

# Protecting the Environment Canadian Nuclear Laboratories

CNL has more than 60 years of experience conducting monitoring programs for vegetation and wildlife (e.g. vegetation, soil and sediments and game animals), water quality (e.g., drinking water, waterborne effluent, groundwater, sediments) and air quality (e.g., ambient air, airborne effluents).

The results of the radiological and non-radiological effluent monitoring program demonstrate that controls for the release of potentially hazardous substances currently in place at Whiteshell Laboratories (WL) continue to provide substantial protection of the environment. The monitoring program confirms that the WL site is operating in a manner that protects workers, the public and the environment.

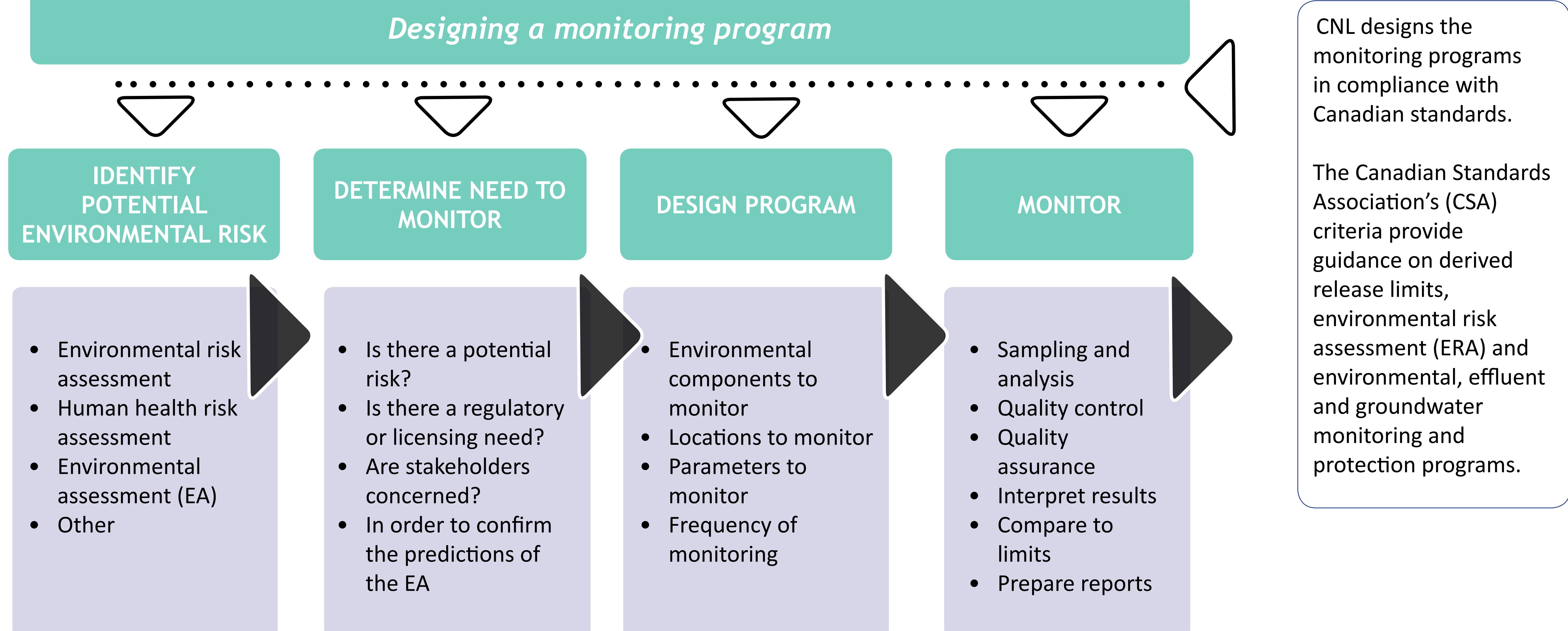
We are committed to providing information on environmental performance. Reports with data from the WL site can be found on [www.cnl.ca](http://www.cnl.ca).

**>130 locations monitored**

**>18,000 analyses performed annually**



## Designing a monitoring program



# Regulatory Oversight Canadian Nuclear Laboratories

*In order for the projects to go forward, regulatory approvals are necessary*



## Regulatory Approvals

For the project to go forward, two main regulatory approvals are required:

1) An Environmental Impact Statement (EIS) will be submitted under the *Canadian Environmental Assessment Act (CEAA) 2012*. The EIS will assess the potential environmental effects of the project and will include stakeholder engagement and Aboriginal engagement.

2) A licence amendment (in conjunction with licence renewal) under the *Nuclear Safety Control Act (NSCA)* is required. The amendment application will include the following component:

- Request for a licence amendment for the change to the decommissioning plan for WR-1 Reactor Building

A decision of approval under CEAA 2012 is required before a decision can be made under the NSCA

### WR-1 In Situ Decommissioning

#### CEAA 2012 Requirements\*

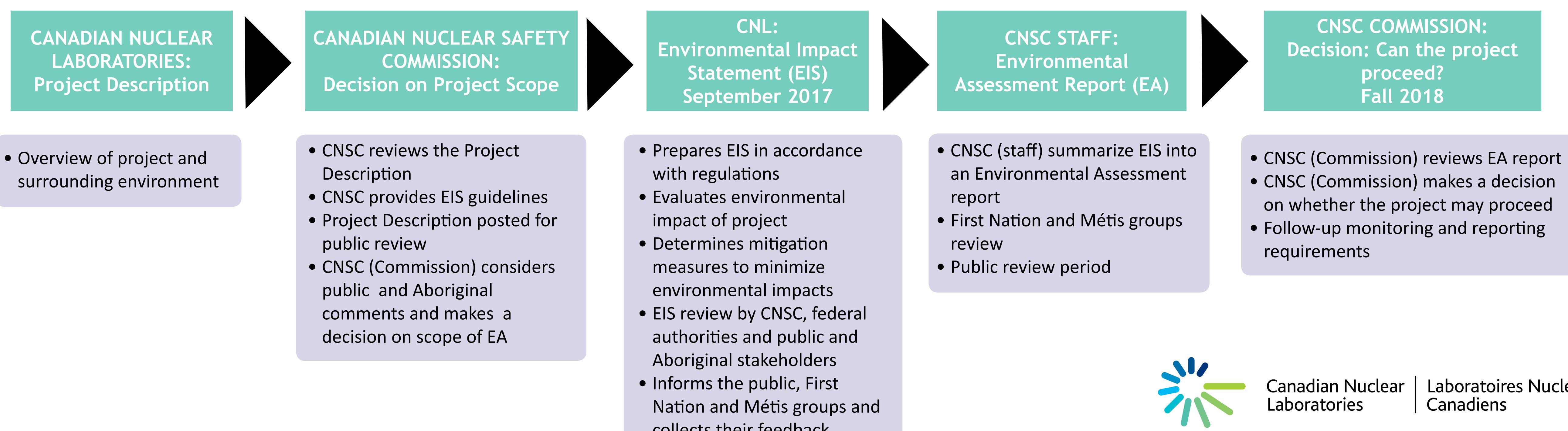
- Environmental Assessment (includes, Environmental Impact Statement, Stakeholder Engagement and Aboriginal Engagement)
- WR-1 in situ decommissioning safety assessment report

#### NSCA Requirements\*

- Request for licence amendment to perform in situ decommissioning of WR-1
- Revised Whiteshell Overview Detailed Decommissioning Plan

\* There are also other requirements beyond those listed.

## Environmental Assessment Process



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# Safe by Design WR-1 Decommissioning

*Ensuring the wellbeing of future communities through planning for normal evolution and disruptive scenarios*



## What is a Post-Closure Safety Assessment?

A Post-Closure Safety Assessment is an assessment to demonstrate understanding of the waste management system through a well-structured, transparent and traceable methodology.

A Post-Closure Safety Assessment will provide a quantitative assessment of the post closure radiological and non-radiological safety of the in situ decommissioning of WR-1.

It will also identify the uncertainties or potential events that have the greatest potential impact on the long-term performance of the in situ decommissioning.

## Disruptive scenarios

Disruptive scenarios refer to events or situations unlikely to occur but which lead to the possible penetration of barriers and abnormal loss of containment. The following are being assessed:

- Early degradation of grout
- Early glaciation
- Digging a well
- Human intrusion
- Site investigation

## Normal evolution

Normal evolution is the expected long-term evolution of the WR-1 site following closure. It is the scenario that is predicted based on reasonable extrapolations of present-day site features and receptors' lifestyles. This includes the site's expected degradation with time.



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# Public Engagement

## WR-1 Decommissioning

At public information sessions and community events, on the telephone and by email, you provided your thoughts and opinions on the project. Several comments have also been registered with the CNSC and the Canadian Environmental Assessment Agency (CEAA) website.

Knowing what you value helps us assess how to protect or mitigate any potential impacts the project could have on the environment.

This is how you inform the environmental assessment and our planning.

### Provide us with your feedback by:

Completing a feedback form and leaving it with our team.

### Contact Us!

Email: [communications@cnl.ca](mailto:communications@cnl.ca)

Telephone: 1-800-364-6989

[www.cnl.ca/wr-1](http://www.cnl.ca/wr-1)

 Twitter: @CNL\_LNC

 Facebook: @CanadianNuclearLaboratories

Feedback from the public, First Nations and Métis, local governments and stakeholder groups throughout project development and project environmental assessment will be considered, along with technical and financial information, as the project team refines project design and develops mitigation measures.

Announcement  
of Project  
May 2016

Preliminary  
engagement  
Summer 2016  
*Gathering feedback*

Round one  
engagement  
Fall 2016  
*Understanding  
interests and  
concerns*

Round two  
engagement  
Winter 2017  
*Preliminary  
results & mitigation*

Submittal of  
Environmental  
impact  
statement  
Fall 2017

**What is important to you?**  
*Let us know*

### Land and Resources Use

- Land and resource use tenures
- Focal areas for public recreation and tourism activity

### What we heard...

### Land and Resources Use for Traditional Purposes

- Traditional land use activity
- Cultural site

### Aquatic

- Fish
- Fish habitat

### Sediment Quality

### Public Safety

### Air Quality

### Socioeconomics

- Employment and income
- Business and economic development
- Government finance
- Housing, services and infrastructure
- Community wellbeing
- Public safety

### Terrestrial Biodiversity

- Migratory birds

### Surface Water Quality and Quantity

### Groundwater Quality and Quantity



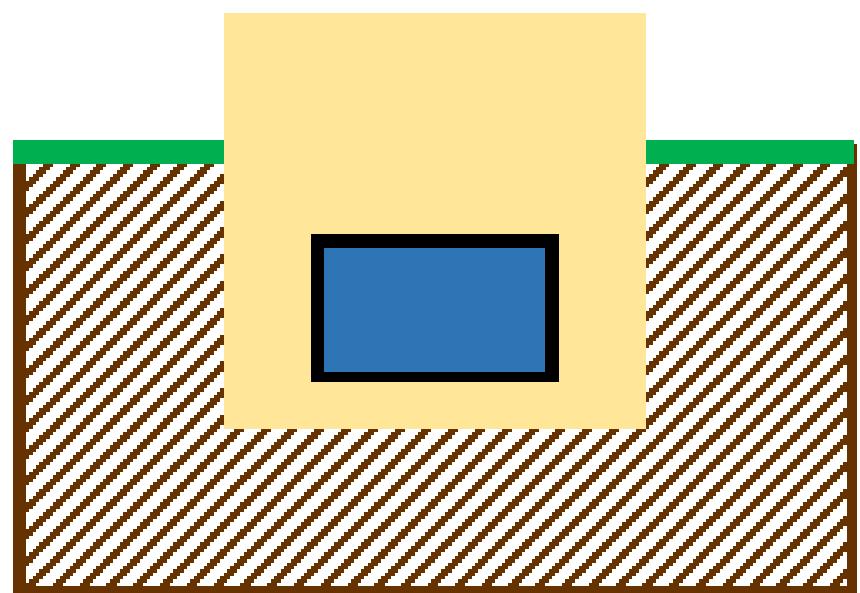
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# WR-1 Decommissioning

## Alternative Means

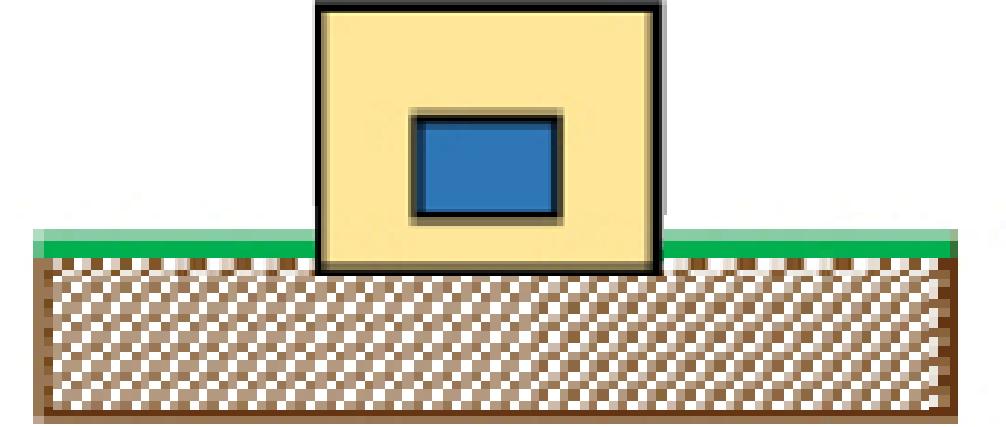
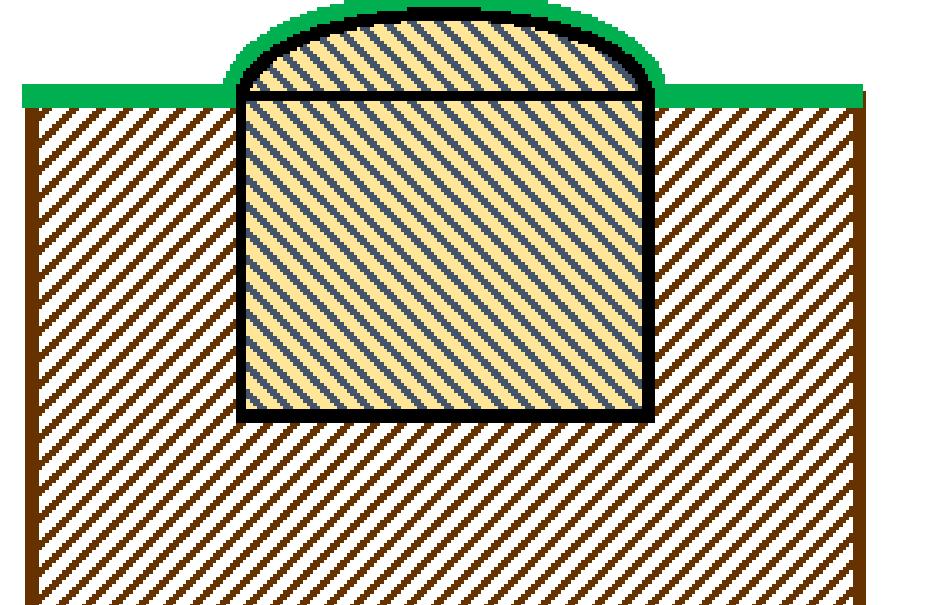
### Continued Storage with Surveillance

Continued Storage with Surveillance (SWS) for 45 years or more.  
In Situ Decommissioning following SWS.



### Partial Dismantling and Removal

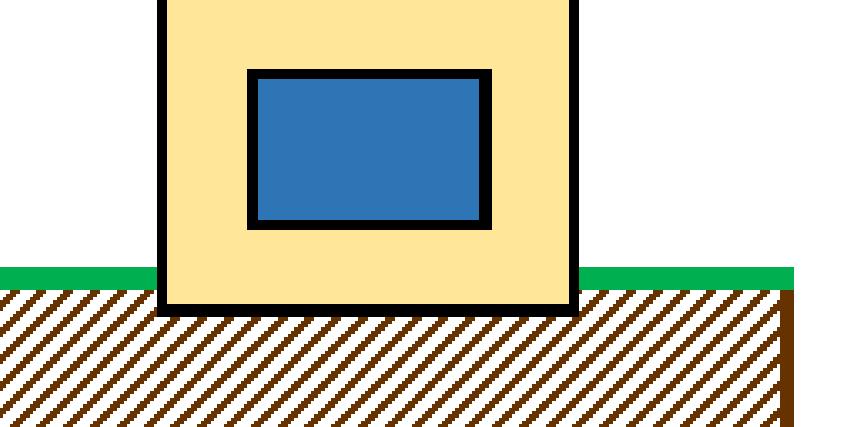
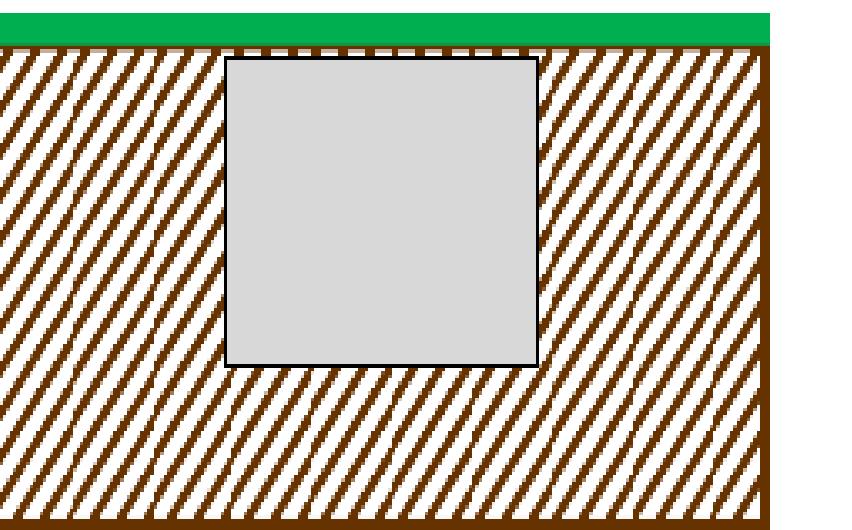
Greater risk of contamination or radiation exposure to workers during decommissioning activities and transport of waste off site.



*Disposal of waste off site*

### Complete Dismantling and Removal

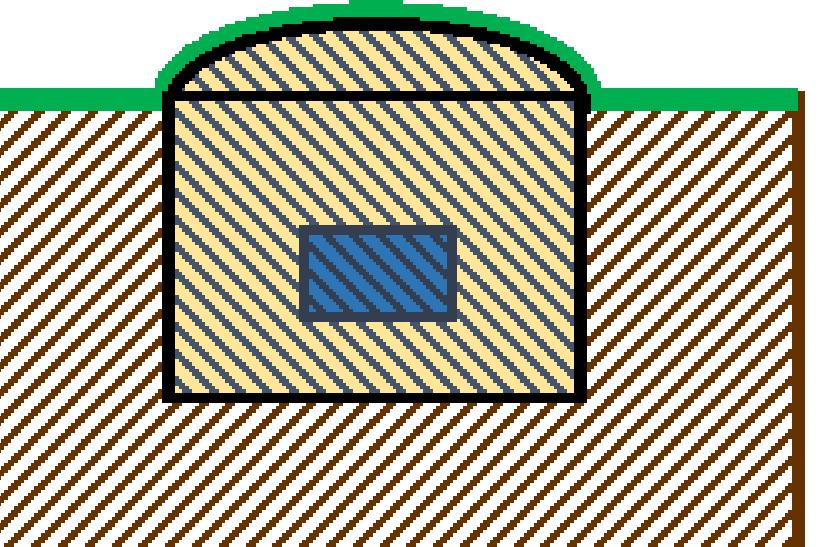
Greater risk of contamination or radiation exposure to workers during decommissioning activities and transport of waste off site.



*Disposal of waste off site*

### In situ Decommissioning

Greater environmental monitoring requirements into the future.



Low level radioactive material

Reactor systems and components

Ground

Grouted low level radioactive material

Grouted reactor systems and components

Grass

Zero activity structure

**Key Objective:**

***Safe and timely disposition of Canada's nuclear legacy liability***

### WR-1 Building Quick Facts:

- Footprint of WR-1 reactor hall 633 m<sup>2</sup> (an NHL Hockey rink is 1586 m<sup>2</sup>)
- 17.8 m below grade
- Exterior wall 60 cm thick
- Reactor vessel 5 m high 2.7 m across with 2.1 m thick wall



# What do you think? WR-1 Decommissioning

Valued components (VCs) are environmental features that may be affected by a project and that have been identified to be of concern by:

- the proponent
- government agencies
- First Nation and Métis groups
- the public

The value of a component not only relates to its role in the ecosystem, but also to the value people place on it. For example, it may have been identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance.

VC selection is based on the potential project-environment interactions in various environmental components.

**What do you value?**

- Grab a comment card and fill it out.
- Use the marker attached to this poster and mark an X next to what is important to you on this poster.
- Or write down what's missing in the bottom of this poster.

**Let us know**

## Contact us!

For more information or to share your thoughts on the Valued Components, related to this project, contact us:

Email: [communications@cnl.ca](mailto:communications@cnl.ca)

Telephone: 1-800-364-6989

[www.cnl.ca/WR-1](http://www.cnl.ca/WR-1)

 Twitter: [@CNL\\_LNC](https://twitter.com/CNL_LNC)

 Facebook: [@CanadianNuclearLaboratories](https://facebook.com/CanadianNuclearLaboratories)

## Valued Components Identified for the WR-1 in situ decommissioning

### Ecological Health

- American Robin
- Barn Swallow
- Loggerhead Shrike
- Grass and shrubs
- Blueberries
- Meadow Vole
- Common shrew
- Snowshoe Hare
- White-tailed Deer
- Red Fox
- Little Brown Myotis
- Northern Myotis
- Canada Warbler
- Snapping Turtle
- Invertebrates
- Horned Grebe
- Trumpeter Swan
- Mallard
- Mink

### Land and Resource Use

- Winnipeg River
- Land Tenure
- Outdoor Recreation
- Tourism
- Cultural sites
- Traditional land



### Socio-economic

- Employment
- Income
- Business opportunities
- Government finances
- Community infrastructure
- Community services
- Community well-being
- Public safety

### Human Health

- Worker health
- Public health

### Aquatic

- Carmine Shiner
- Lake Sturgeon
- Walleye
- Aquatic plants
- Invertebrates
- Fish & Fish Habitat



### Atmospheric Environment

- Air quality
- Greenhouse gases



### Physical Environment

- Geology
- Hydrogeology

**What's missing? Write it down.**

# Decommissioning Solution

## WR-1 Decommissioning



### Why in situ decommissioning?

In situ decommissioning has been selected as the proposed 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 WR-1 property
- Reduced cost to Canadian tax payers

In situ decommissioning requires additional long-term monitoring of the impacted area.

