



Supplementary Information

Presentation from the Canadian Nuclear Laboratories

In the Matter of the

**Canadian Nuclear Laboratories,
Chalk River Laboratories**

Application to amend its Chalk River
Laboratories site licence to authorize the
construction of a near surface disposal
facility

**Commission Public Hearing
Part 1**

February 22, 2022

Renseignements supplémentaires

Présentation des Laboratoires Nucléaires Canadiens

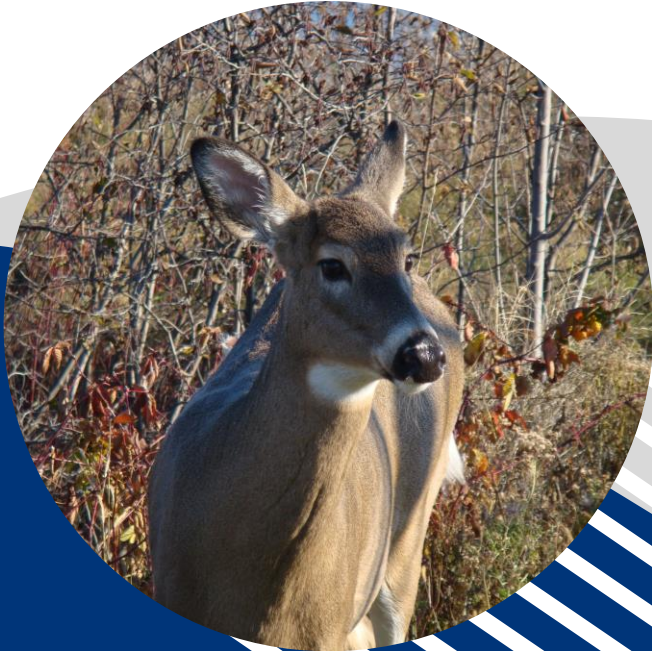
À l'égard de

**Laboratoires Nucléaires Canadiens,
Laboratoires de Chalk River**

Demande visant à modifier le permis du site des
Laboratoires de Chalk River pour autoriser la
construction d'une installation de gestion des
déchets près de la surface

**Audience publique de la Commission
Partie 1**

22 février 2022



We would like to acknowledge

The Chalk River Laboratories site is located on the unceded and unsurrendered territory of the Algonquin Anishnaabe people. As an organization, CNL recognizes and appreciates their historic connection to this place. CNL also recognizes the contributions that First Nations, Métis, Inuit and other Indigenous Peoples have made, both in shaping and strengthening this community in particular, and this province and country as a whole.



Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

Near Surface Disposal Facility Project




Canadian Nuclear Laboratories

CNSC Commission Hearing – Part 1

February 22, 2022 | 232-508760-130-000 | CMD 22-H7.1A



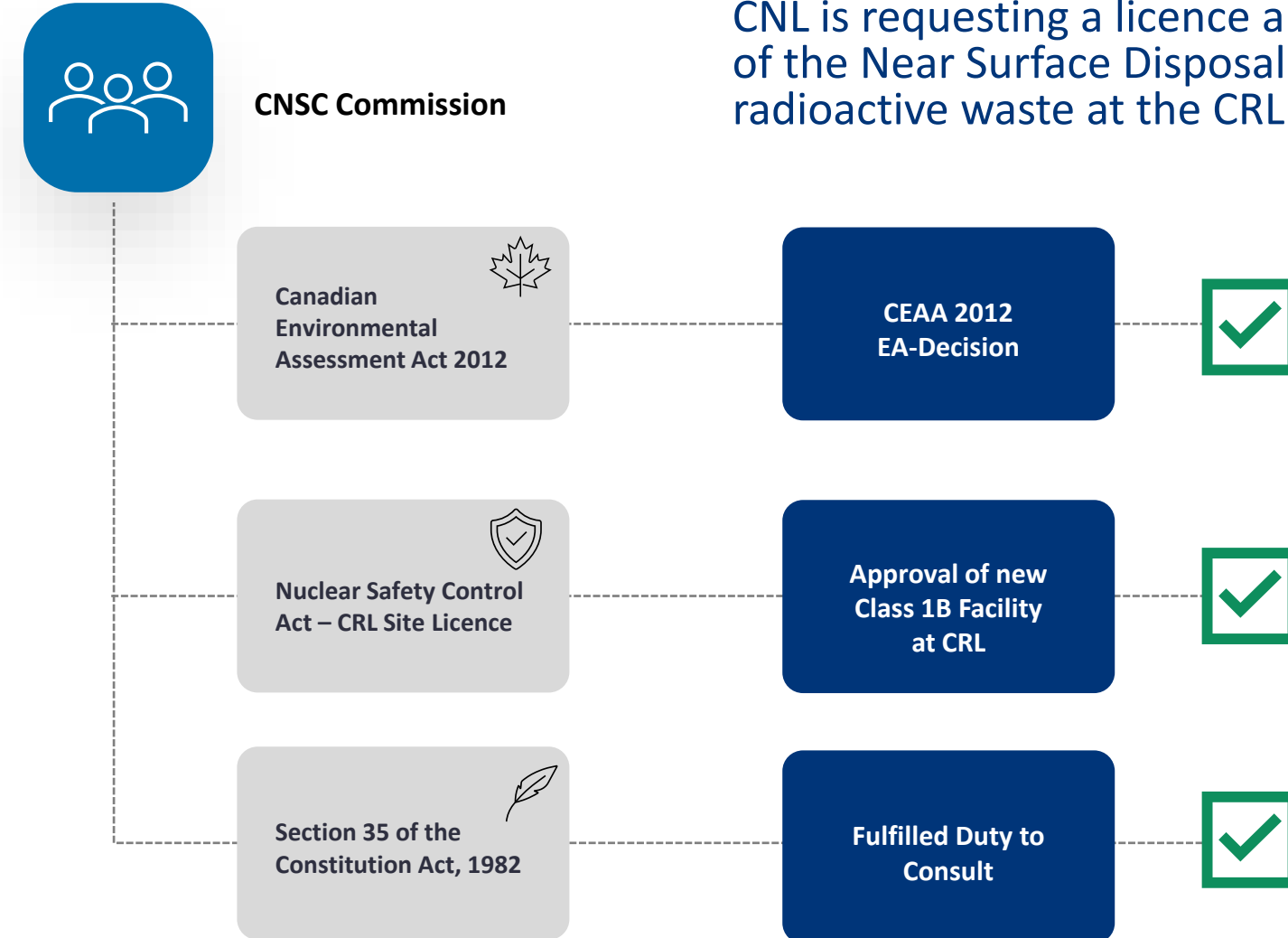
Presenters

-  Phil Boyle | Vice President Central Technical Authority & Chief Nuclear Officer
-  Joe McBrearty | President & Chief Executive Officer
-  Meggan Vickerd | General Manager, Waste Services





CNL is requesting a licence amendment to proceed with the construction of the Near Surface Disposal Facility for the disposal of solid low-level radioactive waste at the CRL site.





Overview

-  The **Importance of the NSDF Project**
-  **Indigenous and Public Engagement**
-  NSDF is **Protective of the Environment** and the **Ottawa River**
-  NSDF is **Protective of Human Health**
-  **CNL Management System**





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3 MEMORANDUMS OF UNDERSTANDING



3 CONTRIBUTION AGREEMENTS



1 LETTER OF INTENT



130 NSDF PROJECT COMMITMENTS TO INDIGENOUS COMMUNITIES



3 LONG-TERM RELATIONSHIP AGREEMENTS IN PROGRESS



CNL recognizes the importance of meaningful Indigenous engagement and relationship building is ongoing





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Restore and
protect Canada's
environment



Clean energy for today
and tomorrow



Contributing to the
health of Canadians



Legacy Waste Management Areas at Chalk River Laboratories

CNL (and previously AECL) has been safely storing waste in the licensed Waste Management Areas for over 70 years. The Waste Management practices were consistent with the time and have not resulted in any unacceptable offsite impacts.



