nwmo

NUCLEAR WASTE MANAGEMENT ORGANIZATION

SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

CANADA'S PLAN FOR USED NUCLEAR FUEL


nwmo

Hello.

We are the

NUCLEAR WASTE MANAGEMENT ORGANIZATION

(but you can call us the NWMO for short).

We are a not-for-profit organization whose purpose is ensuring Canada's intermediate- and high-level radioactive waste is safely managed for generations to come — including that created using new or emerging technologies.

In 2002, federal legislation made us responsible for the safe, long-term management of Canada's used nuclear fuel. The plan is to contain and isolate it in a deep geological repository.

In 2023, Canada's Minister of Energy and Natural Resources also tasked the NWMO with a new mandate to plan for the safe, long-term management of intermediate-level and non-fuel high-level waste. Work on a new, separate site selection process for a repository for this type of waste is ongoing.

Since our beginning, we have been working closely with municipal and Indigenous communities, industry, regulators and all levels of government to protect people and the environment, both now and in the future.

In short, ***your safety is our purpose***.

Nuclear energy in Canada

For decades, Canadians and Indigenous peoples have relied on nuclear energy to power their homes and businesses. In Ontario, nuclear is the single largest source of electricity, accounting for about 60 per cent of electrical power generated in the province.

Canada's nuclear industry supports hundreds of businesses and tens of thousands of jobs from coast to coast. It plays a critical role in the production of medical isotopes for life-saving diagnostics and treatments, both at home and abroad. As an energy source free of carbon dioxide emissions, nuclear power is a part of government strategies to fight global climate change, both in Canada and internationally.

As governments seek to balance sustained economic growth with responsibility to people and the planet, nuclear power's importance is likely to continue growing.

However, a necessary byproduct of generating nuclear power is used nuclear fuel. Although its radioactivity level decreases rapidly with time, the used fuel remains a potential health risk for hundreds of thousands of years. Used fuel must be contained and isolated from people and the environment, essentially indefinitely — and that safety imperative is at the heart of the plan underway to manage used nuclear fuel over the long term.

What is used nuclear fuel?

Unlike depictions in comic books and movies, most used nuclear fuel that exists today in Canada is CANDU fuel. This fuel is not a liquid or a gas. It is a stable solid — actually a ceramic — sealed into a specially designed container and then bound in a "bundle." Each bundle weighs about 53 pounds (24 kilograms) and is roughly the size and shape of a fireplace log.

When removed from a nuclear reactor, the bundle looks the same as when it went in — but it is highly radioactive and will remain that way for a long time.

Once a used nuclear fuel bundle is removed from a reactor, it is placed in a water-filled pool where its heat and radioactivity decrease over time. After seven to 10 years, the bundle is placed in a dry storage container, a method that has been in use worldwide since the 1980s.

This approach is perfectly safe, but temporary. Since it will take hundreds of thousands of years for radioactivity in used nuclear fuel to subside, ***we need a long-term approach***.

That is why Canada has a plan to manage its used nuclear fuel in a deep geological repository. According to this plan, waste owners pay for its implementation, with funding in place for its entire life cycle.

New nuclear technologies may result in different types of used fuel, and we will be responsible for these too. Canada's plan is designed to adapt to changes in technology, and we can build flexibility into repository designs so we can be ready for future decisions.

Canadians and Indigenous peoples agree that we simply cannot leave the management of used nuclear fuel for future generations — we must act now.

