DECOMMISSIONING OF A NUCLEAR RESEARCH SITE IN CANADA: APPLICATION OF THE FEDERAL EA PROCESS.

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ABSTRACT

AECL proposed a program to decommissioning the Whiteshell Laboratories safely and in an environmentally friendly manner. In compliance with its own policy and to meet the requirements of the Canadian legislation, AECL assessed the potential environmental effects of the project.

As part of the environmental assessment, conducted at a comprehensive study level, AECL established an extensive public consultation program, which allowed members of the public to express their views and concerns on the project.

A number of technical issues as well as concerns of the public and First Nations (Indian people in Canada) were identified through the consultation process. All issues were addressed in one of three ways: in the Comprehensive Study Report (CSR), in a response from AECL or through an element of the follow-up program.

As a result of the assessment, it was concluded that the project would not cause any significant adverse effects taking into consideration mitigation measures proposed in the study report.

INTRODUCTION

The Whiteshell Laboratories (WL), located in Manitoba, Canada, has operated as a nuclear research facility since the early 1960's. Because of the financial impact of the federal government program review process, Atomic Energy of Canada Ltd. (AECL), a federal Crown agency, made a business decision in 1997 to discontinue the research programs and operations at the WL and to decommission the facilities. This is the first decommissioning project of an entire nuclear research site in Canada.

Prior to proceeding with the decommissioning project, AECL must obtain a decommissioning licence from its regulator, the Canadian Nuclear Safety Commission (CNSC). As part of the documentation provided in support of AECL's submission to obtain such licence, an environmental assessment (EA), pursuant to the Canadian Environmental Assessment Act (the Act), was prepared.

This paper provides an overview of the EA process for this project with an emphasis on the consultation process carried out as part of the assessment. Some of the key issues identified by the participants are discussed including proposed AECL resolution to address those concerns.

CANADIAN FEDERAL EA PROCESS

The Canadian Environmental Assessment Act (the Act) sets out the responsibilities and procedures for the environmental assessment of projects involving the federal government. The Act applies to projects for which a federal department or agency holds a decision-making authority, whether as a proponent, land administrator, source of funding or regulator.

The Act is based on four guiding principles:

- Application of the EA process as early in the project planning stages as possible, before irrevocable decisions are made;
- Self-assessment of projects by federal departments;
- Only one assessment per project with the level of effort to complete the EA commensurate with the scale of the likely environmental effects; and
- Public participation as an important element of an open and balanced EA process.

The Act is administered by the Canadian Environmental Assessment Agency (the Agency), whose president is accountable to the Minister of the Environment.

Application of the Act

The decommissioning of the WL is an undertaking in relation to a physical work. This constitutes a project under the Act. Since a federal department holds a decision-making authority for the project, the Act is deemed applicable. Because of the scale and complexity of the project, no exclusion provision could be applied.

AECL, the proponent of the WL decommissioning project, will require an amendment to the existing site operating licence from the Canadian Nuclear Safety Commission (CNSC) in order to proceed with the site decommissioning.

Because of that regulatory duty, the CNSC becomes a responsible authority for the purpose of the Act and has to assess the potential for adverse environmental effects of the project before it exercises a regulatory duty. The responsible authority (RA) has a number of obligations under the Act, including:

- Ensuring that an EA is conducted as early in the planning process as possible; and
- Establishing the scope of the environmental assessment in consultation with other federal departments.

While the responsible authority can delegate the preparation of the EA to a third party, it remains responsible for the conclusions of the EA and has to decide on the course of action based on the outcome of the study.

Because it was thought possible that the project could lead to a harmful alteration or destruction of a fish habitat, the Department of Fisheries and Oceans indicated it was also a responsible authority under the Act. However, because of the technical nature of the project, the CNSC acted as a lead RA.

It should be noted that other federal departments had an interest in the project and participated in the establishment of the scope of the EA and in the review of the EA report. In addition, the Manitoba provincial government participated in the process through a technical advisory committee, established for this particular project.

To sum up, the CNSC and DFO are the responsible authorities under the Act and have delegated the preparation of the comprehensive study report (1) to AECL. However, the two departments must decide on the course of action for the project based on the environmental assessment.

EA Track

Under the Act, there are a number of possible EA tracks, ranging from screening assessments for simple projects to public review or mediation for more significant and/or potentially contentious undertakings.

Large projects can trigger a comprehensive study, which can be considered an intermediate level of assessment. When projects fall in this category, the scope of the assessment is broadened and public consultation becomes mandatory.

For the WL Decommissioning project, it was determined that a comprehensive study was required. It was triggered because the decommissioning project included the WR-1 research reactor, one of several nuclear facilities at the Whiteshell site. A description of the decommissioning project and components is provided below.

PROJECT DESCRIPTION

The Whiteshell Laboratories is a nuclear research facility located approximately 100 km northeast of Winnipeg near Pinawa, Manitoba. The site occupies approximately 4375 ha of land owned by AECL, adjacent to the Winnipeg River. The Laboratories consist of ten major buildings and a number of smaller support facilities. The main laboratory site layout is shown schematically in Figure 1. The Waste Management Area (WMA), the Concrete Canister Storage Facilities (CCSF) and the Large Scale Vented Combustion Test Facility (LSVCTF) are located approximately 1 km northeast of the main laboratory site.

