993 and 1994.



A power shovel removes a thin layer of soil at the work site in Fort McMurray. Each layer is first surveyed, using the survey cart in the right foreground, so pieces of ore can be segregated prior to the layer's removal.

Port Hope, Ontario



The presence of widespread contamination of soils and building materials in Port Hope was discovered in the mid 1970s. A large scale cleanup program was carried out by the AECL as the lead agency for a Federal/Provincial Task Force on Radioactivity (F/P Task Force). However, the radioactive waste management storage site at the Chalk River Laboratories of AECL, to which the Port Hope wastes were transferred, had limited capacity. Remedial work thus concentrated on developed residential, public and commercial properties. Large volumes of contaminated soil in vacant areas, and the contaminated sediments at the harbour, were left for cleanup at a later date. As well, small quantities of slightly contaminated soils, that is soils with above background radioactivity content, but meeting the cleanup criteria established by the F/P Task Force, exist along some public roads and on some private and public properties. LLRWMO activities in Port Hope are directed at completing work at both large and small scale sites.

At the large scale sites in 1992/93, the focus was primarily on contributing to the completion of remedial action plans through the Siting Task Force on LLRW management which was established by the Minister of Energy, Mines and Resources Canada to locate a new permanent site for all of the historic wastes found in the Port Hope area. A subsurface waste delineation project, to address data gaps at three sites, including the municipal landfill at Highland Drive, was completed. A follow-up leachate plume investigation and a project to develop a computer model of groundwater contaminant transport were undertaken on behalf of the Siting Task Force. A separate, but related, activity involves interim closure of the landfill by Northumberland County to meet the regulatory agency requirements of the Ontario Ministry of the Environment. The LLRWMO has produced input to this project in terms of identifying factors arising from the presence of historic wastes and the need for a joint monitoring program after closure.

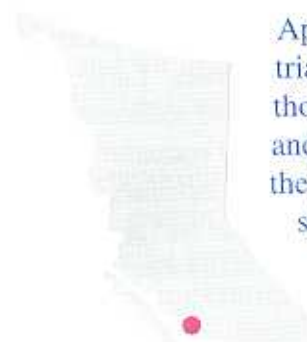


LLRWMO staff use a gamma spectrometer in the Port Hope Field Services Office to analyze soil samples for radioactive contamination. This instrument identifies contaminants which emit gamma radiation and measures their concentrations in the soil.

The Construction Monitoring Program (CMP), a joint initiative of the Town of Port Hope and the LLRWMO, continued. The previous cleanup criteria are based on the existing use of the property, but additional controls are needed for new construction and to prevent the inadvertent use of mildly contaminated soils as backfill around buildings at other locations. One hundred and eighteen properties were checked out through the CMP in 1992/93, bringing the total since the program began in 1989 January to 644. Small scale cleanups were also done at two properties outside the CMP following investigations of residual contamination levels. Approximately 3,500 m³ of contaminated soil, from 41 properties, has been taken to the Temporary Storage Site, a licensed storage facility located in the town, since the start of the CMP.

The program for small scale sites, combined with the earlier F/P Task Force program and the LLRWMO's environmental monitoring, site investigation and interim remedial work activities at major sites, ensures protection of human health and the environment, even though permanent disposal of the contaminated soils is some years away.

Surrey, B.C.



Approximately 4,000 m³ of contaminated soils and slag exist on two industrial properties in Surrey, B.C. The principal radioactive contaminant is thorium, which was contained in niobium ore imported during the 1970s and which remained in the slag following smelting. Remedial work during the 1980s resulted in the material being placed in interim storage on both sites pending disposal.

The Surrey Siting Task Force (SSTF) was established by the Minister of Energy, Mines and Resources Canada to seek a disposal site within the province. The LLRWMO continued to provide administrative and technical support to the SSTF in 1992/93.

A major activity undertaken this year by the SSTF and its associated Community Liaison Group (CLG) was a comprehensive sampling and analysis program of the contaminated soil stored at the site at Anvil Way. The aim of the sampling program was to confirm the chemical and radiological characteristics of the contaminated soil, which were based on earlier laboratory characterization of the slag and a mixing factor based on estimates of the original amount of slag present at the site. The LLRWMO provided technical assistance for the sampling program and an independent assessment of thorium content, using borehole gamma spectral logging, in cooperation with Geological Survey of Canada (GSC) staff. This method is an innovative application of methods originally developed by the GSC for mineral exploration, and several papers have been jointly published in the scientific literature on its application here and at other LLRWMO historic sites.



The results of the sampling program will be published in 1993/94. Confirmation that the contaminated soil at the Anvil Way site is neither "radioactive waste" nor a "special waste" according to regulatory definitions will be important to the SSTF and CLG, during consultations with both the public and regulatory agencies on proposals for disposal.

This concrete bunker at an industrial site, and a similar structure at a second industrial site provide secure containment for the contaminated slag and soils pending final disposal.

Scarborough, Ontario



Radium-contaminated soil was discovered at McClure Crescent in the Scarborough community of Malvern in 1980. Several initiatives to remove it failed when residents who lived close to proposed interim storage sites objected vigorously. In 1990, a second area with contaminated soil was found at an undeveloped site adjacent to McLevin Avenue in Malvern.

Here, interim remedial work was successfully carried out by segregating the relatively small volumes of waste materials requiring an AECB license for their possession from the much larger volume of mildly contaminated soil. The former was transferred to a licensed storage warehouse, operated for the LLRWMO by the Chalk River Laboratories of AECL, while the latter was kept on site.