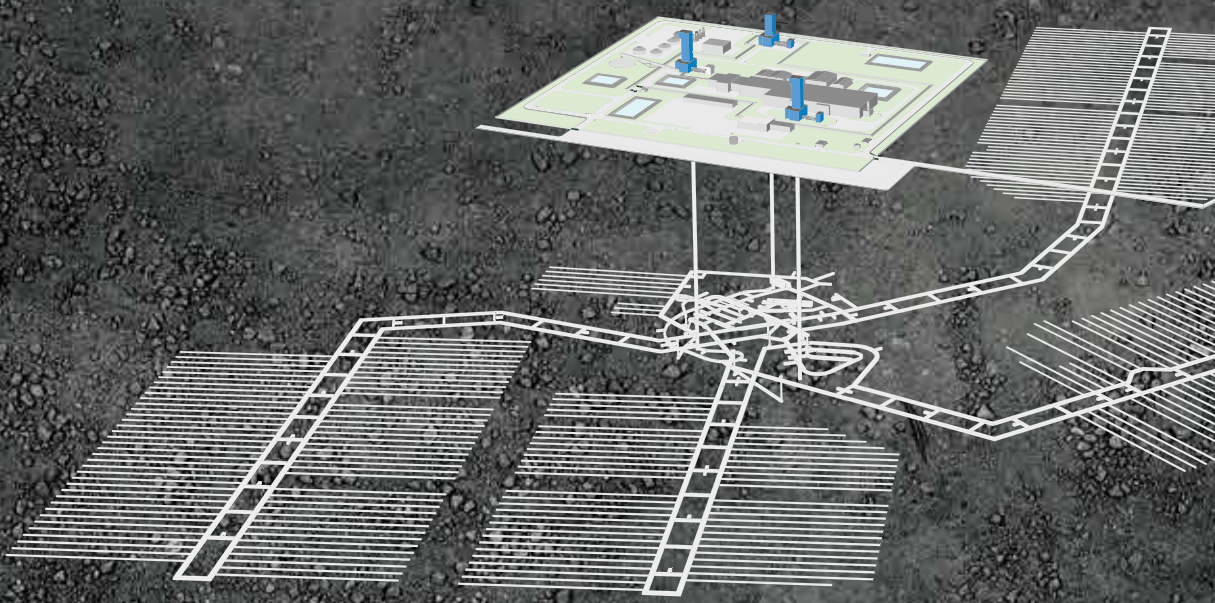
What is the plan?

Federal legislation directed the NWMO to study how to manage used nuclear fuel and recommend a preferred approach. In 2005, after a three-year period of study and dialogue with Canadians and Indigenous peoples from coast to coast, we submitted our proposed approach to the Minister of Natural Resources. In June 2007, the federal government selected the plan we are now implementing — known as Adaptive Phased Management — as Canada's plan.

Canada's plan calls for used nuclear fuel to be stored in a ***deep geological repository***: a network of underground tunnels and placement rooms. After extensive technical study and community engagement, we selected the Wabigoon Lake Ojibway Nation-Ignace area that has a suitable rock formation to safely contain and isolate Canada's used nuclear fuel, and where both the municipality and First Nation are informed and willing hosts.

Built to a depth of 650-800 metres, the repository will be much deeper than the CN Tower is tall. Its design will rely upon a series of engineered and natural barriers that work together to contain and isolate used nuclear fuel.

This approach is safe, low-risk, technically sound and consistent with best practices from around the world.



Canada's plan is based on years of input from Canadians and Indigenous peoples, international scientific consensus, Indigenous Knowledge and decades of research. In fact, most other countries with commercial nuclear programs are pursuing this approach, including Finland, France, Japan, Sweden, Switzerland and the United Kingdom.

However, Canada's plan is much more than a document or regulatory framework. As a national infrastructure project worth billions of dollars over many decades, the repository has potential to be a long-term economic engine in the area where it is located, as well as the broader region.

The potential economic benefits are just one aspect of the project. We are committed to implementing the plan in a way that fosters well-being as defined by those living in the area, and we are constantly learning from communities about the many factors that are important to them.

Because this multi-generational project will be implemented in phases over a period of about 175 years, we will continually review, strengthen and adjust the plan in the face of new information, direction and guidance.

At or near the repository site, a **Centre of Expertise** will be built to support our work — initially by facilitating safety-oriented testing and assessment, and also by serving as a hub for community interests and innovation.