To define the scope of the Whiteshell Laboratories Decommissioning Project, the site has been segregated into affected and unaffected lands. The affected lands are defined as the lands where

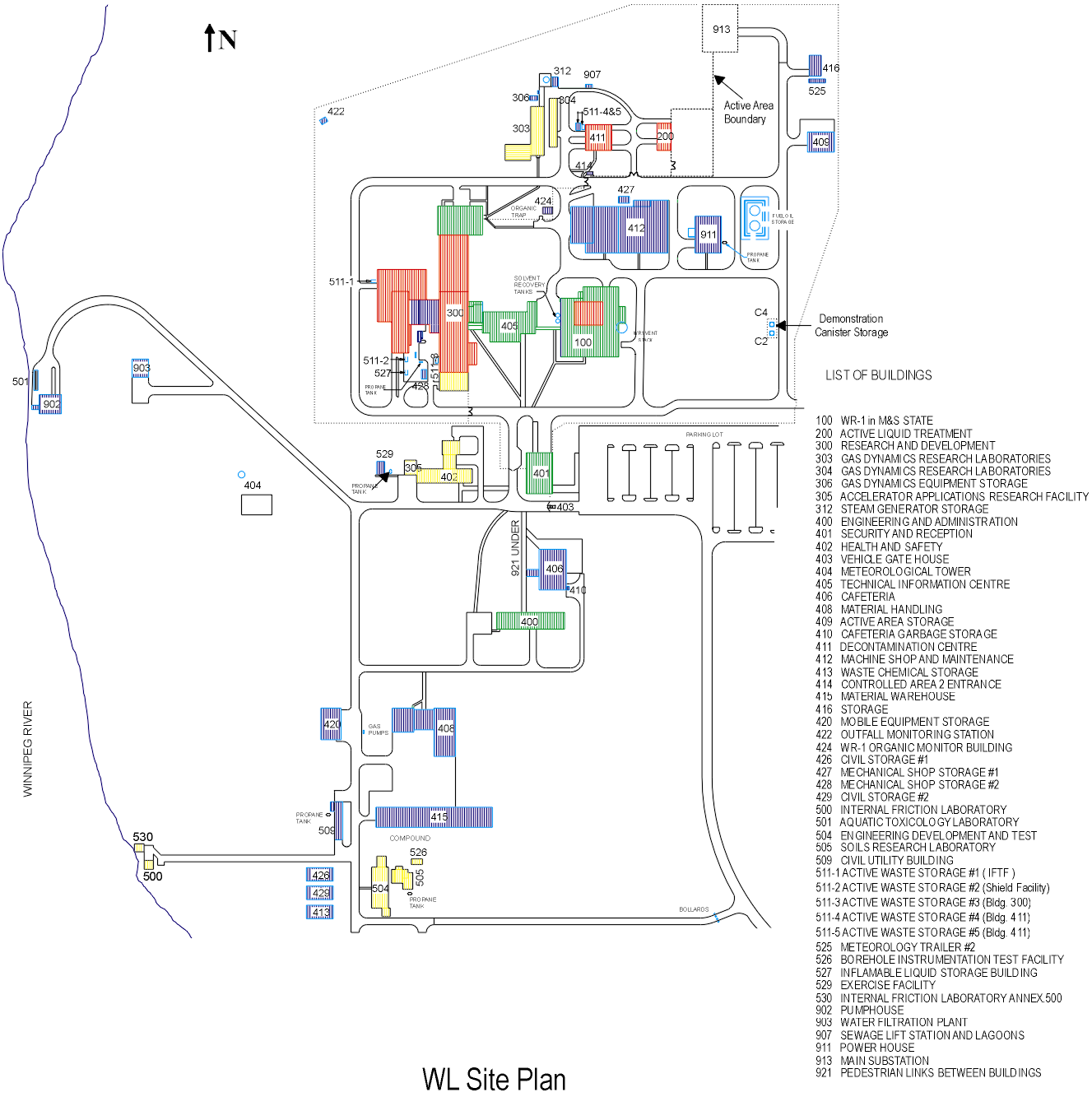

Fig. 1. Schematic Layout of Whiteshell Laboratories

nuclear development, operations or supporting activities are conducted and also includes land potentially affected by such activities. The unaffected lands are the balance of the site, which have not been associated with AECL nuclear operations (Figure 2), and are not linked to, or required for the decommissioning project.

The Whiteshell Laboratories decommissioning program encompasses all of the site facilities, buildings and land within the affected lands (Table I)

Table I. Project Components

Nuclear Facilities	Radioisotope Facilities	General Infrastructure
Shielded Facilities	B300	Non-nuclear Buildings
Van de Graaff Accelerator	Decontamination Centre	Landfill
Neutron Generator	B402	Sewage Lagoon
Active Liquid Waste Treatment Centre		Buried Services
Whiteshell Reactor –1		Contaminated Lands
Concrete Canister Storage Facility		Affected Lands
Waste Management Are		Off-site Contamination including River Sediments

Decommissioning Strategy

The proposed Whiteshell Laboratories decommissioning program will be implemented through a phased approach preceded by operational shutdown work. Actual decommissioning cannot proceed until the environmental assessment Comprehensive Study Report (CSR) is approved. The operational shutdown work, which can be conducted in parallel with the preparation of the CSR will require a period of approximately 15 months. Preparatory work for the initial phase of decommissioning will be completed as follows:

- Prepare and submit facility detailed decommissioning plans for approval;
- Secure transfer of the listed facilities addressed in Phase 1 to a site licence structure recognizing the decommissioning on acceptance of the CSR and approval of detailed decommissioning plans; and
- Establish the licensing requirements for the remainder of site facilities.

Shutdown operations for the research facilities at Whiteshell Laboratories are in progress and occur in parallel with decommissioning planning.

Currently there is no national nuclear waste disposal facility in Canada, thus limiting the decommissioning activities to achieving and maintaining a secure monitoring and surveillance state for the nuclear facilities until such a facility is available.

Decommissioning is planned in three phases followed by an institutional control period:

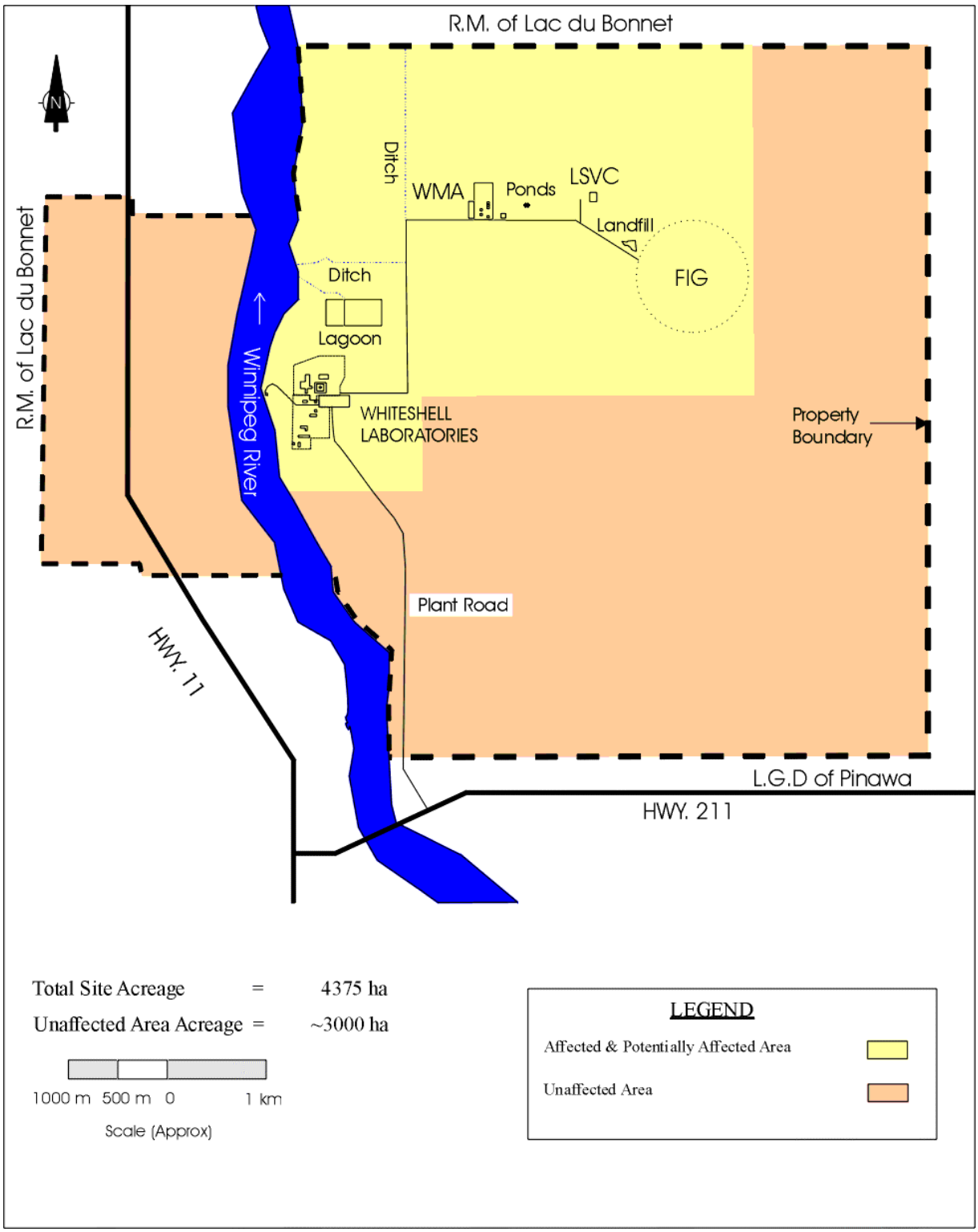

Fig. 2. Affected vs Unaffected Area Designation

Phase 1 (approximately 5 years) – Activities will be directed toward nuclear and radioisotope buildings and facilities to place them in a safe, secure interim end state. The Van de Graaff Accelerator and the Neutron Generator will be completely decommissioned.

Phase 2 (approximately 10 years) – Regular monitoring and surveillance implemented for all buildings and facilities. Most of project activity is focussed on the WMA. Most waste management facilities will be placed in a passive operational state meaning that no further waste can be added but facility monitoring is maintained. Interim processing, handling and storage facilities, required during monitoring and surveillance and decommissioning project activities, will be established.

Phase 3 (approximately 45 years) – Activities directed to bringing the site to a final end state will fulfil all pertinent regulatory and national policy requirements. The timing and sequence of decommissioning activities will be determined largely by the availability of disposal facilities and by the age and condition of engineered structures and buildings.

Institutional Control Period – The three phases of decommissioning activity will be followed by a period of institutional control where the performance of the remaining in-situ disposal components (river sediments and low-level waste trenches) is monitored and controlled. The institutional control activities are designed to demonstrate that the in-situ components perform in the manner predicted in the related safety assessments and to ensure that there is no development on or intrusion into affected areas until the hazards have been reduced to acceptable levels. For Whiteshell Laboratories this period is expected to extend for approximately 200 years beyond the physical project work.

Three alternative means were established for delivering the decommissioning program

- Alternative 1 – Endstate in a short time period (20 years).
- Alternative 2 – Endstate in a long time period (100 years).
- Alternative 3 – Endstate in a moderate time period (60 years).

All alternatives include a period of waste storage on site with transfer to an off-site waste disposal facility when it becomes available. The establishment of an off-site waste disposal facility is not within the scope of this project.

The following outlines each alternative.

Alternative 1 – Endstate in a Short Time Period

This alternative proposed that Whiteshell Laboratories be decommissioned over a relatively short time period (approximately 20 years). The time frame provides sufficient time to meet characterization, safety assessment and planning/approval requirements needed to implement the project work. Twenty years would allow time to assess wastes and to differentiate the wastes that can be managed in-situ at the site from those that will require removal to disposal or alternative storage.

The approach assumes that a radioactive waste disposal repository would be available within 10 years. The Whiteshell Laboratories' facilities would initially be decommissioned to a safe monitoring and surveillance state. Once waste disposal facilities are available, the final decommissioning phase would be completed. The waste would be removed to disposal throughout the subsequent 10-year time period.

This alternative presents substantial risks in that waste disposal facilities which are outside the control of the Whiteshell Laboratories management program, may not be available.

Alternative 2 – Endstate in a Long time Period

This alternative proposes decommissioning of Whiteshell Laboratories over as long a period as necessary to implement national waste disposal policies. The assumption is that the longest this process would take is 100 years. As in Alternative 1, the initial work would involve placing site facilities in a secure monitoring and surveillance state. It is likely that all waste disposal requirements could be optimized as part of the national program. Implementation would occur in three phases followed by an institutional control period.

Alternative 3 – Endstate in a Moderate Time Period

This alternative proposes that Whiteshell Laboratories be decommissioned over an intermediate time frame (approximately 60 years). The time frame is based on the concept that safety and costs can be optimized by taking advantage of natural radioactive decay and by decommissioning buildings as they come to the end of their economic and structural life. It is also based on the assumption that national waste disposal facilities would be available for low-level waste by 2025 and high-level waste by 2050. Decommissioning would be carried out in three phases.

This alternative has the advantage of presenting a feasible approach that is planned in accordance with assumptions for disposal space for Whiteshell Laboratories waste. The approach also achieves maximum cost-efficiency since it capitalizes on existing engineered services and building envelopes to (i) monitor liabilities in the interim, and (ii) schedule final decommissioning for individual facilities based on the expected life span of structures. It also minimizes the production of new waste from refurbishment or construction required to maintain facilities over a lengthy deferment period.

If off-site waste disposal becomes available earlier, all site facilities except those that provide radioactivity decay benefits (e.g. WR-1 reactor and some WMA wastes) could be decommissioned earlier. On the other hand, should off-site waste disposal availability take longer than assumed, the contingency would be to revert to Alternative 2.

The main difference between the three alternative means of decommissioning the Whiteshell Laboratories is the time involved. The steps to completing decommissioning of the site and the proposed endstate are virtually the same for the three alternatives considered. It is understood that the public preference is for an early and complete decommissioning, that is Alternative 1. That approach appears to have two limitations. One relates to the short period for deriving

benefits from natural radioactive decay; the other to the unavailability of a site for facilities for disposal of radioactive wastes. Alternatives 2 and 3 offer longer time frames to complete the project, allowing optimization of radioactivity decay and the avoidance of double handling by moving wastes directly to disposal facilities.

The main benefit of a radioactivity decay period is provided through the decay of the shorter half-life radioisotopes ^{60}Co, ^{55}Fe, ^{54}Mn, ^{125}Sn, and ^{125m}Te. After about 50 years, the radiation fields in the WR-1 reactor vault are dominated by the long-lived radioisotopes, ^{94}Nb, ^{63}Ni, ^{14}C and there is limited benefit to further deferment.

Handling of the highly radioactive materials places economic and safety limitations on the implementation of the decommissioning program. Although doable, removal of highly radioactive material prior to optimizing radioactive decay, dramatically increases the cost to maintain worker safety.

