Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 21-M17.1

Date: 2021-04-07
File / dossier : 6.02.04
Edocs pdf : 6532605

Reference: CMD 17-M50.1

Written submission from the Nuclear Waste Management Organization (NWMO)

Mémoire de la Société de gestion des déchets nucléaires (SGDN)

Implementation of Adaptive Phased Management (APM)

Mise en œuvre de la Gestion adaptative progressive (GAP)

Commission Meeting

Réunion de la Commission

April 27, 2021

Le 27 avril 2021

Canada

Revision Summary	
Date	**Description of Changes/Improvements**
April 7, 2021	Original CMD submitted to CNSC

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Executive Summary

The purpose of this Commission Member Document is to update the Commission on the activities that have been undertaken by the NWMO since our last appearance in 2017 [CMD 17-M50.1]. The NWMO remains on track in the implementation of Adaptive Phased Management (APM).

The NWMO continues to:

- Engage with potential communities on the site selection process, including discussions on partnership;
- Pursue site characterization, design, safety and environmental assessments to develop a safety case;
- Undertaken technical and engagement activities on the transport of used nuclear fuel, including the development of a transportation planning framework in collaboration with Canadians; and
- Engage with CNSC staff on the pre-licensing work.

This Commission Member Document reports on recent progress and preparations for:

- Selection of the site for the deep geological repository; and, then
- Initiation of the licensing process including the assessment to be conducted under the Impact Assessment Act.

The NWMO's target is to select a site by the end of 2023 and then progress into the licensing process.

1.0 INTRODUCTION

Nuclear fuel has powered communities in Canada for decades. A necessary by-product of this carbon-free source of energy is used nuclear fuel. Used nuclear fuel gives off radiation and is a potential hazard to human health and the environment. While the hazard continues to diminish over time, for practical purposes, used nuclear fuel remains hazardous, essentially indefinitely.

There are presently about 3 million CANDU used fuel bundles in Canada and a small amount of research reactor used fuel. This quantity of used fuel is expected to reach approximately 5.5 million CANDU used fuel bundles when the existing nuclear power generating facilities cease operations. All of Canada's used nuclear fuel[1] is safely stored on an interim basis in licensed facilities at or near where it is generated.

Although the challenge of long-term management for Canada's used nuclear fuel has been studied for decades, including by the Seaborn Panel [CEAA 1998], there is currently no implemented solution. The Nuclear Waste Management Organization (NWMO) was established in 2002 by Canada's nuclear electricity corporations in accordance with the federal *Nuclear Fuel Waste Act* (*NFWA*). Further information on the NFWA and the obligations placed on the NWMO are provided in Addendum A.

The *NFWA* required the NWMO to study approaches for the management of nuclear fuel waste and recommend a preferred approach. In 2007, the Government of Canada selected the Adaptive Phased Management (APM) approach [GoC 2007a]. It also gave the NWMO the mandate to implement the selected approach.

2.0 ADAPTIVE PHASED MANAGEMENT

APM is both a technical method and a management system as illustrated in Figure 1. It involves the containment and isolation of used nuclear fuel in a deep geological repository in a suitable rock formation. Under APM, used nuclear fuel will be safely and securely contained and isolated from people and the environment in the repository using a multiple-barrier system. The plan builds in the potential for retrieval of the used nuclear fuel for an extended period, until such time as a future society makes a determination on final closure, along with the form and duration of post-closure monitoring [NWMO 2005].

APM aligns with the internationally accepted technical approach of a deep geological repository for the long-term management of used nuclear fuel. For example, 22 countries

[1] The Nuclear Fuel Waste Act (2002) defines nuclear fuel waste as "irradiated fuel bundles removed from a commercial or research fission reactor." In this document, the NWMO refers to used nuclear fuel as a more general term.

have also decided on a deep geological repository as the long-term approach to manage used nuclear fuel and/or high level waste [NWMO 2020a].

As a management system, APM is responsive not only to new technologies, but also to the evolving societal expectations and needs of Canadians and Indigenous peoples. The NWMO is flexible in terms of the pace of implementation of APM and has established a siting process, based on extensive public input.

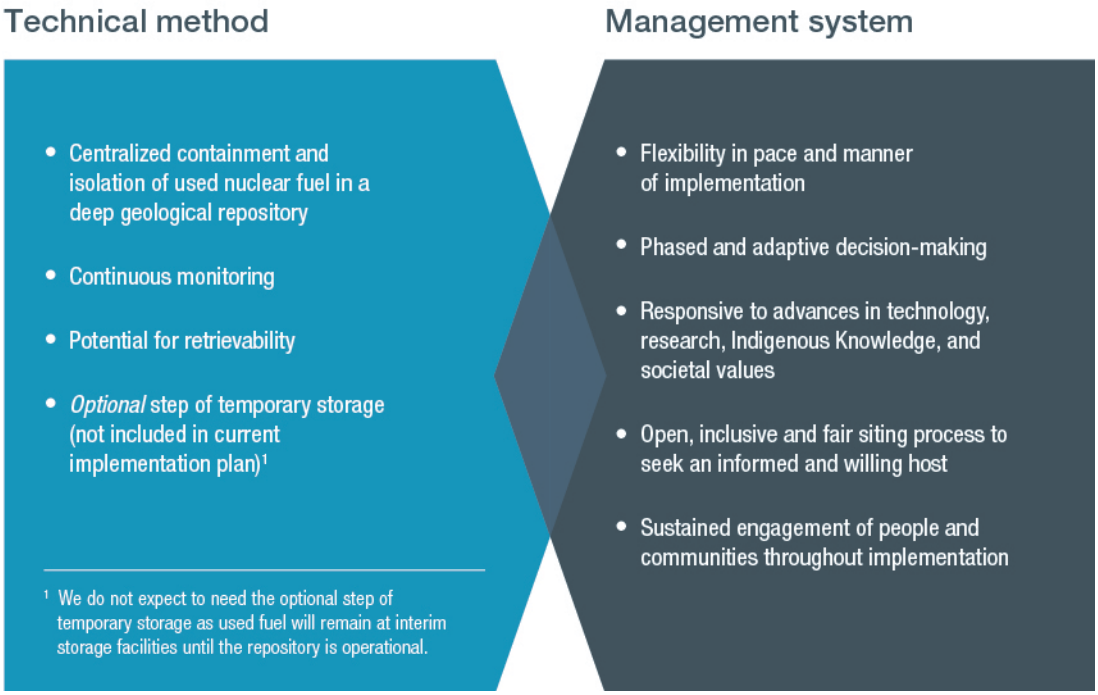

Figure 1: Adaptive Phased Management

The NWMO keeps a watching brief to anticipate any changes in fuel cycles used in Canada and the types of waste that may need to be managed. The NWMO also has agreements in place with several SMR proponents to allow discussions to be conducted on possible new technologies but has not yet actively assessed potential SMR waste streams. Once sufficient information is available about new types of fuel to be managed, the NWMO will determine potential impacts to repository designs and how the funding formulas can be adapted to include new entrants.

The NWMO continues to implement APM and has not identified a technical difficulty with its implementation or technical innovation, as described in Clause 20 of the *NFWA*, that would require a new approach.

The key components of APM currently being implemented or planned by the NWMO include:

- An engagement program for key decisions such as selecting a site;

- Site characterization, safety analyses and environmental assessment for the deep geological repository at the site and to transport used fuel from the reactor sites;
- Engagement with regulatory authorities to ensure pre-licensing work would be suitable for the subsequent licensing processes;
- Selecting a site that has rock formations suitable for a deep geological repository;
- Continuing research into technology improvements for used fuel management;
- Developing and certifying transportation containers and used fuel handling capabilities;
- Initiating the licensing process, which triggers the Impact Assessment; and
- Initiating site preparations, followed by construction and operations.

A high-level timeline for implementing APM activities is shown in Figure 2. The NWMO expects to start the regulatory approvals process in 2024 with the licence to prepare site application, followed by an application for a construction licence in 2029. This would allow construction to begin in 2033. Additional information on our planned activities is provided in Section 9.0.

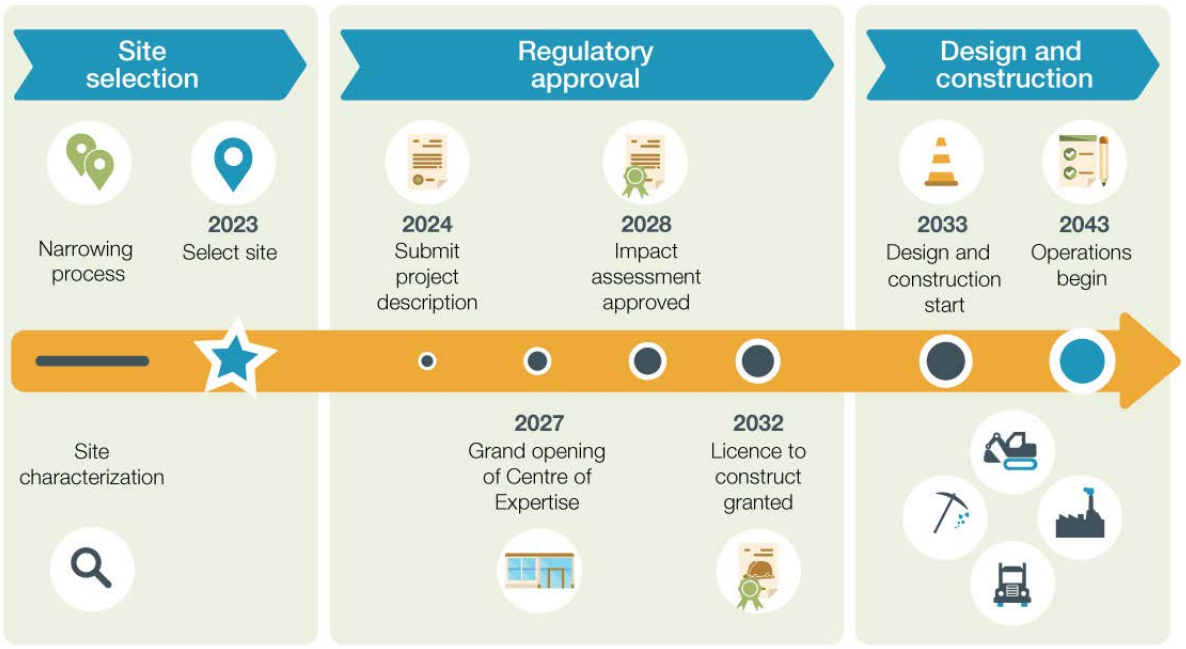

Figure 2: Timeline for Implementation of Adaptive Phased Management

3.0 ABOUT THE NWMO

The NWMO is a not-for profit organization established in 2002 by Canada's nuclear electricity producers in accordance with the *NFWA*. The founding members of the NWMO are Ontario Power Generation (OPG), New Brunswick Power Corporation, and

Hydro-Québec (HQ). These organizations, along with Atomic Energy of Canada Limited (AECL), are mandated to fund the NWMO's operations.