A joint Canada/Ontario project to complete the cleanup of radium-contaminated soil in the Malvern area was announced in 1992 March. The main elements of the project are to complete the cleanup of soils at McClure Crescent and McLevin Avenue, to segregate licensable material and remove it from the local area, to store the remaining mildly contaminated soil at an interim site to be located in Scarborough, and to conduct an extended survey of the community to confirm that no further areas of contamination exist. Three committees guide the project. The Steering Committee comprises senior representatives of Energy, Mines and Resources Canada and the Ontario Management Board Secretariat, together with the chairpersons of the other two committees. These are the Technical Advisory Committee (TAC) made up of technical experts from government departments, and the Public Liaison Committee (PLC) comprising members of the community. The LLRWMO chairs the TAC and provides administrative and technical support to the project, including project management and contract administration, and operation of a project information office in the Malvern Town Centre shopping mall.

The work to date has been directed at identification of a technically suitable, publicly acceptable temporary site, or sites, for sorting and storage of the mildly contaminated soils. A consultant was contracted to assist with identification of potential sites, public consultation and environmental screening of the potential sites. The PLC has been actively involved in the development and communication of information to local residents through a process which has included two newsletters, two open houses and a workshop.



A store-front office in a major shopping mall has provided a visible and continuing contact point for people interested in the project to clean up contaminated soil in Malvern.

The consultant has recommended a preferred area for the interim storage site in an industrial area adjacent to the residential community. Subject to identification and acquisition of a specific site, and a decision to proceed upon completion of the environmental screening process, the targets for 1993/94 include completing the detailed engineering work, developing the sorting system and procuring the equipment, constructing the interim storage and sorting facilities and starting the cleanup work. The extended radon and gamma radiation surveys will also be started.

Small-Scale Cleanups

In addition to remedial work at major historic waste sites, the LLRWMO undertakes cleanups of small-scale historic waste occurrences as required. These often involve buildings used in connection with the radium industry, but can also include cleanups of contaminated artifacts or small volumes of contaminated soil.

During 1992/93 the LLRWMO undertook two major cleanups at private homes. One required replacement of the house due to the extensive use of contaminated lumber for major structural members.

The LLRWMO also collects small quantities of miscellaneous historic waste that are brought to its attention. If required, further cleanups are scheduled or carried out at these locations. In 1992, nine such collections took place. No follow-up cleanups were performed in 1992/93.

Supporting Technical Studies

The LLRWMO carries out a variety of studies in support of the projects it undertakes. A major initiative during the past year has been directed at developing a common technical framework for defining cleanup criteria for contaminated soil and for contamination of building interiors. As well, the framework for contaminated soil considers both radiological and chemically hazardous contaminants. Although the technical work is complete, it will be some time before a consensus emerges through discussions with Energy, Mines and Resources Canada, regulatory agencies and interactions with interested members of the public. In the meantime, the empirical application of internationally accepted principles continues to provide a satisfactory, albeit case by case, basis for establishing cleanup criteria.

The LLRWMO has carried out considerable work to establish the normal background concentrations of naturally occurring radionuclides in soil. This included publication in 1992/93 of the first results from a study of Radium-226 concentrations in soils commonly found in Ontario. This study used samples and protocols consistent with those used by Ontario Ministry of the Environment (MOE) for determining the upper limit of normal (ULN) for chemical elements. Further LLRWMO work is in progress to complement ongoing work by Ontario MOE on chemical elements.

ONGOING WASTES PROGRAM

Ongoing wastes are LLRW which are produced from operational activities of generators who are currently in business. The generators are thus held responsible for the management and disposal of these wastes.

The goals of the Ongoing Wastes Program are to provide EMR with comprehensive analysis of the national needs for disposal services and facilities, and technical assessments and advice toward development of national policies and strategies for disposal of these wastes.

Inventory of Low-Level Radioactive Waste in Canada

Annual Report
1991



Work started in 1990 to review LLRW produced on an ongoing basis in Canada, disposal requirements and options for meeting these requirements. The initial target was to construct a national database from which an annual report summarizing LLRW inventories, production, future projections and management practices can be developed. This has been achieved. A computer-based database was set up and is operational. The first annual inventory report was published this year. According to this report, about 135,000 m³ of ongoing wastes have accumulated in Canada up to 1991, of which 8,000 m³ was accumulated in 1991. On the other hand, accumulation of historic waste was substantially larger at about 1,160,000 m³.

Further efforts are under way which focus on improving the waste characterization data, specifically with respect to the quantitative data available for key radionuclides and chemical components in each waste stream. This will be done through an annual survey and follow-up discussions with waste generators.

Assessments were also initiated, beginning in fiscal year 1991-92, on selected topical issues on the management of ongoing LLRW in Canada. These topics include: future LLRW from decommissioning of nuclear facilities, significance of mixed radioactive and hazardous wastes, volumes of waste containing long-lived radionuclides, current status of waste classification systems and assay methods, and LLRW produced from provincially regulated non-nuclear industry sources. These reports have been completed and are due to be published shortly.

INFORMATION PROGRAM

Information programs were carried out, either directly or through the use of contractors, in support of specific historic waste projects. The Malvern Remedial Project Office (MRPO) was opened as a project information office in 1992 May. In addition to hiring and training staff, the LLRWMO produced a series of fact sheets for the project, and has contributed to the production of newsletters by the PLC. A community information program was initiated in Fort McMurray, and an ongoing program was continued through schools in Port Hope.

The production of information materials includes the preparation of technical papers and their presentation at scientific conferences. These papers are authored or co-authored by LLRWMO staff. During 1992/93, 8 papers were published.

Administration

The LLRWMO is operated by AECL through a cost recovery agreement with Energy, Mines and Resources Canada, the federal department which provides the funding and establishes national policy. Administratively, the LLRWMO operates at the Division level within the Environmental Sciences and Waste Management Operating Unit of AECL.

The LLRWMO has operations at two locations. During the year the National Office relocated, from accommodation shared with AECL Head Office in downtown Ottawa, to a suite in a suburban office building in Gloucester. In conjunction with this move, several other changes designed to increase operating efficiency and decrease costs were instituted. Details are described in Appendix B.

The Port Hope Field Services Office (PHFSO) provides field and laboratory support to LLRWMO projects in Port Hope and across Canada. The PHFSO operates on a cost recovery basis and charges its services at a fully overheaded rate. LLRWMO projects purchase the services of the PHFSO if they can be provided more economically, or more expeditiously, than from other sources. In some cases the PHFSO has also provided services to other organizations. For example, the Siting Task Force Secretariat purchased analytical and technical support services from the PHFSO in support of its investigations at sites in the area.

During 1992/93 the LLRWMO participated in AECL programs to maintain and improve quality. The Continuous Quality Improvement (CQI) program, initiated the previous year by AECL, helped LLRWMO staff pay increased attention to quality and customer satisfaction. Related to this, a schedule was developed for the extension of Quality Assurance (QA) documents to all activities which should be included within the formal QA envelope, and preparation of documents was maintained to this schedule.



Dr. R.W. Morrison, (L) the Director General of the Electricity Branch, EMR, and Dr. C.J. Allan, Vice-president of Environmental Sciences and Waste Management, AECL, cut the ribbon to open the new National Office of the LLRWMO as staff and guests look on. Holding the ribbon are AECL acting president Dr. T.E. Rummery (L) and LLRWMO Director R.W. Pollock (R).

FINANCIAL REVIEW

General

Funding for the LLRWMO is established within the reference level of EMR, through Treasury Board approval. The current approval covers a five year period, beginning in fiscal year 1990/91 and ending in fiscal year 1994/95.

EMR transfers funds to AECL through a cost recovery agreement (a Memorandum of Understanding) for the operation of the LLRWMO. The major planning document is the annual Business Plan, submitted by the LLRWMO for approval by EMR prior to the start of each fiscal year. The Business Plan takes account of both changes in funding levels which have occurred subsequent to the original Treasury Board approval, and changes in priorities which have to be accommodated within the available funding. Adjustments to priorities during the year are accommodated through quarterly progress reviews held between LLRWMO staff and staff of the Electricity Branch of EMR.

The following paragraphs compare 1992/93 actual expenditures with the 1992/93 Business Plan, and provide a summary of the 1992/93 expenditures by major program areas. Appendix C provides additional details on the allocation of costs to major program areas for 1992/93, and on costs during prior years of the current Treasury Board approval period.

1992/93 Actual Expenditures Compared to Business Plan

In making this comparison, it is necessary to differentiate between core funding activities and project-specific funding. Core funding activities are those associated with ongoing operation of the LLRWMO. Project-specific funding refers to funding required for waste disposal or interim remedial work at specific major historic waste sites. The estimates submitted for Treasury Board approval were based on this format, which includes several different items in each of the two main categories. Expenditure planning and tracking within the AECL financial reporting system is based on assigning a work project number to each different item.

Table 1 provides a summary of the work project numbers for 1992/93, and the corresponding description of the items of expense, following the format of the submission to Treasury Board. A change was made in 1991/92 to the method of reporting costs for ongoing management of historic wastes. In prior years, only small scale cleanups and some of the ongoing costs incurred in Port Hope were included in this item. Other costs, such as those incurred for the Surrey wastes on an ongoing basis, were previously considered as miscellaneous expenses. As well, AECB licensing fees are a new type of expense not included in the original Treasury Board submission. This line now includes all costs for the ongoing management of historic wastes.

Table 2 provides the 1992/93 financial summary, with a graphical display in Figure 1.

Table 1 - 1992/93 Work Project Numbers and Description of Items

Type of Expense	Description of Expense	Internal W.P. No.
<i>Core Funding</i>		
Staffing, Support Services and Miscellaneous Expenses	Annual costs for operation of the National Office, Allocation as overheaded costs to major program areas is included in Table 3	310
Studies and Assessments	Costs for studies and assessments, where the output is a technical report.	579
Ongoing Management of Historic Wastes ⁽¹⁾	Ongoing costs for interim storage sites (including AECEB licences), environmental monitoring programs and other ongoing activities such as the Port Hope Construction Monitoring Program, and for small scale cleanups.	580
Port Hope Field Services Office	Annual net costs for operation of the Field Services Office. Costs are recovered, on a fully overheaded basis, from LLRWMO internal projects and, where appropriate, external sources. This line shows only the net difference between costs incurred and costs recovered.	562
<i>Project-Specific Funding</i>		
Port Hope	Interim remedial work at historic waste sites in Port Hope	578
Surrey	Disposal of the Surrey historic wastes, including flow through funding for the Surrey Siting Task Force and Community Liaison Group	577
Scarborough	Costs for the Malvern Remedial Project shared by the federal government through the LLRWMO, and the Ontario government through the Management Board Secretariat	576
Northern Transportation Route/Fort McMurray	Surveys, cleanup and disposal of historic wastes along the northern transportation route, including the major historic waste sites at Fort McMurray	200

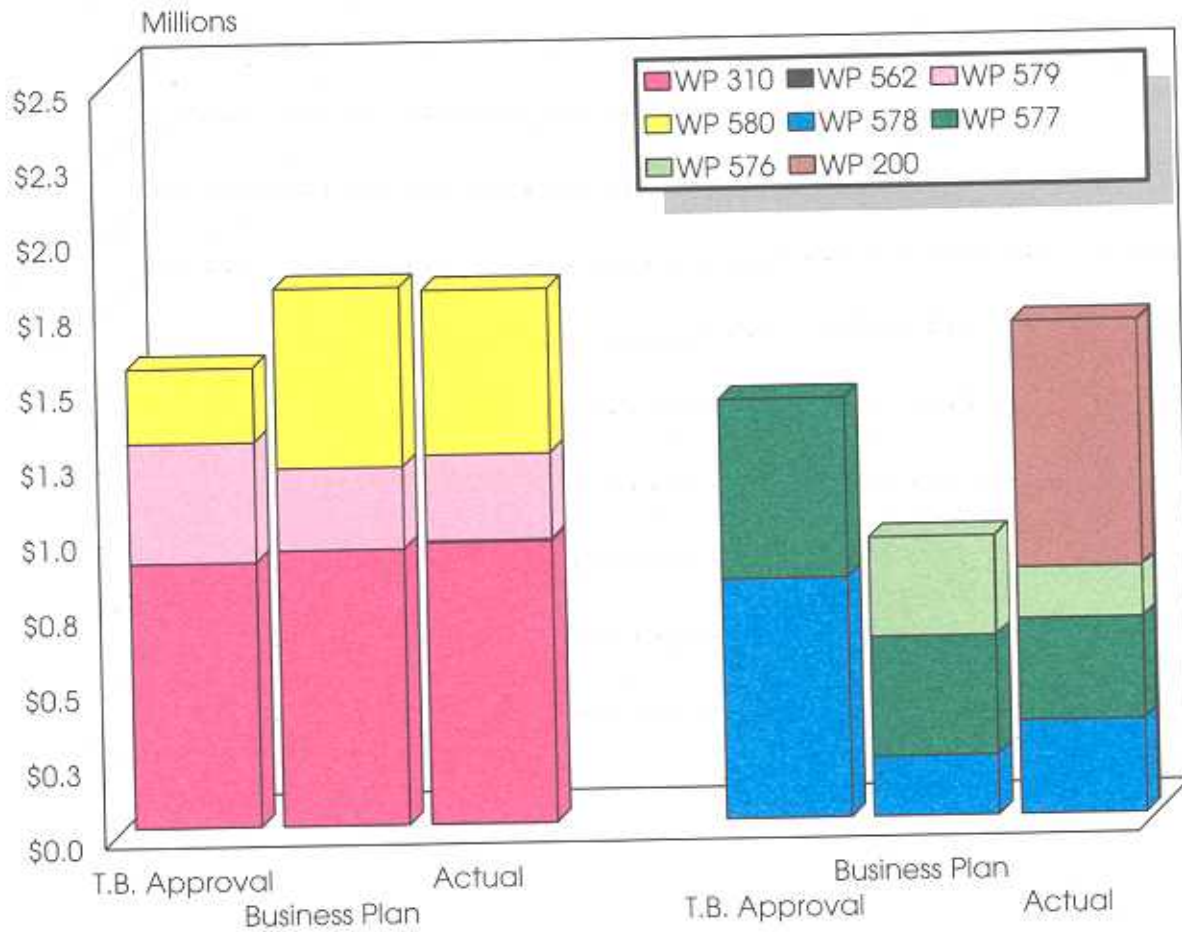
⁽¹⁾ See text for description of changes made in 1991/92 for reporting of this item.

Table 2: LLRWMO 1992/93 Financial Summary (\$M)

	WP Code	Treasury Board Approval	1992/93 Business Plan	1992/93 Actual
Core Funding				
<i>Staffing, Support Services & Miscellaneous Expenses</i>	310	0.882	0.92	0.94
<i>Studies & Assessments</i>	579			
- Historic Wastes		0.1	0.124	0.188
- Ongoing Wastes		0.3	0.15	0.099
Sub-Total		0.4	0.274	0.287
<i>Ongoing Management of Historic Wastes</i>	580			
- Port Hope		0.1	0.25	0.221
- Scarborough		—	0.005	0.006
- Surrey		0.05	0.065	0.061
- Small Scale Cleanups		0.1	0.27	0.226
- CRL Interim Storage Bldgs		—	0.01	0.004
- Miscellaneous		—	—	0.032
Sub-Total		0.25	0.60	0.55
<i>Field Office (net costs)</i>	562	—	—	0.005
TOTAL CORE FUNDING		1.532	1.794	1.782
Project Funding				
- Port Hope	578	0.8	0.2	0.313
- Scarborough	576			
- Total Project Costs		0	1.034	0.563
- Cost Recovery from Ontario		0	0.702	0.393
- Net Cost to LLRWMO		0	0.332	0.170
- Surrey	577	0.6	0.40	0.341
- Northern Transport, Network	200	0	0	0.822 ⁽¹⁾
TOTAL PROJECT FUNDING (by EMR)		1.4	0.932	1.646
TOTAL EMR FUNDING		2.932	2.726	3.428

⁽¹⁾ Additional funding was provided by EMR during the year (see text).