Similarly, the unavailability of disposal facilities impacts cost and worker safety. To provide interim storage space requires the construction of high integrity shielded facilities, which would add significantly to the cost of the decommissioning project. The double handling to move materials to disposal adds cost to the project and contributes to significant additional dose to workers.

An evaluation of the alternatives concluded that Alternative 3 provides the best worker dose optimization and is the lowest cost approach. This approach is summarized as follows:

1. The achievement of a monitoring and surveillance state for the site nuclear facilities within 6 years of project implementation.
2. Monitoring and surveillance of the nuclear facilities with decommissioning activities scheduled to coincide with the end of building structural life and the expected availability of national disposal facilities.
3. Movement of wastes only when off-site disposal is available or when safety in existing structures is compromised.
4. In-situ management for selected low-level waste trenches in the Waste Management Area.

Decommissioning Alternatives Within the Preferred Time Period

Within the preferred option, Alternative 3, it is recognized that various strategies, approaches and technologies will be available to achieve the endstate. It is expected that an optimization exercise will be conducted for each facility and the results will form the basis for the individual detailed decommissioning plans. Because of the technical developments that will be achieved over the lifetime of the project, it is not possible to speculate on what new processes or techniques will be available to those implementing the decommissioning plans. When the detailed decommissioning plans are developed in the future, the regulator will be able to verify that the optimization process takes place and that the applicable standards will be met.

That said, there exist two fundamental alternatives that apply to project components or facilities. One such option is complete removal. It applies to most of the facilities at Whiteshell Laboratories. When complete removal is achieved, the land will become available to other uses.

However, for some other components or facilities, the advantages of complete removal are not easily demonstrated. For those components, in-situ management is an option that warrants consideration. Therefore, a decision has to be made on whether a facility or component can be managed in-situ or if it merits full removal. A number of criteria need to be established to make that decision. These may include:

- Nature and level of contaminants still present;
- Exposure pathways (workers and public);
- Potential environmental effects;
- Technical feasibility of remediation;
- Economic feasibility of remediation; and
- Level of public concern.

The two areas involving possible in-situ disposal include contaminated river sediments downstream of the site discharge to the Winnipeg River and the low-level radioactive waste (LLW) trenches at the Waste Management Area. During the assessment, it was established that additional fieldwork was necessary to gain enough information to select the decommissioning option for these components. Detailed field evaluation was conducted for both areas and is described under 'Key Technical Issues and Resolution' below.

CONSULTATION PROCESS

Overview of the Consultation

The consultation process spanned the entire duration of the assessment: from the scoping phase to the review and approval of the assessment report. It also relied on two main sources of input and feedback. The first source consisted of experts from a number of government departments who provided, for the most part, technical comments. The second source comprised members of the public and First Nations. While the technical and public reviews obviously differed in scope and issues raised, they both contributed in making the EA process open and balanced and in improving the overall quality of the assessment report.

Technical Review

The environmental assessment commenced in the summer of 1999. The results of the assessment were documented in a draft comprehensive study report (CSR), which was submitted to the responsible authorities in 2000 April. The draft CSR underwent an initial technical review by the federal authorities and the provincial technical advisory committee. The object of the review was to ensure all factors identified in the scope of assessment had in fact been considered. A number of comments were provided to AECL over the summer of 2000. As mentioned earlier, some additional fieldwork was required in order to address the issues related to the river sediments and the low-level waste storage.

The CSR was revised and submitted to the responsible authorities who initiated a 30-day public review, which ended on 2001 April 30. In parallel with the public review, technical experts had an opportunity to re-examine the report and ensure their comments had been properly incorporated. Some additional comments were made at that time.

A final procedural review is performed by the Agency to ascertain the study meets all the requirements of the Act. Essentially, this review allows the Agency to make recommendations to the Minister of the Environment who has the decision-making authority for comprehensive studies.

Public Consultation

A public consultation program was designed to satisfy the requirements of the Act by providing opportunities for members of the public interested in the proposed decommissioning project to learn about it and express any concerns. It was also designed to establish long-term relationships that would extend beyond the EA phase of the project. Those goals are consistent with AECL Communications policy.

The specific requirements of the Act regarding public participation include consideration of public comments by the responsible authorities and by the Agency and public notification of the course of action and proposed follow-up program. There is no requirement to consult the public during the EA at the self-assessment stage, but the Agency clearly supports and recommends early and meaningful participation.

AECL and its consultants utilized a number of techniques and activities to inform the public and obtain feedback and input. The techniques included:

- Key person interviews,
- Interviews with experts and laypersons to identify valued ecosystem components (VECs);
- Newsletters;
- Letters to interest groups and local organizations,
- An Open House at WL,
- Information sessions for elected officials, and,
- Follow-up presentations as requested by interested parties.

All issues raised were responded to in one of three ways: in the CSR, in a response from AECL or though an element of the follow-up program.

First Nations Consultation

Two First Nations communities are located within the regional study area: the Sagkeeng and Brokenhead Ojibway Nations. The Sagkeeng Nation is located about 55 km downstream of the WL site but utilizes traditional territories closer to the site. The Ojibway Nation is located at the edge of the study area, in a different hydrological basin.