The design and use of the centre will be developed collaboratively with those living in the area. Should local Indigenous communities desire, it could feature a learning area focused on how Indigenous Knowledge is being applied to the project.

Eventually, the Centre of Expertise could be home to research programs and a technology demonstration program involving experts from a diverse set of disciplines.

Collaboration with communities is at our core

The safe, long-term management of used nuclear fuel will require one of our best and most precious resources: the determination of Canadians and Indigenous peoples to secure a safe, environmentally sound future.

Protecting the environment by implementing Canada's plan will require collaborative work that is inclusive of diverse perspectives and sources, including public input, multiple levels of government, Indigenous Knowledge and the scientific community.

Though the construction of the deep geological repository and transportation of used nuclear fuel are not due to begin until the 2030s and 2040s respectively, we are committed to using the intervening years to meaningfully engage with Canadians and Indigenous peoples affected by these decisions.

Commitment to Reconciliation and aligning with Indigenous Knowledge

In travelling a path together with Indigenous peoples, we consider different worldviews and how Indigenous Knowledge can inform all aspects of our work, from decision-making and strategic planning, to fieldwork and human resources.

Through respectful knowledge exchange, the NWMO works to create opportunities for Indigenous voices to be acknowledged and heard. Key to our Reconciliation journey is a strong foundation of recognition and respect through ongoing education opportunities.

In 2019, we took an important step in formalizing our *Reconciliation Policy*. We committed to developing an annual implementation plan to measure and publicly report on our progress, and to build sustainable relationships with Indigenous and municipal communities.

And with strong guidance from a Council of Elders and Youth, Indigenous Knowledge Holders in siting communities, and the *Indigenous Knowledge Policy* we adopted in 2016, we continue to intentionally align with insights from different knowledge systems throughout our work.

Guided by knowledge, grounded in community

Transparency and accountability are not just important to us; they are of critical importance to all the Canadians and Indigenous peoples relying on us to safely implement Canada's plan. It is imperative that people and communities can participate in all aspects of the process that affect them.

That is why our team of world-class technical experts — including experienced scientists and engineers — works in collaboration with municipal and Indigenous communities, the public, all levels of government, national and international regulators, industry and academia to implement Canada's plan.

In 2010, we initiated a community-driven process to identify a site where Canada's used nuclear fuel can be safely contained and isolated. This process was the result of a two-year dialogue and was designed to meet the highest scientific, professional and ethical standards.

We have only ever worked in areas where at least one community expressed interest in learning more about the project and exploring its potential to host it — 22 communities did just that. Over more than a decade of increasingly intensive community engagement and technical studies, we gradually narrowed down our focus. In 2024, we selected the Wabigoon Lake Ojibway Nation-Ignace area as the site for Canada's deep geological repository for used nuclear fuel.

Following a multi-step process that includes field investigations, a comprehensive regulatory decision-making process, and ongoing community and public engagement, the deep geological repository will be constructed over an estimated 10-year period.

As we implement Canada's plan, we will continue serving the communities where we work by supporting youth programs, services for community seniors, community sustainability, energy efficiency, economic development, and other initiatives with strong local interest and support.

Learning is a process unto itself, and we anticipate that learning opportunities will continue to emerge as Canada's plan is implemented. Maintaining an adaptable and community-oriented approach will help ensure communities' needs are addressed.

Get in touch

Toronto, Ont.

22 St. Clair Avenue East,
Fourth Floor
Toronto, ON M4T 2S3
Tel.: 416.934.9814
Toll free: 1.866.249.6966

Ignace, Ont.

304 Main Street
Ignace, ON P0T 1T0
Tel.: 807.934.2472

Email: contactus@nwmo.ca
Website: nwmo.ca
@nwmocanada
/company/nwmocanada

nwmo

NUCLEAR WASTE MANAGEMENT ORGANIZATION

SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES