

Nuclear Waste Burial in Canada

Community Briefing Note

Prepared by Northwatch – Updated January 2020

Since 2010, the Nuclear Waste Management Organization has investigated 22 communities as potential locations for a deep geological repository that would accept all of the Canada's highly radioactive wastes from nuclear reactors in Ontario, Quebec and New Brunswick. As of January 2020, only two areas remain under investigation. The NWMO has been investigating the Revell Lake area, 35 kilometres west of Ignace in northwestern Ontario for a number of years, and in January 2020 it announced that it had agreements with an aggregate of landowners in the vicinity of Teeswater, in the Municipality of South Bruce in southwestern Ontario and would begin investigations in that area.

This brief is a summary of background information, and has been prepared by Northwatch to support community discussions.

What is nuclear waste?

Nuclear wastes are the radioactive by-products of developing and using nuclear technologies, including nuclear power reactors and nuclear weapons. Nuclear fuel waste is also called "high level" waste, and is the most radioactive of the waste products generated by nuclear power production.

What is the nuclear industry looking for?

The nuclear industry - under the banner of the Nuclear Waste Management Organization - is looking for a community willing to become the "host" to all of Canada's nuclear fuel waste - approximately 50,000 tonnes to date. The NWMO plan is to place the waste deep underground in a geological repository.

The Nuclear Waste Management Organization calls their plan to bury nuclear waste deep underground "Adaptive Phased Management". The key elements of the plan are to place the highly radioactive nuclear fuel waste in copper coated containers which would in turn be placed in a series of rooms in a repository constructed approximately 500 metres below the surface in one or more rock formations. This approach has been favoured by the nuclear industry in several countries for many years, but no country has yet approved, constructed and begun operating a similar facility.

A summary of key facts:

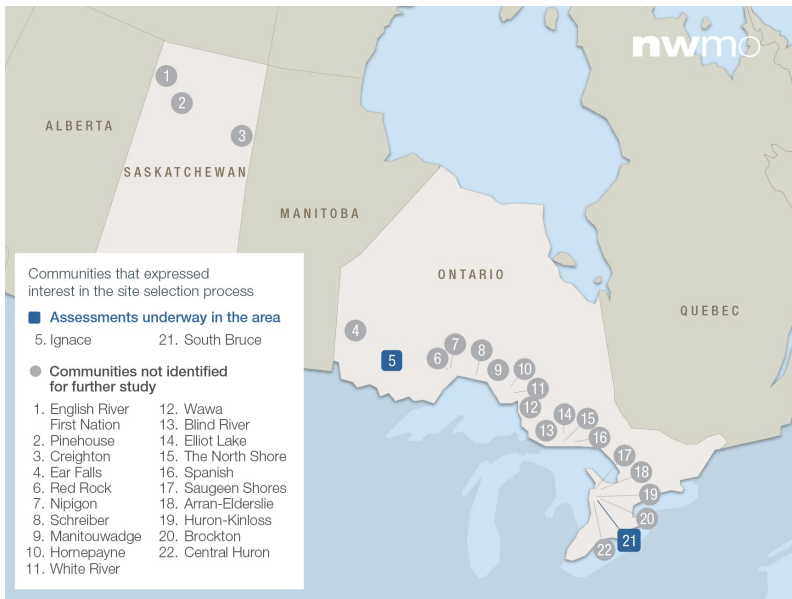
- Nuclear waste from reactors is extremely hazardous now and for hundreds of thousands of years. The radioactive and chemical hazards will outlast the containers and, over time, the wastes - which even the nuclear industry agrees must be strictly isolated from the environment - will be released.
- Transportation of nuclear fuel waste will come with its own set of hazards and risks. The practice is relatively unknown in Canada, and the few incidents of highly radioactive nuclear fuel waste being transported in Canada are not comparable to the frequency and volume of transportation that would be required to move all of Canada's nuclear fuel waste to a single location. There are risks of accident, but there are also concerns with exposure levels from the transport of the waste even without accidents.
- The concept of burying nuclear waste failed an environmental assessment review in Canada. The NWMO's "Adaptive Phased Management" is based on Atomic Energy of Canada Limited's 1988 "concept" of burying nuclear waste in the Canadian Shield. After a ten year review - which included 13 months of public hearings - the review panel concluded in 1998 that the AECL concept had not been demonstrated to be safe and acceptable.
- Many countries are studying the idea of burying nuclear waste, and have been doing so for more than 40 years. But no one has done it. The NWMO says that their proposal is similar to that of many other countries, but no other country has actually built, approved and begun to use such a facility.

Canada and nuclear waste

Nuclear power production began in the 1970's, before the government or the nuclear industry had any safe means of storing or disposing of the highly radioactive wastes

- In 1977 a 3 month 3-man federal "commission" recommended burying nuclear waste in the Canadian Shield of northern Ontario
- In 1988 the federal government referred the "concept" of burying nuclear waste to an eight person environmental assessment panel; in 1998 the environmental assessment panel concluded that burying nuclear waste was not acceptable to Canadians, and recommended that an independent agency be established to do future research into the long term management of nuclear waste
- In 2002 the federal government passed the Nuclear Fuel Waste Act which directed the nuclear waste owners to create an organization which would then be responsible for researching options and then for the long term management of nuclear fuel waste . That organization is the Nuclear Waste Management Organization.
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The Nuclear Waste Management Organization (NWMO) was created by Ontario Power Generation, Hydro Quebec and New Brunswick Power, the generators and owners of nuclear fuel waste. The NWMO was directed by the Nuclear Fuel Waste Act to review three "options" for the long term management of nuclear fuel waste (continued storage at the reactor site, centralized storage, or geological disposal) and report with a recommended option by November 15, 2005



