



NUCLEAR WASTE MANAGEMENT ORGANIZATION SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

# Phase 1 Preliminary Assessments

## SUMMARY FINDINGS AND DECISIONS



- Arran-Elderslie, Ontario
- Brockton, Ontario
- Huron-Kinloss, Ontario
- Saugeen Shores, Ontario
- South Bruce, Ontario

**December 2014**

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## Purpose of Document

Over the course of a three-year nationwide dialogue, Canadians laid out a plan for the long-term management of Canada's used nuclear fuel. This plan, called Adaptive Phased Management (APM), includes a technical method and a management system. An important component of this plan is identifying a site for Canada's long-term used fuel management facilities in a safe location in a community that is informed and willing.

With this direction, in May 2010 the Nuclear Waste Management Organization (NWMO) launched a site selection process to identify a safe location in an informed and willing host community. The principles and decision-making framework for selecting a site were developed through a two-year collaboration and dialogue in 2008 and 2009.

The site selection process is continuing to advance through a multi-year series of steps to ensure that, above all, the site selected is safe, secure and meets the highest scientific, professional and ethical standards. Since launching the process, the NWMO has worked collaboratively with interested communities to begin to explore their potential to meet site selection requirements for locating the deep geological repository and Centre of Expertise, the core components of Canada's plan.

The objective of the site selection process, through several phases of progressively more detailed assessment, is to arrive at a single location for a deep geological repository and Centre of Expertise. It will take several more years of detailed technical, scientific and social study and assessments, and much more engagement with interested communities, their neighbours and First Nation and Métis peoples before a preferred safe site for the project can be confirmed.

With 21 communities having come forward to explore potential interest and suitability for hosting the project, the siting process must provide a basis to progressively narrow the focus to communities with strong potential to meet requirements until a single preferred site and area is identified. These decisions will be supported by a sequence of assessments and engagement designed to enable the NWMO and communities to learn more about the potential suitability of each area and decide whether to proceed to the next stage.

The first phase of Preliminary Assessment was initiated upon request in 21 communities involved in the site selection process. It represents the initial phase of study in Step 3 of the nine-step site selection process, described in *Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel*. These assessments are intended to identify those communities with strong potential to meet specific technical, scientific and community well-being requirements for the project, recognizing much more study is required before site suitability can be confirmed.

The purpose of this document is to provide an overview of findings from the first phase of Preliminary Assessments now completed in five communities located within the Bruce County area: Arran-Elderslie, Brockton, Huron-Kinloss, Saugeen Shores and South Bruce. This document outlines the NWMO's rationale for focusing the next phase of more detailed technical studies on a subset of communities in the area with strong potential to meet the project's robust requirements. It is understood that in this area, any interested communities not selected for further study would continue to be involved as neighbours of communities identified to advance to next steps.

This document summarizes the findings for:

- Arran-Elderslie and Saugeen Shores, for whom early geoscientific findings released in January 2014 identified low potential to meet the site evaluation factors and siting assessments were concluded at that time; and
- Brockton, Huron-Kinloss and South Bruce, for whom Phase 1 Preliminary Assessments were recently completed.

Learning from Phase 1 Preliminary Assessments is captured in *Phase 1 Preliminary Assessment Reports* for each community. Where assessments were completed, a series of supporting reports is also provided. These reports outline findings that emerged from:

- desktop studies that explored the potential to find a site that can safely and securely contain and isolate used nuclear fuel from people and the environment for the long time period required; and
- working with the community to explore the potential for the project to align with the community's longer-term vision and to sustain interest in learning about the project through subsequent phases of work to support informed decision-making.

At this early point in the assessment process, it must be emphasized that many questions remain to be addressed in future studies. The NWMO will work together with communities identified for further study to address these questions and more intensively explore the potential to meet safety requirements, for the project to align with the community's longer-term vision, and for sustained interest.

Although the focus of the first phase of study was on communities that initiated engagement in the APM site selection process, it is understood that a broader partnership involving First Nation and Métis communities, and surrounding communities will be needed for the project to proceed. The nature and shape of the partnerships required to implement APM is emerging through work with communities involved in the site selection process. Looking forward, this project will only proceed with involvement of the interested community, potentially affected First Nation and Métis communities, and surrounding communities working in partnership to implement it.

# About Adaptive Phased Management

## A Matter of Safety and Responsibility

For decades Canadians have been using electricity generated by nuclear power reactors in Ontario, Quebec and New Brunswick. Just over 2 million used fuel bundles have been produced. When used nuclear fuel is removed from a reactor, it is considered a waste product, is radioactive and requires careful management. Although its radioactivity decreases with time, chemical toxicity persists, and the used fuel will remain a potential health risk to people and the environment for many hundreds of thousands of years. Canada's used nuclear fuel is now safely stored on an interim basis at licensed facilities located where it is produced. Putting in place a plan for the long-term, safe and secure management of used nuclear fuel for the protection of people and the environment is an important responsibility that Canadians share. Through dialogues with citizens and First Nation and Métis peoples across Canada, the NWMO has heard that this generation wants to move forward in dealing with our used nuclear fuel, believing it to be imprudent and unfair to future generations to wait any longer.

*The NWMO wishes to acknowledge the leadership of the 21 communities participating in Preliminary Assessments, and their contribution to the implementation of Canada's plan for the long-term management of used nuclear fuel.*

## The Foundation of Canada's Plan

The Government of Canada selected Canada's plan for the long-term management of used nuclear fuel in 2007. The plan, called Adaptive Phased Management (APM), involves the development of a large national infrastructure project in an informed and willing host community. The project involves the long-term containment and isolation of used nuclear fuel from people and the environment in a deep geological repository in a suitable rock formation. It also involves the development of a Centre of Expertise and a used fuel transportation system.

