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Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2021

CNSC Staff Presentation

Commission Meeting
November 2, 2022

CMD 22-M33.A





ROR for Canadian Nuclear Laboratories Sites: 2021
CMD 22-M33.A

Canadian Nuclear Laboratories (CNL) Regulatory Oversight Report (ROR) – 2021

The report includes:

- CNSC staff regulatory oversight efforts
- Assessment of CNL sites
 - CNSC's 14 Safety and Control Areas (SCA) ratings for CNL sites
- Indigenous consultation and engagement
- ROR Dashboard
- Reportable events
- Other matters of regulatory interest
 - Public engagement
 - COVID-19 response

	
UNPROTECTED/NON PROTÉGÉ	
ORIGINAL/ORIGINAL	
CMD : 22-M33	
Date signed/Signé le : 21 JULY 2022	
Annual Program Report	Rapport annuel sur les programmes
Canadian Nuclear Laboratories	Laboratoires Nucléaires Canadiens
Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2021	Rapport de surveillance réglementaire pour les sites des Laboratoires Nucléaires Canadiens : 2021
Public meeting	Réunion publique
Scheduled for: November 2 or 3, 2022	Prévue pour : Les 2 ou 3 novembre 2022
Submitted by: CNSC Staff	Soumis par : Le personnel de la CCSN
e-Doc 6808833 (WORD) e-Doc 6837033 (PDF)	
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Indigenous Consultation and Engagement

- Continued to engage and identify opportunities to discuss and address all topics of interest and concern (e.g., regular facility updates, ongoing environmental assessments, environmental monitoring, collaborative long-term engagement)
- Informed Indigenous Nations and communities of participant funding opportunities for this regulatory oversight report
- Hosted a virtual engagement session with Indigenous Nations and communities in addition to organizations in proximity to CNL sites for this report

September 8, 2022

Regulatory Oversight Report for Canadian Nuclear Laboratory Sites: 2021 – Engagement Session

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**CNSC is committed to building
long-term relationships with
Indigenous Nations and
communities**



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CNL ROR 2021 Indigenous Engagement Session

On September 8, 2022 an engagement session was held to have a discussion with Indigenous Nations and communities in the following areas:

- Sites covered by the 2021 CNL ROR
- Methods CNSC staff take to engage with Indigenous Nations and communities with regards to the ROR
- 2021 CNL ROR findings
- How to participate in CNSC Commission proceedings including the intervention process
- An opportunity to discuss and raise questions / concerns with CNSC staff



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Results from the 2021 CNL ROR Indigenous Engagement Session

There were 15 participants in attendance and of those that responded:

- Many participants indicated that prior to the session they had a poor understanding of the ROR
- Following the session, nearly all participants indicated that the engagement session helped with their understanding of the ROR
- Majority of participants indicated that they were satisfied with the responses provided by CNSC staff to their questions
- All attendees expressed interest in attending these sessions for future RORs

CNSC staff remain committed to conducting Indigenous engagement sessions for future RORs



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CNL SITES



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CNL Sites

Manitoba

Winnipeg

Lake Winnipeg

Whiteshell
Laboratories

Ontario

Quebec

Gentilly-1

Quebec
City

Chalk River
Laboratories

Nuclear Power
Demonstration

Ottawa

Port Hope,
Port Granby

Toronto

Douglas
Point

Lake Superior

Lake Huron

Lake Ontario

Lake Erie

Legend



Low-level radioactive waste



Spent fuel



Intermediate-level radioactive waste



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CNSC STAFF REGULATORY OVERSIGHT



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CNSC Staff Regulatory Focus – Chalk River Laboratories

- Decommissioning of legacy facilities and management of waste
- Planning and construction of new facilities, including science research facilities
- Assessed licensing and Environmental Assessment submissions for the Near Surface Disposal Facility
- Improvements required to the security program



CNSC staff performing an inspection at Chalk River Laboratories. Source: CNSC staff



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CNSC Staff Regulatory Focus – Whiteshell Laboratories

- Evaluating waste management practices and planned decommissioning work
- Reviewing submissions related to proposed construction work (e.g. Recoverable Surface Storage and Staging Area)
- Assessing licensing and Environmental Assessment submissions for proposed projects (e.g. In-situ Decommissioning of Whiteshell Reactor-1)
- Continuing to review Environmental Risk Assessments submissions for specific facilities (e.g. Landfill and Lagoon)
- Continuing to evaluate security arrangements



CNSC staff performing an inspection at Whiteshell Laboratories. Source: CNSC staff



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CNSC Staff Regulatory Focus – Prototype Power Reactors (Douglas Point Waste Facility, Gentilly-1 Waste Facility and Nuclear Power Demonstration Waste Facility)

For Douglas Point Waste Facility, Gentilly-1 Waste Facility, and Nuclear Power Demonstration Waste Facility:

- Inspection was focused on hazard reduction and waste characterization work, in preparation for full decommissioning
- Monitored CNL's implementation of storage-with-surveillance activities

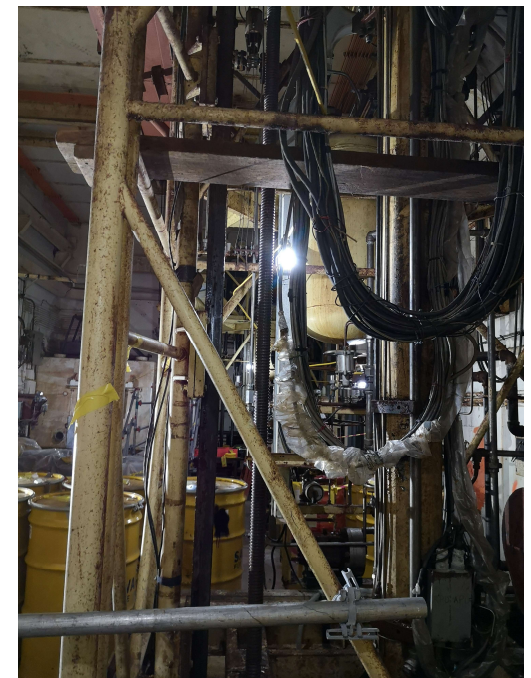
For Nuclear Power Demonstration Waste Facility:

- Assessed licensing and Environmental Assessment submissions for proposed Nuclear Power Demonstration in-situ decommissioning

For Douglas Point Waste Facility and Gentilly-1 Waste Facility:

- Reviewed environmental protection documents

**Licence amendment to Douglas Point Waste Facility was authorized on
March 12, 2021**



*Nuclear Power Demonstration
Waste Facility. Source: CNSC staff*



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CNSC Staff Inspections at CNL Sites 2021

Site/Facility/Project	Inspections (Notice(s) of Non-Compliance) (NNC)
Chalk River Laboratories	11 (30)
Whiteshell Laboratories	4 (11)
Port Hope Project	6 (21)
Port Granby Project	2 (5)
Douglas Point Waste Facility	1 (0)
Gentilly-1 Waste Facility	0 (0)
Nuclear Power Demonstration Waste Facility	1 (2)
Total	25 (69)

All Notice(s) of Non-Compliance (NNC) were considered low-risk and did not have an impact on health, safety, or environment at CNL sites



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CNSC STAFF ASSESSMENT



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Satisfactory (SA)
Below expectations (BE)

CNL 2021 SCA Performance Ratings

Safety and Control Area	Chalk River Laboratories	Whiteshell Laboratories	Douglas Point Waste Facility	Gentilly-1 Waste Facility	Nuclear Power Demonstration Waste Facility
Management system	SA	SA	SA	SA	SA
Human performance management	SA	SA	SA	SA	SA
Operating performance	SA	SA	SA	SA	SA
Safety analysis	SA	SA	SA	SA	SA
Physical design	SA	SA	SA	SA	SA
Fitness for service	SA	SA	SA	SA	SA
Radiation protection	SA	SA	SA	SA	SA
Conventional health and safety	SA	SA	SA	SA	SA
Environmental protection	SA	SA	SA	SA	SA
Emergency management and fire protection	SA	SA	SA	SA	SA
Waste management	SA	SA	SA	SA	SA
Security	BE	BE	SA	SA	SA
Safeguards and Non-proliferation	SA	SA	SA	SA	SA
Packaging and transport	SA	SA	SA	SA	SA



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Security SCA at Chalk River Laboratories

- The Security SCA was rated below expectations following a desktop review of the security response arrangements at Chalk River Laboratories
- An order was issued requiring CNL to implement appropriate corrective actions
- CNL implemented compensatory measures and are working towards completing the necessary program updates to address this Order
- There was no impact to health, safety and security of nuclear substances at Chalk River Laboratories
- Additional information is available to the Commission in the supplemental CMD 22-M33.B (protected information)

CNL's compensatory measures reduced the risk to security of nuclear substances at Chalk River Laboratories.



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Security SCA at Whiteshell Laboratories

- The Security SCA was rated below expectations
- CNL developed a Corrective Action Plan to address the NNCs
- All NNCs have been closed following an inspection in September 2022
- There was no impact to health, safety and security of nuclear substances at Whiteshell Laboratories
- Additional information is available to the Commission in the supplemental CMD 22-M33.B (protected information)

CNL's corrective actions for improving the performance in security at Whiteshell Laboratories are acceptable.



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Radiation Protection SCA

CNL's corporate
and site-level
programs were
effective in
controlling
radiological
hazards

Action level for
Committed effective
dose was exceeded for
two CNL New Energy
Workers (NEWs)

Doses to workers and
the public were well
below regulatory limits
at all CNL sites



*CNSC inspector conducting a field
inspection at Chalk River Laboratories.
Source: CNSC staff*



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Estimated Dose to the Public and Dose to NEWs 2021

Maximum doses

Regulatory limit

Estimated dose

Effective dose

The public

~ 0.00
mSv/y

1 mSv/y

The maximum estimated dose to the public from any CNL site in 2021 was at CRL

Nuclear energy workers (NEWs)

7.01
mSv/y

50 mSv/y

The maximum effective dose received by a NEW in 2021 across CNL sites was at CRL

**Estimated dose to the public and dose to NEWs remain low
and radiation doses remain ALARA**



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Conventional Health and Safety SCA

CNL Staff	CRL	WL	DP	G-1	NPD
Person Hours Worked	5 358 630	684 000	29 130	20 350	11 600
Lost-Time Injuries	3	0	0	0	0
Working Days Lost	4	0	0	0	0
Frequency ^a	0.11	0	0	0	0
Severity ^b	0.15	0	0	0	0

**CNL
maintained
effective
oversight of
health and
safety of
workers**

^a Frequency = number of lost-time injuries x 200 000 hours of exposure ÷ person hours worked (based on 100 full-time workers)

^b Severity = number of working days lost x 200 000 hours of exposure ÷ person hours worked (based on 100 full-time workers)

Contractors	CRL	WL	DP	G-1	NPD
Lost-Time Injuries	2	0	0	0	0



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Environmental Protection SCA

CNL's effluent
verification
monitoring programs
at all sites were
effective in
controlling airborne
and waterborne
releases of
radioactive and
hazardous substances

All releases in 2021
were well below
regulatory limits at all
CNL sites

One action level
exceedance at the
Fuels and Materials
Cells Facility



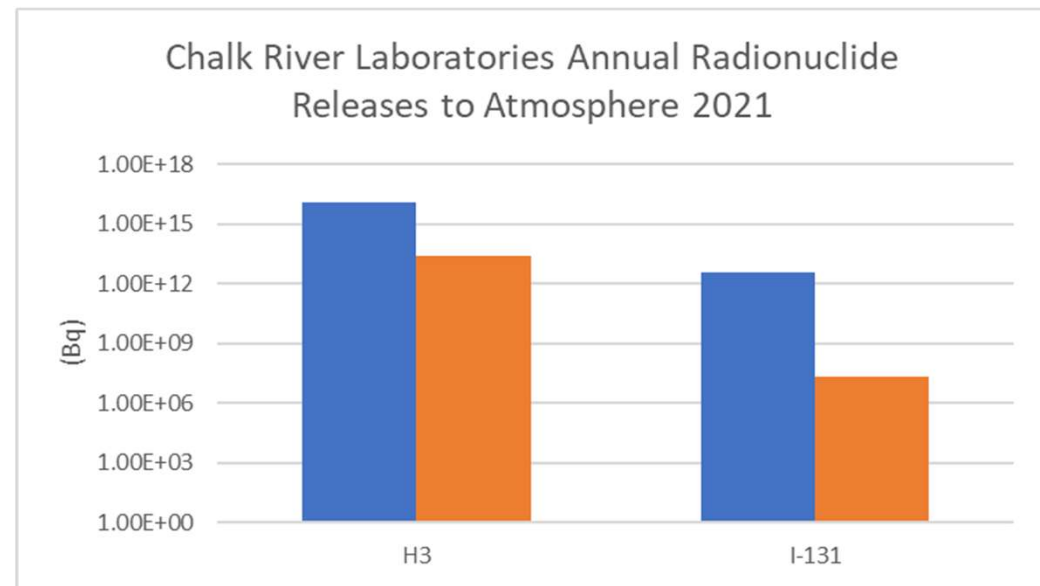
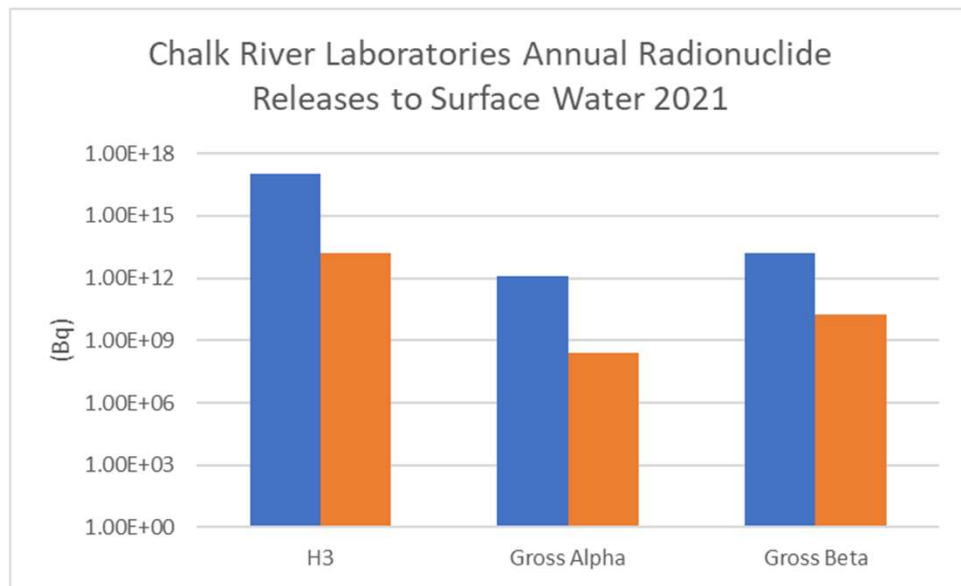
*Water sample collection
conducted by CNSC staff. Source:
CNSC staff*



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Releases to the Environment 2021 – Chalk River Laboratories

CNL's environmental protection programs were effective in controlling environmental releases