The NWMO is committed to proceeding in stages in an open, transparent, and inclusive manner. The NWMO takes the time needed to collaboratively plan and confirm each step through an ongoing dialogue with the public.

The team at the NWMO is made up of some of Canada's leading experts in fields related to nuclear waste management. The NWMO has approximately 200 highly dedicated employees working from offices in Toronto, Oakville, Teeswater, and Ignace. These employees are involved in technical and engagement work programs, working themselves with other experts and suppliers across Ontario and Canada. The NWMO also collaborates with experts from around the world to ensure the work benefits from the best available research and experience.

Adaptive Phased Management is an inter-generational undertaking. The NWMO accordingly has taken steps to ensure that it is building a diverse workforce that is representative of the peoples of Canada. The NWMO is also engaged in encouraging youth to become interested in the sciences, technology, engineering and mathematics.

Since its creation in 2002, the NWMO has worked with Canadians to develop and implement an approach for long-term management of used nuclear fuel. The NWMO regularly communicates its plans through its annual and triennial reports that are provided to the Minister of Natural Resources Canada and tabled in Parliament, annual implementation plans, its website, other reports and a range of engagement activities.

Activities are also subject to independent oversight by an Advisory Council appointed by the Government of Canada. The Council is an independent and arms-length body comprised of individuals knowledgeable in the management of used nuclear fuel, and in working with people and communities on difficult public policy issues.

The Advisory Council's role is to:

- Ensure that the views of the public and communities of interest are considered and reflected in a thoughtful, balanced way in the proposed approaches and reports of the NWMO; and
- Assist the NWMO in ensuring that its processes are of good quality, and are open, transparent, thorough, and sound.

The Advisory Council provides advice and views on how the NWMO discharges its responsibilities. Their work is made public through their reports to the Minister of Natural Resources Canada.

In implementing APM, the NWMO is guided by the six values shown in Figure 3.

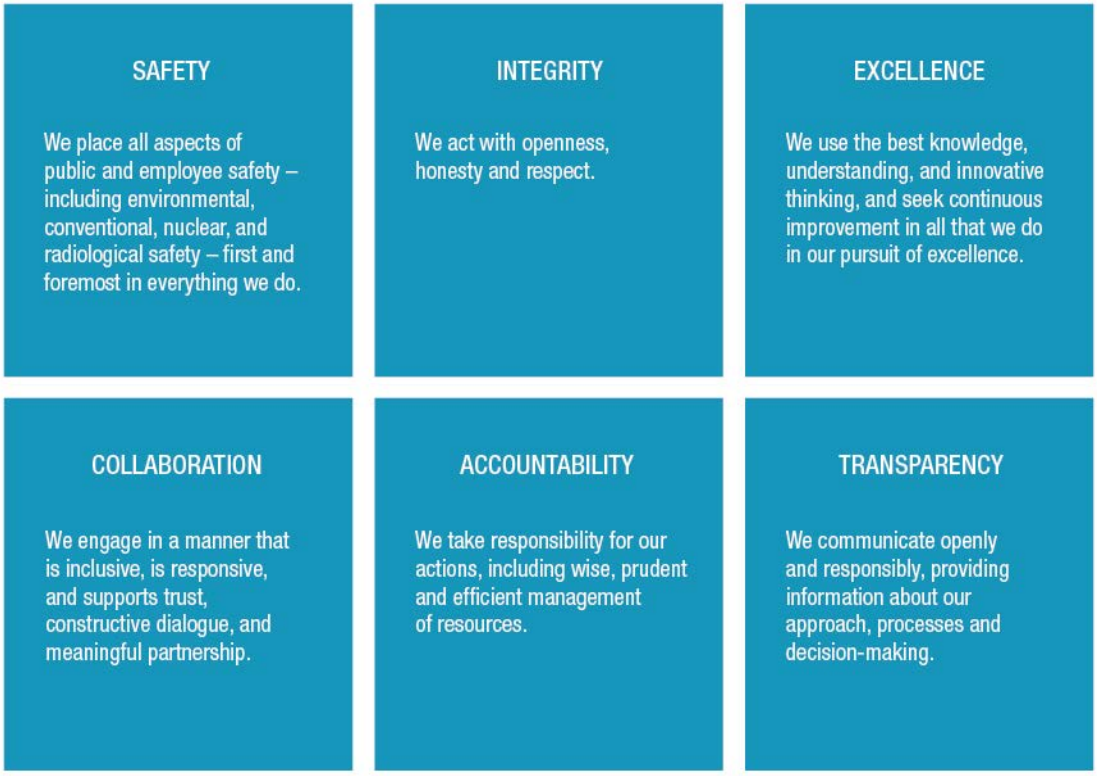

Figure 3: Six Values Guiding APM Activities

3.1 Indigenous Perspectives and Reconciliation

As part of establishing a solid foundation for working with Indigenous peoples, the NWMO has embarked on a Reconciliation journey. In advancing that journey, there is recognition that Reconciliation is more than an acknowledgment of injustice (although that is part of the process); it also means taking action to co-create a better future built on rights, equity and well-being.

Since 2005, the NWMO reached out to better understand Indigenous Knowledge, and how it might inform and become an integral part of our work. The NWMO invited recognized organizations to recommend to the NWMO two Elders to sit on a group that would provide wisdom and advice for engaging with Indigenous peoples. The Elders Forum evolved into the Council of Elders and Youth, an independent advisory body made up of First Nation and Métis Elders and youth.

The NWMO's Indigenous Knowledge policy was issued in 2016 [NWMO 2016]. The Council of Elders and Youth provides counsel to the NWMO on how to apply Indigenous Knowledge in implementing APM and enhancing the development and maintenance of good relations with First Nation and Métis communities and organizations.

In 2020, the NWMO did just that by implementing a Reconciliation Policy (Addendum B). Progress in moving towards Reconciliation is measured by the NWMO using both qualitative and quantitative approaches. The NWMO has started using assessment tools to evaluate implementation of the Reconciliation policy and how to move forward as an organization.

The International Association of Business Communicators recognized our work on Reconciliation with a 2020 Gold Quill Award. The NWMO also gained recognition from the IABC Toronto Chapter's 2020 OVATION Awards.

The NWMO also continues to build a culture of Reconciliation by providing ongoing training and education opportunities to staff and extending these opportunities to contractors and external partners. Through participation in Indigenous events and corporate sponsorship initiatives around Reconciliation, the NWMO is living its values and helping set new standards for corporate Canada.

3.1.1 Interweaving Indigenous Knowledge

The NWMO strives to interweave Indigenous Knowledge into all work activities. A misconception is that Indigenous Knowledge is only applicable to knowledge of the land when in fact it includes things like resource management, science, governance and much more. For example, our Human Resources department has taken steps to interweave Indigenous Knowledge into their work by coordinating with our Indigenous Relations team to offer sharing circles to support mental health during the global COVID-19 pandemic.

NWMO technical experts and research partners come together with Indigenous scientists and Knowledge Keepers each year (virtually in 2020) to explore how we can continue to interweave Indigenous knowledge into the technical research programs. These workshops create collaboration on a national and international basis by bringing together scientists and Indigenous Knowledge Keepers to address the safe and secure containment of Canada's used nuclear fuel over the long term.

One of the topics for integration of Indigenous Knowledge and Western Science is water. The NWMO now has a deeper understanding of the spiritual importance of water. Water sustains life and is a subject of vital importance to people. Several communities in the site selection process asked about providing more information on how the project will protect water. The NWMO has developed three presentations that explore the relationship between water, clay, and copper, which are vital components of the multiple-barrier system in the proposed deep geological repository. Developed with input from Indigenous communities, the presentations incorporate Indigenous teachings about water, clay, and copper, and use oral tradition as part of how they are delivered.

The NWMO also understands that water has its own story to tell as it shapes and is shaped by the land. Existing geological data in the potential siting areas shows that the water within the rock has remained isolated from the surface for millions of years and therefore has withstood the impact of many past glacial cycles. The NWMO needs to

listen and learn from the water within the rock to better understand its ability to safely store used nuclear fuel.

In travelling a path together, it is important to consider different world views and how aspects of the Indigenous Knowledge system can inform the project moving forward. The NWMO will continue to find opportunities to interweave Indigenous Knowledge into everything we do, and to create a space to learn from ceremony and apply those teachings to how decisions are made.

3.2 International Collaboration

The NWMO also works with other radioactive waste management organizations, often through co-operative activities arranged through the OECD Nuclear Energy Agency or the International Atomic Energy Agency. The NWMO has co-operation agreements with its counterparts in Belgium, Sweden, Finland, France, Switzerland, Japan, the United Kingdom, and South Korea. This co-operation allows the NWMO to contribute to and benefit from other countries' experience in site selection, engagement, repository design and safety case development. These agreements also support joint research projects at underground research laboratories in other countries.