As required by the *Nuclear Fuel Waste Act* (2002), the NWMO is responsible for implementing Canada's plan. The NWMO is committed to carrying out its work collaboratively with interested and affected citizens, organizations and First Nation and Métis peoples, in a manner that is socially acceptable, technically sound, environmentally responsible and economically feasible.

## Adaptive Phased Management (APM) – At a Glance:

- Was developed through a nationwide dialogue between 2002 and 2005
- Was selected as Canada's plan by the Government of Canada in 2007, consistent with the *Nuclear Fuel Waste Act*
- Key features include:
  - Safe and secure centralized containment and isolation of used nuclear fuel in a repository deep underground in a suitable rock formation
  - A series of steps and clear decision points that can be adapted over time
  - Flexibility in the pace and manner of implementation through a phased decision-making process, supported by a program of continuous learning, research and development
  - An open, inclusive and fair siting process to identify an informed and willing host community
  - Opportunities for people and communities to be involved throughout the implementation process
  - Optional temporary shallow storage at the central site, if needed (Note: Temporary shallow storage is considered optional and is not currently included in the NWMO's implementation plan)
  - Long-term stewardship through the continuous monitoring of used fuel
  - Ability to retrieve the used fuel over an extended period should there be a need to access the waste or take advantage of new technologies
  - Financial surety and long-term program funding to ensure the necessary money will be available for the long-term care of used nuclear fuel
  - Meeting or exceeding all applicable regulatory requirements for protecting the health, safety and security of humans and the environment
  - Sustained engagement of people and communities throughout the phased process of decision and implementation
  - Responsiveness to advances in technology, natural and social science research, Aboriginal Traditional Knowledge, and social values expectations

## The Site Selection Process

Through a collaborative process in 2008 and 2009, the NWMO worked with interested Canadians to develop the decision-making framework for selecting a site for the project. The site selection process is laid out in the NWMO's document *Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel*.

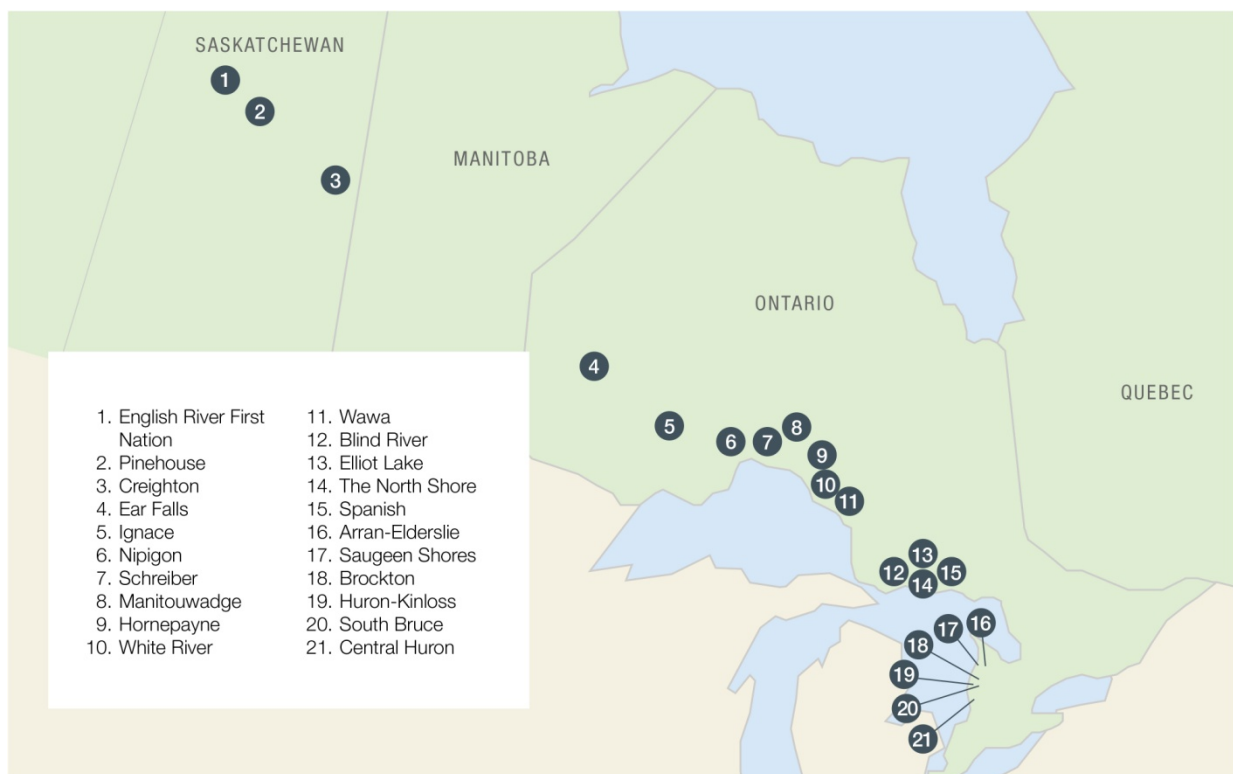
The site selection process is designed to ensure safety, security and protection of people and the environment. Reflecting the guidance provided by Canadians, the site selection process is built on a set of principles that reflects the values and priorities of Canadians on this issue. The process also contains a number of steps these Canadians told us need to be part of the decision-making process to ensure it is an appropriate one for Canada. These steps are described in *Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel*.

Preliminary Assessments are conducted in Step 3 of the site selection process. Several additional steps must be completed over the course of the next several years before a preferred site will be identified and environmental assessment and regulatory review will be sought. Interested communities may leave the site selection process at any time during this process until a final agreement is signed, subject to all regulatory requirements being met and regulatory approvals received.

It is fundamental to the siting process that only an informed and willing community be selected to host the project as evidenced by a compelling demonstration of willingness involving community residents. The project will only be implemented in an area in which robust safety requirements can be met and well-being will be fostered.

## Communities

Figure 1 maps the locations of the 21 communities in Saskatchewan and Ontario that requested Preliminary Assessments. These two provinces, along with Quebec and New Brunswick, are involved in the nuclear fuel cycle. Saskatchewan is involved through the mining of uranium, which is used in the fabrication of nuclear fuel. Ontario, Quebec and New Brunswick are involved through the production of electricity using nuclear power plants.



**Figure 1: Communities that Requested Preliminary Assessments in the Site Selection Process**

Communities entered the site selection process by expressing interest in learning more about Canada’s plan for the long-term management of used nuclear fuel and the APM Project (Step 2) as part of an open invitation process.

As communities expressed interest, the NWMO undertook an Initial Screening as part of Step 2 studies and began working with each community as they learned about the project and reflected upon their interest in it. The purpose of the Initial Screening was to determine whether, based on readily available information and five screening criteria, there were any obvious conditions that would exclude the community from further consideration in the site selection process.

For communities that successfully completed an Initial Screening and decided to enter Step 3 of the site selection process (Preliminary Assessments), the NWMO began working with the community to conduct a preliminary assessment. All 21 communities that successfully completed Initial Screenings requested Preliminary Assessments.

As of September 2012, after prior notification, the NWMO suspended the “expressions of interest” phase of the site selection process in order to focus efforts on working with the communities that had expressed interest to that point.

Communities initiated their assessments at different times. Decision-making about which communities should be the focus of more detailed studies began with the first eight assessments, which concluded in Fall 2013. Decision-making is continuing as Phase 1 Assessments are completed in other communities. The narrowing down process will continue throughout the phases of progressively more detailed technical and social assessments.

Phase 2 Preliminary Assessment studies will take place over multiple years, with a smaller number of communities that have strong potential to host the APM Project. During this period, the NWMO works with interested communities, First Nation and Métis communities and other surrounding municipalities to begin field studies, advance community-focused engineering and design studies, and broaden engagement.

Building on earlier studies, Phase 2 will include:

- preliminary geoscientific- and environment-focused field investigations;
- preliminary safety assessments;
- more detailed social, economic and cultural studies;
- awareness building and deepening learning and reflection by the interested community; and
- broadening of engagement to involve potentially affected First Nation and Métis communities and surrounding municipalities in learning and assessment of the suitability of the area.

By the end of the second phase of study, one or possibly two preferred sites with strong potential to meet requirements to host the facility will be the focus of Step 4, Detailed Site Characterization. This step will include extensive studies to assess and confirm safety, and may require an additional three to five years or more to complete. Findings will support identification of the preferred location that will be the focus of a regulatory approvals process led by the Canadian Nuclear Safety Commission (CNSC).



## Two Phases of Preliminary Assessments

Preliminary Assessments address siting factors and criteria as described in the NWMO's document *Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel*. Preliminary Assessment studies in Step 3 of the siting process are being conducted in two phases, with the opportunity for stock-taking by both the community and the NWMO throughout.

- **Phase 1** – Assessments are conducted with all communities that successfully completed an Initial Screening and asked to be the focus of a Preliminary Assessment. This phase involves desktop studies to explore the potential to meet safety requirements, and includes studies of engineering, geoscientific suitability, environment and safety, and transportation. This phase also involves community learning about the project, and engagement and reflection on the potential for the project to foster the well-being of the community and fit with its long-term vision. Working with communities, this phase also explores early indications as to whether it would be possible to sustain interest in learning through the subsequent phases of work required to support informed decision-making and a compelling demonstration of willingness at a future stage. This phase begins to involve potentially affected First Nations and Métis communities as well as surrounding municipalities in a dialogue about the project that would continue in future phases.
- **Phase 2** – Assessments are conducted with a smaller number of interested communities selected by the NWMO based on the outcome of Phase 1 studies. Phase 2 work will further assess potentially suitable areas through detailed technical studies and field investigations. This phase also involves more detailed exploration of the potential to foster the well-being of the community. Learning and engagement are expanded to involve potentially affected First Nation and Métis communities, and surrounding communities in exploring the potential to foster the well-being of the larger area, interest in the project, and the foundation to work together in partnership to implement it. Together, the NWMO, potentially suitable communities, First Nation and Métis communities, and surrounding communities will reflect upon the suitability of the community and area to host the APM Project.

This two-phased approach to assessments is discussed in *Preliminary Assessment of Potential Suitability – Feasibility Studies*.

Learning to date from Phase 1 Preliminary Assessment studies for five communities in the Bruce area is summarized in this document.

### An Integrated Approach

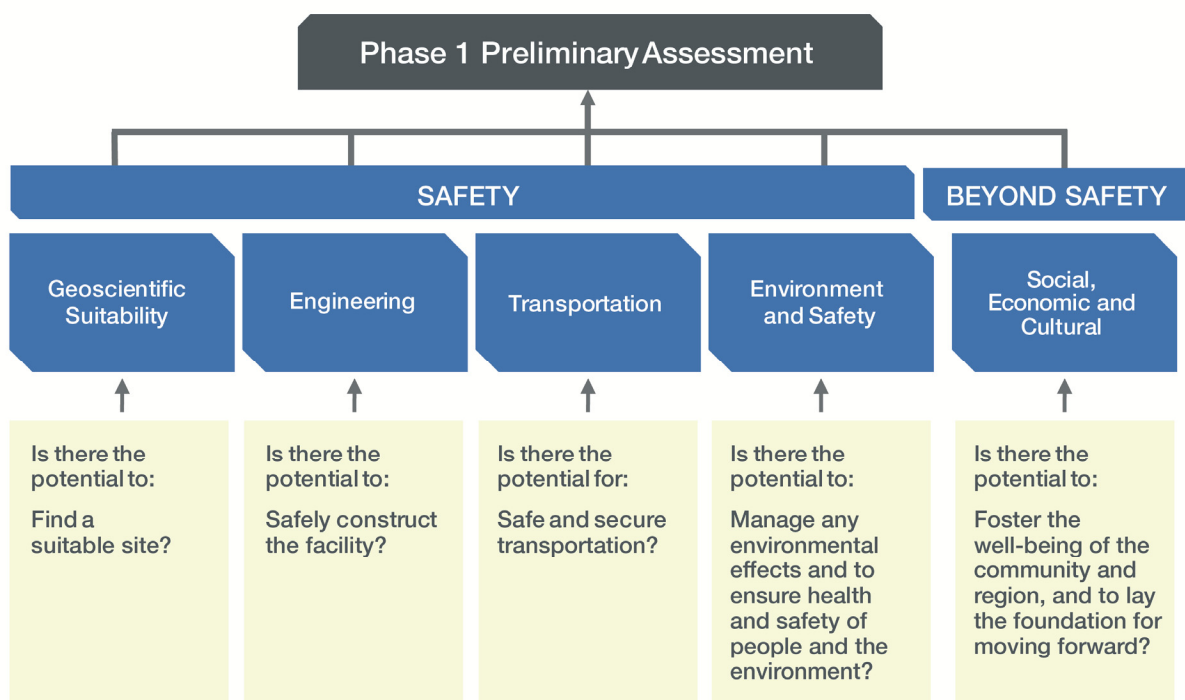
The NWMO has adopted an integrated approach to Preliminary Assessments. As outlined in *Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel*, assessments focus on safety and community well-being, through study of many technical, scientific and social requirements for the project.

In assessing these siting factors and criteria, four overarching questions have guided this early phase of Preliminary Assessment, and have been a focus of reflection by both the NWMO and the community. These questions, which are discussed in *Preliminary Assessment of Potential*

*Suitability – Feasibility Studies*, will be studied further in expanded activities with communities progressing to Phase 2.

1. Safety, security and protection of people and the environment are central to the siting process. ***Is there potential to find a safe site?***
2. The project will be implemented in a way that will foster long-term well-being of the community. ***Is there potential to foster the well-being of the community through implementation of the project, and what might need to be put in place (e.g. infrastructure, resources, planning initiatives) to ensure this outcome?***
3. At a later step in the process, the community must demonstrate it is informed and willing to host the project. ***Is there potential for citizens in the community to continue to be interested in exploring this project through subsequent steps in the site selection process?***
4. The project will be implemented in a way that will foster the long-term well-being of the surrounding area. ***Is there potential to foster the well-being of the surrounding area and to establish the foundation to move forward with the project?***

These broad questions are addressed through a series of studies as outlined in the following figure.



**Figure 2: Structure of Phase 1 Preliminary Assessments**

In Phase 1, studies have involved a range of activities. Some activities have been completed by expert consultants, such as the assessment of the geological characteristics of the area, which

is one of several studies focused on assessing the potential to find a safe site. Other activities were completed in partnership with the community; for instance, exploring the potential for the project to be implemented in a way that contributes to the long-term well-being of the community. Throughout, the NWMO has worked with community leaders to engage residents, and begin to reach out to First Nation and Métis communities, surrounding municipalities and others in the area to involve them in the work. In Phase 2, these studies will be expanded through commencement of fieldwork and broadened engagement.

As discussed in the NWMO site selection process, the suitability of potential sites is assessed against a number of site evaluation factors, organized under six safety functions a site would need to satisfy to be considered suitable. Phase 1 safety assessment studies initiated exploration of a subset of these factors using a desktop study approach. Phase 2 assessments will include field studies and borehole investigation, which will allow for a broadening of the assessment to more comprehensively address the evaluation factors. The six safety evaluation factors are:

- **Safe containment and isolation of used nuclear fuel:** Are the characteristics of the rock at the site appropriate to ensuring 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:** Is the rock formation at the siting area 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?
- **Safe construction, operation and closure of the repository:** Are conditions at the site suitable for the safe construction, operation and closure of the repository?
- **Isolation of used fuel from future human activities:** Is human intrusion at the site unlikely, for instance, through future exploration or mining?
- **Amenable to site characterization and data interpretation activities:** Can the geologic conditions at the site be practically studied and described on dimensions that are important for demonstrating long-term safety?
- **Safe transportation:** Does the site have a route that exists or is amenable to being created that enables the safe and secure transportation of used fuel from storage sites to the repository site?

A number of factors beyond safety were identified for assessment of the potential for the project to foster the well-being of the interested community. Phase 1 community well-being studies are focused on each community that expresses interest in learning about the project. For this reason, the studies address the subset of factors pertaining to the community. Phase 2 studies are designed to expand the assessment to consider factors related to the surrounding area, including surrounding communities and Aboriginal peoples. The factors beyond safety are:

- Potential social, economic and cultural effects during the implementation phase of the project, including factors identified by Aboriginal Traditional Knowledge.
- Potential for enhancement of the community's and the region's long-term sustainability through implementation of the project, including factors identified by Aboriginal Traditional Knowledge.

- Potential to avoid ecologically sensitive areas and locally significant features, including factors identified by Aboriginal Traditional Knowledge.
- Potential for physical and social infrastructure to adapt to changes resulting from the project.
- Potential to avoid or minimize effects of the transportation of used nuclear fuel from existing storage facilities to the repository site.

In order to ensure a broad, inclusive and holistic approach to assessment in these areas, a community well-being framework was identified to help understand and assess the potential effects of the APM Project. This framework is used to help explore the project, understand how communities and the surrounding area may be affected should the project be implemented in the area, and identify opportunities to leverage the project to achieve other objectives important to people in the area. In the future, broadened engagement may expand the framework through, for instance, insight from Indigenous science, ways of life and spiritual considerations.

## What We Learned – Findings for Five Communities in the Bruce County Area

Phase 1 Preliminary Assessments have concluded for the five communities in the Bruce County area that entered the site selection process: Arran-Elderslie, Brockton, Huron-Kinloss, Saugeen Shores, and South Bruce.

This document summarizes the findings for:

- Arran-Elderslie and Saugeen Shores, for whom early geoscientific findings released in January 2014 identified low potential to meet the site evaluation factors and siting assessments were concluded at that time; and
- Brockton, Huron-Kinloss and South Bruce, for whom Phase 1 Preliminary Assessments were recently completed.

In the NWMO site selection process, potential suitability is studied for each interested community, exploring the areas of safety and community well-being as described in the previous section. A *Preliminary Assessment Report* is published for each community, bringing findings from individual studies together in a single document. For each community in which Phase 1 Assessments were fully completed, a series of supporting reports is also provided. These supporting reports focus on individual aspects of the studies.

Findings are briefly summarized in the discussion that follows.

### **1. The geoscientific desktop preliminary assessment showed that the geological setting in the area of the five communities has a number of favourable geoscientific characteristics for hosting a deep geological repository for used nuclear fuel. However, the assessment revealed that there are areas that have more potential than others to satisfy NWMO's geoscientific site evaluation factors.**

#### **▪ Geoscientific Suitability – Potential to find a site with suitable geology**

Geoscientific suitability is the first consideration in identifying communities and areas that warrant further study, as no decision will be made that compromises safety. The geoscientific suitability of the communities was assessed in a consistent manner using a wide range of available data sources, including geophysical surveys, geological maps, technical reports and papers, and government geoscientific databases.

The geoscientific desktop preliminary assessment showed that the geological setting in the area of the five communities has a number of favourable geoscientific characteristics for hosting a deep geological repository for used nuclear fuel. However, the assessment revealed that there are areas that have more potential than others to satisfy NWMO's geoscientific site evaluation factors. Based on available information for the area, it was determined that the Ordovician Cobourg Formation (limestone) within the sedimentary sequence is the preferred host rock for a used fuel deep geological repository. For the specific sedimentary sequence in the area of the five communities, it was determined that a minimum depth of 500 metres below ground surface is preferred in order to maintain the integrity of a repository within the Cobourg Formation. Based on the

assessment of the key geoscientific characteristics and constraints, it was concluded that:

- The Municipality of Arran-Elderslie does not contain sufficient land areas that have the potential to meet the geoscientific site evaluation factors outlined in the site selection process document.
- The Town of Saugeen Shores has very limited potential to contain areas that would meet the geoscientific site evaluation factors outlined in the site selection process document.
- The Municipality of Brockton, the Municipality of South Bruce and the Township of Huron-Kinloss appear to contain large areas that have the potential to meet the geoscientific site evaluation factors outlined in the site selection process document.

While the municipalities of Brockton and South Bruce, and the Township of Huron-Kinloss appear to contain large areas with favourable geoscientific characteristics, there are inherent uncertainties that would need to be addressed during subsequent stages of the site evaluation process. The assumption of transferability of geoscientific characteristics and understanding based on regional data to the communities of Brockton, South Bruce and Huron-Kinloss would need to be confirmed. The potential for hydrocarbon resources and faults within the sedimentary sequence beneath the three communities would also need to be further assessed.

## **2. Preliminary Assessment studies found potential to meet project requirements in three safety-related areas in the three communities that have strong potential to meet geoscientific site evaluation factors: Brockton, Huron-Kinloss and South Bruce.**

At this early phase of assessment, studies have suggested that all three communities have potential to meet safety-related requirements focused on Engineering, Transportation and Environment and Safety.

- **Engineering – All three communities have potential to meet requirements related to safe construction of the facility in the area**

Assessments completed to date concluded that from an engineering perspective, there is potential to safely construct the facility in each of the three communities. Similar conclusions were made for communities whose Phase 1 Assessment was completed in 2013.

- **Transportation – All three communities have potential to meet requirements related to safe and secure transportation of used nuclear fuel to a site in the area**

From a technical perspective, there is potential to safely and securely transport used nuclear fuel from existing interim storage facility sites to each of the three communities. At this early stage of assessment, all three communities have potential to meet the technical transportation requirements of the project. Radiological safety is assured through the robust transportation package and the risk of conventional (non-radiological) transportation accidents is similar among communities, as is carbon footprint. Similar conclusions about transportation were made for communities whose Phase 1 Assessment was completed in 2013.

Transportation is an important element of the project that will become a focus of public engagement to understand societal considerations. It is expected that groups and individuals will have questions, concerns and preferences to be addressed as assessments continue through the second phase of study and engagement. Social considerations will be assessed in the next phase of work.

- **Environment and Safety – All three communities have potential to meet requirements related to managing any environmental effects and ensuring safety of people and the environment**

At this early stage, the environment and safety preliminary assessments did not identify any obvious conditions that would preclude siting within the three communities. For communities that will continue into Phase 2 Preliminary Assessment, the environmental characteristics of the candidate areas will be important in guiding the identification of more defined potentially suitable siting areas.

Local community input and field studies will be required in Phase 2 to better understand and characterize the local environmental conditions. Working collaboratively with local Elders, the NWMO will also seek to understand Aboriginal Traditional Knowledge to further guide understanding of the area.

Wherever the selected site is located, there will be environmental effects to be managed or mitigated. Many of these effects would be similar to other large industrial or mining projects. Potential effects would be managed or mitigated through a combination of site selection, in-design features, operating practices, and an environmental monitoring and management plan.

At this early stage of assessment, all three communities have potential to meet the environment and safety requirements of the project. Social considerations in this area will be more intensively examined in the next phase of work with those communities continuing in the process.

These conclusions are similar to those in communities whose Phase 1 Assessments were completed in 2013.

### **3. Potential for the project to foster well-being varies across the three communities. There are differences in each community's potential to foster well-being through the implementation of the project and sustain interest to support further learning.**

Similar to assessments completed for eight communities in 2013, Phase 1 Assessments suggest that each of the three Bruce County area communities has the potential to very substantially benefit from the implementation of the APM Project and to achieve important community objectives. Each community also has potential to sustain interest, which would be required to support further learning and informed decision-making in the future.

However, there are some differences among the three communities. Understanding these differences is important to determining how the project might best fit within this area and to make decisions about where to focus more detailed studies.

***The potential to benefit:*** The opportunity for all three communities to benefit from the project is driven by the fact that it will be a catalyst for economic growth, which in turn will assist in achievement of other community goals. The population and economic activity that would come with the project has the potential build out existing community infrastructure, enhance services and expand population. The APM Project will be implemented over many decades, and would contribute to community sustainability over this extended period.

Similar to other large projects, the APM Project would bring direct, indirect and induced jobs to a community and area. These jobs would help a community retain population, grow population and develop economically. The increased population would be a boost to the community and a catalyst for spinoff growth and development. Skills and labour supply in the community would likely diversify and expand with the increased population and as a result of new and diverse job opportunities created by the project. An increased population will, in turn, support goals related to education by expanding enrolment, which will help sustain existing schools and create the financial foundation for enhancing educational opportunities within the community. More households and greater expenditure would open up market opportunities for local businesses to service the expanding needs of a growing and more affluent population.

From the perspective of community finances, the assessment base would be expected to grow and become more equitably spread across industry, residential and commercial components. Increased funding and participation would allow the community to upgrade and expand health services, as well as recreational and social programs. The project would be expected to help provide a more stable population base for a community through retention of younger families and youth and by providing the ability to support its middle-aged and senior populations.

Each community in the area would benefit from the project for these reasons, irrespective of where the facility was located in the siting region, understanding that the project would need to be carefully and collaboratively planned and implemented.

***Fitting the project in the area:*** Phase 1 Preliminary Assessments suggest the project has the potential to align with the aspirations of each of the three communities. However this alignment appears stronger in Huron-Kinloss and South Bruce than in Brockton.

For both Huron-Kinloss and South Bruce, the APM Project appears to align with community values and objectives as the NWMO has come to understand them. The project has the ability to enable many of the goals set out by the communities. The APM Project would generate population and economic growth, and provide human and fiscal resources to shape the future and well-being of each community in keeping with its plan.

Based on engagement activities to date, the widely held view in South Bruce appears to support continuing to learn about the project and build understanding and confidence in the safety case. Although the widely held view appears to strongly support learning more, some community members have concerns about the APM Project. These individuals will need to be more deeply engaged in any further learning and/or studies in the community.

Based on engagement activities to date in Huron-Kinloss the widely held view appears to be in favour of continuing to learn more about the project and build understanding and confidence in the safety case. It is also recognized that some community members have concerns about the APM Project. In any further learning and/or studies in the community,



the Township and the NWMO will need to work closely together to address community concerns related to the project.

For Brockton, preliminary assessment studies suggest the APM Project has some potential to enable the community's aspirations and foster well-being as Brockton defines it. It would provide economic growth, increase the population and bring greater balance to the demographic profile of the community. Brockton is well suited to take on additional growth and has a strong foundation for finding people with skills that could be employed for the implementation and operation of the APM Project. However, the APM Project appears to be only a partial fit for the community of Brockton. While the APM Project has the potential to enable aspirations and foster well being for many people, for some community members the project does not fit with their vision for Brockton as it would precipitate unwanted growth.

Based on engagement activities to date, further exploration of hosting the project has the potential to be a divisive issue and exacerbate pre-existing tensions within the community. If Brockton were the focus of more detailed studies as a potential host community, there is a risk these tensions may become more pronounced, permeate other matters and activities, and negatively affect overall community well-being.

### **Communities with Strong Potential Suitability for the APM Project**

When findings from the assessments for the three communities are taken into account, South Bruce and Huron-Kinloss are identified by the NWMO as having strong overall potential to meet the requirements for the APM Project. These two communities will be the focus of more detailed studies to further explore suitability for the project.

Phase 2 studies will continue with this smaller number of interested communities where the potential to meet the wide range of project requirements is strong, and the process of dialogue and learning can be sustained.

For each of these two communities, the overarching questions described earlier can be answered affirmatively. In summary, Preliminary Assessment studies conducted to date suggest there is potential for both Huron-Kinloss and South Bruce to be suitable for the project from multiple perspectives.

1. There is potential to find a safe site in the area.
  - There is potential to find a site with suitable geology.
  - There is potential to safely construct the facility at the potential site.
  - There is potential for safe and secure transportation to the area.
  - There is potential to manage any environmental effects and to ensure safety of people and the environment.
2. There is potential to foster community well-being in each community through the implementation of the project.
3. There is potential for sustained interest in each community to support further learning about the project.

4. There is potential to foster community well-being in the surrounding area through the implementation of the project, and also to sustain interest in surrounding communities to support further learning.

For each of these communities identified for further study:

- The APM Project has the potential to be safely located within the community in a manner that will protect people and the environment now and in the future.
- From a technical perspective, there is potential to safely transport used nuclear fuel from existing storage facility sites to these areas.
- There is potential to find a site that does not adversely affect future options for other activities valued by the community and area. In other words, if any of these areas were to be selected for the APM Project, it is likely that a geologically and environmentally suitable site can be found that does not jeopardize long-term objectives and future uses of the land and resources valued by the community as understood today.
- There is a strong potential for sustained interest in the local community. There is evidence to suggest strong potential for longer-term sustained interest in progressing through the NWMO siting process.
- Based on very preliminary engagement, there is strong potential for sustained interest in the surrounding area through continued activities for learning and discussion about the implications of the APM Project and suitability for the area.
- There appears to be potential for the APM Project to foster well-being in the area. If APM facilities were sited in the area, the community and many communities in the area would experience significant economic development and growth. This development and growth has the potential to align well with their collective aspirations.

In summary, Huron-Kinloss and South Bruce are understood to have potential to meet specific technical siting requirements designed to ensure safety. In addition, each has a longer-term vision and aspirations that may align well with the APM Project. In each, there is potential for strong interest in sustaining involvement and exploring the project further, and there is potential to engage the surrounding area in the learning and decision-making process.

Full accounts of assessment findings are available in the community assessment reports.

### **The Platform for Further Study**

It is important to note that communities identified for further study in Phase 2 have *not* been confirmed as suitable for hosting the APM Project. Also, no community has confirmed its willingness to host the project.

Regarding safety, several more years of field studies and detailed site evaluations are required before the NWMO, the community and the regulator could be satisfied on the safety of the site. In the interim, there is much more information to be gathered, data to be analyzed, questions to be answered, and uncertainties to be explored in collaboration with communities to better understand the potential of sites to meet requirements. Further research questions will be carried forward to Phase 2 to explore in greater depth the range of important geoscientific, environmental, transportation and engineering considerations as well as interweaving of Aboriginal Traditional Knowledge key to assessing suitability and ensuring safety.

At this early phase of the process, communities are still learning and engaging in a dialogue within the community and with neighbours. More time and reflection will be required before they can arrive at informed decisions as to whether the APM Project would make a positive contribution to the long-term well-being of the area and that they are willing to host it.

The more detailed studies planned for Phase 2 will enable the NWMO and the communities to gain an expanded understanding of potential suitability. For example, geological field investigations will bring forward important additional site-specific information that will be used to assess residual geoscientific uncertainties identified during Phase 1 studies and gain more insight into geoscientific suitability of the communities. In considering community well-being, early dialogues in Phase 1 revealed important community-specific priorities, concerns and challenges that will be important to address in continuing phases of work. Other areas of uncertainty, and opportunities for detailed work, are expected to be identified as the NWMO and communities continue to work together and the process continues.

Examples of the range and type of uncertainties and areas for further study and dialogue in Huron-Kinloss and South Bruce are outlined below.

### **Geoscientific Considerations**

Geoscience studies suggest that while the Township of Huron-Kinloss and the Municipality of South Bruce appear to contain large areas with favourable geoscientific characteristics, there are inherent uncertainties that would need to be addressed during subsequent stages of the site evaluation process.

Phase 2 activities will focus on evaluating remaining geoscientific uncertainties and will provide additional information that can be used to assess and compare potential suitability of the communities. Aspects of this work will need to be aligned with community input, including the involvement of First Nation and Métis communities. Involvement of potentially affected First Nation and Métis communities and surrounding municipalities is a key component in planning and implementing Phase 2 field studies.

### **Environment and Safety**

Environment and safety studies to date suggest there is potential to implement the project safely and with respect for the environment in the Huron-Kinloss and South Bruce area. Although the assessment has identified some specific areas that would be excluded as they contain parks and protected areas, a more definitive environmental evaluation would be required once smaller potential siting areas have been identified. These further studies could result in the exclusion of additional areas based on such factors as, for example, the presence of migration routes, the proximity to important habitats and cultural sensitivity. Discussions with interested communities, potentially affected First Nations and Métis communities and surrounding communities, as well as field studies, would be needed to fully characterize the environmental conditions in these smaller potential siting areas.

Looking to Phase 2, environment and safety evaluations need to be aligned with input from the community, surrounding communities and Aboriginal peoples. This requires engagement by the NWMO and capacity building to enable this input, which could include Aboriginal Traditional Knowledge. Input from communities on potential transportation routes, as a group with a shared interest, will also need to be incorporated. Phase 2 activities will address these uncertainties and will provide additional information that can be used to assess and compare potential suitability of the communities.

## Transportation

Transportation studies conducted to date suggest there is technical potential to safely transport used nuclear fuel from interim management sites where it is currently stored, to each of the two communities. Transportation will involve travelling long distances from some current interim storage sites, where a small amount of used nuclear fuel is currently stored, to these communities. Further work is required to identify and develop potential transportation routes and mode(s) to each site that will meet detailed technical safety criteria.

Looking to Phase 2, transportation planning and evaluation needs to be aligned with community input, which requires:

- taking into account social values and preferences, and understanding and addressing social questions and concerns;
- understanding and addressing regulatory matters along the routes in several provinces including New Brunswick, Quebec, and Ontario; and
- input from communities on transportation routes, as a group with a shared interest, about potential transportation routes.

Phase 2 activities will address these uncertainties and provide additional information to assess and compare potential suitability of the communities.

## Community Well-Being, Interest and Potential for Willingness

Preliminary Assessment studies conducted to date suggest there is potential to foster well-being, sustain interest, and engage First Nation and Métis communities and surrounding communities in further assessing suitability for the APM Project. Huron-Kinloss and South Bruce appear to have strong potential to meet requirements in this area.

Key determinants of suitability include decisions people will make in the future regarding learning more about the project, the potential to foster well-being of the community and area, and ultimately whether they are willing to host the project and support its implementation. To fully understand the suitability of a community and area to host the project, engagement activities need to continue and broaden to involve surrounding communities and potentially affected First Nation and Métis peoples in the learning and decision-making process.

Across all the communities that continue to the second phase of study, a number of important questions will need to be explored and addressed:

- Among potentially suitable land areas, can specific smaller siting areas be identified that are also socially acceptable?
  - Potential siting areas identified through scientific and technical studies must be the subject of community input to identify socially acceptable land areas.
  - If the APM Project were to be sited in Huron-Kinloss or South Bruce, the NWMO would eventually have to acquire sufficient land to site the repository and associated Centre of Expertise. It will be important in the coming years to approach this challenge in a manner that is both consistent with the principles of the site selection process and informed by the advice and guidance of the community at every stage of work. Working in partnership with municipalities and community groups will be essential to begin to identify specific areas to focus studies. An appropriate process for securing land will

need to be identified, in collaboration with the community, private land owners, and First Nation and Métis communities in the vicinity.

- Discussion will need to expand beyond the community to include potentially affected First Nation and Métis communities and surrounding municipalities, which will have their own perspectives. It will be important in this further work to integrate Aboriginal Traditional Knowledge into the identification and assessment of potentially suitable sites.
- Can an implementation plan for the project (including engineering, logistics and/or community well-being) be developed to ensure safety, align with expectations of the community and area, and be economically feasible?
  - The siting process encourages shared planning to ensure that, as much as possible, community needs and expectations are understood and addressed in the design of implementation plans.
  - The NWMO and communities will need to develop a more detailed understanding of project benefits and how potential negative effects associated with project implementation can be managed in a specific area. This will be important to understand alignment of the project with community priorities, objectives and aspirations.
  - Phase 2 will explore total resources required to support safe project implementation as the NWMO assesses whether the investment required to ensure this outcome in the area is a reasonable and prudent use of ratepayer funds. This assessment will include looking at location-specific costs to design, construct, and operate the facility; costs of required transportation and other infrastructure upgrades; and costs of investment required to foster well-being in the community and area.
- Can interest and conversation in the community and area be sustained through subsequent phases of study, which will span several years and multiple election cycles?
  - The project demands a sustained interest and participation from the community in a process of learning over an extended period. The ability to sustain interest and participation will be better understood through intensive engagement activities during Phase 2 studies.
- Can the social and political conditions be supported to advance the study in the broader area, including involvement of the community, potentially affected First Nation and Métis communities and surrounding municipalities working in partnership to implement the project?
  - Beyond sustained interest and participation, the APM Project ultimately requires those who will be affected to be able to work together to envision and help plan implementation in the area. Intensive engagement activities led with Huron-Kinloss and South Bruce during Phase 2 studies will build understanding of the ability to form the kind of working partnerships that will be required for the project to proceed in the area.

# The Way Forward

## Next Steps for Communities

More than four years after the launch of the siting process, the communities highlighted in this report are at the end of their Phase 1 Preliminary Assessments, and decisions have been taken on the smaller number that will become the focus of the next phase of studies.

With the conclusion of Phase 1 studies, two of the five communities in the Bruce County area are identified as having strong potential to meet siting requirements for the APM Project and warrant further study. The NWMO looks forward to discussing next steps with Huron-Kinloss and South Bruce, and reviewing together the Phase 2 program.

The NWMO wishes to acknowledge the leadership role taken by each of these communities and their contribution to defining the path forward and advancing Canada's plan for the long-term management of used nuclear fuel.

## A Continued Process of Taking Stock

Through a multi-year sequence of engagement and assessments, the NWMO and communities will continually take stock. This will help focus progressively more detailed studies in areas with strong potential to meet the requirements, and over time, arrive at a single, preferred safe site in an informed and willing community.

The outcome of Phase 1 Preliminary Assessments guide early decisions about where to focus more detailed studies among a subset of communities that expressed interest in participating in the site selection process. A smaller number of communities with strong potential to meet the many siting requirements will be the focus of Phase 2 Assessments involving detailed field studies and broadened dialogue.

As we move forward in this process, when findings emerge that suggest a community has low potential to meet project requirements, timely discussions will take place to support the orderly conclusion of studies in that area. Communities recognize that a process of narrowing down is a required and inevitable part of the siting process, and have asked to be updated regularly and kept apprised if studies suggest they are not strong candidates. Out of respect and fairness for the communities involved, the NWMO has committed to regular stock-taking with communities to review findings throughout the multi-year period of assessments. This narrowing down process will enable studies and resources to be concentrated in areas that hold greater potential to be suitable.

## Moving Forward in Partnership

Each community engaging in Preliminary Assessments has helped initiate the process of relationship building needed to support the implementation of the APM Project.

Through work with interested communities, and initial outreach to First Nation and Métis communities and surrounding communities, the NWMO is learning about the nature and shape of partnerships that will be required to implement the APM Project together. The size and scale of APM is such that its implementation will not only have an effect on the local area in which it is sited, it will also have an effect on those in the surrounding area. Surrounding communities and First Nation and Métis peoples need to be involved in decision-making about the project and planning for its implementation if it were to proceed in the area. Only through working together can the project be harnessed to maximize benefits to the area, manage any negative effects that may result, and ensure it fosters long-term well-being and sustainability in a way that is consistent with the area's vision for the future.

Throughout the process, the unique status and rights of Aboriginal people must be respected. As outlined in the *NWMO Aboriginal Policy*, the NWMO acknowledges, respects and honours that Aboriginal peoples – Indian, Inuit 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 Aboriginal peoples.

Working with the interested community and the NWMO, the continued involvement of First Nation and Métis communities and surrounding municipalities in learning and decision-making will be an important component of Phase 2.

As Canada continues along the path of implementing APM, it will take our collective best knowledge and expertise, the continued leadership of communities and all of us working together to ensure the safe long-term management of Canada's used nuclear fuel.