■ Release Limit ■ 2021 Releases

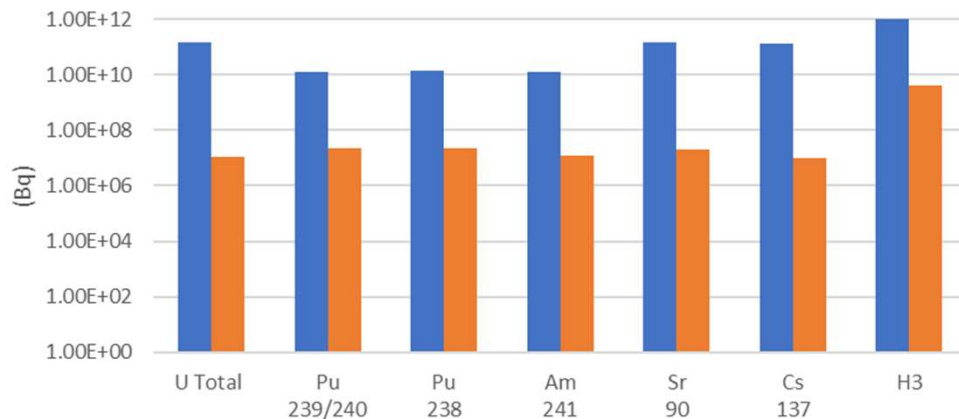


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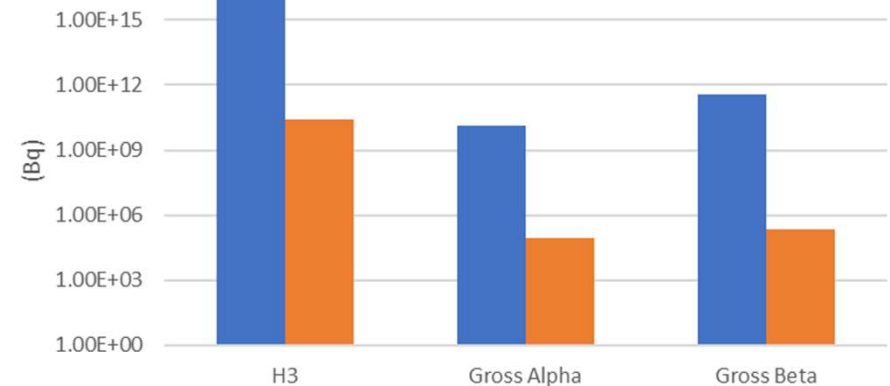
Releases to the Environment 2021 – Whiteshell Laboratories

CNL's environmental protection programs were effective in controlling environmental releases

Whiteshell Laboratories Annual Radionuclide Releases
to Surface Water 2021



Whiteshell Laboratories Annual Radionuclide
Releases to Atmosphere 2021



■ Release Limit ■ 2021 Releases



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Event Reporting at CNL Sites

- CNL is required to report specific types of events, as per REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*
- CNSC staff analyzed all event reports and are satisfied with CNL's corrective actions
- No trends of concern were identified by reports provided by CNL

Site/Facility/Project	# of Events
Chalk River Laboratories	37
Whiteshell Laboratories	6
Douglas Point Waste Facility	1
Gentilly-1 Waste Facility	1
Nuclear Power Demonstration Waste Facility	0
Total	45

CNL met event reporting requirements in 2021



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OTHER MATTERS OF REGULATORY INTEREST



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CNSC Public Engagement

In 2021, CNSC staff conducted engagement activities, which included:

- Virtual webinars
- Participation in community events (e.g., Petawawa Showcase, Nuclear Power Demonstration Waste Facility 60th anniversary, and CRL Open House)
- Sharing information through CNSC website, social media channels, annual regulatory reports, dashboards

CNSC is committed to disseminate information to the public and provide opportunities for discussion



CNSC staff conducting outreach at the Petawawa Showcase. Source: CNSC staff



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Participant Funding Program

- CNSC made approximately \$107,190 available through the Participant Funding Program
- Funding was awarded to 8 recipients based on independent funding committee recommendations