4.0 OVERVIEW OF THE NWMO'S SITE SELECTION PROCESS

The NWMO site selection process "*Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel*" started in 2010. The Minister of Natural Resources determined this process to be a reasonable approach for moving forward with the implementation of APM [GoC 2010]. The NWMO continues to implement this process. Adjustments have been made, as identified in the NWMO's annual and triennial reports, to respond to learning from the ongoing dialogue with Canadians and Indigenous peoples.

The 2010 siting document includes several site evaluation factors that any site will have to meet in order to be considered suitable. The overarching factors are:

- A deep geological repository can be developed with a strong technical safety case at that location. Safety is first and foremost in selecting a site and the NWMO has committed to meet or exceed all applicable regulatory standards and requirements for protecting the health, safety and security of people and the environment.

- A safe, secure and socially acceptable transportation plan can be developed to transport used nuclear fuel to that location.

- A strong and supportive partnership can be developed with the interested community, First Nation and Métis communities in the area, and surrounding communities.

Safety criteria are included in the siting process and they are grouped under the following six safety functions [NWMO 2010]:

- Safe containment and isolation of used nuclear fuel: The characteristics of the rock at the site must be appropriate to ensure long-term containment and isolation of used nuclear fuel from humans, the environment, and surface disturbances caused by human activities and natural events.

- Long-term resilience to future geological processes and climate change: The rock formation at the siting area must be geologically stable and likely to remain stable over the very long term in a manner that will ensure the repository will not be substantially affected by geological and climate change processes such as earthquakes and glacial cycles.

- Isolation of used nuclear fuel from future human activities: Human intrusion such as through future exploration or mining must be unlikely.

- Safe construction, operation and closure of the repository: Conditions at the site must be suitable for the safe construction, operation, and ultimate closure of the repository.

- Amenability to site characterization and data interpretation activities: The geologic conditions at the site must be amenable to being practically studied and described on dimensions that are important for demonstrating long-term safety.

- Safe transportation: The site must have a route that exists or can be created that enables the safe and secure transportation of used nuclear fuel from interim storage sites to the repository site.

These criteria are consistent with Canadian and international guidance. Section 6.0 in this document describes the work to support the deep geological repository's safety case and Section 7.0 describes the work supporting transportation.

Beyond confirming that the safety criteria can be met, the NWMO is also assessing the contribution to well-being that the deep geological repository would provide the potential host communities and working with the communities to establish draft hosting agreements.

5.0 WORKING WITH COMMUNITIES

Twenty-two communities expressed interest in learning more and to explore their potential suitability for the deep geological repository, as shown in Figure 4. These communities, and the area around them, represented a broad range of potential sites from a technical and social perspective. Three were in Saskatchewan and nineteen were in Ontario. The NWMO suspended the expressions of interest phase in 2012 in order to focus on these communities.

Over the course of the last decade, through increasingly intensive study and engagement, the NWMO gradually narrowed its focus to two remaining potential sites: the Ignace area and the South Bruce area.

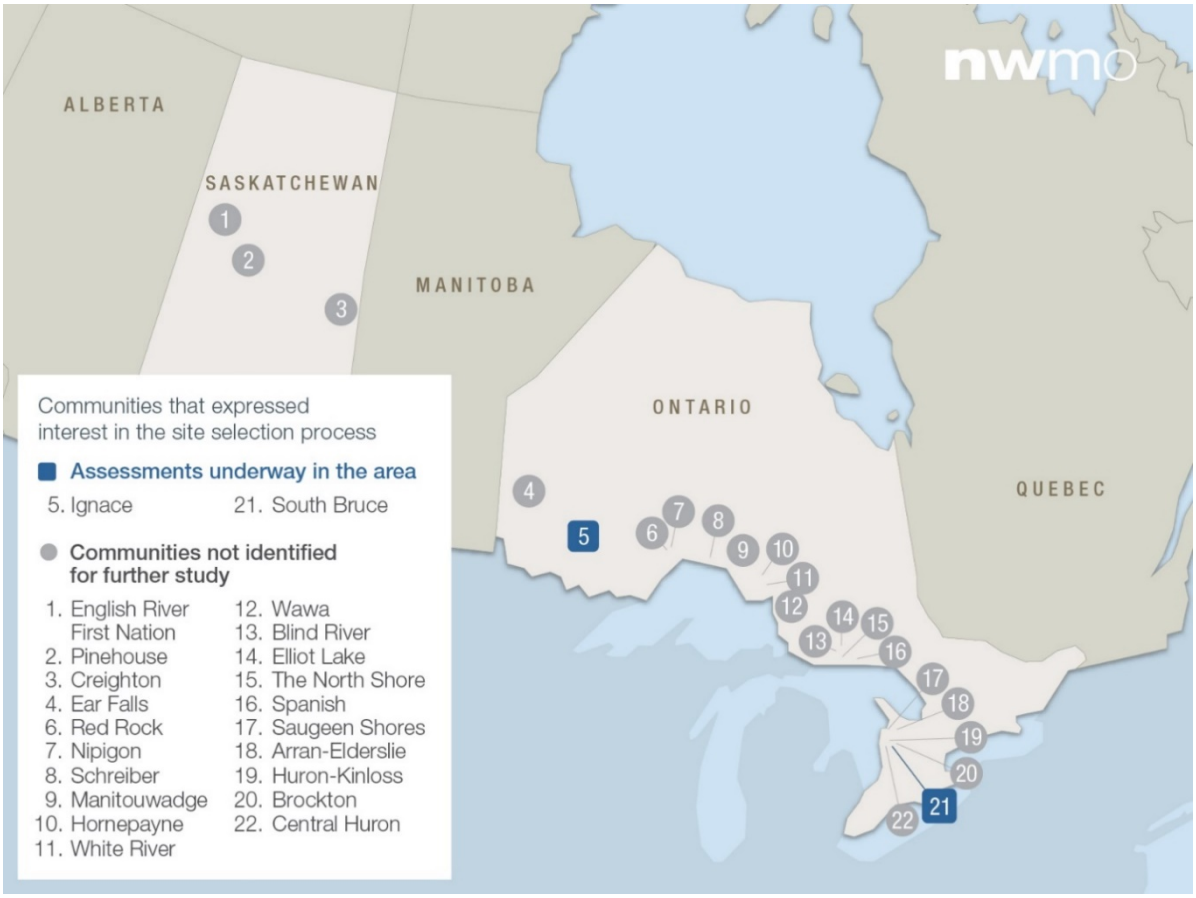

Figure 4: Communities in Site Selection Process as of April 2020

The Ignace area includes the township of Ignace and the traditional territory of the Anishinaabe and Metis Nations, and many other Indigenous peoples, past and present, including the Ojibway of present day Wabigoon Lake Ojibway Nation.

The South Bruce area consists of the municipality of South Bruce and the Saugeen Ojibway Nation territory, including members from Saugeen First Nation and Chippewas of Nawash Unceded First Nation.

5.1 Social Engagement

Dialogue with communities and a range of interested individuals and organizations is central to the work being done to advance Canada's plan. As the siting process advances, the NWMO has broadened and deepened engagement activities with municipal, First

Nation and Métis communities, as well as surrounding communities in each area. The NWMO has also maintained relationships with national and provincial Indigenous organizations, as well as municipal associations.

With two siting areas remaining in the site selection process – Ignace and South Bruce – not only is the NWMO continuing to support communities in learning more about Canada's plan, but also working with them towards defining partnership.

The global COVID-19 pandemic had an impact on the NWMO's engagement activities, and it delayed or caused the cancellation of some planned activities. Even so, throughout the year, the NWMO worked hard to remain present (virtually when necessary) in the communities working towards selecting a site for Canada's plan. The NWMO also provided $800,000 for COVID support to the communities during the global pandemic.

More information is provided below on: municipal engagement; engaging First Nations and Métis communities; and engaging youth.

5.1.1 Municipal Engagement

The NWMO supported hundreds of municipal engagement activities since the Commission update in 2017. A full list of engagement activities between 2017 and 2019 is published as a separate document [NWMO 2020c] and posted on the NWMO's website.

Prior to the pandemic, the NWMO held one-on-one conversations and conducted presentations and discussions with groups. Engagement also occurred through meetings and briefings, conferences, tours of interim storage facilities and the NWMO's proof test facility, monthly meetings of community liaison committees (CLC), community open houses, symposiums, drop-ins to local community offices, and community festivals and events. The NWMO also constructed a Mobile Learn More Centre that can travel to communities. A municipal conference program and meetings of the NWMO's Municipal Forum are maintained. The NWMO also continues to hear from citizens via our website, email and social media platforms.

During the height of the pandemic, Community Liaison Committee (CLC) meetings and other outreach activities were continued through online and phone meetings. The NWMO also held workshops to share information and seek input about our environmental baseline monitoring virtually in Ignace and South Bruce after the pandemic began.

When the health and safety protocols in Ontario permitted limited direct engagement, the NWMO Mobile Learn More Centre visited interested and neighbouring communities in both potential siting regions. Pandemic-related safety protocols were carefully followed, including wearing masks, limiting attendance and following public health guidelines. The NWMO also hosted virtual and in-person open houses in both potential siting areas, again, following defined safety protocols.

Throughout 2020, the NWMO also engaged a broad range of municipalities across Ontario. For example, the NWMO participated in the 2020 Association of Municipalities of Ontario conference which was held online, and sent a letter to all 444 municipalities in the province to inform them of progress towards Canada's plan and offer to answer any questions they have.

5.1.2 Engaging First Nations and Métis Communities

The NWMO continues to build sustainable relationships with First Nation and Métis peoples in and near potential siting areas, while maintaining ongoing engagement with national, provincial and treaty Indigenous organizations. These engagements include more than 23 separate groups and communities across Ontario and New Brunswick.

The NWMO actively engages with Elders, youth and community members, as well as Chiefs and Councils or leadership, providing information on the APM Project, and borehole drilling in the Ignace area. Technical specialists also share insight into their fields of expertise.

From 2017 to 2019, the NWMO attended more than 100 community events, powwows, open houses, learning and sharing gatherings, cultural awareness workshops, assemblies, conferences, and special occasions in the area. The NWMO also facilitated community members attending dry storage tours at interim storage facilities, as well as visiting our proof test facility in Oakville.

Many communities accessed the NWMO's community sponsorships and donations programs for a variety of activities such as robotics programs, rangers' camps, cultural verification, youth gatherings, wellness camps, language classes, hockey tournaments, and science camps.

As a result of the pandemic, the NWMO looked for ways to support the communities. The NWMO provided funding that aided the communities' response to the pandemic and limited its engagement activities. The site investigations programs were also paused, putting a temporary halt to the borehole drilling program in both potential siting areas.

NWMO engagement staff continue to reach out to Indigenous communities through each of their community liaisons to discuss their situation with respect to the pandemic. In-person engagement activities will be resumed once pandemic restrictions are lifted and the communities are comfortable with allowing visitors to come and present.

In 2020, the NWMO entered into a dialogue process with the Saugeen Ojibway Nation (the Saugeen Ojibway Nation territory includes members from Saugeen First Nation and Chippewas of Nawash Unceded First Nation). Previously the NWMO provided the Saugeen Ojibway Nation with information on APM, but had not extensively entered into dialogue with the community while they were completing their community process related to OPG's DGR Project for low and intermediate level waste.

5.1.3 Engaging Youth

Canada's plan is a multi-generational infrastructure project. As such, from the very beginning, the NWMO has invested in building the next generation of scientists, engineers, journeypersons, and nuclear industry employees. NWMO employees have been recognized for their contribution to promoting science, technology, engineering, and mathematics (STEM) careers for youth and women.

The NWMO invests in bursaries and scholarships to encourage education in the skilled trades and careers in STEM. These include the NWMO Women for STEM Scholarship, NWMO Indigenous Student Success Award, as well as bursaries handed out by local organizations and municipalities. An endowed memorial scholarship is also supported at Western University: Flight 752 Memorial Graduate Scholarship in Engineering and Science. All 176 passengers (including Canadians) on the Ukraine International Airlines flight travelling from Tehran to Kyiv were killed in a tragic accident when the plane was brought down by an Iranian surface-to-air missile. The scholarship is a way to honour the Western University graduate students on the flight, who had worked on research projects for the NWMO.

Annually, contributions are made to Scientists in School, Science North and Shad Canada to promote STEM learning in siting areas and beyond. This year, Science North delivered online workshops in Ignace, Shad held webinars for youth across Canada, and Scientists in School created virtual community workshops. In South Bruce, a new digital summer camp was supported to teach young people about nuclear energy through the Nuclear Innovation Institute.

A direct investment in students is supported by an annual summer student program, which grew to 11 students in 2020. Despite the pandemic, the NWMO was able to maintain the program and supported the students in doing their work virtually, and was able to hire many of these students from within the potential siting communities. Nine of the students were able to continue to work with the NWMO part time once their classes resumed in the fall.

The NWMO also helps teachers and administrators bring more STEM education to the classroom. Since 2016, a funding program has been implemented called Early Investments in Education and Skills (EIES). Among other investments, the EIES can be used to help teachers and school administrators purchase and implement technology to teach everything from coding to robotics.

5.2 Partnership

The NWMO continues to explore partnership with municipal and Indigenous communities in both potential siting areas. To guide discussions about partnership with communities as part of the siting process, the NWMO continues to implement a partnership road map (Figure 5).

Figure 5: Partnership Road Map

The partnership discussion is guided by shared values and principles that were established through dialogue in the potential host communities. The shared values include safety as a priority as well as other items such as a community well-being, protection of the environment, and involvement of regional communities.

The NWMO worked on project visioning with some siting area municipal communities through a series of virtual and in-person workshops, meetings, and other outreach activities. The resulting visions were shared publicly through municipal websites for further feedback and presented before municipal councils.

The project visioning enables the NWMO to understand each communities' questions, concerns and aspirations. This will become the basis of work to determine the extent to which the questions and concerns can be resolved through assessments, and the contribution that the project could make towards achieving the community aspirations.

As an example, in southern Ontario questions and concerns have been raised about potential impacts on property values. The NWMO has committed to develop, in consultation with the Municipality of South Bruce, a program to compensate property owners in the vicinity of the deep geological repository if their property values are adversely affected by the project, should it be sited in the South Bruce area.

The NWMO's objective is to express the potential partnerships in draft hosting agreements developed based on the questions, concerns and aspirations from community members (i.e., through visioning). These will enable community members to see the commitments that have jointly been made by the NWMO and the community leadership before they are asked to show their support for hosting the project.

The project will bring benefits to the communities that surround the potential sites. The NWMO is now working with the potential host communities to identify the required partnerships that will be needed for the implementation of the project. Discussions are occurring regionally to explore the different roles that the surrounding communities may have as the project is implemented.

Following site selection in 2023, the NWMO will shift focus from exploring the potential for partnerships to implementing partnership agreements.

Ultimately, only one site can be selected for the deep geological repository, and as communities exit the siting process, the NWMO remains committed to ensuring they are better off for having participated. The NWMO takes great pride in feedback to date from local leaders who maintain their communities benefited from their involvement in the process.

5.2.1 Willingness

The NWMO's community-driven site selection process is designed to ensure, above all, that any location selected is safe and secure, and has informed and willing hosts.

The NWMO 2010 site selection process includes principles and commitments regarding willingness. These include: a commitment to only site the project in a community that is informed and willing; providing the time needed by the communities and the resources to learn about the project to make a decision; and a compelling demonstration of community willingness. Community residents, at the grass roots level, must be involved in that demonstration of willingness.

The site selection process does not prescribe how communities should demonstrate willingness but outlines best practices and experience with similar projects which a community may consider to demonstrate its willingness in a compelling way. These include documented support expressed through open community discussions or town hall meetings, a telephone poll, online meetings or surveys and/or a vote or referendum. Using multiple approaches to assess and demonstrate willingness is expected to increase the NWMO and public confidence in community willingness.

New approaches may also emerge. The NWMO is encouraging the potential host communities to identify processes that meet their specific needs and demonstrate clearly to the NWMO whether the project has the support of citizens. Communities in the potential siting areas are working on defining these processes.

6.0 BUILDING A SAFETY CASE

The long-term management of used nuclear fuel will involve a deep geological repository as part of a passive multi-barrier system designed to protect people and the environment from the hazard of used nuclear fuel.

Multiple passive barriers within a stable geological setting, is internationally recognized as the safest and most responsible method of managing used nuclear fuel [LBNL 2016]. It is the approach adopted by all countries that have defined an end-point for long-lived radioactive wastes. Finland, France, Sweden and Switzerland, in particular, are also well advanced in their efforts to find a suitable site for a geological repository for their used nuclear fuel.

6.1 The NWMO Design Concept

The repository will be constructed at a depth of approximately 500 metres, depending upon the specific geology and characteristics of the site. It will consist of a network of placement rooms for the used fuel containers and clay-based sealing systems, as well as a series of access tunnels and shafts to ensure accessibility and monitoring. Figure 6 provides an illustration of the NWMO deep geological repository concept.

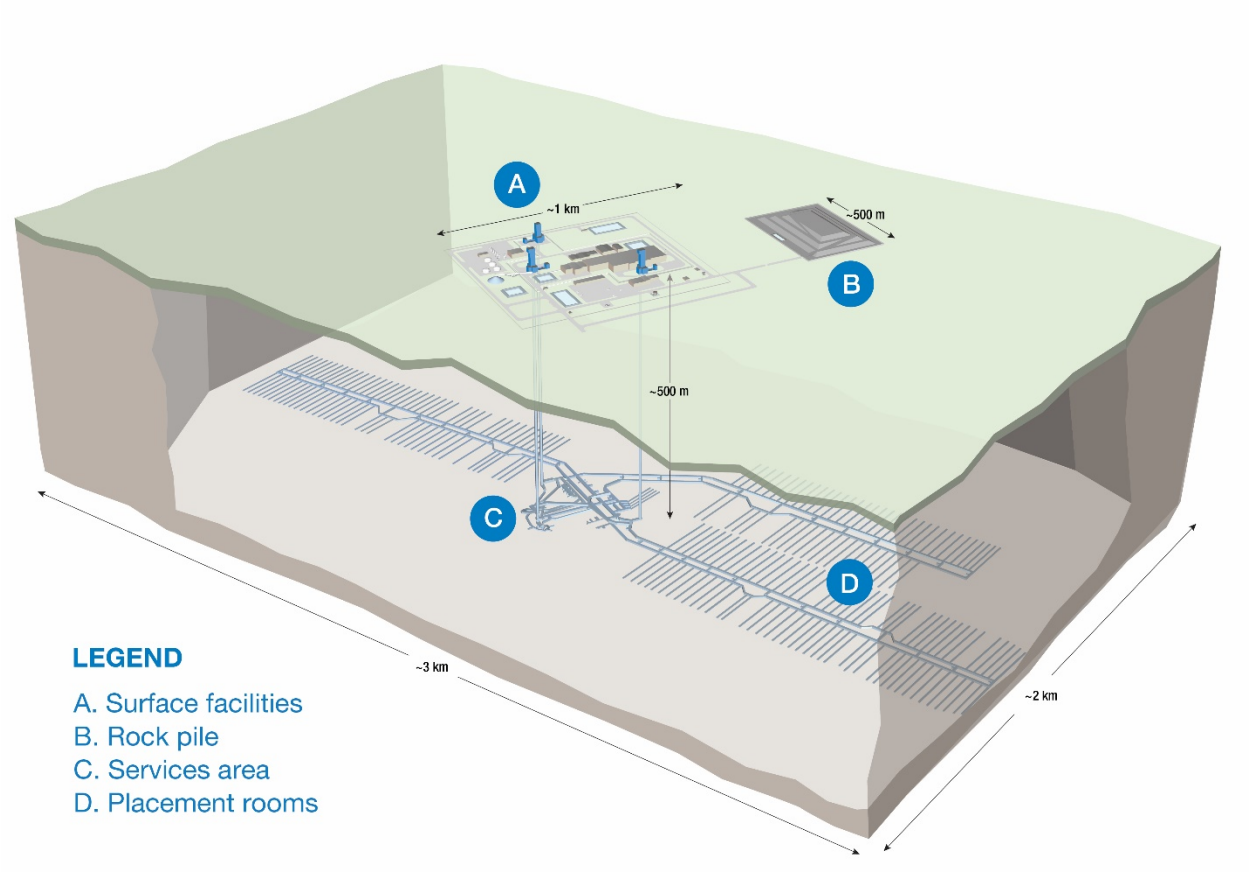

Figure 6: Illustration of the NWMO's Deep Geological Repository Concept

Once each room is filled, the emplacement room will be sealed. After all the used nuclear fuel has been emplaced in the repository and all rooms sealed, the access tunnels and perimeter tunnels will be left open and maintained to support on-site monitoring and provide an extended period of retrievability. This monitoring period will extend as long

as needed to demonstrate the site's long-term safety. Closure activities will only begin after sufficient performance data has been collected to support a decision to decommission and close the repository. These activities will also be undertaken in discussion with people in the area.

The NWMO is also updating the conceptual design of the surface facilities, including a Used Fuel Packaging Plant. A conceptual layout of the surface facilities is illustrated in Figure 7.

As site-specific technical data emerges from the site assessment program, the NWMO will continue to iterate the design.

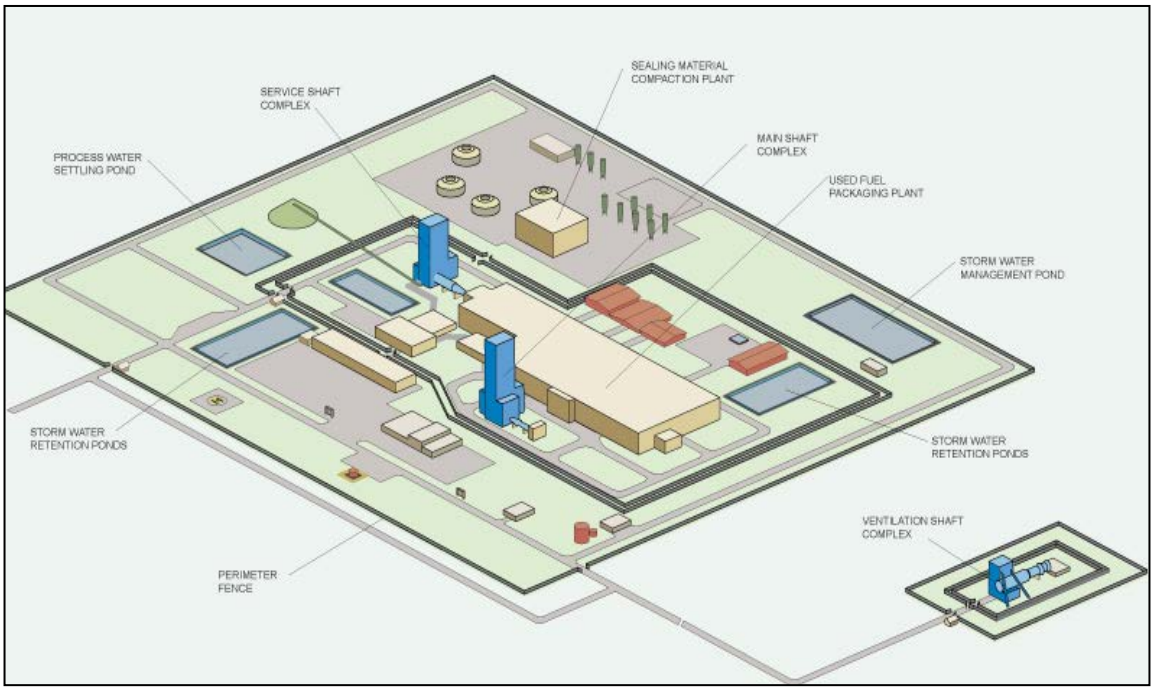

Figure 7: Conceptual Surface Facility Layout

6.1.1 Engineered Barrier System

The NWMO has developed a reference engineered barrier system design that builds on international concepts that have been widely studied for decades. In addition to the inherent characteristics of the used fuel, the engineered barrier system is composed of a copper-coated used fuel container (UFC), the highly compacted bentonite clay buffer box and the granular bentonite gap fill shown Figure 8.

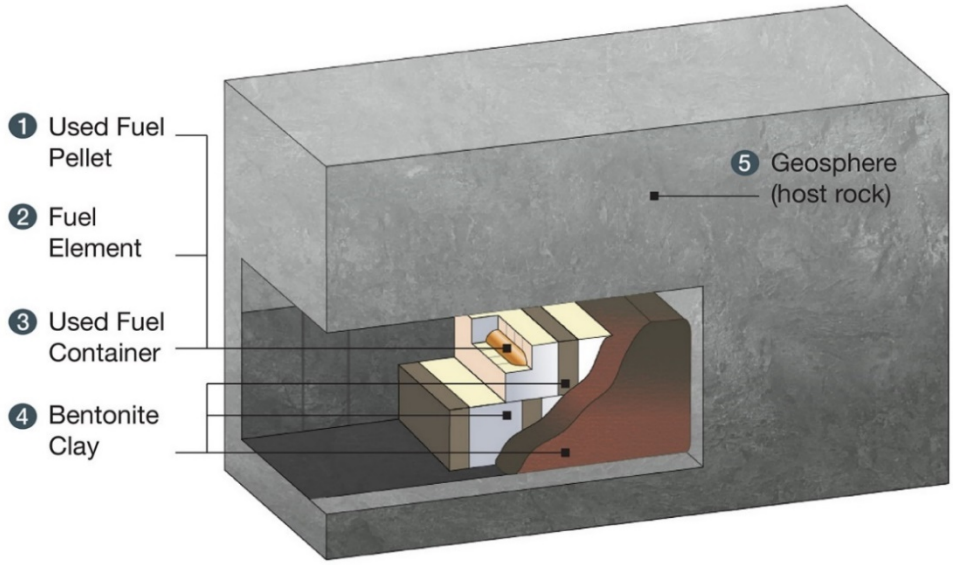

Figure 8: Illustration of the Multiple-Barrier System for Containing and Isolating Used Nuclear Fuel

The NWMO's engineering program has focused on proof testing activities to demonstrate the performance of the engineered barrier system (EBS) design.

The international used fuel container concept is being optimized for the characteristics of Canada's used fuel bundles. The NWMO concept in particular takes advantage of current developments in industrial high-quality copper coatings.

In 2020, the NWMO started work with Integran Technologies Inc. on a refined copper electroplating process using a new chemistry bath. The program is expected to optimize the copper coating that is applied to used fuel containers to resist corrosion. The NWMO also initiated parallel copper trials with BEP Surface Technologies Ltd. in the United Kingdom.

The NWMO is also developing non-destructive examination techniques and custom equipment to inspect the UFCs following the various stages of fabrication such as welding, copper coating and machining. These inspections will ensure the UFC meets the required specifications. As with container fabrication, the NWMO has adapted standard methods currently used in industry to address these specific needs.

The NWMO requested a pre-licensing review of the UFC design requirements by CNSC staff. Modelled on the vendor design review process that has been used for potential reactor technologies, CNSC staff examined 14 focus areas and concluded the following (from CNSC 2020):

- CNSC staff are satisfied that in 11 areas, the NWMO's design intent complies with CNSC regulatory requirements and meets CNSC expectations for a high-level waste container to be used in Canada.

- However, in three focus areas, CNSC staff identified eight occurrences where the design intent of the UFC diverges from documented CNSC requirements and expectations or where insufficient information was provided. Specifically, gaps were identified in the following focus areas: criticality; supporting research and development program; and structural analysis.

The NWMO is responding in its UFC design program to this guidance from CNSC staff to ensure that gaps are addressed before the design of the used fuel container is submitted for formal review as part of the application for the licence to construct in 2029.

6.1.2 Next Steps for Design

The NWMO will conduct a full-scale emplacement trial at its Oakville proof test facility, from 2021 through 2022. During the past three years, the NWMO has been preparing for these activities by procuring raw materials, and designing, fabricating, installing, and commissioning equipment to support the serial fabrication of UFCs and buffer boxes. Much of this equipment is first-of-a-kind. The NWMO has also constructed a mock-up emplacement room.

To develop the full-scale emplacement plan, the NWMO leveraged its experience participating in Posiva's Full-Scale In-Situ System Test (FISST) project. This is a full-scale emplacement trial of the EBS at the ONKALO geological repository under construction in Finland. Specifically, the NWMO sought Posiva's review of the NWMO's plans to benefit from their experience.

The NWMO has initiated a multi-year repository design program to begin site specific designs in support of the planned application to the CNSC for the licence to construct in 2029.

6.2 Site Assessment

Confirming that a potential site can meet the safety criteria for the underground repository and its surface facilities is a key part of the site selection process. Site assessment involves activities such as borehole drilling, environmental monitoring and other site investigation work.

To ensure Indigenous Knowledge is appropriately incorporated in the site assessment, guidance is sought from local knowledge holders in planning and executing work. Activities have included cultural verification studies of potentially affected areas, the use of ceremony before work is carried out, having Indigenous guides and monitors on-site to observe the work, and conducting cultural awareness training for staff as well as contractors performing work in the field.

The NWMO integrated findings from early site assessments of each siting area and analyzed the data to support the identification of a potential repository site. In the Ignace area, the preferred location on Ontario Crown Land was identified based on a wide range

of technical studies and through extensive engagement activities, including with First Nation and Métis communities. In the South Bruce area, the potential site was identified through a land access process that included transactions with landowners who expressed interest and voluntarily chose to participate. The NWMO has acquired or optioned the lands in the South Bruce area.

In both potential areas, the NWMO is advancing borehole drilling. The NWMO geoscience studies include a series of instrumented down-hole tests at each borehole as well as analysis of core samples in laboratories. The NWMO is working closely with industry and academic partners to complete analysis and laboratory testing of the information and samples retrieved from boreholes such as core (rock and porewater) and water samples.

In the Ignace area, four initial boreholes were drilled to a depth of about a kilometre to study the geological conditions at depth, and two more boreholes are currently being implemented. The geological conditions in the South Bruce area are known from existing data. Two boreholes are planned to confirm consistency at the potential site with geological conditions in the general area.

In 2020, the NWMO paused its borehole investigations in response to the COVID-19 pandemic. Activities are set to resume in 2021 in keeping with the health and safety protocols that have been established by the Province of Ontario.

The NWMO has started the data interpretation from the samples collected from the boreholes in the Ignace area. The data has supported development of a preliminary 3D geological model for the site.

Throughout geological investigations, the NWMO has sought feedback and comment from the international Adaptive Phased Management Geoscientific Review Group. This group of international experts reviews on an ongoing basis approaches, methods, criteria and findings from the NWMO geological site investigation program.

In addition to the remaining boreholes, in the Ignace area, the NWMO conducted 2D seismic surveys and is now progressing with the installation of a network of micro-seismic monitoring stations. Shallow groundwater wells are also now being installed to enable monitoring of the near surface groundwater characteristics and flow patterns.

In 2021 at the potential South Bruce site, deep boreholes, groundwater monitoring and 3D seismic surveys are planned to be completed. In addition, the NWMO completed archeological and environmental surveys of the borehole sites, completed a round of pre-drilling private drinking water well sampling, and implemented pre-drilling noise and air quality studies.

At both potential sites, the NWMO is developing its environmental characterization program to understand the natural environment at the potential locations, how that environment may change with the implementation of the deep geological repository, and

the hazards that the natural environment poses that need to be addressed in the design of the facilities. The design of the programs includes local public input. Data collection will commence in 2021.

6.2.1 Next Steps for Site Assessment

The next few years will see the NWMO identify a single preferred site and move into the licensing and regulatory process. The NWMO will use geological information collected to support a determination that the potential sites can meet its safety criteria. Environmental characterization information will be used to support the understanding of the baseline conditions. The information collected up to the point of site selection will be included in the request to the CNSC for a licence to prepare site and the Initial Project Description that will be submitted to the Impact Assessment Agency of Canada.

The NWMO will also continue geological site characterization of the preferred site in support of the design of the deep geological repository. This program will take up to five additional years to complete, and the incremental site characterization information will be included in the application for the licence to construct the repository in 2029.

6.3 Safety Assessment

The site, the facility's robust design, and the way it is built, operated and monitored will all ensure safety. The post-closure safety assessments test the safety of the repository by looking at the potential impact on a hypothetical family in the future living and working directly above the repository and obtaining food from local sources and well water from a deep well. The assessments so far show that for a well-designed repository at an appropriate site, the family would be safe. The generic pre-closure and post-closure safety assessments indicate that the radiological safety criteria could be achieved at either potential repository site.

The NWMO has developed generic safety assessments (also referred to as case studies) to demonstrate that the regulatory requirements for radiological exposure of the public will be met. The safety assessments address radiological exposure in both the near term (during facility operations) and the long term (post-closure after the repository has been filled, sealed off and closed).

The near-term or pre-closure safety assessment evaluates the potential radiological impact on people and the environment due to facility operation under normal and abnormal operating conditions and for credible accident scenarios. In 2018, a preliminary analysis of accidents was completed for a generic site. A study was initiated in 2019 to review the anticipated climate change impacts on precipitation, and update the estimates of the flood potential for the regional areas under consideration as potential siting areas. These results will help improve the design basis.

Post-closure safety assessments are simulations that calculate repository performance for a million years or longer. From 2017 to 2019, the NWMO completed updated post-closure safety assessments for both a hypothetical crystalline rock repository and a

hypothetical sedimentary rock repository. These updated safety assessments incorporate the NWMO's engineered barrier system design and emplacement room layout.

The NWMO has started to develop the next safety assessment model to support site-specific safety assessments. This model will take advantage of current enhancements in computer models to provide a more complete representation of the repository system.

Development of a preliminary site-specific safety assessment is underway for a potential repository location in the Ignace area. This iterative assessment will build on the methodologies developed in latest case studies and incorporate information from current site assessment work.

The NWMO will extend this work to the second potential siting area in South Bruce as field data becomes available.

6.3.1 Next Steps for Safety Assessment

The NWMO will further develop the site-specific safety assessments for the two potential sites that remain in the site selection process using the pre-closure and post-closure safety assessment methodologies. This work includes examining features of the repository system, testing key safety parameters, and confirming that people and the environment will be protected in the long-term under a range of scenarios.

The safety assessment work will continue towards the development of the preliminary safety analysis report that will be submitted as part of the application for the licence to construct in 2029.

6.4 Technical Research

The NWMO continues to advance its understanding of many elements of the APM through the research and development (R&D) program. In 2018, technical research activities were re-organized and an internal Technical Research Review Committee was established to provide an information-sharing forum within the NWMO.

R&D requirements were assessed across all phases of the project, from current state through detailed characterization, construction, operations, decommissioning, and closure. The goal was to better understand how current R&D activities support technical knowledge of repository performance and safety and identify future R&D activities. This work culminated in an integrated R&D program report, focusing on technical research in the areas of the safety case, engineered barriers and geoscience. It improved planning for R&D activities through all phases of the project.

Research partnerships with universities play an important role in ensuring the NWMO's technical work is scientifically rigorous, and in maintaining a supply of knowledgeable young people that can support APM in the next decades. The NWMO has supported research at 17 universities for many years, with the majority here in Canada. Due to the global COVID-19 pandemic, some planned R&D projects had to be delayed.

The NWMO and its contractors regularly publish research results at technical conferences, on the NWMO website and in peer reviewed journals. For example, most recently a prestigious international journal, Progress in Materials Science, published an article by our corrosion science team that confirms the copper coating on our container for used nuclear fuel is robust and thick enough to withstand any corrosive effects over the timeframe relevant to post-closure safety (i.e., for over 1 million years).

7.0 TRANSPORTATION

Canada's plan for the long-term management of used nuclear fuel will require the used nuclear fuel to be transported beginning in the 2040s from where it is currently being stored to the repository site. Although the site has not yet been selected, work is underway to ensure that used nuclear fuel will be transported in a way that is safe, secure and socially acceptable.

Two complementary programs support this work: a technical program that addresses all aspects of technical safety and security, and an engagement program that helps communities and other interested people learn more about the transportation of used nuclear fuel and encourages their involvement in planning.

7.1 Technical Program

Used nuclear fuel transportation packages are designed and tested to ensure protection of the public and environment during normal operations, as well as during severe accident conditions. Before a transportation package can be used in Canada, the CNSC must certify the design as meeting its regulatory requirements, which incorporate international safety standards published by the International Atomic Energy Agency. The requirements include successfully passing tests designed to demonstrate the package's ability to withstand severe impact, fire and immersion in water.

There are two existing transportation package designs that are certified in Canada and could be used to transport used nuclear fuel to the repository: a Used Fuel Transportation Package and a Dry Storage Container Transportation Package. The NWMO owns and maintains the certificate for the Used Fuel Transportation Package. The Used Fuel Transportation Package certificate was renewed in 2018 in accordance with its 5-year renewal cycle.

7.2 Transportation Engagement Program

No matter the location, used nuclear fuel will need to be transported past communities and through traditional territories to arrive at a central location for its containment and isolation for many generations to come. Work is already underway to ensure transportation will be safe and secure, with a plan that reflects public priorities and concerns.

In 2020, the NWMO published a draft transportation framework. This framework summarized priorities Canadians have identified related to the transportation of used

nuclear fuel and outlined a proposed approach to collaborative transportation planning based on those priorities.

The framework was developed following thousands of conversations with communities and those interested in Canada's plan, and shared publicly for broader engagement and refinement.

The NWMO also continued to engage in conversations about its transportation program and Canada's plan with those new to the project. Due to the global COVID-19 pandemic, we have found new ways to engage (including virtual platforms) that we expect to be able to use in the future to reach remote audiences.

The NWMO understands that Indigenous voices are critical to transportation planning. Applying a Reconciliation lens to this work will help us to fully understand how planning can be implemented in a way that takes into account Indigenous priorities.

8.0 CNSC STAFF INVOLVEMENT

Pre-licensing reviews provide valuable information and guidance for planning the NWMO's work activities.

The NWMO continues to engage with CNSC staff to ensure that work being undertaken will be suitable for the future regulatory process. A Special Project Arrangement between the NWMO and CNSC staff establishes a framework for these activities. This arrangement was updated in 2019 and it takes into consideration the pre-licensing efforts of the NWMO. This arrangement provides a framework by which the NWMO can seek additional information on regulatory expectations; ensures CNSC staff are updated on the status of the APM program; enables the NWMO to request formal regulatory reviews; and provides for cost-recovery.

As mentioned above, the NWMO has engaged with CNSC staff on first-of-a-kind design elements. In addition, to support the development of a licence to prepare site application, CNSC staff were involved in a review of the baseline environmental characterization program. A similar review was coordinated by the Impact Assessment Agency with respect to the requirements of the impact assessment process. In the future the NWMO will bring additional information to CNSC staff respecting the efforts underway to develop the safety case for the repository.

Another key activity involving CNSC staff is their outreach into the potential host communities to ensure the public is informed respecting the CNSC's role as the regulatory authority. The NWMO anticipates that the potential host communities will continue to make requests of the CNSC staff given the important role the CNSC will have in confirming that the deep geological repository will protect the public, workers, and the environment.