Waste Management Area A : 1946 - 1956

Liquid Dispersal of Low-Level Liquid Waste: 1953 - 2000



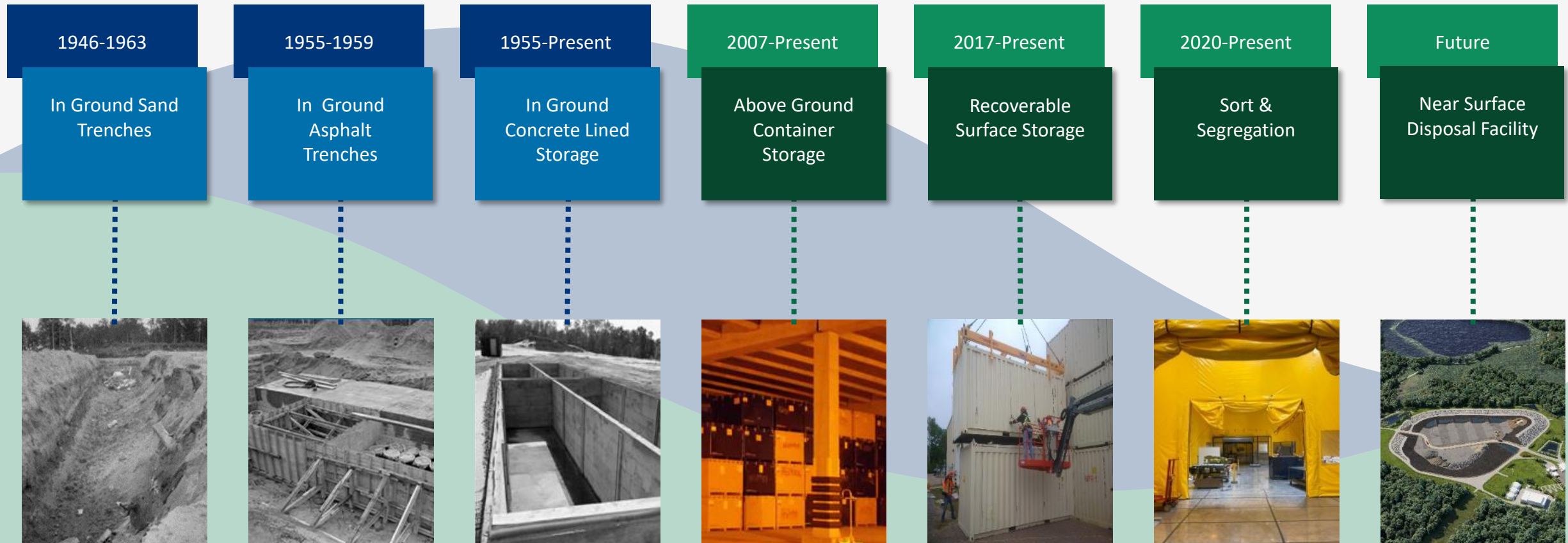
Waste Management Area F : 1976 - 1980



Waste Management Area C: 1963 - 2006



Evolution to Modern Waste Management Standards



*Risk decreases as technology improves



90%

Chalk River
Laboratories



5%

AECL-owned
sites



5%

Universities &
Hospitals



Whiteshell
Laboratories

Chalk River
Laboratories

Douglas Point

Gentilly-1
Prototype
Reactor



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The Importance of the NSDF Project



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Waste Disposal Cells

**Surface Water
Management**

**Wastewater
Treatment
Plant**

**Support
Facilities**





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Waste Disposal Cells

**Surface Water
Management**

**Wastewater
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**Support
Facilities**





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Engineered Containment Mound





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Monitoring and Surveillance



232-508760-130-000 - UNRESTRICTED

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Indigenous Engagement



CNL is committed to working in collaboration with local and interested Indigenous Peoples including:

- Algonquins of Ontario
- Algonquins of Pikwakanagan First Nation
- Métis Nation of Ontario
- Algonquin Anishinabeg Nation Tribal Council
- Kitigan Zibi Anishinabeg First Nation
- Kebaowek First Nation
- Williams Treaties First Nations
 - Alderville First Nation
 - Beausoleil First Nation
 - Georgina Island First Nation
 - Rama First Nation
 - Curve Lake First Nation
 - Hiawatha First Nation
 - Scugog Island First Nation
- Anishinabek Nation
- Algonquin Nation Secretariat
- Mohawks of the Bay of Quinte





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Public Engagement



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71 PRESENTATIONS & SITE TOURS

23 PUBLIC INFORMATION SESSIONS

19 COMMUNITY EVENTS

17 ENVIRONMENTAL STEWARDSHIP COUNCIL MEETINGS

13 WEBINARS

140 SOCIAL MEDIA POSTS

32 YOUTUBE VIDEOS



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CNL will continue engagement efforts throughout the life cycle of the NSDF demonstrating transparency and access to information

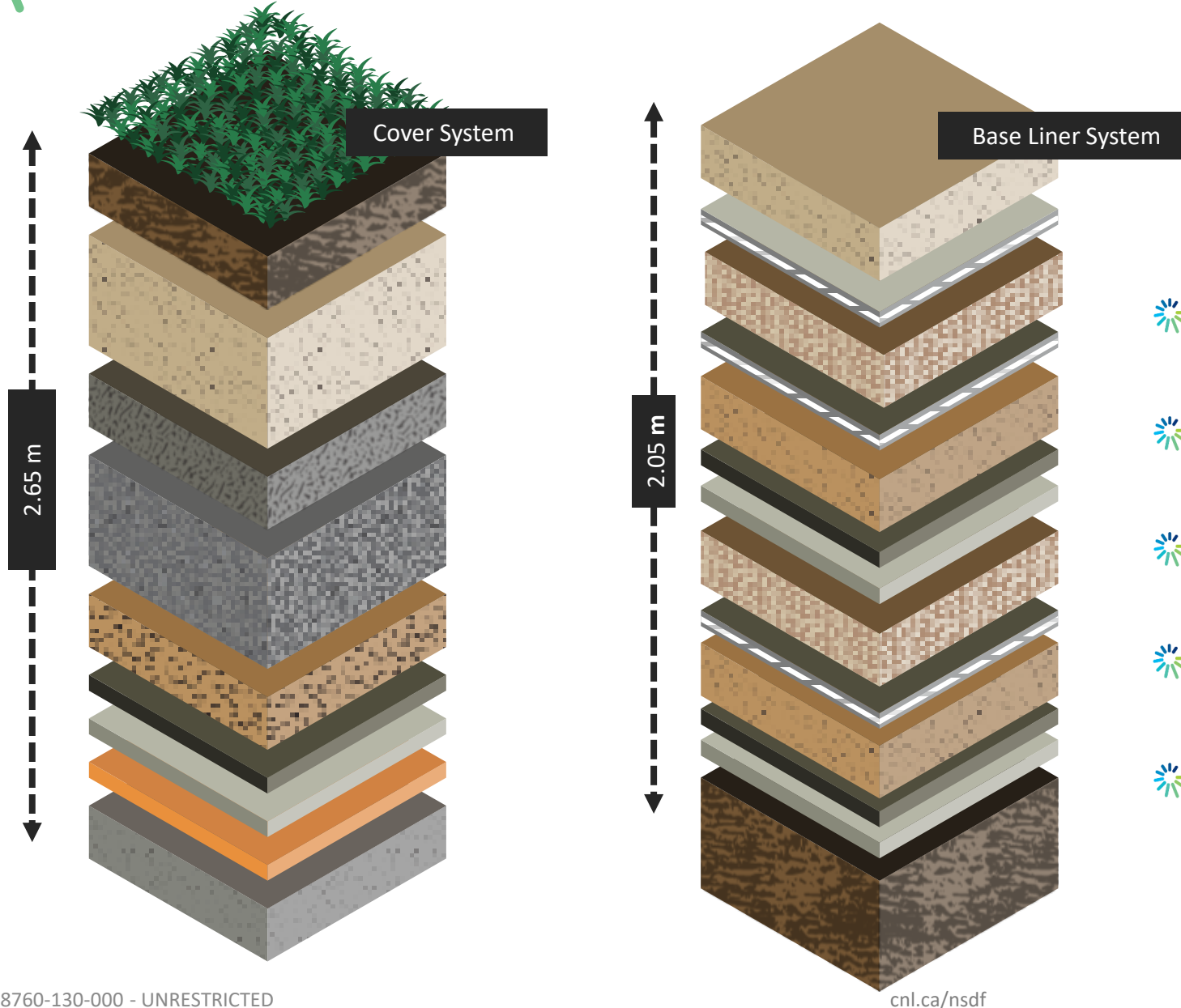




NSDF is Protective of the Environment and the Ottawa River



Engineered Containment

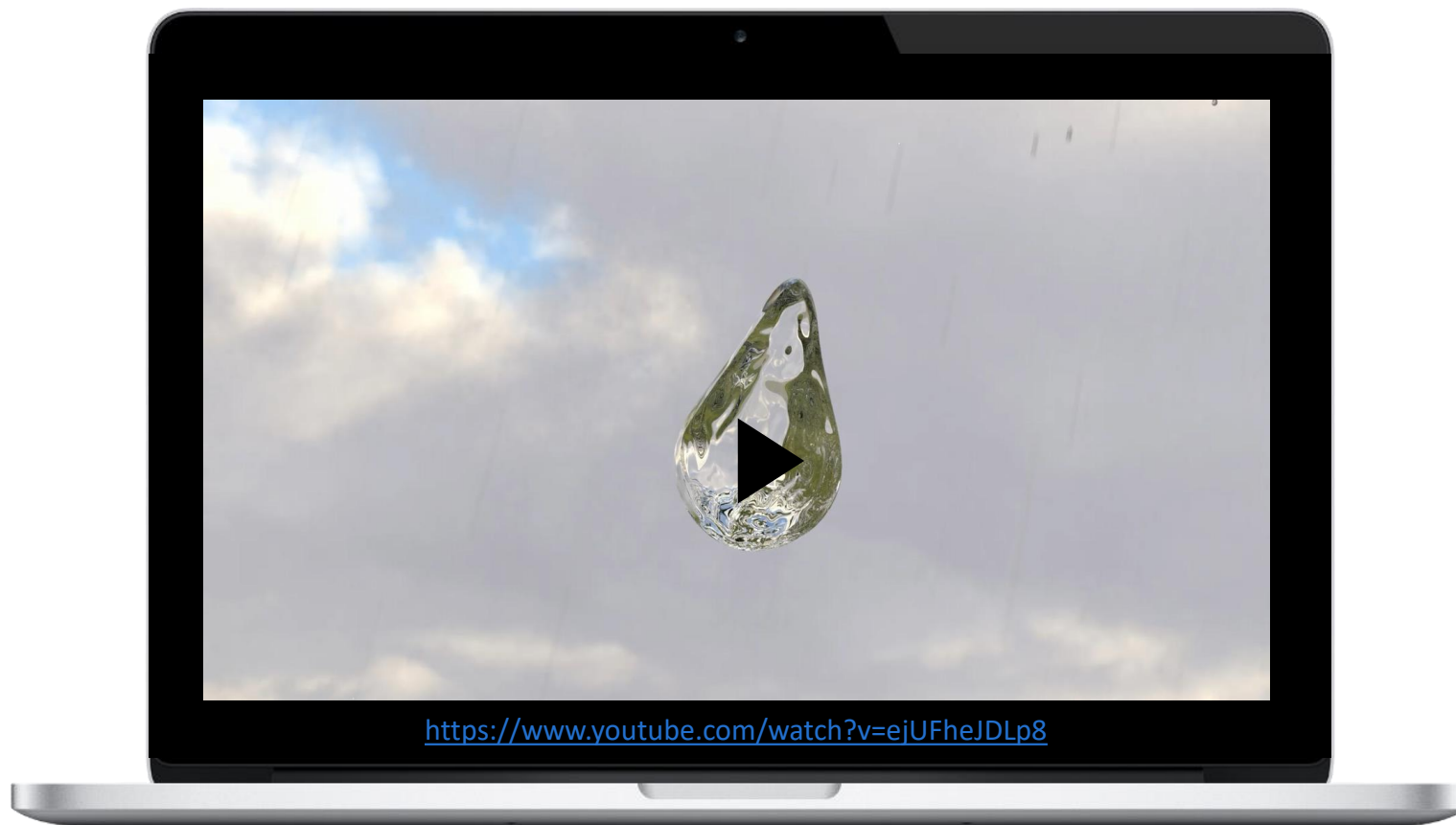


- ✦ Containment and isolation of waste for more than 550 years
- ✦ Multiple layers of natural and synthetic barriers design to work together
- ✦ Passive safety features which also serve multiple safety functions
- ✦ Rigorous testing demonstrates design life will be exceeded
- ✦ Based on international best practices



Responsible Water Management

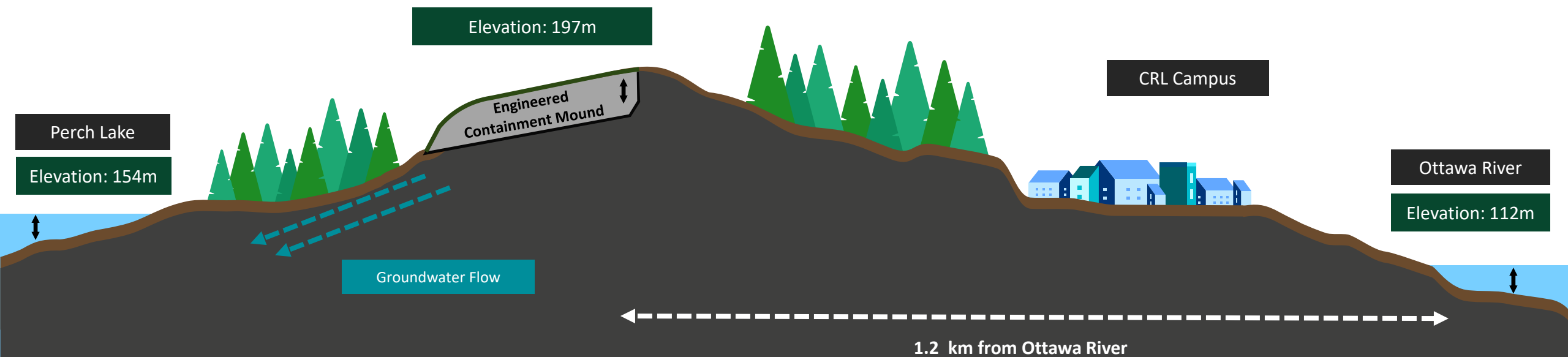
- ☀ Features and operational practices minimize quantity of leachate
- ☀ Wastewater Treatment Plant uses best available technology
- ☀ Treatment process confirmed with pilot testing
- ☀ Controlled discharge to environment after effluent targets met





The Site Is Appropriate

- Alternative means assessment included site selection process
- Sited on a bedrock ridge sloping away from Ottawa River
- Elevation well above the worst case flood levels
- Extensive site characterization performed





Designed to withstand the most extreme events



Forest Fires



Seismic
Events



Extreme Rainfall /
Potential for
Flooding



High Winds /
Tornadoes



Climate Change



NSDF is Protective of Human Health



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Radiation in Everyday Life



.0001 mSv

Eating a single banana



.03 mSv

A flight from
Toronto to
Vancouver



.125 mSv

An X-Ray at the
dentist



.3 mSv

Average
annual dose
from eating
everyday foods



1.5 mSv

Treatment for thyroid
cancer



1.8 mSv

Average annual dose from
natural background radiation
Canada

In Canada, the annual effective dose limit for the public is 1 mSv.



Only Low-Level Waste

"Low-level radioactive waste (LLW) contains material with radionuclide content above established clearance levels and exemption quantities, but generally has limited amounts of long-lived activity. LLW requires isolation and containment for periods of up to a few hundred years and is suitable for disposal in near surface facilities."^{1, 2, 3}

¹ REGDOC-2.11.1 Waste Management, Volume 1: Management of Radioactive Waste

² CSA N292.0 General Principles for the management of radioactive waste and irradiated fuel

³ IAEA GSG-1 Classification of Radioactive Waste

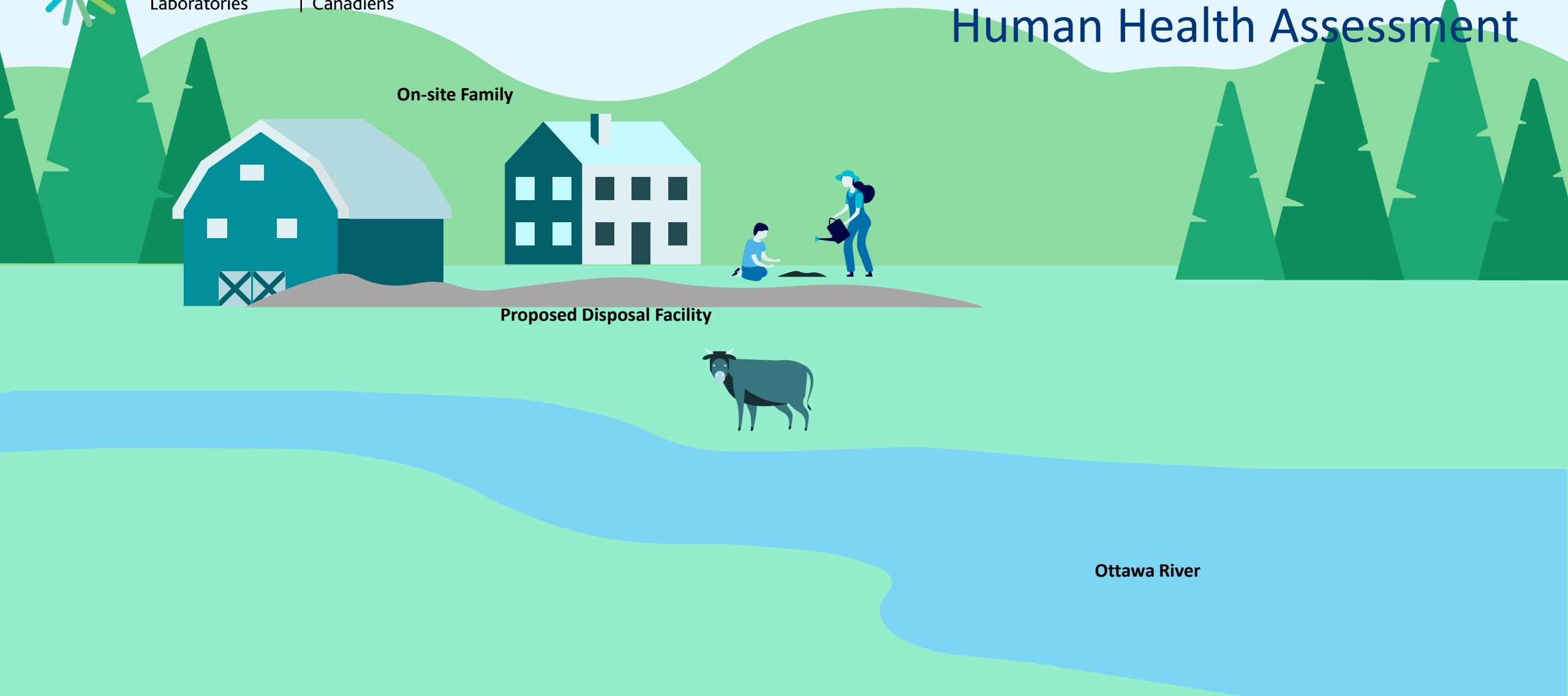


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Human Health Assessment

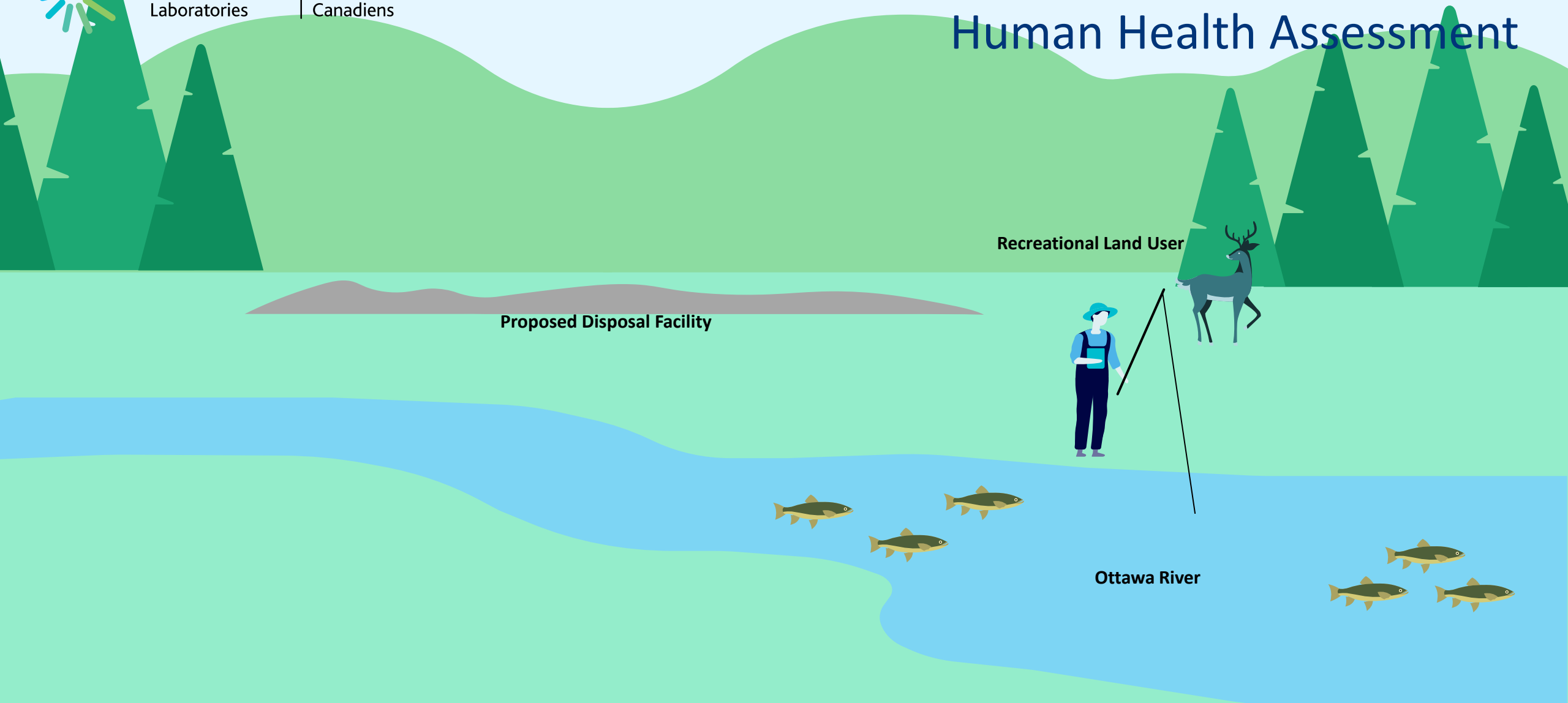




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Human Health Assessment





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Human Health Assessment

Proposed Disposal Facility



Ottawa River

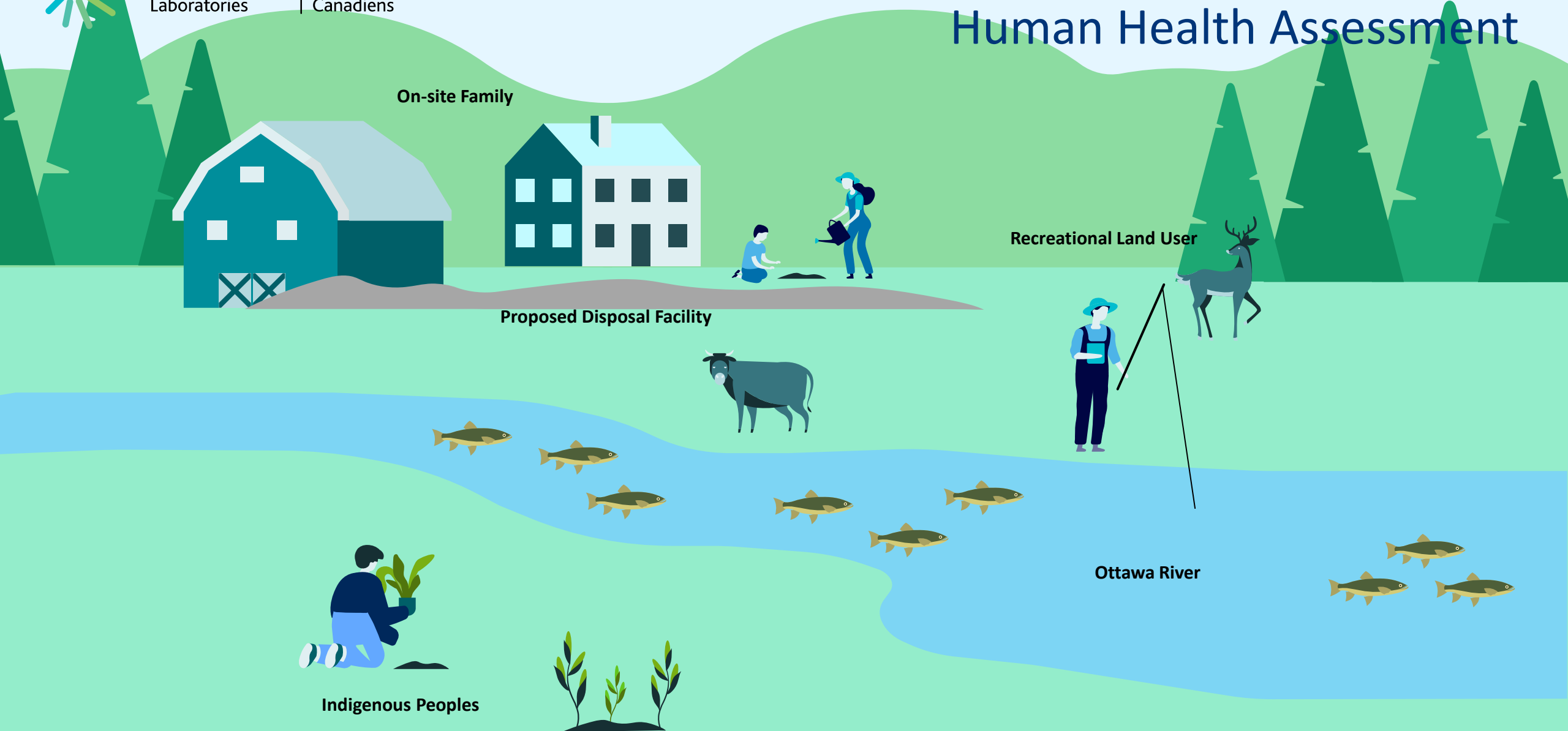


Indigenous Peoples





Human Health Assessment





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Long-term Safety of Human Health



.0000015 mSv
annually -

Public downstream in
Ottawa/ Gatineau



.0001 mSv
Eating a single
banana



.012 mSv
annually -
Recreational
land user



.015 mSv
annually -
On-site family
living on top
of NSDF



.03 mSv
A flight from
Toronto to
Vancouver



.077 mSv
annually -
Indigenous
Peoples



.3 mSv
Average
annual dose
from eating
everyday foods



1.8 mSv
Average yearly dose from
background radiation
anywhere in Canada

In Canada, the annual effective dose limit for the public is 1 mSv.



CNL has a Robust Management System





Management
System



Human Performance
Management



Operating
Performance



Safety
Analysis



Physical
Design



Fitness for
Service



Radiation Protection



Conventional Health
and Safety



Environmental
Protection



Emergency
Management and Fire
Protection



Waste Management



Security



Safeguards and Non-
Proliferation



Packaging and
Transport

The life cycle of the NSDF is supported by CNL's existing Management System defined in the CRL site Licence Conditions Handbook.



CNL's construction process provides the framework for performing construction at CNL sites to ensure adequate control and documentation within approved safety margins and regulatory or statutory requirements.



Management
System



Human Performance
Management



Operating
Performance



Safety
Analysis



Physical
Design



Conventional Health
and Safety



Environmental
Protection



Emergency
Management and
Fire Protection





CNL Operating Experience at Port Granby





LEGEND

Air Monitors

- H3 - Air
- TLD - Air
- Gamma - Air

Water Monitors

- ▲ Surface Water
- ▲ Liquid Effluent
- ▲ Ground Water




- CRL
- NSDF
- Water

CRL Off-site Environmental Monitoring









NSDF Environmental Assessment Follow-up Monitoring

-  Effluent, Environment, Groundwater Programs
-  Received public, stakeholder and Indigenous feedback on draft plan
-  Discussions have started on Indigenous involvement in monitoring



Our Commitments

-  We will apply modern waste management standards and technologies to reduce risks associated with radioactive wastes
-  We will continue engagement with the public and Indigenous Peoples and proactively address concerns
-  We will ensure the protection of human health and the environment during every phase of the project
-  We will carry out periodic reviews and updates of the safety case through all licensing stages

CNL is requesting a licence amendment to proceed with the construction of the Near Surface Disposal Facility for the disposal of solid low-level radioactive waste at the CRL site.



Meegwetch. Thank you. Merci.



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