Figure 1: 1992/93 Financial Summary



Core funding activities

Project funding activities

It can be seen that the 1992/93 Business Plan was broadly similar to the original 1990 Treasury Board approval, but that some adjustments were required to reflect changing priorities. Within core funding activities, the major change was the increased costs for ongoing management of historic wastes. This is a reflection of the significantly higher costs, than originally identified, for activities which will be required on an ongoing basis until such times as these historic wastes inventories are permanently disposed. This was partially offset by decreasing the funds allocated to studies and assessments, but there is limited scope to do this if the LLRWMO is to fully carry out its mandate. Changes to individual items covered by project-specific funding were more pronounced. This is a reflection of the fact that annual cash flows are difficult to estimate, given the uncertainties inherent to project approval and implementation.

A comparison of 1992/93 actual expenditures with the Business Plan shows close agreement for total core funding and for all individual activities covered by core funding. Project-specific funding shows about the same total expenditure as originally projected for the known major historic waste sites, at Port Hope, Surrey and Scarborough, with some variances at individual locations to reflect changing circumstances during the year. There was no allowance initially for the Northern Transportation Route/Fort McMurray project, since the need for this project was not known at the time the Business Plan was developed. Additional funding was provided during the year so that the opportunity to make an early start on resolution of this new historic waste problem was not lost.

Overall, the ongoing cooperation between LLRWMO staff and Electricity Branch staff of EMR has resulted in a flexible and cost effective approach to changes in priorities during the year.

This has enabled substantial progress to be made in response to the discovery of new historic waste sites in the north, while still allowing the LLRWMO to discharge its responsibilities elsewhere.

Summary of Expenditures By Program

The LLRWMO mandate has three major program areas - historic wastes, ongoing wastes and information. To allow comparison with these program areas, each item of the 1992/93 expenditures, including overhead costs, has been assigned to its program area. Details are provided in Appendix C. Table 3 provides a summary of the results, which were also used to provide the graphical summary shown in the 1992/93 Highlights sections.

Table 3: Summary of 1992/93 LLRWMO Expenditures by Program Area

Program Area	Amount (in thousands)	%
Historic Wastes	878.0	25.6
- Port Hope	461.6	13.5
- Surrey	303.2	8.8
- Scarborough	926.9	27.0
- Northern Transportation Route/Fort McMurray	307.5	9.0
- Small Scale Cleanups	90.1	2.6
- Other (Technical Studies & Assessments)	2967.3	86.5
<i>Subtotal for Historic Wastes</i>		
Ongoing Wastes	293.4	8.6
Information	167.6	4.9
1992/93 TOTAL EXPENDITURES	3428.3	100.0

Overall, about 85% of the 1992/93 expenditures was in support of historic waste programs. This is a reflection of the fact that major initiatives are now in progress, either directly through the LLRWMO or to which the LLRWMO contributes, to resolve all known historic waste problems which are a federal responsibility in Canada.

APPENDIX A

Low-level Radioactive Waste Management Office Staff 1993 March



Front Row, L-R

T.A. Valentonis, L.D. Delaney, S.E. Beauchamp

Middle Row, L-R

D.M. Huffman, G.G. Rondeau, P.L. De, E.P. Rowden, B.S. Dosanjh, M.J. Gardiner, A.M. Kundu

Back Row, L-R

R.W. Pollock, B.A. McCallum, R.L. Zelmer, R.C. Barker, A.M. Boorne, B.J. Franklin

Missing D.E. Main

APPENDIX B

LLRWMO ORGANIZATION CHART AND STAFF LIST

The organization chart at year end is shown in Figure B1. This reflects organizational changes, made subsequent to the restructuring of AECL Head Office in mid-1992, to improve the efficiency and cost effectiveness of LLRWMO operations. The following specific changes were made:

- The organizational structure now fully reflects the basic function of the LLRWMO as a small project management-oriented organization. All Technical Program Managers and senior Project Managers report directly to the LLRWMO Director and have substantial autonomy within project budgets approved through the Business Plan.
- All direct field support and laboratory services are consolidated through the Port Hope Field Services Office (PHFSO). The PHFSO has no direct budget and thus operates fully on a cost recovery basis, from LLRWMO projects and, where appropriate, external sources. The Supervisor, Field Services is responsible for estimating the work load, providing staff and other resources to meet this work load, and developing cost recovery rates for technical services and laboratory analyses. This is done on an annual basis for the Business Plan, and reviewed quarterly.
- The provision of support services was reorganized. Two support staff, charged directly to the LLRWMO budget, were assigned by AECL to consolidate activities previously carried out, on a part-time basis, through multiple staff at AECL Head Office. A reduced number of services, which are most efficiently provided by other units of AECL, are still provided on a prorated or direct user-pay basis. Other services are purchased directly from external suppliers.
- The LLRWMO relocated to offices separate from AECL Head Office.

Overall, these changes have improved the focus on project planning and management, including the integration of financial planning and reporting with the technical components.

The staff list at year end is provided in Table B1.

Figure B1: LLRWMO Organization Chart (1992 December)

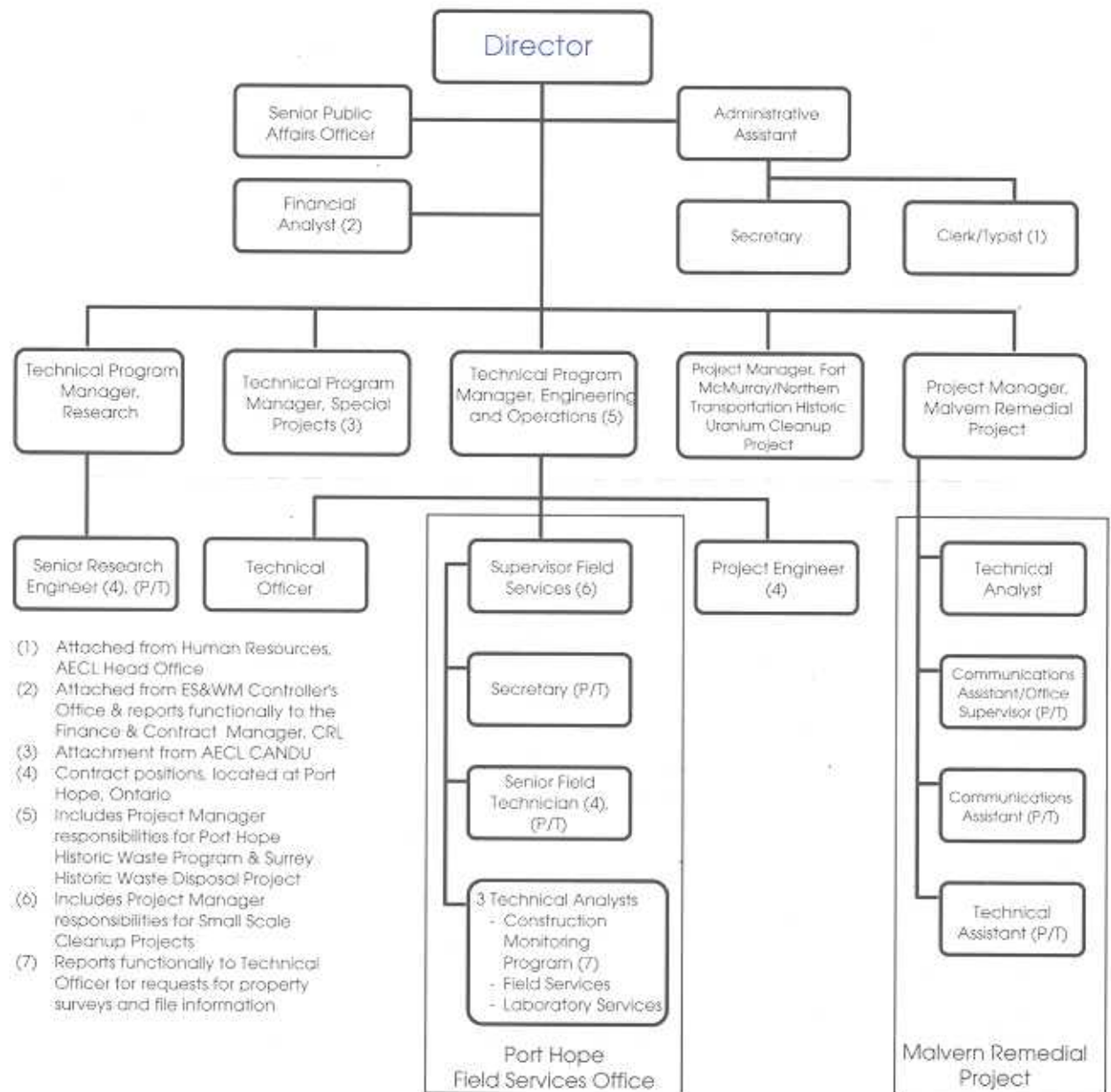


TABLE B1 - LLRWMO Staff List (1992 December)

<i>Location</i>	<i>Position</i>	<i>Incumbent</i>
National Office (Ottawa)		
	Director	R.W. (Bob) Pollock
	Administrative Assistant	L.D. (Lorraine) Delaney
	Secretary	T.A. (Teena) Valentonis
	Clerk Typist ⁽¹⁾	G.G. (Gerri) Rondeau
	Financial Analyst ⁽²⁾	S.E. (Sylvie) Beauchamp
	Sr. Public Affairs Officer	B.J. (Brad) Franklin
	Technical Program Managers, Special Projects ⁽³⁾	P.L. (Pab) De
	Research	D.E. (Dennis) Main
	Engineering & Operations ⁽⁵⁾	R.L. (Bob) Zelmer
	Technical Officer	R.C. (Bob) Barker
Port Hope Field Services Office		
	Supervisor, Field Services ⁽⁶⁾ and Project Manager, Fort McMurray/ Northern Transportation Route Historic Uranium Cleanup Project	B.A. (Barry) McCallum
	Secretary (p/t)	Vacant
	Sr. Field Technician (p/t) ⁽⁴⁾	J.G. (John) DeJong
	Technical Analysts	
	Construction Monitoring Program ⁽⁷⁾	E.P. (Ted) Rowden
	Field Services	M.J. (Mark) Gardiner
	Laboratory Services	D.M. (Dale) Huffman
	Sr. Research Engineer ⁽⁴⁾⁽⁸⁾	A.E. (Aldo) D'Agostino
	Project Engineer ⁽⁴⁾⁽⁹⁾	Vacant
Malvern Remedial Project		
	Project Manager	B.S. (Bhajan) Dosanjh
	Technical Analyst	C.M. (Chris) Clement
	Communications Asst./ Office Supervisor (p/t)	A.M. (Angela) Boorne
	Communications Asst. (p/t)	A.M. (Michael) Kundu
	Technical Asst. (p/t)	Vacant

