A first in Canada

NPD played an important part in the history of nuclear energy in Canada as it was the first nuclear power reactor to contribute to the electrical grid.

25 years of serving Canadian industry

In 1988, following permanent shutdown of the reactor, removal of the fuel, heavy water and power generating equipment from the site, Ontario Hydro transferred the responsibility of monitoring and licencing of NPD to Atomic Energy of Canada Limited (AECL). Now, CNL has a commitment to the government of Canada to permanently decommission the remaining structures.

Ensuring a solution for future generations

Decommissioning NPD will also provide an opportunity to collapse the footprint of the site that is currently in the care of CNL. Once the decommissioning project is complete, approximately one per cent of the land will remain under institutional control for monitoring by CNL.
Why in-situ decommissioning?

In-situ decommissioning has been selected as the decommissioning technique as it provides the following advantages:

- Reduced risk for radiological and industrial hazards exposure to workers
- Reduced transport/waste handling risks to the public and environment
- Effective reduction of the nuclear liability and eliminating interim waste storage
- Eliminates the risk associated with multiple handling of waste packages to and from interim storage and final disposal
- Allows for early release of non-impacted NPD property

A disadvantage of in-situ decommissioning is that it requires additional long-term monitoring of the impacted area, as a result of the disposal site created.
Understanding the waste inventory at NPD is vital to the in-situ decommissioning method; a robust characterization program allows Canadian Nuclear Laboratories to achieve a better understanding of the types and levels of radionuclides in a particular waste inventory. To verify the waste inventory in detail, the NPD Closure Project team is conducting extensive characterization activities, including:

- sampling of the reactor components
- internal scappings of the nuclear systems
- systematic surveys of the building

The nature of the materials at the Nuclear Power Demonstration (NPD) site, known collectively as the waste inventory, as well as the numerous safeguards to protect the environment and human health, make this reactor a particularly suitable candidate for in-situ decommissioning.
Minimizing Environmental Impact

**NPD Closure Project**

The Nuclear Power Demonstration (NPD) Closure Project plans to curtail any impact that decommissioning activities may have on the environment through mitigation of identified effects and by monitoring to that ensure the anticipated minimal impact to the environment is, in fact, maintained.

**Mitigation Measures during the NPD Closure Project**

<table>
<thead>
<tr>
<th>Environmental Effect</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact to Air Emissions</td>
<td>Wetting or misting during demolition</td>
</tr>
<tr>
<td>Impact to surface water</td>
<td>Secondary containment of storage tanks and use of silt fences</td>
</tr>
<tr>
<td>Greenhouse gas emissions</td>
<td>Proper vehicle maintenance and limit idling</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental Effect</th>
<th>Follow-up Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact to Human Health</td>
<td>Monitoring of worker dose and general radiation fields around the NPD site</td>
</tr>
<tr>
<td>Impact to Chimney Swifts (e.g. noise, vibration, light)</td>
<td>Regular Chimney Swift Counts during their seasonal presence at NPD</td>
</tr>
</tbody>
</table>

**Mitigation and Monitoring after Decommissioning**

In-design mitigation measures and safety features to prevent releases to the environment include:
- Grout: the grouted facility will isolate radionuclides
- Cap: the concrete cap will protect against inadvertent human intrusion
- Engineered cover: an engineered cover will be placed over the concrete cap to divert surface water from the facility

Follow up monitoring:
- Visual inspections of the site, management of vegetation and maintenance of the engineered cover
- Groundwater monitoring would occur on down and side gradient of the grouted facility

**Designing a monitoring program**

- **IDENTIFY POTENTIAL ENVIRONMENTAL RISK**
  - Environmental risk assessment
  - Human health risk assessment
  - Environmental assessment (EA) under the CEAA 2012
  - Other

- **DETERMINE NEED TO MONITOR**
  - Is there a potential risk?
  - Is there a regulatory or licensing need?
  - Are stakeholders concerned?
  - In order to confirm predictions for EA

- **DESIGN PROGRAM**
  - Compartments to monitor
  - Locations to monitor
  - Parameters to monitor
  - Frequency of monitoring

- **MONITOR**
  - Sampling and analysis
  - Quality control
  - Quality assurance
  - Interpret results
  - Compare to limits
  - Prepare reports

The Canadian Standards Association’s (CSA) criteria provide guidance on derived release limits, environmental risk assessment (ERA) and environmental, effluent and groundwater monitoring and protection programs.
What you told us

NPD Closure Project

Over the last year, you’ve told us what you think about the Nuclear Power Demonstration (NPD) Closure Project. At our public information sessions and community events, on the telephone and by email, you have shared your thoughts and opinions on the decommissioning of the first power reactor in Canada to provide electricity to the grid.

Several comments have also been provided to the Canadian Nuclear Safety Commission (CNSC) and posted on the web page for the NPD Closure Project’s Environmental Assessment (reference number: 80121).

Knowing what aspects of the environment you value helps us identify what to assess in the Environmental Impact Statement (EIS) and ensures appropriate mitigations are in place to protect our environment. In this way, you inform how we plan for the decommissioning of NPD.

The EIS is a document that the project team working on the NPD Closure Project will submit to the CNSC detailing how Canadian Nuclear Laboratories (CNL) is fulfilling the requirements of the Environmental Assessment process.

What’s on your mind...

How will the decommissioning affect the chimney swifts roosting in the NPD stack?
How will the Ottawa River be protected?
Has this project examined the potential effects of an earthquake or climate change or other natural disasters?
How will monitoring occur around the site and how long will the NPD site be monitored post-decommissioning?
What is the cost of this option in comparison to alternative methods, and who is funding this project?
How will the unaffected land be released after the project is finished?

Contact Us!

For more information or to share your thoughts related to this project, contact us:

Email: communications@cnl.ca
Telephone: 1-800-364-6989
Web page: www.cnl.ca/NPD
Social Media:

@CNL_LNC @CanadianNuclearLaboratories

The Environmental Impact Statement: Important Dates

September 2017
The NPD Closure Project submits the draft Environmental Impact Statement (EIS) to the Canadian Nuclear Safety Commission (CNSC) and the public can submit comments to the CNSC on the draft EIS

December 2017
Canadian Nuclear Safety Commission’s deadline for accepting public comments on the draft Environmental Impact Statement for the NPD Closure Project

December 2018
Anticipated date for the Environmental Assessment decision on the NPD Closure Project