SUMMARY OF NWMO SITING PROCESS MILESTONES MAY 2010 – MARCH 2015	
May 2010	The Nuclear Waste Management Organization launched their site search with the release of Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel and the announcement of their Learn More Program. They also announced the NWMO Learn More, through which they would make available resources (information and funding) to support participation in early steps of the siting process. Other programs of support will be developed as the process unfolds.
March 2012	The NWMO announced it would suspend the expressions of interest phase of the site selection process on September 30, 2012.
September 2012	Twenty-one communities were being investigated by the time the NWMO closed the list of Learn More communities. On the list were: Arran-Elderslie, Blind River, Brockton, Central Huron, Creighton, Ear Falls, Elliot Lake, English River, First Nation, Homepayne, Huron-Kinloss, Ignace, Manitowadge, Nipigon, Township of the North Shore, Pinehouse, Saugeen Shores, Schreiber, South Bruce, Spanish, Wawa, and White River. Red Rock had been released from the NWMO process in June 2011 after an initial screening.
November 2013	NWMO released the preliminary assessment from the first phase of Step 3 of their nine step process for eight communities. Creighton, Ignace, Homepayne and Schreiber were identified for further study, meaning they would move to the next of the NWMO siting process. English River First Nation, Pinehouse, Ear Falls and Wawa were not selected for more detailed study.
January 2014	NWMO announced that it had concluded its preliminary assessment of Arran-Elderslie and Saugeen Shores and that early findings indicate both have very limited potential to meet the geoscientific criteria required to host a deep geological repository for used nuclear fuel. The preliminary assessment was not released until December 2014.
June 2014	The Township of Nipigon passed a resolution to discontinue its involvement as a potential host community for a repository for nuclear waste. The decision followed review of an interim report, which the NWMO prepared at the request of the Township to report on preliminary assessment work completed in the community so far.
December 2014	NWMO released the "preliminary assessment" from the first phase of Step 3 of their nine step process for three Bruce County communities. South Bruce and Huron Kinloss were "identified for further study. Brockton "was not selected to be the focus of more detailed study."
January 2015	NWMO released the preliminary assessment from the first phase of Step 3 of their nine step process for six communities in northern Ontario. Manitowadge, White River, Blind River and Elliot Lake were identified for further study. Spanish and the Township of the North Shore were not selected to be the focus of more detailed study.
March 2015	NWMO announced that it was "concluding" its studies in Creighton Saskatchewan and Schreiber in northern Ontario.
June 2017	Municipality of Central Huron and the Township of White River will no longer be considered a potential host for the project
December 2017	NWMO announced that the area around <u>Blind River and Elliot Lake, Ontario</u> , will no longer be considered to host the project
January 2018	NWMO announced completion of first borehole drilling in Revell Lake area, 35 km west of Ignace
September 2019	NWMO completion of second borehole in the Revell Lake area
October 2019	NWMO announces plans to drill additional four boreholes in Revell Lake area
November 2019	NWMO announces that the Townships of <u>Homepayne</u> and <u>Manitowadge</u> will no longer be considered.
January 2020	NWMO announces that it has signed agreements with landowners in South Bruce, and will no longer consider Huron Kinloss as a potential host

NWMO and their Adaptive Phased Management Plan

In November 2005 the Nuclear Waste Management Organization submitted its recommendation to the federal government. Calling it "Adaptive Phased Management", the NWMO reports to have combined the three nuclear waste management "options" identified in the Nuclear Fuel Waste Act into a 300-year phased approach moving from storage at nuclear plants, to centralized storage, and finally to a deep geological repository. The federal government announced its acceptance in 2007.

According to the 2005 plan as proposed, in the first phase of the NWMO plan, the waste will remain at nuclear plants for 30 years while a centralized site is selected. In the second 30-year phase of the NWMO plan either a shallow underground waste facility will be built at the identified site and waste transportation will begin, or waste will remain at the nuclear plants pending completion of a site research facility and construction of a deep geological repository at the site. In either case, the waste will at some point be moved to the selected site and eventually placed deep underground.

The International Situation

Several countries that use nuclear power have programs to investigate and/or develop a deep geologic repository for nuclear fuel waste, and have had for several decades.

- There is no approved or operating geologic repository for high level nuclear fuel waste anywhere in the world
- Yucca Mountain, the proposed repository in the US, lost funding in 2009; a commission appointed by the president has recommended a new program be established, that would rely on a "consent-based" process to identify centralized storage sites; a repository would be investigated as a longer-term option
- A proposal for a geologic repository in Sweden was submitted to the review agency in 2011, but was returned to the proponent for additional work in 2012 and again in 2018
- Candidate sites in a "voluntary" process to identify potential locations for geologic repositories in the UK were rejected by County Council in 2013. No additional sites have been identified.
- In 2014 the only operating deep geologic repository in the world – the Waste Isolation Pilot Plant in New Mexico, which is a repository for US weapons waste – was shut down following an underground fire and release of radiation to the surface environment

Know Nuclear Waste is a public interest project about nuclear waste in Canada. www.KnowNuclearWaste.ca is the dedicated web site about the nuclear industry's proposal to bury nuclear waste and their related siting process. Please send questions and suggestions to northwatch@northwatch.org or call us at 705 497 0373 and we'll do our best to respond in a timely and helpful manner.