Welcome!

- The Nuclear Waste Management Organization (NWMO) is responsible for implementing, collaboratively with Canadians and Indigenous people, Canada's plan for the safe, long-term management of used nuclear fuel

- Canada's plan calls for used nuclear fuel to be contained and isolated in a deep geological repository, a system of engineered and naturally occurring barriers, indefinitely).

- Currently the NWMO is working to identify a single, preferred location for the deep geological repository and associated surface facilities, to be located in an area with informed and willing hosts

- There are currently two landlocked areas exploring the project, South Bruce, in southern Ontario and Ignace in northwestern Ontario and the NWMO expects to identify the single, preferred location in 2023

NWMO

- Formed in 2002 as required by *Nuclear Fuel Waste Act*
- Mandate to collaboratively develop and implement long-term management of Canada's used fuel
- The project will only proceed with the interested community, First Nation and Métis communities and surrounding communities working in partnership



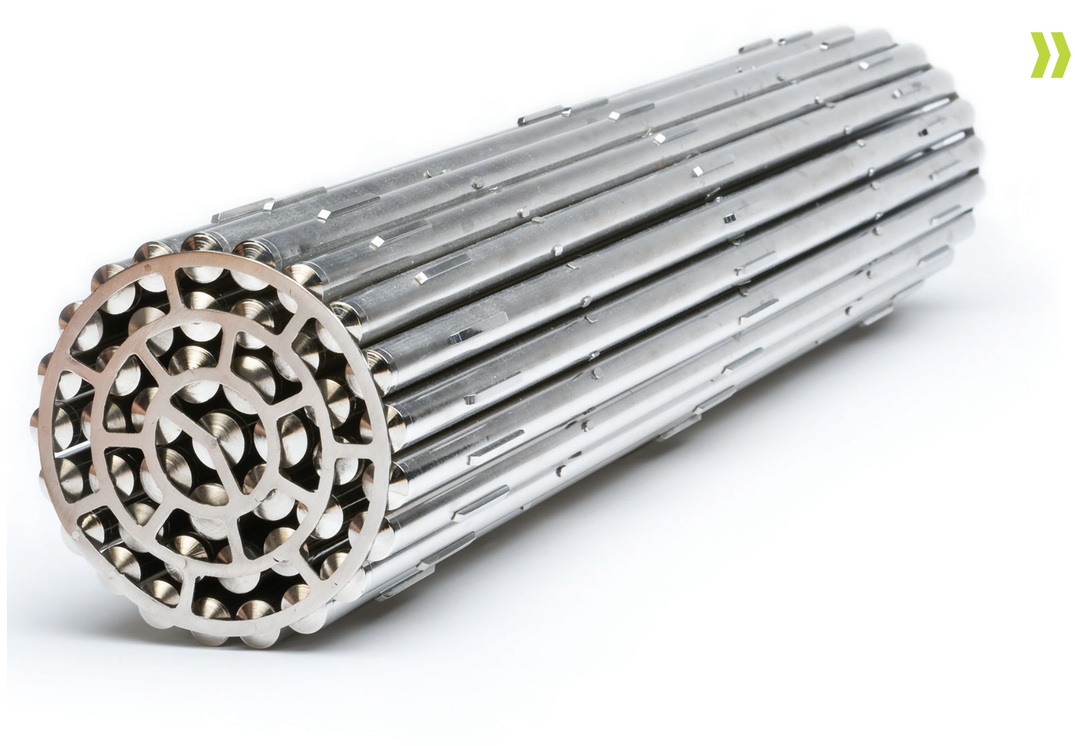
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SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

What is Used Nuclear Fuel?

- Used nuclear fuel is a by-product of the production of electricity by nuclear power plants.
- When used nuclear fuel is removed from a reactor, it is radioactive and needs to be properly managed essentially indefinitely.
- Although its radioactivity decreases with time, chemical toxicity persists and used fuel will remain a potential health risk for many hundreds of thousands of years.
- To date, over 2.9 million fuel bundles have been produced.
- If used fuel could be stacked like cordwood, it would fill 8 hockey rinks to the top of the boards.
- This number will double to about 5.5 million if Canada's existing reactors operate to the end of their planned current lives.



- CANDU fuel bundle:
  - 20 kg natural uranium dioxide ($U0_2$)
  - 0.5 m length
  - 1 million kWh - 100 homes for a year

How is Used Nuclear Fuel Currently Managed?

- Today, used nuclear fuel is safely stored at licensed interim storage facilities at nuclear reactor sites in Canada.

- Fuel bundles spend a minimum of 7 years in large pool-like structures filled with water (called fuel bays).

- They are then placed in robust dry storage containers made of steel and concrete that provide shielding.

- These facilities are licensed by the Canadian Nuclear Safety Commission and monitored to confirm they meet all requirements.



Used fuel storage at Ontario Power Generation's Western Waste Management Facility

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Extensive Study of Options (2002–2005)

- *Nuclear Fuel Waste Act* (*NFWA*) required NWMO to engage Canadians in review of different approaches for managing used fuel.

- NWMO study process engaged nationwide:
  - >18,000 Canadians contributed to 3-year study between 2002–2005
  - Public information & discussion sessions, regional dialogues, open houses and workshops – every province and territory
  - 2,500 Aboriginal people participated in dialogues
  - 500 specialists in scientific (natural and social sciences) and technical disciplines related to the management of used nuclear fuel
  - More than 50,000 individuals visited NWMO website (www.nwmo.ca)

- What Canadians told us:
  - **Safety and security** is top priority
  - This generation must **take action now**; we owe it to future generations
  - Be consistent with best **international standards and practices**
  - Approach must be **adaptable**; allow improvements based on new knowledge or societal priorities

Why Adaptive Phased Management?

» **Adaptive Phased Management** best meets the values and objectives that Canadians said were important:

- It commits this generation of Canadians to take the first steps now to manage the used nuclear fuel we have created
- It will meet rigorous safety and security standards
- It allows flexibility to adapt to experience and societal change
- It provides genuine choice by providing for capacity to be transferred from one generation to the next
- It promotes continuous learning
- It provides a viable, safe and secure long-term storage capability, with the potential for the retrieval of the used fuel
- It is rooted in values and ethics, and it engages citizens throughout implementation

Adaptive Phased Management Site Selection Process

- Developed through two-year public dialogue.
- Initiated in May 2010.
- Seeks to identify informed and willing host community with suitable geological formation.
- Multiple stages of technical and socio-economic assessments.
- Feasibility studies will proceed in future in response to requests of potentially interested communities that meet initial screening requirements.
- Site selection process requires engagement of surrounding communities and communities along the transportation route.



Adaptive Phased Management (APM)

Technical method

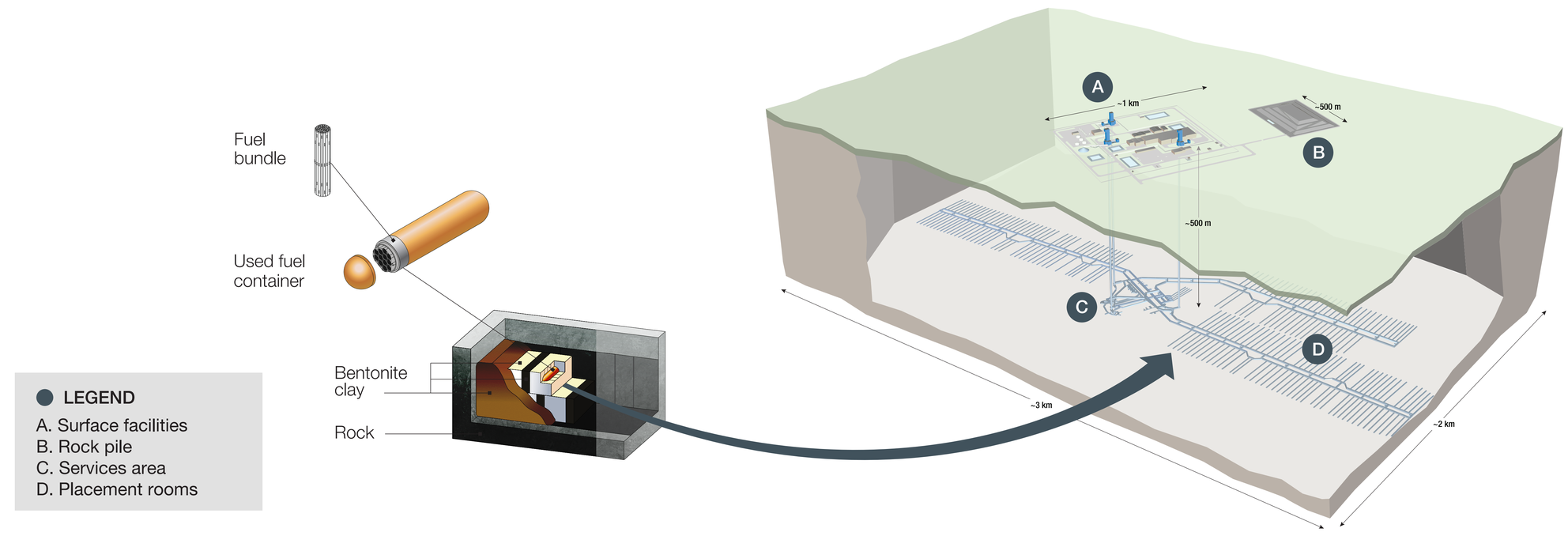
- Centralized containment and isolation of used nuclear fuel in a deep geological repository
- Continuous monitoring
- Potential for retrievability
- Optional step of temporary shallow underground storage (not currently included in the NWMO's implementation plan)

Management system

- Flexibility in pace and manner of implementation
- Phased and adaptive decision-making
- Responsive to advances in technology, research, Indigenous Knowledge, and societal values
- Open, inclusive and fair siting process to seek an informed and willing host
- Sustained engagement of people and communities throughout implementation

National Infrastructure Project

- Protection of people and environment
- High technology
- Strongly regulated
- Centre of Expertise
- Long-term partnership between NWMO and community
- Investment of ~$24 billion
- Decades of sustainable operation
- International consensus



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The Centre of Expertise

- Will support multi-year program of technical testing and verification and later the construction and operation of the deep geological repository

- Important aspects of the Centre will be developed collaboratively with people in the area





Here are some early artist renderings of what the Centre might look like.

Surface Facilities

- Designed to provide processes and equipment for receiving, repackaging and transferring used fuel into the underground repository.
- Require a dedicated surface area of about 600 m by 550 m for main buildings.
- Will be surrounded by a perimeter fence including: facilities that require high security in a protected area; and facilities that do not require high security.
- Other land above the underground footprint could be available for public or private uses.

Project economics:
Estimated annual employment by phase of project

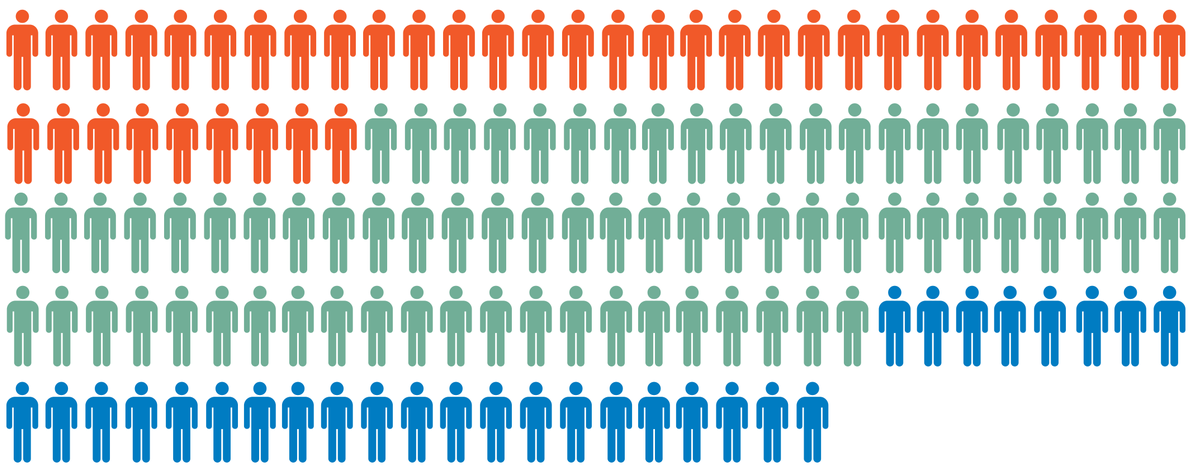
South Bruce and area

Siting and Initial Licensing
~ 15-Year Period*



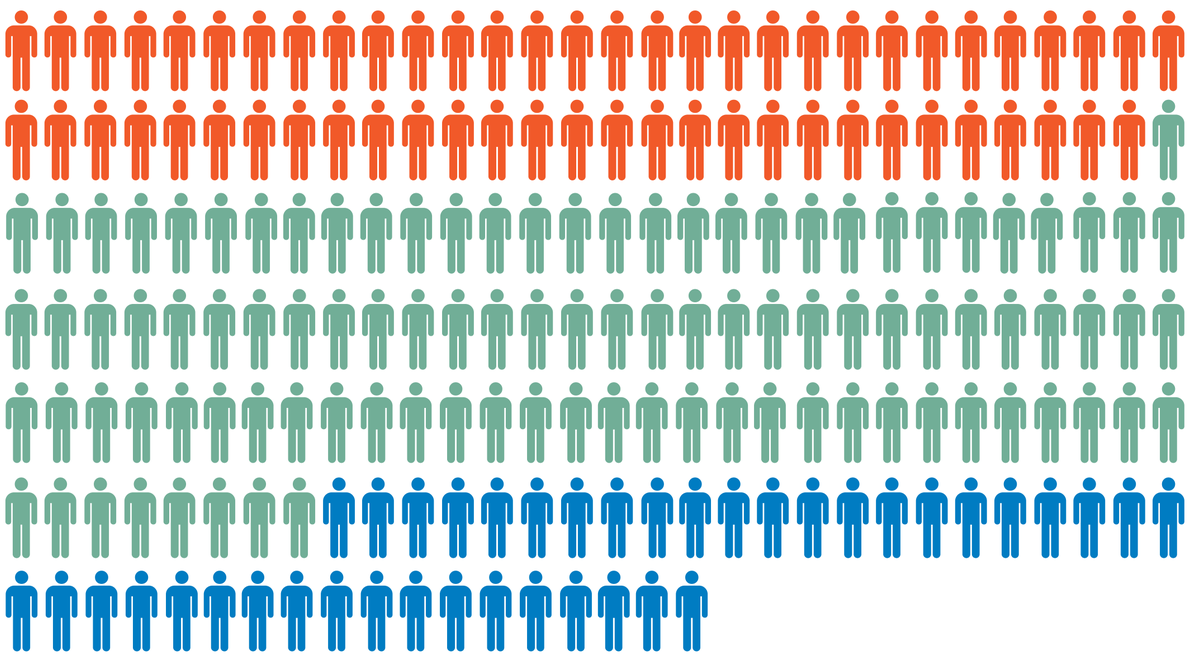
95
JOBS

Construction
~ 10-Year Period*



1,410
JOBS

Operations
~ 40-Year Period*



1,980
JOBS

Extended Monitoring
~ 70-Year Period*



270
JOBS

Decommissioning
~ 30-Year Period*



420
JOBS

Direct Jobs

Indirect Jobs

Induced Jobs

= 10 Jobs

* All timelines are estimates for planning purposes – actual times may vary.

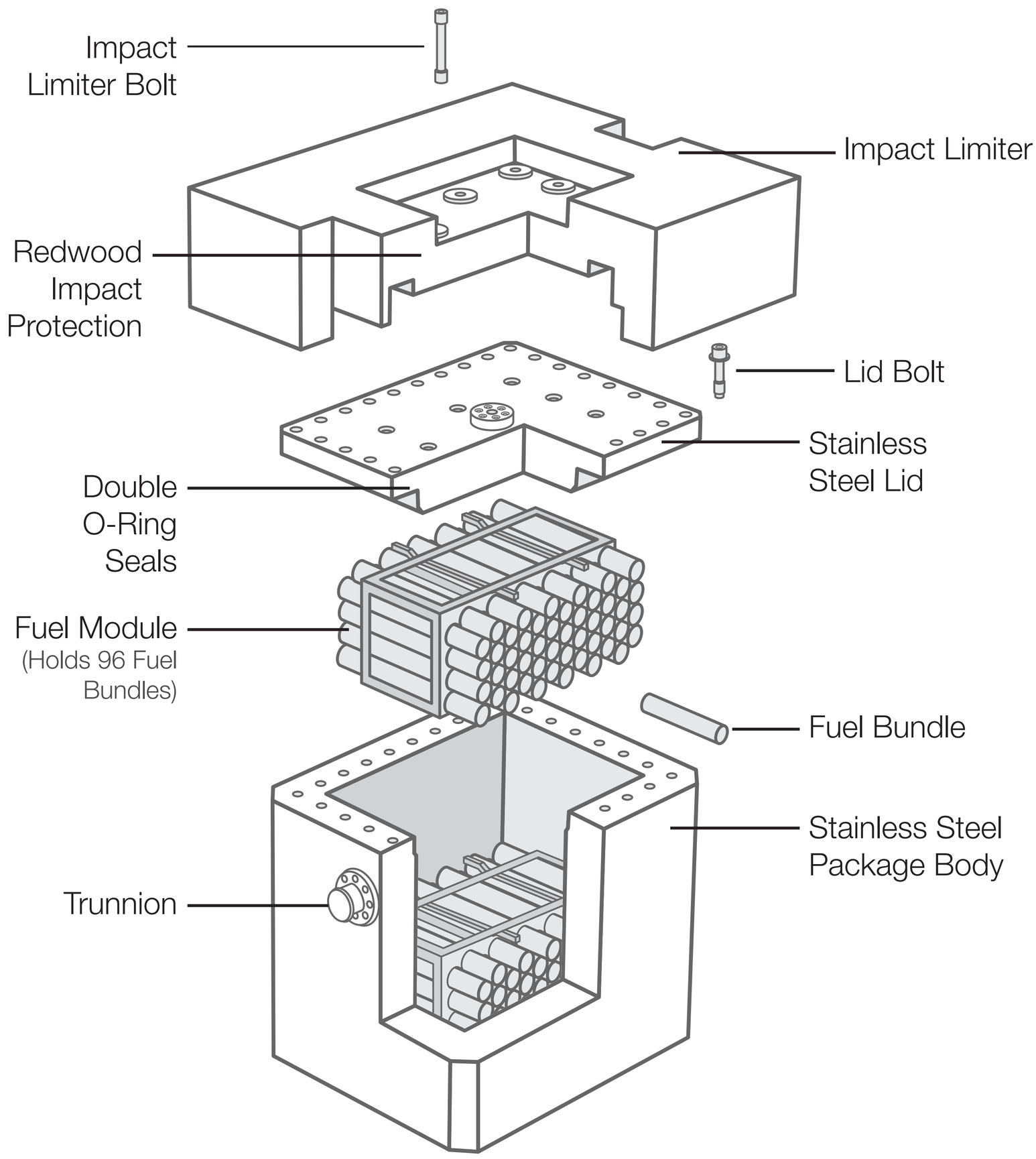
Through working together to plan implementation, we can optimize and direct economic benefits associated with the project to support communities' preferences and aspirations

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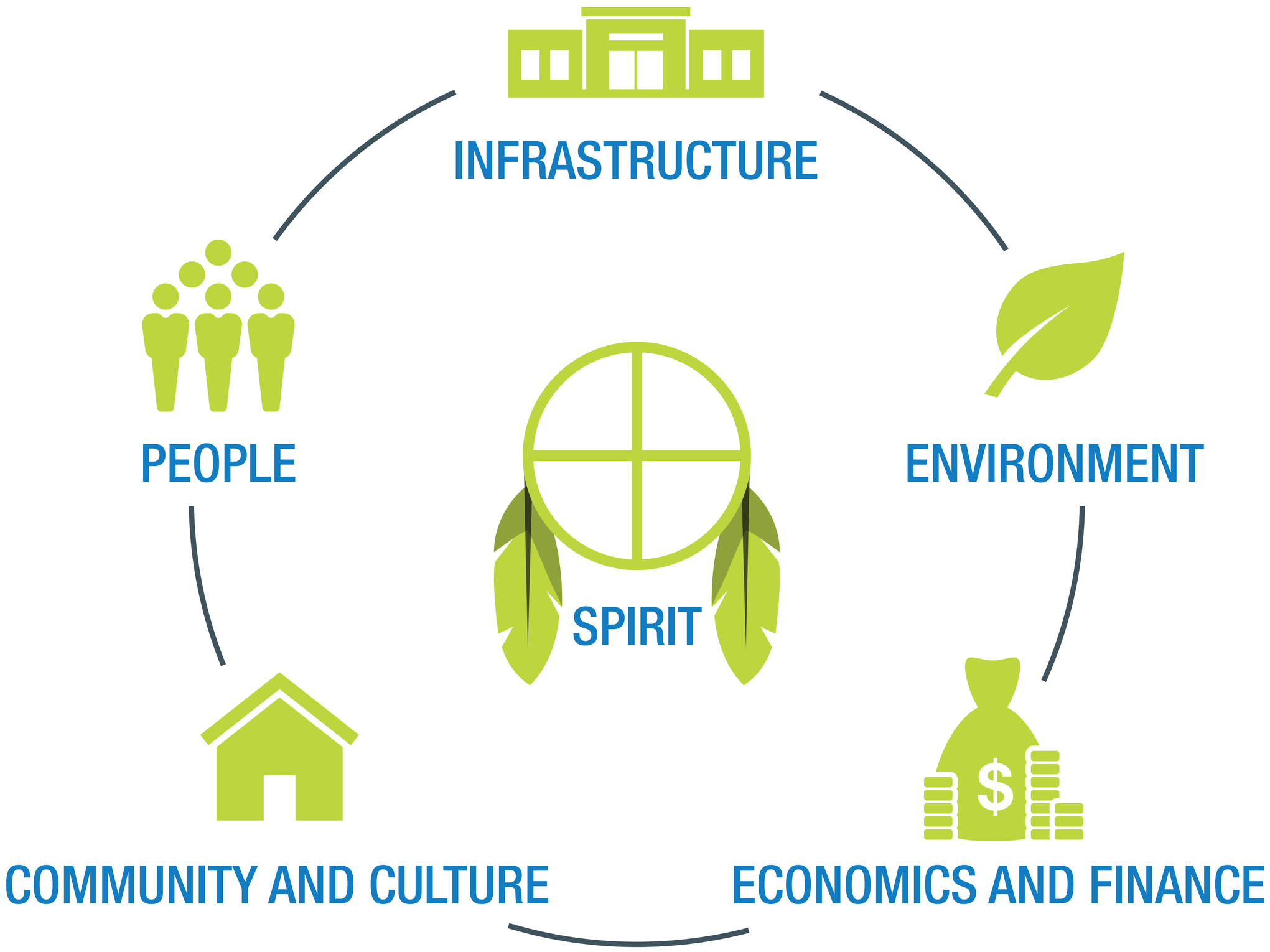
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Used Fuel Transportation Package

- Safety is built into all elements of used fuel management.
- The used nuclear fuel transportation package is designed and tested to ensure it will protect the public during normal operation, as well as accident conditions, in strict compliance with Canadian Nuclear Safety Commission regulations.
- Transportation of used nuclear fuel could begin as early as 2035.



Many Dimensions of Well-Being



Communities will want to consider the APM project from all dimensions of long-term sustainability

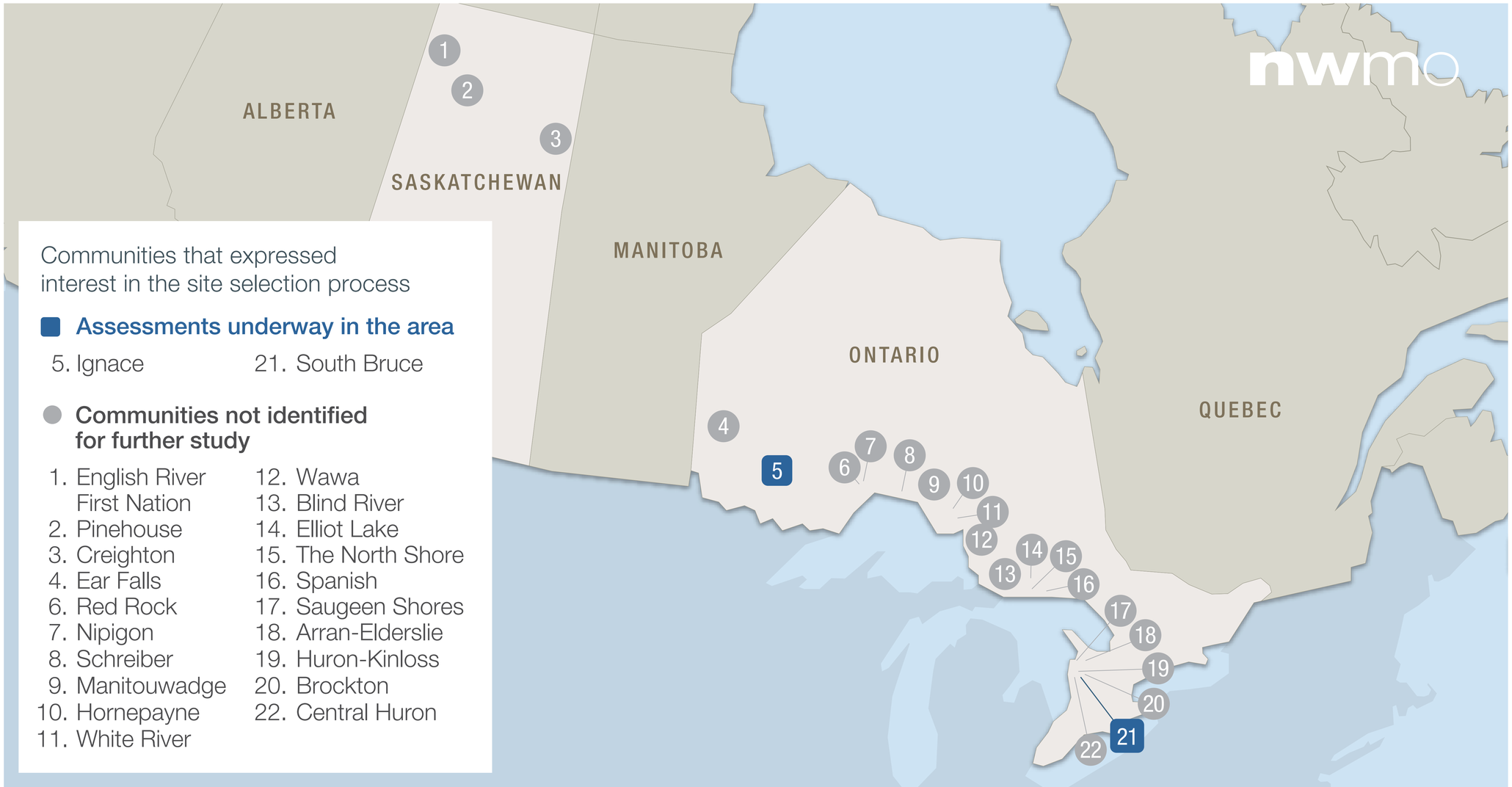
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Communities that Expressed Interest in the Site Selection Process



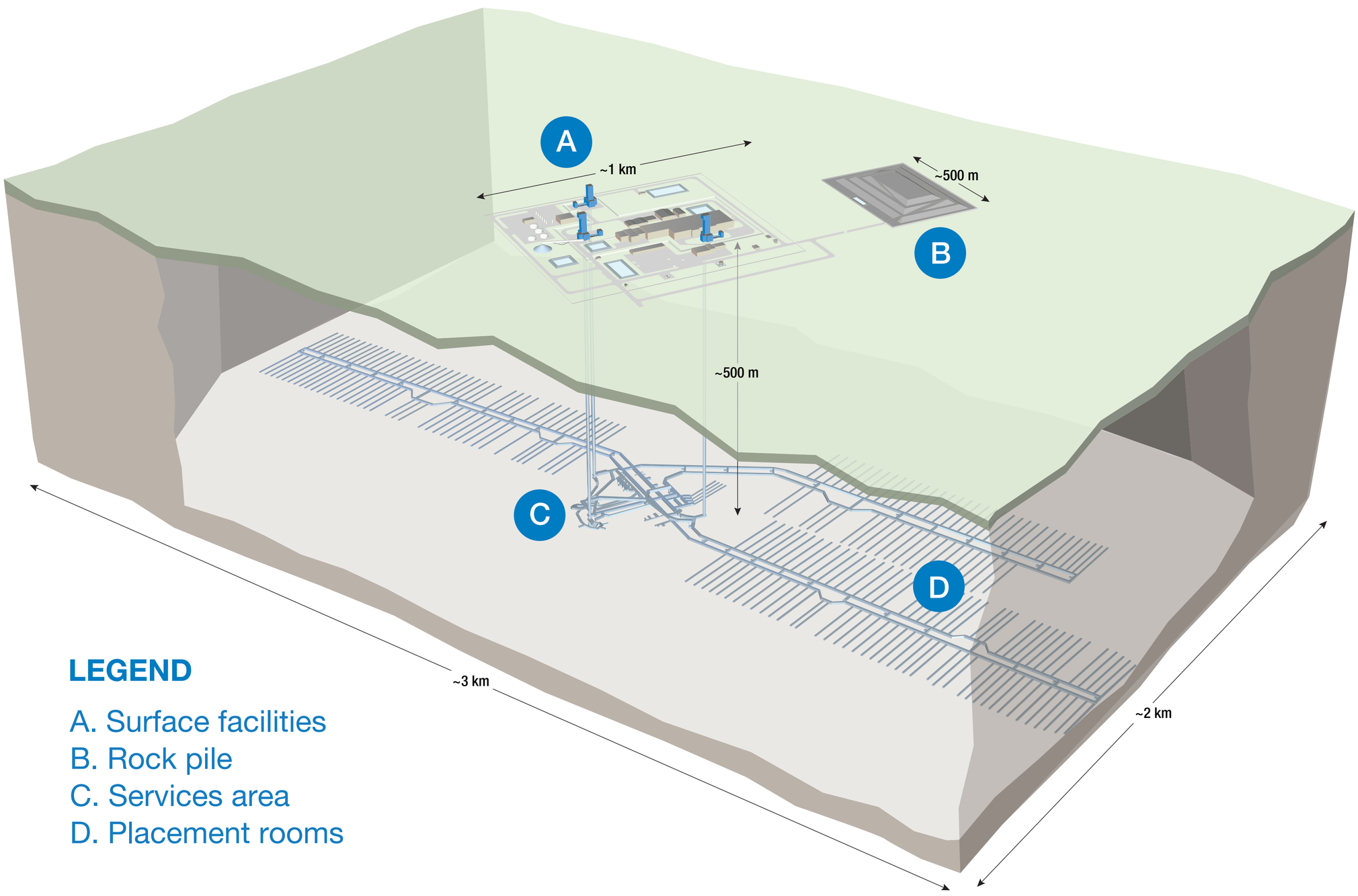
Proposed Roadmap to Partnership (2017-2022)

Aligned Partnerships	Through a schedule developed and agreed upon with partners
Investments	Identify and deliver investments that drive capability and economic prosperity for partners
Identify Required Partnerships	Identify required partnerships with whom, at what level, in what combination, and when
Develop Vision for the Project	Develop the project vision which will meet NWMO and South Bruce interests, and potential partners as well
Values and Principles to Guide Partnership Discussions	Agree on common values and principles to guide partnership discussions

NWMO and Adaptive Phased Management (APM) overview

Welcome to the Nuclear Waste Management Organization's (NWMO) **South Bruce Fall 2020 Update**. The purpose of this virtual open house is to provide residents with an update on our activities in the community.

The NWMO is responsible for designing and implementing Canada's plan for the safe, long-term management of used nuclear fuel. The plan requires used fuel to be contained and isolated in a deep geological repository.



LEGEND

A. Surface facilities
B. Rock pile
C. Services area
D. Placement rooms

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What’s new in South Bruce?

The Municipality of South Bruce is one of two communities involved in the site selection process to identify a host for Canada’s deep geological repository to safely store used nuclear fuel. The NWMO expects to identify a single willing and informed host community by 2023. We invite you to explore here six exhibits to learn more about:

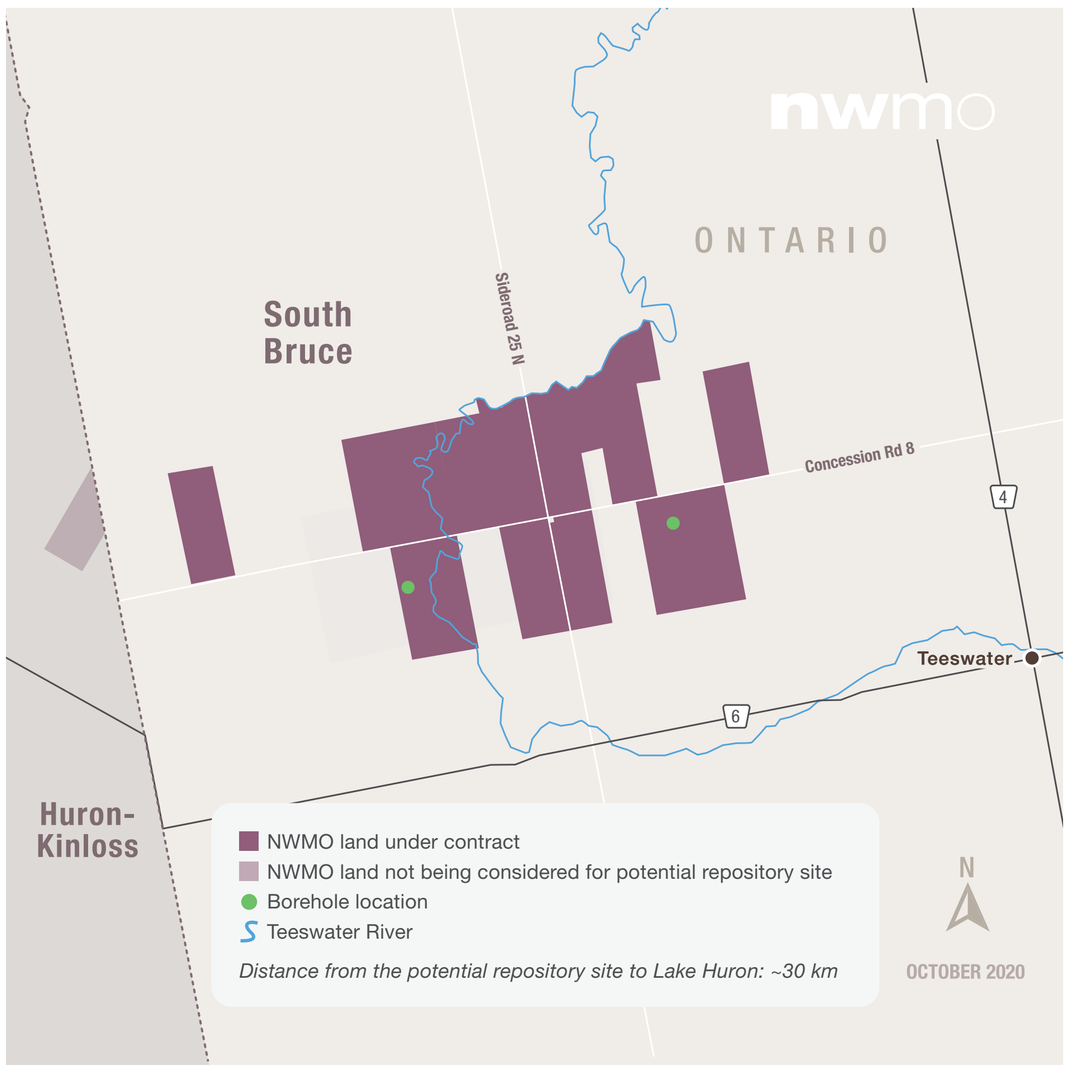
- The Land Access process
- Planned activities for borehole drilling
- The environmental monitoring program
- South Bruce project vision and studies
- The recently released Draft Transportation Planning Framework
- The NWMO Reconciliation Policy

We invite you to share your perspectives with us.

Land Access Process

The NWMO Land Access Program initiated a process in May 2019 to aggregate an area of land required to host a potential deep geological repository site.

As of January 2020, the NWMO had signed agreements with local landowners in an area northwest of Teeswater, making up 1300 acres. Since then, the NWMO continued discussions with interested landowners to aggregate a total of 1,548 acres.



Through engagement we have heard a range of perceptions about the likely potential impacts on neighboring property values. The NWMO, in consultation with the Municipality, will establish a program to compensate property owners if property values are adversely affected by the project if it is sited in South Bruce. We will continue discussions with landowners in the vicinity of the potential site to ensure we understand topics of interest and concern.

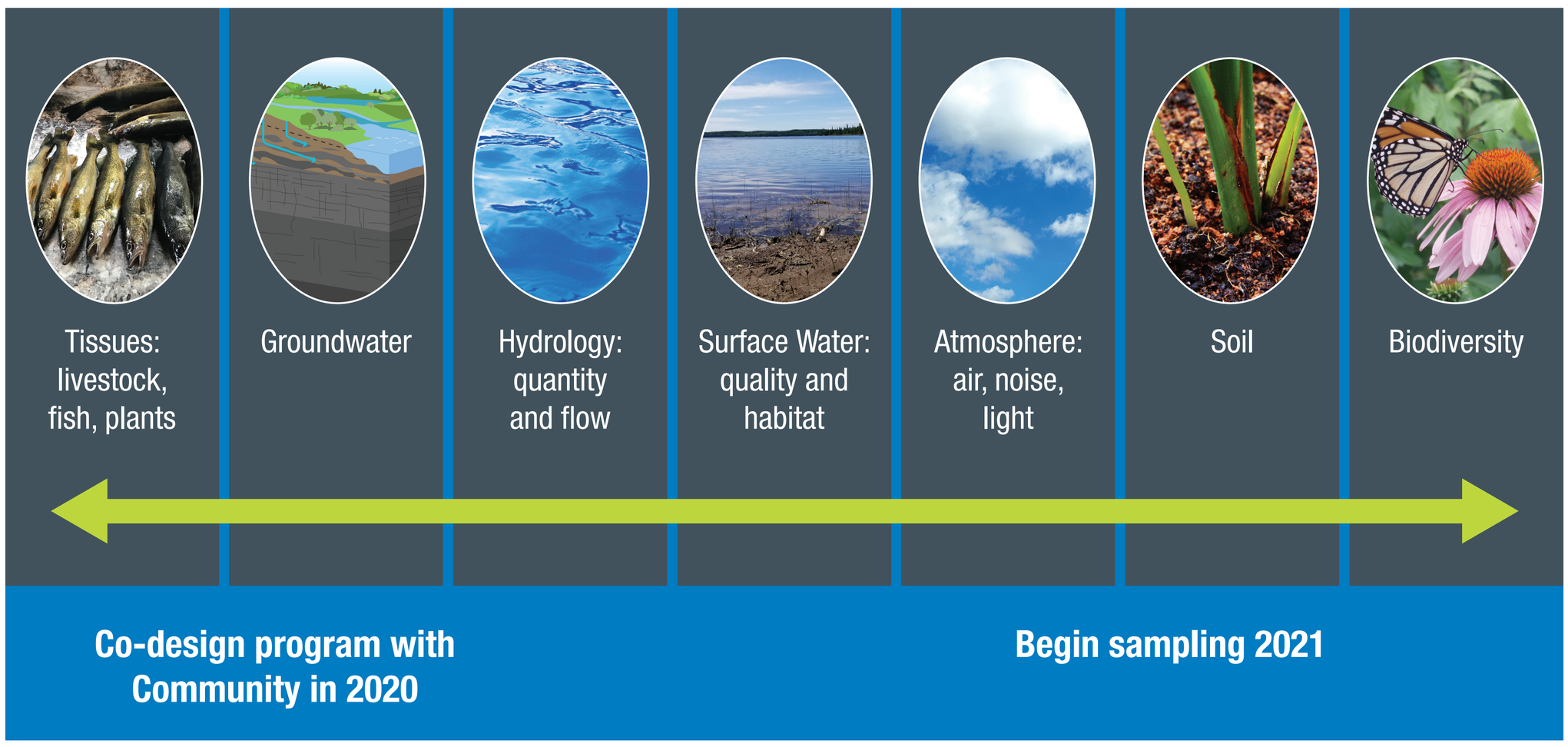
We would like to thank all the landowners involved in the land access program.

Environmental monitoring program

Environmental monitoring is an important part of the preliminary work to establish a site-specific environmental baseline program at a potential deep geological repository site. This is an integral step as the environmental monitoring program will identify future areas of study and monitoring that will be conducted around the potential repository site and the surrounding region.

Recently, the NWMO hosted virtual and in-person environment workshops to gather feedback from the community to better understand current stressors on the local environment. Input and feedback received from the community will be incorporated into the co-designed environmental baseline monitoring program. The NWMO plans to share this draft co-design with the community later this year.

Baseline sample components



The eventual monitoring program could include valued environmental features such as water, air, soil, plants and animals. Participation in environmental monitoring work is a great way to get involved in Canada's plan and there will be future opportunities for residents to participate in training programs and actively take part in sample collection. Together we will identify future areas of study and monitoring that will be conducted around the potential repository site and the surrounding region.

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Borehole drilling

An important component of geoscientific studies involves drilling a small number of boreholes to further understand the geology at the potential repository site. Cylinder-shaped rock samples, (pictured here) called core are retrieved from the borehole. Studying core samples will help confirm understanding of the local geology and affirm that the site could be a safe place for a deep geology repository.



The NWMO plans to drill two boreholes in the area prior to site selection in 2023. Current planning is to initiate drilling of the first borehole in the spring of 2021.

This year, we conducted an environmental due diligence walkover, a topographical survey, and an archaeological survey. Still to come are Indigenous cultural verification and continued site visits, pad preparations, well water sampling and other technical assessments.

The NWMO is also beginning to plan for a second borehole. Site preparation activities at this borehole will start later this fall so that drilling could also begin in 2021.

South Bruce Community Project Vision

Through a series of workshops, discussions, and subsequent reviews in 2019 and 2020, South Bruce residents explored their community aspirations and priorities for the future should the APM project proceed in the area. Engagements also focused on the community's vision for a Centre of Expertise, both in terms of design features and activities that might support community well-being. A summary of the resulting project priorities is illustrated in the graph below.

South Bruce Project Priorities

ENVIRONMENT

- Drinking water supply, ground & surface water
- Green spaces
- Environment & landscape
- Environmental programs
- Minimize project footprint

PEOPLE

- Managed growth
- Community values
- Attraction & retention
- Education & training
- Healthcare

INFRASTRUCTURE

- Integrated planning
- Roads & bridges
- Water, wastewater & waste
- Housing stock
- Utilities
- Facilities & amenities
- Emergency services

COMMUNITY AND CULTURE

- Values and cohesion
- Agricultural roots
- Activities & organizations
- Social issues
- Relationships – site neighbours, landowners, neighbouring municipalities & Indigenous communities

ECONOMICS AND FINANCE

- Diversification
- Vitality & revitalization
- Employment opportunities
- Businesses
- Agriculture
- Housing
- Tourism
- Regional benefits

SAFETY & SECURITY OF PEOPLE & THE ENVIRONMENT

SOLID UNDERSTANDING OF THE PROJECT, INCLUDING RISKS & BENEFITS

South Bruce and Area Studies

Initial studies have indicated there is strong potential to identify a safe site in South Bruce for a repository that will safely contain and isolate used nuclear fuel from people and the environment for the long timeframes required. Studies have also shown that the project has the potential to “fit” with the social, cultural, spiritual and economic well-being aspirations of the community and the area.

Further detailed studies are required to fully assess each of the potential safety and social, economic and cultural impacts of the project in the community and regionally. These studies will be shared broadly with the community. A number of independent studies are also expected to be undertaken by the Municipality.

Further detailed studies:	
Employment and workforce	Describing how many workers and what skills will be required at key points in the project.
Housing	Whether sufficient short-term or long-term housing will be available, and what increased demand may mean for housing prices.
Infrastructure improvement	Examining potential effects of having additional people and traffic, including required improvements to roads and other infrastructure.
Economic	Identifying local and regional economic development opportunities for existing businesses.
Environmental	Ensuring the protection of the Teeswater River and local groundwater, and that development of the site will not harm sensitive ecosystems or endangered species.
Health	Examining the regional health system to prepare for the new families the project will bring into the area.
Well-being	Examining the effects on education, and other social programs in the region to the meet needs of families.

Draft Transportation Planning Framework

In 2020, the NWMO published *Moving forward together: An invitation to review a draft planning framework for the transportation of used nuclear fuel*. The draft framework outlines what we heard and understand from the public about how to implement this phase of Canada's plan, and includes planning objectives, issues to be addressed and factors the NWMO needs to consider.

Canada's plan calls for used nuclear fuel to be transported from interim storage facilities to be centrally contained and isolated in a deep geological repository. The NWMO's transportation program includes technical aspects to meet regulatory requirements, as well as public engagement activities to understand people's priorities, questions and concerns.

We are inviting the public to review the draft framework. Readers will find an opportunity to share their thoughts by answering some questions at the end of the document. Comments can be submitted by mail, fax, or email.



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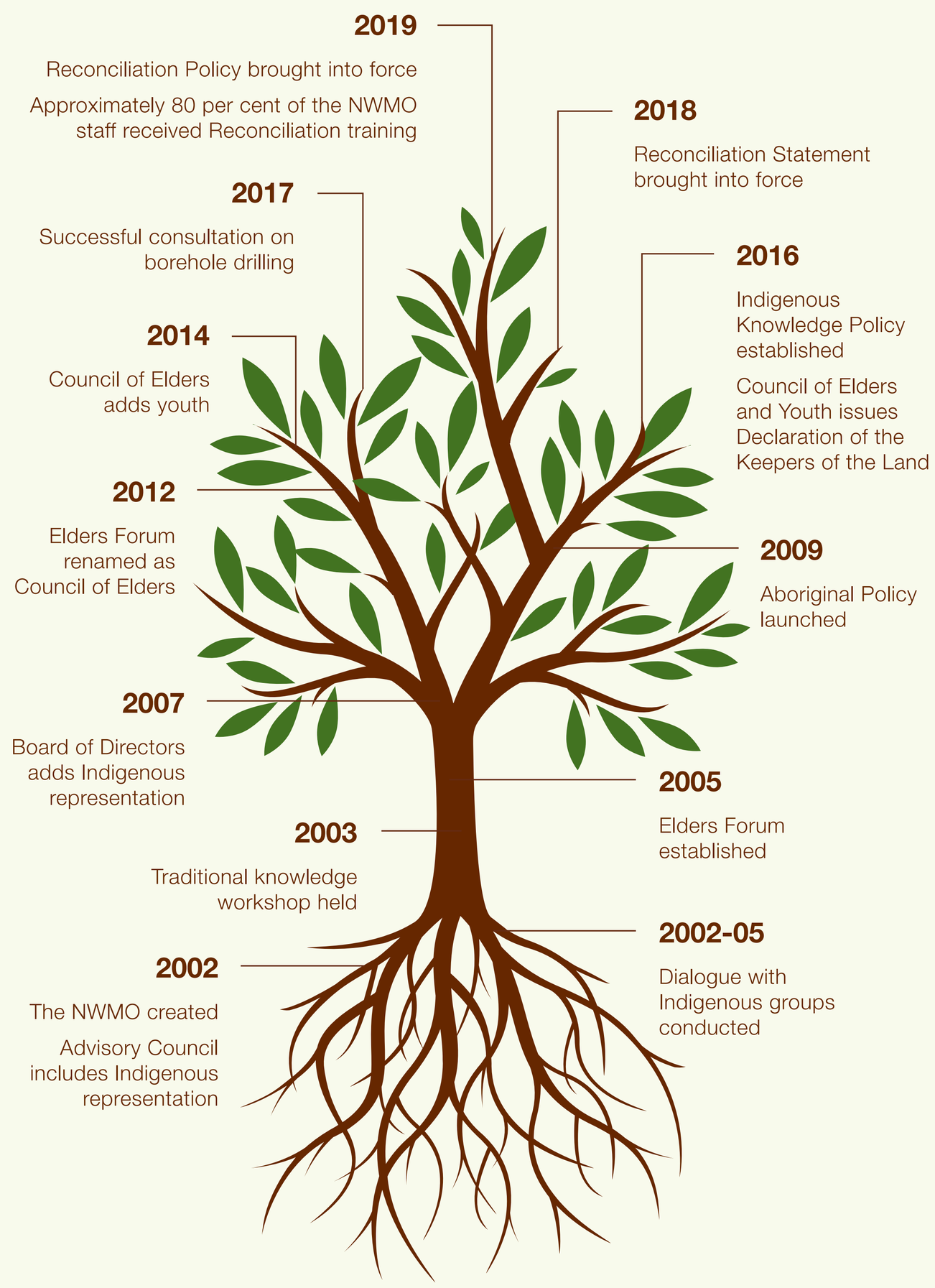
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Reconciliation

The interests, concerns and counsel of Indigenous peoples have been an integral part of the NWMO's work from the start. It began as we studied options for the long-term management of Canada's used nuclear fuel. It has continued throughout the implementation of all aspects of Adaptive Phased Management.

NWMO MILESTONES
in Indigenous Relations



Reconciliation

On Oct. 17, 2019, through ceremony, the NWMO issued a Reconciliation Policy that sets out how the organization will contribute to Reconciliation. Under the policy, the NWMO commits to respectful and meaningful engagement with Indigenous peoples and communities, providing cultural awareness and Reconciliation training to staff and contractors, and annually publishing a Reconciliation implementation plan.

#VoicesOfReconciliation Video Series

As our mandate progresses, we will ensure ongoing, active and meaningful collaboration. We have developed an Indigenous Knowledge Policy to help guide our work. Our engagement is informed by the Council of Elders and Youth, an advisory body to NWMO management.

