

THE MALVERN REMEDIAL PROJECT - A CASE HISTORY

R. W. POLLOCK and B.J. FRANKLIN

Low-Level Radioactive Waste Management Office, AECL, Gloucester, Ontario. K1B 5R3
Presented at International Conference on Deep Geological Disposal of Radioactive Wastes
1996 September 16-19, Winnipeg, Manitoba

ABSTRACT

The Low-Level Radioactive Waste Management Office (LLRWMO) was established by the federal government in 1982 to carry out the government's responsibilities for low-level radioactive waste (LLRW) management in Canada. The LLRWMO mandate includes the resolution of historic waste problems which are a federal responsibility.

A recent successful project required that a site for the interim storage of radium-contaminated soil be established in an urban area. Some aspects of this siting experience are applicable to the siting of a repository for high-level radioactive wastes. This paper describes the program of public consultation and shared decision-making which was successful in establishing the site, and allowing the project to proceed with community support. It analyzes the process and presents lessons learned which are relevant to future siting undertakings.

INTRODUCTION

The Low-Level Radioactive Waste Management Office (LLRWMO) was established by the federal government in 1982 to carry out the government's responsibilities for LLRW management in Canada. 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 LLRW produced on an ongoing basis, and
- address general public information needs about low-level radioactive wastes.

This paper is based on experience at historic waste sites. Historic wastes are defined as wastes for which the original producer can no longer reasonably be held responsible and which are managed in a manner no longer considered acceptable. In general, these wastes are in the form of either bulk soils or building materials, contaminated with natural radioactive elements such as radium or uranium. Although progress is being made, there are currently no AECL licensed permanent disposal sites in Canada for LLRW. Cleanup projects undertaken by the LLRWMO thus also include interim storage of the wastes. Small volumes of waste are transferred to an existing warehouse-type facility, operated for the LLRWMO by AECL at Chalk River Laboratories. This is not a practical approach for large volumes of contaminated soil, and several projects have required interim storage at, or near, the original waste sites.

This aspect, interim storage, can be controversial. From a technical perspective, the radionuclide inventories in low-level radioactive wastes (LLRW) are less than those in nuclear fuel wastes.

However, the public perception of radioactive materials is such that high standards of isolation and containment are demanded for all radioactive wastes, regardless of radioactivity concentrations or total inventory. For this reason, experience in the acquisition of storage sites may be applicable to other siting efforts including that for The Nuclear Fuel Waste Management Program (NFWMP). The Siting Task Force on Low-Level Radioactive Waste Management was established by the government to site a permanent disposal site for historic wastes, including the Scarborough wastes which are the subject of this presentation.

Site Selection Process Principles (NFWMP)

Principles that could be considered in a site selection process for nuclear fuel waste are outlined in the program's Environmental Impact Statement.

- Safety and Environmental Protection
- Volunteerism
- Shared Decision Making
- Openness
- Fairness

This presentation on LLRWMO experience is made in the context of these principles.

It should be noted that, by definition, a community does not volunteer for an historic waste site requiring cleanup - the site already exists. Siting in the context of this paper thus refers to whether the historic wastes are to be managed in situ, or relocated to another location for interim storage until a permanent disposal site is available.

MALVERN REMEDIAL PROJECT - HISTORY

In 1945, materials containing the naturally radioactive element radium were brought to a farm located to the southwest of what is now the intersection of Neilson Road and Sheppard Avenue in Scarborough. Some of these materials were burned in a crude incinerator, so radium could be recovered from the ashes. This resulted in wastes from this operation, and perhaps some of the original material, apparently being buried at the farm. Some of the original material was also dumped at another location about 1.3 km to the north, at a currently undeveloped area north of McLevin Avenue opposite the Malvern Town Centre.

Beginning in the early 1950s, the Federal and Ontario governments began assembling land which included both the area of the farm and the other area where radium-contaminated materials were dumped. Development of this area into what is now the Malvern Community began in 1971, without the developer's knowledge of the presence of this material. By 1980, when contamination at the location of the former farm site was discovered, the area (now McClure Crescent) had been developed as medium density residential.