Of all First Nations consulted within and beyond the study area, the Sagkeeng had the greatest interest in the project. The initial consultation with the Sagkeeng provided an understanding of their interests and paved the way to the establishment of a communication protocol. The Sagkeeng participated in a number of consultation activities thereafter and expressed both their concerns about the project and identified future activities they would be interested in, such as participation in monitoring activities.

The key issues and concerns identified by the technical experts, the public and First Nations are discussed in the next section, along with the resolutions proposed by AECL.

Key Technical Issues and Resolution

For the most part, the technical issues identified by the federal and provincial agencies were related to uncertainties associated with the timelines proposed by AECL. For example, the technical experts looked for some re-assurance on the rationale for a 60-year decommissioning program. Also related to the timelines is the ability to maintain adequate security and emergency response resources. Purely technical issues pertained to the proponent's ability to develop a successful safety case for the components for which in-situ disposal is the preferred option. The feasibility of the in-situ disposal option raised a series of questions that required additional fieldwork to provide resolution.

Details on specific technical issues follow:

- Project Time Frame of 60 Years Regarded as Excessive

The main concern was the length of time over which wastes and radioactivity required management at the site.

Resolution of the issue was achieved by including a comparative evaluation of economic and technical feasibility weighed against public concern.

The evaluation showed that radioactivity decay for some key project components coupled with waste disposal availability made the 60-year project period the most viable option.

- Support for Feasibility of In-Situ Disposal for Some Wastes

The decommissioning approach for some project components (low-level waste trenches, contaminated river sediments) left some uncertainty in the potential environmental effects. Given that those uncertainties could be regarded as a reason to refer the whole project to a public review panel, AECL was requested to select a preferred approach based on technical and economic feasibility. Therefore, significant field studies were undertaken for these components to provide a sound rationale for the selected decommissioning approach. The results are discussed briefly below and were incorporated into CSR Rev. 2.

- Winnipeg River Sediment Contamination

- The objective of this evaluation was to estimate the potential effects of the contaminated sediment on biota in the river and on humans and to evaluate the feasibility of abandoning the contaminated sediment in-situ.

The investigation work involved the following steps:

- Developing a conceptual model of the river bottom and the general nature of the sediments;
- Adjusting the model with information obtained from a series of diver inspections of the River;
- Defining a survey area based on areas delimited by identifying criteria where there would be no effects on human or ecological health;
- Carrying out a gamma survey of the river bottom;
- Analyzing sediments;
- Analyzing clams (as an indicator of ecological risk); and
- Preparing dose estimates for clams and humans.

Underwater divers were used to carryout a radiation survey to confirm the size of the assessment area.

The key conclusions drawn from the survey and sediment sampling were:

- The Evaluation Area (the area including all data points that exceed 10 times background) is limited to the area from the outfall pipe end, out 20 metres and downstream 80 metres (1600 m^2).
- There is a rapid decrease in sediment contaminant concentration with distance from the outfall.
- The average reading in the evaluation Area is ~ 7 times background.
- ^{137}Cs and ^{40}K were the only contaminants identified by in-situ gamma spectroscopy.
- Only a very small fraction of the radionuclides released is still present in the sediment near the outfall.
- Even with extremely conservative dose estimation methods, the doses to non-human biota (clams as the specific endpoint) and humans (based on external exposure) are below accepted guidelines.

The abandonment of the contaminated sediment in-situ is considered feasible as the final endstate for the process water outfall area.

- Waste Management Area – Low Level Waste Trenches

The specific objectives of this evaluation were:

- To demonstrate in a preliminary way the level of risk to human health as a result of in-situ disposal of low-level waste (LLW) emplaced in the WMA earthen trenches.

- To confirm that there will be no contaminant transport beyond the WMA boundary resulting in significant effects on the environment or human health over a 200-year period (potential institutional control period).
- To provide an information base to establish a monitoring program necessary to confirm in-situ disposal as the final end-state.

Two steps were involved in this evaluation. The first was the development of a conceptual model of the trench storage/disposal environment, including a detailed evaluation of the waste inventory, and confirmation of aspects of this with on-site measurements. The second involved contaminant migration modelling and exposure pathways analysis.

The evaluation of the LLW inventory, contaminant transport mechanisms and possible receptors led to the following conclusions:

- A highly conservative method of calculating the radionuclide inventory has been used identifying the upper bound of the radionuclide inventory as 40 TBq of initial radioactivity.
- The majority of radionuclides in the inventory have relatively short half-lives. There are non-radiological contaminants of concern, which will likely require selective remediation.
- The sorptive clay soils around the trenches provide a natural attenuation (retards contaminant transport).
- There is no indication of significant upward or lateral migration in the near trench zone.
- Migration of dominant radioactive contaminants ^{137}Cs and ^{90}Sr occurs at a rate slower than the rate of radioactive decay for these radionuclides.
- Exposure pathways resulting from the groundwater flow patterns and physical isolation are relatively indirect making it difficult for any contaminant to reach a receptor.
- Institutional control will be required beyond the project period to confirm the performance of the disposal environment (approx. 200 years).

The analysis concludes that in-situ disposal for all but four LLW trenches is considered feasible as the final endstate.

Additional technical issues included:

- Rationale for an Institutional Control Period

The proposed in-situ waste management option raised questions relative to the length of an institutional control period following the 60-year project period.

The institutional control period was selected on the basis of radioactivity decay to background levels and the supporting arguments were incorporated into the CSR Rev. 2.

- Project Resourcing, Financial Guaranties, Socio-Economic Issues

There were general concerns raised relative to the lengthy project period, demands to ensure the liabilities remained under control and that funding was available to complete the project.

AECL commitments to resourcing levels, to maintaining project funding and assurances on maintaining safety were clearly specified in the CSR.

Under the federal EA process, only the socio-economic impacts caused by a change in the environment due to the project need be considered. Thus, socio-economic issues relating to jobs in the Pinawa area are not part of the environmental assessment scope. However AECL does support the use of non-nuclear facilities for economic development activity and provides support to the community of Pinawa through an annual grant-in-lieu of taxes payment.

Public Concerns and Resolution

Some commonalities were evident between the comments made by technical reviewers and those made by the public. Common issues and concerns were in the following categories:

- Project time frame,
- Financial guarantees,
- Site resource levels, and
- Impact of releases, e.g., contaminated river sediments.

In general terms, the public did not view favourably the time frame proposed by AECL. However, the public recognized that the unavailability of national disposal facilities imposed a significant constraint. The public is also seeking assurances from the government and AECL that an appropriate level of financial and human resources remain committed to the WL decommissioning program. Similar to the technical experts, the public was concerned about the loss of corporate technical knowledge as a result of staff reductions.

Interestingly, it was noted that the public was little aware of the routine emissions from the laboratories and of the comprehensive monitoring program. Because of the heightened awareness, the public expressed interest in the environmental monitoring program and in participation in future monitoring activities.

These issues were resolved following an approach similar to that used in the technical review process outlined above, with appropriate adjustments in the language where necessary.

Some additional public concerns were also identified and are described below.

- Removal of Waste From the Site and the Need for Disposal Facilities

This issue relates to the local community reluctance to have waste remain at the site in the absence of on-going research activity with related community benefits.

The resolution is embodied in the evaluation of project time frame alternatives. However, it is acknowledged that the local public still encourages an accelerated schedule for achieving a final site endstate.

- Economic Issues Related to Site Closure

These concerns relate to jobs in the local area and support for the Pinawa tax base.

Although these socio-economic concerns are outside the scope of the EA, AECL has committed to co-operating with economic development activities aimed at utilizing site infrastructure. As well, the contributions to Pinawa in the form of a grant-in-lieu of taxes will be maintained until reductions acceptable to the community can be negotiated.

- Mechanisms for Participating in Site Decommissioning Plans

There is public concern about lack of opportunities to review and comment/influence on-going decommissioning plans and work.

AECL has proposed the formation of a public liaison committee to provide mechanisms for public input and routine communications. As well, all decommissioning plans are public documents and the regulatory approvals process provides opportunities for public review.

AECL strived to provide satisfactory resolution to all public comments. For the most part, the public appears to be satisfied with proposed resolutions to their environmental issues, but remains concerned about the delays in initiating the decommissioning work. There is also some scepticism regarding AECL's commitments vis-à-vis financial guarantees and the maintenance of adequate resources on site. AECL believes the proposed public liaison committee should help achieve an increased level of trust between the communities and the proponent.

First Nations Issues and Resolution

As indicated earlier, a considerable effort was made to consult with any First Nations that might have an interest, however limited, in the project. Given the expanse of the regional study area and the diversified land uses of the aboriginal people, nine First Nations were approached initially. However, only the Sagkeeng First Nation expressed a reasonably sustained interest in the project. This was expected given the Sagkeeng's past involvement in discussions related to the use of the Winnipeg River through their participation in the discussions of the Winnipeg River Roundtable on Environment and Economy.

As expected, the main concerns of the Sagkeeng were centered on potential impacts on the river water quality and fish habitat. Concerns are summarized as follows:

- Possibility of Accidents/Releases or Intrusion into Waste Management Facilities

The primary concern was the potential for releases of radioactivity to the river and security against intrusion into WMA facilities.

Mitigation methods to control releases during remediation work were outlined, an institutional control period of 200 years post project was included and AECL documented a commitment to maintaining appropriate security for WMA facilities throughout.

- Impact on Winnipeg River Fish

There was a concern that the project could release radioactivity into the river impacting fish populations.

Project impacts on the river were documented in the CSR demonstrating that releases over the project period will be controlled to a tiny fraction of releases incurred over the operating period.

- Request for Involvement in Environmental Monitoring Activities

An interest in direct involvement in environmental monitoring, particularly relative to the Winnipeg River was expressed. This was based on a desire to fully understand the monitoring process and to provide some capacity building for the Sagkeeng.

AECL agreed to involve the Sagkeeng in the monitoring program to acquire samples and to be trained in analysis. The timing proposed was to initiate involvement shortly after project implementation.

- Lessons Learned

AECL developed an extensive consultation program where the public was provided with adequate opportunities to review the proposal and voice any concerns they might have had. One of the challenges in maintaining an open dialog stemmed from the long duration of the EA process. Regulatory reviews introduced long periods where AECL had little progress or new information to share with the public. Long silences often gave the public the impression they were left out of the process. Thus, to alleviate that difficulty, it is recommended that the public is briefed on a regular basis even when there is little new information to report.

CONCLUSIONS

In compliance with its own policy and to meet the requirements of the Canadian legislation, AECL assessed the potential environmental effects of the project, including an assessment of the cumulative effects of the project with other existing and proposed projects. As illustrated in Figure 3, the assessment was carried out over a three-year period and provided all stakeholders with numerous opportunities to comment on the project.

AECL established an extensive public consultation program, which allowed members of the public to express their views and concerns on the project. The consultation process also tapped into the existing knowledge of the local and regional ecology. It clearly assisted the assessment team in identifying Valued Ecosystem Components (VECs) and in establishing an adequate baseline for the study.

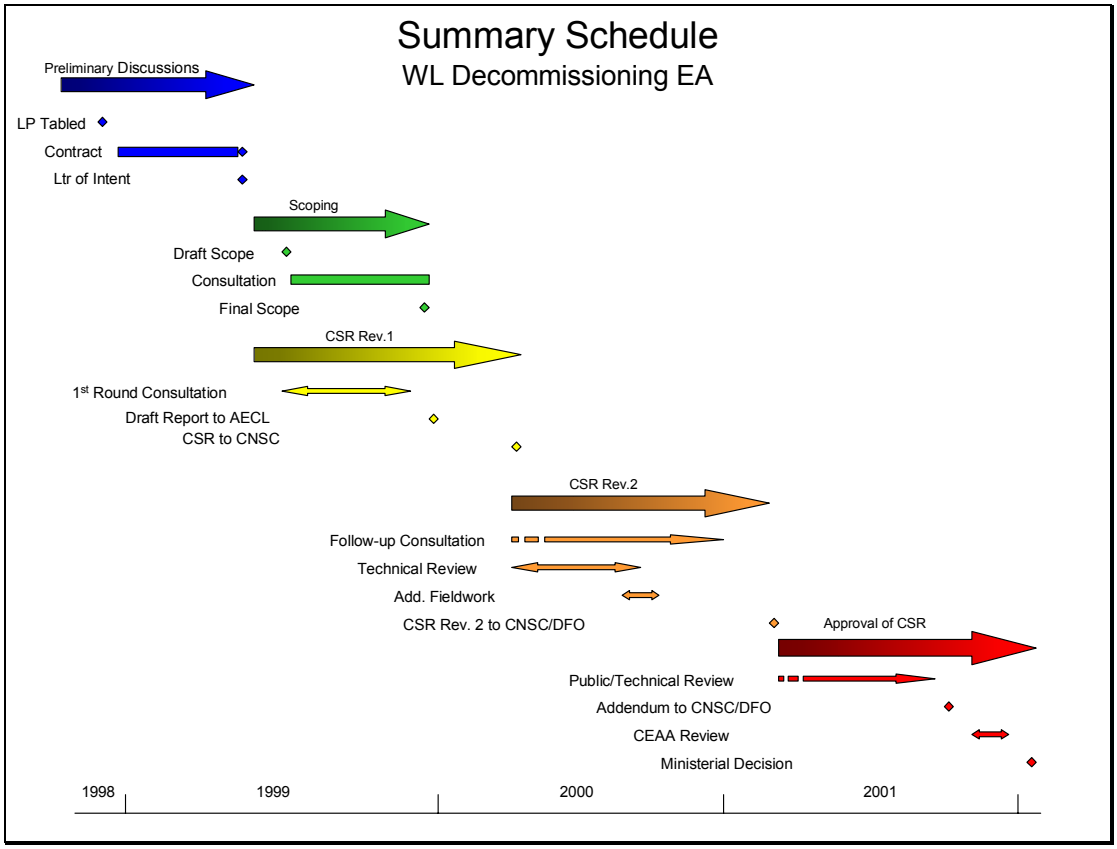

Fig. 3. Steps and timing of the environmental assessment process

Similarly, a dedicated consultation process was established with the First Nations to help understand their areas of interest within the regional study area and to providing continuing involvement in the project.

A particular aspect of this project is the duration of the undertaking. The project will span approximately 60 years, creating uncertainties relative to the completion timeframe. The project will therefore rely on an on-going follow-up and monitoring program to confirm that the appropriate mitigation measures have been successfully implemented and to develop an appropriate response to any unforeseen effects.

Applying standard and accepted assessment methodologies, AECL concluded that the decommissioning project was not likely to cause any significant adverse effects taking into account mitigation measures proposed in the CSR and that there were not likely to be any cumulative effects associated with the project.

AECL also addressed all technical issues and public concerns related to the proposed undertaking. The CNSC and DFO, who are acting as responsible authorities for the purpose of the environmental assessment, concurred with AECL's conclusions. The Agency is also supportive of AECL's conclusions and made relevant recommendations to the Minister of Environment.

REFERENCE

1. AECL, "Whiteshell Laboratories Decommissioning Project. Comprehensive Study Report. Vol. 1: Main Report, Vol. 2: Appendices, Vol. 3: Addendum"(2001)