9.0 PREPARING FOR THE WORK AHEAD

The NWMO is preparing now to become a licensee by ensuring a strong nuclear safety and security culture, an effective management system and a diverse, inclusive and qualified workforce.

In 2020, the NWMO conducted an initial nuclear safety and security culture self-assessment. The insights from this assessment identify strengths in the current safety culture that can be leveraged as well as areas that need focused attention as the NWMO prepares to become a nuclear operator.

As the work evolves, the NWMO will ensure that the right people are in the right jobs with the right skills and tools at the right time. A key element of this effort is providing funding, internships, and other employment opportunities to students in colleges and universities who in the future may come to fill roles in the NWMO. Recruitment strategies also continue to evolve to ensure diversity in all disciplines and at all levels of the organization.

Although the global COVID-19 pandemic had an impact on work activities, the NWMO remained focused and productive. Still, it was necessary to adjust some of the planned timelines associated with regulatory approvals and building the Centre of Expertise to fully address all the work required in these areas.

The NWMO remains on track to meet its expected site selection date of 2023 – an important milestone in the implementation of Canada's plan. Site selection will also mark the beginning of a multi-phase organizational transformation for the NWMO. With site selection, the NWMO will begin the multi-year process of mobilizing its resources to the area. This will include constructing the offices and other buildings that will be needed, including the Centre of Expertise. Figure 9 presents the NWMO's general planning timeline for the implementation of APM.

The NWMO has also been keeping abreast of all regulatory changes that are pertinent to the project. For example, the NWMO has already begun, and will continue over the next five years, to conduct studies consistent with the Impact Assessment Act passed in 2019.

The NWMO expects to start the regulatory approvals process in 2024. Planning assumptions shown in Figure 9 are updated to align with phases in the latest legislation. With a positive decision on the impact assessment, site preparation activities could start in approximately 2028, followed by an application for a construction licence in 2029. This would allow construction to begin in 2033.

The NWMO will continue to interact with CNSC staff, consistent with the terms of the special project arrangement prior to the submission of a licence application. This includes work with CNSC staff and other regulatory authorities to obtain certainty regarding the requirements of the regulatory approvals process.

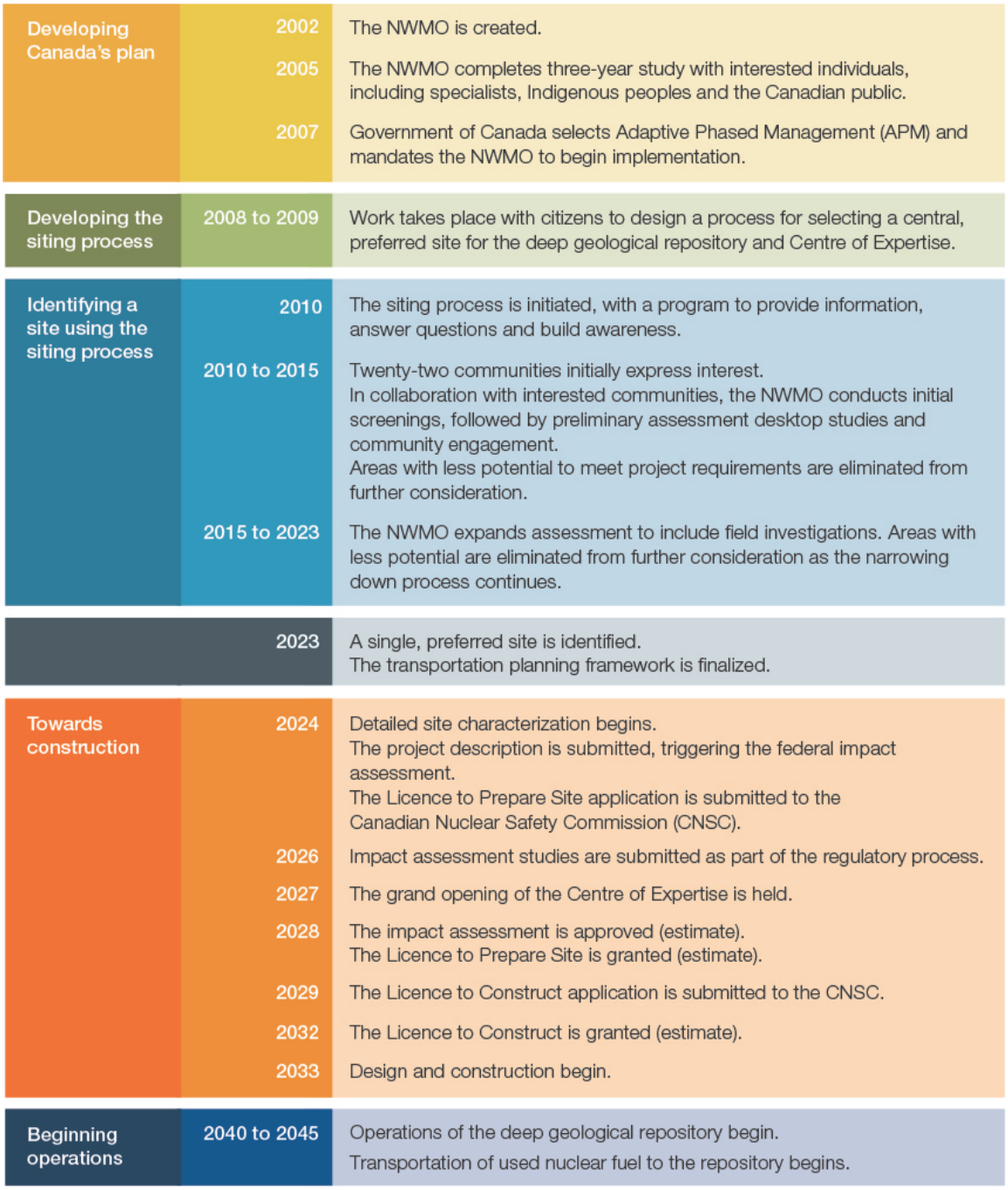

Figure 9: The NWMO's Planning Assumptions for Implementation of APM [2]

[2] Licence is an NWMO planning assumption only. This will be subject to independent regulatory process.

10.0 DEVELOPING AN INTEGRATED WASTE MANAGEMENT STRATEGY

In 2020, the Minister of Natural Resources announced that the federal government will complete a Radioactive Waste Policy Review (www.radwastereview.ca). The objective is to elaborate on the existing policy in order to provide greater leadership on radioactive waste management and ensure that Canada continues to meet international best practices.

In November 2020, the Minister of Natural Resources Canada asked the NWMO to lead discussions about an integrated strategy for the safe, long-term management of all Canada's radioactive waste. The NWMO has been selected in part to leverage our almost 20 years of recognized expertise in the engagement of Canadians and Indigenous peoples on plans for the safe, long-term management of used nuclear fuel. This work will run in parallel with APM and does not alter our current implementation mandate.

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Glossary

AECL	Atomic Energy of Canada Limited
APM	Adaptive Phased Management – Canada's plan for the long-term management of used nuclear fuel.
CLC	Community Liaison Committee
CMD	Commission Member Document
CNSC	Canadian Nuclear Safety Commission
DGR	Deep Geological Repository
EBS	Engineered Barrier System
EIES	Early Investments in Education and Skills
FISST	Full-Scale In-Situ System Test
GoC	Government of Canada
HQ	Hydro-Québec
NBP	New Brunswick Power
NFWA	Nuclear Fuel Waste Act (2002)
NWMO	Nuclear Waste Management Organization
OECD	Organisation for Economic Co-operation and Development
OPG	Ontario Power Generation
R&D	Research & Development
STEM	Science, Technology, Engineering, and Mathematics
UFC	Used Fuel Container

Addendum A – THE NUCLEAR FUEL WASTE ACT

The *Nuclear Fuel Waste Act (NFWA)* was promulgated by the Government of Canada in 2002. The *NFWA* required Canada's nuclear energy corporations to establish a waste management organization [NFWA 2002; Clause 6(1)] and the NWMO was created in 2002.

The NWMO was given a series of obligations under the NFWA:

- To study approaches for the management of nuclear fuel waste, and to recommend an approach to the Minister of Natural Resources within 3 years [NFWA 2002; Clause 12(1)]. It also required that at least three specific methods be included in the study: deep geological disposal in the Canadian Shield; storage at nuclear reactor sites; and centralized storage, either above or below ground, anywhere in Canada [NFWA 2002; Clause 12(2)].
- To issue annual and triennial reports to the Minister of Natural Resources [NFWA 2002; Clauses 16, 18].
- To propose a funding formula for implementing the selected approach; for the nuclear energy corporations and Atomic Energy of Canada Limited to establish and deposit into trust funds based on this funding formula; and for NWMO to report on the status of the funds in its annual and triennial reports [NFWA 2002; Clauses 9(1), 10(1), 10(2), 16(2), 16(3), 17(1)].

In 2007, the federal government selected the APM approach by Order-in-Council (consistent with NFWA 2002; Clause 15) and published the federal government's decision in the Canada Gazette (June 27, 2007) [GoC 2007a]. Direction was given to the NWMO to begin implementation of this approach [GoC 2007b].

The *NFWA* limits the NWMO to implementation of APM as the path forward for used nuclear fuel. The NWMO can only propose an alternative to APM to the Government of Canada if:

- The NWMO is unable, for technical reasons beyond its control, to implement the approach that was selected by the Governor in Council under section 15, the waste management organization shall so report in its triennial report and shall, in that report, propose a new approach, or
- A new technological method is developed that has been the subject of a scientific and technical review by experts from international governmental organizations that deal with nuclear matters and has received their support, the NWMO may propose, in its triennial report, a new approach for the management of nuclear fuel waste that is based on that new method. [NFWA; Clauses 20(1) and (2)].

Under the *NFWA*, an Advisory Council was also established with members covering a range of scientific and technical disciplines, public affairs and social science, and including representatives nominated by local and regional governments and aboriginal

organizations [NFWA 2002; Clauses 8(1), 8(2)]. The Advisory Council meets regularly and provides ongoing advice and guidance on NWMO work plans and activities. As required by the Act [NFWA 2002; Clause 18], the Advisory Council provides comments to the federal government as part of the NWMO triennial report. The most recent NWMO triennial report was published in 2020 [NWMO. 2020b] and the latest annual report was published in March 2021 [NWMO. 2021].

A.1 Financing the Program

The *NFWA* requires the nuclear fuel waste owners to establish trust funds to finance the selected approach [NFWA 2002; Clauses 9(1), 11(2)]. These funds were established in 2002 by OPG, HQ, NBP and AECL. NWMO can only use these funds for activities for which it has received a construction or operating licence [NFWA 2002; Clause 11(3)].

In 2008, as required by the Act [NFWA 2002; Clauses 16(2), 16(3)], the NWMO proposed a funding formula to determine the deposits to be made each year by the waste owners to pay for APM implementation. The proposed formula was approved by the Minister of Natural Resources in 2009 [GoC 2009].

The lifecycle costs for implementing APM have been estimated by the NWMO, incorporating input from expert third party consultants and experience from other international programs. These estimates have been benchmarked with those of other national waste management organizations. The cost estimates are formally updated every 5 years and reported to the Minister of Natural Resources as required by the *NFWA.* The next update will be published this year.

Costs for repository siting, design, regulatory approvals and site preparation are covered through separate funds and provincial guarantees as part of the financial guarantees required by the CNSC from nuclear facility owners for waste management and decommissioning.

Addendum B – NWMO Reconciliation Policy

NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Reconciliation Policy

OCTOBER 2019

Introduction

The Reconciliation Policy is designed to provide a framework to support a body of work that has been underway since the Nuclear Waste Management Organization's (NWMO) inception in 2002. The NWMO's Reconciliation Policy will replace and build on the NWMO's Aboriginal Policy.

The Truth and Reconciliation Commission released its final report in December 2015, which included 94 calls to action. Call to action # 92 calls upon the corporate sector in Canada to adopt the United Nations Declaration on the Rights of Indigenous Peoples as a Reconciliation framework, and to apply its principles, norms and standards to corporate policy and core operational activities involving Indigenous peoples and their lands and resources.

The Council of Elders and Youth have had made significant contributions to the development of NWMO policies. The Council recognizes that the NWMO has taken a leadership role in the private sector to establish progressive policies of importance to First Nation and Métis peoples. The NWMO's commitment to Reconciliation presents the opportunity to harmonize the key elements of many of our policies into a holistic policy framework as guided by the Council of Elders and Youth.

On July 18, 2018, the NWMO made a commitment to contribute towards Reconciliation by acknowledging historical wrongs in Canada's past and the need to create a better future by addressing the challenges of today.

This acknowledgment forms part of the NWMO's Reconciliation Statement, which was finalized through an Indigenous ceremony. Members of the Council of Elders and Youth, and NWMO Board of Directors and senior leadership took part in the ceremony, which included a traditional gift exchange.

The NWMO's Reconciliation Statement reads as follows:

In the context of Reconciliation, the Nuclear Waste Management Organization (NWMO) recognizes historical wrongs in Canada's past and the need to create a better future by addressing the challenges of today. The NWMO Council of Elders and Youth speaks of this journey as a new era for humanity – a time of Reconciliation with First Nation, Métis and Inuit peoples.

The NWMO is committed to contribute to Reconciliation in all its work by co-creating a shared future built on rights, equity and well-being. In addition, the NWMO will establish a Reconciliation Policy with an implementation strategy that will be measured annually and publicly reported to contribute to the Truth and Reconciliation Commission's calls to action.

Purpose

Education and creating a strong foundation of recognition and respect has been the key to the NWMO's journey in Reconciliation. The actions that follow over the next few years will be vital for the NWMO to demonstrate the truth behind our commitment to Reconciliation. Reconciliation as defined by the Truth and Reconciliation Commission is an ongoing process of establishing and maintaining respectful relationships. This policy sets out how the NWMO will contribute to Reconciliation in all our work. The NWMO will build on our current commitments to work in partnership with First Nation, Métis and municipal communities to develop and implement, collaboratively with communities, a management approach for the long-term care of Canada's used nuclear fuel that is socially acceptable, technically sound, environmentally responsible, and economically feasible.

Scope

This policy applies to all NWMO activities.

Truth (background)

The first step in working towards Reconciliation is understanding the truth and history of First Nation and Métis peoples and their relationship with Canada.

The report of the Truth and Reconciliation Commission reads:

"Canada's residential school system for Aboriginal children was an education system in name only for much of its existence. These residential schools were created for the purpose of separating Aboriginal children from their families, in order to minimize and weaken family ties and cultural linkages, and to indoctrinate children into a new culture—the culture of the legally dominant Euro-Christian Canadian society, led by Canada's first prime minister, Sir John A. Macdonald. The schools were in existence for well over 100 years, and many successive generations of children from the same communities and families endured the experience of them. That experience was hidden for most of Canada's history, until Survivors of the system were finally able to find the strength, courage, and support to bring their experiences to light in several thousand court cases that ultimately led to the largest class-action lawsuit in Canada's history."

Through the work of the Truth and Reconciliation Commission and other initiatives, residential schools are becoming a more widely known fact by many Canadians. The realities of those tragedies and trauma continue to affect generations. Now is the time to move from this darkness into light, where all Canadians find a way to reconcile the truth, never forget the past and create a better future with relationships based on respect.

Canadians can create a new legacy for children of all nations and cultures by joining hands in an open process of dialogue and truth-telling, of Reconciliation. The Truth and Reconciliation Commission estimates that 80,000 survivors of residential schools live in all regions of Canada today. Canadians need to hear their stories and find ways to ensure our collective future rests on a solid foundation of respect, openness and trust. For the sake of our children and future generations, we can build a stronger Canada.[1]

[1] http://reconciliationcanada.ca/about/history-and-background/background

Principles

The NWMO will be guided by the following principles in all our work:

- The NWMO recognizes, honours and supports the belief that Indigenous peoples have a special relationship with the natural environment and have unique stewardship responsibilities that are part of this relationship and are guided by the seven teachings whose principles are universal, including the sacred laws and codes of Indigenous peoples.
- The NWMO recognizes that protection of Mother Earth for future generations is, in itself, a foundational commitment to be a responsibility of all people.
- The NWMO supports the Council of Elders and Youth's Declaration of the Keepers of the Land, and the Indigenous Knowledge Policy.
- The NWMO acknowledges that Indigenous peoples are holders of Indigenous Knowledge, and recognizes that Indigenous Knowledge is essential and integral to decision-making processes.
- The NWMO will foster respectful relationships among community partners, and recognizes that it takes time to develop knowledge, to experience deep understandings, and to establish trust and respect.
- The NWMO recognizes that the safety and security of future generations is integral to the Indigenous world view and fundamental to decision-making processes of Indigenous peoples, and is the responsibility of all people to future generations.
- The NWMO acknowledges that good decision-making among communities regarding the NWMO's work must be built on a foundation of knowledge to ensure that informed choices can be made by communities in the spirit of Reconciliation and partnership together with the NWMO.
- The NWMO understands that Indigenous Knowledge, together with western science, is part of good decision-making when built on a foundation of trust and sharing of information in a respectful manner.

Policy

The NWMO commits that Indigenous Knowledge will inform all work and activities.

The NWMO acknowledges, respects and honours that First Nation and Métis peoples of Canada have unique status and rights as recognized and affirmed in s.35 of the *Constitution Act* (1982). The NWMO is committed to respecting the Aboriginal rights and treaties of First Nation and Métis peoples. The NWMO also recognizes that there may be unresolved claims between First Nation and Métis communities and the Crown to be considered in relation to a proposed site.

The NWMO will build relationships with First Nation and Métis communities and municipalities, groups and peoples on a foundation of respect for languages and customs, cultural protocols, and political, social, economic, and cultural institutions.

The NWMO commits to meaningful engagement, including consultation as required, building respectful relationships, and seeking the free, prior, and informed consent of impacted Indigenous peoples before proceeding with development of a deep geological repository.

The NWMO will provide impacted First Nation and Métis peoples equitable access to jobs, business opportunities, training, and education opportunities in our work, and ensure their communities gain long-term sustainable benefits from the development of a deep geological repository.

The NWMO commits to providing education for management and staff on the history of Indigenous peoples, including the history and legacy of residential schools, the United Nations Declaration on the Rights of Indigenous Peoples, treaties and Aboriginal rights, Indigenous law, and Aboriginal-Crown relations, which will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism as stated in the Truth and Reconciliation Commission call to action # 92.

The NWMO will work with impacted Indigenous communities in implementing our mandate under the *Nuclear Fuel Waste Act* (*NFWA)* and in the selection of a site as required by Adaptive Phased Management, which was selected as Canada's plan for the long-term management of used nuclear fuel by the Government of Canada in 2007. The selection of a site must be informed by the best available knowledge, including science, social science, Indigenous Knowledge, and ethics.

The NWMO will work with the Crown regarding the Crown's duty to consult and accommodate as guided by decisions of the Supreme Court of Canada in fulfilling the NWMO's obligations under the *NFWA*. All our work with respect to the duty to consult will be guided by Reconciliation.

The NWMO will work with First Nation and Métis communities and municipalities that wish to share their knowledge and advice in the implementation of the site selection process, and in the design, construction, operation, and monitoring of the deep geological repository.

The NWMO commits to respecting and following local First Nation and Métis protocols related to burial sites found on work sites.

The NWMO will develop an annual Reconciliation implementation plan that will be measured and publicly reported.

The NWMO will communicate clearly with new potential employees about who we are as an organization with regards to our commitment to interweaving Indigenous Knowledge, building partnerships with Indigenous communities and our commitment to Reconciliation.

For more information, please contact:

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