⁽¹⁾ Attached from Human Resources, AECL Head Office

⁽²⁾ Attached from ES&WM Controller's Office & reports functionally to the Finance & Contract Manager, CRL

⁽³⁾ Attachment from AECL CANDU

⁽⁴⁾ Contract positions, located at Port Hope, Ontario

⁽⁵⁾ Includes Project Manager responsibilities for Port Hope Historic Waste Program & Surrey Historic Waste Disposal Project

⁽⁶⁾ Includes Project Manager responsibilities for Small Scale Cleanup Projects

⁽⁷⁾ Reports functionally to Technical Officer for requests for property surveys and file information

⁽⁸⁾ Reports to Technical Program Manager, Research

⁽⁹⁾ Reports to Technical Program Manager, Engineering and Operations

APPENDIX C

C1. COMPARISON OF 1992/93 EXPENDITURES TO PRIOR YEAR EXPENDITURES

Table C1 provides a breakdown of LLRWMO actual expenditures for 1990/91, 1991/92, and 1992/93 compared to the original Treasury Board approval in early 1990, to the annual Business Plan and to changes approved by EMR during each year. A comparison to original Treasury Board approvals is made in Figure C1.

It can be seen that core funding activities are reasonably close to those originally estimated to EMR and approved by Treasury Board in early 1990. There are some differences for Work Project 580, which collects all costs required for the ongoing management of historic wastes prior to their final disposal. The costs reported for 1990/91 are artificially low in that costs for a number of activities carried out in Port Hope on an ongoing basis were not separated from costs for major interim remedial work projects. The breakdown of these ongoing costs for the Port Hope historic wastes, and for historic wastes at other locations, was substantially improved in 1991/92, and further refined in 1992/93. This represents a substantial improvement in cost reporting, because it is important to distinguish between costs which will continue to occur until the wastes are eventually disposed permanently, and those for specific projects. Changing the operation of the PHFSO to fully overheaded cost recovery has been the major factor allowing this improvement.

Costs for specific disposal or interim remedial work projects show much more variability from the original 1990 estimates. This is a reflection of two factors:

- schedules for approvals for these projects are subject to considerable inherent uncertainties beyond the control of the LLRWMO and EMR. This has some effect on overall costs, because delays invariably increase costs, and a much more pronounced effect on costs in any given year. It can be seen that the differences between estimated and actual costs have increased with each year beyond the original approval. There is little resemblance between the 1992/93 actual costs and estimates made three year earlier.
- the total expenditure each year has to be limited to the available budget. Since core funding activities are relatively consistent, changes in priorities and available funding primarily affect the rate at which specific major projects can be undertaken.

C2. DETAILS OF BREAKDOWN OF EXPENDITURES BY MAJOR PROGRAM AREA

The format used for expenditure estimating, approvals and reporting does not readily provide a picture of total costs for each of the three main program areas. To provide this picture, the individual items of expenditure were compiled as follows:

Table C1: Breakdown of LLRWMO Actual Expenditures versus Treasury Board and Business Plan Approvals (in thousands of dollars)

	W.P. Code	1990/91		1991/92		1992/93	
		TB App. ⁽¹⁾	Actual	TB App. ⁽¹⁾	Actual	TB App. ⁽¹⁾	Actual
<i>Core Funding</i>							
- Staffing, Support Services and Misc. Expenses	310	850	896	866	954	882	945
- Studies and Assessments	579	400	247	400	378	400	287
- Ongoing Wastes of Historic Wastes	580	250	157	250	437	250	550
Total Core Funding		1,500	1,300	1,516	1,769	1,532	1,782
<i>Historic Waste Disposal/ Interim Remedial Work</i>							
- Port Hope	578	1,050	1,234	800	716	800	313
- Surrey	577	350	171	600	244	600	341
- Scarborough	576	—	109	—	103	—	170
- Northern Transportation Route/Fort McMurray	200	—	—	—	—	—	822
Total Historic Waste		1,400	1,514	1,400	1,063	1,400	1,646
TOTAL - Original Approval		2,900	2,814	2,916	2,832	2,932	3,428
TOTAL - Business Plan		2,900	2,814	2,816⁽²⁾	2,832	2,732⁽³⁾	3,428
TOTAL - Approved Year End		2,900	2,814	2,832⁽⁴⁾	2,832	3,432⁽³⁾	3,428

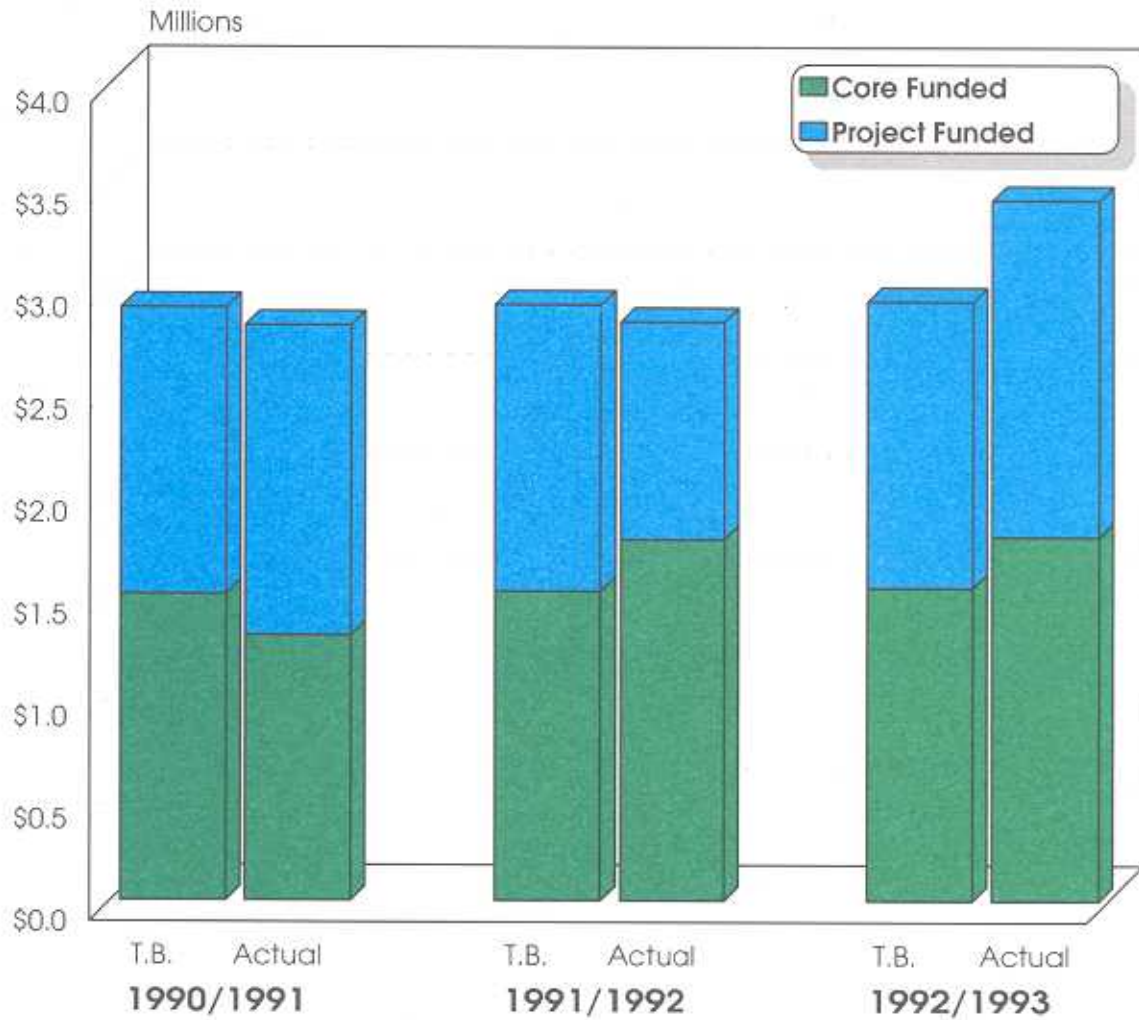
⁽¹⁾ Original basis of submission to Treasury Board

⁽²⁾ Decreased to 2,816, prior to start of year, for Business Plan

⁽³⁾ Decreased to 2,732, prior to start of year, for Business Plan; increased to 3,432 during year as result of priority changes approved by EMR

⁽⁴⁾ Year end adjustment approved by EMR

Figure C1: Actual Expenditures Compared to Original Treasury Board Approval (1990/91 to 1992/93)



- direct costs for each major disposal or interim remedial work project are already readily available through the work project reporting structure.
- costs for ongoing management of historic wastes, reported in work project 580, were assigned to their respective historic waste site.
- costs for studies and assessments, reported in work project 579, were assigned to their respective historic waste site, or to the ongoing wastes program area.
- costs for basic operation of the LLRWMO (costs for the National Office, reported in work project 310, plus any difference between costs recovered and incurred for the Port Hope Field Services Office, reported in work project 562), were considered an overhead cost. These were assigned on a prorated basis to each major program area, with further subdivision between major historic waste sites. The basis for the prorating was the amount of time spent by the LLRWMO technical and management staff on each program area.

Table C2 provides the detailed breakdown, which is the basis for the summary table and figure in the main text.

Table C2: 1992/93 LLRWMO Expenditures by Major Program Area

Program Area	Project Directs	580 ⁽¹⁾ Directs	579 ⁽²⁾ Directs	Overhead	TOTAL
<i>Historic Wastes</i>					
Port Hope	313,000	231,878	69,374	263,715	877,967
Scarborough	170,000	6,000	42,537	84,700	303,237
Surrey	341,000	61,000	3,764	55,805	461,569
Fort McMurray	822,000	—	—	104,949	926,949
Small Scale Cleanups	—	250,010	14,482	42,968	307,460
Other	—	1,607	57,361	31,152	90,120
Sub-Total	1,646,000	550,495	187,518	583,289	2,967,302
Ongoing Wastes	—	—	99,000	194,430	293,430
Information	—	—	—	167,575	167,575
TOTAL	1,646,000	550,495	286,518	945,294	3,428,307

(1) Ongoing Management of Historic Wastes

(2) Studies and Assessments