There are many past examples in Canada, in which government and technical experts have tried to implement projects without prior consultation with the community. This is often referred to as the DAD (Decide, Announce, Defend) approach, and it is marked by many past failures. The events subsequent to the discovery of radium contaminated soil in the Malvern subdivision of Scarborough in 1980 are one such example. Several proposals to move the soil were unsuccessful due to vigorous public opposition to the proposed storage sites. In one, the LLRWMO undertook an extensive public information program in 1983, in parallel with environmental screening of a plan to move the contaminated soils to a storage site at a location, designated by the Ontario government, within Scarborough. This initiative was opposed by a citizens' group, precipitating a trial of the technical issues, which extended over three years in federal court. The case was eventually decided in favour of the decisions reached by the LLRWMO through the EARP process, which would have allowed the relocation of the wastes. However, in the interval, the Ontario government had offered to purchase the affected properties in Malvern, and subsequently announced plans to create a future natural environment park including the area of the proposed storage site, which effectively ruled out its use for storage of the contaminated soil.

The second location north of McLevin Avenue was found during a predevelopment survey in 1990. A working group, known as the Malvern Remedial Action Committee (MRAC), was established to assess this problem and coordinate remedial work. It comprised representatives from the federal, provincial and municipal governments. It was headed by the LLRWMO, acting on behalf of the Ontario Ministry of Government Services (MGS) and Canada Mortgage and Housing Corporation (CMHC), the departments responsible for development of the Malvern community. An extensive public consultation process in the local area resulted in a decision to focus on remedial work to segregate discrete pieces of contaminated plastic tubing from the contaminated soil. This was successfully carried out for this area. Approximately 2,500 m³ (250 loads for a typical gravel truck) of contaminated soil was excavated and sorted to remove the tubing. Close to 20,000 pieces of radioactively contaminated tubing were recovered (approximate volume of 0.1 m³) and transferred to a storage building operated for the LLRWMO by the Chalk River Laboratories of AECL. Analyses of the sorted soil showed that about two thirds of the volume now contained only normal amounts of natural background radioactivity. The remainder, about 800 m³, had some residual contamination distributed throughout its volume with the average being several times normal radium concentrations. This soil is still a potential environmental hazard if it were to be used as backfill around basements, because it could cause elevated indoor radon, but otherwise represents very low risk. Because of the potential hazard if it is misused, this mildly contaminated soil was to be stored securely at the site until a permanent disposal site became available.

The Malvern Remedial Project (MRP), a joint Canada/Ontario project to complete the cleanup 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 at the second location subsequently discovered at McLevin Avenue, to sort the soil to remove all licensable material, and to store the remaining mildly contaminated soil at the sorting site until a permanent disposal site is available in Ontario. An extended survey of the Malvern community, to confirm that no further areas of radium contaminated soil exist, is being performed in parallel with the cleanup project.

The MRP was conceived and established in a manner designed to integrate community and government efforts to solve this longstanding problem.

MALVERN REMEDIAL PROJECT - ORGANIZATION

The MRP is directed by three committees: The Malvern Steering Committee (MSC) made up of an official from each of the federal and provincial governments, and the chairs of two other committees - the Public Liaison Committee (PLC) and the Technical Advisory Committee (TAC).

The MSC is responsible for providing guidance and final approval on all major aspects of the project.

The PLC is composed of citizens who are broadly representative of the community. It is responsible for obtaining community opinion and concerns, and factoring those into the planning and implementation of the project. The PLC works closely with the TAC and provides advice on behalf of the community to the TAC and the MSC, for resolving concerns related to the extended survey and remedial work activities, and identification of one or more interim storage sites for soil sorting and interim storage.

The TAC is composed of representatives from various departments of the federal, Ontario and City of Scarborough governments. It is responsible for providing technical expertise and advice to the MSC, and acts as a technical resource to the PLC. Under the guidance of the MSC, and in consultation with the PLC, the TAC carries out the remedial work using a lead agency or department approach. That is, each major task or activity is overseen by one of the departments or agencies.

These committees are supported by project staff located in the office at a local shopping centre. Project staff, general contract administration and project management services are provided through the LLRWMO. Consultants, reporting to the TAC and PLC through project staff, are hired to provide expert assistance for major activities. The initial technical support contractor provided assistance for storage site selection, public consultation and environmental assessment.

Details on the project organization are provided in MRP Fact Sheets prepared for the project [1-5]. These show that the principles of shared decision making, openness and fairness were incorporated into the MRP, and that safety and environmental protection were not to be compromised.

MALVERN REMEDIAL PROJECT - ASSESSMENT/IMPLEMENTATION

During the first several months the PLC members became familiar with the project, and began the public consultation process. Walkin traffic at the store-front office was slow, and early meetings to communicate with the public proved difficult, as few turned out. A technical support contractor was hired to assist with both the technical issues and the problem of communicating difficult and potentially contentious issues with the public.

The period between 1992 October and 1993 January saw the preparation, by the consultant, of a siting criteria report which proposed general criteria for the selection of a sorting and temporary storage site. The siting criteria report noted that all alternatives met all health and safety criteria. It also noted that cost differences (including transportation) among the alternatives were not significant when compared with total project costs. The main differences related to land use and

to public perceptions. [6] Once the PLC and TAC had recommended that the siting criteria report be issued for public comment, an extensive public consultation process was initiated to determine community opinion on the criteria on the basic options for siting, and on potential candidate areas.

The endpoint for this stage of the consultation process was when a proposed site for the soil sorting and interim storage activities was identified by the Government of Ontario in mid-1993. The proposed activities of the project were assessed, based on this site, in accordance with the provisions of the Federal Environmental Assessment Review Process (EARP) Guidelines Order. The assessment process involved the preparation of draft reports by consultants hired by the MRP, an extensive public consultation process led by the Public Liaison Committee, and final reports responding to all comments received on the draft reports. Environmental screenings were then carried out by Natural Resources Canada, as the initiating department responsible for the project, and by Atomic Energy of Canada Limited, as the organization responsible for the LLRWMO which manages the project. Both of these assessments concluded, in 1994 May, that the project could proceed with appropriate measures in place for mitigation of potential environmental effects. [7]

Although there had been extensive consultations, leading to a general consensus within the community prior to the decisions under the EARP Guidelines Order, legal action to initiate a judicial review was initiated by several owners of properties nearby the planned sorting and temporary storage site. The legal action was subsequently resolved through successful negotiations prior to its consideration in court. An enhanced landscaping plan to visually reintegrate the site into the surrounding area was an important component of the agreement, reached in 1994 November. A licence was obtained from the Atomic Energy Control Board (AECB) for possession of radium-contaminated materials resulting from the project, to complete the planning and approval phase.

In order to minimize the overall schedule, soil-sorting equipment was acquired, assembled and tested in advance. The approach of using an automated soil sorting conveyor system to remove material with licensable amounts of radium, and then to characterize and segregate the soil into clean and mildly contaminated inventories, was customized for application to the MRP. The original version of the system was developed for the partial cleanup at McLevin Avenue in 1990. The sorting system was functionally tested successfully in late 1994. An engineering consultant was also contracted to perform detailed design of the sorting site in advance, so that initial site preparation could be started in 1994 December, immediately upon completion of the planning and approval process. In parallel with site preparation, bids were solicited, and the contractor selected, for the soil excavation and sorting operation scheduled to start in 1995 June.

The cleanup started on schedule on 1995 June 01, and was completed by 1995 November 01, even though 25 additional properties were added in the McClure Crescent area, as a result of the extended radiological survey of the area in 1994. Final touches to the restoration of some properties, which had been delayed by the onset of winter, were finished this spring. Soil sorting was also completed in 1995, and final decommissioning, closure of the temporary storage mound, and landscaping of the site are scheduled for completion by 1996 September. The key statistics of the cleanup are shown in Table 1.

The most interesting statistic from the point of view of this paper is probably the following:

Period for consultation and assessment:	32 months
Period for cleanup and soil sorting activity:	6 months

LESSONS LEARNED

It is not surprising that initial attempts to move contaminated soil, in the early 1980s failed. They incorporated valid technical solutions in that they could have moved the soil and contained it in a manner which would have protected public health and the environment through good engineering practices, and would not have contravened any regulations. They provided good technical answers to the technical questions being asked. They were accompanied by information programs which portrayed them as complete, or largely complete packages, and they failed because, in spite of a willingness on the part of the proponent to share all the technical logic with anyone who cared to listen, there had been little, if any, acceptance by the local community as part of the project planning process. These failures also increased the time and effort required to have a successful outcome to the current project. In effect, the initial step was to "climb out of the hole that had been dug in the past".

The public was involved in the process early and intensively through the PLC, newsletters, public meetings and readily-available store-front office. Most of the questions asked were not highly technical and the PLC and members of the public participated effectively in technical discussions and decisions. People considering the impact of a potential storage site asked about things like how thick the cover would be, what sort of trucks would be used, what dust suppression measures would be in place, and who would monitor. What they were trying to find out is whether the project will pose any hazard to them, their families, their property and their way of life. The lesson is that the proponent will achieve a satisfactory outcome only if it is recognized that satisfactory answers are arrived at only if the concerned public has had a hand in working them out. This was the approach used for this project.

Having provided easy access for the public to project information, and having established public mechanisms for public participation in decision making, the level of public participation which actually took place, if considered as a percentage of the population of Scarborough, was small. It is certainly true that, during the period when this project was taking place there were other concerns which may have distracted people from the issue of contaminated soil, but it may also be true that demonstrating a willingness to include those from the community who wished to be involved in planning and decision making, in itself, reduced general public anxiety and, therefore overall participation.

To borrow some phraseology from Dr. Peter Sandman of the United States, what earlier projects had treated as risk was, in the public's perception, a combination of hazard and outrage. Hazard can be calculated and is a technical issue. Outrage is completely different and is, Sandman argues, far more important. The earlier attempts to move the soil had been technically satisfactory but had outraged the public. This time the community actually helped develop the project and could have stopped it in its tracks, had it not been satisfied.

Processes involving extensive public consultation cost money, but so did the earlier processes which failed, and it can be argued that if lengthy delays, perhaps leading to court battles, can be

avoided, public consultation becomes a bargain. The consultation process in support of this project added in the order of ten percent to the cost of the technical requirements.

Spending money on process will not, of itself, bring success if the technical approach is not sound. Considerable effort was devoted to pursuing and documenting the response to all technical questions and issues raised during the consultation process.

Regardless of the process, and the time taken to implement the process, some amount of opposition to the project may not be fully avoided. The opposition which remained to this project at the end of the assessment phase was able to be settled by negotiation. The lesson here is that the public is not a homogeneous population, and public consultation must be responsive to the concerns of all parties, both in considering them seriously, and in being willing to incorporate the results of that consideration into an evolving project plan.

In conclusion, the consultation process followed for the MRP lead to the development and implementation of a project which resolved a longstanding issue. It included finding a site, within an urban area, to which radioactively contaminated soil could be transferred for sorting and removal of small quantities of material with licensable amounts of contamination, followed by interim storage of the remaining mildly contaminated soil. It incorporated the principles of safety and environmental protection, openness, fairness and shared decision making including, in particular, a community lead decision on siting. It thus not only differed from previous processes in terms of its principles, it also differed in that it was successful.

REFERENCES

- [1] MALVERN REMEDIAL PROJECT OFFICE, Scarborough Remedial Project, Funding and Project Management, Fact Sheet, 1992
- [2] MALVERN REMEDIAL PROJECT OFFICE, Scarborough Remedial Project, Joint Consultation and Decision Making with the Community, Fact Sheet, 1992
- [3] MALVERN REMEDIAL PROJECT OFFICE, Malvern Remedial Project Steering Committee, Terms of Reference, Fact Sheet, 1992
- [4] MALVERN REMEDIAL PROJECT OFFICE, Technical Advisory Committee, Terms of Reference, Fact Sheet, 1992
- [5] MALVERN REMEDIAL PROJECT OFFICE, Public Liaison Committee, Terms of Reference, Fact Sheet, 1992
- [6] ACRES INTERNATIONAL LIMITED, "Report M93-01, Siting Criteria Report", prepared for the Malvern Remedial Project, 5259 Dorchester Road, Niagara Falls, Ontario, L2E 6W1
- [7] AECL RESEARCH, "Project Register and Initial Assessment Report" 1994

Table 1

Key Facts Concerning The Malvern Remedial Project

Date that contaminated soil was discovered: - McClure Crescent - McLevin Avenue		November, 1980 April, 1990
Beginning of current project		March, 1992
Acquisition of soil sorting/temporary storage site		September, 1993
Start of excavation		June 1, 1995
Number of properties cleaned up: - residential - proposed for commercial/residential development		68 3
Volume of soil removed		16,600 m ³
Quantity of sod installed (McClure Crescent area site)		9,650 m ³
Duration of soil removal/restoration		6 months
Volume of soil and artifacts containing licensable concentrations of radium being shipped for storage in the LLRWMO warehouse at Chalk River (est.)		50 m ³
Final volume of mildly contaminated soil in temporary storage mound (est.)		7,700 m ³
Volume of clean soil segregated out during sorting process		8,850 m ³
Cost of MRP to end of FY '95/96, including planning		\$7.9 million
Estimated total cost to completion, excluding final disposal		\$8.5 million
Estimated future cost for transportation and disposal of mildly contaminated soil (\$300 - \$1,000 m ³)		\$2.3 - \$7.7 million
Additional disposal cost if clean soil had not been segregated out (\$300 - \$1,000 m ³)		\$2.7 - \$8.9 million
Approximate value of properties cleaned up: - residential - proposed for commercial/residential development		\$10.2 million \$20 million
Number of lost-time accidents		0