Recipients

Algonquins of Pikwakanagan First Nation

Canadian Environmental Law Association

Chippewas of Kettle and Stony Point First Nation

Grand Council of Treaty #3

Manitoba Métis Federation

Sagkeeng First Nation

Curve Lake First Nation

Nuclear Transparency Project



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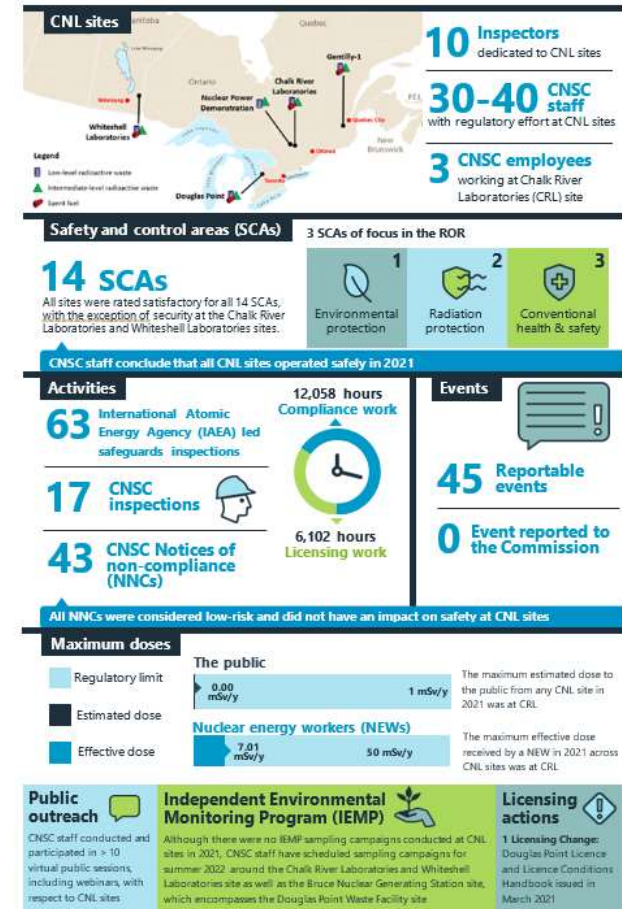
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Regulatory Oversight Report Dashboard

- ROR dashboard was developed to be:
 - included in 2021 CNL ROR (CMD 22-M33, Appendix B)
 - used to complement engagement activities with Indigenous Nations and communities

Regulatory Oversight Report (ROR) Dashboard of Canadian Nuclear Laboratories Sites: 2021

This dashboard reports on the safety performance of Canadian Nuclear Laboratories (CNL) sites and the efforts of the Canadian Nuclear Safety Commission (CNSC) to ensure the safety and protection of the people and the environment around the sites in 2021. For the full ROR, please refer to CMD 22-M33.



Port Hope Project and Port Granby Project are not included in the dashboard data.



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KEY THEMES FROM INTERVENTIONS



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Key Themes from Interventions

1. Indigenous consultation and engagement

- Further consultation on licensed activities at CNL sites
- Expanded involvement in the consultation process (e.g. to include attending community feasts, outreach at schools, involvement in sampling campaigns)
- Request for CNSC to consider variations for collaboration and engagement to expand information sharing opportunities in a way that is collaborative and culturally appropriate

2. ROR content and scope

- Request that the content of the ROR be expanded (e.g. additional information associated with inspections, reportable events, transportation, projects that are likely to cause significant adverse environmental affects and security)
- Provide further flexibility in the public proceeding process to ensure effective engagement and intervention



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Errata

- Security SCA rating for WL is 'Below Expectations' for 2020
- CRL estimated dose to the public data was updated from 0.0015 mSv/year to 0.0039 mSv/year
- Addition of one environmental action level exceedance occurred at CRL
- Change to the highest effective dose received by a CNL Nuclear Energy Worker in 2021 to 7.01 mSv



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Conclusions

CNSC staff performed regulatory oversight activities at all CNL sites in 2021, and conclude that:

- All CNL sites operated safely in 2021
- Doses to workers and the public were below regulatory limits
- Workers were protected from conventional health and safety risks
- Environmental releases were below regulatory limits
- SCAs were rated satisfactory with the exception of Security at CRL and WL



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