

OPG'S DEEP GEOLOGIC REPOSITORY PROJECT

For Low & Intermediate Level Waste

Safe and responsible long-term management

Frequently Asked Questions

About OPG's Deep Geologic Repository for Low and Intermediate-level Nuclear Waste

NEED FOR A DGR

Q. Where is the low and intermediate level waste managed now?

A. Low and intermediate level waste (L&ILW) from the Darlington, Pickering and Bruce Power nuclear generating stations has been safely transported and managed at OPG's Western Waste Management Facility at the Bruce nuclear site for more than 40 years.

Q. Why is it necessary to move from interim to long-term management of the low and intermediate level waste in a DGR?

A. Nuclear has powered our province and made it one of the most prosperous in Canada for more than 40 years. One of the by-products of nuclear power is waste, which includes components and materials used in the nuclear station that have become radioactive. While most of the radioactivity in the waste will decay, a small portion of the waste is long-lasting (hundreds of thousands of years) and requires safe, long-term isolation and containment from the public and the environment. OPG has been safely storing these materials for over 40 years at the Western Waste Management Facility in Bruce County, the site of the proposed DGR. OPG could continue storing the waste safely above ground but we have an obligation to those future generations to dispose of this waste safely where it cannot pose a threat to the public or the environment.

Q. Who is responsible and accountable for a long-term management plan for low and intermediate level waste in Canada?

A. Under the Federal Radioactive Waste Management Policy Framework, the producers of L&ILMW are responsible for the safe management their radioactive waste in an environmentally, socially, and financially responsible way. OPG is fulfilling this responsibility with the DGR project.

Q. Why a DGR?

A. DGRs are recognized as best international practice for the long-term management of L&ILW. Experts agree, it's the responsible choice and reflects international best practice. The Municipality of Kincardine selected a DGR (and OPG concurred) because it would provide the highest margin of safety for storing the waste on behalf of present and future generations.

LOCATION

Q. Where will the DGR be located?

A. The DGR will be located in low permeability limestone rock formations 680 metres beneath the secure Bruce nuclear site in the Municipality of Kincardine. The DGR will safely isolate and contain L&ILW deep underground ensuring protection of water and the environment in 450 million year old stable rock formations.

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Q. Will the DGR be located on the shore of Lake Huron?

A. No, the DGR is not located on the shore of Lake Huron; it is just over one kilometer inland on the secure Bruce nuclear site. The shortest distance from any part of the DGR's underground facilities at 680 metres and the bottom of the lake is 1.2 km.

Q. Why Kincardine?

A. The proposed site has both a willing host municipality and suitable geologic attributes – two components that international experience has shown are essential for the successful implementation of the DGR concept.

After a significant review of the alternatives, the host Municipality of Kincardine indicated its preference for the DGR by council resolution in 2004 because:

- Geologic disposal is consistent with best international practices; and
- The DGR option offers the highest margin of safety in the long-term.

The close proximity of the Western Waste Management Facility, where much of the waste designated for the DGR is already safely managed, avoids additional transportation risks.

Q. Did OPG consider any other sites for the DGR?

A. OPG did not actively solicit other potential sites for the DGR project because Kincardine has suitable geology and is a willing host municipality.

WASTE STREAMS AND RADIOACTIVITY

Q. What kind of nuclear waste will be accommodated in the DGR?

A. The DGR will provide safe, permanent storage for about 200,000 cubic metres of low and intermediate level waste, including packaging, from the Bruce, Darlington and Pickering nuclear generation stations.

Q. What is low level waste?

A. Low level waste consists of minimally radioactive materials that have become contaminated during routine clean-up and maintenance at the generating stations. Materials can include mop heads, cloths, paper towels, floor sweepings and protective clothing. These materials can be handled without any special protection or shielding. Eighty per cent or more of the waste in the DGR will be low-level waste, dominated by relatively short-lived radionuclides. Most of the radioactivity in the large volume of low-level waste will decay away within 300 years.

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Q. What is intermediate level waste?

A. Intermediate level waste consists of used reactor core components, resins, and filters. Most of the intermediate level waste will decay within 100,000 years, but a small portion (about one per cent) will remain radioactive and requires safe isolation and containment for hundreds of thousands of years.

Q. What is high level waste?

A. High level waste consists of used nuclear fuel bundles and must be managed for a very long period of time, essentially indefinitely.

Q. Will OPG's DGR for low and intermediate level waste accommodate used nuclear fuel or nuclear waste from other countries?

A. No, OPG's DGR will not accommodate used nuclear fuel or nuclear waste from other countries. OPG has signed a hosting agreement with the Municipality of Kincardine to the extent that only low and intermediate level waste from OPG-owned or operated reactors will be accommodated in the DGR. OPG's Environmental Impact Statement and licence application are exclusive to low and intermediate level waste.

Q. What is the long-term plan for Canada's used nuclear fuel bundles?

A. The Nuclear Waste Management Organization (NWMO) – a Canadian company established by Canada's nuclear electricity generating utilities, as outlined in the Nuclear Fuel Waste Act - is responsible for implementing Adaptive Phased Management, which is the approach selected by the Government for Canada for the long-term management of Canada's used nuclear fuel. The end point for this approach is the construction of a deep geologic repository in sedimentary or crystalline rock in an informed and willing host community.

Q. Will the DGR accommodate decommissioning waste?

A. Yes, the DGR will accommodate L&ILW, which is generated from the decommissioning of OPG-owned and operated reactors. It is an activity which is not expected to take place for several decades. The decommissioning of the reactors will and must comply with all regulatory requirements of the time.

SAFETY CASE/ATTRIBUTES OF THE GEOLOGY

Q. What attributes in the geology beneath the Bruce nuclear site will ensure the safe isolation and containment of the low and intermediate level waste?

- The DGR will be isolated from surface waters by its depth at 680 metres beneath the Bruce nuclear site.
- The 450 million-year-old rock formations are stable and will safely isolate and contain the low and intermediate level waste.
- There are multiple layers of low-permeability rock above the repository.

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- The Bruce nuclear site is located in a seismically quiet area.
- Almost all of the radioactivity would decay within or near the DGR.
- The waste contains primarily shorter-lived radionuclides and decreases with time.
- Any movement of materials will only take place after many tens of thousands of years at an extremely slow rate of less than one metre per millions of years.

RESULTS OF ENVIRONMENTAL IMPACT STATEMENT

Q. What was the conclusion of the Environmental Statement?

A. After many years of study, analysis and national/international technical review, the Environmental Impact Statement concluded the DGR project will safely isolate and contain the waste without any significant adverse effects to human health or the environment. The DGR project will result in beneficial socio-economic effects for the local and regional communities in terms of additional employment and learning opportunities, and additional spending.

Q. Did the public have an opportunity to review these documents?

A. The Environmental Impact Statement, Preliminary Safety Report and other documentation - more than 12,500 pages in total – underwent 15 months of public review where members of the public, First Nations and Métis communities, NGOs, government agencies and the Joint Review Panel had opportunity to review the documents and post information requests to OPG.

Following the comment period, in 2013 33 days of **public hearings** took place in Kincardine (17) and Saugeen Shores (8) and eight (8) additional days in 2014. The Joint Review Panel (JRP) heard numerous presentations about the DGR project from OPG, the Canadian Nuclear Safety Commission (CNSC) - Canada's nuclear regulator - federal and provincial government agencies and independent professionals, and over 200 presentations by members of the public as interveners. Collectively, the presentations covered a wide spectrum of information, which was then supplemented by the responses to hundreds of questions posed by hearing participants. Information requests/responses and daily transcripts from the hearing proceedings can be accessed on the [public registry for the DGR](#).

REGULATORY APPROVALS PROCESS

Q. How is public safety assured with projects like the DGR?

A. Projects such as OPG's DGR for are subject to a rigorous regulatory approval process. This process provides numerous opportunities for the public to review and comment on proposed projects.

Q. What is the role of the Canadian Nuclear Safety Commission with respect to the DGR?

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A. The role of the Canadian Nuclear Safety Commission (CNSC), under the federal *Nuclear Safety and Control Act*, is to regulate the use of nuclear energy and materials to protect the health, safety and security of Canadians, and the environment; and to implement Canada's international commitments on the peaceful use of nuclear energy. All nuclear facilities, including DGRs, are governed by CNSC regulations and oversight, and operators must meet these robust regulations.

Q. Why did the DGR go through a Joint Review Panel environmental assessment?

A. The proposed DGR is a nuclear facility so it requires a site preparation/construction licence from the CNSC. A requirement of the licensing is that an environmental assessment (EA) of the proposed DGR project under the provisions of the Canadian Environmental Assessment Act be completed. The Joint Review Panel EA allows for both the licensing and EA process to take place concurrently.

Q. What were the conclusions of the Joint Review Panel?

A. On May 6, 2015, the Joint Review Panel (JRP) issued the Environmental Assessment (EA) Report to the federal Minister of the Environment. The Panel's report concluded:

- the project is not likely to cause significant adverse environmental effects;
- the DGR should be built now rather than later;
- there is a strong safety case for the DGR;
- the Bruce Nuclear site is appropriate;
- public health and safety will be protected; and
- the DGR project will not affect Lake Huron

The recommendation confirms the DGR will safely isolate and contain the waste deep underground, ensuring the Great Lakes and the environment would remain protected for many thousands of years. The JRP's report comes after more than 15 years of study, consultation and the most comprehensive and science-based nuclear waste storage review in Canadian history.

Q. Where is the DGR project in the regulatory process?

A. The following chart depicts where the DGR project is in the regulatory approvals process:

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TIMELINE REGULATORY MILESTONE

2005	Submission of the DGR project Description to the Canadian Nuclear Safety Commission (CNSC).
2006	CNSC hosts a public scoping hearing for the DGR project.
2007	Federal Minister of Environment refers DGR project to a Joint Review Panel Environmental Assessment.
2008	Draft guidelines for DGR project Environmental Impact Statement (EIS) and Joint Review Panel Agreement are issued for public review.
2009	Final DGR project guidelines issued.
2010	Completion of geoscientific site characterization and assessment of safety and environmental effects (2006 – 2010).
2011	Submission of the EIS, Preliminary Safety Report (PSR) and supporting documents to the CNSC for the Joint Review Panel.
2012	Joint Review Panel (JRP) is appointed by the federal government; JRP announces beginning of public comment period for EIS, PSR and supporting documents, which extends for 15 months
2013 & 2014	DGR Public Hearing - In June 2013, the Joint Review Panel announced the public hearing for the DGR project. The hearing was held over 33 days, in the fall of 2013 and fall of 2014.
2015	On May 6, 2015 the Joint Review Panel issued the Environmental Assessment (EA) Report recommending the approval of the Deep Geologic Repository for Ontario's low and intermediate level waste to the federal government.
2015	June 3 - the Canadian Environmental Assessment Agency (CEAA) announced a 90-day public comment period for OPG's Deep Geologic Repository project for low and intermediate level waste.
2015	The 120-day timeline for the EA decision by the federal minister of environment was extended to December 2, 2015.
2015	Nov. 27 - the Minister of the Environment and Climate Change announced to delay a decision statement on the Deep Geologic Repository (DGR) for Low- and Intermediate-level nuclear waste until March 1, 2016.
2016	TBA